

ENVIRONMENTAL Fact Sheet



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The Souhegan River Flood Control Sites of New Ipswich, NH

Creation of the Flood Control Sites

During the early 1960s, the provisions of Public Law 566, the Watershed Protection and Flood Prevention Act, were being implemented in New Hampshire. This initiative, which was in large part influenced by occurrences of repetitive flooding and the large floods of 1936 and 1938, was intended to provide the means to study the hydrology of the watershed and the hydraulics of the Souhegan River and its tributaries and to follow-up by constructing strategically located flood control sites. Four of the 12 sites were constructed in the town of New Ipswich. They are Sites 13, 14, 19 and 35, and all are currently owned and operated by the NHDES.

Although many federal, state and local sponsors played roles in the planning and execution of these projects, the U.S. Department of Agriculture Soil Conservation Service and the New Hampshire Water Resources Board were the entities primarily involved with the design, construction and operation of the projects. Today, the Soil Conservation Service goes by the name of Natural Resources Conservation Service and is still part of the USDA, while the New Hampshire Water Resources Board has become part of NHDES and is called the New Hampshire Water Resources Council. The map at right shows the locations of the four sites.



Current Dam Safety Practices

Although NHDES' regulations governing the oversight of dams have changed considerably over the years, the principle remains the same: keep dams in New Hampshire functioning properly for the continuing safety of those living, working and playing downstream. All four of the flood control reservoirs in New Ipswich are impounded by dams which are considered to pose a threat to downstream lives and property should they fail. For this reason, they are required to have a thorough safety inspection at regular intervals. Because Sites 14, 19 and 35 are considered to pose more of a threat than Site 13, they are classified as "high hazard" structures and are inspected at least once every two years. Site 13 is classified as a "significant hazard" structure due to its smaller dam height and reservoir volume, and has a detailed inspection carried out at least once every four years.

In addition to requiring routine safety inspections at regular intervals, NHDES mandates that all dams that pose a significant or high hazard potential to downstream lives and property have an emergency action plan (EAP) prepared for them. This plan is a compilation of information intended to facilitate rapid and coordinated response to an imminent or actual failure of the dam. Some of the items included in an EAP are:

Notification Flowchart: A flowchart diagram listing the names and telephone numbers of the emergency respondents and/or affected parties who are to make or receive calls should a situation develop at the dam.

Preventive Action: A section in the EAP that outlines the steps that a dam monitor or other respondent might take to address various situations that may reasonably occur at the dam. This section should also include a sketch of the dam, information relative to how the monitor has been trained, and what materials may be needed to address problems.

Breach Analysis: A simulation, usually using a specialized computer program, estimating the locations and depths of flooding along the downstream reach of the dam.

Inundation Maps: The maps generated from the breach analysis which show potentially inundated areas and provide emergency respondents and inhabitants with information relative to evacuation.

SITE 13

Height: 14 feet **Length:** 1,120 feet

Maximum Storage: 278 acre-feet

Hazard Classification: Significant hazard

Areas Susceptible to Breach Flooding: Greenville Road (3 crossings) and the Mill Pond at Otis Falls. Any development along the stream from the dam to the confluence with the Souhegan River, including the short stretch of the Souhegan River to the Mill Pond at Otis Falls may also be susceptible to flooding.



By having a plan that describes the potential hazards of a dam failure and which identifies the respondents and their roles should such an event begin to develop, the possibility to reduce or even prevent loss of life and property damage is increased. These plans are reviewed, updated and tested on an annual basis to ensure that they are functional and accurate.

In addition to the flooding that could result from a breach of these dams, there also exists the possibility that some travel areas within the flood storage pool upstream of the dams will become flooded. NHDES, in cooperation with the N.H. Association of Conservation Districts, the N.H. Office of Emergency Management, and the Hillsborough County Conservation District, has erected signs along these travel routes to warn motorists that backwater flooding may be experienced in these areas.

Since their construction in the mid-1960s, these sites have been routinely inspected, operated and maintained by NHDES. A typical detailed safety inspection includes a field evaluation and an office review. The field evaluation includes a complete walk-through to view all areas of the dam, inspection of the interior of drop inlets and principal spillway pipes, and a review of the development along the downstream reach of the dam. Deficiencies are noted, measurements are verified and photos are taken to completely document the inspection.

Subsequent to the field evaluation, an office review is performed. During this segment of the inspection process, the watershed hydrology and structure hydraulics are evaluated. Generally, unless considerable development has occurred within the watershed which could change the amount or speed of runoff into the reservoir or hydrological analysis techniques have evolved, these office analyses do not result in identifying deficiencies. However, since a dam's ability to pass storm discharges is paramount to its safe operation, these parameters must be verified as part of every safety inspection.

SITE 14

Height: 35 feet **Length:** 1,500 feet

Maximum Storage: 885 acre-feet

Hazard Classification: High hazard

Areas Susceptible to Breach Flooding: Ashley Mill Road, Greenville Road, Tricnut Road, N.H. Route 124 (Old Turnpike Road), and the Mill Pond at Otis Falls. Any development along Furnace Brook and the Souhegan River between these road crossings/structures may also be susceptible to flooding.



SITE 19

Height: 35.5 feet **Length:** 1,200 feet

Maximum Storage: 2,378 acre-feet

Hazard Classification: High hazard

Areas Susceptible to Breach Flooding: Ashby Road, Waterloom Falls, N.H. Route 124 (at High Bridge), the Mill Pond at Otis Falls, Main Street, Mill Street, Old Wilton Road and perhaps N.H. Route 31. Any development along the Souhegan River between these road crossings/structures may also be susceptible to flooding.



Manual operations at these flood control sites is rarely needed, as their original designers built in the ability for the structures to slowly store large volumes of storm runoff while keeping discharges through the dam controlled. However, there will be rare instances when water levels in the reservoirs will increase to the point where discharges will be safely directed around one end of the dam through a specially designed emergency spillway in a less controlled manner. This is not to say that the dams or the people living downstream are in danger. On the contrary, this condition is just what the designers had in mind. When flow begins to pass through these auxiliary spillways, it means that the reservoir's storage capability has been used to the extent that any additional flows coming into the reservoir will be passed more quickly through the site - and potentially add to damaging flooding that might be occurring downstream.

SITE 35

Height: 30 feet **Length:** 1,209 feet

Maximum Storage: 1,787 acre-feet

Hazard Classification: High hazard

Areas Susceptible to Breach Flooding: Taylor Road, Page Hill Road, Gibson Pond, Ashby Road, River Road and Waterloom Pond. Any development along the West Branch of the Souhegan River and the Souhegan River



between these road crossings/structures may also be susceptible to flooding.

Maintenance at the flood control sites is performed on an as-needed basis as dictated by either the findings of a detailed safety inspection or by periodic visits by NHDES maintenance staff. It is important to note that these sites are visited much more frequently than the required inspection interval of either two or four years. In reality, NHDES visits the sites bimonthly to make sure that the sites are functioning normally, and much more frequently during times of extreme weather. For the most part, maintenance issues include the removal of beaver debris or other floating debris from spillways, trimming woody vegetation or woody growth back away from the dam area, reestablishing hardy grass cover, and dealing with items resulting from transient use of the properties. This includes repairing vehicle ruts, foot traffic erosion and picking up trash.

Inspections, Operation and Maintenance

For more information on these or other Souhegan River Watershed flood control sites, please contact the NHDES Dam Bureau at (603) 271-3406, or go to NHDES Dam Bureau Webpage.

This fact sheet is accurate as of December 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.

Glossary

Dam monitor: A person familiar with the operational and maintenance issues of a dam who is assigned to monitor a dam.

Drop inlet: A vertical structure, usually a circular or square conduit, located on the upstream side of a dam which is used to control discharge through a dam.

Emergency spillway: An auxiliary outlet structure designed to pass flows greater in volume than the primary outlet structure.

Inundation map: A map delineating the area that would be inundated or flooded during a dam failure or other defined event.

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