

## **5.2 Watershed Characteristics**

### **5.2.1 Area**

The size of the contributing drainage area expressed in hectares (acres) or square kilometers (square miles) is determined from some or all of the following:

- Direct field surveys with conventional surveying instruments
- Use of USGS topographic maps together with field checks to determine any changes in the contributing drainage area
- Topographic maps or other survey data may be available in the Department's Central Surveys office
- Aerial maps or aerial photographs of the State are available from the ConnDEP and the Department's Bureau of Policy and Planning
- Mapping prepared by the municipality or regional agency
- Atlas of the Public Water Supply Sources and Drainage Basins of Connecticut (DEP Bulletin No. 4), June 1982

In determining the size of the contributing watershed, any areas outside the physical boundaries of the drainage area that have runoff diverted into the drainage area being analyzed shall be included in the total contributing drainage area. In addition, it must be determined if flood waters are naturally diverted out of the basin before reaching the site. Diversion to or from the watershed in question should be specifically documented in the hydrology section of the hydraulic or drainage design report.

### **5.2.2 Slopes**

Determine the slope of the stream, the average slope of the watershed (basin slope), and land slope. Hydrologic and hydraulic procedures in other chapters of this manual are dependent on these slopes.

### **5.2.3 Land Use**

- Define and document the present and expected future land use (where practicable), particularly the location, degree of anticipated urbanization and data source
- Information on existing use and future urbanization trends may be obtained from aerial photographs
- Zoning maps and master plans, USGS maps and municipal planning agencies provide land use data
- Specific information about particular tracts of land can often be obtained from owners, developers, realtors and local residents
- Existing land use data for small watersheds can best be determined or verified from a field investigation

Field surveys can be used to update information on maps and aerial photographs, especially in basins that have experienced changes in development since the maps or photos were prepared.

#### **5.2.4 Streams, Rivers, Ponds, Lakes and Wetlands**

At all streams, rivers, ponds, lakes and wetlands that will affect, or may be affected by, the proposed structure or construction, the following data should be secured. This is important in determining the expected hydrology and may be needed for regulatory permits.

- Outline of the boundary (perimeter) of the water body for the ordinary highwater
- Elevation of normal as well as highwater for various frequencies. (See Chapter 6, Hydrology.)
- Detailed description of any natural spillway, manmade spillway, or outlet works, including dimensions, elevations and operational characteristics
- Detailed description of any emergency spillway works including dimensions and elevations
- Description of adjustable gates, soil and water control devices
- Profile along the top of any dam and a typical cross section of the dam
- The use of the water resource (fish, recreation, power, irrigation, municipal or industrial water supply, etc.)
- The existing conditions of the stream, river, pond, lake or wetlands with respect to turbidity and silt.
- Riparian ownership(s) as well as any water rights

#### **5.2.5 Environmental Considerations**

The need for environmental data stems from the need to investigate and mitigate possible impacts due to specific design configurations. Information necessary to define the need for mitigation measures for fish passage should be coordinated with Conn D.E.P. Fisheries Unit and/or U.S. Fish and Wildlife.

#### **5.2.6 Geological Considerations**

All watersheds in the State of Connecticut have had the soils classified by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), formerly Soil Conservation Service (SCS). The soils surveys are prepared for the counties within the State and can be obtained from the abutting states. These surveys indicate the types of soil and the areas where they are found. From these plans, soil groups can be developed which can then be used for:

- Determining runoff coefficients used with the Rational method. (See Chapter 6, Hydrology.)
- Determining curve numbers for use in computer models such as HEC-1 and NRCS methods. (See Chapter 6, Hydrology.)

The regional regression equations (see Chapter 6, Hydrology) require that the percentage of coarse-grained stratified drift within the watershed be determined. This information is available from the Hydraulics and Drainage Section. Include copies of overlays for U.S.G.S. 1:24000 scale quadrangle maps. The USGS is also a primary source of data related to surficial geology.