

5 Watershed Modifications

5.1 Dams and Impoundments

The North Branch Park River watershed includes a number of dams and reservoirs that were constructed for flood control, water supply, industrial power, and recreation. Some of the existing dams and reservoirs retain their original uses, while others now primarily provide recreation, habitat, and open space. The major flood control reservoirs in the watershed, several of which only impound water during large storms, are largely undeveloped and therefore provide valuable wildlife habitat and open space. Other impoundments in the watershed provide aquatic and wildlife habitat and recreational opportunities, but may also limit or impede fish migration. *Table 5-1* lists the flood control reservoirs in the watershed, while *Table 5-2* lists state-registered

dams in the watershed. *Figure 5-1* depicts the locations of the various dams and impoundments in the watershed.



Monument at Blue Hills Reservoir (NEE, 2009).

Table 5-1. Flood Control Reservoirs in the North Branch Park River Watershed

Name/ Year Completed	CTDEP Flood Control ID No.	Location	Drainage Area (square miles)	Flood Control Pool Volume (acre-feet)	Pool Surface Area (acres)
Wintonbury Reservoir/ 1963 *dam only	1	Westerly branch of Beamans Brook, 1.2 miles northeast of Bloomfield Town Hall	1.42	850	165
Blue Hills Reservoir/1964 *dam only	2	Easterly branch of Beamans Brook, 1.3 miles northeast of Bloomfield Town Hall	1.9	700	175
Bloomfield (Tunxis) Reservoir/1962 *dam w/dike structure	3	Wash Brook, 1.5 miles north of Bloomfield Town Hall, adjacent to Tunxis Avenue (Rt. 189)	3.05	1,750	245
Cold Spring Reservoir/1968 *dam only	9	Northerly branch of Tumbledown Brook, 1.7 miles southwest of Bloomfield Town Hall	1.94	1,100	137

Figure 5-1

The flood control reservoirs listed in *Table 5-1* were constructed by the State of Connecticut in the early 1960s in response to the severe flooding that occurred in 1955. The reservoirs are designed to be primarily dry (no permanent pool) during non-flood events but have a total combined flood storage capacity of 1.44 billion gallons (4,408 acre-feet). These reservoirs are also designed to control approximately 12 inches of runoff from the contributing drainage area with allowances for approximately 50 years of sediment accumulation. A 1959 report to the Greater Hartford Flood Commission (Metcalf & Eddy, 1959) estimated the construction cost of these reservoirs at \$2,200,000 (based on 1955 prices).

Figure 5-1 shows the location and hazard classification of state-registered dams within the North Branch Park River watershed. According to the CTDEP Dam Safety Regulations, the hazard classification of a dam is based on the damage potential from failure of the structure. For example, a Class C dam is a high hazard potential dam which, if it were to fail, would result in probable loss of life; major damage to habitable structures, residences, hospitals, and other inhabited and public gathering places; damage to main highways with greater than 1,500 average daily trips; and great economic loss.

Table 5-2. Hazard Classification of State-Registered Dams

Dam Name	Hazard Class	Town
Brainard Pond Dam #1	A	West Hartford
Brainard Pond Dam #2	A	West Hartford
Tobacco Pond Dam #3	A	Bloomfield
Wash Brook Pond Dam	A	Bloomfield
Park Pond Dam	A	Bloomfield
Detention Basin Dam	A	Bloomfield
Dudley Town Pond Dam	A	Bloomfield
Filley Park Pond Dam	A	Bloomfield
Old Mill Pond Dam	A	Bloomfield
Natural Pond Dam	A	Bloomfield
Emerick Pond Dam	B	Bloomfield
Sinnot Pond Dam	B	Bloomfield
Serbin Dam	B	Bloomfield
Gale Pond Dam	BB	Bloomfield
Bloomfield Site 3A Dam	BB	Bloomfield
Schweitzer Pond Dam	BB	Bloomfield
University Of Hartford Dam	BB	Hartford
Cold Spring Dam	C	Bloomfield
Hartford Reservoir Dam #6	C	West Hartford
Talcott Reservoir Dam #1	C	West Hartford
Bloomfield Dam	C	Bloomfield
Wintonbury Site #1 Dam	C	Bloomfield
Blue Hills Reservoir Site #2 Dam	C	Bloomfield

Dams that have changed use or ownership often degrade in condition and fall into a state of disrepair, increasing the likelihood of dam failure. The CTDEP Dam Safety Section is required to inspect dams periodically, with increased inspection frequency for dams with higher hazard potential.

5.2 Park River Conduit System

Prior to the construction of the flood control reservoirs in the 1950s, a major flood control system was designed and constructed in Hartford in response to the devastating floods that occurred in the 1930s. The flood control system, much of which is intact today, consists of dikes to protect the city from the Connecticut River and twin underground conduits to control flooding along the Park River. Construction of the Park River conduits began in 1940, and was later modified in the 1950s following the 1955 flood. The Park River conduit system conveys flows from Hartford's interior drainage system, both artificial and natural, including the north and



The confluence of the Park River conduit with the Connecticut River in Hartford.

south branches of the Park River, into the Connecticut River. The Park River conduit system consists of tunnels that carry the north and south branches of the Park River separately to their confluence, and then join to form a twin-barreled conduit that carries the entire main branch of the Park River to its mouth at the Connecticut River. The North Branch Park River enters this conduit system near Farmington Avenue in Hartford. Each of the two conduits that comprise the main branch of the conduit system is 36 feet wide and 27.5 feet high. Under typical conditions, the conduits flow by gravity with a free water surface. However, during large flood events, the conduit inlets can become submerged, causing the conduits to flow under pressure.

The conduit system also includes an additional siphon conduit that augments the capacity of the main conduits.

While the flood control projects of the last century have protected the City of Hartford from the type of catastrophic floods that occurred in the 1930s and 1950s, these changes have also disconnected the river from the surrounding communities and have contributed to the river's deteriorated water quality and degraded habitat conditions that exist today.

The Park River conduit system is designed to manage flows associated with localized storm events (i.e., limited to the Park River watershed) much larger than the 100-year storm, which is the design standard for flood control. The selected design storm for the Park River conduit system was the “storm of record” in New England (18.3 inches of rain in a 24-hour period as recorded at Westfield, Massachusetts in 1955). By comparison, a 100-year storm in Hartford is estimated to be approximately 6.7 inches of rain in

24 hours. The conduit system is designed to accommodate these flood flows even while the Connecticut River is peaking at its 100-year flood elevation. A drainage analysis of the City of Hartford's Levee and Flood Control System was completed in June 2009 as part of the City's effort to obtain FEMA accreditation for the system. Based on this analysis, the capacity of the main branch of the Park River conduit system is approximately 24,000 cubic feet per second (cfs) and the capacity of the Auxiliary Conduit is approximately 6,700 cfs.

The flood control projects of the last century have protected the City of Hartford from the type of catastrophic floods that occurred in the 1930s and 1950s. However, as indicated in Section 3.1 *History of the Watershed*, channelization and burial of portions of the North Branch Park River dramatically altered the physical and habitat characteristics of the river and the land development patterns along the river and within its watershed, which have disconnected the river from the surrounding communities and have contributed to the river's deteriorated water quality and degraded habitat conditions that exist today.

5.3 Water Supply

The Metropolitan District Commission (MDC), chartered by the Connecticut General Assembly in 1929, provides potable water to approximately 90,000 customers and 400,000 people in its eight member communities, which include Bloomfield, East Hartford, Hartford, Newington, Rocky Hill, West Hartford, Wethersfield and Windsor; as well as portions of East Granby, Farmington, Glastonbury, South Windsor, Manchester and Windsor Locks. As of 2000, 95% of Bloomfield's and 100% of West Hartford's and Hartford's populations were supplied water by the MDC. Avon and Simsbury, small areas of which are located within the North Branch Park River watershed, are served by Connecticut Water Company and Aquarion Water Company, respectively.

Drinking water supplied to the North Branch Park River watershed originates from surface waters located outside of the watershed boundaries, including the East Branch of the Farmington River and the Nepaug River, a tributary of the Farmington River. The associated drinking water reservoirs are located in the northwest hills of Connecticut – the 30.3 billion

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gallon Barkhamsted Reservoir and the 9.5 billion gallon Nepaug Reservoir. Water from these sources flows by gravity to two treatment facilities, including a slow sand filtration plant located off Farmington Avenue in West Hartford and a rapid sand filtration facility located at the MDC-operated West Hartford Reservoir No. 6, which is located in the southwest portion of the North Branch Park River watershed. West Hartford Reservoir No. 6 typically receives water from Barkhamsted

Reservoir and may receive water from Nepaug Reservoir depending on the positioning of flow control valves along the transmission main (MDC, 2008).

Portions of the watersheds of two other MDC reservoirs, West Hartford Reservoirs No. 2 and No. 3, are located within the North Branch Park River watershed. Although active, West Hartford Reservoirs No. 2 and No. 3 are rarely used at this time. *Table 5-3* provides additional information on the three MDC reservoirs that are located within the North Branch Park River watershed.

**Table 5-3. MDC Drinking Water Reservoirs
in the North Branch Park River Watershed**

West Hartford Reservoir	Location	Use	Built	Capacity (million gallons)		Watershed Area (sq.mi.)
				Total	Usable	
No. 2	West Hartford	Water supply (active, rarely used)	1867-1868	284	277	1.1
No. 3	West Hartford	Water supply (active, rarely used)	1875	144	96	0.6
No. 6	West Hartford & Bloomfield	Water supply (active)	1891-1895	809	796	2

Source: The Metropolitan District Individual Water Supply Plan, 2008.

The MDC water supply system is largely protected by its undeveloped watershed land. The West Hartford Reservoir system watershed is predominantly rural, with few commercial or industrial facilities. A large percentage of the watershed land is owned by the MDC or the State of Connecticut. Of the over 2,300 acres of watershed area associated with the West Hartford Reservoir system (Reservoirs No. 2, 3, 5, and 6), approximately 91 percent of the land in the watershed is preserved including all watershed land owned by the MDC, state forest and parklands, and municipally or privately held land designated as open space (CTDPH, 2003). However, the MDC implements a number of source water protection programs to further protect the quality of its drinking water supplies, including:

- Watershed inspection
- Water quality monitoring
- Land use monitoring
- Land use planning and zoning
- Technical assistance and education
- Emergency spill response
- Watershed forest management
- Land acquisition

The State of Connecticut Department of Public Health, Drinking Water Section completed an assessment of public drinking water sources to identify and document potential sources of contamination that could adversely impact drinking water quality. The assessments found that the West Hartford Reservoir system has a low susceptibility to potential sources of contamination (CTDPH, 2003).

Less than 10 percent of the residents of the North Branch Park River watershed obtain their drinking water from private groundwater wells and other water supplies sources. Private water supplies are regulated by the local health departments.

5.4 Wastewater

In addition to water supply, the MDC also provides sewerage services on a regional basis to its member communities. The MDC owns and operates a combined sewer system within Hartford and a small portion of West Hartford. These sewers date back to the 19th century, when it was believed that dual-purpose pipes for sewage and storm water conveyance would result in more manageable and cost-effective collection systems. While the pipes were originally sized to carry both sewage and stormwater, intense storm events and expansion of the collection system due to development have historically taxed the capacity of the MDC's interceptor sewers and the wastewater treatment facility, which cannot handle the large wet weather flows from the combined sewer system (CTDEP, 2007). During rain events, basements may fill with sewage, streets may flood, and untreated wastewater may discharge from the sewer system at combined sewer overflow (CSO) and sanitary sewer overflow (SSO) locations.

A combined sewer system uses a single pipe to carry both sewage and stormwater. When it rains, stormwater enters the pipe with the sewage. As these sewers become overloaded, they can back up onto streets, into yards and into basements. Combined Sewer Overflows or CSOs are used to alleviate pipe surcharging, spilling sewage into open waters.

Six of the eight member communities contribute flow to the Hartford collection system for conveyance to the Hartford Water Pollution Control Facility, including all of Hartford, all of West Hartford, and portions of Bloomfield, Newington, Wethersfield and Windsor. Hartford and West Hartford are the only member communities with any combined sewers. The MDC's CSOs are ultimately discharged to the Connecticut River having a direct effect on multiple downstream communities (CTDEP, 2007). *Figure 5-2* depicts the sewer service area within the North Branch Park River watershed. There are currently four CSOs (Hartford) and one SSO (Bloomfield) within the North Branch Park River watershed (*Figure 5-3*). The partially and fully combined portions of the sewer system are located within the West Hartford and Hartford portions of the watershed.

The MDC is implementing a major infrastructure improvement program known as "The Clean Water Project" to address a federal consent decree and a CTDEP consent order to achieve the Federal Clean Water Act goals by 2020. The Clean Water Project includes three basic elements: (1) reduction of combined sewer overflows (CSOs) within the Hartford central sewer system, (2) elimination of sanitary sewer overflows (SSOs) in the sanitary sewers of Wethersfield, West Hartford, Windsor, Rocky Hill and Newington and (3) nitrogen reductions. The MDC

Figure 5-2

Figure 5-3

abatement plan would eliminate all discharge from CSOs/SSOs during storms up to and including the typical one-year frequency event. The District plans to address the SSO and CSO issues by implementing one or more of the following strategies:

- Separating the combined sewer systems
- Correcting illegal connections including roof drains and sump pumps and groundwater infiltration locations
- Installing new, larger sewer pipes
- Installing storage pipes to hold storm flows and prevent storm event related discharges
- Increasing sewer treatment plant capacities

These projects will help to eliminate sewage overflows to area waterways during an average year, significantly improving water quality. In addition to CSO and SSO abatement program, the “Clean Water Project” also includes plans to upgrade District water pollution control facilities (WPCFs) to meet nitrogen removal requirements. However, none of the MDC WPCFs discharge into the North Branch Park River watershed.

The MDC and the City of Hartford are also evaluating the use of green infrastructure approaches and low impact development (LID) to further manage wet weather flows, including storm runoff volume and quality. Such practices include the installation of rain gardens, open channels/swales, and pervious pavements which promote the infiltration of runoff into the soil instead of directing it into the storm and/or combined sewer system. Green infrastructure concepts have been proposed for in and around the State Capitol in Hartford including the removal of impervious cover (reduction of paved areas) and the installation of stormwater swales and rain gardens.

The Towns of Avon and Simsbury are not served by MDC sewer system. Alternately, all private septic systems in these Towns are regulated under the Farmington Valley Health District. This District is responsible for the enforcement of the Connecticut Public Health Code requirements governing the disposal of sewage through septic systems including the installation of new systems as well as the repair and replacement of existing septic systems.

5.5 Regulated Sites

Historical and current industrial and commercial development within the North Branch Park River watershed poses a potential threat to surface water and groundwater supplies in the watershed. Wastewater discharges, illegal waste disposal, improper use and disposal of chemicals such as used oil, pesticides, and herbicides, chemical spills, and historical site contamination are potential sources of contaminants from industrial and commercial facilities.

Table 5-4 summarizes the facilities in the North Branch Park River watershed with surface water discharges regulated under the National Pollutant Discharge Elimination System (NPDES) permit program, which is administered by the CTDEP. The facilities listed in *Table 5-4* have permits for discharges of wastewater or stormwater discharges either directly to surface waters or indirectly via stormwater drainage systems. The majority of these facilities are located in Bloomfield, although a number are also located in Hartford and West Hartford.

**Table 5-4. Facilities with NPDES Discharge Permits
in the North Branch Park River Watershed**

Type of Discharge Permit	Permit ID Prefix	Number of Facilities in the Watershed		
		Bloomfield	Hartford	West Hartford
Surface Water Discharge	CT	3	0	1
General Permit for Cooling Water	GCW	4	1	0
General Permit for Domestic Sewage	GDS	1	1	1
General Permit for Food Processing	GFP	2	0	0
General Permit for Groundwater Remediation	GGR	2	2	1
General Permit for Miscellaneous Discharges to Sewer	GMI	2	0	0
General Permit for Photographic System	GPH	3	6	1
General Permit for Swimming Pool Filters	GPL	7	4	5
General Permit for Printing & Publishing	GPP	4	0	0
General Permit for Commercial Stormwater	GSC	4	1	0
General Permit Industrial Stormwater	GSI	15	0	0
General Permit for Municipal Separate Storm Sewer Systems (MS4s)	GSM	1	1	1
General Permit for Construction Stormwater	GSN	26	8	6
General Permit for Parts Tumbling and Cleaning	GTC	3	0	0
General Permit for Vehicle Maintenance	GVM	5	2	0
General Permit for Potable Water Filtration	GWT	5	0	0
Pretreated Sewer Discharge	SP	2	0	0
Total:		89	25	15

Source: CTDEP, December 2007.

Table 5-5 summarizes hazardous waste generators and other regulated industrial facilities within the watershed. These facilities are located in the upper portion of the watershed primarily along the Route 187 corridor in Bloomfield and in the lower portion of the watershed clustered along Homestead Avenue in Hartford. Hazardous waste facilities are regulated under the Resource Conservation and Recovery Act (RCRA), including Large Quantity Generators (i.e., facilities that generate 1,000 kilograms per month or more of hazardous waste, more than 1 kilogram per month of acutely hazardous waste, or more than 100 kilograms per month of acute spill residue or soil) and facilities registered with the CTDEP Corrective Action Program. Small Quantity Generators are not included in *Table 5-5*. The Toxics Release Inventory (TRI) is a database containing detailed information on chemicals that industrial facilities manage through disposal or other releases, or recycling, energy recovery, or treatment. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Certain facilities are required to report to the TRI Program annually.

There are no sites in the watershed that are listed as potential hazardous waste sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), otherwise known as "Superfund." Additionally, there are no facilities in the watershed requiring a Federal Title V permit for major emitters of air pollutants.

Table 5-5. Summary of Regulated Waste Facilities

Facility Name	Address	Town	Resource Conservation and Recovery Act	Toxic Release Inventory
Birken Manufacturing Company, Inc.	3 Old Windsor Road	Bloomfield	Corrective Action	Reporter
Connecticut Printers, Inc.	55 Granby Street	Bloomfield	-	Reporter
Kamatics Corporation	1330 Blue Hills Ave.	Bloomfield	Large Quantity Generators	Reporter
Lesro Industries, Inc.	55 Peters Rd	Bloomfield	Large Quantity Generators	--
New England Dairies, Inc.	255 Homestead Avenue	Hartford	--	Reporter
Otis Service Center	212 W. Newberry Rd.	Bloomfield	--	Reporter
Philbrick-Booth & Spencer	367 Homestead Avenue	Hartford	--	Reporter
Rollprint Packaging Prod, Inc	16 Southwood Rd.	Bloomfield	--	Reporter
St Francis Hospital & Med Ctr	114 Woodland Street	Hartford	Large Quantity Generators	--
Stanley P Rockwell Company	296 Homestead Avenue	Hartford	--	Reporter
Tilcon Connecticut, Inc	301 Hartford Avenue	Newington	--	Reporter
Turbine Controls Inc	2 Old Windsor Rd	Bloomfield	Large Quantity Generators	Reporter
Turbotec Products Incorporated	125 Old Iron Ore Rd.	Bloomfield	--	Reporter
Ultra Vac Metallizing Corporation	195 W. Newberry Rd.	Bloomfield	--	Reporter
Wood Group Pratt & Whitney Industrial Turbine Service LLC	1460 Blue Hills Ave	Bloomfield	Large Quantity Generators	--

Sources: EPA Geospatial Data Access Project. Featured Environmental Interests. http://www.epa.gov/enviro/geo_data.html. Updated January 1, 2009 and Department of Environmental Protection. Commercial Hazardous Waste and Connecticut Regulated Waste Facilities In Connecticut. http://www.ct.gov/dep/cwp/view.asp?a=2718&q=325490&depNav_GID=1646. Updated October 21, 2008.

A former municipal landfill is located immediately adjacent to the western boundary of the West Hartford Reservoir subwatershed. The closed landfill, which is now a leaf compost facility operated by the Town of West Hartford, is located off of Route 44 on the southwest side of West Hartford Reservoir No. 6. The facility is identified as a significant potential contamination source in the MDC Water Supply Plan (2008).