5759

IEMP MID-YEAR DATA SUMMARY REPORT FOR 2004

FERNALD CLOSURE PROJECT
FERNALD, OHIO

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U.S. DEPARTMENT OF ENERGY

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AMSL	above mean sea level
AWWT	Advanced Wastewater Treatment facility
CAWWT	Converted Advanced Wastewater Treatment facility
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FCP	Fernald Closure Project
FFCA	Federal Facilities Compliance Agreement
FRL	final remediation level
GMA	Great Miami Aquifer
gpm	gallons per minute
HTW	Horizontal Till Well
IEMP	Integrated Environmental Monitoring Plan
lbs	pounds
LCS	leachate collection system
LDS	leak detection system
M gal	million gallons
mg/L	milligrams per liter
mrem	millirems
µCi	microCuries
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity units
OEPA	Ohio Environmental Protection Agency
OSDF	on-site disposal facility
pCi/L	picoCuries per liter
pCi/m^3	picoCuries per cubic meter
RCS	Radon Control System
TLD	thermoluminescent dosimeter

1.0 INTRODUCTION

This Integrated Environmental Monitoring Plan (IEMP) Mid-Year Data Summary for 2004 provides the environmental monitoring results from monitoring activities performed from January 1 through June 30, 2004 at the Fernald site. This is the third mid-year data summary prepared in accordance with an agreement between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Ohio Environmental Protection Agency (OEPA) (as identified in IEMP, Revision 3 [DOE 2003b], requirements). As they become available, the IEMP data continue to be provided to the EPA and OEPA via the IEMP Data Information Site (i.e., the "Extranet Site"), at *http://iempdata.fernald.gov*.

As with the reporting approach in previous IEMP quarterly data summaries, the goal of the IEMP mid-year data summary is to focus on notable events and results, which are related to the data through a concise text discussion and presentation of data in graphical and tabular formats. Comprehensive full-year reporting, including all tables and graphs, are still provided through the annual site environmental report. Table 1-1 identifies the IEMP data for each IEMP program under this report.

TABLE 1-1

DATA COVERED IN THE IEMP MID-YEAR SUMMARY AND/OR AVAILABLE ON THE IEMP DATA INFORMATION SITE

PROGRAMS	TIME PERIOD					
	Semiannual 2004					
	First Quarter 2004[a]			Second Quarter 2004[a]		
	JAN	FEB	MAR	APR	MAY	JUN
GROUNDWATER SAMPLING ACTIVITIES						
Extraction/Re-injection Operational Data	◆	◆	◆	◆	◆	◆
Total Uranium Only	|----------◆	----------◆	----------◆	----------◆		
Non-Uranium Monitoring[b]	◆----------	◆----------	◆----------	◆----------	◆----------	◆----------
Groundwater Elevations	◆----------	----------|		◆----------	----------|	
OSDF SAMPLING ACTIVITIES						
LCS and LDS Volumes	◆	◆	◆	◆	◆	◆
Cells 1, 2, and 3 GMA Wells/HTW/LCS/LDS Analytical	|----------◆	----------|		|----------◆	----------|	
Cells 4 and 5 GMA Wells/HTW Analytical[c]	◆	NA	◆	NA	◆	NA
Cells 4 and 5 LCS/LDS Analytical	|----------◆	----------|		|----------◆	----------|	
Cell 6 GMA Wells/HTW Analytical[c]	NA	◆	NA	◆	NA	◆
Cell 6 LCS/LDS Analytical	|----------◆	----------|		|----------◆	----------|	
Cell 7 GMA Wells/HTW Analytical[d]	◆	◆	◆	◆	◆	◆
Cell 8 GMA Wells/HTW Analytical[e]	NA	NA	◆	◆	◆	◆
SURFACE WATER SAMPLING ACTIVITIES						
NPDES	◆	◆	◆	◆	◆	◆
FFCA	◆	◆	◆	◆	◆	◆
IEMP Characterization	◆----------	----------◆		◆----------	----------◆	
AIR SAMPLING ACTIVITIES						
Radiological Particulate (biweekly/monthly samples)	◆	◆	◆	◆	◆	◆
NESHAP Composite Analytical	|----------	----------◆		|----------	----------◆	
NESHAP Stack Analytical	|----------	----------◆		|----------	----------◆	
Environmental Radon	◆	◆	◆	◆	◆	◆
Silos Headspace Real Time Radon	◆	◆	◆	◆	◆	◆
Direct Radiation (TLD)	|----------	----------◆		|----------	----------◆	

◆ Data collected during this time period are covered in this mid-year summary. IEMP sampling that takes place during one scheduled event or round, quarterly or semiannually, is identified with a marker (e.g., |----------◆----------|) where the symbol is present in the month or months the samples were collected and the dashed line indicates the sampling period.

[a]NA = not applicable

[b]Includes South Field Extraction, Waste Storage Area, Property/Plume Boundary monitoring for FRL exceedances, and Property/Plume Boundary monitoring for Paddys Run Road Site constituents.

[c]This monitoring is bimonthly.

[d]Cell 7 HTW sampling started in February

[e]Cell 8 HTW sampling started in May.

2.0 GROUNDWATER MONITORING DATA

2.1 DATA COVERED

This IEMP mid-year data summary covers operational and analytical data that became available for posting to the IEMP Data Information Site from January 1 through June 30, 2004. Specifically, data are discussed below or provided on the IEMP Data Information Site, including:

- Operational data collected during the first half of 2004
- Analytical data collected during the first half of 2004
- Groundwater (Great Miami Aquifer) elevation data collected during the first half of 2004.

A review of activities during this reporting period was conducted to identify notable results and events (listed below). Tables 2-1 through 2-5 provide an operational summary of the groundwater extraction well performance for the reporting period, as well as a summary of all pumping efforts accomplished to date. Figure 2-1 is an extraction and injection well location map. Figures 2-2 through 2-4 are updated uranium plume maps.

Data covered by this mid-year summary are available on the IEMP Data Information Site. Maps showing the locations of IEMP groundwater monitoring wells are also provided on the IEMP Data Information Site. All of these data sets are complete in accordance with sampling requirements identified in the IEMP, Revision 3.

2.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could impact, the scope of IEMP monitoring or remediation operations at the Fernald site. Notable results and events associated with IEMP groundwater monitoring data for the time period covered by this mid-year summary include:

- Waste Storage Area – Two notable results in the first half of 2004: (1) uranium concentrations continue to increase in Monitoring Well 2649 located next to the clearwell; and (2) the uranium concentration measured in Monitoring Well 2010, which is located east of the excavation site for Waste Pit 4, increased to a level just under the groundwater final remediation level (FRL).

- South Field Area – Four notable results in the first half of 2004: (1) the uranium concentration measured in Monitoring Well 2045 dramatically increased in the first half of 2004; (2) direct-push data collected along Willey Road indicate lower-than-expected uranium concentrations; (3) sampling for hexavalent chromium near the active re-injection wells indicates hexavalent chromium is present; but results obtained from filtered samples indicate that the hexavalent chromium is not dissolved in the groundwater; and (4) a high uranium concentration was measured at Monitoring Well 23280.

- Former Production Area – There was one notable result in the first half of 2004. Routine groundwater monitoring at Monitoring Well 2389 and direct-push groundwater sampling right next to Monitoring Well 2389 (Location 13317) indicated uranium concentrations are below the groundwater FRL.

- Analysis of how uranium is sorbed and partitioned on Great Miami Aquifer matrix sediments – Work on Phase II continued during the first half of 2004. The Phase I and Phase II reports were transmitted to EPA and OEPA on August 23, 2004.

- Conversion of the Advanced Wastewater Treatment (AWWT) facility – The decision was made to begin the conversion in September 2004.

- Decision to discontinue well-based re-injection – Well-based re-injection will be discontinued in September 2004.

- Plugging and abandonment of four groundwater monitoring wells.

More detailed information on these notable results and events follows.

Waste Storage Area

First Notable Result: Monitoring Well 2649 is located at the southeast corner of the clearwell (refer to Figure 2-3). Prior to 2003, the maximum uranium concentration measured at this well was 15.3 micrograms per liter (µg/L); it was an unfiltered sample collected on March 26, 2002. In 2003 concentrations of 35.2 µg/L and 34.7 µg/L were measured in filtered samples collected from the well. The increase was attributed to leakage from the clearwell. The unfiltered groundwater sample and duplicate sample collected on January 19, 2004 had measured uranium concentrations of 93.9 µg/L and 125 µg/L, respectively. The data from Monitoring Well 2649 will be considered in the design of the Waste Storage Area (Phase II) Groundwater Restoration Module, scheduled for completion in 2005.

Second Notable Result: Monitoring Well 2010 is located east of the excavation site for Waste Pit 4. As shown in Figure A.2-10 of the 2003 Site Environmental Report, uranium concentrations since 2001 have been well below the groundwater FRL of 30 µg/L. On January 19, 2004 a filtered groundwater sample collected from Well 2010 had a uranium concentration of 29.7 µg/L. If the second half 2004 sample also has a uranium concentration this high, direct-push sampling will be considered to further assess the area as part of the Waste Storage Area (Phase II) Design.

South Field Area

First Notable Result: Monitoring Well 2045 is located along the trailing edge of the 30 µg/L total uranium plume, south of the former southern waste units area. Prior to pumping in the South Field, uranium concentrations in this well were considerably above the groundwater FRL of 30 µg/L. Once active remediation began in 1998, the measured concentration was reduced for the most part down below

the groundwater FRL. Figure A.2-17 in the 2003 Site Environmental Report is a total uranium concentration versus time plot for Monitoring Well 2045. For the last few years, it appears that rising water levels in the first half of the year correspond to an increase in the dissolved uranium concentration measured at this location. The source for the increase is attributed to uranium partitioned to aquifer sediment in the vadose zone. High water levels saturate the sediments causing rebound of dissolved uranium concentrations in the water. This situation is common for pump-and-treat remediation operations. The total uranium plume contour shown in Figures 2-2 through 2-4 has been adjusted to honor the seasonal increased uranium data.

Second Notable Result: One location along Willey Road (Location 13319) was sampled using direct-push methods during the first half of 2004. This location is shown in Figure 2-2. The objective of the sampling was to determine if a lobe of the plume extended south of Willey Road at concentrations above 200 µg/L. The results indicated much lower uranium concentrations were actually present. The highest measured uranium concentration was 79.6 µg/L. The total uranium contour shown in Figures 2-2 through 2-4 has been adjusted to honor these new data.

Third Notable Result: In response to a comment on the 2002 Site Environmental Report, three monitoring wells (22301, 22302, and 22303) were sampled for hexavalent chromium in the first half of 2004. These three monitoring wells were scheduled to undergo routine IEMP sampling for hexavalent chromium in 2006, but were sampled in 2004 to alleviate concerns that hexavalent chromium was present in the aquifer as a result of re-injection operations. Samples were collected on Monday, January 27, 2004 and results were reported in the weekly conference call for the Aquifer Restoration/Wastewater Project for the week ending March 7, 2004.

No hexavalent chromium was detected at Monitoring Wells 22301 and 22302, but a concentration of 19.8 µg/L with a laboratory qualifier of "J" was detected at Monitoring Well 22303. All samples were unfiltered, with a turbidity of <5 neophelometric turbidity units (NTU). The method detection limit was 15 µg/L. The groundwater FRL for hexavalent chromium is 22 µg/L.

A confirmatory sampling of Monitoring Well 22303 was conducted on March 31, 2004 and results were reported in the weekly conference call for Aquifer Restoration/Wastewater Project for the week ending May 16, 2004. Nothing was detected in either the filtered sample or the filtered duplicate sample, but the unfiltered sample and the unfiltered duplicate sample (turbidity <5 NTU) had concentrations of 82.5 µg/L and 93.7 µg/L, respectively.

Sampling results indicate that hexavalent chromium is present in a solid phase on the aquifer grains. It does not appear, though, that the hexavalent chromium is oxidizing and becoming mobile because no hexavalent chromium was detected in the filtered sample and the filtered duplicate sample.

Fourth Notable Result: A uranium concentration of 700 µg/L was measured at Monitoring Well 23280 on March 8, 2004 in an unfiltered sample. (Monitoring Well 23280 is located in the former inactive flyash pile area.) A duplicate unfiltered sample, collected on the same day, had a measured concentration of 463 µg/L. The 463 µg/L uranium concentration is more representative of the uranium concentrations characterized for the area prior to the sampling event. Because of the inconclusive nature of these two samples, the 700 µg/L value is posted to the map, but contours were not adjusted to honor the high concentration. Results from the second half of 2004 will be used to confirm whether or not a change to the contours is needed.

Former Production Area

A project-specific plan to conduct direct-push groundwater sampling in the former production area was submitted to the EPA and OEPA for review on Monday March 8, 2004. Following approval of the plan by EPA and OEPA, work began on June 28, 2004.

The plan calls for conducting direct-push groundwater sampling slightly downgradient of any deep soil excavation/foundation removal (including the removal of perched groundwater) that comes within 5 feet of the base of the glacial overburden where above-FRL material was identified. These deep-excavation areas are of concern because they are potential pathways for contamination to reach the Great Miami Aquifer via infiltrating contaminated storm water or perched water during the excavation and prior to the deep excavation being plugged with compacted clay.

Data collected under this project-specific plan will be used to determine if any groundwater FRL exceedances for uranium or technetium-99 are present in the Great Miami Aquifer now that deep excavations are complete. These data will then factor into a decision to determine if additional groundwater remedy infrastructure is required in these areas to support site closure in 2006. Data will also be used to bolster the Great Miami Aquifer data set for on-site disposal facility leak detection purposes in the Great Miami Aquifer. Results of the sampling effort will be made available to EPA and OEPA through weekly conference calls and will be presented in the 2004 Site Environmental Report.

One location presented in the plan was sampled during the first half of 2004. Direct-push Location 13317 is next to Monitoring Well 2389. The maximum total uranium concentration measured at this direct-push location was 6.7 µg/L. The maximum technetium-99 concentration measured was 8 picoCuries per liter (pCi/L). A groundwater sample collected from Monitoring Well 2389 in the first half of 2004 had a uranium concentration of 17.8 µg/L. Based on the direct-push sampling data from Location 13317, the small uranium plume that was shown in the Plant 6 area in the 2003 Site Environmental Report is not depicted in this semiannual report.

Analysis of How Uranium is Sorbed and Partitioned on Great Miami Aquifer Matrix Sediments

As reported in the 2003 mid-year report, this analysis consists of two phases. Phase II work continued in the first half of 2004. In Phase II, desorption and dissolution kinetics are being investigated by conducting batch experiments using uranium contaminated aquifer sediments and Great Miami Aquifer groundwater spiked with varying levels of uranium. The objective of the work is to examine the rate at which uranium will be released from the sediments.

Additionally, microscopy studies on selected aquifer sediment samples are being conducted to assess how uranium is sequestered in the mineral structure. The primary focus is uranium associated with carbonate minerals and iron oxyhydroxide phases, and this assessment is being performed using a combination of high-resolution transmission electron microscopy and secondary ion mass spectrometry. The Phase I and Phase II reports were transmitted to EPA and OEPA on August 23, 2004.

Conversion of the AWWT

With site closure in 2006, several water treatment flows (remediation wastewater, sanitary wastewater, and storm water runoff) will be eliminated or reduced from the scope of the treatment operation. Elimination or reduction of these flow streams provides an opportunity to reduce the size of the water treatment facility that will remain to service the aquifer restoration after site closure. Reducing the size of the treatment facility prior to site closure in 2006 will reduce the amount of impacted materials that may need future off-site disposal while maintaining uranium discharge limits. The 1,800-gallons-per-minute (gpm) Phase III expansion system of the AWWT will remain, but about 90 percent of the existing facility footprint will be dismantled and placed in the on-site disposal facility. The subsequent placement of the affected debris and underlying soils in the on-site disposal facility will be completed to meet the 2006 site closure schedule, and result in a protective, more cost-effective long-term treatment facility to complete aquifer restoration.

EPA concurred on a path forward for the conversion process in a letter dated May 17, 2004. OEPA's conditional approval of a path forward for the conversion process was received in a letter dated June 3, 2004. Conversion is scheduled to begin in September 2004.

Decision to Discontinue Well-Based Re-Injection in September 2004

Groundwater modeling presented in the Comprehensive Groundwater Strategy Report (DOE 2003a) indicates that it would no longer be economically feasible to continue the use of well-based re-injection as a means of accelerating the aquifer remedy. Re-injection is scheduled for shutdown in September 2004 to facilitate the "carve down" of the AWWT into the converted AWWT (CAWWT). During CAWWT construction, groundwater treatment capacity will be limited and not enough treated groundwater will be available to support well-base re-injection. The decision has been made not to re-start re-injection after completion of the CAWWT. Instead, operations will proceed without well-based re-injection, and other operational strategies to enhance the aquifer remedy will be explored, such as inducing recharge to the Great Miami Aquifer through the Storm Sewer Outfall Ditch. A project-specific plan to address inducing recharge through the Storm Sewer Outfall Ditch was issued to EPA and OEPA in June 2004. Investigations involving recharge through the Storm Sewer Outfall Ditch are being planned for late 2004 or early 2005.

Plugging and Abandonment of Four Groundwater Monitoring Wells

Five groundwater monitoring wells (2006, 2007, 63121, 2053 and 3053) installed in the Great Miami Aquifer were plugged and abandoned during the first half of 2004. Well 63121 was sampled for total uranium and used to measure water levels under the IEMP, Revision 3. Wells 2006, 2007, 2053, and 3053 were not monitored under Revision 3 of the IEMP. These monitoring wells were in the way of soil remediation activities. The wells were sampled per the IEMP prior to being plugged and abandoned. The plugging and abandonment of Wells 2006 and 63121 were reported to the EPA and OEPA in the March 8 weekly report. The plugging and abandonment of Wells 2053 and 3053 were reported to the EPA and OEPA in the June 20 weekly report.

Updated Uranium Plume Map

In addition to the notable results discussed above, the maximum total uranium concentration map was updated using uranium concentration data collected through the first half of 2004. Figure 2-2 presents direct-push data that have been collected through June 2004. Figures 2-3 and 2-4 present the highest uranium concentration for each monitoring well that was sampled during the reporting period, and the average pumped water uranium concentration measured at each operating extraction well during the first half of 2004. Unfiltered sample results were normally posted for monitoring wells, but when the sample turbidity is high, filtered results are used. At a minimum, all direct-push samples are filtered through a 5-micron filter.

TABLE 2-1

AQUIFER RESTORATION SYSTEM OPERATIONAL SUMMARY SHEET

	Reporting Period					
	January 2004 through June 2004			August 1993 through June 2004		
	Gallons Pumped/Re-Injected (M gal)	Total Uranium Removed/Re-Injected (lbs)	Uranium Removal Index[a] (lbs/M gal)	Gallons Pumped/Re-injected (M gal)	Total Uranium Removed/Re-Injected (lbs)	Uranium Removal Index[a] (lbs/M gal)
South Field Extraction Module	776.485	357.4	0.46	6001.835	3549.34	0.59
Waste Storage Area Module[b]	259.443	126.5	0.49	1133.954	850.35	0.75
South Plume Module	365.372	78.6	0.22	8505.904	1826.27	0.21
Re-Injection Module	203.991	10.04	NA	1810.648	74.57	NA
Aquifer Restoration Systems Totals						
Extraction Wells	1401.30	562.5	0.40	15641.693	6225.96	0.40
(Re-Injection Wells)	203.991	10.04	NA	1810.648	74.57	NA
Net	1197.309	552.46	NA	13831.045	6151.39	NA

[a]NA = not applicable
[b]Waste Storage Area Module began operations on May 8, 2002.

TABLE 2-2

SOUTH FIELD (PHASE I) EXTRACTION MODULE OPERATIONAL SUMMARY SHEET (JANUARY THROUGH JUNE 2004)

Extraction Well[a,b]	33262[c] (EW-15a)	31567[d] (EW-17)	31550[e] (EW-18)	31560[f] (EW-19)	31561[g] (EW-20)	33298[h] (EW-21a)	32276 (EW-22)	32447 (EW-23)	32446[i] (EW-24)	33061[j] (EW-25)	33264[k] (EW-30)	33265[l] (EW-31)	33266[m] (EW-32)
	Baseline Remedial Strategy Report Target Pumping Rates (gpm)												
	NA	200	200	200	100	100	100	NA	NA	NA	NA	NA	NA
	Average Pumping Rates (gpm)												
January	199	243	196	173	200	176	263	215	209	245	299	301	201
February	176	227	197	187	188	195	268	219	214	298	297	299	198
March	183	199	178	170	185	200	274	236	209	298	292	301	198
April	193	233	174	170	194	165	236	212	190	223	289	291	194
May	198	239	192	191	191	208	296	266	258	285	282	255	196
June	199	188	200	200	200	234	304	290	280	299	303	298	186
Average	191	222	190	182	193	196	274	240	227	275	294	291	196
	Average Total Uranium Concentrations[n] (µg/L)												
January	63.4	27.0	40.2	45.0	37.5	49.0	63.7	89.1	60.2	42.4	125.6	29.0	25.4
February	62.1	27.6	43.2	46.7	36.9	50.9	66.6	94.1	58.4	47.4	123.3	30.0	24.0
March	67.6	30.1	47.6	45.6	36.6	51.8	69.5	92.8	60.0	45.5	124.1	29.4	24.2
April	62.5	29.2	47.2	44.9	36.5	54.2	69.1	89.8	62.2	46.9	122.3	29.0	23.3
May	57.9	27.0	47.6	44.0	34.2	52.6	63.5	81.6	57.7	47.0	112.3	27.5	21.4
June	66.2	28.3	47.7	44.3	36.6	56.5	64.1	87.6	57.4	41.0	114.7	30.5	21.4
Average	63.3	28.2	45.6	45.1	36.4	52.5	66.1	89.2	59.3	45.0	120.4	29.2	23.3
	Uranium Removal Index (Pounds of Total Uranium Removed/Million Gallons Pumped)												
January	0.53	0.23	0.34	0.38	0.31	0.41	0.53	0.74	0.50	0.35	1.05	0.24	0.21
February	0.52	0.23	0.36	0.39	0.31	0.42	0.56	0.79	0.49	0.40	1.03	0.25	NA
March	0.56	0.25	0.40	0.38	0.31	0.43	0.58	0.77	0.50	0.38	1.04	0.25	0.20
April	0.52	0.24	0.39	0.37	0.30	0.45	0.58	0.75	0.52	0.39	1.02	0.24	0.19
May	0.48	0.23	0.40	0.37	0.29	0.44	0.53	0.68	0.48	0.39	0.94	0.23	0.18
June	0.55	0.24	0.40	0.37	0.31	0.47	0.53	0.73	0.48	0.34	0.96	0.25	0.18
Average	0.53	0.24	0.38	0.38	0.30	0.44	0.55	0.74	0.50	0.38	1.00	0.24	0.19

TABLE 2-2
(Continued)

	Average Module Pumping Rate (gpm)	Water Pumped by Module (M gal)	Total Uranium Concentration from Module[o] (µg/L)
January	225	129.914	55.1
February	228	123.832	57.0
March	225	130.182	57.6
April	213	118.734	56.5
May	235	136.465	52.8
June	245	137.358	56.2
	Average 229	Total 776.485	Average 55.9

[a]Several South Field extraction wells are no longer operating. Well 31565 (EW-13) was removed from service on May 22, 2001. Well 31564 (EW-14) was removed from service on December 19, 2001. Well 31566 (EW-15) was removed from service on August 7, 1998. Well 31563 (EW-16) was removed from service on December 9, 2002. It

[b]All south field wells were down on April 25 due to a CG&E power outage.

[c]Well 33262 (EW-15a) was down February 28 to March 1 for maintenance and repairs, and March 4 to March 5 for chlorination.

[d]Well 31567 (EW-17) was down March 11 to March 16 for chlorination.

[e]Well 31550 (EW-18) was down March 19 to March 22 for chlorination, and May 1 due to a power outage.

[f]Well 31560 (EW-19) was down March 24 to March 28 for chlorination, and May 1 due to a power outage.

[g]Well 31561 (EW-20) was down March 28 to March 30 for chlorination.

[h]Well 33298 (EW-21a) was down March 6 to March 8 to reduce flow in order to investigate resin at the Parshall Flume, and from April 1 to April 3 for chlorination.

[i]Well 32446 (EW-24) was down March 6 to March 8 to reduce flow in order to investigate resin at the Parshall Flume.

[j]Well 33061 (EW-25) was down April 22 to April 30 for chlorination.

[k]Well 33264 (EW-30) was down May 17 to May 18 for chlorination.

[l]Well 33265 (EW-31) was down May 21 to May 25 for chlorination.

[m]Well 33266 (EW-32) was down June 16 to June 18 for chlorination.

[n]Average is from weekly measurements.

[o]Average is calculated from individual well total uranium concentrations and flow rates.

TABLE 2-3

SOUTH PLUME MODULE OPERATIONAL SUMMARY SHEET (JANUARY THROUGH JUNE 2004)

Extraction Well[a]	3924 (RW-1)[b]	3925 (RW-2)	3926 (RW-3)[c]	3927 (RW-4)[d]	32308 (RW-6)[d]	32309 (RW-7)
	Baseline Remedial Strategy Report Target Pumping Rates (gpm)					
	300	300	400	400	250	250
	Average Pumping Rates (gpm)					
January	300	296	288	355	124	124
February	267	309	278	348	122	122
March	286	309	255	324	203	203
April	296	293	40	279	269	262
May	297	290	0	266	250	225
June	291	289	0	252	148	148
Average	290	298	144	304	186	181
	Average Total Uranium Concentrations (µg/L)					
January	27.7	21.6	27.5	3.6	49.7	44.7
February	26.9	22.0	27.6	3.0	42.8	44.8
March	24.8	23.8	29.3	3.4	45.5	48.8
April	23.9	24.8	28.6	3.6	45.7	47.1
May	23.0	23.9	0.0	3.4	43.1	45.4
June	24.8	25.3	0.0	3.4	44.4	47.0
Average	25.2	23.6	18.8	3.4	45.2	46.3
	Uranium Removal Index (Pounds of Total Uranium Removed/Million Gallons Pumped)					
January	0.23	0.18	0.23	0.03	0.41	0.37
February	0.22	0.18	0.23	0.03	0.36	0.37
March	0.21	0.20	0.24	0.03	0.38	0.41
April	0.20	0.21	0.24	0.03	0.38	0.39
May	0.19	0.20	NA	0.03	0.36	0.38
June	0.21	0.21	NA	0.03	0.37	0.39
Average	0.21	0.20	0.24	0.03	0.38	0.39

TABLE 2-3
(Continued)

	Average Module Pumping Rate (gpm)	Water Pumped by Module (M gal)	Total Uranium Concentration From Module[e] (µg/L)
January	248	66.388	23.76
February	241	58.257	23.17
March	263	70.557	26.62
April	240	62.169	23.43
May	221	59.281	26.84
June	188	48.720	25.66
	234	365.372	24.9

[a]All recovery wells were shut down on April 25 due to a scheduled CG&E power outage.
[b]Recovery Well 1 was down February 26 to March 2 for chlorination.
[c]Recovery Well 3 was down April 6 to June 30 for rehabilitation.
[d]Recovery Wells 6 and 7 were down January 6 to January, February 1 to February 9, February 20 to March 11, April 10 to April 12, and May 25 to June 16 in order to meet discharge limits at the Parshall Flume.
[e]Average is calculated from individual well total uranium concentrations and flow rates.

TABLE 2-4

RE-INJECTION MODULE OPERATIONAL SUMMARY SHEET (JANUARY THROUGH JUNE 2004)

Re-Injection Well	33253 (IW-8a)	33254 (IW-9a)	22109 (IW-10)	33255 (IW-10a)	22240 (IW-11)	33063 (IW-16)	33263 (IW-29)
	Baseline Remedial Strategy Report Target Re-Injection Rates (gpm)						
	200	200	200	NA	200	NA	NA
	Average Re-Injection Rates (gpm)						
January[a]	82	84	80	86	77	86	51
February[a]	53	54	52	55	50	57	35
March[a]	130	132	128	133	127	86	86
April[b]	159	165	136	169	135	152	94
May[c]	167	172	162	177	161	174	111
June[d]	144	146	143	146	141	46	29
Average	123	126	117	128	115	100	68

	Average Module Re-Injection Rate (gpm)	Water Re-Injected By Module (M gal)	Total Uranium To Module[e] (µg/L)
January	61	24.367	7.20
February	39	14.842	8.50
March	91	36.695	6.25
April	112	43.618	7.42
May	125	50.140	4.72
June	88	34.330	3.46
	Average 86	Total 203.992	Average 6.26

[a]Re-Injection wells were down January 6 to January 23, February 1 to February 9, and February 17 to March 11 in order to meet discharge limits at the Parshall Flume.

[b]Re-Injection wells were down April 10 to April 12 due to a high uranium concentration in the expansion system discharge, and April 25 to April 27 due to a scheduled CG&E power outage. Wells IW-10, IW-11, IW-16, and IW-29 were down April 29 to April 30 to regenerate the 1800 system IX vessel.

[c]Re-injection wells were down May 1 to May 3 to facilitate the restart of the 1800 system after regeneration.

[d]Re-injection wells were down June 9 to June 16 to regenerate the 1800 system IX vessel, and Re-Injection Wells 16 and 29 were down June 17 to June 30 due to a failure of one of the re-injection pumps.

[e]Average is calculated from injectate treatment facility daily uranium concentrations and individual well injection rates.

TABLE 2-5

WASTE STORAGE AREA MODULE OPERATIONAL SUMMARY SHEET (JANUARY THROUGH JUNE 2004)

Extraction Well	32761 (EW-26)[a]	33062 (EW-27)[b]	33063 (EW-28)[c]
	Waste Storage Area Phase I Design Target Pumping Rates (gpm)		
	300	300	400
	Average Pumping Rates (gpm)		
January	298	381	339
February	298	396	336
March	235	313	361
April	288	385	303
May	288	318	395
June	267	356	386
Average	279	358	353
	Average Total Uranium Concentrations (µg/L)		
January	67.1	74.5	40.8
February	68.6	73.5	40.1
March	69.4	74.2	41.5
April	69.9	73.6	40.0
May	60.7	67.4	37.4
June	64.2	67.7	35.5
Average	66.7	71.8	39.2
	Uranium Removal Index (Pounds of Total Uranium Removed/Million Gallons Pumped)		
January	0.56	0.62	0.34
February	0.57	0.61	0.33
March	0.58	0.62	0.35
April	0.58	0.61	0.33
May	0.51	0.56	0.31
June	0.54	0.57	0.30
Average	1.18	1.65	1.46

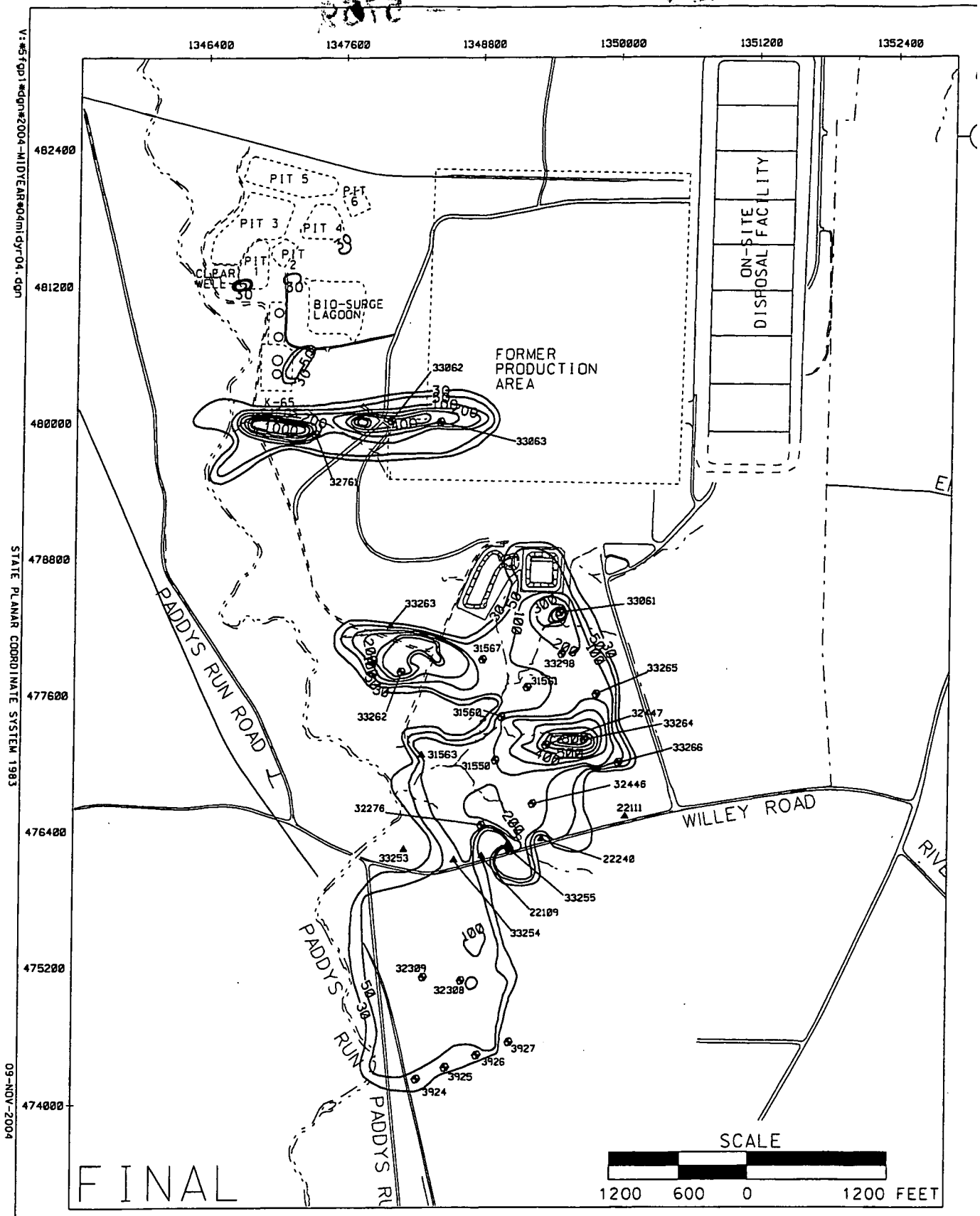
	Average Module Pumping Rate	Water Pumped by Module (M gal)	Total Uranium Concentration From Module[d] (µg/L)
January	339	45.301	61.1
February	343	43.068	61.9
March	303	40.457	59.9
April	325	42.270	61.5
May	334	44.736	52.0
June	366	43.611	54.4
	Average 335	Total 259.443	Average 58.5

[a]Recovery Well 26 was shut down March 2 to March 7, and June 8 to June 11 due to regeneration of the 1800 gpm system ion exchange vessel. Recovery Well 26 was shut down on May 4 for chlorination.

[b]Recovery Well 27 was shut down March 2, 2004 to March 7, and June 8 to June 11 due to regeneration of the 1800 gpm system ion exchange vessel. Extraction Well 27 was down May 6 to May 12 for chlorination.

[c]Recovery Well 28 was down April 28 to April 30 for maintenance.

[d]Average is calculated for individual well total uranium concentrations and flow rates.



LEGEND:

— · — · — FERNALD SITE BOUNDARY

—30— URANIUM CONTOURS BASED ON 30 μg/L FRL, MAXIMUM GEOPROBE RESULTS, AND MAXIMUM TOTAL URANIUM DATA THROUGH THE FIRST HALF OF 2004

⊙ EXTRACTION WELL

▲ INJECTION WELL

FIGURE 2-1. EXTRACTION AND INJECTION WELL LOCATION MAP

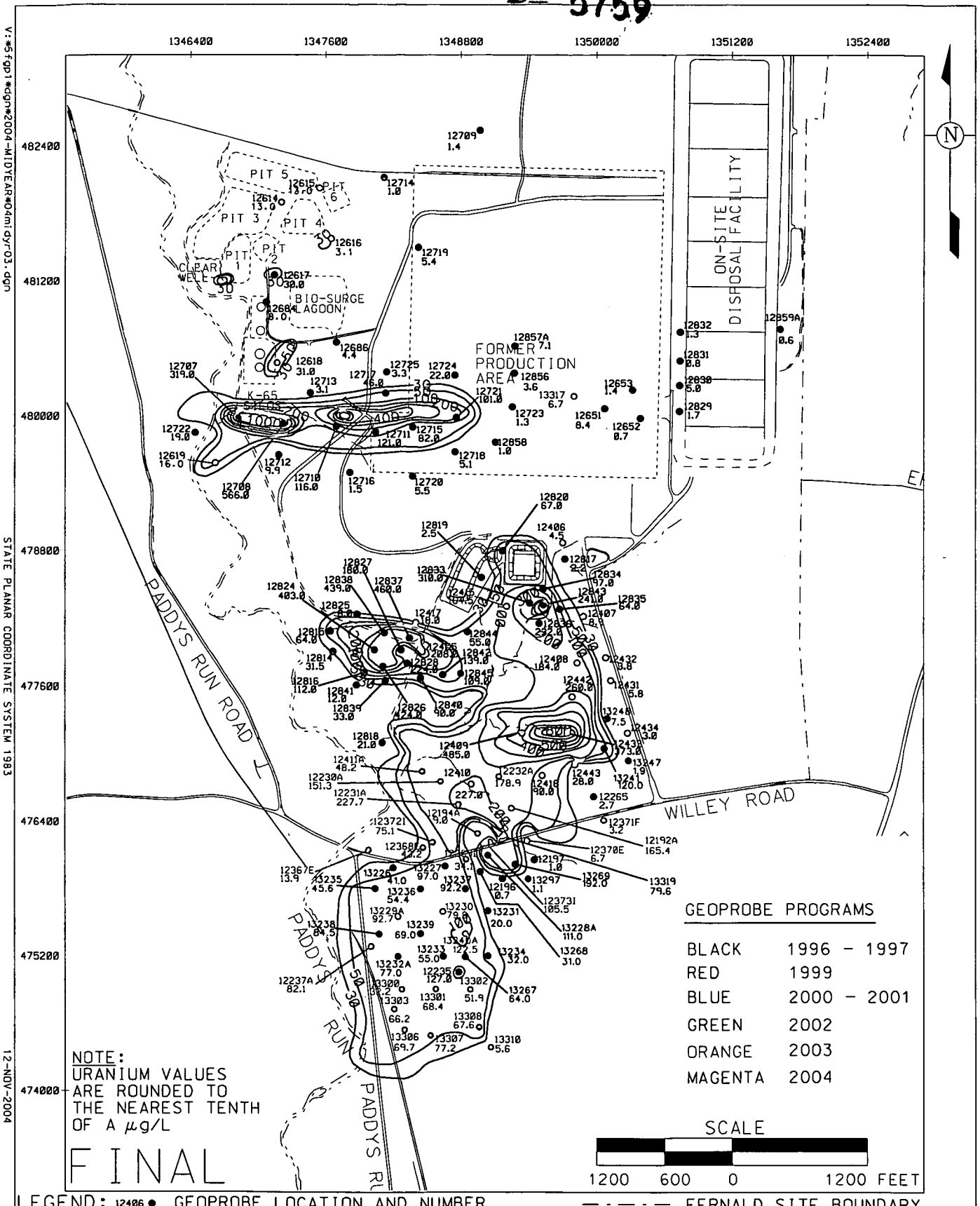
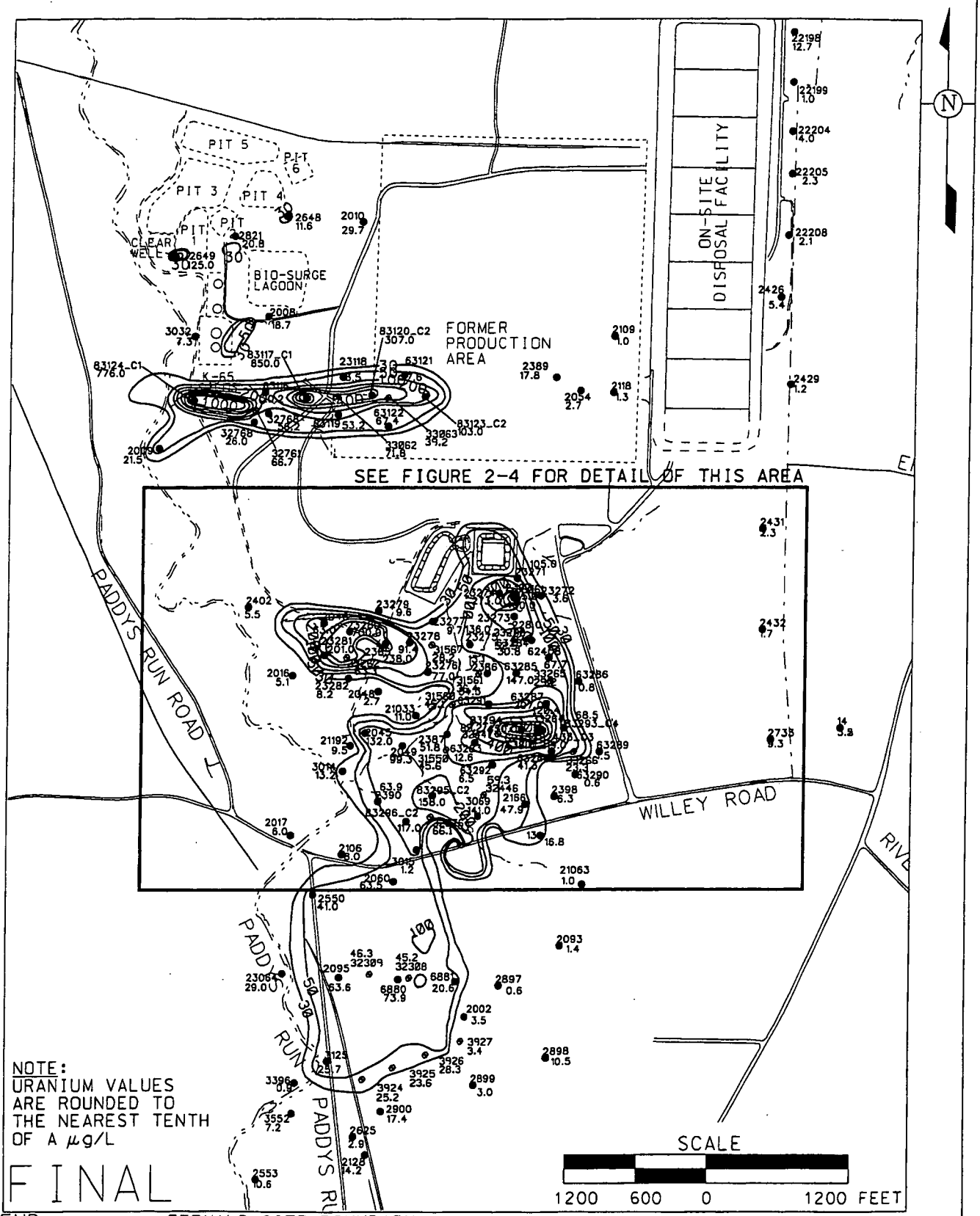


FIGURE 2-2. DIRECT-PUSH DATA AND MAXIMUM TOTAL URANIUM PLUME THROUGH THE FIRST HALF OF 2004



LEGEND: — · — · — FERNALD SITE BOUNDARY

5.1 TOTAL URANIUM CONCENTRATION MEASURED IN THE FIRST HALF OF 2004

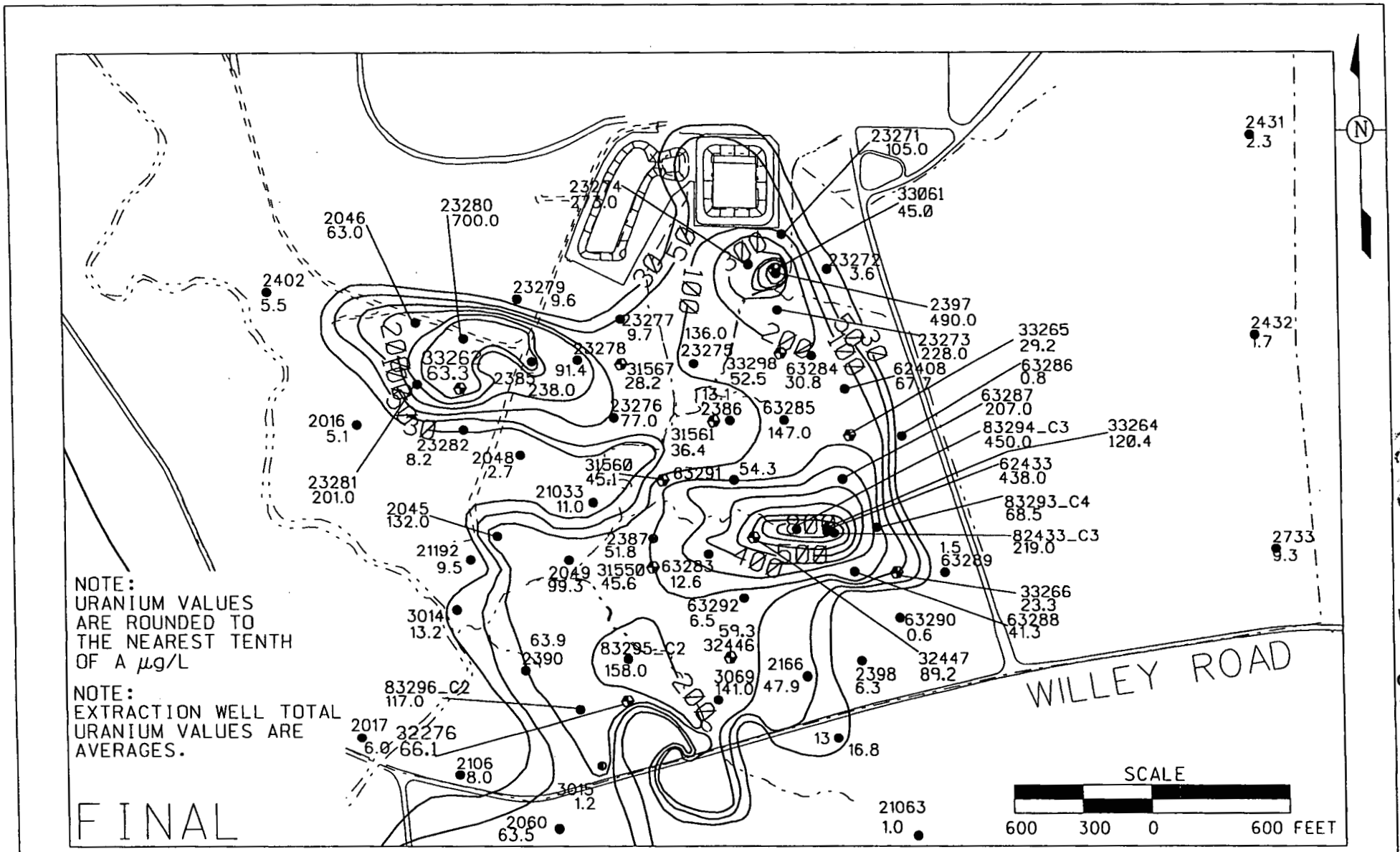
—— 30 —— URANIUM CONTOURS BASED ON 30 µg/L FRL, MAXIMUM, GEOPROBE RESULTS, AND MAXIMUM TOTAL URANIUM DATA THROUGH THE FIRST HALF OF 2004

● MONITORING WELL

⊗ EXTRACTION WELL

NOTE:
EXTRACTION WELL TOTAL URANIUM VALUES ARE AVERAGES.

FIGURE 2-3. MONITORING WELL DATA AND MAXIMUM TOTAL URANIUM PLUME THROUGH THE FIRST HALF OF 2004



V:\5fgp1\dgn\2004-MIDYEAR\04midyr02.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-4. MONITORING WELL DATA AND MAXIMUM TOTAL URANIUM PLUME IN SOUTH FIELD THROUGH THE FIRST HALF OF 2004

09-NOV-2004

3.0 ON-SITE DISPOSAL FACILITY MONITORING DATA

3.1 DATA COVERED

This IEMP mid-year data summary covers the on-site disposal facility monitoring data collected from January 1 through June 30, 2004. Specifically, data are discussed below or provided on the IEMP Data Information Site, including:

- Leak detection system (LDS) volumes and accumulation rates, and leachate collection system (LCS) volumes
- Perched water level data collected from the horizontal till wells for Cells 1 through 6, and Type 1 water level monitoring wells around Cell 1
- Analytical data.

These data sets are complete in accordance with sampling requirements identified in the On-Site Disposal Facility Groundwater/Leak Detection and Leachate Monitoring Plan (OSDF GWLMP) (DOE 1997) and subsequent agreements with the EPA and OEPA. The OSDF GWLMP Revision 1 was submitted in July 2004 to EPA and OEPA as part of Volume II of the Comprehensive Legacy Management and Institutional Controls Plan (DOE 2004). Figure 3-1 shows those on-site disposal facility locations monitored during the first half of 2004.

3.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the scope of on-site disposal facility leak detection monitoring or remediation operations at the Fernald site. Notable results and events associated with on-site disposal facility monitoring data covered by this mid-year report include the following:

- LDS Accumulation Rates: The January through June 2004 LDS accumulation rates with precipitation for Cells 1 through 6 are provided in Figures 3-2 through 3-7. The maximum accumulation rates for Cells 1 through 6 were 1.4, 0.2, 7.8, 22.7, and 16.1 percent, respectively, of the initial response leakage rate of 20 gallons per acre per day. Table 3-1 provides precipitation volumes that fell on Cell 6 during construction of the secondary and primary liners. The calculated volume that fell on Cell 6 during construction of the primary liner was 1,326,183 gallons. A portion of the water became trapped, as construction water, in the geosynthetic clay liner on top of the LDS and in the geotextile cushion within the LDS. The total water yield recorded for the Cell 6 LDS for January through June 2004 was 4,040 gallons. A similar analysis was provided in the 2003 IEMP mid-year report for Cells 4 and 5 when their respective liners were under construction. Although the liners for Cells 7 and 8 were under construction during the first half of 2004, no LDS data was available until after June 30, 2004. Consequently, a similar analysis of precipitation for Cells 7 and 8 will be provided in a future IEMP report.

- Baseline Sampling for Cells 4 through 8: Baseline sampling of the Great Miami Aquifer and horizontal till wells for Cells 4 through 6 continued through the reporting period. Baseline sampling of the Great Miami Aquifer began in January and March 2004 for Cells 7 and 8, respectively and baseline sampling of the horizontal till wells began in February and May 2004 for Cells 7 and 8, respectively.

- New Maximum Concentrations (refer to Tables 3-2 through 3-9): The data from the first half of 2004 indicate new maximum detected concentrations as follows:

Cell 1
Great Miami Aquifer – downgradient 22198
Total Uranium – 12.7 µg/L

Cell 2
LCS – 12339C
Boron – 2.29 mg/L
Total Uranium – 71.6 µg/L

Cell 3
LDS – 12340D
Boron – 0.557 mg/L
LCS – 12340C
Technetium-99 – 9.89 pCi/L
Total Organic Halogens – 0.0332 mg/L
Great Miami Aquifer – upgradient 22203
Sulfate – 735 mg/L

Cell 4
LCS – 12341C
Total Organic Carbon – 3.61 mg/L
Total Uranium – 110 µg/L
LDS – 12341D
Technetium-99 – 7.26 pCi/L
Total Uranium – 15.9 µg/L
Great Miami Aquifer – upgradient 22206
Sulfate – 559 mg/L

Cell 5
LCS – 12342C
Technetium-99 – 11.3 pCi/L
Total Organic Carbon – 2.23 mg/L
Total Uranium – 128 µg/L
LDS – 12342D
Total Uranium – 15.7 µg/L
Great Miami Aquifer – downgradient 22208
Sulfate – 503 mg/L
Total Uranium – 2.1 µg/L

Cell 6
HTW – 12343
Technetium-99 – 10.6 pCi/L
LCS – 12343C
Total Uranium – 93 µg/L
LDS – 12343D
Total Uranium – 6.11 µg/L
Great Miami Aquifer – downgradient 22210
Sulfate – 211 mg/L

There are no new maximums for Cells 7 and 8 because sampling began in 2004.

- Glacial Overburden Water Level Monitoring: Water level monitoring for the horizontal till wells associated with Cells 1 through 6 are shown in Figures 3-8 through 3-13. The horizontal till well water levels indicate that the perched water level remained below the secondary liners of Cells 1 through 6 during the reporting period. Additionally, there are five Type 1 well locations (13249, 13250, 13251, 13252, and 13261) around Cell 1, which are presented in Figure 3-14. Water level measurements have been monitored and stored electronically on an hourly basis; data for these locations are provided in Figures 3-15 through 3-19. The water levels from the Cell 1 network (including the horizontal till well for Cell 1) indicate that the perched water level beneath Cell 1 remained below the secondary liner during the reporting period. The 2004 water level data from the Cell 1 network further indicate that the drainage improvements completed on the west side of Cell 1 in early 2004 have been beneficial in maintaining the perched water levels below the liner in this area, therefore no additional actions to lower perched water levels in the vicinity of Cell 1 are planned.

A thorough review of the on-site disposal facility monitoring data covered by this mid-year data summary was conducted to identify the notable results as presented in associated tables and figures. All data covered by this mid-year summary are available on the IEMP Data Information Site.

TABLE 3-1

PRECIPITATION DURING CONSTRUCTION OF CELL 6 SECONDARY AND PRIMARY LINERS

Activity / Item		Cell 6
Secondary liner construction	Start: July 17, 2003 Finish: August 15, 2003	
Precipitation during construction (inches)		2.59
Cell area (acres)		6.45
Precipitation volume on cell during Construction (gallons)		452,545
Primary liner construction	Start: August 12, 2003 Finish: October 17, 2003	
Precipitation during construction (inches)		7.59
Cell area (acres)		6.45
Precipitation volume on cell during Construction (gallons)		1,326,183
Total precipitation volume on cell during secondary and primary liner construction periods (gallons)		1,778,728

ON-SITE DISPOSAL FACILITY CELL 1 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12338C)		LDS[c,d,e,f] (12338D)		HTW[c,d,e,f] (12338)		Great Miami Aquifer: Upgradient[c,d,e] (22201)		Great Miami Aquifer: Downgradient[c,d,e] (22198)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	23/26	ND to 123	21/25	ND to 80.9	35/46	ND to 12.2	32/41	ND to 59.7	28/40	ND to 52.5
	2/2	*26.4 to 37.9*	*1/2*	*ND to 7.67*	*1/2*	*ND to 4.25*	*1/2*	*ND to 2.87*	*1/2*	*ND to 1.37*
Total Organic Halogens (NA mg/L)	24/26	ND to 1.52	20/25	ND to 0.361	25/45	ND to 0.077	16/41	ND to 0.308	10/40	ND to 0.0526
	2/2	*0.178 to 0.477*	*1/2*	*ND to 0.0352*	*0/2*	*ND*	*0/2*	*ND*	*0/2*	*ND*
Boron (0.35 mg/L)	26/27	ND to 2.8	24/25	ND to 0.321	39/46	ND to 0.685	34/41	ND to 0.142	44/59	ND to 0.116
	1/2	*ND to 1.3*	*2/2*	*0.203 to 0.223*	*2/2*	*0.228 to 0.231*	*1/2*	*ND to 0.0935*	*1/2*	*ND to 0.0735*
Mercury (0.0020 mg/L)	2/20	ND to 0.00047	1/19	ND to 0.000072	0/38	ND	0/33	ND	0/52	ND
	0/1	*ND*	*0/1*	*ND*						
Technetium-99 (94 pCi/L)	5/20	ND to 18.28	1/19	ND to 8.92	7/38	ND to 21.1	1/33	ND to 13.41	2/52	ND to 14.8
	0/1	*ND*	*0/1*	*ND*						
Total Uranium (30 µg/L)	25/26	ND to 142.186	25/25	1.5 to 23.2	44/46	ND to 19	37/41	ND to 8.33	61/61	0.557 to 12.7
	2/2	*36.8 to 40.5*	*2/2*	*10.1 to 10.3*	*2/2*	*4.5 to 9.13*	*2/2*	*2.35 to 3.56*	*3/3*	*5.31 to 12.7*
Alpha-chlordane (2.0 µg/L)	0/20	ND	0/19	ND	0/38	ND	0/33	ND	0/34	ND
	0/1	*ND*	*0/1*	*ND*						
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/20	ND	0/19	ND	0/38	ND	0/33	ND	0/34	ND
	0/1	*ND*	*0/1*	*ND*						
Bromodichloromethane (100 µg/L)	0/21	ND	1/19	ND to 0.8	5/38	ND to 8	0/33	ND	0/34	ND
	0/1	*ND*	*0/1*	*ND*						
Carbazole (11 µg/L)	0/20	ND	0/19	ND	0/38	ND	0/33	ND	0/34	ND
	0/1	*ND*	*0/1*	*ND*						
1,1-Dichloroethene (7.0 µg/L)	0/21	ND	0/19	ND	0/38	ND	0/33	ND	0/34	ND
	0/1	*ND*	*0/1*	*ND*						
1,2-Dichloroethene (total) (NA µg/L)	0/19	ND	0/19	ND	0/38	ND	0/33	ND	0/33	ND
	0/1	*ND*	*0/1*	*ND*						

TABLE 3-2
(Continued)

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12338C)		LDS[c,d,e,f] (12338D)		HTW[c,d,e,f] (12338)		Great Miami Aquifer: Upgradient[c,d,e] (22201)		Great Miami Aquifer: Downgradient[c,d,e] (22198)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
4-Nitroaniline (NA; µg/L)	1/20	ND to 1.01[h]	0/19	ND	0/38	ND	0/33	ND	0/33	ND
	0/1	*ND*	*0/1*	*ND*						
Tetrachloroethene (NA; µg/L)	0/21	ND	0/19	ND	0/38	ND	1/33	ND to 1	0/33	ND
	0/1	*ND*	*0/1*	*ND*						
Trichloroethene (5.0 µg/L)	0/21	ND	0/19	ND	0/38	ND	0/33	ND	0/52	ND
	0/1	*ND*	*0/1*	*ND*						
Vinyl Chloride (2.0 µg/L)	0/21	ND	0/19	ND	0/38	ND	0/33	ND	0/34	ND
	0/1	*ND*	*0/1*	*ND*						

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[g]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[h]This result represents a detect below the contract required detection limit. All other results have been non-detected.

TABLE 3-3

ON-SITE DISPOSAL FACILITY CELL 2 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	LCS[c,d,e,fg] (12339C)		LDS[c,d,e,f] (12339D)		HTW[c,d,e,f] (12339)		Great Miami Aquifer: Upgradient[c,d,e] (22200)		Great Miami Aquifer: Downgradient[c,d,e] (22199)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	12/23	ND to 6.25	15/23	ND to 26.1	31/44	ND to 11.1	29/36	ND to 47.6	24/36	ND to 51.8
	1/2	***ND to 2.3***	***0/2***	***ND***	***1/2***	***ND to 2.06***	***2/2***	***1.28 to 3.1***	***1/2***	***ND to 1.5***
Total Organic Halogens (NA mg/L)	5/23	ND to 0.0576	8/23	ND to 0.0205	31/44	ND to 0.101	14/36	ND to 0.177	10/36	ND to 0.0386
	0/2	***ND***	***0/2***	***ND***	***1/2***	***ND to 0.0152***	***0/2***	***ND***	***0/2***	***ND***
Boron (0.33 mg/L)	23/24	ND to 2.29	23/23	0.289 to 2.22	32/44	ND to 0.0829	25/36	ND to 0.158	26/36	ND to 0.0579
	2/2	***1.77 to 2.29***	***2/2***	***0.398 to 0.865***	***2/2***	***0.068 to 0.071***	***1/2***	***ND to 0.0562***	***1/2***	***ND to 0.0478***
Mercury (0.0020 mg/L)	0/17	ND	0/17	ND	2/35	ND to 0.00025	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
Technetium-99 (94 pCi/L)	1/17	ND to 21.25	1/17	ND to 15.99	5/37	ND to 12	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
Total Uranium (30 µg/L)	23/23	4.51 to 71.6	23/23	8.69 to 71	43/44	ND to 7.34	23/36	ND to 1.11	37/38	ND to 12.1
	2/2	***64.5 to 71.6***	***2/2***	***17.7 to 22.3***	***1/1***	***7.34***	***2/2***	***0.326 to 0.568***	***3/3***	***0.481 to 0.954***
Alpha-chlordane (2.0 µg/L)	0/17	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/17	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
Bromodichloromethane (100 µg/L)	0/18	ND	0/17	ND	1/36	ND to 0.4[h]	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
Carbazole (11 µg/L)	0/16	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
1,1-Dichloroethene (7.0 µg/L)	0/18	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						
1,2-Dichloroethene (total) (NA µg/L)	0/17	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	***ND***	***0/1***	***ND***						

TABLE 3-3
(Continued)

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12339C)		LDS[c,d,e,f] (12339D)		HTW[c,d,e,f] (12339)		Great Miami Aquifer: Upgradient[c,d,e] (22200)		Great Miami Aquifer: Downgradient[c,d,e] (22199)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
4-Nitroaniline (NA µg/L)	0/17	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	*ND*	*0/1*	*ND*						
Tetrachloroethene (5.0 µg/L)	0/18	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	*ND*	*0/1*	*ND*						
Trichloroethene (5.0 µg/L)	0/18	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	*ND*	*0/1*	*ND*						
Vinyl Chloride (2.0 µg/L)	0/18	ND	0/17	ND	0/36	ND	0/28	ND	0/28	ND
	0/1	*ND*	*0/1*	*ND*						

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[g]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[h]This result represents a detect below the contract required detection limit. All other results have been non-detected.

ON-SITE DISPOSAL FACILITY CELL 3 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12340C)		LDS[c,d,e,f] (12340D)		HTW[c,d,e,f] (12340)		Great Miami Aquifer: Upgradient[c,d,e] (22203)		Great Miami Aquifer: Downgradient[c,d,e] (22204)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	10/20	ND to 34.2	3/7	ND to 7.94	22/39	ND to 9.81	17/34	ND to 14.1	35/34	ND to 8.83
	1/2	***ND to 1.83***	*1/2*	***ND to 7.77***	*1/2*	***ND to 2.27***	*1/2*	***ND to 1.6***	*1/2*	***ND to 1.5***
Total Organic Halogens (NA mg/L)	4/20	ND to 0.178	2/7	ND to 0.0332	31/39	ND to 0.158	14/34	ND to 0.213	9/35	ND to 0.165
	1/2	***ND to 0.00374***	*1/2*	***ND to 0.0332***	*1/2*	***ND to 0.0132***	*0/2*	***ND***	*0/2*	***ND***
Boron (0.33 mg/L)	20/21	ND to 2.87	7/7	0.188 to 0.557	34/38	ND to 0.24	22/34	ND to 0.0776	24/34	ND to 0.179
	2/2	***1.74 to 2.7***	*2/2*	***0.188 to 0.557***	*2/2*	***0.0896 to 0.1***	*0/2*	***ND***	*1/2*	***ND to 0.0401***
Mercury (0.0020 mg/L)	0/14	ND	0/2	ND	1/30	ND to 0.00026	0/27	ND	2/26	ND to 0.00028
	0/1	***ND***	*0/1*	***ND***			*0/1*	***ND***		
Technetium-99 (94 pCi/L)	2/15	ND to 9.89	0/2	ND	2/30	ND to 38.35	1/26	ND to 8.438	0/26	ND
	1/2	***ND to 3.84***	*0/1*	***ND***						
Total Uranium (30 µg/L)	20/20	9.27 to 83.7	7/7	15.1 to 27.3	36/38	ND to 29.3	29/34	ND to 7.92	34/36	ND to 5.924
	2/2	***49 to 59.4***	*2/2*	***20 to 20.6***	*2/2*	***23.9 to 28.3***	*2/2*	***1.48 to 2.22***	*3/3*	***2.92 to 4.03***
Alpha-chlordane (2.0 µg/L)	0/14	ND	0/2	ND	0/31	ND	0/26	ND	0/26	ND
	0/1	***ND***	*0/1*	***ND***						
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/14	ND	0/2	ND	0/31	ND	0/26	ND	0/26	ND
	0/1	***ND***	*0/1*	***ND***						
Bromodichloromethane (100 µg/L)	1/15	ND to 0.5[h]	0/2	ND	0/30	ND	0/26	ND	0/26	ND
	0/1	***ND***	*0/1*	***ND***						
Carbazole (11 µg/L)	0/14	ND	0/2	ND	0/31	ND	0/26	ND	0/26	ND
	0/1	***ND***	*0/1*	***ND***						
1,1-Dichloroethene (7.0 µg/L)	1/15	ND to 1.3[h]	0/2	ND	0/30	ND	0/26	ND	0/26	ND
	1/1	***1.3***[h]	*0/1*	***ND***						
1,2-Dichloroethene (total) (NA µg/L)	0/13	ND	0/2	ND	0/30	ND	0/26	ND	0/26	ND
	0/1	***ND***	*0/1*	***ND***						

TABLE 3-4
(Continued)

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12340C)		LDS[c,d,e,f] (12340D)		HTW[c,d,e,f] (12340)		Great Miami Aquifer: Upgradient[c,d,e] (22203)		Great Miami Aquifer: Downgradient[c,d,e] (22204)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
4-Nitroaniline (NA µg/L)	0/14	ND	0/2	ND	0/31	ND	0/26	ND	0/26	ND
	0/1	*ND*	*0/1*	*ND*						
Tetrachloroethene (5.0 µg/L)	0/15	ND	0/2	ND	0/30	ND	0/26	ND	0/26	ND
	0/1	*ND*	*0/1*	*ND*						
Trichloroethene (5.0 µg/L)	0/15	ND	0/2	ND	0/30	ND	0/26	ND	0/26	ND
	0/1	*ND*	*0/1*	*ND*						
Vinyl Chloride (2.0 µg/L)	0/15	ND	0/2	ND	0/30	ND	0/26	ND	0/26	ND
	0/1	*ND*	*0/1*	*ND*						

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[g]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[h]This result represents a detect below the contract required detection limit. All other results have been non-detected.

TABLE 3-5

ON-SITE DISPOSAL FACILITY CELL 4 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12341C)		LDS[c,d,e,f] (12341D)		HTW[c,d,e,f] (12341)		Great Miami Aquifer: Upgradient[c,d,e] (22206)		Great Miami Aquifer: Downgradient[c,d,e] (22205)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	2/5	ND to 3.61	3/6	ND to 8	10/18	ND to 4.42	13/22	ND to 9.84	11/22	ND to 4.43
	1/2	***ND to 3.61***	*1/2*	***ND to 4.42***	*3/3*	***1.99 to 2.84***	*3/3*	***0.875 to 1.51***	*3/3*	***1.32 to 1.93***
Total Organic Halogens (NA mg/L)	2/5	ND to 0.0126	4/6	ND to 0.0282	12/18	ND to 0.0193	6/22	ND to 0.0132	3/22	ND to 0.016
	1/2	***ND to 0.00392***	*1/2*	***ND to 0.0108***	*1/3*	***ND to 0.00376***	*1/3*	***ND to 0.00184***	*0/3*	***ND***
Boron (0.33 mg/L)	5/5	0.0626 to 0.767	6/6	0.951 to 1.81	17/18	ND to 1.55	20/22	ND to 0.0577	18/22	ND to 0.0586
	2/2	***0.0788 to 0.245***	*2/2*	***0.951 to 1***	*3/3*	***0.137 to 0.14***	*3/3*	***0.0397 to 0.0434***	*2/3*	***ND to 0.0453***
Mercury (0.0020 mg/L)	0/5	ND	0/6	ND	0/18	ND	1/22	ND to 0.0167	3/22	ND to 0.000153
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*1/3*	***ND to 0.000098***
Technetium-99 (94 pCi/L)	4/5	ND to 37.8	1/6	ND to 7.26	0/18	ND	0/22	ND	0/22	ND
	2/2	***8.16 to 8.82***	*1/2*	***ND to 7.26***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***
Total Uranium[i] (30 µg/L)	5/5	4.41 to 110	6/6	5.74 to 15.9	18/18	4.89 to 7.91	20/22	ND to 5.78	24/24	0.446 to 19.7
	2/2	***55.5 to 110***	*2/2*	***12.8 to 15.9***	*3/3*	***7.2 to 7.89***	*2/3*	***ND to 4.67***	*4/4*	***0.901 to 2.25***
Alpha-chlordane (2.0 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	1/22	ND to 0.085
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***
Bromodichloromethane (100 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***
Carbazole (1 µg/L)	0/5	ND	0/6	ND	2/18	ND to 3.66	0/22	ND	1/22	ND to 0.07[h]
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***
1,1-Dichloroethene (7.0 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***
1,2-Dichloroethene (total) (NA µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	***ND***	*0/2*	***ND***	*0/3*	***ND***	*0/3*	***ND***	*0/3*	***ND***

TABLE 3-5
(Continued)

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12341C)		LDS[c,d,e,f] (12341D)		HTW[c,d,e,f] (12341)		Great Miami Aquifer: Upgradient[c,d,e] (22206)		Great Miami Aquifer: Downgradient[c,d,e] (22205)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
4-Nitroaniline (NA µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Tetrachloroethene (5.0 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Trichloroethene (5.0 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Vinyl Chloride (2.0 µg/L)	0/5	ND	0/6	ND	0/18	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[g]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[h]This result represents a detect below the contract required detection limit. All other results have been non-detected.

TABLE 3-6

ON-SITE DISPOSAL FACILITY CELL 5 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12342C)		LDS[c,d,e,f] (12342D)		HTW[c,d,e,f] (12342)		Great Miami Aquifer: Upgradient[c,d,e] (22207)		Great Miami Aquifer: Downgradient[c,d,e] (22208)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	1/7	ND to 2.23	3/5	ND to 5.32	11/19	ND to 5.85	11/22	ND to 4.15	12/22	ND to 14.2
	1/2	***ND to 2.23***	***1/1***	***2.63***	***3/3***	***1.87 to 3.14***	***1/3***	***ND to 1.58***	***2/3***	***ND to 1.4***
Total Organic Halogens (NA mg/L)	2/7	ND to 0.0118	1/5	ND to 0.0103	11/19	ND to 0.0186	6/22	ND to 0.015	2/22	ND to 0.014
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***1/3***	***ND to 0.00198***	***0/3***	***ND***
Boron (0.33 mg/L)	6/7	ND to 0.745	5/5	0.94 to 1.2	18/19	ND to 0.275	18/22	ND to 0.0692	16/22	ND to 0.0717
	1/2	***ND to 0.171***	***1/1***	***1.09***	***3/3***	***0.112 to 0.156***	***2/3***	***ND to 0.04***	***1/3***	***ND to 0.0381***
Mercury (0.0020 mg/L)	0/7	ND	0/5	ND	0/19	ND	3/22	ND to 0.000523	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
Technetium-99 (94 pCi/L)	5/7	ND to 11.3	0/5	ND	2/19	ND to 9.68	0/22	ND	1/22	ND to 12.8
	2/2	***9.27 to 11.3***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
Total Uranium (30 µg/L)	7/7	3.39 to 128	5/5	2.93 to 15.7	19/19	10.3 to 21.1	19/22	ND to 4.48	16/24	ND to 2.1
	2/2	***84 to 128***	***1/1***	***15.7***	***3/3***	***11.2 to 13.9***	***2/3***	***ND to 0.576***	***1/4***	***ND to 2.1***
Alpha-chlordane (2.0 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
Bromodichloromethane (100 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
Carbazole (1.1 µg/L)	0/7	ND	0/5	ND	1/19	ND to 0.052[h]	0/22	ND	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
1,1-Dichloroethene (7.0 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***
1,2-Dichloroethene (total) (NA µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	***ND***	***0/1***	***ND***	***0/3***	***ND***	***0/3***	***ND***	***0/3***	***ND***

TABLE 3-6
(Continued)

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12342C)		LDS[c,d,e,f] (12342D)		HTW[c,d,e,f] (12342)		Great Miami Aquifer: Upgradient[c,d,e] (22207)		Great Miami Aquifer: Downgradient[c,d,e] (22208)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
4-Nitroaniline (NA (µg/L)	0/7	ND	1/5	ND TO 11.2	0/19	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/1*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Tetrachloroethene (5.0 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/1*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Trichloroethene (5.0 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/1*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Vinyl Chloride (2.0 µg/L)	0/7	ND	0/5	ND	0/19	ND	0/22	ND	0/22	ND
	0/2	*ND*	*0/1*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[g]The LCS is also sampled for nitrate/nitrite and total dissolved solids.
[h]This result represents a detect below the contract required detection limit. All other results have been non-detected.

TABLE 3-7

ON-SITE DISPOSAL FACILITY CELL 6 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only.
Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12343C)		LDS[c,d,e,f] (12343D)		HTW[c,d,e,f] (12343)		Great Miami Aquifer: Upgradient[c,d,e] (22209)		Great Miami Aquifer: Downgradient[c,d,e] (22210)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	3/4	ND to 25.4	1/3	ND to 6.71	7/13	ND to 3.72	4/16	ND to 1.24	3/16	ND to 1.66
	1/2	***ND to 2.22***	*0/2*	*ND*	*3/3*	***1.81 to 3.24***	*0/3*	*ND*	*0/3*	*ND*
Total Organic Halogens (NA mg/L)	2/4	ND to 0.0159	1/3	ND to 0.0212	9/13	ND to 0.0187	2/16	ND to 0.0171	1/16	ND to 0.0126
	1/2	***ND to 0.0021***	*0/2*	*ND*	*1/3*	***ND to 0.00706***	*0/3*	*ND*	*0/3*	*ND*
Boron (0.33 mg/L)	4/27	40.0566 to 0.624	3/3	0.638 to 1.22	12/13	ND to 0.116	13/16	ND to 0.0402	13/16	ND to 0.0416
	2/2	***0.0566 to 0404***	*2/2*	***0.638 to 0.755***	*3/3*	***0.0904 to 0.116***	*3/3*	***0.0345 to 0.0395***	*3/3*	***0.0338 to 0.0347***
Mercury (0.0020 mg/L)	1/4	ND to 0.000338	2/3	ND to 0.000178	0/13	ND	4/16	ND to 0.000132	1/16	ND to 0.000078
	0/2	*ND*	*1/2*	***ND to 0.0001***	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Technetium-99 (94 pCi/L)	2/4	ND to 8.79	0/3	ND	1/13	ND to 10.6	0/16	ND	1/16	ND to 6.61
	1/2	***ND to 6.54***	*0/2*	*ND*	*1/3*	***ND to 10.6***	*0/3*	*ND*	*0/3*	*ND*
Total Uranium (30 µg/L)	4/4	8.03 to 93	3/3	3.1 to 6.11	12/13	ND to 10.9	12/16	ND to 2.38	13/16	ND to 1.02
	2/2	***54.4 to 93***	*2/2*	***5.53 to 6.11***	*3/3*	***8.95 to 9.79***	*1/3*	***ND to 0.723***	*2/3*	***ND to 0.696***
Alpha-chlordane (2.0 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Bromodichloromethane (100 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Carbazole (11 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
1,1-Dichloroethene (7.0 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
1,2-Dichloroethene (total) (NA µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*

TABLE 3-7
(Continued)

Constituent (FRL)[a,b]	LCS[c,d,e,f,g] (12343C)		LDS[c,d,e,f] (12343D)		HTW[c,d,e,f] (12343)		Great Miami Aquifer			
							Upgradient[c,d,e] (22209)		Downgradient[c,d,e] (22210)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
4-Nitroaniline (NA µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Tetrachloroethene (5.0 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Trichloroethene (5.0 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*
Vinyl Chloride (2.0 µg/L)	0/4	ND	0/3	ND	0/13	ND	0/16	ND	0/16	ND
	0/2	*ND*	*0/2*	*ND*	*0/3*	*ND*	*0/3*	*ND*	*0/3*	*ND*

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]LCS = leachate collection system; LDS = leak detection system; HTW = horizontal till well
[g]The LCS is also sampled for nitrate/nitrite and total dissolved solids.

TABLE 3-8

ON-SITE DISPOSAL FACILITY CELL 7 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only. Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	Great Miami Aquifer					
	HTW[c,d,e,f] (12344)		Upgradient[c,d,e] (22212)		Downgradient[c,d,e] (22211)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	4/5	ND to 3.34	2/6	ND to 1.42	2/6	ND to 2.15
	4/5	***ND to 3.34***	***2/6***	***ND to 1.42***	***2/6***	***ND to 2.15***
Total Organic Halogens (NA mg/L)	1/5	ND to 0.013	0/6	ND	0/6	ND
	1/5	***ND to 0.013***	***0/6***	***ND***	***0/6***	***ND***
Boron (0.33 mg/L)	3/4	ND to 0.0343	5/6	ND to 0.0402	3/6	ND to 0.0363
	3/4	***ND to 0.0343***	***5/6***	***ND to 0.0402***	***3/6***	***ND to 0.0363***
Mercury (0.0020 mg/L)	1/4	ND to 0.000088	2/6	ND to 0.000098	0/6	ND
	1/4	***ND to 0.000088***	***2/6***	***ND to 0.000098***	***0/6***	***ND***
Technetium-99 (94 pCi/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***
Total Uranium (30 µg/L)	5/5	0.674 to 3.65	5/6	ND to 3.41	3/6	ND to 0.751
	5/5	***0.674 to 3.65***	***5/6***	***ND to 3.41***	***3/6***	***ND to 0.751***
Alpha-chlordane (2.0 µg/L)	0/3	ND	0/6	ND	0/6	ND
	0/3	***ND***	***0/6***	***ND***	***0/6***	***ND***
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/4	ND	0/6	ND	0/6	ND
	0/4	***ND***	***0/6***	***ND***	***0/6***	***ND***
Bromodichloromethane (100 µg/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***
Carbazole (11 µg/L)	0/4	ND	0/6	ND	0/6	ND
	0/4	***ND***	***0/6***	***ND***	***0/6***	***ND***
1,1-Dichloroethene (7.0 µg/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***
1,2-Dichloroethene (total) (NA µg/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***
4-Nitroaniline (NA µg/L)	0/4	ND	0/6	ND	0/6	ND
	0/4	***ND***	***0/6***	***ND***	***0/6***	***ND***
Tetrachloroethene (NA µg/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***
Trichloroethene (5.0 µg/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***
1,2-Dichloroethene (total) (NA µg/L)	0/5	ND	0/6	ND	0/6	ND
	0/5	***ND***	***0/6***	***ND***	***0/6***	***ND***

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]HTW = horizontal till well

TABLE 3-9

ON-SITE DISPOSAL FACILITY CELL 8 DATA SUMMARY FOR MID-YEAR 2004

Note: Non-italicized pertains to total number of samples. ***Italicized/bold*** pertains to samples collected January to June 2004 only. Shading indicates at least one detection for that constituent at that location.

Constituent (FRL)[a,b]	HTW[c,d,e,f] (12345)		Great Miami Aquifer: Upgradient[c,d,e] (22213)		Great Miami Aquifer: Downgradient[c,d,e] (22214)	
	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range	No. of Samples with Detections / No. of Samples	Range
Total Organic Carbon (NA mg/L)	0/1	ND	3/4	ND to 3.77	3/4	ND to 3.28
	0/1	*ND*	*3/4*	*ND to 3.77*	*3/4*	*ND to 3.28*
Total Organic Halogens (NA mg/L)	1/1	0.0612	0/4	ND	0/4	ND
	1/1	*0.0612*	*0/4*	*ND*	*0/4*	*ND*
Boron (0.33 mg/L)	1/1	0.0768	3/4	ND to 0.0387	2/4	ND to 0.0327
	1/1	*0.0768*	*3/4*	*ND to 0.0387*	*2/4*	*ND to 0.0327*
Mercury (0.0020 mg/L)	0/1	ND	2/4	ND to 0.000085	1/4	ND to 0.000085
	0/1	*ND*	*2/4*	*ND to 0.000085*	*1/4*	*ND to 0.000085*
Technetium-99 (94 pCi/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
Total Uranium (30 µg/L)	1/1	5.54	0/4	ND	3/4	ND to 0.727
	1/1	*5.54*	*0/4*	*ND*	*3/4*	*ND to 0.727*
Alpha-chlordane (2.0 µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
Bis(2-chloroisopropyl)ether (5.0 µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
Bromodichloromethane (100 µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
Carbazole (11 µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
1,1-Dichloroethene (7.0 µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
1,2-Dichloroethene (total) (NA µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
4-Nitroaniline (NA µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
Tetrachloroethene (NA µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
Trichloroethene (5.0 µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*
1,2-Dichloroethene (total) (NA µg/L)	0/1	ND	0/4	ND	0/4	ND
	0/1	*ND*	*0/4*	*ND*	*0/4*	*ND*

[a]From Operable Unit 5 Record of Decision, Table 9-4
[b]NA = not applicable
[c]If there was more than one sample result per day (e.g., a duplicate sample), then only the maximum sample concentration was counted and compared to the FRL.
[d]Rejected data qualified with either an R or Z were not used in this comparison.
[e]ND = not detected
[f]HTW = horizontal till well

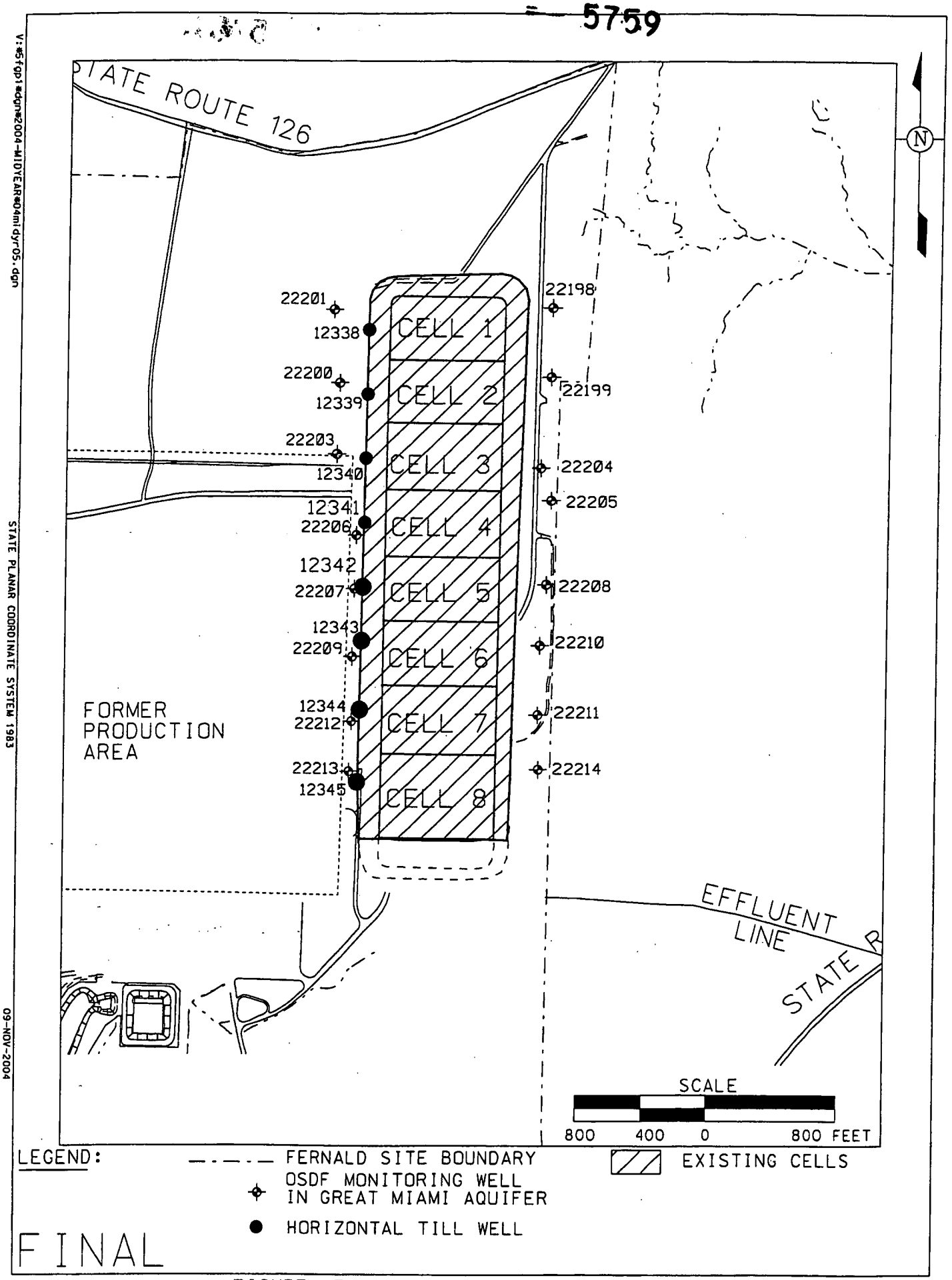


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FIGURE 3-1. ON-SITE DISPOSAL FACILITY FOOTPRINT AND MONITORING WELL LOCATIONS

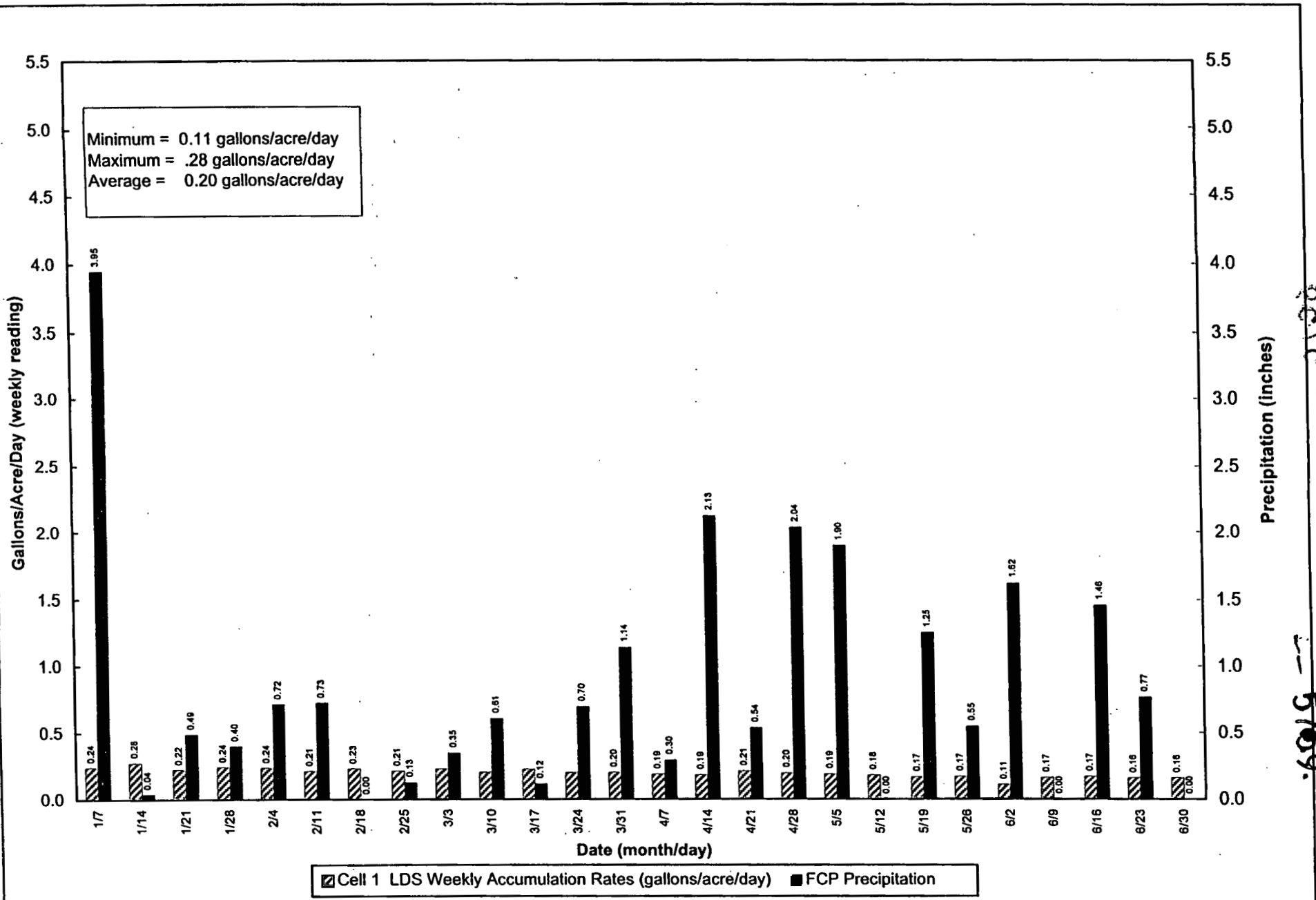

FIGURE 3-2. ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 1, JANUARY THROUGH JUNE 2004

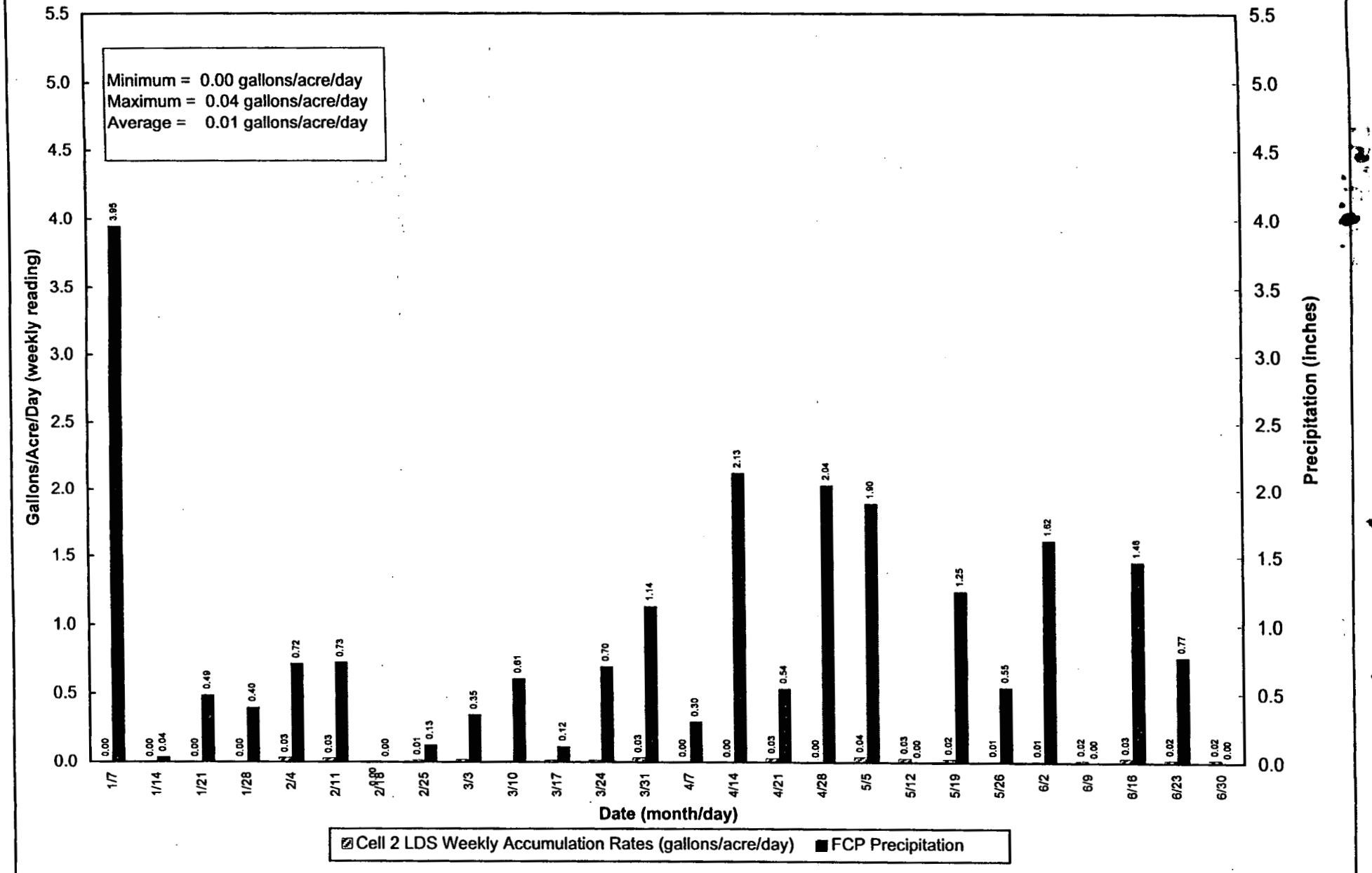

FIGURE 3-3. ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 2, JANUARY THROUGH JUNE 2004

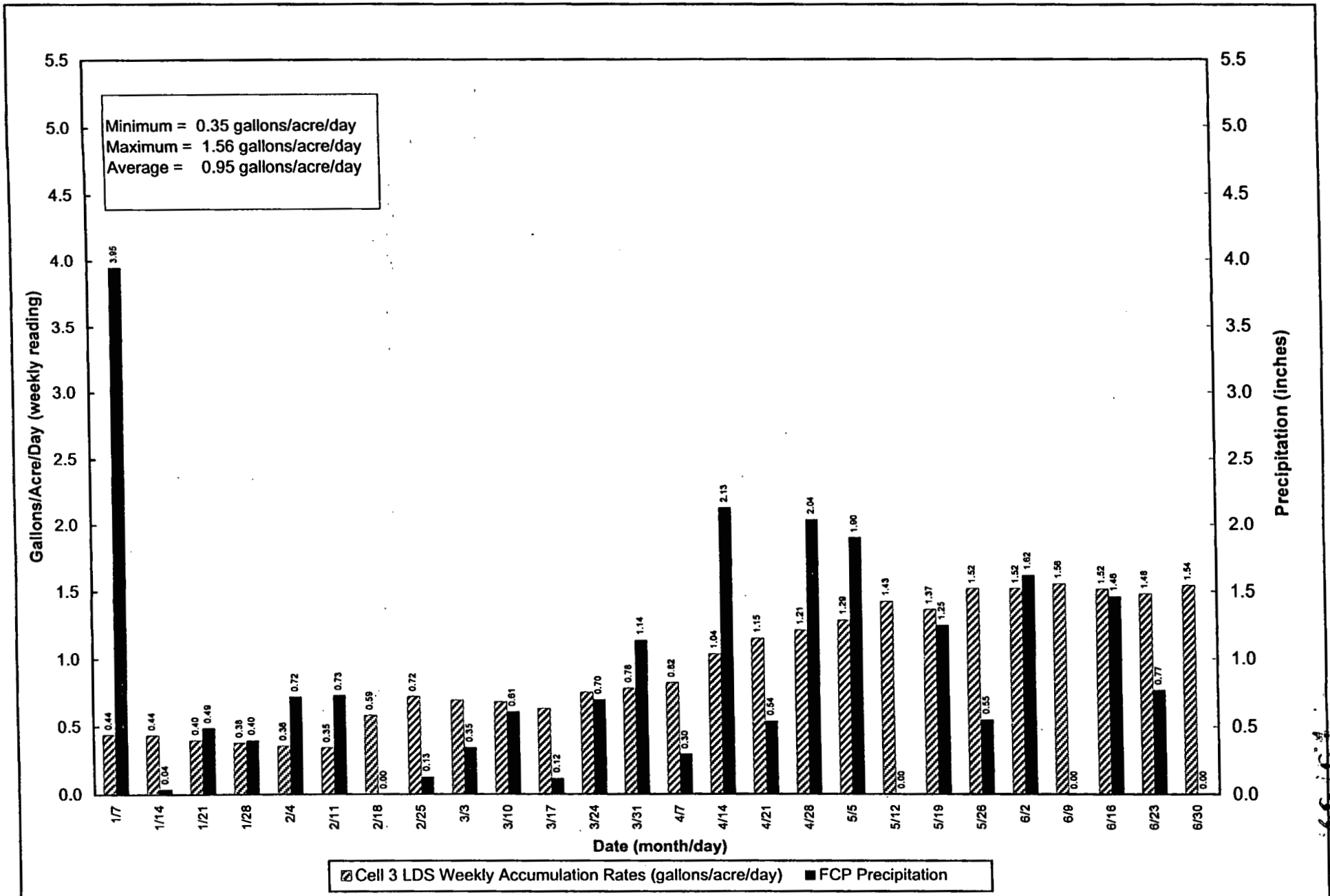

FIGURE 3-4. ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 3, JANUARY THROUGH JUNE 2004

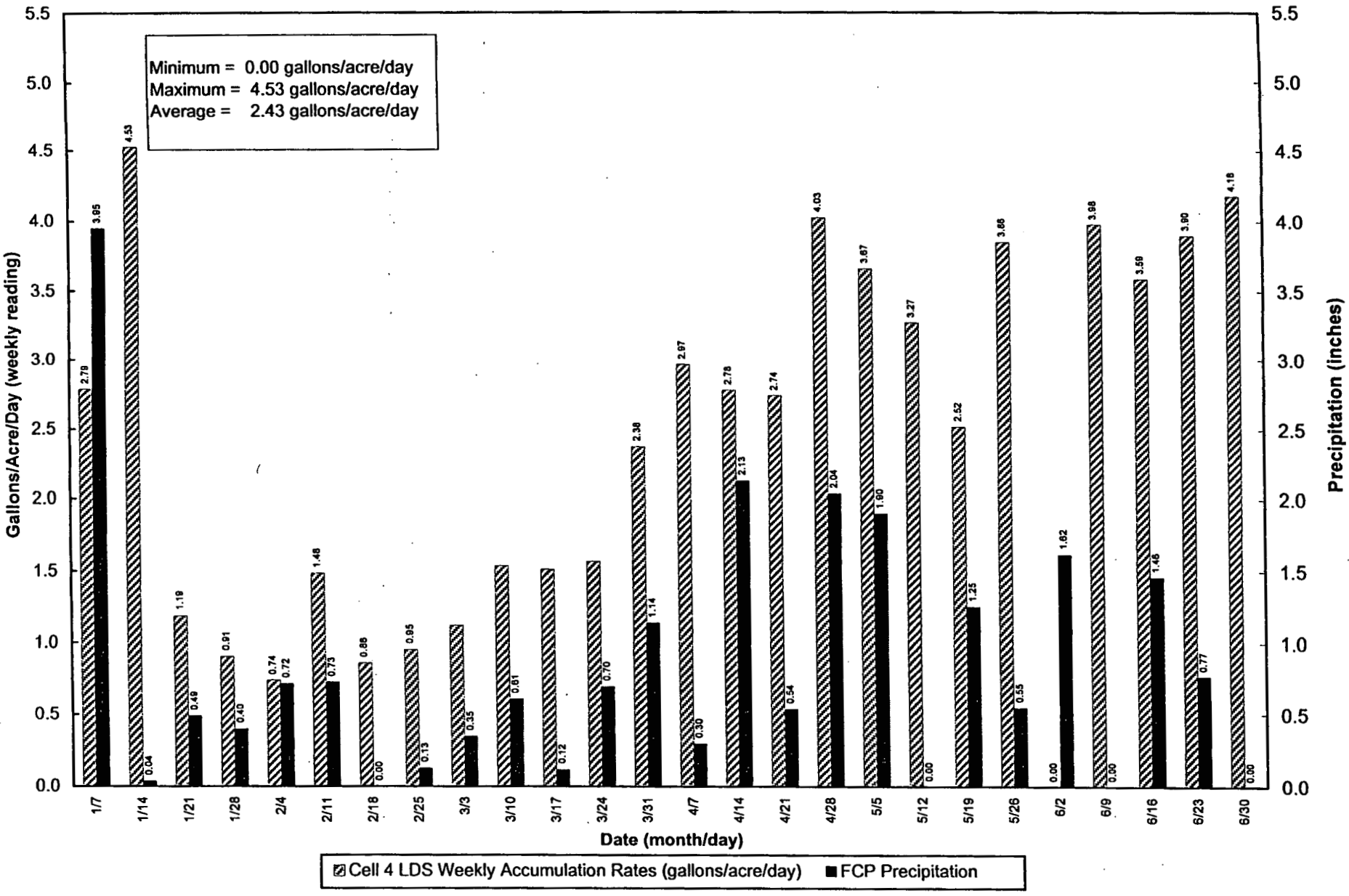

FIGURE 3-5. ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 4, JANUARY THROUGH JUNE 2004

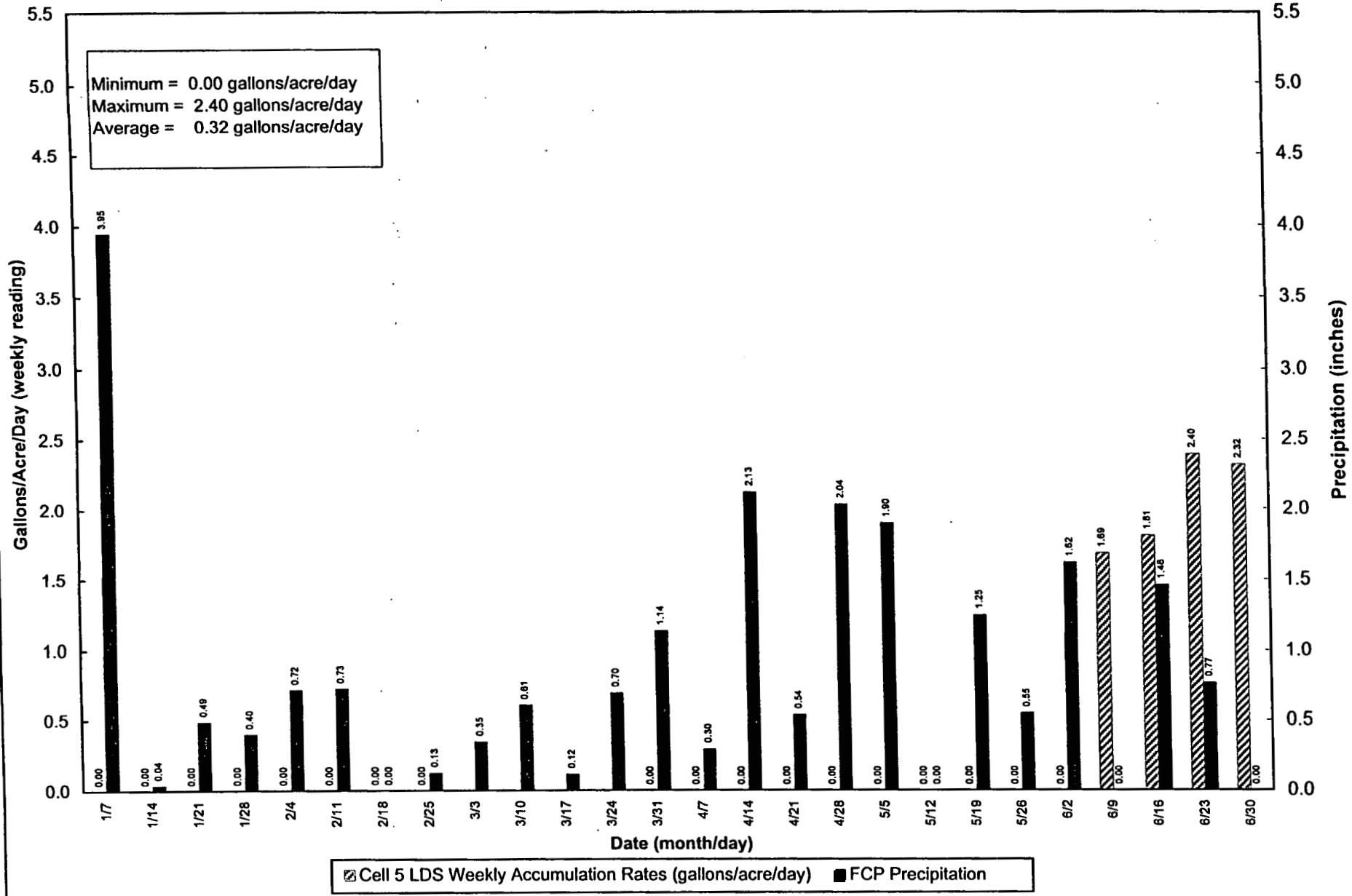

FIGURE 3-6. ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 5, JANUARY THROUGH JUNE 2004

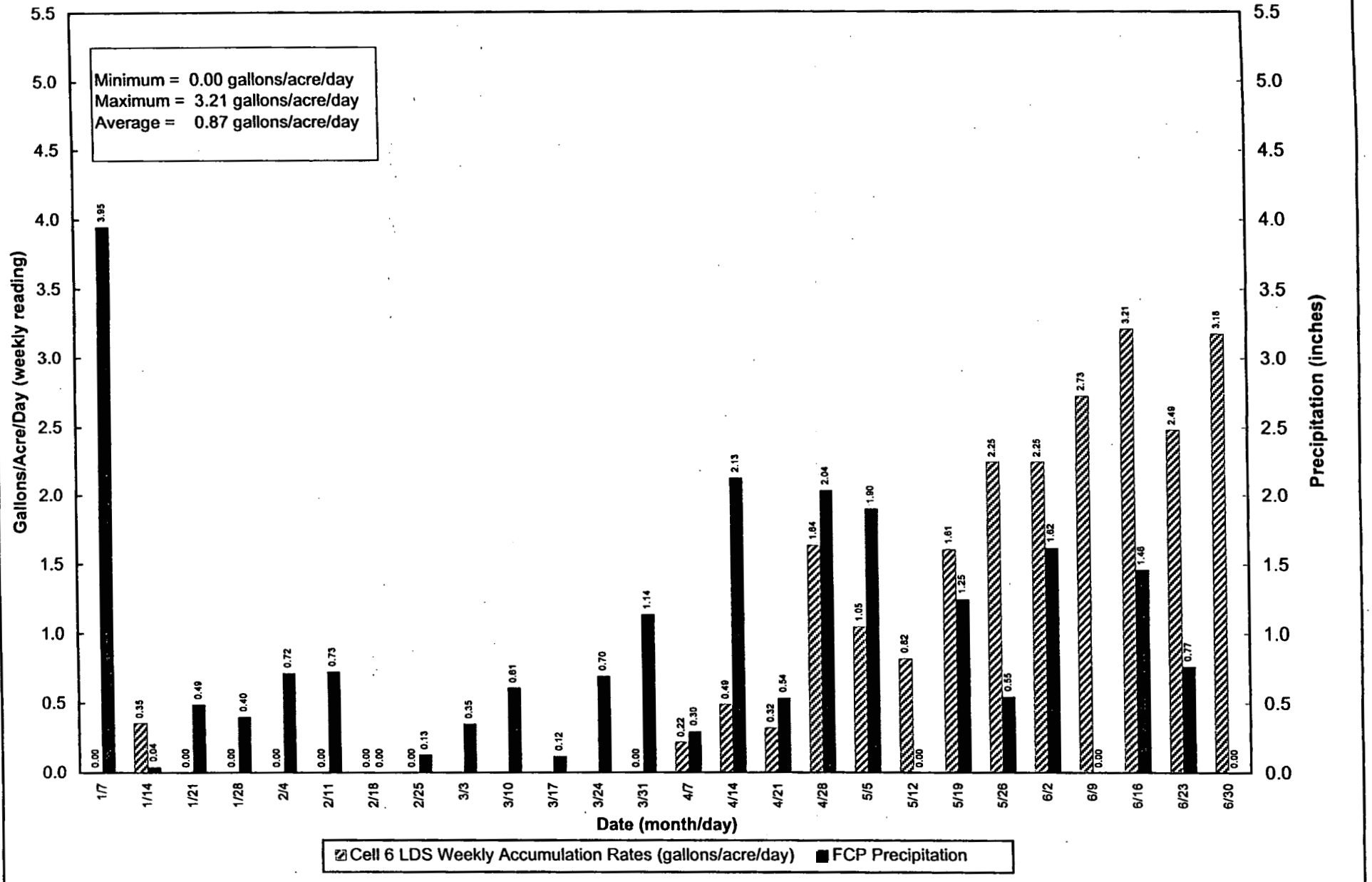

FIGURE 3-7. ON-SITE DISPOSAL FACILITY LDS ACCUMULATION RATES FOR CELL 6, JANUARY THROUGH JUNE 2004

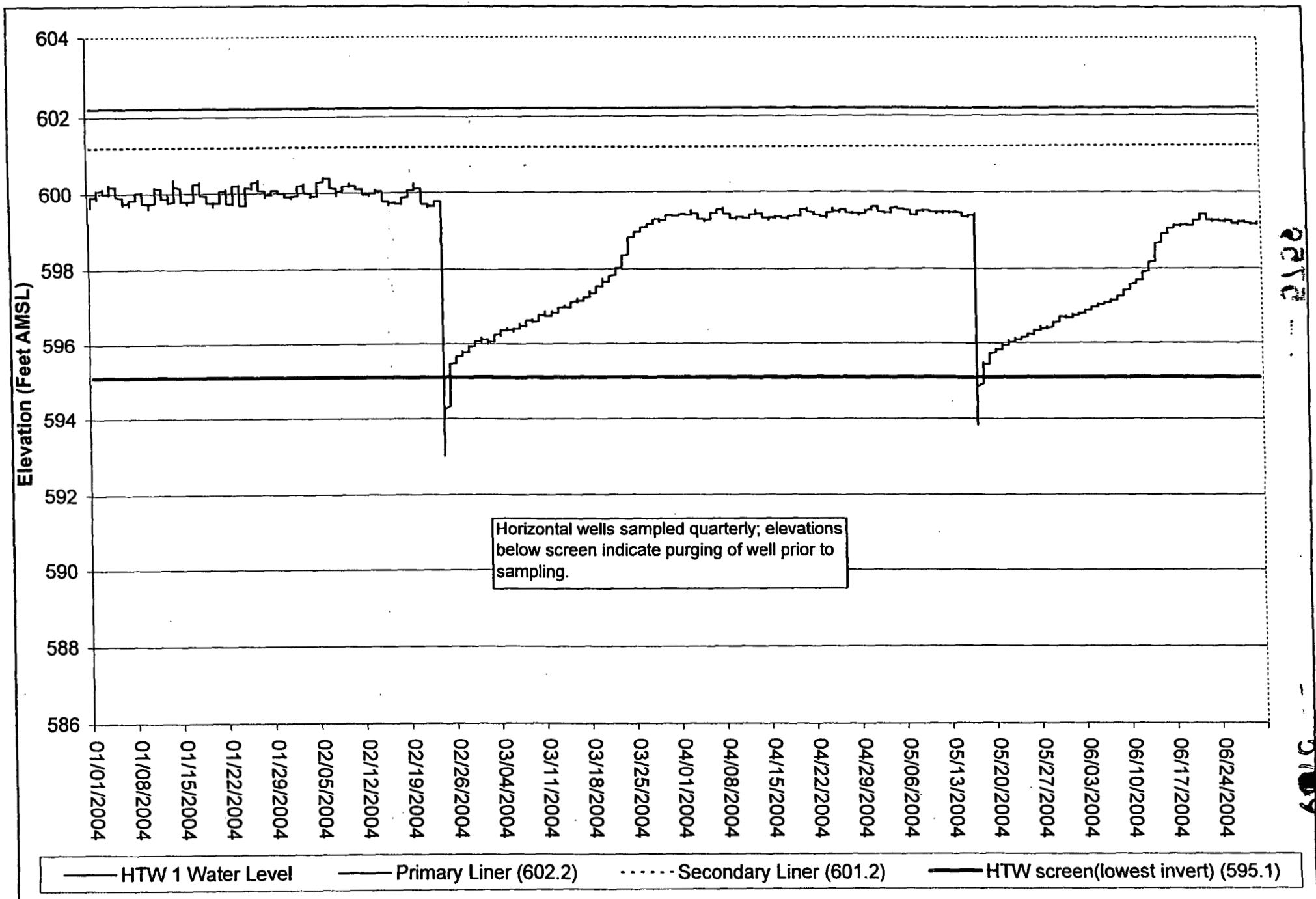

FIGURE 3-8. CELL 1 HORIZONTAL TILL WELL WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

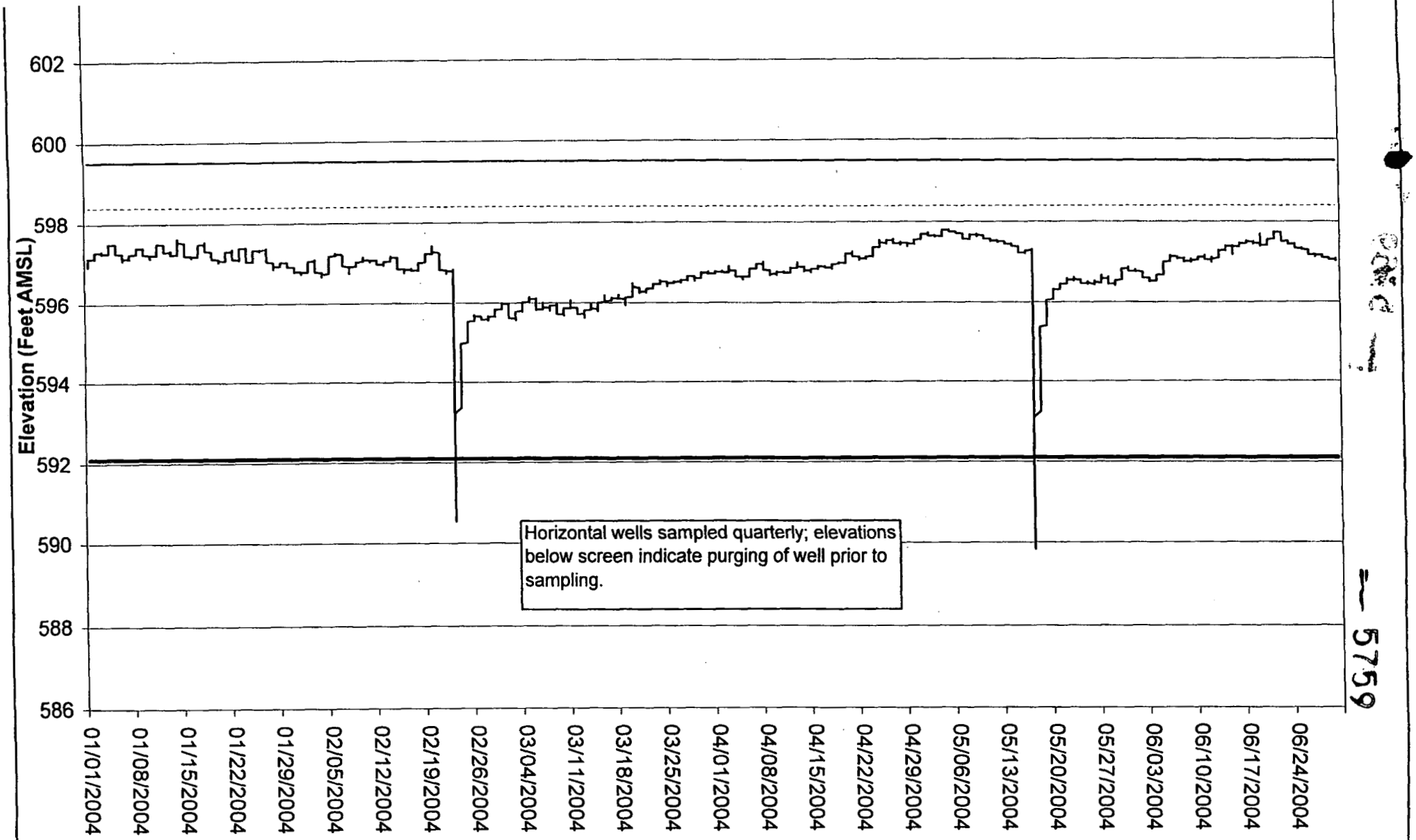

FIGURE 3-9. CELL 2 HORIZONTAL TILL WELL WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

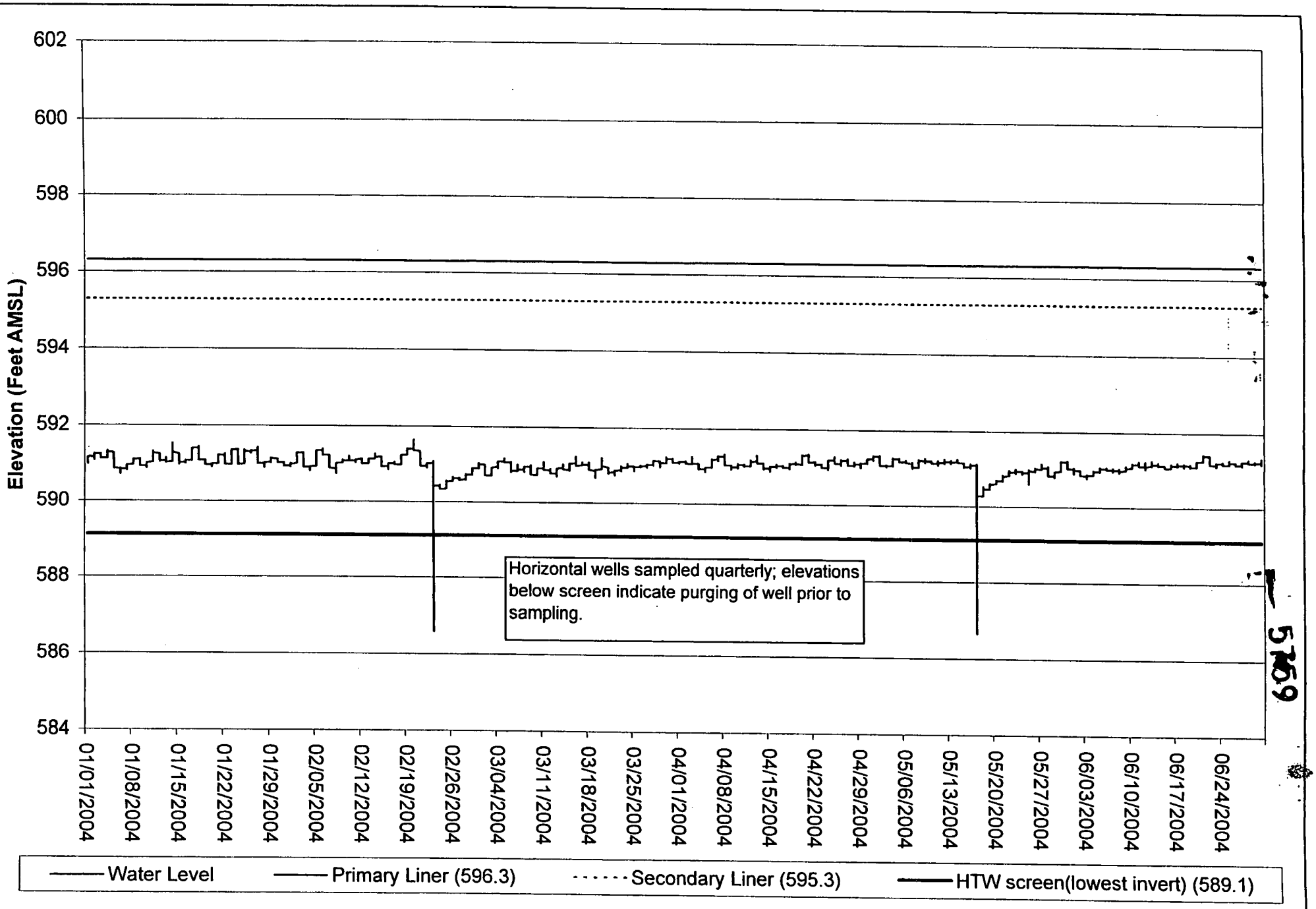

FIGURE 3-10. CELL 3 HORIZONTAL TILL WELL WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

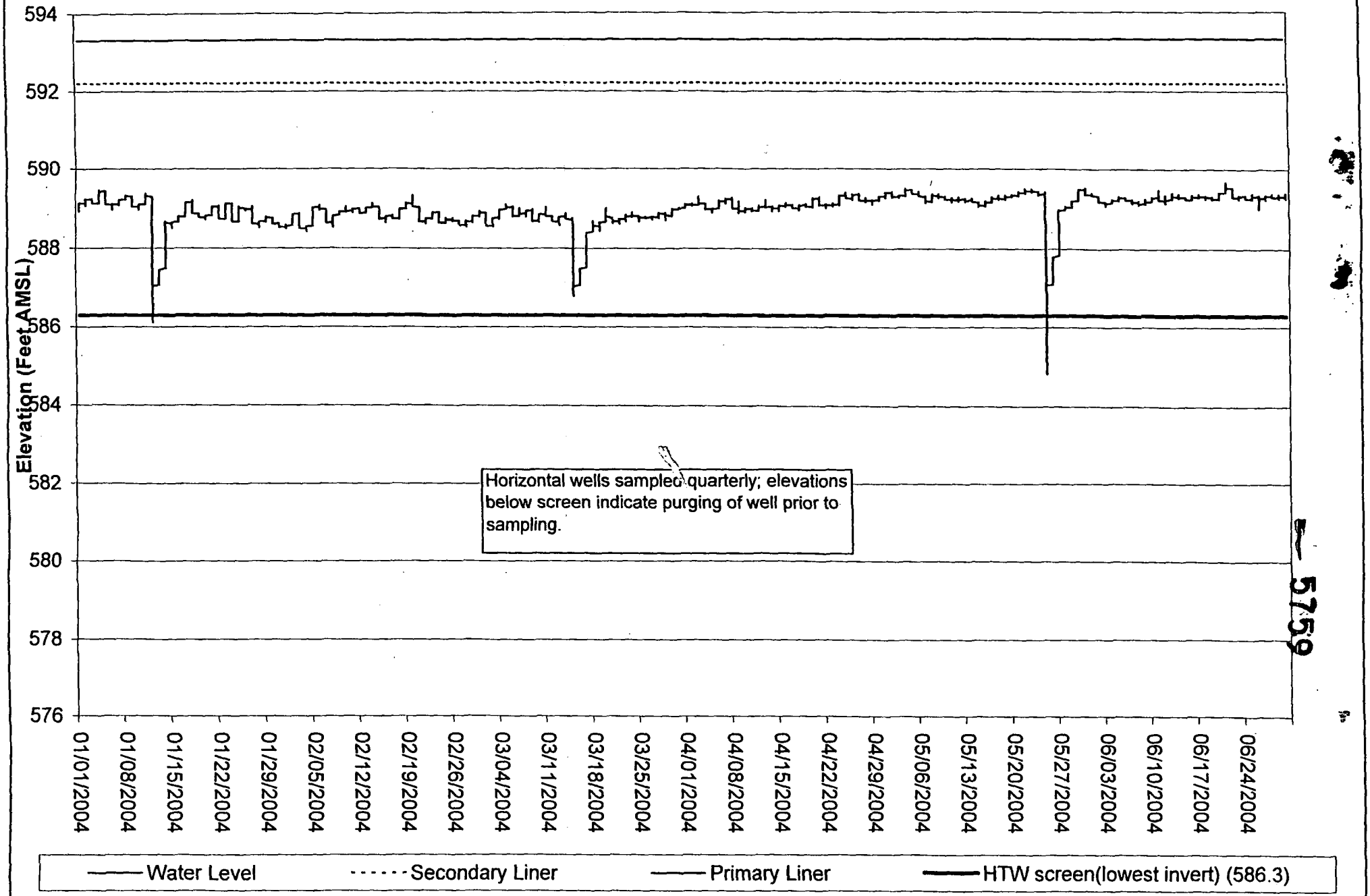

FIGURE 3-11. CELL 4 HORIZONTAL TILL WELL WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

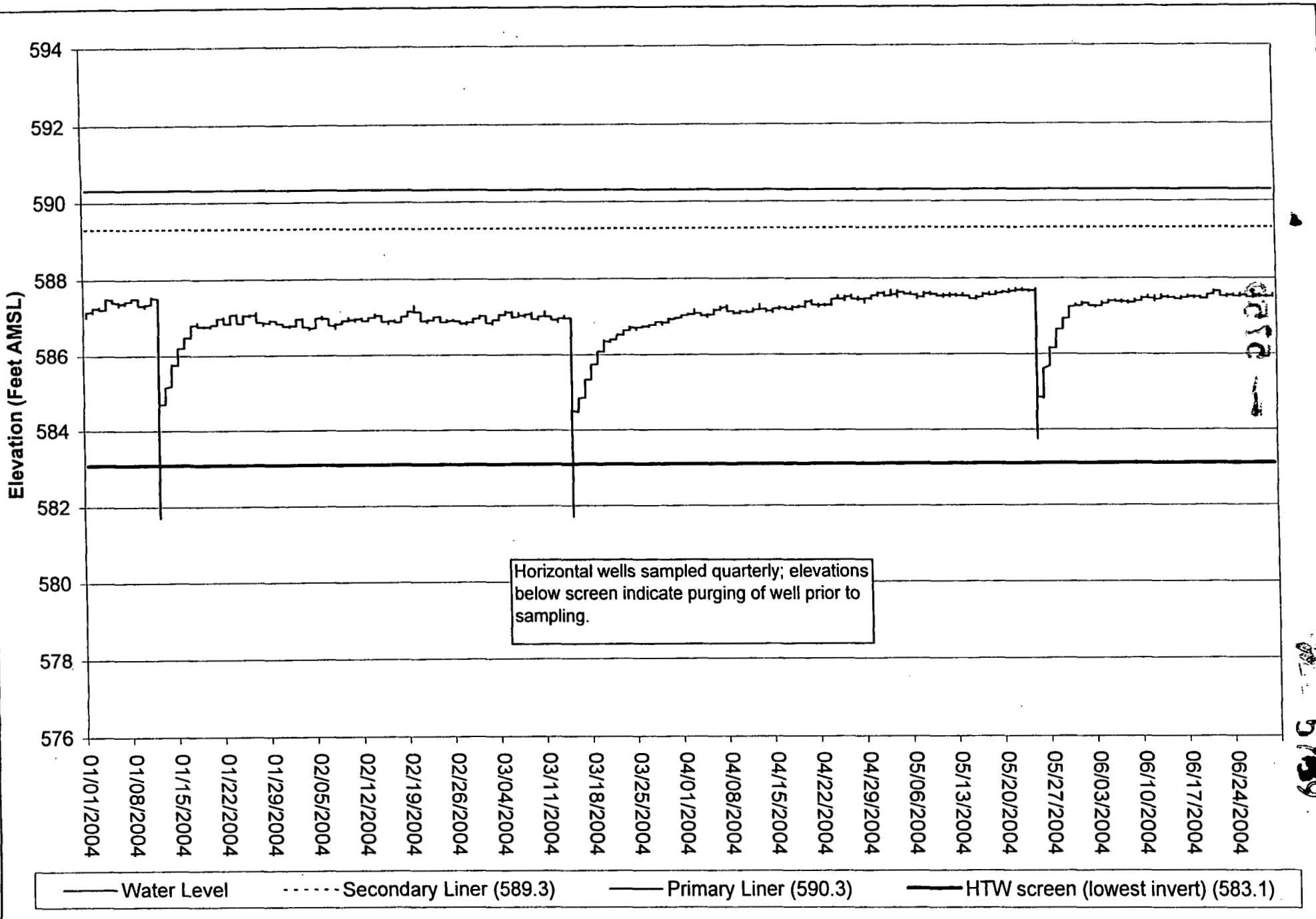

FIGURE 3-12. CELL 5 HORIZONTAL TILL WELL WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

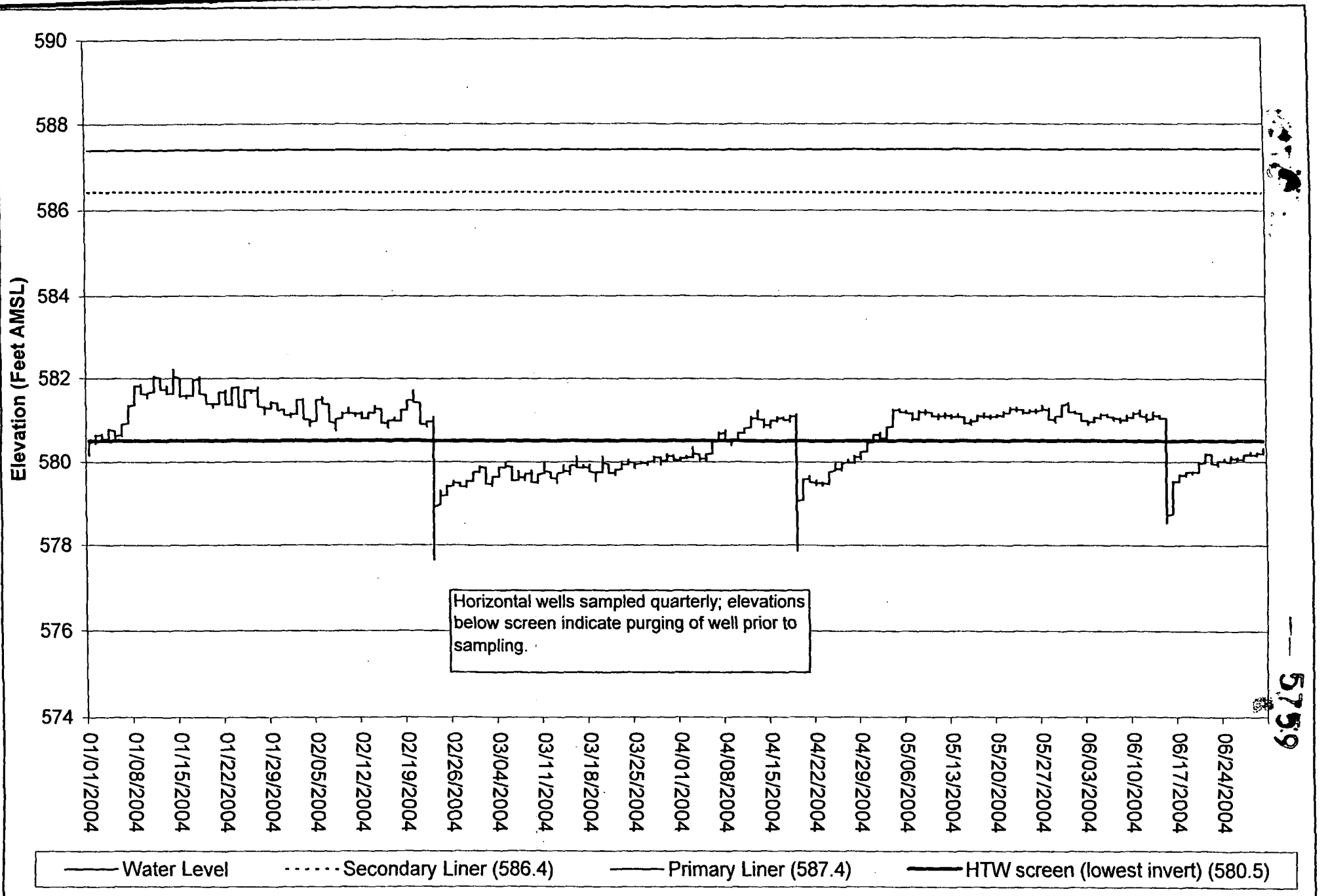

FIGURE 3-13. CELL 6 HORIZONTAL TILL WELL WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

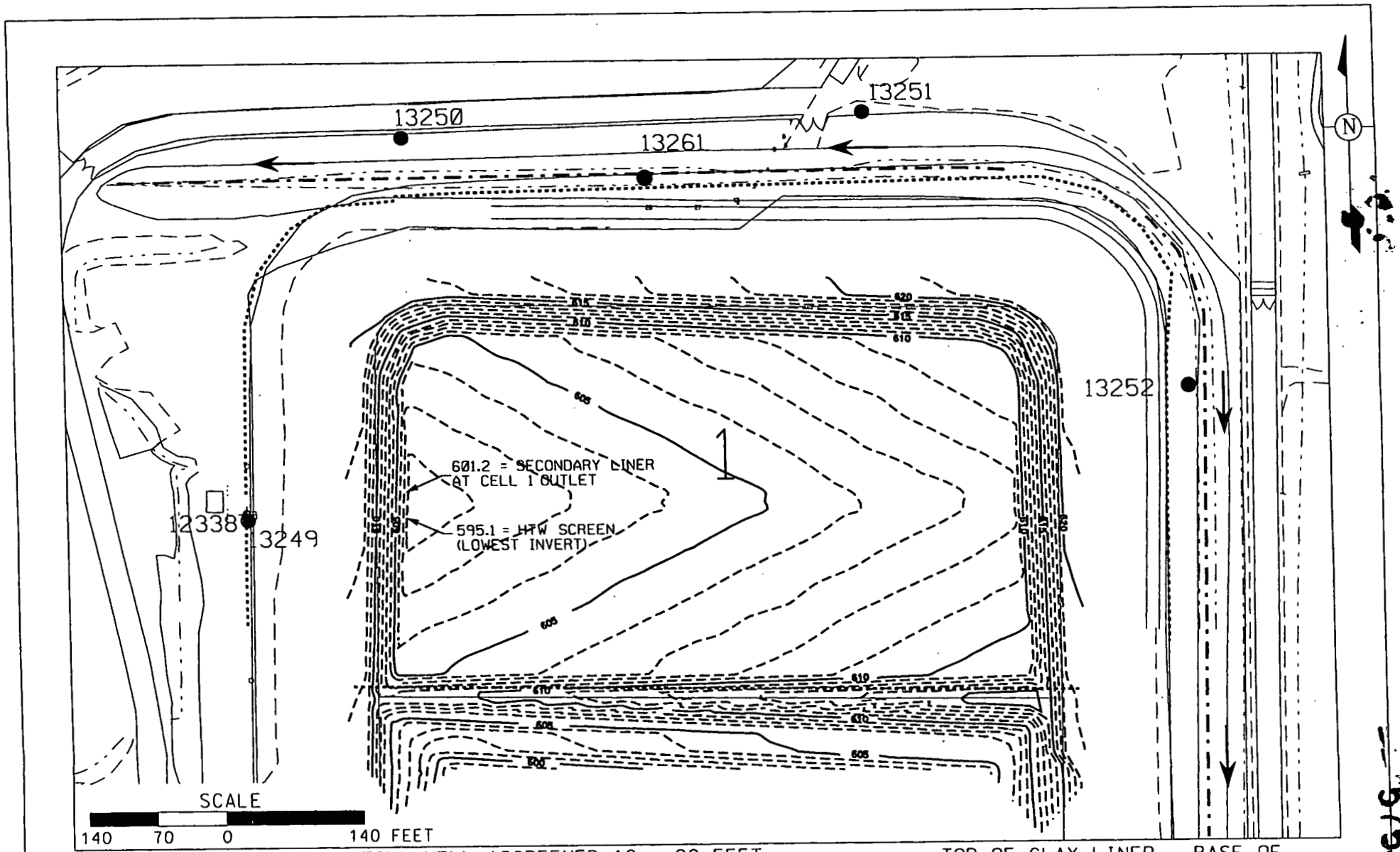

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FIGURE 3-14. OSDF CELL 1 PERCHED WATER WELLS

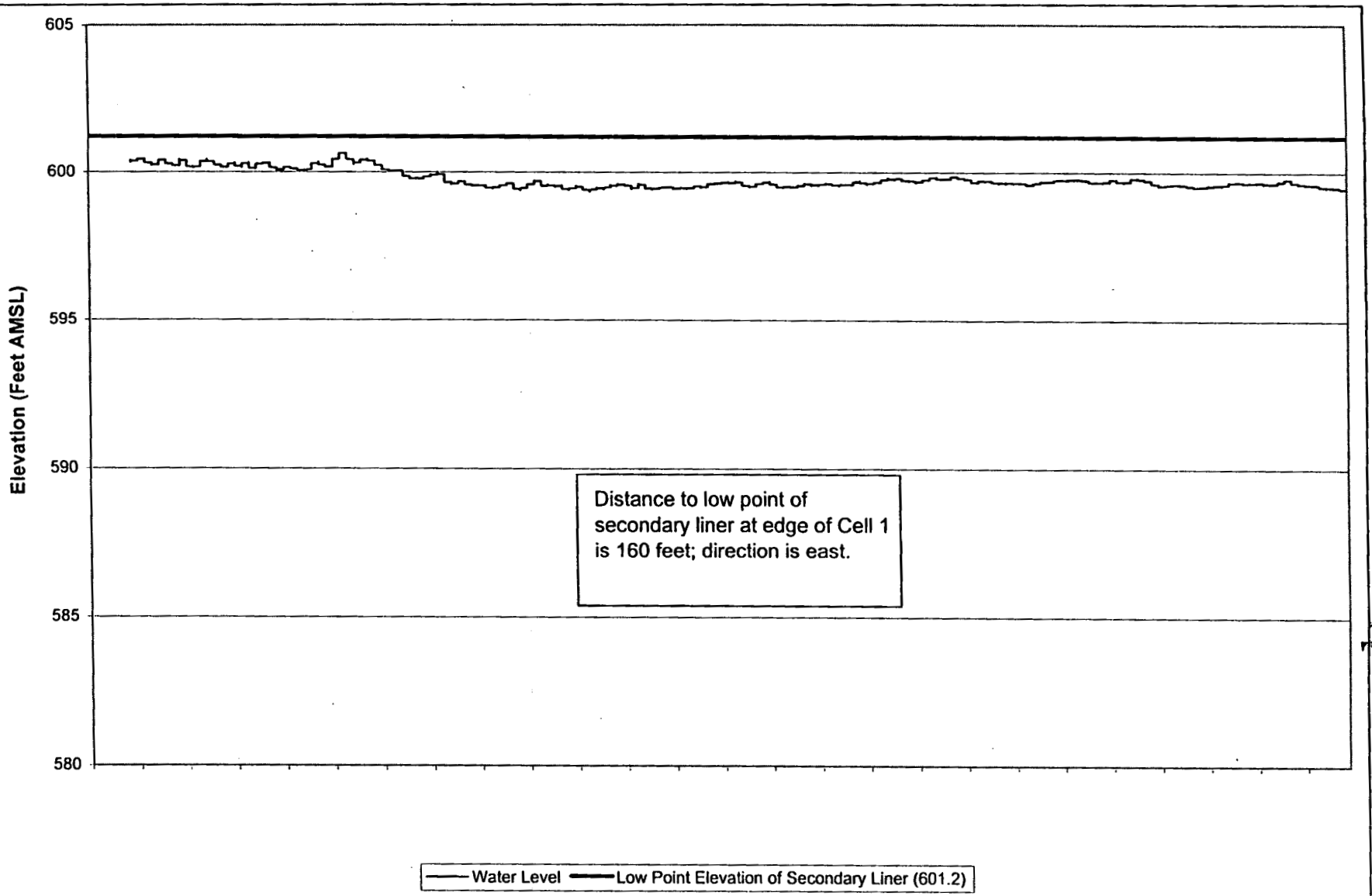


FIGURE 3-15. CELL 1 MONITORING WELL 13249 WATER LEVELS, JANUARY THROUGH JUNE 30, 2004

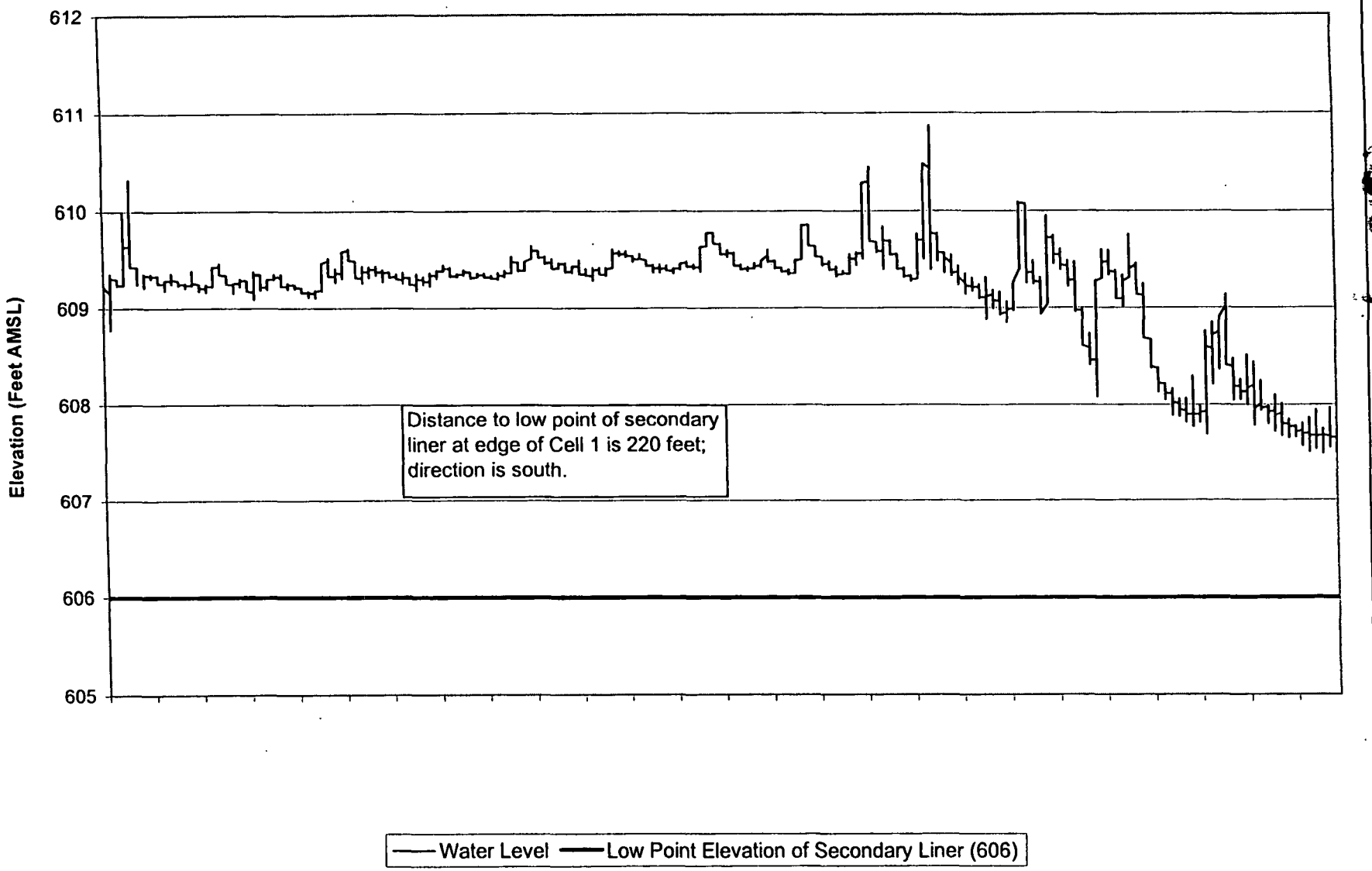


FIGURE 3-16. CELL 1 MONITORING WELL 13250 WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

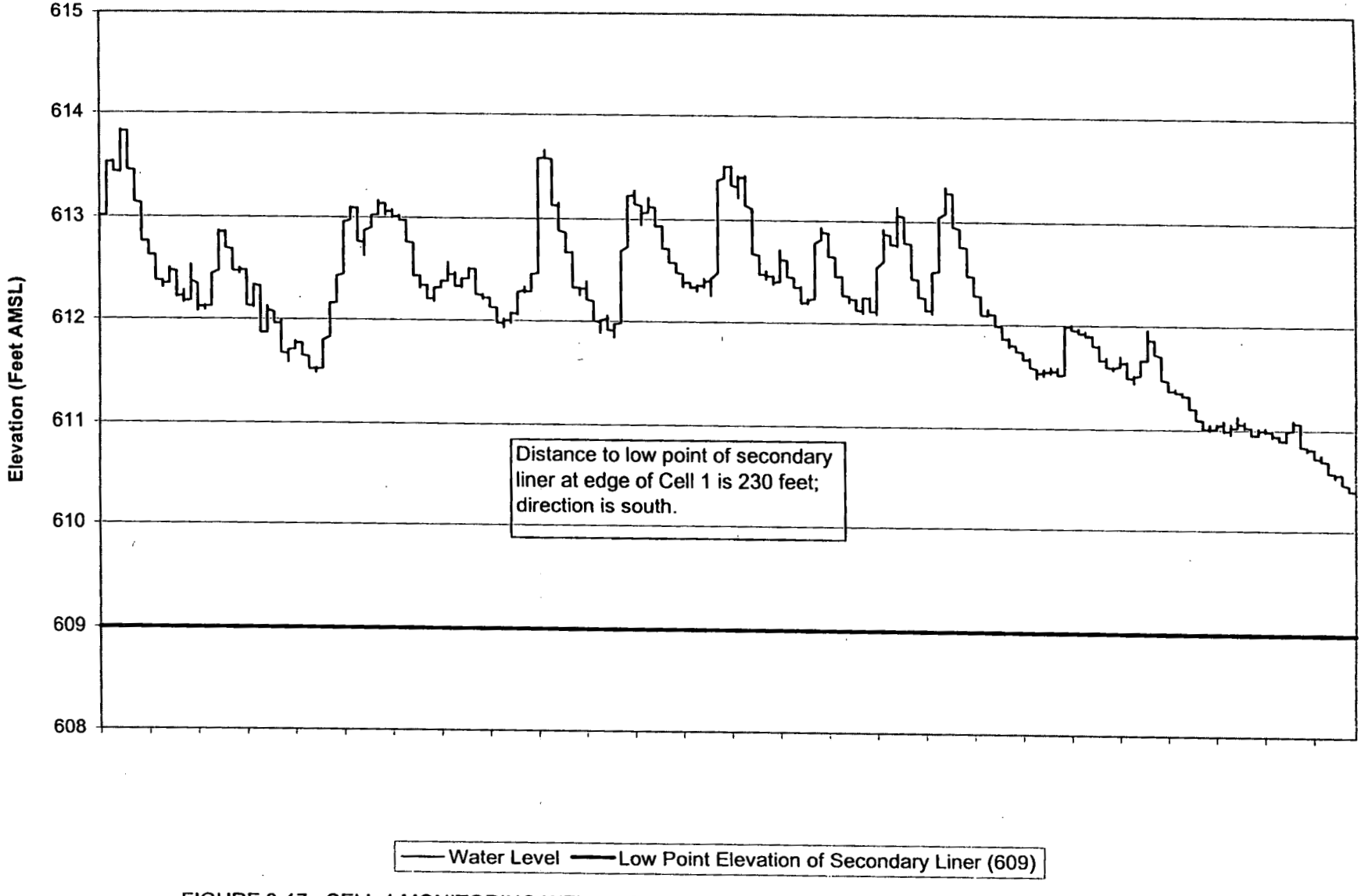


FIGURE 3-17. CELL 1 MONITORING WELL 13251 WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

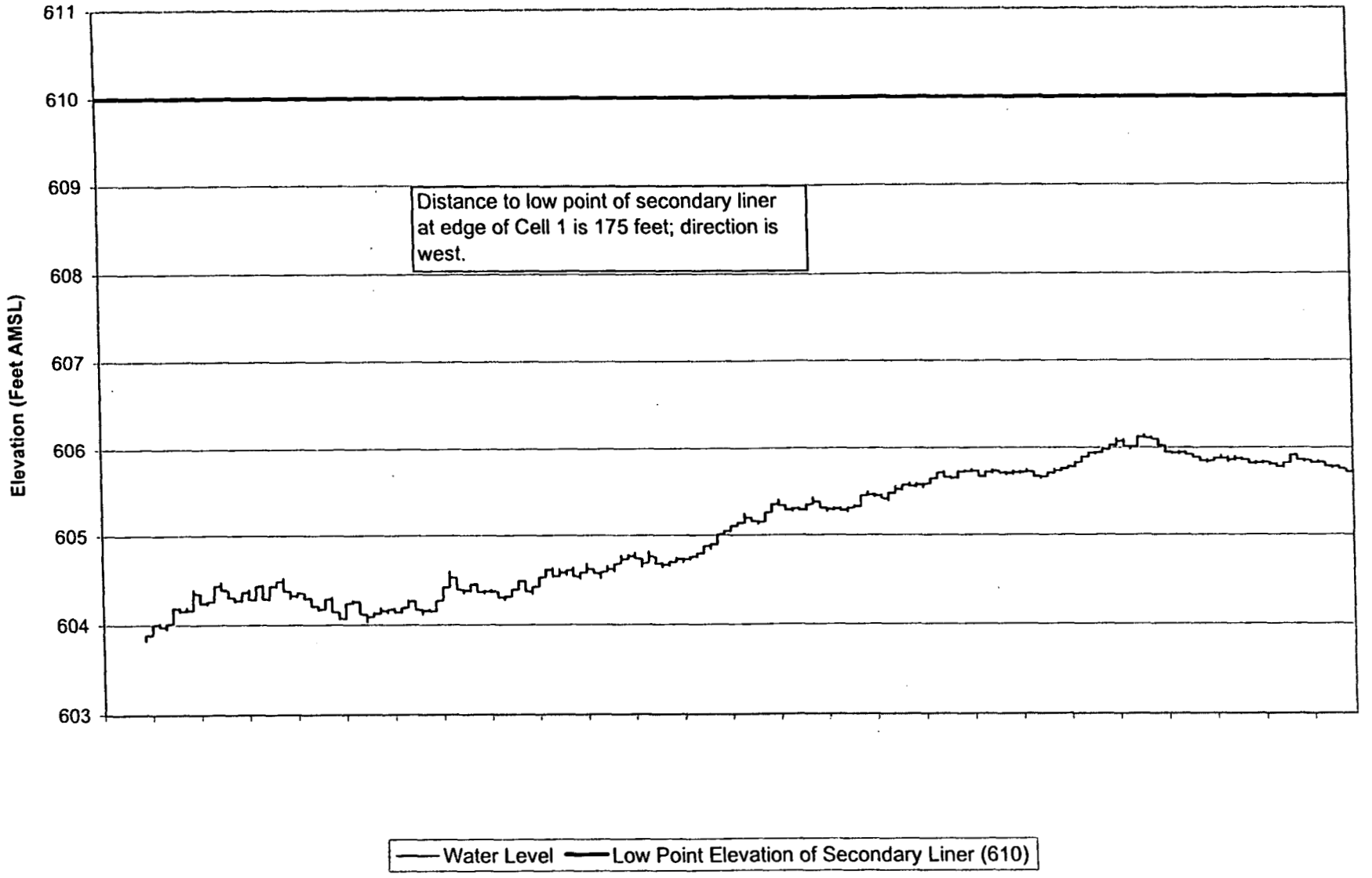


FIGURE 3-18. CELL 1 MONITORING WELL 13252 WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

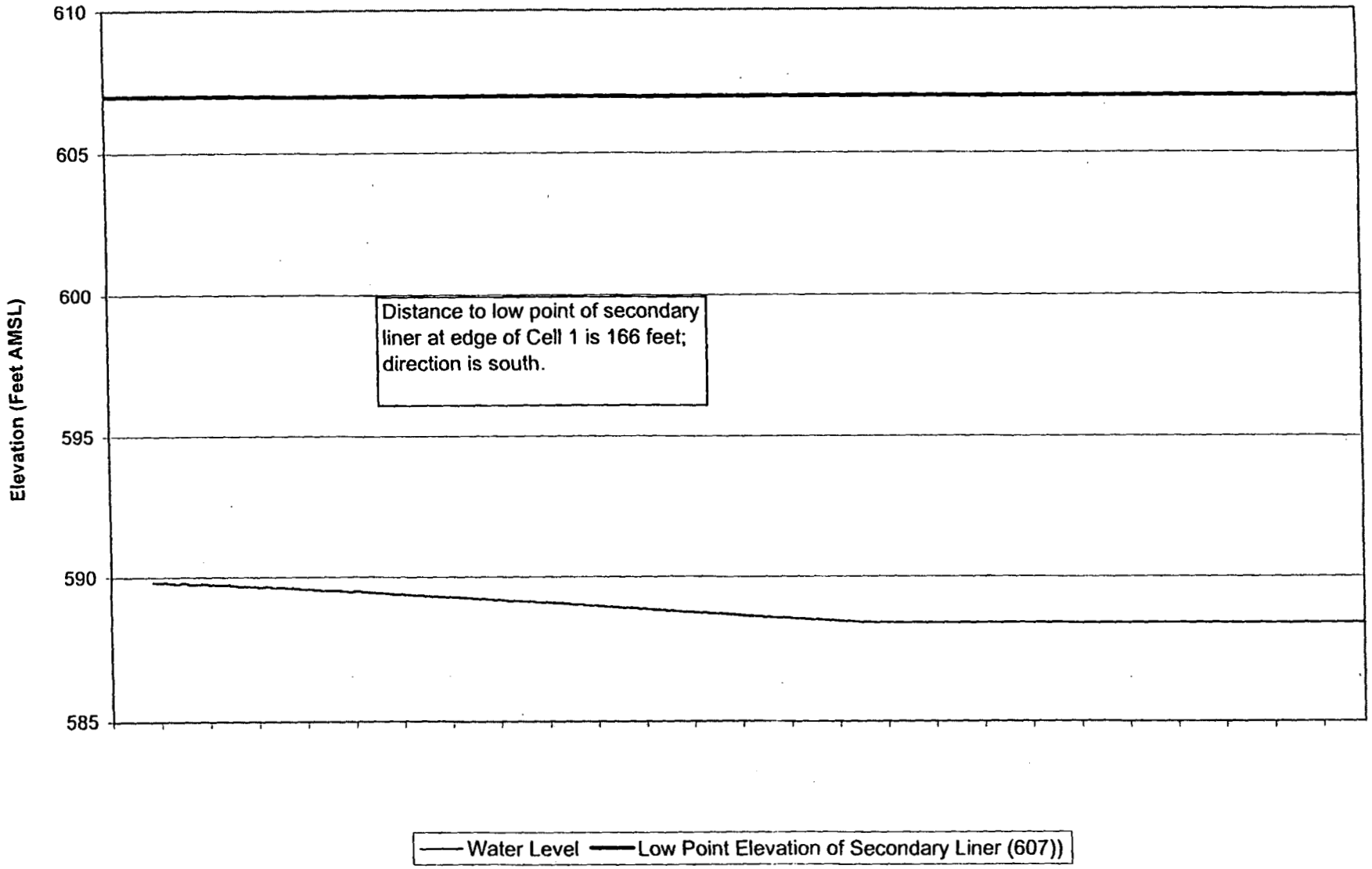


FIGURE 3-19. CELL 1 MONITORING WELL 13261 WATER LEVELS, JANUARY 1 THROUGH JUNE 30, 2004

4.0 SURFACE WATER MONITORING DATA

4.1 DATA COVERED

This IEMP mid-year data summary covers all surface water monitoring data collected under the IEMP program from January 1 through June 30, 2004. Specifically, this includes:

- National Pollutant Discharge Elimination System (NPDES) data
- Federal Facilities Compliance Agreement (FFCA)/Operable Unit 5 Record of Decision data
- IEMP characterization monitoring data.

All of these data sets are complete in accordance with sampling requirements identified in the IEMP, Revision 3.

4.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the scope of IEMP monitoring or remediation operations at the Fernald site. Notable results and events associated with the surface water monitoring program data identified above are as follows:

- NPDES Permit non-compliances: Eight NPDES non-compliances occurred and were reported to OEPA, as required, during the period under evaluation. The data for these non-compliances are as follows:

Date	Location	Parameter	Limit	Result
January 2004	STP 4601	Total Suspended Solids (Avg.)	20 mg/L	22.5 mg/L
February 17, 2004	STP 4601	Total Suspended Solids	40 mg/L	52 mg/L
February 24, 2004	STP 4601	Total Suspended Solids	40 mg/L	65 mg/L
February 26, 2004	STP 4601	Total Suspended Solids	40 mg/L	53 mg/L
February 2004	STP 4601	Total Suspended Solids (Avg.)	20 mg/L	34.2 mg/L
March 2004	STP 4601	Total Suspended Solids (Avg.)	20 mg/L	26.1 mg/L
April 4, 2004	STP 4601	Total Suspended Solids	40 mg/L	48 mg/L
April 2004	STP 4601	Total Suspended Solids (Avg.)	20 mg/L	20.8 mg/L

- FFCA/Operable Unit 5 Record of Decision compliance: The monthly average total uranium concentration of 30 µg/L for discharge to the Great Miami River was met every month in the reporting period.
- The Fernald site is on track complying with the 600-pounds-per-year limit of uranium discharged to the Great Miami River. At the end of June 2004, the total mass of uranium discharged was 291.45 pounds.

- IEMP FRL exceedances: For the first half of 2004, there were two FRL exceedances attributable to the Fernald site.

  One surface water sample collected on January 3 from the cross-medium impact location SWD-03 had a total uranium concentration of 40.7 µg/L that exceeded the associated groundwater FRL of 30 µg/L. On April 13, 2004, the surface water sample result from SWD-03 for zinc was 0.0317 mg/L exceeding the respective groundwater FRL of 0.021 mg/L.

A thorough review of the surface water monitoring data covered in this mid-year data summary was conducted to identify the notable results and events. Supplementary figures are provided here in support of the findings listed above. Figure 4-1 shows pounds of uranium discharged to the Great Miami River from the Parshall Flume. Figure 4-2 shows the monthly average total uranium concentrations in water discharged from the Parshall Flume. All data covered by this mid-year data summary are available on the IEMP Data Information Site. Maps of NPDES and surface water sample locations are also provided on the IEMP Data Information Site.

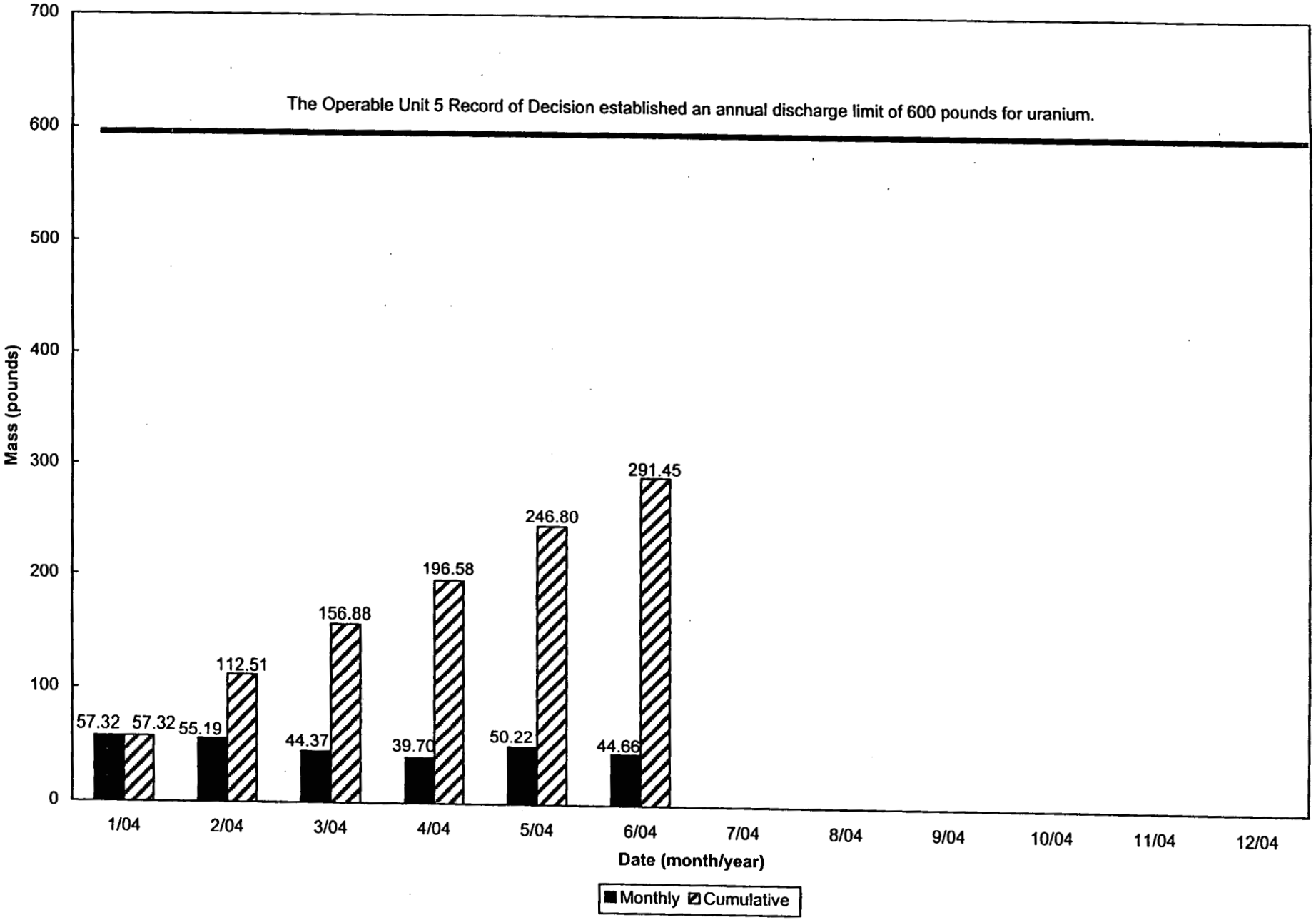


FIGURE 4-1. POUNDS OF URANIUM DISCHARGED TO THE GREAT MIAMI RIVER FROM THE PARSHALL FLUME (PF 4001), JANUARY THROUGH JUNE 2004

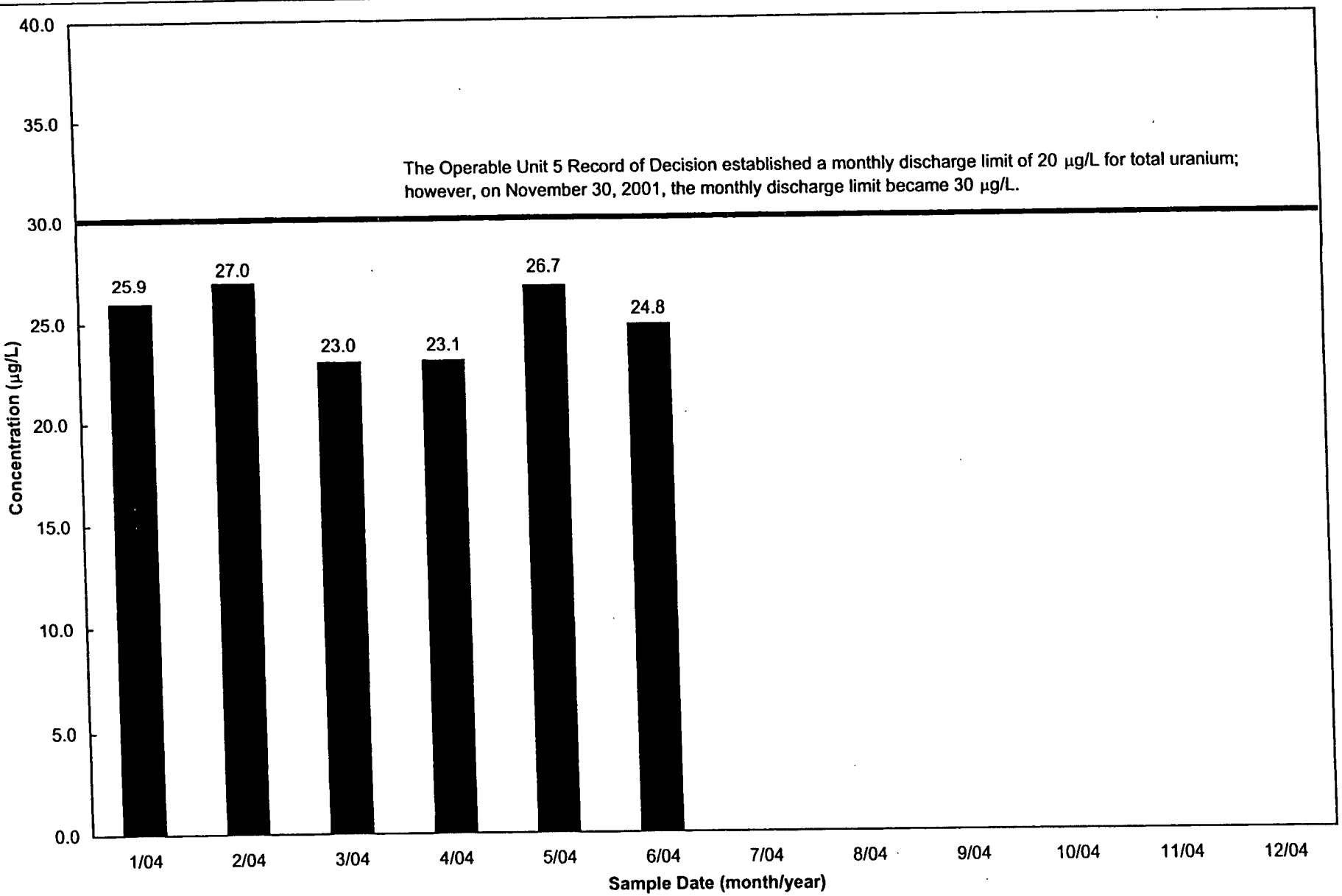


FIGURE 4-2. MONTHLY AVERAGE TOTAL URANIUM CONCENTRATION IN WATER DISCHARGED FROM THE PARSHALL FLUME (PF 4001) TO THE GREAT MIAMI RIVER, JANUARY THROUGH JUNE 2004

5.0 AIR MONITORING DATA

5.1 DATA COVERED

This IEMP mid-year data summary covers all air monitoring data collected under the IEMP program from January 1 through June 30, 2004. Specifically, this includes:

- Radiological air particulate monitoring results from biweekly samples covering the period of December 23, 2003 through June 22, 2004 (i.e., biweekly samples were actually collected January 6 through June 22, 2004). The biweekly sample results for the first half of 2004 are compiled in Tables 5-1 through 5-5 for the purpose of comparison to previous results.
- Radiological air particulate quarterly composite samples collected during the first half of 2004 for National Emissions Standards for Hazardous Air Pollutants (NESHAP) compliance purposes
- NESHAP stack emissions monitoring samples collected during the first half of 2004
- Environmental radon monitoring data collected during the first half of 2004
- Silos headspace radon concentrations data collected during the first half of 2004
- Direct radiation (thermoluminescent dosimeter [TLD]) monitoring data collected during the first half of 2004.

All of the data sets for the aforementioned programs are complete in accordance with sampling requirements identified in the IEMP, Revision 3.

5.2 NOTABLE RESULTS AND EVENTS

Notable results and events are those that impact, or could potentially impact, the environmental pathways under the scope of IEMP monitoring at the Fernald site. Notable results and events associated with IEMP air monitoring data for the time period covered by this mid-year data summary include the following:

Biweekly Air Particulate Results

- Figures 5-1 through 5-3 illustrate that there was a relative increase in uranium concentrations at the site fenceline during January and into February, when compared to biweekly data reported in the second half of 2003. Per the data evaluation criteria of the IEMP, the impact of the higher concentrations was evaluated with respect to the NESHAP annual limit of 10 millirem (mrem)/year. The estimated dose from the increase in uranium concentrations was less than 1 millirem. The higher uranium concentrations are attributed to fugitive emissions from the decontamination and dismantlement of buildings, emissions from the excavation of building foundations and handling of contaminated soil, and fugitive emissions from the Waste Pits Project.

- Figures 5-4 through 5-6 illustrate that thorium-230 concentrations at the site fenceline during the first half of 2004 were comparable to the biweekly data from the second half of 2003. The pugmill ventilation system (which began operating in April 2002) has been effective in controlling fugitive emissions from pugmill operations and limiting thorium-230 levels at the fenceline monitors even though the rate of waste processing has increased. During the third month of each calendar quarter (i.e., March, June, September, and December) the monthly thorium analysis is suspended and the quarterly composite analysis is used to monitor fenceline thorium.

NESHAP Quarterly Composite Air Data

- The maximum 2004 year-to-date (as of June) dose at the site fenceline air monitoring stations (AMS-23) was 0.52 mrem as summarized in Table 5-6. For comparison, the maximum mid-year dose in 2003 was 0.46 mrem. On average, thorium isotopes contributed approximately 48 percent of the year-to-date dose measured at all fenceline air monitors. In particular, thorium-230 contributed an average of 21 percent of the dose, while uranium and radium-226 contributed an average of approximately 48 and 2 percent, respectively.

Direct Radiation Results

- Prior to the continuous operation of the Radon Control System (RCS), direct radiation TLD measurements indicated a generally upward trend in the immediate area of the K-65 Silos (locations 22 through 26) and, to a lesser extent, at the site fenceline nearest the K-65 Silos (location 6). Following the startup of the RCS in May 2003, there was a significant decrease in direct radiation levels in the vicinity of the K-65 Silos and at the western fenceline of the site. The decrease in direct radiation levels is related to the decrease in headspace radon concentration from the operation of the RCS. Figures 5-7 and 5-8 illustrate the decrease in direct radiation measurements in the vicinity of the K-65 Silos and at Location 6 during the first half of 2004, respectively.

Radon Monitoring Results

- During the first half of 2004, the silo headspace radon concentrations (refer to Figure 5-9) were comparable to concentrations measured during the last half of 2003. During the second quarter of 2003, and more specifically since May 2003, the silo headspace radon concentrations sharply decreased due the operation of the RCS. Continuous operation of the RCS has maintained the average silo headspace radon concentration at levels below one million pCi/L. In addition, mining operations (removal of K-65 material through sluicing operations) began in September 2004 and preliminary review of the data indicates consistent trends with the headspace concentrations.

- During the period of January through June 2004, there were no exceedance events of the 100 pCi/L radon limit in the Silos exclusion area. For comparison, there were no exceedance events during the same time period in 2003, which is primarily due to the startup and operation of the RCS. Exceedance events are defined as a period of time during which the hourly average radon concentration exceeds the pCi/L limit in DOE Order 5400.5 100. The effect of RCS operations on environmental radon levels is illustrated in Figure 5-10.

NESHAP Stack Emissions Results

- The mid-year summary NESHAP stack emission results for Waste Pits Projects dryer stack, Waste Pits Project pugmill stack, and the Silos RCS stack are presented in Table 5-9. Indicated results are within expected ranges. No significant changes in the sources operations were noted with the dryer stack, the pugmill stack, and the RCS stack.

A thorough review of the air monitoring data covered by this mid-year data summary was conducted to identify the notable results. Supplementary tables and figures are also provided in support of the information above. Tables 5-1 through 5-5 summarize the biweekly total uranium, total particulate, and isotopic thorium concentrations from January through June of 2004. Tables 5-1 through 5-5 also include 2003 annual summary results and 1990 through 2003 summary results. Table 5-6 contains the 2004 year-to-date doses for each air monitoring station and the fractional contribution of each radionuclide to the total dose. Table 5-7 summarizes the environmental radon data from continuous monitors from January through June 2004 and the annual summary results for 2003. Table 5-8 provides the direct radiation measurements from the first and second quarter 2004, and the annual summary results for 2003. Table 5-9 contains the NESHAP stack results from the first half of 2004 and the annual summary results for 2003. All data covered by this mid-year data summary are available on the IEMP Data Information Site, as well as maps showing the locations of monitoring stations.

TABLE 5-1

TOTAL URANIUM PARTICULATE CONCENTRATIONS IN AIR FROM BIWEEKLY SAMPLES

	Mid-Year 2004 Results[a] (January - June) (pCi/m^3 x 1E-6)				2003 Annual Summary Results (pCi/m^3 x 1E-6)				1990 through 2003 Summary Results[a] (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	13	56	9060	994	26	4.7	609	141	0.0	3500
AMS-3	13	68	585	203	26	8.8	2259	312	0.0	17000
AMS-4	13	8.0	123	54	26	3.4	181	60	0.0	2300
AMS-5	13	3.7	358	84	26	3.3	178	69	0.0	4400
AMS-6	13	35	776	178	26	8.3	1146	235	0.0	3200
AMS-7	13	3.5	144	54	26	4.8	421	82	0.0	7800
AMS-8A	13	11	2125	461	26	4.6	687	205	0.0	1862
AMS-9C[b]	13	80	1193	344	26	6.2	1633	307	0.0	1712
AMS-22	13	96	8105	1100	26	19	1622	248	0.0	1622
AMS-23	13	54	13425	1233	26	14	692	158	0.0	692
AMS-24	13	7.7	73	35	26	10	146	56	0.0	207
AMS-25	13	1.3	103	35	26	6.8	113	44	0.0	402
AMS-26	13	15	1524	293	26	11	1000	167	0.0	1000
AMS-27	13	19	165	72	26	18	1348	173	0.0	1348
AMS-28	13	45	3018	580	26	13	943	235	0.0	943
AMS-29	13	37	405	130	26	9.0	1888	182	0.0	1888
Background										
AMS-12	13	0.0	109	19	26	3.2	40	14	0.0	480

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2003 include AMS-9B/C data.

TABLE 5-2

TOTAL PARTICULATE CONCENTRATIONS IN AIR FROM BIWEEKLY SAMPLES

	Mid-Year 2004 Results (January-June) ($\mu g/m^3$)				2003 Annual Summary Results ($\mu g/m^3$)				1990 through 2003 Summary Results ($\mu g/m^3$)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	13	15	58	33	26	18	54	31	7.0	77
AMS-3	13	17	102	53	26	18	89	42	8.0	159
AMS-4	13	16	55	32	26	17	81	32	13	81
AMS-5	13	13	48	27	26	15	43	26	9.6	62
AMS-6	13	17	50	31	26	18	62	32	8.0	69
AMS-7	13	13	49	30	26	16	46	29	6.8	84
AMS-8A	13	11	66	35	26	9.0	58	33	9.0	89
AMS-9C[a]	13	23	83	45	26	23	66	39	7.1	136
AMS-22	13	17	40	28	26	18	48	30	13	57
AMS-23	13	23	75	33	26	15	55	29	11	57
AMS-24	13	15	39	27	26	15	114	37	5.4	114
AMS-25	13	15	53	31	26	11	59	27	11	69
AMS-26	13	14	46	29	26	5.0	124	36	5.0	124
AMS-27	13	24	79	52	26	27	88	46	16	92
AMS-28	13	8.1	42	25	26	15	47	26	12	68
AMS-29	13	13	66	36	26	12	93	39	11	93
Background										
AMS-12[b]	13	6.2	42	25	26	14	48	25	6.0	416
Project-Specific										
WPTH-2[c]	13	17	54	36	26	19	53	34	19	77

[a]Summary results for 1990 through 2003 include AMS-9B/C data.
[b]Total particulate analysis was discontinued during 1994 and was reinstated for AMS-12 in 1997.
[c]Monitor associated with the Waste Pits Project.

TABLE 5-3

THORIUM-228 PARTICULATE CONCENTRATIONS IN AIR FROM MONTHLY SAMPLES

	Mid-Year 2004 Results (January-June) (pCi/m^3 x 1E-6)				2003 Annual Summary Results[a] (pCi/m^3 x 1E-6)				1990 through 2003 Summary Results[a] (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	4	10	11	11	6	0.4	9.0	6.0	0.0	38
AMS-3	4	11	28	16	7	6.8	23	13	0.0	26
AMS-4	4	5.5	9.4	7.1	7	0.0	17	7.4	0.0	22
AMS-5	4	0.6	6.3	4.9	7	0.0	13	7.8	0.0	18
AMS-6	4	3.2	11	5.9	7	3.2	16	11	0.0	18
AMS-7	4	3.3	13	5.9	7	1.2	17	8.5	0.0	17
AMS-8A	4	5.4	17	12	7	3.4	15	9.9	0.0	39
AMS-9C[b]	4	7.1	24	13	7	3.2	35	16	0.0	50
AMS-22	4	7.8	16	11	7	2.0	15	8.6	0.0	30
AMS-23	4	3.1	20	8.8	6	1.0	16	8.1	0.0	22
AMS-24	4	2.4	7.5	5.2	7	0.7	12	8.1	0.0	27
AMS-25	4	2.8	13	6.4	6	0.0	7.0	4.1	0.0	17
AMS-26	4	3.2	12	7.5	6	0.1	17	8.7	0.0	24
AMS-27	4	4.6	14	8.8	6	0.2	16	9.7	0.0	22
AMS-28[c]	4	0.6	8.2	3.1	7	2.9	21	8.7	0.0	39
AMS-29	4	2.0	13	8.3	7	3.6	21	13	0.0	46
Background										
AMS-12	4	3.1	9.5	4.7	7	0.3	12	4.3	0.0	17
Project-Specific										
WPTH-2[d]	4	0.4	38	16	7	5.7	29	13	0.0	29

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2003 include AMS-9B/C data.
[c]AMS-28 includes WPTH-1 results.
[d]Monitor associated with the Waste Pits Project.

TABLE 5-4

THORIUM-230 PARTICULATE CONCENTRATIONS IN AIR FROM MONTHLY SAMPLES

	Mid-Year 2004 Results[a] (January-June) (pCi/m^3 x 1E-6)				2003 Annual Summary Results[a] (pCi/m^3 x 1E-6)				1990 through 2003 Summary Results[a] (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	4	25	81	49	6	0.0	56	35	0.0	140
AMS-3	4	47	131	82	7	0.0	212	104	0.0	744
AMS-4	4	10	39	25	7	0.0	43	26	0.0	91
AMS-5	4	19	39	28	7	0.0	85	38	0.0	620
AMS-6	4	15	103	67	7	0.0	177	82	0.0	488
AMS-7	4	6.8	23	15	7	0.0	70	31	0.0	77
AMS-8A	4	24	102	57	7	0.0	121	56	0.0	461
AMS-9C[b]	4	17	96	64	7	0.0	133	79	0.0	407
AMS-22	4	21	120	75	7	0.0	182	70	0.0	493
AMS-23	4	47	113	72	6	0.0	86	42	0.0	210
AMS-24	4	6.4	18	11	7	0.0	48	28	0.0	125
AMS-25	4	15	30	22	6	0.0	22	15	0.0	223
AMS-26	4	24	68	48	6	0.0	141	53	0.0	233
AMS-27	4	20	32	27	6	0.0	74	37	0.0	189
AMS-28[c]	4	21	84	46	7	4.4	129	59	4.4	401
AMS-29	4	27	87	56	7	0.0	153	65	0.0	537
Background										
AMS-12	4	0.0	27	13	7	0.0	36	12	0.0	42
Project Specific										
WPTH-2[d]	4	28	421	178	7	0.0	201	85	0.0	580

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2003 include AMS-9B/C data.
[c]AMS-28 includes WPTH-1 results.
[d]Monitor associated with the Waste Pits Project.

TABLE 5-5

THORIUM-232 PARTICULATE CONCENTRATIONS IN AIR FROM MONTHLY SAMPLES

	Mid-Year 2004 Results (January-June) (pCi/m^3 x 1E-6)				2003 Annual Summary Results[a] (pCi/m^3 x 1E-6)				1990 through 2003 Summary Results[a] (pCi/m^3 x 1E-6)	
	No. of Samples	Min.	Max.	Avg.	No. of Samples	Min.	Max.	Avg.	Min.	Max.
Fenceline										
AMS-2	4	4.9	12	10	6	0.0	9.2	4.9	0.0	22
AMS-3	4	6.4	25	16	7	3.1	20	10	0.0	23
AMS-4	4	2.6	8	6	7	0.2	10	6.4	0.0	22
AMS-5	4	4.9	8.8	6.6	7	0.0	9.0	4.8	0.0	25
AMS-6	4	4.8	12	7.2	7	1.5	20	10	0.0	22
AMS-7	4	2.2	9	4.7	7	0.0	13	5.9	0.0	16
AMS-8A	4	9.0	15	11	7	2.3	15	8.2	0.0	33
AMS-9C[b]	4	5.0	29	13	7	2.4	25	12	0.0	36
AMS-22	4	5.5	18	13	7	0.2	13	5.4	0.0	35
AMS-23	4	7.6	14	12	6	0.0	9.1	5.7	0.0	75
AMS-24	4	1.0	7.0	4.7	7	0.0	11	6.9	0.0	16
AMS-25	4	3.1	6.3	4.8	6	0.0	7.4	4.4	0.0	14
AMS-26	4	6.9	11	8.4	6	0.0	13	5.7	0.0	14
AMS-27	4	4.2	22	11	6	0.0	16	8.9	0.0	22
AMS-28[c]	4	5.2	17	8.3	7	0.7	14	6.6	0.0	33
AMS-29	4	3.8	22	13	7	0.8	13	9.4	0.0	31
Background										
AMS-12	4	2.3	9.0	5.0	7	0.0	5.0	3.2	0.0	34
Project Specific										
WPTH-2[d]	4	4.2	43	23	7	0.2	19	10	0.0	22

[a]For blank corrected concentrations less than or equal to 0.0 pCi/m^3, the concentration is set as 0.0 pCi/m^3.
[b]Summary results for 1990 through 2003 include AMS-9B/C data.
[c]AMS-28 includes WPTH-1 results.
[d]Monitor associated with the Waste Pits Project.

TABLE 5-6

2004 MID-YEAR NESHAP COMPLIANCE REPORT

	40 CFR 61 (NESHAP) Subpart H Appendix E, Table 2; Net Ratios[a]													
Location	U-238	U-234	U-235/ U-236	Th-228	Th-230	Th-232	Ra-226	Th-234[b]	Ra-228[b]	Ac-228[b]	Ra-224[b]	Th-231[b]	Ratio Totals	Dose[c] (mrem)
Fenceline														
AMS-2	2.2E-002	9.4E-003	1.6E-003	8.7E-004	4.0E-003	3.3E-003	1.3E-003	8.4E-005	3.5E-004	5.6E-007	1.4E-005	4.0E-008	0.043	0.431
AMS-3	4.3E-003	3.6E-003	4.7E-004	2.1E-003	1.2E-002	1.2E-002	1.6E-003	1.6E-005	1.2E-003	2.0E-006	4.9E-005	1.2E-008	0.037	0.371
AMS-4	1.1E-003	1.0E-003	3.0E-005	3.5E-004	1.5E-003	1.9E-003	--	4.2E-006	2.0E-004	3.1E-007	7.7E-006	7.6E-010	0.006	0.061
AMS-5	1.5E-003	1.7E-003	6.8E-005	3.7E-005	1.7E-003	1.3E-003	--	5.5E-006	1.4E-004	2.3E-007	5.6E-006	1.7E-009	0.006	0.065
AMS-6	3.7E-003	2.4E-003	2.6E-004	6.0E-004	6.4E-003	4.6E-003	--	1.4E-005	4.8E-004	7.7E-007	1.9E-005	6.6E-009	0.018	0.185
AMS-7	6.6E-004	6.1E-004	1.2E-004	1.9E-004	8.4E-004	9.3E-004	--	2.5E-006	9.8E-005	1.6E-007	3.9E-006	3.1E-009	0.003	0.035
AMS-8A	1.0E-002	7.2E-003	7.1E-004	1.0E-003	5.5E-003	6.8E-003	4.8E-003	3.8E-005	7.2E-004	1.1E-006	2.8E-005	1.8E-008	0.037	0.370
AMS-9C	8.4E-003	6.3E-003	1.1E-003	1.9E-003	6.6E-003	7.3E-003	1.9E-003	3.2E-005	7.7E-004	1.2E-006	3.0E-005	2.8E-008	0.034	0.343
AMS-22	2.6E-002	9.3E-003	1.2E-003	4.2E-004	5.7E-003	2.9E-003	--	9.6E-005	3.0E-004	4.8E-007	1.2E-005	3.1E-008	0.045	0.455
AMS-23	3.3E-002	7.5E-003	1.2E-003	4.5E-004	5.1E-003	4.5E-003	--	1.2E-004	4.7E-004	7.6E-007	1.9E-005	2.9E-008	0.052	0.520
AMS-24	2.8E-004	3.3E-004	1.7E-004	1.2E-004	6.8E-004	7.9E-004	--	1.1E-006	8.3E-005	1.3E-007	3.3E-006	4.3E-009	0.002	0.024
AMS-25	3.9E-004	3.5E-004	8.7E-005	1.8E-004	4.3E-004	9.6E-004	--	1.5E-006	1.0E-004	1.6E-007	4.0E-006	2.2E-009	0.003	0.025
AMS-26	5.1E-003	5.5E-003	6.1E-004	3.8E-004	3.2E-003	2.1E-003	--	1.9E-005	2.2E-004	3.5E-007	8.7E-006	1.6E-008	0.017	0.172
AMS-27	1.7E-003	1.1E-003	1.9E-004	7.8E-004	2.0E-003	4.8E-003	--	6.5E-006	5.0E-004	8.0E-007	2.0E-005	4.8E-009	0.011	0.111
AMS-28	1.3E-002	4.3E-003	6.3E-004	1.1E-004	5.2E-003	3.0E-003	--	5.1E-005	3.2E-004	5.1E-007	1.2E-005	1.6E-008	0.027	0.271
AMS-29	2.5E-003	1.8E-003	2.5E-004	1.3E-003	5.5E-003	6.0E-003	2.0E-003	9.5E-006	6.4E-004	1.0E-006	2.5E-005	6.3E-009	0.020	0.201
Background														
AMS-12	7.4E-004	4.8E-004	2.8E-005	1.0E-003	1.8E-003	3.0E-003	9.3E-003	2.8E-006	3.2E-004	5.1E-007	1.3E-005	7.2E-010	NA[d]	NA[d]
QA/QC														
Column Check[e]	1.337	0.624	0.086	0.108	0.663	0.631	0.115	0.005	0.066	0.000	0.003	0.000	NA[d]	3.64

Maximum Year-To-Date Ratio: 0.052
Maximum Year-To-Date Dose (mrem): 0.52

[a]A "--" indicates the filter results were less than or equal to the blank results, and/or the indicator concentrations were less than or equal to the average net background concentrations.
[b]Isotopes assumed to be in equilibrium with their parents.
[c]Dose conversions are based on the NESHAP standard of 10 mrem per year.
[d]NA = not applicable
[e]Column check is the sum of doses from each radionuclide, followed by the sum of doses (3.64) at all fenceline monitors.

TABLE 5-7

CONTINUOUS ENVIRONMENTAL RADON MONITORING MONTHLY AVERAGE CONCENTRATIONS[a]

	Mid-Year 2004 Results (January - June) (Instrument Background Corrected)[b] (pCi/L)			2003 Summary Results (Instrument Background Corrected)[b] (pCi/L)		
Location	Min.	Max.	Avg.	Min.	Max.	Avg.
Fenceline						
AMS-02	0.2	0.5	0.3	0.1	0.6	0.3
AMS-03	0.2	0.5	0.3	0.1	0.5	0.3
AMS-04	0.2	0.3	0.2	0.2	0.6	0.4
AMS-05	0.1	0.5	0.3	0.2	0.9	0.4
AMS-06	0.2	0.4	0.3	0.3	0.8	0.5
AMS-07	0.3	0.6	0.4	0.3	0.9	0.6
AMS-08A	0.2	0.5	0.3	0.2	0.4	0.3
AMS-09C	0.2	0.4	0.3	0.2	0.5	0.4
AMS-22	0.1	0.5	0.3	0.1	0.4	0.2
AMS-23	0.2	0.3	0.3	0.2	0.4	0.3
AMS-24	0.3	0.7	0.4	0.3	0.7	0.5
AMS-25	0.2	0.3	0.2	0.2	0.6	0.3
AMS-26	0.2	0.3	0.3	0.2	0.6	0.4
AMS-27	0.3	0.4	0.3	0.2	0.8	0.5
AMS-28	0.2	0.7	0.4	0.3	0.9	0.5
AMS-29	0.2	0.4	0.3	0.2	0.5	0.4
Background						
AMS-12	0.2	0.4	0.2	0.2	0.4	0.3
On Site						
KNE	0.3	0.4	0.3	1.4	5.6	3.7
KNO	0.3	0.5	0.5	1.1	2.7	1.7
KNWA	0.3	0.5	0.4	0.5	2.0	1.1
KSE	0.2	0.4	0.3	1.1	3.6	2.4
KSO	0.3	0.4	0.3	0.2	1.2	0.6
KSWA	0.3	0.6	0.5	0.7	1.7	1.0
KTOP	0.3	1.5	0.8	2.8	8.8	4.7
LP2	0.3	0.4	0.4	0.4	1.4	0.8
Pilot Plant Warehouse	0.2	0.4	0.3	0.1	0.7	0.4
PR-1	0.2	0.4	0.3	0.1	1.1	0.5
Rally Point 4	0.2	0.3	0.3	0.2	0.8	0.4
Surge Lagoon	0.3	0.3	0.3	0.4	1.3	0.8
T117	0.2	0.3	0.3	0.2	1.0	0.4
T28	0.2	0.4	0.3	0.4	1.0	0.6
WP17A	0.3	0.4	0.3	0.1	1.1	0.5

[a]Monthly average radon concentrations are calculated from daily average concentrations. Daily average concentrations are calculated by summing all hourly count data, treating the sum as a single daily measurement, and then converting the sum to a (daily average) concentration.
[b]Instrument background changes as monitors are replaced.

TABLE 5-8

DIRECT RADIATION TLD MEASUREMENTS

Location	Direct Radiation (mrem)		
	Mid-Year 2004 Summary Results		
	First Qtr	Second Qtr	2003 Summary Results
Fenceline			
2	18	17	73
3	16	15	68
4	17	16	69
5	18	16	71
6	17	15	73
7	18	16	70
8A	19	17	74
9C	18	17	74
13	16	14	64
14	16	16	72
15	18	16	75
16	18	15	76
17	16	16	71
34	17	16	72
35	15	14	68
36	15	14	68
37	18	17	74
38	15	14	67
39	20	18	75
40	17	15	68
41	17	15	68
On Site (K-65 area)			
22	45	39	399
23A	37	43	445
24	24	24	294
25	26	26	131
26	21	20	310
43	30	30	254
44	27	28	215
45	18	17	147
46	16	16	145
47	13	12	107
32 (Building 53A, Dosimetry Laboratory)	13	12	56
Background			
19	16	15	65
20	16	14	62
27	15	14	61
33	17	15	70
42	18	17	71

TABLE 5-9

NESHAP STACK EMISSION MONITORING RESULTS

	Mid-Year Results		2003 Year End Results	
Analysis Performed	No. of Samples	Total Pounds[a,c]	No. of Samples	Total Pounds[a,b,c]
Silos RCS Stack				
Uranium-238	5	1.2E-05	9	3.1E-05
Uranium-235/236	5	2.1E-06	9	5.7E-07
Uranium-234	5	1.7E-09	9	2.1E-09
Thorium-232	5	8.1E-05	9	6.1E-05
Thorium-230	5	1.8E-09	9	3.6E-09
Thorium-228	5	1.5E-14	9	8.2E-15
Thorium-227	5	ND	9	ND
Radium-226	5	1.5E-11	9	ND
Polonium-210	5	7.3E-15	9	6.3E-15
Total Particulate	5	3.5E-02	8	1.5E-01
WPP Dryer Stack				
Uranium-238	6	4.1E-05	14	3.1E-05
Uranium-235/236	6	2.1E-07	14	2.0E-07
Uranium-234	6	6.3E-10	14	1.1E-09
Thorium-232	6	2.2E-06	14	4.1E-06
Thorium-230	6	1.7E-10	14	4.9E-10
Thorium-228	6	4.9E-16	14	1.1E-15
Radium-226	6	1.5E-13	14	4.6E-13
WPP Pugmill Stack				
Uranium-238	26	8.4E-04	57	1.2E-03
Uranium-235/236	26	5.0E-06	57	3.4E-06
Uranium-234	26	1.0E-08	57	3.1E-08
Thorium-232	26	1.2E-04	57	2.6E-04
Thorium-230	26	2.0E-08	57	4.4E-08
Thorium-228	26	1.3E-14	57	4.4E-14
Radium-226	26	5.4E-12	57	3.2E-11

	2004 Mid-Year Results		
Analysis Perfc	*Maximum Release*	Total *Release (µCi)*	Estimated Max. Hourly *Release Rate, Rn-222 (µCi/hr)*
WPP Dryer Stack			
Radon-220/22	4,650 (µCi/hr)	4,270,000	13,000
Silos RCS Stack			
Radon-220/22	178 (µCi/instant.)	1,170,000	-

[a]Total pounds are only determined from detected results.

[b]Includes sample probe rinse.

[c]ND = not detectable

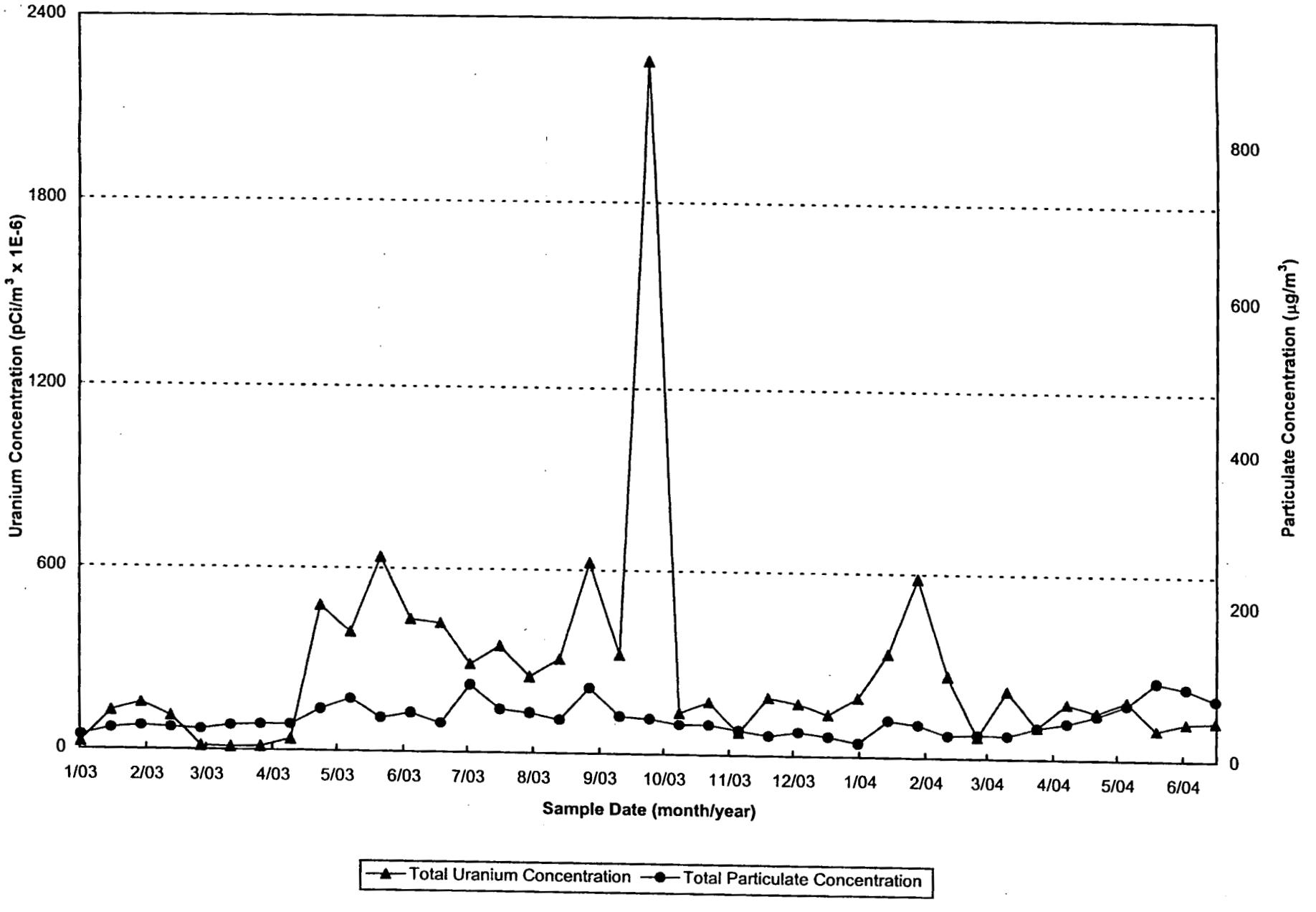


FIGURE 5-1. TOTAL URANIUM AND PARTICULATE CONCENTRATIONS IN AIR FROM BIWEEKLY SAMPLES AT AMS-3, JANUARY 2003 THROUGH JUNE 2004

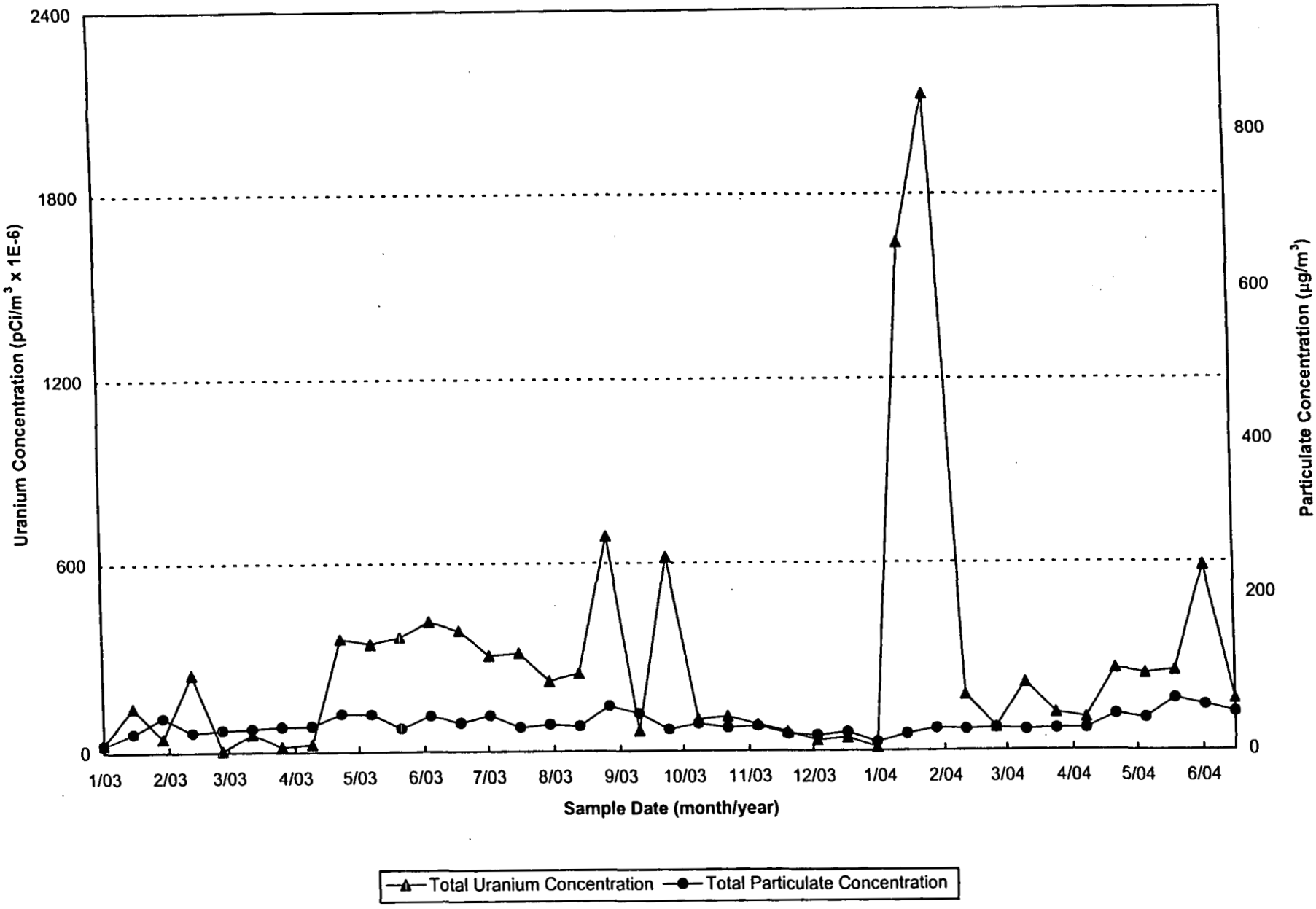


FIGURE 5-2. TOTAL URANIUM AND PARTICULATE CONCENTRATIONS IN AIR FROM BIWEEKLY SAMPLES AT AMS-8A, JANUARY 2003 THROUGH JUNE 2004

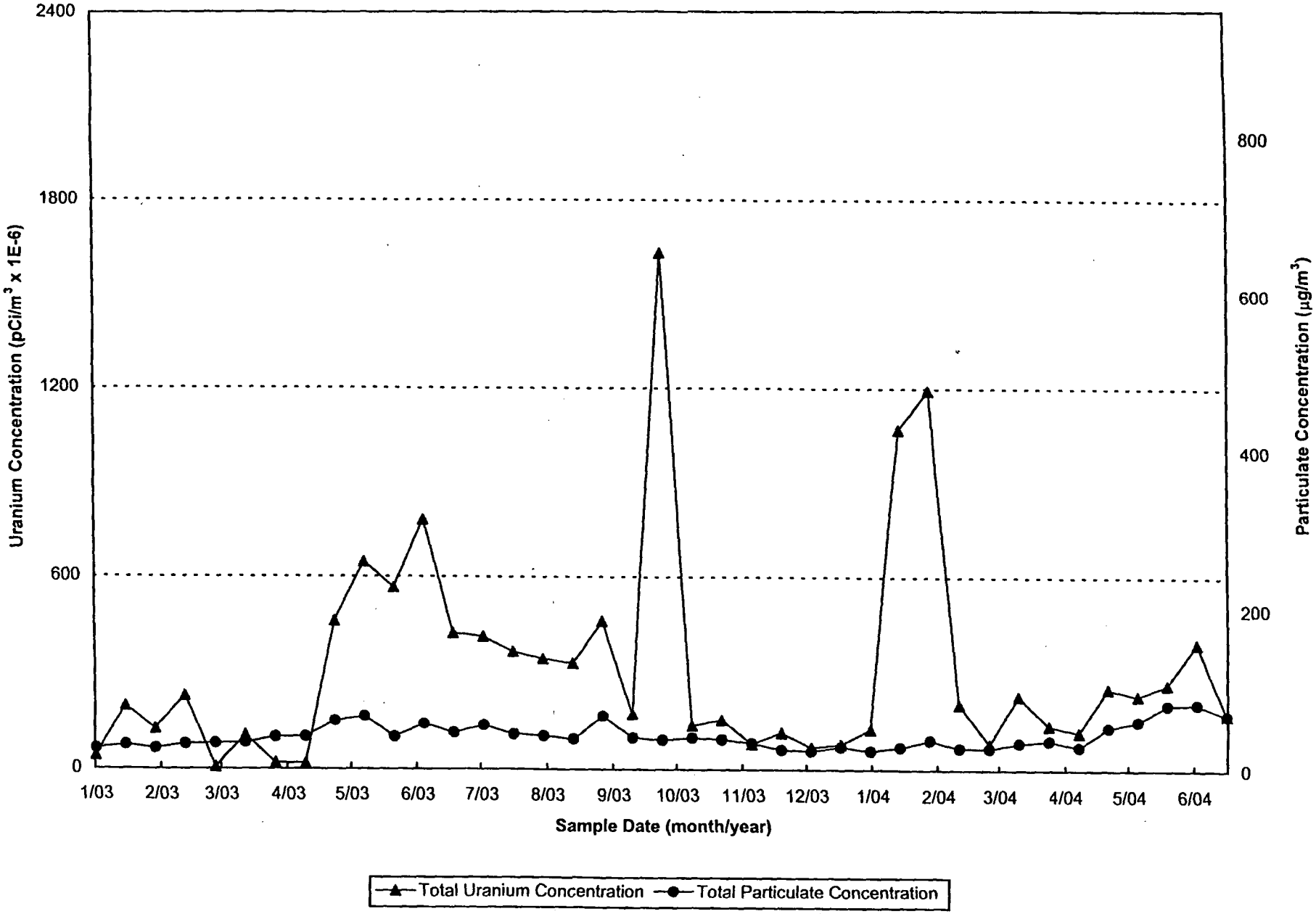


FIGURE 5-3. TOTAL URANIUM AND PARTICULATE CONCENTRATIONS IN AIR FROM BIWEEKLY SAMPLES AT AMS-9C, JANUARY 2003 THROUGH JUNE 2004

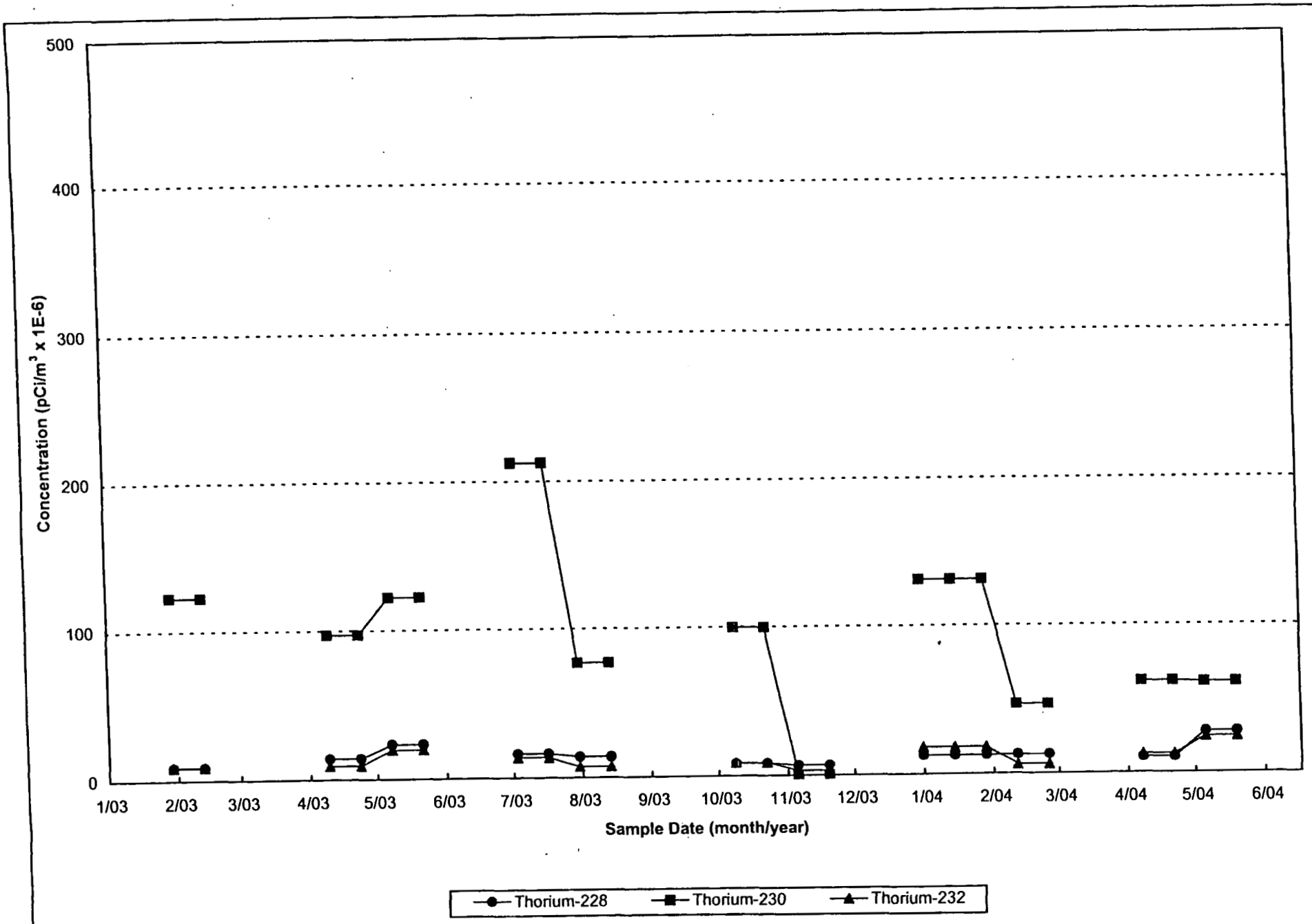


FIGURE 5-4. THORIUM-228, THORIUM-230, AND THORIUM-232 CONCENTRATIONS IN AIR AT AMS-3, JANUARY 2003 THROUGH JUNE 2004

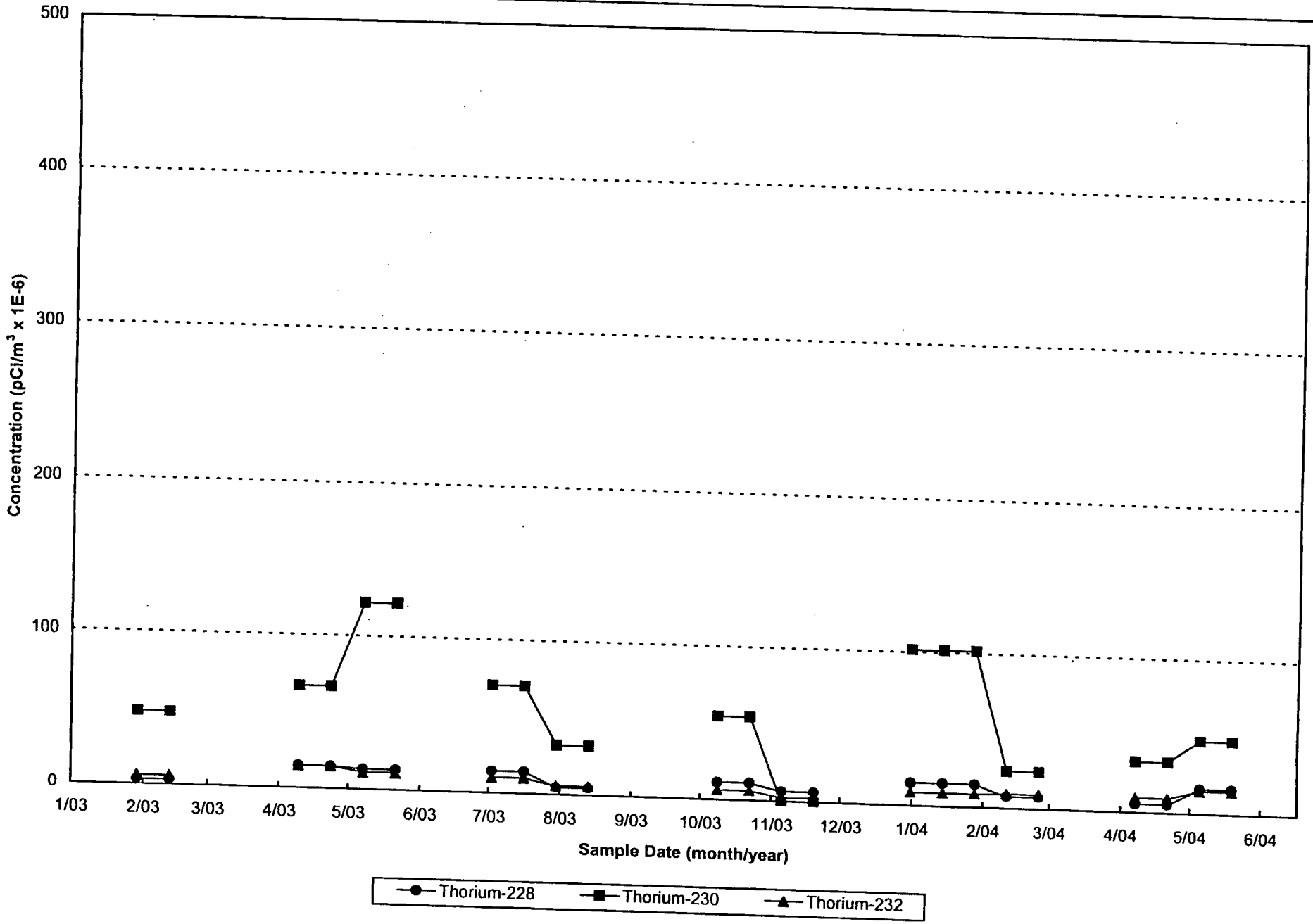


FIGURE 5-5. THORIUM-228, THORIUM-230, AND THORIUM-232 CONCENTRATIONS IN AIR AT AMS-8A, JANUARY 2003 THROUGH JUNE 2004

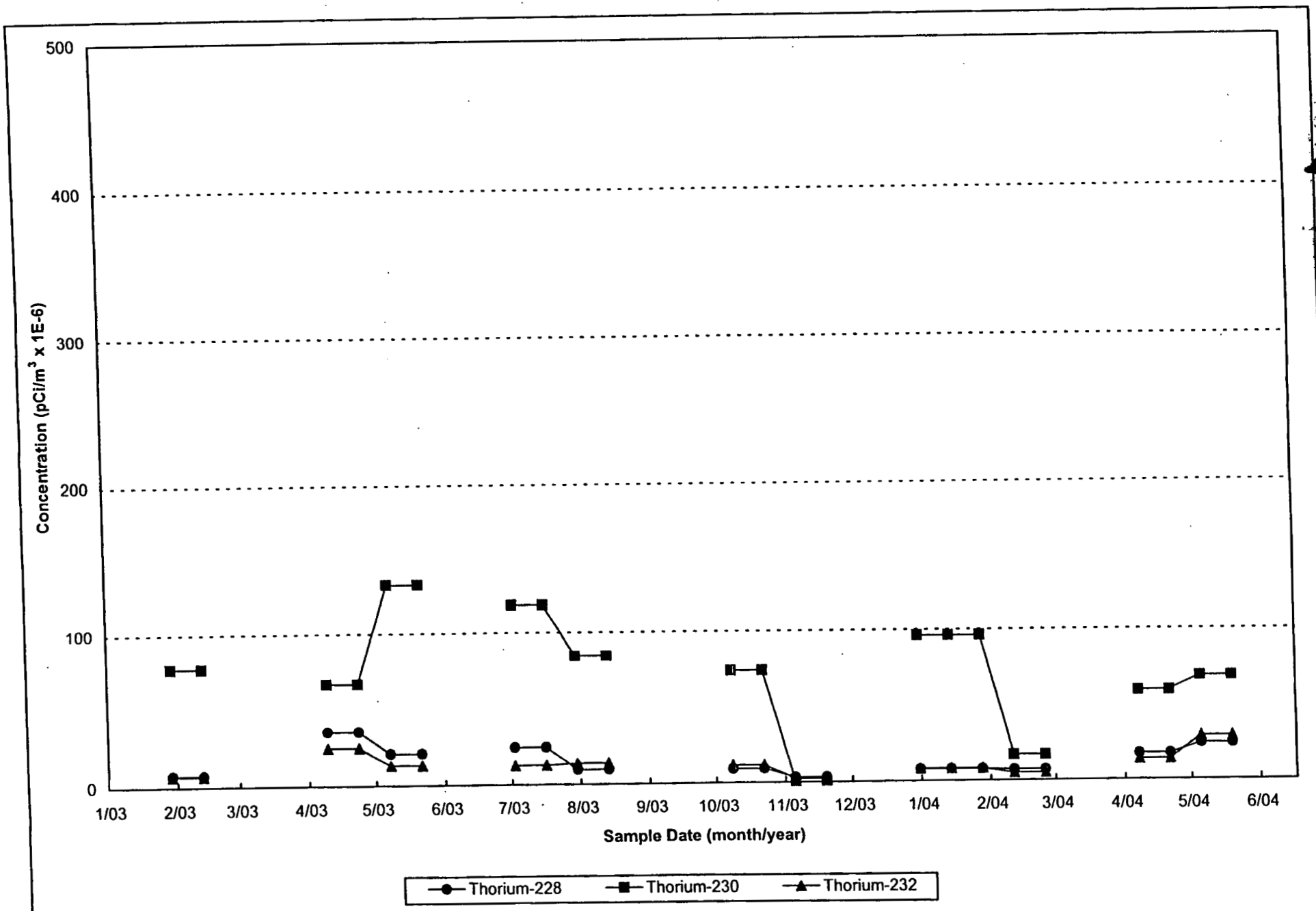


FIGURE 5-6. THORIUM-228, THORIUM-230, AND THORIUM-232 CONCENTRATIONS IN AIR AT AMS-9C, JANUARY 2003 THROUGH JUNE 2004

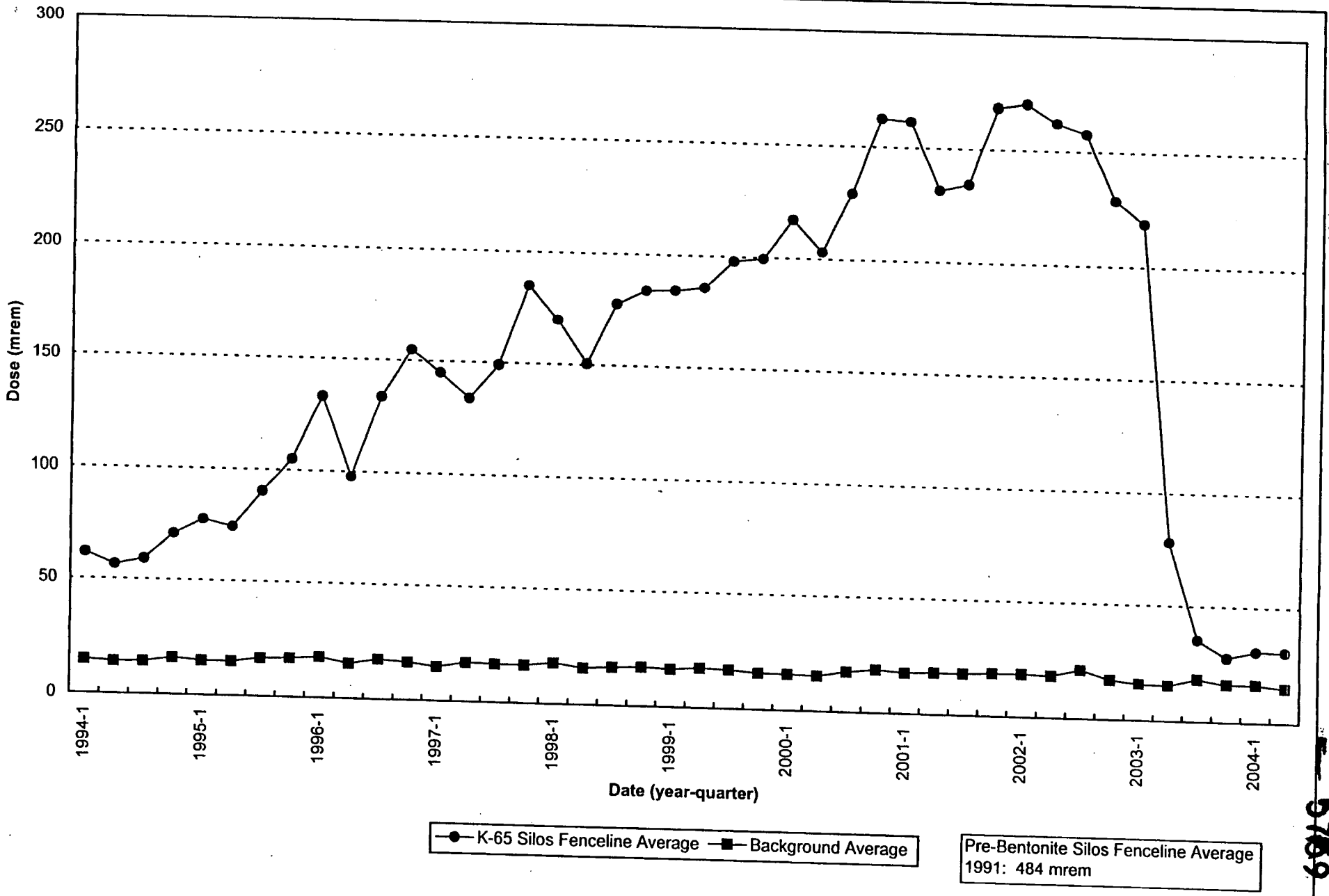


FIGURE 5-7. QUARTERLY DIRECT RADIATION (TLD) MEASUREMENTS
(K-65 SILOS FENCELINE AVERAGE VS. BACKGROUND AVERAGE), 1994-2004

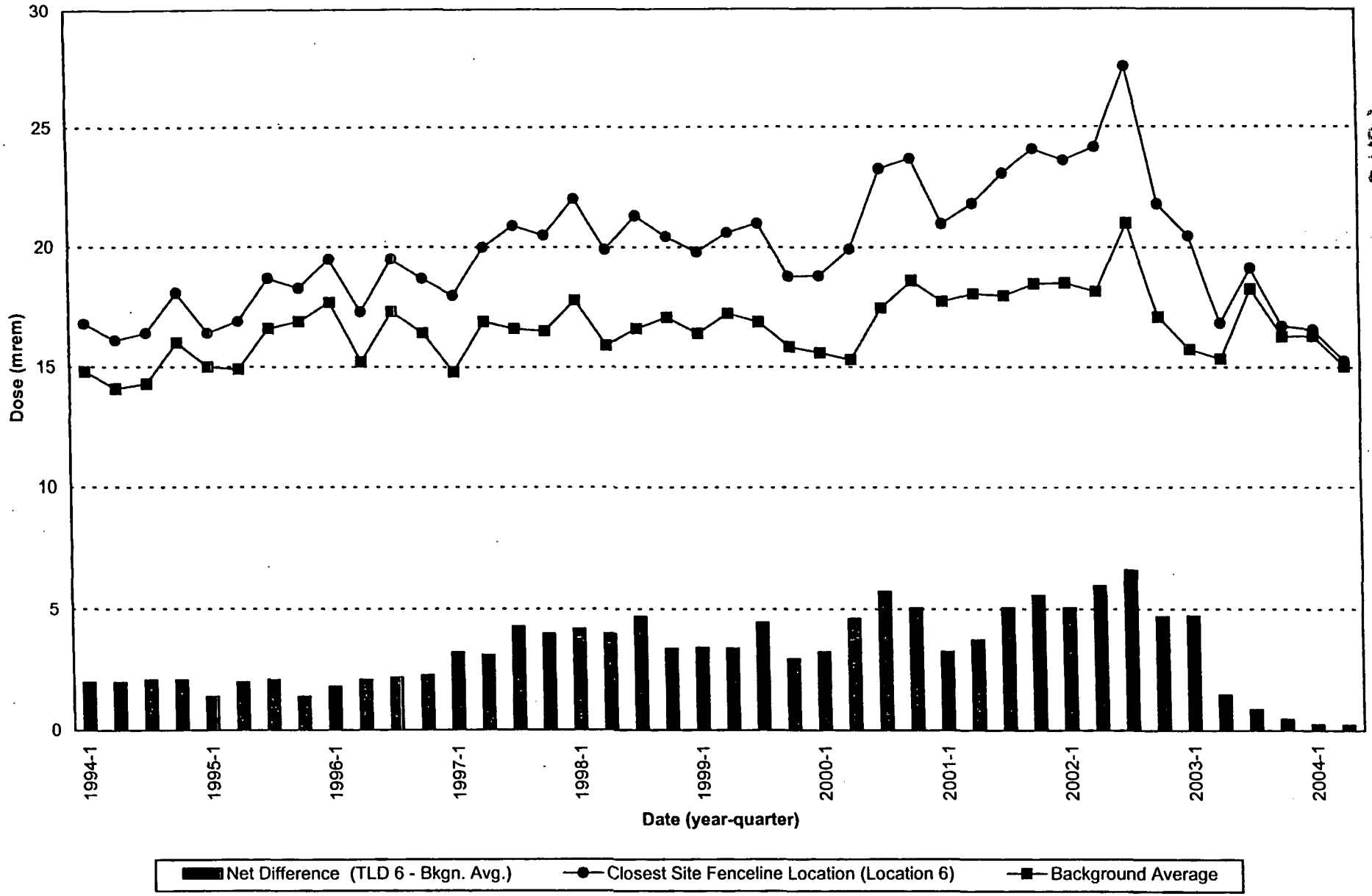
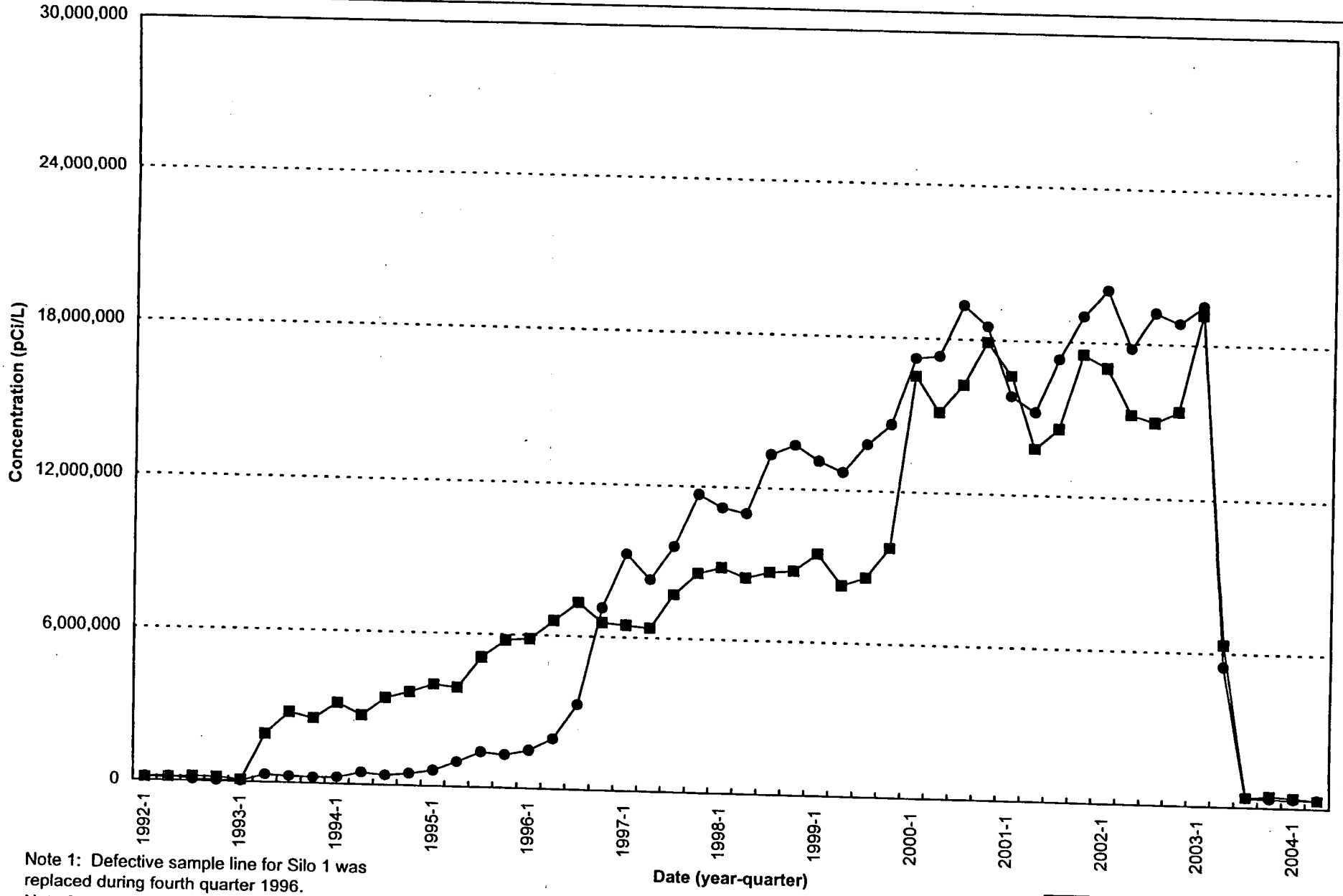


FIGURE 5-8. QUARTERLY DIRECT RADIATION (TLD) MEASUREMENTS
(LOCATION 6 VS. BACKGROUND AVERAGE), 1994-2004



Note 1: Defective sample line for Silo 1 was replaced during fourth quarter 1996.
Note 2: Silo headspace correction was applied beginning with the first quarter of 2000.

FIGURE 5-9. QUARTERLY K-65 SILO HEADSPACE RADON CONCENTRATIONS, 1992 THROUGH SECOND QUARTER 2004

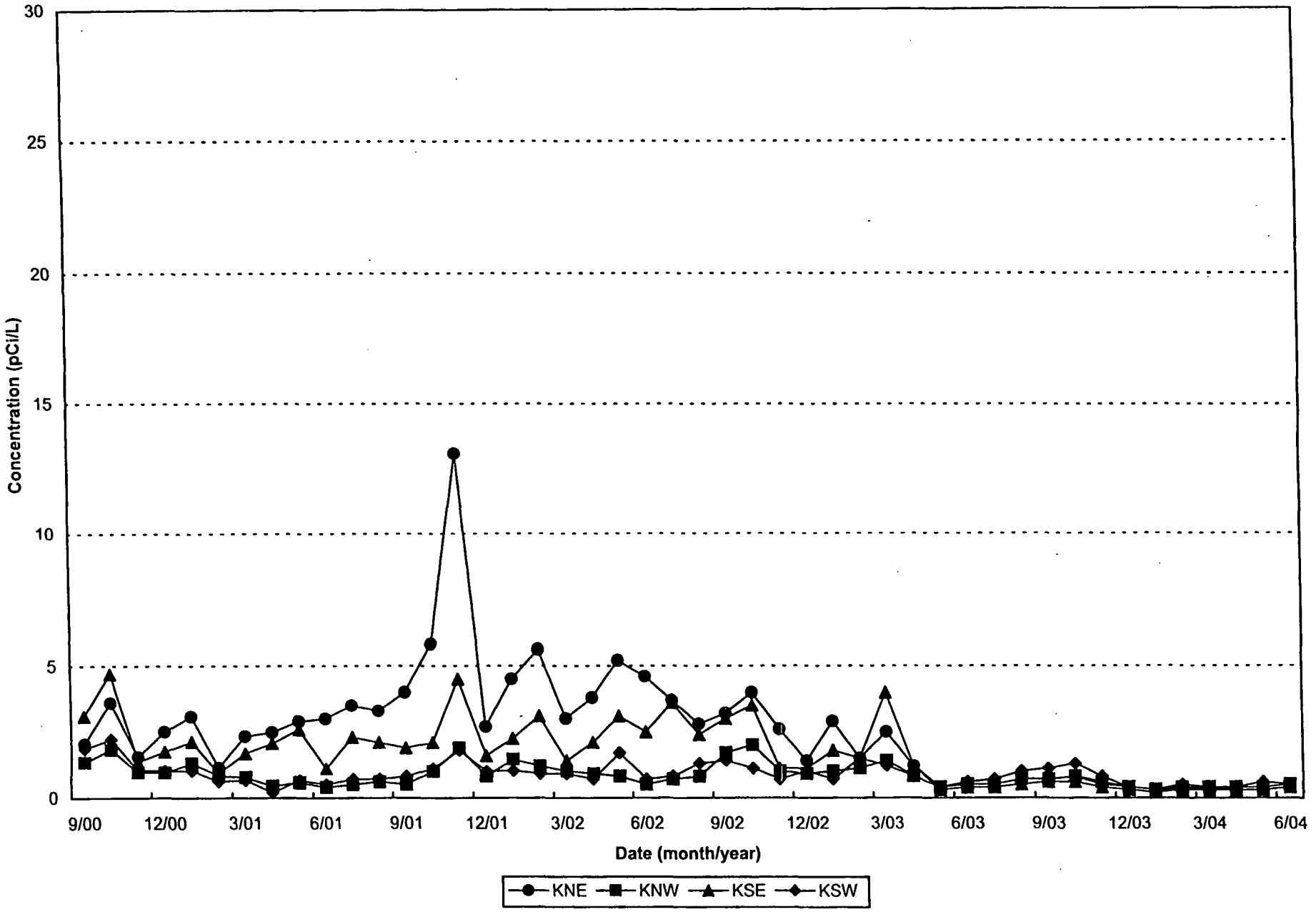


FIGURE 5-10. MONTHLY AVERAGE RADON CONCENTRATIONS FOR
SILO EXCLUSION FENCE MONITORS, SEPTEMBER 2000 THROUGH JUNE 2004

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