APPENDIXES

APPENDIX A. RESULTS OF CHEMICAL ANALYSES OF WATER, SEDIMENT, AND BIOTA

Results from the analysis of elements in water, sediment, and biota samples collected from 1987 through 1990 are shown here in detail. Included are Tukey box plots of the dissolved (fig. A1), total recoverable (fig. A2), and suspended-sediment data (fig. A3) by site. Concentrations of all elements in streambed sediment data for individual sites can be found in Colman and Sanzolone (1991).

Results of analysis of elements in biota are presented in table A1. Concentrations of elements in streambed-sediment samples collected concurrently with the tissue samples are presented in tables A2 and A3. Loads and yields from total recoverable concentrations in water are presented in table A4. Trends in concentrations in water are presented in table A5.

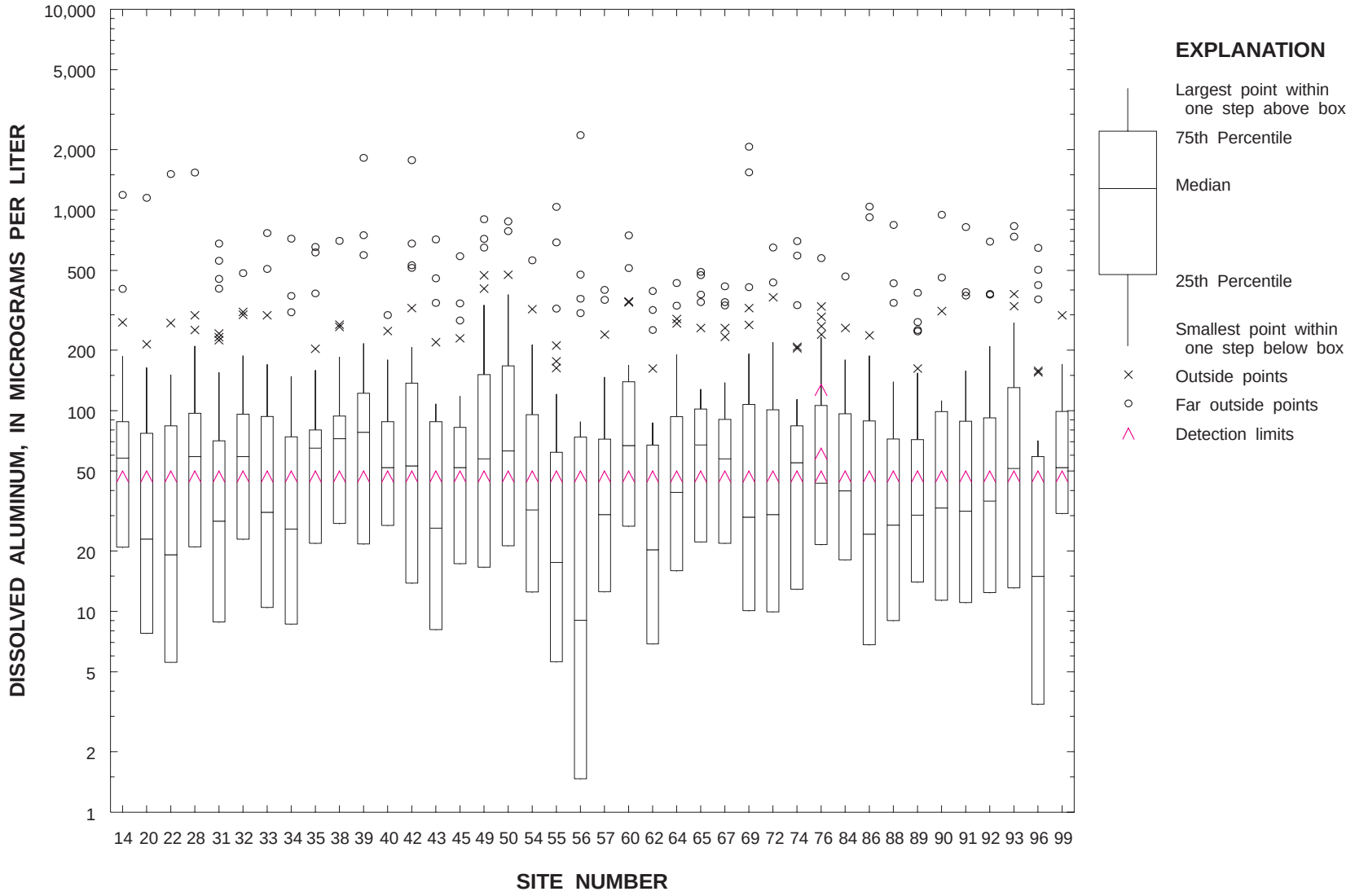


Figure A1. Concentrations of elements dissolved in water in the upper Illinois River Basin, 1987–90 (see figure 5 for site locations).

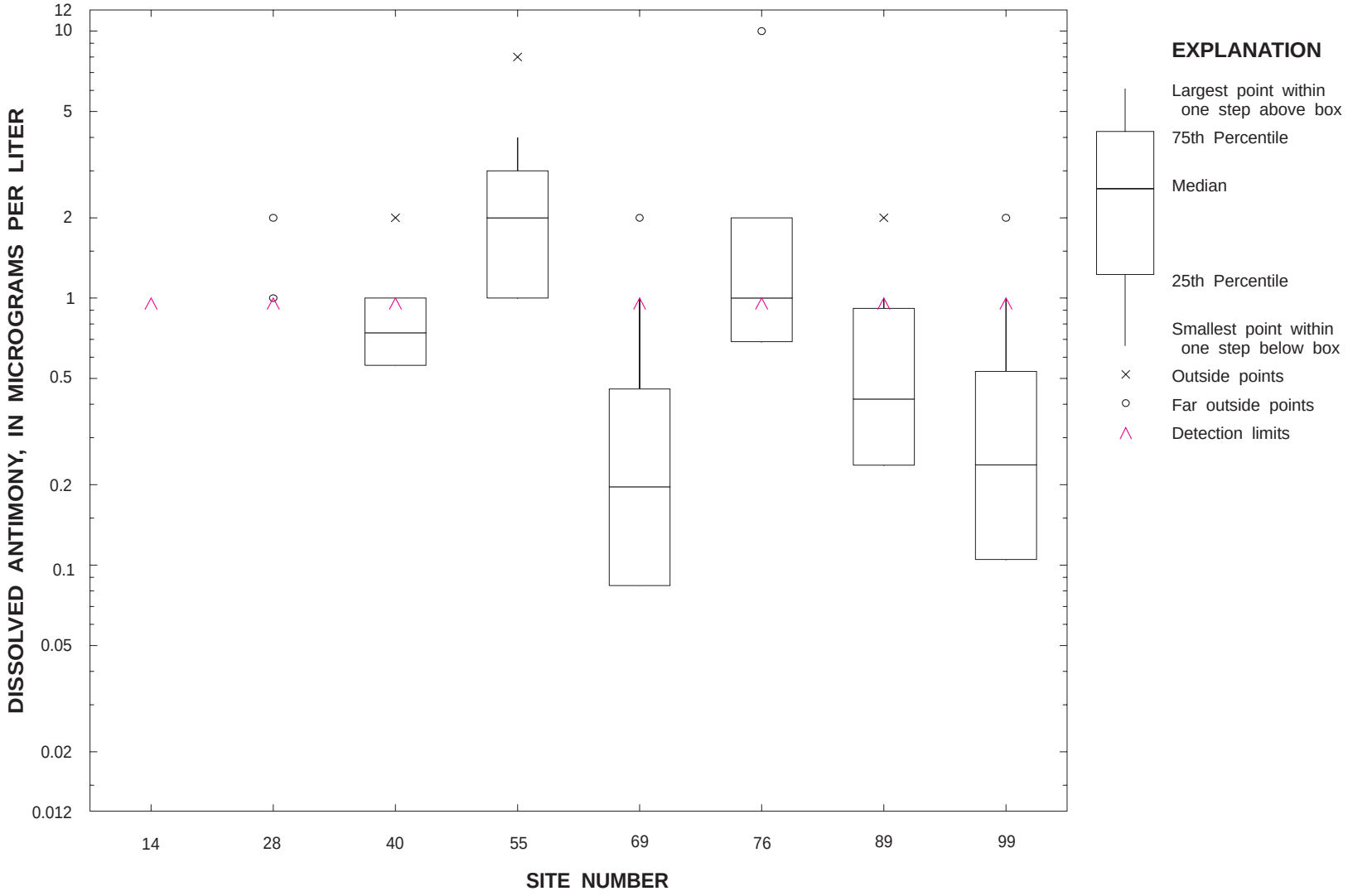
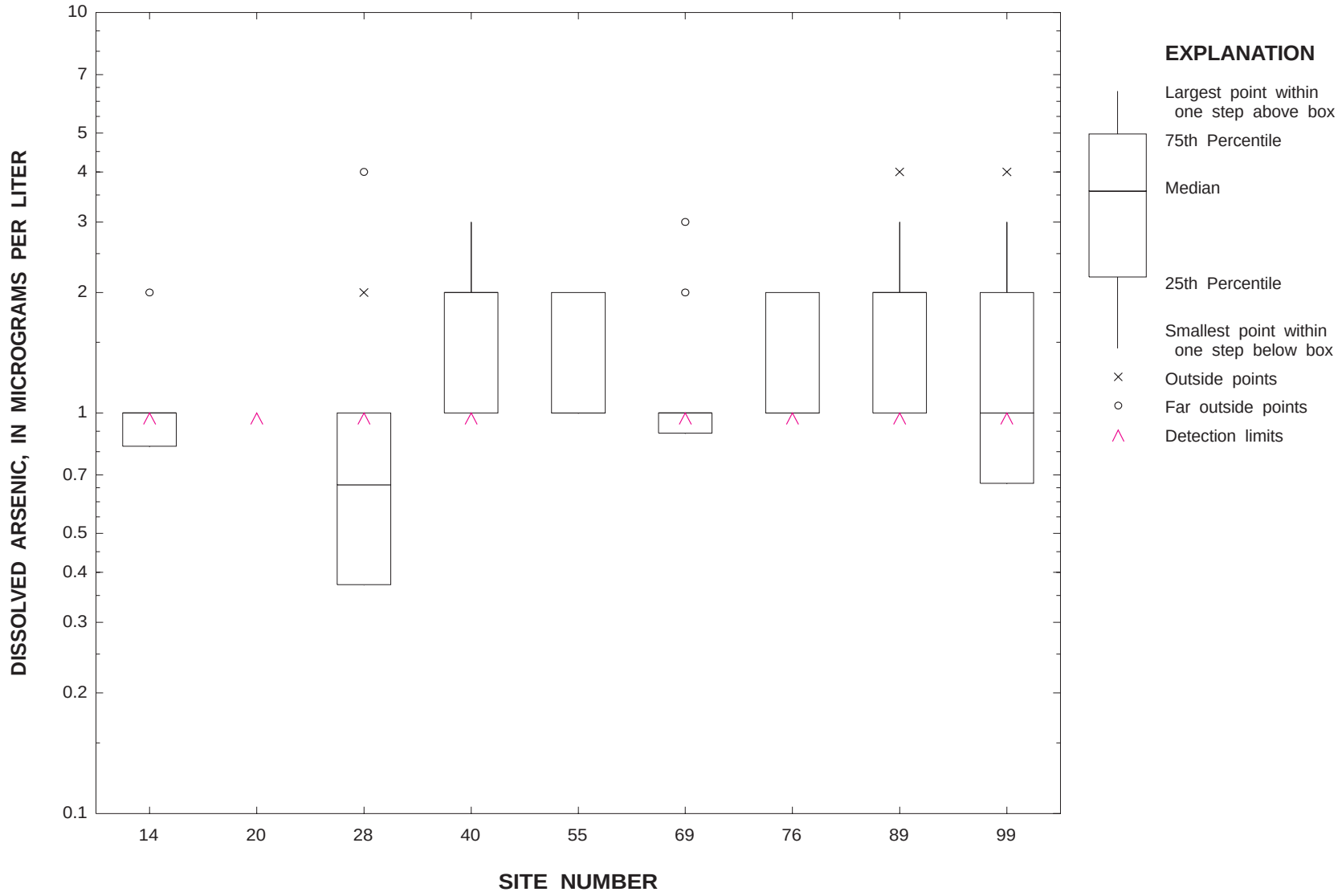


Figure A1. Continued.



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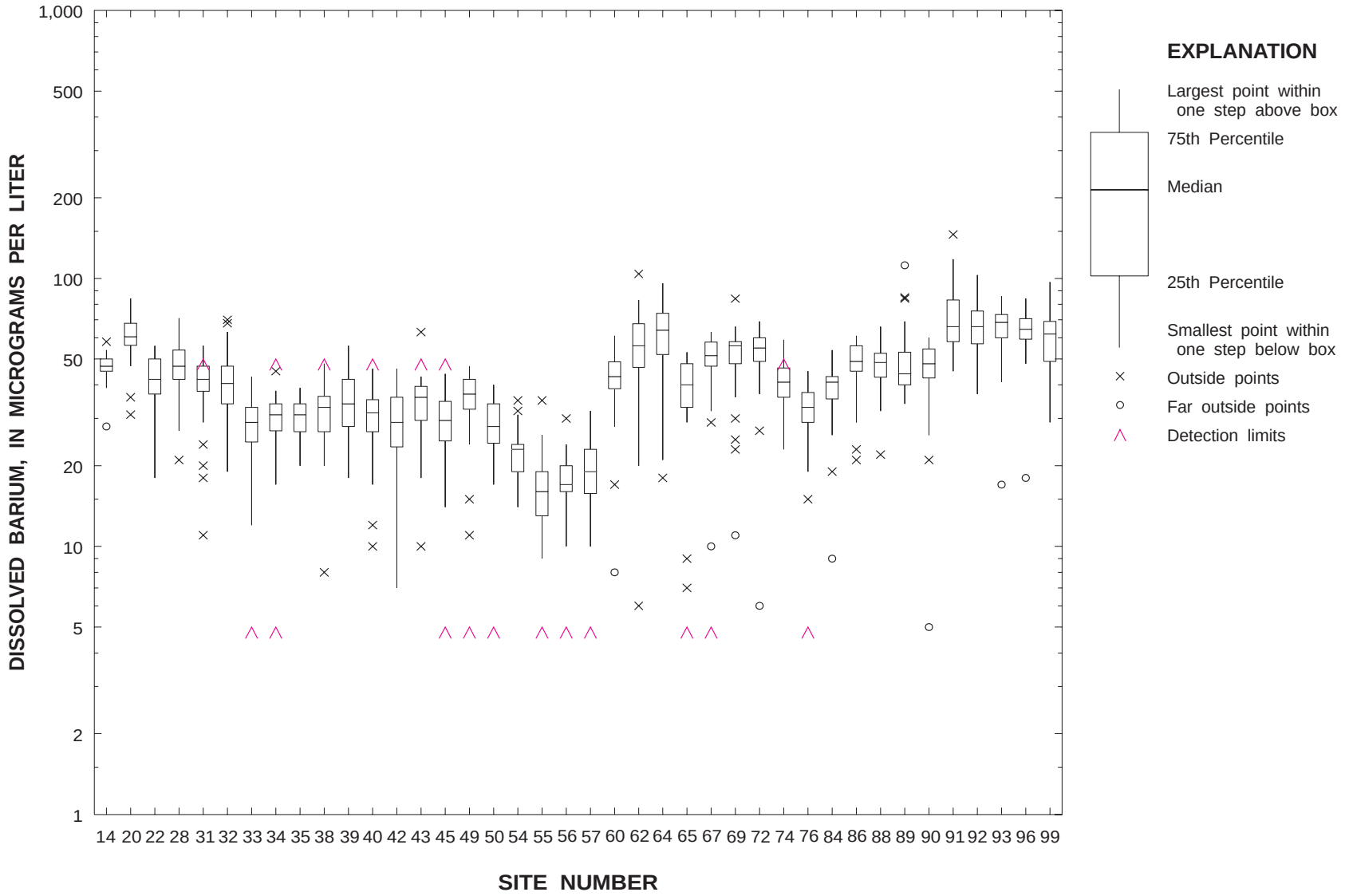

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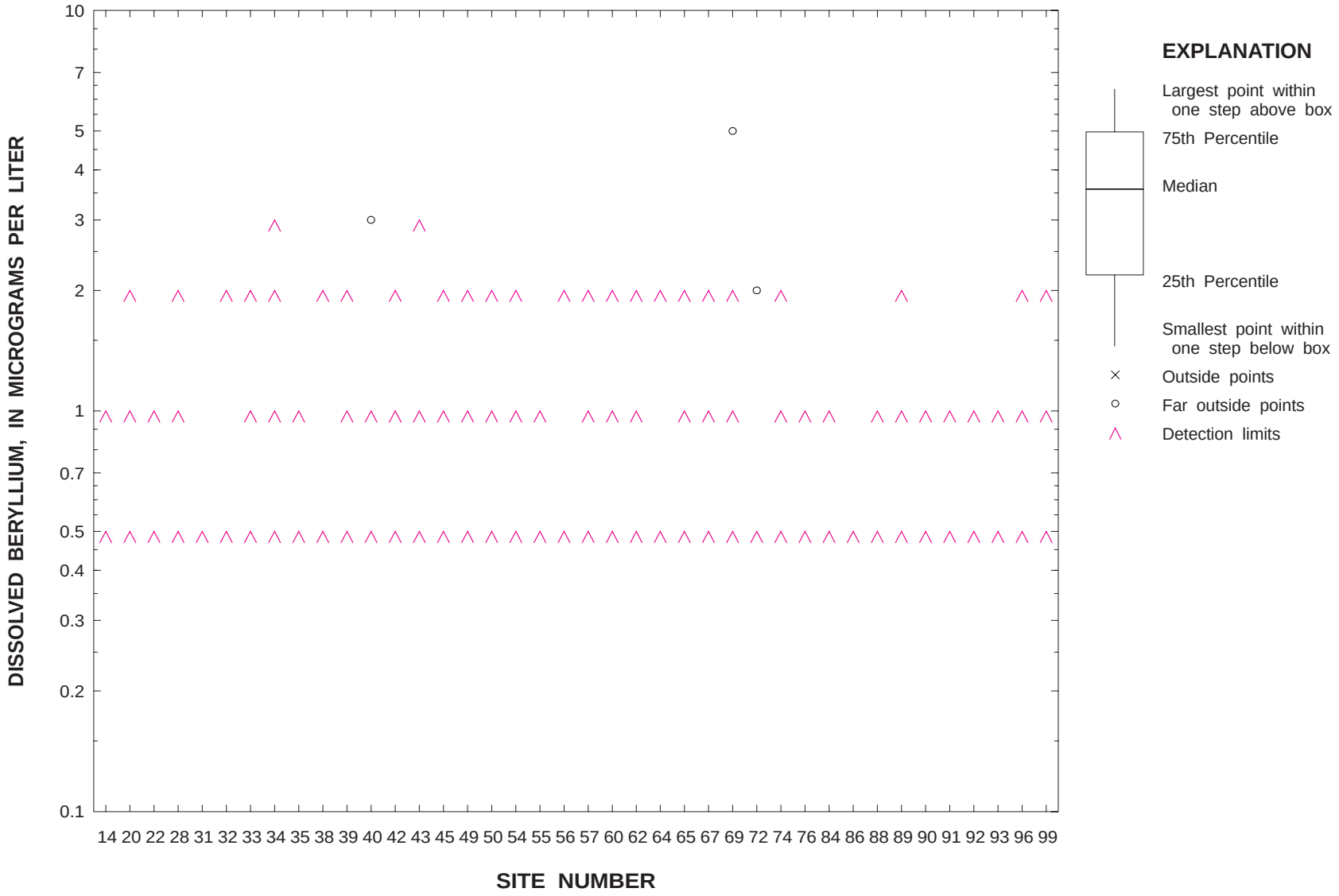

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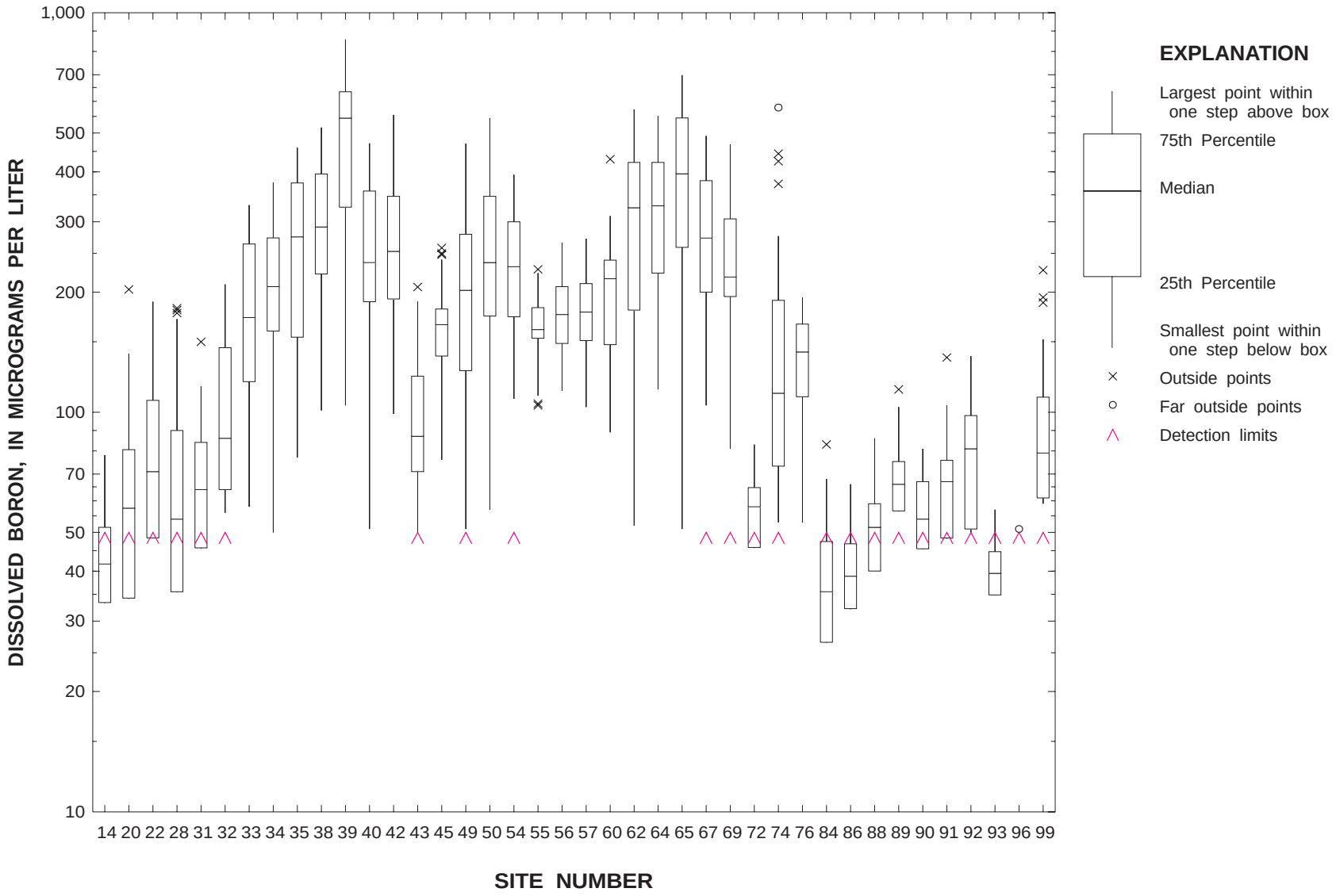

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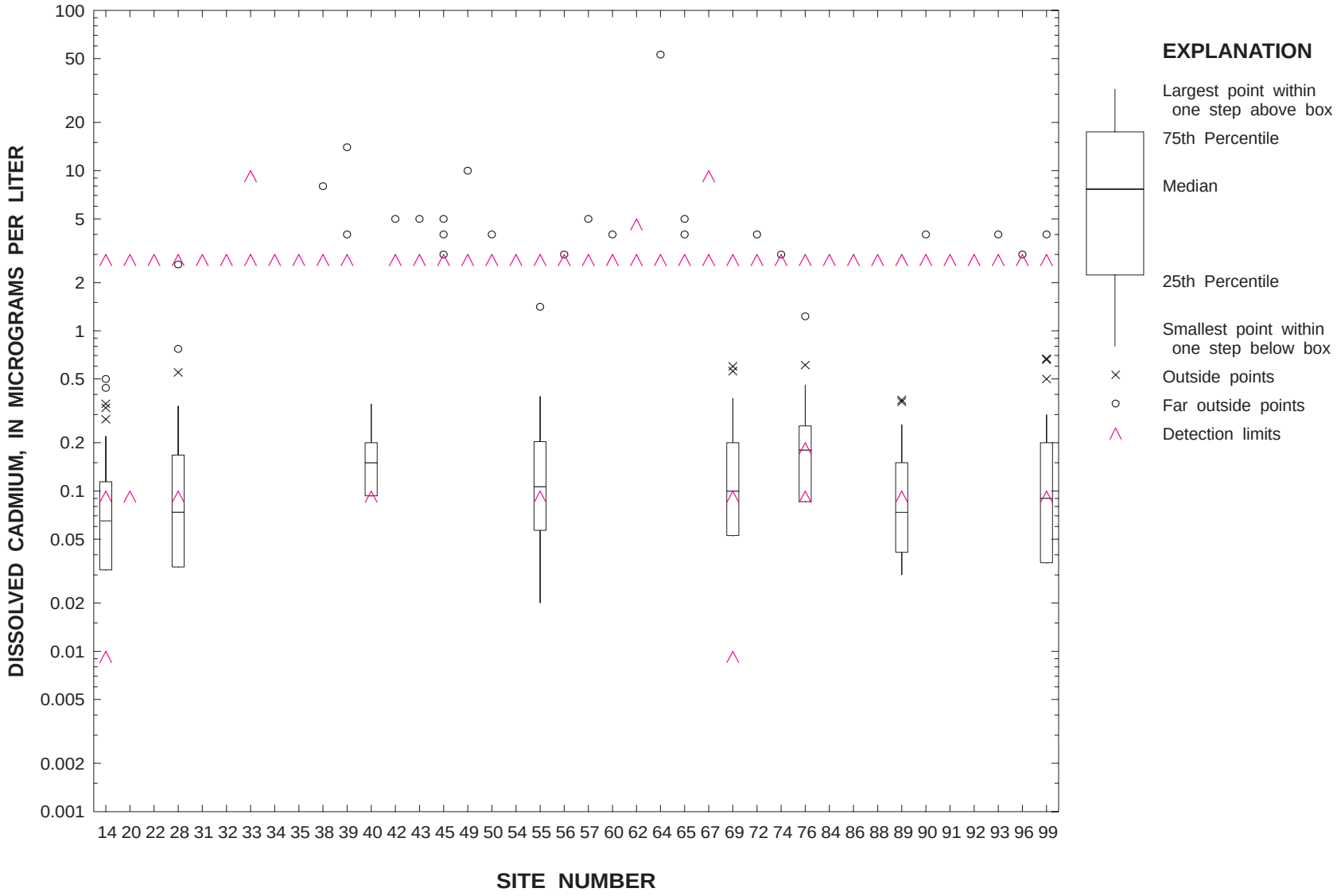

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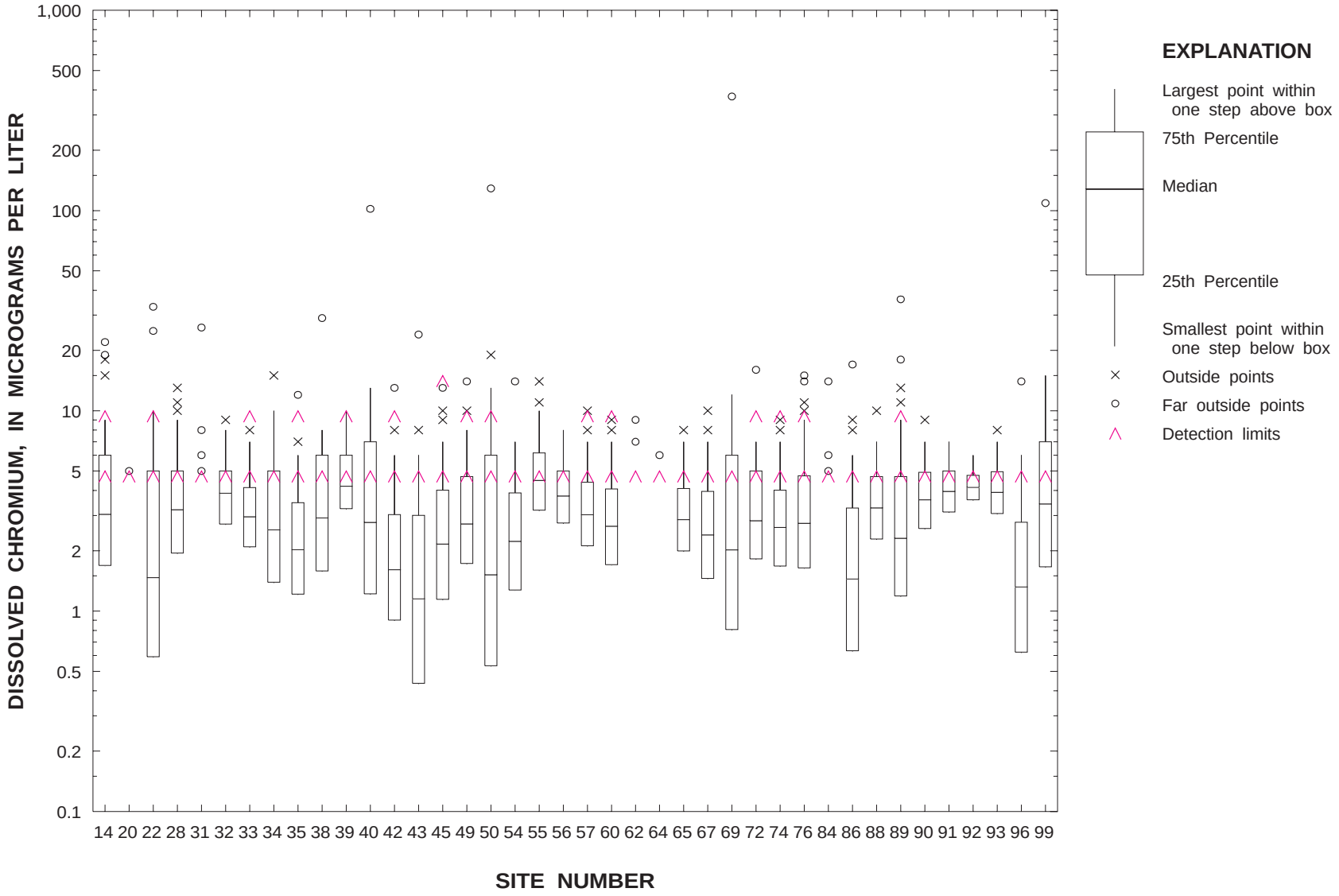

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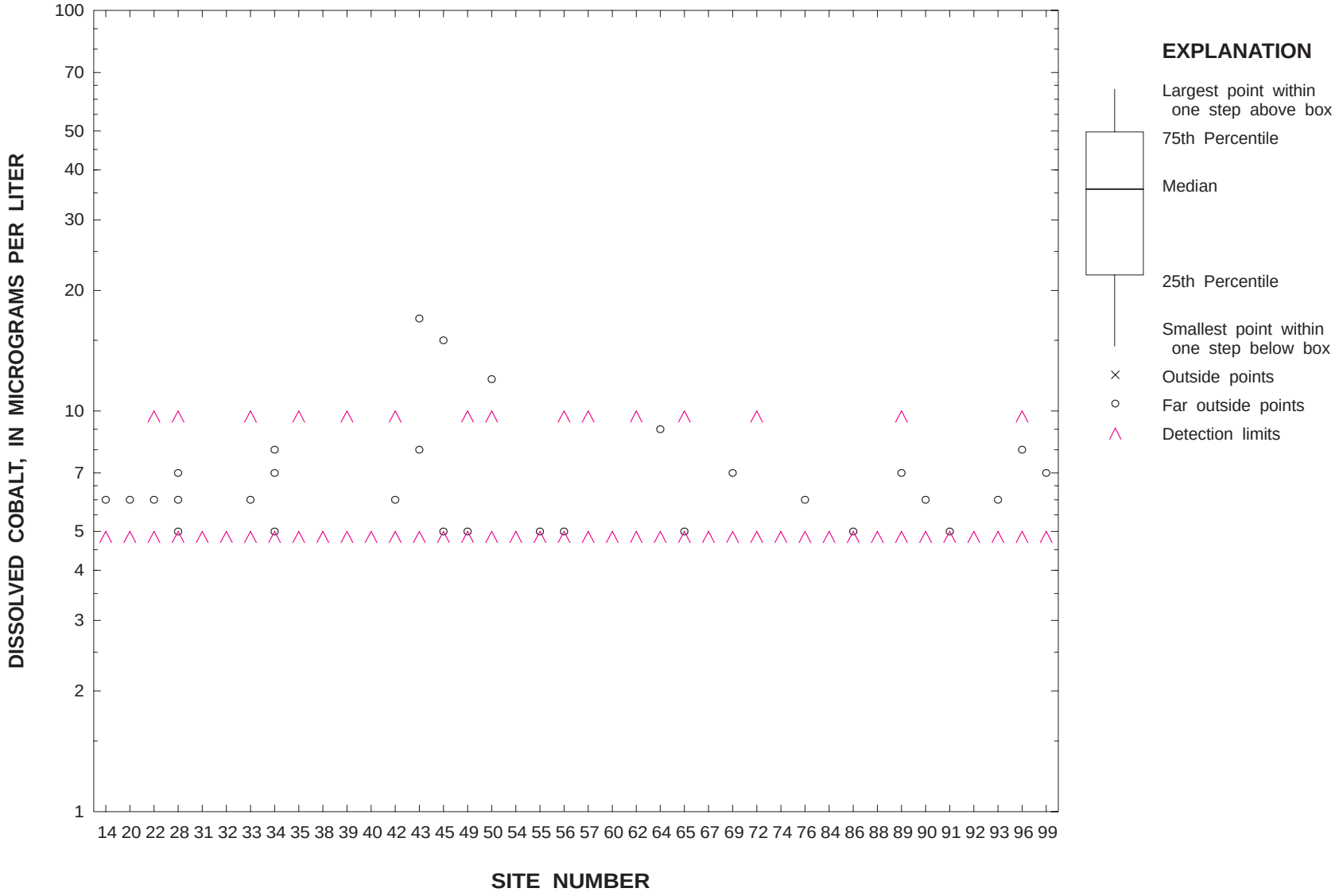

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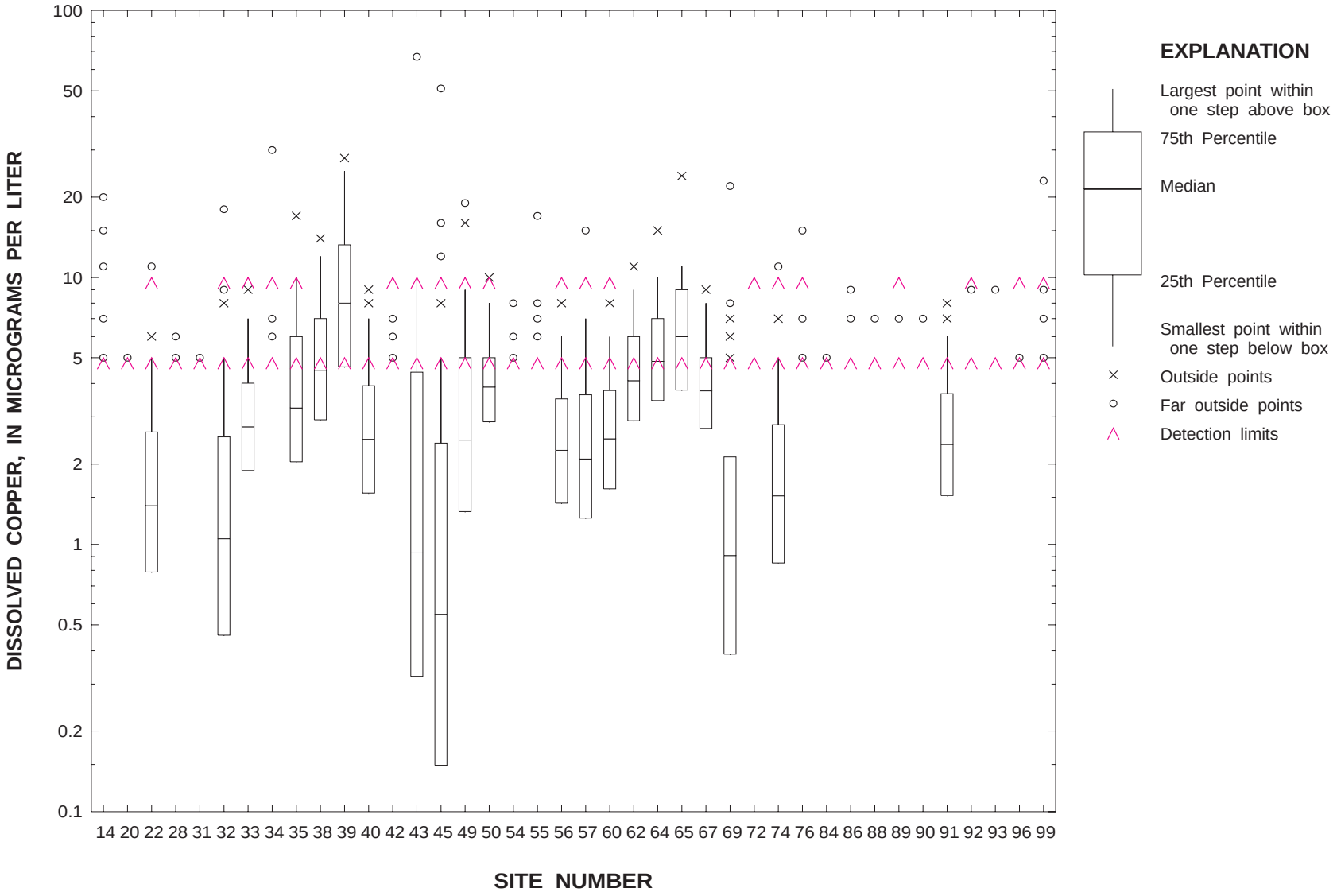

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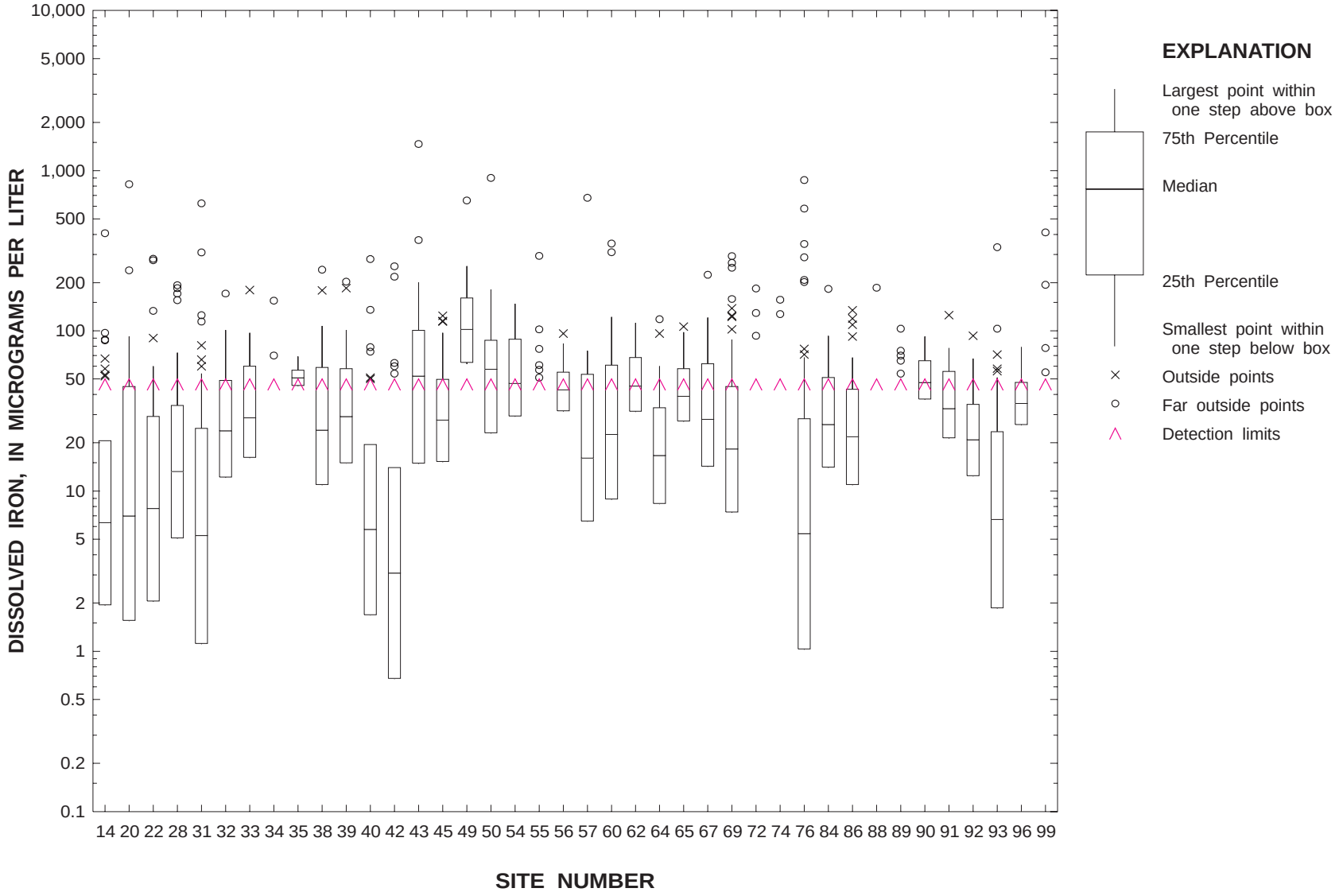

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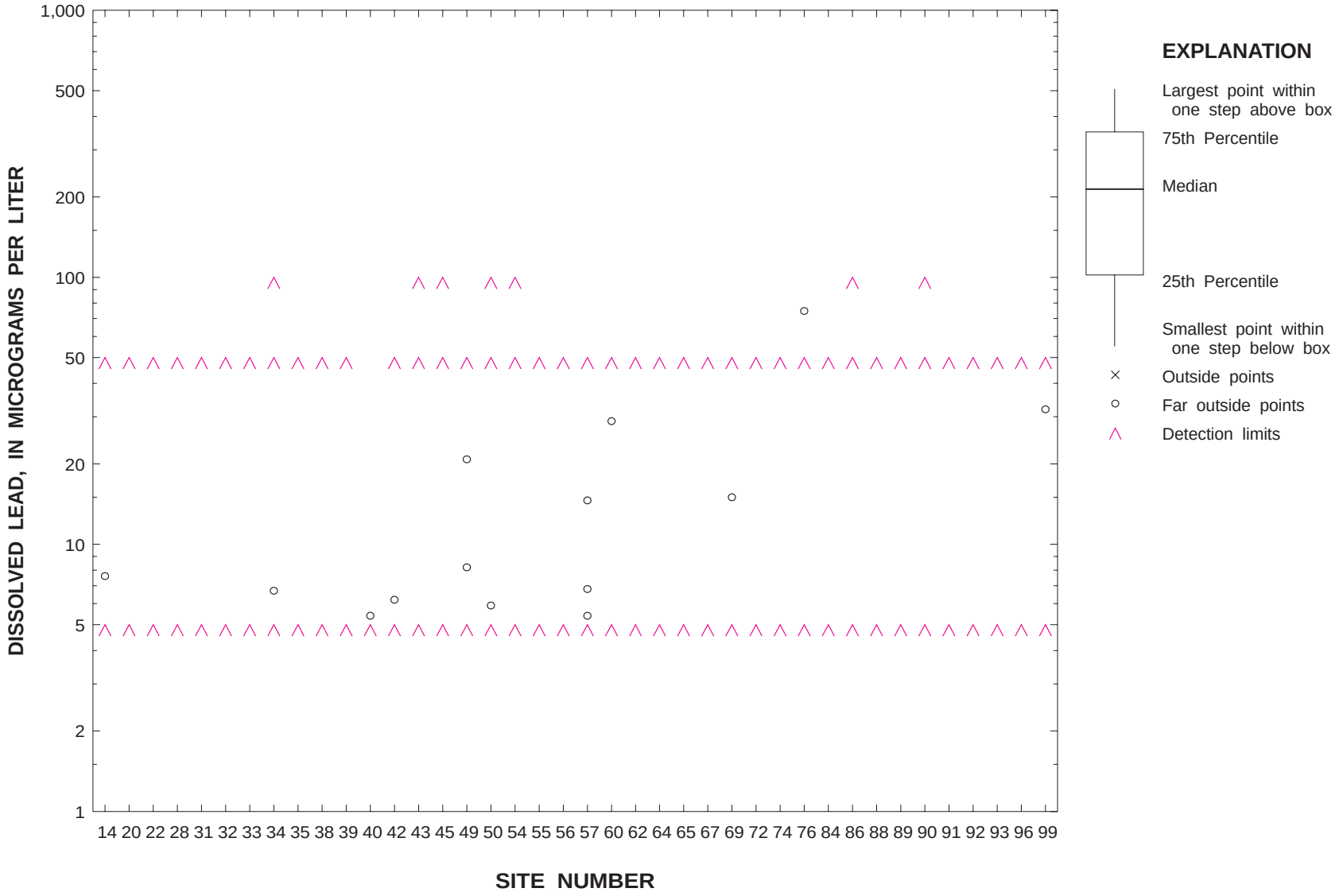

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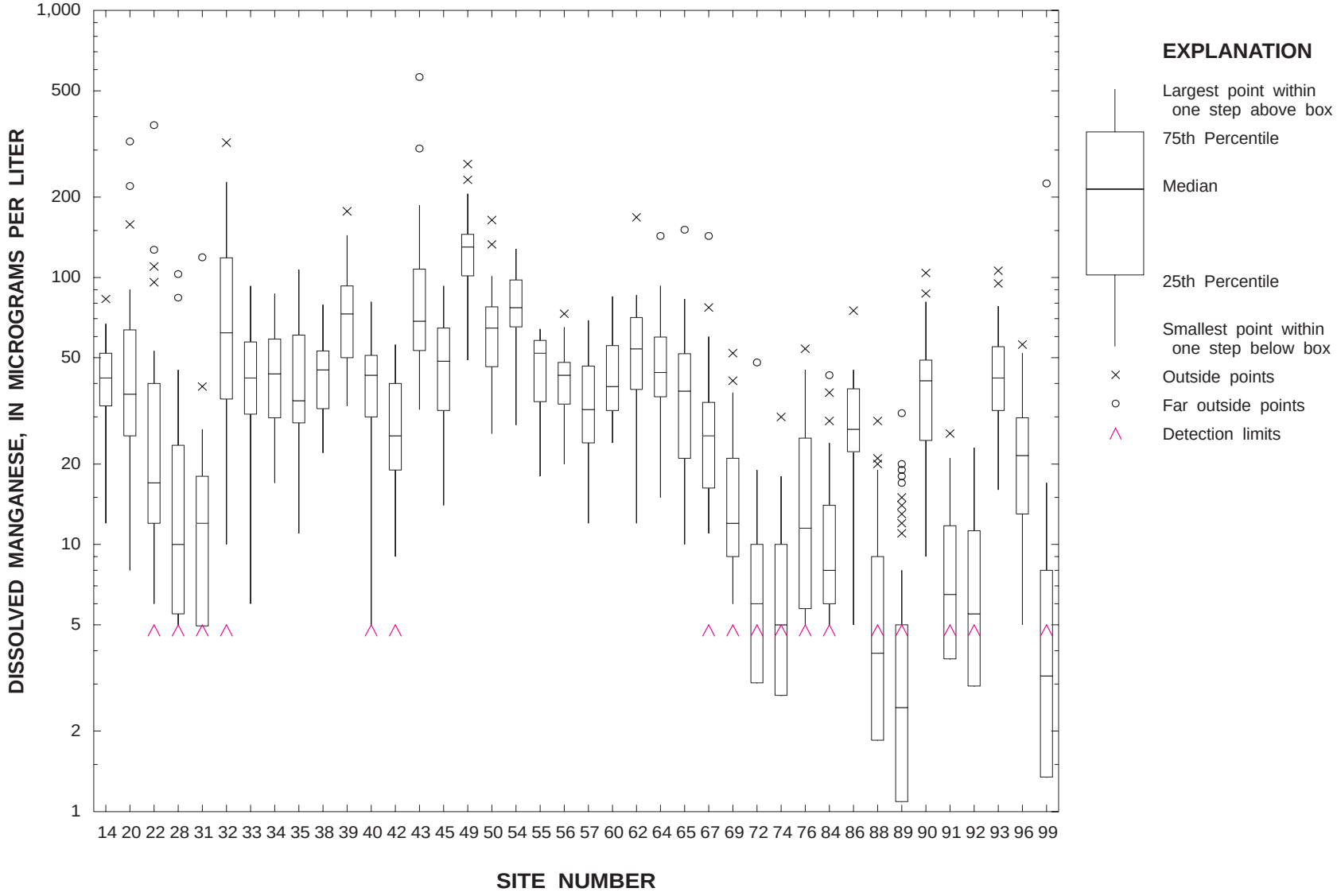

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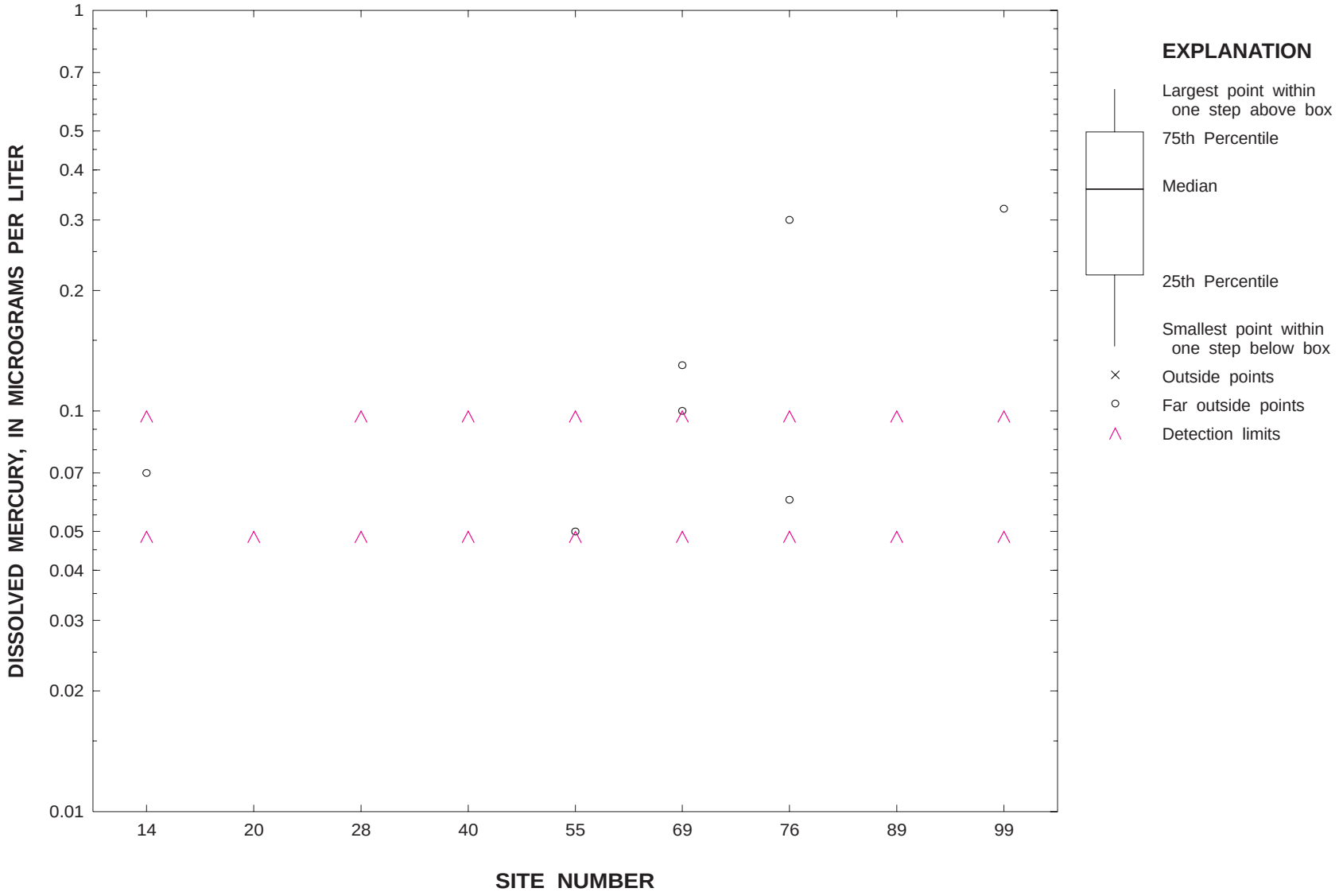

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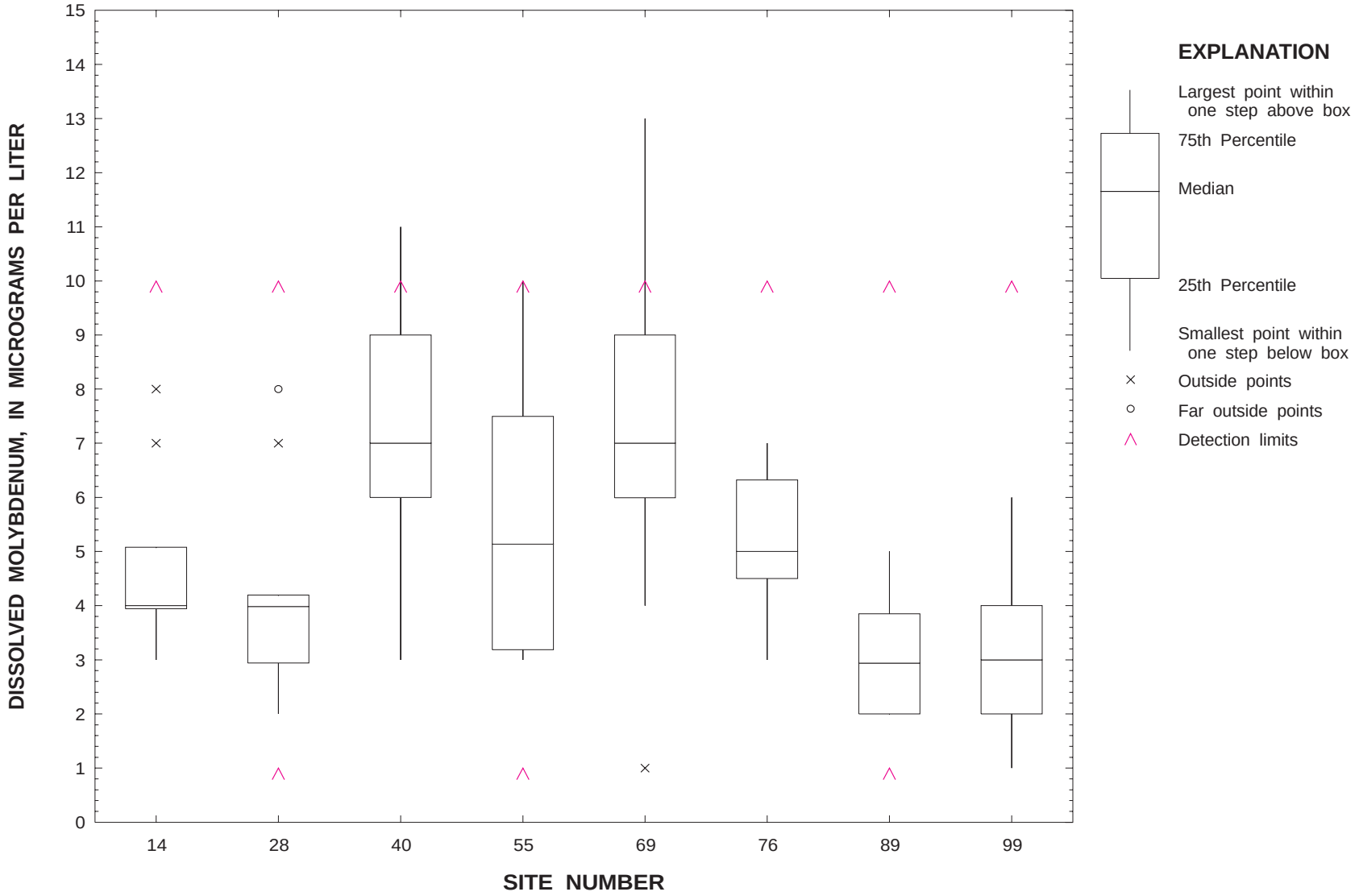

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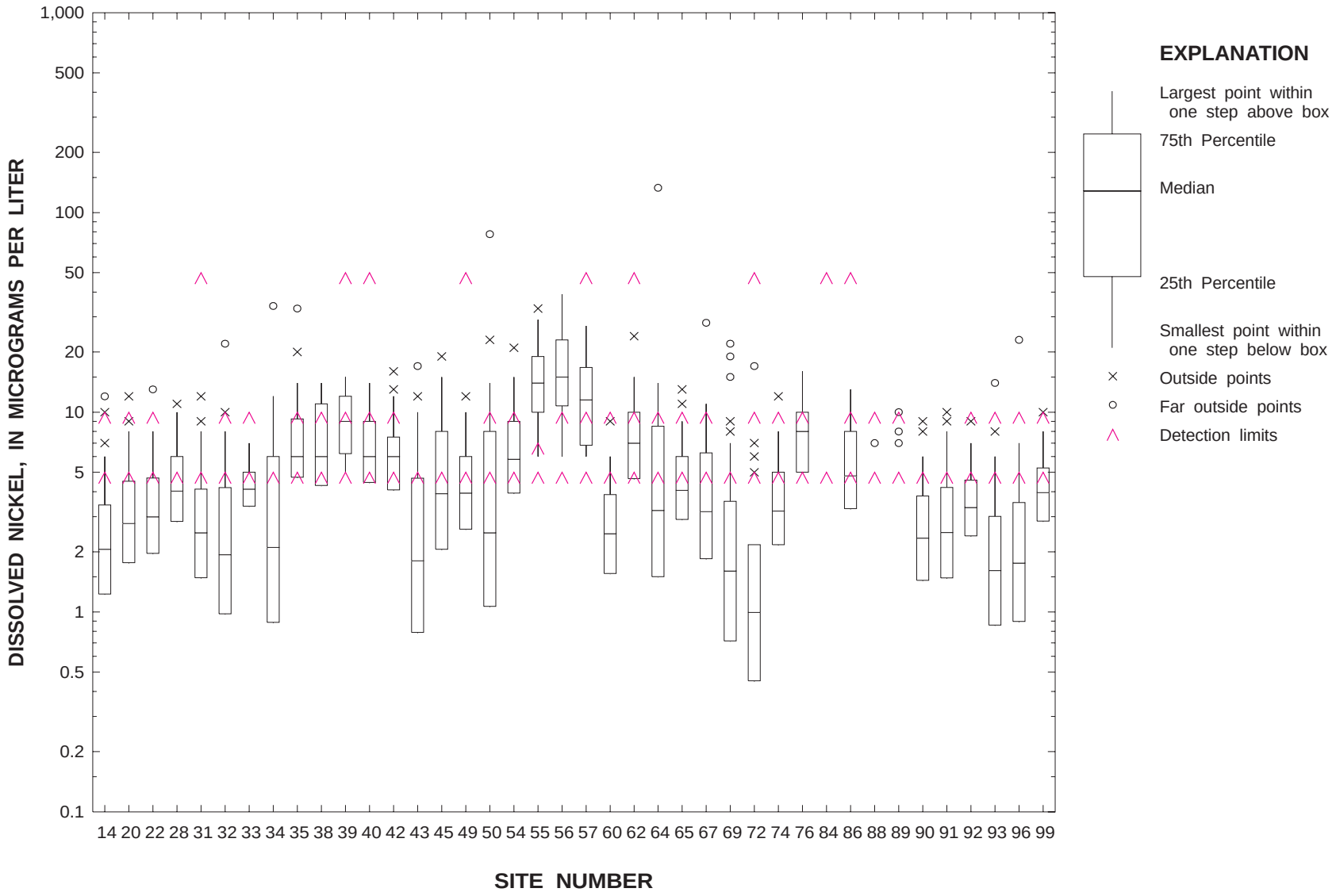

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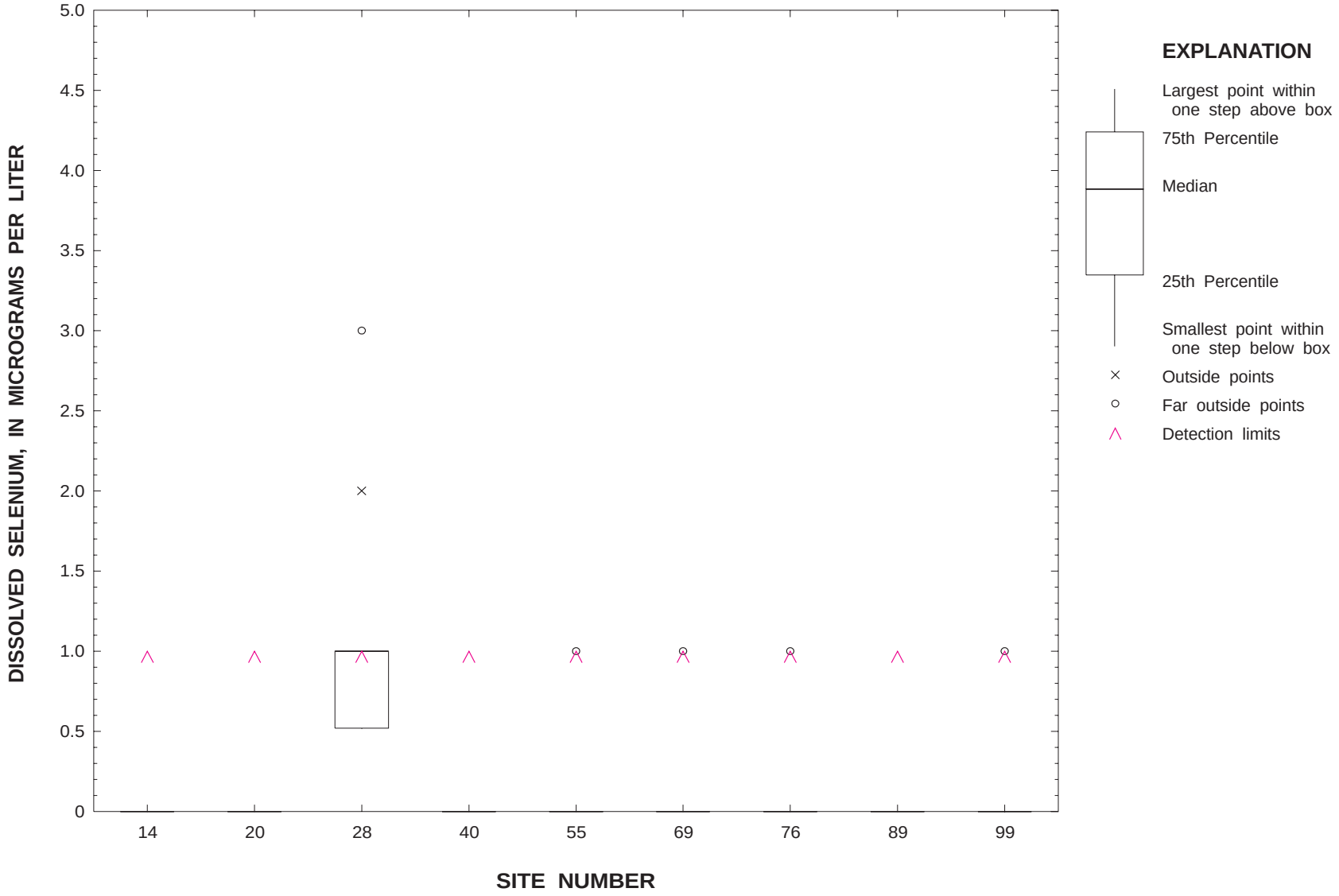

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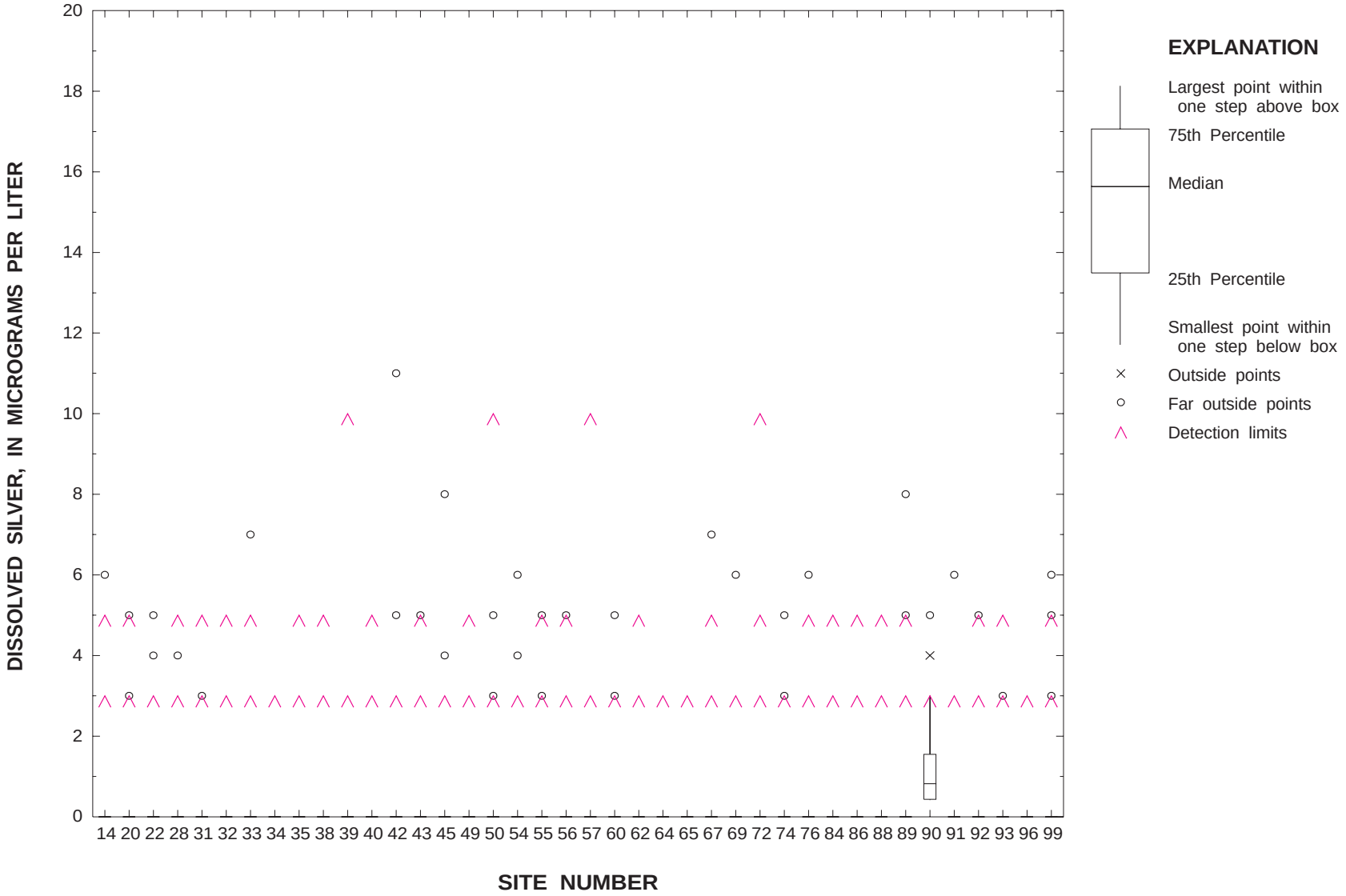

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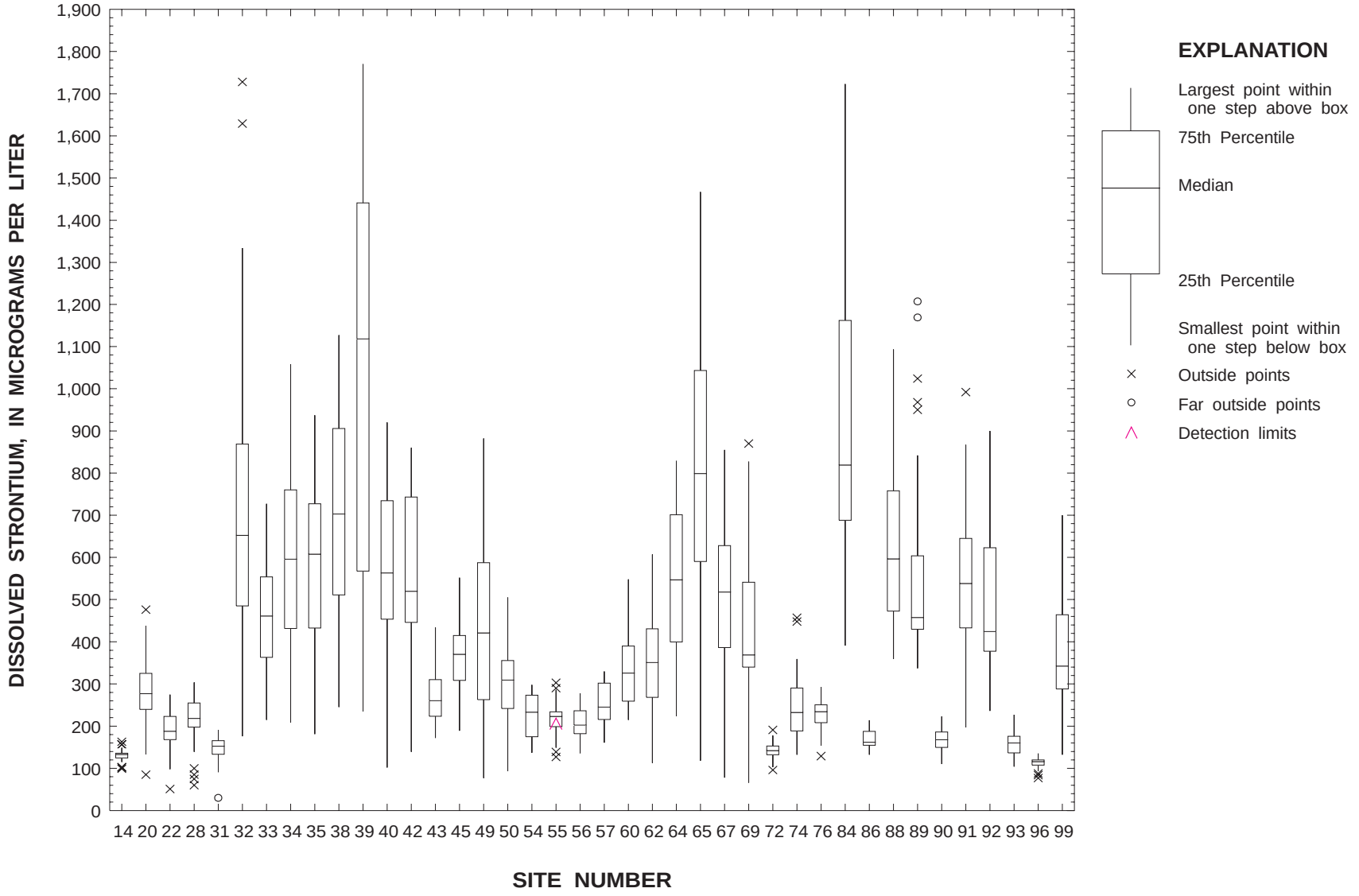

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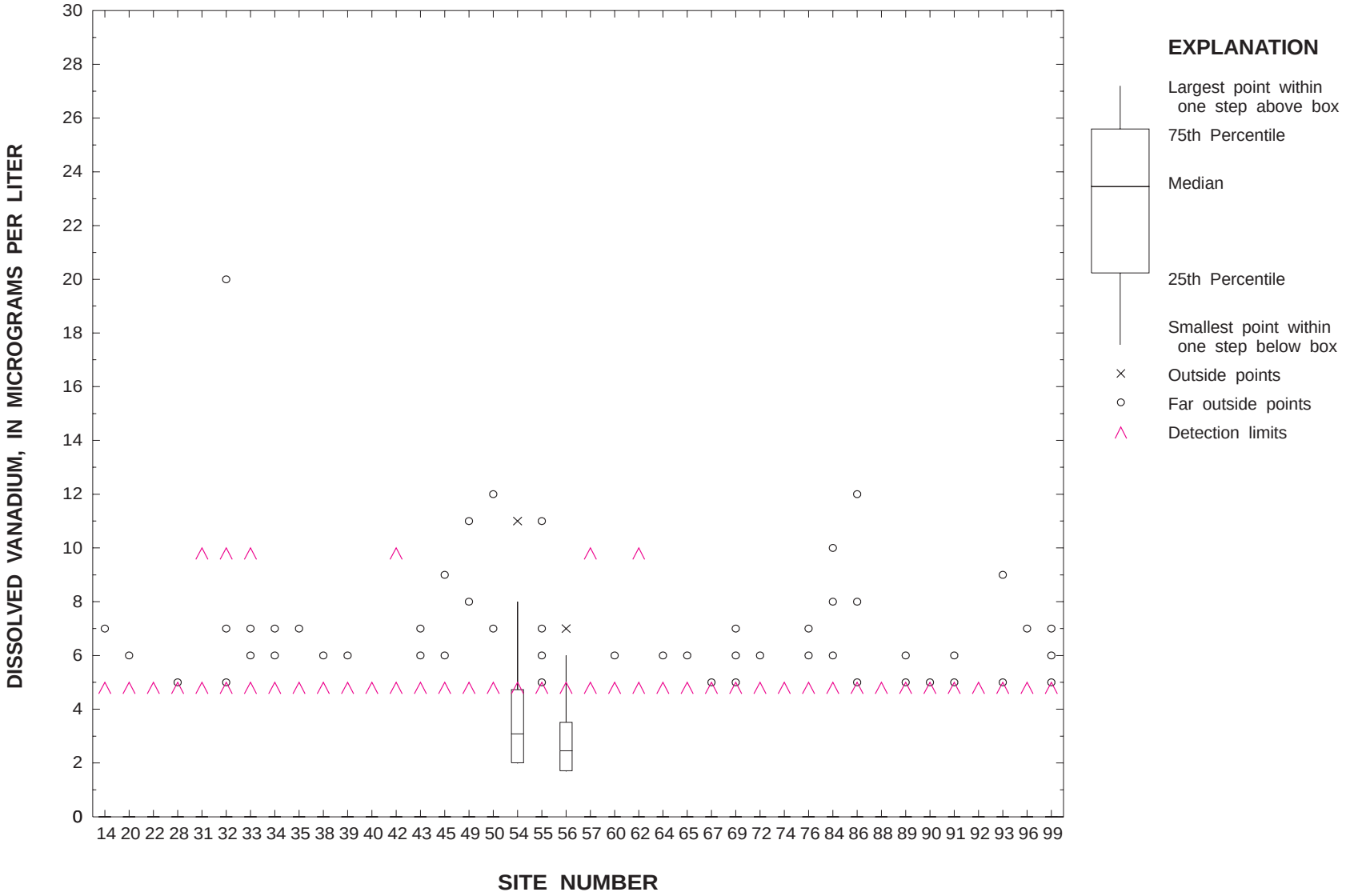

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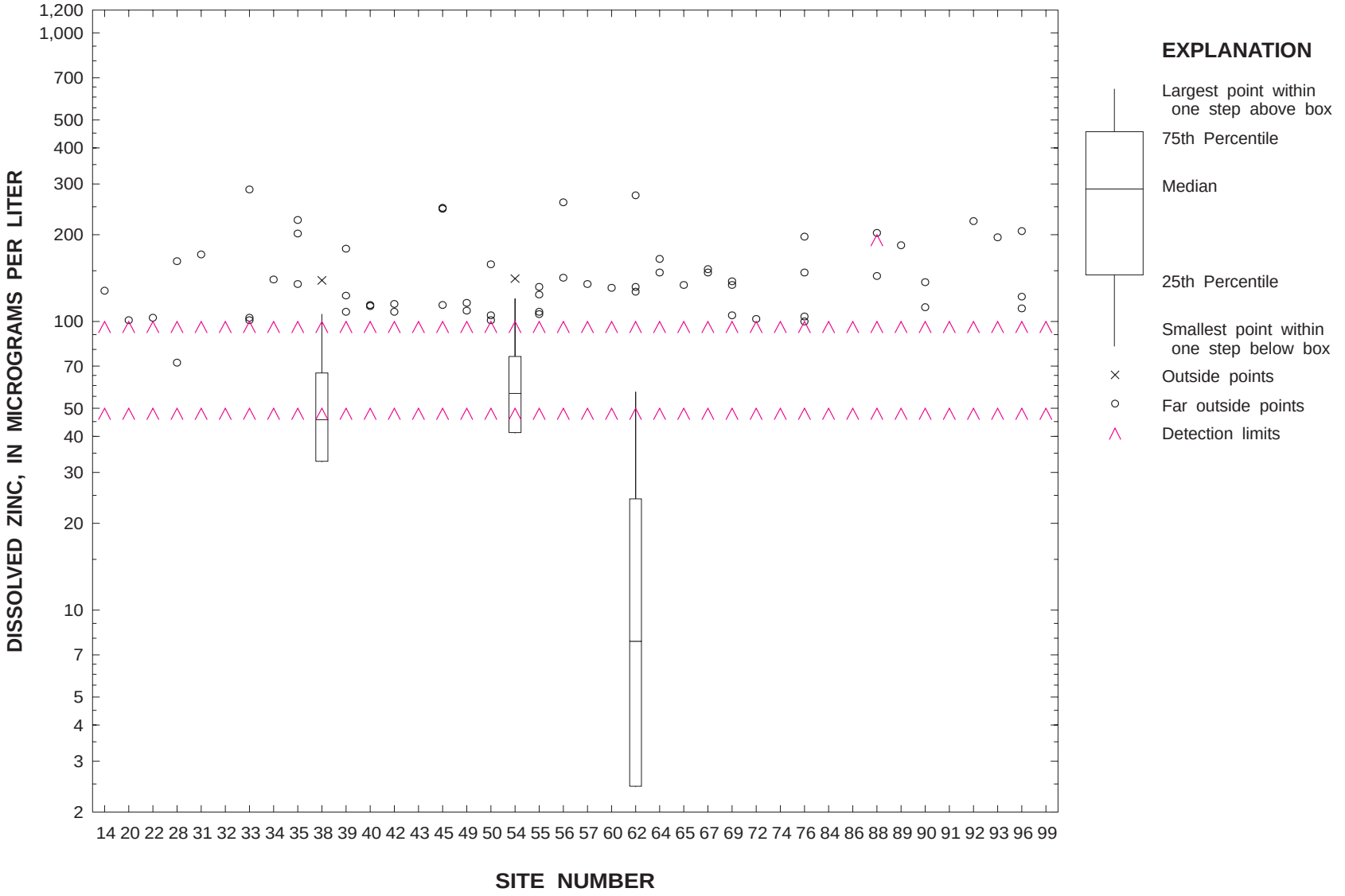

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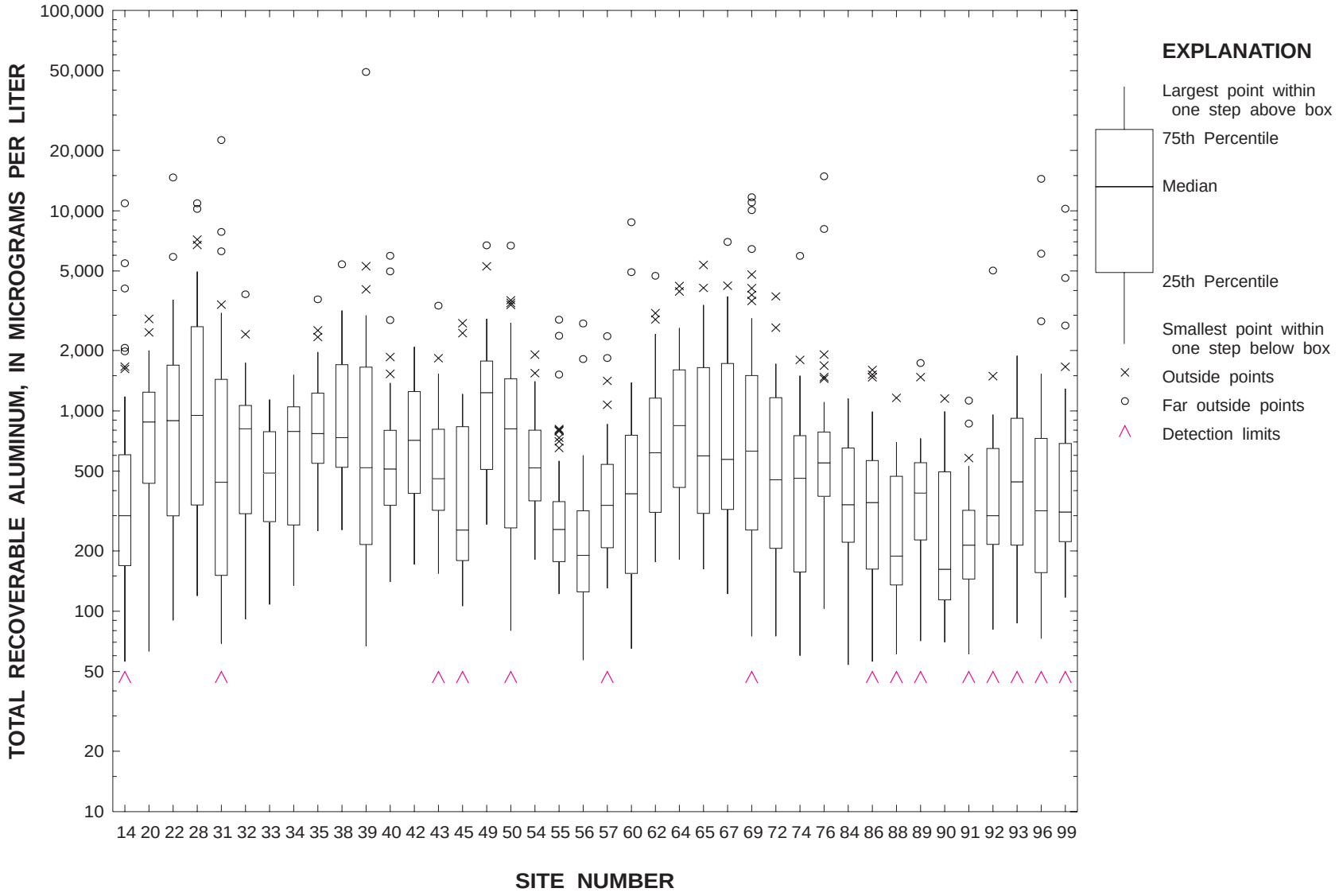
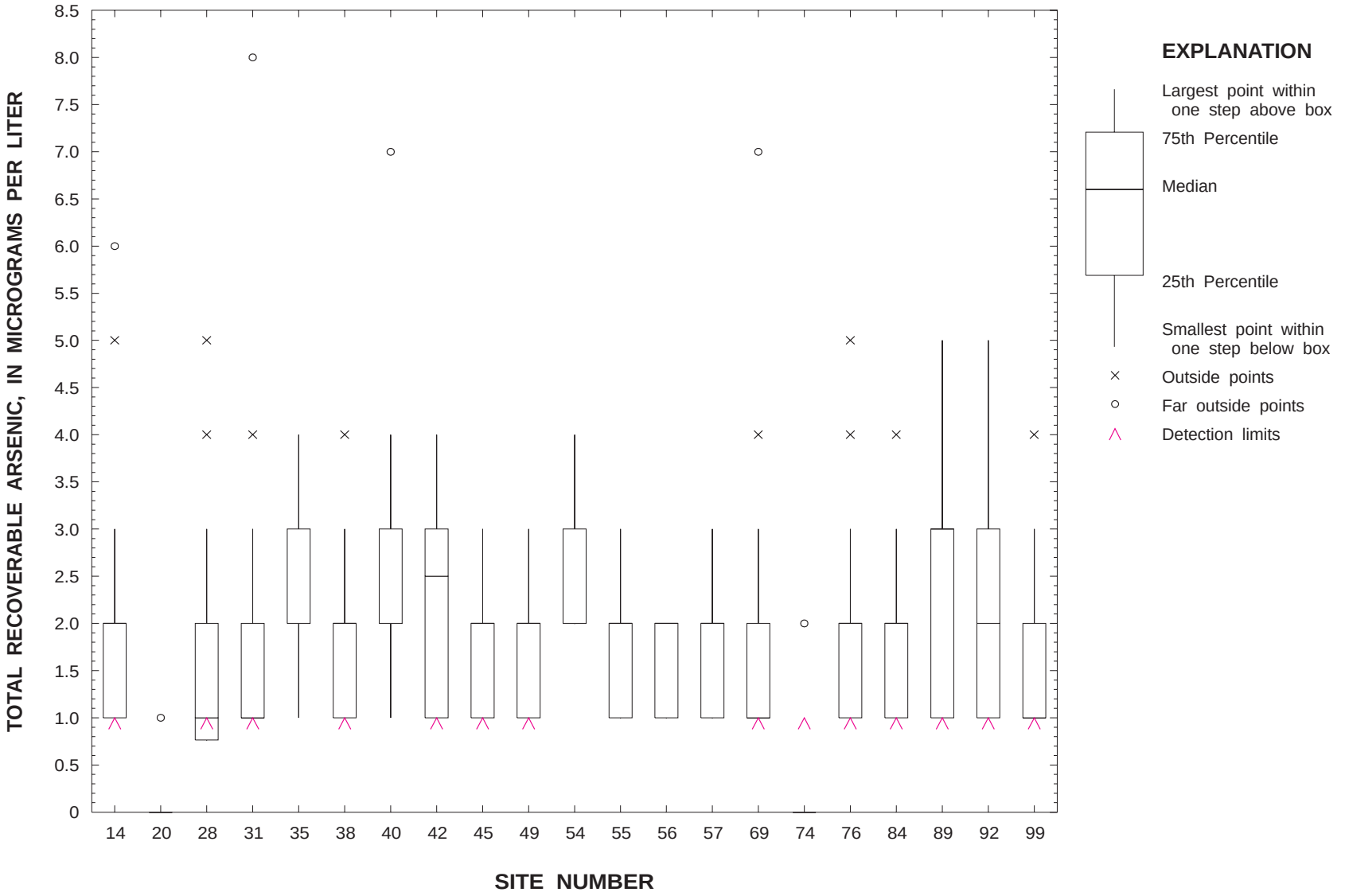


Figure A2. Total recoverable concentrations of elements in water in the upper Illinois River Basin, 1987–90 (see figure 5 for site locations).



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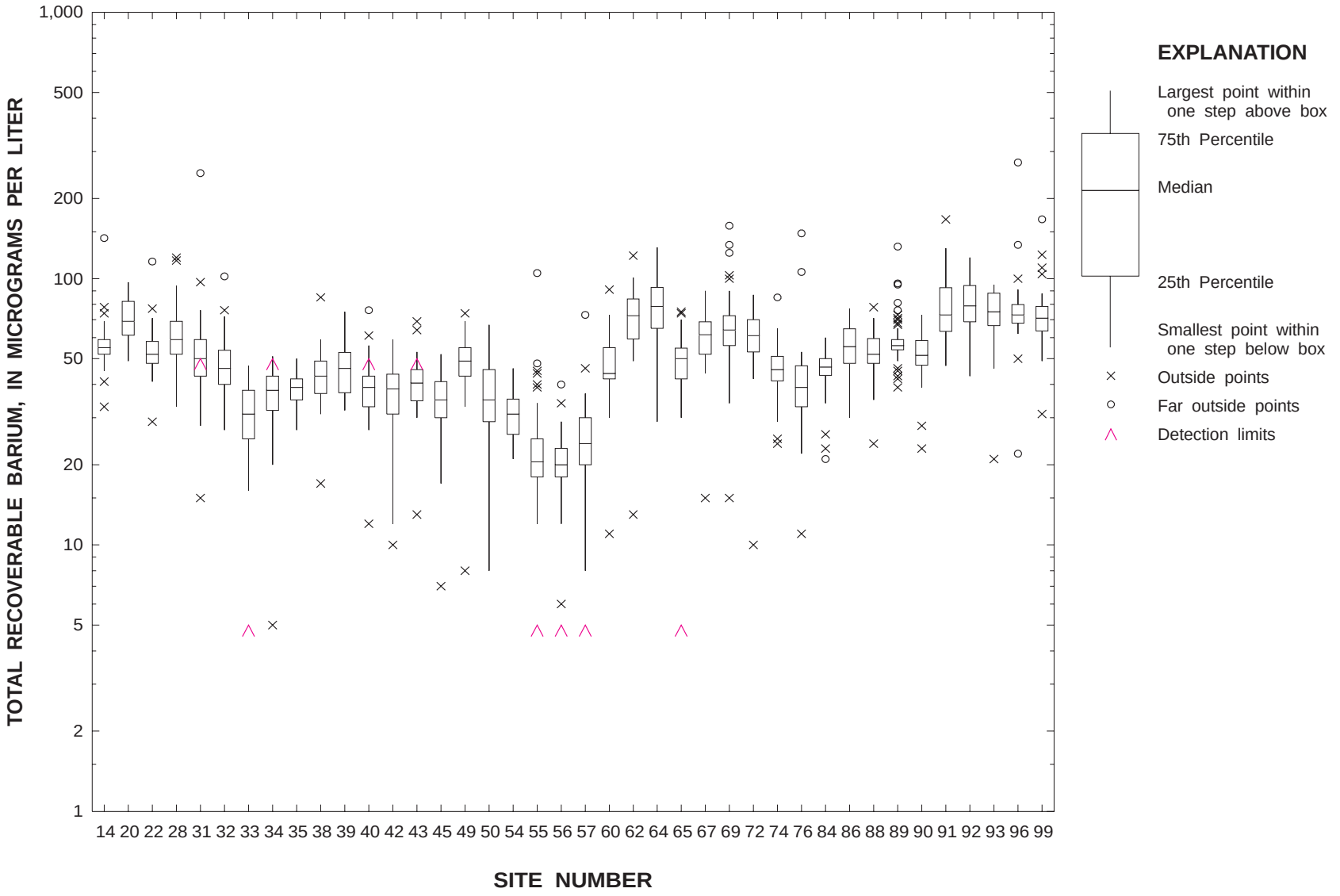

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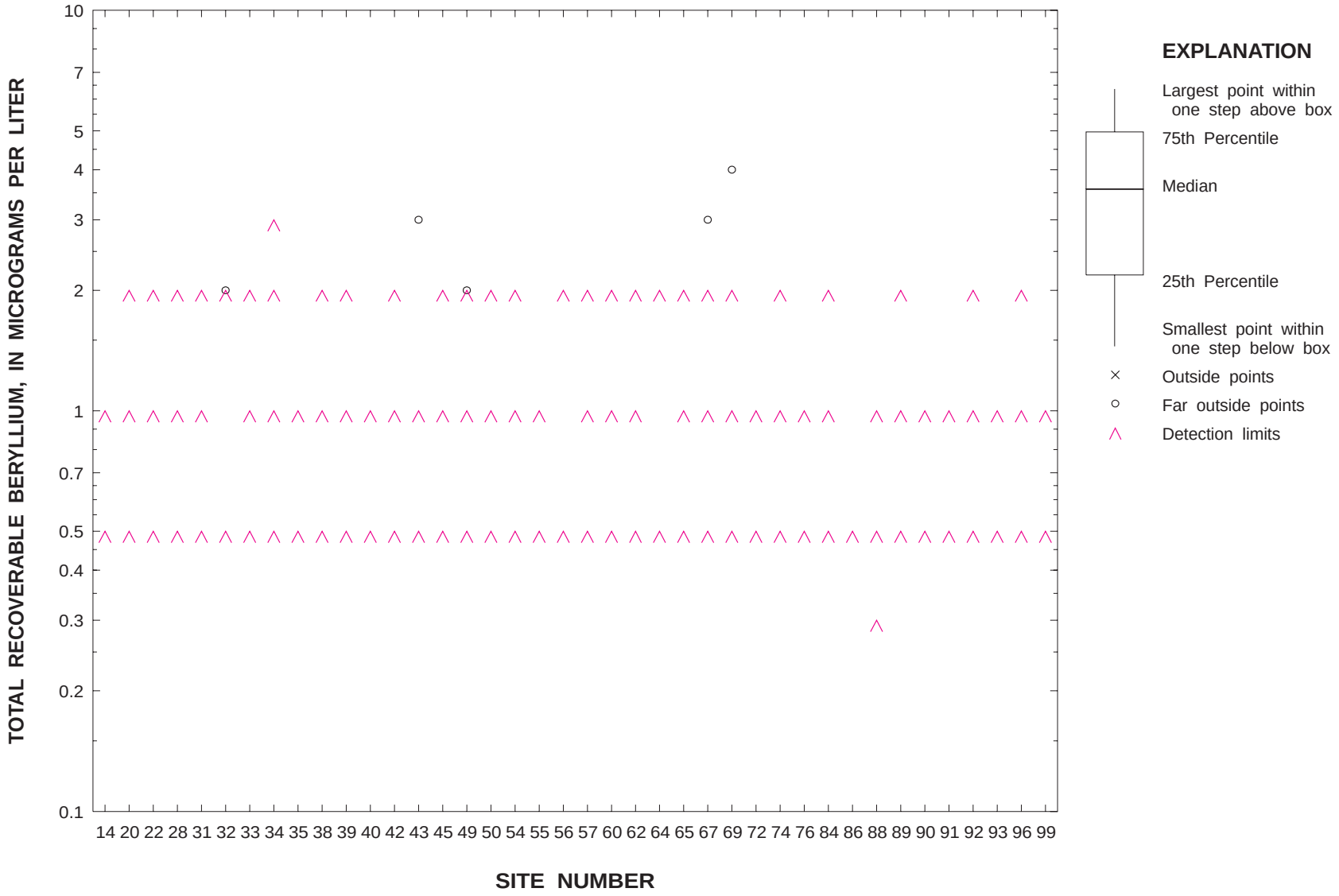

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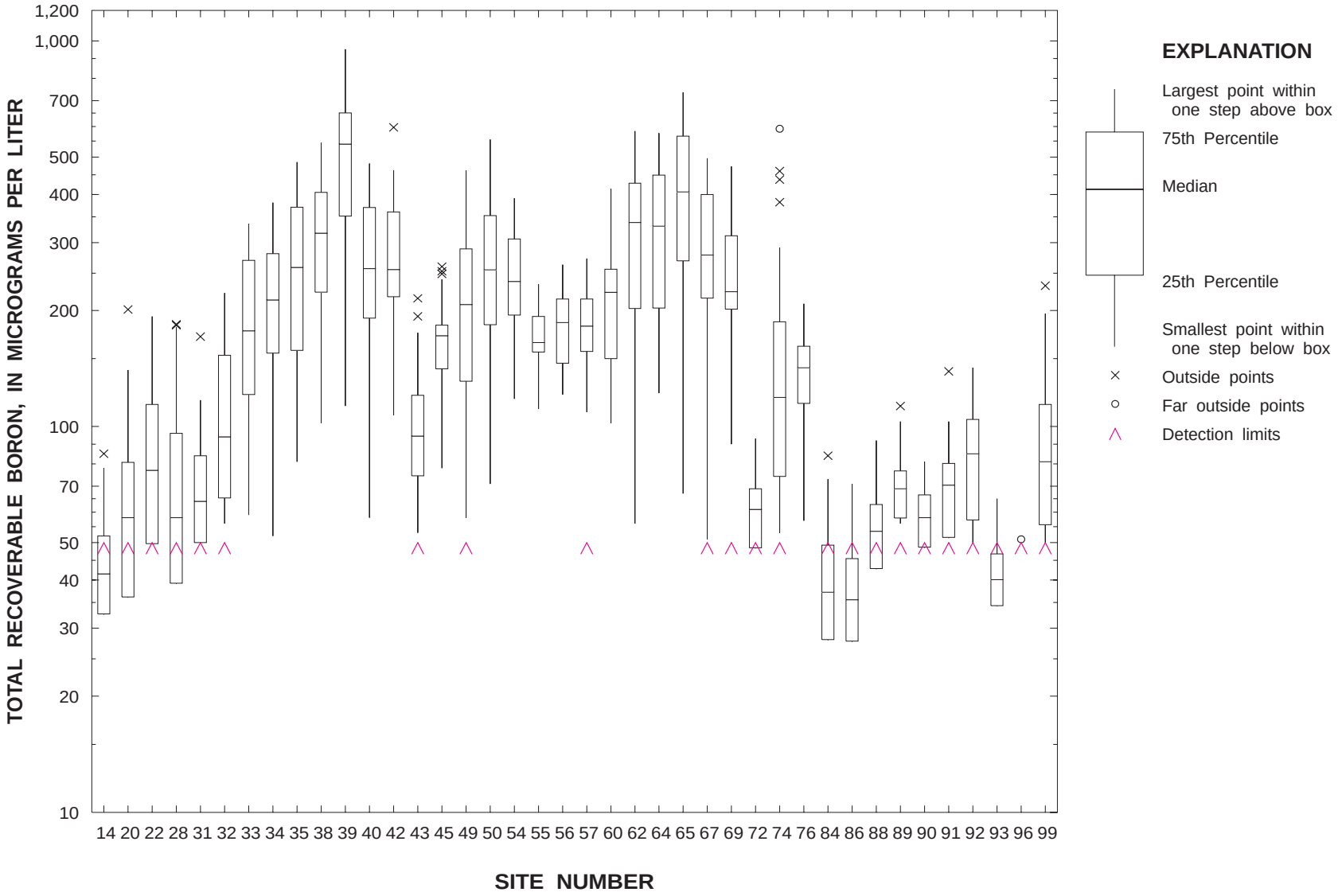

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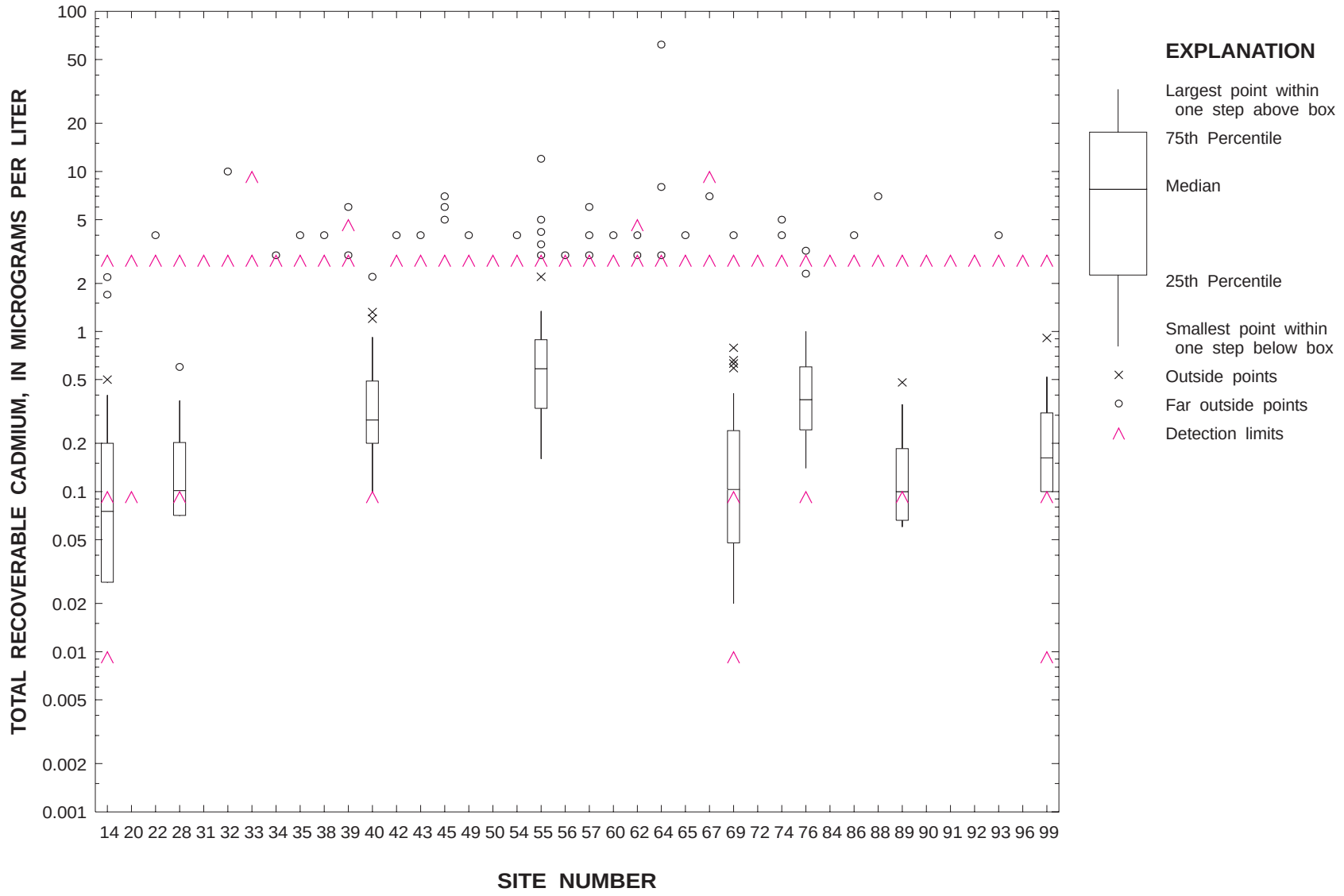

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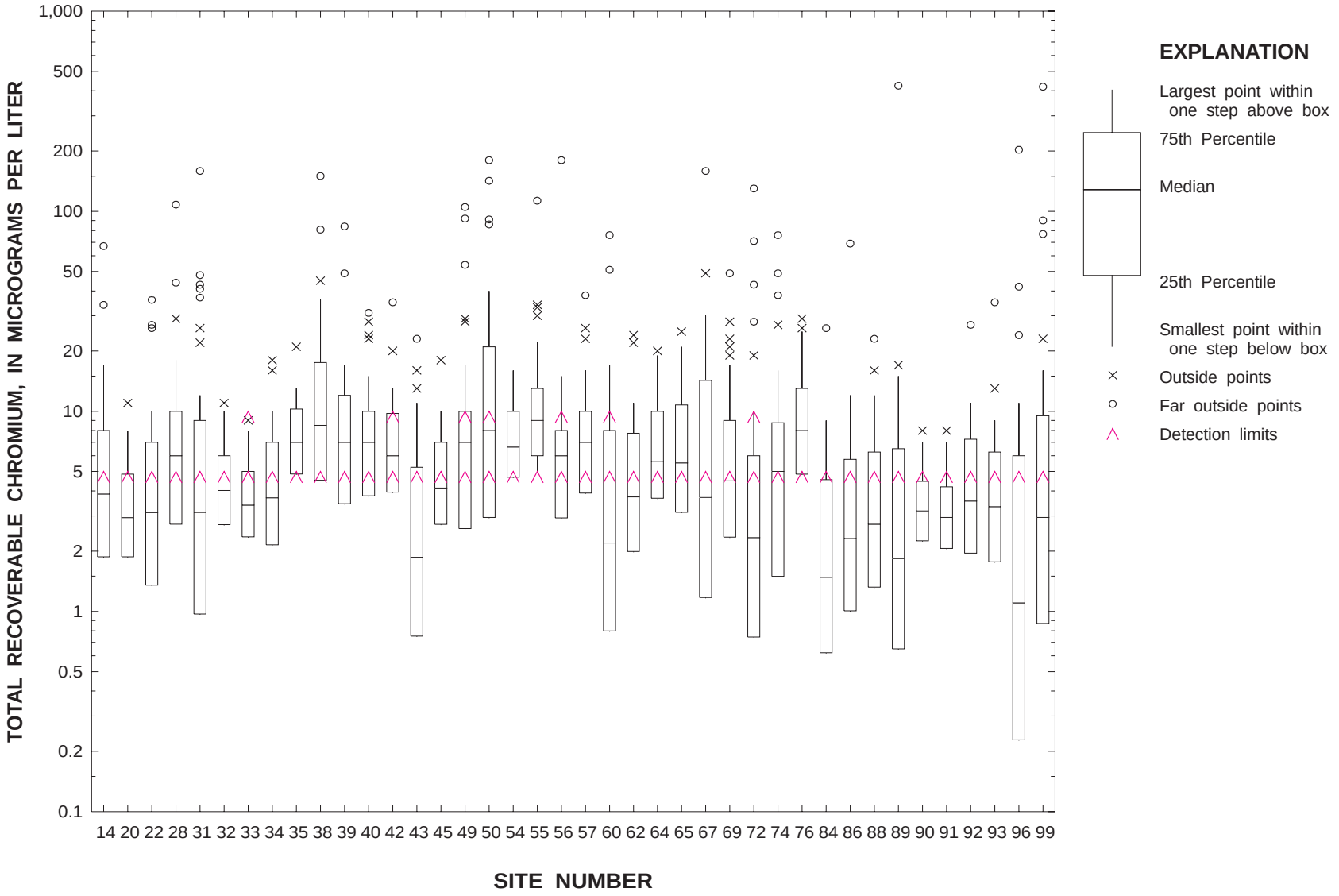

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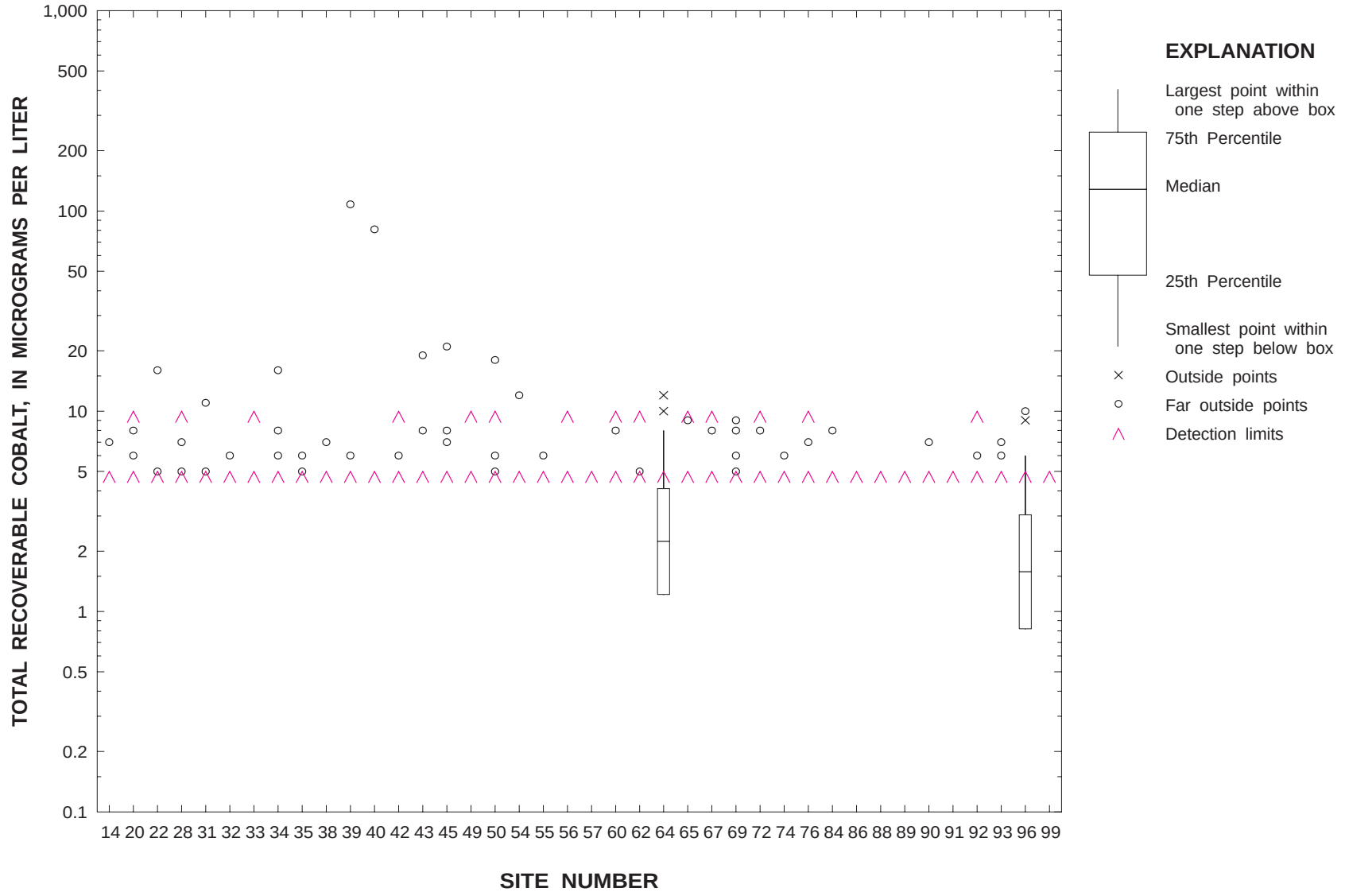

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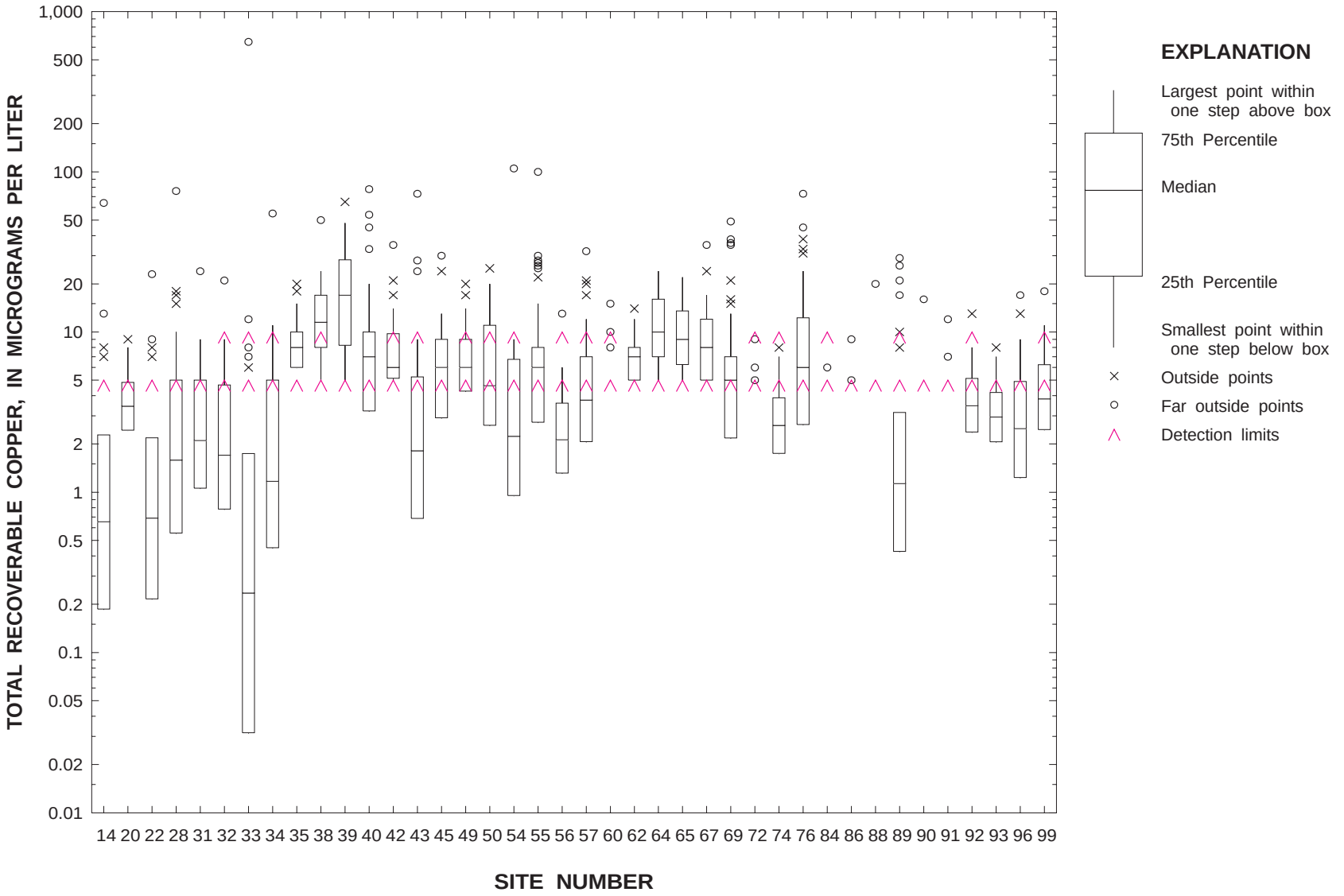

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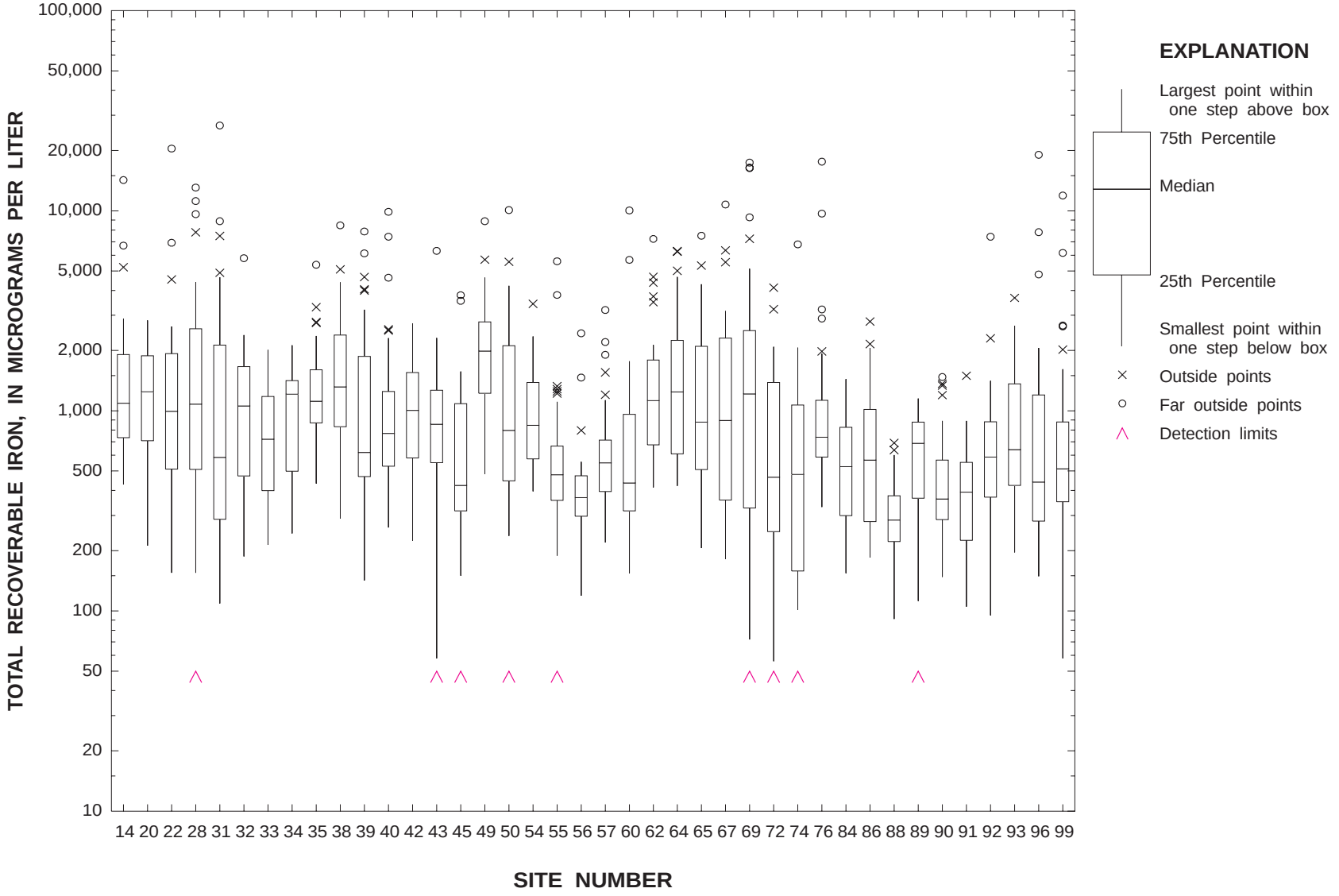

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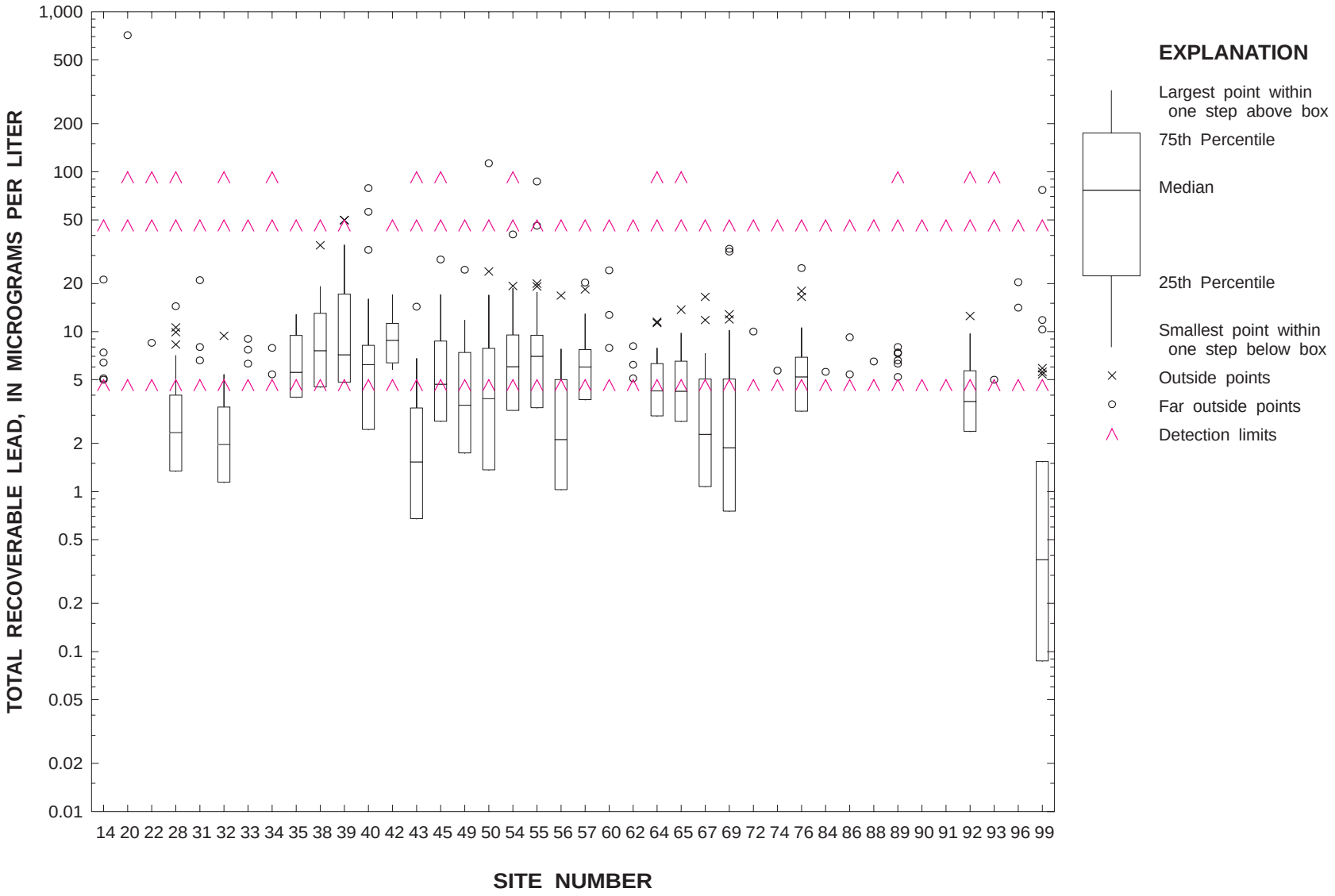

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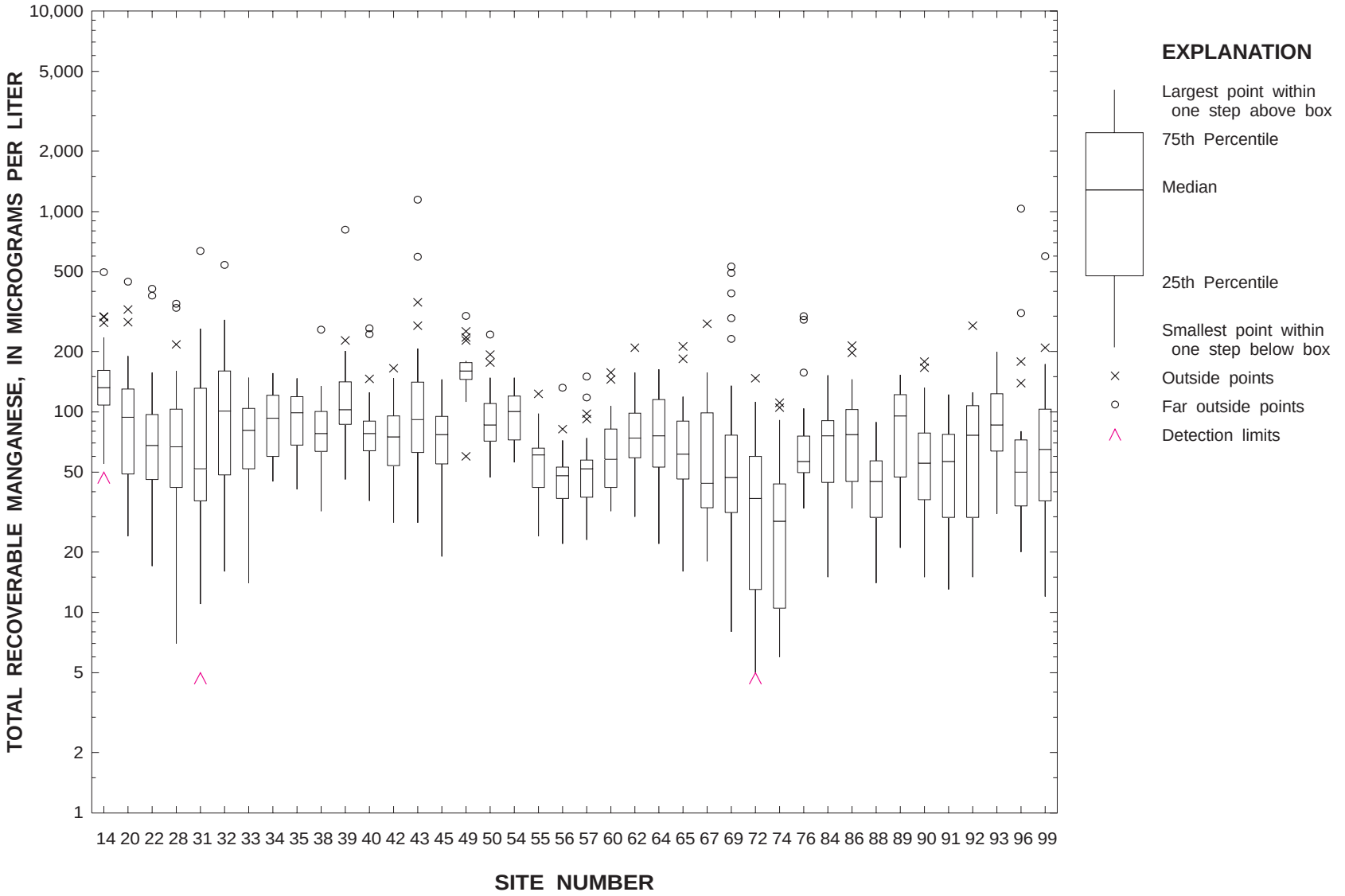

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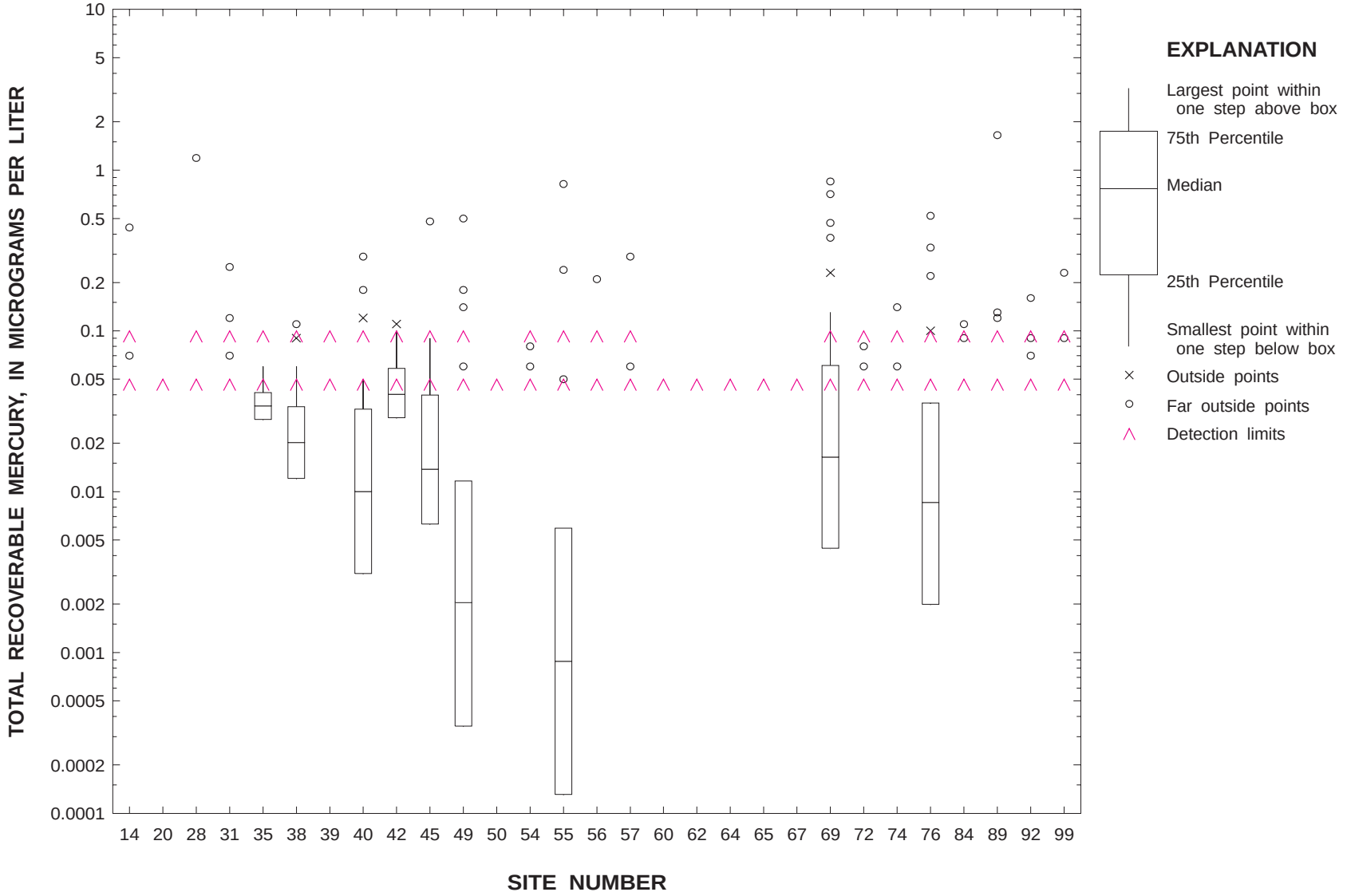

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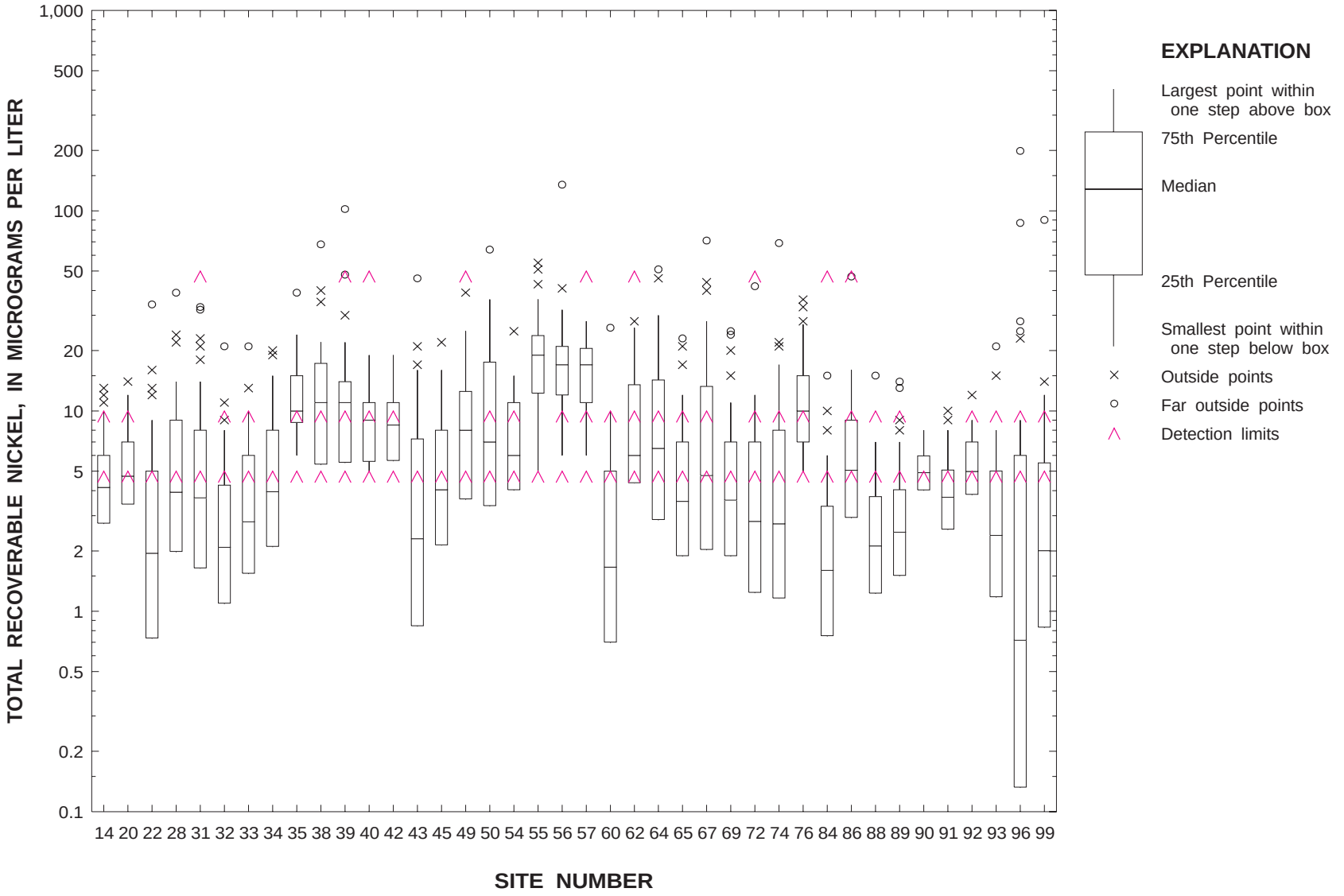

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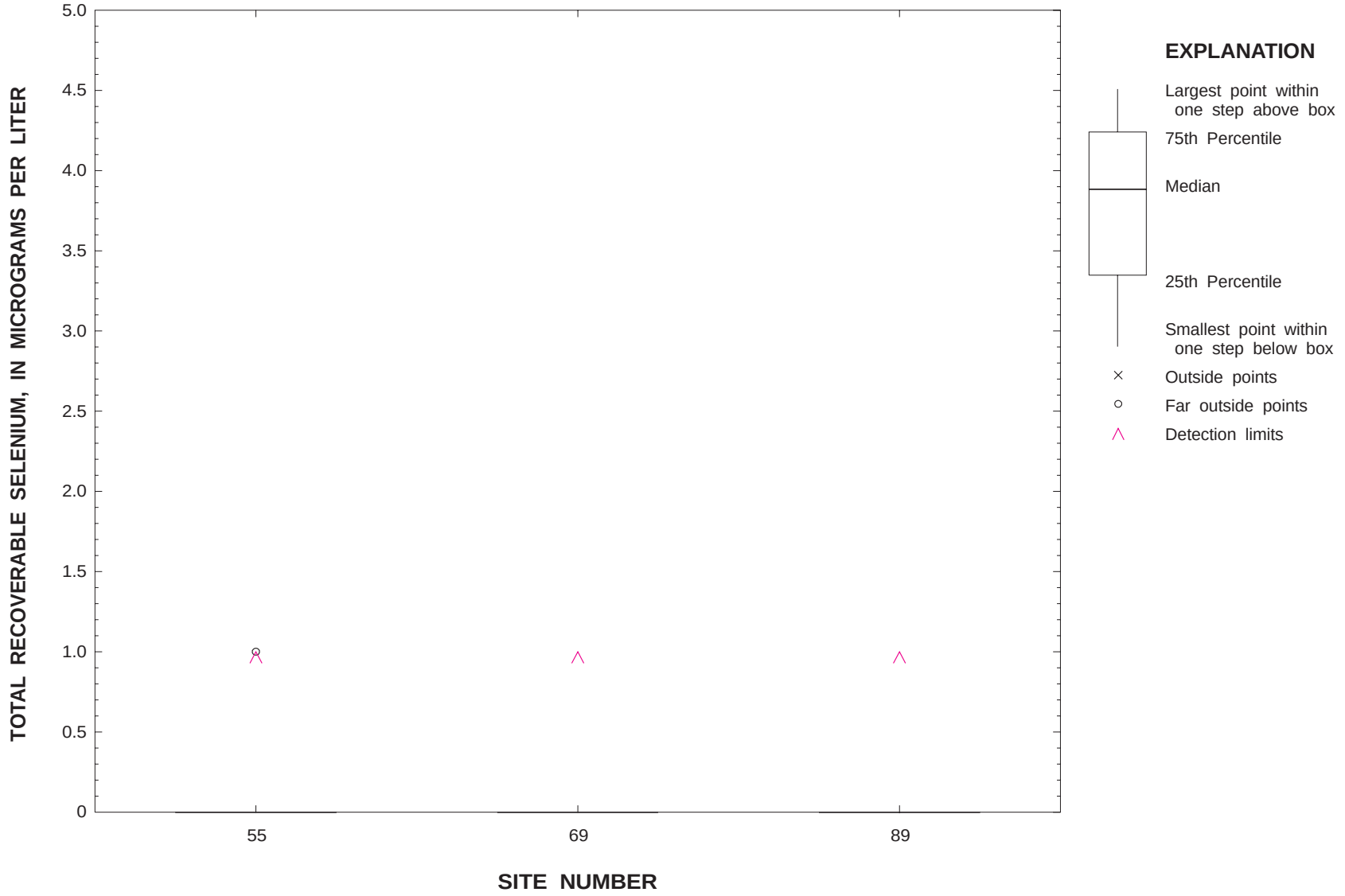

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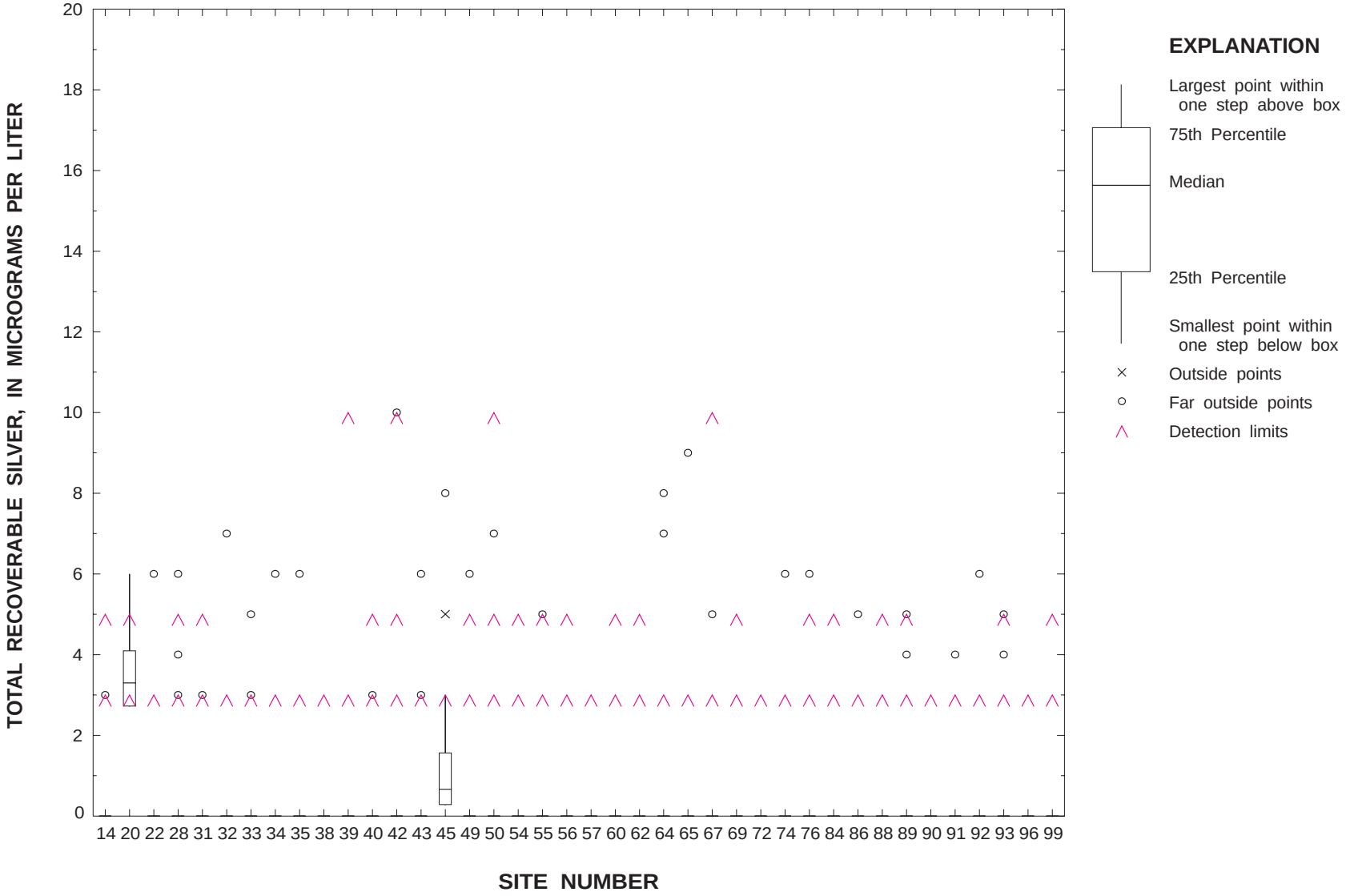

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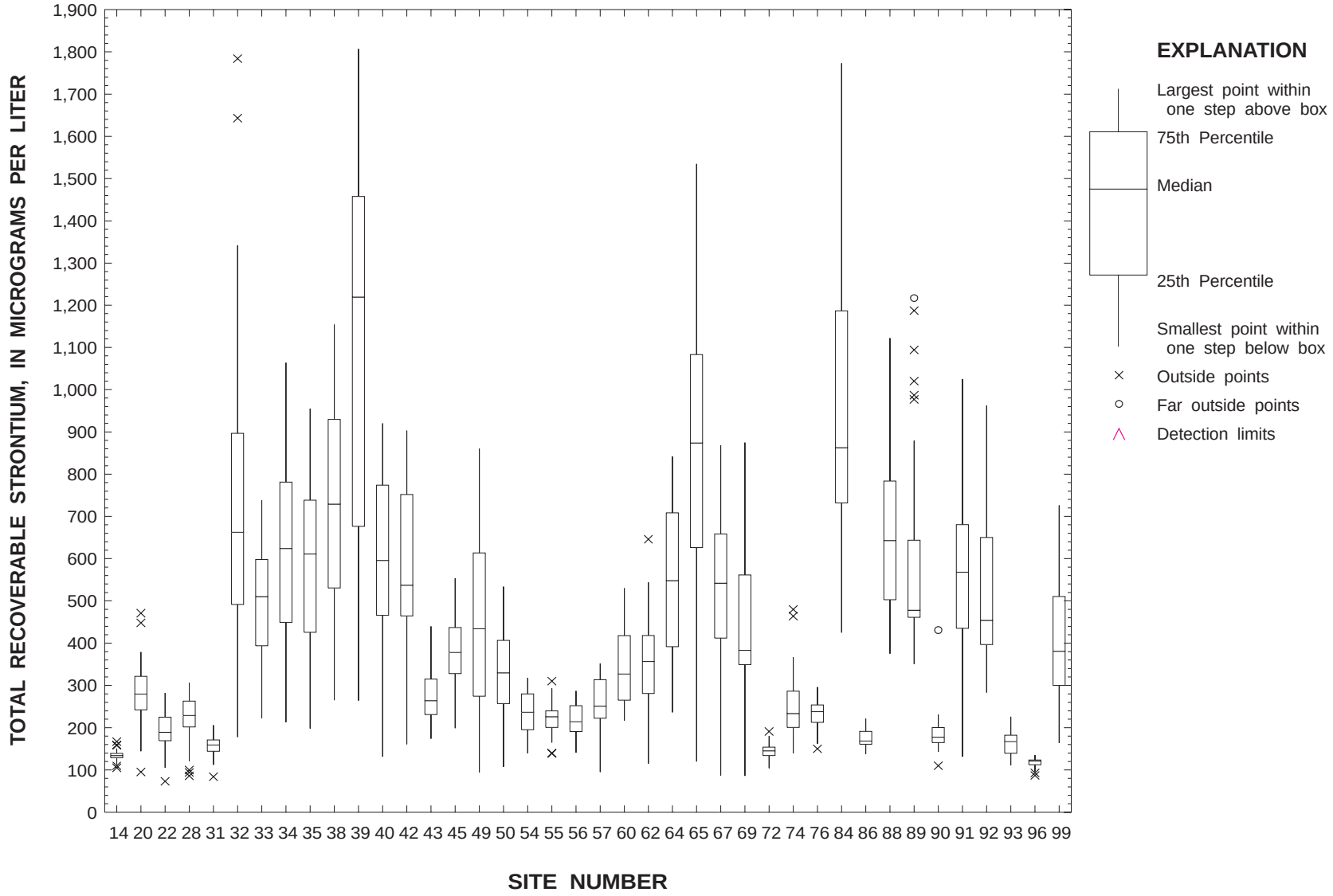

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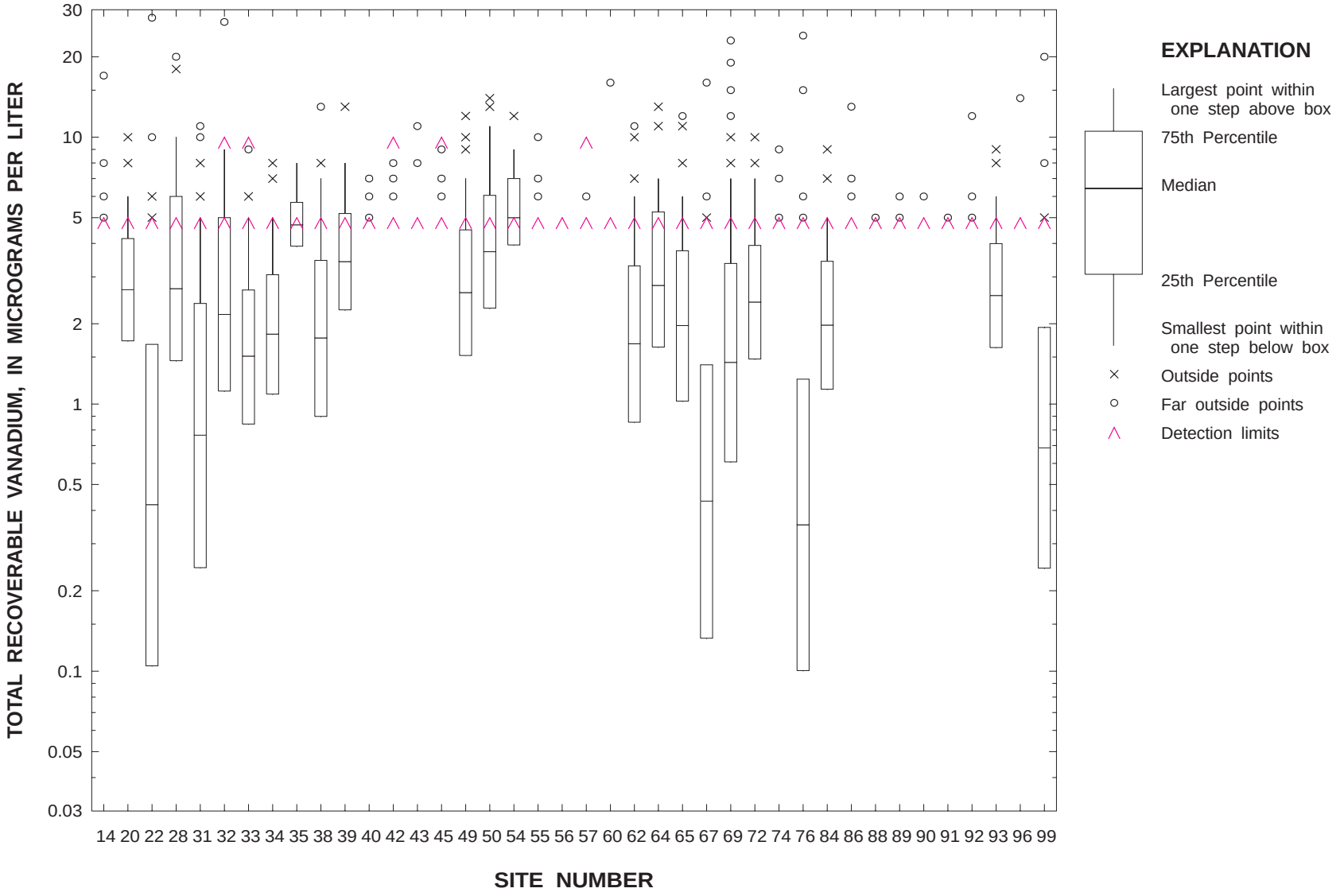

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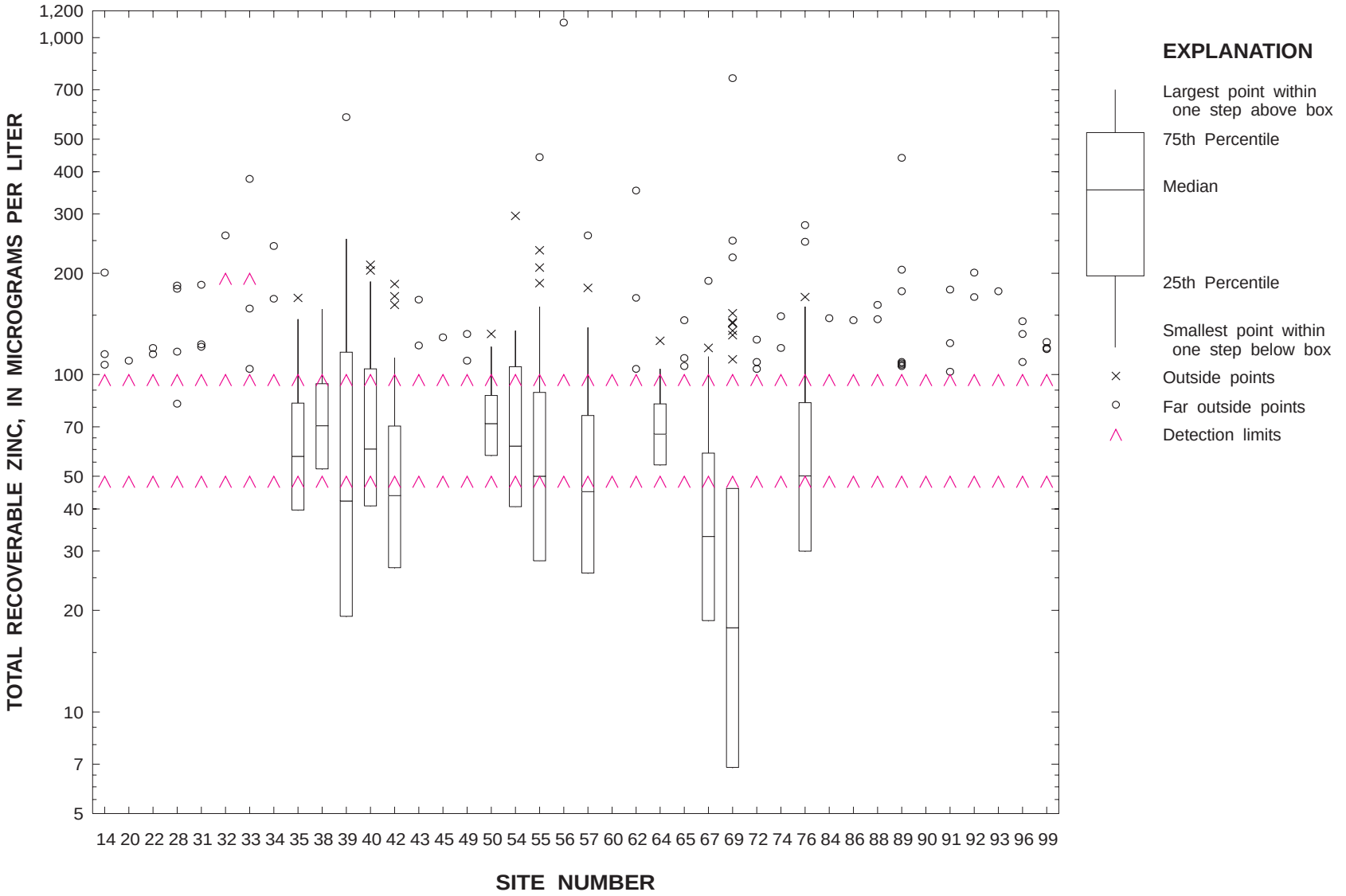

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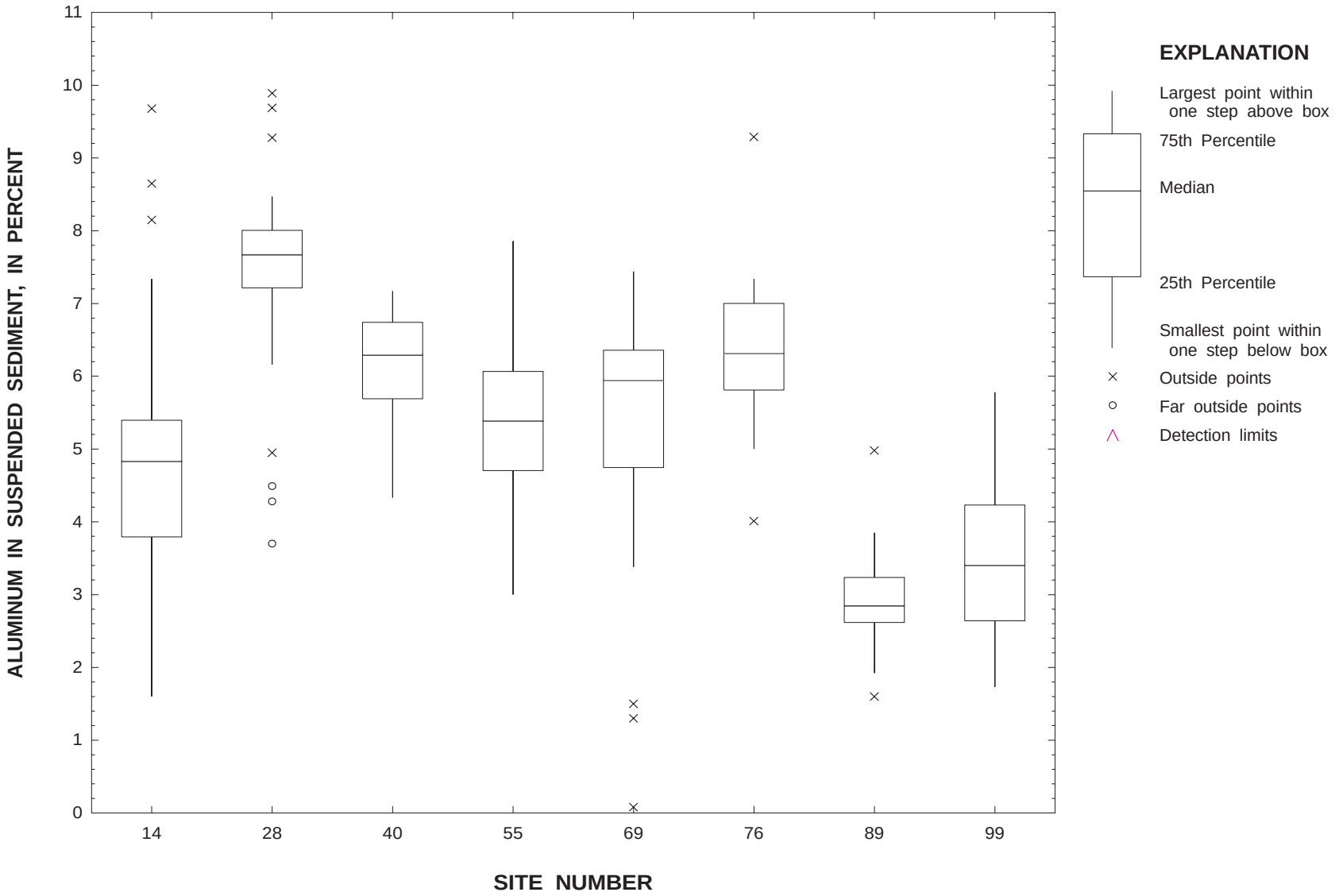
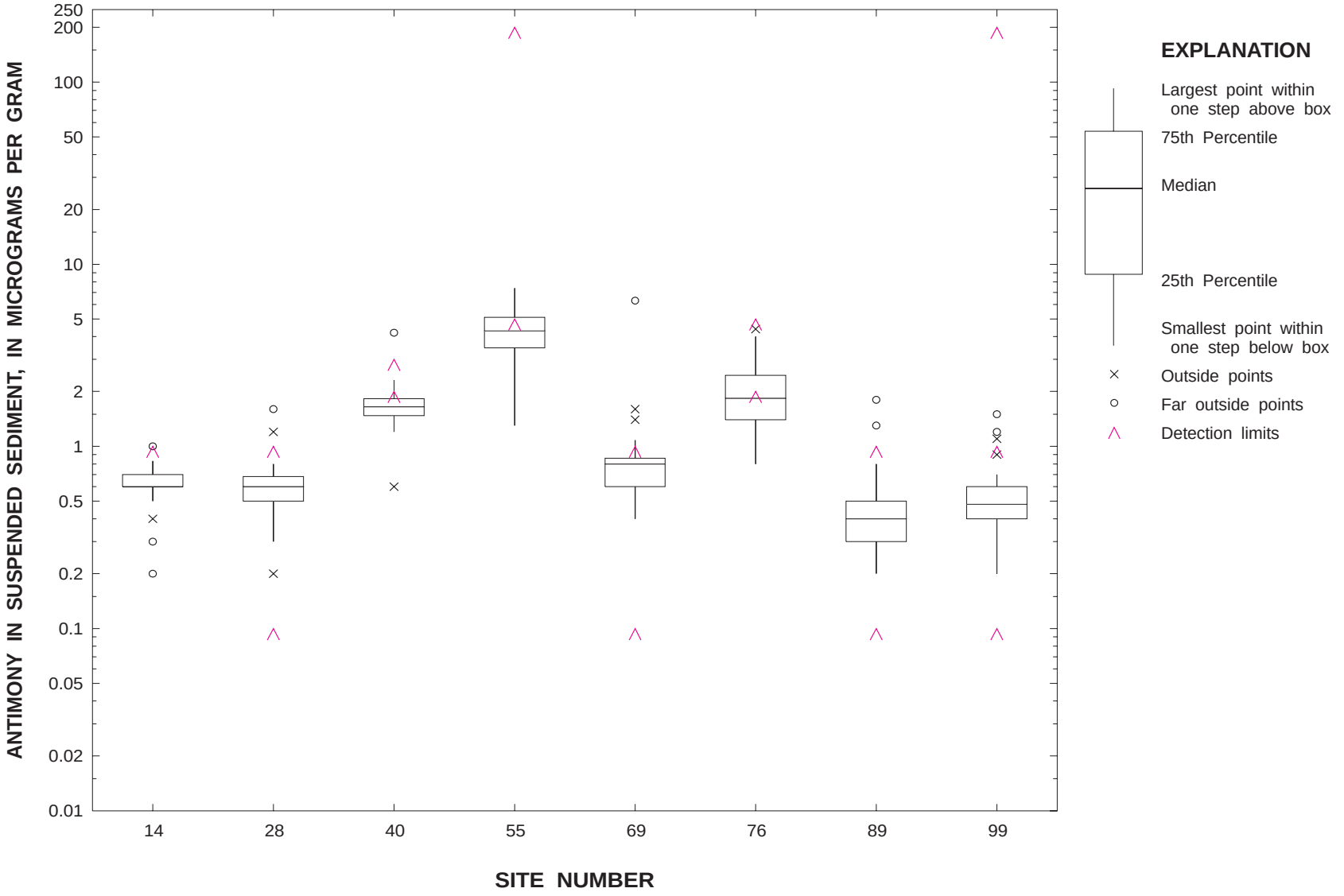


Figure A3. Concentrations of elements in suspended sediments in the upper Illinois River Basin, 1987–90 (see figure 5 for site locations).



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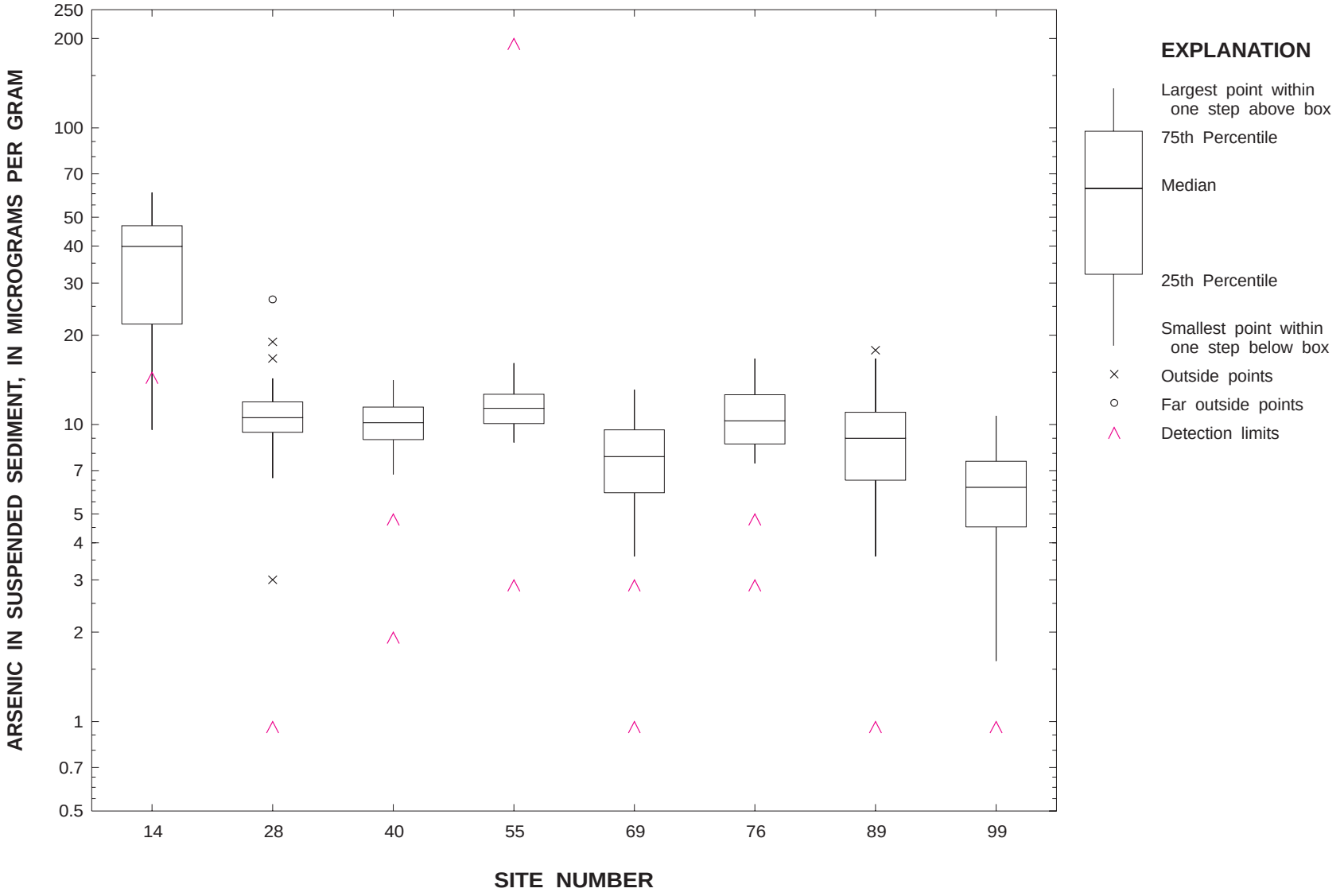

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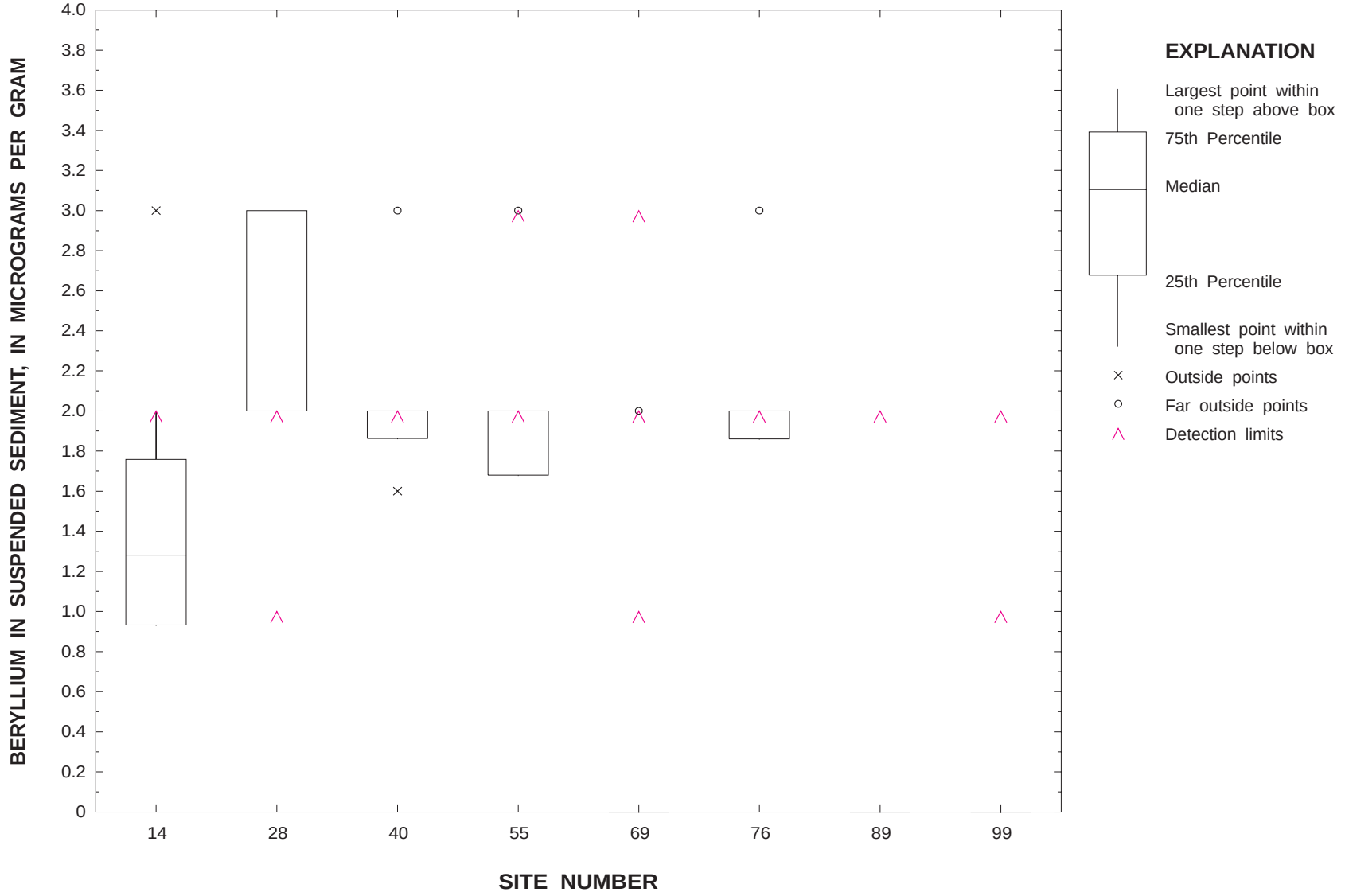

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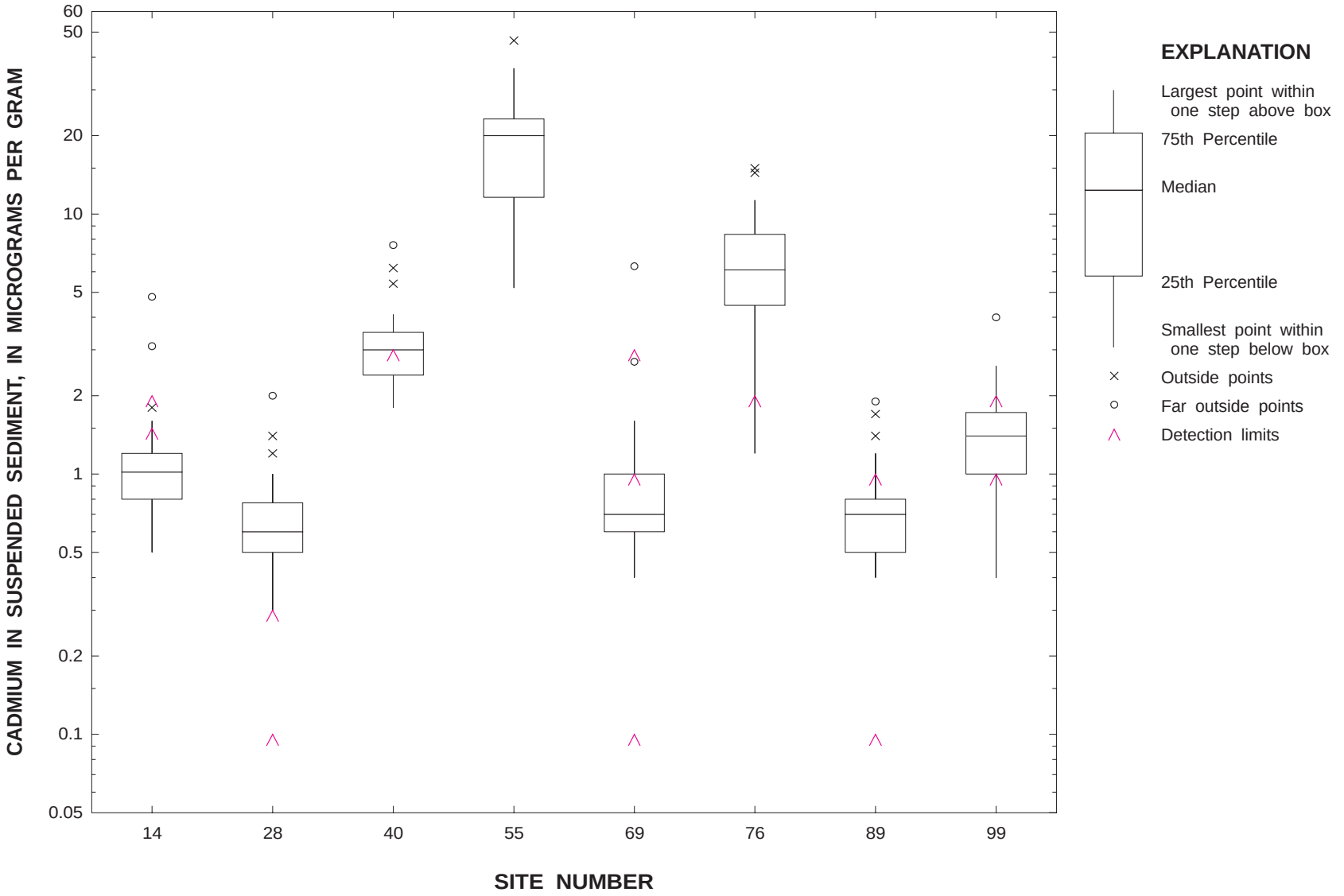

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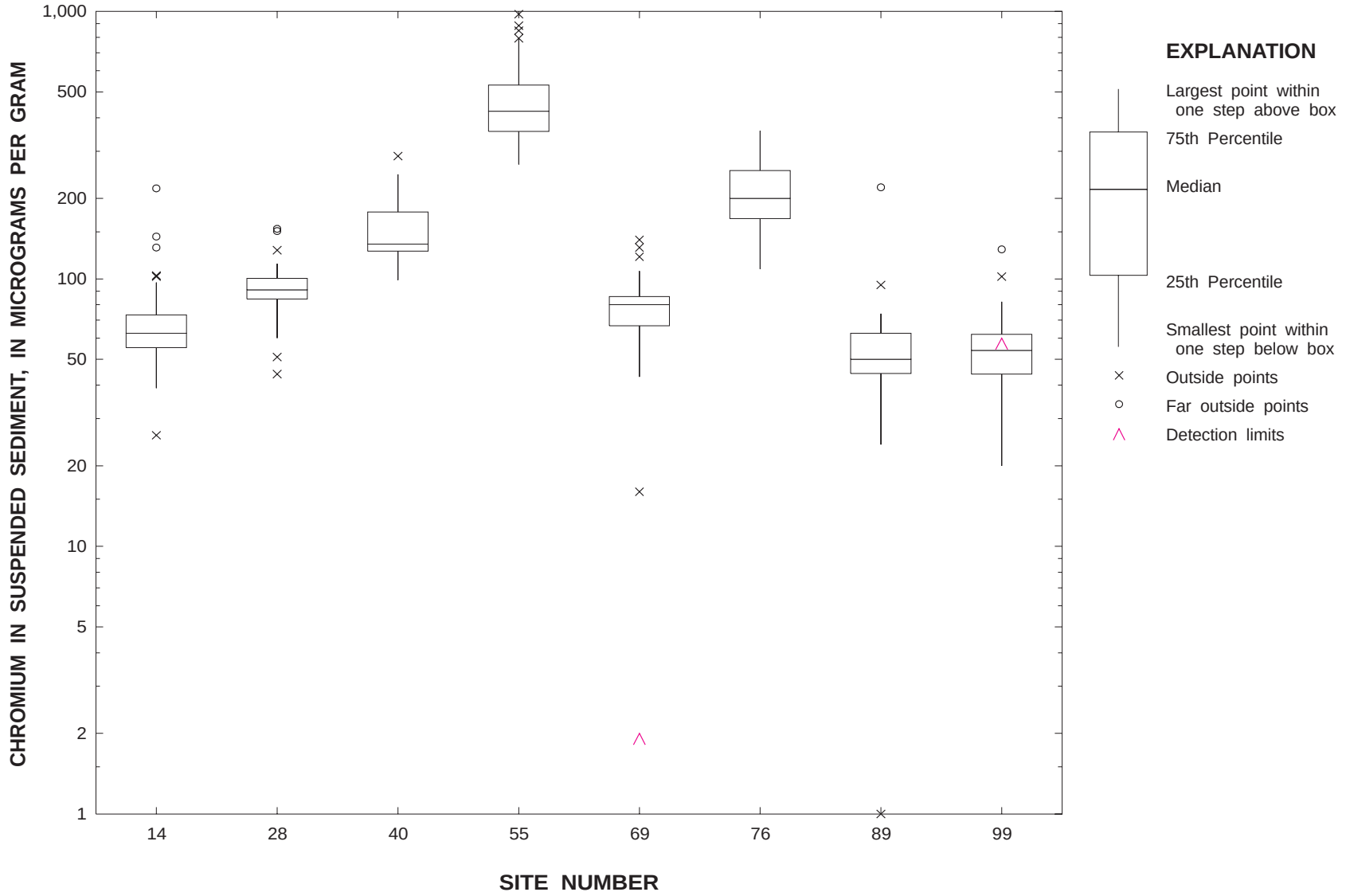

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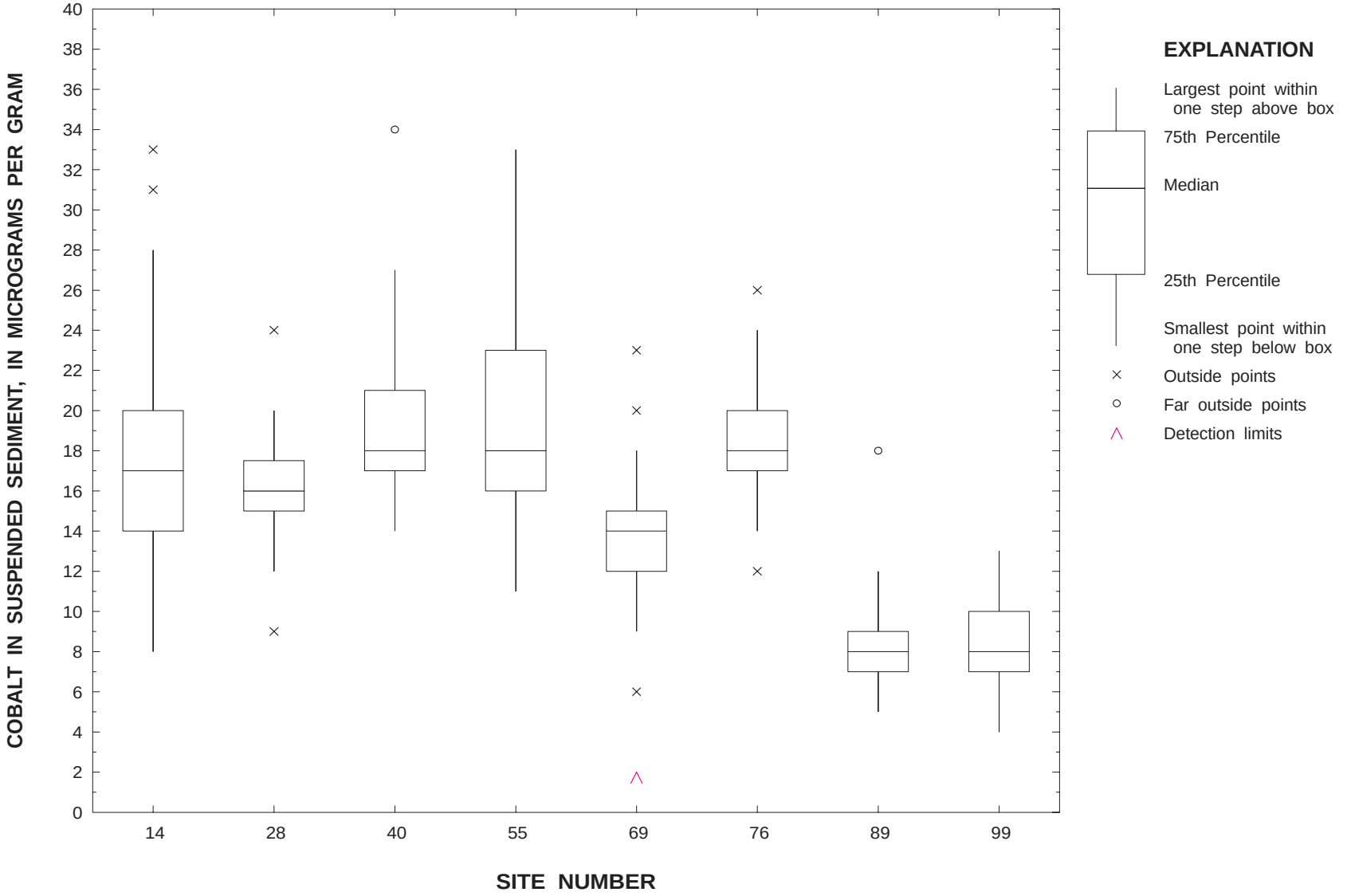

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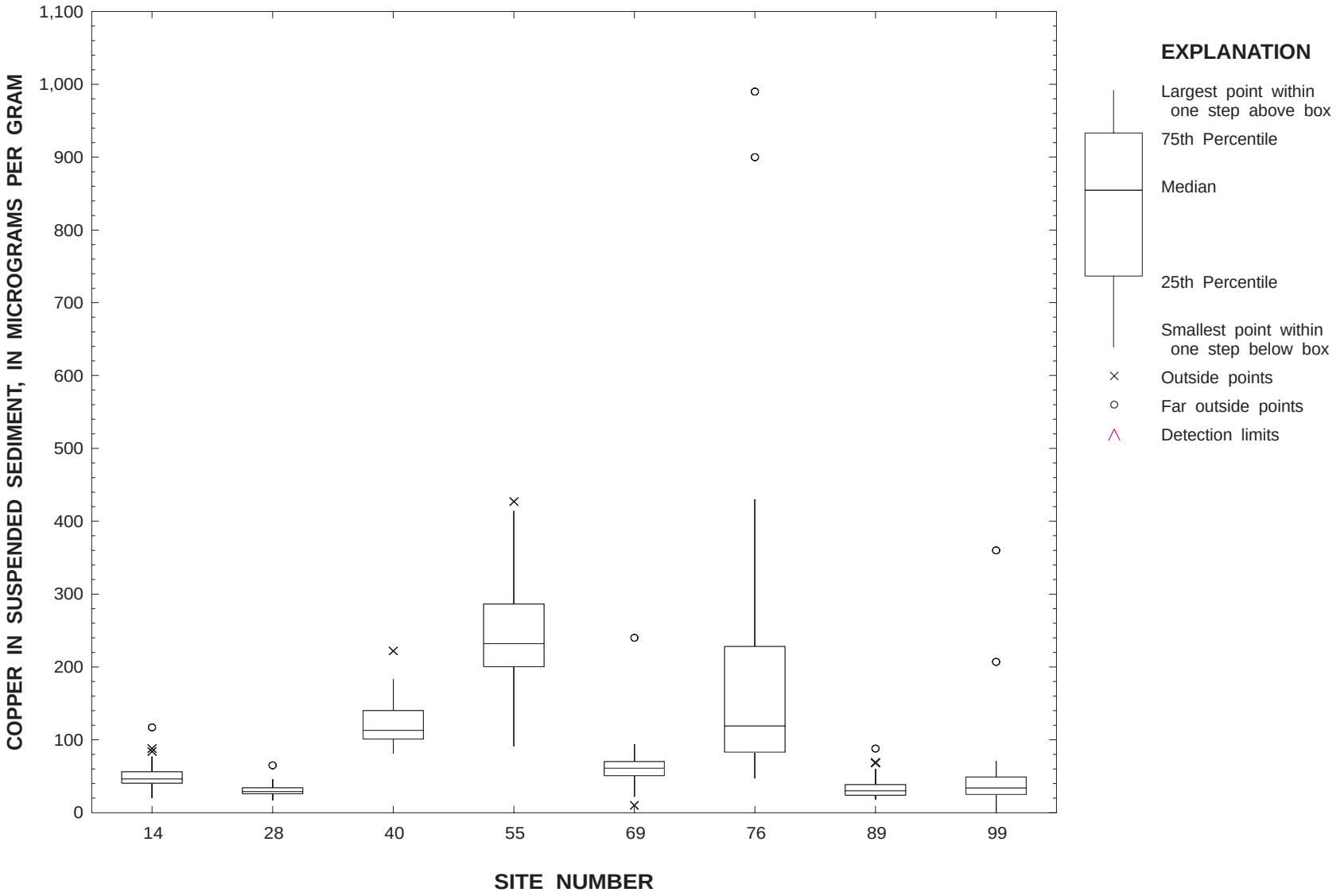

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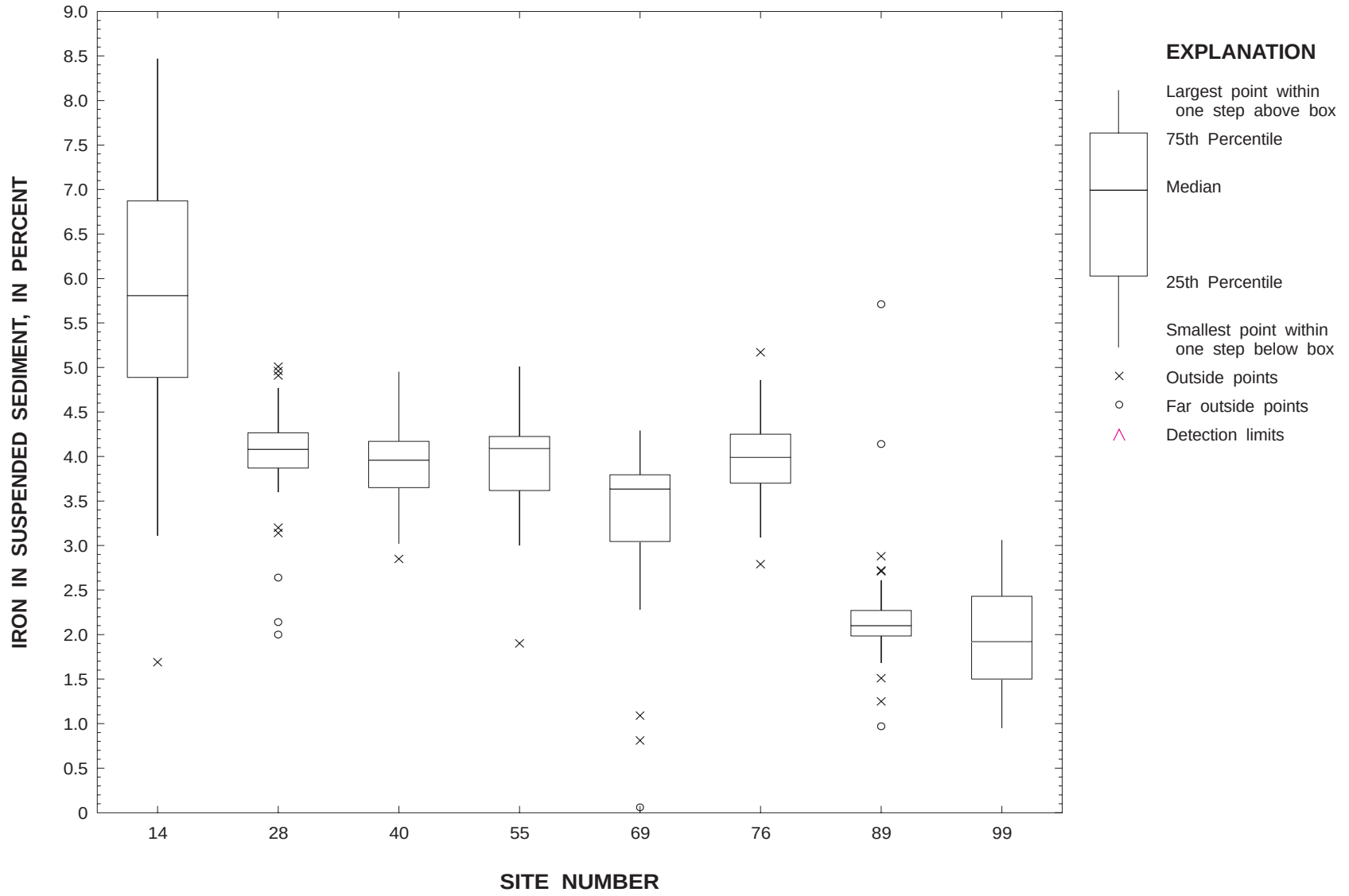

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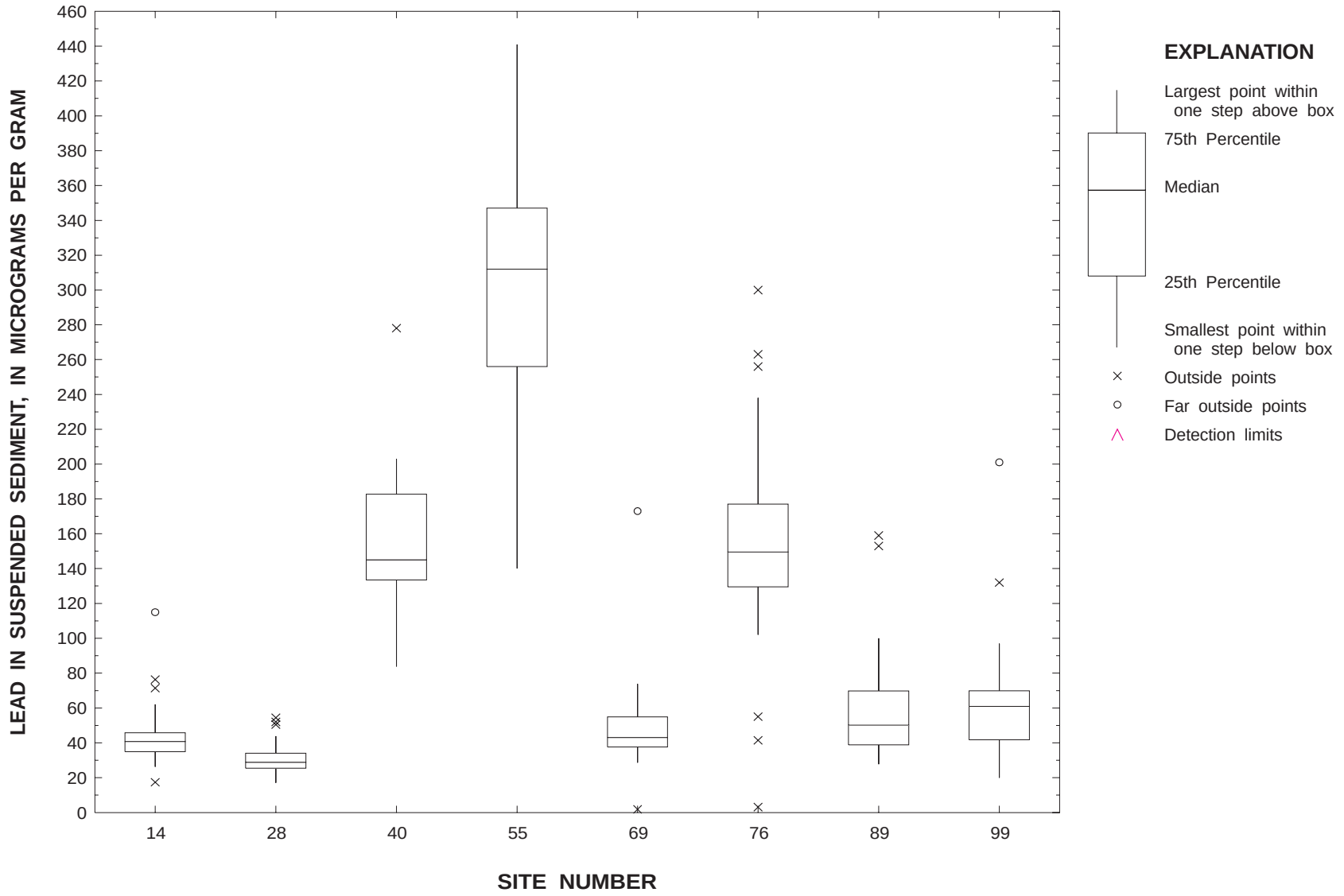

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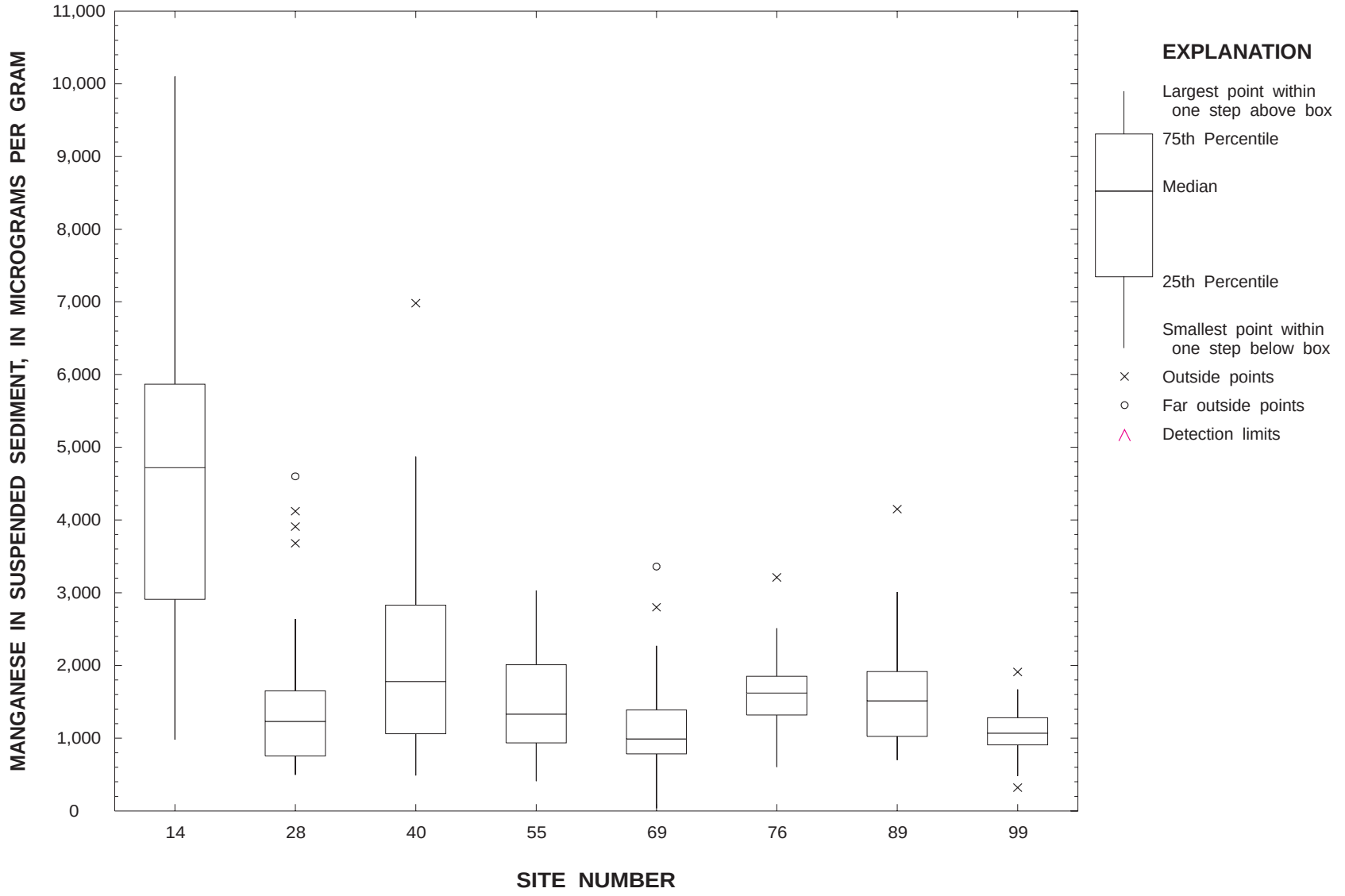

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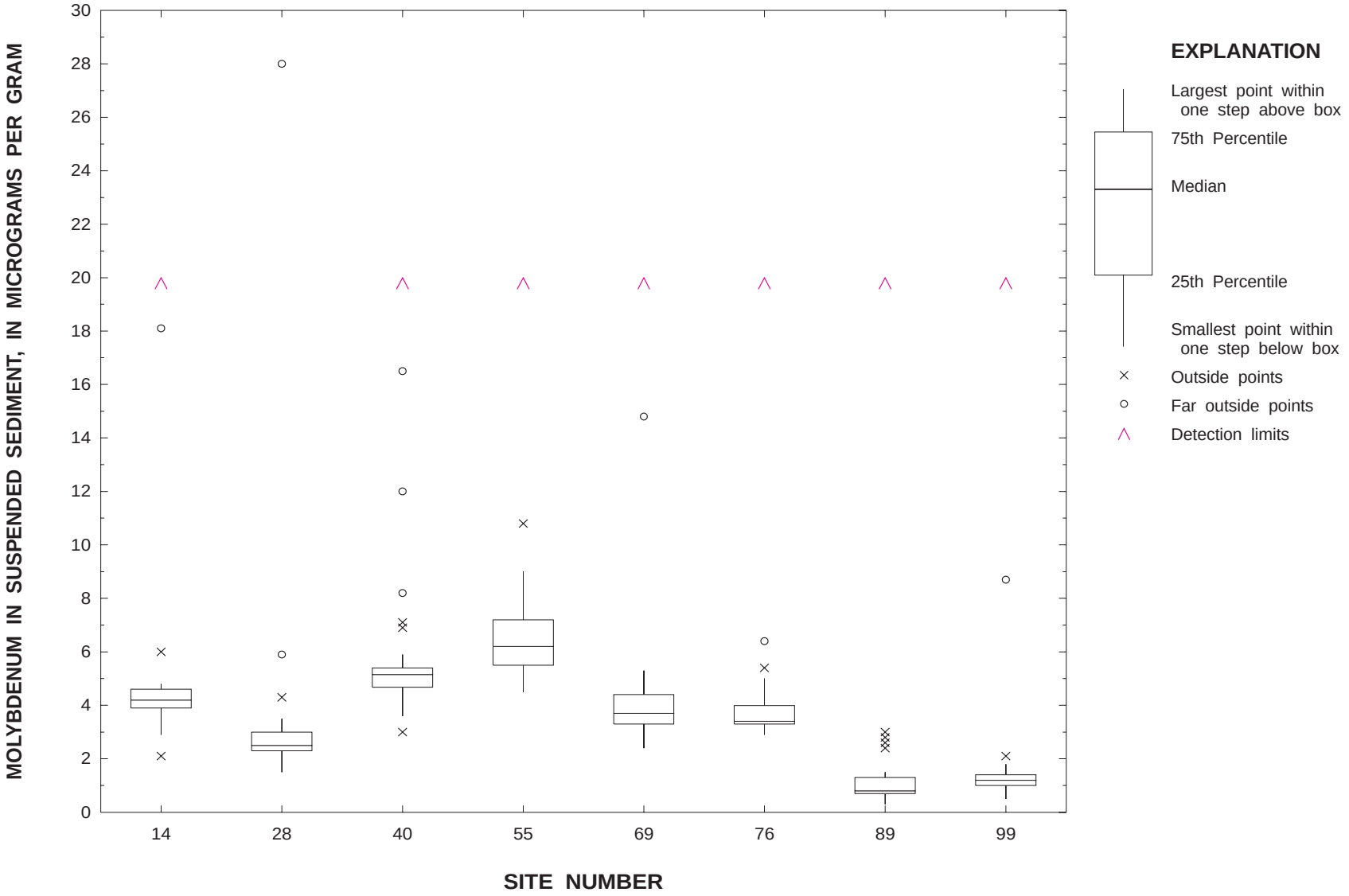

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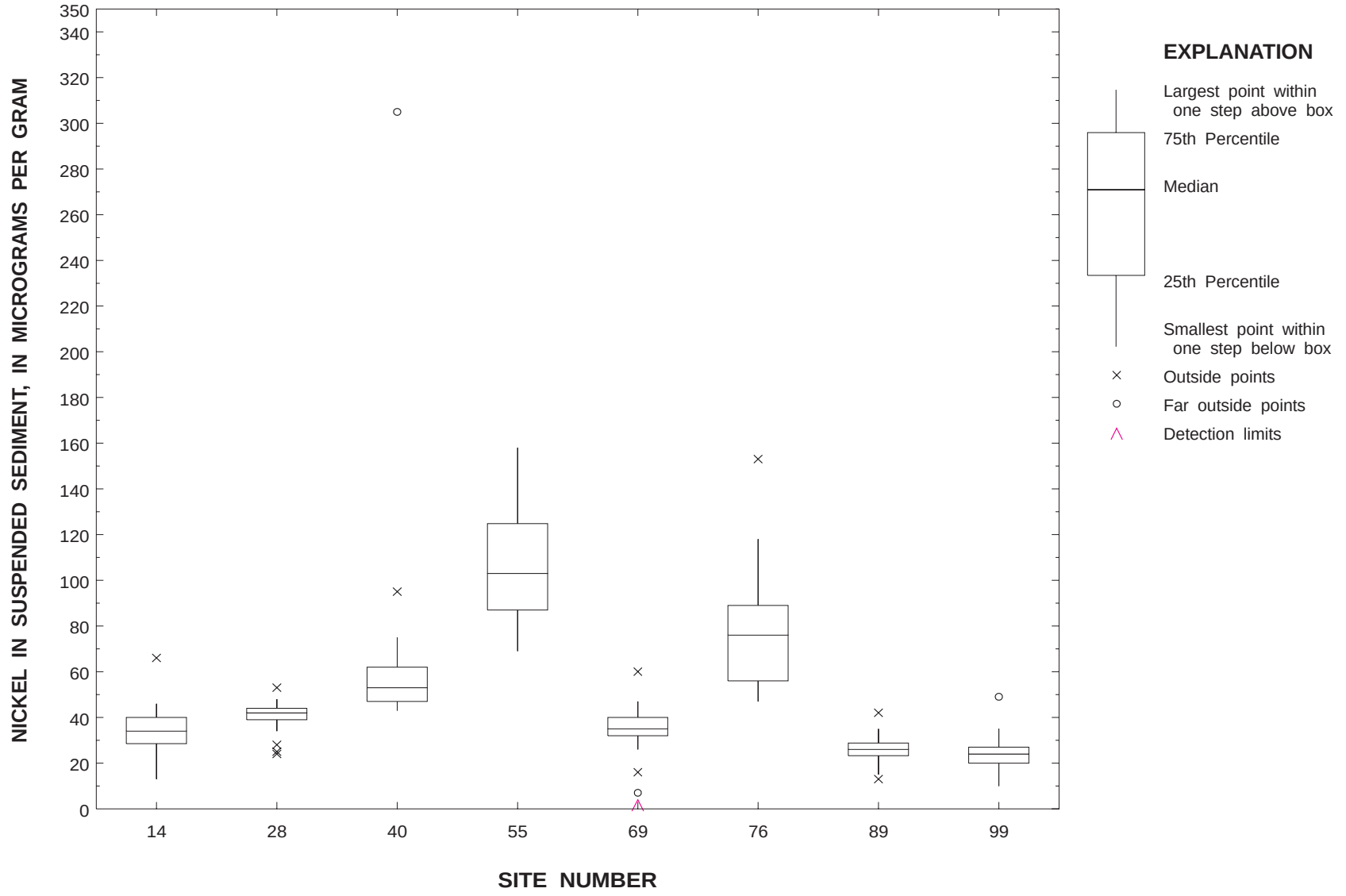

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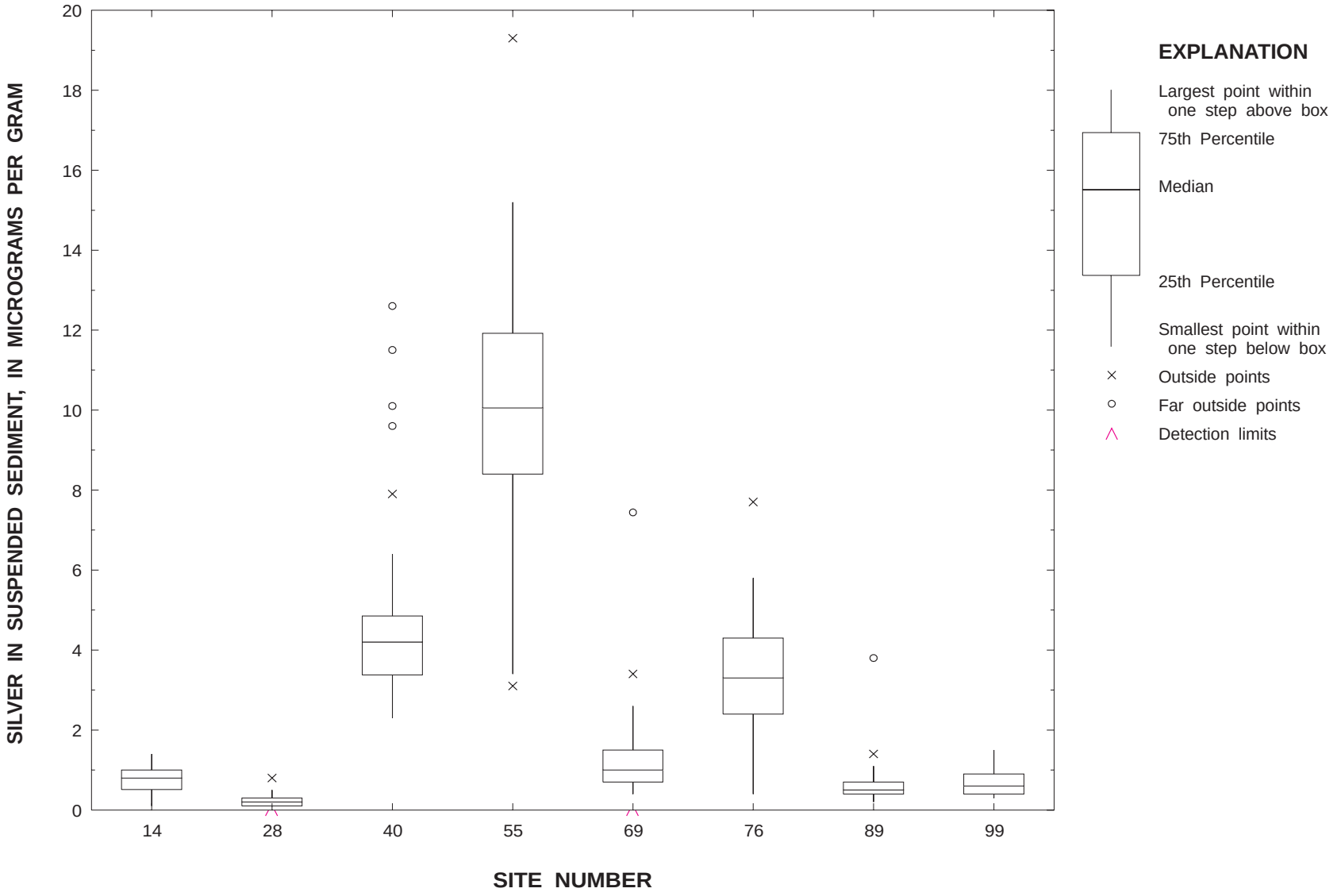

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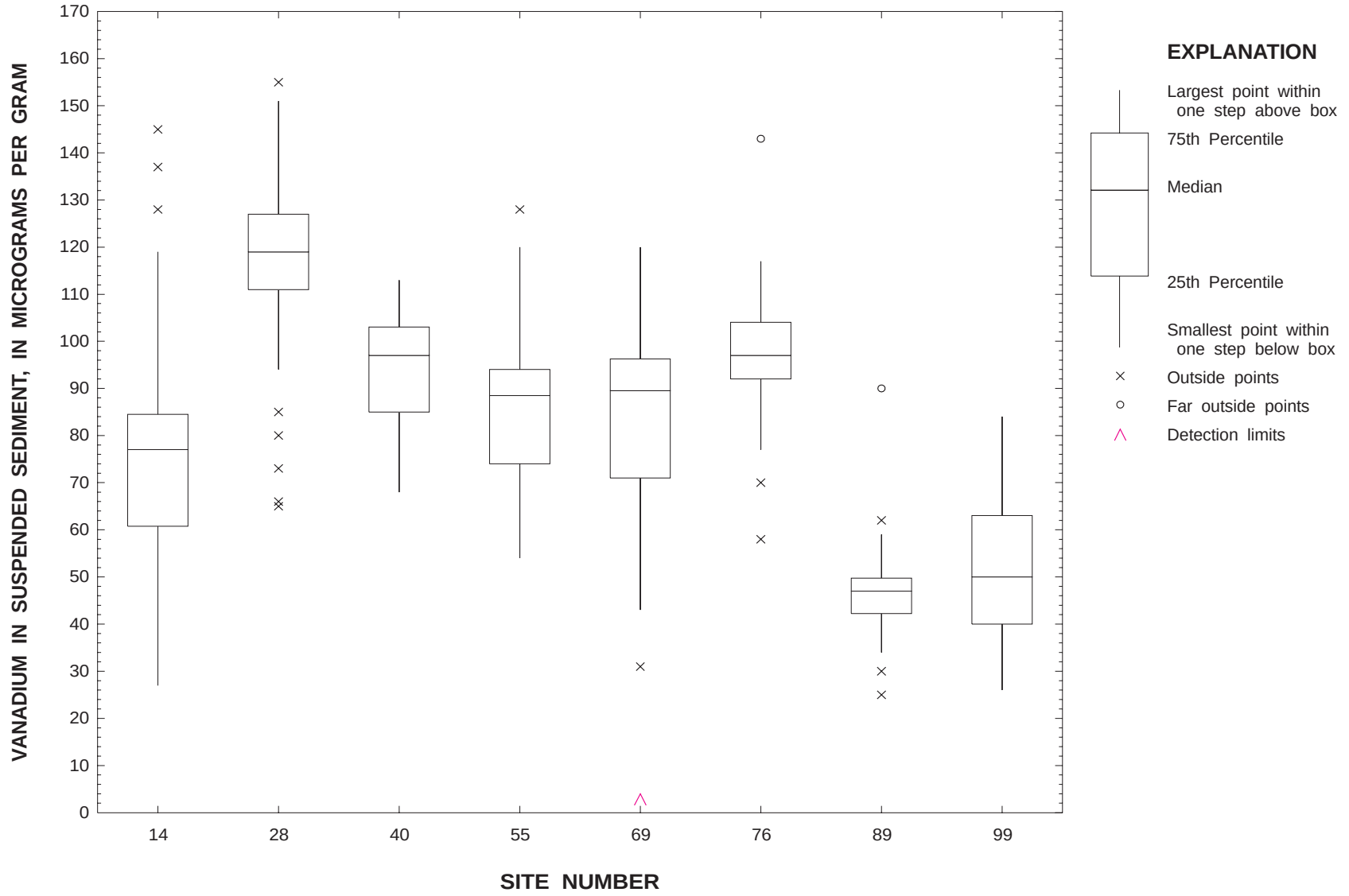

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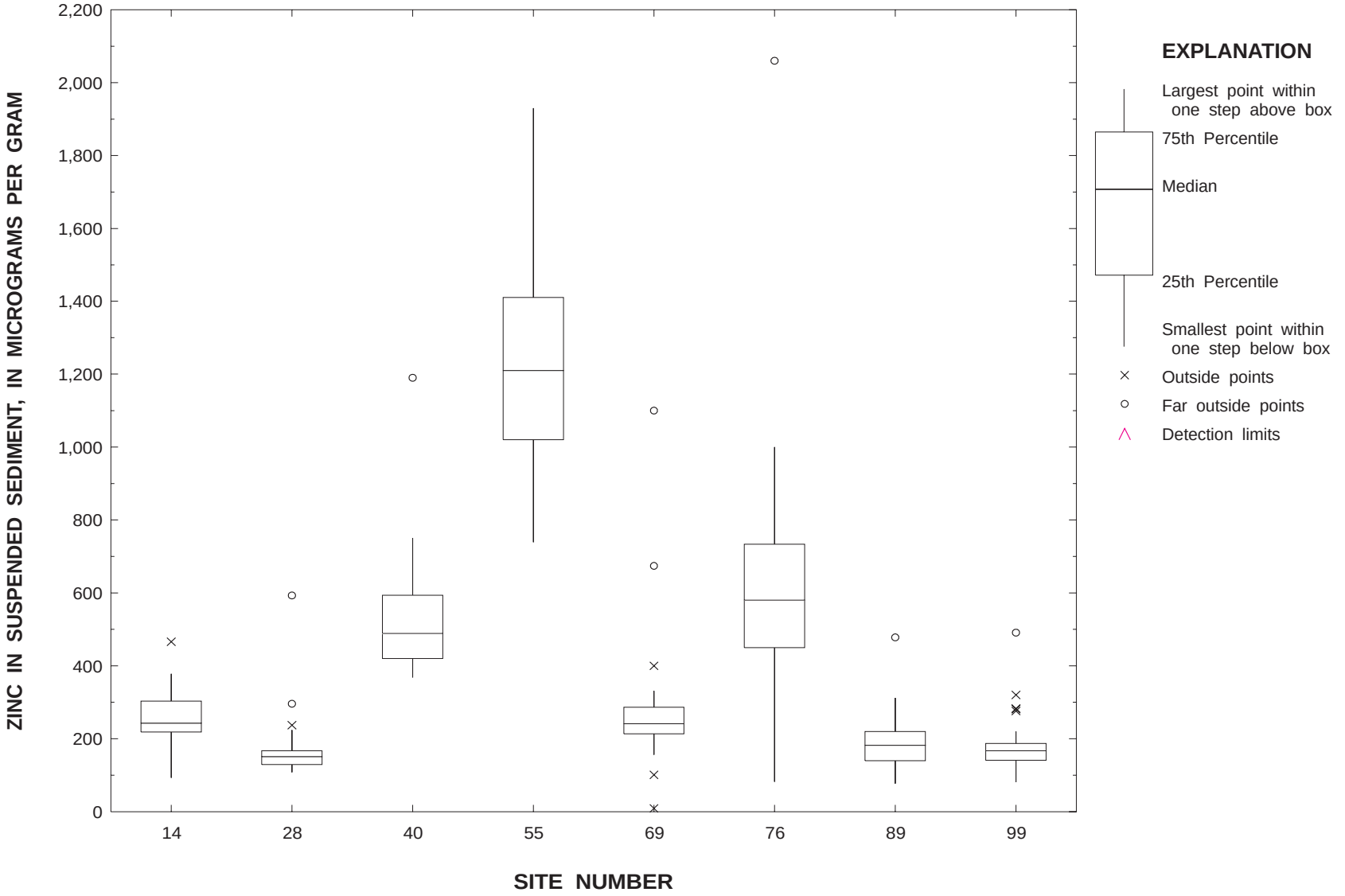

Figure A3. Continued.

Table A1. Element concentrations in biota from the upper Illinois River Basin, 1989–90

[Concentrations are in micrograms per gram dry weight. n, number of individuals per composite sample; length is in millimeters; weight is in grams; --, no data available; <, less than]

Site number (fig. 5)	Sample collection date		Organism	Length/weight		n		Percent moisture		Aluminum		Arsenic	
	1989	1990		1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
2	--	August 2	White sucker	--/--	272/207	--	10	--	79.1	--	<3	--	<0.2
2	--	August 2	Curly leaf pondweed	--/--	--/--	--	--	--	94.4	--	150	--	.57
6	--	August 3	White sucker	--/--	416/804	--	5	--	78.4	--	<3	--	<.2
9	--	August 2	White sucker	--/--	355/487	--	10	--	76.4	--	6	--	<.2
9	--	August 2	White sucker	--/--	324/373	--	10	--	77.5	--	<3	--	<.2
11	July 24	--	Common carp	491/1,556	--/--	9	--	75.6	--	<3	--	0.3	--
14	July 31	--	Asiatic clam	--/--	--/--	14	--	86.3	--	<4	--	5.3	--
14	July 31	August 13	Common carp	440/1,340	540/2,451	4	10	78.6	72.9	13	5	1.3	.3
24	--	July 30	Fat mucket/giant floater	--/--	--/--	--	4	--	88.3	--	48	--	6.2
25	--	July 31	Common carp	--/--	450/1,362	--	4	--	73.7	--	6	--	<.2
27	--	July 31	Fat mucket	--/--	--/--	--	3	--	88.5	--	79	--	4.7
28	--	August 1	Common carp	--/--	501/1,586	--	6	--	73.8	--	<3	--	<.2
38	July 25	--	Fingernail clam	--/--	--/--	30	--	71.3	--	290	--	.4	--
38	July 25	--	Caddisflies	--/--	--/--	--	--	85.7	--	2140	--	1.2	--
38	July 25	--	Crayfish	--/--	--/--	37	--	71.2	--	438	--	1	--
38	--	August 8	Common carp	--/--	333/665	--	8	--	73.2	--	4	--	<.2
38	July 25	--	Wild celery	--/--	--/--	--	--	96.0	--	434	--	.7	--
40	July 25	--	Crayfish	--/--	--/--	289	--	78.6	--	505	--	1.2	--
40	--	August 9	Common carp	--/--	489/1,697	--	10	--	72.4	--	5	--	<.2
40	July 25	--	Goldfish	313/873	--/--	9	--	68.7	--	<3	--	<.2	--
45	August 2	--	Crayfish	--/--	--/--	4	--	78.9	--	200	--	1.2	--
45	August 2	--	Water weed	--/--	--/--	--	--	95.6	--	607		.7	
45	--	August 9	Sago pondweed	--/--	--/--	--	--	--	92.5	--	858	--	.55
46	August 2	--	Ashy physa snail	--/--	--/--	--	--	77.1	--	398	--	1.2	--
46	August 2	--	Eurasian watermilfoil	--/--	--/--	--	--	95.0	--	697	--	.9	--
52	August 4	--	Crayfish	--/--	--/--	--	--	76.3	--	350	--	1.4	--
52	--	August 3	Goldfish	--/--	196/168	--	10	--	73.3	--	<3	--	<.2
53	--	August 3	Common carp	--/--	478/1,765	--	10	--	71.3	--	<3	--	<.2
53	August 4	--	Sago pondweed	--/--	--/--	--	--	93.3	--	1,650	--	1.6	--
58	July 28	August 13	Common carp	436/1,464	476/1,793	10	7	71.8	73.3	8	<3	.3	<.2
63	--	August 7	Common carp	--/--	464/1,458	--	8	--	76.6	--	5	--	<.2
66	August 1	--	Crayfish	--/--	--/--	--	--	79.0	--	533	--	1.1	--
66	August 1	--	Crayfish	--/--	--/--	12	--	76.7	--	381	--	1.1	--
66	August 3	--	Common carp	508/1,743	--/--	6	--	71.6	--	5	--	<.2	--
66	--	August 7	White sucker	--/--	264/196	--	10	--	77	--	<3	--	<.2
69	July 29	August 8	Asiatic clam	--/--	--/--	28	13	84.4	84	13	9	2.4	1.8
69	August 1	August 8	Common carp	506/1,888	497/1,743	5	10	67.3	73.7	<3	3	.6	<.2
76	July 27	August 4	Common carp	570/2,452	356/669	3	10	80.5	73.6	9	<3	.3	.50
78	--	August 11	White sucker	--/--	242/214	--	10	--	80.9	--	<4	--	.30
80	--	August 11	Elktoe	--/--	--/--	--	5	--	86.1	--	7	--	6.70

Table A1. Element concentrations in biota from the upper Illinois River Basin, 1989–90—Continued

Site number (fig. 5)	Sample collection date 1989	Sample collection date 1990	Organism	Length/weight 1989	Length/weight 1990	n 1989	n 1990	Percent moisture 1989	Percent moisture 1990	Aluminum 1989	Aluminum 1990	Arsenic 1989	Arsenic 1990
80	--	August 11	Three ridge	--/--	--/--	--	6	--	83.2	--	<3	--	5.70
80	--	August 10	Common carp	--/--	519/1,790	--	10	--	73.6	--	<3	--	.40
81	August 3	--	Common carp	499/2,965	--/--	9	--	74.4	--	<3		0.5	--
81	August 3	--	Crayfish	--/--	--/--	--	--	74.8	--	210		2.1	--
89	July 25	August 10	Common carp	556/2,258	470/1,402	10	10	68.9	72.6	<3	3	.5	.50
93	--	August 4	Plain pocketbook	--/--	--/--	--	6	--	87	--	37	--	4.50
93	--	August 4	White sucker	--/--	266/206	--	10	--	78.6	--	<3	--	<.2
94	--	August 6	Common carp	--/--	539/2,178	--	10	--	72.3	--	<3	--	.62
94	--	August 6	Common carp	--/--	468/1,393	--	10	--	73.9	--	<3	--	.78
97	July 27	--	Crayfish	--/--	--/--	15	--	80.8	--	367		2.9	--
97	--	August 5	Golden redhorse	--/--	270/213	--	10	--	72.5	--	<3	--	.30
99	--	August 6	Common carp	--/--	464/1,396	--	8	--	75.9	--	54	--	.20

Table A1. Element concentrations in biota from the upper Illinois River Basin, 1989–90—Continued

Site number (fig. 5)	Organism	Barium		Beryllium		Boron		Cadmium		Chromium		Copper		Iron		Lead		Manganese	
		1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
2	White sucker	--	<0.1	--	<0.1	--	<2	--	<0.3	--	<1	--	100	--	845	--	<5	--	8.5
2	Curly leaf pondweed	--	24.4	--	<.1	--	13	--	.5	--	1	--	3.8	--	525	--	<4	--	186
6	White sucker	--	<.1	--	<.1	--	<2	--	<.3	--	<1	--	65.8	--	1,040	--	<5	--	6.5
9	White sucker	--	<.1	--	<.1	--	<2	--	<.3	--	<1	--	68.6	--	859	--	<5	--	5.4
9	White sucker	--	<.1	--	<.1	--	<2	--	<.3	--	<1	--	45.9	--	750	--	<5	--	5.9
11	Common carp	0.1	--	<0.1	--	<2		1.2	--	<1	--	77.3	--	732	--	<4	--	13	--
14	Asiatic clam	6.4	--	<.1	--	<2		.30	--	<1	--	12	--	110	--	<5	--	7.9	--
14	Common carp	.3	<.1	<.1	<.1	<2	<2	.75	1.8	<1	<1	88.1	56.2	651	545	<4	<4	8.2	6.9
24	Fat mucket/giant floater	--	198	--	<.1	--	<2	--	.96	--	<1	--	8.8	--	522	--	<5	--	3,280
25	Common carp	--	<.1	--	<.1	--	<2	--	3.8	--	<1	--	146	--	335	--	<5	--	4.2
27	Fat mucket	--	585	--	<.1	--	<2	--	2.2	--	1	--	11	--	1,560	--	<5	--	7,770
28	Common carp	--	<.1	--	<.1	--	<2	--	44.8	--	<1	--	116	--	501	--	<5	--	3.6
38	Fingernail clam	4.9	--	<.1	--	3	--	.30	--	<1	--	22	--	293	--	<5	--	31.2	--
38	Caddisflies	21.8	--	<.1	--	6	--	.2	--	5.4	--	27.2	--	2,370	--	9	--	516	--
38	Crayfish	24	--	<.1	--	3	--	.2	--	2	--	152	--	402	--	<4	--	105	--
38	Common carp	--	<.1	--	<.1	--	<2	--	2.1	--	<1	--	115	--	330	--	<5	--	4.5
38	Wild celery	32.3	--	<.1	--	17	--	3.5	--	2	--	27.5	--	843	--	7	--	2,750	--
40	Crayfish	23.1	--	<.1	--	2	--	<.2	--	2	--	81.5	--	573	--	<4	--	32.2	--
40	Common carp	--	<.1	--	<.1	--	<2	--	4.6	--	<1	--	65.6	--	1,270	--	<4	--	3.3
40	Goldfish	<.1	--	<.1	--	<2	--	3.1	--	<1	--	46.9	--	680	--	<4	--	2.1	--
45	Crayfish	32.6	--	<.1	--	2	--	<.2	--	1	--	185	--	230	--	<4	--	158	--
45	Water weed	38.7	--	<.1	--	18	--	1.5	--	3	--	48.6	--	1,000	--	8	--	1,620	--
45	Sago pondweed	--	38.9	--	<.1	--	205	--	.7	--	3	--	17	--	800	--	5	--	1,720
46	Ashy physa snail	12.3	--	<.1	--	<2	--	5.9	--	6	--	209	--	668	--	9	--	18	--
46	Eurasian watermilfoil	15.6	--	<.1	--	15	--	8.6	--	11	--	38.4	--	1,090	--	9	--	58.9	--
52	Crayfish	27.5	--	<.1	--	120	--	<.3	--	1	--	115	--	313	--	<4	--	55.7	--
52	Goldfish	--	<.1	--	<.1	--	<2	--	.5	--	<1	--	34.1	--	594	--	<5	--	2.3
53	Common carp	--	<.1	--	<.1	--	<2	--	.6	--	<1	--	18	--	393	--	<5	--	3
53	Sago pondweed	47.3	--	<.1	--	343	--	1.3	--	10	--	20	--	2,510	--	22	--	1,340	--
58	Common carp	.2	<.1	<.1	<.1	<2	<2	1.2	2.8	<1	<1	24.1	16	289	532	<4	<4	2.1	1.9
63	Common carp	--	.1	--	<.1	--	<2	--	3	--	<1	--	153	--	1,080	--	<5	--	4.9
66	Crayfish	40.9	--	<.1	--	5.9	--	<.2	--	2	--	165	--	508	--	<4	--	53.6	--
66	Crayfish	34.6	--	<.1	--	6	--	<.2	--	2	--	170	--	395	--	<4	--	44.9	--
66	Common carp	<.1	--	<.1	--	<2	--	1.2	--	<1	--	72.9	--	629	--	<4	--	3	--
66	White sucker	--	<.1	--	<.1	--	<2	--	.5	--	<1	--	153	--	1,200	--	<5	--	5.3
69	Asiatic clam	4.3	5	<.1	<.1	<2	<2	.4	.6	<1	2	32.9	38.6	143	133	<4	<5	15	21.6
69	Common carp	.2	<.1	<.1	<.1	<2	<2	.93	1.9	<1	<1	74.9	91.8	669	887	<4	<5	3.4	4
76	Common carp	.2	<.1	<.1	<.1	<2	<2	9.5	2.4	<1	<1	122	103	432	731	<4	<5	5	3.3
78	White sucker	--	<.1	--	<.1	--	<3	--	<.4	--	<1	--	100	--	474	--	<5	--	6.1
80	Elktoe	--	124	--	<.1	--	<2	--	1.8	--	2	--	7	--	869	--	<5	--	2,850

Table A1. Element concentrations in biota from the upper Illinois River Basin, 1989–90—Continued

Site number (fig. 5)	Organism	Barium		Beryllium		Boron		Cadmium		Chromium		Copper		Iron		Lead		Manganese	
		1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
80	Three ridge	--	72.2	--	<0.1	--	<2	--	<0.3	--	2	--	4.1	--	592	--	<5	--	1,150
80	Common carp	--	.1	--	<.1	--	<2	--	1.5	--	<1	--	124	--	988	--	<4	--	7.5
81	Common carp	<0.1	--	<0.1	--	<2	--	0.72	--	<1	--	62.3	--	609	--	<4	--	5	--
81	Crayfish	89.6	--	<.1	--	2	--	<.2	--	2	--	54.9	--	320	--	<4	--	134	--
89	Common carp	<.1	<.1	<.1	<.1	<2	<2	.84	.89	<1	<1	66.1	61	1,020	708	<4	<4	2.8	3.8
93	Plain pocketbook	--	203	--	<.1	--	<2	--	.8	--	2	--	4.3	--	651	--	<6	--	3,190
93	White sucker	--	.1	--	<.1	--	<2	--	.5	--	<1	--	168	--	1,840	--	<5	--	5.8
94	Common carp	--	<.1	--	<.1	--	<2	--	4	--	<1	--	179	--	598	--	<5	--	4.6
94	Common carp	--	<.1	--	<.1	--	<2	--	3.7	--	<1	--	130	--	734	--	<5	--	5.2
97	Crayfish	129	--	<.1	--	<2	--	.30	--	2	--	76.4	--	425	--	<4	--	150	--
97	Golden redhorse	--	<.1	--	<.1	--	<2	--	<.3	--	<1	--	25	--	789	--	<5	--	4.4
99	Common carp	--	.48	--	<.1	--	<2	--	18	--	<1	--	110	--	882	--	<5	--	5.8

Table A1. Element concentrations in biota from the upper Illinois River Basin, 1989–90—Continued

Site number (fig. 5)	Organism	Mercury		Molybdenum		Nickel		Lead		Selenium		Silver		Strontium		Vanadium		Zinc	
		1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
2	White sucker	--	0.110	--	1	--	<2	--	<5	--	5.2	--	<2	--	<0.1	--	<0.3	--	161
2	Curly leaf pondweed	--	.005	--	2	--	2	--	<4	--	.3	--	<2	--	19	--	.4	--	51.8
6	White sucker	--	.09	--	<1	--	<2	--	<5	--	4.7	--	<2	--	.1	--	<.3	--	116
9	White sucker	--	.11	--	<1	--	<2	--	<5	--	5	--	<2	--	<.1	--	<.3	--	121
9	White sucker	--	.088	--	<1	--	<2	--	<5	--	4.8	--	<2	--	<.1	--	<.3	--	103
11	Common carp	0.22	--	<1	--	<2	--	<4	--	4.4	--	<2	--	0.2	--	0.6	--	761	--
14	Asiatic clam	.09	--	<1	--	<2	--	<5	--	1.7		<2	--	2.4	--	<.4	--	104	--
14	Common carp	.12	.14	<1	1	<2	<2	<4	<4	4.2	6.3	<2	<2	.4	<.1	.4	.4	676	576
24	Fat mucket/giant floater	--	.097	--	<1	--	<2	--	<5	--	2.6	--	<2	--	89.9	--	.6	--	223
25	Common carp	--	.15	--	1	--	<2	--	<5	--	7.4	--	<2	--	.2	--	.4	--	621
27	Fat mucket	--	.085	--	<1	--	<2	--	<5	--	2.6	--	<2	--	244	--	<.4	--	911
28	Common carp	--	.33	--	<1	--	<2	--	<5	--	5.7	--	<2	--	.1	--	.6	--	442
38	Fingernail clam	.03	--	<1	--	<2	--	<5	--	.5	--	<2	--	582	--	1.3	--	34.5	--
38	Caddisflies	.14	--	3	--	7.6	--	9	--	2	--	<2	--	16.7	--	4.6	--	159	--
38	Crayfish	.12	--	<1	--	3	--	<4	--	1.2	--	<2	--	567	--	.9	--	66.9	--
38	Common carp	--	.24	--	<1	--	<2	--	<5	--	4.5	--	<2	--	1.1	--	<.3	--	1,060
38	Wild celery	.04	--	2	--	30	--	7	--	.4	--	<2	--	94.7	--	1.5	--	415	--
40	Crayfish	.07	--	<1	--	2	--	<4	--	<51.4	--	<2	--	440	--	.97	--	71.7	--
40	Common carp	--	.13	--	1	--	<2	--	<4	--	7.2	--	<2	--	.32	--	<.3	--	653
40	Goldfish	.14	--	<1	--	<2	--	<4	--	4.7	--	<2	--	.5	--	<.3	--	207	--
45	Crayfish	.15	--	<1	--	2	--	<4	--	2	--	<2	--	221	--	.5	--	76.2	--
45	Water weed	.1	--	2	--	36	--	8	--	.6	--	<2	--	56.2	--	1.8		301	--
45	Sago pondweed	--	.019	--	17	--	11	--	5	--	.5	--	<2	--	57.60	--	<.3	--	95.3
46	Ashy physa snail	.08	--	<1	--	28	--	9	--	1.6	--	15	--	167	--	.6	--	61.7	--
46	Eurasian watermilfoil	.07	--	<1	--	17	--	9	--	.5	--	<2	--	37.7	--	1.2	--	157	--
52	Crayfish	.1	--	<1	--	<2	--	<4	--	1.1	--	<2	--	160	--	.7	--	60	--
52	Goldfish	--	.093	--	<1	--	<2	--	<5	--	4.9	--	<2	--	.20	--	<.3	--	106
53	Common carp	--	.071	--	1	--	<2	--	<5	--	5.4	--	<2	--	.33	--	2.3	--	342
53	Sago pondweed	.09	--	4.5	--	6.7	--	22	--	.7	--	<2	--	47.3	--	5.6	--	245	--
58	Common carp	.06	.061	<1	1	<2	<2	<4	<4	3.9	7.3	<2	<2	1.1	.10	.4	<.3	477	511
63	Common carp	--	.410	--	2	--	<2	--	<5	--	7.9	--	<2	--	.55	--	<.3	--	964
66	Crayfish	.05	--	<1	--	3	--	<4	--	1.6	--	<2	--	339	--	1.1	--	73.5	--
66	Crayfish	.06	--	<1	--	3	--	<4	--	1.4	--	<2	--	334	--	.7	--	77.1	--
66	Common carp	.3	--	<1	--	<2	--	<4	--	6.3	--	<2	--	.3	--	.3	--	771	--
66	White sucker	--	.330	--	1	--	<2	--	<5	--	5.2	--	2	--	.32	--	<.3	--	176
69	Asiatic clam	.10	.097	<1	1	2	5	<4	<5	3	2.9	<2	<2	9.6	7.50	<.3	2	175	172
69	Common carp	.19	.29	<1	1	<2	<2	<4	<5	3.9	5.3	<2	<2	1.8	.20	<.3	.4	528	951
76	Common carp	.17	.098	2	<1	<2	<2	<4	<5	6.1	6.2	3	<2	.7	.36	.60	<.3	980	822
78	White sucker	--	.548	--	<1	--	<2	--	<5	--	4.6	--	<2	--	<.1	--	<.4	--	170
80	Elktoe	--	.078	--	<1	--	7	--	<5	--	1.8	--	<2	--	28.1	--	<.3	--	119

Table A1. Element concentrations in biota from the upper Illinois River Basin, 1989–90—Continued

Site number (fig. 5)	Organism	Mercury		Molybdenum		Nickel		Lead		Selenium		Silver		Strontium		Vanadium		Zinc	
		1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990
80	Three ridge	--	0.094	--	<1	--	<2	--	<5	--	1.9	--	<2	--	18.8	--	<0.3	--	113
80	Common carp	--	.30	--	2	--	<2	--	<4	--	7.2	--	5	--	<.1	--	.5	--	854
81	Common carp	.24	--	<1	--	<2	--	<4	--	3.7	--	<2	--	0.1	--	0.40	--	561	--
81	Crayfish	.04	--	<1	--	4	--	<4	--	1.5	--	<2	--	114	--	.70	--	70	--
89	Common carp	.27	.25	<1	1	<2	<2	<4	<4	4	4.3	<2	<2	.5	.55	.70	.4	1,310	797
93	Plain pocketbook	--	.083	--	1	--	8.9	--	<6	--	1.9	--	<2	--	42.4	--	2.3	--	194
93	White sucker	--	.34	--	1	--	<2	--	<5	--	5.5	--	<2	--	<.1	--	1	--	236
94	Common carp	--	.36	--	1	--	<2	--	<5	--	7.6	--	<2	--	<.1	--	.8	--	1,140
94	Common carp	--	.24	--	1	--	<2	--	<5	--	7.4	--	<2	--	<.1	--	.6	--	769
97	Crayfish	.08	--	<1	--	<2	--	<4	--	2	--	<2	--	149	--	1.1	--	70.5	--
97	Golden redhorse	--	.11	--	<1	--	<2	--	<5	--	5.5	--	<2	--	.10	--	<.3	--	62.1
99	Common carp	--	.23	--	1	--	<2	--	<5	--	5.1	--	<2	--	.79	--	1.1	--	1,010

Table A2. Major element concentrations in streambed sediments in the upper Illinois River Basin, August 1990

[All concentrations are in percent]

Site number (fig. 5)	Date	Aluminum	Calcium	Iron	Potassium	Magnesium	Sodium	Phosphorus
2	Aug. 2, 1990	3.5	4.2	7.2	1.2	0.82	0.38	0.19
6	Aug. 3, 1990	4.7	2.8	7.4	1.4	1.1	.58	.17
9	Aug. 2, 1990	4.1	4.4	9.1	1.5	1.2	.47	.27
14	Aug. 13, 1990	5.0	3.9	5.3	1.7	1.4	.57	.15
24	July 30, 1990	6.6	1.9	3.2	2.7	1.5	.56	.07
25	July 30, 1990	6.2	2.3	2.9	2.9	1.7	.56	.06
27	July 31, 1990	6.2	3.1	3.1	2.6	1.8	.5	.08
28	Aug. 1, 1990	6.6	2.9	3.4	2.5	1.8	.48	.90
38	Aug. 8, 1990	6.2	4.2	3.5	2.6	2.7	.51	.22
40	Aug. 9, 1990	5.3	5.9	3.2	2.3	3.3	.5	.2
45	Aug. 9, 1990	6.2	4.6	3.3	2.6	2.9	.47	.16
52	Aug. 3, 1990	5.9	4.8	3.3	2.5	2.6	.52	.22
53	Aug. 3, 1990	6.1	4.7	3.5	2.5	2.6	.47	.26
58	Aug. 13, 1990	6.0	5.0	3.7	2.4	2.9	.39	.35
63	Aug. 7, 1990	5.5	4.0	3.2	2.1	2.3	.61	.19
66	Aug. 7, 1990	5.2	4.5	3.1	2.1	2.4	.63	.17
69	Aug. 8, 1990	4.9	6.6	2.7	1.9	2.5	.61	.15
76	Aug. 4, 1990	5.9	4.4	3.5	2.3	2.2	.52	.23
89	Aug. 10, 1990	3.8	14	2.3	1.3	2.1	.36	.12
93	Aug. 4, 1990	4.5	5.8	2.8	1.5	1.4	.79	.11
94	Aug. 6, 1990	4.7	6.4	2.4	1.6	1.7	.65	.11
97	Aug. 5, 1990	4.5	6.4	2.1	1.7	2.1	.75	.07
99	Aug. 6, 1990	4.3	9.4	2.1	1.6	2	.6	.1

Table A3. Trace element concentrations in streambed sediments in the upper Illinois River Basin, August 1990

[All concentrations are in micrograms per gram; <, less than]

Site number (fig. 5)	Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Vanadium	Zinc
2	Aug. 2, 1990	27	460	1	<2	40	28	41	5,300	0.08	4	26	1.4	<2	80	55	180
6	Aug. 3, 1990	35	460	1	<2	52	35	34	2,900	.14	6	32	1	<2	95	71	190
9	Aug. 2, 1990	16	440	1	<2	44	32	31	1,800	.16	13	24	.5	<2	92	59	160
14	Aug. 13, 1990	20	460	1	<2	58	35	39	2,500	.18	2	29	.9	<2	110	69	190
24	July 30, 1990	5.1	490	2	<2	73	20	27	610	.04	<2	32	.6	<2	110	89	88
25	July 30, 1990	4.2	450	2	<2	68	19	23	590	.04	<2	33	.4	<2	95	80	82
27	July 31, 1990	5.1	440	2	<2	65	23	25	620	.04	2	32	.7	<2	100	82	100
28	Aug. 1, 1990	5.6	460	2	<2	74	22	26	720	.16	<2	34	.5	<2	100	92	110
38	Aug. 8, 1990	5.6	460	2	<2	120	90	120	570	.42	5	44	.8	3	150	86	310
40	Aug. 9, 1990	5.8	420	1	3	110	120	140	610	.8	2	41	.9	6	150	71	370
45	Aug. 9, 1990	5.6	430	2	<2	130	120	140	590	.78	3	53	1	8	120	86	340
52	Aug. 3, 1990	5.7	450	2	<2	100	76	110	530	.44	2	40	.7	<2	130	77	370
53	Aug. 3, 1990	6.9	470	2	2	120	91	130	610	.54	3	46	.8	2	130	83	510
58	Aug. 13, 1990	10	570	2	14	280	210	260	550	1.5	4	62	1.3	7	130	84	950
63	Aug. 7, 1990	5.6	500	1	<2	73	54	45	610	.24	3	31	.7	<2	140	73	170
66	Aug. 7, 1990	6.4	430	1	<2	61	56	47	430	.2	3	30	.6	<2	130	67	200
69	Aug. 8, 1990	4.4	440	1	<2	56	46	38	500	.26	<2	26	.6	<2	150	63	160
76	Aug. 4, 1990	6	480	2	4	120	73	81	730	.56	<2	50	.8	<2	120	82	330
89	Aug. 10, 1990	4.5	370	<1	<2	60	29	36	770	.32	<2	26	.7	<2	460	51	120
93	Aug. 4, 1990	4.4	500	1	<2	44	19	22	1,100	.04	<2	17	.5	<2	150	55	81
94	Aug. 6, 1990	4.5	510	1	<2	50	19	22	990	.06	<2	20	.8	<2	130	62	88
97	Aug. 5, 1990	3.5	480	1	<2	44	15	18	680	.06	<2	18	.4	<2	130	56	67
99	Aug. 6, 1990	4.2	440	1	<2	48	25	39	430	.14	<2	22	.7	<2	240	54	110

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90

[Sites included are those with continuous discharge data and more than 30 observations. Sites with more than 90 percent of the observations less than the detection limit are excluded. Loads were calculated twice, once with censored values set to zero and once with censored values set to the detection limit. --, calculations resulted in the same values, which indicates that no or few censored values were present; >, greater than]

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable aluminum			
14	47	3,850	2,710	221	95.4	1.68	1.18
20	32	652	--	86.3	--	.95	--
22	31	1,190	--	75.6	--	2.68	--
28	50	7,270	--	90.5	--	3.48	--
31	41	17,200	13,800	231	103	3.33	2.67
32	31	46.0	--	63.0	--	.37	--
34	31	327	--	58.5	--	.91	--
39	31	155	--	172	--	8.67	--
40	43	985	--	57.5	--	1.56	--
45	31	729	305	275	71.4	7.29	3.05
50	32	369	368	376	81.0	3.55	3.53
55	67	1,050	--	52.3	--	1.43	--
62	31	39.7	--	54.9	--	1.39	--
69	72	1,620	1,220	169	81.0	5.01	3.78
76	57	11,700	--	66.4	--	1.41	--
86	31	144	77.0	706	88.3	.75	.40
89	72	8,190	9,470	117	42.2	84	6.75
99	45	2,980	1,570	610	85.7	1.13	.59
				Total recoverable arsenic			
14	46	4.81	4.62	52.1	34.8	.00	.00
28	47	3.28	2.49	126	46.5	.00	.00
31	41	10.0	8.78	116	50.6	.00	.00
40	43	1.54	--	39.4	--	.00	--
45	31	.16	.14	52.9	26.0	.00	.00
55	67	4.27	--	38.2	--	.01	--
69	69	.46	.52	85.1	42.5	.00	.00
76	56	17.7	18.2	50.4	33.7	.00	.00
89	70	41.2	22.5	48.3	21.7	.03	.02
99	45	2.71	2.69	92.7	31.6	.00	.00

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable barium			
14	47	135	--	16.2	--	0.06	--
20	32	33.9	--	7.72	--	.05	--
22	31	15.6	--	20.8	--	.03	--
28	50	108	--	20.5	--	.05	--
31	31	301	304	135	34.3	.06	0.06
32	31	3.03	--	23.6	--	.02	--
34	31	11.9	13.6	155	38.7	.03	.04
39	31	1.03	--	18.5	--	.06	--
40	43	35.1	29.4	116	24.5	.06	.05
45	31	4.74	--	38.3	--	.05	--
50	32	4.96	--	33.1	--	.05	--
55	67	62.8	61.5	79.9	32.5	.08	.08
60	31	3.57	--	46.6	--	.03	--
62	31	3.01	--	38.8	--	.11	--
69	72	25.4	--	23.1	--	.08	--
76	57	457	--	26.4	--	.06	--
86	31	6.93	--	20.5	--	.04	--
89	71	669	--	16.0	--	.48	--
99	45	148	--	24.2	--	.06	--
				Total recoverable boron			
14	47	34.6	119	7,500	13.7	.02	.05
20	32	20.8	27.4	1,160	22.3	.03	.04
22	31	7.60	14.8	886	23.0	.02	.03
28	50	79.3	87.9	1,930	21.6	.04	.04
31	31	289	297	2,720	21.5	.06	.06
32	31	10.8	7.43	804	48.2	.09	.06
34	31	42.4	--	15.3	--	.12	--
39	31	8.44	--	31.8	--	.47	--
40	43	125	--	18.9	--	.20	--
45	31	13.5	--	21.5	--	.14	--
50	32	20.9	--	23.0	--	.20	--
55	67	428	--	11.4	--	.58	--
60	31	12.0	--	22.8	--	.11	--
62	31	8.74	--	23.4	--	.31	--
69	72	68.3	61.6	118	16.7	.21	.19

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable boron—Continued			
76	57	1,090	--	22.3	--	0.13	--
86	31	.32	6.15	1,110	7.59	.00	0.03
89	72	40.9	668	757	14.4	.03	.48
99	45	98.8	134	1,570	20.7	.04	.05
				Total recoverable cadmium			
14	47	.55	1.40	81.1	132	.00	.00
28	49	.28	.57	50.8	72.7	.00	.00
39	31	.01	.07	155	15.5	.00	.00
40	43	.39	--	63.8	--	.00	--
45	31	.08	.35	193	21.5	.00	.00
55	67	3.24	3.65	146	62.6	.00	.00
69	72	.09	.37	71.2	146	.00	.00
76	57	4.95	9.99	78.6	99.3	.00	.00
89	72	4.78	301	40.2	116	.00	.21
99	45	.45	.91	68.6	87.8	.00	.00
				Total recoverable chromium			
14	47	36.0	18.8	1,120	58.8	.02	.01
20	32	1.04	2.92	467	17.7	.00	.00
22	31	1.36	2.12	1,720	58.9	.00	.00
28	50	19.3	18.3	1,290	71.5	.01	.01
31	41	176	81.0	1,810	96.0	.03	.02
32	31	.18	.40	800	21.1	.00	.00
34	31	2.08	2.16	815	33.3	.01	.01
39	31	.62	.25	760	58.3	.03	.01
40	43	10.3	7.53	1,150	51.9	.02	.01
45	31	.98	.74	1,050	28.9	.01	.01
50	32	2.71	2.79	2,870	129	.03	.03
55	67	30.0	30.4	422	52.5	.04	.04
60	31	.73	.73	2,060	77.8	.01	.01
62	31	1.46	.27	545	40.0	.05	.01
69	72	5.68	3.16	1,150	51.5	.02	.01
76	56	145	105	1,100	59.1	.02	.01
86	31	.29	.70	835	20.4	.00	.00
89	72	6.79	47.4	732	60.9	.00	.03
99	45	51.5	31.4	2,060	108	.02	.01

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable cobalt			
20	32	0.24	2.81	169	14.0	0.00	0.00
34	31	.13	1.73	207	22.0	.00	.00
40	43	1.14	4.35	137	44.8	.00	.00
45	31	.08	.59	210	26.5	.00	.01
50	32	.11	.65	197	19.3	.00	.01
55	67	.72	13.3	80.3	3.14	.00	.00
				Total recoverable copper			
14	47	8.98	16.0	357	41.0	.00	.01
20	32	1.00	2.81	430	15.5	.00	.00
22	31	.65	1.77	254	28.9	.00	.00
28	50	19.4	13.8	536	45.8	.01	.01
31	41	19.6	31.5	311	25.4	.00	.01
32	31	.14	.41	746	35.7	.00	.00
34	31	1.54	2.22	803	49.6	.00	.01
39	31	.60	.50	231	74.9	.03	.03
40	43	21.3	10.7	610	59.5	.03	.02
45	31	216	1.78	695	40.2	2.16	.02
50	32	2.67	1.16	1,220	41.5	.03	.01
55	67	32.1	24.5	580	51.2	.04	.03
60	31	.09	.54	187	23.8	.00	.01
62	31	.88	.32	412	27.3	.03	.01
69	72	7.69	3.63	789	45.2	.02	.01
76	57	186	119	1,340	71.3	.02	.01
86	31	.10	.62	196	10.3	.00	.00
89	72	53.2	247	339	39.4	.04	.18
99	45	9.97	12.9	493	30.2	.00	.00
				Total recoverable iron			
14	47	4,960	--	55.0	--	2.16	--
20	32	737	--	67.0	--	1.07	--
22	31	1,270	--	72.5	--	2.85	--
28	50	9,450	7,920	296	99.4	4.52	3.79
31	41	16,400	--	71.7	--	3.18	--

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable iron—Continued			
32	31	59.1	--	52.9	--	0.48	--
34	31	501	--	42.9	--	1.39	--
39	31	55.5	--	58.5	--	3.10	--
40	43	1,480	--	53.6	--	2.34	--
45	31	879	373	294	66.1	8.79	3.73
50	32	456	487	395	75.0	4.39	4.68
55	67	1,610	1,740	171	56.4	2.18	2.35
60	31	284	--	70.8	--	2.66	--
62	31	66.5	--	54.1	--	2.33	--
69	72	1,700	1,810	220	91.6	5.25	5.58
76	57	17,300	--	49.6	--	2.10	--
86	31	103	--	56.9	--	.53	--
89	72	36,400	30,800	120	34.6	26.0	22.0
99	45	2,210	--	77.6	--	.84	--
				Total recoverable lead			
14	47	1.97	23.0	185	76.1	.00	.01
28	50	3.46	15.9	328	63.3	.00	.01
32	31	.03	4.13	218	59.1	.00	.03
39	31	.27	1.05	463	77.9	.02	.06
40	43	26.3	9.83	304	37.8	.04	.02
45	31	13.0	9.09	332	73.2	.13	.09
50	32	2.19	5.18	1,030	66.2	.02	.05
55	67	44.5	50.1	371	63.5	.06	.07
60	31	.27	3.30	259	65.1	.00	.03
69	71	4.33	6.65	200	93.5	.01	.02
76	57	117	125	919	68.6	.01	.02
99	44	4.40	20.7	247	59.0	.00	.01
				Total recoverable manganese			
14	47	309	336	141	32.0	.13	.15
20	32	33.3	--	36.8	--	.05	--
22	31	24.4	--	62.2	--	.05	--
28	50	158	--	64.4	--	.08	--
31	41	644	578	145	64.4	.13	.11

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable manganese—Continued			
32	31	6.43	--	59.3	--	0.05	--
34	31	25.0	--	27.0	--	.07	--
39	31	3.20	--	53.2	--	.18	--
40	43	65.9	--	32.3	--	.10	--
45	31	12.0	--	41.6	--	.12	--
50	32	14.6	--	31.7	--	.14	--
55	67	138	--	22.7	--	.19	--
60	31	7.01	--	39.5	--	.07	--
62	31	3.03	--	36.7	--	.11	--
69	72	42.7	--	49.9	--	.13	--
76	57	801	--	29.8	--	.10	--
86	31	10.2	--	35.1	--	.05	--
89	72	1,080	--	26.4	--	.77	--
99	45	152	--	48.8	--	.06	--
				Total recoverable mercury			
55	47	.37	--	26.2	--	.00	--
69	43	.05	--	58.8	--	.00	--
				Total recoverable nickel			
14	47	7.56	14.3	644	28.2	.00	0.01
20	32	2.67	3.57	1,100	30.6	.00	.01
22	31	1.58	2.29	878	46.7	.00	.01
28	50	8.98	12.9	1,550	51.5	.00	.01
31	41	52.0	48.1	1,200	51.1	.01	.01
32	31	0.13	0.46	422	30.7	.00	.00
34	31	1.36	2.30	809	40.1	.00	.01
39	31	.52	.31	1,070	65.6	.03	.02
40	43	4.91	6.74	981	53.4	.01	.01
45	31	.34	.81	1,550	43.5	.00	.00
50	32	2.62	1.70	2,470	75.3	.03	.02
55	67	53.9	52.3	86.8	51.2	.07	.07
60	31	.14	.56	630	43.9	.00	.01
62	31	.29	.40	1,360	62.3	.01	.01
69	72	1.83	2.51	1,240	43.9	.01	.01

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable nickel—Continued			
76	57	141	112	534	57.6	0.02	0.01
86	31	.46	.94	1,260	54.6	.00	.00
89	72	122	1370	283	34.3	.09	.98
99	45	10.1	15.3	1,100	56.1	.00	.01
				Total recoverable silver			
20	32	.34	1.86	189	19.7	.00	.00
45	31	.04	.34	164	20.3	.00	.00
				Total recoverable strontium			
14	47	290	--	7.60	--	.13	--
20	32	114	--	17.8	--	.17	--
22	31	38.3	--	16.0	--	.09	--
28	50	281	--	19.0	--	.13	--
31	41	748	--	14.8	--	.15	--
32	31	49.1	--	54.1	--	.40	--
34	31	132	--	14.3	--	.37	--
39	31	17.9	--	34.7	--	.00	.00
40	43	292	--	17.8	--	.46	--
45	31	33.5	--	17.2	--	.33	--
50	32	29.0	--	16.4	--	.28	--
55	67	--	6.47	--	--	.00	.00
60	31	20.5	--	18.2	--	.19	--
62	31	11.7	--	17.3	--	.41	--
76	57	2,020	--	9.20	--	.24	--
86	31	20.0	--	8.58	--	.10	--
89	72	9880	--	17.7	--	7.05	--
99	45	719	--	22.0	--	.27	--
				Total recoverable vanadium			
14	47	1.69	12.3	162	18.4	.00	.01
20	32	1.13	2.75	334	14.4	.00	.00
22	31	.69	1.77	319	31.5	.00	.00
28	50	7.28	10.7	601	28.4	.00	.01
31	41	11.3	32.4	339	30.9	.00	.01

Table A4. Calculated loads and yields for total recoverable elements from 26 sites in the upper Illinois River Basin, 1987–90—Continued

Site number (fig. 5)	Number of observations	Load (tons per year)		Standard deviation of mean annual load		Yield (tons per square mile per year)	
		Censored values set to zero	Censored values set to detection limit	Censored valuses set to zero	Censored values set to detection limit	Censored values set to zero	Censored values set to detection limit
				Total recoverable vanadium—Continued			
32	31	0.09	0.35	568	20.7	0.00	0.00
34	31	.17	1.68	224	9.72	.00	.00
40	43	.51	3.49	169	5.37	.00	.01
45	31	.04	.51	155	16.1	.00	.01
50	32	.68	.75	229	24.4	.01	.01
62	31	.04	.22	212	15.9	.00	.01
69	72	1.63	2.25	273	24.2	.01	.01
76	57	12.1	56.0	260	22.2	.00	.01
86	31	.14	.62	143	16.8	.00	.00
				Total recoverable zinc			
31	41	56.1	299	1,070	34.4	.01	.06
33	30	1.98	17.1	1,300	56.7	.01	.07
38	30	72.4	--	1,880	--	.63	--
39	31	11.8	2.77	12,100	52.0	.66	.15
40	43	55.3	68.7	>20,000	43.3	.09	.11
50	32	.87	11.6	725	32.9	.01	.11
55	67	394	301	5,230	31.6	.53	.41
62	31	.68	3.25	1,390	50.7	.02	.11
69	72	50.1	31.6	2,270	52.0	.15	.10
76	57	491	910	8,740	46.8	.06	.11

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90

[Censored data treatment: 0 denotes censored values set to zero; D denotes censored values set to the detection limit; --, all data were above the detection limit; <, less than]

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
				Total recoverable aluminum (micrograms per liter)						
14	--	8	72	0.065	0.56	--	4.7	1.3	450	300
20	--	8	62	–.01	.95	--	–2	–.23	990	880
22	--	8	61	–.03	.85	--	–4.1	–.49	850	900
28	--	8	72	.038	.75	--	14	1.4	1,100	950
31	0	8	61	.03	.85	--	2.5	.66	310	440
31	D	8	61	.015	.95	--	2.5	.66	--	--
32	--	8	61	–.11	.36	--	–17	–2.1	1,100	810
33	--	8	57	–.16	.23	--	–20	–4.4	480	490
34	--	7	62	–.09	.47	--	–11	–1.5	660	790
35	--	7	62	.041	.77	--	7.2	1.0	670	770
38	--	7	62	.099	.43	--	36	5.2	700	740
39	--	8	62	.07	.58	--	28	6.4	450	520
40	--	7	65	.084	.48	--	32	4.7	--	510
43	--	7	62	–.25	.030	--	–60	–9.0	900	460
45	--	7	63	.027	.86	--	5.3	1.7	470	250
49	--	8	64	.15	.21	--	49	5.3	520	1,200
50	--	8	63	.091	.46	--	30	6.3	--	810
54	--	8	62	.13	.31	--	23	5.2	380	520
56	--	7	59	–.18	.16	--	–11	–5.1	240	190
57	--	7	64	.087	.47	--	8.8	2.7	330	340
60	-	7	58	.046	.75	--	14	4.4	230	390
62	--	7	58	.14	.26	--	31	5.5	510	620
64	--	7	57	.097	.47	--	26	3.8	660	840
65	--	7	59	.26	.035	--	57	13	290	600
67	--	7	61	.16	.19	--	35	7.1	390	570
69	0	7	70	–.06	.58	--	–7	–1.7	470	630
69	D	7	70	–.06	.58	--	–6.5	–1.6	--	--
72	--	7	59	.12	.36	--	18	5.2	350	450
74	--	7	60	–.09	.48	--	–15	–3.2	490	460
76	--	8	63	.038	.78	--	15	3.0	510	550
84	--	8	63	–.13	.29	--	–7.4	–2.2	340	340
86	--	7	62	–.06	.66	--	–5.4	–1.8	310	350
88	--	8	60	.046	.74	--	1.3	.70	240	190
89	--	8	69	–.01	1	--	–.38	–.14	280	390
90	--	7	56	–.03	.88	--	–4	–1.9	220	160

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable aluminum (micrograms per liter)—Continued										
91	0	8	59	–0.21	0.084	--	–16	–6.4	320	210
91	D	8	59	–.21	.084	--	–11	–4.5	--	--
92	0	7	59	–.15	.25	--	–38	–8.9	530	300
92	D	7	59	–.15	.25	--	–36	–8.5	--	--
93	0	8	60	–.05	.74	--	–18	–3.2	610	440
93	D	8	60	–.05	.75	--	–16	–2.9	--	--
96	0	8	61	.12	.32	--	20	6.1	330	320
96	D	8	61	.12	.32	--	16	5.1	--	--
99	0	8	69	–.14	.22	--	–21	–5.3	450	310
99	D	8	69	–.14	.22	--	–16	–4.2	--	--
Dissolved aluminum (micrograms per liter)										
50	0	7	48	.16	.26	--	0	0	38	63
50	D	7	48	.11	.45	--	0	0	--	--
Total recoverable arsenic (micrograms per liter)										
14	0	13	125	.20	.0033	0.12	0	0	1	2
14	D	13	125	.12	.072	.28	0	0	--	--
28	0	13	47	.16	.23	.37	0	0	<1	1
28	D	13	47	.20	.11	.18	0	0	--	--
31	0	11	82	–.05	.58	.60	0	0	1	1
31	D	11	82	–.06	.50	.41	0	0	--	--
35	0	13	112	–.32	.000010	.020	–.25	–8.3	4	2
35	D	13	112	–.34	.0000032	.015	–.25	–8.3	--	--
38	0	13	113	–.09	.20	.46	0	0	2	2
38	D	13	113	–.14	.041	.20	0	0	--	--
40	0	13	32	.13	.61	.74	.045	2.3	--	2
40	D	13	32	.033	1	1	0	0	--	--
45	0	13	112	–.07	.33	.54	0	0	2	2
45	D	13	112	–.12	.068	.15	0	0	--	--
49	0	11	74	–.19	.039	.080	0	0	2	2
49	D	11	74	–.16	.074	.13	0	0	--	--
54	0	13	87	–.01	.89	.92	0	0	3	2
54	D	13	87	–.02	.79	.84	0	0	--	--
56	0	13	116	.12	.087	.41	0	0	2	2
56	D	13	116	.046	.50	.71	0	0	--	--

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable arsenic (micrograms per liter)—Continued										
57	0	9	76	–0.18	0.036	--	0	0	2	2
57	D	9	76	–.18	.041	--	0	0	--	--
69	0	13	47	.12	.34	0.48	0	0	.6	1
69	D	13	47	–.03	.88	.88	0	0	--	--
76	0	11	79	–.19	.027	.086	0	0	2	2
76	D	11	79	–.23	.0067	.038	0	0	--	--
84	0	13	117	–.11	.11	.36	0	0	2	2
84	D	13	117	–.15	.031	.19	0	0	--	--
89	0	13	47	.11	.43	.65	0	0	.9	3
89	D	13	47	.013	1	1	0	0	--	--
92	0	13	109	.035	.63	.73	0	0	2	2
92	D	13	109	–.02	.78	.84	0	0	--	--
99	0	13	124	.059	.39	.64	0	0	2	1
99	D	13	124	.008	.91	.95	0	0	--	--
Dissolved arsenic (micrograms per liter)										
14	0	4	38	–.05	.82	--	0	0	--	1
14	D	4	38	.071	.47	--	0	0	--	--
69	0	4	38	–.02	1	--	0	0	--	1
69	D	4	38	–.12	.40	--	0	0	--	--
76	--	4	35	–.03	1	--	0	0	--	1
89	0	4	36	–.03	1	--	0	0	--	2
89	D	4	36	.053	.82	--	0	0	--	--
99	0	4	35	.22	.23	--	0	0	--	1
99	D	4	35	.083	.67	--	0	0	--	--
Total recoverable barium (micrograms per liter)										
14	--	10	93	.19	.026	.070	.5	.93	53	55
20	--	11	83	.091	.35	.31	.4	.59	70	69
22	--	11	83	.019	.87	.87	0	0	50	52
28	--	10	89	–.04	.69	.69	–.2	–.34	59	59
31	0	10	89	.01	.94	.95	0	0	50	50
31	D	10	89	.031	.76	.79	.11	.22	--	--
32	--	10	82	–.14	.1	.17	–.90	–1.9	50	46
33	--	10	82	–.18	.055	.13	–1	–3.1	35	31
34	0	10	87	–.07	.49	.67	–.33	–.90	39	38
34	D	10	87	–.05	.62	.73	–.21	–.56	--	--

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable barium (micrograms per liter)—Continued										
35	--	10	89	–0.18	0.049	0.20	–0.5	–1.3	41	39
38	--	10	86	–.47	.00000024	.0062	–4	–7.8	60	43
39	--	10	84	–.08	.39	.48	–.33	–.69	48	46
40	--	10	86	–.26	.0051	.028	–1.5	–3.7	--	39
43	0	10	86	.027	.79	.85	.33	.81	37	35
43	D	10	86	.062	.51	.66	.5	1.2	--	--
45	--	10	88	–.01	.94	.96	0	0	48	49
49	--	10	73	–.01	.96	.95	0	0	42	35
50	--	10	85	–.31	.0009	.018	–2	–5.4	--	21
54	--	11	84	–.21	.023	.077	–1	–3.2	28	20
56	--	10	80	–.34	.0003	.0073	–1.4	–5.9	46	44
57	--	9	77	–.09	.37	--	–.6	–2.2	140	73
60	--	10	82	–.09	.34	.41	–.5	–1.1	120	79
62	--	10	78	–.68	0	.0026	–16	–14	49	50
64	--	10	81	–.5	.00000013	.012	–6.4	–6.6	72	62
65	--	10	75	–.09	.39	.54	–.58	–1.2	70	64
67	--	10	81	–.37	.0001	.0059	–2.0	–3.0	63	61
69	--	10	90	–.28	.0012	.012	–2	–3.1	50	46
72	--	10	80	–.17	.071	.20	–.85	–1.4	48	39
74	--	10	82	–.09	.34	.46	–.65	–1.4	47	47
76	--	10	87	–.19	.034	.077	–.93	–2.2	58	56
84	--	10	86	–.15	.10	.079	–.41	–.90	54	52
86	--	10	88	–.02	.88	.87	0	0	58	56
88	--	10	80	.14	.16	.37	.6	1.2	54	52
89	--	10	92	.034	.71	.82	.083	.15	58	56
90	--	10	80	–.02	.89	.91	–.2	–.39	51	52
91	--	10	80	–.22	.021	.039	–3.2	–4.0	94	73
92	--	10	80	–.22	.024	.074	–1.3	–1.6	93	79
93	--	10	84	–.06	.56	.56	–.4	–.53	77	75
96	--	10	83	–.17	.074	.099	–.62	–.84	76	73
99	--	10	94	–.34	.000063	.013	–2.5	–3.3	86	71

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
				Dissolved barium (micrograms per liter)						
14	--	10	87	0.21	0.019	0.11	0.5	1.1	44	47
20	--	7	59	.11	.39	--	1.2	2.0	61	60
22	--	10	59	.17	.17	.15	1	2.4	40	42
28	--	7	69	.13	.25	--	.37	.78	46	48
31	0	10	77	.10	.30	.20	.24	.56	42	42
31	D	10	77	.14	.15	.090	.33	.79	--	--
32	--	10	65	−.01	.95	.95	−.21	−.53	38	40
33	--	10	61	−.02	.95	.95	0	0	30	29
34	0	10	65	−.11	.32	.50	−.53	−1.8	30	31
34	D	10	65	−.11	.32	.45	−.53	−1.8	--	--
35	--	10	82	−.13	.17	.29	−.5	−1.6	34	31
38	0	10	80	−.54	.000000019	.0033	−4.3	−12	49	33
38	D	10	80	−.53	.00000005	.0033	−4	−1.6	--	--
39	--	10	67	−.28	.013	.032	−1.8	−4.7	40	36
40	--	10	71	−.2	.054	.027	−1	−3.2	--	32
43	0	10	51	.087	.55	.61	1	3.0	36	36
43	D	10	51	.087	.55	.41	1	2.9	--	--
45	0	10	81	−.23	.015	.036	−1	−3.3	31	30
45	D	10	81	−.22	.024	.032	−.9	−3	--	--
49	0	10	72	−.05	.69	.65	−.42	−1.1	38	37
49	--	10	72	−.05	.69	.65	−.42	−1.1	--	--
50	--	10	49	−.18	.20	.22	−.85	−3.0	31	28
54	--	10	77	−.31	.0015	.016	−1	−4.3	25	22
56	--	10	75	−.29	.0038	.037	−1	−5.6	19	17
57	--	9	75	−.17	.085	--	−.6	−2.9	23	19
60	--	10	63	−.03	.86	.87	0	0	40	43
62	--	10	64	−.76	0	.0033	−17	−21	140	57
64	--	10	61	−.48	.000055	.0089	−6.9	−9.4	85	62
65	--	10	62	−.21	.080	.18	−1.5	−3.6	41	41
67	--	10	67	−.29	.0096	.031	−1.8	−3.2	62	52
69	--	10	77	−.17	.082	.24	−1.3	−2.2	62	56
72	--	10	41	−.19	.26	.21	−1.5	−2.7	--	55
74	0	10	41	−.05	.83	.64	−.062	−.15	--	41
74	D	10	41	−.16	.38	.11	−.42	−1.0		
76	--	10	68	−.21	.56	.11	−1	−2.9	39	33

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Dissolved barium (micrograms per liter)—Continued										
84	--	10	80	–0.14	0.15	0.19	–0.33	–0.83	40	41
86	--	10	69	.091	.41	.37	.18	.38	50	48
88	--	10	66	.081	.49	.64	.33	.71	46	48
89	--	10	70	.066	.56	.67	.2	.43	47	43
90	--	6	39	–.1	.62	--	–.79	–1.6	<100	48
91	--	10	66	–.13	.24	.17	–1.5	–2.2	73	66
92	--	10	76	–.01	.96	.96	0	0	70	65
93	--	10	60	.032	.84	.78	.1	.15	64	68
96	--	10	68	–.07	.56	.48	–.25	–.39	64	64
99	--	10	86	–.08	.42	.44	–.5	–.81	63	61
Total recoverable boron (micrograms per liter)										
14	0	13	101	–.35	.0000089	.023	–5	–13	53	<50
14	D	13	101	–.04	.66	.82	0	--	--	--
20	0	13	84	–.26	.004	.0031	–4	–7.2	59	56
20	D	13	84	.058	.54	.57	0	0	--	--
22	0	13	85	–.21	.021	.056	–4.3	–5.9	85	77
22	D	13	85	–.11	.22	.33	–1	–1.4	--	--
28	0	13	94	–.23	.0052	.0097	–3.6	–5.7	71	56
28	D	13	94	–.1	.25	.29	0	0	--	--
31	0	10	89	.054	.56	.67	0	0	68	64
31	D	10	89	.207	.018	.15	1	1.7	--	--
32	0	13	89	–.14	.12	.26	–2.8	–2.8	100	88
32	D	13	89	–.13	.14	.28	–2	–2	--	--
33	--	10	82	.02	.86	.85	1.4	.79	200	180
34	--	13	93	–.02	.81	.83	–1.3	–.62	200	210
35	--	12	90	.109	.23	.35	4.6	2.1	200	260
38	--	13	111	–.25	.0012	.011	–19	–5.5	400	320
39	--	12	104	–.12	.13	.23	–13	–2.4	540	550
40	--	13	95	–.17	.046	.069	–9.6	–3.6	--	260
43	0	13	94	–.15	.077	.23	–2.5	–2.6	100	94
43	D	13	94	–.15	.077	.23	–2.4	–2.4	--	--
45	--	13	91	–.06	.52	.61	–.88	–.51	170	170
49	D	11	74	–.16	.12	.22	–1.7	–4.3	290	210
50	--	12	102	–.48	.0000000043	.0013	–39	–9.8	520	270
54	--	13	107	–.33	.000027	.0090	–7.5	–2.9	290	240
56	--	13	102	–.56	0	.0012	–13	–6.0	240	190

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable boron (micrograms per liter)—Continued										
57	--	9	77	–0.28	0.0043	--	–6.1	–3.0	210	180
60	--	11	84	–.07	.45	0.32	–3.4	–1.6	210	220
62	--	12	96	–.23	.0075	.024	–15	–4.1	400	340
64	--	10	84	–.1	.30	.36	–6.3	–1.9	390	330
65	--	13	103	–.21	.0093	.023	–13	–2.7	480	410
67	--	13	111	–.25	.001	.0087	–14	–4.1	370	280
69	0	13	118	–.16	.026	.038	–6	–2	300	220
69	D	13	118	–.16	.028	.038	–6	–2	--	--
72	0	10	80	–.26	.0054	.046	–2.9	–4.7	63	61
72	D	10	80	–.1	.31	.52	0	0	--	--
74	0	13	88	–.08	.41	.53	–1.1	–.96	120	120
74	D	13	88	–.08	.41	.53	–1	–.86	--	--
76	--	10	87	–.2	.031	.088	–4	–2.8	150	140
84	0	13	90	–.39	.0000022	.0037	–6.9	–20	54	<50
84	D	13	90	–.15	.082	.24	0	0	--	--
88	0	12	83	–.03	.77	.86	0	0	54	54
88	D	12	83	.13	.16	.44	.45	.85	--	--
89	0	13	101	–.11	.19	.44	–.2	–.33	61	69
89	D	13	101	.031	.72	.85	0	0	--	--
90	0	10	80	–.21	.030	.17	–2.2	–3.6	80	69
90	D	10	80	–.07	.46	.60	–.29	–.48	--	--
91	0	13	87	–.18	.053	.30	–3.4	–4.7	73	70
91	D	13	87	–.13	.16	.45	–1.8	–2.6	--	--
92	0	13	87	–.08	.38	.55	–.81	–1.1	75	84
92	D	13	87	–.04	.66	.76	–.27	–.37	--	--
99	0	13	96	0	1	1	0	0	85	82
99	D	13	96	.058	.51	.61	.83	1.0	--	--
Dissolved boron (micrograms per liter)										
20	--	7	56	–.06	.64	--	0	0	65	56
22	0	10	59	–.15	.22	.27	–1.2	–1.7	70	71
22	D	10	59	–.14	.25	.30	–.74	–1.7	--	--
28	--	7	63	–.17	.12	--	–1	–1.7	67	52
31	0	10	75	.01	.96	.96	0	0	70	65

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Dissolved boron (micrograms per liter)—Continued										
31	D	10	75	0.22	0.026	0.11	1.1	1.9	--	--
32	0	10	64	–.04	.76	.82	–.33	–.38	91	86
32	D	10	64	–.03	.85	.89	–.25	–.28	--	--
33	--	10	61	–.01	1	1	–.36	–.20	200	170
34	--	10	65	.019	.91	.92	1	.51	190	210
35	--	10	79	.096	.34	.48	6.3	2.8	230	280
38	--	10	79	–.15	.13	.14	–11	–3.4	370	290
39	--	10	67	.071	.55	.57	67	1.3	480	540
40	--	10	70	–.03	.79	.72	–5	–2.0	270	240
43	--	10	49	–.07	.63	.74	–1.6	–1.8	110	87
45	--	10	81	–.02	.90	.92	–.46	–.29	140	170
49	--	10	72	–.15	.17	.25	–10	–4.3	300	200
50	--	10	48	–.37	.012	.054	–40	–13	430	270
54	--	10	74	–.06	.57	.56	–1.5	–.64	240	230
56	--	10	72	–.31	.0031	.029	–7	–3.6	200	180
57	--	9	73	–.29	.0057	--	–6.9	–3.4	220	180
60	--	10	61	–.14	.26	.27	–3.3	–1.5	220	220
62	--	10	63	–.16	.18	.14	–20	–5.9	370	330
64	--	10	59	.016	.95	.95	1	.30	350	330
65	--	10	61	–.16	.20	.080	–18	–4.3	440	400
67	--	10	67	–.09	.43	.27	–11	–3.8	330	270
69	--	10	74	–.07	.51	.57	–5.9	–2.1	310	220
72	--	10	36	–.11	.58	.68	0	0	--	58
74	0	11	44	–.06	.77	.81	–2.2	–2.2	120	110
74	D	11	44	–.04	.84	.88	–.75	–.72	--	--
76	--	10	65	–.29	.010	.040	–5.1	–3.6	160	140
88	0	10	63	.006	1	1	0	0	54	52
88	D	10	63	.12	.31	.54	.12	.24	--	--
89	0	10	66	.05	.68	.78	0	0	51	66
89	D	10	66	.24	.027	.16	1.5	2.9	--	--
90	0	6	38	–.3	.093	--	–7	–13	100	53
90	D	6	38	–.28	.12	--	–.88	–1.6	--	--
91	0	10	63	–.06	.61	.76	–.25	–.37	67	67
91	D	10	63	–.01	.96	.97	0	0	--	--
92	0	10	75	.005	1	1	0	0	65	81

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Dissolved boron (micrograms per liter)—Continued										
92	D	10	75	0.081	0.44	0.60	0.75	1.2	--	--
99	0	10	85	.14	.15	.24	2	2.8	69	80
99	D	10	85	.23	.014	.075	2	2.8	--	--
Total recoverable cadmium (micrograms per liter)										
99	0	13	124	.32	0	.017	0	--	<3	.16
99	D	13	124	.13	.053	.48	0	0	--	--
Total recoverable chromium (micrograms per liter)										
14	0	13	128	.21	.000065	.011	0	--	<5	<5
14	D	13	128	.48	0	.0034	.56	11	--	--
28	0	13	97	.25	.0004	.013	0	--	3	6
28	D	13	97	.38	.00000048	.0032	.42	8.3	--	--
35	0	13	114	.32	.00000048	.0093	0	--	<5	7
35	D	13	114	.51	0	.0020	.67	1	--	--
38	0	13	113	.32	.0000026	.0014	.31	--	3	8.5
38	D	13	113	.42	.00000024	.00093	.71	14	--	--
39	0	12	86	–.01	.93	.95	0	0	4	7
39	D	12	86	–.02	.83	.86	0	0	--	--
40	0	13	99	.17	.024	.085	0	--	--	7
40	D	13	99	.28	.0002	.016	.31	6.2	--	--
45	0	13	115	.19	.0007	.017	0	--	2	<5
45	D	13	115	.43	0	.0092	.5	10	--	--
49	0	11	74	.26	.0053	.017	0	--	3	7
49	D	11	74	.30	.0012	.012	0	0	--	--
54	0	13	92	.078	.33	.19	0	--	3	6.5
54	D	13	92	.17	.030	.013	0	0	--	--
56	0	13	117	.006	.96	.97	0	0	6	6
56	D	13	117	.12	.11	.26	.14	2.4	--	--
57	0	9	77	–.14	.15	--	–.17	–2.1	8	7
57	D	9	77	–.15	.13	--	0	0	--	--
76	0	11	89	.17	.056	.17	.27	3.8	8	8
76	D	11	89	.21	.013	.092	.25	3.6	--	--
92	0	13	114	.21	.0002	.0056	0	--	<5	<5

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable chromium (micrograms per liter)—Continued										
92	D	13	114	0.50	0	0.0026	0.56	11	--	--
99	0	13	125	.23	.0000091	.0060	0	--	<5	<5
99	D	13	125	.48	0	.00059	.56	11	--	--
Total recoverable copper (micrograms per liter)										
28	0	13	117	–.13	.035	.067	0	--	4	<5
28	D	13	117	.063	.35	.42	0	0	--	--
32	0	13	103	–.13	.084	.27	0	--	5	<5
32	D	13	103	.034	.66	.72	0	0	--	--
33	0	10	86	–.1	.23	.30	0	--	7	<5
33	D	10	86	.033	.72	.73	0	0	--	--
34	0	13	101	–.09	.24	.46	0	--	5	<5
34	D	13	101	–.01	.97	.98	0	0	--	--
35	0	13	114	–.19	.013	.062	–.67	–6.7	12	8
35	D	13	114	–.23	.0021	.024	–.68	–6.8	--	--
38	0	13	115	–.07	.34	.46	0	0	18	12
38	D	13	115	–.07	.34	.46	0	0	--	--
39	--	12	105	.095	.24	.38	.27	2.7	10	17
40	0	13	101	–.29	.0003	.015	–.67	–7.4	--	7
40	D	13	101	–.28	.0005	.016	–.5	–5.6	--	--
43	0	13	100	–.13	.098	.37	0	0	7	<5
43	D	13	100	–.1	.21	.45	0	0	--	--
45	0	13	115	–.05	.47	.62	0	0	7	6
45	D	13	115	.018	.83	.88	0	0	--	--
49	0	11	75	–.01	.92	.92	0	0	6	6
49	D	11	75	.009	.96	.96	0	0	--	--
50	0	12	104	–.24	.0014	.034	–.29	–4.4	7	<5
50	D	12	104	–.2	.0069	.064	0	0	--	--
54	0	13	110	–.15	.018	.12	0	--	4	<5
54	D	13	110	.006	.95	.96	0	0	--	--
56	0	13	117	–.29	.000014	.0059	–.33	–6.7	7	<5
56	D	13	117	–.15	.031	.10	0	0	--	--
57	0	9	77	–.23	.014	--	–.5	–7.1	8	<5
57	D	9	77	–.22	.017	--	–.29	–4.1	--	--
62	0	12	97	–.05	.53	.68	0	0	7	7

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable copper (micrograms per liter)—Continued										
62	D	12	97	–0.07	0.38	0.52	0	0	--	--
64	--	10	85	.18	.045	.12	.5	5	11	10
65	0	13	109	–.01	.91	.93	0	0	7	9
65	D	13	109	–.01	.95	.96	0	0	--	--
67	0	13	115	–.02	.83	.88	0	0	7	8
67	D	13	115	–.02	.79	.83	0	0	--	--
69	--	13	121	–.11	.095	.15	0	0	6	5
76	0	11	89	–.28	.0014	.061	–1.1	–11	15	6
76	D	11	89	–.28	.0017	.065	–.67	–6.7	--	--
86	0	13	120	–.05	.42	.49	0	--	3	<5
86	D	13	120	.15	.023	.16	0	0	--	--
92	0	13	115	0	1	1	0	0	3	<5
92	D	13	115	.23	.0007	.032	0	0	--	--
99	0	13	125	–.08	.17	.16	0	--	4	<5
99	D	13	125	.098	.13	.25	0	0	--	--
Dissolved copper (micrograms per liter)										
35	0	10	80	–.09	.32	.37	0	--	6	<5
35	D	10	80	–.12	.16	.25	0	0	--	--
38	0	10	78	–.06	.56	.69	0	0	7	<5
38	D	10	78	–.11	.22	.40	0	0	--	--
39	0	10	66	.16	.14	.22	.78	11	7	8
39	D	10	66	.13	.23	.30	.15	1.9	--	--
64	0	10	60	–.2	.073	.12	0	0	6	6
64	D	10	60	–.23	.030	.078	0	0	--	--
Total recoverable iron (micrograms per liter)										
14	--	13	101	.11	.18	.13	23	2.0	1,200	1,100
20	--	13	84	–.04	.72	.74	–3.8	–.33	1,100	1,200
22	--	13	86	–.07	.50	.32	–19	–1.9	1,200	990
28	--	13	100	–.06	.51	.29	–5.5	–.44	1,400	1,100
31	--	10	89	0	1	1	–.67	–.098	740	590
32	--	13	96	–.12	.15	.29	–19	–1.9	980	1,000
33	--	10	86	–.34	.0002	.011	–45	–6.2	940	720
34	--	13	94	–.25	.0035	.037	–43	–3.5	1,400	1,200
35	--	13	91	–.02	.83	.86	–1.8	–.16	1,200	1,100
38	--	13	94	.044	.63	.75	15	1.3	1,100	1,300

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable iron (micrograms per liter)—Continued										
39	--	12	85	0	1	1	–1	–0.14	740	620
40	--	13	94	–.03	.73	.69	–3.3	–.37	--	770
43	0	13	94	.023	.81	.87	12	1.1	1,300	860
43	D	13	94	.023	.81	.87	11	.99	--	--
45	--	13	92	–.04	.68	.76	–4.7	–.77	790	420
49	--	10	73	.23	.029	.061	89	5.5	1,200	1,200
50	--	12	87	.11	.23	.14	20	2.9	560	800
54	--	13	85	–.21	.026	.089	–52	–5.0	1,100	850
56	--	13	88	–.35	.000091	.019	–39	–7.6	610	870
57	--	9	77	–.14	.16	--	–29	–4.7	680	550
60	--	12	83	.094	.33	.42	13	2.9	490	440
62	--	12	79	–.06	.57	.44	–17	–1.5	1,200	1,100
64	--	10	85	.15	.11	.077	25	2.4	1,200	1,200
65	--	13	84	–.04	.69	.69	–7.1	–.88	800	880
67	--	13	89	.11	.22	.22	19	2.4	720	890
69	--	13	98	–.06	.53	.34	–6	–1.1	710	1,200
72	--	12	100	.057	.51	.58	7.8	1.6	500	470
74	0	13	110	–.1	.20	.34	–18	–2.9	670	480
74	D	13	110	–.1	.20	.34	–16	–2.6	--	--
76	--	11	89	–.09	.34	.30	–14	–1.9	930	740
84	--	13	92	–.19	.031	.051	–29	–4.7	690	530
86	--	13	96	–.02	.87	.90	–4	–.66	650	570
88	--	10	80	–.1	.30	.55	–12	–3.5	410	280
89	--	13	99	.022	.82	.88	1	.25	400	690
90	--	10	84	–.1	.27	.20	–7.5	–1.8	500	360
91	--	13	86	–.17	.061	.21	–10	–2.1	560	390
92	--	13	90	–.16	.071	.19	–21	–3.0	820	590
93	--	13	94	–.15	.093	.13	–28	–2.6	1,200	640
96	--	10	83	.008	.97	.94	1	.19	560	440
99	--	13	125	–.07	.33	.43	–8.5	–1.4	700	510
Dissolved iron (micrograms per liter)										
43	0	10	50	.01	1	1	0	0	69	52
43	D	10	50	.031	.87	.89	0	0	--	--
49	0	10	72	.036	.77	.75	.33	.32	110	100
49	D	10	72	.025	.84	.83	0	0	--	--
50	D	10	49	–.02	.93	.90	0	0	65	58

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Dissolved iron (micrograms per liter)—Continued										
50	0	10	49	–0.11	0.42	0.12	0	0	--	--
54	0	10	78	–.28	.003	.079	–9.8	–15	82	<50
54	D	10	78	–.23	.016	.13	–2.6	–4.0	--	--
56	0	10	75	–.31	.0008	.018	–2.0	–13	51	<50
56	D	10	75	–.01	.92	.94	0	0	--	--
Total recoverable lead (micrograms per liter)										
40	0	13	122	.045	.41	.75	0	--	--	6.2
40	D	13	122	.11	.087	.53	0	0	--	--
Total recoverable manganese (micrograms per liter)										
14	--	13	101	.005	.97	.98	0	0	140	180
20	--	13	84	.04	.69	.77	.37	.45	80	94
22	--	13	86	–.05	.60	.65	–.56	–.9	62	68
28	--	13	94	–.12	.16	.10	–.67	–1.1	68	67
31	--	10	89	.017	.88	.82	.25	.42	61	52
32	--	13	88	–.08	.40	.45	–1.5	–1.6	96	100
33	--	10	82	–.27	.0041	.023	–6.7	–7.6	100	81
34	--	13	95	–.27	.0014	.0070	–3.2	–3.3	100	93
35	--	13	91	–.17	.061	.081	–3	–3.0	99	99
38	--	13	97	–.07	.43	.54	–.5	–.71	70	78
39	--	12	86	.20	.033	.047	3.4	3.2	110	100
40	--	13	94	–.07	.44	.39	–1.1	–1.5	--	78
43	--	13	93	.063	.48	.49	1	1.1	92	92
45	--	13	94	–.15	.087	.22	–1.2	–1.6	82	77
49		10	73	–.21	.046	.14	–4.1	–2.5	170	160
50	--	12	87	.01	.94	.94	.14	.17	86	86
54	--	13	87	–.39	.000019	.0022	–4	–3.7	110	100
56	--	13	88	–.3	.0009	.024	–2	–3.6	62	48
57	--	9	77	–.14	.16	--	–1.3	–2.4	62	52
60	--	12	83	–.13	.16	.25	–1.3	–2.1	69	58
62	--	12	79	–.13	.19	.27	–2	–2.2	95	74
64	--	10	81	–.04	.67	.74	–.34	–.42	90	70
65	--	13	85	–.17	.065	.12	–1.8	–2.5	73	62
67	--	13	89	–.27	.0023	.011	–2	–3.3	60	64
69	--	13	97	–.18	.030	.095	–2.3	–4.5	60	47

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable manganese (micrograms per liter)										
72	--	12	100	–0.13	0.10	0.27	–1	–2.7	40	37
74	0	13	113	–.05	.54	.64	–.5	–1.7	35	29
74	D	13	113	–.05	.54	.64	–.5	–1.7	--	--
76	--	10	87	–.18	.044	.015	–1.4	–2.4	70	57
84	--	13	93	–.15	.078	.054	–1.8	–2.5	70	76
86	--	13	97	.058	.51	.61	.4	.53	78	77
88	--	12	81	–.1	.31	.49	–1.6	–3.3	55	45
89	--	13	100	–.04	.60	.50	–.35	–.65	62	96
90	--	10	80	.056	.59	.69	.5	1.0	50	56
91	--	13	87	–.3	.001	.021	–2	–3.5	59	57
92	--	13	89	–.14	.13	.16	–1	–1.3	80	77
93	--	13	96	–.01	.97	.96	0	0	100	86
96	--	10	83	.031	.77	.75	.17	.33	50	50
99	--	13	97	–.18	.036	.096	–2.2	–2.9	81	65
Dissolved manganese (micrograms per liter)										
14	--	10	87	.018	.87	.87	.083	.19	44	45
20	--	7	59	–.01	1	--	–.33	–.81	40	37
22	--	10	60	.015	.95	.90	0	0	18	17
28	0	7	69	.16	.13	--	.12	1.4	7	10
28	D	7	69	.10	.32	--	0	0	--	--
31	--	10	77	–.03	.81	.87	0	0	8	12
32	0	10	65	.10	.38	.42	3.5	5.8	61	60
32	D	10	65	.10	.38	.42	3.3	5.6	--	--
33	--	10	61	–.22	.069	.045	–4	–8.5	60	38
34	--	10	65	–.18	.12	.20	–2.5	–5.2	51	44
35	--	10	82	–.14	.14	.18	–1.9	–4.2	46	34
38	--	10	80	–.02	.86	.84	0	0	39	45
39	--	10	67	.16	.14	.14	2.5	3.4	73	74
40	--	10	70	–.12	.29	.24	–.9	–3.2	28	43
43	--	10	50	.19	.17	.12	3.8	5.8	62	68

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
				Dissolved manganese (micrograms per liter)—Continued						
45	--	10	81	–0.05	0.61	0.54	–0.54	–1.1	49	48
49	--	10	72	–.25	.016	.064	–4.5	–3.3	160	130
50	--	10	49	–.11	.45	.61	–1.5	–2.2	70	65
54	--	10	78	–.26	.0091	.018	–3	–3.2	100	78
56	--	10	75	–.24	.016	.11	–1.4	–3.0	45	43
57	--	9	75	–.19	.058	--	–1.3	–3.3	40	32
60	--	10	63	.14	.23	.18	1	2.6	42	39
62	--	10	64	–.29	.011	.11	–4.8	–7.9	68	54
64	--	10	61	–.36	.0021	.088	–3.5	–6.9	60	44
65	--	10	63	–.45	.000081	.030	–4.5	–11	51	38
67	--	10	67	–.42	.0001	.50	–2.8	–9.4	34	27
69	--	10	76	–.21	.035	.18	–1	–5.3	21	12
72	0	10	41	–.07	.73	.81	0	0	--	6
72	D	10	41	–.11	.56	.70	0	0	--	--
74	0	11	46	–.09	.55	.65	0	0	5	5
74	D	11	46	–.12	.43	.55	0	0	--	--
76	0	10	68	–.34	.0016	.010	–1.4	–9.5	20	10
76	D	10	68	–.35	.0009	.0099	–.88	–5.8	--	--
84	0	10	80	–.24	.012	.078	–.79	–6.6	14	8
84	D	10	80	–.24	.012	.078	–.75	–6.2	--	--
86	--	10	70	.092	.41	.22	.6	2.3	24	27
88	0	10	65	–.34	.0013	.041	–1.1	–14	10	<5
88	D	10	65	–.32	.0016	.048	–.33	–4.2	--	--
90	--	6	39	–.1	.62	--	–1.4	–3.8	30	41
91	0	10	66	–.15	.18	.37	–.75	–9.4	11	6.5
91	D	10	66	–.23	.04	.18	–.6	–7.1	--	--
92	0	10	76	–.02	.88	.88	0	0	6	6
92	D	10	76	–.07	.46	.44	0	0	--	--
93	--	10	60	.12	.34	.39	1.2	3.1	32	43
96	--	10	68	.15	.18	.27	.89	4.3	18	22
99	0	10	86	–.09	.26	.39	0	0	5	<5
99	D	10	86	–.08	.29	.40	0	0	--	--

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable nickel (micrograms per liter)										
28	0	10	89	–0.11	0.17	0.20	0	0	5	<5
28	D	10	89	–.06	.46	.53	0	0	--	--
35	0	10	89	.20	.021	.10	.4	5	5	10
35	D	10	89	.26	.0028	.040	.5	6.3	--	--
38	0	11	89	0	1	1	0	0	8	11
38	D	11	89	.072	.43	.34	0	0	--	--
39	0	10	84	.35	.000035	.012	1.2	20	4	11
39	D	10	84	.43	.00000072	.0055	1	17	--	--
40	0	10	86	.13	.15	.30	0	0	--	9
40	D	10	86	.16	.080	.27	.063	.89	--	--
49	0	10	73	.12	.23	.23	0	0	5	8
49	D	10	73	.17	.071	.11	0	0	--	--
50	0	11	86	.088	.28	.22	0	--	4	7
50	D	11	86	.11	.19	.20	0	0	--	--
54	0	11	84	.037	.68	.72	0	--	4	6
54	D	11	84	.16	.068	.20	0	0	--	--
56	0	10	80	–.46	.0000010	.0056	–2	–9.5	22	17
56	D	10	80	–.46	.0000012	.0055	–2	–9.5	--	--
57	0	9	77	–.39	.000078	--	–1.8	–10	20	17
57	D	9	77	–.36	.0003	--	–1.7	–9.3	--	--
62	0	10	78	.026	.81	.82	0	0	7	6
62	D	10	78	.14	.15	.24	.15	2.2	--	--
64	0	10	81	.18	.043	.11	0	0	5	6.5
64	D	10	81	.24	.0068	.056	.23	3.8	--	--
76	0	10	87	–.13	.16	.18	–.5	–4.5	14	10
76	D	10	87	–.12	.17	.19	–.33	–3.0	--	--
86	0	10	88	–.22	.011	.072	–.54	–7.7	8	<5
86	D	10	88	–.12	.17	.30	–.083	–1.0	--	--
Dissolved nickel (micrograms per liter)										
35	0	10	82	.093	.31	.33	0	0	4	6
35	D	10	82	.11	.23	.18	0	0	--	--
38	0	10	80	–.07	.44	.46	0	0	7	6
38	D	10	80	–.05	.65	.66	0	0	--	--
39	0	10	66	.18	.090	.078	0	0	5	9

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Dissolved nickel (micrograms per liter)—Continued										
39	D	10	66	0.18	0.080	0.096	0	0	--	--
40	0	10	71	.075	.45	.56	0	--	--	5
40	D	10	71	.08	.40	.53	0	0	--	--
56	0	10	71	–.38	.0002	.027	–1.8	–9.6	21	15
56	D	10	71	–.37	.0004	.025	–1.8	–9.5	--	--
57	0	9	72	–.38	.0002	--	–1.8	–12	17	12
57	D	9	72	–.35	.0006	--	–1.5	–10	--	--
62	0	10	62	–.06	.64	.51	0	0	8	7
62	D	10	62	.036	.79	.76	0	0	--	--
76	0	10	67	–.25	.019	.092	–.63	–7.8	11	8
76	D	10	67	–.2	.067	.073	–.5	–6.3	--	--
86	0	10	69	–.16	.13	.19	0	0	6	<5
86	D	10	69	–.02	.87	.89	0	0	--	--
Total recoverable selenium (micrograms per liter)										
28	0	4	38	–.02	1	--	0	0	--	1
28	D	4	38	–.05	.81	--	0	0	--	--
Total recoverable strontium (micrograms per liter)										
14	--	10	93	.24	.0058	.083	1.4	1.1	130	130
20	--	11	82	.24	.013	.034	6	2.3	250	280
22	--	11	82	.20	.035	.082	3.2	1.7	170	190
28	--	10	89	.19	.039	.056	4	1.8	220	230
31	--	10	88	.18	.048	.17	1.7	1.1	150	160
32	--	10	82	.16	.096	.082	19	3.5	490	660
33	--	10	82	.18	.057	.14	12	2.7	400	510
34	--	10	87	.082	.38	.45	8.6	1.6	470	620
35	--	10	90	–.05	.56	.66	–9.3	–1.6	580	610
38	--	10	86	–.12	.22	.33	–26	–3.3	950	730
40	--	10	87	–.14	.12	.067	–19	–3.2	--	600
43	--	10	86	.20	.033	.14	6	2.4	230	260
45	--	10	88	–.13	.17	.17	–7.0	–1.8	360	380
49	--	10	74	.005	1	1	1.2	.29	440	430
50	--	10	85	–.63	0	.0017	–93	–20	690	330

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Total recoverable strontium (micrograms per liter)—Continued										
54	--	10	84	–0.23	0.013	0.15	–5.4	–2.2	260	240
56	--	10	81	–.44	.0000032	.0065	–6.6	–2.9	240	210
57	--	9	77	–.35	.0004	--	–8.8	–3.0	320	250
60	--	10	82	.13	.18	.20	7.1	2.3	300	330
62	--	10	78	–.58	.0000000045	.0089	–92	–16	860	360
64	--	10	81	–.13	.17	.18	–15	–2.6	720	550
65	--	10	76	.055	.62	.46	7.8	.97	790	870
67	--	10	81	.079	.43	.29	6.2	1.1	540	540
69	--	10	89	.089	.33	.29	10	2.1	450	380
72	--	10	81	.055	.59	.56	.5	.35	140	150
74	--	10	82	.02	.87	.86	.39	.17	230	230
76	--	10	88	–.16	.08	.15	–3.1	–1.3	250	240
84	--	10	86	.28	.0025	.012	39	4.8	730	860
86	--	10	87	.23	.011	.19	2	1.2	160	170
88	--	10	81	.32	.0008	.093	25	4.9	480	640
89	--	10	93	.21	.018	.23	12	2.3	480	480
90	--	10	80	.14	.16	.27	2	1.1	170	180
91	--	10	81	.26	.0061	.11	16	3.4	440	570
92	--	10	81	.33	.0005	.067	21	5.0	400	450
93	--	10	84	.10	.28	.45	1.3	.83	160	170
96	--	10	84	.054	.59	.64	.5	.43	120	120
99	--	10	94	.29	.0007	.085	14	4.2	330	380
Dissolved strontium (micrograms per liter)										
14	--	10	83	.16	.089	.27	1	.77	130	130
20	--	7	58	.16	.22	--	6.3	2.3	270	280
22	--	10	59	.19	.12	.20	5.7	3.2	170	190
28	--	7	67	.19	.092	--	5.2	2.4	220	220
31	--	10	73	.051	.65	.70	.8	.53	150	150
32	--	10	63	.25	.030	.030	26	4.9	460	670
33	--	10	58	.15	.26	.32	12	2.7	430	470
34	--	10	65	.14	.23	.36	1.4	1.9	450	600
35	--	10	81	–.02	.87	.91	–6.8	–1.1	600	610
38	--	10	80	–.2	.042	.12	–44	–5.8	1,000	700

Table A5. Trend-test results and median concentrations for elements in stream water in the upper Illinois River Basin, 1978–90—Continued

Site number (fig. 5)	Censored data treatment	Years of record	Number of observations	Tau	p-value	Adusted p-value[1]	Slope		Median concentration	
							Per year	Percent of median per year	1978–86	1987–90
Dissolved strontium (micrograms per liter)—Continued										
40	--	10	69	–0.16	0.15	0.14	–22	–3.9	--	560
43	--	10	50	.19	.18	.31	9.1	3.5	230	26
45	--	10	81	–.08	.42	.36	–5.8	–1.6	360	38
49	--	10	72	–.03	.84	.79	–2.8	–.66	440	420
50	--	10	47	–.62	.000022	.0015	–75	–21	610	320
54	--	10	76	–.34	.0007	.058	–8	–3.2	260	240
56	--	10	72	–.44	.000024	.0043	–6.9	–3.1	230	200
57	--	9	73	–.36	.0005	--	–9.5	–3.3	310	240
60	--	10	62	.11	.35	.23	6.5	2.1	310	330
62	--	10	61	–.67	.000000014	.0072	–120	–23	850	350
64	--	10	60	–.16	.21	.15	–21	–3.7	680	540
65	--	10	61	0	1	1	.7	.088	820	820
67	--	10	67	–.04	.78	.67	–3.4	–.63	580	520
69	--	10	73	–.02	.88	.86	–3.2	–.64	530	370
72	--	10	40	0	1	1	0	0	--	140
74	--	10	41	–.16	.38	.51	–6.3	–2.8	--	230
76	--	10	66	–.2	.069	.17	–4	–1.7	260	240
84	--	10	77	.32	.0013	.0093	45	5.8	710	820
86	--	10	62	.079	.53	.75	1.5	.93	160	160
88	--	10	66	.32	.0043	.13	23	4.5	480	600
89	--	10	67	.37	.001	.074	19	3.8	450	460
90	--	6	35	–.03	1	--	–.5	–.28	210	170
91	--	10	65	.31	.0066	.13	21	4.6	440	540
92	--	10	76	.41	.000044	.034	23	5.6	390	410
93	--	10	59	.13	.33	.51	1.7	1.1	150	160
96	--	10	68	.099	.39	.43	.81	.71	110	120
99	--	10	83	.28	.0027	.075	13	4.1	310	350

[1]P-value adjusted for serial correlation when there were 10 or more years of record.