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SUPPLY SYSTEM NUCLEAR PLANT NO. 2

ANNUAL ENVIRONMENTAL OPERATING REPORT

1986

ENVIRONMENTAL PROGRAMS DEPARTMENT

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

APRIL 1987

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INTRODUCTION

The WNP-2 Environmental Protection Plan (Appendix B to Operating License No. NPF-21) addresses the protection of nonradiological environmental values during plant operation. Section 3.0 of the EPP requires that changes in plant design and operation be assessed for environmental impacts against the impacts which were projected by the NRC at the time the plant was licensed. Changes which involve an unreviewed environmental question (defined in the EPP) must be approved by the NRC. Section 4.0 requires the reporting of events which may result in significant environmental impacts and also requires a soil and vegetation monitoring program to evaluate cooling tower drift impacts. Section 5.0 addresses administrative matters and requires an annual report on several EPP conditions including the monitoring program. This Annual Environmental Operating Report is submitted per Section 5.4.1 of the EPP.

UNREVIEWED ENVIRONMENTAL QUESTIONS

A proposed change, test, or experiment is deemed to involve an unreviewed environmental question if it concerns: (1) a matter which may result in significant increase in any adverse environmental impact previously evaluated in the environmental licensing documentation; or (2) a significant change in effluents or power level; or (3) a matter not previously evaluated in the environmental documentation which may have a significant adverse environmental impact (EPP Section 3.1). No changes in WNP-2 design or operation, or tests or experiments in 1986 involved an unreviewed environmental question.

COOLING TOWER DRIFT STUDIES

Section 4.2.1 of the EPP requires a monitoring program to assess the effects of cooling tower drift. As in previous years, soil and vegetation samples were collected in May at four grassland (G01-G04) and five shrub (S01-S05) sites (see Figure 1) and analyzed for relevant chemistry parameters. Analytical methods were described in the Environmental Operating Report for 1985. The results for 1986 and comparisons with previous years are summarized below.

Soil Chemistry Results

The results of the 1986 soil chemical analyses are presented in Table 1 and are shown graphically in Figures 2 through 18.

Soils at all sample sites range from sandy to sandy loam and contain a low percentage of clay. Soil pH values were well within the range of measurements in previous years. Other than a three-year decline at site G03, no trends were apparent (Figure 2). Soil conductivity ranged from 13.6 microsiemens/cm at site S05 to 50.8 at G04. The large increases noted in 1985 at sites G01, G02, and G03 were not evident in 1986 (Figure 3).

Soil sulfate concentrations at all sites were low (Figure 4). Calcium (Figure 5) and magnesium (Figure 6) values were near the means for previous years. Site G02 experienced a marked increase in calcium concentration between 1985 (0.27%) and 1986 (0.57%). Sodium (Figure 7) and potassium (Figure 8) measurements were generally lower than in previous years. Soil bicarbonate at all sites was within the range of previous measurements. Fluoride and chloride (Figures 10 and 11) were also within the range of concentrations previously recorded.

Soil copper was measured at levels generally exceeding previous measurements (Figure 12). However, at site G03, which is closest to the cooling towers, the concentration (10.6 ug/g) was near the median for previous years. Lead and cadmium concentrations (Figures 13 and 14) were at the lower end of the historical data. Chromium measurements were near the means of previously recorded data (Figure 15). Nickel concentrations showed increases over the past three years at sites G01, G02, G04, and S01 (Figure 16). Several values were the highest recorded since the study began in 1980. Soil mercury and zinc were within the ranges previously recorded.

Vegetation Chemistry Results

The results of the 1986 vegetation chemical analyses are presented in Table 2. Copper, sulfate, and chloride concentrations in Poa sandbergii and Bromus tectorum are shown in Figures 19 through 24.

Copper concentrations were similar to measurements for previous years with some exceptions. The copper in Sisymbrium altissimum at site G04 was approximately three times the mean for that station in previous years. Concentrations in Poa sandbergii were markedly elevated at sites G02, G04, S02, and S05. Bromus tectorum exhibited a large increase in copper at site G03. With very few exceptions, concentrations of chloride and sulfate in all species were near the means recorded for previous years. Poa sandbergii at site G02 showed marked increases for both chloride and sulfate.

Soil and Vegetation Study Summary

Although some stations show departure from means of historical data for some chemical constituents, no trends or adverse impacts are apparent. The cooling tower drift study may be modified in 1987 to allow for better evaluation of spatial relationships and time trends.

NONROUTINE REPORTS

During 1986 there were no nonroutine reports required by Section 5.4.2 of the EPP nor were there any EPP noncompliances.

NPDES PERMIT-RELATED REPORTS

Monthly discharge monitoring reports are submitted to the Energy Facility Site Evaluation Council (EFSEC). A summary of the reported data is shown in Table 3. They were no instances of noncompliance in 1986.

Table 1
SOIL CHEMISTRY AT NINE SAMPLE LOCATIONS, MAY 1986

	G01	G02	G03	G04	S01	S02	S03	S04	S05
pH (1:2 soil-water)	7.17	7.18	6.97	7.01	6.81	7.94	7.29	7.22	7.02
Conductivity (1:2 soil-water) microsiemens/cm	37.8	28.1	25.8	50.8	21.0	26.1	13.7	24.2	13.6
Sulfate ug/g	4.88	3.04	5.44	7.96	2.84	2.80	2.16	2.84	0.88
Chloride ug/g	4.80	4.48	5.92	4.56	4.56	5.76	4.80	5.92	4.56
Copper ug/g	14.29	16.90	10.62	13.87	14.45	14.34	12.86	17.06	10.72
Lead ug/g	4.54	1.66	1.37	2.39	1.81	1.77	1.70	1.99	1.83
Cadmium ug/g	0.05	0.07	0.04	0.06	0.06	0.03	0.05	0.05	0.04
Chromium ug/g	13.10	11.01	8.01	7.32	9.52	10.22	8.72	10.69	7.65
Nickel ug/g	23.43	15.16	12.41	21.53	16.76	19.08	10.88	11.80	11.10
Zinc ug/g	54.01	51.19	43.95	51.60	50.47	37.52	56.35	56.61	56.22
Sodium %	0.018	0.020	0.013	0.013	0.017	0.008	0.018	0.017	0.017
Potassium %	0.187	0.143	0.096	0.080	0.099	0.052	0.095	0.122	0.092
Calcium %	0.32	0.57	0.34	0.34	0.35	0.44	0.37	0.36	0.34
Mercury ug/g	0.007	0.005	0.002	0.003	0.006	0.004	0.003	0.005	0.004
Fluoride ug/g	207	189	204	184	201	174	167	186	218
Bicarborate (meq/HCO3/g)	0.0021	0.0025	0.0015	0.0014	0.0007	0.0024	0.0010	0.0006	0.0006
Magnesium %	0.49	0.50	0.41	0.38	0.45	0.35	0.42	0.43	0.40

TABLE 2
VEGETATION CHEMISTRY AT NINE SAMPLE LOCATIONS, MAY 1986

	SITE	POSA*	BRTE*	SIAL*	PHLO*	PUTR*	ARTR*
Copper (ug/g)	G01	2.49	4.07	5.23	4.92		
	G02	8.25	4.68	4.10	4.50		
	G03	4.90	14.62	7.89		8.52	
	G04	7.79	10.12	15.98	6.38		
	S01	3.38	6.75	3.08	8.28		
	S02	9.12	4.50		3.06	4.74	
	S03	4.02	5.53		12.04		6.80
	S04	5.07	6.18	6.32	7.44		
	S05	5.40	6.30			4.00	6.38
Extractable Sulfate (%)	G01	0.000	0.068	0.596	0.000		
	G02	0.170	0.294	0.793	0.000		
	G03	0.000	0.026	0.822		0.000	
	G04	0.000	0.078	0.524	0.000		
	S01	0.000	0.019	0.564	0.096		
	S02	0.037	0.176		0.018	0.000	
	S03	0.026	0.094		0.026		0.000
	S04	0.000	0.000	0.671	0.036		
	S05	0.000	0.079			0.000	0.050
Extractable Chloride (%)	G01	0.13	0.28	0.75	0.16		
	G02	0.47	0.16	0.49	0.14		
	G03	0.33	0.15	0.45		0.17	
	G04	0.15	0.15	0.51	0.14		
	S01	0.13	0.10	0.31	0.19		
	S02	0.14	0.12		0.13	0.19	
	S03	0.17	0.17		0.16		0.85
	S04	0.14	0.40	0.53	0.11		
	S05	0.19	0.15			0.09	0.85

*POSA = Poa Sandbergii
BRTE = Bromus tectorum
SIAL = Sisymbrium altissimum
PHLO = Phlox longifolia
PUTR = Purshia tridentata
ARTR = Artemisia tridentata

Table 3
SUMMARY OF DISCHARGE MONITORING REPORTS, 1986

Month	Low Volume Waste						Cooling Tower Blowdown		
	TSS (lbs/d)		O/G (lbs/d)		Vol (10^3 gal/d)		TRC (mg/l)	Vol (10^6 gal/d)	
	Ave	Max	Ave	Max	Ave	Max	Max	Ave	Max
Jan	0.5	1.5	0.3	3.1	10.9	23.4	<0.1	2.7	7.1
Feb	1.4	17.4	0.1	0.3	11.9	25.3	<0.1	1.8	4.1
Mar	1.2	5.3	0.1	0.7	11.0	16.5	<0.1	1.4	2.3
Apr	0.9	3.9	0.1	0.8	14.0	29.5	<0.1	3.3	6.1
May	4.5	25.1	0.3	1.9	14.5	28.9	—	0.0	0.0
Jun	1.4	4.9	0.1	0.6	14.1	20.3	<0.1	2.6	5.6
Jul	1.1	5.3	0.1	0.9	10.7	15.0	<0.1	2.7	4.9
Aug	3.6	15.4	0.4	1.8	12.2	20.0	<0.1	2.2	3.5
Sep	1.9	12.6	0.1	0.2	9.5	15.9	<0.1	1.8	3.8
Oct	1.2	6.6	0.1	0.2	11.6	17.7	<0.1	1.6	4.7
Nov	2.1	20.2	0.2	0.8	10.9	17.6	<0.1	1.2	4.3
Dec	1.5	18.9	0.2	2.4	14.5	31.2	<0.1	0.8	1.7
Permit Limt	5	34	2.5	7	20	40	0.1	4.6	9.4

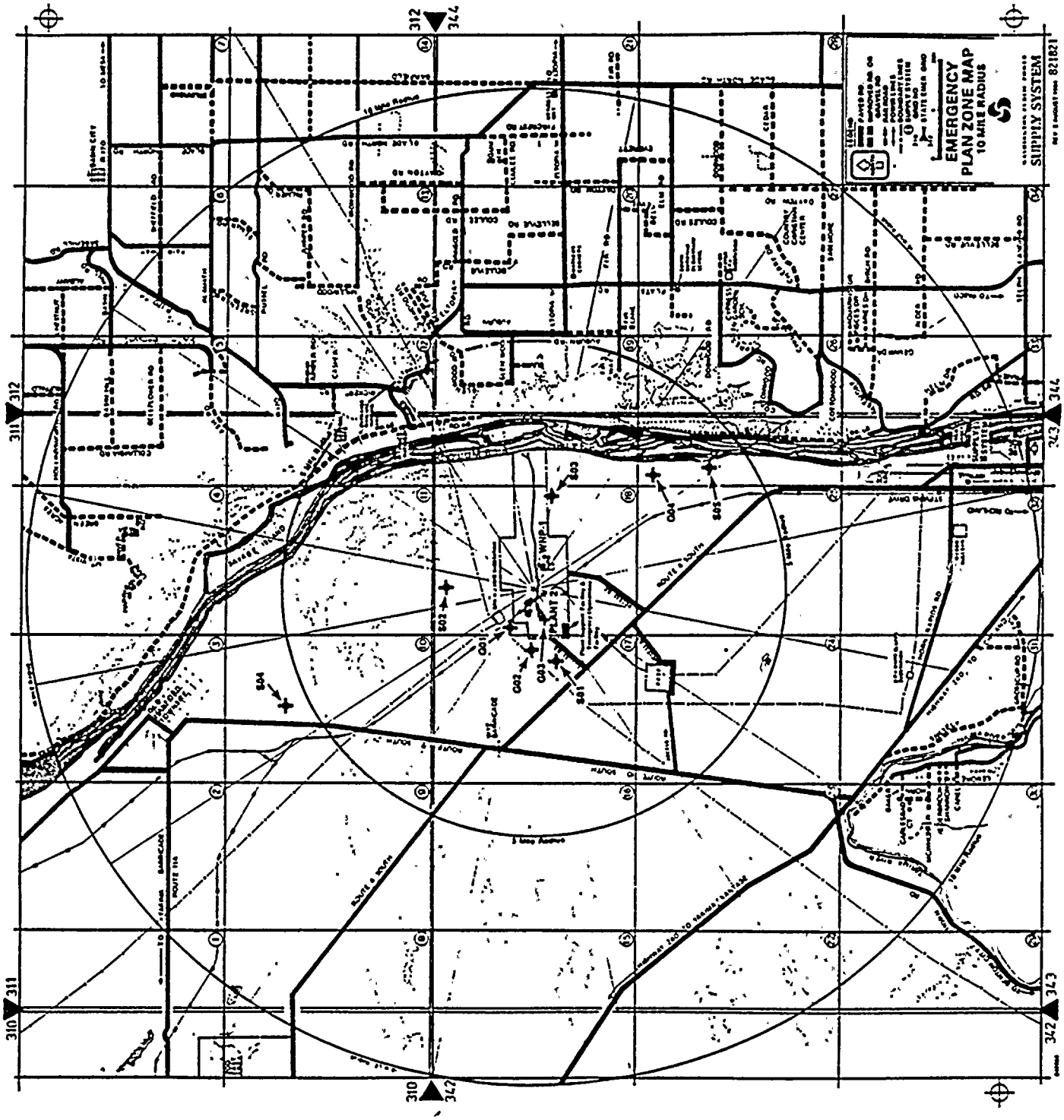

FIGURE 1. SOIL & VEGETATION CHEMISTRY SAMPLE LOCATIONS

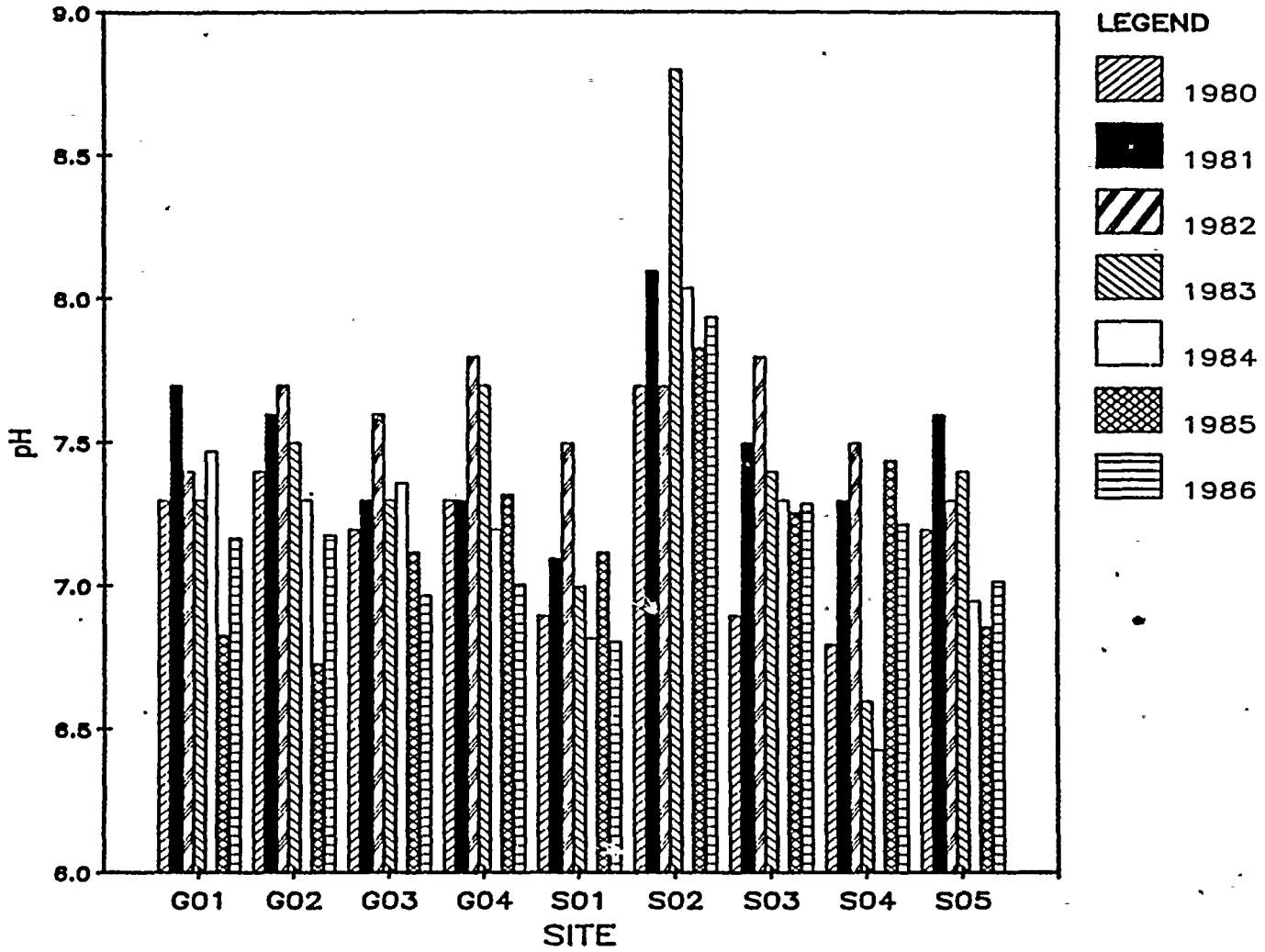

FIGURE 2. SOIL pH, 1980-1986

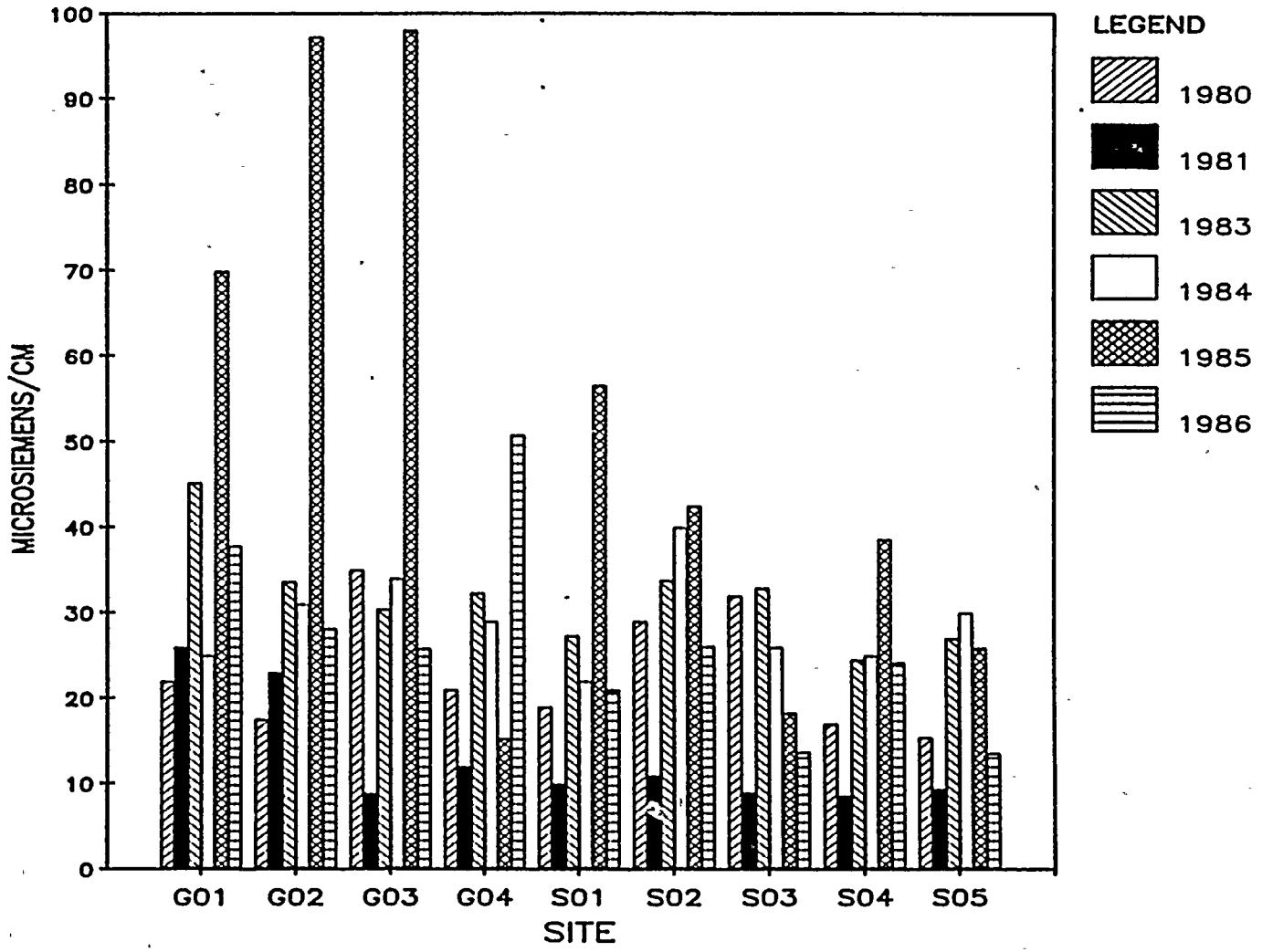

FIGURE 3. SOIL CONDUCTIVITY, 1980, 1981, and 1983-1986

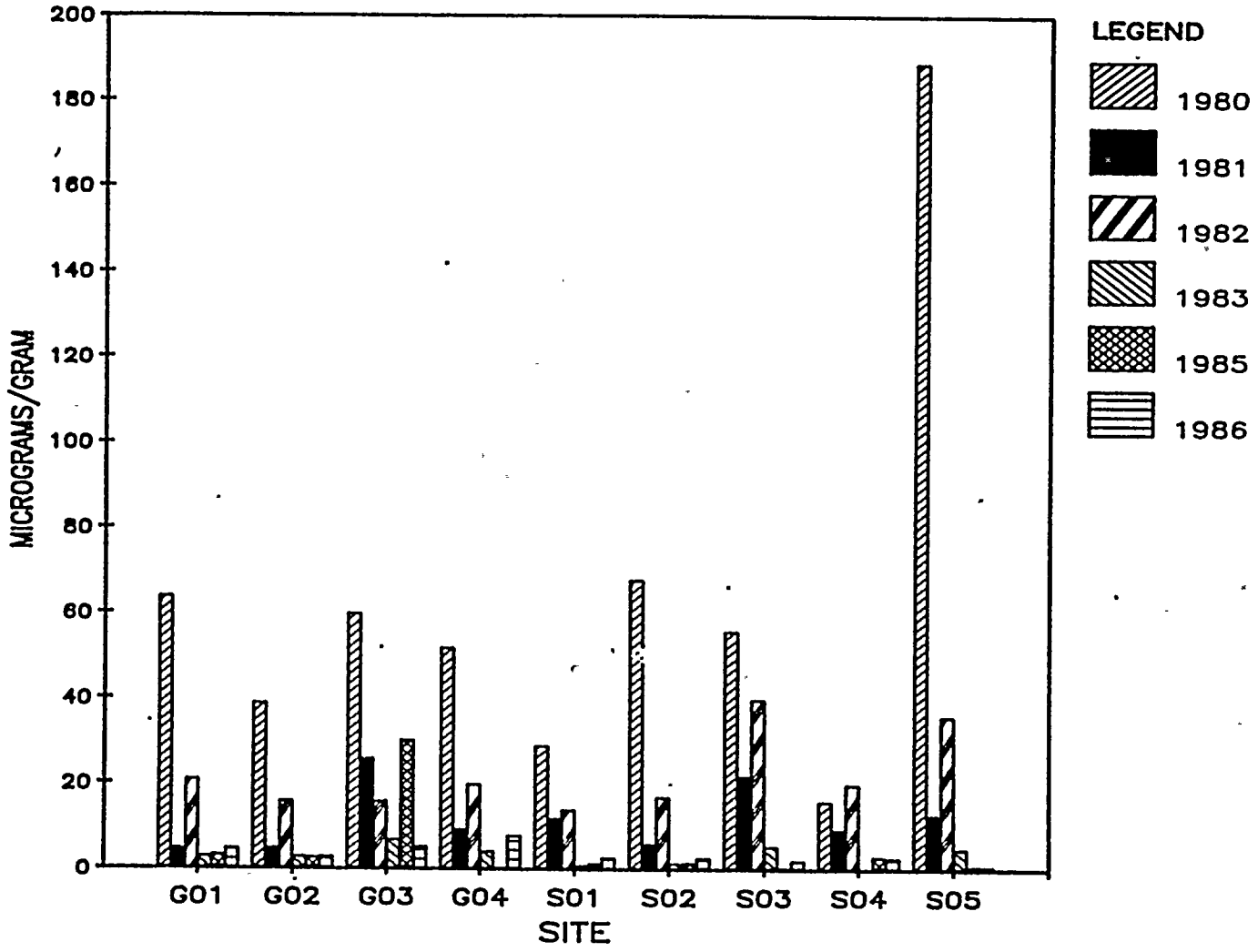

FIGURE 4. SOIL SULFATE, 1980-1986

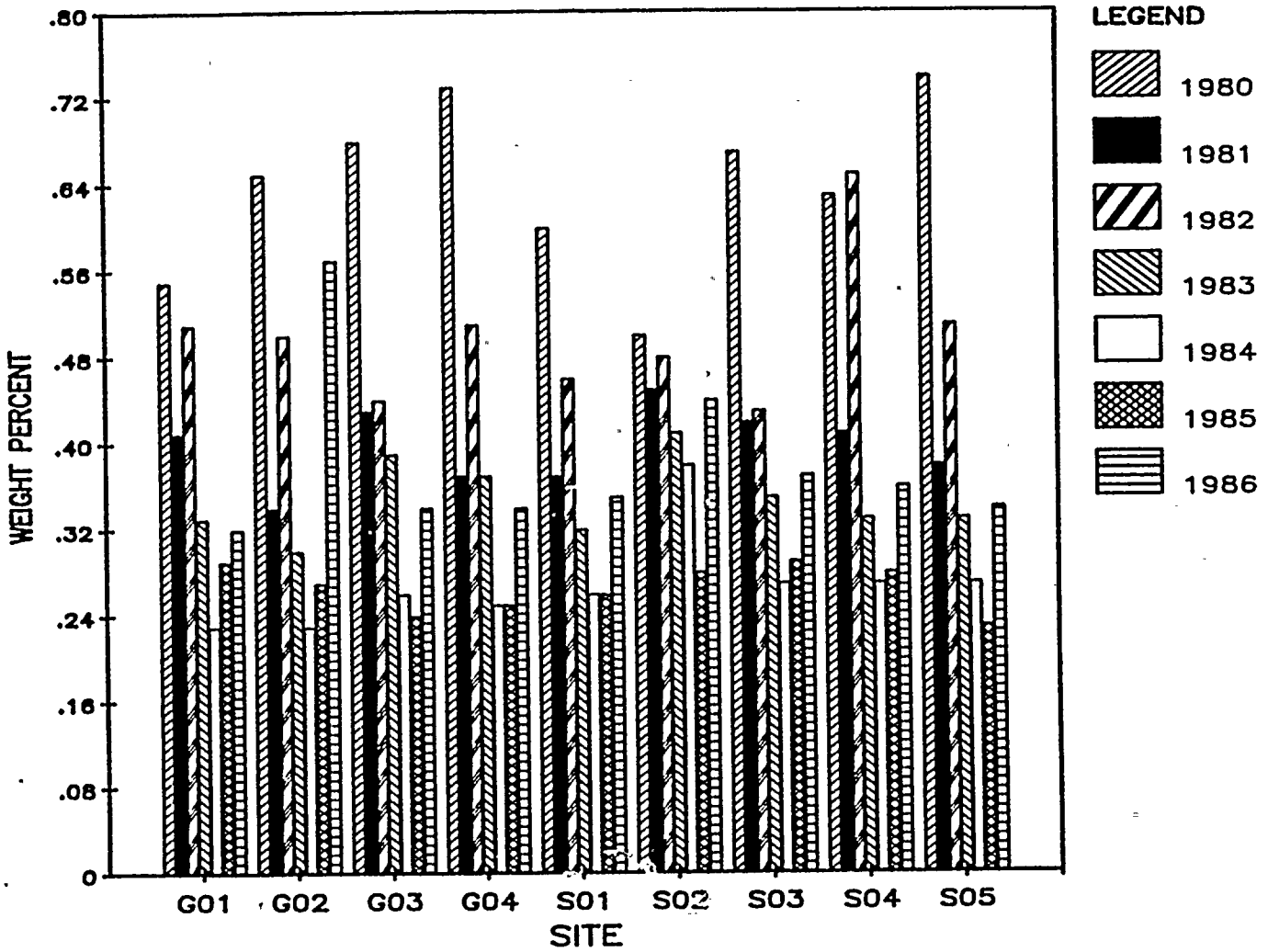

FIGURE 5. SOIL CALCIUM (Wt %), 1980-1986

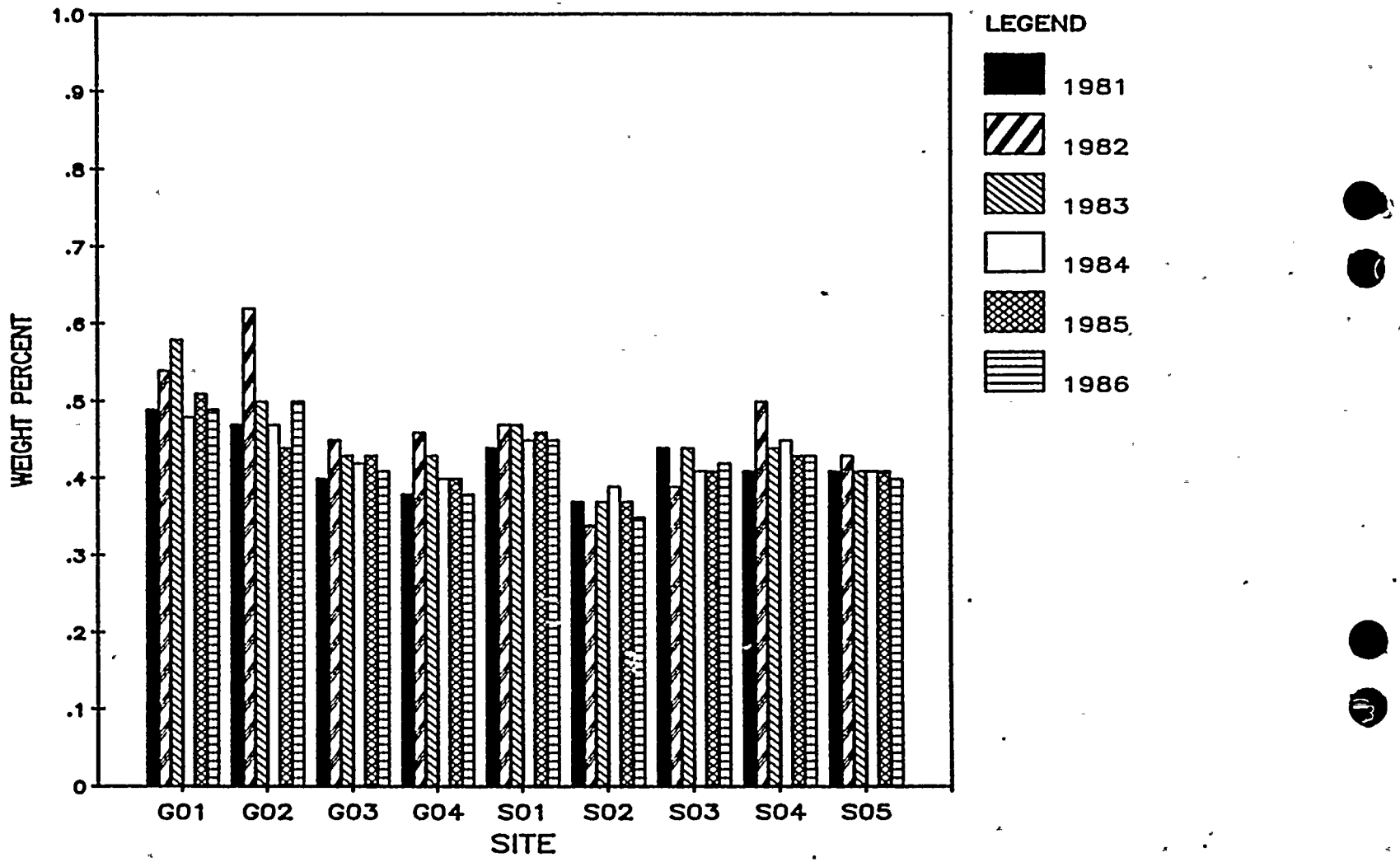

FIGURE 6. SOIL MAGNESIUM (Wt %), 1980-1986

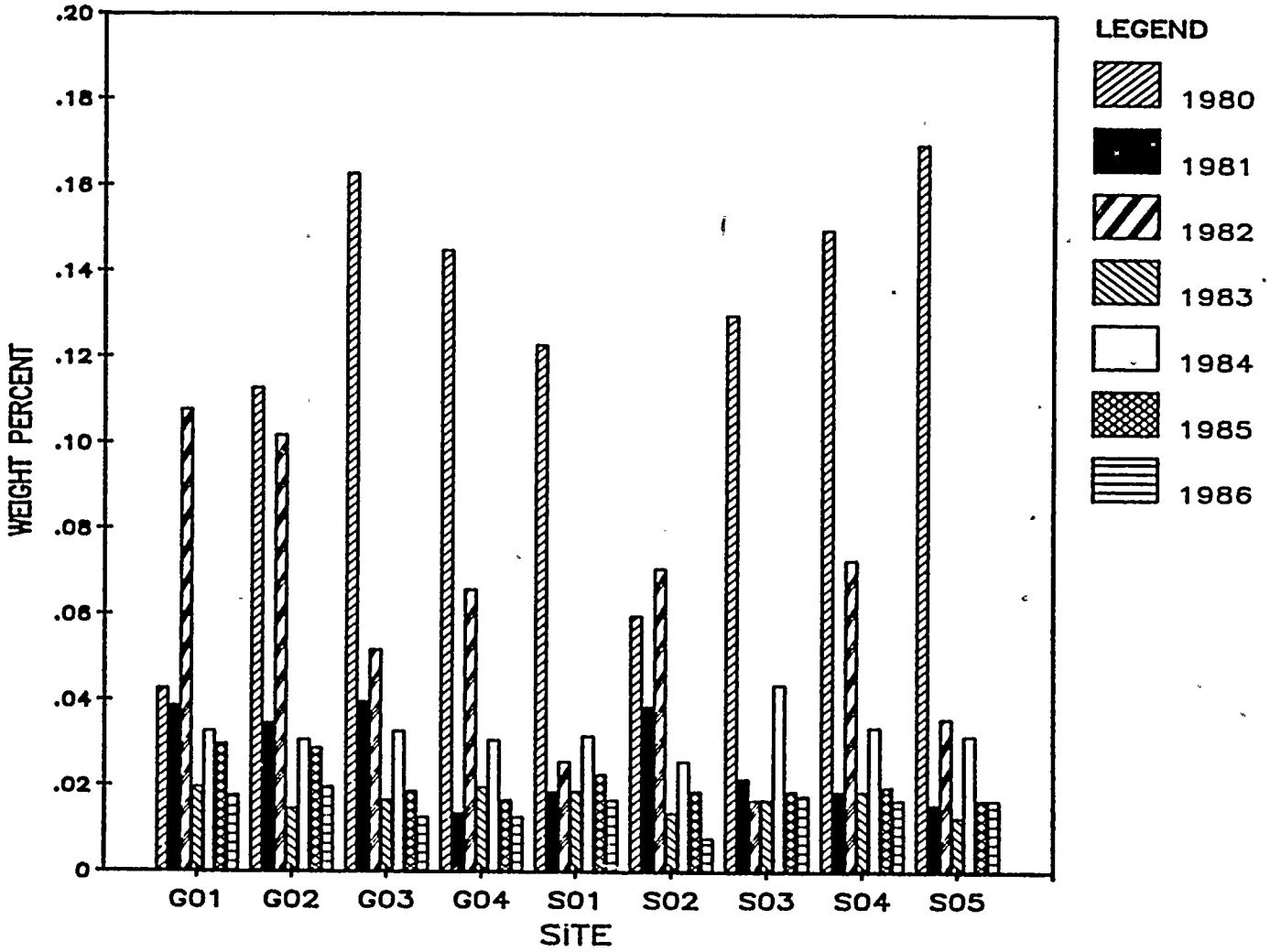

FIGURE 7. SOIL SODIUM (Wt %), 1980-1986

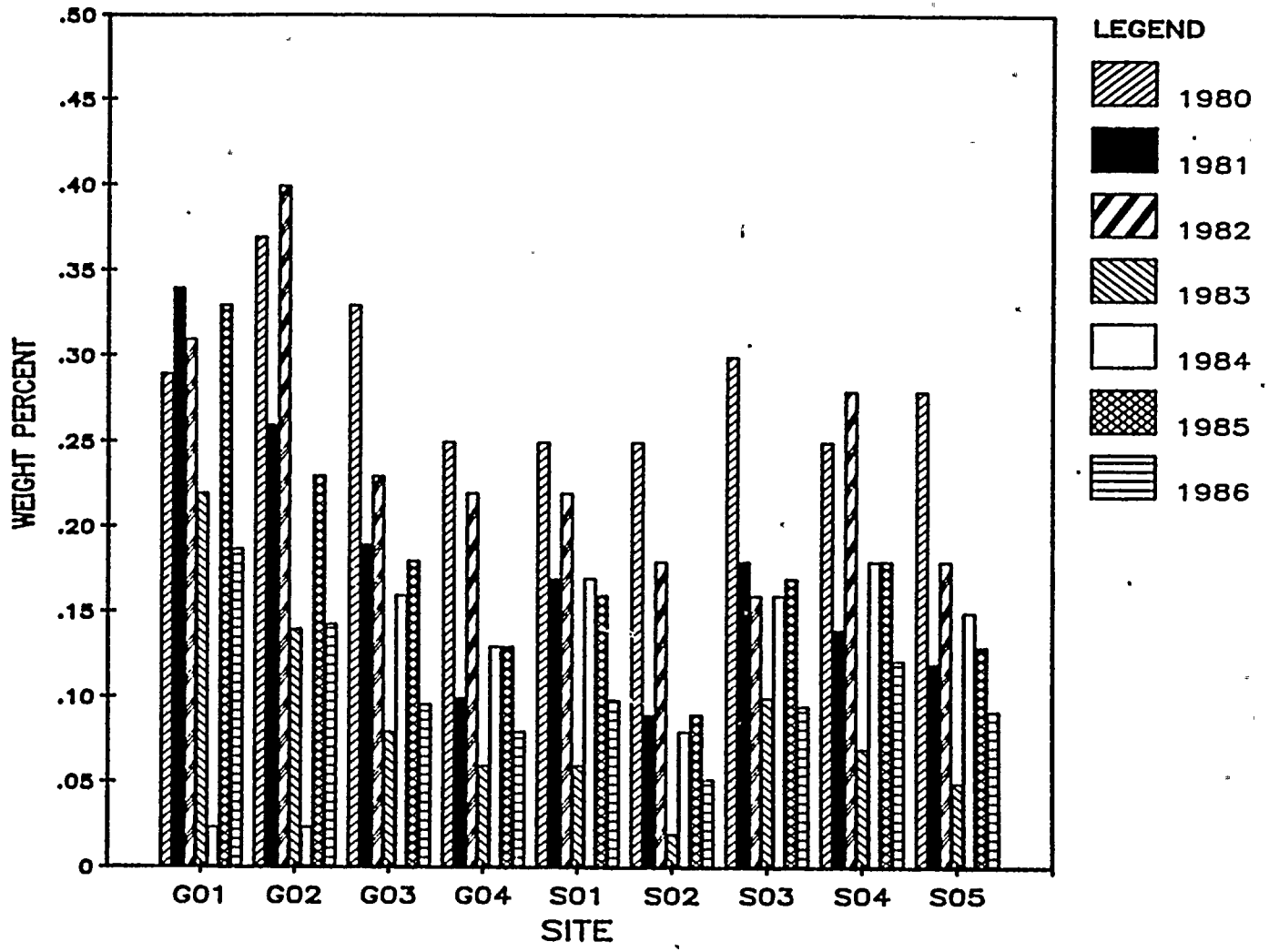

FIGURE 8. SOIL POTASSIUM (Wt %), 1980-1986

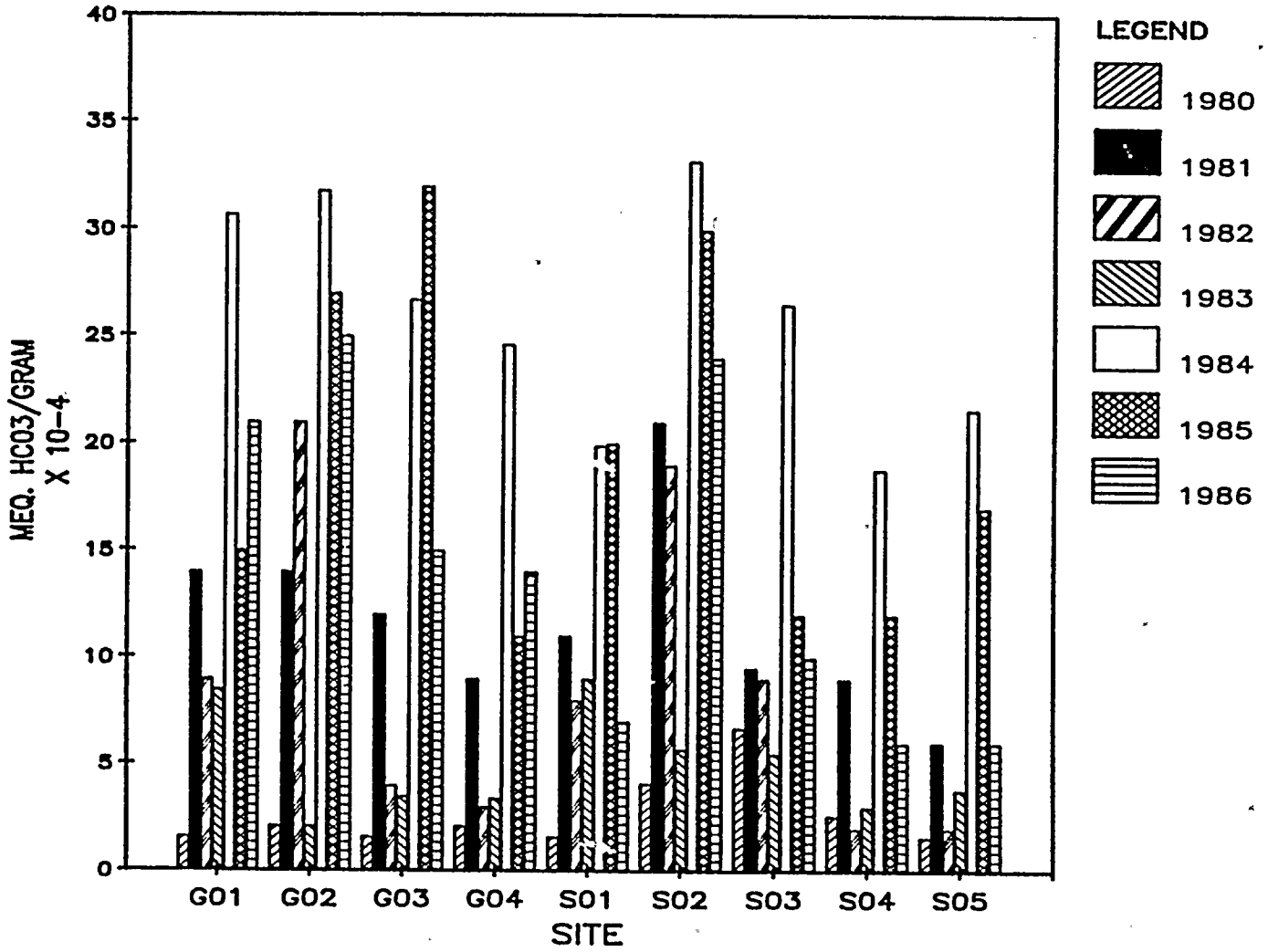

FIGURE 9. SOIL BICARBONATE, 1980-1986

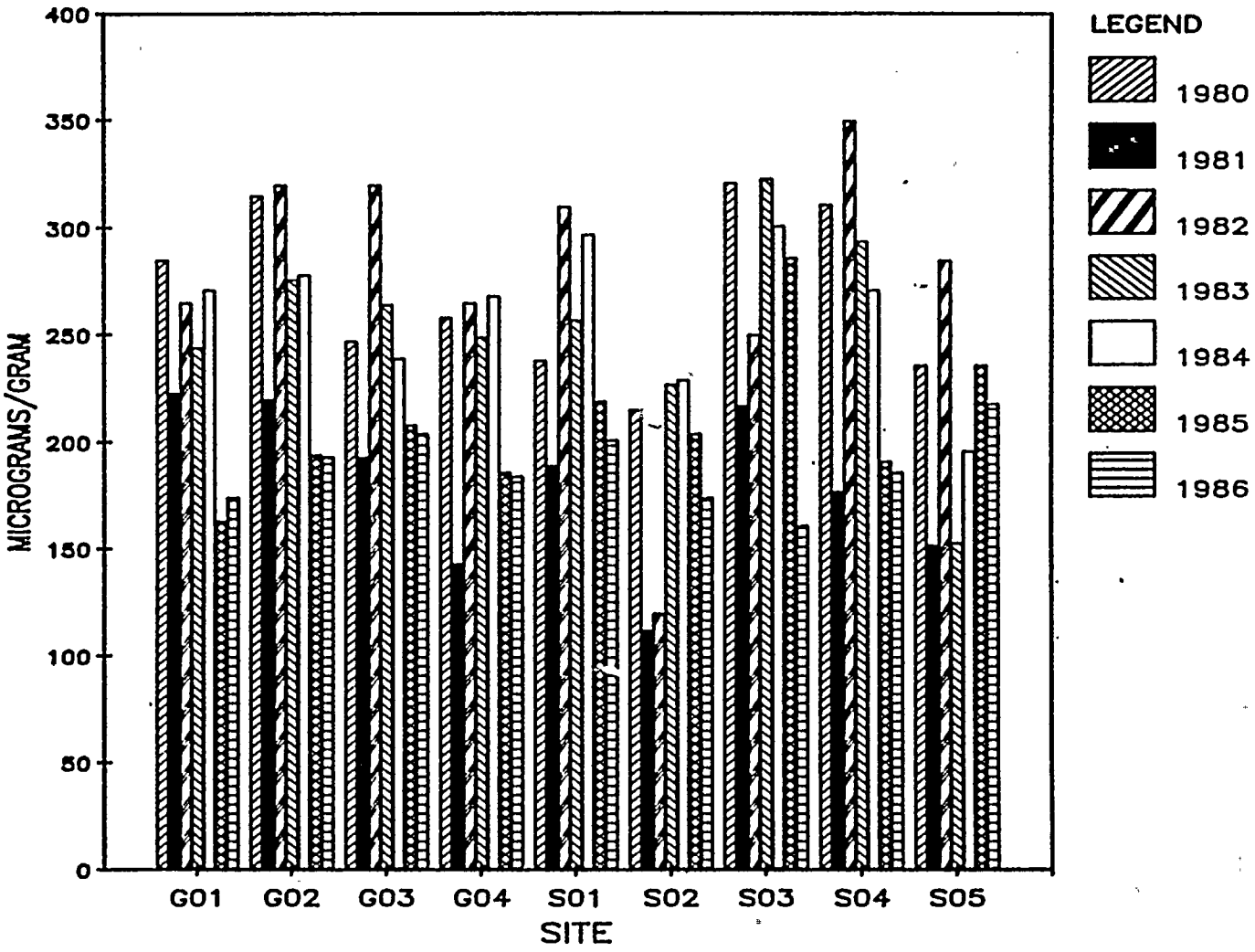

FIGURE 10. SOIL FLUORIDE, 1980-1986

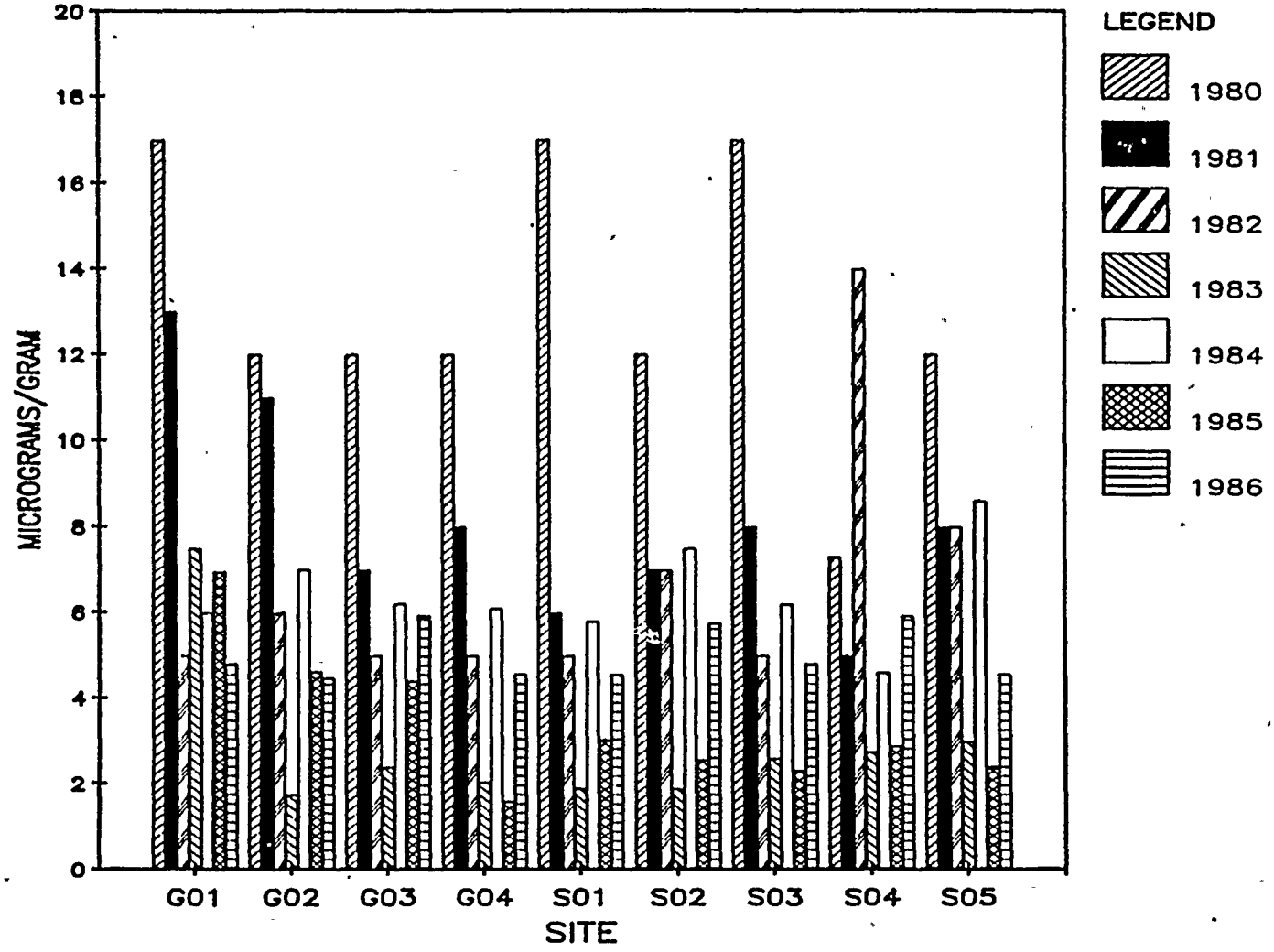

FIGURE 11. SOIL CHLORIDE, 1980-1986

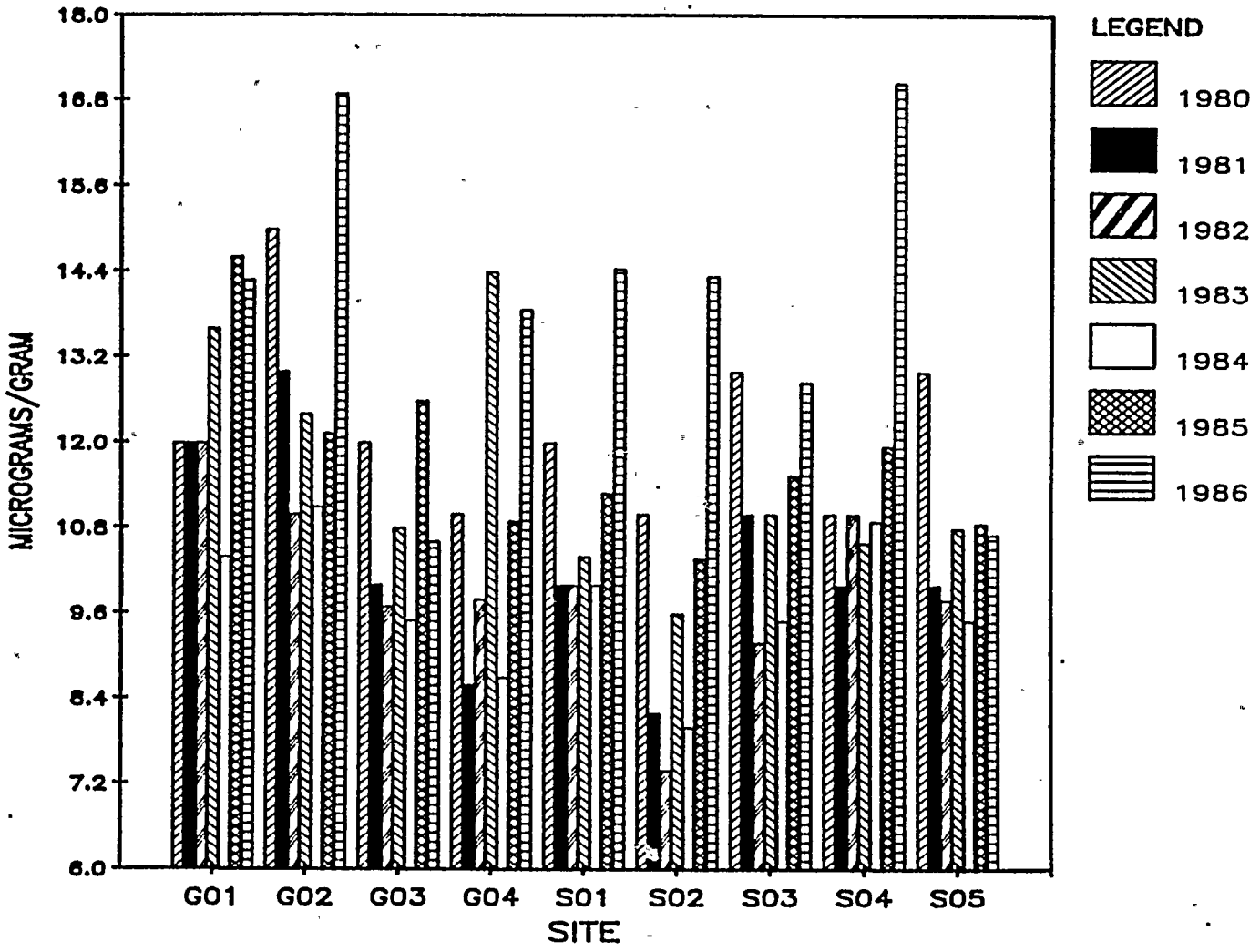

FIGURE 12. SOIL COPPER, 1980-1986

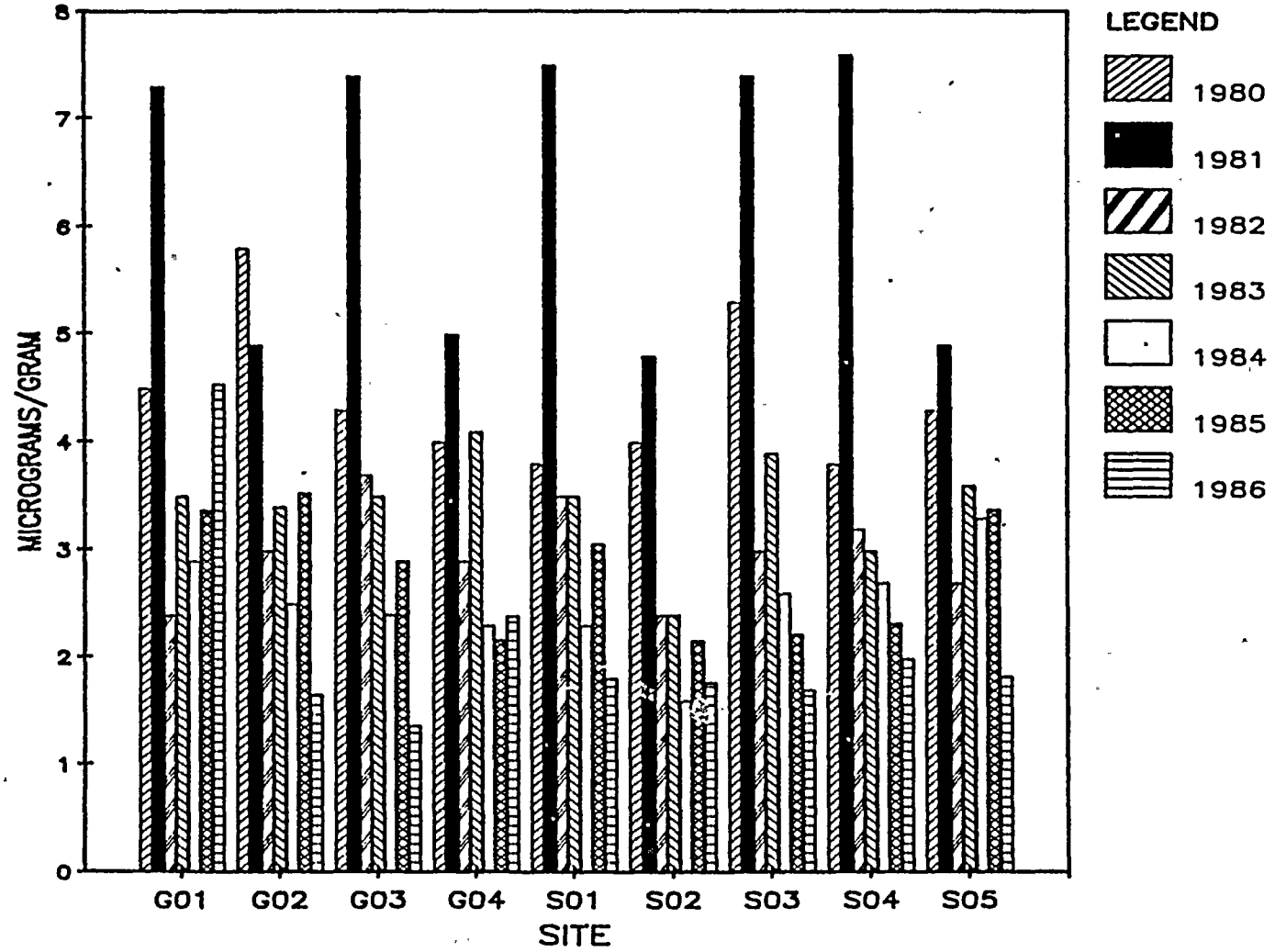

FIGURE 13. SOIL LEAD, 1980-1986

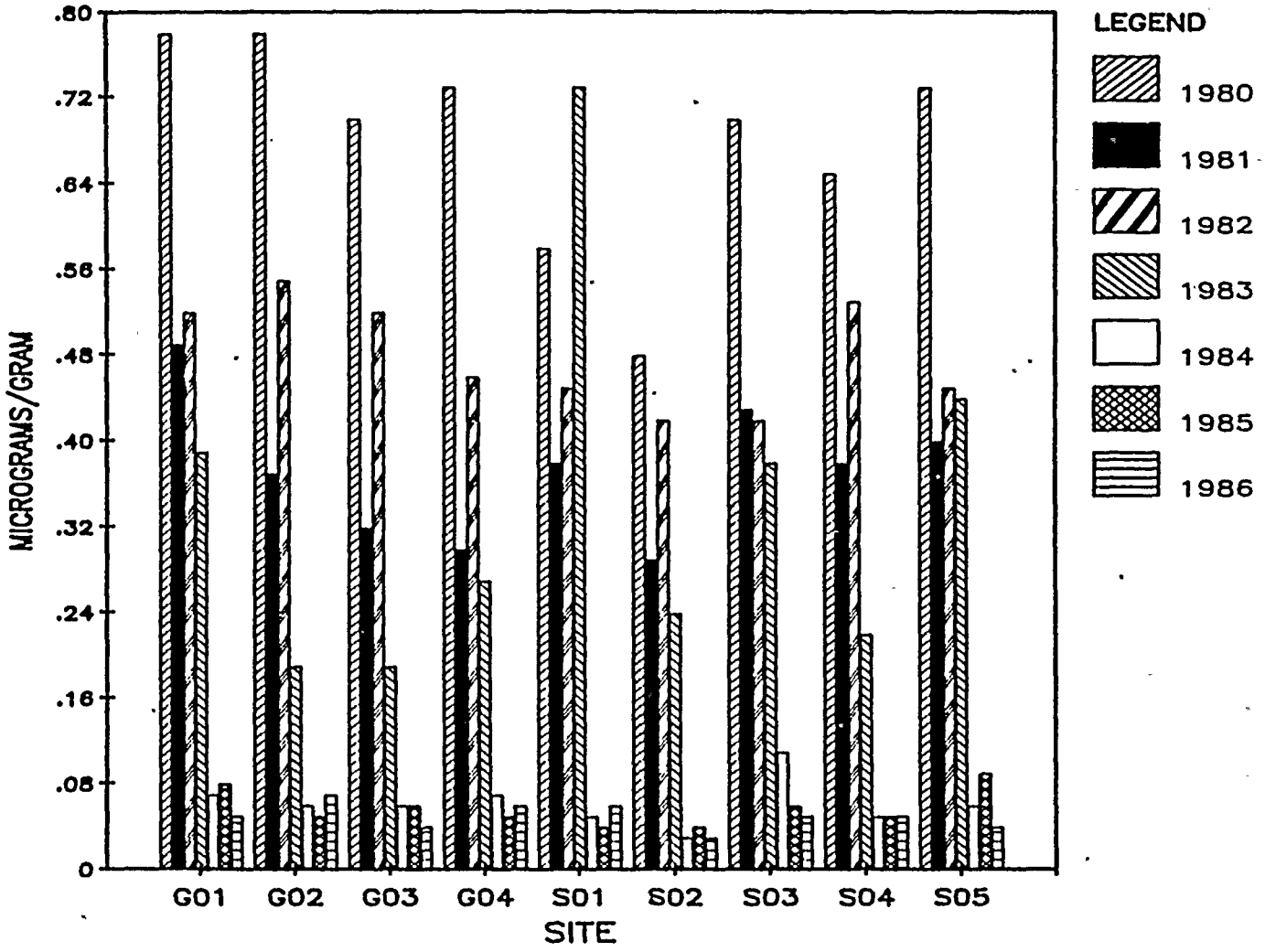

FIGURE 14. SOIL CADMIUM, 1980-1986

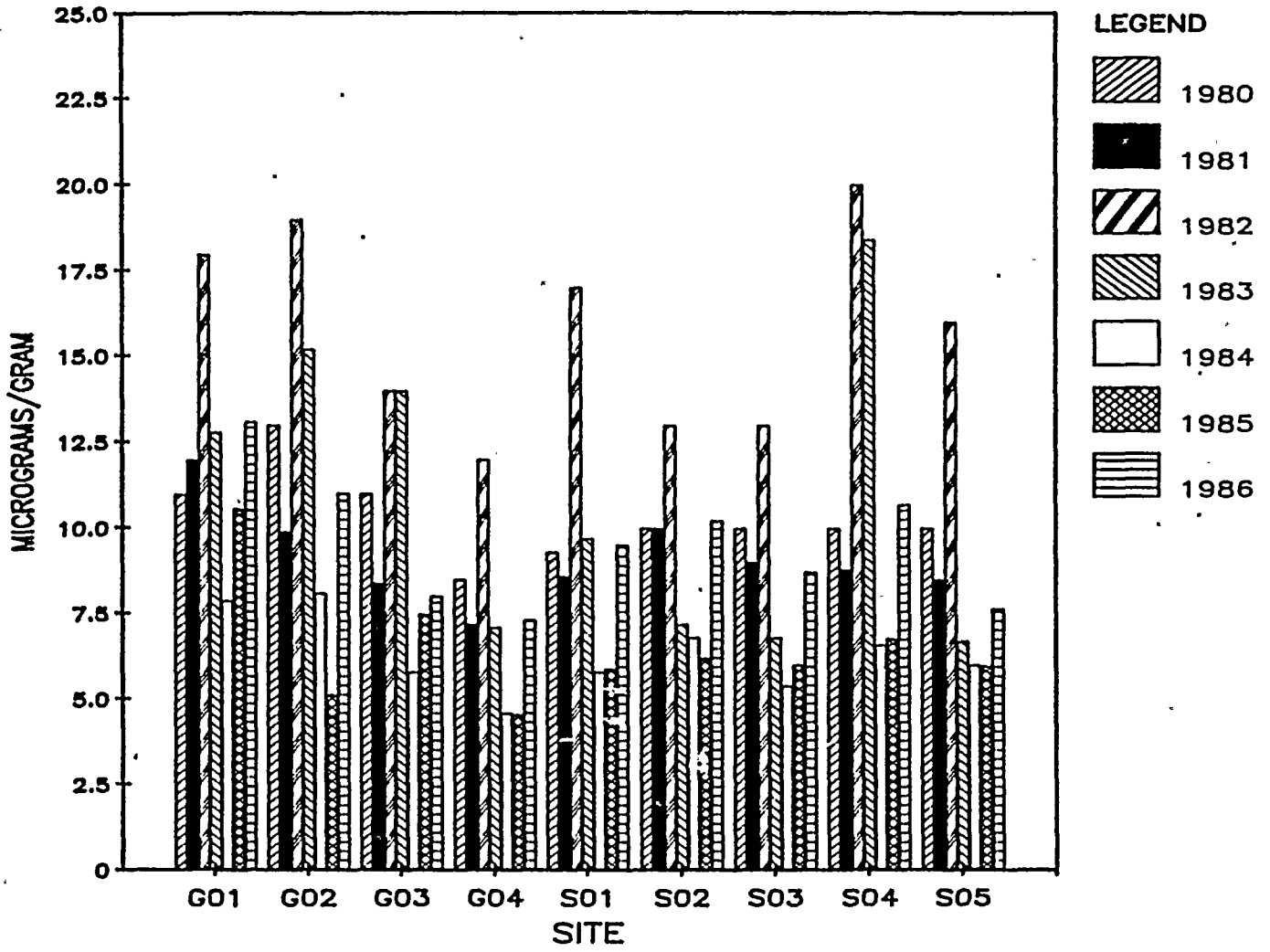

FIGURE 15. SOIL CHROMIUM, 1980-1986

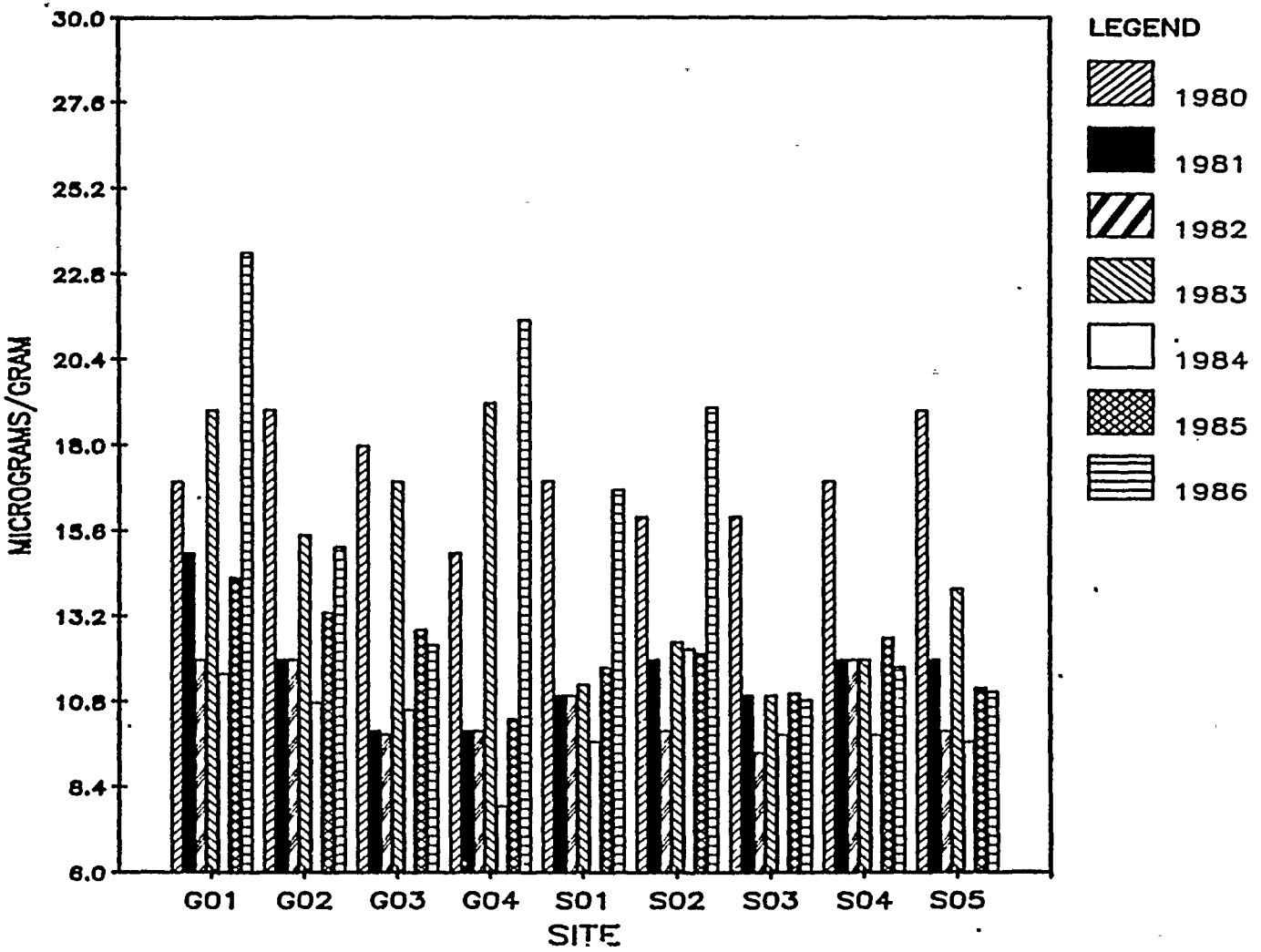

FIGURE 16. SOIL NICKEL, 1980-1986

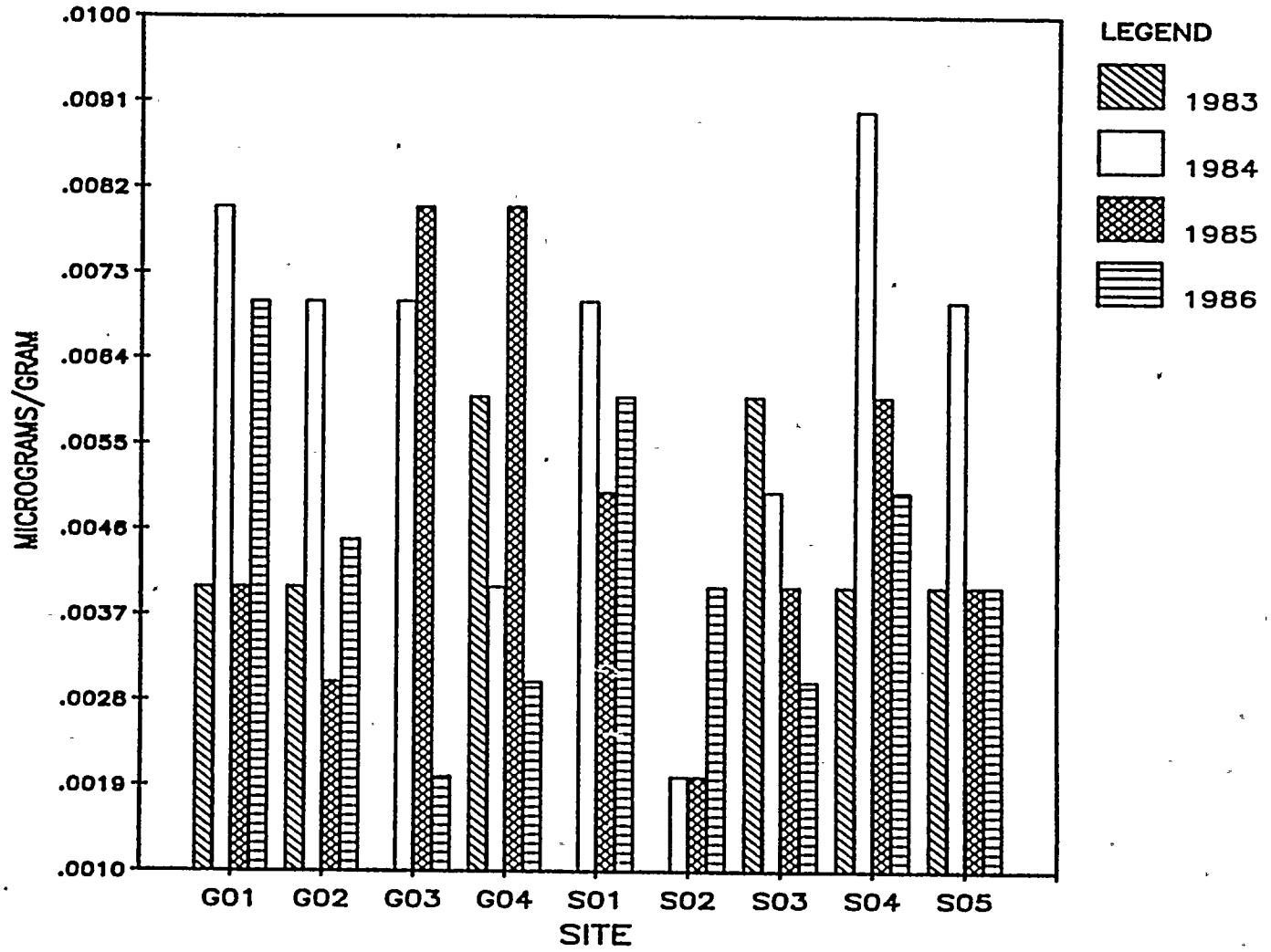

FIGURE 17. SOIL MERCURY, 1983-1986

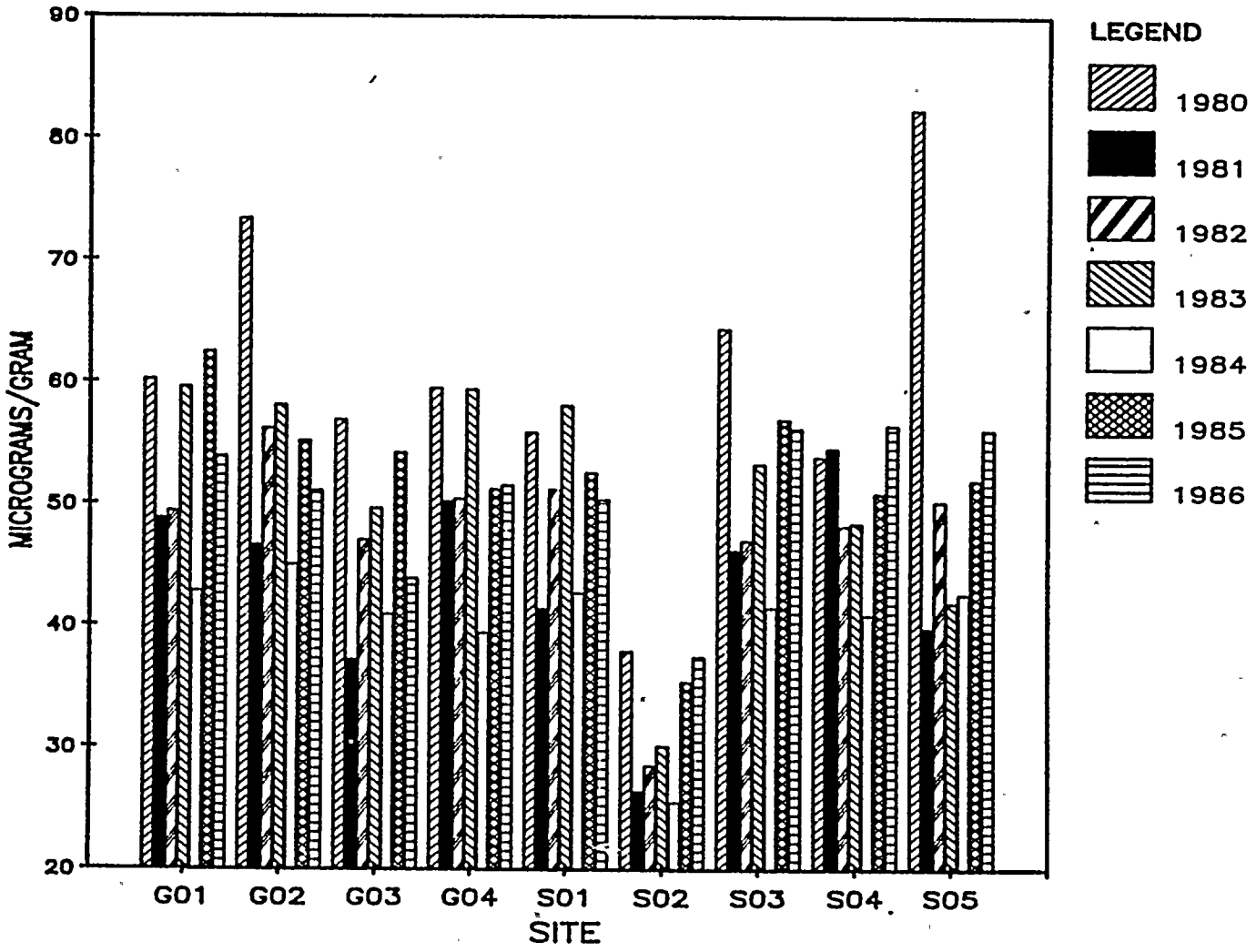

FIGURE 18. SOIL ZINC, 1980-1986

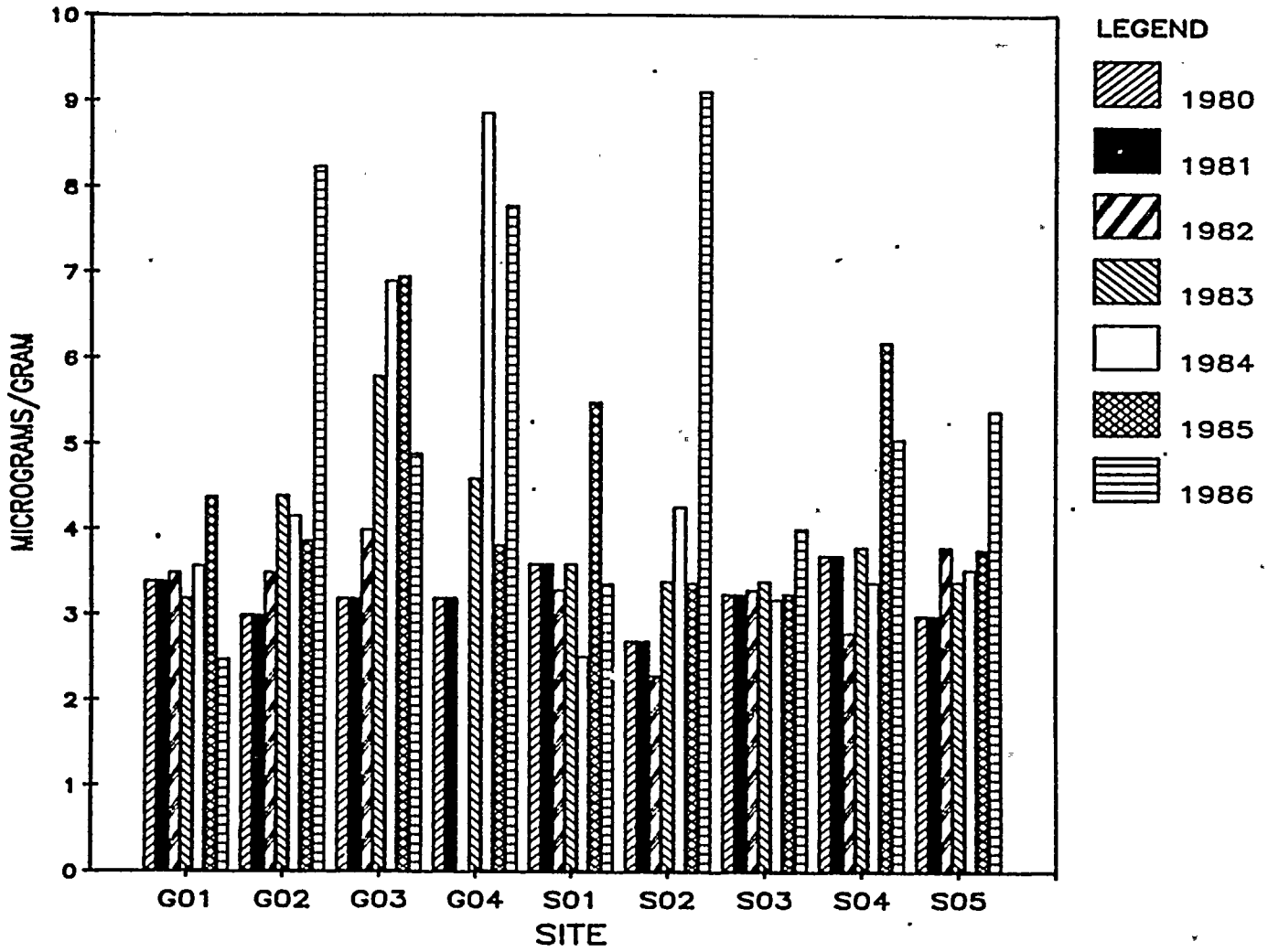

FIGURE 19. COPPER IN POA SANDBERGII, 1980-1986

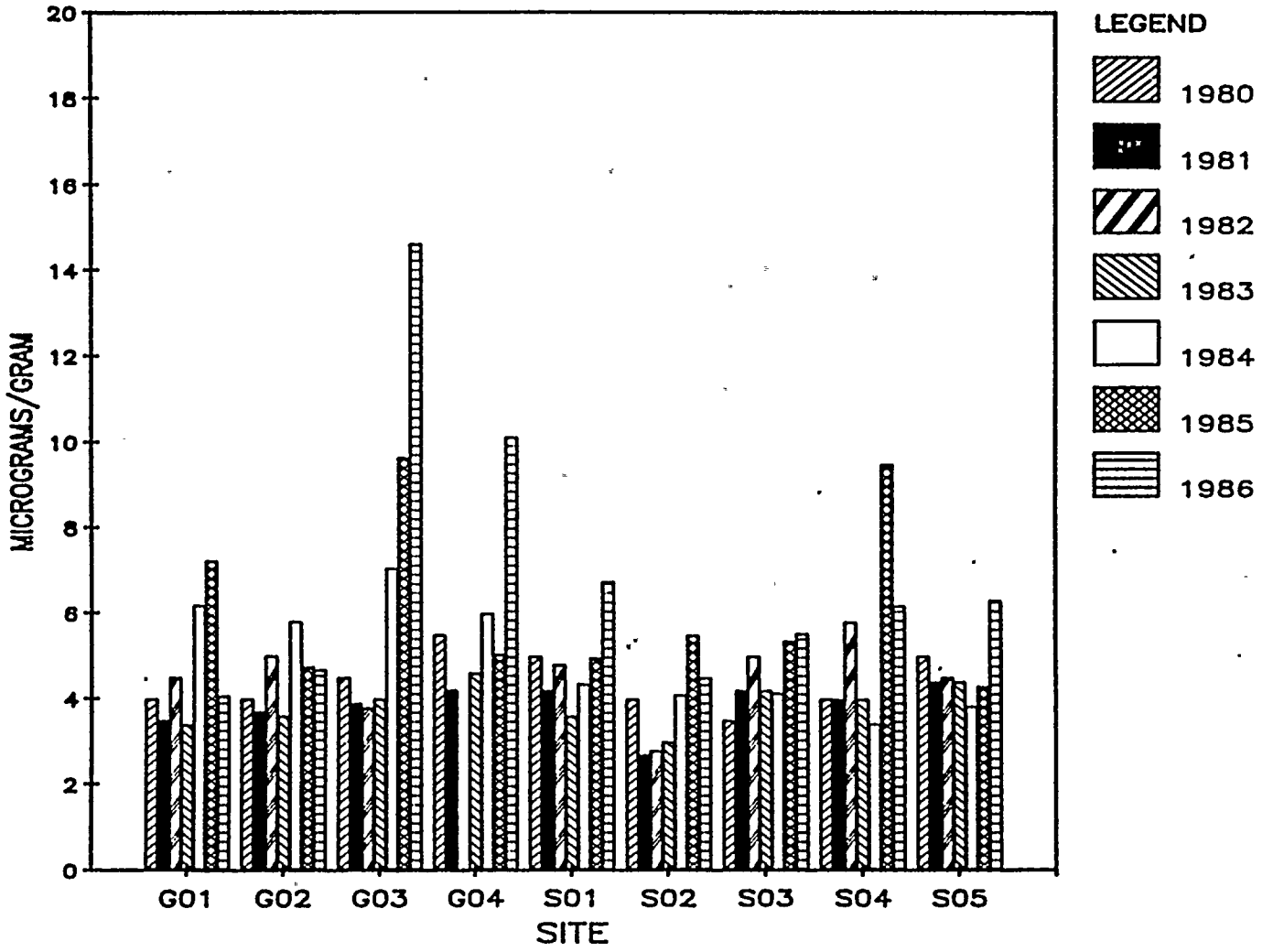

FIGURE 20. COPPER IN BROMUS TECTORUM, 1980-1986

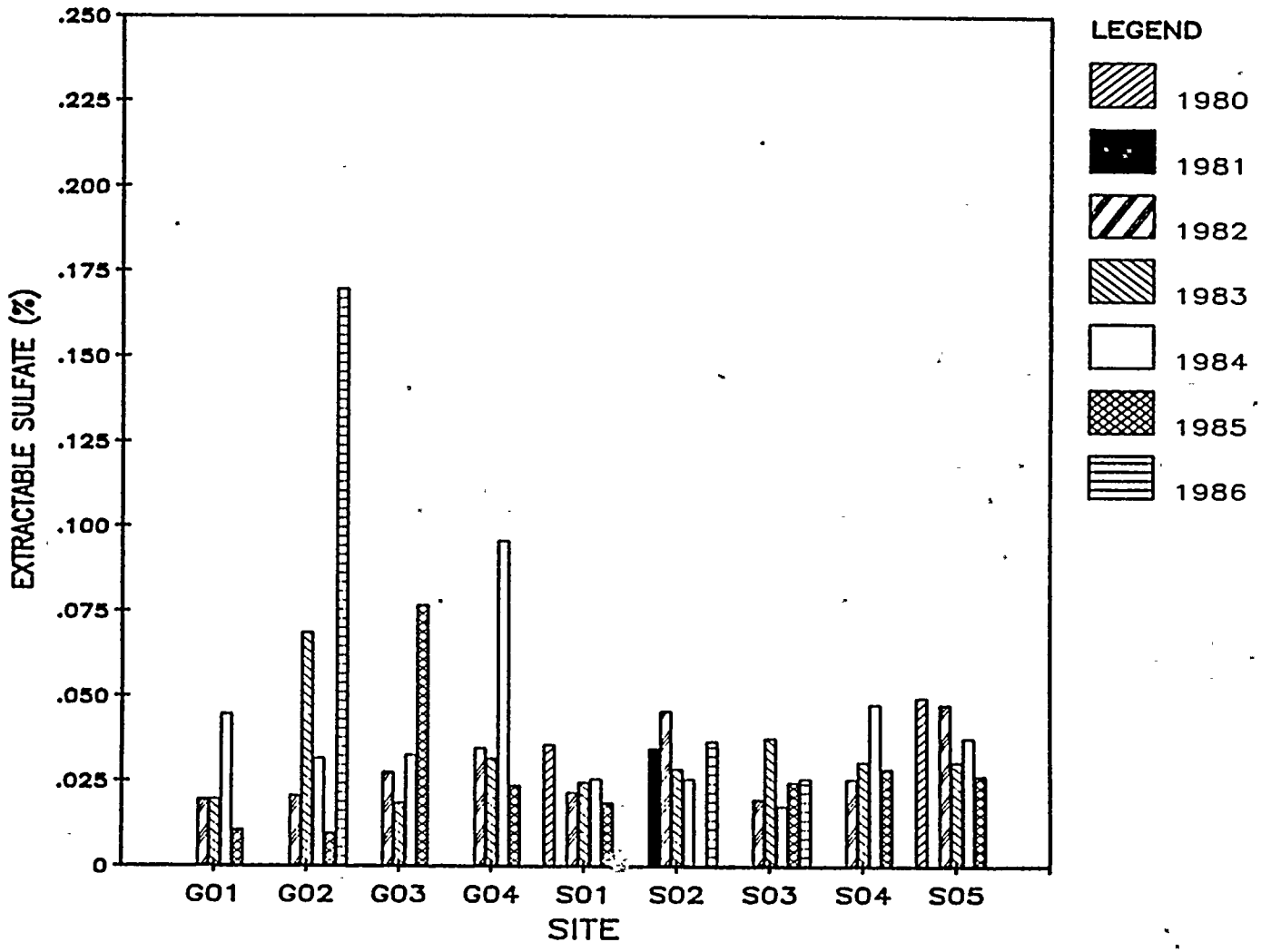

FIGURE 21. SULFATE IN POA SANDBERGII, 1980-1986

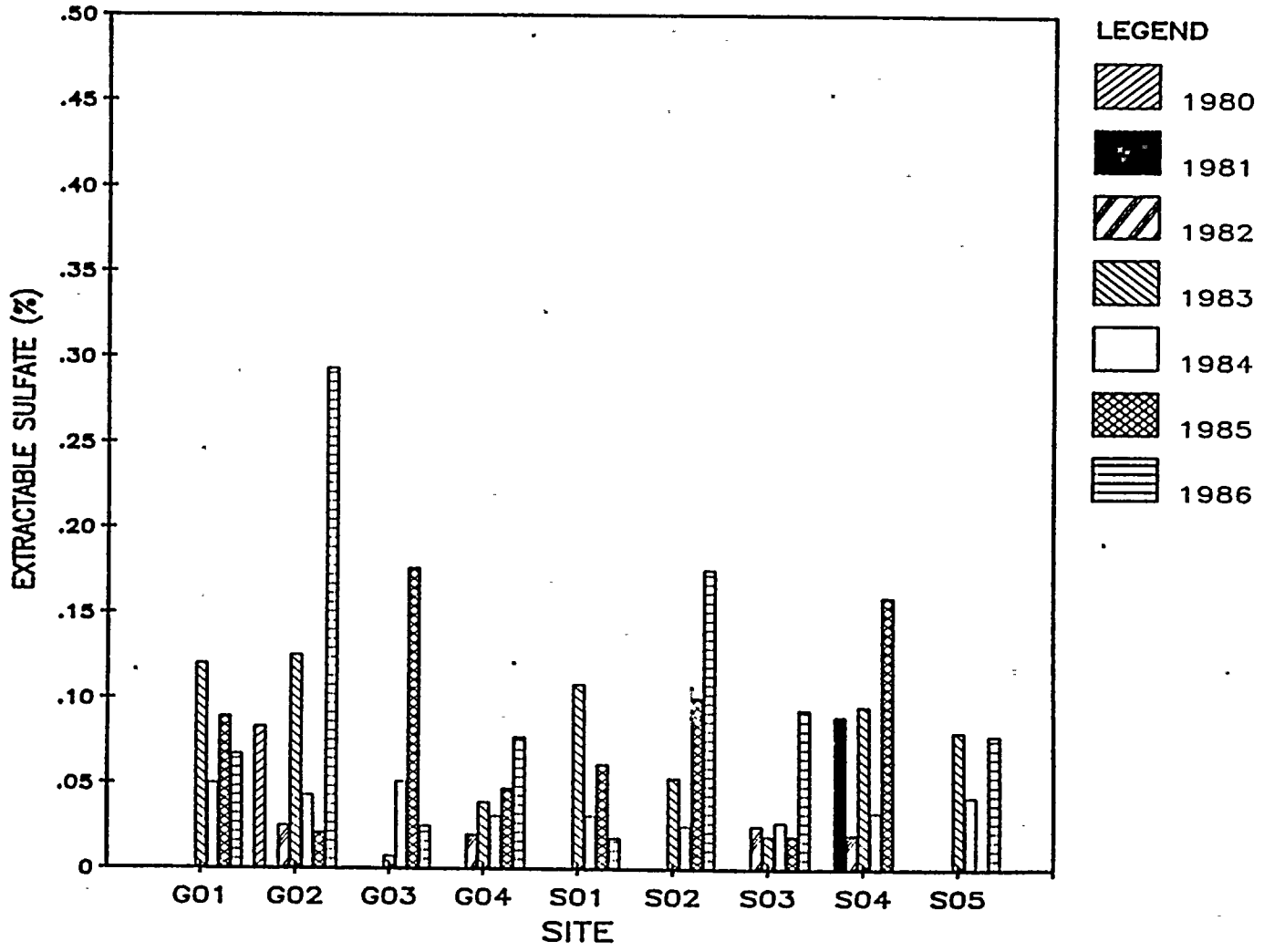

FIGURE 22. SULFATE IN BROMUS TECTORUM, 1980-1986

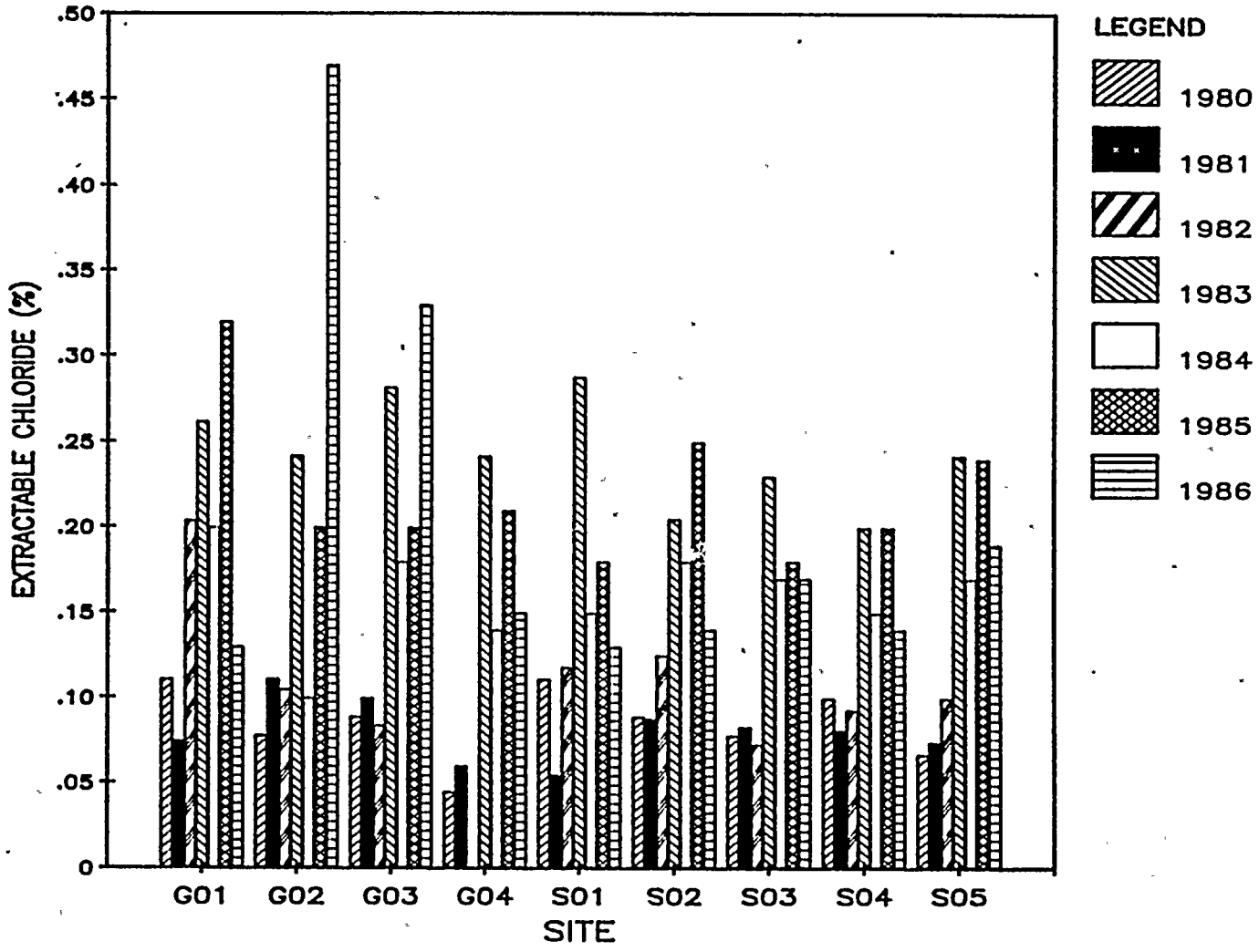

FIGURE 23. CHLORIDE IN POA SANDBERGII, 1980-1986

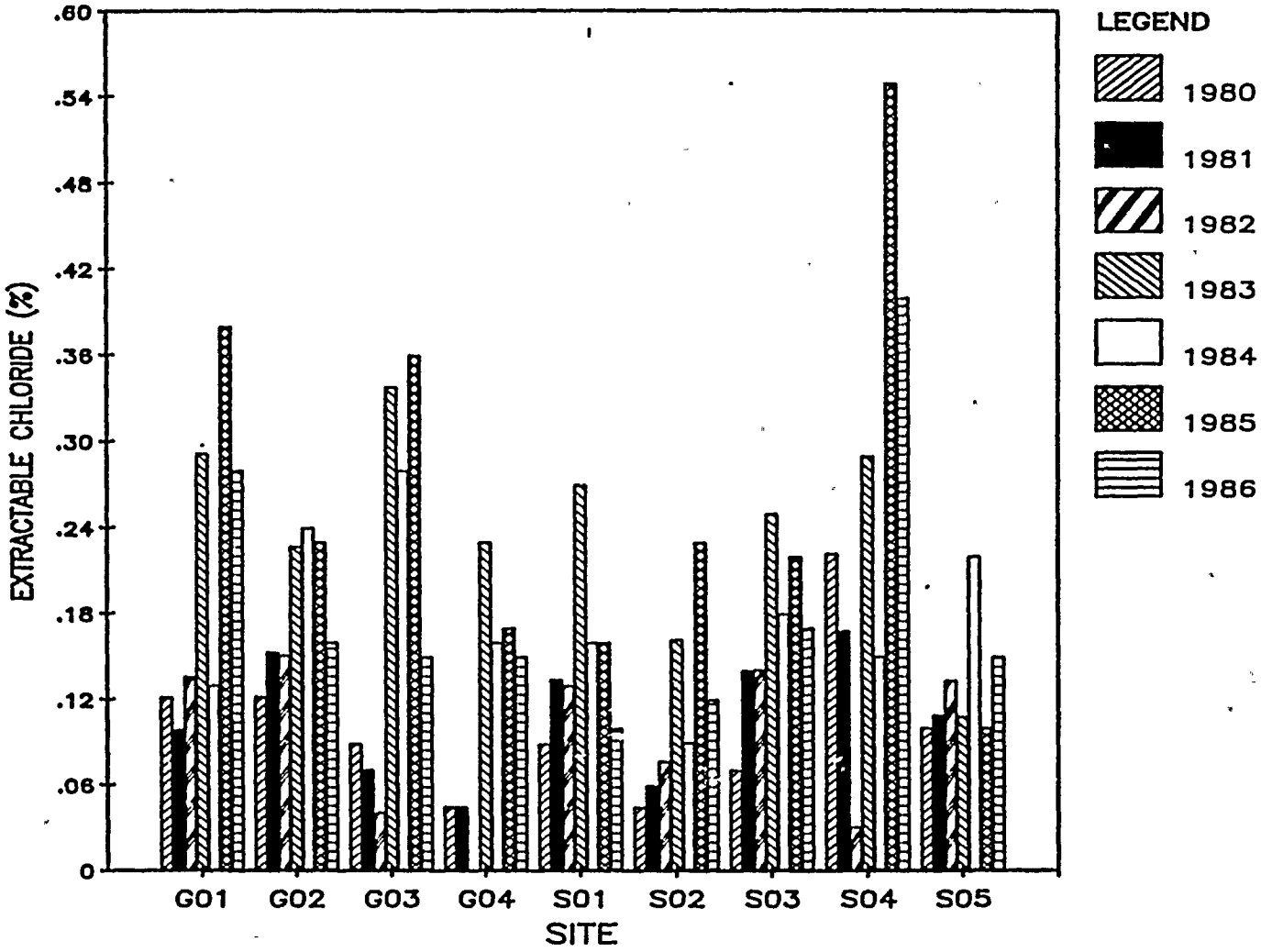

FIGURE 24. CHLORIDE IN BROMUS TECTORUM, 1980-1986

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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Docket No. 50-397

April 23, 1987
G02-87-146

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Washington, D. C. 20555

Dear Sirs:

Subject: NUCLEAR PLANT NO. 2
ANNUAL ENVIRONMENTAL OPERATING REPORT

Reference: Facility Operating License NPF-21
Appendix B - Environmental Protection Plan

Per Section 5.4.1 of the referenced EPP, please find attached the subject report for the 1986 calendar year.

Very truly yours,

GC Sorensen

G. C. Sorensen
Manager, Regulatory Programs

Attachment: As stated

cc: JB Martin/NRC RV
R Dodds/Resident Inspector/901A
WL Fitch/EFSEC

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