Santa Margarita River Conjunctive Use

Pre-Feasibility Plan Formulation Study

Appendices—Pre-Feasibility Cost Estimates

Pre-Feasibility Alternatives Line Item Cost Summaries, Operations, Maintenance Costs, and Total Cost Analyses

San Diego County, California

prepared by



U.S. Department of the Interior Bureau of Reclamation Technical Service Center Denver, Colorado

Santa Margarita River Conjunctive Use

Pre-Feasibility Plan Formulation Study

Appendix A—with Advanced Water Treatment

Pre-Feasibility Alternatives Line Item Cost Summaries, Operations, Maintenance Costs, and Total Cost Analyses

San Diego County, California

prepared by



U.S. Department of the Interior Bureau of Reclamation Technical Service Center Denver, Colorado

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Appendix A—with Advanced Water Treatment

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Santa Margarita Conjunctive Use Project Pre-Feasibility Cost Summary With Advanced Water Treatment

					1/20/2005
	Net Project	Construction	Net Present	С	ost Per
Alternative	Yield	Cost	Value	A	cre-Foot
#	(af)	(\$)	(\$)		(\$/af)
1A	11985	\$ 59,291,411	\$ 418,670,579	\$	699
1B	14785	\$ 65,029,881	\$ 437,762,022	\$	592
1C	14365	\$ 72,171,912	\$ 455,892,644	\$	635
1D	14875	\$ 84,879,796	\$ 463,017,856	\$	623
1E	13770	\$ 69,559,781	\$ 473,187,890	\$	687
1F	12835	\$ 63,673,283	\$ 437,826,750	\$	682
1G	12835	\$ 64,661,920	\$ 440,498,927	\$	686
1H	12580	\$ 80,270,169	\$ 483,402,908	\$	769
11	11985	\$ 59,792,614	\$ 418,370,604	\$	698
2A	10710	\$ 57,305,930	\$ 335,812,680	\$	627
2B	14020	\$ 89,360,710	\$ 407,484,135	\$	581
2C	11560	\$ 62,621,571	\$ 347,081,931	\$	600
2D	11560	\$ 63,610,208	\$ 349,617,994	\$	605
3A	10200	\$ 49,335,123	\$ 389,299,251	\$	763
3B	13000	\$ 55,073,592	\$ 408,374,617	\$	628
3C	12580	\$ 62,215,623	\$ 426,505,239	\$	678
3D	13090	\$ 75,988,566	\$ 439,886,739	\$	672
3E	11985	\$ 59,614,085	\$ 443,820,735	\$	741
3F	11050	\$ 55,469,995	\$ 412,342,047	\$	746
3G	11050	\$ 56,458,632	\$ 415,014,224	\$	751
3H	10795	\$ 72,066,882	\$ 457,934,281	\$	848
31	10200	\$ 49,836,326	\$ 388,637,559	\$	762

Santa Margarita Conjunctive Use Project Pre-Feasibility Construction Costs With Advanced Water Treament





Santa Margarita Conjunctive Use Project Pre-Feasibility Net Present Values With Advanced Water Treament



Santa Margarita Conjunctive Use Project Pre-Feasibility Costs per Acre-foot With Advanced Water Treament

Alternative 1a Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatme	nt		20-Jan-05
Alternative			
1A			
Feature	Component Details	C: I	apital costs tem Costs \$
Diversion dam -Obermeyer installation	280' long, 7.9' high, Replaces existing sheet pile diversion dam	\$	2,738,000
Headworks gates - reconstructed with Obermeyer dam	Increased from 60 to 200 cfs	\$	101,791
O'Neill ditch - widening improvements along with road siphon crossings	Increased from 60 to 200 cfs	\$	406,219
Recharge ponds	Rehab 1-5 existing ponds: 312 AF;	\$	1,261,473
	Construct 2 new ponds, 6&7: 242 AF	\$	2,269,454
Groundwater extraction wells	6 wells, 10 cfs net	\$	812,685
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	87,128
Water treatment plant	Haybarn Canyon; brine disposal assumed included, train 1, 29 cfs	\$	28,740,909
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 24-19 cfs	\$	10,050,353
Storage tanks	At water treatment clearwell or existing		
Pumping plants	Base in water treatment; mid-booster included in pipeline		
Lake O'Neill rehab	LC designs	\$	12,823,400
Open space management zone	Land purchase, included below TOTAL	\$	59.291.411

Alternative 1a Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
Total Construction Costs	\$ 59,291,411
Mobilization 5 %	\$ 2,964,571
Unlisted Items 15 %	\$ 8,893,712
Total Contract Costs	\$ 71,149,693
Contingencies 25 %	\$ 17,787,423
Total Field Costs	\$ 88,937,117
Non-Contract 33 %	\$ 29,349,249
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 131,286,365
PV of Annual O&M Costs	\$ 287,384,214
Net Present Value	\$ 418,670,579
Viald as f	4 4 4 0 0
Yield, ac-m	14100
	11,985
Cost Per Acre-Foot per year	\$ 699

Alternative 1a Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05
Annual Operating costs		
1A	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,591,096
Pumping plants, pipe, O&M		\$ 100,504
Distribution systems, pumping		
flow, cfs (base)	24	
head, ft	500	
flow, cfs (mid)	19	
head, ft	700	
flow, cfs		
head, ft		
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,971,113
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1b Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt	20-Jan-05
Alternative 1B		
Feature	Component Details	Item Costs \$
Alt 1A, plus below		\$ 59,291,411
San Mateo extraction wells (SMC/SOC)	2 new wells, approx 4 cfs new	\$ 309,619
San Mateo pump station and storage		
tank, included below	Q=7 cfs, H=450ft, 1 day storage	\$
Pipeline to Orange County (OC)	23,000 ft, 21" dia, 450' head, flow = 7 cfs	\$ 5,347,351
Well head treatment	7 cfs, chloramination	\$ 81,500
	TOTAL	\$ 65,029,881

Alternative 1b Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
13 Total Construction Costs	\$	65,029,881
Mo	bilization 5 % 🖇	\$ 2,964,571
Unliste	d Items 15 % \$	9,754,482
Total Contract Costs	\$	5 77,748,933
Conting	gencies 25 % \$	§ 19,437,233
Total Field Costs	\$	97,186,167
Non-C	ontract 33 % \$	\$ 32,071,435
Open Space Manag	gement Zone <u></u> \$	\$ 13,000,000
Total Project Costs	\$	§ 142,257,602
PV of Annua	I O&M Costs \$	\$ 295,504,420
Net Present Value	\$	437,762,022
	Yield, ac-ft	16900
Net Proje	ct Yield, ac-ft	14,785
Cost Per Acre-Foot per ye	ar \$	592

Alternative 1b Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	:	20-Jan-05
Annual Operating costs		
1B	Variables	Annual \$
Wells, pumping		
flow, cfs	14	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,632,096
Pumping plants, pipe, O&M		\$ 153,977
Distribution systems, pumping		
flow, cfs	24	
head, ft	500	
flow, cfs	19	
head, ft	700	
flow, cfs (SMC)	7	
head, ft (OC)	450	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,347,454
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1c Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt		20-Jan-05
Alternative			
1C			
Feature	Component Details	Ca I	apital costs tem Costs \$
Alt 1A, plus below		\$	59,291,411
San Mateo extraction wells (SMC/SOC)	2 new wells, approx 4 cfs new	\$	309,619
San Mateo pump station and storage, included below	Q=7 cfs, H=450ft, 1 day storage	\$	-
Pipeline to Santa Margarita River	One-directional, 104,000 ft, 21" dia, 750'	¢	10 570 990
Dasin		φ	12,570,002
	TOTAL	\$	72,171,912

Alternative 1c Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
1C Total Construction Costs	\$ 72,171,912
Mobilization 5 %	\$ 2,964,571
Unlisted Items 15 %	\$ 10,825,787
Total Contract Costs	\$ 85,962,269
Contingencies 25 %	\$ 21,490,567
Total Field Costs	\$ 107,452,836
Non-Contract 33 %	\$ 35,459,436
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 155,912,273
PV of Annual O&M Costs	\$ 299,980,371
Net Present Value	\$ 455,892,644
Yield, ac-ft	16900
Net Project Yield, ac-ft	 14,365
Cost Per Acre-Foot per year	\$ 635

Alternative 1c Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatmen	t	20-Jan-05
Annual Operating costs		
1C	Variables	Annual \$
Wells, pumping		
flow, cfs	14	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,591,096
Pumping plants, pipe, O&M		\$ 209,816
Distribution systems, pumping		
flow, cfs	24	
head, ft	500	
flow, cfs	19	
head, ft	700	
flow, cfs	7	
head, ft (Cross Base)	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,592,134
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1d Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt		20-Jan-05
Alternative			
1D Feature	Component Details	(Capital costs Item Costs \$
Alt 1A, minus Fallbrook bi-directional pipeline, plus below		\$	49,241,059
San Mateo ponds - rehab	Area and depth affect costs - 2'; haul mile assumed	\$	306,000
San Mateo extraction wells (SMC/SOC)	3 new wells, approx 5 cfs new	\$	464,428
San Mateo pump station(s)	Q=8 cfs, H=450' to OC or 750' to SMR, included in OC below		
Pipeline to Orange County (OC)	23,000 ft, 18" dia, 450' head, flow = 8 cfs, new storage tank	\$	6,090,640
Pipeline from Santa Margarita river basin	Bi-directional, 104,000 ft, 36" dia, 750' head, flow =40 cfs 1-way	\$	27,334,678
Well head treatment	8 cfs, chloramination	\$	86,000
Haybarn WTP to mid-tanks, pipeline only	10,000 ft, 30" dia, 500' head, flow =24 cfs to existing tanks	\$	1,356,992
	ΤΟΤΑΙ	¢	84 870 706
		φ	04,0/9,/90

Alternative 1d Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1D Total Construction Costs	\$	84,879,796
Mobilization 5 %	\$	2,964,571
Unlisted Items 15 %	\$	12,731,969
Total Contract Costs	\$	100,576,336
Contingencies 25 %	\$	25,144,084
Total Field Costs	\$	125,720,421
Non-Contract 33 %	\$	41,487,739
Open Space Management Zone	\$	13,000,000
Total Project Costs	\$	180,208,159
PV of Annual O&M Costs	\$	282,809,697
Net Present Value	\$	463,017,856
Yield, ac-tt		17500
Net Project Yield, ac-ft	_	14,875
Cost Per Acre-Foot per year	\$	623

Alternative 1d Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	:	20-Jan-05
Annual Operating costs		
1D	Variables	Annual \$
Wells, pumping		
flow, cfs	16	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,634,096
Pumping plants, pipe, O&M		\$ 162,786
Distribution systems, pumping		
flow, cfs (24+8)	32	
head, ft	500	
flow, cfs	0	
head, ft	700	
flow, cfs (1/5 of year)	40	
head, ft, averaged	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,600,598
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1e Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmen	nt		20-Jan-05
Alternative			
1E			
		Ca	bital costs
Feature	Component Details	lite	s Costs
Similar to Alt 1A w/ larger pumping,			Ψ
as below		\$	20,500,150
NIME Treatment wotlands and	l		
NWS - Healinein wellanus anu rosorvoir	Wetland: 18 acres	\$	630 000
	Reservoir: earth dam, H= x ft; 49	Ψ	000,000
	surface acres, V= 1,600 ac-ft	\$	4,145,041
Land Outfall Pipeline	9,000 ft, 12" dia, 50' head, flow =3.5 cfs	\$	312,303
	1.000 ft. flow =3.5 cfs, open channel		
Treatment-Reservoir Pipeline	ditch	\$	-
Clarified water Pineline	5,900 ft 18" dia min head flow = 8.7 cfs	¢	333 777
	5,600 ft, 10 dia, min fiead, now -0.7 dia	φ	555,111
Spreading basin	As is - no change	TBD	
Groundwater extraction wells	add 2 more wells than in 1A, 8 total	\$	270,895
	Beesed on 750 gpm wells numped into		
Groundwater collection pipe system	existing collector	\$	29.043
		Ψ	
Weten two other and island	Haybarn Canyon; brine disposal	¢	00.001.076
Water treatment plant	assumed included, train 1, 55 cis	پ	32,001,270
	Bi-directional to Fallbrook: 67,000', 33"-		
Distribution main pipeline	30" dia, 1100' head, 28-23 cfs	\$	11,337,296
	TOTAL	\$	69,559,781

Alternative 1e Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1 E Total Construction Costs	\$	69,559,781
Mobilization 5	%\$	2,964,571
Unlisted Items 15	%\$	10,433,967
Total Contract Costs	\$	82,958,319
Contingencies 25	% \$	20,739,580
Total Field Costs	\$	103,697,899
Non-Contract 33	%\$	34,220,307
Open Space Management Zor	e \$	13,000,000
Total Project Costs	\$	150,918,205
PV of Annual O&M Cos	ts \$	322,269,685
Net Present Value	\$	473,187,890
Yield, ac-	ft	16200
Net Project Yield, ac-	ft	13,770
Cost Per Acre-Foot per year	\$	687

Alternative 1e Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05
Annual Operating costs		
1E	Variables	Annual \$
Wells, pumping		
flow, cfs	14	
drawdown, ft	20	
Water treatment plants, O&M		\$ 15,067,271
Pumping plants, pipe, wetlands, dam		\$ 78,420
Distribution systems, pumping		
flow, cfs	28	
head, ft	500	Ì
flow, cfs	23	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,539,703
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1f Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05
Alternative 1F			
Feature	Component Details	(Capital costs Item Costs \$
Alt 1A w/ larger pumping, as below		\$	20,500,150
Pueblitos Canyon - wetlands	Wetland: 33 acres	\$	1,155,000
	Expansion area: 12 acres	\$	420,000
Land Outfall Dinaling	18,400 ft, 16" dia, 150' head, flow =6.3	*	040.055
	cis	A	918,355
De-nitrified Pipeline	5,700 ft, 16" dia, gravity head, flow =6.3 cfs	\$	284,490
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$	469,160
Groundwater extraction wells	1 more well than in Alt 1A, 7 total	\$	135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	14,521
Water treatment plant	Haybarn Canyon; brine disposal assumed included, train 1, 30 cfs	\$	29,557,097
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$	10,219,062
	TOTAL	\$	63.673.283

Alternative 1f Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
1F Total Construction Costs	\$ 63,673,283
Mobilization 5 %	\$ 2,964,571
Unlisted Items 15 %	\$ 9,550,992
Total Contract Costs	\$ 76,188,846
Contingencies 25 %	\$ 19,047,212
Total Field Costs	\$ 95,236,058
Non-Contract 33 %	\$ 31,427,899
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 139,663,957
PV of Annual O&M Costs	\$ 298,162,794
Net Present Value	\$ 437,826,750
Yield, ac-ft	15100
Net Project Yield, ac-ft	 12,835
Cost Per Acre-Foot per year	\$ 682

Alternative 1f Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatmen	it	20-Jan-05
Annual Operating costs		
1F	Variables	Annual \$
Wells, pumping		
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,960,184
Pumping plants, pipe, wetlands O&M		\$ 72,070
Distribution systems, pumping		
flow, cfs	26	
head, ft	500	
flow, cfs	21	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,255,408
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1g Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05
Alternative			
Feature	Component Details	С	apital costs Item Costs \$
Alt 1A w/ larger pumping, as below		\$	20,500,150
Newton Canyon - wetlands	Wetland: 35 acres	\$	1,225,000
	Expansion area: 11 acres	\$	385,000
Land Outfall Pipeline	7,300 ft, 15" dia, connects to existing pump head, flow =6.3 cfs	\$	364,347
De-nitrified Pipeline	20,600 ft, 15" dia, pump head 60', flow =6.3 cfs	\$	1,792,135
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3	¢	469 160
		Ψ	403,100
Groundwater extraction wells	1 more well than in Alt 1A, 7 total	\$	135 448
			100,110
Groundwater collection pipe system	existing collector	\$	14,521
Water treatment plant, same as 1F	Haybarn Canyon; brine disposal assumed included, train 1, 30 cfs	\$	29,557,097
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$	10,219,062
	TOTAL	\$	64,661,920

Alternative 1g Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
1G Total Construction Costs	\$ 64,661,920
Mobilization 5 %	\$ 2,964,571
Unlisted Items 15 %	\$ 9,699,288
Total Contract Costs	\$ 77,325,779
Contingencies 25 %	\$ 19,331,445
Total Field Costs	\$ 96,657,223
Non-Contract 33 %	\$ 31,896,884
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 141,554,107
PV of Annual O&M Costs	\$ 298,944,820
Net Present Value	\$ 440,498,927
Yield, ac-ft	15100
Net Project Yield, ac-ft	 12,835
Cost Per Acre-Foot per year	\$ 686

Alternative 1g Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05
Annual Operating costs		
1G	Variables	Annual \$
Wells, pumping		
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,960,184
Pumping plants, pipe, wetlands O&M		\$ 73,370
Distribution systems, pumping		
flow, cfs	26	
head, ft	500	
flow, cfs	21	
head, ft	700	
flow, cfs (denitrified)	6.3	
head, ft	60	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,299,451
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1h Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatme	nt		20-Jan-05
Alternative			
1H Feature	Component Details	С	apital costs Item Costs \$
Alt 1A w/ larger pumping, as below		\$	20,500,150
Off-stream storage reservoir	Reservoir: earth dam, H= x ft; 55 surface acres, V= 4,800 ac-ft	\$	12,021,016
Bi-direction raw water Pipeline	12,000 ft, 36" dia, 400' head, flow =40 cfs; between reservor and Pond 7	\$	7,972,844
	Haybarn Canyon; brine disposal		
Water treatment plant, same as 1F	assumed included, train 1, 30 cfs	\$	29,557,097
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$	10,219,062
	TOTAL	\$	80,270,169

Alternative 1h Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1 Total Construction Costs	\$	80,270,169
Mobilization 5	%\$	2,964,571
Unlisted Items 15	% \$	12,040,525
Total Contract Costs	\$	95,275,265
Contingencies 25	% \$	23,818,816
Total Field Costs	\$	119,094,082
Non-Contract 33	%\$	39,301,047
Open Space Management Zor	ie <u>\$</u>	13,000,000
Total Project Costs	\$	171,395,129
PV of Annual O&M Cos	ts \$	312,007,780
Net Present Value	\$	483,402,908
Yield, ac	·ft	14800
Net Project Yield, ac-	·ft	12,580
Cost Per Acre-Foot per year	\$	769

Alternative 1h Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05
Annual Operating costs		
1H	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,960,184
Pumping plants, pipe, dam		\$ 133,780
Distribution systems, pumping		
flow, cfs	26	
head, ft	500	
flow, cfs	21	
head, ft	700	
flow, cfs (2/5 of year)	40	
head, ft	400	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,996,439
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1i Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmen	nt	20-Jan-05
Alternative		
11 Feature	Component Details	Capital costs Item Costs \$
Alt 1A, slightly reduced per below		\$ 59,291,411
Decreased groundwater wells	2 fewer wells than in Alt 1A, 4 total	\$ (270,895)
Groundwater collection pipe system - savings	Based on 750 gpm wells pumped into existing collector	\$ (29,043)
Enhanced extraction piping	7,500 ft, 12" dia, 50' head, flow =4 cfs to Haybarn WTP	\$ 801,141
	Haybarn Canyon; brine disposal	
Water treatment plant, same as 1A	assumed included, train 1, 29 cfs	
	TOTAL	\$ 59,792,614

Alternative 1i Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
1 Total Construction Costs	\$ 59,792,614
Mobilization 5 %	\$ 2,964,571
Unlisted Items 15 %	\$ 8,968,892
Total Contract Costs	\$ 71,726,077
Contingencies 25 %	\$ 17,931,519
Total Field Costs	\$ 89,657,596
Non-Contract 33 %	\$ 29,587,007
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 132,244,602
PV of Annual O&M Costs	\$ 286,126,002
Net Present Value	\$ 418,370,604
Yield, ac-ft	14100
Net Project Yield, ac-ft	11,985
Cost Per Acre-Foot per year	\$ 698

Alternative 1i Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05
Annual Operating costs		
11	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	50	
Water treatment plants, O&M		\$ 13,591,096
Pumping plants, pipe, O&M		\$ 13,570
Distribution systems, pumping		
flow, cfs	24	
head, ft	500	
flow, cfs	19	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,985,095
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 2a Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt		20-Jan-05
Alternative			
2A			
Feature	Component Details	Ca It	pital costs em Costs \$
Diversion dam -Obermeyer installation	280' long, 7.9' high, Replaces existing sheet pile diversion dam	\$	2,738,000
Headworks gates - reconstructed with Obermeyer dam	Increased from 60 to 200 cfs	\$	101,791
O'Neill ditch - widening improvements along with road siphon crossings	Increased from 60 to 200 cfs	\$	406,219
Recharge ponds	Rehab 1-5 existing ponds: 312 AF;	\$	1,261,473
	Construct 2 new ponds, 6&7: 242 AF	\$	2,269,454
Groundwater extraction wells	4 wells, 6.4 cfs net	\$	541,790
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	58,085
Water treatment plant	Haybarn Canyon; brine disposal assumed included, train 1, 21 cfs	\$	22,274,560
Distribution main pipeline	From WTP pumps, 18 cfs, 27" pipeline to existing So. CPEN tanks	\$	1,170,791
Diversion weir	Fallbrook PUD sump, 357'x10'	\$	4,363,688
Fallbrook sump to Red Mtn pipeline	29,000', 15" dia, 700' head, 5 cfs	\$	2,427,864
Water treatment plant	Red Mountain - train 2	\$	3,590,600
New Oceanside- Morro Hill pipeline	28,000', 27" dia, gravity head, 20 cfs	\$	3,278,215
Lake O'Neill rehab	same as Alt 1a	\$	12,823,400
Open space management zone	land purchase, included below TOTAL	\$	57.305.930

Alternative 2a Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
24 Total Construction Costs	\$	57,305,930
Mobilization 5 %	ό \$	2,865,297
Unlisted Items 15 %	ό\$	8,595,890
Total Contract Costs	\$	68,767,116
Contingencies 25 %	ó \$	17,191,779
Total Field Costs	\$	85,958,895
Non-Contract 33 %	ó\$	21,489,724
Open Space Management Zon	e <u>\$</u>	13,000,000
Total Project Costs	\$	120,448,619
PV of Annual O&M Cost	з\$	215,364,060
Net Present Value	\$	335,812,680
Yield, ac-	ť	12600
Net Project Yield, ac-	t	10710
Cost Per Acre-Foot per year	\$	627

Alternative 2a Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05
Annual Operating costs		
2A	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 10,921,355
Pumping plants, pipe, O&M		\$ 35,987
Distribution systems, pumping		
flow, cfs (base)	18	
head, ft	500	
flow, cfs (mid)	0	
head, ft	700	
flow, cfs (FPUD to RMR)	5	
head, ft	800	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 1,529,599
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 2b Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05
Alternative 2B		Ca	apital costs
Feature	Component Details	lt	tem Costs \$
Alt 2A without Morro Hill Pipeline,			
plus larger Haybarn WTP per below		\$	30,582,364
San Mateo ponds - rehab	Area and depth affect costs - 2'; haul mile assumed	\$	306,000
San Mateo wells	3 new wells, 5 cfs	\$	406,343
Well head treatment	8 cfs, chloramination	\$	86,000
Pipeline to Orange County (OC)	23,000 ft, 18" dia, 450' head, flow = 8 cfs, new storage tank	\$	6,090,640
Pipeline from Santa Margarita river basin	Bi-directional, 104,000 ft, 36" dia, 750' head, flow = 40 cfs 1-way	\$	27,334,678
Groundwater extraction wells	2 additional SMR wells over 2a	\$	270,895
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	29,043
Existing Oceanside- Morro Hill pipeline	28,000', 12" dia, gravity head	\$	-
Water treatment plant	Haybarn Canyon; brine disposal assumed included, train 1, 22 cfs	\$	23,083,957
Distribution main pipeline	From WTP pumps, 18 cfs, 27" pipeline to existing So. CPEN tanks	\$	1,170,791
		\$	89,360,710

Alternative 2b Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
2B Total Construction Costs	\$ 89,360,710
Mobilization 5 %	\$ 2,865,297
Unlisted Items 15 %	\$ 13,404,107
Total Contract Costs	\$ 105,630,114
Contingencies 25 %	\$ 26,407,528
Total Field Costs	\$ 132,037,642
Non-Contract 33 %	\$ 33,009,410
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 178,047,052
PV of Annual O&M Costs	\$ 229,437,083
Net Present Value	\$ 407,484,135
Yield, ac-ft	16000
Net Project Yield, ac-ft	 14020
Cost Per Acre-Foot per year	\$ 581

Alternative 2b Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment		20-Jan-05	
Annual Operating costs			
2B	Variables	Annual \$	
Wells, pumping			
flow, cfs	15		
drawdown, ft	20		
Water treatment plants, O&M		\$ 11,333,171	
Pumping plants, pipe, O&M		\$ 187,064	
Distribution systems, pumping			
flow, cfs (base)	18		
head, ft	500		
flow, cfs (OC)	8		
head, ft	450		
flow, cfs (1/5 of year)	40		
head, ft	750		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$ 1,782,668	
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		

Alternative 2c Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05	
Alternative				
2C		C	nital agata	
Feature	Component Details	Capital costs Item Costs		
Alt 2A with treatment plant and wells				
as below, plus below		\$	33,860,579	
Pueblitos Canyon - wetlands	Wetland: 33 acres	\$	1,155,000	
	Expansion area: 12 acres	\$	420,000	
	18,400 ft, 16" dia, 150' head, flow =6.3			
Land Outfall Pipeline	cfs	\$	918,355	
Do nitrified Pinoling	5,700 ft, 16" dia, gravity head, flow =6.3	¢	284 400	
		φ	204,490	
	9,400 ft, 16" dia gravity boad flow -6.3			
Groundwater spreading Pipeline	cfs	\$	469,160	
Groundwater extraction wells	3 additional SMR wells over 2a	6	406 343	
		Ψ	+00,0+0	
Groundwater collection nine system	Based on 750 gpm wells pumped into existing collector	¢	43 564	
		Ψ	+0,00+	
	Haybarn Canyon; brine disposal			
Water treatment plant	assumed included, train 1, 23 cfs	\$	23,893,290	
	From WTP pumps, 20 cfs, 27" pipeline			
Distribution main pipeline	to existing So. CPEN tanks	\$	1,170,791	
L				
	1	\$	62,621,571	

Alternative 2c Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
2C Total Construction Costs	\$	62,621,571
Mobilization 5 %	\$	2,865,297
Unlisted Items 15 %	\$	9,393,236
Total Contract Costs	\$	74,880,104
Contingencies 25 %	\$	18,720,026
Total Field Costs	\$	93,600,130
Non-Contract 33 %	\$	23,400,032
Open Space Management Zone	\$	13,000,000
Total Project Costs	\$	130,000,162
PV of Annual O&M Costs	\$	217,081,769
Net Present Value	\$	347,081,931
Yield, ac-f	Ĺ	13600
Net Project Yield, ac-f	:	11560
Cost Per Acre-Foot per year	\$	600

Alternative 2c Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	:	20-Jan-05	
Annual Operating costs			
2C	Variables	Annual \$	
Wells, pumping			
flow, cfs	12		
drawdown, ft	20		
Water treatment plants, O&M		\$ 11,322,544	
Pumping plants, pipe, O&M		\$ 24,279	
Distribution systems, pumping			
flow, cfs (base)	20		
head, ft	520		
flow, cfs	0		
head, ft	0		
flow, cfs (denitrified)	6.3		
head, ft	0		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$ 1,239,712	
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		

Alternative 2d Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05	
Alternative				
2D				
Facture	Component Dataila	Ca	pital costs	
reature	Component Details	10	s series	
Alt 2A with treatment plant and wells		\$	33 860 579	
		ψ	33,000,379	
Newton Canyon - wetlands	Wetland: 35 acres	\$	1,225,000	
	Expansion area: 11 acres	\$	385,000	
	7 300 ft 15" dia connects to existing			
Land Outfall Pipeline	pump head, flow =6.3 cfs	\$	364.347	
•			, -	
De-nitrified Pipeline	=6.3 cfs	\$	1 792 135	
		Ψ	1,702,100	
Groundwater enreading Bineline	9,400 ft, 16" dia, gravity head, flow =6.3	¢	460 160	
Groundwater spreading Fipenne		φ	409,100	
		ļ		
Groundwater extraction wells	3 additional SMR wells over 2a	\$	406 343	
		Ţ.	100,010	
	Based on 750 gpm wells pumped into	<u>^</u>		
Groundwater collection pipe system	existing collector	\$	43,564	
	Haybarn Canyon; brine disposal			
Water treatment plant, same as 2C	assumed included, train 1, 23 cfs	\$	23,893,290	
	From WTP pumps, 20 cfs. 27" pipeline			
Distribution main pipeline	to existing So. CPEN tanks	\$	1,170,791	
		\$	63,610,208	

Alternative 2d Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
20 Total Construction Costs	\$ 63,610,208
Mobilization 5 %	\$ 2,865,297
Unlisted Items 15 %	\$ 9,541,531
Total Contract Costs	\$ 76,017,036
Contingencies 25 %	\$ 19,004,259
Total Field Costs	\$ 95,021,295
Non-Contract 33 %	\$ 23,755,324
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 131,776,619
PV of Annual O&M Costs	\$ 217,841,375
Net Present Value	\$ 349,617,994
	(0000
Yield, ac-ft	13600
Net Project Yield, ac-ft	11560
Cost Per Acre-Foot per year	\$ 605

Alternative 2d Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment	t	20-Jan-05	
Annual Operating costs			
2D	Variables	Annual \$	
Wells, pumping			
flow, cfs	12		
drawdown, ft	20		
Water treatment plants, O&M		\$ 11,322,544	
Pumping plants, pipe, O&M		\$ 24,279	
Distribution systems, pumping			
flow, cfs (base)	20		
head, ft	520		
flow, cfs	0		
head, ft	700		
flow, cfs	6.3		
head, ft	60		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$ 1,283,754	
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		
Alternative 3a Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmen	nt	20-Jan-05
Alternative		
3A		
P 4:		Capital costs
Feature	Component Details	Item Costs
	Obermeyer replacement not done with	Ψ
Diversion dam - SMR	this alternative	\$-
Headworks gates - reconstruct	Increased from 60 to 100 cfs	\$ 101.791
O'Noill ditch - widening		
improvements along with road		
siphon crossings	Increased from 60 to 100 cfs	\$ 179,369
Deskame worde	Dahah 1 5 aviating panday 212 AFr	¢ 4.004.470
Recharge ponds	Renab 1-5 existing ponds: 312 AF;	\$ 1,261,473
	Construct 2 new ponds, 6&7: 242 AF	\$ -
		-
Groundwater extraction wells	4 wells, 6.4 cfs net	\$ 541,790
	Based on 750 gpm wells pumped into	
Groundwater collection pipe system	existing collector	\$ 58,085
	Havbarn Canvon: brine disposal	
Water treatment plant	assumed included, train 1, 25 cfs	\$ 25,514,909
	Bi-directional to Fallbrook: 67.000'. 30"-	
Distribution main pipeline	27" dia, 1100' head, 24-16 cfs	\$ 8,837,597
Storago tanko	At water treatment cleanwell or evicting	
	Base in water treatment: mid-booster	
Pumping plants	included in pipeline	
	4 Instream Check Structures in the	
Instream checks	unappo Basin, 3 teet nign, 200 to 400 ft in length	\$ 16 709
		÷ 10,709
Lake O'Neill rehab	LC designs	\$ 12,823,400
Open space management zone	land purchase, included below	
	TOTAL	\$ 49,335,123

Alternative 3a Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatmen	t	 20-Jan-05
TOTAL COST ANALYSIS		
3A	Total Construction Costs	\$ 49,335,123
	Mobilization 5 %	\$ 2,466,756
	Unlisted Items 15 %	\$ 7,400,268
	Total Contract Costs	\$ 59,202,147
	Contingencies 25 %	\$ 14,800,537
	Total Field Costs	\$ 74,002,684
	Non-Contract 33 %	\$ 24,420,886
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 111,423,570
	PV of Annual O&M Costs	\$ 277,875,681
	Net Present Value	\$ 389,299,251
	Yield, ac-ft	12000
	Net Project Yield, ac-ft	 10200
	Cost Per Acre-Foot per year	\$ 763

Alternative 3a Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

Annual Operating costs		
3A	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,462,056
Pumping plants, pipe, O&M		\$ 100,504
Distribution systems, pumping		
flow, cfs (base)	21	
head, ft	500	
flow, cfs (mid)	16	
head, ft	700	
flow, cfs		
head, ft		
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,543,273
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3b Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt		20-Jan-05
Alternative			
3B			
Feature	Component Details		Item Costs
			\$
Alt 3A, plus below		\$	49,335,123
		-	
		-	
		<u> </u>	
San Mateo extraction wells			
(SMC/SOC)	2 new wells, approx 4 cfs new	\$	309,619
San Mateo numn station and storage		<u> </u>	
tank, included below	Q=7 cfs, H=450ft, 1 day storage	\$	-
Pipeline to Orange County (OC)	23,000 ft, 21" dia, 450' head, flow = 7 cfs	\$	5 347 351
		Ŷ	0,011,001
	. .		04 500
Well head treatment	7 cts, chloramination	\$	81,500
		-	
		<u> </u>	
		\vdash	
		-	
	TOTAL	\$	55,073,592

Alternative 3b Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment

TOTAL COST ANALYSIS		
3B	Total Construction Costs	\$ 55,073,592
	Mobilization 5 %	\$ 2,466,756
	Unlisted Items 15 %	\$ 8,261,039
	Total Contract Costs	\$ 65,801,387
	Contingencies 25 %	\$ 16,450,347
	Total Field Costs	\$ 82,251,734
	Non-Contract 33 %	\$ 27,143,072
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 122,394,806
	PV of Annual O&M Costs	\$ 285,979,811
	Net Present Value	\$ 408,374,617
	Yield, ac-ft	14800
	Net Project Yield, ac-ft	13000
	Cost Per Acre-Foot per year	\$ 628

Alternative 3b Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

	With	Advanced	Water	Treatment
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Annual Operating costs		
3B	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,503,056
Pumping plants, pipe, O&M		\$ 153,977
Distribution systems, pumping		
flow, cfs (base)	21	
head, ft	500	
flow, cfs (mid)	16	
head, ft	700	
flow, cfs (SMC)	7	
head, ft (OC)	450	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,918,682
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3c Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt		20-Jan-05
Alternative			
30			
Feature	Component Details	lt	tem Costs \$
Alt 3A, plus below		\$	49,335,123
San Mateo extraction wells (SMC/SOC)	2 new wells, approx 4 cfs new	\$	309,619
San Mateo pump station and storage, included below	Q=7 cfs, H=450ft, 1 day storage	\$	-
Pipeline to Santa Margarita River basin	One-directional, 104,000 ft, 21" dia, 750' head, flow = 7 cfs	\$	12,570,882
	TOTAL	\$	62,215,623

Alternative 3c Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3С то	tal Construction Costs	\$ 62,215,623
	Mobilization 5 %	\$ 2,466,756
	Unlisted Items 15 %	\$ 9,332,344
То	tal Contract Costs	\$ 74,014,723
	Contingencies 25 %	\$ 18,503,681
То	tal Field Costs	\$ 92,518,404
	Non-Contract 33 %	\$ 30,531,073
	Open Space Management Zone	\$ 13,000,000
То	tal Project Costs	\$ 136,049,477
	PV of Annual O&M Costs	\$ 290,455,762
Ne	t Present Value	\$ 426,505,239
	Yield, ac-ft	14800
	Net Project Yield, ac-ft	12580
Co	st Per Acre-Foot per year	\$ 678

Alternative 3c Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

with Auvanceu water meatinent	With	Advanced	Water	Treatment
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Annual Operating costs		
3C	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,462,056
Pumping plants, pipe, O&M		\$ 209,816
Distribution systems, pumping		
flow, cfs	21	
head, ft	500	
	16	
	700	
flow, cfs	7	
head, ft (Cross Base)	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,163,362
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3d Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmer	nt	20-Jan-05
Alternative		
3D		
Feature	Component Details	Item Costs
Alt 3A, minus Fallbrook bi-directional pipeline, plus below		\$ ↓ 40,497,526
San Mateo ponds - rehab	mile assumed	\$ 306,000
San Mateo extraction wells (SMC/SOC)	3 new wells, approx 5 cfs new	\$ 464,428
	Q=8 cfs, H=450' to OC or 750' to SMR,	
San Mateo pump station(s)	included in OC below	
Pipeline to Orange County (OC)	23,000 ft, 18" dia, 450' head, flow = 8 cfs, new storage tank	\$ 6,090,640
Pipeline from Santa Margarita river	Bi-directional, 104,000 ft, 36" dia, 750'	
basın	head, flow =40 cfs 1-way	\$ 27,334,678
Well head treatment	8 cfs, chloramination	\$ 86,000
Haybarn WTP to mid-tanks, pipeline only	10,000 ft, 27" dia, 500' head, flow =21 cfs to existing tanks	\$ 1,209,294
	TOTAL	\$ 75,988,566

Alternative 3d Santa Margarita Project - Pre-Feasibility Study **Alternative Total Cost Analysis**

With Advanced Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3D Total Construction Costs	\$	75,988,566
Mobilization 5	% \$	2,466,756
Unlisted Items 15	% \$	11,398,285
Total Contract Costs	\$	89,853,607
Contingencies 25	% \$	22,463,402
Total Field Costs	\$	112,317,009
Non-Contract 33	% \$	37,064,613
Open Space Management Zo	ne \$	13,000,000
Total Project Costs	\$	162,381,622
PV of Annual O&M Cos	sts \$	277,505,117
Net Present Value	\$	439,886,739
Yield, ac	-ft	15400
Net Project Yield, ac	⊱ft	13090
Cost Per Acre-Foot per year	\$	672

Alternative 3d Santa Margarita Project - Pre-Feasibility Study **Alternative Annual Costs**

With Advanced Water Treatment

20-Jan-05 Annual Operating costs Variables 3D Annual \$ Wells, pumping 12 flow, cfs drawdown, ft 20 Water treatment plants, O&M \$ 13,505,056 Pumping plants, pipe, O&M \$ 162,786 Distribution systems, pumping flow, cfs (21+8) 29 head, ft 500 flow, cfs 0 head, ft 700 flow, cfs (1/5 of year) 40 head, ft, averaged 750 Power value, \$/kw-hr \$0.11 Power for pumping, annually \$ 2,416,506 Repair to river check structures \$ 5,570 Interest rate 5.375% Assumed design life, years 50 Present worth factor 17.25

Alternative 3e Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmen	nt		20-Jan-05
Alternative			
32			
Feature	Component Details	lt	em Costs
Similar to Alt 3A w/ larger pumping,			φ
as below		\$	14,982,618
NWS - Treatment wetlands and			
reservoir	Wetland: 18 acres	\$	630,000
	Reservoir: earth dam, H= x ft; 49	¢	A 145 0A1
		Ψ	4,143,041
Land Outfall Pipeline	9,000 ft, 12" dia, 50' head, flow =3.5 cfs	\$	312,303
	1,000 ft, flow =3.5 cfs, open channel		
Treatment-Reservoir Pipeline	ditch	\$	-
Clarified water Pipeline	5,800 ft, 18" dia, min head, flow =8.7 cfs	\$	333,777
Spreading basin	As is - no change	TBD	
Groundwater extraction wells	2 more wells than in Alt 3A, 6 total	\$	270,895
	Based on 750 gpm wells pumped into		
Groundwater collection pipe system	existing collector	\$	29,043
	Haybarn Canyon; brine disposal	é	00 775 070
water treatment plant	assumed included, train 1, 29 cts	\$	28,775,276
	Di directional to Fallbrook: 67,0001,201		
Distribution main pipeline	27" dia, 1100' head, 25-20 cfs	\$	10,135,132
	TOTAL	\$	59,614,085

Alternative 3e Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment			20-Jan-05
TOTAL COST ANALYSIS			
3E Total Construction Costs	\$	5	59,614,085
Mobiliza	tion 5 %	\$	2,466,756
Unlisted Iten	ns 15 % \$	5	8,942,113
Total Contract Costs	\$	5	71,022,953
Contingenci	es 25 % _\$	5	17,755,738
Total Field Costs	\$	5	88,778,692
Non-Contra	ict 33 % \$	5	29,296,968
Open Space Manageme	nt Zone \$	5	13,000,000
Total Project Costs	\$	5	131,075,660
PV of Annual O&	M Costs \$	5	312,745,076
Net Present Value	\$	5	443,820,735
Yie	eld, ac-ft		14100
Net Project Yie	ld, ac-ft		11985
Cost Per Acre-Foot per year	\$;	741

Alternative 3e Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

Willi Auvanceu Waler mealment

Annual Operating costs		
3E	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 14,938,231
Pumping plants, pipe, wetlands, dam		\$ 78,420
Distribution systems, pumping		
flow, cfs	25	
head, ft	500	
flow, cfs	20	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,110,930
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3f Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmen	nt	20-Jan-05
Alternative 3F		
Feature	Component Details	Item Costs \$
Alt 3A w/ larger pumping, as below		\$ 14,982,618
Pueblitos Canyon - reservoir	Wetland: 33 acres	\$ 1,155,000
	Expansion area: 12 acres	\$ 420,000
Land Outfall Pipeline	18,400 ft, 16" dia, 150' head, flow =6.3 cfs	\$ 918,355
De-nitrified Pipeline	5,700 ft, 16" dia, gravity head, flow =6.3 cfs	\$ 284,490
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$ 469,160
Groundwater extraction wells	1 more well than in Alt 3A, 5 total	\$ 135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$ 14,521
Water treatment plant	Haybarn Canyon; brine disposal assumed included, train 1, 27 cfs	\$ 27,130,045
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$ 9,960,359
	TOTAL	\$ 55,469,995

Alternative 3f Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
3F Total Construction Costs	\$ 55,469,995
Mobilization 5 %	\$ 2,466,756
Unlisted Items 15 %	\$ 8,320,499
Total Contract Costs	\$ 66,257,251
Contingencies 25 %	\$ 16,564,313
Total Field Costs	\$ 82,821,563
Non-Contract 33 %	\$ 27,331,116
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 123,152,679
PV of Annual O&M Costs	\$ 289,189,368
Net Present Value	\$ 412,342,047
Yield. ac-ft	13000
Net Project Yield, ac-ft	11050
Cost Per Acre-Foot per year	\$ 746

Alternative 3f Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment

Annual Operating costs		
3F	Variables	Annual \$
Wells, pumping		
flow, cfs	8	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,863,102
Pumping plants, pipe, wetlands O&M		\$ 72,070
Distribution systems, pumping		
flow, cfs	23	
head, ft	500	
flow, cfs	18	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,826,636
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3g Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatmen	nt		20-Jan-05
Alternative 3G			
Feature	Component Details		Item Costs \$
Alt 3A w/ larger pumping, as below		\$	14,982,618
Newton Canyon - wetlands	Wetland: 35 acres	\$	1,225,000
	Expansion area: 11 acres	\$	385,000
Land Outfall Pipeline	7,300 ft, 15" dia, connects to existing pump head, flow =6.3 cfs	\$	364,347
De-nitrified Pipeline	20,600 ft, 15" dia, pump head 60', flow =6.3 cfs	\$	1,792,135
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$	469,160
Groundwater extraction wells	1 more well than in Alt 3A, 5 total	\$	135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	14,521
	Havbarn Canvon: brine disposal		
Water treatment plant, same as 1F	assumed included, train 1, 27 cfs	\$	27,130,045
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 23-18 cfs	\$	9,960,359
		¢	EC 1E0 622
	IOTAL	Ψ	50,458,632

Alternative 3g Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment

TOTAL COST ANALYSIS		
3G	Total Construction Costs	\$ 56,458,632
	Mobilization 5 %	\$ 2,466,756
	Unlisted Items 15 %	\$ 8,468,795
	Total Contract Costs	\$ 67,394,183
	Contingencies 25 %	\$ 16,848,546
	Total Field Costs	\$ 84,242,729
	Non-Contract 33 %	\$ 27,800,101
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 125,042,829
	PV of Annual O&M Costs	\$ 289,971,394
	Net Present Value	\$ 415,014,224
	Yield, ac-ft	13000
	Net Project Yield, ac-ft	11050
	Cost Per Acre-Foot per year	\$ 751

Alternative 3g Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

Annual Operating costs		
3G	Variables	Annual \$
Wells, pumping		
flow, cfs	8	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,863,102
Pumping plants, pipe, wetlands O&M		\$ 73,370
Distribution systems, pumping		
flow, cfs	23	
head, ft	500	
flow, cfs	18	
head, ft	700	
flow, cfs (denitrified)	6.3	
head, ft	60	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,870,678
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3h Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05
Alternative			
38			
Feature	Component Details		Item Costs
Alt 3A w/ larger pumping, as below	+	\$	14,982,618
	Reservoir: earth dam, H= x ft; 55		10.004.040
Off-stream storage reservoir	surface acres, V= 4,800 ac-tt	\$	12,021,016
	12,000 ft, 36" dia, 400' head, flow =40		
Bi-direction raw water Pipeline	cfs; between reservor and Pond 7	\$	7,972,844
		-	
Water treatment plant, same as 1F	Haybarn Canyon; brine disposal assumed included, train 1, 27 cfs	\$	27,130,045
		*	
	Bi-directional to Fallbrook: 67,000', 30"-		
Distribution main pipeline	27" dia, 1100' head, 26-21 cfs	\$	9,960,359
	TOTAL	\$	72,066,882

Alternative 3h Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
3H Total Construction Costs	\$ 72,066,882
Mobilization 5 %	\$ 2,466,756
Unlisted Items 15 %	\$ 10,810,032
Total Contract Costs	\$ 85,343,670
Contingencies 25 %	\$ 21,335,917
Total Field Costs	\$ 106,679,587
Non-Contract 33 %	\$ 35,204,264
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 154,883,851
PV of Annual O&M Costs	\$ 303,050,430
Net Present Value	\$ 457,934,281
	40700
Yield, ac-ft	12700
Net Project Yield, ac-ft	10795
Cost Per Acre-Foot per year	\$ 848

Alternative 3h Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With	Advanced	Water	Treatment
	/	TT GLOI	

Annual Operating costs		
ЗН	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,863,102
Pumping plants, pipe, dam		\$ 133,780
Distribution systems, pumping		
flow, cfs	23	
head, ft	500	
flow, cfs	18	
head, ft	700	
flow, cfs (2/5 of year)	40	
head, ft	400	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,568,598
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17 25	

Alternative 3i Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Advanced Water Treatment			20-Jan-05
Alternative 3I			
Feature	Component Details		Item Costs \$
Alt 3A, slightly reduced per below		\$	49,335,123
Decreased groundwater wells	2 fewer wells than in Alt 1A, 2 total	\$	(270,895)
Groundwater collection pipe system - savings	Based on 750 gpm wells pumped into existing collector	\$	(29,043)
Enhanced extraction piping	7,500 ft, 12" dia, 50' head, flow =4 cfs to Haybarn WTP	\$	801,141
	Havbarn Canvon: brine disposal		
Water treatment plant, same as 3A	assumed included, train 1, 25 cfs		
	TOTAL	\$	49,836,326

Alternative 3i Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Advanced Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
31 Total Construction Costs	\$ 49,836,326
Mobilization 5 %	\$ 2,466,756
Unlisted Items 15 %	\$ 7,475,449
Total Contract Costs	\$ 59,778,531
Contingencies 25 %	\$ 14,944,633
Total Field Costs	\$ 74,723,163
Non-Contract 33 %	\$ 24,658,644
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 112,381,807
PV of Annual O&M Costs	\$ 276,255,752
Net Present Value	\$ 388,637,559
Yield, ac-ft	12000
Net Project Yield, ac-ft	10200
Cost Per Acre-Foot per year	\$ 762

Alternative 3i Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Advanced Water Treatment

Annual Operating costs		
31	Variables	Annual \$
Wells, pumping		
flow, cfs	3.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 13,462,056
Pumping plants, pipe, O&M		\$ 13,570
Distribution systems, pumping		
flow, cfs	21	
head, ft	500	
flow, cfs	16	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,536,282
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Santa Margarita River Conjunctive Use

Pre-Feasibility Plan Formulation Study

Appendix B—with Minimal Water Treatment

Pre-Feasibility Alternatives Line Item Cost Summaries, Operations, Maintenance Costs, and Total Cost Analyses

San Diego County, California

prepared by



U.S. Department of the Interior Bureau of Reclamation Technical Service Center Denver, Colorado

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Appendix B—with Minimal Water Treatment

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Santa Margarita Conjunctive Use Project Pre-Feasibility Cost Summary With Minimal Water Treament

	-		-	-		1/20/2005
	Net Project	Construction		Net Present	C	ost Per
Alternative	Yield	Cost		Value	Α	cre-Foot
#	(af)	(\$)		(\$)		(\$/af)
1A	14100	\$ 40,248,371	\$	158,213,697	\$	224
1B	16900	\$ 45,986,841	\$	177,305,140	\$	210
1C	16900	\$ 53,128,872	\$	195,435,763	\$	231
1D	17500	\$ 65,836,756	\$	202,560,974	\$	231
1E	16200	\$ 48,141,301	\$	183,822,099	\$	227
1F	15100	\$ 44,036,383	\$	170,142,641	\$	225
1G	15100	\$ 45,025,020	\$	172,814,818	\$	229
1H	14800	\$ 60,633,269	\$	215,718,799	\$	292
11	14100	\$ 40,749,574	\$	157,913,723	\$	224
2A	12600	\$ 43,013,770	\$	135,283,593	\$	215
2B	16000	\$ 74,474,690	\$	199,796,115	\$	250
2C	13600	\$ 47,141,691	\$	137,917,124	\$	203
2D	13600	\$ 48,130,328	\$	140,453,186	\$	207
3A	12000	\$ 32,667,523	\$	135,220,154	\$	225
3B	14800	\$ 38,405,992	\$	154,295,521	\$	209
3C	14800	\$ 45,548,023	\$	172,426,143	\$	233
3D	15400	\$ 59,320,966	\$	185,807,643	\$	241
3E	14100	\$ 40,571,045	\$	160,832,730	\$	228
3F	13000	\$ 37,614,675	\$	149,490,641	\$	230
3G	13000	\$ 38,603,312	\$	152,162,818	\$	234
3H	12700	\$ 54,211,562	\$	195,082,876	\$	307
31	12000	\$ 33,168,726	\$	134,558,463	\$	224



Santa Margarita Conjunctive Use Project Pre-Feasibility Construction Costs With Minimal Water Treament

Santa Margarita Conjunctive Use Project Pre-Feasibility Net Present Values With Minimal Water Treament



Santa Margarita Conjunctive Use Project Pre-Feasibility Costs per Acre-foot With Minimal Water Treament



Alternative 1a Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
1A			
Feature	Component Details	C: I	apital costs tem Costs \$
Diversion dam -Obermeyer installation	280' long, 7.9' high, Replaces existing sheet pile diversion dam	\$	2,738,000
Headworks gates - reconstructed with Obermeyer dam	Increased from 60 to 200 cfs	\$	101,791
O'Neill ditch - widening improvements along with road sinhon crossings	Increased from 60 to 200 cfs	\$	406.219
		Ψ	100,210
Recharge ponds	Rehab 1-5 existing ponds: 312 AF;	\$	1,261,473
	Construct 2 new ponds, 6&7: 242 AF	\$	2,269,454
Groundwater extraction wells	6 wells, 10 cfs net	\$	812,685
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	87,128
Water treatment plant	Haybarn Canyon; train 2, 29 cfs	\$	9,697,869
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 24-19 cfs	\$	10,050,353
Storage tanks	At water treatment clearwell or existing		
Pumping plants	Base in water treatment; mid-booster included in pipeline		
Lake O'Neill rehab	LC designs	\$	12,823,400
Open space management zone	Land purchase, included below TOTAL	\$	40.248.371

Alternative 1a Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1A Total Construct	ion Costs	\$ 40,248,371
	Mobilization 5 %	\$ 2,012,419
	Unlisted Items 15 %	\$ 6,037,256
Total Contract 0	Costs	\$ 48,298,045
	Contingencies 25 %	\$ 12,074,511
Total Field Cost	S	\$ 60,372,557
	Non-Contract 33 %	\$ 19,922,944
Open Sp	ace Management Zone	\$ 13,000,000
Total Project Co	osts	\$ 93,295,500
P'	✓ of Annual O&M Costs	\$ 64,918,197
Net Present Val	ue	\$ 158,213,697
	Yield, ac-ft	14100
	Net Project Yield, ac-ft	 14,100
Cost Per Acre-F	oot per year	\$ 224

Alternative 1a Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment			20-Jan-05
Annual Operating costs			
1A	Variables	,	Annual \$
Wells, pumping			
flow, cfs	10		
drawdown, ft	20		
Water treatment plants, O&M		\$	692,380
Pumping plants, pipe, O&M		\$	100,504
Distribution systems, pumping			
flow, cfs (base)	24		
head, ft	500		
flow, cfs (mid)	19		
head, ft	700		
flow, cfs			
head, ft			
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$	2,971,113
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		

Alternative 1b Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
IB			
Feature	Component Details		Item Costs \$
Alt 1A, plus below		\$	40,248,371
San Mateo extraction wells (SMC/SOC)	2 new wells, approx 4 cfs new	\$	309.619
		Ť	,
San Mateo pump station and storage tank, included below	Q=7 cfs, H=450ft, 1 day storage	\$	-
Pipeline to Orange County (OC)	23,000 ft, 21" dia, 450' head, flow = 7 cfs	\$	5.347.351
		Ť	-,,
Well head treatment	7 cfs, chloramination	\$	81,500
		├	
	L TOTAL	\$	45,986,841

Alternative 1b Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1B	Total Construction Costs	\$ 45,986,841
	Mobilization 5 %	\$ 2,012,419
	Unlisted Items 15 %	\$ 6,898,026
	Total Contract Costs	\$ 54,897,285
	Contingencies 25 %	\$ 13,724,321
	Total Field Costs	\$ 68,621,607
	Non-Contract 33 %	\$ 22,645,130
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 104,266,737
	PV of Annual O&M Costs	\$ 73,038,403
	Net Present Value	\$ 177,305,140
	Yield, ac-ft	16900
	Net Project Yield, ac-ft	 16,900
	Cost Per Acre-Foot per year	\$ 210

Alternative 1b Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
1B	Variables	Annual \$
Wells, pumping		
flow, cfs	14	
drawdown, ft	20	
Water treatment plants, O&M		\$ 733,380
Pumping plants, pipe, O&M		\$ 153,977
Distribution systems, pumping		
flow, cfs	24	
head, ft	500	
flow, cfs	19	
head, ft	700	
flow, cfs (SMC)	7	
head, ft (OC)	450	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,347,454
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1c Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative		
1C		
Feature	Component Details	Capital costs Item Costs \$
Alt 1A, plus below		\$ 40,248,371
San Mateo extraction wells (SMC/SOC)	2 new wells, approx 4 cfs new	\$ 309,619
San Mateo pump station and storage, included below	Q=7 cfs, H=450ft, 1 day storage	\$-
Dia dia a ta Ocata Manazita Diaza		
basin	head, flow = 7 cfs	\$ 12,570,882
	TOTAL	\$ 53,128,872

Alternative 1c Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1C T	Fotal Construction Costs	\$ 53,128,872
	Mobilization 5 %	\$ 2,012,419
	Unlisted Items 15 %	\$ 7,969,331
г	Fotal Contract Costs	\$ 63,110,621
	Contingencies 25 %	\$ 15,777,655
Т	Fotal Field Costs	\$ 78,888,276
	Non-Contract 33 %	\$ 26,033,131
	Open Space Management Zone	\$ 13,000,000
Т	Fotal Project Costs	\$ 117,921,408
	PV of Annual O&M Costs	\$ 77,514,355
N	Net Present Value	\$ 195,435,763
	Yield, ac-ft	16900
	Net Project Yield, ac-ft	16,900
C	Cost Per Acre-Foot per year	\$ 231

Alternative 1c Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
1C	Variables	Annual \$
Wells, pumping		
flow, cfs	14	
drawdown, ft	20	
Water treatment plants, O&M		\$ 692,380
Pumping plants, pipe, O&M		\$ 209,816
Distribution systems, pumping		
flow, cfs	24	
head, ft	500	
flow, cfs	19	
head, ft	700	
flow, cfs	7	
head, ft (Cross Base)	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,592,134
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1d Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
1D			
Fosturo	Component Details	C	apital costs
reature	Component Details		s
Alt 1A, minus Fallbrook bi-directional			
pipeline, plus below		\$	30,198,019
	Area and depth affect costs - 2': haul		
San Mateo ponds - rehab	mile assumed	\$	306,000
San Mateo extraction wells			
(SMC/SOC)	3 new wells, approx 5 cfs new	\$	464,428
	Q=8 cfs_H=450' to OC or 750' to SMR		
San Mateo pump station(s)	included in OC below		
	23,000 ft, 18" dia, 450' head, flow = 8		
Pipeline to Orange County (OC)	cfs, new storage tank	\$	6,090,640
Pipeline from Santa Margarita river	Bi-directional, 104,000 ft, 36" dia, 750'		
basin	head, flow =40 cfs 1-way	\$	27,334,678
Well head treatment	8 cfs, chloramination	\$	86,000
			,
Haybarn WTP to mid-tanks, pipeline	10,000 ft, 30" dia, 500' head, flow =24	¢	1 356 003
only		Э	1,350,992
<u> </u>	Ι	\$	65,836,756
		Ψ	00,000,100

Alternative 1d Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1D Total Construction Costs		\$ 65,836,756
Mobilizatio	n 5 %	\$ 2,012,419
Unlisted Items	15 %	\$ 9,875,513
Total Contract Costs	-	\$ 77,724,688
Contingencies	25 %	\$ 19,431,172
Total Field Costs	-	\$ 97,155,861
Non-Contract	33 %	\$ 32,061,434
Open Space Management	Zone	\$ 13,000,000
Total Project Costs		\$ 142,217,295
PV of Annual O&M	Costs	\$ 60,343,680
Net Present Value		\$ 202,560,974
Yield	, ac-ft	17500
Net Project Yield	, ac-ft	17,500
Cost Per Acre-Foot per year		\$ 231

Alternative 1d Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05	
Annual Operating costs			
1D	Variables	Annual \$	
Wells, pumping	1		
flow, cfs	16		
drawdown, ft	20		
Water treatment plants, O&M		\$ 735,380	
Pumping plants, pipe, O&M		\$ 162,786	
Distribution systems, pumping			
flow, cfs (24+8)	32		
head, ft	500		
flow, cfs	0		
head, ft	700		
flow, cfs (1/5 of year)	40		
head, ft, averaged	750		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$ 2,600,598	
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		

Alternative 1e Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
1E			
Feature	Component Details	Capital costs Item Costs \$	
Similar to Alt 1A w/ larger pumping, as below		\$	20,500,150
NWS - Treatment wetlands and			
reservoir	Wetland: 18 acres	\$	630,000
	Reservoir: earth dam, H= x ft; 49		
	surface acres, V= 1,600 ac-ft	\$	4,145,041
Land Outfall Pipeline	9,000 ft, 12" dia, 50' head, flow =3.5 cfs	\$	312,303
Treatment-Reservoir Pipeline	1,000 ft, flow =3.5 cfs, open channel ditch	\$	-
Clarified water Pipeline	5,800 ft, 18" dia, min head, flow =8.7 cfs	\$	333,777
Spreading basin	As is - no change	TBD	
Groupdwater extraction wells	add 2 more wells than in 1A 8 total	¢	270 805
		φ	270,095
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	29,043
Water treatment plant	Haybarn Canyon; train 2, 33 cfs	\$	10,582,796
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 33"- 30" dia, 1100' head, 28-23 cfs	\$	11,337,296
	TOTAL	\$	48,141,301

Alternative 1e Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1E Total Construction Co	osts	\$ 48,141,301
	Mobilization 5 %	\$ 2,012,419
Un	listed Items 15 %	\$ 7,221,195
Total Contract Costs	-	\$ 57,374,915
Co	ntingencies 25 %	\$ 14,343,729
Total Field Costs	-	\$ 71,718,644
N	on-Contract 33 %	\$ 23,667,152
Open Space M	anagement Zone	\$ 13,000,000
Total Project Costs	-	\$ 108,385,796
PV of A	nnual O&M Costs	\$ 75,436,303
Net Present Value		\$ 183,822,099
	Yield, ac-ft	16200
Net F	Project Yield, ac-ft	16,200
Cost Per Acre-Foot p	er year	\$ 227

Alternative 1e Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05	
Annual Operating costs			
1E	Variables	Annual \$	
Wells, pumping			
flow, cfs	14		
drawdown, ft	20		
Water treatment plants, O&M		\$ 755,720	
Pumping plants, pipe, wetlands, dam		\$ 78,420	
Distribution systems, pumping			
flow, cfs	28		
head, ft	500		
flow, cfs	23		
head, ft	700		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$ 3,539,703	
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		
Alternative 1f Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
7F Feature	Component Details	(Capital costs Item Costs \$
Alt 1A w/ larger pumping, as below		\$	20,500,150
Pueblitos Canyon - wetlands	Wetland: 33 acres	\$	1,155,000
	Expansion area: 12 acres	\$	420,000
	18 400 ft 16" dia 150' bead flow =6.3		
Land Outfall Pipeline	cfs	\$	918,355
De-nitrified Pipeline	5,700 ft, 16" dia, gravity head, flow =6.3 cfs	\$	284,490
	9,400 ft, 16" dia, gravity head, flow =6.3		
Groundwater spreading Pipeline	cfs	\$	469,160
Groundwater extraction wells	1 more well than in Alt 1A, 7 total	\$	135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	14,521
Water treatment plant	Haybarn Canyon; train 2, 30 cfs	\$	9,920,197
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$	10,219,062
	TOTAL	\$	44,036,383

Alternative 1f Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1F	Total Construction Costs	\$ 44,036,383
	Mobilization 5 %	\$ 2,012,419
	Unlisted Items 15 %	\$ 6,605,457
	Total Contract Costs	\$ 52,654,259
	Contingencies 25 %	\$ 13,163,565
	Total Field Costs	\$ 65,817,824
	Non-Contract 33 %	\$ 21,719,882
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 100,537,706
	PV of Annual O&M Costs	\$ 69,604,936
	Net Present Value	\$ 170,142,641
	Yield, ac-ft	15100
	Net Project Yield, ac-ft	15,100
	Cost Per Acre-Foot per year	\$ 225

Alternative 1f Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
1F	Variables	Annual \$
Wells, pumping		
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 708,259
Pumping plants, pipe, wetlands O&M		\$ 72,070
Distribution systems, pumping		
flow, cfs	26	
head, ft	500	
flow, cfs	21	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,255,408
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1g Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
1G			
Feature	Component Details		Capital costs Item Costs \$
Alt 1A w/ larger pumping, as below		\$	20,500,150
Newton Canyon - wetlands	Wetland: 35 acres	\$	1,225,000
	Expansion area: 11 acres	\$	385,000
	7 200 ft 15" dia connects to evicting		
Land Outfall Pipeline	pump head, flow =6.3 cfs	\$	364,347
	20,600 ft, 15" dia, pump head 60', flow		
De-nitrified Pipeline	=6.3 cfs	\$	1,792,135
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$	469,160
Groundwater extraction wells	1 more well than in Alt 1A, 7 total	\$	135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	14,521
Water treatment plant, same as 1F	Havbarn Canvon: train 2, 30 cfs	\$	9 920 197
		¥	0,020,101
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$	10,219,062
	TOTAL	\$	45,025,020

Alternative 1g Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1G	Total Construction Costs	\$ 45,025,020
	Mobilization 5 %	\$ 2,012,419
	Unlisted Items 15 %	\$ 6,753,753
-	Total Contract Costs	\$ 53,791,192
	Contingencies 25 %	\$ 13,447,798
-	Total Field Costs	\$ 67,238,989
	Non-Contract 33 %	\$ 22,188,867
	Open Space Management Zone	\$ 13,000,000
-	Total Project Costs	\$ 102,427,856
	PV of Annual O&M Costs	\$ 70,386,962
	Net Present Value	\$ 172,814,818
	Yield, ac-ft	15100
	Net Project Yield, ac-ft	 15,100
	Cost Per Acre-Foot per year	\$ 229

Alternative 1g Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
1G	Variables	Annual \$
Wells, pumping	1	
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 708,259
Pumping plants, pipe, wetlands O&M		\$ 73,370
Distribution systems, pumping		
flow, cfs	26	
head, ft	500	
flow, cfs	21	
head, ft	700	
flow, cfs (denitrified)	6.3	
head, ft	60	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,299,451
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 1h Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
1H			
Feature	Component Details	C	apital costs Item Costs \$
Alt 1A w/ larger pumping, as below		\$	20,500,150
Off-stream storage reservoir	Reservoir: earth dam, H= x ft; 55 surface acres, V= 4,800 ac-ft	\$	12,021,016
Bi-direction raw water Pipeline	12,000 ft, 36" dia, 400' head, flow =40 cfs; between reservor and Pond 7	\$	7,972,844
water treatment plant, same as 1F	Haybarn Canyon; train 2, 30 cfs	\$	9,920,197
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$	10,219,062
		¢	
	IUIAL	\$	60,633,269

Alternative 1h Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1H	Total Construction Costs	\$ 60,633,269
	Mobilization 5 %	\$ 2,012,419
	Unlisted Items 15 %	\$ 9,094,990
	Total Contract Costs	\$ 71,740,678
	Contingencies 25 %	\$ 17,935,170
	Total Field Costs	\$ 89,675,848
	Non-Contract 33 %	\$ 29,593,030
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 132,268,878
	PV of Annual O&M Costs	\$ 83,449,922
	Net Present Value	\$ 215,718,799
	Yield, ac-ft	14800
	Net Project Yield, ac-ft	 14,800
	Cost Per Acre-Foot per year	\$ 292

Alternative 1h Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment			20-Jan-05
Annual Operating costs			
1H	Variables	,	Annual \$
Wells, pumping	1		
flow, cfs	10		
drawdown, ft	20		
Water treatment plants, O&M		\$	708,259
Pumping plants, pipe, dam		\$	133,780
Distribution systems, pumping			
flow, cfs	26		
head, ft	500		
flow, cfs	21		
head, ft	700		
flow, cfs (2/5 of year)	40		
head, ft	400		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$	3,996,439
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		

Alternative 1i Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative		
Feature	Component Details	Capital costs Item Costs \$
Alt 1A, slightly reduced per below		\$ 40,248,371
Decreased groundwater wells	2 fewer wells than in Alt 1A, 4 total	\$ (270,895)
Groundwater collection pipe system - savings	Based on 750 gpm wells pumped into existing collector	\$ (29,043)
Enhanced extraction piping	7,500 ft, 12" dia, 50' head, flow =4 cfs to Haybarn WTP	\$ 801,141
	Hauthara Capurani, train 2, 20 efa	
water treatment plant, same as 1A	Haybam Canyon, train 2, 29 cis	
	TOTAL	\$ 40,749,574

Alternative 1i Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
1 Total Construction Costs	\$	40,749,574
Mobilization 5 %	6\$	2,012,419
Unlisted Items 15 %	6 \$	6,112,436
Total Contract Costs	\$	48,874,429
Contingencies 25 %	6 \$	12,218,607
Total Field Costs	\$	61,093,036
Non-Contract 33 %	6\$	20,160,702
Open Space Management Zon	e <u>\$</u>	13,000,000
Total Project Costs	\$	94,253,738
PV of Annual O&M Cost	s \$	63,659,985
Net Present Value	\$	157,913,723
Yield, ac-	ť	14100
Net Project Yield, ac-	t	14,100
Cost Per Acre-Foot per year	\$	224

Alternative 1i Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
11	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	50	
Water treatment plants, O&M		\$ 692,380
Pumping plants, pipe, O&M		\$ 13,570
Distribution systems, pumping		
flow, cfs	24	
head, ft	500	
flow, cfs	19	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,985,095
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 2a Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative		
2A		
Feature	Component Details	Capital costs Item Costs \$
Diversion dam -Obermeyer installation	280' long, 7.9' high, Replaces existing sheet pile diversion dam	\$ 2,738,000
Headworks gates - reconstructed with Obermeyer dam	Increased from 60 to 200 cfs	\$ 101,791
O'Neill ditch - widening improvements along with road siphon crossings	Increased from 60 to 200 cfs	\$ 406,219
Recharge ponds	Rehab 1-5 existing ponds: 312 AF;	\$ 1,261,473
	Construct 2 new ponds, 6&7: 242 AF	\$ 2,269,454
Groundwater extraction wells	4 wells, 6.4 cfs net	\$ 541,790
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$ 58,085
Water treatment plant	Haybarn Canyon; train 2, 21 cfs	\$ 7,982,400
Distribution main ainsline	From WTP pumps, 18 cfs, 27" pipeline	• • • • • • • • • •
Distribution main pipeline	to existing So. CPEN tanks	\$ 1,170,791
Diversion weir	Fallbrook PUD sump, 357'x10'	\$ 4,363,688
Fallbrook sump to Red Mtn pipeline	29,000', 15" dia, 700' head, 5 cfs	\$ 2,427,864
Water treatment plant	Red Mountain - train 2	\$ 3,590,600
New Oceanside- Morro Hill pipeline	28,000', 27" dia, gravity head, 20 cfs	\$ 3,278,215
Lake O'Neill rehab	same as Alt 1a	\$ 12,823,400
Open space management zone	land purchase, included below	
	TOTAL	\$ 43.013.770

Alternative 2a Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
2A	Total Construction Costs	\$ 43,013,770
	Mobilization 5 %	\$ 2,150,689
	Unlisted Items 15 %	\$ 6,452,066
-	Total Contract Costs	\$ 51,616,524
	Contingencies 25 %	\$ 12,904,131
-	Total Field Costs	\$ 64,520,655
	Non-Contract 33 %	\$ 16,130,164
	Open Space Management Zone	\$ 13,000,000
-	Total Project Costs	\$ 93,650,819
	PV of Annual O&M Costs	\$ 41,632,774
'''''''''''''''''''''''''''''''''''''	Net Present Value	\$ 135,283,593
	Yield, ac-ft	12600
	Net Project Yield, ac-ft	 12600
	Cost Per Acre-Foot per year	\$ 215

Alternative 2a Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
2A	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 848,308
Pumping plants, pipe, O&M		\$ 35,987
Distribution systems, pumping		
flow, cfs (base)	18	
head, ft	500	
flow, cfs (mid)	0	
head, ft	700	
flow, cfs (FPUD to RMR)	5	
head, ft	800	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 1,529,599
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 2b Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative 2B		
Feature	Component Details	Capital costs Item Costs \$
Alt 2A without Morro Hill Pipeline, plus larger Haybarn WTP per below		\$ 30,582,364
San Mateo ponds - rehab	Area and depth affect costs - 2'; haul mile assumed	\$ 306,000
San Mateo wells	3 new wells, 5 cfs	\$ 406,343
Well head treatment	8 cfs. chloramination	\$ 86.000
		ф 00,000
Pipeline to Orange County (OC)	23,000 ft, 18" dia, 450' head, flow = 8 cfs, new storage tank	\$ 6,090,640
Pipeline from Santa Margarita river basin	Bi-directional, 104,000 ft, 36" dia, 750' head, flow = 40 cfs 1-way	\$ 27,334,678
Groundwater extraction wells	2 additional SMR wells over 2a	\$ 270,895
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$ 29,043
Existing Oceanside- Morro Hill		
pipeline	28,000', 12" dia, gravity head	\$ -
Water treatment plant	Haybarn Canyon; brine disposal assumed included, train 2, 22 cfs	\$ 8,197,937
Distribution main pipeline	From WTP pumps, 18 cfs, 27" pipeline to existing So. CPEN tanks	\$ 1,170,791
		\$ 74,474,690

Alternative 2b Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
25 Total Constructio	n Costs	\$ 74,474,690
	Mobilization 5 %	\$ 2,150,689
	Unlisted Items 15 %	\$ 11,171,204
Total Contract Co	sts	\$ 87,796,583
	Contingencies 25 %	\$ 21,949,146
Total Field Costs		\$ 109,745,728
	Non-Contract 33 %	\$ 27,436,432
Open Spac	e Management Zone	\$ 13,000,000
Total Project Cost	s	\$ 150,182,160
PV	of Annual O&M Costs	\$ 49,613,955
Net Present Value		\$ 199,796,115
	Yield, ac-ft	16000
N	et Project Yield, ac-ft	16000
Cost Per Acre-Foo	ot per year	\$ 250

Alternative 2b Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
2B	Variables	Annual \$
Wells, pumping	1	
flow, cfs	15	
drawdown, ft	20	
Water treatment plants, O&M		\$ 906,915
Pumping plants, pipe, O&M		\$ 187,064
Distribution systems, pumping		
flow, cfs (base)	18	
head, ft	500	
flow, cfs (OC)	8	
head, ft	450	
flow, cfs (1/5 of year)	40	
head, ft	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 1,782,668
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 2c Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative 2C			
Feature	Component Details	C	apital costs Item Costs \$
Alt 2A with treatment plant and wells as below, plus below		\$	33,860,579
Pueblitos Canyon - wetlands	Wetland: 33 acres Expansion area: 12 acres	\$ \$	1,155,000 420,000
Land Outfall Pipeline	18,400 ft, 16" dia, 150' head, flow =6.3 cfs	\$	918,355
De-nitrified Pipeline	5,700 ft, 16" dia, gravity head, flow =6.3 cfs	\$	284,490
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$	469,160
Groundwater extraction wells	3 additional SMR wells over 2a	\$	406,343
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$	43,564
Water treatment plant	Haybarn Canyon; train 2, 23 cfs	\$	8,413,410
Distribution main pipeline	From WTP pumps, 20 cfs, 27" pipeline to existing So. CPEN tanks	\$	1,170,791
		\$	47,141,691

Alternative 2c Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment			20-Jan-05
TOTAL COST ANALYSIS			
2C	Total Construction Costs	\$	47,141,691
	Mobilization 5 %	\$	2,150,689
	Unlisted Items 15 %	\$	7,071,254
	Total Contract Costs	\$	56,363,634
	Contingencies 25 %	\$	14,090,908
	Total Field Costs	\$	70,454,542
	Non-Contract 33 %	\$	17,613,636
	Open Space Management Zone	\$	13,000,000
	Total Project Costs	\$	101,068,178
	PV of Annual O&M Costs	\$	36,848,946
	Net Present Value	\$	137,917,124
	Yield, ac-ft		13600
	Net Project Yield, ac-ft	_	13600
	Cost Per Acre-Foot per year	\$	203

Alternative 2c Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
2C	Variables	Annual \$
Wells, pumping		
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 872,534
Pumping plants, pipe, O&M		\$ 24,279
Distribution systems, pumping		
flow, cfs (base)	20	
head, ft	520	
flow, cfs	0	
head, ft	0	
flow, cfs (denitrified)	6.3	
head, ft	0	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 1,239,712
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 2d Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
2D			
		С	apital costs
Feature	Component Details		tem Costs «
			Ψ
Alt 2A with treatment plant and wells			
as below, plus below		\$	33,860,579
Newton Canyon - wetlands	Wetland: 35 acres	\$	1,225,000
	Expansion area: 11 acres	\$	385,000
	7,300 ft, 15" dia, connects to existing		
Land Outfall Pipeline	pump head, flow =6.3 cfs	\$	364,347
	20 COO # 15" dia nume bood COL flow		
De-nitrified Pipeline	=6.3 cfs	\$	1 792 135
		Ψ	1,7 52,155
_	9,400 ft, 16" dia, gravity head, flow =6.3		
Groundwater spreading Pipeline	cfs	\$	469,160
Groundwater extraction wells	3 additional SMR wells over 2a	\$	406,343
		<u> </u>	
Groundwater collection nine system	Based on 750 gpm wells pumped into	¢	43 564
Groundwater conection pipe system		φ	43,304
Water treatment plant, same as 2c	Haybarn Canyon; train 2, 23 cfs	\$	8,413,410
Distribution main nineline	From WIP pumps, 20 cfs, 27" pipeline	¢	1 170 701
		φ	1,170,791
		¢	40,400,000
		\$	48,130,328

Alternative 2d Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
2D T	otal Construction Costs	\$ 48,130,328
	Mobilization 5 %	\$ 2,150,689
	Unlisted Items 15 %	\$ 7,219,549
Т	otal Contract Costs	\$ 57,500,566
	Contingencies 25 %	\$ 14,375,142
Т	otal Field Costs	\$ 71,875,708
	Non-Contract 33 %	\$ 17,968,927
	Open Space Management Zone	\$ 13,000,000
Т	otal Project Costs	\$ 102,844,634
	PV of Annual O&M Costs	\$ 37,608,552
N	let Present Value	\$ 140,453,186
	Yield, ac-ft	13600
	Net Project Yield, ac-ft	13600
c	Cost Per Acre-Foot per year	\$ 207

Alternative 2d Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
2D	Variables	 Annual \$
Wells, pumping		
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 872,534
Pumping plants, pipe, O&M		\$ 24,279
Distribution systems, pumping		
flow, cfs (base)	20	
head, ft	520	
flow, cfs	0	
head, ft	700	
flow, cfs	6.3	
head, ft	60	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 1,283,754
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3a Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative		
3A		
		Capital costs
Feature	Component Details	Item Costs
	Obermever replacement not done with	Þ
Diversion dam - SMR	this alternative	\$-
Headworks gates - reconstruct	Increased from 60 to 100 cfs	\$ 101 791
		φ 101,701
O'Neill ditch - widening		
improvements along with road		
siphon crossings	Increased from 60 to 100 cfs	\$ 179,369
Becharge nonds	Rebab 1-5 existing ponds: 312 AF:	\$ 1 261 473
Recharge points		φ 1,201,473
	Construct 2 new ponds, 6&7: 242 AF	\$ -
Groundwater extraction wells	4 wells, 6.4 cfs net	\$ 541,790
Groundwater collection nine evotem	Based on 750 gpm wells pumped into	¢ 59.095
Groundwater conection pipe system		۵ 50,005
Water treatment plant	Haybarn Canyon; train 2, 29 cfs	\$ 8,847,309
	Bi-directional to Fallbrook: 67,000', 30"-	
Distribution main pipeline	27" dia, 1100' head, 24-16 cfs	\$ 8,837,597
Storage tanks	At water treatment clearwell or existing	
	Base in water treatment; mid-booster	
Pumping plants	included in pipeline	
	Chappo Basin, 3 feet high. 200 to 400 ft	
Instream checks	in length	\$ 16,709
Lake O'Neill rehab	LC designs	\$ 12.823.400
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Open space management zone	land purchase, included below	
	TOTAL	\$ 32,667,523

Alternative 3a Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3A	Total Construction Costs	\$ 32,667,523
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 4,900,128
	Total Contract Costs	\$ 39,201,027
	Contingencies 25 %	\$ 9,800,257
	Total Field Costs	\$ 49,001,284
	Non-Contract 33 %	\$ 16,170,424
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 78,171,708
	PV of Annual O&M Costs	\$ 57,048,446
	Net Present Value	\$ 135,220,154
	Yield, ac-ft	12000
	Net Project Yield, ac-ft	12000
	Cost Per Acre-Foot per year	\$ 225

Alternative 3a Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3A	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 658,358
Pumping plants, pipe, O&M		\$ 100,504
Distribution systems, pumping		
flow, cfs (base)	21	
head, ft	500	
flow, cfs (mid)	16	
head, ft	700	
flow, cfs		
head, ft		
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,543,273
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3b Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative 3B			
Feature	Component Details		Item Costs \$
Alt 3A, plus below		\$	32,667,523
San Mateo extraction wells (SMC/SOC)	2 new wells, approx 4 cfs new	\$	309,619
San Mateo pump station and storage tank, included below	Q=7 cfs_H=450ft_1 day storage	\$	
		Ţ.	
Pipeline to Orange County (OC)	23,000 ft, 21" dla, 450" head, flow = 7 cfs	\$	5,347,351
Wellhead Treatment	Chloramination, 7cfs	\$	81,500
	TOTAL	\$	38,405,992

Alternative 3b Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3B	Total Construction Costs	\$ 38,405,992
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 5,760,899
	Total Contract Costs	\$ 45,800,267
	Contingencies 25 %	\$ 11,450,067
	Total Field Costs	\$ 57,250,334
	Non-Contract 33 %	\$ 18,892,610
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 89,142,944
	PV of Annual O&M Costs	\$ 65,152,576
	Net Present Value	\$ 154,295,521
	Vield ac ft	14800
	Net Project Yield, ac-ft	14800
	Cost Per Acre-Foot per year	\$ 209

Alternative 3b Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3B	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 699,358
Pumping plants, pipe, O&M		\$ 153,977
Distribution systems, pumping		
flow, cfs (base)	21	
head, ft	500	
flow, cfs (mid)	16	
head, ft	700	
flow, cfs (SMC)	7	
head, ft (OC)	450	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,918,682
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3c Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
3C			
Feature	Component Details		Item Costs
			\$
Alt 3A, plus below		\$	32,667,523
San Mateo extraction wells	2 new wells, approx 4 cfs new	¢	309 619
		Ψ	000,010
San Mateo pump station and storage			
included below	Q=7 cfs, H=450ft, 1 day storage	\$	-
Pipeline to Santa Margarita River	One-directional, 104,000 ft, 21" dia, 750'		
basin	head, flow = 7 cfs	\$	12,570,882
	тотл	¢	
	IUIAL	\$	45,548,023

Alternative 3c Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3C	Total Construction Costs	\$ 45,548,023
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 6,832,204
	Total Contract Costs	\$ 54,013,603
	Contingencies 25 %	\$ 13,503,401
	Total Field Costs	\$ 67,517,004
	Non-Contract 33 %	\$ 22,280,611
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 102,797,615
	PV of Annual O&M Costs	\$ 69,628,528
	Net Present Value	\$ 172,426,143
	Yield, ac-ft	14800
	Net Project Yield, ac-ft	14800
	Cost Per Acre-Foot per year	\$ 233

Alternative 3c Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

20-Jan-05

Annual Operating costs		
3C	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 658,358
Pumping plants, pipe, O&M		\$ 209,816
Distribution systems, pumping		
flow, cfs	21	
head, ft	500	
	16	
	700	
flow, cfs	7	
head, ft (Cross Base)	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,163,362
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3d Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative 3D			
Feature	Component Details		Item Costs \$
Alt 3A, minus Fallbrook bi-directional pipeline, plus below		\$	23,829,926
San Mateo ponds - rehab	Area and depth affect costs - 2'; haul mile assumed	\$	306,000
San Mateo extraction wells (SMC/SOC)	3 new wells, approx 5 cfs new	\$	464,428
San Mateo pump station(s)	Q=8 cfs, H=450' to OC or 750' to SMR, included in OC below		
Pipeline to Orange County (OC)	23,000 ft, 18" dia, 450' head, flow = 8 cfs. new storage tank	\$	6.090.640
Dineline from Sente Margarite river		Ψ	0,000,040
basin	head, flow =40 cfs 1-way	\$	27,334,678
Well head treatment	8 cfs, chloramination	\$	86,000
Haybarn WTP to mid-tanks, pipeline only	10,000 ft, 27" dia, 500' head, flow =21 cfs to existing tanks	\$	1,209,294
	TOTAL	\$	59,320,966

Alternative 3d Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3D	Total Construction Costs	\$ 59,320,966
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 8,898,145
	Total Contract Costs	\$ 69,852,487
	Contingencies 25 %	\$ 17,463,122
	Total Field Costs	\$ 87,315,609
	Non-Contract 33 %	\$ 28,814,151
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 129,129,760
	PV of Annual O&M Costs	\$ 56,677,883
	Net Present Value	\$ 185,807,643
	Yield, ac-ft	15400
	Net Project Yield, ac-ft	15400
	Cost Per Acre-Foot per year	\$ 241

Alternative 3d Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3D	Variables	Annual \$
Wells, pumping		
flow, cfs	12	
drawdown, ft	20	
Water treatment plants, O&M		\$ 701,358
Pumping plants, pipe, O&M		\$ 162,786
Distribution systems, pumping		
flow, cfs (21+8)	29	
head, ft	500	
flow, cfs	0	
head, ft	700	
flow, cfs (1/5 of year)	40	
head, ft, averaged	750	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,416,506
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3e Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment			20-Jan-05
Alternative			
32			
Feature	Component Details	lte	em Costs s
Similar to Alt 3A w/ larger pumping,			Ψ.
as below		\$	14,982,618
NWS - Treatment wetlands and			
reservoir	Wetland: 18 acres	\$	630,000
	Reservoir: earth dam, $H=x$ ft; 49	¢	4 4 4 5 0 4 4
	surface acres, v= 1,600 ac-n	<u></u>	4,145,041
Land Outfall Pipeline	9,000 ft, 12" dia, 50' head, flow =3.5 cfs	\$	312,303
Trastmant Pasaryair Pinalina	1,000 ft, flow =3.5 cfs, open channel	¢	
		Ψ	
Clarified water Pipeline	5,800 ft, 18" dia, min head, flow =8.7 cfs	\$	333,777
Spreading basin	As is - no change	TBD	
Groundwater extraction wells	2 more wells than in Alt 3A, 6 total	\$	270,895
	Based on 750 gpm wells pumped into		
Groundwater collection pipe system	existing collector	\$	29,043
Water treatment plant	Haybarn Canyon; train 2, 29 cfs	\$	9,732,236
	Bi-directional to Fallbrook: 67,000', 30"-		
Distribution main pipeline	27" dia, 1100' head, 25-20 cfs	\$	10,135,132
	TOTAL	\$	40,571,045

Alternative 3e Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3E	Total Construction Costs	\$ 40,571,045
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 6,085,657
	Total Contract Costs	\$ 48,290,077
	Contingencies 25 %	\$ 12,072,519
	Total Field Costs	\$ 60,362,597
	Non-Contract 33 %	\$ 19,919,657
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 93,282,254
	PV of Annual O&M Costs	\$ 67,550,476
	Net Present Value	\$ 160,832,730
	Yield, ac-ft	14100
	Net Project Yield, ac-ft	14100
	Cost Per Acre-Foot per year	\$ 228

Alternative 3e Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3E	Variables	Annual \$
Wells, pumping		
flow, cfs	10	
drawdown, ft	20	
Water treatment plants, O&M		\$ 721,698
Pumping plants, pipe, wetlands, dam		\$ 78,420
Distribution systems, pumping		
flow, cfs	25	
head, ft	500	
flow, cfs	20	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,110,930
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3f Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative 3F		
Feature	Component Details	Item Costs \$
Alt 3A w/ larger pumping, as below		\$ 14,982,618
Pueblitos Canyon - reservoir	Wetland: 33 acres	\$ 1,155,000
	Expansion area: 12 acres	\$ 420,000
Land Outfall Pipeline	18,400 ft, 16" dia, 150' head, flow =6.3 cfs	\$ 918,355
	5 700 ft 16" dia gravity head flow -6 3	
De-nitrified Pipeline	cfs	\$ 284,490
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$ 469,160
Groundwater extraction wells	1 more well than in Alt 3A, 5 total	\$ 135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$ 14,521
Water treatment plant	Haybarn Canyon; train 2, 27 cfs	\$ 9,274,725
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 26-21 cfs	\$ 9,960,359
	TOTAL	\$ 37,614,675

Alternative 3f Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3F	Total Construction Costs	\$ 37,614,675
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 5,642,201
	Total Contract Costs	\$ 44,890,253
	Contingencies 25 %	\$ 11,222,563
	Total Field Costs	\$ 56,112,816
	Non-Contract 33 %	\$ 18,517,229
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 87,630,045
	PV of Annual O&M Costs	\$ 61,860,596
	Net Present Value	\$ 149,490,641
	Yield, ac-ft	13000
	Net Project Yield, ac-ft	13000
	Cost Per Acre-Foot per year	\$ 230

Alternative 3f Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3F	Variables	Annual \$
Wells, pumping		
flow, cfs	8	
drawdown, ft	20	
Water treatment plants, O&M		\$ 682,440
Pumping plants, pipe, wetlands O&M		\$ 72,070
Distribution systems, pumping		
flow, cfs	23	
head, ft	500	
flow, cfs	18	
head, ft	700	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,826,636
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

Alternative 3g Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative 3G		
Feature	Component Details	Item Costs \$
Alt 3A w/ larger pumping, as below		\$ 14,982,618
Newton Canyon - wetlands	Wetland: 35 acres	\$ 1,225,000
	Expansion area: 11 acres	\$ 385,000
Land Outfall Pipeline	7,300 ft, 15" dia, connects to existing pump head, flow =6.3 cfs	\$ 364,347
De-nitrified Pipeline	20,600 ft, 15" dia, pump head 60', flow =6.3 cfs	\$ 1,792,135
Groundwater spreading Pipeline	9,400 ft, 16" dia, gravity head, flow =6.3 cfs	\$ 469,160
Groundwater extraction wells	1 more well than in Alt 3A, 5 total	\$ 135,448
Groundwater collection pipe system	Based on 750 gpm wells pumped into existing collector	\$ 14,521
Water treatment plant, same as 3F	Haybarn Canyon; train 2, 27 cfs	\$ 9,274,725
Distribution main pipeline	Bi-directional to Fallbrook: 67,000', 30"- 27" dia, 1100' head, 23-18 cfs	\$ 9,960,359
	TOTAL	\$ 38,603,312

Alternative 3g Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3G	Total Construction Costs	\$ 38,603,312
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 5,790,497
	Total Contract Costs	\$ 46,027,185
	Contingencies 25 %	\$ 11,506,796
	Total Field Costs	\$ 57,533,981
	Non-Contract 33 %	\$ 18,986,214
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 89,520,195
	PV of Annual O&M Costs	\$ 62,642,623
	Net Present Value	\$ 152,162,818
	Yield, ac-ft	13000
	Net Project Yield, ac-ft	13000
	Cost Per Acre-Foot per year	\$ 234

Alternative 3g Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3G	Variables	Annual \$
Wells, pumping		
flow, cfs	8	
drawdown, ft	20	
Water treatment plants, O&M		\$ 682,440
Pumping plants, pipe, wetlands O&M		\$ 73,370
Distribution systems, pumping		
flow, cfs	23	
head, ft	500	
flow, cfs	18	
head, ft	700	
flow, cfs (denitrified)	6.3	
head, ft	60	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 2,870,678
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

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Alternative 3h Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative		
3H		
Feature	Component Details	Item Costs
		\$
Alt 3A w/ larger pumping, as below		\$ 14,982,618
	Reservoir: earth dam H= v ft [.] 55	
Off-stream storage reservoir	surface acres, V= 4,800 ac-ft	\$ 12,021,016
Bi-direction raw water Pipeline	12,000 ft, 36" dia, 400' head, flow =40 cfs: between reservor and Pond 7	\$ 7 972 844
		φ 1,012,011
	l	
Water treatment plant, same as 3F	Haybarn Canyon; train 2, 27 cfs	\$ 9,274,725
	Bi-directional to Fallbrook: 67,000', 30"-	
Distribution main pipeline	27" dia, 1100' head, 26-21 cfs	\$ 9,960,359
L	TOTAL	\$ 54,211,562

Alternative 3h Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment		20-Jan-05
TOTAL COST ANALYSIS		
3H	Total Construction Costs	\$ 54,211,562
	Mobilization 5 %	\$ 1,633,376
	Unlisted Items 15 %	\$ 8,131,734
	Total Contract Costs	\$ 63,976,672
	Contingencies 25 %	\$ 15,994,168
	Total Field Costs	\$ 79,970,840
	Non-Contract 33 %	\$ 26,390,377
	Open Space Management Zone	\$ 13,000,000
	Total Project Costs	\$ 119,361,217
	PV of Annual O&M Costs	\$ 75,721,659
	Net Present Value	\$ 195,082,876
	Yield, ac-ft	12700
	Net Project Yield, ac-ft	12700
	Cost Per Acre-Foot per year	\$ 307

Alternative 3h Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment		20-Jan-05
Annual Operating costs		
3H	Variables	Annual \$
Wells, pumping		
flow, cfs	6.4	
drawdown, ft	20	
Water treatment plants, O&M		\$ 682,440
Pumping plants, pipe, dam		\$ 133,780
Distribution systems, pumping		
flow, cfs	23	
head, ft	500	
flow, cfs	18	
head, ft	700	
flow, cfs (2/5 of year)	40	
head, ft	400	
Power value, \$/kw-hr	\$0.11	
Power for pumping, annually		\$ 3,568,598
Repair to river check structures		\$ 5,570
Interest rate	5.375%	
Assumed design life, years	50	
Present worth factor	17.25	

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Alternative 3i Santa Margarita Project - Pre-Feasibility Study Project Capital Cost Breakdown

With Minimal Water Treatment		20-Jan-05
Alternative		
51		
Feature	Component Details	Item Costs \$
Alt 3A. slightly reduced per below		\$ 32.667.523
		· · · · · · · · · · · · · · · · · · ·
Decreased groundwater wells	2 fewer wells than in Alt 1A, 2 total	\$ (270,895)
Groundwater collection pipe system - savings	Based on 750 gpm wells pumped into existing collector	\$ (29,043)
Enhanced extraction piping	7,500 ft, 12" dia, 50' head, flow =4 cfs to Haybarn WTP	\$ 801,141
Water treatment plant, same as 3A	Haybarn Canyon; train 2, 25 cfs	
	TOTAL	\$ 33,168,726

Alternative 3i Santa Margarita Project - Pre-Feasibility Study Alternative Total Cost Analysis

With Minimal Water Treatment	20-Jan-05
TOTAL COST ANALYSIS	
3 Total Construction Costs	\$ 33,168,726
Mobilization 5 %	\$ 1,633,376
Unlisted Items 15 %	\$ 4,975,309
Total Contract Costs	\$ 39,777,411
Contingencies 25 %	\$ 9,944,353
Total Field Costs	\$ 49,721,763
Non-Contract 33 %	\$ 16,408,182
Open Space Management Zone	\$ 13,000,000
Total Project Costs	\$ 79,129,945
PV of Annual O&M Costs	\$ 55,428,518
Net Present Value	\$ 134,558,463
Yield, ac-ft	12000
Net Project Yield, ac-ft	12000
Cost Per Acre-Foot per year	\$ 224

Alternative 3i Santa Margarita Project - Pre-Feasibility Study Alternative Annual Costs

With Minimal Water Treatment			20-Jan-05
Annual Operating costs			
31	Variables	Annual \$	
Wells, pumping			
flow, cfs	3.4		
drawdown, ft	20		
Water treatment plants, O&M		\$	658,358
Pumping plants, pipe, O&M		\$	13,570
Distribution systems, pumping			
flow, cfs	21		
head, ft	500		
flow, cfs	16		
head, ft	700		
Power value, \$/kw-hr	\$0.11		
Power for pumping, annually		\$	2,536,282
Repair to river check structures		\$	5,570
Interest rate	5.375%		
Assumed design life, years	50		
Present worth factor	17.25		