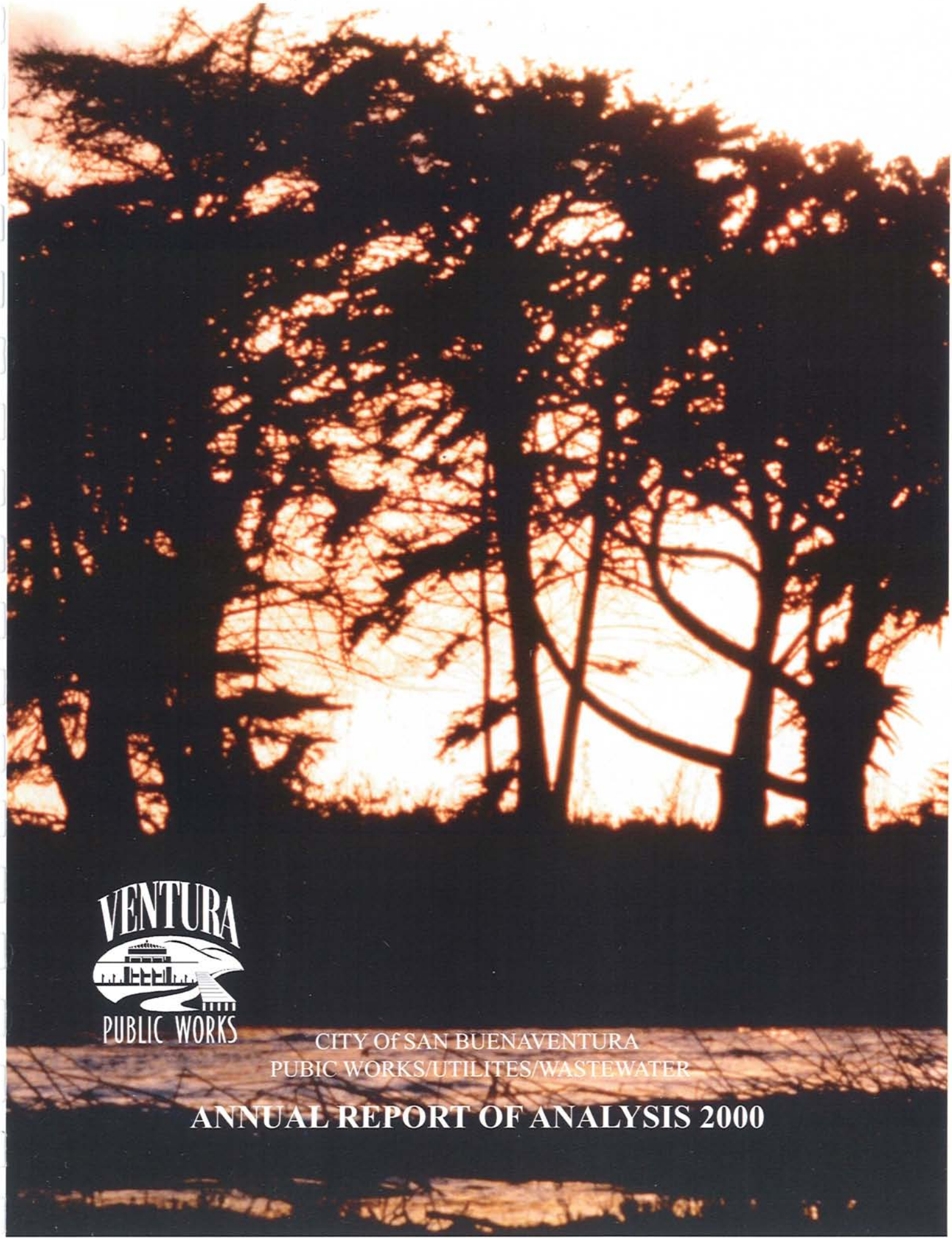

VENTURA PUBLIC WORKS

CITY Of SAN BUENAVENTURA
PUBIC WORKS/UTILITES/WASTEWATER

ANNUAL REPORT OF ANALYSIS 2000

ANNUAL REPORT OF ANALYSIS

CITY OF SAN BUENAVENTURA

VENTURA WATER RECLAMATION FACILITY

2000

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DISCUSSION

I. INTRODUCTION: THE CITY OF SAN BUENAVENTURA

The City of San Buenaventura provides wastewater collection and treatment for the City, for McGrath State Beach Park, for the community of Cabrillo Village and for the North Coast Communities (Ventura County Service Area 29). These areas include a population of approximately 105,000 people.

THE SANITATION DIVISION:

Wastewater collection and treatment facilities are operated by the Sanitation Division, which along with the Water Division comprises Utilities Division of the Public Works Department. Facilities include 375 miles of sewer mains, 12 lift stations and the Ventura Water Renovation Facility, a tertiary treatment plant.

The Ventura Water Renovation Facility, at 1400 Spinnaker Drive, is located on the north bank of and discharges treated effluent to the Santa Clara River Estuary.

Processes employed at the treatment facility during 2000 include comminution, grit removal, primary sedimentation, primary flow equalization, roughing filters, activated sludge secondary biological treatment, tertiary effluent filtration and Chlorination.

During 2000 the ongoing Upgrade construction completed the rehabilitation of the activated sludge system, the main secondary treatment process. Operation of the trickling filter as a roughing filter ahead of the activated sludge process was ceased and full operation of the activated sludge system had been restored.

In 2000 process solids were treated by anaerobic digestion, dewatered and applied to agricultural land at River Island Farm near Wasco, California.

Following disinfection, effluent enters a system of Wildlife Ponds with a combined capacity of 34 million gallons. At the current average daily outfall flow rate of 9.1 MGD, this provides approximately 4 days of detention.

Wastewater facilities include pump stations and pipelines for water reclamation. In 2000 the daily average volume of treated effluent reclaimed was 953,000 gallons. The maximum daily reuse volume measured in 2000 was 2,347,000 gallons per day.

The effluent reuse system provides effluent for irrigation of golf course, park and similar landscape areas. This reuse is an integral part of the city water conservation program and represents a reduction in demand on the freshwater supply each year of approximately 325 million gallons.

Reclaimed water for irrigation and for discharge to the Santa Clara Tidal Prism is withdrawn from the end of the wildlife pond system. Irrigation water supply is delivered by two pump stations into 3 distribution lines.

Residence in these ponds provides substantial dissipation of Chlorine residual and a corresponding reduction in the cost of dechlorination chemicals needed to meet the requirement for complete Chlorine neutralization prior to discharge to the tidal prism. Chlorine dissipation also reduces the risk of landscape damage from high Chlorine concentrations in water supplied for irrigation.

Additionally the reservoir capacity of the wildlife ponds serves as a safeguard against use of effluent of unacceptable quality for irrigation of park land, where significant public health risk may occur. The pond detention time allows completion of analysis necessary to assure the safety of the irrigation supply before that water would reach the point of irrigation withdrawal.

When necessary, irrigation use from the ponds can be discontinued before inadequately treated effluent reaches the irrigation intake. When ponds operate in series, and all ponds are in operation, the safety margin is 4 days.

NPDES permit CA0053651, issued by the Los Angeles Regional Water Quality Control Board as Order 00 -144 regulates discharge of treated effluent to the Santa Clara Tidal Prism.

Reuse of effluent for irrigation is regulated by Los Angeles Regional Water Quality Control Board Order 87-45.

II. PROCESS PERFORMANCE AND COMPLIANCE WITH DISCHARGE REQUIREMENTS

On 44 days during 2000 the effluent total coliform failed to meet compliance exceeding the 7-day coliform median of 2.2 MPN.

On 12 days during 2000 the turbidity of the filtered effluent failed to meet compliance exceeding the daily limit of 2.0 NTU.

On 5 days during 2000 the turbidity of the filtered effluent failed to meet compliance of the 5.0 NTU more than 5% for a 24-hour period.

III. IRRIGATION EFFLUENT QUALITY

A summary of principle effluent mineral constituent concentrations is presented below.

Year	Avg TDS	Avg Chloride	Avg Sulfate	Avg Boron	Avg Fluoride
1972	1950	487	421	1.5	1.04
1973	1740	440	399	1.4	0.96
1974	1547	422	358	1.5	1.11
1975	1454	374	369	1.1	0.61
1976	1474	366	398	1.4	0.65
1977	1479	372	383	1.2	0.64
1978	1525	358	409	1.0	0.80
1979	1527	359	481	1.1	0.89
1980	1451	342	463	1.2	0.73
1981	1330	312	424	0.9	0.88
1982	1452	334	443	0.8	0.80
1983	1367	308	435	0.7	0.81
1984	1398	312	454	0.7	0.80
1985	1380	313	393	0.8	0.78
1986	1411	309	415	0.8	0.62
1987	1309	317	371	0.8	0.63
1988	1457	333	412	0.8	0.58
1989	1424	324	418	0.7	0.59
1990	1561	328	444	0.9	0.67
1991	1583	334	418	0.9	0.56
1992	1569	333	456	0.7	0.55
1993	1493	315	446	0.7	0.67
1994	1403	304	416	0.7	0.71
1995	1508	293	460	0.8	0.66
1996	1425	295	425	0.7	0.52
1997	1310	279	366	0.7	0.41
1998	1387	263	405	0.6	0.71
1999	1348	285	388	0.7	0.72
2000	1474	286	423	0.8	0.58

Year	Avg Na	Avg Ca	Avg Mg	Avg K
1975	354	112	45	17
1976	331	118	36	15
1977	320	109	40	15
1978	325	110	40	17
1979	308	117	45	14
1980	295	120	43	15
1981	278	117	41	18
1982	280	136	46	17
1983	275	125	43	13
1984	257	130	42	20
1985	249	126	42	16
1986	269	132	44	19
1987	240	117	39	19
1988	274	123	44	17
1989	274	117	43	17
1990	307	126	46	18
1991	308	130	46	20
1992	283	140	46	18
1993	295	138	46	18
1994	289	131	44	19
1995	286	145	38	16
1996	273	130	42	20
1997	249	115	40	19
1998	261	124	43	19
1999	249	116	43	21
2000	287	130	48	23

LOCATION OF SAMPLE POINTS FOR MONITORING AND REPORTING PROGRAMS

The liquid fraction flow path for both discharge to the Santa Clara Tidal Prism and treated effluent reused for landscape irrigation was as shown in the schematic plant flow diagram which follows. This has been the treatment plant operating mode throughout all of 2000.

The total wastewater flow is treated and disinfected through the system as shown without regard to the ultimate discharge.

The following describes sample locations designated and the purposes for which each is used.

LOCATION 1 - INFLUENT PUMP STATION

This location receives all raw wastewater flow to the treatment plant unless failure of pumping systems occurs. If such failure occurs, or should storm flows exceed the capacity of this primary station, all or part of the influent flow will be diverted to a standby facility, which has no provision for sampling or flow measurement. Such events are infrequent and duplication of influent sampling programs is not warranted.

The sampler used here is an ECOA model E dip sampler controlled by a PLC using the signal from the influent flow meters.

The sampler is located downstream of comminution equipment and upstream of grit removal and the entry point for recirculation from the Activated Sludge process.

Sampling is performed here for compliance monitoring and for process control. Analyses for pH, 5-day BOD, COD, Suspended Solids, Nitrogen Compounds and Priority Pollutants are performed on samples collected at this station.

LOCATION 2 - PRIMARY EFFLUENT

Through this location passes all effluent from the Primary Clarifier. This sample station can be bypassed and raw sewage delivered directly to the Activated Sludge System if routine maintenance or emergency requires it.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow to the Roughing Filter System.

Sampling is performed here for process control.

Analyses for 5-day BOD, COD, Suspended Solids, Settleable Solids, MBAS and Nitrogen Compounds are performed on samples collected at this station.

LOCATION 3 - ROUGHING FILTER EFFLUENT

Interim sample point in use only during Upgrade construction for monitoring roughing filter performance and activated sludge process loading. Roughing Filter (trickling filter) was in service until July 2000.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow to the Activated Sludge System.

Sampling is performed here for process control.

Analyses for 5-day BOD, COD, Suspended Solids and Nitrogen Compounds are performed on samples collected at this station.

LOCATION 4 - ACTIVATED SLUDGE PROCESS EFFLUENT

This location is at the end of the 36 inch line from the Activated Sludge Final Sedimentation Tanks and before the Mixed Media Filter Station Surge Ponds. Effluent from the Trickling Filter secondary process does not ordinarily pass through this sample point.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow to the Activated Sludge System.

Sampling is performed here for process control.

Analyses for pH, 5-day BOD, COD, Suspended Solids, Settleable Solids, MBAS and Nitrogen Compounds are performed on samples collected at this station. The stream from the Activated Sludge System is also continuously monitored by a process turbidimeter.

LOCATION 5 - EFFLUENT TRANSFER STATION

This location follows Filtration and Disinfection and from here treated effluent is pumped to the Wildlife Ponds. All treated effluent passes through this station.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow leaving the Mixed Media Filter Station.

Sampling is performed here for compliance monitoring and for process control. Analyses for pH, 5-day BOD, COD, Suspended Solids, Grease and Oil, Nitrogen Compounds, Phosphate, MBAS, Phenols, Chloride, Sulfate, Boron, Fluoride, Sodium, Potassium, Calcium, Magnesium and Priority Pollutants are performed on samples collected at this station. Chlorophyll A, Phosphorous and the 17 Dioxin Congeners were add to the compliance monitoring program in November 2000. The flow from the Filtration and Disinfection processes is also continuously monitored here by a process turbidimeter.

Grab samples for bacteriological examination are collected three times daily, at 7:00 AM, 11:00 AM and 8:00 PM, just ahead of this sample station from the outlet end of the first contact chamber in use.

LOCATION 6 - OUTFALL METERING STRUCTURE

This sample location follows the Wildlife Pond System and the point of addition of Sulfur Dioxide used for Chlorine Residual neutralization and is immediately ahead of the point of discharge to the Santa Clara River Tidal Prism. All effluent reaching the Tidal Prism must pass through this Station.

Sampling is performed here for compliance monitoring and for process control.

Grab samples for Temperature and Composite samples used for Acute Toxicity and Chronic Toxicity are collected here. A Residual Chlorine Analyzer also continuously monitors the flow from the station.

RECEIVING WATER SAMPLE STATIONS

Ten sample stations, designated R1 through R4 within the Santa Clara Tidal Prism and R5 through R9 along the Pacific Ocean shore are specified by the Los Angeles Regional Water Quality Control Board in the facility NPDES permit. An additional sample station, designated L5, is located on the Santa Clara River approximately 1 mile east of the Harbor Boulevard Bridge. The City monitored this additional station voluntarily until 1995 when the renewed NPDES permit made it a required monitoring station. In November 2000, sample stations R5 through R9 were dropped from the renewed NPDES permit and L5 was relocated to Harbor Boulevard Bridge crossing at the Santa Clara River.

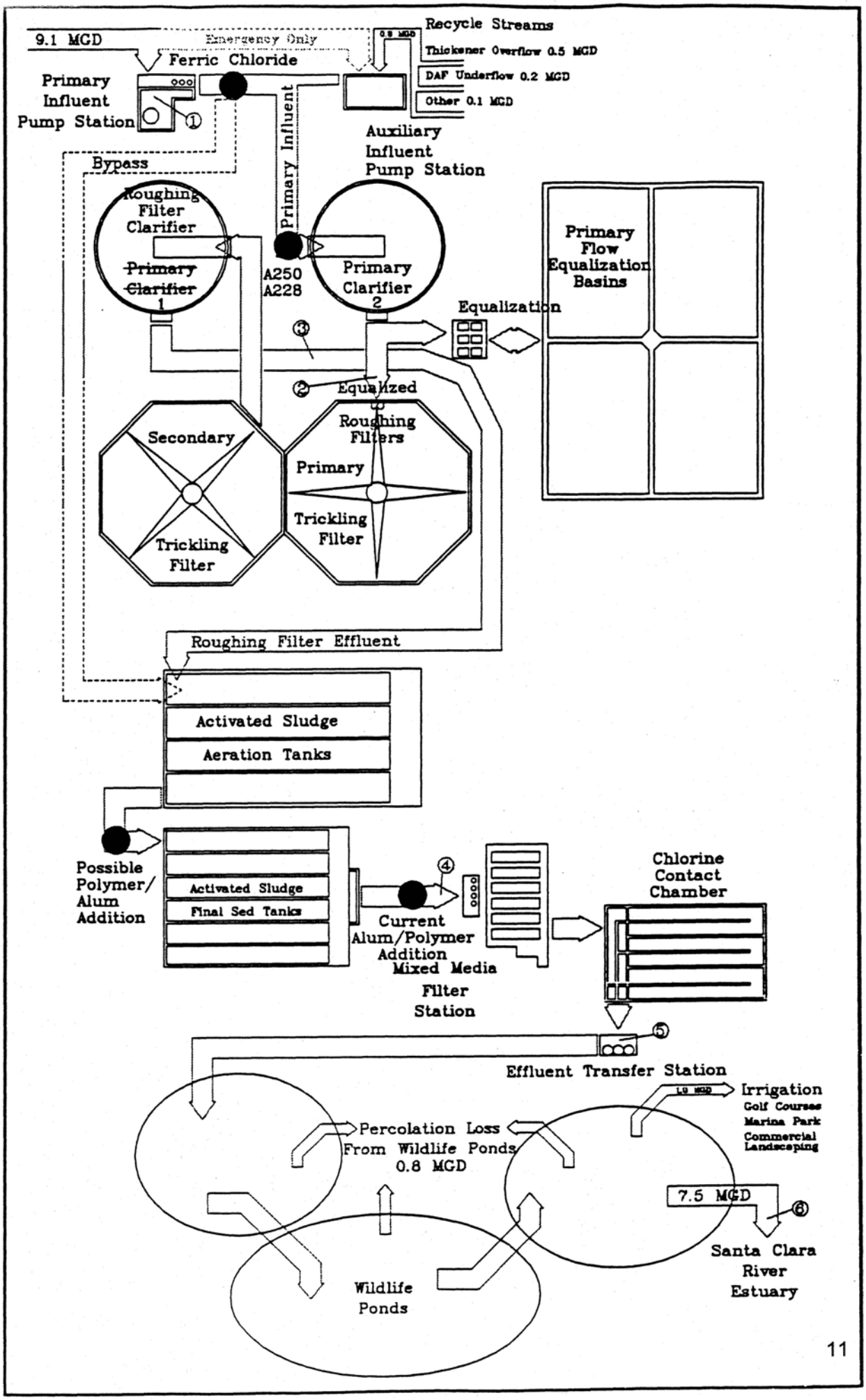
Water quality observations and temperature measurements are made at each of these sites.

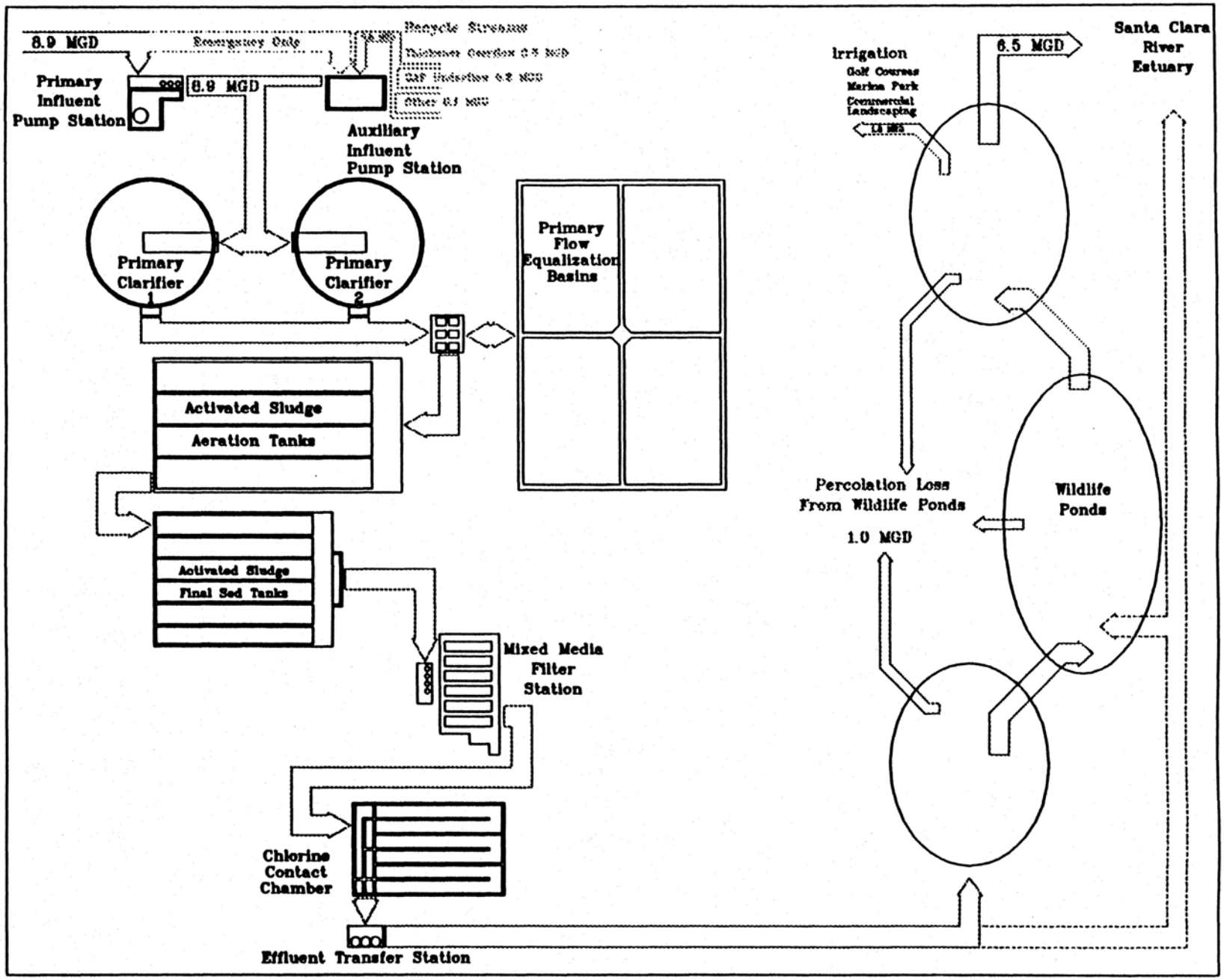
Grab samples from these locations are taken weekly and analyzed for Total Coliform and, for stations within the Tidal Prism, for Residual Chlorine. The renewed NPDES permit required additional receiving water monitoring on stations R1 through R4 and L5 for Hardness, Salinity, Fecal Coliform, Total Phosphorous, Nitrogen Compounds, Chlorophyll A, and Dissolved Oxygen. Priority Pollutants are performed on sample stations R1, R3 and L5.

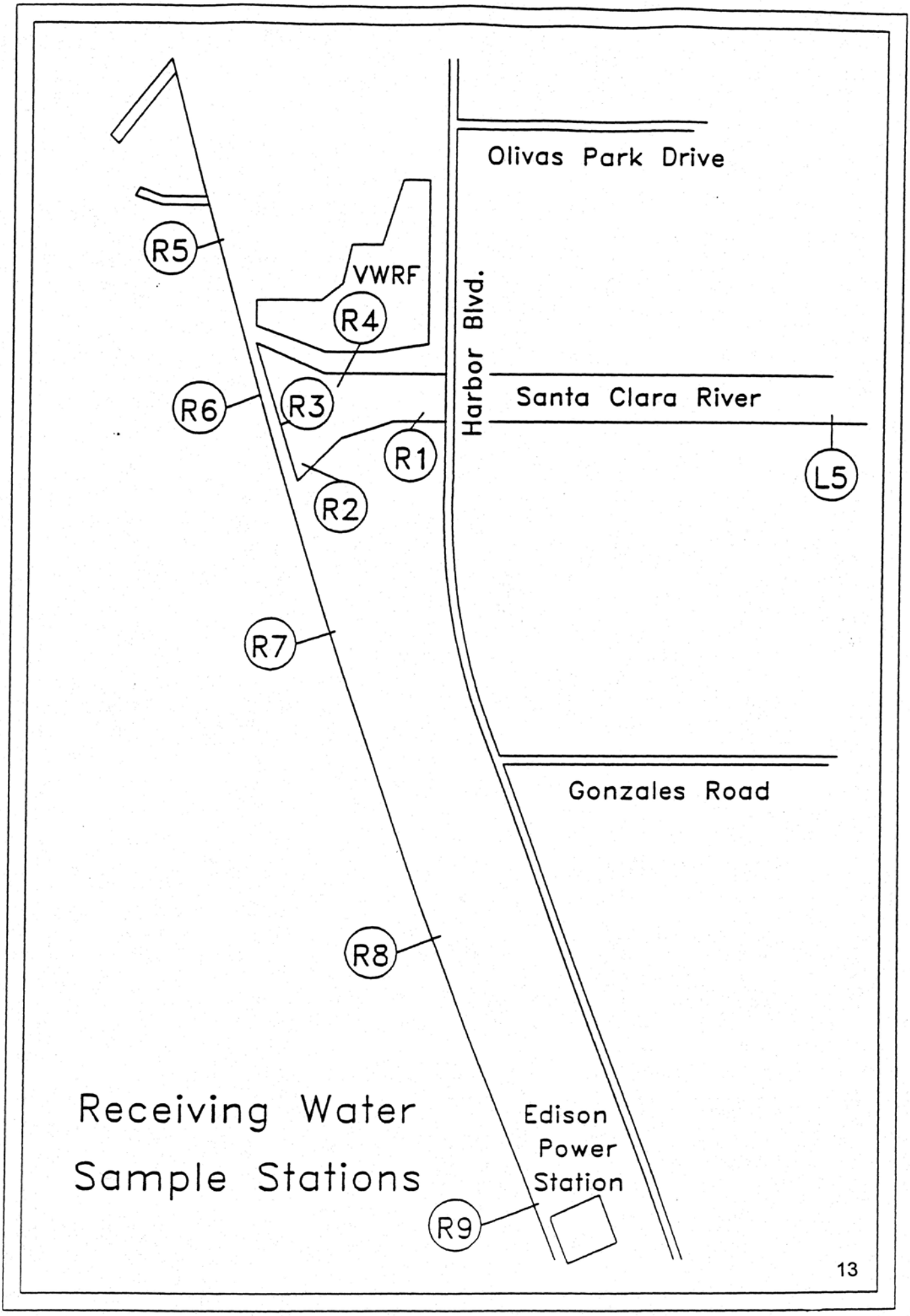
Grab samples from station R1, on the flowing stream as it enters the Tidal Prism, and R2, on the South shore of the Tidal Prism opposite the discharge from the Ventura Water Reclamation Facility. Samples are taken monthly for three months during the winter and analyzed for Chronic Toxicity using the same three species protocol applied to the discharge. Chronic toxicity was added to the list of analyses for sample station L5 under the renewed NPDES permit.

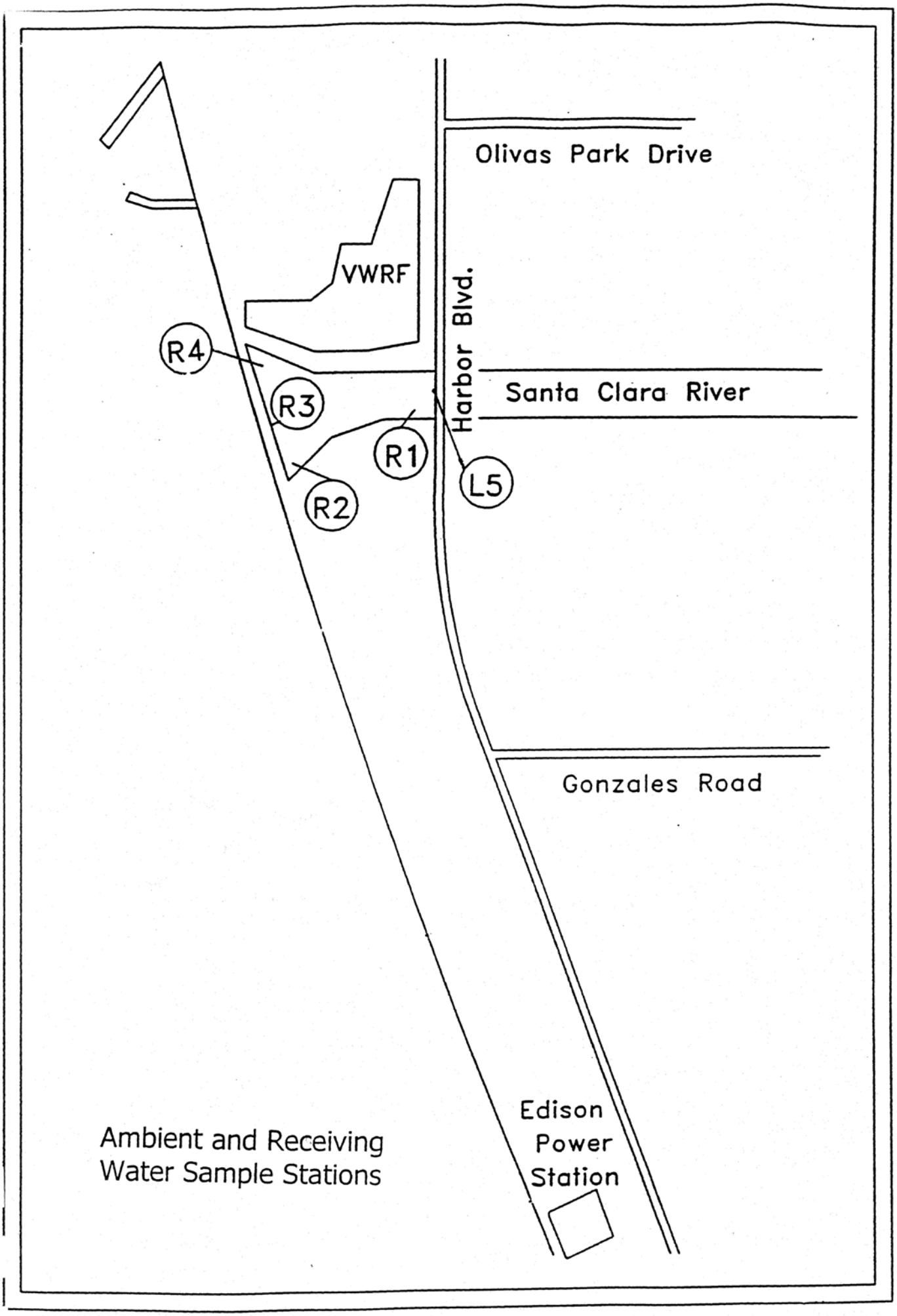
Maps showing these sample locations before November 2000 (pg. 13) and after November 2000 (pg. 14) when the NPDES permit was renewed follows

the schematic plant flow diagrams. The first diagram shows the plant flow when the Trickling Filter (pg. 11) was in operations during construction and the second shows the plant flow pattern with the Activated Sludge System (pg. 12).


9.1 MGD
Emergency Only
Ferric Chloride
Recycle Streams
0.8 MGD
Thickener Overflow 0.5 MGD
DAF Underflow 0.2 MGD
Other 0.1 MGD
Primary Influent Pump Station
1
Primary Influent
Auxiliary Influent Pump Station
Bypass
Roughing Filter Clarifier
Primary Clarifier 1
A250
A228
Primary Clarifier 2
Primary Flow Equalization Basins
Equalization
3
2
Equalized
Roughing Filters
Secondary
Trickling Filter
Primary
Trickling Filter
Roughing Filter Effluent
Activated Sludge
Aeration Tanks
Possible Polymer/ Alum Addition
Activated Sludge
Final Sed Tanks
4
Current Alum/Polymer Addition
Mixed Media Filter Station
Chlorine Contact Chamber
5
Effluent Transfer Station
1.9 MGD
Irrigation
Golf Courses
Marina Park
Commercial Landscaping
Percolation Loss From Wildlife Ponds 0.8 MGD
7.5 MGD
6
Santa Clara River Estuary
Wildlife Ponds


8.9 MGD
Emergency Only
Recycle Streams
Primary Influent Pump Station
8.9 MGD
Auxiliary Influent Pump Station
Primary Clarifier 1
Primary Clarifier 2
Primary Flow Equalization Basins
Activated Sludge
Aeration Tanks
Activated Sludge
Final Sed Tanks
Mixed Media Filter Station
Chlorine Contact Chamber
Effluent Transfer Station
Irrigation
Golf Courses
Marina Park
Commercial Landscaping
6.5 MGD
Santa Clara River Estuary
Percolation Loss From Wildlife Ponds
1.0 MGD
Wildlife Ponds


Olivas Park Drive
VWRF
R5
R4
R6
R3
R1
R2
Harbor Blvd.
Santa Clara River
L5
R7
Gonzales Road
R8
Receiving Water
Sample Stations
Edison
Power
Station
R9



Ambient and Receiving
Water Sample Stations

Ventura Water Reclamation Facility

Annual Report 2000

Influent Pump Station

Month	Average Flow MGD	pH Units	Suspended Solids mg/l	BOD mg/l	COD mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	8.61	7.43	204	271	520	24.7	38.9
February	9.50	7.39	200	244	480	20.7	69.8
March	9.51	7.40	191	251	464	19.8	66.0
April	9.74	7.17	211	289	529	19.7	37.0
May	9.89	7.25	186	256	433	20.2	36.5
June	10.00	7.31	225	265	531	21.6	35.2
July	9.57	7.30	231	244	457	22.8	30.6
August	9.61	7.37	233	240	524	23.0	33.8
September	9.35	7.37	227	271	569	24.3	41.3
October	9.30	7.35	220	262	562	24.3	38.3
November	8.96	7.19	217	264	530	26.0	42.7
December	8.88	7.24	234	264	523	29.8	41.9
Average	9.41	7.32	215	260	509	23.0	42.7
Maximum	12.67	7.91	479	490	776	31.9	69.8
Minimum	7.68	6.67	70	140	244	17.2	30.6
Total	3444.01						

Ventura Water Reclamation Facility

Annual Report 2000

Influent Pump Station

Month	Aluminum mg/l	Antimony mg/l	Arsenic mg/l	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Cobalt mg/l	Copper mg/l	Iron mg/l
February	1.397	<0.006	<0.002	<0.096	0.0013	<0.00059	<0.005	0.0107	0.1352	0.900
February	0.076	<0.001	0.007	0.040	<0.0002	<0.00400	<0.007	0.0030	0.0630	
May	1.153	<0.006	<0.002	<0.096	<0.00008	<0.00059	0.007	0.0096	0.1260	1.100
August	1.714	<0.006	<0.002	<0.096	<0.00008	0.00841	<0.005	0.0074	0.1207	0.946
August	1.116	<0.001	<0.002	0.086	<0.0002	<0.00400	<0.007	<0.0010	0.0205	
November	1.547	<0.005	<0.002	0.117	<0.0010	<0.0010	<0.010	<0.0007	0.1953	1.600
Average	1.167			0.040				0.005	0.1101	1.137
Maximum	1.714			0.1169				0.0107	0.1953	1.600
Minimum	0.076			<0.096				<0.0007	0.0205	0.900

Ventura Water Reclamation Facility

Annual Report 2000

Influent Pump Station

Month	Lead mg/l	Mercury mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Silver mg/l	Thallium mg/l	Tin mg/l	Vanadium mg/l	Zinc mg/l
February	0.0119	0.0029	0.1340	<0.005	<0.0033	0.0026	<0.001		0.0130	0.1719
February	<0.100	<0.0002	0.0160	0.0190	0.011	<0.0002	0.007	<0.100	<0.004	0.0540
May	0.0083	0.0013	0.0219	0.0345	<0.0033	0.0055	<0.001		0.0075	0.1419
August	<0.005	<0.001	0.0134	0.0840	0.0053	0.0020	<0.001		0.0249	0.2294
August	<0.100	<0.0002	0.0112	<0.0150	<0.002	<0.0002	<0.001	<0.100	<0.0040	0.1460
November	0.0056	<0.001	0.0031	<0.010	<0.005	<0.002	<0.001		0.0049	0.1960
Average	0.004	0.001	0.033	0.023	0.003	0.002	<0.001		0.008	0.157
Maximum	0.012	0.003	0.134	0.084	0.011	0.0055			0.0249	0.2294
Minimum										0.054

Ventura Water Reclamation Facility

Annual Report 2000

Influent Pump Station

Month	Acetone	Chloroform	1,4 Dichlorobenzene	Ethylbenzene
February	0.185	0.0022	<0.0005	<0.00034
August	0.107	0.0035	<0.0005	<0.00034

Month	Tetrachloroethylene	Toluene	1,1,1-Trichloroethane	Xylenes
February	<0.00003	<0.0002	<0.00003	<0.0005
August	<0.00003	<0.0002	<0.00003	<0.0005

Ventura Water Reclamation Facility

Annual Report 2000

Primary Clarifier Effluent Splitter Box

Month	pH Units	Suspended Solids mg/l	BOD mg/l	COD mg/l	MBAS mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	7.33	110.15	169.52	327.76	7.5	24.8	38.5
February	7.29	115.81	159.05	310.19	3.2	23.3	82.0
March	7.33	117.48	155.50	303.29	3.6	20.1	72.0
April	7.20	133.09	248.89	397.39	4.1	19.2	27.1
May	7.24	161.58	242.38	421.67	5.8	20.6	35.4
June	7.28	151.03	224.27	423.91	4.6	21.0	42.7
July	7.30	142.64	209.05	364.73	7.0	22.8	34.9
August	7.26	82.51	188.64	343.91	2.8	23.9	39.8
September	7.33	82.57	181.90	350.10	3.9	28.2	40.7
October	7.32	85.13	201.43	373.43	5.2	30.5	39.8
November	7.25	86.51	189.55	366.09	5.1	30.4	38.4
December	7.29	74.63	185.30	341.83	5.2	32.7	42.5
Average	7.29	111.47	195.79	359.98	4.9	24.8	43.7
Maximum	7.68	271.60	420.00	602.00	7.5	35.8	82.0
Minimum	6.81	46.20	100.00	167.00	2.8	16.4	27.1

Ventura Water Reclamation Facility

Annual Report 2000

Mixed Media Filter Influent

Month	Average Flow MGD	Suspended Solids mg/l	BOD mg/l	COD mg/l	MBAS mg/l	Nitrate Nitrogen mg/l	Nitrite Nitrogen mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	9.36	13.29	13.5	37.5	0.22	26.63	0.15	1.25	1.1
February	10.06	11.48	11.2	34.3	<0.05	23.40	0.22	1.16	2.4
March	10.11	15.85	15.1	38.9	<0.05	21.52	0.50	1.34	
April	9.99	28.10	24.2	54.2	<0.05	21.44	0.52	1.34	
May	9.97	37.76	43.1	71.9	<0.05	22.30	0.56	0.90	1.9
June	9.98	27.22	33.6	64.7	<0.05	17.03	<0.40	0.70	2.8
July	9.81	22.00	19.9	49.5	<0.05	17.88	0.03	0.78	0.5
August	9.07	68.90	53.6	101.6	<0.05	10.82	0.72	2.16	1.6
September	9.16	35.08	33.3	65.8	0.07	10.58	0.83	2.10	2.9
October	9.07	31.18	41.5	61.9	0.12	9.23	1.43	5.41	9.7
November	8.91	20.18	40.9	62.5	<0.0	8.36	2.08	4.51	12.1
December	8.59	11.19	17.5	40.6	0.09	7.23	1.78	8.95	6.2
Average	9.51	29.14	30.6	60.8	0.10	16.06	0.73	2.49	3.7
Maximum	13.34	429.00	270.0	524.0	0.22	27.50	3.50	13.20	12.1
Minimum	3.23	6.04	4.8	22.7	<0.05	3.40	<0.40	0.30	0.5

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	pH Units	Suspended Solids mg/l	lb/day	TDS mg/l	Specific Cond uMHO	BOD mg/l	lb/day	COD mg/l	Settleable Solids ml/l
January	6.74	1.35	90	1403	1956	1.3	87	24.5	<0.1
February	6.77	2.17	166	1454	2019	1.9	144	22.8	<0.1
March	6.85	1.75	128	1566	2209	2.1	153	22.9	<0.1
April	6.79	1.80	125	1489	2081	2.2	149	25.2	<0.1
May	6.86	1.86	119	1415	2049	2.2	142	25.9	<0.1
June	6.95	2.07	133	1498	2134	1.6	102	25.9	<0.1
July	6.84	1.57	98	1513	2121	1.4	85	26.3	<0.1
August	6.68	3.16	207	1505	1981	3.4	222	29.2	<0.1
September	6.63	1.08	69	1526	1998	2.2	139	26.5	<0.1
October	6.55	0.71	43	1503	2101	2.0	122	25.0	<0.1
November	6.62	1.20	75	1404	2183	1.9	117	23.8	<0.1
December	6.80	1.71	103	1415	2180	2.5	151	24.5	<0.1
Annual Average	6.76	1.70	113	1474	2084	2.1	134	25.2	<0.1
Maximum	7.28	14.70	1128	1833	2390	12.7	901	59.6	<0.1
Minimum	6.10	0.19	13	1148	1420	<0.3	<19	13.6	<0.1
Limitations of Permit CA0053651									
Maximum		45.00	5250			45	5250		0.3
7 Day Average		40.00	4670			30	3500		
30 Day Average		15.00	1751			20	2340		0.1

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	Grease and Oil mg/l	lb/day	Continuous Turbidity NTU	Nitrate Nitrogen mg/l	Nitrite Nitrogen mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	0.3	0	1.1	26.9	<0.4	0.7	0.5
February	0.3	0	1.4	24.8	<0.4	0.3	1.7
March	0.5	0	1.3	23.3	<0.4	0.9	2.1
April	0.1	0	1.4	23.3	<0.4	0.9	1.0
May	0.5	0	1.3	22.6	<0.4	0.6	0.8
June	1.6	0	1.2	18.9	<0.4	1.4	2.3
July	0.9	0	1.0	19.6	<0.4	1.5	-0.4
August	0.6	0	1.8	12.0	<0.4	1.5	0.5
September	0.4	0	0.9	13.5	<0.4	1.3	0.6
October	0.6	0	0.8	10.3	<0.4	5.3	3.3
November	0.6	0	0.8	9.9	<0.4	4.1	7.7
December	<0.1	0	1.0	8.6	<0.4	8.1	7.3
Annual Average	0.6	0	1.2	17.5	<0.4	2.2	2.3
Maximum	3.5	0	6.7	28.6	0.6	11.4	7.7
Minimum	<0.1	<7	0.6	7.6	<0.4	<0.4	<0.4
Limitations of Permit CA0053651							
Maximum	15.0	1750	2.0				
7 Day Average							
30 Day Averag	10.0	1170					

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	MBAS mg/l	Chloride mg/l	Sulfate mg/l	Phosphate mg/l	Boron mg/l	Fluoride mg/l
January	<0.05	282	403	1.69	0.75	0.48
February	<0.05	297	446	1.60	0.84	0.50
March	<0.05	294	494	2.40	0.73	0.53
April	<0.05	297	489	3.35	0.67	0.50
May	<0.05	283	379	3.43	0.69	0.55
June	<0.05	268	407	4.60	0.67	0.58
July	<0.05	326	526	9.47	0.75	0.59
August	<0.05	240	346	7.50	0.78	0.60
September	0.34	262	362	8.09	0.76	0.60
October	0.098	326	435	8.05	0.75	0.64
November	0.05	283	443	7.80	0.87	0.71
December	0.03	298	395	7.76	0.91	0.63
Annual Average	0.11	286	421	5.5	0.76	0.58
Maximum	0.34	418	796	9.47	0.91	0.71
Minimum	<0.05	147	312	1.60	0.67	0.48

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	Sodium mg/l	Calcium mg/l	Magnesium mg/l	Potassium mg/l
January	270	151	47.5	21.7
February	275	137	49.1	22.8
March	291	136	50.6	19.3
April	280	131	50.2	20.6
May	285	130	46.0	28.4
June	289	121	45.6	29.4
July	274	139	48.1	20.5
August	262	114	44.7	21.2
September	374	121	54.2	20.0
October	266	111	45.7	22.9
November	277	143	46.5	22.6
December	301	122	43.6	23.1
Annual Average	287	130	47.7	22.7
Maximum	374	151	54.2	29.4
Minimum	262	111	43.6	19.3

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	0700 Bay 1 Chlorine Residual mg/l	1100 Bay 1 Chlorine Residual mg/l	2000 Bay 1 Chlorine Residual mg/l	1100 ETS Chlorine Residual mg/l
January	13.7	12.6	13.3	10.8
February	13.7	12.1	12.9	10.3
March	12.8	11.3	12.4	9.0
April	13.5	11.7	13.8	9.7
May	13.6	11.8	13.8	8.4
June	11.9	10.0	12.9	7.2
July	13.8	11.6	13.3	12.4
August	15.5	14.1	16.7	14.6
September	14.6	12.9	12.2	17.0
October	12.6	10.4	13.1	11.4
November	14.6	11.7	13.0	13.2
December	14.4	13.3	12.9	13.2
Annual Average	13.7	12.0	13.4	11.5
Maximum	34.3	32.4	26.0	62.8
Minimum	0.6	3.0	2.5	0.2

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	Cyanide mg/l	Aluminum mg/l	Antimony mg/l	Arsenic mg/l	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Cobalt mg/l	Copper mg/l
January										0.010
February	<0.004	0.0565	<0.006	<0.002	<0.096	<0.00008	<0.00059	<0.005	0.00681	0.008
February		0.1500	<0.001	0.006	0.019	<0.0002	<0.004	<0.007	<0.0010	<0.006
March										0.008
April										0.006
May	<0.004	0.2615	<0.006	<0.002	<0.096	<0.00008	<0.00059	<0.005	0.0079	0.014
June										0.008
July										0.003
August	<0.004	0.3257	<0.006	<0.002	<0.096	<0.00008	<0.00059	<0.005	0.0074	0.021
August		<0.003	<0.001	<0.002	<0.002	<0.0002	<0.004	<0.007	<0.0010	0.020
September										<0.0025
October										0.021
November	<0.004	0.1455	<0.005	<0.002	0.057	<0.0010	<0.0010	<0.010	<0.0010	0.010
December										0.008
Annual Average	-0.004	0.157	<0.001	0.001	0.012633				0.003685	0.010
Maximum	-0.004	0.3257		0.006	0.0568				0.0079	0.0209
Minimum									<0.0007	<0.001
Limitations of Permit CA0053651										
Maximum	0.012			0.076			0.016			0.098
7 Day Average										
30 Day Average								0.050		

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	Lead mg/l	Mercury mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Silver mg/l	Thallium mg/l	Tin mg/l	Vanadium mg/l	Zinc mg/l
January	<0.005			<0.005						<0.05
February	<0.005	0.0015	0.0131	<0.005	<0.0033	<0.0002	<0.001		0.012	<0.05
February	<0.100	<0.0002	0.0160	0.017	0.008	<0.0002	<0.001	<0.100	<0.004	0.036
March	<0.005			<0.005						<0.05
April	<0.005			<0.005						<0.05
May	<0.005	<0.001	0.0193	<0.005	<0.0033	0.0014	<0.001		0.005	0.193
June	<0.005			<0.005						<0.05
July	<0.005			<0.005						0.092
August	<0.005	<0.001	0.0125	0.080	<0.0033	<0.0002	<0.001		0.019	0.075
August	<0.100	<0.0002	0.0102	<0.0150	<0.0020	<0.0002	<0.001	<0.100	<0.004	0.0606
September	<0.005			<0.005						0.051
October	0.0138			0.010						0.209
November	<0.005	<0.001	0.0034	<0.010	<0.0020	0.0029	<0.001		<0.004	<0.05
December	<0.005			<0.010						<0.05
Annual Average	0.001	0.002	0.0124	0.008	0.001	0.001	<0.001	<0.100	0.0060	0.047
Maximum	0.0138	0.0015	0.0193	0.080	0.008	0.0029			0.019	0.209
Minimum	<0.005	<0.0002	0.0034							<0.050
Limitations of Permit CA0053651										
Maximum	0.077	0.003		0.271		0.027	1.765			1.181
7 Day Average										
30 Day Average										

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	Iron mg/l	Manganese mg/l
January	<0.1	<0.03
February	0.1	0.04
March	<0.1	<0.03
April	<0.1	<0.03
May	<0.1	<0.03
June	<0.1	<0.03
July	<0.1	<0.03
August	<0.1	<0.03
September	<0.1	<0.03
October	<0.1	<0.03
November	<0.1	0.15
December	0.1	0.09
Annual Average	<0.1	0.02
Maximum	0.1	0.15
Minimum	<0.1	<0.03

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Effluent Transfer Station

Month	Aldrin mg/l	alpha-BHC mg/l	beta-BHC mg/l	delta-BHC mg/l	Lindane mg/l	PCBs mg/l	Bromodichloromethane mg/l	Bromoform mg/l
February	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.0004		
February	<0.000004	<0.000003	<0.000006	<0.000009	0.000007	<0.000065	0.0632	0.0044
May	<0.000020	0.000305	0.00024	<0.000010	0.0002	<0.0001	0.0645	<0.005
August	<0.000030	<0.000010	<0.000010	<0.000030	<0.000020	<0.0004		
August	<0.000004	<0.000003	<0.000006	<0.000009	<0.000004	<0.000065	0.0620	<0.0002
November	0.000168	<0.000010	<0.000010	<0.000010	<0.000010	<0.0004	0.0181	0.009
Annual Average	<0.00001	<0.000014	<0.000034	<0.000015	<0.000029	<0.0001	0.05195	0.00335
Maximum	0.000168	0.000305	0.00024	<0.000010	0.0002	<0.0001	0.0645	0.009
Minimum	<0.000004	<0.000003	<0.000006	<0.000009	<0.000004	<0.000065	0.0181	<0.0002

Limitations of Permit CA0053651

Maximum	0.00130				0.00016		0.070	
7 Day Average								
30 Day Average								

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Chloroform mg/l	Carbon tetrachloride	Chlorobenzene	Dibromochloromethane	1,4-Dichlorobenzene
February	0.0686	<0.00012	<0.0002	0.0339	<0.0005
May	0.0967	<0.00100	<0.001	0.0279	<0.0005
August	0.1200	<0.00012	<0.0002	0.0290	<0.0005
November	0.0163	<0.00100	<0.0001	0.0146	<0.0010
Annual Average	0.0754	<0.00012	<0.0002	0.0264	<0.0005
Maximum	0.12			0.0339	
Minimum	0.0163			<0.0009	<0.0005
Limitations of Permit CA0053651					
Maximum					
7 Day Average					
30 Day Average					

Month	Pentachlorophenol mg/l	bis (2-Ethylhexyl)phthalate
February	<0.0036	0.0967
May	<0.0100	<0.0100
August	<0.0036	<0.0025
November	<0.0100	<0.0100
Annual Average		0.024175
Maximum		
Minimum		
Limitations of Permit CA0053651		
Maximum	0.013	0.0059
7 Day Average		
30 Day Average	0.0079	

Ventura Water Reclamation Facility

Annual Report 2000

Irrigation Reuse Flows

Month	Olivas Pump Station Flow MGD	Marina Park Flow MGD	Buena Pump Station Flow MGD	Total Irrigation Flow MGD
January	0.2419	0.0221	0.0973	0.3614
February	0.1085	0.0070	0.0409	0.1195
March	0.2811	0.0114	0.1469	0.3827
April	0.6486	0.0311	0.3210	0.9569
May	0.8490	0.0411	0.4245	1.3145
June	0.9964	0.0588	0.4922	1.5474
July	1.0523	0.0638	0.5641	1.6802
August	0.9623	0.0649	0.5548	1.5820
September	0.7462	0.0661	0.3170	1.1293
October	0.4155	0.0626	0.3525	0.8050
November	0.5569	0.0333	0.2544	0.8423
December	0.3764	0.0212	0.2125	0.6094
Annual Average	0.6133	0.0409	0.3345	0.9529
Maximum	1.4500	0.1580	1.1180	2.3470
Minimum	0.0010	0.0010	0.0010	0.0020

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Outfall Junction Structure

Month	Flow MGD	Max Contin Chlorine Residual mg/l	1100 Grab Temp Degrees C	Bioassay Acute Toxicity Survival %	Bioassay Chronic Ceriodaphnia Survival TU	Bioassay Chronic Ceriodaphnia Reproduction TU
January	7.98	<0.1	17.28	100.00%		
February	9.03	<0.1	17.79			
March	8.71	<0.1	19.45			
April	8.28	<0.1	21.48			
May	7.65	<0.1	23.63		1.00	1.00
June	7.71	<0.1	25.00			
July	7.50	<0.1	24.73			
August	7.53	<0.1	25.07		1.00	1.00
September	7.58	<0.1	24.45			
October	7.73	<0.1	22.50			
November	7.48	<0.1	18.96		1.00	1.00
December	7.60	<0.1	18.02		1.00	1.79
Annual Average	7.89	<0.1	21.54	100.00%	1.00	1.20
Maximum	12.83		26.80			
Minimum	6.20		15.00			

Limitations of Permit CA0053651

Maximum	70
7 Day Average	
30 Day Average	90

Ventura Water Reclamation Facility

Annual Report 2000

Outfall Junction Structure

Month	Bioassay Chronic Fathead Larvae Survival TU	Bioassay Chronic Fathead Larvae Growth TU	Bioassay Chronic Selenastrum Growth TU
January	2.00	2.00	1.00
February	1.00	1.00	1.00
March	1.00	1.00	
April	1.00	1.00	
May	1.00	1.00	
June	1.00	1.00	
July	1.00	1.00	
August	1.00	1.00	
September	1.00	1.00	
October	1.00	1.00	
November	1.79	1.79	1.00
December	3.13	5.56	1.00
Annual Average	1.33	1.53	1.00
Maximum	3.13	5.56	1.00
Minimum	1.00	1.00	1.00

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Tidal Prism Receiving Water Stations

Month	R1 Bioassay Chronic Ceriodaphnia Survival TU	R1 Bioassay Chronic Ceriodaphnia Reproduction TU	R1 Bioassay Chronic Fathead Larvae Survival TU	R1 Bioassay Chronic Fathead Larvae Growth TU	R1 Bioassay Chronic Selenastrum Growth TU
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November	1.79	3.13	1.00	1.00	1.00
December	5.56	10.00	5.56	>10	1.00
Annual Average	3.68	6.57	3.28	0.50	1.00
Maximum	5.56	10.00	5.56	1.00	1.00
Minimum	1.79	3.13	1.00		1.00

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Tidal Prism Receiving Water Stations

Month	R3 Bioassay Chronic Ceriodaphnia Survival TU	R3 Bioassay Chronic Ceriodaphnia Reproduction TU	R3 Bioassay Chronic Fathead Larvae Survival TU	R3 Bioassay Chronic Fathead Larvae Growth TU	R3 Bioassay Chronic Selenastrum Growth TU
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November	>10	>10	3.13	3.13	1.79
December	>10	>10	5.56	5.56	5.56
Annual Average	>10	>10	4.35	4.35	3.68
Maximum	>10	>10	5.56	5.56	5.56
Minimum			3.13	3.13	1.79

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2000

Tidal Prism Receiving Water Stations

Month	R1 Air Temp Degrees C	R2 Air Temp Degrees C	R3 Air Temp Degrees C	R4 Air Temp Degrees C	L5 Air Temp Degrees C	R1 Water Temp Degrees C	R2 Water Temp Degrees C	R3 Water Temp Degrees C	R4 Water Temp Degrees C	L5 Water Temp Degrees C
January	16.0	16.0	16.1	16.0	15.5	14.4	14.6	15.3	15.2	12.4
February	15.1	15.2	15.2	15.3	15.5	14.5	14.4	14.5	15.2	14.7
March	15.0	15.3	15.2	15.2	14.9	15.4	15.7	15.5	17.0	15.7
April	17.4	18.1	17.2	19.3	19.4	20.2	19.3	18.7	23.6	19.3
May	18.9	18.8	17.9	18.4	19.1	21.0	21.0	20.1	20.6	20.7
June	20.3	21.1	20.3	21.4	20.0	24.8	23.4	22.9	25.0	24.0
July	19.1	19.5	19.0	19.9	20.4	24.9	23.9	23.8	24.6	22.8
August	20.1	20.2	20.4	20.3	19.9	23.3	23.5	23.5	23.9	22.9
September	19.8	19.6	19.5	20.0	20.0	22.8	23.5	23.3	23.5	22.0
October	17.6	16.8	16.8	17.2	15.8	17.6	18.6	18.3	18.3	16.8
November	13.2	16.0	15.8	16.8	13.7	13.0	13.5	15.0	16.8	10.8
December	15.2	16.2	16.4	16.1	12.8	13.2	13.0	12.8	13.2	10.4
Annual Average	17.3	17.7	17.5	18.0	17.3	18.8	18.7	18.7	19.7	17.8
Maximum	24.6	24.6	24.4	24.0	23.0	25.5	26.5	26.0	26.5	25.5
Minimum	10.1	9.6	9.5	9.7	9.6	9.6	9.5	9.1	10.1	7.5

Ventura Water Reclamation Facility

Annual Report 2000

Tidal Prism Receiving Water Stations

Month	R1 Chlorine Residual mg/l	R2 Chlorine Residual mg/l	R3 Chlorine Residual mg/l	R4 Chlorine Residual mg/l	L5 Chlorine Residual mg/l
January	<0.1	<0.1	<0.1	<0.1	<0.1
February	<0.1	<0.1	<0.1	<0.1	<0.1
March	<0.1	<0.1	<0.1	<0.1	<0.1
April	<0.1	<0.1	<0.1	<0.1	<0.1
May	<0.1	<0.1	<0.1	<0.1	<0.1
June	<0.1	<0.1	<0.1	<0.1	<0.1
July	<0.1	<0.1	<0.1	<0.1	<0.1
August	<0.1	<0.1	<0.1	<0.1	<0.1
September	<0.1	<0.1	<0.1	<0.1	<0.1
October	<0.1	<0.1	<0.1	<0.1	<0.1
November	<0.1	<0.1	<0.1	<0.1	<0.1
December	<0.1	<0.1	<0.1	<0.1	<0.1
Annual Average	<0.1	<0.1	<0.1	<0.1	<0.1
Maximum					
Minimum					

Ventura Water Reclamation Facility

Annual Report 2000

Pacific Ocean Receiving Water Stations

Month	R5 Air Temp Degrees C	R6 Air Temp Degrees C	R7 Air Temp Degrees C	R8 Air Temp Degrees C	R9 Air Temp Degrees C	R5 Water Temp Degrees C	R6 Water Temp Degrees C	R7 Water Temp Degrees C	R8 Water Temp Degrees C	R9 Water Temp Degrees C
January	16.0	16.0	15.7	15.6	15.7	14.6	15.6	14.6	14.8	15.3
February	15.5	14.6	15.4	15.4	15.4	15.0	15.0	15.0	15.0	15.8
March	14.6	14.6	14.6	13.8	14.0	14.8	14.8	15.3	15.0	14.6
April	16.9	17.5	15.5	16.8	17.0	14.3	14.8	15.4	15.5	15.8
May	16.3	16.2	17.9	18.1	17.1	15.1	15.1	15.8	15.9	16.4
June	18.6	19.0	18.6	18.4	19.8	18.0	17.9	17.6	17.6	22.5
July	17.5	17.4	18.9	18.0	18.3	18.0	17.9	19.1	18.6	20.5
August	18.1	18.2	19.4	18.8	18.9	18.5	18.5	19.6	19.3	22.7
September	17.5	17.6	19.0	19.3	18.9	18.4	18.6	19.5	20.0	21.8
October	16.1	16.6	15.9	15.8	15.8	17.2	17.2	17.3	17.4	18.0
November										
December										
Annual Average	16.7	16.7	17.1	17.0	17.1	16.4	16.5	16.9	16.9	18.3
Maximum	20.3	22.0	22.0	24.0	20.5	20.0	20.0	21.0	21.0	27.5
Minimum	11.0	11.0	12.0	12.0	12.0	13.0	13.5	13.5	13.5	13.0

Ventura Water Reclamation Facility

Annual Report 2000

Solids Streams

Total Metal in mg/Kg Dry Weight

Dissolved Air Flotation System (Waste Activated Sludge)

Month	Cadmium mg/Kg	Chromium mg/Kg	Copper mg/Kg	Lead mg/Kg	Nickel mg/Kg	Silver mg/Kg	Zinc mg/Kg
February	2.4	13.6	778	26.0	18.1	1.6	590
May	2.7	14.5	679	26.8	15.4	1.4	446
August	2.3	14.1	893	20.3	19.0	0.9	595
November	2.0	10.0	692	22.4	13.6	0.6	336
Average	2.3	13.0	760.4	23.9	16.5	1.1	491.6

Gravity Thickener (Primary Sludge)

Month	Cadmium mg/Kg	Chromium mg/Kg	Copper mg/Kg	Lead mg/Kg	Nickel mg/Kg	Silver mg/Kg	Zinc mg/Kg
February	1.5	19.0	395	23.5	17.9	1.4	457
May	2.4	16.2	471	31.8	16.5	1.3	878
August	1.8	16.4	398	23.7	14.9	1.2	453
November	1.8	13.0	437	25.6	13.9	0.9	376
Average	1.9	16.1	425.2	26.2	15.8	1.2	540.9

Ventura Water Reclamation Facility

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Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium
09-Feb-00	FILTER PRESS 1 RUN 2						3.2	29.1
09-Feb-00	FILTER PRESS 1 RUN 3						3.2	29.1
09-Feb-00	FILTER PRESS 2 RUN 2						3.1	28.1
09-Feb-00	FILTER PRESS 2 RUN 2						3.1	28.3
02-Feb-00	FILTER PRESS 2 RUN 3	28735	<2.0	<2.0	441	<2.0	<2.0	33.1
05-Apr-00	FILTER PRESS 1 RUN 1	29902	<2.5	<2.5	409	<2.5	<2.5	33.5
03-May-00	FILTER PRESS 1 RUN 1						4.7	30.8
03-May-00	FILTER PRESS 1 RUN 2						4.7	30.5
03-May-00	FILTER PRESS 2 RUN 1						4.7	30.5
03-May-00	FILTER PRESS 2 RUN 2						4.7	30.4
07-Jun-00	FILTER PRESS 1 RUN 1	14775	3.2	<2.3	329	<2.3	<2.3	28.7
09-Aug-00	FILTER PRESS 1 RUN 1						3.8	28.2
09-Aug-00	FILTER PRESS 1 RUN 2						3.8	28.5
09-Aug-00	FILTER PRESS 2 RUN 1						3.8	28.2
09-Aug-00	FILTER PRESS 2 RUN 2						3.9	27.4
09-Aug-00	FILTER PRESS 1 RUN 1	12865	<2.7	<2.7	446	<2.7	<2.7	31.6
04-Oct-00	FILTER PRESS 1 RUN 1	10366	<3.1	<3.1	355	<3.1	<3.05	36.3
08-Nov-00	FILTER PRESS 1 RUN 1						3.8	21.6
08-Nov-00	FILTER PRESS 1 RUN 2						3.8	20.8
08-Nov-00	FILTER PRESS 2 RUN 1						3.7	20.8
08-Nov-00	FILTER PRESS 2 RUN 2						5.0	21.0
06-Dec-00	FILTER PRESS 1 RUN 1	10559	<3.1	<3.1	362	<3.1	<3.1	29.9
Average		17867	<2.8	<2.8	390	<2.8	2.9	28
Maximum		29902			446		5	36
Minimum		10366	<2.3	<2.3	329	1.8	<2.7	21

Ventura Water Reclamation Facility

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Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium
09-Feb-00	FILTER PRESS 1 RUN 2		871	45.7			30.6	
09-Feb-00	FILTER PRESS 1 RUN 3		907	46.1			31.2	
09-Feb-00	FILTER PRESS 2 RUN 2		886	46.4			30.1	
09-Feb-00	FILTER PRESS 2 RUN 2		886	45.6			29.2	
02-Feb-00	FILTER PRESS 2 RUN 1	13.3	943	26.8	2.0	17.1	26.9	20.3
05-Apr-00	FILTER PRESS 1 RUN 1	11.9	907	22.0	2.5	11.6	28.1	15.9
03-May-00	FILTER PRESS 1 RUN 1		907	41.4			31.4	
03-May-00	FILTER PRESS 1 RUN 2		915	44.1			32.4	
03-May-00	FILTER PRESS 2 RUN 1		941	42.5			31.1	
03-May-00	FILTER PRESS 2 RUN 2		878	40.4			30.3	
07-Jun-00	FILTER PRESS 1 RUN 1	7.4	824	28.7	5.0	39.7	26.2	13.1
09-Aug-00	FILTER PRESS 1 RUN 1		1124	29.4			33.9	
09-Aug-00	FILTER PRESS 1 RUN 2		1102	31.9			34.4	
09-Aug-00	FILTER PRESS 2 RUN 1		1157	30.2			35.2	
09-Aug-00	FILTER PRESS 2 RUN 2		1098	34.6			36.7	
09-Aug-00	FILTER PRESS 1 RUN 1	8.4	1097	26.1	3.9	<2.7	28.8	22.8
04-Oct-00	FILTER PRESS 1 RUN 1	5.5	970	15.9	1.7	14.6	28.2	15.7
08-Nov-00	FILTER PRESS 1 RUN 1		1005	46.7			29.0	
08-Nov-00	FILTER PRESS 1 RUN 2		1033	45.9			31.0	
08-Nov-00	FILTER PRESS 2 RUN 1		997	40.1			28.4	
08-Nov-00	FILTER PRESS 2 RUN 2		984	38.0			27.0	
06-Dec-00	FILTER PRESS 1 RUN 1	5.6	1143	16.8	2.6	17.2	22.6	15.2
Average		8.7	980.7	35.7	3.0	16.7	30.1	17.2
Maximum		13.3	1157.0	46.7	5.0	39.7	36.7	22.8
Minimum		5.5	824.0	15.9	<0.91	0.0	22.6	13.1

Ventura Water Reclamation Facility

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Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Silver	Thallium	Tin	Vanadium	Zinc
09-Feb-00	FILTER PRESS 1 RUN 2	1.8				747
09-Feb-00	FILTER PRESS 1 RUN 3	1.9				781
09-Feb-00	FILTER PRESS 2 RUN 2	1.7				803
09-Feb-00	FILTER PRESS 2 RUN 2	2.0				881
02-Feb-00	FILTER PRESS 2 RUN 1	33.8	11.8	<20.4	3.7	702
05-Apr-00	FILTER PRESS 1 RUN 1	27.4	11.0	<24.5	5.1	672
03-May-00	FILTER PRESS 1 RUN 1	2.1				835
03-May-00	FILTER PRESS 1 RUN 2	2.6				843
03-May-00	FILTER PRESS 2 RUN 1	2.1				830
03-May-00	FILTER PRESS 2 RUN 2	2.5				791
07-Jun-00	FILTER PRESS 1 RUN 1	25	<2.3	<22.5	4.5	622
09-Aug-00	FILTER PRESS 1 RUN 1	1.8				874
09-Aug-00	FILTER PRESS 1 RUN 2	2.0				858
09-Aug-00	FILTER PRESS 2 RUN 1	2.0				589
09-Aug-00	FILTER PRESS 2 RUN 2	1.6				859
09-Aug-00	FILTER PRESS 1 RUN 1	26.7	27.3	<27.0	8.7	811
04-Oct-00	FILTER PRESS 1 RUN 1	29.5	<3.1	37.9	6.6	570
08-Nov-00	FILTER PRESS 1 RUN 1	1.7				726
08-Nov-00	FILTER PRESS 1 RUN 2	1.8				826
08-Nov-00	FILTER PRESS 2 RUN 1	1.7				719
08-Nov-00	FILTER PRESS 2 RUN 2	1.6				723
06-Dec-00	FILTER PRESS 1 RUN 1	41.3	<3.1	<31.0	5.9	665
Average		9.8	8.4	6.3	5.8	760
Maximum		41.3	27.3	37.9	8.7	881
Minimum		1.6	<2.7	<2.5	3.7	570

Ventura Water Reclamation Facility

Annual Report 2000

Solids Streams

Total Compound in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Acetone	Chloromethane	1,4-Dichlorobenzene	Toluene
02-Feb-00	FILTER PRESS 2 RUN 1	83.7	<2.0	<0.41	<0.41
05-Apr-00	FILTER PRESS 1 RUN 1				
09-Aug-00	FILTER PRESS 1 RUN 1		<2.6	<0.54	<0.54
04-Oct-00	FILTER PRESS 1 RUN 1				
06-Dec-00	FILTER PRESS 1 RUN 1				

Date	Sample	Xylenes	Bis (2-Ethylhexyl)phthalate	TOX
02-Feb-00	FILTER PRESS 2 RUN 1	0.81	5306.1	<34
05-Apr-00	FILTER PRESS 1 RUN 1			26.8
07-Jun-00	FILTER PRESS 1 RUN 1			33.3
09-Aug-00	FILTER PRESS 1 RUN 1	0.88	<1.78	102.7
04-Oct-00	FILTER PRESS 1 RUN 1			87.7
06-Dec-00	FILTER PRESS 1 RUN 1			<31

Ventura Water Reclamation Facility

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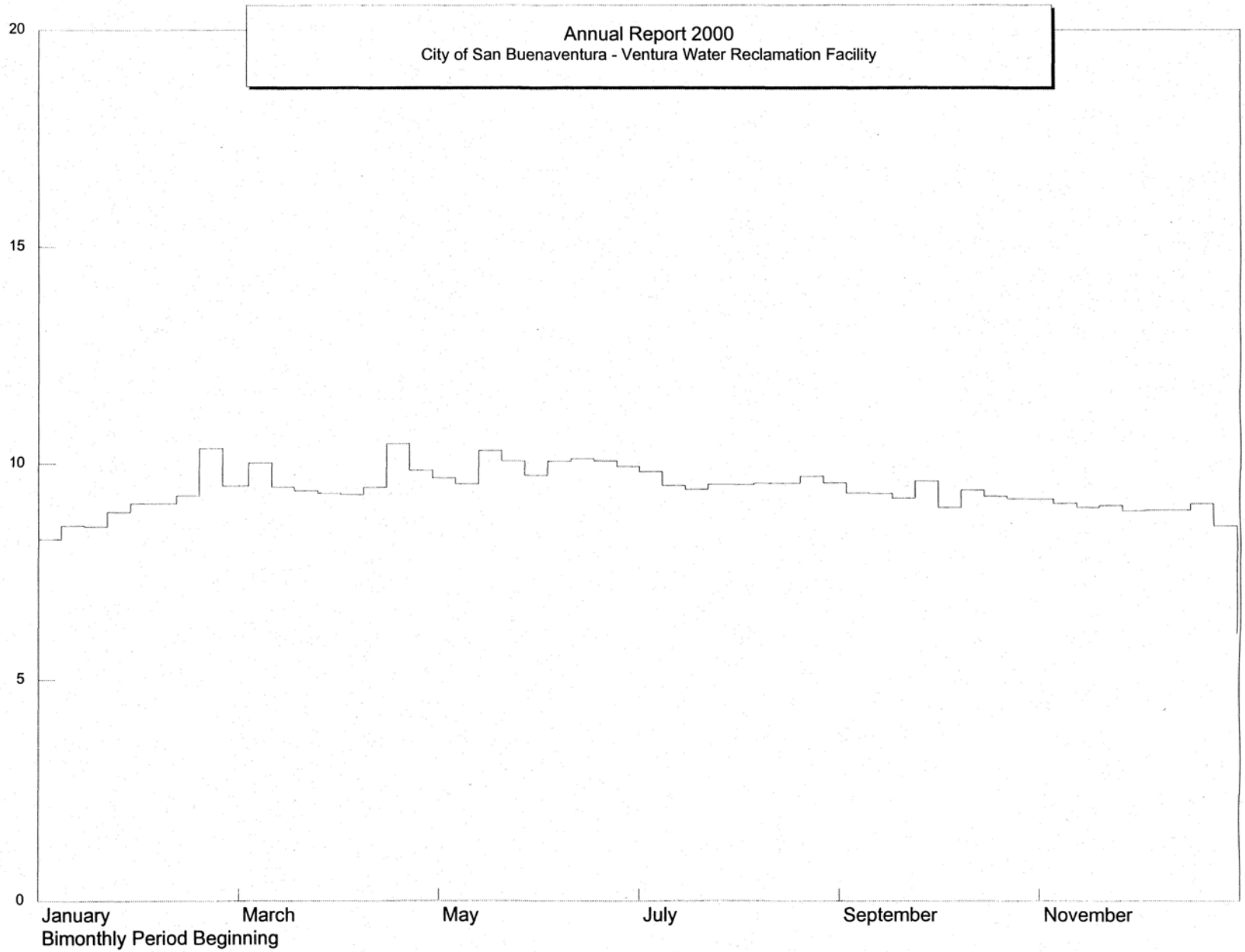
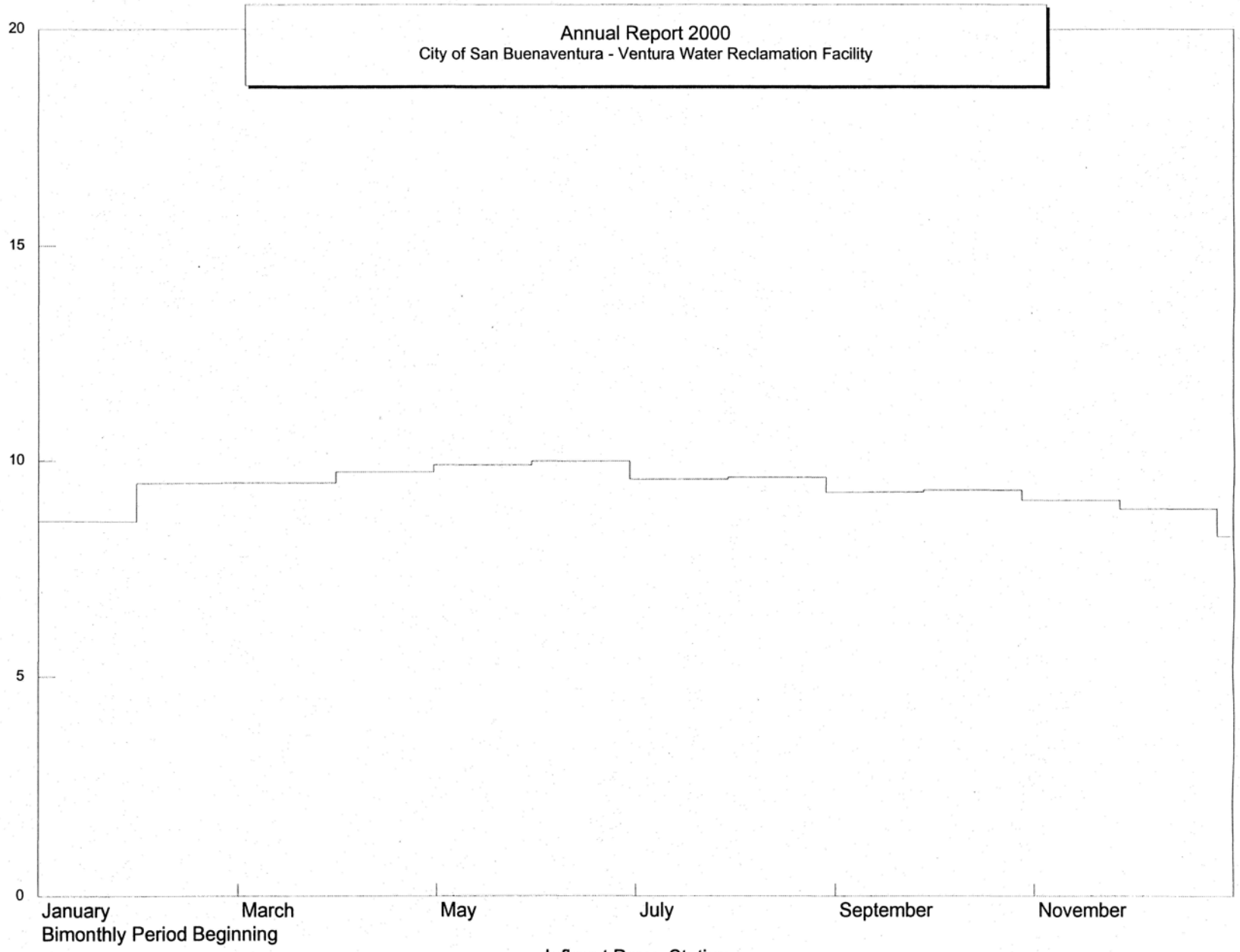
Trickling Filter Effluent

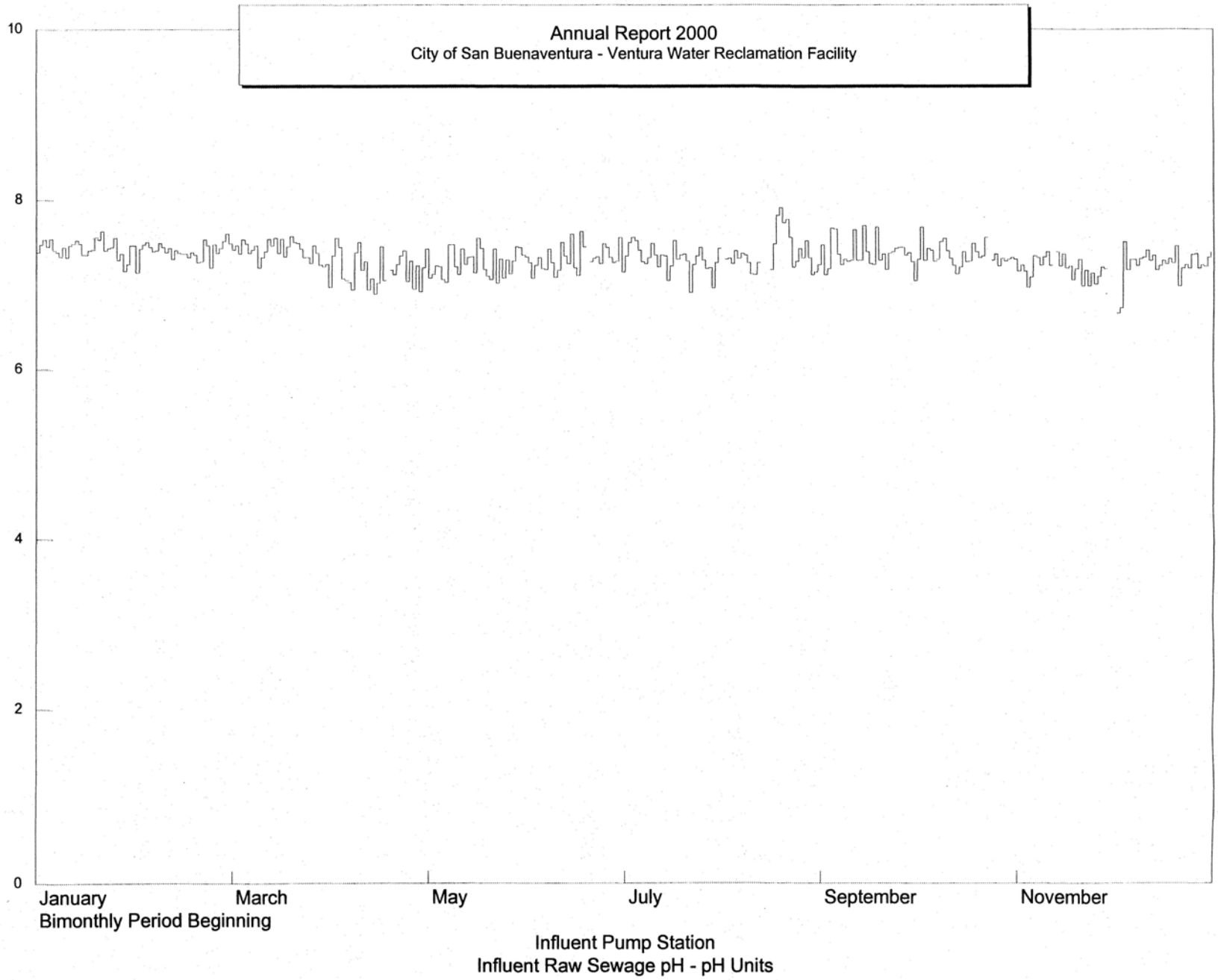
Month	pH Units	Suspended Solids mg/l	BOD mg/l	COD mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	7.35	64.22	83	190	24.6	41.6
February	7.31	65.00	77	168	21.2	70.0
March	7.35	66.29	90	161	18.3	52.0
April	7.30	72.55	117	207	18.5	29.5
May	7.38	64.99	97	182	21.5	31.5
June	7.45	74.17	112	199	18.9	30.5
July	7.50	71.83	103	175	19.8	35.2
August						
September						
October						
November						
December						
Average	7.37	74.79	96.15	183.04	20.4	41.5
Maximum	7.69	429.00	270.00	524.00	29.00	70.0
Minimum	7.07	6.04	4.80	22.70	16.20	29.5



Influent Pump Station
Daily Influent Raw Sewage 7 Day Flow



Influent Pump Station
Daily Influent Raw Sewage 30 Day Flow


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
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January
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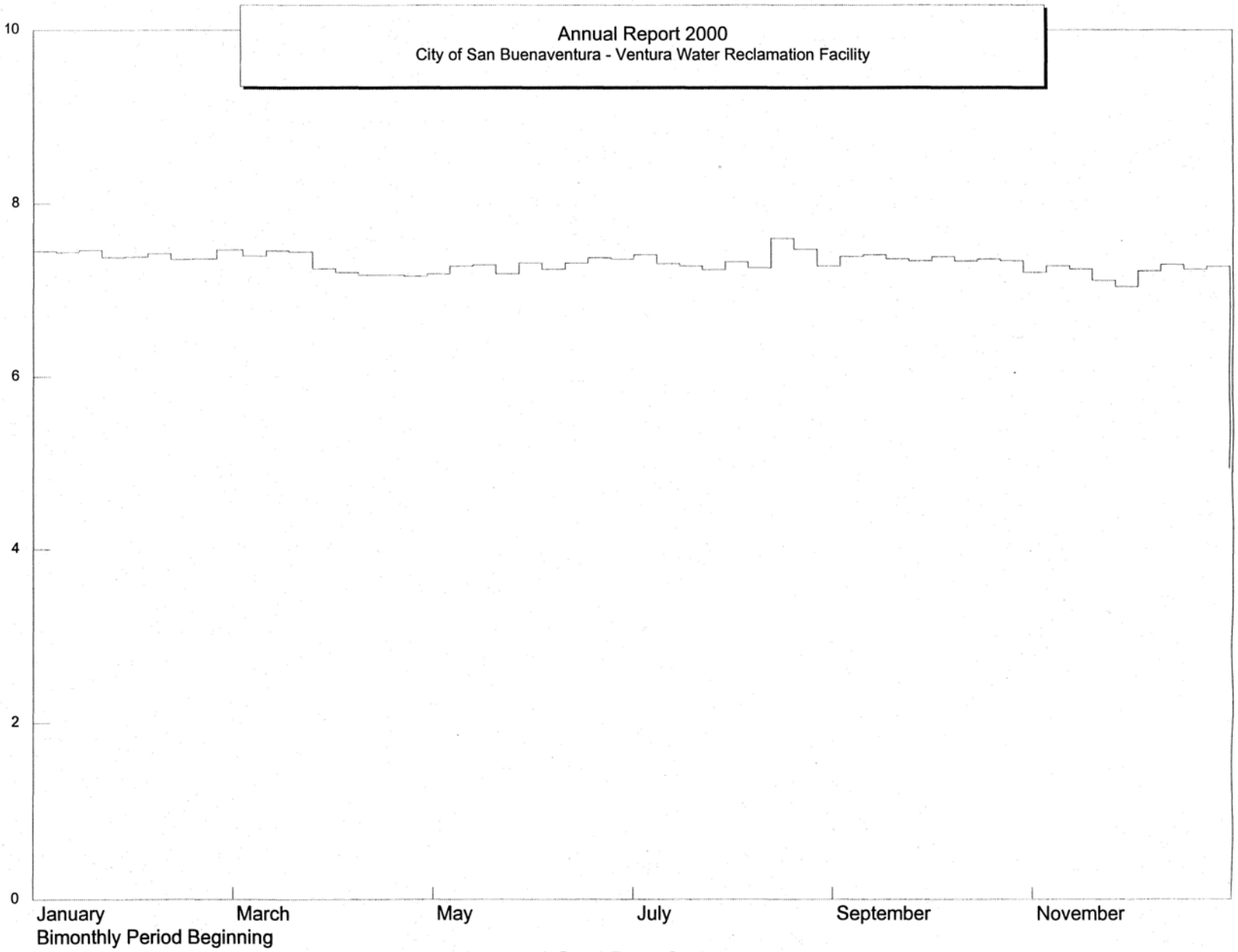
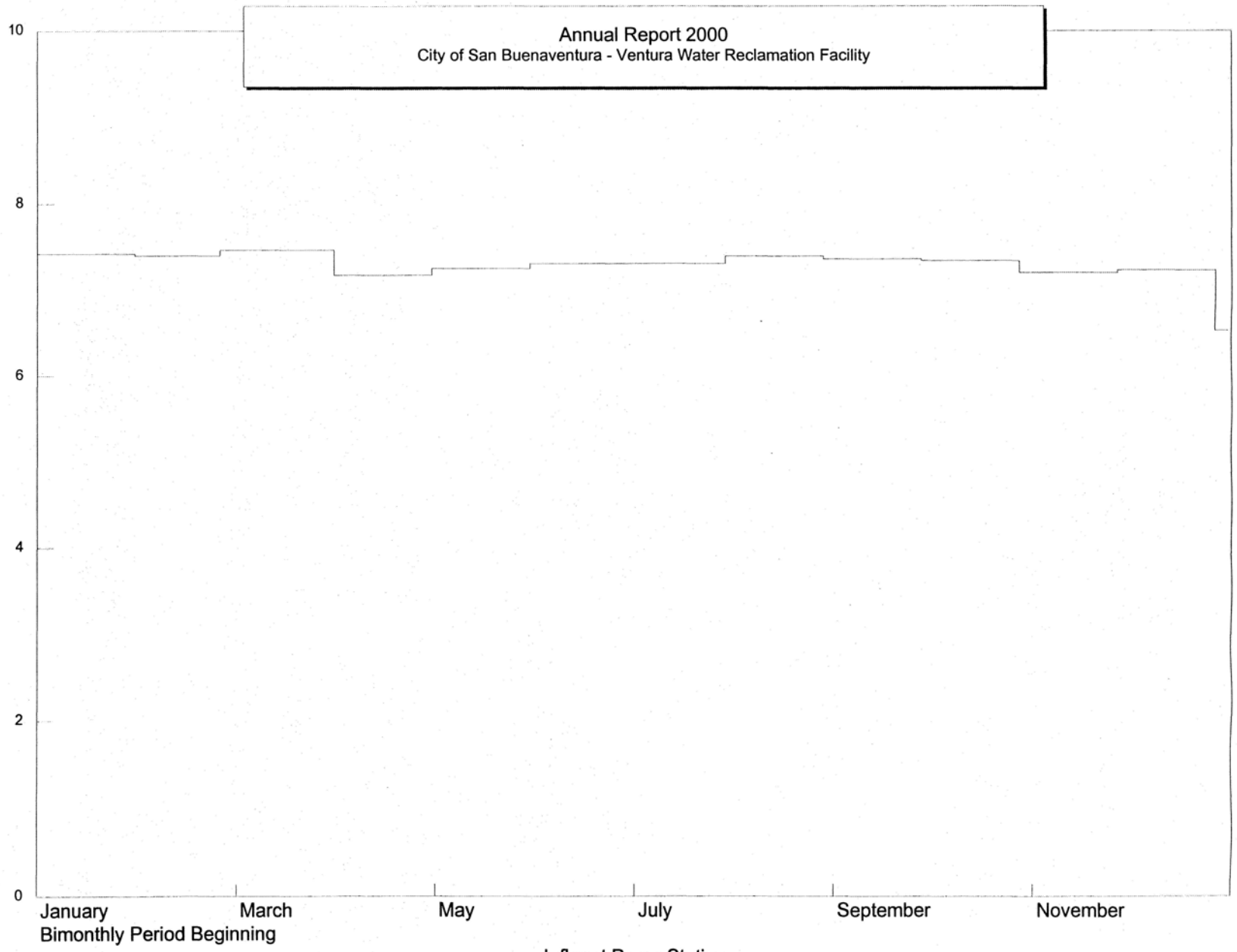
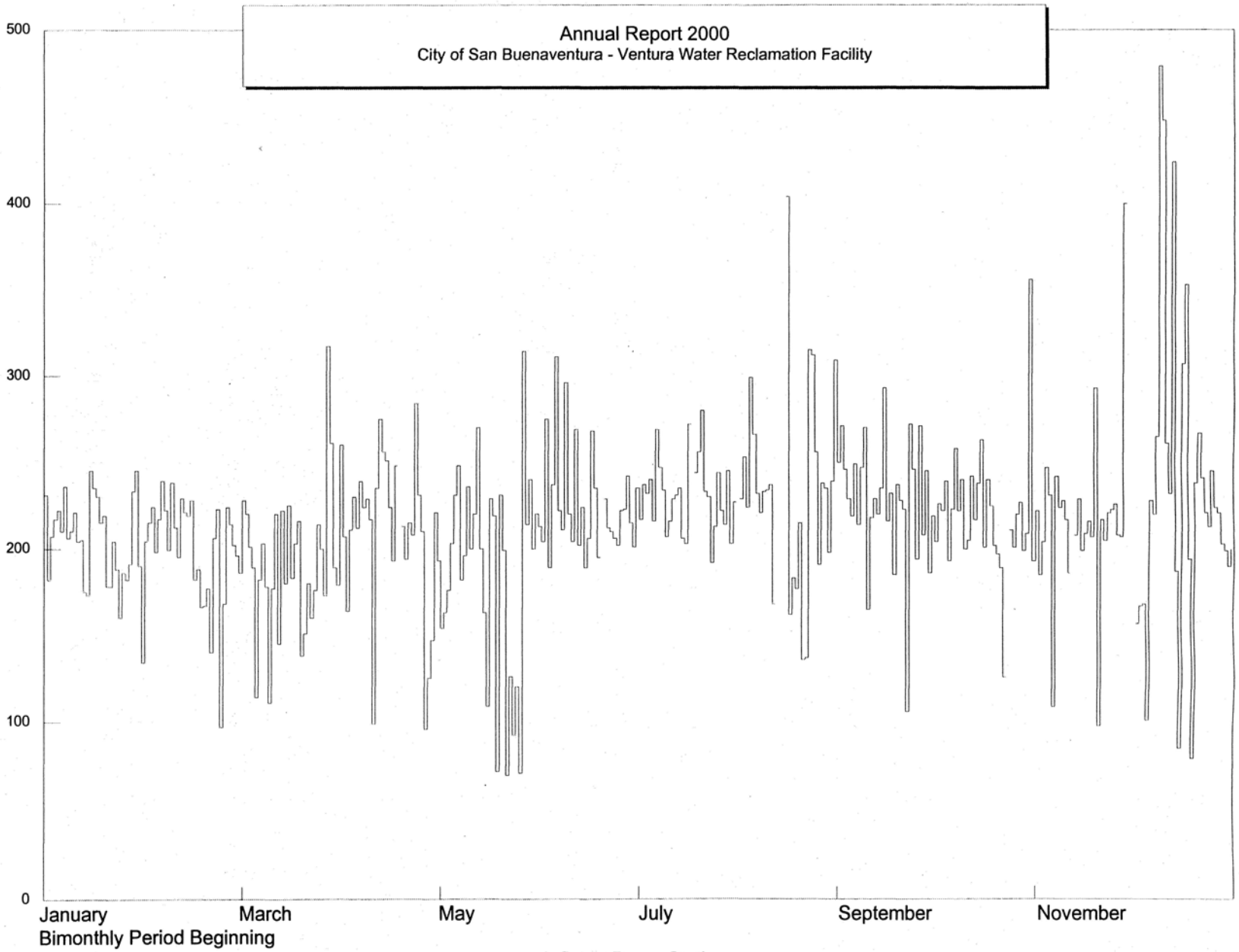
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage pH - pH Units



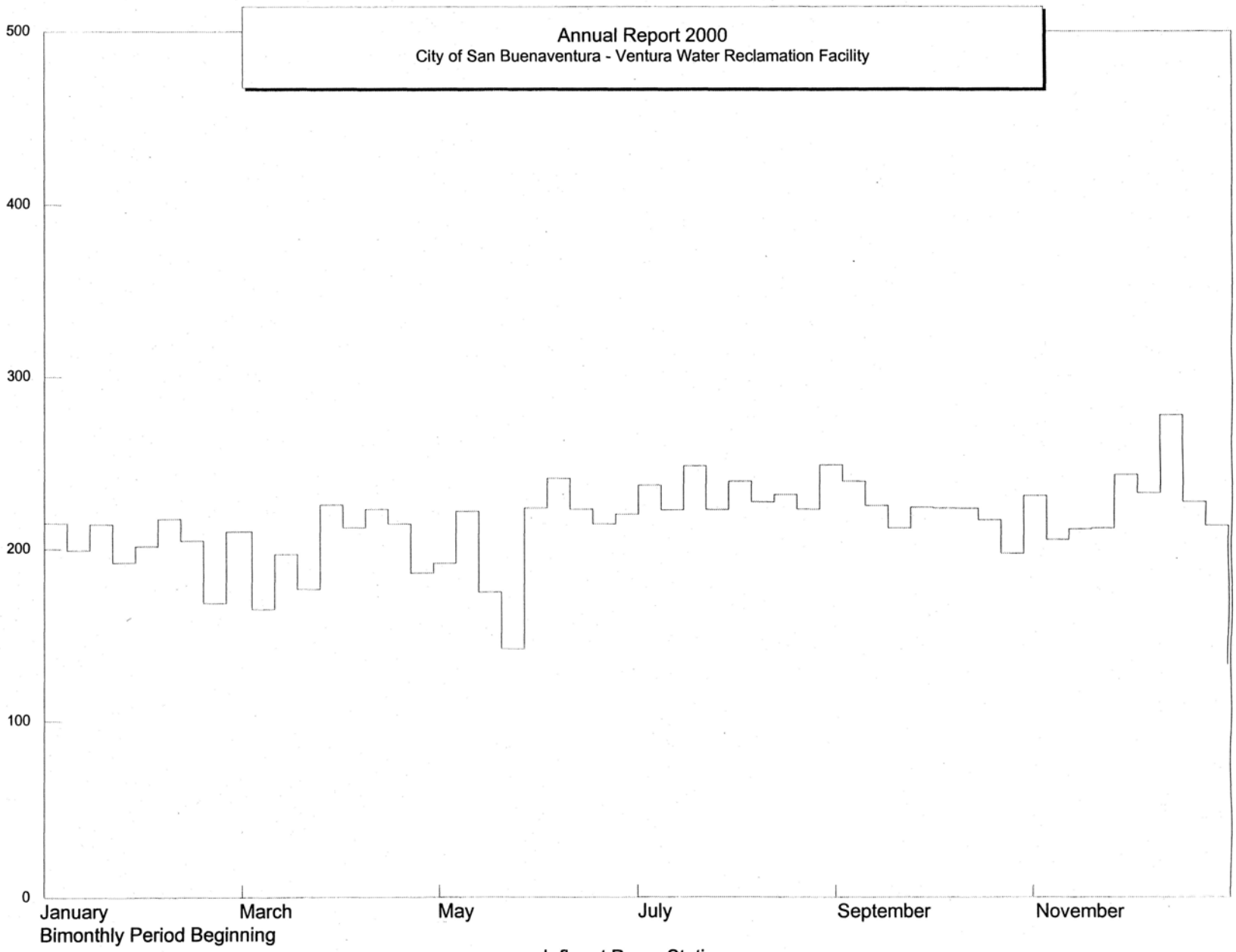
Influent Pump Station
Influent Raw Sewage 7 Day Average pH - pH Units



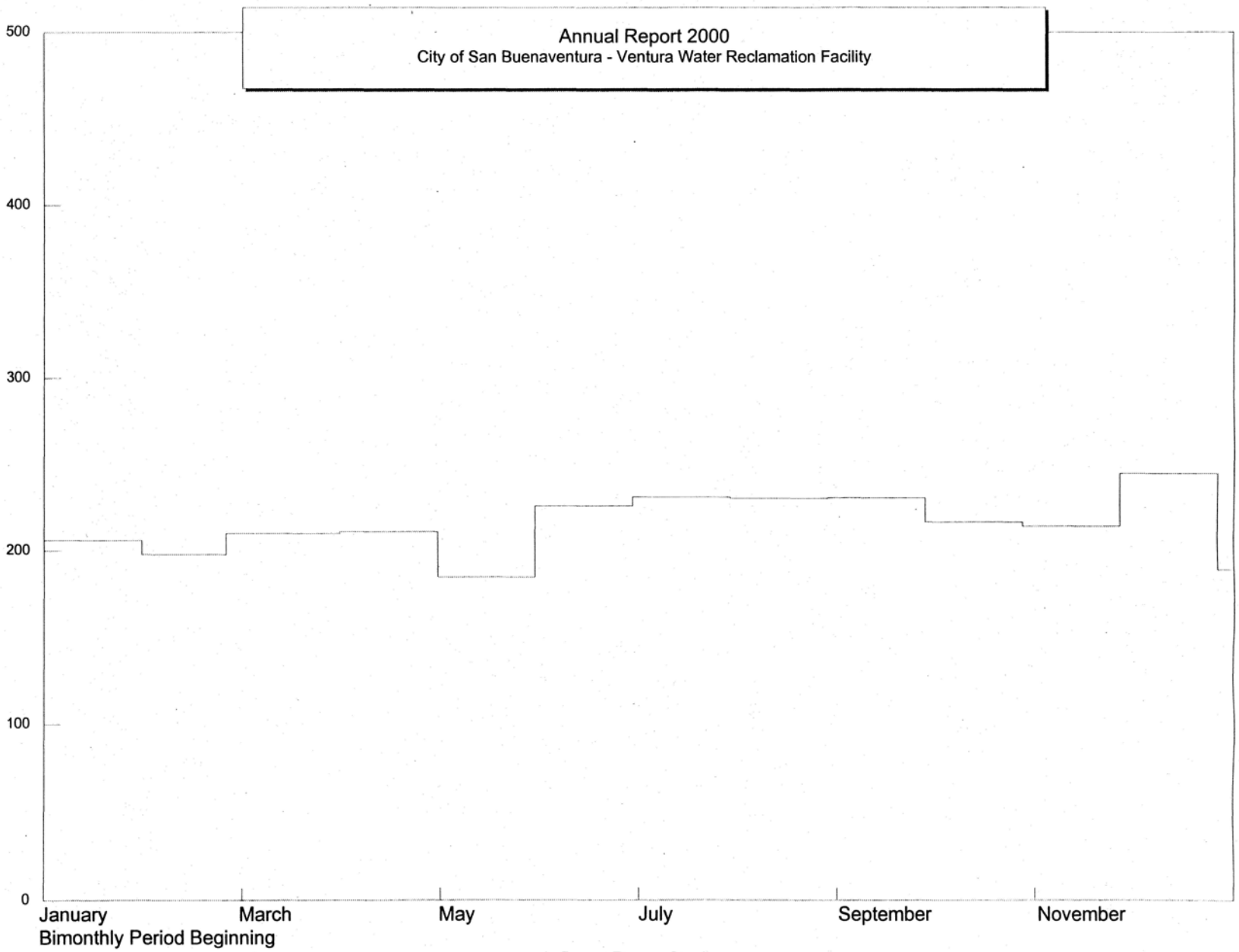
Influent Pump Station
Influent Raw Sewage 30 Day Average pH - pH Units



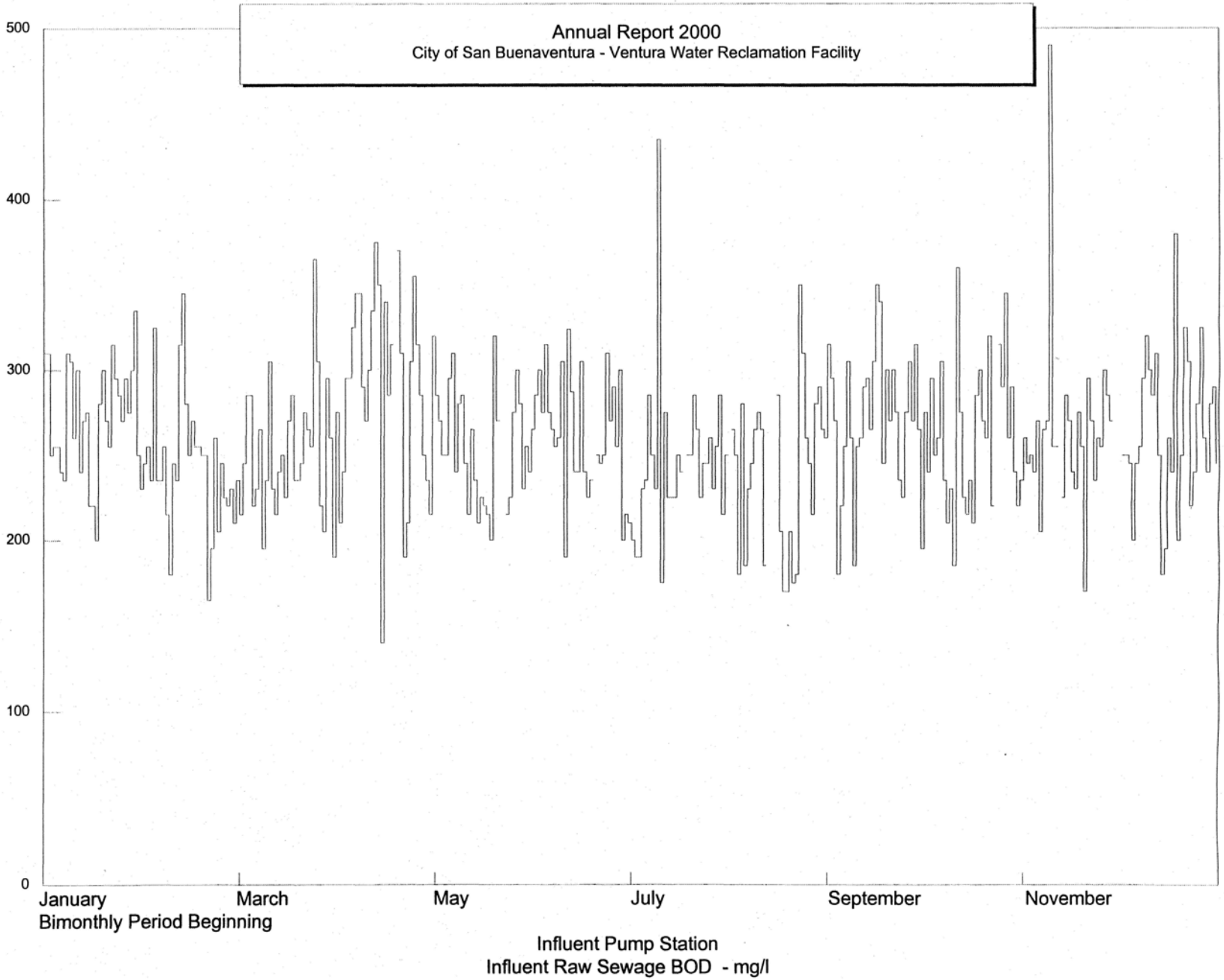
Influent Pump Station
Influent Raw Sewage Suspended Solids - mg/l



Influent Pump Station
Influent Raw Sewage 7 Day Average Suspended Solids - mg/l



Influent Pump Station
Influent Raw Sewage 30 Day Average Suspended Solids - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
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January
March
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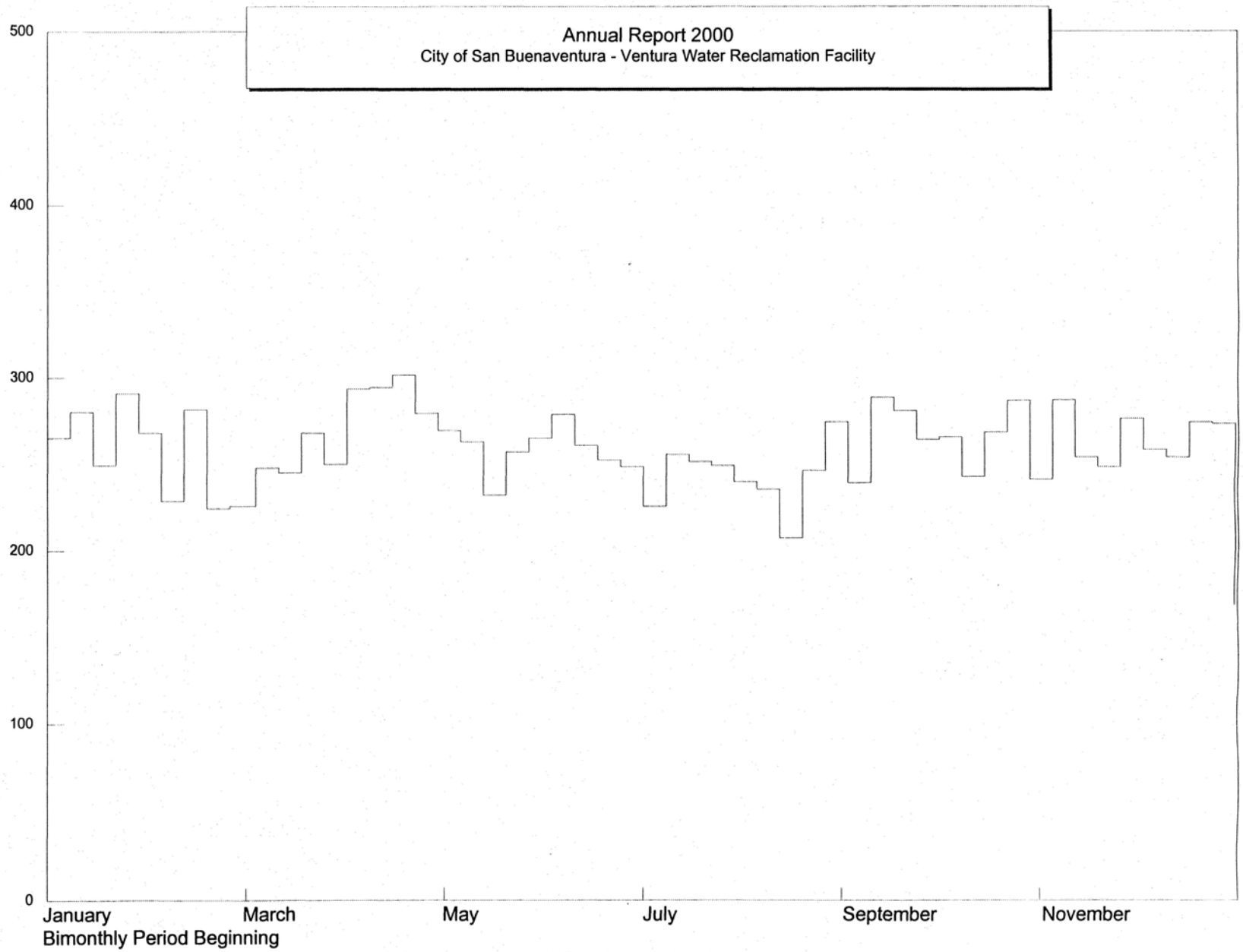
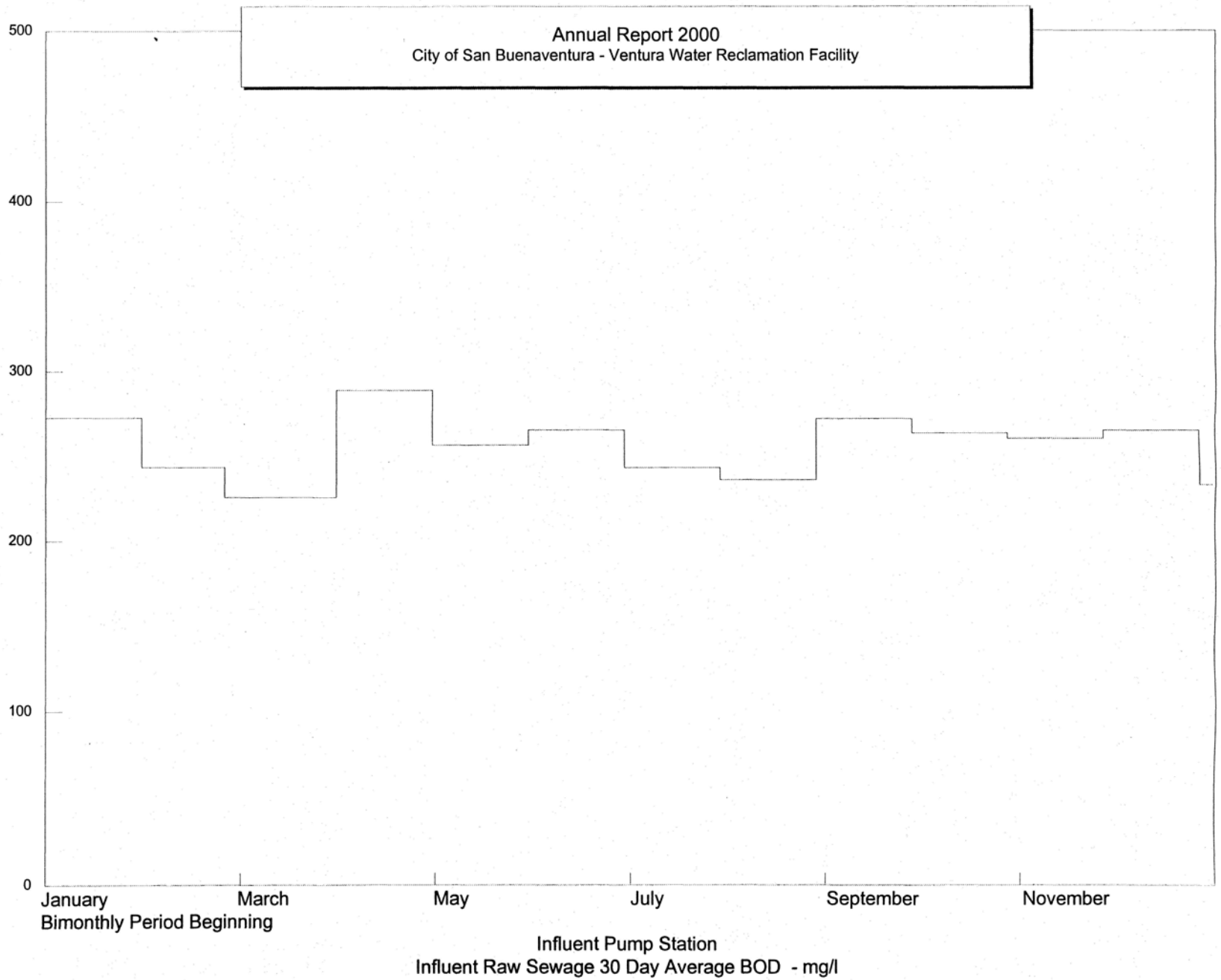
September
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage BOD - mg/l



Influent Pump Station
Influent Raw Sewage 7 Day Average BOD - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
500
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January
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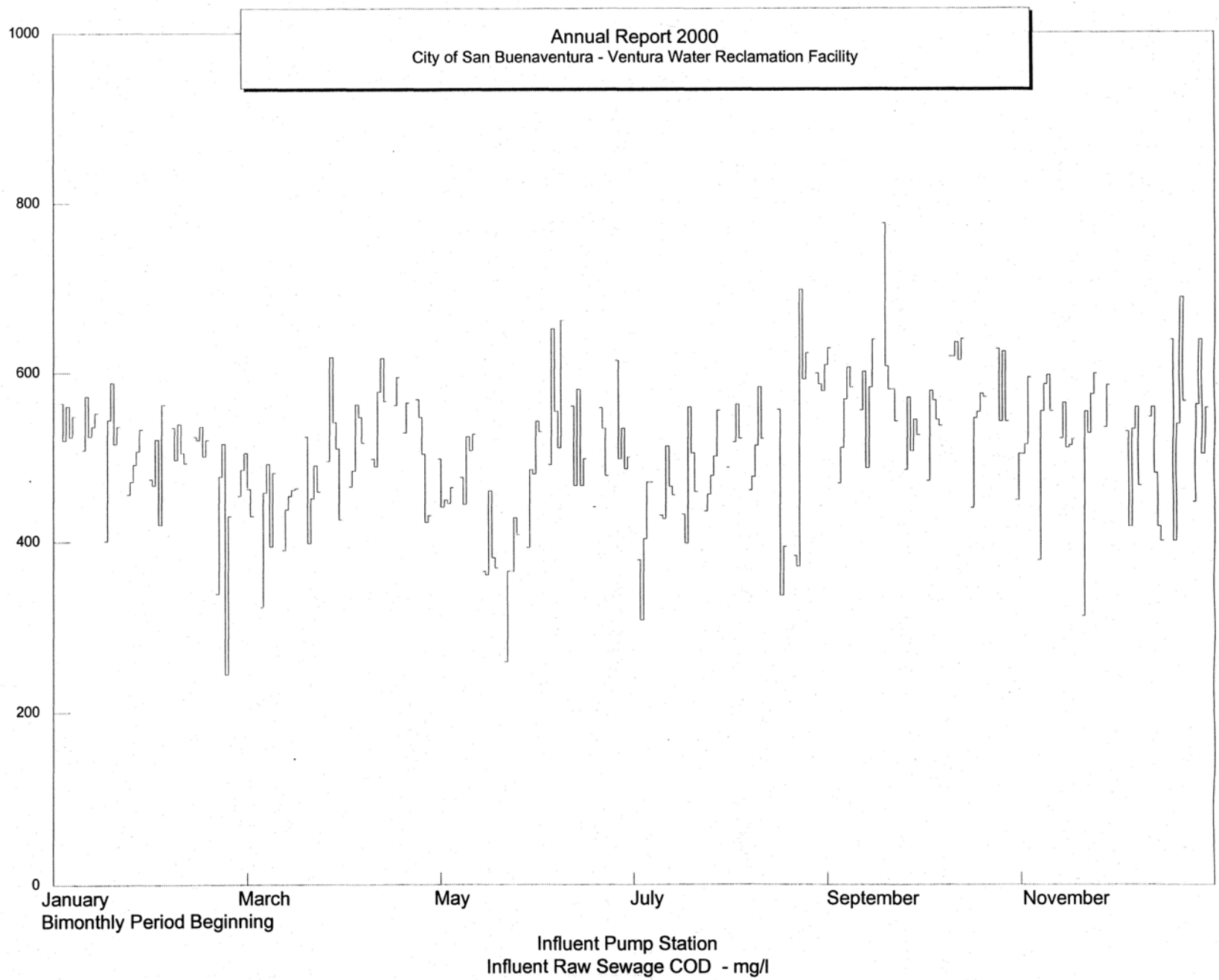
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage 30 Day Average BOD - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
1000
800
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January
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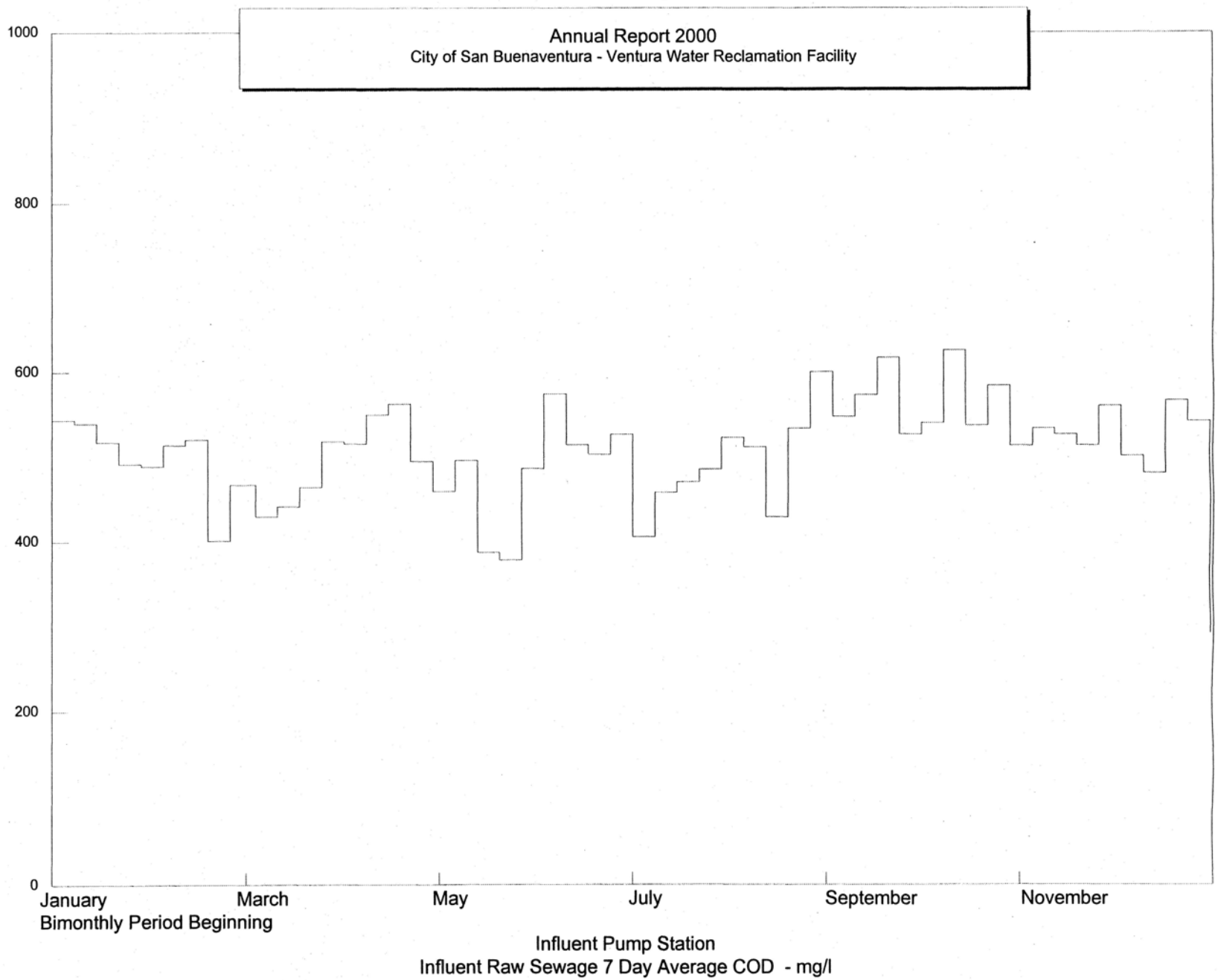
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage COD - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
1000
800
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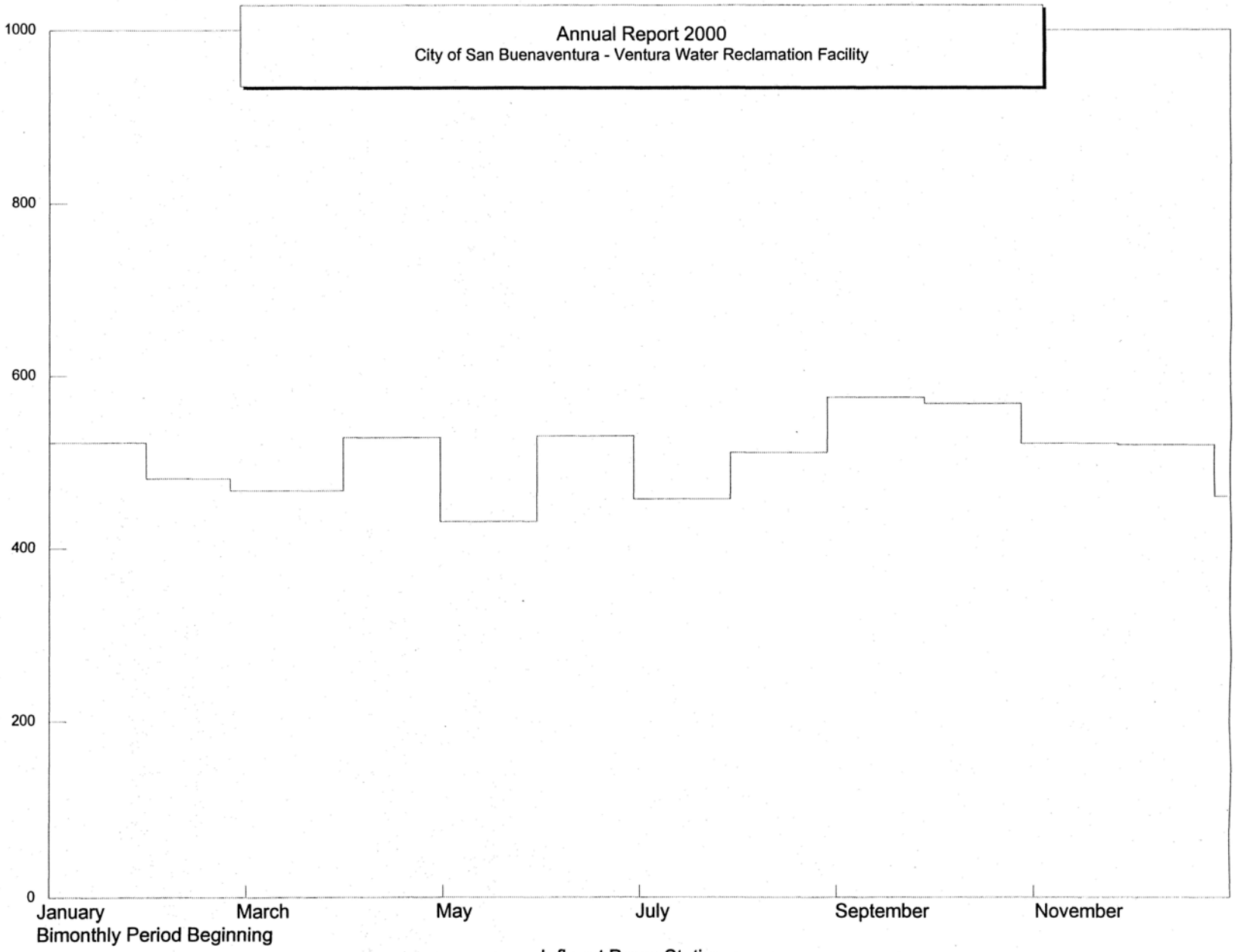
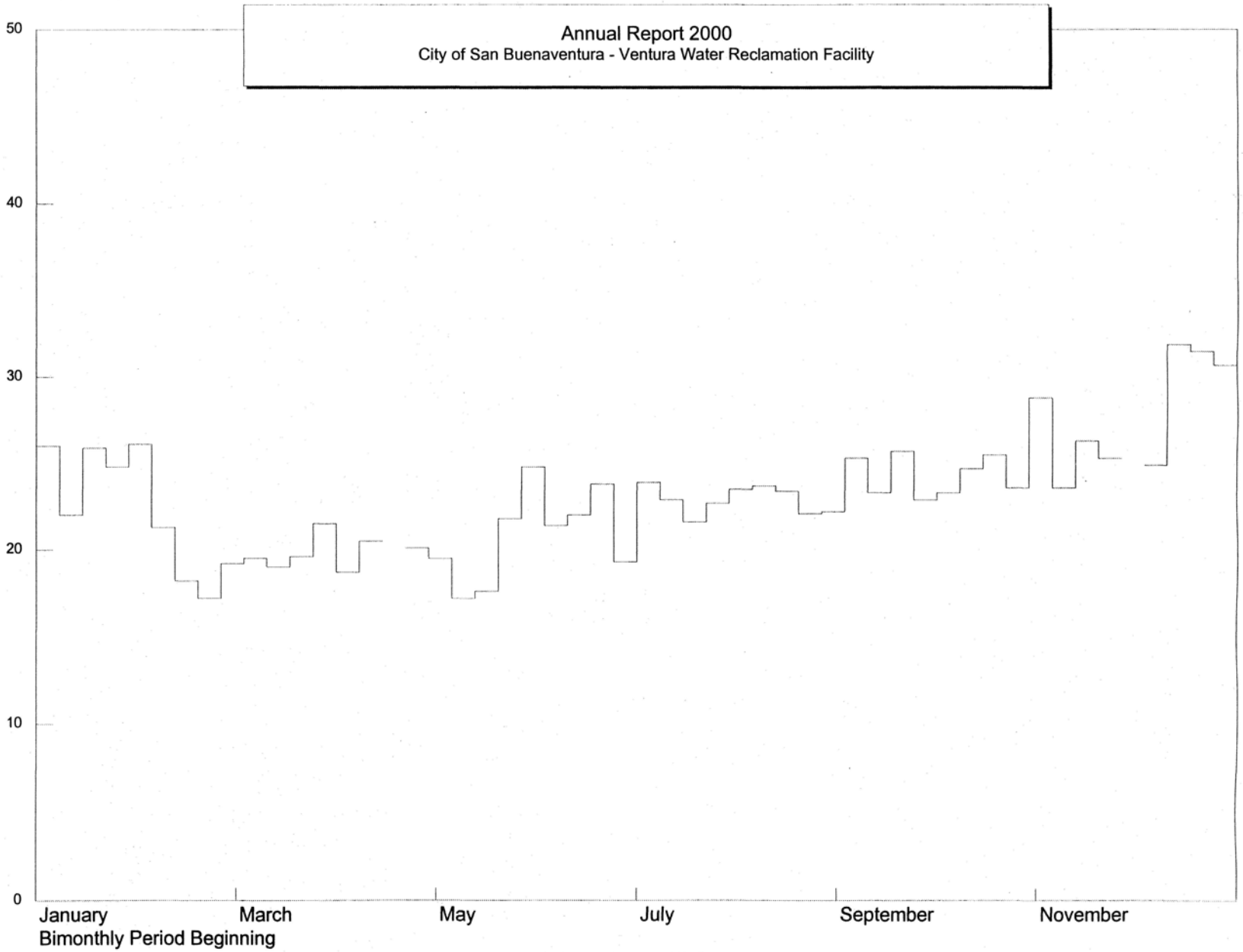
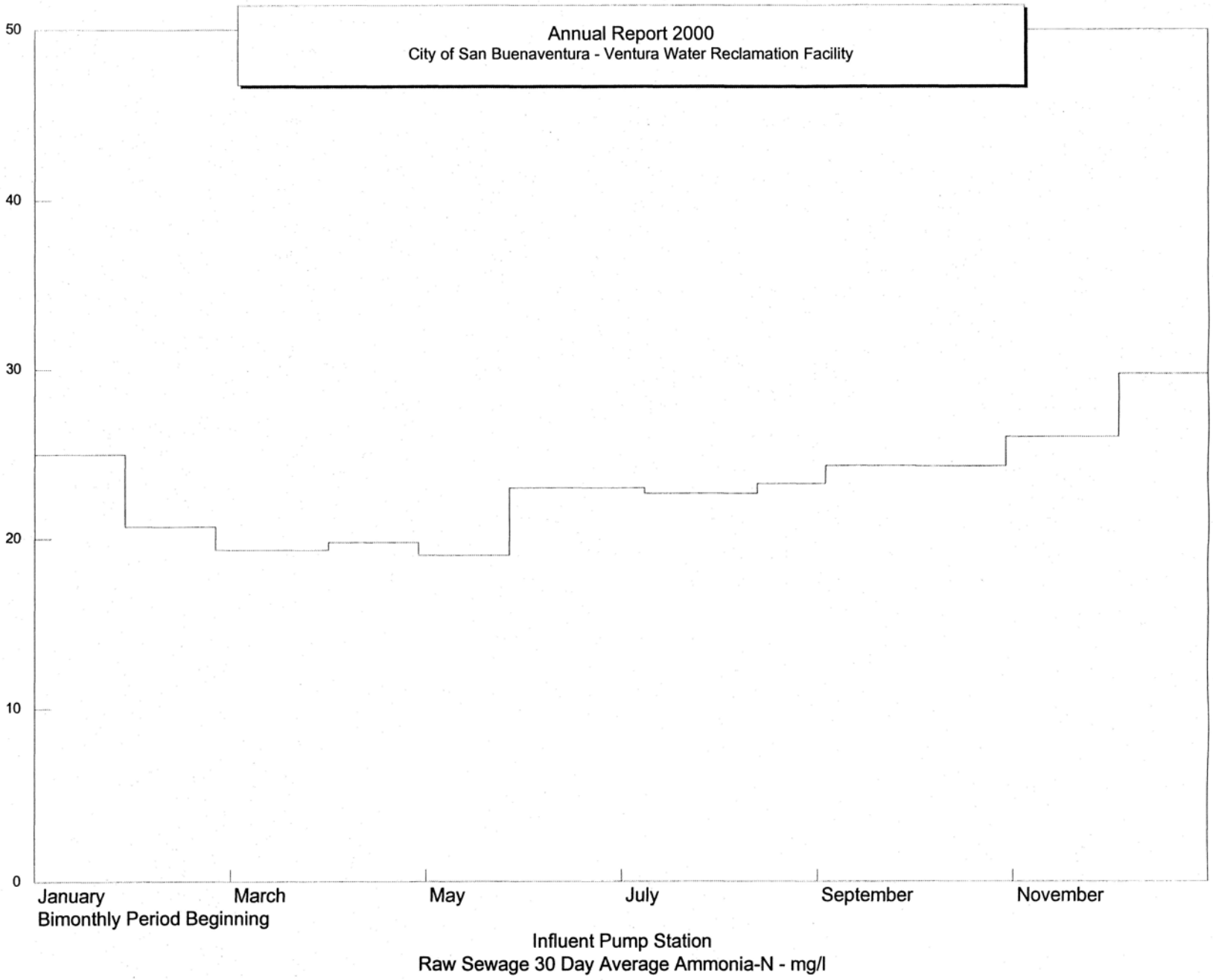
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage 7 Day Average COD - mg/l



Influent Pump Station
Influent Raw Sewage 30 Day Average COD - mg/l



Influent Pump Station
Raw Sewage Weekly Ammonia-N - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
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January
March
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July
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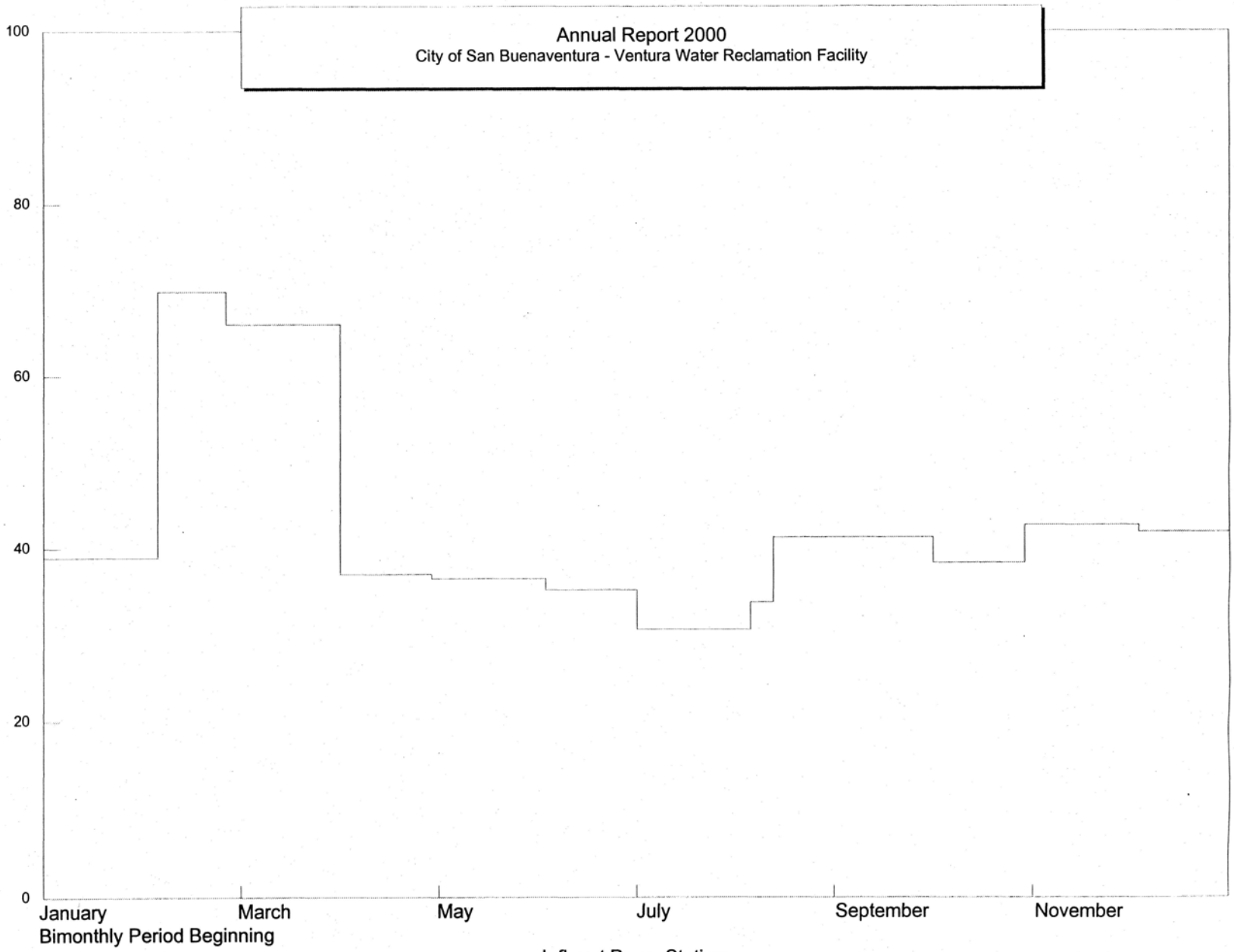
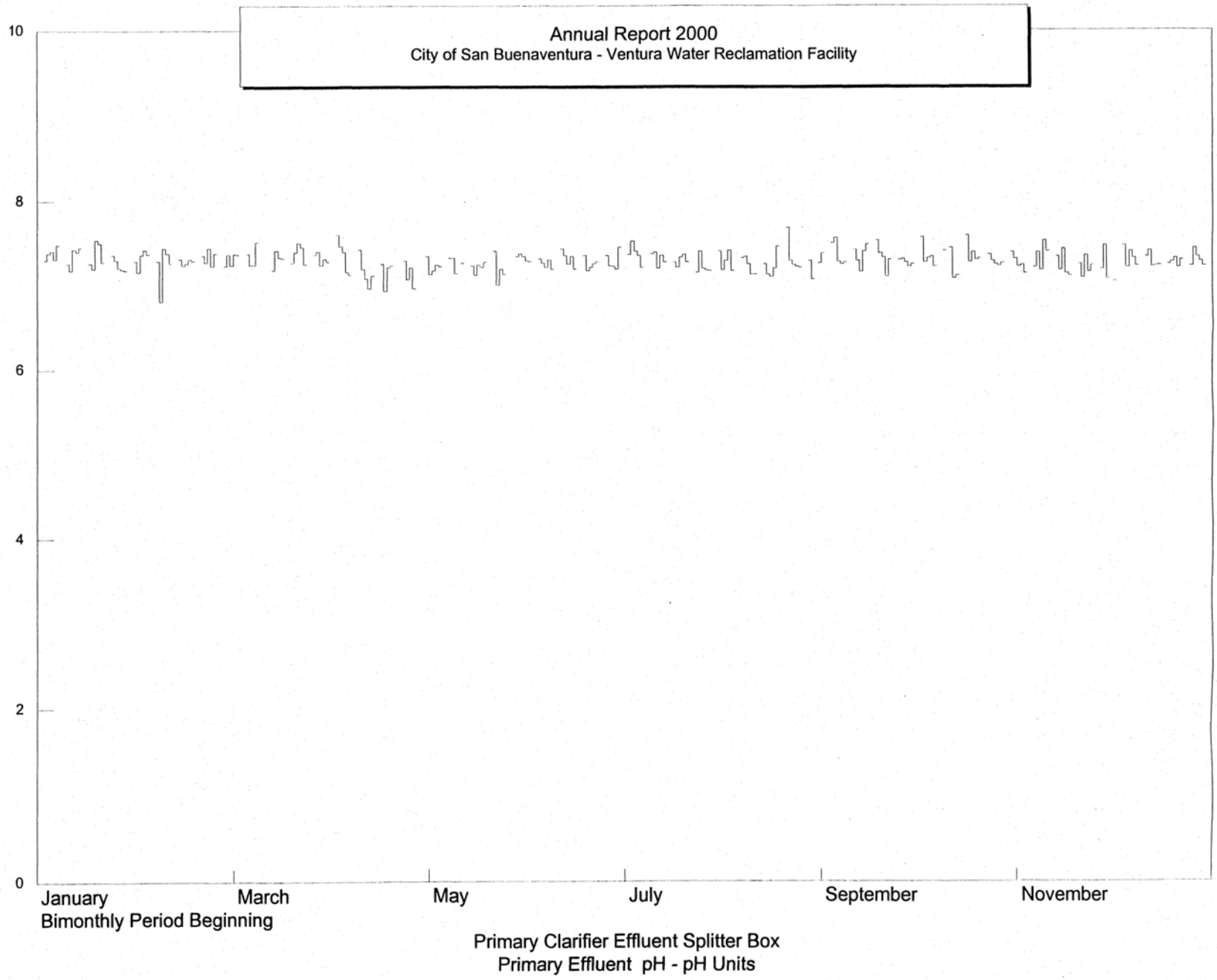
November
Bimonthly Period Beginning
Influent Pump Station
Raw Sewage 30 Day Average Ammonia-N - mg/l



Influent Pump Station
Monthly Raw Sewage TKN - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
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January
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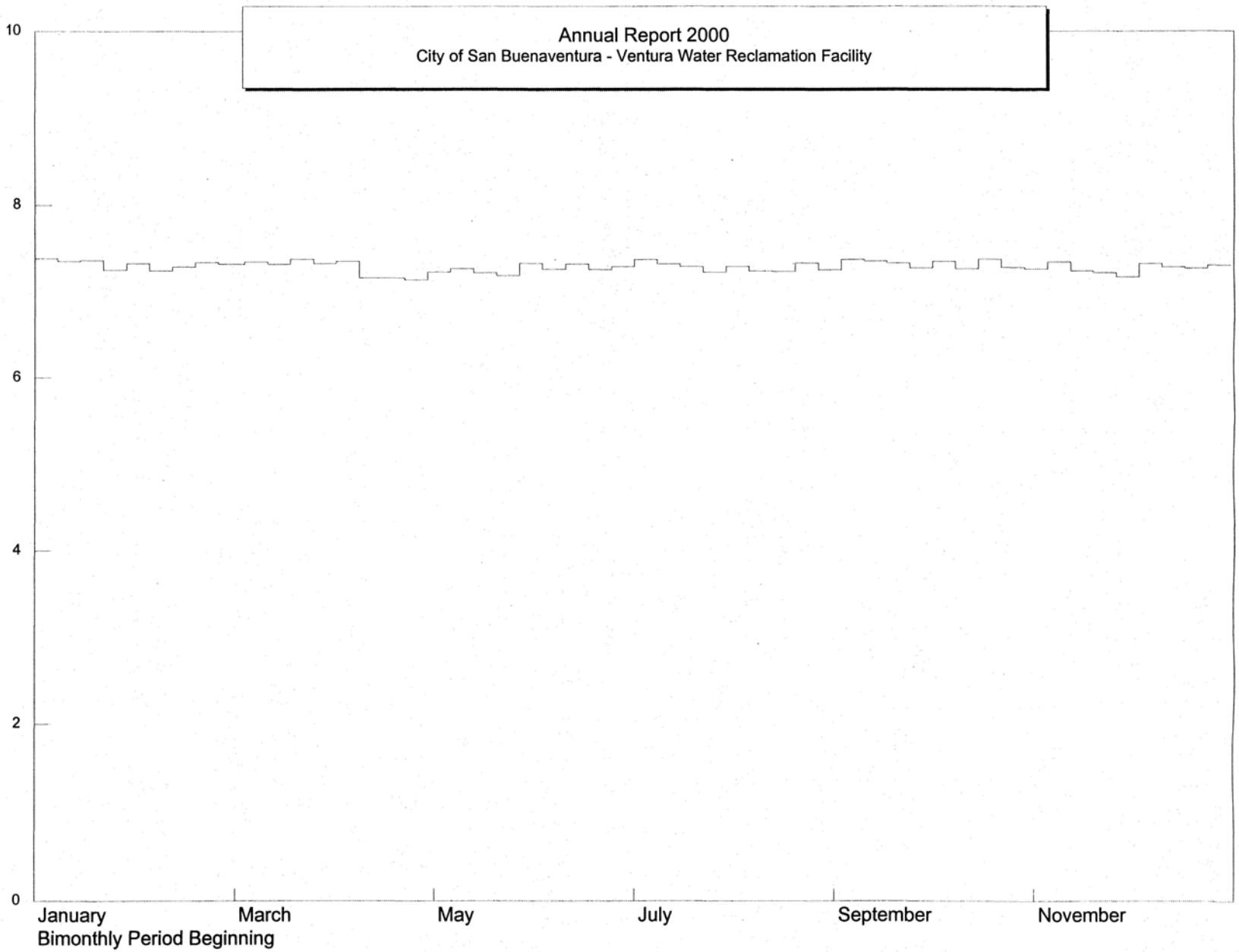
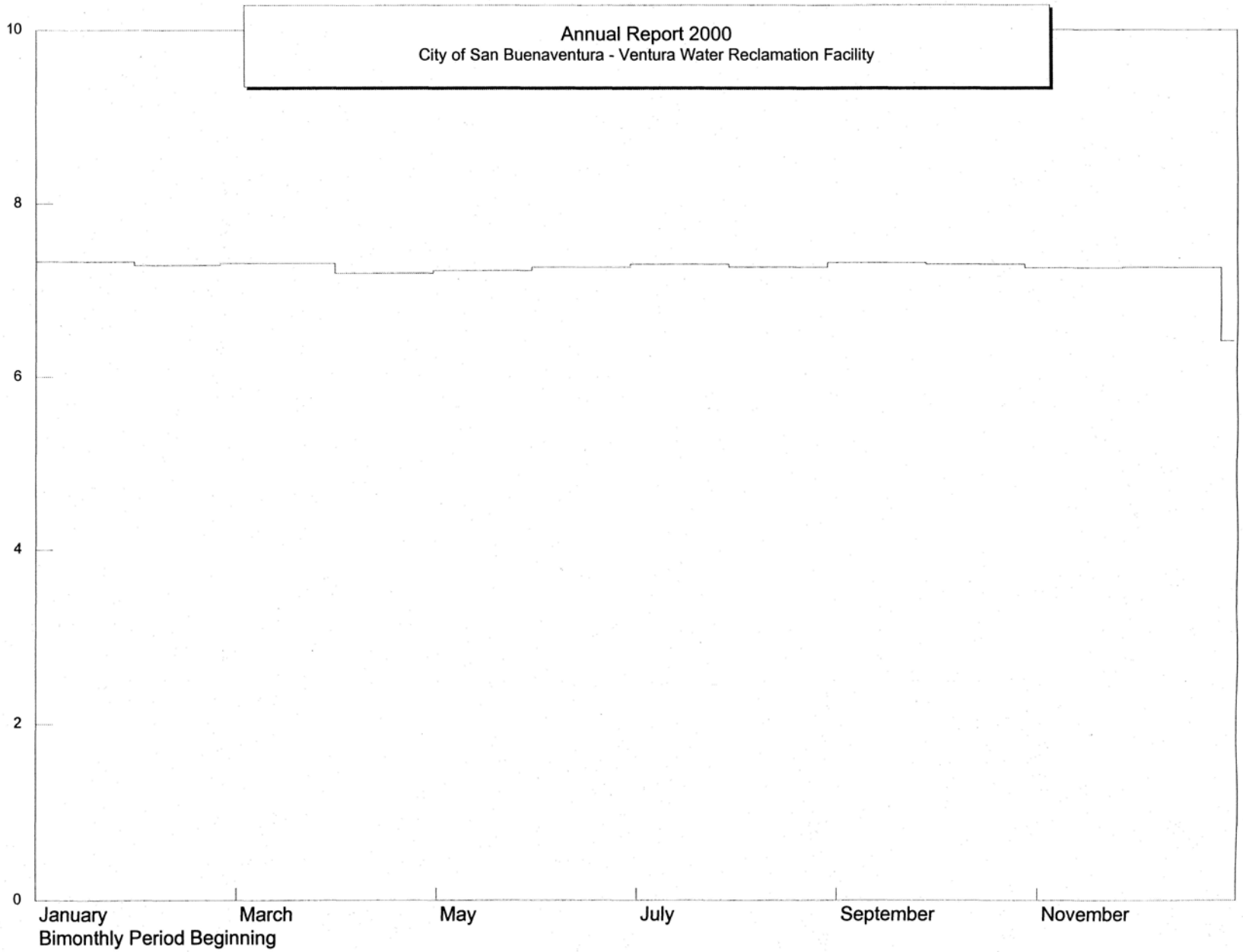
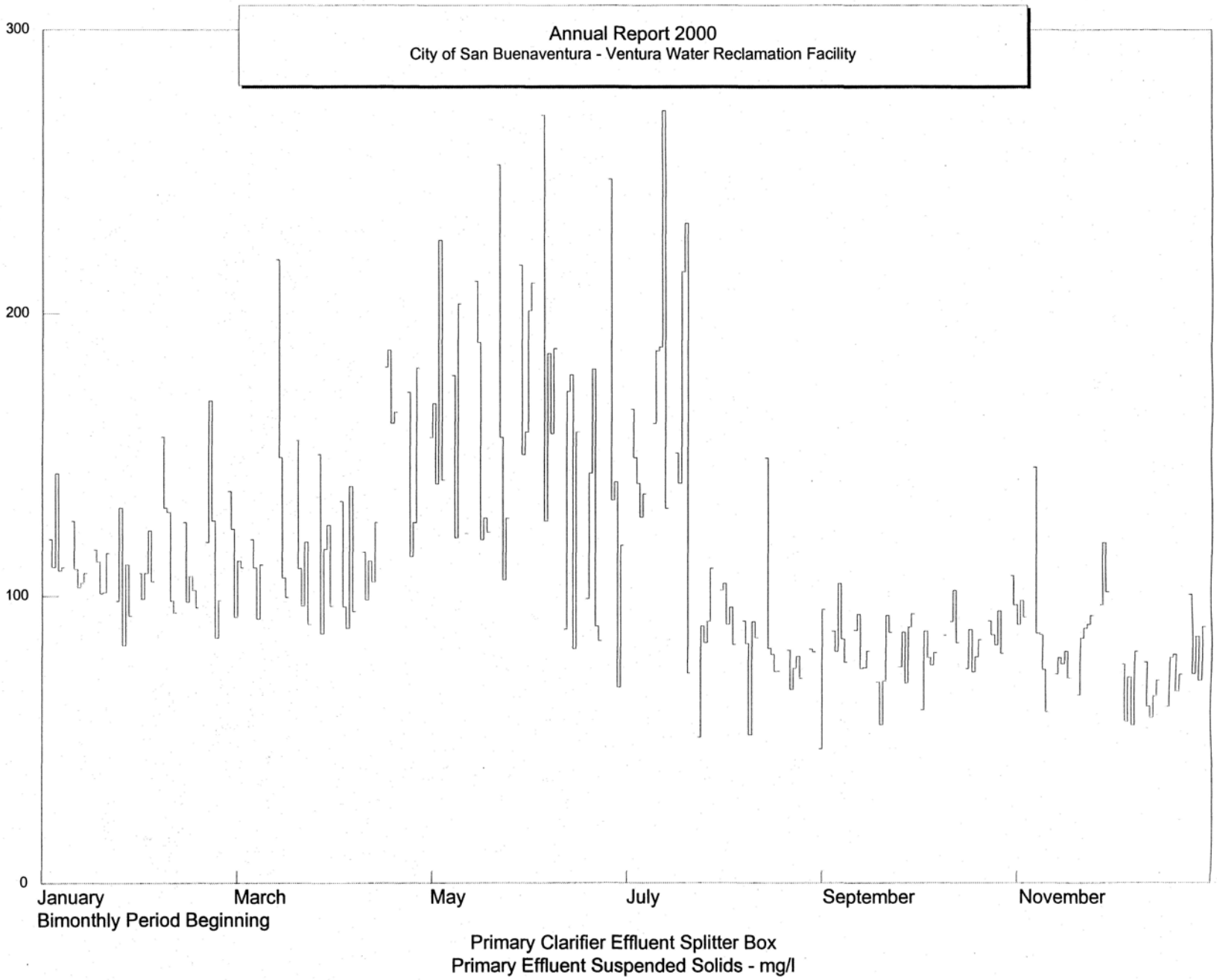
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent pH - pH Units



Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average pH - pH Units



Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average pH - pH Units


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
300
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January
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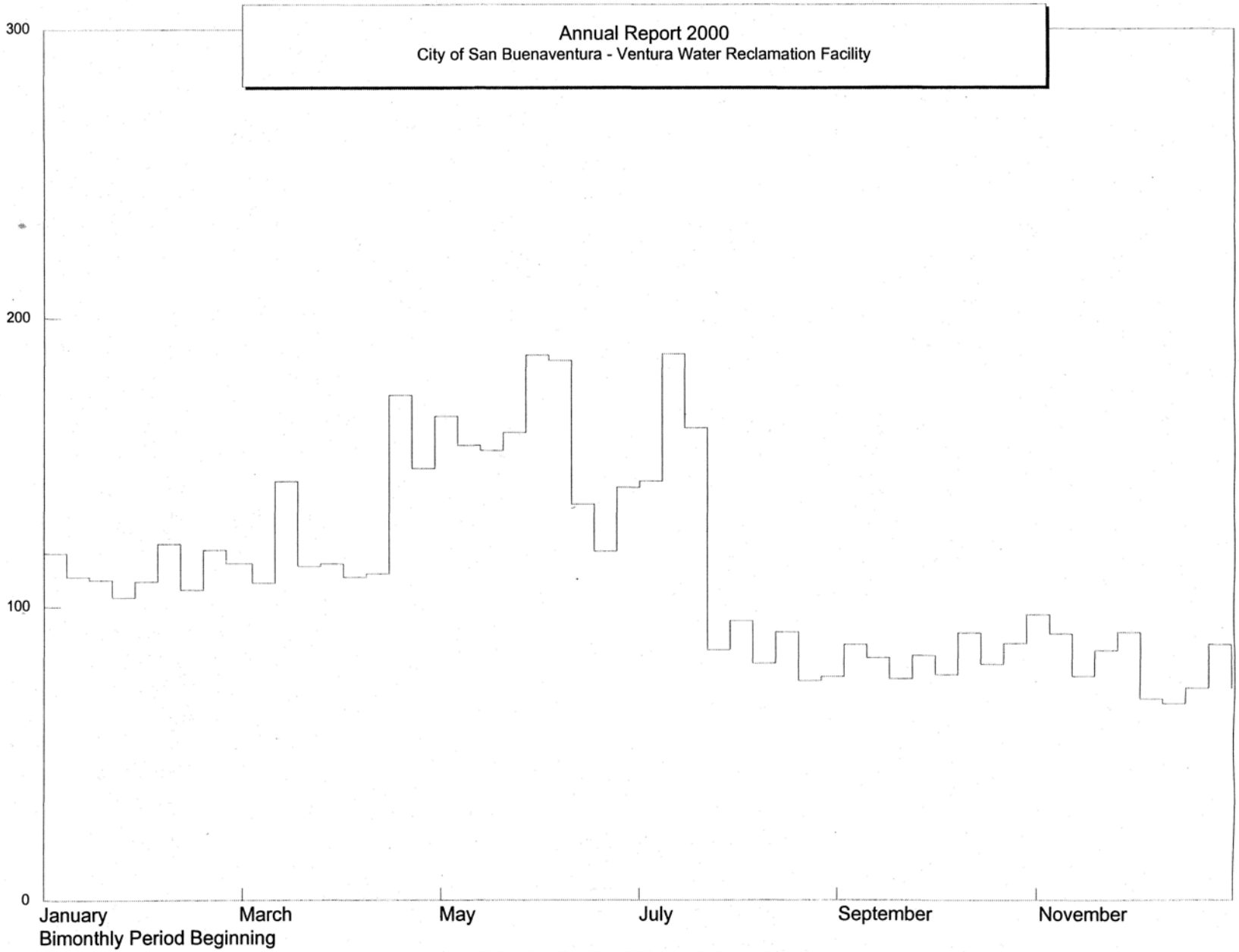
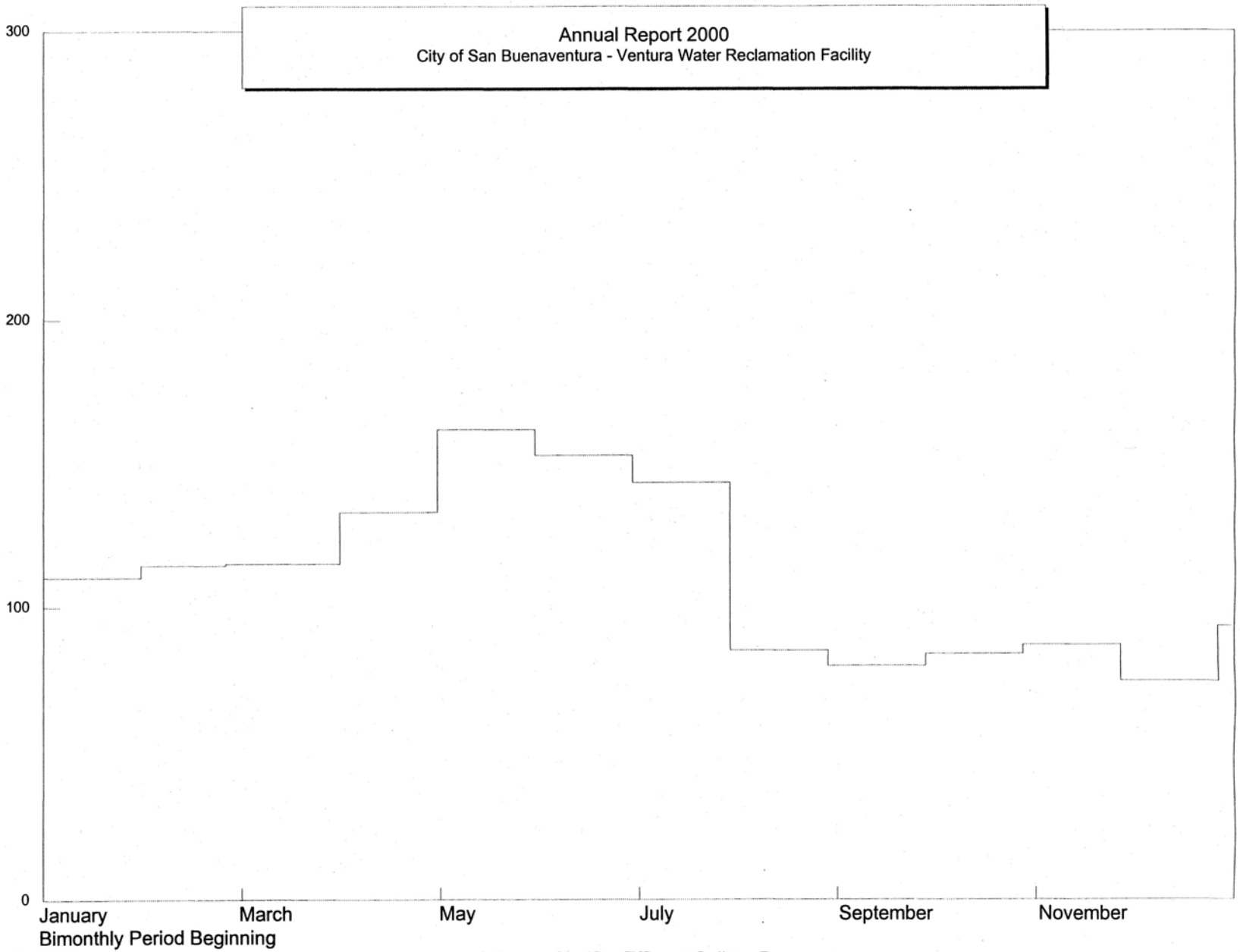
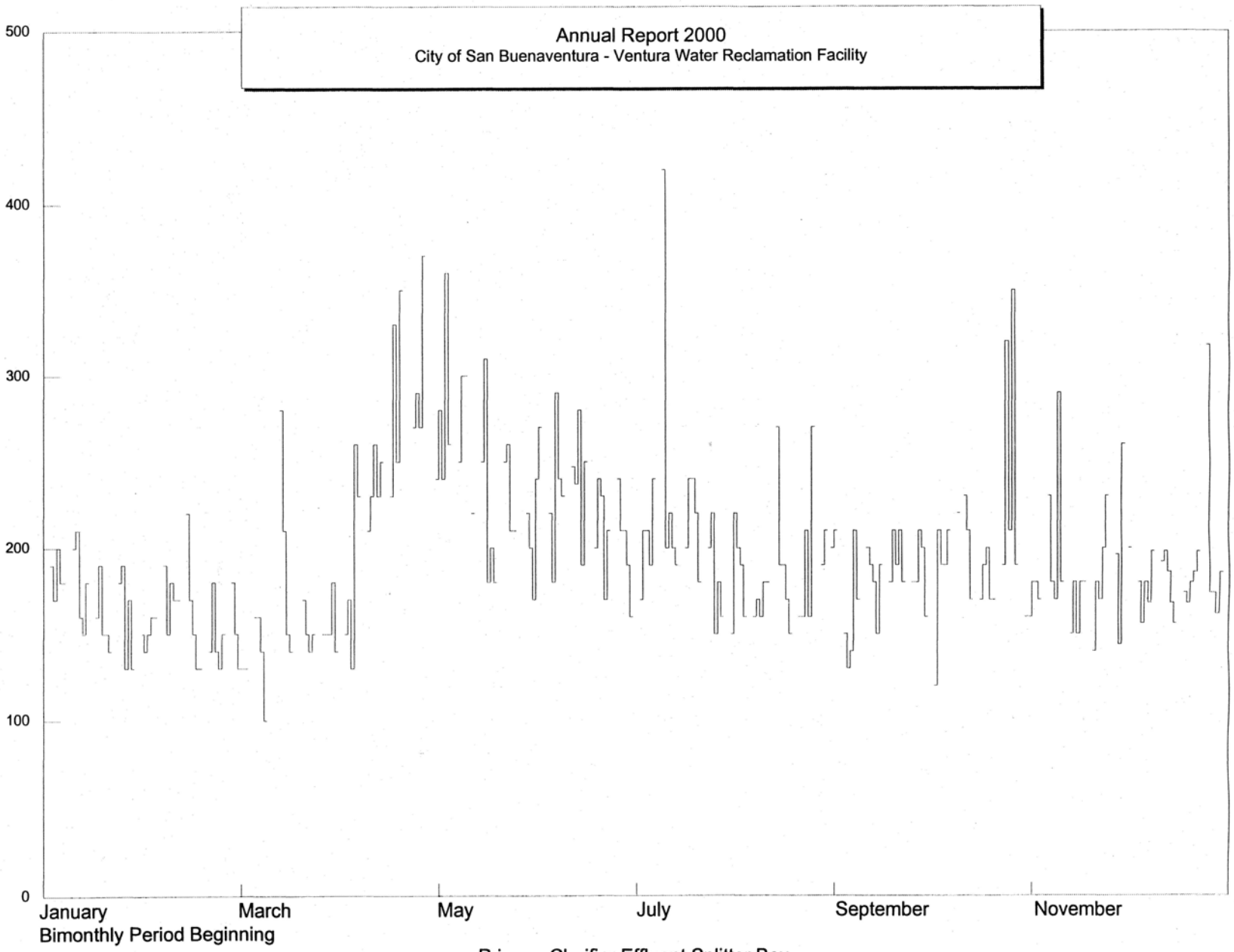
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent Suspended Solids - mg/l



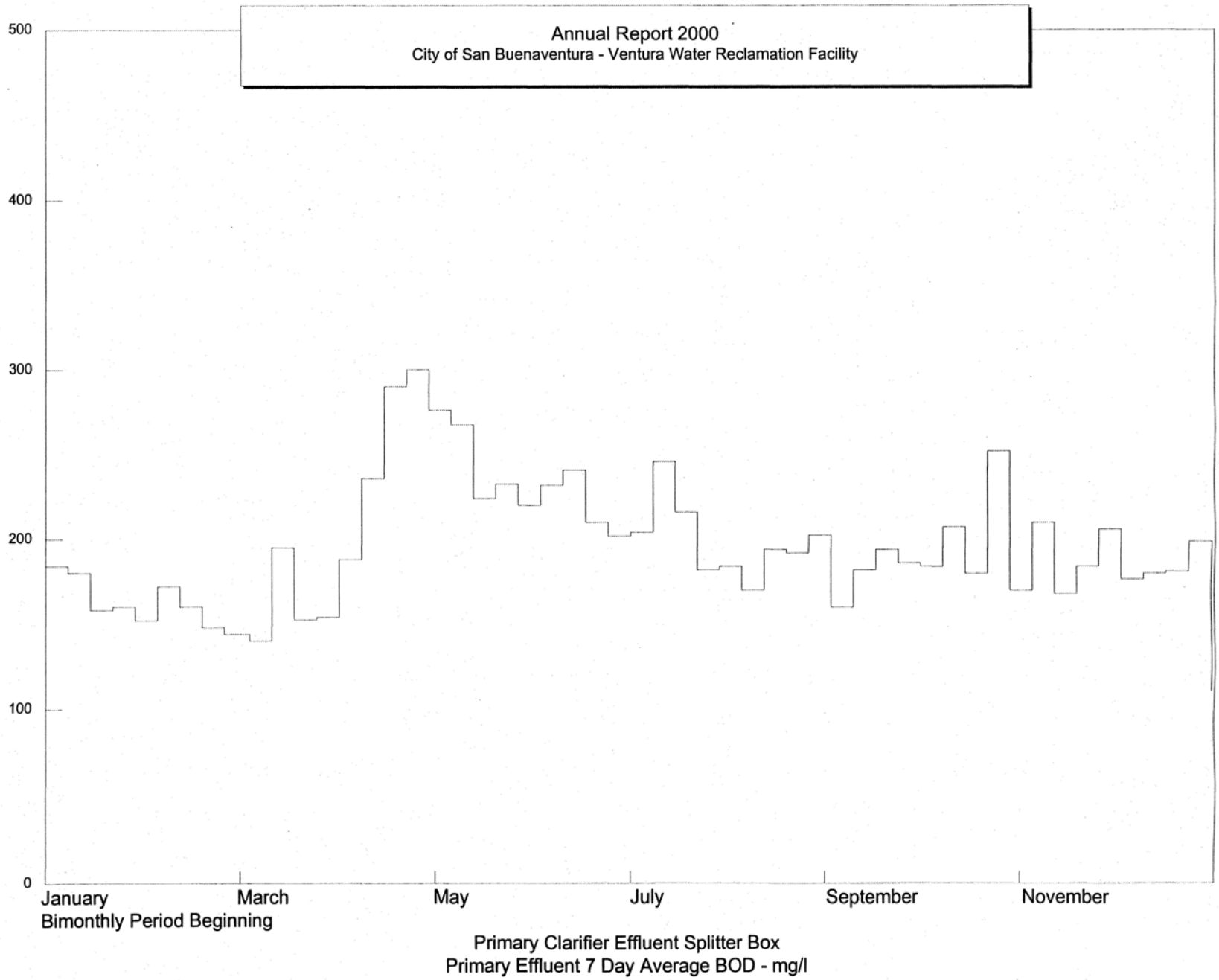
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average Suspended Solids - mg/l



Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average Suspended Solids - mg/l



Primary Clarifier Effluent Splitter Box
Primary Effluent BOD - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
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January
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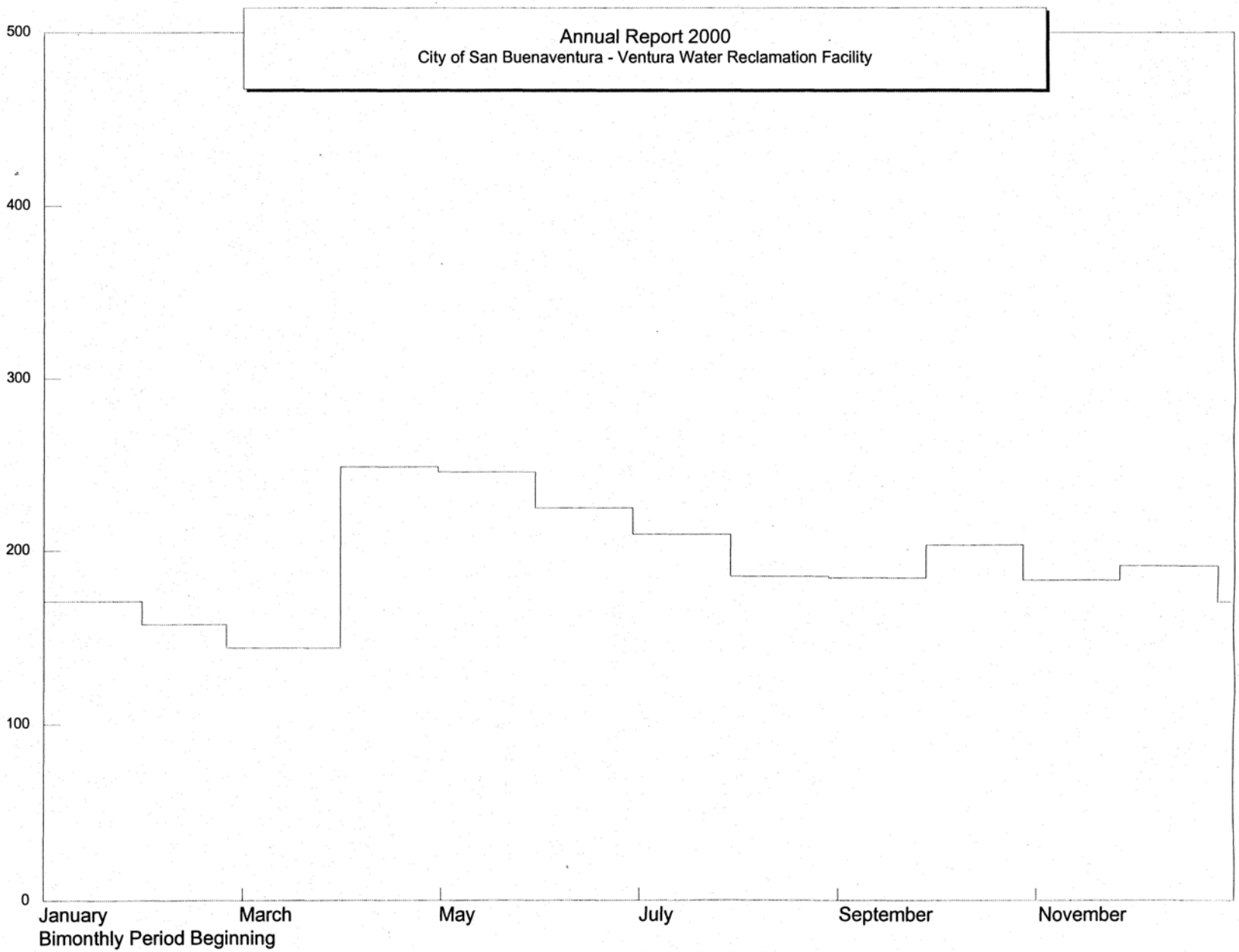
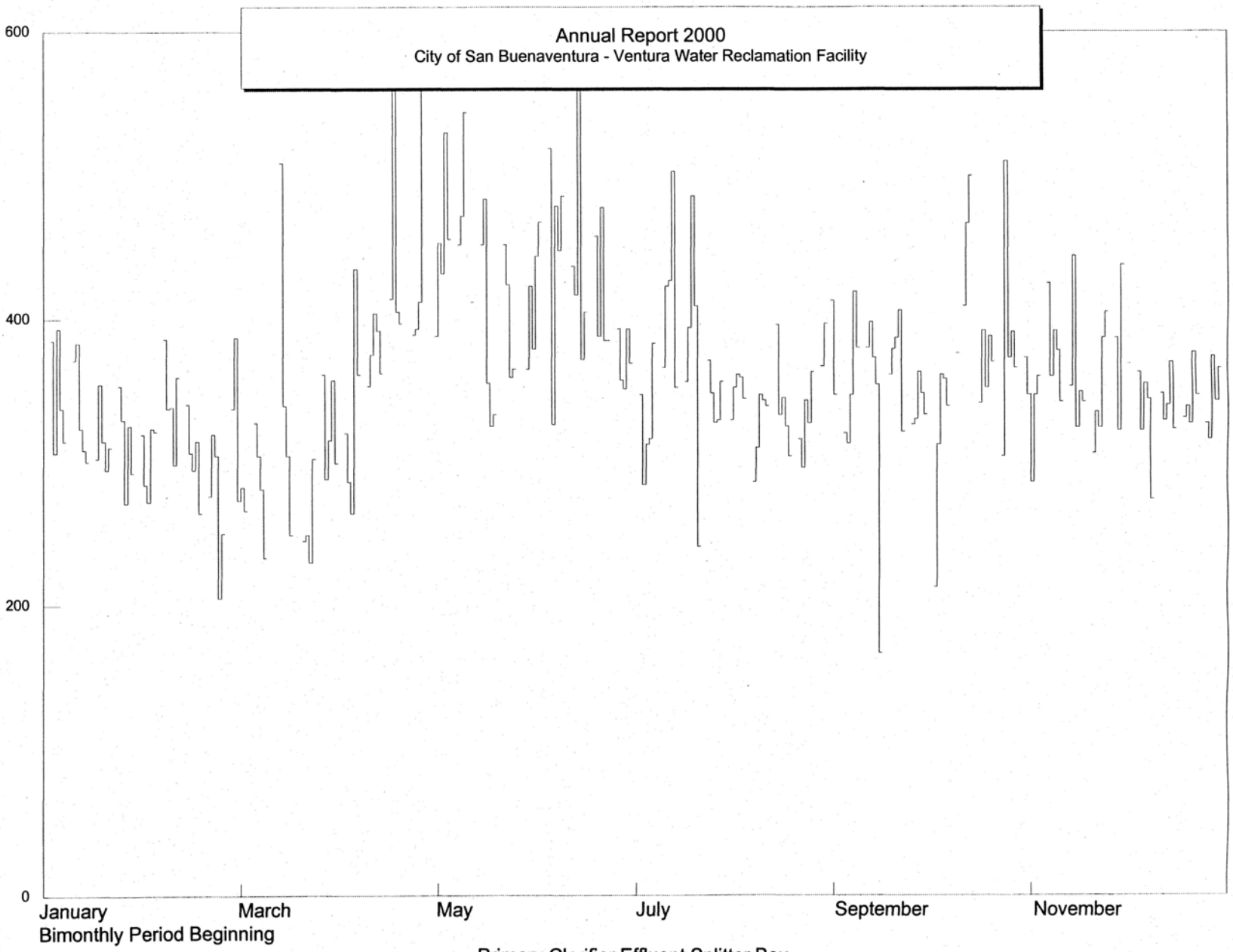
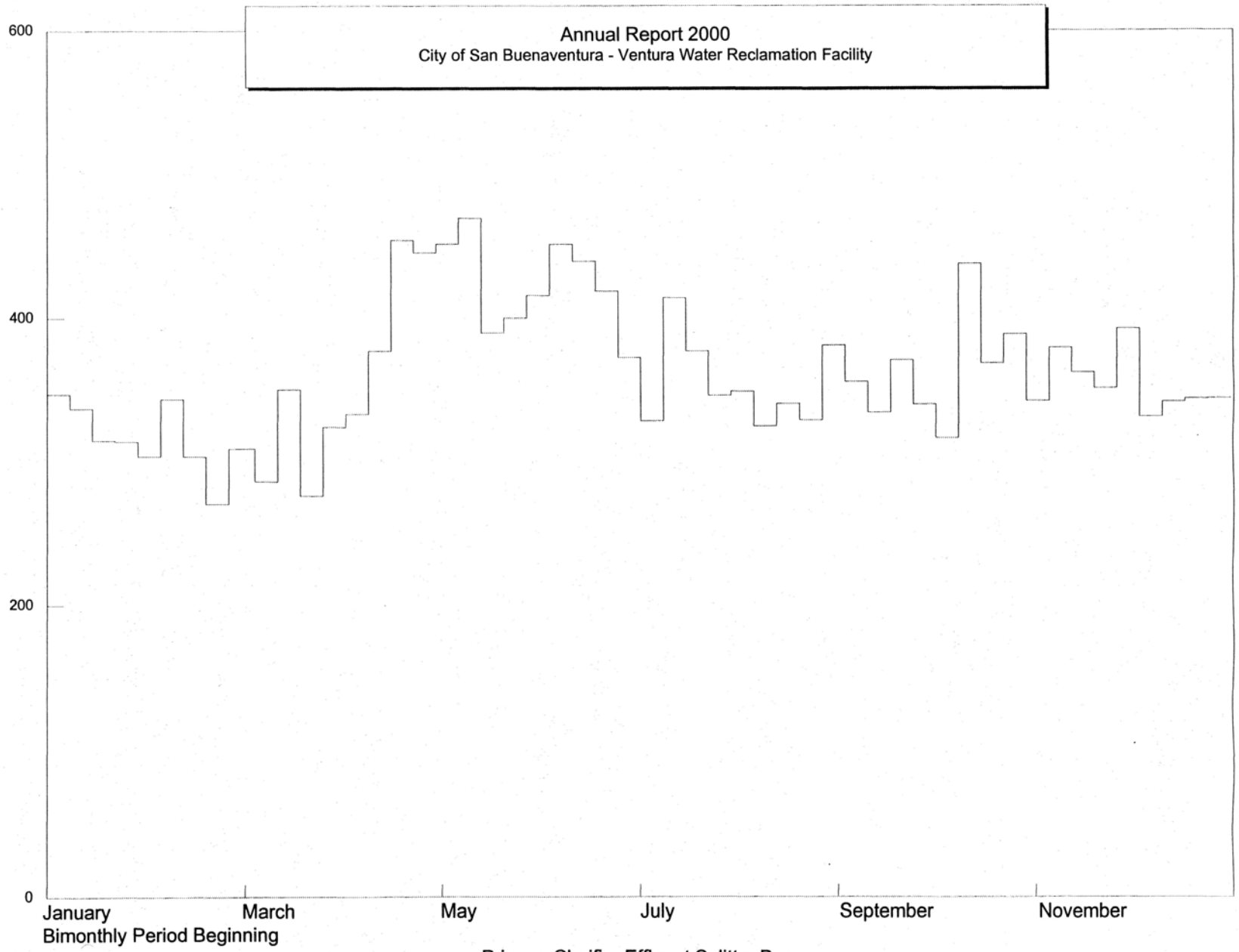
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average BOD - mg/l



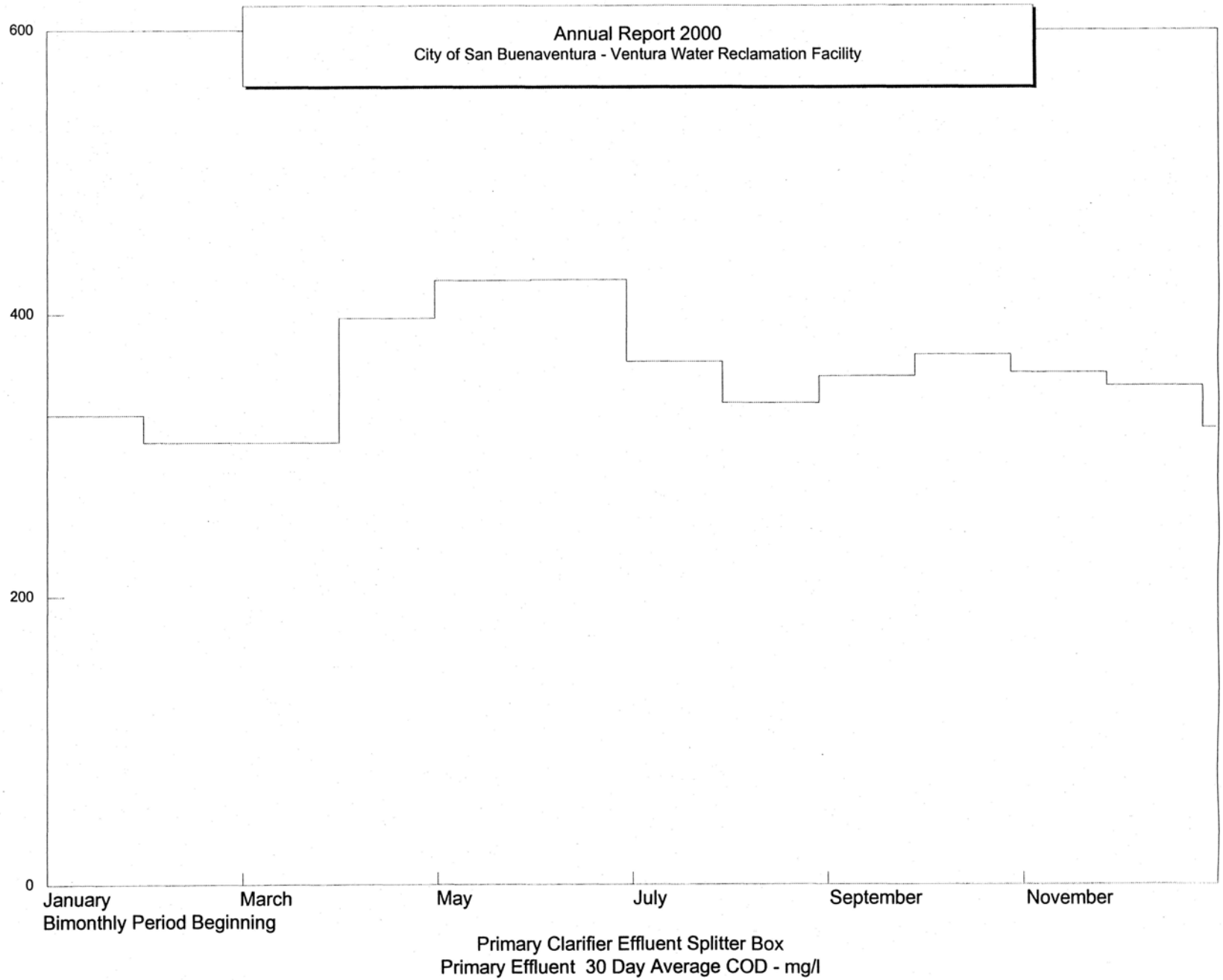
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average BOD - mg/l

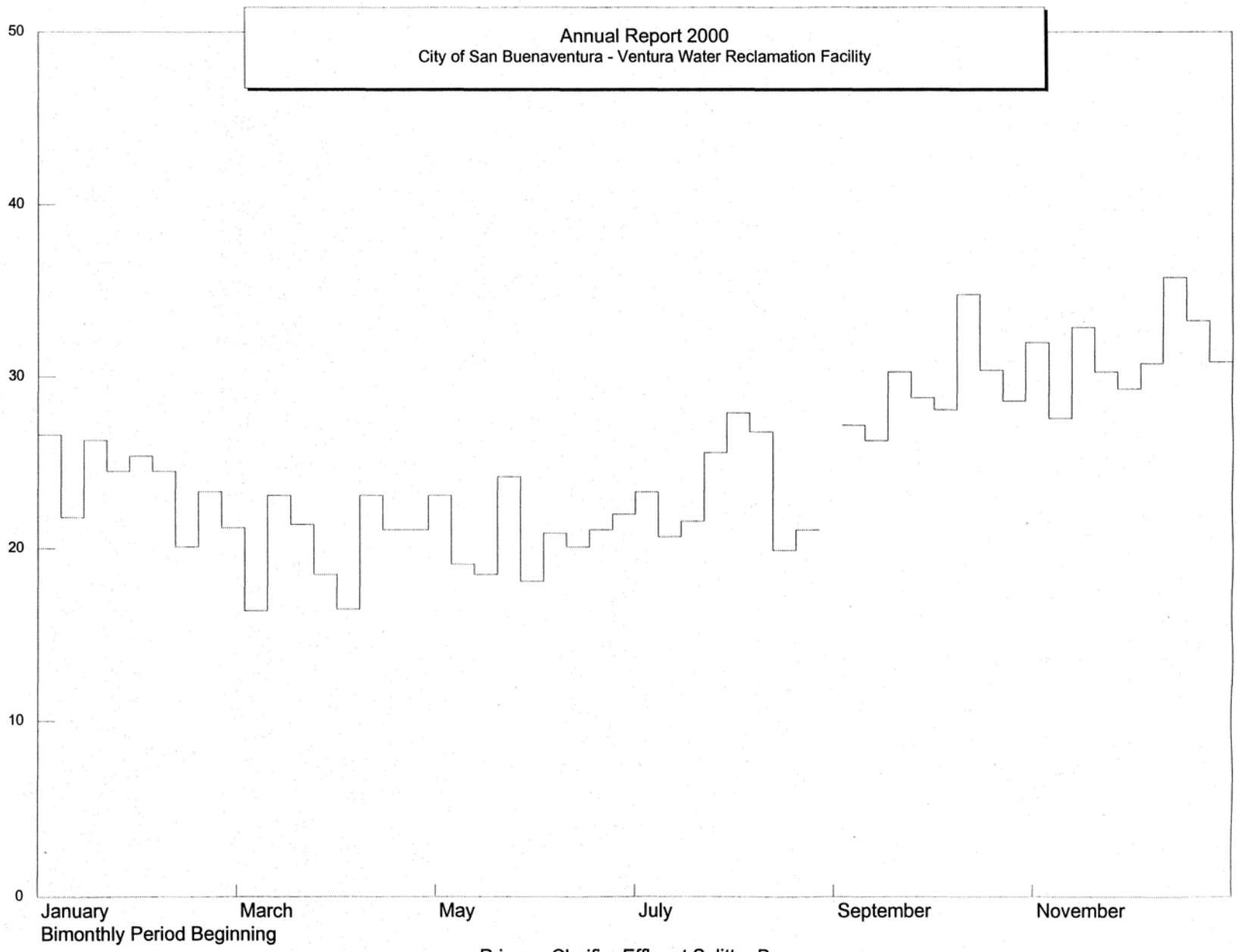


Primary Clarifier Effluent Splitter Box
Primary Effluent COD - mg/l

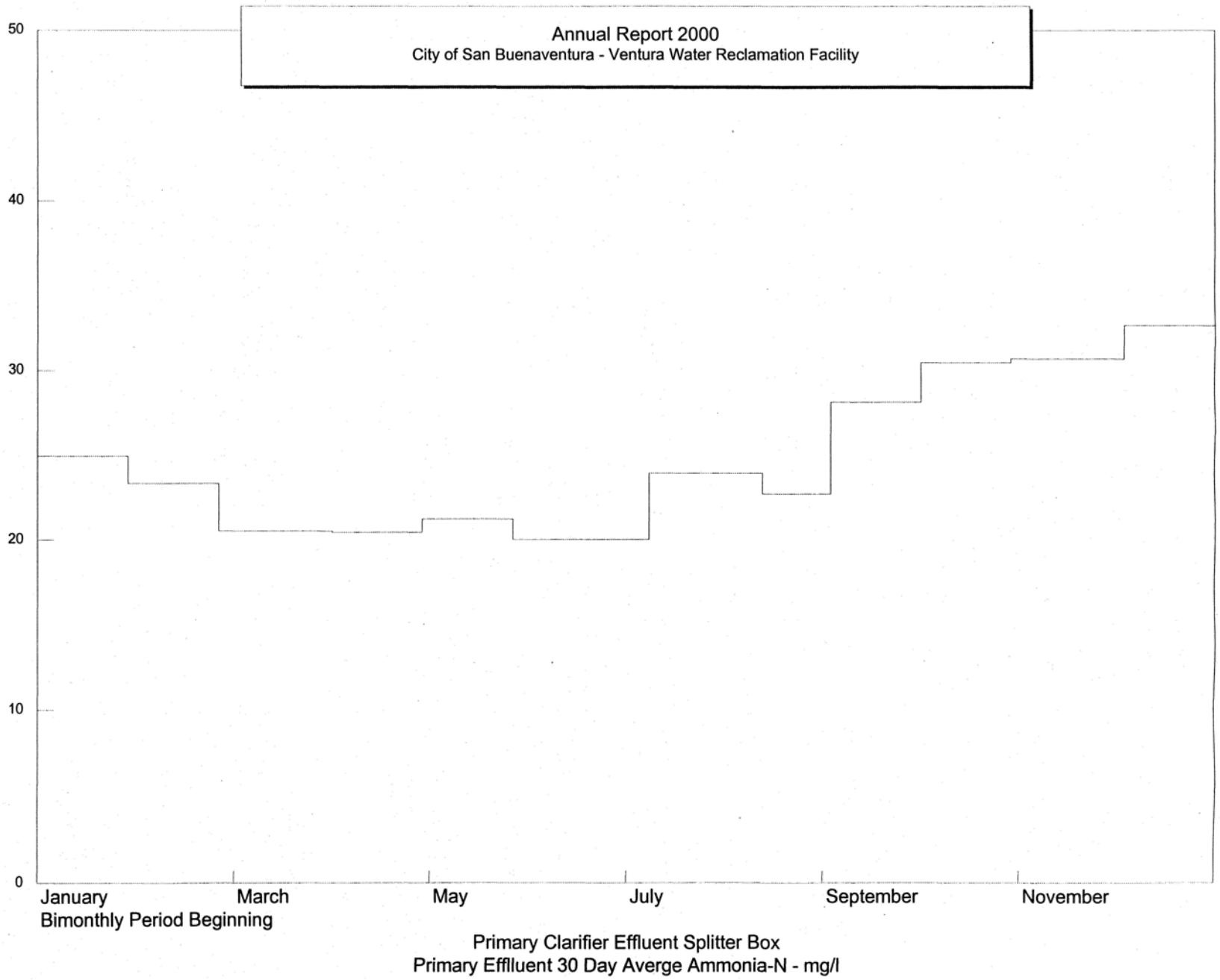


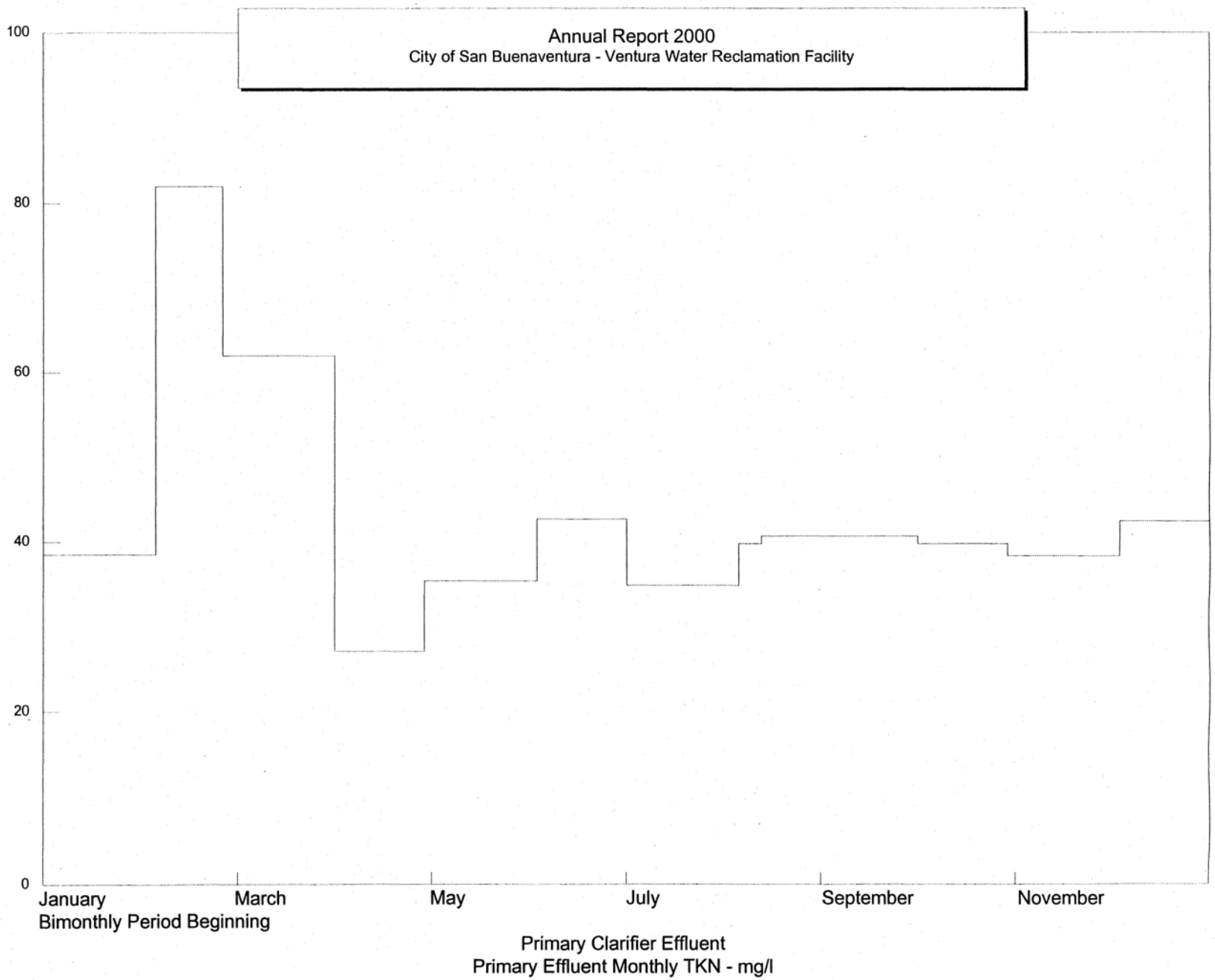
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average COD - mg/l

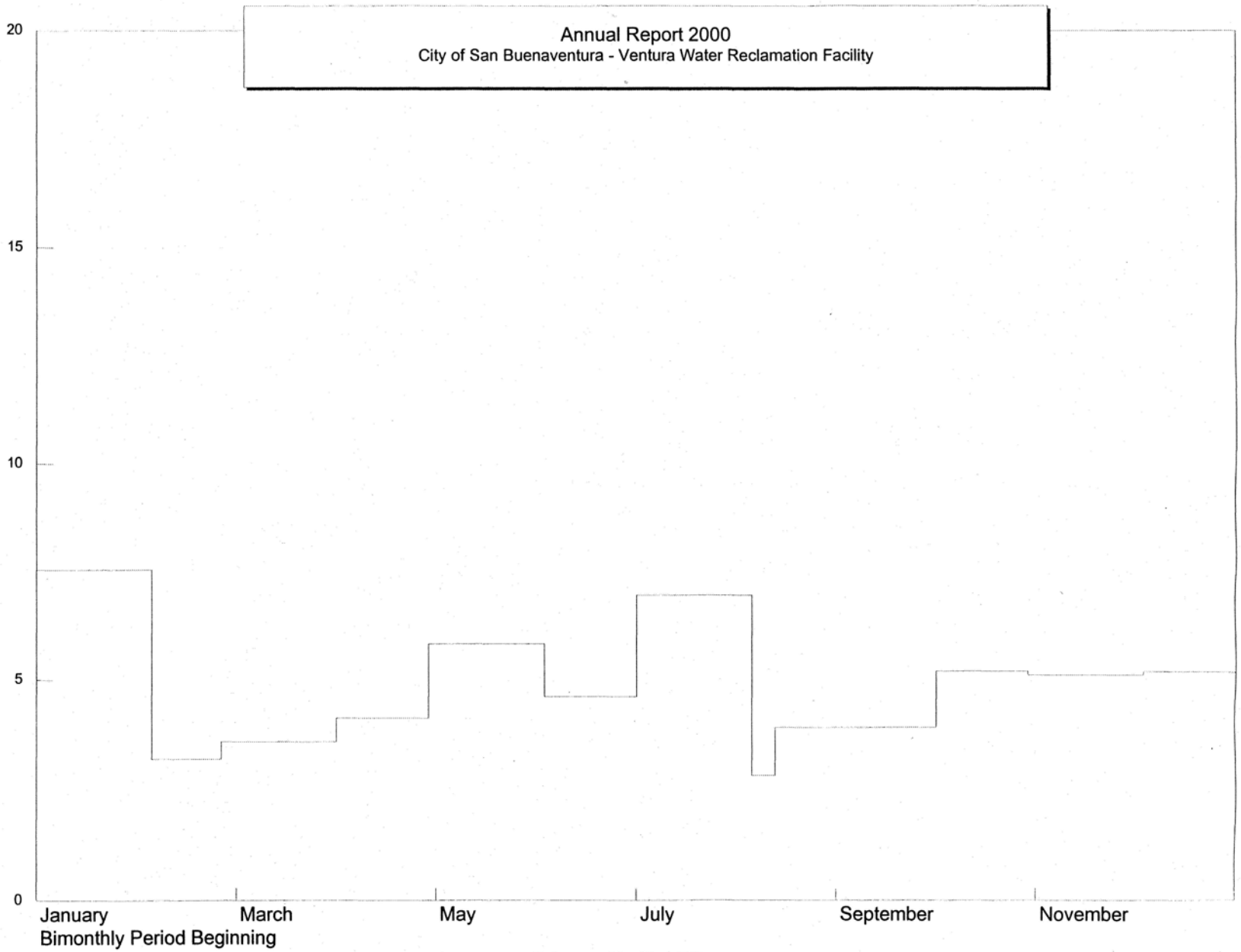

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
600
400
200
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average COD - mg/l



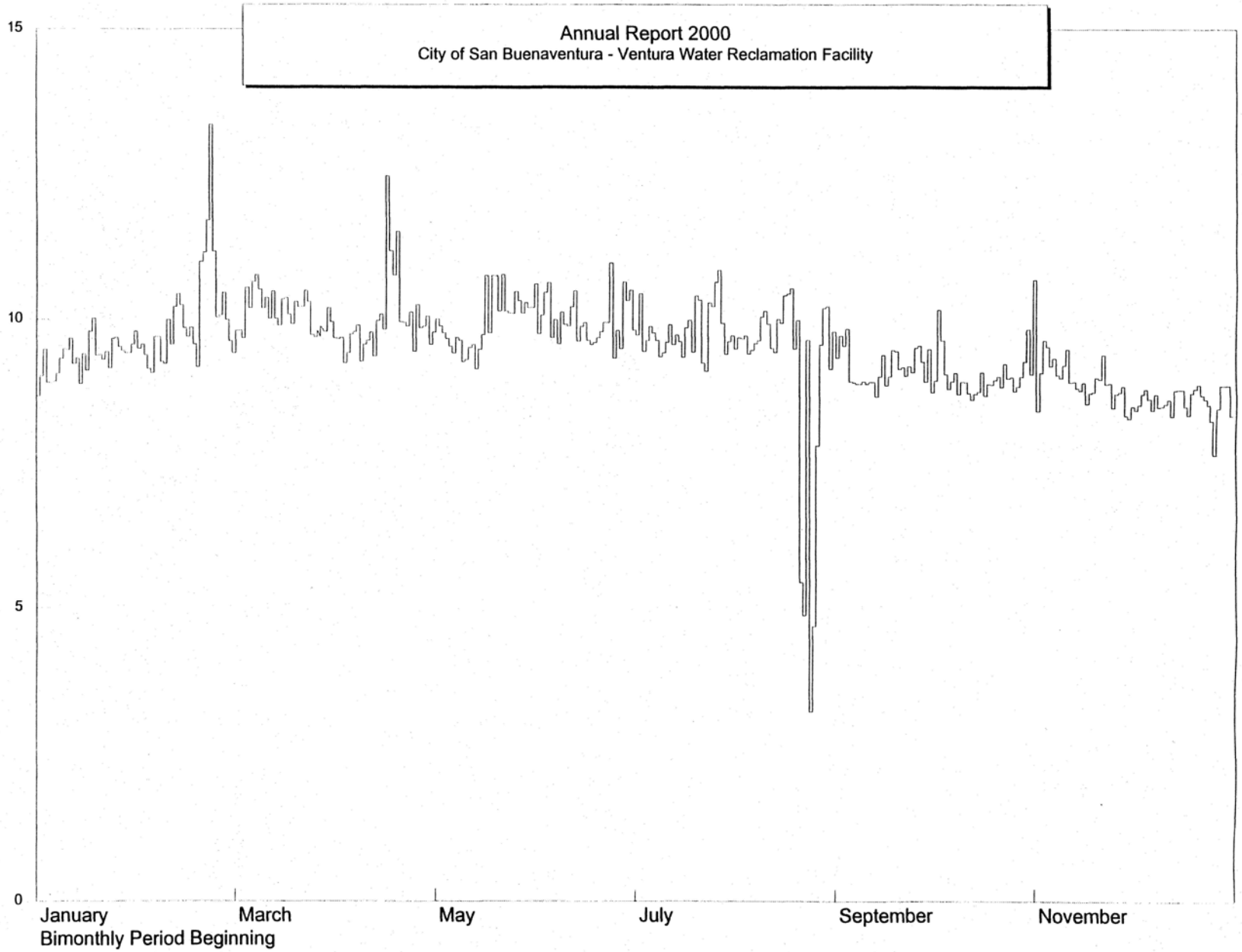
Primary Clarifier Effluent Splitter Box
Primary Effluent Weekly Ammonia-N - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Averge Ammonia-N - mg/l

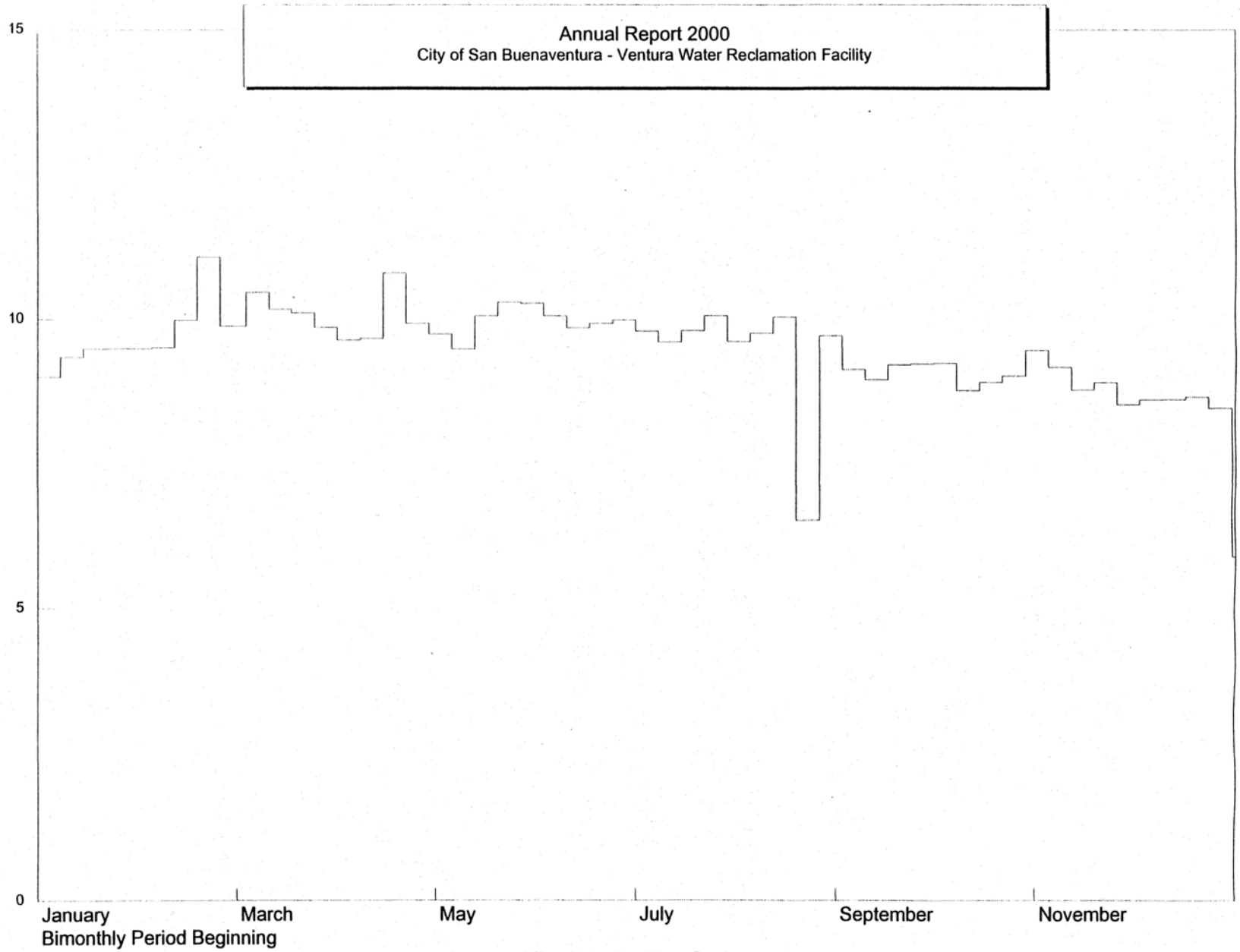

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent
Primary Effluent Monthly TKN - mg/l



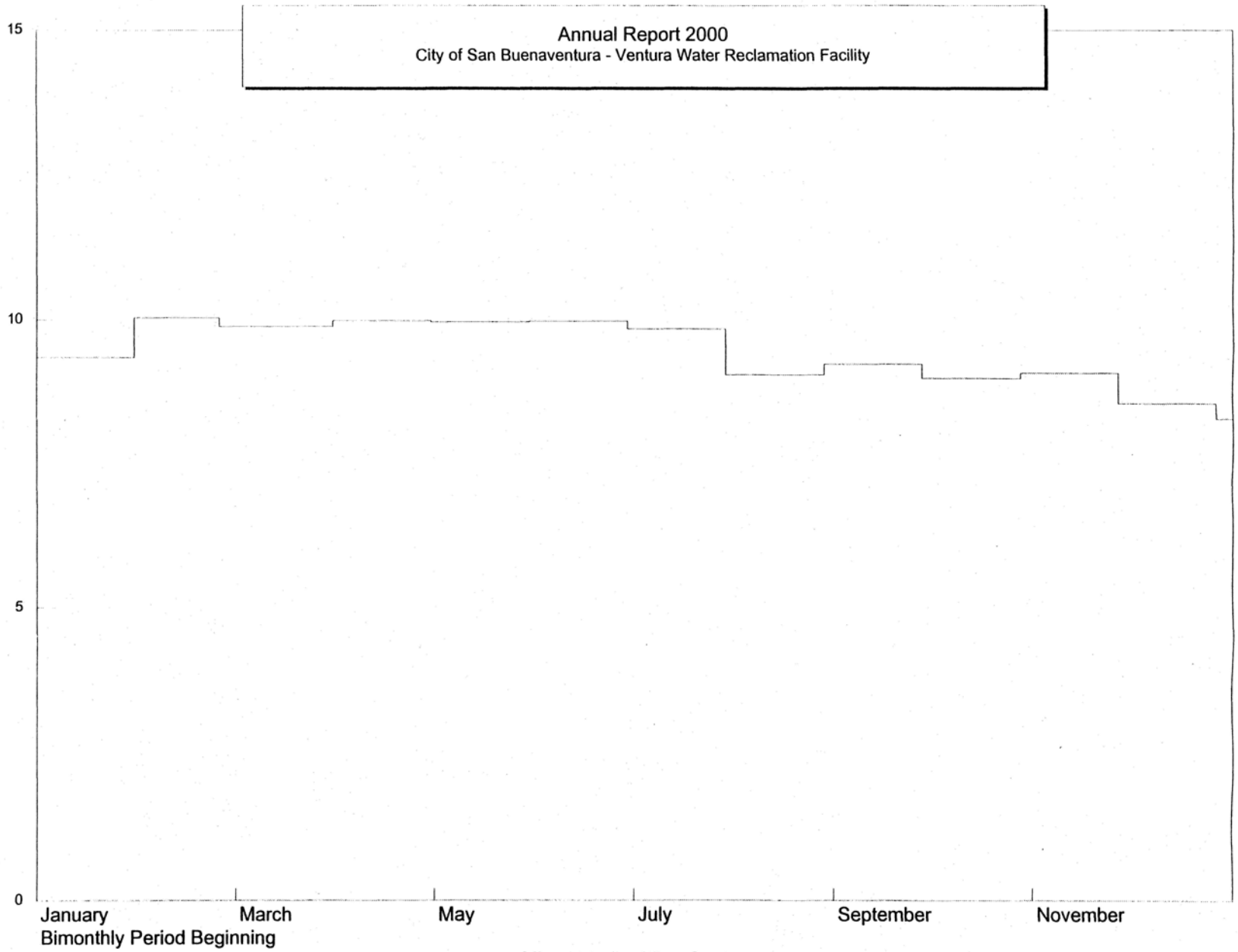
Primary Clarifier Effluent
Primary Effluent Monthly MBAS - mg/l



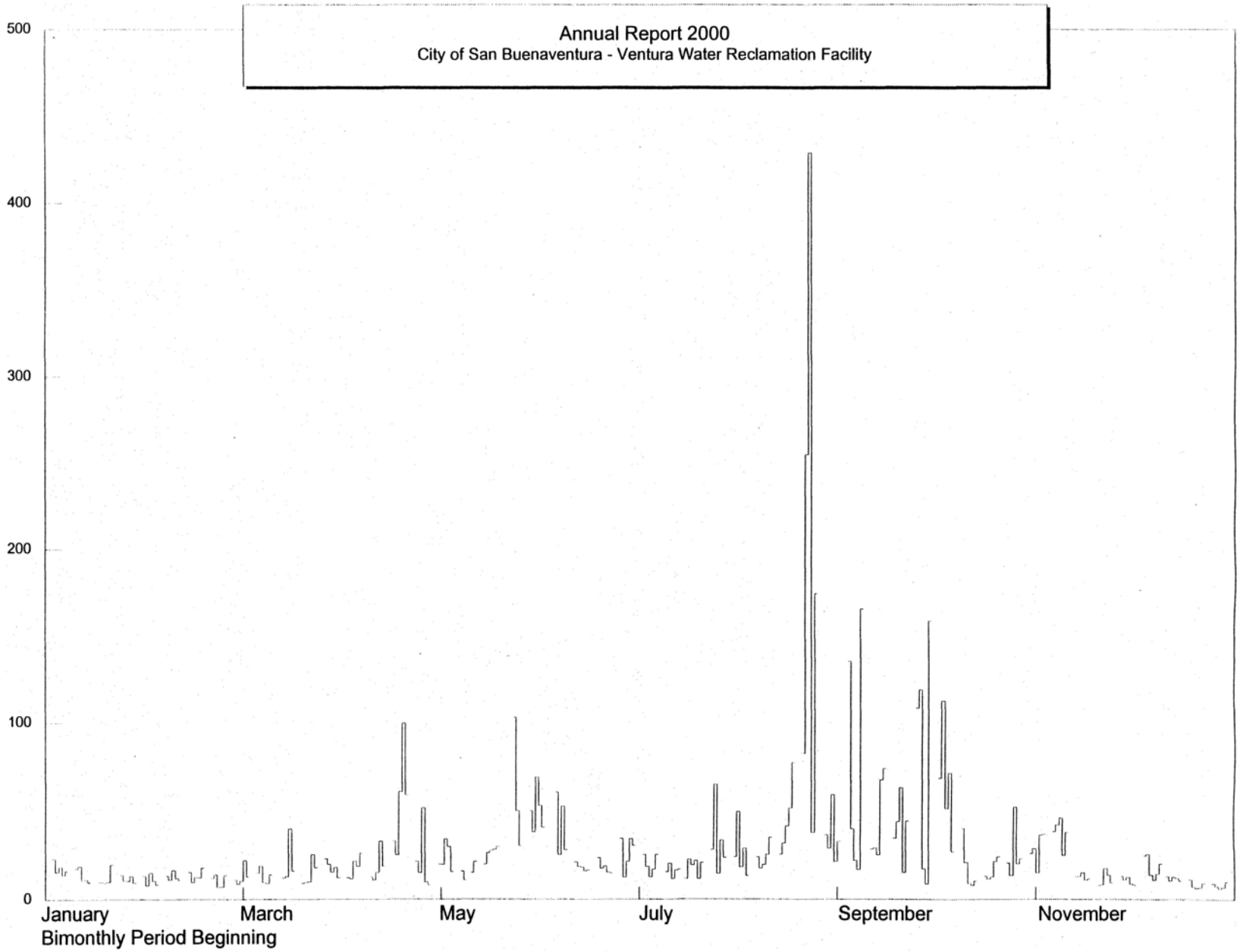
Mixed Media Filter Station
Mixed Media Filter Flows - MGD



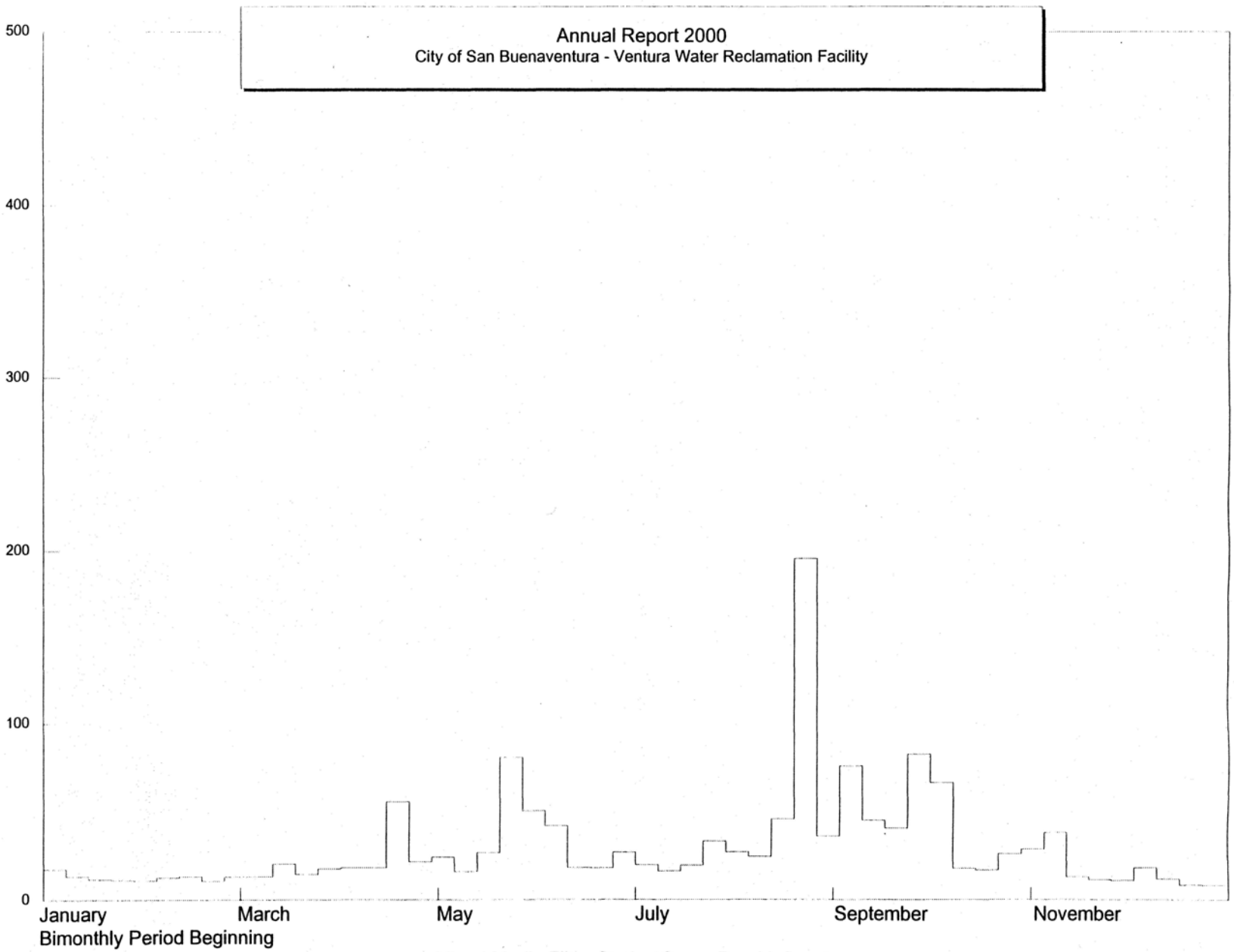
Mixed Media Filter Station
Mixed Media Filter 7 Day Average Flows - MGD



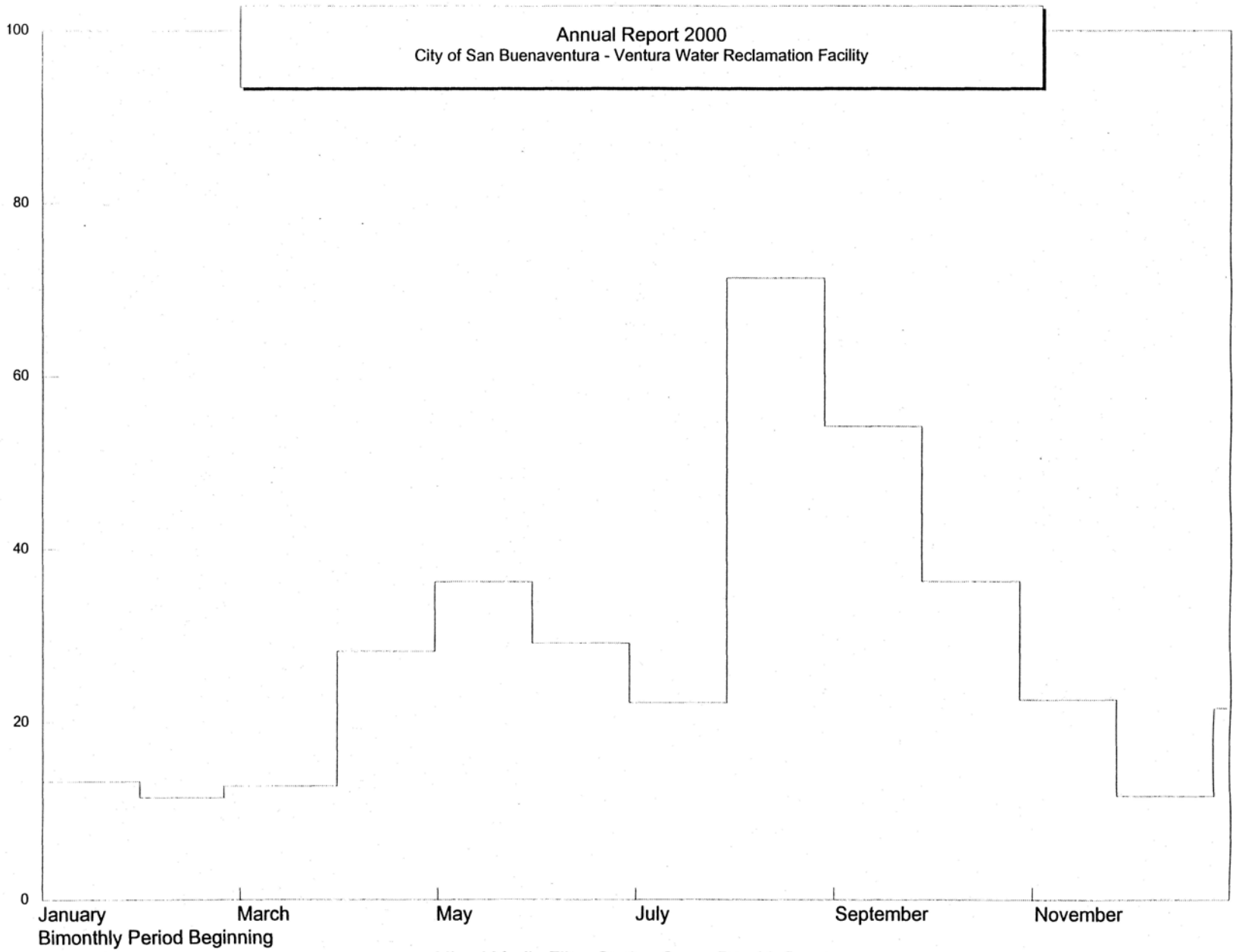
Mixed Media Filter Station
Mixed Media Filter 30 Day Average Flows - MGD



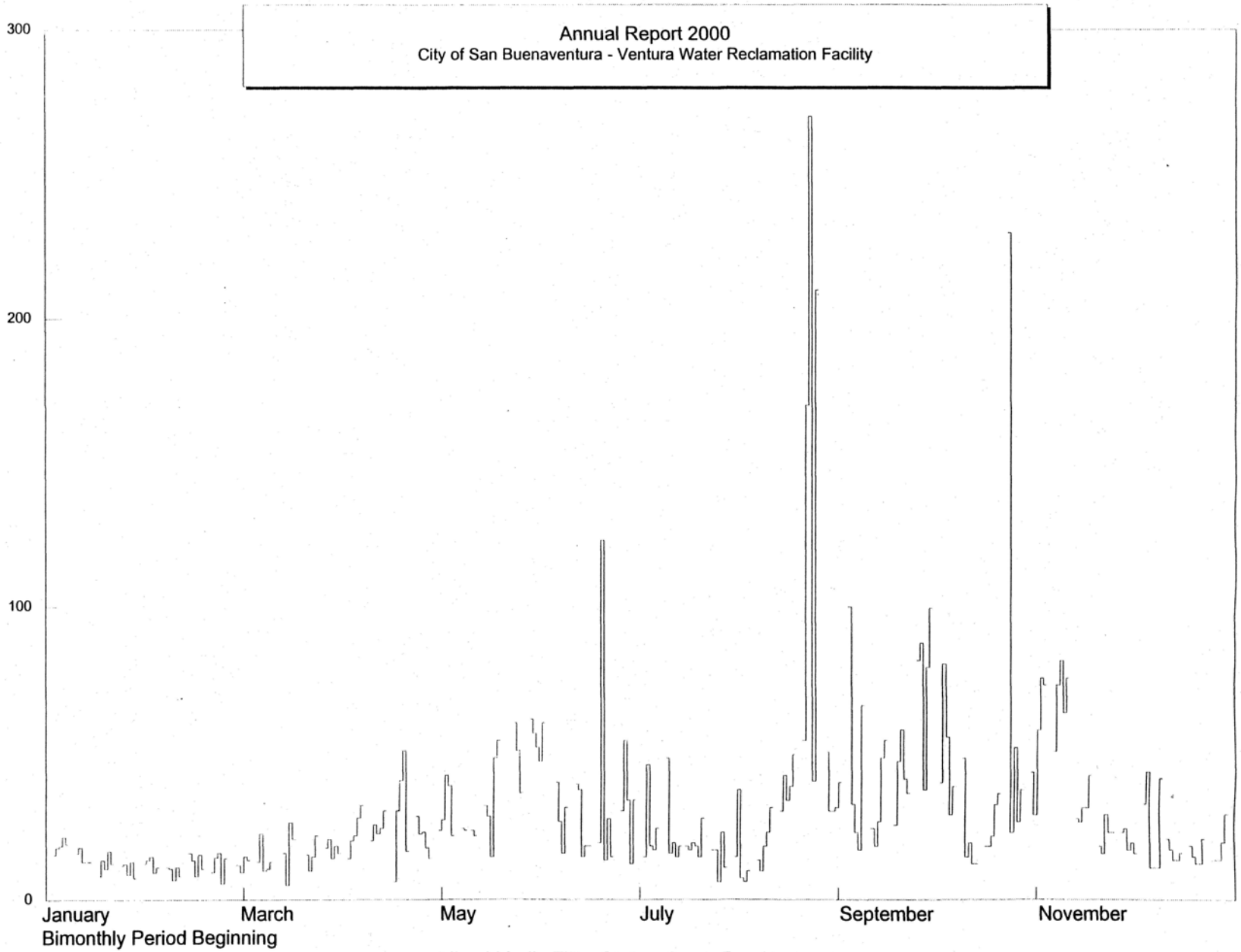
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Suspended Solids - mg/l



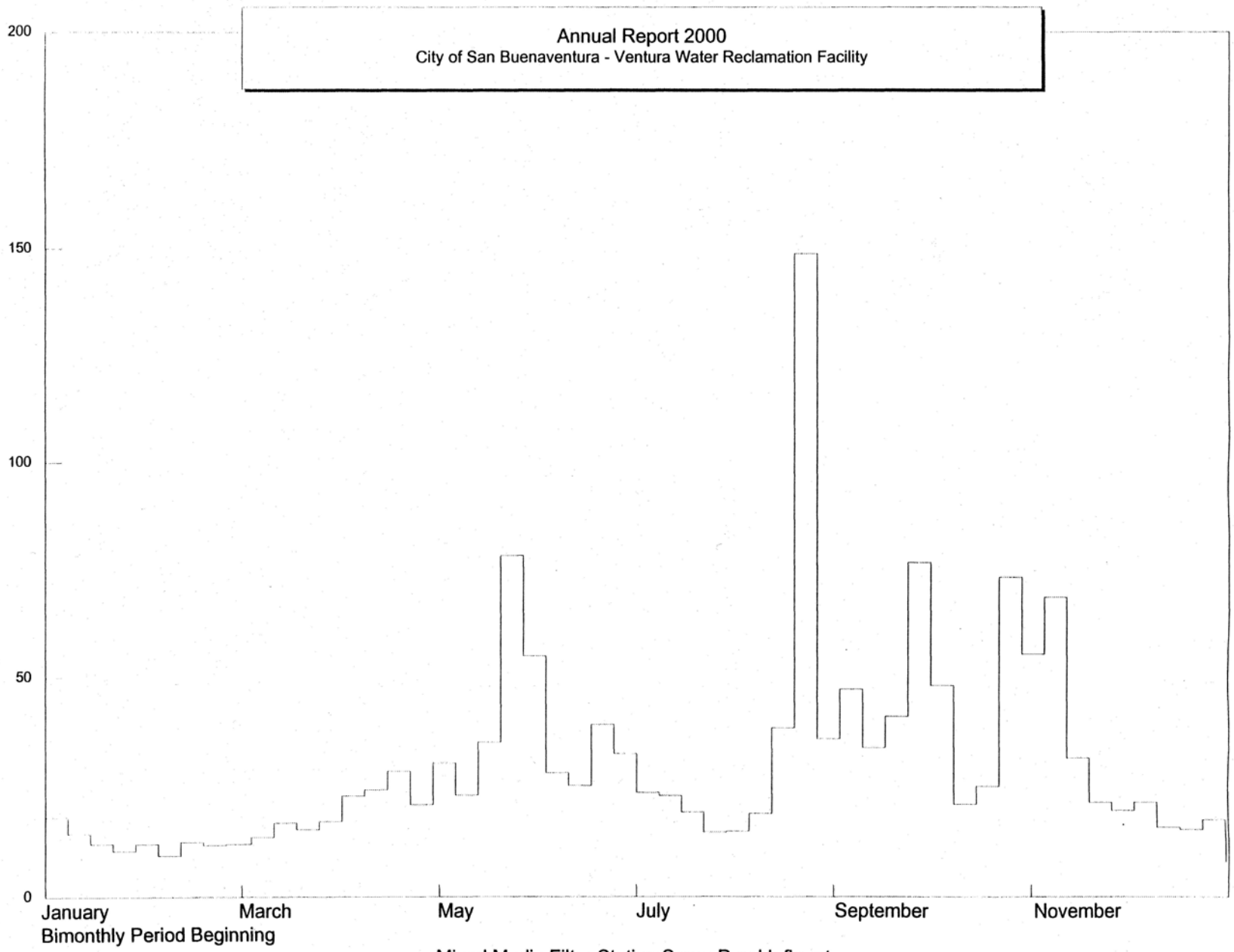
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average Suspended Solids - mg/l



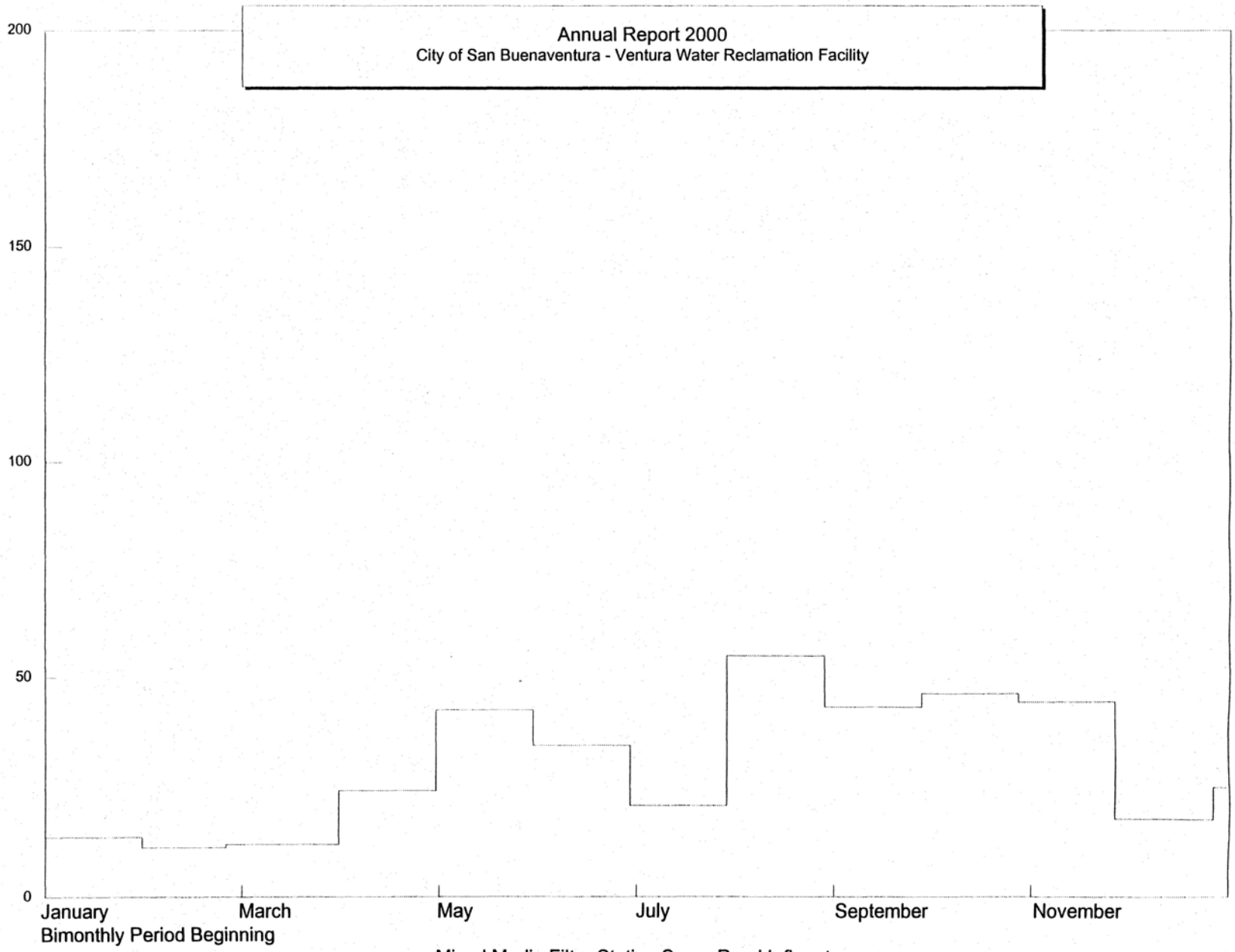
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Suspended Solids - mg/l



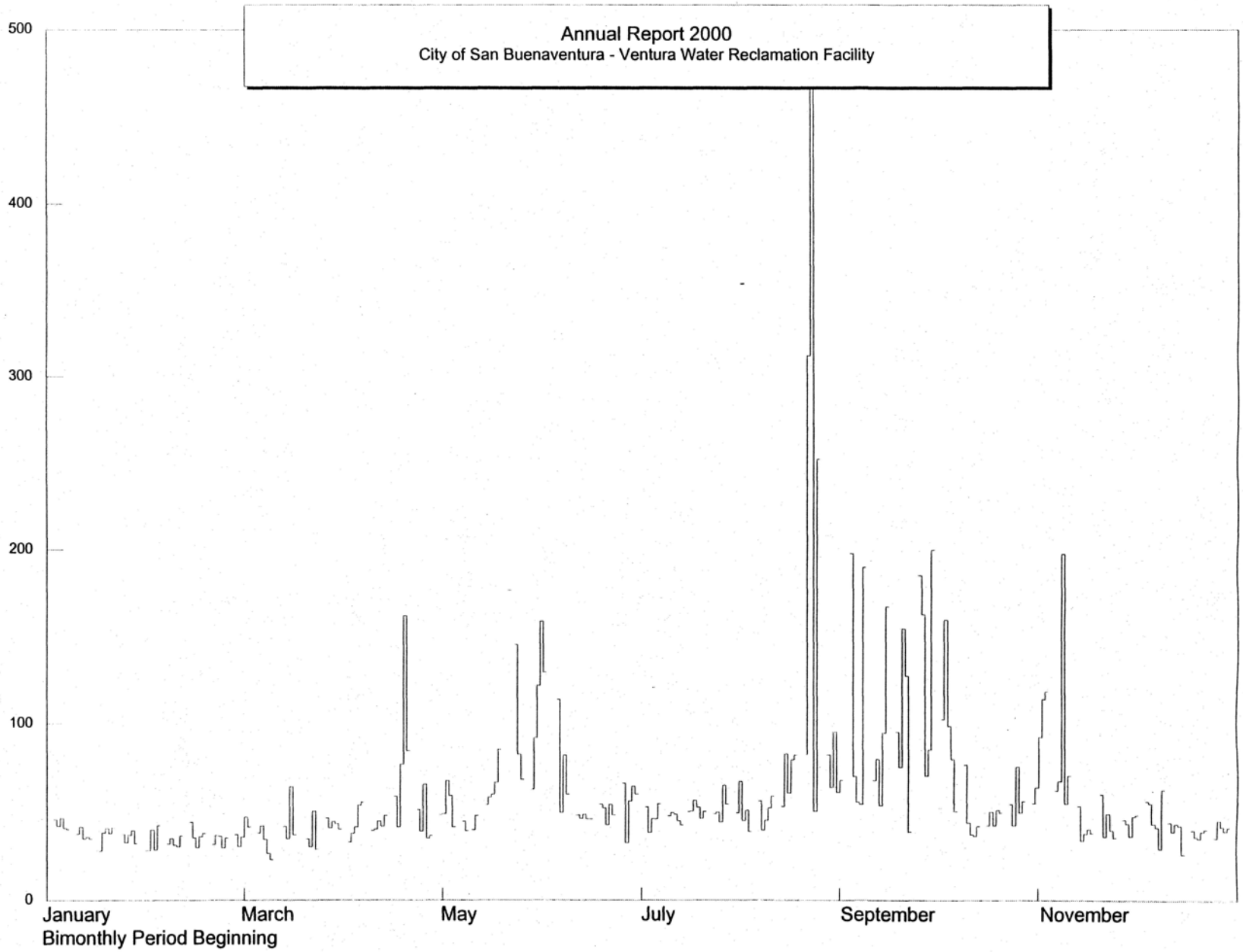
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent BOD - mg/l



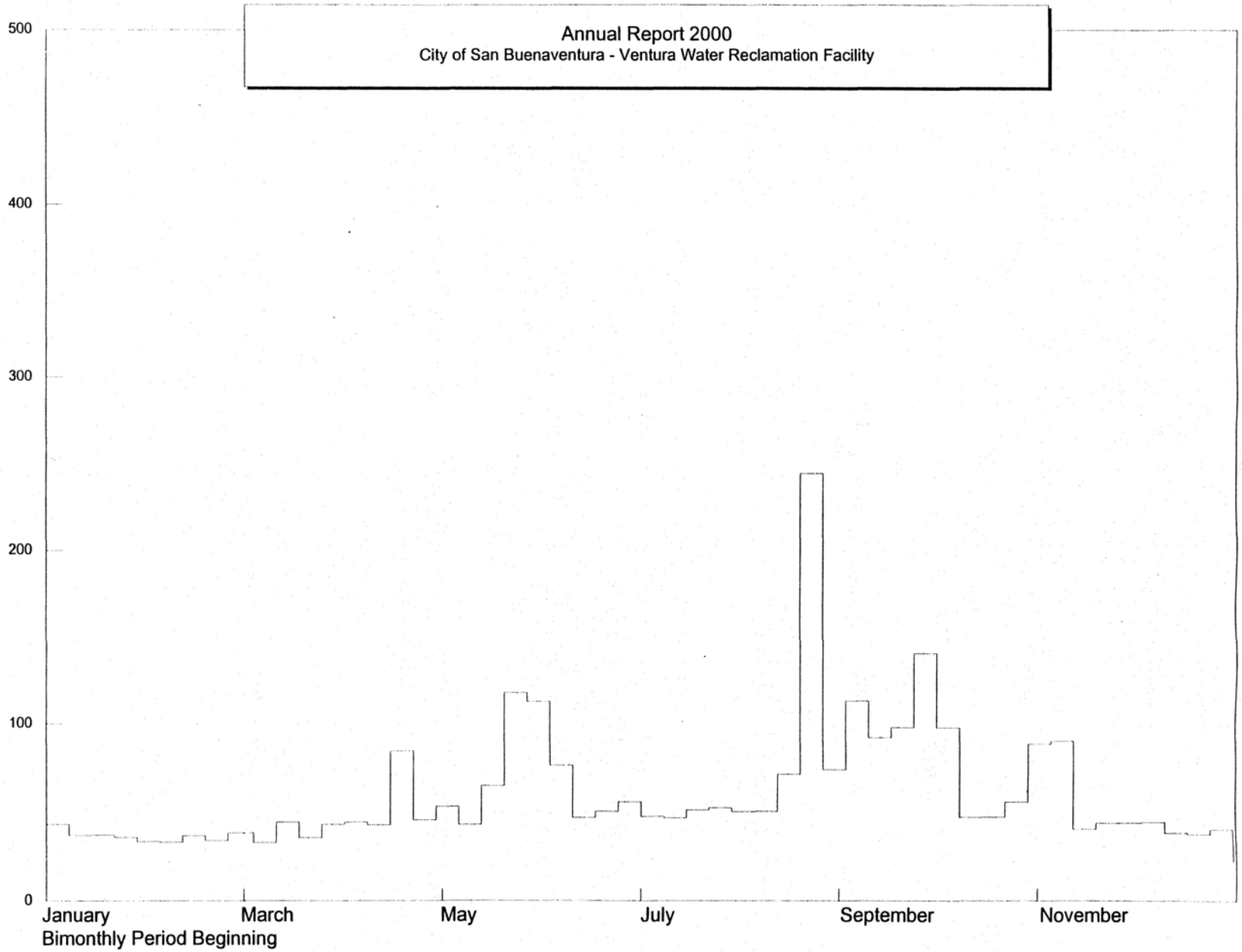
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average BOD - mg/l



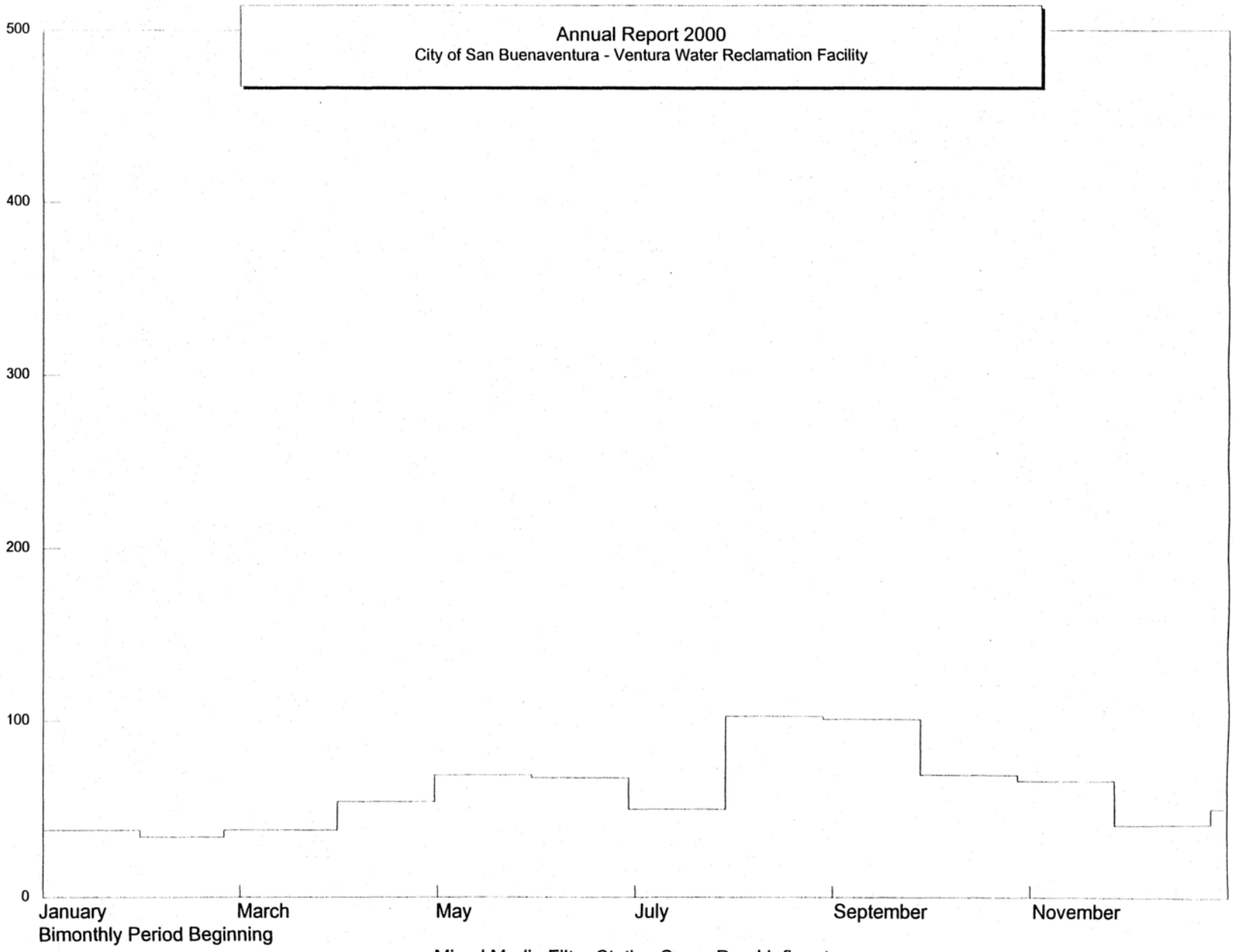
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average BOD - mg/l



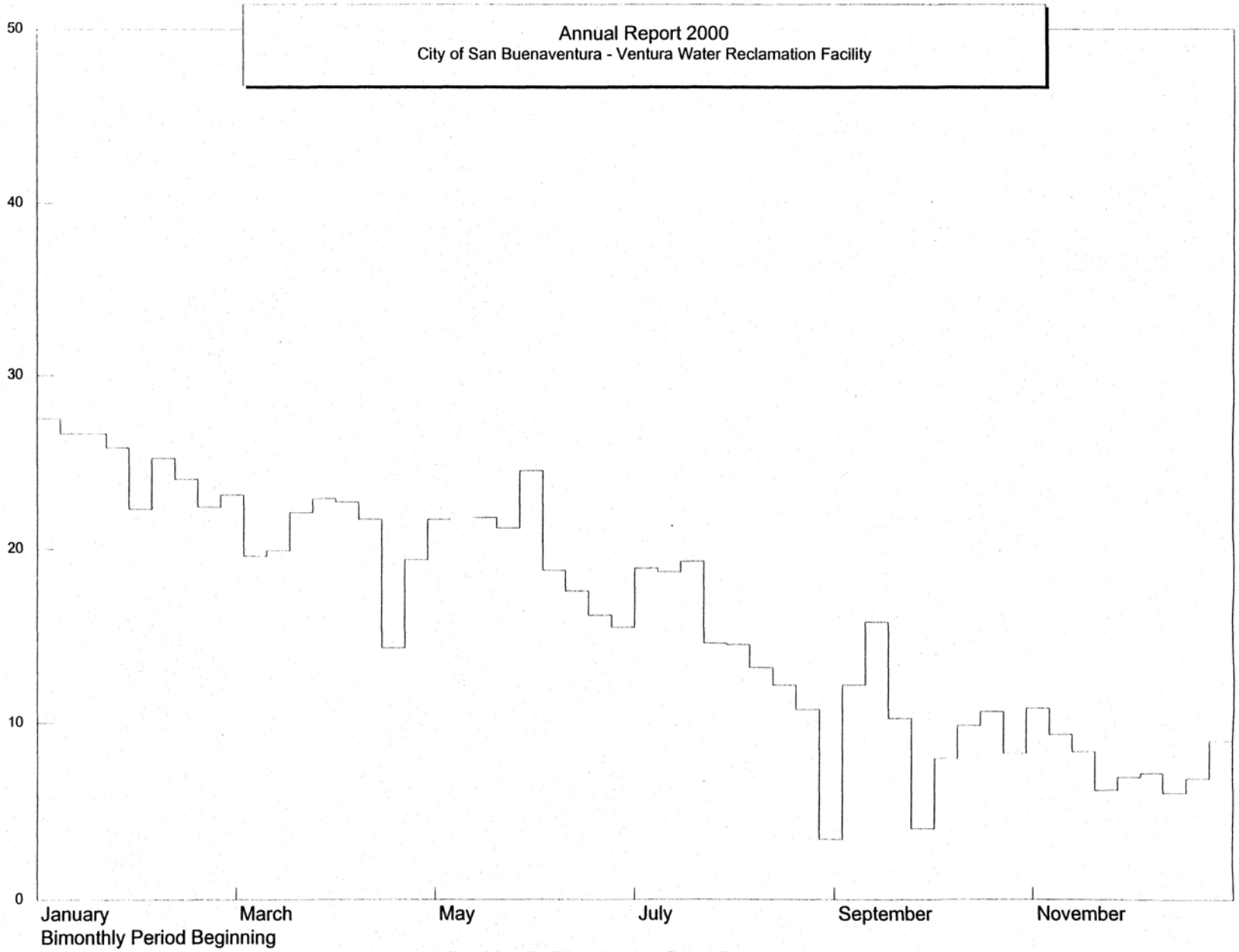
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent COD - mg/l



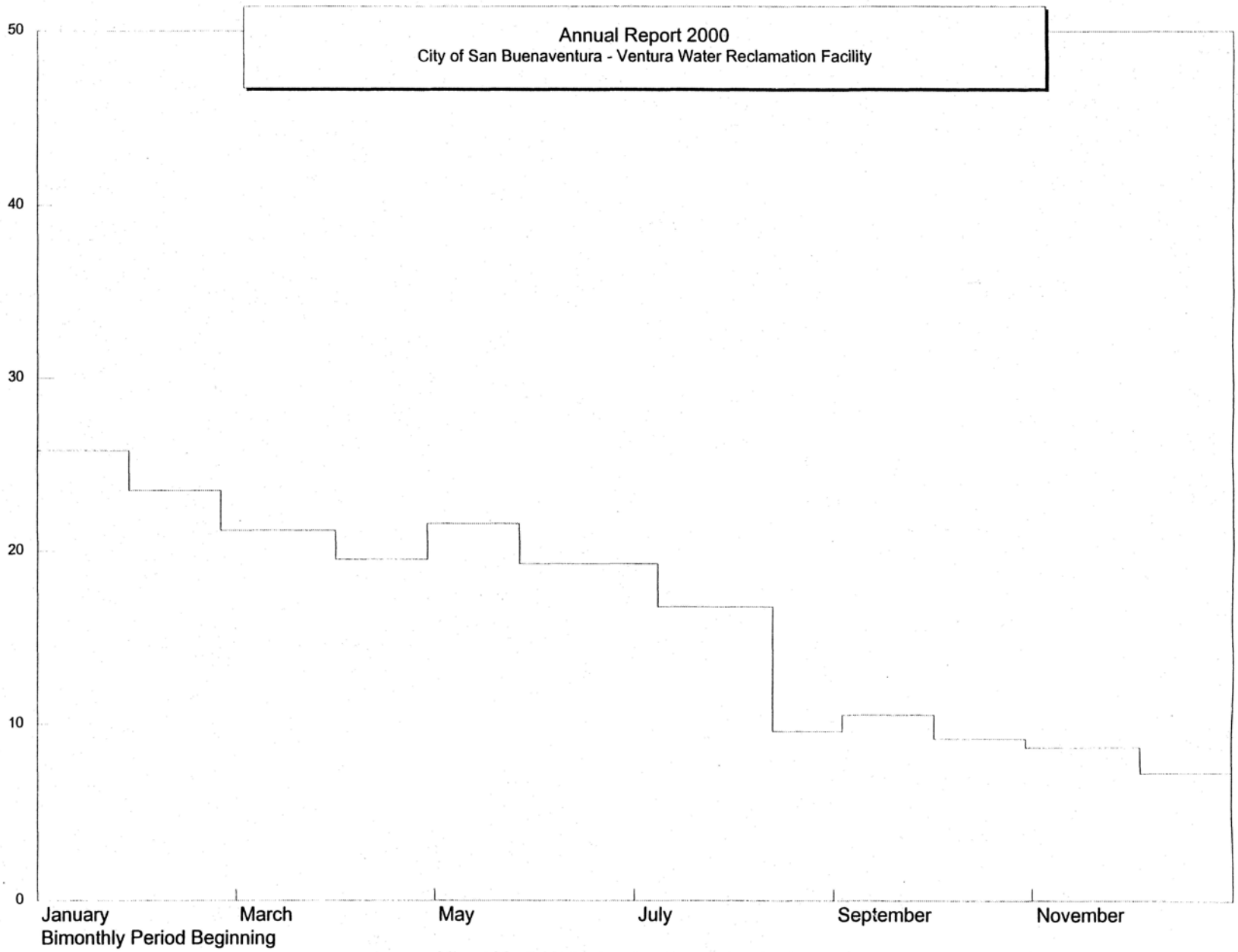
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average COD - mg/l



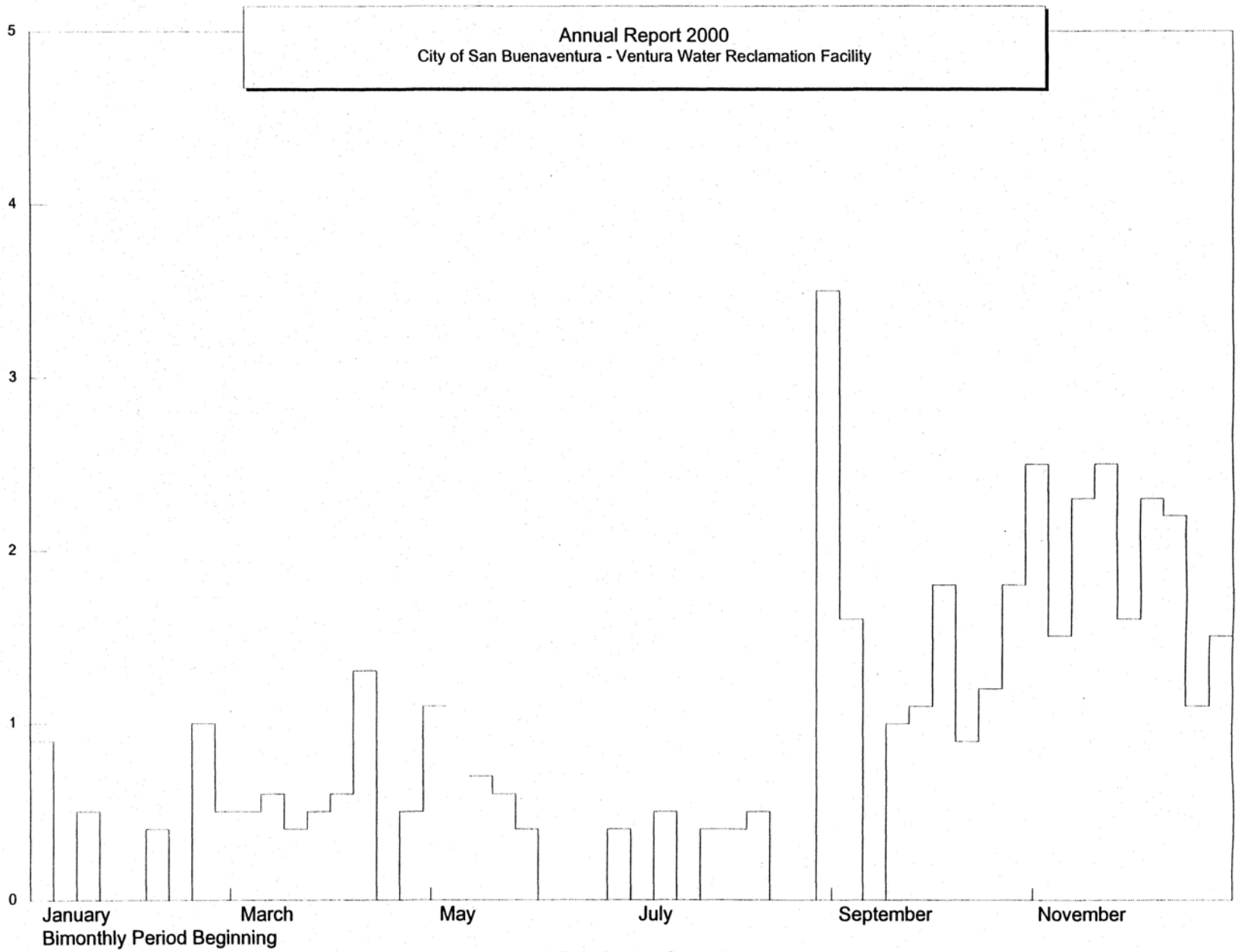
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average COD - mg/l



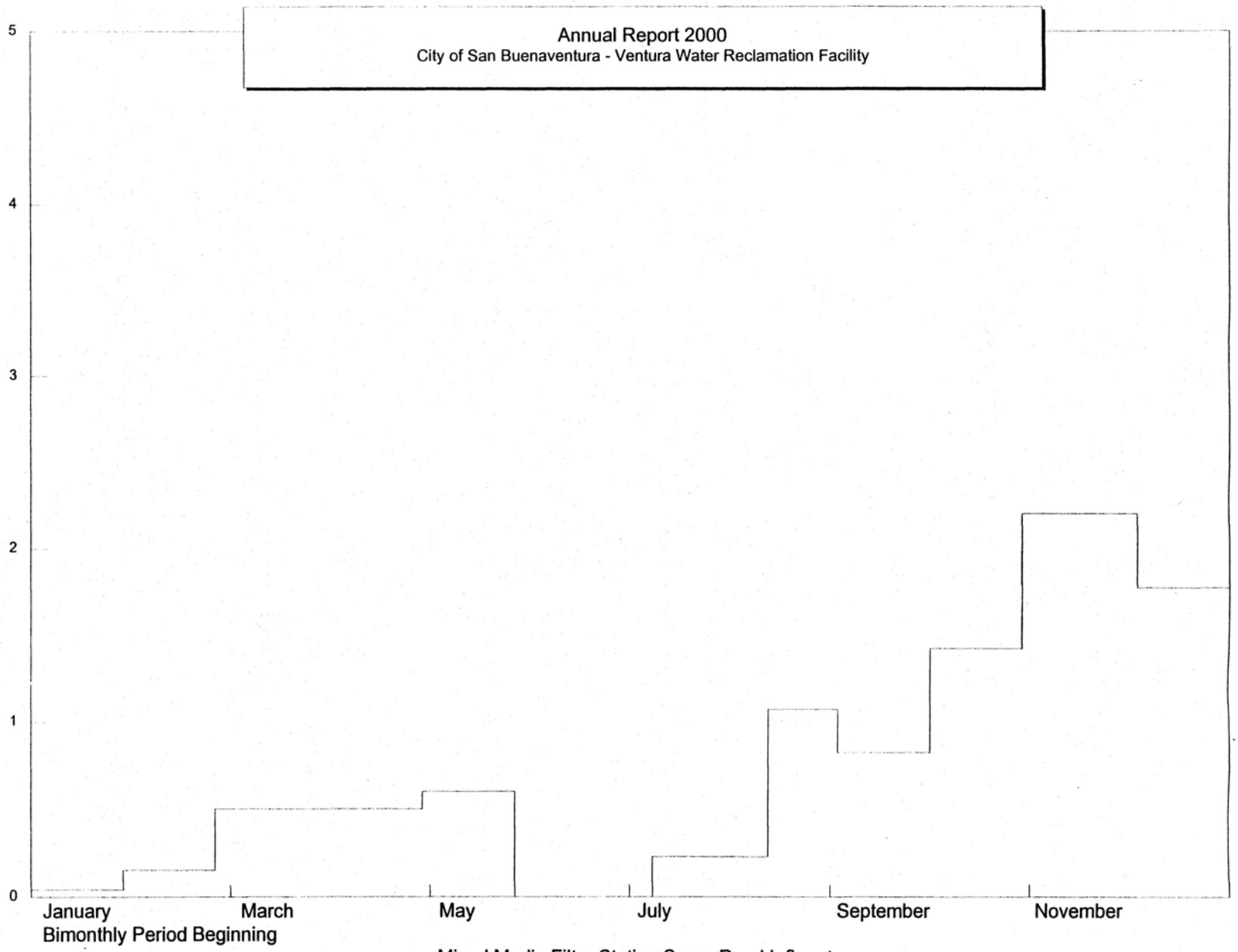
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Weekly Nitrate-N - mg/l



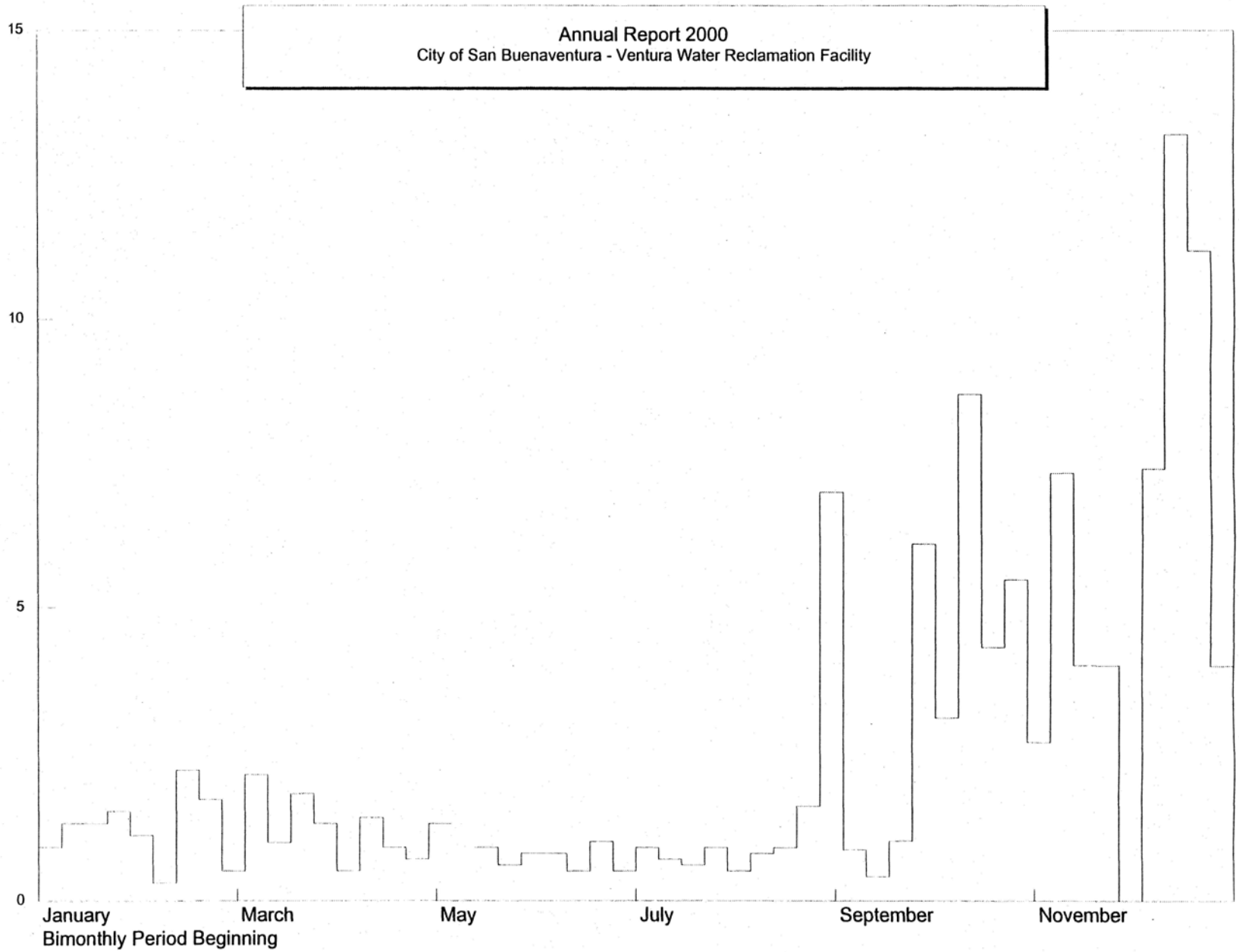
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Nitrate-N - mg/l



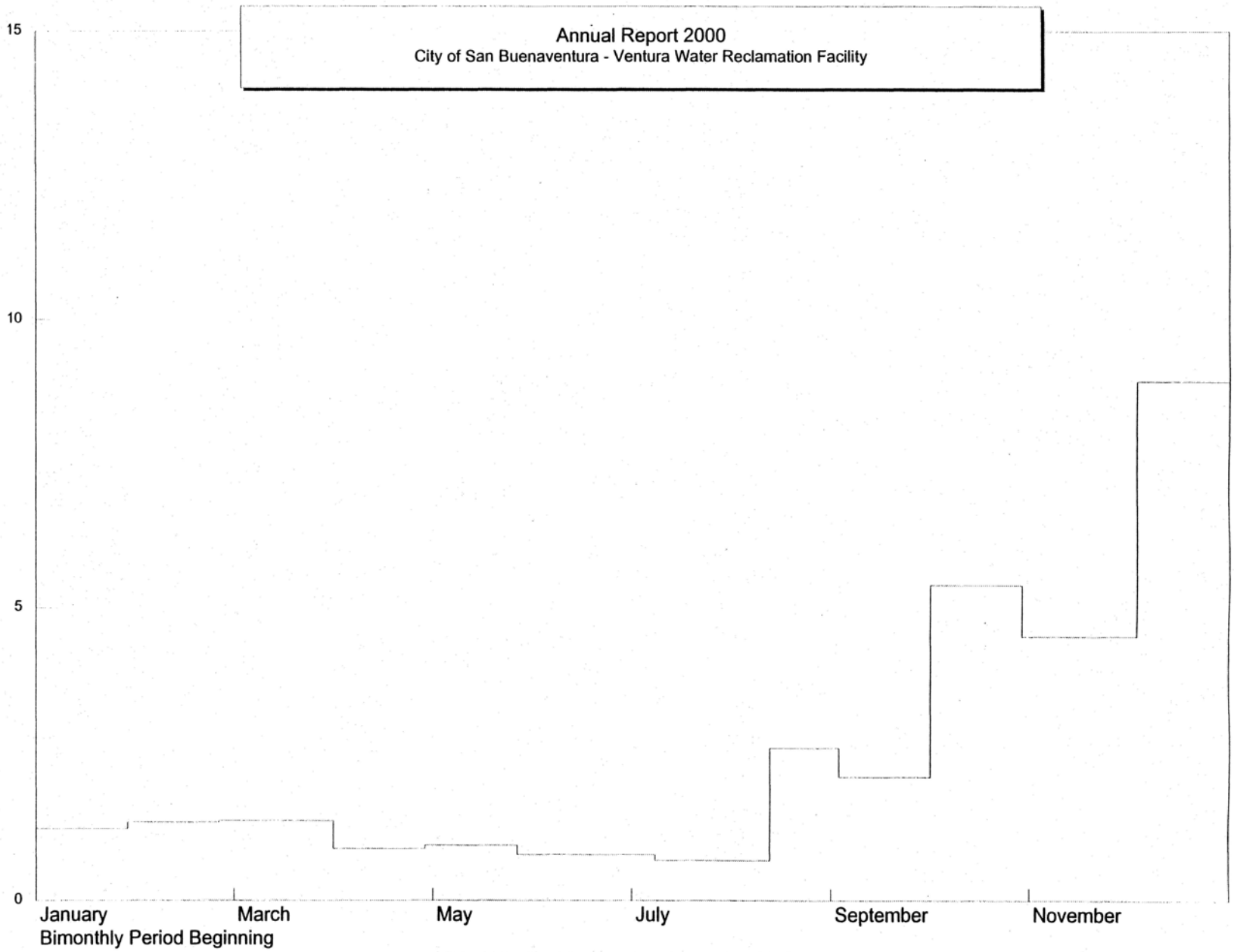
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Weekly Nitrite-N - mg/l



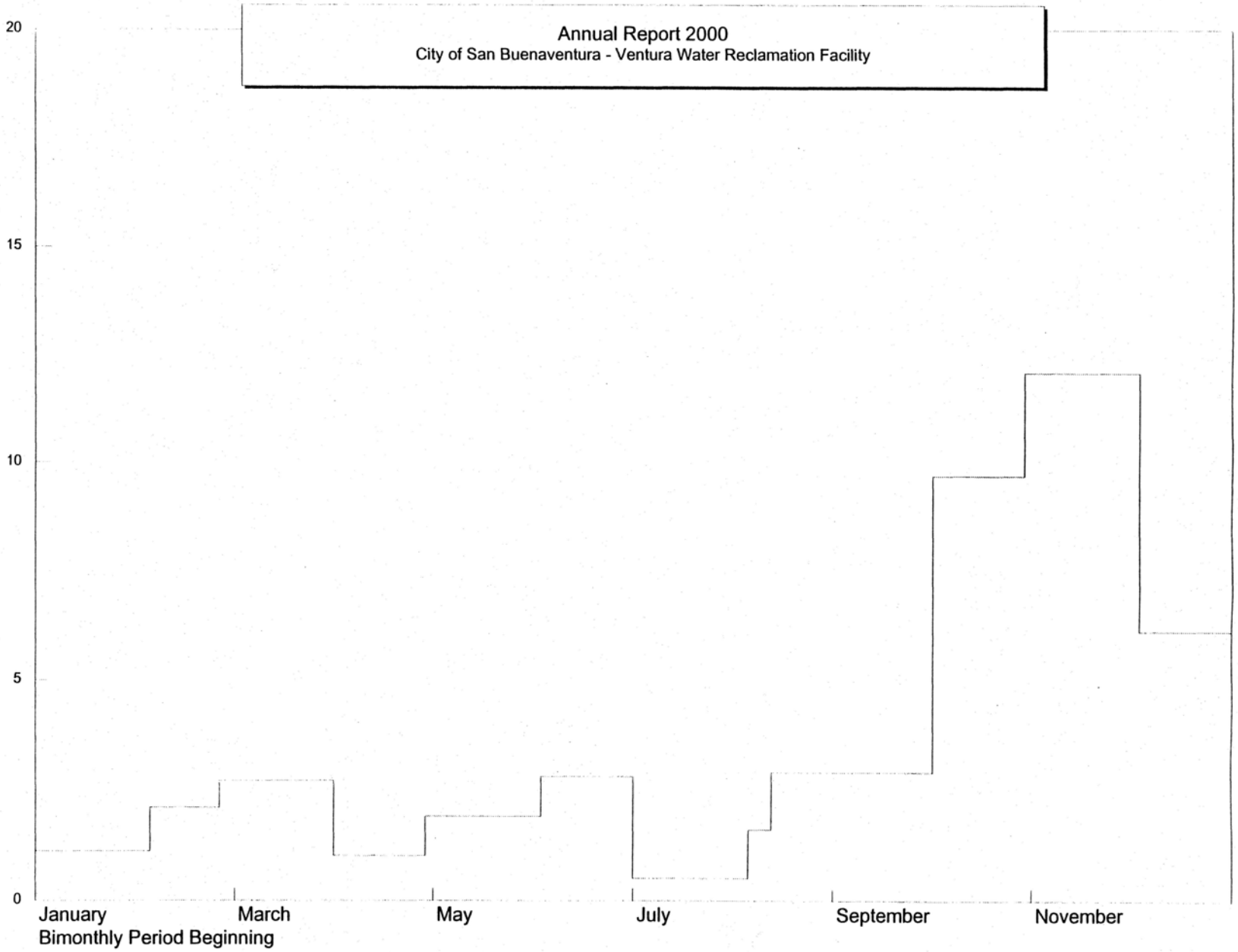
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Nitrite-N - mg/l



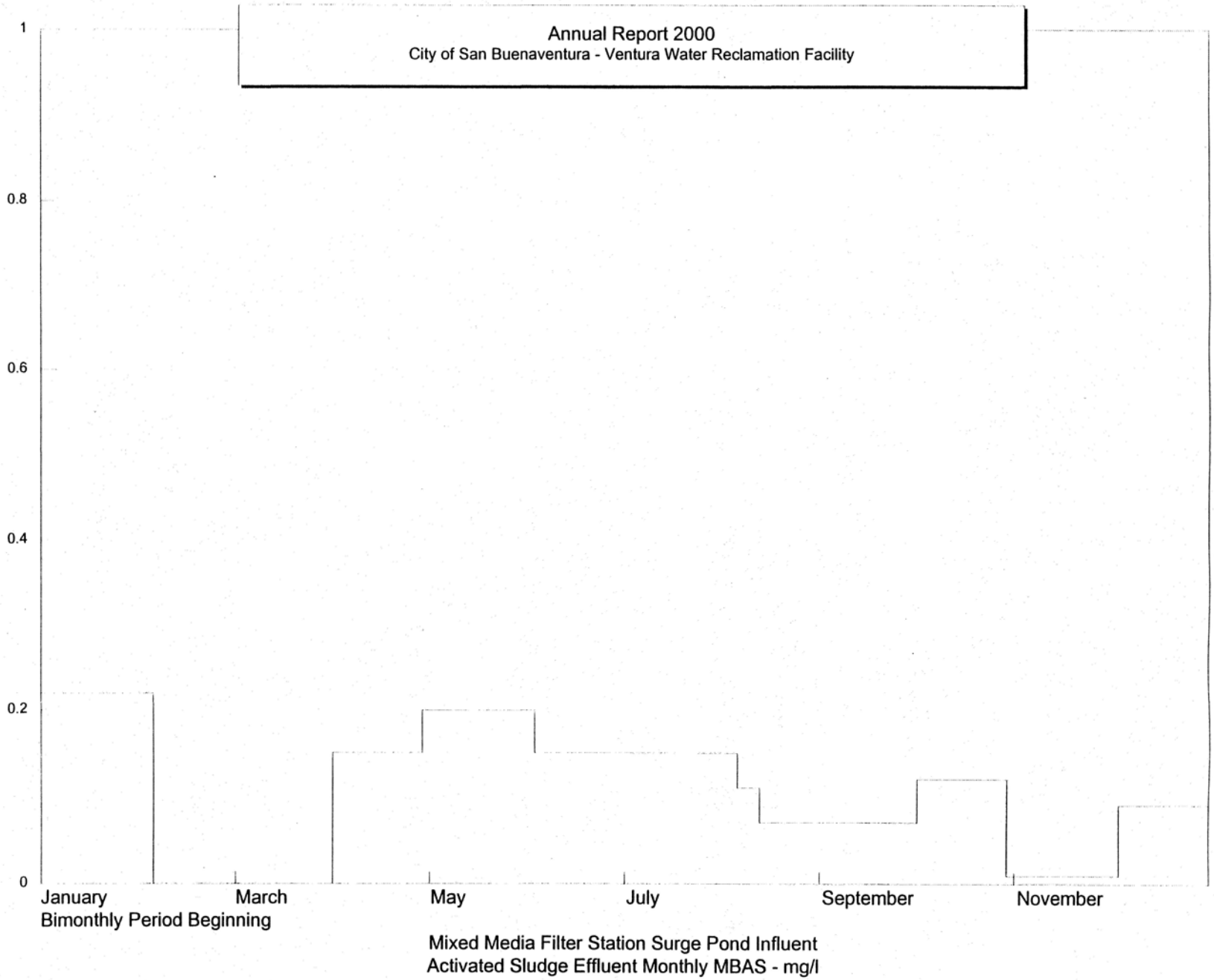
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Weekly Ammonia-N - mg/l

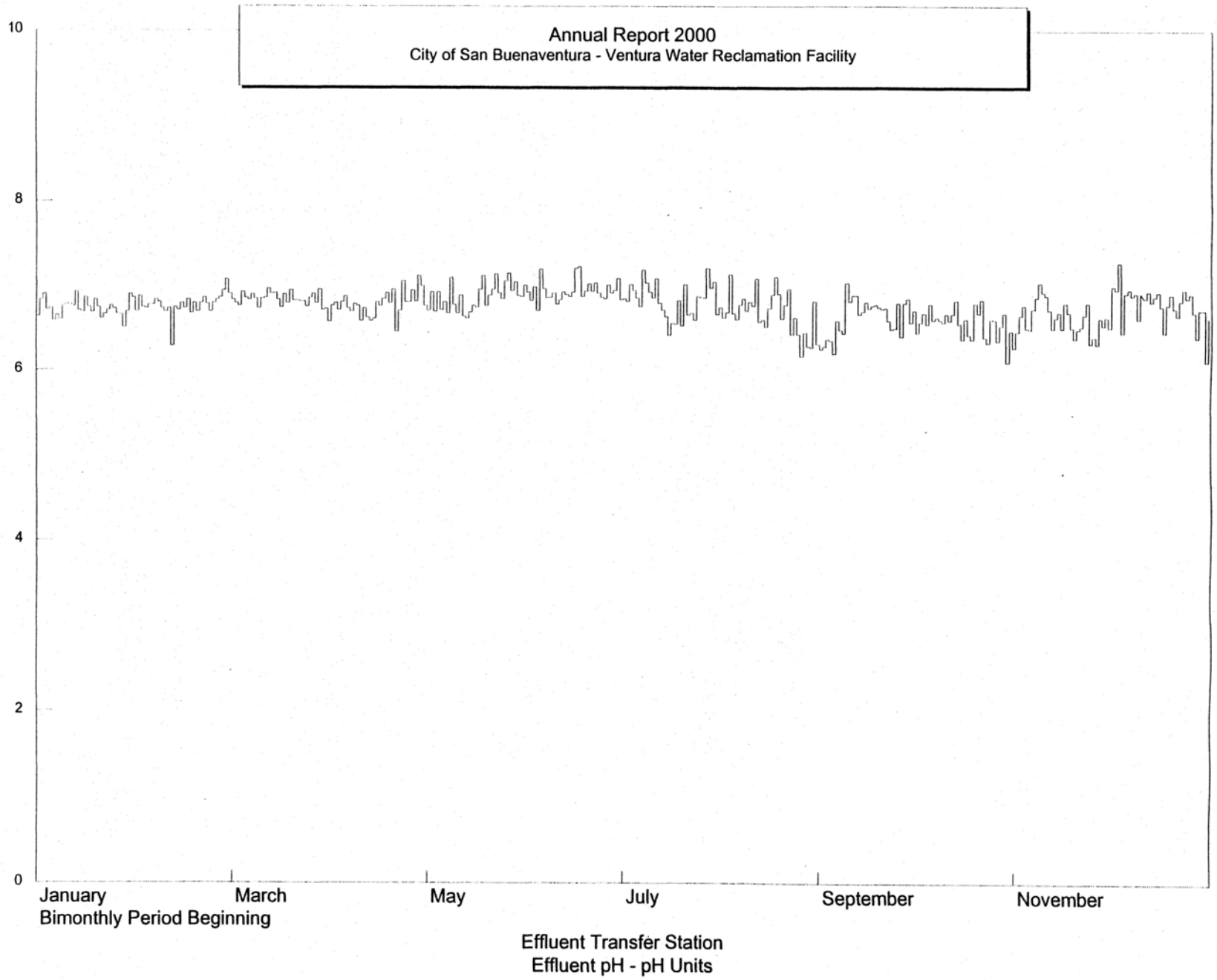


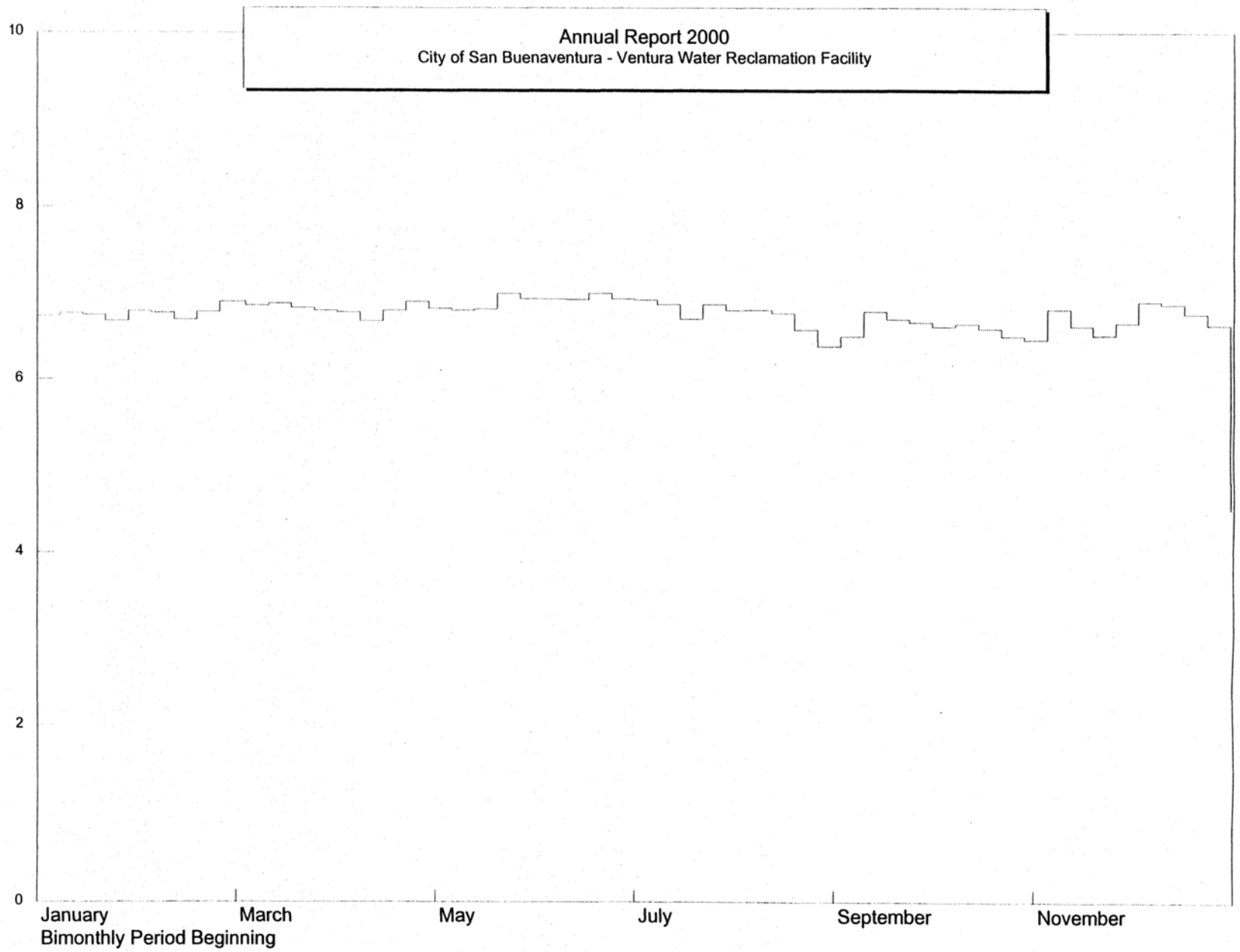
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Ammonia-N - mg/l



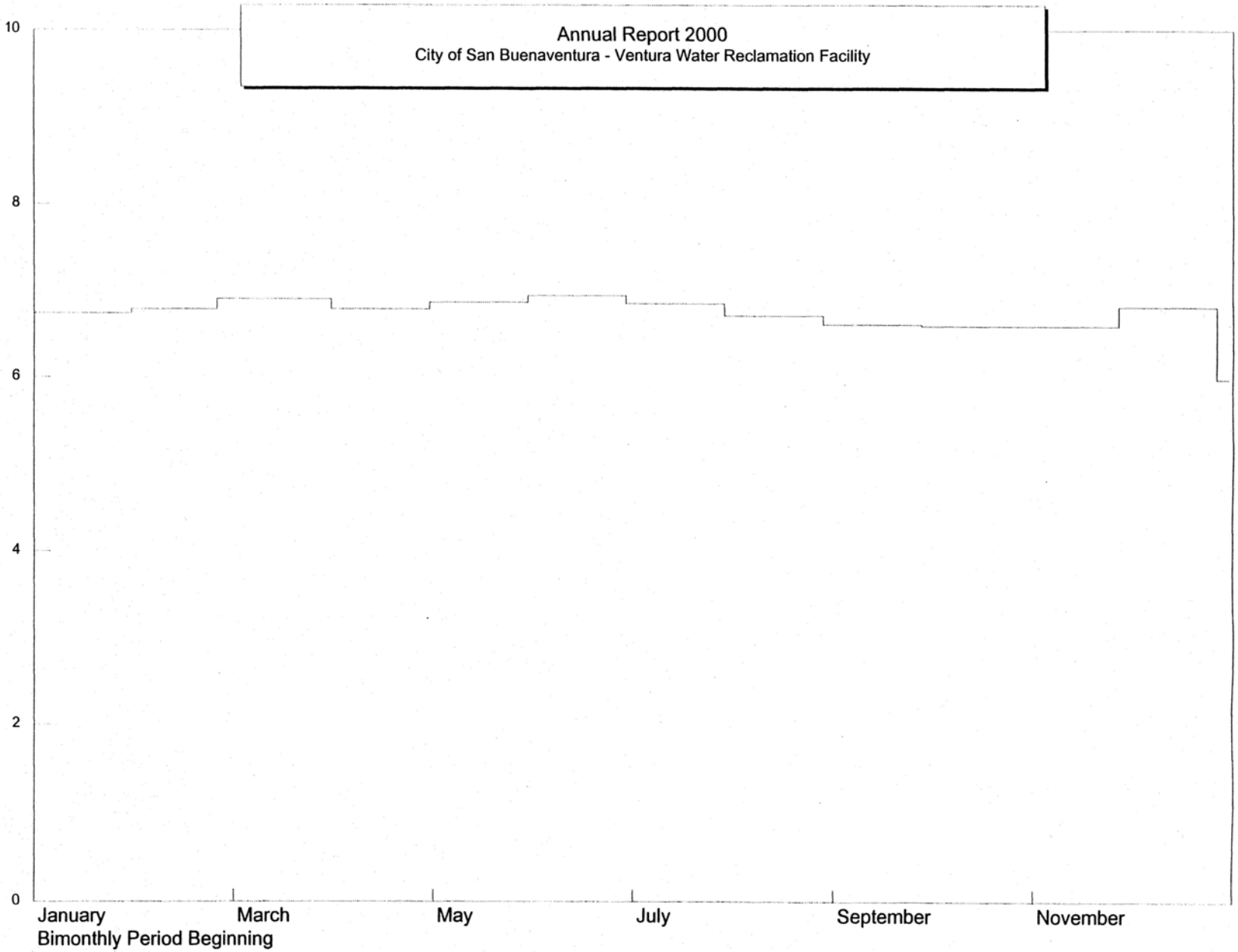
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Monthly TKN - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Monthly MBAS - mg/l

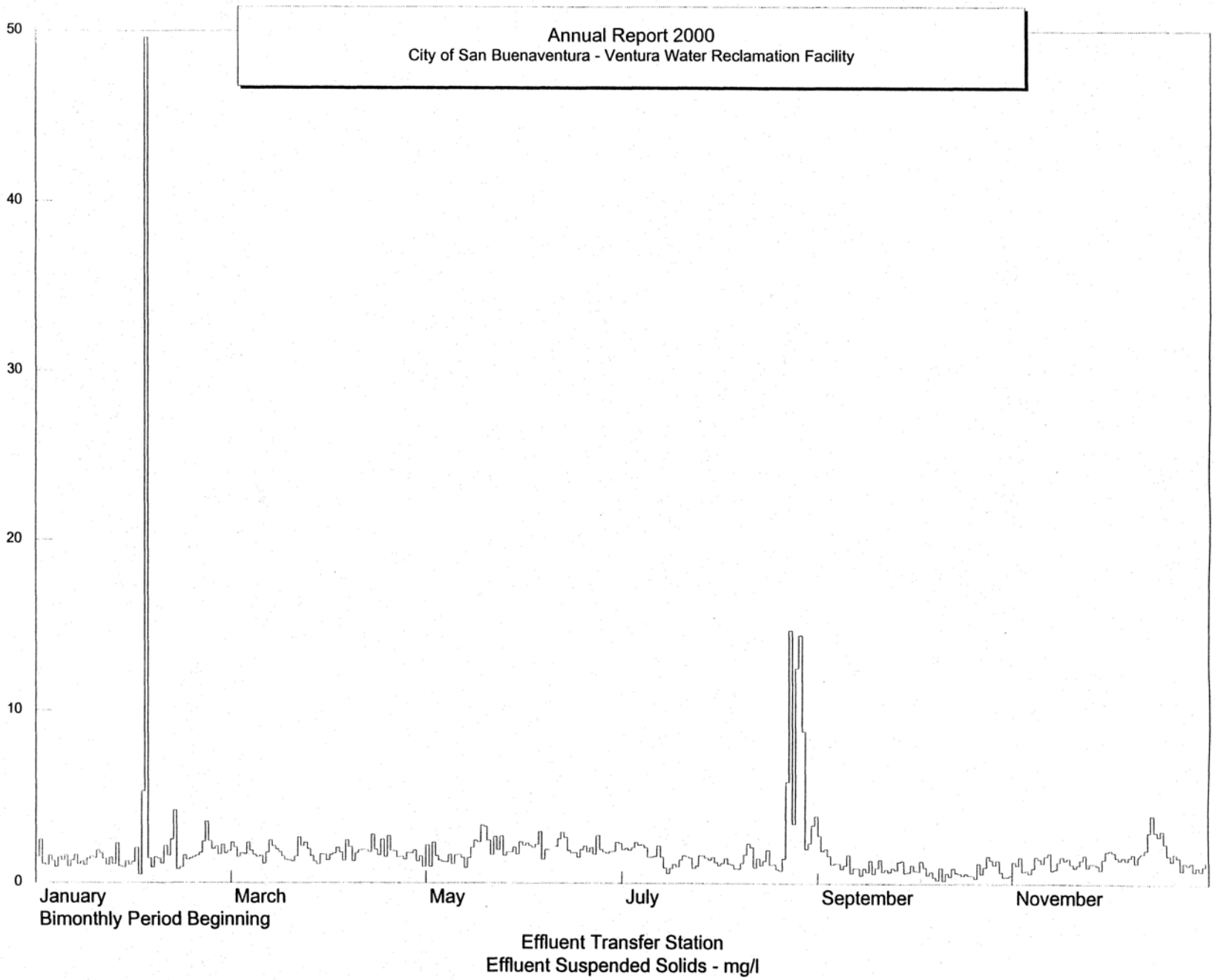

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent pH - pH Units

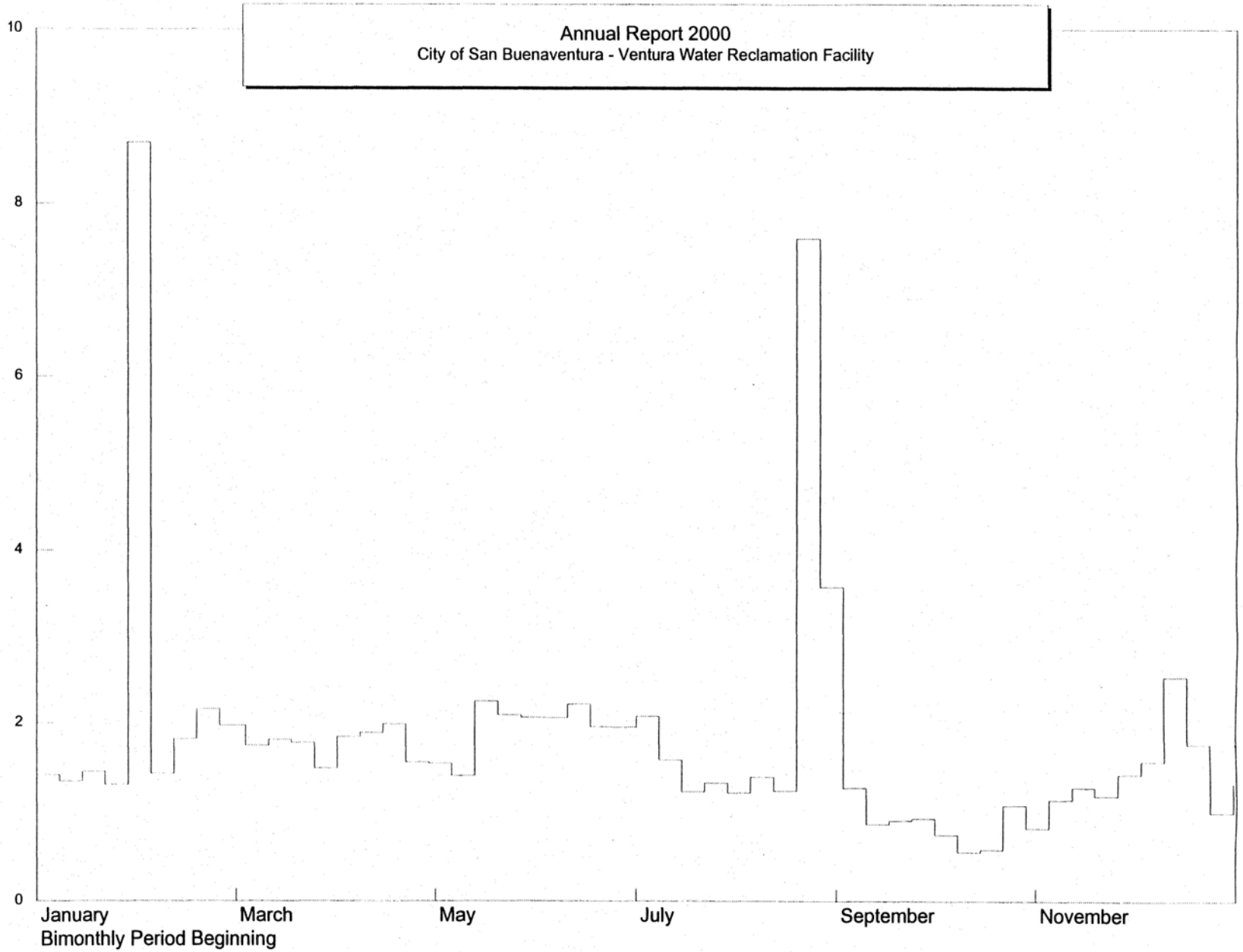


Effluent Transfer Station
Effluent 7 Day Average pH - pH Units

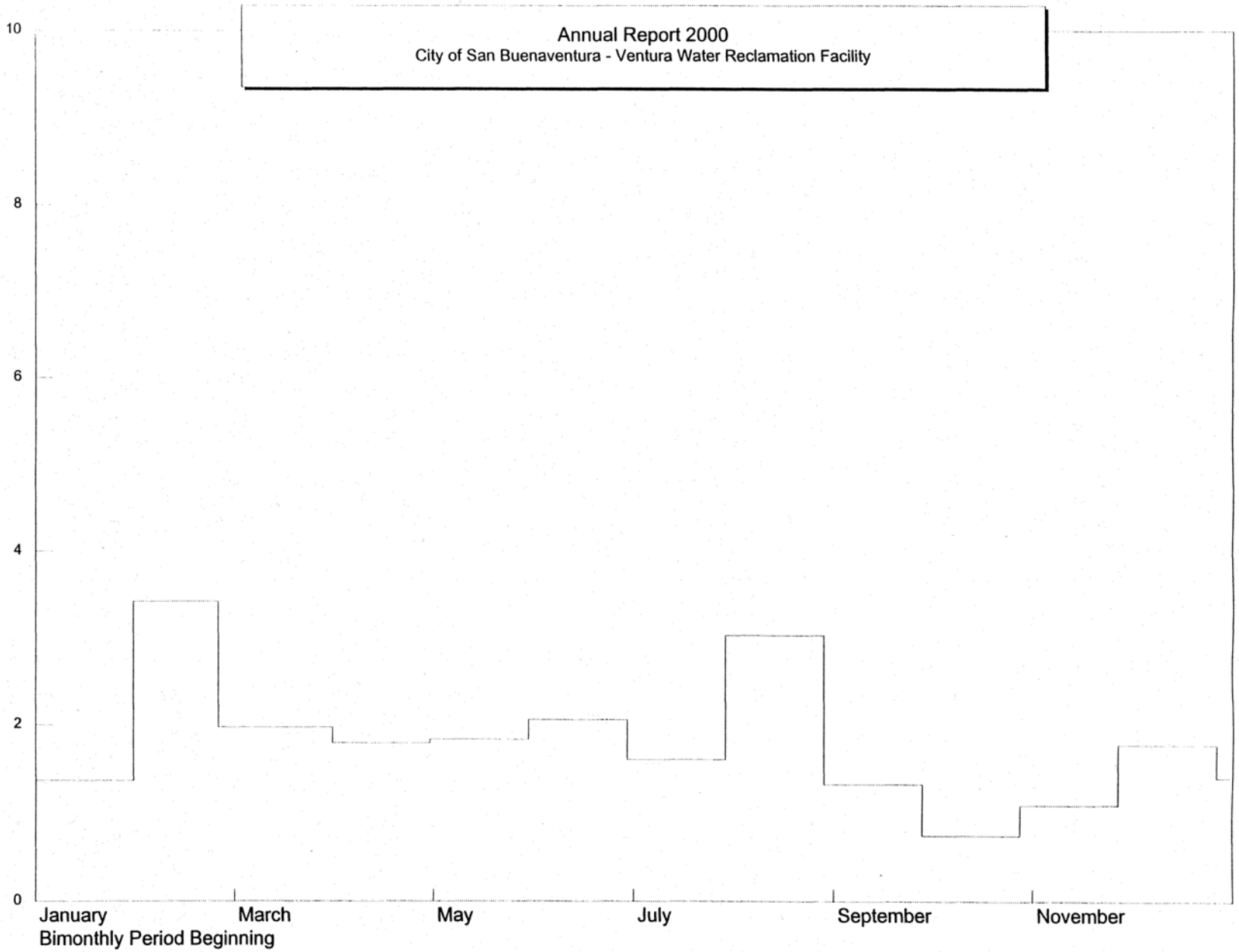


Effluent Transfer Station
Effluent 30 Day Average pH - pH Units

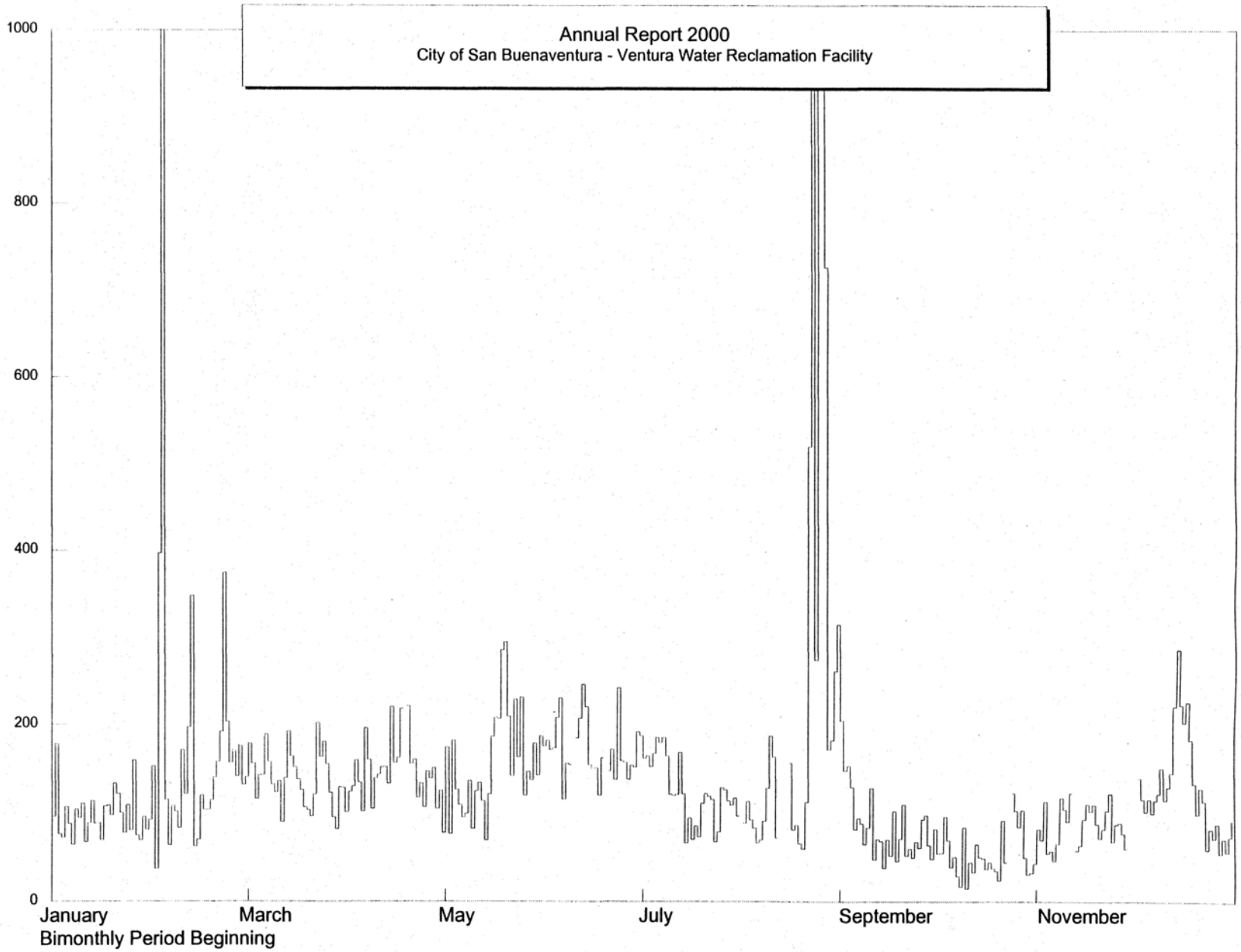

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Suspended Solids - mg/l



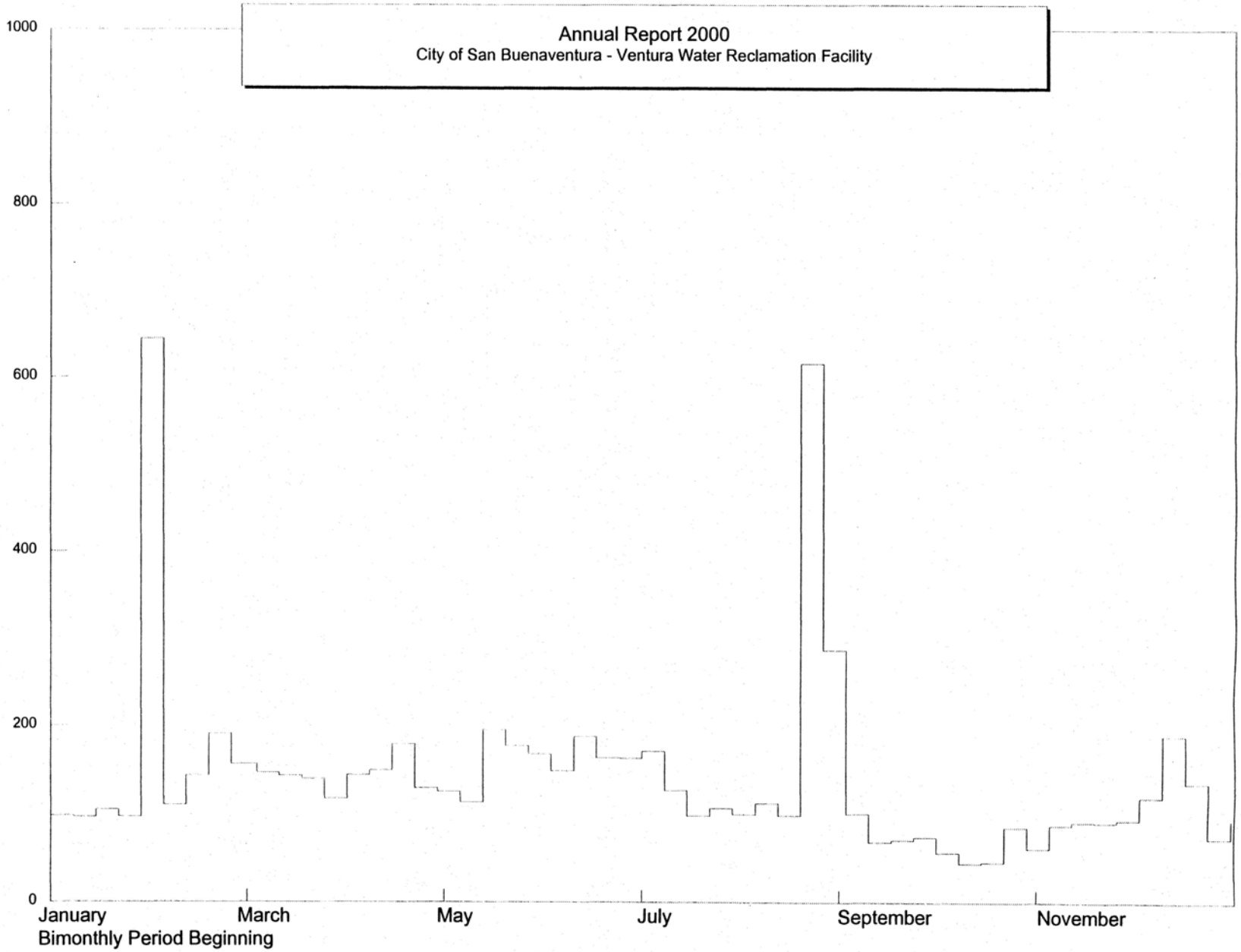
Effluent Transfer Station
Effluent 7 Day Average Suspended Solids - mg/l



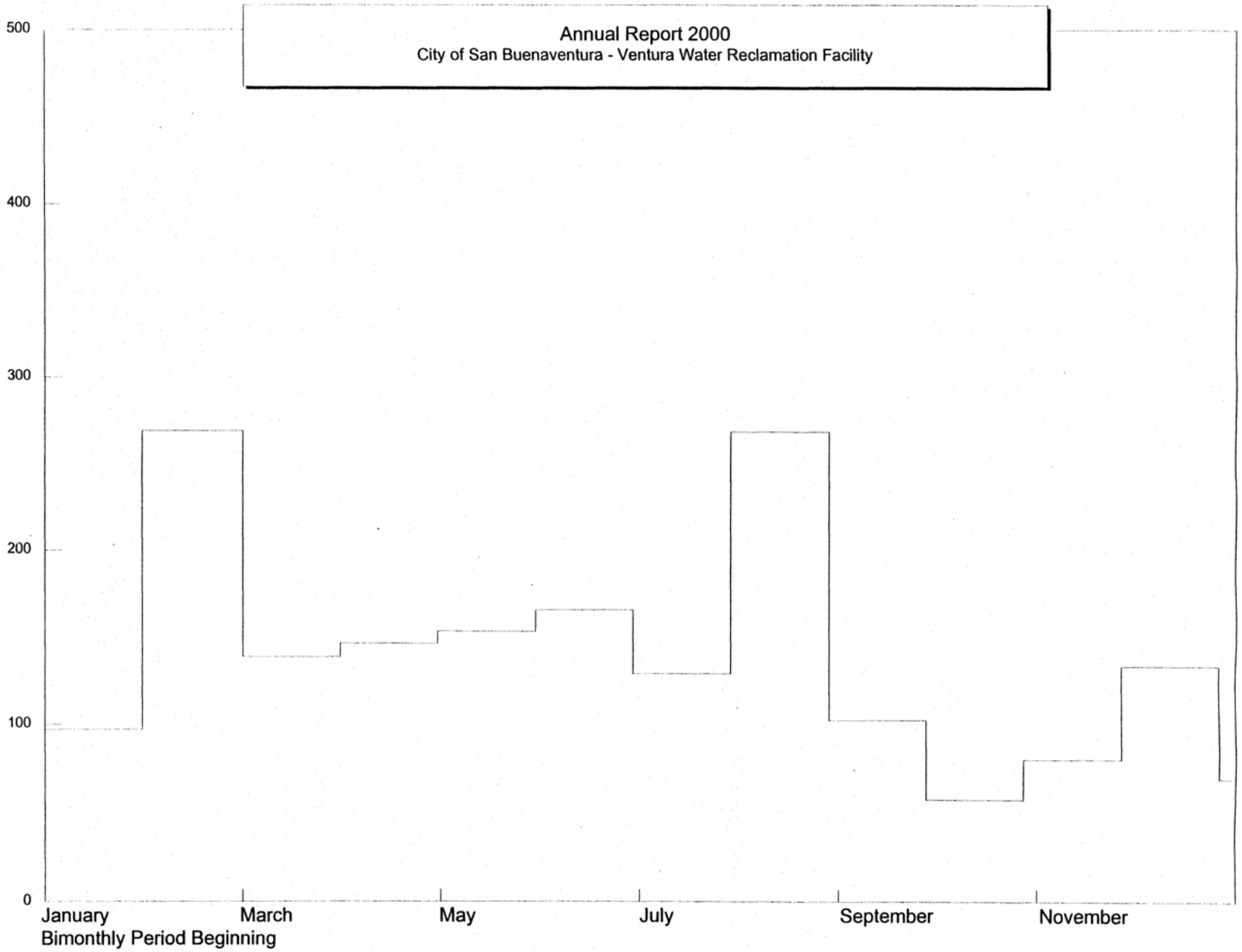
Effluent Transfer Station
Effluent 30 Day Average Suspended Solids - mg/l



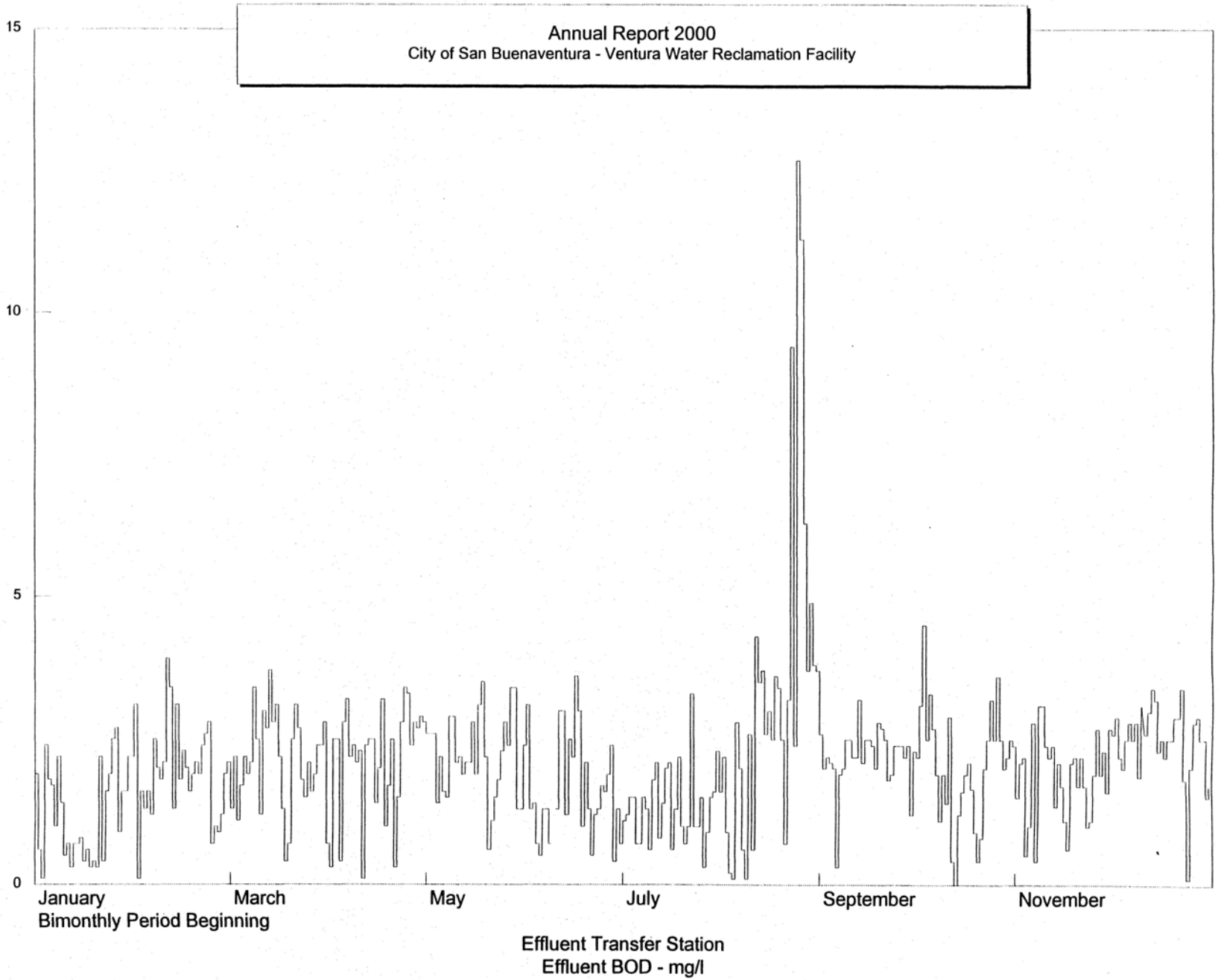
Effluent Transfer Station
Effluent Suspended Solids Mass Emission Rate- lb/Day

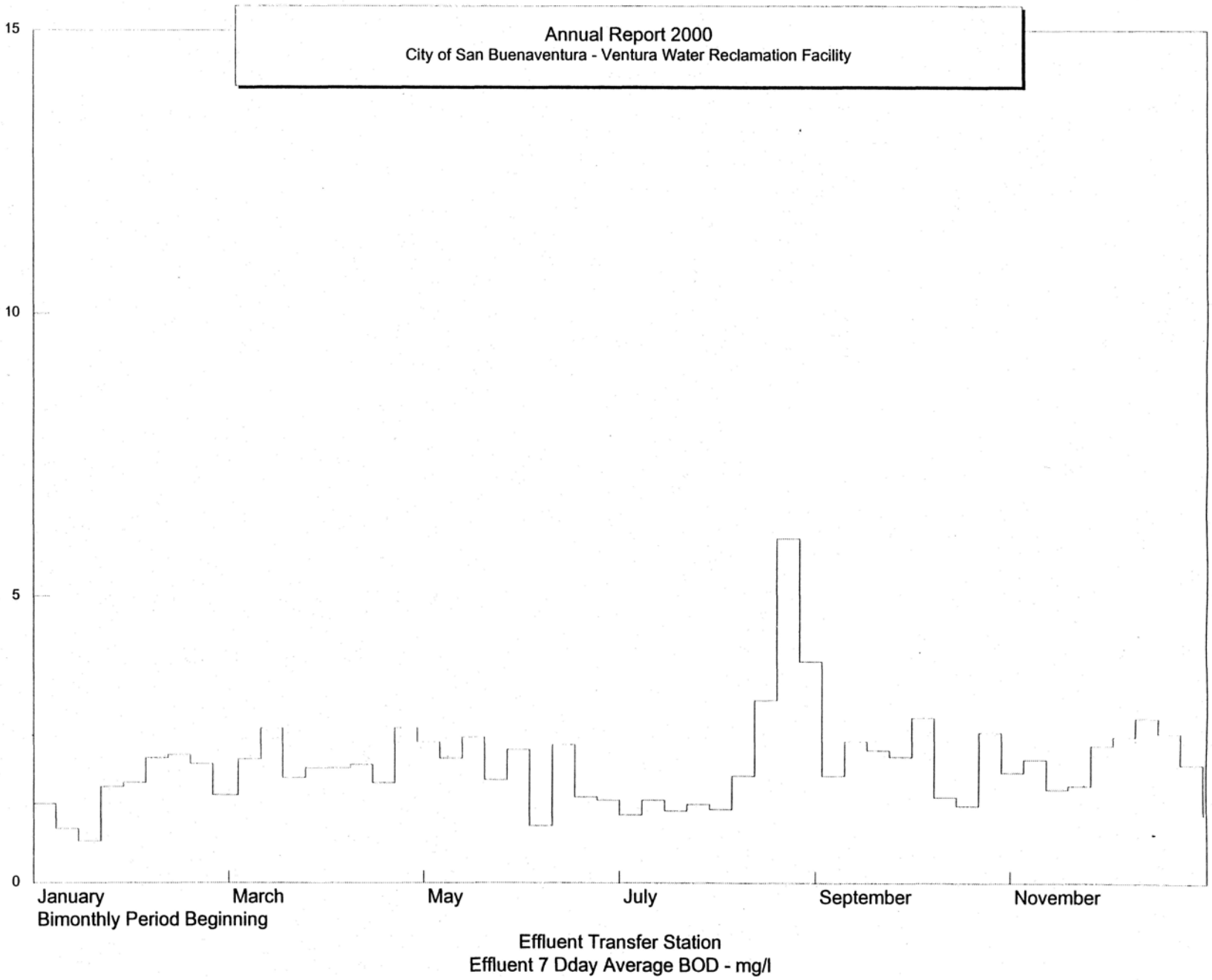


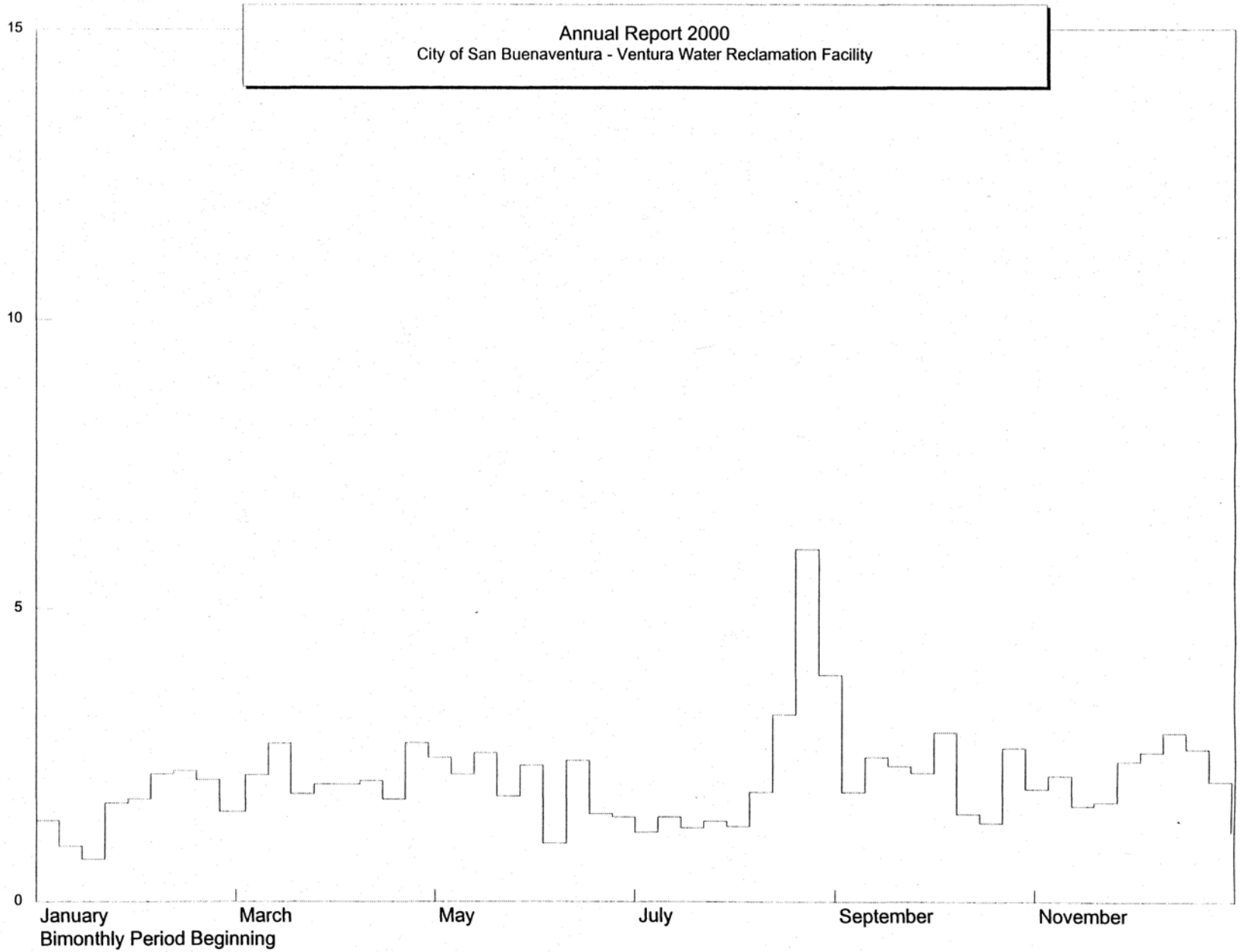
Effluent Transfer Station
Effluent 7 Day Average Suspended Solids Mass Emission Rate- lb/Day



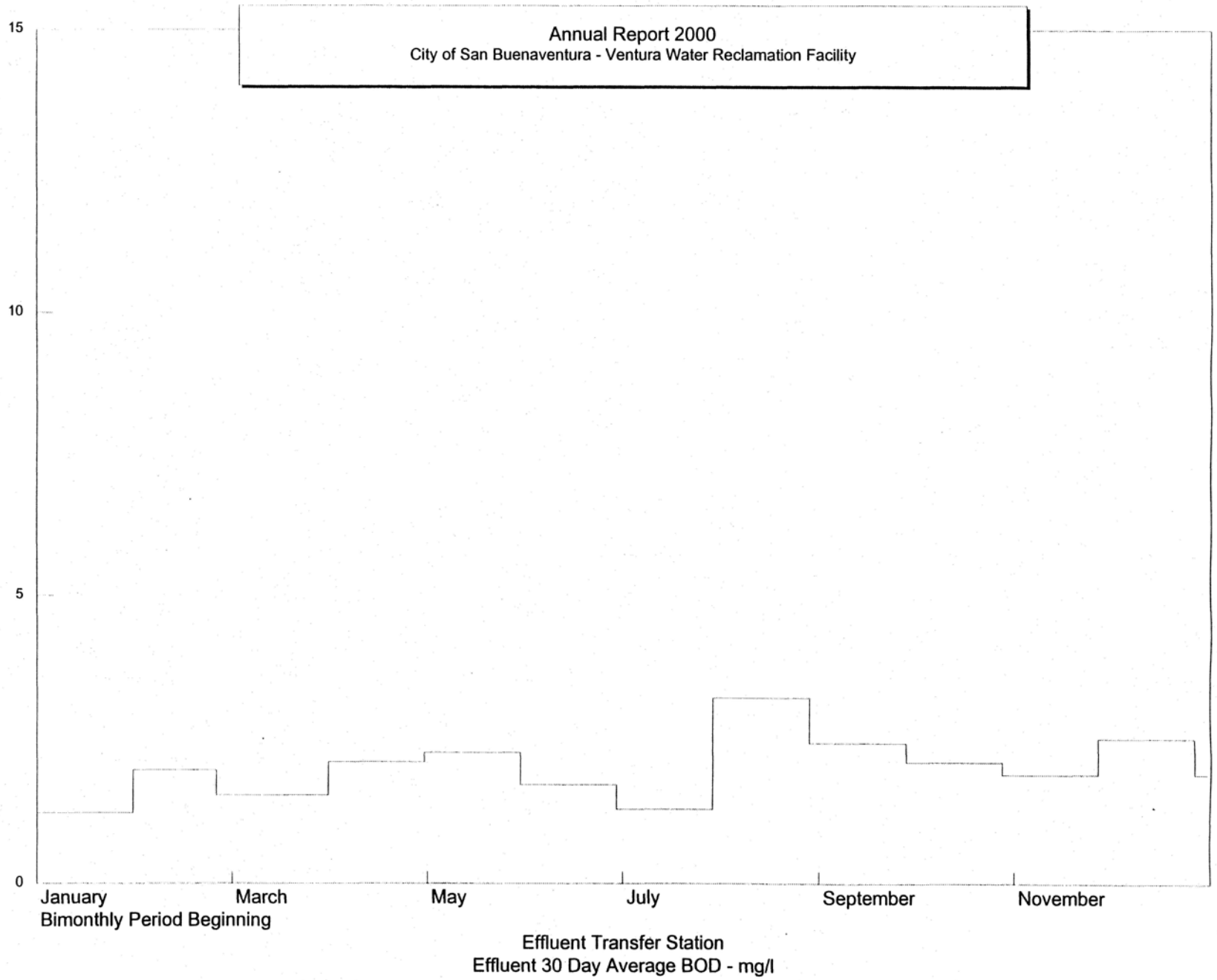
Effluent Transfer Station
Effluent 30 Day Average Suspended Solids Mass Emission Rate- lb/Day

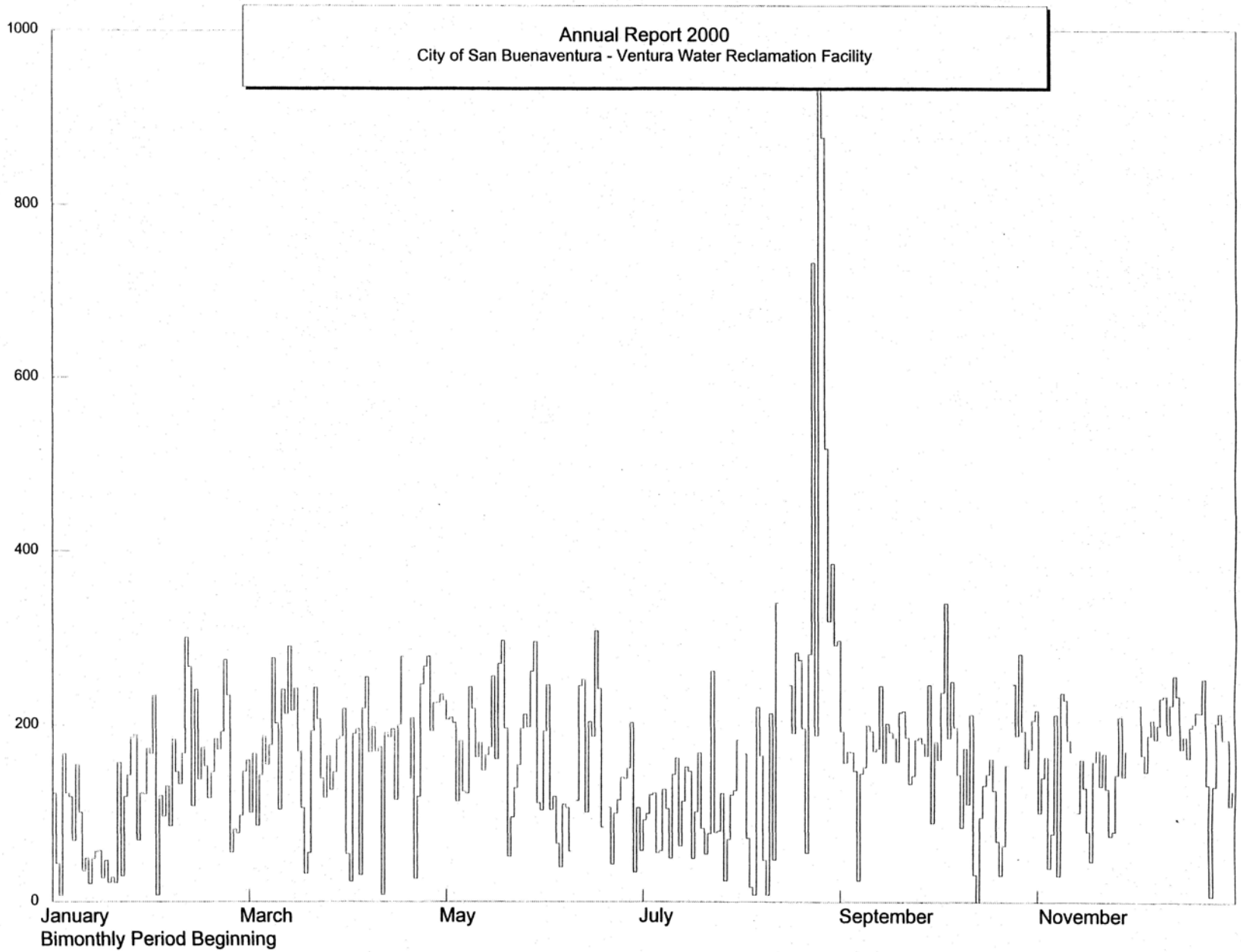

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent BOD - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 7 Dday Average BOD - mg/l

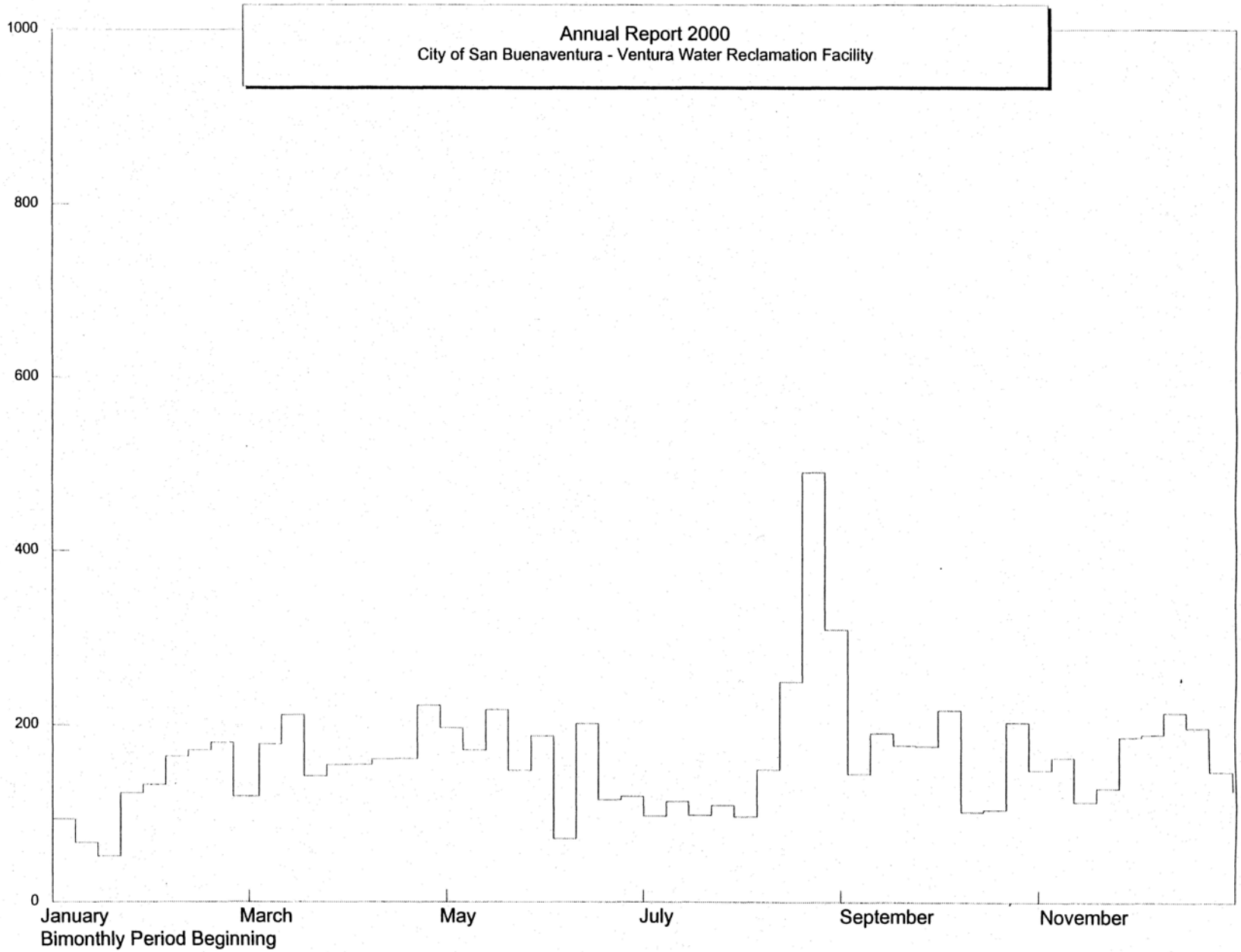


Effluent Transfer Station
Effluent 7 Day Average BOD - mg/l

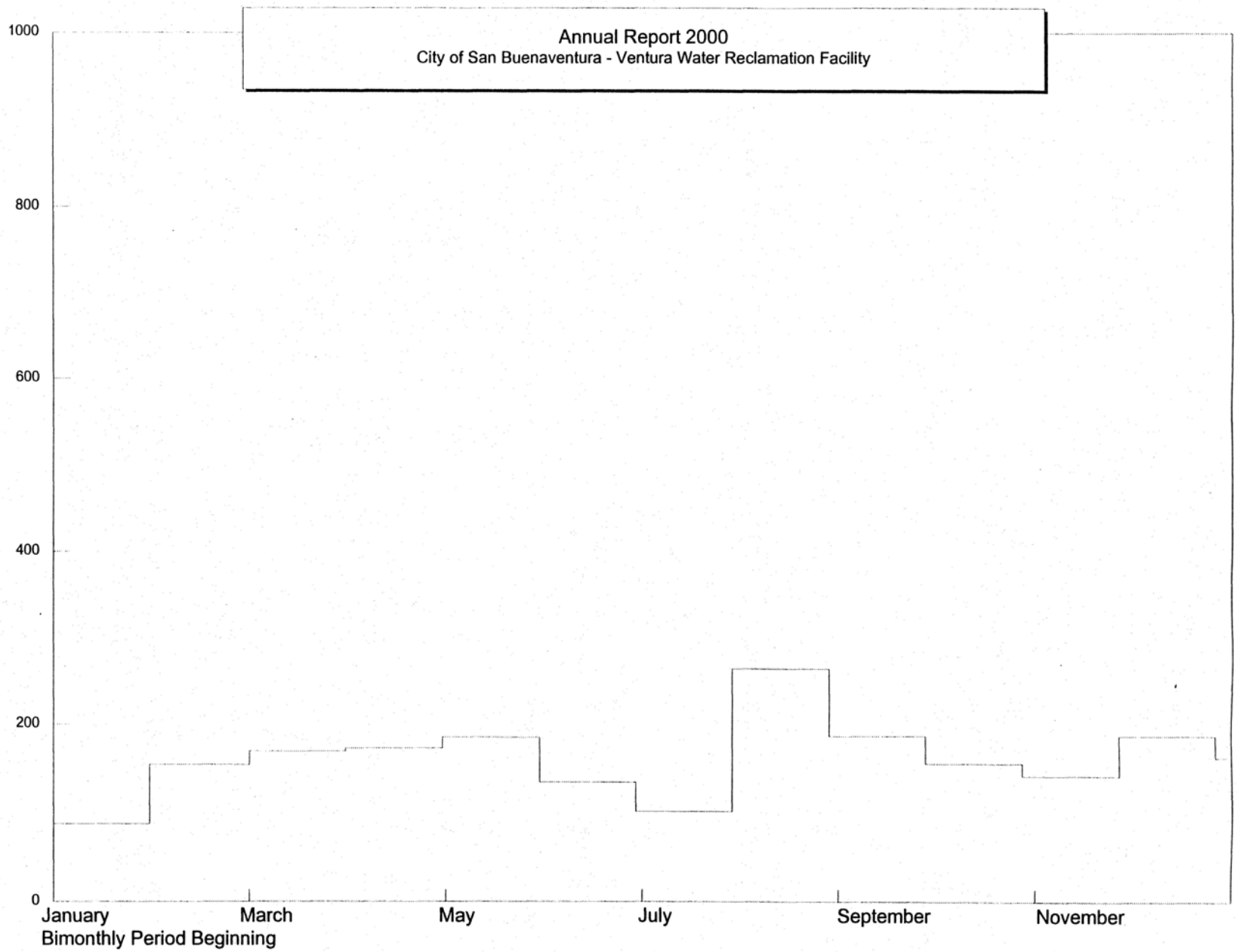

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average BOD - mg/l



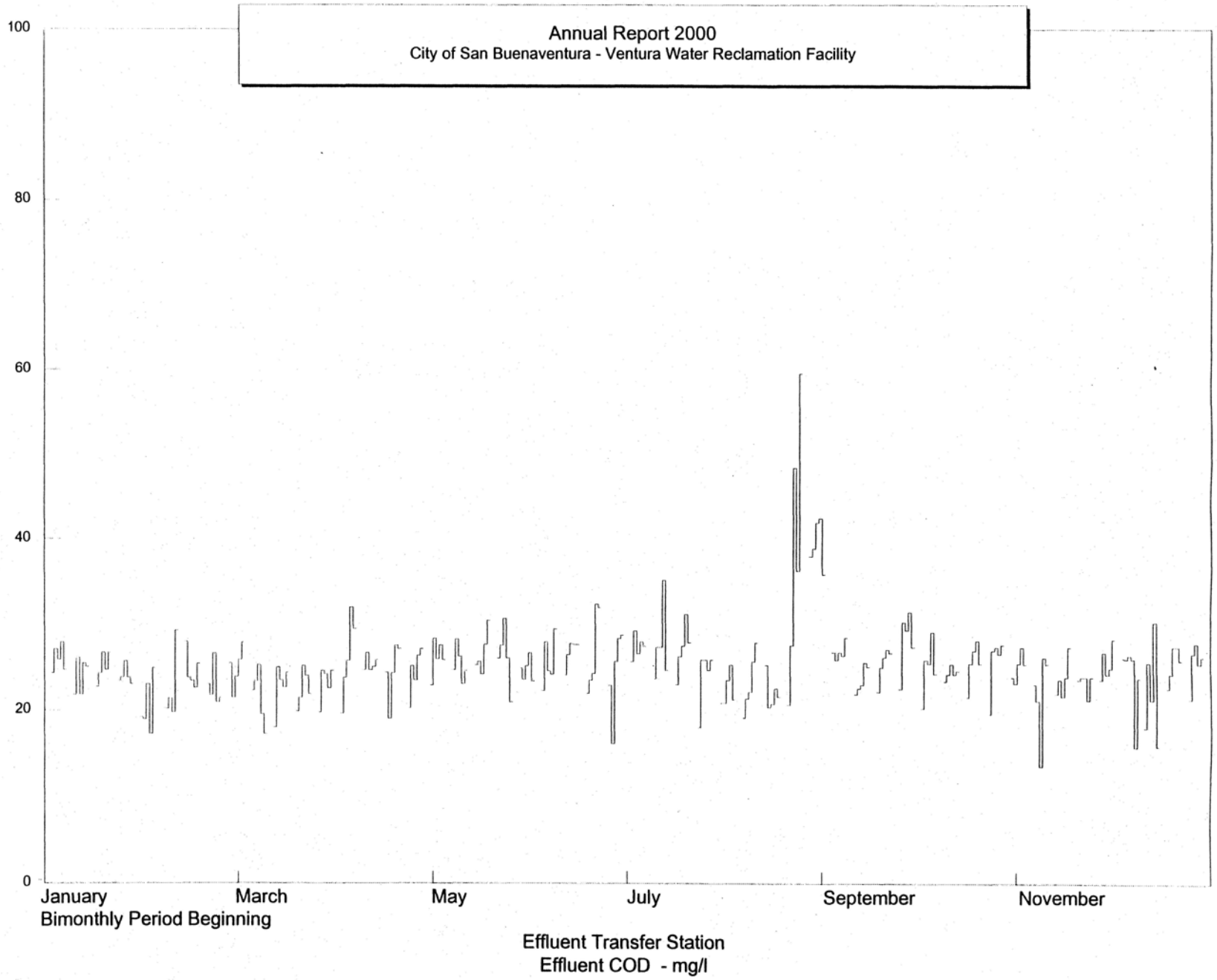
Effluent Transfer Station
Effluent BOD Mass Emission Rate - mg/l

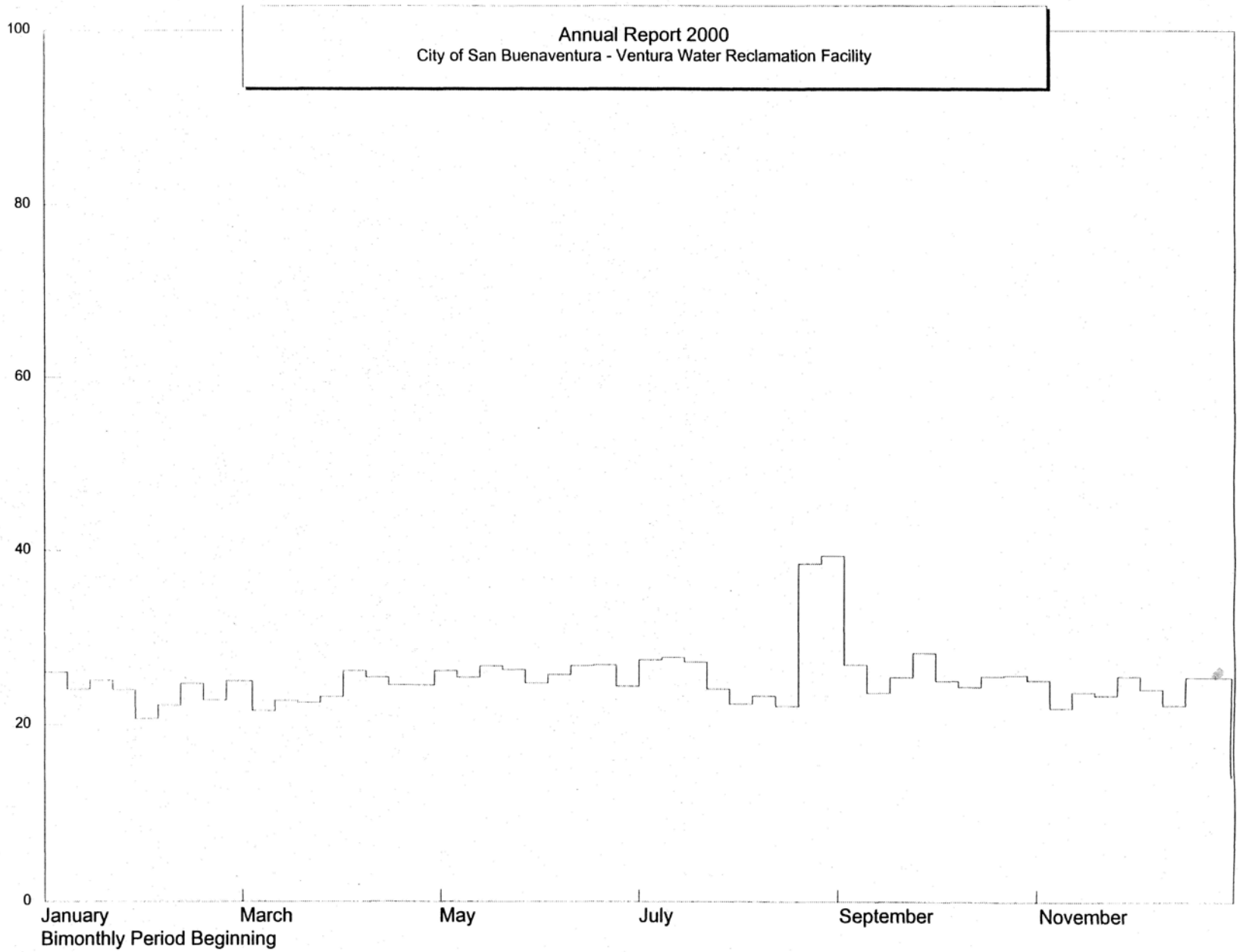


Effluent Transfer Station
Effluent 7 Day Average BOD Mass Emission Rate - mg/l

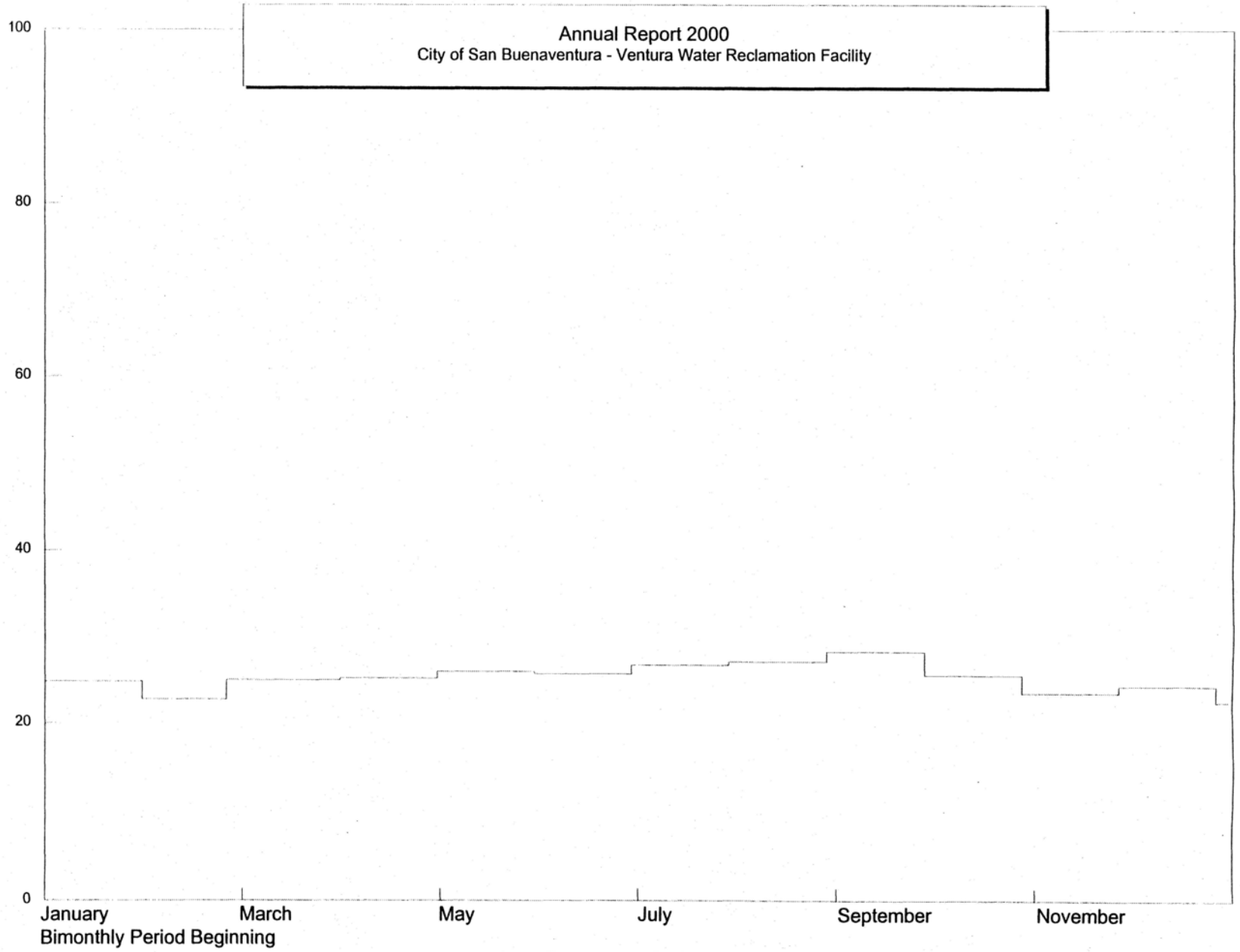


Effluent Transfer Station
Effluent 30 Day Average BOD Mass Emission Rate - mg/l

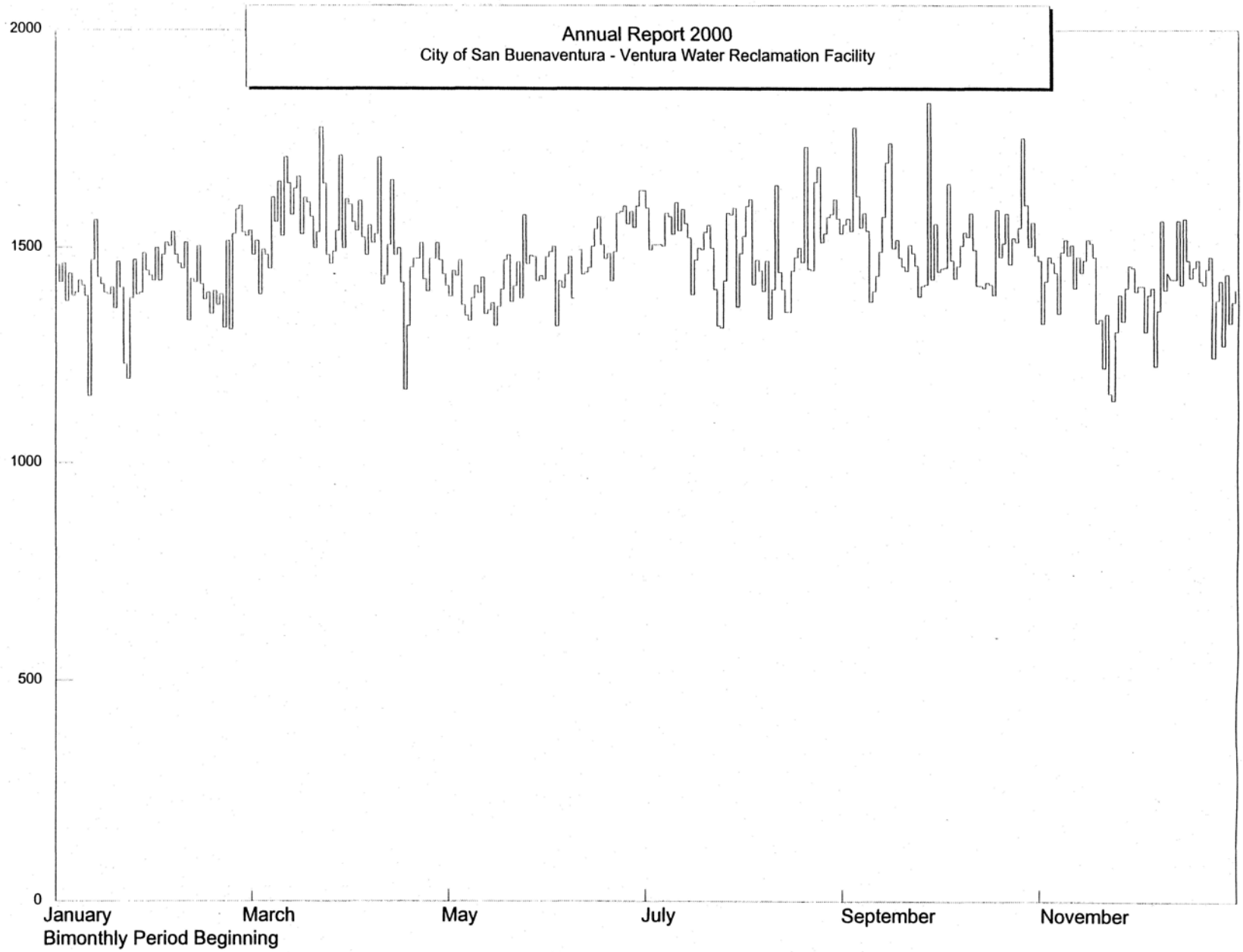

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent COD - mg/l



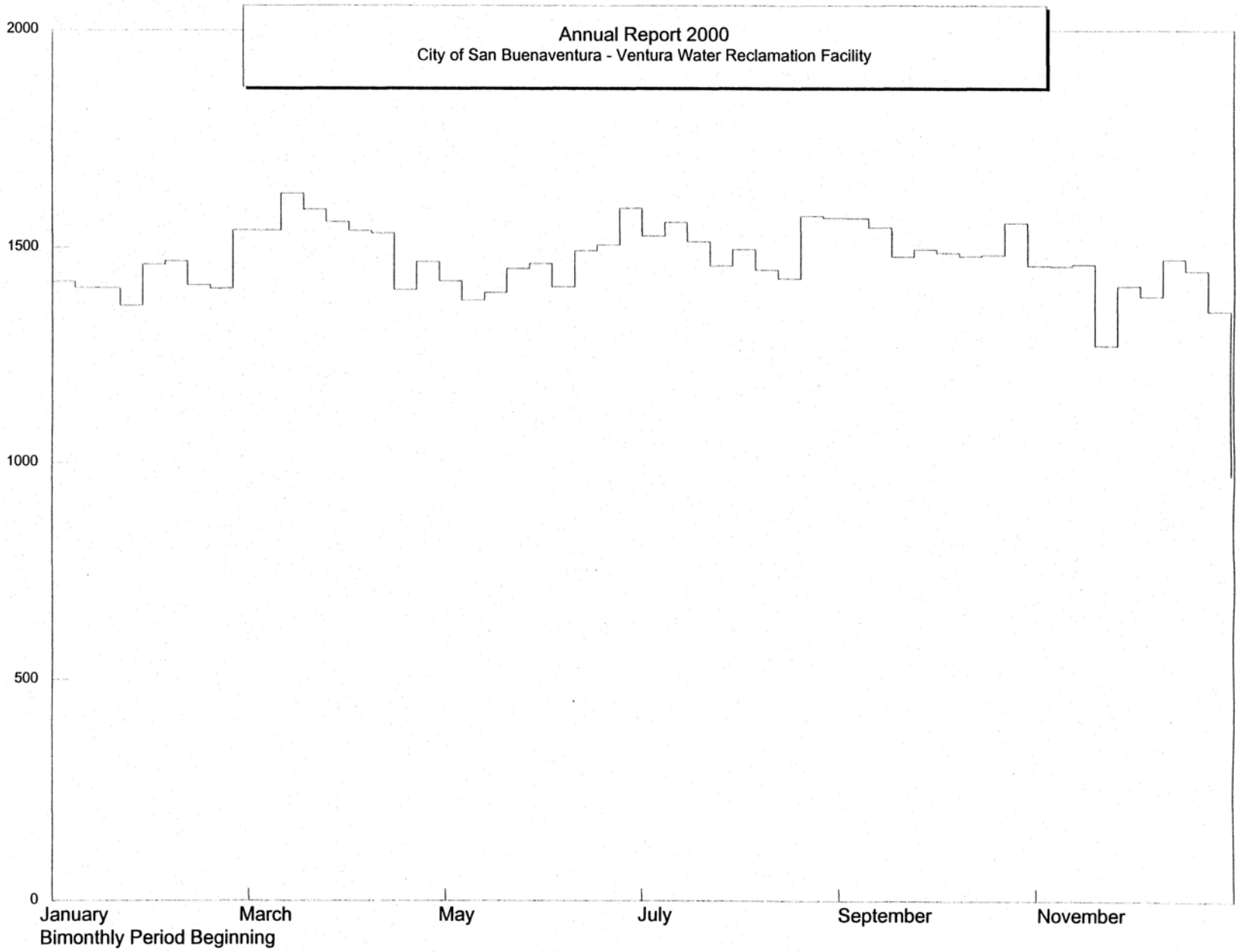
Effluent Transfer Station
Effluent 7 Day Average COD - mg/l



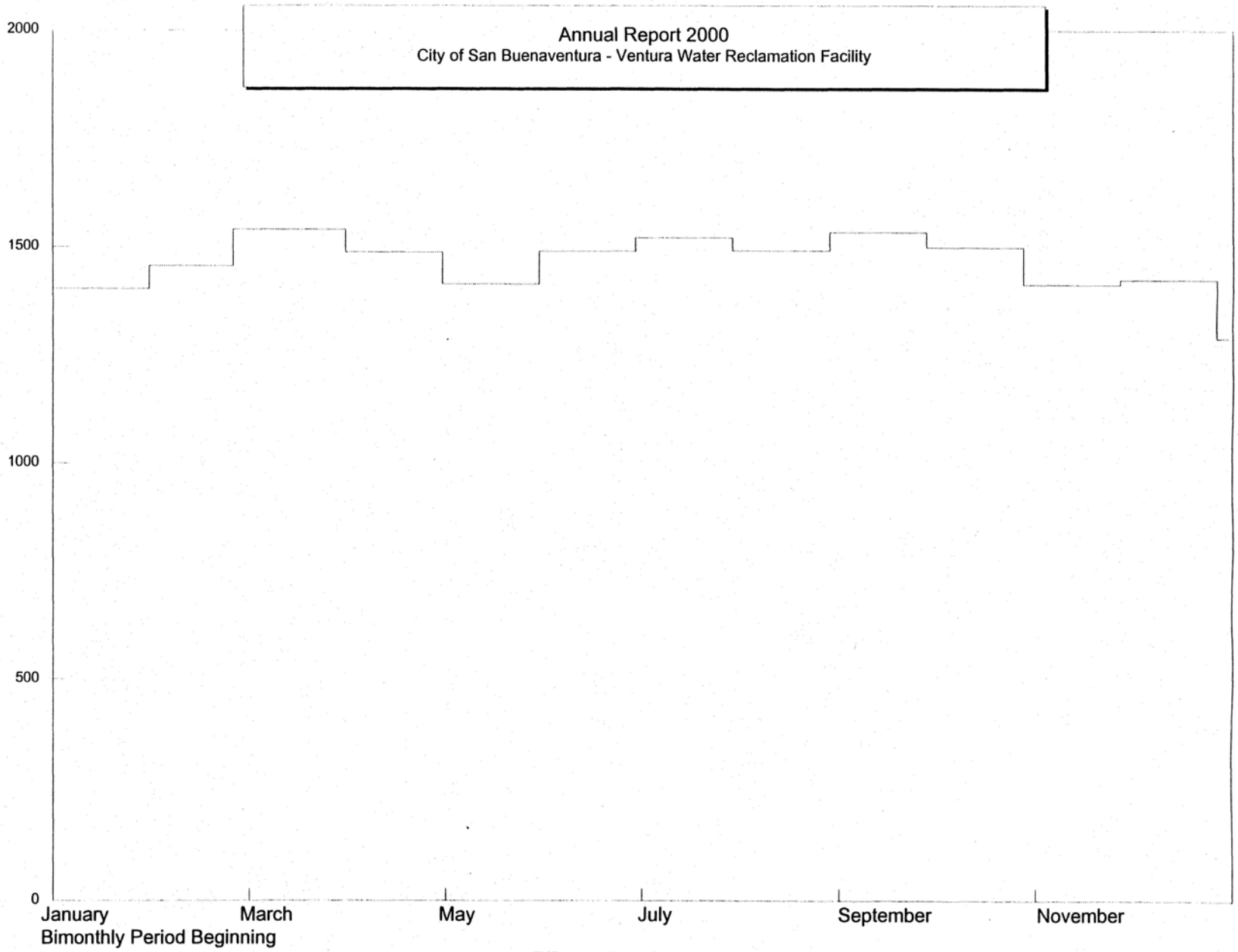
Effluent Transfer Station
Effluent 30 Day Average COD - mg/l



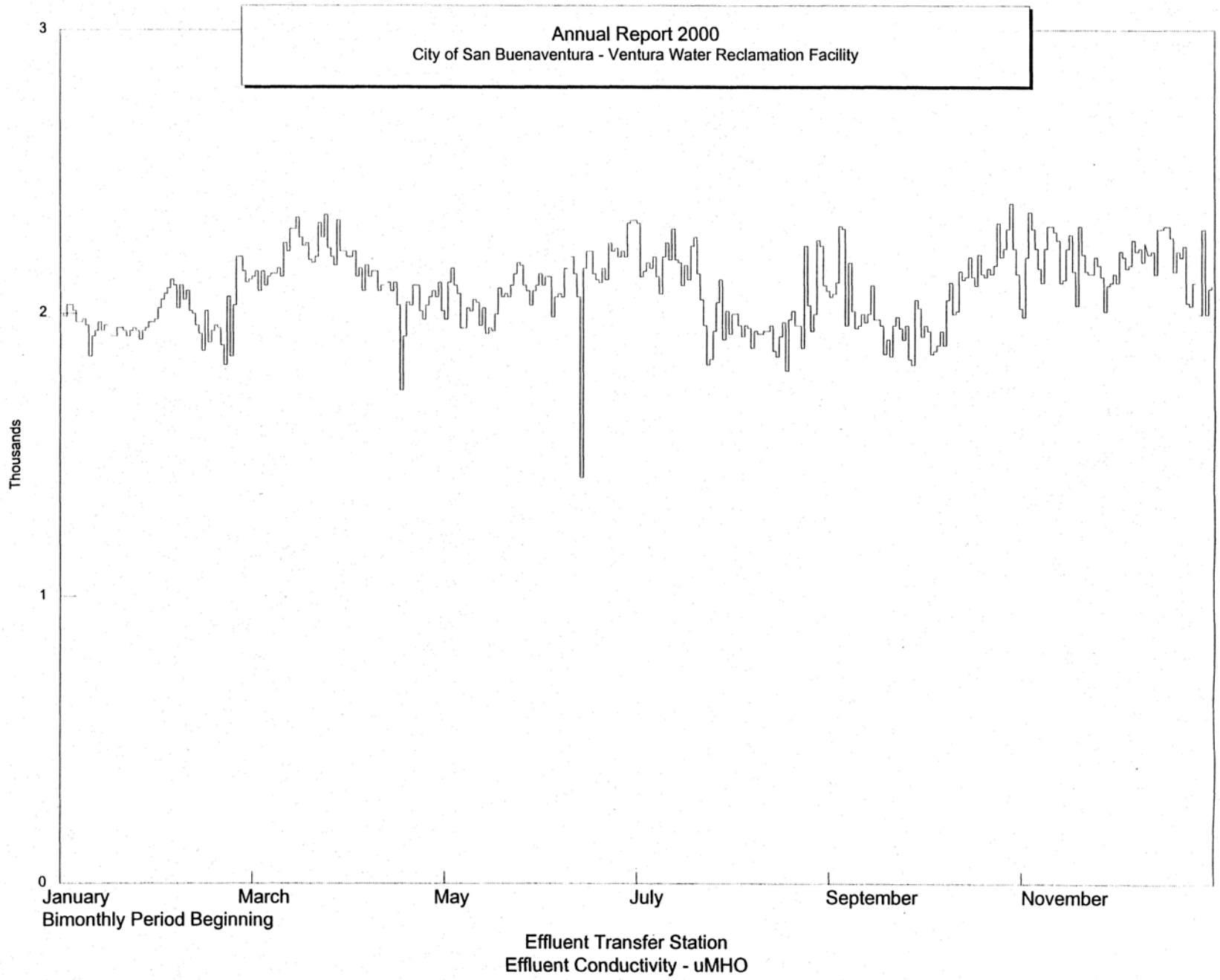
Effluent Transfer Station
Effluent Total Dissolved Solids - mg/l

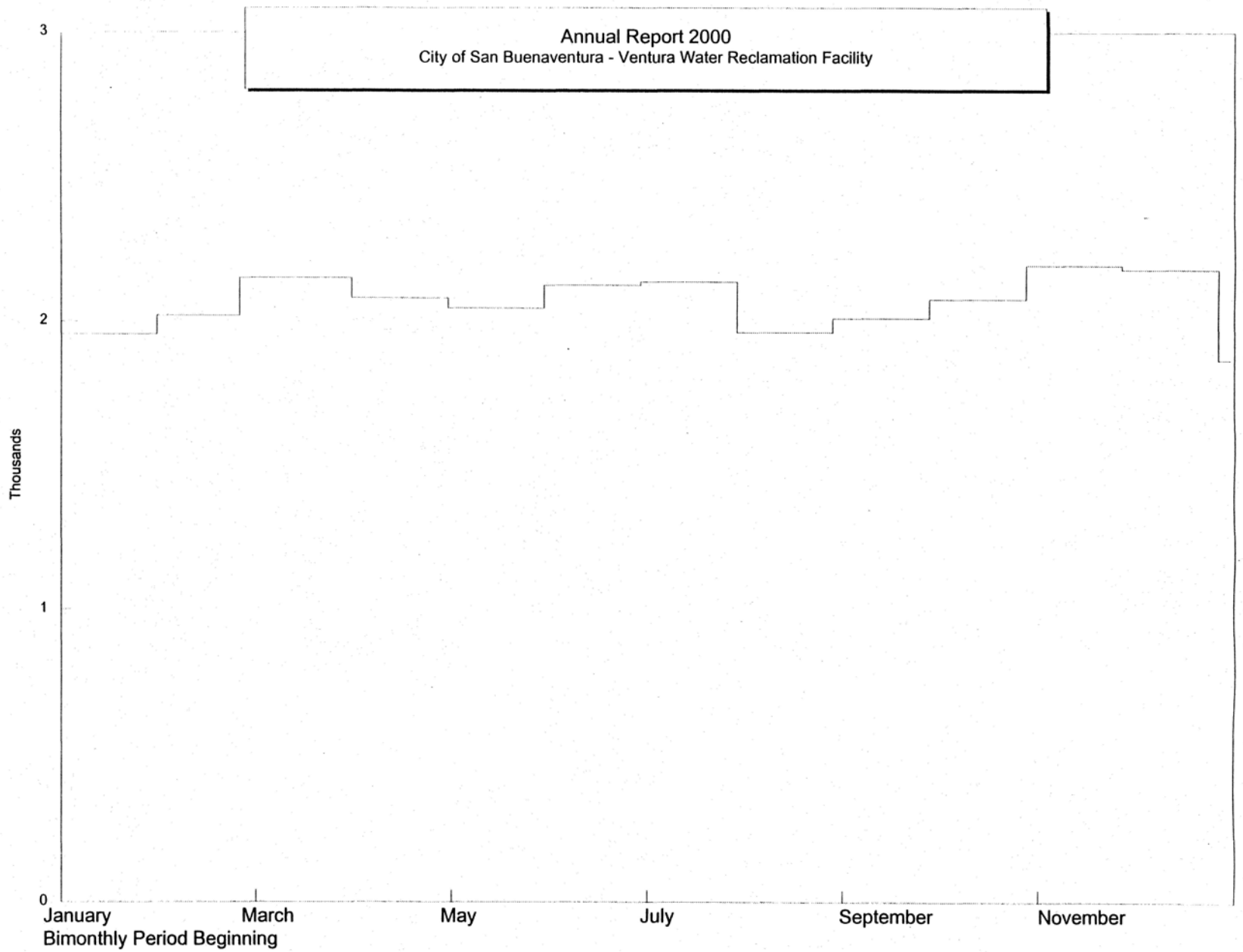


Effluent Transfer Station
Effluent 7 Day Average Total Dissolved Solids - mg/l

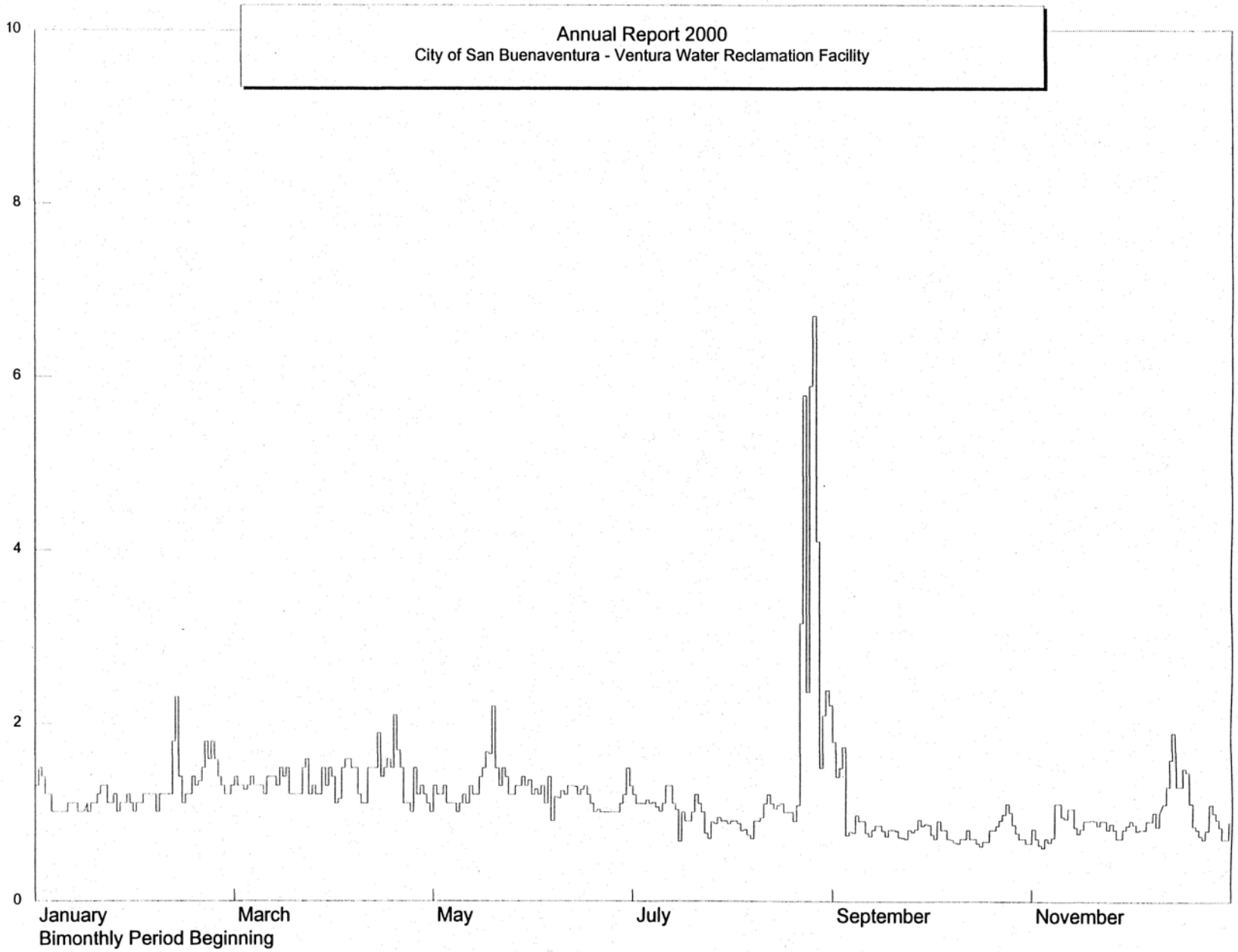


Effluent Transfer Station
Effluent 30 Day Average Total Dissolved Solids - mg/l

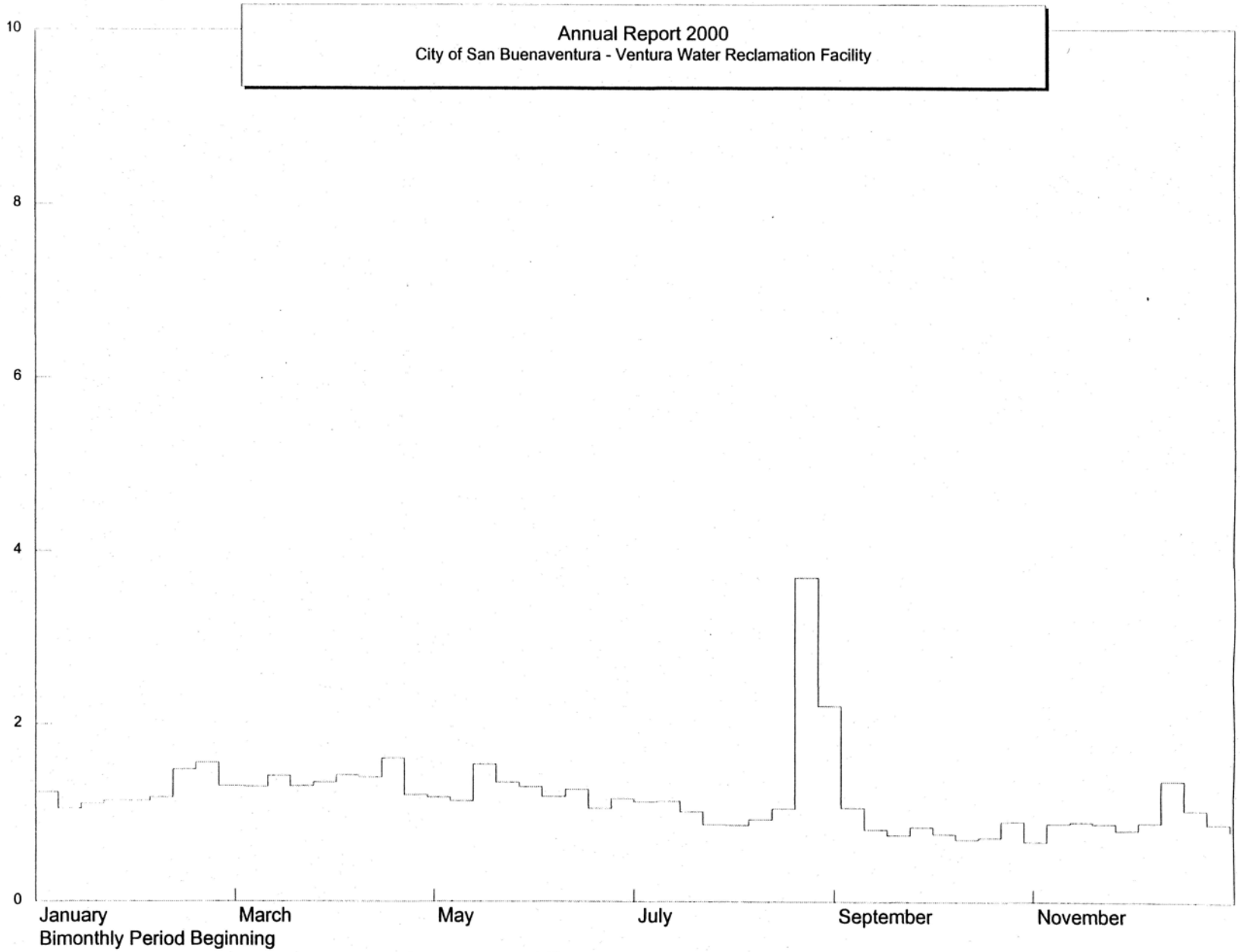

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
3
2
1
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Conductivity - uMHO



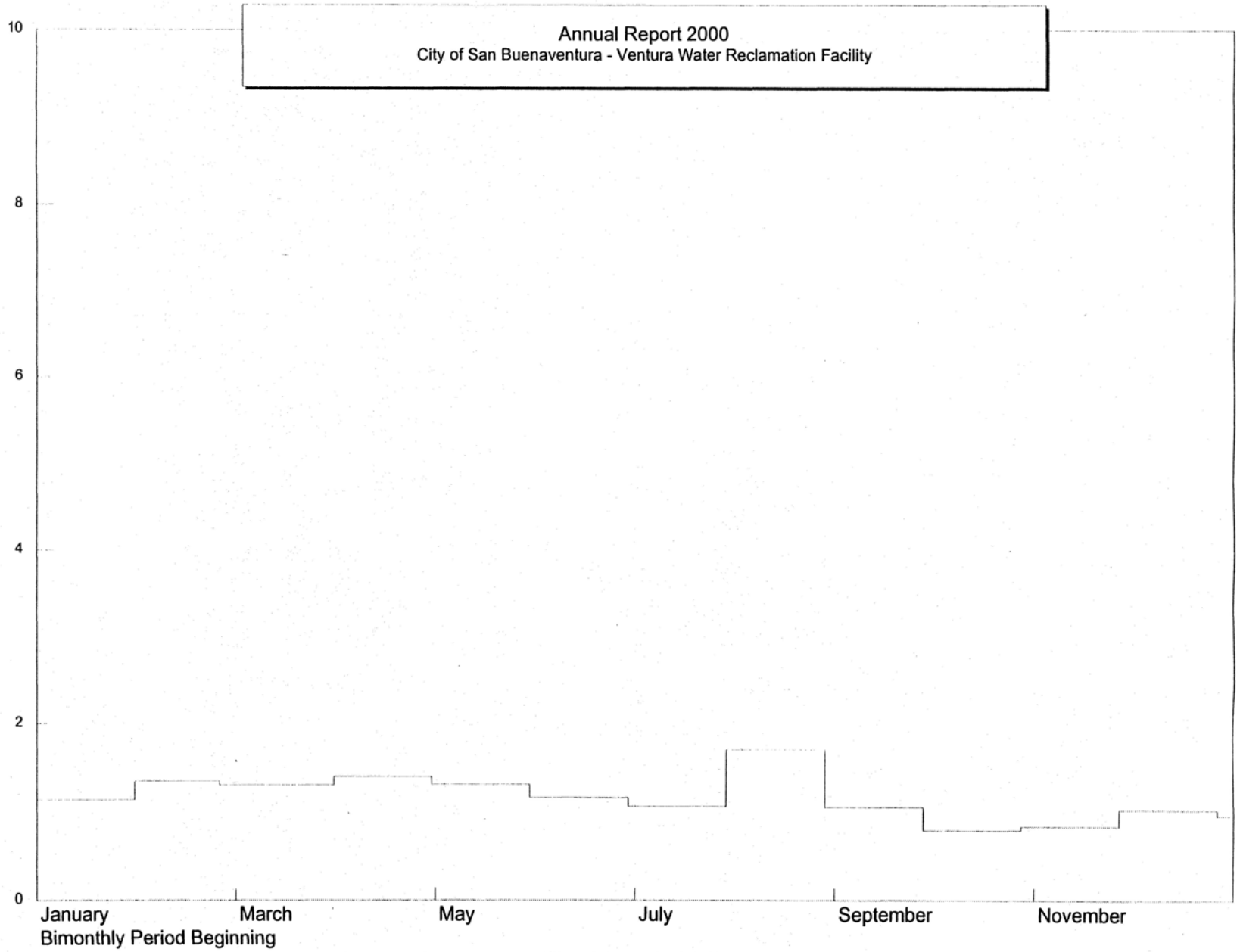
Effluent Transfer Station
Effluent 30 Day Average Conductivity - uMHO



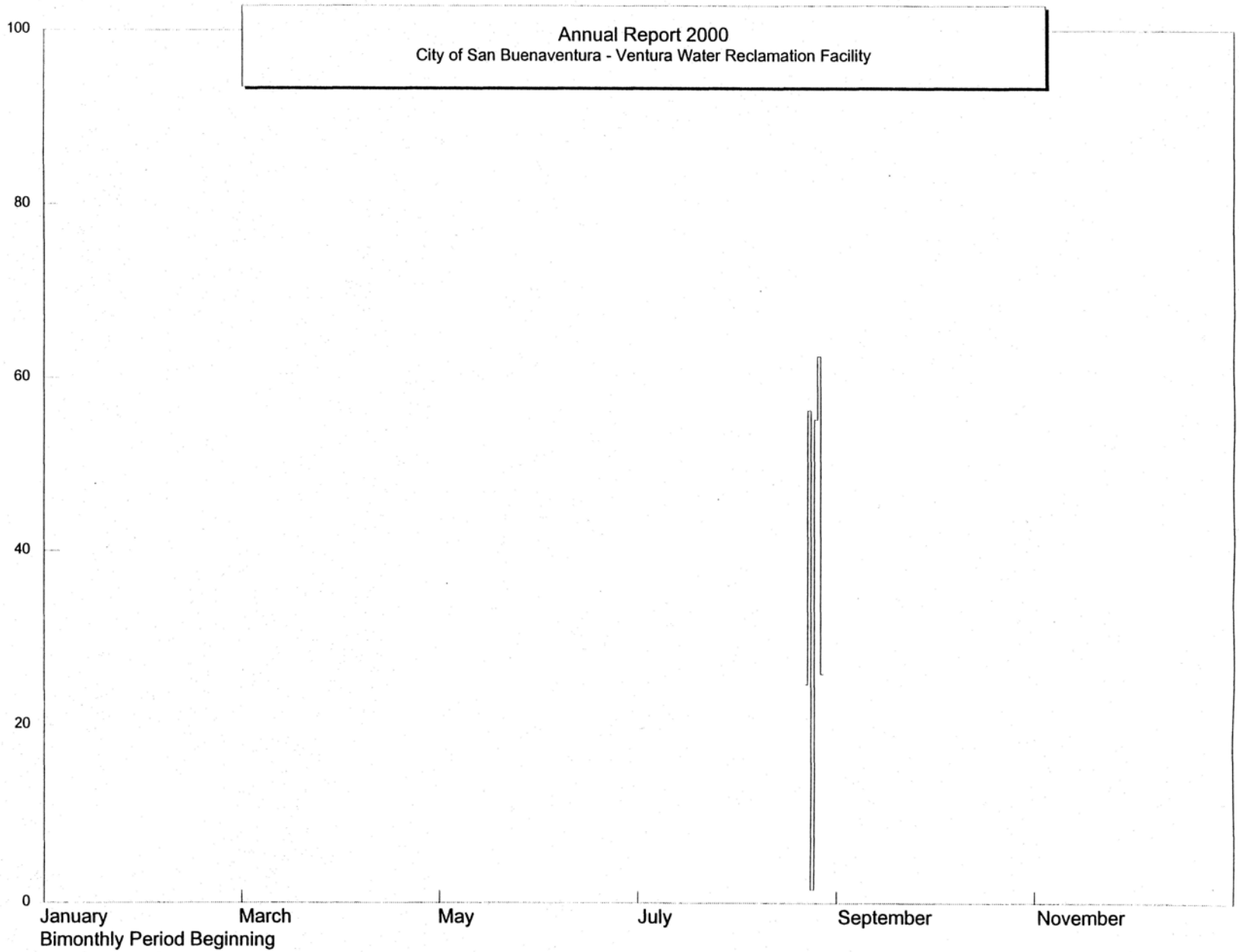
Effluent Transfer Station
Effluent Daily Average Turbidity - NTU



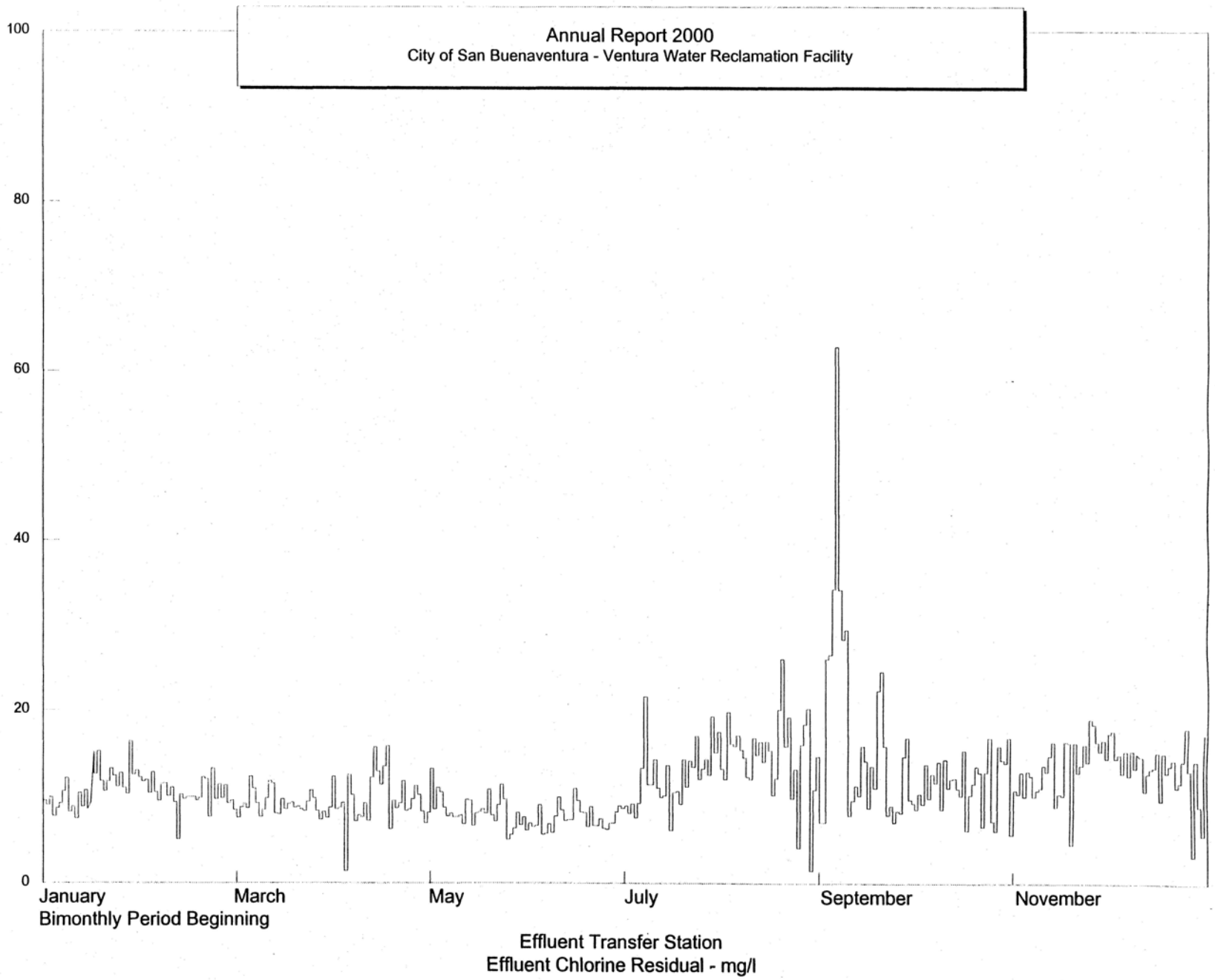
Effluent Transfer Station
Effluent 7 Day Average Turbidity - NTU

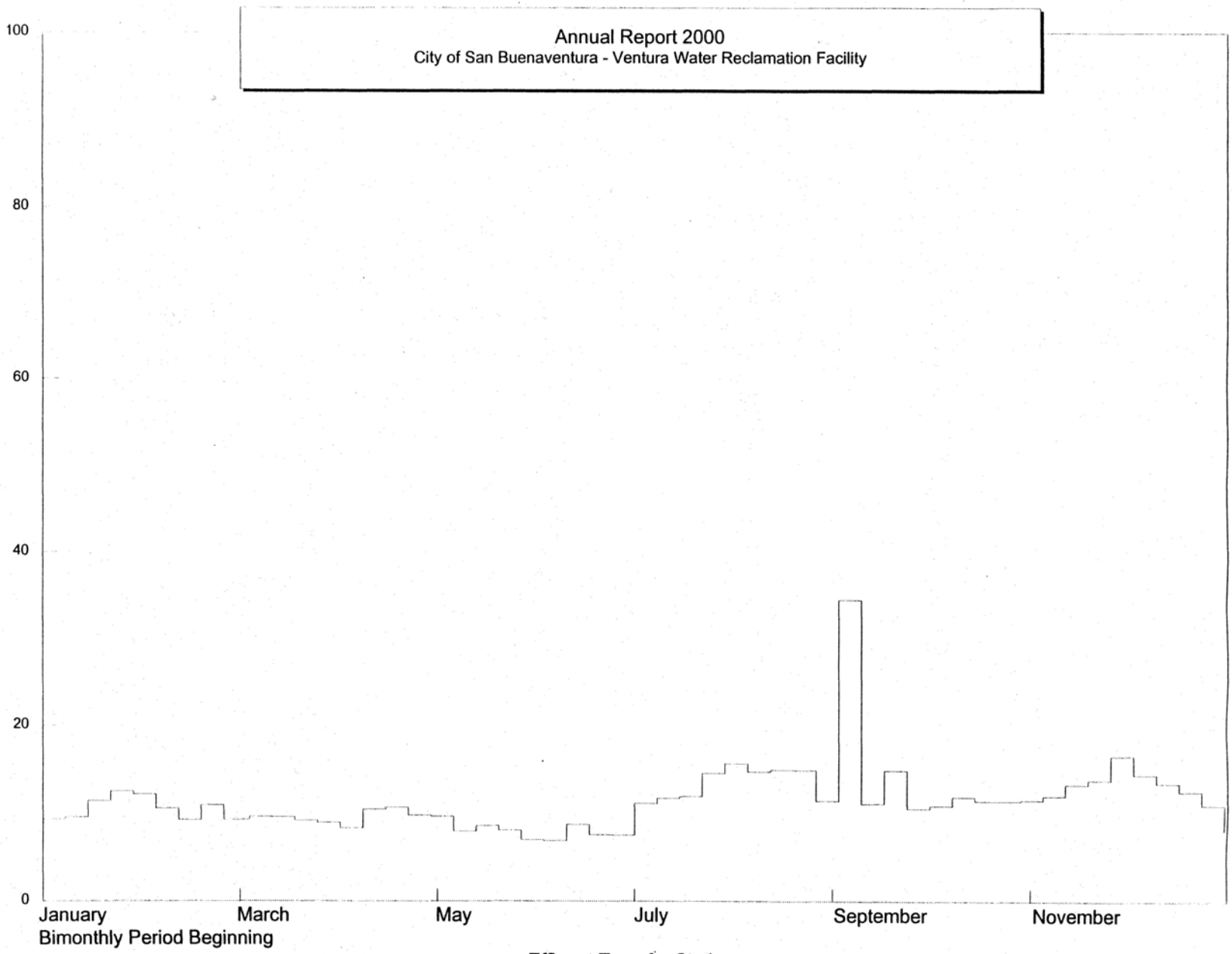


Effluent Transfer Station
Effluent 30 Day Average Turbidity - NTU

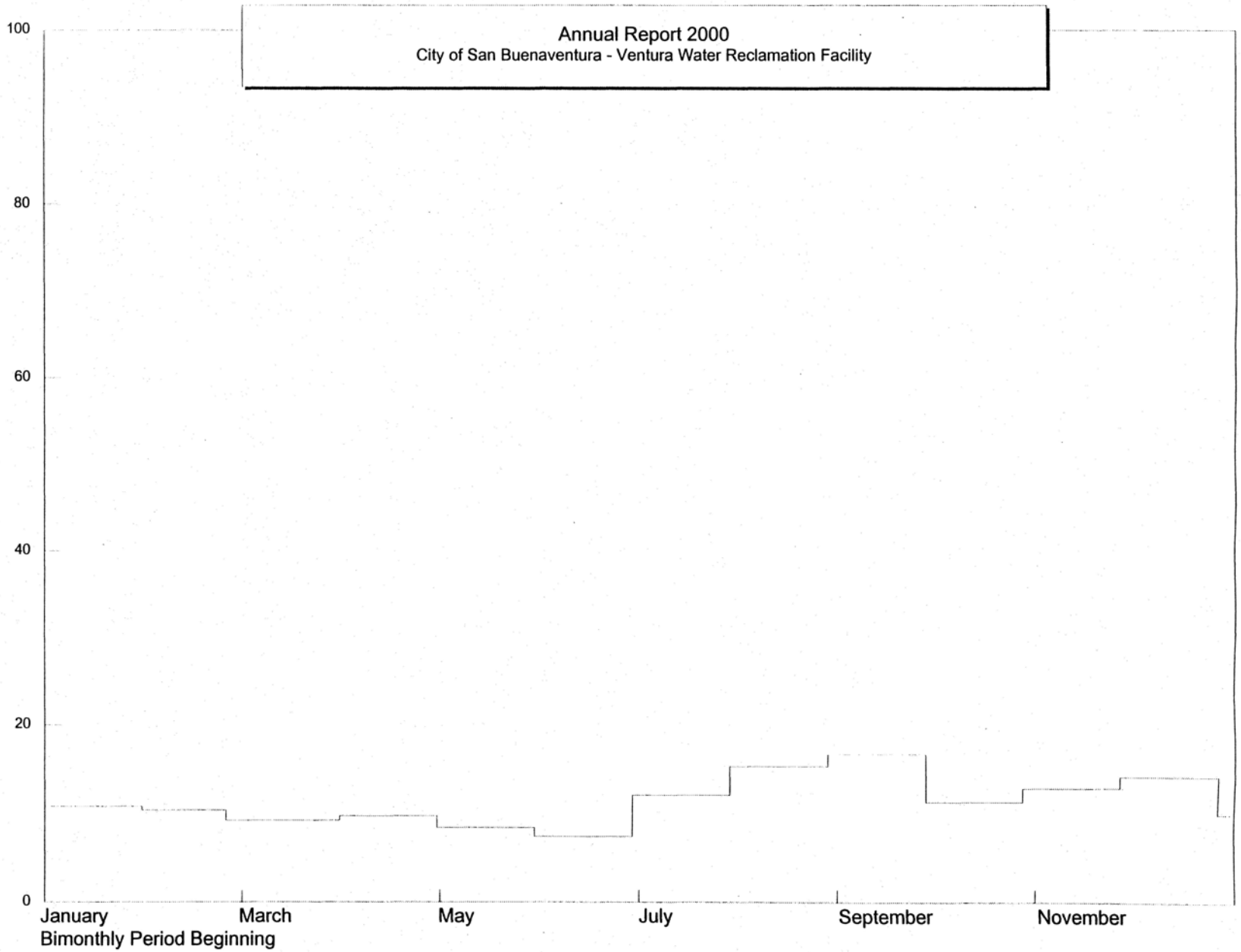


Effluent Transfer Station
Effluent Turbidity Exceeding 5 NTU - %

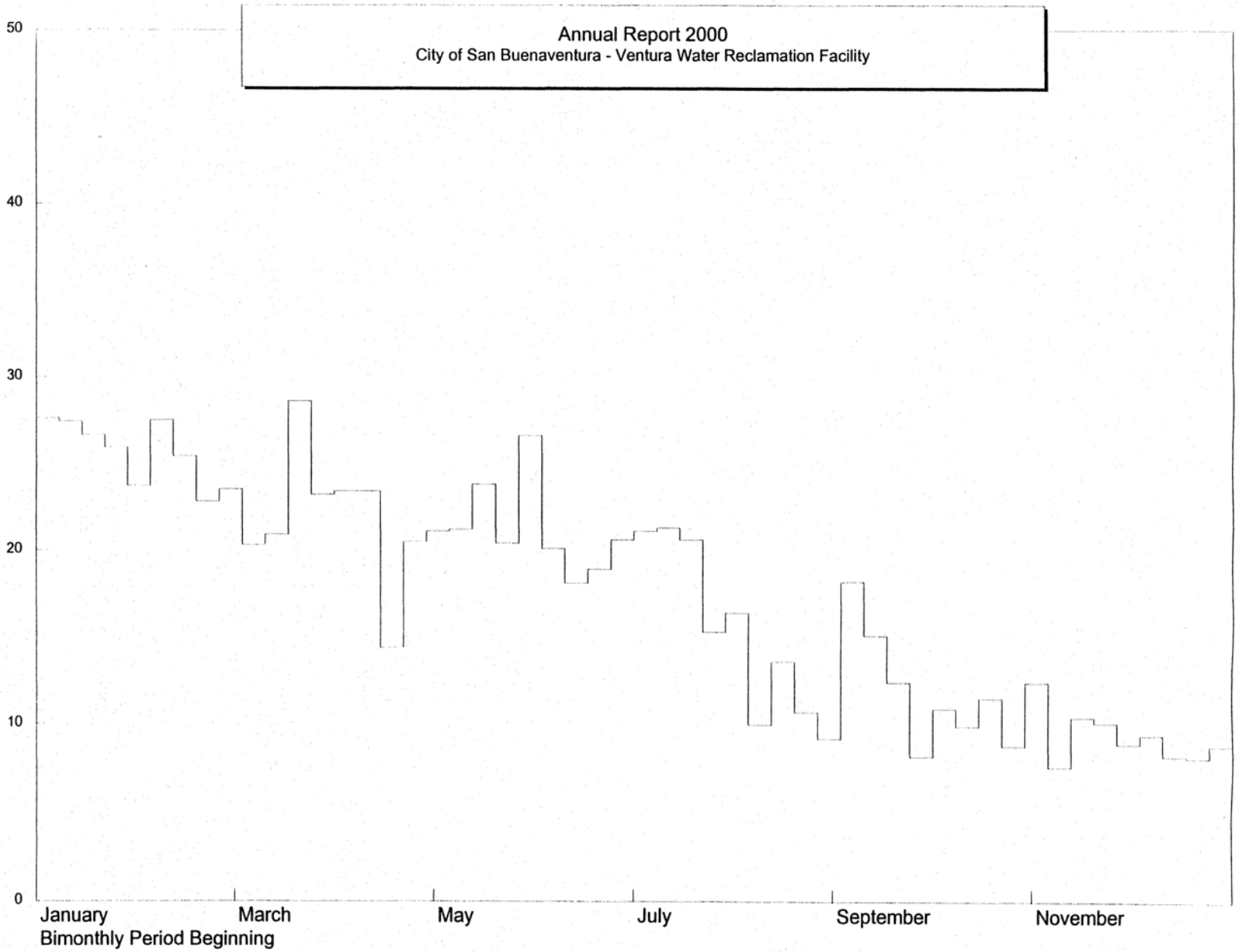

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Chlorine Residual - mg/l



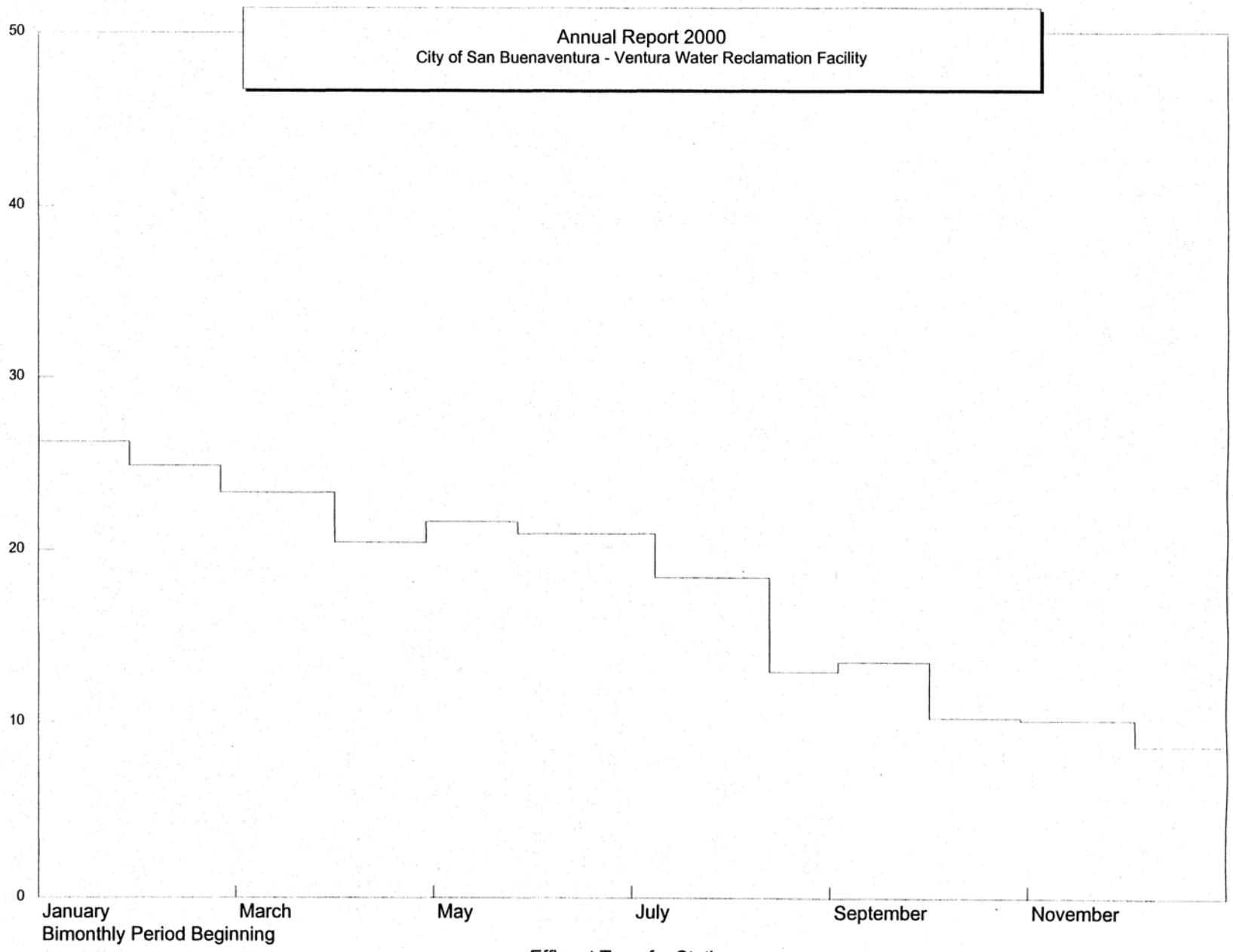
Effluent Transfer Station
Effluent 7 Day Average Chlorine Residual - mg/l



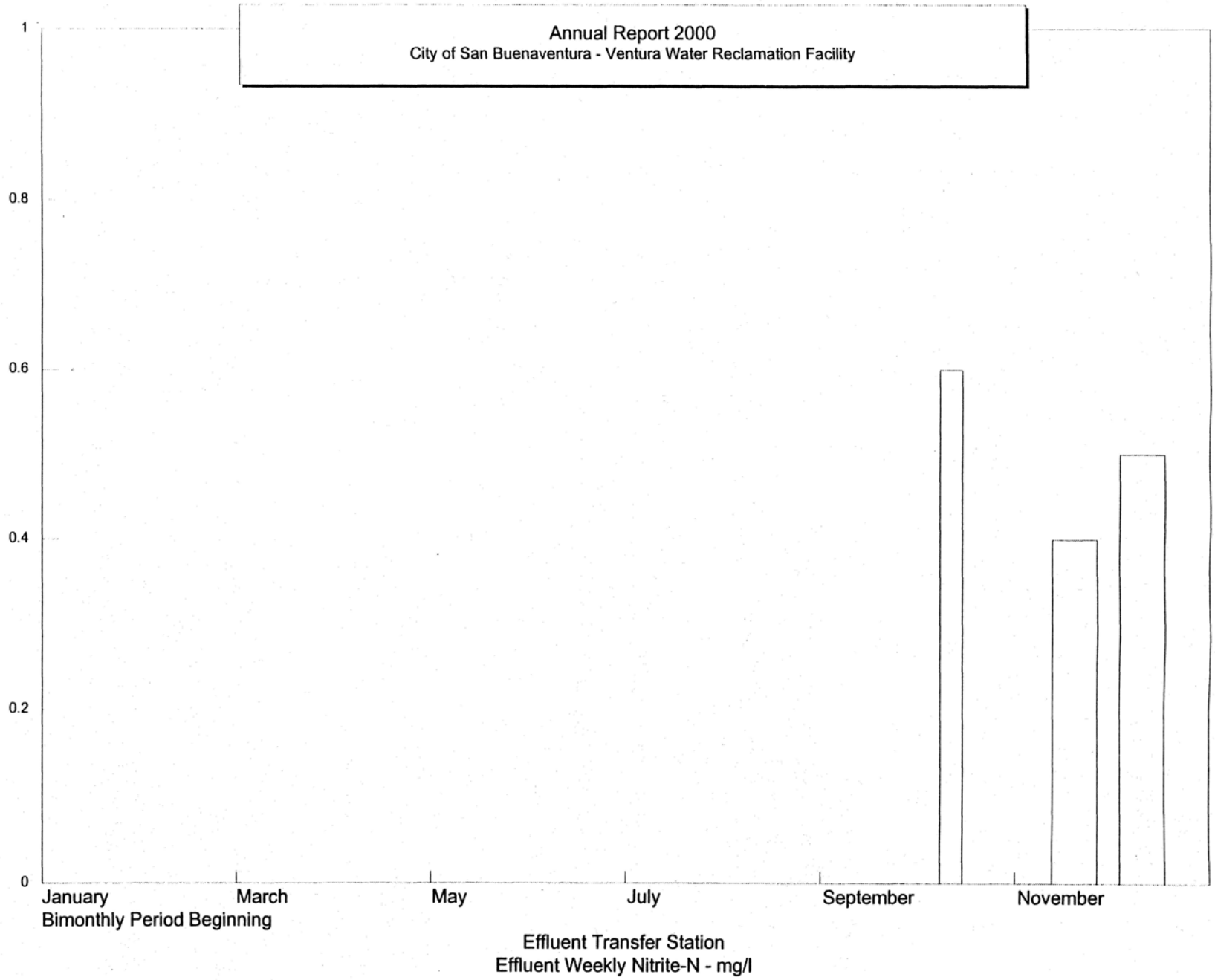
Effluent Transfer Station
Effluent 30 Day Average Chlorine Residual - mg/l

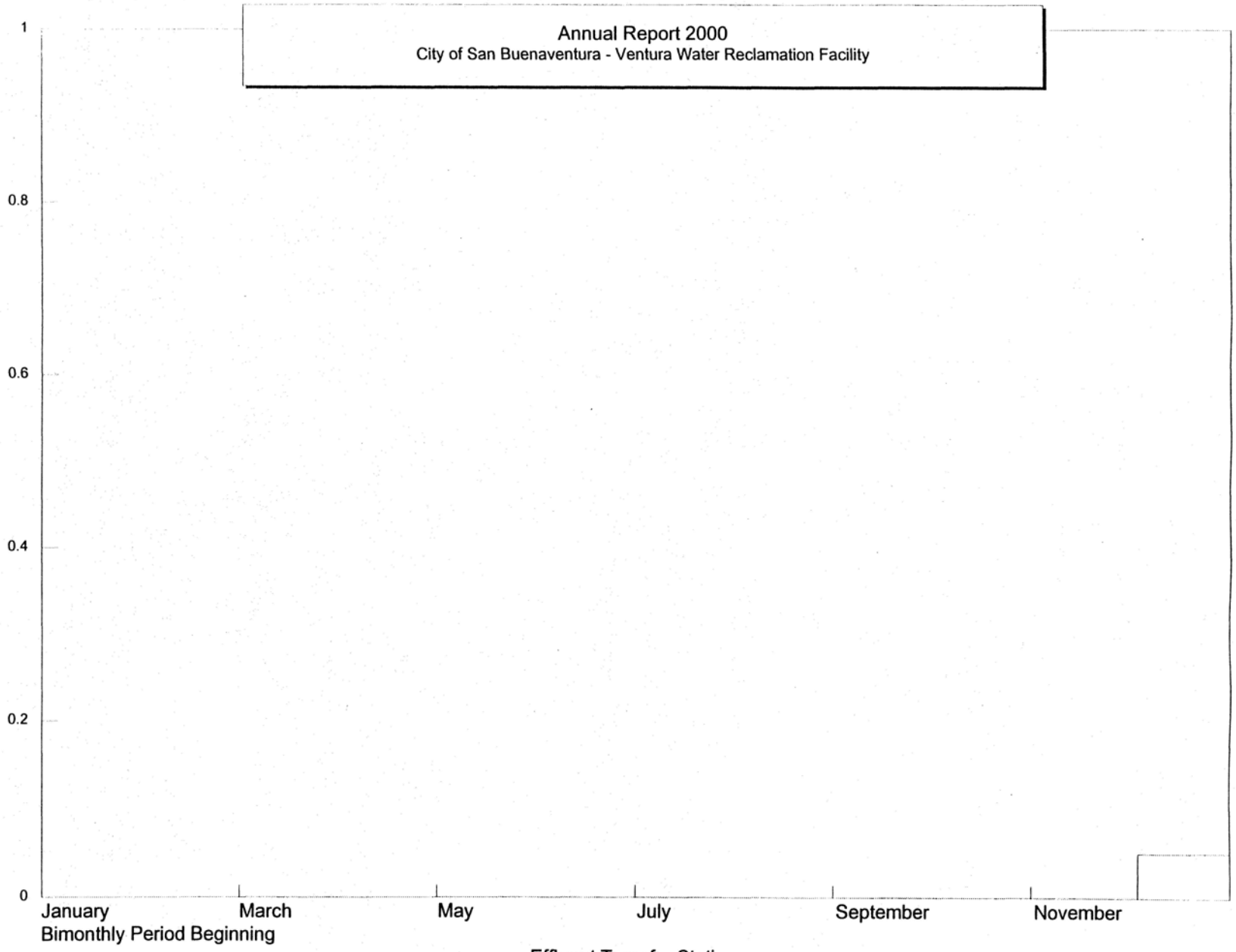


Effluent Transfer Station
Effluent Weekly Nitrate-N - mg/l

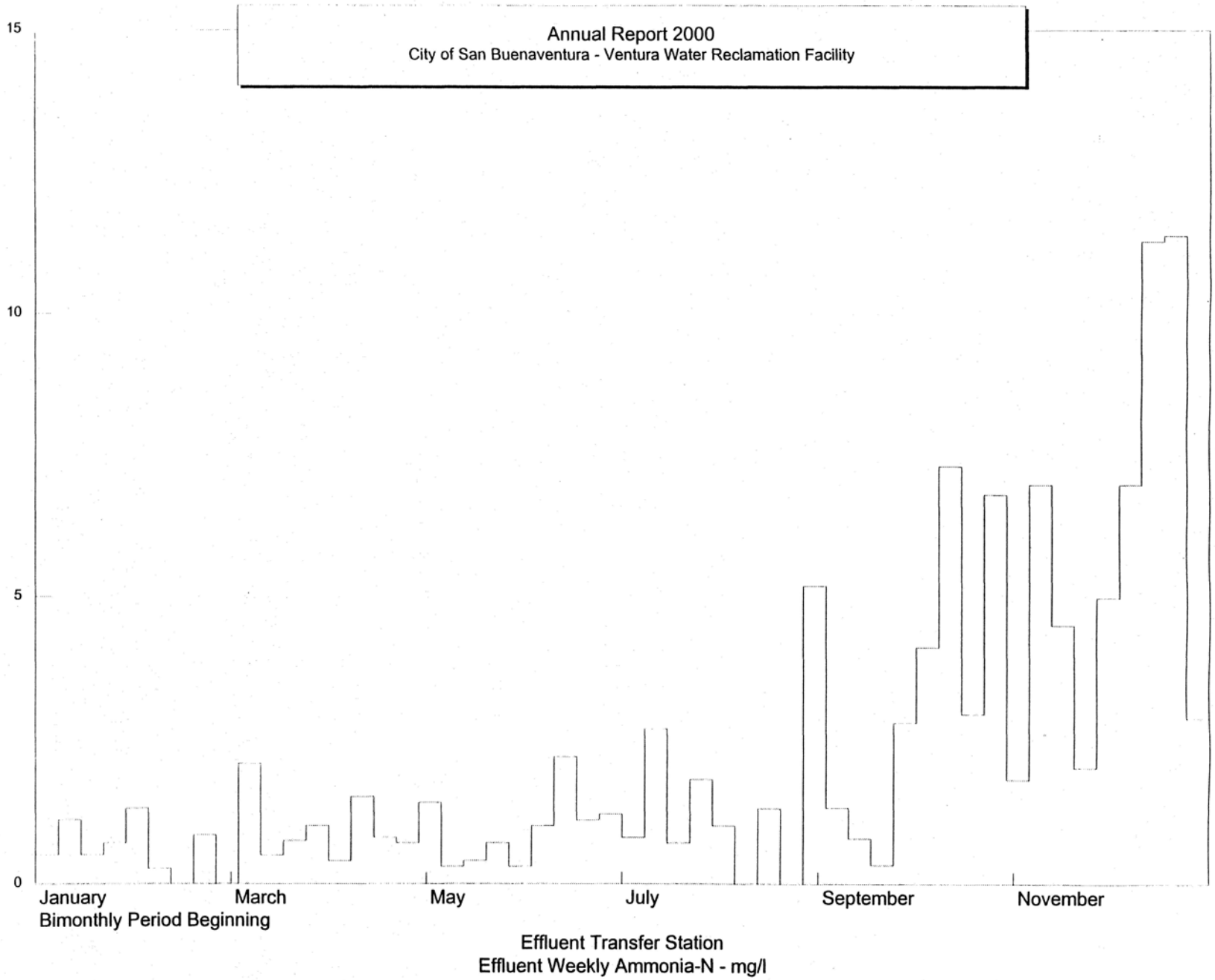


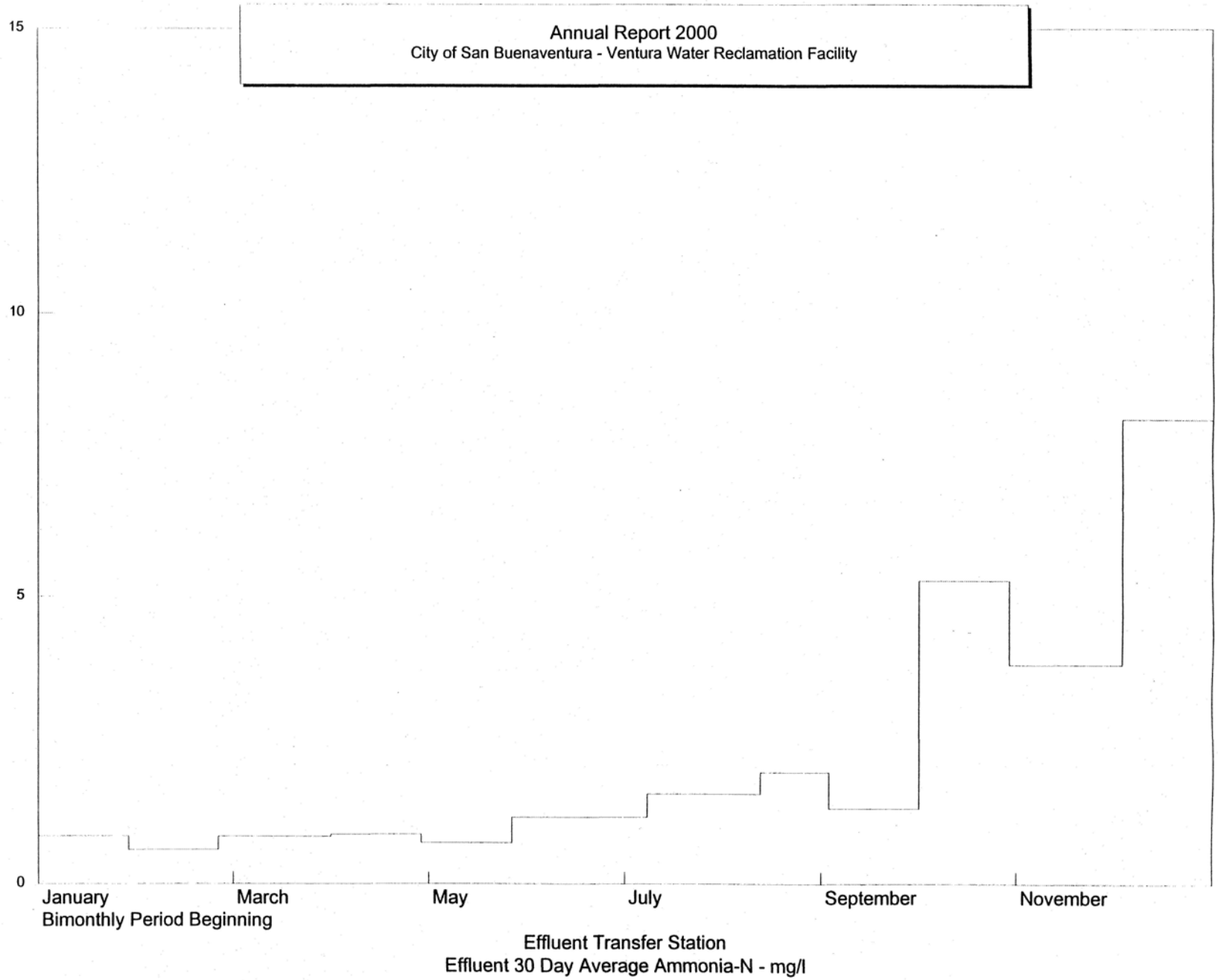
Effluent Transfer Station
Effluent 30 Day Average Nitrate-N - mg/l

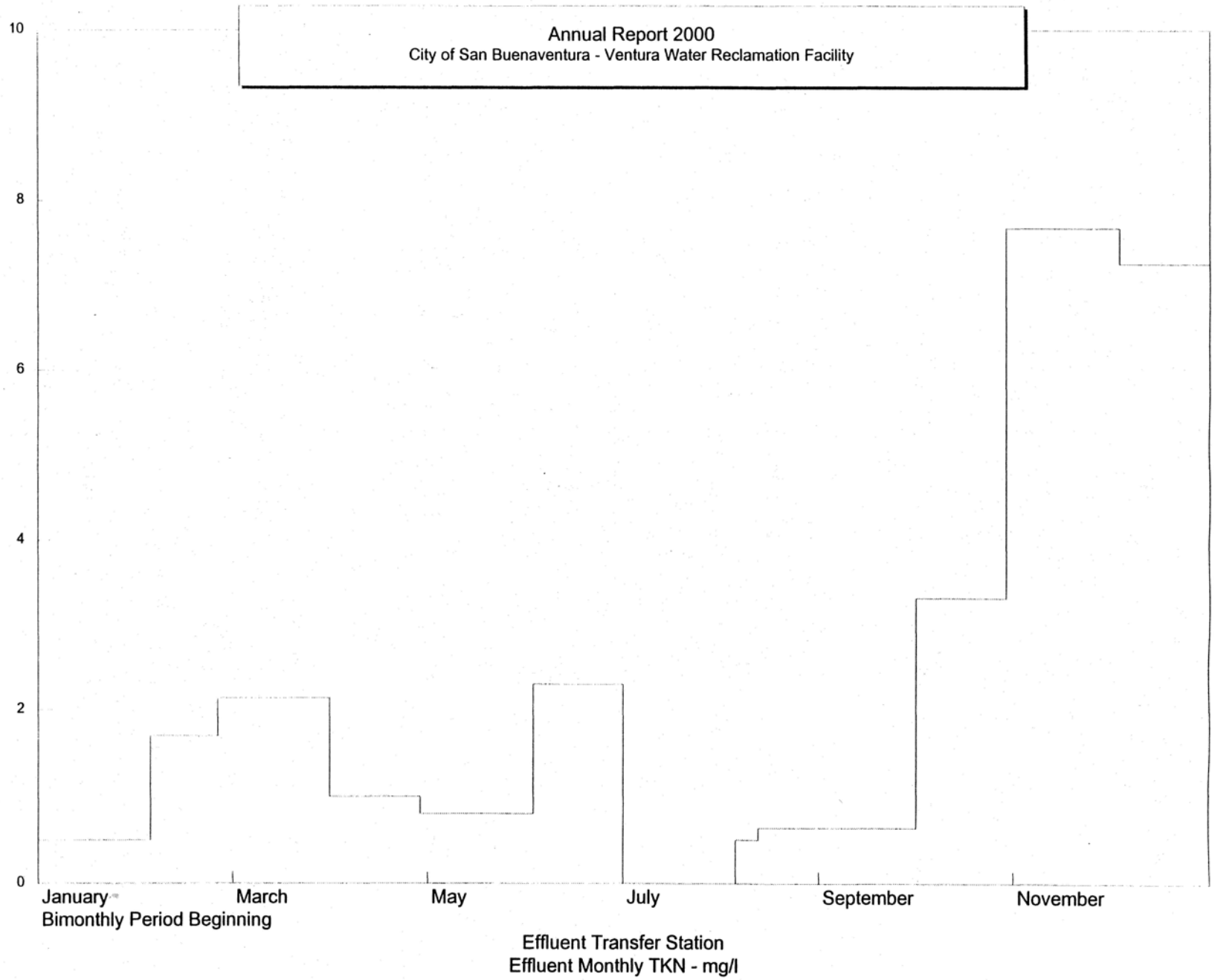

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Weekly Nitrite-N - mg/l

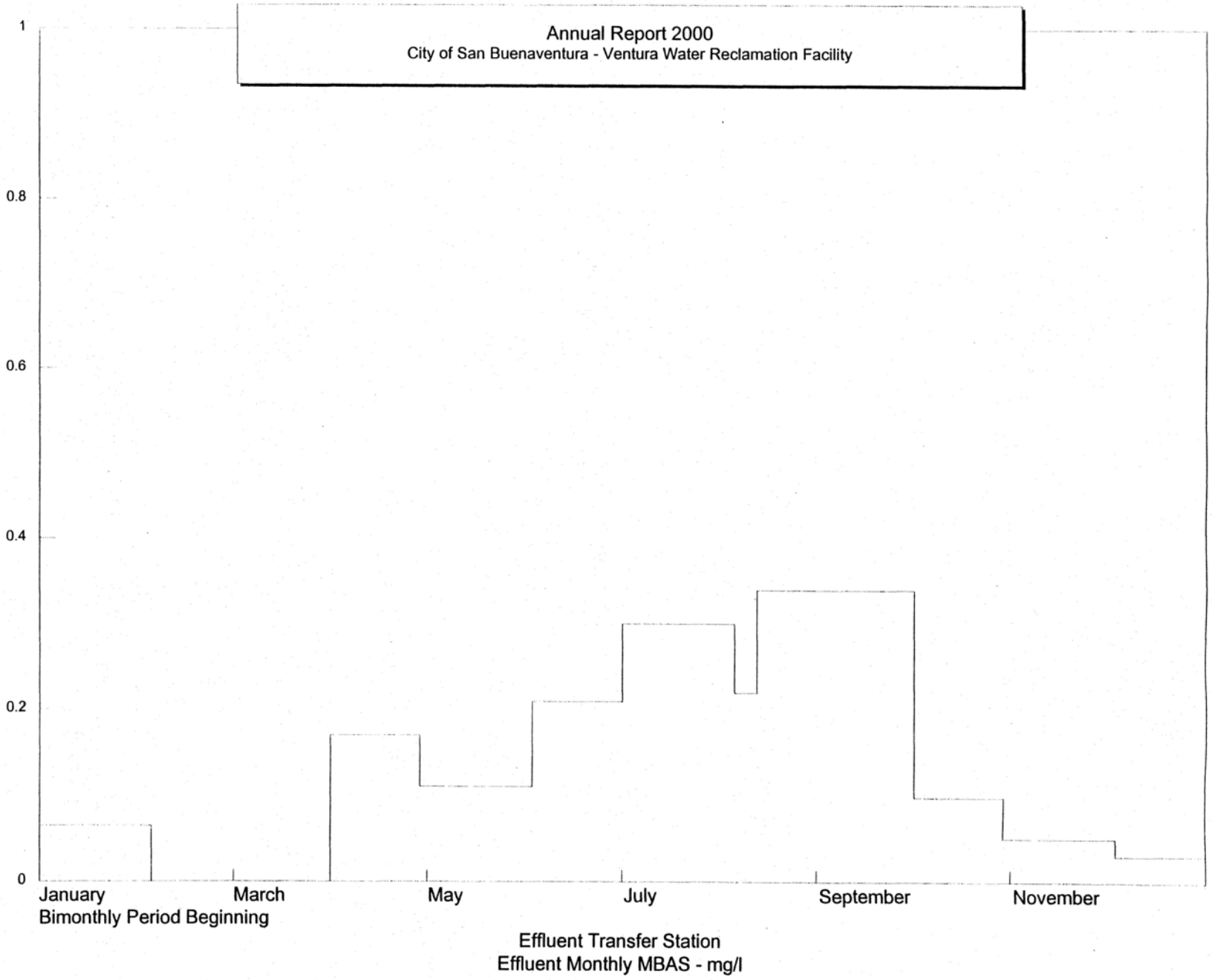


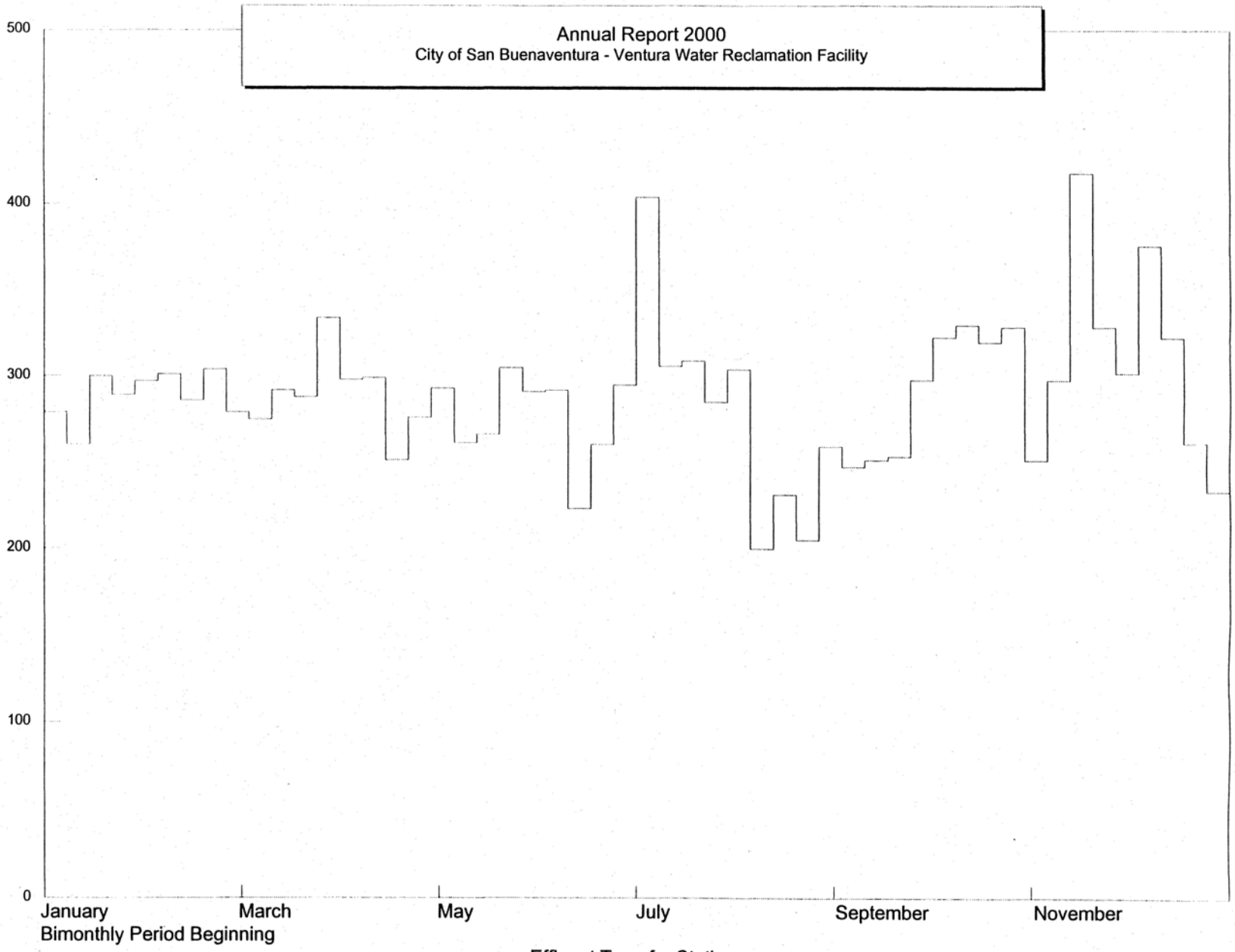
Effluent Transfer Station
Effluent 30 Day Average Nitrite-N - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Weekly Ammonia-N - mg/l

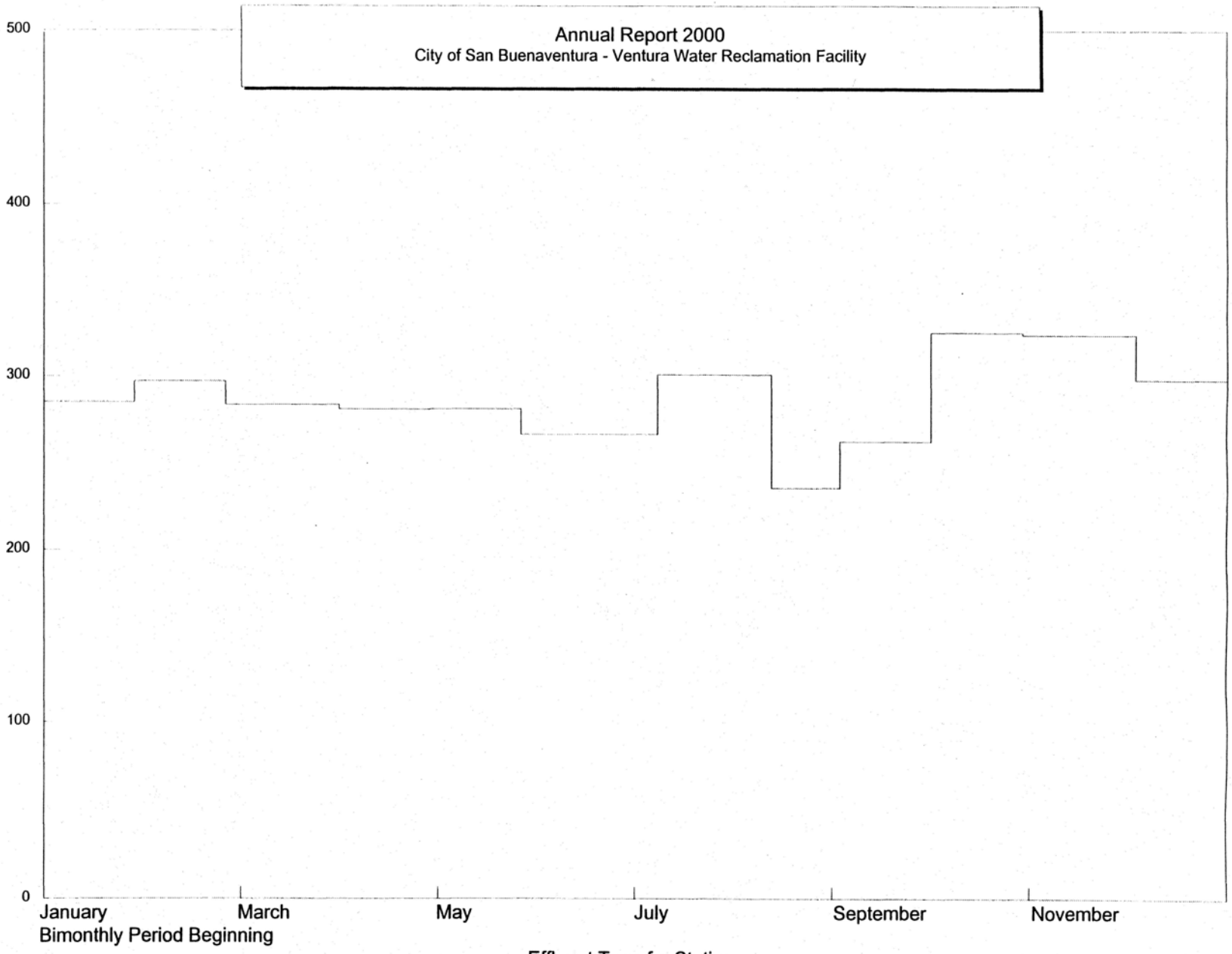

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average Ammonia-N - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly TKN - mg/l

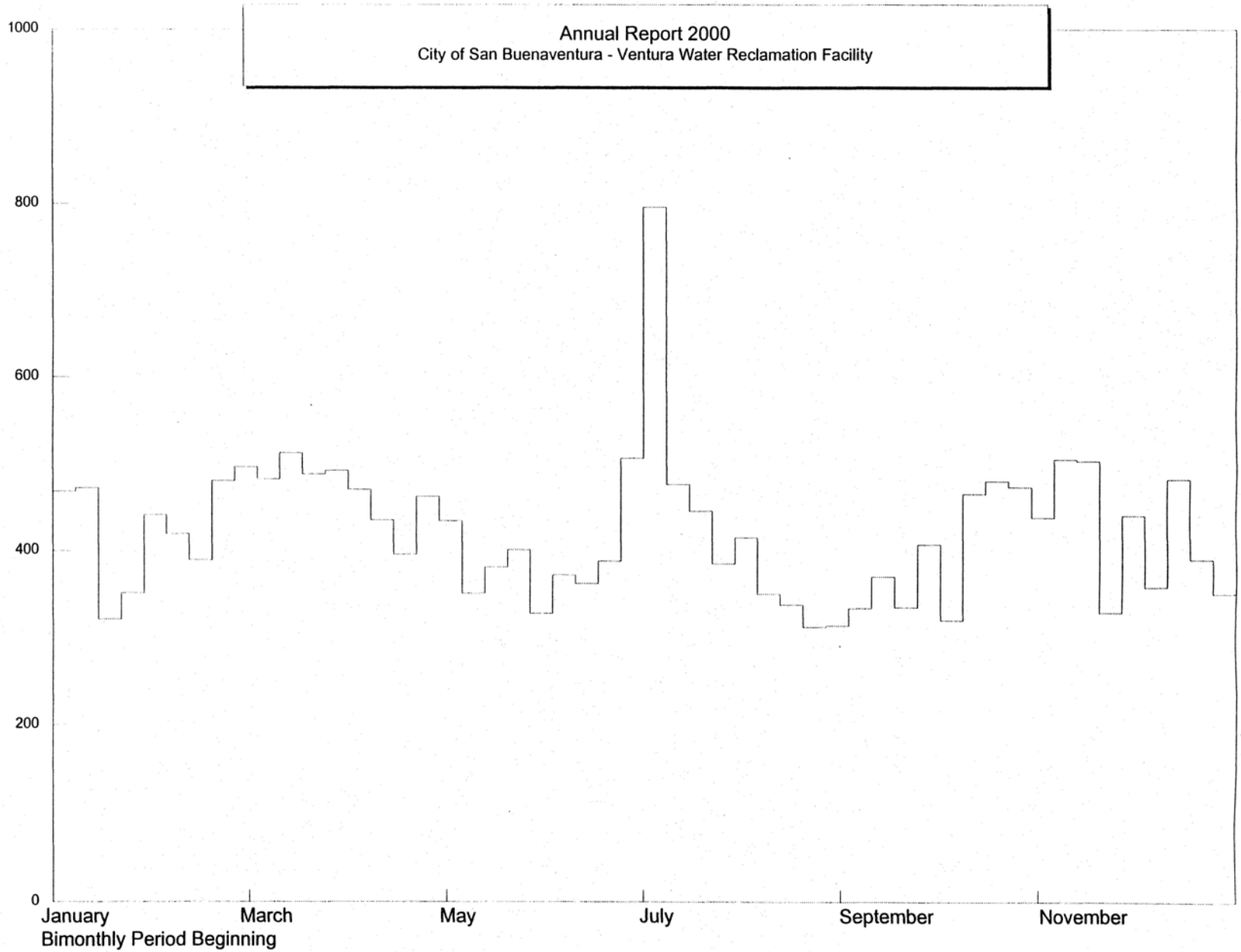

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly MBAS - mg/l



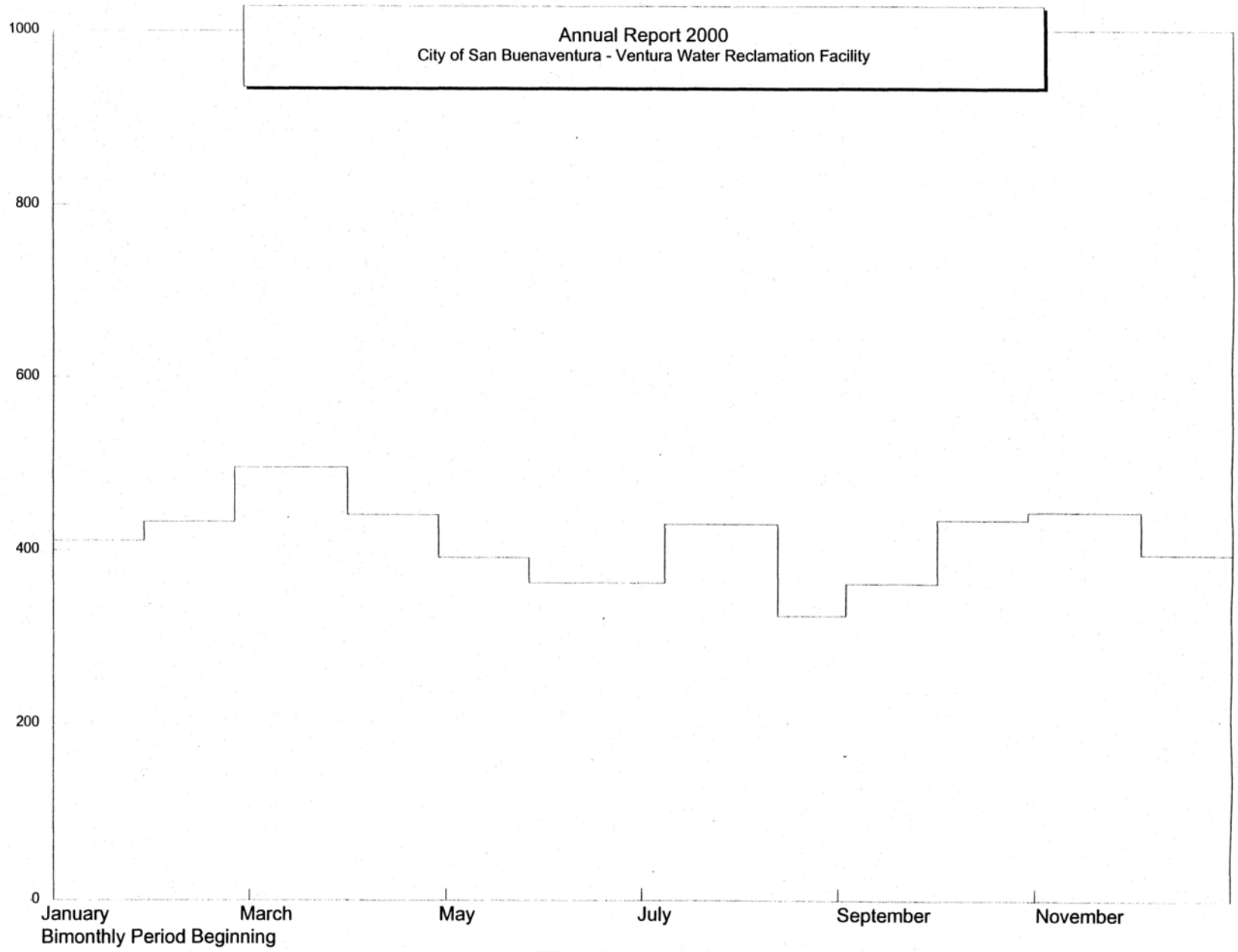
Effluent Transfer Station
Effluent Weekly Chloride - mg/l



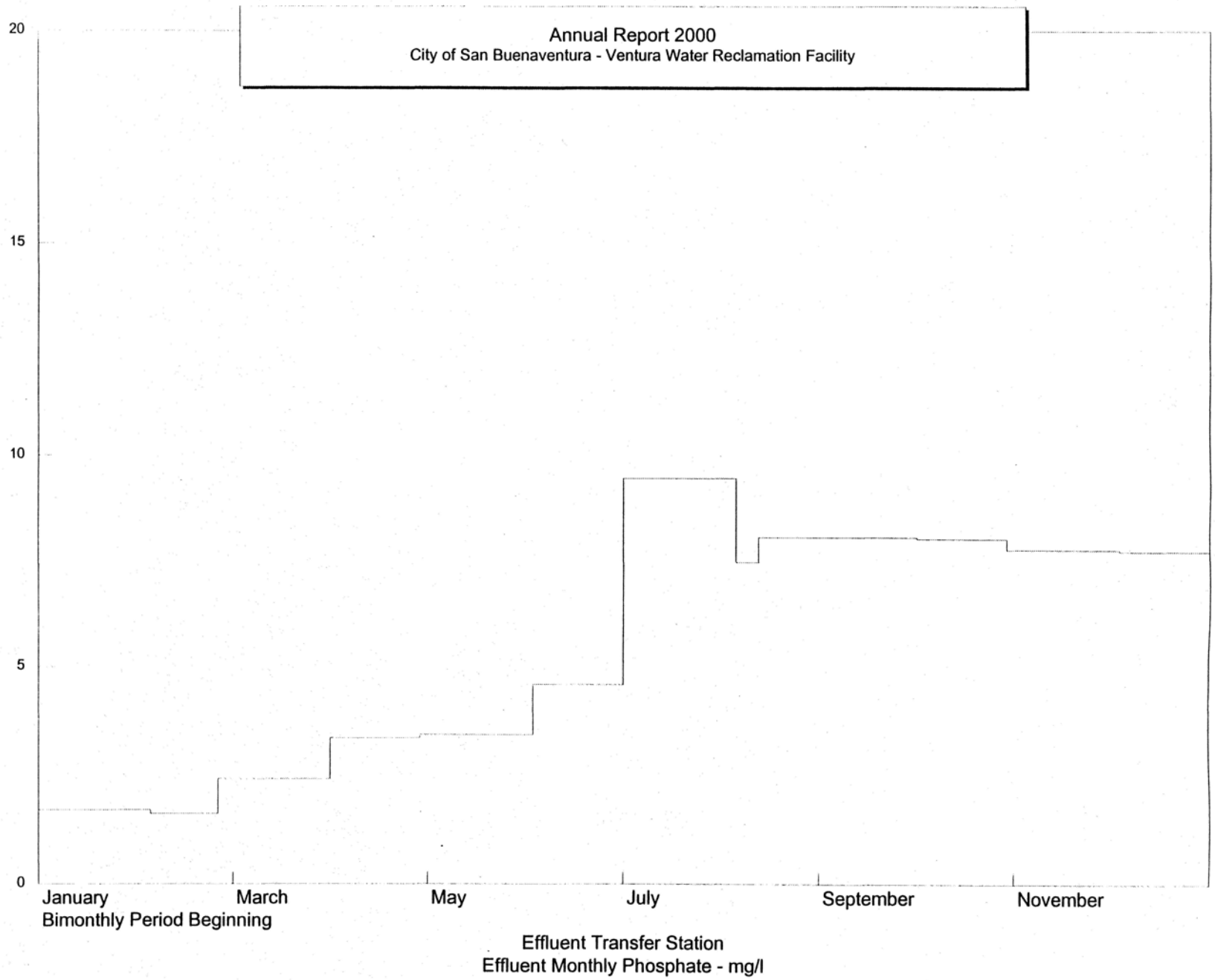
Effluent Transfer Station
Effluent 30 Day Average Chloride - mg/l

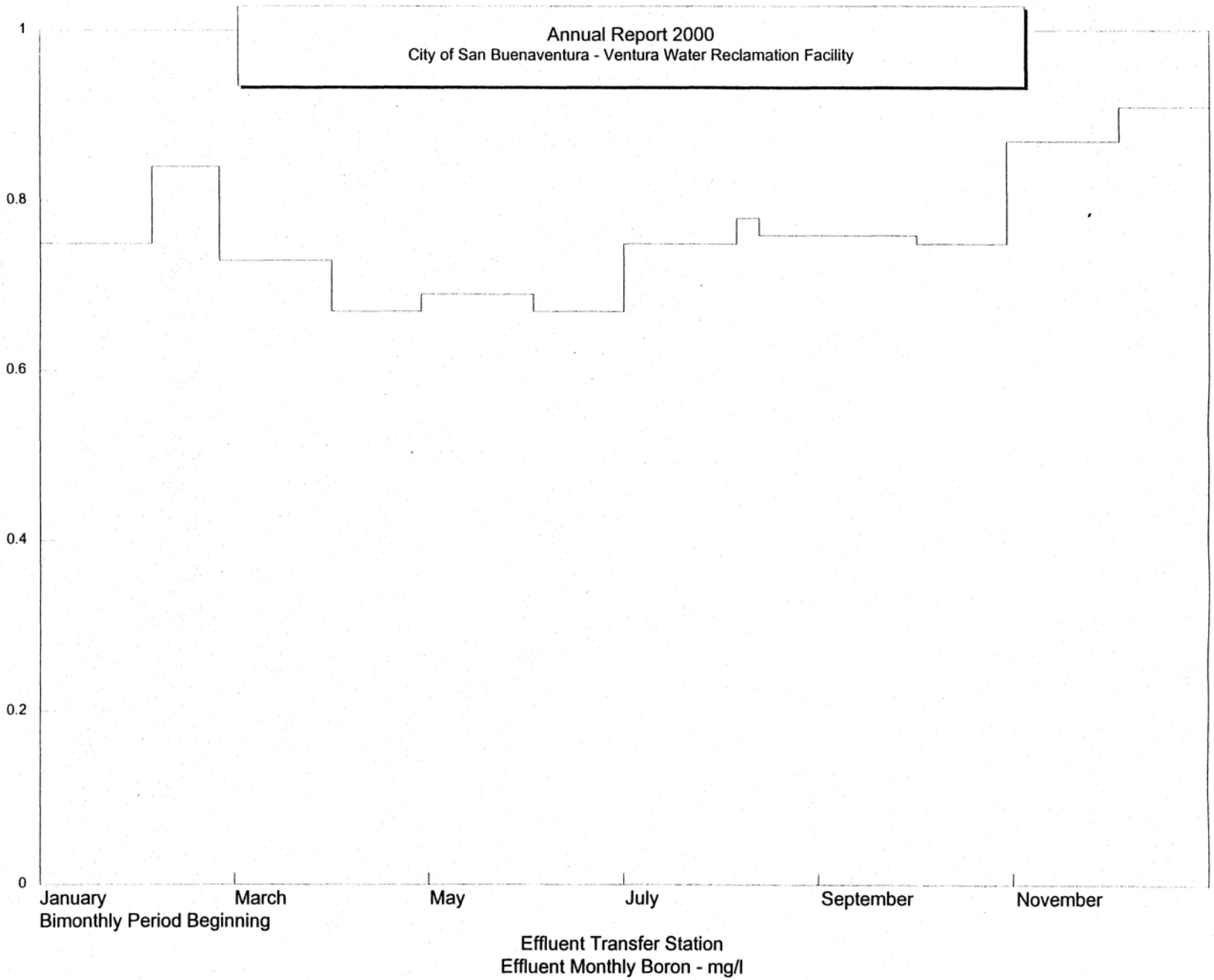


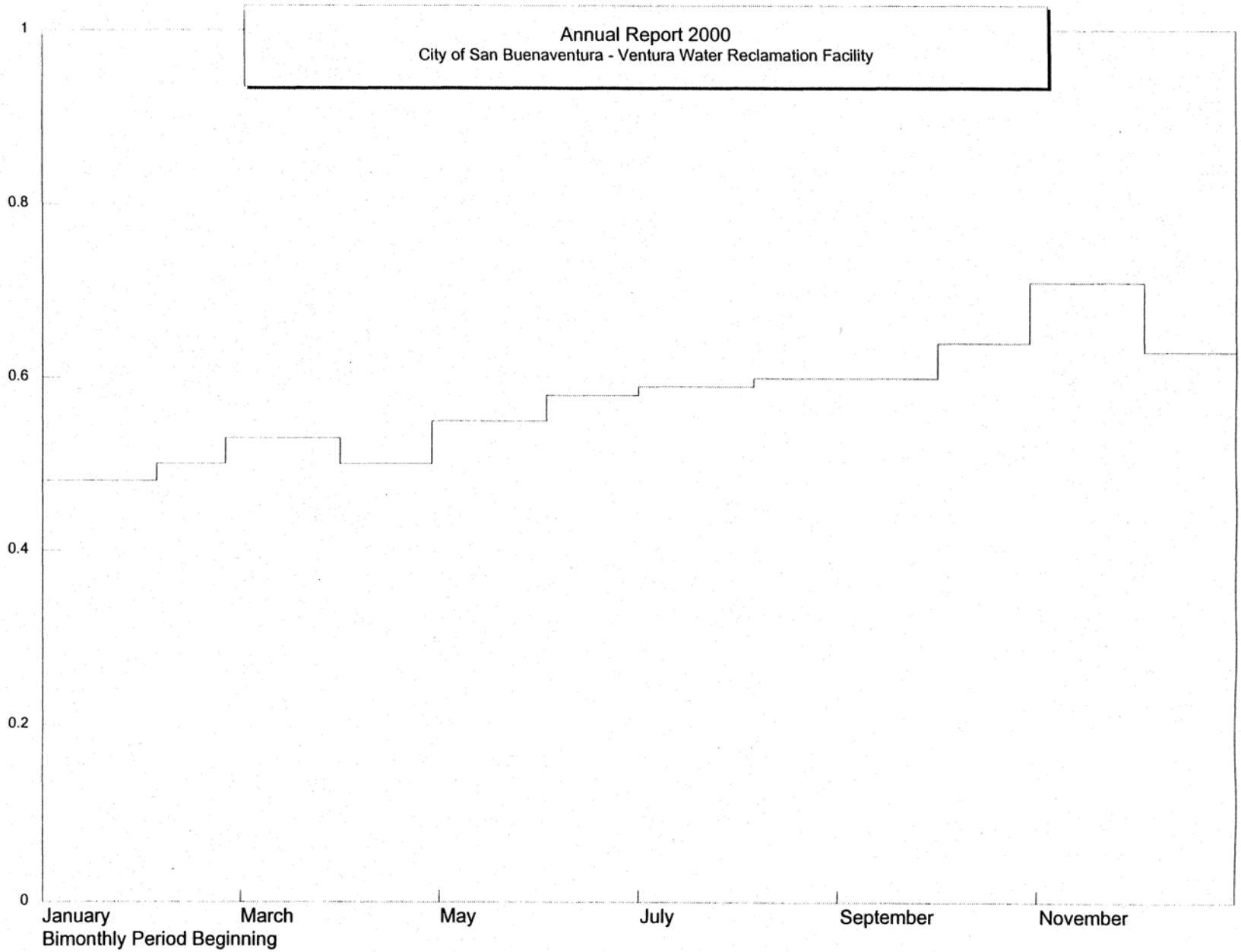
Effluent Transfer Station
Effluent Weekly Sulfate - mg/l



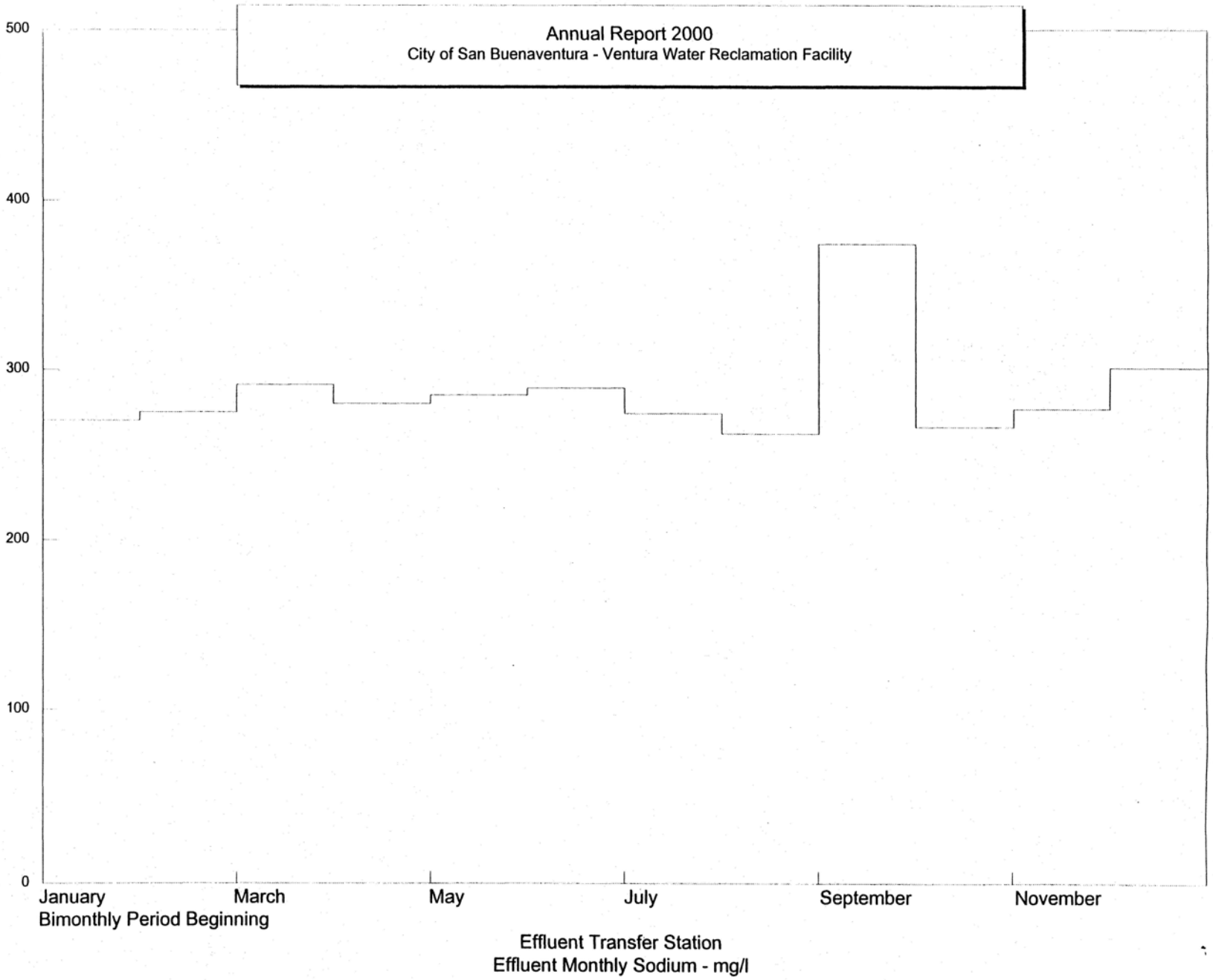
Effluent Transfer Station
Effluent 30 Day Average Sulfate - mg/l

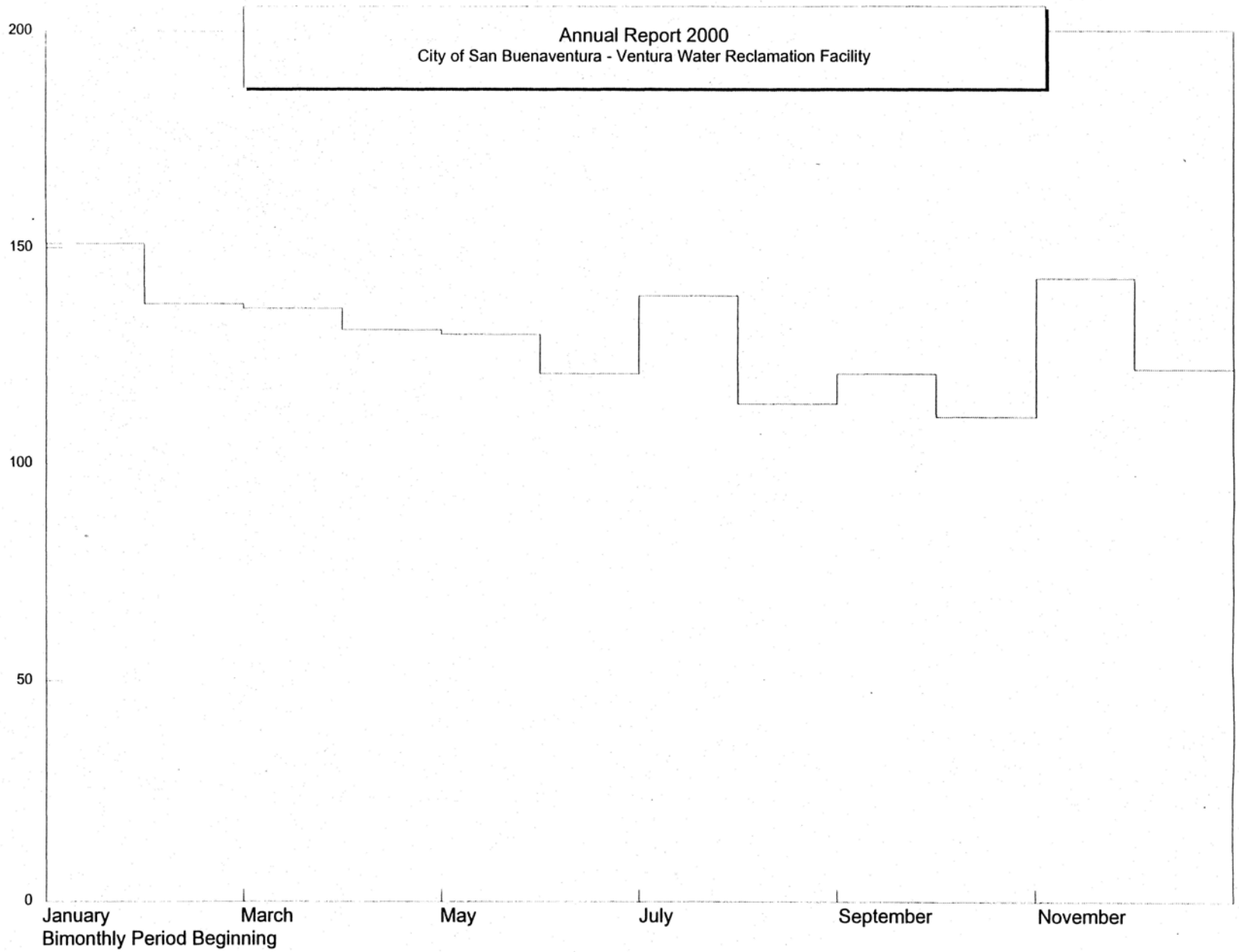

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Phosphate - mg/l


Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Boron - mg/l

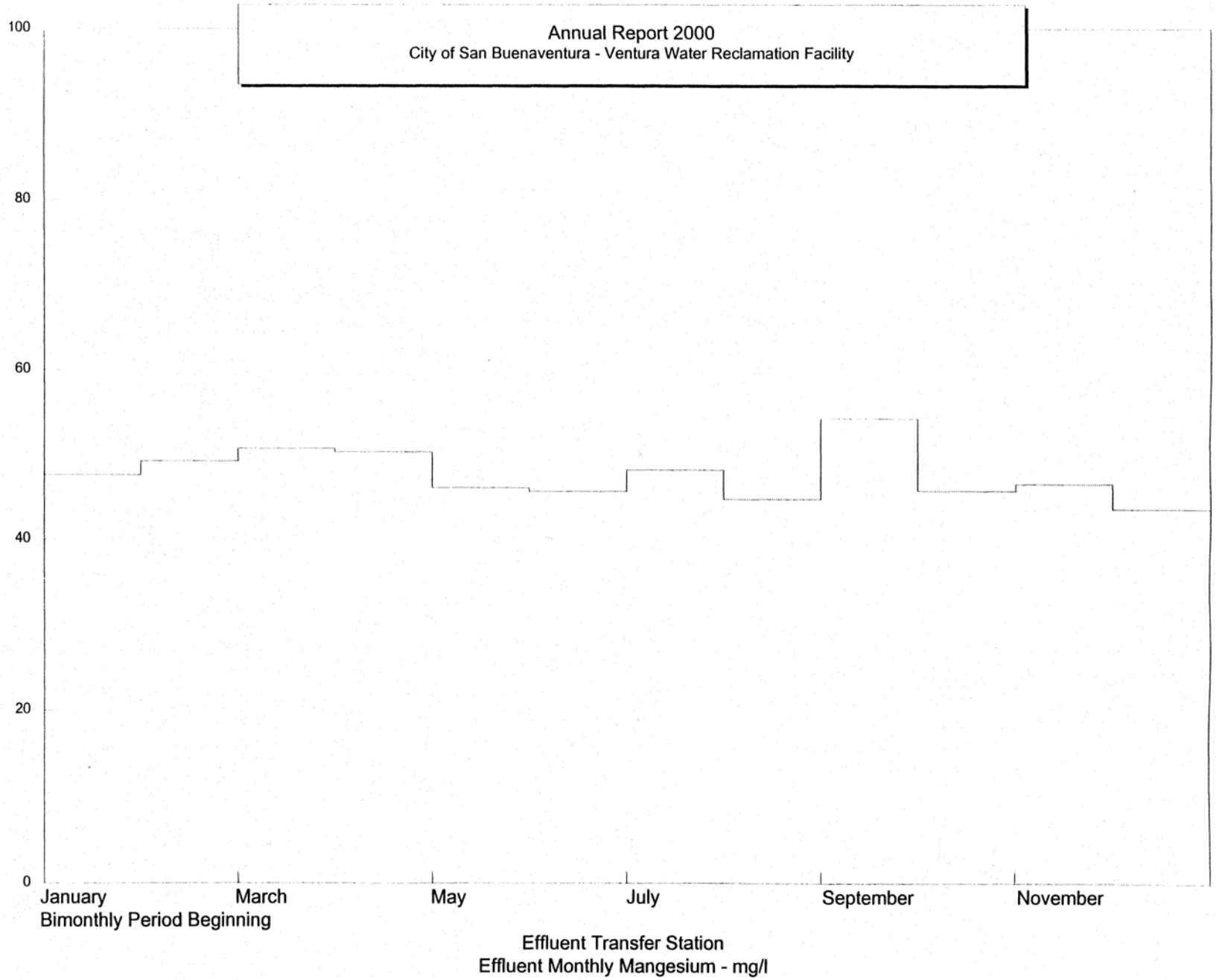


Effluent Transfer Station
Effluent Monthly Fluoride - mg/l

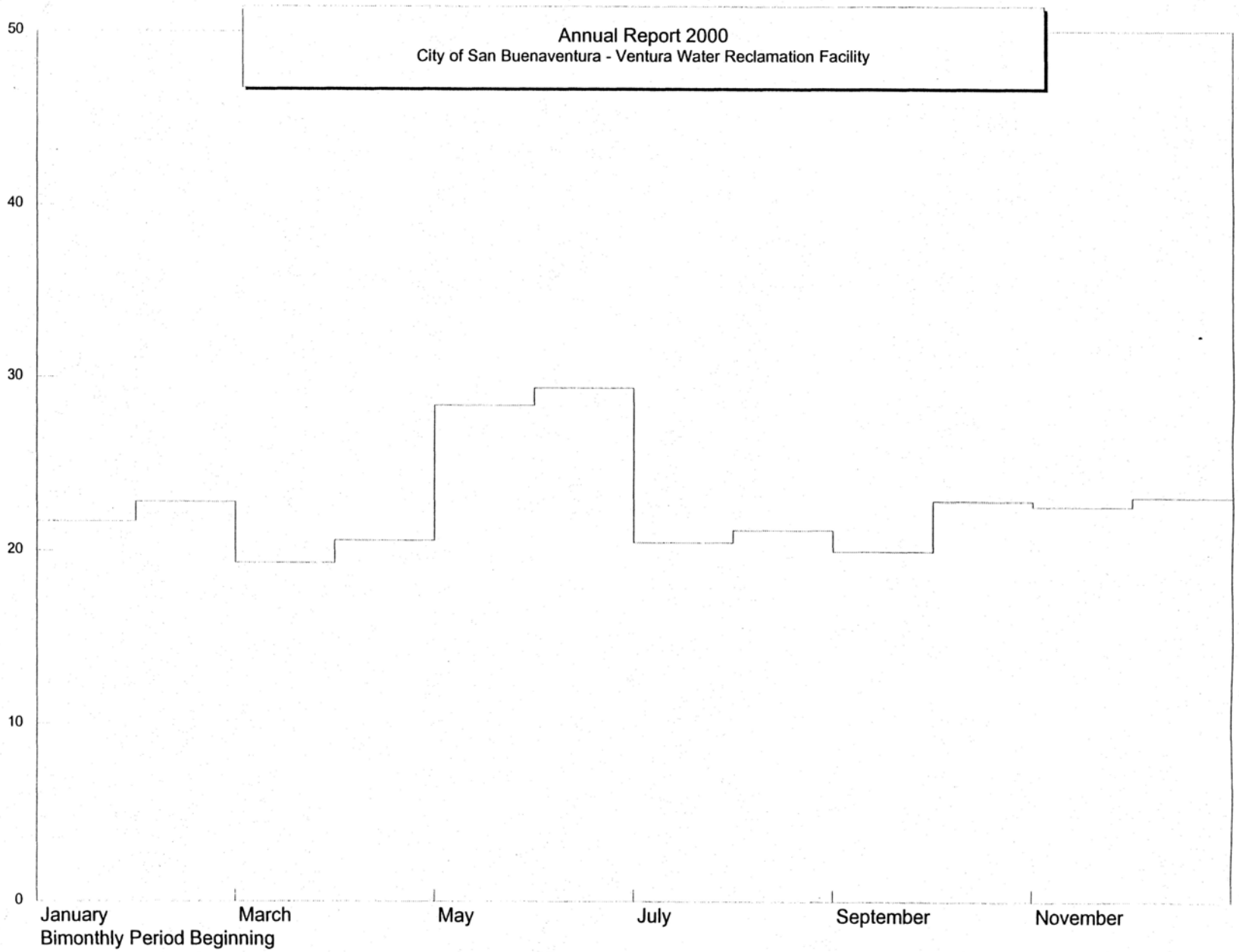

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Sodium - mg/l



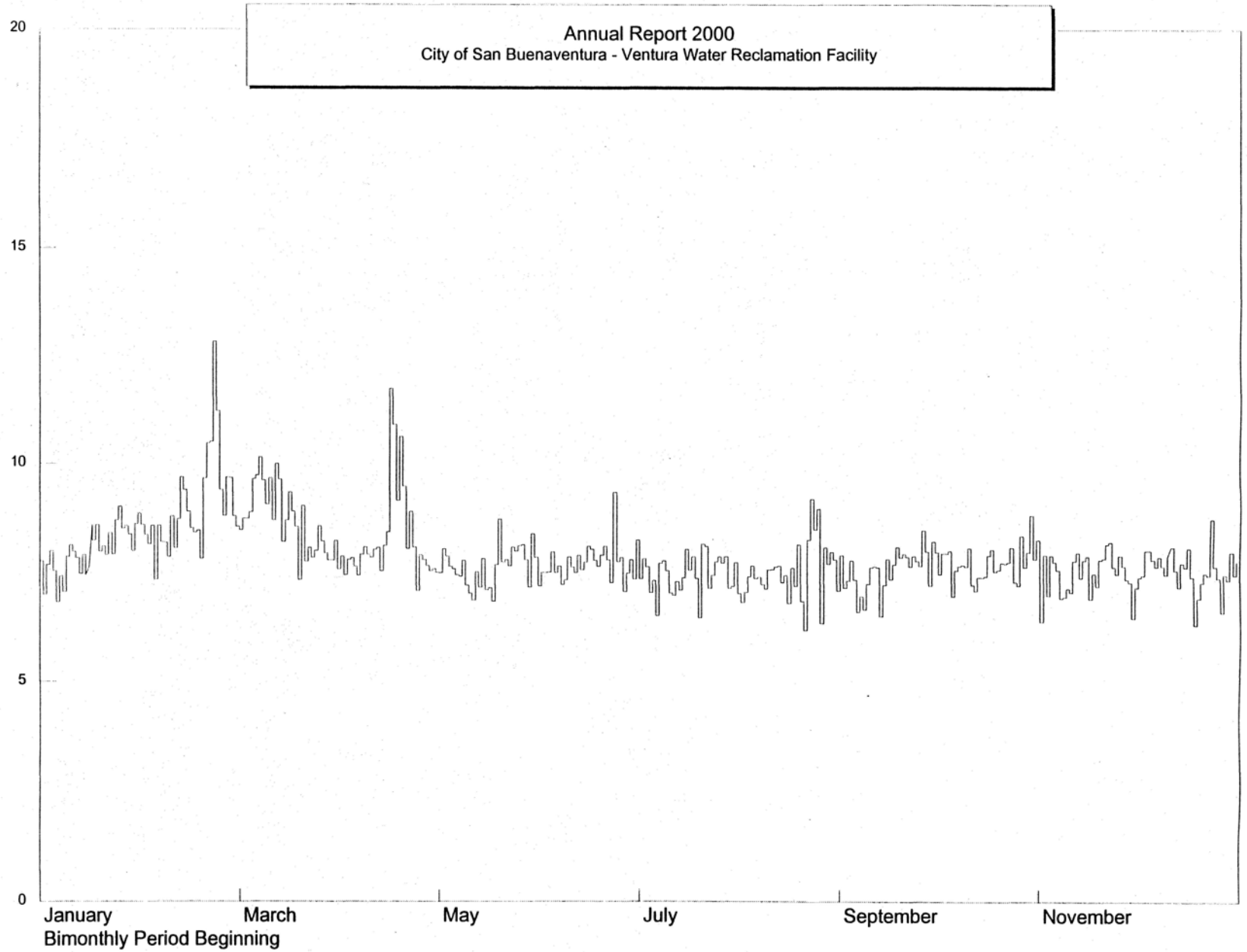
Effluent Transfer Station
Effluent Monthly Calcium - mg/l



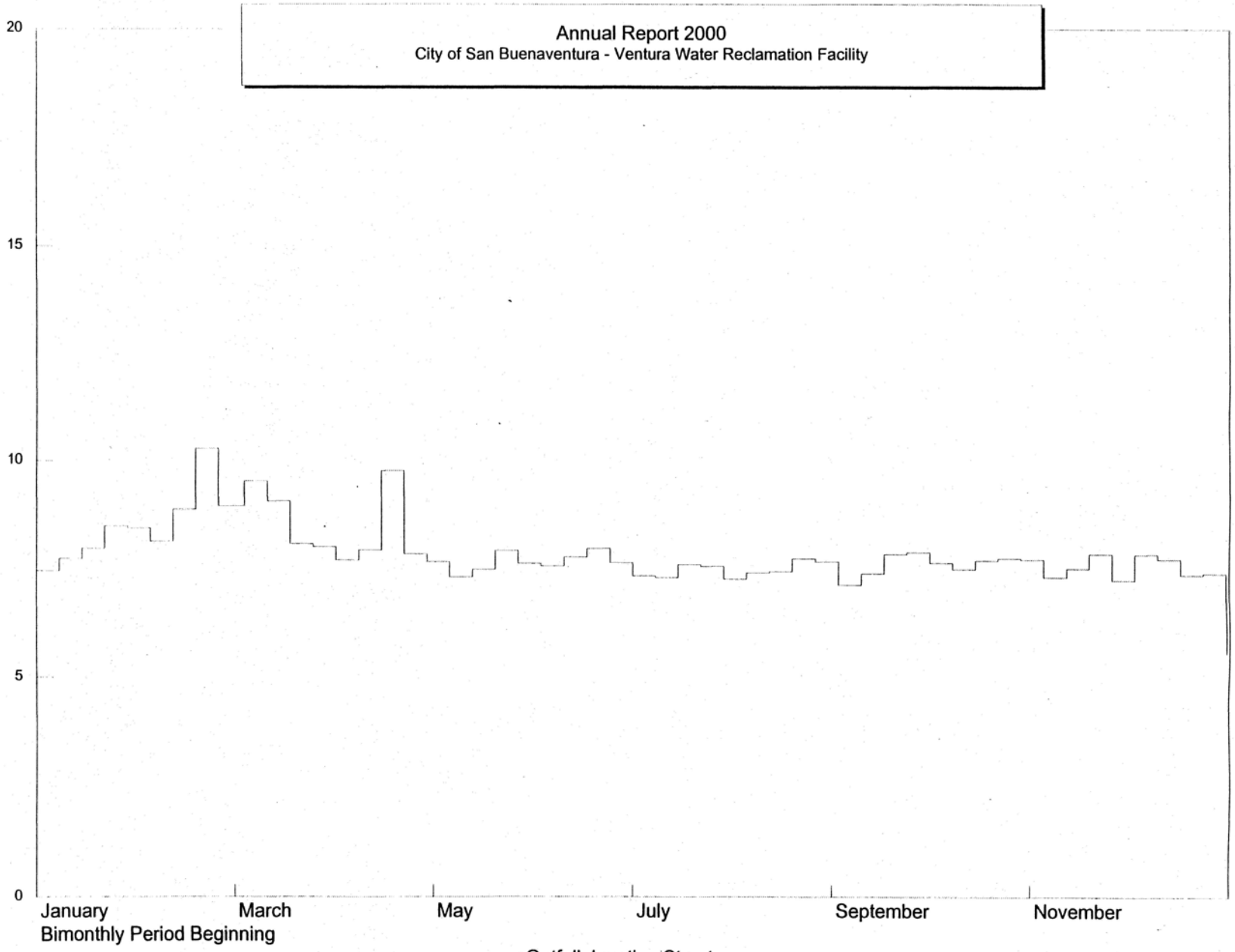
Effluent Transfer Station
Effluent Monthly Mangesium - mg/l



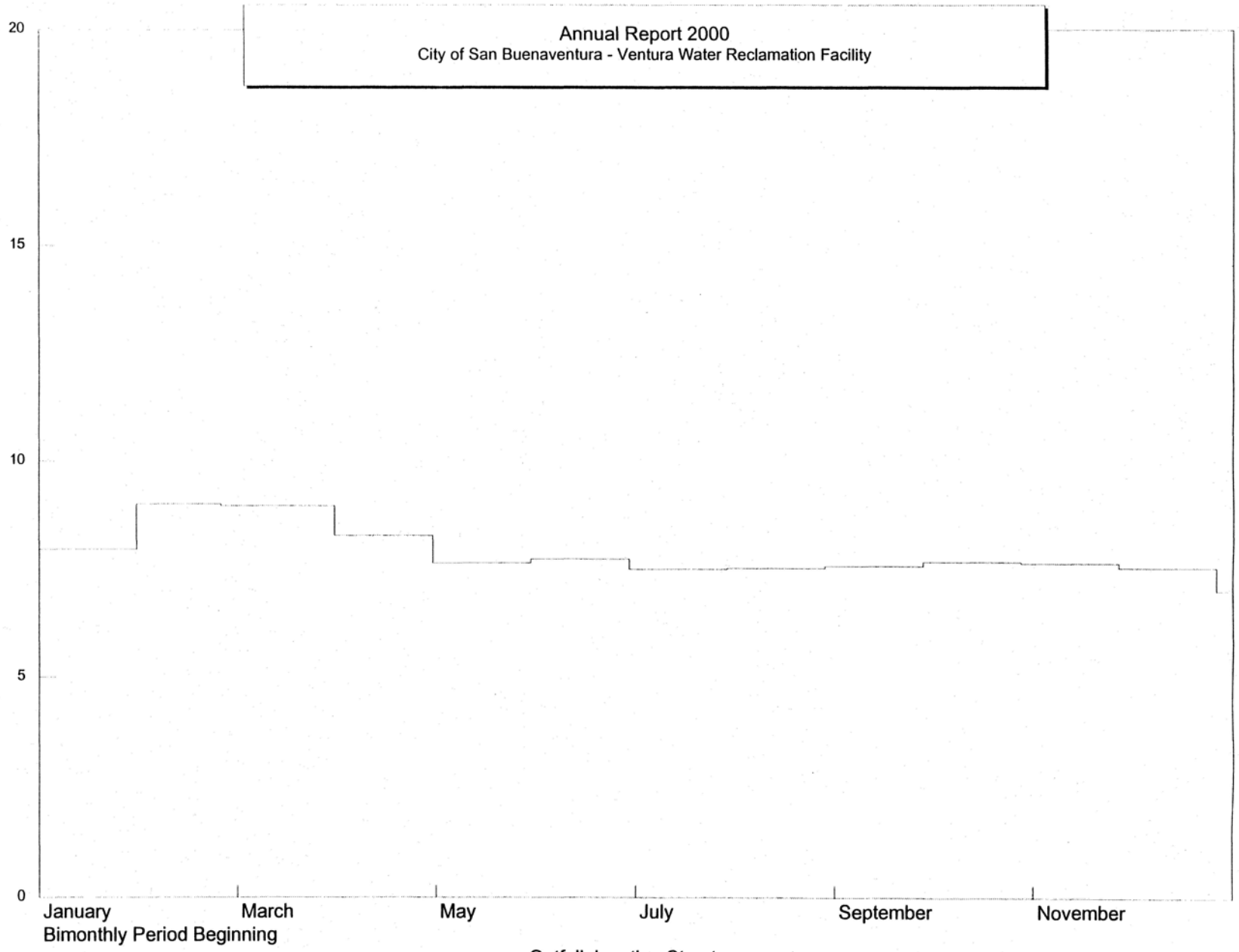
Effluent Transfer Station
Effluent Monthly Potassium - mg/l



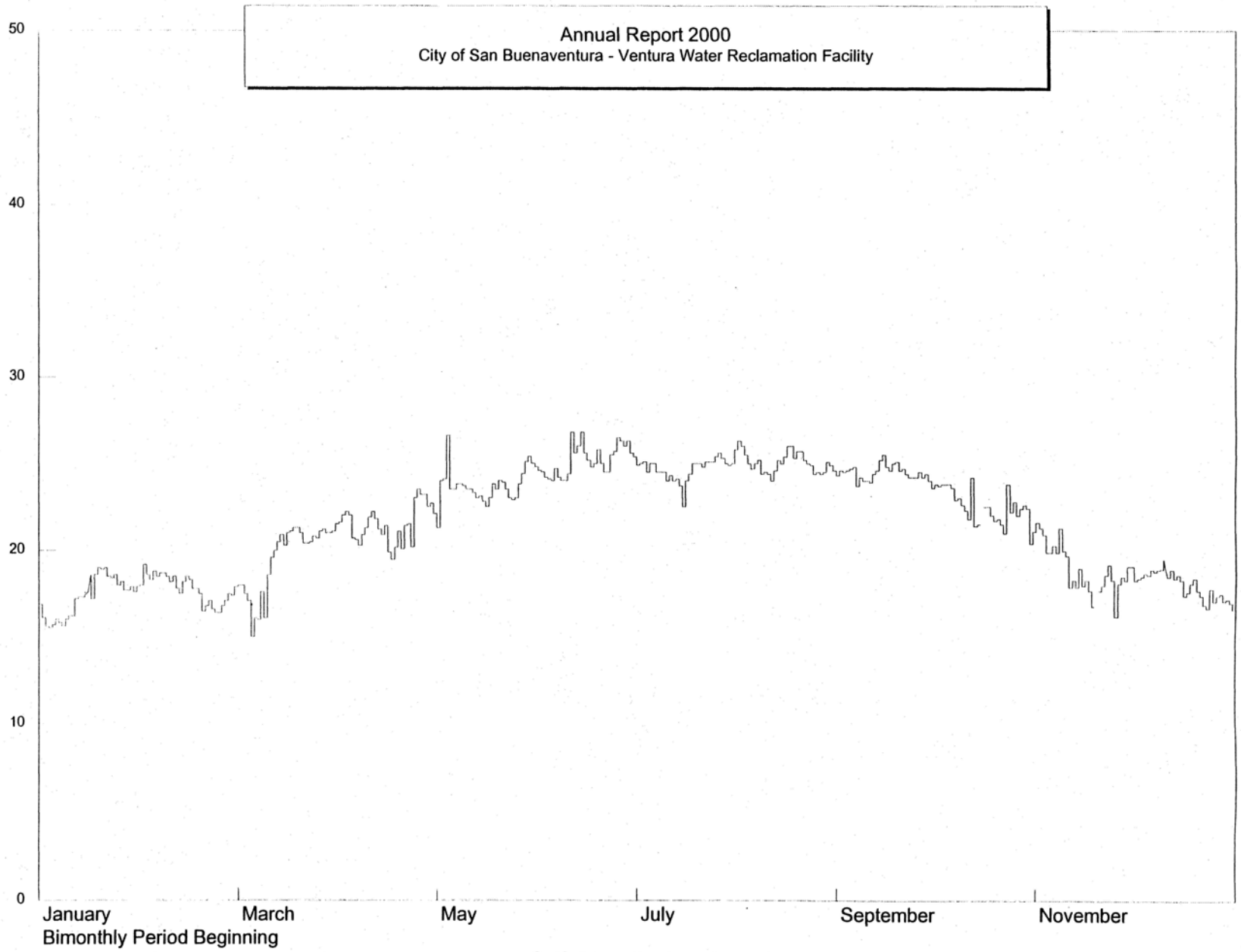
Outfall Junction Structure
Effluent Discharge to the Santa Clara Tida Prism - MGD



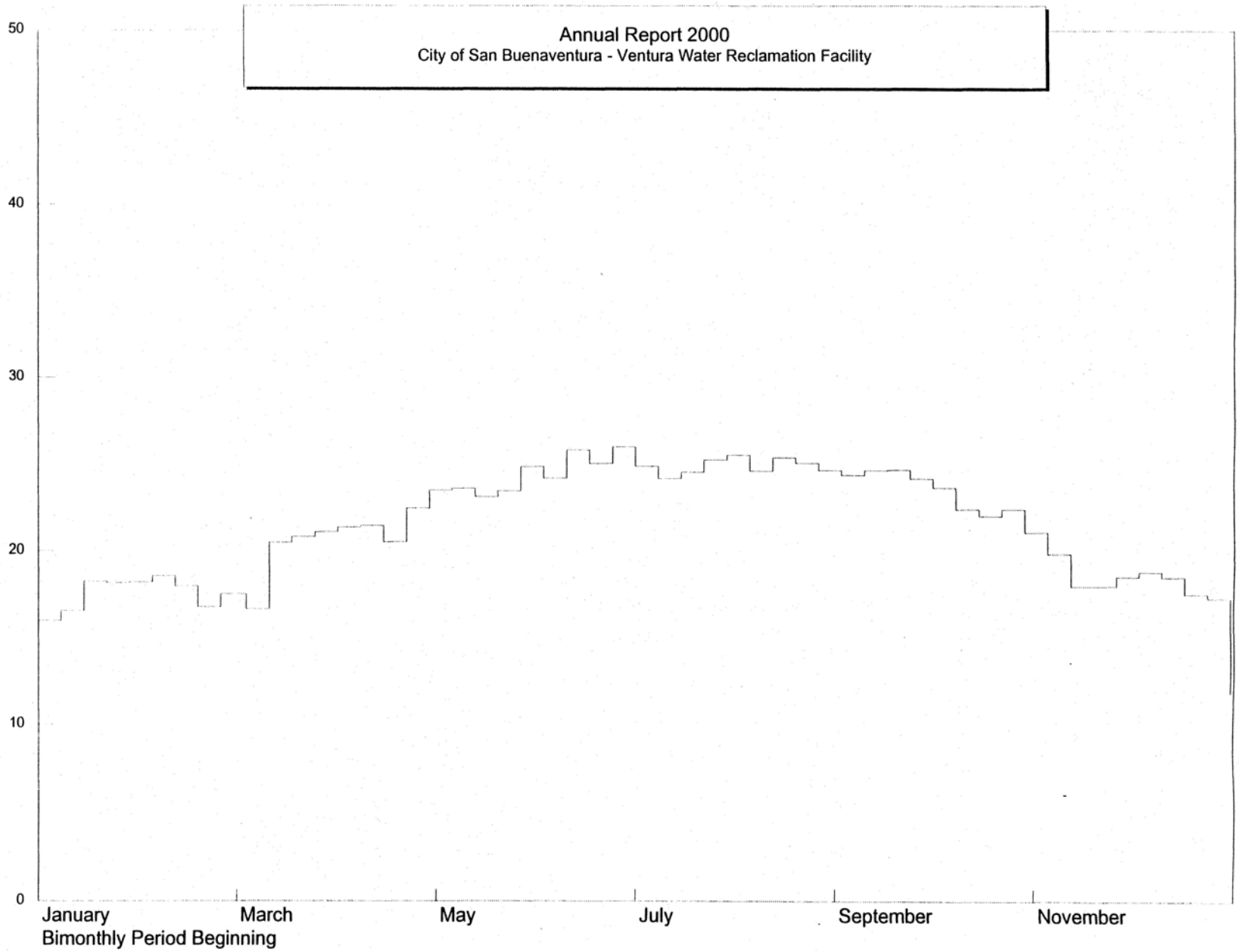
Outfall Junction Structure
Effluent Discharge 7 Day Average to the Santa Clara Tida Prism - MGD



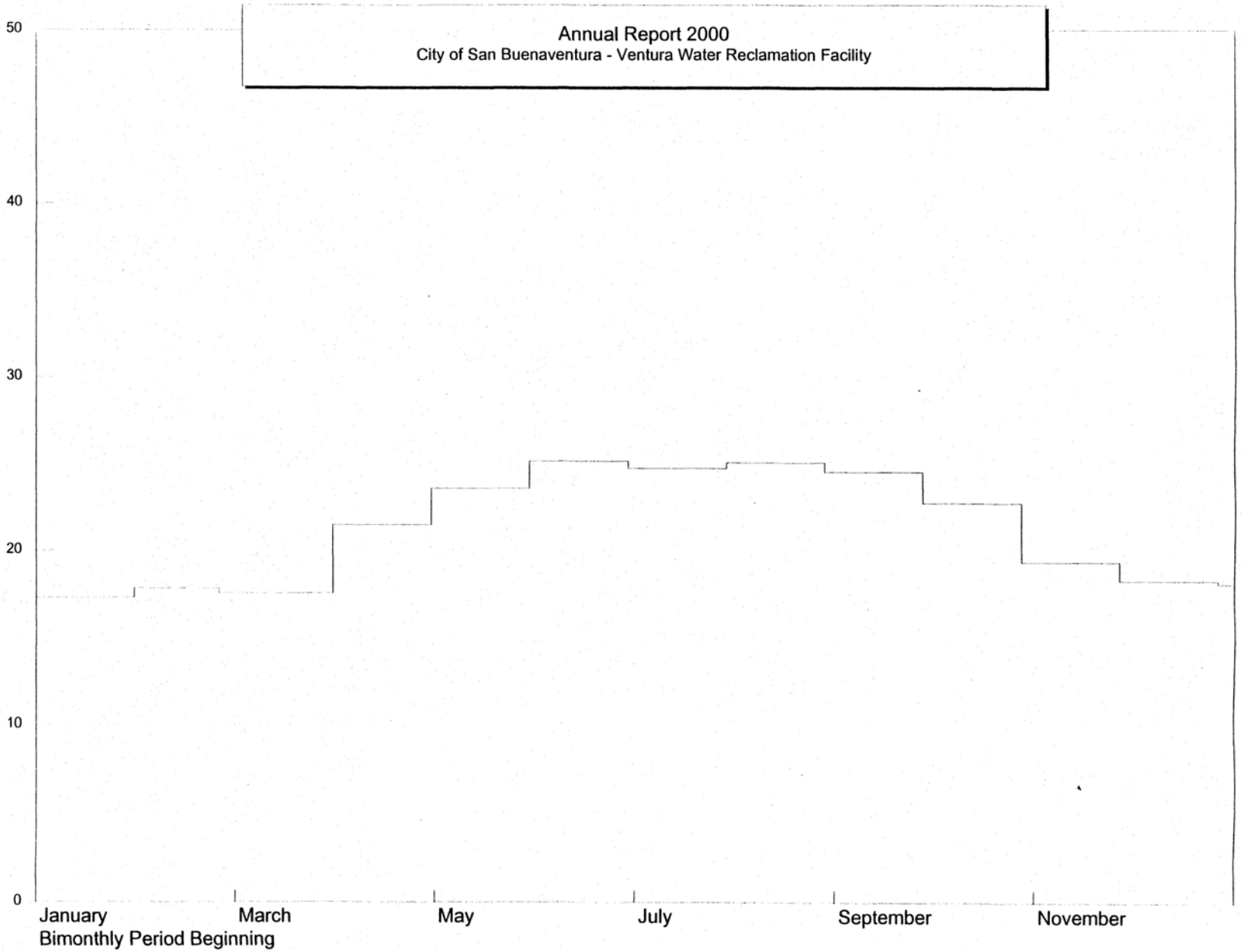
Outfall Junction Structure
Effluent Discharge 30 Day Average to the Santa Clara Tida Prism - MGD



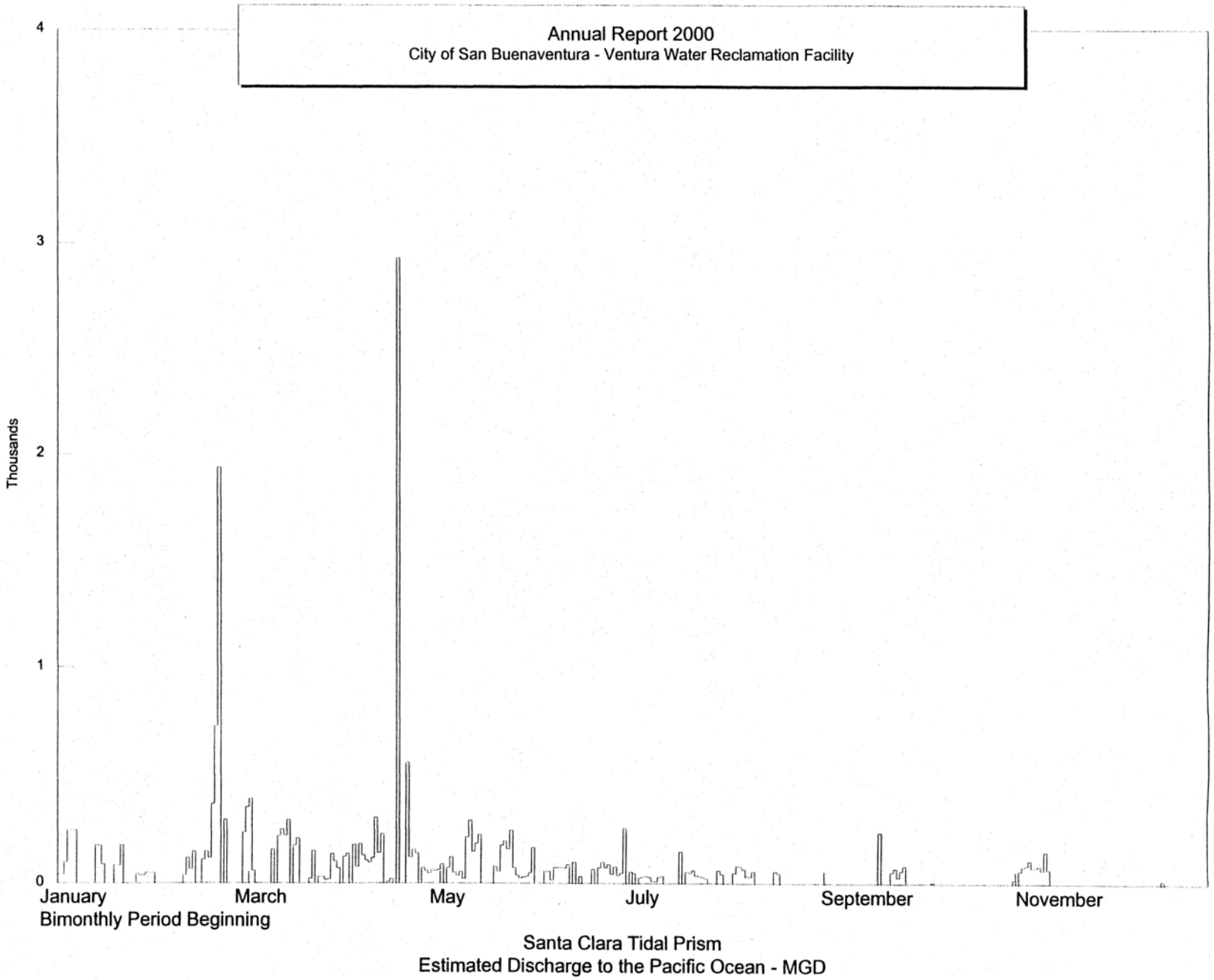
Outfall Junction Structure
Effluent Temperature at 11:00 AM - Degrees C

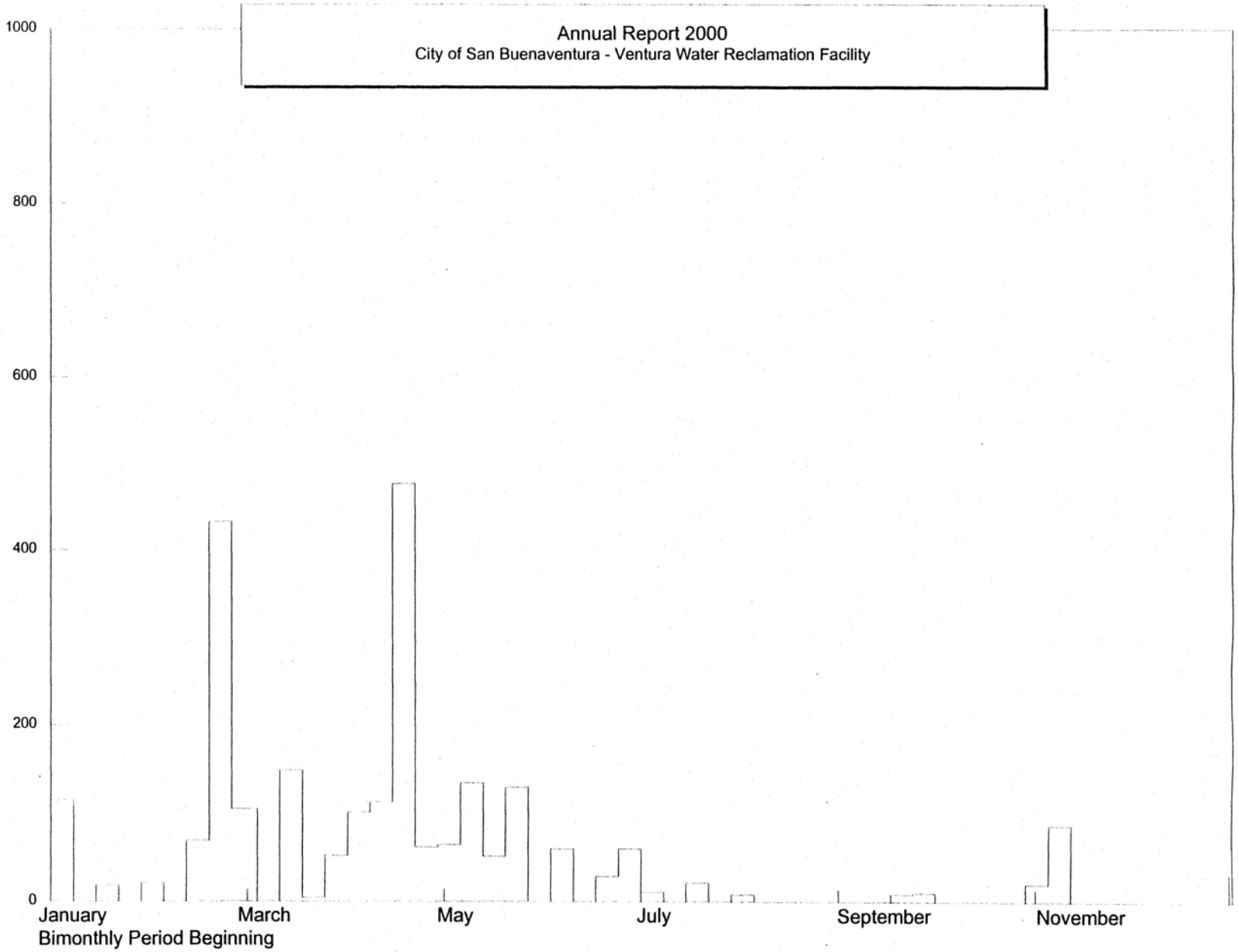


Outfall Junction Structure
Effluent 7 Day Average Temperature at 11:00 AM - Degrees C

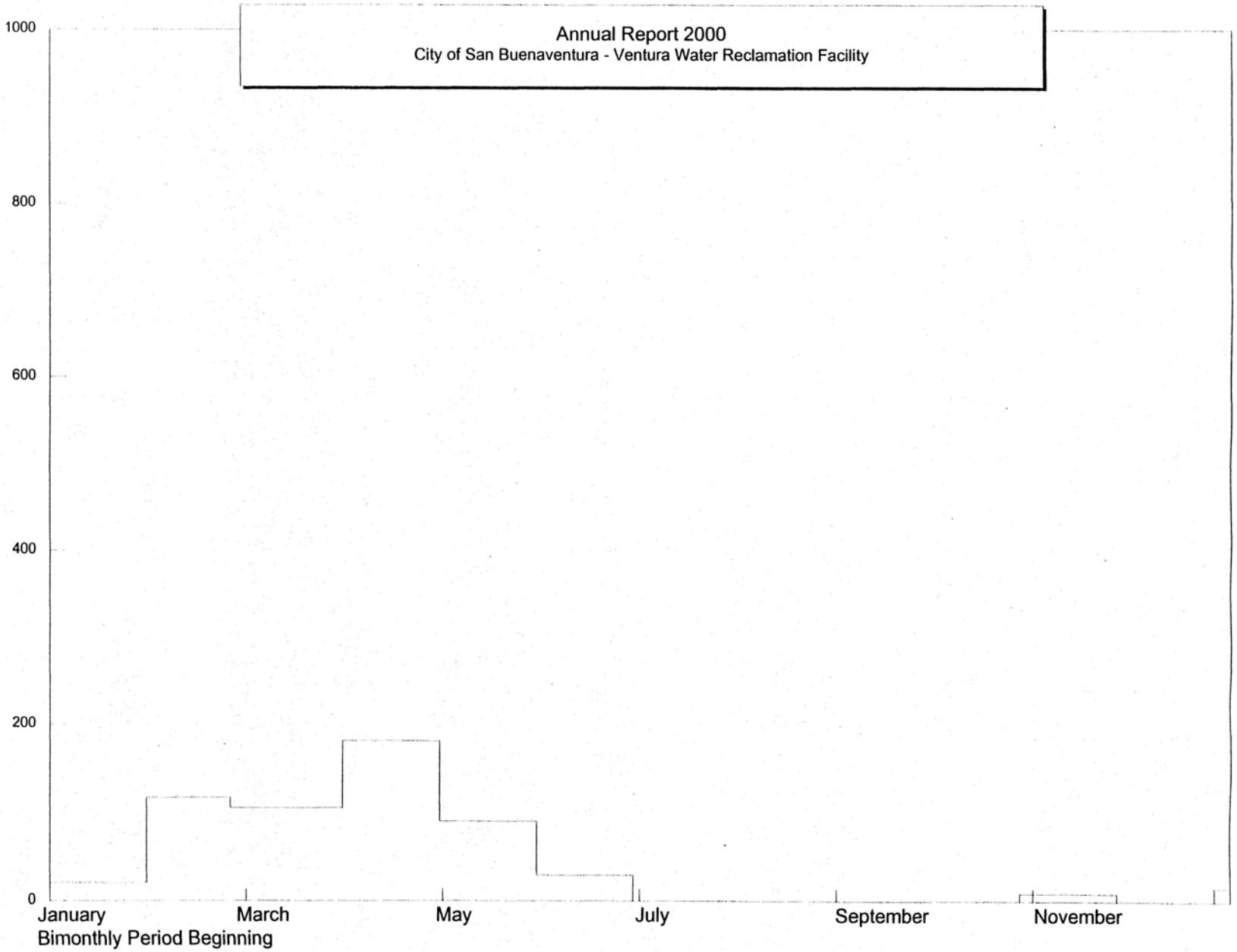


Outfall Junction Structure
Effluent 30 Day Average Temperature at 11:00 AM - Degrees C

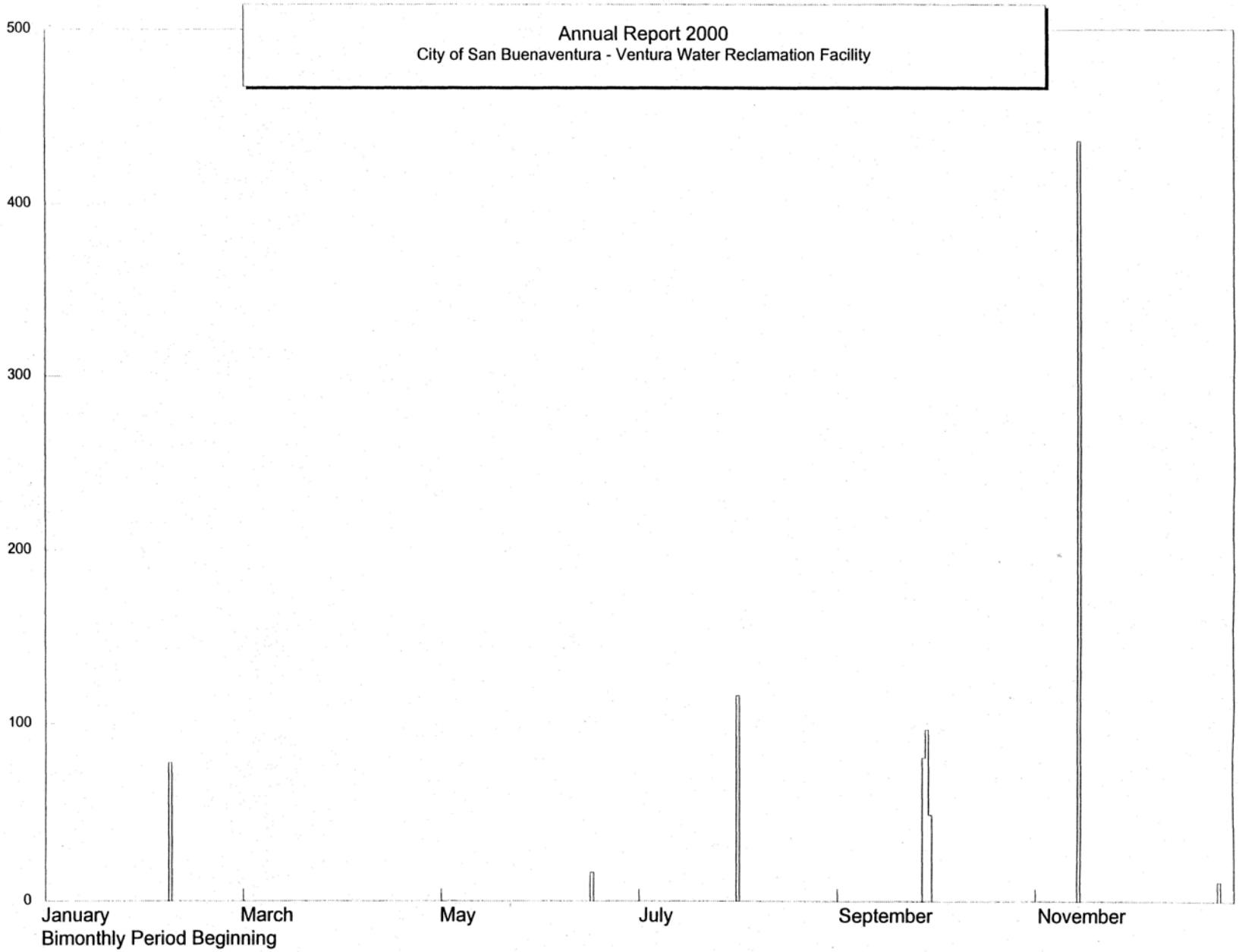

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility
Thousands
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Santa Clara Tidal Prism
Estimated Discharge to the Pacific Ocean - MGD



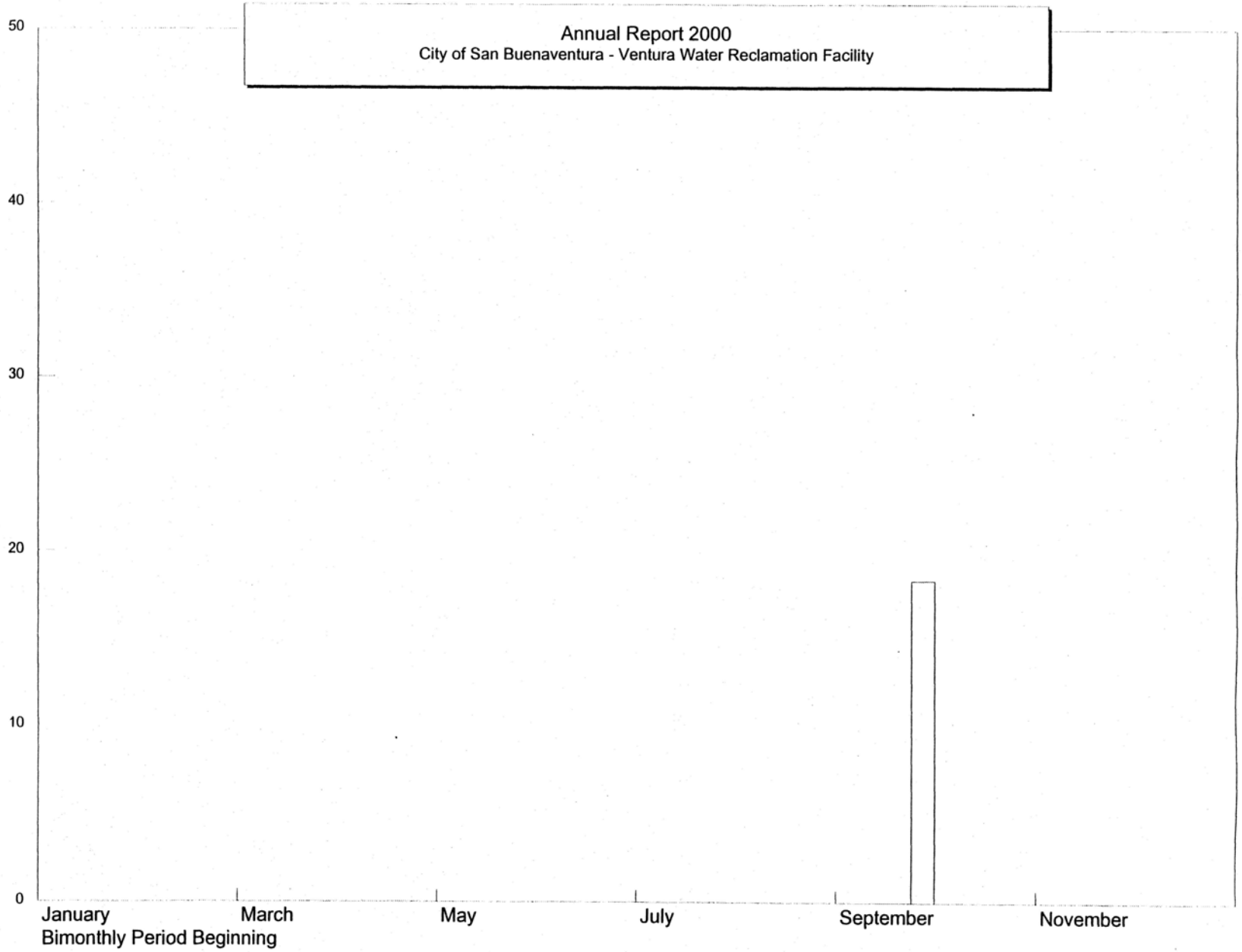
Santa Clara Tidal Prism
Estimated 7 Day Average Discharge to the Pacific Ocean - MGD



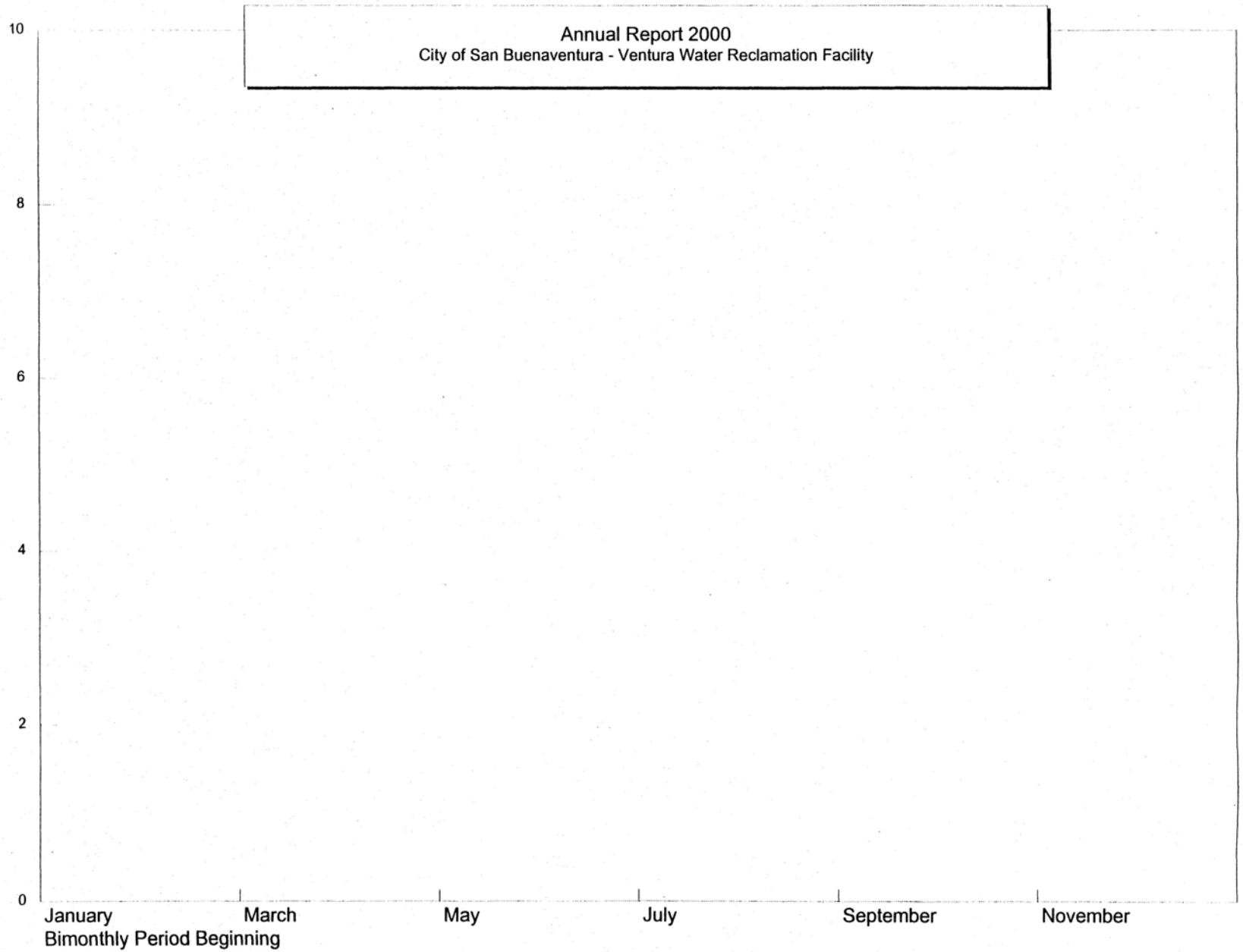
Santa Clara Tidal Prism
Estimated 30 Day Average Discharge to the Pacific Ocean - MGD



Santa Clara Tidal Prism
Estimated Influx to the Pacific Ocean - MGD

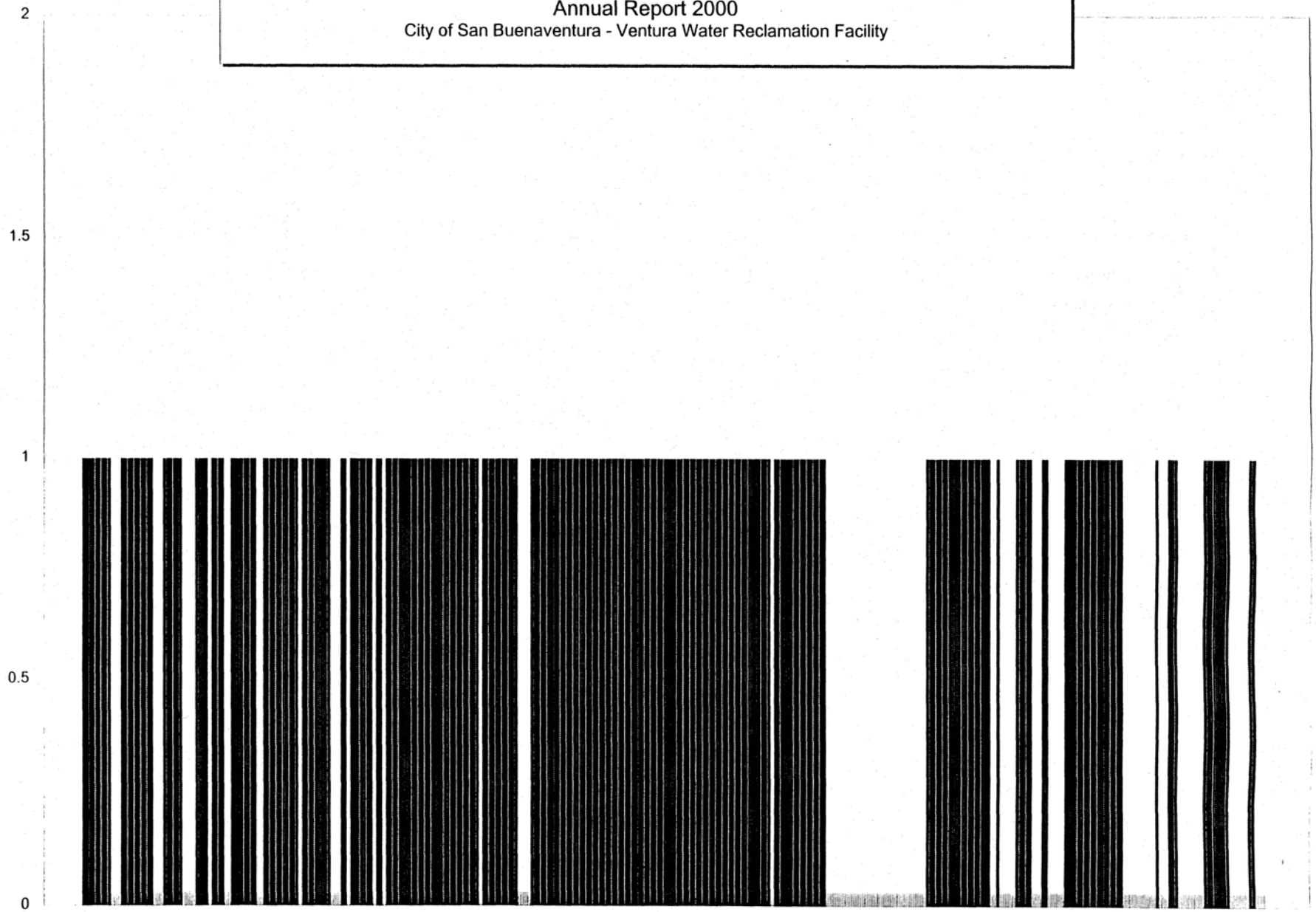


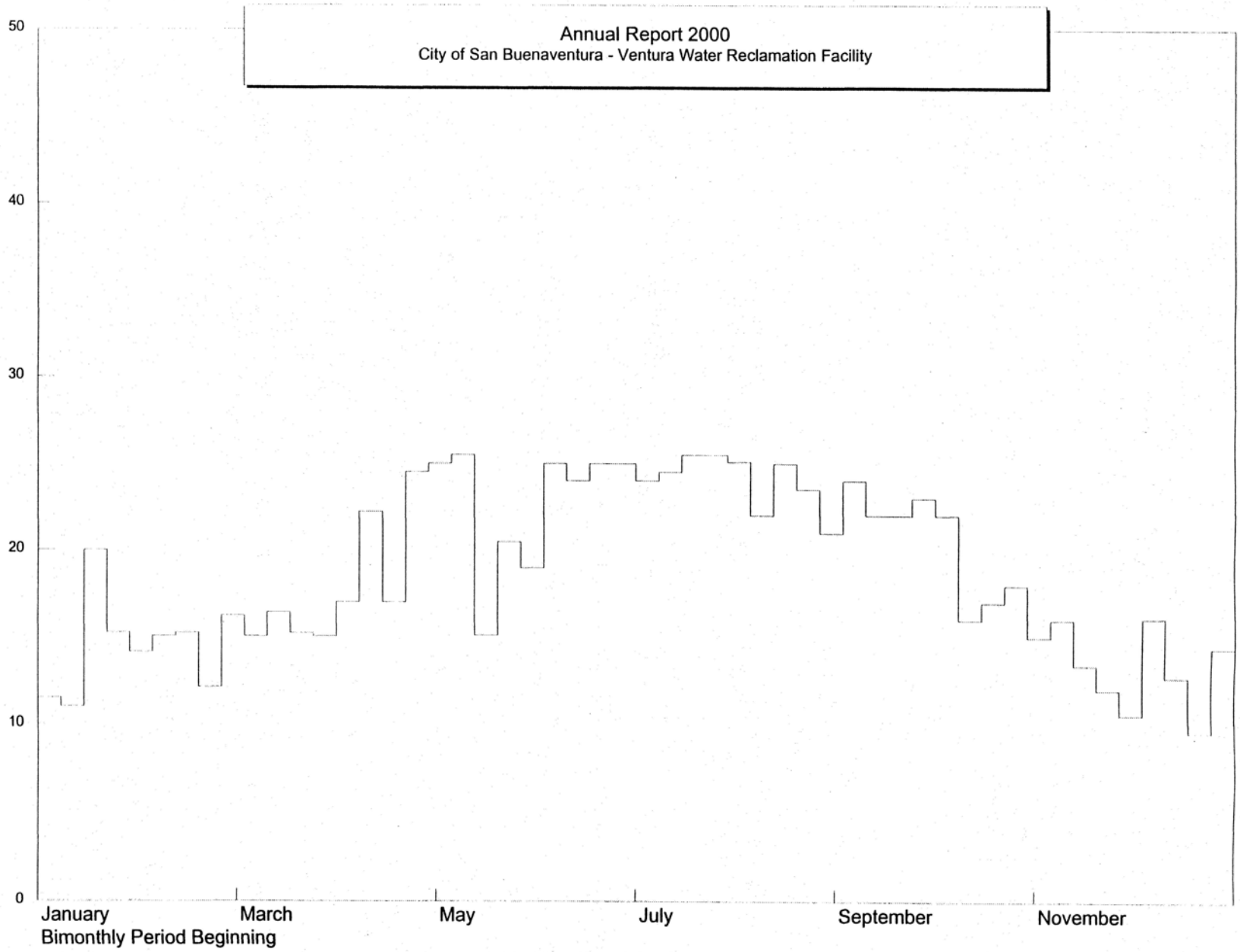
Santa Clara Tidal Prism
Estimated 7 Day Average Influx to the Pacific Ocean - MGD



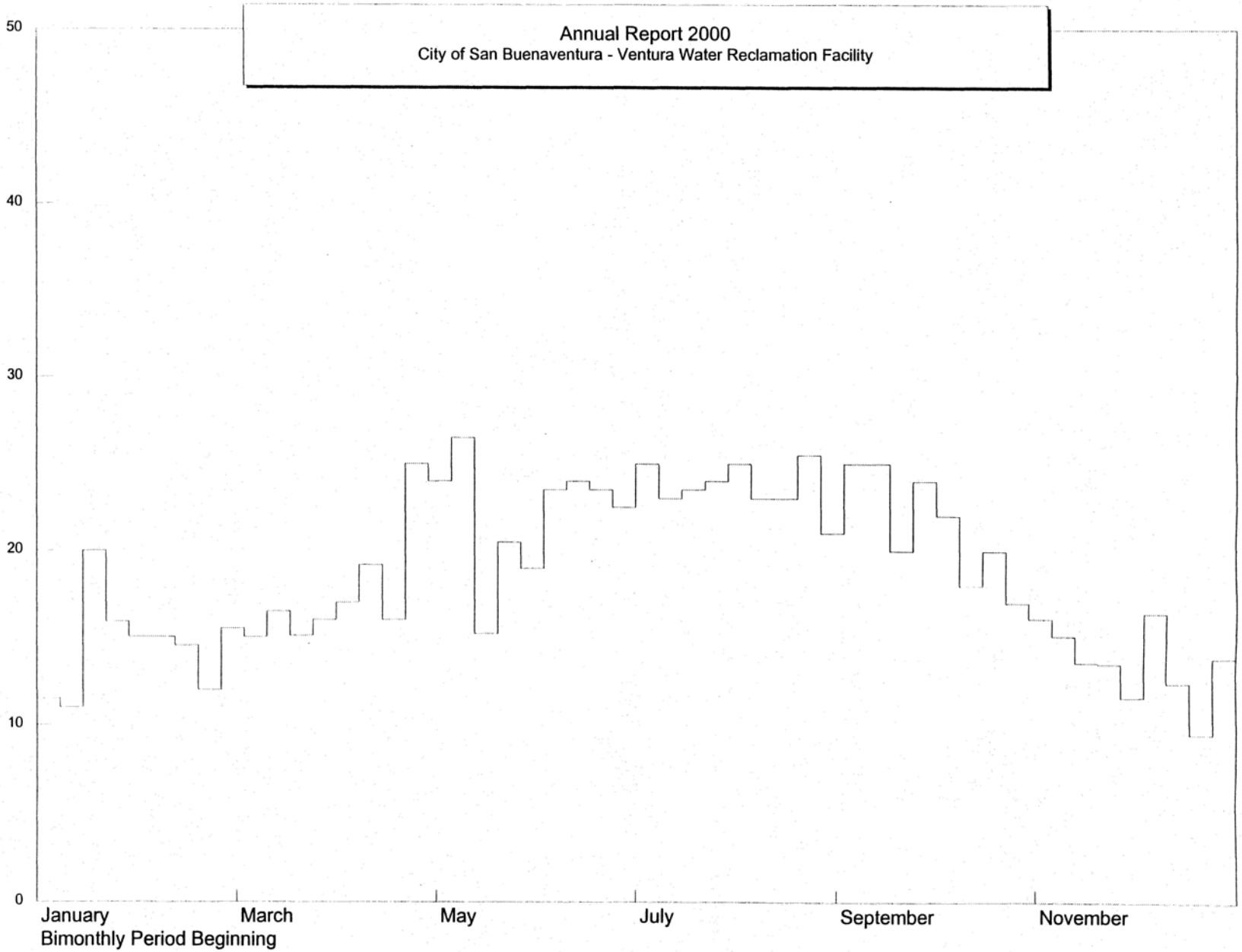
Santa Clara Tidal Prism
Estimated 30 Day Average Influx to the Pacific Ocean - MGD

Annual Report 2000
City of San Buenaventura - Ventura Water Reclamation Facility

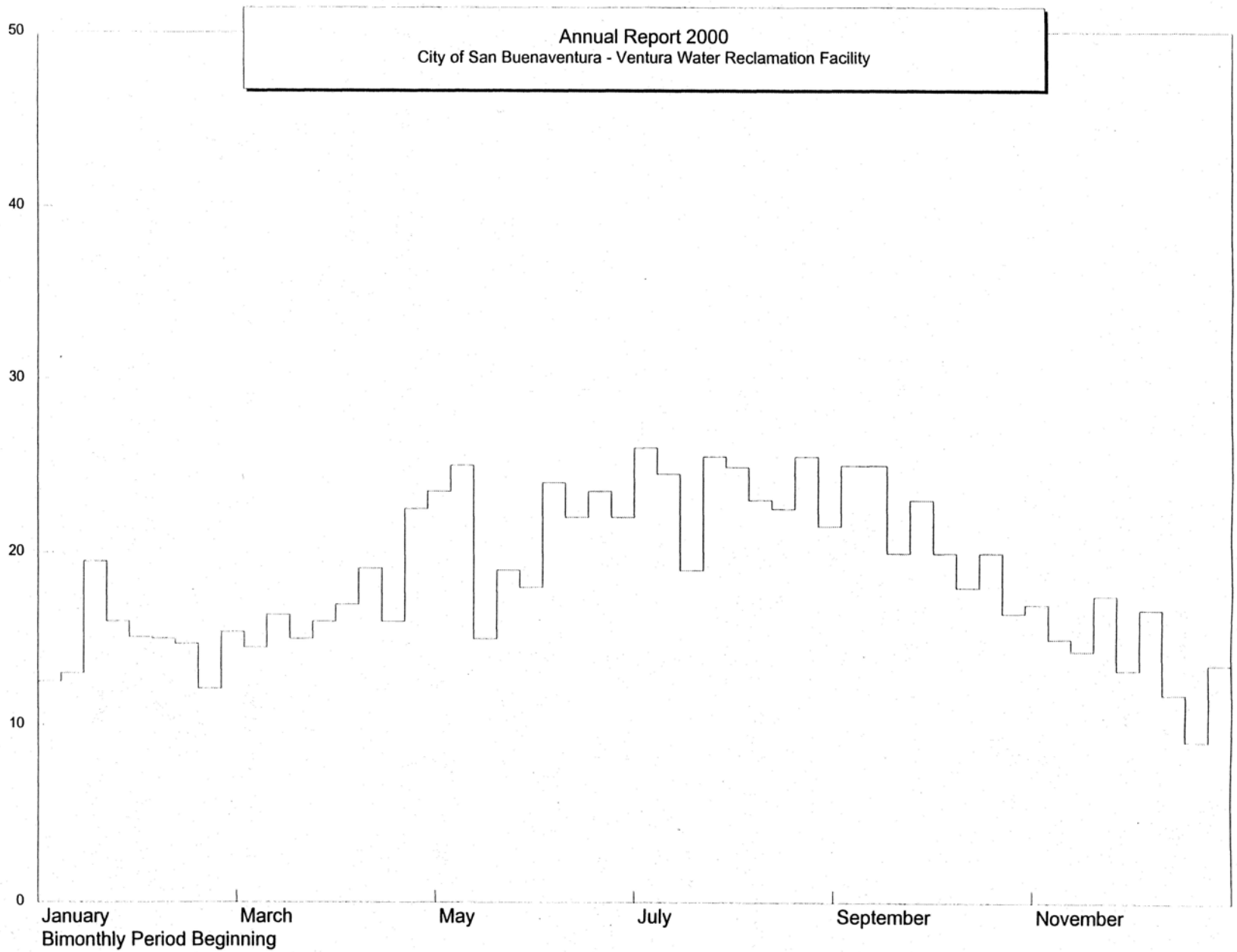




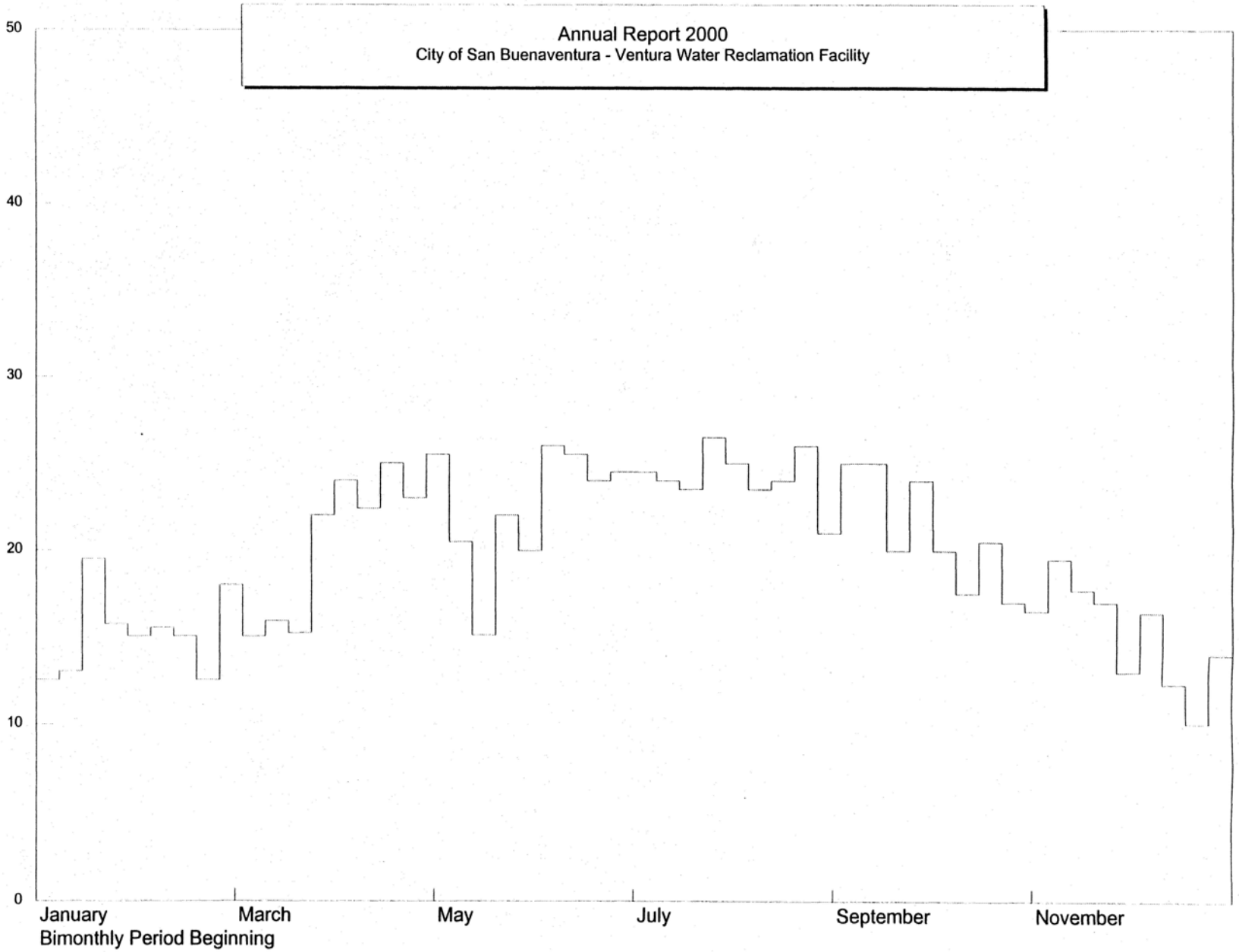
Tidal Prism Receiving Water Stations
R1 Weekly Temperature - Degrees C



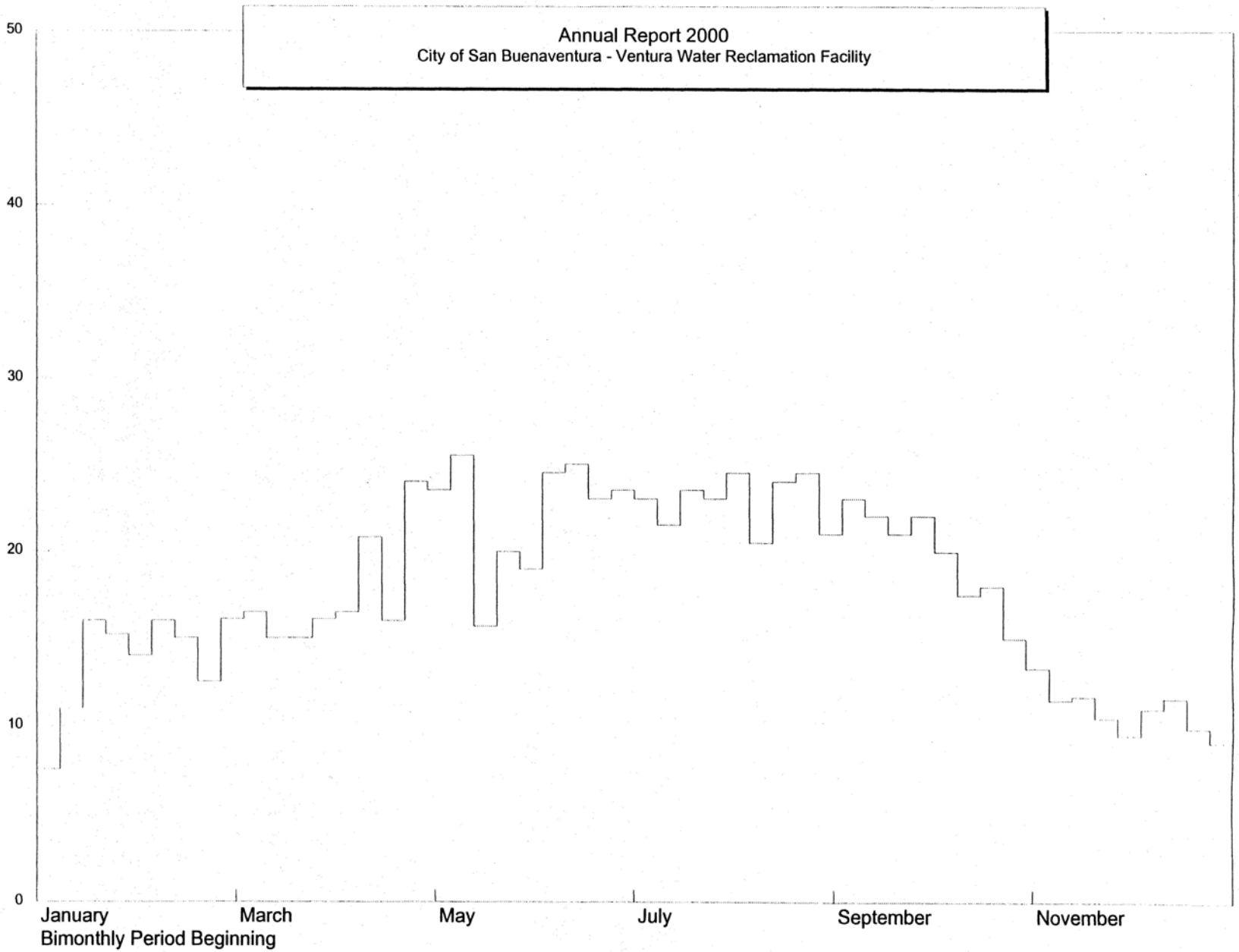
Tidal Prism Receiving Water Stations
R2 Weekly Temperature - Degrees C



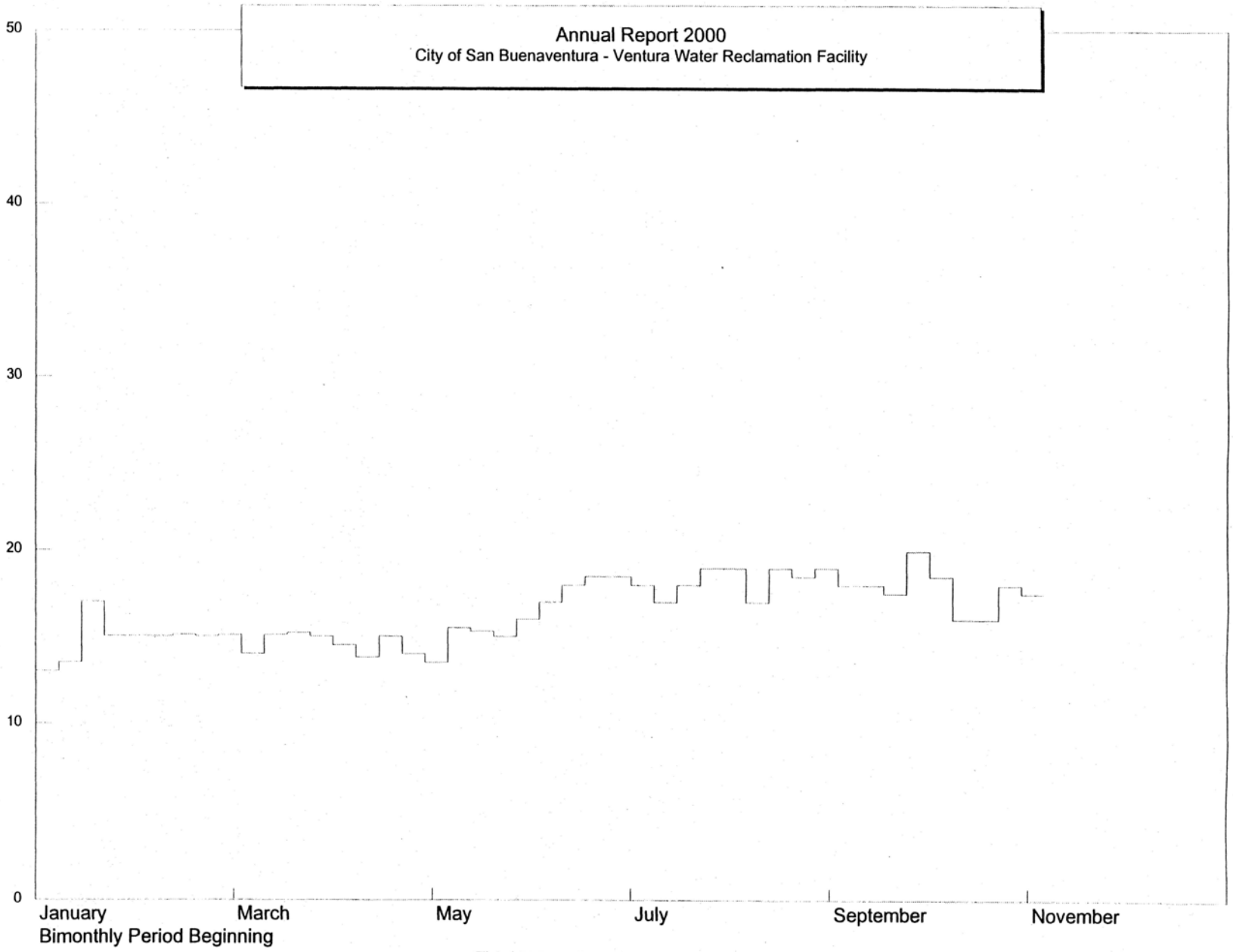
Tidal Prism Receiving Water Stations
R3 Weekly Temperature - Degrees C



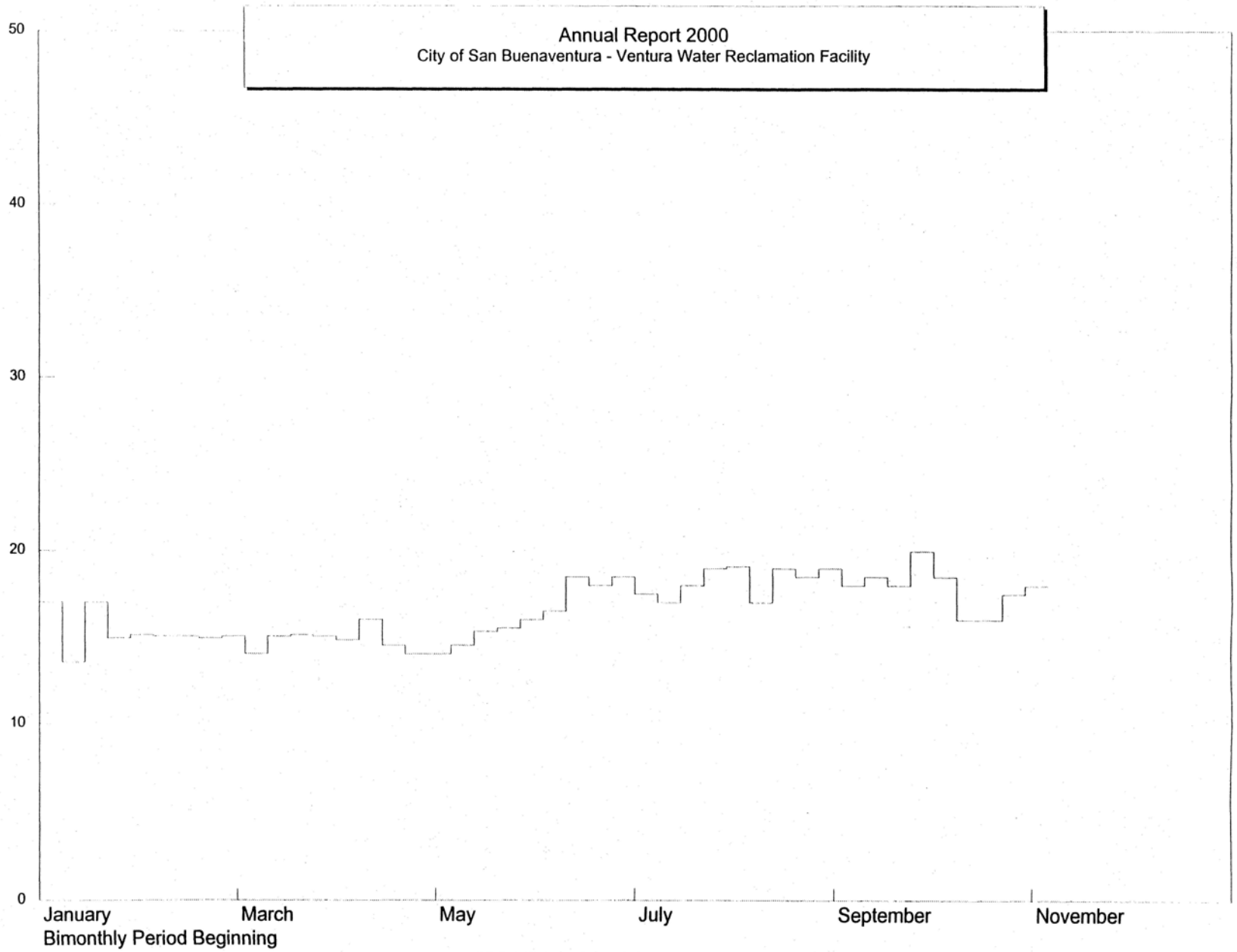
Tidal Prism Receiving Water Stations
R4 Weekly Temperature - Degrees C



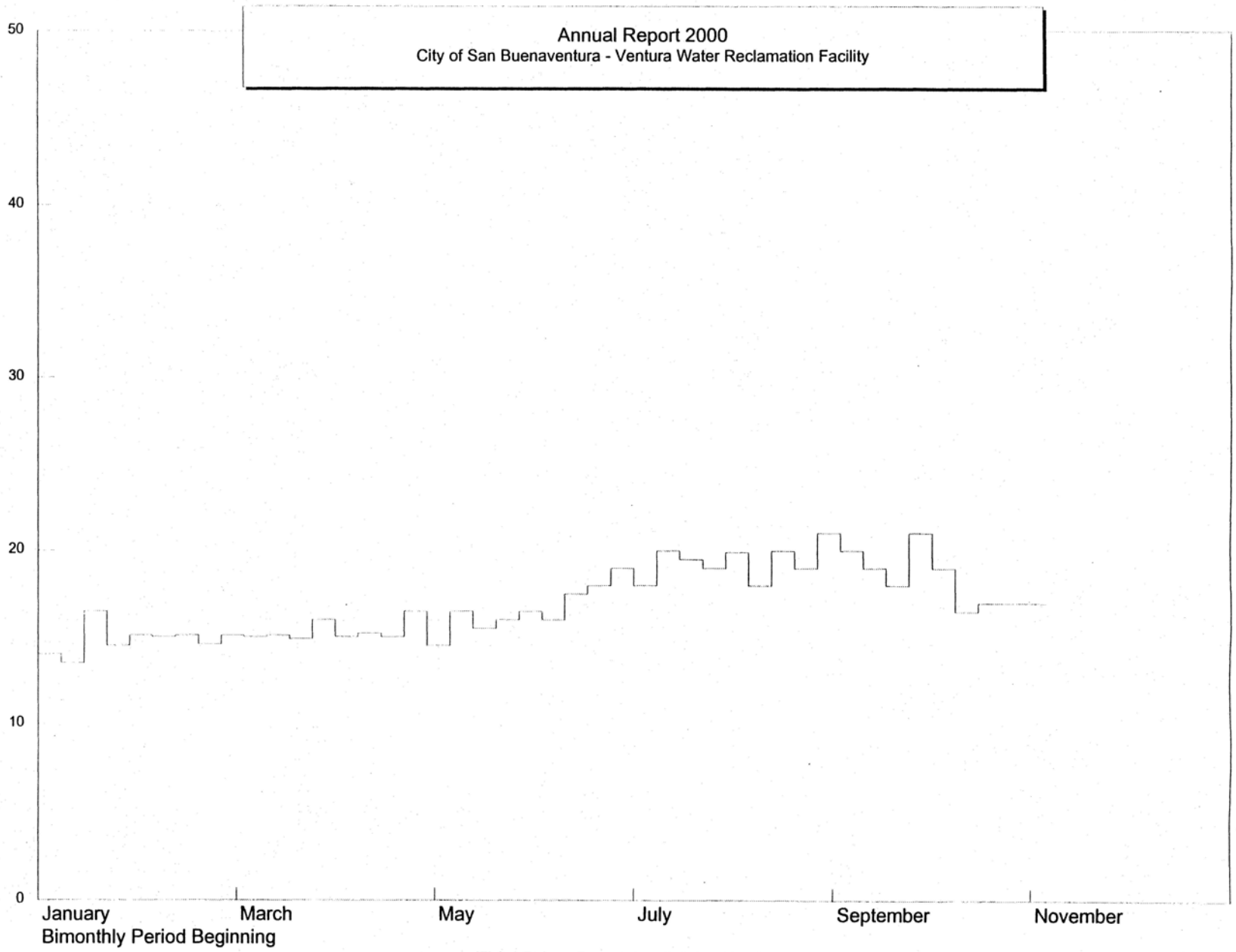
Tidal Prism Receiving Water Stations
L5 Weekly Temperature - Degrees C



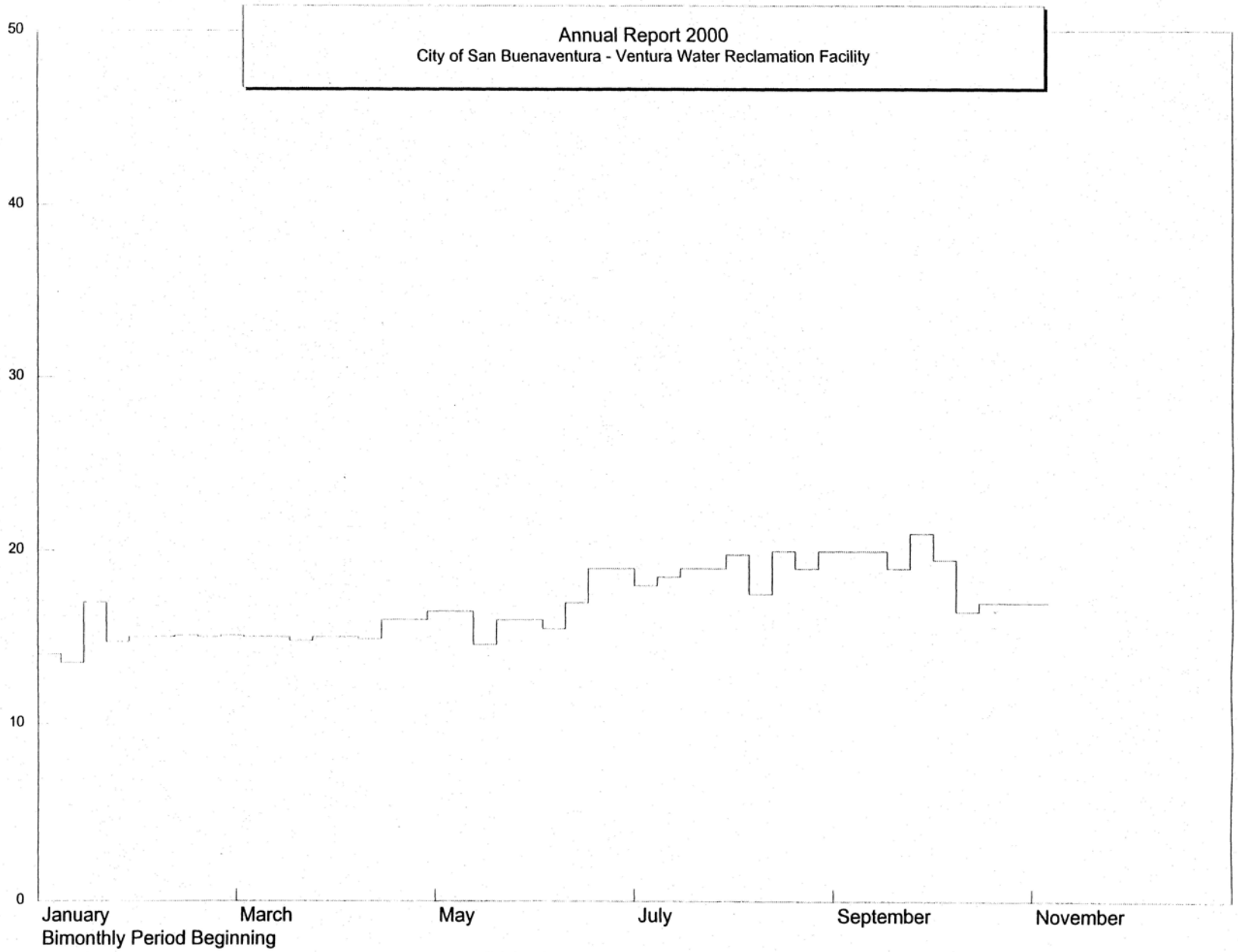
Tidal Prism Receiving Water Stations
R5 Weekly Temperature - Degrees C



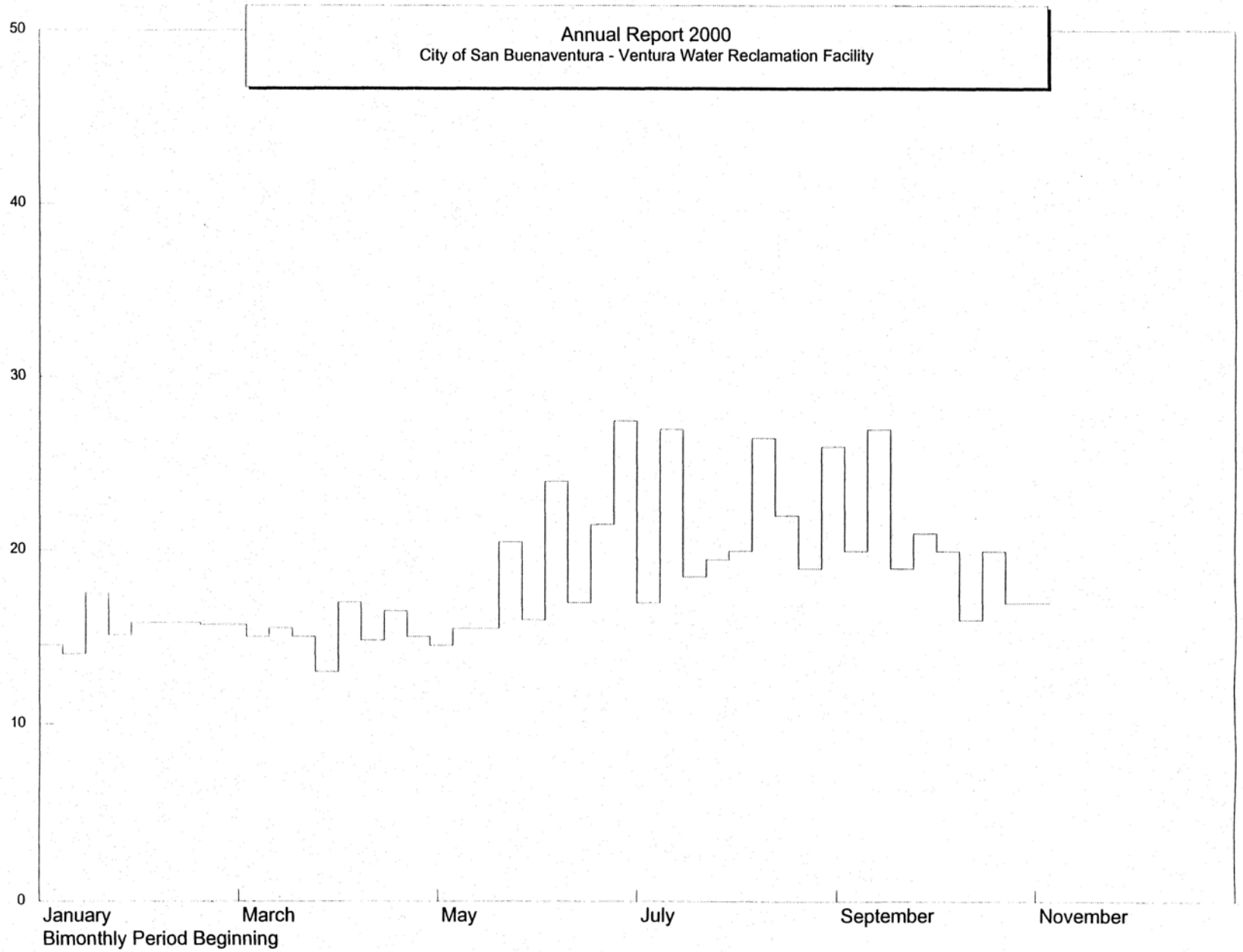
Tidal Prism Receiving Water Stations
R6 Weekly Temperature - Degrees C



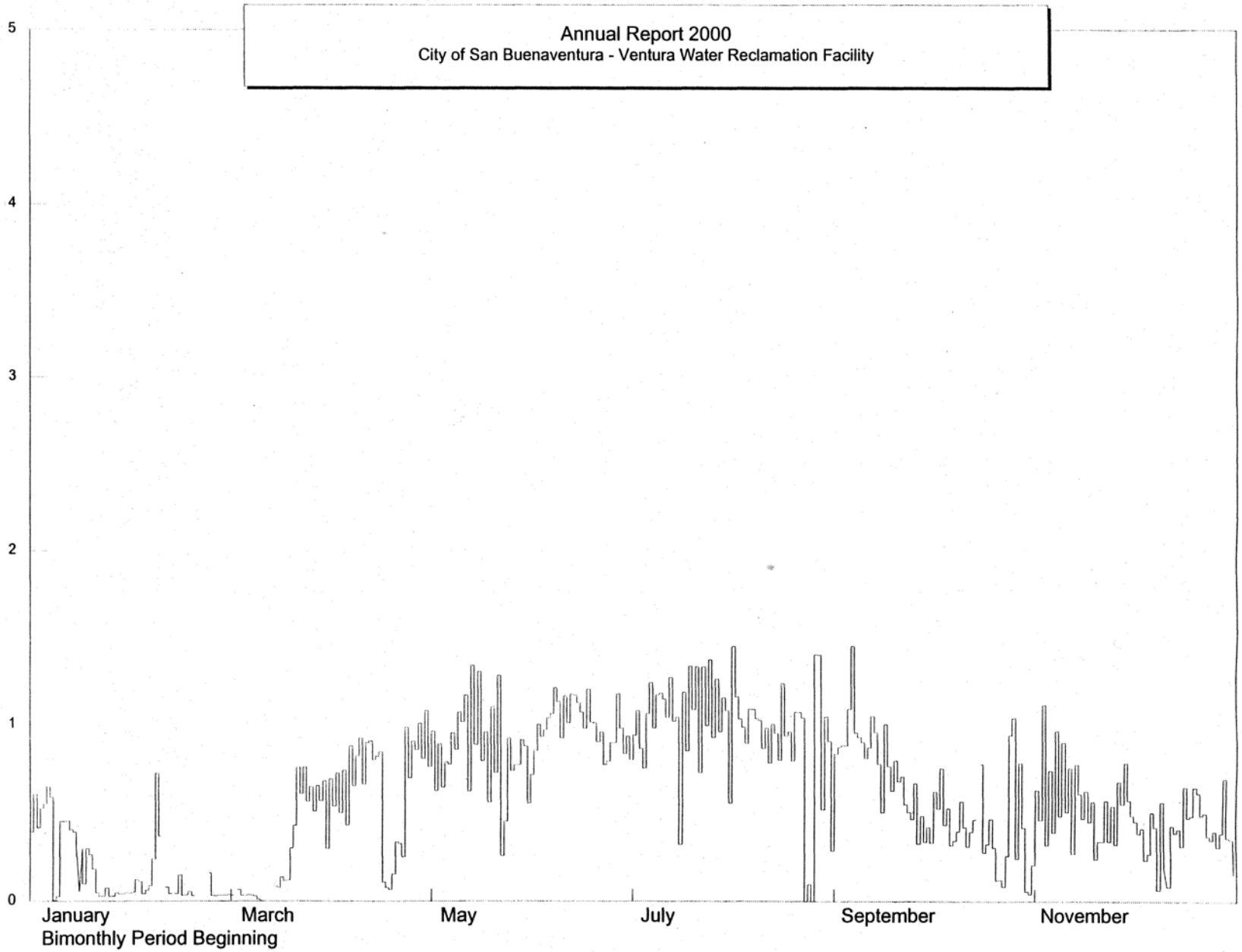
Tidal Prism Receiving Water Stations
R7 Weekly Temperature - Degrees C



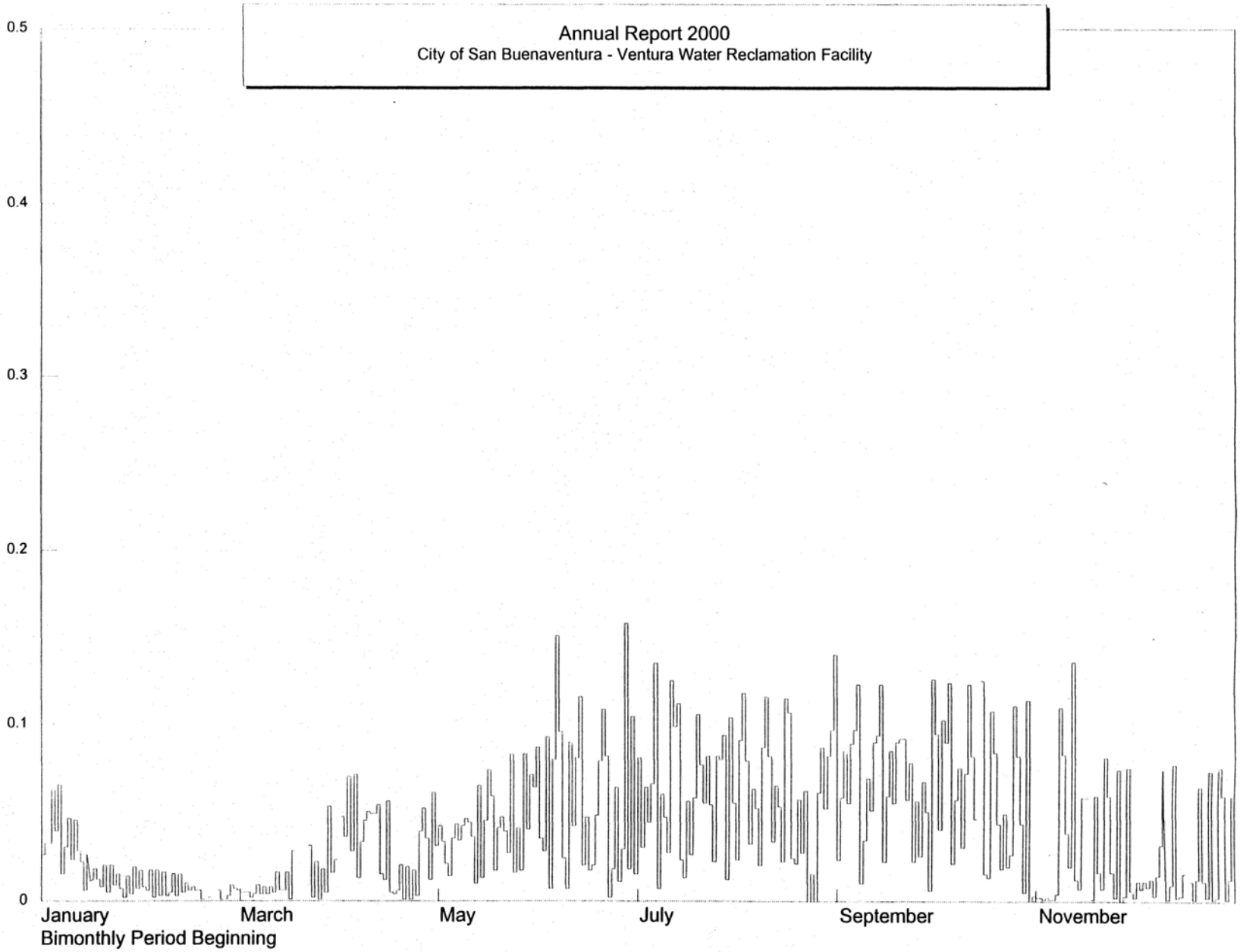
Tidal Prism Receiving Water Stations
R8 Weekly Temperature - Degrees C



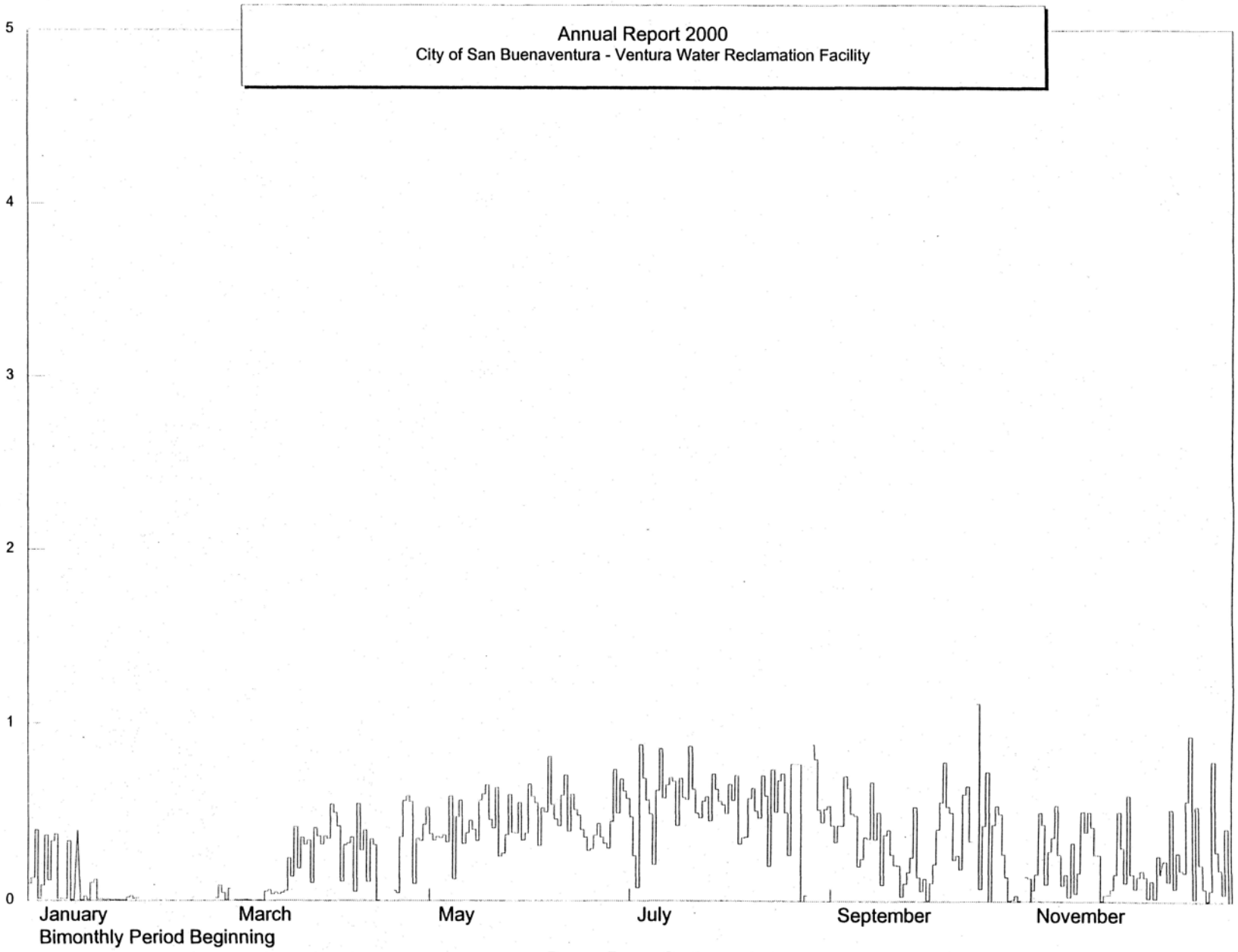
Tidal Prism Receiving Water Stations
R9 Weekly Temperature - Degrees C



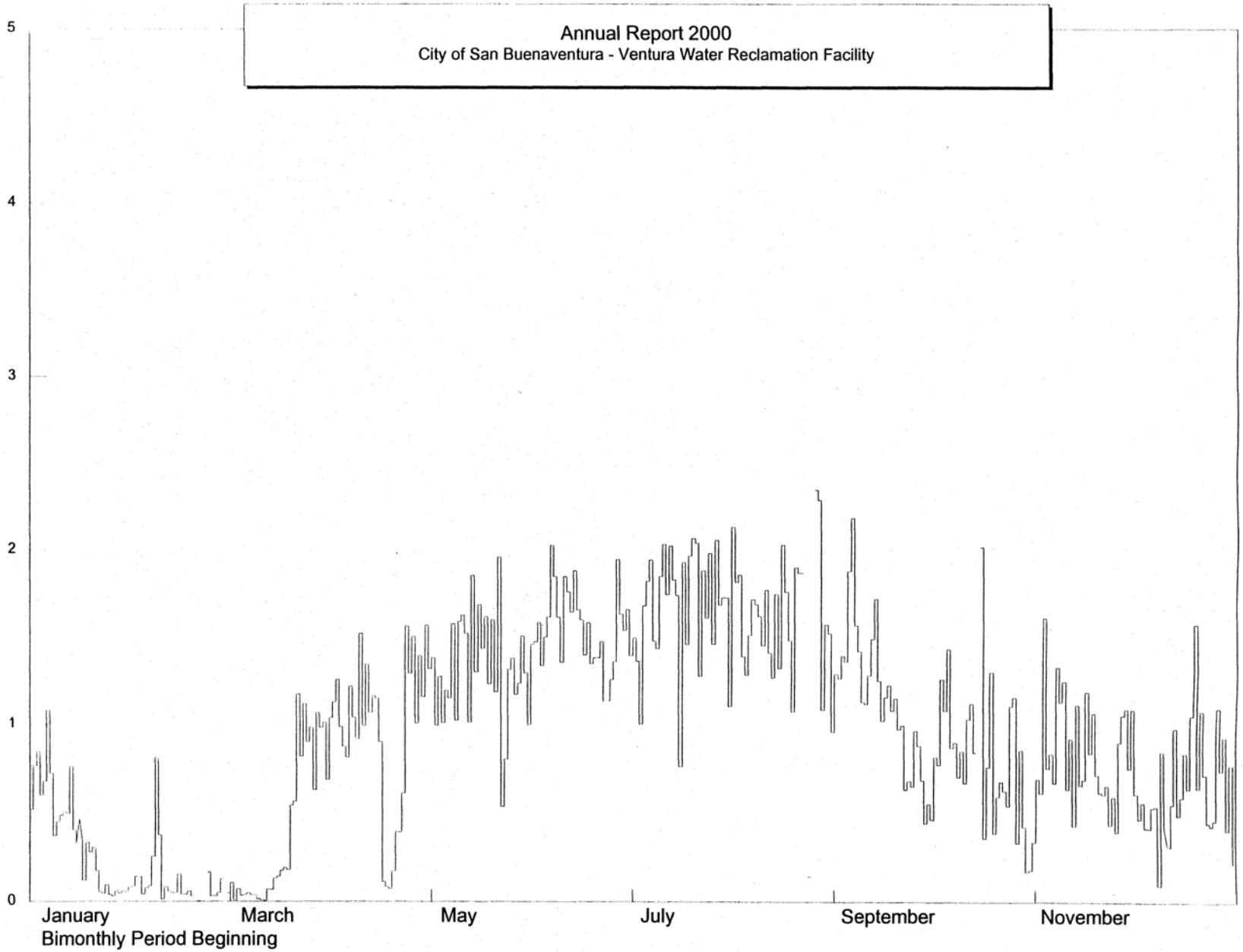
Olivas Pump Station
Daily Reclaimed Water Delivery - MGD



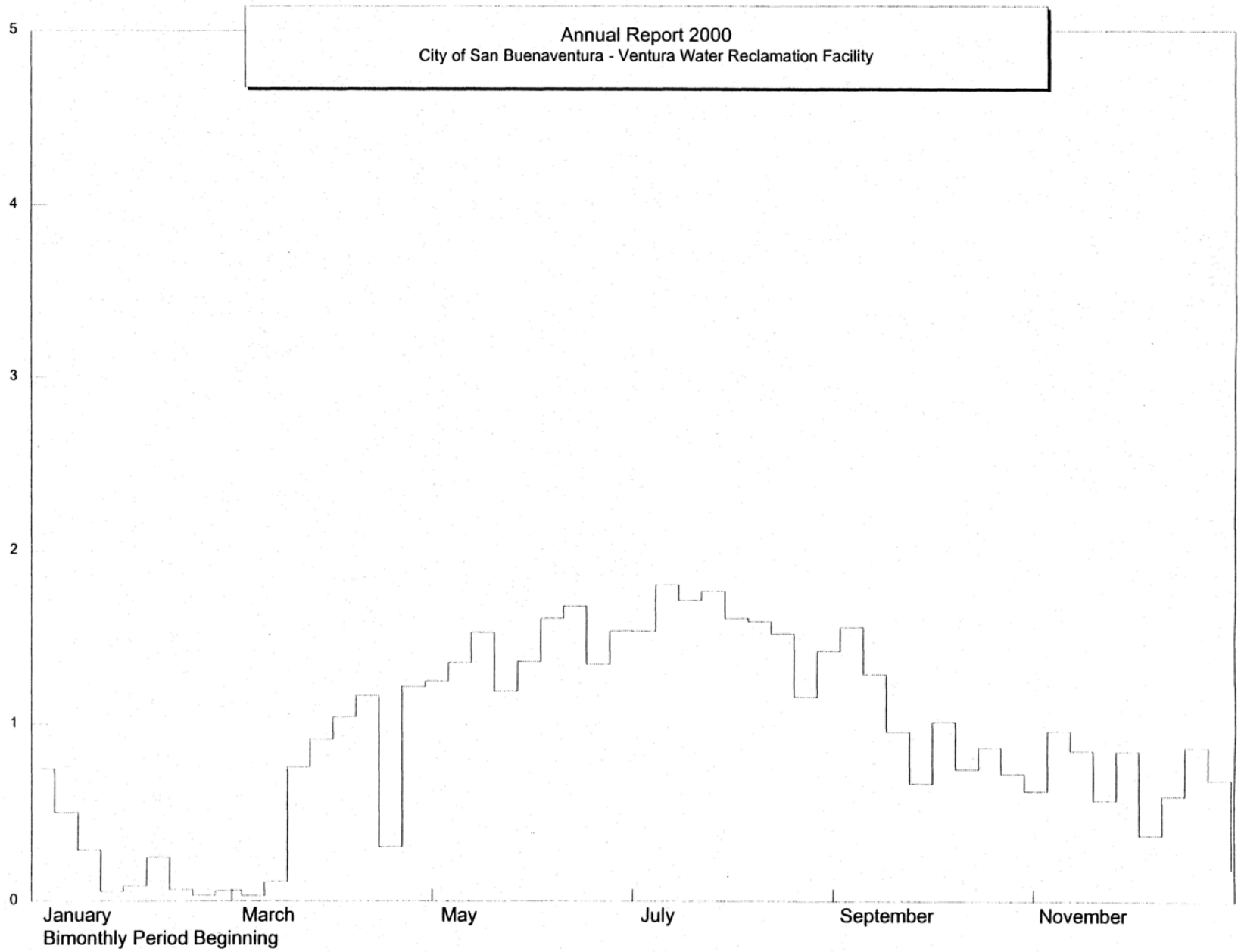
Marina Park Irrigation Systems
Daily Reclaimed Water Delivery - MGD



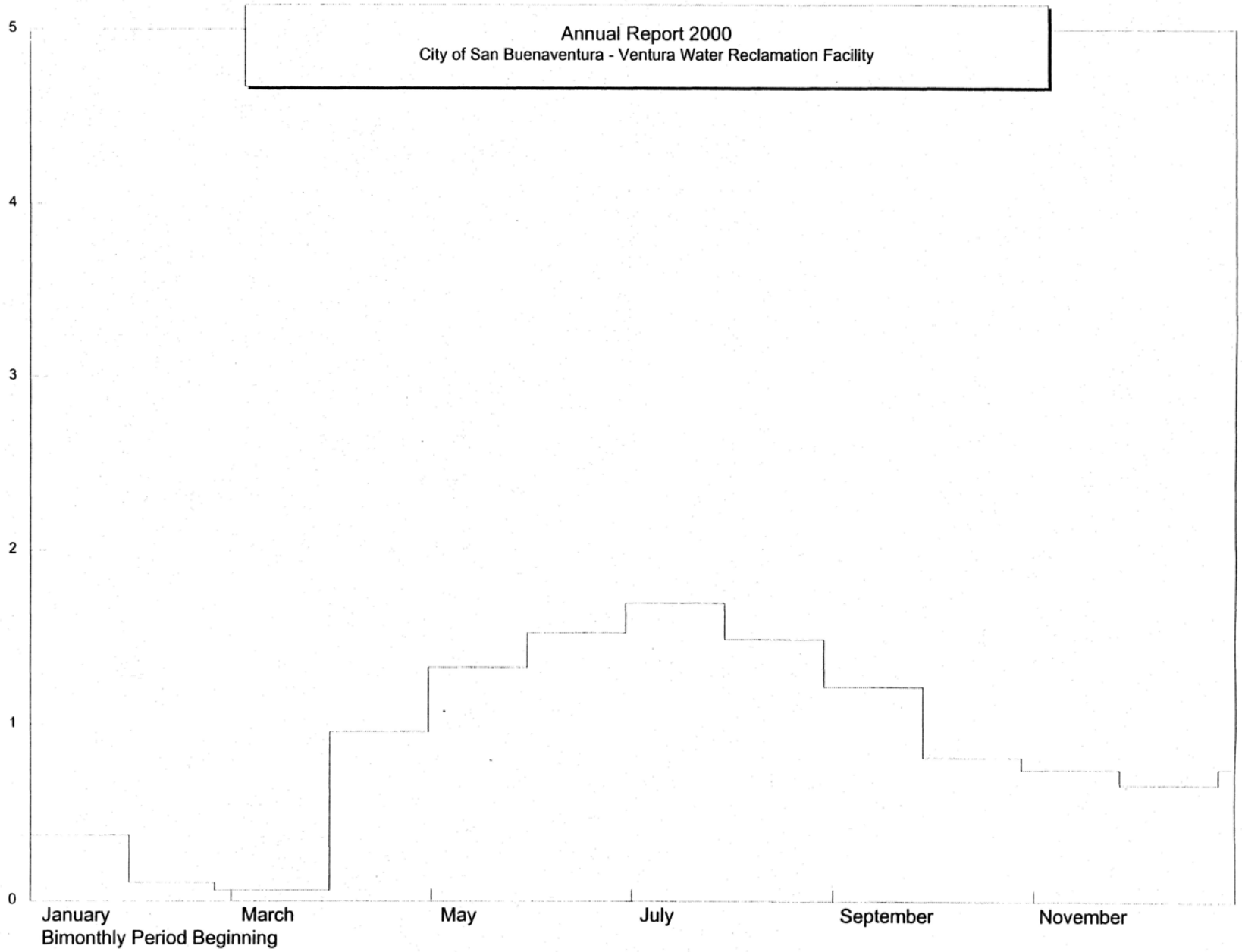
Buena Pump Station
Daily Reclaimed Water Delivery - MGD



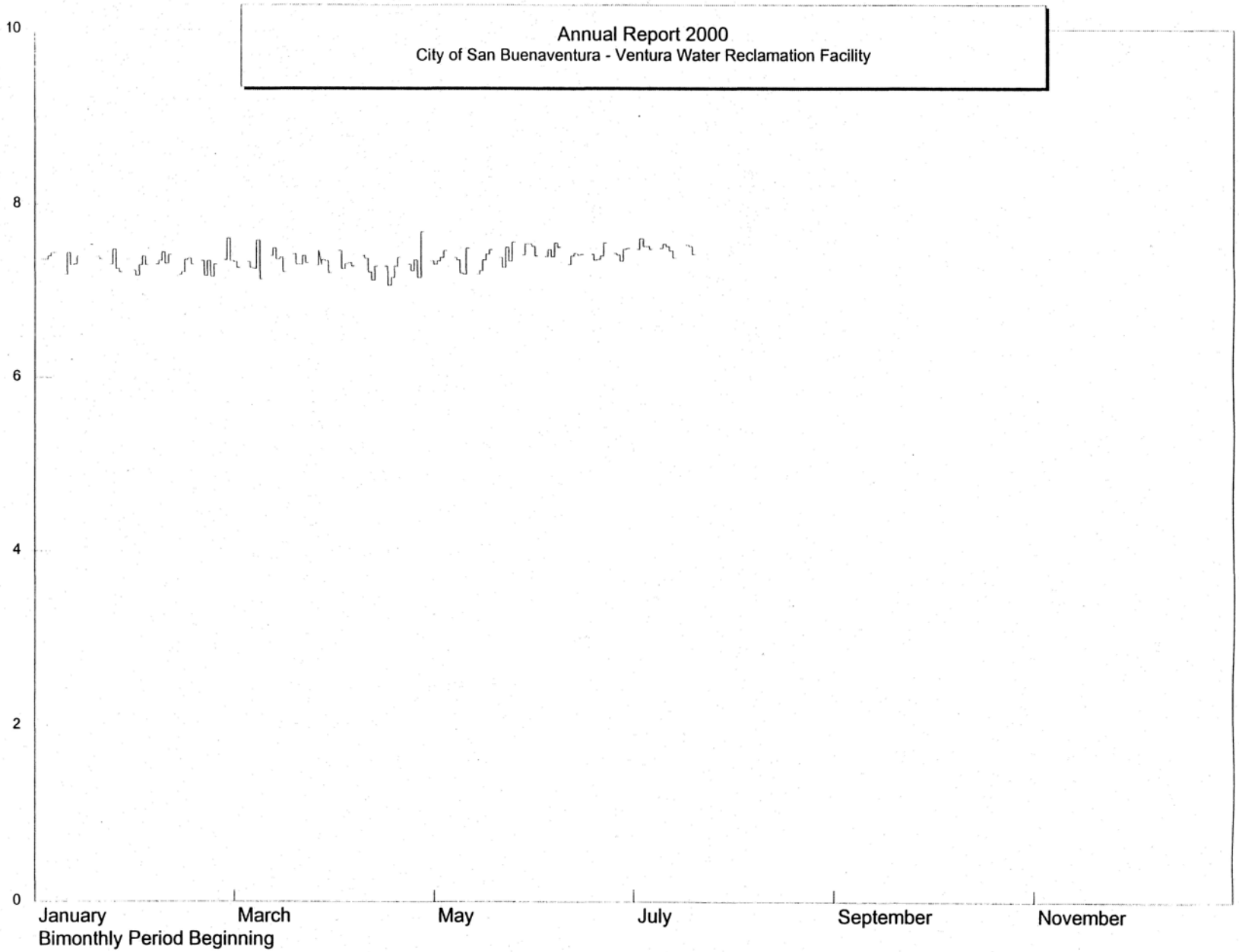
All Irrigation Deliveries
Daily Reclaimed Water Delivery - MGD



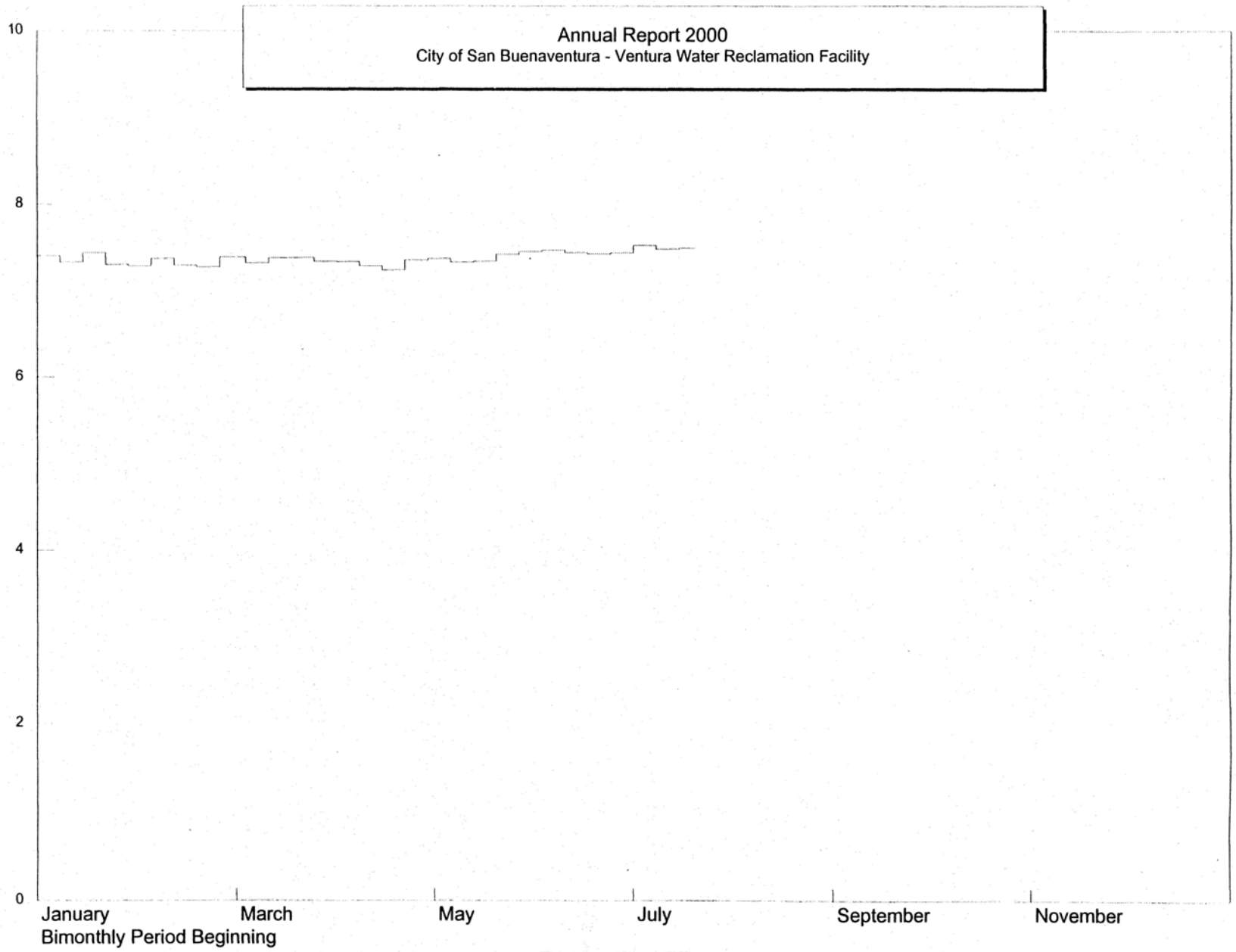
All Irrigation Deliveries
Daily Reclaimed Water 7 Day Average Delivery - MGD



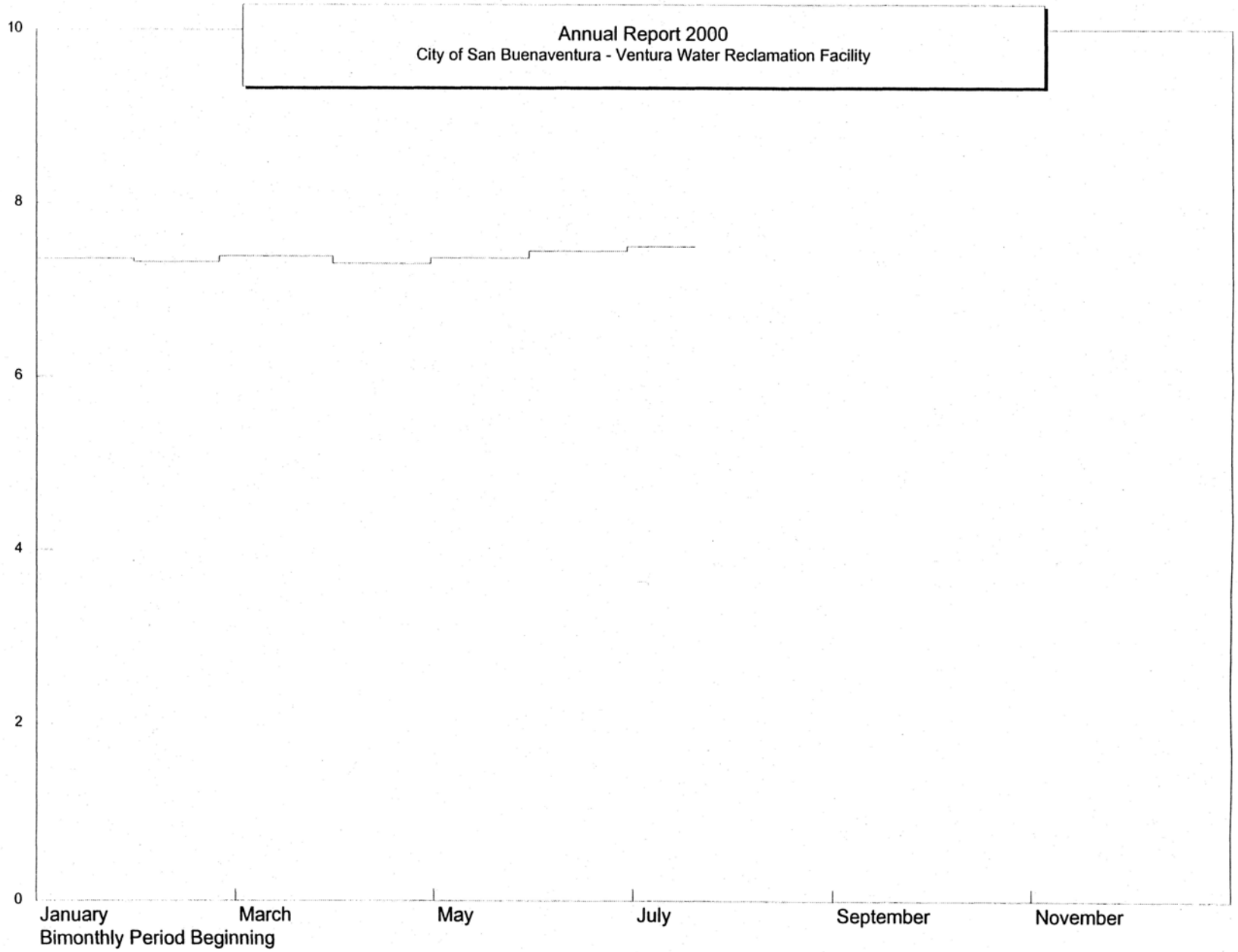
All Irrigation Deliveries
Daily Reclaimed Water 30 Day Average Delivery - MGD



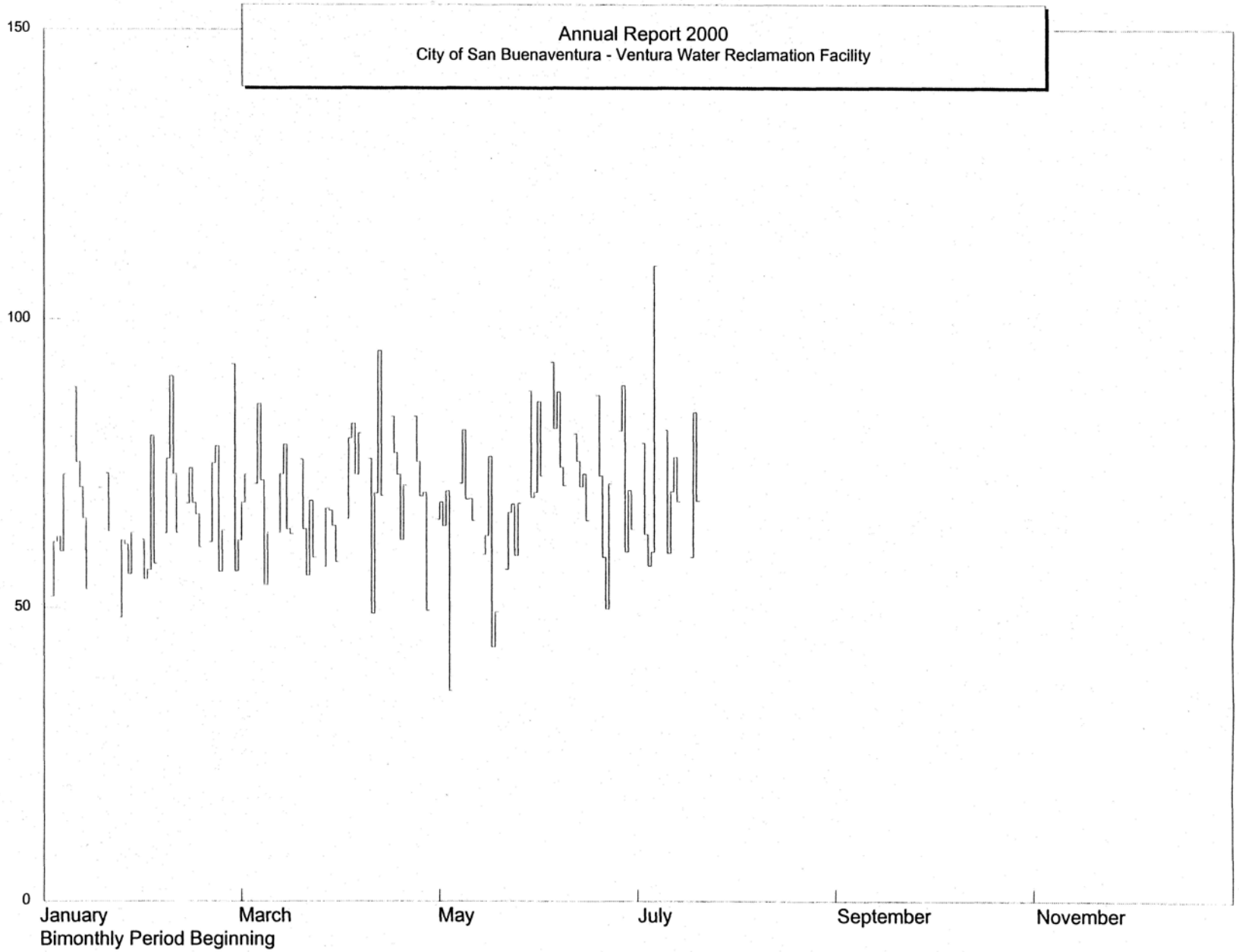
Trickling Filter Effluent
Trickling Filter Effluent pH - pH Units



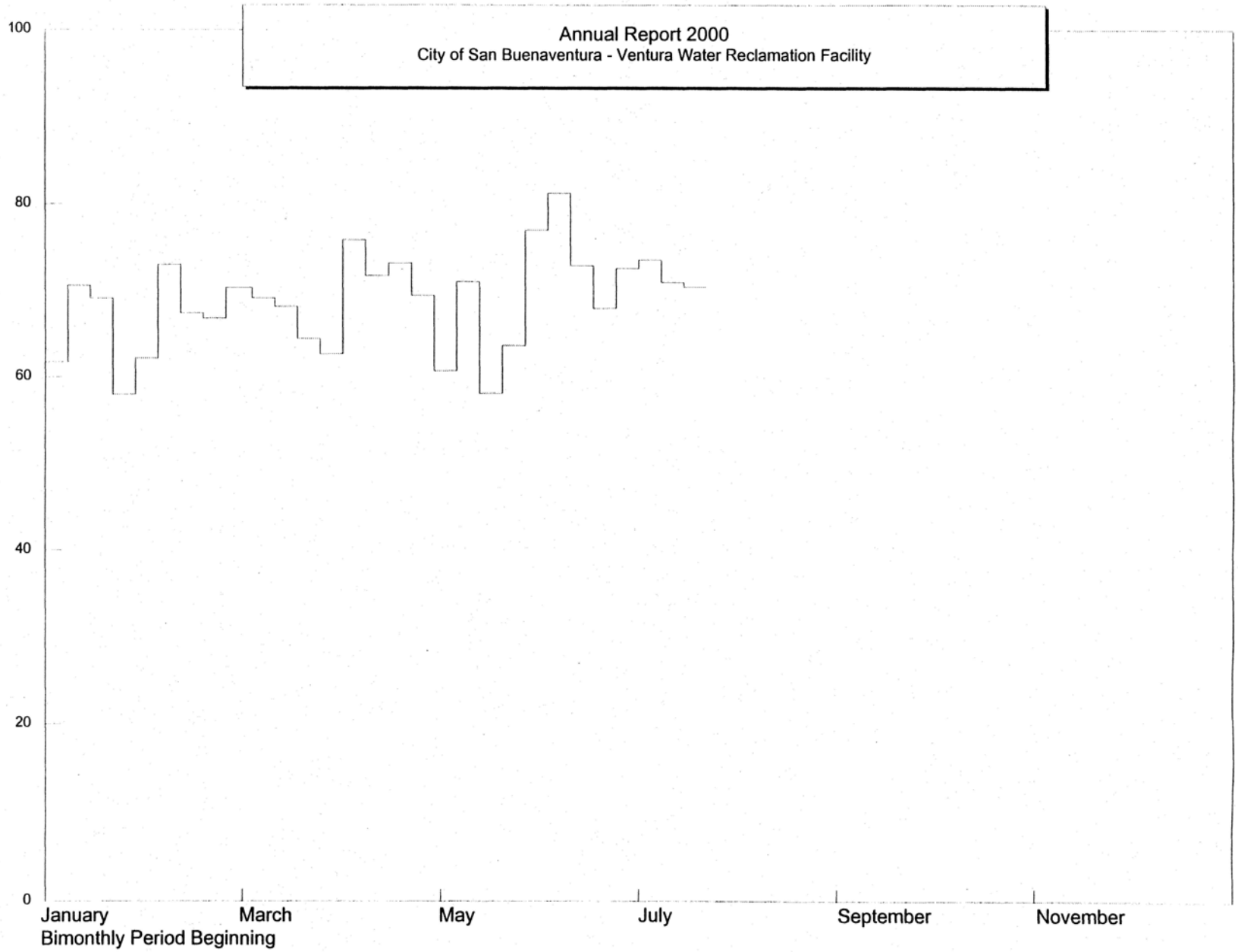
Trickling Filter Effluent
Trickling Filter Effluent 7 Day Average pH - pH Units



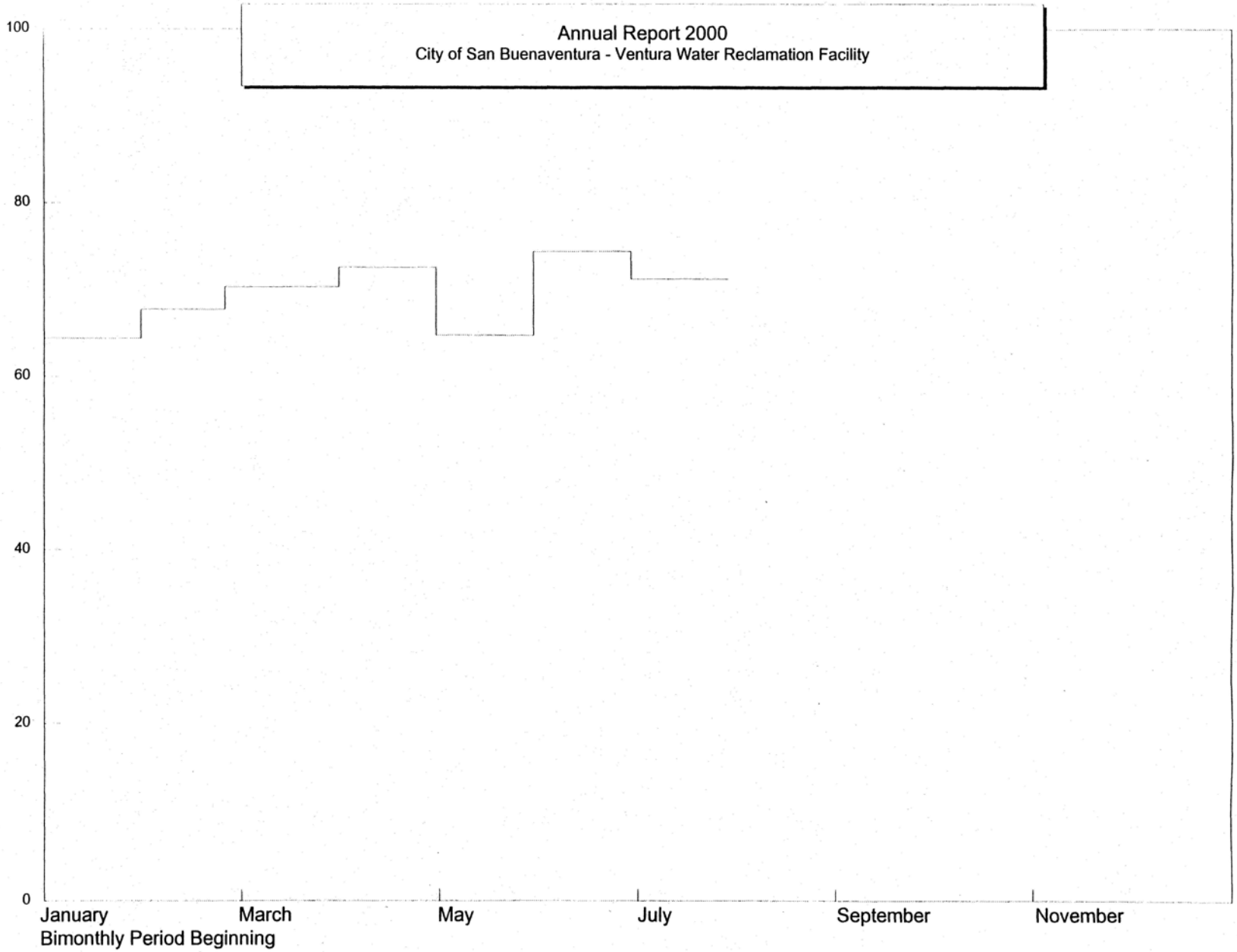
Trickling Filter Effluent
Trickling Filter Effluent 30 Day Average pH - pH Units



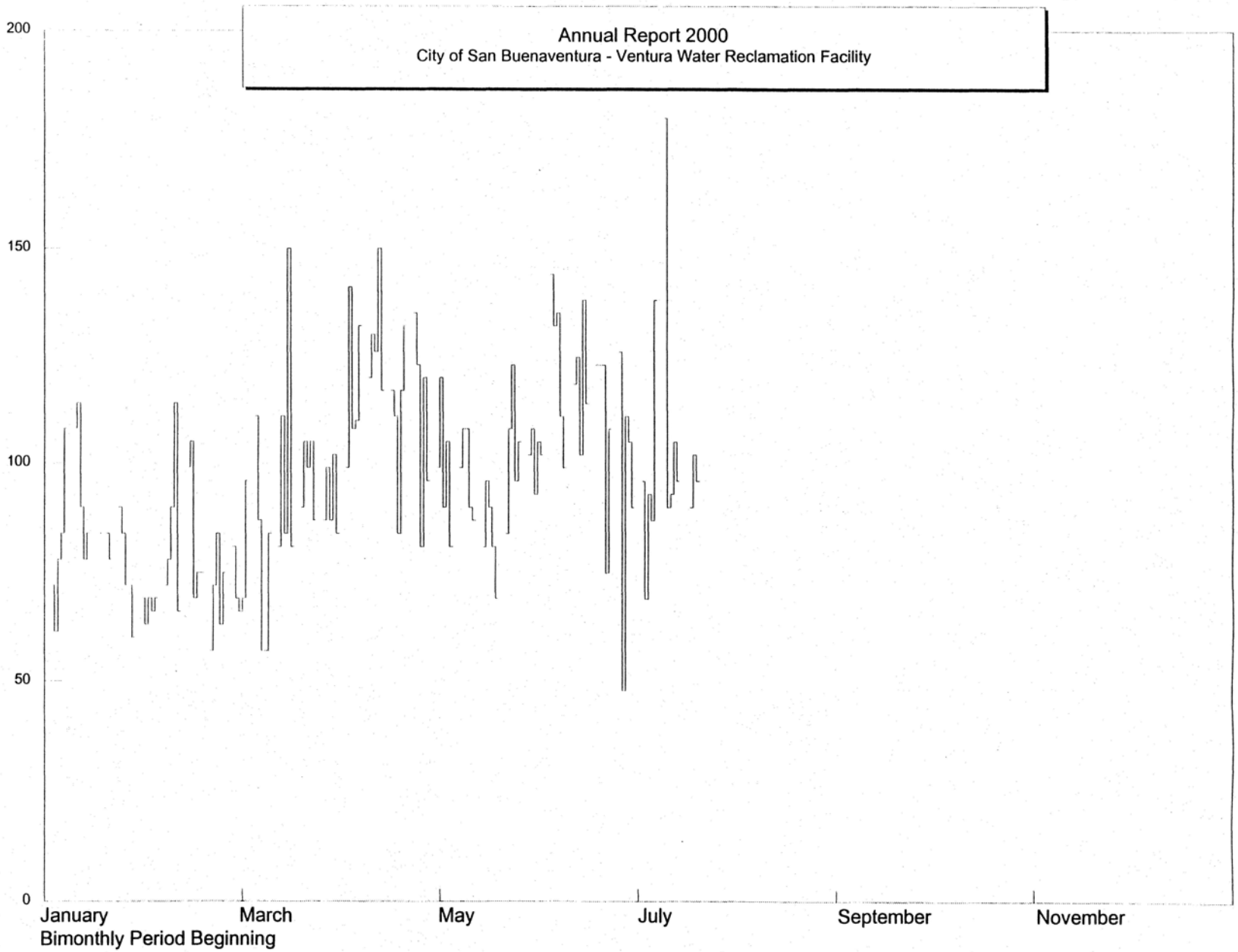
Trickling Filters Effluent
Trickling Filters Effluent Suspended Solids - mg/l



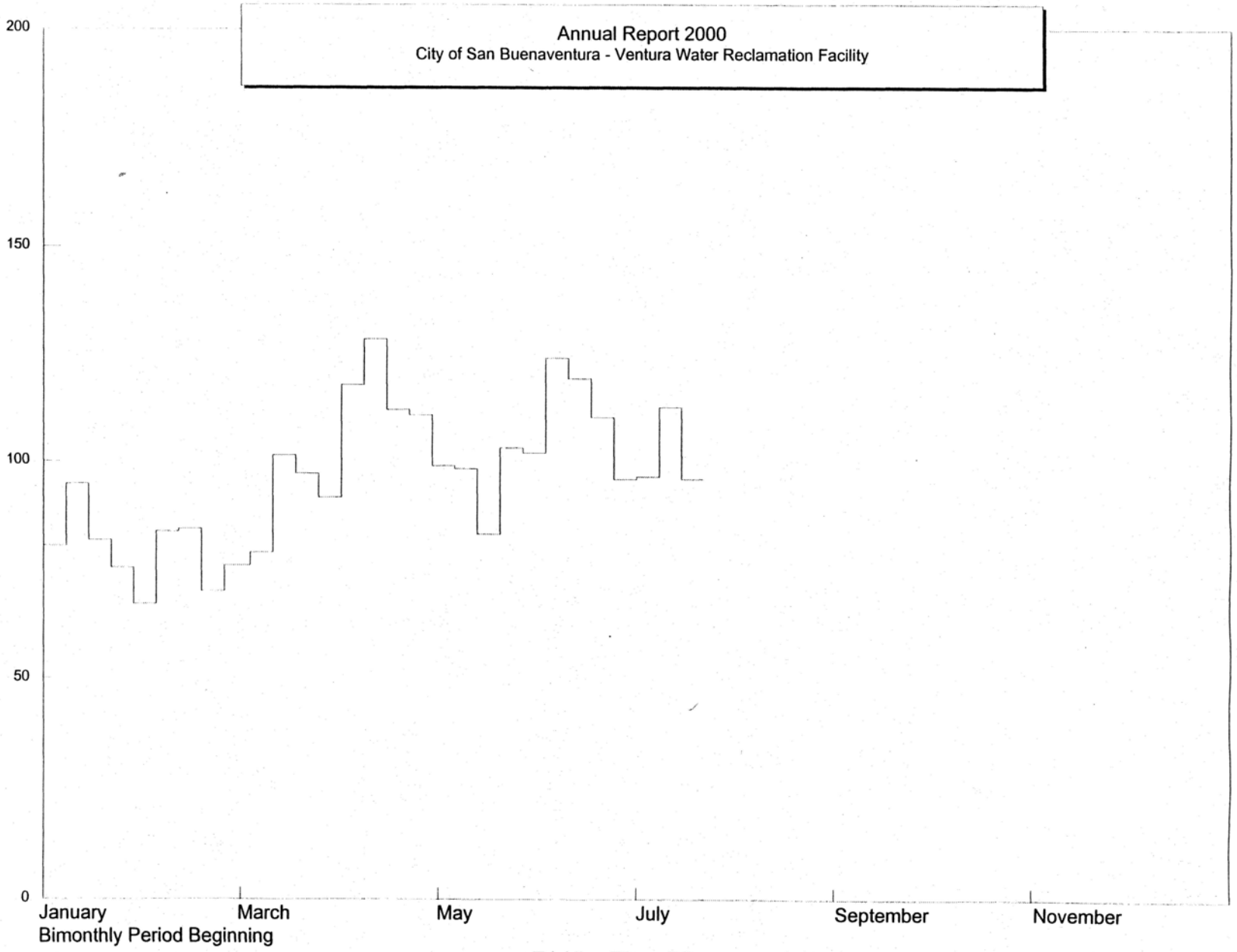
Trickling Filters Effluent
Trickling Filters Effluent 7 Day Average Suspended Solids - mg/l



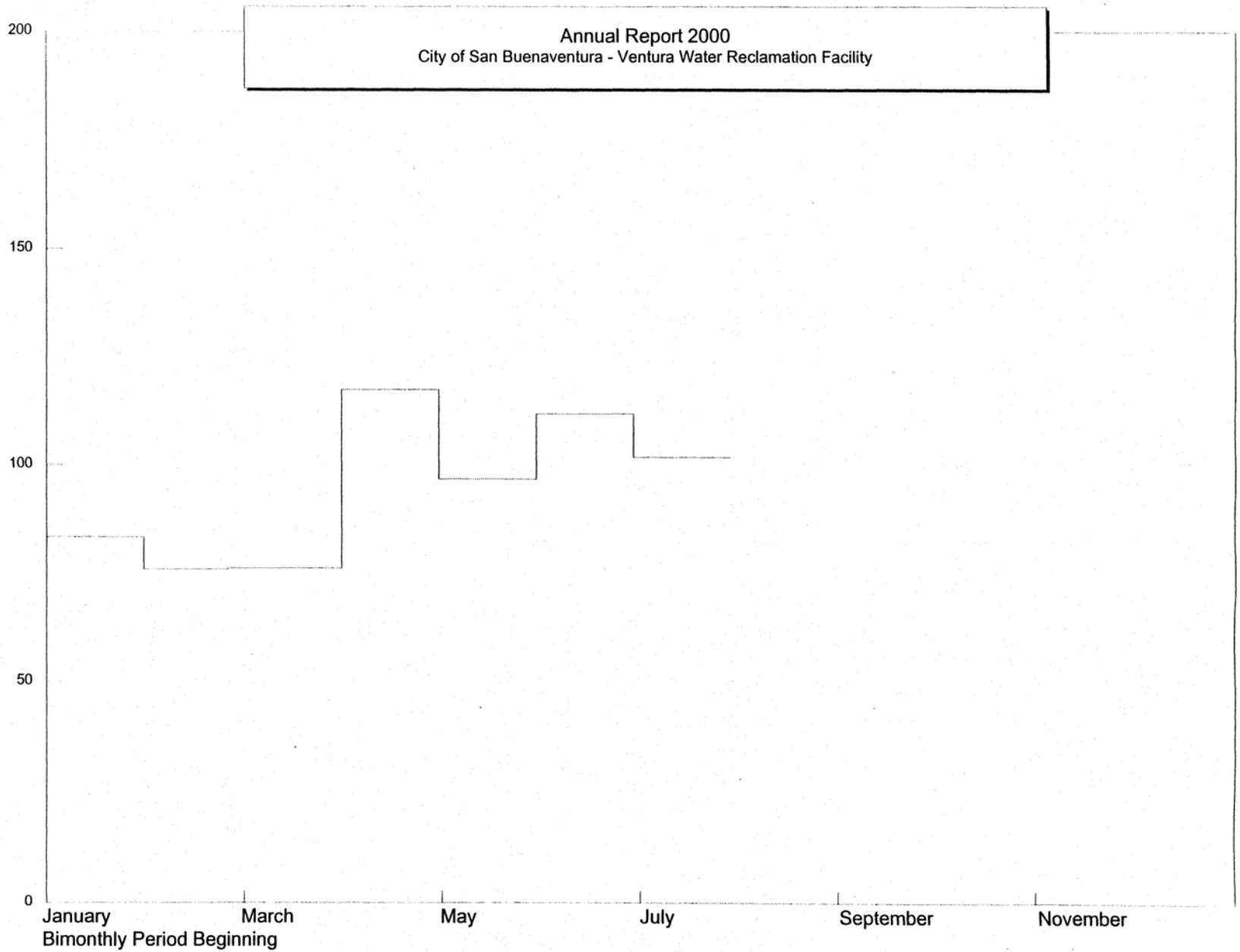
Trickling Filters Effluent
Trickling Filters Effluent 30 Day Average Suspended Solids - mg/l



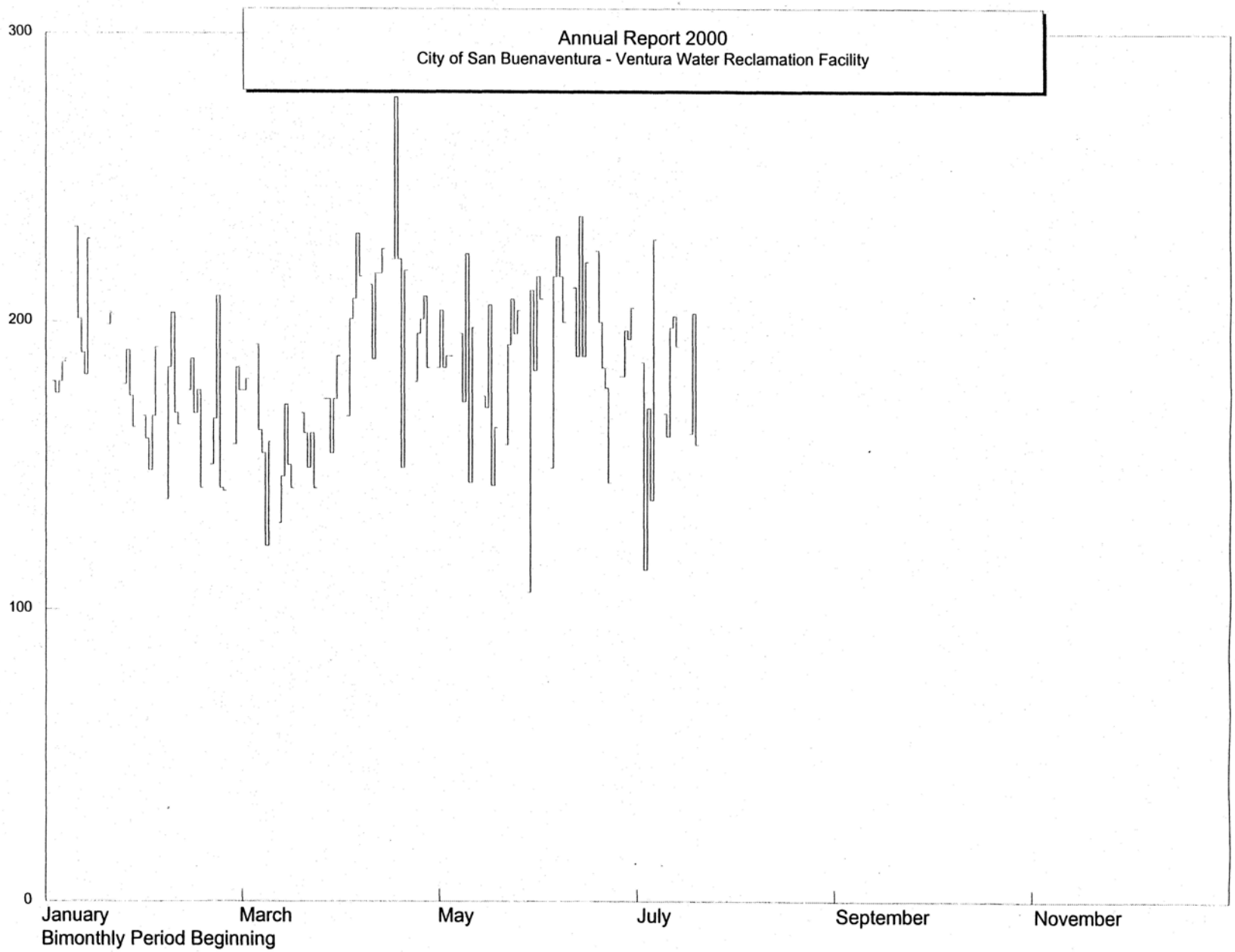
Trickling Filters Effluent
Trickling Filters Effluent BOD - mg/l



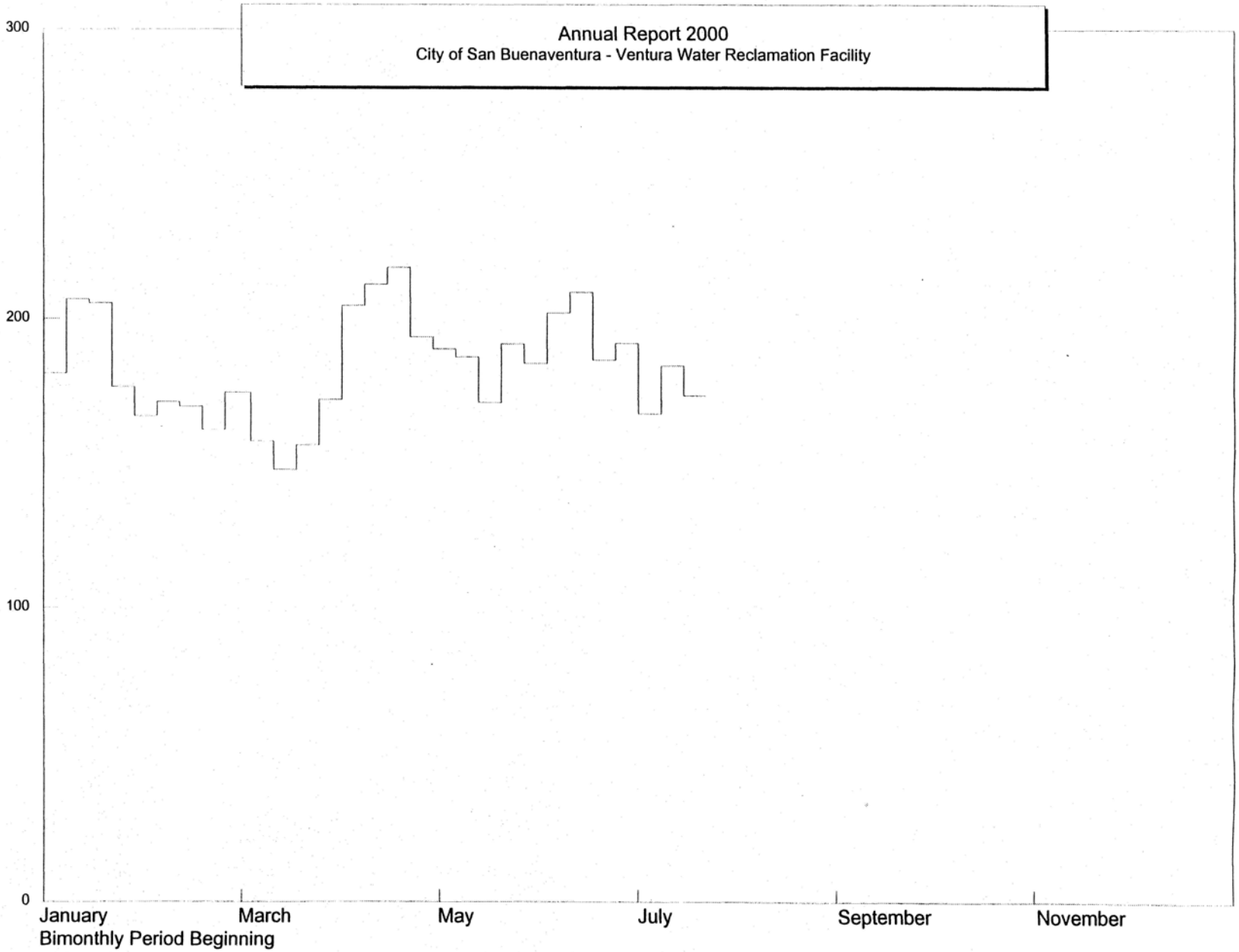
Trickling Filters Effluent
Trickling Filters Effluent 7 Day Average BOD - mg/l



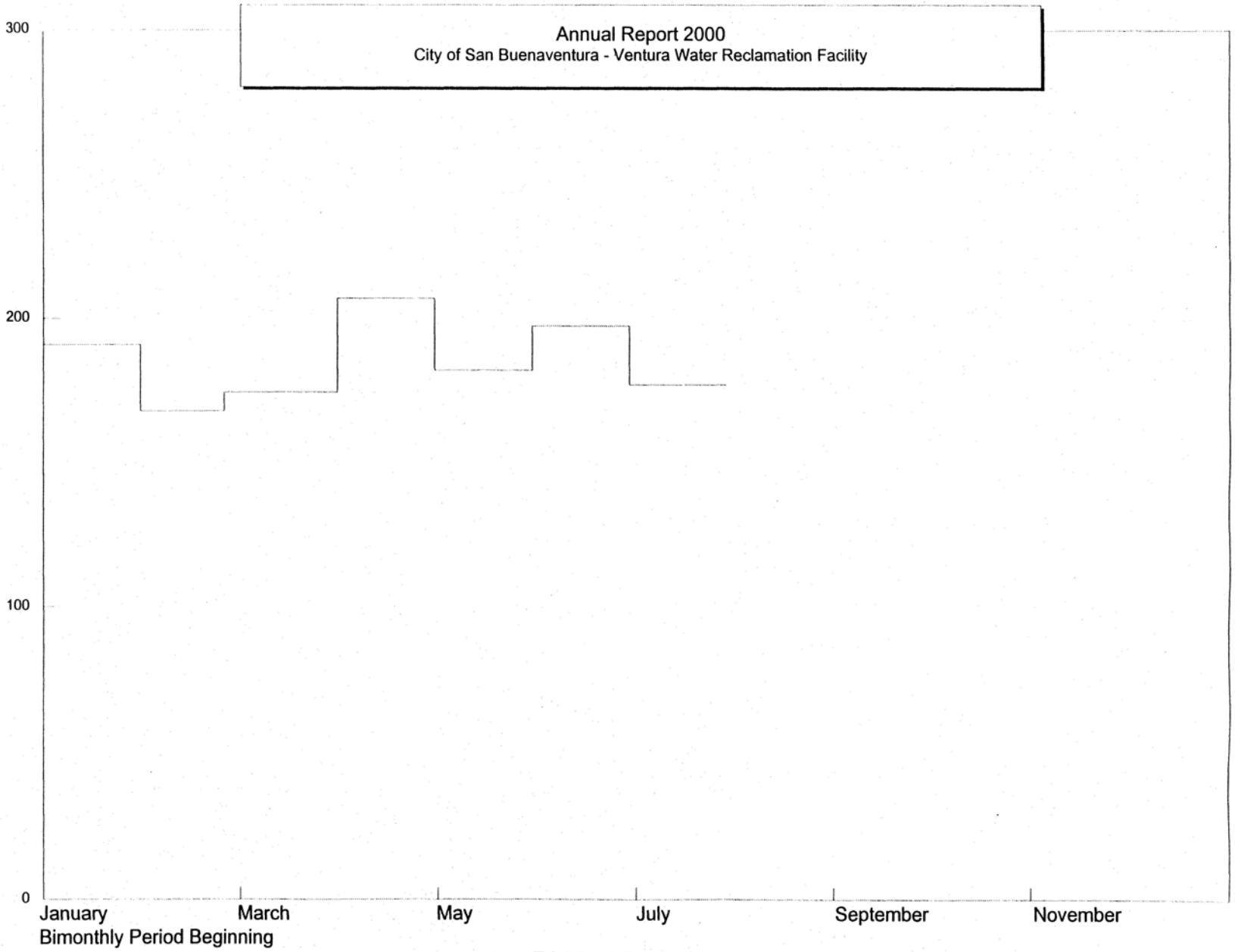
Trickling Filters Effluent
Trickling Filters Effluent 30 Day Average BOD - mg/l



Trickling Filters Effluent
Trickling Filters Effluent COD - mg/l

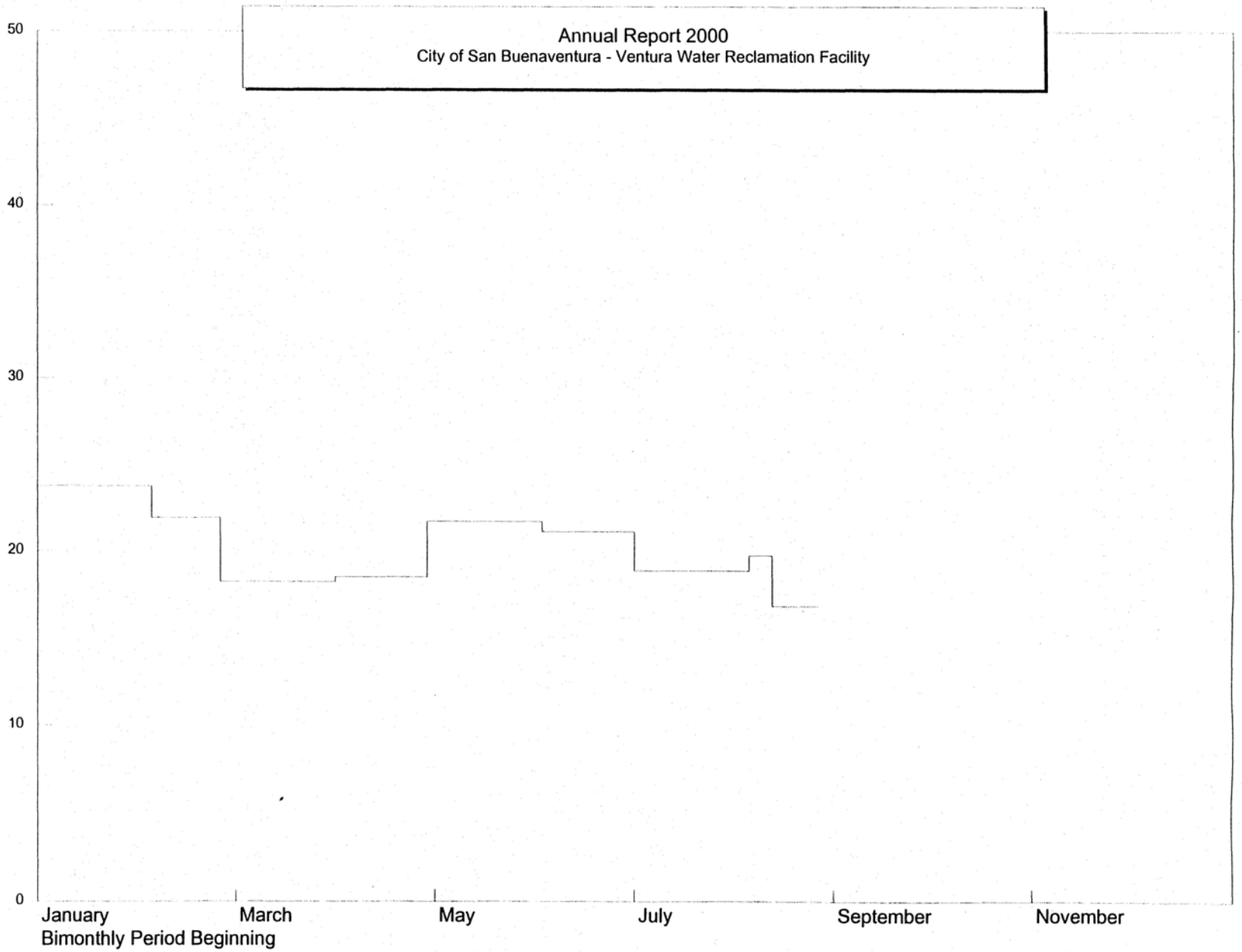


Trickling Filters Effluent
Trickling Filters Effluent 7 Day Average COD - mg/l

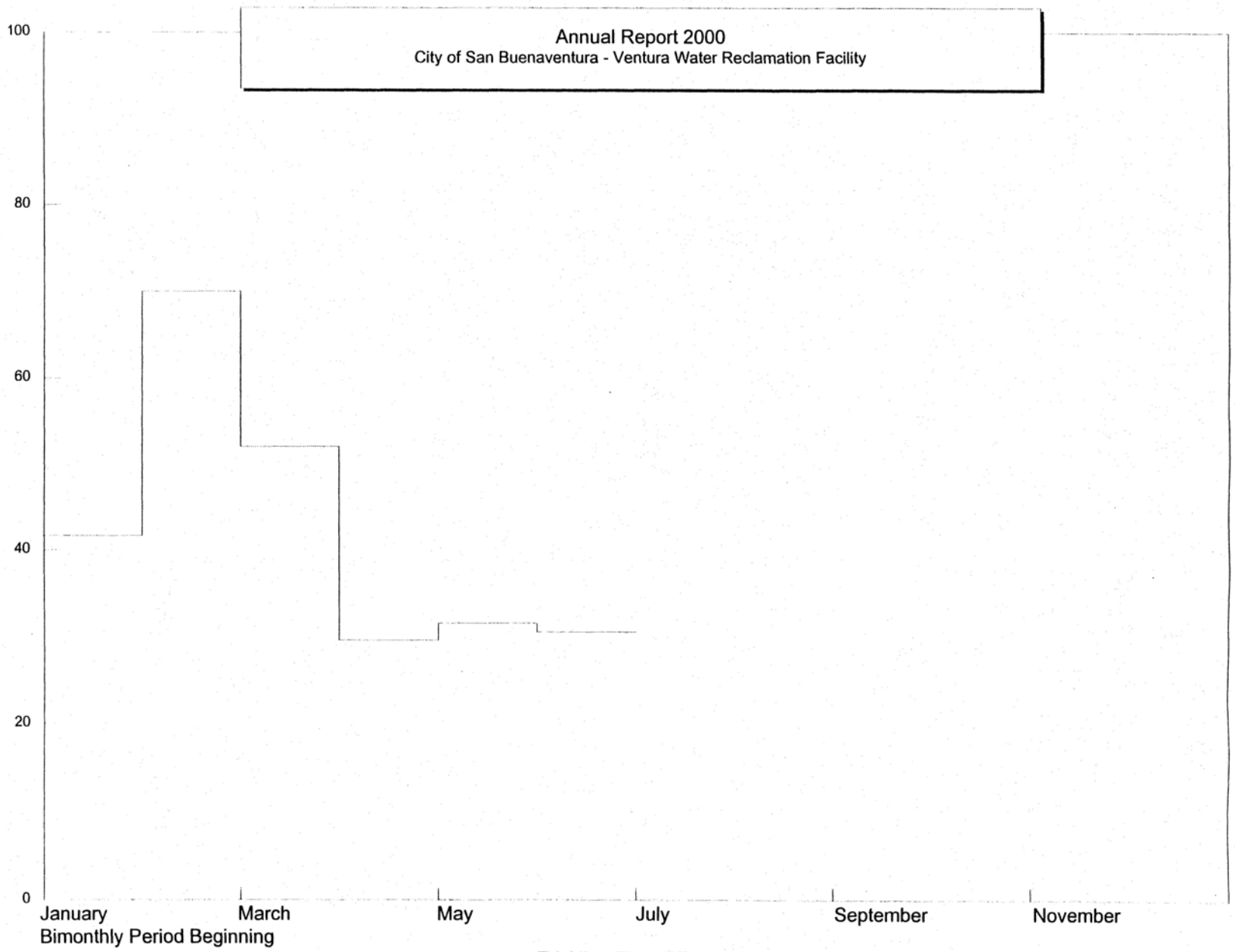


Trickling Filters Effluent
Trickling Filters Effluent 30 Day Average COD - mg/l

Trickling Filter Effluent
Trickling Filter Effluent Weekly Ammonia-N - mg/l



Trickling Filter Effluent
Trickling Filter Effluent 30 Day Average Ammonia-N - mg/l



Trickling Filter Effluent
Trickling Filter Effluent Monthly TKN - mg/l

ANALYTICAL QUALITY ASSURANCE PROGRAM 2000

I. LABORATORY DUTIES AND OBJECTIVES

The City of San Buenaventura Sanitation Division Laboratory is responsible for all sampling and analysis for purposes of NPDES compliance monitoring related to the City operated wastewater treatment plant and for the City domestic water supply and water distribution system monitoring for SDWA compliance.

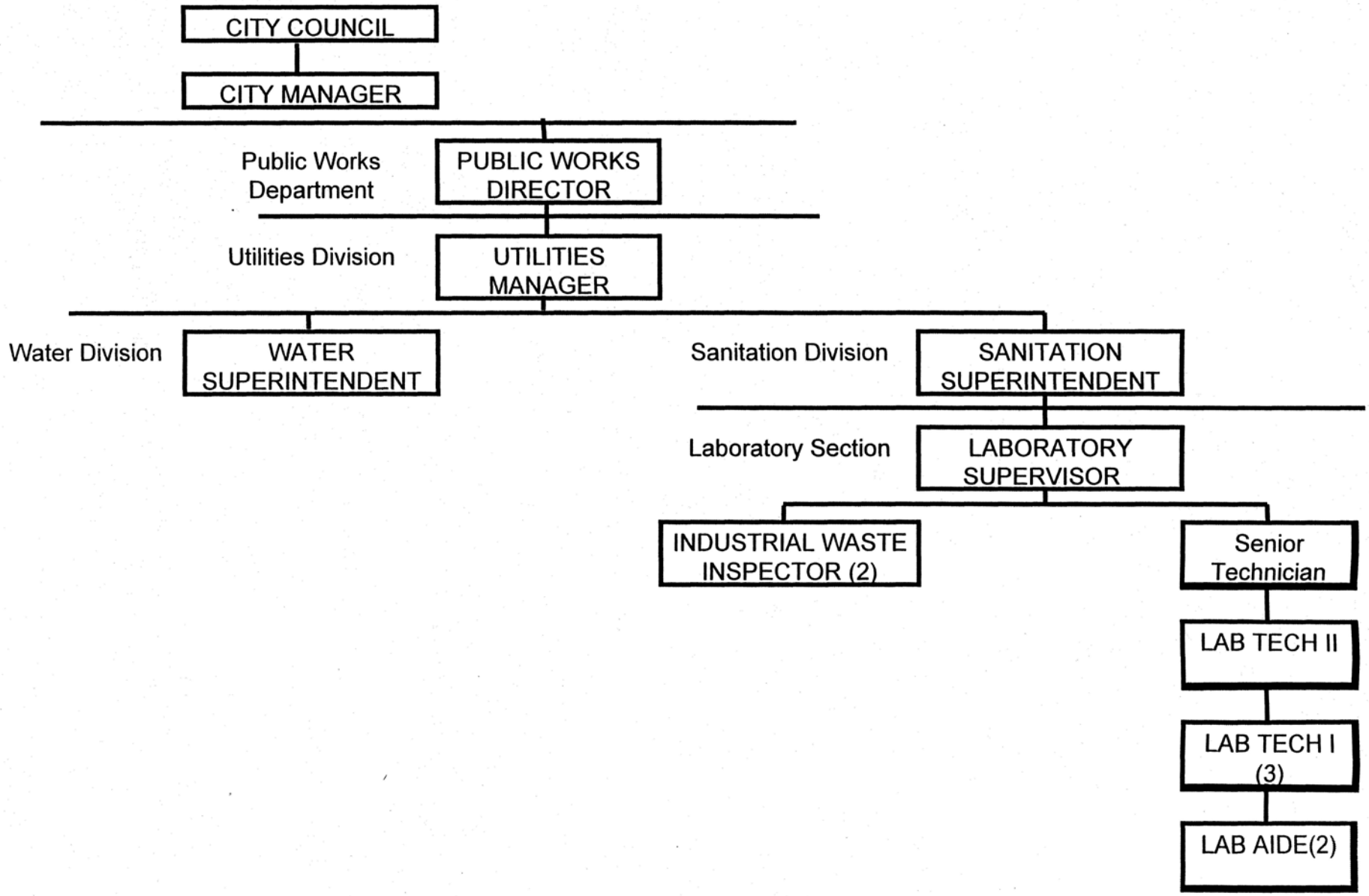
Current State of California Department of Health Services laboratory approval is attached.

All analyses for purposes of NPDES and SDWA reporting or for industrial waste monitoring conforms to the current requirements of 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants" or of 40 CFR Part 141, "National Interim Primary Drinking Water Regulations."

The purpose of this document is to outline the laboratory quality assurance procedures as they relate to compliance monitoring and to evaluate performance where statistically valid numbers of control results are available.

II. Laboratory Overview

A. Organization



B. Laboratory Personnel Qualifications and Experience

Laboratory Supervisor: **Florence Jay**

1979 to Present

Education

Bachelor of Sciences Fort Valley State College Major - Biology

Master of Sciences Iowa State University Major - Fisheries Biology

Experience

Lab Tech I City of San Buenaventura Water Division

Lab Tech II City of San Buenaventura Wastewater Division

Present Duties

Responsibility for the laboratory service including planning, budget, employee evaluations and QA functions. Perform and supervise others in performing routine and sophisticated chemical, physical and biological analysis of water and wastewater.

Senior Technician: **Michael L. Torres**

1999 to Present

Education

Bachelor of Science Microbiology – California State University @ Northridge (Pending)

Experience

Microbiologist – Montgomery Watson Laboratories

Present Duties

Supervise Laboratory personnel and perform chemical, physical and biological analysis of water and wastewater.

Lab Tech II: **Michele G. Holmes**

1989 to Present

Education

Associate of Arts, Ventura College, Major - Natural Science

Experience

Laboratory Technician, BTC Laboratories, Ventura California

Laboratory Technician, SOCI Laboratory, Westlake, California

Laboratory Technician, City of Oxnard, Oxnard, California

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and wastewater.

Lab Tech I: **George Beswick**

1972 to Present

Education

Waynesburg College
Seton Hill College
University of Pittsburg Total 60 Units Major - General Education

Experience

Lab Technician University of Pittsburg School of Medicine

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and wastewater.

Lab Tech I: **Lourdes A Geise**

2000 to Present

Education

Bachelor of Science in Chemistry – Far Eastern University, Manila, Philippines

Experience

City of Simi Valley Sanitation Laboratory

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and wastewater.

Lab Tech I: **Craig Jones**

2000 to Present

Education

Bachelor of Science in Biology- University of North Carolina @ Chapel Hill

Experience

Laboratory Technician, Ventura County Waterworks

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and wastewater.

C. Instrumentation and Equipment

The division laboratory owns and maintains the following equipment and instrumentation.

UNIT	MANUFACTURER/MODEL	MAINTENANCE
Water Still	Corning 3 Liter Megapure	Division
D. I. Water Supply	Culligan Commercial Units	Culligan
Forced Convection Oven	VWR S/P Model 1370FM	Division
Oven	VWR Model 1670 HAFO Series	Division
Muffle Furnace	Thermoline Model FA-1730/Temcometer	Division
Incubator (Air)	Precision Model 30M	Division
Incubator (Water Bath)	Blue M Magniwhirl Model 1110A	Division
Incubator (BOD)	Freas Model 815	Division
Autoclave	Getinge/Castle Model 133LS	Getinge/Castle
pH Meters	Orion Model 601	Division
	Orion Model 701	Division
	Cole-Parmer 5938-00 Portable	Division
Specific Ion System	Orion Model EA 940 Meter/Electrodes	Division
Conductivity Meter	Barnstead Model PM 70-CB	Division
D.O. Meters	Orion SL 9 Portable Probe	Division
	Orion Model 9708 Electrode	Division
Nepthelometers	Hach Model 2100A	Division
	Hach Ratio/XR	Division
Analytical Balances	Mettler Model AT 201 Mettler Model AE 163	Division
	Mettler Model H20T	Division
Top-Loading Balances	Mettler Model PM2000	Division
	Mettler Model PM2000	Division
Microscopes	American Optical 40-1000X Phastar	Division
	American Optical .7-3X Stereo	Division
Spectrophotometers	HP 8453 UV-Visible Spectrophotometer	HP
	Bausch & Lomb Spectronic 20	Division
Spectrophotometer AA-AE	Varian Spectra220/Furnace Atomizer/ GTA110 Autosamplers	Varian
Ion Chromatograph	Waters/Millipore/Dionex, ASRS-I Self Regenerating Supressor/Dionex, CD20 conductivity Detector	Waters
Gas Chromatograph	HP 6890 GCSystem Series Autosampler; Micro EC Detector Flame Ionization Detector	HP
Purge/Trap system	HP 7695	HP
Dispenser/Diluter	Gilson 222	Division
Samplers	4 ISCO Model 2700	Division
	3 ISCO Model 2900	Division
	3 American Sigma 800SL	Division
	2 American Sigma 900	Division
	1 ECOA Model E	Division

Hewlett Packard	-- Hewlett Packard Co. Van Nuys, Ca.	
Getinge/ Castle	-- Getinge/Castle Rochester, New York	
Varian	-- Varian Sugarland, Texax	
Division	-- Ventura Sanitation Division Personnel	

III. PROCEDURES, RECORDS AND REPORTS

A. Sampling

Procedures for sampling, sample preservation, handling, storage, disposal and transportation conform to the requirements of 40 CFR Part 136 and/or to 40 CFR Part 141 and amendments.

1. Collection

Samples are collected and delivered to the Sanitation Laboratory for analysis by Wastewater personnel (laboratory staff and plant operators), Industrial Waste Inspector, Water Division and other agency.

Sample collection maybe a grab or a 24-hour composite. All composite samples are collected using ISCO Models 2700 & 2900, American Sigma Models 800SL and 900. Samplers are set to operate in flow proportion by utilizing the non-uniform time option of the control electronics.

Sample container must be of a material that will not produce positive or negative errors or cause contamination to the sample. Sampler containers used for composite samples are pre–clean ICHEM plastic cubtainers or stainless steel container for organic analysis. Grab samples are collected in pre-cleaned plastic ICHEM cubtainers, pre-cleaned glass amber bottles and pre-cleaned 40 vials depending upon the analysis.

All samples are collected in a manner that will not introduce contaminate or cause interference producing erroneous results. Sample collection is done on a daily, weekly, monthly, quarterly, annually or, as in the case of special request, one time basis.

2. Sample Preservation

Sample preservation will be done in accordance with the analysis to be performed.

The laboratory will preserve all samples not analyzed immediately that are collected and delivered to the laboratory by wastewater personnel (laboratory staff and plant operators), Water Division and outside agencies will be preserved by the technician performing the analysis.

The industrial waste inspector will preserve the samples when collected for metals, cyanide and total sulfide analyses. The lab technician performing the

analysis will preserve all other industrial waste samples. Sample preservation will be done in accordance with the analysis to be performed.

3. Handling and Storage

The person who preserved the sample is responsible for placing them into storage. If possible the samples should be stored in the containers in which they are collected and according to the analysis to be performed.

All samples not requiring immediate analysis are to be preserved and refrigerated at 4° C and remain in storage until the analysis is complete and data has been approved. The technician responsible for performing the required analysis should remove and replace the samples in storage.

Samples placed into storage must be labeled with the sample name, date, and time sampled, the analysis required and the initial of the sampler. As part of the chain of custody the technician should fill out the sign in and out label on the sample container.

The amount of time a sample can be held in storage varies from .5 hours to 6 months depending upon the analysis to be performed. Check the holding time for each sample placed into storage to ensure that the analysis is done within that time frame.

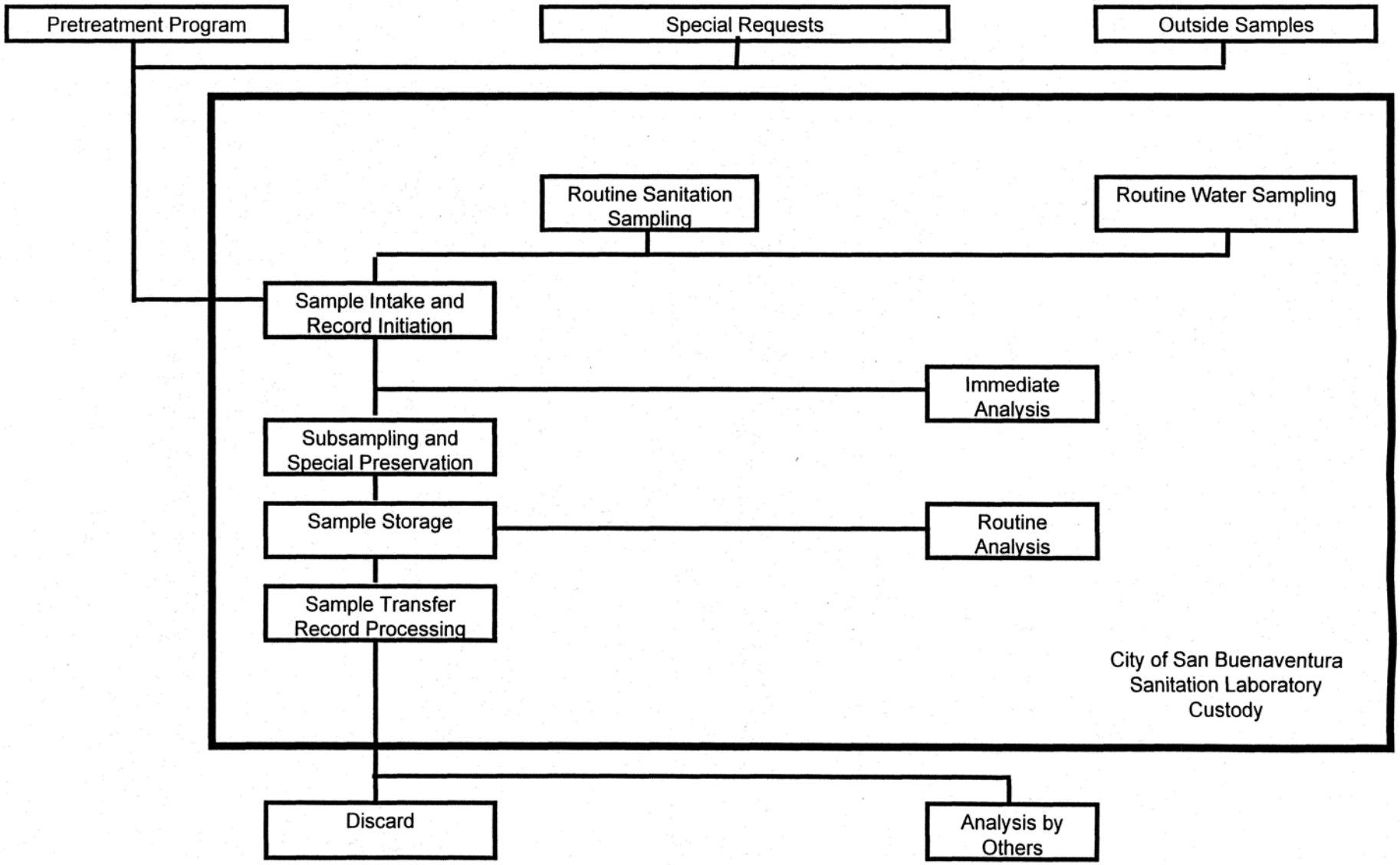
4. Disposal

A sample can be disposed only after the analysis such as in the case of pH has been completed or after the data has been reviewed by the Laboratory Supervisor and Industrial Waste Inspector. Samples should be dispose of in a safe manner that will not harm employees or the environment. Special care must be taken with samples that have been stored for long periods of times.

Wastewater and some Industrial Waste samples that have been stored for several weeks can create hazardous odor such as sulfides at the time of disposal. Proper safety attire and precaution must be taken when disposing of the samples.

Some samples are disposed of by pouring down the drain and flushing with large volume of water such as mineral or metal samples while others have to neutralize before they can be disposed as in the case of COD samples. Samples that have been analyzed for Pesticides or Phenols are evaporated under the fume hood.

The laboratory sample path is shown in the chart below.



Sample Retention Requirements

Sample Source	Frequency	Subsample	Discard After:	Authorization by:
Drinking Water	Weekly	Turbidity, Iron Filters	Analysis Complete	Analysts
Drinking Water	Any	Bacti	Inoculation Complete	Analysts
Drinking Water	Monthly	Chemistry	Report Reviewed	Lab Supervisor
Drinking Water	Quarterly	THM	Report Reviewed	Lab Supervisor
Drinking Water	Annual	Metals, Organics	Report Reviewed	Lab Supervisor
Conjunctive Use	Any	All	Report Reviewed	Lab Supervisor
Surface and Ocean	Any	Bacti	Inoculation Complete	Analysts
Wastewater	Daily Grab	pH, Turbidity, Residual, Oil and Grease	Analysis Complete	Analysts
Wastewater	Daily Grab	Bacti	Inoculation Complete	Analysts
Wastewater	Daily Composite	pH, Solids, Oxygen Demands, Conductivity	Analysis Complete	Analysts
Wastewater	Weekly Composite	Nitrogen, Chloride	Analysis Complete	Analysts
Wastewater	Weekly Composite	MBAS	Analysis Complete	Analysts
Wastewater	Weekly Composite	Sulfate	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	Phenols	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	Minerals	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	CN, PO4, Alkalinity, B, F	Analysis Complete	Analysts
Wastewater	Monthly Grab	Bioassay	Test Setup	Analysts
Wastewater	Quarterly Composite	Metals	Report Reviewed	Lab Supervisor
Wastewater	Quarterly Composite	Pesticides	Report Reviewed	Lab Supervisor
Source Control	Any	All	Report Reviewed	IW Inspector
Special	Any	All	Report Reviewed	Lab Supervisor

Sample Identification

Sampling sites for routine Sanitation and Drinking Water which are monitored daily, weekly, quarterly or annually have fixed identity by name, number or acronym. This identification is used on location maps, in sample logs, on bench worksheets, on permanent records and on analysis reports.

Other Water or Sanitation samples, Industrial Waste samples and any non-routine sample received is assigned a unique Laboratory Identification Number (LID) by the Laboratory Computer Data System. The LID is in numerical order and is automatically assigned by the computer. This number is used in sample logs, bench worksheets, permanent records and on analysis reports. A copy of the Computer Data System is in the laboratory's Standard Operation Procedures.

Custody

Change of custody occurs when a sample enters or leaves the laboratory unit. All samples done on regular bases have printed worksheet which sample collectors log in custody information. All other samples enter the laboratory are log in the Incoming Sample Book and given a Laboratory Identification Number.

Custody documents vary with the sampling purpose, but all custody transfers identify the sample by name and/or Laboratory Identification Number, identify the sample collector and document date, time, location, analysis required and circumstances of sample collection along with the history of sample transfers by person and/or organization. An example of the chain of custody form is in the laboratory's Standard Operation Procedures.

B. Analysis Procedures

Analytical Procedures which the laboratory is certified to perform are according to the Standard Methods for the Examination of Water and Wastewater, EPA Chemical Method for Analysis of Water and Wastes and EPA 40 CFR.

Bench procedures for analytical methods performed by the Laboratory are maintained in a loose-leaf notebook in the Laboratory work area. These are derived from approved standard procedures; which include reagents, standard preparation and concentration, test procedures and instrumentation with the analytical options for interference correction; samples and sample volumes defined for the samples routinely examined. These procedures are reviewed periodically and revised to accommodate method and sample changes.

For unfamiliar and non-routine samples, the primary analytical procedures are followed for determining dilution, interference correction and all other method variables.

C. Records

Systematic procedures for record keeping and retention have been established in conformance with the requirements of compliance monitoring and good practice.

The following summarizes the purposes and retention criteria for each general type of written laboratory record.

Record	Function	Retention
Field Logs	Record of Field Measurements and Circumstances of Sampling	7 Years
Receiving Log	Record of Samples Received from Others	7 Years
Sample/Custody Form	Pretreatment Program Sampling	7 Years
Chromatographs	Analysis from Gas Chromatograph, Ion Chromatograph and Atomic Absorption	7 Years
Bench Logs	Worksheets for Data and Calculation	7 Years
Bound Record Books	Permanent Record of Analysis Results	7 Years
Reports	Transmittal of Information to Others	7 Years

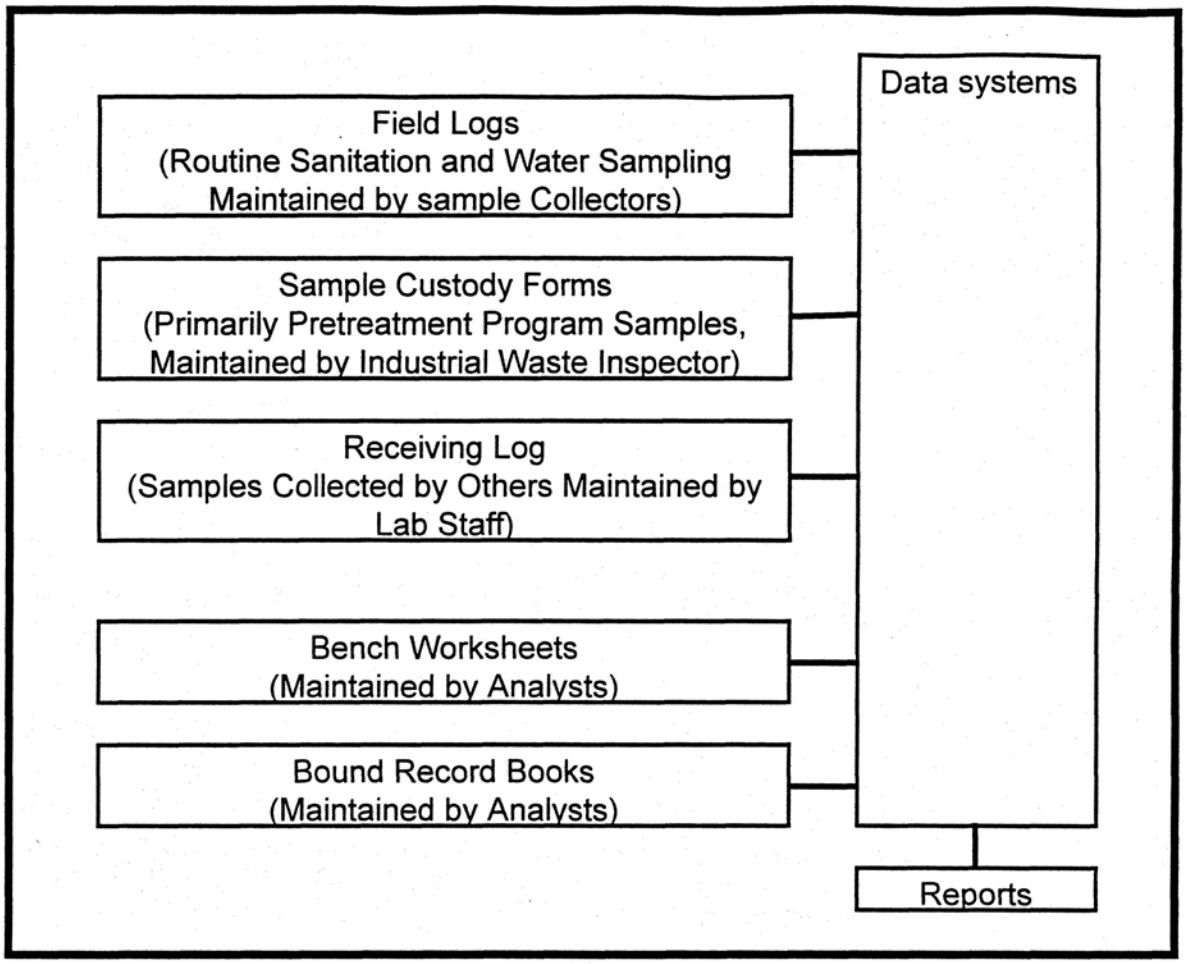
D. Reports

Report formats and contents are generally specified by the agency requesting such reports. Reports of routine monitoring are provided by computer methods designed to meet these specifications. Reports for Water and Wastewater schedule samples are generated from data entered into Run: Input 2, Ioutil, Organic, Metals, Phenols, and Bactin. Industrial Waste and other unscheduled samples reports are obtain from data entered into Run: Input 3 and IWMON. A copy of the Laboratory Computer Data Systems is located in the SOP manual in the Laboratory.

Data from field logs, custody forms, receiving logs, bench worksheets, bound logbooks, chromatographs and spectrophotometer is used to compile information required for these report. A flow chart for data input information is below.

All current procedures, records and reports are available at the laboratory for review and inspection. Records of analytical results are available from 1971 to date. Reports are reviewed and signed by the Laboratory Supervisor.

Data flow from generation to reporting is shown below.



IV. QUALITY ASSURANCE PROCEDURES AND DOCUMENTATION

A. General

The quality assurance procedures employed by the laboratory are intended to accomplish the following objectives:

1. Provide primary control over the accuracy reagents, standards and other related materials employed in analysis.

2. Provide day-to-day control over the accuracy of measurements.

Specific actions designed to accomplish these goals in each area of laboratory measurement are discussed in the following.

B. Laboratory Equipment

Equipment subject to read-out drift for environmental, mechanical or electronic reasons is checked periodically for alignment. Other units, such as ovens or incubators are monitored for accuracy and consistency. Readings are taken or calibration procedures are performed and recorded at the frequency indicated below.

Unit	Calibration Procedure	Frequency
Ovens	Verify Temperature and Adjust as needed	Daily
Incubators	Verify Temperature and Adjust as needed	Daily
Furnace	Verify Temperature and Adjust as needed	Daily
Conductivity Meter	Calibrate with 1413 calibration standard	Daily
pH Meters	Calibrate with Buffer Solutions	Prior to Use
D.O. Meters	Air Calibrate	Prior to Use
D.O. Meters	Check Against Winkler Titration	Weekly
Turbidimeters	Calibrate with Secondary Turbidity Standards	Prior to Use
Turbidimeters	Calibrate with Certified Standards	Prior to Use
Spectrophotometer	Verify Wavelength Accuracy with Holmium Oxide Filter	Quarterly
Autoclave	Verify Accuracy of Integral Recorder with Lag Thermometer	Weekly
Balances	Verify Accuracy with External Calibration Weights	Weekly

C. Primary QA Control

Stock standard and reagents used in the analysis should be logged with the amount weight out, lot number, finally volume, initials of the preparer, date prepared and discard date. The storage container should be labeled with this information also. Check the method for the stability and storage of the stock solution or the reagent.

Titration reagents used on a daily basis should be standardized weekly. The results from that standardization; the multiplication factor adjustments; the normality of the reagent; and the initials of the person doing the standardization should be on the buret and the worksheet put in the file. Other titration reagents not used on a regular basis should be standardized prior to use and labeled with the same information listed above.

D. Chemical Analysis

Analysis reagents and standards are prepared from Primary standard materials, calibrated against Primary Standard materials, or purchased as certified purity and/or certified concentration standards.

These procedures are used to assure conformance to narrow concentration or purity limits when procedures require it, to determine when a reagent must be discarded and for purposes of determining calculation factors to avoid determinant errors in analysis results.

E. Day-to-day Control of Accuracy of Results

Testing for chemical and physical composition is routinely conducted on a batch basis. Each sample batch is run with controls and acceptance of sample results as valid is based on the results of the control analysis.

Most routine control samples are prepared in house for frequently performed analyses. For other procedures the Division Laboratory analyzes Spex Certiprep and Accustandard traceable commercial reference samples.

In addition to these primary checks on the accuracy and precision of measurement, blank, sample replicates and matrix spikes are carried through all procedures.

F. Corrective Actions

Some laboratory data reduction is automated in many cases including instrument data generation. For automated applications, when a control, spike or sample duplicate evaluation fails to meet standard criteria for method performance, the analysis process is halted and/or sample results are withheld by the software

system. Analysis cannot continue until the cause of the failure is identified and acceptable results from the control materials are produced.

In procedures where automation is not employed, the analyst performs the same function: data is not reportable unless results from analysis of control, spike and sample duplicates run with the analysis batch are within acceptance standards.

All controls, spikes and duplicates must be within the acceptance limits before the results from the analysis can be recorded. After reviewing the analysis procedures, calculations and redoing the analysis it cannot be determine the reason for the failure you must check with the QA person and the laboratory supervisor before recording the data. If it is determined that the QA material failed and the same material was accurate you will have to record the reason for the failure in the "FIXIT" logbook.

G. Special considerations for Trace Organic Analyses

The Quality Assurance requirements for trace organic analysis are narrowly defined by the approved analytical procedures. These requirements are adhered to.

Standard materials used in Trace Organic Analysis are normally obtained from Supelco Incorporated, Bellefonte, PA. If appropriate materials are not available from this source, they are obtained from manufacturers or from normal chemical supply sources.

Control and spike materials employed in these analyses are also obtained from Supelco Incorporated, Bellefonte, PA.

As with all other measurements, acceptability of sample results is dependent on controls, spikes and duplicates analysis results being within acceptance limits. As with all QA analysis the data cannot be recorded if the control, spike or duplicate fail without a valid reason.

G. Special Considerations for Toxicity Analysis

Instrument Calibration

Continuous temperature recorders for monitoring test solution temperatures are Taylor Instrument drum recorders with remote sensor probes. Recorders are calibrated against ASTM 90C glass thermometers by adjustment of the pen arm.

pH measurement is made with a Markson 6100 portable meter. Calibration is done daily during the course of the analysis.

D.O. measurement is made with an Orion SL9 portable meter. Calibration is done daily.

Reference materials are analyzed as noted below.

Analysis	Reference Material	Frequency of Reference Analysis
Acute Toxicity	Copper Sulfate	With Every Test Sample
Algae Growth Chronic Toxicity	Cadmium Chloride	With Every Test Sample
Ceriodaphnia Survival and Reproduction	Copper Sulfate	With Every Test Sample
Larval Fathead Minnow Survival and Growth	Copper Sulfate	With Every Test Sample

Other test acceptance criteria are noted below.

Analysis	Criterion
Acute Toxicity	Survival in Controls >> 90 %
Algae Growth Chronic Toxicity	Control cell counts >> 200,000/ml
Algae Growth Chronic Toxicity	Control Replicate Counts << 20% Different
Ceriodaphnia Survival and Reproduction	Survival in Controls >> 90 %
Ceriodaphnia Survival and Reproduction	Average Number of Offspring >>= 15
Larval Fathead Minnow Survival and Growth	Survival in Controls >> 90 %
Larval Fathead Minnow Survival and Growth	Control Average Dry Weight >> 0.250 mg

H. Bacteriological Analysis

Bacteriological analysis required by NPDES and SDWA monitoring is routinely performed by the multiple-tube fermentation procedure.

The Laboratory is equipped to perform MTF tests for Total Coliform, Fecal Coliform and Fecal Streptococci; Membrane Filter tests for Total and Fecal Coliform; and Heterotrophic Plate Count.

Quality assurance is directed primarily toward control of the MTF procedures. Other procedures above are utilized at irregular intervals and generally for other than compliance monitoring. Basic media and equipment quality control for these other procedures is conducted similar to that for MTF analysis described herein.

Total Coliform testing is routinely performed following the procedures of Section 9221B of "Standard Methods for the Examination of Water and Wastewater," 18th Edition. All Samples are carried through the Brilliant Green Bile confirmation step.

At least 5% of all samples testing positive in the confirmed coliform procedure are carried through the completed procedure.

Fecal Coliform testing is routinely performed following the procedures of Section 9221E of "Standard Methods for the Examination of Water and Wastewater," 18th Edition.

Fecal streptococcus testing is routinely performed following the procedures of Section 9230B of "Standard Methods for the Examination of Water and Wastewater," 18th Edition.

Control tests for water suitability and for inhibitory residues are performed annually following the procedures of Section 9020B(3)(a)(2) and 9020A(3)(c)(1) of "Standard Methods for the Examination of Water and Wastewater," 18th Edition.

Commercial dehydrated media is used for all analysis. Media is tested for accurate response by inoculation of portions from each prepared batch with Escherichia coli (ATCC 25922), Staphylococcus aureus (ATCC 25923) and Streptococcus faecalis (USEPA-EMSL Cincinnati 111054).

Coliform test materials failing to give a positive response to Echerichia coli, a negative response to Staphylococcus aureus and no response upon incubation of non-inoculated media are discarded.

Fecal strep test materials failing to give a positive response to Streptococcus faecalis, a negative response to Staphylococcus aureus and no response upon incubation of non-inoculated media are discarded.

Both media and equipment are prepared in weekly batches, and materials are tested for sterility using Tryptic Soy Broth before use and dated to assure they are used within acceptable holding periods or discarded.

ANNUAL REPORT OF ANALYSIS

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Executed on the 21th day of March, 2001, at Ventura, CA.

Wastewater Superintendent

Daniel E. Pfeifer

Daniel E. Pfeifer
Acting Wastewater Superintendent

Florence B Jay

Florence B. Jay
Laboratory Supervisor