RESULTS OF A SOLUTE TRANSPORT EXPERIMENT AT UVAS CREEK, SEPTEMBER 1972, CALIFORNIA

By Ronald J. Avanzino, Gary W. Zellweger, Vance C. Kennedy,
S. Marc Zand and Kenneth E. Bencala

U. S. GEOLOGICAL SURVEY

Open-File Report 84-236

Menlo Park, California

1984

UNITED STATES DEPARTMENT OF THE INTERIOR

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ABSTRACT

A 3-hour constant-rate injection of chloride, strontium, and sodium was made into Uvas Creek, Santa Clara County, California, to determine solute transport and sorption properties of a small stream. Seven observation stations were selected within a 635-m reach of the stream where water samples were collected before, during and after the injection. Size-sorted stream sediments placed in the stream prior to the injection were sampled to determine sediment sorption properties. Dissolved solute concentration data are presented in both original and normalized forms to illustrate the different transport properties of the three solutes. Sorbed concentrations are tabulated as a function of both time and grain size. Calculations of streamflow and sorptive distribution coefficient are given.

INTRODUCTION

On September 26, 1972, an injection of chloride, strontium, and sodium was made at a constant rate for 3 hours into Uvas Creek, Santa Clara County, California, to study mass transport and sorptive processes in a small stream. The experimental site and field experiment have been described by Zand (1976) and are repeated here in more detail. Water samples were collected at seven stations before, during, and after the injection period. Pre-sorted sediment samples placed in the stream at two stations prior to the experiment were also collected. Laboratory analyses were made to determine dissolved solute concentrations in the water and sorbed concentrations on the sediment.

The purpose of this report is to present all experimental data in tabular and graphical form. The data have been used previously in reports describing simulations of stream processes (Zand,1976; Bencala,1983; and Bencala and Walters, 1983).

FIELD EXPERIMENT

Site Description

The experiment was conducted near the headwaters of Uvas Creek, a small stream located on the eastern slopes of the Santa Cruz mountains in California (Fig. 1). The drainage area of the stream above the study reach is about 9 km^2 and is forested mostly by second growth coast redwood (Sequoia sempervirens), madrone (Arbutus menziesii), big-leaf maple (Acer macrophyllum), and California laurel (Umbellularia california). Annual rainfall in the area is normally 1000 to 1400 mm per year, occuring mostly between October and May. The watershed located just upstream of Uvas Canyon County Park, Santa Clara County, California, is itself undeveloped and is used as a private recreational area by only a small number of individuals. Relief of the watershed is 840 m.

The 635-m experimental reach is accessible by a foot trail along its banks and by a fire road that approximately parallels the stream on higher ground. In downstream order, the experimental reach includes a background monitoring station (T), an injection point, a 15-m mixing reach, an input monitoring station (0), and five additional observation stations (Fig. 1). A standard U.S. Geological Survey stream gage was installed just upstream of Station 1. Table 1 gives the station names and their distances downstream from the injection point. The drop in elevation from the injection point to the lowest station in the reach is 19.2 m through a series of pools and riffles. Stream width ranges from about 0.3 to 4 m, and the streambed is composed largely of particles greater than 4 mm in diameter. The experiment was conducted near

the end of the summer dry season when the average daily streamflow (about 12.5 L/s) was relatively constant. Background (Station T) water composition is included in Appendix I. The pH was approximately 8.

Injection Solution and Methods

The injection solution was made by dissolving $SrCl_2 \cdot 6H_2O$ and NaCl in distilled water. After the experiment, solute concentrations were determined by analysis (see below) to be 118.7 g Cl/L, 24.0 g Sr/L and 65.0 g Na/L.

The gravity-fed injection apparatus consisted of a carboy bottle, tubing, a control valve, and a flowmeter. The flowmeter was calibrated by timing the discharge of injection solution into a volumetric flask. During the injection period, the control valve was adjusted manually to keep the flowmeter reading constantly at the pre-calibrated point of 50.0 mL/min. Injection solution entered the stream at the center of a stream constriction point located just upstream of a narrow riffle zone that served as a mixing reach. Injection was started at 0830 P.d.t. and stopped at 1130 P.d.t. on September 26, 1972.

Water Sampling

Water samples were collected either in polyethylene bags by hand or in polycarbonate bottles using automatic samplers. The sampling points were at the center points of stream constrictions where mixing was presumed complete. Samples were not filtered but were refrigerated at about 5°C within 48 h of

collection. Sampling began 30 minutes before the start of the injection and continued for 27 hours after the injection ended. Sampling was continued in spite of a small rainstorm that began at about 2330 hours on September 26, 12 hours after the end of the injection period.

Sediment Preparation and Sampling

Several weeks prior to the start of the experiment, representative samples of sediment were taken from the stream bed, sorted into five size ranges and placed in 90 mm-diameter plastic petri dishes. About 1 week before the experiment, the petri dishes, each containing about 10 g of sediment, were placed uncovered in quiet pools adjacent to Stations 2 and 3. Both stations held several dishes from each of the five grain-size ranges.

During the course of the experiment, petri dishes containing sediment samples were removed from the stream, drained briefly, covered, and placed in self-sealing polyethylene bags.

LABORATORY ANALYSIS

Dissolved Constituents

All water samples were kept refrigerated until analyzed. Chloride was determined using an automated mercuric thiocyanate method adapted from O'Brien (1962). Precision (1SD) determined by analyzing 127 samples in duplicate was ±0.06 mg Cl/L. Strontium and sodium were determined by atomic absorption spectrophotometry using the method of Brown (1970). Precision (1SD) was ±0.005 mg Sr/L (39 duplicates) and ±0.08 mg Na/L (24 duplicates).

Water samples collected after 0100 P.d.t. on Sept 27 appeared colored due to the presence of organic matter. To determine the extent of any positive interference from color, deionized water was substituted for both color-forming reagents used in the method and 16 colored samples were re-run. Color interference averaged only +0.05 mg/L with a range of +0.00 to +0.08 mg/L. Because this amount of interference was considered negligible, no corrections were applied.

A sample of strontium/sodium chloride injection solution was diluted volumetrically with deionized water by a factor of 10,000:1 and analyzed as above.

Sorbed Constituents

Half of each 10-g sample was placed in a 60 mL polyethylene centrifuge tube and about 20 mL of a 1M ammonium acetate (pH 7.0) desorbing solution was added. The sediment was allowed to soak in the desorbing solution for a prescribed length of time that varied with grain size (Table 2). Then the tube was centrifuged and the supernatant liquid decanted and saved for later analysis. After repeating this process four more times, the sediment was washed with deionized water, oven dried, and weighed. All five portions of desorbing solution were combined, diluted to 100 mL, and filtered through a 0.45-um membrane filter. The solutions were then analyzed for strontium, sodium, calcium and magnesium by atomic absorption spectrophotometry (Brown, 1970).

The desorption schedule (Table 2) was determined after analyzing separately all five portions of desorbing solution from a pre-experimental batch of sediment samples. All labware used in the analysis had been previously soaked in 1M HNO_3, rinsed well in distilled water, and dried before use. All standards and blanks were made from the same batch of ammonium acetate as had been used for the sediment desorption.

The sorbed strontium concentration was calculated by multiplying desorbing solution concentration by volume and dividing by sample weight. An adjustment was made to this calculated concentration to correct for the presence of stream water that remained interstitially between the sediment grains. The amount of water adhering to each gram of sediment was conservatively estimated to be 0.5 mL. The amount of Sr contained in 0.5 mL of stream water at the time of sediment sampling was therefore subtracted from the gross sorbed

strontium concentration. Sorbed sodium, calcium and magnesium were similarly calculated. Because dissolved calcium and magnesium concentrations were not measured during the experiment, typical values of 50 mg Ca/L and 13 mg Mg/L, from samples collected on August 29, were used for the interstitial-water corrections.

For 31 sediment samples, desorption was carried out separately on both halves of each 10-g sample. From these duplicate measurements, analytical precision (1SD) was estimated to be ± 0.7 ug Sr/g. Precision of sorbed sodium, calcium or magnesium could not be estimated because no duplicates were analyzed.

DATA

Dissolved Constituents

Solute concentration data are tabulated and plotted in Appendix I. Elapsed time was calculated from the start of the injection period, September 26, 1972 at 0830 P.d.t. A dash indicates that samples were not analyzed for that constituent.

The tables cover the entire sampling period from 0745 P.d.t., Sept 26, to 1500 P.d.t., Sept 27, whereas the plots cover only the period from 0800 P.d.t. to midnight on Sept 26. After midnight, rain falling during the morning of Sept 27 caused a slight increase in chloride. At Station 5, chloride reached a minimum value of 3.8 mg/L at about 2330 P.d.t. on Sept 26 and then increased to almost 4.4 mg/L at about 1030 P.d.t. on Sept 27.

Of the three chloride values from Station T, the value of 4.11 mg/L appears to be anomalously high based on the fact that the mean pre-injection chloride concentration for all stations was 3.69 mg/L $\pm$0.04 mg/L (1SD).

Normalized concentration data are presented in Appendix II. Normalized concentration is calculated by dividing the concentration increase over background at any downstream station by the mean concentration increase at Station 0. The resulting ratio is then expressed as a percentage by multiplying by 100.

$$C_n = \frac{C - \overline{C}_b}{\overline{C}_0 - \overline{C}_b} \times 100$$

where C_n = Normalized concentration (%)

C = Observed solute concentration (mg/L)

$\overline{C}b$ = Mean background concentration at Station T (mg/L)

$\overline{C}_0$ = Mean concentration at Station 0 during the injection period (mg/L)

Mean solute concentrations used in the calculations are given in Table 3. Negative values of normalized concentration are the result of experimental error.

Streamflow

The chloride data from Station 0 show that streamflow was relatively constant during the 3-h injection period. An average flow rate of 12.4 L/s was calculated from the measured chloride increase between Station T and Station 0 (7.99 ±0.08 mg/L) and the measured injection concentration (118.7 ±0.6 g/L) and flow rate (50.0 ±0.3 mL/min). Propagation of the above errors through the calculation results in an estimated error (1SD) in streamflow of ±0.2 L/s. These calculations assume that all of the stream volume flowed through the mixing reach and that complete mixing took place.

Data collected from the standard stream gage near Station 1 are tabulated and plotted in Appendix III. The gage could only resolve a gage-height difference of 0.01 ft (3 mm) which corresponded to a flow difference of 0.8 L/s during

periods of low flow (9-14 L/s). Calibration (rating-curve) error was probably about ±5 to 10%. Nevertheless, a diurnal flow pattern with a range of about 3.5 L/s can be seen.

During the injection period, gaged flow near Station 1 was about 13.3 L/s whereas flow measured by chloride dilution at Station 0 averaged 12.4 L/s. These two flow rates are in good agreement considering the errors involved.

Sorbed Constituents

Sorbed concentrations for strontium, sodium, calcium and magnesium are tabulated and plotted in Appendix IV. When both halves of a sediment sample were analyzed, the mean value is given. A dash in the table indicates that samples were either not available or not analyzed.

Sorbed constituents were presumed to be in equilibrium with dissolved constituents prior to the arrival of the injection pulse. Because several sediment samples were collected under these conditions, the distribution coefficient could be calculated from the ratio of sorbed to dissolved concentration. The results of these calculations are given in Table 4.

ACKNOWLEDGEMENTS

Assistance with the field sampling was provided by J.W. Ball, D.W. Brown, R.V. James, E.A. Jenne, C.D. Ripple, and J. Rubin.

Measurement and calibration of flow were made by personnel of the U.S. Geological Survey, California District.

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TABLE 1. LOCATION OF SAMPLING STATIONS

UVAS CREEK -- SEPTEMBER 1972

Station Name	Downstream Distance from Injection Point (m)
T	-15
0	+15
1	38
2	105
3	281
4	433
5	619

TABLE 2. DESORPTION SCHEDULE

UVAS CREEK SEDIMENT -- SEPTEMBER 1972

Desorption Number	Soaking Time (hours)				
	180-250um	350-500um	710-1000um	1650-2000um	3360-4000um
1	0.3	1.0	1.5	4.0	4.0
2	0.3	1.0	1.5	4.0	4.0
3	0.3	1.0	1.5	16.0	16.0
4	0.3	1.0	1.5	4.0	8.0
5	0.3	1.0	1.5	4.0	16.0

TABLE 3. AVERAGE WATER COMPOSITION AT STATION 0

UVAS CREEK -- SEPTEMBER 1972

Constituent	Concentration before Injection (mg/L)	Concentration during Injection (mg/L)
Chloride	3.7	11.7
Strontium	0.13	1.73
Sodium	12.3	16.4

TABLE 4. CALCULATED DISTRIBUTION COEFFICIENTS

UVAS CREEK -- SEPTEMBER 26, 1972

			DISTRIBUTION COEFFICIENT (mL/g)				
CONSTITUENT	STATION	CLOCK TIME	180-250um	350-500um	710-1000um	1650-2000um	3360-4000um
Strontium	2	08:35	62	54	81	76	60
	3	09:12	56	62	80	89	73
Sodium	2	08:35	1.7	1.6	2.2	2.3	1.9
	3	09:12	1.6	1.8	2.1	2.3	2.1
Calcium	2	08:35	53	42	44	38	37
	3	09:12	41	37	40	39	33
Magnesium	2	08:35	20	20	27	26	24
	3	09:12	16	19	28	27	23

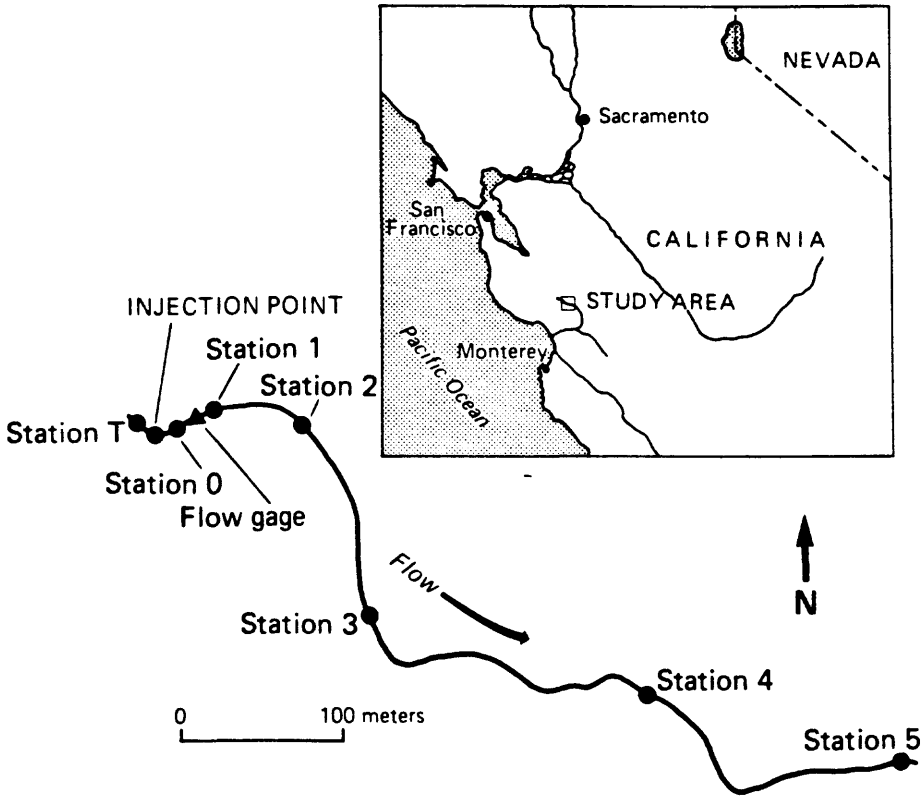


Figure 1. Experimental reach of Uvas Creek, Santa Clara County, California

APPENDIX I

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: T

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L)		
			CHLORIDE	STRONTIUM	SODIUM
SEP 26	08:30	0.000	4.11 *	---	12.47
SEP 26	10:05	1.583	3.67	0.114	12.25
SEP 26	11:22	2.866	3.80	0.124	12.35

* Probable outlier; see text.

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 0

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	08:45	0.250	12.04	1.770	16.58
SEP 26	09:00	0.500	11.67	1.760	16.31
SEP 26	09:15	0.750	11.79	1.750	16.34
SEP 26	09:30	1.000	11.71	1.740	16.41
SEP 26	09:45	1.250	11.71	1.750	16.37
SEP 26	10:00	1.500	11.89	1.770	16.47
SEP 26	10:15	1.750	11.67	1.720	16.51
SEP 26	10:30	2.000	11.75	1.730	16.58
SEP 26	10:45	2.250	11.67	1.710	16.47
SEP 26	11:00	2.500	11.67	1.710	16.51
SEP 26	11:15	2.750	11.76	1.720	16.41

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 1

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:56	-0.566	3.87	---	12.33
SEP 26	08:01	-0.483	3.76	0.143	12.36
SEP 26	08:30	0.000	3.67	0.135	12.06
SEP 26	08:32	0.033	3.73	0.141	12.31
SEP 26	08:34	0.066	3.66	0.143	12.27
SEP 26	08:36	0.100	3.69	0.138	12.33
SEP 26	08:38	0.133	3.73	0.146	12.28
SEP 26	08:40	0.166	5.58	0.456	13.29
SEP 26	08:42	0.200	8.44	0.919	14.80
SEP 26	08:46	0.266	10.61	1.296	15.62
SEP 26	08:48	0.300	10.91	1.390	16.04
SEP 26	08:50	0.333	11.14	1.430	16.11
SEP 26	08:52	0.366	11.22	1.457	16.21
SEP 26	08:54	0.400	11.41	1.496	16.21
SEP 26	08:56	0.433	11.49	1.508	16.21
SEP 26	08:58	0.466	11.49	1.542	16.22
SEP 26	09:00	0.500	11.61	1.528	16.27
SEP 26	09:02	0.533	11.49	1.550	16.35
SEP 26	09:04	0.566	11.47	1.542	16.28
SEP 26	09:06	0.600	11.59	1.542	16.17
SEP 26	09:08	0.633	11.47	1.550	16.19
SEP 26	09:10	0.666	11.47	1.548	16.28
SEP 26	09:14	0.733	11.55	1.579	16.10
SEP 26	09:18	0.800	11.47	1.558	16.21
SEP 26	09:22	0.866	11.47	1.569	16.16
SEP 26	09:26	0.933	11.43	1.562	16.25
SEP 26	09:30	1.000	11.47	1.572	16.18
SEP 26	09:34	1.066	11.47	1.590	16.11
SEP 26	09:38	1.133	11.43	1.589	16.12
SEP 26	09:42	1.200	10.99	1.521	15.96
SEP 26	09:46	1.266	11.41	1.542	16.00
SEP 26	09:50	1.333	11.48	1.579	15.96
SEP 26	10:00	1.500	11.68	1.590	16.37
SEP 26	10:10	1.666	11.63	1.590	16.17
SEP 26	10:20	1.833	11.52	1.611	16.24
SEP 26	10:30	2.000	11.54	1.519	16.25
SEP 26	10:40	2.166	11.56	1.594	16.25
SEP 26	10:50	2.333	11.37	1.594	16.12
SEP 26	11:00	2.500	11.46	1.599	15.99
SEP 26	11:10	2.666	11.40	1.567	16.19

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 1

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	11:20	2.833	11.44	1.624	16.13
SEP 26	11:30	3.000	10.23	1.423	15.40
SEP 26	11:32	3.033	10.51	1.473	15.51
SEP 26	11:34	3.066	10.99	1.538	15.78
SEP 26	11:36	3.100	11.22	1.579	15.78
SEP 26	11:38	3.133	11.21	1.565	15.78
SEP 26	11:40	3.166	9.05	1.236	14.75
SEP 26	11:42	3.200	6.47	0.789	13.65
SEP 26	11:44	3.233	5.22	0.595	13.04
SEP 26	11:46	3.266	4.60	0.454	12.84
SEP 26	11:48	3.300	4.28	0.384	12.78
SEP 26	11:50	3.333	4.18	0.340	12.70
SEP 26	11:52	3.366	4.01	0.316	12.51
SEP 26	11:54	3.400	3.95	0.294	12.41
SEP 26	11:56	3.433	3.93	0.274	12.57
SEP 26	11:58	3.466	3.86	0.268	12.42
SEP 26	12:00	3.500	3.85	0.229	12.39
SEP 26	12:02	3.533	3.96	0.244	12.42
SEP 26	12:04	3.566	3.81	0.236	12.51
SEP 26	12:06	3.600	3.79	0.240	12.45
SEP 26	12:08	3.633	3.76	0.226	12.41
SEP 26	12:10	3.666	3.73	0.226	12.45
SEP 26	12:14	3.733	3.72	0.222	12.36
SEP 26	12:18	3.800	3.71	0.206	12.37
SEP 26	12:22	3.866	3.71	0.192	---
SEP 26	12:26	3.933	3.72	0.198	---
SEP 26	12:30	4.000	3.71	0.206	---
SEP 26	12:34	4.066	3.67	0.194	---
SEP 26	12:38	4.133	3.67	0.182	---
SEP 26	12:42	4.200	3.70	0.198	---
SEP 26	12:46	4.266	3.71	0.180	---
SEP 26	12:50	4.333	3.71	0.190	---
SEP 26	13:00	4.500	3.67	0.173	---
SEP 26	13:10	4.666	3.64	0.171	---
SEP 26	13:20	4.833	3.66	0.178	---
SEP 26	13:30	5.000	3.64	0.157	---
SEP 26	13:40	5.166	3.66	0.168	---
SEP 26	13:50	5.333	3.64	0.168	---
SEP 26	14:00	5.500	3.75	0.173	---
SEP 26	14:10	5.666	3.68	0.173	---

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 1

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	14:20	5.833	3.70	0.166	---
SEP 26	15:10	6.666	3.70	0.159	---
SEP 26	15:41	7.183	3.83	0.140	---
SEP 26	16:10	7.666	3.74	0.159	---
SEP 26	16:41	8.183	3.88	0.156	---
SEP 26	17:10	8.666	3.66	0.152	---
SEP 26	17:41	9.183	3.72	0.165	---
SEP 26	18:41	10.183	3.76	0.151	---
SEP 26	19:41	11.183	3.72	0.155	---
SEP 26	20:41	12.183	3.74	0.158	---
SEP 26	21:41	13.183	3.83	0.134	---
SEP 26	22:41	14.183	3.80	---	---
SEP 26	23:41	15.183	3.93	---	---
SEP 27	00:41	16.183	4.06	---	---
SEP 27	01:41	17.183	4.10	---	---
SEP 27	02:41	18.183	4.11	---	---
SEP 27	03:41	19.183	4.08	---	---
SEP 27	04:41	20.183	4.16	---	---
SEP 27	05:41	21.183	4.50	---	---
SEP 27	06:41	22.183	4.46	---	---
SEP 27	07:41	23.183	4.28	---	---
SEP 27	08:41	24.183	4.41	---	---
SEP 27	09:41	25.183	4.38	---	---
SEP 27	10:41	26.183	4.51	---	---
SEP 27	11:41	27.183	4.39	---	---

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 2

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:46	-0.733	3.72	---	12.34
SEP 26	08:00	-0.500	3.66	0.157	12.35
SEP 26	08:05	-0.416	3.63	0.157	12.25
SEP 26	08:20	-0.166	3.72	0.141	12.38
SEP 26	08:30	0.000	3.65	0.155	12.26
SEP 26	08:40	0.166	3.65	0.160	12.26
SEP 26	08:45	0.250	3.79	0.164	12.35
SEP 26	08:50	0.333	3.91	0.164	12.25
SEP 26	08:55	0.416	3.75	0.158	12.38
SEP 26	09:00	0.500	3.75	0.173	12.26
SEP 26	09:05	0.583	4.16	0.238	12.47
SEP 26	09:10	0.666	5.49	0.416	13.00
SEP 26	09:15	0.750	7.15	0.648	13.87
SEP 26	09:20	0.833	8.21	0.827	14.41
SEP 26	09:25	0.916	9.39	---	14.93
SEP 26	09:30	1.000	10.20	1.182	15.46
SEP 26	09:35	1.083	10.57	1.271	15.48
SEP 26	09:40	1.166	10.87	1.335	15.61
SEP 26	09:45	1.250	11.03	1.364	15.74
SEP 26	09:50	1.333	11.22	1.396	15.91
SEP 26	09:55	1.416	11.22	1.416	15.85
SEP 26	10:00	1.500	11.26	1.411	15.98
SEP 26	10:05	1.583	11.22	1.423	15.91
SEP 26	10:10	1.666	11.18	1.436	15.74
SEP 26	10:15	1.750	11.28	1.472	15.86
SEP 26	10:20	1.833	11.23	1.456	15.86
SEP 26	10:25	1.916	11.24	1.456	15.98
SEP 26	10:30	2.000	11.40	1.458	15.93
SEP 26	10:40	2.166	11.40	1.483	16.02
SEP 26	10:50	2.333	11.38	1.487	15.96
SEP 26	11:00	2.500	11.38	1.494	15.89
SEP 26	11:10	2.666	11.48	1.485	15.99
SEP 26	11:20	2.833	11.51	1.483	16.02
SEP 26	11:30	3.000	11.40	1.490	16.05
SEP 26	11:35	3.083	11.51	1.501	16.02
SEP 26	11:40	3.166	11.44	1.501	16.05
SEP 26	11:45	3.250	11.40	1.505	16.11
SEP 26	11:50	3.333	11.34	1.505	16.06
SEP 26	11:55	3.416	11.16	1.481	16.04
SEP 26	12:00	3.500	10.95	1.463	15.94

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 2

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	12:05	3.583	10.45	1.409	15.77
SEP 26	12:10	3.666	8.97	1.196	14.84
SEP 26	12:15	3.750	7.68	0.987	14.28
SEP 26	12:20	3.833	6.31	0.777	13.55
SEP 26	12:25	3.916	5.66	0.671	13.26
SEP 26	12:30	4.000	4.89	0.530	12.82
SEP 26	12:35	4.083	4.53	0.453	12.84
SEP 26	12:40	4.166	4.24	0.387	12.62
SEP 26	12:45	4.250	4.10	0.350	12.54
SEP 26	12:50	4.333	3.94	0.323	12.48
SEP 26	12:55	4.416	3.84	0.293	12.38
SEP 26	13:00	4.500	3.81	0.287	12.38
SEP 26	13:05	4.583	3.79	0.276	12.35
SEP 26	13:10	4.666	3.75	0.257	12.27
SEP 26	13:15	4.750	3.75	0.251	12.31
SEP 26	13:20	4.833	3.78	0.249	12.38
SEP 26	13:25	4.916	3.74	0.244	12.32
SEP 26	13:30	5.000	3.74	0.236	12.29
SEP 26	13:35	5.083	3.77	0.232	12.32
SEP 26	13:40	5.166	3.72	0.228	12.22
SEP 26	13:45	5.250	3.72	0.226	12.29
SEP 26	13:55	5.416	3.75	0.223	12.26
SEP 26	14:05	5.583	3.71	0.223	12.28
SEP 26	14:15	5.750	3.71	0.209	12.31
SEP 26	14:25	5.916	3.72	0.198	---
SEP 26	14:35	6.083	3.73	0.209	12.27
SEP 26	14:45	6.250	3.68	0.198	12.27
SEP 26	14:55	6.416	3.70	0.185	12.26
SEP 26	15:05	6.583	3.76	0.188	12.29
SEP 26	15:15	6.750	3.70	0.190	12.30
SEP 26	15:30	7.000	3.70	0.192	12.26
SEP 26	15:45	7.250	3.68	0.188	12.31
SEP 26	16:00	7.500	3.68	0.196	---
SEP 26	16:15	7.750	3.75	0.171	---
SEP 26	16:30	8.000	3.69	0.169	---
SEP 26	16:45	8.250	3.66	0.173	---
SEP 26	17:00	8.500	3.71	---	---
SEP 26	17:30	9.000	3.79	---	---
SEP 26	18:04	9.566	3.72	---	---
SEP 26	19:04	10.566	3.72	---	---

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 2

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	20:04	11.566	3.70	---	---
SEP 26	21:04	12.566	3.71	---	---
SEP 26	22:04	13.566	3.71	---	---
SEP 26	23:04	14.566	3.77	---	---
SEP 27	00:04	15.566	3.79	---	---
SEP 27	01:04	16.566	3.94	---	---
SEP 27	02:04	17.566	4.02	---	---
SEP 27	03:04	18.566	3.99	---	---
SEP 27	04:04	19.566	4.08	---	---
SEP 27	05:04	20.566	4.16	---	---
SEP 27	06:04	21.566	4.20	---	---
SEP 27	07:04	22.566	4.36	---	---
SEP 27	08:04	23.566	4.33	---	---
SEP 27	09:04	24.566	4.34	---	---
SEP 27	10:04	25.566	4.29	---	---
SEP 27	11:04	26.566	4.34	---	---
SEP 27	12:04	27.566	4.35	---	---
SEP 27	13:04	28.566	4.21	---	---
SEP 27	14:04	29.566	4.25	---	---

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 3

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:48	-0.700	3.69	0.131	12.26
SEP 26	08:20	-0.166	3.67	0.128	12.23
SEP 26	08:30	0.000	3.71	0.128	12.30
SEP 26	08:40	0.166	3.77	0.131	12.24
SEP 26	08:50	0.333	3.70	0.139	12.25
SEP 26	09:00	0.500	3.73	0.134	12.29
SEP 26	09:10	0.666	3.65	0.133	---
SEP 26	09:20	0.833	3.65	0.133	---
SEP 26	09:30	1.000	3.73	0.126	12.20
SEP 26	09:40	1.166	3.68	0.122	12.09
SEP 26	09:50	1.333	3.70	0.123	12.32
SEP 26	10:00	1.500	3.83	0.135	12.35
SEP 26	10:10	1.666	4.15	0.155	12.43
SEP 26	10:20	1.833	5.36	0.258	13.09
SEP 26	10:30	2.000	6.75	0.363	13.71
SEP 26	10:40	2.166	8.03	0.513	14.27
SEP 26	10:50	2.333	8.71	0.624	14.80
SEP 26	11:00	2.500	9.18	0.696	15.02
SEP 26	11:10	2.666	9.49	0.752	15.04
SEP 26	11:20	2.833	9.64	0.811	15.27
SEP 26	11:30	3.000	9.74	0.857	15.31
SEP 26	11:40	3.166	9.94	0.909	15.31
SEP 26	11:50	3.333	9.91	0.928	15.49
SEP 26	12:00	3.500	9.91	0.946	15.25
SEP 26	12:10	3.666	9.95	0.971	15.24
SEP 26	12:20	3.833	9.94	0.985	15.36
SEP 26	12:30	4.000	9.94	0.994	15.33
SEP 26	12:40	4.166	9.91	1.012	15.43
SEP 26	12:50	4.333	9.96	1.035	15.42
SEP 26	13:00	4.500	9.81	1.021	15.23
SEP 26	13:10	4.666	9.36	1.001	15.09
SEP 26	13:20	4.833	8.29	0.892	14.51
SEP 26	13:30	5.000	7.02	0.794	14.87
SEP 26	13:40	5.166	5.81	0.644	13.28
SEP 26	13:50	5.333	5.06	0.557	12.88
SEP 26	14:00	5.500	4.61	0.486	12.71
SEP 26	14:10	5.666	4.33	0.426	12.49
SEP 26	14:20	5.833	4.15	0.379	12.51
SEP 26	14:30	6.000	4.07	0.346	12.37
SEP 26	14:40	6.166	4.00	0.308	12.32

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 3

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	14:50	6.333	3.92	0.306	12.29
SEP 26	15:00	6.500	3.92	0.288	12.31
SEP 26	15:10	6.666	3.90	0.273	12.34
SEP 26	15:20	6.833	3.88	0.266	12.36
SEP 26	15:30	7.000	3.89	0.251	12.46
SEP 26	15:40	7.166	3.85	0.244	12.27
SEP 26	15:50	7.333	3.83	0.244	12.29
SEP 26	16:00	7.500	3.91	0.205	12.46
SEP 26	16:10	7.666	3.86	0.216	12.21
SEP 26	16:20	7.833	3.86	0.223	12.22
SEP 26	16:30	8.000	3.86	0.200	12.31
SEP 26	16:40	8.166	3.91	0.200	12.35
SEP 26	16:50	8.333	3.88	0.186	12.26
SEP 26	17:00	8.500	3.87	0.207	12.27
SEP 26	17:22	8.866	3.80	0.191	12.18
SEP 26	17:52	9.366	3.82	0.194	12.26
SEP 26	18:22	9.866	3.75	0.185	12.20
SEP 26	19:22	10.866	3.73	0.178	12.19
SEP 26	20:22	11.866	3.73	0.174	12.25
SEP 26	21:22	12.866	3.75	0.168	---
SEP 26	22:22	13.866	3.73	0.165	---
SEP 26	23:22	14.866	3.72	0.159	---
SEP 27	00:22	15.866	3.83	---	---
SEP 27	01:22	16.866	4.00	---	---
SEP 27	02:22	17.866	4.00	---	---
SEP 27	03:22	18.866	4.06	---	---
SEP 27	04:22	19.866	4.22	---	---
SEP 27	05:22	20.866	4.14	---	---
SEP 27	06:22	21.866	4.20	---	---
SEP 27	07:22	22.866	4.29	---	---
SEP 27	08:22	23.866	4.24	---	---
SEP 27	09:22	24.866	4.31	---	---
SEP 27	10:22	25.866	4.33	---	---
SEP 27	11:22	26.866	4.22	---	---
SEP 27	12:22	27.866	4.24	---	---
SEP 27	13:22	28.866	4.24	---	---
SEP 27	14:22	29.866	4.20	---	---

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 4

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:50	-0.666	3.65	0.147	12.28
SEP 26	09:00	0.500	3.64	0.133	12.31
SEP 26	09:30	1.000	3.68	0.148	12.28
SEP 26	09:40	1.166	3.71	0.141	12.35
SEP 26	09:50	1.333	3.70	0.140	12.61
SEP 26	10:00	1.500	3.68	0.152	12.35
SEP 26	10:10	1.666	3.72	0.134	12.35
SEP 26	10:12	1.700	3.67	0.146	12.33
SEP 26	10:20	1.833	3.68	0.146	12.41
SEP 26	10:30	2.000	3.64	0.149	12.31
SEP 26	10:40	2.166	3.68	0.139	12.31
SEP 26	10:50	2.333	3.69	0.137	12.38
SEP 26	11:00	2.500	3.71	0.131	12.38
SEP 26	11:10	2.666	3.84	0.144	12.35
SEP 26	11:20	2.833	4.15	0.149	12.50
SEP 26	11:30	3.000	4.75	0.185	12.75
SEP 26	11:40	3.166	5.58	0.231	13.08
SEP 26	11:50	3.333	6.37	0.286	13.34
SEP 26	12:00	3.500	6.95	0.359	13.73
SEP 26	12:10	3.666	7.60	0.398	14.05
SEP 26	12:20	3.833	8.01	0.435	14.28
SEP 26	12:30	4.000	8.33	0.488	14.49
SEP 26	12:40	4.166	8.60	0.515	14.52
SEP 26	12:50	4.333	8.81	0.542	14.72
SEP 26	13:00	4.500	8.95	0.557	14.85
SEP 26	13:10	4.666	9.37	0.602	14.85
SEP 26	13:20	4.833	9.03	0.631	14.92
SEP 26	13:30	5.000	9.17	0.651	15.01
SEP 26	13:40	5.166	9.31	0.657	14.85
SEP 26	13:50	5.333	9.31	0.680	14.88
SEP 26	14:00	5.500	9.34	0.684	14.95
SEP 26	14:10	5.666	9.19	0.696	14.91
SEP 26	14:20	5.833	8.80	0.696	14.75
SEP 26	14:30	6.000	8.20	0.664	14.52
SEP 26	14:40	6.166	7.55	0.644	14.27
SEP 26	14:50	6.333	6.78	0.583	13.73
SEP 26	15:00	6.500	6.10	0.524	13.37
SEP 26	15:10	6.666	5.62	0.464	13.12
SEP 26	15:20	6.833	5.28	0.464	13.02
SEP 26	15:30	7.000	4.85	0.423	12.76

APPENDIX I

SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 4

DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	15:40	7.166	4.62	0.389	12.54
SEP 26	15:50	7.333	4.42	0.370	12.54
SEP 26	16:00	7.500	4.34	0.349	12.41
SEP 26	16:10	7.666	4.26	0.327	12.38
SEP 26	16:20	7.833	4.19	0.313	12.43
SEP 26	16:30	8.000	4.11	0.289	12.48
SEP 26	16:40	8.166	4.03	0.278	12.37
SEP 26	16:50	8.333	4.03	0.263	12.40
SEP 26	17:00	8.500	4.01	0.240	12.43
SEP 26	17:31	9.016	3.93	0.232	12.44
SEP 26	18:00	9.500	3.92	0.218	12.26
SEP 26	18:31	10.016	3.85	0.192	12.44
SEP 26	19:31	11.016	3.84	0.175	12.37
SEP 26	20:31	12.016	3.82	0.173	12.38
SEP 26	21:31	13.016	3.80	0.168	12.38
SEP 26	22:31	14.016	3.83	0.154	12.34
SEP 26	23:31	15.016	3.78	---	---
SEP 27	00:31	16.016	3.91	---	12.47
SEP 27	05:31	21.016	4.13	---	11.96
SEP 27	06:31	22.016	4.26	---	11.72
SEP 27	07:31	23.016	4.30	---	---
SEP 27	08:31	24.016	4.40	---	---
SEP 27	10:31	26.016	4.30	---	---
SEP 27	11:31	27.016	4.26	---	---
SEP 27	12:31	28.016	4.26	---	---
SEP 27	14:31	30.016	4.26	---	---

APPENDIX I

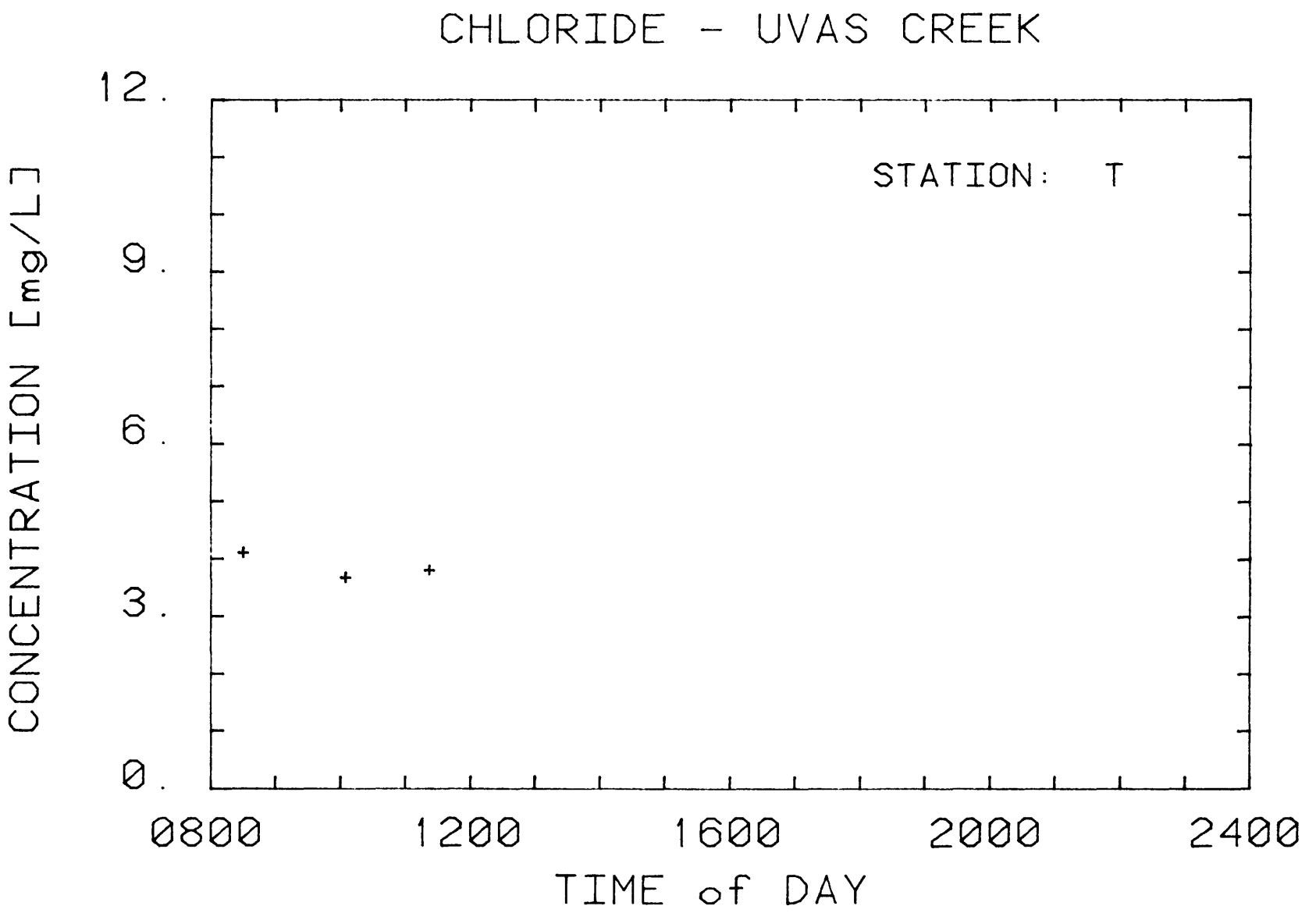
SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 5

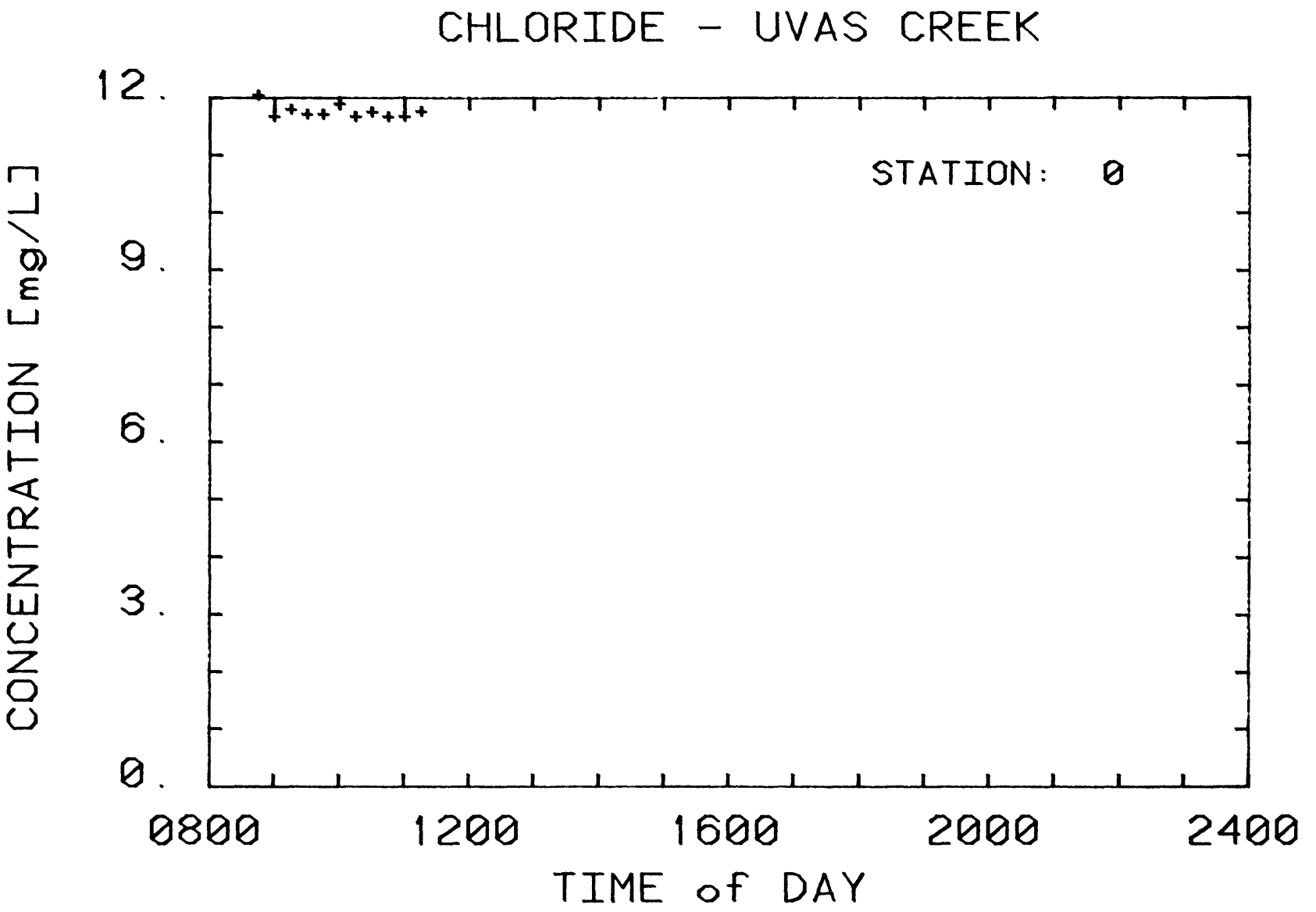
DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:55	-0.583	3.64	---	12.26
SEP 26	10:00	1.500	3.83	0.135	12.28
SEP 26	10:10	1.666	3.68	0.132	12.28
SEP 26	10:20	1.833	3.65	0.126	12.24
SEP 26	10:30	2.000	3.68	0.130	12.31
SEP 26	10:40	2.166	3.68	0.148	12.31
SEP 26	10:50	2.333	3.62	0.139	12.31
SEP 26	11:00	2.500	3.65	0.135	12.33
SEP 26	11:10	2.666	3.67	0.137	12.24
SEP 26	11:20	2.833	3.68	0.130	12.35
SEP 26	11:30	3.000	3.67	0.132	12.22
SEP 26	11:40	3.166	3.68	0.130	12.26
SEP 26	11:50	3.333	3.63	0.143	12.17
SEP 26	12:00	3.500	3.68	0.139	12.29
SEP 26	12:10	3.666	3.65	0.135	12.23
SEP 26	12:20	3.833	3.72	0.132	12.31
SEP 26	12:30	4.000	3.72	0.130	12.27
SEP 26	12:40	4.166	3.86	0.128	12.25
SEP 26	12:50	4.333	3.96	0.126	12.28
SEP 26	13:00	4.500	4.06	0.130	12.26
SEP 26	13:10	4.666	4.38	0.132	12.34
SEP 26	13:20	4.833	4.75	0.140	12.47
SEP 26	13:30	5.000	5.21	0.148	12.75
SEP 26	13:40	5.166	5.65	0.152	12.89
SEP 26	13:50	5.333	6.01	0.163	13.04
SEP 26	14:00	5.500	6.34	0.168	13.25
SEP 26	14:10	5.666	6.65	0.181	13.35
SEP 26	14:20	5.833	6.91	0.185	13.39
SEP 26	14:30	6.000	7.09	0.200	13.49
SEP 26	14:40	6.166	7.26	0.216	13.63
SEP 26	14:50	6.333	7.37	0.218	13.75
SEP 26	15:00	6.500	7.52	0.229	13.88
SEP 26	15:10	6.666	7.64	0.242	13.91
SEP 26	15:20	6.833	7.70	0.247	13.91
SEP 26	15:33	7.050	7.73	0.282	13.98
SEP 26	15:40	7.166	7.76	0.273	13.89
SEP 26	15:50	7.333	7.67	0.282	13.94
SEP 26	16:00	7.500	7.46	0.286	13.73
SEP 26	16:10	7.666	7.21	0.275	13.81
SEP 26	16:20	7.833	6.82	0.286	13.68

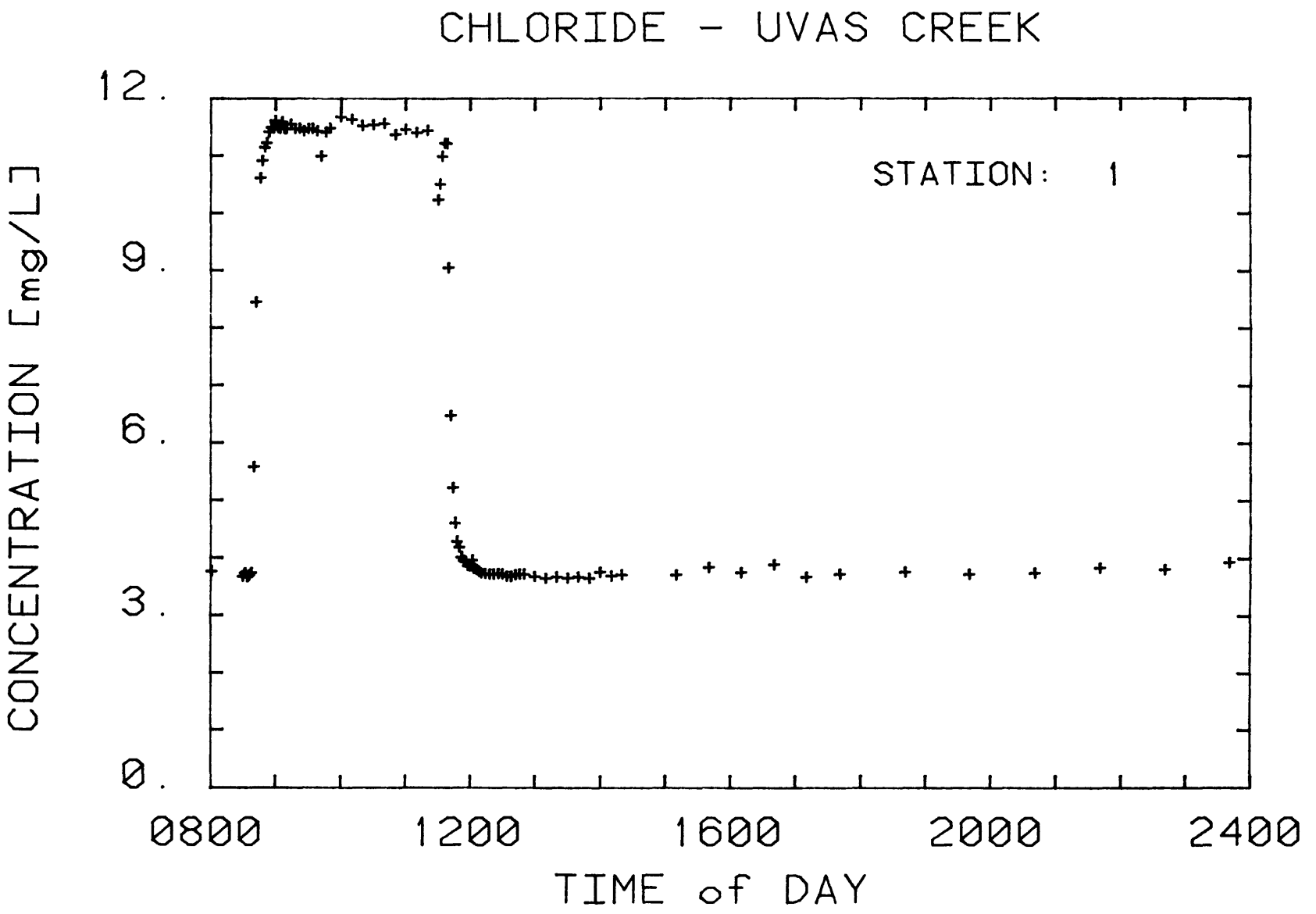
APPENDIX I

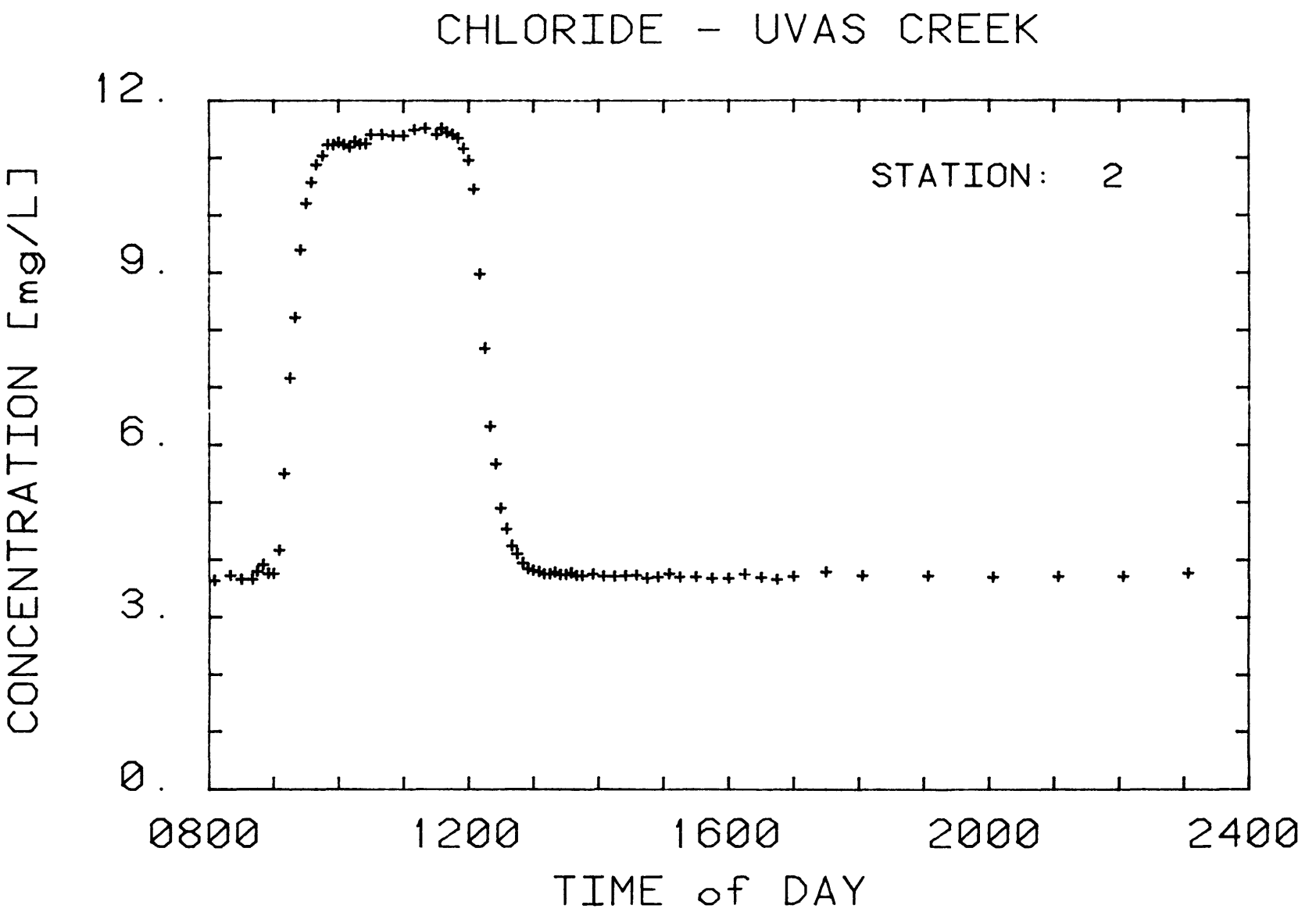
SOLUTE CONCENTRATIONS
Uvas Creek -- September 1972
Station: 5

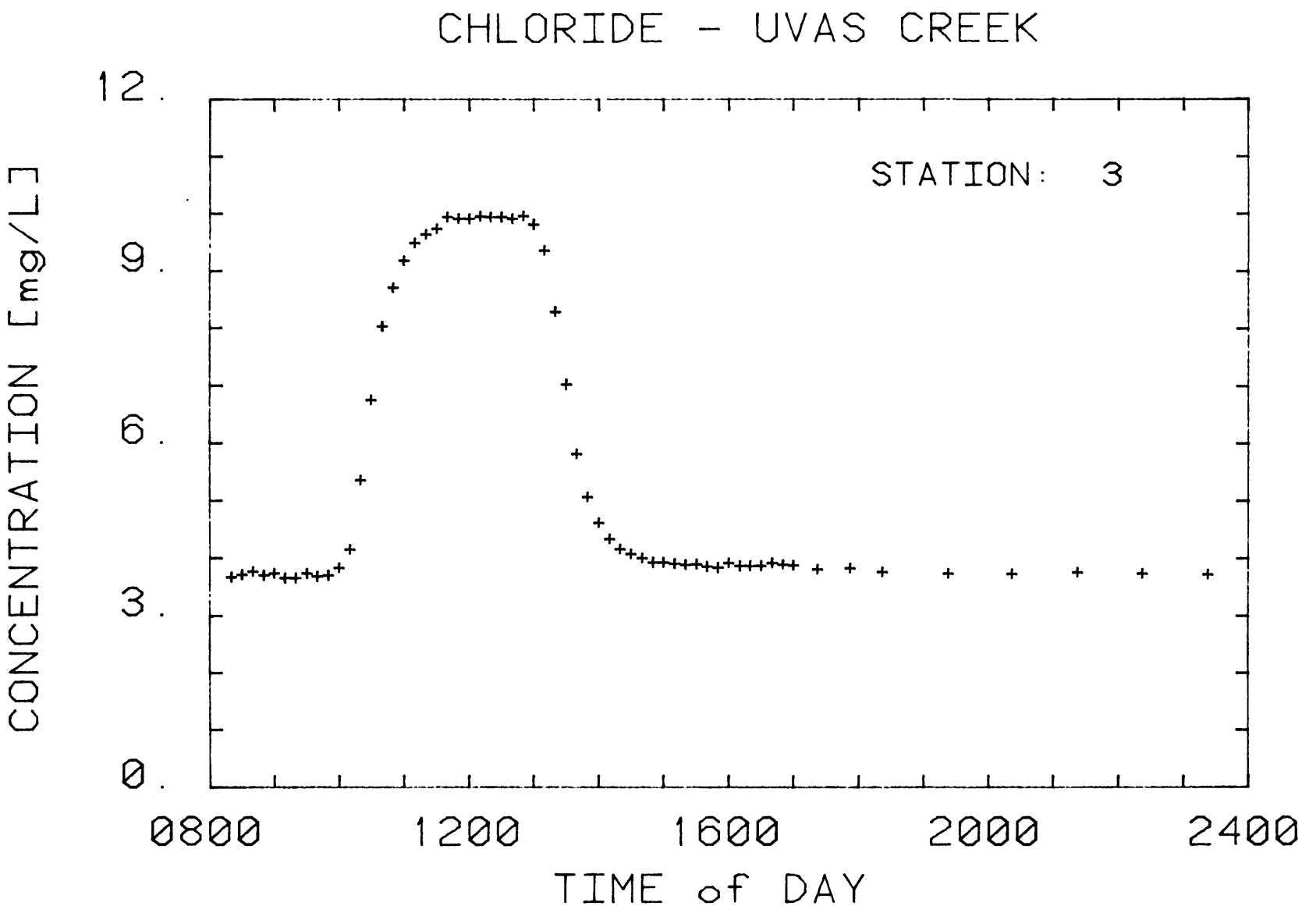
DATE	CLOCK TIME	ELAPSED TIME (h)	CONCENTRATION (mg/L) CHLORIDE	STRONTIUM	SODIUM
SEP 26	16:30	8.000	6.41	---	---
SEP 26	16:45	8.250	5.61	0.269	12.95
SEP 26	17:00	8.500	5.45	0.288	13.14
SEP 26	17:15	8.750	5.01	0.269	13.04
SEP 26	17:30	9.000	4.81	0.266	12.73
SEP 26	17:45	9.250	4.56	0.275	12.60
SEP 26	18:00	9.500	4.47	0.251	12.72
SEP 26	18:15	9.750	4.26	0.253	12.59
SEP 26	18:30	10.000	4.20	0.238	12.55
SEP 26	18:45	10.250	4.12	0.231	12.45
SEP 26	19:30	11.000	4.02	0.229	12.51
SEP 26	20:15	11.750	3.96	0.209	12.30
SEP 26	21:00	12.500	3.92	0.207	12.39
SEP 26	21:45	13.250	3.86	0.207	12.40
SEP 26	22:30	14.000	3.84	0.194	12.35
SEP 26	23:15	14.750	3.88	0.192	12.35
SEP 27	00:00	15.500	3.82	---	12.41
SEP 27	00:45	16.250	3.90	---	12.61
SEP 27	01:30	17.000	4.13	---	12.36
SEP 27	02:15	17.750	4.07	---	12.29
SEP 27	03:00	18.500	4.15	---	12.18
SEP 27	03:45	19.250	4.11	---	12.03
SEP 27	04:30	20.000	4.19	---	---
SEP 27	05:15	20.750	4.23	---	---
SEP 27	06:00	21.500	4.21	---	---
SEP 27	06:45	22.250	4.21	---	---
SEP 27	07:30	23.000	4.24	---	---
SEP 27	08:15	23.750	4.35	---	---
SEP 27	09:00	24.500	4.33	---	---
SEP 27	09:45	25.250	4.33	---	---
SEP 27	10:30	26.000	4.38	---	---
SEP 27	11:15	26.750	4.32	---	---
SEP 27	12:00	27.500	4.35	---	---
SEP 27	12:45	28.250	4.32	---	---
SEP 27	13:30	29.000	4.23	---	---
SEP 27	14:15	29.750	4.19	---	---
SEP 27	15:00	30.500	4.19	---	---

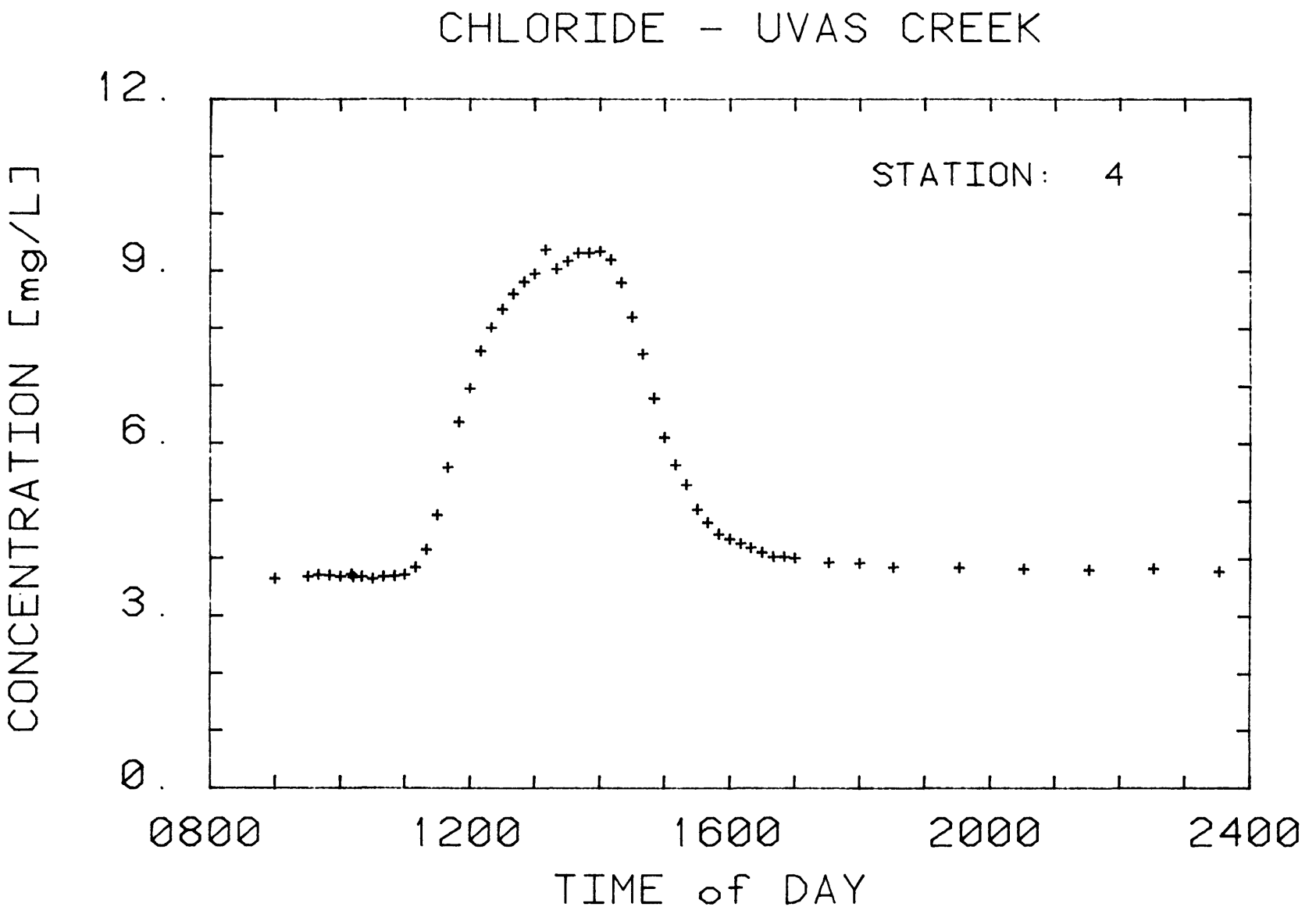

CHLORIDE - UVAS CREEK
STATION: T
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

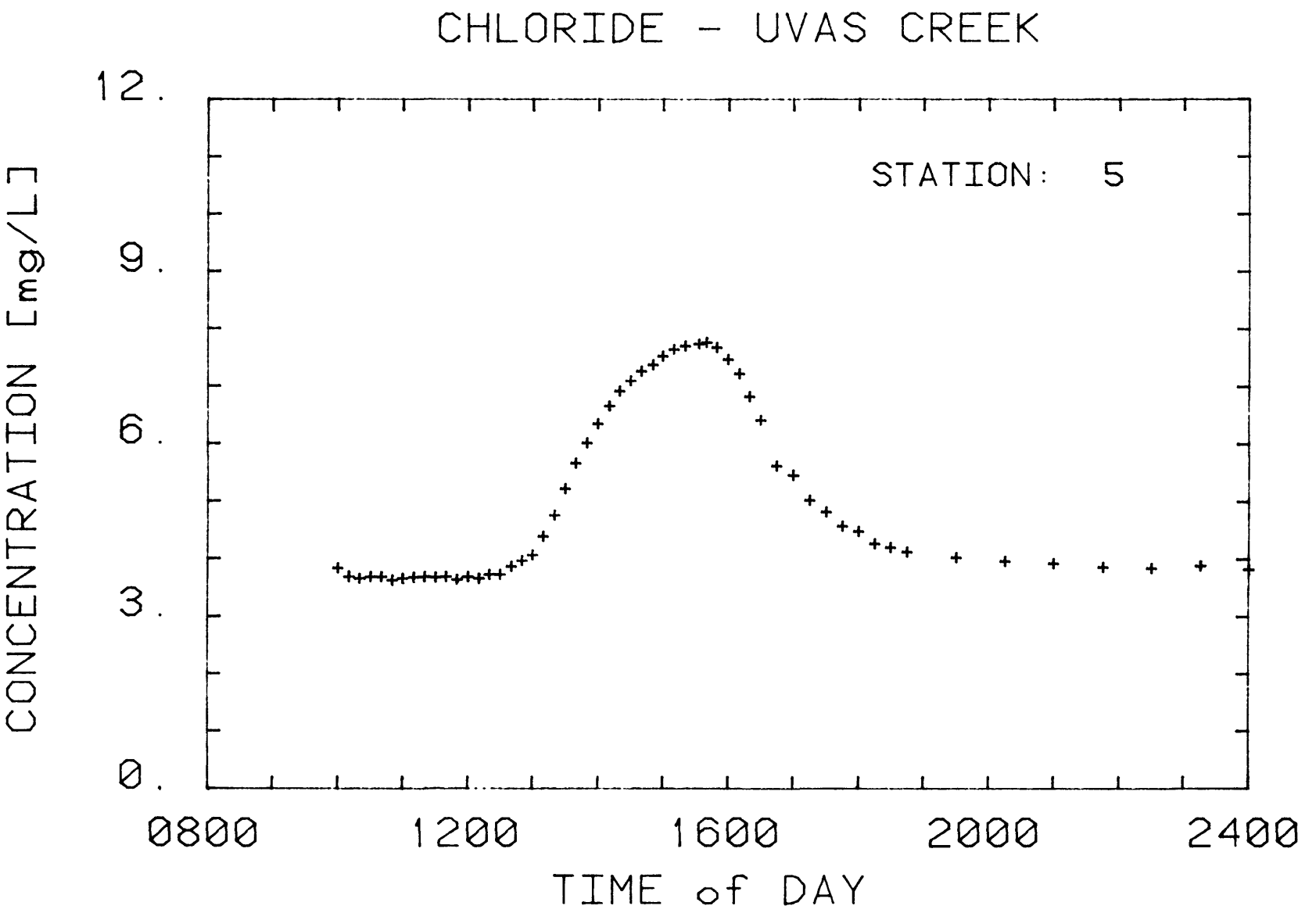

CHLORIDE - UVAS CREEK
STATION: 0
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

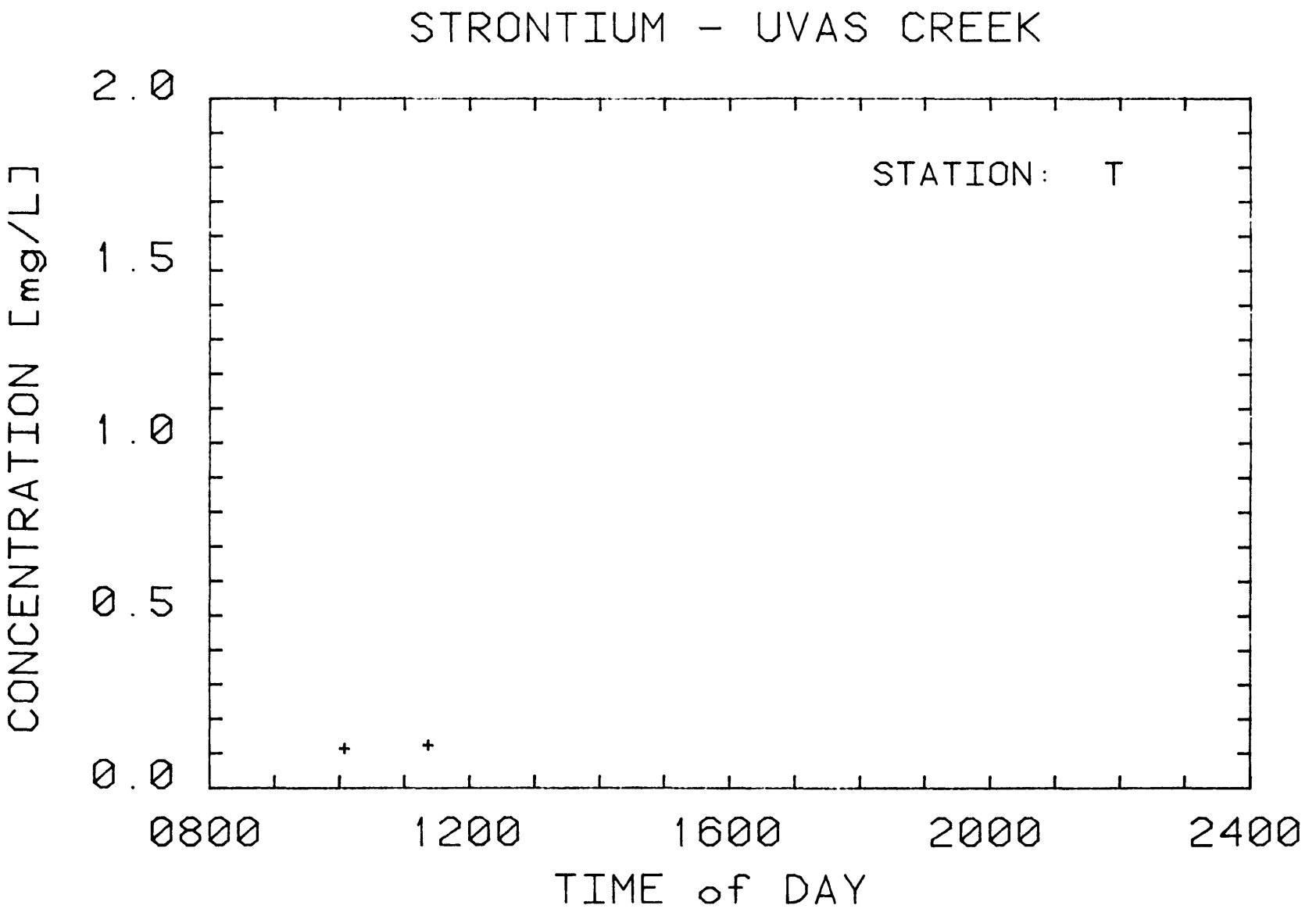

CHLORIDE - UVAS CREEK
STATION: 1
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

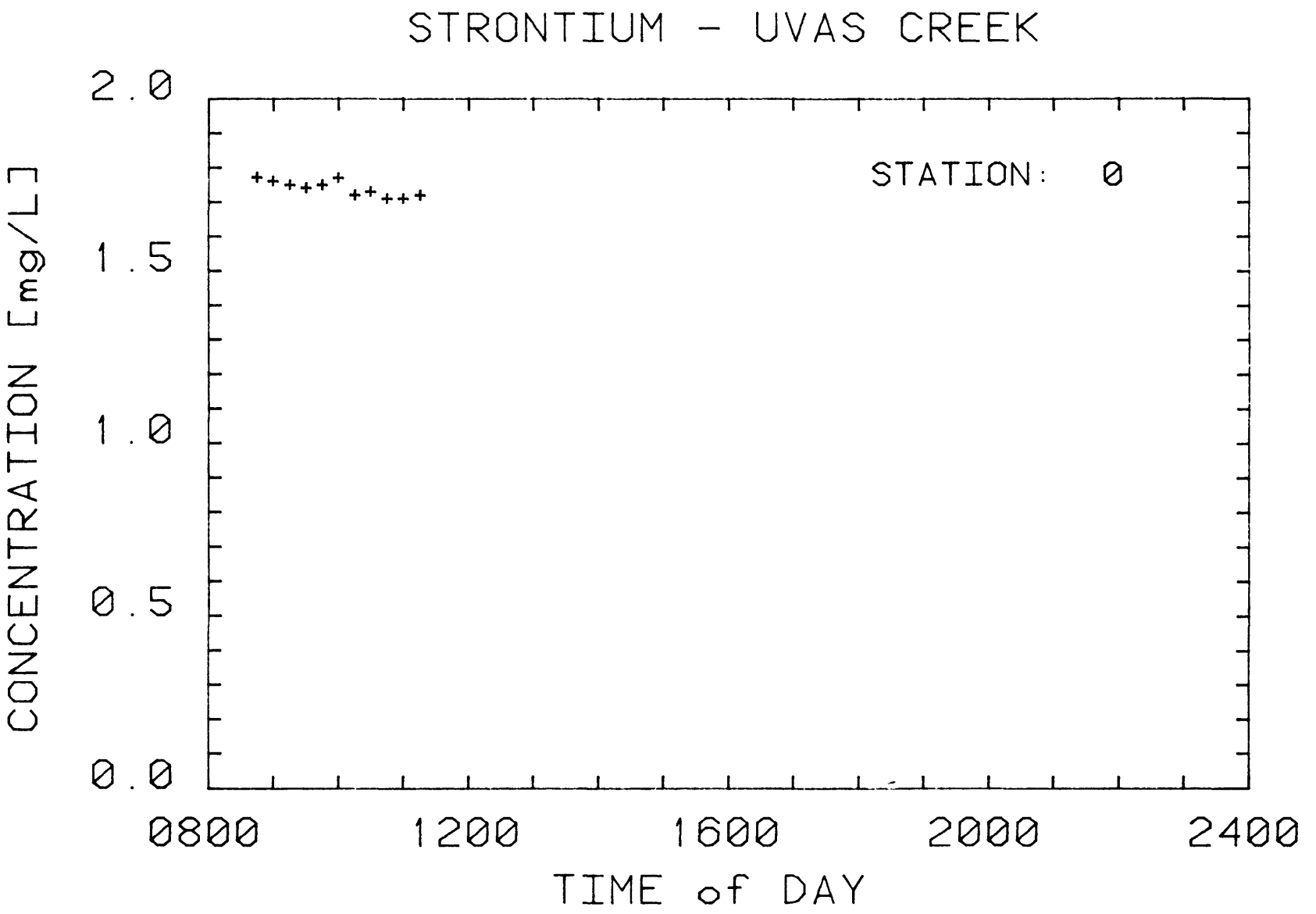

CHLORIDE - UVAS CREEK
STATION: 2
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

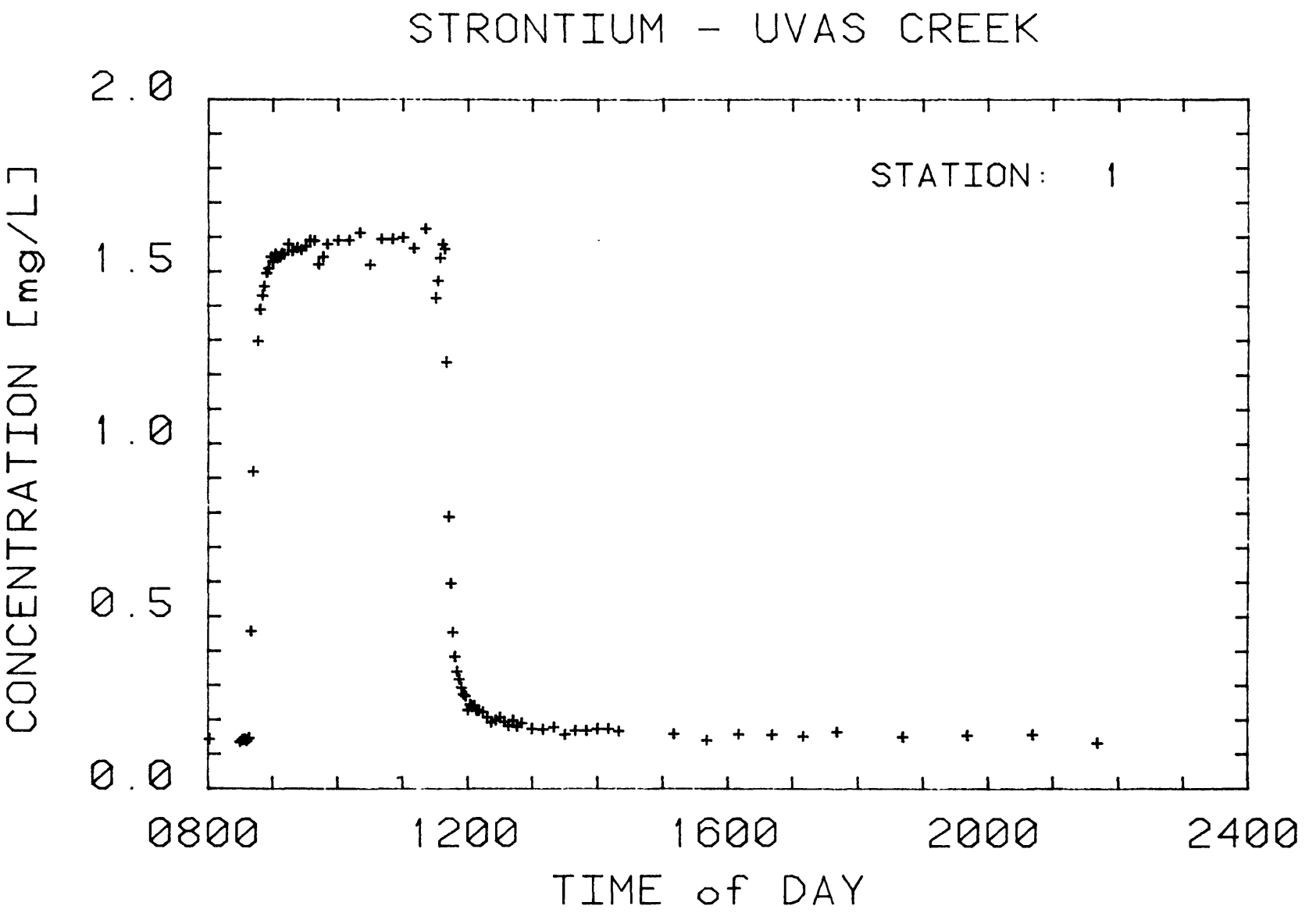

CHLORIDE - UVAS CREEK
STATION: 3
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

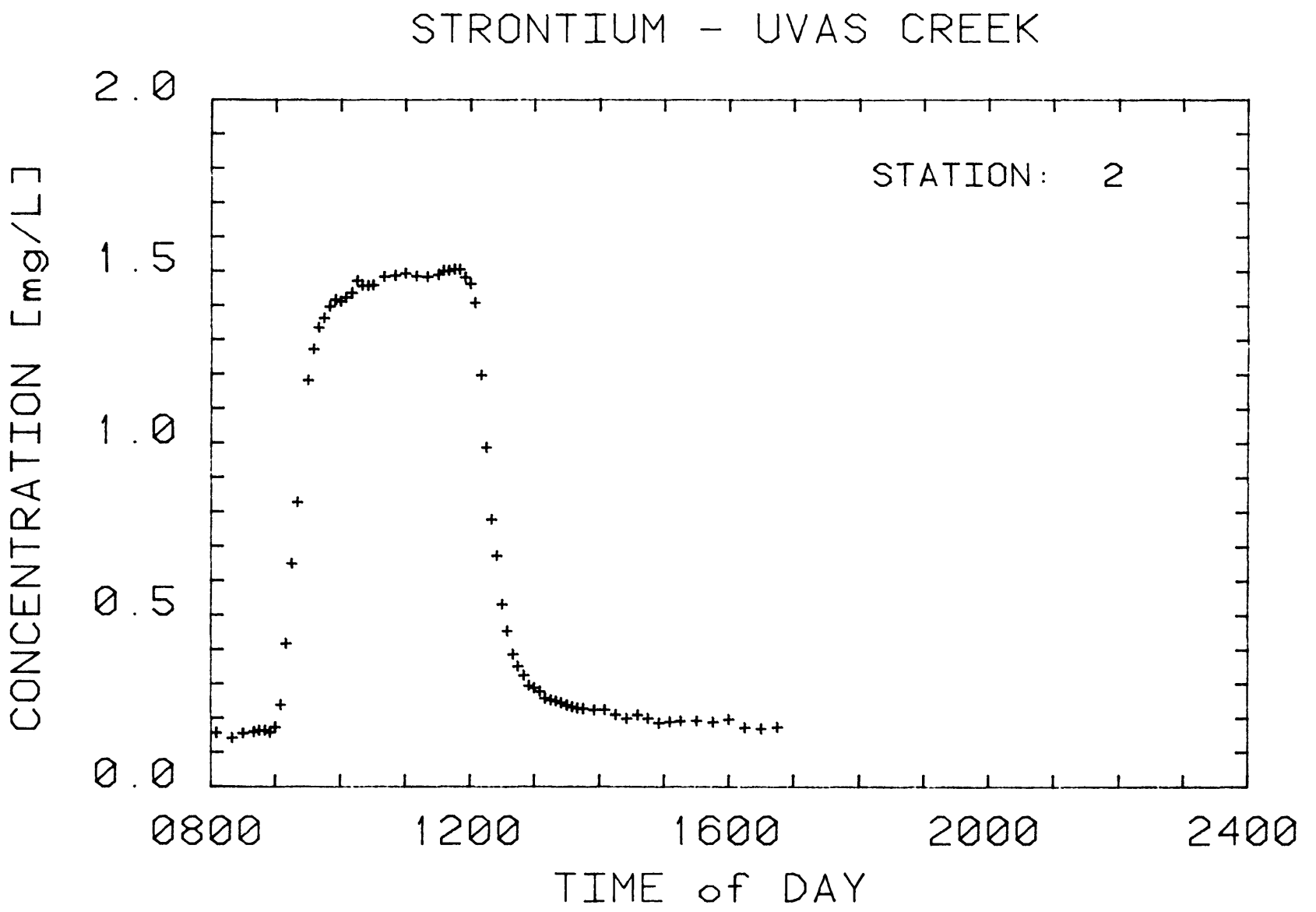

CHLORIDE - UVAS CREEK
STATION: 4
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

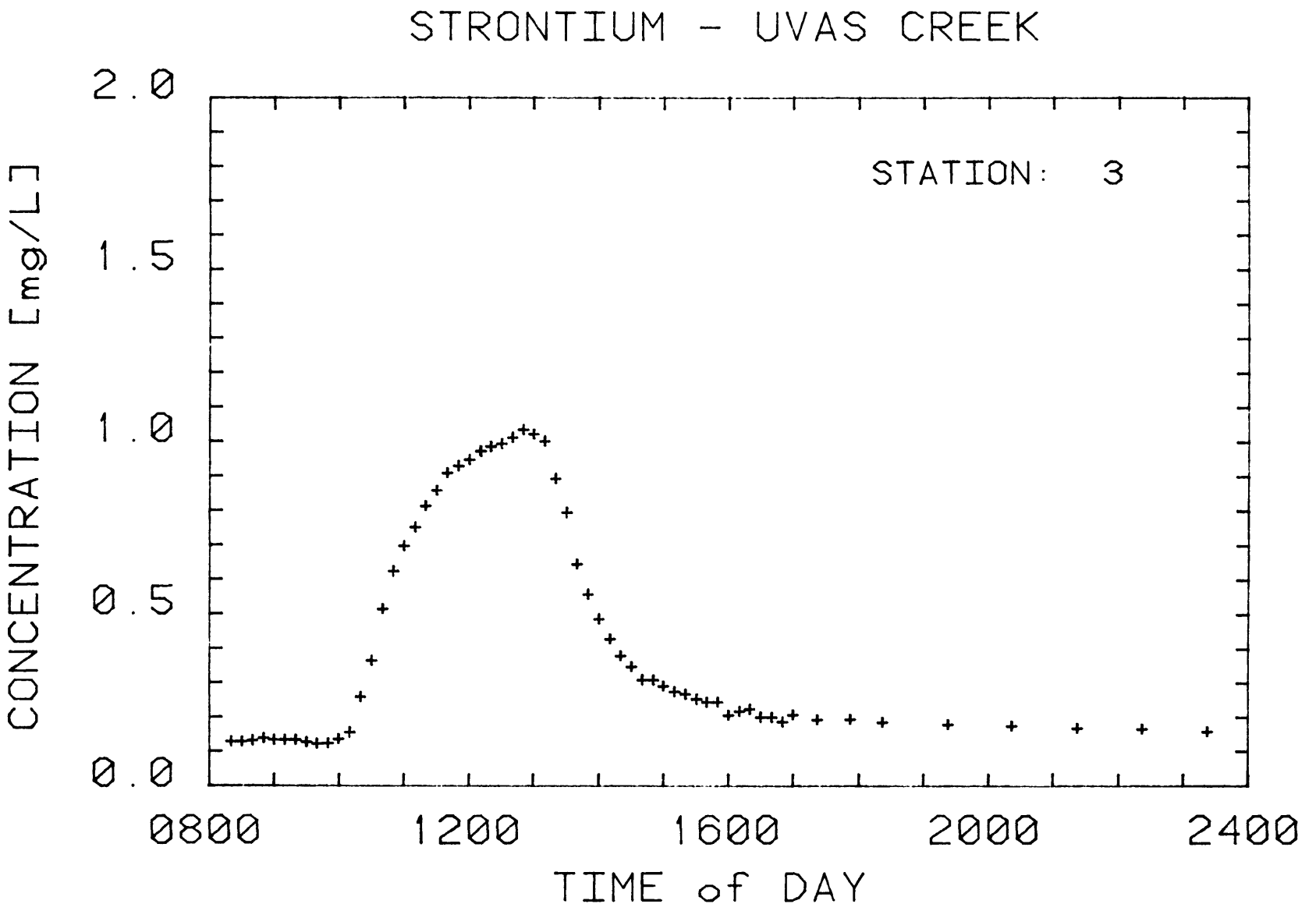

CHLORIDE - UVAS CREEK
STATION: 5
CONCENTRATION [mg/L]
12.
9.
6.
3.
0.
0800
1200
1600
2000
2400
TIME of DAY

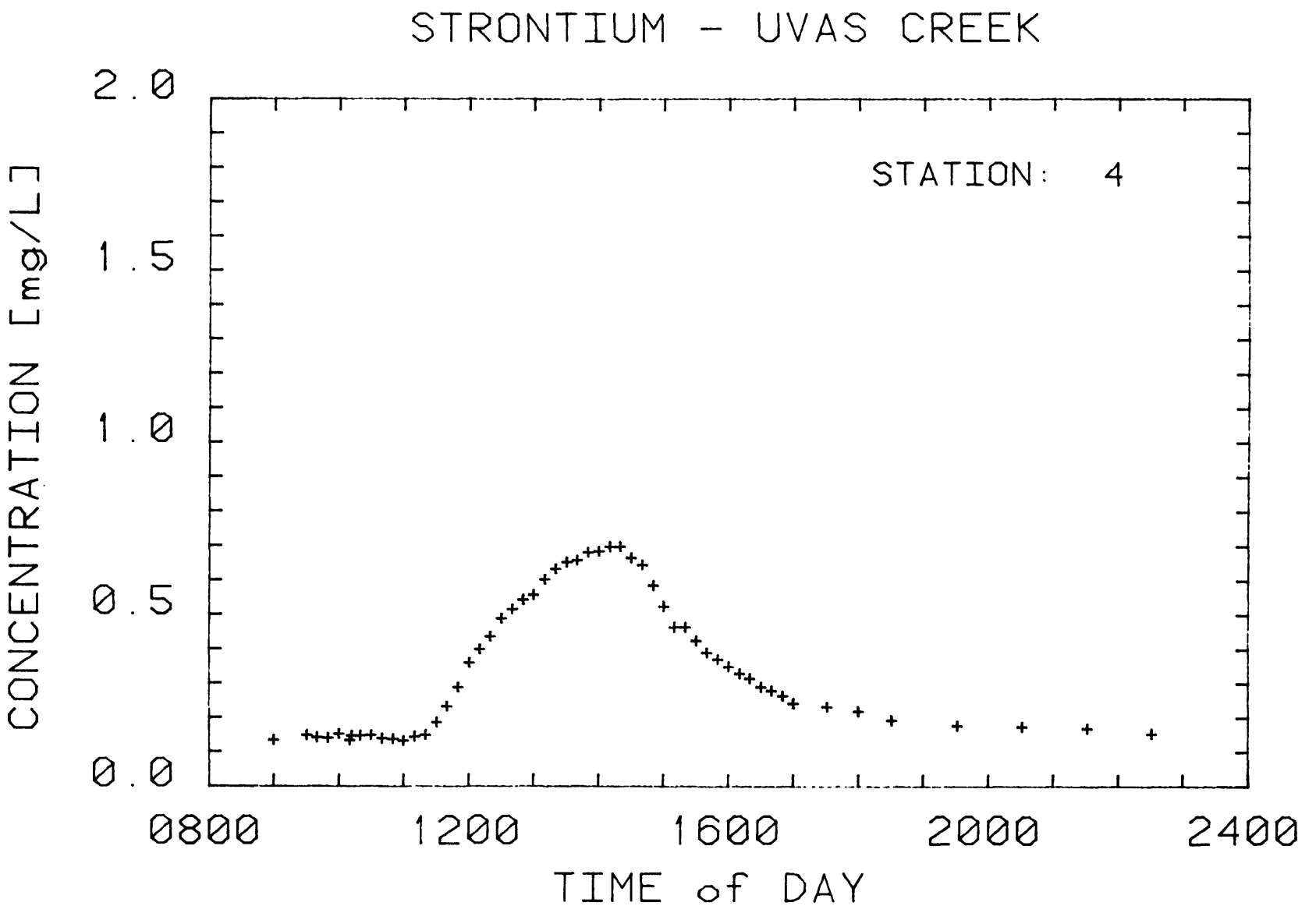

STRONTIUM - UVAS CREEK
STATION: T
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

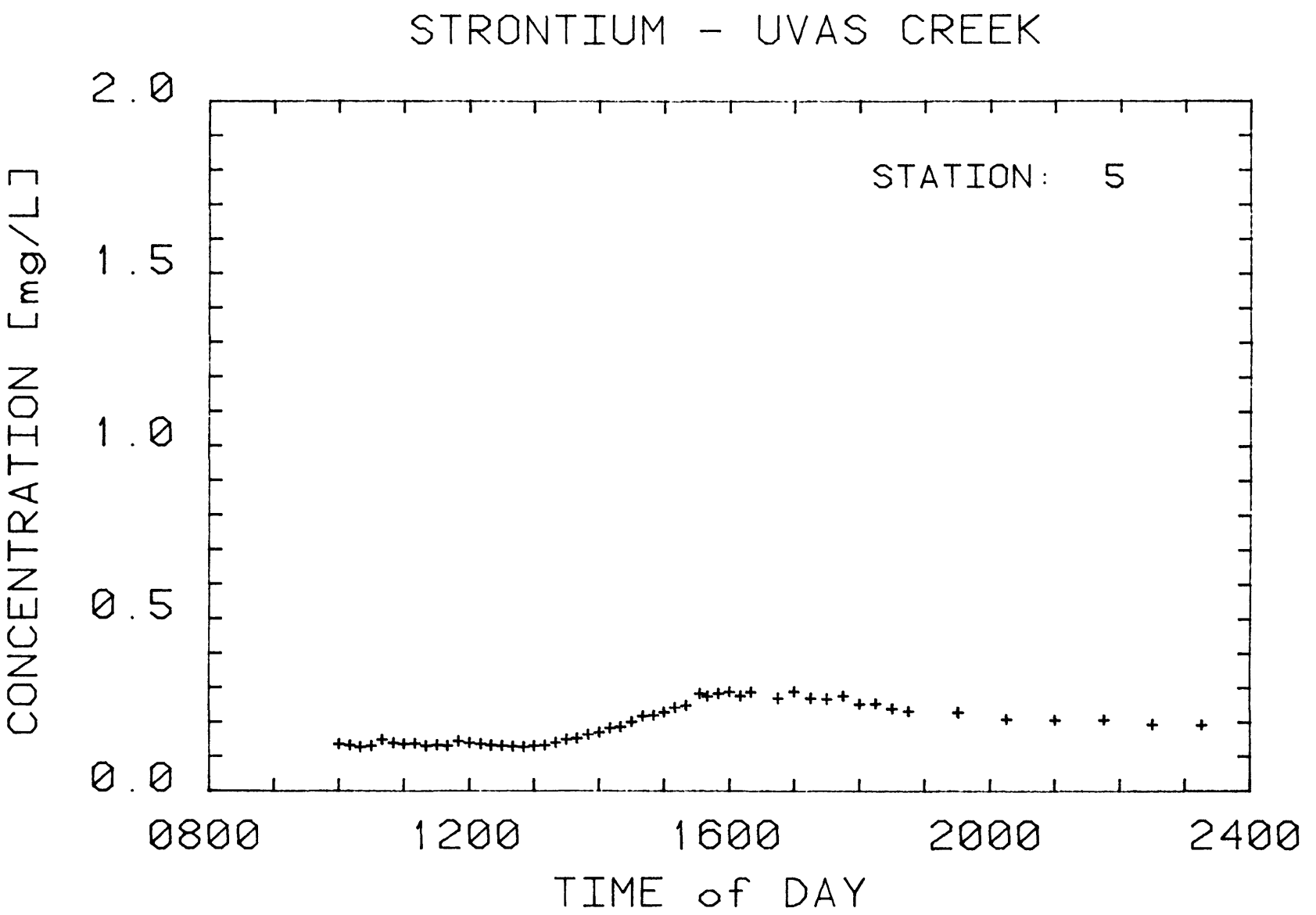

STRONTIUM - UVAS CREEK
STATION: 0
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

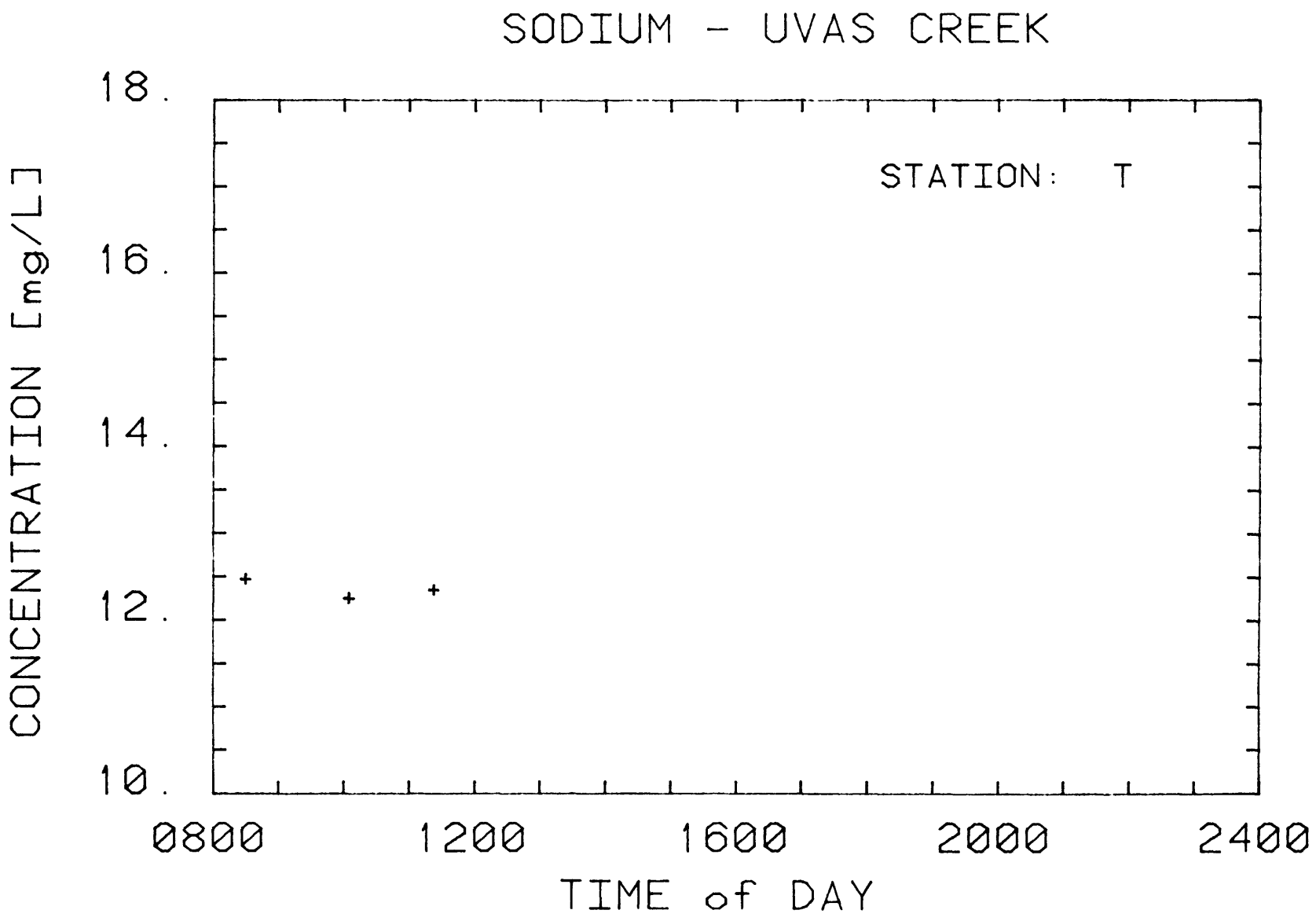

STRONTIUM - UVAS CREEK
STATION: 1
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

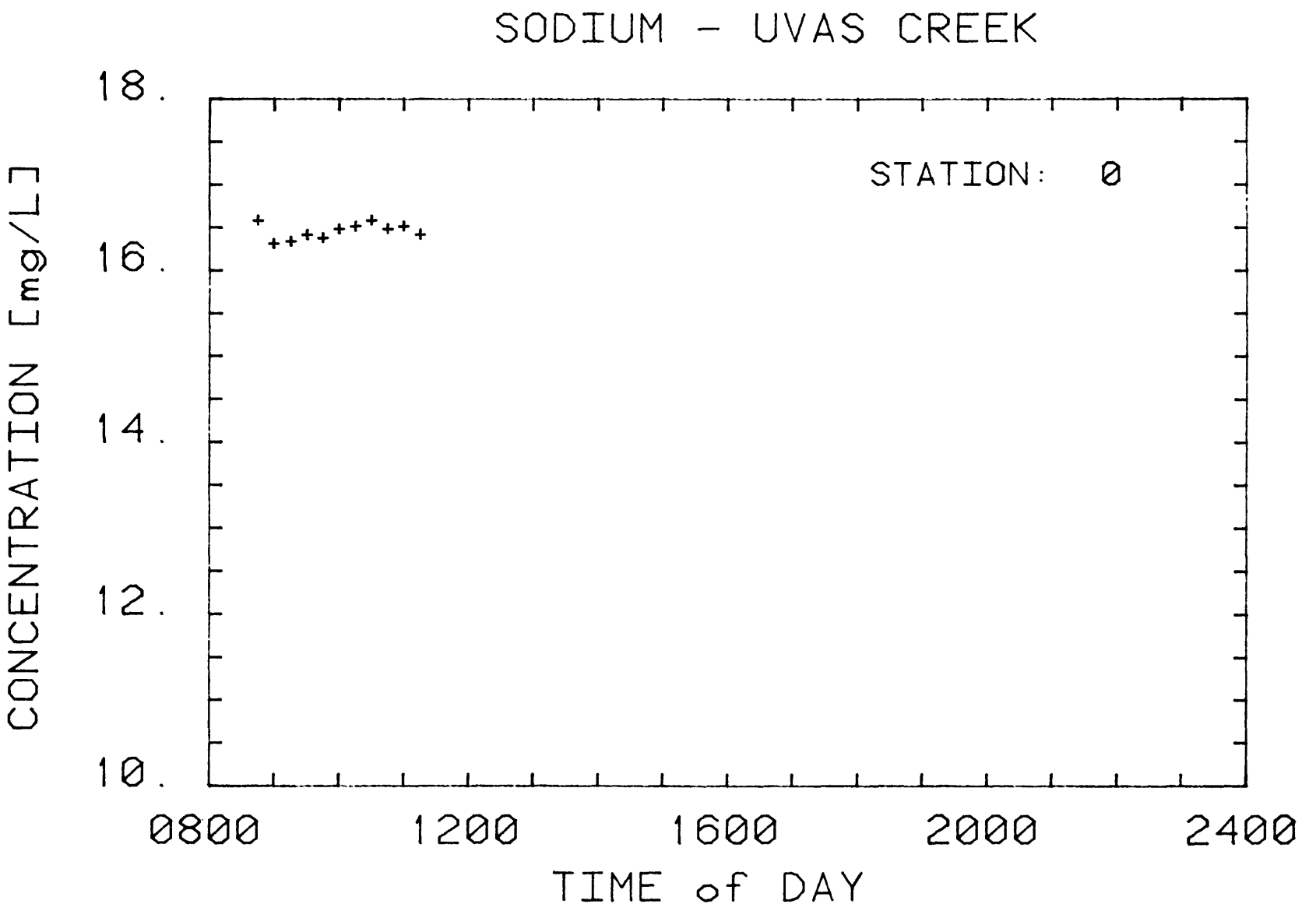

STRONTIUM - UVAS CREEK
STATION: 2
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

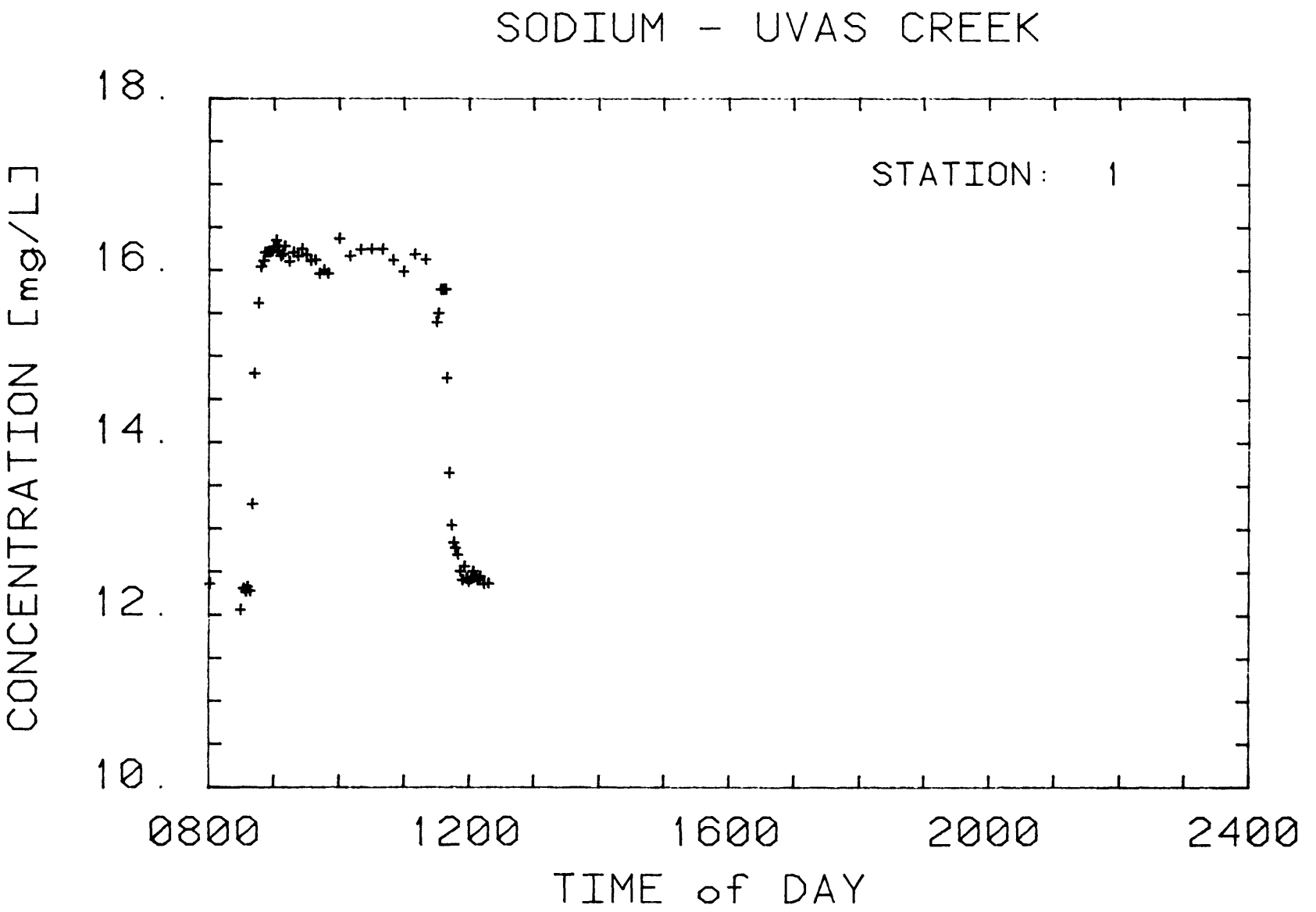

STRONTIUM - UVAS CREEK
STATION: 3
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

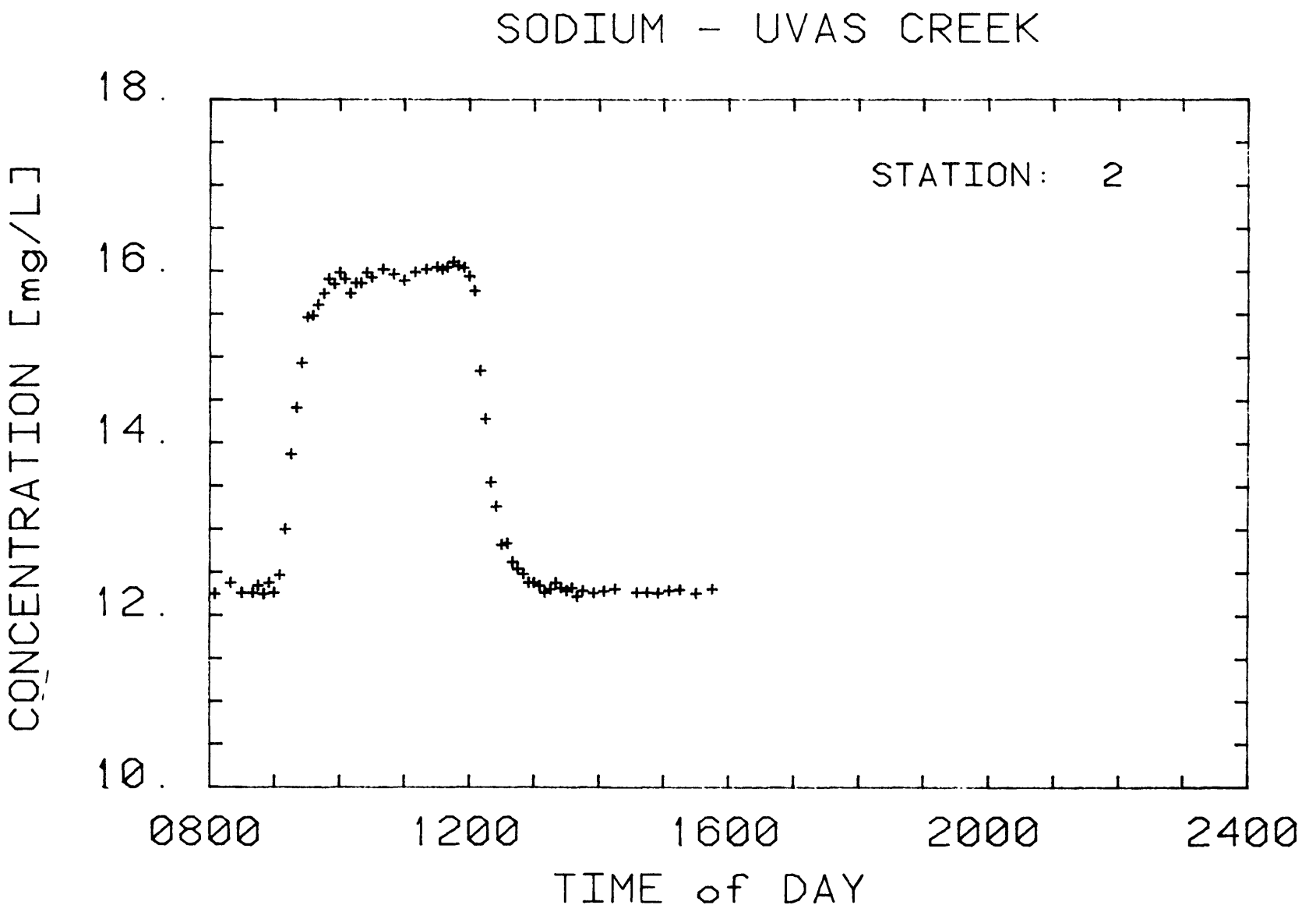

STRONTIUM - UVAS CREEK
STATION: 4
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

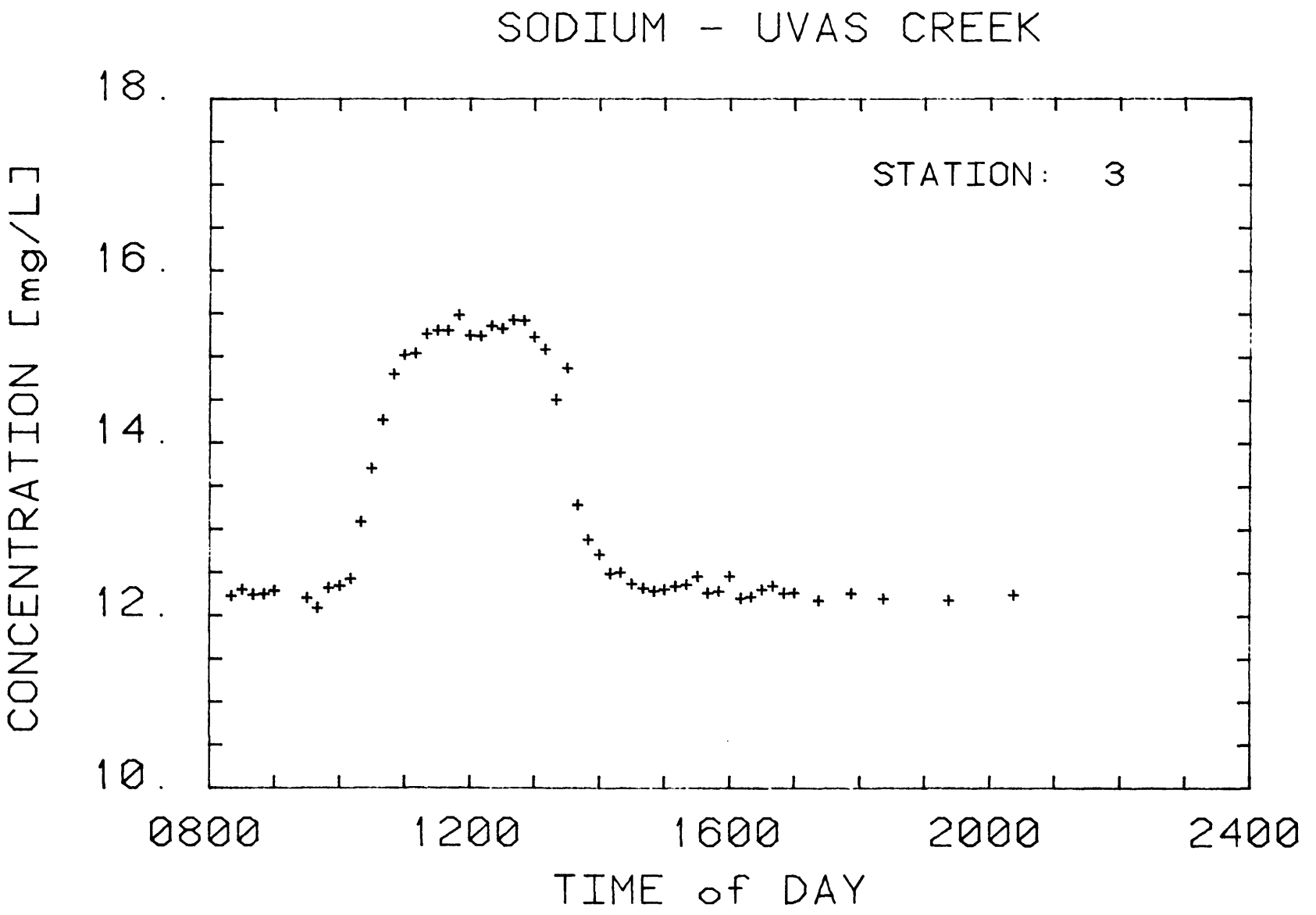

STRONTIUM - UVAS CREEK
STATION: 5
CONCENTRATION [mg/L]
2.0
1.5
1.0
0.5
0.0
0800
1200
1600
2000
2400
TIME of DAY

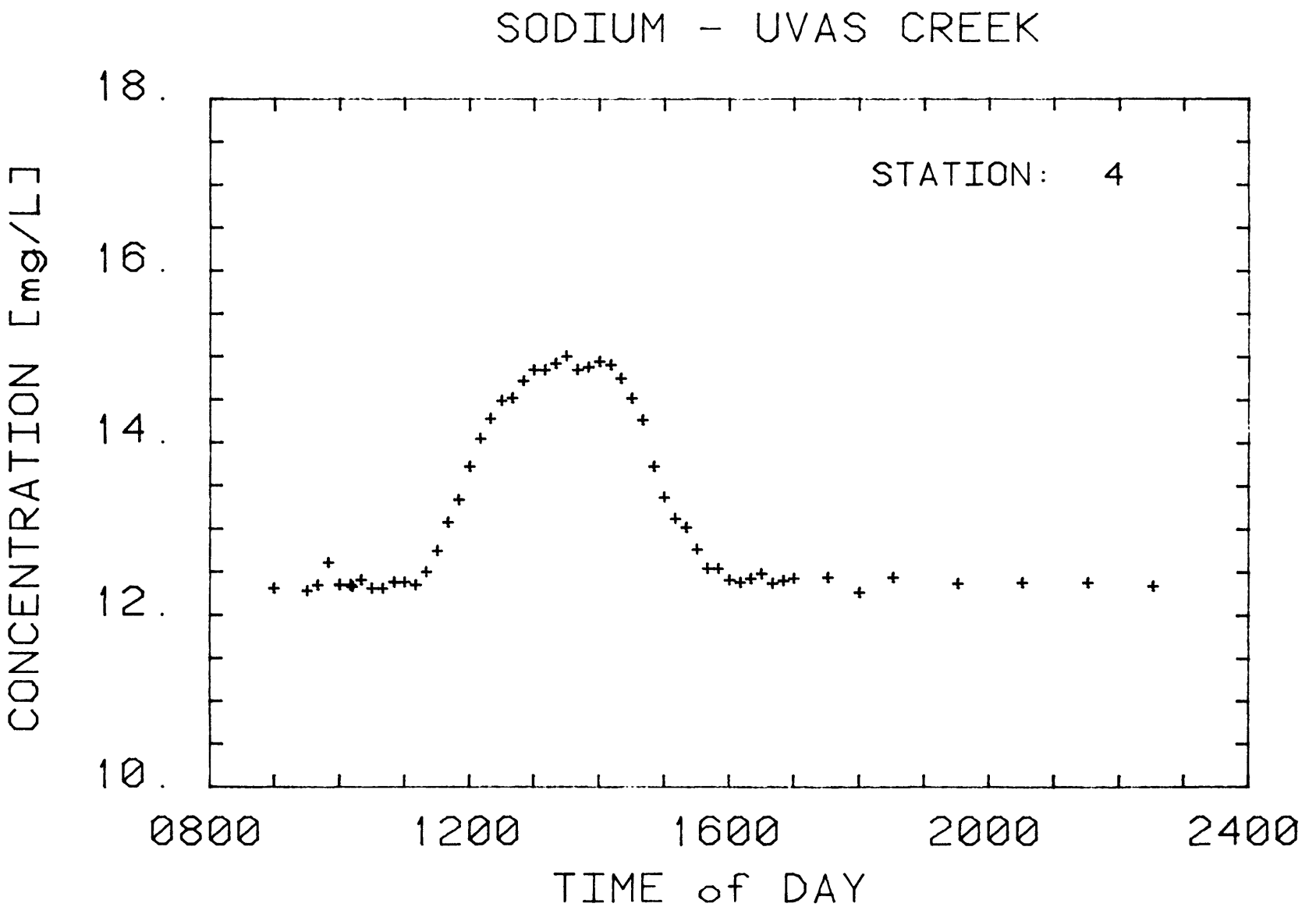

SODIUM - UVAS CREEK
STATION: T
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY

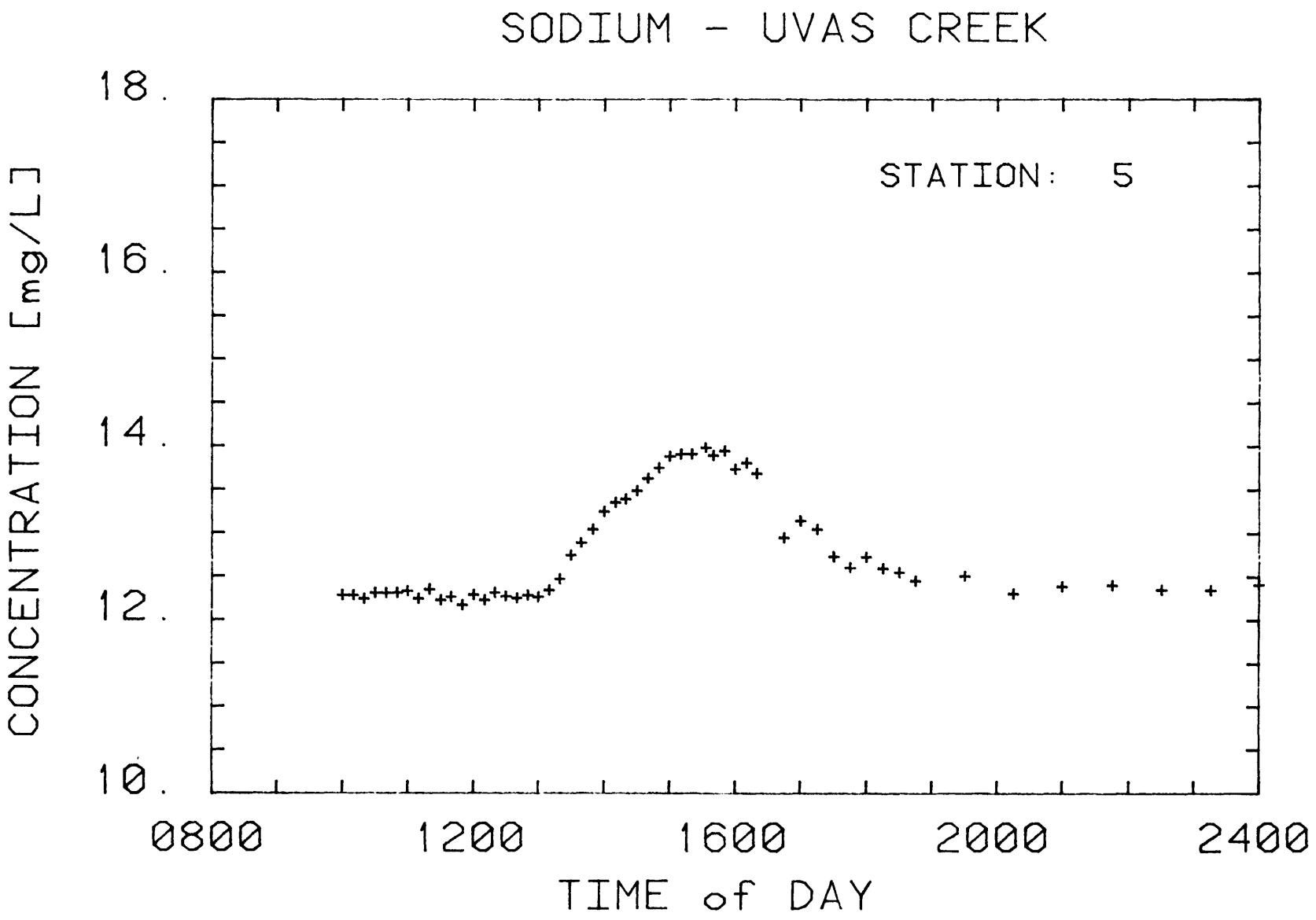

SODIUM - UVAS CREEK
STATION: 0
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY


SODIUM - UVAS CREEK
STATION: 1
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY


SODIUM - UVAS CREEK
STATION: 2
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY


SODIUM - UVAS CREEK
STATION: 3
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY


SODIUM - UVAS CREEK
STATION: 4
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY


SODIUM - UVAS CREEK
STATION: 5
CONCENTRATION [mg/L]
18.
16.
14.
12.
10.
0800
1200
1600
2000
2400
TIME of DAY

APPENDIX II

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 1

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:56	-0.567	2.1	---	0.7
SEP 26	08:01	-0.483	0.8	0.8	1.5
SEP 26	08:30	0.000	-0.4	0.3	-5.9
SEP 26	08:32	0.033	0.4	0.7	0.2
SEP 26	08:34	0.067	-0.5	0.8	-0.7
SEP 26	08:36	0.100	-0.1	0.5	0.7
SEP 26	08:38	0.133	0.4	1.0	-0.5
SEP 26	08:40	0.167	23.5	20.4	24.1
SEP 26	08:42	0.200	59.2	49.3	61.0
SEP 26	08:46	0.267	86.4	72.9	81.0
SEP 26	08:48	0.300	90.1	78.8	91.2
SEP 26	08:50	0.333	93.0	81.3	92.9
SEP 26	08:52	0.367	94.0	82.9	95.4
SEP 26	08:54	0.400	96.4	85.4	95.4
SEP 26	08:56	0.433	97.4	86.1	95.4
SEP 26	08:58	0.467	97.4	88.3	95.6
SEP 26	09:00	0.500	98.9	87.4	96.8
SEP 26	09:02	0.533	97.4	88.8	98.8
SEP 26	09:04	0.567	97.1	88.3	97.1
SEP 26	09:06	0.600	98.6	88.3	94.4
SEP 26	09:08	0.633	97.1	88.8	94.9
SEP 26	09:10	0.667	97.1	88.6	97.1
SEP 26	09:14	0.733	98.1	90.6	92.7
SEP 26	09:18	0.800	97.1	89.3	95.4
SEP 26	09:22	0.867	97.1	89.9	94.1
SEP 26	09:26	0.933	96.6	89.5	96.3
SEP 26	09:30	1.000	97.1	90.1	94.6
SEP 26	09:34	1.067	97.1	91.3	92.9
SEP 26	09:38	1.133	96.6	91.2	93.2
SEP 26	09:42	1.200	91.1	86.9	89.3
SEP 26	09:46	1.267	96.4	88.3	90.2
SEP 26	09:50	1.333	97.3	90.6	89.3
SEP 26	10:00	1.500	99.7	91.3	99.3
SEP 26	10:10	1.667	99.1	91.3	94.4
SEP 26	10:20	1.833	97.8	92.6	96.1
SEP 26	10:30	2.000	98.0	86.8	96.3
SEP 26	10:40	2.167	98.2	91.5	96.3
SEP 26	10:50	2.333	95.9	91.5	93.2
SEP 26	11:00	2.500	97.0	91.8	90.0
SEP 26	11:10	2.667	96.3	89.8	94.9

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 1

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	11:20	2.833	96.8	93.4	93.4
SEP 26	11:30	3.000	81.6	80.8	75.6
SEP 26	11:32	3.033	85.1	83.9	78.3
SEP 26	11:34	3.067	91.1	88.0	84.9
SEP 26	11:36	3.100	94.0	90.6	84.9
SEP 26	11:38	3.133	93.9	89.7	84.9
SEP 26	11:40	3.167	66.9	69.1	59.8
SEP 26	11:42	3.200	34.6	41.2	32.9
SEP 26	11:44	3.233	19.0	29.1	18.0
SEP 26	11:46	3.267	11.3	20.3	13.2
SEP 26	11:48	3.300	7.2	15.9	11.7
SEP 26	11:50	3.333	6.0	13.1	9.8
SEP 26	11:52	3.367	3.9	11.6	5.1
SEP 26	11:54	3.400	3.1	10.2	2.7
SEP 26	11:56	3.433	2.9	9.0	6.6
SEP 26	11:58	3.467	2.0	8.6	2.9
SEP 26	12:00	3.500	1.9	6.2	2.2
SEP 26	12:02	3.533	3.3	7.1	2.9
SEP 26	12:04	3.567	1.4	6.6	5.1
SEP 26	12:06	3.600	1.1	6.9	3.7
SEP 26	12:08	3.633	0.8	6.0	2.7
SEP 26	12:10	3.667	0.4	6.0	3.7
SEP 26	12:14	3.733	0.2	5.7	1.5
SEP 26	12:18	3.800	0.1	4.7	1.7
SEP 26	12:22	3.867	0.1	3.9	---
SEP 26	12:26	3.933	0.2	4.3	---
SEP 26	12:30	4.000	0.1	4.7	---
SEP 26	12:34	4.067	-0.4	4.0	---
SEP 26	12:38	4.133	-0.4	3.3	---
SEP 26	12:42	4.200	0.0	4.3	---
SEP 26	12:46	4.267	0.1	3.1	---
SEP 26	12:50	4.333	0.1	3.8	---
SEP 26	13:00	4.500	-0.4	2.7	---
SEP 26	13:10	4.667	-0.7	2.6	---
SEP 26	13:20	4.833	-0.5	3.0	---
SEP 26	13:30	5.000	-0.7	1.7	---
SEP 26	13:40	5.167	-0.5	2.4	---
SEP 26	13:50	5.333	-0.7	2.4	---
SEP 26	14:00	5.500	0.6	2.7	---
SEP 26	14:10	5.667	-0.2	2.7	---

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 1

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	14:20	5.833	0.0	2.3	---
SEP 26	15:10	6.667	0.0	1.8	---
SEP 26	15:41	7.183	1.6	0.6	---
SEP 26	16:10	7.667	0.5	1.8	---
SEP 26	16:41	8.183	2.3	1.6	---
SEP 26	17:10	8.667	-0.5	1.4	---
SEP 26	17:41	9.183	0.2	2.2	---
SEP 26	18:41	10.183	0.8	1.3	---
SEP 26	19:41	11.183	0.2	1.6	---
SEP 26	20:41	12.183	0.5	1.8	---
SEP 26	21:41	13.183	1.6	0.2	---
SEP 26	22:41	14.183	1.3	---	---
SEP 26	23:41	15.183	2.9	---	---
SEP 27	00:41	16.183	4.5	---	---
SEP 27	01:41	17.183	5.0	---	---
SEP 27	02:41	18.183	5.1	---	---
SEP 27	03:41	19.183	4.8	---	---
SEP 27	04:41	20.183	5.8	---	---
SEP 27	05:41	21.183	10.0	---	---
SEP 27	06:41	22.183	9.5	---	---
SEP 27	07:41	23.183	7.2	---	---
SEP 27	08:41	24.183	8.9	---	---
SEP 27	09:41	25.183	8.5	---	---
SEP 27	10:41	26.183	10.1	---	---
SEP 27	11:41	27.183	8.6	---	---

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 2

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:46	-0.733	0.2	---	1.0
SEP 26	08:00	-0.500	-0.5	1.7	1.2
SEP 26	08:05	-0.417	-0.9	1.7	-1.2
SEP 26	08:20	-0.167	0.2	0.7	2.0
SEP 26	08:30	0.000	-0.6	1.6	-1.0
SEP 26	08:40	0.167	-0.6	1.9	-1.0
SEP 26	08:45	0.250	1.1	2.1	1.2
SEP 26	08:50	0.333	2.6	2.1	-1.2
SEP 26	08:55	0.417	0.6	1.8	2.0
SEP 26	09:00	0.500	0.6	2.7	-1.0
SEP 26	09:05	0.583	5.8	6.8	4.1
SEP 26	09:10	0.667	22.4	17.9	17.1
SEP 26	09:15	0.750	43.1	32.4	38.3
SEP 26	09:20	0.833	56.4	43.6	51.5
SEP 26	09:25	0.917	71.1	---	64.1
SEP 26	09:30	1.000	81.3	65.8	77.1
SEP 26	09:35	1.083	85.9	71.3	77.6
SEP 26	09:40	1.167	89.6	75.3	80.7
SEP 26	09:45	1.250	91.6	77.1	83.9
SEP 26	09:50	1.333	94.0	79.1	88.0
SEP 26	09:55	1.417	94.0	80.4	86.6
SEP 26	10:00	1.500	94.5	80.1	89.8
SEP 26	10:05	1.583	94.0	80.8	88.0
SEP 26	10:10	1.667	93.5	81.6	83.9
SEP 26	10:15	1.750	94.8	83.9	86.8
SEP 26	10:20	1.833	94.1	82.9	86.8
SEP 26	10:25	1.917	94.3	82.9	89.8
SEP 26	10:30	2.000	96.3	83.0	88.5
SEP 26	10:40	2.167	96.3	84.6	90.7
SEP 26	10:50	2.333	96.0	84.8	89.3
SEP 26	11:00	2.500	96.0	85.3	87.6
SEP 26	11:10	2.667	97.3	84.7	90.0
SEP 26	11:20	2.833	97.6	84.6	90.7
SEP 26	11:30	3.000	96.3	85.0	91.5
SEP 26	11:35	3.083	97.6	85.7	90.7
SEP 26	11:40	3.167	96.8	85.7	91.5
SEP 26	11:45	3.250	96.3	85.9	92.9
SEP 26	11:50	3.333	95.5	85.9	91.7
SEP 26	11:55	3.417	93.3	84.4	91.2
SEP 26	12:00	3.500	90.6	83.3	88.8

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 2

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	12:05	3.583	84.4	79.9	84.6
SEP 26	12:10	3.667	65.9	66.6	62.0
SEP 26	12:15	3.750	49.8	53.6	48.3
SEP 26	12:20	3.833	32.6	40.4	30.5
SEP 26	12:25	3.917	24.5	33.8	23.4
SEP 26	12:30	4.000	14.9	25.0	12.7
SEP 26	12:35	4.083	10.4	20.2	13.2
SEP 26	12:40	4.167	6.7	16.1	7.8
SEP 26	12:45	4.250	5.0	13.8	5.9
SEP 26	12:50	4.333	3.0	12.1	4.4
SEP 26	12:55	4.417	1.8	10.2	2.0
SEP 26	13:00	4.500	1.4	9.8	2.0
SEP 26	13:05	4.583	1.1	9.1	1.2
SEP 26	13:10	4.667	0.6	7.9	-0.7
SEP 26	13:15	4.750	0.6	7.6	0.2
SEP 26	13:20	4.833	1.0	7.4	2.0
SEP 26	13:25	4.917	0.5	7.1	0.5
SEP 26	13:30	5.000	0.5	6.6	-0.2
SEP 26	13:35	5.083	0.9	6.4	0.5
SEP 26	13:40	5.167	0.2	6.1	-2.0
SEP 26	13:45	5.250	0.2	6.0	-0.2
SEP 26	13:55	5.417	0.6	5.8	-1.0
SEP 26	14:05	5.583	0.1	5.8	-0.5
SEP 26	14:15	5.750	0.1	4.9	0.2
SEP 26	14:25	5.917	0.2	4.3	---
SEP 26	14:35	6.083	0.4	4.9	-0.7
SEP 26	14:45	6.250	-0.2	4.3	-0.7
SEP 26	14:55	6.417	0.0	3.4	-1.0
SEP 26	15:05	6.583	0.8	3.6	-0.2
SEP 26	15:15	6.750	0.0	3.8	0.0
SEP 26	15:30	7.000	0.0	3.9	-1.0
SEP 26	15:45	7.250	-0.2	3.6	0.2
SEP 26	16:00	7.500	-0.2	4.1	---
SEP 26	16:15	7.750	0.6	2.6	---
SEP 26	16:30	8.000	-0.1	2.4	---
SEP 26	16:45	8.250	-0.5	2.7	---
SEP 26	17:00	8.500	0.1	---	---
SEP 26	17:30	9.000	1.1	---	---
SEP 26	18:04	9.567	0.2	---	---
SEP 26	19:04	10.567	0.2	---	---

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 2

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%)		
			CHLORIDE	STRONTIUM	SODIUM
SEP 26	20:04	11.567	0.0	---	---
SEP 26	21:04	12.567	0.1	---	---
SEP 26	22:04	13.567	0.1	---	---
SEP 26	23:04	14.567	0.9	---	---
SEP 27	00:04	15.567	1.1	---	---
SEP 27	01:04	16.567	3.0	---	---
SEP 27	02:04	17.567	4.0	---	---
SEP 27	03:04	18.567	3.6	---	---
SEP 27	04:04	19.567	4.8	---	---
SEP 27	05:04	20.567	5.8	---	---
SEP 27	06:04	21.567	6.3	---	---
SEP 27	07:04	22.567	8.2	---	---
SEP 27	08:04	23.567	7.9	---	---
SEP 27	09:04	24.567	8.0	---	---
SEP 27	10:04	25.567	7.4	---	---
SEP 27	11:04	26.567	8.0	---	---
SEP 27	12:04	27.567	8.1	---	---
SEP 27	13:04	28.567	6.4	---	---
SEP 27	14:04	29.567	6.9	---	---

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 3

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:48	-0.700	-0.1	0.1	-1.0
SEP 26	08:20	-0.167	-0.4	-0.1	-1.7
SEP 26	08:30	0.000	0.1	-0.1	0.0
SEP 26	08:40	0.167	0.9	0.1	-1.5
SEP 26	08:50	0.333	0.0	0.6	-1.2
SEP 26	09:00	0.500	0.4	0.2	-0.2
SEP 26	09:10	0.667	-0.6	0.2	---
SEP 26	09:20	0.833	-0.6	0.2	---
SEP 26	09:30	1.000	0.4	-0.3	-2.4
SEP 26	09:40	1.167	-0.2	-0.5	-5.1
SEP 26	09:50	1.333	0.0	-0.4	0.5
SEP 26	10:00	1.500	1.6	0.3	1.2
SEP 26	10:10	1.667	5.6	1.6	3.2
SEP 26	10:20	1.833	20.7	8.0	19.3
SEP 26	10:30	2.000	38.1	14.6	34.4
SEP 26	10:40	2.167	54.1	23.9	48.0
SEP 26	10:50	2.333	62.6	30.9	61.0
SEP 26	11:00	2.500	68.5	35.4	66.3
SEP 26	11:10	2.667	72.4	38.9	66.8
SEP 26	11:20	2.833	74.2	42.6	72.4
SEP 26	11:30	3.000	75.5	45.4	73.4
SEP 26	11:40	3.167	78.0	48.7	73.4
SEP 26	11:50	3.333	77.6	49.9	77.8
SEP 26	12:00	3.500	77.6	51.0	72.0
SEP 26	12:10	3.667	78.1	52.6	71.7
SEP 26	12:20	3.833	78.0	53.4	74.6
SEP 26	12:30	4.000	78.0	54.0	73.9
SEP 26	12:40	4.167	77.6	55.1	76.3
SEP 26	12:50	4.333	78.2	56.6	76.1
SEP 26	13:00	4.500	76.4	55.7	71.5
SEP 26	13:10	4.667	70.8	54.4	68.0
SEP 26	13:20	4.833	57.4	47.6	53.9
SEP 26	13:30	5.000	41.5	41.5	62.7
SEP 26	13:40	5.167	26.4	32.1	23.9
SEP 26	13:50	5.333	17.0	26.7	14.1
SEP 26	14:00	5.500	11.4	22.3	10.0
SEP 26	14:10	5.667	7.9	18.5	4.6
SEP 26	14:20	5.833	5.6	15.6	5.1
SEP 26	14:30	6.000	4.6	13.5	1.7
SEP 26	14:40	6.167	3.8	11.1	0.5

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 3

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	14:50	6.333	2.8	11.0	-0.2
SEP 26	15:00	6.500	2.8	9.9	0.2
SEP 26	15:10	6.667	2.5	8.9	1.0
SEP 26	15:20	6.833	2.3	8.5	1.5
SEP 26	15:30	7.000	2.4	7.6	3.9
SEP 26	15:40	7.167	1.9	7.1	-0.7
SEP 26	15:50	7.333	1.6	7.1	-0.2
SEP 26	16:00	7.500	2.6	4.7	3.9
SEP 26	16:10	7.667	2.0	5.4	-2.2
SEP 26	16:20	7.833	2.0	5.8	-2.0
SEP 26	16:30	8.000	2.0	4.4	0.2
SEP 26	16:40	8.167	2.6	4.4	1.2
SEP 26	16:50	8.333	2.3	3.5	-1.0
SEP 26	17:00	8.500	2.1	4.8	-0.7
SEP 26	17:22	8.867	1.3	3.8	-2.9
SEP 26	17:52	9.367	1.5	4.0	-1.0
SEP 26	18:22	9.867	0.6	3.4	-2.4
SEP 26	19:22	10.867	0.4	3.0	-2.7
SEP 26	20:22	11.867	0.4	2.8	-1.2
SEP 26	21:22	12.867	0.6	2.4	---
SEP 26	22:22	13.867	0.4	2.2	---
SEP 26	23:22	14.867	0.2	1.8	---
SEP 27	00:22	15.867	1.6	---	---
SEP 27	01:22	16.867	3.8	---	---
SEP 27	02:22	17.867	3.8	---	---
SEP 27	03:22	18.867	4.5	---	---
SEP 27	04:22	19.867	6.5	---	---
SEP 27	05:22	20.867	5.5	---	---
SEP 27	06:22	21.867	6.3	---	---
SEP 27	07:22	22.867	7.4	---	---
SEP 27	08:22	23.867	6.7	---	---
SEP 27	09:22	24.867	7.6	---	---
SEP 27	10:22	25.867	7.9	---	---
SEP 27	11:22	26.867	6.5	---	---
SEP 27	12:22	27.867	6.7	---	---
SEP 27	13:22	28.867	6.7	---	---
SEP 27	14:22	29.867	6.3	---	---

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 4

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:50	-0.667	-0.6	1.1	-0.5
SEP 26	09:00	0.500	-0.7	0.2	0.2
SEP 26	09:30	1.000	-0.2	1.1	-0.5
SEP 26	09:40	1.167	0.1	0.7	1.2
SEP 26	09:50	1.333	0.0	0.6	7.6
SEP 26	10:00	1.500	-0.2	1.4	1.2
SEP 26	10:10	1.667	0.2	0.2	1.2
SEP 26	10:12	1.700	-0.4	1.0	0.7
SEP 26	10:20	1.833	-0.2	1.0	2.7
SEP 26	10:30	2.000	-0.7	1.2	0.2
SEP 26	10:40	2.167	-0.2	0.6	0.2
SEP 26	10:50	2.333	-0.1	0.4	2.0
SEP 26	11:00	2.500	0.1	0.1	2.0
SEP 26	11:10	2.667	1.8	0.9	1.2
SEP 26	11:20	2.833	5.6	1.2	4.9
SEP 26	11:30	3.000	13.1	3.4	11.0
SEP 26	11:40	3.167	23.5	6.3	19.0
SEP 26	11:50	3.333	33.4	9.8	25.4
SEP 26	12:00	3.500	40.6	14.3	34.9
SEP 26	12:10	3.667	48.8	16.7	42.7
SEP 26	12:20	3.833	53.9	19.1	48.3
SEP 26	12:30	4.000	57.9	22.4	53.4
SEP 26	12:40	4.167	61.2	24.1	54.1
SEP 26	12:50	4.333	63.9	25.8	59.0
SEP 26	13:00	4.500	65.6	26.7	62.2
SEP 26	13:10	4.667	70.9	29.5	62.2
SEP 26	13:20	4.833	66.6	31.3	63.9
SEP 26	13:30	5.000	68.4	32.6	66.1
SEP 26	13:40	5.167	70.1	32.9	62.2
SEP 26	13:50	5.333	70.1	34.4	62.9
SEP 26	14:00	5.500	70.5	34.6	64.6
SEP 26	14:10	5.667	68.6	35.4	63.7
SEP 26	14:20	5.833	63.7	35.4	59.8
SEP 26	14:30	6.000	56.3	33.4	54.1
SEP 26	14:40	6.167	48.1	32.1	48.0
SEP 26	14:50	6.333	38.5	28.3	34.9
SEP 26	15:00	6.500	30.0	24.6	26.1
SEP 26	15:10	6.667	24.0	20.9	20.0
SEP 26	15:20	6.833	19.8	20.9	17.6
SEP 26	15:30	7.000	14.4	18.3	11.2

APPENDIX II

NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 4

DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	15:40	7.167	11.5	16.2	5.9
SEP 26	15:50	7.333	9.0	15.0	5.9
SEP 26	16:00	7.500	8.0	13.7	2.7
SEP 26	16:10	7.667	7.0	12.3	2.0
SEP 26	16:20	7.833	6.1	11.4	3.2
SEP 26	16:30	8.000	5.1	9.9	4.4
SEP 26	16:40	8.167	4.1	9.3	1.7
SEP 26	16:50	8.333	4.1	8.3	2.4
SEP 26	17:00	8.500	3.9	6.9	3.2
SEP 26	17:31	9.017	2.9	6.4	3.4
SEP 26	18:00	9.500	2.8	5.5	-1.0
SEP 26	18:31	10.017	1.9	3.9	3.4
SEP 26	19:31	11.017	1.8	2.8	1.7
SEP 26	20:31	12.017	1.5	2.7	2.0
SEP 26	21:31	13.017	1.3	2.4	2.0
SEP 26	22:31	14.017	1.6	1.5	1.0
SEP 26	23:31	15.017	1.0	---	---
SEP 27	00:31	16.017	2.6	---	4.1
SEP 27	05:31	21.017	5.4	---	-8.3
SEP 27	06:31	22.017	7.0	---	-14.1
SEP 27	07:31	23.017	7.5	---	---
SEP 27	08:31	24.017	8.7	---	---
SEP 27	10:31	26.017	7.5	---	---
SEP 27	11:31	27.017	7.0	---	---
SEP 27	12:31	28.017	7.0	---	---
SEP 27	14:31	30.017	7.0	---	---

APPENDIX II

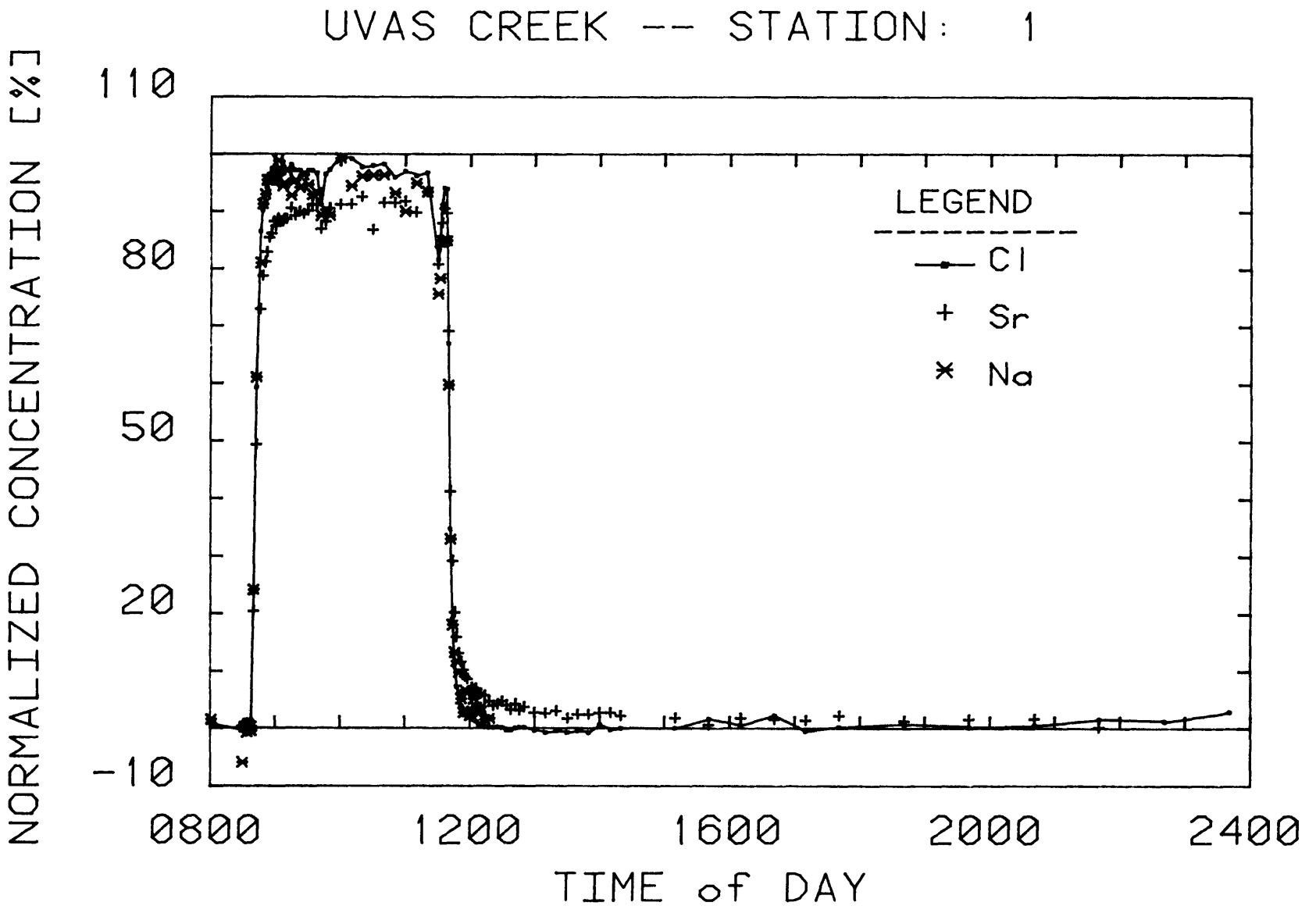
NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 5

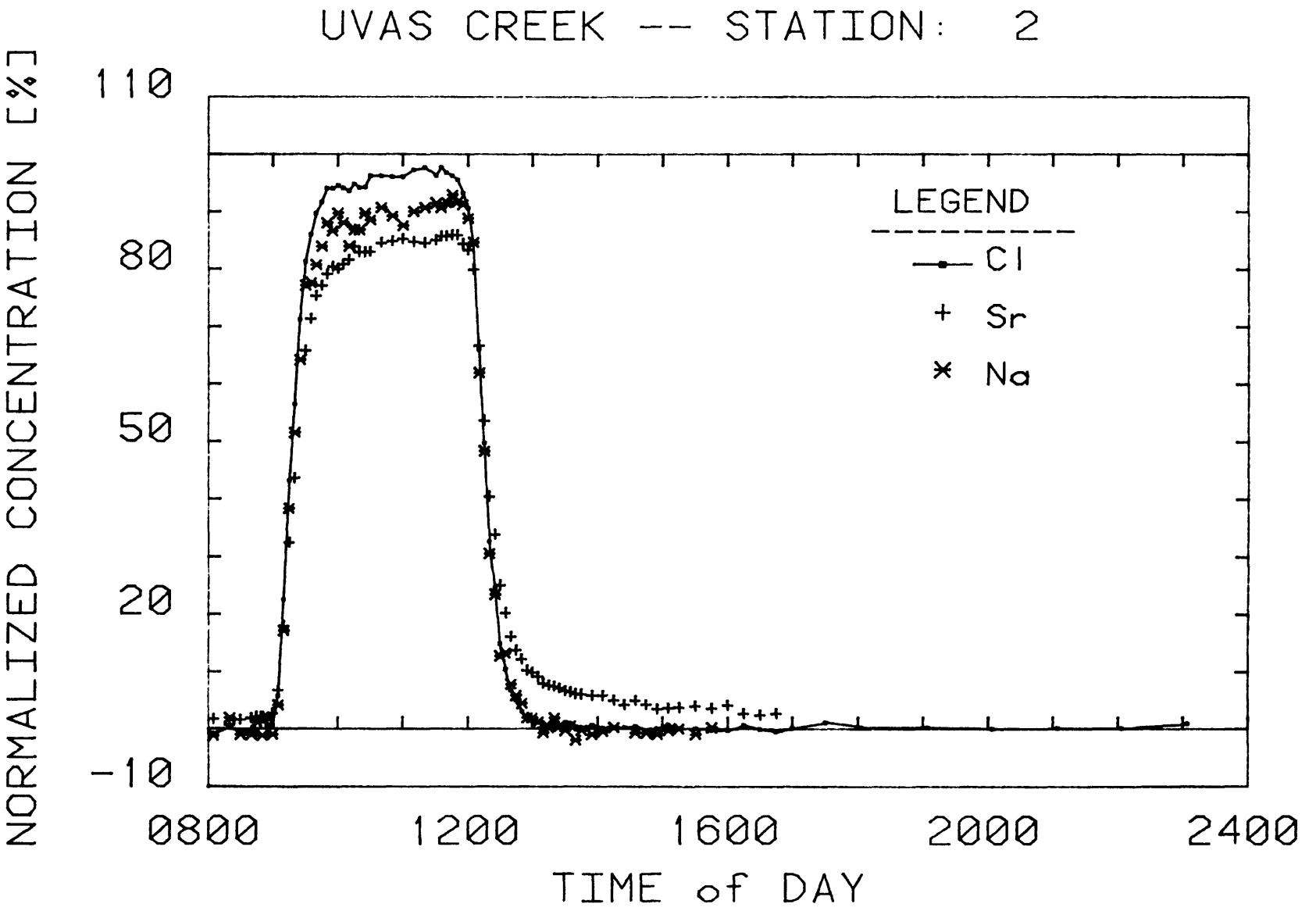
DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	07:55	-0.583	-0.7	---	-1.0
SEP 26	10:00	1.500	1.6	0.3	-0.5
SEP 26	10:10	1.667	-0.2	0.1	-0.5
SEP 26	10:20	1.833	-0.6	-0.3	-1.5
SEP 26	10:30	2.000	-0.2	0.0	0.2
SEP 26	10:40	2.167	-0.2	1.1	0.2
SEP 26	10:50	2.333	-1.0	0.6	0.2
SEP 26	11:00	2.500	-0.6	0.3	0.7
SEP 26	11:10	2.667	-0.4	0.4	-1.5
SEP 26	11:20	2.833	-0.2	0.0	1.2
SEP 26	11:30	3.000	-0.4	0.1	-2.0
SEP 26	11:40	3.167	-0.2	0.0	-1.0
SEP 26	11:50	3.333	-0.9	0.8	-3.2
SEP 26	12:00	3.500	-0.2	0.6	-0.2
SEP 26	12:10	3.667	-0.6	0.3	-1.7
SEP 26	12:20	3.833	0.2	0.1	0.2
SEP 26	12:30	4.000	0.2	0.0	-0.7
SEP 26	12:40	4.167	2.0	-0.1	-1.2
SEP 26	12:50	4.333	3.3	-0.3	-0.5
SEP 26	13:00	4.500	4.5	0.0	-1.0
SEP 26	13:10	4.667	8.5	0.1	1.0
SEP 26	13:20	4.833	13.1	0.6	4.1
SEP 26	13:30	5.000	18.9	1.1	11.0
SEP 26	13:40	5.167	24.4	1.4	14.4
SEP 26	13:50	5.333	28.9	2.1	18.0
SEP 26	14:00	5.500	33.0	2.4	23.2
SEP 26	14:10	5.667	36.9	3.2	25.6
SEP 26	14:20	5.833	40.1	3.4	26.6
SEP 26	14:30	6.000	42.4	4.4	29.0
SEP 26	14:40	6.167	44.5	5.4	32.4
SEP 26	14:50	6.333	45.9	5.5	35.4
SEP 26	15:00	6.500	47.8	6.2	38.5
SEP 26	15:10	6.667	49.3	7.0	39.3
SEP 26	15:20	6.833	50.0	7.3	39.3
SEP 26	15:33	7.050	50.4	9.5	41.0
SEP 26	15:40	7.167	50.8	8.9	38.8
SEP 26	15:50	7.333	49.6	9.5	40.0
SEP 26	16:00	7.500	47.0	9.8	34.9
SEP 26	16:10	7.667	43.9	9.1	36.8
SEP 26	16:20	7.833	39.0	9.8	33.7

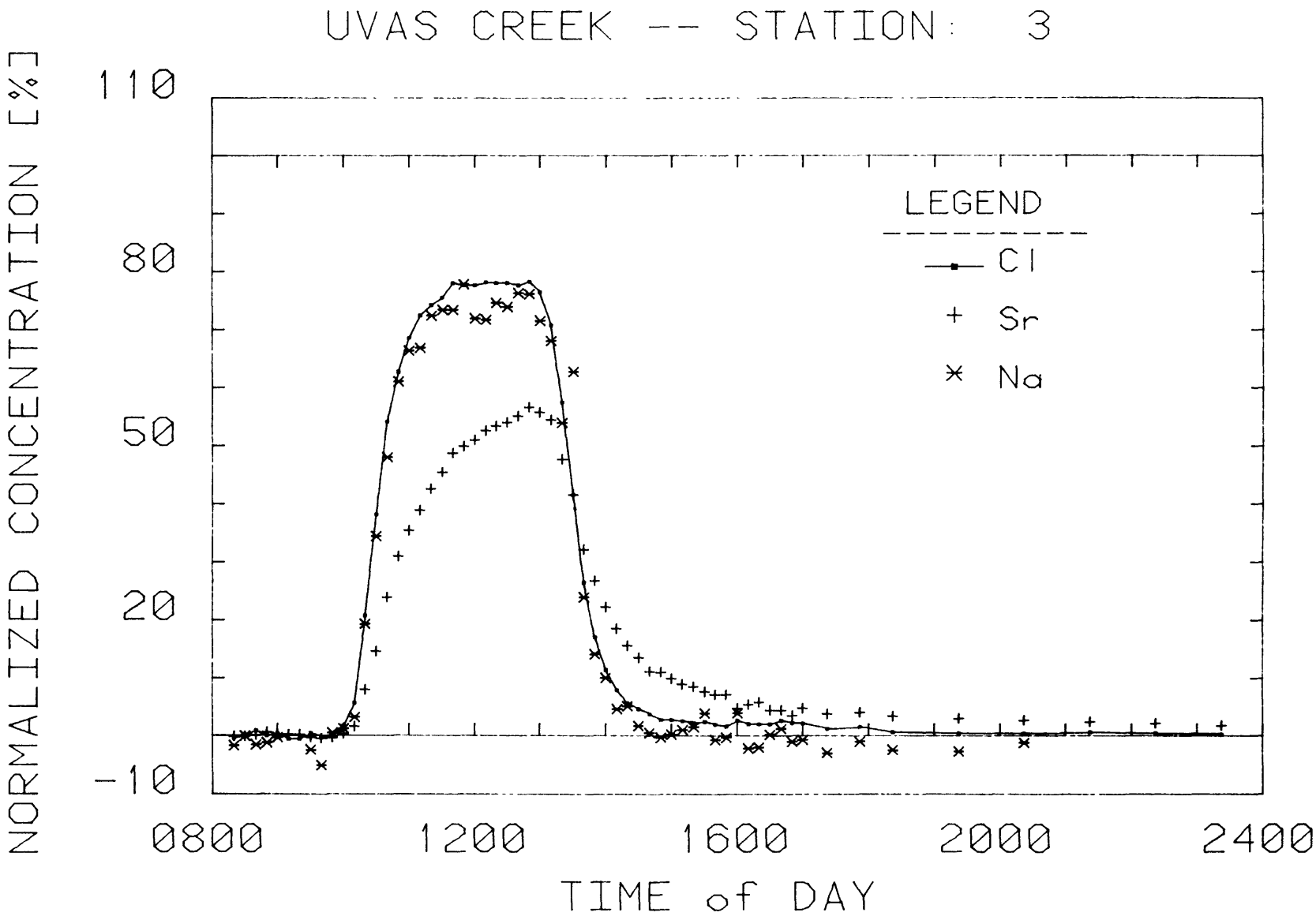
APPENDIX II

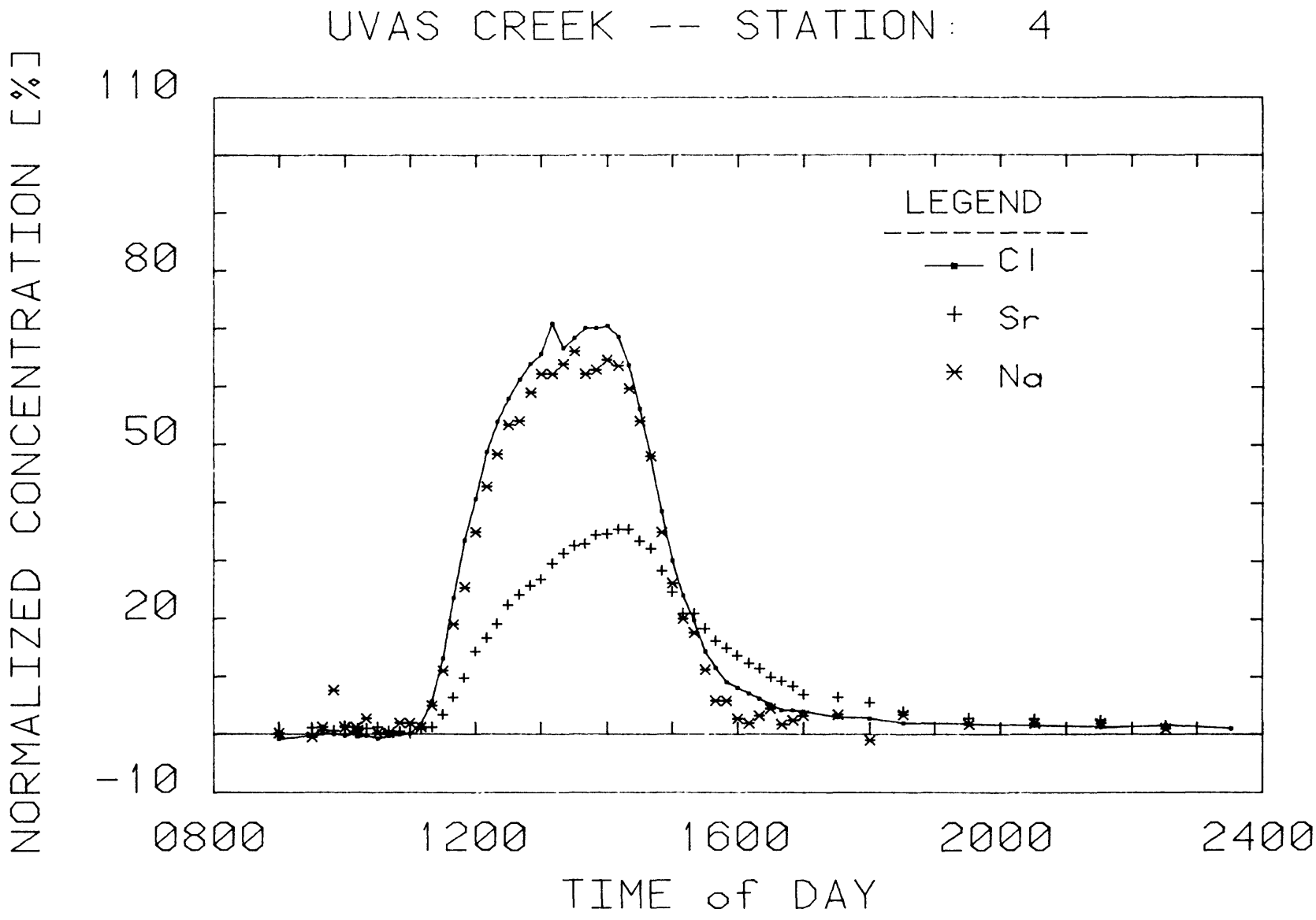
NORMALIZED CONCENTRATIONS
Uvas Creek -- September 1972
Station: 5

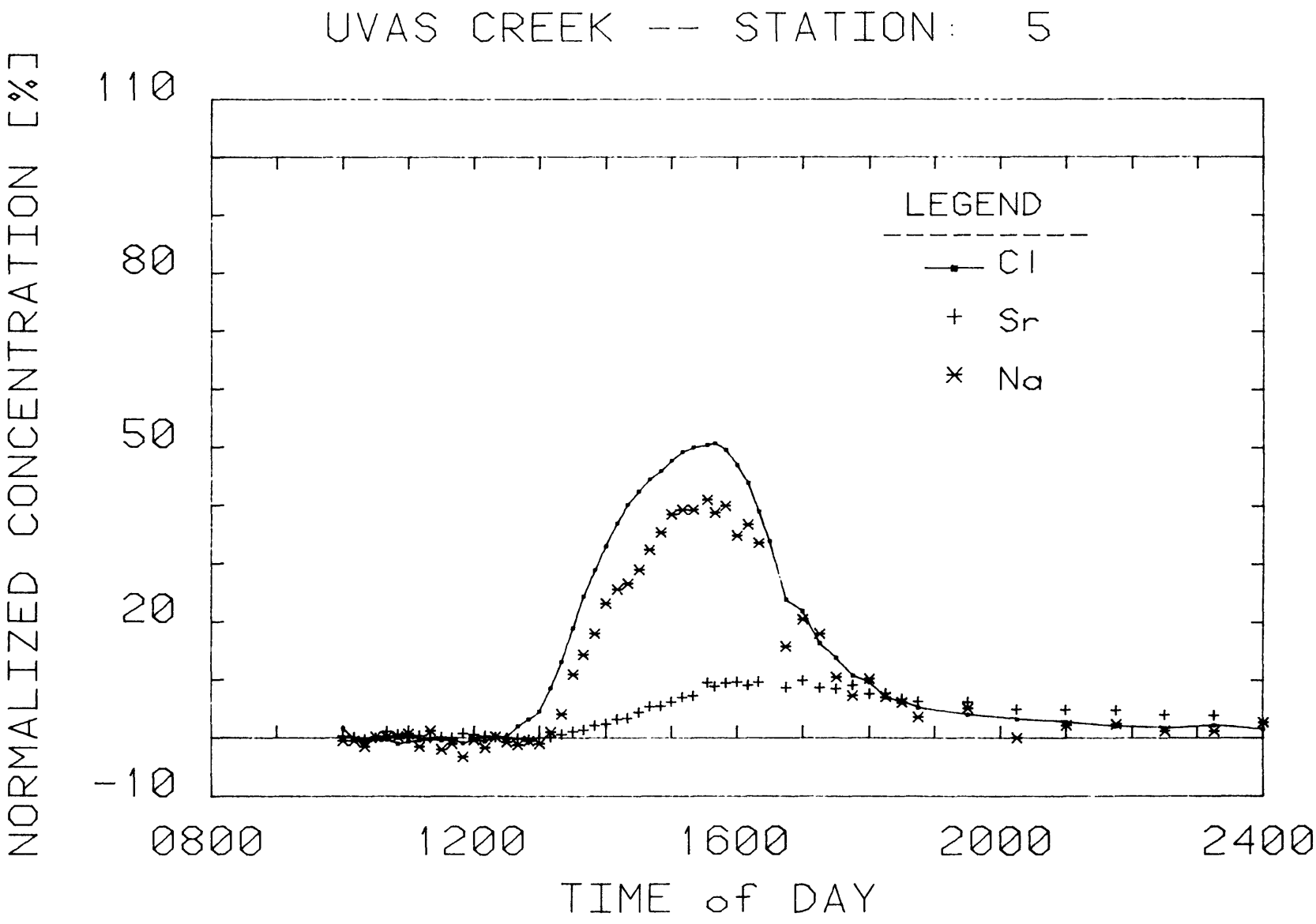
DATE	CLOCK TIME	ELAPSED TIME (h)	NORMALIZED CONCENTRATION (%) CHLORIDE	STRONTIUM	SODIUM
SEP 26	16:30	8.000	33.9	---	---
SEP 26	16:45	8.250	23.9	8.7	15.9
SEP 26	17:00	8.500	21.9	9.9	20.5
SEP 26	17:15	8.750	16.4	8.7	18.0
SEP 26	17:30	9.000	13.9	8.5	10.5
SEP 26	17:45	9.250	10.8	9.1	7.3
SEP 26	18:00	9.500	9.6	7.6	10.2
SEP 26	18:15	9.750	7.0	7.7	7.1
SEP 26	18:30	10.000	6.3	6.8	6.1
SEP 26	18:45	10.250	5.3	6.3	3.7
SEP 26	19:30	11.000	4.0	6.2	5.1
SEP 26	20:15	11.750	3.3	4.9	0.0
SEP 26	21:00	12.500	2.8	4.8	2.2
SEP 26	21:45	13.250	2.0	4.8	2.4
SEP 26	22:30	14.000	1.8	4.0	1.2
SEP 26	23:15	14.750	2.3	3.9	1.2
SEP 27	00:00	15.500	1.5	---	2.7
SEP 27	00:45	16.250	2.5	---	7.6
SEP 27	01:30	17.000	5.4	---	1.5
SEP 27	02:15	17.750	4.6	---	-0.2
SEP 27	03:00	18.500	5.6	---	-2.9
SEP 27	03:45	19.250	5.1	---	-6.6
SEP 27	04:30	20.000	6.1	---	---
SEP 27	05:15	20.750	6.6	---	---
SEP 27	06:00	21.500	6.4	---	---
SEP 27	06:45	22.250	6.4	---	---
SEP 27	07:30	23.000	6.7	---	---
SEP 27	08:15	23.750	8.1	---	---
SEP 27	09:00	24.500	7.9	---	---
SEP 27	09:45	25.250	7.9	---	---
SEP 27	10:30	26.000	8.5	---	---
SEP 27	11:15	26.750	7.7	---	---
SEP 27	12:00	27.500	8.1	---	---
SEP 27	12:45	28.250	7.7	---	---
SEP 27	13:30	29.000	6.6	---	---
SEP 27	14:15	29.750	6.1	---	---
SEP 27	15:00	30.500	6.1	---	---


UVAS CREEK -- STATION: 1
NORMALIZED CONCENTRATION [%]
110
80
50
20
-10
0800
1200
1600
2000
2400
TIME of DAY
LEGEND
Cl
Sr
Na


UVAS CREEK -- STATION: 2
NORMALIZED CONCENTRATION [%]
110
80
50
20
-10
0800
1200
1600
2000
2400
TIME of DAY
LEGEND
Cl
Sr
Na


UVAS CREEK -- STATION: 3
NORMALIZED CONCENTRATION [%]
110
80
50
20
-10
0800
1200
1600
2000
2400
TIME of DAY
LEGEND
Cl
Sr
Na


UVAS CREEK -- STATION: 4
NORMALIZED CONCENTRATION [%]
110
80
50
20
-10
0800
1200
1600
2000
2400
TIME of DAY
LEGEND
Cl
Sr
Na


UVAS CREEK -- STATION: 5
NORMALIZED CONCENTRATION [%]
110
80
50
20
-10
0800
1200
1600
2000
2400
TIME of DAY
LEGEND
Cl
Sr
Na

APPENDIX III

GAGED STREAMFLOW
Uvas Creek -- September/October 1972

DATE	CLOCK TIME	FLOW (L/s)
SEP 22	00:00	9.9
SEP 22	03:15	9.9
SEP 22	03:30	10.8
SEP 22	05:30	10.8
SEP 22	05:45	11.6
SEP 22	08:15	11.6
SEP 22	08:30	12.5
SEP 22	11:15	12.5
SEP 22	11:30	11.6
SEP 22	13:45	11.6
SEP 22	14:00	10.8
SEP 22	15:15	10.8
SEP 22	15:30	9.9
SEP 22	17:00	9.9
SEP 22	17:15	9.9
SEP 22	17:30	10.8
SEP 22	19:45	10.8
SEP 22	20:00	9.1
SEP 22	21:00	9.1
SEP 22	21:15	10.8
SEP 22	22:00	10.8
SEP 22	22:15	9.9
SEP 23	00:00	9.9
SEP 23	03:30	9.9
SEP 23	03:45	10.8
SEP 23	05:00	10.8
SEP 23	05:15	12.5
SEP 23	05:30	11.6
SEP 23	09:00	11.6
SEP 23	09:15	12.5
SEP 23	11:15	12.5
SEP 23	11:30	11.6
SEP 23	13:15	11.6
SEP 23	13:30	12.5
SEP 23	13:45	10.8
SEP 23	15:00	10.8
SEP 23	15:15	9.9
SEP 23	17:15	9.9
SEP 23	17:30	10.8
SEP 23	18:30	10.8
SEP 23	18:45	9.1
SEP 23	22:45	9.1
SEP 23	23:00	10.8
SEP 24	00:00	10.8
SEP 24	00:30	9.9
SEP 24	03:45	9.9
SEP 24	04:00	10.8
SEP 24	06:15	10.8
SEP 24	06:30	11.6
SEP 24	09:00	11.6
SEP 24	09:15	12.5
SEP 24	12:00	12.5
SEP 24	12:15	11.6
SEP 24	14:30	11.6
SEP 24	14:45	12.5
SEP 24	15:00	10.8
SEP 24	16:30	10.8
SEP 24	16:45	9.9
SEP 24	22:15	9.9
SEP 24	22:30	10.8
SEP 25	00:00	10.8
SEP 25	02:00	10.8
SEP 25	02:15	11.6
SEP 25	05:15	11.6
SEP 25	05:30	12.5
SEP 25	08:30	12.5
SEP 25	08:45	10.8
SEP 25	09:00	14.2
SEP 25	09:15	13.3
SEP 25	11:00	13.3
SEP 25	11:15	14.2
SEP 25	11:30	10.8
SEP 25	12:00	10.8
SEP 25	12:15	12.5
SEP 25	13:30	12.5
SEP 25	13:45	11.6
SEP 25	15:45	11.6
SEP 25	16:00	12.5
SEP 25	16:15	12.5
SEP 25	16:30	10.8
SEP 26	00:00	10.8
SEP 26	00:30	10.8
SEP 26	00:45	11.6
SEP 26	03:45	11.6
SEP 26	04:00	12.5
SEP 26	05:30	12.5
SEP 26	05:45	10.8
SEP 26	06:00	14.2
SEP 26	06:15	14.2
SEP 26	06:30	13.3
SEP 26	10:45	13.3
SEP 26	11:00	14.2
SEP 26	11:45	14.2
SEP 26	12:00	11.6

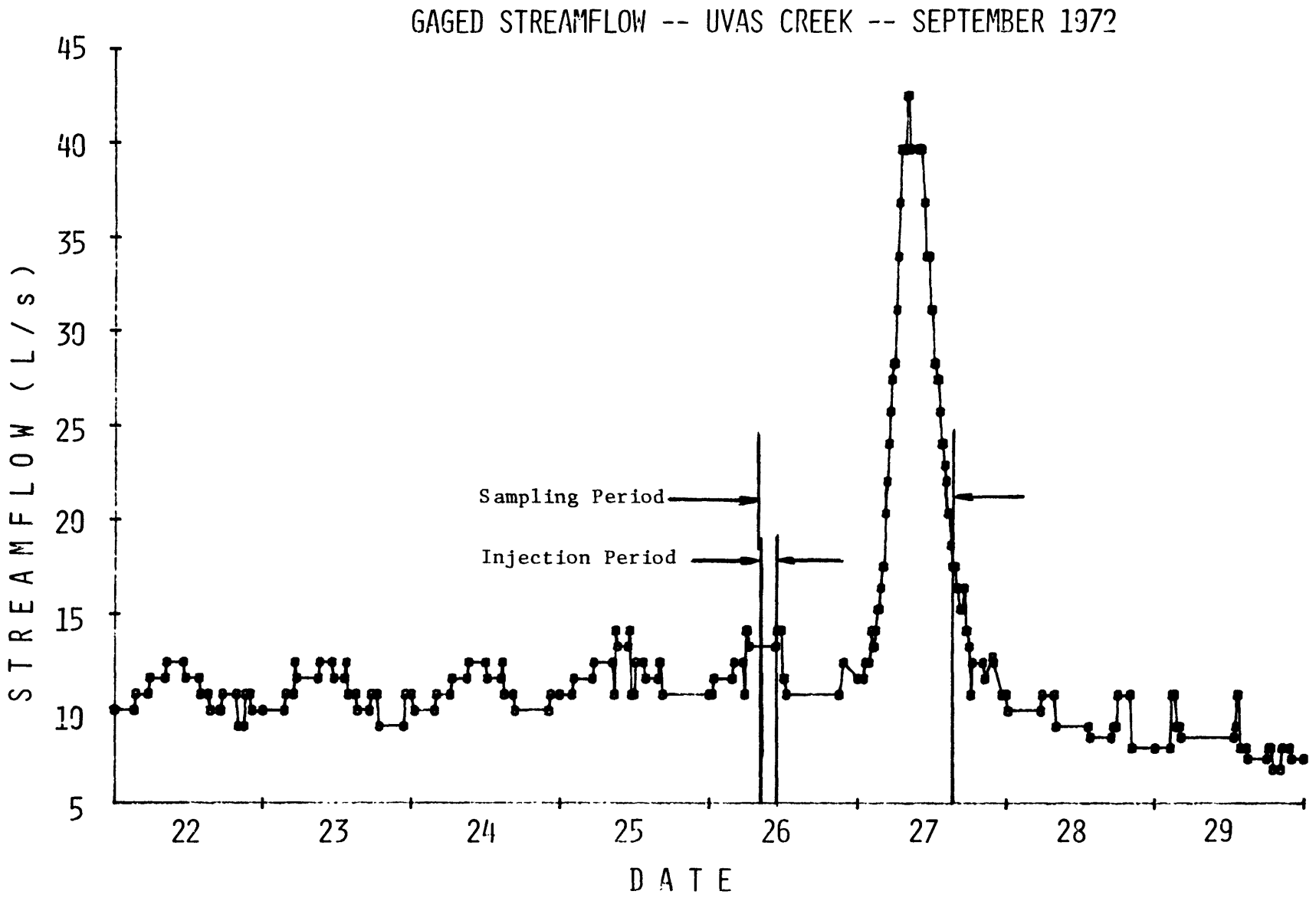
GAGED STREAMFLOW
Uvas Creek -- September/October 1972

DATE	CLOCK TIME	FLOW (L/s)
SEP 26	12:15	11.6
SEP 26	12:30	10.8
SEP 26	21:00	10.8
SEP 26	21:45	12.5
SEP 27	00:00	11.6
SEP 27	01:00	11.6
SEP 27	01:15	12.5
SEP 27	02:00	12.5
SEP 27	02:15	14.2
SEP 27	02:30	13.3
SEP 27	02:45	13.3
SEP 27	03:00	14.2
SEP 27	03:15	15.3
SEP 27	03:30	15.3
SEP 27	03:45	16.4
SEP 27	04:00	17.6
SEP 27	04:15	17.6
SEP 27	04:30	20.4
SEP 27	04:45	22.1
SEP 27	05:00	24.1
SEP 27	05:15	25.8
SEP 27	05:30	27.5
SEP 27	05:45	28.3
SEP 27	06:00	28.3
SEP 27	06:15	31.1
SEP 27	06:30	34.0
SEP 27	06:45	36.8
SEP 27	07:00	39.6
SEP 27	07:15	39.6
SEP 27	07:30	39.6
SEP 27	07:45	39.6
SEP 27	08:00	42.5
SEP 27	08:15	42.5
SEP 27	08:30	39.6
SEP 27	09:45	39.6
SEP 27	10:00	39.6
SEP 27	10:15	39.6
SEP 27	10:45	36.8
SEP 27	11:00	34.0
SEP 27	11:15	34.0
SEP 27	11:30	34.0
SEP 27	11:45	31.1
SEP 27	12:00	31.1
SEP 27	12:15	28.3
SEP 27	12:30	28.3
SEP 27	12:45	27.5
SEP 27	13:00	27.5

DATE	CLOCK TIME	FLOW (L/s)
SEP 27	13:15	25.8
SEP 27	13:30	24.1
SEP 27	13:45	24.1
SEP 27	14:00	22.9
SEP 27	14:15	22.1
SEP 27	14:30	20.4
SEP 27	14:45	20.4
SEP 27	15:00	18.7
SEP 27	15:15	17.6
SEP 27	15:45	17.6
SEP 27	16:00	16.4
SEP 27	16:15	16.4
SEP 27	16:30	15.3
SEP 27	17:00	15.3
SEP 27	17:15	16.4
SEP 27	17:30	14.2
SEP 27	17:45	14.2
SEP 27	18:00	13.3
SEP 27	18:15	10.8
SEP 27	18:30	12.5
SEP 27	20:15	12.5
SEP 27	20:30	11.6
SEP 27	21:45	12.7
SEP 27	22:00	12.5
SEP 27	23:15	10.8
SEP 28	00:00	10.8
SEP 28	00:15	9.9
SEP 28	05:30	9.9
SEP 28	05:45	10.8
SEP 28	07:45	10.8
SEP 28	08:00	9.1
SEP 28	13:15	9.1
SEP 28	13:30	8.5
SEP 28	17:00	8.5
SEP 28	17:15	9.1
SEP 28	17:45	9.1
SEP 28	18:00	10.8
SEP 28	20:00	10.8
SEP 28	20:15	7.9
SEP 29	00:00	7.9
SEP 29	02:30	7.9
SEP 29	02:45	10.8
SEP 29	03:15	10.8
SEP 29	03:30	9.1
SEP 29	04:00	9.1
SEP 29	04:15	8.5
SEP 29	12:45	8.5

GAGED STREAMFLOW
Uvas Creek -- September/October 1972

DATE	CLOCK TIME	FLOW (L/s)
SEP 29	13:00	9.1
SEP 29	13:15	10.8
SEP 29	13:30	10.8
SEP 29	13:45	7.9
SEP 29	14:45	7.9
SEP 29	15:00	7.4
SEP 29	18:00	7.4
SEP 29	18:15	7.9
SEP 29	18:45	7.9
SEP 29	19:00	6.8
SEP 29	20:15	6.8
SEP 29	20:30	7.9
SEP 29	21:45	7.9
SEP 29	22:00	7.4
SEP 30	00:00	7.4
SEP 30	04:00	7.4
SEP 30	04:15	7.9
SEP 30	08:15	7.9
SEP 30	08:30	10.8
SEP 30	09:15	10.8
SEP 30	09:30	9.1
SEP 30	09:45	9.1
SEP 30	10:00	8.5
SEP 30	12:00	8.5
SEP 30	12:15	9.1
SEP 30	12:45	9.1
SEP 30	13:00	10.8
SEP 30	13:15	10.8
SEP 30	13:30	7.9
SEP 30	15:30	7.9
SEP 30	15:45	7.4
OCT 1	00:00	7.4
OCT 1	02:30	7.4
OCT 1	02:45	7.9
OCT 1	07:00	7.9
OCT 1	07:15	10.8
OCT 1	08:00	10.8
OCT 1	08:15	9.1
OCT 1	08:30	9.1
OCT 1	08:45	8.5
OCT 1	14:15	8.5
OCT 1	14:30	9.1
OCT 1	14:45	9.1
OCT 1	15:00	10.8
OCT 1	15:30	10.8
OCT 1	15:45	7.9
OCT 2	00:00	7.9
OCT 2	02:30	7.9
OCT 2	02:45	10.8
OCT 2	03:15	10.8
OCT 2	03:30	9.1
OCT 2	04:15	9.1
OCT 2	04:30	8.5
OCT 2	15:00	8.5
OCT 2	15:15	9.1
OCT 2	15:30	10.8
OCT 2	15:45	10.8
OCT 2	16:00	7.9
OCT 3	00:00	7.9
OCT 3	01:45	7.9
OCT 3	02:00	10.8
OCT 3	02:45	10.8
OCT 3	03:00	9.1
OCT 3	03:45	9.1
OCT 3	04:00	8.5
OCT 3	13:45	8.5
OCT 3	14:00	9.1
OCT 3	14:15	9.1
OCT 3	14:30	10.8
OCT 3	14:45	7.9
OCT 3	16:00	7.9
OCT 3	16:15	7.4
OCT 4	00:00	7.4
OCT 4	03:00	7.4
OCT 4	03:15	7.9
OCT 4	06:00	7.9
OCT 4	06:15	10.8
OCT 4	06:45	10.8
OCT 4	07:00	9.1
OCT 4	07:30	9.1
OCT 4	07:45	8.5
OCT 4	14:00	8.5
OCT 4	14:15	9.1
OCT 4	14:45	9.1
OCT 4	15:00	10.8
OCT 4	15:30	10.8
OCT 4	15:45	7.9
OCT 4	21:30	7.9
OCT 4	21:45	10.8
OCT 4	22:45	10.8
OCT 4	23:00	9.1
OCT 5	00:00	9.1


GAGED STREAMFLOW -- UVAS CREEK -- SEPTEMBER 1972
STREAMFLOW (L/s)
45
40
35
30
25
20
15
10
5
Sampling Period
Injection Period
22
23
24
25
26
27
28
29
DATE

APPENDIX IV

SORBED STRONTIUM

UVAS CREEK -- SEPTEMBER 26, 1972

STATION 2

CLOCK TIME	ELAPSED TIME (h)	SORBED STRONTIUM (ug Sr/g Sediment) 180-250um	350-500um	710-1000um	1650-2000um	3360-4000um
08:35	0.083	9.58	8.32	12.54	11.77	9.36
09:30	1.000	11.94	10.58	12.01	13.53	8.69
10:30	2.000	16.79	18.44	17.40	20.06	11.41
11:30	3.000	24.70	-----	17.59	22.72	13.21
12:30	4.000	23.27	24.10	18.78	27.35	12.98
13:30	5.000	19.05	16.84	17.09	20.64	14.91
14:30	6.000	14.12	20.36	18.20	18.34	12.04
15:30	7.000	17.44	17.04	16.89	20.84	12.14

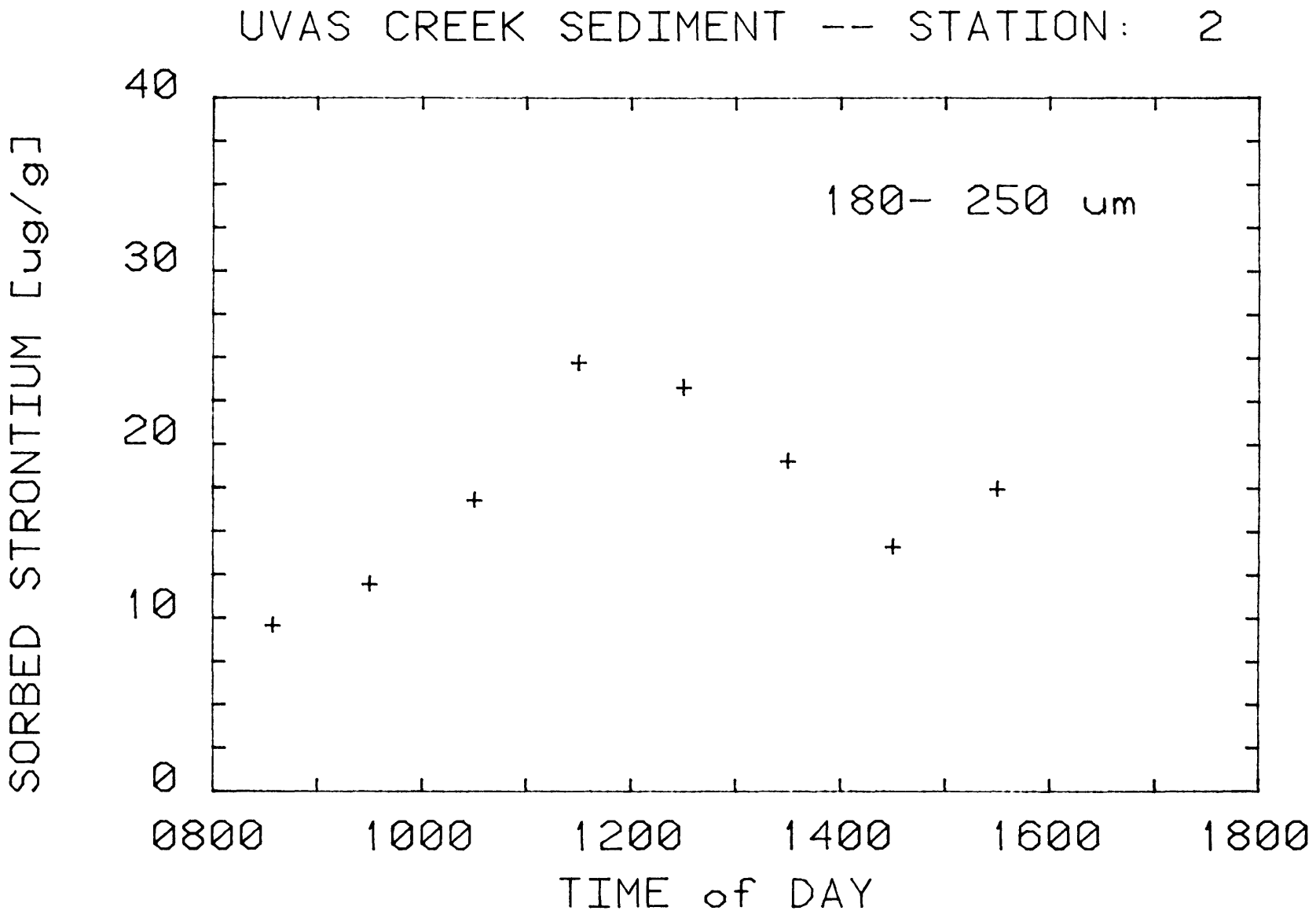
STATION: 3

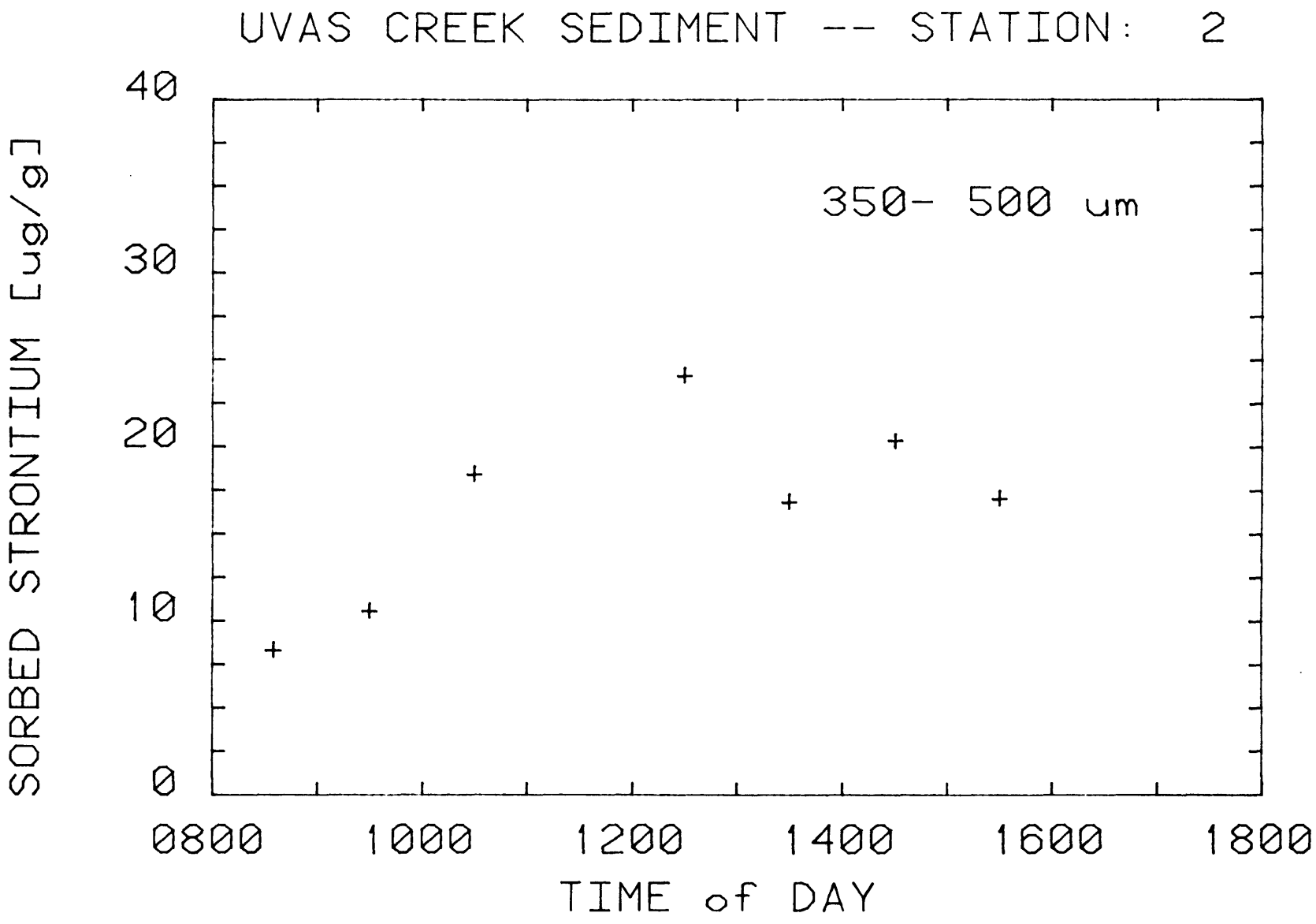
CLOCK TIME	ELAPSED TIME (h)	SORBED STRONTIUM (ug Sr/g Sediment) 180-250um	350-500um	710-1000um	1650-2000um	3360-4000um
09:12	0.700	7.51	8.20	10.69	11.85	9.68
10:12	1.700	10.00	7.48	12.24	11.93	8.91
11:14	2.733	11.76	10.17	12.19	16.06	12.64
12:14	3.733	13.20	13.62	19.10	22.29	15.35
13:12	4.700	23.90	14.63	22.89	27.44	17.29
14:12	5.700	19.59	18.26	25.27	21.12	16.42
15:14	6.733	18.16	15.22	22.07	23.03	16.84
16:13	7.717	16.58	13.58	22.13	23.50	13.08
17:12	8.700	16.39	12.77	19.32	-----	12.80

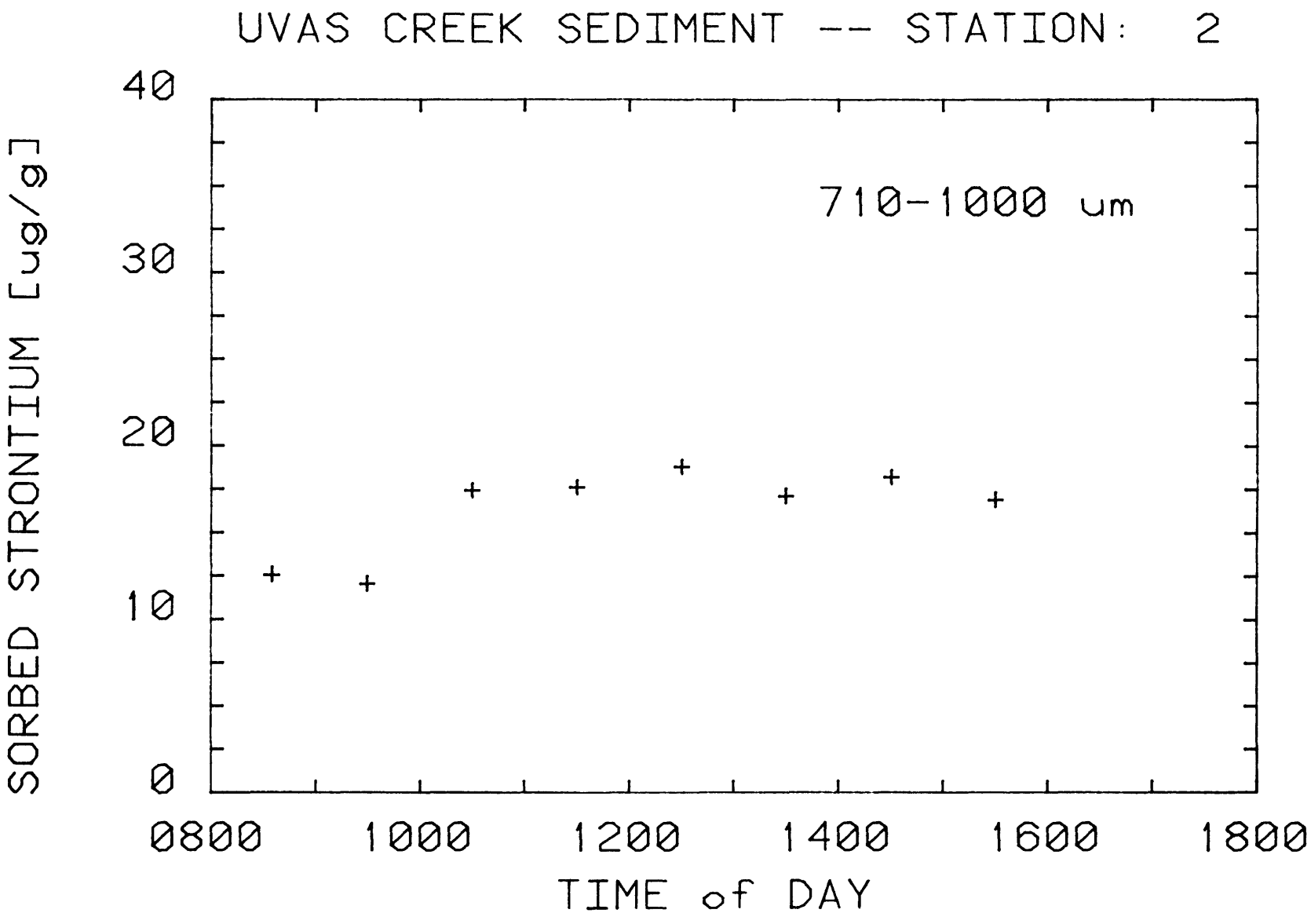
SORBED SODIUM, CALCIUM AND MAGNESIUM

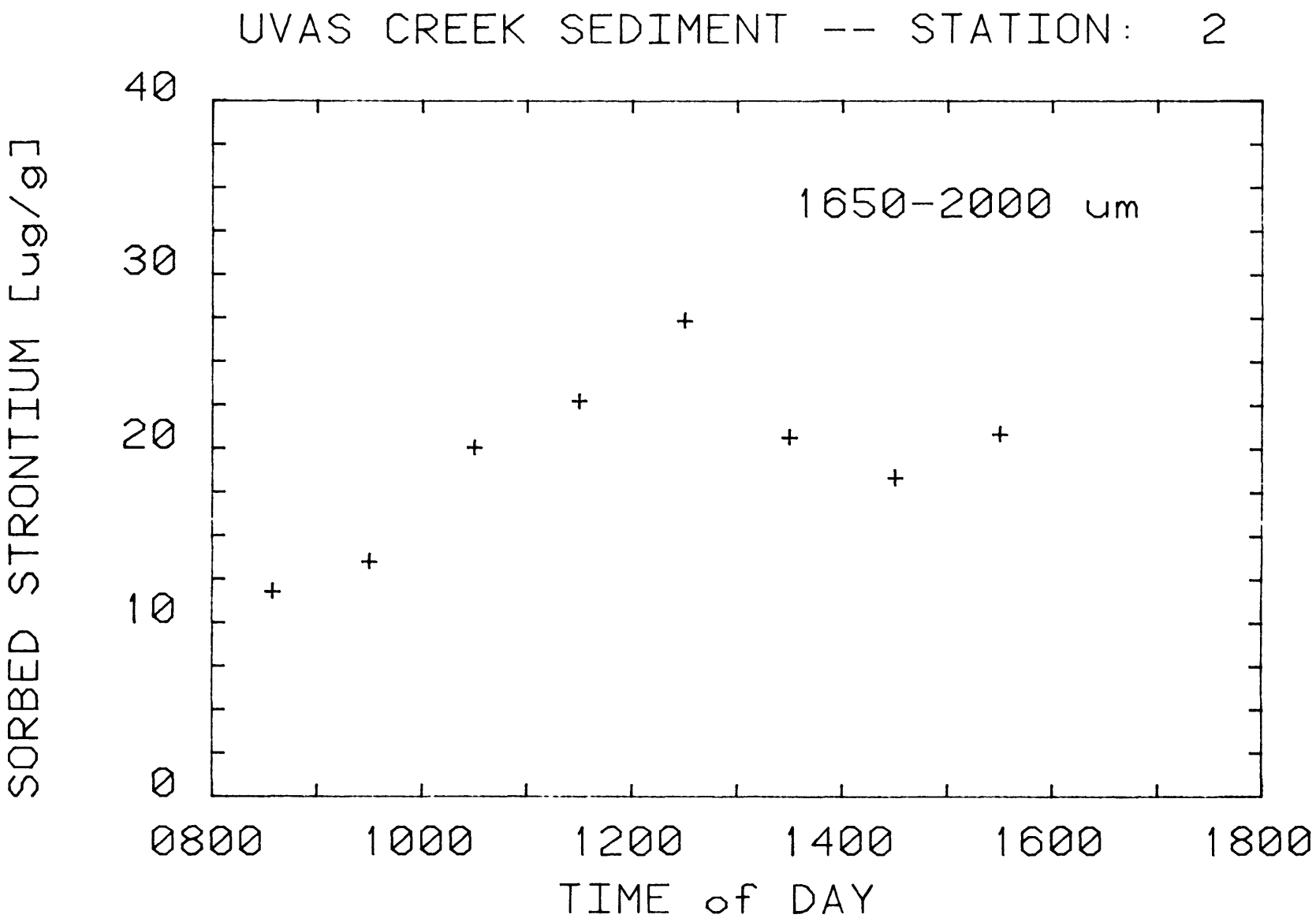
UVAS CREEK -- SEPTEMBER 26, 1972

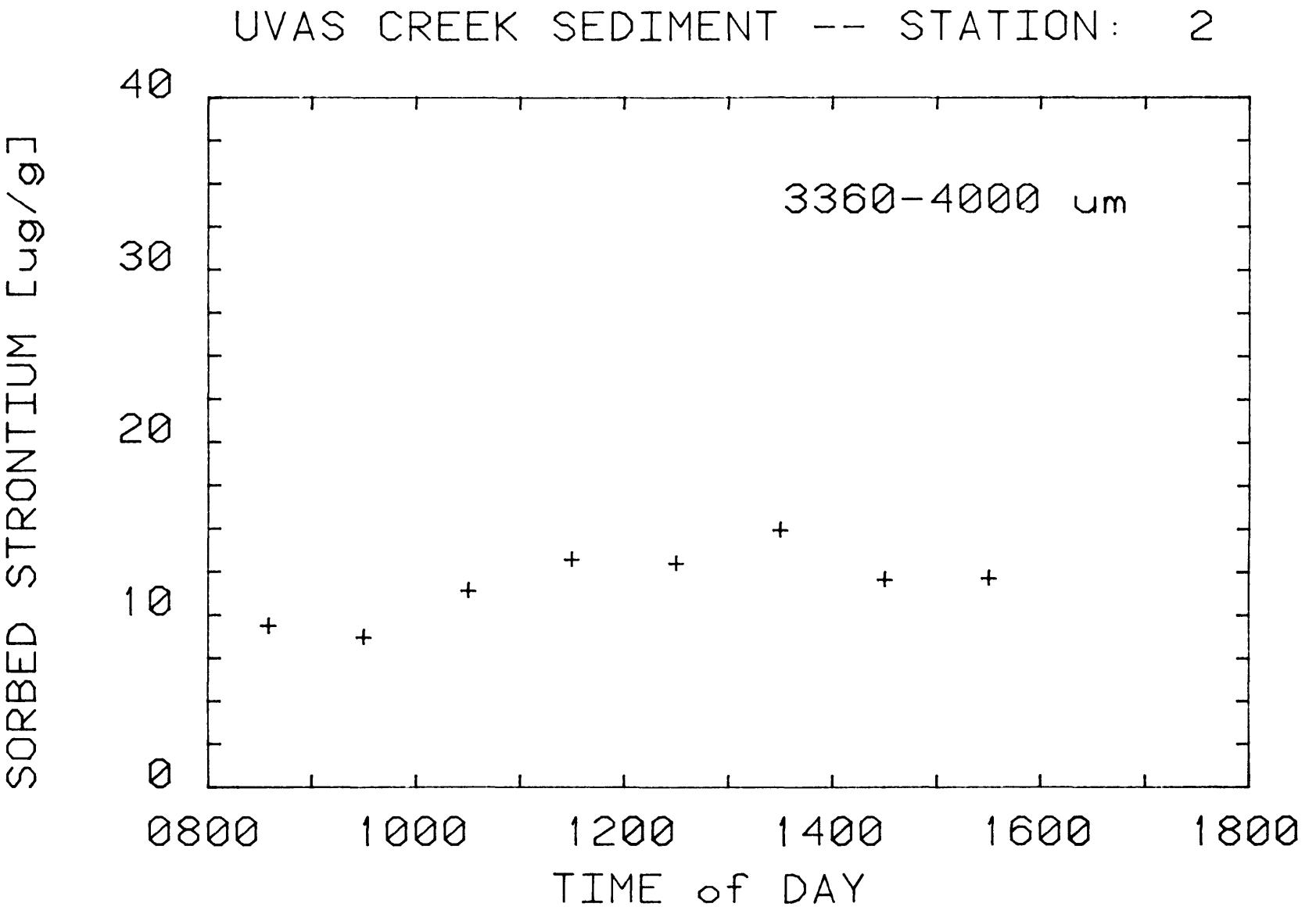
			SORBED CONCENTRATION (ug/g)				
CONSTITUENT	STATION	CLOCK TIME	180-250um	350-500um	710-1000um	1650-2000um	3360-4000um
Sodium	2	08:35	21.01	19.43	26.12	27.73	22.76
	2	10:30	22.09	20.05	28.83	28.53	23.63
	3	09:12	18.99	21.52	25.66	28.12	25.73
	3	12:14	20.05	23.06	33.20	33.22	22.71
Calcium	2	08:35	2507	2022	2098	1792	1782
	2	10:30	2218	1812	2080	1892	1725
	3	09:12	1952	1786	1920	1878	1559
	3	12:14	2156	1804	2064	1828	1651
Magnesium	2	08:35	260.9	254.9	350.0	339.1	304.0
	2	10:30	231.3	242.5	351.4	345.5	316.3
	3	09:12	207.5	241.3	360.8	340.6	292.7
	3	12:14	229.5	243.9	349.3	357.5	285.3

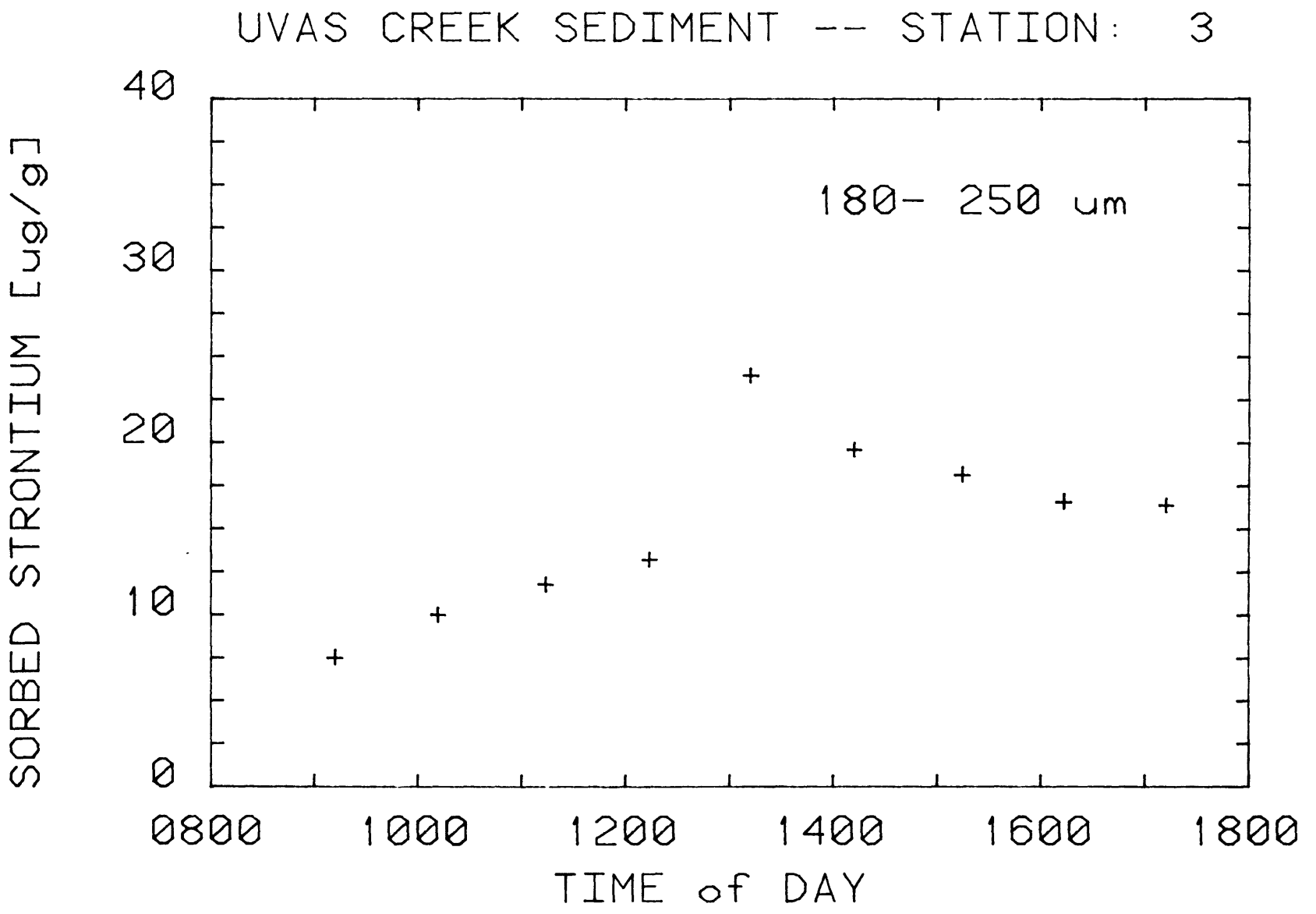

UVAS CREEK SEDIMENT -- STATION: 2
180- 250 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY

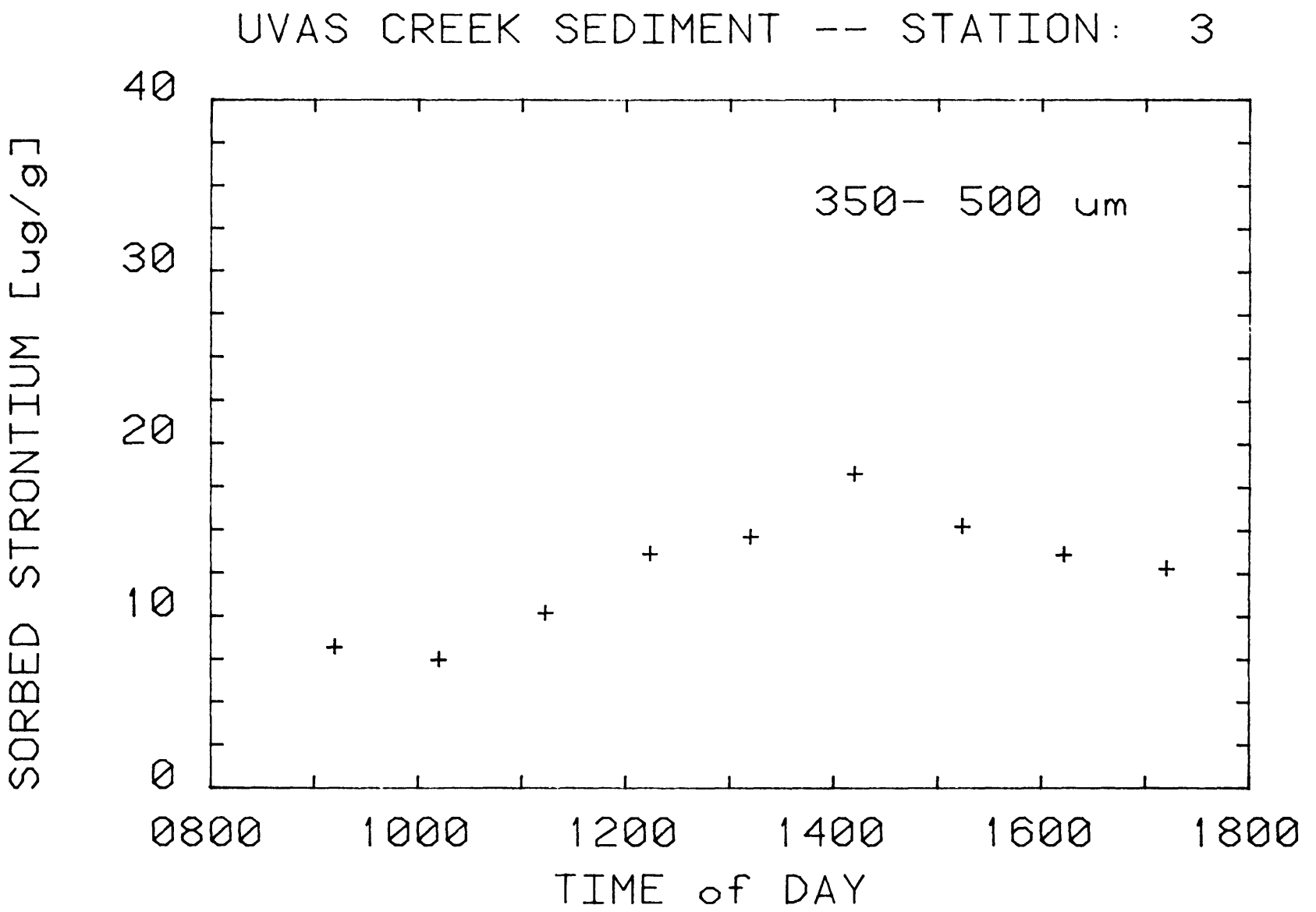

UVAS CREEK SEDIMENT -- STATION: 2
350- 500 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY

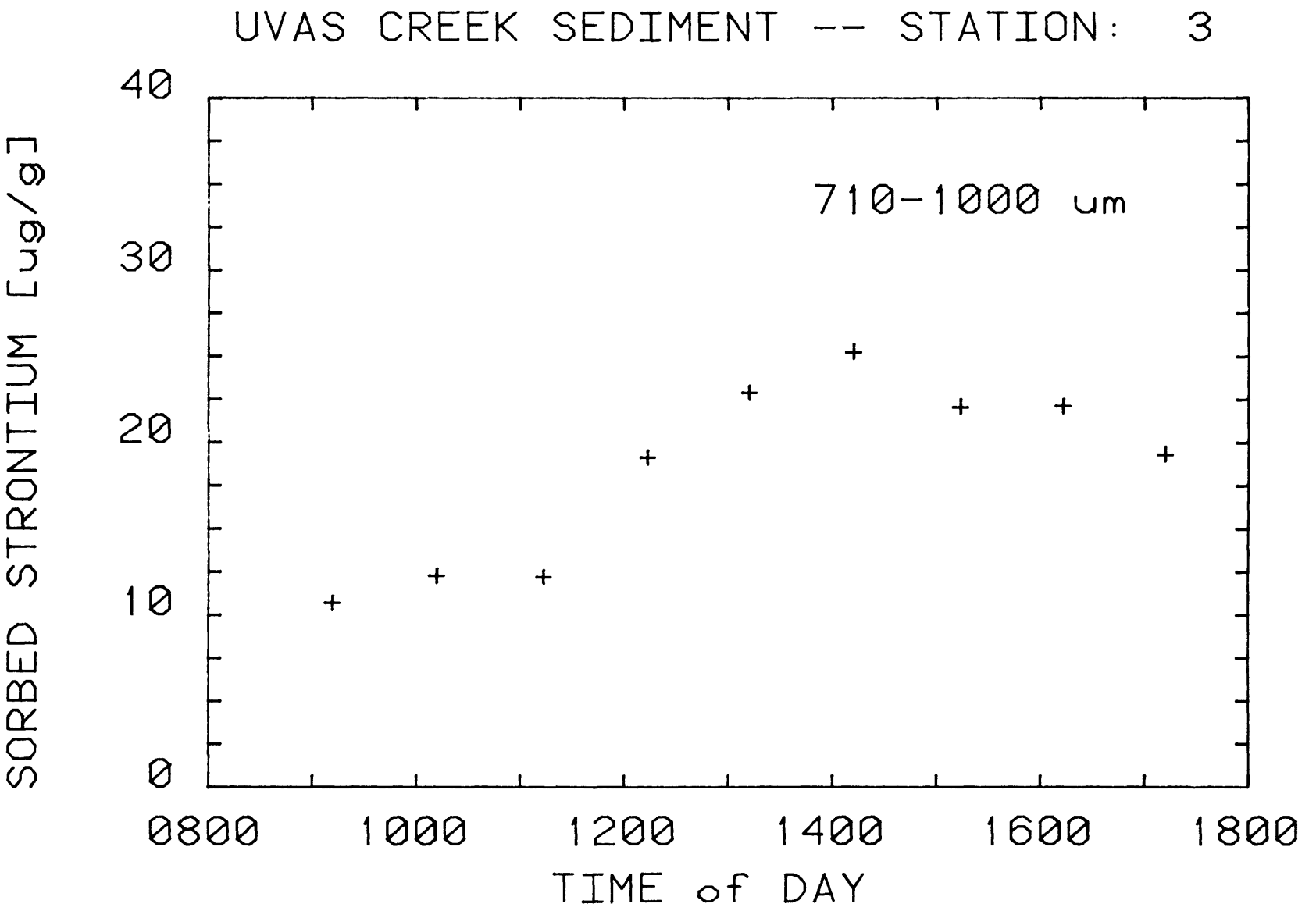

UVAS CREEK SEDIMENT -- STATION: 2
710-1000 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY

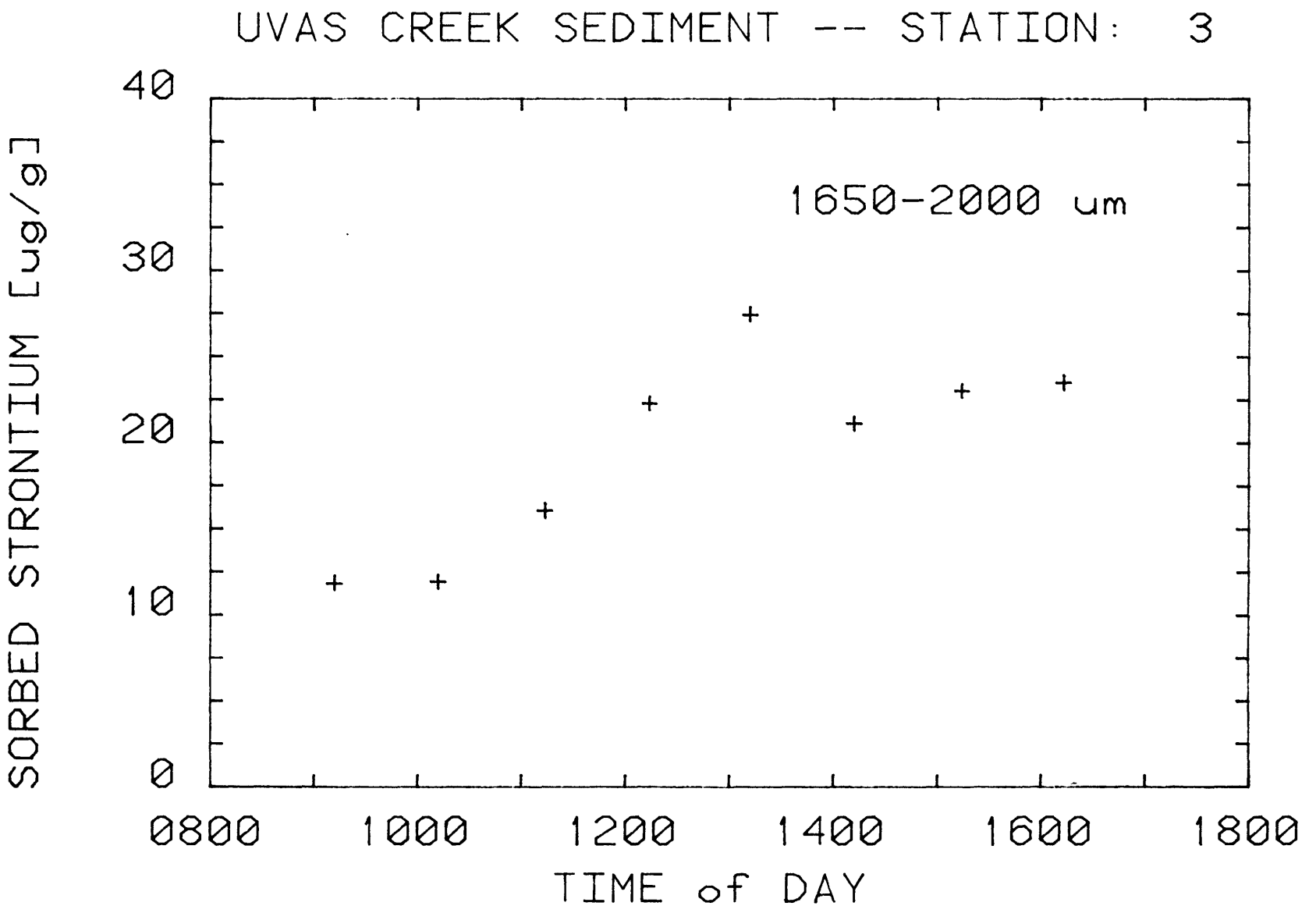

UVAS CREEK SEDIMENT -- STATION: 2
1650-2000 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY

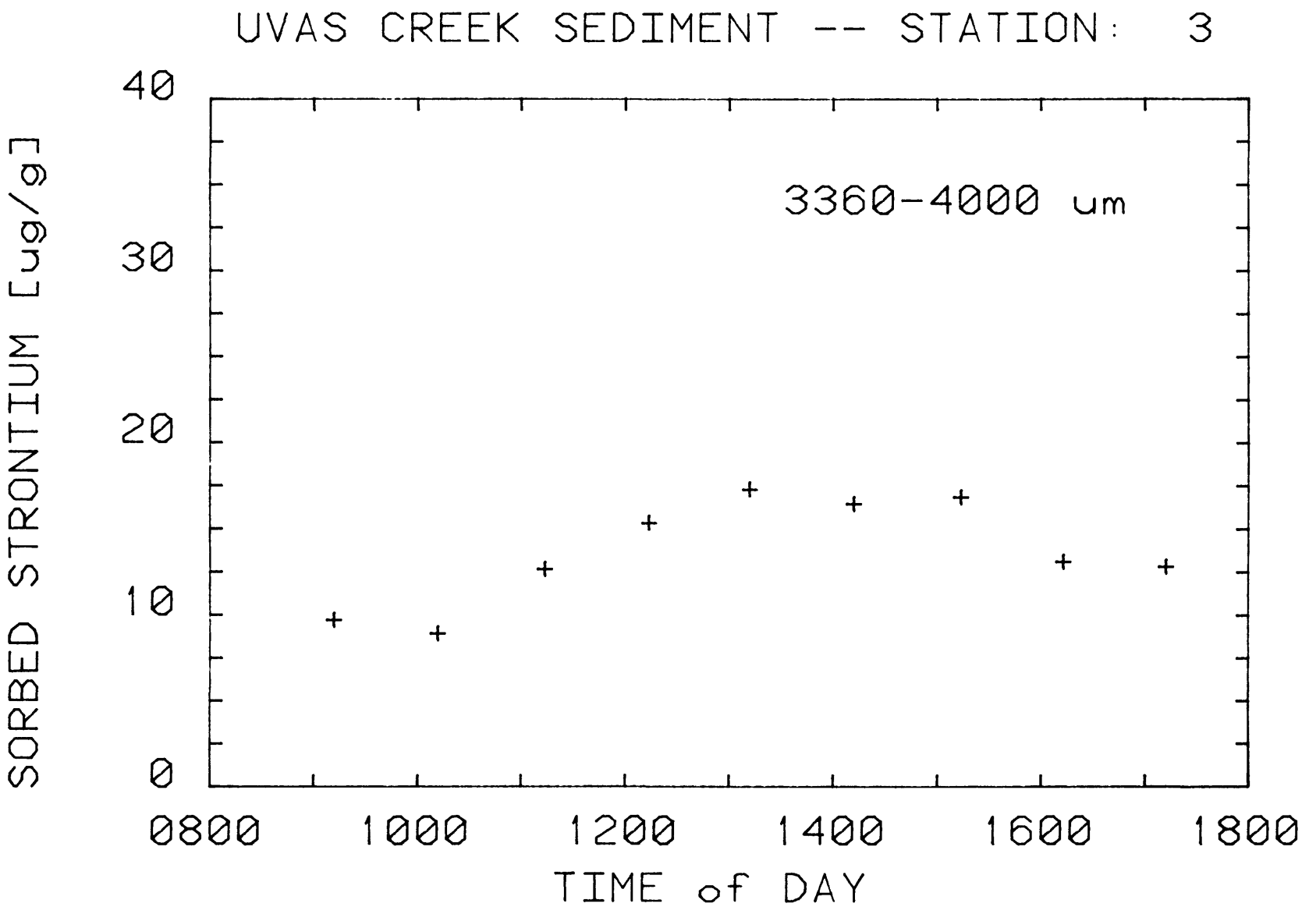

UVAS CREEK SEDIMENT -- STATION: 2
3360-4000 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY

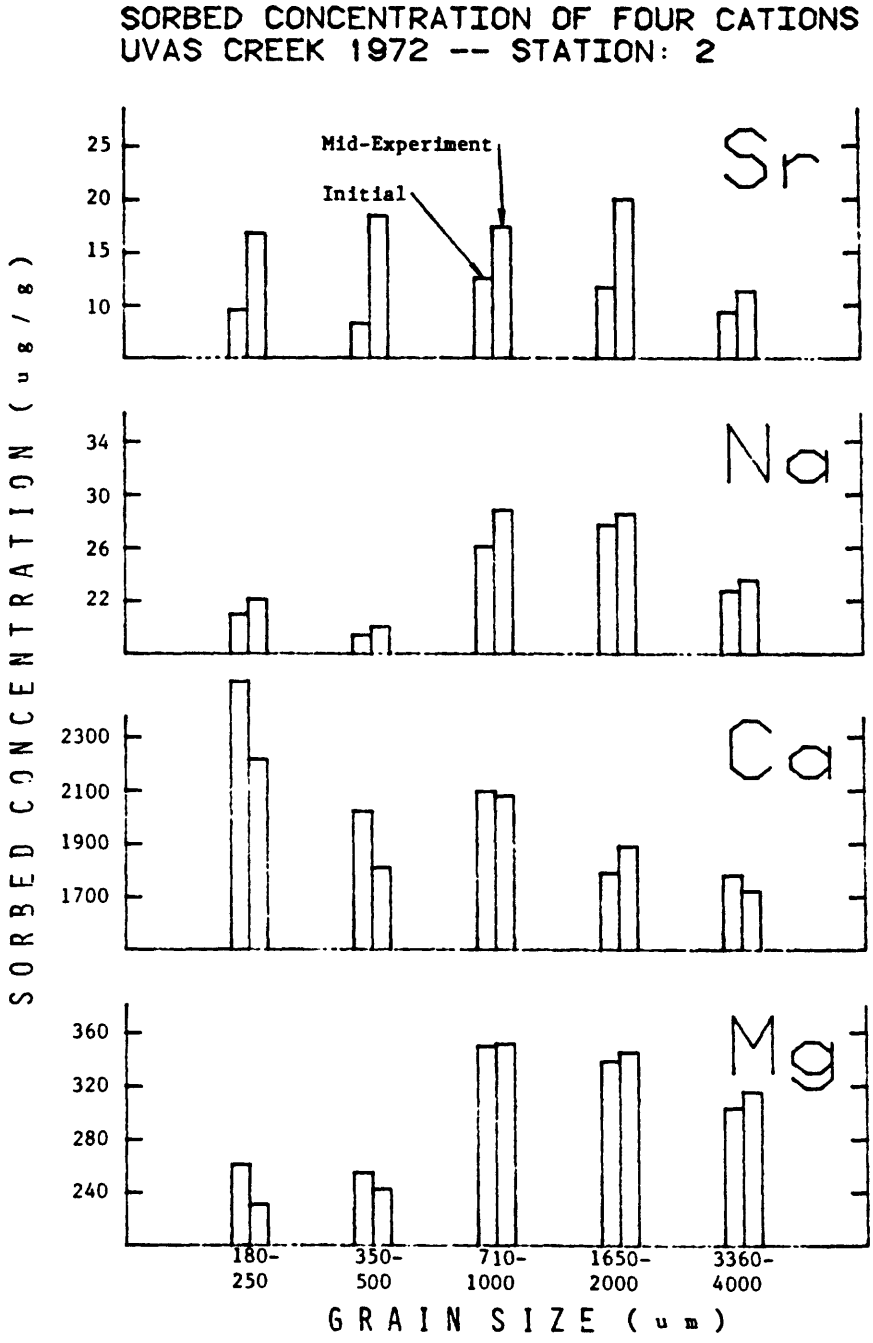

UVAS CREEK SEDIMENT -- STATION: 3
180- 250 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY


UVAS CREEK SEDIMENT -- STATION: 3
350- 500 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY

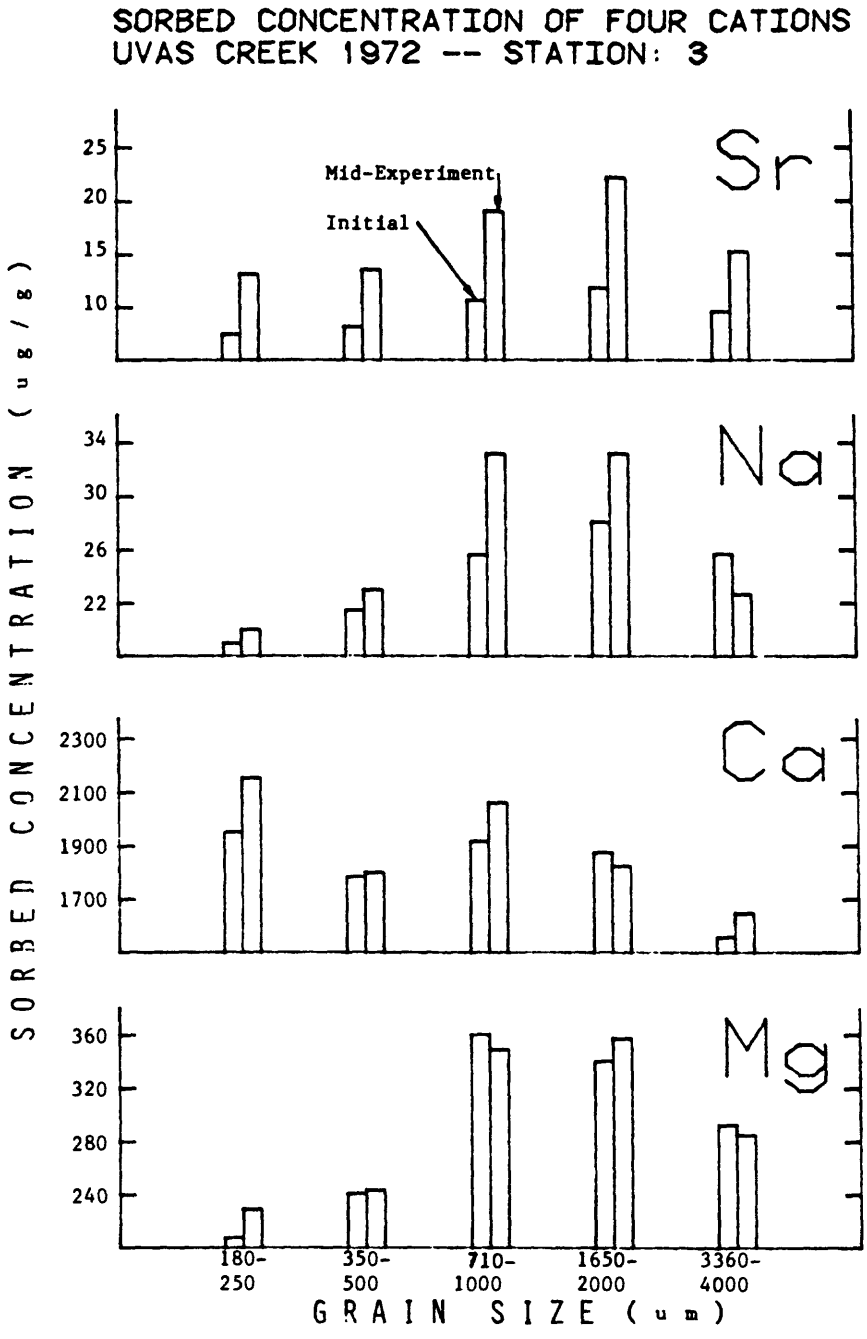

UVAS CREEK SEDIMENT -- STATION: 3
710-1000 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY


UVAS CREEK SEDIMENT -- STATION: 3
1650-2000 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY


UVAS CREEK SEDIMENT -- STATION: 3
3360-4000 um
SORBED STRONTIUM [ug/g]
40
30
20
10
0
0800
1000
1200
1400
1600
1800
TIME of DAY



Explanation: Bars on the left represent the condition before the arrival of the injection pulse; bars on the right represent the condition about 1.5 h after the arrival of the pulse.



Explanation: Bars on the left represent the condition before the arrival of the injection pulse; bars on the right represent the condition about 2.2 h after the arrival of the pulse.