

Appendix F
Water Demand
Information

Appendix F1
Water Use by County

Table F1-1. Mora County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000

Page 1 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground-water	Surface Water	Ground-water	Surface Water	Ground-water			
2000 Water Year									
Commercial (self-supplied)	0	6	0	6	0	0	6	6	0
Domestic (self-supplied)	0	343	0	343	0	0	343	343	0
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	32,626	45	15,196	38	17,430	7	32,671	15,234	17,437
Livestock (self-supplied)	135	146	135	146	0	0	280	280	0
Mining (self-supplied)	0	0	0	0	0	0	0	0	0
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	305	0	177	0	129	305	177	129
Reservoir evaporation	0	0	0	0	0	0	0	0	0
Totals	32,761	845	15,331	710	17,430	136	33,606	16,041	17,566
1995 Water Year									
Commercial (self-supplied)	0	6	0	3	0	4	6	3	4
Domestic (self-supplied)	0	290	0	130	0	159	290	130	159
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	36,450	35	16,946	30	19,504	5	36,485	16,976	19,509
Livestock (self-supplied)	146	157	146	157	0	0	303	303	0
Mining (self-supplied)	0	0	0	0	0	0	0	0	0
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	232	0	104	0	127	232	104	127
Reservoir evaporation	0	0	0	0	0	0	0	0	0
Totals	36,596	720	17,092	424	19,504	295	37,316	17,516	19,799
1990 Water Year									
Commercial (self-supplied)	0	0	0	0	0	0	0	0	0
Domestic (self-supplied)	0	150	0	67	0	83	150	67	83
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	38,128	46	17,676	39	20,452	7	38,174	17,715	20,459

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-1. Mora County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000

Page 2 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground-water	Surface Water	Ground-water	Surface Water	Ground-water			
1990 Water Year (continued)									
Livestock (self-supplied)	130	146	130	146	0	0	276	276	0
Mining (self-supplied)	0	0	0	0	0	0	0	0	0
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	263	0	90	0	173	263	90	173
Reservoir evaporation	0	0	0	0	0	0	0	0	0
Totals	38,258	605	17,806	342	20,452	263	38,863	18,148	20,715
1985 Water Year									
Commercial	0	0	0	0	0	0	0	0	0
Fish and wildlife	2,162	0	2,162	0	0	0	2,162	2,162	0
Industrial	0	0	0	0	0	0	0	0	0
Irrigated agriculture	41,334	8	15,332	6	26,002	2	41,342	15,338	26,004
Livestock	151	154	151	153	0	1	305	304	1
Military	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0
Power	0	0	0	0	0	0	0	0	0
Recreation	0	5	0	5	0	0	5	5	0
Reservoir evaporation	1,727	0	1,727	0	0	0	1,727	1,727	0
Rural	0	465	0	209	0	256	465	209	256
Stockpond evaporation	497	0	497	0	0	0	497	497	0
Urban	0	0	0	0	0	0	0	0	0
Totals	45,871	632	19,869	373	26,002	259	46,503	20,242	26,261
1980 Water Year									
Commercial	0	0	0	0	0	0	0	0	0
Fish and wildlife	2,162	0	2,162	0	0	0	2,162	2,162	0
Industrial	0	0	0	0	0	0	0	0	0
Irrigated agriculture	42,660	0	19,550	0	23,110	0	42,660	19,550	23,110

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-1. Mora County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000

Page 3 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground- water	Surface Water	Ground- water	Surface Water	Ground- water			
1980 Water Year (continued)									
Livestock	221	232	221	230	0	2	453	451	2
Military	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0
Power	0	0	0	0	0	0	0	0	0
Recreation	0	0	0	0	0	0	0	0	0
Reservoir evaporation	1,727	0	1,727	0	0	0	1,727	1,727	0
Rural	0	430	0	193	0	237	430	193	237
Stockpond evaporation	497	0	497	0	0	0	497	497	0
Urban	0	0	0	0	0	0	0	0	0
Totals	47,267	662	24,157	423	23,110	239	47,929	24,580	23,349
1975 Water Year									
Fish and wildlife	1,959	0	1,959	0	0	0	1,959	1,959	0
Irrigated agriculture	44,700	0	20,140	0	24,560	0	44,700	20,140	24,560
Livestock	168	168	168	168	0	0	336	336	0
Manufacturing	0	4	0	2	0	2	4	2	2
Military	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0
Playa lake evaporation	0	0	0	0	0	0	0	0	0
Power	0	0	0	0	0	0	0	0	0
Recreation	0	0	0	0	0	0	0	0	0
Reservoir evaporation	1,600	0	1,600	0	0	0	1,600	1,600	0
Rural	0	447	0	201	0	246	447	201	246
Stockpond evaporation	497	0	497	0	0	0	497	497	0
Urban	0	0	0	0	0	0	0	0	0
Totals	48,924	619	24,364	371	24,560	248	49,543	24,735	24,808

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-2. San Miguel County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground-water	Surface Water	Ground-water	Surface Water	Ground-water			
2000 Water Year									
Commercial (self-supplied)	164	186	164	168	0	18	350	332	18
Domestic (self-supplied)	0	989	0	989	0	0	989	989	0
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	47,838	0	18,370	0	29,468	0	47,838	18,370	29,468
Livestock (self-supplied)	297	343	297	343	0	0	640	640	0
Mining (self-supplied)	0	1	0	0	0	1	1	0	1
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	2,607	351	922	197	1,686	154	2,959	1,119	1,840
Reservoir evaporation	47,653	0	47,653	0	0	0	47,653	47,653	0
Totals	98,560	1,871	67,406	1,697	31,154	173	100,430	69,103	31,327
1995 Water Year									
Commercial (self-supplied)	185	135	170	82	15	52	319	252	67
Domestic (self-supplied)	0	798	0	359	0	439	798	359	439
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	29,512	0	11,388	0	18,124	0	29,512	11,388	18,124
Livestock (self-supplied)	325	371	325	371	0	0	696	696	0
Mining (self-supplied)	0	20	0	4	0	16	20	4	16
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	2,879	408	1,014	223	1,865	185	3,287	1,237	2,050
Reservoir evaporation	47,406	0	47,406	0	0	0	47,406	47,406	0
Totals	80,307	1,732	60,303	1,040	20,004	693	82,039	61,343	20,697
1990 Water Year									
Commercial (self-supplied)	105	262	97	128	8	134	367	225	142
Domestic (self-supplied)	0	570	0	257	0	313	570	257	313
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	37,362	432	17,176	354	20,186	78	37,794	17,530	20,264

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-2. San Miguel County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000
Page 2 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground-water	Surface Water	Ground-water	Surface Water	Ground-water			
1990 Water Year (continued)									
Livestock (self-supplied)	276	328	276	327	0	1	604	603	1
Mining (self-supplied)	0	25	0	4	0	21	25	4	21
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	2,883	120	1,014	53	1,869	67	3,003	1,067	1,936
Reservoir evaporation	23,971	0	23,971	0	0	0	23,971	23,971	0
Totals	64,597	1,737	42,534	1,123	22,063	614	66,334	43,657	22,677
1985 Water Year									
Commercial	0	207	0	104	0	103	207	104	103
Fish and wildlife	9,056	0	1,953	0	7,103	0	9,056	1,953	7,103
Industrial	0	8	0	8	0	0	8	8	0
Irrigated agriculture	25,986	407	10,953	264	15,033	143	26,393	11,217	15,176
Livestock	312	318	312	317	0	1	630	629	1
Military	0	0	0	0	0	0	0	0	0
Minerals	0	29	0	6	0	23	29	6	23
Power	0	0	0	0	0	0	0	0	0
Recreation	112	82	0	73	112	9	194	73	121
Reservoir evaporation	26,867	0	26,867	0	0	0	26,867	26,867	0
Rural	0	671	0	303	0	368	671	303	368
Stockpond evaporation	724	0	724	0	0	0	724	724	0
Urban	3,008	0	1,354	0	1,654	0	3,008	1,354	1,654
Totals	66,065	1,722	42,163	1,075	23,902	647	67,787	43,238	24,549
1980 Water Year									
Commercial	0	64	0	38	0	26	64	38	26
Fish and wildlife	707	0	519	0	188	0	707	519	188
Industrial	0	0	0	0	0	0	0	0	0
Irrigated agriculture	27,400	440	12,680	250	14,720	190	27,840	12,930	14,910

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-2. San Miguel County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000
Page 3 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Total Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground- water	Surface Water	Ground- water	Surface Water	Ground- water			
1980 Water Year (continued)									
Livestock	328	340	328	337	0	3	668	665	3
Military	0	0	0	0	0	0	0	0	0
Minerals	0	23	0	5	0	18	23	5	18
Power	0	0	0	0	0	0	0	0	0
Recreation	100	152	57	152	43	0	252	209	43
Reservoir evaporation	30,602	0	30,602	0	0	0	30,602	30,602	0
Rural	0	464	0	209	0	255	464	209	255
Stockpond evaporation	724	0	724	0	0	0	724	724	0
Urban	2,644	7	1,190	3	1,454	4	2,651	1,193	1,458
Totals	62,505	1,490	46,100	994	16,405	496	63,995	47,094	16,901
1975 Water Year									
Fish and wildlife	404	0	373	0	31	0	404	373	31
Irrigated agriculture	23,280	450	10,850	250	12,430	200	23,730	11,100	12,630
Livestock	320	320	320	320	0	0	640	640	0
Manufacturing	0	29	0	17	0	12	29	17	12
Military	0	0	0	0	0	0	0	0	0
Minerals	0	20	0	4	0	16	20	4	16
Playa lake evaporation	0	0	0	0	0	0	0	0	0
Power	0	0	0	0	0	0	0	0	0
Recreation	0	100	0	100	0	0	100	100	0
Reservoir evaporation	19,100	0	19,100	0	0	0	19,100	19,100	0
Rural	0	362	0	163	0	199	362	163	199
Stockpond evaporation	747	0	747	0	0	0	747	747	0
Urban	2,137	0	962	0	1,175	0	2,137	962	1,175
Totals	45,988	1,281	32,352	854	13,636	427	47,269	33,206	14,063

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-3. Guadalupe County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000
Page 1 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground- water	Surface Water	Ground- water	Surface Water	Ground- water			
2000 Water Year									
Commercial (self-supplied)	0	29	0	25	0	4	29	25	4
Domestic (self-supplied)	0	18	0	18	0	0	18	18	0
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	12,685	1,186	5,016	692	7,669	494	13,871	5,708	8,163
Livestock (self-supplied)	75	318	75	318	0	0	393	393	0
Mining (self-supplied)	0	0	0	0	0	0	0	0	0
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	899	0	449	0	449	899	449	449
Reservoir evaporation	12,888	0	12,888	0	0	0	12,888	12,888	0
Totals	25,648	2,450	17,979	1,503	7,669	947	28,098	19,482	8,616
1995 Water Year									
Commercial (self-supplied)	0	22	0	10	0	12	22	10	12
Domestic (self-supplied)	0	96	0	43	0	53	96	43	53
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	18,475	1,761	7,304	1,030	11,171	731	20,236	8,334	11,902
Livestock (self-supplied)	105	438	105	438	0	0	543	543	0
Mining (self-supplied)	0	0	0	0	0	0	0	0	0
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	0	727	0	463	0	265	727	463	265
Reservoir evaporation	14,071	0	14,071	0	0	0	14,071	14,071	0
Totals	32,651	3,044	21,480	1,984	11,171	1,061	35,696	23,464	12,232
1990 Water Year									
Commercial (self-supplied)	0	15	0	7	0	8	15	7	8
Domestic (self-supplied)	0	87	0	39	0	48	87	39	48
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	14,196	943	7,016	545	7,180	398	15,139	7,561	7,578

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-3. Guadalupe County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000

Page 2 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground-water	Surface Water	Ground-water	Surface Water	Ground-water			
1990 Water Year (continued)									
Livestock (self-supplied)	98	415	98	415	0	1	513	513	1
Mining (self-supplied)	0	0	0	0	0	0	0	0	0
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	23	605	21	239	2	366	628	260	368
Reservoir evaporation	4,470	0	4,470	0	0	0	4,470	4,470	0
Totals	18,787	2,066	11,605	1,245	7,182	821	20,853	12,850	8,003
1985 Water Year									
Commercial	0	12	0	6	0	6	12	6	6
Fish and wildlife	41	0	41	0	0	0	41	41	0
Industrial	0	0	0	0	0	0	0	0	0
Irrigated agriculture	16,657	898	6,995	484	9,662	414	17,555	7,479	10,076
Livestock	235	238	235	237	0	1	473	472	1
Military	0	0	0	0	0	0	0	0	0
Minerals	0	5	0	1	0	4	5	1	4
Power	0	0	0	0	0	0	0	0	0
Recreation	26	164	26	108	0	56	190	134	56
Reservoir evaporation	18,566	0	18,566	0	0	0	18,566	18,566	0
Rural	0	770	0	386	0	384	770	386	384
Stockpond evaporation	710	0	710	0	0	0	710	710	0
Urban	0	0	0	0	0	0	0	0	0
Totals	36,235	2,087	26,573	1,222	9,662	865	38,322	27,795	10,527
1980 Water Year									
Commercial	0	10	0	6	0	4	10	6	4
Fish and wildlife	41	0	41	0	0	0	41	41	0
Industrial	0	0	0	0	0	0	0	0	0
Irrigated agriculture	14,240	1,200	7,010	690	7,230	510	15,440	7,700	7,740

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Table F1-3. Guadalupe County Withdrawals, Depletions and Return Flows by OSE Water Use Category, 1975-2000
Page 3 of 3

Use Category	Withdrawal (acre-feet)		Depletion (acre-feet)		Return Flow (acre-feet)		Withdrawal (acre-feet)	Total Depletion (acre-feet)	Total Return Flow (acre-feet)
	Surface Water	Ground- water	Surface Water	Ground- water	Surface Water	Ground- water			
1990 Water Year (continued)									
Livestock	359	365	359	364	0	1	724	723	1
Military	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0
Power	0	0	0	0	0	0	0	0	0
Recreation	26	138	26	108	0	30	164	134	30
Reservoir evaporation	2,301	0	2,301	0	0	0	2,301	2,301	0
Rural	0	714	0	357	0	357	714	357	357
Stockpond evaporation	710	0	710	0	0	0	710	710	0
Urban	0	0	0	0	0	0	0	0	0
Totals	17,677	2,427	10,447	1,525	7,230	902	20,104	11,972	8,132
1975 Water Year									
Fish and wildlife	238	0	238	0	0	0	238	238	0
Irrigated agriculture	14,290	1,320	7,140	760	7,150	560	15,610	7,900	7,710
Livestock	335	335	335	335	0	0	670	670	0
Manufacturing	0	3	0	2	0	1	3	2	1
Military	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0
Playa lake evaporation	0	0	0	0	0	0	0	0	0
Power	0	0	0	0	0	0	0	0	0
Recreation	0	0	0	0	0	0	0	0	0
Reservoir evaporation	200	0	200	0	0	0	200	200	0
Rural	0	218	0	109	0	109	218	109	109
Stockpond evaporation	706	0	706	0	0	0	706	706	0
Urban	0	362	0	181	0	181	362	181	181
Totals	15,769	2,238	8,619	1,387	7,150	851	18,007	10,006	8,001

Sources: Sorensen, 1976; Sorensen, 1981; Wilson, 1986; Wilson, 1992; Wilson and Lucero, 1997; Wilson et al., 2003

Appendix F2

**Public Water Supply
Use Data**

Public Water Supply Systems

County	Surface Water Basin	Ground Water Basin	Water Supplier	Census Classification (Urban/Rural)	Population	Gallons per Capita per Day	Withdrawals (ac-ft/yr)		Depletions (ac-ft/yr)	
							Surface water	Ground-water	Surface water	Ground-water
Guadalupe	Pecos	Not specified	Anton Chico MDWCA	R	300	58	0	19.4	0	9.7
			Los Sisneros MDWCA	R	35	50	0	1.96	0	0.98
			Puerto de Luna MDWCA	R	210	138	0	32.42	0	16.21
			Rio Pecos Villa WUA	R	30	91	0	3.07	0	1.53
			Rural self-supplied homes	R	96	80	0	8.6	0	8.6
			Sangre de Cristo MDWCA	R	100	99	0	11.08	0	5.54
			Santa Rosa Water Supply	R	2,744	202	0	621.13	0	310.57
			Vaughn Water System	R	717	261	0	209.82	0	104.91
Mora	Arkansas-White	Canadian	El Alto MDWCA	R	85	223	0	22.21	0	11.1
			Holman	R	110	59	0	7.32	0	3.66
			La Cordillera	R	50	74	0	4.17	0	2.09
			Mora MDWCA	R	680	286	0	217.67	0	132.78
			Upper Holman	R	110	34	0	4.2	0	2.1
			Wagon Mound MDWCA	R	316	140	0	49.7	0	24.85
San Miguel	Arkansas-White	Upper Pecos	Big Mesa Water Co-op	R	500	150	83.92	0	41.96	0
			Conchas Dam	R	400	207	92.89	0	46.44	0
		Canadian	Pendaries Water System	R	300	103	34.73	0	17.36	0
	Pecos	Upper Pecos	East Pecos MDWCA (1990)	R	600	69	0	46.4	0	23.2
			El Coruco Domestic(est)	R	100	80	0	9	0	4.5
			Ilfield MDWCA	R	160	99	0	17.8	0	8.9
			La Pasada MDWCA	R	150	51	0	8.61	0	4.3
			Las Vegas Water Supply System	U	14,565	146	2,386.63	0	811.45	0
			Pecos Water System	R	1,441	121	0	195.28	0	119.12
			Ribera MDWCA	R	140	75	0	11.79	0	5.89
			Rowe MDWCA	R	103	76	0	8.76	0	4.38
			San Jose MDWCA	R	160	51	9.14	0	4.57	0
			San Miguel	R	40	97	0	4.35	0	2.17
			Sena Water System	R	55	193	0	11.87	0	5.93
			Tecolote Domestic Water Users Assn	R	120	124	0	16.7	0	8.35
Tecolotito MDWCA	R	250	75	0	20.9	0	10.45			

Source: Modified from Wilson et al., 2003

Appendix F3
Growth Projections

**PROJECTION OF
GUADALUPE, MORA & SAN MIGUEL COUNTY
REGIONAL GROWTH, 2000-2040
Southwest Planning & Marketing
August, 2004**

To project future water demand in Guadalupe, Mora and San Miguel counties, which make up a water planning region in Northeastern New Mexico, it is necessary to project the future growth of the area's population and economy. Growth must be forecast in each of eight sectors (two other sectors, fish and wildlife and reservoir evaporation, are not driven by demand):

1. Residential (self-supplied)
2. Commercial (self-supplied)
3. Municipal water supply
4. Industrial (self-supplied)
5. Power (self-supplied)
6. Mining (self-supplied)
7. Irrigated Agriculture
8. Livestock (self-supplied)

Southwest Planning & Marketing (SPM) forecast growth in ten-year increments from 2000 to 2040. In the balance of this report, growth is projected in each of these sectors. For convenience of organization, the eight sectors are grouped into three categories:

1. Residential, municipal and commercial,
2. Industrial, mining, and power generation,
3. Irrigated agriculture and livestock.

The growth of the first category of water users -- self-supplied-residential, self-supplied commercial and municipal users – parallels the growth of the regional population.

1. Process

Southwest Planning & Marketing (SPM) has projected the future growth of the population and growth of the sectors of the economy for the planning region on a County and sub-region level as a first step toward making a determination of potential future water use in the region. All projections are made using two different growth scenarios, referred to as Low and High.

SPM collected data on historic population growth in all three counties and the cities of Las Vegas and Santa Rosa, and examined other growth forecasts. In addition, we examined trends in land use, changes and trends in each sector, and proposed or potential future development. We also reviewed demographic and economic information, population projections, and water use trends from a draft of the Santa Rosa water plan.

We used this information to guide the development of our High and Low growth forecasts and projected changes for each sector.

The projection for San Miguel County is broken out to show separately the sub-region of Las Vegas because it contains approximately half of the County's population. The same is true of Guadalupe County and the City of Santa Rosa. No sub-regions are included in Mora County because it has no large concentrations of people.

2. Population Growth Projections by County

Future water supply requirements in New Mexico and the Mora-San Miguel-Guadalupe water planning region will depend in large measure on the degree of future population growth. All of the counties in the region are rural. There has been a national trend for businesses and self-employed individuals to relocate to rural communities with a high quality of life. This trend has spurred in-migration into the Rocky Mountain States to communities such as Santa Fe, Flagstaff, and Durango. Communities along the Interstate 25 corridor between Santa Fe and Las Vegas in San Miguel County are well within the Santa Fe commuter shed, allowing people to live in rural mountain communities and still take advantage of employment opportunities and the social and cultural amenities of Santa Fe. This trend has been accelerated by the Information Revolution that allows people to live in remote areas and telecommute. In addition, new wealth and the retirement of the baby boom generation has spurred in-migration to the Sun Belt for its mix of mild climate, recreational assets and unique natural environment. To the degree that these trends continue and municipalities and county governments in San Miguel County, and to a lesser extent Mora County, position themselves to take advantage of it, there will be additional growth in population. These trends are not a significant factor in Guadalupe County. Santa Rosa is primarily dependent on commercial businesses focused on tourism and travelers that arrive on Interstate 40. The economy of much of the rest of the county is based on ranching and agriculture.

The Bureau of Business and Economic Research (BBER) prepared county-level population forecasts for the Interstate Stream Commission (ISC) specifically for water planning purposes using data and historic trends from 1960 up to the 2000 Census. The projections were done in five year increments through 2060. The data prepared for the Interstate Stream Commission breaks out a portion of eastern San Miguel County which was part of a separate ISC water planning region. BBER treated this area, including Conchas Lake, as a separate entity for the purpose of making population projections for the ISC. SPM determined through data collection and interviews that there is no significant difference in population characteristics between the two parts of San Miguel County as it is broken out by BBER that would warrant separate analysis or projections. Therefore, SPM combined the data for the two sections of San Miguel to represent the County population projections as a whole. BBER did no such breakout of the population projections for Guadalupe and Mora counties. SPM used the BBER projections for Guadalupe and Mora as is.

2.1 Guadalupe County Population Projections

The economy of Guadalupe County outside of Santa Rosa is heavily dependent on ranching. The economy of Santa Rosa, on the other hand, is heavily dependent on recreational tourism and Interstate 40 travelers. Outdoor recreation in and near Santa Rosa largely consists of water attractions including Blue Hole Lake, Twin Lake, Perch Lake, Park Lake, and Santa Rosa Lake. Santa Rosa Lake State Park alone had over 55,000 visitors in 2003.

In 2000, Santa Rosa's population accounted for 55% of the county's total population -- 2,744 of the county's 4,969 residents lived in Santa Rosa. Since ranching is an established and relatively stable sector of the county's economy, we do not foresee a major population shift in regions of the county that are predominantly rural in nature. Santa Rosa is and will continue to be the largest factor affecting the population of Guadalupe County as a whole. In fact, from April 1, 1960 to April 1, 2000, Guadalupe County lost 930 residents while the population of Santa Rosa grew by 524 residents.

Our Low growth projection shows essentially no overall growth for Guadalupe County over 40 years. Our Low projection assumes that the population outside of Santa Rosa will continue to decline as it has over the last 40 years, while Santa Rosa itself shows relatively robust growth due to economic expansion.

We used the BBER growth projections as our High projection, showing annual compounded growth rates in 10-year increments, as compared with BBER's 5-year increments. The High growth scenario shows county-wide growth rates that are approximately 64 percent of the growth rates of Santa Rosa. This growth assumes the sustained well-being or expansion of the region's agricultural economy and some development in communities outside of Santa Rosa.

Guadalupe Population Projections					
Growth Rate					
'00	'10	'20	'30	'40	
---	-0.02%	-0.01%	0.00%	0.01%	Low
---	1.23%	0.80%	0.41%	0.12%	High
Population					
'00	'10	'20	'30	'40	
4,696	4,687	4,682	4,682	4,687	Low
4,696	5,304	5,748	5,989	6,059	High

2.1.1 City of Santa Rosa Growth

From 1960 to 2000 the population of Santa Rosa, according to the Bureau of Business & Economic Research (BBER), grew from 2,220 residents to 2,744 residents. The 40-year growth rate projections made by BBER for Guadalupe County are being used in the City

of Santa Rosa water plan that is currently being completed by city staff and consultants. The BBER rates are used as a “Low Growth Scenario” in the city’s plan. Two additional growth scenarios are also projected in the city’s plan; a “Medium Growth Scenario” assumes that growth will be 50% higher than the BBER rates for the county, and a “High Growth Scenario” assumes that growth will be 100% higher than the BBER rates for the county. Using growth rates that are a set percentage higher than the growth rate for the overall county is consistent with historical trends and is plausible based on the fact that growth is more likely to occur in a population center that has infrastructure and an economic base to support new businesses and residential growth.

Expected expansion of the Guadalupe County Correctional Facility two miles south of Santa Rosa and the addition of two 60 to 80-bed motels in Santa Rosa in the next five years represent significant economic growth. However, a local real estate agent noted that jobs that were created with the opening of the correctional facility in 1999 were expected to stimulate residential growth and home sales in Santa Rosa. The anticipated rise in housing demand never occurred, as most of the jobs were either absorbed by existing residents or were filled by individuals who commute from other counties.

In making population projections, we considered historical population trends, housing market trends, anticipated development, and growth projections made in the Santa Rosa water plan. Our Low growth projection for Santa Rosa assumes a slowly expanding tourist-based economy with little economic diversification. In the Low scenario, all of the County’s population growth happens in Santa Rosa.

Our High growth projection is approximately 48 percent higher than our Low growth projection and falls between the Santa Rosa water plan’s Medium and High growth scenarios. It is approximately 63 percent higher than the BBER projected population growth rates for Guadalupe County. Our High projection assumes a continued robust tourist economy and further economic diversification represented by industries such as the Guadalupe County Correctional Facility. It also assumes the sustained well-being or expansion of the region’s agricultural economy.

Santa Rosa Population Projections					
Growth Rate					
'00	'10	'20	'30	'40	
---	0.92%	0.60%	0.31%	0.09%	Low
---	1.93%	1.26%	0.65%	0.19%	High
Population					
'00	'10	'20	'30	'40	
2,744	3,007	3,193	3,293	3,323	Low
2,744	3,323	3,766	4,018	4,095	High

2.1.2 Growth in the Balance of Guadalupe County

Our Low growth scenario for the portion of the county that lies outside of Santa Rosa shows the difference between projected growth in Santa Rosa and the population loss in the rest of the county, represented by negative growth rates.

Our High growth scenario represents strong growth in Santa Rosa and low growth to slight population loss in the remainder of the county.

County Balance Population Projections					
Growth Rate					
'00	'10	'20	'30	'40	
---	-1.49%	-1.19%	-0.69%	-0.18%	Low
---	0.15%	0.01%	-0.05%	-0.04%	High
Population					
'00	'10	'20	'30	'40	
1,952	1,679	1,489	1,389	1,364	Low
1,952	1,981	1,982	1,971	1,964	High

2.2 Mora County Population Projections

There is a trend toward the purchase and conversion of operating ranches to “gentleman ranches” in Mora County by well-to-do people who use them as retreats and vacation properties. In addition, there is a trend throughout the West, including New Mexico, of developers purchasing ranches and subdividing them into large lots, typically from 2 to 10 acres, to be sold as vacation, second home, and retirement properties. These developments are often in the County’s high country and mountain valleys. This trend suggests that the population of Mora County will increase due to in-migration of this type of resident. Since the population of Mora County is just over 5000 people, a small increase or decrease in total numbers of population can significantly change the population growth rate. For example, the population of Mora County increased by approximately 1000 new residents from 1990 to 2000, or an average of 100 new residents per year. These new residents represent a county growth rate of 22 percent over the same ten year period.

We project the population of Mora County will continue to increase at a very moderate rate as a Low estimate. This estimate assumes that growth due to in-migration of new residents and a slightly positive natural population increase will be nearly balanced by out-migration due to a lack of educational and income-generating opportunities, including a drought-induced decline in ranching and farming activities.

We used BBER population projections for Mora County as our High estimate. We believe this higher growth would be driven by in-migration related to new subdivision development and a positive natural population increase.

Under these forecasts, Mora’s 2000 population of 5,205 will increase to between 6,136 residents and 8,468 residents in 2040.

Mora Population Projections					
Estimated Annual County Growth Rate					
'00	'10	'20	'30	'40	
---	0.75%	0.50%	0.25%	0.15%	<i>Low</i>
---	1.77%	1.42%	1.00%	0.71%	<i>High</i>

Estimated County Population					
'00	'10	'20	'30	'40	
5,205	5,609	5,896	6,045	6,136	<i>Low</i>
5,205	6,203	7,143	7,890	8,468	<i>High</i>

2.3 San Miguel County Population Projections

The economy of San Miguel has historically been driven by the ranching sector. However, a variety of economic development efforts are aimed at creating new employment opportunities that will potentially bring new residents to the county. The Las Vegas San Miguel Economic Development Corporation is actively working on improving the business climate and attracting new businesses to both the City of Las Vegas and San Miguel County by offering incentives and promoting the area’s quality-of-life, favorable climate, recreational opportunities, and institutions such as Highlands University. Las Vegas is well-positioned to take advantage of certain service and industrial development or recruitment opportunities since it has Interstate 25 highway access, passenger and freight rail connections, and a regional airport.

Communities along the Interstate 25 corridor between Santa Fe and Las Vegas in San Miguel County are well within the Santa Fe commuter shed, allowing people to live in rural mountain communities and still take advantage of employment opportunities and the social and cultural amenities of Santa Fe. This trend has been accelerated by the Information Revolution that allows people to live in remote areas and telecommute. In addition, new wealth and the retirement of the baby boom generation has spurred in-migration to the county due to its mix of mild climate, recreational assets and unique natural environment.

2.3.1 San Miguel County Growth

SPM used the BBER projection as our Low growth scenario for the County. Our High projection predicts that the County will grow at a consistent 1.5% compounded rate over 40 years. This scenario assumes that the Southern end of San Miguel County along the Interstate corridor will continue to gain population because it is located within the City of Santa Fe’s commuter shed and offers more affordable and rural living options compared

to adjacent Santa Fe County. The scenario also assumes that economic development efforts will be successful at attracting new businesses and new residents to Las Vegas.

Under these forecasts, San Miguel’s 2000 population of 29,723 will increase to between 43,939 residents and 53,918 residents in 2040.

San Miguel Population Projections					
Growth Rate					
'00	'10	'20	'30	'40	
---	1.41%	1.12%	0.83%	0.57%	<i>Low</i>
---	1.50%	1.50%	1.50%	1.50%	<i>High</i>
Population					
'00	'10	'20	'30	'40	
29,723	34,190	38,218	41,512	43,939	<i>Low</i>
29,723	34,495	40,033	46,459	53,918	<i>High</i>

2.3.2 Las Vegas Growth

The projections for the city of Las Vegas predict that the extremely low growth experienced by the city over the last 40 years will continue for the next 40 years. In fact, Las Vegas lost approximately 300 residents between 2000 and 2002, despite the fact the county as a whole experienced growth.

Under these forecasts, Las Vegas will have a population of between 14,530 and 18,183 residents by 2040.

Las Vegas Population Projections					
Growth Rate					
'00	'10	'20	'30	'40	
---	0.00%	0.00%	0.00%	0.00%	<i>Low</i>
---	0.25%	0.50%	0.75%	0.75%	<i>High</i>
Population					
'00	'10	'20	'30	'40	
14,530	14,530	14,530	14,530	14,530	<i>Low</i>
14,530	14,897	15,659	16,874	18,183	<i>High</i>

2.3.3 Growth in the Balance of San Miguel County

The remainder of San Miguel County’s overall growth will take place outside of Las Vegas. The area outside of Las Vegas is expected to grow from a 2000 population of 15,193 residents to between 29,409 and 35,735 people, accounting for the majority of future growth in San Miguel.

County Balance Population Projections					
Growth Rate					
'00	'10	'20	'30	'40	
---	2.61%	1.88%	1.31%	0.86%	<i>Low</i>
---	2.58%	2.20%	1.96%	1.91%	<i>High</i>
Population					
'00	'10	'20	'30	'40	
15,193	19,660	23,688	26,982	29,409	<i>Low</i>
15,193	19,597	24,373	29,585	35,735	<i>High</i>

2.4 Water Planning Region (Tri-County) Population Projections

The overall growth of the region is the sum of the individual population projections for each county. We project the Mora-San Miguel-Guadalupe Water Planning Region, including all of San Miguel County, will grow from a population of nearly 40,000 in 2000 to a population of over 55,000 in the Low growth scenario and over 68,000 in the High growth scenario by 2040.

Mora-San Miguel-Guadalupe Population Projections					
'00	'10	'20	'30	'40	
39,624	44,486	48,796	52,238	54,762	<i>Low</i>
39,624	46,002	52,923	60,338	68,445	<i>High</i>

3. Residential, Commercial, & Municipal Sector Growth Projections (Sector 1)

Future water demand by residential self-supplied, commercial self-supplied and municipal users will depend in large part on the degree of future population growth. (Of course, demand will also be affected by other factors, such as the cost of water and electricity and the availability of new water-conserving technologies.) The Low scenario for each of the counties assumes that the residential, commercial, and municipal sectors will follow the Low population projection for its corresponding county, and the High

projection assumes that the same sectors will follow the High population projection for its corresponding county.

We conducted research and interviews within the region to identify factors that could affect growth in the counties as a whole and within the Las Vegas and Santa Rosa sub-regions. (See list of references and contacts.) What follows are sector growth projections, tables with projected annual growth rates, and narratives describing factors that could affect sector growth in each county.

3.1 Guadalupe County Projected Growth in Sector 1

According to Guadalupe County staff and area real estate agents, there is little current or proposed residential development in the county. In northwest Guadalupe in the community of Milagro, there is a subdivision of twenty 20-acre lots under development, and in Cuervo there is a large-lot subdivision of 140-acre tracts. These subdivisions and developments are not large enough or numerous enough to indicate that residential development will significantly increase in the near future.

The construction of the Guadalupe County Correctional facility in 1999 two miles south of Santa Rosa was expected to result in an increase in short-term residential real estate development in the area. The opening of the 600-person capacity institution had almost no impact on the market according to area real estate professionals.

Near-term real estate activity and growth projections, coupled with historical population growth trends, suggest that substantial economic development outside of the county’s agricultural base will need to occur before we see large changes in the Residential, Municipal, and Commercial sectors in Guadalupe County.

Guadalupe County					
	'10	'20	'30	'40	
Residential	0.62%	0.40%	0.21%	0.06%	Low
	1.23%	0.80%	0.41%	0.12%	High
Municipal	0.62%	0.40%	0.21%	0.06%	Low
	1.23%	0.80%	0.41%	0.12%	High
Commercial	0.62%	0.40%	0.21%	0.06%	Low
	1.23%	0.80%	0.41%	0.12%	High

3.2 Mora County Projected Growth in Sector 1

There is a trend toward converting ranch land to housing subdivisions in Mora County. The anticipated rate and scale of future developments of this type could have a significant impact on water consumption rates and the availability of quality water in the watershed. Such development is typically very low density, consisting of large lots or “ranchettes” rather than urban subdivision forms that have much higher densities. An example of this type of development is the Whispering Pines at Pendaries, which is former ranch land

south of Mora that was subdivided into 44 residential lots of half an acre to three quarters of an acre in size. Such development has the potential to adversely affect both the quantity and quality of surface water that reaches downstream users in addition to affecting groundwater levels due to the sinking of multiple wells to provide water to scattered individual residences.

Mora is a rural county, and the municipal and commercial sectors currently consume very little water. The largest community and County seat of Mora County is the unincorporated village of Mora. A small labor force, underdeveloped infrastructure, scarce services, and a strong agricultural tradition will limit large-scale municipal and commercial growth between now and 2040 in both the village and the County of Mora.

Mora County					
	'10	'20	'30	'40	
Residential	0.75%	0.50%	0.25%	0.15%	Low
	1.77%	1.42%	1.00%	0.71%	High
Municipal	0.75%	0.50%	0.25%	0.15%	Low
	1.77%	1.42%	1.00%	0.71%	High
Commercial	0.75%	0.50%	0.25%	0.15%	Low
	1.77%	1.42%	1.00%	0.71%	High

3.3 San Miguel County Projected Growth in Sector 1

Growth in the residential, municipal, and commercial sectors in San Miguel County will likely happen because of two factors – growth of low density development along the Interstate 25 corridor between Santa Fe and Las Vegas and economic development, particularly in the City of Las Vegas, that will draw new residents into the area for employment.

Communities along the Interstate 25 corridor between Santa Fe and Las Vegas in San Miguel County are well within the Santa Fe commuter shed, allowing people to live in rural mountain communities and still take advantage of employment opportunities and the social and cultural amenities of Santa Fe. In addition, there are significant housing price differences. The average cost of a home in Santa Fe in 2002 was \$189,400 compared with \$112,500 in Pecos in San Miguel County. Therefore, Santa Fe’s future growth will likely spill over into San Miguel County.

The potential for future growth in San Miguel County will be increased by the Information Revolution that allows people to live in remote areas and telecommute. In addition, new wealth and the retirement of the baby boom generation has spurred immigration to San Miguel County due to its mix of mild climate, recreational assets and unique natural environment.

One issue that can temper the potential for future growth in San Miguel County is a lack of sufficient water. This issue has already had a negative impact on economic development and population growth, according to some people we interviewed in Las Vegas. This view is supported by the fact that in September 2003 San Miguel County commissioners denied a developer’s application to build 87 homes on the 2,300 acre Starkey Ranch in Gallinas Canyon, 10 miles north of Las Vegas. The primary reason the commissioners cited for denying the development was the perceived lack of sufficient water.

The Las Vegas San Miguel Economic Development Corporation is actively working on improving the business climate and attracting new businesses to both the City of Las Vegas and San Miguel County by offering incentives and promoting the area’s quality-of-life, favorable climate, recreational opportunities, and institutions such as Highlands University. Las Vegas is well-positioned to take advantage of certain service and industrial development or recruitment opportunities since it has Interstate highway access, passenger and freight rail connections, and a regional airport.

SPM projects residential, municipal, and commercial growth will be consistent with the population growth projections for San Miguel County.

San Miguel County					
	'10	'20	'30	'40	
Residential	1.41%	1.12%	0.83%	0.57%	Low
	1.50%	1.50%	1.50%	1.50%	High
Municipal	1.41%	1.12%	0.83%	0.57%	Low
	1.50%	1.50%	1.50%	1.50%	High
Commercial	1.41%	1.12%	0.83%	0.57%	Low
	1.50%	1.50%	1.50%	1.50%	High

4. Projected Growth in Industrial, Power Generation & Mining Sectors (Sector 2)

Although the Industrial sector in Guadalupe, Mora and San Miguel Counties is not a large driver of the region’s economy, industrial and power generation could be a factor in San Miguel and Guadalupe Counties. These sectors have the potential to use large amounts of water, depending on the scale, type, and processes used to mine, generate power or produce industrial products. It is important to determine each county’s development capacity and growth potential for these sectors.

4.1 Guadalupe County Projected Growth in Sector 2

Our Low estimate for the Industrial, Power Generation and Mining sectors show no growth in the next forty years. There are currently no appreciable mining activities in the

county, and this is not expected to change in either our Low or High projections for the sector. There is the potential to develop the Industrial segment, particularly in Santa Rosa, since it has a relatively large resident workforce, well-developed infrastructure, is located on Interstate 40, and has rail access. This potential is reflected in our High projection. We project no growth in the power generation segment in our Low estimate. The growth shown in our High projection for the segment assumes resumption of hydro-electric power generation at Power Dam Lake near Santa Rosa once safety issues are resolved. It also reflects the potential for the area to benefit from the trend toward large alternative energy power production projects, including wind farms and large solar arrays that are increasingly being proposed and developed in New Mexico. It should be noted that there is typically very little water use associated with renewable energy production such as wind farms and solar arrays.

Guadalupe County					
	'10	'20	'30	'40	
Industrial	0.00%	0.00%	0.00%	0.00%	Low
	1.00%	1.00%	1.00%	1.00%	High
Mining	0.00%	0.00%	0.00%	0.00%	Low
	0.00%	0.00%	0.00%	0.00%	High
Power Generation	0.00%	0.00%	0.00%	0.00%	Low
	1.50%	0.75%	0.05%	0.00%	High

4.2 Mora County Projected Growth in Sector 2

Mora County has little capacity and few assets in terms of transportation, infrastructure, natural resources, or labor force that would lend themselves to either industrial development or power generation. Mora also currently has no mining activity. Our growth assumptions in this sector are based on the expectation that no industrial, mining or power generation operations will be developed in the county.

Mora County					
	'10	'20	'30	'40	
Industrial	0.00%	0.00%	0.00%	0.00%	Low
	0.00%	0.00%	0.00%	0.00%	High
Mining	0.00%	0.00%	0.00%	0.00%	Low
	0.00%	0.00%	0.00%	0.00%	High
Power Generation	0.00%	0.00%	0.00%	0.00%	Low
	0.00%	0.00%	0.00%	0.00%	High

4.3 San Miguel County Projected Growth in Sector 2

SPM does not predict an increase in mining activity over the current activity associated with the small-scale mining operations in southern San Miguel County. The current minimal water use associated with mining is not predicted to significantly increase in the next forty years.

There is significant potential for growth in the industrial sector in San Miguel County. Las Vegas has developed an industrial park and the City’s location offers convenient access to multiple forms of light and heavy transportation, including Interstate 25, freight rail, and a regional airport. In addition, there are local resources such as industrial training programs and an educated labor force due to the close proximity to educational institutions including Luna Vocational Technical Institute and Highlands University.

As a High estimate, we project that industrial growth will be moderate but steady in the next forty years. The Low scenario shows no growth for this sector.

San Miguel County					
	'10	'20	'30	'40	
Industrial	0.00%	0.00%	0.00%	0.00%	Low
	1.00%	1.00%	1.00%	1.00%	High
Mining	0.00%	0.00%	0.00%	0.00%	Low
	0.00%	0.00%	0.00%	0.00%	High
Power Generation	0.00%	0.00%	0.00%	0.00%	Low
	0.00%	0.00%	0.00%	0.00%	High

5. Projected Growth of Irrigated Agriculture & Livestock (Sector 3)

Agriculture and livestock grazing are important sectors of the economies of Guadalupe, Mora and San Miguel counties.

In examining the irrigated agriculture sector for the Mora-San Miguel-Guadalupe region, we used the US Department of Agriculture figures for Acres of Irrigated Cropland as one of the sources for making projections. This figure, published annually, includes land that has the potential to be irrigated or has previously been irrigated, even if it is idle, fallow, or diverted to other uses during the reporting year. Typically the amount of land that is actually irrigated in any given year is some fraction of the Acres of Irrigated Cropland figure. For example, in 1998 Mora County had 15,460 acres of cropland that could potentially be irrigated, but only 14,200 acres were actually irrigated that year. Nevertheless, we use the Irrigated Cropland figure because it represents the amount of land that has the potential to be irrigated in a given year, assuming there are no limiting factors such as low crop prices, drought, the need to let land lie fallow, or other factors that prevent farmers from planting crops that require irrigation. In effect it represents the total amount of land that could potentially require water for irrigation in a County in a given year.

The following are factors that contribute to the potential for changes in both the irrigated agriculture and livestock sectors in the Mora-San Miguel-Guadalupe region.

5.1 Guadalupe County Projected Growth in Sector 3

The economy of Guadalupe County outside of Santa Rosa is heavily dependent on ranching. Approximately 98 percent of cash receipts from agriculture in the county come from ranching and livestock operations. In the mid 1990s, before the drought became severe, there were projected annually to be 44,000 head throughout the county. The county also produces over 7,800 tons of alfalfa hay in the Pecos River valley, with a small amount of other crops such as chile, mostly in the Puerto de Luna area. However, all non-livestock agricultural activities including hay production make up less than two percent of the total agricultural receipts.

Continuing drought conditions have the potential to limit the number of head of cattle or sheep that can be supported per acre. Value-added agricultural production operations such as the cheese factory in Clovis could factor into the expansion of livestock operations in Guadalupe County in the form of dairy operations. Dairies consume large amounts of water, but are not as dependent on weather patterns for their operations since they are localized, thus allowing them to use available well or surface water.

As with other counties in New Mexico and throughout the West, ranch land in Guadalupe County is likely to be lost to low density housing development, subdivisions, and conversion to “ranchettes”. For example the 2,562 acre Pecos River Ranch on US Highway 84 between Santa Rosa and Ft. Sumner on the Pecos River is currently for sale. It is advertised in a national publication that promotes ranch properties as “ranch retreats”, “gentleman’s ranches” or development properties. However, we believe the amount of land in agriculture that could potentially be lost to this type of development is not likely to be a significant factor in Guadalupe County in the next forty years.

We project, as a Low estimate, that activity in the agriculture and livestock segments will remain at current levels and show no growth. As a High estimate, the livestock sector will have a moderate growth rate assuming nearby markets show demand, particularly in the beef industry. Additionally, production of value-added products such as cheese could increase the demand in the region’s agriculture and livestock markets.

		Guadalupe County				
		'10	'20	'30	'40	
Irrigated Agriculture	Low	0.00%	0.00%	0.00%	0.00%	Low
	High	0.10%	0.10%	0.10%	0.10%	High
Livestock	Low	0.00%	0.00%	0.00%	0.00%	Low
	High	0.75%	0.75%	0.75%	0.75%	High

5.2 Mora County Projected Growth in Sector 3

It is estimated that 95 percent of the water consumed by all users in Mora County in 2000 was consumed in irrigated agriculture. The amount of land that can be irrigated in Mora County has remained stable since the mid-1970s at 15,460 acres. Figures for the amount of water used in Mora County by irrigated agriculture over the past 30 years show that, although irrigated agriculture water use fluctuates substantially from year to year, it has remained constant within a range of values. Given that the amount of land in irrigation has been stable for over 30 years, use figures suggest that farmers who irrigate vary their use according to the amount of irrigation water available to them in any given year. This in turn, suggests that adding additional irrigated agriculture in Mora County in the next 40 years would require an increase in the amount of available water.

Consequently, as a Low estimate, we project that the amount of irrigated agriculture will remain at current levels. As a High estimate we project that there will be a very small increase in irrigated agriculture.

Most of the activity in the livestock sector consists of range grazing, primarily of cattle. This requires widely dispersed wells that supply water to stock tanks. One head typically consumes 20 gallons of water per day. Mora County is also home to the Southwest’s largest alpaca ranch, the 1,100 acre Victory Ranch, which supports 200 head of Alpaca. It is undetermined how much water alpaca consume, although it is assumed to be less than a comparable number of cattle.

Continuing drought conditions that will potentially limit the number of head of cattle that can be supported per acre and the conversion of some ranches to low density housing subdivisions are both factors that could reduce the amount of future livestock grazing in Mora County. Therefore, we project that, as a Low estimate, it will remain at current levels. As a High estimate, the livestock sector will have a low growth rate.

		Mora County				
		'10	'20	'30	'40	
Irrigated Agriculture	Low	-0.50%	-0.50%	-0.50%	-0.50%	Low
	High	0.00%	0.00%	0.00%	0.00%	High
Livestock	Low	0.00%	0.00%	0.00%	0.00%	Low
	High	0.75%	0.75%	0.75%	0.75%	High

5.3 San Miguel County Projected Growth in Sector 3

The largest water user in San Miguel County is irrigated agriculture, which consumes approximately 86 percent of the total water used in the County. The amount of land in irrigated agriculture has remained constant for the last 30 years at 13,520 acres.

We project that irrigated agriculture will either continue to hold steady as a Low estimate, based on the assumption that there will continue to be a scarcity of water in the region and the majority of growth in the County will focus on residential, municipal and commercial growth rather than irrigated agriculture. Our High estimate shows a very

small increase in irrigated agriculture based the same conditions noted for Mora, namely increasing the amount of available water.

There is also a large amount of livestock grazing activity in the County, and there are no foreseeable trends that will significantly alter the activity in this sector. We project that water use associated with the livestock sector will have no growth as a Low projection and grow at a low rate as a High projection.

San Miguel County					
	'10	'20	'30	'40	
Irrigated Agriculture	0.00%	0.00%	0.00%	0.00%	Low
	0.10%	0.10%	0.10%	0.10%	High
Livestock	0.00%	0.00%	0.00%	0.00%	Low
	0.25%	0.25%	0.25%	0.25%	High

REFERENCES

Bureau of Business and Economic Research, University of New Mexico, regional water projections for New Mexico Interstate Stream Commission, 2003

Bureau of Business and Economic Research, University of New Mexico, state, regional, county, and community demographic data and analysis, BBER website at <http://www.unm.edu/~bber/>

New Mexico Department of Agriculture, New Mexico Agricultural Statistics 1986

New Mexico Department of Agriculture, New Mexico Agricultural Statistics 1998

New Mexico Agriculture Statistics Service, United States Department of Agriculture web site at <http://www.nass.usda.gov/nm/>

Las Vegas San Miguel Economic Development Corporation (LVSMEDEC) website at <http://www.lvsmedc.org/>

Regional Water Planning Handbook, New Mexico Interstate Stream Commission, 1994

Mora County Population, Employment, Earnings and Personal Income Trends, Sonoran Institute, 2003

San Miguel County Population, Employment, Earnings and Personal Income Trends, Sonoran Institute, 2003

Golf Course-Based Communities in Northern New Mexico comparison data sheet, Southwest Planning & Marketing, 2002

Minutes, Mora-San Miguel Water Plan Committee Meeting, May 27, 2003

City of Santa Rosa 40-Year Water Plan 90% draft, July 2004.

New Mexico Corrections Department, Adult Prisons Division web site at <http://corrections.state.nm.us/prisons/gccf.html>

Northeast New Mexico Counties web site, Guadalupe County information at <http://nenewmexico.com/counties/guadalupe/>

City of Santa Rosa web site at <http://www.srnm.org>

Santa Rosa Chamber of Commerce web site at <http://www.santarosanm.com>

CONTACTS

Manuel Baca –County Manager, Guadalupe County

Randolf Barnhouse – Executive Director, 1000 Friends of New Mexico

Dr. Kenneth Benson – Associate Professor of Environmental Science, New Mexico Highlands University

Philip Don Cantu – County Manager, Mora County

Richard Delgado – Guadalupe County Tourism Director/City of Santa Rosa Visitor Center

Timothy Dodge – City of Santa Rosa Community Development Officer

Darrell Freeman -- Freeman Real Estate Agency of Santa Rosa

Michael Gregory, Jr. – Michael Gregory Real Estate Company

Clarence Montoya – Coordinator, US Department of Agriculture, Resource Conservation & Development program

Dr. Luis Ortiz – Executive Director Las Vegas San Miguel Economic Development Corporation

Marino Rivera – Acequia Association in Mora County

Alex Tafoya – Planning Director, San Miguel County

Antoinette Vigil-Gallegos – President, Las Vegas San Miguel Chamber of Commerce

Max Weber – Foreman, Los Trigos Ranch

Appendix F4
Projected Water Use

Table F4-1. Projected Water Withdrawals by Sector, Mora County

Mora County	2000 Total Withdrawal (ac-ft) ^a	10-Year % Growth by 2010 ^b	2010 Water Use (ac-ft)	10-Year % Growth by 2020 ^b	2020 Water Use (ac-ft)	10-Year % Growth by 2030 ^b	2030 Water Use (ac-ft)	10-Year % Growth by 2040 ^b	2040 Water Use (ac-ft)
commercial low	6	7	7	5	7	2	7	2	8
commercial high	6	19	8	15	9	10	10	7	10
industrial low	0	0	0	0	0	0	0	0	0
industrial high	0	0	0	0	0	0	0	0	0
mining low	0	0	0	0	0	0	0	0	0
mining high	0	0	0	0	0	0	0	0	0
power low	0	0	0	0	0	0	0	0	0
power high	0	0	0	0	0	0	0	0	0
irrigated land low	32,671	-5	31,074	-5	29,555	-5	28,110	-5	26,735
irrigated land high	32,671	1	32,999	1	33,331	1	33,665	1	34,004
livestock low	280	0	280	0	280	0	280	0	280
livestock high	280	8	302	8	326	8	351	8	378
municipal/public low ^c	305	8	329	5	346	3	355	2	360
municipal/public high ^c	305	19	364	15	419	10	463	7	497
domestic low	503	8	542	5	570	3	584	2	593
domestic high	503	19	600	15	690	10	763	7	819

^a Wilson, 2003

^b From Southwest Planning & Marketing, 2004

^c Includes municipal, community, and mutual domestic water consumers associations

Table F4-2. Projected Water Withdrawals by Sector, San Miguel County

San Miguel County	2000 Total Withdrawal (ac-ft) ^a	10-Year % Growth by 2010 ^b	2010 Water Use (ac-ft)	10-Year % Growth by 2020 ^b	2020 Water Use (ac-ft)	10-Year % Growth by 2030 ^b	2030 Water Use (ac-ft)	10-Year % Growth by 2040 ^b	2040 Water Use (ac-ft)
commercial low	332	15	381	11	424	8	460	6	487
commercial high	332	16	385	16	447	16	519	16	602
industrial low	0	0	0	0	0	0	0	0	0
industrial high	0	10	11	10	12	10	13	10	15
mining low	1	0	1	0	1	0	1	0	1
mining high	1	0	1	0	1	0	1	0	1
power low	0	0	0	0	0	0	0	0	0
power high	0	0	0	0	0	0	0	0	0
irrigated land low	47,838	0	47,838	0	47,838	0	47,838	0	47,838
irrigated land high	47,838	1	48,319	1	48,804	1	49,294	1	49,789
livestock low	640	0	640	0	640	0	640	0	640
livestock high	640	3	656	3	672	3	689	3	707
municipal/public low ^c	2,959	11	3,099	5	3,246	4	3,366	3	3,454
municipal/public high ^c	2,959	13	3,156	9	3,456	11	3,845	11	4,284
domestic low	1,303	30	1,689	20	2,036	14	2,319	9	2,527
domestic high	1,303	29	1,684	24	2,094	21	2,542	21	3,071

^a Wilson et al., 2003

^b Southwest Planning & Marketing, 2004

^c Includes municipal, community, and mutual domestic water consumers associations

Table F4-3. Projected Water Withdrawals by Sector, Guadalupe County

Guadalupe County	2000 Total Withdrawal (ac-ft) ^a	10-Year % Growth by 2010 ^b	2010 Water Use (ac-ft)	10-Year % Growth by 2020 ^b	2020 Water Use (ac-ft)	10-Year % Growth by 2030 ^b	2030 Water Use (ac-ft)	10-Year % Growth by 2040 ^b	2040 Water Use (ac-ft)
commercial low	25	0	25	0	25	0	25	0	25
commercial high	25	13	28	8	30	4	32	1	32
industrial low	0	0	0	0	0	0	0	0	0
industrial high	0	10	11	10	12	10	13	10	15
mining low	0	0	0	0	0	0	0	0	0
mining high	0	0	0	0	0	0	0	0	0
power low	0	0	0	0	0	0	0	0	0
power high	0	10	12	7	12	0	12	0	12
irrigated land low	13,871	0	13,871	0	13,871	0	13,871	0	13,871
irrigated land high	13,871	1	14,010	1	14,151	1	14,293	1	14,437
livestock low	393	0	393	0	393	0	393	0	393
livestock high	393	8	423	8	456	8	492	8	530
municipal/public low ^c	899	3	923	2	941	1	951	0	954
municipal/public high ^c	899	15	1,034	10	1,134	5	1,190	1	1,206
domestic low	70	-14	60	-11	53	-7	50	-2	49
domestic high	70	1	71	0	71	-1	71	0	70

^a Wilson et al., 2003

^b Southwest Marketing & Planning, 2004

^c Includes municipal, community, and mutual domestic water consumers associations