

# STATE OF RHODE ISLAND

**2011**

Annual Report to the Governor  
on the Activities of the

## **DAM SAFETY PROGRAM**



Rehabilitated Limerock Dam (No. 295) in Lincoln

Department of Environmental Management

Prepared by the Office of Compliance and Inspection

## **TABLE OF CONTENTS**

<i>HISTORY OF RHODE ISLAND'S DAM SAFETY PROGRAM</i> .....	3
<i>STATUTES</i> .....	3
<i>Federal Energy Regulatory Commission (FERC) Authority</i> .....	4
<i>Proposed Legislation</i> .....	4
<i>GOVERNOR'S TASK FORCE ON DAM SAFETY AND MAINTENANCE</i> .....	4
<i>DAM SAFETY REGULATIONS</i> .....	5
<i>DAM CLASSIFICATIONS</i> .....	6
<i>INSPECTION PROGRAM</i> .....	8
<i>ACTIVITIES IN 2011</i> .....	9
<i>UNSAFE DAMS</i> .....	9
<i>COMPLIANCE INSPECTIONS</i> .....	18
<i>High Hazard Dam Inspections</i> .....	18
<i>Significant Hazard Dam Inspections</i> .....	21
<i>Requested Inspections</i> .....	23
<i>REPAIR APPROVALS</i> .....	23
<i>OWNER / CONTACT INFORMATION</i> .....	23
<i>Orphan Dams</i> .....	24
<i>REMOVALS</i> .....	25
<i>REGISTRATION</i> .....	25
<i>GRANTS TO DEM</i> .....	26
<i>INTERAGENCY COORDINATION</i> .....	27
<i>MEETING/SEMINAR ATTENDANCE</i> .....	27
<i>DEM OWNED DAM REPAIRS</i> .....	27
<i>EMERGENCY ACTION PLANS</i> .....	28
<i>DAM MANAGEMENT DISTRICTS</i> .....	29
<i>PROFESSIONAL ASSOCIATIONS</i> .....	29
<i>PROGRAM LIMITATIONS</i> .....	29
<i>STAFFING</i> .....	29
<i>FINANCIAL ASSISTANCE FOR REPAIRS</i> .....	30
<i>INSPECTION LIMITATIONS</i> .....	30
<i>TECHNICAL GUIDANCE DOCUMENTS</i> .....	30

### **HISTORY OF RHODE ISLAND'S DAM SAFETY PROGRAM**

The Rhode Island dam inspection and inventory program had its inception in 1883, and was under the authority and responsibility of the Commissioner of Dams and Reservoirs. At that time, there were 86 dams included in the records; today, there are 668 inventoried dams.

The 2010 Annual Report indicated 671 inventoried dams. The following changes were made in 2011, which lowered the total to 668 dams:

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>2010 STATUS</b>	<b>2011 STATUS</b>
Burrillville	766	Ocean State Power	Not in inventory	Newly discovered & added to inventory. Hazard class to be determined.
Charlestown/ Richmond	250	Shannock	Low hazard	Removed
North Smithfield	393	Tupperware	Omitted from inventory	Added to inventory (low hazard)
Providence	089	Geneva	Significant hazard	Breached & removed
Providence	092	Leonard	Low hazard	Not present
Providence	136	Dyerville	Low hazard	Not present
Providence	139	Paragon	Low hazard	Removed
Scituate	351	Peepetoad	Omitted from inventory	Added to inventory (low hazard)
Warwick	143	Pawtuxet Lower	Low hazard	Removed

A complete list of the inventoried dams, sorted by town and river, is attached.

### **STATUTES**

As set forth in Rhode Island General Laws, Chapters 46-18 and 46-19, a dam owner has the responsibility for the safe operation of his/her dam, and is liable for the consequences of accidents or failures of the dam. In general, a dam owner is required to use "*reasonable care*" in the operation and maintenance of a dam. This responsibility includes the proper operation, maintenance, repair and rehabilitation of a dam, which are essential elements in preventing a dam failure.

The criteria governing the administration and enforcement of Rhode Island's Dam Safety Program are contained in the General Laws of Rhode Island, Chapter 46-19. The Department of Environmental Management (DEM) has the responsibility to cause to be inspected dams to determine their condition, to review and approve plans for construction or substantial alteration of a dam, to order the owner to make repairs or to take other necessary action to make a dam safe.

In 2001, Section 46-12.2-2 was amended, authorizing the Clean Water Finance Agency to issue loans for projects associated with dam safety.

In 2005, Chapter 45-62 (Dam Management Districts) was added, authorizing municipalities to create dam management districts for dam repairs, maintenance, management and/or removal.

In 2006 two amendments to Chapter 46-19 were enacted. Section 4 was amended to authorize DEM, in an emergency, to take necessary actions to mitigate an unsafe condition at a dam and to assess the costs of those actions against the dam owner. Section 9 was amended to require

a city or town where a high or significant hazard dam is located, and to require a state agency that owns a high or significant hazard dam, to complete by July 1, 2008, an Emergency Action Plan (EAP) for the dam. Rhode Island's Emergency Management Agency is responsible for coordinating development of the EAPs and must give final approval for the EAP to be considered complete.

Federal Energy Regulatory Commission (FERC) Authority

In 2011, DEM became aware that for any dam in the state that has a Federal Energy Regulatory Commission (FERC) Permit or Exemption, DEM does not have any dam safety regulatory authority. DEM is awaiting a list of FERC regulated dams from the federal agency and, in 2011, has confirmed that the following two dams fall into this category:

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>HAZARD CLASS</b>
North Smithfield	043	Slatersville Reservoir Upper	High
West Warwick	148	Arctic	High

Proposed Legislation

In 2011, DEM proposed legislation to provide DEM with the authority to issue a fine to any municipality which does not complete the required emergency action plan(s) (EAP) and to issue a fine to a dam owner who refuses to sign the EAP.

DEM also proposed legislation to allow DEM to record a Notice of Violation issued to the owner of a high or significant hazard dam, in the land evidence records of the city or town in which the dam is located.

None of the proposed legislation was passed into law.

GOVERNOR'S TASK FORCE ON DAM SAFETY AND MAINTENANCE

In May 2000, Governor Almond issued Executive Order 00-6, *Creation of Dam Safety and Maintenance Task Force*. The Task Force was charged with developing recommendations for a comprehensive program of monitoring, maintenance and repairs that will enhance upkeep and safety of the dams in the State.

The Task Force, co-chaired by the Directors of DEM and the Rhode Island Emergency Management Agency, was comprised of representatives of the Rhode Island Budget Office, the Rhode Island Clean Water Finance Agency, the Federal Natural Resources Conservation Service, Public Works Directors for three Rhode Island municipalities, five dam associations, two dam owners, and four members of the General Assembly (not all General Assembly members were officially appointed to the Task Force).

The Task Force convened for 12 two-hour sessions over a six month period, and finalized their recommendations in a report dated January 2001. The recommendations included legislative, regulatory, administrative and policy proposals designed to protect public safety, create an efficient approach to dam repairs and ensure a timely response should a community be threatened by a dam failure.

Although the proposed legislation developed by the Task Force was not enacted, DEM identified a number of recommendations that have been implemented through regulation (see *Dam Safety Regulations* on page 5).



Spillway at Curran Upper Dam (No. 166), Cranston

### DAM SAFETY REGULATIONS

In 2002, DEM began drafting Dam Safety Regulations to incorporate those recommendations from the Governor's Task Force on Dam Safety and Maintenance (see page 4) that can be implemented within the framework of the existing statute.

In 2005, DEM completed a preliminary draft of the Dam Safety Regulations. DEM then invited former members of the Task Force to participate in an initial review of the draft Dam Safety Regulations and incorporated many of their suggestions into a revised draft. In conjunction with draft Dam Safety Regulations, DEM drafted amendments to the Freshwater Wetlands Regulations to streamline approvals for repair of high and significant hazard dams.

In October 2006, DEM held a workshop on the draft Dam Safety Regulations. About 55 people attended the 2 hour workshop, which resulted in many questions and comments, both at the workshop and in follow-up letters. In December 2006, DEM forwarded to the workshop attendees a written response to comments, along with revised draft regulations reflecting comments, as appropriate.

DEM then initiated the formal process of promulgating the regulations. On July 23, 2007, a notice was placed in the Providence Journal newspaper, notifying the public that DEM was seeking comment on the proposed Dam Safety Regulations at a public hearing to be held on August 23, 2007, at the DEM headquarters. About 10 people attended the public hearing and one person submitted formal comments (these comments were also previously submitted to DEM in a May 2007 letter, to which DEM responded in writing). The public comment period remained open following the hearing for 30 days until September 24, 2007; no additional comments were received.

Since no new comments on the proposed Dam Safety Regulations were received during the public hearing and comment period, DEM executed the regulations and filed them with the Secretary of State on November 30, 2007. The regulations, which are available on DEM's website at <http://www.dem.ri.gov/pubs/regs/regs/compinsp/dams07.pdf>, became effective on December 20, 2007 and include the following:

- Definitions of important terms including dam, hazard classifications, maintenance, repair and unsafe dam;

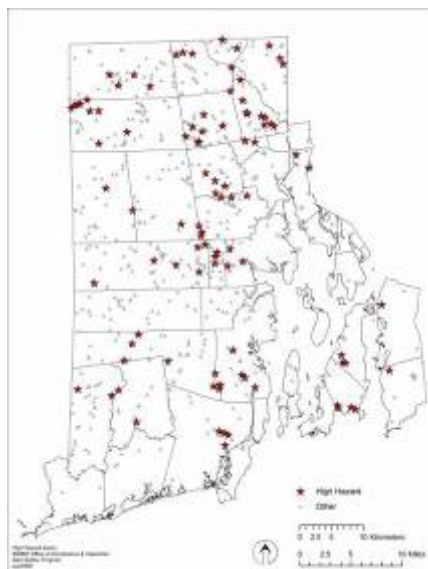
- Assignment of a hazard classification to each dam in the state inventory;
- Requirement that owners register their dams and notify DEM when ownership is transferred (no associated fee);
- A schedule for visual inspections of high and significant hazard dams;
- Procedure to streamline repair of high and significant hazard dams (no associated permit fee); and
- A procedure for dam owners to take emergency actions at high and significant hazard dams.

In June 2007, DEM's Freshwater Wetlands Regulations were amended to allow high and significant hazard dam repair requests to be approved under the Dam Safety Regulations. The Dam Safety Program coordinates such requests with the Freshwater Wetlands Program.

**DAM CLASSIFICATIONS**

Inventoried dams are classified by size and hazard ratings. The size classification provides a relative description of small, medium or large, based on the storage capacity and height of the impounded water. The hazard classification relates to the probable consequences of failure or misoperation of the dam; it does not relate to the current condition or the likelihood of failure of the dam. The hazard classifications are defined in the Dam Safety Regulations, as follows:

*High Hazard* – means a dam where failure or misoperation will result in a probable loss of human life.



High Hazard Dams

*Significant Hazard* – means a dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare. Examples of major economic loss include washout of a state or federal highway, washout of two or more municipal roads, loss of vehicular access to residences, (e.g. a dead end road whereby emergency personnel could no longer access residences beyond the washout area) or damage to a few structures.



Significant Hazard Dams

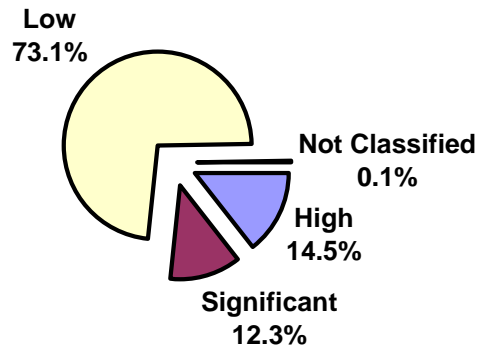
*Low Hazard* – means a dam where failure or misoperation results in no probable loss of human life and low economic losses.



Low Hazard Dams

There are 97 high hazard dams, 82 significant hazard dams, 488 low hazard dams and 1 dam not hazard classified, for a total active inventory of 668 dams. The following chart illustrates the percentage of dams in each classification:

### Hazard Classifications (Percent of Total Inventory)



### **INSPECTION PROGRAM**

In accordance with the Dam Safety Regulations, a dam's hazard classification determines the inspection frequency. Visual inspections of high hazard dams are required to be performed every two years and significant hazard dams every five years. Low hazard dams are inspected every five years to determine whether downstream conditions have changed over time that warrant raising the hazard classification to significant or high. A high or significant hazard dam is also visually inspected upon request by any person who has cause to believe that an unsafe dam exists. In addition, a visual inspection will be performed whenever DEM has cause to believe that an unsafe dam exists, to determine if the dam is unsafe.

The visual inspections performed are conducted under a general inspection format based on guidelines established in 1976 by the United States Army Corps of Engineers for the National Program for the Inspection of (Non-Federal) Dams. A visual inspection may be performed by DEM or by an engineer hired by the dam owner.

As part of each visual inspection, the condition of the major components of the dam are subjectively rated as *good*, *fair* or *poor*. The major components of a dam are the embankment, the spillway and the low level outlet. *Good* is defined as meeting minimum guidelines, where no irregularities are observed and the component appears to be maintained properly. *Fair* is defined as a component that requires maintenance. *Poor* is defined as a component that has deteriorated beyond a maintenance issue and requires repair; the component no longer functions as it was originally intended.

A detailed investigation may be required if a visual inspection leads to a determination that a dam is or may be unsafe. A detailed investigation may include studies, investigations and analyses appropriate to evaluate the structural safety and hydraulic capacity of a dam or



reservoir and appurtenant works, such as soil analysis, concrete or earth stability analysis, materials testing, foundation explorations, hydraulic and hydrologic analysis, including basin studies, flood potential, and an analysis of the dam's ability to pass flood waters.

Following a visual inspection performed by DEM, a dam inspection report is prepared, identifying specific deficiencies and, when warranted, recommending corrective measures. A copy of the report is forwarded to the owner, with the expectation that the deficiencies will be corrected. If a dam is determined to be unsafe, then DEM will order corrective action.



Spillway at Oak Swamp Dam (No. 168), Johnston

## **ACTIVITIES IN 2011**

### **UNSAFE DAMS**

One of DEM's primary responsibilities in the Dam Safety Program is to identify unsafe dams and take appropriate action to return the dams to a safe condition. An unsafe dam is a high or significant hazard dam whose condition is such that an unreasonable risk of failure exists.

Following a visual or detailed inspection of a dam, the owner is notified of any condition that DEM considers to be unsafe. Notification is in the form of a Notice of Violation and Order (NOV), which sets forth the unsafe condition/s and requires the owner to make the dam safe.

In 2011, DEM was addressing 26 unsafe dams, as indicated below:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	EMBANKMENT	SPILLWAY	LOW LEVEL OUTLET	OWNER
Burrillville	010	Mapleville	High	Fair To Poor	Fair To Poor	Poor	Mapleville Main, Inc.
Burrillville	027	Sucker	Significant	Fair To Poor	Fair To Poor	Poor	Bliss Golf Investors LLC
Burrillville	035	Gilleran	Low	Fair	Fair	Poor	Mapleville Main, Inc.
Cranston	373	Clarke's Upper	High	Poor	Poor	Poor	Lois Labrie
Exeter	239	Slocum	High	Good To Poor	Good To Fair	Poor	American Baptist Churches Of R.I.
Exeter	527	Metcalf	High	Fair To Poor	Fair	Poor	SCOBSCO Associates
Glocester	555	Hawkins	High	Poor	Poor	Poor	Glocester Land Trust
Hopkinton	225	Wincheck	Significant	Fair To Poor	Fair To Poor	Poor	Rhode Island Boy Scouts
Hopkinton	229	Blue	Significant	Breached	Fair	Poor	Ashville Corp.
Johnston	168	Oak Swamp	High	Fair To Poor	Fair To Poor	Poor	Town of Johnston
Johnston	169	Almy	High	Poor	Poor	Poor	Town of Johnston
Johnston	170	Simmons Upper	High	Poor	Poor	Poor	Town of Johnston
Johnston	171	Simmons Lower	High	Poor	Poor	Poor	Town of Johnston
Lincoln	097	Butterfly	High	Fair To Poor	Fair To Poor	Poor	Town of Lincoln
Lincoln	104	Bleachery	High	Fair	Fair	Poor	Providence Casket Co.
Lincoln	295	Limerock	High	Poor	Fair	Poor	Town of Lincoln
Lincoln	391	Handy Upper	High	Poor	Fair	Not Present	Town of Lincoln
Lincoln	408	Bridlewood	High	Fair	Fair	Not Present	Lucy V Delisi, Per, Res, Tr
North Kingstown	615	Rodman Mill	High	Poor	Fair	Poor	Lafayette Mill Complex Associates
North Providence	084	Wenscott	High	Fair	Fair	Poor	Town of North Providence
North Smithfield	043	Slatersville Upper	High	Fair	Fair	Poor	Dudley Development Corp.
North Smithfield	046	Slatersville Middle	High	Fair	Fair	Poor	Dudley Development Corp.
Smithfield	109	Stillwater	Significant	Poor	Fair	Poor	Breakwater Preservation Conservancy
Smithfield	120	Sprague Upper	High	Poor	Good	Poor	Greater Providence YMCA
South Kingstown	425	Wakefield	High	Fair To Poor	Fair	Poor	Town of South Kingstown
Tiverton	742	Creamer	High	Fair To Poor	Good	Not Present	Manuel Laureanno & Laureanno Development Corp.

A summary of each dam follows:

*Dam number 010 (Mapleville) in Burrillville*

DEM's engineering consultant inspected the dam in May 2010 and forwarded the report to DEM in September 2010. The report stated that excessive vegetation prohibited a complete inspection of the dam, vegetation in the spillway channel could obstruct flow, the auxiliary spillway could not be located and operability of the low level outlet was not known. DEM issued an NOV to the owner (Mapleville Main, Inc.) in June 2011 to address these unsafe conditions. The owner requested a hearing on the NOV, which is before DEM's Administrative Adjudication Division (AAD).

*Dam number 027 (Sucker) in Burrillville*

DEM's engineering consultant inspected the dam in May 2010 and forwarded the report to DEM in September 2010. The report indicated that excessive vegetation and deadfall prohibited a complete inspection of the dam, plywood was partially blocking the primary spillway, a former low level outlet was no longer present and the current auxiliary spillway conveys flow through a pipe. DEM issued an NOV to the owner (Bliss Golf Investors, L.L.C.) in May 2011 to address these unsafe conditions. The owner did not request a hearing on the NOV. The case has been placed on a list of cases that require action in Superior Court.

*Dam number 035 (Gilleran) in Burrillville*

The dam was inspected by DEM's engineering consultant in May 2010 and the report was forwarded to DEM in September 2010. The report stated that the low level outlet was inoperable and DEM issued an NOV to the owner (Mapleville Main, Inc.) in May 2011 to address this unsafe condition. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 373 (Clarke's Upper) in Cranston*

DEM's engineering consultant inspected the dam in October 2009 and forwarded the report to DEM in June 2010. The report indicated that leaves and yard debris prevented a complete inspection of the dam and the low level outlet was inoperable. An NOV was issued to the owner (Lois Labrie) in April 2011 to address these unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 239 (Slocum) in Exeter*

DEM's engineering consultant inspected the dam in June 2010 and forwarded the report to DEM in September 2010. The report stated that heavy vegetation prevented a complete inspection of the dam and the low level outlet was inoperable. An NOV was issued to the owner (American Baptist Churches of Rhode Island) in May 2011 for these unsafe conditions. The owner did not request a hearing on the NOV. A Consent Agreement was entered between DEM and the owner in December 2011, which resolved the NOV and provided a schedule and plan by which the dam would be returned to a safe condition.

*Dam number 527 (Metcalf) in Exeter*

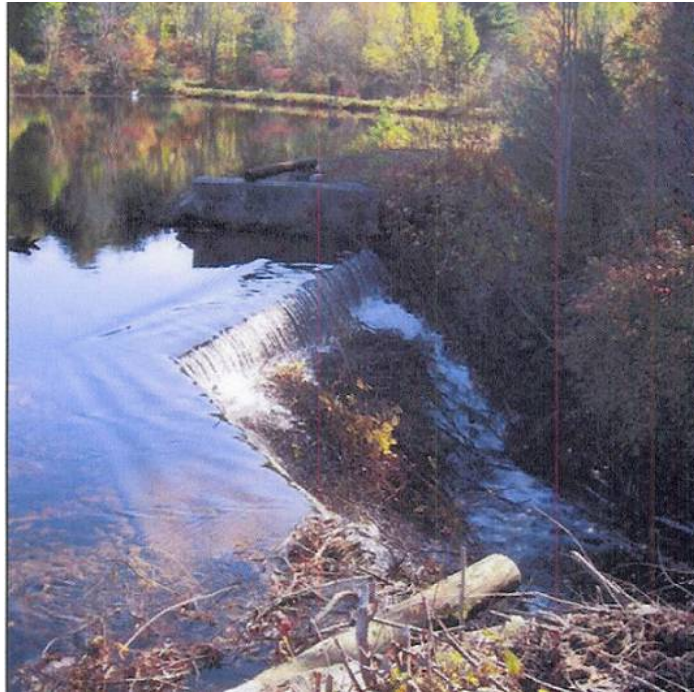
The dam was inspected by DEM's engineering consultant in June 2010 and the report was forwarded to DEM in September 2010. The report indicated that excessive vegetation prohibited a complete inspection of the dam and the low level outlet was inoperable. An NOV was issued to the owners (SCOBOCO Associates and Pauline C. Metcalf) to address these unsafe conditions. The owners requested a hearing on the NOV, which was before AAD. The owners also negotiated with DEM and entered a Consent Agreement in October 2011 to resolve

the NOV. The Consent Agreement includes a plan and schedule to return the dam to a safe condition.

*Dam number 555 (Hawkins) in Gloucester*

DEM's engineering consultant inspected the dam in October 2009 and forwarded the report to DEM in June 2010. The report stated that excessive vegetation inhibited a complete inspection of the dam and severe leakage in one of the outlet pipes posed unsafe conditions. DEM issued an NOV to the owner (Gloucester Land Trust) in November 2010 to address the unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.

In 2011, the owner removed the vegetation – and worked toward hiring an engineer to inspect the area and assess the outlet pipes.



Hawkins Dam (No. 555) in Gloucester – spillway in foreground & “L” shaped embankment continues in background.

*Dam number 225 (Wincheck) in Hopkinton*

DEM's engineering consultant inspected the dam in May 2010 and forwarded the report to DEM in September 2010. The report indicated excessive vegetation and debris that prevented a complete inspection of the dam, possible sediment transport through the dam, an inoperable low level outlet and the presence of sand bags to prevent overtopping of the dam. DEM issued an NOV to the owner (Rhode Island Boy Scouts) in June 2011 for these unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 229 (Blue) in Hopkinton*

DEM's engineering consultant inspected the dam to reassess its hazard classification (see *Grants To DEM* on page 26) and submitted a draft report dated March 2007 to DEM recommending the dam be classified as a significant hazard. In addition to the classification, the report advised DEM of a potential unsafe condition. That is, significant leakage at two locations along with other stability problems including the downstream masonry wall tipping

slightly downstream, downward movement of the material on the upstream and downstream slopes, and sinkholes on the crest were observed. DEM issued an informal written notice to the owner in April 2007. The notice required the owner to temporarily lower the impoundment such that leakage no longer posed a safety threat, and to develop a report specifying how the dam would be returned to a safe condition. Due to the significant leakage and lack of precipitation, the water level dropped without further intervention.

In February 2008, DEM inspected the dam following heavy rains. The water level was 6 to 12 inches higher than it was during an inspection in November 2006 and was 6 to 12 inches below the crest of the spillway. The areas of significant leakage through the earthen embankment appeared unchanged.

In March 2008, the owner submitted a freshwater wetlands permit application to DEM proposing to permanently lower the water level. The proposal included construction of a new spillway at an elevation about 7.5 feet lower than the existing spillway. In addition to the physical modifications, the owner applied to the DEM to lower the hazard classification from significant hazard to low hazard.

In January 2009, DEM forwarded comments to the owner's engineer, requesting additional information to support the request for the hazard classification change. In a subsequent telephone conversation, the engineer indicated that the freshwater wetlands permit issues would be addressed first. The dam safety issues would be addressed next, either by reclassifying the dam to a low hazard or by leaving the dam as a significant hazard, requiring that seepage along the length of the embankment be addressed.

In March 2010, during heavy rain and flooding conditions (see *Requested Inspections* on page 23), approximately 25 feet of the dam failed, suddenly releasing the impoundment, and likely contributing to the reports of downstream damage to private property and extensive damage to local roads. Fortunately, no injuries or loss of human life occurred.

In August 2010, DEM issued an NOV to the owner for failure to maintain the dam in a safe condition and assessed a penalty of \$59,747. The owner requested a hearing on the NOV, which is before AAD.



Breached section of Blue Dam (No. 229) in Hopkinton

In 2011, DEM continued to negotiate with the owner to pay the penalty and resolve the NOV.

*Dam number 168 (Oak Swamp) in Johnston*

DEM inspected the dam in September 2008. An informal written notice was forwarded to the owner (Town of Johnston) in July 2009, which advised the town that a complete visual inspection of the dam could not be performed due to the presence of excessive vegetation on and adjacent to the dam. The notice required the owner to remove sufficient vegetation to allow inspection. In August 2009, the owner notified DEM that the vegetation was removed.

DEM inspected the dam on June 4, 2010. The dam was determined unsafe due to an inoperable low level outlet and severe erosion on several areas of the embankment. An NOV was issued to the owner in October 2010 for the unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 169 (Almy) in Johnston*

DEM inspected the dam in September 2008. An informal written notice was issued to the owner (Town of Johnston) in December 2008. The notice advised the owner that a complete visual inspection could not be performed due to excessive vegetation on the dam, the low level outlet was inoperable and the spillway did not function as originally constructed. The notice required the owner to cut sufficient vegetation to allow DEM to perform a complete visual inspection of the dam and to develop a reasonable schedule to address the other two unsafe conditions. In July 2009, the owner stated that vegetation removal would commence following removal of vegetation from the Oak Swamp Dam (see paragraph above).

DEM inspected the dam in July 2010 and determined the dam unsafe for the same reasons noted in the notice. An NOV was issued to the owner in October 2010 for the unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 170 (Simmons Upper) in Johnston*

DEM inspected the dam in September 2010. The dam was determined unsafe due to an inoperable low level outlet and excessive vegetation that prohibited a complete inspection. An NOV was issued in October 2010 to the owner (Town of Johnston) to address these conditions. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 171 (Simmons Lower) in Johnston*

DEM inspected the dam in September 2010 and determined it unsafe due to an inoperable low level outlet, a spillway that no longer functioned as originally constructed, severe erosion in the embankment and excessive vegetation that prohibited a thorough inspection. An NOV was issued in October 2010 to the owner (Town of Johnston) for the unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 097 (Butterfly) in Lincoln*

DEM's engineering consultant inspected the dam in May 2010 and forwarded the report to DEM in September 2010. The report stated the low level outlet was inoperable and DEM issued an NOV to the owner (Town of Lincoln) in May 2011 to address this unsafe condition. The owner requested a hearing on the NOV, which is before AAD. DEM and the owner have also been in negotiation to develop a dam repair plan for town owned dams.

*Dam number 104 (Bleachery) in Lincoln*

The dam was inspected by DEM's engineering consultant in June 2010 and the report forwarded to DEM in September 2010. The report indicated the low level outlet was inoperable

and DEM issued an NOV to the owner (Providence Casket Company) in June 2011 for this unsafe condition. The owner requested a hearing and the matter is before AAD.

*Dam number 295 (Limerock) in Lincoln.*

DEM's engineering consultant inspected the dam and advised DEM, in their hazard classification report dated January 2004, of conditions present at the dam which could lead to an unsafe condition. DEM inspected the dam in March 2004. The inspection revealed that the condition of the spillway was inadequate and the dam was unsafe. In April 2005, DEM issued an informal written notice to the owner (Town of Lincoln). The notice required that the owner perform frequent inspections of the dam, lower the impoundment as a temporary measure and retain an engineer to develop a plan that described how the dam would be made safe. In October 2005, the owner submitted an engineering report to DEM that presented options for addressing both the short term and long term safety of the dam. In 2006, the owner implemented the short term measures. The owner and their engineer met with DEM in July 2007 to review progress and verify that the proposed direction of permanently lowering the water level was feasible. During 2007, the owner continued monitoring the dam on a regular basis and worked with partners collecting data to be used for the DEM permitting process.

In February 2008, DEM inspected the dam following heavy rain. The water level was 2 to 4 inches above the spillway crest and the water was flowing freely. Debris in the emergency spillway had been removed and it was available for use, although the water level was not high enough to flow through it.

In July 2008, DEM issued an NOV to the owner. The NOV required the owner to make the dam safe and assessed a penalty of \$1,000, which continued to accrue per day unless the owner demonstrated that reasonable efforts were made to comply promptly with the NOV.

In March 2009, DEM and the owner entered a Consent Agreement to resolve the NOV. As a result, the owner paid a \$500 penalty and in September 2009, submitted plans to DEM with proposed repairs to return the dam to a safe condition. DEM reviewed the plans and requested additional information in October 2009, and the approval process continued through the end of the year.

In June 2010, DEM approved the plans to repair the dam. The work includes replacing the spillway, adding a new low level outlet to replace the inoperable ones and regrading the earthen embankment. The owner received construction bids in July 2010 and began construction in September 2010.

In 2011, construction was substantially complete in June 2011 and the dam was returned to a safe condition.



*Same view of downstream slope of Limerock Dam (No. 295), Lincoln, before and after work*

*Dam number 391 (Handy Upper) in Lincoln*

DEM's engineering consultant inspected the dam in June 2010 and forwarded the report to DEM in September 2010. The report stated that excessive vegetation prohibited a complete inspection of the dam and there was possible sediment transport through the dam. An NOV was issued to the dam owner (Town of Lincoln) in May 2011 for these unsafe conditions. The owner did not request a hearing on the NOV and they have been negotiating with DEM to develop a dam repair plan for town owned dams.

*Dam number 408 (Bridlewood) in Lincoln*

DEM's engineering consultant inspected the dam in June 2010 and forwarded the report to DEM in September 2010. The report indicated possible sediment transport through the dam and DEM issued the owner (Lucy V. DeLisi) an NOV in June 2011 to address this unsafe condition. The owner requested a hearing on the NOV, which was before AAD. The owner also expeditiously addressed the unsafe condition and entered a Consent Agreement with DEM in December 2011.

*Dam number 615 (Rodman Mill) in North Kingstown*

The dam was inspected in May 2010 by DEM's engineering consultant and the report was forwarded to DEM in September 2010. It indicated excessive vegetation which prohibited a complete inspection of the dam and the lack of a low level outlet. DEM issued an NOV to the owner (Bakeford Properties, LLC) in May 2011 for these unsafe conditions. The owner requested a hearing on the NOV, which is before AAD.



*Downstream side of Rodman Mill Dam (No. 615) in North Kingstown.*



*Dam number 084 (Wenscott) in North Providence*

DEM's engineering consultant inspected the dam in November 2009 and submitted the inspection report to DEM in June 2010. The report indicated the low level outlet was inoperable and DEM issued an NOV to the owner (Town of North Providence) in November 2010 for this unsafe condition. The owner requested a hearing on the NOV, which is before AAD.

*Dam number 043 (Slatersville Upper) in North Smithfield*

DEM's engineering consultant inspected the dam in November 2009 and forwarded the report to DEM in June 2010. The report stated the low level gates were inoperable and DEM issued an NOV to the owner (Dudley Development Corp.) in April 2011 for this unsafe condition. DEM subsequently became aware that the dam was regulated by the Federal Energy Regulatory Commission, which superseded DEM's regulatory authority. In September 2011, DEM rescinded the NOV.

*Dam number 046 (Slatersville Middle) in North Smithfield*

The dam was inspected by DEM's engineering consultant in November 2009 and DEM received the report in June 2010. The report stated the low level outlet was inoperable and DEM issued an NOV to the owner (Dudley Development Corp.) in April 2011 for this unsafe condition. The owner requested a hearing on the NOV and the matter is before AAD.

*Dam number 109 (Stillwater) in Smithfield*

DEM's engineering consultant inspected the dam in May 2010 and forwarded the report to DEM in September 2010. The report indicated that the low level outlet was inoperable, overgrown vegetation and inadequate lighting in an adjacent building prohibited a complete inspection of the dam and vegetation in the spillway discharge channel inhibited flow. DEM issued an NOV to the owner (Breakwater Nature Conservancy) in March 2011 for these unsafe conditions. The owner did not request a hearing on the NOV and has made little progress toward resolution. The case has been placed on a list of cases that require action in Superior Court.

*Dam number 120 (Sprague Upper) in Smithfield*

DEM's engineering consultant inspected the dam in November 2009 and forwarded the report to DEM in June 2010. The report revealed an inoperable low level outlet and excessive vegetation that prohibited a thorough inspection of the dam. DEM issued an NOV to the owner (Greater Providence YMCA) in November 2010 for these unsafe conditions. The owner requested a hearing on the NOV, which is before AAD. In December 2010, DEM realized that it previously authorized the owner to abandon the low level outlet; therefore, that violation in the NOV is no longer an issue.

*Dam number 425 (Wakefield) in South Kingstown*

The dam was inspected by DEM's engineering consultant in June 2010 and the report was submitted to DEM in September 2010. The report indicated excessive vegetation that prohibited a complete inspection of the dam and an inoperable low level outlet. DEM issued an NOV to the dam owner (Town of South Kingstown) for these unsafe conditions in June 2011. The owner requested a hearing on the NOV, which is before AAD, and continues to negotiate with DEM to resolve the matter.

*Dam number 742 (Creamer) in Tiverton*

DEM inspected the dam in September 2010 and discovered excessive vegetation which prohibited a complete inspection of the dam. DEM issued an NOV to the owners (Manuel Laureanno and Laureanno Development Corporation) in August 2011 for this unsafe condition.

### COMPLIANCE INSPECTIONS

The Dam Safety Regulations (see page 5) require visual inspection of high hazard dams every two years and significant hazard dams every five years.

#### High Hazard Dam Inspections

Eighteen high hazard dams were inspected in 2011. The inspections were completed by DEM, by the dam owner's engineer or by an engineering consultant hired by DEM using a Federal Emergency Management Agency (FEMA) grant (see page 26).

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>EMBANKMENT</b>	<b>SPILLWAY</b>	<b>LOW LEVEL OUTLET</b>
Coventry	185	Black Rock	(1)	(1)	(1)
Coventry	561	Arnold	(1)	(1)	(1)
East Providence	446	Bucklin Point	(1)	(1)	(1)
Exeter	382	Austin Upper	(1)	(1)	(1)
Foster	349	Spear	(1)	(1)	(1)
Glocester	018	Burlingame Upper	Poor	Fair	Poor
Hopkinton	226	Yawgoog	(1)	(1)	(1)
Hopkinton / Richmond	216	Wyoming Upper	(1)	(1)	(1)
Johnston	313	Hughesdale Upper	(1)	(1)	(1)
Lincoln	099	Moffett	(1)	(1)	(1)
Lincoln	102	Olney	Fair	Good	Poor
Middletown	582	Nelson	(1)	(1)	(1)
Middletown	583	Gardiner	(1)	(1)	(1)
Middletown	584	Easton North	(1)	(1)	(1)
North Kingstown	444	Silver Spring	(1)	(1)	(1)
North Kingstown	693	Slocum Woods	(1)	(1)	(1)
Portsmouth	580	Sisson	(1)	(1)	(1)
South Kingstown	549	Asa	(1)	(1)	(1)

- (1) Inspection reports have not been received or have not been reviewed. The reports will be reviewed and the results will be reported in the 2012 Annual Report.

The following high hazard dams were inspected in 2009 or 2010, as reported in the respective Annual Reports, and the inspection reports were reviewed in 2011. The conditions are indicated in the following table:

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>EMBANKMENT</b>	<b>SPILLWAY</b>	<b>LOW LEVEL OUTLET</b>
Burrillville	008	Harrisville	(2)	(2)	(2)
Burrillville	010	Mapleville	Fair to Poor	Fair to Poor	Poor
Burrillville	016	Pascoag Upper	Fair	Good	Fair
Burrillville	572	Wilbur	Fair to Poor	Poor	Poor
Coventry	167	Flat River	Fair to Poor	Fair	Good
Coventry	176	Coventry	Poor	Fair	Poor
Coventry	177	Tiogue	Fair	Fair	Fair
Coventry	371	Pearce	Fair to Poor	Fair to Poor	Poor
Cranston	166	Curran Upper	Poor	Poor	Poor
Cranston	198	Curran Lower	Poor	Poor	Poor
Cranston	373	Clarke's Upper	Poor	Poor	Poor
Exeter	219	Boone	Fair	Good to Fair	Good
Exeter	239	Slocum	Good to Poor	Good to Fair	Poor
Exeter	240	Yorker Mill	Fair to Poor	Fair	Good
Exeter	527	Metcalf Wildlife	Fair to Poor	Fair	Poor
Glocester	401	Lake Washington	Poor	Fair	Not Present
Glocester	727	Bowdish Lower	Fair to Poor	Poor	Not Inspected
Hopkinton	262	Locustville	Fair to Poor	Fair	Not Present
Lincoln	097	Butterfly	Fair to Poor	Fair to Poor	Poor
Lincoln	104	Bleachery	Fair	Fair	Poor
Lincoln	391	Handy Upper	Poor	Fair	Not Present
Lincoln	408	Bridlewood	Fair	Fair	Not Present
Lincoln	649	Bridlewood Upper End	Poor	Not Present	Not Present
North Kingstown	615	Rodman Mill	Poor	Fair	Poor
North Kingstown	710	Slocum Road Upper	Poor	Fair to Poor	Not Inspected
North Providence	760	Louisquisset Flood Control	Fair	Fair	Fair
North Smithfield	043	Slatersville Upper	Fair	Fair	Poor
North Smithfield	046	Slatersville Middle	Fair	Fair	Poor

TOWN	DAM NO.	DAM NAME	EMBANKMENT	SPILLWAY	LOW LEVEL OUTLET
North Smithfield	048	Forestdale	Fair	Fair	Poor
Smithfield	121	Sprague Lower	Poor	Fair to Poor	Poor
Smithfield	126	Georgiaville	Poor	Good to Poor	Not Inspected
South Kingstown	425	Wakefield	Fair to Poor	Fair	Poor
South Kingstown	525	Hefler Farm	Poor	Poor	Not Present
Tiverton	742	Creamer	Fair to Poor	Good	Not Present
Warwick	764	Grist Mill Apartments	Fair to Poor	Fair	Unknown
Warwick/West Warwick	145	Natick	Fair to Poor	Fair	Poor
West Warwick	147	Riverpoint Upper	Good to Fair	Good to Fair	Unknown
West Warwick	148	Arctic	(3)	(3)	(3)
Woonsocket	621	Holley Lane	Fair	Fair to Poor	Not Present

- (2) The entire dam was rehabilitated in late 2009, but was not inspected.
- (3) It was determined that the dam was exempt from RI dam safety regulatory authority in 2011 because it has a valid Federal Energy Regulatory Commission (FERC) Permit.

Significant Hazard Dam Inspections

Twenty-nine significant hazard dams were inspected in 2011. The inspections were completed by DEM or by an engineering consultant hired by DEM using a FEMA grant (see page 26). The reports are expected to be submitted to DEM in March 2012 and the inspection results will be included in the 2012 Dam Safety Report.

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>
Burrillville	015	Union Mill
Burrillville	039	Spring
Burrillville	565	Ross
Coventry	152	Mill
Coventry	186	Upper
Foster	526	Gorham, N. Farm
Glocester	021	Cherry Valley
Glocester	032	Snakeskin
Glocester	514	Lake Aldersgate
Glocester	594	David King Farm
Hopkinton	227	Ashville
Hopkinton	285	Langworthy
Hopkinton / Richmond	215	Barberville
Johnston	127	Belknap
Johnston	310	Pocasset
Johnston	323	Caesarville
Johnston	346	Kimball
Johnston	504	Dexter Farm
North Kingstown	550	Hamilton
North Kingstown	704	Secret
North Smithfield	047	Slatersville Lower
Providence	093	Canada Upper
Richmond	273	Wood River Junction
Scituate	160	Hope
Scituate	345	Jordan
Scituate	361	Pine Swamp #1
Scituate	648	Shoestring Mill
Smithfield	123	Hawkins
West Warwick	455	Bouchar Farm

The following significant hazard dams were inspected in 2010, as reported in last year's Annual Report, and the inspection reports were reviewed in 2011. The conditions are indicated in the following table:

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>EMBANKMENT</b>	<b>SPILLWAY</b>	<b>LOW LEVEL OUTLET</b>
Burrillville	027	Sucker	Fair to Poor	Fair to Poor	Poor
Burrillville	035	Gilleran	Fair	Fair	Poor
Burrillville	051	Nichols	Poor	Poor	Not Present
Coventry	151	Quidnick Upper	Fair to Poor	Fair	Poor
Coventry	157	Harris	Fair to Poor	Fair to Poor	Poor
Coventry	187	Middle	Poor	Poor	Poor
Cumberland	081	Robin Hollow	Fair to Poor	Fair to Poor	Poor
East Greenwich	432	Gale Farm Upper	Fair	Fair	Not Present
Hopkinton	225	Wincheck	Fair to Poor	Fair to Poor	Poor
Hopkinton	274	Harris	Fair to Poor	Fair	Not Present
Hopkinton	440	Hoxie Farm	Poor	Fair	Not Applicable
North Smithfield	067	Todd's	Poor	Fair to Poor	Poor
Smithfield	109	Stillwater	Poor	Fair	Poor
Warwick	669	Daves Marketplace	Fair to Poor	Fair to Poor	Not Present



Crest of Stillwater Dam (No. 109) in Smithfield

Requested Inspections

DEM inspects any high or significant hazard dam upon request by any person who has cause to believe the dam is unsafe. In 2011, DEM received the following inspection request:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	REASON FOR INSPECTION	CONCLUSION
Coventry	167	Flat River	High	Rising water level	Unfounded

DEM received a complaint that the water level in the pond was getting high. Upon investigation, DEM determined that the dam owner was performing maintenance on the low level outlets, which required that the valves be closed. The water level was only about 6 inches above the spillway, which allowed for substantial additional capacity. The maintenance, which was being completed in accordance with the DEM's Dam Safety Regulations, was expected to be completed in about a week, at which time the low level outlets would be partially opened to lower the pond level.

REPAIR APPROVALS

In 2011, DEM issued approvals to repair the following dams:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS	REPAIR
Cumberland	081	Robin Hollow	Significant	Rehabilitation of the embankment, spillway & low level outlet
Lincoln	408	Bridlewood	High	Seepage mitigation in the area of the spillway, installation of toe drains and seepage monitoring

A summary of the approvals follows:

*Dam number 081 (Robin Hollow) in Cumberland*

In November 2010, the owner's engineering consultant submitted plans to repair the dam to DEM. Proposed work included rehabilitation of the spillway, low level outlet and embankment. DEM approved the proposal in February 2011. Work began in the summer of 2011, stopped in the fall for the winter and is expected to be completed in late 2012.

*Dam number 408 (Bridlewood) in Lincoln*

DEM issued the owner an NOV in June 2011, to address an unsafe condition (sediment transport) at the dam. In response, the owner expeditiously provided an engineering plan to remedy and monitor the unsafe condition, which DEM approved in September 2011. The remedial work was completed in October 2011

OWNER / CONTACT INFORMATION

DEM's records for the owners of dams that were previously classified as high or significant hazard are fairly accurate; however, many dams that were previously classified as low hazard and were reclassified to significant or high hazard have questionable owner information. DEM legal counsel has been researching ownership of these dams as time allows.

### Orphan Dams

DEM has identified 42 high and significant hazard dams for which an owner has not been identified and formally notified through the registration process (see *Registration* of page 25). Most dams still require DEM research to identify owners, which is completed as time allows by DEM legal counsel. DEM refers to these dams as orphan dams.

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>HAZARD CLASS</b>
Burrillville	001	Wallum	Significant
Burrillville	015	Union Mill	Significant
Burrillville	016	Pascoag Upper	High
Burrillville	039	Spring	Significant
Burrillville	051	Nichols	Significant
Charlestown	758	Cross Mills	Significant
Coventry	152	Mill	Significant
Coventry	176	Coventry	High
Coventry	177	Tiogue	High
Coventry	185	Black Rock	High
Coventry	186	Upper	Significant
Coventry	187	Middle	Significant
Coventry	371	Pearce	High
Cumberland	074	Miscoe	High
East Greenwich	432	Gale Farm Upper	Significant
Foster	349	Spear	High
Foster	526	Gorham, N. Farm	Significant
Glocester	021	Cherry Valley	Significant
Glocester	032	Snakeskin	Significant
Glocester	381	Sucker Brook Bridge	Significant
Glocester	401	Lake Washington	High
Hopkinton	227	Ashville	Significant
Hopkinton	285	Langworthy	Significant
Hopkinton	440	Hoxie Farm	Significant
Johnston	323	Caesarville	Significant
Johnston	504	Dexter Farm	Significant
Lincoln	099	Moffett	High
Lincoln	104	Bleachery	High
Lincoln	649	Bridlewood Upper End	High
Little Compton	746	Adamsville	Significant
New Shoreham	424	Block Island Rod & Gun Club	Significant
North Kingstown	550	Hamilton	Significant
North Kingstown	704	Secret	Significant
North Providence	760	Louisquisset Flood Control	High
Richmond	273	Wood River Junction	Significant
Scituate	160	Hope	Significant
Smithfield	121	Sprague Lower	High



<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>HAZARD CLASS</b>
South Kingstown	525	Hefler Farm	High
Warwick	669	Daves Marketplace	Significant
Warwick	764	Grist Mill Apartments	High
Warwick/West Warwick	145	Natick	High
West Warwick	455	Bouchar Farm	Significant

### REMOVALS

DEM was involved in the removal of one dam in 2011, as follows:

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>RIVER</b>	<b>HAZARD CLASS</b>
Warwick	143	Pawtuxet Lower	Pawtuxet River	Low

#### *Dam number 143 (Pawtuxet Lower) in Warwick*

A permit application was submitted to DEM in June 2010. The permit was issued and the dam was removed in 2011. The main purpose of the removal was for fish passage.

### REGISTRATION

In 2008 DEM began registering dams. The process involves mailing a registration form to each owner of a high hazard or significant hazard dam and formally notifying the owner of the dam's hazard classification. The owner then has a specific time period to return a completed registration form or to appeal ownership and/or the hazard classification. There is no fee to register a dam and the main purpose of the registration form is to obtain up-to-date contact information on the dam owner.

DEM has mailed about 175 registration letters through 2011, with the remainder scheduled to be mailed as time allows and as the dam owners are determined (see *Owner/Contact Information* on page 23). Following receipt of completed registration forms, DEM issues a certificate of registration to the owner, identifying the proper name, registration number and hazard classification of the dam. The registration process has been completed for the following dams:

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>HAZARD CLASS</b>
Burrillville	010	Mapleville	High
Burrillville	027	Sucker	Significant
Burrillville	035	Gilleran	Low
Exeter	239	Slocum	High
Exeter	240	Yorker Mill	High
Exeter	240	Yorker Mill	High
Exeter	527	Metcalf Wildlife Marsh	High
Hopkinton	225	Wincheck	Significant
Hopkinton	262	Locustville	High
Lincoln	097	Butterfly	High
Lincoln	104	Bleachery	High
Lincoln	391	Handy Upper	High
Lincoln	408	Bridlewood	High

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
North Kingstown	615	Rodman Mill	High
North Smithfield	043	Slatersville Upper	High
North Smithfield	046	Slatersville Middle	High
Smithfield	109	Stillwater	Significant
Smithfield	126	Georgiaville	High
South Kingstown	425	Wakefield	High

### GRANTS TO DEM

From 2000 through 2011, DEM received grants totaling \$506,970 from the Federal Emergency Management Agency (FEMA) National Dam Safety Program.

In the mid 2000's a substantial amount of the grant funds were used for engineering services to assess the hazard classification of about 200 dams throughout the state. A typical inundation map is shown below. The hypothetically failed Creamer Pond Dam is in the bottom right corner of the photo and the blue area indicates the expected path of the released water. This dam is classified as a high hazard.



Creamer Pond Dam (No. 742), Tiverton

The 2010 FEMA grant was awarded in September 2010 for \$60,422. The grant was proposed be used to fund the following projects:

- \$41,000 engineering services to visually inspect high and significant hazard dams and complete inspection reports
- \$7,045 assist RI Emergency Management Agency (RIEMA) in the development of emergency action plans for high and significant hazard dams  
Only \$5,378 was used, to fund an emergency action plan workshop for dam owners and municipal emergency responders.
- \$5,000 transfer of paper records onto laptop computers for field use  
Not used, as DEM will likely complete most of this work with in-house personnel.

- \$3,400 engineering services to hazard classify two dams
- \$2,800 purchase of a color digital scanner/sender
- \$1,120 purchase of three camera phones and one year service contract

The 2011 grant was awarded in September 2011 for \$59,771 and was proposed to be used as follows:

- \$40479 engineering services to visually inspect high and significant hazard dams and complete inspection reports
- \$14943 consulting services to assist with the development of emergency action plans for high hazard dams
- \$2500 training and associated travel
- \$1849 cell phone service for 3 phones for 1 year

INTERAGENCY COORDINATION

Since 2010, DEM and the Rhode Island Emergency Management Agency (RIEMA) has been meeting on a semi-regular basis to improve communication and response to dam safety emergencies. Meetings also included a DEM review of sections of emergency action plans (see *Emergency Action Plans* on page 28) for which RIEMA requested assistance, such as a dam-specific condition that describes when the plan must go into effect.

MEETING/SEMINAR ATTENDANCE

DEM participated in the following meetings and seminars, and provided an overview of the Dam Safety Program and the DEM's Dam Safety Regulations, as needed:

DEM and Save the Bay met in February 2011 to discuss dam related legislation that Save the Bay was going to propose. The legislation was submitted, but not enacted.

In May 2011, DEM attended an Emergency Management Advisory Council meeting held by Lieutenant Governor Roberts. The topic of discussion was the impacts of the flood of March 2010.

In May 2011, DEM attended a Hurricane Conference presented by the Rhode Island Emergency Management Agency. The purpose of the conference was to bring emergency responders throughout the state together in preparation of hurricane season.

DEM OWNED DAM REPAIRS

DEM continued to move forward under its Capital Development Projects program, undertaking the engineering evaluation, design and reconstruction at the following DEM owned dam:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
Cranston	166	Curran Upper	High

In 2008, an engineering consultant was selected to develop the final design for the reconstruction project. Development of the final design plans continued through 2009. In 2010 negotiations proceeded with an adjacent property owner to acquire property to allow reconfiguration of the downstream spillway channel. The current discharge channel places flow along the toe of the earthen embankment; the revised design will move flow away from the dam after it passes the spillway. Efforts to acquire the adjacent property continued through 2011.

### EMERGENCY ACTION PLANS

Rhode Island General Laws Section 46-19-9 requires a city or town in which a high hazard or significant hazard dam is located, and a state agency that owns a high hazard or significant hazard dam, to complete by July 1, 2008, an Emergency Action Plan (EAP) for the dam (see *Statutes* on page 3). An EAP is a formal document that identifies potential emergency conditions at a dam and specifies pre-planned actions to be followed to minimize loss of life and property damage. The law mandates that the Rhode Island Emergency Management Agency (RIEMA) coordinate development of the EAPs and give final approval for an EAP to be considered complete. The law also requires DEM and the Rhode Island League of Cities and Towns to cooperate with RIEMA.

In October 2007, RIEMA presented a draft EAP template to DEM and the League of Cities and Towns for review. DEM provided comments to RIEMA which made changes to the template and finalized it.

The EAP template was presented to city and town officials in January 2008. The officials were informed that DEM would provide dam failure inundation maps for all high hazard and significant hazard dams, for use in completing the EAPs. As the inundation maps were finalized, DEM mailed them to the appropriate municipalities.

Through 2011, RIEMA received a total of 93 draft EAPs, none of which have been approved. No EAPs have been submitted by DEM for the 14 high and significant hazard dams it owns. A list of the DEM owned dams and the EAP status for each dam is shown below.

<b>TOWN</b>	<b>DAM NO.</b>	<b>DAM NAME</b>	<b>HAZARD CLASS</b>	<b>EAP STATUS</b>
Cranston	166	Curran Upper Reservoir	High	
Cranston	198	Curran Lower Reservoir	High	
Cranston	340	Meshanticut Park Pond	Significant	Out to bid by July 2012
Exeter	221	Browning Mill Pond	High	Out to bid by March 2012
Glocester	018	Burlingame Reservoir Upper	High	In process – to be completed early 2012
Glocester	499	Durfee Hill Wildlife Marsh #2	Significant	Out to bid by July 2012
Glocester	566	Bowdish Reservoir	High	In process – to be completed early 2012
Hopkinton / Richmond	215	Barberville	Significant	Out to bid by July 2012
Hopkinton / Richmond	216	Wyoming Upper	High	Out to bid by March 2012
Lincoln	102	Olney Pond	High	In process – to be completed early 2012
Little Compton	474	Simmons Pond	Significant	Out to bid by July 2012
North Kingstown	444	Silver Spring Lake	High	Out to bid by March 2012
Richmond	261	White's Pond	High	Out to bid by March 2012
Smithfield	108	Stillwater Reservoir	High	In process – to be completed early 2012

### DAM MANAGEMENT DISTRICTS

Rhode Island General Laws Chapter 45-62 authorizes cities and towns to create dam management districts for the maintenance and repair of dams within their boundaries. The following two districts are currently in operation:

TOWN	DAM NO.	DAM NAME	HAZARD CLASS
Burrillville	016	Pascoag Upper	High
Exeter	219	Boone	High

The first such district was created in 2008 by the Town of Exeter for the *Boone Lake Dam (No. 219)*, which is a privately owned, high hazard dam.

In 2009 the Towns of Burrillville and Glocester created the second such district for the *Pascoag Reservoir Upper Dam (No. 16)*. The dam is a privately owned, high hazard dam. The dam is located in Burrillville and the impoundment continues into Glocester.

### PROFESSIONAL ASSOCIATIONS

Rhode Island has been a member of Association of State Dam Safety Officials (ASDSO) since its inception in Denver, Colorado in 1984. ASDSO membership consists of state representatives along with corporate and individual members representing dam owners and professional engineering firms. ASDSO was formed to serve these initial functions:

- Improve efficiency and effectiveness of state dam safety programs;
- Foster public awareness;
- Facilitate inter-organizational, intergovernmental and interstate cooperation;
- Assist the dam safety community and provide a forum for the exchange of information;
- Provide representation of dam safety interests before state legislatures and before Congress; and
- Manage the association effectively through internal policies and procedures.

ASDSO has helped to improve dam safety in Rhode Island mainly through its sponsorship of regional dam safety workshops and its national annual conferences.

### PROGRAM LIMITATIONS

#### STAFFING

Currently, the Dam Safety Program has 1.6 full time equivalents (FTEs), consisting of 1.4 FTEs (engineers/inspectors), 0.1 FTE (management) and 0.1 FTE (administrative/clerical). To successfully meet the requirements of the current statute and the Dam Safety Regulations, DEM needs an additional 0.6 FTE (engineer/inspector).

The 0.4 FTE portion of the 1.4 FTEs (engineers/inspectors) above consists of one engineer who was previously assigned to perform other work in the office. In 2009 and 2010, DEM trained two engineers. One engineer has been assisting with day to day management of the program on a part time basis (0.4 FTE). The other engineer will perform inspections only during major storms.

### FINANCIAL ASSISTANCE FOR REPAIRS

The Governor's Dam Safety and Maintenance Task Force concluded that repairs to bring all Rhode Island dams up to current safety standards could cost on average as much as \$800,000 per dam. The Governor and General Assembly recognized the need for financial assistance and enacted legislation to assist owners with the cost of dam repair. In 2001 the Clean Water Finance Agency (CWFA) was authorized to issue loans for projects associated with dam safety. Unfortunately, the costs are so overwhelming that most owners are unable to afford to pay the principal, let alone the interest, on the loans from the CWFA. Recognizing this problem, in 2005 cities and towns were authorized to create dam management districts to, among other things, collect funds for the maintenance and repair of dams.

### INSPECTION LIMITATIONS

By law, DEM is required to cause to be inspected all the dams in the state. However, the visual inspections performed by the Dam Safety Program do not involve full engineering analyses of the structural integrity of dams. DEM does not have the staff or the financial resources to ensure that such detailed inspections are completed. Although a visual inspection can provide indicators of underlying problems, an engineering analysis is sometimes needed to more fully assess the condition of the dam.

### TECHNICAL GUIDANCE DOCUMENTS

DEM has made available a technical guidance document titled, *Dam Safety – An Owner's Guidance Manual*, prepared by the Federal Emergency Management Agency (FEMA) and the State of Colorado. The document is available on DEM's website at <http://www.dem.ri.gov/programs/benviron/compinsp/pdf/damguide.pdf>. Although it is a useful document, DEM would like to develop technical guidance documents specific to Rhode Island. Such documents would better assist both dam owners and consultants in understanding requirements in the Dam Safety Regulations.

This completes the annual report on dam safety and the activities performed by DEM in 2011. For further information on the Dam Safety Program please contact David Chopy at (401) 222-1360, extension 7400.