300

San Luis Rey Watershed – Water Quality Status

Three water bodies are currently listed or recommended for listing on the Clean Water Act Section 303(d) list of water quality limited segments. These water bodies, the stressor and the year of listing are:

Pacific Ocean Shoreline (at the San Luis Rey River Mouth)	0.4 miles	Bacterial Indicators	1998
Lake Guajome	25 acres	Eutrophic	1998
San Luis Rey River	lower 13 miles	Chloride	2002
	lower 17 miles	TDS	2002

It is anticipated that the San Luis Rey River will be added to the 303(d) list later this year after State Board and USEPA approval. None of these water bodies currently have a TMDL under development. No TMDL-related activities are planned for the remainder of the 02-03 fiscal year.

Additionally, there is some data that indicates that manganese and phosphorus may be exceeding Basin Plan Objectives in the San Luis Rey River. Regional Board Staff also believe eutrophication to be a problem in this river, but data is lacking to corroborate visual observations.

San Luis Rey River - City of Oceanside Water Utilities Laboratory

	Date	Chloride (mg/L)	avg	median	Sulfate (mg/L)	avg	median	TDS (mg/L)	avg	median
Bonsall	October 27, 1997	421			459			1900		
	March 16, 1998	216			334			1700		
	June 1, 1998	206	281.0	216.0	326			1130	1576.667	1700
	September 21, 1998	297			412			1400		
	March 8, 1999	286			441			1348		
	September 13, 1999	380	321.0	297.0	500			1790	1512.7	1400
	December 13, 1999	350			490			1580		
	April 27, 2000	270			460			1500		
	July 6, 2000	330			480			1840		
	September 19, 2000	380			NM			1870		
	November 27, 2000	240	314.0	330.0	360			1680	1694.0	1680
	Avg =	306.9			426.2			1612.5		
	Median =	297.0			450.0			1680.0		
	Std Dev =	71.4			65.0			246.2		
	95% C I =	42.2			40.3			145.5		
	95% CI Range =	264.7 to 349.1			385.9 to 466.5			1467.1 to 1758.0		
Douglas	October 27, 1997	342			347			1500		
	March 16, 1998	230			305			1180		
	June 1, 1998	216			326			1150		
	September 21, 1998	302	272.5	266.0	361			1480	1327.5	1330
	March 8, 1999	301			431			1372		
	September 13, 1999	320			420			1560	1466.0	1466
	December 13, 1999	NF	310.5	310.5	NF			NF		
	April 27, 2000	310			450			1530		
	July 6, 2000	360			390			1660		
	September 19, 2000	340			NM			1680		
	November 27, 2000	240	312.5	325.0	270			1580	1612.5	1620
	Avg =	296.1			366.7			1469.2		
	Median =	306.0			361.0			1515.0		
	Std Dev =	50.4			60.9			182.9		
	95% CI =	31.2			39.8			113.4		
	95% CI Range =	264.9 to 327.3			326.9 to 406.5			1355.8 to 1582.6		
Benet	October 27, 1997	805			541			2660		
	March 16, 1998	233			330			1187		
	June 1, 1998	226			330			1090		
	September 21, 1998	342	401.5	287.5	391			1350	1571.8	1268.5
	March 8, 1999	329			420			1400		
	September 13, 1999	NS			NS			NS		
	December 13, 1999	560	444.5	444.5	520			1990	1695.0	1695.0
	April 27, 2000	320			430			1540		
	July 6, 2000	410			420			1800		
	September 19, 2000	560			510			2100		
	November 27, 2000	350	410.0	380.0	350			1900	1835.0	1850.0
	Avg =	413.5			424.2			1701.7		
	Median =	346.0			420.0			1670.0		
	Std Dev =	179.2			77.9			481.8		
	95% CI =	111.1			48.3			298.6		
	95% CI Range =	302.4 to 524.6			375.9 to 472.5			1403.1 to 2000.3		

(-) = either not evaluated or not detected
ND = non detect, NF = no flow, NM = not measured, NS = not sampled

Chloride Basin Plan Water Quality Objective = 250 mg/L is not to be exceeded more than 10% of the time in any one year

Sulfate Basin Plan Water Quality Objective = 250 mg/L is not to be exceeded more than 10% of the time in any one year

TDS Basin Plan Water Quality Objective = 500 mg/L is not to be exceeded more than 10% of the time in any one year

SAN LUIS REY RIVER
Hydrologic Unit # 903.11

NEW 303(d) LISTINGS
Chloride, Sulfate and Total Dissolved Solids (TDS)

PREVIOUS 303(d) LISTINGS
None

WATERSHED CHARACTERISTICS
The San Luis Rey River is located in the San Luis Rey Watershed in the north end of San Diego County, California. The San Luis Rey River originates from Lake Henshaw. In the lower segment, it runs parallel to Highway 76 all the way to the pacific coastline.

The San Luis Rey River is classified an inland surface water. It is designated with the following beneficial uses: MUN, AGR, IND, REC1, REC2, WARM, WILD and RARE[1].

WATER QUALITY OBJECTIVES NOT ATTAINED

Chloride The Basin Plan[1] objective is 250 mg/L.

Sulfate The Basin Plan[1] objective is 250 mg/L.

TDS The Basin Plan[1] objective is 500 mg/L.

EVIDENCE OF IMPAIRMENT

Chloride Data collected in October 1997 to November 2000 by the City of Oceanside Water Utilities Laboratory[2] showed 3 locations along the San Luis Rey River to exceed 250 mg/L. Three locations in the City of Oceanside were sampled quarterly for chloride. At Bonsall Bridge, 8 of 11 (73%) samples exceeded the Basin Plan objective, with a mean concentration of 306.9 mg/L and a median of 297.0 mg/L. At Douglas Bridge, 7 of 10 (70%) samples exceeded the Basin Plan objective, with a mean concentration of 296.1 mg/L and a median of 306.0 mg/L. At Benet Road, 8 of 10 (80%) samples exceeded the Basin Plan objective, with a mean concentration of 413.5 mg/L and a median of 346.0 mg/L. See graph below for trend.

Chlorides may impart a salty taste to drinking water in concentrations between 100 – 700 mg/L. The secondary drinking water standard for chlorides is 500 mg/L. The measured values may be impairing the MUN beneficial use.

Elevated concentrations in waters used for industrial process and supply can significantly increase the corrosion rate of steel and aluminum. The observed concentrations may be impairing the IND beneficial use.

High chloride concentrations can be toxic to plant life. A safe concentration of chloride of irrigation waters is considered to be in the range of 100 – 140 mg/L. Irrigation with water containing 140 – 350 mg/L of chloride may cause slight to moderate plant injury.[1] The measured concentrations can be expected to impair the AGR beneficial use. Damage to native flora could also impair the WARM, WILD and RARE beneficial uses.

Sulfate Data collected in October 1997 to November 2000 by the City of Oceanside Water Utilities Laboratory[2] showed 3 locations along the San Luis Rey River

to exceed 250 mg/L. Three locations in the City of Oceanside were sampled quarterly. At Bonsall Bridge, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 426.2 mg/L and a median of 450.0 mg/L. At Douglas Bridge, 9 of 9 samples exceeded the Basin Plan objective, with a mean concentration of 366.7 mg/L and a median of 361.9 mg/L. At Benet Road, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 424.2 mg/L and a median of 420.0 mg/L. See graph below for trend.

High concentrations of sulfate in drinking water can cause laxative effects[1] and would impair the MUN beneficial use.

TDS Data collected in October 1997 to November 2000 by the City of Oceanside Water Utilities Laboratory[2] showed 3 locations along the San Luis Rey River to exceed 500 mg/L. Three locations in the City of Oceanside were sampled quarterly. At Bonsall Bridge, 11 of 11 samples exceeded the Basin Plan objective, with a mean concentration of 1612.5 mg/L and a median of 1680.0 mg/L. At Douglas Bridge, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 1469.2 mg/L and a median of 1515.0 mg/L. At Benet Road, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 1701.7 mg/L and a median of 1670.0 mg/L. See graph below for trend.

Sampling by the Regional Water Quality Control Board, San Diego Region in May and June of 1998[3] also contain evidence of elevated concentrations of TDS. One sample at Foussat Rd had a concentration of 850 mg/L and one sample at Old Highway 395 had a concentration of 970 mg/L.

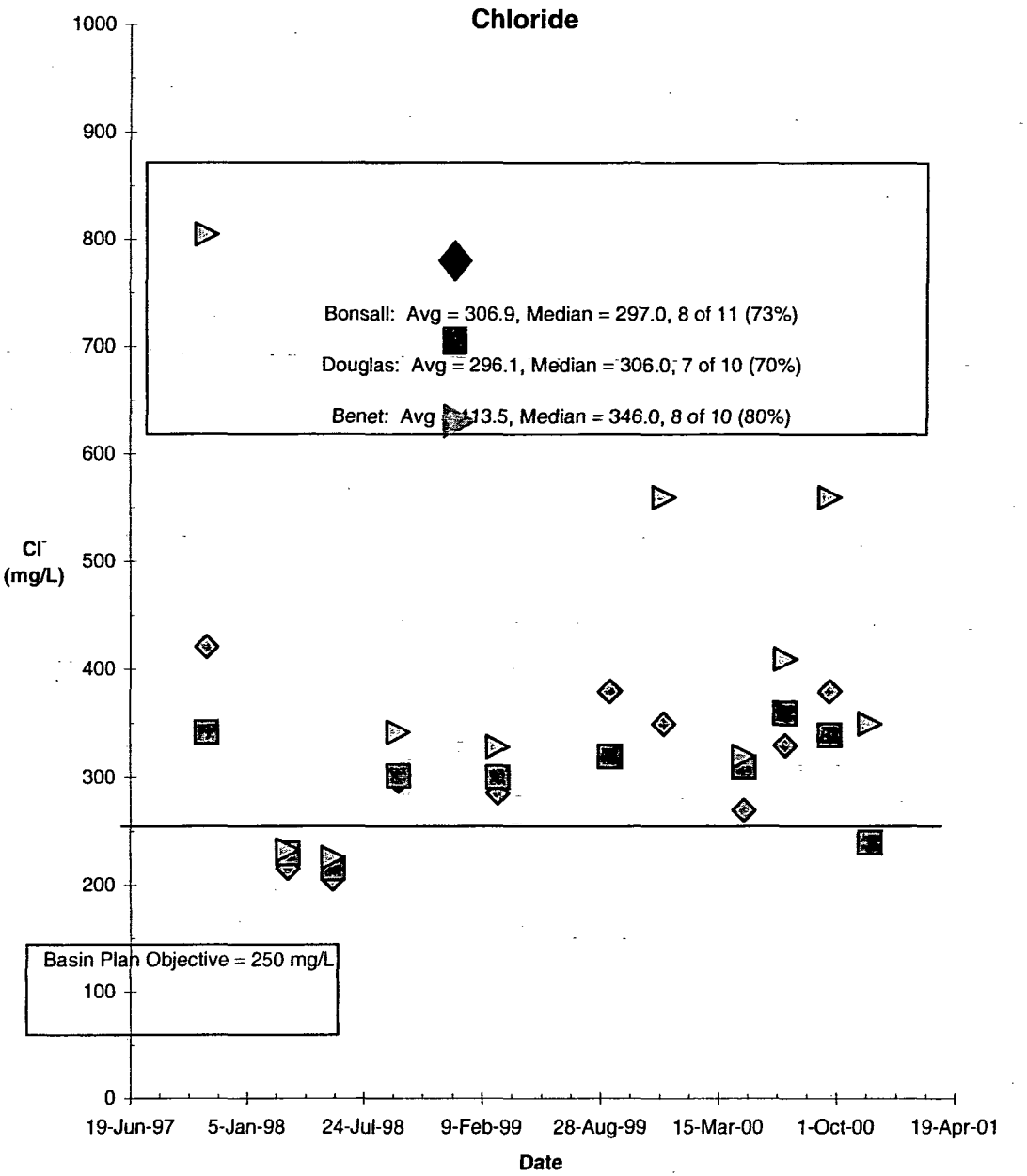
Total Dissolved Solids may consist of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, magnesium, sodium, iron and manganese. The most frequent constituents are usually salts (sodium, chloride, boron, etc.) Most of the problem can be traced to human impacts, and therefore, can be mitigated. Geologic conditions help to define the natural levels of many of these constituents. High concentrations of TDS are expected to impact the AGR beneficial use directly through irrigation waters or indirectly through adverse effects on soil permeability. TDS values between 450 to 2000 mg/L are expected to have a slight to moderate restriction on use of waters for irrigation of crops[1].

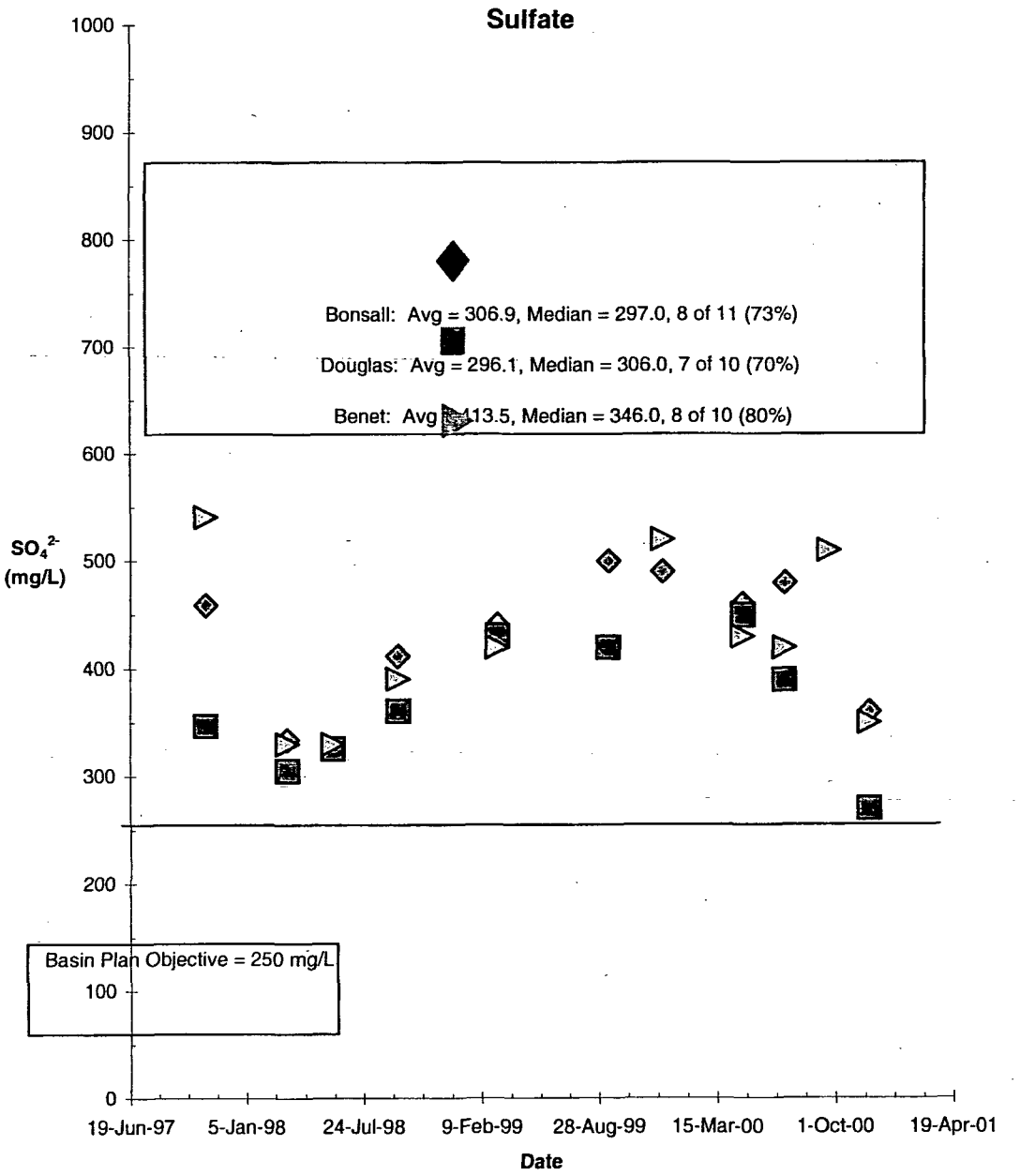
EXTENT OF IMPAIRMENT

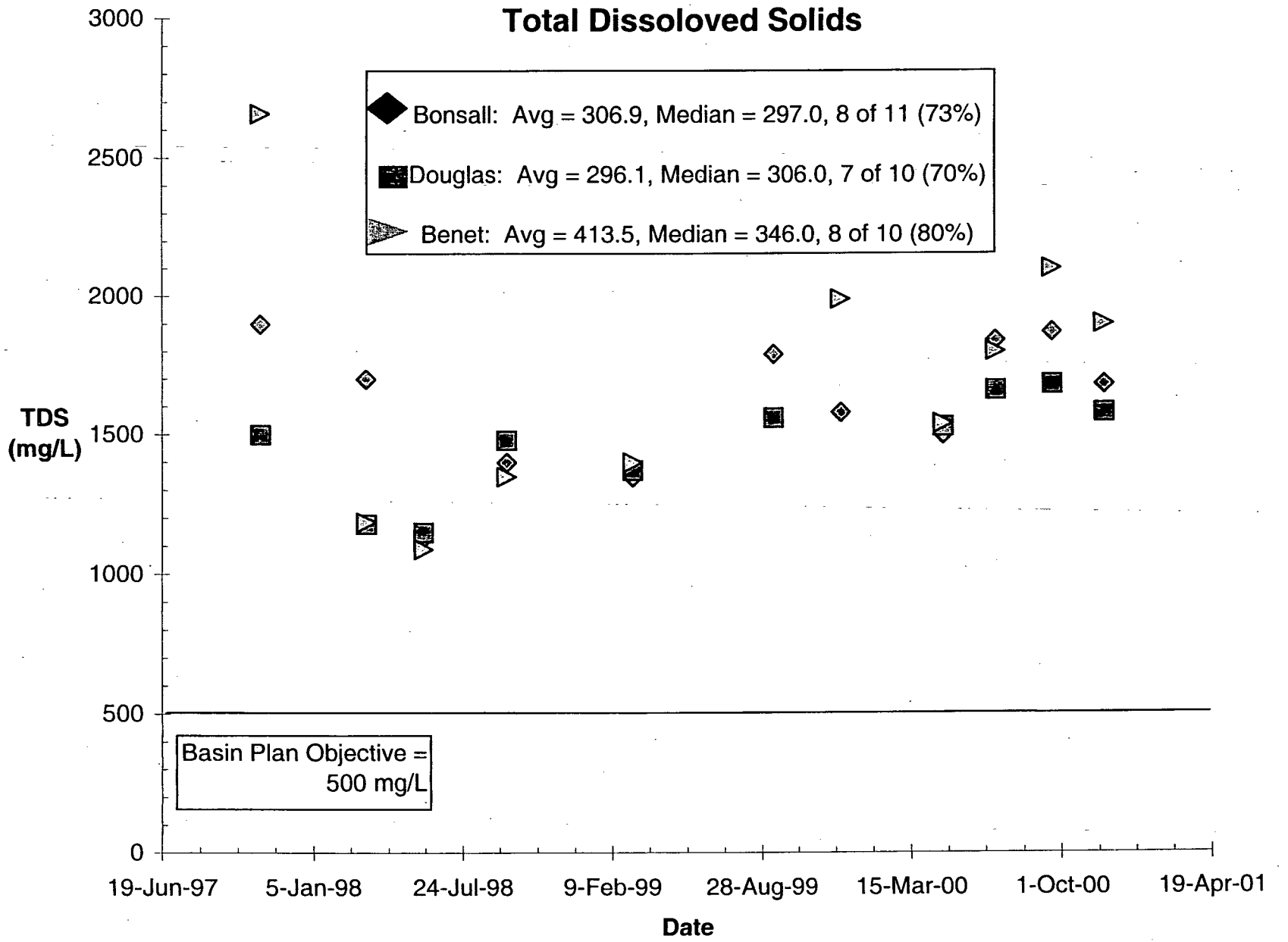
Chloride Sampling occurred at 3 locations on the San Luis Rey River: at Bonsall Bridge, at Douglas Bridge and at Benet Road. All 3 locations are in or near the City of Oceanside, in the lower section of the river. The entire lower extent of the river is impaired for chloride.

Sulfate Sampling occurred at 3 locations on the San Luis Rey River: at Bonsall Bridge, at Douglas Bridge and at Benet Road. All 3 locations are in or near the City of Oceanside, in the lower section of the river. The entire lower extent of the river is impaired for sulfate.

TDS Sampling occurred at 3 locations on the San Luis Rey River: at Bonsall Bridge, at Douglas Bridge and at Benet Road. All 3 locations are in or near the City of Oceanside, in the lower section of the river. Sampling also occurred at Foussat Rd and at Old Highway 395. The entire lower extent of the river is impaired for TDS.


Chloride
Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)
Basin Plan Objective = 250 mg/L
Cl- (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
19-Jun-97
5-Jan-98
24-Jul-98
9-Feb-99
28-Aug-99
15-Mar-00
1-Oct-00
19-Apr-01
Date


Sulfate
1000
900
800
700
600
500
400
300
200
100
0
SO_4^{2-} (mg/L)
Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)
Basin Plan Objective = 250 mg/L
19-Jun-97
5-Jan-98
24-Jul-98
9-Feb-99
28-Aug-99
15-Mar-00
1-Oct-00
19-Apr-01
Date


Total Dissoloved Solids
Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)
TDS (mg/L)
3000
2500
2000
1500
1000
500
0
Basin Plan Objective = 500 mg/L
19-Jun-97
5-Jan-98
24-Jul-98
9-Feb-99
28-Aug-99
15-Mar-00
1-Oct-00
19-Apr-01
Date

POTENTIAL SOURCES

Chloride Urban runoff, other point sources and non-point sources

Sulfate Urban runoff, other point sources and non-point sources

TDS Urban runoff, other point sources and non-point sources

TMDL PRIORITY

Chloride Medium

Sulfate Medium

TDS Medium

INFORMATION SOURCES

Water Quality Objectives and Watershed Characteristics

[1] Water Quality Control Plan for the San Diego Basin (9), 1994. California Regional Water Quality Control Board, San Diego Region.

Data Sources

[2] Quarterly Monitoring Reports for the City of Oceanside. 1997- 2000. City of Oceanside, CA.

[3] SDRWQCB In-House Monitoring. 1998. California Regional Water Quality Control Board, San Diego Region.

San Luis Rey River - City of Oceanside Water Utilities Laboratory

	Date	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium (mg/L)	Total Phosphorus (mg/L)
Bonsall	October 27, 1997	421	459	1900	ND	0.014	187	NM
	March 16, 1998	216	334	1700	0.211	0.218	127	NM
	June 1, 1998	206	326	1130	0.162	0.093	121	NM
	September 21, 1998	297	412	1400	0.074	0.052	162	NM
	March 8, 1999	286	441	1348	0.301	0.139	154	NM
	September 13, 1999	380	500	1790	ND	0.06	180	NM
	December 13, 1999	350	490	1580	ND	ND	160	NM
	April 27, 2000	270	460	1500	0.24	0.23	160	NM
	July 6, 2000	330	480	1840	0.07	0.59	190	NM
	September 19, 2000	380	NM	1870	0.11	0.18	190	0.1
	November 27, 2000	240	360	1680	0.05	0.1	170	0.56
	Avg =	306.9	426.2	1612.5	0.152	0.168	163.7	
	Median =	297.0	450.0	1680.0	0.136	0.120	162.0	
Douglas	October 27, 1997	342	347	1500	0.039	0.083	147	NM
	March 16, 1998	230	305	1180	0.163	0.058	128	NM
	June 1, 1998	216	326	1150	0.149	0.058	118	NM
	September 21, 1998	302	361	1480	0.151	0.099	149	NM
	March 8, 1999	301	431	1372	0.534	0.106	154	NM
	September 13, 1999	320	420	1560	0.32	0.06	150	NM
	December 13, 1999	NF	NF	NF	NF	NF	NF	NF
	April 27, 2000	310	450	1530	0.06	0.04	160	NM
	July 6, 2000	360	390	1660	ND	0.02	180	NM
	September 19, 2000	340	NM	1680	2	1.3	180	0.18
	November 27, 2000	240	270	1580	0.93	1.7	160	0.32
	Avg =	296.1	366.7	1469.2	0.483	0.352	152.6	
	Median =	306.0	361.0	1515.0	0.163	0.072	152.0	
Benet	October 27, 1997	805	541	2660	0.099	0.085	212	NM
	March 16, 1998	233	330	1187	0.116	0.07	128	NM
	June 1, 1998	226	330	1090	0.284	0.141	126	NM
	September 21, 1998	342	391	1350	0.556	0.308	170	NM
	March 8, 1999	329	420	1400	0.159	0.07	155	NM
	September 13, 1999	NS	NS	NS	NS	NS	NS	NS
	December 13, 1999	560	520	1990	0.17	0.15	200	NM
	April 27, 2000	320	430	1540	0.06	0.05	160	NM
	July 6, 2000	410	420	1800	0.21	0.52	190	NM
	September 19, 2000	560	510	2100	0.42	0.75	230	0.18
	November 27, 2000	350	350	1900	0.44	0.98	210	0.12
	Avg =	413.5	424.2	1701.7	0.251	0.312	178.1	
	Median =	346.0	420.0	1670.0	0.190	0.146	180.0	

(-) = either not evaluated or not detected

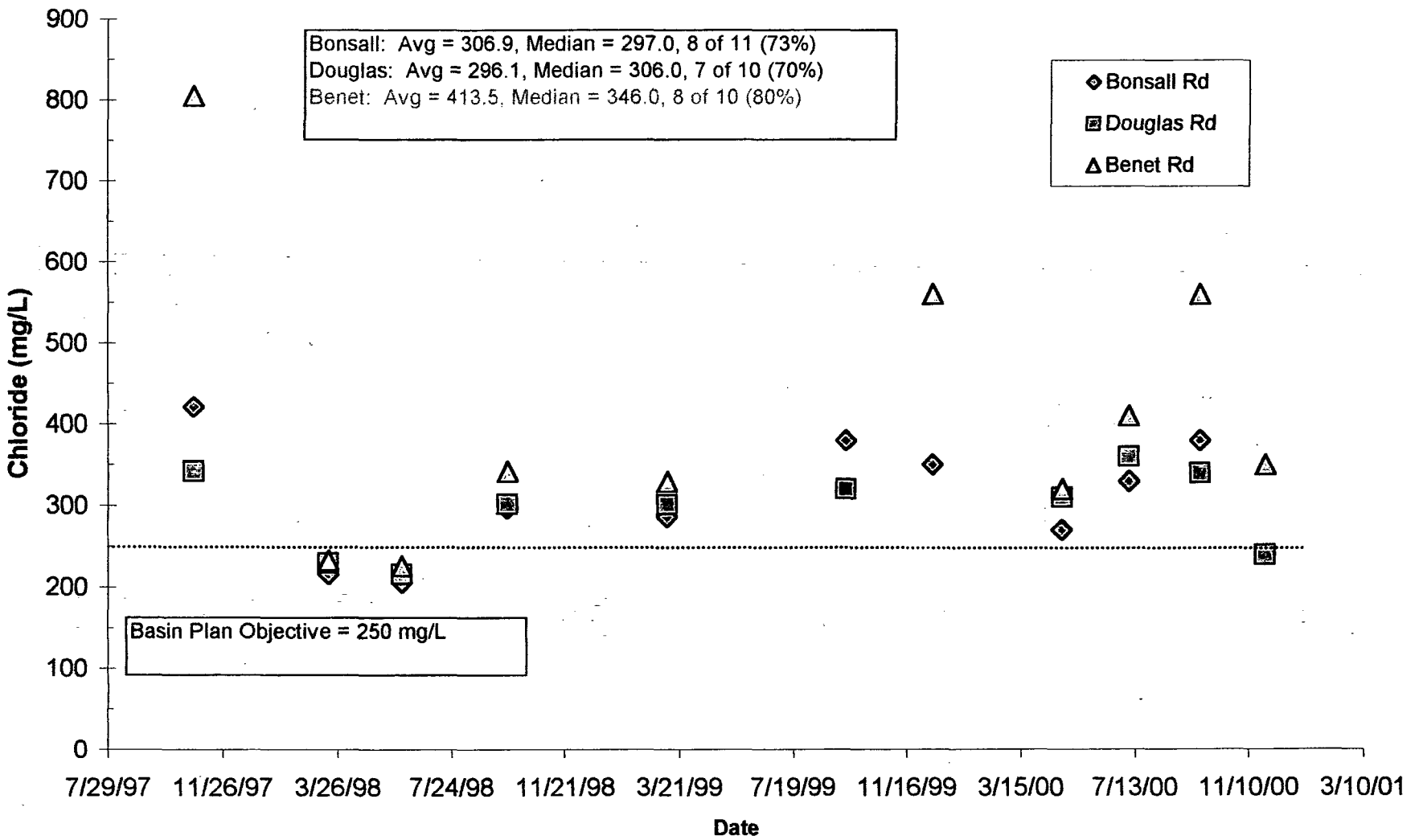
ND = non detect, NF = no flow, NM = not measured, NS = not sampled

R9 In House Monitoring

Date	Locatation	Parameter	Value (mg/L)
5/20/98	Foussat Rd.	Ammonia	<0.14
5/20/98	Foussat Rd.	Nitrate	2.4
5/20/98	Foussat Rd.	Total Phosphate	0.24
5/20/98	Foussat Rd.	TDS	850
5/20/98	Foussat Rd.	Turbidity	5.1
6/11/98	SLR at Old Hwy 395	Ammonia	<0.14
6/11/98	SLR at Old Hwy 395	Nitrate	4.2
6/11/98	SLR at Old Hwy 395	Total Phosphate	0.99
6/11/98	SLR at Old Hwy 395	TDS	970
6/11/98	SLR at Old Hwy 395	Turbidity	3.73

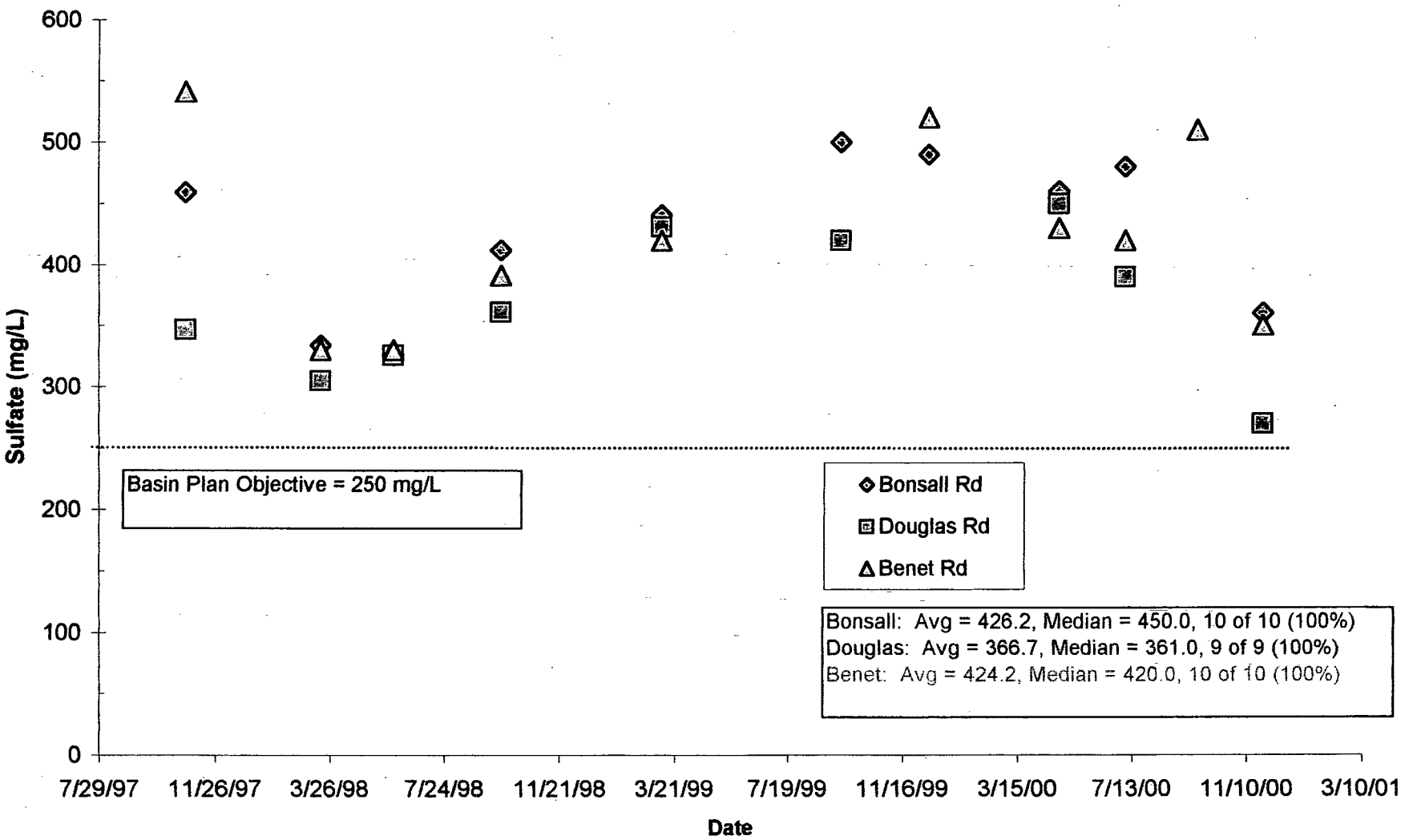
303d?

San Luie Rey River - Chloride



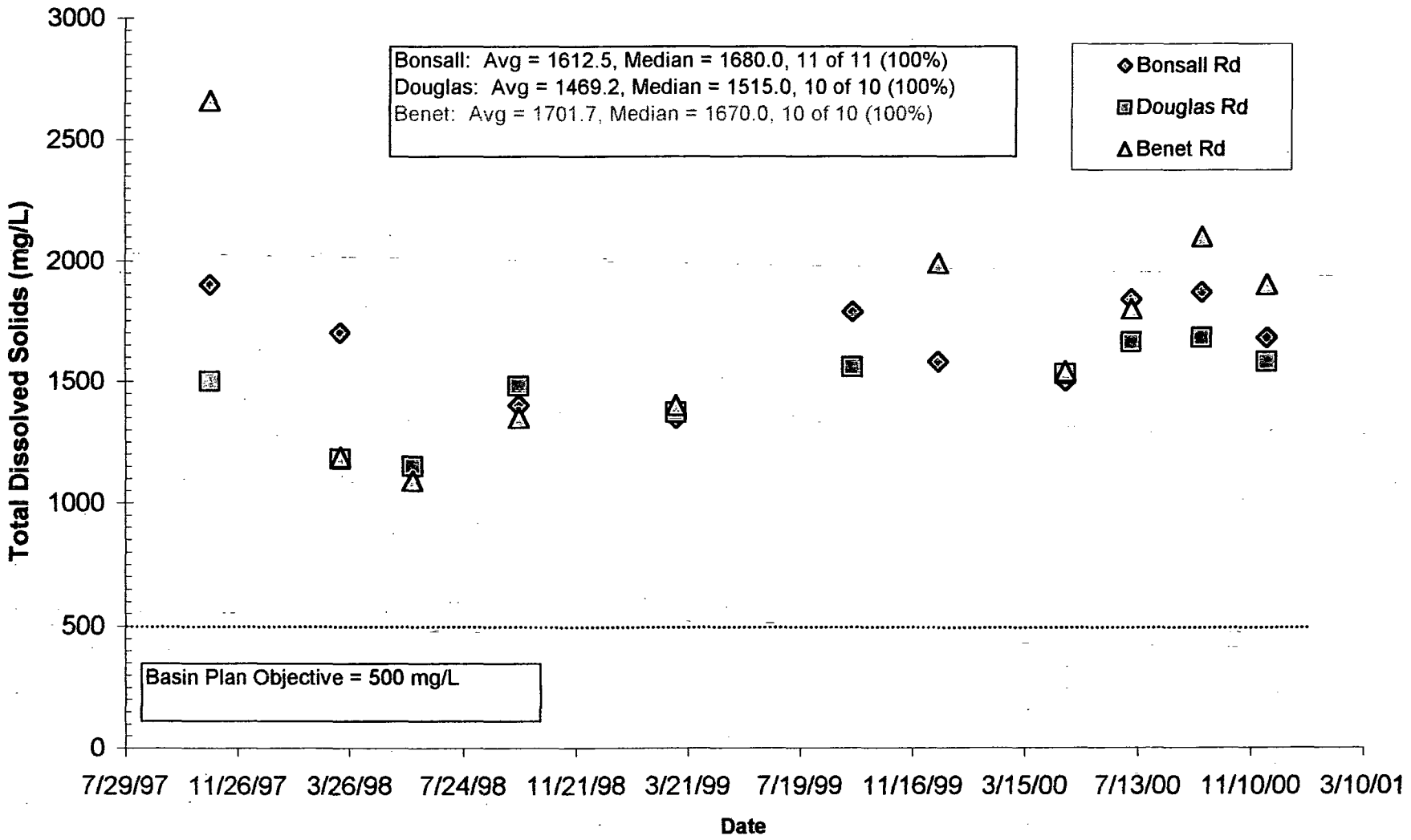
303d?

San Luie Rey River - Sulfate

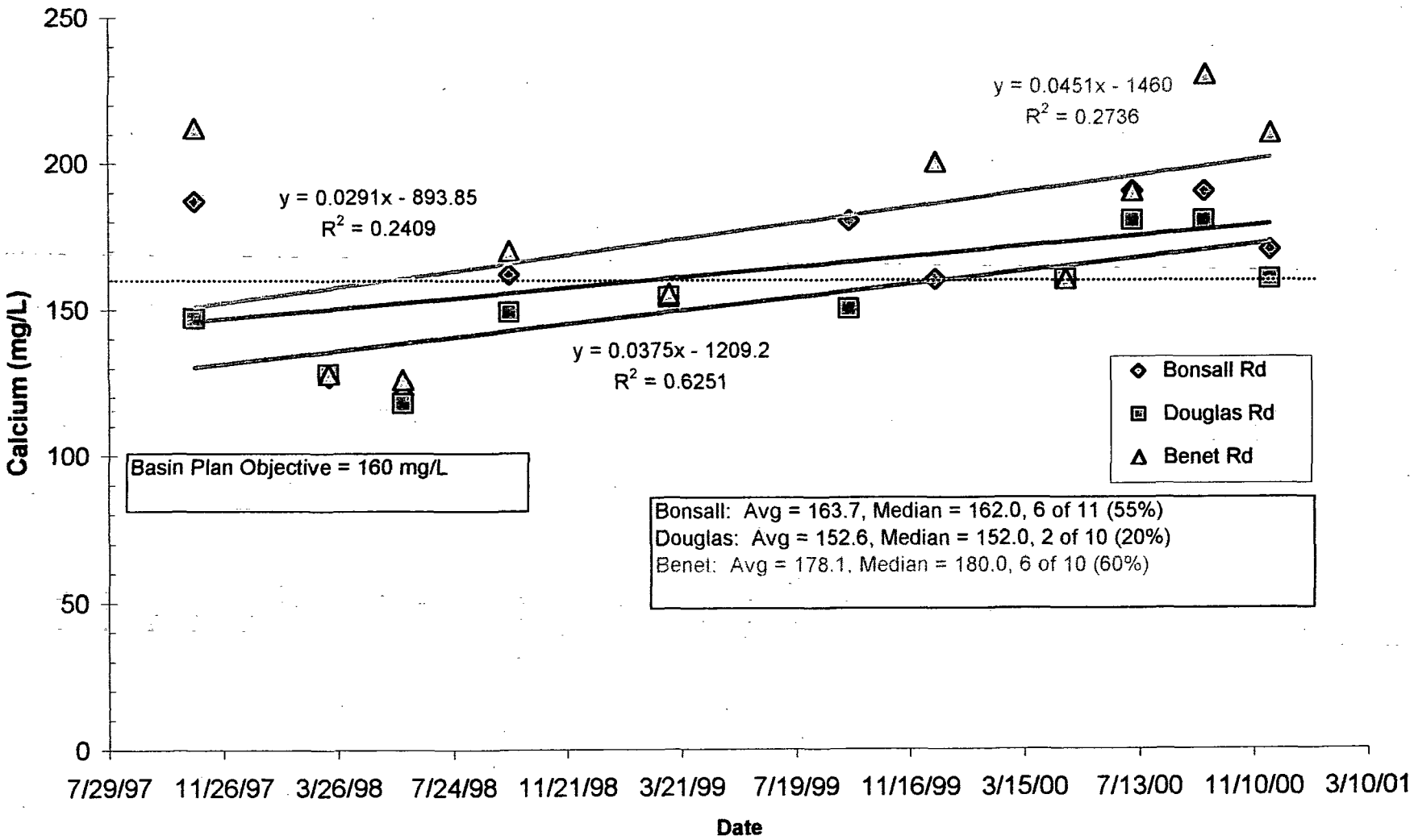


303d?

San Luie Rey River - TDS

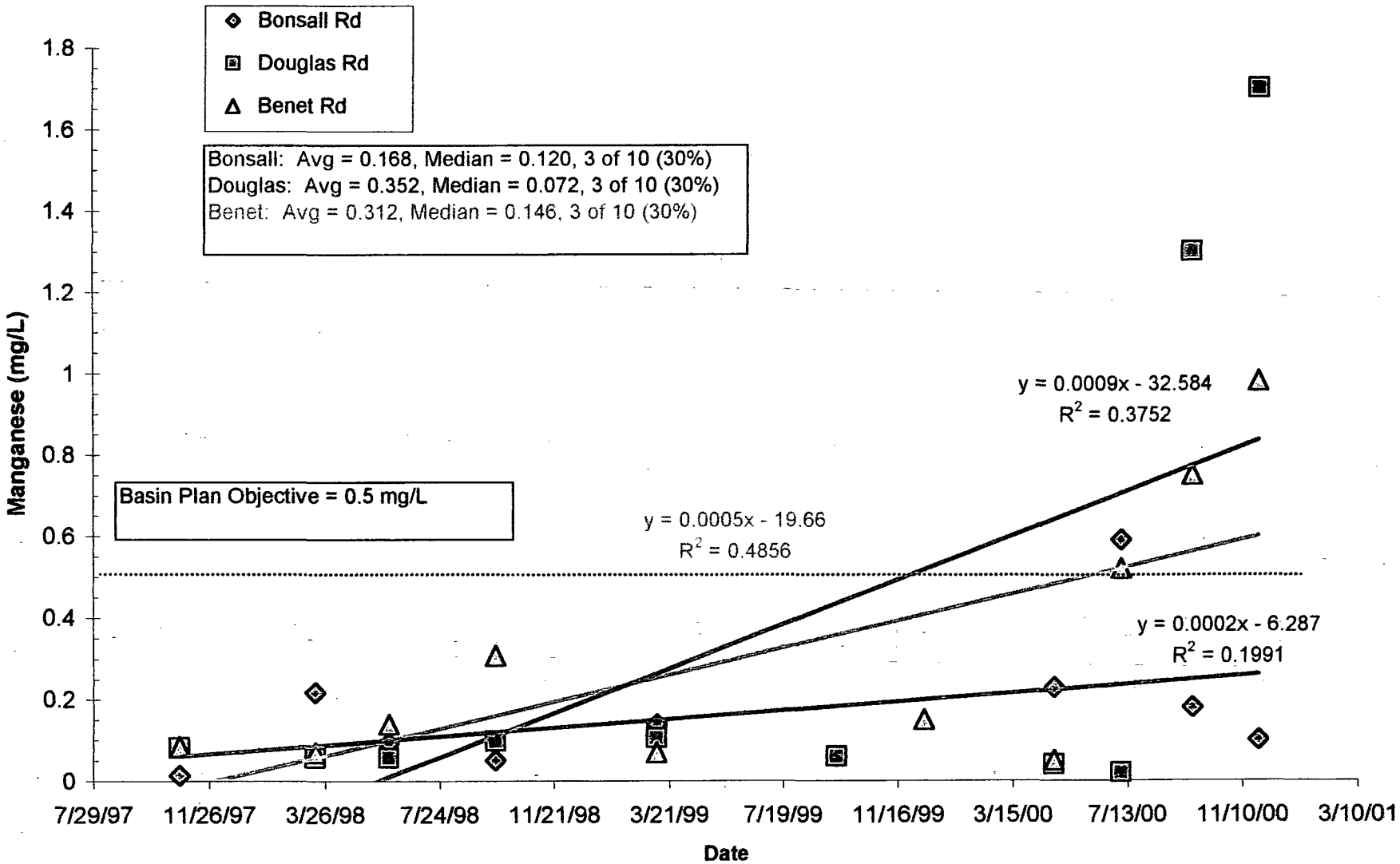


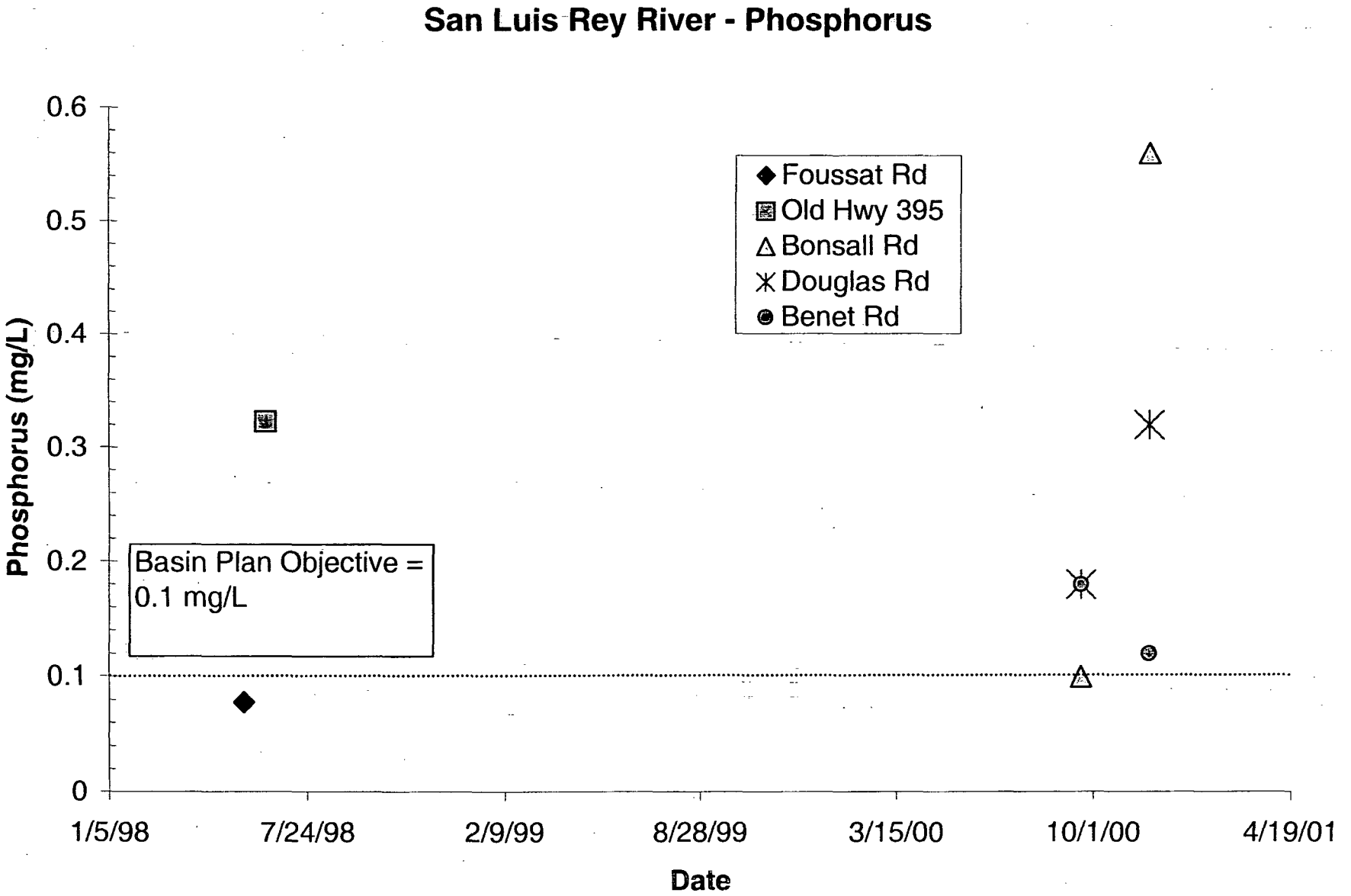
San Luie Rey River - Ca

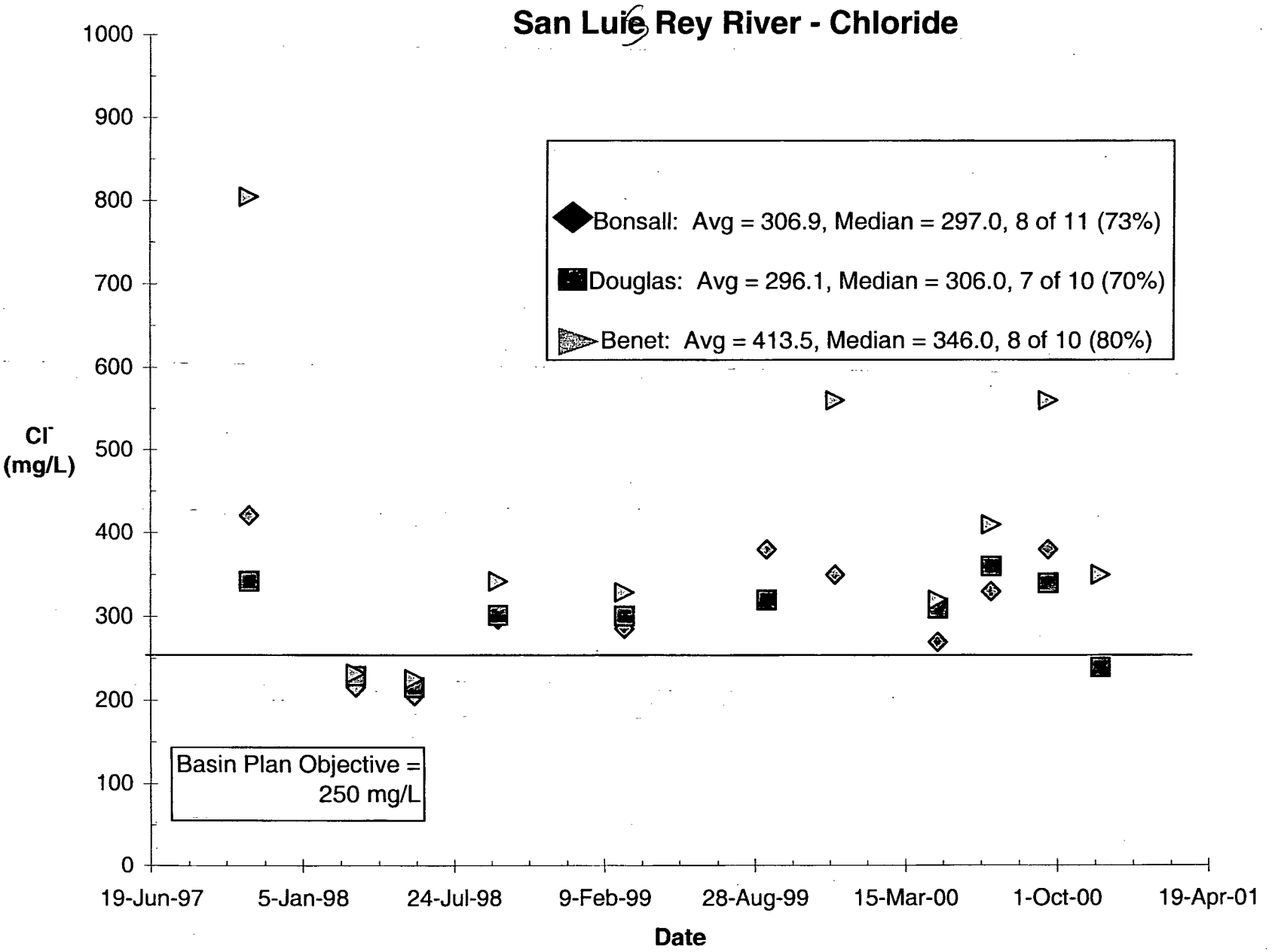


(6 PC?

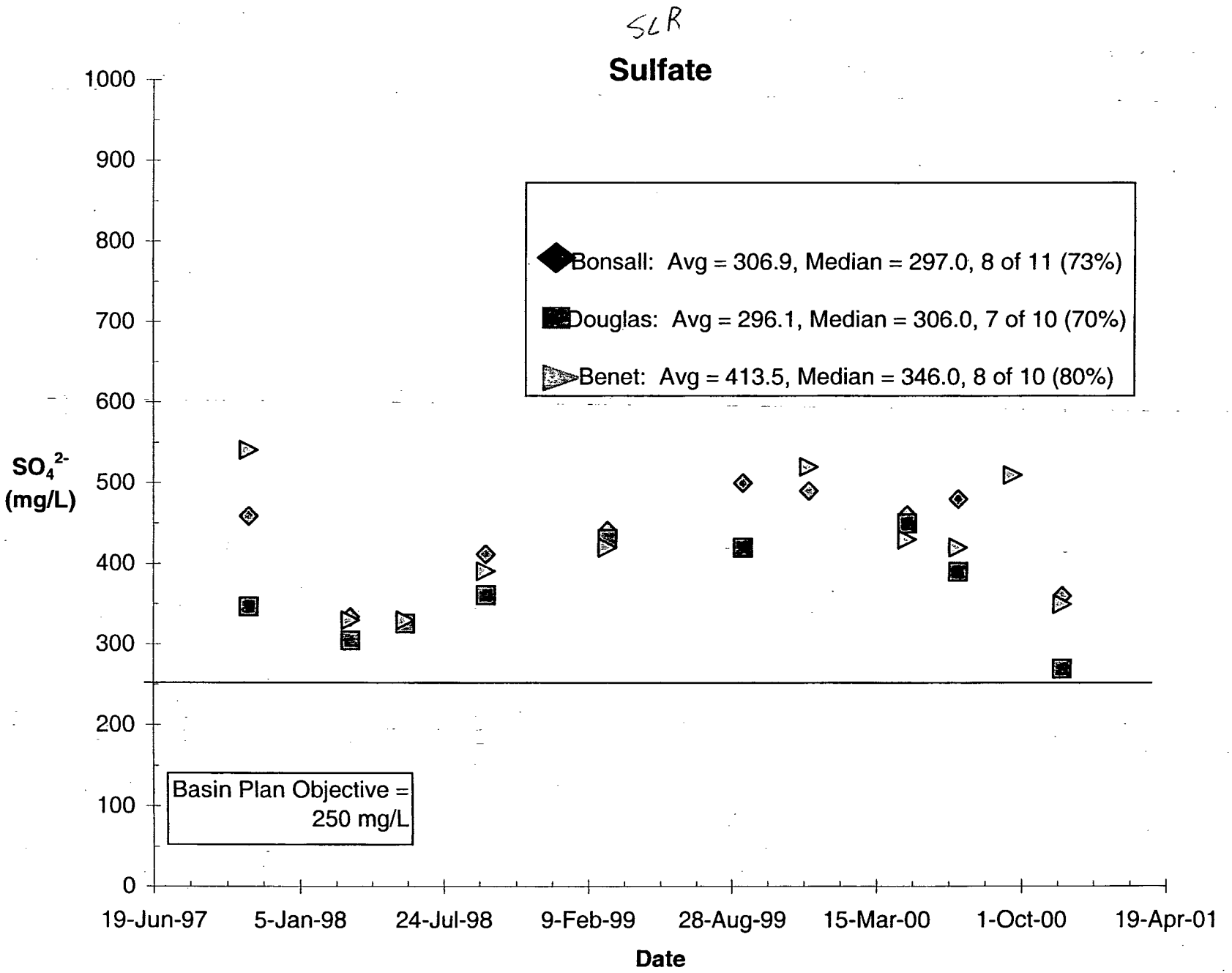
San Luie Rey River - Mn



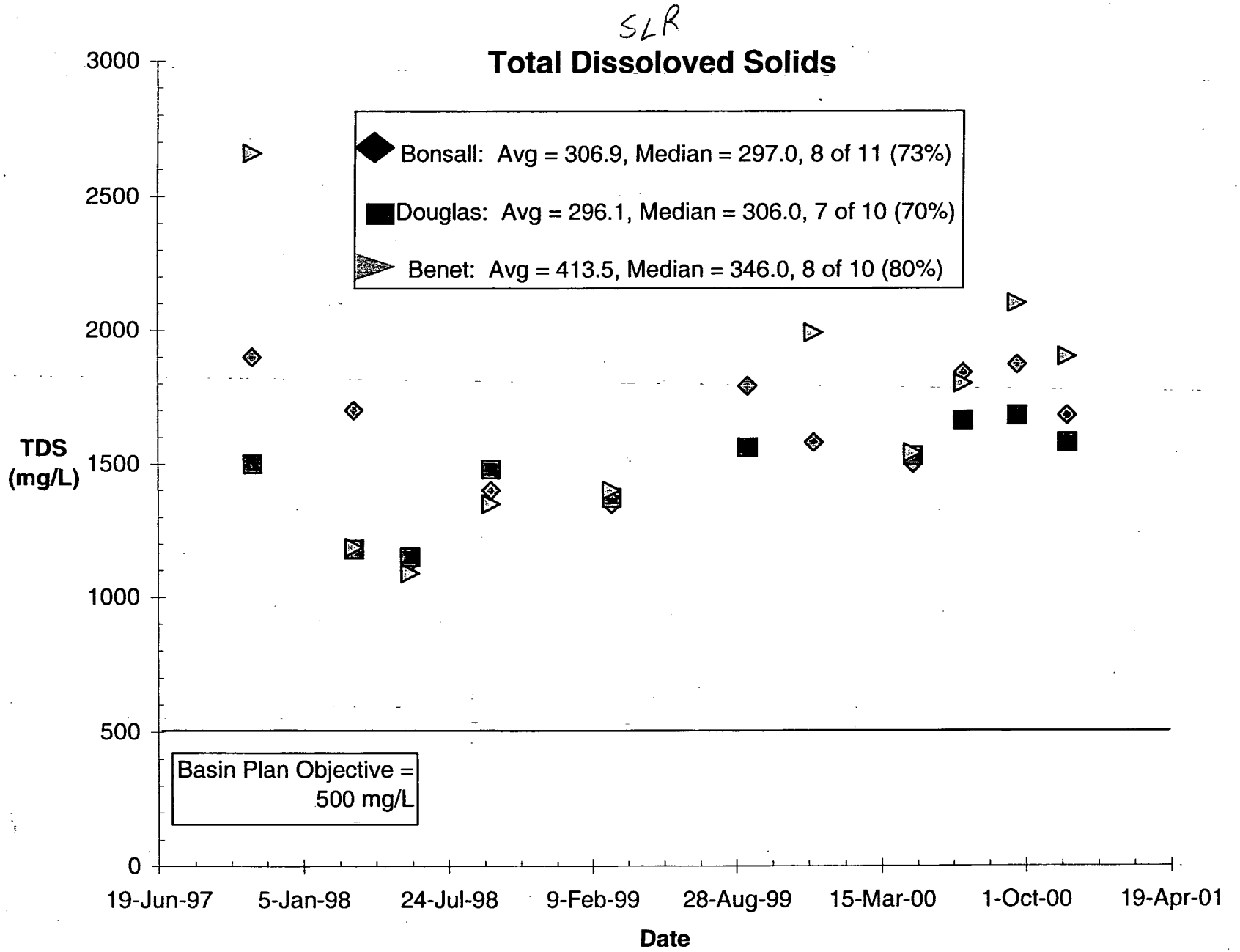

San Luis Rey River - Phosphorus
Phosphorus (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
Foussat Rd
Old Hwy 395
Bonsall Rd
Douglas Rd
Benet Rd
Basin Plan Objective = 0.1 mg/L
1/5/98
7/24/98
2/9/99
8/28/99
3/15/00
10/1/00
4/19/01
Date


San Luis Rey River - Chloride
1000
900
800
700
600
500
400
300
200
100
0
Cl- (mg/L)
Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)
Basin Plan Objective = 250 mg/L
19-Jun-97
5-Jan-98
24-Jul-98
9-Feb-99
28-Aug-99
15-Mar-00
1-Oct-00
19-Apr-01
Date

SLR


Sulfate
1000
900
800
700
600
500
400
300
200
100
0
SO_4^{2-} (mg/L)
Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)
Basin Plan Objective = 250 mg/L
19-Jun-97
5-Jan-98
24-Jul-98
9-Feb-99
28-Aug-99
15-Mar-00
1-Oct-00
19-Apr-01
Date

SLR


Total Dissoloved Solids
Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)
Basin Plan Objective = 500 mg/L
TDS (mg/L)
3000
2500
2000
1500
1000
500
0
19-Jun-97
5-Jan-98
24-Jul-98
9-Feb-99
28-Aug-99
15-Mar-00
1-Oct-00
19-Apr-01
Date

4th Quarter 1997 Violations

Date	Locatation	Parameter	Value (mg/l)
10/27/97	Bonsall	Chloride	421
10/27/97	Bonsall	Sulfate	459
10/27/97	Bonsall	Conductivity	2590*
10/27/97	Bonsall	TDS	1900
10/27/97	Bonsall	Total Hardness	931

Date	Locatation	Parameter	Value (mg/l)
10/27/97	Doouglas	Chloride	342
10/27/97	Doouglas	Sulfate	347
10/27/97	Doouglas	Conductivity	2110*
10/27/97	Doouglas	TDS	1500
10/27/97	Doouglas	Total Hardness	716
10/27/97	Doouglas	Iron	0.039
10/27/97	Doouglas	Manganese	0.083

Date	Locatation	Parameter	Value (mg/l)
10/27/97	Benet	Chloride	805
10/27/97	Benet	Sulfate	541
10/27/97	Benet	Conductivity	3610*
10/27/97	Benet	TDS	2660
10/27/97	Benet	Total Hardness	1110
10/27/97	Benet	Iron	0.099
10/27/97	Benet	Manganese	0.085

*units in umho/cm

1st Quarter 1998 Violations

Date	Locatation	Parameter	Value (mg/l)
3/16/98	Bonsall	Total Hardness	597
3/16/98	Bonsall	Sulfate	334
3/16/98	Bonsall	Manganese	0.218
3/16/98	Bonsall	Aluminum	0.26
3/16/98	Bonsall	Conductivity	1700*
3/16/98	Bonsall	TDS	1160

Date	Locatation	Parameter	Value (mg/l)
3/16/98	Douglas	Total Hardness	603
3/16/98	Douglas	Sulfate	335
3/16/98	Douglas	Manganese	0.058
3/16/98	Douglas	Aluminum	0.21
3/16/98	Douglas	Conductivity	1730*
3/16/98	Douglas	TDS	1180

Date	Locatation	Parameter	Value (mg/l)
3/16/98	Benet	Total Hardness	600
3/16/98	Benet	Sulfate	330
3/16/98	Benet	Manganese	0.07
3/16/98	Benet	Conductivity	1760*
3/16/98	Benet	TDS	1187

* units in umho/cm

2nd Quarter 1998 Violations

Date	Locatation	Parameter	Value (mg/l)
6/1/98	Bonsall	Total Hardness	558
6/1/98	Bonsall	Sulfate	326
6/1/98	Bonsall	Manganese	0.093
6/1/98	Bonsall	TDS	1130

Date	Locatation	Parameter	Value (mg/l)
6/1/98	Douglas	Total Hardness	546
6/1/98	Douglas	Sulfate	328
6/1/98	Douglas	Manganese	0.058
6/1/98	Douglas	TDS	1150

Date	Locatation	Parameter	Value (mg/l)
6/1/98	Bonsall	Total Hardness	580
6/1/98	Bonsall	Sulfate	330
6/1/98	Bonsall	Manganese	0.141
6/1/98	Bonsall	TDS	1090

3rd Quarter 1998 Violations

Date	Locatation	Parameter	Value (mg/l)
9/21/98	Bonsall	Chloride	297
9/21/98	Bonsall	Sulfate	412
9/21/98	Bonsall	Manganese	0.052
9/21/98	Bonsall	Conductivity	2140*
9/21/98	Bonsall	TDS	1400

Date	Locatation	Parameter	Value (mg/l)
9/21/98	Douglas	Chloride	302
9/21/98	Douglas	Sulfate	361
9/21/98	Douglas	Manganese	0.099
9/21/98	Douglas	Conductivity	1730*
9/21/98	Douglas	TDS	1480

Date	Locatation	Parameter	Value (mg/l)
9/21/98	Benet	Chloride	342
9/21/98	Benet	Sulfate	391
9/21/98	Benet	Manganese	0.308
9/21/98	Benet	Conductivity	2240*
9/21/98	Benet	TDS	1350
9/21/98	Benet	Iron	0.556

* units in umho/cm

4th Quarter 1998 Violations

Date	Locatation	Parameter	Value (mg/l)
11/30/98	Benet	-	-

** only tested for pesticide, all came back ND

1st Quarter 1999 Violations

Date	Locatation	Parameter	Value (mg/l)
3/8/99	Bonsall	Chloride	286
3/8/99	Bonsall	Sulfate	441
3/8/99	Bonsall	Manganese	0.139
3/8/99	Bonsall	Conductivity	2020*
3/8/99	Bonsall	TDS	1348

Date	Locatation	Parameter	Value (mg/l)
3/8/99	Douglas	Chloride	301
3/8/99	Douglas	Sulfate	431
3/8/99	Douglas	Iron	0.534
3/8/99	Douglas	Manganese	0.106
3/8/99	Douglas	Conductivity	2080*
3/8/99	Douglas	TDS	1372

Date	Locatation	Parameter	Value (mg/l)
3/8/99	Benet	Chloride	329
3/8/99	Benet	Sulfate	420
3/8/99	Benet	Manganese	0.07
3/8/99	Benet	Conductivity	2140*
3/8/99	Benet	TDS	1400

* units in umho/cm

2nd Quarter 1999 Violations

Date	Locatation	Parameter	Value (mg/l)
6/16/99	Benet	-	-

** Pesticides only at Benet. All in compliance

3rd Quarter 1999 Violations

Date	Locatation	Parameter	Value (mg/l)
9/13/99	Bonsall	Total Hardness	840
9/13/99	Bonsall	Calcium	180
9/13/99	Bonsall	Bicarbonate	390
9/13/99	Bonsall	Chloride	380
9/13/99	Bonsall	Sulfate	500
9/13/99	Bonsall	Manganese	0.06
9/13/99	Bonsall	Conductivity	2600*

Date	Locatation	Parameter	Value (mg/l)
9/13/99	Douglas	Total Hardness	730
9/13/99	Douglas	Bicarbonate	340
9/13/99	Douglas	Chloride	320
9/13/99	Douglas	Sulfate	420
9/13/99	Douglas	Iron	0.32
9/13/99	Douglas	Manganese	0.06
9/13/99	Douglas	Conductivity	2250*

** No Benet Sample

* units in umho/cm

4th Quarter 1999 Violations

Date	Locatation	Parameter	Value (mg/l)
12/13/99	Bonsall	Total Hardness	780
12/13/99	Bonsall	Bicarbonate	370
12/13/99	Bonsall	Chloride	350
12/13/99	Bonsall	Sulfate	490
12/13/99	Bonsall	Conductivity	2390*

Date	Locatation	Parameter	Value (mg/l)
12/13/99	Benet	Total Hardness	780
12/13/99	Benet	Calcium	200
12/13/99	Benet	Bicarbonate	440
12/13/99	Benet	Chloride	560
12/13/99	Benet	Sulfate	520
12/13/99	Benet	Conductivity	3050*
12/13/99	Benet	Manganese	0.15

**No Flow at Douglass

1st Quarter 2000 Violations

4/7/00

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Bonsall	Total Hardness	760
11/27/00	Bonsall	Calcium	160
11/27/00	Bonsall	Chloride	270
11/27/00	Bonsall	Bicarbonate	320
11/27/00	Bonsall	Sulfate	460
11/27/00	Bonsall	Specific Conductance	2170*
11/27/00	Bonsall	TDS	1500
11/27/00	Bonsall	Iron	0.24
11/27/00	Bonsall	Manganese	0.23

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Douglas	Total Hardness	760
11/27/00	Douglas	Calcium	160
11/27/00	Douglas	Bicarbonate	300
11/27/00	Douglas	Sulfate	450
11/27/00	Douglas	Chloride	310
11/27/00	Douglas	Specific Conductance	2260*
11/27/00	Douglas	TDS	1530

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Benet Dr.	Total Hardness	760
11/27/00	Benet Dr.	Bicarbonate	330
11/27/00	Benet Dr.	Sulfate	430
11/27/00	Benet Dr.	Chloride	320
11/27/00	Benet Dr.	Specific Conductance	2340*
11/27/00	Benet Dr.	TDS	1540

2nd Quarter 2000 Violations

7/6/00

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Bonsall	Total Hardness	880
11/27/00	Bonsall	Calcium	190
11/27/00	Bonsall	Bicarbonate	380
11/27/00	Bonsall	Sulfate	480
11/27/00	Bonsall	Specific Conductance	2320*
11/27/00	Bonsall	TDS	1840
11/27/00	Bonsall	Manganese	0.59

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Douglas	Total Hardness	810
11/27/00	Douglas	Calcium	180
11/27/00	Douglas	Bicarbonate	330
11/27/00	Douglas	Sulfate	390
11/27/00	Douglas	Chloride	360
11/27/00	Douglas	Specific Conductance	2200*
11/27/00	Douglas	TDS	1660

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Benet Dr.	Total Hardness	850
11/27/00	Benet Dr.	Calcium	190
11/27/00	Benet Dr.	Bicarbonate	380
11/27/00	Benet Dr.	Sulfate	420
11/27/00	Benet Dr.	Chloride	410
11/27/00	Benet Dr.	Specific Conductance	2440*
11/27/00	Benet Dr.	TDS	1800
11/27/00	Benet Dr.	Manganese	0.52
11/27/00	Benet Dr.	Iron	0.21

** units = umho/cm*

3rd Quarter 2000 Violations

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Bonsall	Total Hardness	920
11/27/00	Bonsall	Calcium	190
11/27/00	Bonsall	Bicarbonate	400
11/27/00	Bonsall	Chloride	380
11/27/00	Bonsall	Specific Conductance	2640*
11/27/00	Bonsall	TDS	1870
11/27/00	Bonsall	Manganese	0.18

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Douglas	Total Hardness	840
11/27/00	Douglas	Calcium	180
11/27/00	Douglas	Bicarbonate	390
11/27/00	Douglas	Chloride	340
11/27/00	Douglas	Specific Conductance	2320*
11/27/00	Douglas	TDS	1680
11/27/00	Douglas	Total Phosphorus	0.18
11/27/00	Douglas	Manganese	1.3
11/27/00	Douglas	Iron	2

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Benet Dr.	Total Hardness	1100
11/27/00	Benet Dr.	Calcium	230
11/27/00	Benet Dr.	Bicarbonate	470
11/27/00	Benet Dr.	Sulfate	510
11/27/00	Benet Dr.	Chloride	560
11/27/00	Benet Dr.	Specific Conductance	3110*
11/27/00	Benet Dr.	TDS	2100
11/27/00	Benet Dr.	Total Phosphorus	0.18
11/27/00	Benet Dr.	Manganese	0.75
11/27/00	Benet Dr.	Iron	0.42

Date	Locatation	Parameter	Value (mg/l)
9/19/00	Pacific	Total Phosphorus	0.42

4th Quarter 2000 Violations

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Bonsall	Total Hardness	830
11/27/00	Bonsall	Calcium	170
11/27/00	Bonsall	Bicarbonate	370
11/27/00	Bonsall	Sulfate	360
11/27/00	Bonsall	Specific Conductance	2380*
11/27/00	Bonsall	TDS	1680
11/27/00	Bonsall	Total Phosphorus	0.56
11/27/00	Bonsall	Manganese	0.1

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Douglas	Total Hardness	780
11/27/00	Douglas	Bicarbonate	390
11/27/00	Douglas	Sulfate	270
11/27/00	Douglas	Specific Conductance	2320*
11/27/00	Douglas	TDS	1580
11/27/00	Douglas	Total Phosphorus	0.32
11/27/00	Douglas	Manganese	1.7
11/27/00	Douglas	Iron	0.93

Date	Locatation	Parameter	Value (mg/l)
11/27/00	Benet Dr.	Total Hardness	940
11/27/00	Benet Dr.	Calcium	210
11/27/00	Benet Dr.	Bicarbonate	440
11/27/00	Benet Dr.	Sulfate	350
11/27/00	Benet Dr.	Chloride	350
11/27/00	Benet Dr.	Specific Conductance	2920*
11/27/00	Benet Dr.	TDS	1900
11/27/00	Benet Dr.	Total Phosphorus	0.12
11/27/00	Benet Dr.	Manganese	0.98
11/27/00	Benet Dr.	Iron	0.44

** units = umho/cm*

9-32

San Luis Rey

903

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2001 MAY 15 P 12:55

City of Oceanside

Water Utilities Laboratory

Monitoring Area: **San Luis Rey River**

Date Reported: 03-May-01

Type of Sampling: **Quarterly Bacteriological**

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
Bonsall Bridge	AA15813	3/8/1999 10:35 AM	HAMMOND	1700	220	0.129	80	
Benet Bridge	AA15814	3/8/1999 11:10 AM	HAMMOND	3000	270	0.090	160	
Douglas Bridge	AA15815	3/8/1999 11:40 AM	HAMMOND	800	300	NA	240	
Benet Bridge	AA19680	6/16/1999 10:45 AM	MOLINA	16000	2200	0.138		
Benet Bridge	AA23032	9/13/1999 10:30 AM	LUCORE	3000	40	0.013	44	
Douglas Bridge	AA23033	9/13/1999 10:10 AM	LUCORE	350	20	NA	130	
Bonsall Bridge	AA23034	9/13/1999 9:45 AM	LUCORE	5000	<2	0.000	180	
Benet Bridge	AA26490	12/13/1999 8:47 AM	HAMMOND	1100	80	0.073	<7	
Bonsall Bridge	AA26491	12/13/1999 12:10 PM	HAMMOND	2200	70	0.032	<7	
Bonsall Bridge	AA30176	3/23/2000 5:10 PM	ORR	5000	40	0.008		53
Douglas Bridge	AA30177	3/23/2000 5:30 PM	ORR	7000	40	0.006		75
Bonsall Bridge	AA32735	5/26/2000 2:15 PM	LUCORE	2800	80	0.029		111
Benet Bridge	AA32736	5/26/2000 2:15 PM	MOLINA	2800	170	0.061		87
Benet Bridge	AA33741	6/21/2000 9:05 AM	GALLWAS	1700	800	0.471		648.8
Douglas Bridge	AA33742	6/21/2000 11:47 AM	GALLWAS	5000	800	0.160		517.2

Sampling Locations	Lab Number	Collection Date/Time		Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
Bonsall Bridge	AA33743	6/21/2000	12:10 PM	GALLWAS	7000	40	0.006		28.5
Benet Bridge	AA37171	9/19/2000	11:40 AM	MOLINA	300	40	NA		31
Douglas Bridge	AA37172	9/19/2000	11:20 AM	MOLINA	5000	70	0.014		52
Bonsall Bridge	AA37173	9/19/2000	11:00 AM	MOLINA	16000	170	0.011		246
Bonsall Bridge	AA39553	11/27/2000	12:20 PM	ORR	1300	20	0.015		146
Douglas Bridge	AA39554	11/27/2000	12:55 PM	ORR	230	<20	NA		269
Benet Bridge	AA39555	11/27/2000	1:30 PM	ORR	2100	20	0.010		84

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WATER UTILITIES DEPARTMENT LABORATORY, by:

Valerie Gallwas
Microbiologist

City of Oceanside
Water Utilities Laboratory

Monitoring Area: **San Luis Rey River Mixing Zone**
Type of Sampling: **Bacteriological**

Date Reported: 03-May-01

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA13679	1/11/1999 9:24 AM	LUCORE	8	<2	NA	4	
SLR Mixing Zone	AA14299	1/27/1999 10:38 AM	LUCORE	9000	3000	0.333	TNTC > 1,000	
SLR Mixing Zone	AA14733	2/8/1999 10:44 AM	LUCORE	500	110	NA	50	
SLR Mixing Zone	AA15345	2/23/1999 8:53 AM	LUCORE	500	110	NA	65	
SLR Mixing Zone	AA15897	3/9/1999 8:24 AM	LUCORE	240	240	NA	30	
SLR Mixing Zone	AA16424	3/23/1999 8:26 AM	LUCORE	500	50	NA	24	
SLR Mixing Zone	AA16967	4/5/1999 11:09 AM	LUCORE	70	50	NA	8	
SLR Mixing Zone	AA17598	4/20/1999 7:50 AM	GALLWAS	500	300	NA	28	
SLR Mixing Zone	AA18072	5/4/1999 8:19 AM	LUCORE	300	130	NA	72	
SLR Mixing Zone	AA18279	5/10/1999 10:05 AM	LUCORE	170	50	NA	13	
SLR Mixing Zone	AA18539	5/17/1999 8:43 AM	LUCORE	5000	700	0.140	95	ok 10g 6M for fecal
SLR Mixing Zone	AA18929	5/26/1999 10:17 AM	LUCORE	240	130	NA	18	

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA19411	6/3/1999 9:16 AM	LUCORE	13	4 GM= 79.96	NA	2 GM = 20.00	
SLR Mixing Zone	AA19421	6/7/1999 10:55 AM	LUCORE	240	240	NA	130	
SLR Mixing Zone	AA19623	6/15/1999 9:28 AM	LUCORE	4	4	NA	2	
SLR Mixing Zone	AA19966	6/22/1999 9:48 AM	LUCORE	4	4	NA	<2	
SLR Mixing Zone	AA20153	6/29/1999 8:48 AM	LUCORE	33	33	NA	15	
SLR Mixing Zone	AA20372	7/6/1999 9:39 AM	LUCORE	<2	<2	NA	<2	
SLR Mixing Zone	AA20652	7/13/1999 9:19 AM	LUCORE	17	17	NA	4	
SLR Mixing Zone	AA20937	7/20/1999 9:31 AM	LUCORE	8	8	NA	<2	
SLR Mixing Zone	AA21134	7/26/1999 9:41 AM	LUCORE	13	13	NA	4	
SLR Mixing Zone	AA21388	8/2/1999 10:50 AM	LUCORE	8	8	NA	<2	
SLR Mixing Zone	AA21789	8/11/1999 9:11 AM	LUCORE	7	7	NA	2	
SLR Mixing Zone	AA22234	8/17/1999 10:35 AM	LUCORE	7	7	NA	<4	

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA22311	8/24/1999 10:37 AM	LUCORE	30	30	NA	12	
SLR Mixing Zone	AA22635	9/1/1999 10:20 AM	LUCORE	2	2	NA	<2	
SLR Mixing Zone	AA22931	9/7/1999 12:12 PM	LUCORE	2	<2	NA	1	
SLR Mixing Zone	AA23092	9/14/1999 9:32 AM	LUCORE	11	11	NA	1	
SLR Mixing Zone	AA23453	9/21/1999 10:29 AM	LUCORE	4	4	NA	3	
SLR Mixing Zone	AA23668	9/28/1999 9:52 AM	LUCORE	13	13	NA	22	
SLR Mixing Zone	AA23952	10/5/1999 10:54 AM	LUCORE	<2	<2	NA	2	
SLR Mixing Zone	AA24162	10/11/1999 10:05 AM	LUCORE	6	6	NA	3	
SLR Mixing Zone	AA24510	10/19/1999 10:06 AM	LUCORE	50	50	NA	1	
Comments: No flow								
SLR Mixing Zone	AA24753	10/26/1999 9:12 AM	LUCORE	4	4	NA	17	
Comments: No flow								
SLR Mixing Zone	AA25031	11/2/1999 9:54 AM	LUCORE	2	2	NA	<1	
Comments: SLR River - light flow.								
SLR Mixing Zone	AA25535	11/16/1999 9:25 AM	LUCORE	6	6	NA	1	
Comments: San Luis Rey River is not flowing.								

Sampling Locations	Lab Number	Collection Date/Time		Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA26009	11/30/1999	10:32AM	LUCORE	2	2	NA	7	
Comments: Light flow from San Luis Rey River.									
SLR Mixing Zone	AA26553	12/14/1999	9:35 AM	LUCORE	<2	<2	NA	<1	
Comments: San Luis Rey River has no flow.									
SLR Mixing Zone	AA27006	12/28/1999	11:15AM	ORR	<2	<2	NA	1	
Comments: No Flow from San Luis Rey River.									
SLR Mixing Zone	AA27483	1/11/2000	9:12 AM	LUCORE	2	2	NA	1	
SLR Mixing Zone	AA27898	1/24/2000	8:54 AM	LUCORE	80	50	NA	20	
Comments: Light flow from San Luis Rey River.									
SLR Mixing Zone	AA28472	2/8/2000	10:03AM	LUCORE	13	11	NA	18	
Comments: Light flow from San Luis Rey River									
SLR Mixing Zone	AA28991	2/22/2000	9:48 AM	LUCORE	1700	700	0.412	100	
Comments: Moderate flow from San Luis Rey River.									
SLR Mixing Zone	AA29432	3/6/2000	8:59 AM	LUCORE	80	13	NA	15	
SLR Mixing Zone	AA30085	3/21/2000	8:57 AM	LUCORE	110	50	NA	27	
Comments: Light flow from San Luis Rey River.									
SLR Mixing Zone	AA30178	3/23/2000	6:00 PM	ORR	300	300	NA		222
SLR Mixing Zone	AA30215	3/25/2000	9:50 AM	GALLWAS	1100	170	0.155		64
SLR Mixing Zone	AA30492	4/3/2000	9:12 AM	LUCORE	17	11	NA	2	
Comments: Light flow from San Luis Rey River.									

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA30798	4/10/2000 10:00 AM	ORR	900	300	NA	18	
Comments: Moderate flow from the San Luis Rey River.					GM=72.32			
SLR Mixing Zone	AA31307	4/17/2000 9:40 AM	ORR	17	17	NA	5	
SLR Mixing Zone	AA31416	4/25/2000 8:46 AM	LUCORE	500	130	NA	27	
SLR Mixing Zone	AA31666	5/1/2000 10:02 AM	LUCORE	500	240	NA		64.0
SLR Mixing Zone	AA31974	5/8/2000 9:17 AM	LUCORE	900	130	NA		42
Comments: Light flow from San Luis Rey River.								
SLR Mixing Zone	AA32377	5/17/2000 9:19 AM	LUCORE	1600	70	0.044		150
SLR Mixing Zone	AA32425	5/18/2000 4:12 PM	LUCORE	80	80	NA		31
SLR Mixing Zone	AA32535	5/22/2000 9:07 AM	LUCORE	500	500	NA		1111
SLR Mixing Zone	AA32644	5/24/2000 9:13 AM	LUCORE	500	300	NA		42
SLR Mixing Zone	AA32704	5/25/2000 12:38 PM	LUCORE	300	170	NA		137
SLR Mixing Zone	AA32737	5/26/2000 12:44 PM	LUCORE	300	170	NA		20
SLR Mixing Zone	AA32840	5/30/2000 10:04 AM	LUCORE	170	70	NA	17	42
Comments: Light flow from San Luis Rey River.								

5 pts -
GM = 197.89

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA33073	6/5/2000 10:39 AM	LUCORE	23	23	NA	5	10
SLR Mixing Zone	AA33367	6/12/2000 9:48 AM	LUCORE	110	110	NA	1	
Comments: *Light flow from San Luis Rey River.*								
SLR Mixing Zone	AA33664	6/19/2000 9:32 AM	LUCORE	80	80	NA	12	20
					GM = 125.47			
SLR Mixing Zone	AA33802	6/23/2000 9:20 AM	ORR	110	40	NA		10
SLR Mixing Zone	AA33904	6/26/2000 9:51 AM	LUCORE	17	17	NA	4	<10
SLR Mixing Zone	AA34213	7/5/2000 8:57 AM	LUCORE	4	<2	NA		<10
Comments: No flow from San Luis Rey River.								
SLR Mixing Zone	AA34387	7/10/2000 8:55 AM	LUCORE	70	50	NA		<10
Comments: Light flow from the San Luis Rey River.								
SLR Mixing Zone	AA34653	7/17/2000 9:02 AM	LUCORE	7	7	NA		10
Comments: No flow from San Luis Rey River.								
SLR Mixing Zone	AA34900	7/24/2000 9:41 AM	LUCORE	17	17	NA		<10
SLR Mixing Zone	AA35164	7/31/2000 9:12 AM	LUCORE	13	13	NA		10
Comments: No flow from San Luis Rey River.								
SLR Mixing Zone	AA35426	8/7/2000 9:08 AM	LUCORE	90	50	NA		53
SLR Mixing Zone	AA36035	8/14/2000 9:35 AM	LUCORE	17	17	NA		<10
Comments: No flow from the San Luis Rey River.								

Sampling Locations	Lab Number	Collection Date/Time		Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA36097	8/21/2000	9:12 AM	LUCORE	17	11	NA		10
SLR Mixing Zone	AA36350	8/28/2000	9:47 AM	LUCORE	50	50	NA		<10
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA36482	8/31/2000	9:08 AM	LUCORE	60	50	NA		<10
SLR Mixing Zone	AA36641	9/5/2000	8:54 AM	LUCORE	22	11	NA		<10
Comments: Light flow from San Luis Rey River.									
SLR Mixing Zone	AA36786	9/11/2000	9:29 AM	LUCORE	8	<2	NA		10
Comments: Light flow from San Luis Rey River.									
SLR Mixing Zone	AA37082	9/18/2000	9:02 AM	LUCORE	13	13	NA		<10
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA37365	9/25/2000	9:40 AM	LUCORE	50	50	NA		10
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA37607	10/2/2000	9:05 AM	LUCORE	23	23	NA		<10
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA37726	10/4/2000	12:59 PM	LUCORE	1600	1600	1.000		1652
Comments: Moderate flow from the San Luis Rey River.									
SLR Mixing Zone	AA37754	10/5/2000	8:44 AM	LUCORE	350	170	NA		20
Comments: Light flow from the San Luis Rey River.									
SLR Mixing Zone	AA37860	10/9/2000	9:28 AM	LUCORE	80	30	NA	24	
Comments: Light flow from the San Luis Rey River.									
SLR Mixing Zone	AA38204	10/18/2000	8:50 AM	LUCORE	21	21	NA		<10
Comments: No flow from the San Luis Rey River.									

Sampling Locations	Lab Number	Collection Date/Time		Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA38388	10/24/2000	8:54 AM	LUCORE	1600	1600	1.000		306
Comments: Light flow from the San Luis Rey River.									
SLR Mixing Zone	AA38444	10/25/2000	10:29 AM	LUCORE	110	110	NA		75
Comments: Light flow from the San Luis Rey River. Resample #1 for the week of 10/23.									
SLR Mixing Zone	AA38584	10/30/2000	9:29 AM	LUCORE	9000	500	0.056		1374
Comments: Moderate flow from the San Luis Rey River.									
SLR Mixing Zone	AA38720	11/1/2000	8:15 AM	LUCORE	240	240	NA		209
Comments: Moderate flow from the San Luis Rey River.									
SLR Mixing Zone	AA38845	11/6/2000	9:20 AM	LUCORE	110	110	NA		31
Comments: No flow from San Luis Rey River.									
SLR Mixing Zone	AA39089	11/13/2000	9:08 AM	LUCORE	500	500	NA		111
Comments: Light flow from the San Luis Rey River.									
SLR Mixing Zone	AA39163	11/14/2000	1:40 PM	LUCORE	9	4	NA		<10
Comments: Flow from the San Luis Rey River blocked by sand.									
SLR Mixing Zone	AA39533	11/27/2000	10:44 AM	LUCORE	30	30	NA		99
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA39665	11/29/2000	12:56 PM	LUCORE	20	20	NA		20
Comments: Light flow from the San Luis Rey River. Sample collected on outgoing tide.									
SLR Mixing Zone	AA40025	12/11/2000	10:39 AM	LUCORE	13	13	NA		41
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA40188	12/14/2000	12:45 PM	LUCORE	170	170	NA		52
Comments: No flow from the San Luis Rey River.									
SLR Mixing Zone	AA40561	12/27/2000	10:31 AM	LUCORE	2	2	NA		10
Comments: No flow from the San Luis Rey River.									

GM = 182.83

GM = 202.85

Sampling Locations	Lab Number	Collection Date/Time	Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	Enterococcus by Membrane Filtration CFU/100ml	Enterococcus by Enterolert MPN/100ml
SLR Mixing Zone	AA40655	12/29/2000 12:49 PM	HAMMOND	2	<2	NA		<10
Comments: Resmple due to high entero on 12/28. Sample due to open of mouth.								
SLR Mixing Zone	AA40732	12/28/2000 7:54 AM	LUCORE	240	240	NA		209
Comments: Moderate flow from the San Luis Rey River								
150 ft. South of Mixing	AA40733	12/28/2000 8:00 AM	LUCORE	17	17	NA		<10
Comments: Moderate flow from the San Luis Rey River								
SLR Mixing Zone	AA40952	1/8/2001 10:47 AM	LUCORE	300	130	NA		42
SLR Mixing Zone	AA41371	1/22/2001 9:25 AM	LUCORE	70	70	NA		10
SLR Mixing Zone	AA41857	2/5/2001 9:33 AM	LUCORE	240	205	NA		26
Comments: Moderate flow from the San Luis Rey River.								
SLR Mixing Zone	AA42296	2/19/2001 9:16 AM	LUCORE	1700	500	0.294		164
Comments: Moderate flow from the San Luis Rey River.								
SLR Mixing Zone	AA42827	3/5/2001 10:45 AM	LUCORE	240	80	NA		111
SLR Mixing Zone	AA43283	3/19/2001 9:31 AM	LUCORE	500	300	NA		41
Comments: Moderate flow from the San Luis Rey River.								
SLR Mixing Zone	AA43745	4/2/2001 9:02 AM	LUCORE	110	30	NA		42
Comments: Moderate flow from the San Luis Rey River.								
SLR Mixing Zone	AA43975	4/9/2001 9:15 AM	LUCORE	9000	900	0.100		429
Comments: Moderate flow from San Luis Rey River.								
SLR Mixing Zone	AA44129	4/12/2001 11:59 AM	LUCORE	220	70	NA		10
Comments: Moderate flow from the San Luis Rey River.								

Sampling Locations	Lab Number	Collection Date/Time		Sampler	Total Coliform MPN/100ml	Fecal Coliform MPN/100ml	Fecal/Total Ratio	*Enterococcus* by Membrane Filtration CFU/100ml	*Enterococcus* by Enterolert MPN/100ml
SLR Mixing Zone	AA44226	4/16/2001	9:30 AM	ORR	300	50	NA		10
Comments: Moderate flow from the San Luis Rey River.						GM = [illegible]			
SLR Mixing Zone	AA44508	4/24/2001	9:50 AM	ORR	170	50	NA		10
Comments: Light flow from the San Luis Rey River.									

WATER UTILITIES DEPARTMENT LABORATORY,

Valerie Gallwas
Microbiologist