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ENVIRONMENTAL ENGINEERING

WATER RESOURCES
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SOLID WASTES DISPOSAL
AIR POLLUTION CONTROL
RATE INVESTIGATIONS
SANITARY LABORATORIES
AREAWIDE PLANNING


December 14, 1987

Ms. Anne Gobin
Water Supplies Section
Department of Health Services
150 Washington Street
Hartford, CT 06106

Dear Anne,

Havens and Emerson is pleased to submit the "Final Water Supply Assessment for the Upper Connecticut River Water Supply Management Area" on behalf of the Upper Connecticut River WUCC. We are including 70 copies of the Assessment to the Department of Health Services for your distribution as required by our contract.

We are also providing an additional 35 copies of the Assessment to be distributed to the list of active WUCC members as has been the practice with past submittals.

If we can be of further service in any way please advise.

Sincerely,
HAVENS AND EMERSON, INC.

David L Klunzinger
David L. Klunzinger

DLK/jh
Enclosures

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# CHAPTER ONE

# WATER SUPPLY ASSESSMENT

## 1.1 INTRODUCTION

### 1.1.1 The Coordinated Water System Planning Process

During the 1985 Legislative Session the Connecticut General Assembly passed an Act Concerning a Connecticut Plan for Public Water Supply Coordination effectively initiating a state-wide water supply planning program. The Department of Health Services (DOHS) in consultation with the Department of Public Utility Control (DPUC), Department of Environmental Protection (DEP) and Office of Policy and Management (OPM), was given charge of providing a coordinated approach to long-range planning, addressing both water quality and quantity issues to assure future supplies.

The first step to be addressed in this process by the DOHS was delineation of the state into regional water supply management areas as illustrated in Figure 1.1. Consideration of the following factors resulted in the delineation of the State into seven management areas:

1. similarity of water supply problems,
2. population density and distribution,
3. existing sources of public water supply,
4. service areas or franchise areas,
5. existing interconnections between utilities,
6. municipal and regional planning agency boundaries, natural drainage basins, and
7. similar topographic and geologic characteristics.

Once the water supply management areas were designated, the DOHS set priorities for each regional planning process designed to bring together both utility representatives and representatives from regional planning organizations in a Water Utility Coordinating Committee (WUCC) to discuss all pertinent issues. It is here that the WUCC will get to the heart of the program, formulating a plan to address future needs and concerns, to identify potential conflicts over future water supply sources, competition for future service areas, and areas of anticipated growth where public water supply is not available.

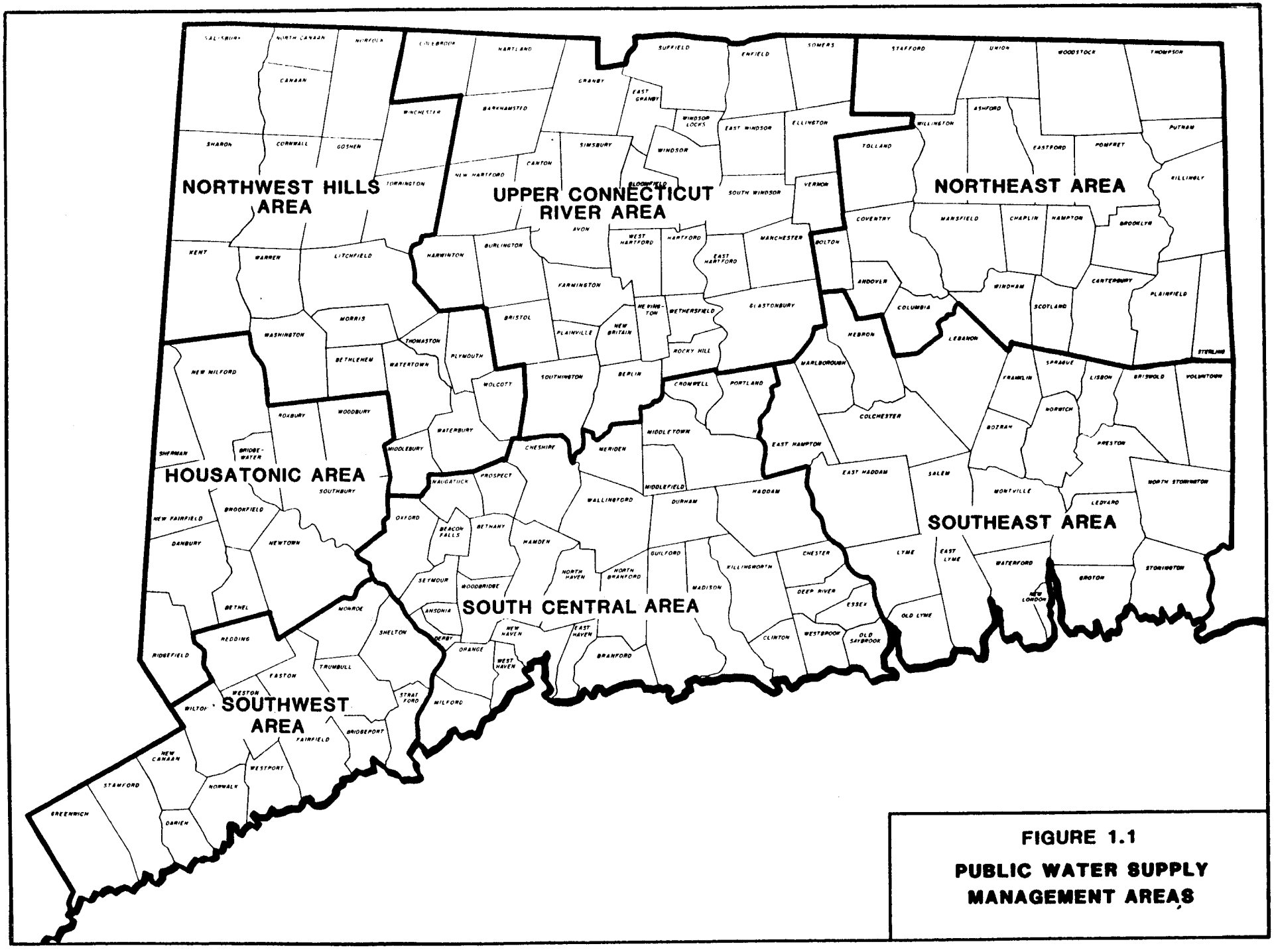


**FIGURE 1.1**

**PUBLIC WATER SUPPLY MANAGEMENT AREAS**

The Housatonic area WUCC was the first to be convened on June 11, 1986, prioritized first due to its rapid population growth and numerous small water systems. The Upper Connecticut River area (the focus of this report) was set as the second priority of the state due to its higher population concentration, groundwater contamination problems, concerns over the adequacy of existing future water supplies, the general level of existing utility planning, and inter-utility coordination. The South Central area was selected as the third priority. The Commissioner of Health Services convened the Upper Connecticut River Water Utility Coordinating Committee on March 24, 1987. The WUCC is comprised of representatives of public water systems and regional planning organizations within the management area.

The WUCC has two years to complete the Coordinated Water System Plan as shown in Figure 1.2. As outlined, the plan must include a minimum of the individual water system plans for each utility required to submit a plan pursuant to Connecticut General Statutes section 25-32d and the area-wide supplement that addresses the area's water systems concerns as they pertain to the public water supply management area, exclusive of the individual plans. The Areawide Supplement is comprised of four components, the Water Supply Assessment, the Exclusive Service Area Boundaries, the Integrated Report and the Executive Summary.

The first component, the Water Supply Assessment, constitutes the compilation of all raw data available to form a problem statement for the Upper Connecticut River Area. The Assessment will primarily address the general water supply conditions and the area's water system issues, concerns and needs.

The Exclusive Service Area Boundaries Report defines the future service areas of each public water system, using the following criteria:

- existing water service area,
- land use planning, zoning regulations and growth trends,
- physical limitations to water service,
- political boundaries,

- water company rights as established by statute, special act or administrative decisions,
- system hydraulics, including potential elevations or pressure zones,
- ability of a water system to provide a pure and adequate supply of water now and into the future.

The Integrated Report is developed to provide an overview of individual public water systems within the management area, address area-wide water supply issues, concerns and needs, and promote cooperation among utilities. The following factors are addressed in the Integrated Report:

- population and water consumption projections,
- alternative supplies and future availability,
- identification of areas not within the exclusive service area boundaries,
- compatibility with land-use planning and growth policies,
- utility interconnections, existing and future plans,
- provisions for joint use, management or ownership of systems,
- satellite management or transfer of ownership,
- minimum design standards,
- financial data pertinent to area-wide projects, and
- potential impacts on additional water resource use.

The fourth and final component of the Areawide Supplement consists of the Executive Summary. It will include an abbreviated overview and will summarize the major elements of the coordinated water system plan.

### 1.1.2 Upper Connecticut River Public Water Supply Management Area

The Upper Connecticut River Public Water Supply Management Area (as outlined in Figure 1.3) is located in the north central region of Connecticut, bordered to the north by the Commonwealth of Massachusetts. Thirty-five communities comprise the Upper Connecticut River Area, which covers a land mass of greater than 1,000 square miles. Eighty-six utilities are found within this area.

The predominant geologic feature of the Upper Connecticut Management Area is the Central Valley. This region, also known as the Connecticut Valley, consists of a generally low-lying zone divided in two by a high ridge - the Metacomet Ridge - that runs almost the whole length of the region.[1] The

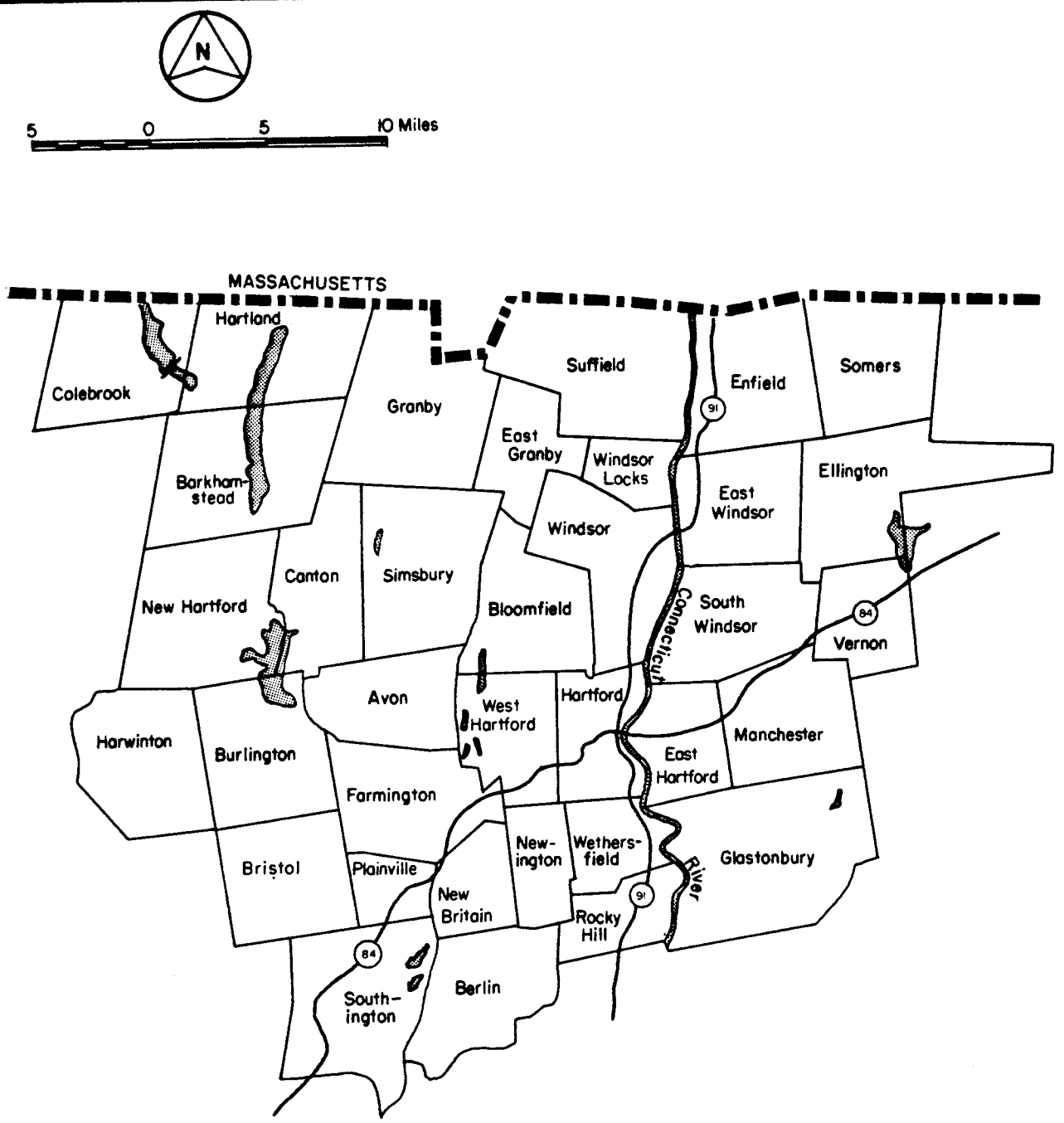


**FIGURE 1.3**

**UPPER CONNECTICUT RIVER WATER SUPPLY MANAGEMENT AREA**

valley with its rich fertile soil, indicative of stratified drift, was formed by Glacial Lake Hitchcock. Approximately 4,000 years ago the dam to the Lake collapsed leaving behind flat terrain and an abundance of sediment, thus setting the Central Valley apart from most of the region, giving it good rich farmland, not the rocky soil that plagues most of New England. Glacial till, the other geological unit found in the Central Valley, produces a clayey soil with a variance of sediment particles consisting of unsorted clay, silt, sand, pebbles and stones.(1) Glacial till is likely to appear along the outer edges of the valley, sometimes in the form of drumlins (distinctively rounded egg-shaped hills). The western and eastern edges of the Upper Connecticut River Water Supply Management Area are part of another physiographic region of the state and are aptly known as the Eastern and Western Uplands. The Uplands, underlain by crystalline rocks, are covered by a varying thickness of glacial till and rocky but fertile soil.

The Connecticut Department of Environmental Protection (DEP)(2) published figures that assessed 90 percent of the Upper Connecticut area population (estimated at about 885,760 in 1985) as served by public or private utilities, with the remainder deriving their supply from individual groundwater wells. There are a total of 86 utilities in the Upper Connecticut River Study Area; of these, 63 serve a customer base of fewer than 1,000 people. The remaining 23 utilities provide water to a densely populated core of the management area.

The center of the Upper Connecticut River area, both geographically and in population density, is Hartford, which hosts the largest utility. The population center radiates outward from Hartford, with larger utilities typically found in the capitol region and the smaller sized utilities generally located in the outer reaches of the Upper Connecticut area. As shown in Table 1.1, population trends in the study area as a whole have varied from town to town. Although the area's population grew by about 20 percent on an area-wide basis between 1960 and 1970, there was a drop of the total population during the next 10 year period (1970 - 1980). This drop was primarily associated with significant declines in the major population center in and around Hartford. The Connecticut Office of Policy and Management (OPM),(3)

TABLE 1.1

UPPER CONNECTICUT RIVER AREA POPULATION DATA

| COMMUNITY | CENSUS POPULATION(1) 1960 | 1970 | 1980 | OPM(2) POPULATION PROJECTIONS 1986(3) | 1991(3) | 2000 | 2030 |
|---|---|---|---|---|---|---|---|
| Avon | 5,273 | 8,352 | 11,201 | 12,400 | 13,300 | 14,200 | 18,900 |
| Barkhamsted | 1,370 | 2,066 | 2,935 | 3,090 | 3,260 | 3,490 | 4,400 |
| Berlin | 11,250 | 14,149 | 15,121 | 15,600 | 15,930 | 15,840 | 17,200 |
| Bloomfield | 13,613 | 18,301 | 18,608 | 19,670 | 20,470 | 22,110 | 27,200 |
| Bristol | 45,499 | 55,487 | 57,370 | 59,090 | 60,130 | 61,470 | 67,800 |
| Burlington | 2,790 | 4,070 | 5,660 | 6,020 | 6,270 | 6,540 | 7,900 |
| Canton | 4,783 | 6,868 | 7,635 | 8,040 | 8,360 | 8,650 | 10,300 |
| Colebrook | 791 | 1,020 | 1,221 | 1,260 | 1,290 | 1,350 | 1,500 |
| East Granby | 2,434 | 3,532 | 4,102 | 4,350 | 4,580 | 4,870 | 6,100 |
| East Hartford | 43,977 | 57,583 | 52,563 | 53,900 | 55,100 | 57,060 | 64,000 |
| East Windsor | 7,500 | 8,513 | 8,925 | 9,340 | 9,600 | 9,680 | 11,000 |
| Ellington | 5,580 | 7,707 | 9,711 | 10,480 | 11,070 | 11,710 | 14,900 |
| Enfield | 31,464 | 46,189 | 42,695 | 44,980 | 46,840 | 50,200 | 61,300 |
| Farmington | 10,813 | 14,390 | 16,407 | 16,770 | 17,030 | 17,610 | 19,200 |
| Glastonbury | 14,497 | 20,651 | 24,327 | 26,610 | 28,470 | 31,830 | 43,000 |
| Granby | 4,968 | 6,150 | 7,956 | 8,460 | 8,940 | 9,760 | 12,400 |
| Hartford | 162,178 | 158,017 | 136,392 | 136,790 | 138,890 | 143,390 | 153,900 |
| Hartland | 1,040 | 1,303 | 1,416 | 1,470 | 1,550 | 1,670 | 2,100 |
| Harwinton | 3,344 | 4,318 | 4,889 | 5,230 | 5,520 | 5,920 | 7,500 |
| Manchester | 42,102 | 47,994 | 49,761 | 50,700 | 51,360 | 52,760 | 57,000 |
| New Britain | 82,201 | 83,441 | 73,840 | 73,830 | 73,160 | 70,810 | 66,700 |
| New Hartford | 3,033 | 3,970 | 4,884 | 5,100 | 5,260 | 5,350 | 6,100 |
| Newington | 17,664 | 26,037 | 28,841 | 29,840 | 30,840 | 32,140 | 37,500 |
| Plainville | 13,149 | 16,733 | 16,401 | 16,990 | 17,410 | 17,500 | 19,400 |
| Rocky Hill | 7,404 | 11,103 | 14,559 | 16,960 | 18,860 | 21,560 | 32,300 |
| Simsbury | 10,138 | 17,475 | 21,161 | 22,400 | 23,620 | 26,160 | 33,500 |
| Somers | 3,702 | 6,893 | 8,473 | 8,720 | 8,920 | 9,030 | 10,000 |
| Southington | 22,797 | 30,946 | 36,879 | 38,180 | 39,620 | 41,580 | 48,900 |
| South Windsor | 9,460 | 15,553 | 17,198 | 18,290 | 19,100 | 20,580 | 25,500 |
| Suffield | 6,779 | 8,634 | 9,294 | 9,590 | 9,770 | 9,860 | 10,800 |
| Vernon | 16,961 | 27,237 | 27,974 | 28,930 | 30,170 | 32,530 | 39,400 |
| West Hartford | 62,382 | 68,031 | 61,301 | 61,230 | 61,210 | 60,070 | 58,700 |
| Wethersfield | 20,561 | 26,662 | 26,013 | 26,350 | 26,570 | 27,010 | 28,500 |
| Windsor | 19,467 | 22,502 | 25,204 | 26,620 | 27,740 | 29,700 | 36,500 |
| Windsor Locks | 11,411 | 15,080 | 12,190 | 12,460 | 12,620 | 12,320 | 12,800 |
| TOTAL | 722,375 | 866,957 | 863,107 | 889,740 | 912,830 | 946,310 | 1,074,200 |

Notes: (1) U.S. Department of Commerce, Bureau of the Census.
(2) Connecticut OPM Projections (see Reference No. 3).
(3) 1986 and 1991 population figures based on a straight-line interpolation of the population projections provided by OPM for the years 1985, 1990 and 1995.

however, projects that there will be a general increase in the overall population of the Upper Connecticut River area, which will be principally stimulated by growth in the eastern and western parts of the study area. The overall growth and changing growth patterns, coupled with known contaminated groundwater supplies of many individual wells, points to the need for a well planned expansion of water service from existing utilities.

### 1.1.3 Information Sources

An abundance of data was obtained for the assessment of the Upper Connecticut Management Area. There are a good number of medium to large-sized utilities that provided information from planning documents. The WUCC questionnaires (a sample WUCC questionnaire is included in Appendix B) were relied upon heavily, as it was structured specifically to gather information for this assessment and in many ways provides the most up-to-date information available. Since the Water Supply Assessment is essentially a summary of existing conditions with the inclusion of a problem statement, it was presumed that the utilities provided the most accurate information source.

Other valuable sources of information included inspection reports, correspondence and other information from the DOHS files and the DEP's Water Supply Shared Data Base.

### 1.1.4 Structure of the Water Supply Assessment

The structure of the Water Supply Assessment is designed to specifically meet the requirements of the regulations. The following five points of concern are reflective of the regulation's requirements, with the addition of a sixth point of concern as designated by the WUCC:

- Description of the existing water systems (Section 1.2 and Appendix A)
- Availability and adequacy of future sources (Section 1.3)
- Existing service area boundaries (Section 1.4)
- Land use and population trends (Section 1.5)
- Status of water system planning, land use planning and coordination between public water systems (Section 1.6)

- Identification of key water supply problems within the Upper Connecticut Public Water Supply Management Area (Section 1.7)

## 1.2 DESCRIPTION OF EXISTING WATER SUPPLY SYSTEMS

### 1.2.1 General

The intent of this section is to provide a brief summary of the existing water supply systems. The information presented will be organized by utility as well as town groupings due to the broad area that many utilities cover and numerous situations where more than one utility services a single town. Tabular summaries of information for each utility are also contained in Appendix A.

### 1.2.2 Questionnaire Response Data, Inconsistencies and Resolution

A profile of questionnaire returns is presented in Table 1.2, and indicates an overall excellent response to the questionnaire. Between 55 and 60 percent of the utilities in the Upper Connecticut River Public Water Supply Management Area responded, including 45 to 50 percent of the smaller utilities (with fewer than 1000 customers) and over 80 percent of the larger utilities. This return, however, represents about 95 percent of the utility-supplied customers. Also as noted in Table 1.2, DOHS typically counts two of the utilities (Connecticut Water Company and Unionville Water Co.) which have multiple divisions each as a single utility.

The questionnaires were filled out in varying degrees of completeness. The larger utilities generally provided a more complete document (completion of 90 percent or more of questions) reflecting their past planning activities, more comprehensive historic records, and need to complete annual DPUC reports. The smaller utilities typically completed about two-thirds of the questions, with most frequent nonresponsive categories including questions pertaining to water production (No. 11), safe yield (No. 12), source withdrawal (No. 13), distribution piping (No. 17) and facility needs (No. 20).

TABLE 1.2

PROFILE OF WUCC QUESTIONNAIRE RETURNS

| UTILITY CUSTOMER BASE | NUMBER OF AREA UTILITIES | | NUMBER OF AREA UTILITIES RESPONDING | | PERCENT OF AREA UTILITIES RESPONDING | |
|---|---|---|---|---|---|---|
| | ALL (1) DIVISIONS | (1) GROUPED | ALL DIVISIONS | GROUPED | ALL DIVISIONS | GROUPED |
| 0 - 100 | 39 | 39 | 14 | 14 | 36 | 36 |
| 101 - 200 | 9 | 9 | 6 | 6 | 67 | 67 |
| 201 - 300 | 5 | 5 | 4 | 4 | 80 | 80 |
| 301 - 400 | 4 | 4 | 1 | 1 | 25 | 25 |
| 401 - 500 | 4 | 4 | 4 | 4 | 100 | 100 |
| 501 - 1000 | 2 | 2 | 2 | 2 | 100 | 100 |
| 1001 - 5000 | 11 | 8 | 9 | 6 | 82 | 75 |
| 5001 - 10000 | 2 | 2 | 1 | 1 | 50 | 50 |
| 10001 - 20000 | 5 | 4 | 5 | 4 | 100 | 100 |
| 20001 - 30000 | 0 | 0 | - | - | - | - |
| 30001 - 40000 | 1 | 1 | 1 | 1 | 100 | 100 |
| 40001 - 50000 | 1 | 1 | 1 | 1 | 100 | 100 |
| 50,001 - 100,000 | 3 | 3 | 3 | 3 | 100 | 100 |
| 100,001 - 500,000 | 1 | 1 | 1 | 1 | 100 | 100 |
| UTILITIES WITH WELLS OR WATERSHED AREA ONLY(2) | 3 | 3 | 3 | 3 | 100 | 100 |
| TOTAL | 90 | 86 | 55 | 51 | 61% | 59% |

Note: (1) Two utilities have been grouped by DOHS in enumerating the number of utilities in the Upper Connecticut River Area. These utilities are Connecticut Water Company and Unionville Water Company. The "All Divisions" column lists each separate division or independent service area of the two utilities, while the second column considers each of these two companies as single utilities.

(2) These utilities are: Cromwell Fire District (wells), Portland Water Dept. and Winsted Water Works (which apparently serves one commercial building on the Barkhamsted town line but no permanent residents).

To supplement the WUCC questionnaire, DOHS' files (inspection reports) on each utility were examined and an information summary sheet was prepared for each utility. These inspection reports consist of a written summary of observations made by DOHS' engineering staff and thus represent a record of their firsthand knowledge of the utilities inspected. Various DEP sources were examined and other documents were obtained from the Natural Resources Center. The larger utilities also typically provided copies of their annual reports to the Department of Public Utility Control (DPUC) along with their WUCC questionnaire. These sources collectively provided a broad base of information about the Upper Connecticut River area, and, in lieu of detailed reports on each facility, provide the most comprehensive data base available for completion of this Assessment.

In addition to the various questions posed in the questionnaire, each utility was asked to submit a map of its service area. Of the 32 utilities which responded to this request, 14 indicated that the service area depicted on DEP's map entitled "Community Water Systems In Connecticut A 1984 Inventory" was correct while the other 18 utilities provided maps of their service area. The information illustrated on the maps provided was transferred to 1:24,000 scale computer generated maps for digitizing into DEP's Connecticut Geographic Information System by DEP staff. The service areas of the remaining utilities were delineated on 1:24,000 scale computer generated maps by DOHS based on their understanding of these systems and then digitized by DEP staff.

The extensive data-gathering exercise did reveal similar informational inconsistencies encountered during completion of the first public water supply management area's (the Housatonic) assessment. These principally included the manner in which service population is estimated by the utilities and DOHS and the manner in which source yield is calculated. When such situations were encountered, choices were made that were commonly consistent with the precedent set in the previous public water supply management area assessment. Where appropriate, such choices are discussed in the subsequent portion of this Water Supply Assessment.

### 1.2.3 Summary Description

In all, 86 utilities are eligible for representation on the WUCC for the Upper Connecticut River Public Water Supply Management Area. Of these 86, 20 have a total customer base of greater than 1,000; three have only watershed area or supply source in the area (as noted in Table 1.2, Winsted Water Works apparently serves one commercial building on the Winsted/Barkhamsted line, but has no residential service and the Cromwell Fire District has a groundwater supply), and two others (Meriden Water Department and Torrington Water Co.) collectively provide water to about 200 people within the bounds of the Upper Connecticut River area. Of the remaining 61 utilities, 13 serve a population ranging from 201-500 customers and 48 serve a customer base of fewer than 200. Thus, about 20 percent of the area's utilities provide the bulk of the water to the utility-supplied customers, with one utility, the MDC, serving nearly 50 percent.

A review of the supply source data included in Table A.1 in Appendix A reveals that wells constitute the vast majority, in terms of number of sources, of the supplies for the area's utilities. However, in terms of volume of water supplied, about two-thirds of the water comes from surface water sources. Characteristic of the geology of this area, about one-third of the utilities supplying ground water use wells tapping sand and gravel aquifers, while the remainder rely on lower yielding bedrock wells. Although wells constitute the majority of the supply sources, more than half of the area's utility customers receive water from surface water supplies, since some of the larger utilities (e.g., MDC, New Britain Water Dept., Manchester Water Dept., and Bristol Water Dept.) use reservoir supplies.

Table 1.3 provides a listing of the communities in the water supply management area and illustrates the number of utilities serving each community, the estimated percentage of the population served, and the estimated water use by the utility-supplied customers within each community. This table illustrates that the number of people receiving water from utilities in each community varies dramatically, ranging from zero in two communities to 100

TABLE 1.3

COMMUNITY SUMMARY OF UTILITIES

| COMMUNITY | NUMBER OF UTILITIES SERVING TOWN(1) | NUMBER OF UTILITIES RESPONDING TO WUCC QUESTIONNAIRE | 1986 POPULATION SERVED BY UTILITIES(2) | 1986 PERCENT POP. SERVED BY UTILITIES(3) | 1986 TOTAL AVG. DAILY CONSUMPTION BY UTILITY USERS (MGD)(4) |
|---|---|---|---|---|---|
| Avon | 7 | 5 | 12,815(5) | 100(6) | 1.28 |
| Barkhamsted | 2 | 0 | 107 | 3 | 0.008 |
| Berlin | 5 | 4 | 12,668 | 81 | 1.78 |
| Bloomfield | 7 | 3 | 20,566 | 100(6) | 3.13 |
| Bristol | 3 | 2 | 53,280 | 90 | 6.61 |
| Burlington | 4 | 2 | 295 | 5 | 0.026 |
| Canton | 2 | 2 | 2,928 | 36 | 0.272 |
| Colebrook | 0 | - | 0 | 0 | - |
| East Granby | 9 | 6 | 1,111 | 26 | 0.088 |
| East Hartford | 1 | 1 | 52,180 | 97 | 8.04 |
| East Windsor | 5 | 3 | 4,972 | 53 | 0.447 |
| Ellington | 5 | 3 | 3,985 | 38 | 0.512 |
| Enfield | 3 | 3 | 43,355 | 96 | 3.90 |
| Farmington | 8 | 6 | 13,964 | 83 | 1.46 |
| Glastonbury | 9 | 5 | 18,051 | 68 | 2.69 |
| Granby | 2 | 2 | 1,647 | 19 | 0.123 |
| Hartford | 1 | 1 | 135,080 | 99 | 20.8 |
| Hartland | 0 | - | 0 | 0 | - |
| Harwinton | 2 | 1 | 46 | 1 | 0.009 |
| Manchester | 3 | 2 | 48,062 | 95 | 4.76 |
| New Britain | 1 | 1 | 73,090 | 99 | 10.8 |
| New Hartford | 3 | 3 | 1,200 | 24 | 0.136 |
| Newington | 2 | 2 | 30,150 | 100(6) | 4.62 |
| Plainville | 5 | 3 | 17,866 | 100(6) | 2.95 |
| Rocky Hill | 1 | 1 | 15,550 | 92 | 2.40 |
| Simsbury | 5 | 5 | 16,510(5) | 74 | 1.86 |
| Somers | 5 | 3 | 5,488 | 63 | 0.429 |
| Southington | 6 | 3 | 34,779 | 91 | 4.01 |
| South Windsor | 6 | 6 | 15,053 | 82 | 1.67 |
| Suffield | 2 | 2 | 7,250 | 76 | 0.677 |
| Vernon | 7 | 4 | 19,562 | 68 | 2.68 |
| West Hartford | 1 | 1 | 61,180 | 100 | 9.42 |
| Wethersfield | 1 | 1 | 27,410 | 100(6) | 4.22 |
| Windsor | 1 | 1 | 27,040 | 100(6) | 4.16 |
| Windsor Locks | 2 | 2 | 13,538 | 100(6) | 1.27 |
| | | TOTALS | 790,778 | | 107.2 |

Notes: (1) The four systems of Connecticut Water Company are listed in accounting of utilities. However, the two systems of Unionville Water Company are grouped and considered as a single utility.
(2) Based on combination of utility estimated and average household size estimated population served data.
(3) Used 1986 population from Table 1.1 which is based on published Connecticut OPM Population Projections.
(4) Consumption values either reported by utilities or computed using average household size information.
(5) Excludes population of Avon Old Farms School and Ethel Walker School in Avon and Simsbury, respectively.
(6) Utilities' reported total population exceeds 1986 OPM estimated population.

percent in eight communities. The overall distribution is skewed towards 100 percent, such that on an area-wide basis approximately 93 percent of the total estimated population receives water from one of the area's utilities.

The presentation of the "percent population served estimates" represents the first example of where choices regarding data inconsistencies are encountered. Therefore, an understanding of the manner in which the percent served values listed in Table 1.3 were derived will be addressed at this point. There were four sources from which the population served estimates could be derived, including the following:

- DOHS

  Typically derived by multiplying 4 people by each residential service connection with adjustments, as appropriate, to more properly represent type of service. Estimates are used by DOHS for design purposes.

- Utilities

  Values reported by each utility responding to the WUCC questionnaire. Numbers cited are based on the utility's understanding of its system and the application of an appropriate (varies per utility) number of individuals to the corresponding service connections (accounts) within the system. Averaged between 3.1 and 3.2 people per connection.

- Average Household Size

  Derived by multiplying number of service connections identified in DOHS inspection reports and/or questionnaires by the average household size updated from 1980 U.S. Census Data by DOHS.

- DEP

  Values reported in DEP's computerized "Water Supply Shared Data Base." These data are derived from DPUC reports submitted by regulated utilities (data updated annually) and from DOHS file information for the non-DPUC regulated utilities (updated by DEP periodically).

Ultimately, it was concluded that a combination of utility supplied and average household size derived values would provide the best population served estimates. Using this approach, the population served estimates provided by the utilities in the WUCC questionnaire have been used. Since a large per-

centage of the larger systems are metered and commonly have a significant commercial/industrial component, to assume a standard number of users per connection for these utilities (particularly the larger ones) may bias the use of these data for projecting future water consumption. The bulk of nonresponding utilities tended to be smaller and more residential in nature. Thus, applying a community average household size to the number of connections estimated by DOHS for these systems would tend to properly reflect the customer base. When obvious error would result from the application of these average household size values to each service connection, alternate means were employed. For example, for a housing complex having one-bedroom units a maximum of two people per bedroom was assumed, while for units of two bedrooms or greater the average household size values were used. For population served estimates based on average household size, the following figures have been used for each community (the figures constitute an update of 1980 U.S. Census data by DOHS to 1986):

| TOWN | AVERAGE HOUSEHOLD SIZE | TOWN | AVERAGE HOUSEHOLD SIZE |
|---|---|---|---|
| Avon | 2.70 | Harwinton | 3.08 |
| Barkhamsted | 2.85 | Manchester | 2.57 |
| Berlin | 2.81 | New Britain | 2.41 |
| Bloomfield | 2.76 | New Hartford | 2.96 |
| Bristol | 2.70 | Newington | 2.70 |
| Burlington | 3.13 | Plainville | 2.66 |
| Canton | 2.71 | Rocky Hill | 2.41 |
| Colebrook | 2.73 | Simsbury | 3.07 |
| East Granby | 2.89 | Somers | 3.10 |
| East Hartford | 2.54 | Southington | 2.92 |
| East Windsor | 2.68 | South Windsor | 3.09 |
| Ellington | 2.90 | Suffield | 2.78 |
| Enfield | 3.08 | Vernon | 2.63 |
| Farmington | 2.59 | West Hartford | 2.49 |
| Glastonbury | 2.81 | Westhersfield | 2.65 |
| Granby | 3.01 | Windsor | 2.81 |
| Hartford | 2.46 | Windsor Locks | 2.86 |
| Hartland | 3.04 | | |

It should also be pointed out, as indicated by Note 5 in Table 1.3, that the estimated total number of utility supplied customers in some instances exceeds a community's 1986 population. Thus, for some communities the percent

of the population served by utilities is also high. This potential error results in the manner in which the population served numbers have been derived, i.e., the summation of utility supplied service population plus the estimated service population for utilities which did not provide their own estimates. This issue is further discussed in Sections 1.3.2 and 1.7.13.

### 1.2.4 Water Quality History

Water quality information was derived from DOHS files. In general, the majority of the utilities have not experienced serious water quality problems. Table 1.4 summarizes (under the "Comments" column) the various water quality problems which have been detected in the Upper Connecticut River Public Water Supply Management Area. Many of the reported problems are associated with EDB (ethylene dibromide) contamination in wells, resulting from agricultural use of this pesticide. Other groundwater supplies have been contaminated with volatile organics (VOC's) used in many manufacturing processes. Both situations represent the results of competing use for the generally flat fertile area of the Connecticut Valley (the fertile soils attractive for historic agriculture use and the open space conducive to commercial/industrial development). Typically, such contamination problems have a short-term impact upon system users while the utility finds an alternate source of supply or provides treatment for the contamination problem, although a longer term inconvenience may result if the implementation time for developing a new source or installation of treatment becomes delayed.

### 1.2.5 System Reliability, Service and Supply Adequacy

Information pertaining to system reliability problems was derived from both the WUCC questionnaire and DOHS files. This information has been summarized in Table 1.4 and is also listed in the summary tables (Tales A.1, A.2 and A.3) in Appendix A. It may be appropriate at this time to summarize the problems that Table 1.4 outlines. Of the smaller utilities (less than 1000 customers) that supplied information, 20 do not have emergency power and 44 utilize a single source supply. However, in light of the total population

TABLE 1.4

SUMMARY OF WATER UTILITY DATA

| WATER UTILITY NAME | [redacted] | [redacted] | WATER USE RESTRICTIONS | | SMALL DISTRIBUTION PIPING (1) | | [redacted] | [redacted] | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| | | | PERM | OCC. | 4" OR LESS | 6" OR LESS | | | |
| Avery Heights Water Assoc. | | | | | | 69% | | | - well 3 high levels of iron, manganese, high color, odor and sodium<br>- Gallionella greater than 10,000/100 ml |
| Avon Old Farms School | | | | | | NA | | | |
| Avon Water Company | | | | | 2% | 19% | | | - one well has problems with iron and manganese, iron bacteria and sodium |
| Berlin Water Control Commission | | | | | | 27% | | | - well 3 contains volatile organics<br>- agreement between Berlin WCC & Cromwell FDWD for sale of water |
| Briarwood College | | | | | | NA | | NA | - 2 organic carbon filters on-line<br>- organohalides detected after treatment |
| Bristol Water Dept. | | | | x | 3% | 32% | | NA | - occasional ban on nonessential water use |
| Burnham Acres Water Assoc. | | | | x | | NA | | | - well 1 has concentration of sulfate, iron, manganese and sodium at higher than acceptable levels |
| Chelsea Common Assoc., Inc. | | | | | x | | | | - all piping less than 2 inches<br>- reported high hardness and sodium levels |
| Chestnut Hill Heights Water Assoc. | | | | | x | | | | - all piping less than 1.5 inches<br>- near capacity at peak hour demand<br>- reported high sodium levels |
| Chippanydale Assoc. | | | | | | NA | | NA | |
| Ciccio Court | | | x | | x | | | | |
| Connecticut Correctional Institute for Men | | | | | | | | | - tetrachloroethylene levels in wells 2 & 3 near state action level |
| Connecticut Water Company Collinsville Division | | | | | | NA (2) | | | - supplemented with water from MDC<br>- some turbidity, color & odor problems |
| Connecticut Water Company Northern Division, Somers System | | | | | | NA (2) | | | - reported high sodium levels |
| Connecticut Water Company Northern Division, Western System | | | | | | NA (2) | | | - EDB contamination in Windsor Locks and O'Bready wells |
| Connecticut Water Company Rockville Division | | | | | | NA (2) | | | - well 2 inactive |

TABLE 1.4
(CONTINUED)
SUMMARY OF WATER UTILITY DATA

| WATER UTILITY NAME | WATER USE RESTRICTIONS | | SMALL DISTRIBUTION PIPING (1) | | COMMENTS |
|---|---|---|---|---|---|
| | PERM | OCC. | 4" OR LESS | 6" OR LESS | |
| Cope Manor | | | NA | | |
| Country Gardens Apts. | | | NA | | - 3 independent systems serving 3 buildings<br>- each well approximately 100' from septic systems |
| Cromwell Fire District Water Dept. | | | NA (2) | | - does not serve customers in Upper Conn. River Mgmt. Area<br>- serves Cromwell area only, although agreement exists between Cromwell FDWD and Berlin WCC for sale of water |
| East Granby Village Condos., Inc. | | | NA | | |
| East Windsor Housing Authority | | | NA | | - reported high coliform level |
| Ellington Acres Co. | | | | | |
| Ellsworth Estates | | | x | | - all piping less than 4 inches<br>- nitrate levels high in 1982 and 1983 |
| Ethel Walker School | | | | 80% | - reported high coliform level |
| Farmington Line West Condo. Assoc. | | | NA | | - reported high coliform level |
| Farmington Woods Water Co., Inc. | | | 3% | 21% | - reported high sodium level |
| Grant Hill Associates, Inc. | | | x | | - all piping 4" or less |
| Hazardville Water Co. | | | 6% | 32% | - EDB contamination in Oak St. wells; proposed service extension to Somersville where EDB contamination has occurred |
| High Manor Mobile Home Park | | | NA | | - 4 out of 7 wells in use; not known if this affects adequacy of supply<br>- chromium contamination in wells |
| Higley Village (3) | | | NA | | - raw water consistently exceeds max. contamination level of sodium<br>- contains iron and manganese<br>- sulfate content high |
| Hillsdale Water Co-op | | | x | | - nitrate concentration approaching max. allowable level |
| Hilltop, Inc. | | x | NA | | - contains high hardness and sodium<br>- lacking sufficient storage capacity<br>- sulfate concentration greater than the recommended level |

TABLE 1.4
(CONTINUED)
SUMMARY OF WATER UTILITY DATA

| WATER UTILITY NAME | [redacted] | WATER USE RESTRICTIONS | | SMALL DISTRIBUTION PIPING (1) | | [redacted] | COMMENTS |
|---|---|---|---|---|---|---|---|
| | | M | OCC. | 4" OR LESS | 6" OR LESS | | |
| Jensens, Forest Hills Mobile Home Park | | | | NA | | | |
| Juniper Club, Inc. | | | | | x | | - reported high coliform level |
| Kenmore Road Assoc. | | | | NA | | | - well 3 has hardness & iron contamination |
| Kensington Fire District | | | | NA | | | - one well supplemented with New Britain W.D. (active source) and Berlin W.C.C. (emergency source) |
| Kimberly Lane Water Assoc. | | | | NA | | | - sodium problems only when home water softeners used |
| Lakeview of Farmington | | | | x | | | - all piping 3" or less |
| Latimer Farms Water Assoc. | | | | NA | | | |
| Liebman Apartments | | | | NA | | | [redacted] - taste & odor problems caused by [illegible] - allowable nitrate levels frequently exceeded - high sodium level |
| Little Brook Road Supply | | | | x | | | - all piping less than 1.5" - may need additional storage capacity |
| Llynwood, Inc. | | | | x | | | - all piping less than 2" |
| Manchester Water Dept. | | | x | NA | | | - occasional water restrictions during drought conditions - benzene, trichloroethane, trichloroethylene & tetrachloroethylene contamination in New State Rd wells - wells treated by blending |
| Maple Ridge Farms Water Assoc. | | | | NA | | | - well house located less than 100' from septic systems - high sodium level |
| Meadowbrook Apartments | | | | NA | | | |
| Meriden Water Dept. | | | | NA | | | - utility supplies only a few customers in Upper Conn. Area - problems providing adequate supply during drought - PCE contamination in Lincoln wells |
| Metacomet Village (3) | | | | NA | | | - high hardness level |
| Metropolitan District Commission (MDC) | | | | 4% | 17% | | - numerous interconnections |

TABLE 1.4
(CONTINUED)
SUMMARY OF WATER UTILITY DATA

| WATER UTILITY NAME | WATER USE RESTRICTIONS | | SMALL DISTRIBUTION PIPING (1) | | [redacted] | [redacted] | COMMENTS |
|---|---|---|---|---|---|---|---|
| | PERM | OCC. | 4" OR LESS | 6" OR LESS | | | |
| Meipsic Woods Section 3 | | | NA | | | | - pH below acceptable range |
| Meipsic Woods Water Assoc. | | | NA | | | NA | |
| New Britain Water Dept. | | x | 1% | 38% | | | |
| New Hartford Water Dept. | | | 21% | 23% | | | [redacted] |
| Oakwood, Inc. | | | 75% | | | | - routinely above maximum recommended levels of sodium |
| Old Newgate Ridge Water Co. | | | NA | | | | |
| Orchard Hill Assoc. | | | NA | | | | - high pH and sodium readings |
| Penwood Assoc., Inc. | | | NA | | | NA | - high sulfate values |
| Pine Hill, Inc. | | | x | | | | - 2" piping comprises 90% of the system |
| Plainville Water Co. | | | 11% | 22% | | | [redacted]n)<br>- supply supplemented by Bristol & New Britain interconnections<br>- water wholesaled to Unionville WC<br>- volatile organic contamination in Johnson Ave wells |
| Portland Water Dept. | | | 9% | 36% | | | - does not service customers in Upper Conn. River Area, has either a watershed or water supply source in area<br>- rely primarily on reservoir for supply - well used during high demand |
| Redwood Farms L&M Water Co. | | | NA | | | | - utility sold to Aqua Treatment and Service, Inc. |
| Reid Treatment Center | | | NA | | | | |
| Rock Tree Apartments | | | NA | | | | - high sodium level |
| Rolling Hills Water Assoc., Inc. | | | | x | | | |
| Salmon Brook District Water Dept. | | | 15% | 39% | | | - recent engineering study reports excess capacity to expand service area |
| School Hill Assoc., Inc. | | | NA | | | | - well contaminated with EDB |
| Shaker Heights, Inc. | | | x | | | | |
| Sharon Heights Water Assoc. | | | NA | | | | |

TABLE 1.4
(CONTINUED)
SUMMARY OF WATER UTILITY DATA

| WATER UTILITY NAME | WATER USE RESTRICTIONS | | SMALL DISTRIBUTION PIPING (1) | | COMMENTS |
|---|---|---|---|---|---|
| | PERM | OCC. | 4" OR LESS | 6" LES | |
| Snipsic Village Housing Authority | | | NA | | |
| Somers Elderly Housing Authority | | | NA | | |
| Somersmill Water Assoc. | | | NA | | - GAC filters installed to eliminate EDB contamination<br>- reduced or zero water pressure during periods of peak demand<br>- plans for interconnection with Hazardville W.C. and abandonment of Somersmill well |
| Southington Water Co. | | | 2% | 20% | - well 2 is treated with packed column aeration facility to eliminate PCE |
| Tariffville Fire District Water Dept. | | x | 6% | 20% | - occasional supply difficulty during peak demand periods in summer<br>- water use restrictions during heavy demand use |
| Taylor Trailer Park | | | x | | - all piping 2" in dia.<br>- low pressure problems |
| Torrington Water Co. | | | 9% | 30% | - utility's principal service area is outside the mgmt. area, but has a few customers & water sources within mgmt. area |
| Towpath Condominiums | | | NA | | [redacted] |
| Trailsend Water Company | | | x | | - all piping is 2" in dia.<br>- corrosive water (due to low pH & hardness) has extensively corroded the distribution system |
| Turkey Hill Apartments | | | NA | | - high hardness level |
| Unionville Water Co. | | x | 4% | 31% | - some color & turbidity<br>- high coliform count noted<br>- occasional water conservation restrictions during high seasonal demand<br>- Farmington Div. has problems during fire protection demand<br>- supply supplemented with unfiltered water from MDC |
| Vernon Village, Inc. | | | NA | | - presence of tetrachloroethylene & trichloroethylene<br>- high coliform count noted |
| Vernon Water Dept. | | | NA | | - small amounts of asbestos fibers found in water<br>- negotiating agreement with Conn. Water Co. for takeover of system by Conn. Water Co. |
| Village Water Co. of Simsbury | | x | 5% | 19% | - well 5 contaminated with EDB<br>- high hardness level |

TABLE 1.4
(CONTINUED)
SUMMARY OF WATER UTILITY DATA

| WATER UTILITY NAME | WATER USE RESTRICTIONS | SMALL DISTRIBUTION PIPING (1) | | [redacted] | [redacted] | COMMENTS |
|---|---|---|---|---|---|---|
| | OCC. | 4" OR LESS | 6" OR LESS | | | |
| Wallens Hill Apartments | | NA | | | | - well located within 35' of underground fuel tank |
| West Hill Lake Water Assoc. | | x | | | | - utility operates 5.5 months out of year to supply summer cottages<br>- all piping less than 3" in dia. |
| West Service Corp. | | | 55% | | | |
| Windsorville Water Assoc. | | NA | | | | |
| Winsted Water Works Dept. | | NA | | | | - only serves one commercial building on Winsted/Barkhamsted line |
| Wintergreen | | | x | | | |
| Woodcrest Assoc., Inc. | | NA | | | NA | |
| Worthington Fire District | | 2% | 58% | | see comments | - receives 100% of supply from Berlin WCC which purchases treated water from New Britain WD and MDC for emergency purposes |

NOTES:

(1) Indicates diameter of total distribution system as less than or equal to 4" or less than or equal to 6"; or as percentage of total system.
(2) Breakdown of the Conn. Water Co. distribution system is not available on an individual utility basis
(3) Metacomet Homes, Inc. retains ownership of Higley Village and Metacomet Village

NA = Information Not Available

that these utilities service (less than 5% of the total population of the Upper Connecticut Management Area) the impact is minimal in a general overview. Various utilities experience supply difficulties (low pressure) under high flow demand conditions due either to a combination of inadequate supply and/or storage or due to old or inadequately sized distribution piping. Older distribution piping can create additional system reliability difficulties since it has a greater potential for leakage and pipe failures.

Many utilities also do not have alternate sources available in the event their prime groundwater supply is lost. As shown in Table 1.4, some of these utilities rely on either a single rock well or a greater number of rock wells which have marginal "safe yields." When a contamination problem or loss of capacity occurs, the users of the affected system may be without potable water for an extended period until a new or alternate supply is obtained, or until an effective treatment system is identified and installed. Single source wells also can be impacted by short-term outages resulting from routine well maintenance, pump replacement or other minor problems. The total potential yield of a surface supply may not be realized if water loss occurs (via dam seepage or raw water transmission main leakage) or if insufficient transmission, treatment or distribution of the source water is provided. Ultimately, it is the utility's charge to be cognizant of such issues and to plan for solving these issues as they arise to maintain reliable and adequate service.

Table A.3 also provides a summary of DOHS' analysis of the capability of the utilities to meet peak hour demand. As is illustrated in this table, only a few utilities do not have sufficient storage and/or excess pumping capacity to meet peak hour demand.

### 1.2.6 Fire Fighting Capability

High flow demand situations are frequently associated with fire flows. Thus, a general discussion of this issue is appropriate at this point, and is especially applicable to any area exhibiting a long history of water distribu-

tion system expansion from a central core. Based on DPUC report data provided by various larger utilities along with their WUCC questionnaires, it is apparent that a wide variety of pipe sizes, materials and ages are found in the distribution systems of these utilities. This variability commonly reflects the needs and standards of the distribution piping at the time of installation. Thus, in older communities, the distribution network typically includes piping which may have been appropriate for its intended use, but which is no longer adequate for present needs and/or design standards. Good examples of this are areas with a large portion of 4- or 6-inch pipe that are now inadequate or marginal for transmission of fire flows due to high friction losses. For example, for fire flows in the 1500 to 3000 gpm range, friction losses (with Hazen-Williams "C" factor equal to 100, commonly used for old cast iron pipe) in 4-inch piping would range from about 185 to 670 feet per 100 feet of pipe, with losses of about 25 to 90 feet per 100 feet of 6-inch pipe. Thus, it is apparent that a single run of a few tens of feet of 4-inch pipe would render a hydrant useless for firefighting needs similar to the flows noted above, while a few hundred feet of single source 6-inch piping would also compromise a hydrant. Consequently, those areas characterized by old, smaller distribution piping which is not adequately looped to a hydrant connection will likely have supply problems during fire flow conditions.

While the distribution networks of many of the larger systems contain areas with piping 6 inches in diameter or less, the majority of the systems serving smaller residential or cluster housing developments have little, if any, piping greater than 4 to 6 inches in diameter. (See Table 1.4 for a summary of those utilities which have all 4-inch or less piping or all 6-inch or less piping, and a listing of those which do and do not provide for firefighting.) These smaller systems typically do not presently provide fire-fighting capability with system connected hydrants. Furthermore, even if additional storage and/or a system interconnection to a larger source were provided, it would be virtually impossible to transmit adequate fire flows to hydrants within a typical smaller utility's distribution network due to inadequate pipe sizing and/or looping. In other words, without the addition of the appropriately sized distribution piping and/or system looping, it is

impossible to provide future firefighting capability with the distribution network in the majority of the smaller utilities.

It should be also be pointed out that at present there are no state regulations governing the provision of fire protection capability. Thus, municipalities rely on their own regulations, if such exist, or more often on criteria established by the Insurance Services Office (ISO) or the National Fire Protection Association (NFPA). As a result, many of the smaller utility distribution systems were never designed for future firefighting capability due to alternate sources for firefighting (e.g. on-site ponds) or other arrangements (e.g. coverage provided by community tanker trucks). Furthermore, unless these systems desire to expand, it is not anticipated that their distribution piping would necessarily need to be upgraded for firefighting purposes.

### 1.2.7 Major Facility Needs

Many utilities within the Upper Connecticut River area maintain an ongoing or regular planning process (see Section 1.6) to identify major facility needs and to develop capital budgets to address these needs. Various utilities have recently completed or are in the process of designing or constructing water treatment facilities. Others have identified the need for additional supply sources and have begun investigations to locate and/or develop these sources. Various utilities provided information pertaining to their plans for upgrading facilities and increasing supply. This information has been summarized (in Table 1.7) as part of Section 1.6.1. It is also anticipated that specific needs will be identified by utilities during the completion of their individual plans which will ultimately become part of the Coordinated System Plan, and thus will be more fully addressed later as part of the planning process. It is also anticipated that recently proposed EPA regulations may place additional capital improvement burdens on some of the area's utilities.

In essence, the 1986 amendments of the Safe Drinking Water Act include proposed regulatory provisions of four major changes. The first of these is the requirement that chlorination be provided for groundwater supplies. Secondly, the development of well-head protection is promoted. Thirdly, the amendments stipulate that under virtually all circumstances surface water supplies must be filtered, although the specific criteria for this requirement apparently have not been defined. And lastly, periodic analysis for eighty-three contaminants is proposed. On July 8, 1987, EPA issued a final rule establishing MCL's for eight volatile organic chemicals.

## 1.3 AVAILABILITY AND ADEQUACY OF FUTURE SOURCES

### 1.3.1 Potential Water Supply Sources

The geologic origin discussed in Section 1.1.2 pointed to the stratified glacial deposits which characterize the Connecticut Valley. These deposits were described as offering rich agriculture land, but they also represent a prime source of groundwater due to their thick, unconsolidated (granular) nature. Thus, it is not surprising to see the relatively large number of wells tapping sand and gravel aquifers, as compared to other parts of the state, and numerous stratified drift aquifers identified by U.S. Geological Survey in cooperation with the DEP.[4] The aquifers identified are part of an ongoing process by the DEP and USGS to delineate all groundwater sources. These aquifers have been listed in Table 1.5 and, as shown therein, are keyed to the State's numbering system. Existing aquifer withdrawal information for public water supply wells included in DEP's "Water Supply Shared Data Base" is also listed for comparative purposes. However, other withdrawals such as domestic, private, commercial/industrial, and agricultural wells may further erode the potential for tapping these aquifers. In addition, possible problems or conflicts which could impact the viability of these sources are listed in order to provide a more realistic perspective as to their potential. For each of the aquifers, DEP's leachate and wastewater inventories[5][6] were compared with the stratified drift area map to identify possible sources of contamination. Additionally, the sandstones and shales of Triassic Age offer

TABLE 1.5

POTENTIAL FUTURE GROUNDWATER SUPPLY SOURCES

| SOURCE AQUIFER LOCATION NUMBER(1) | COMMUNITIES IN WHICH AQUIFER LOCATED | ESTIMATED YIELD (MGD) | ESTIMATED EXISTING WITHDRAWALS (MGD)(2) | QUALIFICATIONS TO USE OF POTENTIAL SOURCE(3) | WATER QUALITY CLASSIFICATION(4) |
|---|---|---|---|---|---|
| 43-1 | Colebrook | 0.4 | - | Nearby salt storage pile | . Class GA |
| 43-3 | Barkhamsted<br>New Hartford | 0.7 | 0.003 | Well contaminated with solvents and landfill leachates; 2 salt storage facilities; 1 active and 1 closed mixed waste landfill; 2 former industrial discharges to ground; 1 active waste discharge to ground | . Class GA - 70%, GB/GA - 30% |
| 43-4 | New Hartford<br>Canton | 1.7 | - | Former auto parts cleaning & degreasing ground discharge; metal finishing discharge; metal hydroxide sludge beds; 2 domestic wells contaminated with fuel oil & solvents; new Hartford STP | . Class GA - 80%; GB/GA - 20% |
| 43-5 | New Hartford | 1.2 | - | Salt storage nearby | . Class GAA |
| 43-6 | Canton | 0.8 | 0.002 | 2 salt storage facilities; Canton STP; abandoned auto junkyard; 2 gasoline spills; 1 fuel oil spill; former solvent & fuel oil tank leaks; well contaminated with fuel oil solvents; surface discharge from GW treatment system | . Class GA - 60%; GB/GA - 30%; GAA - 10% |
| 43-7 | Avon<br>Farmington | 1.2 | 0.82 | Former felt washing with pesticides to lagoon; active industrial discharge; soaps, detergents, sludge to lagoon; gasoline leak; salt storage | . Class GA - 40%; GAA - 30%; GB/GA - 30% |
| 43-13 | Simsbury<br>Avon | 7.5 | 0.15 | Former wood preservative & chalking test water to septic system; former STP; well contaminated with road salt; 2 salt storage areas; 3 former STP, 1 active STP; closed mixed waste landfill | . Class GA - 70%; GAA - 10%; GB/GA - 10%; GB - 5%; GB/GAA - 5% |
| 43-8 | Farmington | 4.5 | 0.05 | Active mixed waste landfill | . Class GA - 50%; GB/GC - 40%; GAA - 10% |
| 43-12 | Farmington<br>Plainville<br>Bristol | 8.1 | 0.01 | 2 metal finishing lagoons; 1 former metal hydroxide sludge lagoon & zyglo discharge to ground; 4 metal finishing discharges; 2 STP's; 2 salt storage areas; 2 active waste landfills & 1 former bulky waste landfills; 2 facilities' oils discharged to ground; former ground discharge of photo chemicals; former solvent discharge to dry well; former ground discharge of untreated etching WW; former industrial WW discharge to ground; former failed septic system with blood-wastes; solvents and oil spills; TCE spills and leaks from solvents storage; 3 public wells contaminated with TCE & other solvents; 12 private wells contaminated with Vorlex. | . Class GB/GA - 50%; GA - 20%; GB - 15%; GB/GAA - 10%; GAA - 5% |
| 43-11 | Bristol | 0.7 | - | Closed mixed waste landfill; STP; sewage & oil waste pit; metal hydroxide sludge drying beds; pickling waste drying beds; metal hydroxide sludge and plating waste storage; metal finishing, brass pickling WW, oily WW, and industrial discharge; former metal finishing waste lagoons | . Class GB - 85%; GA - 10%; GAA - 5% |
| 43-9 | Bristol | 1.2 | 0.47 | Salt storage; metal finishing discharge; STP; 1 active & 1 closed waste landfill | . Class GAA - 60%; GA 40% |
| 43-10 | Bristol | 1.4 | 0.03 | Waste oil & petroleum spills; metal finishing discharge | . Class GA - 80%; GAA - 10%; GB/GA - 10% |
| 52-2 | Southington<br>Plainville<br>Bristol | 2.2 - 3.0 | 0.04 | 2 metal hydroxide sludge pits; former solvent storage site; 4 treated industrial discharges; 3 metal hydroxide sludge lagoons; former GW discharge of metal finishing wastes to lagoon; closed metal hydroxide sludge beds; 2 oil spills; well contaminated with TCE; 2 wells contamination with solvents | . Class GB/GA - 75%; GA - 15%; GAA - 10% |

TABLE 1.5 (Continued)

POTENTIAL FUTURE GROUNDWATER SUPPLY SOURCES

| SOURCE AQUIFER LOCATION NUMBER[1] | COMMUNITIES IN WHICH AQUIFER LOCATED | ESTIMATED YIELD (MGD) | ESTIMATED EXISTING WITHDRAWALS (MGD)[2] | QUALIFICATIONS TO USE OF POTENTIAL SOURCE[3] | WATER QUALITY CLASSIFICATION[4] |
|---|---|---|---|---|---|
| 52-5 | Southington<br>Bristol | 1.4 - 1.9 | 0.03 | Industrial storage lagoon; treated metal finishing WW; sand & gravel washing discharge; salt storage; 2 active mixed waste sites; former oily sludge pile on ground; former occasional discharge of kerosene to GW; former discharge to ground of steam cleaning machinery, untreated very dilute heavy metals, tumbling waste, and treated industrial discharge; former discharge of cutting oils to septic tank; closed sludge drying bed; dry well for treated chrome plating rinse water; untreated metal finishing discharge to stream (1960's); sludge pit for methylene chloride and methanol sludge; dredging disposal site; low level hydrocarbon contamination of 2 wells; well contaminated with septic tank degreaser; possible solvent contamination of GW; probable TCE spill; many wells contaminated with TCE; TCE & chloroform contaminated well; well contaminated with 1,1,1 trichlorethane; well contaminated with 1,2 chloroform and 1,7 TCE; well contaminated with organohalides; 3 wells with chlorinated hydrocarbons | . Class GA - 45%; GB - 35%; GB/GC - 15%; GB/GA - 4%; GAA - 1% |
| 52-1 | Southington | 1.0 | 0.54 | No sources reported | . Class GA - 95%; GAA - 5% |
| 52-3 | Southington | 2.5 - 3.8 | 0.79 | Former solvents lagoon; chlorinated hydrocarbon spill; 700 gal. spill of methyl ethyl ketone; treated industrial discharge; sludge from parts washer; well contaminated with TCE | . Class GB/GA - 50%; GA -40%; GAA - 7%; GB/GAA - 3% |
| 52-4 | Southington | 2.3 | - | Sludge disposal site by solvents recovery Co.; 500-gallon fuel oil spill | . Class GA |
| 43-17 | Granby | 6.5 | - | #2 fuel oil spill; manure storage; salt storage; active mixed waste landfill; 2 domestic wells contaminated with landfill leachate | . Class GA - 95%; GB/GA - 5% |
| 43-16 | Granby; Simsbury | 7.3 | - | 2 domestic wells contaminated with EDB | . Class GA - 90%; GB/GA - 10% |
| 43-18 | Granby<br>East Granby<br>Simsbury | 11.4 | 0.28 | Gasoline spill; 3 former STP's & lagoon; STP; 2 active mixed waste landfills; 12 wells contaminated with landfill leachate; salt storage; well contaminated with EDB; 2 wells contaminated with Vorlex | . Class GA - 60%; GB/GA - 25%; GA/GA/GC - 10%; GB/GAA - 5% |
| 43-14 | Simsbury | 6.5 | 0.27 | 2 salt storage areas; gasoline tank leak; oil spill; well contaminated with hydrocarbons; well contaminated with degreasers | . Class GA - 85%; GB/GA - 10%; GAA - 5% |
| 43-15 | Simsbury | 4.0 | 1.4 | 4 former STP's; alcohol discharge to ground; 3 closed industrial landfills | . Class GA - 70%; GB/GA - 25%; GB - 5% |
| 42-1 | Somers | 5.8 | 0.02 | Petroleum spill; salt storage; 3 wells contaminated with EDB; former WW lagoon | . Class GA/GA/GAA - 85%; GAA - 10%; GB/GA/GAA - 5% |
| 42-2 | Somers<br>Enfield | 1.5 | 0.14 | 2 STP's; former etching WW lagoon; 56 domestic & 24 public wells contaminated with EDB | . Class GA - 80%; GB - 20% |
| 42-3 | Enfield | 0.3 | - | Active bulky waste landfill | . Class GB/GA - 60%; GA - 40% |
| 42-4 | Enfield<br>East Windsor | 5.1 | 2.5 | Manure storage; milk lagoons; sewage sludge storage; 2 closed mixed waste landfill; buried industrial waste | . Class GA - 80%; GAA - 10%; GB/GA - 10% |
| 42-6 | East Windsor<br>Ellington | 0.5 | - | Silage pit; well contaminated with heavy metals, taste & odor; 29 wells contaminated with EDB; milk lagoon; 3 wells with taste & odor | . Class GA |

TABLE 1.5 (Continued)

POTENTIAL FUTURE GROUNDWATER SUPPLY SOURCES

| SOURCE AQUIFER LOCATION NUMBER(1) | COMMUNITIES IN WHICH AQUIFER LOCATED | ESTIMATED YIELD (MGD) | ESTIMATED EXISTING WITHDRAWALS (MGD)(2) | QUALIFICATIONS TO USE OF POTENTIAL SOURCE(3) | WATER QUALITY CLASSIFICATION(4) |
|---|---|---|---|---|---|
| 42-7 | East Windsor | 1.2 | 1.7 | Former STP; active mixed waste landfill - hydroxide sludge; nitrate contaminated well; 8 wells contaminated with EDB | . Class GA - 85%; GAA - 15% |
| 42-8 | East Windsor | 1.7 | 0.01 | 2 active mixed waste landfills; asbestos and latex waste disposal | . Class GA - 70%; GB/GA - 25%; GAA - 5% |
| 42-5 | Ellington | 1.5 | - | Active mixed waste landfill; 2 manure storage areas; milk lagoon; land spreading of treated sewage sludge | . Class GA - 90%; GB/GA - 10% |
| 45-1 | Ellington<br>Vernon | 5.9 | - | Sand and salt storage; manure storage; nitrate contaminated wells; 23 wells contaminated with EDB; STP | . Class GA - 70%; GB/GAA - 10%; GAA - 10%; GB - 5%; GB/GA - 5% |
| 45-2 | Vernon | 1.5 | - | Sludge drying lagoons; dyes, detergent in WW; gasoline spills; solvents, oils, grease to ground & dry well; closed mixed waste landfill; caustic rinse and methylene chloride to dry well; automobile fluids on ground; former chromium discharge to ground; well contaminated with industrial solvents | . Class GA |
| 45-3 | Vernon | 0.5 | - | 3 salt contaminated wells; 2 salt storage areas; petroleum spills | . Class GA - 85%; GB/GA - 10%; GAA - 5% |
| 45-4 | Vernon<br>South Windsor<br>Manchester | 1.2 | 0.07 | Petroleum spills; gas tank leak; 2 gasoline spills; waste oil to ground; photo, printing, metal finishing discharge to ground; detergents, paint thinners to dry well; organic solvents spill; well contaminated with solvents | . Class GA - 75%; GB/GA - 10%; GB - 10%; GAA - 5% |
| 45-5 | Manchester | 0.3 | - | Former solvents discharge to ground; former sludge pits; oil & phenol spills; well contaminated with solvents | . Class GB |
| 45-6 | Manchester | 1.1 | 1.5 | Filtration plant filter backwash discharge | . Class GAA - 70%; GA - 30% |
| 45-7 | Manchester<br>East Hartford | 4.6 | 1.6 | 2 active mixed waste landfills; salt storage; former septage disposal; 2 STP's; 1 former STP; former metals WW settling beds; former ground discharge of paints & thinners; former discharge to dry well of solvents & petroleum products; inground gasoline tank leak ( 700 gal.); well contaminated with solvents and gasoline; well contaminated with EDC | . Class GA - 65%; GB/GC - 20%; GB/GAA - 10%; GAA - 5% |
| 40-1 | Glastonbury | 1.2 | - | Industrial discharge; community septic system; former metal sludge storage; metal hydroxide sludge disposal at landfill; metal sludge drying beds; sand and salt storage; active mixed waste landfill | . Class GAA - 40%; GA - 40%; GB/GA - 20% |
| 40-2 | Glastonbury<br>Rocky Hill | 1.3 | - | Former pickling & galvanizing lagoon & drying beds; metals WW discharge to seepage beds; closed mixed waste landfill; former metals sludge disposal; plating solution spill | . Class GA |
| 40-3 | Glastonbury<br>Rocky Hill | 7.4 | - | Metal finishing discharge; 2 closed bulky waste landfills; 3 wells contaminated with EDB in Portland | . Class GA - 95%; GAA - 5% |
| 40-4 | Glastonbury<br>Rocky Hill | 11.1 | 1.1 | Solvents to unlined lagoons; salt storage cleaning waters ground discharge; former tumbling, chrome WW to drywell; cement washdown lagoon; former solvents & metals discharge to ground; former STP; STP; petroleum tank leak | . Class GA - 85%; GB - 10%; GAA - 5% |

some potential for water supply, although generally not to the degree of the unconsolidated aquifers listed in Table 1.5. These bedrock sources are more suited for smaller municipal or private commercial/industrial demands, with the water derived from these aquifers tending to be highly mineralized.

Table 1.5A lists potential future surface water supply sources. These potential supplies were developed from various reference sources as noted in Table 1.5A. This listing constitutes a preliminary identification of possible surface water supplies to be addressed in the Integrated Report. Their relevance to the regional water supply picture will be assessed in the development of the Integrated Report. Also, the significance of these and possibly other sources to individual utilities will be further addressed in the individual utility plans which constitute an important aspect of the Upper Connecticut River Water Supply Management Area's portion of the Coordinated Water System Plan.

The sources listed in Table 1.5 and 1.5A provide potential on both a local and regional basis. Typically, the yields from individual wells are such that they are suitable for the local area or municipality in which they are found with multiple well sites required for utilities with larger customer bases served solely by groundwater supplies. Since groundwater is presently the source of supply for the bulk of the area's utilities, ground water aquifers will continue to play an important role in the region's water supply picture. The river and reservoir impoundment projects, however, have a much larger single source safe yield. Thus, these sources constitute supplies of a regional significance, but also carry with them the potential for greater controversy.

### 1.3.2 Adequacy of Future Sources

In order to assess the adequacy of the potential future sources cited above, a sense of the future water requirements must be provided. The water needs information can be developed from an understanding of the per capita water consumption for the study area (or portions thereof) and the anticipated

TABLE 1.5A

POTENTIAL FUTURE SURFACE WATER SUPPLY SOURCES

| WATER SOURCE | POTENTIAL YIELD (MGD) | QUALIFICATION TO USE OF POTENTIAL SOURCE[3] | WATER QUALITY CLASSIFICATION[4] |
|---|---|---|---|
| Proposed new reservoir, Cook's Dam, in Harwinton | 2.0 | Land aquisition and various permits | . Proposed reservoir - goal of Class AA |
| with diversion from Rock Brook and Leadmine Brook(4) | 4.6 | | . Classification depends upon point of withdrawal |
| Proposed reservoir at Lamson Corner/ Burlington Diversion Project (in Burlington) | 4.0[5] or 2.5(12) | | . Class A |
| Crescent Lake Reservoir (in Southington, owned by Plainville Water Co.)(6) | 0.4 (Filter plant) | Poor quality, even with treatment - not used for many years | . Class AA |
| Tuller Reservoirs AKA Simsbury Res. (owned by Water Co.)(7) | 0.5 | Needs treatment, not intended for future use by utility | . Class AA |
| Wadsworth Reservoir AKA Farmington Res. (Farmington)(7) | 0.20 | Inactive, not intended for future use | . Class AA |
| Buckingham Reservoir (in Glastonbury, owned by Manchester Water Dept.)(8) | 1.0 | Dam seepage losses above average | . Class AA |
| East Branch Salmon Brook (Granby)[7] | 6.0 | | . Class B/A |
| West Branch Salmon Brook (Granby)[7] | 10.0 | | . Classification depends upon point of withdrawal |
| Thrasher Brook (Somers)[7] | 2.9 | | . Classification depends upon point of withdrawal |
| Connecticut River[7] | 75 max.[9] | High coliform counts; non-point sources in CT and Mass.(9); many treated STP discharges | . Classification depends upon point of withdrawal, although highest classification is Class B |
| Farmington River reservoir system[11] (includes existing supplies). West Branch to Colebrook Res. | 36 | Historic conflicts with other uses, potential designation (study just beginning by National Park Services) as "Wild and Scenic River," and 4 downstream segments in the Basin that do not meet Class B water quality goals(10); yield based on release of 32 mgd to the West Branch Channel to maintain minimum flows | . West Branch Res. Class AA<br>. Colebrook Res. Class A, with goal of Class AA |

NOTES: (1) Aquifer Location Numbers keyed to regional drainage basins, see Reference No. 4.

(2) Includes public water supply withdrawals obtained from DEP's Water Supply Shared Data Base which are based un DPUC reports (about 85% of recorded public supply wells) or on estimated water use (number of users times 75 gpcd). Residential, private industrial or commercial, and agricultural well withdrawals are not included in the estimates.

(3) See Reference Nos. 5 and 6.
(4) Proposed water quality classifications.
(5) Yield estimate derived from Reference No. 8.
(6) Yield estimate derived from Reference No. 11.
(7) Yield estimate derived from Reference No. 12.
(8) Yield estimate derived from Reference No. 13.
(9) Yield estimate derived from Reference No. 14.
(10) Yield estimate derived from Reference No. 15.
(11) Yield estimate derived from Reference No. 16.
(12) Yield estimate derived from Reference No. 17.

growth in population during the planning period. The population growth data for the coordinated water system planning process have been developed by OPM and were summarized in Table 1.1 (also see Section 1.5 for discussion of population growth). In Section 1.2.1 difficulties associated with data inconsistencies were alluded to and, in Section 1.2.3, discussion was provided for selecting the most valid population served estimates.

In the initial draft of this document the future water needs projections were based upon estimates generated from per capita consumption values derived from utility average use data and service populations. With such an approach, commercial/industrial water use is reflected in the higher per capita consumption values of those communities with a more significant commercial/industrial component. This procedure also tied the expansion of this nonresidential water use to population growth. Since concern was expressed that this procedure would not properly reflect the growth in commercial/industrial water use, an alternate means of estimating future water needs was employed. With this alternate approach in the second draft, the 12 utilities with the greatest commercial/industrial component (listed in Table 1.6A) were asked to segment their average daily usage (as reported in their questionnaire) into the following two components:

- domestic water use,
- commercial, industrial and nonrevenue water.

These utilities were then asked to estimate the future growth of the commercial/industrial/nonrevenue segment. Since these utilities had not yet completed their individual plans which would provide such a breakdown, those which responded could provide only preliminary estimates.

To calculate the future water needs estimates, the nondomestic water use was then added to the domestic use which was derived by multiplying 75 gpcd plus a 0.25 gpcd/yr escalator times the estimated future population. For all other utilities, the 75 gpcd value plus the 0.25 gpcd escalator was used to estimate future water needs. These utility estimates were then applied to the various communities that they serve using a ratio similar to their present distribution of customers.

In review of the second draft of the assessment, several utilities expressed concern that their 1986 use and projected consumption values were still underestimated. The Manchester Water Department, Metropolitan District Commission and New Britain Water Department chose to revise their baseline 1986 useage values to properly reflect existing conditions which were in turn used to adequately project future consumption.

The projected water usage data for each of the communities within the Upper Connecticut River Public Water Supply Management Area and the area as a whole have been summarized in Table 1.6. The step-by-step procedures for estimating the community water needs are presented an Table 1.6A for clarity. In this table, the future water needs data have been distributed between utility and self-supplied needs using the same ratios as presently exist in the communities. These ratios were derived from the information contained in Table A.4 (see Appendix A). (Here it should be clarified that self-supplied water constitutes residents and commercial/industrial concerns who supply their own water with individual wells which are not part of any of the area's public water supply utilities.) It is recognized that the percent of utility-supplied versus self-supplied will change with time and that degree of change will vary from community to community. However, since the utility and self-supplied values are ultimately summed in the table, a worst case projection of the potential utility supplied needs is provided (i.e., total utility supply of a community's water users). At this juncture, a sense of the total future water needs is most important, and not the precise definition of the distribution of utility-supplied versus self-supplied water. A refinement of this distribution is more appropriately included as part of the Integrated Report. Therein, such factors as land use will be examined to assess the potential for increased percentages of utility supplied water. For example, such factors as two-acre zoning may deter expansion of public water supply into certain areas of a community, thus affecting the degree of change in the percent of the population served by public water utilities.

It should also be pointed out that, for this Water Supply Assessment, per capita consumption rates have been escalated by 0.25 gpcd/year for projecting the water needs in Table 1.6. Other planning projects within the State[7] and

TABLE 1.6

PRELIMINARY PROJECTED WATER SUPPLY NEEDS BY COMMUNITY

| COMMUNITY | EXISTING SUPPLY SOURCE (%) UTILITY | SELF | [redacted] | PROJECTED FUTURE WATER NEEDS (MGD)(2)(3) UTILITY SUPPLIED 1991 | 2000 | 2030 | SELF SUPPLIED 1991 | 2000 | 2030 | COMMUNITY TOTAL 1991 | 2000 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avon | 100 | 0 | | 1.35 | 1.54 | 2.34 | 0 | 0 | 0 | 1.35 | 1.54 | 2.34 |
| Barkhamsted | 3 | 97 | | 0.009 | 0.009 | 0.013 | 0.24 | 0.26 | 0.37 | 0.25 | 0.27 | 0.38 |
| Berlin | 81 | 19 | | 1.45 | 1.73 | 2.17 | 0.23 | 0.23 | 0.28 | 1.68 | 1.96 | 2.45 |
| Bloomfield | 100 | 0 | | 3.61 | 4.09 | 5.91 | 0 | 0 | 0 | 3.61 | 4.09 | 5.91 |
| Bristol | 90 | 10 | | 5.62 | 5.95 | 7.60 | 0.45 | 0.47 | 0.57 | 6.07 | 6.42 | 8.17 |
| Burlington | 5 | 95 | | 0.03 | 0.04 | 0.05 | 0.45 | 0.49 | 0.64 | 0.48 | 0.53 | 0.69 |
| Canton | 36 | 64 | | 0.38 | 0.43 | 0.58 | 0.41 | 0.44 | 0.57 | 0.79 | 0.86 | 1.14 |
| Colebrook | 0 | 100 | | 0 | 0 | 0 | 0.10 | 0.11 | 0.13 | 0.10 | 0.11 | 0.13 |
| East Granby | 26 | 74 | | 0.22 | 0.27 | 0.37 | 0.26 | 0.28 | 0.39 | 0.48 | 0.55 | 0.76 |
| East Hartford | 97 | 3 | | 13.93 | 16.00 | 22.99 | 0.13 | 0.14 | 0.18 | 14.06 | 16.14 | 23.17 |
| East Windsor | 53 | 47 | | 0.72 | 0.81 | 1.06 | 0.34 | 0.36 | 0.44 | 1.06 | 1.17 | 1.50 |
| Ellington | 38 | 62 | | 0.40 | 0.50 | 0.79 | 0.52 | 0.57 | 0.79 | 0.92 | 1.07 | 1.58 |
| Enfield | 96 | 4 | | 4.20 | 5.33 | 7.26 | 0.13 | 0.14 | 0.19 | 4.33 | 5.47 | 7.45 |
| Farmington | 83 | 17 | | 2.16 | 2.44 | 3.29 | 0.22 | 0.24 | 0.29 | 2.38 | 2.68 | 3.56 |
| Glastonbury | 68 | 32 | | 2.10 | 2.43 | 3.64 | 0.70 | 0.80 | 1.19 | 2.80 | 3.23 | 4.83 |
| Granby | 19 | 81 | | 0.13 | 0.15 | 0.21 | 0.55 | 0.62 | 0.86 | 0.68 | 0.77 | 1.07 |
| Hartford | 99 | 1 | | 20.57 | 23.13 | 31.28 | 0.13 | 0.14 | 0.17 | 20.70 | 23.27 | 31.45 |
| Hartland | 0 | 100 | | 0 | 0 | 0 | 0.12 | 0.13 | 0.18 | 0.12 | 0.13 | 0.18 |
| Harwinton | 1 | 99 | | 0.003 | 0.004 | 0.005 | 0.42 | 0.46 | 0.64 | 0.42 | 0.46 | 0.64 |
| Manchester | 95 | 5 | | 6.53 | 6.95 | 8.27 | 0.20 | 0.22 | 0.26 | 6.73 | 7.17 | 8.53 |
| New Britain | 99 | 1 | | 11.71 | 12.02 | 13.54 | 0.06 | 0.06 | 0.06 | 11.71 | 12.08 | 13.60 |
| New Hartford | 24 | 76 | | 0.15 | 0.15 | 0.19 | 0.31 | 0.32 | 0.40 | 0.46 | 0.47 | 0.59 |
| Newington | 100 | 0 | | 4.02 | 4.04 | 5.87 | 0 | 0 | 0 | 4.02 | 4.04 | 5.87 |
| Plainville | 100 | 0 | | 2.85 | 3.10 | 3.94 | 0 | 0 | 0 | 2.85 | 3.10 | 3.94 |
| Rocky Hill | 92 | 8 | | 2.33 | 2.76 | 4.36 | 0.12 | 0.14 | 0.23 | 2.45 | 2.90 | 4.59 |
| Simsbury | 74 | 26 | | 1.96 | 2.24 | 3.08 | 0.47 | 0.53 | 0.75 | 2.43 | 2.77 | 3.83 |
| Somers | 63 | 37 | | 0.47 | 0.50 | 0.67 | 0.25 | 0.26 | 0.32 | 0.72 | 0.76 | 0.99 |
| Southington | 91 | 9 | | 4.18 | 4.50 | 5.60 | 0.27 | 0.29 | 0.37 | 4.45 | 4.79 | 5.97 |
| South Windsor | 82 | 18 | | 2.37 | 2.67 | 3.74 | 0.26 | 0.29 | 0.39 | 2.63 | 2.96 | 4.13 |
| Suffield | 76 | 24 | | 0.83 | 0.89 | 1.09 | 0.18 | 0.19 | 0.23 | 1.01 | 1.08 | 1.32 |
| Vernon | 68 | 32 | | 2.40 | 2.62 | 3.46 | 0.74 | 0.83 | 1.10 | 3.14 | 3.45 | 4.56 |
| West Hartford | 100 | 0 | | 7.19 | 7.73 | 9.67 | 0 | 0 | 0 | 7.19 | 7.73 | 9.64 |
| Wethersfield | 100 | 0 | | 3.04 | 3.33 | 4.26 | 0 | 0 | 0 | 3.04 | 3.33 | 4.26 |
| Windsor | 100 | 0 | | 4.65 | 5.46 | 7.77 | 0 | 0 | 0 | 4.65 | 5.46 | 7.77 |
| Windsor Locks | 100 | 0 | | 2.22 | 2.28 | 2.82 | 0 | 0 | 0 | 2.22 | 2.28 | 2.82 |
| | | | | 113.8 | 126.4 | 167.9 | 8.3 | 9.0 | 12.0 | 122.0 | 135.1 | 179.8 |

Notes: (1) UTIL. ONLY column lists safe yield as provided by utilities in their questionnaires, and when such data were not available DOHS yield estimates were used to supplement the utility data and are listed in the COMBINED column.

(2) For those utilities serving more than one community, the water usage has been apportioned between the respective communities. For utilities providing water to customers outside the study area the service population and respective usage has been reduced appropriately.

(3) Self-supplied water consumption was estimated using the existing town-wide utility average per capita consumption values listed in this table, except for Colebrook and Hartland where 75 gpcd was assumed.

TABLE 1.6A

METHODOLOGY FOR PROJECTING FUTURE WATER SUPPLY NEEDS

1. Estimate current population served in each community by utilities. The residential population served numbers for each utility are reported in Table A.2 and A.4 (in Appendix A). The values reported therein consist of population served numbers as provided by utilities in their questionnaire. If a questionnaire was not received, the population served figures were calculated from community average household sizes multiplied by the number of service connections reported in DOHS inspection information. (Also see discussion in Section 1.2.3).

2. Calculate percent of each community's population served by utilities. The number of people served by one or more utilities in each community was summed, and then divided by the 1986 community population reported in Tables 1.1 to yield the percentage of UTILITY SUPPLIED customers. The remainder of the community population was assumed to be SELF SUPPLIED by individual wells. It was also assumed that the percent of water provided by each utility to a given community would remain the same. It is recognized that this percentage may change with time. However, since the UTILITY SUPPLIED and SELF SUPPLIED values are summed under the COMMUNITY TOTAL column, a worst case projection of potential future utility supplied needs is provided (i.e., total utility supply of a community's water needs).

3. Calculate the average domestic water use for each community. Domestic use for both UTILITY SUPPLIED and SELF SUPPLIED residents was taken at 75 gpcd for the present per capita consumption. For estimating future water needs, a 0.25 gpcd/yr escalator was added to the per capita domestic consumption usage.

4. Estimate nonresidential consumption (per Table A.4). Estimates of present and future nonresidential consumption (commercial/industrial/nonrevenue water) were requested of the twelve utilities with the anticipated greatest concentration of commercial/industrial. Nine utilities (Avon W.C., Bristol W.D., Connecticut WC, Manchester W.D., MDC, Plainville W.C., Southington W.C., Unionville W.C. and Village W.C.) provided preliminary future estimates, and three (Berlin W.C.C., Hazardville W.C. and New Britain W.D.) were unable to provide estimates. When the preliminary water utility estimates were provided by utilities, these values were used. Additionally, three utilities (Manchester W.D., MDC and New Britain W.D.) supplied supplemental information to increase their 1986 utility useage to reflect existing conditions. For those utilities not providing future estimates, an average per capita water consumption estimate was derived for these utilities (see bracketed numbers in Table A.4) by dividing the utilities service population into the utilities' average daily water production (from Table A.2). A value of 75 gpcd was subtracted from the estimated average water consumption to yield the estimated nonresidential contribution. The present estimated nonresidential water use was derived by multiplying the service population by the nonresidential per capita contribution. Future nonresidential water use for these utilities was estimated using a one percent (1%) per year escalator. The one percent per year escalator represents the average escalation factor (to nearest whole percent) between the present and the Year 2030 for those utilities providing adequate information to derive such.

5. Determine the total future estimated water consumption by community. Sum "Projected Water Use" values (from Table A.4) contributed by each utility in each community to provide estimated future water consumption by community.

the study area[8] have used such escalators, which have varied from about 0.5 to 1.5 gpcd. However, recent experience in the Housatonic Public Water Supply Management Area and other areas has seen a stabilization of the per capita water use reflecting ongoing leak detection programs, conservation and, probably most importantly, the price of water. Ultimately, the change of per capita consumption will reflect the character of the users of the utilities, as well as the relative growth of population as compared to the growth of significant commercial/industrial users. Given the results of the preliminary work on Individual Plans for various utilities in the Management Area, the 0.25 gpcd/year escalator appears valid.

None of the utilities from which the distribution of residential and nonresidential water use was requested were able to provide the appropriate information. Therefore, the nonresidential use for those utilities unable to provide future estimates was projected as described in Table 1.6A. The appropriate values for the individual utilities are shown in Table A.4, and these have been incorporated in the community summaries listed in Table 1.6.

In order to compare the existing available water (from utility supplies) with the projected future needs, the estimated total utility yield "available" for each community is listed in Table 1.6. The estimated yields reported by utilities (UTIL. ONLY) in their questionnaires is listed in the table; if such data was missing, DOHS yield estimates were used to supplement the utility values to provide the total (COMBINED) estimated yield by community. For those utilities serving more than one community, their existing estimated yield was apportioned according to the ratio of the number of people served by the utility in each given community divided by the total number of users served by the utility. This approach does not reflect a utility's ability to move water from one part of its system to another (eg. hydraulic restrictions may not allow its yield to be realized in specific parts of its service area). However, it does provide a sense of available yield as compared to projected growth and future water needs.

At the time the second draft was reviewed several utilities expressed concern that the updated estimations underestimated the acutal 1986 and

projected use values. One case in point is the Metropolitan District Commission (MDC). In the second draft their 1991 projected consumption was 56.5 MGD, while their actual 1986 usage was 56.7 MGD. On the basis of this example, three utilities (the Manchester Water Department, MDC, and New Britain Water Department) chose to upgrade their baseline non-domestic consumption values to alleviate inconsistencies (or underestimation) in their actual 1986 use and projected consumption values. Please note that this example underestimation of consumption may hold true for other utilities, but it is not possible to assess properly in all cases since many utilities have not completed their individual supply plans. Therefore, the projections in Tables 1.6 and A.4 are given as preliminary and not as final projections. The Integrated Report will address and properly correlate the consumption projections for the individual utilities and the Upper Connecticut Management Area as a whole.

An inspection of Table 1.6 indicates that, from a total area-wide perspective, the estimated total existing yield from utility supplies is slightly less than the projected future water needs. Inspection of this table indicates that there are at least nineteen communities where a shortfall could be realized by the Year 2030 or earlier. Nine of these communities are either entirely or partly served by the MDC. Based on the values listed in Table A.4, the MDC will have an estimated demand of over 91 mgd by the Year 2030.

[redacted]

The Connecticut Water Co. and the MDC are the two principal providers of water to South Windsor, serving approximately one half and one quarter of the town population, respectively. Due to the projected growth in population, by the Year 2030 additional supplies will be needed in South Windsor.

Based on the more up-to-date commercial/industrial/non-revenue water projections, three communities for which the Connecticut Water Company is the

principal supplier of water have potential shortfalls by the Year 2030. These communities include Canton, East Windsor and Windsor Locks.

East Granby is presently served by eight utilities which collectively provide water to about one third of the residents in the town. Due to the projected growth rate for this community, additional water needs are anticipated in the near future.

The principal provider of water in the Town of Farmington is the Unionville Water Co., although six other utilities provide water to the remaining utility-supplied customers. Given Unionville's existing estimated yield, which includes an unfiltered surface supply from MDC's raw water main, it should have sufficient water to meet future needs assuming it maintains approximately the same percentage of the community's customer base. However, given the anticipated growth in the town, additional water will be needed by the Unionville Water Co. if it absorbs a greater portion of the growth, or by the other utilities in the community. Also, based on the new EPA regulations, the Unionville Water Co. most probably will need to provide treatment to its supplemental surface supply or develop additional groundwater supplies.

Berlin's apparent shortfall stems from the fact that the Berlin Water Control Commission's wells are not adequate to meet their demand. However, they presently purchase sufficient water (from MDC, New Britain Water Dept. and Kensington Fire District) to meet their existing demand. With continued purchase agreements the apparent shortfall will not occur.

The above provides a generalized perspective of possible shortfalls. However, potential problems from an individual utility perspective must not be overlooked. Due to the incidence of contaminated wells in the area, utilities have in the past lost significant portions of their existing yield (eg. Southington Water Co.). Unless there is sufficient buffer between a utility's existing yield and its average daily usage, the utility's customers could face future water shortages if an individual well or other source of supply is lost. This issue will come into better focus as the utilities finish their Individual Plans.

From a total area-wide perspective, the available utility supplies are slightly less than the estimated future average daily demand for the Year 2030. When looked at on an individual community or utility basis, additional supplies will be necessary earlier than the Year 2030 to service future customers. Additionally, utilities with marginal existing safe yields must develop sufficient back-up to meet future demands in the event one of their prime supply sources is lost.

One final issue which merits discussion at this point is the future population estimates (listed in Table 1.1) which were used to estimate the projected future water needs in Table 1.6. The concern that the population numbers in the state regulations are too low has been discussed at length during the WUCC meetings and various comments (Town of Suffield, Unionville Water Co., Town of Manchester, and CRCOG) were received as part of the public comments. Some of these comments included suggestions that updated DOHS or OPM estimates be used which are more reflective of recent population growth. Unfortunately, such updated numbers will not be available until early 1988. Consequently, the values in the state regulations have been retained for use in this Water Supply Assessment. The obvious impact of using these numbers is that the future water needs may be underestimated if the population estimates are low. Additional discussion on this matter is included in Section 1.7.13.

### 1.3.3 Barriers to Source Development

Any of the ground or surface water sources carry some degree of uncertainty that they will provide the yields listed in Table 1.5. With a ground water supply, despite the existence of a good degree of subsurface data, the true potential of a well site cannot be ascertained until the appropriate test wells are installed to evaluate the aquifer's hydraulic response to the withdrawal of water and water quality is examined. The "estimated or theoretical yield" values listed in Table 1.5 for aquifers generally reflect estimates based on USGS or other groundwater models and limited pumping test data. These values then are indicative of the available data and assumptions used and may well provide a good estimate of the total yield of the aquifer in a general sense, but may not be indicative of the yield derived from a well

sited at a given location within the aquifer. Even when a site is found to be suitable, a well is susceptible to varying aquifer recharge rates and the potential migration of contaminants to the well from a variety of sources (e.g., leachate from buried wastes or spillage within the recharge area). For this reason, a well site must not only be carefully selected, tested and monitored, but must also be protected by means of proper land use controls within the recharge area. For larger aquifers, water quality protection can be particularly difficult since the recharge areas can potentially be very large and transcend town boundaries. For significant well withdrawals, the potential for stream flow depletion in watersheds of other utilities must also be considered, since such pumping can reduce the safe yield of downstream utilities. The State's diversion permit program requires that sufficient low flow be maintained in a stream in order to protect such factors as its waste assimilative capacity and fisheries. These permits consider a variety of factors set forth in Section 22a - 373 of the General Statutes which, when considered collectively, can limit the amount of ground water withdrawal or surface water diversion if negative impacts are anticipated.

The major surface and groundwater sources identified have varying water quality classifications. Under state law those surface water sources which are designated as Class B are prohibited for use as a water supply, although under this planning process their consideration as potential sources is permitted. In addition to the State's water quality classification issue, many other factors can come into play when considering a surface water body for water supply purposes. These include recreational uses, fisheries, hydroelectric generation and philosophical differences or legal restraints regarding the transport of water from one political entity to another. Additionally, watershed areas for surface supplies can be very large and, thus, the implementation of protection strategies for these watersheds is difficult. Development pressures can lead to conflicting land uses within watershed areas, and the proper control of the disposal of potential contaminants throughout such a wide area is difficult, if not impossible.

Groundwater sources are covered by a water quality classification similar to that for surface supplies, although the delineation of the nonuse of a

Class GB groundwater is not as restrictive as that for a Class B surface water. In the case of groundwaters, Class GB aquifers are degraded or potentially degraded groundwater sources that may serve as public or private supplies with proper treatment, as needed.

The development of additional water supplies which leads to the supply of water in excess of 50,000 gallons per day to one water supply system from one or more existing or new sources requires a diversion permit - regardless of a utility's desire to develop a ground or surface water source. A variety of factors must be considered collectively in the permitting process. As set forth in Section 22a - 373 of the General Statutes, the following items must be considered:

- The effect of the proposed diversion on related needs for public water supply including existing and projected uses, safe yield of reservoir systems and reservoir and groundwater development;
- The effect of the proposed diversion on existing and planned water uses in the area affected such as public water supplies, relative density of private wells, hydropower, flood management, water-based recreation, wetland habitats, waste assimilation and agriculture;
- Compatibility of the proposed diversion with the policies and programs of the State of Connecticut, as adopted or amended, dealing with long-range planning, management, allocation and use of the water resources of the State;
- The relationship of the proposed diversion to economic development and the creation of jobs;
- The effect of the proposed diversion on the existing water conditions, with due regard to watershed characterization, groundwater availability potential, evapotranspiration conditions and water quality;
- The effect, including thermal effect, on fish and wildlife as a result of flow reduction, alteration or augmentation caused by the proposed diversion;
- The effect of the proposed diversion on navigation;
- Whether the water to be diverted is necessary and, to the extent that it is, whether such water can be derived from other alternatives including, but not limited to, conservation;

- Consistency of the proposed diversion with action taken by the attorney general pursuant to sections 3-126 and 3-127; and
- The interests of all municipalities which would be affected by the proposed diversion.

Each permit is evaluated in light of the above factors by DEP as to the need for an Environmental Impact Report (EIR). If interbasin transfer of water is proposed an EIR is mandated. As the competition for water resources intensifies (e.g., water supply versus other uses or competition for use of resources by different utilities) the diversion permitting process will become more difficult. However, as the demand for additional water supplies increases, the need for additional diversion permits, especially those requiring interbasin transfer, will become more necessary. Not only will competing environmental issues need to be addressed, but economic issues will become an important factor.

## 1.4 EXISTING SERVICE AREA BOUNDARIES

The service area boundaries for the existing utilities in the Upper Connecticut River Public Water Supply Management Area are illustrated on Plates 1A and 1B. The water service areas and all base information shown on Plates 1A and 1B were plotted at 1:50,000 from DEP's Connecticut Geographic Information System. As discussed in Section 1.2.2, water service areas were delineated on 1:24,000 scale maps by the consultants and DOHS staff and then digitized and edited by DEP staff at this scale. All base features such as town boundaries, major rivers and water bodies, and federal, state and interstate roads were also prepared and edited by DEP staff at 1:24,000 scale. This information which was input at 1:24,000 scale was then simultaneously plotted at 1:50,000 scale to generate Plates 1A and 1B.

## 1.5 LAND USE AND POPULATION TRENDS

Based upon the OPM population projections for water supply planning summarized in Table 1.1, the population of the Upper Connecticut River Public Water Supply Management Area is projected to increase by about 21 percent from

1985 to the year 2030. However, this table shows some interesting trends in the population for various communities within the region. Between 1960 and 1980, the City of Hartford had a significant decline, about 16 percent, in population. Three other communities (East Hartford, New Britain and West Hartford) increased in population between 1960 and 1970 and then decreased between 1970 and 1980. The other communities in the region collectively grew by about 45 percent during the 1960 to 1980 time frame. The population projections through 2030 find two communities (New Britain and West Hartford) continuing to decrease in population, while East Hartford and Hartford are projected to have modest to average population increases.

From a land use perspective, this apparent migration from the central city areas has been reflected in population growth and development around the central urbanized core. A loss of agricultural land has been seen in communities to the north, east and west of Hartford and may have been part of the stimulus for the State's farmland protection program. The smaller communities around this central core have experienced stresses on community services, with many building new schools to cope with the residential influx of younger families. Some redevelopment in the Hartford central city area appears to have slowly brought younger people back into the city - a fact reflected in the modest growth projected through 2030.

In terms of water supply issues, the same flat fertile areas in the Connecticut Valley which were conducive to farming have also been attractive for development. Thus, we find both historic and recent impact upon the groundwater resources found within the stratified drift deposits of the Connecticut Valley as evidenced by EDB and VOC contamination of various wells. These areas are desirable for multiple uses both in terms of development and water supply thereby creating a natural conflict for use.

The character of past growth was fostered by zoning regulations, or the lack thereof, established by various communities. Future growth will continue to be shaped by these regulations. DEP, in cooperation with DOHS, has been incorporating municipal zoning for the various communities in the Upper Connecticut River area into DEP's computerized mapping system. This

information will be invaluable for the more detailed evaluation of the compatibility of land use plans with water supply planning scheduled as part of the Integrated Report.

## 1.6 STATUS OF WATER SYSTEM AND LAND USE PLANNING AND COORDINATION BETWEEN PUBLIC WATER SYSTEMS

### 1.6.1 Water System Planning

The extent of water system planning by the utilities in the Upper Connecticut River Public Water Supply Management Area varies considerably. Typically, for those utilities servicing residential areas or multi-family housing complexes which have no plans or space for growth, little planning is really necessary. For systems such as these, plans for regular maintenance and periodic repairs typically constitute the bulk of the planning.

On the other hand, those systems servicing a larger and more diverse customer base normally conduct planning either with an internal engineering staff or utilize outside engineering consultants. These utilities typically assess their need for future water supplies, and develop capital improvement programs for upgrading existing treatment and distribution facilities. Table 1.7 summarizes various planning or engineering documents which utilities indicated in their WUCC questionnaire responses to have recently completed, are in the process of completing, or other projects that they expect to address in the near future. As may be seen therein, about one-quarter of the utilities in the area have indicated that they completed recent water supply planning/engineering reports. Additionally, these utilities have a number of engineering construction projects underway or planned in the near future to upgrade their systems or to develop additional sources. Many utilities have also been required to prepare an individual utility plan, pursuant to Connecticut General Statutes Section 25-32d, which will become part of the Coordinated Water System Plan.

### 1.6.2 Land Use Planning

Land use planning is typically carried out from a community perspective and takes the character of a community's plan of development, as reflected in

TABLE 1.7

STATUS OF UTILITY PLANNING

| UTILITY | RECENTLY COMPLETED ENGINEERING/PLANNING | ONGOING OR ANTICIPATED PLANNING/ENGINEERING NEEDS |
|---|---|---|
| Avery Heights Water Assoc., Inc. | | . General rehabilitation |
| Avon Water Company | | . General improvements include adding new well, distribution enlargement<br>. Interconnection with Farmington Woods W.C. |
| Berlin Water Control Commission | | [redacted] |
| Bristol Water Department | | . Evaluation of water and sewer services to southwest [redacted] |
| Connecticut Water Company | | . Ongoing Filtration Plant project<br>. Emergency interconnection with CWC<br>[redacted]<br>. Treatment of EDB co[redacted]<br>. General rehabilitation and improvements<br>. Purchase of Vernon Water Dept. in 1987 |
| Cromwell Fire Dist. Water Department | | . Rate and water study by CDM [redacted] |
| Ellington Acres Company | | |
| Ethel Walker School | | |
| Farmington Woods Water Co. | | [redacted] |
| Hazardville Water Company | | to . Additional supplies needed-achieved by increasing existing yield, adding storage, developing new sources [redacted] |
| Lakeview of Farmington | | |
| Manchester Water Department | | . Ongoing rehabilitation projects planned over the next 5 years. |
| Meriden Water Dept. | | |
| Metropolitan Dist. Commission | | . Strategic plan by CDM [redacted] |
| New Britain Water Department | | . General rehabilitation and improvements |
| New Hartford Water Company | | |
| Plainville Water Company | | . Increase existing supply yields, storage and distribution system |
| Portland Water Works | | |
| Salmon Brook District | | . Improvements in distribution system |
| Somersmill Water Association | | Abandonment of EDB contaminated well [redacted] |
| Southington Water Department | G | . Additional supply required, add packed tower aeration to one well<br>. Conduct volatile organic contamination study on 2 wells<br>. Use towns authority to protect supply<br>. Improvements in distribution system<br>. Filtration plant at resevoir |
| Trailsend Water Company | | . Distribution system in need of replacement |
| Torrington Water Company | | . Increase in distribution system |
| Unionville Water Company | | . General rehabilitation and system improvements |
| Vernon Water Dept. | | . Planned purchase of utility by CWC in 1987 |
| Village Water Company of Simsbury | | . General rehabilitation and system improvements |
| West Service Corporation | | . Establishing fire protection service [redacted] |
| Winsted Water Works | | . Improve distribution system |

local zoning regulations. These plans and regulations are designed to set the framework for growth within a community and tend to reflect the desires of the community residents as implemented through the community's governing bodies. In the Upper Connecticut River Public Water Supply Management Area, the plans of development are in various stages of completion, as is illustrated by Table 1.8. Given the rapidly changing character of the region, these plans can become quickly outmoded if not examined and updated regularly. Furthermore, different objectives of different communities for their future growth or the manner in which growth has or has not been planned has led to irregular growth patterns throughout the region.

From a water supply perspective, many older planning efforts did not place particular emphasis upon the potential incompatibility of water resource needs and development with surface supply watersheds or, more critically, groundwater recharge areas. Recent legislation, Public Act 85-279 entitled "An Act Concerning the Protection of Public Water Supplies," requires municipal planning and zoning commissions to include consideration of existing and potential surface and groundwater source protection in their local plans and regulations. Compliance with this requirement by communities will place the probable conflict of development and water supply sources into clearer focus. In terms of potential groundwater source impacts, Table 1.5 (in Section 1.3.1) provides a good illustration of existing and future potential conflicts between land use and groundwater contamination. What this table further indicates very clearly is the historic conflict between development and waste disposal practices and the continued need for good quality groundwater supplies (which by number of sources constitutes the majority of the supply).

Ultimately the success of regional water supply planning will hinge upon the compatible marriage of local land use planning and the water supply needs of utilities. The utilities will respond to growth as controlled or fostered by the community plans of development which, as stated above, must by law include consideration of existing and potential surface and groundwater source protection. Since water supply issues can commonly transcend community borders, a regional perspective is helpful. Public Acts 84-502 and 85-535, which are administered by DOHS, require that individual utility water supply

TABLE 1.8

STATUS OF LAND USE PLANNING

| COMMUNITY | PLANNING DOCUMENTS | ADDITIONAL SOURCE OF PLANNING INFORMATION | SUMMARY OF WATER SUPPLY RELATED PLANNING INFORMATION |
|---|---|---|---|
| Avon | July 1979 Plan of Development - Avon Planning Department | Bruce Hoben, Planning Adminstrator | . Plan of Development recommends adopting aquifer protection policies<br>. Small amount of industrial/commercial development projected<br>. Stated policy to allow development of lands with poor soils permitted only when adequate sewage disposal and drainage probelms resolved contradicts areas of potential future growth outlined on zoning map as public open spaces, areas with steep hills (15%) and land with poor soil conditions |
| Barkhamstead | 1985 Plan of Development - John W. Netherton | Harriet Boyko, Adminstrative Asst. | . Limited development projected due to natural physical limitations and lack of public sewer and water systems<br>. Aquifer upgrade goal of 2 areas in town GB/GA to GA |
| Berlin | 1974 Plan of Development(1) | | |
| Bloomfield | 1984 Plan of Development - Brown, Donald and Donald | Alice Williams, Admin. of Planning and Zoning Permits | . Majority of town is residentially zoned, 5,000 acres of unused land is zoned for residential use<br>. Plan of Development identifies sensitive wetland areas |
| Bristol | No existing Plan of Development(2) | | |
| Burlington | 1985 Plan of Development - Lawrence T. Alberti | Theodore C. Scheidel, First Selectman | . Plan of development recommends policies to protect watersheds, aquifers and all water supplies from contamination thru land use policies<br>. The town should monitor the utilities' policies & plans as they effect the sale and/or use of water supplies |
| Canton | 1972 Plan of Development - Brown, Donald and Donald | Christopher Windsor, Chairman Planning & Zonning Commission | . At time of plan, area proposed for future town water coincided with medium density area and encompassed commercial/industrial areas. Remainder of town expected to develop at very low density. |
| Colebrook | No existing Plan of Development | | |
| East Granby | 1976 Plan of Development - Bureau of Local Government, State Dept. of Community Affairs | Charles Francis; Barnhardt, Johnson Francis & Wild - Consultant | . Main goal of Plan of Development is to maintain "rural character" of town |
| East Hartford | 1980 Plan of Development - C.E. Maguire | Michael Dayton, Town Planner | . Nearly entire town served by MDC water and sewer.<br>. 12% of town industrial and 3% is commercial.<br>. 1100 acres which is zoned residential and unused, consists of small scattered single-family parcels. |
| East Windsor | 1986 Plan of Development - the FMA Partnership | | . Main goal of Plan of Development is to maintain "rural character" of town<br>. CWC states ample supplies of pure drinking water for the future and will provide service anywhere in town it is required<br>. Recommend utility expansion into Broad Brook area<br>. Possible area of development include lands west of town, along routes 140-191 to the north, and between the Connecticut and Scantic Rivers (south border) |
| Ellington | 1967 Plan of Development - Yarwood and Block, Inc. | Steven M. Kushner, Planning Director | . Plan of Development describes the community with a rural character, not possible to assess the impact of the intervening 20 years on land use w/o an update of plans |
| Enfield | 1987 Plan of Development - C.E. Maguire | Gregory Chiara, Town Planner | . About one-half of town's land area undeveloped, of which 75% zoned residential and 25% zoned industrial.<br>. Town experiencing high rate of economic growth.<br>. Moratorium on residential subdivisions since Sept, 1986.<br>. Recommended change in existing residential zoning to achieve higher diversity at lower overall density. |

TABLE 1.8 (Continued)

STATUS OF LAND USE PLANNING

| COMMUNITY | PLANNING DOCUMENTS | ADDITIONAL SOURCE OF PLANNING INFORMATION | SUMMARY OF WATER SUPPLY RELATED PLANNING INFORMATION |
|---|---|---|---|
| Farmington | 1982 Plan of Development - Town Plan and Zoning Commission | Bruce Hoben, Planning Director | . Plan of Development recommends aquifer protection by limiting development of potential pollution sources near recharge areas<br>. Limitations on groundwater withdrawal considered in plan<br>. Growth anticipated in certain neighborhoods in the town;<br>- Central: significant growth in residential development at present with minimal water systems<br>- Health Center: growth in high density residential & offices, existing water system will need sizeable extension<br>- Southwest: contains sizeable portions of towns vacant land<br>- West District: development of 400 acres of residentially zoned land<br>. Potential lack of coordination between major utilities and smaller systems may pose future development problems for the town |
| Glastonbury | 1984 Plan of Development(1) | | |
| Granby | 1980 Plan of Development - Brown, Donald and Donald | Brenda Campbell, Chair Planning & Zoning Commission | . Housing plan outlines 3 areas of development:<br>- Western Uplands: poor soils, steep slopes and water supply to be considered prior to development<br>- Valley Floor: most development has occurred here but this area is possibly positioned over an aquifer, guide development in aquifer protection<br>- Granby Center: ideal location for further development |
| Hartford | 1985 Plan of Development - City Planning Department | | . Plan of Development projects no vacant land available in year 2000<br>. Farmington River projected as future water supply<br>. Plan of Development has no criteria to address water supply issues, states it must be addressed in a regional context |
| Hartland | No existing Plan of Development | | |
| Harwinton | No existing Plan of Development | | |
| Manchester | 1986 Plan of Development - Town Planning Deparment | Mark Pellegrini, Director of Planning | . Current development is on lands deemed suitable, i.e., served by utilities, good access, no wetlands or steep slopes<br>. Plan of Development establishes concern over protection of groundwater including aquifers and surface water supplies<br>. Concern addressed over vacant lands which either are not served by public utilities, are regulated wetlands or are moderate to steeply sloping sites<br>. Water main extensions should be encouraged in the northwestern and southwestern quadrants as development increases |
| New Britain | 1984 Plan of Development - Raymond, Parish, Pine & Weiner, Inc. | Sebastian R. Papa, Director of Planning | . Highly developed community<br>. Very few projected development changes, little effect on<br>. existing water system |
| New Hartford | 1983 Plan of Development - The FMA | Louis Pepe, Chairman Planning & Zoning Commission | . Vacant land represents 60% of total acreage<br>. Discourage development and placement of optimum residential densities for groundwater aquifer and recharge area protection |
| Newington | 1984 Plan of Development - Brown, Donald and Donald | Bruce Hoben, Interim Town Planner(3) | . Town was 75% developed in 1982<br>- 36% Residential<br>- 12% Commercial/industrial<br>- 24% Public & Semi-public<br>- 28% Vacant<br>. Plan encouraged development and redevelopment of Central Business District, development of industrial and commercial building, and development of a variety of housing types |

TABLE 1.8 (Continued)

STATUS OF LAND USE PLANNING

| COMMUNITY | PLANNING DOCUMENTS | ADDITIONAL SOURCE OF PLANNING INFORMATION | SUMMARY OF WATER SUPPLY RELATED PLANNING INFORMATION |
|---|---|---|---|
| Plainville | 1983 Plan of Development - CCRPA | | . Vacant lands total 43% of towns area and would be difficult to develop due to area designated as wetlands or moderate to severe development limitations placed on land<br>. 350 and 250 acres zoned respectively for residential and industrial future development<br>. 95% of developed area is served by sewers<br>. Increasing concern over pollution sources in conflict with aquifer usage (town covers 60% of aquifer) |
| Rocky Hill | 1985 Plan of Development - Flaherty Giavara Assoc., Inc. | Thomas B. Hooper, Town Planner | . Land prime for development is located in western section of town<br>. Vacant land represents 36% of total acreage |
| Simsbury | 1983 Plan of Development - John Netherton | Leonard D. Tolisano, Town Planner | . Recommended creaction of Local Water Supply Advisory Board<br>. Protect groundwater aquifers through proper land management<br>. Policy statement to ensure adequate and safe public water supply exists<br>- cooperate with town water companies<br>- protect all public water supply wells through appropriate land use controls<br>- encourage looped systems<br>- encourage town water companies to monitor water quality and comply with strictest applicable Federal and State Water Quality Standards |
| Somers | 1973 Plan of Development(1) | | |
| Southington | No existing Plan of Development | | |
| South Windsor | 1987 Plan of Development - (Draft) S. Windsor Planning & Zoning | Michele M. Rowley, Asst. Planner/Analyst | . Land use and other appropriate measures should be taken to protect ground and surface water resources from contamination<br>. Water service should be extended to areas of future growth but service should not be extended to rural areas where growth is not desired |
| Suffield | 1986 Plan of Development - Lord-wood, Larson Assoc., Inc. | William Leahey, Chairman Planning & Zoning Commission | . Conn. Water Co. serves eastern half of Town<br>. Much of western half of Town is residential on individual wells<br>. Primary influence on growth is Bradley Airport with industrial growth in area north of Airport, as well as expanded industrial area between Rte. 75 & 159.<br>. Increased high density and multi-family development predicted in rest of "Sewer Service Area," plus some commercial expansion and low density residential<br>. Success of "Sewer Service Area" program will likely determine future character of Town. |
| Vernon | 1981 Plan of Development - Town Planning Department | | . Prime development land is limited<br>. 4.6% of land industrial zoned<br>. Small population increase to the year 2000 |
| West Hartford | 1987 Plan of Development | Don Foster, Town Planner | . Vacant land available for development is scarce<br>. Plan encourages ongoing maintenance, repair, replacement, improvement & expansion of utility systems<br>. Recommends confinement of future business development within town's existing commercial boundaries and maintenance of existing residential areas |
| Wethersfield | 1983 Plan of Development - Buckhurst Fish Hutton Katz/Clark Assoc. | | . Majority of town is residentially developed<br>. Land for future development comprises 14% of total town acreage, is located in western third of town and is zoned for both residential and industrial use |
| Windsor | 1983 Plan of Development(4) | | |
| Windsor Locks | 1987 Plan of Development - Lord-Wood, Larson Associates | Richard Williams, Chairman Planning & Zonning Commission | . 1600 acres vacant, developable land available, of which 1000 acres is zoned commercial/industrial<br>. Emphasis on continuing its suburban residential character<br>. Primary judgement in Site Plan Review Regulations is potential to cause groundwater pollution, and conformance with DEP regulations regarding "A Guide to Groundwater Protection for Local Officials." |

Notes: (1) Did not receive Plan of Development.
(2) Plan of Development under study by RPPW, Inc.
(3) New town planner effective end of November, 1987.
(4) Incomplete Plan of Development.

plans and the area-wide supplement to the Coordinated Plan consider land use planning. Additionally, this perspective can be provided by the regional planning organizations (planning agency, council of elected officials, or council of government) whose funding may in large part be derived from the member communities that they serve as well as from state and federal grant monies. These funding sources can either promote or limit the ability of the planning organizations to respond to particular issues. The coordinated water system planning process recognizes the importance of the regional perspective as evidenced by the inclusion of a representative elected by the municipalities of each RPO in the area. These organizations should continue to play an active role in integrating local land use planning into a regional perspective, particularly as it relates to the area-wide protection of surface supply watershed areas and groundwater recharge areas.

### 1.6.3 Coordination Between Public Water Systems

There is a good degree of coordination among utilities within the Upper Connecticut River Area. A number of interconnections exist whereby one utility wholesales water to another on a continuous basis or as an emergency supply. Additional interconnections are planned in the future. Utilities have also provided main extensions from one town to another to provide water service where well supplies have become contaminated. Utilities frequently share equipment when the need arises and share ideas and information by participating in organizations such as CWWA, NEWWA and AWWA. On the other hand, situations do occur where better cooperation or communication is needed with new source development and service area expansion so that two or more utilities do not expend resources to develop a new source of supply or serve an area that will conflict with another utility.

## 1.7 IDENTIFICATION OF KEY WATER SUPPLY PROBLEMS WITHIN THE UPPER CONNECTICUT RIVER PUBLIC WATER SUPPLY MANAGEMENT AREA

This section is specifically designed to clearly identify in summary form all problems or issues which the WUCC considers to be important to this Water Supply Assessment. This document represents the WUCC's "problem statement," and these problems or issues will be addressed in the development of the

Integrated Report so that the completed Coordinated Plan properly covers the key issues of the Upper Connecticut River Public Water Supply Management Area.

### 1.7.1 Inconsistent Data

As was found in the Housatonic Area, one of the more prevalent problems which came to light during the development of the Water Supply Assessment for the Upper Connecticut River Area has been the inconsistency of the available utility data base. The lack of individual utility plans has created a void in the potentially comprehensive source of direct utility information. The WUCC questionnaire was designed to try to fill this void, and succeeded to a much greater extent here than in the Housatonic Area. However, about 40 percent of the utilities did not respond or did not provide the information requested. This was more typical of the smaller utilities, since in many cases they do not collect the requested data or were unable to respond for lack of resources. When the questionnaire data were supplemented by information from other sources, it became apparent that not only did utilities not approach data gathering or interpretation in a similar manner, but information developed from state agency inspections of the various utilities did not necessarily correspond to the utility supplied data. Thus, there was both a lack of data as well as procedural differences in how data were derived.

### 1.7.2 Regulatory Burden

Many regulatory requirements are placed upon utilities regardless of their size. What may be easy or less burdensome for those organizations with a full-time staff may be entirely overburdening for those who function with a minimal, part-time staff commitment. New requests for additional water quality information, completion of forms or preparation of planning documents seem to continually arise. Frequently, the same or similar information is requested by various agencies creating the burden of supplying redundant information. These problems affect utilities of all sizes, and tax everyone's resources.

The 1986 amendments of the Safe Drinking Water Act contain four major changes which have potential regulatory impact on the area's utilities, as follows:

- Chlorination of groundwater supplies
- Well head protection
- Filtration of surface water supplies under virtually all circumstances
- Periodic analysis of eighty-three contaminants

Although the specific regulatory requirements are not in place, these amendments promise to impact many, if not all, of the utilities in the Upper Connecticut River. The utilities will be faced with the need to capitalize new improvements (see 1.7.7, Financing), as well as with additional operation and maintenance costs.

### 1.7.3 Competition Between Utilities

Overlap of franchise areas exists in the Upper Connecticut River Area, and represents a potential conflict between two utilities who wish to serve the same area. The forthcoming designation of exclusive areas by utilities will attempt to solve this problem. However, there is a concern among utilities as to whether a designated exclusive service area or franchise area will take precedence. Due to the unique nature of each franchise, the Attorney General's office is unable to provide a generic ruling, and believes that each situation must be dealt with on a case-by-case basis. A possible solution would be for the state legislature to pass a Special Act resolving this issue. Should the state legislature decide not to act, the problem may endure until a litigative precedent is established.

Competing interests can also be created by the water users. As an example, actions by the town of South Windsor, acting through their legislative representatives, has led to passage of legislation by the General Assembly (Public Act 87-110) creating a Task Force to study consolidation of private water companies by public water utilities. A Task Force is now studying the feasibility and economics of such takeovers. The issue appears

to be principally associated with the difference in the cost of water versus any issues raised by the utilities involved.

### 1.7.4 Potential Groundwater Problems

The potential for contamination of the major stratified drift aquifers, as well as bedrock aquifers, in the Upper Connecticut River Area was highlighted in Table 1.5. The contamination of wells has been documented, but it is anticipated that additional problems will be realized with increased monitoring and better detection. This situation has been created by a greater knowledge and awareness of the groundwater contamination problem, as well as increased monitoring of groundwater supplies and individual wells. The potential for groundwater contamination also affects water supply reliability and may influence growth by requiring public water system expansion, groundwater treatment or interconnection to meet the needs of individual homeowners or other utilities experiencing contamination. Furthermore, an understanding of existing contaminated groundwater sources or areas containing probable contamination sources will become increasingly important in siting new wells, as will the need for comprehensive groundwater protection policies for the area's critical aquifiers (see also Section 1.7.8).

### 1.7.5 Barriers to the Use of Some Supplies

The development of any surface water supply commonly carries with it a degree of controversy whether it entails diverting water from an existing source or creating a new reservoir. Although the state's diversion permit process is designed to address the issue of competing use, individuals or groups can generate unique sources of opposition and elevate the level of controversy. Consequently, uncertainty exists as to whether some of the potential surface water resources of the Upper Connecticut River Management Area can be developed and, if they can, what degree of utilization will be

storing up to 16 billion gallons of drinking water, but their diversion has not been authorized. A supply of this magnitude has great significance in planning for the entire Upper Connecticut River Management Area, not just the projected needs of MDC.

Water utilities desire a degree of balance between the need to provide their customers with a sufficient water supply and alternative riverine uses. The diversion permit process was designed as a mechanism to allocate water use and assess the balance between competing uses. However, from the utilities' perspective, this process has not satisfactorily evaluated legitimate water supply needs and the allocation of river flows for competing uses.

Groundwater supply sources also fall under the diversion permit process, and have most recently been an object of public concern due to competing uses. A good example is a proposed groundwater diversion permit by the Southington Water Company which has been preliminarily judged by the DEP to adversely impact the Quinnipiac River. Using water balance/water quality modeling techniques ("Stream 7B Water Quality Analysis" computer model) the DEP has determined that the diversion, located in the area of the Quinnipiac River, will result in inadequate flow to the river for waste assimilation during drought conditions. DEP has requested that the utility perform a groundwater basin study to assess all environmental factors concerned, including competing uses. It should be noted that two other utilities have indicated a need for a groundwater diversion permit near the Quinnipiac River, further downstream, but quite similar to the Southington Water Co. planned diversion.

In Connecticut, another situation often arises when certain surface water sources are considered for water supply purposes. This revolves around the issue that if the quality of a water body meets federal criteria for a drinking water source and can be appropriately treated then it should not be excluded from use for water supply purposes due to its State Water Quality Classification. This apparent conflict between federal and state criteria revolves around Section 22a - 417 of the General Statutes which prohibits the discharge of wastewater/sewage into waters used for public water supply. State regulators have generally interpreted this law conversely to mean that

waste receiving waters are forbidden for use as public water supplies. State policy for the use of water resources is embodied in the State's Water Quality Classifications for both ground and surface waters which allocate these resources for specific uses. In the case of surface waters, those which presently serve as water supplies or have been proposed for water supply purposes either are classified as AA or have a goal of AA. Additionally, sources which may be suitable for existing or future water supply purposes are classified as A or have a goal of A. All other surface waters are designated as waste receiving streams with classifications of B, C or D but all with a goal of at least B and thus all have been generically referred to as "Class B waters."

The issue of the use of Class B waters for water supply purposes is not a new one. Due to the past controversy, the 1984 Water Resources Task Force and the 1985 Class B Task Force addressed this issue. These task forces found that there was no immediate need for the use of Class B sources and recommended that the existing state policy of prohibiting the use of Class B waters for water supply be continued. The Water Resources Task Force did, however, recommend, and the legislature adopted into law, the provision that utilities be allowed to consider sources which receive wastes in their assessment of water supply alternatives for future needs when developing water supply plans under Section 25-32d of the General Statutes. Based on preliminary information contained in at least one individual plan, it appears that the Connecticut River has been cited as a possible future supply service. Although utilities can consider Class B sources, there is presently no mechanism in place to implement the use of such sources, although DEP's Water Compliance Unit can prohibit the release of additional wastewater discharges to these sources. Furthermore, there is no differentiation made in terms of any types of wastewater allocation between a Class B stream or water body which has not been identified as a future water supply source and a Class B stream or water body which has been identified as a potential future water supply. The absence of mechanisms to identify and protect these streams or water bodies creates the potential for future water supply problems.

Ultimately the resolution of the question "Why not allow the use of Class B waters if they meet federal quality criteria?" will have ramifications beyond the withdrawal of supply at a particular point within a water body. This would impact the foundation on which the State's Water Quality Classification system and water allocation programs are based, and thus would require sufficient justification to merit change. Consequently, if the need for use of Class B waters is perceived at some point, the documentation to support this need and the mechanism by which such use would be allowed should be established well in advance of the actual need, since the process for change promises to be a time-consuming one. So long as permission to use Class B waters is in doubt, the WUCC believes it would be imprudent to place any planning reliance on these waters as potential sources of supply.

Additional questions can be raised in the Class B diversion issue. The Connecticut River has been potentially viewed as a water supply source by entities outside the state boundaries. If utility members of the WUCC decide not to use the Connecticut River in planning because of the Class B designation, would utilities in New Hampshire, Vermont and Massachusetts have priority usage due to a prior designation in planning?

Concern has also been expressed by some communities that a potential water supply within their borders may be lost forever because a significant portion of the community's landmass falls within the bounds of a watershed area of a utility not serving their residents. These communities believe that some provisions need to be established whereby these communities can reserve a portion of the water resources within their border for their future use.

### 1.7.6 Aging and/or Substandard Infrastructure

This is really a two-fold problem. With older utilities, water supply equipment and/or distribution piping may have reached or exceeded its useful life. Thus, its continued use represents a liability to reliable water supply for the utility's customers. Eventually such equipment or infrastructure must be replaced at increased cost to the system users.

The issue of substandard facilities partially stems from the fact that older facilities (e.g., piping) which may have been appropriate at the time of installation are no longer adequate due to new system demands. Other situations may be a result of changes in design standards or changes in use (e.g, conversion from seasonal to year-round use). In a few cases, the substandard infrastructure may be a result of the desire to cut corners (save capital costs), since no minimum design standards were in place at the time of installation.

### 1.7.7 Financing

The financing issue is multifaceted, covering issues such as rate structures for customers, capitalization of improvements and bonding issues. In the Upper Connecticut River Public Water Supply Management Area there is a broad cross-section of the type of utility structure. These include utilities which are essentially an adjunct of a residential or multi-family housing complex, privately or investor-owned companies, and municipal utilities. This difference in structure will impact the rate structures of these utilities. For example, a utility may charge a nominal fee for water service to cover miscellaneous service, but with no long-term view towards replacement of worn-out equipment. An investor-owned company obviously must have a rate structure which provides a return on investment, as well as a plan for the capitalization of future needs or improvements. A municipal utility typically covers operating and debt service with its rate structure, while improvements are normally financed through bond sales. Since a municipality provides a number of different services requiring bond monies to its residents, there is a potential for conflict as to how bond money should be used, especially if the limits of a community's bonding capacity are stretched.

Regardless of the methodology used to obtain financing, the inability to secure adequate monies can impact utilities in a variety of ways. These include the inability to make needed system improvements for replacement of aged facilities (maintenance), and improvements for system expansion or increased reliability (an interconnection or new supply source). Coupled with this will be the increased cost to system users, who may be reluctant to pay for improvements which they may perceive as not critical.

### 1.7.8 Lack of Local Ordinances for Water Supply Protection

Development pressures have typically outpaced most communities' ability to deal with the lesser understood process of identifying and protecting water supply sources. Oft times those charged with approving building permits or zoning changes are not familiar with the relatively complex inter-relationship between water supply and the recharge of groundwater resources. Many towns lack the resources to identify water supply sources, which in turn hinders their ability to protect supply sources through various mechanisms such as zoning regulations or land aquisition. Thus, conflicts of land use and water supply have occurred and have led to a situation (see Table 1.5) where potential contamination sources have been located within aquifer recharge areas. Communities are now playing catch-up with the groundwater contamination issue and the protection of the community's existing and potential ground and surface water resources.

The development of aquifer protection strategies will be stimulated by the recent (1985) passage of Public Act 85-279 entitled "An Act Concerning the Protection of Public Water Supplies." This act requires municipal planning and zoning commissions to include consideration of surface and groundwater supply protection (for both existing and potential water sources) in their community plans and regulations. The lack of protection for future water sources hinders the planning process, making it unknown whether future sources will be viable when needed. DEP has prepared a handbook on groundwater protection which can aid communities in developing their plans. In addition, OPM, DOHS, DPUC and DEP are preparing a handbook with examples of how surface water supply protection can be accomplished.

Presently, there are no state regulations concerning the protection or testing of private wells. Additionally, although the State Building Code calls for the connection to public water service when such service is available, the definition of availability is left open to local interpretation. Thus, local requirements regarding the connection of individual homes to public water supply when such is available adjacent to an area's property (e.g. water main in street) are quite variable.

### 1.7.9 System and Source Reliability

A number of utilities have single source supplies or wells that draw from similar depths, while others do not have sufficient storage and/or pumping capacity to meet peak demands or have system constrictions which impact their ability to deliver sufficient fire flows. Various utilities were required to institute water restrictions due to the unusually high demands that occurred during the recent heat wave this summer. All systems require preventative maintenance and replacement schedules so that system reliability can be maximized and the reaction to crisis syndrome can be avoided. Table 1.4 also clearly indicates that a number of utilities do not have standby power which will enable them to operate adequately during power loss.

### 1.7.10 Lack of Coordination Between Utilities and Communities

In many ways the lack of coordination between utilities and communities centers around land use and water supply protection. This problem appears to revolve around either the general lack of communication or lack of defined mechanisms or procedures for communicating information. To bridge the communication gap a commitment of time and people will be required. For example, the regular participation of utility representatives in community task forces or planning board meetings dealing with water supply issues would represent the type of commitment needed to facilitate communication.

### 1.7.11 Lack of Adequate Incentive to be a Satellite Manager

For some utilities, this issue revolves around the basic premise that "it's more trouble (too much expense) than it's worth (too little return)." An investor-owned company is obviously not anxious to take on a financially troubled utility if there is no reasonable way to recoup their potential investment. Also, there is a recognition that the new tax laws may make it even less attractive than previously to invest in other utilities. Until this issue is more fully understood by the privately owned utilities there will be a reluctance to jump in too quickly.

From another perspective, many utilities may not understand just what satellite management entails, or how a utility could benefit from it, or how such services can be obtained. Others may be concerned that satellite management is merely a mechanism for taking over utilities, instead of a means for obtaining services or assistance (for a fee) from someone who can provide such assistance. This issue will be addressed in more detail in the Integrated Report, wherein the various possibilities for, and the potential benefits of, satellite management will be delineated. One such apparent positive incentive is embodied in Public Act 85-259, An Act Concerning Satellite Management of Water Companies and Expedite Rate Proceedings on a Limited Basis, which can provide for expedited and/or premium rate increases. Despite this act, some of the area's utilities have indicated that the takeover of any utility generally proves to be a difficult and financially burdening experience.

### 1.7.12 Need For Technical and/or Managerial Support/Information

It is apparent that there are many utilities in the Upper Connecticut River Public Water Supply Management Area which were not created strictly for the purpose of water supply. Typically, these utilities evolved from a need to supply water to a residential development or multi-family housing complex which, by definition, are water supply utilities. As a result, organizations such as these function with a minimum of staff, typically with no full-time commitment. Therefore, there is a significant need within those organizations who have the desire to respond to the requirements placed before them, but do not have sufficient managerial or informational resources to draw from. Thus, a resource pool of managerial and/or technical support/information is needed.

### 1.7.13 Population Projections

Much concern has been expressed in WUCC meetings and from public comment that the OPM population projections mandated for use by the legislature are not sensitive to recent changes in the population of some communities and, thus, may not properly reflect future growth from a water supply perspective. Additionally, internal population estimates are used by DOHS for planning purposes that do not appear consistent with the OPM projections. Unfortunate-

ly, updated population estimates from either DOHS or OPM will not be available until early 1988. Consequently, it was necessary to use the legislatively mandated OPM population estimates in the Water Supply Assessment. The obvious impact of using these estimates is that the projected future water needs contained in Table 1.6 may be low. Although there are potential problems associated with any population estimate used, the OPM numbers do provide a consistent basis for all of the Water Supply Management Areas in the State until better values are made available. Utilities have the opportunity to address this issue in their Individual Plans and, based on the widespread concern, the WUCC will certainly examine this issue more fully as part of the Integrated Report. Therein more up-to-date estimates may be used to project future water needs.

### 1.7.14 Water Sources on Public Property

Presently no legislation exists which directly addresses the issue of utilizing ground or surface water sources which are located on public lands. Consequently, utilities desiring to develop such potential sources have no defined mechanism for attempting to enter into agreements with public bodies to use these sources of supply. There is some precedent for this type of legislation, since the State appears to be moving to acquire sensitive areas which contain underlying high yielding aquifers in order to protect these sources for future use.

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# FINAL
# WATER SUPPLY ASSESSMENT
# UPPER CONNECTICUT RIVER
# WATER SUPPLY
# MANAGEMENT AREA

# APPENDIX A

**DECEMBER, 1987**

TABLE A.1

UTILITY PROFILES

| QUEST. RE'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | Avery Heights Water Assoc. | South Windsor | 216 single-family homes | [redacted] | [redacted] |
| | Avon Old Farms School | Avon | boys' private boarding school; total est. pop. served = 500; 300 boarding students & 70 day students; faculty residences = 7 houses + 31 apts. | | [redacted] |
| x | Avon Water Company | Avon<br>Simsbury | West Avon System (higher) and Avon Center system (lower) with 2065 customers in Avon, 161 customers in Simsbury | | [redacted] |
| x | Berlin Water Control Commission | Berlin | serves east part of town; 90% single-family residential units, 5% multi-family dwellings, 5% commercial/industrial; 1063 retail customers & 2 wholesale (Worthington F.D. and Cromwell F.D.) | | [redacted] |
| | Briarwood College | Southington | ? students, ~ 60 full-time employees; ~450 people served total | | [redacted] |
| x | Bristol Water Dept. | Bristol<br>Burlington<br>Plainville | 16,000+ customers in Bristol-residential, commercial & industrial; 16 homes Campgrounds school | | [redacted] |
| x | Burnham Acres Water Assoc. | South Windsor | 40 pre-1960 Cape and ranch-style houses | | [redacted] |
| | Chelsea Common Assoc., Inc. | East Granby | condominiums | | [redacted] |
| x | Chestnut Hill Heights Water Assoc. | Glastonbury | 7 single-family homes - 2 homes on Marilyn Drive, 5 homes on Sunset Drive | | [redacted] |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. I.D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| | Chippanydale Assoc. | Bristol | 13 houses on Everett Street | [redacted] | [redacted] |
| | Ciccio Court | Plainville | 21 homes on Ciccio Ct | | [redacted] |
| x | Connecticut Correctional Institute for Men | Somers | prison inmates & staff | | [redacted] |
| x | Connecticut Water Company Collinsville Division | Avon<br>Burlington<br>Canton | serves to 480 people in Avon, 154 people in Burlington, & 2832 people in the Collinsville section of Canton; 1007 total cust. | | |
| x | Connecticut Water Company Northern Division Somers System | Somers | serves 370 customers, 1295 people | | |
| x | Connecticut Water Company Northern Division Western System | East Granby<br>East Windsor<br>Enfield<br>South Windsor<br>Suffield<br>Vernon<br>Windsor Locks | serves 17,073 customers, 58,889 people; includes Bradley Int'l Airport | | |
| x | Connecticut Water Company Rockville Division | Ellington<br>Vernon<br>Tolland<br>Coventry | serves 5711 customers total - 5347 in study area: 4738 in Vernon (including wholesale to Town of Vernon) & 609 in Ellington | | |
| | Cope Manor | Plainville | One bldg. with 8 rental units; 2 bldgs., each with 4 rental units (2-bdrm) and 7 single-family homes | | [redacted] |
| | Country Gardens Apts. | Somers | 3 8-unit bldgs; 3 independent systems | | |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. C'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | Cromwell Fire District Water Dept. | Cromwell | 14,000 people served in Cromwell - does not serve to any customers in study area | [redacted] | [redacted] |
| | East Granby Village Condos, Inc. | East Granby | serves East Granby Village | | |
| | East Windsor Housing Authority | East Windsor | #1 System serves 30 apts: 10 doubles, 20 singles. #2 System serves 24 apts: 8 doubles, 16 singles. 54 connections total | | |
| x | Ellington Acres Co. | Ellington | 560 connections, serves 18 unit apt complex, 2-customer office complex, 6 businesses, 1 baseball field, and 533 2-bdrm houses | | |
| x | Ellsworth Estates | East Windsor | 82 homes on Rye STreet in East Windsor, 2 miles south of Broad Brook | | |
| x | Ethel Walker School | Simsbury | Campus area buildings & houses | | |
| | Farmington Line West Condos. Assoc. | Burlington | 17 2-bdrm units | | |
| x | Farmington Woods Water Co., Inc. | Farmington Avon | 868-unit condo complex | | |
| x | Grant Hill Associates, Inc. | Bloomfield | 40 single-family homes | | |
| x | Hazardville Water Co. | Enfield | 5846 customers, 97% residential, 2% commercial, less than 1% public authorities, & 0.2% industrial in the south-eastern portion of town | | |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. C'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | High Manor Mobile Home Park | Vernon | an adult mfg. mobile home park with 115 mobile homes | [redacted] | [redacted] |
| x | Higley Village | East Granby | Elderly housing: 11 2-bdrm units and 33 1-bdrm units | | [redacted] |
| x | Hillsdale Water Co-op | South Windsor | 11 individual homes in area of Sullivan Ave & Hillsdale Rd | | [redacted] |
| | Hilltop, Inc. | Farmington | 34 connections | | [redacted] |
| | Jensens, Forest Hills Mobile Home Park | Southington | 188 connections | | [redacted] |
| | Juniper Club, Inc. | Bloomfield | 25 residential homes | | [redacted] |
| | Kenmore Road Assoc. | Bloomfield | 40 connections | | [redacted] |
| | Kensington Fire District | Berlin | 2466 residential connections<br>18 industrial conn.<br>174 commercial conn. | | [redacted] |
| | Kimberly Lane Water Assoc. | Glastonbury | 9 connections | | [redacted] |
| x | Lakeview of Farmington | Farmington | 214 1 & 2-bdrm townhouses | | [redacted] |
| x | Latimer Farms Water Assoc. | Simsbury | 7 homes on Hamilton Lane; families jointly own -- non-profit | | [redacted] |
| | Liebman Apartments | Ellington | 16 apartments in 1 bldg. | | [redacted] |
| x | Little Brook Road Supply | New Hartford | 16 single-family dwellings consisting of 10 2-bdrm and 6 3-bdrm | | [redacted] |
| | Llynwood, Inc. | Bolton<br>Vernon | 70 connections; Bolton customers not included in study area | | [redacted] |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. ID. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | Manchester Water Dept. | Manchester<br>Glastonbury<br>South Windsor<br>Vernon | serves ~95% of town of Manchester or 12,966 customers; 290 customers in Glastonbury, 18 customers in South Windsor, 24 customers in Vernon. Serves to industry, commercial establishments, multi- & single-family dwellings; number of customers = 13,298 plus 1 wholesale; approx. 48,000 people served. | [redacted] | [redacted] |
| | Maple Ridge Farms Water Assoc. | Farmington | 36 connections | | [redacted] |
| x | Meadowbrook Apartments | Ellington | 20 apartments | | [redacted] |
| x | Meriden Water Dept. | Meriden<br>Cheshire<br>Southington<br>Berlin | Primarily serves to City of Meriden; only Southington (37 customers) & Berlin (1 customer) within study area | | [redacted] |
| x | Metacomet Village | East Granby | Senior citizen village with 21 1-bdrm units and 7 2-bdrm units | | |
| x | Metropolitan District Commission (MDC) | Hartford<br>East Hartford<br>West Hartford<br>Wethersfield<br>Windsor<br>Rocky Hill<br>Bloomfield<br>Newington<br>Glastonbury<br>South Windsor<br>Windsor Locks<br>East Granby<br>Farmington<br>Cromwell<br>Manchester | Regional public authority -- first 8 towns listed are member towns; number of customers = 86,726; may serve to any town with any part within 20 miles of the State Capitol in Hartford | | [redacted] |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. 'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| | Redwood Farms L&M Water Co. | Manchester | 101 connections | [redacted] | [redacted] |
| | Reid Treatment Center | Avon | 2 buildings on site, 1 bldg. serves 20 people max.; other bldg. serves 10 people max; also, 7 employees | | [redacted] |
| | Rock Tree Apartments | Barkhamsted | 3 buildings with a total of 22 units: 16 2-bdrm units and 6 1-bdrm units | | [redacted] |
| | Rolling Hills Water Assoc., Inc. | Glastonbury | 40 connections | | [redacted] |
| x | Salmon Brook District Water Dept. | Granby | 130 individual homes, 71 apartments (~75% are 2-bdrm and ~ 25% are 1-bdrm), 58 condos. (all 2-bdrm or more), and 42 commercial customers. No industrial customers. 259 residential customers total. | | [redacted] |
| | School Hill Assoc., Inc. | East Windsor | 30 single-family homes, 1 two-family home. | | [redacted] |
| x | Shaker Heights, Inc. | Enfield | 45 2-bdrm single-family homes on Westview Dr, Pine Hill Rd, & Lake Rd | | [redacted] |
| x | Sharon Heights Water Assoc. | Bloomfield | 29 homes with 2-4 bdrms each | | [redacted] |
| | Snipsic Village Housing Authority | Ellington | 28 singles, 14 doubles | | [redacted] |
| x | Somers Elderly Housing Authority | Somers | 2 systems, 54 units total; #1 serves 7 2-bdrm units, 17 1-bdrm units and maintenance building with laundry room and admin. office; #2 serves 8 2-bdrm units and 22 1-bdrm units. Two systems are connected. | | [redacted] |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. RESP'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | Somersmill Water Assoc. | Somers | 32 residential structures and 1 commercial structure with 8 shops; 95 retail connections & 34 wholesale to landlords. | [redacted] | [redacted] |
| x | Southington Water Co. | Southington<br>Cheshire | Town of Southington:<br>69.4% residential,<br>14.7% commercial,<br>14.7% industrial,<br>Z1.2% public authorities;<br>8939 total connections.<br>200 people served in Cheshire near town line (these customers not in Study Area). | [redacted] | [redacted] |
| x | Tariffville Fire District Water Dept. | Simsbury | 455 connections: 67% single family dwellings, 33% multipl dwelling units, small number commercial, virtually no industrial | [redacted] | [redacted] |
| | Taylor Trailer Park | Southington | 40 trailers & 1 house | [redacted] | [redacted] |
| x | Torrington Water Co. | Torrington<br>Harwinton | built-up area of Torrington and part of Harwinton; only Harwinton customers in Study Area. Within their franchise area in Harwinton, serves to 1 industrial customer, 1 public authority and 1-2 houses; outside of their franchise area, serves to 20 living units on a satellite basis.<br>24 connections total. | [redacted] | [redacted] |
| x | Towpath Condominiums | Avon | 57 unit condo complex:<br>20 1-bdrm units and<br>37 2-bdrm units | [redacted] | [redacted] |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. REQ'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | Trailsend Company | Canton | 9 single-family homes & 1 3-family house & 2 stores = 12 customers | [redacted] | [redacted] |
| x | Turkey Hill Apartments | East Granby | 120-unit rental complex | | [redacted] |
| x | Unionville Water Co. | Farmington<br>Avon | 3138 residential customers<br>305 commercial customers<br>22 industrial customers<br>22 public authorities;<br>of residential customers,<br>62% are single-family houses,<br>18% are condos., 10%<br>are multi-family houses;<br>3169 customers in<br>Farmington; 335 in Avon;<br>2 divisions: Farmington Sys.<br>and Main System | | [redacted] |
| | Vernon Village, Inc. | Vernon | mobile home park with<br>160 connections | | [redacted] |
| | Vernon Water Dept. | Vernon | 916 connections | [redacted] | [redacted] |
| x | Village Water Co. of Simsbury | Simsbury<br>Granby<br>East Granby | 14,549 people served;<br>13,832 in Simsbury,<br>647 in Granby,<br>70 in East Granby | [redacted] | [redacted] |
| | Wallens Hill Apartments | Barkhamsted | 2 bldgs., each has 10<br>apts.; 10 1-bdrm apts.,<br>10 2-bdrm apts. | [redacted] | [redacted] |

TABLE A.1
(continued)
UTILITY PROFILES

| QUEST. C'D. | NAME | TOWNS SERVED | SERVICE AREA DESCRIPTION | WATER SUPPLY DESCRIPTION | WATER SUPPLY TREATMENT |
|---|---|---|---|---|---|
| x | West Hill Lake Water Assoc. | New Hartford | 87 summer cottages used 5 1/2 months per year, located at West Hill Pond in New Hartford and Barkhamsted | [redacted] | [redacted] |
| x | West Service Corp. | Suffield | 155 single-family homes, 1 town fire station -- a satellite system. | [redacted] | [redacted] |
| x | Windsorville Water Assoc. | East Windsor | 13 one-family, 4 & 5 room dwellings | [redacted] | [redacted] |
| x | Winsted Water Works Dept. | Winchester | City of Winsted plus extensions along Route 8 North of the City in the Town of Winchester; no customers in Study Area, but MDC watershed extends into town. | [redacted] | [redacted] |
| | Wintergreen | Harwinton | Senior citizen housing (rentals); 20 1-bdrm apts. | [redacted] | [redacted] |
| | Woodcrest Assoc., Inc. | Burlington | 20 2-bdrm units | [redacted] | [redacted] |
| x | Worthington Fire District | Berlin | 1.4 square miles<br>1100 customers<br>95% residential<br>5% commercial | [redacted] | [redacted] |

TABLE A.2

CONSUMPTION AND SOURCE YIELD DATA

| NAME | RESIDENTIAL POPULATION SERVED (1) | AVERAGE DAILY USAGE | | COMMENTS |
|---|---|---|---|---|
| | | PER CAPITA (GPCD) (2) | TOTAL (1000 GPD) (3) | |
| Avery Heights Water Assoc. | 800 | 87.5 | 70.0 | |
| Avon Old Farms School | 500 | 75 | 37.5 | |
| Avon Water Company | 9240 | 93.2 | 861.0 | |
| Berlin Water Control Commission | 2445 | 201 | 999.9 | |
| Briarwood College | 450 | 75 | 33.8 | |
| Bristol Water Dept. | 53200 | 100 | 6613 | |
| Burnham Acres Water Assoc. | 124 | 75 | 9.3 | |
| Chelsea Common Assoc., Inc. | 132 | 75 | 9.9 | |
| Chestnut Hill Heights Water Assoc. | 21 | 198 | 4.2 | |
| Chippanydale Assoc. | 35 | 75 | 2.6 | |
| Ciccio Court | 56 | 75 | 4.2 | |
| Connecticut Correctional Institute for Men | 4800 | 80.3 | 385.2 | |
| Connecticut Water Company Collinsville Division | 3466 | 93 | 324.0 | |
| Connecticut Water Company Northern Division Somers System | 1295 | 69.5 | 90.0 | |
| Connecticut Water Company Northern Division Western System | 58889 | 93.5 | 5506.0 | |
| Connecticut Water Company Rockville Division | 19402 | 149 | 2893.0 | |

TABLE A.2
(continued)
CONSUMPTION AND SOURCE YIELD DATA

| NAME | RESIDENTIAL POPULATION SERVED (1) | AVERAGE DAILY USAGE: PER CAPITA (GPCD) (2) | AVERAGE DAILY USAGE: TOTAL (1000 GPD) (3) | ESTIMATED SOURCE YIELD (MGD): DOHS CALC. | ESTIMATED SOURCE YIELD (MGD): UTILITY SUPPLIED | COMMENTS |
|---|---|---|---|---|---|---|
| Cope Manor | 61 | 75 | 4.6 | | | |
| Country Gardens Apts. | 74 | 75 | 5.6 | | | |
| Cromwell Fire District Water Dept. | --- | --- | --- | | | |
| East Granby Village Condos, Inc. | 301 | 75 | 22.6 | | | |
| East Windsor Housing Authority | 72 | 75 | 5.4 | | | |
| Ellington Acres Co. | 1680 | 109 | 183.3 | | | |
| Ellsworth Estates | 300 | 46.6 | 14.0 | | | |
| Ethel Walker School | 266 | 75.2 | 20.0 | | | |
| Farmington Line West Condos. Assoc. | 53 | 75 | 4.0 | | | |
| Farmington Woods Water Co., Inc. | 1700 | 125 | 213.3 | | | |
| Grant Hill Associates, Inc. | 92 | 75 | 6.9 | | | |
| Hazardville Water Co. | 19000 | 85 | 1620.0 | | | |
| High Manor Mobile Home Park | 235 | 64 | 15.0 | | | |
| Higley Village | 98 | 75 | 7.4 | | | |
| Hillsdale Water Co-op | 23 | 75 | 1.7 | | | |
| Hilltop, Inc. | 88 | 75 | 6.6 | | | |
| Jensens, Forest Hills Mobile Home Park | 376 | 75 | 28.2 | | | |
| Juniper Club, Inc. | 69 | 75 | 5.2 | | | |
| Kenmore Road Assoc. | 110 | 75 | 8.3 | | | |

TABLE A.2
(continued)
CONSUMPTION AND SOURCE YIELD DATA

| NAME | RESIDENTIAL POPULATION SERVED (1) | AVERAGE DAILY USAGE | | ESTIMATED SOURCE YIELD (MGD) | COMMENTS |
|---|---|---|---|---|---|
| | | PER CAPITA (GPCD) (2) | TOTAL (1000 GPD) (3) | | |
| Kensington Fire District | 7469 | 75 | 560.2 | [redacted] | [redacted] |
| Kimberly Lane Water Assoc. | 25 | 75 | 1.9 | | |
| Lakeview of Farmington | 500 | 60.0 | 30.0 | | |
| Latimer Farms Water Assoc. | 28 | 75 | 2.1 | | |
| Liebman Apartments | 46 | 75 | 3.5 | | |
| Little Brook Road Supply | 50 | 75 | 3.8 | | |
| Llynwood, Inc. | 32 | 75 | 2.4 | | |
| Manchester Water Dept. | 48000 | 98 | 4699.3 | | |
| Maple Ridge Farms Water Assoc. | 93 | 75 | 7.0 | | |
| Metropolitan District Commission (MDC) | 391230 | 154 | 60,164.0 | | |
| Meadowbrook Apartments | 58 | 75 | 4.4 | | |
| Meriden Water Dept. | 134 | 75 | 10.05 | | |
| Metacomet Village | 62 | 75 | 4.7 | | |
| Neipsic Woods Section 3 | 28 | 75 | 2.1 | | |
| Neipsic Woods Water Assoc. | 65 | 75 | 4.9 | | |
| New Britain Water Dept. | 90677 | 121 | 11,000 | | |
| New Hartford Water Dept. | 950 | 123 | 117.0 | | |
| Oakwood, Inc. | 135 | 75 | 10.1 | | |
| Old Newgate Ridge Water Co. | 121 | 75 | 9.08 | | |
| Orchard Hill Assoc. | 25 | 75 | 1.875 | | |

TABLE A.2
(continued)
CONSUMPTION AND SOURCE YIELD DATA

| NAME | RESIDENTIAL POPULATION SERVED (1) | AVERAGE DAILY USAGE | | COMMENTS |
|---|---|---|---|---|
| | | PER CAPITA (GPCD) (2) | TOTAL (1000 GPD) (3) | |
| Penwood Assoc., Inc. | 55 | 75 | 4.125 | |
| Pine Hill, Inc. | 18 | 75 | 1.35 | |
| Plainville Water Co. | 18500 | 166 | 3074 | |
| Portland Water Dept. | --- | --- | --- | |
| Redwood Farms L&M Water Co. | 260 | 75 | 19.5 | |
| Reid Treatment Center | 30 | 75 | 2.25 | |
| Rock Tree Apartments | 58 | 75 | 4.35 | |
| Rolling Hills Water Assoc., Inc. | 112 | 75 | 8.40 | |
| Salmon Brook District Water Dept. | 1000 | 47.4 | 47.7 | |
| School Hill Assoc., Inc. | 86 | 75 | 6.45 | |
| Shaker Heights, Inc. | 135 | 81.5 | 11.0 | |
| Sharon Heights Water Assoc. | 75 | 68.3 | 5.123 | |
| Snipsic Village Housing Authority | 97 | 75 | 7.275 | |
| Somers Elderly Housing Authority | 69 | 75 | 5.175 | |
| Somersmill Water Assoc. | 250 | 85.5 | 21.38 | |
| Southington Water Co. | 33475 | 115.9 | 3881.0 | |
| Tariffville Fire District Water Dept. | 1980 | 83.3 | 165.0 | |
| Taylor Trailer Park | 83 | 75 | 6.225 | |

TABLE A.2
(continued)
CONSUMPTION AND SOURCE YIELD DATA

| NAME | RESIDENTIAL POPULATION SERVED (1) | AVERAGE DAILY USAGE PER CAPITA (GPCD) (2) | AVERAGE DAILY USAGE TOTAL (1000 GPD) (3) | COMMENTS |
|---|---|---|---|---|
| Torrington Water Co. | 74 | 75 | 5.550 | [redacted] |
| Towpath Condominiums | 120 | 75 | 9.0 | |
| Trailsend Company | 48 | 75 | 3.6 | |
| Turkey Hill Apartments | 250 | 6? | 1.5? | |
| Unionville Water Co. | 13500 | 99.8 | 1347 | |
| Vernon Village, Inc. | 320 | 75 | 24.0 | |
| Vernon Water Dept. | 2409 | 75 | 180.7 | |
| Village Water Co. of Simsbury | 14459 | 117 | 1698 | |
| Wallens Hill Apartments | 49 | 75 | 3.68 | |
| West Hill Lake Water Assoc. | 200 | 75 | 15.0 | |
| West Service Corp. | 400 | 90.0 | 36.0 | |
| Windsorville Water Assoc. | 30 | 75 | 2.25 | |
| Winsted Water Works Dept. | --- | --- | --- | serves on[redacted] on the [redacted] |
| Wintergreen | 40 | 75 | 3.0 | |
| Woodcrest Assoc., Inc. | 63 | 75 | 4.73 | |
| Worthington Fire District | 2530 | 75 | 189.8 | 100% purchased water from Berlin WCC, New Britain, & MDC |
| TOTALS | 809956 | | | |

TABLE A.2
(continued)
CONSUMPTION AND SOURCE YIELD DATA

NOTES:

(1) Where utility values were available, the utility supplied value was assumed. Where questionnaire data was not available, population was estimated based on 1986 average household size estimates (adjusted from U.S. census data by DOHS) multiplied by number of service connections.

(2) Where usage or production information was available from the utilities, the per capita consumption value was calculated based upon these figures.

(3) Derived by multiplying population served estimate by the per capita usage.

(4) DOHS CALC - Calculated by multiplying well capacity times 18 hours of pumping per day and reported as gallons per day.

UTILITY SUPPLIED - Consists of statistically derived safe yield calculations, well yield tests conducted during well installation, or well pump capacities.

DNA = Does not apply

NA = Information not available

TABLE A.3
SYSTEM STORAGE AND PEAK DEMAND ASSESSMENT (1)

| NAME | [redacted] | PROBLEM |
|---|---|---|
| Avery Heights Water Assoc. | | [redacted] |
| Avon Old Farms School | | |
| Avon Water Company | | |
| Berlin Water Control Commission | | |
| Briarwood College | | |
| Bristol Water Dept. | | [redacted] |
| Burnham Acres Water Assoc. | | |
| Chelsea Common Assoc., Inc. | | |
| Chestnut Hill Heights Water Assoc. | | [redacted] |
| Chippanydale Assoc. | | |
| Ciccio Court | | [redacted] |
| Connecticut Correctional Institute for Men | | |
| Connecticut Water Company Collinsville Division | | |
| Connecticut Water Company Northern Division Somers System | | |
| Connecticut Water Company Northern Division Western System | | |

TABLE A.3
SYSTEM STORAGE AND PEAK DEMAND ASSESSMENT (1)

| NAME | PROBLEM |
|---|---|
| Connecticut Water Company Rockville Division | |
| Cope Manor | |
| Country Gardens Apts. | |
| Cromwell Fire District Water Dept. | |
| East Granby Village Condos, Inc. | |
| East Windsor Housing Authority | |
| Ellington Acres Co. | |
| Ellsworth Estates | |
| Ethel Walker School | |
| Farmington Line West Condos. Assoc. | |
| Farmington Woods Water Co., Inc. | |
| Grant Hill Associates, Inc. | |
| Hazardville Water Co. | |
| High Manor Mobile Home Park | 4 out of 7 wells in use<br>not known if this affects adequacy of supply |
| Higley Village | |
| Hillsdale Water Co-op | |
| Hilltop, Inc. | occasional conservation restrictions during maximum demand periods<br>lack of storage capacity<br>occasional problems with power outages |

TABLE A.3
SYSTEM STORAGE AND PEAK DEMAND ASSESSMENT (1)

| NAME | [redacted] | PROBLEM |
|---|---|---|
| Jensens, Forest Hills Mobile Home Park | | |
| Juniper Club, Inc. | | |
| Kenmore Road Assoc. | | |
| Kensington Fire District | | |
| Kimberly Lane Water Assoc. | | |
| Lakeview of Farmington | | - [redacted] |
| Latimer Farms Water Assoc. | | |
| Liebman Apartments | | - [redacted] |
| Little Brook Road Supply | | - [redacted] |
| | | - [redacted] |
| Llynwood, Inc. | | - [redacted] |
| Manchester Water Dept. | | - [redacted] |
| Maple Ridge Farms Water Assoc. | | |
| Meadowbrook Apartments | | |
| Meriden Water Dept. | | [redacted] |
| Metacomet Village | | |
| Metropolitan District Commission (MDC) | | |
| Neipsic Woods Section 3 | | |
| Neipsic Woods Water Assoc. | | |
| New Britain Water Dept. | | |
| New Hartford Water Dept. | | |
| Oakwood, Inc. | | |

TABLE A.3
SYSTEM STORAGE AND PEAK DEMAND ASSESSMENT (1)

| NAME | PROBLEM |
|---|---|
| Old Newgate Ridge Water Co. | |
| Orchard Hill Assoc. | |
| Penwood Assoc., Inc. | |
| Pine Hill, Inc. | - insufficient capacity at peak hour |
| Plainville Water Co. | |
| Portland Water Dept. | |
| Redwood Farms L&M Water Co. | |
| Reid Treatment Center | |
| Rock Tree Apartments | |
| Rolling Hills Water Assoc., Inc. | |
| Salmon Brook District Water Dept. | |
| School Hill Assoc., Inc. | |
| Shaker Heights, Inc. | |
| Sharon Heights Water Assoc. | |
| Snipsic Village Housing Authority | |
| Somers Elderly Housing Authority | |
| Somersmill Water Assoc. | |
| Southington Water Co. | |

TABLE A.3
SYSTEM STORAGE AND PEAK DEMAND ASSESSMENT (1)

| NAME | [redacted] | PROBLEM |
|---|---|---|
| Tariffville Fire District Water Dept. | | [redacted] |
| Taylor Trailer Park | | |
| Torrington Water Co. | | |
| Towpath Condominiums | | |
| Trailsend Company | | |
| Turkey Hill Apartments | | |
| Unionville Water Co. | | |
| Vernon Village, Inc. | | [redacted] |
| Vernon Water Dept. | | |
| Village Water Co. of Simsbury | | |
| Wallens Hill Apartments | | |
| West Hill Lake Water Assoc. | | |
| West Service Corp. | | |
| Windsorville Water Assoc. | | |
| Winsted Water Works Dept. | | |
| Wintergreen | | |
| Woodcrest Assoc., Inc. | | |
| Worthington Fire District | | |

TABLE A.3
SYSTEM STORAGE AND PEAK DEMAND ASSESSMENT (1)

NOTES:

(1) Peak demand assessment based on information derived from DOHS files. DOHS volume at maximum hour is an estimated value and does not consider hydraulic limitations of pipes, etc.
(2) Calculated using volume available for maximum day
(3) Per DOHS inspection report
(4) Estimated in DOHS inspection report
(5) Only one (1) storage unit in use, diminished maximum volume available per hour
(6) Not including well #3, per DOHS
(7) Does not include volume for well #2 that is reserved for peak use
(8) The utility has one (1) storage tank, capacity unknown
(9) The utility has two (2) separate facilities, and these figures reflect the division
(10) Estimated peak hour flow MGD, 1984
(11) Well yield is unknown, but described as adequate by DOHS

NA - not available

TABLE A.4

PRELIMINARY PROJECTED WATER SUPPLY NEEDS FOR EACH UTILITY

| NAME | TOWNS SERVED | RES. POPULATION SERVED (1) | % OF TOWN PRESENTLY SERVED(2) | ESTIMATED DOMESTIC PER CAPITA CONSUMPTION (GPCD) (3) | COMM., INDUST., AND NON-REVENUE CONSUMPTION (1000 GPD) (4) | | | | PROJECTED WATER USE FOR EACH UTILITY (1000 GPD) (5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | 1991 | 2000 | 2030 | 1991 | 2000 | 2030 |
| Avery Heights Water Assoc. | South Windsor | 800 | 4.4 | 75 [88] | --- | --- | --- | --- | 64 | 71 | 96 |
| Avon Old Farms School | Avon | 430 | 3.5 | 75 | --- | --- | --- | --- | 35 | 39 | 56 |
| Avon Water Company | Avon | 8570 | 69.1 | 75 [93] | 195 | 232 | 306 | 508 | 933 | 1076 | 1632 |
| | Simsbury | 670 | 3.0 | | 37 | 44 | 58 | 97 | 98 | 120 | 183 |
| Berlin Water Control Commission | Berlin | 2445 | 15.7 | 75 [201] | 308 | 324 | 354 | 477 | 406 | 549 | 709 |
| Briarwood College | Southington | 450 | 1.2 | 75 | --- | --- | --- | --- | 36 | 38 | 50 |
| Bristol Water Dept. | Bristol | 53200 | 90.0 | 75 [124] | --- | 1490 | 1600 | 2340 (7) | 5618 | 5944 | 7590 (8) |
| | Burlington | 50 | 0.8 | | 0 | 0 | 0 | 0 | 4 | 4 | 6 |
| | Plainville | 0 | 0.0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Burnham Acres Water Assoc. | South Windsor | 124 | 0.7 | 75 | --- | --- | --- | --- | 10 | 11 | 15 |
| Chelsea Common Assoc. Inc. | East Granby | 132 | 3.0 | 75 | --- | --- | --- | --- | 11 | 12 | 16 |
| Chestnut Hill Heights Water Assoc. | Glastonbury | 21 | 0.1 | 75 [200] | --- | --- | --- | --- | 2 | 2 | 3 |
| Chippanydale Assoc. | Bristol | 35 | 0.1 | 75 | --- | --- | --- | --- | 3 | 3 | 3 |
| Ciccio Court | Plainville | 56 | 0.3 | 75 | --- | --- | --- | --- | 4 | 5 | 5 |
| Connecticut Correctional Institute for Men | Somers | 3800 | 43.6 | 75 [101] | --- | --- | --- | --- | 297 | 309 | 375 |
| Connecticut Water Company Collinsville Division (9) | Avon | 480 | 3.9 | 75 [94] | 10 | 21 | 34 | 81 | 60 | 77 | 144 |
| | Burlington | 154 | 2.6 | | 3 | 5 | 5 | 6 | 17 | 18 | 23 |
| | Canton | 2832 | 35.2 | | 111 | 151 | 187 | 266 | 376 | 426 | 578 |
| Connecticut Water Company Northern Division Somers System (9) | Somers | 1295 | 14.9 | 75 [70] | 29 | 39 | 50 | 129 | 140 | 155 | 257 |
| Connecticut Water Company Northern Division Western System (9) | East Granby | 77 | 0.9 | 75 [94] | 75 | 133 | 173 | 236 | 136 | 176 | 241 |
| | East Windsor | 4484 | 48.0 | | 239 | 325 | 406 | 554 | 676 | 771 | 1008 |
| | Enfield | 24220 | 53.8 | | 950 | 1190 | 1310 | 1879 | 3113 | 3432 | 4718 |
| | South Windsor | 9541 | 52.2 | | 356 | 411 | 608 | 806 | 1171 | 1451 | 1950 |
| | Suffield | 6850 | 71.4 | | 210 | 269 | 307 | 389 | 801 | 860 | 1053 |
| | Vernon (10) | - | - | | - | - | - | - | - | - | - |
| | Windsor Locks | 13538 | 100.0 | | 928 | 1255 | 1313 | 1714 | 2217 | 2280 | 2815 |

TABLE A.4
(continued)
PRELIMINARY PROJECTED WATER SUPPLY NEEDS FOR EACH UTILITY

| NAME | TOWNS SERVED | RES. POPULATION SERVED (1) | % OF TOWN PRESENTLY SERVED(2) | ESTIMATED DOMESTIC PER CAPITA CONSUMPTION (GPCD) (3) | COMM., INDUST., AND NON-REVENUE CONSUMPTION (1000 GPD) (4) | | | | PROJECTED WATER USE FOR EACH UTILITY (1000 GPD) (5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | 1991 | 2000 | 2030 | 1991 | 2000 | 2030 |
| Connecticut Water Company Rockville Division (9) | Ellington | 2104 | 20.1 | 75 [149] | 69 | 80 | 146 | 307 | 249 | 330 | 564 |
| | Vernon (10) | 16300 | 56.4 | | 795 | 854 | 908 | 1186 | 2150 | 2347 | 3095 |
| Cope Manor | Plainville | 61 | 0.4 | 75 | --- | --- | --- | --- | 5 | 5 | 6 |
| Country Gardens Apts. | Somers | 74 | 0.8 | 75 | --- | --- | --- | --- | 6 | 6 | 7 |
| East Granby Village Condos, Inc. | East Granby | 301 | 6.9 | 75 | --- | --- | --- | --- | 24 | 26 | 36 |
| East Windsor Housing Authority | East Windsor | 72 | 0.8 | 75 | --- | --- | --- | --- | 6 | 6 | 7 |
| Ellington Acres Co. | Ellington | 1680 | 16.0 | 75 [109] | --- | --- | --- | --- | 135 | 147 | 205 |
| Ellsworth Estates | East Windsor | 300 | 3.2 | 75 [47] | --- | --- | --- | --- | 24 | 24 | 30 |
| Ethel Walker School | Simsbury | 266 | 1.2 | 75 [75] | --- | --- | --- | --- | 21 | 24 | 34 |
| Farmington Line West Condos. Assoc. | Burlington | 53 | 0.9 | 75 | --- | --- | --- | --- | 4 | 5 | 6 |
| Farmington Woods Water Co., Inc. | Farmington | 470 | 2.8 | 75 [125] | --- | --- | --- | --- | 36 | 39 | 46 |
| | Avon | 1230 | 9.9 | | --- | --- | --- | --- | 101 | 111 | 161 |
| Grant Hill Associates, Inc. | Bloomfield | 92 | 0.5 | 75 | --- | --- | --- | --- | 7 | 7 | 7 |
| Hazardville Water Co. | Enfield | 19000 | 42.2 | 75 [85] | 190 | 200 | 218 | 294 | 1709 | 1883 | 2521 |
| High Manor Mobile Home Park | Vernon | 235 | 0.8 | 75 [64] | --- | --- | --- | --- | 19 | 21 | 28 |
| Higley Village | East Granby | 98 | 2.3 | 75 | --- | --- | --- | --- | 8 | 9 | 12 |
| Hillsdale Water Co-op | South Windsor | 23 | 0.1 | 75 | --- | --- | --- | --- | 2 | 2 | 3 |
| Hilltop, Inc. | Farmington | 88 | 0.5 | 75 | --- | --- | --- | --- | 7 | 7 | 9 |
| Jensens, Forest Hills Mobile Home Park | Southington | 376 | 1.0 | 75 | --- | --- | --- | --- | 30 | 32 | 41 |

TABLE A.4
(continued)
PRELIMINARY PROJECTED WATER SUPPLY NEEDS FOR EACH UTILITY

| NAME | TOWNS SERVED | RES. POPULATION SERVED (1) | % OF TOWN PRESENTLY SERVED(2) | ESTIMATED DOMESTIC PER CAPITA CONSUMPTION (GPCD) (3) | COMM., INDUST., AND NON-REVENUE CONSUMPTION (1000 GPD) (4) | | | | PROJECTED WATER USE FOR EACH UTILITY (1000 GPD) (5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | 1991 | 2000 | 2030 | 1991 | 2000 | 2030 |
| Juniper Club, Inc. | Bloomfield | 69 | 0.4 | 75 | --- | --- | --- | --- | 5 | 6 | 8 |
| Kenmore Road Assoc. | Bloomfield | 110 | 0.6 | 75 | --- | --- | --- | --- | 9 | 10 | 13 |
| Kensington Fire District | Berlin | 7469 | 47.9 | 75 | --- | --- | --- | --- | 582 | 595 | 708 |
| Kimberly Lane Water Assoc. | Glastonbury | 25 | 0.1 | 75 | --- | --- | --- | --- | 2 | 2 | 3 |
| Lakeview of Farmington | Farmington | 500 | 3.0 | 75 [60] | --- | --- | --- | --- | 39 | 41 | 49 |
| Latimer Farms Water Assoc. | Simsbury | 28 | 0.1 | 75 | --- | --- | --- | --- | 2 | 3 | 4 |
| Liebaan Apartments | Ellington | 46 | 0.4 | 75 | --- | --- | --- | --- | 4 | 4 | 6 |
| Little Brook Road Supply | New Hartford | 50 | 1.0 | 75 | --- | --- | --- | --- | 4 | 4 | 5 |
| Llynwood, Inc. | Vernon | 32 | 0.1 | 75 | --- | --- | --- | --- | 3 | 3 | 4 |
| Manchester Water Dept. (11) | Manchester | 46802 | 92.3 | | 2724 | 2824 | 3024 | 3624 | 6439 | 6847 | 8149 |
| | Glastonbury | 1047 | 3.9 | 75 [98] | 0 | 0 | 0 | 0 | 85 | 98 | 146 (6) |
| | South Windsor | 65 | 0.4 | | 0 | 0 | 0 | 0 | 5 | 6 | 8 (6) |
| | Vernon | 87 | 0.3 | | 0 | 0 | 0 | 0 | 7 | 8 | 10 (6) |
| Maple Ridge Farms Water Assoc. | Farmington | 93 | 0.6 | 75 | --- | --- | --- | --- | 7 | 8 | 9 |
| Metropolitan District Commission-MDC (11) | Hartford | 135080 | 98.7 | | 9113 | 10113 | 12013 | 14113 | 20571 | 23128 | 27183 |
| | East Hartford | 52180 | 96.8 | | 8861 | 9861 | 11661 | 13661 | 13928 | 15997 | 18989 |
| | West Hartford | 61180 | 99.9 | | 2328 | 2528 | 3128 | 4628 | 7192 | 7840 | 9672 |
| | Wethersfield | 27410 | 100.0 | | 812 | 1012 | 1212 | 1812 | 3038 | 3332 | 4263 |
| | Windsor | 27040 | 100.0 | | 2328 | 2528 | 3128 | 4628 | 4643 | 5459 | 7767 |
| | Rocky Hill | 15550 | 91.7 | | 812 | 1012 | 1212 | 1812 | 2331 | 2764 | 4359 |
| | Bloomfield | 20140 | 100.0 | 75 [154] | 1823 | 2023 | 2323 | 3523 | 3584 | 4059 | 5862 |
| | Newington | 29350 | 98.4 | | 1443 | 1643 | 1943 | 2943 | 3956 | 4425 | 6115 |
| | Glastonbury | 16600 | 62.4 | | 532 | 632 | 732 | 1132 | 1986 | 2291 | 3439 |
| | South Windsor | 4500 | 24.6 | | 532 | 632 | 732 | 1132 | 990 | 1129 | 1671 |
| | Windsor Locks | 0 | 0.0 | | --- | --- | --- | --- | 0 | 0 | 0 |
| | East Granby | 0 | 0.0 | | --- | --- | --- | --- | 0 | 0 | 0 |
| | Farmington | 1200 | 7.2 | | 912 | 1012 | 1212 | 1812 | 1105 | 1311 | 1930 |
| | Manchester | 1000 | 2.0 | | --- | --- | --- | --- | 77 | 82 | 97 |
| Meadowbrook Apartments | Ellington | 58 | 0.6 | 75 [76] | --- | --- | --- | --- | 5 | 5 | 7 |
| Meriden Water Dept. | Southington | 130 | 0.3 | 75 | --- | --- | --- | --- | 10 | 11 | 14 |
| | Berlin | 4 | 0.0 | | --- | --- | --- | --- | 0 | 0 | 0 |

TABLE A.4
(continued)
PRELIMINARY PROJECTED WATER SUPPLY NEEDS FOR EACH UTILITY

| NAME | TOWNS SERVED | RES. POPULATION SERVED (1) | % OF TOWN PRESENTLY SERVED(2) | ESTIMATED DOMESTIC PER CAPITA CONSUMPTION (GPCD) (3) | COMM., INDUST., AND NON-REVENUE CONSUMPTION (1000 GPD) (4) | | | | PROJECTED WATER USE FOR EACH UTILITY (1000 GPD) (5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | 1991 | 2000 | 2030 | 1991 | 2000 | 2030 |
| Metacomet Village | East Granby | 62 | 1.4 | 75 | --- | --- | --- | --- | 5 | 5 | 7 |
| Neipsic Woods Section 3 | Glastonbury | 28 | 0.1 | 75 | --- | --- | --- | --- | 2 | 3 | 4 |
| Neipsic Woods Water Assoc. | Glastonbury | 65 | 0.2 | 75 | --- | --- | --- | --- | 5 | 6 | 9 |
| New Britain Water Dept. (11) | New Britain | 73090 | 99.0 | | 5692 | 6186 | 6518 | 7862 | 11709 | 12021 | 13541 |
| | Berlin | 220 | 1.4 | | NA | NA | NA | NA | 17 | 18 | 21 (6) |
| | Newington | 800 | 2.7 | 75 [121] | NA | NA | NA | NA | 63 | 68 | 86 (6) |
| | Plainville | 137 | 0.8 | | NA | NA | NA | NA | 11 | 11 | 13 (6) |
| | Farmington | 520 | 3.1 | | NA | NA | NA | NA | 40 | 43 | 51 (6) |
| New Hartford Water Dept. | New Hartford | 950 | 18.6 | 75 [123] | --- | --- | --- | --- | 75 | 78 | 98 |
| Oakwood, Inc. | Glastonbury | 135 | 0.5 | 75 | --- | --- | --- | --- | 11 | 13 | 19 |
| Old Newgate Ridge Water Co. | East Granby | 121 | 2.8 | 75 | --- | --- | --- | --- | 10 | 11 | 15 |
| Orchard Hill Assoc. | Bloomfield | 25 | 0.1 | 75 | --- | --- | --- | --- | 2 | 2 | 3 |
| Penwood Assoc., Inc. | Bloomfield | 55 | 0.3 | 75 | --- | --- | --- | --- | 4 | 5 | 7 |
| Pine Hill, Inc. | Glastonbury | 18 | 0.1 | 75 | --- | --- | --- | --- | 1 | 2 | 3 |
| Plainville Water Co. | Plainville | 17587 | 100.0 | | 1485 | 1500 | 1700 | 2250 | 2828 | 3074 | 3918 |
| | Southington | 465 | 1.2 | 75 [166] | 0 | 0 | 0 | 0 | 37 | 40 | 51 (6) |
| | Bristol | 45 | 0.1 | | 0 | 0 | 0 | 0 | 3 | 4 | 4 (6) |
| | Farmington | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 (6) |
| Redwood Farms L&M Water Co. | Manchester | 260 | 0.5 | 75 | --- | --- | --- | --- | 20 | 21 | 25 |
| Reid Treatment Center | Avon | 30 | 0.2 | 75 | --- | --- | --- | --- | 2 | 3 | 4 |
| Rock Tree Apartments | Barkhamsted | 58 | 1.9 | 75 | --- | --- | --- | --- | 5 | 5 | 7 |
| Rolling Hills Water Assoc., Inc. | Glastonbury | 112 | 0.4 | 75 | --- | --- | --- | --- | 9 | 11 | 16 |
| Salmon Brook District Water Dept. | Granby | 1000 | 11.8 | 75 [47] | --- | --- | --- | --- | 81 | 91 | 126 |
| School Hill Assoc., Inc. | East Windsor | 86 | 0.9 | 75 | --- | --- | --- | --- | 7 | 7 | 9 |
| Shaker Heights, Inc. | Enfield | 135 | 0.3 | 75 [82] | --- | --- | --- | --- | 11 | 12 | 16 |

TABLE A.4
(continued)
PRELIMINARY PROJECTED WATER SUPPLY NEEDS FOR EACH UTILITY

| NAME | TOWNS SERVED | RES. POPULATION SERVED (1) | % OF TOWN PRESENTLY SERVED(2) | ESTIMATED DOMESTIC PER CAPITA CONSUMPTION (GPCD) (3) | COMM., INDUST., AND NON-REVENUE CONSUMPTION (1000 GPD) (4) | | | | PROJECTED WATER USE FOR EACH UTILITY (1000 GPD) (5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | 1991 | 2000 | 2030 | 1991 | 2000 | 2030 |
| Sharon Heights Water Assoc. | Bloomfield | 75 | 0.4 | 75 [68] | --- | --- | --- | --- | 6 | 7 | 9 |
| Snipsic Village Housing Authority | Ellington | 97 | 0.9 | 75 | --- | --- | --- | --- | 8 | 9 | 12 |
| Somers Elderly Housing Authority | Somers | 69 | 0.8 | 75 | --- | --- | --- | --- | 5 | 6 | 7 |
| Somersmill Water Assoc. | Somers | 250 | 2.9 | 75 [86] | --- | --- | --- | --- | 20 | 20 | 25 |
| Southington Water Co. | Southington | 33275 | 87.2 | 75 [116] | NA | 1424 | 1523 | 1774 | 4057 | 4368 | 5439 |
| Tariffville Fire District Water Dept. | Simsbury | 1980 | 8.8 | 75 [83] | --- | --- | --- | --- | 159 | 182 | 255 |
| Taylor Trailer Park | Southington | 83 | 0.2 | 75 | --- | --- | --- | --- | 7 | 7 | 9 |
| Torrington Water Co. | Harwinton | 6 | 0.1 | 75 | --- | --- | --- | --- | 0 | 1 | 1 |
| Towpath Condominiums | Avon | 120 | 1.0 | 75 | --- | --- | --- | --- | 10 | 11 | 16 |
| Trailsend Company | Canton | 48 | 0.6 | 75 | --- | --- | --- | --- | 4 | 4 | 5 |
| Turkey Hill Apartments | East Granby | 250 | 5.7 | 75 | --- | --- | --- | --- | 20 | 22 | 30 |
| Unionville Water Co. | Farmington | 11000 | 65.6 | 75 [100] | 62 | 73 | 83 | 96 | 925 | 990 | 1179 |
| | Avon | 2500 | 20.2 | | 0 | 0 | 0 | 0 | 204 | 225 | 328 |
| Vernon Village, Inc. | Vernon | 320 | 1.1 | 75 | --- | --- | --- | --- | 25 | 28 | 37 |
| Vernon Water Dept. | Vernon | 2409 | 8.3 | 75 | --- | --- | --- | --- | 192 | 213 | 282 |
| Village Water Co. of Simsbury | Simsbury | 13832 | 61.8 | | 400 | 570 | 640 | 820 | 1682 | 1908 | 2599 |
| | Granby | 647 | 7.6 | 75 [117] | NA | NA | NA | NA | 52 | 54 | 82 (6) |
| | East Granby | 70 | 1.6 | | NA | NA | NA | NA | 6 | 6 | 8 (6) |
| Wallens Hill Apartments | Barkhamsted | 49 | 1.6 | 75 | --- | --- | --- | --- | 4 | 4 | 6 |
| West Hill Lake Water Assoc. | New Hartford | 200 | 3.9 | 75 | --- | --- | --- | --- | 16 | 16 | 21 |
| West Service Corp. | Suffield | 400 | 4.2 | 75 [90] | --- | --- | --- | --- | 31 | 32 | 39 |
| Windsorville Water Assoc. | East Windsor | 30 | 0.3 | 75 | --- | --- | --- | --- | 2 | 2 | 3 |

TABLE A.4
(continued)
PRELIMINARY PROJECTED WATER SUPPLY NEEDS FOR EACH UTILITY

| NAME | TOWNS SERVED | RES. POPULATION SERVED (1) | % OF TOWN PRESENTLY SERVED(2) | ESTIMATED DOMESTIC PER CAPITA CONSUMPTION (GPCD) (3) | COMM., INDUST., AND NON-REVENUE CONSUMPTION (1000 GPD) (4) | | | | PROJECTED WATER USE FOR EACH UTILITY (1000 GPD) (5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1986 | 1991 | 2000 | 2030 | 1991 | 2000 | 2030 |
| Wintergreen | Harwinton | 40 | 0.8 | 75 | --- | --- | --- | --- | 3 | 4 | 5 |
| Woodcrest Assoc., Inc. | Burlington | 63 | 1.0 | 75 | --- | --- | --- | --- | 5 | 5 | 7 |
| Worthington Fire District | Berlin | 2530 | 16.2 | 75 [201] | 319 | 335 | 367 | 494 | 443 | 569 | 734 |
| TOTALS: | | | | | 44559 | 52931 | 61134 | 79385 | 114222 | 126570 | 160025 |

NOTES:

(1) Population served estimates provided from utilities' information if questionnaire was received; if not, estimates derived from average household size data multiplied by number of connections.

(2) 1986 population figures derived using straight-line projections from Connecticut OPM Population Projections data - see Reference No. 3.

(3) 75 gpcd was used for all domestic use and for the total water consumption rate of those utilities that do not have significant commercial and industrial demands; value shown in brackets is the ratio of total average water use to utility-estimated service population.

(4) Commercial/industrial/non-revenue water demand figures provided by the particular utility.

(5) For projecting future water use, a per capita consumption escalator of 0.25 gpcd/year is used.

(6) Domestic water consumption only.

(7) Figures include industries' and public authorities' water use only.

(8) Totals (given by the water dept.) include domestic, commercial, industrial, and public authorities' water use.

(9) Commercial, industrial and non-revenue consumption has been estimated from data included in CWC's individual plan. Since values contained in the plan for residential and non-residential water were for the years 1987, 1992, 2000, and 2030, these values have been reported. Also, the non-revenue segment of the various systems' average demand was not tabulated, but instead was graphed collectively with other water use for the system. In order to distribute non-revenue water by community, the total system non-revenue water was backed out of the graphically displayed total and applied to individual communities on a ratio equal to community service population divided by total system service population.

(10) For convenience, the water usage for Vernon's entire service population has been listed under the Rockville Division, since such a small percentage (approx. 1%) can be attributed to the Northern Division's Western System.

(11) Commercial/industrial/non-revenue water baseline (1986) was increased to reflect existing conditions.

# FINAL
# WATER SUPPLY ASSESSMENT
# UPPER CONNECTICUT RIVER
# WATER SUPPLY
# MANAGEMENT AREA

# APPENDIX B

**DECEMBER, 1987**

DATE: 4/28/87
REV: 5/4/87

# UPPER CONNECTICUT RIVER WATER UTILITY COORDINATING COMMITTEE

## INSTRUCTIONS FOR COMPLETING QUESTIONNAIRE

The purpose of the questionnaire is to establish a data base of information on the Upper Connecticut River's water utilities. The data base is essential to the proper development of the Upper Connecticut River Coordinated Water System Plan. The purpose of most questions is self-explanatory; however, if any questions require clarification please feel free to call either of the following:

Len Warburton, Keyes Associates (203) 563-2341
Bruce Pierstorff, Havens and Emerson (617) 350-6622

The attached questionnaire covers most aspects of water utility operation. We have structured the questions so that the minimum amount of information can be obtained from you for completion of the Water Supply Assessment portion of the Coordinated Plan.

We know that every question cannot be answered by every water utility. Several questions may not be pertinent to your utility or you simply may not have the requested information. We ask that you mark such questions as:

DNA for "Does Not Apply" or
NA for data "Not Available"

In preparing the questionnaire, we have used the following definitions of terms below:

MG - million gallons
MGD - million gallons per day
Retail water - water which is sold for direct consumption
Wholesale water - water which is resold upon purchase
Interconnection - any link between two utilities capable of one-way or two-way transmission of water, and capable of use either permanently or in an emergency situation.
New Construction - construction of <u>new</u> facilities required to improve service or increase a utility's water production capability.
Rehabilitation - renovation or replacement of <u>existing</u> facilities, e.g., replacement of distribution pipe.

Thank you very much for your cooperation.

UPPER CONNECTICUT RIVER WUCC

WATER UTILITY QUESTIONNAIRE

RETURN TO

Keyes Associates
55 Town Line Road
Wethersfield, CT 06109

Attn: Len Warburton

WATER UTILITY

(Place Mailing Label Here)

Please correct above label if necessary

Name and address of Chief Official to whom all correspondence should be addressed _____

_____

_____

Telephone No. of Water Utility (203) _____

Town(s) Where Located _____

If part of a larger utility, please give name. _____

Person to contact for additional information _____

## SECTION A - GENERAL INFORMATION

1. Total number of: Retail customers (1986) _____; Wholesale customers _____

2. Estimated total population served _____

3. Provide written description of existing service area (e.g., 250-unit condominium complex consisting of 200 one-bedroom units and 50 two-bedroom units) _____

_____

_____

_____

_____

Water Utility Name_____

4. Describe anticipated future service area and/or franchise area (please provide copy of legislation or DPUC Docket establishing franchise area).

_____

_____

_____

_____

_____

5. Type of supplier (Check one)

Municipal _____ Association _____
Investor _____ Taxing District _____
Other _____

6. Residential water bill for quarterly consumption of 18,000 gallons would be $_____.

Please furnish a copy of your water rate schedule. Indicate effective date of rate _____ and if/when you anticipate a change in your rate.

_____

7. Please furnish a map (or copy) indicating source location(s), well fields, service area boundaries, franchise area boundaries, interconnections, and give date of most recent revision. If information contained on the map entitled "Community Water Systems in Connecticut, A 1984 Inventory" (prepared by the Natural Resources Center, Connecticut DEP) and/or "Atlas of the Public Water Supply Sources and Drainage Basins of Connecticut, June, 1982" (DEP Bulletin No. 4) is up-to-date and accurate, so stipulate or revise as appropriate. Alternatively, use a U.S.G.S. map or other existing map of your choice (please indicate scale).

Comments: _____

_____

_____

_____

_____

8. Please list recent engineering/water supply planning studies performed (within last ten years) for your utility or parts of your utility by consultants or in-house. (Give title, author, and date of report and copy if possible).

_____

_____

_____

_____

Water Utility Name_____

9. Have any other questionnaires been completed recently? If so, for whom? Please give name and address and subject covered.

_____

_____

10. Please attach a copy of your most recent DPUC annual report and/or audit. If not available, give most recent year available.

Comments: _____

_____

_____

11. What was your total system production in thousands of gallons in 1986? (If you use other units, please state the units used). Are your production sources metered? Yes _____ No _____

| | Total Production (1000 GPD) |
|---|---|
| Average Day (Yearly average) | _____ |
| Average Day (Maximum month) | _____ |
| Which month? | _____ |
| Maximum Day (Annual maximum) | _____ |

Estimate the percent of your total production which is retail (individual, commercial or industrial accounts) and wholesale (provided to another utility or entity for resale).

Retail _____% Wholesale _____%

Comments: _____

_____

_____

12. What do you normally consider to be the existing safe yield of your active sources? (1000 GPD)

Surface Source _____ Groundwater Source _____ Total _____

On what basis is/was your safe yield determined? Please give examples if you can, such as extended pumping tests, pump capacity, etc.

_____

_____

_____

Water Utility Name_____

13. List your sources of supply.

a. Surface Supplies

| Name of Source | Status* (Active) (Inactive) (Emergency) | Storage Volume @ Spillway Level (MG) | Avg. Amt. Water Withdrawn (MGD) | Maximum Allowable Withdrawal (MGD) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

b. Groundwater supplies

| Name of Aquifer or Well Field | No. of Wells | Status* (Active) (Inactive) (Emergency) | Avg. Amt. Water Withdrawn (MGD) | Maximum Allowable Withdrawal (MGD) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

c. Comments:

_____

_____

_____

_____

*Definitions:

(1) Active - Supplies that are permanently connected to the system (including seasonal supplies) and available for distribution.

(2) Inactive - no longer used or maintained as a source of supply; restricted from use unless approved by DOHS and reclassified to emergency or actual status.

( 3) Emergency - not regular sources of supply which may be approved by DOHS for use on intermittent basis.

Water Utility Name_____

14. Treatment provided

| Source | Degree of Treatment |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

15. Do you anticipate serving additional municipalities or water utilities? _____ If so, who?_____

_____

16. During the next five (5) years, do you anticipate an extension or addition in your:

Service Area? _____ If so, additional area (sq miles) _____

Franchise Area? _____ If so, additional area (sq miles) _____

Number of service connections _____

If your projections are based on population data or land use patterns or trends, please state source and, if possible, enclose statistics concerned. Do you have liaison and coordination with your Town on this subject?

Comments: _____

_____

_____

_____

17. What is the total length of pipe in your distribution system? _____ List pipe sizes and approximate percentage each size represents of total length.

| Size (inches) | Percent Of Total Length | Pipe Materials (if known) |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Water Utility Name_____

Comments: _____

_____

_____

_____

18. Distribution System Storage (Standpipes, storage tanks, etc.)

Total Covered Storage (MG) _____ Number of Units _____

Please list storage units:

| Location or Name | Volume (MG) |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

19. Facility needs: estimate the total dollar value of your utility's new construction needs over the next 5 years. Total $_____
Portion of needs resulting from the following:

- Rehabilitation $_____
- Increase in system demand $ _____
- Compliance $ _____

Comments: _____

_____

_____

_____

20. Supply problems

a. In the last 5 years have you had difficulty providing an adequate supply to your customers? Yes _____ No _____ Sometimes _____

Explain: _____

_____

_____

b. Do you have an emergency power supply? Yes _____ No _____

Comments: _____

_____

_____

Water Utility Name_____

c. Have you experienced supply problems during droughts? Yes ___ No ___

Explain: _____

_____

_____

d. Have you experienced supply problems during fire protection demand?
Yes ____ No ____

Explain: _____

_____

_____

21. Does your utility provide public or private fire protection service?
Yes_____ No_____

Comments: _____

_____

_____

_____

22. Has an individual water supply plan been requested for your utility by DOHS?
Yes ____ No ____
If yes, what is the status of your individual water supply plan? _____

_____

Name of consultant completing your individual plan: _____

Please indicate the name of the person responsible for completing this questionnaire.

Name_____

Title_____

Signature_____

We appreciate your time and trouble. We realize this has been an imposition on your valuable time. Maybe you'd now like to tell <u>us</u> a thing or two, so we have provided the following page (Page 8) for this purpose. Your frank and open views on any water-related topic will be very much appreciated. You'll notice that we have even omitted the "Water Utility Name" on this so you can be anonymous if you wish!

Thank you.

## ADDITIONAL COMMENTS

Please give your views on any aspects of the water supply industry about which you feel strongly, in terms of items which you think might improve the industry in general and the State of Connecticut in particular. For example, are there any large-scale projects which would affect your utility? Are there any supply projects you would like to see? Is there legislation pending which you feel would help (or hinder) the industry?