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ANNUAL REPORT



**OFFICE OF WATER PROGRAMS
CALIFORNIA STATE UNIVERSITY,
SACRAMENTO**

1994 ANNUAL REPORT

for

OPERATION OF WASTEWATER TREATMENT PLANTS

ADVANCED WASTE TREATMENT

INDUSTRIAL WASTE TREATMENT

TREATMENT OF METAL WASTESTREAMS

PRETREATMENT FACILITY INSPECTION

OPERATION & MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS

WATER TREATMENT PLANT OPERATION

SMALL WATER SYSTEM OPERATION & MAINTENANCE

WATER DISTRIBUTION SYSTEM OPERATION & MAINTENANCE



Summary	1991	1992	1993	1994	Total 1972 to Date
Manuals Sold	49,849	56,370	52,632	54,364	490,700
Enrollments	12,358	13,950	13,685	13,639	116,376
Completions	7,761	8,357	9,478	8,651	79,492
Students Dropped	1,350	1,723	2,170	3,563	17,812
University Credits	249	321	246	177	5,475
Tests Graded*	68,396	68,471	74,970	65,780	378,618

*Tabulation of tests graded did not begin until 1989.



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and

DEPARTMENT OF CIVIL ENGINEERING

KENNETH D. KERRI, PROGRAM DIRECTOR

for the

U. S. ENVIRONMENTAL PROTECTION AGENCY

January 1995

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The purpose of this report is to provide a summary of the accomplishments of each program on an annual basis since its inception. All programs are operating on a financially self-sustaining basis.



OPERATION OF WASTEWATER TREATMENT PLANTS, (First Edition)

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>CE-12</u>
1972	8,063	571	128	82	614
1973	5,747	1,569	1,490	51	389
1974	6,523	1,144	1,717	40	289
1975	4,543	804	655	55	164
1976	3,992	676	1,052	39	119
1977	3,280	570	248	70	166
1978	3,232	789	310	72	141
1979	3,180	881	191	82	103
1980	2,444	745	431	63	109
1981	1,093	1,028	239	81	55
TOTAL	41,100	8,777	4,124*	68	2,149

Colleges and Universities: 301
 Foreign Countries: 32

*From 1979 on only persons who actually started a course and did not finish were counted as drops.

OPERATION OF WASTEWATER TREATMENT PLANTS

VOLUME I - SECOND, THIRD AND FOURTH EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12A</u>
1980	1,190				19
1981	3,960	411	8	98	127
1982	3,976	731	181	80	98
1983	2,963	655	184	78	76
1984	3,347	1,087	171	86	66
1985	4,064	862	267	76	59
1986	4,534	896	155	85	82
1987	5,360	828	262	76	47
1988	7,591	1,172	326	78	37
1989	8,641	1,334	142	90	113
1990	9,338	1,561	361	81	43
1991	10,557	1,891	430	82	52
1992	11,701	2,091	596	78	66
1993	11,106	2,322	834	74	42
1994	<u>10,298</u>	<u>1,988</u>	<u>1,254</u>	<u>79</u>	<u>42</u>
TOTAL	98,626	17,829	5,171	82	969

VOLUME II - SECOND, THIRD AND FOURTH EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12B</u>
1980	715				4
1981	3,023	182			47
1982	3,575	309	18	94	45
1983	2,438	381	33	92	39
1984	2,219	472	35	93	29
1985	2,827	454	91	83	25
1986	3,161	438	21	95	43
1987	4,134	604	72	89	20
1988	6,386	934	49	95	22
1989	6,038	883	51	95	27
1990	6,645	761	49	97	27
1991	7,478	1,249	89	93	47
1992	8,324	1,155	93	93	38
1993	7,769	1,133	138	89	35

1994	<u>7,725</u>	<u>1,159</u>	<u>231</u>	<u>92</u>	<u>17</u>
TOTAL	72,457	9,112	970	92	

VOLUME III

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12C</u>
1980	428				1
1981	2,422	140			58
1982	1,898	213	35	86	25
1983	1,437	217	33	87	30
1984	1,537	430	24	95	12
1985	1,525	310	45	87	17
1986	2,266	291	30	91	29
1987	1,762	322	27	92	15
1988	<u>7</u>	<u>280</u>	<u>19</u>	<u>94</u>	<u>4</u>
TOTAL	13,282	2,203	213	91	191

Colleges and Universities: 366
Foreign Countries: 37

In 1987 Volume III was revised and split into two manuals, **ADVANCED WASTE TREATMENT** and **INDUSTRIAL WASTE TREATMENT**.

ADVANCED WASTE TREATMENT
FIRST AND SECOND EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12E</u>
1987	960	7	0	100	0
1988	3,199	340	1	100	7
1989	3,291	349	12	97	12
1990	3,583	531	32	94	20
1991	3,298	552	58	91	21
1992	3,912	647	72	90	21
1993	3,719	642	87	88	24
1994	<u>3,642</u>	<u>559</u>	<u>170</u>	<u>89</u>	<u>12</u>
TOTAL	25,604	3,627	432	94	117

Colleges and Universities: 132

Foreign Countries:

19

INDUSTRIAL WASTE TREATMENT, (FIRST EDITION)*

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12EF</u>
1987	941	3	0	100	0
1988	2,273	132	1	100	5
1989	2,502	146	14	91	6
1990	3,473	268	30	90	21
1991	3,119	349	39	90	26
1992	3,480	347	56	86	20
1993	3,039	402	70	85	22
1994	<u>2,237</u>	<u>313</u>	<u>116</u>	<u>88</u>	<u>7</u>
TOTAL	21,064	1,960	326	91	107

*In 1994 *INDUSTRIAL WASTE TREATMENT* was revised and split; Volume I was available in Fall 1994; Volume II will be available Spring 1995.

INDUSTRIAL WASTE TREATMENT

VOLUME I - SECOND EDITION

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-21A</u>
1994	1,105	17	0	83	0

VOLUME II - FIRST EDITION (Available Spring 1995)

Colleges and Universities: 94
Foreign Countries: 18

TREATMENT OF METAL WASTESTREAMS
FIRST AND SECOND EDITIONS

(Formerly **TREATMENT OF WASTEWATER FROM ELECTROPLATING, METAL FINISHING AND PRINTED CIRCUIT BOARD MANUFACTURING**)

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12D</u>
1986	1,281	98	0	100	18
1987	1,678	229	5	98	25
1988	2,077	283	4	99	13
1989	2,524	344	5	99	7
1990	2,798	332	27	92	22
1991	2,716	332	21	94	13
1992	2,688	393	24	94	25
1993	2,760	518	19	96	12
1994	<u>3,003</u>	<u>495</u>	<u>61</u>	<u>94</u>	<u>13</u>
TOTAL	21,525	3,025	166	96	148

Colleges and Universities: 88
Foreign Countries: 25

PRETREATMENT FACILITY INSPECTION
FIRST AND SECOND EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12G</u>
1988	1,355	48	0	100	0
1989	1,135	310	8	97	6
1990	1,216	380	76	83	11
1991	1,027	237	56	81	10
1992	1,346	373	48	89	19
1993	1,043	292	57	84	13
1994	<u>889</u>	<u>268</u>	<u>90</u>	<u>85</u>	<u>6</u>
TOTAL	8,011	1,904	335	88	65

Colleges and Universities: 35

Foreign Countries:

15

OPERATION & MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS
FIRST EDITION

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-11</u>
1976	966	3			7
1977	1,093	281	8	97	77
1978	759	246	70	78	46
1979	633	179	83	68	34
1980	645	226	53	81	37
1981	680	218	37	85	46
<u>1982</u>	<u>601</u>	<u>265</u>	<u>42</u>	<u>86</u>	<u>23</u>
TOTAL	5,377	1,418	293	83	263

SECOND EDITION*

1983	583	25	0	100	3
1984	751	97	10	91	10
1985	1,103	147	16	90	13
1986	1,237	157	31	84	13
1987	1,108	329	90	79	9
1988	<u>0</u>	<u>121</u>	<u>33</u>	<u>79</u>	<u>4</u>
TOTAL	4,782	876	180	83	52

*In 1987 the Second Edition was revised and split into two Volumes.

OPERATION & MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS

VOLUME I - THIRD AND FOURTH EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-11A</u>
1987	546	2	0	100	0
1988	1,803	189	0	100	3
1989	2,350	177	27	87	3
1990	3,100	367	47	89	15
1991	3,192	490	58	89	6
1992	3,516	428	96	82	18
1993	3,177	551	109	83	14
1994	<u>3,137</u>	<u>520</u>	<u>183</u>	<u>85</u>	<u>7</u>
TOTAL	20,821	2,724	520	89	66

OPERATION & MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS

VOLUME II - THIRD AND FOURTH EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-11B</u>
1987	338	0	0	0	0
1988	1,413	65	0	100	1
1989	1,545	99	5	95	3
1990	2,330	171	3	98	9
1991	2,401	265	9	97	9
1992	2,660	254	10	96	12
1993	2,366	319	16	95	8
1994	<u>2,054</u>	<u>270</u>	<u>47</u>	<u>93</u>	<u>6</u>
TOTAL	15,107	1,443	90	96	48

Colleges and Universities: 121
 Foreign Countries: 29

WATER TREATMENT PLANT OPERATION

VOLUME I - FIRST, SECOND & THIRD EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-18A</u>
1983	1,469	31	0	100	10
1984	2,068	327	27	92	116
1985	2,344	355	82	81	69
1986	2,391	415	108	79	35
1987	2,972	422	143	75	29
1988	3,898	554	159	78	20
1989	5,044	717	160	82	22
1990	5,554	793	242	77	24
1991	5,507	936	317	75	22
1992	6,626	1,212	407	75	48
1993	6,675	1,444	489	75	30
1994	<u>7,320</u>	<u>1,180</u>	<u>774</u>	<u>77</u>	<u>26</u>
TOTAL	51,868	8,386	2,908	80	451

VOLUME II - FIRST AND SECOND EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-18B</u>
1983	183	0	0		1
1984	1,331	140	0	100	9
1985	1,572	133	7	95	19
1986	1,467	163	21	89	6
1987	1,916	211	13	94	12
1988	2,301	266	23	92	9
1989	3,047	365	22	94	12
1990	3,298	500	29	95	10
1991	3,752	541	52	91	20
1992	4,114	651	66	91	23
1993	3,985	717	77	90	18
1994	<u>4,378</u>	<u>743</u>	<u>156</u>	<u>91</u>	<u>16</u>
TOTAL	31,344	4,430	466	93	155

Colleges and Universities: 281
 Foreign Countries: 34

WATER SUPPLY SYSTEM OPERATION

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-17</u>
1983	537	0	0		3
1984	1526	140	0	100	13
1985	1957	146	22	87	39
1986	1814	148	50	75	5
1987	<u>399</u>	<u>290</u>	<u>71</u>	<u>80</u>	<u>10</u>
TOTAL	6,233	724	143	84	70

Colleges and Universities: 59
 Foreign Countries: 9

*In 1987 **WATER SUPPLY SYSTEM OPERATION** was revised into a Second Edition and split into two manuals, **SMALL WATER SYSTEM OPERATION & MAINTENANCE** and **WATER DISTRIBUTION SYSTEM OPERATION & MAINTENANCE**.

**SMALL WATER SYSTEM OPERATION & MAINTENANCE
 SECOND AND THIRD EDITIONS**

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-19</u>
1987	2,175	36	0	100	2
1988	2,115	177	9	95	5
1989	2,926	146	44	77	3
1990	3,090	266	62	81	9
1991	2,841	330	121	73	7
1992	3,641	314	119	73	14
1993	2,937	478	128	79	15
1994	<u>3,766</u>	<u>497</u>	<u>251</u>	<u>79</u>	<u>16</u>
TOTAL	23,491	2,244	734	82	71

Colleges and Universities: 102
 Foreign Countries: 25

WATER DISTRIBUTION SYSTEM OPERATION & MAINTENANCE
SECOND AND THIRD EDITIONS

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-20</u>
1987	2,864	42	0	100	0
1988	2,812	226	12	95	9
1989	2,933	197	38	84	13
1990	4,332	362	56	87	11
1991	3,961	589	100	85	16
1992	4,362	492	136	78	17
1993	4,056	660	146	82	13
1994	<u>4,810</u>	<u>641</u>	<u>230</u>	<u>83</u>	<u>9</u>
TOTAL	30,130	3,209	718	87	88
Colleges and Universities:			109		
Foreign Countries:			26		

