WATER SERVICE FEASIBILITY STUDY
FOR THE EL PASO COUNTY
LOWER VALLEY WATER DISTRICT AUTHORITY

Prepared by : CONDE, Inc.

and

Espey, Huston and Associates, Inc.

Rec'd by IFAND 10/28/87

Document No. 870788
EH&A Job No. 10404

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FOR THE EL PASO COUNTY
LOWER VALLEY WATER DISTRICT AUTHORITY

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September 1987

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1.0 INTRODUCTION

In April 1987, the El Paso County Lower Valley Water District Authority (LVA) commissioned an engineering feasibility study to investigate and recommend potable water system alternatives in a level of detail sufficient for the District Board to determine bond authorization wording and bond sizing for consideration by District voters in an election to be held in fall 1987. The location and general boundaries of the District are shown in Exhibit 1 (map pocket).

1.1 OVERVIEW OF PROJECT STATUS

To date, the basic planning efforts that identifies the projected District service population and expected potable water demands are complete. The various engineering design parameters that are also needed to size facilities have been determined and will meet applicable regulatory standards.

As discussed in the following status report, the Stand-Alone Water System alternative has been completed on a preliminary design and cost basis, also subject to further clarification concerning ground-water well testing and possible contract negotiation.

A meeting was held with the Water Development Fund staff of the Texas Water Development Board in early July to discuss the District activities, present preliminary design and cost information and to determine the eligibility of the District in being able to seek financial assistance from this state water agency. From that meeting, the District appears to be eligible for Water Development Fund assistance, and an application was invited by the State for their consideration and decision.

Recent late developments have opened opportunities for a potential joint-venture project with the El Paso Public Service Board (PSB). Because of the attractiveness of many existing joint-venture projects, resulting "economies of scale" in lowering unit costs, reduced environmental impact of regional facilities and generally more favorable treatment by regulatory authorities, it is strategic for the District to pursue the further evaluation of these options sufficient for decision-making purposes. However, because of the need to secure contractual commitments between the parties, and access further engineering information, this approach can be addressed only in preliminary terms at this time.

Finally, a list of further major activities that will need to be accomplished for the joint-venture water system alternative is identified at the end of the report.

2.0 EXISTING AND PROJECTED WATER DEMAND ALTERNATIVES

2.1 POPULATION

Historical population and development trends were examined and future populations were projected for five-year intervals between 1990 and 2015.

Table 2.1-1 shows projected population for subdivisions, communities and currently undeveloped areas ("Hill Country") for three different growth rates. As shown in the tables, there are three types of areas which are expected to receive future growth. First, there are numerous subdivisions throughout the district which have generally defined capacity, limited by their number of subdivision lots. Secondly, there are three communities -- Buford, Socorro, and San Elizario -- which can be assumed to grow and to extend their boundaries as development occurs. Finally, the currently undeveloped portions of the district north of IH 10, the "Hill Country", can be expected to come under development with future subdivisions after the currently platted areas of the District approach capacity.

Table 2.1-1 shows projected population in these various locales under three growth assumptions. The low-case population projections assume that currently platted subdivisions will gradually build out to full capacity almost 50 years hence (2035), and that communities (and the large Sparks Addition subdivision) will grow at a compound annual rate of two percent. At this rate, current subdivisions would have grown to half of their capacities by the end of the 25-year study period in 215. The communities, collectively, would have increased by 64%. The Hill Country is assumed to begin substantial growth within about 15 years. By the year 2015, 1.0 million gallons daily (MGD) of average-day water supply is planned to be reserved for whatever growth occurs in this area under the low growth scenario. That capacity would serve a Hill Country population of almost 10,000.

TABLE 2.1-1
PROJECTED DISTRICT SERVICE POPULATION

ITEM	1990	1995	2000	2005	2010	2015
LOW CASE POPULATION GROWTH						
ALDAMA	23	46	69	92	115	138
ALJO ESTATES	55	110	165	220	275	330
ATHENA WEST	43	85	128	170	213	255
BAUMAN ESTATES	107	214	321	428	535	642
BELEN PLAZA	28	56	84	112	140	168
BOSQUE BONITA	107	214	321	428	535	642
BRINKMAN	20	39	59	78	98	117
BURBRIDGE ACRES	30	60	90	120	150	180
COLONIA DE LAS AZALEAS	136	271	407	542	678	813
COLONIA DEL LAS DALLAS	161	321	482	642	803	963
CONNORS	3	6	9	12	15	18
COUNTRY GREEN	79	157	236	314	393	471
EL GRAN VILLA	530	530	530	530	530	530
FRIEDMAN	1,093	1,093	1,093	1,093	1,093	1,093
GLORIA ELENA	16	32	48	64	80	96
GLORIETTA	15	30	45	60	75	90
GONZALES	18	35	53	70	88	105
HILL CREST MANOR	28	55	83	110	138	165
LA JOLLA	59	118	177	236	295	354
LAS MILPAS	24	48	72	96	120	144
LAS PAMPAS	123	246	369	492	615	738
MADRILENA	8	16	24	32	40	48
McADOO	52	104	156	208	260	312
MELTON PLACE	13	26	39	52	65	78
MESA VERDE	22	43	65	86	108	129
MONTEROSALES	42	84	126	168	210	252
POOLE	75	149	224	298	373	447
QUAIL MESA	7	13	20	26	33	39
RANCHO MIRAVEL	25	50	75	100	125	150
RIO RANCHO ESTATES	155	155	155	155	155	155
ROSEVILLE	18	35	53	70	88	105
SAN AUGUSTIN	199	199	199	199	199	199
SAN PAULO	19	37	56	74	93	111
SPARKS ADDITION	1,500	1,656	1,828	2,019	2,229	2,461
SUN HAVEN FARMS	39	77	116	154	193	231
SYLVIA ANDREA	27	54	81	108	135	162
VALLE REAL	20	39	59	78	98	117
VALLE VILLA	58	115	173	230	288	345
VENADO ACRES	30	59	89	118	148	177
WISEMAN ESTATES	26	51	77	102	128	153
BUFORD	1,420	1,568	1,731	1,911	2,110	2,329
SOCORRO	18,284	20,187	22,288	24,607	27,168	29,996
SAN ELIZARIO	3,564	3,935	4,344	4,797	5,296	5,847
HILL COUNTRY	0	0	0	3,333	6,667	10,000
OTHER	75	149	224	298	373	447
STUDY AREA TOTAL	28,366	32,566	37,034	45,132	53,557	62,343

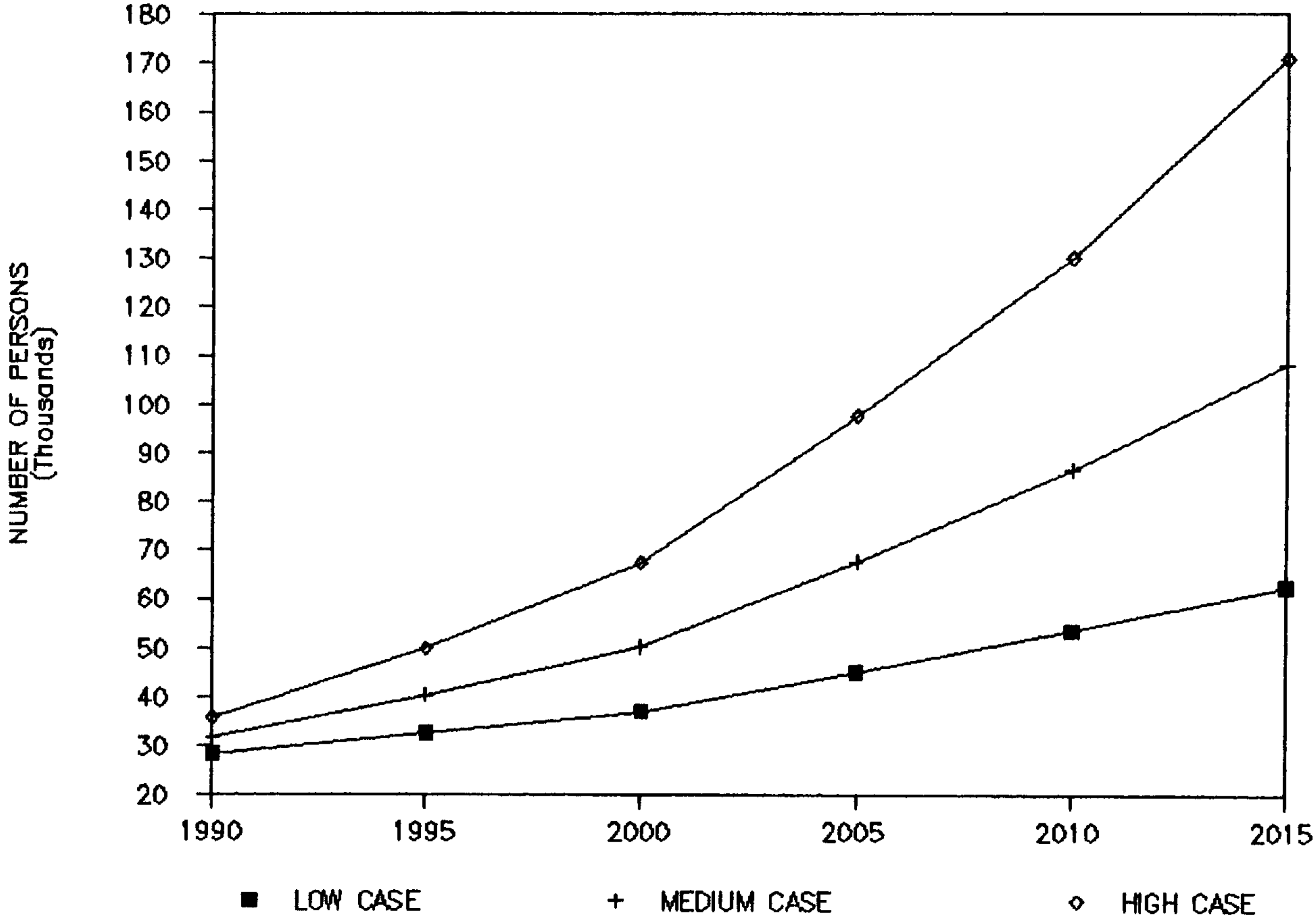
TABLE 2.1-1 (cont.)
PROJECTED DISTRICT SERVICE POPULATION

ITEM	1990	1995	2000	2005	2010	2015
MEDIUM CASE POPULATION GROWTH						
ALDAMA	38	77	115	153	192	230
ALJO ESTATES	92	183	275	367	458	550
ATHENA WEST	71	142	213	283	354	425
BAUMAN ESTATES	178	357	535	713	892	1,070
BELEN PLAZA	47	93	140	187	233	280
BOSQUE BONITA	178	357	535	713	892	1,070
BRINKMAN	33	65	98	130	163	195
BURBRIDGE ACRES	50	100	150	200	250	300
COLONIA DE LAS AZALEAS	226	452	678	903	1,129	1,355
COLONIA DEL LAS DALLAS	268	535	803	1,070	1,338	1,605
CONNORS	5	10	15	20	25	30
COUNTRY GREEN	131	262	393	523	654	785
EL GRAN VILLA	530	530	530	530	530	530
FRIEDMAN	1,093	1,093	1,093	1,093	1,093	1,093
GLORIA ELENA	27	53	80	107	133	160
GLORIETTA	25	50	75	100	125	150
GONZALES	29	58	88	117	146	175
HILL CREST MANOR	46	92	138	183	229	275
LA JOLLA	98	197	295	393	492	590
LAS MILPAS	40	80	120	160	200	240
LAS PAMPAS	205	410	615	820	1,025	1,230
MADRILENA	13	27	40	53	67	80
McADOO	87	173	260	347	433	520
MELTON PLACE	22	43	65	87	108	130
MESA VERDE	36	72	108	143	179	215
MONTEROSALES	70	140	210	280	350	420
POOLE	124	248	373	497	621	745
QUAIL MESA	11	22	33	43	54	65
RANCHO MIRAVEL	42	83	125	167	208	250
RIO RANCHO ESTATES	155	155	155	155	155	155
ROSEVILLE	29	58	88	117	146	175
SAN AUGUSTIN	199	199	199	199	199	199
SAN PAULO	31	62	93	123	154	185
SPARKS ADDITION	1,500	1,825	2,220	2,701	3,287	3,999
SUN HAVEN FARMS	64	128	193	257	321	385
SYLVIA ANDREA	45	90	135	180	225	270
VALLE REAL	33	65	98	130	163	195
VALLE VILLA	96	192	288	383	479	575
VENADO ACRES	49	98	148	197	246	295
WISEMAN ESTATES	43	85	128	170	213	255
BUFORD	1,565	1,904	2,316	2,818	3,428	4,171
SOCORRO	20,148	24,513	29,824	36,285	44,146	53,711
SAN ELIZARIO	3,927	4,778	5,813	7,073	8,605	10,470
HILL COUNTRY	0	0	0	5,833	11,667	17,500
OTHER	124	248	373	497	621	745
STUDY AREA TOTAL	31,820	40,403	50,260	67,501	86,627	108,047

TABLE 2.1-1 (concl.)
PROJECTED DISTRICT SERVICE POPULATION

ITEM	1990	1995	2000	2005	2010	2015
HIGH CASE POPULATION GROWTH						
ALDAMA	58	115	173	230	230	230
ALJO ESTATES	138	275	413	550	550	550
ATHENA WEST	106	213	319	425	425	425
BAUMAN ESTATES	268	535	803	1,070	1,070	1,070
BELEN PLAZA	70	140	210	280	280	280
BOSQUE BONITA	268	535	803	1,070	1,070	1,070
BRINKMAN	49	98	146	195	195	195
BURBRIDGE ACRES	75	150	225	300	300	300
COLONIA DE LAS AZALEAS	339	678	1,016	1,355	1,355	1,355
COLONIA DEL LAS DALLAS	401	803	1,204	1,605	1,605	1,605
CONNORS	8	15	23	30	30	30
COUNTRY GREEN	196	393	589	785	785	785
EL GRAN VILLA	530	530	530	530	530	530
FRIEDMAN	1,093	1,093	1,093	1,093	1,093	1,093
GLORIA ELENA	40	80	120	160	160	160
GLORIETTA	38	75	113	150	150	150
GONZALES	44	88	131	175	175	175
HILL CREST MANOR	69	138	206	275	275	275
LA JOLLA	148	295	443	590	590	590
LAS MILPAS	60	120	180	240	240	240
LAS PAMPAS	308	615	923	1,230	1,230	1,230
MADRILENA	20	40	60	80	80	80
McADOO	130	260	390	520	520	520
MELTON PLACE	33	65	98	130	130	130
MESA VERDE	54	108	161	215	215	215
MONTEROSALES	105	210	315	420	420	420
POOLE	186	373	559	745	745	745
QUAIL MESA	16	33	49	65	65	65
RANCHO MIRAVEL	63	125	188	250	250	250
RIO RANCHO ESTATES	155	155	155	155	155	155
ROSEVILLE	44	88	131	175	175	175
SAN AUGUSTIN	199	199	199	199	199	199
SAN PAULO	46	93	139	185	185	185
SPARKS ADDITION	1,500	2,007	2,686	3,595	4,811	6,438
SUN HAVEN FARMS	96	193	289	385	385	385
SYLVIA ANDREA	68	135	203	270	270	270
VALLE REAL	49	98	146	195	195	195
VALLE VILLA	144	288	431	575	575	575
VENADO ACRES	74	148	221	295	295	295
WISEMAN ESTATES	64	128	191	255	255	255
BUFORD	1,721	2,303	3,082	4,124	5,519	7,386
SOCORRO	22,161	29,656	39,687	53,110	71,073	95,112
SAN ELIZARIO	4,320	5,781	7,736	10,353	13,854	18,540
HILL COUNTRY	0	0	0	8,333	16,667	25,000
OTHER	186	373	559	745	745	745
STUDY AREA TOTAL	35,734	49,835	67,333	97,712	130,121	170,673

FIGURE 2.1-1
PROJECTED DISTRICT SERVICE POPULATION



Given the above assumptions, the low growth scenario produces a District-wide population growth of about 120% between 1990 and 2015 -- a population change of about 34,000 persons.

The second page of Table 2.1-1 presents a mid-level growth scenario which assumes that currently platted subdivisions will be fully builtout in a 25-year period, or by the end of the study period in 2015. This medium case was adapted for planning purposes as the most likely future growth rate of District population.

An additional assumption for this scenario was that communities and the Sparks Addition would increase by 4% annually during the study period. Also, 1.75 MGD of average-day water capacity was reserved for Hill Country development, sufficient to serve 17,500 persons in 2015.

The medium case scenario results in a population growth of about 76,200 between 1990 and 2015, or a tripling of population over current levels (240% increase).

The third page of Table 2.1-1 shows high case projections which assume full buildout of subdivisions in 15 years (by the year 2005) and a community growth rate of 6% annually. Capacity for the Hill Country is assumed to be 2.5 MGD on an average day basis, enough for 25,000 persons. As a result of these assumptions, the high case projections produce a 378% growth rate over the study period, with no growth in existing platted subdivisions after the year 2005. This growth rate amounts to a population increase of about 135,000 over the 25-year study horizon.

The three growth scenarios are shown graphically in Figure 2.1-1. It was determined that the high case growth rate, which assumed annual growth of 6% in communities, resulted in a large increase which is not justified by current knowledge of development conditions. On the other hand, given the advanced state of development in many areas, a 50-year buildout, as represented by the low case scenario, seemed too low; moreover, there is concern that designing a system for this lower growth might result in considerable deficiencies in the relatively near-term future. Thus, medium case scenario of steady, gradual growth was adopted as the most probable future condition.

2.2 PER CAPITA WATER USAGE

Table 2.2.1 shows the usage standards which were adopted for further planning efforts. Water consumptions of 100 gallons per capital daily (gpcd) is the expected demand based on historical patterns. However, it is hoped that the enactment of a conservation policy by the District will result in reduced demand. Typically, such reductions range from 15-30%. For planning purposes, conservation efforts are assumed to result in a 25% reduction in demand to 75 gpcd. It is expected that these savings will be achieved in demand associated with nonirrigational demands (such as plumbing changes), since lawn irrigation is currently not a significant demand element in this arid region.

Conversely, drought conditions result in higher usage patterns due to a combination of high temperatures and limited rainfall over a period of time. Planning for drought conditions assumed a 25% increase in demand over average historical demand, for a demand of 125 gpcd. Assuming that effective conservation measures were enacted during a drought, drought demand would then be approximately equivalent to historical demand as drought demand increases in demand and conservation decreases in demand cancel out each other.

2.3 DISTRICT MUNICIPAL WATER DEMAND

This section discusses projected municipal (residential and commercial) demand (as opposed to industrial, agricultural or other demand) for both annual total demand and average daily demand.

TABLE 2.2-1
PROJECTED PER CAPITA MUNICIPAL WATER DEMAND
(gallons per capita daily)

ITEM	1990	1995	2000	2005	2010	2015
CONSERVATION SCENARIO	75	75	75	75	75	75
HISTORICAL TREND SCENARIO	100	100	100	100	100	100
DROUGHT SCENARIO	125	125	125	125	125	125

2.3.1 Municipal Annual Water Demand

Total annual demand, by subdivision or community, were calculated for three demand levels: conservation, historical and drought demand. In addition, for each demand level, consumption is projected under three growth scenarios (low, medium, and high) as discussed above. These alternative projections were derived by direct application of the three levels of usage to the three alternatives population projections, for a total of nine scenarios. Annual demand in 1990 varies from 776-1,630 MG annually, with a mid-range (medium range population, historical unit usage) of 1,161 MG. By 2015, the range is between 1,903 MG and 7,786 MG, with a mid-range value of 3,943 MG. These mid-range projections show water demand increasing by 248% (i.e., tripling) over the 25-year planning period - an increase of 2,782 MG in annual demand.

2.3.2 Municipal Average Daily Demand

Average daily demand is calculated by dividing total annual demand by 365 days. For 1990, the nine scenarios range from 2.127 MGD to 4.467 MGD with a mid-range value of 3.182 MGD. By 2015, this range is 5.215 MGD to 21.334 MGD, with a 10.805 MGD mid-range value. Mid-range projections show a 25-year increase in daily demand of 7.623 MGD (248% increase).

2.4 OTHER DISTRICT POTABLE WATER DEMAND

Although there is currently no significant nonmunicipal demand (industrial, agricultural, etc.) which would be met by the District, it is expected that considerable District residential growth will ultimately result in changing land use patterns, with increased commercial and industrial uses and water demand. For that reason, an amount equal to 2.5% of mid-range municipal demand beginning in 1995 was allotted for industrial uses in the future.

2.5 DISTRICT TOTAL WATER DEMAND

2.5.1 Total Annual Water Demand

Total annual water demand under all scenarios is summarized in Table 2.5-1 and Figure 2.5-1. The low-end projection (low population growth with conversation-level usage) for 1990 is 776 MG annually, increasing by 158% to 2,002 MG annually in 2015. In contrast, high-end projections (high population growth with drought conditions usage) shows a growth of 384% between 1990 and 2015 (1,630 MG to 7,885 MG). Mid-range demand indicates that demand will more than triple during the study period, from 1,161 MG to 4,042 MG. Figure 2.5-1 shows the lower and upper extremes and the mid-range projection graphically.

2.5.2 Total Average Daily Water Demand

The corresponding calculations for average daily water demand are shown in Table 2.5-2 and Figure 2.5-2. At the low extreme, demand is shown to rise from 2.127 MGD to 5.486 MGD over 25 years, while high-range projections show growth from 4.467 MGD to 21.604 MGD in 2015. Mid-range values are 3.182 MGD in 1990 and 11.075 MGD in 2015.

2.5.3 Total Peak Daily Water Demand

Design of water treatment facilities is based on peak daily water demand. The adopted factor for peak daily demand is twice average daily demand. This calculation was performed under the nine planning scenarios; low and high extremes and mid-range projections are also shown in Table 2.7-1 and Figure 2.7-1. Mid-range projections adopted for planning purposes show peak day consumption of 6.364 MGD in 1990, rising to 22.150 MGD in 2015.

TABLE 2.5-1
DISTRICT TOTAL ANNUAL WATER DEMAND
(million gallons)

ITEM	1990	1995	2000	2005	2010	2015
MUNICIPAL DEMAND						
CONSERVATION USAGE/LOW POPULATION	776.530	891.500	1,013.815	1,235.488	1,466.115	1,903.618
CONSERVATION USAGE/MEDIUM POPULATION	871.075	1,106.041	1,375.880	1,847.835	2,371.411	2,977.171
CONSERVATION USAGE/HIGH POPULATION	978.212	1,364.224	1,843.250	2,674.875	3,562.069	4,691.559
HIST. TREND USAGE/LOW POPULATION	1,035.374	1,186.997	1,351.753	1,647.318	1,954.820	2,275.503
HIST. TREND USAGE/MEDIUM POPULATION	1,161.433	1,474.721	1,834.507	2,463.780	3,161.881	3,943.721
HIST. TREND USAGE/HIGH POPULATION	1,304.282	1,818.965	2,457.667	3,566.501	4,749.426	6,229.570
DROUGHT USAGE/LOW POPULATION	1,294.217	1,485.833	1,689.691	2,059.147	2,443.525	3,172.696
DROUGHT USAGE/MEDIUM POPULATION	1,451.791	1,843.402	2,293.134	3,079.725	3,952.351	4,929.651
DROUGHT USAGE/HIGH POPULATION	1,630.353	2,273.706	3,072.084	4,458.126	5,936.782	7,786.962
INDUSTRIAL DEMAND	0.000	0.000	45.863	61.595	79.047	98.593
OTHER DEMAND	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL ANNUAL WATER DEMAND (mg)						
CONSERVATION USAGE/LOW POPULATION	776.530	891.500	1,059.677	1,297.083	1,545.162	2,002.211
CONSERVATION USAGE/MEDIUM POPULATION	871.075	1,106.041	1,421.743	1,909.430	2,450.458	3,075.764
CONSERVATION USAGE/HIGH POPULATION	978.212	1,364.224	1,889.113	2,736.470	3,641.116	4,790.152
HIST. TREND USAGE/LOW POPULATION	1,035.374	1,186.997	1,397.615	1,708.912	2,033.867	2,374.096
HIST. TREND USAGE/MEDIUM POPULATION	1,161.433	1,474.721	1,880.370	2,525.375	3,240.928	4,042.314
HIST. TREND USAGE/HIGH POPULATION	1,304.282	1,818.965	2,503.530	3,628.095	4,828.473	6,328.163
DROUGHT USAGE/LOW POPULATION	1,294.217	1,485.833	1,735.554	2,120.742	2,522.572	3,271.289
DROUGHT USAGE/MEDIUM POPULATION	1,451.791	1,843.402	2,338.996	3,141.320	4,031.398	5,028.244
DROUGHT USAGE/HIGH POPULATION	1,630.353	2,273.706	3,117.946	4,519.720	6,015.829	7,885.555

FIGURE 2.5-1
ALTERNATIVE ANNUAL TOTAL WATER DEMAND

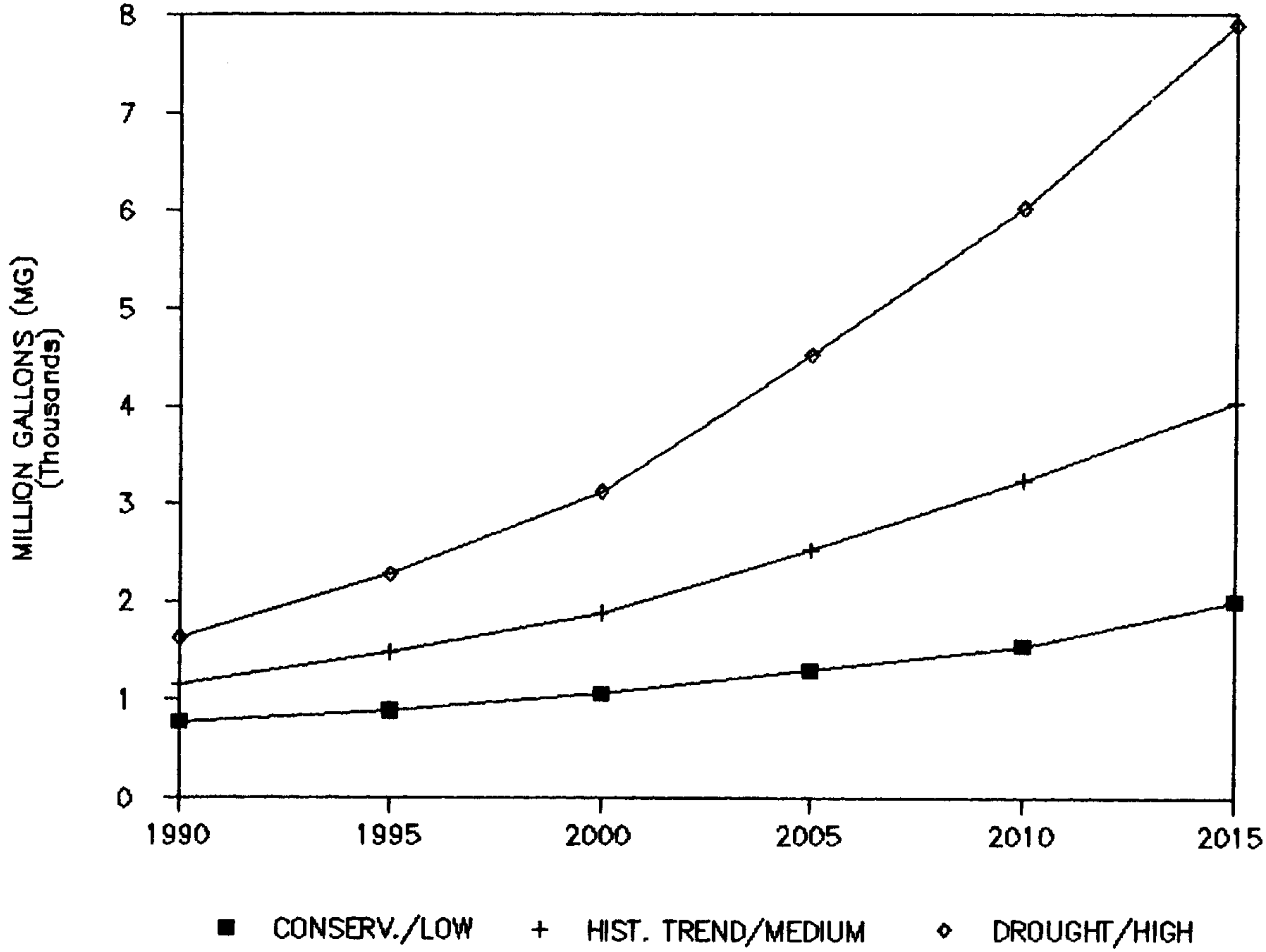


TABLE 2.5-2
AVERAGE DAILY TOTAL WATER DEMAND
(million gallons daily)

ITEM	1990	1995	2000	2005	2010	2015
MUNICIPAL DEMAND						
CONSERVATION USAGE/LOW POPULATION	2.127	2.442	2.778	3.385	4.017	5.215
CONSERVATION USAGE/MEDIUM POPULATION	2.387	3.030	3.770	5.063	6.497	8.157
CONSERVATION USAGE/HIGH POPULATION	2.680	3.738	5.050	7.328	9.759	12.854
HIST. TREND USAGE/LOW POPULATION	2.837	3.252	3.703	4.513	5.356	6.234
HIST. TREND USAGE/MEDIUM POPULATION	3.182	4.040	5.026	6.750	8.663	10.805
HIST. TREND USAGE/HIGH POPULATION	3.573	4.983	6.733	9.771	13.012	17.067
DROUGHT USAGE/LOW POPULATION	3.546	4.071	4.629	5.641	6.695	7.793
DROUGHT USAGE/MEDIUM POPULATION	3.978	5.050	6.283	8.438	10.828	13.506
DROUGHT USAGE/HIGH POPULATION	4.467	6.229	8.417	12.214	16.265	21.334
INDUSTRIAL DEMAND	0.000	0.000	0.126	0.169	0.217	0.270
OTHER DEMAND	0.000	0.000	0.000	0.000	0.000	0.000
AVERAGE DAILY TOTAL WATER DEMAND (mgd)						
CONSERVATION USAGE/LOW POPULATION	2.127	2.442	2.903	3.554	4.233	5.486
CONSERVATION USAGE/MEDIUM POPULATION	2.387	3.030	3.895	5.231	6.714	8.427
CONSERVATION USAGE/HIGH POPULATION	2.680	3.738	5.176	7.497	9.976	13.124
HIST. TREND USAGE/LOW POPULATION	2.837	3.252	3.829	4.682	5.572	6.504
HIST. TREND USAGE/MEDIUM POPULATION	3.182	4.040	5.152	6.919	8.879	11.075
HIST. TREND USAGE/HIGH POPULATION	3.573	4.983	6.859	9.940	13.229	17.337
DROUGHT USAGE/LOW POPULATION	3.546	4.071	4.755	5.810	6.911	8.063
DROUGHT USAGE/MEDIUM POPULATION	3.978	5.050	6.408	8.606	11.045	13.776
DROUGHT USAGE/HIGH POPULATION	4.467	6.229	8.542	12.383	16.482	21.604

FIGURE 2.5-2
ALTERNATIVE AVG. DAILY WATER DEMAND

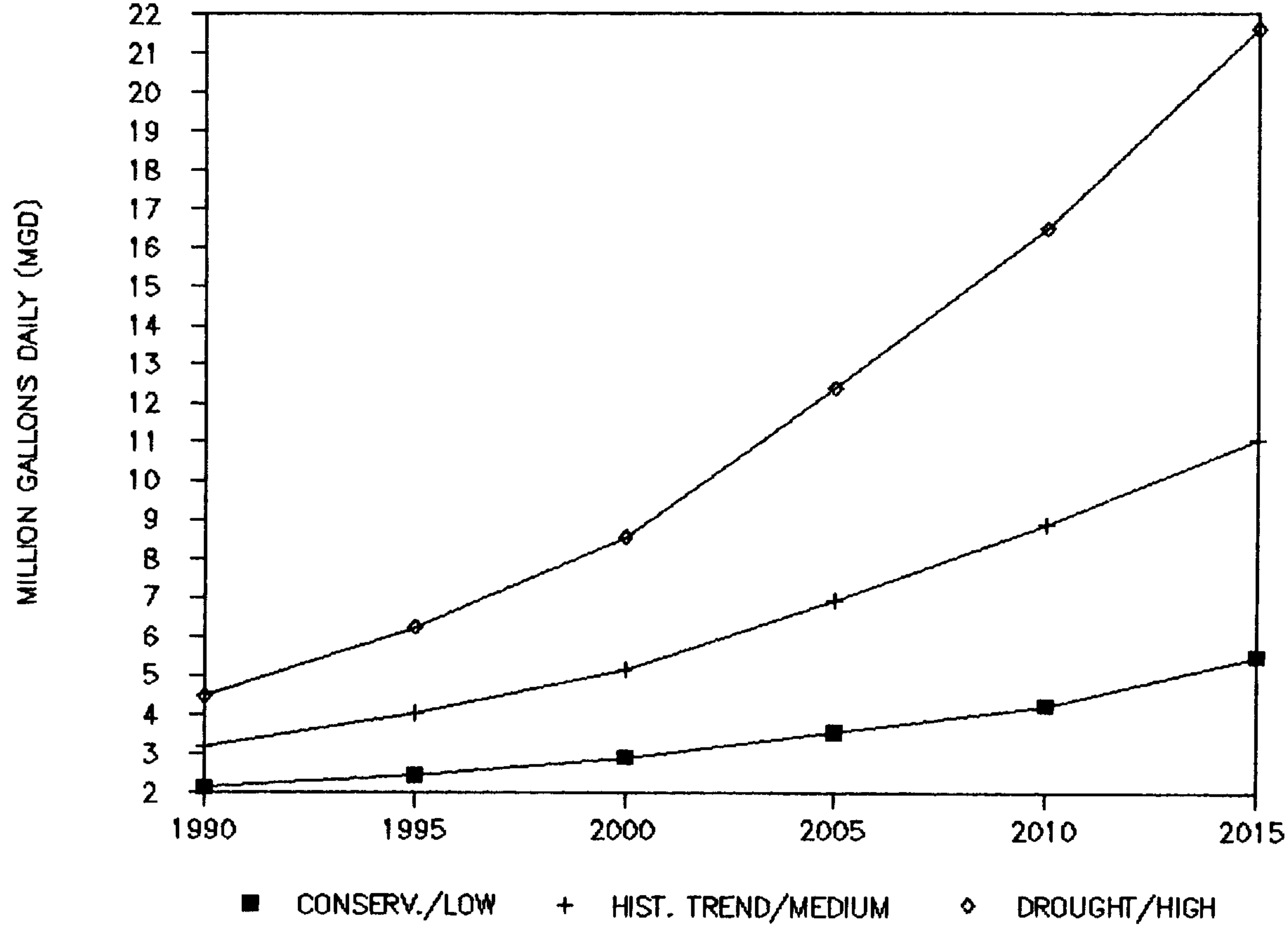
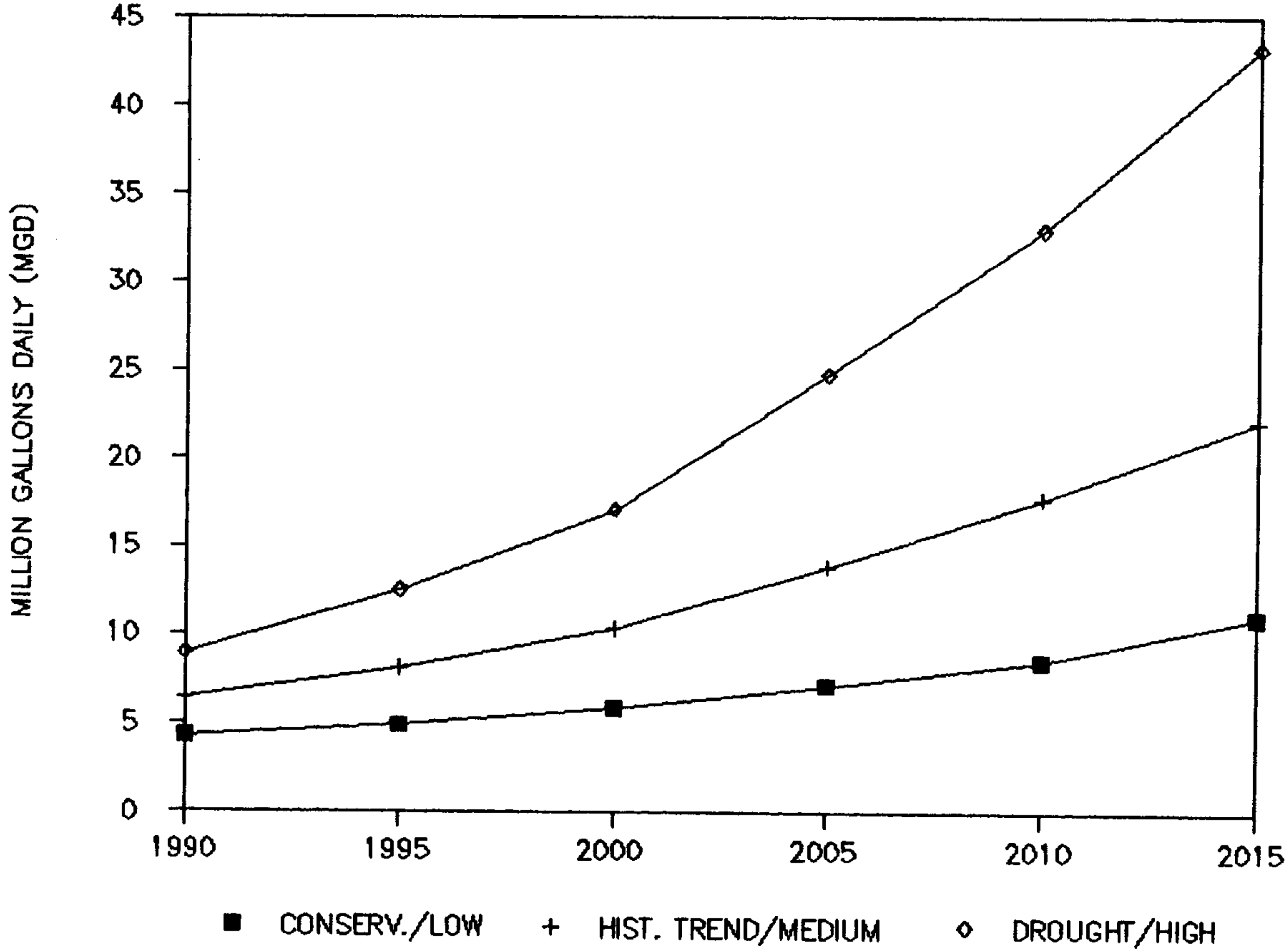


TABLE 2.5-3
PEAK DAILY TOTAL WATER DEMAND
(million gallons daily)

ITEM	1990	1995	2000	2005	2010	2015
MUNICIPAL DEMAND						
CONSERVATION USAGE/LOW POPULATION	4.255	4.885	5.555	6.770	8.034	10.431
CONSERVATION USAGE/MEDIUM POPULATION	4.773	6.060	7.539	10.125	12.994	16.313
CONSERVATION USAGE/HIGH POPULATION	5.360	7.475	10.100	14.657	19.518	25.707
HIST. TREND USAGE/LOW POPULATION	5.673	6.504	7.407	9.026	10.711	12.469
HIST. TREND USAGE/MEDIUM POPULATION	6.364	8.081	10.052	13.500	17.325	21.609
HIST. TREND USAGE/HIGH POPULATION	7.147	9.967	13.467	19.542	26.024	34.135
DROUGHT USAGE/LOW POPULATION	7.092	8.142	9.259	11.283	13.389	15.586
DROUGHT USAGE/MEDIUM POPULATION	7.955	10.101	12.565	16.875	21.657	27.012
DROUGHT USAGE/HIGH POPULATION	8.933	12.459	16.833	24.428	32.530	42.668
INDUSTRIAL DEMAND	0.000	0.000	0.251	0.338	0.433	0.540
OTHER DEMAND	0.000	0.000	0.000	0.000	0.000	0.000
PEAK DAILY TOTAL WATER DEMAND (mgd)						
CONSERVATION USAGE/LOW POPULATION	4.255	4.885	5.806	7.107	8.467	10.971
CONSERVATION USAGE/MEDIUM POPULATION	4.773	6.060	7.790	10.463	13.427	16.854
CONSERVATION USAGE/HIGH POPULATION	5.360	7.475	10.351	14.994	19.951	26.247
HIST. TREND USAGE/LOW POPULATION	5.673	6.504	7.658	9.364	11.144	13.009
HIST. TREND USAGE/MEDIUM POPULATION	6.364	8.081	10.303	13.838	17.759	22.150
HIST. TREND USAGE/HIGH POPULATION	7.147	9.967	13.718	19.880	26.457	34.675
DROUGHT USAGE/LOW POPULATION	7.092	8.142	9.510	11.621	13.822	16.126
DROUGHT USAGE/MEDIUM POPULATION	7.955	10.101	12.816	17.213	22.090	27.552
DROUGHT USAGE/HIGH POPULATION	8.933	12.459	17.085	24.766	32.963	43.209

* Assumes peak to average ratio of 2:1.

FIGURE 2.5-3
ALTERNATIVE PEAK DAILY WATER DEMAND



3.0 MAJOR WATER SUPPLY ALTERNATIVES

This section examines the potential availability of both ground water and surface water and describes the prospective quantities and qualities of available water.

3.1 DELINEATION OF SUPPLY ALTERNATIVES AND ADEQUACY

3.1.1 Ground-Water Availability and Quality

Ground-water resources were evaluated in 1980 study by the Texas Department of Water Resources (TDWR) entitled "Ground-water Development in the El Paso Region, Texas, with Emphasis on the Resources of the Lower El Paso Valley".

3.1.1.1 Hueco Bolson Aquifer

According to the TDWR study, a potential source of ground water for the District can be found in the Hueco Bolson deposits. This is an area adjacent to the Rio Grande River in "the mesa" bench lands. While the Hueco Bolson does contain fresh water, this water is found almost exlusively in the City of El Paso's artesian area. The remainder of the Bolson deposits contain saline ground water which predominately ranges from moderately saline to very saline. The State analyses notes only the small deep zone between Fabens and the Rio Grande which contains slightly saline water which could possibly be used for municipal use. However, the report cautions that this source is surrounded by large quantities of much more saline water and is believed to be a small extension of fresh to slightly saline water in Mexico.

3.1.1.2 Rio Grande River Alluvium

There are an estimated 1.4 million acre-feet of ground water available in the alluvium which have less than 2,500 mg/l of dissolved solids, at a well depth of 200 feet or less; only 39,000 acre-feet have dissolved solids content of less than 1,000 mg/l (fresh water quality). These fresh-to-slightly-saline supplies are primarily adjacent to the River, with a discontinguous area in the vicinity of Fabens. Although, 1.4 million acre-feet are theoretically available, the report states that this amount is not necessarily recoverable in an economic fashion. Moreover, the area is effected by complex recharge/discharge and ground-water movement dynamics influenced by (1) infiltration of participation and runoff; (2) upward leakage from underlying deposits; (3) leakage from the Rio Grande and numerous canals; (4) excess application of irrigation water; and (5) well pumpage. Annual recharge has been estimated to be from 74,000 to 90,000 acre-feet annually, although to the extent that this occurs through irrigation, it tends to increase ground-water salinity.

These factors effect both the quality of available water. Moreover, alluvium ground water may be effected by activities on the Mexican side of the Rio Grande as well as local activities. Thus, there is considerable uncertainty about longer-term availability of these waters. To the extent that water of sufficiently low saline content is available, it may be improved by desalination or blending.

3.1.1.3 Ground-Water System Alternative

Ground water is basically only one source of water. However, we will identify it as potable water and slightly brackish water for this report.

Potable water is a source only needing chlorine dosing before being pumped into a distribution system. It is economical to use and adapt to easy operation into the pipe system.

Slightly saline or brackish water requires a few decisions to be made. One, it can be blended with good water and the resultant mixture put into the system under favorable conditions. Next, it can be utilized by a surface treatment plant to blend with poor water in the winter to help reduce some treatment costs. During summer months, it will supplement irrigation allotment water and add a small cost for treatment purposes.

Finally, in the event technology provides us some unique method of economically treating brackish water, it becomes a viable source and possibility could stand alone or be the main stay of the public water system.

Presently, we are negotiating with two entities to either purchase wells, purchase water or a combination of both. These two areas will be evaluated to determine the potential life of the field and the potable quality available. Other sources similar to these will be continually sought and utilized where they will benefit the system and its operation.

3.1.2 Surface Water Availability and Quality

Surface water is the most important consideration for the development of the water supply for the District. The reason for this is that with the established irrigation district and its operation, water will be available for sometime in the future, where as potable water from wells is a limited supply. Quality will vary as development takes place between Elephant Butte and El Paso County. Uses of the irrigation water runoff into the river by various communities, and direct discharges into the canal system could have a deteriorating effect on the quality either chemically or biographically. This change will ultimately have an effect on treatment methods and costs, but surface water will still remain the major source for potential drinking water. The only other surface water that might be available, other than irrigation water, is the river water. This source is controlled by the irrigation district and is dry a good portion of the year, especially where the District would be obtaining access.

3.2 STAND-ALONE WATER SYSTEM

3.2.1 General Engineering Description

The stand alone water system for the District contemplates the intitial use of ground water from the Hueco Bolson Aquifer. Five million gallons per day (5 MGD) of supply are anticipated from both the Tornillo well field and the Fabens area (Morris Farm) for a total supply of 10 MGD. In the second phase of the system, a surface water supply of approximately 12 MGD will need to be constructed to insure the ability to supply peak demands during summer months past the year 2000.

3.2.2 Engineering Design Criteria

The design standards utilized for this report meet the minimum standards for a State "Approved" system as set out in Rules and Regulations for Public Water Systems published by the Texas Department of Health. Additionally, storage proposed for the system meets the minimum capacity as set out in "Key Rate Schedule" published by the State Board of Insurance. The basic criteria are as follows:

Supply

- o Ground Water Supply - two or more wells having a total rated capacity of 0.6 gpm per connection.

- o Surface Water Supply - 0.6 gpm per connection under normal design capacity.

Service Pumps

Two or more having a total rated capacity of 2.0 gpm per connection or total capacity of 1,000 gpm and able to meet peak demand, whichever is less.

Storage

- o Minimum 1 MGD at surface treatment plant.
- o Total Storage = 130 gallons per capita.
- o Elevated Storage = 55 gallons per capita.

Transmission Mains

Sized to provide minimum 35 psi during maximum hour demands.

3.2.3 Computer Water Modelling Efforts

3.2.3.1 Introduction to Water Modeling Effort

Preliminary water modeling efforts were performed to assess the performance of various demands on the proposed system. Demands utilized in the model considered the medium case population growth and the historical trend water usage scenario. Peak day demands were modeled for the areas adjacent to the spine transmission main and the 3832 HGL overflow reservoirs. Peak hour demands considered at two times maximum day demand were modeled for Socorro and the San Elizario area as they are separated from the proposed elevated storage sites.

The model utilized for the effort was Micro Hardy Cross by CE Comp (copyright 1985, 1986). The Micro Hardy Cross performs an analysis of the flow in a water system using the Hardy Cross Methods. The Hardy Cross Method is based on successive approximations to two physical laws:

1) the law of conservation of mass, and

2) the law of conservation of energy.

The system is modeled utilizing a series of nodes and pipes. The model was run using a Hazen Williams "C" value of 110. A system map showing the network result of the two modeling efforts performed for the study are found in Exhibit 2 (map pocket).

3.2.3.2 Model No. 1

Model Effort No. 1 considers a year 2000 peak day water demand of approximately 10 MG. Demands for Socorro and San Elizario were then doubled to study system performance during a peak hour demand period. This modeling effort also approximates system performance during winter usage as the year 2015 is approached.

3.2.3.3 Model No. 2

Modeling Effort No. 2 considers the peak day water for the year 2015. An additional 12 MGD input (surface water facility) is input at node 790. Again peak hour demands were modeled for the Socorro and San Elizario area.

3.2.4 Preliminary Construction Cost Estimate

A preliminary cost estimate has been prepared to reflect the estimated construction costs of Phase I and Phase II systems. The costs presented are in 1987 dollars. The preliminary cost estimate is presented in Table 3.2-1.

3.2.5 Preliminary Financing Costs and Bond Issue Sizing

Using the basic construction, engineering and contingencies costs identified above, the estimated sizing of the bond issue(s) necessary to finance the Phase I Stand-Alone Water System alternative is presented in Table 3.2-2.

TABLE 3.2-1
CONSTRUCTION COST SUMMARY

STANDALONE GROUNDWATER/SURFACE WATER POTABLE SYSTEM
EL PASO COUNTY LOWER VALLEY WATER DISTRICT AUTHORITY
(1987 Dollars)

ITEM	BASIS	TOTAL CONSTRUCTION COST
PHASE I SYSTEM		
WELL SYSTEMS	L.S.	$1,500,000
WATER STORAGE	L.S.	$1,100,000
SPARKS AREA STORAGE AND PUMPING	L.S.	$180,000
MAJOR TRANSMISSION AND LOOPING	L.S.	$7,540,000
LOCAL DISTRIBUTION	L.S.	$3,281,000
CONTINGENCIES	10%	$1,360,100
ENGINEERING	10%	$1,496,110
PROPERTY/R.O.W. ACQUISITION	L.S.	$120,000
BUYOUT OF EXISTING PSB SYSTEM *	L.S.	$6,000,000
TOTAL PHASE I CONSTRUCTION COST		$22,577,210
PHASE II SYSTEM		
SURFACE WATER TREATMENT PLANT	L.S.	$9,130,000
WATER STORAGE	L.S.	$1,100,000
MAJOR TRANSMISSION	L.S.	$1,250,000
PROPERTY/R.O.W. ACQUISITION	L.S.	$70,000
CONTINGENCIES	10%	$1,155,000
ENGINEERING	10%	$1,270,500
ACQUISITION OF WATER RIGHTS	L.S.	$300,000
TOTAL PHASE I CONSTRUCTION COST		$14,275,500
TOTAL PHASE I & II CONSTRUCTION COST		$36,852,710

* Amount not to exceed.

TABLE 3.2-2
ESTIMATED BOND REQUIREMENTS COST SUMMARY

STANDALONE GROUNDWATER/SURFACE WATER POTABLE SYSTEM
EL PASO COUNTY LOWER VALLEY WATER DISTRICT AUTHORITY
(1987 Dollars)

ITEM	BASIS	TOTAL CONSTRUCTION COST
I. CONSTRUCTION COSTS		
A. CONSTRUCTION COSTS (1987$)	L.S.	$13,601,000
B. CONTINGENCIES	10.0%	$1,360,100
C. ENGINEERING	10.0%	$1,496,110
D. PROPERTY/R.O.W. ACQUISITION	L.S.	$120,000
E. BUYOUT OF PSB SYSTEM	L.S.	$6,000,000
F. TOTAL CONSTRUCTION COSTS		$22,577,210
II. NON-CONSTRUCTION COSTS		
A. COST OF ISSUANCE	L.S.	$1,995,403
B. CAPITALIZED INTEREST (2 YRS)	17.5%	$5,880,053
C. RESERVE FUND	L.S.	$3,147,635
D. TOTAL NON-CONSTRUCTION COSTS		$11,023,090
III. ESTIMATED PHASE I BOND ISSUE REQUIREMENTS		$33,600,300

In addition to the basic construction costs, other financing costs include allowables for creation expenses, attorney and financial advisor fees, capitalized interest and issuance, printing and review costs of the bond issue. These estimates are preliminary and may change with varying financial conditions or institutional approaches.

A major non-construction cost in the bond issue sizing is capitalized interest which are funds to provide for two initial years of interest-only payments before pledged District taxes or rate revenues must begin to fully support the District's debt service obligations.

3.3 JOINT-VENTURE WATER SYSTEM

The second major approach being investigated in the potable water service feasibility study is that of the District participating in facility costs and operations with the El Paso Public Service Board (PSB).

3.3.1 General Engineering Description

The proposed system, sufficient in its Phase I capacity to serve a population of about 50,000 people, would include a water treatment plant, storage and pumping facilities, a major pipeline transmission network and a series of local distribution systems. This system is proposed to be constructed and operated in conjunction with the El Paso Public Service Board water utility.

The proposed system would obtain water rights gathered from current owners or assignees within the District boundaries which in turn would provide access to surface waters supplies from the Rio Grande River. This raw water supply would be treated in a facility to be built and financed by the El Paso PSB. Treated water would then be wholesaled by the PSB to the District system for the ultimate delivery of retail service to the District customer.

Mains already in place serving approximately 3,000 meters in the Socorro and Clint areas would be purchased from the PSB at an agreed upon price. Also, a surface water treatment would be built by the PSB in the Socorro area which would treat water secured under the previously discussed water rights program. The water rights would be leased by the District and treated in the plant. The WTP would either be sized for the population projected for the year 2000 and incremented later or sized to the year 2010-2015 demand with excess capacity used by the PSB. Water would be treated during the irrigation season in excesss of the District's needs, so that the excess could be credited towards dry or winter season consumption by the District. Features of this joint venture are presently being reviewed for Phase I prior to any finalization of obligations of either party.

At this time, it is the opinion of the engineers that this joint-venture proposal merits serious consideration in that this approach may result in: 1) lower unit costs to District customers; 2) a more dependable, quality water supply than sole use of area groundwater supplies; and 3) other benefits of "regionalization" which include regional cooperation, reduced environmental impact and generally more favorable treatment by regulatory authorities and financial markets.

3.3.2 Engineering Design Criteria

Engineering design criteria used in the development of the joint-venture alternative meet or exceed the minimum standards set out in Rules and Regulations for Public Water Systems published by the Texas Department of Health as well as standards set by the State Board of Insurance. These standards are further delineated in Section 3.2.2.

3.3.3 Computer Water Modelling Efforts

Preliminary water modelling efforts were performed to assess the performance of various demands on the proposed system. Demands utilized in the model considered the medium case population growth and the historical trend water usage scenario. Peak day demands were modelled for the areas adjacent to the spine transmission main and the 3832 HGL overflow reservoirs. Peak hour demands considered at two times maximum day demand were modelled for Socorro and the San Elizario area as they are separated from the proposed elevated storage sites.

Other aspects of the water modelling approach are discussed in Section 3.2.3.1.

3.3.3.1 Model 1

This modelling efforts considers a year 2015 peak day demand of approximately 22 mgd. The system network that was developed from this modelling is shown on the facilities map Exhibit 3 (map pocket).

3.3.4 Preliminary Construction Cost Estimates

The overall construction cost of the entire Phase I joint-venture water system is estimated at $30.251 million, of which the District would have a construction cost share of about $13.458 million (see Table 3.3-1). These costs are based on preliminary design estimates and are subject to revision based on final design and negotiations with El Paso PSB.

3.3.5 Preliminary Financing Costs and Bond Issue Sizing

In addition to the $13.458 million construction cost share of the District, another $8.007 million are estimated for bond financing costs, bringing the total District bond requirements to $21.465 million (see Table 3.3-2). Because of uncertainty concerning future interest rates and to allow for unexpected financing costs, the total bond amount proposed for voter consideration was increased slightly to $22.5 million.

TABLE 3.3-1
CONSTRUCTION COST SUMMARY

10 MGD WTP AND ACQUISITION OF EXISTING SYSTEM THAT PSB FINANCES
OTHER MAJOR INFRASTRUCTURE FINANCING BY
EL PASO COUNTY LOWER VALLEY WATER DISTRICT AUTHORITY
(1987 Dollars)

ITEM	BASIS	TOTAL COST	FINANCING BY EL PASO PSB *	DISTRICT FINANCING BACKED BY WATER DEV. FUND *	FINANCING BY EPCLVWDA *
PHASE I SYSTEM					
PSB BUYOUT (Not to Exceed)	L.S.	$6,000,000	$6,000,000		
WATER TREATMENT PLANT (10 mgd)	L.S.	$8,920,000	$8,920,000		
MAJOR TRANSMISSION	L.S.	$5,154,600		$5,154,600	
RESERVOIRS	L.S.	$1,100,000		$1,100,000	
SPARKS STORAGE AND PUMPING	L.S.	$180,000		$180,000	
MAJOR TRANSMISSION LOOPING	L.S.	$1,200,000		$1,200,000	
EXISTING SUBDIVISIONS DISTRIBUTION	L.S.	$3,281,000			$3,281,000
CONTINGENCIES	10%	$1,983,560	$892,000	$763,460	$328,100
ENGINEERING	10%	$2,181,916	$981,200	$839,806	$360,910
FUNDING OF INITIAL WATER RIGHTS	L.S.	$250,000			$250,000
TOTAL PHASE I CONSTRUCTION COST		$30,251,076	$16,793,200	$9,237,866	$4,220,010

* Regardless of the entity financing or backing the bonds or costs, the EPCLVWDA would be fully responsible for the generation of sufficient revenues to repay these debt service obligations.

TABLE 3.3-2
BOND COST SUMMARY

10 MGD WTP AND ACQUISITION OF EXISTING SYSTEM THAT PSB FINANCES
OTHER MAJOR INFRASTRUCTURE BY
EL PASO COUNTY LOWER VALLEY WATER DISTRICT AUTHORITY
(1987 Dollars)

ITEM	BASIS	DISTRICT FINANCING BACKED BY WATER DEV. FUND *	FINANCING BY EPCLVWDA *	TOTAL EPCLVWDA BONDS
I. CONSTRUCTION COSTS				
A. CONSTRUCTION COSTS (1987$)	L.S.	$7,634,600	$3,281,000	$10,915,600
B. CONTINGENCIES	10.0%	$763,460	$328,100	$1,091,560
C. ENGINEERING	10.0%	$839,806	$360,910	$1,200,716
D. ACQUIRE INITIAL WATER RIGHTS	L.S.	$0	$250,000	$250,000
D. TOTAL CONSTRUCTION COSTS		$9,237,866	$4,220,010	$13,457,876
II. NON-CONSTRUCTION COSTS				
A. COST OF ISSUANCE		$1,013,700	$440,432	$1,454,132
B. CAPITALIZED INTEREST (2 yrs)		$2,261,000	$2,264,658	$4,525,658
C. RESERVE FUND (1 yr)		$1,277,430	$750,000	$2,027,430
D. TOTAL NON-CONSTRUCTION COSTS		$4,552,130	$3,455,090	$8,007,220
III. ESTIMATED PHASE I BOND ISSUE REQUIREMENTS *		$13,789,996	$7,675,100	$21,465,096

* Includes combined Tax and Revenue Bonds.

The bond financing costs include moneys for making the first several years debt service payments so as to ease the initial cost effects on the District residents, moneys for a reserve fund to be drawn on to make debt service payment in the case of a major plant breakdown or some other unforeseen financial emergency, and other costs associated with legal and financial advisors and the costs of bond issuance.

The District is seeking financial assistance with or placement of eligible bond costs with the Texas Water Development Fund to reduce the interest rate on the bond sale. The remainder of District bonds would either be privately placed or be sold on the open market.

The District is also seeking financial support though grants from philanthropic organizations to help reduce the cost of the proposed system.

3.3.7 Proposed District Revenue Sources

In terms of moneys that would be required to support the bond debt service, the District is proposing a mix of utility rate and tax revenues which would spread the cost responsibilities over both the utility customers of the District who would benefit directly from safe, dependable potable water service and property owners within the District who can benefit from the increased health and well-being of the public, expanded economic growth potential and increases in property values.

The District is considering the future levy of an overall District tax rate of $0.51 per $100 of property valuation, with $0.46 of that going towards the proposed bond debt service and $0.05 for the maintenance and operation of the District. The $0.46 tax levied for debt service would support about $14.184 million in tax-funded bonds in the early years of the system, leaving a remaining $7.281 million in bond needs to be covered with utility rate revenues (see Table 3.3-3). As the economy within the District grows and the tax base expands,

TABLE 3.3-3
DISTRIBUTION OF DISTRICT BONDING SOURCES

10 MGD WTP & ACQUISITION OF EXIST. SYSTEM THAT PSB
FINANCES AND OTHER MAJOR INFRASTRUCTURE BY
EL PASO COUNTY LOWER VALLEY WATER DISTRICT AUTHORITY
(1987 Dollars)

ITEM	AMOUNT
INITIAL TAX REVENUES	
PROJ. 1990 ASSESSED VALUATION (mill.$)	$339.838
/ PER $100	$100
= EFFECTIVE VALUATION BASE (mill.$)	$3.398
X PROPOSED I&S TAX RATE ($)	$0.46
X EST. COLLECTION RATE	85.0%
= EST. TAX REVENUES (mill.$)	$1.329
DISTRIBUTION OF BONDING REQUIREMENTS (mill.$)	
TOTAL INITIAL DISTRICT BONDING NEED	$21.465
- BONDS SUPPORTED WITH TAXES *	$14.184
= BONDS SUPPORTED WITH RATES *	$7.281

* Assumes 8% annual interest & 25 year term.

the District tax rate supporting the fixed debt service requirements can be reduced over time.

In addition to District tax revenues, utility rates and charges are proposed to cover the remaining costs of the system including: the portion of District bond debt service requirements not covered with taxes; wholesale water costs from the PSB; operations, maintenance and administrative costs of the District; and payments for maintenance or acquisition of surface water rights. These costs that would be borne by customers through their utility rates are estimated to total about $4.158 million annually in the early 1990's with an estimated customer base of 9,500 connections (see Table 3.3-4).

3.3.8 Projected Average Costs to District Residents

As previously discussed, the District is proposing to support the future water system with both tax and utility rate revenues so the cost effect would be somewhat different for each individual person, family or business.

Given the projected initial overall District tax rate of $0.51 per $100 valuation, a property owner within the District would pay $5.10 per year or $0.43 per month for each $1,000 of taxable property. This local tax cost may be offset somewhat by Federal income tax deductions.

Based on a typical monthly water usage of 15,500 gallons per customer or household, the projected bill arising from the water rate charges would total about $36.47 per month.

So for a customer with a $30,000 house that uses 15,500 gallons of potable water per month, the monthly cost of water would be $12.75 through District taxes and $36.47 through the water rates or a total monthly bill of $49.22 (see Table 3.3-4). A customer with a $60,000 house using the same water volume would pay a total $62.00 per month in both taxes and water rate costs.

TABLE 3.3-4
ESTIMATED MONTHLY AVERAGE CUSTOMER COST

10 MGD WTP & ACQUISITION OF EXIST. SYSTEM THAT PSB FINANCES AND OTHER MAJOR INFRASTRUCTURE BY EL PASO COUNTY LOWER VALLEY WATER DISTRICT AUTHORITY
(1987 Dollars)

ITEM	AMOUNT
CALCULATION OF MONTHLY AVG. TAX COST	
ASSESSED VALUATION OF AVG. HOUSE ($)	$30,000
/ PER $100	$100
= EFFECTIVE VALUATION BASE ($)	$300
X PROPOSED I&S AND M&O TAX RATES ($)	$0.51
= EST. ANNUAL TAX COST ($)	$153
/ 12 MONTHS	12
= EST. MONTHLY TAX COST/CUSTOMER ($)	$12.75
CALCULATION OF MONTHLY WATER RATE COSTS	
DISTRICT REVENUE BOND AVG. ANN. DEBT SERVICE COSTS (mill.$) *	$1.023
+ PSB AVG. ANN. DEBT SERVICE **	$2.107
+ OPERATIONS & MAINTENANCE COSTS	$0.572
+ WATER RIGHTS COSTS	$0.300
+ ADMINISTRATIVE COSTS	$0.300
- O&M TAX REVENUES	$0.144
= ANN. COSTS COVERED THROUGH RATES	$4.158
/ NUMBER OF INITIAL CUSTOMERS	9,500
= ANNUAL RATE COST PER CUSTOMER	$437.65
MONTHLY RATE COST PER CUSTOMER	$36.47
CALCULATION OF TOTAL MONTHLY WATER COSTS	
MON. COSTS THROUGH RATES PER CUSTOMER	$36.47
MON. COSTS THROUGH TAXES PER CUSTOMER	$12.75
EST. TOTAL MONTHLY COSTS PER CUSTOMER	$49.22

* Assumes 8% annual interest, 25 year term and 1.5 times coverage.

** Includes 1.25 times coverage, but does not reflect PSB usage of the plant which would reduce this cost.

In considering the affordability of the proposed new potable water system, these projected monthly costs should be compared against current costs and methods of obtaining potable water. For the few District residents in Socorro and Clint that already receive potable water from El Paso PSB, the typical customer water bill currently ranges from $15 to $18 per month or $34 to $31 per month lower than the expected total cost of the new District system of $49 per month.

For those existing District residents that pay to have water hauled to their homes, their current cost is about $80.00 per month or $30 higher than the expected total monthly cost of the new District potable water system.

3.4 PROJECTED BENEFITS OF A POTABALE WATER SYSTEM

Projected benefits of the District water system that should weight in the overall evaluation of the proposal are:

(1) the provision of a safe, dependable and convenient source of drinking water,

(2) reduction of significant health problems associated with the drinking of contaminated water,

(3) provision of water for firefighting,

(4) removal of constraint on economic growth caused by current lack of potable water in the Lower Valley,

(5) likely increases in property values caused by the availability of potable water and expanded economic growth, and

(6) increased regulatory control to minimize sub-standard development through proposed District policies on septic tanks and plumbing codes, resulting in better home construction and improved ground-water quality.

4.0 PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

4.1 WATER RIGHTS ACQUISITION

Regardless of whether a stand-alone or joint-venture option is pursued, it is imperative that an aggressive program to acquire the use of surface water rights be implemented as quickly as possible.

Surface water is available by two means of acquisition. One would be to purchase land having water irrigation rights assigned to the land. This would be expensive and create additional problems as to managing the land. The other alternative is to lease irrigation rights from the El Paso County Water Improvement District #1. Leasing the rights makes available water assigned to the land from March 1st to September 30th when reservoir releases occur.

The basic allotment to the lease provides two acre-feet of water. However, when water is readily available, additional footage of water can be purchased as excess or return flow. The leasing rate is presently $28.25 per acre for two feet of allotment. Additional footage of water is $13.00 per foot or prorated for fractions of rights that are leased, but if water is not utilized that year, only the basic charge of $28.25 is billed. There is a $6.00 accounting fee per contract.

Water rights can be obtained when subdivisions are created and land is removed from crop production. This could be a condition placed on subdivisions receiving potable water from LVWDA. As accounts become delinquent, LVWDA can contact persons not interested in retaining their water rights and lease them for a given period of time up to 75 years.

The water obtained by leasing irrigation rights can be utilized either by a surface water plan or traded with other communities for potable or already treated water.

4.2 PRIORITIZATION OF STAND-ALONE VS. JOINT-VENTURE PROJECTS

In terms of prioritizing the commitment of additional District activities and resources, it is our recommendation that the joint-venture water system project receive primary consideration and that a stand-alone water system receive secondary attention. This in no way, should be construed to stop District-initiated activities related to the ground-water testing or possible subsequent contract negotiation with these ground-water suppliers.

4.3 ONGOING POLICY FOR GROUND-WATER ACQUISITION

The quest for potable ground water should be an ongoing policy till all options are exhausted. Potable ground water is one of the cheapest sources that can be utilized by the public. As the district's distribution grows, ground water can be used to bolster summer demands in certain areas, supplement basic demands and be required in winter months when irrigation water is not available for treatment.

Also useful information is derived from continual exploration and testing because it reveals what qualities and potential quantities might be developed in the future. As potential well field sites are pursued, an evaluation should be performed to assess the quantity and quality of the proposed site. Also, if borderline or slightly saline water is available, future technology may make these waters economically possible to use, while they aren't at the present time. Also these slightly saline waters could be blended with other treated water to extend the available quantities that might be required at various tiems and circumstances (i.e., fires, droughts, other emergencies, etc.).

4.4 FURTHER ACTIVITIES ON JOINT-VENTURE ALTERNATIVES

Additional activities needed to delineate the joint-venture project include: identification and timing of capacity needs of each party; more detailed treatment plant siting, sizing and costing; further identification of additional facility requirements, sizing and costing; economic evaluation of this alternative; and determination of ownership and other contractural provisions. The timing of these efforts will depend, in part, on the cooperation and responsiveness of the other joint-venture party. We have requested to this party that activities commence immediately to sufficiently delineate the joint-venture project for District feasibility and bond sizing consideration.

4.5 PREPARATION OF TEXAS WATER DEVELOPMENT FUND APPLICATION

Once the system alternatives have been evaluated by the Board and a method of approach selected, we recommend that the District authorize the Engineers, Financial Advisors and Attorney to proceed with the preparation of the various application requirements for submission to the Texas Water Development Board for Water Development Fund financial assistance.

Water Service Feasibility Study
For The El Paso County
Lower Valley Water District Authority
Contract No.8-483-509

The following maps are not attached to this report. They are located in the official file and may be copied upon request.

Map No.1-Exhibit 1 Boundary Map

Map No.2-Exhibit 2 Facilities Map-Stand Alone System

Map No.3-Exhibit 3 Facilities Map-Joint Venture System

Please contact Research and Planning Fund Grants Management Division at (512)463-7926 for copies.