Rio Algom Mining LLC

ADDRESSEE ONLY
Mr. Tom McLaughlin, Project Manager
U.S. Nuclear Regulatory Commission
Mail Stop T-8F5
Washington, DC 20555

Subject: **Ambrosia Lake Facility**
License SUA-1473, Docket No. 40-8905
License Condition #34, Semiannual Groundwater Report

Dear Mr. McLaughlin,

Pursuant to license condition #34 of the above referenced license, please find attached the semi-annual groundwater monitoring report for the above referenced facility for the second half of 2007. The review describes the groundwater stability monitoring plan, as approved by Amendment #56.

If you have any questions concerning this submittal, please contact me at (505) 287-8851, extension 20.

Regards,

Donald Sweeney

Donald Sweeney
Environmental Department Supervisor
Radiation Safety officer

Enclosure

CC: Document Control (NRC-MD)
R. Jones (TX)
K. Myers (NMED-NM)
file

P.O. Box 218, Grants, NM USA 87020 - Tel: 505.287.8851 - Fax: 505.285.5550

RIO ALGOM MINING LLC
AMBROSIA LAKE FACILITY

License SUA – 1473 Docket 40 - 8905

Groundwater Stability Monitoring Report

2nd Half 2007

February 1, 2008

RIO ALGOM MINING LLC
AMBROSIA LAKE FACILITY
GROUNDWATER MONITORING REPORT – 2nd HALF 2007

NRC source material license SUA-1473, condition #34(D) requires Rio Algom Mining LLC (RAM) submit semi-annual groundwater monitoring reports associated with the facility's groundwater stability monitoring plan established by Amendment 56. Condition 34.D states:

> ***Submit, by February 1 and August 1 of each year ground water monitoring reports to include a minimum of the following: potentiometric surface maps for each aquifer; time vs. concentration plots for all parameters for which ACLs have been issued, hydrographs for the downgradient most trend well or POE well in each aquifer, hydraulic gradient calculations, and tabulated analytical data for each ACL parameter for each well.***

This report presents the groundwater monitoring data for monitoring wells completed in the Alluvium, Tres Hermanos A, Tres Hermanos B, and Dakota Sandstone for the period covering July – December 2007.

Background

RAM's Ambrosia Lake facility is located in McKinley County approximately 24 miles due north of Grants, New Mexico, in the Ambrosia Lake valley. Uranium milling activities started at the site in 1957. The waste management structures were Tailings Impoundments 1 and 2, Decantation Pond 3, and Evaporation Ponds 4 through 10. Tailings Impoundments 1 and 2 were built in late 1958, along with Pond 3 at the eastern toe of Tailings Impoundment 1, to accept decanted tailings liquids. Tailings were first produced at the site in November 1958. In 1976, RAM diverted the natural course of the Arroyo del Puerto east of Ponds 4, 5, and 6 and lined Ponds 9 and 10. The solids fraction was disposed through a slurry transfer system to the tailings impoundments, while the liquids fraction was transferred to the evaporation ponds. Evaporation pond residues from Ponds 3, 4, 5, 6, 7, and 8 were placed in Tailings Impoundments 1 and 2 prior to final

reclamation. All the aforementioned tailings impoundments and ponds were unlined. Seepage from the tailings impoundments and Evaporation Ponds 3 through 6, along with seepage from unrelated mining and milling operations, has saturated and impacted the Alluvium of the Arroyo del Puerto (Alluvium). Seepage from the tailings impoundments and evaporation Ponds 7 and 8 has recharged and impacted the Tres Hermanos B (TRB) sandstones within the Mancos Formation shale and the Dakota Sandstone, which underlies the Mancos Formation.

Consequently, in 1983, Rio Algom entered into an Assurance of Discontinuance (AOD) with the State of New Mexico to minimize the future impact of mill tailings solutions seepage on ground water. The approved AOD remedial action required the construction and maintenance of an interceptor trench (IT-1) and the cessation of discharges to unlined Ponds 4 through 8. These ponds were taken out of service in 1983. In the late 1990s, RAM added interceptor trenches IT-2, -3, and -4 south of Pond 10 to collect seepage potentially missed by IT-1.

In 1986, after the State of New Mexico relinquished its licensing authority over uranium mill activities, NRC reasserted jurisdiction at the site and required that the site begin a ground water detection monitoring program. Data from this program were the basis for the ground water protection standards (GPSs) established for the site by NRC and a corrective action program (CAP) for the ground water was developed based on this information. The CAP required pumping and treating ground water to remove certain constituents. Rio Algom implemented the CAP since the mid-1980s.

Mining and milling operations in the area have had two notable hydrologic effects: creation and maintenance of a saturated zone at the base of the Alluvium and creation of a cone of ground water depression in bedrock aquifers due to dewatering of underground mines. Water quality in the alluvium and the units into which the alluvium drains has also been affected by area mining operations not directly related to the licensee.

2nd Half 2007 Activities

Activities associated with groundwater monitoring program at the mill facility during the second half of 2007 consisted of performing sampling pursuant to the approved groundwater stability monitoring plan. The well network was designed to track and assess ground-water contamination between the tailings impoundment and the long-term care boundary and point of exposure (POE). NRC required more frequent monitoring during the beginning of the compliance monitoring program because of uncertainties in the hydrogeologic and transport models. Contaminated ground water will not express itself as surface water; therefore any exposure must occur through actual ground water use. The approved ACLs for the site are presented in Table 1 below.

Table 1

Rio Algom Mining – Ambrosia Lake Operation

Approved Alternate Concentration Limits

Parameter	Dakota	Tres Hermanos A	Tres Hermanos B	Alluvium
U-nat (mg/L)	1.6	No ACL	1.6	23
Th-230 (pCi/L)	945	945	945	13,627
Ra-226 and – 228 (pCi/L)	218	218	218	3,167
Pb-210 (pCi/L)	88	88	88	1,274
Gross Alpha (pCi/L)	No ACL	No ACL	No ACL	8,402
Molybdenum (mg/L)	No ACL	No ACL	No ACL	176
Nickel (mg/L)	6.8	No ACL	6.8	98
Selenium (mg/L)	No ACL	No ACL	No ACL	49
Chloride (mg/L)	3,200	1,070	2,810	7,110
Nitrate (mg/L)	22.8	9.2	7.7	351
Sulfate (mg/L)	6,480	2,584	4,760	12,000
Total Dissolved Solids (mg/L)	14,100	6,400	11,700	26,100

Appendix 1 contains the analytical data for the Dakota, Tres Hermanos A, Tres Hermanos B, and alluvial units, respectively. Appendix 2 contains the time

versus concentration plots for the ACL parameters for the Dakota, Tres Hermanos A, Tres Hermanos B, and alluvial units.

Appendix 3 contains the hydrographs for the downgradient most monitor well for the Dakota, Tres Hermanos A, Tres Hermanos B, and alluvial units. The most notable observation in the data is that the potentiometric surface in the Alluvium continues to decline. For example, Rio Algom has observed a decline of 11 feet at monitor well 30-48 since May of 2005. This drop is attributable to the discontinuance of the alluvial CAP, which was maintaining the artificial water mound in the vicinity of the site. Rio Algom's groundwater flow model projected a 65-100 year period for the Alluvium to dewater following cessation of the CAP. This water table drop acts to slow the lateral migration rate of milling related seepage. The area with the greatest drop in potentiometric surface was the southeast region near the POE for the alluvium.

Rio Algom determined the hydraulic gradients by calculating the difference in groundwater elevation between the most upgradient Point of Compliance well in each unit and the farthest downgradient trend or Point of Exposure well in the same unit. That value was then divided by the distance along a flow path between the two wells. Results of these calculations are summarized below.

- Alluvium – 0.008 feet per foot
- Dakota Sandstone – 0.033 feet per foot
- Tres Hermanos A Sandstone – 0.009 feet per foot
- Tres Hermanos B Sandstone – 0.03 feet per foot

Appendix 4 contains the potentiometric surface maps for the Dakota, Tres Hermanos A, Tres Hermanos B, and alluvial units, respectively.

Data Evaluation

As a component of the ACL approval process, NRC not only established ACLs for specific parameters, but NRC also maintained the groundwater protection standards (GPS) for those constituents for which ACLs were not proposed. During the time from initial ACL submission for the bedrock units (February 2000) to ACL approval (2006), the site maintained the Corrective

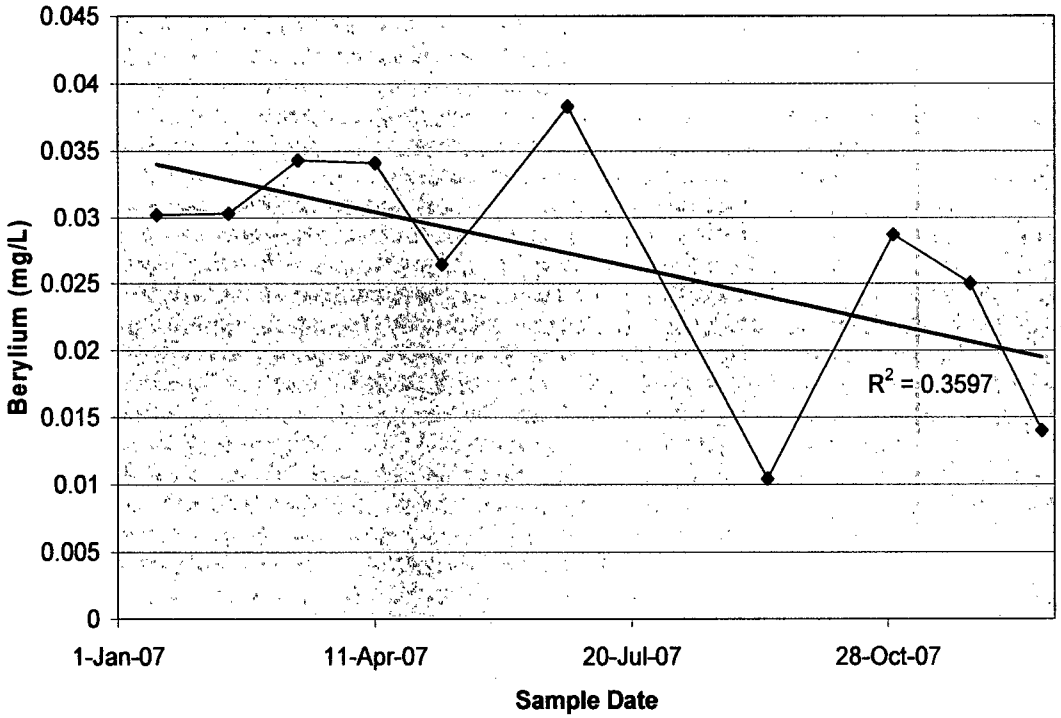
Action Plan. Review of the data has resulted in Rio Algom informing NRC on November 9, 2006 of elevated beryllium concentrations within Dakota point of compliance well 36-06. As a result of this condition, Rio Algom submitted a proposed corrective action plan on January 15, 2007 to address the beryllium concentrations present within monitor well 36-06, which was approved by NRC on April 30, 2007.

RAM has discussed this phenomenon with 36-06 during past meetings with NRC and both parties concurred that fluctuations in well water quality appear to be linked to surface reclamation work. The latest increasing trend correlated with surface field work in the vicinity of the well. During the last reporting period, that trend had leveled and RAM anticipated that the concentration trend would begin to decline over time. RAM proposed to continue monthly monitoring of well 36-06 for beryllium so that additional data will be available in evaluating the beryllium concentrations. The analytical results for beryllium that have been obtained from the monthly sampling, which are presented within Table 2, appear to have begun to decline as predicted (See Figure).

Table 2
Monitor Well 36-06KD
Beryllium Concentration – January – December 2007

Date	Concentration (mg/L)
January 2007	0.0302
February 2007	0.0303
March 2007	0.0343
April 2007	0.0341
May 2007	0.0264
June 2007	0.0383
Sepember 2007	0.0104
October 2007	0.0287
November 2007	0.025
December 2007	0.014

Dakota Monitor Well 36-06



Based on these developments with 36-06, RAM proposes to continue to conduct monthly sampling of the well for beryllium for another six (6) months or until the beryllium concentrations decrease to below 0.01 mg/L. Water levels will also be monitored to determine whether the water available within the Dakota formation is continuing to decline. Results of this test phase will be presented within the 1st half 2008 groundwater report, scheduled for submission by August 2008.

Appendix 1

Stability Monitoring Plan
Analytical Results

RIO ALGOM MINING LLC
2nd HALF 2007
DAKOTA WELL RESULTS - ACL PARAMETERS

Well	Date	Depth To Water	Total Depth	Spec. (Cond.)	Temp C	pH	Chloride (mg/L)	Sulfate (mg/L)	T.D.S. (mg/L)	Nitrate (mg/L)
17-01KD	18-Sep-07	683.73	807.55	1851	19.7	9.51	68	740	1230	0.08
17-01KD	4-Dec-07	683.74	807.52	1731	19.2	10.36	57	720	1150	0.02
30-02KD	16-Jul-07	310.17	313.40	7980	16.8	6.84	2180	1570	5660	0.05
30-02KD	19-Nov-07	309.62	313.49	8420	16.3	6.44	2510	1800	5910	-0.02
30-48KD	16-Jul-07		337.84							
30-48KD	19-Nov-07		337.55							
32-45KD	16-Jul-07	253.59	278.05	1973	17.3	7.55	185	790	1580	0.07
32-45KD	12-Nov-07	253.57	273.03	2210	15	7.84	190	800	1600	0.1
36-06KD	11-Sep-07	185.15	198.12	8340	15.8	5.19	1110	1600	7730	0.03
36-06KD	19-Nov-07	181.96	197.94	9810	15.4	4.1	1420	5600	10500	0.05
5-02KD	18-Sep-07	179.75	191.35	887	16.2	7.55	5	370	610	-0.02
5-02KD	12-Nov-07	183.22	191.50	10550	15.1	7.64	7	410	730	-0.02
ACL							**3200**	**6480**	**14100**	**22.8**

Well	Ni (mg/L)	U-nat (mg/L)	Th-230 (pCi/L)	Pb-210 (pCi/L)	Ra-226+Ra-228 (pCi/L)
17-01KD	0.0107	0.0006	-0.21	3.9	0.6
17-01KD	0.0093	0.0023	0	1.8	0.6
30-02KD	0.033	0.0015	-0.12	4.9	2.6
30-02KD	0.039	0.004	-0.1	0	3.3
30-48KD					
30-48KD					
32-45KD	0.0057	0.0124	0.11	0	2.3
32-45KD	0.0058	0.0104	0.06	0	2.8
36-06KD	0.102	0.464	10	6.8	25.0
36-06KD	0.378	1.33	33	0.54	15.8
5-02KD	0.0041	0.0064	-0.002	1.5	4.8
5-02KD	0.0041	0.0027	-0.13	0	2.6
ACL	**6.8**	**1.6**	**945**	**88**	**218**

Well 30-48KD was dry.
A negative sign corresponds to "less than"

RIO ALGOM MINING LLC
2nd HALF 2007
TRA WELL RESULTS - ACL PARAMETERS

Well	Date	Depth To Water	Total Depth	Spec. (Cond.)	Temp C	pH	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	T.D.S. (mg/L)
30-01	10-Jul-07	206.09	207.49							
30-01	19-Nov-07	205.65	207.46							
31-01	10-Jul-07	202.85	250.88	1998	16.3	7.64	61	1040	0.05	1770
31-01	12-Nov-07	202.79	250.91	2160	14.2	7.76	66	1100	0.06	1780
33-01TRA	12-Feb-07	118.36	181.13	3670	11.8	6.08	40	1780	0.1	2810
33-01TRA	23-Apr-07	118.41	181.18	3640	14.4	7.82	39	1700	0.05	2770
ACL							**1070**	**2584**	**9.2**	**6400**

Well	Th-230 (pCi/L)	Pb-210 (pCi/L)	Ra-226+Ra-228 (pCi/L)
30-01			
30-01			
31-01	-0.02	0.09	2.5
31-01	-0.23	0	2.7
33-01TRA	-0.21	0	0.7
33-01TRA	0.05	0	2.6
ACL	**945**	**88**	**218**

A negative sign corresponds to "less than"
Well 30-01 contained insufficient water for sample collection.

RIO ALGOM MINING LLC
2nd HALF 2007
TRB WELL RESULTS - ACL PARAMETERS

Well	Date	Depth To Water	Total Depth	Spec. (Cond.)	Temp C	pH	Chloride (mg/L)	Sulfate (mg/L)	T.D.S. (mg/L)	Nitrate (mg/L)
19-77	9-Jul-07	272.17	288.05	4470	18.2	6.82	61	2220	3690	0.33
19-77	3-Dec-07	272.22	288.10	4640	14.2	7.57	22	2000	3020	0.36
31-02	10-Jul-07	37.58	126.15	5380	14	7.15	660	2140	4680	0.96
31-02	19-Nov-07	36.36	124.90	5450	12.2	7.46	590	2300	4490	2.42
31-67	9-Jul-07	24.00	96.29	7180	14.6	6.84	940	3090	6590	4
31-67	6-Nov-07	24.13	96.25	7540	11.7	7.27	1060	3000	6570	5.18
36-01	10-Jul-07	57.81	58.52							
36-01	4-Dec-07	57.92	58.52							
36-02	9-Jul-07	52.01	57.61	9260	16.1	7.14	1990	2430	7320	0.06
36-02	6-Nov-07	40.02	57.59	8060	13.5	7.44	1490	2600	6500	2.7
ACL							**2810**	**4760**	**11700**	**7.7**

Well	Ni (mg/L)	U-nat (mg/L)	Th-230 (pCi/L)	Pb-210 (pCi/L)	Ra-226+Ra-228 (pCi/L)
19-77	0.007	0.0521	0	0	2.6
19-77	0.008	0.0283	0.08	2.6	0.9
31-02	0.0219	1.72	-0.11	0	3.5
31-02	0.014	1.11	-0.07	0	1.9
31-67	0.0273	0.016	0.09	2.8	7.4
31-67	0.037	0.0149	0.21	0.61	6.0
36-01					
36-01					
36-02	0.0131	0.0034	0	0	3.3
36-02	0.012	0.0147	0.18	0	1.3
ACL	**6.8**	**1.6**	**945**	**88**	**218**

A negative sign corresponds to "less than"
Monitor Well 36-01TRB contained insufficient water for sample collection.

RIO ALGOM MINING LLC
2nd HALF 2007
ALLUVIAL WELL RESULTS - ACL PARAMETERS

Well	Date	Depth To Water	Total Depth	Spec. (Cond.)	Temp C	pH	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	T.D.S. (mg/L)
5-73	17-Jul-07	14.70	31.44	4760	12.2	7.41	650	1890	0.0	4110
5-73	5-Nov-07	11.71	31.46	4960	14.1	7.49	730	1800	0.1	3920
5-03	16-Jul-07	21.98	41.60	4520	14.7	7.41	450	2130	0.0	3780
5-03	5-Nov-07	19.24	41.59	4730	14.0	7.91	450	2200	0.1	3910
5-04	17-Jul-07	19.05	64.30	5600	12.5	7.73	800	2590	0.2	4930
5-04	5-Nov-07	10.21	64.26	7600	17.1	8.44	49	230	0.2	440
5-08	17-Jul-07	40.65	87.50	4350	13.1	8.13	590	1890	0.1	3720
5-08	5-Nov-07	40.05	87.45	4460	12.3	8.59	570	1800	0.1	3520
31-61	16-Jul-07	12.43	26.76	9290	13.9	6.30	1250	4070	16.9	8900
31-61	5-Nov-07	11.86	27.86	9820	14.7	6.74	1380	4300	18.9	9140
31-65	16-Jul-07	14.88	46.01	8980	13.0	6.70	1060	4400	2.7	8790
31-65	5-Nov-07	14.42	46.10	4030	14.1	7.42	380	1700	0.1	3240
32-59	16-Jul-07	15.81	28.41	4710	14.5	7.07	550	1980	0.0	4210
32-59	6-Nov-07	13.91	28.34	5010	12.5	7.96	560	2000	1.5	4120
MW-24	10-Sep-07		50.02							
MW-24	5-Nov-07		50.12							
ACL							**7110**	**12000**	**351**	**26100**

A negative sign corresponds to "less than"
Monitor Well MW-24 was dry or contained insufficient water for sample collection.

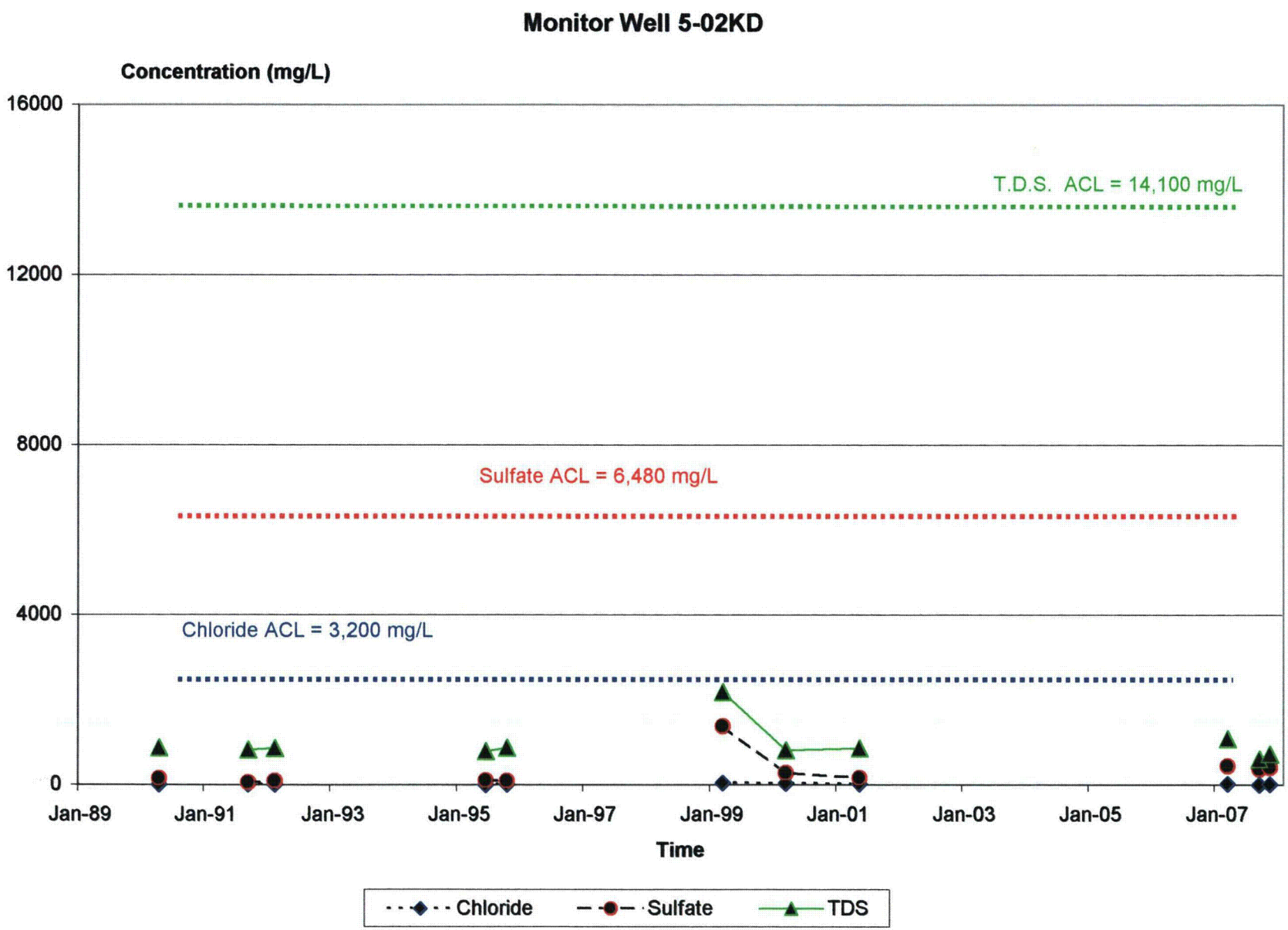
RIO ALGOM MINING LLC
2nd HALF 2007
ALLUVIAL WELL RESULTS - ACL PARAMETERS

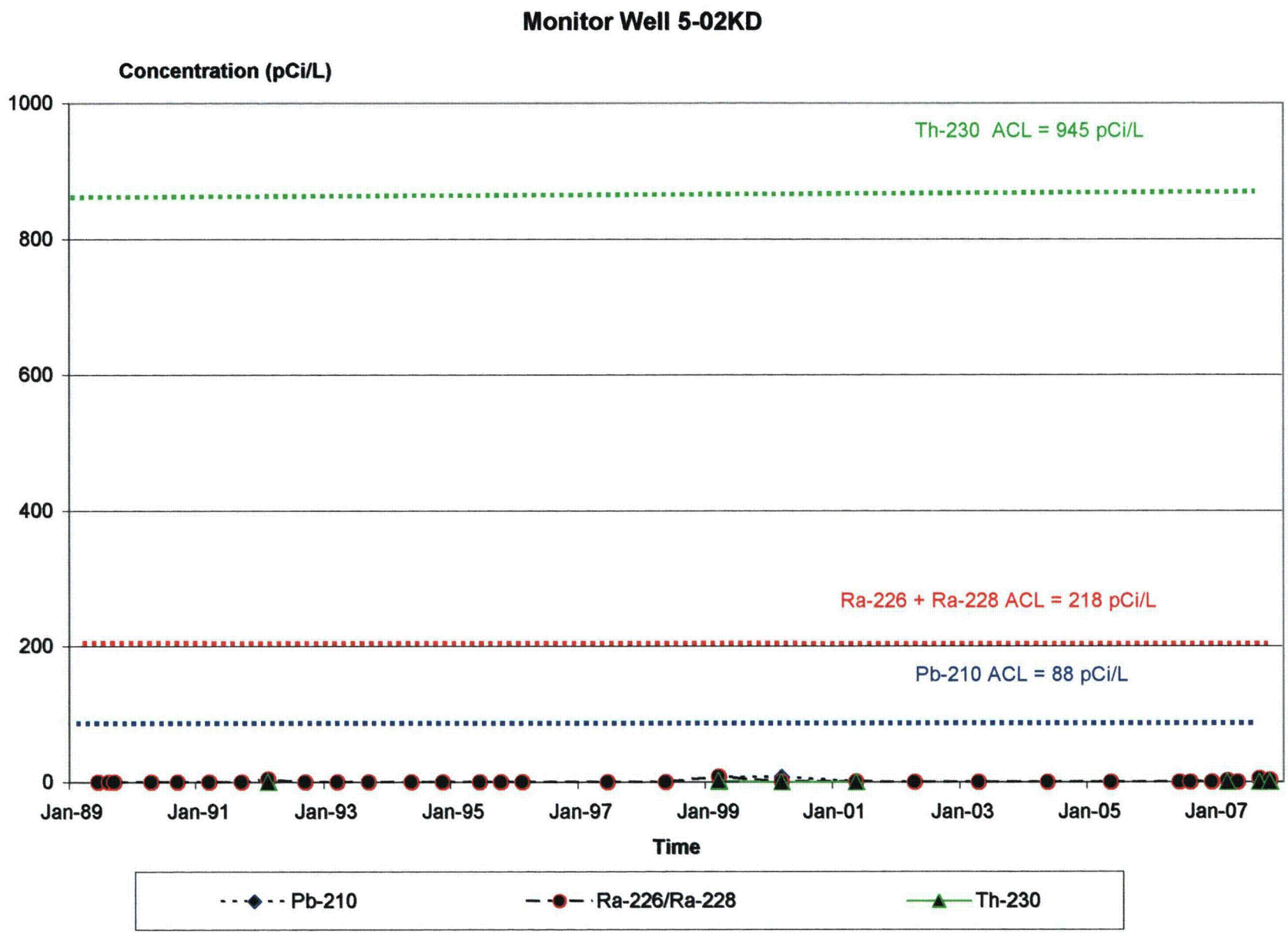
Well	Mo (mg/L)	Ni (mg/L)	Se (mg/L)	U-nat (mg/L)	Th-230 (pCi/L)	Pb-210 (pCi/L)	Ra-226+Ra-228 (pCi/L)	Gross Alpha (pCi/L)
5-73	-0.003	0.022	-0.001	0.2400	0.00	12.00	1.3	0
5-73	0.003	0.012	-0.001	0.2850	-0.11	0.43	1.0	0
5-03	-0.001	0.010	-0.001	0.0023	-0.26	0.55	1.7	2
5-03	0.003	0.004	-0.001	0.0040	0.00	0.90	1.8	17
5-04	-0.003	0.011	-0.001	0.0034	0.06	0.00	1.7	18
5-04	0.002	0.001	-0.001	0.0041	-0.03	0.00	0.4	3
5-08	0.014	0.012	-0.001	0.0057	0.03	4.40	9.0	13
5-08	0.020	0.005	-0.001	0.0084	0.10	0.00	7.3	28
31-61	-0.005	0.033	0.002	0.3270	-0.05	0.48	2.7	0
31-61	0.007	0.025	0.001	0.3870	0.17	1.70	2.2	0
31-65	0.006	0.023	-0.001	0.1470	-0.23	0.00	2.0	0
31-65	0.265	0.007	0.003	1.7100	-0.09	1.10	30.8	0
32-59	0.005	0.018	-0.001	0.1560	0.03	3.20	1.5	0
32-59	0.009	0.011	-0.001	0.1270	0.00	0.00	0.5	0
MW-24								
MW-24								
ACL	**176**	**98**	**49**	**23**	**13627**	**1274**	**3167**	**8402**

A negative sign corresponds to "less than"
Monitor Well MW-24 was dry or contained insufficient water for sample collection.

Stability Monitoring Plan
Time vs. Concentration Plots

Dakota


Monitor Well 5-02KD
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 14,100 mg/L
Sulfate ACL = 6,480 mg/L
Chloride ACL = 3,200 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS


Monitor Well 5-02KD
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
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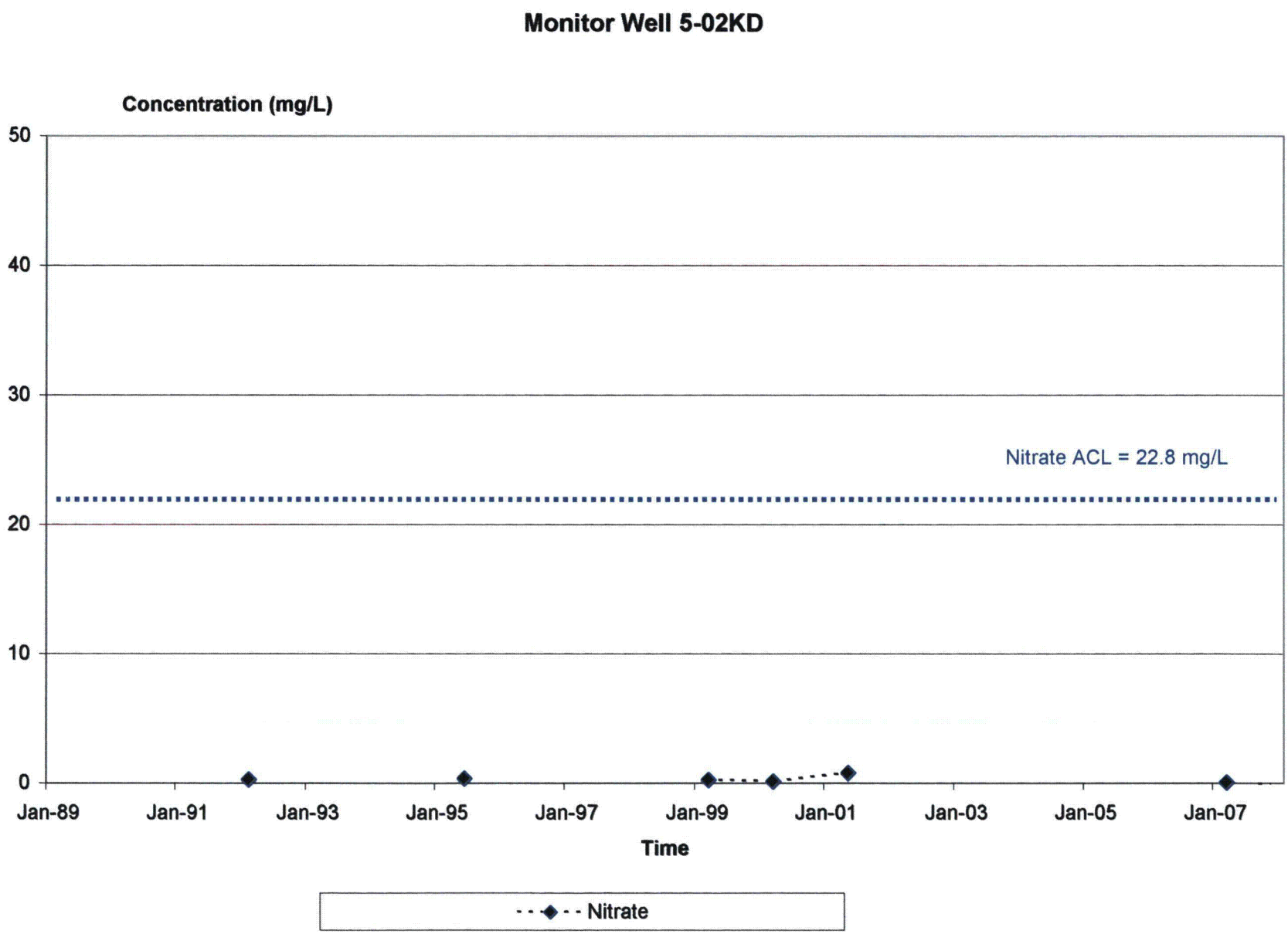
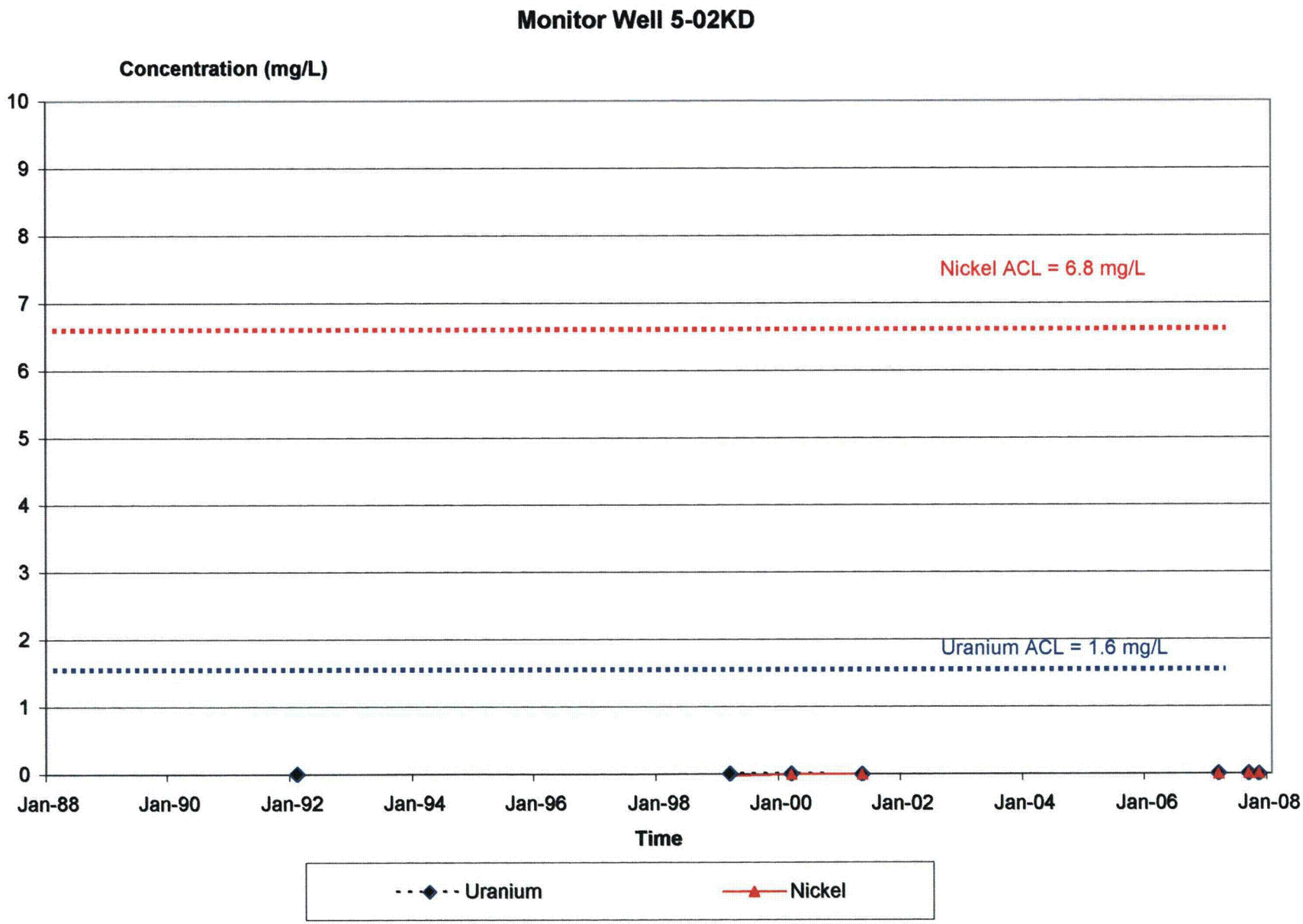
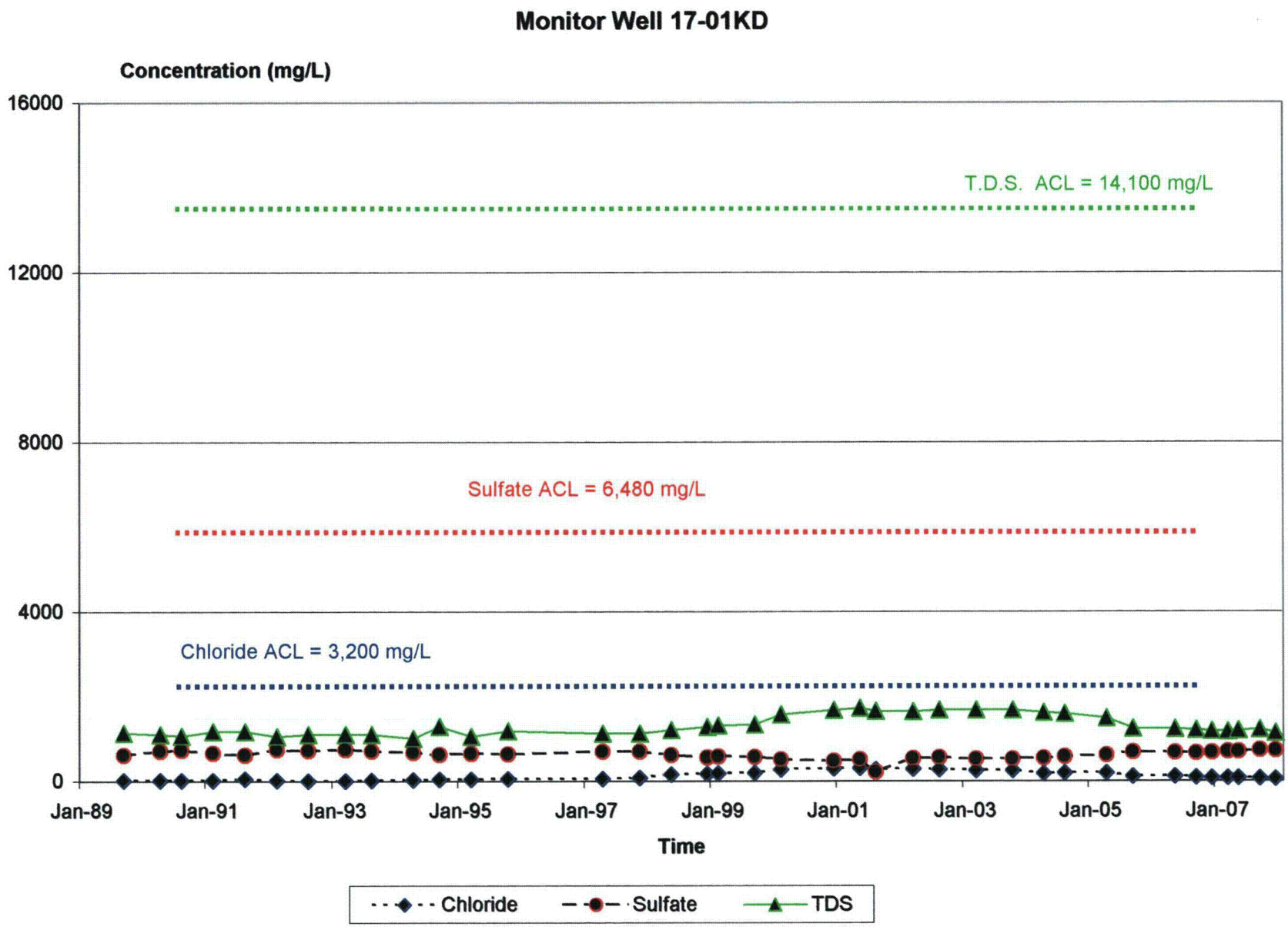
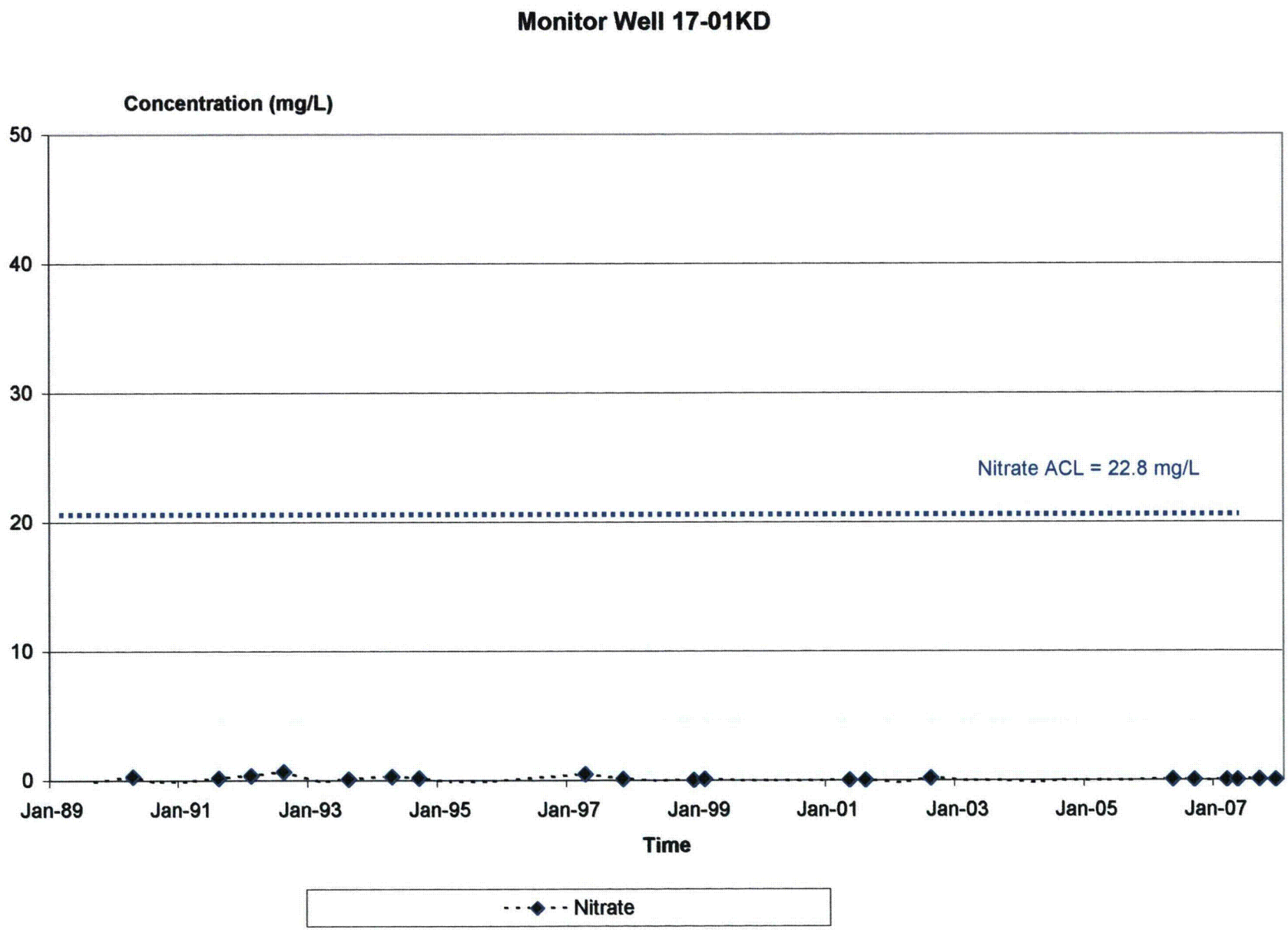
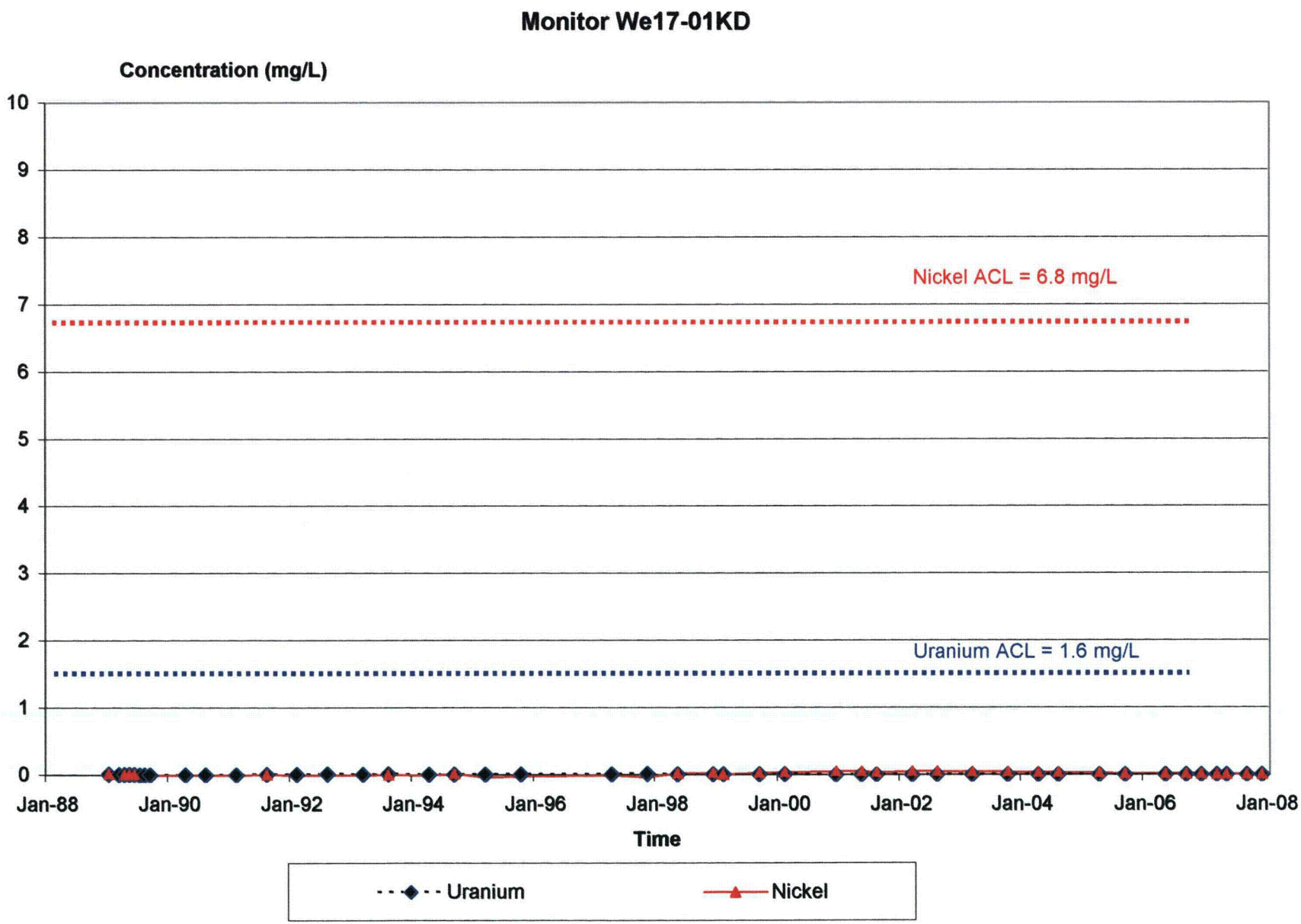
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

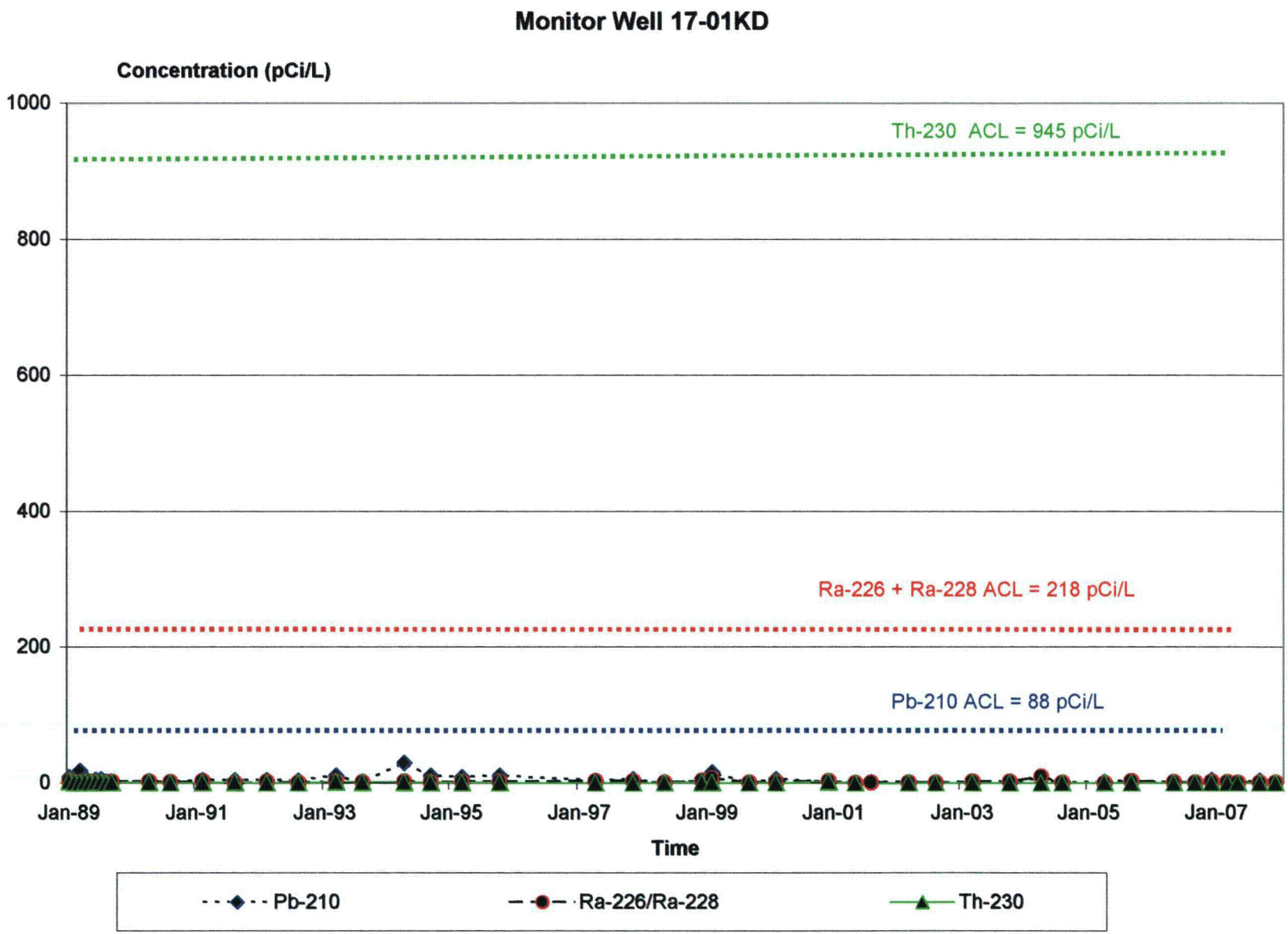

Monitor Well 5-02KD
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 22.8 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

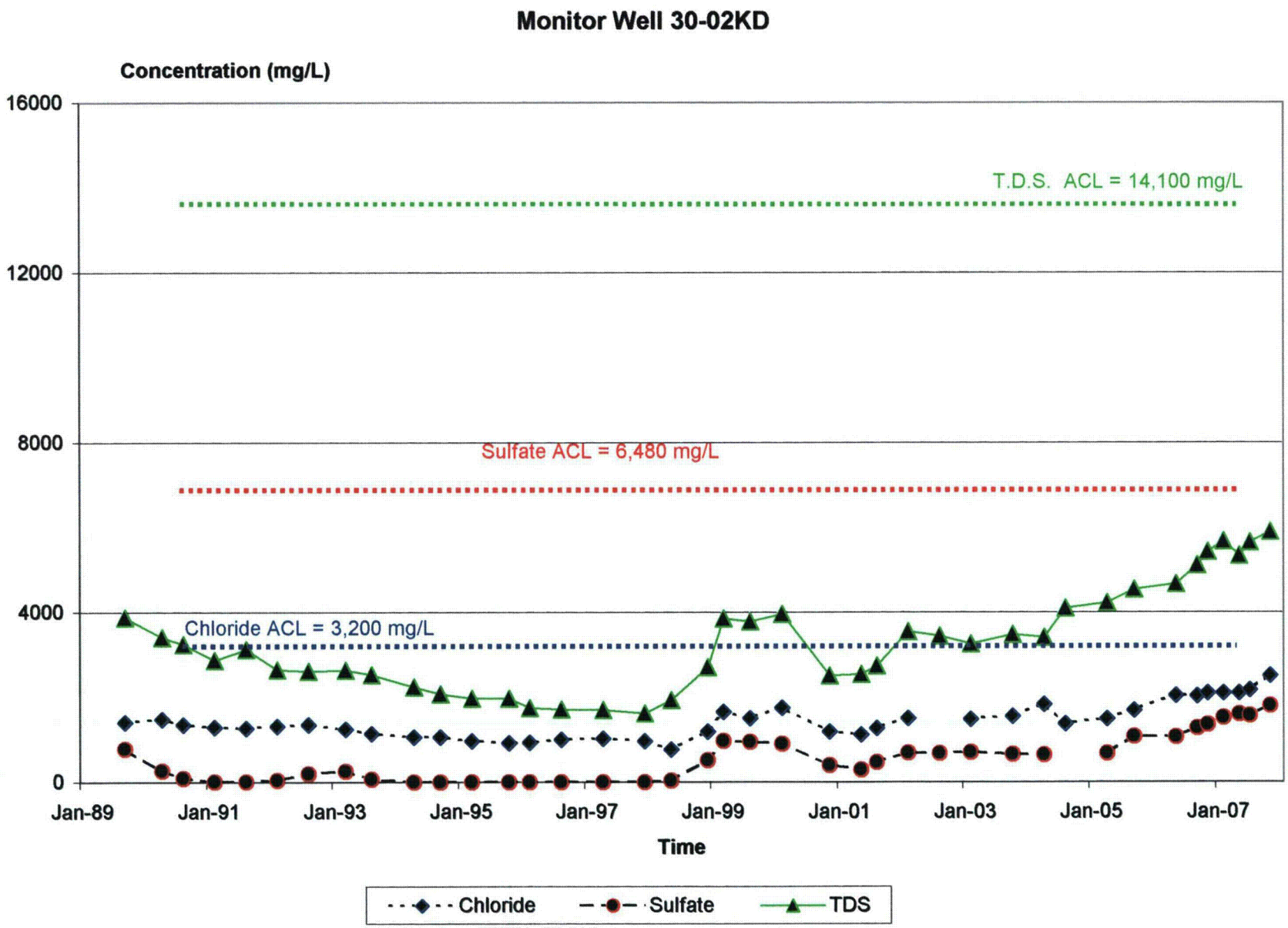

Monitor Well 5-02KD
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Time
Uranium
Nickel

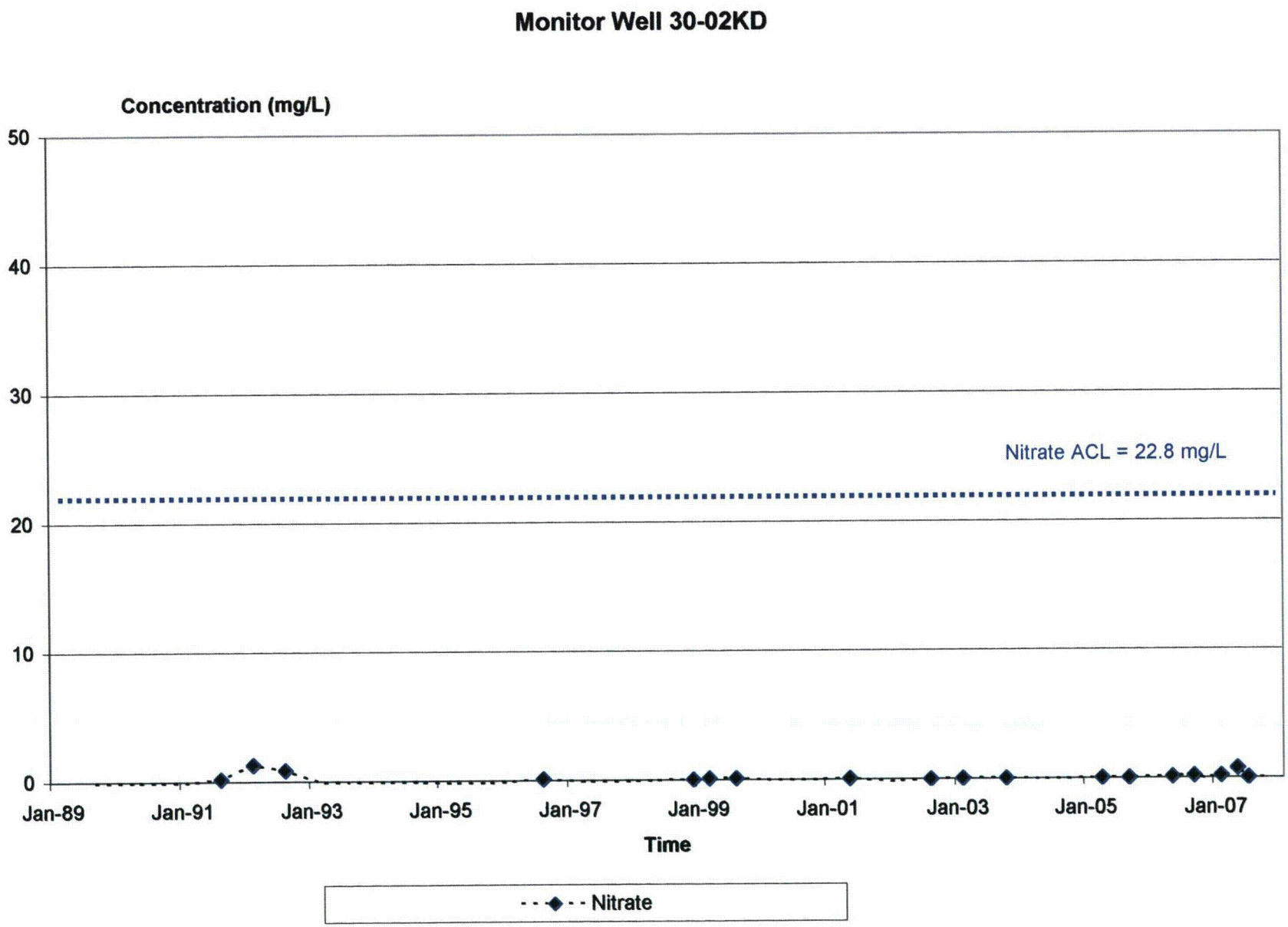

Monitor Well 17-01KD
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 14,100 mg/L
Sulfate ACL = 6,480 mg/L
Chloride ACL = 3,200 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

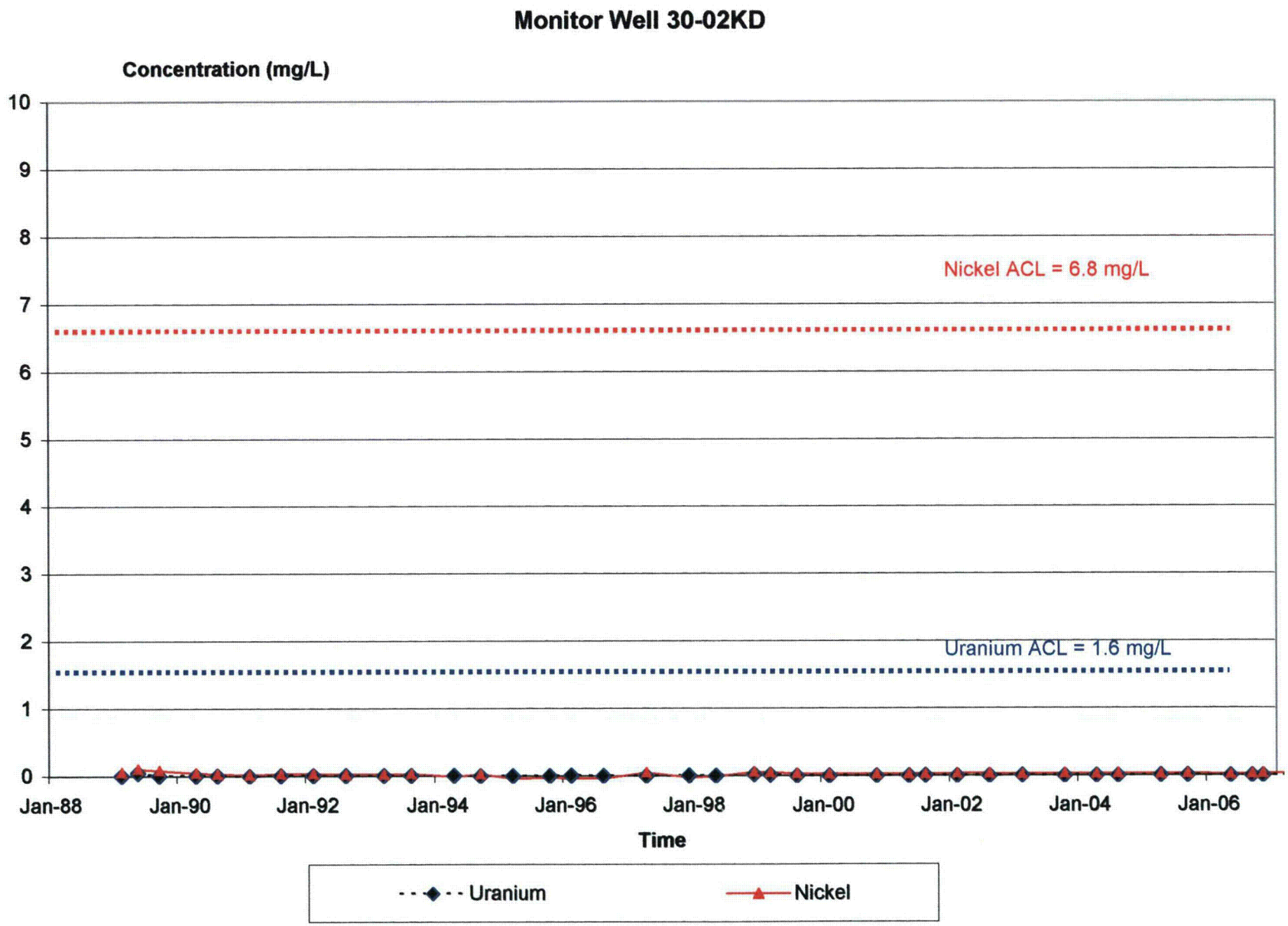

Monitor Well 17-01KD
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 22.8 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

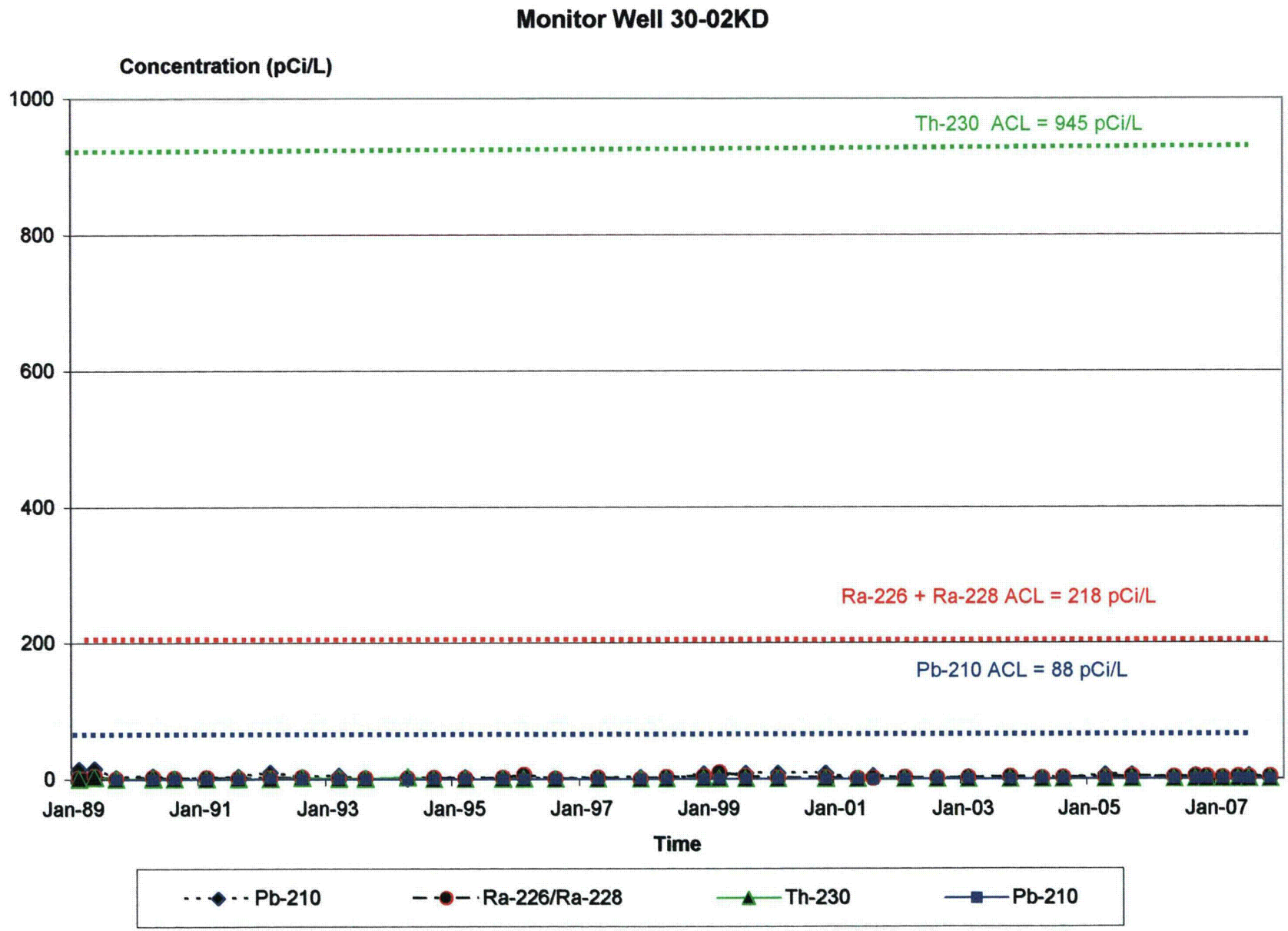

Monitor We17-01KD
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Time
Uranium
Nickel

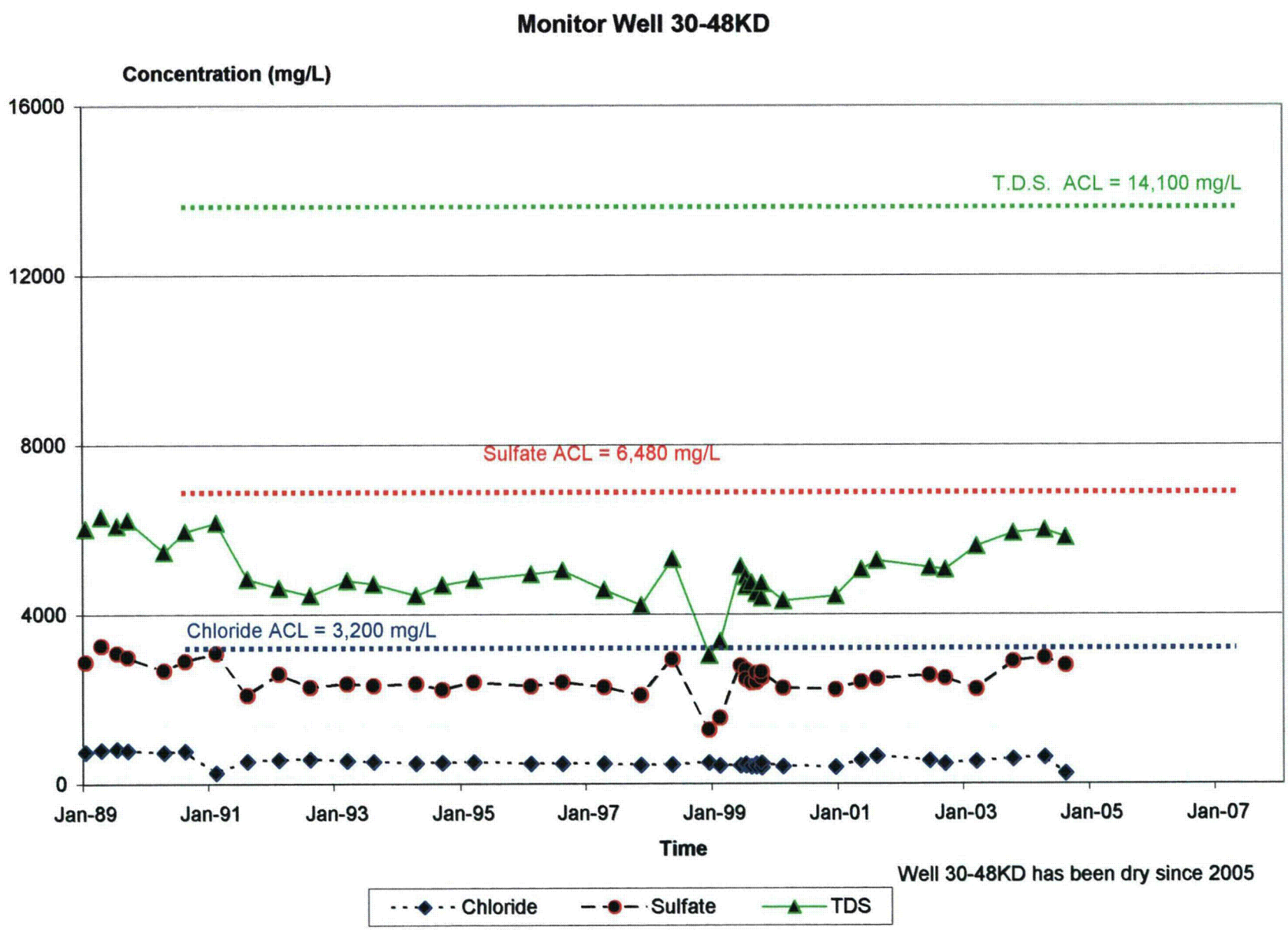

Monitor Well 17-01KD
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

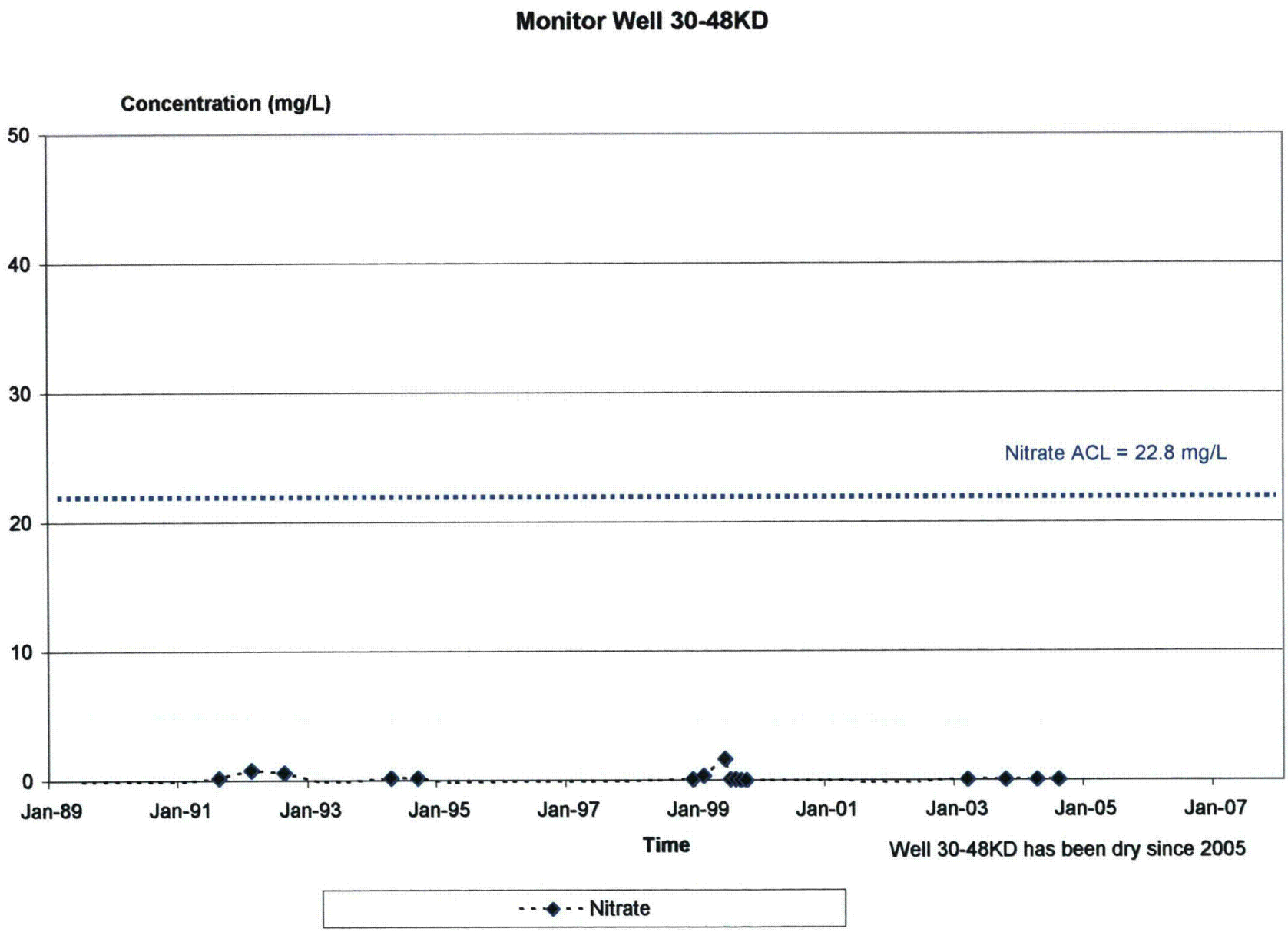

Monitor Well 30-02KD
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 14,100 mg/L
Sulfate ACL = 6,480 mg/L
Chloride ACL = 3,200 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

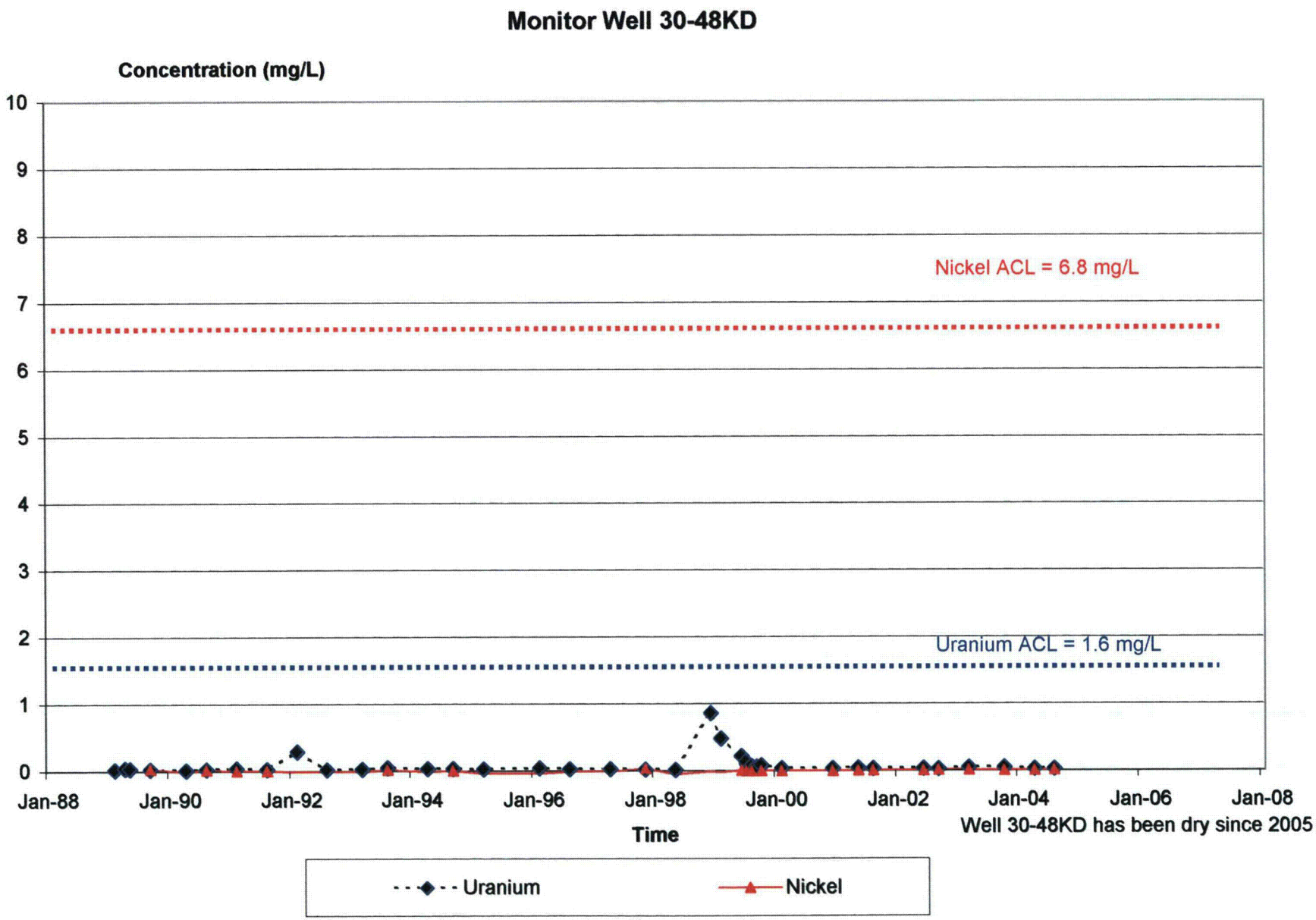

Monitor Well 30-02KD
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 22.8 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

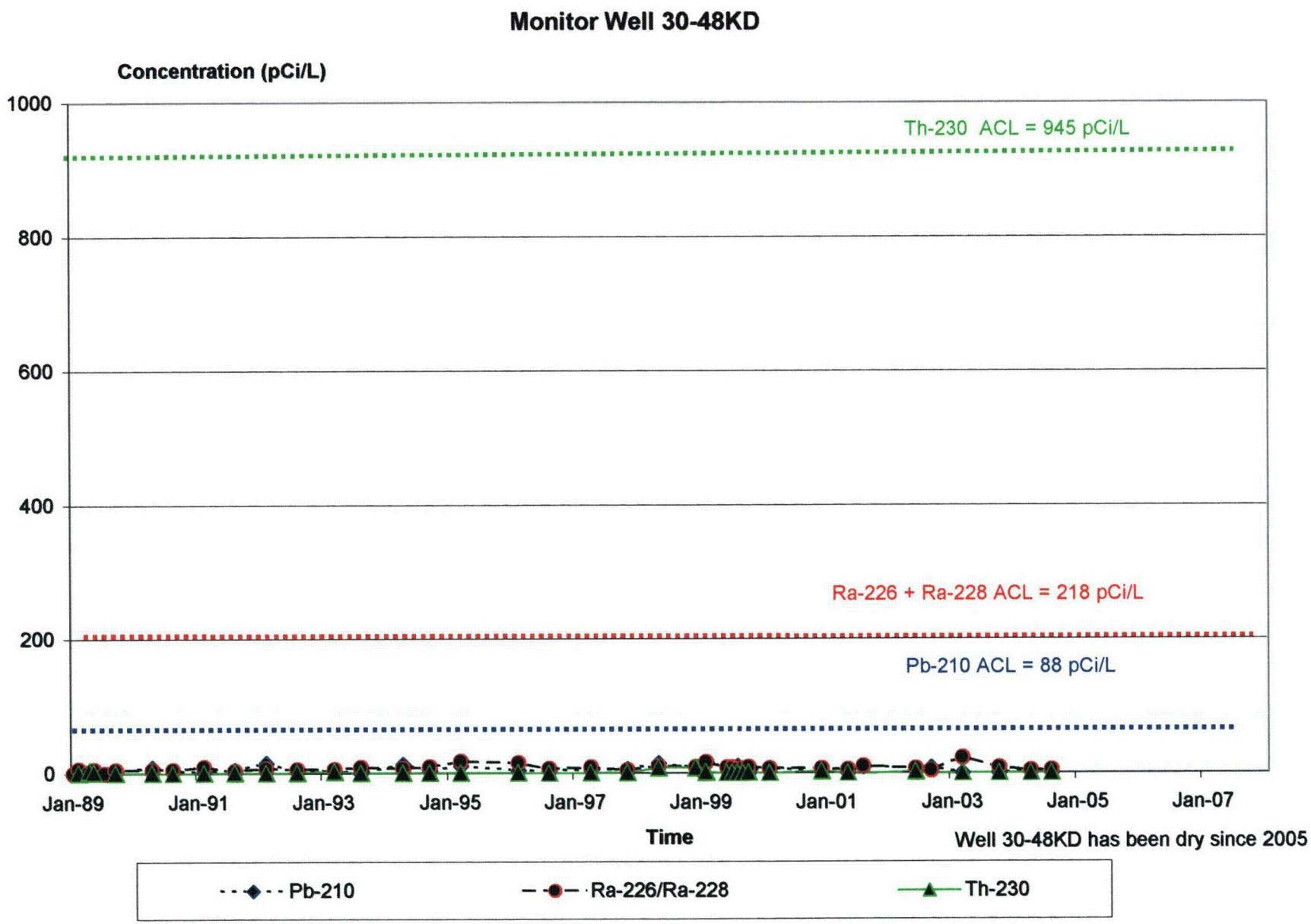

Monitor Well 30-02KD
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Time
Uranium
Nickel

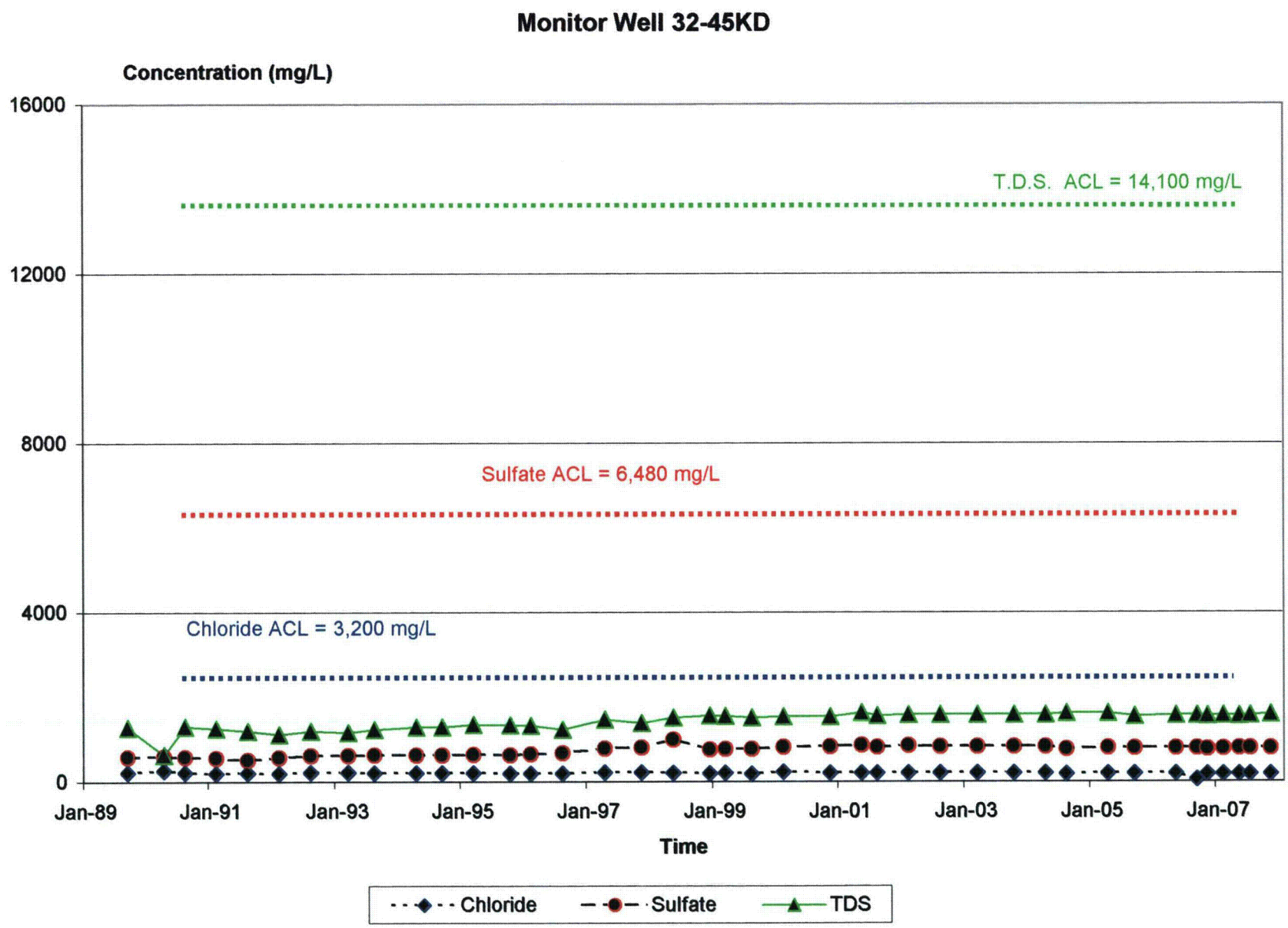

Monitor Well 30-02KD
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Pb-210

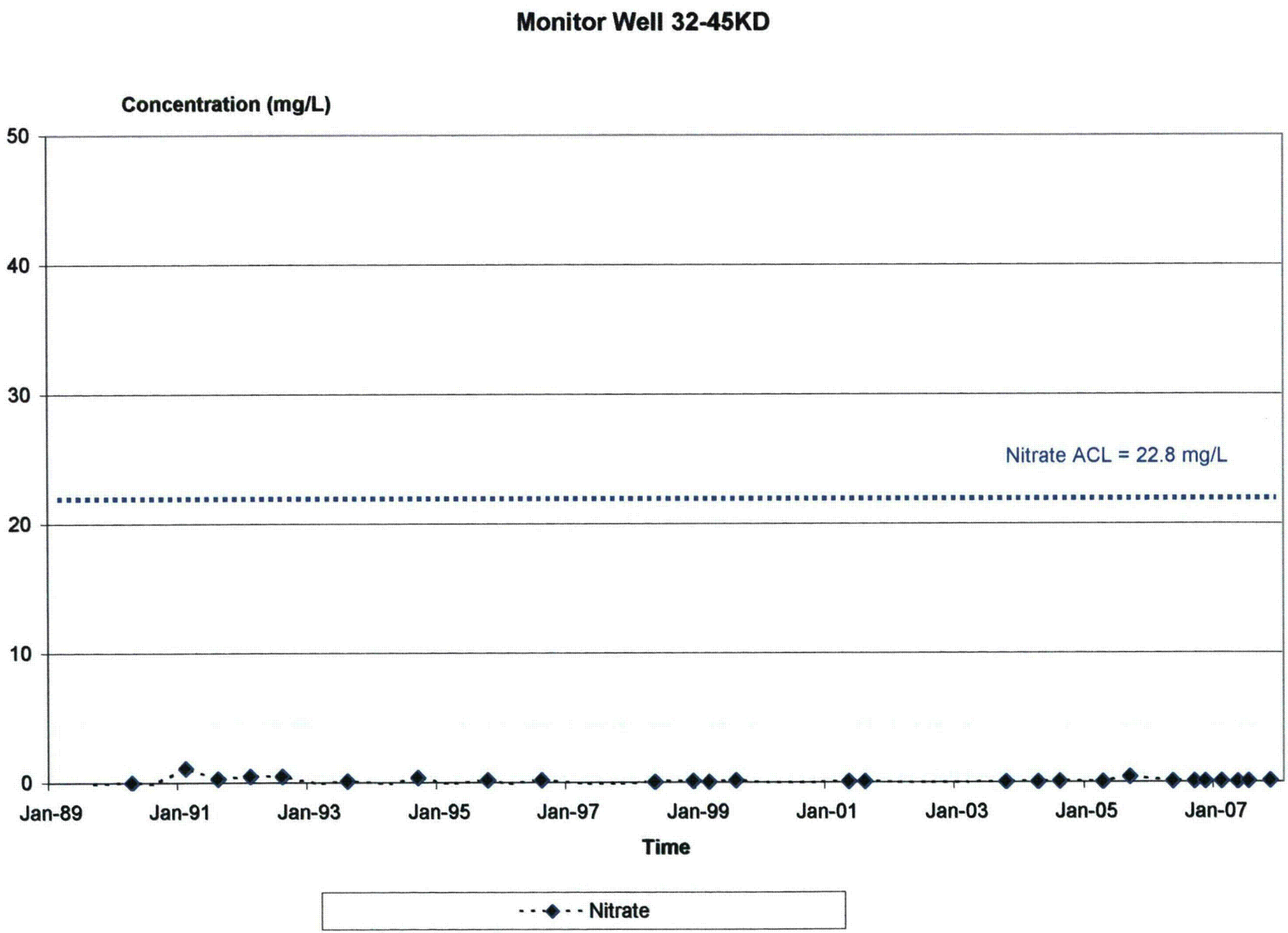

Monitor Well 30-48KD
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 14,100 mg/L
Sulfate ACL = 6,480 mg/L
Chloride ACL = 3,200 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Well 30-48KD has been dry since 2005
Chloride
Sulfate
TDS

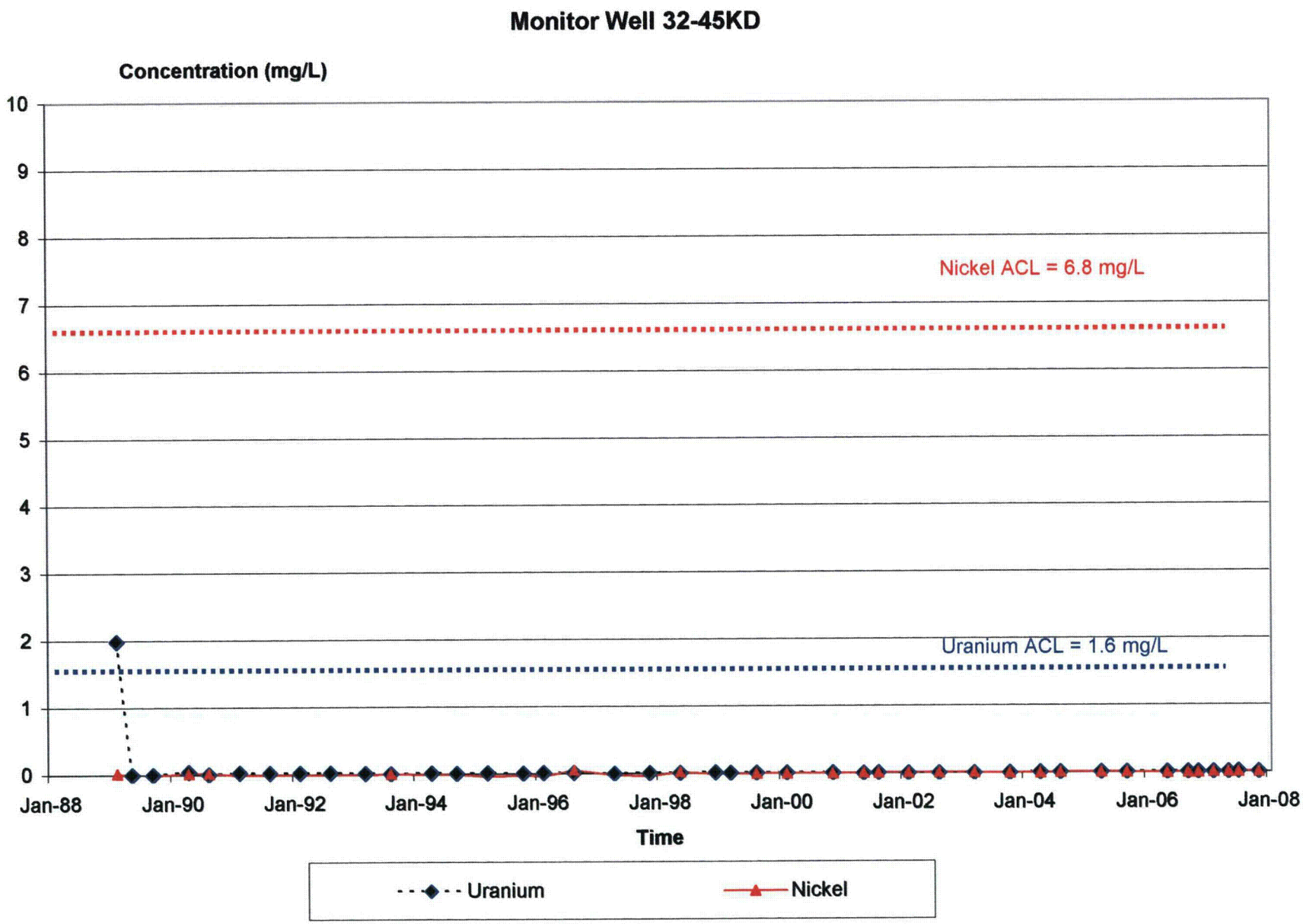

Monitor Well 30-48KD
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 22.8 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Well 30-48KD has been dry since 2005
Nitrate

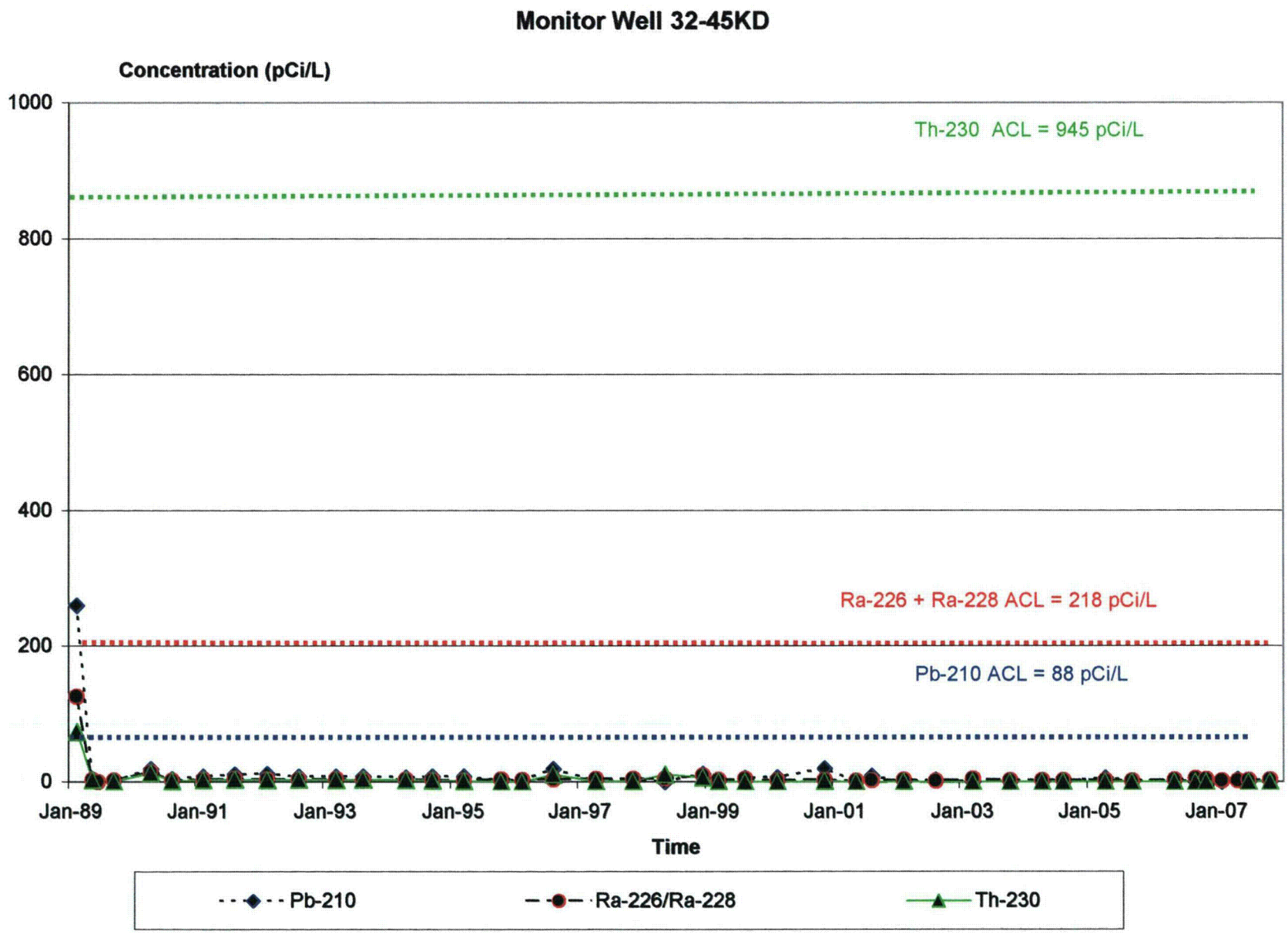

Monitor Well 30-48KD
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Time
Well 30-48KD has been dry since 2005
Uranium
Nickel

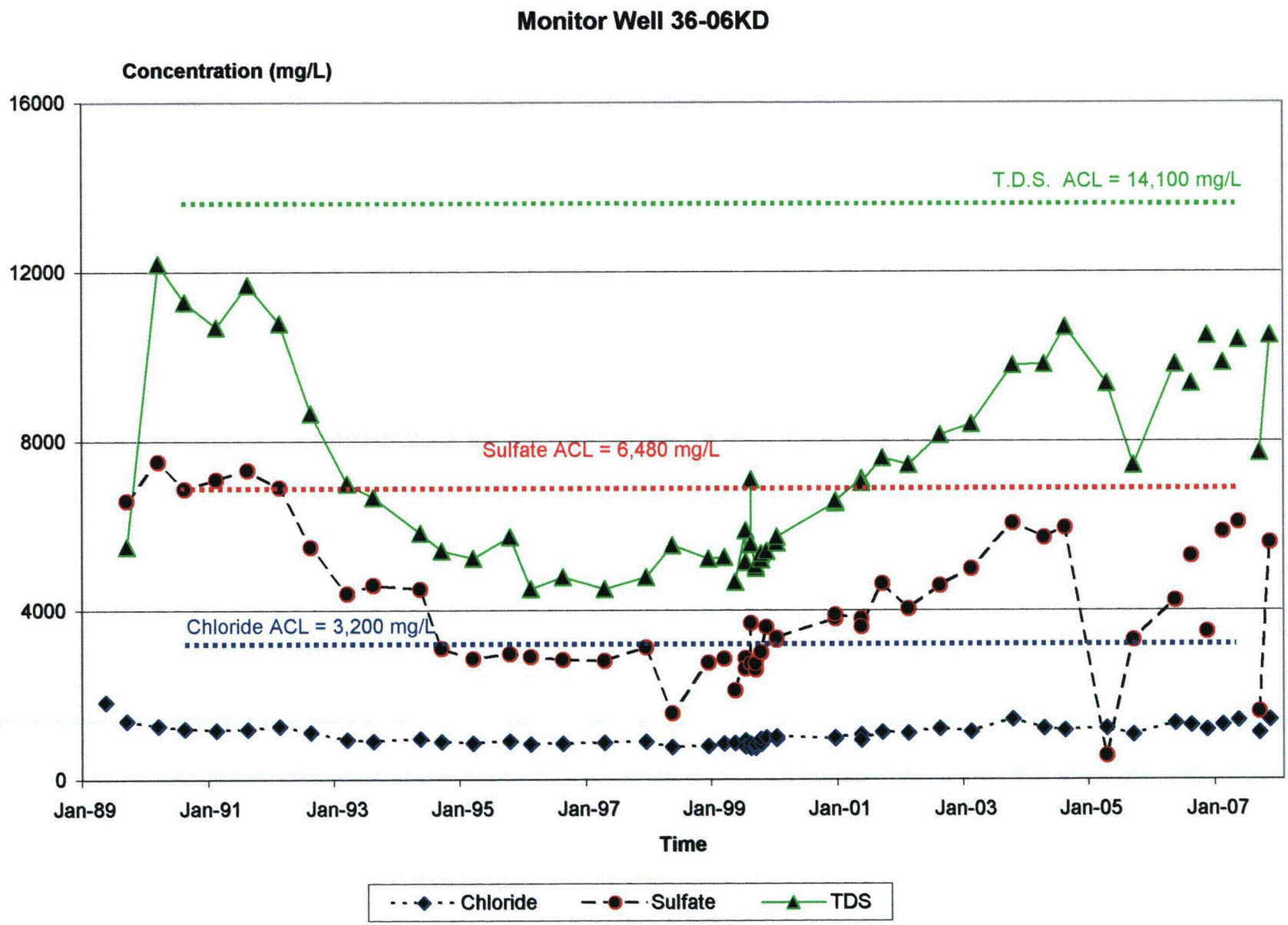

Monitor Well 30-48KD
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Well 30-48KD has been dry since 2005
Pb-210
Ra-226/Ra-228
Th-230

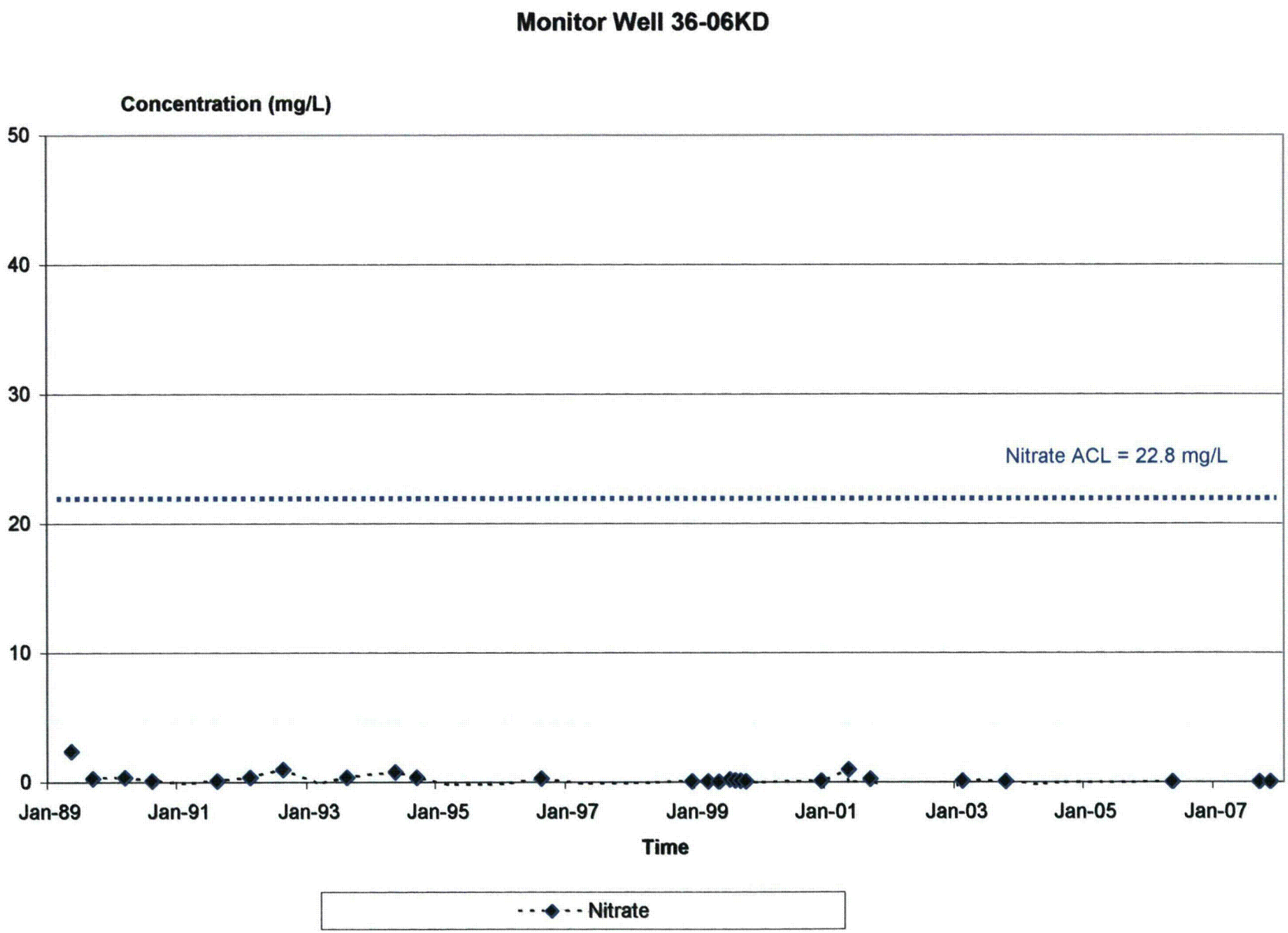

Monitor Well 32-45KD
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 14,100 mg/L
Sulfate ACL = 6,480 mg/L
Chloride ACL = 3,200 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

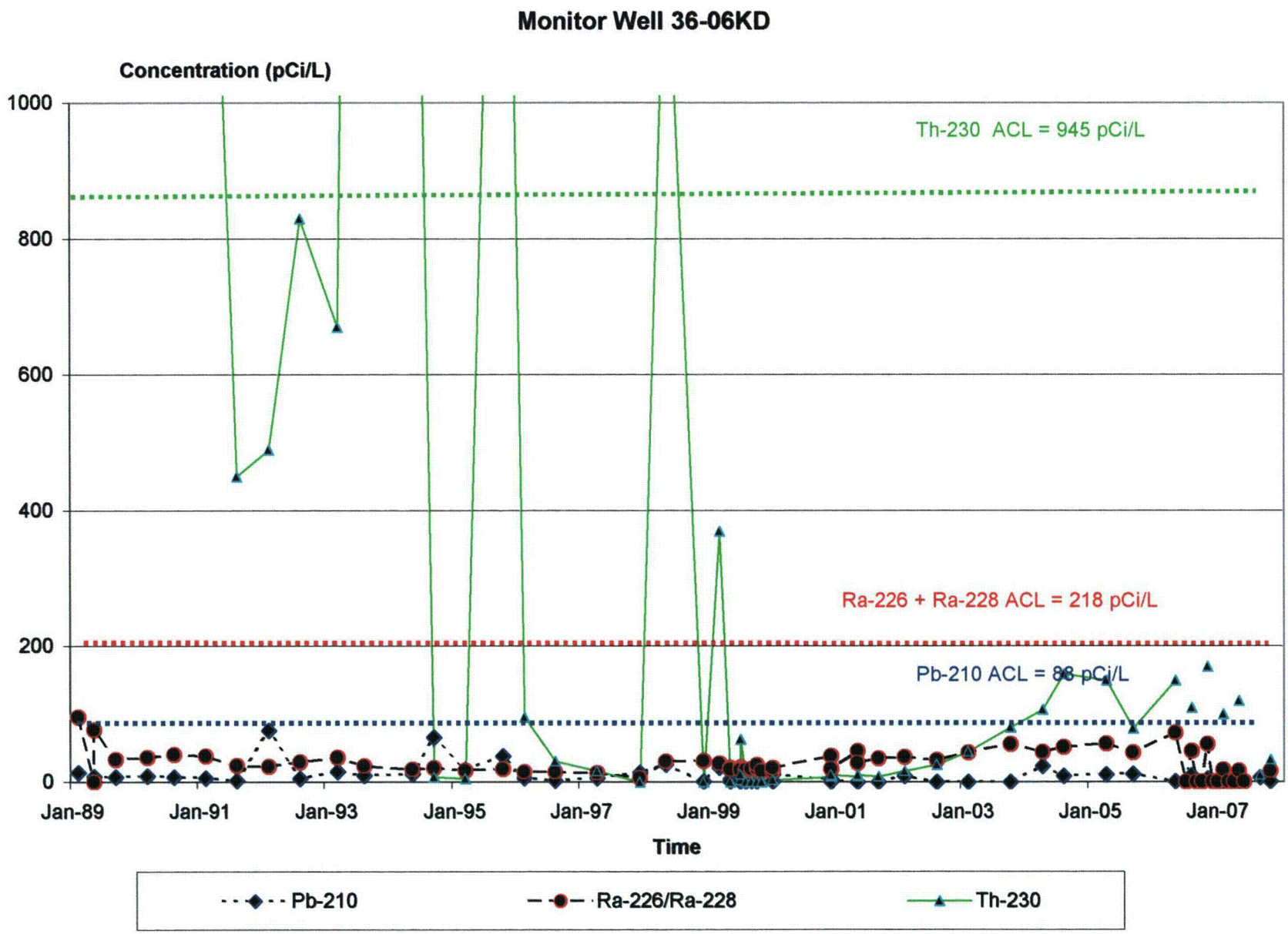

Monitor Well 32-45KD
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 22.8 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

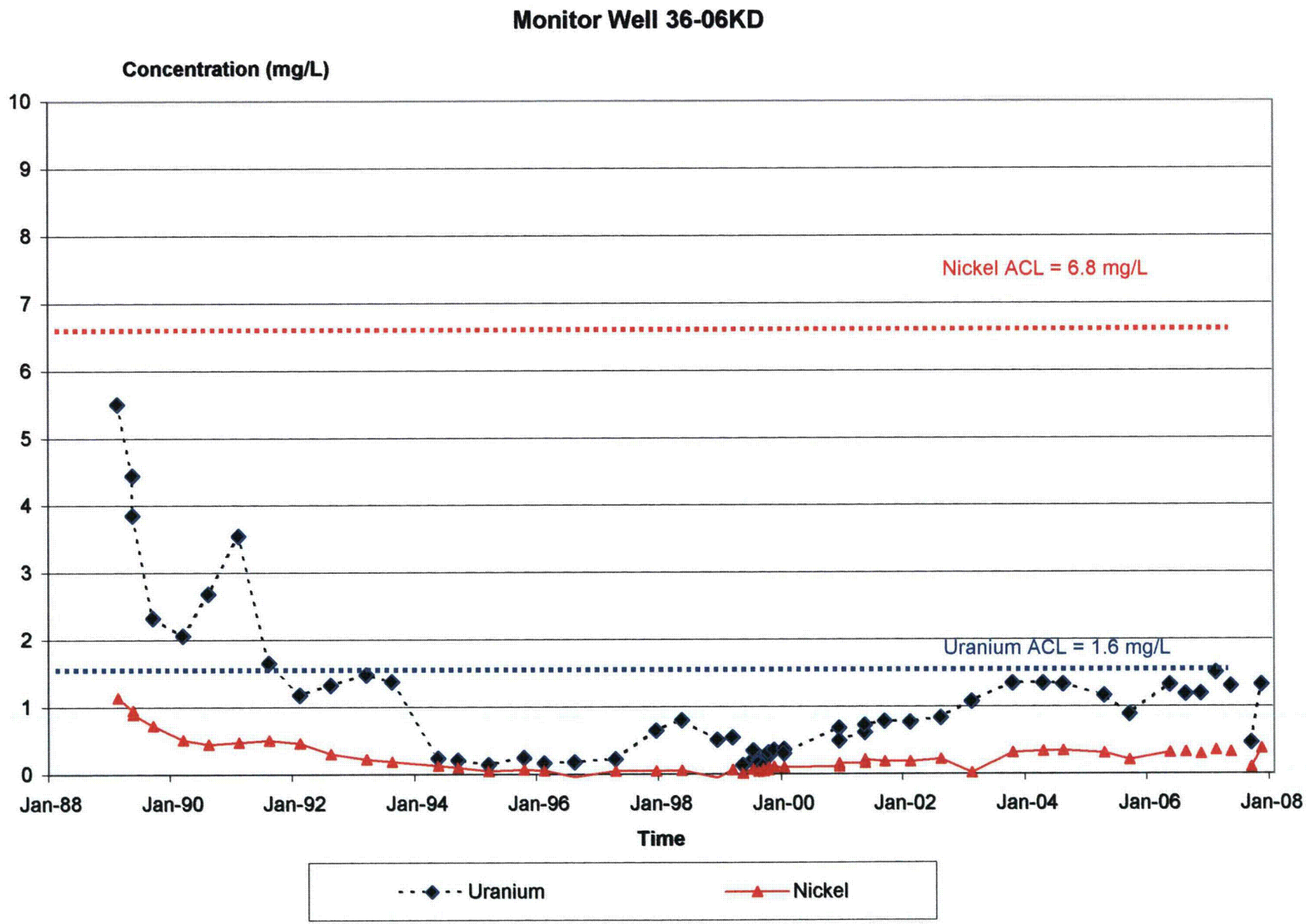

Monitor Well 32-45KD
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Time
Uranium
Nickel


Monitor Well 32-45KD
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230


Monitor Well 36-06KD
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 14,100 mg/L
Sulfate ACL = 6,480 mg/L
Chloride ACL = 3,200 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

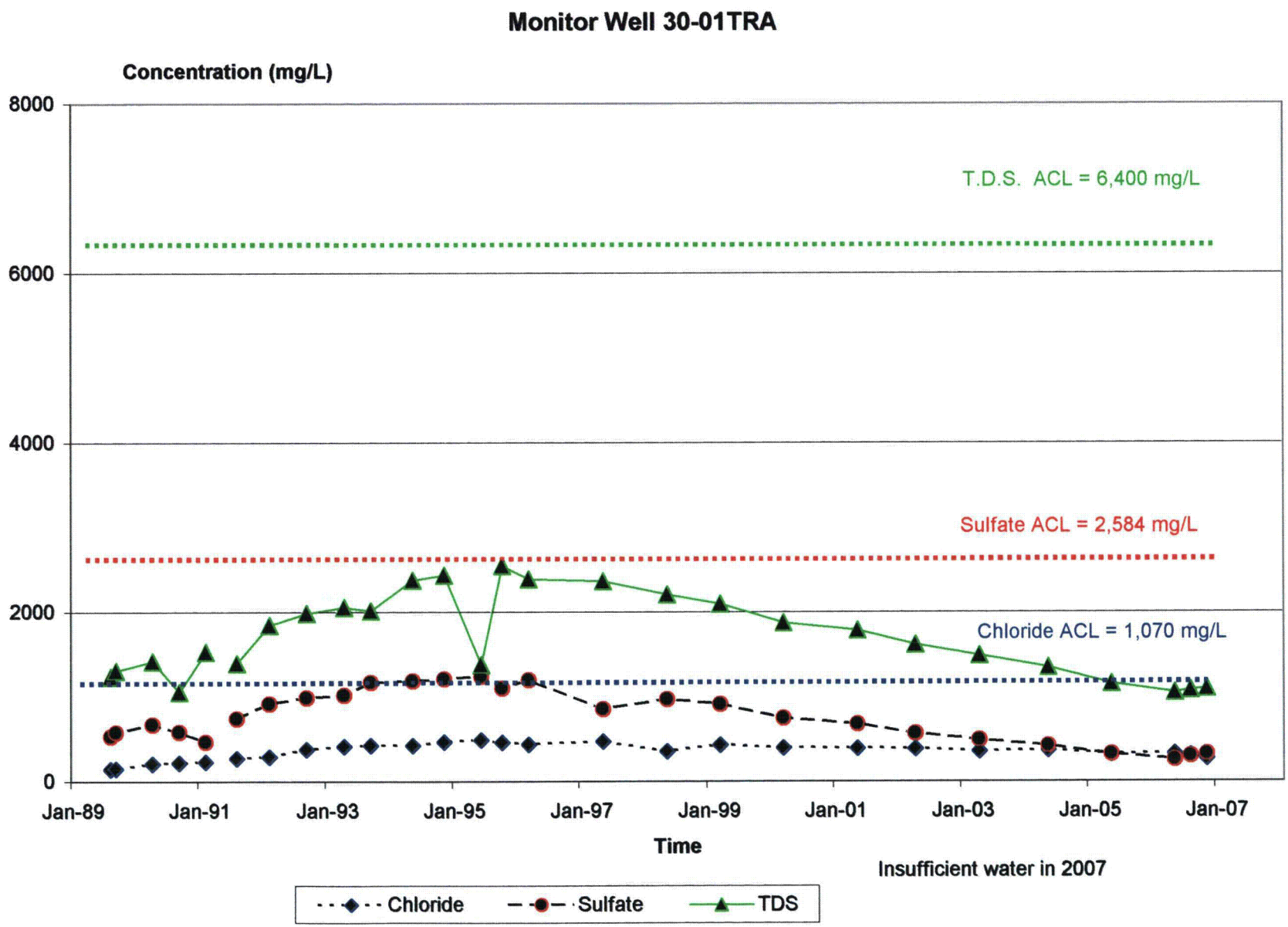

Monitor Well 36-06KD
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 22.8 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

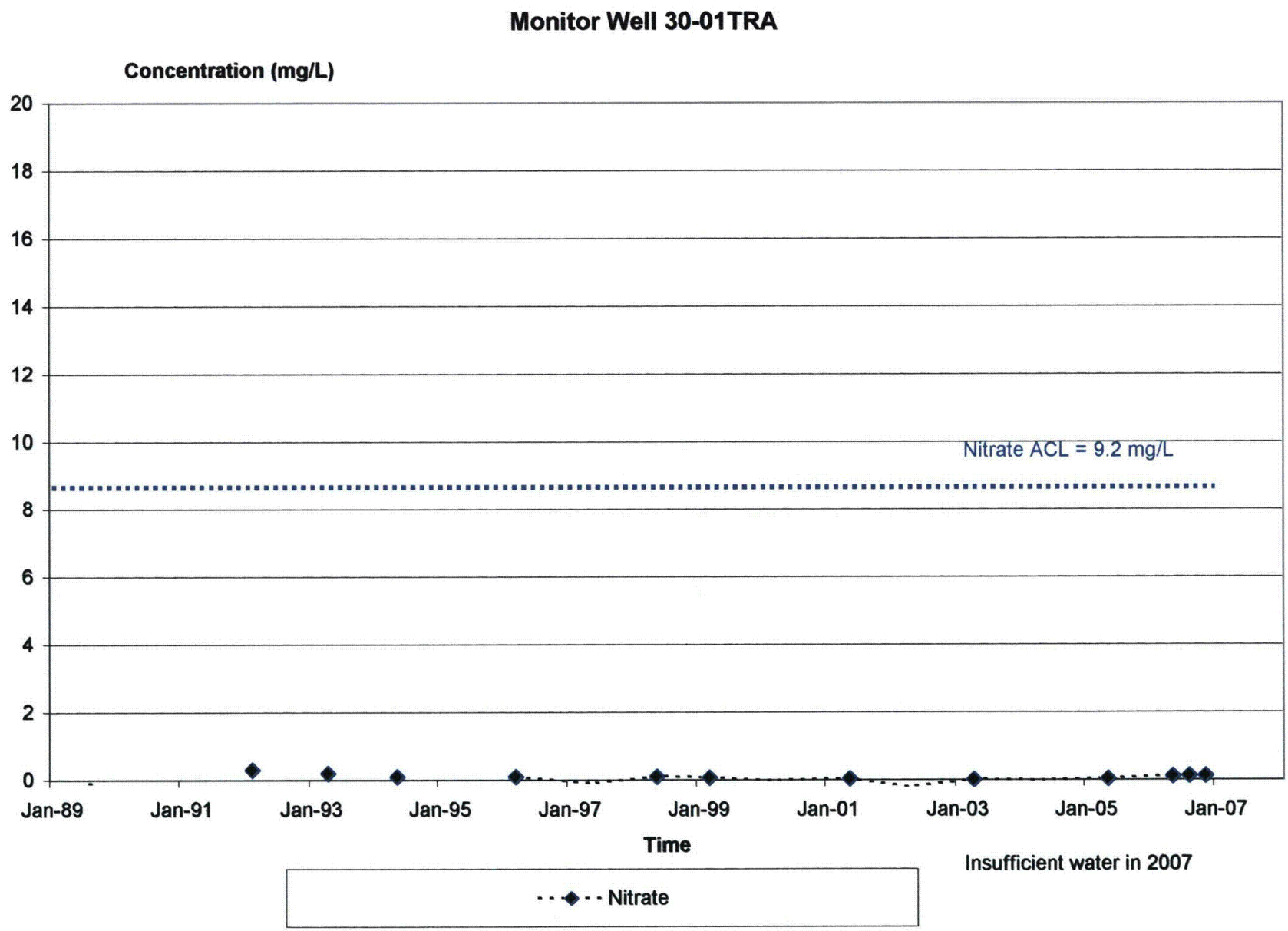

Monitor Well 36-06KD
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

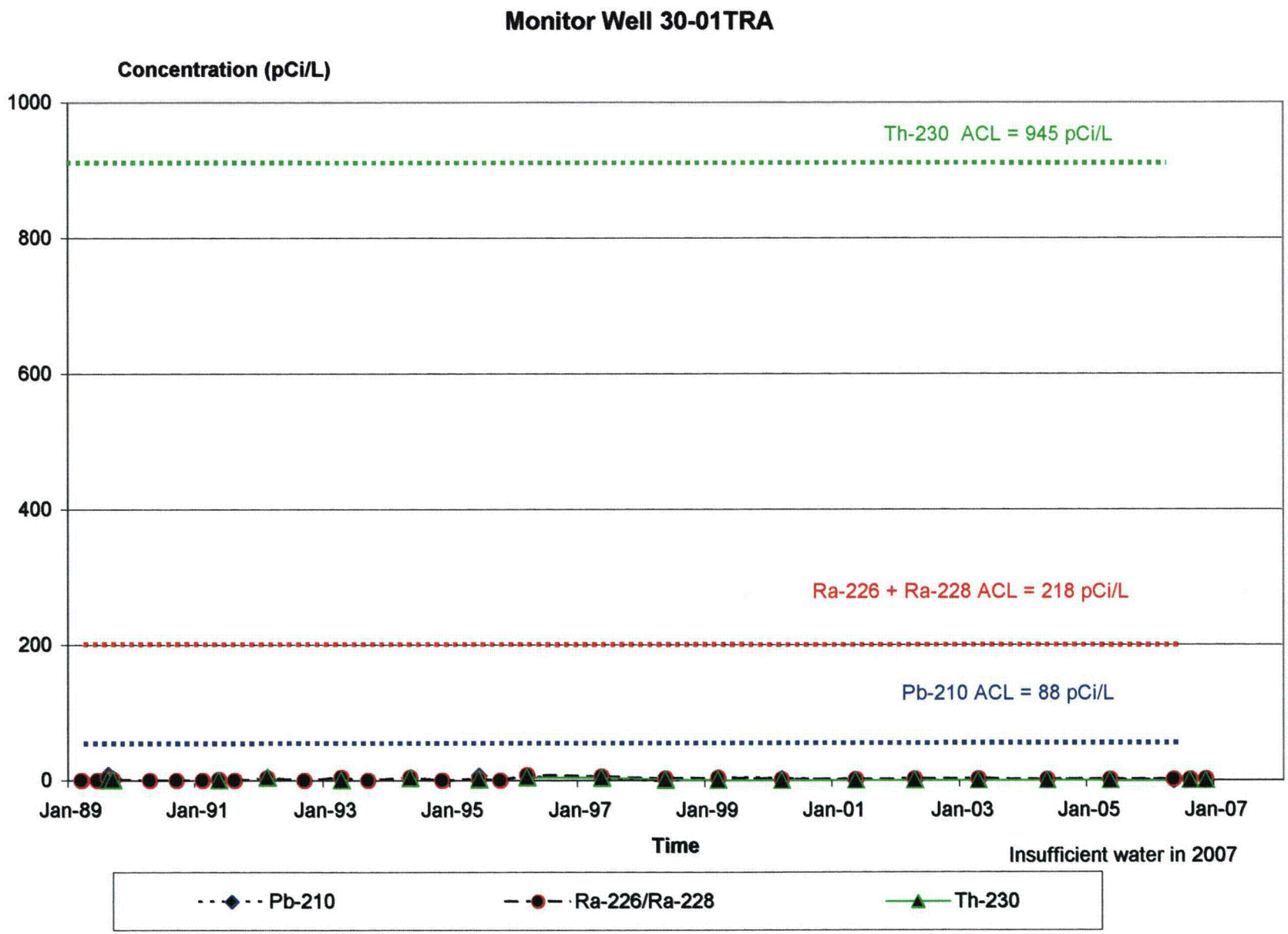

Monitor Well 36-06KD
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Time
Uranium
Nickel

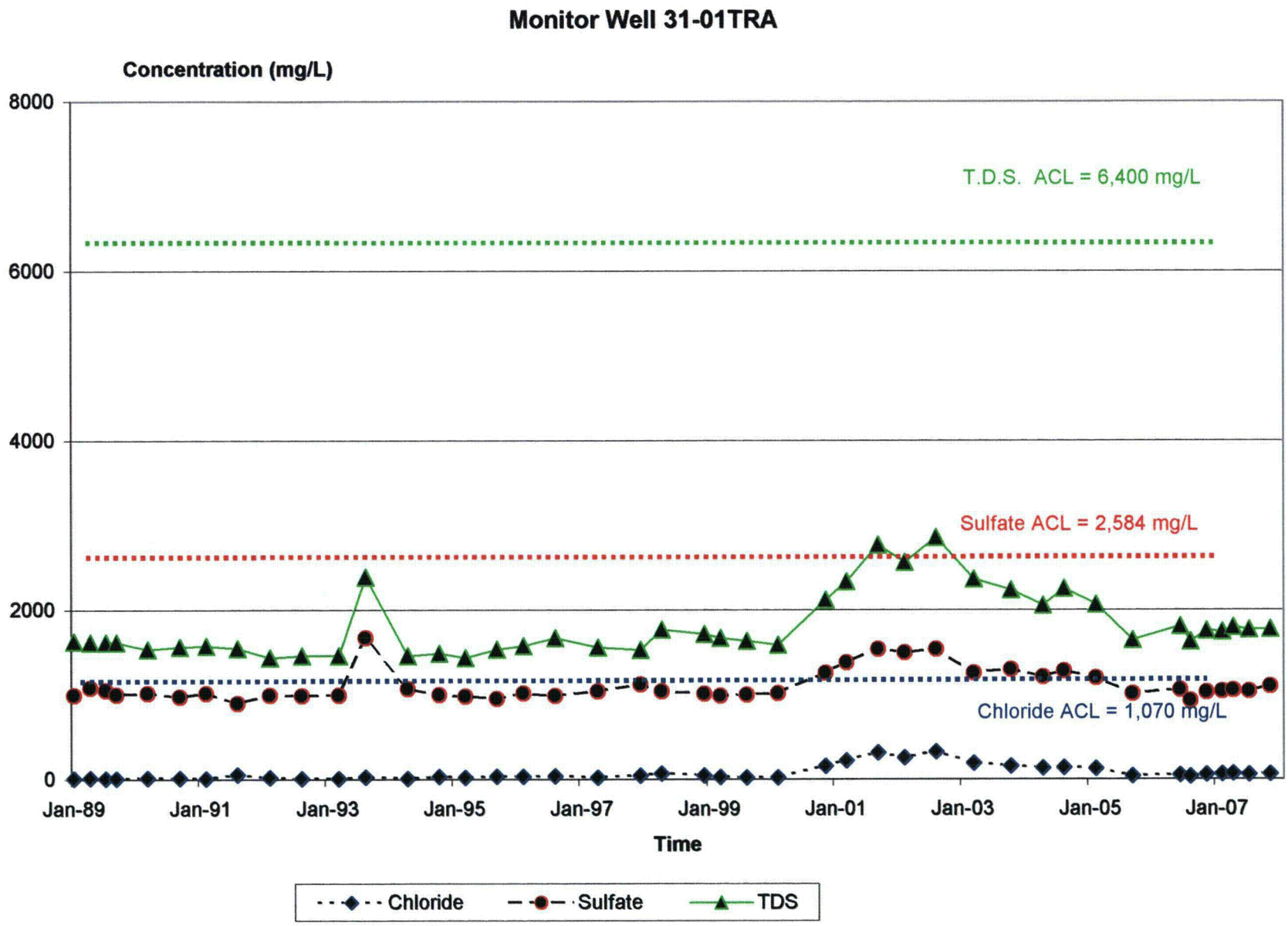
Stability Monitoring Plan
Time vs. Concentration Plots

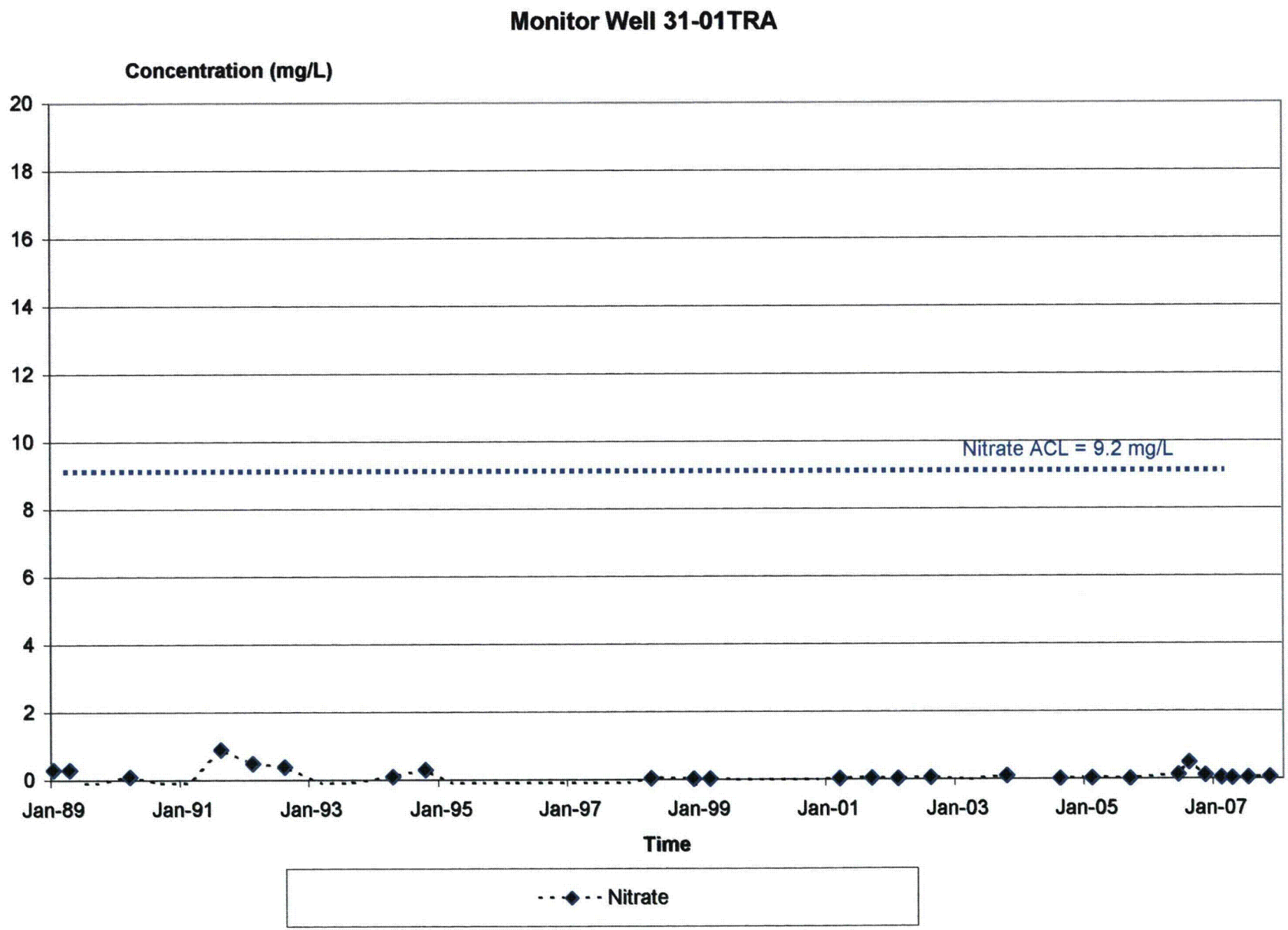
Tres Hermanos A

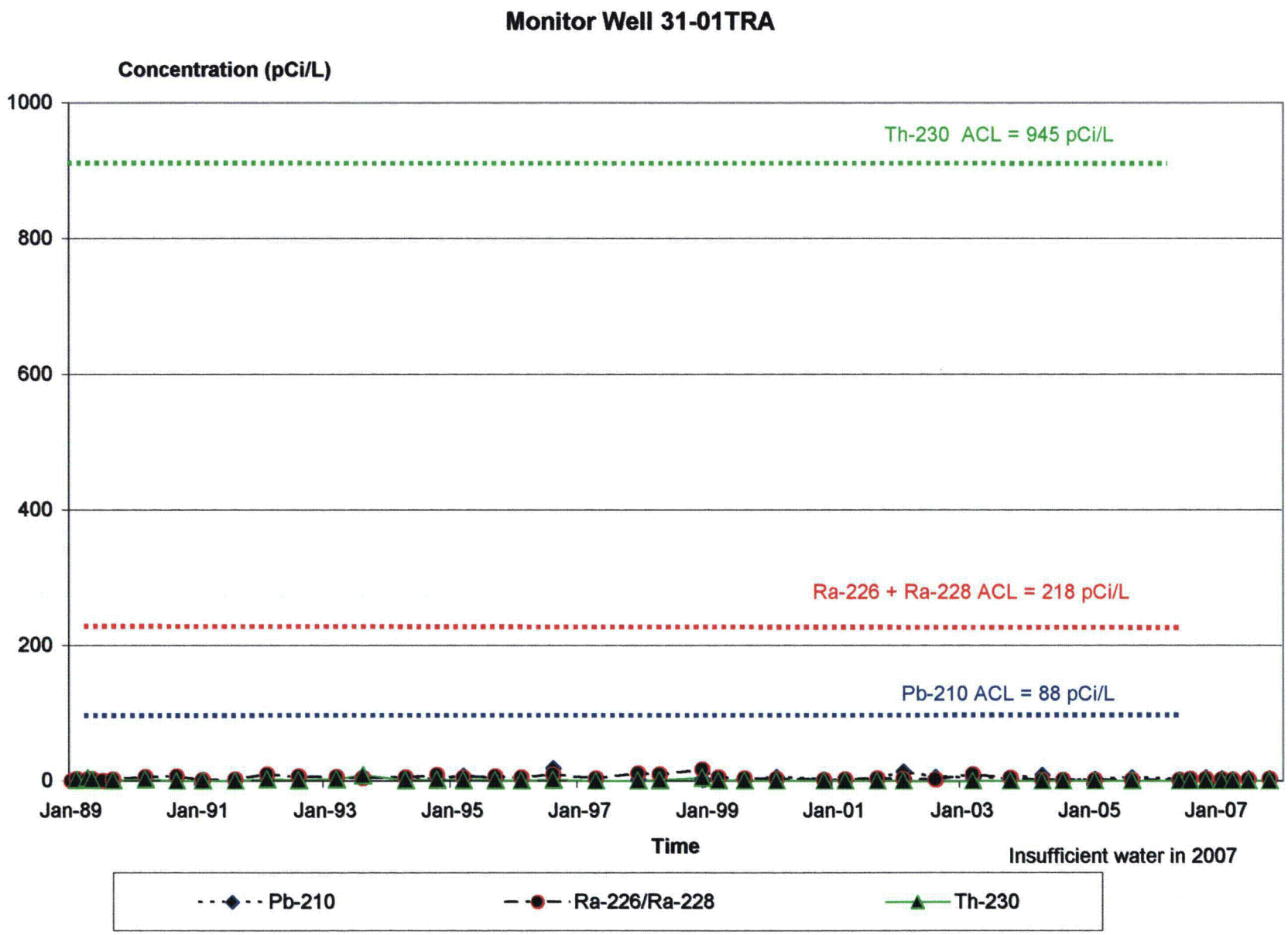

Monitor Well 30-01TRA
Concentration (mg/L)
8000
6000
4000
2000
0
T.D.S. ACL = 6,400 mg/L
Sulfate ACL = 2,584 mg/L
Chloride ACL = 1,070 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Insufficient water in 2007
Chloride
Sulfate
TDS

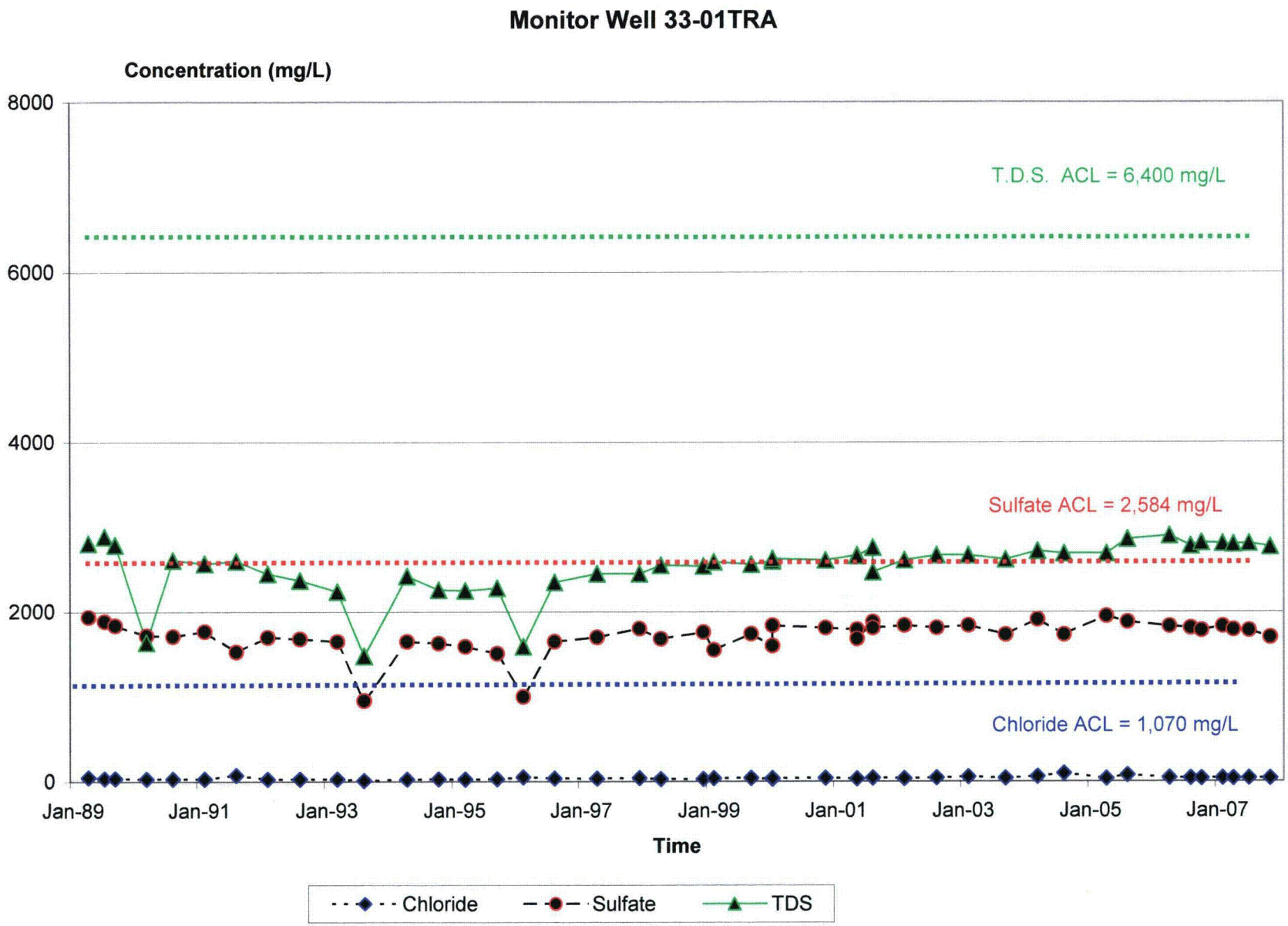

Monitor Well 30-01TRA
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Nitrate ACL = 9.2 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Insufficient water in 2007
Nitrate

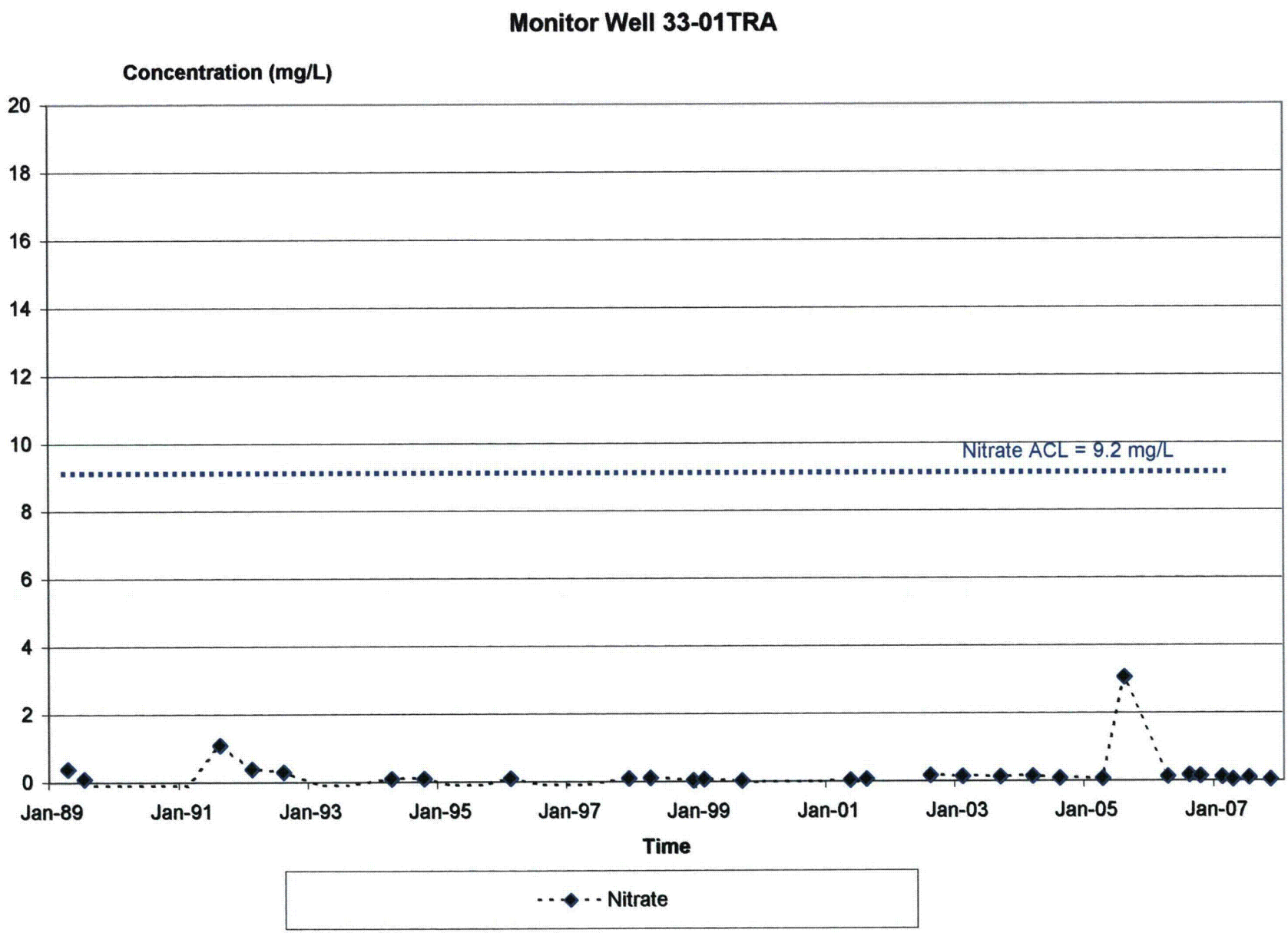

Monitor Well 30-01TRA
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Insufficient water in 2007
Pb-210
Ra-226/Ra-228
Th-230

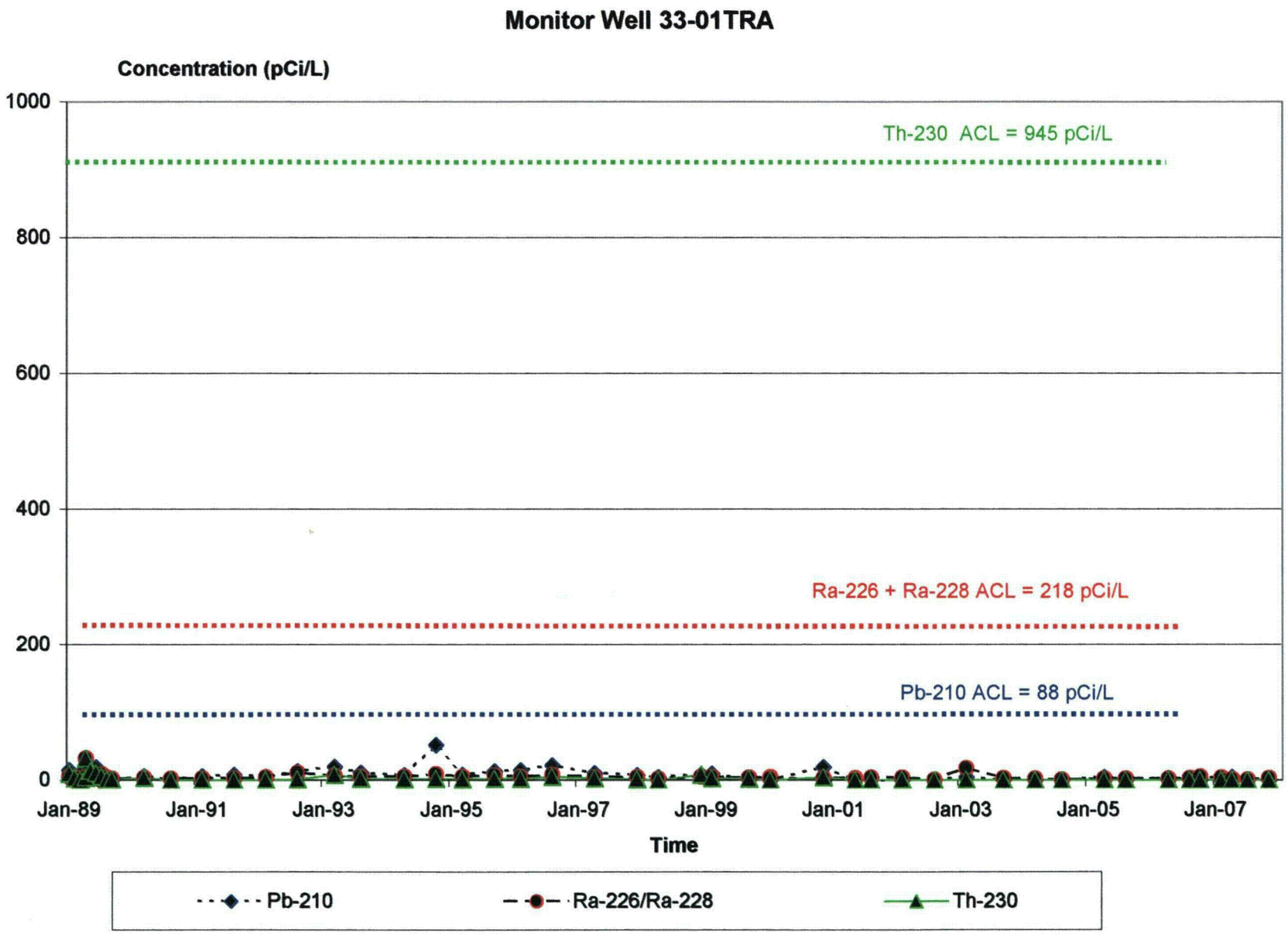

Monitor Well 31-01TRA
Concentration (mg/L)
8000
6000
4000
2000
0
T.D.S. ACL = 6,400 mg/L
Sulfate ACL = 2,584 mg/L
Chloride ACL = 1,070 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS


Monitor Well 31-01TRA
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Nitrate ACL = 9.2 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate


Monitor Well 31-01TRA
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Insufficient water in 2007
Pb-210
Ra-226/Ra-228
Th-230

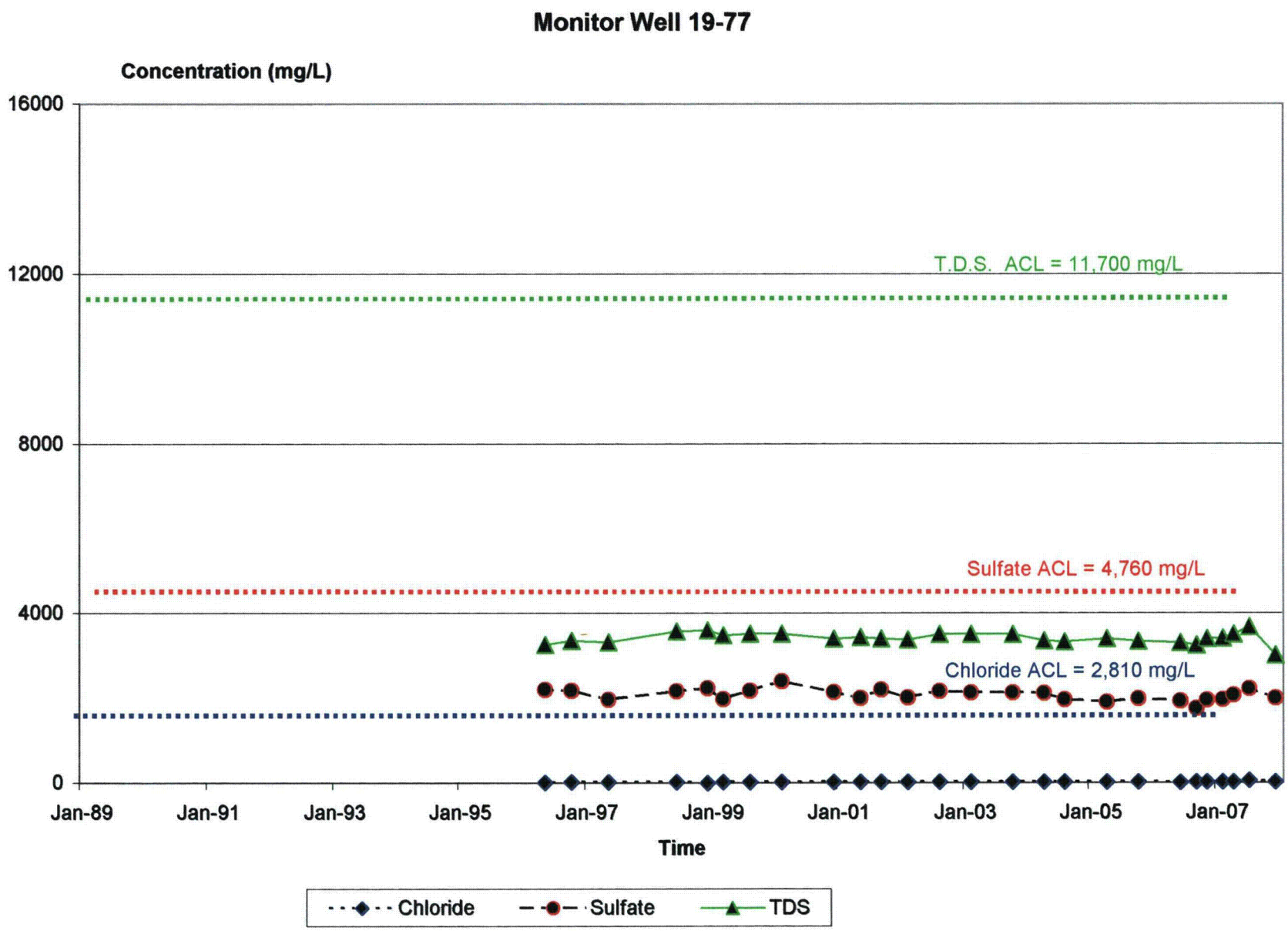

Monitor Well 33-01TRA
Concentration (mg/L)
8000
6000
4000
2000
0
T.D.S. ACL = 6,400 mg/L
Sulfate ACL = 2,584 mg/L
Chloride ACL = 1,070 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

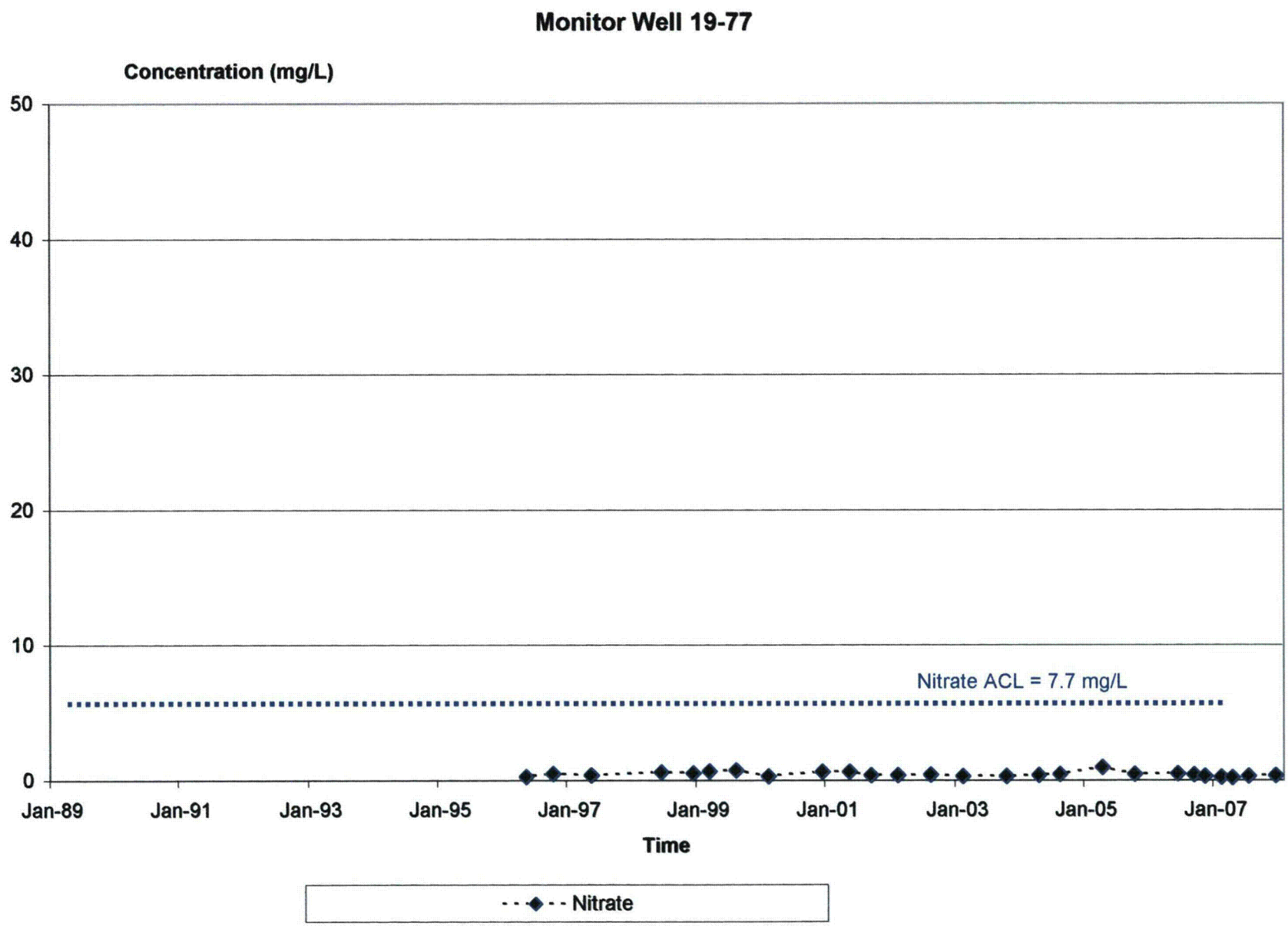

Monitor Well 33-01TRA
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Nitrate ACL = 9.2 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

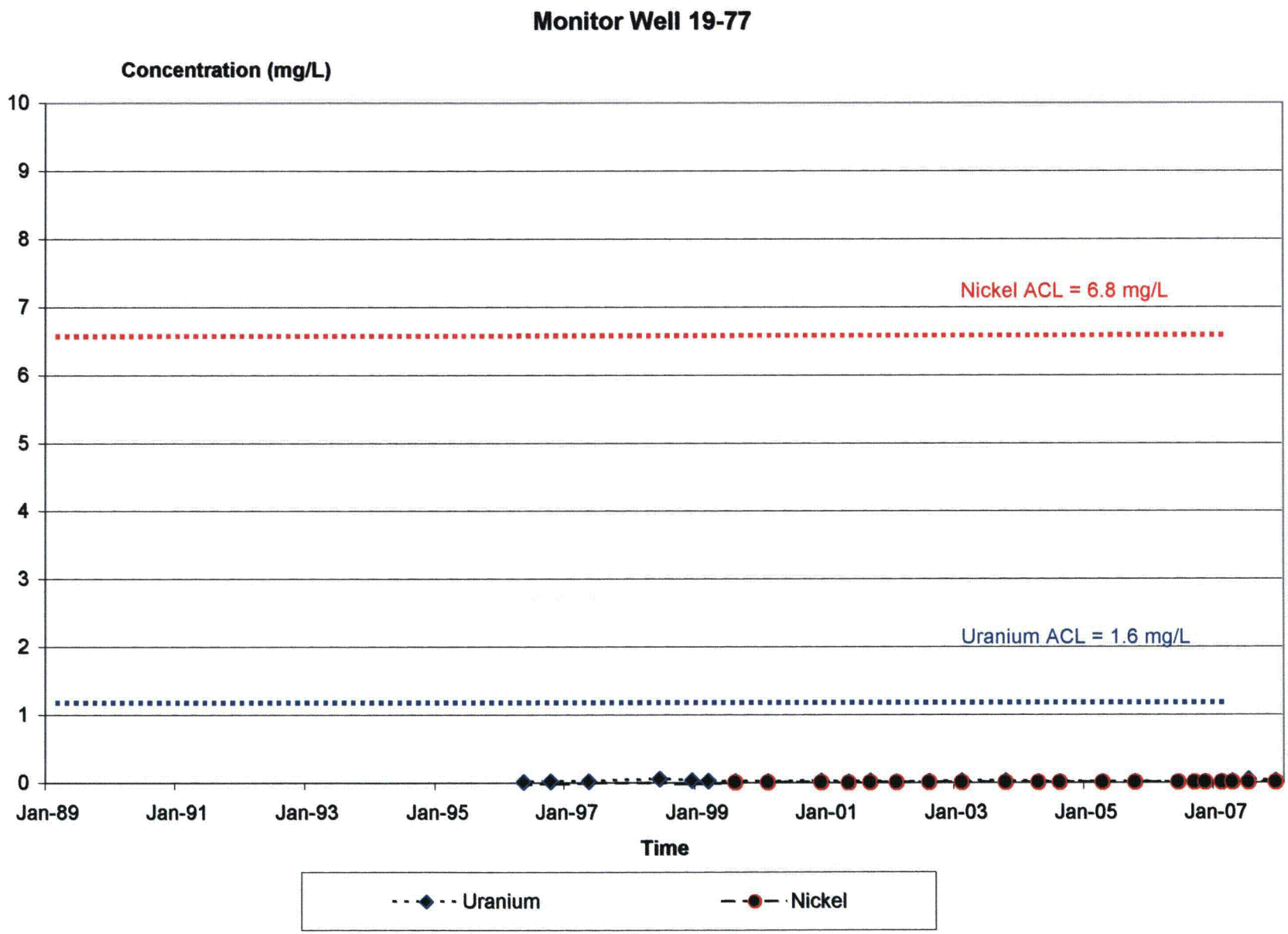

Monitor Well 33-01TRA
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

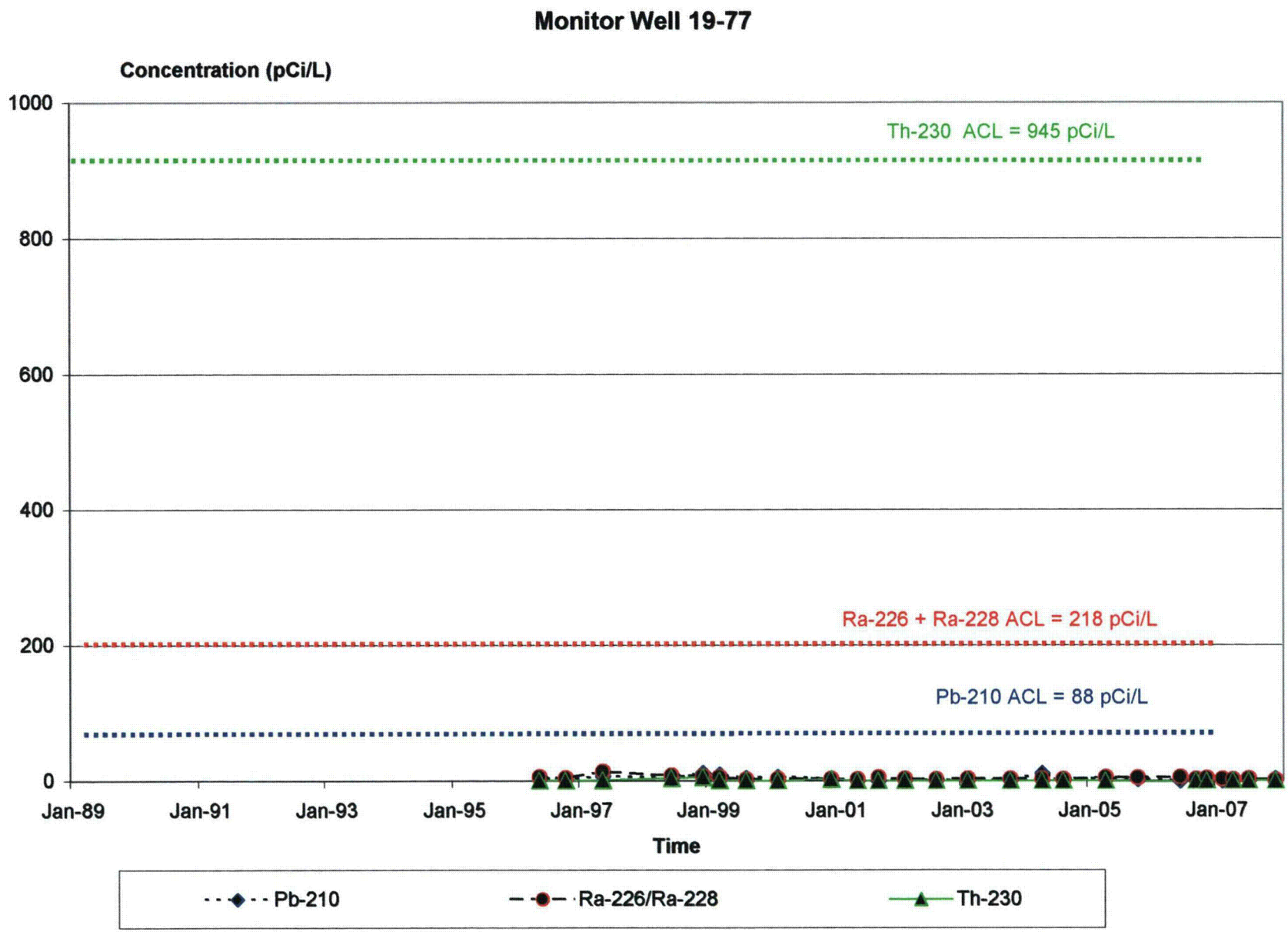
Stability Monitoring Plan
Time vs. Concentration Plots

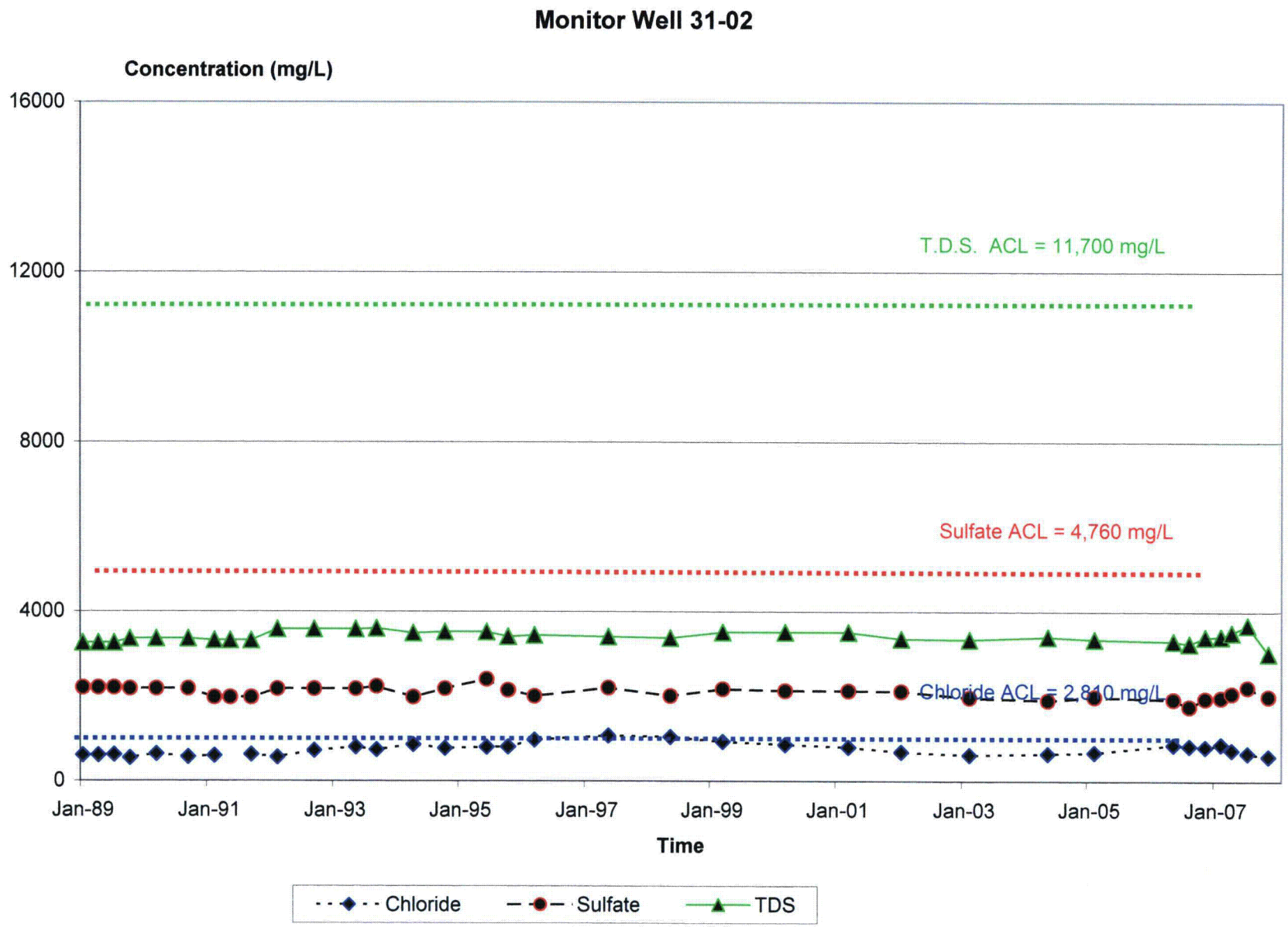
Tres Hermanos B

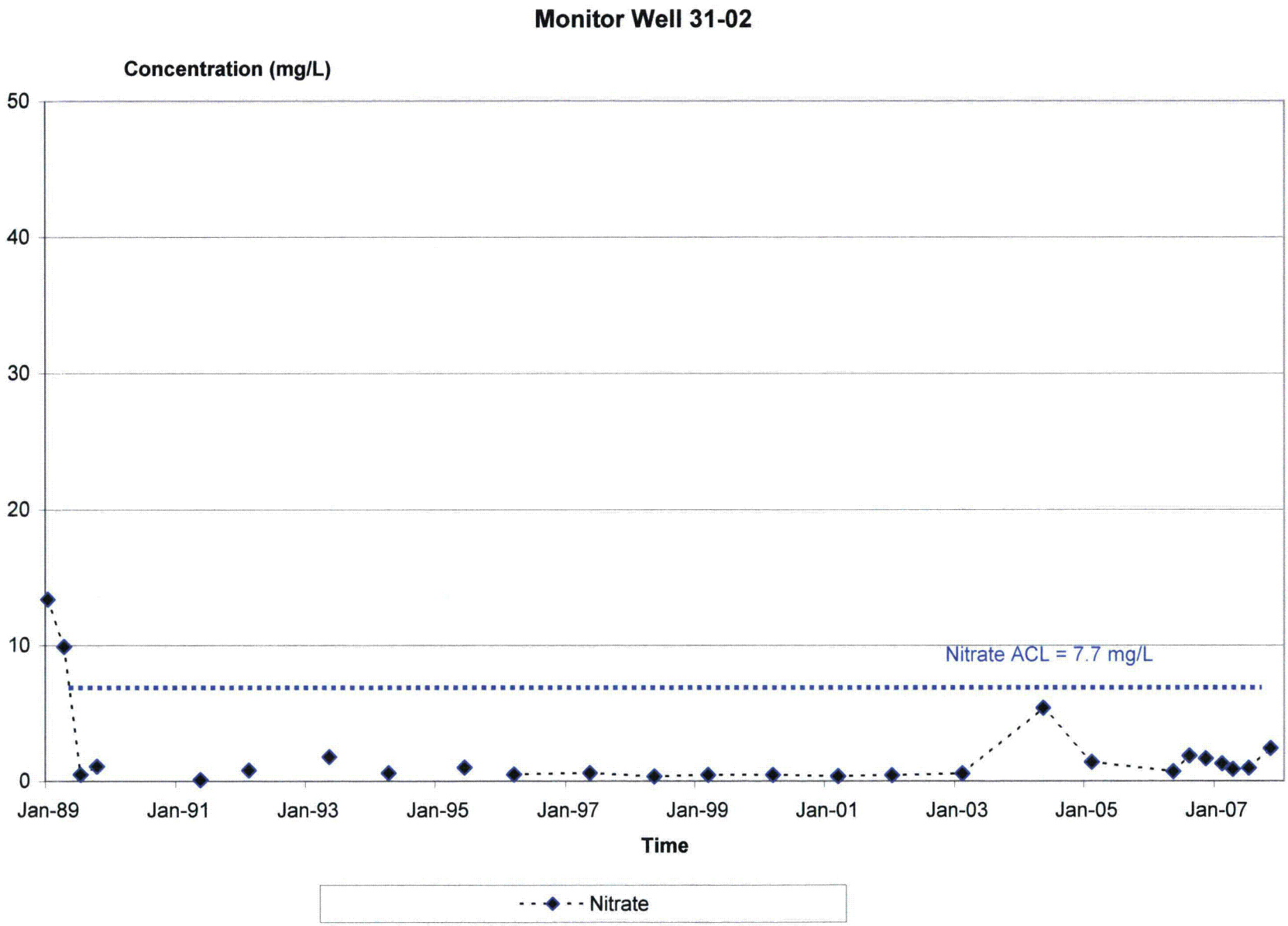

Monitor Well 19-77
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 11,700 mg/L
Sulfate ACL = 4,760 mg/L
Chloride ACL = 2,810 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

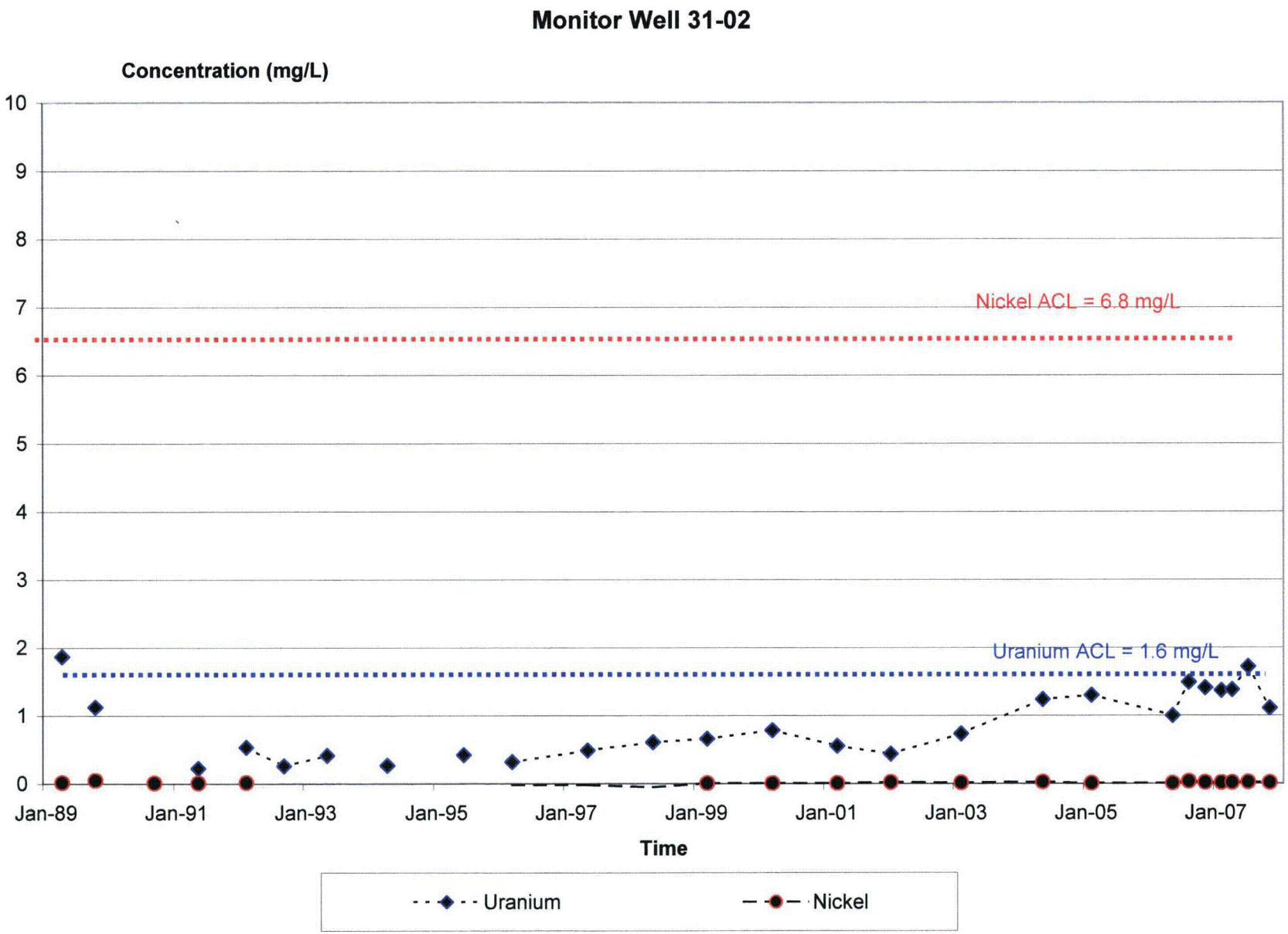

Monitor Well 19-77
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 7.7 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

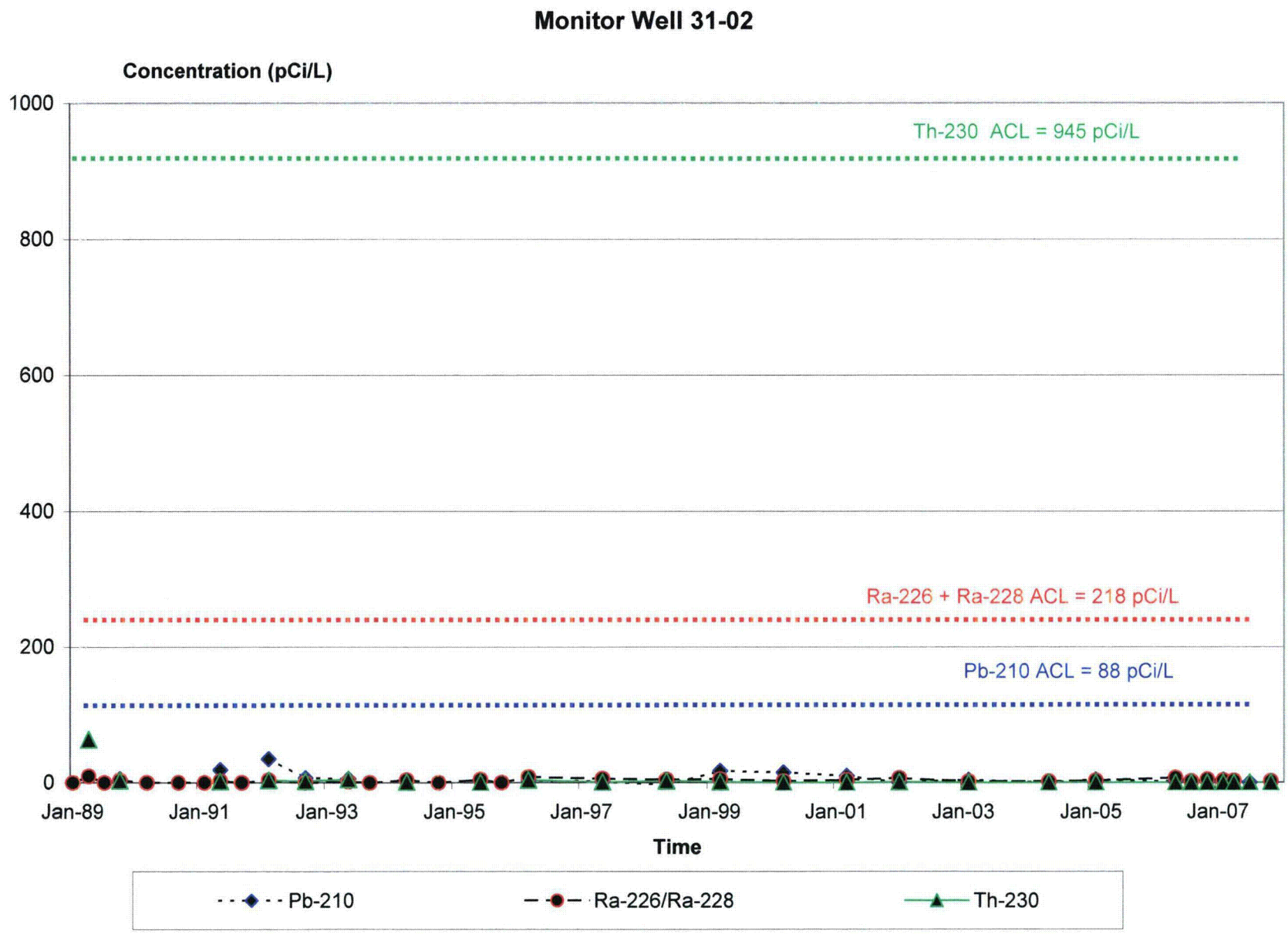

Monitor Well 19-77
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Nickel

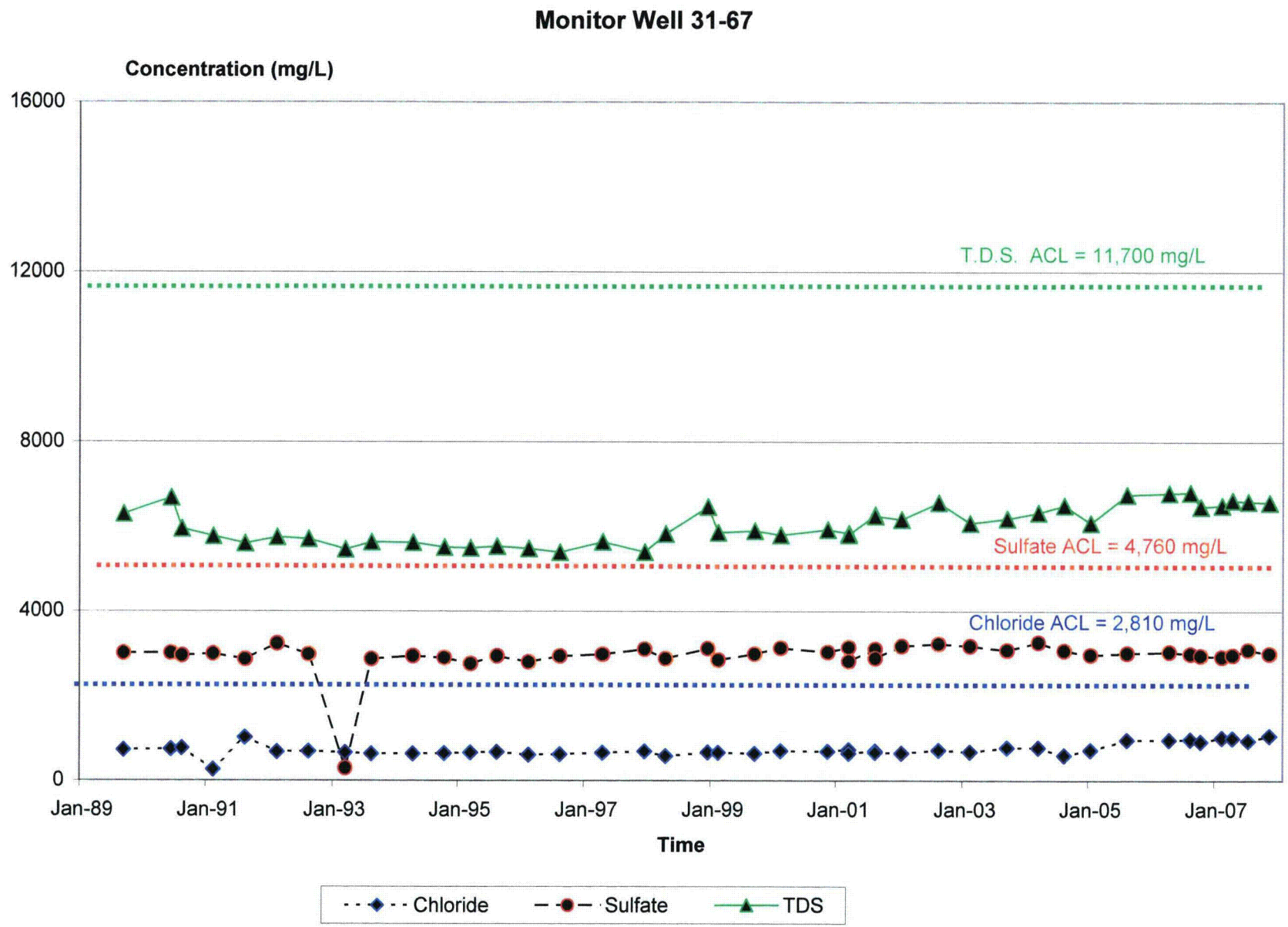

Monitor Well 19-77
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

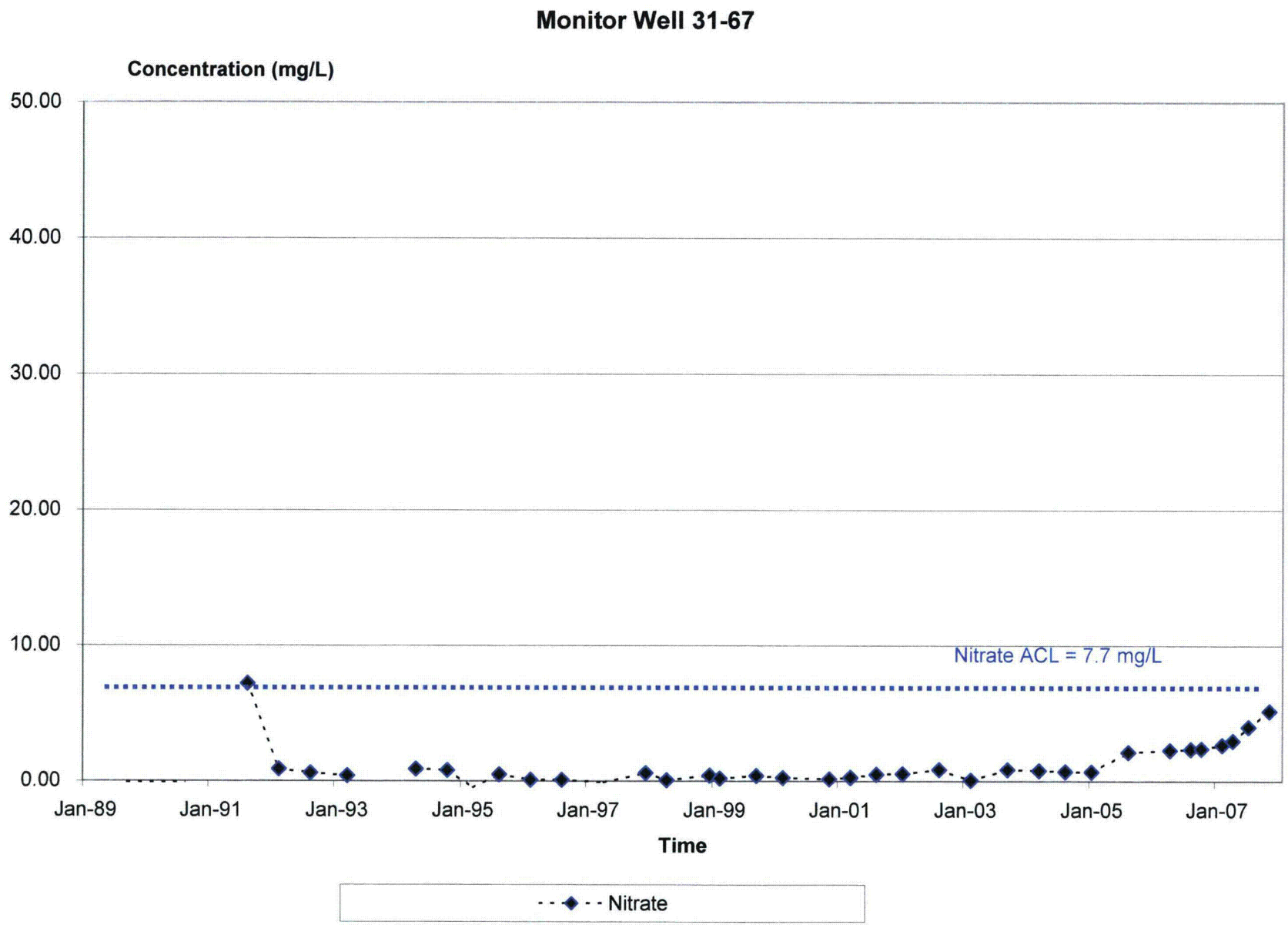

Monitor Well 31-02
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 11,700 mg/L
Sulfate ACL = 4,760 mg/L
Chloride ACL = 2,810 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

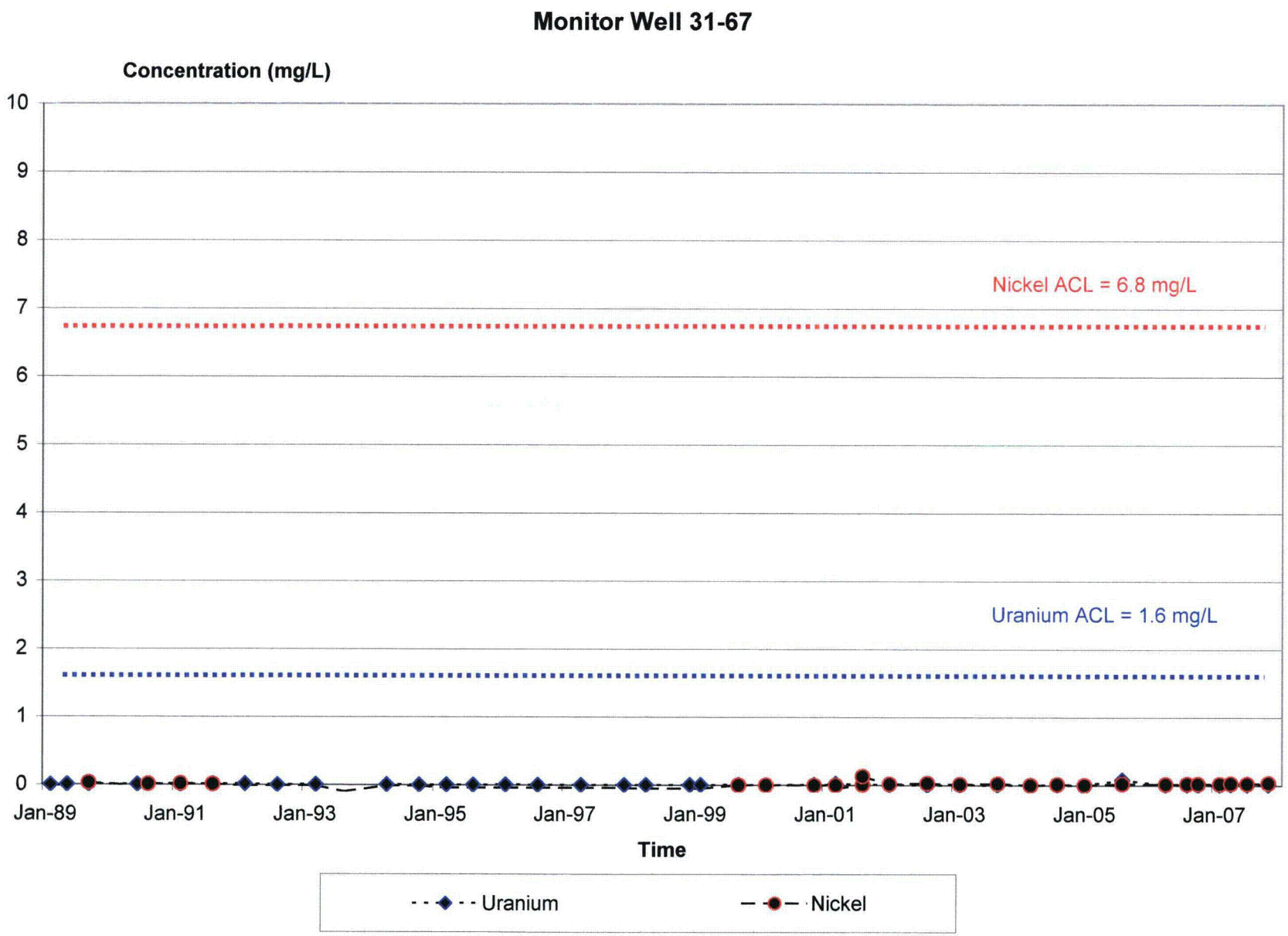

Monitor Well 31-02
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 7.7 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

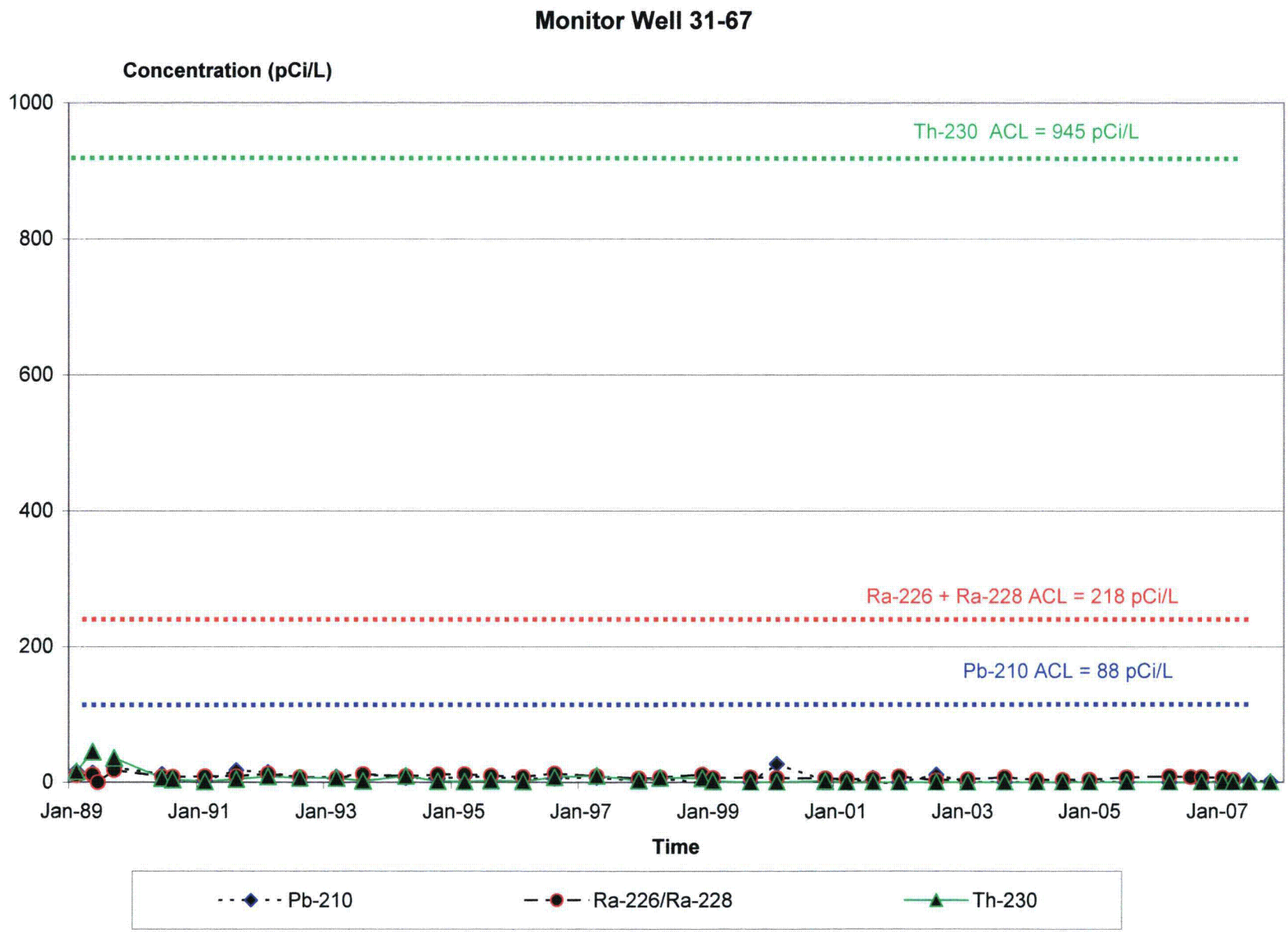

Monitor Well 31-02
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Nickel

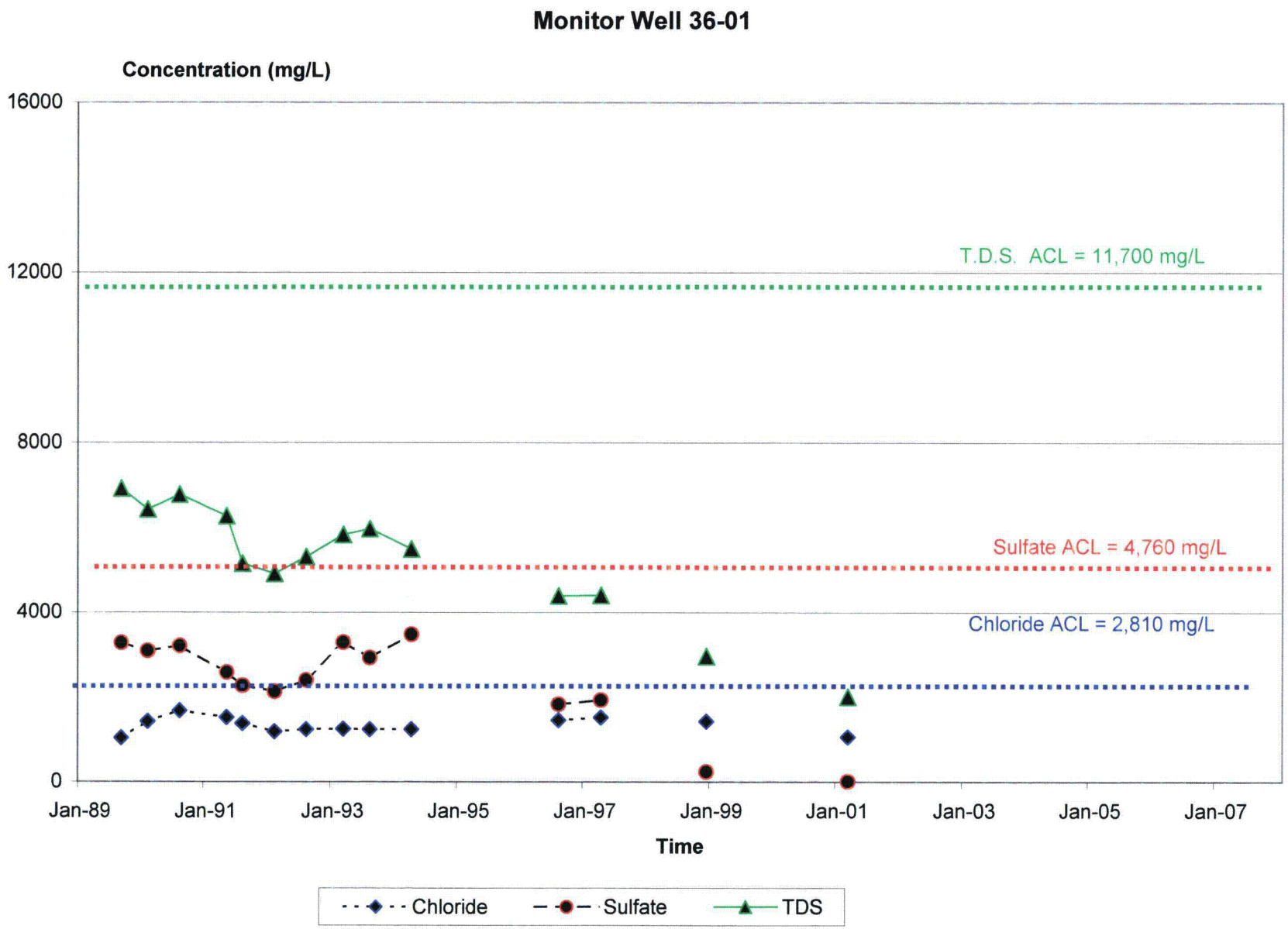

Monitor Well 31-02
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

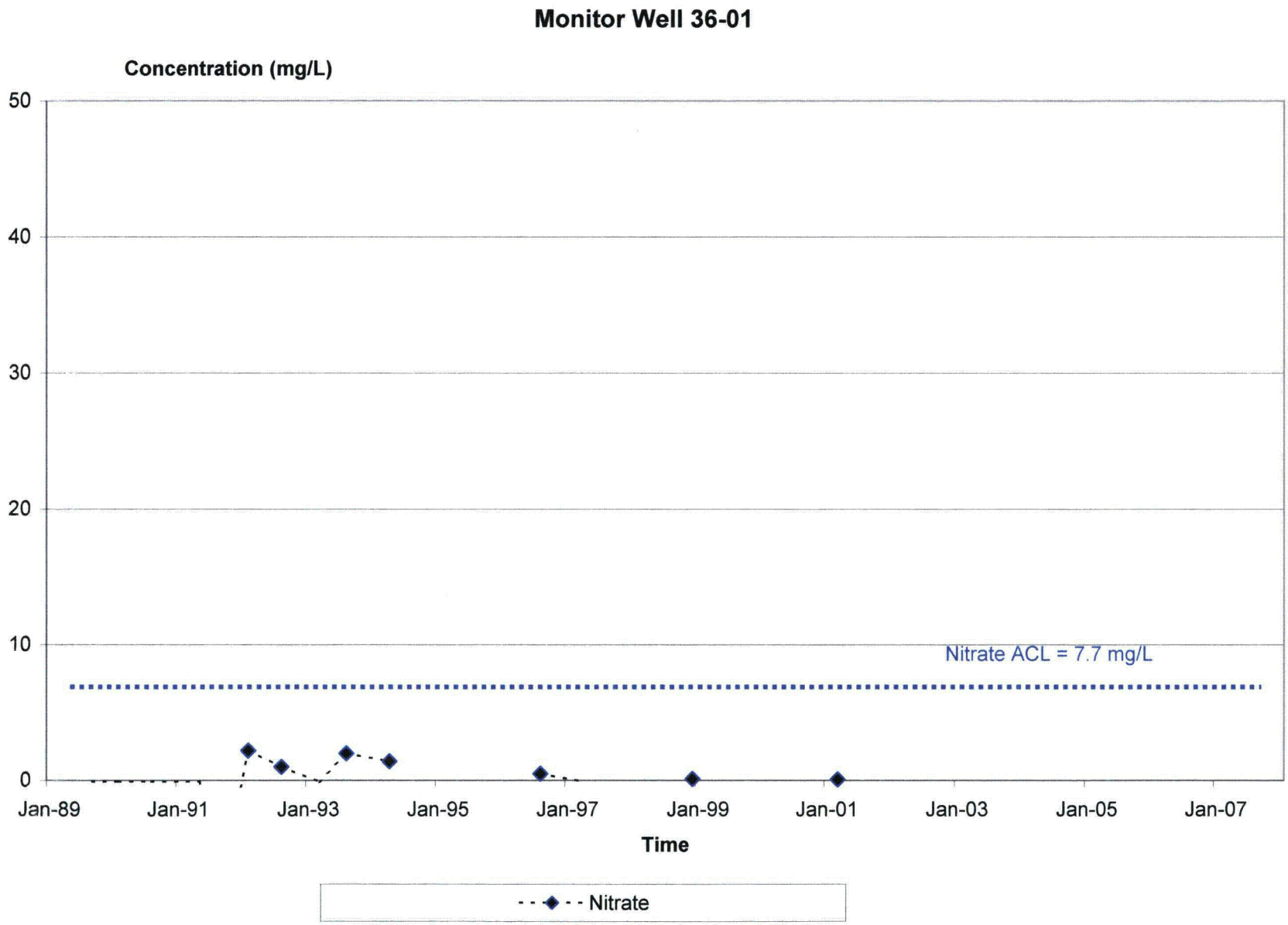

Monitor Well 31-67
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 11,700 mg/L
Sulfate ACL = 4,760 mg/L
Chloride ACL = 2,810 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

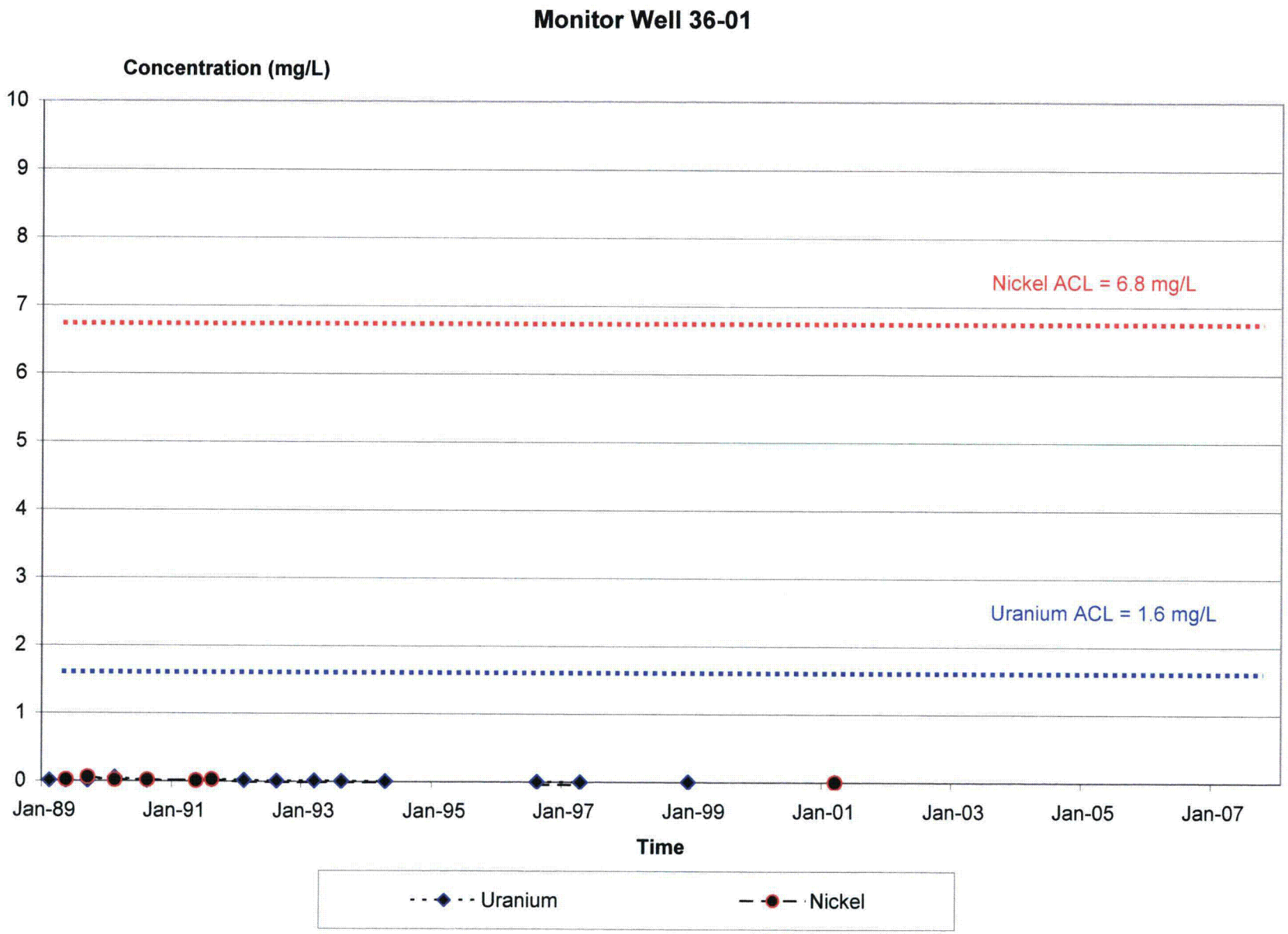

Monitor Well 31-67
Concentration (mg/L)
50.00
40.00
30.00
20.00
10.00
0.00
Nitrate ACL = 7.7 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

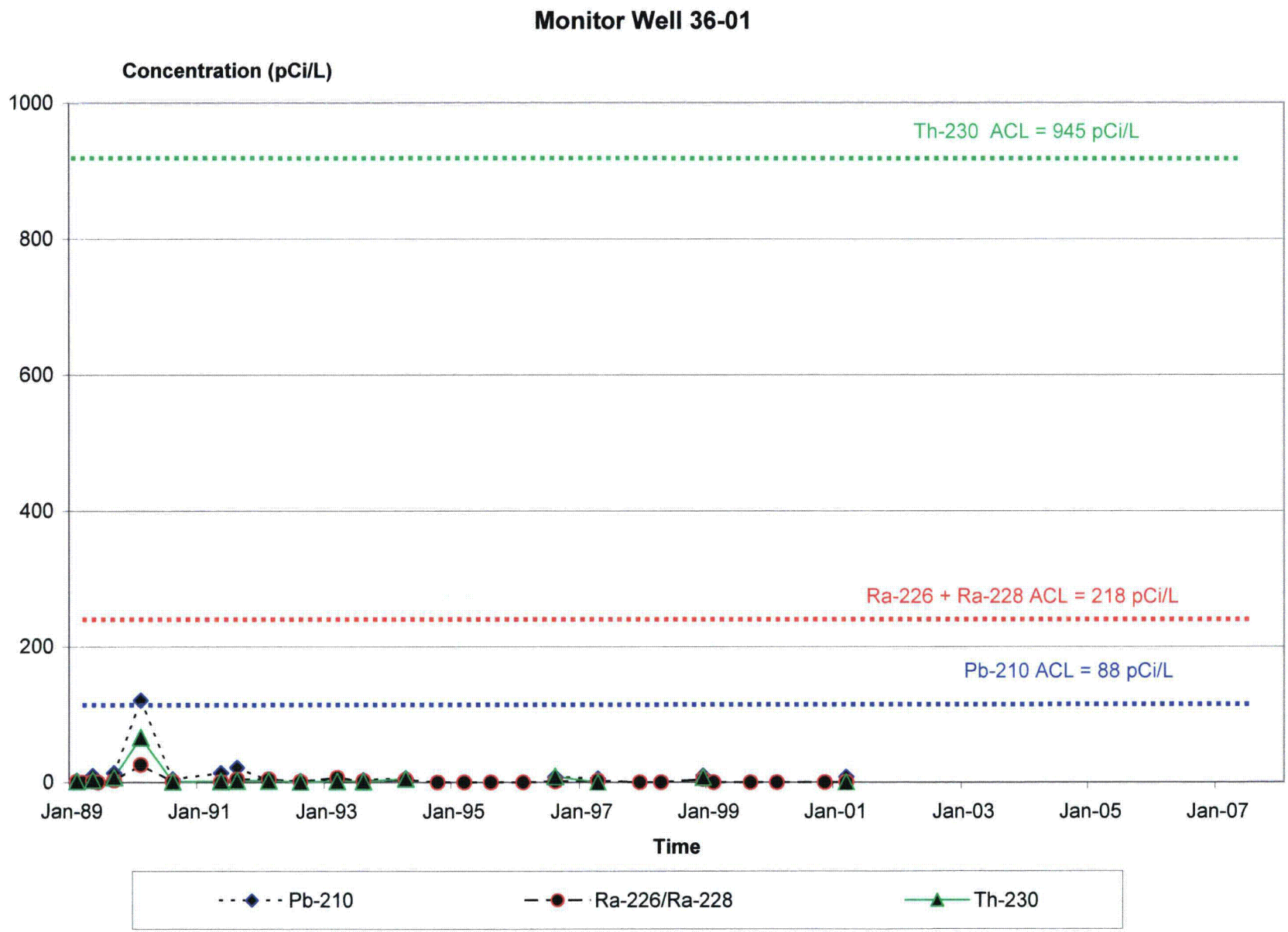

Monitor Well 31-67
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Nickel

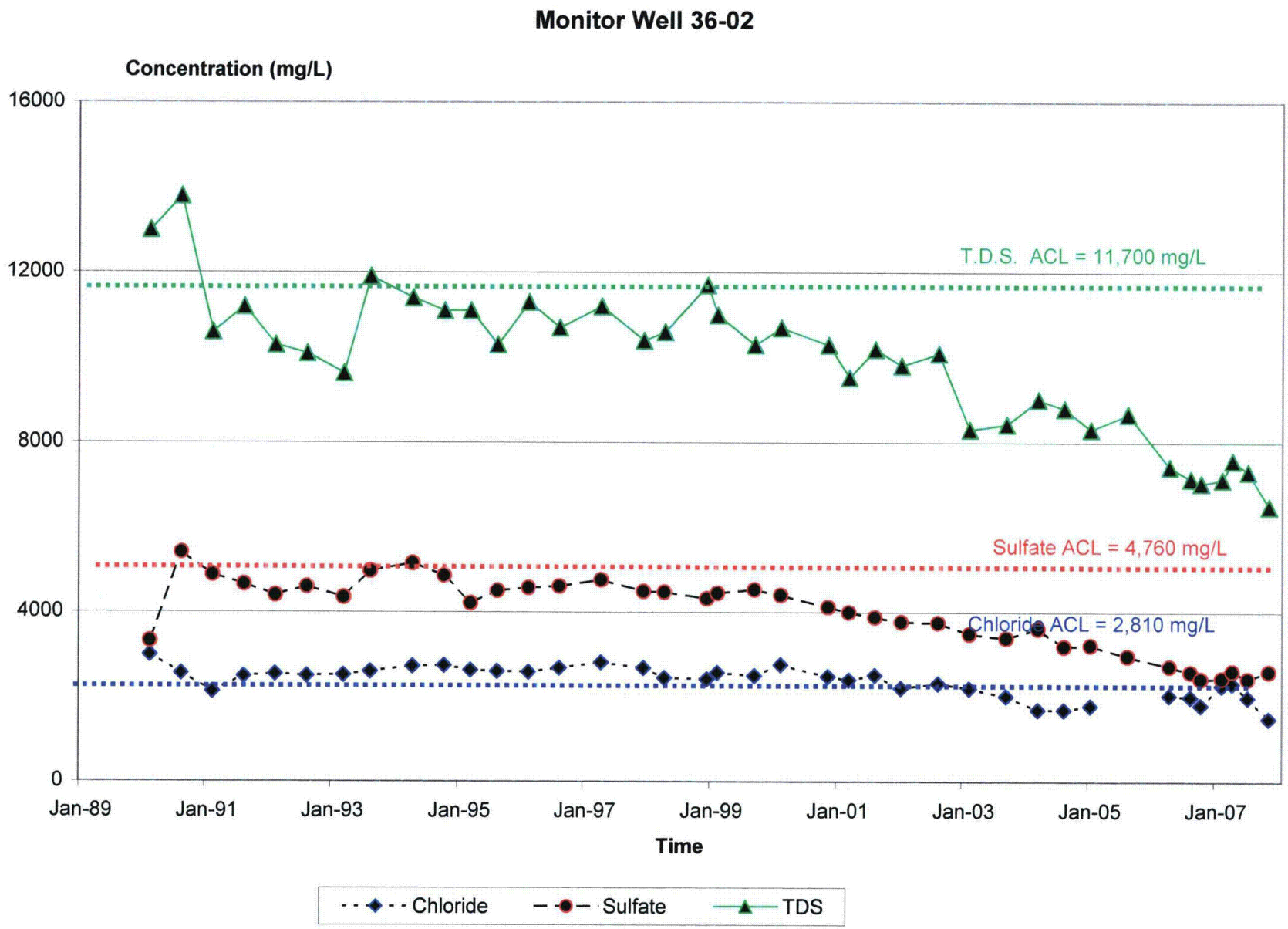

Monitor Well 31-67
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

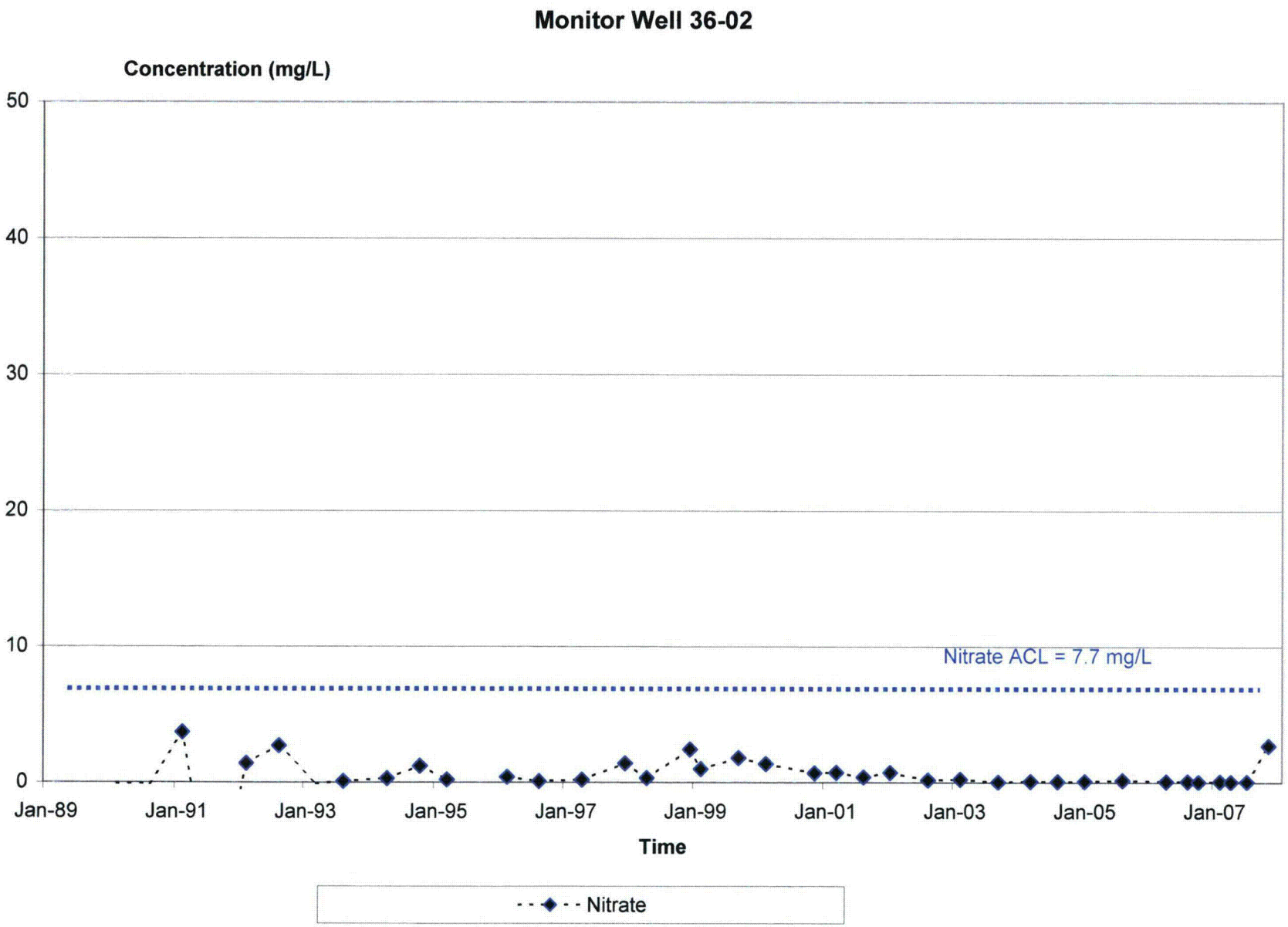

Monitor Well 36-01
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 11,700 mg/L
Sulfate ACL = 4,760 mg/L
Chloride ACL = 2,810 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

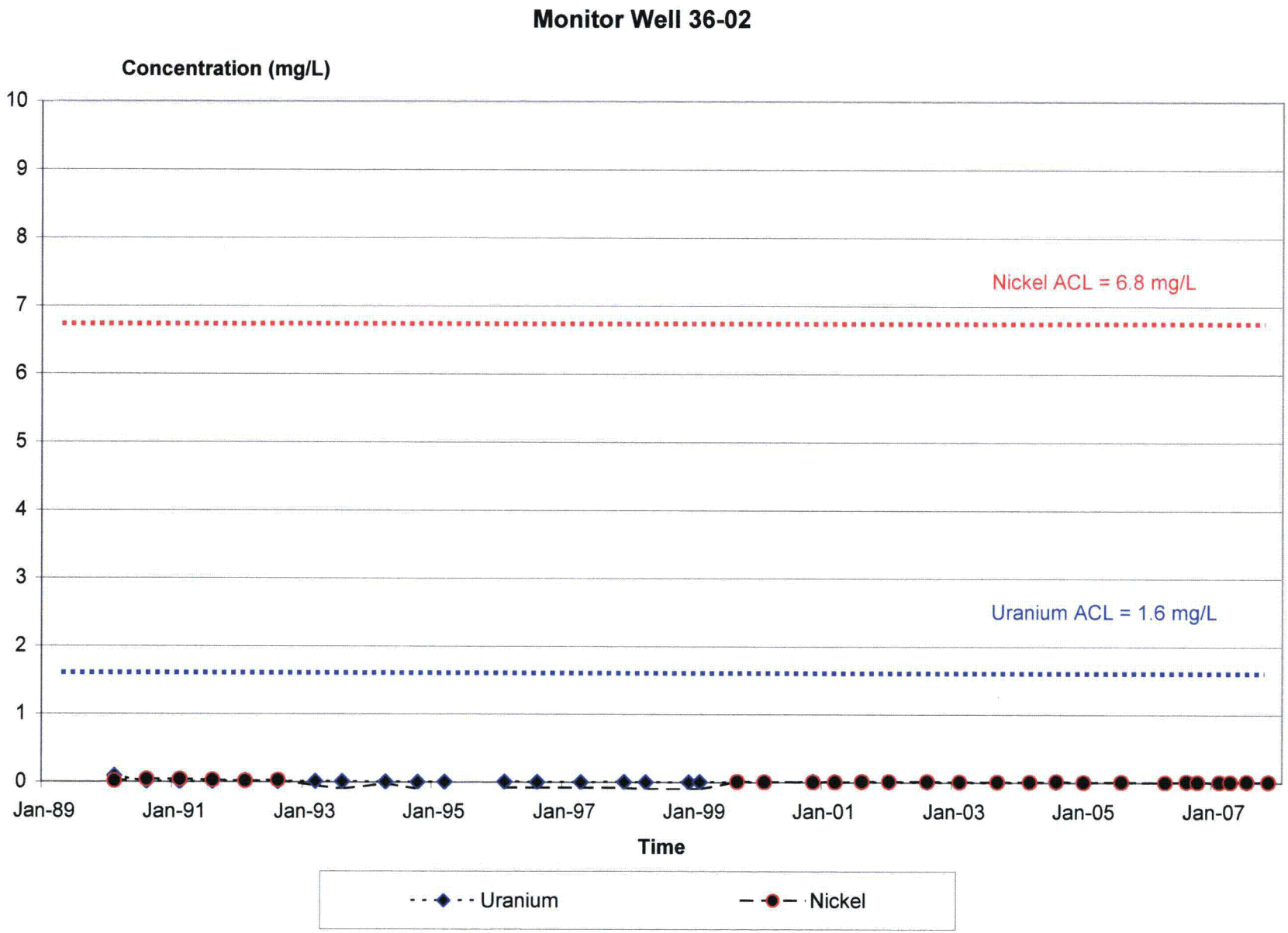

Monitor Well 36-01
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 7.7 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate


Monitor Well 36-01
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Nickel


Monitor Well 36-01
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230


Monitor Well 36-02
Concentration (mg/L)
16000
12000
8000
4000
0
T.D.S. ACL = 11,700 mg/L
Sulfate ACL = 4,760 mg/L
Chloride ACL = 2,810 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

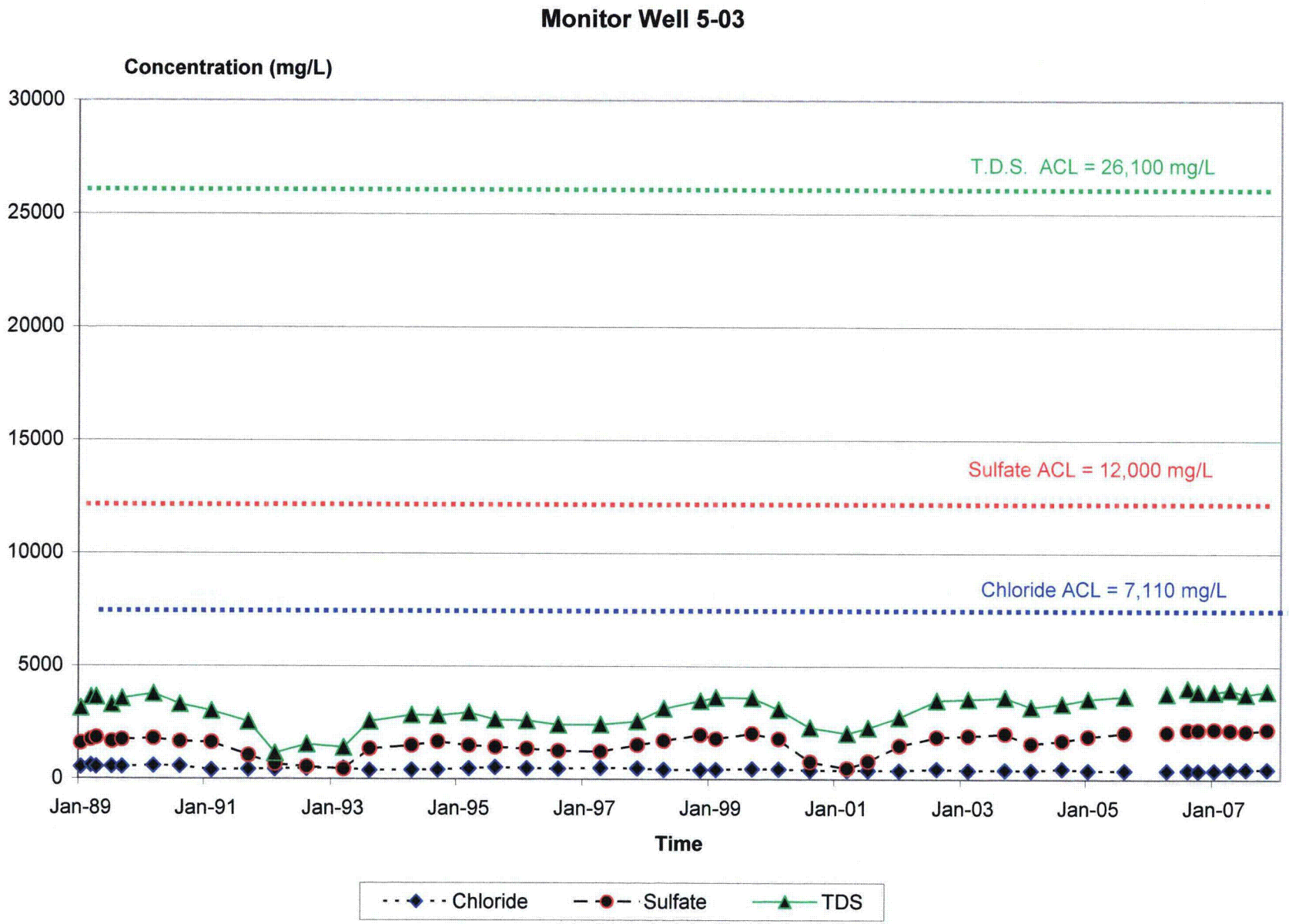

Monitor Well 36-02
Concentration (mg/L)
50
40
30
20
10
0
Nitrate ACL = 7.7 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

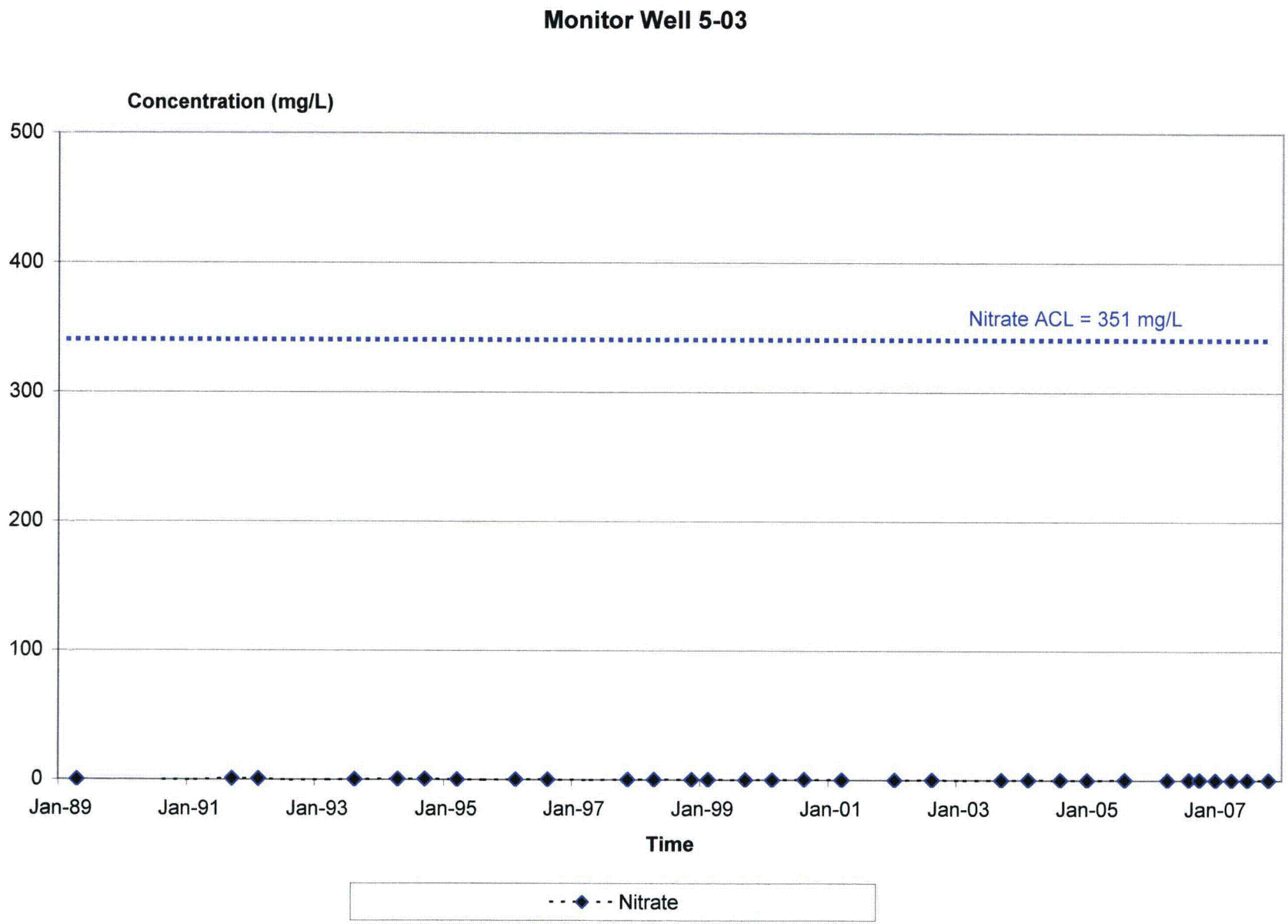

Monitor Well 36-02
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Nickel ACL = 6.8 mg/L
Uranium ACL = 1.6 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Nickel

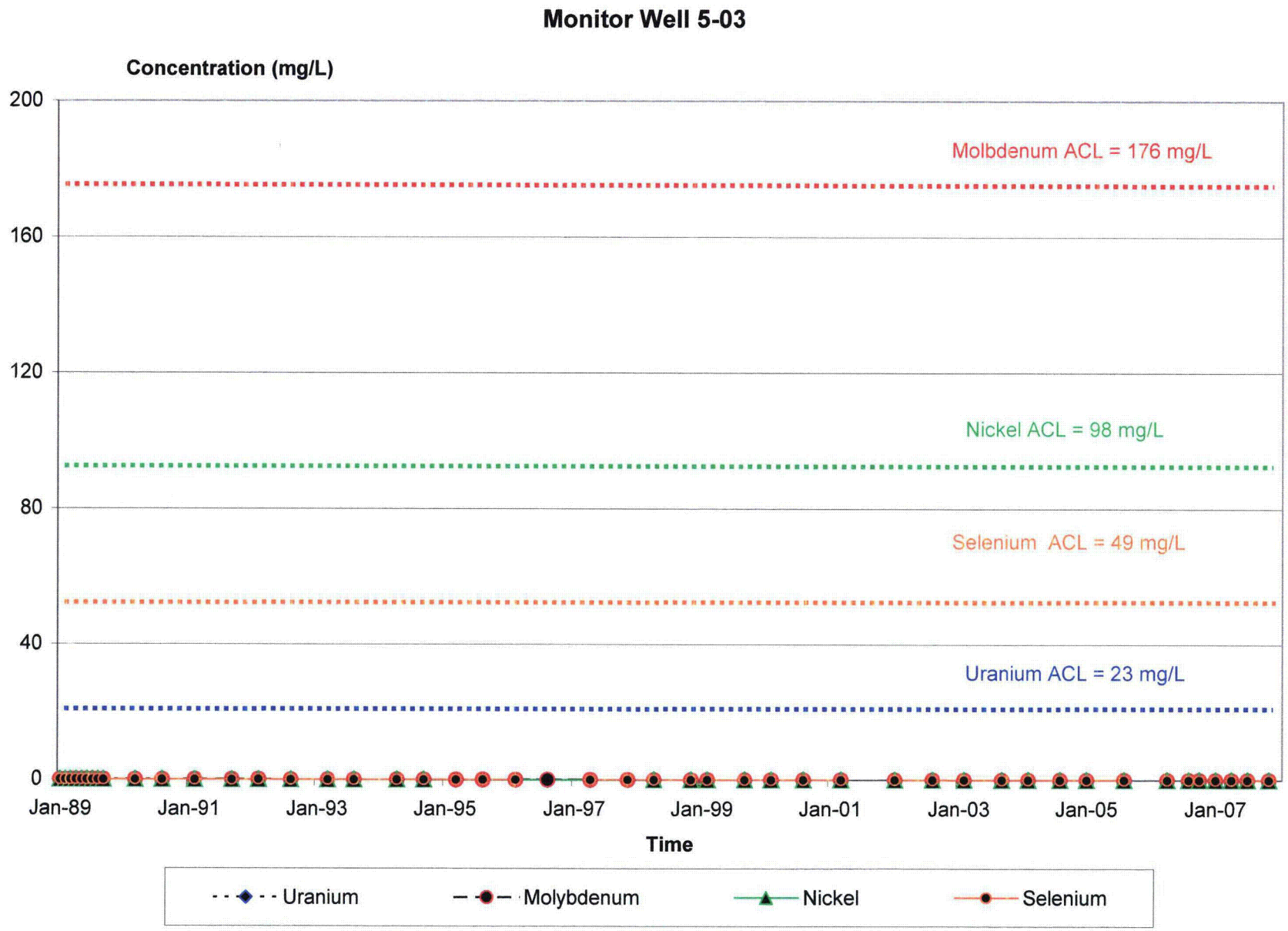
Monitor Well 36-02
Concentration (pCi/L)
1000
800
600
400
200
0
Th-230 ACL = 945 pCi/L
Ra-226 + Ra-228 ACL = 218 pCi/L
Pb-210 ACL = 88 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230

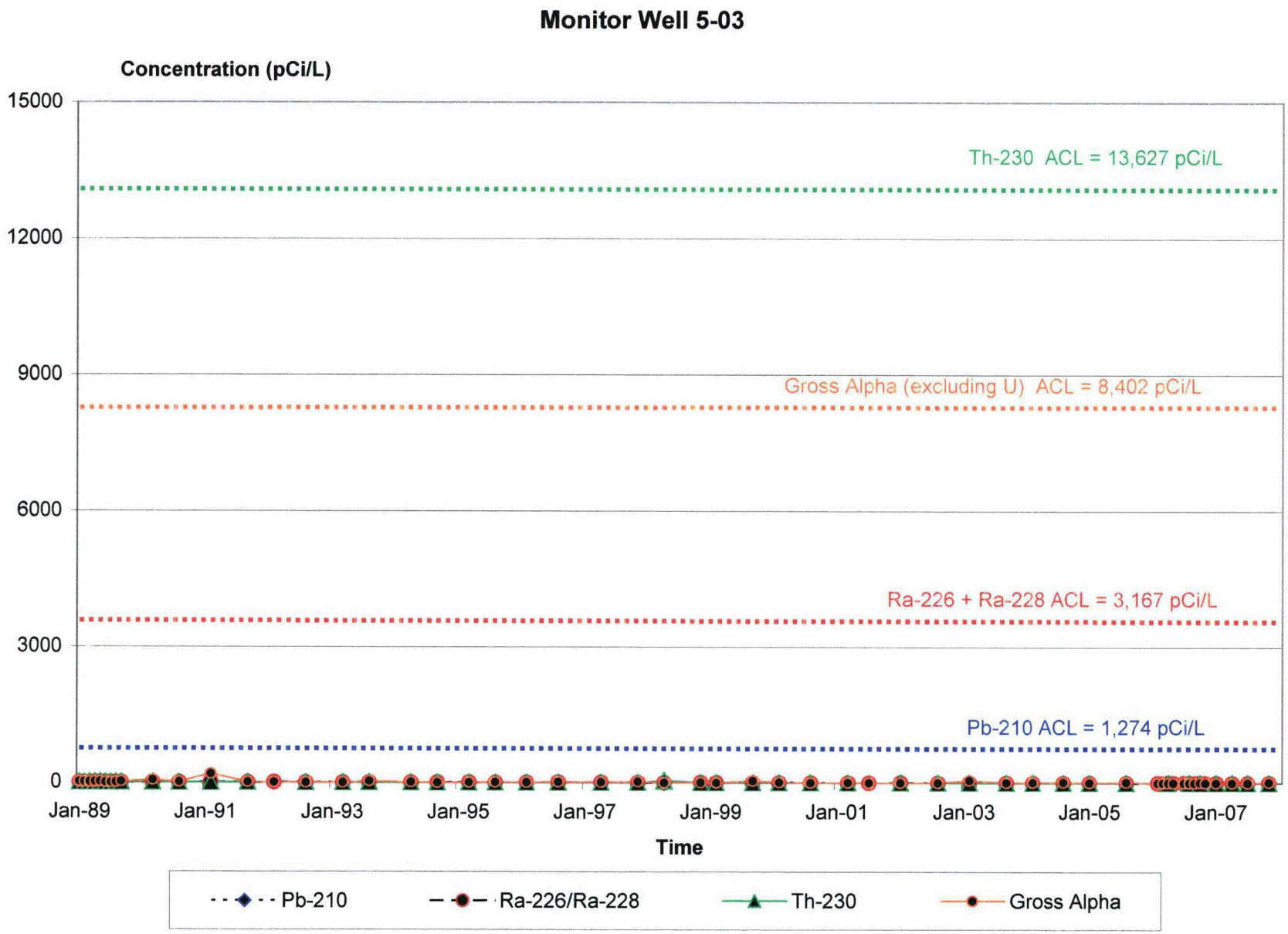
Stability Monitoring Plan
Time vs. Concentration Plots

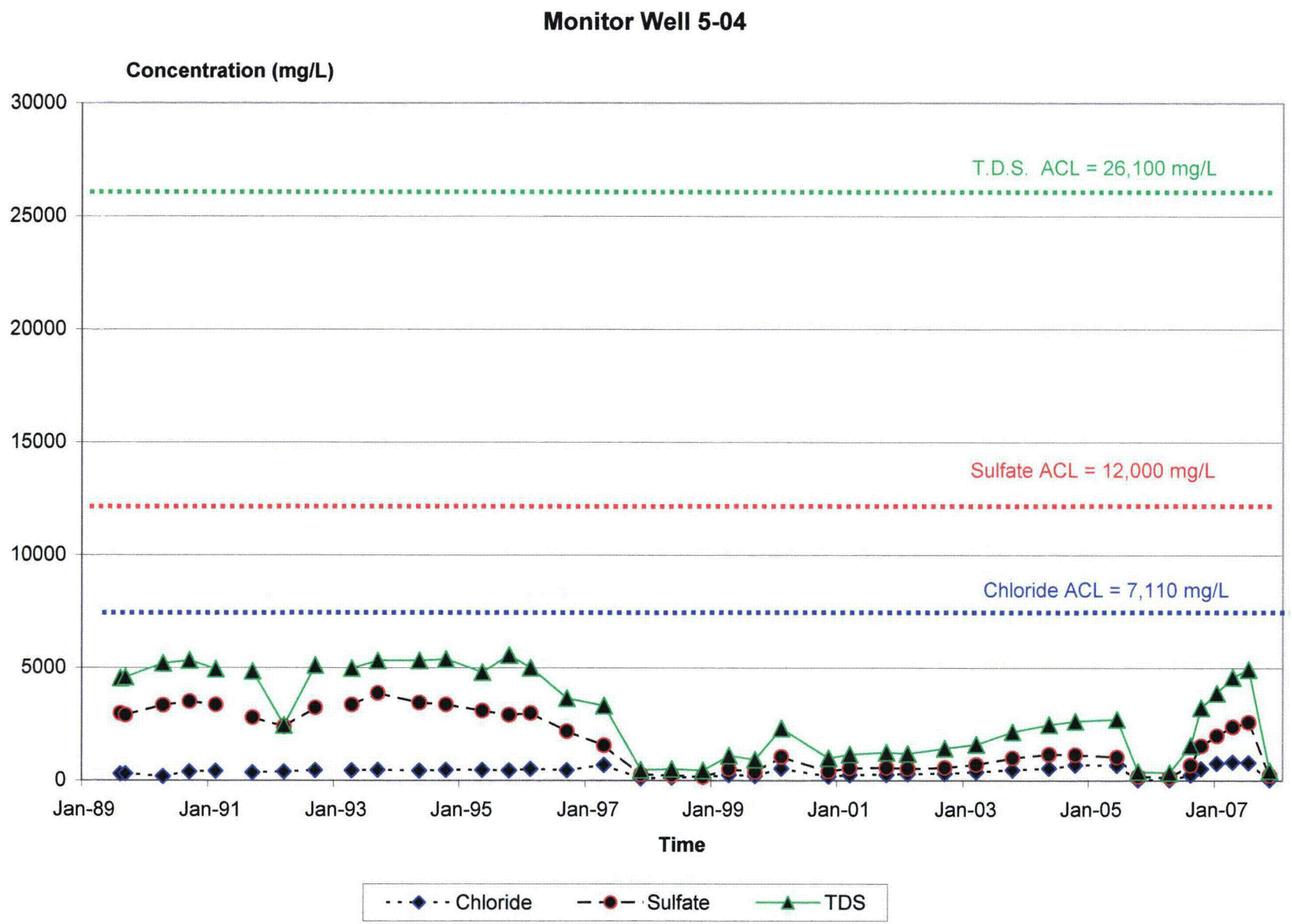
Alluvuim

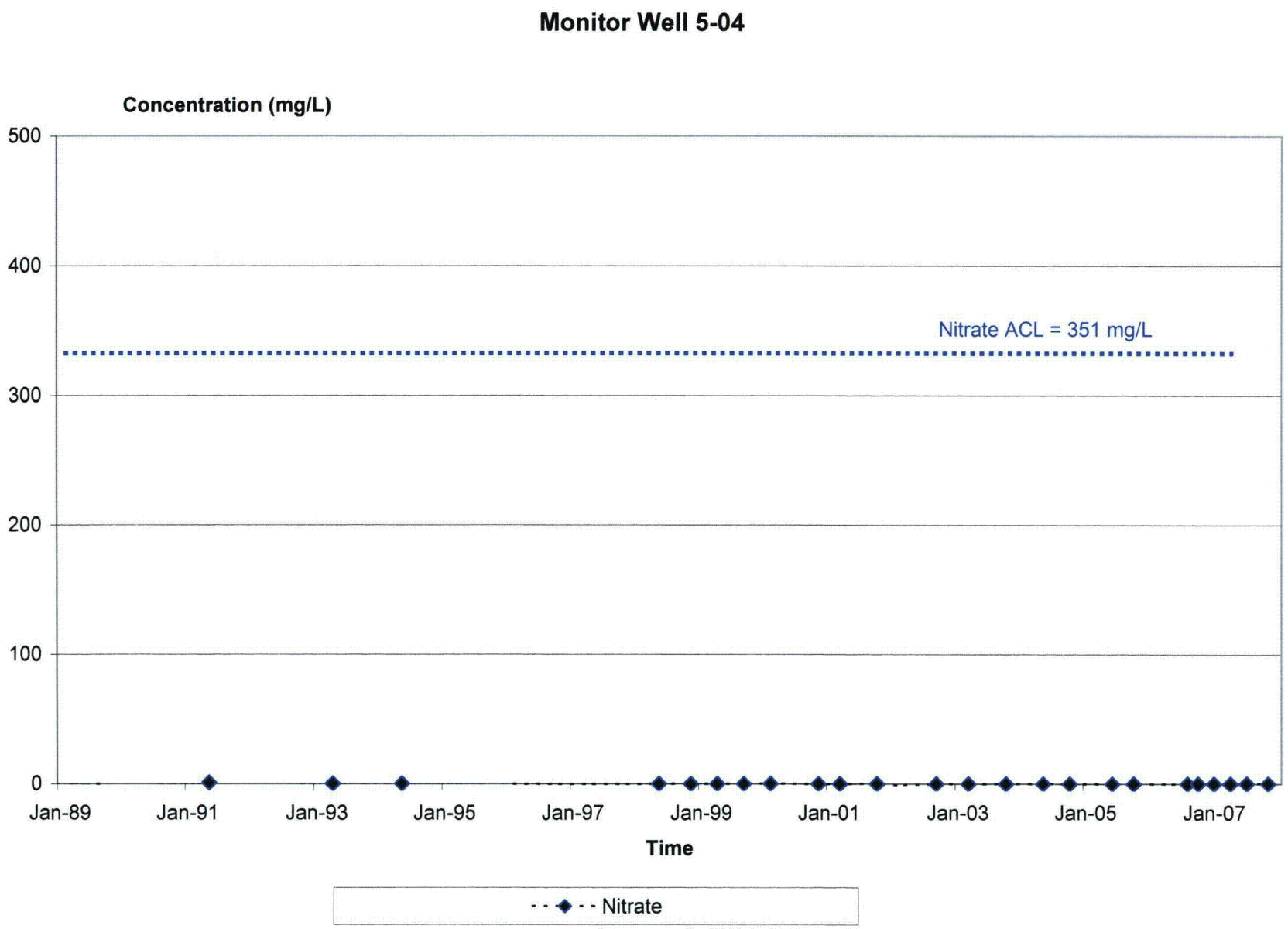

Monitor Well 5-03
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

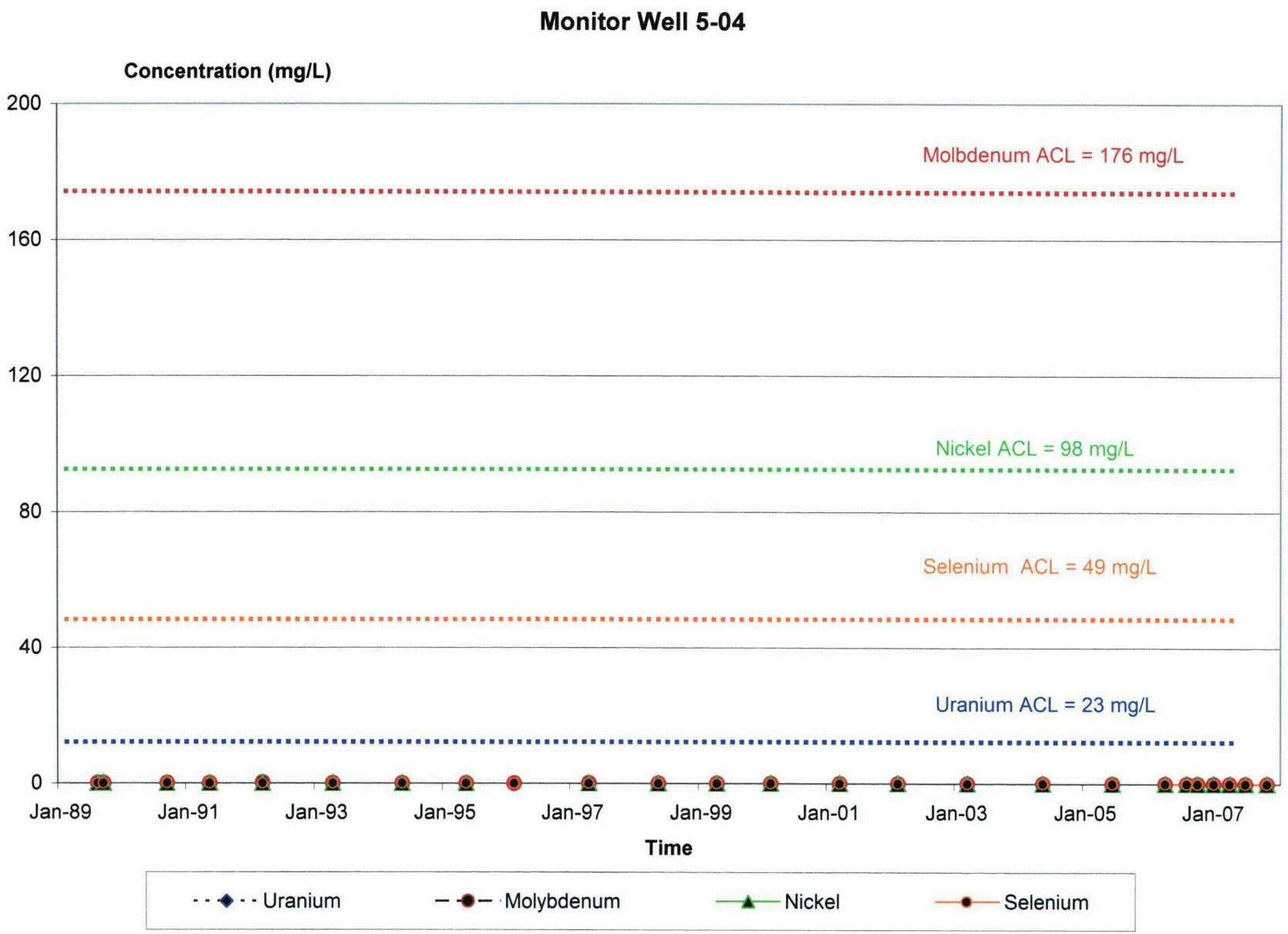

Monitor Well 5-03
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

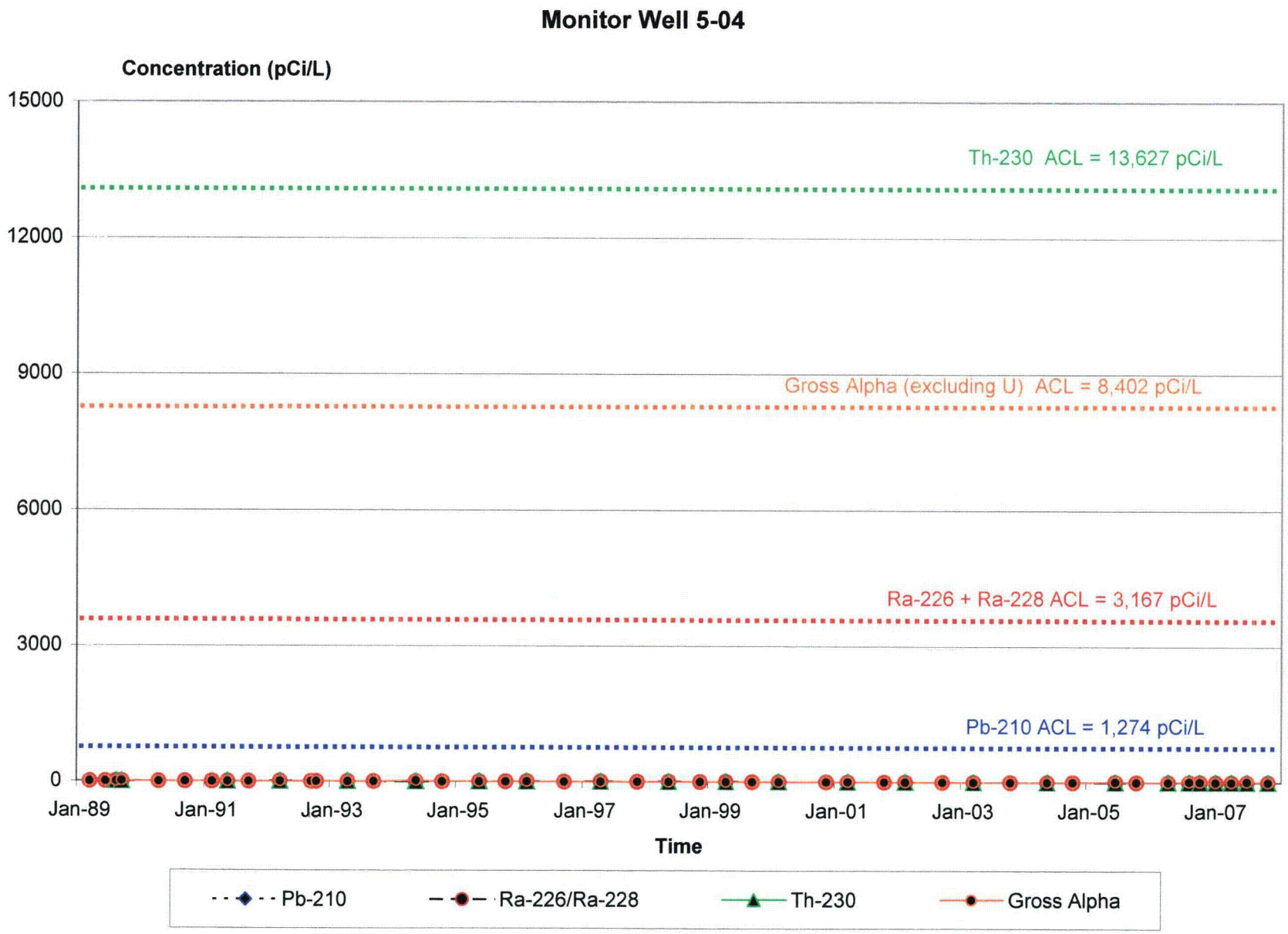

Monitor Well 5-03
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

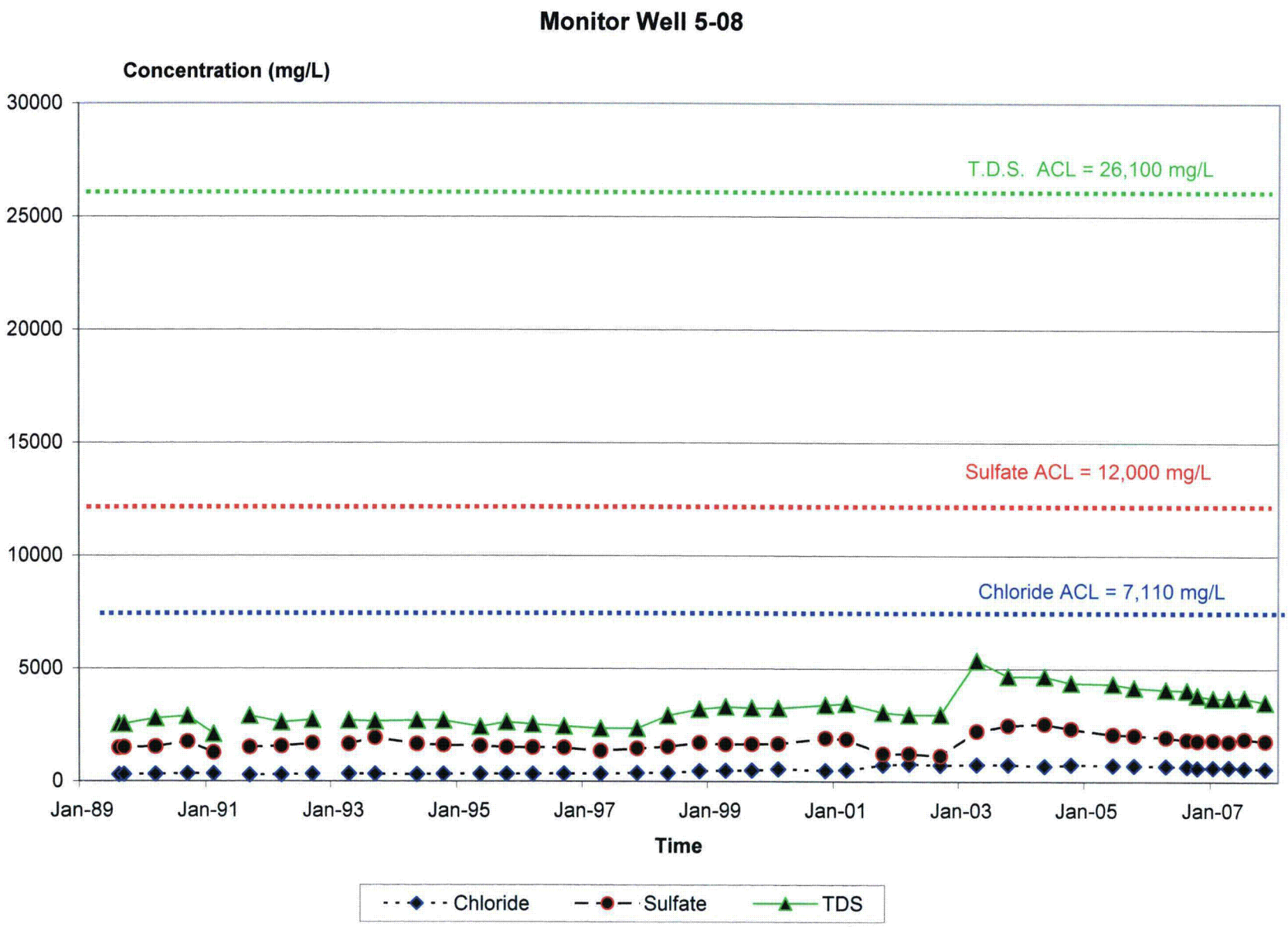

Monitor Well 5-03
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

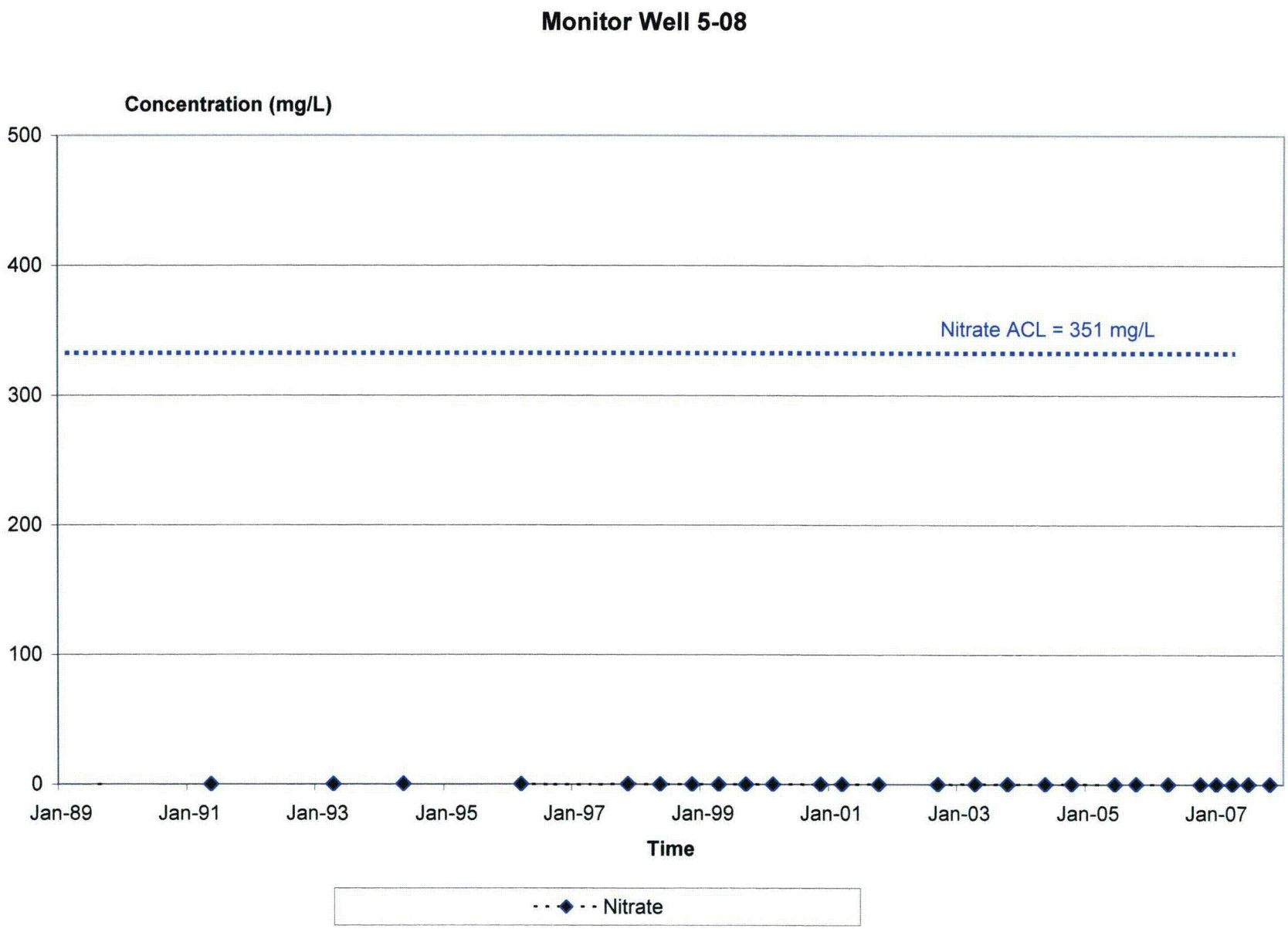

Monitor Well 5-04
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

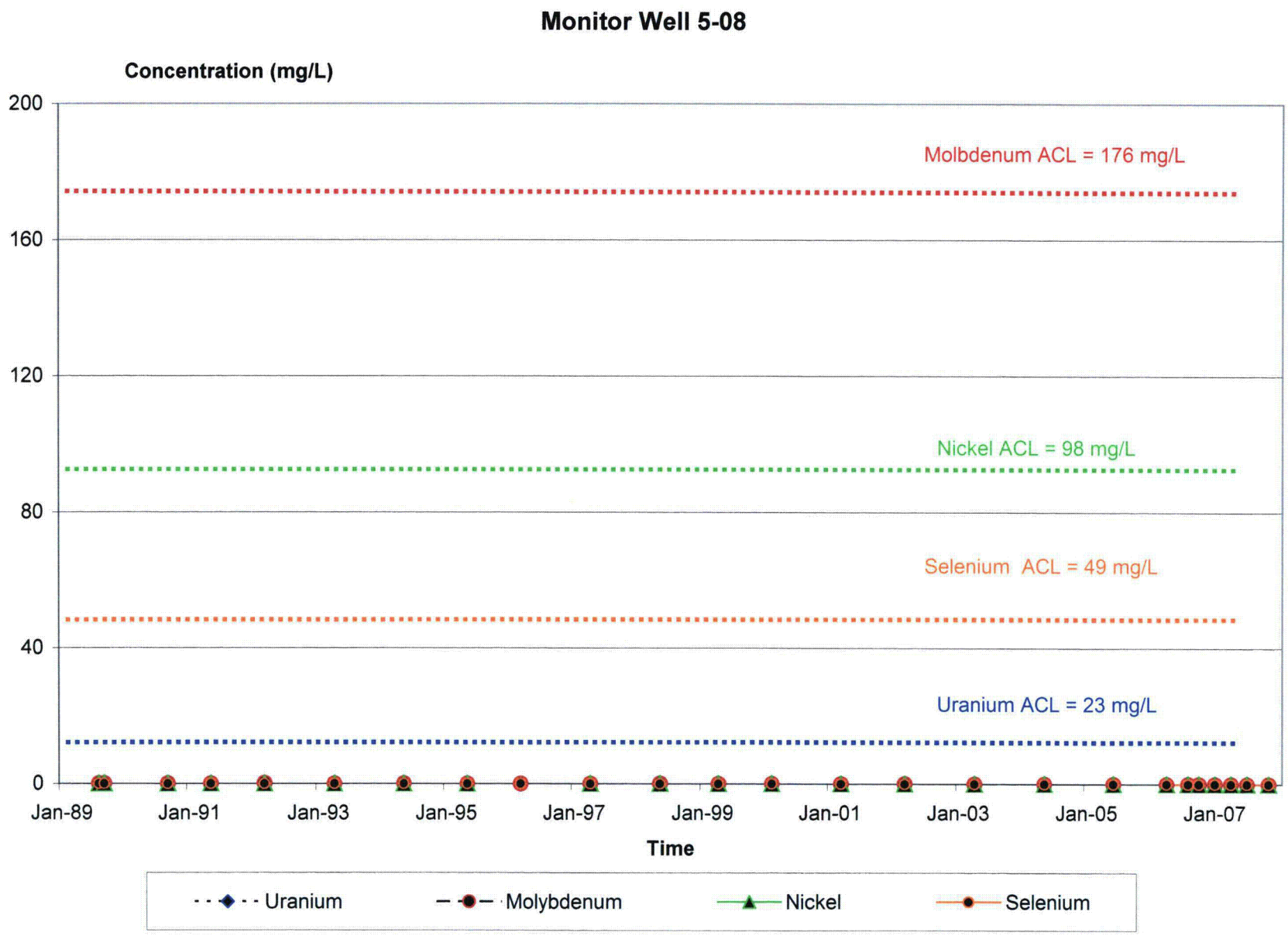

Monitor Well 5-04
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

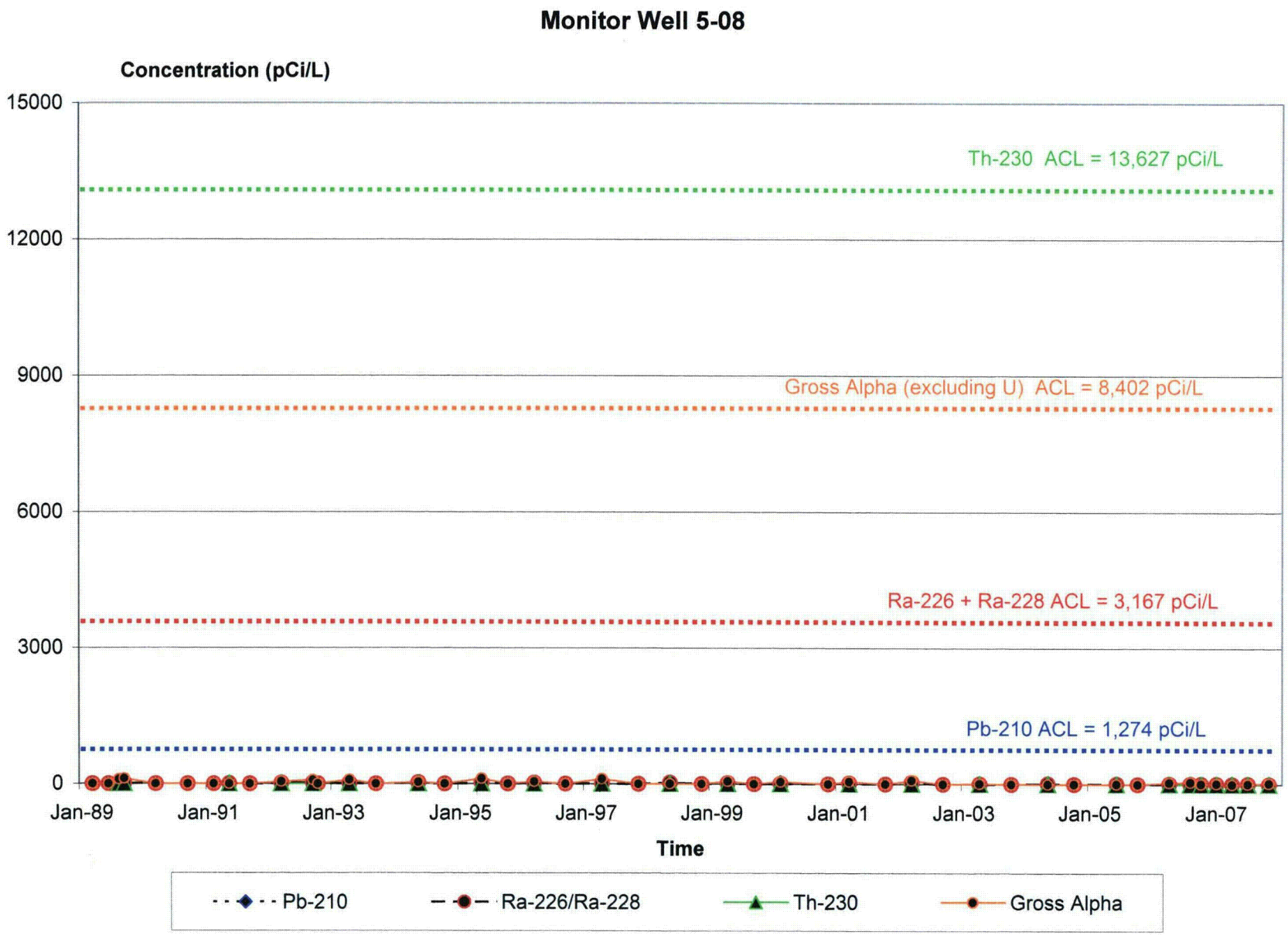

Monitor Well 5-04
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

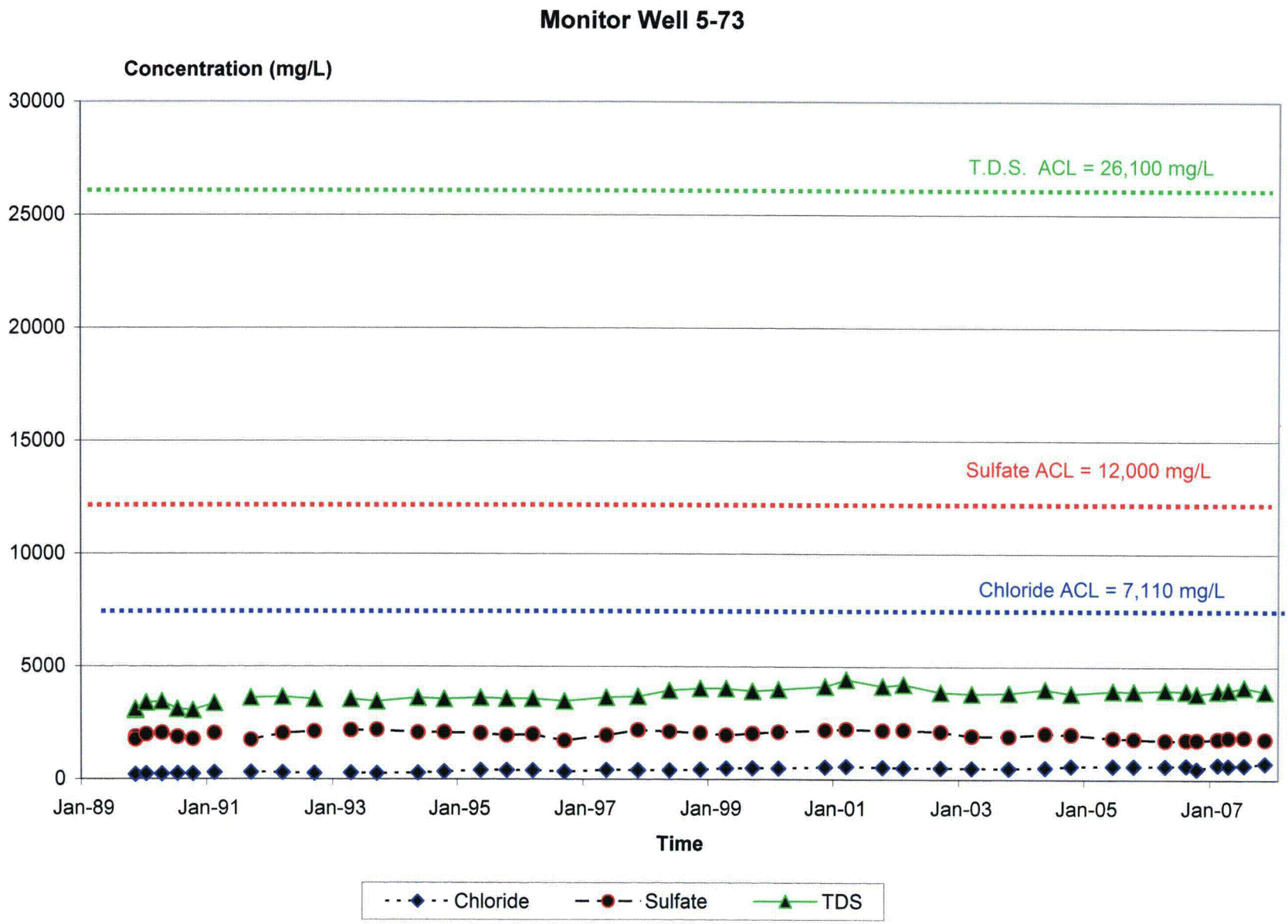

Monitor Well 5-04
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

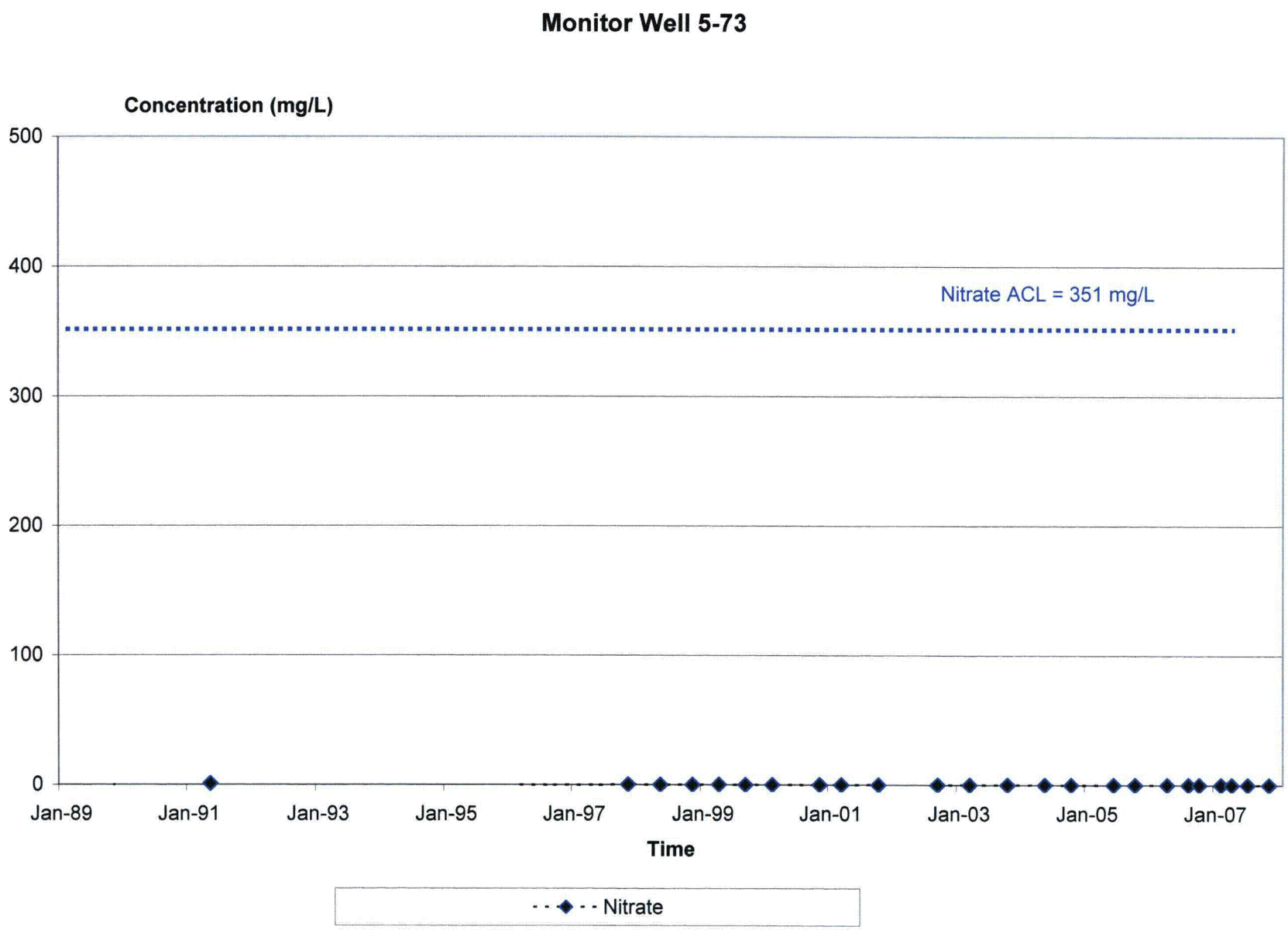

Monitor Well 5-08
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

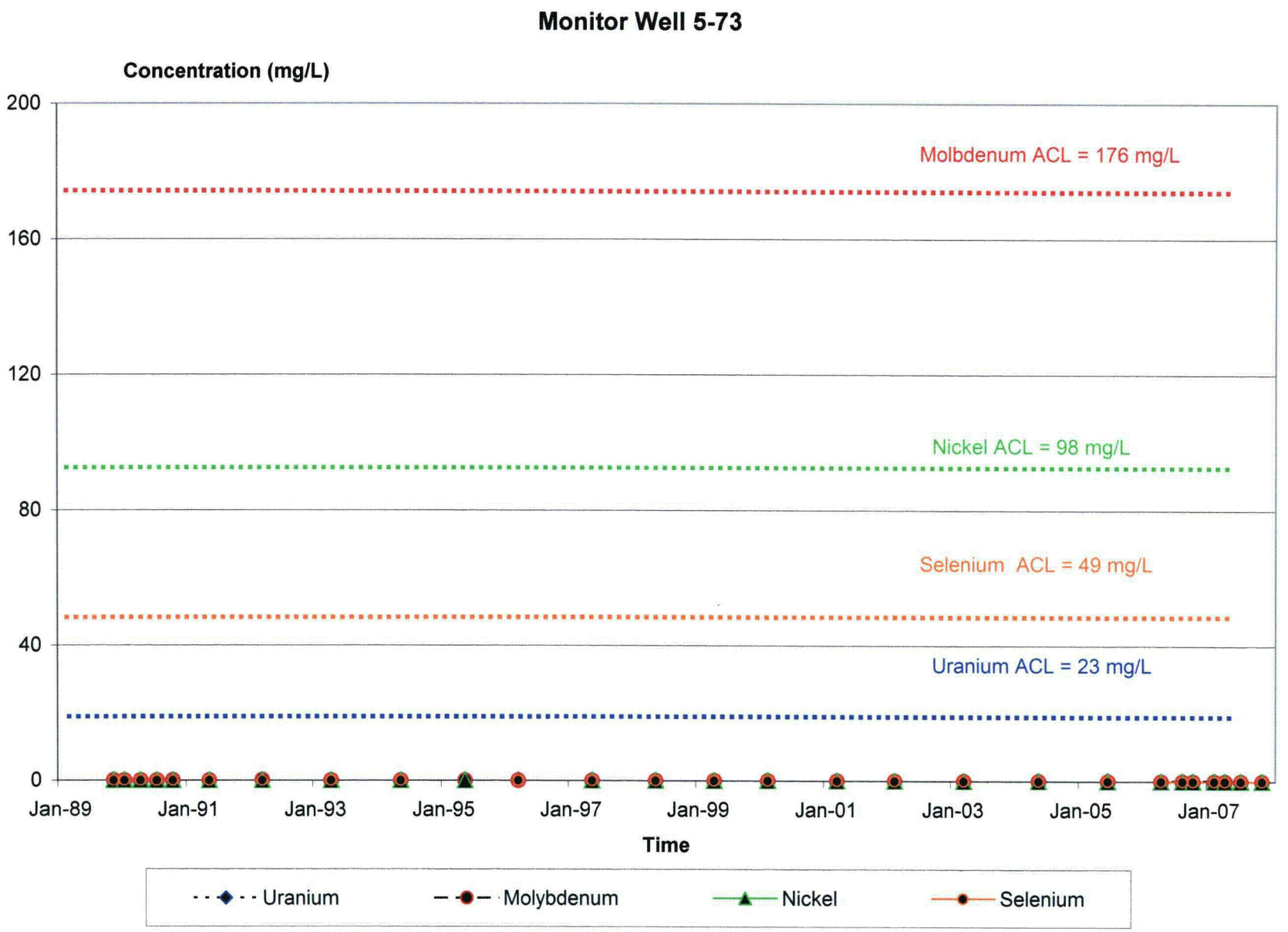

Monitor Well 5-08
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

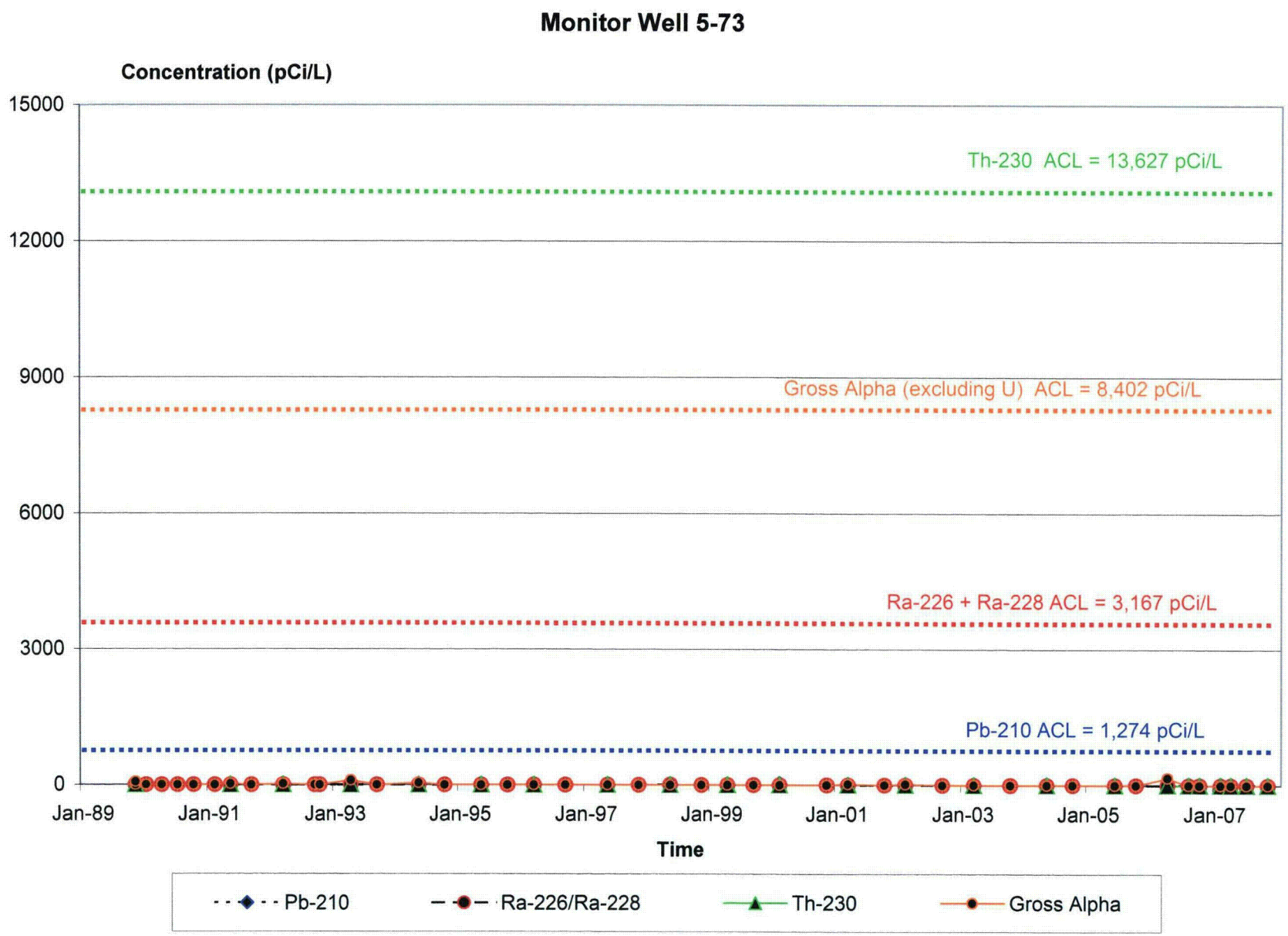

Monitor Well 5-08
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

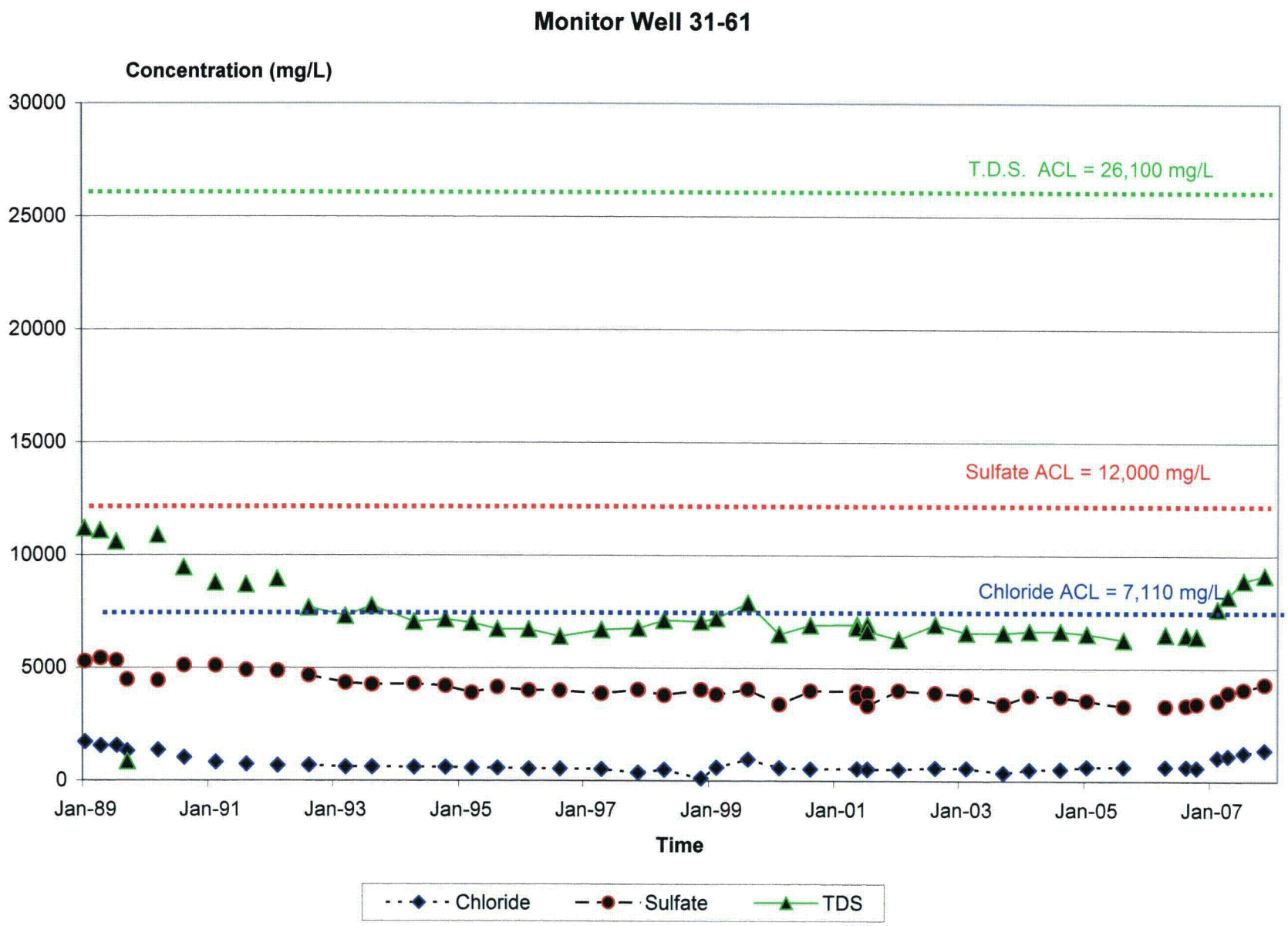

Monitor Well 5-08
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

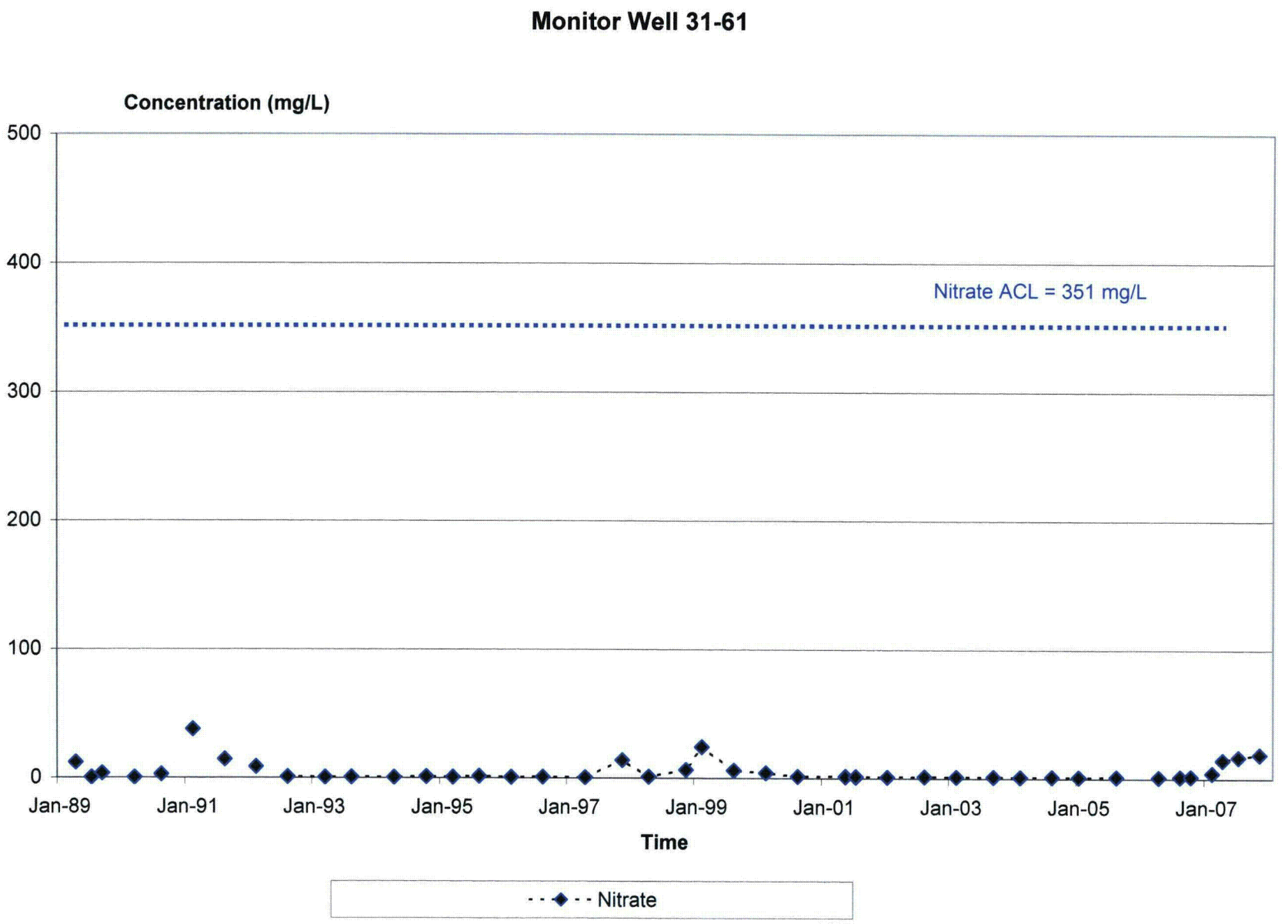

Monitor Well 5-73
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

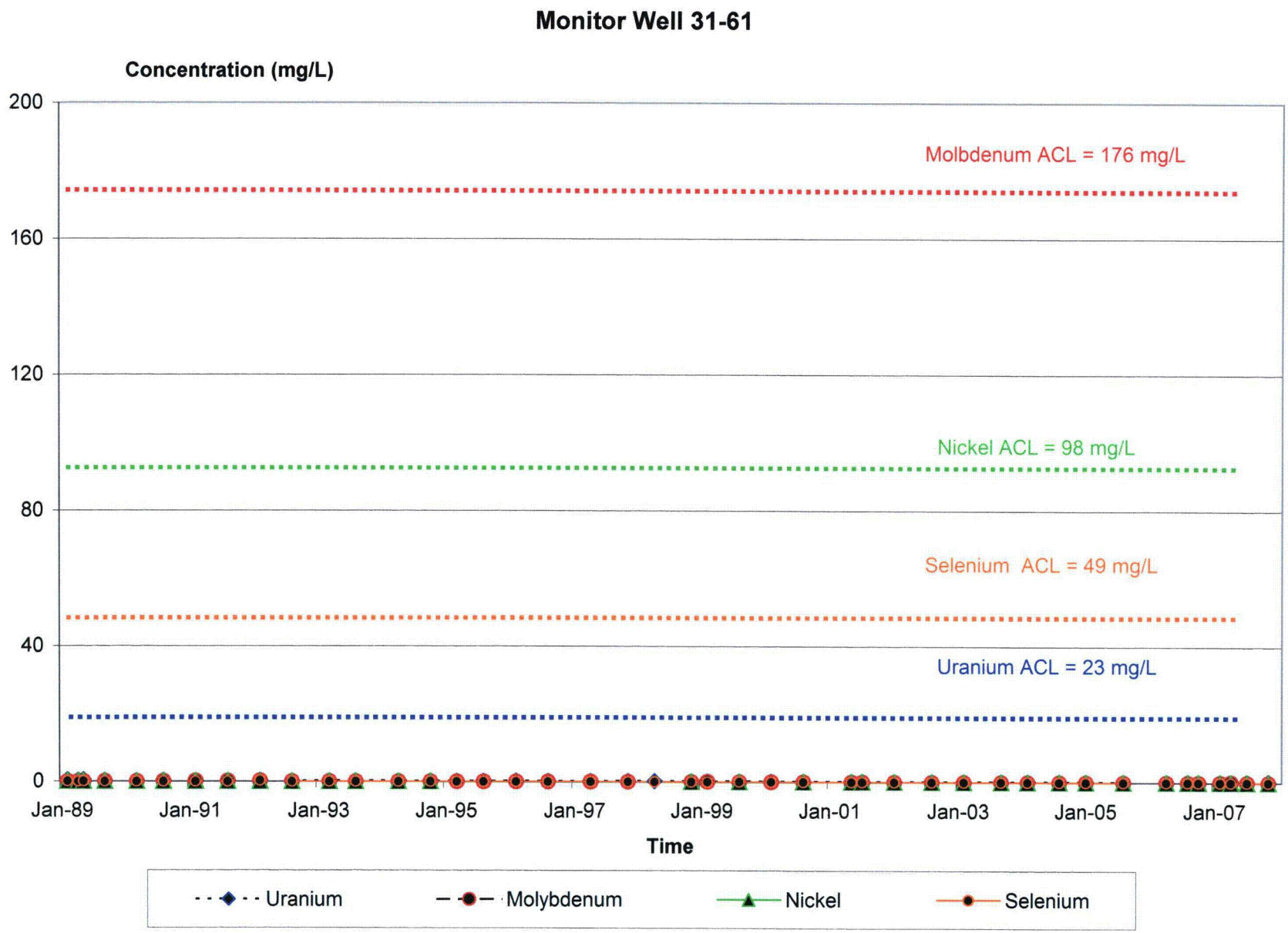

Monitor Well 5-73
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

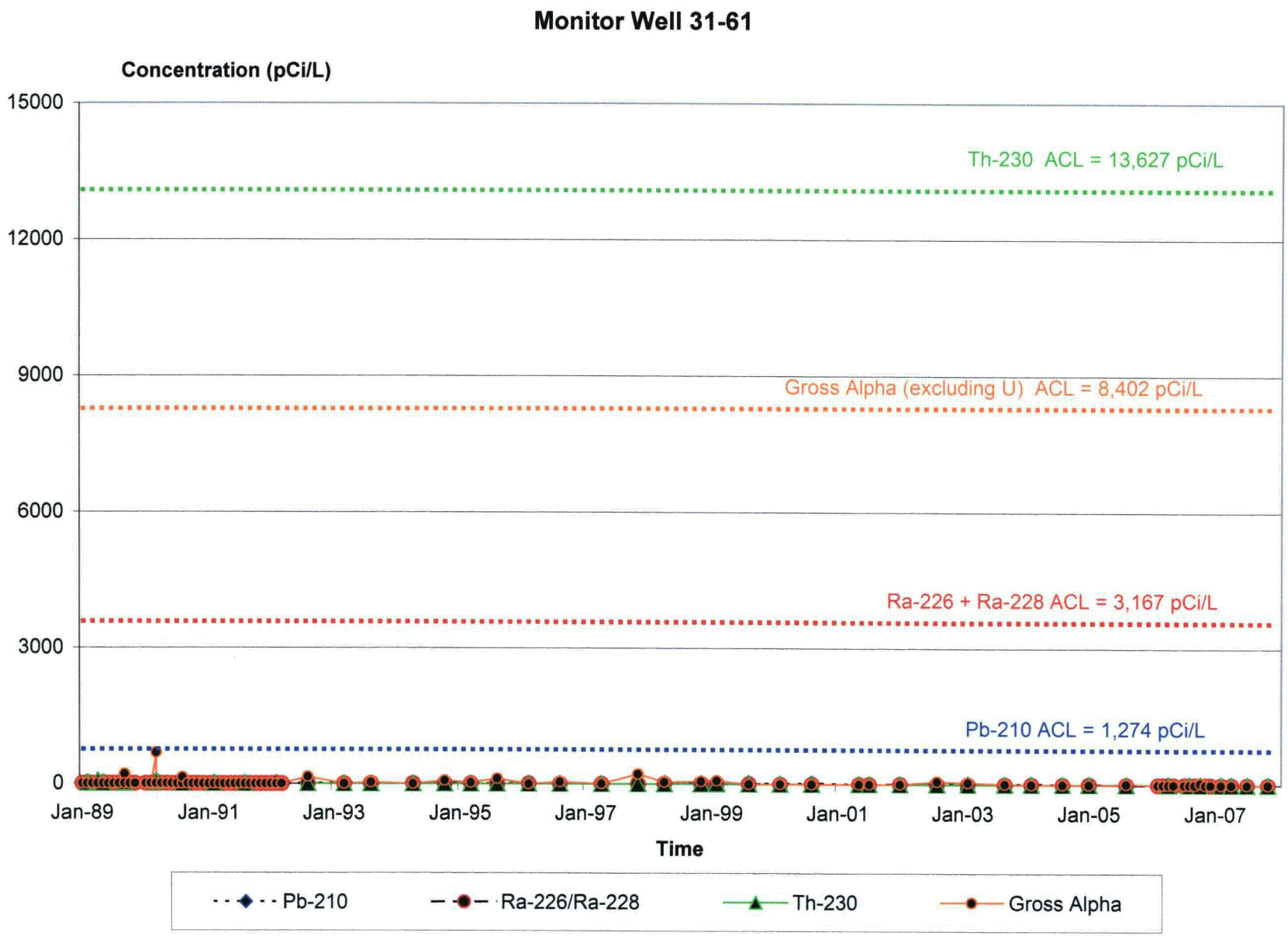

Monitor Well 5-73
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

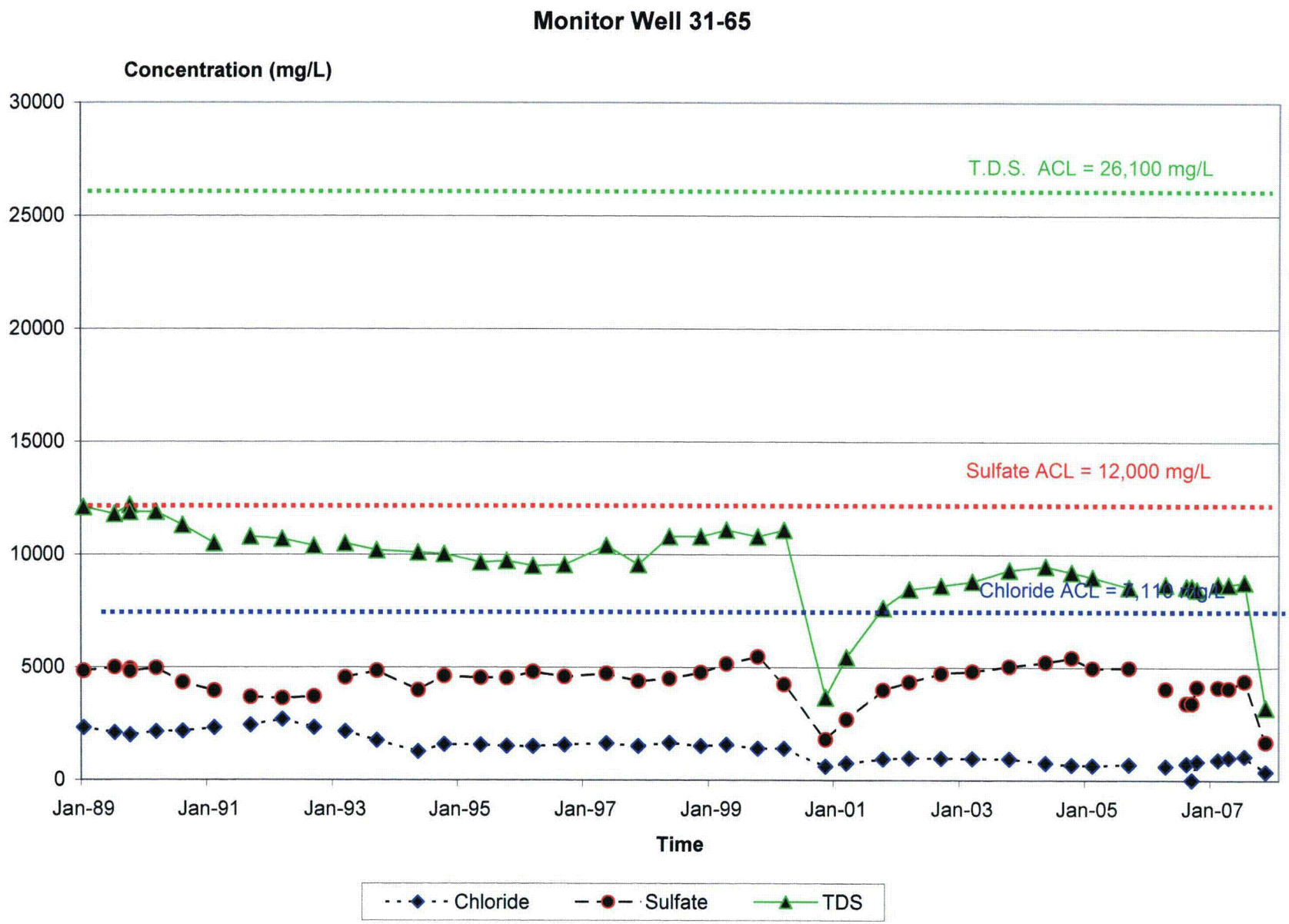

Monitor Well 5-73
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

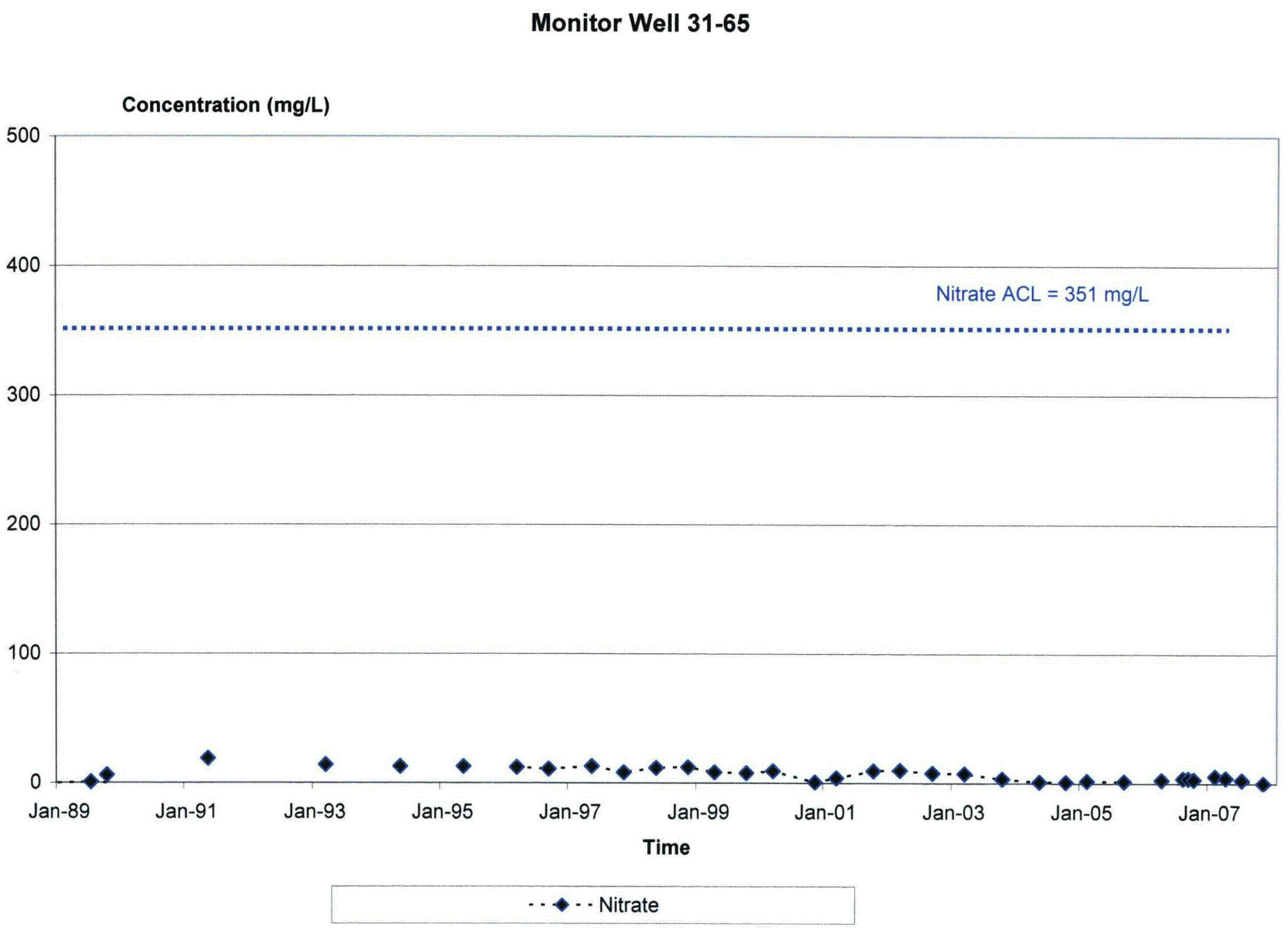

Monitor Well 31-61
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

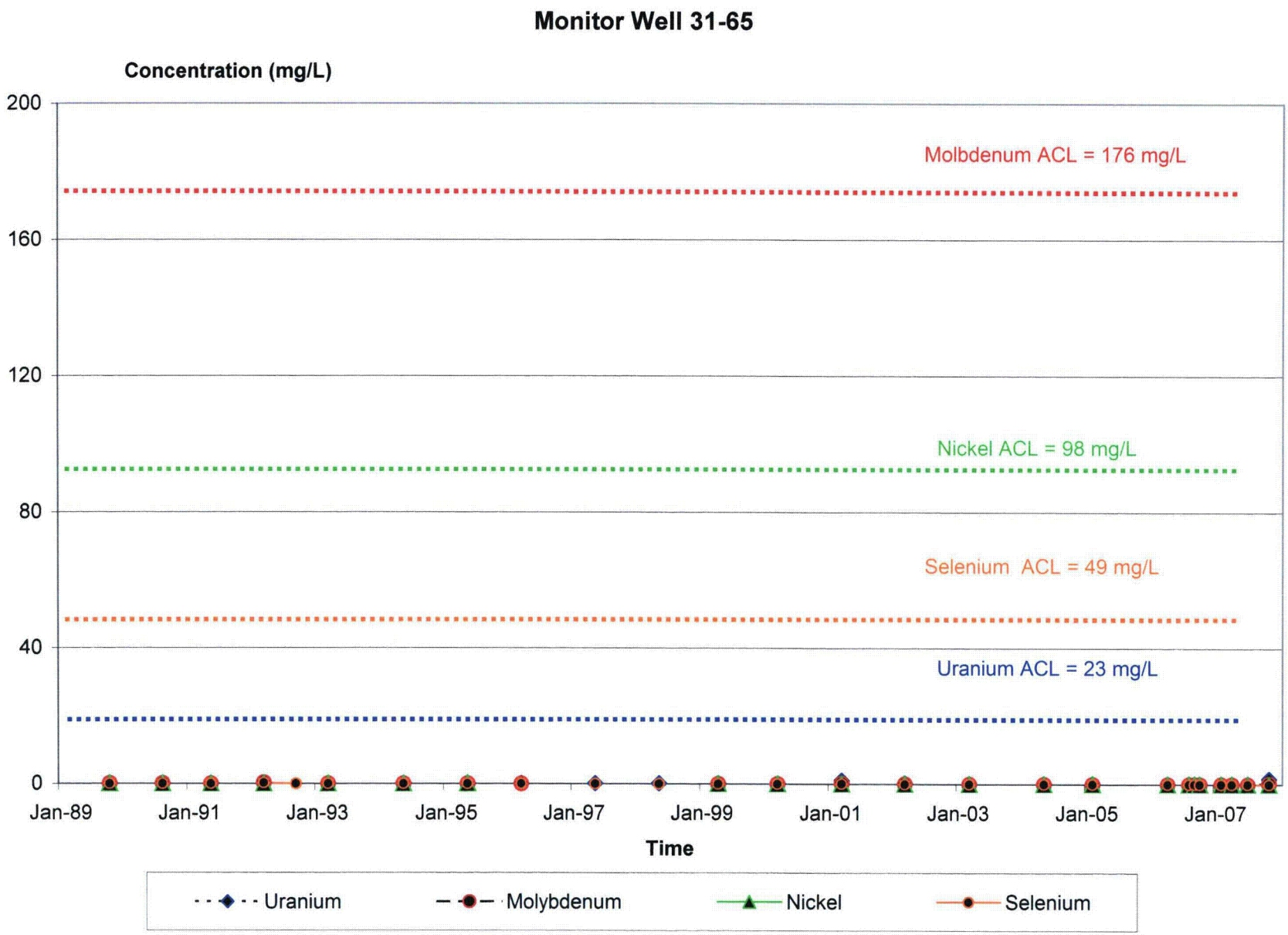

Monitor Well 31-61
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

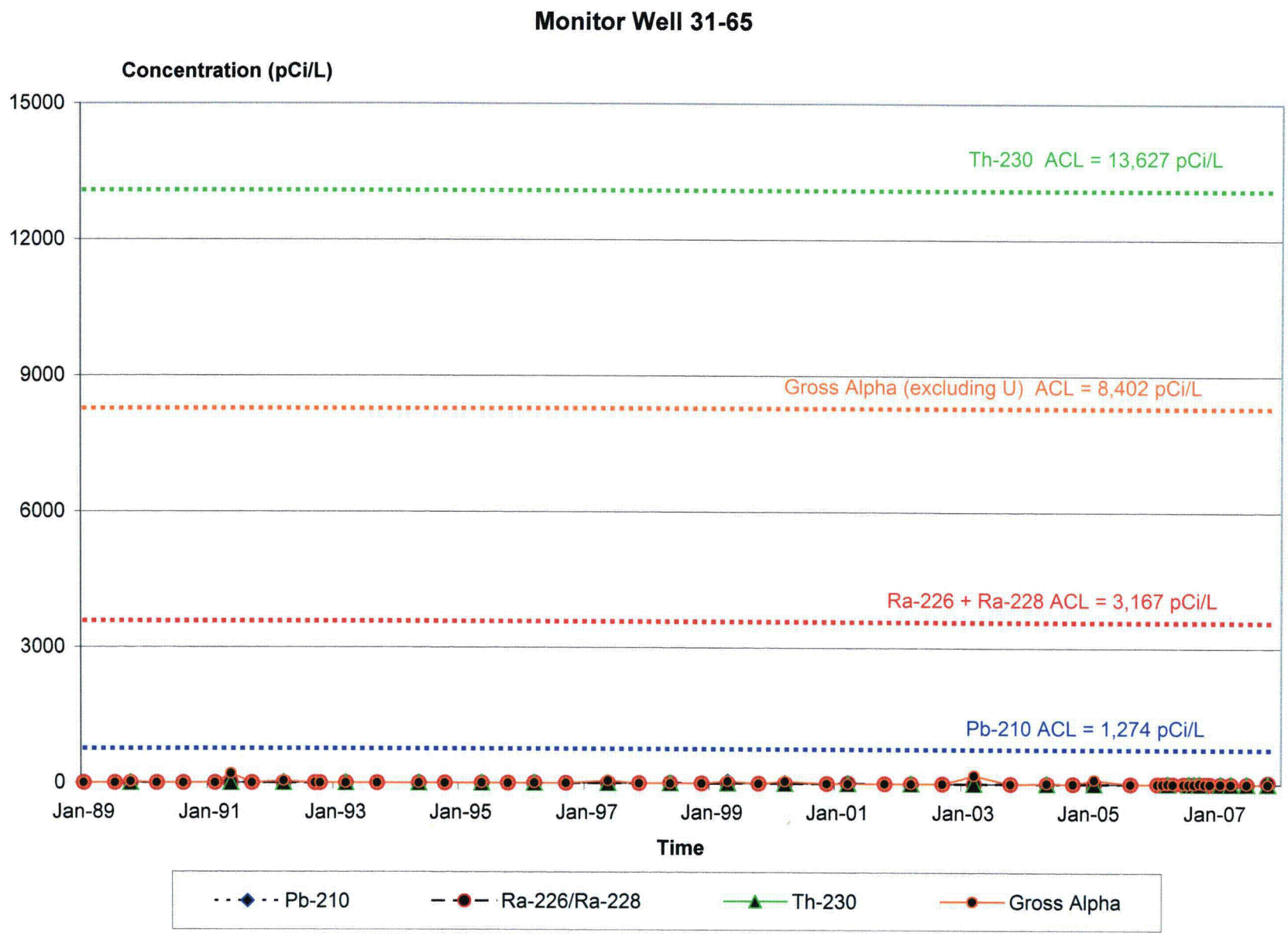

Monitor Well 31-61
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

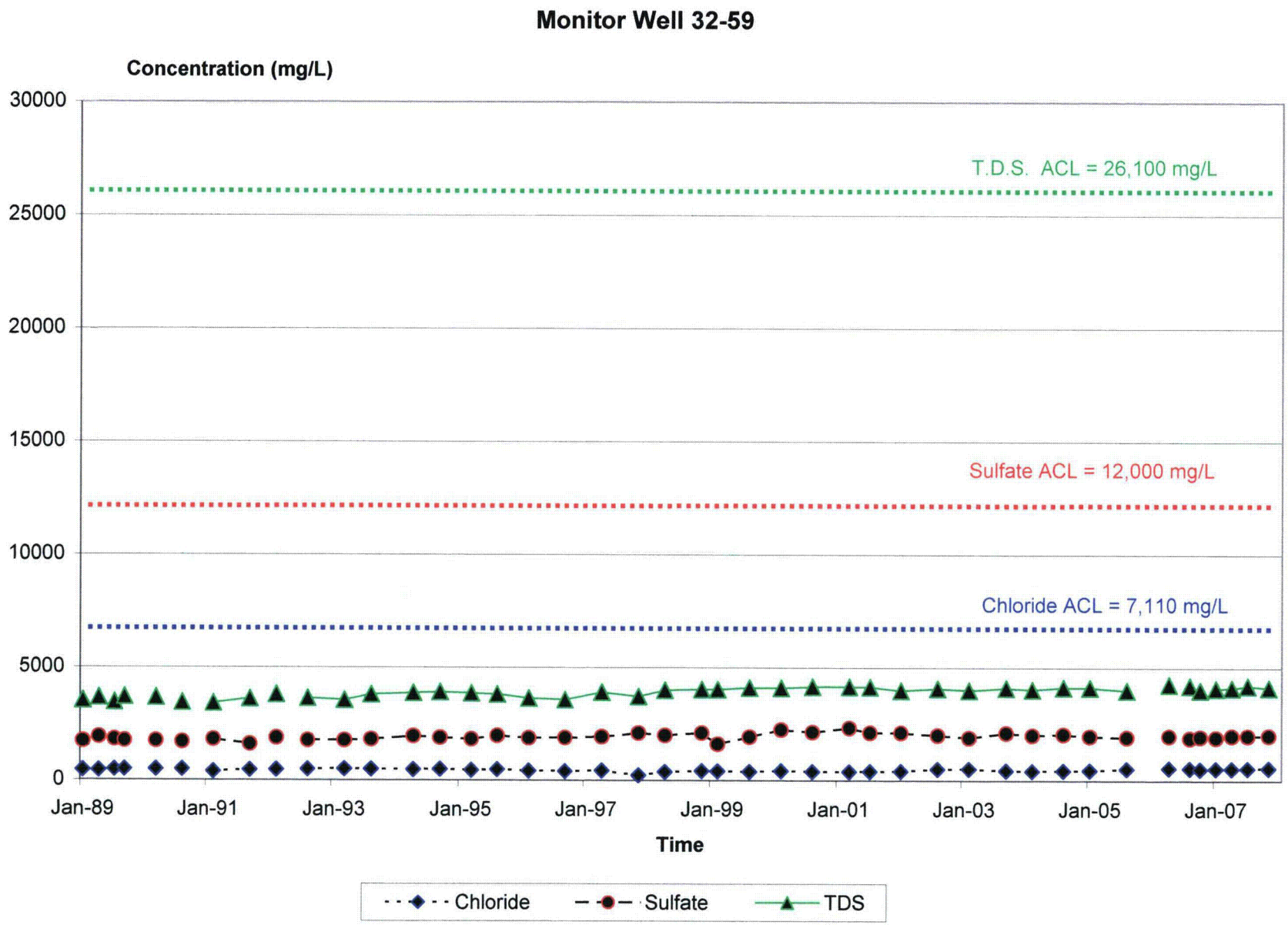

Monitor Well 31-61
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

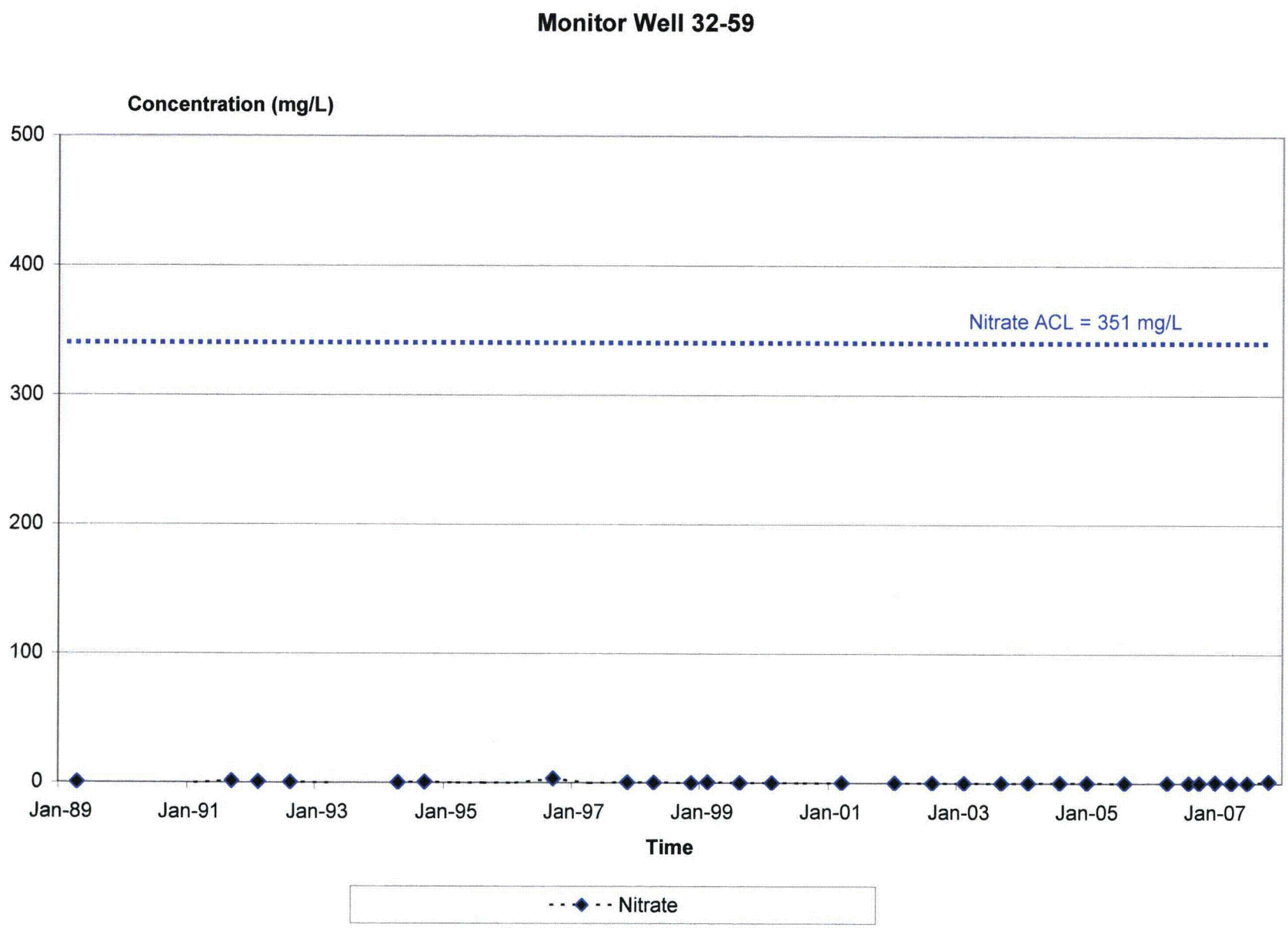

Monitor Well 31-65
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 4,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

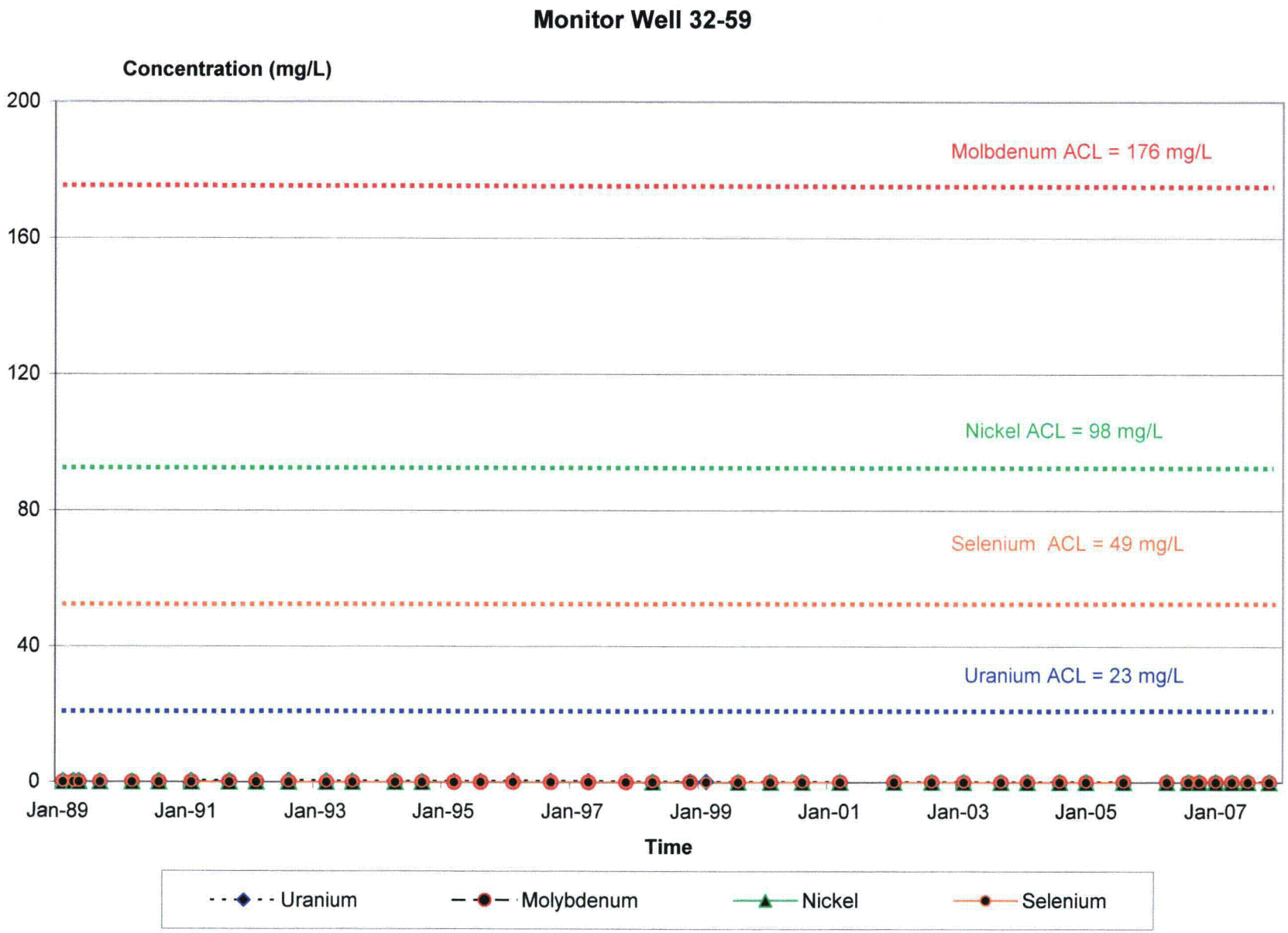

Monitor Well 31-65
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

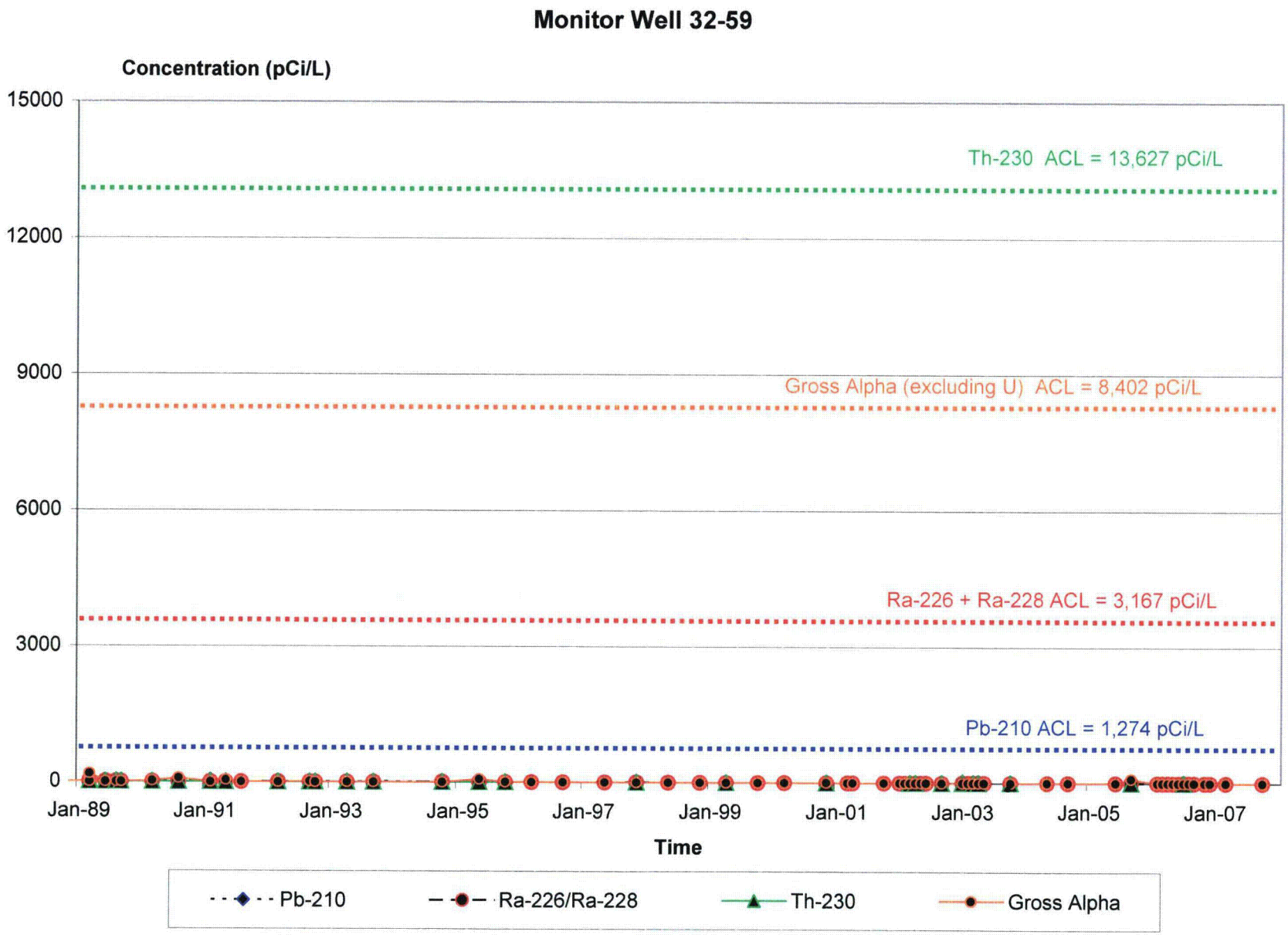

Monitor Well 31-65
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

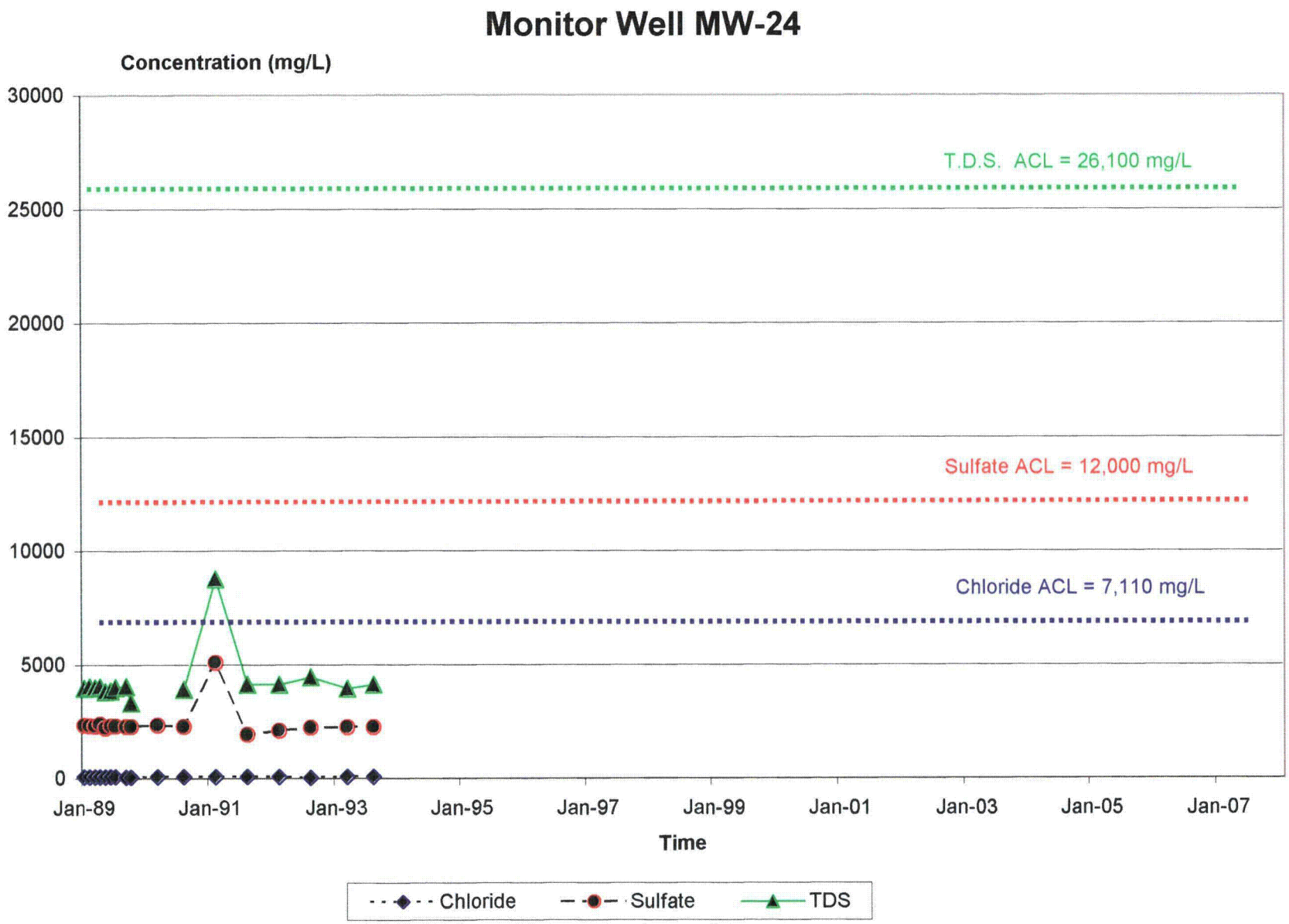

Monitor Well 31-65
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

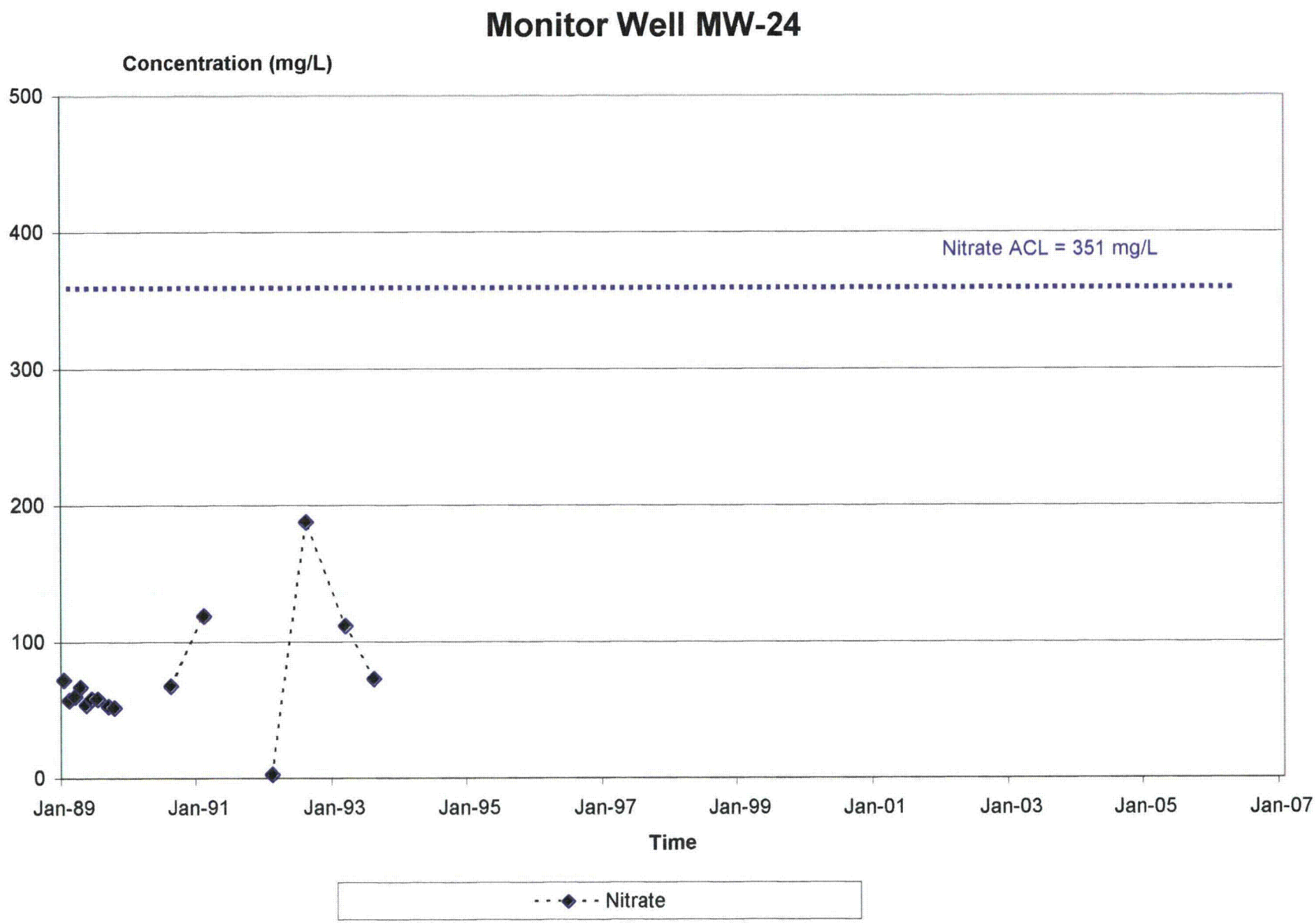

Monitor Well 32-59
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

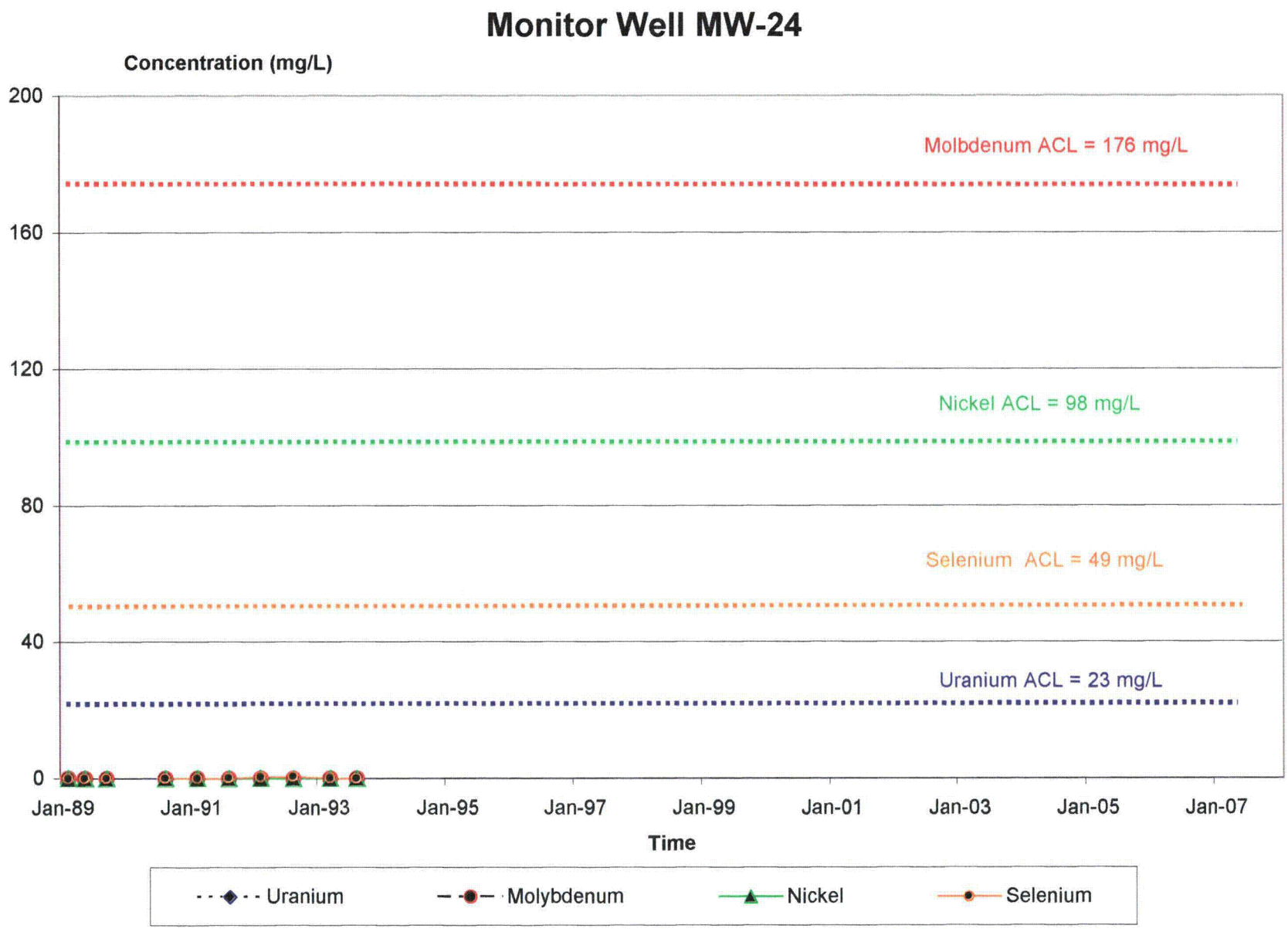

Monitor Well 32-59
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

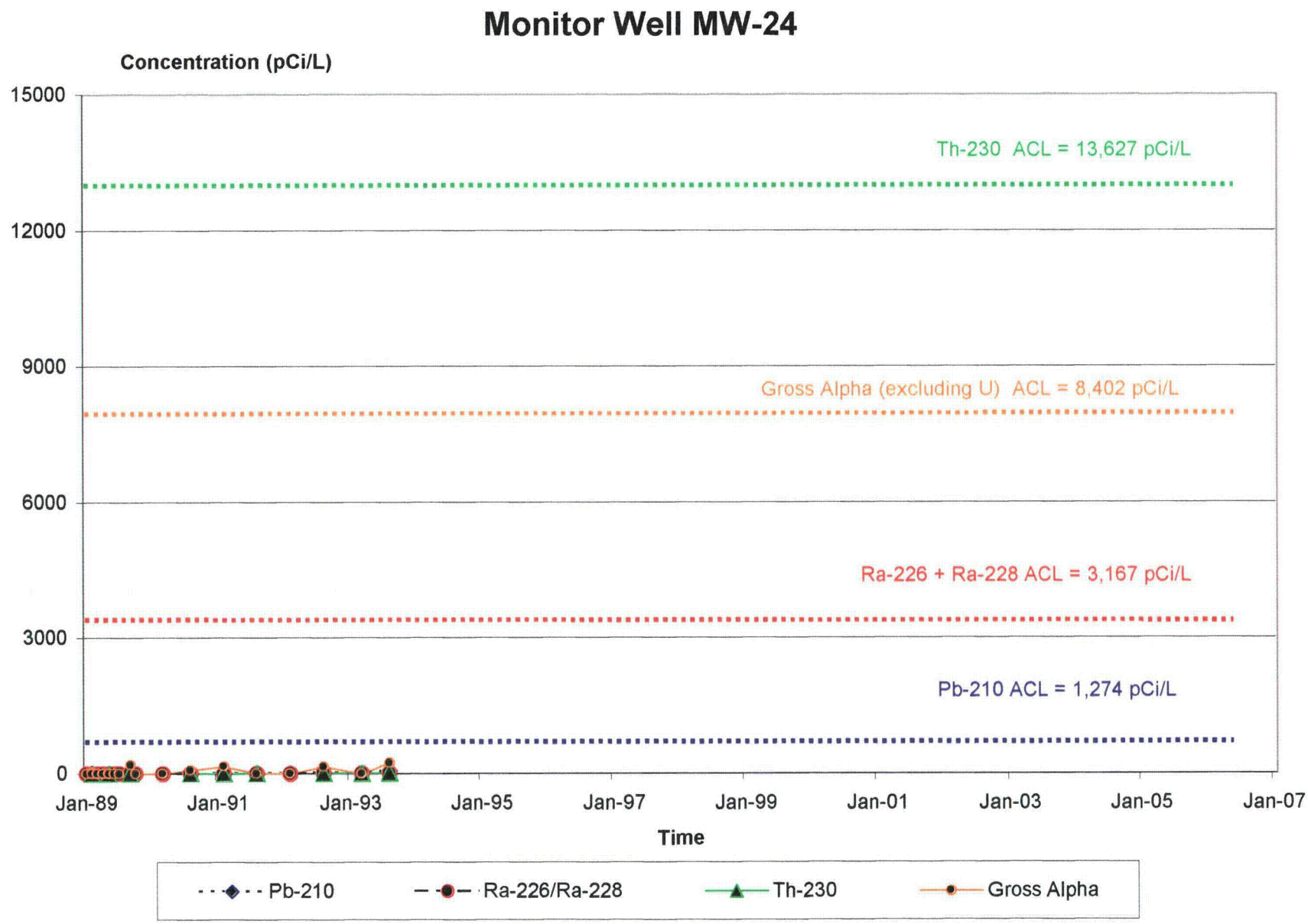

Monitor Well 32-59
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium


Monitor Well 32-59
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha


Monitor Well MW-24
Concentration (mg/L)
30000
25000
20000
15000
10000
5000
0
T.D.S. ACL = 26,100 mg/L
Sulfate ACL = 12,000 mg/L
Chloride ACL = 7,110 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Chloride
Sulfate
TDS

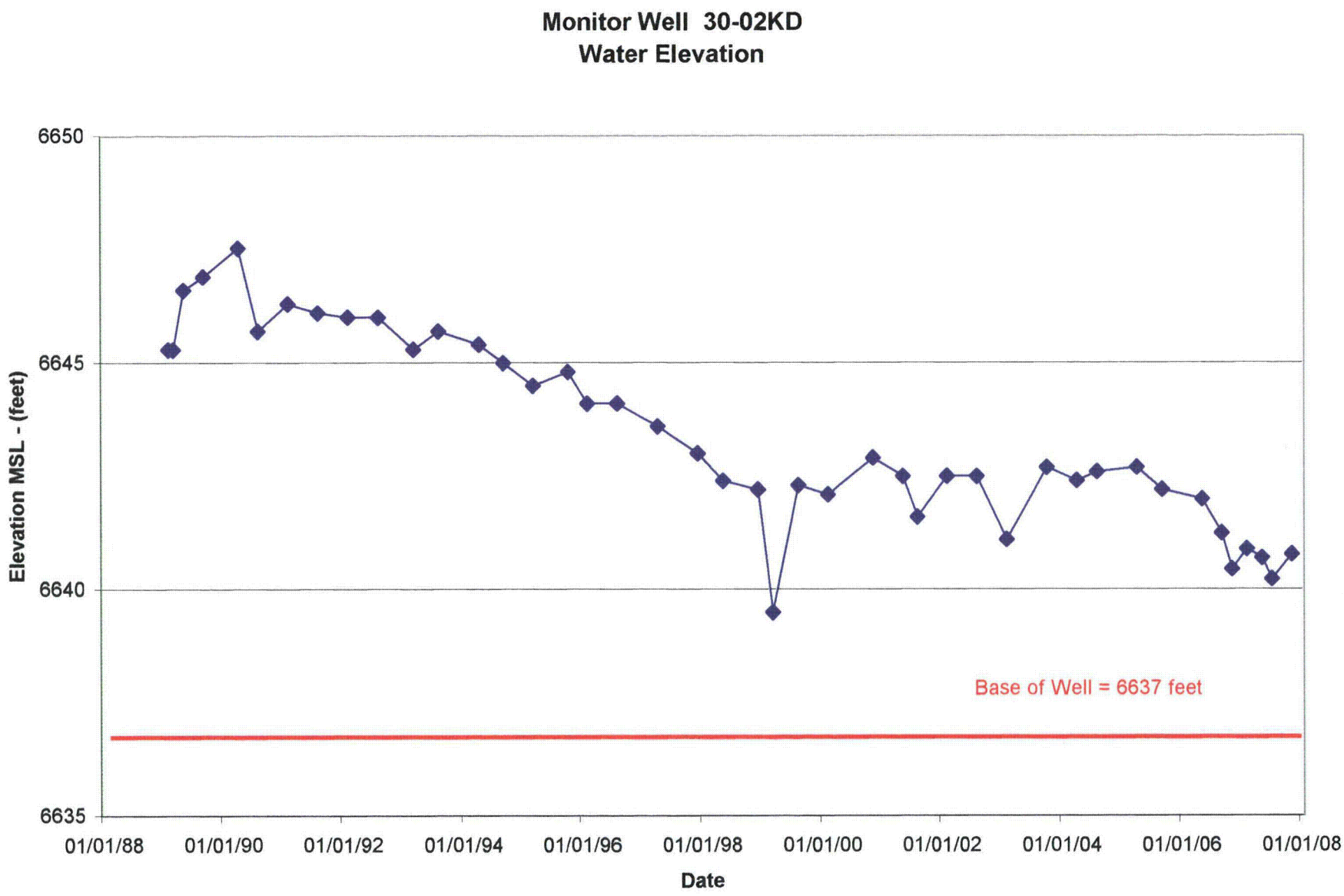

Monitor Well MW-24
Concentration (mg/L)
500
400
300
200
100
0
Nitrate ACL = 351 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Nitrate

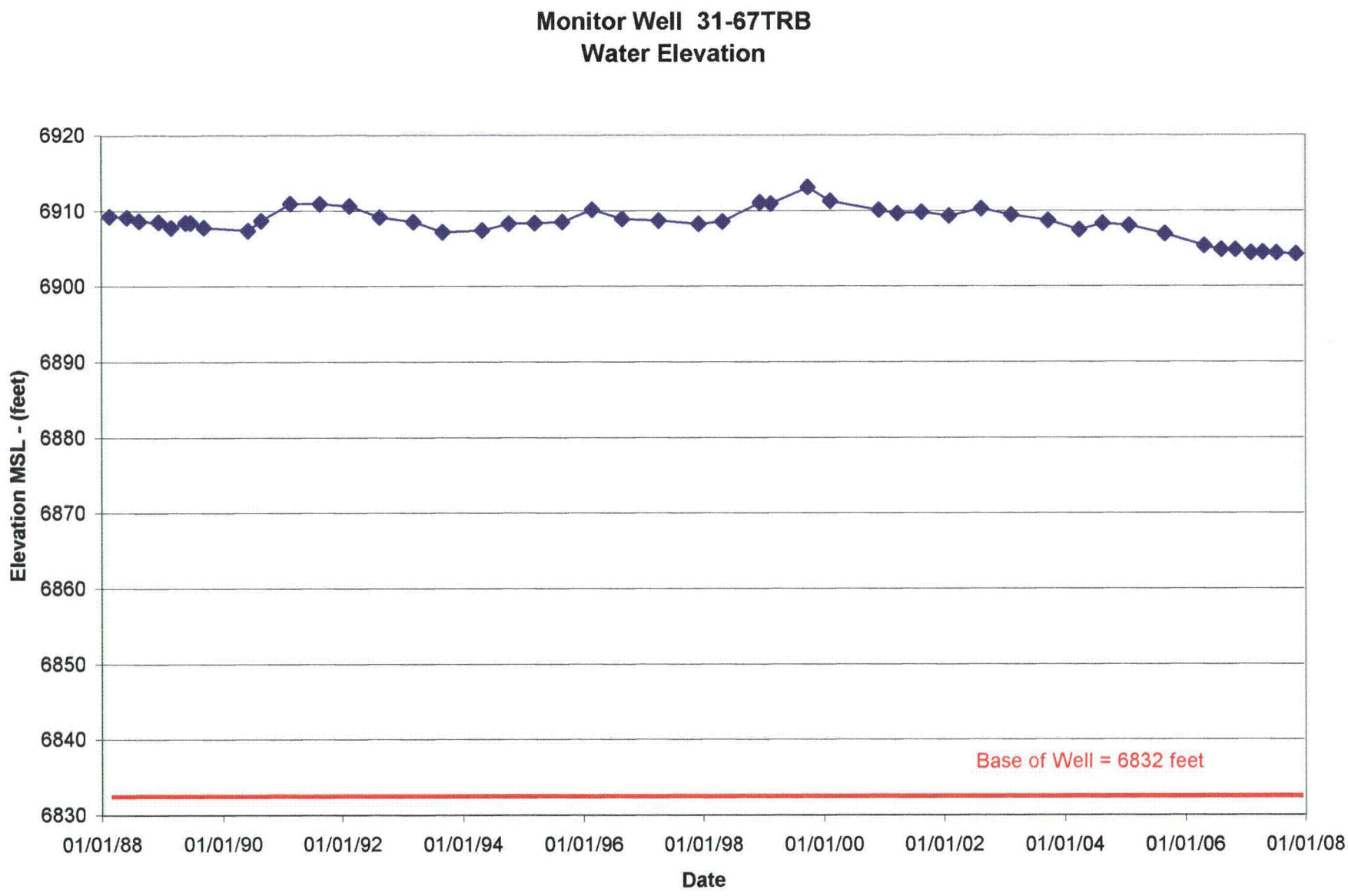

Monitor Well MW-24
Concentration (mg/L)
200
160
120
80
40
0
Molbdenum ACL = 176 mg/L
Nickel ACL = 98 mg/L
Selenium ACL = 49 mg/L
Uranium ACL = 23 mg/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Uranium
Molybdenum
Nickel
Selenium

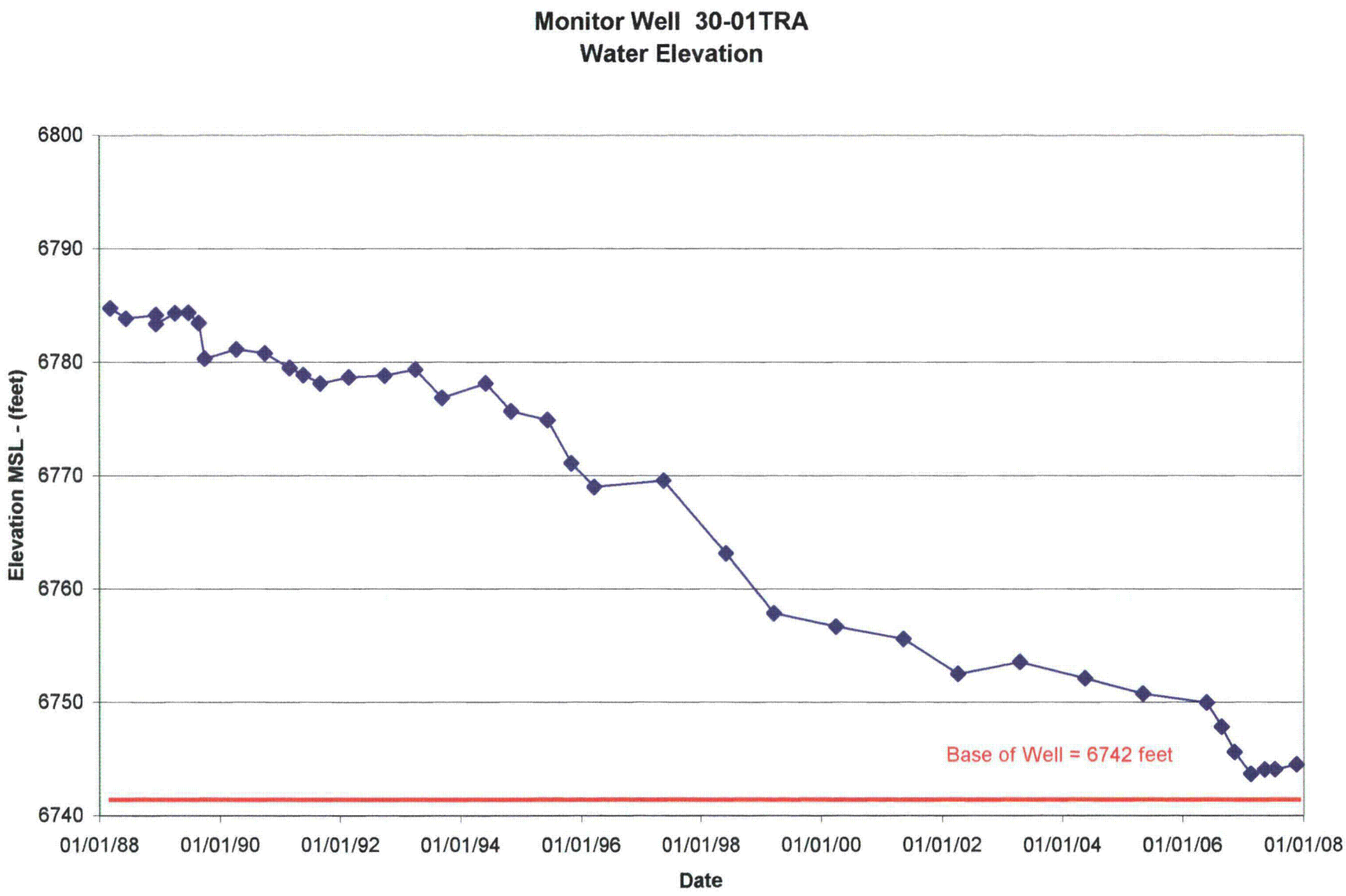

Monitor Well MW-24
Concentration (pCi/L)
15000
12000
9000
6000
3000
0
Th-230 ACL = 13,627 pCi/L
Gross Alpha (excluding U) ACL = 8,402 pCi/L
Ra-226 + Ra-228 ACL = 3,167 pCi/L
Pb-210 ACL = 1,274 pCi/L
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Time
Pb-210
Ra-226/Ra-228
Th-230
Gross Alpha

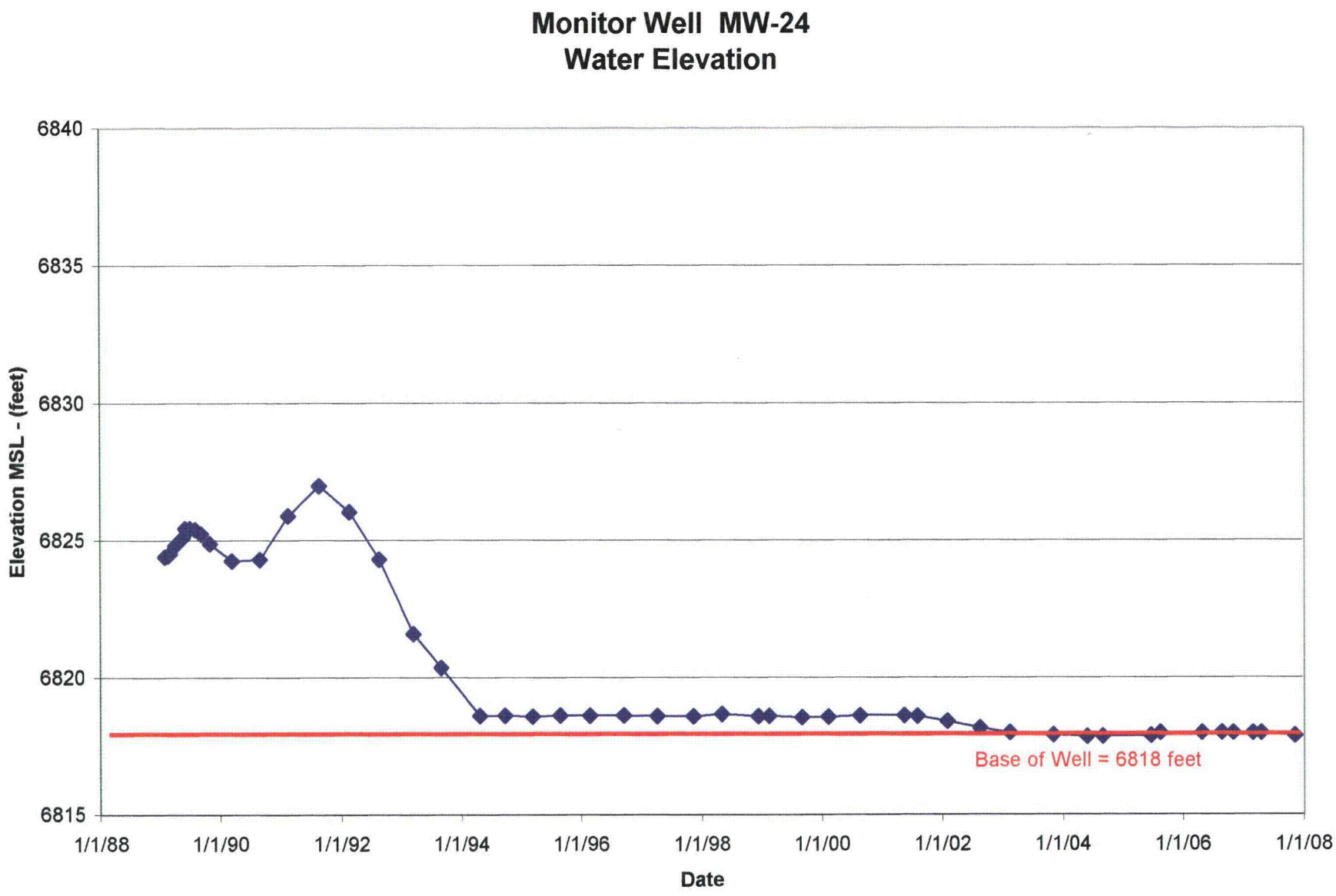
Appendix 3

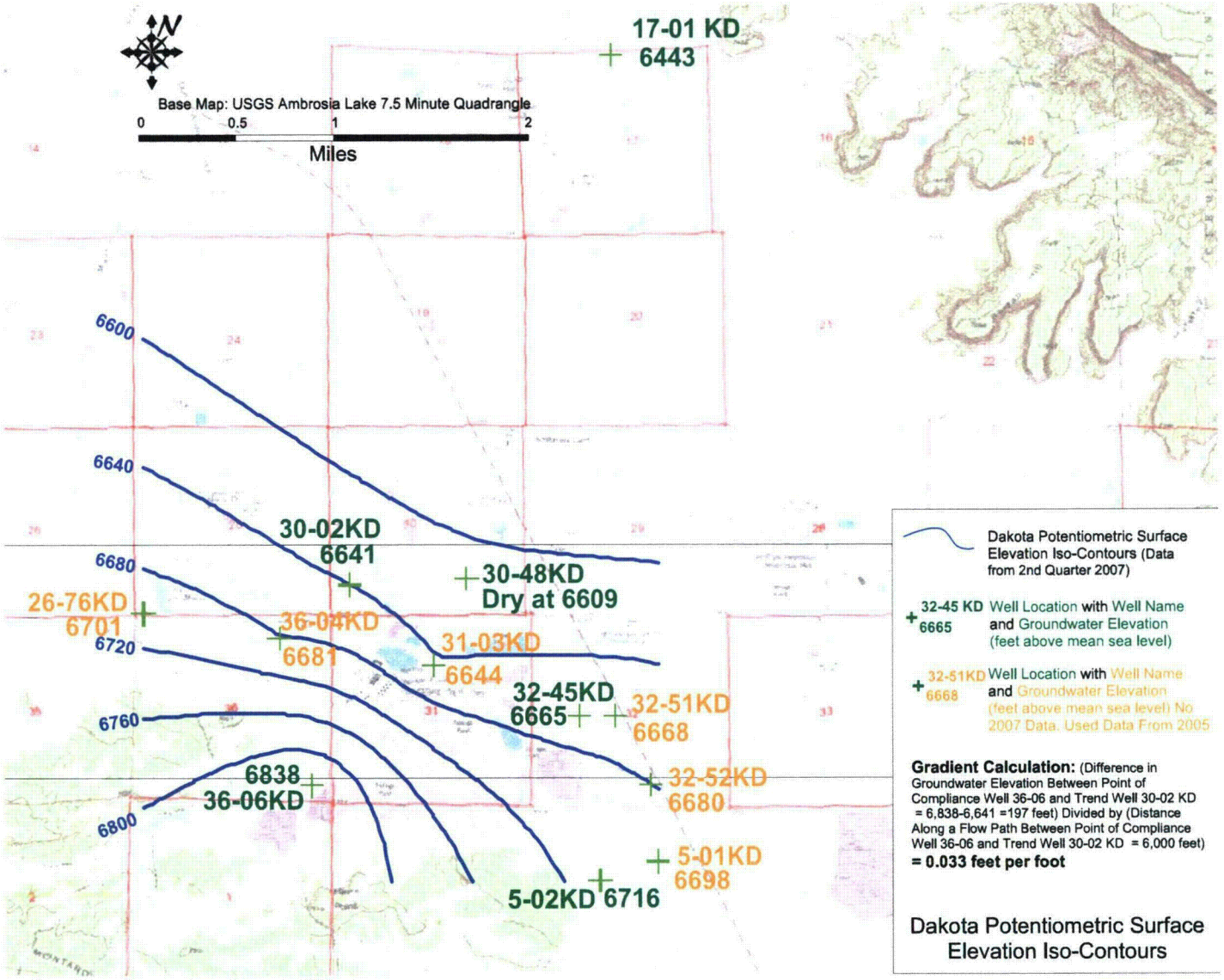
Stability Monitoring Plan
Hydrographs

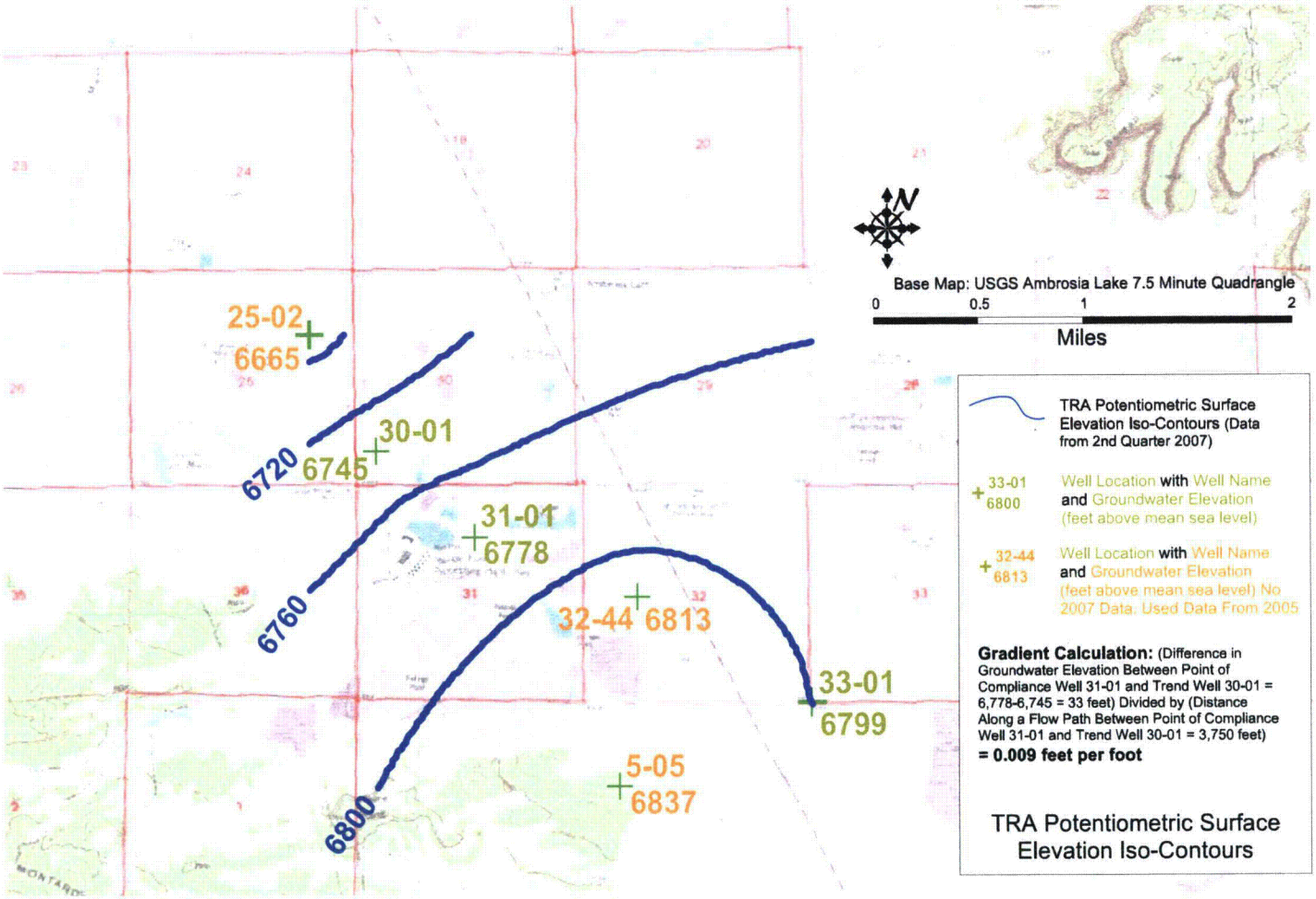

Monitor Well 30-02KD
Water Elevation
6650
6645
6640
6635
Elevation MSL - (feet)
Base of Well = 6637 feet
01/01/88
01/01/90
01/01/92
01/01/94
01/01/96
01/01/98
01/01/00
01/01/02
01/01/04
01/01/06
01/01/08
Date

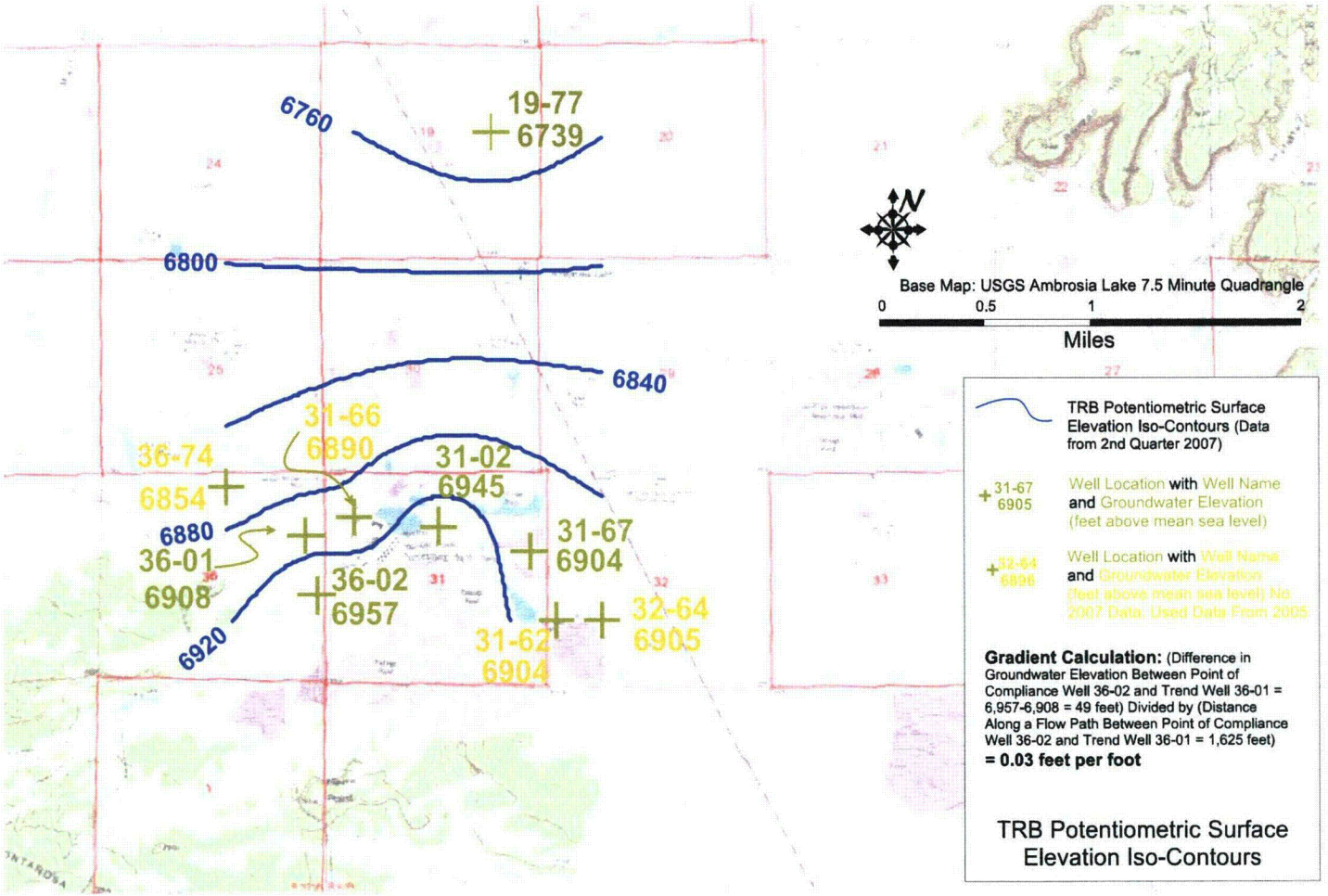

Monitor Well 31-67TRB
Water Elevation
Elevation MSL - (feet)
6920
6910
6900
6890
6880
6870
6860
6850
6840
6830
Base of Well = 6832 feet
01/01/88
01/01/90
01/01/92
01/01/94
01/01/96
01/01/98
01/01/00
01/01/02
01/01/04
01/01/06
01/01/08
Date

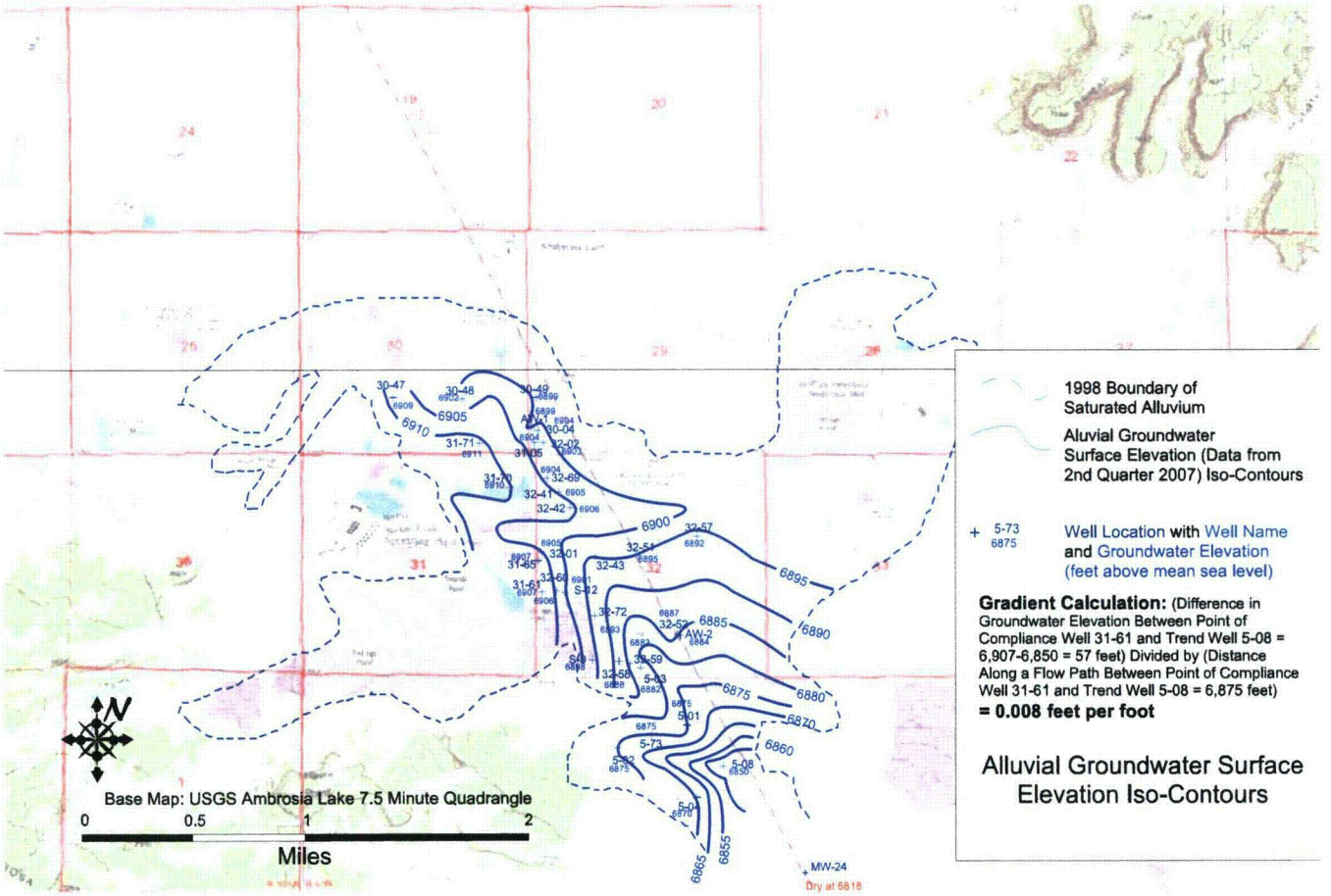

Monitor Well 30-01TRA
Water Elevation
6800
6790
6780
6770
6760
6750
6740
Elevation MSL - (feet)
Base of Well = 6742 feet
01/01/88
01/01/90
01/01/92
01/01/94
01/01/96
01/01/98
01/01/00
01/01/02
01/01/04
01/01/06
01/01/08
Date


Monitor Well MW-24
Water Elevation
6840
6835
6830
6825
6820
6815
Elevation MSL - (feet)
1/1/88
1/1/90
1/1/92
1/1/94
1/1/96
1/1/98
1/1/00
1/1/02
1/1/04
1/1/06
1/1/08
Date
Base of Well = 6818 feet


N
Base Map: USGS Ambrosia Lake 7.5 Minute Quadrangle
0
0.5
1
2
Miles
17-01 KD
6443
6600
6640
6680
6720
6760
6800
30-02KD
6641
30-48KD
Dry at 6609
26-76KD
6701
36-04KD
6681
31-03KD
6644
32-45KD
6665
32-51KD
6668
32-52KD
6680
6838
36-06KD
5-01KD
6698
5-02KD
6716
Dakota Potentiometric Surface Elevation Iso-Contours (Data from 2nd Quarter 2007)
32-45 KD 6665 Well Location with Well Name and Groundwater Elevation (feet above mean sea level)
32-51KD 6668 Well Location with Well Name and Groundwater Elevation (feet above mean sea level) No 2007 Data. Used Data From 2005
Gradient Calculation: (Difference in Groundwater Elevation Between Point of Compliance Well 36-06 and Trend Well 30-02 KD = 6,838-6,641 =197 feet) Divided by (Distance Along a Flow Path Between Point of Compliance Well 36-06 and Trend Well 30-02 KD = 6,000 feet) = 0.033 feet per foot
Dakota Potentiometric Surface Elevation Iso-Contours


25-02
6665
6720
30-01
6745
31-01
6778
6760
32-44
6813
33-01
6799
5-05
6837
6800
N
Base Map: USGS Ambrosia Lake 7.5 Minute Quadrangle
0
0.5
1
2
Miles
TRA Potentiometric Surface Elevation Iso-Contours (Data from 2nd Quarter 2007)
33-01
6800
Well Location with Well Name and Groundwater Elevation (feet above mean sea level)
32-44
6813
Well Location with Well Name and Groundwater Elevation (feet above mean sea level) No 2007 Data. Used Data From 2005
Gradient Calculation: (Difference in Groundwater Elevation Between Point of Compliance Well 31-01 and Trend Well 30-01 = 6,778-6,745 = 33 feet) Divided by (Distance Along a Flow Path Between Point of Compliance Well 31-01 and Trend Well 30-01 = 3,750 feet)
= 0.009 feet per foot
TRA Potentiometric Surface Elevation Iso-Contours


6760
19-77
6739
6800
6840
31-66
6890
36-74
6854
31-02
6945
6880
36-01
6908
31-67
6904
36-02
6957
32-64
6905
31-62
6904
6920
N
Base Map: USGS Ambrosia Lake 7.5 Minute Quadrangle
0
0.5
1
2
Miles
TRB Potentiometric Surface Elevation Iso-Contours (Data from 2nd Quarter 2007)
31-67
6905
Well Location with Well Name and Groundwater Elevation (feet above mean sea level)
32-64
6896
Well Location with Well Name and Groundwater Elevation (feet above mean sea level) No 2007 Data. Used Data From 2005
Gradient Calculation: (Difference in Groundwater Elevation Between Point of Compliance Well 36-02 and Trend Well 36-01 = 6,957-6,908 = 49 feet) Divided by (Distance Along a Flow Path Between Point of Compliance Well 36-02 and Trend Well 36-01 = 1,625 feet) = 0.03 feet per foot
TRB Potentiometric Surface Elevation Iso-Contours


1998 Boundary of Saturated Alluvium
Aluvial Groundwater Surface Elevation (Data from 2nd Quarter 2007) Iso-Contours
+ 5-73 6875
Well Location with Well Name and Groundwater Elevation (feet above mean sea level)
Gradient Calculation: (Difference in Groundwater Elevation Between Point of Compliance Well 31-61 and Trend Well 5-08 = 6,907-6,850 = 57 feet) Divided by (Distance Along a Flow Path Between Point of Compliance Well 31-61 and Trend Well 5-08 = 6,875 feet) **= 0.008 feet per foot**
Alluvial Groundwater Surface Elevation Iso-Contours
Base Map: USGS Ambrosia Lake 7.5 Minute Quadrangle
0 0.5 1 2
Miles
N
6910
6905
6900
6895
6890
6885
6880
6875
6870
6865
6860
6855
30-47
30-48
30-49
30-04
31-71
32-02
32-69
32-41
32-42
32-57
32-51
32-43
32-01
31-65
31-61
S-02
32-72
32-52
AW-2
32-59
32-58
5-03
5-01
5-73
5-08
MW-24
Dry at 6818

Appendix 4

Stability Monitoring Plan
Potentiometric Surface Maps