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EPA

1978 Needs Survey

Conveyance and Treatment of Municipal Wastewater

Summaries of Technical Data

FRD-2

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1978 NEEDS SURVEY

CONVEYANCE AND TREATMENT OF MUNICIPAL WASTEWATER

SUMMARIES OF TECHNICAL DATA

FEBRUARY 10, 1979

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CONVEYANCE AND TREATMENT OF MUNICIPAL WASTEWATER
SUMMARIES OF TECHNICAL DATA

The 1978 Needs Survey

I. INTRODUCTION

This report is a part of the 1978 Needs Survey Report and is a supplement to the Cost Estimate Report to the Congress (FRD-1). It provides summaries of the detailed technical and cost data reported in the Survey for Categories I through IV. A separate supplemental report has been prepared for Categories V and VI (FRD-3). A description of the 1978 Survey methodology is presented in Appendix I herein.

The Needs Survey was performed in compliance with the provisions of Sections 205(a) and 516(b)(2) of the Clean Water Act, of 1977, PL 95-217. The Environmental Protection Agency submitted the cost estimates for municipal wastewater collection and treatment needs to Congress on February 10, 1979.

The 1978 Needs Survey is the fourth such Survey performed by the Agency. After the first two Surveys had been completed, a need became apparent for the tabulation of the great amount of technical data accumulated. The 1976 Survey responded to this need by publishing a report similar to this one which summarized the technical data acquired for the Survey.

Costs of facilities have historically held the primary focus for these Surveys because they have been used by the Congress to provide relative allocations of construction grant funds among the States. Besides the cost data large amounts of technical data are accumulated during each Survey. These technical data are used in many of the cost breakdowns, but have been found to be very useful to many levels of government and quasi-government officials and to industrial organizations. EPA receives a large number of requests annually from these sources for data summaries. One of the purposes of this report is to reduce the number of such requests for special summaries by publishing the commonly asked for information. In addition, the transfer of this material to the total user community working in the field of municipal wastewater treatment and collection, planning, and engineering is considered important to the management and operation of the EPA grant program. EPA foresees these data can be useful in the facilities planning process, both by the Federal government and the State and local governments.

Only data reported to or accumualted by the Survey is summarized herein. The data collection process is described in Appendix I.

EPA feels the completeness and accuracy of this data base is the best and most up-to-date ever available. In an attempt to make it better or more useful to the user community, comments, discussion, or suggestions for improvements are welcomed.

II. DESCRIPTION OF CATEGORIES REPORTED

The 1978 Needs Survey was conducted on a facility-by-facility basis for Categories I through IV. Appendix II presents a copy of the form (EPA-1) which was completed for each of the 32,000 facilities in the country. The codes used, with an explanation of each, are also presented. Cost estimates for all needs categories are presented in "Cost Estimates for Construction of Publicly-Owned Wastewater Treatment Facilities - 1978 Needs Survey," (FRD-1). Detailed methodology and cost data for Categories V and VI are presented in "Summary of Technical Data for Combined Sewer Overflow and Stormwater Discharge," (FRD-3).

A general description of the categories follows:

Category I - Secondary Treatment

This category includes facilities which are only required to provide "secondary treatment" or "best practicable wastewater treatment technology" (BPWTT). For the purpose of the Survey, BPWTT and secondary treatment were considered synonymous. Systems designed to serve individual residences are reported in this category.

Category II - Higher Than Secondary Treatment

Facilities reported in this category are for treatment plants that must achieve treatment levels more stringent than secondary. This requirement generally exists where water quality standards require removal of such pollutants as phosphorus, ammonia, nitrates, or organic and other substances. Included in Category II is the construction necessary to raise the treatment level, e.g. if the existing treatment level of a facility is primary, then construction necessary to raise the treatment level to secondary is reported in Category II, together with the construction for treatment levels greater than secondary.

Category IIIA - Correction of Infiltration/Inflow

Included is the correction of sewer system infiltration/inflow problems. Preliminary sewer system analysis and detailed sewer system evaluation surveys are also itemized.

Category IIIB- Major Rehabilitation of Sewers

Requirements for replacement and/or major rehabilitation of existing sewer systems were reported in this category. If corrective actions were necessary to protect the total integrity of the system, they were reported. Major rehabilitation is considered to be extensive repair of existing sewers beyond the scope of normal maintenance programs, where sewers are collapsing or structurally unsound.

Category IVA - New Collector Sewers

This category includes construction of new collector sewer systems and appurtenances designed to correct violations caused by raw discharges, seepage to waters from septic tanks and the like, and/or to comply with Federal, State or local actions.

Category IVB - New Interceptor Sewers

Included in this category were new interceptor sewers and transmission pumping staitons necessary for the bulk transport of wastewaters.

Category V - Control of Combined Sewer Overflow

This category reported facilities designed to prevent and/or control periodic bypassing of untreated wastes from combined sewers to achieve water quality objectives and which are eligible for Federal funding. It does not include treatment and/or control of stormwaters in separate storm and drainage systems.

Category VI - Treatment and/or Control of Stormwaters

This category includes projects designed to abate pollution in urbanized areas from stormwater runoff channeled through sewers and other conveyances used only for such runoff. Stormwater channeled through combined sewers which also carry sewage are not included in Category VI.

III. FACILITIES REPORTED

The 1978 Survey is the first Needs Survey which contains a complete inventory of all known and identified facilities for Categories I through IV. In past years States were given two options to report their needs. They could report all facilities, i.e. 100 percent reporting. Twenty-nine States and Territories chose this option in the 1976 Survey.

The second option was to include all communities within Standard Metropolitan Statistical Areas (SMSA's), and all communities with 1970 populations equal to or greater than 10,000. For the remaining communities outside SMSA's and with 1970 populations of less than 10,000, the State could choose to randomly select a sample proportion for reporting. The minimum sample allowable was 20 percent. Twenty-seven States chose this second sampling option. The samples used in the 1976 Needs Survey ranged from 20 to 63 percent.

Thus, the 1978 Survey eliminated the second option and all States and Territories completed a 100 percent inventory. The data base and resulting compilations of information are thus more accurate in 1978, particularly for the smaller facilities.

IV. PRESENT AND FUTURE NEEDS

Two time periods pervade Needs Survey reporting. These are the present, meaning January 1, 1978, and the future, which means the year 2000. When dollars are used in this report, they represent January 1978 dollars. This is true for both present and future needs. Present populations used are July 1, 1977.

V. METRIC MEASURE

All units shown in the technical summaries are in metric units. Where space permits, English units are shown in parentheses beside the metric measure. The following are the most common units used in this report:

1. Flows are reported in thousands of cubic meters per day. Millions of U.S. gallons per day are shown in parentheses.

2. Per capita flows are shown in liters per day. U.S. gallons are shown in parentheses.

3. Pipe diameters are shown in centimeters. Pipe lengths are shown in meters.

VI. PRESENTATION OF DATA

The report's format has been structured in such a way that a discussion of each table or series of tables is presented immediately before the table. The reader is also referred to Appendix II where an explanation is given for all items in the EPA-1 data form. Item numbers referred to in the text in parentheses refer to the Appendix II explanations.

The tables are arranged in the following general sequence:

1. Treatment Plants

2. Unit Processes

3. Wastewater Conveyance Systems

4. Miscellaneous

Please refer to the Table of Contents for a listing of all tables.

TABLES 1-53

TABLE 1 - NUMBER OF FACILITIES BY NATURE OF FACILITIES - (EXISTING AND PLANNED)

Table 1 lists the total number of facilities, by State required to satisfy discharge requirements by the year 2000. Included are those in operation in 1978, those under construction in 1978, and those proposed to be built before 2000.

The various codes are defined as follows:

Code 1: A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with combined sewers.

Code 2: A complete wastewater treatment system (including all items under Code 1) with separate sanitary sewers.

Code 3: A separate treatment plant, under the control of a separate authority. (Sewers which discharge to these plants are under control of one or more different authorities.)

Code 4: A collection system of separate sanitary sewers under the control of one authority contributing to a treatment plant operated by a different authority.

Code 5: A collection system with combined sewers under the control of a separate authority.

Code 6: Other types of systems.

Code 7: A system for the bulk transmission of wastewater with or without pumping stations, and with or without interceptor sewers.

Code 8: A facility which provides only for the treatment and disposal of sludge including vehicles or vehicle fleets.

A further breakdown on numbers of treatment plants and sewer systems is presented in Table 2.

Code 6, "Other," accounts for approximately 9.7 percent of the total of 30,670 facilities. The majority of these facilities are communities which are presently using septic tank systems and plan to use similar systems through the year 2000. They may or may not have needs. Systems (communities, areas, authorities, etc.) which are served by septic tank systems in 1978 and plan to construct a collection system and treatment plant before 2000 are identified under other codes, usually Code 2.

Facilities existing in 1978, but planned to be abandoned prior to 2000, are included in these summaries.

As used in this report, combined sewers are defined as sewers which carry both storm and sanitary wastewaters. Separate sewers carry only sanitary wastes. Storm sewers convey only storm runoff.

1978 NEEDS SURVEY

NUMBER OF FACILITIES BY NATURE OF FACILITY
(EXISTING AND PLANNED)

STATE	TOTAL	(CODE 1)	(CODE 2)	(CODE 3)	(CODE 4)	(CODE 5)	(CODE 6)	(CODE 7)	(CODE 8)
ALABAMA	524	1	373	15	44	0	91	0	0
ALASKA	237	2	124	0	0	0	111	0	0
ARIZONA	207	1	148	4	16	0	38	0	0
ARKANSAS	785	0	646	4	41	0	94	0	0
CALIFORNIA	1,669	7	989	24	226	0	415	7	1
COLORADO	377	13	308	2	48	0	6	0	0
CONNECTICUT	201	18	91	1	35	1	55	0	0
DELAWARE	46	4	24	0	15	1	1	0	1
DIST. OF COLUM.	1	0	1	0	0	0	0	0	0
FLORIDA	493	2	396	5	82	0	8	0	0
GEORGIA	805	9	529	9	71	0	187	0	0
HAWAII	55	0	55	0	0	0	0	0	0
IDAHO	238	12	190	0	18	0	18	0	0
ILLINOIS	1,458	100	779	36	242	67	234	0	0
INDIANA	708	109	487	5	89	9	9	0	0
IOWA	1,010	24	900	1	30	2	53	0	0
KANSAS	675	8	653	0	7	0	7	0	0
KENTUCKY	468	15	405	4	35	8	1	0	0
LOUISIANA	563	0	517	3	31	0	10	1	1
MAINE	258	54	141	7	30	16	4	6	0
MARYLAND	461	10	362	12	67	2	8	0	0
MASSACHUSETTS	260	36	106	7	96	13	2	0	0
MICHIGAN	1,072	76	450	14	333	41	149	9	0
MINNESOTA	903	35	560	19	139	4	146	0	0
MISSISSIPPI	665	2	620	5	1	0	36	1	0
MISSOURI	1,040	14	945	2	68	0	10	1	0
MONTANA	171	20	147	0	4	0	0	0	0
NEBRASKA	537	3	461	0	6	0	67	0	0
NEVADA	87	0	70	2	14	0	1	0	0
NEW HAMPSHIRE	185	25	115	2	29	5	9	0	0
NEW JERSEY	658	13	226	24	327	15	53	0	0
NEW MEXICO	177	0	160	0	10	0	7	0	0
NEW YORK	2,025	58	823	51	577	19	491	6	0
NORTH CAROLINA	868	5	723	19	108	0	13	0	0
NORTH DAKOTA	376	7	349	0	0	0	20	0	0
OHIO	1,211	90	859	3	179	12	68	0	0
OKLAHOMA	787	1	719	5	15	0	47	0	0
OREGON	300	29	223	3	34	1	10	0	0
PENNSYLVANIA	2,300	94	1,196	37	694	101	173	5	0
RHODE ISLAND	40	2	23	0	12	2	1	0	0
SOUTH CAROLINA	461	0	393	16	34	0	18	0	0
SOUTH DAKOTA	327	9	308	0	0	0	10	0	0
TENNESSEE	371	3	326	4	37	0	1	0	0
TEXAS	1,256	2	1,081	42	131	0	0	0	0
UTAH	280	1	214	1	57	0	7	0	0
VERMONT	117	28	73	0	6	1	9	0	0
VIRGINIA	667	11	371	15	124	3	141	2	0
WASHINGTON	449	50	291	3	88	3	14	0	0
WEST VIRGINIA	638	52	492	1	83	2	8	0	0
WISCONSIN	975	11	629	21	205	2	107	0	0
WYOMING	138	3	124	0	8	0	3	0	0
AMERICAN SAMOA	6	0	6	0	0	0	0	0	0
GUAM	7	0	7	0	0	0	0	0	0
N. MARIANAS	5	0	4	0	0	0	1	0	0
PUERTO RICO	34	1	33	0	0	0	0	0	0
PAC. TR. TERR.	34	0	23	0	0	0	11	0	0
VIRGIN ISLANDS	4	0	2	0	0	0	2	0	0
U.S. TOTALS	30,670	1,070	21,270	428	4,546	330	2,985	38	3

TABLE 2 - NUMBER AND NATURE OF WASTEWATER FACILITIES - (EXISTING AND PLANNED) - UNITED STATES TOTALS

Table 2 is a two part table. The top indicates the number of facilities by treatment plants, sewer systems, other, trunk sewers, and separate sludge handling facilities. Whether these facilities were existent on January 1, 1978 or are planned to be built is also indicated.

Trunk sewers are defined as sewers not a part of a collection system, but which convey waste from one system to another, or from one system to a treatment plant in another system.

The lower part of the table further delineates the total U.S. data base by separating the facilities according to the projected construction, if such is planned. A brief explanation of each follows:

Enlarge: This is applicable to both treatment plants and collection systems. For collection systems, it refers to an existing system being enlarged to cover a larger service area. For treatment plants, enlarge means an existing treatment will be expanded to receive a larger flow at the present level of treatment. "Planned" refers to a new facility which will be built and, at a later date, but prior to 2000, will be enlarged.

Upgrade: This code is applicable to treatment plants and septic tank systems. It refers to an existing facility which will remain at its present hydraulic loading but its level of treatment will be increased. An existing primary plant being upgraded to a secondary plant is an example.

Enlarge and Upgrade: This code is applicable only to treatment plants. It is a combination of Upgrade and Enlarge, as defined above.

New Construction: This code applies equally to treatment plants and conveyance systems. These facilities are planned for a completely new site. Some are for a new authority.

Replace: This code applies to both treatment plants and conveyance systems. In most cases plants are involved. This situation is normally one in which an existing plant will be torn down and a completely new plant constructed on the site.

Abandon: This code applies to both treatment plants and conveyance systems, but generally is the former.

No Change: This category delineates treatment plants and conveyance systems in existence which will remain unchanged through the year 2000.

Other: A number of possible situations fall into this category. One common situation is a treatment plant which will require capital expenditures, such as for a new laboratory, but the level of treatment or capacity will not be changed.

1978 NEEDS SURVEY

NUMBER AND NATURE OF WASTEWATER FACILITIES

(EXISTING & PLANNED)

UNITED STATES TOTALS

****************NUMBER OF FACILITIES****************

	NUMBER OF FACILITIES	TREATMENT PLANTS	SEWER SYSTEMS	OTHER	TRUNK SEWERS	SLUDGE HANDLING FACILITIES
EXISTING	20,018	14,592	17,109	2,610	18	1
PLANNED	10,652	8,176	10,107	375	20	2
TOTALS	30,670	22,768	27,216	2,985	38	3

******************NATURE OF PROJECTED CHANGE******************

	ENLARGE	UPGRADE	ENLARGE AND UPGRADE	NEW CONST.	REPLACE	ABANDON	NO CHANGE	OTHER
EXISTING	2,868	4,065	3,108	130	1,344	441	6,445	1,617
PLANNED	42	9	7	10,243	8	2	304	37
TOTALS	2,910	4,074	3,115	10,373	1,352	443	6,749	1,654

TABLE 3 - NUMBER AND PERCENT BY STATE OF TREATMENT PLANTS BY FLOW RANGE - (EXISTING AND PLANNED)

Table 3 is a summary of all treatment plants in operation in 1978 plus all those proposed to be built between 1978 and 2000. These plants have been further separated by ranges of flow expressed in thousands of cubic meters per day and, in parentheses under that flow, as million gallons per day. These data are presented for each State along with the total number of treatment plants proposed for each State. National totals are summarized at the bottom of the table.

The data indicate 88.69 percent of the treatment plants in the nation will be smaller than 1.0 mgd in design capacity, serving populations of approximately 10,000 people or less. Approximately two-thirds of these treatment plants will be designed for a flow of 105,000 gallons per day or less, serving populations of 1,000 people or less.

These data are for all types of plants regardless of level of treatment. Numerous other tables follow which further break down these summaries by level of treatment for existing (1978) and planned (2000) plants.

The flows used to segregate the plants are design flows for plants not yet built and existing flows for presently operating plants. Existing flow may be equal, greater, or less than the design flow for any particular plant. Existing plants which will be abandoned between 1978 and 2000 are included in these summaries.

1978 NEEDS SURVEY

NUMBER AND PERCENT BY STATE OF TREATMENT PLANTS BY FLOW RANGE

(EXISTING & PLANNED)

CUBIC METERS PER DAY X 1000 (MILLION GALLONS PER DAY)		0-.40 (0-.105)	.401-4.0 (.106-1.05)	4,001-40 (1.06-10.5)	40,001-190 (10.57-50.2)	190+ (50.2+)
STATE	TOTAL NUMBER OF PLANTS	# OF(% OF) PLANTS(PLANTS)	# OF(% OF) PLANTS(PLANTS)	# OF(% OF) PLANTS(PLANTS)	# OF(% OF) PLANTS(PLANTS)	# OF(% OF) PLANTS(PLANTS)
ALABAMA	389	198(50.90)	131(33.68)	54(13.88)	6(1.54)	0(0.00)
ALASKA	126	108(85.71)	15(11.90)	2(1.59)	1(0.79)	0(0.00)
ARIZONA	153	88(57.52)	53(34.64)	9(5.88)	2(1.31)	1(0.65)
ARKANSAS	650	494(76.00)	118(18.15)	37(5.69)	1(0.15)	0(0.00)
CALIFORNIA	1,020	611(59.90)	221(21.67)	156(15.29)	23(2.25)	9(0.88)
COLORADO	323	187(57.89)	105(32.51)	26(8.05)	3(0.93)	2(0.62)
CONNECTICUT	110	22(20.00)	37(33.64)	42(38.18)	9(8.18)	0(0.00)
DELAWARE	28	12(42.86)	13(46.43)	2(7.14)	0(0.00)	1(3.57)
DIST. OF COLUM.	1	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(100.00)
FLORIDA	403	187(46.40)	122(30.27)	83(20.60)	10(2.48)	1(0.25)
GEORGIA	547	287(52.47)	186(34.00)	63(11.52)	10(1.83)	1(0.18)
HAWAII	55	31(56.36)	15(27.27)	8(14.55)	0(0.00)	1(1.82)
IDAHO	202	133(65.84)	50(24.75)	18(8.9[illegible]	1(0.50)	0(0.00)
ILLINOIS	915	434(47.43)	355(38.80)	108(11.8[illegible]	15(1.64)	3(0.33)
INDIANA	601	355(59.07)	167(27.79)	63(10.48)	14(2.33)	2(0.33)
IOWA	925	665(71.89)	222(24.00)	33(3.57)	5(0.54)	0(0.00)
KANSAS	661	466(70.50)	162(24.51)	30(4.54)	3(0.45)	0(0.00)
KENTUCKY	424	265(62.50)	121(28.54)	35(8.25)	2(0.47)	1(0.24)
LOUISIANA	520	312(60.00)	147(28.27)	58(11.15)	3(0.58)	0(0.00)
MAINE	202	137(67.82)	42(20.79)	22(10.89)	1(0.50)	0(0.00)
MARYLAND	384	307(79.95)	51(13.28)	22(5.73)	3(0.78)	1(0.26)
MASSACHUSETTS	149	58(38.93)	38(25.50)	42(28.19)	9(6.04)	2(1.34)
MICHIGAN	540	270(50.00)	195(36.11)	55(10.19)	18(3.33)	2(0.37)
MINNESOTA	614	382(62.21)	193(31.43)	36(5.86)	2(0.33)	1(0.16)
MISSISSIPPI	627	441(70.33)	142(22.65)	42(6.70)	2(0.32)	0(0.00)
MISSOURI	961	702(73.05)	208(21.64)	43(4.47)	5(0.52)	3(0.31)
MONTANA	167	109(65.27)	46(27.54)	11(6.59)	1(0.60)	0(0.00)
NEBRASKA	464	347(74.78)	99(21.34)	15(3.23)	3(0.65)	0(0.00)
NEVADA	72	44(61.11)	20(27.78)	4(5.56)	3(4.17)	1(1.39)
NEW HAMPSHIRE	142	99(69.72)	27(19.01)	16(11.27)	0(0.00)	0(0.00)
NEW JERSEY	263	49(18.63)	107(40.68)	94(35.74)	9(3.42)	4(1.52)
NEW MEXICO	160	104(65.00)	42(26.25)	12(7.50)	2(1.25)	0(0.00)
NEW YORK	932	567(60.84)	221(23.71)	107(11.48)	23(2.47)	14(1.50)
NORTH CAROLINA	747	479(64.12)	182(24.36)	78(10.44)	8(1.07)	0(0.00)
NORTH DAKOTA	356	316(88.76)	32(8.99)	8(2.25)	0(0.00)	0(0.00)
OHIO	952	515(54.10)	302(31.72)	116(12.18)	11(1.16)	8(0.84)
OKLAHOMA	725	528(72.83)	156(21.52)	36(4.97)	5(0.69)	0(0.00)
OREGON	255	124(48.63)	93(36.47)	34(13.33)	3(1.18)	1(0.39)
PENNSYLVANIA	1,327	858(64.66)	310(23.36)	146(11.00)	9(0.68)	4(0.30)
RHODE ISLAND	25	10(40.00)	5(20.00)	9(36.00)	0(0.00)	1(4.00)
SOUTH CAROLINA	409	208(50.86)	157(38.39)	39(9.54)	5(1.22)	0(0.00)
SOUTH DAKOTA	317	258(81.39)	50(15.77)	8(2.52)	1(0.32)	0(0.00)
TENNESSEE	333	139(41.74)	135(40.54)	54(16.22)	2(0.60)	3(0.90)
TEXAS	1,125	507(45.07)	460(40.89)	137(12.18)	17(1.51)	4(0.36)
UTAH	216	147(68.06)	40(18.52)	24(11.11)	5(2.31)	0(0.00)
VERMONT	101	52(51.49)	39(38.61)	10(9.90)	0(0.00)	0(0.00)
VIRGINIA	397	243(61.21)	107(26.95)	34(8.56)	12(3.02)	1(0.25)
WASHINGTON	344	181(52.62)	115(33.43)	41(11.92)	6(1.74)	1(0.29)
WEST VIRGINIA	545	450(82.57)	75(13.76)	19(3.49)	1(0.18)	0(0.00)
WISCONSIN	661	372(56.28)	229(34.64)	50(7.56)	8(1.21)	2(0.30)
WYOMING	127	81(63.78)	34(26.77)	12(9.45)	0(0.00)	0(0.00)
AMERICAN SAMOA	6	5(83.33)	1(16.67)	0(0.00)	0(0.00)	0(0.00)
GUAM	7	4(57.14)	1(14.29)	2(28.57)	0(0.00)	0(0.00)
N. MARIANAS	4	2(50.00)	2(50.00)	0(0.00)	0(0.00)	0(0.00)
PUERTO RICO	34	2(5.88)	21(61.76)	8(23.53)	3(8.82)	0(0.00)
PAC. TR. TERR.	23	23(00.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
VIRGIN ISLANDS	2	1(50.00)	0(0.00)	1(50.00)	0(0.00)	0(0.00)
U.S. TOTALS	22,768	13,976(61.38)	6,217(27.31)	2,214(9.72)	285(1.25)	76(0.33)

TABLE 4 - AVERAGE FLOWS BY STATE - PRESENT, PROJECTED & PERCENT CHANGE

Table 4 summarizes present (1978) and projected (2000) total flow treated by publicly owned treatment plants, along with the industrial component of the flow. The percentage of the total flow from industrial origins is also identified, as is the per capita daily average flow. The percentage change in each category is shown by comparing 1978 with predicted 2000 figures.

A further explanation of these summaries is presented below:

Total Flow: The total flow is expressed as thousands of cubic meters per day followed in parentheses by million gallons per day. These figures were derived from the existing flow for each treatment facility in a State as reported on the EPA-1 form in Block 29(1)(a) for 1978 and 29(1)(c), projected design flow, for the year 2000. Total flows include domestic flow, inflow/infiltration, and industrial flow.

Industrial Flow: The total industrial flow is expressed in the same units as Total Flow. The figures were derived from the existing industrial flow for each treatment facility as reported on the EPA-1 form in Block 29(2)(a) for 1978 and 29(2)(c), projected design flow, for the year 2000.

Industrial Percentage: This number is the calculated percentage of a State's industrial flow compared to the total flow for that State.

Liters/Capita/Day: Per capita average daily flows, in liters per capita per day, are shown followed in parentheses by gallons per capita per day. These flows are based on the nonindustrial component. The populations used to calculate the per capita flows are the resident and nonresident populations receiving treatment in 1978 and 2000, respectively. Thus, for 1978, the 1978 Total Flow minus the Industrial Flow is divided by the 1978 resident population plus the 1978 nonresident population receiving treatment for each State.

Percent Change: These columns simply compare the change in each parameter between 1978 and 2000, expressed as an increase or decrease using 1978 as the base.

Note: The sum of all entries may not equal the total due to rounding of individual items.

1978 NEEDS SURVEY

AVERAGE FLOWS BY STATE
PRESENT, PROJECTED & PERCENT CHANGE
IN THOUSANDS OF CUBIC METERS PER DAY

STATE	************ PRESENT ************ TOTAL FLOW	IND. FLOW	IND. %	LITERS / CAP./DAY	********** PROJECTED ********** TOTAL FLOW	IND. FLOW	IND. %	LITERS / CAP./DAY	***** PERCENT CHANGE ***** TOTAL FLOW	IND. FLOW	LITERS / CAP./DAY
ALABAMA	1,283(338)	236(62)	18.4	505(133)	1,992(526)	326(86)	16.3	466(123)	+55.2	+38.1	-7.5
ALASKA	135(35)	14(3)	10.6	595(157)	356(94)	18(4)	5.2	512(135)	+163.1	+30.4	-13.9
ARIZONA	754(199)	26(7)	3.5	391(103)	1,418(374)	24(6)	1.7	360(95)	+88.0	-7.1	-8.0
ARKANSAS	630(166)	120(31)	19.0	423(111)	1,214(320)	166(43)	13.6	439(115)	+92.7	+38.4	+3.5
CALIFORNIA	12,988(3431)	1,664(439)	12.8	543(143)	14,013(3701)	2,464(651)	17.5	410(108)	+7.8	+48.0	-24.4
COLORADO	1,481(391)	210(55)	14.2	487(128)	2,610(689)	312(82)	11.9	518(137)	+76.2	+48.2	+6.3
CONNECTICUT	1,343(354)	237(62)	17.6	578(152)	2,104(555)	399(105)	18.9	584(154)	+56.6	+68.4	+1.0
DELAWARE	316(83)	140(37)	44.4	342(90)	601(158)	160(42)	26.6	369(97)	+90.2	+13.9	+7.9
DIST. OF COLUM	1,046(276)	0()	0.0	398(105)	1,169(309)	0()	0.0	499(132)	+11.7	+0.0	+25.5
FLORIDA	2,404(635)	202(53)	8.4	411(108)	6,461(1706)	383(101)	5.9	428(113)	+168.7	+89.7	+3.9
GEORGIA	1,902(502)	422(111)	22.1	527(139)	3,750(990)	776(205)	20.7	495(130)	+97.1	+83.9	-6.0
HAWAII	345(91)	34(9)	9.9	1,217(321)	736(194)	57(15)	7.7	442(117)	+112.9	+66.1	-63.6
IDAHO	343(90)	62(16)	18.0	570(150)	637(168)	84(22)	13.2	537(141)	+85.6	+36.4	-5.8
ILLINOIS	7,757(2049)	1,537(406)	19.8	632(167)	11,013(2909)	2,197(580)	19.9	745(196)	+41.9	+42.8	+17.8
INDIANA	2,771(732)	553(146)	19.9	601(159)	4,149(1096)	937(247)	22.5	591(156)	+49.7	+69.4	-1.7
IOWA	1,170(309)	198(52)	16.9	448(118)	1,776(469)	337(89)	18.9	483(127)	+51.7	+69.5	+7.6
KANSAS	833(220)	124(32)	14.8	392(103)	1,401(370)	216(57)	15.4	465(122)	+68.1	+74.4	+18.5
KENTUCKY	974(257)	238(62)	24.4	438(115)	2,098(554)	541(143)	25.8	458(121)	+115.2	+127.2	+4.6
LOUISIANA	1,115(294)	41(10)	3.6	451(119)	2,446(646)	123(32)	5.0	517(136)	+119.2	+198.6	+14.5
MAINE	382(100)	90(23)	23.5	598(158)	667(176)	147(39)	22.1	477(126)	+74.7	+63.8	-20.2
MARYLAND	1,213(320)	210(55)	17.3	405(107)	2,979(786)	353(93)	11.8	507(134)	+145.4	+68.0	+25.2
MASSACHUSETTS	3,163(835)	753(199)	23.8	563(148)	4,904(1295)	1,217(321)	24.8	580(153)	+55.0	+61.5	+2.9
MICHIGAN	5,438(1436)	1,184(312)	21.7	636(168)	8,330(2200)	1,804(476)	21.6	711(188)	+53.1	+52.2	+11.7
MINNESOTA	1,568(414)	418(110)	26.6	389(102)	2,470(652)	665(175)	26.9	477(126)	+57.5	+58.9	+22.5
MISSISSIPPI	824(217)	118(31)	14.3	549(145)	1,260(332)	142(37)	11.3	490(129)	+52.7	+20.3	-10.7
MISSOURI	2,187(577)	401(106)	18.3	417(110)	3,848(1016)	760(200)	19.7	465(122)	+75.9	+89.4	+11.5
MONTANA	260(68)	7(1)	2.8	500(132)	444(117)	14(3)	3.2	585(154)	+70.8	+98.4	+17.0
NEBRASKA	677(179)	141(37)	20.8	418(110)	1,008(266)	239(63)	23.7	435(115)	+48.8	+69.2	+4.2
NEVADA	319(84)	0()	0.1	460(121)	998(263)	19(5)	1.9	741(195)	+212.3	N/M	+61.0
NEW HAMPSHIRE	208(55)	44(11)	21.3	502(132)	709(187)	165(43)	23.2	520(137)	+240.3	+271.0	+3.6
NEW JERSEY	3,772(996)	818(216)	21.6	463(122)	5,711(1508)	1,350(356)	23.6	427(112)	+51.3	+64.9	-7.8
NEW MEXICO	376(100)	22(5)	5.9	345(91)	591(156)	25(6)	4.2	410(108)	+56.1	+11.8	+18.5
NEW YORK	8,971(2370)	879(232)	9.7	590(155)	15,189(4012)	1,677(443)	11.0	640(169)	+69.2	+90.8	+8.5
NORTH CAROLINA	1,664(439)	550(145)	33.0	441(116)	3,338(881)	1,021(269)	30.5	474(125)	+100.5	+85.3	+7.3
NORTH DAKOTA	145(38)	12(3)	8.5	311(82)	228(60)	19(5)	8.6	360(95)	+57.6	+59.1	+15.9
OHIO	5,358(1415)	1,036(273)	19.3	533(140)	8,481(2240)	1,899(501)	22.3	564(149)	+58.3	+83.2	+5.8
OKLAHOMA	903(238)	80(21)	8.8	392(103)	1,629(430)	122(32)	7.5	454(120)	+80.3	+53.0	+15.9
OREGON	1,060(280)	245(64)	23.1	561(148)	1,930(510)	289(76)	15.0	544(143)	+82.1	+18.2	-2.9
PENNSYLVANIA	5,322(1406)	735(194)	13.8	495(130)	7,979(2107)	1,061(280)	13.3	530(140)	+49.9	+44.2	+7.0
RHODE ISLAND	398(105)	123(32)	30.8	514(135)	642(169)	194(51)	30.3	515(136)	+61.0	+58.1	+0.2
SOUTH CAROLINA	988(261)	258(68)	26.1	502(132)	2,906(767)	500(132)	17.2	732(193)	+194.2	+93.7	+45.7
SOUTH DAKOTA	207(54)	29(7)	13.9	394(104)	326(86)	37(9)	11.4	460(121)	+57.1	+29.0	+16.7
TENNESSEE	1,748(461)	487(128)	27.8	558(147)	3,330(879)	937(247)	28.1	551(145)	+90.4	+92.4	-1.2
TEXAS	4,790(1265)	341(90)	7.1	438(115)	8,629(2279)	430(113)	4.9	480(126)	+80.1	+26.0	+9.7
UTAH	802(211)	65(17)	8.1	624(164)	1,135(299)	93(24)	8.2	608(160)	+41.5	+44.2	-2.5
VERMONT	166(43)	17(4)	10.5	561(148)	259(68)	26(7)	10.2	507(134)	+55.7	+51.0	-9.6
VIRGINIA	1,620(427)	167(44)	10.3	405(107)	3,160(834)	568(150)	17.9	416(110)	+95.1	+239.7	+2.7
WASHINGTON	1,598(422)	203(53)	12.7	503(133)	3,354(886)	377(99)	11.2	607(160)	+109.9	+85.7	+20.6
WEST VIRGINIA	383(101)	61(16)	16.0	418(110)	1,055(278)	120(31)	11.4	453(119)	+175.5	+96.9	+8.4
WISCONSIN	2,367(625)	686(181)	29.0	481(127)	2,570(679)	646(170)	25.1	532(140)	+8.5	-5.8	+10.6
WYOMING	161(42)	1()	0.8	471(124)	224(59)	1()	0.6	458(121)	+39.1	+5.5	-2.7
AMERICAN SAMOA	1()	0()	0.0	967(255)	24(6)	10(2)	44.0	375(99)	+1332.6	+0.0	-61.1
GUAM	23(6)	0()	0.0	325(86)	70(18)	0()	0.0	322(85)	+196.9	+0.0	-0.9
N. MARIANAS	2()	0()	0.0	1,452(383)	21(5)	0()	0.0	629(166)	+688.7	+0.0	-56.6
PUERTO RICO	509(134)	47(12)	9.3	268(70)	1,348(356)	241(63)	17.9	341(90)	+164.6	+407.3	+27.3
PAC. TR. TERR.	0()	0()	0.0	234(61)	40(10)	0()	0.1	363(96)	+8130.7	+0.0	+55.1
VIRGIN ISLANDS	9(2)	0()	0.0	429(113)	14(3)	0()	0.0	492(130)	+47.4	+0.0	+14.6
U.S. TOTALS	99,200(26205)	16,306(4307)	16.4	506(133)	161,772(42735)	26,714(7057)	16.5	517(136)	+63.0	+63.8	+2.2

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

TABLE 5 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - ALL FACILITIES

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For instance, some phosphorus is present in all wastewaters and a percentage is removed in all treatment plants. Unless there is a specific requirement to remove phosphorus, neither influent nor effluent values are reported. Thus, removals are shown only where stipulated.

It should be noted that some State totals for nutrients and "Other" indicate a higher effluent than influent value. Part of this discrepancy is caused by rounding errors. The greatest cause of this paradox results in those locales where it was known that water quality standards require limited quantities of these constituents in the effluent but influent values were unknown for a variety of reasons. In these cases the effluent values were recorded to the highest level of accuracy known, but the influent value was left blank unless accurate data were available. Thus, percentage removals are meaningless and the reader is cautioned not to attempt their use.

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Table 5 summarizes the plant's loadings and effluent quantities, as well as efficiencies for all treatment plants in operation on January 1, 1978 and reported in this Survey. Note that the total flow is equal to the flows reported in Table 4 for each State.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES EXISTING IN 1978
IN METRIC TONS PER DAY
ALL FACILITIES

STATE	FLOW	**** BOD5 INF.	***** EFF.	% REM.	**** SOLIDS INF.	***** EFF.	% REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	1,283(338)	210	42	79.6	237	46	80.3			1			
ALASKA	135(35)	20	8	58.9	26	8	66.4						
ARIZONA	754(199)	152	25	83.0	163	31	80.7						
ARKANSAS	630(166)	172	35	79.3	190	51	73.0						
CALIFORNIA	12,988(3431)	3,701	970	73.8	3,902	828	78.8	49	35	43	94		
COLORADO	1,481(391)	351	89	74.5	354	75	78.7			11	11		
CONNECTICUT	1,343(354)	197	49	74.8	215	40	81.1						
DELAWARE	316(83)	55	8	84.7	60	16	73.6						
DIST. OF COLUM.	1,046(276)	162	29	81.9	151	30	80.0	6	2	15	13		
FLORIDA	2,404(635)	455	82	81.9	455	78	82.7						
GEORGIA	1,902(502)	384	63	83.4	331	91	72.5						
HAWAII	345(91)	74	62	16.0	65	50	22.1						
IDAHO	343(90)	82	12	85.2	73	11	85.1			1			
ILLINOIS	7,757(2049)	1,108	104	90.6	1,432	128	91.0	2		77	32		
INDIANA	2,771(732)	479	60	87.4	557	69	87.6	5	2	15	9		
IOWA	1,170(309)	401	84	79.0	367	70	80.8			9	5		
KANSAS	833(220)	199	42	78.8	210	43	79.1						
KENTUCKY	974(257)	239	64	73.2	289	59	79.4						
LOUISIANA	1,115(294)	213	70	66.9	221	73	66.8						
MAINE	382(100)	88	24	72.7	88	19	78.3						
MARYLAND	1,213(320)	304	63	79.0	271	63	76.8	10	4				
MASSACHUSETTS	3,163(835)	517	273	47.2	556	222	60.0						
MICHIGAN	5,438(1436)	1,458	255	82.5	2,535	426	83.2	37	13	12	2		
MINNESOTA	1,568(414)	410	68	83.3	463	58	87.5			12	8		
MISSISSIPPI	824(217)	160	24	84.9	151	44	70.9						
MISSOURI	2,187(577)	492	226	54.1	566	174	69.2						
MONTANA	260(68)	46	7	83.3	39	8	78.3						
NEBRASKA	677(179)	201	78	60.8	206	73	64.5						
NEVADA	319(84)	70	6	90.2	70	6	90.2						
NEW HAMPSHIRE	208(55)	47	17	63.1	47	13	72.2						
NEW JERSEY	3,772(996)	861	518	39.8	863	293	66.1			1			
NEW MEXICO	378(100)	84	21	74.7	81	16	79.5						
NEW YORK	8,971(2370)	1,210	445	63.2	1,194	390	67.3	3	1	2	1		
NORTH CAROLINA	1,664(439)	393	52	86.7	327	65	80.2			2	1		
NORTH DAKOTA	145(38)	33	2	93.8	31	3	88.6						
OHIO	5,357(1415)	985	172	82.5	1,202	225	81.3	26	12	35	21		
OKLAHOMA	903(238)	190	27	85.6	205	32	84.1						
OREGON	1,060(280)	213	23	89.0	221	30	86.0						
PENNSYLVANIA	5,322(1406)	926	245	73.5	1,101	272	75.2	3	1	12	9		
RHODE ISLAND	398(105)	41	21	47.1	53	26	50.6						
SOUTH CAROLINA	988(261)	273	52	80.8	195	53	72.5						
SOUTH DAKOTA	207(54)	53	8	84.0	49	7	84.5			3	2		
TENNESSEE	1,748(461)	561	136	75.7	543	226	58.3			6	2		
TEXAS	4,790(1265)	1,021	98	90.4	1,141	160	86.0						
UTAH	802(211)	113	16	85.8	116	17	85.1						
VERMONT	166(43)	28	13	52.7	25	9	63.1						
VIRGINIA	1,620(427)	314	61	80.6	304	49	83.7	1					
WASHINGTON	1,598(422)	319	117	63.3	334	82	75.3			1	1		
WEST VIRGINIA	383(101)	89	27	69.6	85	19	76.6			1			
WISCONSIN	2,365(624)	572	82	85.6	584	111	80.9	11	3				
WYOMING	161(42)	32	9	70.6	33	8	75.7						
AMERICAN SAMOA	1()	0	0	3.2	0	0	4.7						
GUAM	23(6)	5	5	6.6	5	5	7.0						
N. MARIANAS	2()	0	0	68.8	0	0	41.7						
PUERTO RICO	509(134)	133	53	60.4	115	31	72.3						
PAC. TR. TERR.	0()	0	0	36.4	0	0	56.1						
VIRGIN ISLANDS	9(2)	1	1	12.6	2	1	44.4						
U.S. TOTALS	99,198(26205)	20,924	5,168	75.3	23,129	5,061	78.1	164	80	269	220		

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

4. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

TABLE 6 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES PROJECTED FOR 2000 - ALL FACILITIES

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from projected design flow information as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total design flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For instance, some phosphorus is present in all wastewaters and a percentage is removed in all treatment plants. Unless there is a specific requirement to remove phosphorus, neither influent nor effluent values are reported. Thus, removals are shown only where stipulated.

It should be noted that some State totals for nutrients and "Other" indicate a higher effluent than influent value. Part of this discrepancy is caused by rounding errors. The greatest cause of this paradox results in those locales where it was known that water quality standards require limited quantities of these constituents in the effluent but influent values were unknown for a variety of reasons. In these cases the effluent values were recorded to the highest level of accuracy known, but the influent value was left blank unless accurate data were available. Thus, percentage removals are meaningless and the reader is cautioned not to attempt their use.

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Table 6 summarizes the waste treatment plant loadings and effluent quantities for all treatment plants existing in 1978 which will remain in operation through 2000, plus all those projected to be built during that period. All plants anticipated to be abandoned are deleted from this summary. Level of treatment is not indicated.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES PROJECTED FOR 2000
IN METRIC TONS PER DAY
ALL FACILITIES

STATE	FLOW	**** BODS INF.	***** EFF.	% REM.	**** SOLIDS INF.	***** EFF.	% REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	1,992(526)	426	47	88.9	434	59	86.3			17	3	1	3
ALASKA	356(94)	61	10	83.1	71	10	84.9						
ARIZONA	1,418(374)	327	36	88.9	320	36	88.7						
ARKANSAS	1,214(320)	286	21	92.6	268	25	90.3						
CALIFORNIA	14,013(3701)	4,035	255	93.7	4,149	265	93.6	30	7	69	16	18	25
COLORADO	2,610(689)	667	116	82.5	657	99	84.9			21	2		
CONNECTICUT	2,104(555)	404	55	86.4	408	51	87.3	3		4			
DELAWARE	601(158)	142	8	94.1	139	11	91.4	2		1			
DIST. OF COLUM.	1,169(308)	280	5	97.9	280	8	97.1	8		15	1		
FLORIDA	6,461(1706)	1,367	134	90.1	1,417	143	89.9	16	1	4			
GEORGIA	3,750(990)	798	69	91.3	754	104	86.2	9		41	7	6	12
HAWAII	736(194)	193	20	89.6	156	17	89.0						
IDAHO	637(168)	154	17	88.5	150	19	87.1			4			
ILLINOIS	11,013(2909)	1,794	124	93.0	2,472	149	94.0	5		126	18		
INDIANA	4,149(1096)	828	55	93.3	935	55	94.1	16	1	39	6	1	10
IOWA	1,776(469)	574	39	93.2	475	54	88.5			21	2		
KANSAS	1,401(370)	342	37	88.9	369	41	88.8			1			
KENTUCKY	2,098(554)	442	46	89.4	481	57	88.0			14	1	2	5
LOUISIANA	2,446(646)	547	68	87.4	559	73	86.9						
MAINE	667(176)	159	19	87.7	159	19	88.0						
MARYLAND	2,979(786)	698	37	94.7	639	38	94.0	27	2	38	1	2	13
MASSACHUSETTS	4,904(1295)	997	127	87.3	1,102	128	88.3	8		10			
MICHIGAN	8,330(2200)	1,584	191	87.9	2,245	206	90.8	71	10	19	2		
MINNESOTA	2,470(652)	677	31	95.4	718	35	95.0	2		25	5		
MISSISSIPPI	1,260(332)	264	27	89.5	257	38	85.1			2			1
MISSOURI	3,848(1016)	913	115	87.4	954	127	86.6			2			
MONTANA	444(117)	81	12	84.4	85	12	85.0						
NEBRASKA	1,008(266)	358	28	92.0	355	31	91.2					40	2
NEVADA	998(263)	144	14	90.0	144	11	91.9	6					8
NEW HAMPSHIRE	709(187)	212	18	91.1	218	18	91.4			1			
NEW JERSEY	5,711(1508)	1,665	140	91.6	1,701	141	91.7	5		20	3		3
NEW MEXICO	591(156)	128	13	89.2	126	13	89.0						
NEW YORK	15,189(4012)	2,876	333	88.4	3,143	350	88.8	24	2	28	3	90	23
NORTH CAROLINA	3,338(881)	870	57	93.4	757	97	87.1			35	9	6	11
NORTH DAKOTA	228(60)	58	5	90.6	57	6	88.6						
OHIO	8,481(2240)	1,816	127	93.0	2,019	142	93.0	67	6	111	11		
OKLAHOMA	1,629(430)	365	31	91.3	398	43	89.0	2		1			
OREGON	1,930(510)	476	32	93.1	465	36	92.1	4		1			
PENNSYLVANIA	7,979(2107)	1.667	170	89.7	1,835	200	89.1	25	4	45	5	1	3
RHODE ISLAND	642(169)	160	16	89.9	152	16	89.1			2			
SOUTH CAROLINA	2,906(767)	705	52	92.6	613	85	86.0	1		29	2	4	7
SOUTH DAKOTA	326(86)	91	7	92.1	88	7	91.5			5			
TENNESSEE	3,330(879)	1,014	72	92.9	871	86	90.1			46	9	3	5
TEXAS	8,629(2279)	2,075	108	94.8	2,118	120	94.3	2		45	8		
UTAH	1,135(299)	224	10	95.1	241	10	95.5						
VERMONT	259(68)	54	5	89.4	52	5	88.8	1					
VIRGINIA	3,160(834)	719	56	92.2	714	55	92.3	10		5		2	16
WASHINGTON	3,354(886)	791	93	88.2	835	98	88.2	2		8	1		
WEST VIRGINIA	1,055(278)	241	25	89.4	239	25	89.1			3	1		1
WISCONSIN	2,570(679)	598	53	91.1	579	54	90.6	13	1	12	1	8	2
WYOMING	224(59)	47	6	86.0	48	6	86.2						
AMERICAN SAMOA	24(6)	8	0	90.7	3	0	80.4						
GUAM	70(18)	14	1	86.1	16	1	87.9						
N. MARIANAS	21(5)	2	0	85.2	2	0	85.2						
PUERTO RICO	1,348(356)	373	40	89.3	337	40	88.1						
PAC. TR. TERR.	40(10)	8	1	87.6	8	1	87.6						
VIRGIN ISLANDS	14(3)	2	0	83.4	3	0	89.0						
U.S. TOTALS	161,744(42728)	36,801	3,234	91.2	38,790	3,576	90.8	359	34	870	117	184	150

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 7 - TREATMENT POPULATIONS - PRESENT, PROJECTED, RESIDENT & NONRESIDENT

Table 7 summarizes the populations, by State, for 1978 and 2000 which are now or will be receiving treatment of their wastewaters. Resident populations are permanent residents of the area. Nonresident populations include commuters living in one area and working in another, as well as temporary residents at resort areas and similar locations.

The year 2000 ceiling population is the population expected to be resident in each State as predicted by the Department of Commerce, Bureau of Economic Analysis (BEA). The projections were produced by BEA after extensive analysis which included review and comment by State agencies responsible for population projections. All levels of treatment are included under "Receiving Treatment."

Residents not receiving treatment are those residents of established authorities within a State. Many rural residents, who are counted as a part of a State's ceiling population, are not counted in the resident receiving or not receiving treatment categories. Therefore, the totals of residents receiving treatment and not receiving treatment do not equal the total population of a State.

The "Percent Served" figures are based upon resident populations compared with BEA 1978 estimates and 2000 ceilings. 1978 BEA population estimates can be found in other tables, such as Table 8.

1978 NEEDS SURVEY

TREATMENT POPULATIONS
PRESENT, PROJECTED, RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	2000 CEILING POPULATION	****** RECEIVING TREATMENT ****** 1978 RES.	1978 NONRES.	2000 RES.	2000 NONRES.	*** NOT RECEIVING TREATMENT *** 1978 RES.	1978 NONRES.	2000 RES.	2000 NONRES.	PERCENT SERVED 1978	2000
ALABAMA	4,140	1,970	102	3,365	204	328	3	43	0	53.4	81.3
ALASKA	667	200	3	640	18	66	0	14	0	49.2	96.1
ARIZONA	4,149	1,792	65	3,666	203	222	4	20	0	78.1	88.4
ARKANSAS	2,970	1,182	20	2,346	41	85	0	0	0	55.2	79.0
CALIFORNIA	26,786	19,821	1,025	26,701	1,432	932	7	130	0	90.5	99.7
COLORADO	3,868	2,438	167	3,906	524	13	0	0	0	93.1	101.0
CONNECTICUT	3,741	1,872	41	2,879	39	886	0	514	0	60.3	77.0
DELAWARE	841	462	50	816	378	59	0	18	0	79.4	97.1
DIST. OF COLUM.	661	729	1,898	611	1,728	0	0	0	0	105.8	92.4
FLORIDA	15,049	4,510	835	12,346	1,841	1,513	21	376	0	53.4	82.0
GEORGIA	7,053	2,683	123	5,781	220	423	0	252	0	53.2	82.0
HAWAII	1,366	222	32	1,294	238	467	58	1	0	24.9	94.7
IDAHO	1,183	478	13	948	79	53	5	9	3	55.9	80.2
ILLINOIS	12,358	9,800	32	11,776	46	117	0	12	0	87.2	95.3
INDIANA	5,732	3,444	241	4,933	501	304	23	23	0	64.6	86.1
IOWA	3,101	2,084	81	2,839	140	84	0	0	0	72.4	91.6
KANSAS	2,517	1,795	12	2,532	13	116	0	0	0	77.2	100.6
KENTUCKY	4,224	1,630	50	3,326	67	358	0	252	0	47.2	78.8
LOUISIANA	4,659	2,314	64	4,396	95	217	8	0	0	59.0	94.4
MAINE	1,222	408	79	949	140	187	0	184	0	37.7	77.7
MARYLAND	5,583	2,347	127	4,688	486	329	10	77	0	56.7	84.0
MASSACHUSETTS	6,614	3,818	455	5,740	611	1,251	35	796	55	66.0	86.8
MICHIGAN	10,314	6,563	114	8,916	251	1,127	2	254	6	71.9	86.4
MINNESOTA	4,505	2,930	22	3,740	40	140	0	30	0	73.7	83.0
MISSISSIPPI	2,740	1,276	9	2,202	75	230	1	119	0	53.4	80.4
MISSOURI	5,225	3,414	867	5,206	1,427	193	0	0	0	71.1	99.6
MONTANA	802	472	33	692	41	23	0	1	0	62.0	86.3
NEBRASKA	1,734	1,268	15	1,742	22	38	0	0	0	81.3	100.5
NEVADA	1,141	603	90	1,141	180	40	0	0	0	95.3	100.0
NEW HAMPSHIRE	1,306	269	56	894	150	255	7	223	33	31.7	68.5
NEW JERSEY	8,747	5,704	670	8,919	1,290	556	104	56	60	77.8	102.0
NEW MEXICO	1,436	1,014	14	1,347	32	129	0	45	0	85.3	93.8
NEW YORK	18,922	11,653	2,056	17,194	3,884	1,927	45	856	2	65.0	90.9
NORTH CAROLINA	7,419	2,341	179	4,445	441	1,005	4	834	14	42.4	59.9
NORTH DAKOTA	690	425	0	578	0	0	0	0	0	65.2	83.8
OHIO	12,031	8,051	47	11,567	92	676	0	26	0	75.2	96.1
OKLAHOMA	3,396	2,096	1	3,300	10	107	0	0	0	74.6	97.2
OREGON	3,209	1,415	37	2,939	73	304	2	0	0	59.6	91.6
PENNSYLVANIA	12,365	8,739	526	11,753	1,294	1,252	11	244	0	74.2	95.1
RHODE ISLAND	1,033	486	48	795	71	186	0	100	0	52.1	77.1
SOUTH CAROLINA	3,700	1,220	231	2,787	498	397	3	97	0	42.5	75.3
SOUTH DAKOTA	730	439	13	616	10	2	0	0	0	63.8	84.5
TENNESSEE	5,573	2,184	72	4,191	145	774	0	260	0	50.8	75.2
TEXAS	18,069	10,033	122	16,824	230	651	0	0	0	78.2	93.1
UTAH	1,688	1,164	15	1,683	27	5	0	0	0	91.8	99.7
VERMONT	607	220	45	381	77	64	5	81	7	45.6	62.8
VIRGINIA	6,755	3,283	298	5,754	470	313	0	56	0	63.9	85.2
WASHINGTON	4,417	2,334	435	4,099	800	330	15	98	0	63.8	92.8
WEST VIRGINIA	2,003	752	16	2,034	24	239	0	22	0	40.5	101.6
WISCONSIN	5,553	3,408	79	3,409	201	199	1	28	0	73.3	61.4
WYOMING	484	323	16	468	18	0	0	0	0	79.6	96.8
AMERICAN SAMOA	40	1	0	36	1	27	0	2	0	4.8	90.5
GUAM	275	69	3	215	3	19	0	22	0	75.3	78.5
N. MARIANAS	35	1	0	31	2	8	0	0	0	11.5	89.4
PUERTO RICO	4,700	1,757	0	3,242	0	1,092	0	754	0	53.5	69.0
PAC. TR. TERR.	170	2	0	107	4	48	0	26	0	1.8	63.1
VIRGIN ISLANDS	116	19	3	25	3	3	0	0	0	20.0	21.7
U.S. TOTALS	270,414	151,955	11,672	239,780	20,954	20,397	389	6,976	185	69.1	88.7

TABLE 8 - POPULATIONS SERVED BY TREATMENT WITH NO DISCHARGE - PRESENT RESIDENT & NONRESIDENT

Table 8 summarizes the existing populations, by State, which are receiving treatment by a facility having no discharge to surface waters. This table does not differentiate between treatment levels.

The majority of the facilities are oxidation/ stabilization ponds designed for evaporation and/or infiltration of the total flow. Recycling and reuse, including spray irrigation systems, are also included.

Since populations are given in 1000's, a few States (see Arkansas) indicate treatment plants with no contributory populations. This is due to rounding of the small facilities.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

FEBRUARY 10, 1979
TABLE 8

1978 NEEDS SURVEY

POPULATIONS SERVED BY TREATMENT WITH NO DISCHARGE
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	1978 POPULATION	****** RECEIVING TREATMENT ***** 1978 RES.	1978 NONRES.	*** NOT RECEIVING TREATMENT **** 1978 RES.	1978 NONRES.	** PERCENT SERVED ** 1978	NO. OF TREATMENT PLANTS
ALABAMA	3,690	0	0	0	0	0.0	0
ALASKA	407	2	0	0	0	0.6	1
ARIZONA	2,296	107	10	28	0	4.7	40
ARKANSAS	2,144	0	0	0	0	0.0	2
CALIFORNIA	21,896	1,460	122	237	6	6.7	253
COLORADO	2,619	18	2	0	0	0.7	39
CONNECTICUT	3,108	1	0	6	0	0.0	3
DELAWARE	582	0	0	0	0	0.0	0
DIST. OF COLUM.	690	0	0	0	0	0.0	0
FLORIDA	8,452	0	0	0	0	0.0	0
GEORGIA	5,048	0	0	0	0	0.0	1
HAWAII	895	0	2	3	0	0.1	3
IDAHO	857	15	0	1	0	1.8	21
ILLINOIS	11,245	0	0	0	0	0.0	1
INDIANA	5,330	0	0	0	0	0.0	0
IOWA	2,879	0	0	0	0	0.0	1
KANSAS	2,326	73	0	0	0	3.2	131
KENTUCKY	3,458	0	0	0	0	0.0	0
LOUISIANA	3,921	0	0	0	0	0.0	3
MAINE	1,085	0	0	0	0	0.0	0
MARYLAND	4,139	0	0	0	0	0.0	0
MASSACHUSETTS	5,782	0	0	0	0	0.0	0
MICHIGAN	9,129	66	6	33	0	0.7	40
MINNESOTA	3,975	0	0	0	0	0.0	0
MISSISSIPPI	2,389	0	0	0	0	0.0	0
MISSOURI	4,801	0	0	0	0	0.0	5
MONTANA	761	24	1	1	0	3.2	42
NEBRASKA	1,561	34	1	0	0	2.2	85
NEVADA	633	26	1	3	0	4.2	15
NEW HAMPSHIRE	849	0	1	3	3	0.1	2
NEW JERSEY	7,329	0	0	0	0	0.0	0
NEW MEXICO	1,190	161	0	10	0	13.5	51
NEW YORK	17,924	0	0	0	0	0.0	0
NORTH CAROLINA	5,525	0	0	0	0	0.0	0
NORTH DAKOTA	653	14	0	0	0	2.3	18
OHIO	10,701	0	0	0	0	0.0	0
OKLAHOMA	2,811	47	1	3	0	1.7	98
OREGON	2,376	8	3	0	0	0.4	9
PENNSYLVANIA	11,785	0	0	0	0	0.0	0
RHODE ISLAND	935	0	0	0	0	0.0	0
SOUTH CAROLINA	2,876	0	0	0	0	0.0	0
SOUTH DAKOTA	689	10	0	0	0	1.6	23
TENNESSEE	4,299	0	0	0	0	0.0	0
TEXAS	12,830	25	0	0	0	0.2	5
UTAH	1,268	45	0	0	0	3.6	22
VERMONT	463	0	3	0	0	0.1	1
VIRGINIA	5,135	0	0	0	0	0.0	0
WASHINGTON	3,658	12	0	1	10	0.3	18
WEST VIRGINIA	1,859	0	0	0	0	0.0	0
WISCONSIN	4,651	24	0	1	0	0.5	31
WYOMING	406	10	1	0	0	2.6	20
AMERICAN SAMOA	29	0	0	0	0	0.0	0
GUAM	93	0	0	2	0	0.0	1
N. MARIANAS	12	0	0	0	0	0.0	0
PUERTO RICO	3,282	0	0	0	0	0.0	0
PAC. TR. TERR.	114	0	0	0	0	0.0	0
VIRGIN ISLANDS	95	0	0	0	0	0.0	0
U.S. TOTALS	219,955	2,197	161	340	21	1.0	985

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUNDOFFS.

TABLE 9 - POPULATIONS TO BE SERVED BY TREATMENT WITH NO DISCHARGE - PROJECTED RESIDENT & NONRESIDENT

Table 9 summarizes the year 2000 projected populations, by State, which will be receiving treatment by a facility having no discharge to surface waters. This table does not differentiate between treatment levels.

The majority of the facilities are oxidation/stabilization ponds designed for evaporation and/or infiltration of the total flow. Recycling and reuse, including spray irrigation systems, are also included.

Since populations are given in 1000's, a few States (see Minnesota) indicate treatment plants with no contributory populations. This is due to rounding of the small facilities.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

FEBRUARY 10, 1979
TABLE 9

1978 NEEDS SURVEY

POPULATIONS TO BE SERVED BY TREATMENT WITH NO DISCHARGE
PROJECTED RESIDENT & NONRESIDENT
(IN THOUSANDS)

		****** RECEIVING TREATMENT *****		*** NOT RECEIVING TREATMENT ****		** PERCENT SERVED **	NO. OF
STATE	2000 POPULATION	2000 RES.	2000 NONRES.	2000 RES.	2000 NONRES.	2000	TREATMENT PLANTS
ALABAMA	4,140	0	0	0	0	0.0	0
ALASKA	667	0	0	0	0	0.0	0
ARIZONA	4,149	455	148	4	0	11.0	69
ARKANSAS	2,970	1	0	0	0	0.1	4
CALIFORNIA	26,786	3,588	298	24	0	13.4	581
COLORADO	3,868	14	4	0	0	0.4	30
CONNECTICUT	3,741	0	0	0	0	0.0	1
DELAWARE	841	0	0	0	0	0.0	0
DIST. OF COLUM.	661	0	0	0	0	0.0	0
FLORIDA	15,049	0	0	0	0	0.0	0
GEORGIA	7,053	0	0	0	0	0.0	0
HAWAII	1,366	79	13	0	0	5.8	7
IDAHO	1,183	36	2	0	0	3.1	29
ILLINOIS	12,358	0	0	0	0	0.0	0
INDIANA	5,732	0	0	0	0	0.0	0
IOWA	3,101	1	0	0	0	0.1	2
KANSAS	2,517	115	0	0	0	4.6	232
KENTUCKY	4,224	0	0	0	0	0.0	0
LOUISIANA	4,659	1	0	0	0	0.0	6
MAINE	1,222	11	2	8	0	0.9	18
MARYLAND	5,583	0	0	0	0	0.0	0
MASSACHUSETTS	6,614	5	12	0	0	0.1	4
MICHIGAN	10,314	204	33	6	1	2.0	77
MINNESOTA	4,505	0	0	0	0	0.0	2
MISSISSIPPI	2,740	0	0	0	0	0.0	0
MISSOURI	5,225	3	0	0	0	0.1	23
MONTANA	802	34	1	1	0	4.3	42
NEBRASKA	1,734	97	3	0	0	5.6	171
NEVADA	1,141	74	11	0	0	6.5	37
NEW HAMPSHIRE	1,306	53	38	26	21	4.1	36
NEW JERSEY	8,747	0	0	0	0	0.0	0
NEW MEXICO	1,436	257	0	0	0	17.9	95
NEW YORK	18,922	0	0	0	0	0.0	0
NORTH CAROLINA	7,419	0	0	0	0	0.0	1
NORTH DAKOTA	690	16	0	0	0	2.5	22
OHIO	12,031	0	0	0	0	0.0	0
OKLAHOMA	3,396	176	0	0	0	5.2	277
OREGON	3,209	11	0	0	0	0.4	9
PENNSYLVANIA	12,365	0	0	0	0	0.0	0
RHODE ISLAND	1,033	0	0	0	0	0.0	0
SOUTH CAROLINA	3,700	0	0	0	0	0.0	0
SOUTH DAKOTA	730	14	1	0	0	2.0	25
TENNESSEE	5,573	0	0	0	0	0.0	0
TEXAS	18,069	34	0	0	0	0.2	5
UTAH	1,688	70	1	0	0	4.2	18
VERMONT	607	1	6	0	0	0.2	2
VIRGINIA	6,755	0	0	0	0	0.0	0
WASHINGTON	4,417	32	4	0	0	0.7	23
WEST VIRGINIA	2,003	0	0	0	0	0.0	0
WISCONSIN	5,553	32	2	0	0	0.6	31
WYOMING	484	4	0	0	0	0.8	7
AMERICAN SAMOA	40	0	0	0	0	0.0	0
GUAM	275	12	0	3	0	4.6	3
N. MARIANAS	35	0	0	0	0	0.0	0
PUERTO RICO	4,700	0	0	0	0	0.0	0
PAC. TR. TERR.	170	4	0	0	0	2.9	2
VIRGIN ISLANDS	116	0	0	0	0	0.0	0
U.S. TOTALS	270,414	5,450	588	75	23	2.0	1,891

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUNDOFFS.

TABLE 10 - POPULATIONS SERVED BY RAW DISCHARGE - PRESENT RESIDENT & NONRESIDENT

Table 10 summarizes 1978 populations served by authorities when the collected waste is not treated, but is discharged to the environment as a raw waste. This would include preliminary treatment (comminution, screening, grit chambers, etc.), but not primary sedimentation.

Since populations are given in 1000's, a few States (see Maine) indicate treatment plants with no contributory populations. This is due to rounding of the small facilities.

The populations listed as "Not Served" are those people within the service area or authority whose waste is discharged raw, but are themselves not contributing to the discharge because they are not on a sewer system.

Approximately 64 percent of the facilities having a raw discharge are in coastal States and 10 percent in Great Lakes States.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

A similar table for the projected year 2000 population is not relevant since this treatment and disposal method does not meet the requirements of the Clean Water Act and is planned to be eliminated by that date.

1978 NEEDS SURVEY

POPULATIONS SERVED BY RAW DISCHARGE
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	1978 POPULATION	******** SERVED ******** 1978 RES.	1978 NONRES.	****** NOT SERVED ****** 1978 RES.	1978 NONRES.	** PERCENT SERVED ** 1978	NO. OF FACILITIES
ALABAMA	3,690	0	0	0	0	0.0	1
ALASKA	407	0	0	1	0	0.0	9
ARIZONA	2,296	0	0	0	0	0.0	0
ARKANSAS	2,144	15	0	0	0	0.7	2
CALIFORNIA	21,896	0	0	0	0	0.0	0
COLORADO	2,619	0	0	0	0	0.0	0
CONNECTICUT	3,108	0	0	0	0	0.0	0
DELAWARE	582	0	0	0	0	0.0	0
DIST. OF COLUM.	690	0	0	0	0	0.0	0
FLORIDA	8,452	109	21	266	21	1.3	4
GEORGIA	5,048	0	0	2	0	0.0	4
HAWAII	895	0	0	25	10	0.0	2
IDAHO	857	0	0	0	0	0.0	1
ILLINOIS	11,245	1	0	0	0	0.0	5
INDIANA	5,330	0	0	0	0	0.0	1
IOWA	2,879	0	0	0	0	0.0	1
KANSAS	2,326	0	0	0	0	0.0	0
KENTUCKY	3,458	0	0	4	0	0.0	3
LOUISIANA	3,921	233	0	2	6	6.0	12
MAINE	1,085	0	0	0	0	0.0	15
MARYLAND	4,139	0	0	0	0	0.0	0
MASSACHUSETTS	5,782	0	0	0	0	0.0	0
MICHIGAN	9,129	0	0	0	0	0.0	1
MINNESOTA	3,975	0	0	0	0	0.0	3
MISSISSIPPI	2,389	0	0	3	0	0.0	4
MISSOURI	4,801	0	0	0	0	0.0	3
MONTANA	761	1	0	0	0	0.2	1
NEBRASKA	1,561	0	0	0	0	0.0	0
NEVADA	633	0	0	0	0	0.0	0
NEW HAMPSHIRE	849	0	0	0	0	0.0	0
NEW JERSEY	7,329	0	0	0	0	0.0	0
NEW MEXICO	1,190	0	0	0	0	0.0	0
NEW YORK	17,924	0	0	0	0	0.0	1
NORTH CAROLINA	5,525	0	0	0	0	0.0	2
NORTH DAKOTA	653	0	0	0	0	0.0	0
OHIO	10,701	0	0	0	0	0.0	1
OKLAHOMA	2,811	0	0	0	0	0.0	0
OREGON	2,376	0	0	0	0	0.0	0
PENNSYLVANIA	11,785	0	0	0	0	0.0	3
RHODE ISLAND	935	0	0	0	0	0.0	0
SOUTH CAROLINA	2,876	0	0	1	0	0.0	2
SOUTH DAKOTA	689	0	0	0	0	0.0	3
TENNESSEE	4,299	0	0	0	0	0.0	0
TEXAS	12,830	0	0	0	0	0.0	0
UTAH	1,268	0	0	0	0	0.0	0
VERMONT	483	0	0	1	0	0.0	1
VIRGINIA	5,135	2	0	0	0	0.0	2
WASHINGTON	3,658	0	0	0	0	0.0	0
WEST VIRGINIA	1,859	0	0	0	0	0.0	0
WISCONSIN	4,651	0	0	0	0	0.0	1
WYOMING	406	0	0	0	0	0.1	3
AMERICAN SAMOA	29	0	0	0	0	0.0	0
GUAM	93	0	0	0	0	0.0	0
N. MARIANAS	12	0	0	0	0	0.0	0
PUERTO RICO	3,282	0	0	0	0	0.0	0
PAC. TR. TERR.	114	0	0	0	0	0.0	0
VIRGIN ISLANDS	95	0	0	0	0	0.0	0
U.S. TOTALS	219,955	364	21	312	37	0.2	91

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 11 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - FACILITIES PROVIDING RAW DISCHARGE

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For this treatment category no nutrient data is presented.

*   *   *   *

Table 11 is an extension of Table 10. Because of the small flows and populations affected, rounding of the summaries created some rather confusing results. The user of this table, therefore, should consider only the U.S. totals to be meaningful.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES EXISTING IN 1978
FACILITIES PROVIDING RAW DISCHARGE
IN METRIC TONS PER DAY

STATE	FLOW	**** BOD5 **** INF.	EFF.	% REM.	**** SOLIDS **** INF.	EFF.	% REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	0()	0	0	0.0	0	0	0.0						
ALASKA	0()	0	0	0.0	0	0	0.0						
ARIZONA	0()	0	0	0.0	0	0	0.0						
ARKANSAS	12(3)	9	1	81.7	10	10	0.5						
CALIFORNIA	0()	0	0	0.0	0	0	0.0						
COLORADO	0()	0	0	0.0	0	0	0.0						
CONNECTICUT	0()	0	0	0.0	0	0	0.0						
DELAWARE	0()	0	0	0.0	0	0	0.0						
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	62(16)	12	12	2.9	12	11	4.4						
GEORGIA	0()	0	0	0.0	0	0	0.0						
HAWAII	0()	0	0	0.0	0	0	0.0						
IDAHO	0()	0	0	0.0	0	0	0.0						
ILLINOIS	0()	0	0	85.0	0	0	87.5						
INDIANA	0()	0	0	0.0	0	0	0.0						
IOWA	0()	0	0	0.0	0	0	0.0						
KANSAS	0()	0	0	0.0	0	0	0.0						
KENTUCKY	0()	0	0	0.0	0	0	0.0						
LOUISIANA	154(40)	32	32	0.0	36	36	0.0						
MAINE	0()	0	0	0.0	0	0	0.0						
MARYLAND	0()	0	0	0.0	0	0	0.0						
MASSACHUSETTS	0()	0	0	0.0	0	0	0.0						
MICHIGAN	0()	0	0	0.0	0	0	0.0						
MINNESOTA	0()	0	0	0.0	0	0	0.0						
MISSISSIPPI	0()	0	0	0.0	0	0	0.0						
MISSOURI	0()	0	0	0.0	0	0	0.0						
MONTANA	0()	0	0	77.0	0	0	70.0						
NEBRASKA	0()	0	0	0.0	0	0	0.0						
NEVADA	0()	0	0	0.0	0	0	0.0						
NEW HAMPSHIRE	0()	0	0	0.0	0	0	0.0						
NEW JERSEY	0()	0	0	0.0	0	0	0.0						
NEW MEXICO	0()	0	0	0.0	0	0	0.0						
NEW YORK	0()	0	0	0.0	0	0	0.0						
NORTH CAROLINA	0()	0	0	0.0	0	0	0.0						
NORTH DAKOTA	0()	0	0	0.0	0	0	0.0						
OHIO	0()	0	0	0.0	0	0	0.0						
OKLAHOMA	0()	0	0	0.0	0	0	0.0						
OREGON	0()	0	0	0.0	0	0	0.0						
PENNSYLVANIA	0()	0	0	0.0	0	0	0.0						
RHODE ISLAND	0()	0	0	0.0	0	0	0.0						
SOUTH CAROLINA	0()	0	0	0.0	0	0	0.0						
SOUTH DAKOTA	0()	0	0	0.0	0	0	0.0						
TENNESSEE	0()	0	0	0.0	0	0	0.0						
TEXAS	0()	0	0	0.0	0	0	0.0						
UTAH	0()	0	0	0.0	0	0	0.0						
VERMONT	0()	0	0	0.0	0	0	0.0						
VIRGINIA	1()	0	0	80.6	0	0	86.2						
WASHINGTON	0()	0	0	0.0	0	0	0.0						
WEST VIRGINIA	0()	0	0	0.0	0	0	0.0						
WISCONSIN	0()	0	0	77.3	0	0	93.3						
WYOMING	1()	0	0	57.3	0	0	30.7						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	0()	0	0	0.0	0	0	0.0						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	0()	0	0	0.0	0	0	0.0						
PAC. TR. TERR.	0()	0	0	0.0	0	0	0.0						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	230(60)	53	45	15.1	58	57	1.7						

NOTE: PHOSPHORUS AND NH3 NITROGEN NOT REMOVED BY THIS TYPE TREATMENT PROCESS

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 12 - POPULATIONS SERVED BY PRIMARY
TREATMENT - PRESENT RESIDENT &
NONRESIDENT

Table 12 summarizes 1978 populations served by authorities where the collected waste is treated only to the primary level prior to discharge. Preliminary treatment (comminution, screening, grit chambers, etc.) plus primary sedimentation would be included. Chlorination may or may not be a unit process. Treatment plants are included in this summary without regard to the processing or disposal of sludges generated.

Since populations are given in 1000's, a few States (see Oregon) indicate treatment plants with no contributory populations. This is due to rounding of the small facilities.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

A similar table for the projected year 2000 population is not relevant since this treatment and disposal method does not meet the requirements of the Clean Water Act and is planned to be eliminated by that date.

FEBRUARY 10, 1979
TABLE 12

1978 NEEDS SURVEY

POPULATIONS SERVED BY PRIMARY TREATMENT
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	1978 POPULATION	****** RECEIVING TREATMENT ***** 1978 RES.	1978 NONRES.	*** NOT RECEIVING TREATMENT **** 1978 RES.	1978 NONRES.	** PERCENT SERVED ** 1978	NO. OF TREATMENT PLANTS
ALABAMA	3,690	33	0	1	0	0.9	13
ALASKA	407	128	0	45	0	31.6	5
ARIZONA	2,296	88	0	5	0	3.8	7
ARKANSAS	2,144	197	1	10	0	9.2	31
CALIFORNIA	21,896	1,640	18	81	0	7.5	31
COLORADO	2,619	44	0	0	0	1.7	8
CONNECTICUT	3,108	350	0	143	0	11.3	8
DELAWARE	582	12	16	0	0	2.2	6
DIST. OF COLUM.	690	0	0	0	0	0.0	0
FLORIDA	8,452	26	0	5	0	0.3	4
GEORGIA	5,048	210	3	34	0	4.2	27
HAWAII	895	74	12	36	0	8.4	4
IDAHO	857	27	0	1	0	3.3	12
ILLINOIS	11,245	305	0	13	0	2.7	63
INDIANA	5,330	8	0	0	0	0.2	2
IOWA	2,879	200	15	5	0	7.0	22
KANSAS	2,326	212	0	47	0	9.1	15
KENTUCKY	3,458	50	0	15	0	1.5	9
LOUISIANA	3,921	163	0	3	0	4.2	8
MAINE	1,085	75	28	58	0	7.0	13
MARYLAND	4,139	174	89	29	2	4.2	8
MASSACHUSETTS	5,782	2,473	448	563	27	42.8	23
MICHIGAN	9,129	168	0	27	0	1.8	32
MINNESOTA	3,975	150	0	0	0	3.8	55
MISSISSIPPI	2,389	68	1	9	0	2.9	37
MISSOURI	4,801	1,713	725	44	0	35.7	36
MONTANA	761	19	0	0	0	2.6	3
NEBRASKA	1,561	576	0	5	0	37.0	25
NEVADA	633	1	0	1	0	0.3	4
NEW HAMPSHIRE	849	150	18	66	0	17.8	16
NEW JERSEY	7,329	1,471	329	76	22	20.1	55
NEW MEXICO	1,190	219	0	0	0	18.4	7
NEW YORK	17,924	1,480	219	166	3	8.3	116
NORTH CAROLINA	5,525	81	0	10	0	1.5	21
NORTH DAKOTA	653	3	0	0	0	0.6	5
OHIO	10,701	451	0	19	0	4.2	56
OKLAHOMA	2,811	241	0	20	0	8.6	160
OREGON	2,376	0	0	0	0	0.0	1
PENNSYLVANIA	11,785	1,608	205	135	0	13.6	48
RHODE ISLAND	935	143	5	22	0	15.3	5
SOUTH CAROLINA	2,876	133	5	80	0	4.6	28
SOUTH DAKOTA	689	6	0	0	0	0.9	9
TENNESSEE	4,299	65	0	18	0	1.5	16
TEXAS	12,830	31	0	0	0	0.2	15
UTAH	1,268	1	0	0	0	0.1	2
VERMONT	483	114	17	31	2	23.7	24
VIRGINIA	5,135	633	22	60	0	12.3	46
WASHINGTON	3,658	1,040	303	116	0	28.4	54
WEST VIRGINIA	1,859	212	0	113	0	11.5	44
WISCONSIN	4,651	45	18	8	0	1.0	33
WYOMING	406	23	0	0	0	5.8	8
AMERICAN SAMOA	29	1	0	27	0	4.8	2
GUAM	93	61	2	13	0	66.5	2
N. MARIANAS	12	0	0	0	0	0.0	0
PUERTO RICO	3,282	1,306	0	689	0	39.8	19
PAC. TR. TERR.	114	1	0	2	0	0.9	1
VIRGIN ISLANDS	95	19	3	3	0	20.0	1
U.S. TOTALS	219,955	18,747	2,519	2,877	58	8.5	1,306

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 13 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - FACILITIES PROVIDING PRIMARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For this treatment category no nutrient data is presented.

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Table 13 is an extension of Table 12. Rounding of flows and loadings causes some apparent errors in the table due to a relatively small data base. The value of this analysis is greater for those States having a large number (or high flow) of primary plants.

The national totals indicate approximately the levels of efficiency these types of plants achieve.

FEBRUARY 10, 1979
TABLE 13

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES EXISTING IN 1978
FACILITIES PROVIDING PRIMARY TREATMENT
IN METRIC TONS PER DAY

STATE	FLOW	**** BOD5 **** INF.	EFF.	% REM.	**** SOLIDS **** INF.	EFF.	% REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	16(4)	3	1	58.2	3	1	49.8						
ALASKA	92(24)	13	6	48.9	19	7	62.5						
ARIZONA	29(7)	8	1	77.7	7	2	61.9						
ARKANSAS	96(25)	29	14	49.9	22	11	51.3						
CALIFORNIA	608(160)	165	102	37.8	162	74	54.3						
COLORADO	373(98)	107	55	48.7	101	37	62.7						
CONNECTICUT	248(65)	32	19	38.7	37	12	67.7						
DELAWARE	11(3)	3	0	74.1	2	0	74.3						
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	9(2)	1	0	87.5	1	0	86.4						
GEORGIA	231(61)	46	8	82.4	25	13	48.8						
HAWAII	47(12)	7	4	34.4	8	3	58.6						
IDAHO	19(5)	3	1	66.4	2	1	62.9						
ILLINOIS	183(48)	41	18	55.5	44	32	27.1						
INDIANA	3(1)	0	0	47.4	0	0	47.4						
IOWA	133(35)	62	33	46.2	57	20	63.8						
KANSAS	109(28)	37	18	51.1	34	15	54.4						
KENTUCKY	38(10)	10	6	36.1	11	5	49.0						
LOUISIANA	68(18)	10	6	39.5	16	4	71.9						
MAINE	79(21)	18	10	44.9	18	8	56.2						
MARYLAND	89(23)	20	14	32.8	17	9	47.7						
MASSACHUSETTS	2,229(589)	351	241	31.4	370	189	49.0						
MICHIGAN	101(26)	14	8	40.4	14	6	58.9						
MINNESOTA	94(25)	33	19	40.4	22	8	63.0						
MISSISSIPPI	95(25)	24	4	81.8	23	5	77.2						
MISSOURI	1,215(321)	243	164	32.6	316	117	63.0						
MONTANA	18(4)	2	0	56.0	2	1	28.8						
NEBRASKA	325(85)	112	68	39.7	117	61	48.0						
NEVADA	1()	0	0	76.4	0	0	47.6						
NEW HAMPSHIRE	109(29)	23	12	44.7	25	9	62.3						
NEW JERSEY	1,093(288)	231	169	26.9	168	91	45.6						
NEW MEXICO	87(23)	19	8	53.7	16	7	55.2						
NEW YORK	1,435(379)	197	134	32.0	185	97	47.4						
NORTH CAROLINA	52(13)	15	3	80.8	13	3	70.3						
NORTH DAKOTA	1()	0	0	72.5	0	0	69.5						
OHIO	228(60)	44	24	45.4	53	19	63.1						
OKLAHOMA	103(27)	20	4	77.9	22	5	73.9						
OREGON	0()	0	0	75.0	0	0	75.0						
PENNSYLVANIA	1,278(337)	186	104	43.9	237	109	54.1						
RHODE ISLAND	70(18)	12	8	30.7	12	6	49.2						
SOUTH CAROLINA	107(28)	29	8	71.8	29	8	72.6						
SOUTH DAKOTA	2()	0	0	23.3	0	0	57.9						
TENNESSEE	49(13)	10	5	49.9	10	3	63.8						
TEXAS	9(2)	1	0	69.0	1	0	59.6						
UTAH	0()	0	0	40.1	0	0	48.4						
VERMONT	103(27)	18	10	40.5	15	6	59.5						
VIRGINIA	324(85)	58	35	40.6	54	21	60.6						
WASHINGTON	764(202)	113	77	31.7	141	56	60.2						
WEST VIRGINIA	105(27)	30	13	57.0	26	9	64.4						
WISCONSIN	22(5)	4	2	46.5	3	1	54.0						
WYOMING	9(2)	2	0	53.3	2	0	73.6						
AMERICAN SAMOA	1()	0	0	3.2	0	0	4.7						
GUAM	21(5)	5	5	0.0	5	5	0.0						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	386(101)	99	45	54.5	80	27	65.7						
PAC. TR. TERR.	0()	0	0	36.0	0	0	56.0						
VIRGIN ISLANDS	9(2)	1	1	12.6	2	1	44.4						
U.S. TOTALS	12,926(3414)	2,511	1,487	40.8	2,549	1,124	55.9						

NOTE: PHOSPHORUS AND NH3 NITROGEN NOT REMOVED BY THIS TYPE TREATMENT PROCESS

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 14 - POPULATIONS SERVED BY ADVANCED PRIMARY TREATMENT - PRESENT RESIDENT & NONRESIDENT

Table 14 summarizes 1978 populations served by authorities in which the collected waste is treated by advanced primary treatment prior to discharge. This category of treatment usually has greater removal efficiencies of BOD and suspended solids than do primary plants, but less than secondary treatment plants.

Many of the plants in question are various types of lagoon systems which provide some biological treatment, but are at present designed for inapplicable standards (number of cell, etc.) and probably will be upgraded in the future. Some trickling filter plants are also in this category. It should be noted that those States having the largest number of advanced primary facilities are in areas of the country practicing lagoon treatment - the plains States and the arid western and southwestern states. Kansas, for instance, has the highest population served (41.6 percent) by this level of treatment of any State. Eleven and one-half percent of the existing U.S. population use this type of treatment.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

A similar table for the projected year 2000 population is not relevant since this treatment and disposal method does not meet the requirements of the Clean Water Act, and is planned to be eliminated by that date.

FEBRUARY 10, 1979
TABLE 14

1978 NEEDS SURVEY

POPULATIONS SERVED BY ADVANCED PRIMARY TREATMENT
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	1978 POPULATION	****** RECEIVING TREATMENT ***** 1978 RES.	1978 NONRES.	*** NOT RECEIVING TREATMENT **** 1978 RES.	1978 NONRES.	** PERCENT SERVED ** 1978	NO. OF TREATMENT PLANTS
ALABAMA	3,690	86	1	11	0	2.4	24
ALASKA	407	0	0	0	0	0.0	0
ARIZONA	2,296	409	33	5	0	17.8	13
ARKANSAS	2,144	532	2	41	0	24.8	172
CALIFORNIA	21,896	7,998	519	220	0	36.5	57
COLORADO	2,619	274	6	5	0	10.5	51
CONNECTICUT	3,108	41	1	0	0	1.3	2
DELAWARE	582	5	0	0	0	0.7	1
DIST. OF COLUM.	690	0	0	0	0	0.0	0
FLORIDA	8,452	11	0	7	0	0.1	5
GEORGIA	5,048	582	65	24	0	11.5	50
HAWAII	895	75	0	384	28	8.4	7
IDAHO	857	183	4	19	4	21.4	65
ILLINOIS	11,245	435	1	3	0	3.9	132
INDIANA	5,330	68	0	1	2	1.3	16
IOWA	2,879	827	40	36	0	28.8	362
KANSAS	2,326	967	1	39	0	41.6	240
KENTUCKY	3,458	27	0	17	0	0.8	10
LOUISIANA	3,921	624	3	77	0	15.9	121
MAINE	1,085	2	0	1	0	0.2	1
MARYLAND	4,139	1,366	2	34	0	33.0	17
MASSACHUSETTS	5,782	0	0	0	0	0.0	0
MICHIGAN	9,129	55	2	6	0	0.6	13
MINNESOTA	3,975	168	2	3	0	4.3	96
MISSISSIPPI	2,389	147	1	50	0	6.2	60
MISSOURI	4,801	671	44	32	0	14.0	261
MONTANA	761	56	6	7	0	7.4	22
NEBRASKA	1,561	106	0	5	0	6.8	69
NEVADA	633	22	1	1	0	3.6	6
NEW HAMPSHIRE	849	4	1	2	0	0.5	1
NEW JERSEY	7,329	237	49	3	0	3.2	14
NEW MEXICO	1,190	113	0	56	0	9.5	13
NEW YORK	17,924	3,325	888	124	0	18.6	38
NORTH CAROLINA	5,525	272	1	42	0	4.9	21
NORTH DAKOTA	653	28	0	0	0	4.4	36
OHIO	10,701	1,042	19	77	0	9.7	72
OKLAHOMA	2,811	496	0	34	0	17.6	127
OREGON	2,376	263	12	58	0	11.1	40
PENNSYLVANIA	11,765	1,171	0	91	0	9.9	16
RHODE ISLAND	935	0	0	0	0	0.0	0
SOUTH CAROLINA	2,876	175	6	65	0	6.1	97
SOUTH DAKOTA	689	145	2	0	0	21.2	126
TENNESSEE	4,299	50	4	12	0	1.2	17
TEXAS	12,830	832	7	55	0	6.5	218
UTAH	1,268	5	2	0	0	0.4	2
VERMONT	483	0	0	0	0	0.0	0
VIRGINIA	5,135	308	18	36	0	6.0	75
WASHINGTON	3,658	399	23	57	0	10.9	46
WEST VIRGINIA	1,859	19	0	15	0	1.0	5
WISCONSIN	4,651	205	14	3	0	4.4	86
WYOMING	406	129	10	0	0	32.0	38
AMERICAN SAMOA	29	0	0	0	0	0.0	0
GUAM	93	0	0	0	0	0.0	0
N. MARIANAS	12	1	0	8	0	11.5	2
PUERTO RICO	3,282	356	0	226	0	10.9	4
PAC. TR. TERR.	114	0	0	8	0	0.0	1
VIRGIN ISLANDS	95	0	0	0	0	0.0	0
U.S. TOTALS	219,955	25,333	1,807	1,972	36	11.5	2,972

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 15 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - FACILITIES PROVIDING ADVANCED PRIMARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For this treatment category no nutrient data is presented.

* * * *

Table 15 is an extension of Table 14. Rounding of flows and loadings causes some apparent errors in the table due to a relatively small data base. The value of this analysis is greater for those States having a large number (or high flow) of advanced primary plants.

The national totals indicate approximately the levels of efficiency these types of plants achieve.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES EXISTING IN 1978
FACILITIES PROVIDING ADVANCED PRIMARY TREATMENT
IN METRIC TONS PER DAY

STATE	FLOW	**** BOD5 INF.	**** EFF.	% REM.	**** SOLIDS INF.	**** EFF.	% REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	86(22)	11	5	52.1	10	5	50.7						
ALASKA	0()	0	0	0.0	0	0	0.0						
ARIZONA	130(34)	30	8	73.7	32	6	81.7						
ARKANSAS	236(62)	56	9	83.9	52	14	71.6						
CALIFORNIA	3,613(954)	1,063	593	44.2	1,290	491	61.9						
COLORADO	133(35)	35	5	83.7	34	5	83.0						
CONNECTICUT	35(9)	8	1	84.2	13	1	86.9						
DELAWARE	0()	0	0	47.7	0	0	68.6						
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	90(23)	17	1	89.6	18	9	47.7						
GEORGIA	429(113)	87	16	80.7	77	28	63.5						
HAWAII	269(71)	59	56	6.4	50	45	8.8						
IDAHO	152(40)	39	7	79.9	33	6	79.8						
ILLINOIS	238(63)	50	13	72.5	58	15	73.7						
INDIANA	37(9)	5	2	54.4	5	2	62.9						
IOWA	464(122)	160	32	79.8	159	27	82.7						
KANSAS	461(121)	106	18	82.8	118	21	81.8						
KENTUCKY	17(4)	3	0	79.0	3	1	68.5						
LOUISIANA	268(70)	55	14	74.6	56	13	75.6						
MAINE	0()	0	0	50.0	0	0	53.1						
MARYLAND	722(190)	188	40	78.6	167	39	76.6						
MASSACHUSETTS	0()	0	0	0.0	0	0	0.0						
MICHIGAN	39(10)	7	2	69.6	7	1	76.3						
MINNESOTA	88(23)	24	4	82.1	22	4	81.5						
MISSISSIPPI	103(27)	17	3	78.2	16	7	57.2						
MISSOURI	454(120)	127	48	62.0	141	37	73.3						
MONTANA	34(9)	5	1	79.9	4	0	78.0						
NEBRASKA	51(13)	10	2	79.5	10	2	76.2						
NEVADA	13(3)	2	0	69.9	2	0	69.3						
NEW HAMPSHIRE	1()	0	0	85.0	0	0	85.0						
NEW JERSEY	122(32)	26	11	55.2	30	12	61.0						
NEW MEXICO	40(10)	9	3	66.9	8	2	74.2						
NEW YORK	2,414(637)	285	104	63.4	266	93	64.8						
NORTH CAROLINA	226(59)	62	11	81.1	46	12	74.2						
NORTH DAKOTA	8(2)	1	0	89.6	1	0	82.9						
OHIO	758(200)	159	28	82.3	272	62	77.1						
OKLAHOMA	207(54)	43	7	83.2	47	9	80.7						
OREGON	172(45)	30	5	82.0	32	6	81.4						
PENNSYLVANIA	771(203)	131	43	66.7	195	58	70.2						
RHODE ISLAND	0()	0	0	0.0	0	0	0.0						
SOUTH CAROLINA	113(30)	26	5	80.3	23	7	68.4						
SOUTH DAKOTA	56(14)	15	3	77.8	14	3	75.8						
TENNESSEE	36(9)	6	1	77.7	8	1	83.0						
TEXAS	314(83)	71	13	81.7	69	13	79.9						
UTAH	2()	0	0	83.6	0	0	85.0						
VERMONT	0()	0	0	0.0	0	0	0.0						
VIRGINIA	147(38)	27	3	88.3	26	4	82.3						
WASHINGTON	301(79)	81	28	64.9	69	14	79.2						
WEST VIRGINIA	12(3)	2	0	79.8	2	0	89.3						
WISCONSIN	121(32)	34	11	65.6	30	11	63.7						
WYOMING	72(19)	14	5	57.8	14	4	68.8						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	0()	0	0	0.0	0	0	0.0						
N. MARIANAS	2()	0	0	68.8	0	0	41.7						
PUERTO RICO	89(23)	24	6	71.2	24	3	85.3						
PAC. TR. TERR.	0()	0	0	0.0	0	0	0.0						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	14,146(3736)	3,210	1,167	63.6	3,553	1,093	69.2						

NOTE: PHOSPHORUS AND NH3 NITROGEN NOT REMOVED BY THIS TYPE TREATMENT PROCESS

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 16 - POPULATIONS SERVED BY SECONDARY TREATMENT - PRESENT RESIDENT & NONRESIDENT

Table 16 summarizes 1978 populations served by authorities in which the collected waste is treated by secondary treatment prior to discharge. In general this treatment includes most biological processes - trickling filters, activated sludge including oxidation ditches, rotating biological contactors, etc. - with no additional treatment except disinfection.

This category is by far the largest, serving approximately one-fourth of the total 1978 U.S. population.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used on Item 26 of the EPA-1 form.

1978 NEEDS SURVEY

POPULATIONS SERVED BY SECONDARY TREATMENT
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

		****** RECEIVING TREATMENT *****		*** NOT RECEIVING TREATMENT ****		** PERCENT SERVED **	NO. OF
STATE	1978 POPULATION	1978 RES.	1978 NONRES.	1978 RES.	1978 NONRES.	1978	TREATMENT PLANTS
ALABAMA	3,690	1,443	93	210	3	39.1	201
ALASKA	407	41	3	7	0	10.3	38
ARIZONA	2,296	1,187	21	182	4	51.7	43
ARKANSAS	2,144	367	2	12	0	17.1	50
CALIFORNIA	21,896	3,718	177	228	0	17.0	193
COLORADO	2,619	1,884	137	7	0	72.0	179
CONNECTICUT	3,108	1,410	23	681	0	45.4	71
DELAWARE	582	14	11	3	0	2.5	11
DIST. OF COLUM.	690	729	1,898	0	0	105.8	1
FLORIDA	8,452	2,578	486	845	0	30.5	122
GEORGIA	5,048	1,774	51	340	0	35.2	301
HAWAII	895	68	17	18	20	7.7	18
IDAHO	857	121	7	3	0	14.1	33
ILLINOIS	11,245	1,735	8	7	0	15.4	267
INDIANA	5,330	1,696	236	133	3	31.8	187
IOWA	2,879	1,015	25	39	0	35.3	261
KANSAS	2,326	542	10	28	0	23.3	145
KENTUCKY	3,458	1,413	43	291	0	40.9	175
LOUISIANA	3,921	1,231	61	127	1	31.4	151
MAINE	1,085	272	50	111	0	25.1	63
MARYLAND	4,139	314	2	119	0	7.6	56
MASSACHUSETTS	5,782	1,202	6	627	6	20.8	68
MICHIGAN	9,129	821	24	204	1	9.0	154
MINNESOTA	3,975	1,679	0	77	0	42.2	49
MISSISSIPPI	2,389	1,010	4	160	1	42.3	206
MISSOURI	4,801	907	84	61	0	18.9	233
MONTANA	761	370	24	13	0	48.7	78
NEBRASKA	1,561	549	13	26	0	35.2	242
NEVADA	633	387	35	1	0	61.2	17
NEW HAMPSHIRE	849	112	31	180	4	13.3	32
NEW JERSEY	7,329	2,815	248	336	81	38.4	109
NEW MEXICO	1,190	521	14	61	0	43.8	35
NEW YORK	17,924	5,412	830	759	37	30.2	193
NORTH CAROLINA	5,525	1,013	156	570	2	18.3	431
NORTH DAKOTA	653	378	0	0	0	58.0	215
OHIO	10,701	2,296	4	165	0	21.5	258
OKLAHOMA	2,811	913	0	26	0	32.5	54
OREGON	2,376	147	8	12	1	6.2	69
PENNSYLVANIA	11,785	2,986	105	486	5	25.3	296
RHODE ISLAND	935	341	43	152	0	36.5	10
SOUTH CAROLINA	2,876	743	132	202	3	25.9	146
SOUTH DAKOTA	689	221	1	1	0	32.2	82
TENNESSEE	4,299	1,578	33	475	0	36.7	173
TEXAS	12,830	3,237	7	213	0	25.2	267
UTAH	1,268	695	9	1	0	54.9	26
VERMONT	483	89	19	28	3	18.5	39
VIRGINIA	5,135	352	54	83	0	6.9	66
WASHINGTON	3,658	455	54	50	2	12.5	104
WEST VIRGINIA	1,859	268	10	34	0	14.4	74
WISCONSIN	4,651	922	30	83	1	19.8	267
WYOMING	406	158	5	0	0	39.0	37
AMERICAN SAMOA	29	0	0	0	0	0.0	0
GUAM	93	8	0	3	0	8.7	3
N. MARIANAS	12	0	0	0	0	0.0	0
PUERTO RICO	3,282	94	0	175	0	2.9	5
PAC. TR. TERR.	114	1	0	38	0	1.0	4
VIRGIN ISLANDS	95	0	0	0	0	0.0	0
U.S. TOTALS	219,955	56,256	5,365	8,719	188	25.6	6,608

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 17 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - FACILITIES PROVIDING SECONDARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For this treatment category no nutrient data is presented.

* * * *

Table 17 is an extension of Table 16. Rounding of flows and loadings cause some apparent errors in the table due to a relatively small data base. The value of this analysis is greater for those States having a large number (or high flow) of secondary plants.

The national totals indicate approximately the levels of efficiency these types of plants achieve.

The fact that the national totals indicate approximately 81 percent removal for BOD and suspended solids versus the statutory 85 percent is indicative of both inefficient plants and overloaded plants. These data are derived from existing facilities, using actual operational information, not design information.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 FACILITIES PROVIDING SECONDARY TREATMENT IN METRIC TONS PER DAY

STATE	FLOW	**** BOD5 ****			**** SOLIDS ****			** PHOSPHORUS ***		* NH3 NITROGEN *		***** OTHER *****	
		INF.	EFF.	% REM.	INF.	EFF.	% REM.	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
ALABAMA	900(237)	172	26	84.9	199	31	84.0						
ALASKA	25(6)	3	1	70.3	3	1	69.2						
ARIZUNA	559(147)	105	15	84.9	115	22	80.4						
ARKANSAS	229(60)	65	9	85.7	94	14	84.8						
CALIFURNIA	5,413(1430)	1,538	220	85.7	1,472	205	86.0						
COLORADO	871(230)	188	24	86.8	200	29	85.6						
CONNECTICUT	1,023(270)	151	28	81.3	158	26	83.4						
DELAWARE	8(2)	1	0	88.6	1	0	79.0						
DIST. OF COLUM.	1,046(276)	162	29	81.9	151	30	80.0						
FLORIDA	1,271(335)	234	31	86.8	245	32	86.9						
GEORGIA	1,184(313)	238	37	84.3	218	48	78.0						
HAWAII	27(7)	6	1	77.9	6	1	74.8						
IDAHO	70(18)	17	2	88.1	14	1	88.6						
ILLINOIS	1,208(319)	190	22	88.1	232	27	88.3						
INDIANA	1,314(347)	259	33	87.0	275	35	87.0						
IOWA	549(145)	168	17	89.3	139	21	84.3						
KANSAS	235(62)	49	5	88.5	51	6	87.1						
KENTUCKY	842(222)	210	55	73.8	261	50	80.5						
LOUISIANA	600(158)	110	17	84.2	107	17	83.5						
MAINE	255(67)	55	7	87.3	58	6	88.2						
MARYLAND	147(39)	37	6	83.8	36	9	73.1						
MASSACHUSETTS	823(217)	148	30	79.7	155	31	79.9						
MICHIGAN	765(202)	147	19	86.6	219	25	88.1						
MINNESOTA	863(228)	206	33	83.6	264	33	87.4						
MISSISSIPPI	585(154)	111	15	86.3	102	28	72.6						
MISSOURI	434(114)	102	12	88.0	90	16	82.2						
MONTANA	197(52)	36	5	84.6	30	5	81.0						
NEBRASKA	285(75)	74	8	88.4	75	9	87.2						
NEVADA	209(55)	42	3	90.6	42	4	89.9						
NEW HAMPSHIRE	95(25)	23	4	80.6	21	3	83.4						
NEW JERSEY	1,981(523)	491	317	35.4	551	170	69.1						
NEW MEXICO	203(53)	40	9	76.5	43	7	83.7						
NEW YORK	3,900(1030)	531	180	66.1	565	171	69.7						
NORTH CAROLINA	777(205)	166	24	85.2	142	29	79.0						
NORTH DAKOTA	130(34)	30	1	94.1	29	3	88.7						
OHIO	1,368(361)	260	40	84.3	302	46	84.5						
OKLAHOMA	373(98)	81	10	86.6	88	12	85.8						
OREGON	183(48)	54	8	83.9	60	11	80.2						
PENNSYLVANIA	1,660(438)	298	43	85.4	336	48	85.5						
RHODE ISLAND	326(86)	28	13	54.0	41	20	50.8						
SOUTH CAROLINA	645(170)	163	30	81.3	123	31	74.3						
SOUTH DAKOTA	106(28)	30	3	88.6	26	2	88.9						
TENNESSEE	1,259(332)	467	117	74.9	448	207	53.7						
TEXAS	1,665(440)	347	35	89.9	407	73	82.1						
UTAH	402(106)	64	9	85.5	65	9	84.9						
VERMONT	50(13)	8	2	70.3	8	2	64.2						
VIRGINIA	196(51)	52	8	84.0	43	8	80.5						
WASHINGTON	301(79)	80	7	91.1	75	8	89.4						
WEST VIRGINIA	145(38)	30	9	69.7	31	6	80.6						
WISCONSIN	565(149)	130	15	88.0	122	18	85.3						
WYOMING	73(19)	15	2	83.5	15	2	81.5						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	2()	0	0	91.6	0	0	94.9						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	33(8)	10	0	91.5	10	0	92.2						
PAC. TR. TERR.	0()	0	0	38.2	0	0	56.6						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	38,375(10137)	8,222	1,596	80.6	8,563	1,648	80.8						

NOTE: PHOSPHORUS AND NH3 NITROGEN NOT REMOVED BY THIS TYPE TREATMENT PROCESS

NOTES: 1. FLOWS IN CUBIC METERS x 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS x .9072 = SHORT TONS

TABLE 18 - POPULATIONS TO BE SERVED BY SECONDARY TREATMENT - PROJECTED RESIDENT & NONRESIDENT

Table 18 summarizes projected 2000 populations to be served by authorities in which the collected waste will be treated by secondary treatment prior to discharge. In general this treatment includes most biological processes - trickling filters, activated sludge including oxidation ditches, rotating biological contactors, etc. - with no additional treatment except disinfection.

As will be noted from the summary, 35.2 percent of the total population will be served by this type of treatment in 2000 compared to 25.6 percent in 1978.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used on Item 26 of the EPA-1 form.

1978 NEEDS SURVEY

POPULATIONS TO BE SERVED BY SECONDARY TREATMENT
PROJECTED RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	2000 POPULATION	****** RECEIVING TREATMENT ***** 2000 RES.	2000 NONRES.	*** NOT RECEIVING TREATMENT **** 2000 RES.	2000 NONRES.	** PERCENT SERVED ** 2000	NO. OF TREATMENT PLANTS
ALABAMA	4,140	1,877	156	31	0	45.4	193
ALASKA	667	586	18	6	0	88.0	124
ARIZONA	4,149	3,185	49	16	0	76.8	71
ARKANSAS	2,970	953	1	0	0	32.1	141
CALIFORNIA	26,786	13,585	769	98	0	50.7	284
COLORADO	3,868	1,601	134	0	0	41.4	236
CONNECTICUT	3,741	2,210	35	409	0	59.1	65
DELAWARE	841	2	0	0	0	0.3	3
DIST. OF COLUM.	661	0	0	0	0	0.0	0
FLORIDA	15,049	3,863	585	200	0	25.7	67
GEORGIA	7,053	1,851	71	88	0	26.3	254
HAWAII	1,366	1,214	224	1	0	88.9	37
IDAHO	1,183	523	68	5	3	44.3	158
ILLINOIS	12,358	502	5	0	0	4.1	394
INDIANA	5,732	775	28	0	0	13.5	122
IOWA	3,101	1,464	36	0	0	47.2	765
KANSAS	2,517	2,153	12	0	0	85.5	397
KENTUCKY	4,224	1,415	30	91	0	33.5	148
LOUISIANA	4,659	3,794	89	0	0	81.4	403
MAINE	1,222	816	135	162	0	66.8	158
MARYLAND	5,583	92	8	4	0	1.7	60
MASSACHUSETTS	6,614	4,307	569	536	51	65.1	96
MICHIGAN	10,314	797	23	24	0	7.7	228
MINNESOTA	4,505	1	0	0	0	0.0	4
MISSISSIPPI	2,740	812	5	37	0	29.7	193
MISSOURI	5,225	4,852	1,404	0	0	92.9	785
MONTANA	802	599	35	0	0	74.8	122
NEBRASKA	1,734	1,574	18	0	0	90.8	289
NEVADA	1,141	733	63	0	0	64.3	25
NEW HAMPSHIRE	1,306	693	104	129	12	53.1	84
NEW JERSEY	8,747	4,124	789	37	60	47.2	48
NEW MEXICO	1,436	952	9	0	0	66.3	42
NEW YORK	18,922	10,488	2,660	296	0	55.4	487
NORTH CAROLINA	7,419	1,214	207	335	14	16.4	272
NORTH DAKOTA	690	561	0	0	0	81.4	334
OHIO	12,031	1,302	2	1	0	10.8	141
OKLAHOMA	3,396	382	0	0	0	11.3	25
OREGON	3,209	193	17	0	0	6.0	92
PENNSYLVANIA	12,365	3,514	688	70	0	28.4	721
RHODE ISLAND	1,033	540	67	52	0	52.4	18
SOUTH CAROLINA	3,700	1,870	394	59	0	50.6	151
SOUTH DAKOTA	730	295	4	0	0	40.5	274
TENNESSEE	5,573	1,227	11	35	0	22.0	87
TEXAS	18,069	152	0	0	0	0.8	12
UTAH	1,688	0	0	0	0	0.0	0
VERMONT	607	143	29	56	3	23.6	61
VIRGINIA	6,755	2,178	221	36	0	32.3	192
WASHINGTON	4,417	3,052	621	27	0	69.1	302
WEST VIRGINIA	2,003	1,355	13	3	0	67.7	428
WISCONSIN	5,553	803	131	12	0	14.5	320
WYOMING	484	437	18	0	0	90.3	116
AMERICAN SAMOA	40	36	1	2	0	90.5	5
GUAM	275	203	3	18	0	73.9	3
N. MARIANAS	35	31	2	0	0	89.4	3
PUERTO RICO	4,700	3,137	0	728	0	66.7	26
PAC. TR. TERR.	170	102	4	26	0	60.1	21
VIRGIN ISLANDS	116	25	3	0	0	21.7	2
U.S. TOTALS	270,414	95,173	10,591	3,644	146	35.2	10,091

NOTE: SUM OF ENTRIES MAY NOT EQUAL TO TOTALS DUE TO ROUND OFFS.

TABLE 19 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES PROJECTED FOR 2000 - FACILITIES PROVIDING SECONDARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from projected design flow information as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total design flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For this treatment category no nutrient data is presented.

*   *   *   *

Table 19 is an extension of Table 18. Rounding of flows and loadings causes some apparent error in the table due to the size of the data base in some States. The value of this analysis is greater for those States having a large number (or high flow) of secondary plants.

The national totals indicate approximately the levels of efficiency these types of plants achieve.

It will be noted that the percentage removals indicate a greater efficiency for secondary treatment in 2000 than was the case in 1978 (88.1 percent versus 80.6 percent for BOD_5). This reflects the lessor influence of existing overloaded plants since the 2000 information is for design flows, and most of these plants will have been enlarged.

FEBRUARY 10, 1979
TABLE 19

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES PROJECTED FOR 2000
FACILITIES PROVIDING SECONDARY TREATMENT
IN METRIC TONS PER DAY

		**** BOD5 ****			**** SOLIDS ****			** PHOSPHORUS ***		* NH3 NITROGEN *		***** OTHER *****	
STATE	FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT
ALABAMA	1,127(297)	248	33	86.4	252	34	86.5						
ALASKA	320(84)	54	9	82.4	64	9	84.6						
ARIZONA	1,213(320)	277	36	87.0	272	35	86.8						
ARKANSAS	451(119)	105	13	87.2	100	13	86.1						
CALIFORNIA	6,915(1826)	2,033	188	90.7	2,149	192	91.0						
COLORADO	799(211)	204	23	88.3	185	23	87.1						
CONNECTICUT	1,695(448)	318	47	85.1	326	46	85.7						
DELAWARE	0()	0	0	85.5	0	0	85.5						
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	2,151(568)	476	64	86.5	502	64	87.2						
GEORGIA	1,106(292)	231	33	85.7	230	35	84.8						
HAWAII	692(182)	181	20	88.9	146	17	88.2						
IDAHO	334(88)	86	12	85.9	81	12	84.6						
ILLINOIS	236(62)	47	7	85.1	55	7	87.3						
INDIANA	607(160)	122	17	85.4	130	18	86.1						
IOWA	873(230)	283	26	90.8	229	34	85.2						
KANSAS	1,186(313)	292	35	87.9	320	38	87.9						
KENTUCKY	953(252)	202	28	85.8	206	28	86.1						
LOUISIANA	2,187(577)	492	65	86.7	505	67	86.7						
MAINE	574(151)	140	17	87.3	142	17	87.6						
MARYLAND	45(12)	10	1	87.3	10	1	86.9						
MASSACHUSETTS	3,914(1034)	786	113	85.6	876	114	87.0						
MICHIGAN	567(149)	110	15	86.0	110	17	84.6						
MINNESOTA	1()	0	0	86.8	0	0	85.4						
MISSISSIPPI	448(118)	91	14	84.4	90	15	83.3						
MISSOURI	3,628(958)	826	108	86.8	872	121	86.1						
MONTANA	383(101)	70	11	83.8	74	11	84.5						
NEBRASKA	909(240)	332	27	91.8	327	29	90.9						
NEVADA	412(109)	82	8	89.6	85	8	89.9						
NEW HAMPSHIRE	584(154)	185	17	90.6	190	17	90.8						
NEW JERSEY	3,143(830)	1,004	93	90.6	1,046	93	91.0						
NEW MEXICO	425(112)	90	12	85.9	90	12	85.9						
NEW YORK	9,815(2592)	1,710	229	86.6	1,895	241	87.3						
NORTH CAROLINA	920(243)	230	27	88.1	210	28	86.5						
NORTH DAKOTA	218(57)	55	5	90.2	55	6	88.1						
OHIO	819(216)	233	23	89.8	264	25	90.4						
OKLAHOMA	189(50)	43	5	86.8	44	5	87.1						
OREGON	268(70)	84	8	90.4	84	12	85.5						
PENNSYLVANIA	2,527(667)	500	75	84.9	538	75	85.9						
RHODE ISLAND	454(120)	108	13	87.5	103	13	86.9						
SOUTH CAROLINA	1,179(311)	302	35	88.3	261	35	86.4						
SOUTH DAKOTA	137(36)	33	4	87.8	32	4	87.2						
TENNESSEE	1,051(277)	397	31	92.1	357	32	91.0						
TEXAS	90(23)	22	2	87.8	21	2	87.7						
UTAH	0()	0	0	0.0	0	0	0.0						
VERMONT	103(27)	21	3	85.3	20	3	85.0						
VIRGINIA	1,330(351)	317	39	87.4	307	39	87.0						
WASHINGTON	2,463(650)	571	73	87.1	580	75	86.9						
WEST VIRGINIA	702(185)	143	21	85.4	144	21	85.4						
WISCONSIN	539(142)	125	16	87.1	122	16	86.7						
WYOMING	211(55)	44	6	85.6	44	6	85.8						
AMERICAN SAMOA	24(6)	8	0	90.7	3	0	80.4						
GUAM	66(17)	13	1	85.1	15	1	86.8						
N. MARIANAS	21(5)	2	0	85.2	2	0	85.2						
PUERTO RICO	1,310(346)	364	39	89.2	328	39	88.0						
PAC. TR. TERR.	39(10)	8	1	87.2	8	1	87.2						
VIRGIN ISLANDS	14(3)	2	0	83.4	3	0	89.0						
U.S. TOTALS	62,367(16475)	14,712	1,748	88.1	15,104	1,806	88.0						

NOTE: PHOSPHORUS AND NH3 NITROGEN NOT REMOVED BY THIS TYPE TREATMENT PROCESS

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 20 - NUMBER OF PLANTS PROJECTED FOR SECONDARY TREATMENT FOR YEAR 2000 - TOTAL PROJECTED FLOW

Table 20 summarizes the secondary treatment plants projected to be in operation by the year 2000. In general this treatment includes most biological processes - trickling filters, activated sludge including oxidation ditches, rotating biological contactors, etc. - with no additional treatment except disinfection.

The table summarizes the total number of plants per State, as well as the number of plants in each of seven ranges of flow. The flow range is determined by the year 2000 design flow.

The summary includes all plants now in existence which will not be abandoned between 1978 and 2000, primary and advanced primary plants which will be upgraded to secondary before 2000, and new secondary plants which will be constructed prior to 2000.

It should be noted that over 50 percent of the plants will be designed for flows less than 100,000 gallons per day.

Plants having levels of treatment designed for removals greater than secondary are summarized in Tables 25 and 34. Further summaries of secondary plants are presented in Tables 21, 22, and 23.

1978 NEEDS SURVEY

NUMBER OF PLANTS PROJECTED FOR SECONDARY TREATMENT FOR YEAR 2000

TOTAL PROJECTED FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	193	51	80	24	26	3	9	0
ALASKA	124	94	11	6	11	1	1	0
ARIZONA	71	11	31	10	10	3	5	1
ARKANSAS	141	65	45	14	10	4	3	0
CALIFORNIA	285	74	84	29	52	19	20	7
COLORADO	236	91	81	28	27	5	4	0
CONNECTICUT	65	0	6	6	30	13	9	1
DELAWARE	3	3	0	0	0	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	67	7	22	4	17	6	6	5
GEORGIA	257	69	113	31	34	3	7	0
HAWAII	37	2	7	8	13	5	1	1
IDAHO	158	80	48	13	14	1	2	0
ILLINOIS	394	214	165	11	4	0	0	0
INDIANA	122	49	47	9	10	1	6	0
IOWA	765	544	183	15	13	5	5	0
KANSAS	397	188	138	29	30	10	1	1
KENTUCKY	148	62	59	7	11	3	5	1
LOUISIANA	403	154	137	38	56	8	8	2
MAINE	158	49	56	18	29	3	3	0
MARYLAND	60	42	12	3	3	0	0	0
MASSACHUSETTS	96	7	16	15	38	7	9	4
MICHIGAN	228	92	115	11	8	0	1	1
MINNESOTA	4	3	1	0	0	0	0	0
MISSISSIPPI	193	102	57	15	12	5	2	0
MISSOURI	785	478	177	63	49	6	9	3
MONTANA	122	54	42	12	9	3	2	0
NEBRASKA	289	165	86	19	13	3	2	1
NEVADA	25	7	10	1	4	0	3	0
NEW HAMPSHIRE	86	15	37	10	18	2	4	0
NEW JERSEY	48	0	5	1	16	11	13	2
NEW MEXICO	42	10	13	4	11	3	0	1
NEW YORK	490	170	180	52	48	14	11	15
NORTH CAROLINA	272	134	73	27	28	6	4	0
NORTH DAKOTA	334	279	42	3	6	4	0	0
OHIO	141	48	58	13	16	3	2	1
OKLAHOMA	25	4	12	4	3	1	1	0
OREGON	92	45	32	8	6	0	1	0
PENNSYLVANIA	721	333	240	67	69	7	3	2
RHODE ISLAND	19	3	3	1	7	1	3	1
SOUTH CAROLINA	153	20	54	23	41	9	6	0
SOUTH DAKOTA	274	207	58	4	5	0	0	0
TENNESSEE	87	21	37	11	14	2	0	2
TEXAS	12	2	8	0	1	0	1	0
UTAH	0	0	0	0	0	0	0	0
VERMONT	61	26	23	5	7	0	0	0
VIRGINIA	192	69	79	12	19	2	11	0
WASHINGTON	302	88	110	32	50	12	9	1
WEST VIRGINIA	428	171	191	42	19	3	2	0
WISCONSIN	321	178	97	20	20	4	2	0
WYOMING	116	71	23	6	15	1	0	0
AMERICAN SAMOA	5	2	2	0	0	1	0	0
GUAM	3	0	0	0	1	2	0	0
N. MARIANAS	3	0	1	0	2	0	0	0
PUERTO RICO	26	0	0	5	7	4	9	1
PAC. TR. TERR.	21	4	12	2	3	0	0	0
VIRGIN ISLANDS	4	0	1	0	2	1	0	0
U.S. TOTALS	10,104	4,657	3,220	791	967	210	205	54

TABLE 21 - NUMBER OF SECONDARY TREATMENT PLANTS TO BE CONSTRUCTED BETWEEN 1978 AND 2000 - TOTAL PROJECTED FLOW

Table 21 summarizes the secondary treatment plants projected to be constructed between 1978 and 2000. In general, this treatment includes most biological processes, as discussed in Table 20.

The table summarizes the total number of entirely new secondary plants which are planned to be constructed by the year 2000, by State, and by flow ranges. The flows are determined by the year 2000 design flow.

It is noted that approximately 70 percent of the new plants will be smaller than 100,000 gallons per day.

No upgraded primary plants, upgraded advanced primary plants, or existing secondary plants which will be enlarged are included in this table.

1978 NEEDS SURVEY

NUMBER OF SECONDARY TREATMENT PLANTS TO BE CONSTRUCTED BETWEEN 1978 AND 2000

TOTAL PROJECTED FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	98	44	40	6	7	0	1	0
ALASKA	79	70	3	1	4	1	0	0
ARIZONA	28	6	19	1	1	1	0	0
ARKANSAS	60	52	5	1	1	0	1	0
CALIFORNIA	91	55	24	4	3	1	3	1
COLORADO	36	22	4	2	4	3	1	0
CONNECTICUT	9	0	1	2	6	0	0	0
DELAWARE	3	3	0	0	0	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	38	7	16	1	8	3	2	1
GEORGIA	81	43	28	7	3	0	0	0
HAWAII	22	2	5	5	8	1	1	0
IDAHO	53	39	12	1	1	0	0	0
ILLINOIS	160	124	36	0	0	0	0	0
INDIANA	48	39	8	0	0	0	1	0
IOWA	276	272	3	0	1	0	0	0
KANSAS	37	32	1	0	2	2	0	0
KENTUCKY	85	56	26	1	0	1	1	0
LOUISIANA	202	124	58	9	7	2	1	1
MAINE	92	42	35	6	8	1	0	0
MARYLAND	46	38	6	1	1	0	0	0
MASSACHUSETTS	29	6	7	4	11	0	1	0
MICHIGAN	126	68	54	4	0	0	0	0
MINNESOTA	0	0	0	0	0	0	0	0
MISSISSIPPI	96	79	12	2	2	1	0	0
MISSOURI	393	356	23	4	6	1	3	0
MONTANA	20	19	1	0	0	0	0	0
NEBRASKA	6	5	0	0	1	0	0	0
NEVADA	6	2	2	0	1	0	1	0
NEW HAMPSHIRE	47	11	26	4	4	1	1	0
NEW JERSEY	6	0	0	1	3	1	1	0
NEW MEXICO	9	4	3	0	2	0	0	0
NEW YORK	305	153	119	16	10	2	2	3
NORTH CAROLINA	107	77	17	3	8	0	2	0
NORTH DAKOTA	83	83	0	0	0	0	0	0
OHIO	51	30	17	1	2	0	1	0
OKLAHOMA	3	2	1	0	0	0	0	0
OREGON	28	23	4	1	0	0	0	0
PENNSYLVANIA	529	304	172	30	22	1	0	0
RHODE ISLAND	7	3	0	1	3	0	0	0
SOUTH CAROLINA	53	14	20	4	10	4	1	0
SOUTH DAKOTA	72	72	0	0	0	0	0	0
TENNESSEE	32	15	14	3	0	0	0	0
TEXAS	2	0	2	0	0	0	0	0
UTAH	0	0	0	0	0	0	0	0
VERMONT	25	15	10	0	0	0	0	0
VIRGINIA	95	48	33	3	7	1	3	0
WASHINGTON	114	65	40	4	3	1	1	0
WEST VIRGINIA	348	157	152	30	8	1	0	0
WISCONSIN	103	83	16	3	1	0	0	0
WYOMING	21	20	0	0	1	0	0	0
AMERICAN SAMOA	4	2	2	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	2	0	1	0	1	0	0	0
PUERTO RICO	3	0	0	1	0	1	1	0
PAC. TR. TERR.	18	4	10	2	2	0	0	0
VIRGIN ISLANDS	1	0	1	0	0	0	0	0
U.S. TOTALS	4,288	2,790	1,089	169	173	31	30	6

TABLE 22 - NUMBER OF SECONDARY TREATMENT PLANTS TO BE ENLARGED BETWEEN 1978 AND 2000 - TOTAL EXISTING FLOW

Table 22 summarizes the secondary treatment plants projected to be enlarged between 1978 and 2000. In general, this treatment includes most biological processes as discussed in Table 20.

These plants are primarily secondary plants in existence in 1978 which will be enlarged to treat a greater flow. Also included are a few plants included in Table 21, "To Be Constructed," which will be both constructed and subsequently enlarged between 1978 and 2000.

The State totals and seven flow ranges are based upon flows existing in 1978.

1978 NEEDS SURVEY

NUMBER OF SECONDARY TREATMENT PLANTS TO BE ENLARGED BETWEEN 1978 AND 2000

TOTAL EXISTING FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	15	4	6	1	3	1	0	0
ALASKA	8	4	3	1	0	0	0	0
ARIZONA	18	4	8	2	2	1	0	1
ARKANSAS	2	0	1	0	0	0	1	0
CALIFORNIA	78	15	19	11	27	3	3	0
COLORADO	30	18	9	3	0	0	0	0
CONNECTICUT	15	1	3	3	6	1	1	0
DELAWARE	0	0	0	0	0	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	20	4	3	3	5	1	4	0
GEORGIA	48	13	24	5	3	2	1	0
HAWAII	6	1	3	1	1	0	0	0
IDAHO	7	5	1	0	1	0	0	0
ILLINOIS	6	2	3	1	0	0	0	0
INDIANA	18	3	9	2	1	3	0	0
IOWA	39	26	9	1	3	0	0	0
KANSAS	25	10	10	1	4	0	0	0
KENTUCKY	16	4	10	0	1	1	0	0
LOUISIANA	19	2	8	2	5	0	2	0
MAINE	26	6	7	3	9	0	1	0
MARYLAND	2	1	1	0	0	0	0	0
MASSACHUSETTS	35	7	13	4	10	1	0	0
MICHIGAN	38	14	22	1	0	0	1	0
MINNESOTA	0	0	0	0	0	0	0	0
MISSISSIPPI	8	2	2	1	3	0	0	0
MISSOURI	28	8	14	0	5	0	1	0
MONTANA	18	11	7	0	0	0	0	0
NEBRASKA	71	50	15	4	2	0	0	0
NEVADA	7	4	2	1	0	0	0	0
NEW HAMPSHIRE	12	4	4	1	3	0	0	0
NEW JERSEY	14	2	3	3	3	2	0	1
NEW MEXICO	8	2	2	1	2	0	1	0
NEW YORK	29	7	7	7	4	1	2	1
NORTH CAROLINA	20	9	7	2	2	0	0	0
NORTH DAKOTA	82	61	13	3	4	1	0	0
OHIO	6	1	4	1	0	0	0	0
OKLAHOMA	7	1	3	2	1	0	0	0
OREGON	16	11	3	2	0	0	0	0
PENNSYLVANIA	33	6	13	7	5	1	1	0
RHODE ISLAND	2	1	0	0	1	0	0	0
SOUTH CAROLINA	11	2	4	2	2	0	1	0
SOUTH DAKOTA	12	6	5	1	0	0	0	0
TENNESSEE	11	1	3	3	4	0	0	0
TEXAS	0	0	0	0	0	0	0	0
UTAH	0	0	0	0	0	0	0	0
VERMONT	10	6	2	2	0	0	0	0
VIRGINIA	19	8	6	3	1	1	0	0
WASHINGTON	13	2	7	3	1	0	0	0
WEST VIRGINIA	10	1	9	0	0	0	0	0
WISCONSIN	31	15	15	0	1	0	0	0
WYOMING	3	1	0	1	0	1	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	1	0	0	1	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	2	0	2	0	0	0	0	0
PAC. TR. TERR.	2	2	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0
U.S. TOTALS	957	368	324	96	125	21	20	3

TABLE 23 - NUMBER OF SECONDARY TREATMENT PLANTS TO BE ENLARGED AND UPGRADED BETWEEN 1978 AND 2000 - TOTAL EXISTING FLOW

Table 23 summarizes the secondary treatment plants projected to be both enlarged and upgraded between 1978 and 2000. In general, this treatment includes most biological processes as discussed in Table 20.

Plants to be upgraded are those plants presently in existence which do not meet secondary standards (primary, advanced primary) which will be upgraded to meet this standard. Enlarged is simply to expand the design capacity to accommodate a higher flow. The plants listed in this table are planned to be both enlarged and upgraded. Therefore, no secondary plants in existence in 1978 are a part of this summary.

FEBRUARY 10, 1979
TABLE 23

1978 NEEDS SURVEY

NUMBER OF SECONDARY TREATMENT PLANTS TO BE ENLARGED AND UPGRADED BETWEEN 1978 AND 2000

TOTAL EXISTING FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	12	1	7	1	2	0	1	0
ALASKA	3	0	2	0	0	0	1	0
ARIZONA	7	1	4	1	0	0	1	0
ARKANSAS	32	17	10	2	2	1	0	0
CALIFORNIA	37	7	7	6	12	3	1	1
COLORADO	72	38	24	5	4	0	1	0
CONNECTICUT	6	0	2	0	3	0	1	0
DELAWARE	0	0	0	0	0	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	3	0	2	1	0	0	0	0
GEORGIA	25	6	8	5	5	0	1	0
HAWAII	3	0	0	1	2	0	0	0
IDAHO	30	17	9	3	1	0	0	0
ILLINOIS	65	34	28	3	0	0	0	0
INDIANA	5	1	0	3	1	0	0	0
IOWA	111	67	41	1	1	0	1	0
KANSAS	37	17	16	2	1	0	1	0
KENTUCKY	14	1	8	3	2	0	0	0
LOUISIANA	25	4	12	5	2	1	1	0
MAINE	10	1	2	1	5	1	0	0
MARYLAND	0	0	0	0	0	0	0	0
MASSACHUSETTS	10	0	0	2	3	1	2	2
MICHIGAN	5	2	2	1	0	0	0	0
MINNESOTA	0	0	0	0	0	0	0	0
MISSISSIPPI	16	5	8	0	2	1	0	0
MISSOURI	53	23	25	0	3	2	0	0
MONTANA	14	6	3	4	1	0	0	0
NEBRASKA	29	16	7	3	2	0	1	0
NEVADA	1	1	0	0	0	0	0	0
NEW HAMPSHIRE	10	0	0	3	6	1	0	0
NEW JERSEY	4	0	2	1	1	0	0	0
NEW MEXICO	5	1	1	2	1	0	0	0
NEW YORK	32	6	12	6	4	2	0	2
NORTH CAROLINA	36	8	15	4	7	1	1	0
NORTH DAKOTA	17	13	1	0	2	1	0	0
OHIO	18	5	10	2	1	0	0	0
OKLAHOMA	6	2	3	1	0	0	0	0
OREGON	5	2	3	0	0	0	0	0
PENNSYLVANIA	10	1	0	1	7	1	0	0
RHODE ISLAND	3	0	0	0	0	2	0	1
SOUTH CAROLINA	30	3	14	6	6	1	0	0
SOUTH DAKOTA	38	24	12	1	1	0	0	0
TENNESSEE	7	1	5	0	1	0	0	0
TEXAS	1	1	0	0	0	0	0	0
UTAH	0	0	0	0	0	0	0	0
VERMONT	7	0	2	2	3	0	0	0
VIRGINIA	35	9	17	3	3	0	3	0
WASHINGTON	42	5	12	8	13	1	2	1
WEST VIRGINIA	22	1	14	1	5	0	1	0
WISCONSIN	47	15	24	4	4	0	0	0
WYOMING	18	8	6	1	3	0	0	0
AMERICAN SAMOA	1	1	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	12	0	7	2	1	1	1	0
PAC. TR. TERR.	2	2	0	0	0	0	0	0
VIRGIN ISLANDS	1	0	1	0	0	0	0	0
U.S. TOTALS	1,034	373	388	101	123	21	21	7

TABLE 24 - DOLLAR NEEDS FOR SECONDARY TREATMENT FACILITIES BY PLANT SIZES - TOTAL PROJECTED FLOW

Table 24 summarizes the projected cost, reported as first quarter 1978 dollars, for all secondary wastewater treatment plant construction to be performed through 2000. The individual plants and types of construction have been summarized in Tables 21, 22, and 23.

The summary indicates a total dollar need per State for secondary facilities (Category I). The dollar needs are further broken down by plant capacity expressed in ranges of year 2000 design flow.

It can be seen that the greatest expenditure is required for the largest plants, those with design capacities greater than 50 mgd. This flow range accounts for approximately one-third of the secondary treatment needs.

To obtain total treatment plant needs, this summary should be used in conjunction with Table 38, "Dollar Needs for Treatment More Stringent Than Secondary By Plant Sizes."

FEBRUARY 10, 1979
TABLE 24

1978 NEEDS SURVEY

DOLLAR NEEDS FOR SECONDARY TREATMENT FACILITIES BY PLANT SIZES

(THOUSANDS OF 1978 DOLLARS)

TOTAL PROJECTED FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	193	4,448	18,760	15,007	42,856	3,305	66,385	0
ALASKA	124	14,098	11,346	11,542	37,100	13,284	170,810	0
ARIZONA	71	723	7,902	8,599	16,188	27,325	49,431	24,664
ARKANSAS	141	3,983	9,540	6,075	9,357	17,904	17,909	0
CALIFORNIA	285	12,149	35,285	44,523	221,586	161,258	663,005	985,454
COLORADO	236	4,052	15,595	20,656	42,073	56,406	82,357	0
CONNECTICUT	65	0	1,254	4,245	74,805	13,736	68,137	0
DELAWARE	3	573	0	0	0	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	67	682	10,606	4,979	68,737	46,534	91,911	242,465
GEORGIA	257	4,440	18,616	15,208	44,504	15,132	27,566	0
HAWAII	37	789	14,862	30,187	89,369	55,303	32,670	92,914
IDAHO	158	15,630	29,789	13,262	14,223	0	4,000	0
ILLINOIS	394	36,307	41,594	3,090	1,227	0	0	0
INDIANA	122	7,620	8,454	5,323	9,853	0	14,708	0
IOWA	765	59,196	63,970	14,801	18,032	20,170	996	0
KANSAS	397	21,054	38,984	14,194	59,716	61,991	18,668	57,234
KENTUCKY	148	5,989	19,200	5,122	18,446	5,357	29,649	0
LOUISIANA	403	14,577	33,412	21,741	88,826	36,025	135,322	73,685
MAINE	158	11,340	26,779	11,126	31,902	24,334	10,624	0
MARYLAND	60	4,621	4,050	121	5,058	0	0	0
MASSACHUSETTS	96	1,598	6,845	12,668	106,639	20,510	165,655	387,469
MICHIGAN	228	17,894	51,899	18,660	15,591	0	12,254	0
MINNESOTA	4	0	0	0	0	0	0	0
MISSISSIPPI	193	6,386	14,616	8,350	10,612	9,218	5,837	0
MISSOURI	785	31,402	57,578	34,020	80,874	18,481	211,841	342,890
MONTANA	122	3,174	10,339	7,721	12,060	2,303	0	0
NEBRASKA	289	4,294	9,131	5,188	14,326	17,479	49,086	51,284
NEVADA	25	346	1,442	1,179	7,113	0	52,171	0
NEW HAMPSHIRE	86	3,378	26,751	14,383	45,385	28,803	73,420	0
NEW JERSEY	48	0	2,306	2,827	63,014	110,924	185,765	559,480
NEW MEXICO	42	475	4,674	4,118	12,511	12,377	0	13,573
NEW YORK	490	36,249	95,219	45,910	61,703	13,463	148,689	1,995,045
NORTH CAROLINA	272	6,785	25,872	14,826	33,854	22,307	45,298	0
NORTH DAKOTA	334	5,689	6,042	1,162	6,952	28,179	0	0
OHIO	141	6,658	15,652	5,172	23,003	7,000	24,218	0
OKLAHOMA	25	329	1,638	2,051	5,732	3,672	0	0
OREGON	92	5,644	8,869	2,193	3,451	0	0	0
PENNSYLVANIA	721	55,576	119,796	68,845	126,425	16,743	25,883	29,965
RHODE ISLAND	19	657	2,018	0	21,270	0	25,925	95,065
SOUTH CAROLINA	153	1,778	18,518	9,577	52,069	46,434	27,684	0
SOUTH DAKOTA	274	9,933	15,409	3,904	10,636	0	0	0
TENNESSEE	87	1,999	10,523	5,586	14,950	9,371	0	126,485
TEXAS	12	63	2,717	0	1,939	0	0	0
UTAH	0	0	0	0	0	0	0	0
VERMONT	61	4,252	8,693	2,834	26,223	0	0	0
VIRGINIA	192	11,065	41,580	12,609	51,892	7,562	241,529	0
WASHINGTON	302	11,841	46,152	23,663	115,298	82,312	176,931	122,408
WEST VIRGINIA	428	31,146	117,312	60,359	45,047	17,754	0	0
WISCONSIN	321	16,648	46,296	15,352	12,304	6,377	0	0
WYOMING	116	3,035	9,670	4,468	31,974	0	0	0
AMERICAN SAMOA	5	622	1,183	0	0	21,089	0	0
GUAM	3	0	0	0	2,229	36,098	0	0
N. MARIANAS	3	0	2,900	0	12,670	0	0	0
PUERTO RICO	26	0	0	5,725	17,836	42,095	218,663	52,162
PAC. TR. TERR.	21	1,148	10,586	4,919	10,025	0	0	0
VIRGIN ISLANDS	4	0	1,761	0	14,664	0	0	0
U.S. TOTALS	10,104	502,335	1,203,985	648,070	1,964,129	1,138,615	3,174,997	5,252,242

TABLE 25 - NUMBER OF FACILITIES AND REASONS FOR TREATMENT MORE STRINGENT THAN SECONDARY

Table 25 is a summary of the numbers of treatment facilities required and planned for 2000 which are to have treatment levels more stringent than secondary treatment. This summary includes all those plants existent in 1978 treating wastes to these levels plus those required to be constructed or upgraded to this level between 1978 and 2000.

The first column lists, by State, the total number of treatment plants required in 2000. The second column lists the number of plants more stringent than secondary required by the same date. It can be seen that 41 percent of all the treatment plants in the nation are expected to be treating wastes at a higher level than secondary.

The remaining columns in the table describe the reasons the treatment levels will be greater than secondary. These headings are self-explanatory. It is to be noted that more than one reason is possible for any single treatment being required to provide these levels of treatment. Therefore, the columns for reasons do not equal the number of plants for all States.

Included in this category are "advanced secondary" and "tertiary" plants, as further described by Tables 26 through 38.

1978 NEEDS SURVEY

NUMBER OF FACILITIES AND REASONS FOR TREATMENT MORE STRINGENT THAN SECONDARY

STATE	TOTAL NUMBER OF TREATMENT FACILITIES	NUMBER REQUIRING MORE STRINGENT TREATMENT	***********REASONS FOR TREATMENT LEVEL BEING MORE STRINGENT THAN SECONDARY********** EPA-APPROVED WATER QUALITY PLAN	STATE COURT ORDER	FEDERAL COURT ORDER	DISCHARGE PERMIT CONDITIONS	STATE OR FEDERAL ENFORCEMENT ORDER	VOLUNTARY COMPLIANCE	STATE CERTIFICATE	OTHER
ALABAMA	389	149	6	0	0	85	0	0	72	0
ALASKA	126	2	0	0	0	2	0	0	0	0
ARIZONA	153	11	4	1	0	1	2	0	3	0
ARKANSAS	650	481	5	0	0	58	1	1	426	0
CALIFORNIA	1,020	103	7	0	0	86	3	1	10	0
COLORADO	323	45	28	0	0	14	0	0	2	2
CONNECTICUT	110	29	6	1	0	14	1	0	7	0
DELAWARE	28	21	20	1	0	16	0	0	1	0
DIST. OF COLUM.	1	1	0	0	0	0	0	1	0	0
FLORIDA	403	304	21	0	1	99	0	0	165	49
GEORGIA	547	192	38	0	0	101	1	1	111	3
HAWAII	55	2	0	0	0	2	0	0	0	0
IDAHO	202	14	4	0	0	8	0	0	3	1
ILLINOIS	915	487	3	10	7	425	0	1	190	3
INDIANA	601	469	74	0	1	301	74	0	32	3
IOWA	925	124	8	0	0	24	1	1	95	1
KANSAS	661	5	1	0	0	0	0	0	4	0
KENTUCKY	424	256	18	1	0	104	0	0	190	1
LOUISIANA	520	37	2	0	0	10	0	0	29	0
MAINE	202	22	0	2	0	3	0	0	16	1
MARYLAND	384	320	296	0	0	133	3	0	5	0
MASSACHUSETTS	149	43	22	1	0	9	2	0	14	0
MICHIGAN	540	218	30	15	2	174	11	1	25	0
MINNESOTA	614	588	146	1	2	525	3	0	89	0
MISSISSIPPI	627	348	4	2	0	104	1	0	257	5
MISSOURI	961	30	0	0	0	7	1	0	22	0
MONTANA	167	3	0	0	0	1	0	1	1	0
NEBRASKA	464	3	0	0	0	3	0	0	0	0
NEVADA	72	9	3	0	0	5	0	0	1	0
NEW HAMPSHIRE	142	51	1	0	0	5	1	0	44	0
NEW JERSEY	263	123	1	19	37	8	46	1	15	1
NEW MEXICO	160	16	0	0	0	5	0	2	11	0
NEW YORK	932	365	11	7	10	20	30	5	287	1
NORTH CAROLINA	747	396	41	30	0	116	0	0	287	7
NORTH DAKOTA	356	2	0	0	0	2	0	0	0	0
OHIO	952	733	194	15	5	531	4	0	38	2
OKLAHOMA	725	356	79	0	0	185	0	0	95	0
OREGON	255	143	123	0	0	92	0	0	0	0
PENNSYLVANIA	1,327	567	136	62	10	347	32	1	111	1
RHODE ISLAND	25	7	2	0	0	2	0	0	3	0
SOUTH CAROLINA	409	133	26	0	5	46	1	0	76	5
SOUTH DAKOTA	317	18	2	0	0	16	0	0	1	0
TENNESSEE	333	211	26	0	1	140	0	0	82	7
TEXAS	1,125	1,085	5	0	0	61	20	0	1,044	2
UTAH	216	200	2	0	0	190	1	0	3	4
VERMONT	101	35	3	0	0	6	0	0	25	1
VIRGINIA	397	150	89	1	1	55	2	0	13	1
WASHINGTON	344	10	2	0	0	6	4	1	1	0
WEST VIRGINIA	545	108	69	0	0	33	2	0	13	0
WISCONSIN	661	287	13	4	1	144	8	3	159	3
WYOMING	127	2	2	0	0	0	0	0	0	0
AMERICAN SAMOA	6	0	0	0	0	0	0	0	0	0
GUAM	7	2	2	0	0	0	0	0	0	0
N. MARIANAS	4	0	0	0	0	0	0	0	0	0
PUERTO RICO	34	5	0	0	0	1	1	3	0	0
PAC. TR. TERR.	23	0	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	2	0	0	0	0	0	0	0	0	0
U.S. TOTALS	22,768	9,321	1,575	173	83	4,325	256	24	4,078	104

TABLE 26 - POPULATIONS SERVED BY ADVANCED SECONDARY TREATMENT - PRESENT RESIDENT & NONRESIDENT

Table 26 summarizes the 1978 populations served by treatment plants classified as advanced secondary. The treatment levels attained by advanced secondary were defined primarily on effluent BOD concentrations. Advanced secondary effluents are those whose BOD is 10 mg/l or greater, but less than 30 mg/l. If specific processes are planned to remove nutrients in excess of those removed by these processes, the plants are normally classified as tertiary.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

1978 NEEDS SURVEY

POPULATIONS SERVED BY ADVANCED SECONDARY TREATMENT
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	1978 POPULATION	****** RECEIVING TREATMENT ***** 1978 RES.	1978 NONRES.	*** NOT RECEIVING TREATMENT **** 1978 RES.	1978 NONRES.	** PERCENT SERVED ** 1978	NO. OF TREATMENT PLANTS
ALABAMA	3,690	30	0	16	0	0.8	4
ALASKA	407	27	0	11	0	6.8	2
ARIZONA	2,296	0	0	0	0	0.0	1
ARKANSAS	2,144	37	13	3	0	1.8	14
CALIFORNIA	21,896	2,667	103	39	0	12.2	40
COLORADO	2,619	166	3	1	0	6.4	3
CONNECTICUT	3,108	53	16	52	0	1.7	15
DELAWARE	582	430	23	56	0	74.0	4
DIST. OF COLUM.	690	0	0	0	0	0.0	0
FLORIDA	8,452	1,471	238	308	0	17.4	108
GEORGIA	5,048	85	1	21	0	1.7	15
HAWAII	895	0	0	0	0	0.0	0
IDAHO	857	130	1	27	0	15.2	6
ILLINOIS	11,245	3,985	11	57	0	35.4	194
INDIANA	5,330	968	2	94	2	18.2	102
IOWA	2,879	0	0	0	0	0.0	0
KANSAS	2,326	0	0	0	0	0.0	0
KENTUCKY	3,458	76	2	14	0	2.2	6
LOUISIANA	3,921	61	0	4	0	1.6	3
MAINE	1,085	58	0	12	0	5.4	3
MARYLAND	4,139	454	33	140	0	11.0	59
MASSACHUSETTS	5,782	113	0	41	2	2.0	7
MICHIGAN	9,129	112	0	72	0	1.2	11
MINNESOTA	3,975	874	19	52	0	22.0	304
MISSISSIPPI	2,389	22	2	3	0	0.9	8
MISSOURI	4,801	121	12	53	0	2.5	6
MONTANA	761	0	0	0	0	0.0	0
NEBRASKA	1,561	1	0	0	0	0.1	1
NEVADA	633	164	51	32	0	26.0	5
NEW HAMPSHIRE	849	1	2	1	0	0.1	3
NEW JERSEY	7,329	1,179	42	140	0	16.1	56
NEW MEXICO	1,190	0	0	0	0	0.0	0
NEW YORK	17,924	1,172	91	770	5	6.5	91
NORTH CAROLINA	5,525	605	12	156	2	11.0	28
NORTH DAKOTA	653	0	0	0	0	0.0	0
OHIO	10,701	3,399	11	218	0	31.8	214
OKLAHOMA	2,811	296	0	14	0	10.5	36
OREGON	2,376	517	10	129	0	21.8	74
PENNSYLVANIA	11,785	2,143	99	398	1	18.2	177
RHODE ISLAND	935	2	0	7	0	0.3	1
SOUTH CAROLINA	2,876	21	38	13	0	0.7	4
SOUTH DAKOTA	689	44	6	0	0	6.4	2
TENNESSEE	4,299	59	0	10	0	1.4	12
TEXAS	12,830	5,528	42	355	0	43.1	399
UTAH	1,268	316	4	0	0	24.9	25
VERMONT	483	15	5	0	0	3.1	3
VIRGINIA	5,135	1,817	203	132	0	35.4	75
WASHINGTON	3,658	246	50	100	2	6.7	3
WEST VIRGINIA	1,859	94	5	40	0	5.1	14
WISCONSIN	4,651	1,357	2	52	0	29.2	49
WYOMING	406	0	0	0	0	0.0	0
AMERICAN SAMOA	29	0	0	0	0	0.0	0
GUAM	93	0	0	0	0	0.0	0
N. MARIANAS	12	0	0	0	0	0.0	0
PUERTO RICO	3,282	0	0	0	0	0.0	0
PAC. TR. TERR.	114	0	0	0	0	0.0	0
VIRGIN ISLANDS	95	0	0	0	0	0.0	0
U.S. TOTALS	219,955	30,937	1,170	3,663	15	14.1	2,187

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 27 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - FACILITIES PROVIDING ADVANCED SECONDARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For instance, some phosphorus is present in all wastewaters and a percentage is removed in all treatment plants. Unless there is a specific requirement to remove phosphorus, neither influent nor effluent values are reported. Thus, removals are shown only where stipulated.

It should be noted that some State totals for nutrients and "Other" indicate a higher effluent than influent value. Part of this discrepancy is caused by rounding errors. The greatest cause of this paradox results in these locales where it was known that water quality standards require limited quantities of these constituents in the effluent but influent values were unknown for a variety of reasons. In these cases the effluent values were recorded to the highest level of accuracy known, but the influent value was left blank unless accurate data were available. Thus, percentage removals are meaningless and the reader is cautioned not to attempt their use.

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Table 27 demonstrates that existing flows from the advanced secondary treatment plants are nearly all greater than the 85 percent BOD and suspended solids removals of secondary treatment. The national averages of 89 and 88 percent demonstrate this fact.

Influent and effluent nutrient data are provided for some of the States, but not all of them. Some fraction of the influent nutrients will be removed by all types of advanced secondary plants even though the primary purpose is the removal of BOD and/or suspended solids. When data were available on the quantities removed, they were collected and have been summarized herein.

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TABLE 27

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES EXISTING IN 1978
FACILITIES PROVIDING ADVANCED SECONDARY TREATMENT
IN METRIC TONS PER DAY

STATE	FLOW	**** BOD5 INF.	EFF.	**** % REM.	**** SOLIDS INF.	EFF.	**** % REM.	** PHOSPHORUS INFLUENT	*** EFFLUENT	* NH3 NITROGEN INFLUENT	* EFFLUENT	***** OTHER INFLUENT	***** EFFLUENT
ALABAMA	17(4)	2	0	86.5	2	0	80.4						
ALASKA	16(4)	3	0	87.5	3	0	87.7						
ARIZONA	0()	0	0	91.7	0	0	90.2						
ARKANSAS	22(5)	4	0	89.6	4	0	89.5						
CALIFORNIA	1,290(340)	332	25	92.3	418	25	93.8			2	1		
COLORADO	75(20)	15	3	77.1	12	2	78.7						
CONNECTICUT	26(7)	4	0	93.2	4	0	90.6						
DELAWARE	294(77)	50	7	85.3	56	14	73.4						
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	664(175)	116	8	93.0	117	9	91.6						
GEORGIA	41(11)	9	0	92.1	7	1	85.5						
HAWAII	0()	0	0	0.0	0	0	0.0						
IDAHO	89(23)	20	1	94.5	21	1	92.5						
ILLINOIS	2,663(703)	374	33	91.0	436	31	92.9			19	8		
INDIANA	700(185)	119	7	93.6	130	9	92.4	2	1	4	2		
IOWA	0()	0	0	0.0	0	0	0.0						
KANSAS	0()	0	0	0.0	0	0	0.0						
KENTUCKY	32(8)	4	0	91.3	4	0	90.9						
LOUISIANA	22(5)	4	0	89.0	4	1	75.3						
MAINE	45(12)	13	6	51.9	11	4	63.9						
MARYLAND	240(63)	54	3	94.2	47	4	90.5						
MASSACHUSETTS	93(24)	14	1	88.5	27	1	93.7						
MICHIGAN	91(24)	14	2	84.4	17	2	85.4	1					
MINNESOTA	488(129)	141	10	92.8	148	11	92.0						
MISSISSIPPI	17(4)	3	0	90.5	4	1	69.7						
MISSOURI	82(21)	19	1	92.4	17	3	80.9						
MONTANA	0()	0	0	0.0	0	0	0.0						
NEBRASKA	0()	0	0	94.0	0	0	92.5						
NEVADA	86(22)	23	2	90.6	23	1	92.5						
NEW HAMPSHIRE	1()	0	0	95.9	0	0	96.0						
NEW JERSEY	574(151)	112	20	82.1	112	19	83.1						
NEW MEXICO	0()	0	0	0.0	0	0	0.0						
NEW YORK	889(235)	135	19	85.9	124	21	82.4	1		1	1	2	2
NORTH CAROLINA	355(93)	76	7	90.2	66	9	85.3						
NORTH DAKOTA	0()	0	0	0.0	0	0	0.0						
OHIO	2,377(627)	412	69	83.3	444	86	80.6	12	8	16	10		
OKLAHOMA	156(41)	33	4	86.3	34	4	85.9						
OREGON	318(84)	64	4	93.6	58	5	90.9						
PENNSYLVANIA	1,144(302)	223	33	85.2	240	38	83.9	1		2	1		
RHODE ISLAND	1()	0	0	68.5	0	0	77.0						
SOUTH CAROLINA	19(5)	4	0	87.4	4	0	87.9						
SOUTH DAKOTA	31(8)	4	1	72.9	5	0	82.9						
TENNESSEE	50(13)	8	0	92.5	8	1	88.0						
TEXAS	2,596(685)	560	45	91.9	631	67	89.4						
UTAH	306(80)	35	5	85.3	36	6	82.0						
VERMONT	11(3)	1	0	96.0	1	0	94.9						
VIRGINIA	854(225)	151	14	90.6	149	14	90.0						
WASHINGTON	120(31)	21	0	96.6	26	0	96.3			1	1		
WEST VIRGINIA	45(12)	11	2	77.4	8	1	76.9						
WISCONSIN	971(256)	232	30	86.7	272	54	80.0	5	1				
WYOMING	0()	0	0	0.0	0	0	0.0						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	0()	0	0	0.0	0	0	0.0						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	0()	0	0	0.0	0	0	0.0						
PAC. TR. TERR.	0()	0	0	0.0	0	0	0.0						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	17,911(4731)	3,419	362	89.4	3,730	445	88.1	22	10	45	24	2	2

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 28 - POPULATIONS TO BE SERVED BY ADVANCED SECONDARY TREATMENT - PROJECTED RESIDENT & NONRESIDENT

Table 28 summarizes the 2000 populations served by treatment plants classified as advanced secondary. The treatment levels attained by advanced secondary were defined primarily on effluent BOD concentrations which are 10 mg/l or greater, but less than 30 mg/l. A further discussion of advanced secondary can be found on Table 26.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used for Item 26 of the EPA-1 form.

FEBRUARY 10, 1979
TABLE 28

1978 NEEDS SURVEY

POPULATIONS TO BE SERVED BY ADVANCED SECONDARY TREATMENT
PROJECTED RESIDENT & NONRESIDENT
(IN THOUSANDS)

		****** RECEIVING TREATMENT *****		*** NOT RECEIVING TREATMENT ****		** PERCENT SERVED **	NO. OF
STATE	2000 POPULATION	2000 RES.	2000 NONRES.	2000 RES.	2000 NONRES.	2000	TREATMENT PLANTS
ALABAMA	4,140	128	2	0	0	3.1	10
ALASKA	667	54	0	8	0	8.1	2
ARIZONA	4,149	2	0	0	0	0.1	1
ARKANSAS	2,970	402	30	0	0	13.6	186
CALIFORNIA	26,786	2,676	80	4	0	10.0	41
COLORADO	3,868	2	0	0	0	0.1	1
CONNECTICUT	3,741	63	3	34	0	1.7	10
DELAWARE	841	219	297	5	0	26.1	15
DIST. OF COLUM.	661	0	0	0	0	0.0	0
FLORIDA	15,049	5,303	874	111	0	35.2	119
GEORGIA	7,053	260	4	2	0	3.7	22
HAWAII	1,366	0	0	0	0	0.0	0
IDAHO	1,183	30	0	0	0	2.6	3
ILLINOIS	12,358	3,647	5	0	0	29.5	328
INDIANA	5,732	1,061	46	0	0	18.5	390
IOWA	3,101	32	0	0	0	1.0	5
KANSAS	2,517	104	0	0	0	4.1	2
KENTUCKY	4,224	624	9	2	0	14.8	5
LOUISIANA	4,659	549	6	0	0	11.8	32
MAINE	1,222	78	0	1	0	6.4	3
MARYLAND	5,583	1,236	467	23	0	22.1	290
MASSACHUSETTS	6,614	99	18	49	0	1.5	11
MICHIGAN	10,314	326	18	6	4	3.2	12
MINNESOTA	4,505	1,217	19	6	0	27.0	515
MISSISSIPPI	2,740	71	2	0	0	2.6	7
MISSOURI	5,225	115	23	0	0	2.2	25
MONTANA	802	0	0	0	0	0.0	0
NEBRASKA	1,734	71	0	0	0	4.1	3
NEVADA	1,141	10	0	0	0	0.9	1
NEW HAMPSHIRE	1,306	17	1	8	0	1.3	4
NEW JERSEY	8,747	2,611	64	7	0	29.9	69
NEW MEXICO	1,436	32	0	45	0	2.3	3
NEW YORK	18,922	3,500	644	200	0	18.5	171
NORTH CAROLINA	7,419	68	20	10	0	0.9	15
NORTH DAKOTA	690	0	0	0	0	0.0	0
OHIO	12,031	495	6	0	0	4.1	190
OKLAHOMA	3,396	2,326	9	0	0	68.5	332
OREGON	3,209	1,183	28	0	0	36.9	106
PENNSYLVANIA	12,365	4,083	324	53	0	33.0	162
RHODE ISLAND	1,033	8	0	1	0	0.8	1
SOUTH CAROLINA	3,700	125	0	1	0	3.4	47
SOUTH DAKOTA	730	34	0	0	0	4.8	3
TENNESSEE	5,573	16	0	0	0	0.3	8
TEXAS	18,069	8,500	91	0	0	47.0	955
UTAH	1,688	10	0	0	0	0.6	3
VERMONT	607	8	0	0	0	1.4	2
VIRGINIA	6,755	2,022	239	12	0	29.9	100
WASHINGTON	4,417	3	0	0	0	0.1	1
WEST VIRGINIA	2,003	212	8	3	0	10.6	70
WISCONSIN	5,553	373	6	11	0	6.7	83
WYOMING	484	0	0	0	0	0.0	0
AMERICAN SAMOA	40	0	0	0	0	0.0	0
GUAM	275	0	0	0	0	0.0	0
N. MARIANAS	35	0	0	0	0	0.0	0
PUERTO RICO	4,700	63	0	15	0	1.4	2
PAC. TR. TERR.	170	0	0	0	0	0.0	0
VIRGIN ISLANDS	116	0	0	0	0	0.0	0
U.S. TOTALS	270,414	44,090	3,359	630	4	16.3	4,366

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 29 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES PROJECTED FOR 2000 - FACILITIES PROVIDING ADVANCED SECONDARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from projected design flow information as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total design flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For instance, some phosphorus is present in all wastewaters and a percentage is removed in all treatment plants. Unless there is a specific requirement to remove phosphorus, neither influent nor effluent values are reported. Thus, removals are shown only where stipulated.

It should be noted that some State totals for nutrients and "Other" indicate a higher effluent than influent value. Part of this discrepancy is caused by rounding errors. The greatest cause of this paradox results in those locales where it was known that water quality standards require limited quantities of these constituents in the effluent but influent values were unknown for a variety of reasons. In these cases the effluent values were recorded to the highest level of accuracy known, but the influent value was left blank unless accurate data were available. Thus, percentage removals are meaningless and the reader is cautioned not to attempt their use.

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Table 29, like Table 27, demonstrates national average removal efficiencies of BOD and suspended solids are significantly greater than normal secondary treatment. They are predicted to be two to three percent better than the existing efficiencies of the same type of plant. The 1978 results are based upon existing flows while the 2000 results are based upon design flow.

It is predicted that 2,432 mgd more waste will be treated to this level in 2000 than in 1978, an increase of over 50 percent.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES PROJECTED FOR 2000 FACILITIES PROVIDING ADVANCED SECONDARY TREATMENT IN METRIC TONS PER DAY

STATE	FLOW	**** BOD5 INF.	EFF.	**** % REM.	**** SOLIDS INF.	EFF.	**** % REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	70(18)	18	1	91.7	20	2	89.2						
ALASKA	36(9)	7	0	88.4	7	0	87.8						
ARIZONA	2()	0	0	94.0	0	0	92.0						
ARKANSAS	203(53)	50	2	95.7	46	3	93.1						
CALIFORNIA	1,542(407)	423	28	93.3	398	35	91.1	16	4	28	1		
COLORADO	1()	0	0	90.0	0	0	90.0						
CONNECTICUT	35(9)	9	0	96.0	7	0	94.8						
DELAWARE	173(45)	54	2	95.6	52	3	93.9	1					
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	2,781(734)	584	49	91.5	601	52	91.2	2					
GEORGIA	200(52)	47	3	91.7	39	5	85.5						
HAWAII	0()	0	0	0.0	0	0	0.0						
IDAHO	44(11)	6	0	94.9	7	0	95.6						
ILLINOIS	2,516(664)	495	31	93.6	571	38	93.2						
INDIANA	653(172)	124	6	95.1	135	6	95.4	1					
IOWA	24(6)	4	0	92.6	4	0	89.2						
KANSAS	81(21)	19	0	95.8	14	0	94.3						
KENTUCKY	396(104)	87	8	90.6	113	10	90.4						
LOUISIANA	230(60)	48	2	94.0	47	5	88.7						
MAINE	54(14)	9	1	85.1	6	0	85.5						
MARYLAND	1,045(276)	242	15	93.6	238	13	94.5	3					4
MASSACHUSETTS	111(29)	16	1	91.2	34	1	95.9						
MICHIGAN	268(70)	55	6	87.5	52	6	87.6	1					
MINNESOTA	718(189)	197	15	92.2	187	18	90.3						
MISSISSIPPI	46(12)	10	0	91.9	10	1	87.5						
MISSOURI	52(13)	13	0	96.0	12	0	94.4						
MONTANA	0()	0	0	0.0	0	0	0.0						
NEBRASKA	48(12)	13	1	89.2	15	1	90.8					6	
NEVADA	3()	0	0	90.0	0	0	90.0						
NEW HAMPSHIRE	12(3)	2	0	87.9	2	0	87.9						
NEW JERSEY	1,390(367)	374	33	91.1	346	32	90.5						
NEW MEXICO	12(3)	2	0	90.2	2	0	90.0						
NEW YORK	3,301(872)	730	70	90.4	757	76	89.8	15	2				
NORTH CAROLINA	76(20)	16	1	90.0	16	2	87.8						
NORTH DAKOTA	0()	0	0	0.0	0	0	0.0						
OHIO	256(67)	51	4	92.2	58	4	91.6						
OKLAHOMA	1,164(307)	259	23	91.1	288	34	88.0						
OREGON	633(167)	132	10	92.1	133	10	92.1			1			
PENNSYLVANIA	3,117(823)	663	57	91.4	793	73	90.7	2					
RHODE ISLAND	8(2)	2	0	94.3	2	0	94.6						
SOUTH CAROLINA	71(18)	17	1	90.0	16	1	89.0						
SOUTH DAKOTA	16(4)	6	0	94.1	5	0	93.7						
TENNESSEE	11(3)	2	0	92.8	3	0	93.8						
TEXAS	4,197(1108)	886	75	91.5	899	79	91.2						
UTAH	3()	0	0	95.1	0	0	95.1						
VERMONT	4(1)	0	0	91.9	0	0	91.9						
VIRGINIA	1,141(301)	237	13	94.2	237	13	94.2	2		4			7
WASHINGTON	16(4)	4	0	90.0	4	0	90.0						
WEST VIRGINIA	94(25)	20	1	93.5	19	1	93.0						
WISCONSIN	241(63)	55	4	91.7	54	4	92.4						
WYOMING	0()	0	0	0.0	0	0	0.0						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	0()	0	0	0.0	0	0	0.0						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	20(5)	4	0	94.5	4	0	94.0						
PAC. TR. TERR.	0()	0	0	0.0	0	0	0.0						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	27,115(7163)	5,992	463	92.3	6,253	528	91.6	43	6	33	1	6	11

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 30 - POPULATIONS SERVED BY TERTIARY TREATMENT - PRESENT RESIDENT & NONRESIDENT

Table 30 summarizes the 1978 populations served by tertiary treatment, based upon existing flow. Tertiary treatment, or advanced wastewater treatment, as used in the Survey and included on this and subsequent tables, is a treatment level higher than advanced secondary. Generally this includes BOD removal to levels less than 10 mg/l or significant removal of nutrients or certain other contaminants, mostly toxics.

It should be noted that there are only 701 of these plants existent in the country, serving a population of approximately 18 million.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used on Item 26 of the EPA-1 form.

FEBRUARY 10, 1979
TABLE 30

1978 NEEDS SURVEY

POPULATIONS SERVED BY TERTIARY TREATMENT
PRESENT RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	1978 POPULATION	****** RECEIVING TREATMENT ***** 1978 RES.	1978 NONRES.	*** NOT RECEIVING TREATMENT **** 1978 RES.	1978 NONRES.	** PERCENT SERVED ** 1978	NO. OF TREATMENT PLANTS
ALABAMA	3,690	375	7	88	0	10.2	11
ALASKA	407	0	0	0	0	0.0	0
ARIZONA	2,296	0	0	0	0	0.0	0
ARKANSAS	2,144	31	0	0	0	1.5	11
CALIFORNIA	21,896	2,336	82	124	0	10.7	25
COLORADO	2,619	49	18	0	0	1.9	9
CONNECTICUT	3,108	16	0	2	0	0.5	2
DELAWARE	582	0	0	0	0	0.0	1
DIST. OF COLUM.	690	0	0	0	0	0.0	0
FLORIDA	8,452	312	88	80	0	3.7	10
GEORGIA	5,048	30	1	0	0	0.6	18
HAWAII	895	2	0	0	0	0.3	1
IDAHO	857	0	0	0	0	0.0	0
ILLINOIS	11,245	3,336	10	34	0	29.7	38
INDIANA	5,330	702	2	74	15	13.2	31
IOWA	2,879	39	0	2	0	1.4	2
KANSAS	2,326	0	0	0	0	0.0	0
KENTUCKY	3,458	63	4	14	0	1.8	12
LOUISIANA	3,921	0	0	0	0	0.0	0
MAINE	1,085	0	0	0	0	0.0	0
MARYLAND	4,139	37	0	6	0	0.9	5
MASSACHUSETTS	5,782	28	0	19	0	0.5	4
MICHIGAN	9,129	5,338	80	780	0	58.5	102
MINNESOTA	3,975	56	0	4	0	1.4	9
MISSISSIPPI	2,389	26	0	2	0	1.1	10
MISSOURI	4,801	0	0	0	0	0.0	0
MONTANA	761	0	0	0	0	0.0	0
NEBRASKA	1,561	0	0	0	0	0.0	0
NEVADA	633	0	0	0	0	0.0	1
NEW HAMPSHIRE	849	0	0	0	0	0.0	0
NEW JERSEY	7,329	0	0	0	0	0.0	1
NEW MEXICO	1,190	0	0	0	0	0.0	0
NEW YORK	17,924	262	26	102	0	1.5	17
NORTH CAROLINA	5,525	369	8	214	0	6.7	35
NORTH DAKOTA	653	0	0	0	0	0.0	0
OHIO	10,701	862	12	189	0	8.1	83
OKLAHOMA	2,811	101	0	7	0	3.6	2
OREGON	2,376	478	2	102	0	20.1	10
PENNSYLVANIA	11,785	828	114	187	5	7.0	110
RHODE ISLAND	935	0	0	0	0	0.0	0
SOUTH CAROLINA	2,876	146	49	33	0	5.1	14
SOUTH DAKOTA	689	10	2	0	0	1.6	2
TENNESSEE	4,299	430	33	257	0	10.0	28
TEXAS	12,830	379	65	25	0	3.0	13
UTAH	1,268	100	0	2	0	7.9	7
VERMONT	483	0	0	0	0	0.2	1
VIRGINIA	5,135	170	0	0	0	3.3	4
WASHINGTON	3,658	180	3	4	0	4.9	2
WEST VIRGINIA	1,859	157	0	34	0	8.5	11
WISCONSIN	4,651	852	13	49	0	18.3	59
WYOMING	406	0	0	0	0	0.0	0
AMERICAN SAMOA	29	0	0	0	0	0.0	0
GUAM	93	0	0	0	0	0.0	0
N. MARIANAS	12	0	0	0	0	0.0	0
PUERTO RICO	3,282	0	0	0	0	0.0	0
PAC. TR. TERR.	114	0	0	0	0	0.0	0
VIRGIN ISLANDS	95	0	0	0	0	0.0	0
U.S. TOTALS	219,955	18,117	627	2,448	20	8.2	701

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 31 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES EXISTING IN 1978 - FACILITIES PROVIDING TERTIARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from existing flow (not design flow) as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total existing flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For instance, some phosphorus is present in all wastewaters and a percentage is removed in all treatment plants. Unless there is a specific requirement to remove phosphorus, neither influent nor effluent values are reported. Thus, removals are shown only where stipulated.

It should be noted that some State totals for nutrients and "Other" indicate a higher effluent than influent value. Part of this discrepancy is caused by rounding errors. The greatest cause of this paradox results in those locales where it was known that water quality standards require limited quantities of these constituents in the effluent but influent values were unknown for a variety of reasons. In these cases the effluent values were recorded to the highest level of accuracy known, but the influent value was left blank unless accurate data were available. Thus, percentage removals are meaningless and the reader is cautioned not to attempt their use.

*   *   *   *

Table 31 demonstrates that in most States the removals of nutrients and BOD are greater than for other treatment methods. This table is based upon existing flow to the plants summarized.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES EXISTING IN 1978
FACILITIES PROVIDING TERTIARY TREATMENT
IN METRIC TONS PER DAY

STATE	FLOW	**** BODS INF.	EFF.	**** % REM.	**** SOLIDS INF.	EFF.	**** % REM.	** PHOSPHORUS INFLUENT	*** EFFLUENT	* NH3 NITROGEN INFLUENT	* EFFLUENT	***** OTHER INFLUENT	***** EFFLUENT
ALABAMA	262(69)	21	9	54.9	22	7	66.1			1			
ALASKA	0()	0	0	0.0	0	0	0.0						
ARIZONA	0()	0	0	0.0	0	0	92.4						
ARKANSAS	32(8)	6	0	97.3	6	0	92.4						
CALIFORNIA	1,283(339)	380	24	93.4	370	28	92.3	6	14	19	15	8	1
COLORADO	19(5)	3	0	92.2	3	0	93.2						
CONNECTICUT	8(2)	1	0	87.1	1	0	82.8						
DELAWARE	0()	0	0	0.0	0	0	0.0						
DIST. OF COLUM.	0()	0	0	0.0	0	0	0.0						
FLORIDA	306(80)	71	29	59.4	60	15	75.0						
GEORGIA	14(3)	2	0	84.7	2	0	74.9						
HAWAII	0()	0	0	99.3	0	0	96.9						
IDAHO	0()	0	0	0.0	0	0	0.0						
ILLINOIS	3,463(914)	451	15	96.5	661	22	96.6	1		40	8		
INDIANA	715(189)	94	16	83.0	145	21	85.5	2		1			
IOWA	24(6)	9	0	98.7	10	0	97.0						
KANSAS	0()	0	0	0.0	0	0	0.0						
KENTUCKY	43(11)	9	0	91.4	8	1	87.3						
LOUISIANA	0()	0	0	0.0	0	0	0.0						
MAINE	0()	0	0	0.0	0	0	0.0						
MARYLAND	13(3)	2	0	90.3	2	0	92.3						
MASSACHUSETTS	15(4)	2	0	94.2	2	0	92.5						
MICHIGAN	4,410(1164)	1,268	222	82.5	2,271	390	82.8	31	10	12	2		
MINNESOTA	33(8)	3	0	93.6	5	0	96.0						
MISSISSIPPI	22(6)	3	0	89.5	3	1	46.6						
MISSOURI	0()	0	0	0.0	0	0	0.0						
MONTANA	0()	0	0	0.0	0	0	0.0						
NEBRASKA	0()	0	0	0.0	0	0	0.0						
NEVADA	0()	0	0	0.0	0	0	0.0						
NEW HAMPSHIRE	0()	0	0	0.0	0	0	0.0						
NEW JERSEY	0()	0	0	0.0	0	0	0.0						
NEW MEXICO	0()	0	0	0.0	0	0	0.0						
NEW YORK	331(87)	60	7	88.0	52	5	89.9					35	24
NORTH CAROLINA	252(66)	72	5	92.6	57	9	84.0			2			
NORTH DAKOTA	0()	0	0	0.0	0	0	0.0						
OHIO	625(165)	108	10	90.7	129	10	92.2	3		6	2		
OKLAHOMA	46(12)	8	0	98.2	9	0	97.4						
OREGON	381(100)	61	4	92.0	69	7	89.0						
PENNSYLVANIA	467(123)	86	20	75.8	91	18	80.4	1		4	1		
RHODE ISLAND	0()	0	0	0.0	0	0	0.0						
SOUTH CAROLINA	102(27)	49	7	84.0	13	5	57.4						
SOUTH DAKOTA	4(1)	0	0	95.6	0	0	96.0						
TENNESSEE	351(92)	68	11	82.7	67	12	81.1			5	2		1
TEXAS	196(51)	38	4	87.8	29	5	81.3						
UTAH	71(18)	9	1	83.3	10	0	91.2						
VERMONT	0()	0	0	96.0	0	0	92.0						
VIRGINIA	96(25)	23	0	99.2	30	0	99.7	1					
WASHINGTON	102(27)	20	3	85.0	20	3	85.0						
WEST VIRGINIA	74(19)	14	1	87.7	15	2	86.6			1			
WISCONSIN	673(177)	166	21	86.9	151	26	82.7	5	1				
WYOMING	0()	0	0	0.0	0	0	0.0						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	0()	0	0	0.0	0	0	0.0						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	0()	0	0	0.0	0	0	0.0						
PAC. TR. TERR.	0()	0	0	0.0	0	0	0.0						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	14,433(3812)	3,107	409	86.8	4,313	587	86.4	50	25	91	30	43	26

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 32 - POPULATIONS TO BE SERVED BY TERTIARY TREATMENT - PROJECTED RESIDENT & NONRESIDENT

Table 32 summarizes the 2000 populations to be served by tertiary treatment. Tertiary treatment, or advanced wastewater treatment, as used in the Survey and included in this table, is a treatment level higher than advanced secondary. Generally this includes BOD removal to a level less than 10 mg/l or significant removal of nutrients.

When comparing this table with Table 30, it can be seen that 3,731 additional tertiary plants are planned to serve an additional 77,000,000 people in 2000 as compared to existing 1978 figures.

The total population within a service area or an authority is the sum of "Receiving Treatment" and "Not Receiving Treatment," as listed. Those "Not Receiving Treatment" do not contribute to the treatment facility because they are not on a sewer system.

This table was developed based upon coding used on Item 26 of the EPA-1 form.

1978 NEEDS SURVEY

POPULATIONS TO BE SERVED BY TERTIARY TREATMENT
PROJECTED RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	2000 POPULATION	****** RECEIVING TREATMENT ***** 2000 RES.	2000 NONRES.	*** NOT RECEIVING TREATMENT **** 2000 RES.	2000 NONRES.	** PERCENT SERVED ** 2000	NO. OF TREATMENT PLANTS
ALABAMA	4,140	1,359	45	11	0	32.8	138
ALASKA	667	0	0	0	0	0.0	0
ARIZONA	4,149	24	4	0	0	0.6	1
ARKANSAS	2,970	989	9	0	0	33.3	289
CALIFORNIA	26,786	6,851	283	3	0	25.6	41
COLORADO	3,868	2,287	384	0	0	59.1	35
CONNECTICUT	3,741	604	0	71	0	16.2	15
DELAWARE	841	594	81	12	0	70.7	3
DIST. OF COLUM.	661	611	1,728	0	0	92.4	1
FLORIDA	15,049	3,147	381	64	0	20.9	141
GEORGIA	7,053	3,669	143	160	0	52.0	156
HAWAII	1,366	0	0	0	0	0.0	0
IDAHO	1,183	357	9	3	0	30.2	9
ILLINOIS	12,358	7,626	35	12	0	61.7	126
INDIANA	5,732	3,097	426	22	0	54.0	73
IOWA	3,101	1,341	103	0	0	43.3	119
KANSAS	2,517	159	0	0	0	6.4	3
KENTUCKY	4,224	1,286	27	158	0	30.5	245
LOUISIANA	4,659	47	0	0	0	1.0	5
MAINE	1,222	43	2	12	0	3.6	18
MARYLAND	5,583	3,352	10	49	0	60.0	22
MASSACHUSETTS	6,614	1,328	9	210	3	20.1	30
MICHIGAN	10,314	7,587	176	217	0	73.6	196
MINNESOTA	4,505	2,521	20	23	0	56.0	62
MISSISSIPPI	2,740	1,317	67	81	0	48.1	327
MISSOURI	5,225	235	0	0	0	4.5	4
MONTANA	802	58	5	0	0	7.3	2
NEBRASKA	1,734	0	0	0	0	0.0	0
NEVADA	1,141	322	105	0	0	28.3	5
NEW HAMPSHIRE	1,306	130	6	59	0	10.0	13
NEW JERSEY	8,747	2,183	436	11	0	25.0	82
NEW MEXICO	1,436	104	23	0	0	7.3	10
NEW YORK	18,922	3,204	579	359	2	16.9	167
NORTH CAROLINA	7,419	3,160	212	488	0	42.6	370
NORTH DAKOTA	690	0	0	0	0	0.0	0
OHIO	12,031	9,768	83	24	0	81.2	464
OKLAHOMA	3,396	415	0	0	0	12.2	22
OREGON	3,209	1,551	28	0	0	48.3	28
PENNSYLVANIA	12,365	4,155	281	120	0	33.6	383
RHODE ISLAND	1,033	246	4	46	0	23.9	6
SOUTH CAROLINA	3,700	791	104	36	0	21.4	80
SOUTH DAKOTA	730	271	4	0	0	37.2	14
TENNESSEE	5,573	2,947	133	225	0	52.9	197
TEXAS	18,069	8,137	138	0	0	45.0	103
UTAH	1,688	1,602	26	0	0	95.0	183
VERMONT	607	228	41	24	3	37.6	31
VIRGINIA	6,755	1,553	9	7	0	23.0	19
WASHINGTON	4,417	1,007	173	70	0	22.8	9
WEST VIRGINIA	2,003	465	2	15	0	23.2	38
WISCONSIN	5,553	2,200	60	5	0	39.6	182
WYOMING	484	27	0	0	0	5.7	2
AMERICAN SAMOA	40	0	0	0	0	0.0	0
GUAM	275	0	0	0	0	0.0	0
N. MARIANAS	35	0	0	0	0	0.0	0
PUERTO RICO	4,700	41	0	10	0	0.9	3
PAC. TR. TERR.	170	0	0	0	0	0.0	0
VIRGIN ISLANDS	116	0	0	0	0	0.0	0
U.S. TOTALS	270,414	95,019	6,414	2,625	11	35.1	4,432

NOTE: SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND OFFS.

TABLE 33 - PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES FROM FACILITIES PROJECTED FOR 2000 - FACILITIES PROVIDING TERTIARY TREATMENT

General Explanation of This Table: This is one of a number of similar tables found in this report. It is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. Five day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (shown as Solids) are summarized for each State. The nutrients phosphorus and ammonia nitrogen, as well as "Other" are also listed.

These data are derived from projected design flow information as reported in Block 29, Items 4, 5, 6, 7, 8, 9, and 10 of the EPA-1 form. The concentrations of the pollutants are multiplied by the total design flow, with appropriate conversion factors, and totaled for each State.

Nutrients and "Other" pollutants are not reported unless the plant is specifically designed to remove them. For instance, some phosphorus is present in all wastewaters and a percentage is removed in all treatment plants. Unless there is a specific requirement to remove phosphorus, neither influent nor effluent values are reported. Thus, removals are shown only where stipulated.

It should be noted that some State totals for nutrients and "Other" indicate a higher effluent than influent value. Part of this discrepancy is caused by rounding errors. The greatest cause of this paradox results in those locales where it was known that water quality standards require limited quantities of these constituents in the effluent but influent values were unknown for a variety of reasons. In these cases the effluent values were recorded to the highest level of accuracy known, but the influent value was left blank unless accurate data were available. Thus, percentage removals are meaningless and the reader is cautioned not to attempt their use.

* * * *

Table 33 demonstrates the high degree of BOD and suspended solids removal expected to occur in the tertiary (advanced wastewater treatment) plants at design capacity in 2000. 93.9 and 93.1 percent removal for BOD and suspended solids, respectively, are predicted. It should be noted that high removal efficiencies are anticipated for the nutrients also.

The efficiencies of these plants are significantly greater than the same category of plant in 1978 (see Table 31). Since the 1978 data is based upon existing flows and removals, not design flow, this may indicate that many existing plants are overloaded or have other operational problems which impair their performance. Also, absolute effluent values are high, but the percentage removals are somewhat lower as a result of weak influent waste at many locations.

1978 NEEDS SURVEY

PLANT LOADINGS, REMOVAL EFFICIENCIES AND DISCHARGE RATES
FROM FACILITIES PROJECTED FOR 2000
FACILITIES PROVIDING TERTIARY TREATMENT
IN METRIC TONS PER DAY

STATE	FLOW	**** BODS INF.	EFF.	**** % REM.	**** SOLIDS INF.	EFF.	**** % REM.	** PHOSPHORUS *** INFLUENT	EFFLUENT	* NH3 NITROGEN * INFLUENT	EFFLUENT	***** OTHER ***** INFLUENT	EFFLUENT
ALABAMA	794(209)	159	12	92.4	160	23	85.7			16	2	1	3
ALASKA	0()	0	0	0.0	0	0	0.0						
ARIZONA	10(2)	2	0	88.0	2	0	88.0						
ARKANSAS	554(146)	128	5	96.0	119	8	93.0						
CALIFORNIA	3,421(903)	979	38	96.1	1,047	36	96.5	13	2	41	14	18	25
COLORADO	1,341(354)	306	30	90.2	326	30	90.8			21	2		
CONNECTICUT	373(98)	76	7	90.4	73	4	93.6	3		4			
DELAWARE	426(112)	87	6	93.1	87	8	90.0			1			
DIST. OF COLUM.	1,169(308)	280	5	97.9	280	8	97.1	8		15	1		
FLORIDA	1,516(400)	305	19	93.6	311	24	92.1	13	1	4			
GEORGIA	2,444(645)	519	32	93.7	484	63	86.9	9		41	7	5	11
HAWAII	0()	0	0	0.0	0	0	0.0						
IDAHO	242(64)	57	5	91.1	57	6	88.6			4			
ILLINOIS	8,260(2182)	1,251	86	93.1	1,845	103	94.4	5		126	18		
INDIANA	2,889(763)	581	31	94.7	670	30	95.4	14	1	39	6	1	10
IOWA	878(231)	285	12	95.6	240	19	91.7			21	2		
KANSAS	78(20)	19	1	92.1	22	1	93.4			1			
KENTUCKY	747(197)	152	9	93.5	161	18	88.7			14	1	1	4
LOUISIANA	23(6)	5	0	96.0	5	0	92.4						
MAINE	34(9)	9	0	95.8	9	0	95.3						
MARYLAND	1,805(477)	425	15	96.3	370	9	97.4	24	2	38	1	1	8
MASSACHUSETTS	873(230)	192	12	93.7	190	12	93.2	8		10			
MICHIGAN	7,404(1956)	1,400	169	87.9	2,064	182	91.2	67	9	19	2		
MINNESOTA	1,751(462)	479	16	96.7	530	17	96.7	2		25	5		
MISSISSIPPI	765(202)	161	12	92.2	156	21	86.0			2			1
MISSOURI	118(31)	35	1	96.4	23	1	94.6			2			
MONTANA	41(11)	6	1	81.1	6	1	81.7						
NEBRASKA	0()	0	0	0.0	0	0	0.0						
NEVADA	540(142)	52	5	89.3	49	2	94.1	6					8
NEW HAMPSHIRE	83(22)	18	1	94.4	19	0	95.4			1			
NEW JERSEY	1,177(311)	286	13	95.3	308	14	95.2	5		19	3		3
NEW MEXICO	49(13)	10	0	92.1	10	0	91.8						
NEW YORK	2,072(547)	435	33	92.2	491	32	93.4	9		28	3	90	23
NORTH CAROLINA	2,340(618)	623	28	95.4	530	67	87.4			35	9	6	10
NORTH DAKOTA	0()	0	0	0.0	0	0	0.0						
OHIO	7,405(1956)	1,532	99	93.5	1,696	111	93.4	67	6	110	11		
OKLAHOMA	201(53)	46	3	93.6	49	3	93.3	2		1			
OREGON	1,023(270)	259	14	94.5	247	14	94.2	4					
PENNSYLVANIA	2,334(616)	502	38	92.4	503	50	89.9	22	3	45	5	1	3
RHODE ISLAND	179(47)	49	2	95.2	45	2	93.9			2			
SOUTH CAROLINA	1,655(437)	385	15	96.0	335	48	85.5	1		29	2	4	7
SOUTH DAKOTA	161(42)	49	2	94.4	47	2	93.7			5			
TENNESSEE	2,268(599)	613	40	93.4	510	54	89.4			46	9	3	5
TEXAS	4,325(1142)	1,163	29	97.4	1,193	38	96.8	2		45	8		
UTAH	1,093(288)	215	10	94.9	233	10	95.3						
VERMONT	148(39)	31	2	91.9	30	2	91.1	1					
VIRGINIA	689(182)	164	2	98.4	169	1	99.1	8		1			3
WASHINGTON	830(219)	194	15	92.0	234	21	90.9	2		8	1		
WEST VIRGINIA	258(68)	77	3	95.9	75	3	95.3			3	1		
WISCONSIN	1,775(469)	412	32	92.1	399	33	91.5	12	1	12	1	8	1
WYOMING	11(3)	3	0	89.8	3	0	89.8						
AMERICAN SAMOA	0()	0	0	0.0	0	0	0.0						
GUAM	0()	0	0	0.0	0	0	0.0						
N. MARIANAS	0()	0	0	0.0	0	0	0.0						
PUERTO RICO	18(4)	5	0	89.2	4	0	88.3						
PAC. TR. TERR.	0()	0	0	0.0	0	0	0.0						
VIRGIN ISLANDS	0()	0	0	0.0	0	0	0.0						
U.S. TOTALS	68,590(18119)	15,021	910	93.9	16,416	1,131	93.1	307	25	834	114	139	125

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. APPROXIMATE MGD IN PARENTHESES 3. METRIC TONS X .9072 = SHORT TONS

TABLE 34 - NUMBER OF PLANTS PROJECTED FOR MORE STRINGENT TREATMENT FOR YEAR 2000 - TOTAL PROJECTED FLOW

Table 34 summarizes the total number of treatment plants which will have treatment levels with greater efficiencies than secondary in the year 2000. The reasons for the high level of treatment have been tabulated on Table 25.

The treatment plants expected to be in operation in 2000 include: existing facilities designed for more stringent treatment, those which will be built as new construction between 1978 and 2000, and those which will be upgraded from a less efficient plant between now and 2000. Tables 36, 37, and 38 further define the type of construction predicted.

1978 NEEDS SURVEY

NUMBER OF PLANTS PROJECTED FOR MORE STRINGENT TREATMENT FOR YEAR 2000

TOTAL PROJECTED FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	148	35	58	17	31	4	3	0
ALASKA	2	0	0	0	1	1	0	0
ARIZONA	2	0	0	1	1	0	0	0
ARKANSAS	477	304	104	22	41	3	3	0
CALIFORNIA	93	3	9	8	22	21	23	7
COLORADO	36	1	4	4	20	3	3	1
CONNECTICUT	25	0	5	5	7	5	3	0
DELAWARE	18	1	6	6	1	1	2	1
DIST. OF COLUM.	1	0	0	0	0	0	0	1
FLORIDA	260	23	78	36	75	20	26	2
GEORGIA	179	29	61	22	39	15	11	2
HAWAII	0	0	0	0	0	0	0	0
IDAHO	12	1	0	2	4	1	4	0
ILLINOIS	456	64	158	71	109	24	25	5
INDIANA	463	206	152	27	52	9	13	4
IOWA	124	13	56	15	31	5	4	0
KANSAS	5	0	0	0	2	1	2	0
KENTUCKY	250	99	87	22	37	2	2	1
LOUISIANA	37	8	7	4	14	3	1	0
MAINE	21	11	5	1	3	0	1	0
MARYLAND	312	168	81	23	21	8	7	4
MASSACHUSETTS	41	1	5	4	16	8	6	1
MICHIGAN	208	7	46	44	76	14	17	4
MINNESOTA	577	303	180	44	35	8	6	1
MISSISSIPPI	334	229	65	11	23	3	2	1
MISSOURI	29	12	10	1	5	0	1	0
MONTANA	2	0	0	0	1	1	0	0
NEBRASKA	3	0	1	0	1	1	0	0
NEVADA	6	0	0	1	2	1	1	1
NEW HAMPSHIRE	17	4	3	2	7	1	0	0
NEW JERSEY	111	3	13	13	55	12	12	3
NEW MEXICO	13	1	2	5	5	0	0	0
NEW YORK	339	85	104	36	62	25	23	4
NORTH CAROLINA	385	217	58	27	45	22	16	0
NORTH DAKOTA	0	0	0	0	0	0	0	0
OHIO	655	229	198	59	104	34	22	9
OKLAHOMA	354	144	130	28	39	7	5	1
OREGON	134	18	49	23	27	9	7	1
PENNSYLVANIA	547	110	194	81	118	31	9	4
RHODE ISLAND	7	1	0	0	3	1	2	0
SOUTH CAROLINA	127	57	33	10	16	9	1	1
SOUTH DAKOTA	17	2	3	3	7	0	2	0
TENNESSEE	205	42	70	29	46	9	7	2
TEXAS	1,058	282	399	137	176	29	29	6
UTAH	186	115	38	9	13	5	5	1
VERMONT	33	4	12	6	10	1	0	0
VIRGINIA	119	27	41	17	18	4	9	3
WASHINGTON	10	0	1	1	3	3	1	1
WEST VIRGINIA	108	43	35	10	17	1	2	0
WISCONSIN	266	64	96	45	40	6	11	4
WYOMING	2	0	1	0	1	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	5	0	0	1	4	0	0	0
PAC. TR. TERR.	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0
U.S. TOTALS	8,819	2,966	2,658	933	1,486	371	329	76

TABLE 35 - NUMBER OF MORE STRINGENT TREATMENT PLANTS TO BE CONSTRUCTED BETWEEN 1978 AND 2000 - TOTAL PROJECTED FLOW

Table 35 summarizes the treatment plants designed for more stringent treatment than secondary required to be constructed between 1978 and 2000. In general, these plants will be advanced secondary and tertiary facilities.

The plants are totaled for each State and further categorized into flow ranges.

It is noted that 66 percent of the plants will be smaller than 100,000 gallons per day capacity, and 92 percent will be smaller than 1.0 mgd. This reflects the needs of many small communities located on water quality limited minor streams, many of which are located in the mountains or the Great Lakes region.

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TABLE 35

1978 NEEDS SURVEY

NUMBER OF MORE STRINGENT TREATMENT PLANTS TO BE CONSTRUCTED BETWEEN 1978 AND 2000

TOTAL PROJECTED FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	43	24	15	0	4	0	0	0
ALASKA	0	0	0	0	0	0	0	0
ARIZONA	1	0	0	0	1	0	0	0
ARKANSAS	312	280	25	2	5	0	0	0
CALIFORNIA	11	1	2	0	2	1	3	2
COLORADO	1	1	0	0	0	0	0	0
CONNECTICUT	0	0	0	0	0	0	0	0
DELAWARE	3	0	1	0	1	1	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	119	22	56	13	17	3	8	0
GEORGIA	60	19	25	1	10	5	0	0
HAWAII	0	0	0	0	0	0	0	0
IDAHO	1	0	0	0	1	0	0	0
ILLINOIS	65	31	20	6	5	0	2	1
INDIANA	226	181	39	2	3	0	1	0
IOWA	2	0	0	0	2	0	0	0
KANSAS	1	0	0	0	1	0	0	0
KENTUCKY	128	82	38	4	2	1	0	1
LOUISIANA	16	7	5	2	1	1	0	0
MAINE	13	9	3	1	0	0	0	0
MARYLAND	204	149	38	7	8	0	1	1
MASSACHUSETTS	13	1	2	1	5	1	3	0
MICHIGAN	28	6	13	4	4	0	1	0
MINNESOTA	103	89	7	4	1	1	1	0
MISSISSIPPI	212	199	7	2	3	0	1	0
MISSOURI	10	7	2	1	0	0	0	0
MONTANA	0	0	0	0	0	0	0	0
NEBRASKA	0	0	0	0	0	0	0	0
NEVADA	1	0	0	0	0	0	0	1
NEW HAMPSHIRE	9	2	2	0	5	0	0	0
NEW JERSEY	23	0	9	3	8	2	1	0
NEW MEXICO	0	0	0	0	0	0	0	0
NEW YORK	176	71	60	13	16	7	9	0
NORTH CAROLINA	109	70	20	3	9	5	2	0
NORTH DAKOTA	0	0	0	0	0	0	0	0
OHIO	221	135	57	6	15	5	2	1
OKLAHOMA	73	57	8	2	3	2	0	1
OREGON	24	10	8	1	2	2	1	0
PENNSYLVANIA	182	69	80	24	9	0	0	0
RHODE ISLAND	2	0	0	0	1	1	0	0
SOUTH CAROLINA	77	55	14	2	4	2	0	0
SOUTH DAKOTA	1	0	0	0	1	0	0	0
TENNESSEE	58	27	22	3	4	1	1	0
TEXAS	208	132	56	9	6	3	1	1
UTAH	131	108	21	1	0	1	0	0
VERMONT	7	2	3	1	1	0	0	0
VIRGINIA	43	11	17	6	5	1	3	0
WASHINGTON	2	0	0	0	0	2	0	0
WEST VIRGINIA	73	42	24	4	3	0	0	0
WISCONSIN	34	14	8	7	5	0	0	0
WYOMING	0	0	0	0	0	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	0	0	0	0	0	0	0	0
PAC. TR. TERR.	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0
U.S. TOTALS	3,026	1,913	707	135	173	48	41	9

TABLE 36 - NUMBER OF MORE STRINGENT TREATMENT PLANTS TO BE ENLARGED BETWEEN 1978 AND 2000 - TOTAL EXISTING FLOW

Table 36 summarizes the existing plants which have treatment more stringent than secondary treatment which will be enlarged between 1978 and 2000. The level of treatment will not be altered in any way. That is, an advanced secondary plant will remain as advanced secondary, but its hydraulic capacity will be increased.

No secondary plants are included in this table.

1978 NEEDS SURVEY

NUMBER OF MORE STRINGENT TREATMENT PLANTS TO BE ENLARGED BETWEEN 1978 AND 2000

TOTAL EXISTING FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	0	0	0	0	0	0	0	0
ALASKA	1	0	1	0	0	0	0	0
ARIZONA	0	0	0	0	0	0	0	0
ARKANSAS	2	1	1	0	0	0	0	0
CALIFORNIA	28	1	2	2	9	7	5	2
COLORADO	2	1	1	0	0	0	0	0
CONNECTICUT	2	0	0	1	1	0	0	0
DELAWARE	3	1	0	1	0	0	0	1
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	21	3	6	3	5	2	2	0
GEORGIA	1	0	1	0	0	0	0	0
HAWAII	0	0	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0	0	0
ILLINOIS	34	1	10	7	13	1	2	0
INDIANA	19	8	6	0	4	0	1	0
IOWA	0	0	0	0	0	0	0	0
KANSAS	0	0	0	0	0	0	0	0
KENTUCKY	0	0	0	0	0	0	0	0
LOUISIANA	1	0	0	0	0	1	0	0
MAINE	1	0	1	0	0	0	0	0
MARYLAND	9	2	3	0	3	0	1	0
MASSACHUSETTS	6	1	2	1	2	0	0	0
MICHIGAN	21	0	6	4	7	1	3	0
MINNESOTA	23	8	11	1	3	0	0	0
MISSISSIPPI	2	1	1	0	0	0	0	0
MISSOURI	0	0	0	0	0	0	0	0
MONTANA	0	0	0	0	0	0	0	0
NEBRASKA	0	0	0	0	0	0	0	0
NEVADA	1	0	0	0	0	0	0	1
NEW HAMPSHIRE	1	1	0	0	0	0	0	0
NEW JERSEY	16	0	4	4	7	0	1	0
NEW MEXICO	0	0	0	0	0	0	0	0
NEW YORK	14	1	7	0	3	0	2	1
NORTH CAROLINA	6	1	1	0	4	0	0	0
NORTH DAKOTA	0	0	0	0	0	0	0	0
OHIO	13	6	1	1	5	0	0	0
OKLAHOMA	17	4	5	2	4	0	2	0
OREGON	18	4	7	2	3	2	0	0
PENNSYLVANIA	36	7	11	7	9	1	1	0
RHODE ISLAND	0	0	0	0	0	0	0	0
SOUTH CAROLINA	1	0	0	0	1	0	0	0
SOUTH DAKOTA	0	0	0	0	0	0	0	0
TENNESSEE	4	0	1	0	2	0	0	1
TEXAS	91	19	27	15	24	3	3	0
UTAH	2	1	0	0	1	0	0	0
VERMONT	1	0	1	0	0	0	0	0
VIRGINIA	11	3	4	2	1	0	1	0
WASHINGTON	1	0	1	0	0	0	0	0
WEST VIRGINIA	0	0	0	0	0	0	0	0
WISCONSIN	10	1	6	0	2	0	1	0
WYOMING	0	0	0	0	0	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	0	0	0	0	0	0	0	0
PAC. TR. TERR.	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0
U.S. TOTALS	419	76	128	53	113	18	25	6

TABLE 37 - NUMBER OF MORE STRINGENT TREATMENT PLANTS TO BE ENLARGED AND UPGRADED BETWEEN 1978 AND 2000 - TOTAL EXISTING FLOW

Table 37 summarizes the treatment plants which will be both enlarged and upgraded to a higher level of treatment than secondary between 1978 and 2000. This level of treatment includes both advanced secondary and tertiary as defined and summarized in Tables 26 and 30.

Plants to be upgraded are those plants presently in existence which meet secondary or lower standards which will be upgraded to a higher level than secondary. Enlarged is simply to expand the design capacity to accommodate a higher flow. The plants included in this table are planned to be both enlarged and upgraded.

1978 NEEDS SURVEY

NUMBER OF MORE STRINGENT TREATMENT PLANTS TO BE ENLARGED AND UPGRADED BETWEEN 1978 AND 2000

TOTAL EXISTING FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	19	2	10	2	4	1	0	0
ALASKA	0	0	0	0	0	0	0	0
ARIZONA	0	0	0	0	0	0	0	0
ARKANSAS	64	26	23	7	7	1	0	0
CALIFORNIA	28	3	5	2	12	2	4	0
COLORADO	19	2	3	5	5	2	1	1
CONNECTICUT	7	0	0	1	5	1	0	0
DELAWARE	10	1	5	2	1	1	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	91	9	27	24	22	8	1	0
GEORGIA	60	14	16	11	12	3	4	0
HAWAII	0	0	0	0	0	0	0	0
IDAHO	7	1	1	1	4	0	0	0
ILLINOIS	129	15	55	24	25	2	5	3
INDIANA	59	10	20	11	15	2	1	0
IOWA	52	6	28	13	5	0	0	0
KANSAS	1	0	0	0	0	1	0	0
KENTUCKY	74	8	35	13	17	0	1	0
LOUISIANA	8	0	1	3	3	1	0	0
MAINE	4	1	1	0	2	0	0	0
MARYLAND	42	14	10	4	9	4	1	0
MASSACHUSETTS	15	0	2	1	10	1	1	0
MICHIGAN	69	0	27	19	18	0	4	1
MINNESOTA	66	12	31	14	5	3	0	1
MISSISSIPPI	22	3	9	2	4	2	2	0
MISSOURI	7	3	1	1	1	0	1	0
MONTANA	1	0	0	0	1	0	0	0
NEBRASKA	2	0	0	0	1	1	0	0
NEVADA	4	0	0	2	1	0	1	0
NEW HAMPSHIRE	4	1	0	0	3	0	0	0
NEW JERSEY	55	0	9	14	24	4	2	2
NEW MEXICO	2	0	2	0	0	0	0	0
NEW YORK	56	1	22	5	19	5	2	2
NORTH CAROLINA	75	20	24	5	13	8	5	0
NORTH DAKOTA	0	0	0	0	0	0	0	0
OHIO	158	27	55	23	39	5	5	4
OKLAHOMA	99	64	20	5	9	1	0	0
OREGON	27	3	14	6	3	0	1	0
PENNSYLVANIA	135	21	44	22	36	6	4	2
RHODE ISLAND	5	1	1	0	2	1	0	0
SOUTH CAROLINA	15	1	6	2	5	1	0	0
SOUTH DAKOTA	5	0	0	3	1	1	0	0
TENNESSEE	59	4	23	10	15	5	2	0
TEXAS	139	37	41	14	29	9	6	3
UTAH	24	3	11	1	7	1	1	0
VERMONT	7	1	1	3	1	1	0	0
VIRGINIA	26	8	9	4	3	1	1	0
WASHINGTON	4	0	1	0	2	0	1	0
WEST VIRGINIA	12	1	7	2	2	0	0	0
WISCONSIN	106	35	43	14	10	2	2	0
WYOMING	1	0	0	0	1	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	4	0	2	2	0	0	0	0
PAC. TR. TERR.	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0
U.S. TOTALS	1,878	358	645	297	413	87	59	19

TABLE 38 - DOLLAR NEEDS FOR MORE STRINGENT TREATMENT FACILITIES BY PLANT SIZES - TOTAL PROJECTED FLOW

Table 38 summarizes the projected cost, reported as first quarter 1978 dollars, for all wastewater treatment plant construction for plants whose treatment is more stringent than secondary treatment (Category II, as defined in the Introduction). This includes all such construction to be performed between 1978 and 2000. The individual plants and their characteristics have been discussed and summarized in Tables 25 through 37.

The summary indicates a total dollar need per State for these facilities (Category II). The dollar needs are further broken down by plant capacity expressed in ranges of year 2000 design flow. The total U.S. dollar needs for this category are $20.5 billion.

To obtain total treatment plant needs, this summary should be used in conjunction with Table 24, "Dollar Needs for Secondary Treatment Facilities by Plant Sizes."

1978 NEEDS SURVEY

DOLLARS NEEDS FOR MORE STRINGENT TREATMENT FACILITIES BY PLANT SIZES

(THOUSANDS OF 1978 DOLLARS)

TOTAL PROJECTED FLOW

CUBIC METERS/DAY x 1000 (MILLION GALLONS/DAY)	TOTAL PLANTS	0-.40 (0-.105)	.401-1.9 (.106-.5019)	1.91-4.0 (.502-1.05)	4.001-19 (1.06-5.019)	19.1-40 (5.02-10.5)	40.001-190 (10.6-50.2)	190+ (50.2+)
ALABAMA	148	10,409	45,004	23,162	84,247	22,687	9,650	0
ALASKA	2	0	0	0	3,650	2,320	0	0
ARIZONA	2	0	0	0	3,360	0	0	0
ARKANSAS	477	20,987	26,279	13,990	88,212	4,344	17,906	0
CALIFORNIA	93	61,692	5,614	30,976	66,214	261,485	713,029	443,132
COLORADO	36	55	1,037	4,418	47,064	17,015	43,732	201,931
CONNECTICUT	25	0	872	835	15,636	65,957	56,132	0
DELAWARE	18	0	4,238	5,342	5,905	0	42,788	20,000
DIST. OF COLUM.	1	0	0	0	0	0	0	15,406
FLORIDA	260	7,640	74,500	64,783	376,844	232,679	530,201	117,299
GEORGIA	179	3,677	21,263	23,525	99,427	86,772	160,326	142,674
HAWAII	0	0	0	0	0	0	0	0
IDAHO	12	345	0	1,983	18,811	14,298	60,378	0
ILLINOIS	456	12,222	58,306	61,704	167,479	95,224	195,243	701,406
INDIANA	463	47,059	70,937	23,973	103,390	56,581	107,146	127,308
IOWA	124	3,347	51,069	22,650	73,439	35,651	129,984	0
KANSAS	5	0	0	0	13,800	55,449	54,051	0
KENTUCKY	250	35,117	62,028	26,421	75,245	17,318	68,253	88,746
LOUISIANA	37	1,417	3,501	5,539	37,328	9,850	0	0
MAINE	21	4,001	2,212	2,150	13,809	0	0	0
MARYLAND	312	27,154	33,570	35,299	61,621	67,025	95,112	507,502
MASSACHUSETTS	41	0	3,788	6,809	50,056	50,323	136,722	3,276
MICHIGAN	208	2,458	41,071	57,149	195,267	66,532	119,866	488,253
MINNESOTA	577	38,025	66,953	41,533	90,662	58,204	105,009	305,150
MISSISSIPPI	334	40,122	38,955	12,322	62,644	30,153	23,133	53,665
MISSOURI	29	2,450	6,498	1,700	12,920	0	0	0
MONTANA	2	0	0	0	221	6,228	0	0
NEBRASKA	3	0	0	0	2,580	0	0	0
NEVADA	6	0	0	0	20,857	18,247	49,407	27,075
NEW HAMPSHIRE	17	1,190	4,372	568	35,733	17,293	0	0
NEW JERSEY	111	9	17,428	26,896	356,812	133,113	232,437	99,484
NEW MEXICO	13	336	20	3,533	13,163	0	0	0
NEW YORK	339	24,208	98,973	73,811	225,631	271,378	519,108	75,000
NORTH CAROLINA	385	17,810	27,387	31,571	73,130	141,239	165,093	0
NORTH DAKOTA	0	0	0	0	0	0	0	0
OHIO	655	53,248	119,094	100,202	395,145	252,202	210,[illegible]89	528,035
OKLAHOMA	354	11,110	29,736	14,716	40,367	22,465	64,454	29,747
OREGON	134	3,814	19,760	21,171	47,796	123,480	158,303	28,600
PENNSYLVANIA	547	26,859	125,781	106,805	261,560	146,099	80,473	386,469
RHODE ISLAND	7	332	0	0	11,167	18,614	66,837	0
SOUTH CAROLINA	127	8,710	18,243	4,922	16,548	13,453	0	1,747
SOUTH DAKOTA	17	657	931	3,433	37,548	0	57,276	0
TENNESSEE	205	12,082	42,377	31,546	135,580	28,504	68,800	63,763
TEXAS	1,058	30,949	108,249	86,245	277,468	118,703	223,872	369,289
UTAH	186	15,221	20,578	13,071	36,595	26,253	113,013	2,121
VERMONT	33	1,086	9,778	6,520	57,648	10,393	0	0
VIRGINIA	119	3,519	25,361	26,846	38,844	51,905	57,935	124,870
WASHINGTON	10	0	817	2,751	10,036	41,857	0	136,874
WEST VIRGINIA	108	9,579	26,153	21,249	27,166	4,100	24,510	0
WISCONSIN	266	11,389	56,550	57,828	119,713	16,332	98,183	274,500
WYOMING	2	0	184	0	3,763	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0
PUERTO RICO	5	0	0	2,634	17,470	0	0	0
PAC. TR. TERR.	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0
U.S. TOTALS	8,819	550,285	1,369,467	1,102,581	4,029,571	2,711,725	4,858,651	5,363,322

TABLE 39 - ANALYSIS OF LIQUID EFFLUENT DISPOSAL

Table 39 summarizes the methods which are proposed to be used in the year 2000 to dispose of the liquid effluents after treatment. The categories of disposal methods are self-explanatory.

The nature of the projected change is self-explanatory also, and has been described in detail in the narrative accompanying Table 2.

The totals cannot be compared with most other tabulations since there is significant double counting in this summary. For instance, 15,400 facilities plan to abandon present septic tank fields. The wastes from these existing facilities will undoubtedly be collected and discharged, after some treatment. This discharge may be included under many of the disposal methods and any of the natures of projected change, but probably largely under new construction. Additionally, many facilities have two or more methods of effluent disposal in operation simultaneously.

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TABLE 39

1978 NEEDS SURVEY

ANALYSIS OF LIQUID EFFLUENT DISPOSAL

NUMBER OF RESPONSES

UNITED STATES TOTAL

CURRENT STATUS

IN OPERATION	UNDER CONSTRUCTION	REQUIRED, BUT NOT YET APPROVED OR FUNDED
40,046	1,097	12,703

******DISPOSAL METHOD******	******************NATURE OF PROJECTED CHANGE********************								***TOTAL***
	ENLARGE	UPGRADE	ENLARGE AND UPGRADE	NEW CONST.	REPLACE	ABANDON	NO CHANGE	OTHER	
OUTFALL TO SURFACE WATERS	752	395	540	6,999	329	2,382	9,011	54	20,462
OCEAN OUTFALL	19	6	6	192	18	63	156	1	461
HOLDING POND	186	27	24	831	15	73	627	5	1,788
DEEP WELL	6	0	0	31	1	4	6	0	48
GROUND WATER RECHARGE	69	20	16	435	7	48	234	1	830
OTHER LAND DISPOSAL	4	1	1	35	1	9	12	0	63
RECYCLING AND REUSE	8	1	4	73	0	3	37	1	127
SEPTIC TANK FIELD	5	957	5	153	6	15,400	4,437	1	20,964
OTHER	7	16	4	46	111	96	26	2	308
NO DISCHARGE	8	0	4	473	6	421	566	9	1,487
SPRAY IRRIGATION	54	4	10	514	1	21	306	1	911
DITCH IRRIGATION	13	3	9	89	1	10	110	0	235
TO OTHER WWT PLANTS	239	41	14	3,858	16	33	2,421	15	6,637
TOTAL*	1,370	1,471	637	13,729	512	18,563	17,949	90	54,321

TABLE 40 - NUMBER AND TOTAL ESTIMATED I/I FLOW OF TREATMENT PLANTS

Table 40 summarizes the infiltration/inflow (I/I) quantities which are cost effective to eliminate from conveyance systems, rather than provide treatment.

The "Total Number of Plants" is a summation of the plants within a State from which some I/I flow will be eliminated. The total number of plants receiving such flows is slightly less than the total number of conveyance systems reporting I/I problems (see Table 47). The difference is accounted for by the fact that many authorities which only operate collection systems discharge their waste to another authority which treats it. Thus, a single treatment plant can receive wastes from more than one collection system.

The "Total Estimated I/I Flow" is the summation of I/I flows per State, in mgd, which are cost effective to eliminate. These flows are wet weather flows and are determined by Block 22 of the EPA-1 form. The I/I flow which is more cost effective to treat (versus eliminate) is not included in this summary.

The "Total Existing Flow" is the total present average daily flow in mgd to treatment plants which have excessive I/I in their contributory conveyance systems. The total existing flow includes the industrial flow, dry weather I/I flow, and domestic flow.

In some State summaries the I/I flow can be seen to be an extremely large percentage of the total flow. This occurs because the former is wet weather flow, the latter dry weather flow.

FEBRUARY 10, 1979
TABLE 40

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NUMBER AND TOTAL ESTIMATED I/I FLOW OF TREATMENT PLANTS

STATE	TOTAL NUMBER OF PLANTS	TOTAL ESTIMATED I/I FLOW	TOTAL EXISTING FLOW
ALABAMA	139	141.91	257.73
ALASKA	9	15.53	24.59
ARIZONA	7	.62	2.17
ARKANSAS	48	45.62	58.78
CALIFORNIA	115	210.44	325.73
COLORADO	44	17.54	45.00
CONNECTICUT	35	52.13	92.47
DELAWARE	4	.39	1.72
DIST. OF COLUM.	1	50.00	276.45
FLORIDA	98	63.43	377.29
GEORGIA	226	101.50	305.26
HAWAII	5		1.41
IDAHO	75	10.64	61.78
ILLINOIS	169	134.91	1,530.90
INDIANA	94	67.85	362.33
IOWA	208	69.76	159.86
KANSAS	91	32.77	112.50
KENTUCKY	146	61.17	215.18
LOUISIANA	76	87.30	87.36
MAINE	23	7.68	23.20
MARYLAND	17	6.89	39.19
MASSACHUSETTS	23	4.22	40.15
MICHIGAN	76	194.00	822.25
MINNESOTA	112	19.17	58.14
MISSISSIPPI	209	72.99	171.65
MISSOURI	119	59.62	114.60
MONTANA	26	8.68	25.80
NEBRASKA	25	1.17	4.82
NEVADA	7	2.35	6.65
NEW HAMPSHIRE	19	7.47	15.67
NEW JERSEY	130	94.83	475.59
NEW MEXICO	1	.28	.57
NEW YORK	253	143.90	1,115.87
NORTH CAROLINA	191	47.82	271.61
NORTH DAKOTA	4	1.67	6.94
OHIO	218	372.32	707.40
OKLAHOMA	40	15.82	44.09
OREGON	82	106.79	221.79
PENNSYLVANIA	64	111.40	415.18
RHODE ISLAND	7	2.77	15.66
SOUTH CAROLINA	174	93.61	219.73
SOUTH DAKOTA	22	5.22	25.00
TENNESSEE	152	112.88	400.65
TEXAS	171	255.04	486.37
UTAH	29	48.31	143.69
VERMONT	15	1.78	3.08
VIRGINIA	50	19.06	76.66
WASHINGTON	59	53.94	239.44
WEST VIRGINIA	14	4.65	14.67
WISCONSIN	135	199.67	103.46
WYOMING	31	9.43	20.97
AMERICAN SAMOA			
GUAM	2	.50	4.00
N. MARIANAS			
PUERTO RICO	25	41.14	115.52
PAC. TR. TERR.			
VIRGIN ISLANDS			
U.S. TOTALS	4,115	3,290.58	10,752.57

TABLE 41 - PROJECTED INDUSTRIAL FLOW TO MUNICIPAL TREATMENT PLANTS BY NUMBER, FLOW, AND PERCENT OF TOTAL FLOW

Table 41 summarizes, by State, year 2000 industrial flows predicted to be received by municipally owned wastewater treatment facilities. The summary is further broken down into industrial flow ranges. A description of each column is presented below.

Column 1: Name of State or Territory.

Column 2: Number of Treatment Facilities. This is the total number of facilities projected for each State in 2000 without regard to level of treatment or whether industrial flows will be existent or not. Note totals agree with many other tables; Tables 2 and 3, for example.

Column 3: Flow of Treatment Facilities. This is the total flow of all projected treatment plants, in mgd, for year 2000. The flow includes totals for each State of dry weather I/I, industrial, and domestic flows. Again, these totals compare with other tables; Table 4 for example ("Projected Total Flow").

Columns 4-15: These columns further delineate the plants and industrial flows by ranges of flow. The flow ranges, given in 1000 cubic meters per day and, in parentheses, mgd, are for the industrial component, not the projected design flow of the treatment plant in question. The individual columns under each flow range summarize the following:

Number of Plants: This column summarizes the number of treatment plants projected to receive industrial wastes in that range. For example, 34 wastewater treatment plants in Indiana are expected to each receive between one and 10 mgd industrial waste flows each.

Total Industrial Flow: This column summarizes the total industrial flow, in mgd, which is projected to be received for each flow range given. Using the Indiana example above, the 34 plants will receive 156 mgd among them. Using Nevada as another example, one plant will receive 5 mgd of industrial waste. This plant may be a 20 mgd plant. The sum of the total industrial flow for any State is the same as the Projected Industrial Flow given in Table 4.

% of Total Flow: Under each flow range the percent of total flow contributed by industrial flow has been summarized. The total of these percentages equals the percentage industrial flow summarized in Table 4.

Small errors in totals may be present caused by rounding.

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PROJECTED INDUSTRIAL FLOW TO MUNICIPAL TREATMENT PLANTS BY NUMBER, FLOW, AND PERCENT OF TOTAL FLOW

CUBIC METERS/DAY X 1000 (MILLION GALLONS PER DAY)			0-.40 (0-.105)			.401-4.0 (.106-1.05)			4.001-40 (1.06-10.5)			40.001-190 (10.57-50.2)			190+ (50.2+)		
STATE	NUMBER AND FLOW OF TREATMENT FACILITIES		NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW
ALABAMA	389	526	116	2	0.49	34	14	2.70	20	69	13.17	0	0	0.00	0	0	0.00
ALASKA	126	94	2	0	0.12	1	0	0.26	1	4	4.87	0	0	0.00	0	0	0.00
ARIZONA	153	374	1	0	0.00	4	1	0.50	2	4	1.23	0	0	0.00	0	0	0.00
ARKANSAS	650	338	17	0	0.19	22	10	3.09	16	33	9.96	0	0	0.00	0	0	0.00
CALIF.	1,020	3,751	45	2	0.05	69	28	0.76	52	196	5.24	12	312	8.32	2	115	3.08
COLORADO	323	691	11	0	0.07	12	4	0.71	7	12	1.79	2	64	9.34	0	0	0.00
CONN.	110	583	12	0	0.11	35	16	2.86	22	67	11.50	2	31	5.31	0	0	0.00
DELAWARE	28	158	5	0	0.11	4	1	0.78	1	2	1.51	1	38	24.23	0	0	0.00
WASH. D.C.	1	309	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
FLORIDA	403	1,816	105	2	0.15	13	6	0.36	12	44	2.46	2	57	3.13	0	0	0.00
GEORGIA	547	1,011	117	3	0.31	48	18	1.84	30	96	9.59	3	35	3.48	1	52	5.15
HAWAII	55	200	2	0	0.05	1	0	0.24	1	2	0.99	1	12	6.23	0	0	0.00
IDAHO	202	180	7	0	0.18	9	3	2.07	4	18	10.28	0	0	0.00	0	0	0.00
ILLINOIS	915	2,938	66	3	0.11	87	41	1.41	32	130	4.44	6	156	5.33	2	260	8.86
INDIANA	601	1,096	58	1	0.16	42	19	1.77	34	156	14.25	3	70	6.38	0	0	0.00
IOWA	925	470	22	0	0.17	20	7	1.58	21	69	14.70	1	11	2.48	0	0	0.00
KANSAS	661	370	20	0	0.18	23	9	2.52	6	15	4.14	2	31	8.58	0	0	0.00
KENTUCKY	424	554	134	2	0.48	34	13	2.35	8	20	3.78	3	106	19.17	0	0	0.00
LOUISIANA	520	648	13	0	0.08	6	3	0.50	7	28	4.43	0	0	0.00	0	0	0.00
MAINE	202	176	15	0	0.33	19	7	4.43	14	30	17.28	0	0	0.00	0	0	0.00
MARYLAND	384	786	57	1	0.16	13	4	0.53	9	32	4.08	3	55	7.09	0	0	0.00
MASS.	149	1,297	14	0	0.05	44	20	1.54	25	79	6.11	8	116	8.96	1	105	8.13
MICHIGAN	540	2,212	59	2	0.10	37	16	0.75	18	69	3.14	8	143	6.46	1	245	11.07
MINNESOTA	614	654	69	2	0.40	56	19	3.04	10	29	4.54	2	27	4.19	1	96	14.67
MISS.	627	335	81	1	0.48	28	11	3.35	10	24	7.38	0	0	0.00	0	0	0.00
MISSOURI	961	1,017	64	2	0.23	59	21	2.07	17	56	5.53	1	12	1.22	2	108	10.66
MONTANA	167	117	10	0	0.33	4	2	1.99	1	1	0.93	0	0	0.00	0	0	0.00
NEBRASKA	464	266	10	0	0.16	13	5	1.92	7	17	6.75	2	39	14.86	0	0	0.00
NEVADA	72	263	1	0	0.03	0	0	0.00	1	5	1.89	0	0	0.00	0	0	0.00
NEW HAMP.	142	187	16	1	0.54	18	9	5.07	7	20	11.12	1	12	6.50	0	0	0.00
NEW JERSEY	263	1,512	18	1	0.06	43	19	1.27	28	91	6.02	5	95	6.33	1	150	9.92
NEW MEXICO	160	156	4	0	0.15	5	1	1.23	1	4	2.90	0	0	0.00	0	0	0.00
NEW YORK	932	4,020	134	5	0.13	82	32	0.79	55	180	4.49	7	147	3.68	1	80	1.99
N CAROLINA	747	884	151	4	0.49	69	26	2.99	58	193	21.90	3	45	5.11	0	0	0.00
N DAKOTA	356	60	5	0	0.61	4	1	3.06	1	3	4.96	0	0	0.00	0	0	0.00
OHIO	952	2,269	45	2	0.10	58	32	1.42	42	121	5.33	12	351	15.47	0	0	0.00
OKLAHOMA	725	433	13	0	0.13	19	9	2.10	4	22	5.24	0	0	0.00	0	0	0.00
OREGON	255	510	10	0	0.09	13	4	0.87	3	15	3.06	2	56	10.97	0	0	0.00
PENN.	1,327	2,109	229	6	0.30	93	33	1.59	33	84	4.01	7	155	7.38	0	0	0.00
RHODE IS	25	170	1	0	0.04	9	5	3.29	3	9	5.87	2	35	21.09	0	0	0.00
S CAROLINA	409	767	102	3	0.39	56	22	2.90	29	91	11.94	1	15	1.96	0	0	0.00
S DAKOTA	317	86	9	0	0.32	12	4	5.55	1	4	5.60	0	0	0.00	0	0	0.00
TENNESSEE	333	879	91	2	0.25	49	21	2.42	16	52	6.02	3	97	11.10	1	73	8.34
TEXAS	1,125	2,280	52	2	0.09	75	29	1.30	19	50	2.21	2	31	1.36	0	0	0.00
UTAH	216	299	45	0	0.22	7	4	1.35	5	20	6.68	0	0	0.00	0	0	0.00
VERMONT	101	68	14	0	0.68	13	4	7.24	1	1	2.39	0	0	0.00	0	0	0.00
VIRGINIA	397	839	56	1	0.20	34	11	1.40	18	49	5.88	4	87	10.37	0	0	0.00
WASHINGTON	344	886	17	0	0.10	14	5	0.60	11	40	4.56	2	52	5.97	0	0	0.00
W VIRGINIA	545	278	207	5	1.96	18	6	2.27	4	20	7.20	0	0	0.00	0	0	0.00
WISCONSIN	661	1,016	122	4	0.46	87	33	3.30	22	90	8.85	4	80	7.86	1	80	7.86
WYOMING	127	59	3	0	0.18	2	0	0.45	0	0	0.00	0	0	0.00	0	0	0.00
AMER SAMOA	6	6	0	0	0.00	0	0	0.00	1	2	44.00	0	0	0.00	0	0	0.00
GUAM	7	18	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
N MARIANAS	4	5	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
PUER. RICO	34	356	8	0	0.12	10	2	0.70	9	48	13.50	1	12	3.60	0	0	0.00
PAC TR TER	23	10	1	0	0.18	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
VIRGIN IS	2	3	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
US TOTAL	22,768	43,423	2,486	80	0.18	1,527	634	1.46	759	2,541	5.85	118	2,599	5.98	14	1,366	3.14

TABLE 42 - SUMMARY TREATMENT PROCESS AND SLUDGE HANDLING METHODS - NUMBERS OF PLANTS AND ASSOCIATED FLOW - UNITED STATES TOTALS

Table 42 summarizes the unit processes based upon the inventory performed during the 1978 Survey. Processes 1 through 61 are for the liquid line and 62 through 92 are for the sludge (solids) line, including treatment, handling, and disposal. Table 43 expands the data available for each of the 92 unit processes.

The basis for these summaries is the data developed in Block 30 of the EPA-1 form. The number of plants using a process is given, plus the associated flow for the treatment plant of which it is a part. Existing flow is used for the columns under "Now in Use" while design flow is used for those "Under Construction" and "Required but not yet Funded."

A unit process is defined to mean the complete process. For instance, activated sludge includes the aeration basin, associated blowers and other integral mechanical equipment, and the secondary clarifier, which is not listed separately.

Some flow summaries (Ion Exchange) show a zero flow with the unit process in use or required in the future. This is due to rounding errors and low flows associated with small numbers of facilities.

Multiple or parallel processes are counted as one process for any single facility. For instance, if a facility has four aerobic digesters, the number of aerobic digesters counted in this summary is one, not four. Therefore, the "Number" column denotes the number of plants using that process.

Please refer to Table 43 for additional detail of each of the unit processes listed in Table 42.

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SUMMARY TREATMENT PROCESS AND SLUDGE HANDLING METHODS
NUMBERS OF PLANTS AND ASSOCIATED FLOW
(FLOW IN THOUSANDS OF CUBIC METERS PER DAY)
UNITED STATES TOTALS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
TREATMENT PROCESSES						
1. PUMPING,RAW WASTEWATER	5,700	67,243	404	2,764	4,316	18,134
2. PRELIMINARY TREATMENT - BAR SCREEN	8,174	84,155	515	4,300	5,730	17,489
3. PRELIMINARY TREATMENT - GRIT REMOVAL	3,867	69,714	325	4,768	2,950	15,227
4. PRELIMINARY TREATMENT - COMMINUTORS	3,492	33,382	295	1,822	2,004	8,167
5. PRELIMINARY TREATMENT - OTHERS	45	1,757	2	0	9	20
6. SCUM REMOVAL	360	17,749	34	1,337	116	3,083
7. FLOW EQUALIZATION BASINS	302	5,851	74	1,398	379	10,418
8. PREAERATION	395	18,022	41	698	97	2,729
9. PRIMARY SEDIMENTATION	5,736	78,956	278	3,477	3,346	15,051
10. TRICKLING FILTER - ROCK MEDIA	2,778	16,108	58	672	121	2,153
11. TRICKLING FILTER - PLASTIC MEDIA	43	300	21	338	58	2,281
12. TRICKLING FILTER - REDWOOD SLATS	31	475	7	70	17	452
13. TRICKLING FILTER - OTHER MEDIA	11	210	2	27	4	99
14. ACTIVATED SLUDGE - CONVENTIONAL	3,816	72,237	378	6,520	3,178	23,463
15. ACTIVATED SLUDGE - HIGH RATE	34	2,917	8	835	19	479
16. ACTIVATED SLUDGE - CONTACT STABILIZATION	873	8,541	75	385	249	1,924
17. ACTIVATED SLUDGE - EXTENDED AERATION	1,902	4,530	176	656	3,177	4,380
18. PURE OXYGEN ACTIVATED SLUDGE	45	6,093	25	2,779	50	9,668
19. MICROSTRAINERS - PRIMARY	22	1,751	4	50	28	333
20. MICROSTRAINERS - SECONDARY	73	1,947	22	314	73	1,117
21. SAND FILTERS	1,010	4,824	314	3,004	4,085	20,781
22. MIXED-MEDIA FILTERS (SAND AND COAL)	131	3,217	74	2,327	305	9,454
23. OTHER FILTRATIONS	36	118	6	802	30	633
24. ACTIVATED CARBON - GRANULAR	13	488	14	776	20	1,436
25. ACTIVATED CARBON - POWDERED	3	201	4	28	8	301
26. TWO STAGE LIME TREATMENT OF RAW WASTEWATER	8	52	5	26	15	94
27. TWO STAGE TERTIARY LIME TREATMENT	11	174	15	210	28	447
28. SINGLE STAGE LIME TREATMENT OF RAW WASTEWATER	16	180	6	370	20	517
29. SINGLE STAGE TERTIARY LIME TREATMENT	29	540	30	1,732	94	1,304
30. RECARBONATION	14	296	18	567	49	307
31. NEUTRALIZATION	13	116	3	17	23	295
32. ALUM ADDITION TO PRIMARY	61	1,387	17	965	58	892
33. ALUM ADDITION TO SECONDARY	193	3,274	69	973	407	4,822
34. ALUM ADDITION TO SEPARATE STAGE TERTIARY	40	819	27	496	71	1,573
35. FERRI-CHLORIDE ADDITION TO PRIMARY	36	1,289	6	287	14	310
36. FERRI-CHLORIDE ADDITION TO SECONDARY	127	3,699	37	463	130	755
37. FERRI-CHLORIDE ADDITION TO SEPARATE STAGE TERTIARY	20	229	5	30	24	555
38. OTHER CHEMICAL ADDITIONS	70	2,196	14	129	52	689
39. BIOLOGICAL NITRIFICATION - SEPARATE STAGE	76	1,121	80	2,779	565	15,902
40. BIOLOGICAL NITRIFICATION - BOD & NIT.	112	1,812	55	1,163	758	9,456
41. BIOLOGICAL DENITRIFICATION	38	1,258	29	388	212	4,950
42. ION EXCHANGE	2	0	2	277	6	119
43. BREAKPOINT CHLORINATION	25	785	29	826	137	3,059
44. AMMONIA STRIPPING	24	110	24	189	102	536
45. CHLORINATION FOR DISINFECTION	6,213	53,132	554	4,522	6,674	19,389
46. OZONATION FOR DISINFECTION	12	192	8	193	16	1,357
47. OTHER DISINFECTION	4	50	1	0	3	9
48. LAND TREATMENT OF PRIMARY EFFLUENT	90	98	6	2	46	65
49. LAND TREATMENT OF SECONDARY EFFLUENT (30/30)	305	1,944	43	201	471	2,567
50. LAND TREATMENT OF INTERMEDIATE EFFLUENT	93	169	7	13	51	123
51. STABILIZATION PONDS	5,826	9,144	214	598	3,366	2,606
52. AERATED LAGOONS	1,005	3,431	123	191	1,316	1,666
53. POST AERATION (REAERATION)	432	4,770	139	2,777	976	6,230
54. BIO-DISC (ROTATING BIOLOGICAL FILTER)	71	283	85	1,090	399	3,357
55. OXIDATION DITCH USING MECHANICAL AERATORS	337	496	85	107	503	880
56. CLARIFICATION USING TUBE SETTLERS	40	402	10	173	9	43
57. OUTFALL PUMPING	207	6,492	35	4,389	246	4,654
58. OUTFALL DIFFUSER	52	3,002	11	586	38	4,767
59. EFFLUENT TO OTHER PLANTS	9	468	6	71	32	775
60. EFFLUENT OUTFALL	10,038	77,808	430	2,729	5,992	13,826
61. OTHER TREATMENT	642	5,717	22	1,523	129	3,337

1978 NEEDS SURVEY

SUMMARY TREATMENT PROCESS AND SLUDGE HANDLING METHODS
NUMBERS OF PLANTS AND ASSOCIATED FLOW
(FLOW IN THOUSANDS OF CUBIC METERS PER DAY)
UNITED STATES TOTALS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
SLUDGE HANDLING METHODS						
62. AEROBIC DIGESTION - AIR	2,287	13,507	250	2,219	2,939	8,697
63. AEROBIC DIGESTION - OXYGEN	40	338	12	117	27	690
64. COMPOSTING	10	1,341	5	1,211	15	646
65. ANAEROBIC DIGESTION	4,714	59,268	209	4,968	1,824	11,095
66. SLUDGE LAGOONS	574	11,211	34	731	184	2,340
67. HEAT TREATMENT	148	8,188	22	2,314	48	5,668
68. CHLORINE OXIDATION OF SLUDGE	28	1,118	8	174	14	155
69. LIME STABILIZATION	50	1,512	11	279	33	745
70. WET AIR OXIDATION	45	1,986	6	157	2	259
71. AIR DRYING	6,291	40,519	341	1,792	4,368	10,284
72. DEWATERING - MECHANICAL - VACUUM FILTER	1,042	36,552	177	3,449	702	14,553
73. DEWATERING - MECHANICAL - CENTRIFUGE	155	7,229	31	1,234	67	9,226
74. DEWATERING - MECHANICAL - FILTER PRESS	54	1,183	30	1,565	74	2,785
75. DEWATERING - OTHERS	24	1,418	3	24	7	146
76. GRAVITY THICKENING	557	27,251	104	2,375	279	8,410
77. AIR FLOTATION THICKENING	158	9,723	41	3,136	114	6,492
78. INCINERATION - MULTIPLE HEARTH	320	20,303	41	1,936	98	7,921
79. INCINERATION - FLUIDIZED BEDS	15	455	3	259	0	0
80. INCINERATION - ROTARY KILN	7	131	1	90	2	38
81. INCINERATION - OTHERS	9	241	1	26	3	223
82. PYROLYSIS	2	76	0	0	17	7,097
83. CO-INCINERATION WITH SOLID WASTE	4	71	1	15	3	224
84. CO-PYROLYSIS WITH SOLID WASTE	1	0	0	0	2	278
85. RECALCINATION	27	1,438	6	300	23	1,056
86. LAND FILL	4,930	47,496	327	2,131	4,071	21,017
87. LAND SPREADING OF LIQUID SLUDGE	1,003	8,008	79	498	387	1,741
88. LAND SPREADING OF THICKENED SLUDGE	878	10,959	49	300	293	4,217
89. TRENCHING	6	1,074	3	26	2	2
90. OCEAN DUMPING	49	9,767	0	0	0	0
91. OTHER SLUDGE HANDLING	216	9,788	20	575	94	4,903
92. DIGEST GAS UTILIZATION FACILITIES	173	6,475	5	1,741	39	2,536

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TABLE 43 - PROJECTED CHANGE IN TREATMENT PROCESS USE - NUMBERS OF PLANTS AND ASSOCIATED FLOW - UNITED STATES TOTALS

Table 43 is a companion and expansion of Table 42. Each unit process summarized in Table 42 is presented in greater detail herein.

For easy reference the summaries are presented in the same sequence as in Table 42. For instance, Preaeration, item no. 8 in Table 42 can be found under Table 43-8, the last number referring to the Table 42 number.

Flows associated with each unit process are the sum of the total plant flows for all the facilities using that particular process. They are given in thousands of cubic meters per day followed in parentheses by mgd.

The "projected change codes" are defined as follows:

Enlarge: The same unit process presently in existence will be enlarged to a higher capacity.

Upgrade: The same or similar unit process will be used but it will be designed for greater efficiency.

Enlarge and Upgrade: Both the above two definitions apply.

Install in New Plant: The unit process will be constructed in a new or existing plant.

Replace: This is a unit process, usually presently in use, which will be replaced by another unit process in the same plant.

Abandon: The unit process will be completely abandoned either because a new plant will be built elsewhere or another unit process will be specified.

No Change: No alteration in the unit process is anticipated.

Other: Generally special cases, but few in total number. Installing automated equipment, telemetering, etc. are examples.

The accuracy of these data is at the level of available information at Regional offices. Required facilities for which engineering designs were not available were estimated using commonly accepted practice for the area.

FEBRUARY 10, 1979
TABLE 43

1978 NEEDS SURVEY

PROJECTED CHANGE IN TREATMENT PROCESS USE
NUMBERS OF PLANTS AND ASSOCIATED FLOW
(FLOW IN THOUSANDS OF CUBIC METERS PER DAY)
UNITED STATES TOTALS

43-1 PUMPING,RAW WASTEWATER

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1,212	16,413(4336)	47	607(160)	2	117(31)
UPGRADE	211	2,414(637)	4	8(2)	1	2(0)
ENLARGE AND UPGRADE	386	5,715(1509)	9	98(25)	0	0(0)
INSTALL IN NEW PLANT	1	0(0)	327	1,952(515)	4,313	18,008(4757)
REPLACE	252	1,416(374)	4	29(7)	0	0(0)
ABANDON	880	9,965(2632)	5	36(9)	0	0(0)
NO CHANGE	2,751	31,275(8262)	7	30(8)	0	0(0)
OTHER	7	33(8)	1	0(0)	0	0(0)
TOTAL	5,700	67,234(17761)	404	2,764(730)	4,316	18,128(4788)

43-2 PRELIMINARY TREATMENT - BAR SCREEN

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1,417	20,011(5286)	54	844(223)	3	124(32)
UPGRADE	281	2,387(630)	3	17(4)	1	11(2)
ENLARGE AND UPGRADE	504	5,199(1373)	12	282(74)	2	79(20)
INSTALL IN NEW PLANT	6	5(1)	414	1,791(473)	5,714	17,210(4546)
REPLACE	366	1,903(502)	11	1,257(332)	1	0(0)
ABANDON	1,230	8,540(2256)	3	18(4)	4	0(0)
NO CHANGE	4,366	46,071(12170)	17	86(22)	4	54(14)
OTHER	4	22(5)	1	0(0)	1	0(0)
TOTAL	8,174	84,142(22228)	515	4,300(1136)	5,730	17,480(4617)

43-3 PRELIMINARY TREATMENT - GRIT REMOVAL

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	732	14,949(3949)	32	481(127)	0	0(0)
UPGRADE	144	1,765(466)	1	34(8)	1	15(3)
ENLARGE AND UPGRADE	300	4,831(1276)	10	1,443(381)	0	0(0)
INSTALL IN NEW PLANT	5	385(101)	264	2,336(617)	2,939	15,152(4002)
REPLACE	181	2,165(572)	4	10(2)	0	0(0)
ABANDON	475	6,811(1799)	2	19(5)	4	0(0)
NO CHANGE	2,027	38,720(10228)	11	412(108)	5	54(14)
OTHER	3	78(20)	1	30(7)	1	0(0)
TOTAL	3,867	69,708(18415)	325	4,768(1259)	2,950	15,223(4021)

43-4 PRELIMINARY TREATMENT - COMMINUTORS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	587	7,274(1921)	26	374(98)	0	0(0)
UPGRADE	146	618(163)	3	40(10)	2	5(1)
ENLARGE AND UPGRADE	305	2,218(585)	4	13(3)	0	0(0)
INSTALL IN NEW PLANT	7	7(2)	250	1,302(344)	1,995	8,094(2138)
REPLACE	119	494(130)	3	8(2)	0	0(0)
ABANDON	446	5,454(1440)	1	1(0)	0	0(0)
NO CHANGE	1,880	17,260(4559)	8	80(21)	4	7(1)
OTHER	2	50(13)	0	0(0)	3	58(15)
TOTAL	3,492	33,378(8817)	295	1,822(481)	2,004	8,165(2157)

43-5 PRELIMINARY TREATMENT - OTHERS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	3	54(14)	0	0(0)	0	0(0)
UPGRADE	1	1(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	3	5(1)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	2	0(0)	9	20(5)
REPLACE	3	5(1)	0	0(0)	0	0(0)
ABANDON	11	112(29)	0	0(0)	0	0(0)
NO CHANGE	24	1,578(416)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	45	1,757(464)	2	0(0)	9	20(5)

43-6 SCUM REMOVAL

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	86	2,161(570)	6	82(21)	0	0(0)
UPGRADE	19	7,120(1881)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	12	751(198)	2	152(40)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	24	790(208)	116	3,083(814)
REPLACE	3	2(0)	0	0(0)	0	0(0)
ABANDON	37	423(111)	1	1(0)	0	0(0)
NO CHANGE	203	7,288(1925)	1	310(81)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	360	17,749(4688)	34	1,337(353)	116	3,083(814)

43-7 FLOW EQUALIZATION BASINS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	81	1,691(446)	7	519(137)	0	0(0)
UPGRADE	7	101(26)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	11	715(188)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	67	879(232)	379	10,417(2752)
REPLACE	6	19(5)	0	0(0)	0	0(0)
ABANDON	36	136(35)	0	0(0)	0	0(0)
NO CHANGE	161	3,187(842)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	302	5,851(1545)	74	1,398(369)	379	10,417(2752)

43-8 PREAERATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	70	2,997(791)	3	53(14)	0	0(0)
UPGRADE	24	660(174)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	28	1,293(341)	2	21(5)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	32	610(161)	97	2,729(721)
REPLACE	17	563(148)	0	0(0)	0	0(0)
ABANDON	54	833(220)	0	0(0)	0	0(0)
NO CHANGE	202	11,674(3084)	4	12(3)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	395	18,021(4760)	41	698(184)	97	2,729(721)

43-9 PRIMARY SEDIMENTATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1,043	17,759(4691)	44	930(245)	2	118(31)
UPGRADE	347	5,832(1540)	5	63(16)	3	16(4)
ENLARGE AND UPGRADE	546	11,481(3033)	19	849(224)	0	0(0)
INSTALL IN NEW PLANT	3	4(1)	188	1,085(286)	3,330	14,890(3933)
REPLACE	192	1,384(365)	11	95(25)	0	0(0)
ABANDON	1,364	5,176(1367)	1	0(0)	8	1(0)
NO CHANGE	2,232	37,145(9812)	9	452(119)	1	14(3)
OTHER	9	164(43)	1	0(0)	2	5(1)
TOTAL	5,736	78,948(20856)	278	3,477(918)	3,346	15,046(3974)

43-10 TRICKLING FILTER - ROCK MEDIA

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	234	2,154(569)	10	278(73)	0	0(0)
UPGRADE	350	1,584(418)	4	33(8)	1	794(209)
ENLARGE AND UPGRADE	267	1,601(423)	6	42(11)	1	5(1)
INSTALL IN NEW PLANT	0	0(0)	33	292(77)	119	1,352(357)
REPLACE	132	717(189)	2	17(4)	0	0(0)
ABANDON	1,029	3,891(1028)	3	6(1)	0	0(0)
NO CHANGE	752	6,097(1610)	0	0(0)	0	0(0)
OTHER	14	61(16)	0	0(0)	0	0(0)
TOTAL	2,778	16,108(4255)	58	672(177)	121	2,153(568)

43-11 TRICKLING FILTER - PLASTIC MEDIA

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	6	67(17)	2	89(23)	0	0(0)
UPGRADE	1	8(2)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	3	7(1)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	17	199(52)	58	2,281(602)
REPLACE	1	3(0)	0	0(0)	0	0(0)
ABANDON	7	25(6)	0	0(0)	0	0(0)
NO CHANGE	25	189(50)	2	49(13)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	43	300(79)	21	338(89)	58	2,281(602)

43-12 TRICKLING FILTER - REDWOOD SLATS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	6	68(18)	0	0(0)	0	0(0)
UPGRADE	1	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	2(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	7	70(18)	17	452(119)
REPLACE	1	6(1)	0	0(0)	0	0(0)
ABANDON	4	111(29)	0	0(0)	0	0(0)
NO CHANGE	18	286(75)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	31	475(125)	7	70(18)	17	452(119)

43-13 TRICKLING FILTER - OTHER MEDIA

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1	6(1)	0	0(0)	0	0(0)
UPGRADE	1	8(2)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	5(1)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	2	27(7)	4	99(26)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	3	5(1)	0	0(0)	0	0(0)
NO CHANGE	5	184(48)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	11	210(55)	2	27(7)	4	99(26)

43-14 ACTIVATED SLUDGE - CONVENTIONAL

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	749	14,617(3861)	19	437(115)	2	0(0)
UPGRADE	237	8,531(2253)	4	60(15)	6	139(36)
ENLARGE AND UPGRADE	405	9,448(2496)	14	1,150(303)	0	0(0)
INSTALL IN NEW PLANT	6	7(1)	326	4,716(1245)	3,157	23,194(6127)
REPLACE	94	5,134(1356)	5	31(8)	0	0(0)
ABANDON	626	7,697(2033)	0	0(0)	8	0(0)
NO CHANGE	1,694	26,727(7060)	10	123(32)	2	45(11)
OTHER	5	68(18)	0	0(0)	3	78(20)
TOTAL	3,816	72,232(19081)	378	6,520(1722)	3,178	23,458(6197)

43-15 ACTIVATED SLUDGE - HIGH RATE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	6	128(34)	1	7(1)	0	0(0)
UPGRADE	1	412(108)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	5	877(231)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	7	827(218)	19	479(126)
REPLACE	2	29(7)	0	0(0)	0	0(0)
ABANDON	2	6(1)	0	0(0)	0	0(0)
NO CHANGE	17	1,459(385)	0	0(0)	0	0(0)
OTHER	1	1(0)	0	0(0)	0	0(0)
TOTAL	34	2,917(770)	8	835(220)	19	479(126)

43-16 ACTIVATED SLUDGE - CONTACT STABILIZATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	141	3,782(999)	5	17(4)	0	0(0)
UPGRADE	88	246(65)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	104	1,309(345)	3	26(7)	0	0(0)
INSTALL IN NEW PLANT	1	0(0)	65	337(89)	249	1,924(508)
REPLACE	20	184(48)	1	1(0)	0	0(0)
ABANDON	160	553(146)	1	0(0)	0	0(0)
NO CHANGE	358	2,463(650)	0	0(0)	0	0(0)
OTHER	1	2(0)	0	0(0)	0	0(0)
TOTAL	873	8,541(2256)	75	385(101)	249	1,924(508)

43-17 ACTIVATED SLUDGE - EXTENDED AERATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	330	1,221(322)	7	13(3)	1	1(0)
UPGRADE	126	174(45)	0	0(0)	1	4(1)
ENLARGE AND UPGRADE	129	468(123)	3	14(3)	2	2(0)
INSTALL IN NEW PLANT	2	0(0)	162	626(165)	3,172	4,370(1154)
REPLACE	20	25(6)	0	0(0)	0	0(0)
ABANDON	344	979(258)	2	1(0)	0	0(0)
NO CHANGE	947	1,640(433)	1	0(0)	1	0(0)
OTHER	4	19(5)	1	0(0)	0	0(0)
TOTAL	1,902	4,530(1196)	176	656(173)	3,177	4,378(1156)

43-18 PURE OXYGEN ACTIVATED SLUDGE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	13	1,374(363)	1	24(6)	0	0(0)
UPGRADE	3	90(23)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	7	3,314(875)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	24	2,755(727)	50	9,668(2554)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	62(16)	0	0(0)	0	0(0)
NO CHANGE	18	1,252(330)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	45	6,093(1609)	25	2,779(734)	50	9,668(2554)

43-19 MICROSTRAINERS - PRIMARY

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	5	167(44)	0	0(0)	0	0(0)
UPGRADE	1	58(15)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	4	50(13)	28	333(88)
REPLACE	1	69(18)	0	0(0)	0	0(0)
ABANDON	6	26(6)	0	0(0)	0	0(0)
NO CHANGE	9	1,429(377)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	22	1,751(462)	4	50(13)	28	333(88)

43- 20 MICROSTRAINERS - SECONDARY

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	8	99(26)	1	0(0)	0	0(0)
UPGRADE	3	16(4)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	3	6(1)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	2(0)	21	313(82)	73	1,117(295)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	10	1,178(311)	0	0(0)	0	0(0)
NO CHANGE	48	643(169)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	73	1,947(514)	22	314(83)	73	1,117(295)

43-21 SAND FILTERS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	131	1,088(287)	4	175(46)	0	0(0)
UPGRADE	36	119(31)	0	0(0)	4	22(6)
ENLARGE AND UPGRADE	36	612(161)	1	1(0)	0	0(0)
INSTALL IN NEW PLANT	5	6(1)	301	2,772(732)	4,073	20,729(5476)
REPLACE	10	133(35)	0	0(0)	0	0(0)
ABANDON	164	299(79)	1	16(4)	5	0(0)
NO CHANGE	628	2,564(677)	7	38(10)	0	0(0)
OTHER	0	0(0)	0	0(0)	3	22(6)
TOTAL	1,010	4,824(1274)	314	3,004(793)	4,085	20,775(5488)

43-22 MIX-MEDIA FILTERS (SAND AND COAL)

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	39	1,428(377)	5	340(89)	0	0(0)
UPGRADE	3	1(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	3	400(105)	1	25(6)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	68	1,961(518)	305	9,453(2497)
REPLACE	1	1(0)	0	0(0)	0	0(0)
ABANDON	13	52(13)	0	0(0)	0	0(0)
NO CHANGE	72	1,332(352)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	131	3,217(850)	74	2,327(614)	305	9,453(2497)

43-23 OTHER FILTRATIONS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	4	25(6)	1	541(142)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	5	260(68)	30	633(167)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	11	10(2)	0	0(0)	0	0(0)
NO CHANGE	21	82(21)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	36	118(31)	6	802(211)	30	633(167)

43-24 ACTIVATED CARBON - GRANULAR

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	3	28(7)	1	136(35)	0	0(0)
UPGRADE	2	62(16)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	21(5)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	13	640(169)	20	1,436(379)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	0(0)	0	0(0)	0	0(0)
NO CHANGE	6	374(99)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	13	488(128)	14	776(205)	20	1,436(379)

43-25 ACTIVATED CARBON - POWDERED

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	0	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	4	28(7)	8	301(79)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	3	201(53)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	3	201(53)	4	28(7)	8	301(79)

43-26 TWO STAGE LIME TREATMENT OF RAW WASTEWATER

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	3	14(3)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	5	26(7)	15	94(24)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	3	17(4)	0	0(0)	0	0(0)
NO CHANGE	2	21(5)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	8	52(13)	5	26(7)	15	94(24)

43-27 TWO STAGE TERTIARY LIME TREATMENT

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	5	141(37)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	15	210(55)	28	447(118)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	2	0(0)	0	0(0)	0	0(0)
NO CHANGE	3	31(8)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	11	174(46)	15	210(55)	28	447(118)

43-28 SINGLE STAGE LIME TREATMENT OF RAW WASTEWATER

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	2	1(0)	0	0(0)	0	0(0)
UPGRADE	1	72(19)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	6	370(97)	20	517(136)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	2	3(0)	0	0(0)	0	0(0)
NO CHANGE	11	102(27)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	16	180(47)	6	370(97)	20	517(136)

43-29 SINGLE STAGE TERTIARY LIME TREATMENT

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	6	119(31)	1	253(66)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	1	2(0)
ENLARGE AND UPGRADE	1	12(3)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	29	1,478(390)	93	1,301(343)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	2	111(29)	0	0(0)	0	0(0)
NO CHANGE	20	295(78)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	29	540(142)	30	1,732(457)	94	1,304(344)

43-30 RECARBONATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	4	122(32)	1	253(66)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	17	313(82)	49	307(81)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	10	174(46)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	14	296(78)	18	567(149)	49	307(81)

43-31 NEUTRALIZATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	2	24(6)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	3	17(4)	23	295(78)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	4(1)	0	0(0)	0	0(0)
NO CHANGE	7	87(23)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	13	116(30)	3	17(4)	23	295(78)

43-32 ALUM ADDITION TO PRIMARY

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	7	39(10)	0	0(0)	0	0(0)
UPGRADE	1	10(2)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	5	12(3)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	17	965(254)	58	892(235)
REPLACE	1	3(0)	0	0(0)	0	0(0)
ABANDON	21	126(33)	0	0(0)	0	0(0)
NO CHANGE	26	1,194(315)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	61	1,387(366)	17	965(254)	58	892(235)

43-33 ALUM ADDITION TO SECONDARY

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	31	818(216)	2	158(41)	0	0(0)
UPGRADE	11	49(13)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	14	349(92)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	66	814(215)	405	4,821(1273)
REPLACE	1	0(0)	0	0(0)	0	0(0)
ABANDON	15	71(18)	0	0(0)	2	0(0)
NO CHANGE	121	1,985(524)	1	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	193	3,274(865)	69	973(257)	407	4,821(1273)

43-34 ALUM ADDITION TO SEPARATE STAGE TERTIARY

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	8	138(36)	3	291(77)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	24	204(54)	71	1,573(415)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	57(15)	0	0(0)	0	0(0)
NO CHANGE	27	622(164)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	40	819(216)	27	496(131)	71	1,573(415)

43-35 FERRI-CHLORIDE ADDITION TO PRIMARY

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	2	585(154)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	16(4)	1	62(16)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	5	224(59)	14	310(81)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	17	229(60)	0	0(0)	0	0(0)
NO CHANGE	16	458(121)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	36	1,289(340)	6	287(75)	14	310(81)

43-36 FERRI-CHLORIDE ADDITION TO SECONDARY

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	11	785(207)	0	0(0)	0	0(0)
UPGRADE	7	39(10)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	4	72(19)	1	62(16)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	36	400(105)	129	755(199)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	8	50(13)	0	0(0)	1	0(0)
NO CHANGE	97	2,751(726)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	127	3,699(977)	37	463(122)	130	755(199)

43-37 FERRI-CHLORIDE ADDITION TO SEPARATE STAGE TERTIARY

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	4	67(17)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	2	21(5)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	5	30(7)	24	555(146)
REPLACE	1	3(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	13	137(36)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	20	229(60)	5	30(7)	24	555(146)

43-38 OTHER CHEMICAL ADDITIONS

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	9	109(28)	0	0(0)	0	0(0)
UPGRADE	1	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	6	54(14)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	14	129(34)	52	689(182)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	17	96(25)	0	0(0)	0	0(0)
NO CHANGE	37	1,935(511)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	70	2,196(580)	14	129(34)	52	689(182)

43-39 BIOLOGICAL NITRIFICATION - SEPARATE STAGE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	13	240(63)	3	579(153)	0	0(0)
UPGRADE	2	1(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	4	121(32)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	75	2,193(579)	565	15,901(4200)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	7	29(7)	1	0(0)	0	0(0)
NO CHANGE	50	728(192)	1	4(1)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	76	1,121(296)	80	2,779(734)	565	15,901(4200)

43-40 BIOLOGICAL NITRIFICATION - BOD & NIT.

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	25	631(166)	1	11(2)	1	0(0)
UPGRADE	3	341(90)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	2	31(8)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	3(0)	53	1,151(304)	757	9,454(2497)
REPLACE	2	8(2)	0	0(0)	0	0(0)
ABANDON	6	4(1)	0	0(0)	0	0(0)
NO CHANGE	73	792(209)	1	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	112	1,812(478)	55	1,163(307)	758	9,454(2497)

43-41 BIOLOGICAL DENITRIFICATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	6	27(7)	1	37(9)	0	0(0)
UPGRADE	1	1(0)	0	0(0)	3	5(1)
ENLARGE AND UPGRADE	3	90(23)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	28	350(92)	208	3,774(997)
REPLACE	1	66(17)	0	0(0)	0	0(0)
ABANDON	4	1(0)	0	0(0)	0	0(0)
NO CHANGE	23	1,071(282)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	1	1,169(308)
TOTAL	38	1,258(332)	29	388(102)	212	4,950(1307)

43-42 ION EXCHANGE

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	1	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	2	277(73)	6	119(31)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	0(0)	0	0(0)	0	0(0)
NO CHANGE	0	0(0)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	2	0(0)	2	277(73)	6	119(31)

43-43 BREAKPOINT CHLORINATION

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	2	7(2)	1	136(35)	0	0(0)
UPGRADE	2	6(1)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	87(22)	28	690(182)	137	3,059(808)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	0(0)	0	0(0)	0	0(0)
NO CHANGE	19	684(180)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	25	785(207)	29	826(218)	137	3,059(808)

43-44 AMONIA STRIPPING

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	1	0(0)	1	1(0)	0	0(0)
UPGRADE	1	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	23	188(49)	102	536(141)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	0(0)	0	0(0)	0	0(0)
NO CHANGE	21	108(28)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	24	110(29)	24	189(50)	102	536(141)

43-45 CHLORINATION FOR DISINFECTION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1,112	9,207(2432)	59	1,144(302)	2	3(0)
UPGRADE	320	3,221(851)	2	7(1)	4	23(6)
ENLARGE AND UPGRADE	514	7,258(1917)	6	50(13)	2	0(0)
INSTALL IN NEW PLANT	8	12(3)	457	2,582(682)	6,660	19,351(5112)
REPLACE	217	2,269(599)	6	48(12)	1	0(0)
ABANDON	1,006	7,559(1996)	6	5(1)	3	0(0)
NO CHANGE	3,032	23,562(6224)	16	456(120)	2	0(0)
OTHER	4	30(8)	2	227(60)	0	0(0)
TOTAL	6,213	53,123(14033)	554	4,522(1194)	6,674	19,379(5119)

43-46 OZONATION FOR DISINFECTION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	2	9(2)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	7	144(38)	16	1,357(358)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	10	183(48)	1	49(13)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	12	192(50)	8	193(51)	16	1,357(358)

43-47 OTHER DISINFECTION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	0	0(0)	0	0(0)	0	0(0)
UPGRADE	1	35(9)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	1	0(0)	3	9(2)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	0(0)	0	0(0)	0	0(0)
NO CHANGE	2	14(3)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	4	50(13)	1	0(0)	3	9(2)

43-48 LAND TREATMENT OF PRIMARY EFFLUENT

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	3	2(0)	0	0(0)	0	0(0)
UPGRADE	1	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	6	2(0)	46	65(17)
REPLACE	1	0(0)	0	0(0)	0	0(0)
ABANDON	51	59(15)	0	0(0)	0	0(0)
NO CHANGE	34	36(9)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	90	98(26)	6	2(0)	46	65(17)

43-49 LAND TREATMENT OF SECONDARY EFFLUENT (30/30)

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	65	288(76)	3	7(1)	1	6(1)
UPGRADE	3	9(2)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	13	186(49)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	36	180(47)	470	2,561(676)
REPLACE	3	3(1)	0	0(0)	0	0(0)
ABANDON	23	463(122)	0	0(0)	0	0(0)
NO CHANGE	197	992(262)	4	13(3)	0	0(0)
OTHER	1	1(0)	0	0(0)	0	0(0)
TOTAL	305	1,944(513)	43	201(53)	471	2,567(678)

43-50 LAND TREATMENT OF INTERIMEDIATE EFFLUENT

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	10	35(9)	2	12(3)	0	0(0)
UPGRADE	3	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	4	16(4)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	4	1(0)	51	123(32)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	40	26(7)	0	0(0)	0	0(0)
NO CHANGE	36	89(23)	1	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	93	169(44)	7	13(3)	51	123(32)

43-51 STABILIZATION PONDS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	962	2,920(771)	10	47(12)	1	0(0)
UPGRADE	673	359(94)	1	0(0)	1	0(0)
ENLARGE AND UPGRADE	421	549(145)	1	1(0)	1	0(0)
INSTALL IN NEW PLANT	1	0(0)	187	199(52)	3,361	2,603(687)
REPLACE	240	226(59)	0	0(0)	0	0(0)
ABANDON	1,215	1,672(441)	2	1(0)	0	0(0)
NO CHANGE	2,256	3,285(868)	13	348(92)	1	0(0)
OTHER	58	128(34)	0	0(0)	1	1(0)
TOTAL	5,826	9,144(2415)	214	598(158)	3,366	2,606(688)

43-52 AERATED LAGOONS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	159	582(153)	6	8(2)	0	0(0)
UPGRADE	114	364(96)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	78	569(150)	2	0(0)	1	1(0)
INSTALL IN NEW PLANT	2	1(0)	114	177(46)	1,313	1,664(439)
REPLACE	19	53(14)	0	0(0)	0	0(0)
ABANDON	166	461(121)	0	0(0)	0	0(0)
NO CHANGE	463	1,393(368)	1	4(1)	1	0(0)
OTHER	4	4(1)	0	0(0)	1	0(0)
TOTAL	1,005	3,431(906)	123	191(50)	1,316	1,666(440)

43-53 POST AERATION (REAERATION)

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	51	1,258(332)	4	38(10)	0	0(0)
UPGRADE	9	10(2)	0	0(0)	1	0(0)
ENLARGE AND UPGRADE	10	127(33)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	2	3(0)	131	2,707(715)	975	6,228(1645)
REPLACE	8	86(22)	1	3(0)	0	0(0)
ABANDON	68	125(33)	1	0(0)	0	0(0)
NO CHANGE	284	3,159(834)	1	18(4)	0	0(0)
OTHER	0	0(0)	1	9(2)	0	0(0)
TOTAL	432	4,770(1260)	139	2,777(733)	976	6,229(1645)

43-54 BIO-DISC (ROTATING BIOLOGICAL FILTER)

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	12	53(14)	0	0(0)	0	0(0)
UPGRADE	2	1(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	2(0)	1	11(2)	0	0(0)
INSTALL IN NEW PLANT	1	2(0)	84	1,078(285)	399	3,357(886)
REPLACE	1	3(0)	0	0(0)	0	0(0)
ABANDON	6	37(9)	0	0(0)	0	0(0)
NO CHANGE	48	183(48)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	71	283(74)	85	1,090(288)	399	3,357(886)

43-55 OXIDATION DITCH USING MECHANICAL AERATORS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	62	138(36)	2	7(2)	0	0(0)
UPGRADE	18	28(7)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	10	16(4)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	0(0)	80	96(25)	503	880(232)
REPLACE	3	2(0)	0	0(0)	0	0(0)
ABANDON	12	27(7)	0	0(0)	0	0(0)
NO CHANGE	231	282(74)	3	3(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	337	496(131)	85	107(28)	503	880(232)

43-56 CLARIFICATION USING TUBE SETTLERS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	14	113(29)	1	3(1)	0	0(0)
UPGRADE	2	6(1)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	5	50(13)	1	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	8	169(44)	9	43(11)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	15(4)	0	0(0)	0	0(0)
NO CHANGE	15	216(57)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	40	402(106)	10	173(45)	9	43(11)

43-57 OUTFALL PUMPING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	50	1,806(477)	2	7(1)	0	0(0)
UPGRADE	4	604(159)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	13	292(77)	1	514(135)	0	0(0)
INSTALL IN NEW PLANT	1	0(0)	27	1,925(508)	246	4,654(1229)
REPLACE	5	156(41)	1	1,589(419)	0	0(0)
ABANDON	40	248(65)	0	0(0)	0	0(0)
NO CHANGE	94	3,383(893)	3	329(87)	0	0(0)
OTHER	0	0(0)	1	22(5)	0	0(0)
TOTAL	207	6,492(1715)	35	4,389(1159)	246	4,654(1229)

43-58 OUTFALL DIFFUSER

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	5	563(148)	0	0(0)	0	0(0)
UPGRADE	2	4(1)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	3	44(11)	1	514(135)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	9	54(14)	38	4,767(1259)
REPLACE	3	82(21)	0	0(0)	0	0(0)
ABANDON	2	80(21)	0	0(0)	0	0(0)
NO CHANGE	36	2,223(587)	1	18(4)	0	0(0)
OTHER	1	2(0)	0	0(0)	0	0(0)
TOTAL	52	3,002(793)	11	588(155)	38	4,767(1259)

43-59 EFFLUENT TO OTHER PLANTS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1	65(17)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	5	70(18)	32	775(204)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	2	69(18)	0	0(0)	0	0(0)
NO CHANGE	6	333(87)	0	0(0)	0	0(0)
OTHER	0	0(0)	1	0(0)	0	0(0)
TOTAL	9	468(123)	6	71(18)	32	775(204)

43-60 EFFLUENT OUTFALL

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1,124	9,918(2620)	20	1,073(283)	1	0(0)
UPGRADE	305	1,563(413)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	494	4,364(1153)	8	120(31)	0	0(0)
INSTALL IN NEW PLANT	15	14(3)	380	1,445(381)	5,984	13,802(3646)
REPLACE	466	1,976(522)	7	49(13)	0	0(0)
ABANDON	1,711	10,239(2705)	5	3(0)	4	15(3)
NO CHANGE	5,917	49,680(13124)	9	37(9)	3	1(0)
OTHER	6	34(9)	1	0(0)	0	0(0)
TOTAL	10,038	77,792(20550)	430	2,729(721)	5,992	13,818(3650)

43-61 OTHER TREATMENT

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	23	627(165)	2	140(37)	1	6(1)
UPGRADE	21	971(256)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	11	640(169)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	19	1,379(364)	128	3,331(880)
REPLACE	29	24(6)	0	0(0)	0	0(0)
ABANDON	385	146(38)	0	0(0)	0	0(0)
NO CHANGE	170	3,303(872)	1	3(1)	0	0(0)
OTHER	3	2(0)	0	0(0)	0	0(0)
TOTAL	642	5,717(1510)	22	1,523(402)	129	3,337(881)

43-62 AEROBIC DIGESTION - AIR

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	460	2,888(762)	11	57(15)	1	1(0)
UPGRADE	116	645(170)	1	0(0)	0	0(0)
ENLARGE AND UPGRADE	146	860(227)	2	30(8)	2	31(8)
INSTALL IN NEW PLANT	2	2(0)	226	2,060(544)	2,930	8,661(2288)
REPLACE	38	204(54)	0	0(0)	0	0(0)
ABANDON	313	4,765(1259)	1	0(0)	4	0(0)
NO CHANGE	1,207	4,121(1088)	9	70(18)	1	0(0)
OTHER	5	17(4)	0	0(0)	1	0(0)
TOTAL	2,287	13,506(3568)	250	2,219(586)	2,939	8,694(2296)

43-63 AEROBIC DIGESTION - OXYGEN

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	9	21(5)	1	25(6)	0	0(0)
UPGRADE	4	46(12)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	2	4(1)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	0(0)	11	91(24)	27	690(182)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	36(9)	0	0(0)	0	0(0)
NO CHANGE	20	228(60)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	40	338(89)	12	117(30)	27	690(182)

43-64 COMPOSTING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	0	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	2	5(1)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	5	1,211(319)	15	646(170)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	1(0)	0	0(0)	0	0(0)
NO CHANGE	6	86(22)	0	0(0)	0	0(0)
OTHER	1	1,249(329)	0	0(0)	0	0(0)
TOTAL	10	1,341(354)	5	1,211(319)	15	646(170)

43-65 ANAEROBIC DIGESTION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	751	15,658(4136)	37	820(216)	1	1(0)
UPGRADE	284	3,276(865)	5	1,792(473)	0	0(0)
ENLARGE AND UPGRADE	441	6,674(1763)	9	593(156)	0	0(0)
INSTALL IN NEW PLANT	4	644(170)	144	1,167(308)	1,819	11,087(2929)
REPLACE	190	1,367(361)	5	49(13)	0	0(0)
ABANDON	1,224	6,473(1710)	1	62(16)	1	0(0)
NO CHANGE	1,809	24,706(6526)	7	481(127)	1	2(0)
OTHER	11	459(121)	1	0(0)	2	2(0)
TOTAL	4,714	59,262(15655)	209	4,968(1312)	1,824	11,093(2930)

43-66 SLUDGE LAGOONS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	89	1,499(396)	3	43(11)	0	0(0)
UPGRADE	32	189(50)	0	0(0)	1	0(0)
ENLARGE AND UPGRADE	39	1,050(277)	2	436(115)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	26	247(65)	182	2,337(617)
REPLACE	5	36(9)	0	0(0)	0	0(0)
ABANDON	112	1,834(484)	2	3(0)	0	0(0)
NO CHANGE	296	6,589(1740)	1	0(0)	0	0(0)
OTHER	1	11(2)	0	0(0)	1	3(0)
TOTAL	574	11,210(2961)	34	731(193)	184	2,340(618)

43-67 HEAT TREATMENT

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	25	1,177(310)	0	0(0)	0	0(0)
UPGRADE	9	80(21)	2	74(19)	0	0(0)
ENLARGE AND UPGRADE	9	158(41)	1	435(114)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	18	1,713(452)	48	5,668(1497)
REPLACE	3	6(1)	0	0(0)	0	0(0)
ABANDON	14	144(38)	0	0(0)	0	0(0)
NO CHANGE	88	6,621(1749)	1	90(23)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	148	8,188(2163)	22	2,314(611)	48	5,668(1497)

43-68 CHLORINE OXIDATION OF SLUDGE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	4	475(125)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	16(4)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	8	174(46)	14	155(41)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	383(101)	0	0(0)	0	0(0)
NO CHANGE	19	242(64)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	28	1,118(295)	8	174(46)	14	155(41)

43-69 LIME STABILIZATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	6	527(139)	1	11(2)	0	0(0)
UPGRADE	3	69(18)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	10	267(70)	33	745(196)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	7	168(44)	0	0(0)	0	0(0)
NO CHANGE	34	747(197)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	50	1,512(399)	11	279(73)	33	745(196)

43-70 WET AIR OXIDATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	5	234(62)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	5	457(120)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	6	157(41)	2	259(68)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	4	167(44)	0	0(0)	0	0(0)
NO CHANGE	31	1,126(297)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	45	1,986(524)	6	157(41)	2	259(68)

43-71 AIR DRYING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1,214	8,629(2279)	34	636(168)	0	0(0)
UPGRADE	206	816(215)	3	36(9)	0	0(0)
ENLARGE AND UPGRADE	424	2,407(636)	10	190(50)	1	2(0)
INSTALL IN NEW PLANT	7	379(100)	277	858(226)	4,357	10,258(2710)
REPLACE	207	982(259)	3	26(7)	0	0(0)
ABANDON	1,230	8,498(2244)	3	2(0)	5	0(0)
NO CHANGE	2,994	17,498(4622)	9	33(8)	2	1(0)
OTHER	9	1,298(342)	2	7(2)	3	15(4)
TOTAL	6,291	40,511(10701)	341	1,792(473)	4,368	10,278(2715)

43-72 DEWATERING - MECHANICAL - VACUUM FILTER

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	236	6,354(1678)	22	520(137)	2	123(32)
UPGRADE	39	3,980(1051)	4	65(17)	1	7(1)
ENLARGE AND UPGRADE	75	3,958(1045)	2	79(20)	0	0(0)
INSTALL IN NEW PLANT	2	2(0)	138	2,461(650)	699	14,421(3809)
REPLACE	15	526(139)	0	0(0)	0	0(0)
ABANDON	115	3,144(830)	0	0(0)	0	0(0)
NO CHANGE	558	18,573(4906)	11	322(85)	0	0(0)
OTHER	2	9(2)	0	0(0)	0	0(0)
TOTAL	1,042	36,551(9655)	177	3,449(911)	702	14,552(3844)

43-73 DEWATERING - MECHANICAL - CENTRIFUGE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	41	3,207(847)	4	356(94)	0	0(0)
UPGRADE	6	153(40)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	15	718(189)	2	33(8)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	24	535(141)	67	9,226(2437)
REPLACE	2	30(7)	0	0(0)	0	0(0)
ABANDON	9	81(21)	0	0(0)	0	0(0)
NO CHANGE	81	3,025(799)	1	310(81)	0	0(0)
OTHER	1	12(3)	0	0(0)	0	0(0)
TOTAL	155	7,229(1909)	31	1,234(326)	67	9,226(2437)

43-74 DEWATERING - MECHANICAL - FILTER PRESS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	11	366(96)	1	34(9)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	8	290(76)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	28	1,528(403)	73	2,770(731)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	2(0)	0	0(0)	0	0(0)
NO CHANGE	34	524(138)	1	1(0)	1	15(3)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	54	1,183(312)	30	1,565(413)	74	2,785(735)

43-75 DEWATERING - OTHERS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	3	12(3)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	4	1,156(305)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	3	24(6)	7	146(38)
REPLACE	1	2(0)	0	0(0)	0	0(0)
ABANDON	6	9(2)	0	0(0)	0	0(0)
NO CHANGE	10	237(62)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	24	1,418(374)	3	24(6)	7	146(38)

43-76 GRAVITY THICKENING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	131	7,838(2070)	8	120(31)	1	117(30)
UPGRADE	20	998(263)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	34	2,613(690)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	2(0)	91	1,884(497)	278	8,292(2190)
REPLACE	6	89(23)	0	0(0)	0	0(0)
ABANDON	54	607(160)	0	0(0)	0	0(0)
NO CHANGE	310	15,045(3974)	4	361(95)	0	0(0)
OTHER	1	53(14)	1	9(2)	0	0(0)
TOTAL	557	27,250(7198)	104	2,375(627)	279	8,410(2221)

43-77 AIR FLOTATION THICKENING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	44	3,401(898)	1	18(4)	0	0(0)
UPGRADE	5	147(38)	0	0(0)	1	10(2)
ENLARGE AND UPGRADE	5	189(50)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	39	3,067(810)	113	6,482(1712)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	7	90(23)	0	0(0)	0	0(0)
NO CHANGE	97	5,893(1556)	1	49(13)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	158	9,723(2568)	41	3,136(828)	114	6,492(1715)

43-78 INCINERATION - MULTIPLE HEARTH

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	64	2,922(771)	4	165(43)	0	0(0)
UPGRADE	21	3,860(1019)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	29	3,171(837)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	33	1,330(351)	96	6,690(1767)
REPLACE	5	867(229)	0	0(0)	0	0(0)
ABANDON	45	535(141)	0	0(0)	0	0(0)
NO CHANGE	156	8,945(2363)	4	440(116)	1	60(15)
OTHER	0	0(0)	0	0(0)	1	1,169(308)
TOTAL	320	20,302(5363)	41	1,936(511)	98	7,921(2092)

43-79 INCINERATION - FLUIDIZED BEDS

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	2	8(2)	0	0(0)	0	0(0)
UPGRADE	2	78(20)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	3	259(68)	0	0(0)
REPLACE	1	21(5)	0	0(0)	0	0(0)
ABANDON	1	19(5)	0	0(0)	0	0(0)
NO CHANGE	9	328(86)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	15	455(120)	3	259(68)	0	0(0)

43-80 INCINERATION - ROTARY KILN

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	0	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	2	71(18)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	1	90(23)	2	38(10)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	2	4(1)	0	0(0)	0	0(0)
NO CHANGE	3	56(14)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	7	131(34)	1	90(23)	2	38(10)

43-81 INCINERATION - OTHERS

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	1	7(1)	0	0(0)	0	0(0)
UPGRADE	1	35(9)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	1	26(6)	3	223(59)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	7	198(52)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	9	241(63)	1	26(6)	3	223(59)

43-82 PYROLYSIS

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	0	0(0)	0	0(0)	0	0(0)
UPGRADE	1	3(0)	0	0(0)	1	1,097(289)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	0	0(0)	16	6,000(1585)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	1	72(19)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	2	76(20)	0	0(0)	17	7,097(1875)

43-83 CO-INCINERATION WITH SOLID WASTE

	NOW IN USE NUMBER	NOW IN USE FLOW	UNDER CONSTRUCTION NUMBER	UNDER CONSTRUCTION FLOW	REQUIRED BUT NOT YET FUNDED NUMBER	REQUIRED BUT NOT YET FUNDED FLOW
ENLARGE	0	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	1	15(3)	3	224(59)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	4	71(18)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	4	71(18)	1	15(3)	3	224(59)

43-84 CO-PYROLYSIS WITH SOLID WASTE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	0	0(0)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	0	0(0)	2	278(73)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	0	0(0)	0	0(0)	0	0(0)
NO CHANGE	0	0(0)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	1	0(0)	0	0(0)	2	278(73)

43-85 RECALCINATION

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	5	344(90)	0	0(0)	1	96(25)
UPGRADE	0	0(0)	3	227(59)	1	5(1)
ENLARGE AND UPGRADE	1	348(91)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	3	73(19)	21	954(252)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	7	109(28)	0	0(0)	0	0(0)
NO CHANGE	14	635(167)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	27	1,438(379)	6	300(79)	23	1,056(279)

43-86 LAND FILL

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	546	7,831(2068)	10	338(89)	0	0(0)
UPGRADE	68	707(187)	0	0(0)	2	4(1)
ENLARGE AND UPGRADE	86	4,208(1111)	5	101(26)	1	0(0)
INSTALL IN NEW PLANT	6	85(22)	300	1,570(414)	4,062	21,003(5548)
REPLACE	73	316(83)	0	0(0)	0	0(0)
ABANDON	854	7,015(1853)	2	1(0)	4	0(0)
NO CHANGE	3,292	27,304(7213)	10	118(31)	2	2(0)
OTHER	5	19(5)	0	0(0)	0	0(0)
TOTAL	4,930	47,488(12545)	327	2,131(563)	4,071	21,010(5550)

43-87 LAND SPREADING OF LIQUID SLUDGE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	59	283(74)	2	151(40)	0	0(0)
UPGRADE	20	90(24)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	45	3,271(864)	1	1(0)	0	0(0)
INSTALL IN NEW PLANT	2	2(0)	72	321(84)	387	1,741(459)
REPLACE	13	151(40)	0	0(0)	0	0(0)
ABANDON	133	605(159)	0	0(0)	0	0(0)
NO CHANGE	730	3,593(949)	4	24(6)	0	0(0)
OTHER	1	10(2)	0	0(0)	0	0(0)
TOTAL	1,003	8,008(2115)	79	498(131)	387	1,741(459)

43-88 LAND SPREADING OF THICKENED SLUDGE

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	79	1,289(340)	2	29(7)	0	0(0)
UPGRADE	20	49(13)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	53	3,309(874)	1	0(0)	0	0(0)
INSTALL IN NEW PLANT	1	1(0)	45	251(66)	293	4,217(1114)
REPLACE	5	19(5)	0	0(0)	0	0(0)
ABANDON	124	1,816(479)	0	0(0)	0	0(0)
NO CHANGE	595	4,464(1179)	1	18(4)	0	0(0)
OTHER	1	9(2)	0	0(0)	0	0(0)
TOTAL	878	10,959(2895)	49	300(79)	293	4,217(1114)

43-89 TRENCHING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1	0(0)	0	0(0)	0	0(0)
UPGRADE	0	0(0)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	21(5)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	3	26(7)	2	2(0)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	1	1,046(276)	0	0(0)	0	0(0)
NO CHANGE	3	4(1)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	6	1,074(283)	3	26(7)	2	2(0)

43-90 OCEAN DUMPING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	1	1(0)	0	0(0)	0	0(0)
UPGRADE	1	6(1)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	1	15(4)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	0	0(0)	0	0(0)
REPLACE	0	0(0)	0	0(0)	0	0(0)
ABANDON	43	9,705(2563)	0	0(0)	0	0(0)
NO CHANGE	3	38(10)	0	0(0)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	49	9,767(2580)	0	0(0)	0	0(0)

43-91 OTHER SLUDGE HANDLING

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	21	330(87)	3	33(8)	0	0(0)
UPGRADE	11	589(155)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	6	2,764(730)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	15	215(56)	94	4,903(1295)
REPLACE	3	23(6)	0	0(0)	0	0(0)
ABANDON	57	840(222)	1	16(4)	0	0(0)
NO CHANGE	115	3,440(908)	1	310(81)	0	0(0)
OTHER	3	1,798(475)	0	0(0)	0	0(0)
TOTAL	216	9,787(2585)	20	575(151)	94	4,903(1295)

43-92 DIGEST GAS UTILIZATION FACILITIES

	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
ENLARGE	25	737(194)	1	1,589(419)	0	0(0)
UPGRADE	6	38(10)	0	0(0)	0	0(0)
ENLARGE AND UPGRADE	28	1,604(423)	0	0(0)	0	0(0)
INSTALL IN NEW PLANT	0	0(0)	3	145(38)	39	2,536(669)
REPLACE	5	163(43)	0	0(0)	0	0(0)
ABANDON	23	153(40)	0	0(0)	0	0(0)
NO CHANGE	86	3,778(998)	1	6(1)	0	0(0)
OTHER	0	0(0)	0	0(0)	0	0(0)
TOTAL	173	6,475(1710)	5	1,741(460)	39	2,536(669)

TABLE 44 - COLLECTION POPULATIONS - PRESENT, PROJECTED, RESIDENT & NONRESIDENT

Table 44 summarizes, by State, the present and projected populations "Receiving Collection" and "Not Receiving Collection" of their wastewaters. Resident populations are permanent residents of the service area. Nonresident populations include commuters living in one area and working in another, as well as temporary residents at resort areas and similar locations.

The year 2000 ceiling population is the population expected to be resident in each State as predicted by the Bureau of Economic Analysis (BEA). The projections were produced by BEA after extensive analysis which included review and comments by State agencies responsible for population projections.

Residents "Not Receiving Collection" are those residents of a service area or authority not serviced by the collection system operated by the authority. Many rural residents in sparsely populated, unincorporated areas are included in the BEA ceiling population, but are not counted in either the resident receiving or not receiving collection categories. Therefore, the totals of residents receiving or not receiving collection do not equal the total population of a State.

The "Percent Served" figures are based upon resident populations compared with BEA 1978 estimates and 2000 ceilings.

1978 NEEDS SURVEY

COLLECTION POPULATIONS
PRESENT, PROJECTED, RESIDENT & NONRESIDENT
(IN THOUSANDS)

STATE	2000 CEILING POPULATION	****** RECEIVING COLLECTION ***** 1978 RES.	1978 NONRES.	2000 RES.	2000 NONRES.	*** NOT RECEIVING COLLECTION *** 1978 RES.	1978 NONRES.	2000 RES.	2000 NONRES.	PERCENT SERVED 1978	2000
ALABAMA	4,140	1,971	101	3,366	204	299	1	72	0	53.4	81.3
ALASKA	667	203	3	669	18	64	0	15	0	50.0	100.4
ARIZONA	4,149	1,743	65	3,671	203	173	2	45	2	75.9	88.5
ARKANSAS	2,970	1,203	20	2,926	42	89	0	6	0	56.1	98.5
CALIFORNIA	26,786	19,414	1,066	26,308	1,481	1,083	9	218	5	88.7	98.2
COLORADO	3,868	2,184	134	3,558	526	20	0	2	0	83.4	92.0
CONNECTICUT	3,741	1,875	41	2,937	42	923	0	777	0	60.3	78.5
DELAWARE	841	477	72	580	388	61	0	21	0	82.1	69.1
DIST. OF COLUM.	661	729	744	611	200	0	0	0	0	105.8	92.4
FLORIDA	15,049	5,085	938	13,024	1,841	1,250	0	394	1	60.2	86.5
GEORGIA	7,053	2,875	132	6,014	228	526	0	302	0	57.0	85.3
HAWAII	1,366	594	90	1,351	258	96	0	1	0	66.4	98.9
IDAHO	1,183	483	13	1,052	79	66	5	15	4	56.4	88.9
ILLINOIS	12,358	9,604	32	11,917	42	136	0	132	0	85.4	96.4
INDIANA	5,732	3,442	241	4,957	517	208	4	23	0	64.6	86.5
IOWA	3,101	2,087	73	2,833	110	75	0	4	0	72.5	91.4
KANSAS	2,517	1,818	12	2,567	14	121	0	0	0	78.2	102.0
KENTUCKY	4,224	1,637	50	3,328	73	370	0	255	0	47.3	78.8
LOUISIANA	4,659	2,733	64	4,446	95	127	1	1	0	69.7	95.4
MAINE	1,222	526	81	1,033	139	180	0	206	0	48.5	84.6
MARYLAND	5,583	3,121	131	5,311	491	343	10	110	0	75.4	95.1
MASSACHUSETTS	6,614	3,803	49	5,856	205	941	33	834	55	65.8	88.6
MICHIGAN	10,314	6,614	90	9,068	245	973	8	630	17	72.5	87.9
MINNESOTA	4,505	2,925	22	3,792	40	137	0	62	0	73.6	84.2
MISSISSIPPI	2,740	1,284	10	2,206	25	252	1	121	0	53.8	80.5
MISSOURI	5,225	3,453	873	5,248	1,186	191	0	0	0	71.9	100.5
MONTANA	802	473	33	690	41	24	0	1	0	62.2	86.1
NEBRASKA	1,734	1,274	16	1,752	22	44	0	5	0	81.7	101.1
NEVADA	1,141	603	95	1,141	180	19	0	0	0	95.3	100.0
NEW HAMPSHIRE	1,306	364	57	938	196	163	8	244	33	43.0	71.8
NEW JERSEY	8,747	5,631	887	8,320	1,569	596	74	207	60	76.8	95.1
NEW MEXICO	1,436	850	14	1,369	32	88	0	53	0	71.5	95.3
NEW YORK	18,922	12,077	2,358	17,250	3,359	2,314	44	1,618	4	67.4	91.2
NORTH CAROLINA	7,419	2,370	179	4,485	441	1,062	2	848	14	42.9	60.5
NORTH DAKOTA	690	425	0	578	0	0	0	0	0	65.2	83.8
OHIO	12,031	8,154	57	11,990	93	575	0	64	0	76.2	99.7
OKLAHOMA	3,396	2,098	1	3,319	10	108	0	13	0	74.6	97.8
OREGON	3,209	1,395	37	2,985	73	298	1	2	0	58.7	93.0
PENNSYLVANIA	12,365	8,601	525	11,894	1,237	828	17	548	10	73.0	96.2
RHODE ISLAND	1,033	591	48	926	71	207	0	101	0	63.2	89.7
SOUTH CAROLINA	3,700	1,246	232	2,784	498	403	0	101	0	43.3	75.3
SOUTH DAKOTA	730	438	13	616	10	2	0	0	0	63.7	84.5
TENNESSEE	5,573	2,157	72	4,102	151	701	0	261	0	50.2	73.6
TEXAS	18,069	10,031	44	16,788	131	624	0	0	0	78.2	92.9
UTAH	1,688	1,140	7	1,662	27	11	0	14	0	90.0	98.5
VERMONT	607	223	46	383	78	57	4	78	7	46.3	63.2
VIRGINIA	6,755	3,287	125	6,017	239	634	0	323	0	64.0	89.1
WASHINGTON	4,417	2,323	436	4,127	815	294	13	98	19	63.5	93.4
WEST VIRGINIA	2,003	738	16	2,023	24	96	0	23	0	39.7	101.0
WISCONSIN	5,553	3,369	102	5,198	242	232	1	137	1	72.5	93.6
WYOMING	484	325	16	469	18	0	0	0	0	80.1	97.0
AMERICAN SAMOA	40	1	0	36	1	27	0	2	0	4.8	90.5
GUAM	275	69	9	215	3	19	0	22	0	75.3	78.5
N. MARIANAS	35	1	0	31	2	8	0	1	0	11.5	89.4
PUERTO RICO	4,700	1,780	0	3,242	0	1,069	0	771	0	54.2	69.0
PAC. TR. TERR.	170	2	0	107	4	50	0	64	0	1.8	63.3
VIRGIN ISLANDS	116	66	3	106	3	18	0	7	0	69.5	91.9
U.S. TOTALS	270,414	154,011	10,600	244,201	18,288	19,300	250	9,880	239	70.0	90.3

TABLE 45 - NUMBERS OF FACILITIES NEEDING COLLECTOR SEWERS BY SERVICE-AREA POPULATION AND PER-CAPITA SEWER COST

Table 45 summarizes the collector sewer needs expressed as $/capita and service-area populations. The service-area populations are 1978 resident populations who are presently in need of collector systems, and whose 1972 population met the "2/3 Rule." That is, 2/3 of the population requiring collector sewers in 1978 are required to have been resident within the service area on October 18, 1972.

The matrix delineates costs, in $/capita in the left margin, and service-area populations across the top. Thus, there are 225 service areas whose populations are in the 1,000 to 4,999 range and whose average cost for collector sewers is $500-600 per capita.

A total of 5,569 individual service areas are in need of collector sewers.

FEBRUARY 10, 1979
TABLE 45

1978 NEEDS SURVEY

NUMBERS OF FACILITIES NEEDING COLLECTOR SEWERS BY SERVICE-AREA POPULATION AND PER-CAPITA SEWER COST

COLLECTOR SEWER COST $/CAPITA	****** SERVICE-AREA POPULATION ****** 0-999	1,000-4,999	5,000-9,999	10,000-49,999	50K-100K	>100K	TOTAL
0-100	8	37	19	18	4	2	88
100-200	17	52	22	40	4	4	139
200-300	27	74	26	26	8	2	163
300-400	25	92	40	45	4	4	210
400-500	39	99	33	51	3	7	232
500-600	90	225	45	46	11	3	420
600-700	184	411	88	112	9	7	811
700-800	100	274	127	163	16	10	690
800-900	102	190	63	84	4	9	452
900-1000	158	237	82	130	20	18	645
1000-1100	77	283	124	181	18	9	692
1100-1200	18	93	64	144	14	12	345
1200-1300	8	54	39	82	13	5	201
1300-1400	6	18	11	38	5	9	87
1400-1500	5	11	11	25	7	6	65
>1500	56	129	50	72	14	8	329
TOTAL	920	2,279	844	1,257	154	115	5,569

TABLE 46 - PERCENT OF COLLECTOR DOLLAR NEEDS BY SERVICE-AREA POPULATION AND COST/CAPITA

Table 46 summarizes the collector sewer needs expressed as \$/capita and service-area populations. The service-area populations are 1978 resident populations who are presently in need of collector systems, and whose 1972 population met the "2/3 Rule." That is, 2/3 of the population requiring collector systems in 1978 are required to have been resident within the service area on October 18, 1972.

The matrix delineates the percent of collector dollar needs by service-area population size and cost per capita. This table is a companion to Table 45, which delineates number of facilities, using the same matrix. For example, 12.5 percent of the collector sewer needs for service areas with populations in the 5,000-9,999 range are in the \$1,000-1,100 per capita range.

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TABLE 46

1978 NEEDS SURVEY

PERCENT OF COLLECTOR DOLLAR NEEDS BY SERVICE-AREA POPULATION AND COST/CAPITA

COLLECTOR SEWER COST	******************************** SERVICE-AREA POPULATION ********************************					
$/CAPITA	0-999	1,000-4,999	5,000-9,999	10,000-49,999	50K-100K	>100K
0-100	0.1	0.3	0.3	0.1	0.2	0.1
100-200	0.4	0.7	0.8	1.3	1.2	1.0
200-300	1.1	1.8	1.6	0.9	2.6	1.3
300-400	1.4	2.4	3.6	2.3	1.5	2.2
400-500	3.8	3.4	2.3	2.0	1.5	4.5
500-600	6.8	6.9	3.4	2.7	6.9	1.9
600-700	14.5	12.4	8.5	7.4	2.7	2.7
700-800	11.1	13.5	13.4	13.0	14.9	4.0
800-900	8.4	6.8	10.4	7.9	2.0	12.5
900-1000	11.2	7.2	8.3	8.7	12.8	17.6
1000-1100	11.7	12.7	12.5	12.7	14.6	5.2
1100-1200	2.6	6.5	9.8	12.3	5.1	9.5
1200-1300	1.2	5.3	7.6	10.0	8.7	4.7
1300-1400	1.7	1.7	3.0	4.3	4.9	11.8
1400-1500	1.7	0.9	2.2	3.4	9.3	11.2
>1500	22.4	17.7	12.3	11.0	11.1	9.9
TOTALS	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 47 - REQUIRED INFILTRATION/INFLOW CORRECTIVE ACTIONS AND BASIS OF ESTIMATE - NUMBER OF FACILITIES WITH NEEDS

Table 47 summarizes, for those facilities requiring infiltration/inflow corrective action, the kind of corrective action necessary and the basis of estimate for such action.

Individual cost estimates made in Categories I through IV of the Survey were to be accompanied with a basis of cost estimate so that the accuracy of the estimate could better be determined. EPA has determined that the quality of the cost estimates can be ranked from high to low as follows:

1. Engineer/Consultant Firm Estimate.

2. Engineer/Consultant Preliminary Estimate.

3. Cost/Effective Analysis.

4. Cost of Previous Comparable Construction.

5. EPA Supplied Cost Estimating Procedures.

6. Rough Estimates.

Additionally, three other basis of estimates were permitted for Categories IIIA and IIIB (infiltration/inflow correction and major sewer rehabilitation) needs only. These are:

1. State Certification.

2. Infiltration/Inflow Analysis Completed.

3. Evaluation Survey Completed.

It is noted that 781 estimates were supplied, with no corresponding basis of estimate. This procedure was permitted for Category IIIA only, in order to allow needs for infiltration/inflow analyses where none had previously been accomplished, and infiltration/inflow was suspected to be a problem by State and Federal officials.

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TABLE 47

1978 NEEDS SURVEY

REQUIRED INFILTRATION/INFLOW CORRECTIVE ACTIONS AND BASIS OF ESTIMATE
NUMBERS OF FACILITIES WITH NEEDS

	****************************** CORRECTIVE	ACTION ******************************						
BASIS OF ESTIMATE	NOT KNOWN	NONE	SEAL OFF SEWER LINES	REPLACE/RELINE SEWER SECTIONS	CHANGE/CREATE FLOW ROUTING SYSTEM	PROVIDE FLOW EQUALIZATION	OTHER	TOTAL
STATE CERTIFICATION	0	0	0	0	0	0	0	0
I/I ANALYSIS COMPLETED	108	0	979	554	1	12	20	1,674
EVALUATION SURVEY COMPLETED	8	0	95	144	1	1	5	254
ENGINEER/CONSULTANT FIRM ESTIMATE	2	0	5	16	0	0	1	24
COST OF PREVIOUS COMPARABLE CONSTRUCTION	0	0	0	0	0	0	0	0
ENGINEER/CONSULTANT PRELIMINARY ESTIMATE	158	0	239	420	6	10	16	849
EPA - SUPPLIED COST ESTIMATING PROCEDURES	477	0	275	43	0	0	1	796
COST EFFECTIVE ANALYSIS	1	0	1	7	0	0	2	11
ROUGH ESTIMATE	0	0	0	0	0	0	0	0
(NONE GIVEN)	781	0	0	0	0	0	0	781
TOTALS	1,535	0	1,594	1,184	8	23	45	4,389

TABLE 48 - DOLLAR NEEDS FOR REQUIRED INFILTRATION/INFLOW CORRECTIVE ACTIONS BY BASIS OF ESTIMATE

Table 48 summarizes the dollar needs required for infiltration/inflow corrective actions by basis of estimate and is a companion to Table 47.

It is noted that approximately 45 percent of the total dollar needs estimated for infiltration/inflow correction were based on completed infiltration/inflow analyses.

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TABLE 48

1978 NEEDS SURVEY

DOLLAR NEEDS FOR REQUIRED INFILTRATION/INFLOW CORRECTIVE ACTIONS BY BASIS OF ESTIMATE
(THOUSANDS OF DOLLARS)

	******************************** CORRECTIVE ACTION ********************************							
BASIS OF ESTIMATE	NOT KNOWN	NONE	SEAL OFF SEWER LINES	REPLACE/ RELINE SEWER SECTIONS	CHANGE/ CREATE FLOW ROUT. SYSTEM	PROVIDE FLOW EQUILIZA.	OTHER	TOTAL
STATE CERTIFICATION	0	0	0	0	0	0	0	0
I/I ANALYSIS COMPLETED	33,915	0	494,689	534,959	134	39,423	4,943	1,108,063
EVALUATION SURVEY COMPLETED	1,296	0	45,706	170,515	32	76	5,695	223,320
ENGINEER/CONSULTANT FIRM EST.	93	0	9,473	9,127	0	0	80	18,773
COST OF PREVIOUS COMP. CONST.	0	0	0	0	0	0	0	0
ENG./CONSULTANT PRELIM. EST.	46,653	0	157,591	361,309	2,969	18,222	7,683	594,427
EPA-SUPPLIED COST EST. PROC.	234,040	0	131,559	117,637	0	0	925	484,161
COST EFFECTIVE ANALYSIS	15	0	456	1,404	0	0	84	1,959
ROUGH ESTIMATE	0	0	0	0	0	0	0	0
(NONE GIVEN)	6,749	0	0	0	0	0	0	6,749
TOTALS	322,761	0	839,474	1,194,951	3,135	57,721	19,410	2,437,452

TABLE 49 - REQUIRED REPLACEMENT AND/OR MAJOR REHABILITATION ACTIONS AND BASIS OF ESTIMATE - NUMBERS OF FACILITIES WITH NEEDS

Table 49 presents a summary of the required collection system replacement and major rehabilitation actions by type of corrective action and basis of estimate.

Individual cost estimates made in Categories I through IV of the Survey were accompanied with a basis of cost estimate, so that the accuracy of the estimate can better be determined. EPA has determined that the quality of the cost estimates can be ranked from high to low as follows:

1. Engineer/Consultant Firm Estimate.

2. Engineer/Consultant Preliminary Estimate.

3. Cost/Effective Analysis.

4. Cost of Previous Comparable Construction.

5. EPA Supplied Cost Estimating Procedures.

6. Rough Estimates.

Additionally, three other basis of estimates were permitted for Categories IIIA and IIIB (infiltration/inflow correction and major sewer rehabilitation) needs only. These are:

1. State Certification.

2. Infiltration/Inflow Analysis Completed.

3. Evaluation Survey Completed.

It is noted that 299 of 384 total, or approximately 78 percent, of the required replacement/major rehabilitation corrective actions were based on engineer/consultant preliminary estimates. The majority of these actions involved replacement or relining of sewers.

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TABLE 49

1978 NEEDS SURVEY

REQUIRED REPLACEMENT AND/OR MAJOR REHABILITATION ACTIONS AND BASIS OF ESTIMATE
NUMBERS OF FACILITIES WITH NEEDS

	******** CORRECTIVE ACTION ********							
BASIS OF ESTIMATE	NOT KNOWN	NONE	SEAL OFF SEWER LINES	REPLACE/RELINE SEWER SECTIONS	CHANGE/CREATE FLOW ROUTING SYSTEM	PROVIDE FLOW EQUALIZATION	OTHER	TOTAL
STATE CERTIFICATION	0	0	0	0	0	0	0	0
ANALYSIS COMPLETED	0	0	0	39	4	0	6	49
EVALUATION SURVEY COMPLETED	0	0	0	22	0	0	2	24
ENGINEER/CONSULTANT FIRM ESTIMATE	0	0	0	8	2	0	2	12
COST OF PREVIOUS COMPARABLE CONSTRUCTION	0	0	0	0	0	0	0	0
ENGINEER/CONSULTANT PRELIMINARY ESTIMATE	0	0	0	231	17	0	51	299
EPA - SUPPLIED COST ESTIMATING PROCEDURES	0	0	0	0	0	0	0	0
COST EFFECTIVE ANALYSIS	0	0	0	0	0	0	0	0
ROUGH ESTIMATE	0	0	0	0	0	0	0	0
(NONE GIVEN)	0	0	0	0	0	0	0	0
TOTALS	0	0	0	300	23	0	61	384

TABLE 50 - DOLLAR NEEDS FOR REPLACEMENT AND/OR MAJOR REHABILITATION BY BASIS OF ESTIMATE

Table 50 summarizes the dollar needs estimated for collection system replacement and/or major rehabilitation and is a companion to Table 49.

It is noted that approximately 83 percent of the total needs are based on engineer/consultant preliminary estimates. The majority of these needs are for replacement/relining sewer systems.

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TABLE 50

1978 NEEDS SURVEY

DOLLAR NEEDS FOR REPLACEMENT AND/OR MAJOR REHABILITATION BY BASIS OF ESTIMATE
(THOUSANDS OF DOLLARS)

BASIS OF ESTIMATE	CORRECTIVE ACTION: NOT KNOWN	NONE	SEAL OFF SEWER LINES	REPLACE/ RELINE SEWER SECTIONS	CHANGE/ CREATE FLOW ROUT. SYSTEM	PROVIDE FLOW EQUILIZA.	OTHER	TOTAL
STATE CERTIFICATION	0	0	0	0	0	0	0	0
ANALYSIS COMPLETED	0	0	0	23,676	524	0	3,569	27,769
EVALUATION SURVEY COMPLETED	0	0	0	771,959	0	0	215	772,174
ENGINEER/CONSULTANT FIRM EST.	0	0	0	4,620	491	0	492	5,603
COST OF PREVIOUS COMP. CONST.	0	0	0	0	0	0	0	0
ENG./CONSULTANT PRELIM. EST.	0	0	0	3,798,703	61,164	0	212,373	4,072,240
EPA-SUPPLIED COST EST. PROC.	0	0	0	0	0	0	0	0
COST EFFECTIVE ANALYSIS	0	0	0	0	0	0	0	0
ROUGH ESTIMATE	0	0	0	0	0	0	0	0
(NONE GIVEN)	0	0	0	0	0	0	0	0
TOTALS	0	0	0	4,598,958	62,179	0	216,649	4,877,786

TABLE 51 - TOTAL PIPE LENGTH NEEDED BY DIAMETERS

Table 51 summarizes, by State, the total length of gravity sewer pipe in meters required to satisfy the Category IVA collector and Category IVB interceptor needs by the year 2000.

Total pipe lengths are shown for seven separate ranges of pipe diameter in centimeters (inches in parentheses). These figures do not include force main pipe.

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TOTAL PIPE LENGTH NEEDED BY DIAMETER
(LENGTH IN METERS,DIAMETER IN CENTIMETERS)

	15-31 (6"-12")	31.1-54 (13"-21")	54.1-77 (22"-30")	77.1-107 (31"-42")	107.1-122 (43"-48")	122.1-200 (49"-78")	200+ (79"+)
ALABAMA	3,552,189	184,381	127,355	56,570	152	16,733	
ALASKA	223,067	60,819	21,484			3,907	
ARIZONA	1,180,176	120,180	89,190	111,153	51,848	29,149	
ARKANSAS	1,829,002	108,903	45,240	30,186	38,762	1,584	
CALIFORNIA	6,666,901	632,906	874,424	445,312	6,035	337,562	53,827
COLORADO	370,290	180,708	107,728	99,111	19,690	91,391	
CONNECTICUT	2,565,446	287,327	72,490	15,361	10,972		
DELAWARE	309,086	10,299	25,036		33,205		
DIST. OF COLUM.							
FLORIDA	8,304,127	485,151	343,344	436,448	102,930	179,742	28,503
GEORGIA	3,663,420	471,773	406,597	214,141	80,424	65,145	10,503
HAWAII	922,756	163,569	147,305	66,584	18,394	6,748	3,749
IDAHO	847,247	66,842	80,350	5,333			
ILLINOIS	1,877,976	226,229	92,737	87,377	16,594	6,195	5,791
INDIANA	2,270,265	184,095	129,632	58,462	5,303	51,897	
IOWA	1,362,888	166,447	142,063	19,421	4,419	18,105	
KANSAS	1,070,453	313,637	210,488	55,260	43,348	3,870	
KENTUCKY	4,059,058	195,620	60,719	166,919		44,439	
LOUISIANA	2,914,229	215,331	189,601	87,453		8,564	
MAINE	1,566,515	129,989	20,066	9,143			
MARYLAND	1,631,551	148,391	174,588	89,256	44,549	5,286	
MASSACHUSETTS	4,459,385	473,702	436,067	78,761	8,903	29,311	
MICHIGAN	6,803,653	482,396	248,853	64,426	21,250	75,287	16,818
MINNESOTA	1,253,692	102,072	64,796	31,556	14,758	45,579	31,394
MISSISSIPPI	1,952,873	203,999	78,262	110,317	6,095		
MISSOURI	2,325,398	325,396	72,386	87,385	46,390	87,636	56,845
MONTANA	217,164	30,035	13,889	10,048			
NEBRASKA	273,061	34,966	40,398	92,166		3,654	
NEVADA	318,733	45,642	17,105	2,633	4,876	7,802	
NEW HAMPSHIRE	2,273,460	209,346	81,902				
NEW JERSEY	4,576,610	333,761	176,869	44,083	5,471		13,702
NEW MEXICO	504,084	131,277	20,278	18,565		1,042	
NEW YORK	7,912,320	544,205	263,478	183,192	34,038	269,393	88,471
NORTH CAROLINA	6,076,618	647,517	283,331	147,407	15,371	34,411	
NORTH DAKOTA	47,934	17,893	2,537	4,632			
OHIO	4,431,826	537,133	322,437	309,538	152,674	134,715	50,596
OKLAHOMA	1,147,702	421,112	104,285	56,418	26,548	52,308	
OREGON	1,249,134	150,398	133,022	70,760		62,331	
PENNSYLVANIA	9,279,355	459,815	188,016	17,516		3,188	
RHODE ISLAND	885,183	184,725	58,948	29,307			
SOUTH CAROLINA	3,707,354	391,296	124,455	59,283	1,523		
SOUTH DAKOTA	138,654	39,533	26,790	5,859	313	507	
TENNESSEE	4,222,640	390,519	162,423	69,381		23,439	20,253
TEXAS	11,209,940	656,416	439,356	367,026	158,806	277.189	21,153
UTAH	827,068	135,121	42,734	50			
VERMONT	550,619	33,853	435				
VIRGINIA	3,810,318	203,544	243,765	115,920			2,773
WASHINGTON	2,775,693	319,602	243,577	114,928		57,424	
WEST VIRGINIA	5,063,785	150,102	25,132				
WISCONSIN	2,320,606	223,728	146,878	31,052	68,275		
WYOMING	29,830	24,974	304				
AMERICAN SAMOA	70,829		75,895				
GUAM	12,560						
N. MARIANAS	169,986						
PUERTO RICO	1,474,609	286,647	187,590	149,188	55,394	8,606	
PAC. TR. TERR.	168,127	21,258					
VIRGIN ISLANDS	100,954	4,145	11,614				
UNITED STATES TOTALS	139,828,423	12,568,754	7,698,268	4,324,912	1,097,327	2,044,156	404,384

TABLE 52 - LENGTH AND COST OF PIPE BASED ON 2000 POPULATION TO RECEIVE COLLECTION

Table 52 summarizes, by State, the total lengths in meters of collector and interceptor pipe required to serve the projected year 2000 populations. Per capita lengths and mean costs per meter have also been calculated for each State. Populations used for calculating per capita length were those resident populations projected to receive collection in the year 2000 in facilities with collector or interceptor pipe needs.

It is noted that the highest total lengths of pipe per capita are projected for States and Territories which are largely rural and unsewered at present, such as New Hampshire West Virginia, American Samoa, Northern Marianas, and the Pacific Trust Territories. The total pipe requirements for these areas, however, comprise only 4.5 percent of the national total.

1978 NEEDS SURVEY

LENGTH AND COST OF PIPE BASED ON 2000 POPULATION TO RECEIVE COLLECTION

STATE	TOTAL LENGTH IN METERS			PER CAPITA LENGTH			MEAN COST PER METER (DOLLARS)		
	COLLECTOR	INTERCEPTOR	ALL PIPE	COLLECTOR	INTERCEPTOR	ALL PIPE	COLLECTOR	INTERCEPTOR	ALL PIPE
ALABAMA	2,949,364	1,453,544	4,402,909	0.99	0.49	1.48	101.28	107.92	103.47
ALASKA	147,645	165,773	313,418	0.24	0.27	0.52	277.05	550.35	421.60
ARIZONA	1,060,688	617,988	1,678,677	0.32	0.19	0.51	108.94	271.82	168.90
ARKANSAS	1,577,846	621,083	2,198,929	0.58	0.23	0.81	82.62	135.74	97.63
CALIFORNIA	8,730,616	3,246,188	11,976,804	0.34	0.13	0.47	145.74	401.89	215.17
COLORADO	218,496	595,613	814,109	0.07	0.18	0.25	116.27	403.24	326.22
CONNECTICUT	2,433,225	565,483	2,998,709	1.05	0.24	1.29	162.80	295.29	187.79
DELAWARE	382,214	226,091	608,306	0.69	0.41	1.10	109.22	328.63	190.77
DIST. OF COLUM.	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
FLORIDA	13,117,927	4,845,041	17,962,968	1.14	0.42	1.56	107.41	237.67	142.54
GEORGIA	3,482,469	2,017,096	5,499,565	0.71	0.41	1.13	98.34	179.64	128.16
HAWAII	1,250,380	503,824	1,754,205	1.03	0.42	1.45	155.55	510.82	257.59
IDAHO	730,576	316,062	1,046,638	0.70	0.30	1.01	141.29	250.06	174.13
ILLINOIS	1,542,470	862,788	2,405,259	0.78	0.44	1.22	105.45	180.39	132.33
INDIANA	2,758,871	916,697	3,675,568	0.76	0.25	1.01	119.50	254.27	153.11
IOWA	1,107,494	726,955	1,834,450	0.41	0.27	0.69	110.58	239.12	161.52
KANSAS	888,826	1,030,685	1,919,512	0.37	0.43	0.81	136.11	258.52	201.83
KENTUCKY	4,019,463	2,091,437	6,110,901	1.28	0.67	1.95	131.16	167.89	143.73
LOUISIANA	3,013,161	1,384,055	4,397,217	0.88	0.40	1.28	101.23	147.47	115.78
MAINE	1,351,988	522,945	1,874,933	1.41	0.54	1.95	157.67	189.91	166.66
MARYLAND	1,944,902	640,566	2,585,469	0.45	0.15	0.60	113.66	385.69	181.06
MASSACHUSETTS	4,639,887	1,504,513	6,144,400	1.00	0.32	1.32	159.98	240.15	179.61
MICHIGAN	7,159,686	2,221,507	9,381,194	1.25	0.39	1.64	130.04	236.37	155.22
MINNESOTA	1,156,068	364,877	1,520,946	0.49	0.16	0.65	120.75	205.91	141.18
MISSISSIPPI	1,489,537	1,651,002	3,140,539	0.77	0.85	1.61	101.43	87.88	94.30
MISSOURI	1,970,209	1,785,631	3,755,841	0.57	0.51	1.08	126.07	269.02	194.03
MONTANA	168,020	129,906	297,927	0.26	0.20	0.47	127.62	151.42	138.00
NEBRASKA	217,596	230,711	448,307	0.14	0.14	0.28	149.76	208.98	180.24
NEVADA	581,920	115,940	697,860	0.75	0.15	0.90	60.75	280.54	97.26
NEW HAMPSHIRE	1,728,962	1,148,113	2,877,075	1.94	1.29	3.22	153.69	200.87	172.52
NEW JERSEY	4,572,451	705,755	5,278,206	1.32	0.20	1.52	128.90	539.90	183.85
NEW MEXICO	453,588	220,623	674,211	0.43	0.21	0.64	86.55	141.10	104.40
NEW YORK	10,271,176	2,186,981	12,458,157	1.06	0.23	1.29	222.31	715.99	308.98
NORTH CAROLINA	6,195,248	3,198,565	9,393,813	1.55	0.80	2.35	70.35	109.77	83.78
NORTH DAKOTA	26,332	58,657	84,990	0.05	0.11	0.16	133.18	163.71	154.25
OHIO	5,666,417	2,595,600	8,262,017	0.67	0.31	0.97	111.66	289.84	167.64
OKLAHOMA	1,306,146	694,575	2,000,722	0.47	0.25	0.71	101.00	169.73	124.86
OREGON	1,769,062	624,238	2,393,301	0.59	0.21	0.80	146.07	428.48	219.73
PENNSYLVANIA	8,825,931	1,505,078	10,331,009	1.77	0.30	2.07	111.41	227.53	128.33
RHODE ISLAND	1,248,515	220,076	1,468,591	1.52	0.27	1.79	197.87	358.27	221.91
SOUTH CAROLINA	3,484,388	2,541,514	6,025,902	1.51	1.10	2.61	80.70	81.65	81.10
SOUTH DAKOTA	50,924	208,466	259,390	0.10	0.39	0.49	111.95	137.36	132.37
TENNESSEE	3,656,322	2,268,143	5,924,465	0.93	0.58	1.51	125.14	141.12	131.26
TEXAS	8,387,279	5,686,162	14,073,441	0.51	0.35	0.86	65.53	160.99	104.10
UTAH	574,940	426,138	1,001,078	0.44	0.33	0.77	102.23	126.51	112.56
VERMONT	512,770	131,501	644,272	1.60	0.41	2.01	143.08	155.52	145.62
VIRGINIA	3,915,503	1,456,909	5,372,413	0.85	0.32	1.16	112.10	214.87	139.97
WASHINGTON	2,906,898	1,082,357	3,989,255	0.72	0.27	0.99	144.79	295.62	185.71
WEST VIRGINIA	4,770,783	751,342	5,522,125	3.39	0.53	3.92	108.15	135.33	111.84
WISCONSIN	2,174,256	768,912	2,943,169	0.85	0.30	1.15	121.59	235.88	151.45
WYOMING	11,503	40,188	51,691	0.03	0.10	0.13	108.14	233.15	205.33
AMERICAN SAMOA	69,610	77,114	146,724	1.92	2.13	4.05	135.68	308.50	226.51
GUAM	7,059	8,470	15,529	0.07	0.09	0.16	141.09	304.83	230.40
N. MARIANAS	99,517	70,469	169,986	3.18	2.25	5.43	180.79	219.95	197.03
PUERTO RICO	2,493,913	1,216,788	3,710,702	0.77	0.38	1.15	92.41	223.59	135.43
PAC. TR. TERR.	448,431	353,799	802,230	4.18	3.30	7.48	68.96	33.18	53.18
VIRGIN ISLANDS	98,433	20,361	118,795	0.92	0.19	1.11	99.11	786.42	216.92
U.S. TOTALS	145,817,929	61,620,919	207,438,849	0.79	0.33	1.12	122.84	235.25	156.23

TABLE 53 - DOLLAR NEEDS FOR ALL PIPE SIZE CATEGORIES BY DIAMETER

Table 53 summarizes, by State, the total dollar needs for all pipe broken down into seven separate ranges of pipe size.

It is noted that the largest dollar need is for pipe equal to or less than 20.3 cm (8 in.) in diameter, to be used primarily for collector sewers and smaller force mains.

1978 NEEDS SURVEY

DOLLAR NEEDS FOR ALL PIPE SIZE CATEGORIES BY DIAMETER

(THOUSANDS OF 1978 DOLLARS)

STATE	CENTIMETERS INCHES	<=20.3 (<=8")	22.9-30.5 (9"-12")	33-61 (13"-24")	63.5-91.4 (25"-36")	94-122 (37"-48")	124.5-198.1 (49"-78")	>198.1 (>78")
ALABAMA		320,995	22,258	51,802	25,782	7,192	26,524	1,337
ALASKA		44,016	32,934	34,353	5,878	0	15,026	0
ARIZONA		123,638	10,685	28,459	64,198	47,866	37,507	0
ARKANSAS		139,167	17,253	25,219	11,273	21,206	553	0
CALIFORNIA		1,329,146	64,435	292,761	562,614	50,841	353,991	93,296
COLORADO		33,411	11,437	58,183	64,285	30,665	87,503	0
CONNECTICUT		375,249	49,239	115,431	18,853	5,151	0	0
DELAWARE		51,184	3,713	8,298	10,524	42,326	0	0
DIST. OF COLUM.		0	0	0	0	0	0	0
FLORIDA		1,479,952	68,343	237,960	287,275	149,673	321,119	18,115
GEORGIA		357,508	29,537	101,619	98,525	92,692	28,236	5,770
HAWAII		196,781	11,771	75,103	127,282	29,379	9,630	1,918
IDAHO		111,861	10,107	30,090	30,197	0	0	0
ILLINOIS		179,735	34,698	85,404	85,580	17,223	8,706	9,090
INDIANA		333,733	46,923	68,740	22,382	39,871	63,348	0
IOWA		128,357	31,743	52,939	60,740	8,731	19,674	0
KANSAS		133,323	46,113	134,788	35,543	43,946	5,163	0
KENTUCKY		637,206	38,412	52,025	73,697	12,124	64,880	0
LOUISIANA		310,650	52,805	70,160	44,202	21,102	10,779	0
MAINE		215,922	54,225	41,349	15,401	9,053	0	0
MARYLAND		229,749	6,499	76,638	103,264	13,077	5,399	33,511
MASSACHUSETTS		653,450	152,178	253,758	76,300	20,394	34,249	0
MICHIGAN		844,054	215,141	173,159	94,153	22,961	72,407	138,092
MINNESOTA		146,187	20,330	48,778	23,548	23,731	38,506	79,294
MISSISSIPPI		190,090	22,745	39,652	23,013	20,942	0	0
MISSOURI		302,995	62,050	135,077	26,916	42,884	170,762	89,865
MONTANA		24,353	4,657	6,329	5,774	0	0	0
NEBRASKA		33,496	6,146	9,918	27,468	1,982	1,792	0
NEVADA		36,255	6,039	17,178	1,553	2,828	4,023	0
NEW HAMPSHIRE		300,214	97,945	97,251	9,487	0	0	0
NEW JERSEY		592,313	47,618	259,542	138,704	19,695	27,325	41,690
NEW MEXICO		25,215	16,744	18,677	7,911	1,508	517	0
NEW YORK		1,785,444	554,860	508,382	242,018	94,614	572,823	204,879
NORTH CAROLINA		516,057	73,827	126,632	59,382	35,975	14,197	0
NORTH DAKOTA		5,059	1,315	4,670	2,152	0	0	0
OHIO		651,041	96,499	215,743	174,949	71,539	52,371	152,085
OKLAHOMA		78,127	24,518	74,914	32,931	13,108	26,245	0
OREGON		255.505	33,301	75,089	78,126	21,955	69,631	0
PENNSYLVANIA		1,014,233	88,131	172,073	58,390	0	8,482	0
RHODE ISLAND		152,221	88,099	53,063	34,703	0	0	0
SOUTH CAROLINA		324,259	46,396	79,917	30,940	13,437	0	0
SOUTH DAKOTA		11,095	5,451	14,832	2,662	93	203	0
TENNESSEE		521,589	66,521	107,583	26,951	26,397	9,725	20,580
TEXAS		502,307	239,717	172,629	166,314	146,361	211,395	28,502
UTAH		69,903	9,059	23,205	12,629	0	0	0
VERMONT		71,989	12,811	9,020	0	0	0	0
VIRGINIA		471,408	41,294	91,381	191,368	1,048	1,158	790
WASHINGTON		382,039	116,811	167,359	97,594	25,219	47,093	0
WEST VIRGINIA		526,003	50,371	41,244	0	0	0	0
WISCONSIN		248,679	63,741	92,644	35,716	111,207	0	0
WYOMING		2,352	629	7,723	165	0	0	0
AMERICAN SAMOA		9,445	222	0	23,568	0	0	0
GUAM		1,090	1,720	566	202	0	0	0
N. MARIANAS		17,992	15,500	0	0	0	0	0
PUERTO RICO		244,161	20,034	70,885	133,334	20,976	13,138	0
PAC. TR. TERR.		35,320	2,082	5,261	0	0	0	0
VIRGIN ISLANDS		9,822	987	4,400	10,560	0	0	0
U.S. TOTALS		17,787,345	2,948,619	4,819,855	3,596,976	1,380,972	2,434,080	918,814

APPENDIX I

CONDUCT OF THE SURVEY
CATEGORIES I-IV (TREATMENT PLANTS AND SEWERS)

The 1978 Needs Survey

BACKGROUND

Drawing on the experience of prior Surveys, EPA and the States formed a working group to determine the strategy for the conduct of the 1978 Survey. Several Survey goals were identified by the group:

1. That the Survey identify and quantify all needs.

2. That the conduct of the Survey be nationally uniform.

3. That the utilization of scarce State personnel and dollar resources for the Survey be minimized.

4. That a complete inventory of municipal wastewater facilities be compiled.

The Survey approach taken for Categories I-IV as a result of these recommendations was:

1. An independent consultant, paid by EPA, would conduct the Survey on a facility-by-facility basis for Categories I-IV. The consultant's personnel were to be based in EPA Regional offices, but would visit State and local offices as required to formulate cost estimates. The engineering firm of Dames & Moore, with headquarters in Los Angeles, California, and company resources sufficient for this large effort, was competitively selected.

2. Survey guidance and methodology were formulated for Categories I-IV in draft, and circulated to all parties involved in the Survey. State comments were solicited, and final guidance was issued which reflected those comments.

3. While national uniformity of estimating procedures was a Survey goal, the cost and construction differences inherent to various sections of the country were recognized and accommodated.

The formal Survey of Categories I-IV began with orientation meetings conducted in EPA Regional offices where logistics, target dates, and individual State problems were discussed and resolved. States were asked only to provide as much investment in personnel for the Survey as they considered prudent; but were invited to participate fully in the formal Survey field work.

The Survey field work was conducted in the spring, summer, and fall of 1978. As estimates for Categories I-IV were completed, copies of the estimates were reviewed by States on a facility-by-facility basis. When cost agreement between EPA and State personnel could not be reached, separate estimates were submitted by States and have been included in this report.

Facility estimates were reviewed and accepted and/or approved at four levels:

1. Contractor.

2. EPA Regional Office.

3. State.

4. EPA Headquarters.

After machine preparation, data for Categories I-IV were summarized for this report.

SURVEY METHODOLOGY - OPERATIONAL GUIDANCE FOR CATEGORIES I-IV

Participant guidance for the Survey was formulated by EPA, the States, and the consultant working closely together. This document included the following subjects:

1. Responsibilities of the participants.

2. Target dates for project milestones including the calendar for the Survey and the consultant's contractural obligations.

3. Descriptions of all data sources to be provided to participants to aid in completion of the Survey.

4. Briefing schedules for the participants.

5. Provisions for State and Regional review of consultant's data prior to finalization.

6. Definitions of terms for needs purposes. Standards were established for definitions of secondary treatment, design year, units of measurement, cost estimating, basis of cost estimate, design flows, and infiltration/inflow reporting.

7. Specific guidelines for completing Survey forms.

8. EPA adjustments to the 1976 Needs data base prior to its use as a starting point in 1978.

9. Cost estimating procedures to be used when more reliable local procedures were not available. These included estimating procedures for treatment costs and new sewers, with factors provided for determination of cost variation in any of 51 areas in the vicinity of major cities in the United States.

10. Interceptor sewer sizing tables.

As a result of meetings and other communications with all the States, the guidance was supplemented by request to include:

1. "Rules of Thumb" for estimating needs based on best engineering judgment. All of the participants understood that rules of thumb would be used only when better information was not available. Examples are:

   a. Per capita domestic and commercial flows were allowed consistent with the cost effective regulations.

   b. Collector and interceptor lengths were limited to 16 feet and one foot per capita, respectively, of unsewered population.

2. A procedure for designating the basis of cost estimates.

3. Additional cost data, showing national capital costs for:

   a. Chlorination facilities.

   b. Pumping stations.

   c. Filtration systems.

   d. Aerated lagoons and waste stabilization ponds.

   e. Phosphorus removal.

4. Procedures for estimating backlog needs for all categories.

5. Instructions for reconciliation of populations.

6. Guidance for estimation of collector sewer costs.

7. Information on grant eligibilities for land costs.

8. Guidance for estimation of I/I analysis costs.

9. Small and individual treatment systems.

BASIS OF COST ESTIMATE FOR CATEGORIES I-IV

All individual cost estimates made in Categories I-IV of the Survey were to be accompanied with a basis of cost estimate, so that the quality of the estimate can be better determined. EPA has determined that the quality of cost estimates can be ranked from high to low as follows:

1. Engineer/Consultant Firm Estimate.

2. Engineer/Consultant Preliminary Estimate.

3. Cost/Effectiveness Analysis.

4. Cost of Previous Comparable Construction.

5. EPA Supplied Cost Estimating Procedures.

6. Rough Estimates.

DATA SOURCES FOR CATEGORIES I-IV

1. The types of data needed in the Survey and the sources used to access these data were many. The major types of data used were:

a. Population (year 2000 and present).

b. Total flow (average, current design, and projected year 2000 design).

c. Industrial flow (average, current design, and projected year 2000 design).

d. Biological Oxygen Demand and Suspended Solids concentrations (average, current design, and projected year 2000 design).

e. Nitrogen and phosphorus removal requirements (average, current design, and projected year 2000 design).

f. Treatment methods.

g. Sludge handling and treatment methods.

h. Level of treatment required.

2. The sources of these data were:

a. 1976 Needs Survey data.

b. NPDES applications and permits.

c. Grant application files.

d. Grant files and Grants Information Control System (GICS) data.

e. Regional and/or basin plans (201, 208, and 303 plans).

f. Other engineering plans or reports.

g. State water quality standards.

SURVEY PREPARATION

The 1978 Survey form was generated by computer showing the 1976 Data of Record for each facility. Once the revised cost estimates were recorded on Survey forms for each facility, copies of the completed forms were provided for all parties participating in the Survey, primarily for State review and revision. The forms were then used to record the updated 1978 Needs Survey figures.

Census data for 1977 and BEA 2000 population projections were used as State ceilings. State population totals were not permitted to exceed these ceilings.

As Survey forms were completed, they were double-checked by EPA for accuracy of the data collected and submitted. Each State was then given the opportunity to review and comment upon the revised data shown on the Survey forms, and to review the total cost estimates for the State.

Where differences over cost estimates were not resolved, States submitted independent cost estimates on the form. Few independent State estimates were required.

APPENDIX II

DESCRIPTION OF THE 1978 SURVEY FORM

The 1978 Needs Survey

The principal instrument of the 1978 Needs Survey was form EPA-1 shown in Figure II-1. The 1976 Survey data of record were pre-printed on this form and copies were distributed to cognizant Federal, State, and contractor personnel. One form was completed for each facility in the Needs Survey. The data of record were then updated in accordance with the methodology presented in Appendix I.

The form contains a large quantity of data for each treatment plant or sewerage facility. This is made possible by the elaborate data coding system (Figure II-2) which allows a huge quantity of data to be entered in a compact form and permits it to be easily checked by computer for accuracy and completeness.

Listed below is a brief explanation of each item in the 1978 Needs Survey EPA-1 form.

1. Authority/Facility Number: This is a discrete nine digit number assigned to each facility. The first two digits designate a particular State or Territory and are obtained from the Federal Information Processing Standard for Designating States and Outlying Areas of the United States (FIPS-5). The next four digits are assigned sequentially by each State. The last three numbers are assigned by the authority to the facility.

2. Facility Name: The official name of the facility.

3. Authority Name: The name of the authority which owns and operates the facility.

4. Submission Code: This is a one digit number which indicates whether the needs of the facility changed since the 1976 Survey, or were reported at all in 1976.

5. Grant Number: The six digit number of the most recent EPA construction grant which applies to the facility.

6. Farmers Home Administration Eligibility: An "X" in this block indicates that the facility is eligible for Farmers Home Administration loan or grant funds.

7. NPDES Number: The National Pollutant Discharge Elimination System permit number assigned through the EPA permit program.

8. 245 Number: The 13 digit number for the facility according to the Municipal Waste Facility Inventory.

9. Facility Location: The State location is the same two digit FIPS-5 number used in the authority number. The county location is based on the FIPS-6 codes. The place location number is derived from the "Geographic Identification Place Scheme" developed by the Census Bureau.

10. SMSA Number: The number of the Standard Metropolitan Statistical Area in which a facility is located.

11. Basin Number: The four digit number for the basin in which the facility is located according to the EPA major/minor basin code scheme.

12. Congressional District: The number of the Congressional District in which the facility is located.

13. City: The name of the city or town in which the facility is located.

14. County: The name of the county in which the facility is located.

15. Zip Code: The official Post Office Zip Code of the facility.

16a. Facility Status: A one digit code which indicates whether or not the facility is currently in operation. Facilities not in operation are usually either proposed or under construction.

16b. Nature of Facility: The one digit code which indicates the type or nature of the facility. See Figure II-2 for complete explanations.

16c. Construction Grant Status: A one digit code which indicates whether or not the facility has had a construction grant.

16d. Projected Change: A one digit code which indicates projected physical changes for the facility, if any. Changes include enlargement, upgrading, replacement, abandonment, and others.

16e. Abandonment Date: The month and year of projected abandonment of a facility, if applicable.

17. Summary of Category Needs: This section is used to record the costs for Categories I-IVB. Column (a) is for the EPA assessment; Column (b) is for the State estimate, if different from (a); and Column (c) is the portion required to satisfy "backlog" facility requirements. "Backlog" refers to the facility requirements based on the 1978 population rather than the 2000 population. Column (d) is used to record the one digit code which indicates the basis of estimation for the dollar amounts recorded in Column (a).

18. Facility Population: This section shows the population which receives treatment and/or collection by the facility. Collection and treatment populations are further categorized as follows: present resident population, present nonresident population, projected resident population,

and projected nonresident population.

19. Need for New Collectors, Interceptors, Force Mains, and Pumping Stations: This section lists codes for new collectors, interceptors, force mains, and pumping stations and their costs. The diameter of pipe is in inches and the length is in feet. The capacity of pumping stations is in million gallons per day (mgd).

20. Disposal of Liquid Effluents: A one digit code is listed in Column (a) for each applicable method of liquid effluent disposal. Appropriate "Use" and "Change" codes are listed in Columns (b) and (c), and are defined in Figure II-2.

21. Required Infiltration/Inflow Corrective Action: A one digit code indicating the required action to eliminate excessive infiltration/inflow, as defined in Figure II-2.

22. Estimated Infiltration/Inflow Component: The quantity of infiltration/inflow projected to be eliminated by any corrective action indicated in Item 21.

23. Major Rehabilitation/Replacement Required: A one digit code for the type of corrective action required to accomplish major rehabilitation or replacement of a portion of a sewerage system.

24. Do Wastewaters Originate in Communities Existing Before October 18, 1972? This code is self-explanatory and is answered by "yes" or "no."

25. 1972 Collection Population: The resident population in existence in 1972 which still requires new collector sewers.

26. Effluent Characteristics: A one digit code indicating the present and future effluent characteristics of the facility, as defined in Figure II-2.

27. Reasons for Effluent Characteristics Greater Than Secondary: A one digit code indicating the reason for any present or projected effluent characteristics more stringent than secondary treatment (see Figure II-2).

28. Comment Code: Two spaces are provided for one digit codes to indicate, if necessary, coded reasons why other items of the form differ from the norm. More extensive plain language comments may be entered on the reverse side of the form.

29. Flows, Concentrations, Monthly Average: This section is for monthly average flow and concentration figures according to the existing actual values, the present design flow, and the projected design flow for the following categories:

    a. Total flow in million gallons per day (mgd).

    b. Total industrial flow in million gallons per day (mgd).

c. Domestic flow per capita in gallons per capita per day (gpcpd).

Below these figures, influent and effluent concentrations are shown for five day Biochemical Oxygen Demand, suspended solids, phosphorus, total kjeldahl nitrogen, and others.

30. Treatment and Sludge Handling: There are three columns in this section. Unit process codes for liquid waste treatment and sludge handling are entered in Column (a). Columns (b) and (c) are for the current use and projected change codes, respectively.

FORM EPA-1 (6-3-77)

ENVIRONMENTAL PROTECTION AGENCY
ESTIMATE OF MUNICIPAL WASTEWATER TREATMENT FACILITY REQUIREMENTS

This report is required by law (33 U.S.C. 1251 ET SEQ). While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

O.M.B. No. 158-R0139: Approval Expires February 1980

1. Authority/Fac. No.	2. Facility name	3. Authority name	4. Sub. code

5. Grant number	6. FmHA	7. NPDES No.	8. 245 number	9. State	Co.	Place	10. SMSA	11. Basin	12. Cong. dist.

13. City	14. County	15. ZIP	16a. Fac.	b. Nat.	c. Grant	d. Chng.	e. Date

17. SUMMARY OF CATEGORY NEEDS

Category	Cost of record (Bil./Mil./Thou.) (a)	New and/or revised cost (Bil./Mil./Thou.) (b)	Portion required to satisfy backlog (Bil./Mil./Thou.) (c)	Basis of est. (d)
I	(1)			
II	(2)			
IIIA	(3)			
IIIB	(4)			
IVA	(5)			
IVB	(6)			
TOTAL	(7)			

18. FACILITY POPULATION

	Present resident (a)	Present nonresident (b)	Proj. resident (c)	Proj. nonresident (d)
RCV. TREATMENT	(1)			
NO TREATMENT	(2)			
RCV. COLLECTION	(3)			
NOT RCV. COLLECTION	(4)			

19. NEED FOR NEW COLLECTORS, INTERCEPTORS, FORCE MAINS, AND PUMPING STATIONS

Type (a)	Diam.(in.) number (b)	Length (ft.) Capacity (MGD) (c)	Cost (Bil./Mil./Thou.) (d)
(1)			
(2)			
(3)			
(4)			
(5)			
(6)			
(7)			
(8)			
(9)			
(10)			
(11)			
(12)			

20. DISPOSAL OF LIQUID EFFLUENTS

CODES		
Disp. (a)	Use (b)	Chng. (c)
(1)		
(2)		
(3)		
(4)		

21. I/I Codes

22. Est. I/I flow

23. Maj. rehab. rep. required — Code

24. Do wastewaters originate in communities existing before October 18, 1972?

25. 1972 collection population

26. Effluent characteristic — Present — Future

27. Reasons

28. Comment codes

29. FLOWS/CONCENTRATIONS, MONTHLY AVERAGE

	Existing (a)		Present design (b)		Projected design (c)	
TOTAL FLOW (MGD)	(1)					
INDUS. FLOW (MGD)	(2)					
DOM. FLOW/CAP (GPCD)	(3)					
	Influent (d)	Effluent (e)	Influent (f)	Effluent (g)	Influent (h)	Effluent (j)
BOD_5 (mg/l)	(4)					
SUS. SOLIDS (mg/l)	(5)					
PHOSPHORUS (mg/l)	(6)					
AMMONIA (mg/l)	(7)					
TOTAL N (mg/l)	(8)					
TKN (mg/l)	(9)					
OTHER ______	(10)					

30. TREATMENT AND SLUDGE HANDLING (Codes)

TR a	Use b	CH c	TR a	Use b	CH c	TR a	Use b	CH c	TR a	Use b	CH c
(1)			(3)			(5)			(7)		
(2)			(4)			(6)			(8)		

30. TREATMENT AND SLUDGE HANDLING (Codes) – Continued

TR (a)	Use (b)	Chng. (c)
(9)		
(10)		
(11)		
(12)		
(13)		
(14)		
(15)		
(16)		
(17)		
(18)		
(19)		
(20)		

QUESTIONNAIRE COMPLETED BY

Signature | Date

ACCEPTANCE

STATE AGENCY		EPA REGIONAL OFFICE	
Signature	Date	Signature	Date

NOTE – Indicate revised figures in appropriate shaded areas.

Authority and facility number ▶

FIGURE II-2

CODE REFERENCE CHART

Item 4 – Submission Code
1 – No change from 1976
2 – Facility not reported in 1976
3 – Change from 1976

Item 16a – Facility Status
1 – In operation
2 – Not in operation

Item 16b – Nature of facility
1 – A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with combined sewers.
2 – A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with separate sewers.
3 – A separate treatment plant. (The sewers which discharge to this plant are under the control of one or more different authorities.)
4 – A separate municipal wastewater collection system. (Includes one or more connected collector and/or interceptor sewers, force mains, pumping stations, etc., which either discharge without treatment or discharge to a facility controlled by a different authority. Do **not** include combined sewers or storm sewers.)
5 – A separate combined sewer system. (Includes one or more interconnected sewers which carry both sanitary wastewaters and storm waters, and which either discharge without treatment or to a facility operated by another authority. If facility includes both separate sanitary sewers and combined sewers, report as combined.)
6 – Other
7 – A system for the bulk transmission of wastewater with or without pumping stations, and with or without interceptor sewers.
8 – Sludge handling facilities, including vehicles or vehicle fleets.

Item 16c – Construction Grant Status
1 – Construction grants previously approved or pending
2 – No applicable grants

Items 16d, 20c, and 30c – Projected Change
1 – Enlarge
2 – Upgrade
3 – Enlarge and upgrade
4 – Install in new plant
5 – Replace
6 – Abandon
7 – No change
8 – Other

Item 17d – Basis of Estimate
1 – State certification
2 – Analysis completed
3 – Evaluation survey completed
4 – Engineer/consultant firm estimate
5 – Cost of previous comparable construction
6 – Engineer/consultant preliminary estimate
7 – EPA – supplied cost estimating procedures
8 – Cost effective analysis
9 – Rough estimate

Item 19a – New Collectors, Interceptors, Force Mains, and Pumping Stations
CS – Collector sewers
IS – Interceptor sewers
FM – Force Main
PS – Pumping Station
FF – Outfall sewers
SF – Ocean outfall sewers

Item 20a – Disposal of Liquid Effluents
1 – Outfall to surface waters
2 – Ocean outfall
3 – Holding pond
4 – Deep well
5 – Ground water recharge
6 – Other land disposal
7 – Recycling and reuse
8 – Septic tank field
9 – Other
0 – No discharge
A – Spray irrigation
B – Ditch irrigation
C – To other wastewater treatment plant

Items 20b and 30b – Use codes
1 – Now in use
2 – Under construction or provided for in approved grant
3 – Required, but not yet approved or funded
4 – Not applicable

Item 21 (I/I) and Item 23 (Major Rehab.) Corrective Action
1 – Not known at this time
2 – None
3 – Seal off sewer lines
4 – Replace/reline sewer sections
5 – Change/create flow routing system
6 – Provide flow equalization
7 – Other corrective actions

Item 26 – Characteristic of Effluent
0 – No discharge
1 – Raw discharge
2 – Primary
3 – Advanced primary
4 – Secondary
5 – Advanced secondary
6 – Tertiary

Item 27 – Reason for Treatment More Stringent than Secondary
0 – A water quality plan which has been approved by EPA
1 – Order of State Court
2 – Order of Federal Court
3 – State permit or license
4 – NPDES permit or license
5 – State enforcement order or proceeding
6 – Federal enforcement order or proceeding
7 – Voluntary agreement which includes a schedule of compliance or improvements
8 – Other
9 – A certification by the State that the body of water receiving this discharge is water quality dependent, and that more stringent treatment is needed to meet Federally-approved water quality standards for dissolved oxygen or nutrients

Item 28 – Comment Codes
2 – Excess I/I is cost effective to treat
3 – Package plant for exact required capacity is not available
4 – Total flow is minimum that can be shown on the form due to format restrictions
5 – Existing plant has excess capacity now to treat 2000 population
6 – No sludge handling facility since sludge is pumped to another facility
7 – Receives flow from other facilities
8 – Flow diverted to other facility

Item 30a – Treatment and Sludge Handling
01 – Pumping, raw wastewater
02 – Preliminary treatment – bar screen
03 – Preliminary treatment – grit removal
04 – Preliminary treatment – comminutors
05 – Preliminary treatment – others
06 – Scum removal
07 – Flow equalization basins
08 – Preaeration
09 – Primary sedimentation
10 – Trickling filter – rock media
11 – Trickling filter – plastic media
12 – Trickling filter – redwood slats
13 – Trickling filter – other media
14 – Activated sludge – conventional
15 – Activated sludge – high rate
16 – Activated sludge – contact stabilization
17 – Activated sludge – extended aeration
18 – Pure oxygen activated sludge
19 – Microstrainers – primary
20 – Microstrainers – secondary
21 – Sand filters
22 – Mix-media filters (sand and coal)
23 – Other filtrations
24 – Activated carbon – granular
25 – Activated carbon – powdered
26 – Two stage lime treatment of raw wastewater
27 – Two stage tertiary lime treatment
28 – Single stage lime treatment of raw wastewater
29 – Single stage tertiary lime treatment
30 – Recarbonation
31 – Neutralization
32 – Alum addition to primary
33 – Alum addition to secondary
34 – Alum addition to separate stage tertiary
35 – Ferri-chloride addition to primary
36 – Ferri-chloride addition to secondary
37 – Ferri-chloride addition to separate stage tertiary
38 – Other chemical additions
39 – Biological nitrification – separate stage
40 – Biological nitrification – combined BOD and nitrification
41 – Biological denitrification
42 – Ion exchange
43 – Breakpoint chlorination
44 – Amonia stripping
45 – Chlorination for disinfection
46 – Ozonation for disinfection
47 – Other disinfection
48 – Land treatment of primary effluent
49 – Land treatment of secondary effluent (30/30)
50 – Land treatment of interimediate effluent (less than secondary)
51 – Stabilization ponds
52 – Aerated lagoons
53 – Post aeration (reaeration)
54 – Bio-Disc (rotating biological filter)
55 – Oxidation ditch using mechanical aerators
56 – Clarification using tube settlers
57 – Outfall pumping
58 – Outfall diffuser
59 – Effluent to other plants
60 – Effluent outfall
61 – Other treatment
62 – Aerobic digestion – air
63 – Aerobic digestion – oxygen
64 – Composting
65 – Anaerobic digestion
66 – Sludge lagoons
67 – Heat treatment
68 – Chlorine oxidation of sludge (Purifax)
69 – Lime stabilization
70 – Wet air oxidation
71 – Air drying
72 – Dewatering – mechanical – vacuum filter
73 – Dewatering – mechanical – centrifuge
74 – Dewatering – mechanical – filter press
75 – Dewatering – others
76 – Gravity thickening
77 – Air flotation thickening
78 – Incineration – multiple hearth
79 – Incineration – fluidized beds
80 – Incineration – rotary kilm
81 – Incineration – others
82 – Pyroysis
83 – Co-incineration with solid waste
84 – Co-pyrolysis with solid waste
85 – Co-incineration – others
86 – Recalcination
87 – Land fill
88 – Land spreading of liquid sludge
89 – Land spreading of thickened sludge
90 – Trenching
91 – Ocean dumping
92 – Other sludge handling
93 – Digest gas utilization facilities
94 – Control/ Lab./maintenance buildings
95 – Fully automated using digital control (computer)
96 – Fully automated using analog controls
97 – Semi automated plant
A1 – Manually operated and controlled plant
A2 – Package plant
A3 – Semi-package plant
A4 – Custom built plant
A5 – Primary effluent
A6 – Secondary effluent
A7 – Tertiary effluent

Item reference	Comments	Item reference	Comments

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