

FEBRUARY 2004

EMERGENCY ACTION PLAN

CURTIS POND DAM CALAIS, VERMONT Dam #40.09 (Class 2 Dam)



By:

**DuBois
& King^{INC.}**

ENGINEERING • PLANNING • DEVELOPMENT • MANAGEMENT

TABLE OF CONTENTS

Section 1	Introduction
Section 2	Dam Warning Condition (Yellow or Red)
Section 3	Notification Procedures and Responsibilities
Section 4	Inundation Map
Appendix A	Basic Geometric Data and Flood Analysis
Appendix B	Impact of Breach
Appendix C	Training and Annual Testing
Appendix D	Local Evacuation Procedure
Appendix E	Posting of The Plan
Appendix F	Record of Changes and Additions

SECTION 1

Introduction

Background

This document is an Emergency Action Plan (EAP) for the Curtis Pond Dam located in Calais, Vermont. This EAP is to be used by the Dam Owner, and local and state emergency response officials in the event of a potential or actual failure of Curtis Pond Dam.

The primary purpose of this EAP is to provide general procedures to be followed by emergency response officials to notify people, as appropriate, whose homes and property may be in danger of flooding as a result of a dam failure.

This EAP is organized around three (3) basic components which include:

Section 2: Dam Warning Condition (Yellow and Red)

Section 2 discusses the role and responsibility of the Dam Monitor in assessing the condition of the dam and deciding if a potential or actual emergency situation exists at the dam. A critical component of this EAP is the determination if an emergency exists at the dam and if the Notification Procedures should be implemented.

Section 3: Notification Procedures

Section 3 presents the Notification Procedures. If the Dam Monitor decides that an emergency situation does exist, then the Notification Procedures in this Section should be followed. This Section includes a flow chart that illustrates the specific notification sequence that emergency response officials should follow. It also provides a responsibility checklist to be used by people who implement the notification process.

Section 4: Inundation Map

Section 3 contains an Inundation Map that illustrates the approximate limits of flooding during 2 types of dam failure. The inundation map was prepared using approximate methods to map flood limits resulting from dam failures. The depth

of flooding, and associated aerial extent of flooding may increase or decrease depending on the exact circumstances of dam failure and antecedent metrology conditions.

A dambreak flood analysis was conducted to estimate the aerial limits of flooding. The linear limits of flooding analyzed extend from Curtis Pond Dam to the Kent Corners area of Calais. It is probable that flooding may occur further down Pekin Brook. It is recommended that subsequent studies extend the limits of the dambreak analysis and the inundation map.

Appendices

This EAP also contains several appendices with important information contained therein. Keeping the EAP up to date is very important as people move into and out of the area. Contact names and telephone numbers are constantly changing. Therefore, for this EAP to remain effective, the information needs to remain current.

The Dam Owner is advised that the procedures in this EAP are intended as a guideline. It is important that the Notification Procedures be tested for effectiveness, and the procedures should be adjusted as necessary to best match the current condition at Maple Corners.

SECTION 2

Dam Warning Condition (Yellow or Red)

The purpose of this Section is to provide guidance for the inspection of Curtis Pond dam, and to determine if a potential or actual emergency condition exists at the dam.

Once recommended repairs are implemented, Curtis Pond Dam, like most dams, does not need to be continuously monitored. However, qualified people on behalf of the Dam Owner should inspect the dam annually and prior to and following a severe flood event.

The Dam Owner should identify a Dam Monitor(s) who will have responsibility to inspect the dam and identify and record deficiencies and potential problems. The Dam Monitor(s) should have experience in evaluating the condition of dams, and specifically the Curtis Pond Dam. An inspection checklist is attached to this EAP. The condition of the dam, maintenance work, and water levels are typically recorded during inspections in a logbook to be maintained by the Dam Monitor.

The Dam Monitor is advised, if time allows, to seek concurrence of the dam condition before making a decision whether or not to implement the Notification Procedures. In most situations, there should be adequate time for the Dam Monitor to have other people come to the dam and inspect it at the same time.

The Dam Monitor is responsible to apply judgment and determine if there is adequate time to seek concurrence, or if the situation requires immediate implementation of the Notification Procedures.

Annual Inspections

Annual inspections of the dam by qualified personnel are recommended. The structural components of the dam are checked and the condition of the dam is recorded. These inspections would be coordinated with the Vermont Dam Safety Office and inspection results by the Dam Owner and Vermont Dam Safety officials compared. Annual inspections will allow for the timely identification of deficiencies and the planning for appropriate repairs.

The Dam Monitor should participate in the annual inspections, as it will provide specific experience in the function of the dam. This experience becomes very valuable during times of severe storm events. The Dam Monitor should retain a copy of the inspection report.

Storm Event Inspections

The dam should also be inspected prior to and following a severe storm event. It is important to ensure that the spillway is not plugged with debris as it will reduce the hydraulic capacity and increase the potential for overtopping. A brief visual check by the Dam Monitor will conform that the dam is in a normal condition, or conversely, will allow the Dam Monitor to take action, such as initiating the removal of debris, if required.

A severe storm event is one where the river flows resulting from rainfall exceed the spillway hydraulic capacity and the Curtis Pond dam is potentially overtopped. Table 2 in Appendix A summarizes various frequency storm events and 24-hour rainfall depths. The data under the Available Freeboard column shows that the reconstructed dam could be overtopped by 0.1 feet during a 25-year storm event. A 25-year storm event has an equivalent 24-hour rainfall depth of 3.7-inches.

There are a large variety of meteorology and watershed conditions that could result in the equivalent of a 24-hour, 3.7-inch rainfall depth. For example, long periods of light rain will saturate the ground, and an intense rainfall of less than 3.7-inches could generate the same level of runoff to overtop the dam. Therefore, the Dam Monitor is therefore advised to check the dam during long periods of rainfall and when an intense 2 to 3-inch rainfall storm event is forecasted.

Interim Inspections

As of January 30, 2004, repairs to the existing Curtis pond Dam have not been scheduled for implementation. In 2003, an Inspection Checklist and Schedule of inspections for the deteriorated dam was prepared by local citizens and the Vermont Dam Safety office. A copy of this information (6-pages, including photographs) is attached to Section 2 and should be used until the dam is reconstructed.

A new Inspection Procedure and Checklist will be prepared and included in an Operations and Maintenance manual (O&M) as part of the final design of the new dam. Once the new dam is constructed, then the new O&M procedures should be followed.

Dam Warning Conditions

There are two warning conditions that will require action to be taken by the Dam Monitor(s). These conditions are known as **CONDITION YELLOW** and **CONDITION RED**, and are further outlined below.

CONDITION YELLOW

CONDITION YELLOW is a condition where the safety of the dam becomes questionable, but the dam has not failed, nor has dam failure begun. It is important to remember that a Condition Yellow can occur during normal flow conditions or during flood conditions. Indeed, failure may, or may not occur, but the condition has deteriorated to the point where it is prudent to initiate the Notification Procedures to minimize the potential for loss of life and property damage

A CONDITION YELLOW exists when, in the opinion of the Dam Monitor(s), there is a dangerous situation developing and concludes that dam failure becomes a significant possibility.

Because the notification and evacuation of people from their homes is a serious event, it is recommended that whenever possible, the Dam Monitor collaborate with the Dam Owner, Local Officials, Dam Engineer or the Vermont Dam Safety officials.

If a **CONDITION YELLOW** exists, the Dam Monitor may elect to first implement a portion of the Notification Procedures. By contacting the Dam Owner, Local Officials, Dam Engineer or the Vermont Dam Safety officials first, preparation can begin to notify and evacuate downstream residents but the actual implementation may be avoided if repairs can be made.

It is the Dam Monitor's responsibility to make the decision if there is adequate time to contact other people, or to immediately initiate the Notification Procedures.

A Checklist is attached that describes emergency level concerns at the dam. Several examples of a **CONDITION YELLOW** may include (but not limited to):

- ✓ Visually noticeable movement of the stones on the downstream face of the dam
- ✓ Visually noticeable movement of other components of the dam
- ✓ A sink hole, new or enlarged existing and / or vortexing upstream or sloughing
- ✓ Visually noticeable discharge of silts and sediments in the downstream channel

- ✓ Visually noticeable increase in discharge in the downstream channel
- ✓ Overtopping of the dam, or adjacent road.
- ✓ Severe plugging of the spillway prior to an impending storm event

It is the Dam Monitor's responsibility to determine if a Condition Yellow exists, either independently, or following further consultations with others as indicated above. It is also the Dam Monitor's responsibility to determine if downstream residents should be notified of the condition or if local officials should be notified first and preparations made for resident notification if it becomes necessary.

If a dangerous situation develops during normal flow conditions, the Dam Monitor should immediately notify others (Dam Owner, Local Officials, Dam Engineer or the Vermont Dam Safety officials) and initiate a closer inspection of the dam.

During periods of anticipated high water levels, the Dam Monitor will inspect the dam for signs of stress. If the lake elevation is approaching the top of the dam, and especially if more rainfall or runoff is expected, the Dam Monitor will make frequent return trips to the dam until the lake level begins to drop.

If the Dam Monitor determines that there is not adequate time to contact other people, then a CONDITION RED is assumed to exist and the Notification Procedures should be implemented immediately.

CONDITION RED

Condition Red is an emergency condition and dam failure has occurred or is imminent. If active movement and unraveling of the dam/stones is visible, if significant sinkholes and vortexing is occurring, or if other conditions at the dam as indicated on the attached checklist is developing, then the Dam Monitor should immediately initiate the Notification Procedures. Once all notifications have been made, the Dam Monitor should remain at the dam (at a safe location) to monitor the situation until the condition subsided.

During a Condition Red, local emergency response personnel must notify the impacted Town residents to evacuate, close impacted roads, and reroute traffic.

INSPECTION CHECKLIST

Date: _____ Time: _____ am/pm

Pond Level: _____ from gage (0 gage reading equals spillway crest)

Sloughing or Sinkhole: YES ____ NO ____ If YES, location: _____
(refer to figure below)

Seepage: YES ____ NO ____ If YES, location: _____ (refer to figure below)

Estimated quantity of seepage _____ (g.p.m.)

Vortex: YES ____ NO ____, If YES, location: _____ (refer to figure below)

Other
Discrepancies: _____

Estimated Rate of Rise: _____ in/hr.

INSPECTION CHECKLIST
Curtis Pond Dam
Calais, VT

Date of Inspection: _____ Time of Inspection: _____
Weather: _____ Inspected By: _____
Water Level (in inches over top of nail): _____

Upstream Face

Erosion: _____
Depressions: _____
Other: _____

Spillway

Debris or blockage: _____
Leakage into Dam: _____

Crest

Sinkholes or Erosion: _____
Animal Burrows: _____
Erosion or overtopping: _____

Downstream Face

Seepage thru face: _____

Seepage thru low level drain: _____

Seepage under dam: _____

Wall movement (lean): _____

The purpose of this inspection is to note any changes that may be occurring, or have occurred since the last inspection. The principle areas of concern are seepage through or under the dam, sediment in the seepage, movement of the downstream wall, new or changed depressions, sinkholes or erosion in the crest, new sinkholes or depressions in the upstream face, and debris or blockage in the spillway. Any significant changes should be immediately reported to the Town and to the Dam Safety Section in Waterbury.

CURTIS POND DAM

SCHEDULE OF INSPECTIONS

THE FOLLOWING IS THE PROCESS RELATED TO THE INSPECTION OF THE CURTIS POND DAM DURING THE INTERIM INTERVAL PRIOR TO THE CONSTRUCTION OF A NEW DAM UPSTREAM OF THE CURRENT DAM.

1. THE DAM WILL BE OBSERVED DAILY DURING THE NORMAL COURSE OF DAILY ACTIVITIES OF THE VARIOUS INDIVIDUALS INSPECTING THE DAM. DAILY ACTIVITIES ARE DEFINED AS DRIVING SLOWLY BY THE DAM AND PROPERTY OWNERS ADJACENT TO THE DAM OBSERVING THE DAM WHILE WORKING IN THEIR YARD. IF CHANGES ARE APPARENT, A DETAILED INSPECTION WILL BE CONDUCTED UTILIZING THE INSPECTION CRITERIA AND COMPLETING THE REPORT FORM.
2. A FORMAL MONTHLY INSPECTION WILL BE CONDUCTED UTILIZING THE INSPECTION CRITERIA AND COMPLETING THE REPORT FORM DURING THE DRY SEASON AND STABLE WEATHER CONDITIONS. THE REPORT IS TO BE FILED WITH THE STATE OF VERMONT DAM SAFETY DEPARTMENT ON A MONTHLY BASIS.
3. A FORMAL WEEKLY INSPECTION WILL BE CONDUCTED UTILIZING THE INSPECTION CRITERIA AND COMPLETING THE REPORT FORM DURING THE FOLLOWING:
 - A) SPRING PRIOR TO ICE OUT.
 - B) SIGNIFICANT RAINFALL (GREATER THAN 2 INCHES IN A 24 HOUR PERIOD), A FLOOD WATCH WARNING, OR OTHER HIGH WATER CONDITIONS.THE REPORT WILL BE FILED WITH THE STATE OF VERMONT DAM SAFETY.
4. THE STATE OF VERMONT SAFETY WILL CONDUCT A MONTHLY INSPECTION TO ASSURE PROPER INSPECTIONS ARE BEING PERFORMED BY THE VOLUNTEER DAM INSPECTORS.

IF SIGNIFICANT CHANGES ARE OBSERVED IN ANY OF THE ABOVE INSPECTIONS, AN IMMEDIATE CALL WILL BE MADE TO THE STATE OF VERMONT DAM SAFETY DEPARTMENT.

**Inspection guidelines for
Curtis Pond Dam
Calais, VT**

September 22, 2003

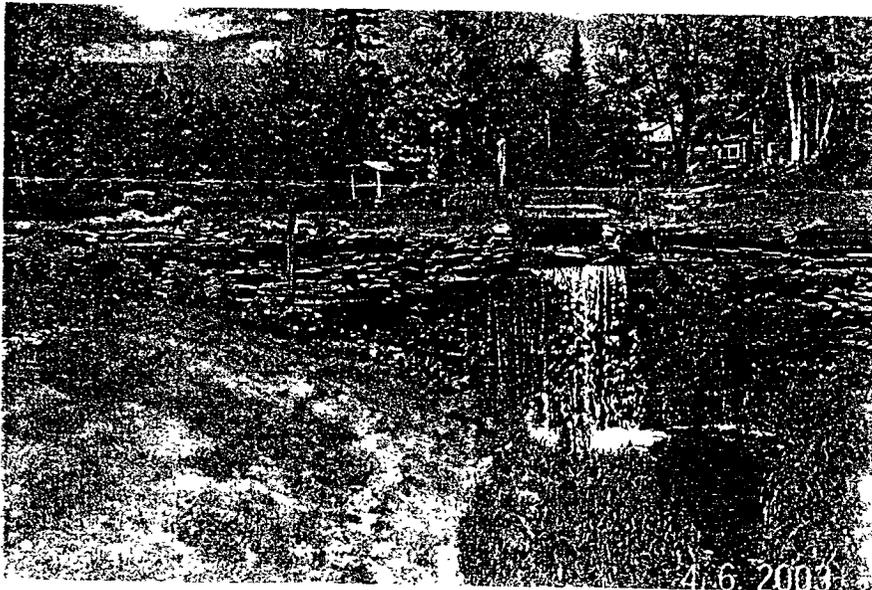
This is a brief description of areas that could be evaluated at the Curtis Pond Dam by volunteer or Town of Calais inspectors. This inspection would serve to document any changes to the structure or facilities until the dam can be reconstructed.

DESCRIPTION OF STRUCTURE – The dam is a dry masonry structure with sand and earth fill behind the downstream stonewall facing. It is built across a ravine and is approximately 110 feet long and 12 feet high at the center section. The dry stonewall on the downstream side supports the earth fill placed behind it.

The spillway section is approximately 5 feet wide by 11 feet long, located near the center of the dam, and is lined with concrete and mortared stones. The spillway has a drop of approximately 11 feet to the brook bed below.

There is also an old outlet or drain located near the bottom of the dam to the left (looking downstream) of the spillway. This drain is a 2-foot by 2 foot opening extending into the dam an unknown distance. There is no known means of operating this drain.

The actual interior construction of the dam upstream of the stonewall is not known.

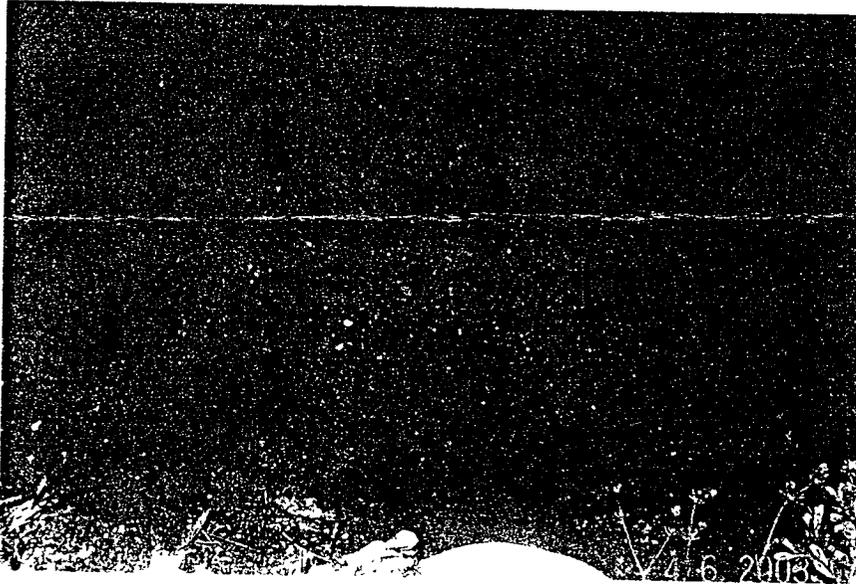


Downstream Face of Dam

AREAS TO INSPECT

UPSTREAM FACE

Any depressions or sinkholes as well as unusual erosion on the upstream face should be noted.



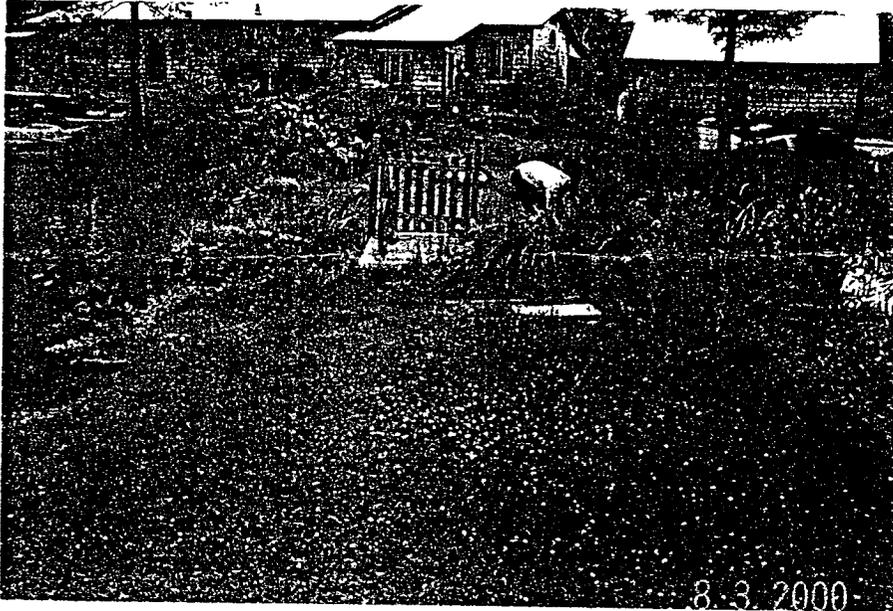
Depression on upstream face

The spillway should be inspected to assure that it is clear of debris and blockages, and that water is not entering the core of the dam from the spillway.



CREST

The crest should be inspected to determine if there are any new or changed depressions, sinkholes, or erosion.

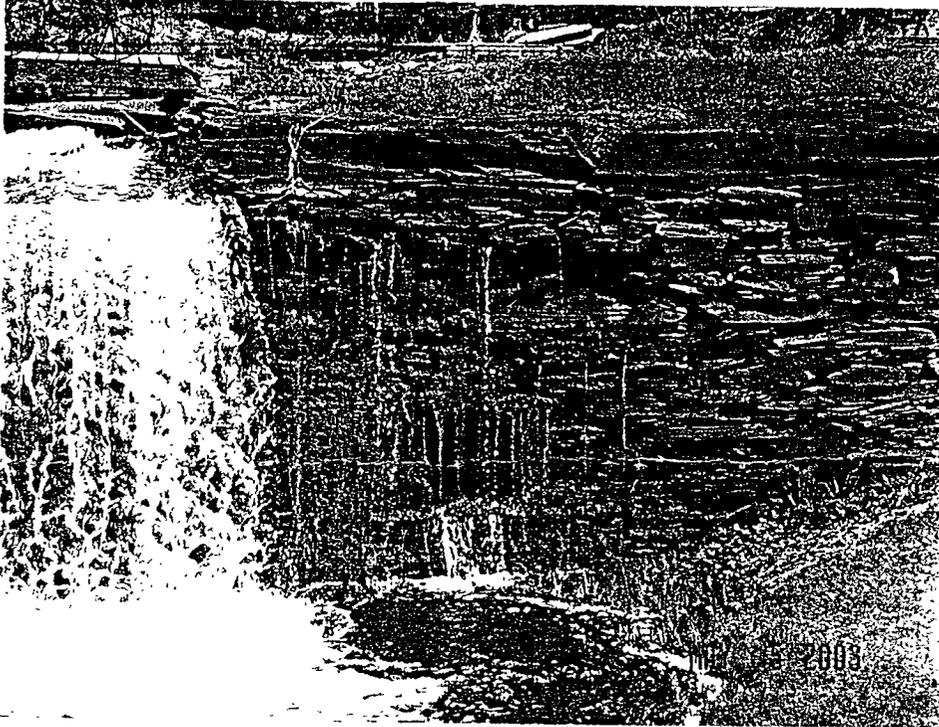


The pond elevation should also be determined by noting the depth of water over the nail driven into a log on the upstream, right side of the spillway. Any depressions or sinkholes should be noted with measurements if possible.

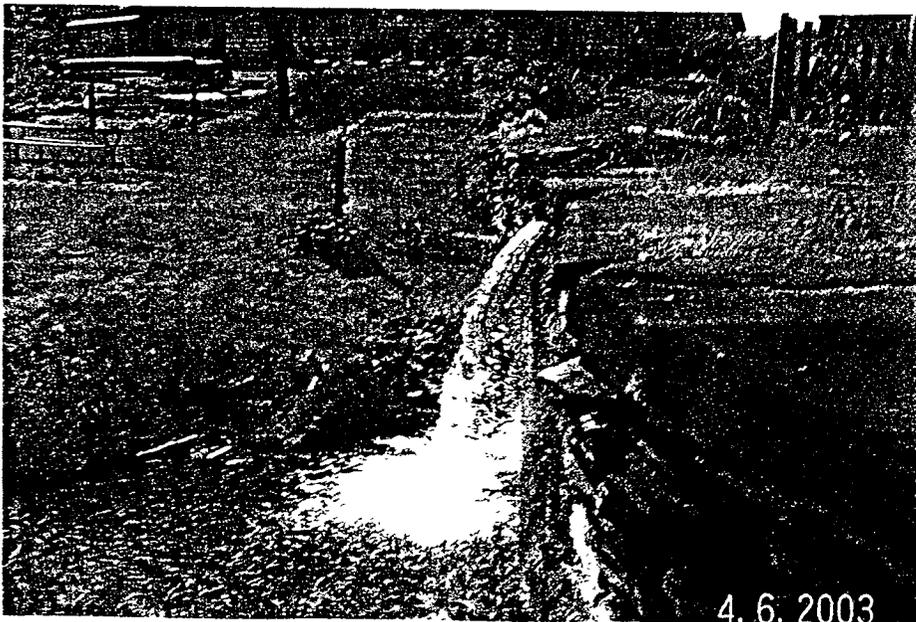


Sinkhole on crest

DOWNSTREAM FACE



The downstream face should be evaluated for any significant change in the seepage. This picture shows the D/S face to the left of the spillway during fairly high water in the spring of 2003. The inspector(s) will become familiar with normal seepage patterns, and should note any significant departure from a normal situation. Notice should also be taken of any sediment in the seepage, which might indicate that material upstream of the stonewall is being carried away. Any additional downstream movement or lean of the stone face should also be noted.



SECTION 3

Notification Procedures and Responsibilities

As indicated in Section 2, the Dam Monitor is responsible for making the decision to implement the Notification Procedures. As also stated, it is desirable to have concurrence regarding implementation from Dam Owner, Local Officials, Dam Engineer or the Vermont Dam Safety Officials. The following information is to be used once a decision has been made to implement the Notification Procedures and during Annual Testing of this EAP.

A Notification Flowchart has been prepared and is attached to this Section. The purpose of the Notification Flowchart is to provide a visual sequence for use by people to place calls and to notify others.

The following pages provide a checklist for the responsibilities of each agency or person shown on the Notification Flowchart during an emergency situation at the Curtis Pond Dam.

When the Notification Procedures are activated, and during annual testing of the plan, each person responsible for a notification is requested to fill out, date, and sign their assigned checklist. These checklists are attached to this Section. Additional copies should be made available to all individuals on the flowchart.

A flood inundation map is attached to Section 3 to assist local authorities in the development of an evacuation plan in the case of dam failure.

CONDITION YELLOW NOTIFICATION

As previously discussed, during a **CONDITION YELLOW**, the Dam Monitor may elect to notify only a portion of the flowchart, depending on the actual condition of the dam. In this case, the Dam Monitor should contact the following:

- ✓ Dam Owner
- ✓ Calais Emergency Management Coordinator
- ✓ Calais Road Commissioner
- ✓ Calais Selectboard Chair
- ✓ Vermont Dam Safety Office

These people should then decide whether or not to implement the full Notification procedures, including 911 and the downstream residents.

CONDITION RED NOTIFICATION

The Notification Flowchart and associated checklists are intended for a **CONDITION RED**. Everyone on the flowchart should be notified and evacuation procedures of people in the inundation area should begin.

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

CURTIS POND DAM MONITOR RESPONSIBILITIES

1. First, the Dam Monitor will contact the Calais Emergency Management Coordinator (Toby Talbot) at (802) 229-0577 (work) or (802) 223-3942 (home), to notify him of the Dam Warning Condition.
2. Second, the Dam Monitor will contact the 911 Notification through the Williston Dispatch at 911 and notify them that a failure is imminent or a potentially hazardous situation is developing at the dam.
3. Third, the dam monitor will contact Calais's Road Commissioner (Donald Singleton, Jr.), at (802) 456-7466 (Work) or (802) 229-0861 (Home) to notify him of the Dam Warning Condition.
4. Fourth, the Dam Monitor will then in coordination with the Emergency Management Coordinator, contact downstream residents on the following list. The residents will be notified of the Dam Warning Condition, and instructed on evacuation procedures.
5. Once the Dam Monitor has completed his / her notification responsibilities, he / she should then complete the following Notification Checklist.

6. In an actual dam failure or Annual Test, the Dam Monitor should then remain on-station (at a telephone) and assist other local emergency response officials as needed.
7. Upon completion of the previous tasks the Curtis Pond Dam Monitor has fulfilled the responsibilities of this EAP.

DAM MONITOR

Notification Checklist

**(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)**

Monitor's Name:		
Date:	Time:	
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

<i>PARTY CONTACTED</i>	<i>TIME</i>	<i>PERSON CONTACTED</i>
1. Calais Emergency Management Coordinator (Toby Talbot) <u>(802) 229-0577</u> (work) <u>(802) 223-3942</u> (home)		
2. 911 Center – Williston		
3. Calais Road Commissioner (Donald Singleton Jr.) <u>(802) 456-7466</u> (work) <u>(802) 229-0861</u> (home)		
4. Calais Residents (downstream) (See Attached List)		

Dam Monitor Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

CALAIS EMERGENCY MANAGEMENT COORDINATOR RESPONSIBILITIES

1. After receiving a call from the Dam Monitor, the Calais Emergency Management Coordinator, in coordination with the Dam Monitor, will begin contacting downstream residents on the following list, to notify them of the Dam Warning Condition.

2. Upon notifying the downstream residents the Calais Emergency Management Coordinator will carry out the remainder of his/her responsibilities as the Town Emergency Management Coordinator. In addition, the Emergency Management Coordinator will also assist in the evacuation of residents in the inundation limits, as necessary.

EMERGENCY MANAGEMENT COORDINATOR

Notification Checklist

(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)

Name:		
Date:	Time:	
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. Calais Residents (downstream) (See Attached List on Flowchart)		

Emergency Management Coordinator Signature:

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

911 CENTER – WILLISTON DISPATCH RESPONSIBILITIES

1. The 911 Center – Williston will contact the Capital West Dispatch in Montpelier (802) _____ (24 hrs) and notify them of the Dam Warning Condition.

2. Upon notifying the local Dispatch Center, 911 Dispatch has completed their notification responsibilities.

911 CENTER – WILLISTON DISPATCH

Notification Checklist

*(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)*

Name:		
Date:	Time:	
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. Capital West Dispatch (802) _____ (24 HRS)		

9-1-1 Dispatcher's Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

CALAIS ROAD COMMISSIONER RESPONSIBILITIES

1. After receiving a call from the dam monitor, the Calais Road Commissioner will contact the Selectboard Chair Robert Withey at (802) 456-8142 (Home) to notify him/her that a failure is imminent or a potentially hazardous situation is developing at the Curtis Pond Dam.
2. Second, the Calais Road Commissioner will contact the Washington County Sheriff's Dispatch at (802) 223-3001, to notify them of the Dam Warning Condition at the Curtis Pond Dam.
3. Contact Calais Emergency Management Coordinator (Toby Talbot) at (802) 229-0577 (Work) or (802) 223-3942 (Home) to notify him/her of the Dam Warning Condition at the Curtis Pond Dam.
4. Upon notifying the appropriate parties, the Calais Road Commissioner will mobilize Town road crews to install barricades to prevent traffic from entering into the inundation limits. In addition, the Road Commissioner will also assist in the evacuation of residents in the inundation limits, as necessary.
5. Once the excavation route from within the inundation limits is established the Road Commissioner, in coordination with the EMC and assistance of the responding Fire Department, will begin a house-to-house notification of those residents not contacted by phone.

6. Upon completion of the evacuation of all residents in the downstream inundation limits the Road Commissioner will have completed his/her notification responsibilities. It may be necessary that the Road Commissioner carry out additional duties assigned during the event.

CALAIS ROAD COMMISSIONER

Notification Checklist

**(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)**

Name:		
Date:	Time:	Call Received from:
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____
PARTY CONTACTED	TIME	PERSON CONTACTED
1. Chairman, Board of Selectmen (Robert Withey) <u>(802) 456-8142</u> (home)		
2. Washington County Sheriff's Department Dispatch <u>(802) 223-3001</u> (24 hours)		
3. Calais Emergency Management Coordinator (Toby Talbot) <u>(802) 229-0577</u> (work) <u>(802) 223-3942</u> (home)		

Calais Road Commissioner Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

CAPITAL WEST DISPATCH RESPONSIBILITIES

1. After receiving a call from 911 Dispatch, the Capital West Dispatch will contact the East Montpelier and Woodbury Fire Departments at (802) 476-4111 (East Montpelier) and (802) 223-5555 (Woodbury) and notify them of the Dam Warning Condition at the Curtis Pond Dam.

2. Capital West Dispatch will then contact the Washington County Sheriff's Department at (802) 223-3001 and notify them of the Dam Warning Condition at the Curtis Pond Dam.

3. Upon notifying the appropriate parties the notification responsibilities of Capital West Dispatch are complete.

CAPITAL WEST DISPATCH

Notification Checklist

*(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)*

Name:		
Date:	Time:	Call Received from:
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. East Montpelier Fire Department (802) 476-4111 (24 hours) and Woodbury Fire Department (802) 223-5555 (24 hours)		
2. Washington County Sheriff's Department (802) 223-3001 (work)		

Capital West Dispatch Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

EAST MONTPELIER AND WOODBURY FIRE DEPARTMENT RESPONSIBILITIES

1. After receiving a call from the Capital West Dispatch, the closest available fire department dispatch will contact the Washington County Sheriff's Department at (802) 223-3001 and notify them of the Dam Warning Condition at the Curtis Pond Dam.

2. The East Montpelier and Woodbury Fire Department dispatch will next contact the Washington Central Supervisory Union (SU32) Office in Barre at (802) 476-5011 and notify them of the Dam Warning Condition at the Curtis Pond Dam.

3. The closest available fire department will respond to Maple Corners and coordinate evacuation assistance with the Calais Road Commissioner.

4. Upon completing the evacuation of all residents within the downstream inundation limits the fire department has completed the responsibilities for this event.

**EAST MONTPELIER & WOODBURY
FIRE DEPARTMENTS
(DISPATCH)**

Notification Checklist

*(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)*

Dispatcher's Name:		
Date:	Time:	Call Received from:
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. Washington County Sheriff's Department Dispatch (802) 223-3001 (24 hours)		
2. SU32 Barre Office (802) 476-5011		

Fire Department Dispatch Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

WASHINGTON COUNTY SHERIFF'S DISPATCHER RESPONSIBILITIES

1. After receiving a call from the Capital West Dispatch, the Washington County Sheriff's Dispatcher will contact the East Montpelier and Woodbury Fire Department Dispatch at (802) 476-4111 (East Montpelier) and (802) 223-5555 (Woodbury) to notify them of the Dam Warning Condition at the dam. Should the responding Fire Department have already contacted the Washington County Sheriff's Department, then the call need not be made but should be so noted on checklist.

2. The Washington County Sheriff's Dispatcher will contact the Calais Road Commissioner (Donald Singleton, Jr.), at (802) 456-7466 (Work) or (802) 229-0861 (Home) to notify him/her that failure is imminent or a potentially hazardous situation is developing. Should the Road Commissioner have already contacted the Washington County Sheriff's Department, then the call need not be made but should be so noted on checklist.

3. The Washington County Sheriff's Dispatcher will contact the Washington Central Supervisory Union (SU32) Office by telephone at (802) 476-5011 or by radio/page if after working hours to notify them of the Dam Warning Condition developing at the dam.

4. Next, the Washington County Sheriff's Dispatcher will contact the Vermont State Police Station in Middlesex, Vermont at (802) 229-9191 (24 Hour) to notify them of the Dam Warning Condition developing at the dam.

5. Next, the Washington County Sheriff's Dispatcher will contact the Chairman, Board of Selectmen (Robert Withey), at (802) 456-8142 (Home) to alert the Chairman of the Dam Warning Condition at the Curtis Pond Dam.

6. Upon completion of the above procedures the notification responsibilities are complete. It may be necessary for the Washington County Sheriff's Dispatch to assign an officer to Calais to assist in the evacuation efforts.

**WASHINGTON COUNTY SHERIFF'S
DEPARTMENT DISPATCHER**

Notification Checklist

**(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)**

Name:		
Date:	Time:	Call Received from:
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. East Montpelier and Woodbury Fire Departments <u>(802) 476-4111</u> (East Montpelier) <u>(802) 223-5555</u> (Woodbury)		
2. Calais Road Commissioner (Donald Singleton, Jr. <u>(802) 456-7466</u> (work) <u>(802) 229-0861</u> (home)		
3. SU32 Barre Office <u>(802) 476-5011</u>		
4. Vermont State Police Station Middlesex, VT <u>(802) 229-9191</u> (24 hours)		
5. Chairman, Board of Selectmen (Robert Withey) <u>(802) 456-8142</u> (home)		

Washington County Sheriff's Department Dispatch

Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

WASHINGTON CENTRAL SUPERVISORY UNION (SU32) RESPONSIBILITIES

1. After receiving a call from either the responding Fire Department Dispatch or the Washington County Sheriff's Dispatch, the Barre SU32 will then contact their school bus drivers by radio, page, or cell phone contact to notify them of the Dam Warning Condition at the Curtis Pond Dam and to divert busses from entering roads near the inundation area.

2. Second, the Barre SU32 Office will contact the Calais Elementary School Principal at (802) 454-7777 between 7:30 a.m. and 3:30 p.m. to notify them of the Dam Warning Condition at the Curtis Pond Dam.

3. Upon receiving notification the Supervisory Union will take the proper protective actions with regard to the condition at the Curtis Pond Dam.

SU32 BARRE OFFICE

Notification Checklist

*(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)*

Name:		
Date:	Time:	Call Received from:
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. Bus Drivers (Radio or Cell Phone Contact)		
2. Calais Elementary School (802) 454-7777 (7:30 a.m. – 3:30 p.m.)		

SU32 Barre Office Signature: _____

**CURTIS POND DAM
NOTIFICATION PROCEDURES AND RESPONSIBILITIES
CONDITION RED**

VERMONT STATE POLICE DISPATCHER RESPONSIBILITIES

1. After receiving a call from the Washington County Sheriff's Dispatch, the Vermont State Police Dispatcher will contact Vermont Office of Emergency Management at 1-800-347-0488 (24 hours) or 1-802-244-8721 to notify them of the Dam Warning Condition at the Curtis Pond Dam.

2. Next, the Vermont State Police Dispatcher will contact the Vermont Department of Environmental Conservation, Dam Safety Section at 1-802-241-3454 between 8:00 a.m. and 4:00 p.m. Monday through Friday to notify them of the Dam Warning Condition at the Curtis Pond Dam. An "on-call" person for the Division can be reached at night or weekends through the Vermont State Police (1-802-_____).

VT STATE POLICE

Notification Checklist

*(to be filled out during any condition yellow or condition red incident,
and during annual testing of the EAP)*

Monitor's Name:		
Date:	Time:	Call Received from:
Check if: Condition Yellow _____	Condition Red _____	Notification Test _____

PARTY CONTACTED	TIME	PERSON CONTACTED
1. VT Office of Emergency Management (802) <u>244-8721 / 800-347-0488</u>		
2. VANR - DEC- Dam Safety Office (802) <u>241-3454</u> or Contact State Police after hours for "on call" staff.		

VT State Police Signature: _____

Notification Flowchart

This Notification Flowchart summarizes the procedures outlined in Section 3. The flowchart provides a step-by-step progression of the notification process. Numerical prioritization is assigned to each of the notification steps. The information provided was obtained with assistance from the Town and State Officials in January of 2004. Verification of this information is required regularly to remain current.

SECTION 4

Inundation Map

The Inundation Map is the result of analysis conducted to determine the approximate limits of flooding during a dam failure scenario downstream of the Curtis Pond Dam. Two hypothetical dam failure scenarios were evaluated for the inundation map, they include a Sunny-day failure, and a Storm-day failure. The hypothetical storm used in the analysis was the 100-year storm event, a storm that results in over topping of the dam. The two dam failure scenarios were subsequently plotted on the map delineating the inundation area downstream of Curtis Pond.

This map was prepared using current digital orthophotos and associated digital elevation models (DEM) obtained from the Vermont Mapping Program. This map was developed using ARC-View Version 3 and is compatible with the Vermont GIS System. A Digital Terrain Model (DTM) was prepared using the DEM data and five-foot interval contours were created. These contours were used in plotting the inundation limits.

The results of the dam failure analysis are plotted on the map indicating the limits of flooding that can be anticipated under a dam failure scenario from Curtis Pond Dam downstream to Kent Corners. This mapping provides graphical information for use in emergency response and evacuation route planning.

Flood limits were estimated for a Sunny-Day dam failure condition and during a 100-year storm dam failure condition. Flood limits are illustrated on the Inundation Map in Section 4 of this EAP. Section 3 contains an Inundation Map that illustrates the approximate limits of flooding during 2 types of dam failure. The inundation map was prepared using approximate methods to map flood limits resulting from dam failures. The depth of flooding, and associated aerial extent of flooding may increase or decrease depending on the exact circumstances of dam failure and antecedent metrology conditions.

The linear limits of flooding analyzed extend from Curtis Pond Dam to the Kent Corners area of Calais. It is probable that flooding may occur further down Pekin Brook. It is recommended that subsequent studies extend the limits of the dambreak analysis and the inundation map.

APPENDICES

Appendix A	Basic Geometric Data and Flood Analysis
Appendix B	Impact of Breach
Appendix C	Training and Annual Testing
Appendix D	Local Evacuation Procedure
Appendix E	Posting of the Plan
Appendix F	Record of Changes and Additions

APPENDIX A

Basic Geometric Data and Flood Analysis

TABLE 1 - BASIC GEOMETRIC DATA

DESCRIPTION	DATA	COMMENT
Surface Area	76 acres	Water level at the principal spillway crest
Drainage Area	917 acres	
Curtis Pond Dam Maximum Storage	1,000 ac-ft.	Top of dam
Spillway Freeboard	1.5 ft	Distance from the principal spillway crest to the top of the dam
Dam Height	14 ft	Top of dam at maximum height
Curtis Pond Dam 100-yr Storm:	1,222 cfs inflow 54 cfs routed outflow	Based on 2003 Hydrologic and Hydraulic Analysis.

TABLE 2 – FLOOD ROUTING RESULTS SUMMARY

Storm Event Frequency	Total Inflow Peak Discharge (cfs)	Routed Outflow Peak Discharge (cfs)	Maximum Lake Level (assumed datum)	Available Freeboard (ft)	24-hour Storm Rainfall Event (inches)
2-Year	239	8	1001.7	0.8	2.1
10-year	520	20	1002.2	0.3	3.0
25-year	764	44	1002.6	-0.1	3.7
50-Year	951	86	1002.8	-0.3	4.2
100-year	1,222	161	1003.1	-0.6	4.9
500-year	1521	271	1003.3	-0.8	5.7
¼-PMP	1,561	330	1003.5	-1.0	6.7
½- PMP	3,959	1,804	1005.3	-2.8	13.5
¾ - PMP	6,508	4,168	1006.8	-4.3	20.3
1-PMP	8,802	6,063	1007.6	-5.1	27.0

Notes:

Freeboard is measured from the top of the dam to the maximum lake level

Initial Water Level: El. 1001.0 (lake level at beginning of flood)

Top of Dam: El. 1002.5

APPENDIX B

Impact of Breach

This appendix is excerpted from the Curtis Pond Engineering Analysis Report prepared for the Curtis Pond Dam Committee and the State of Vermont Agency of Environmental Conservation by DuBois & King, Inc., dated January 30, 2004.

The dam failure analysis was simulated using the National Weather Service Dam-Break Flood Forecasting Model (DAMBRK) developed by D.L. Fread. The model predicts downstream flood wave peak discharges, depths, velocities and travel times for selected downstream locations.

Flood limits were estimated for a Sunny-Day dam failure condition and during a 100-year storm dam failure condition. Flood limits are illustrated on the Inundation Map in Section 4 of this EAP. Section 3 contains an Inundation Map that illustrates the approximate limits of flooding during 2 types of dam failure. The inundation map was prepared using approximate methods to map flood limits resulting from dam failures. The depth of flooding, and associated aerial extent of flooding may increase or decrease depending on the exact circumstances of dam failure and antecedent metrology conditions.

The linear limits of flooding analyzed extend from Curtis Pond Dam to the Kent Corners area of Calais. It is probable that flooding may occur further down Pekin Brook. It is recommended that subsequent studies extend the limits of the dambreak analysis and the inundation map.

Numerical results of the analysis are included on the following Tables B-1 and B-2. Supporting documentation for the Sunny-day and Storm-day failure scenarios are on file at the Vermont Dam Safety office.

Portions of several Town Roads would be impacted including:

- Worchester Road immediately downstream of the Curtis Pond Dam
- Kent Road from the intersection with County Road to the intersection with Church Road at Kent's Corners.

The Robinson Mill Dam at Kent's Corners and culverts along Pekin Brook upstream of Kent Corners may have a significant amount of damage as a result of the storm-day dam failure at Curtis Pond Dam.

The dam-break analysis indicates that the depth of flooding above the riverbed due to a storm-day dam failure would be approximately:

- 2.5 feet over the Worchester Road at the dam.
- 3.8 feet over County Road the intersection with Kent Road
- 1.3 feet over Kent Road at the Pekin Brook – Kent Road crossing near the access drive to the Washington Electric Maple Corners Substation No. 10.

**Table B-1
Dam Failure Summary
Failure of Curtis Pond Dam during “Sunny-day” Conditions**

Downstream Location on the Pekin Brook (River Stationing)	Sunny-day Failure Results			
	Peak Discharge (CFS)	Peak Water Surface Elevation (NGVD)	Above Streambed (FEET)	Time to Peak ¹ (MINUTES)
Worchester Road (MM 0.000)	1449	1220.5	10.5	0
Intersection of County Rd. and Kent Rd. (MM 0.121)	1447	1197.5	8.2	16
Pekin Brook – Kent Rd. Crossing near sub-station (MM 0.535)	1396	1151.0	6.6	29
Robinson’s Mill Dam (MM 0.795)	1378	1136.1	3.4	38

¹Time to peak measured from start of breach at Curtis Pond Dam; breach starts at hour 0.0.

**Table B-2
Dam Failure Summary
Failure of Curtis Pond Dam during “Storm-day” Conditions**

Downstream Location on the Pekin Brook (River Stationing)	Storm-day Failure Results			
	Peak Discharge (CFS)	Peak Water Surface Elevation (NGVD)	Above Streambed (FEET)	Time to Peak ¹ (MINUTES)
Worchester Road (MM 0.000)	2239	1221.1	11.1	0
Intersection of County Rd. and Kent Rd. (MM 0.121)	2200	1197.8	8.8	17
Pekin Brook – Kent Rd. Crossing near sub-station (MM 0.535)	2063	1151.7	7.3	34
Robinson’s Mill Dam (MM 0.795)	2038	1141.0	7.0	41

¹Time to peak measured from start of breach at Curtis Pond Dam; breach starts at hour 0.0.

APPENDIX C

Training and Annual Testing

D.1 Training

The dam is monitored by Town appointment Dam Monitor personnel.

D.2 Annual Testing

Every year the Committee shall conduct or arrange to have conducted a test of the emergency notification procedure. This shall be done by the dam monitor starting the notification procedure. The department shall monitor the test and collect a copy of the notification checklists noting any large discrepancy in the times calls were received by the different organizations/agencies. The department shall also discuss the test with all participating parties to ensure the success of the test. A copy of the notification checklist shall be sent to:

TO BE DETERMINED

APPENDIX D

Local Evacuation Procedure

Insert local evacuation procedure from the Town of Calais.

APPENDIX E

Posting of the Plan

A complete and up-to-date copy of the EAP shall be posted at the Department of Environmental Conservation office at 103 south Main Street, in Waterbury, at all times. In addition, all persons and agencies listed below have been issued a copy of the EAP, and shall be provided with an up-to-date copy of the plan. It is the responsibility of the Town Clerks to disseminate the EAP to the appropriate local emergency response personnel.

1. Dept. of Environmental Conservation
Facilities Engineering Division
Dam Safety Section
103 South Main Street
Waterbury, Vermont 03753
2. Dept. of Public Safety
Vermont State Police
Middlesex Station
1080 US Route 2
Middlesex, Vermont 05602
3. Vermont Emergency Management
Dept. of Public Safety
103 South Main Street
Waterbury, Vermont 05676
4. 911 Dispatch
2777 St. George Road
Williston, Vermont 05495
5. Eva Morse
Town Clerk
Town of Calais
668 West County Road
Calais, Vermont 05648

