US EPA ARCHIVE DOCUMENT

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FIGURES

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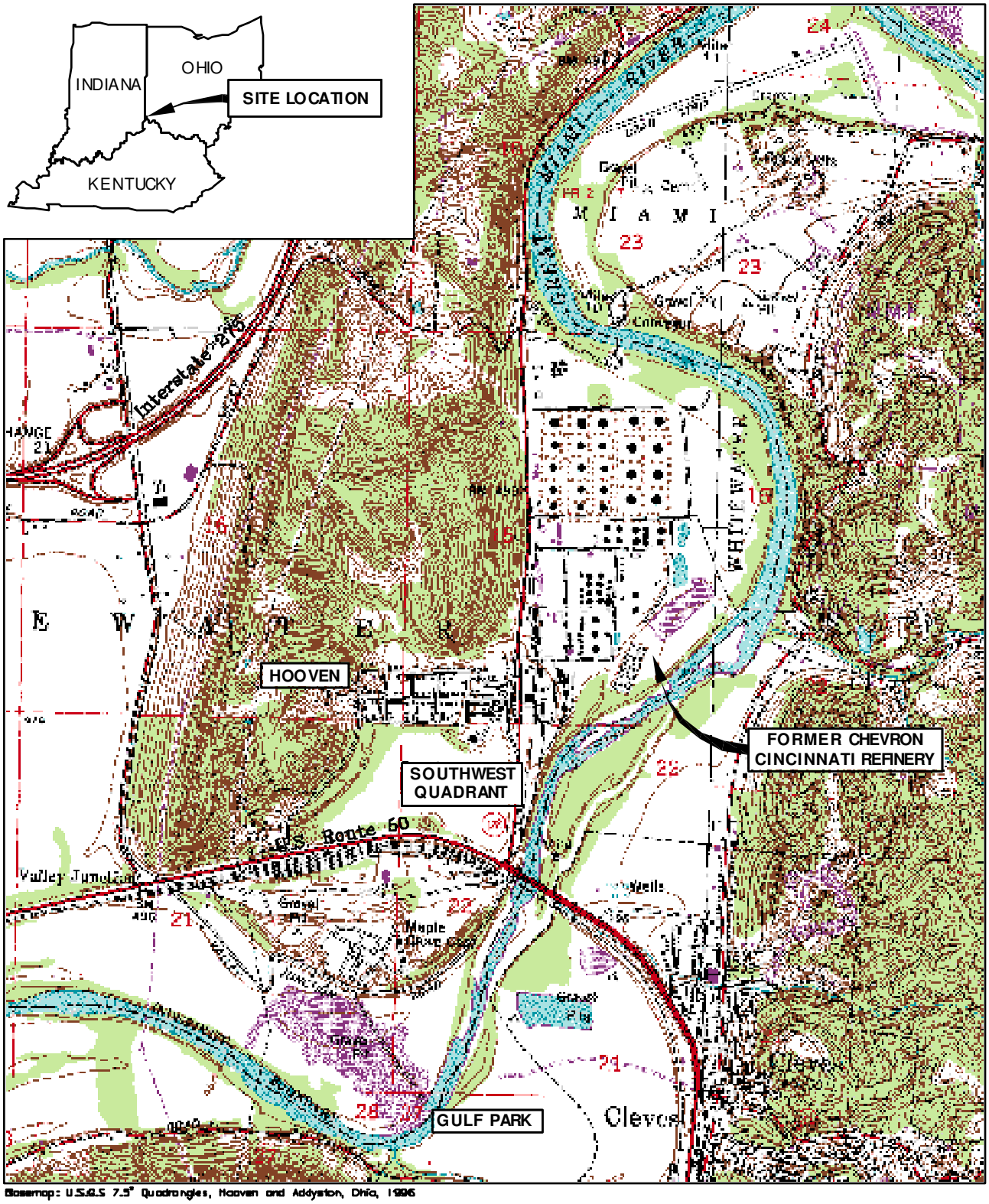

N

0 2,000'

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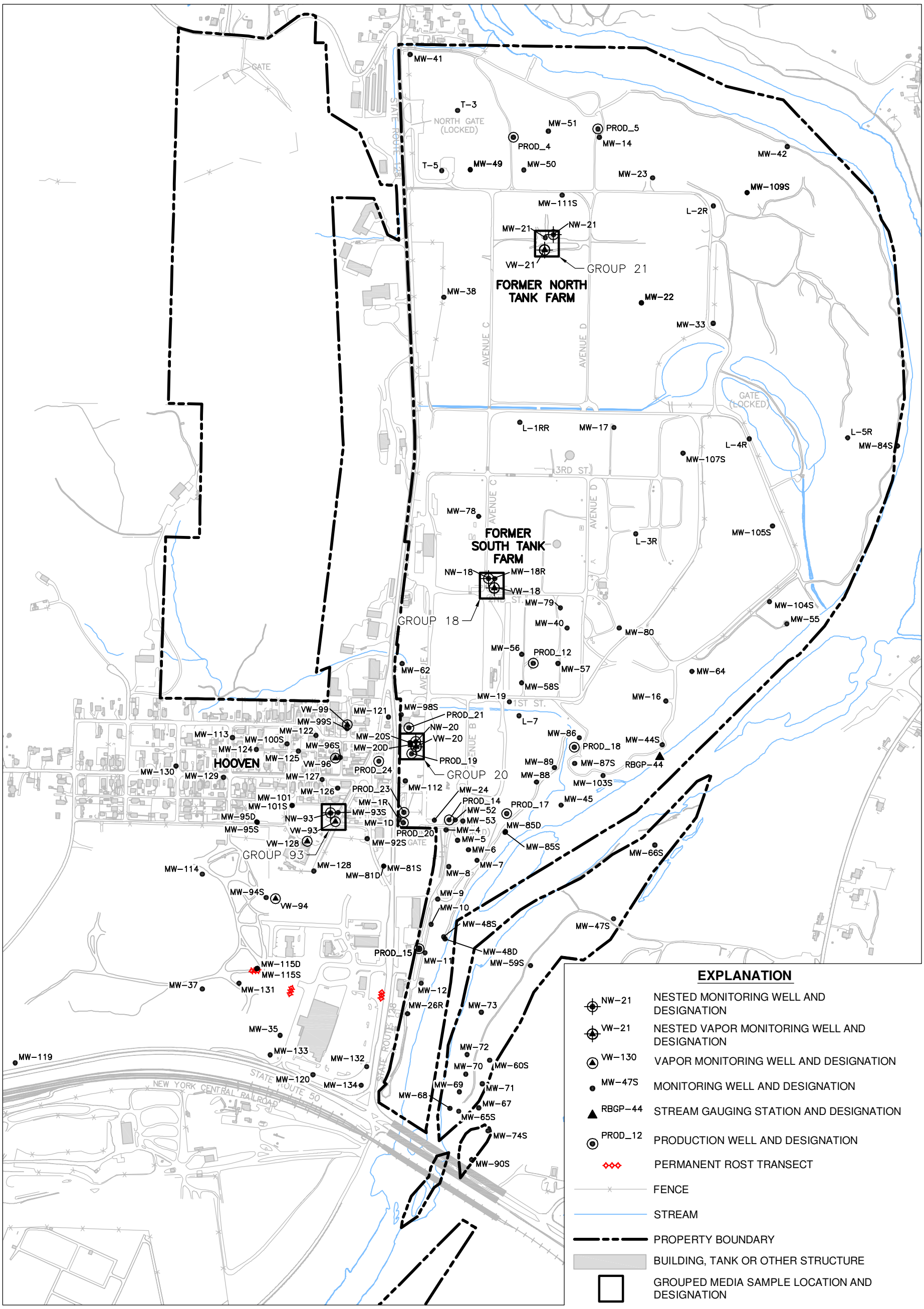
FIGURE 1-1

SITE LOCATION MAP

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: DVS	Checked By: PM	Scale: 1" = 2,000'	Date: 4/28/09	File:500USGSSITE200904



EXPLANATION

NW-21	NESTED MONITORING WELL AND DESIGNATION
VW-21	NESTED VAPOR MONITORING WELL AND DESIGNATION
VW-130	VAPOR MONITORING WELL AND DESIGNATION
MW-47S	MONITORING WELL AND DESIGNATION
RBGP-44	STREAM GAUGING STATION AND DESIGNATION
PROD_12	PRODUCTION WELL AND DESIGNATION
	PERMANENT ROST TRANSECT
	FENCE
	STREAM
	PROPERTY BOUNDARY
	BUILDING, TANK OR OTHER STRUCTURE
	GROUPED MEDIA SAMPLE LOCATION AND DESIGNATION

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FIGURE 1-2

SITE LAYOUT MAP

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PS	Scale: 1" = 650'	Date: 10/31/08	File: 500FACILITYMAP200805

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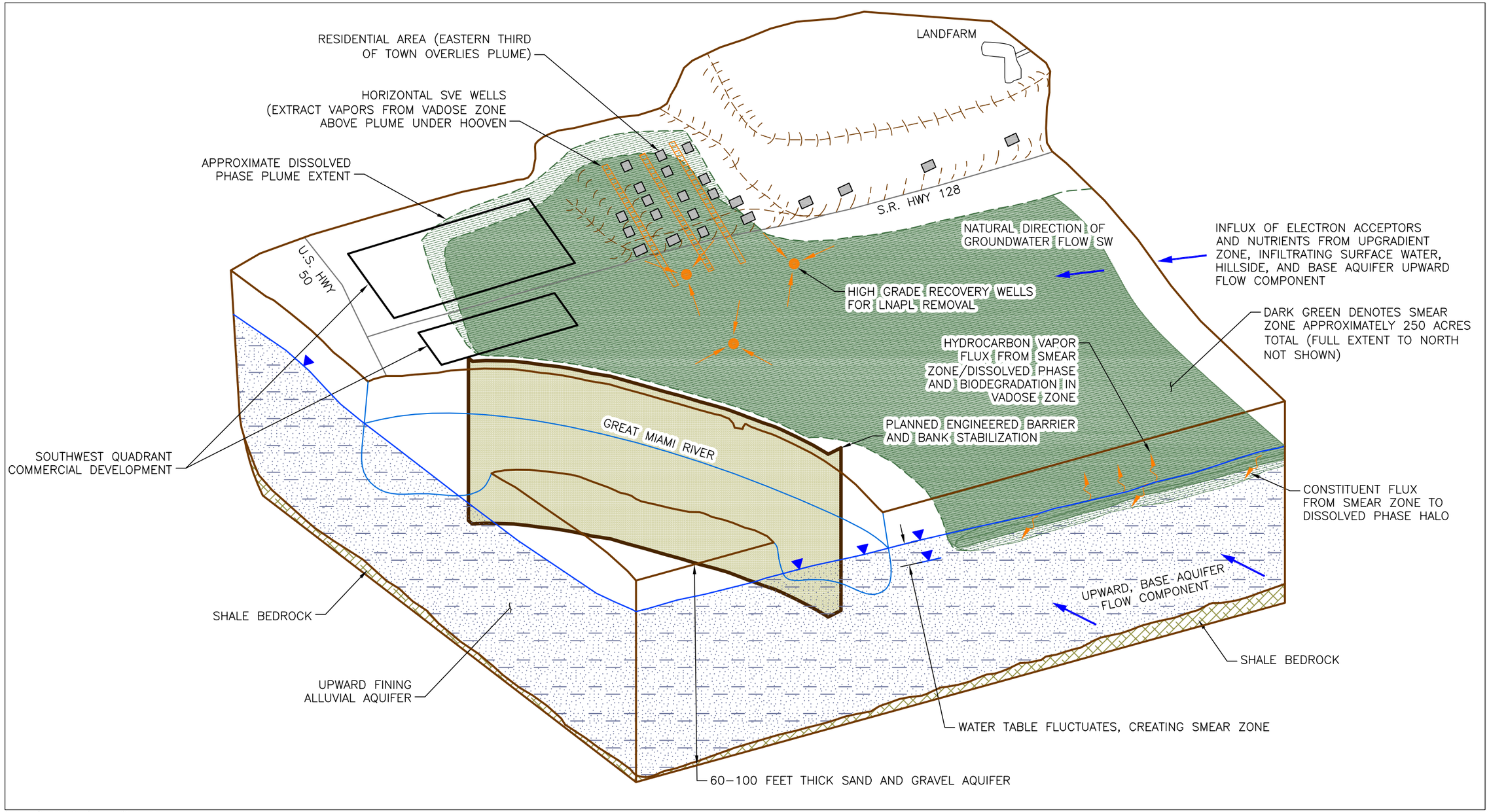

Source: Provided by Chevron Cincinnati.

EXPLANATION

HIGH-GRADE PUMPING TARGETED AREAS WITH HIGHEST RESIDUAL LNAPL SATURATION.

WATER LEVEL

DISSOLVED PHASE PLUME EXTENT

SMEAR ZONE EXTENT

N

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FIGURE 2-1

GROUNDWATER CONCEPTUAL SITE MODEL

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: KR	Scale: NONE	Date: 8/22/07	File: 500GWCONCSITEMODEL

TRANSDUCER MONITORING WELLS FOR PLUME MONITORING
MW-19
MW-20S
MW-26R
MW-35
MW-48S
MW-79
MW-85S
MW-94S
MW-96S
MW-100S
MW-104S
MW-112
MW-131
MW-132

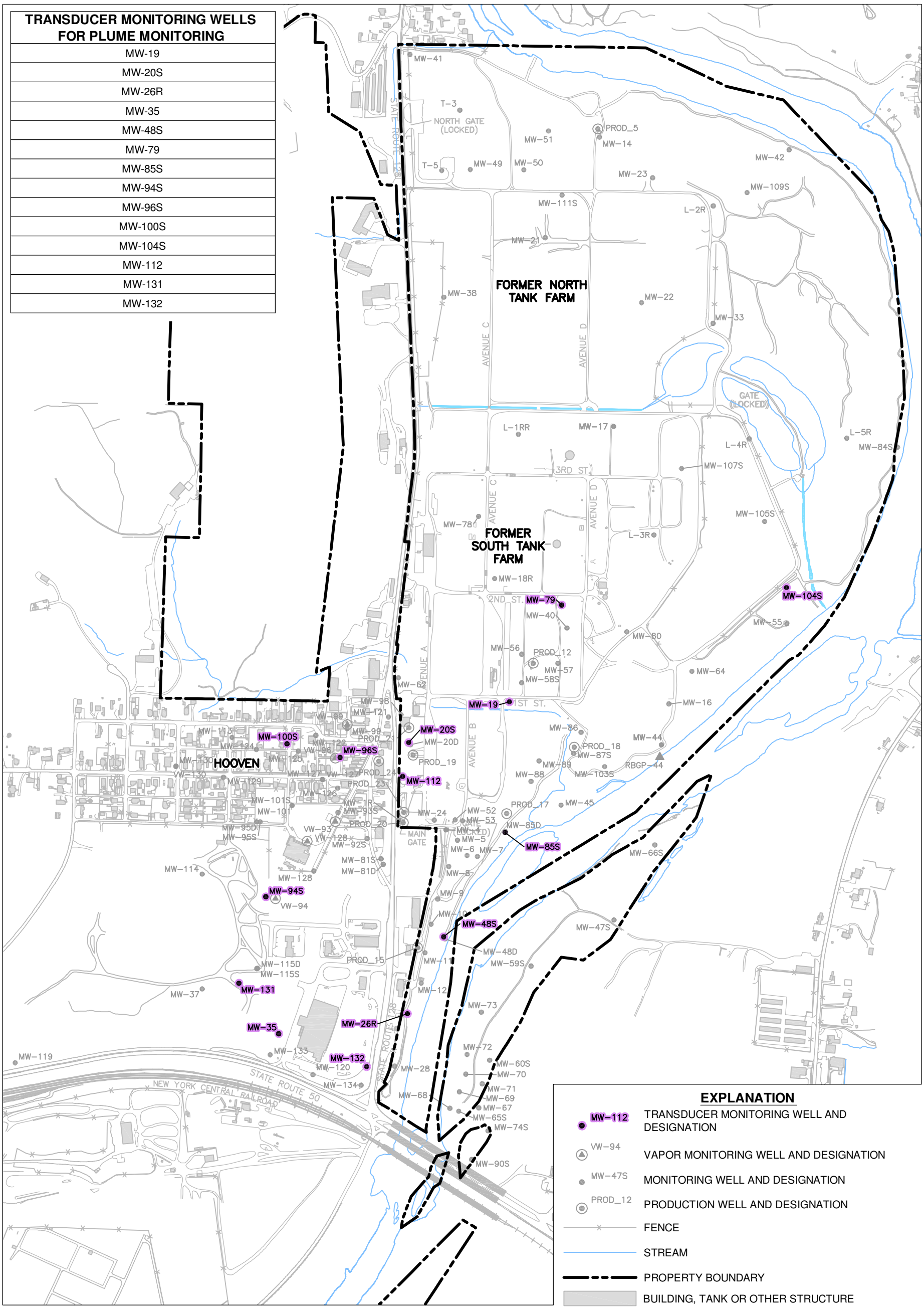

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FIGURE 3-1

TRANSDUCER MONITORING WELLS FOR PLUME MONITORING

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PS	Scale: 1" = 650'	Date: 10/31/08	File: 500TRANMONWELLS200805

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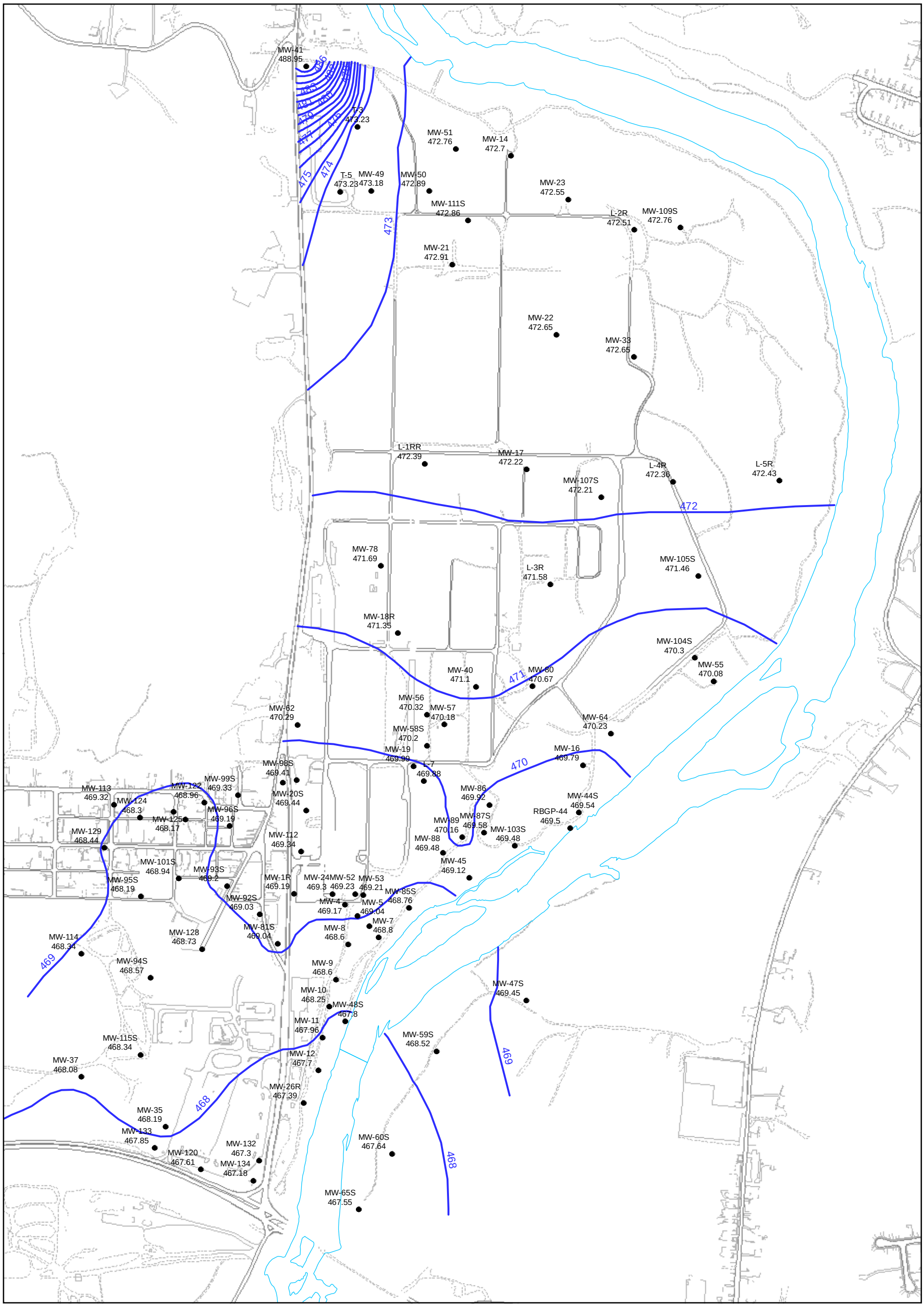

EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Sea Level
Contour Interval is 1.0 feet
(Line Dashed where approximate)

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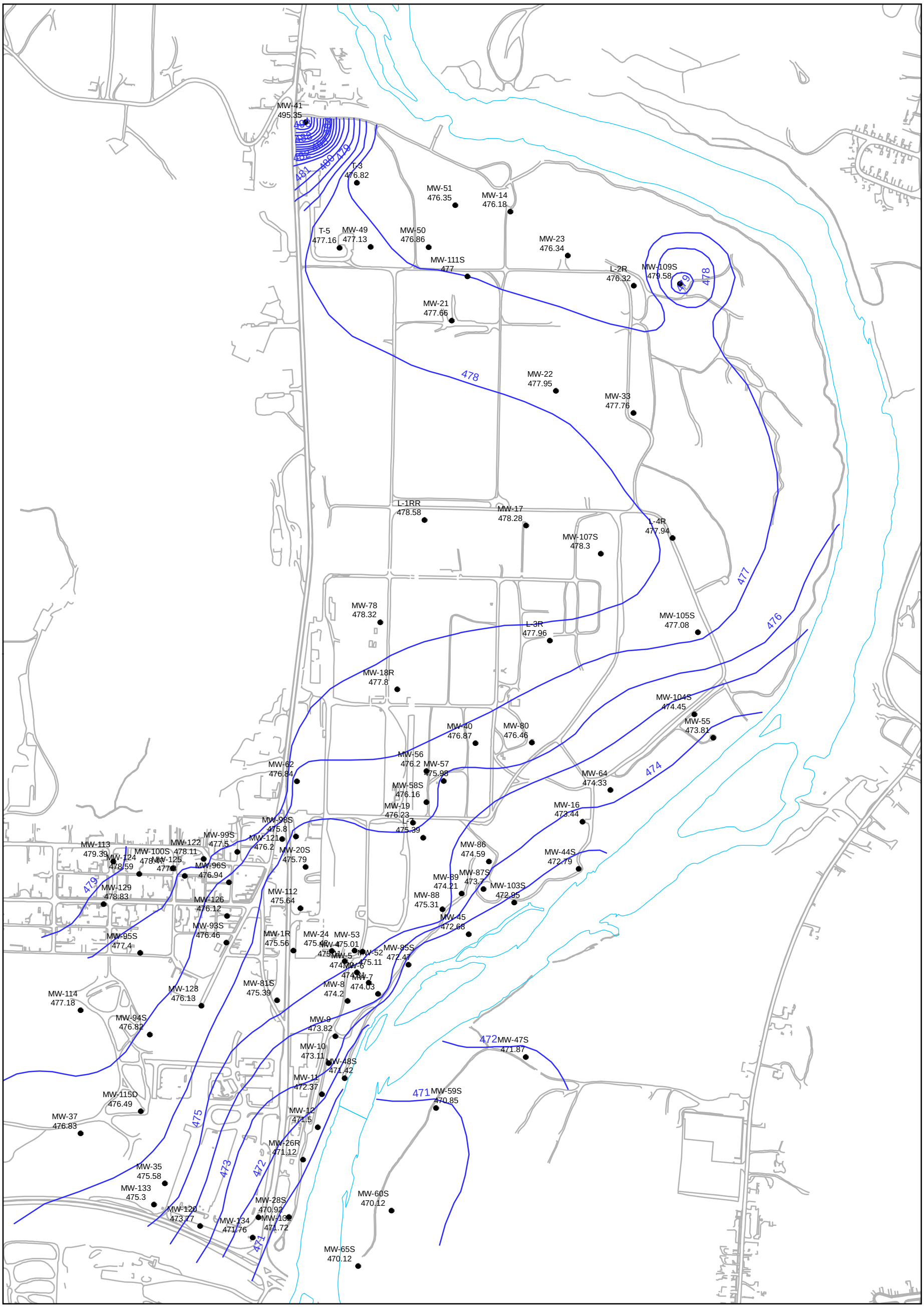
FIGURE 3-2

POTENTIOMETRIC SURFACE MAP, JANUARY 2008

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 600'	Date: 02/26/09	File: Jan08_Potsurface.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Sea Level
Contour Interval is 1.0 feet
(Line Dashed where approximate)

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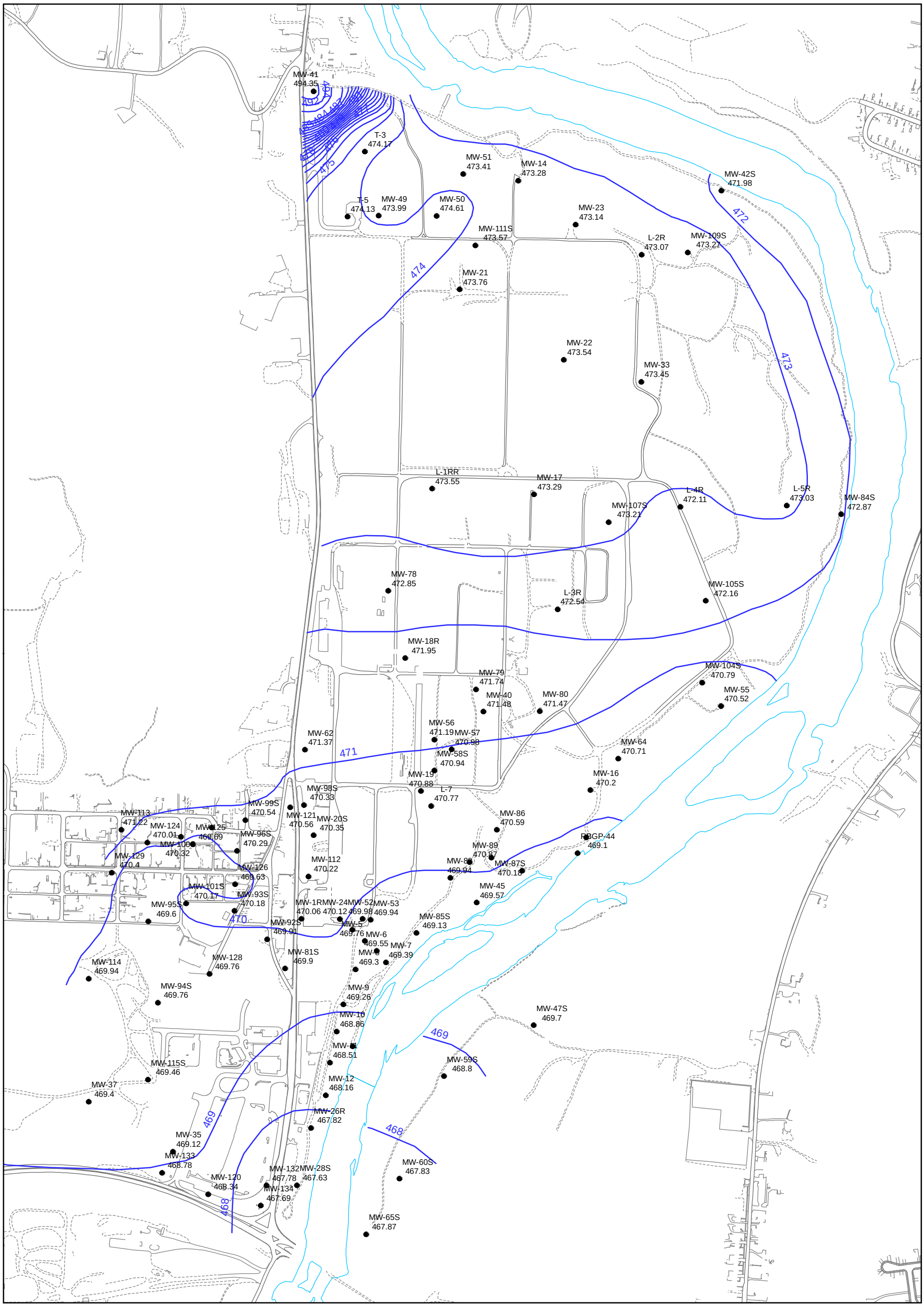
FIGURE 3-3

POTENTIOMETRIC SURFACE MAP, MARCH 2008

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 600'	Date: 04/17/09	File: Mar_08_Potsurface.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Sea Level
Contour Interval is 1.0 feet
(Line Dashed where approximate)

N

0 600'

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FIGURE 3-4

POTENTIOMETRIC SURFACE MAP, MAY 2008

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 600'	Date: 02/26/09	File: May_08_Potsurface.mxd

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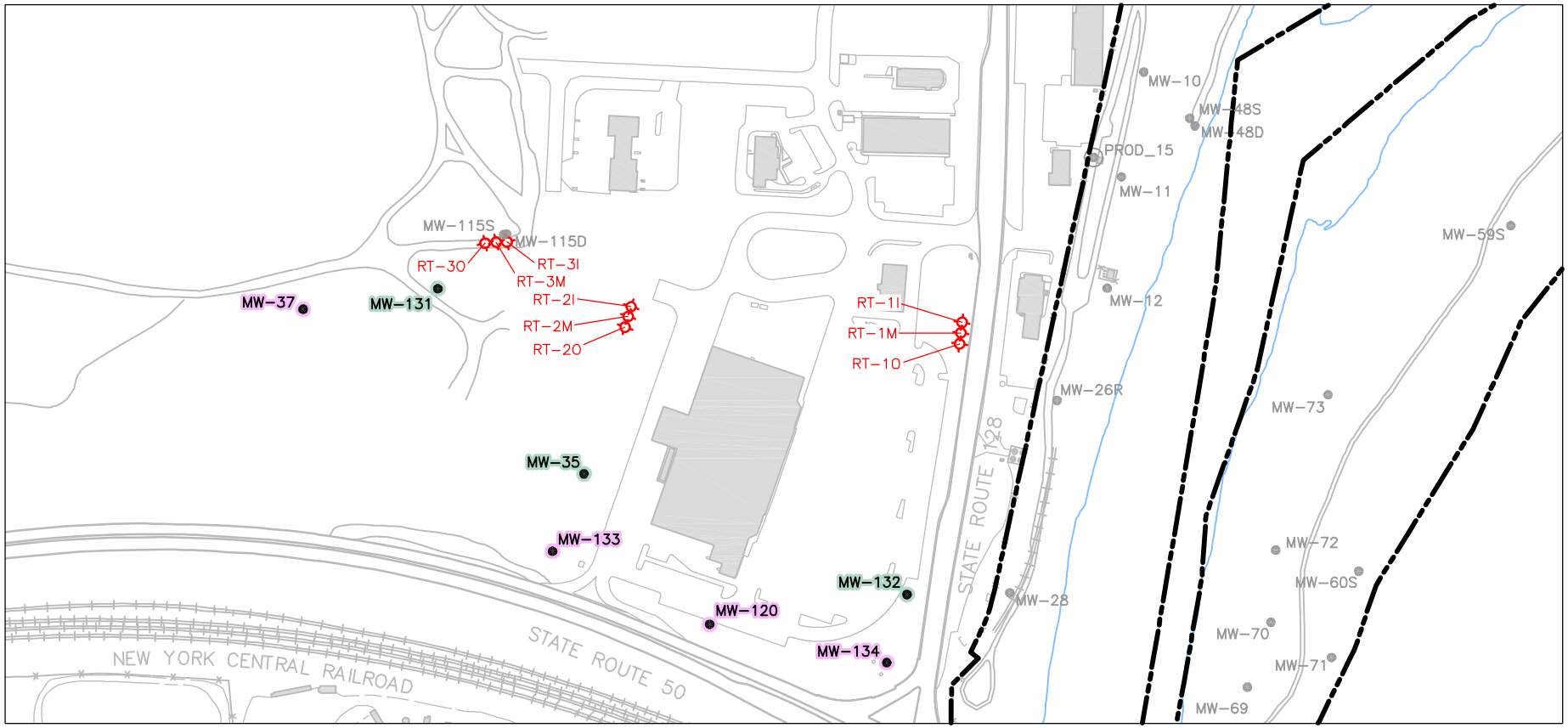

EXPLANATION

RT-2E — PERMANENT ROST TRANSECT AND DESIGNATION

MW-35 — SENTINEL MONITORING WELL AND DESIGNATION

MW-37 — POINT OF COMPLIANCE MONITORING WELL AND DESIGNATION

MW-47S — MONITORING WELL AND DESIGNATION

PROD_12 — PRODUCTION WELL AND DESIGNATION

STREAM

PROPERTY BOUNDARY

BUILDING, TANK OR OTHER STRUCTURE

N

0 300'

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FIGURE 3-5

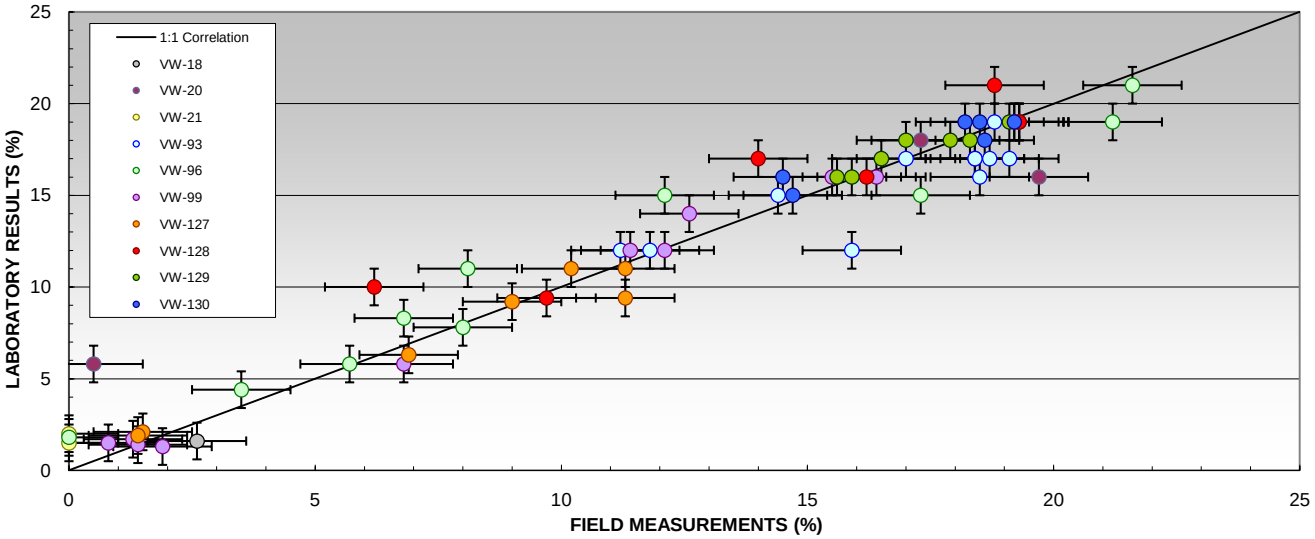
SENTINEL, POINT OF COMPLIANCE, AND ROST MONITORING NETWORK

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

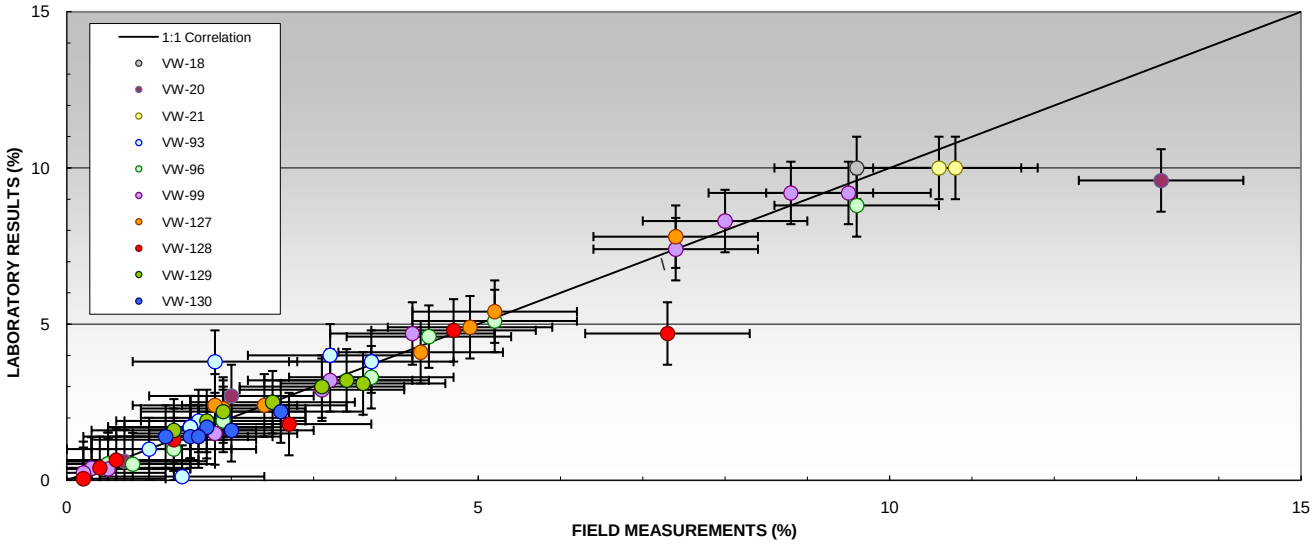
Drawn By: REP	Checked By: PS	Scale: 1"=300'	Date: 10/31/08	File: 500ROST-TRANSECTS200805

FIGURE 3-6. NESTED WELL OXYGEN AND CARBON DIOXIDE CORRELATION PLOTS
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

OXYGEN CORRELATION PLOT

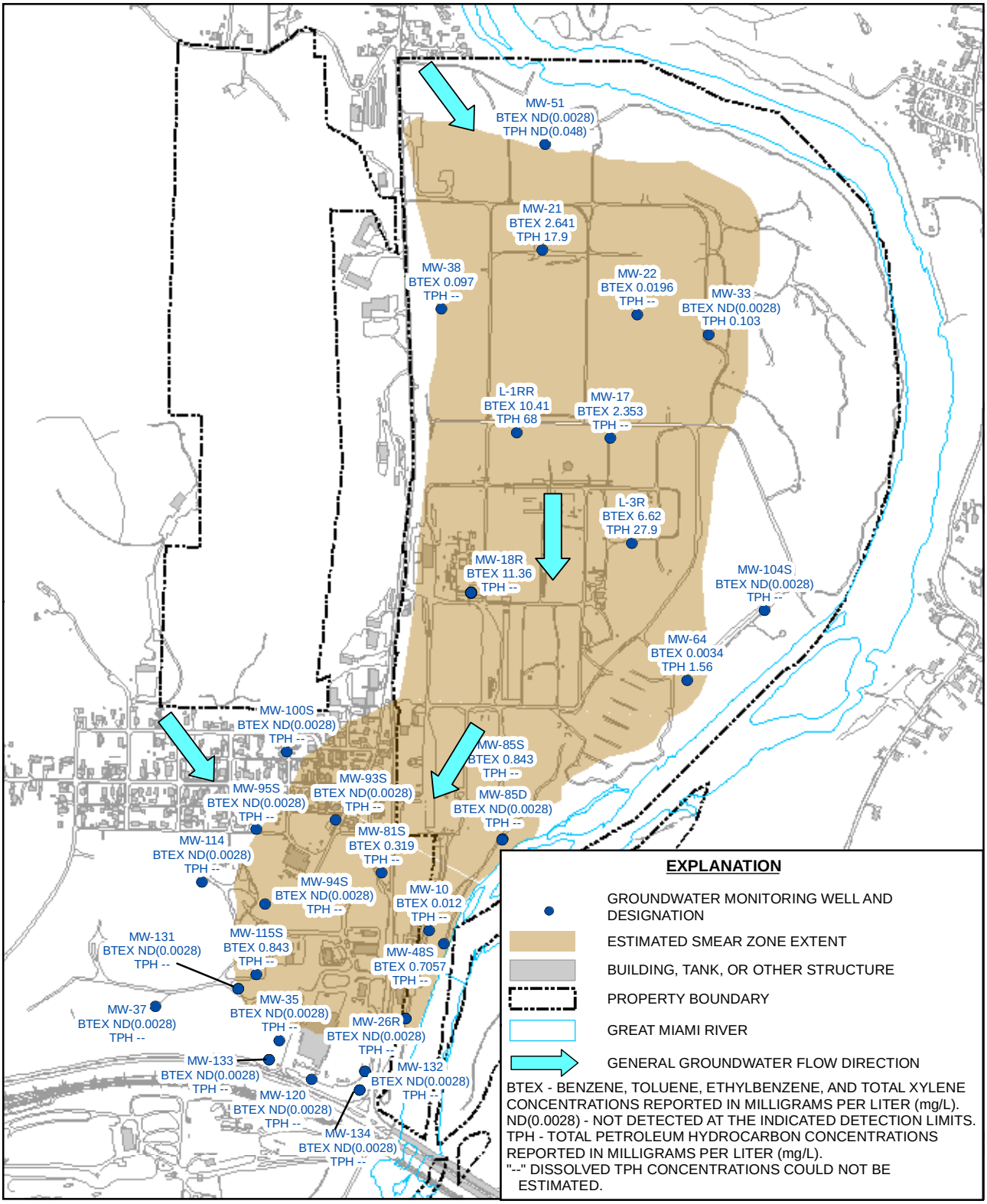


CARBON DIOXIDE CORRELATION PLOT



US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT



N

0 1,000 '

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FIGURE 4-1

DISSOLVED PHASE BTEX AND TPH CONCENTRATIONS

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: BLM	Checked By: BR	Scale: 1" = 1000'	Date: 10/30/08	File: QI_TPHTrends.mxd

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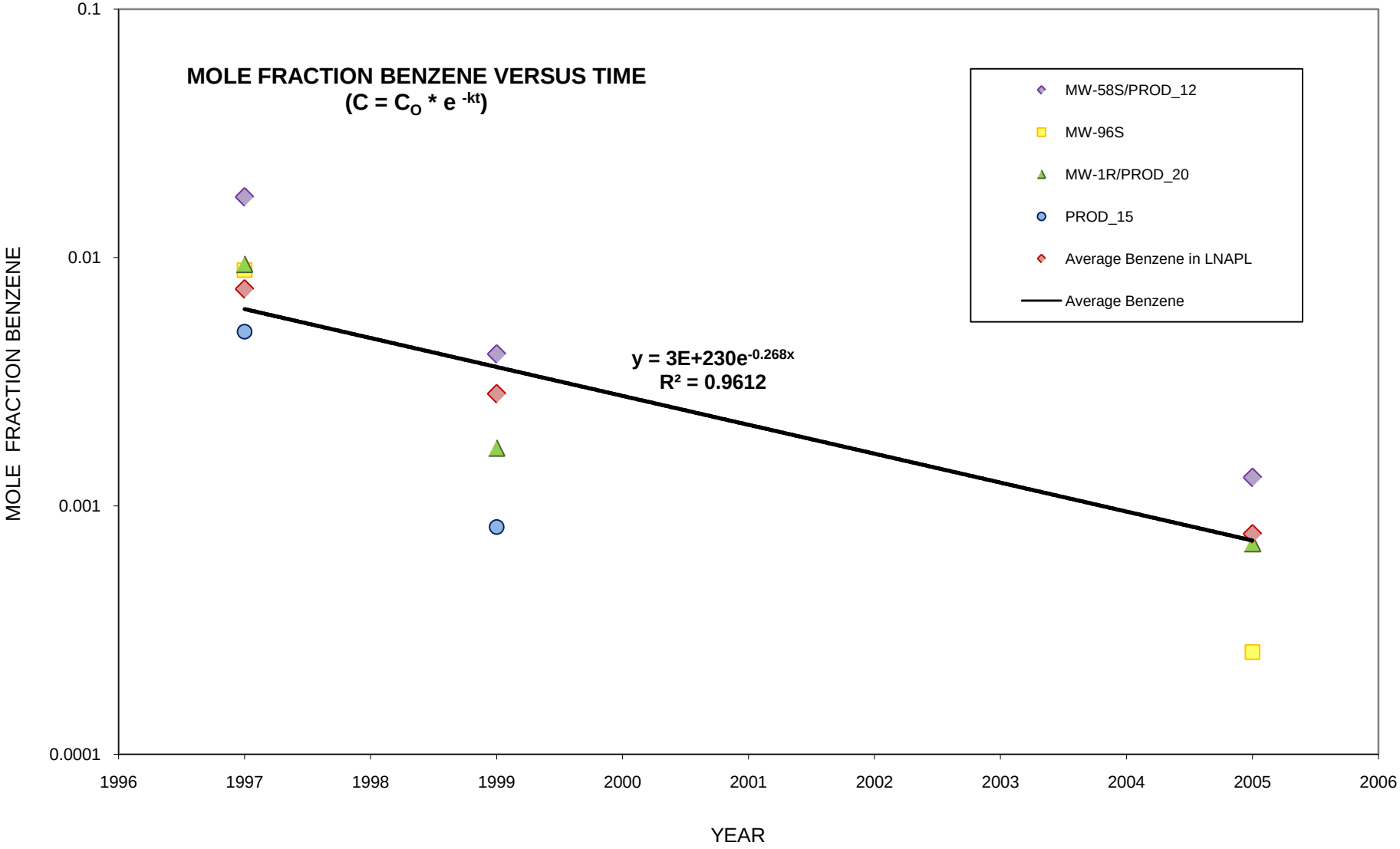
FIGURE 4-2. MOLE FRACTION BENZENE IN LNAPL VERSUS TIME
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



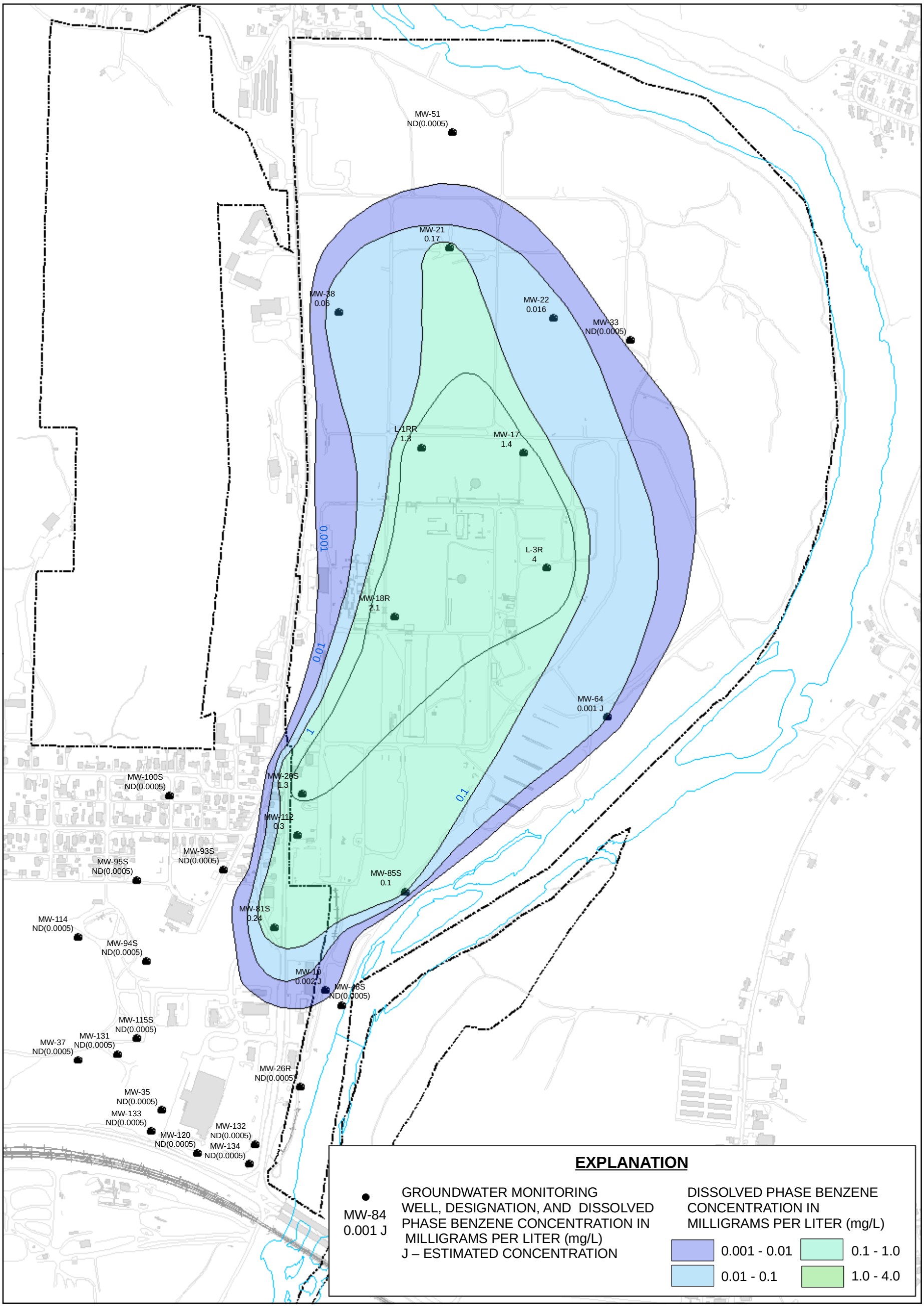


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FIGURE 4-3

BENZENE ISOPLETH MAP
FIRST SEMIANNUAL 2008 MONITORING EVENT

CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 600'	Date: 03/16/09	File: 2008_1stSemi_Benz_GW.mxd

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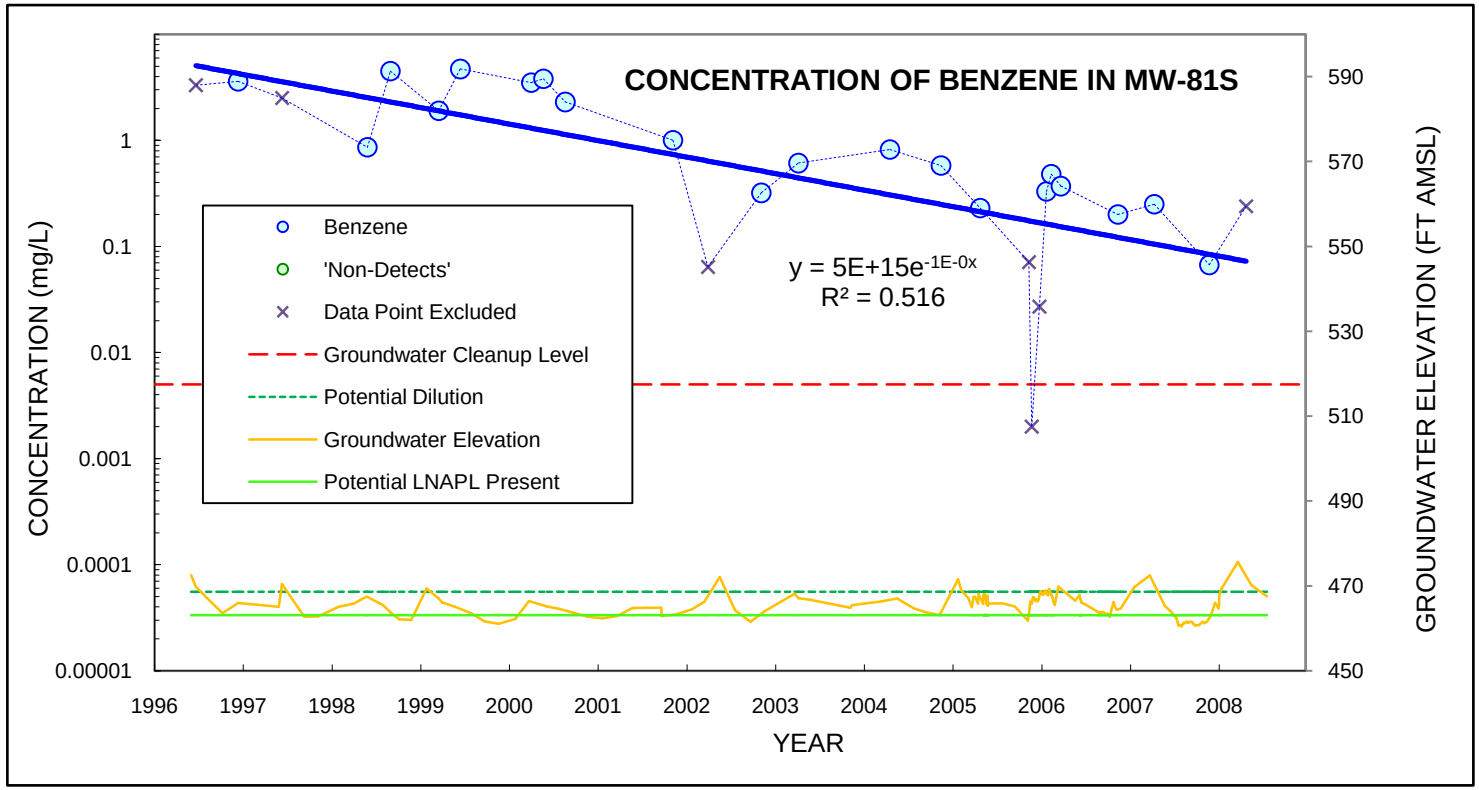
FIGURE 4-4. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME AT MW-81S
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

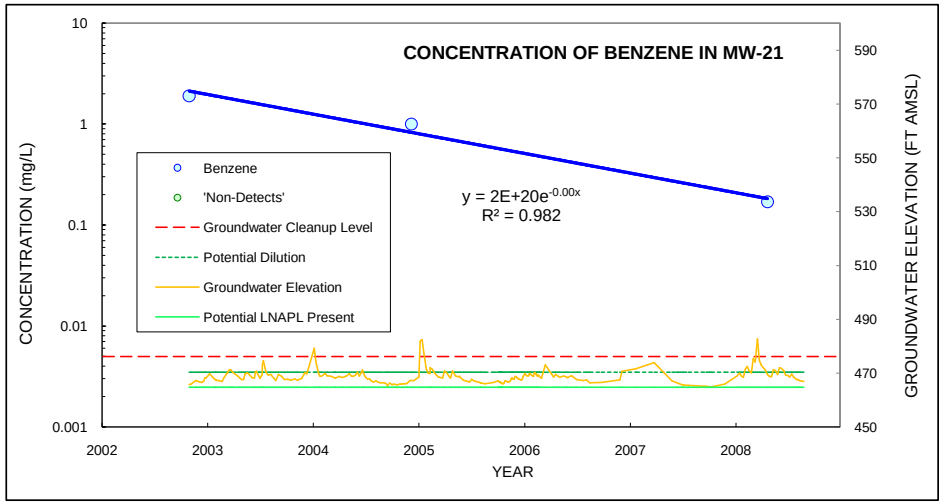


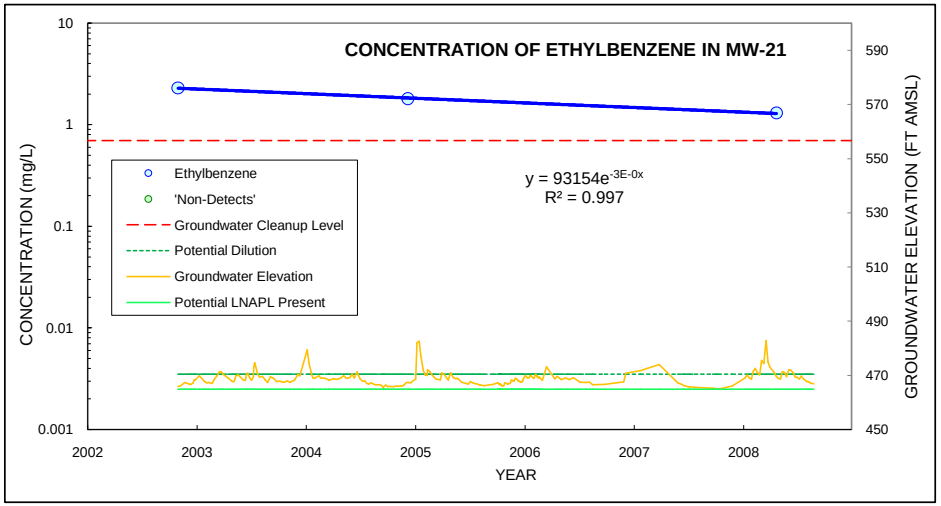
EXPLANATION:

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS. EXCLUSION BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
EIGHT DATA POINTS EXLUDED (6/20/1996, 6/9/1997, 4/1/2002, 11/15/2005, 11/28/2005, 12/29/2005, 4/30/2008)
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

US EPA ARCHIVE DOCUMENT

FIGURE 4-5. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME AT MW-21
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

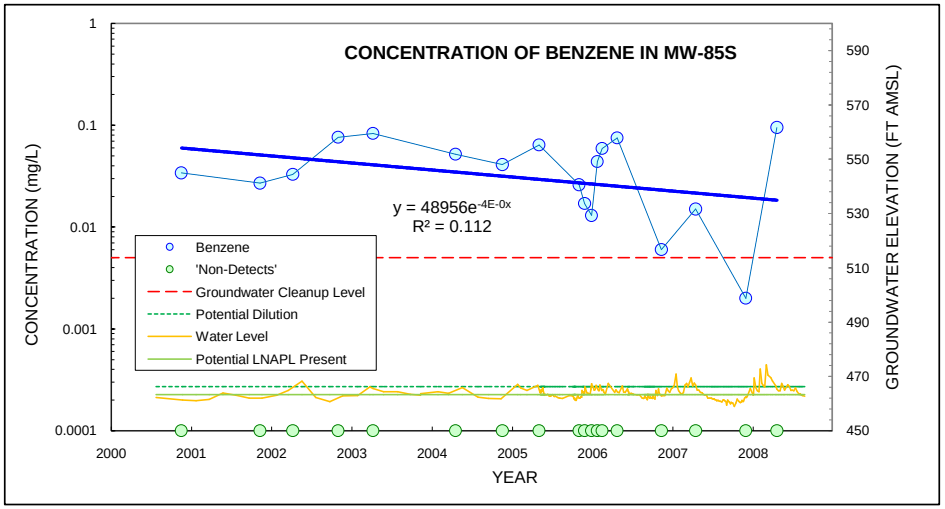


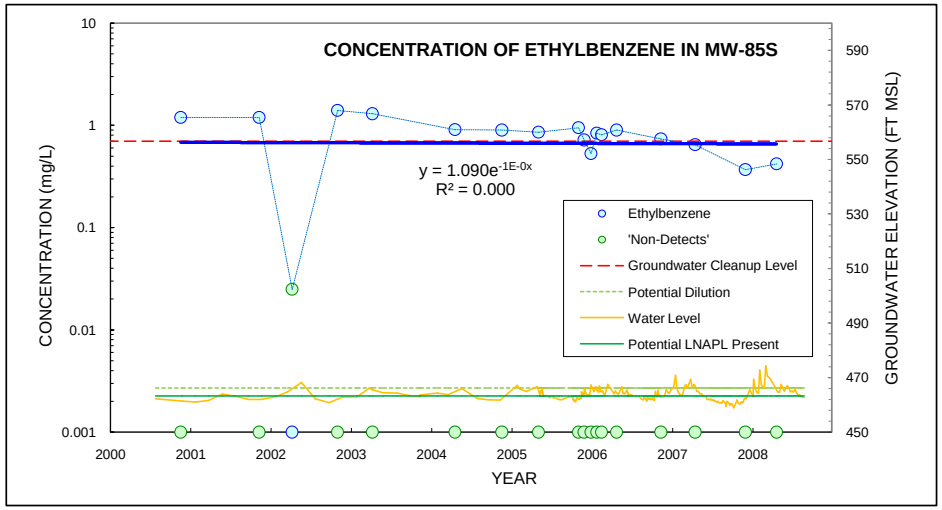


EXPLANATION:
WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS. EXCLUSION BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
NO DATA POINTS EXCLUDED FOR MW-21
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

US EPA ARCHIVE DOCUMENT

FIGURE 4-6. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME AT MW-85S
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

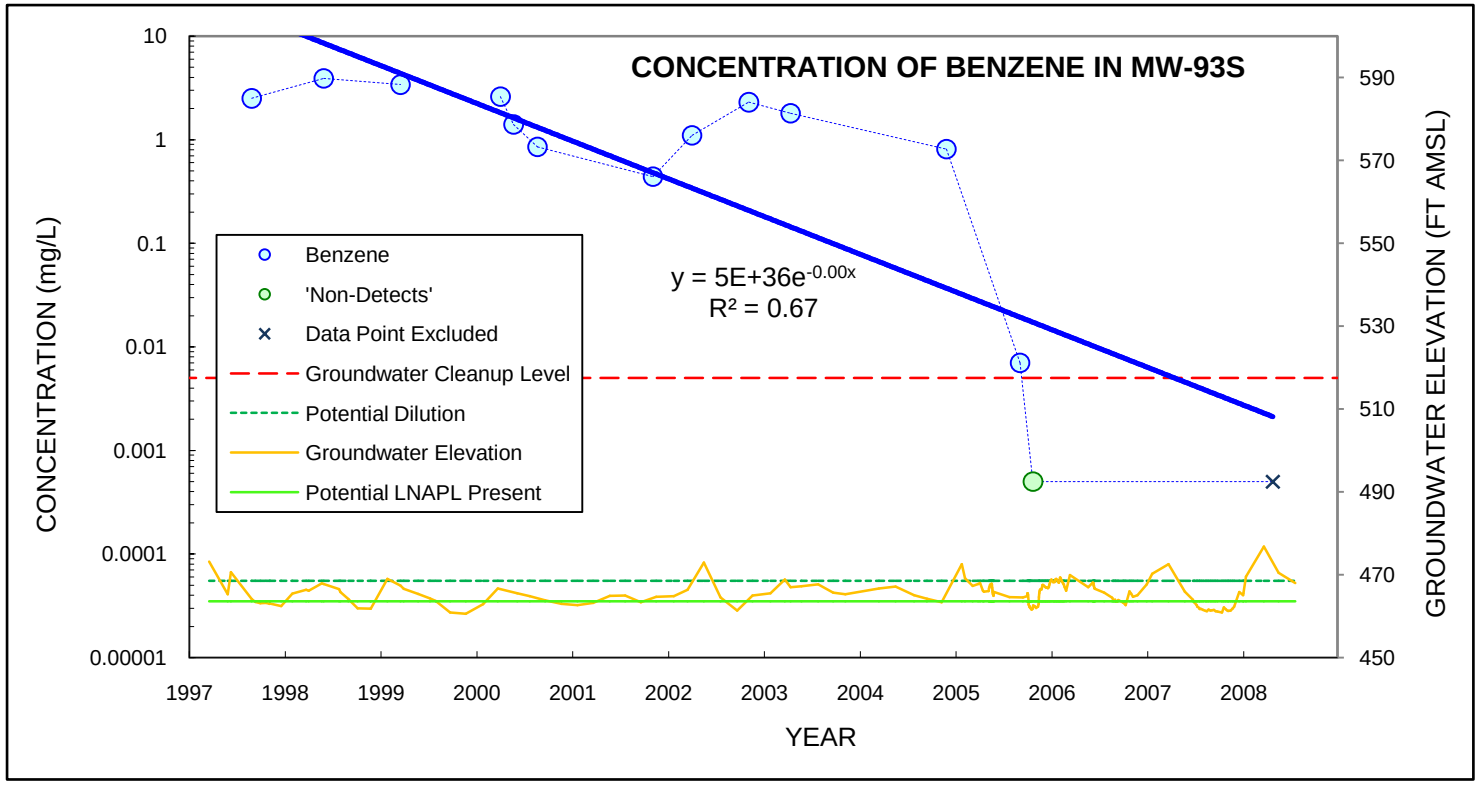




EXPLANATION:
WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS. EXCLUSION BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
NO DATA POINTS EXCLUDED FOR MW-85S
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

US EPA ARCHIVE DOCUMENT

FIGURE 4-7. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME AT MW-93S
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS. EXCLUSION BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
ONE DATA POINT EXLUDED (4/30/2008)
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

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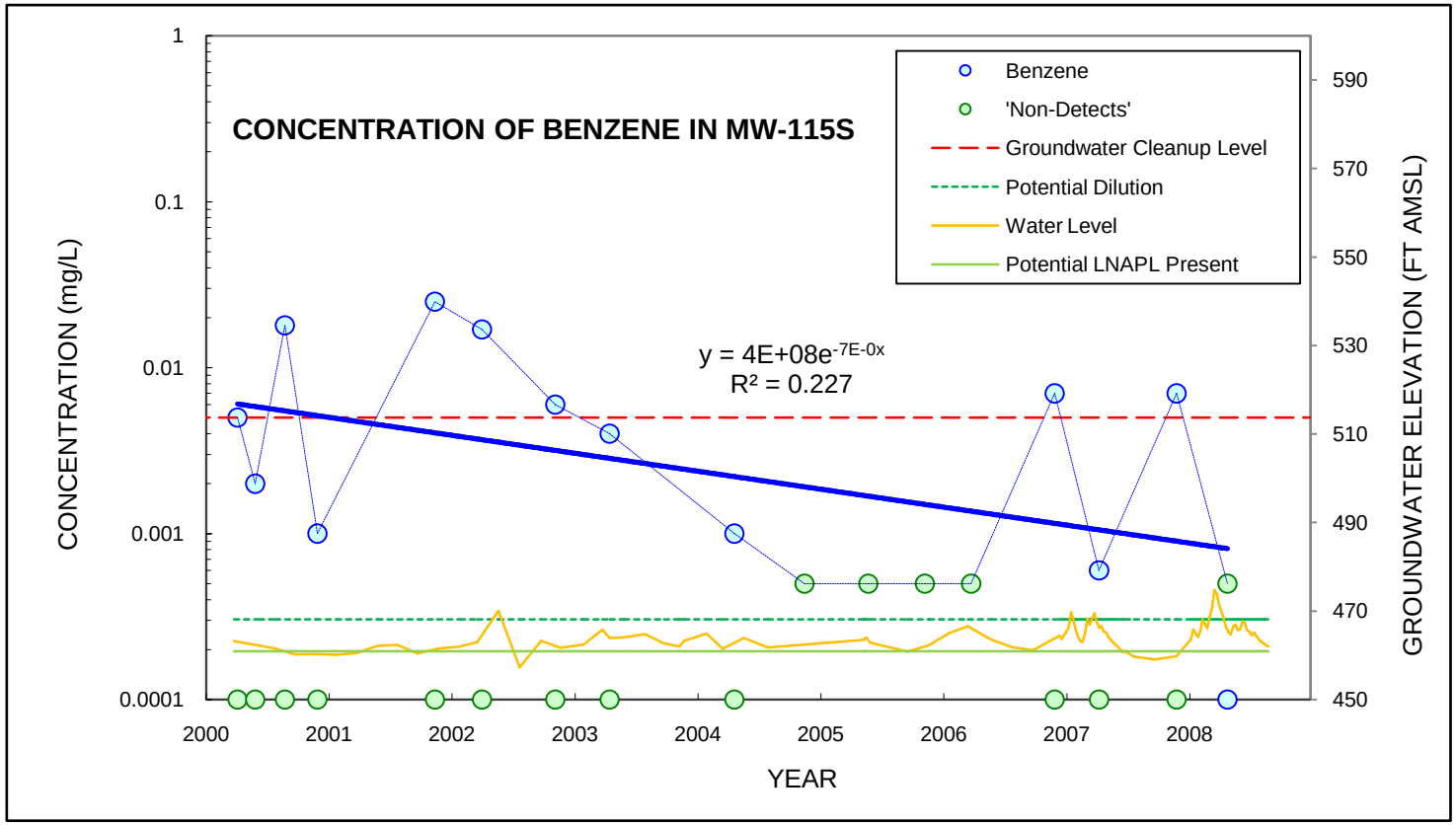
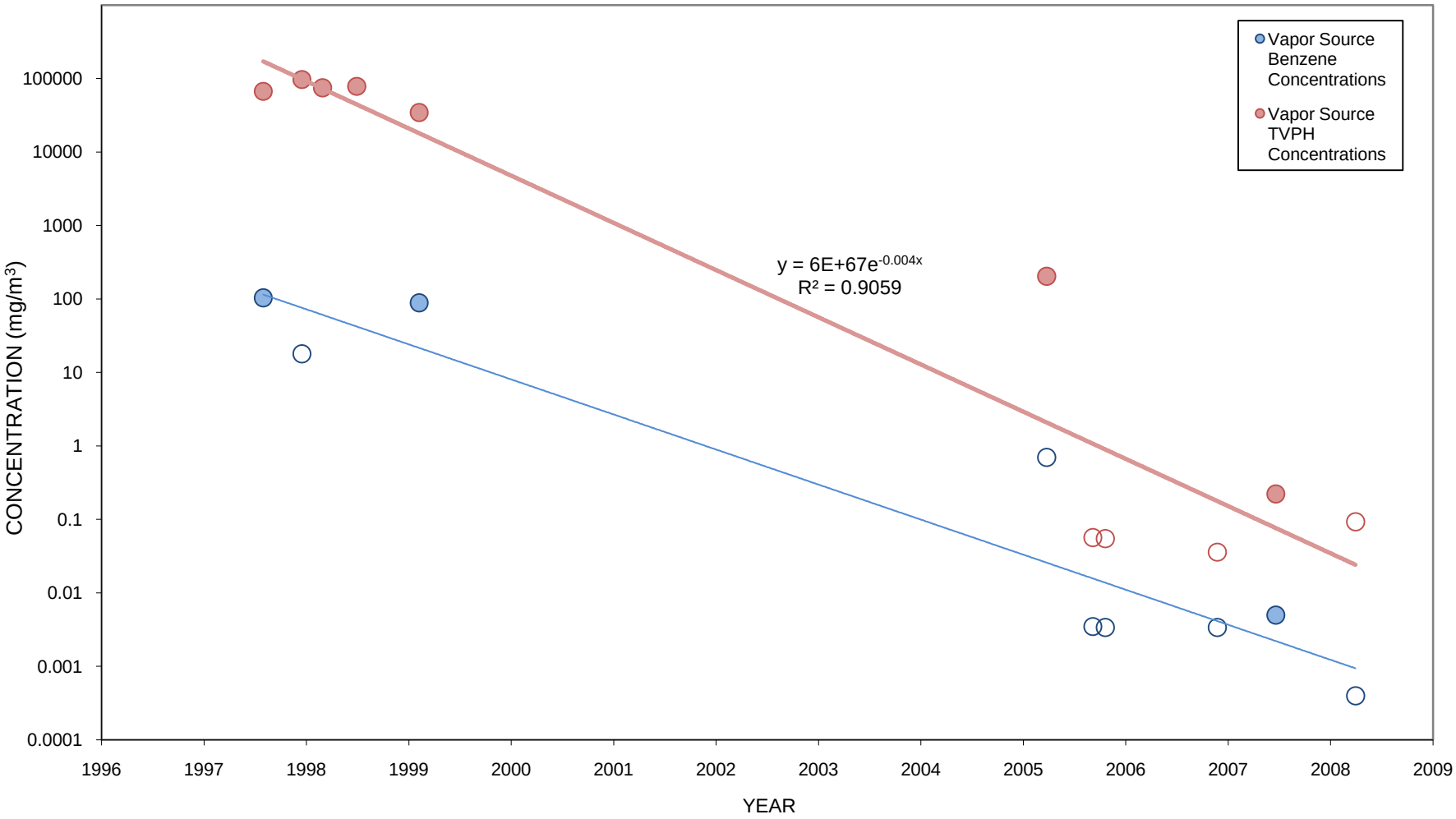
FIGURE 4-8. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME AT MW-115S
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:

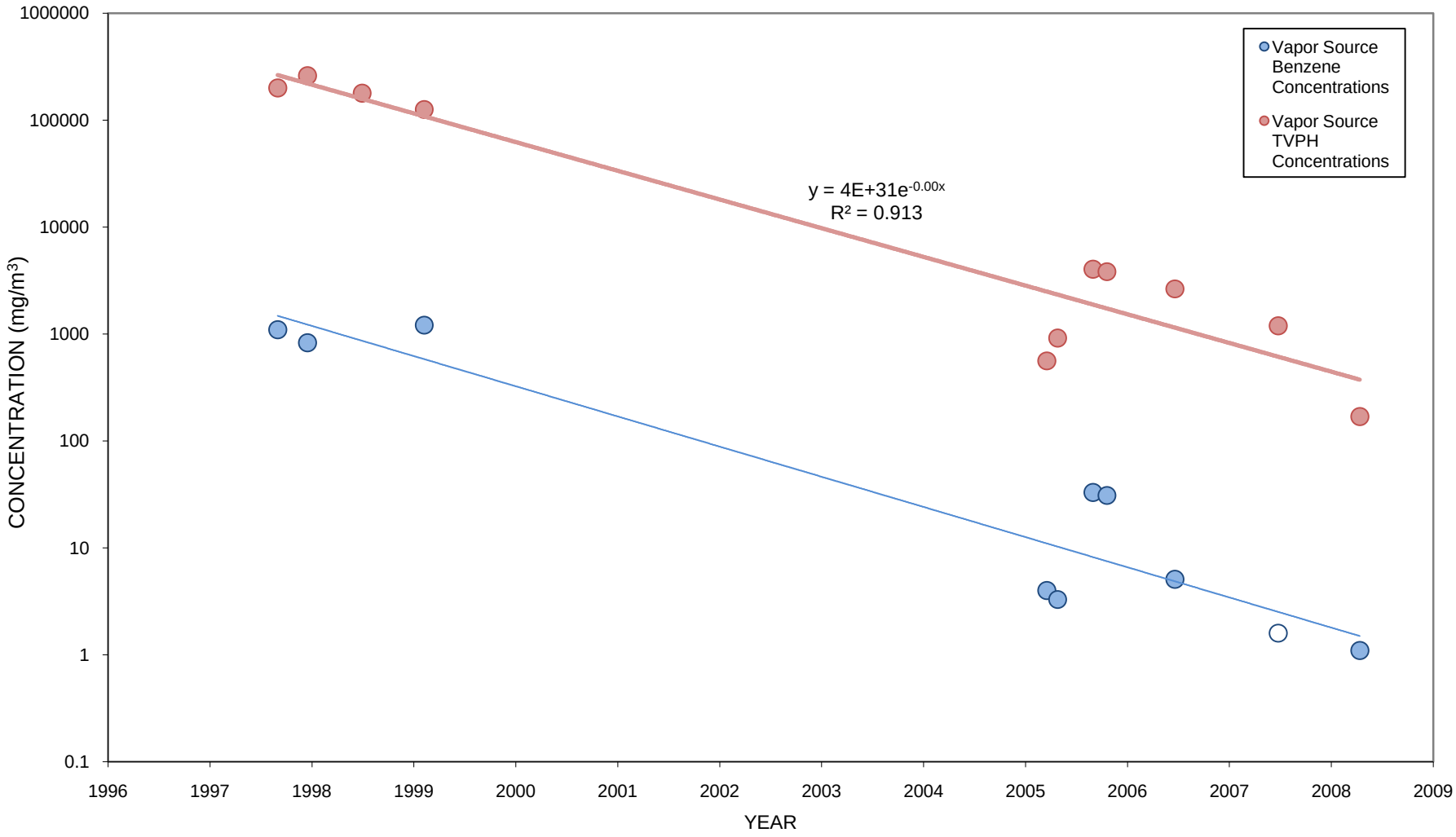
WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS. EXCLUSION BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
NO DATA POINTS EXCLUDED FOR MW-115S
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

FIGURE 4-9a. VAPOR SOURCE CONCENTRATIONS IN VW-93
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:
Open symbol designates a non-detect value

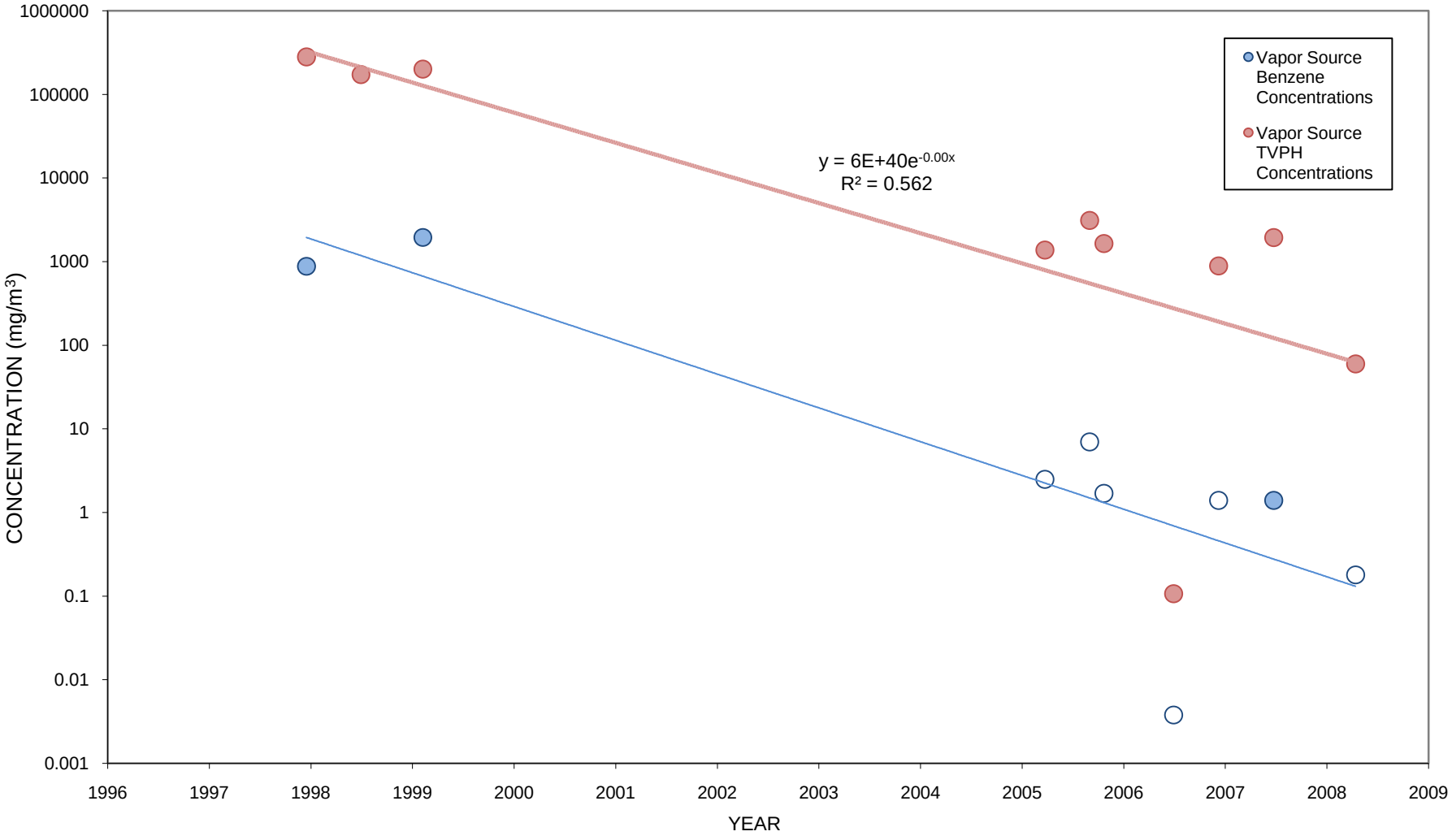
FIGURE 4-9b. VAPOR SOURCE CONCENTRATIONS IN VW-96
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:
Open symbol designates a non-detect value

200904_SourceTermVaporTrends_FIG-4-9

FIGURE 4-9c. VAPOR SOURCE CONCENTRATIONS IN VW-99
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:
Open symbol designates a non-detect value

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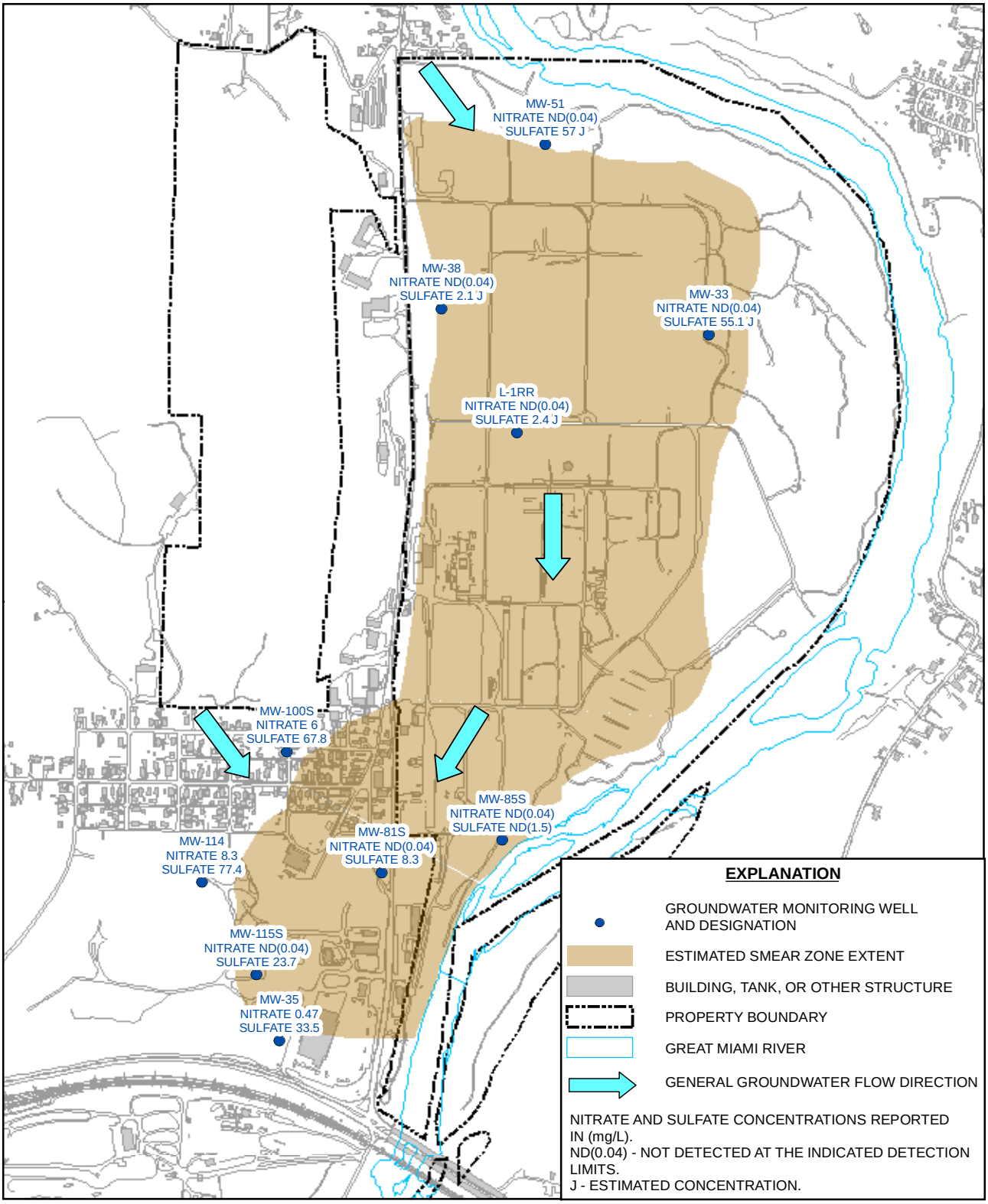

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0 1,000 '

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FIGURE 4-10

DISSOLVED PHASE NITRATE AND SULFATE CONCENTRATIONS

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: BLM	Checked By: BR	Scale: 1" = 1000'	Date: 10/30/08	File: QI_EAccept_OxTrends.mxd

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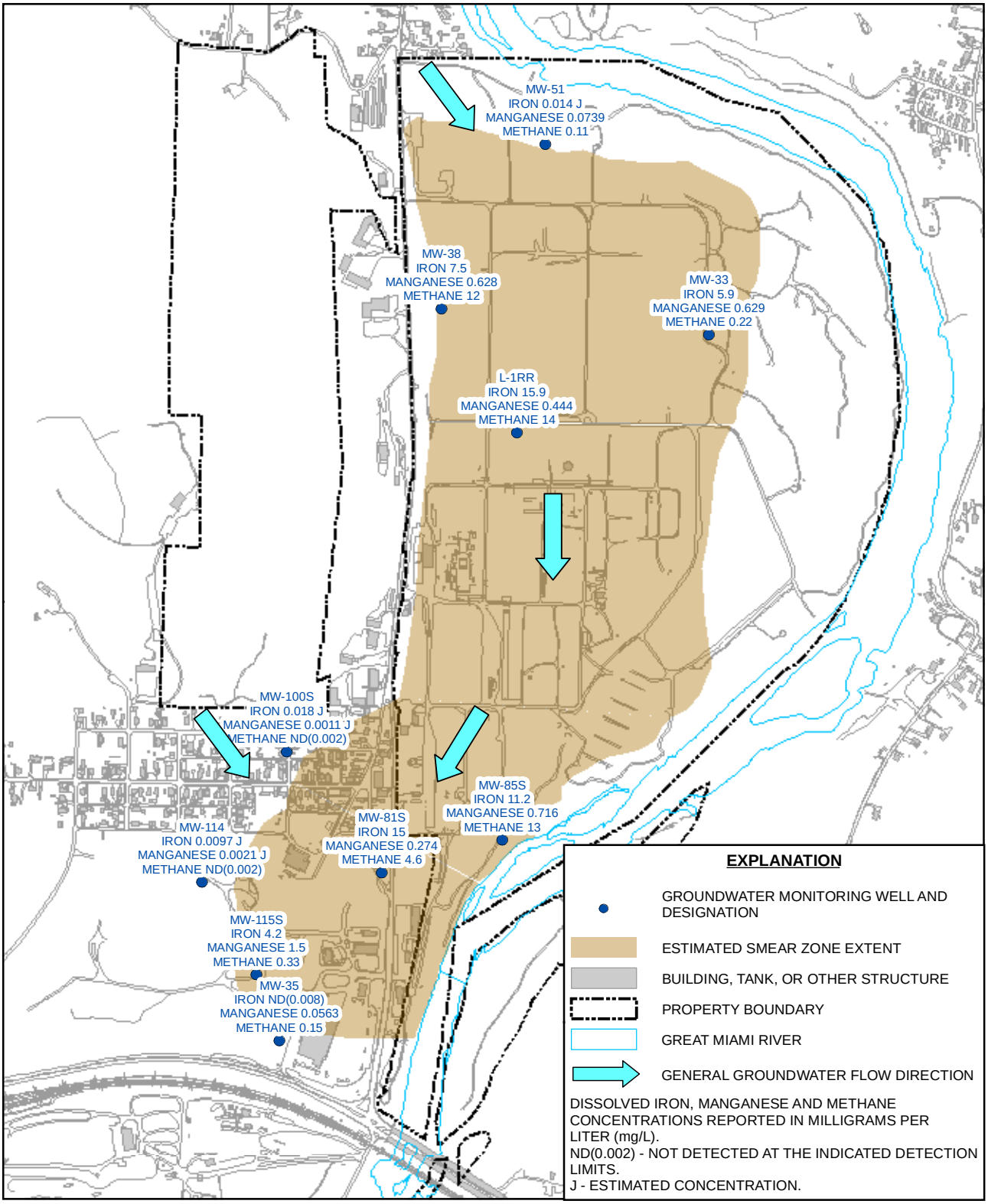

N

0 1,000 '

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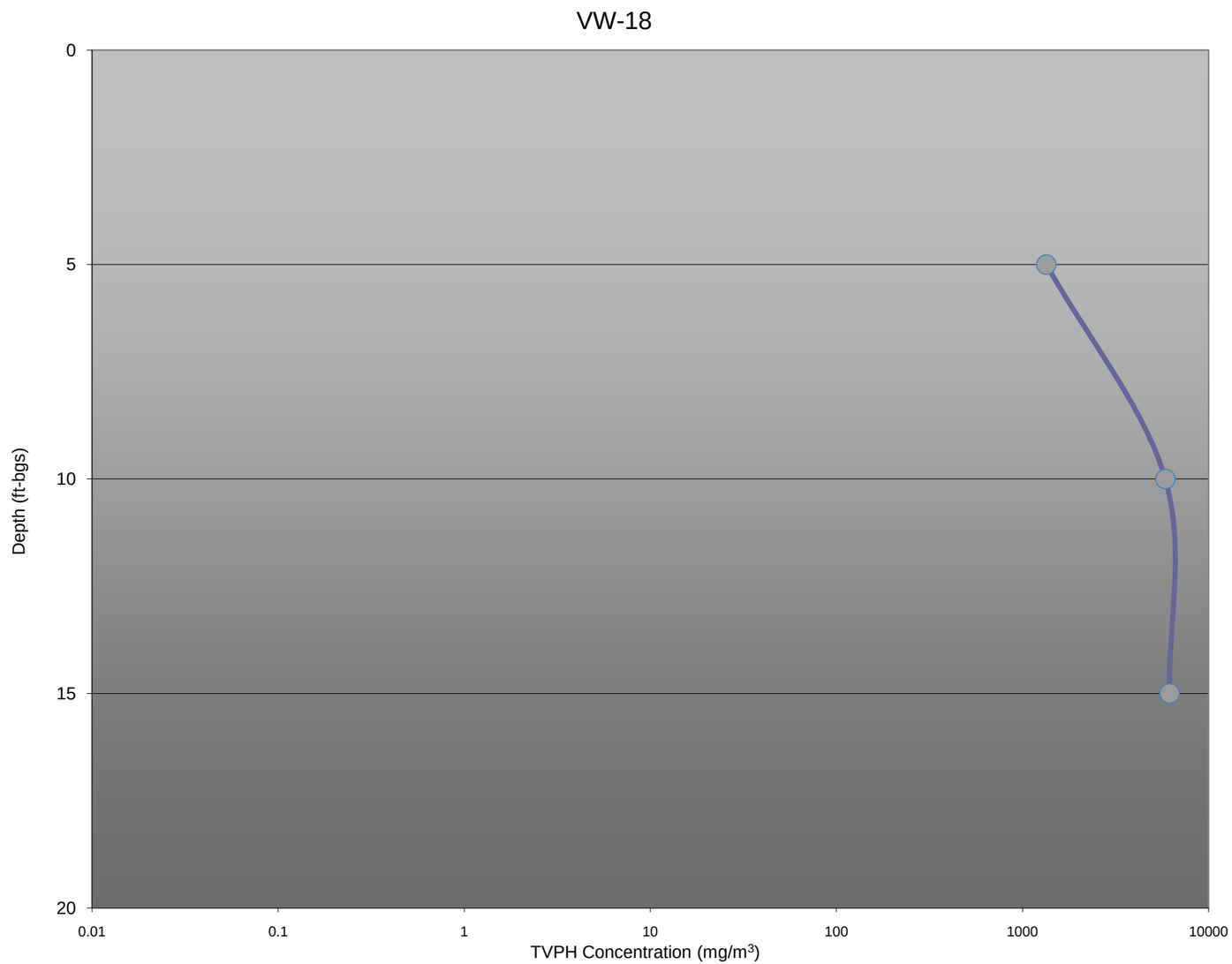
FIGURE 4-11

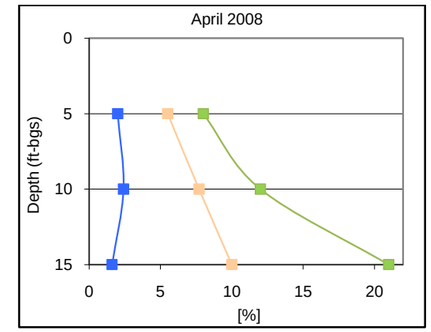
DISSOLVED PHASE IRON, MANGANESE, AND METHANE CONCENTRATIONS

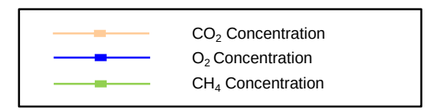
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: BLM	Checked By: BR	Scale: 1" = 1000'	Date: 10/30/08	File: QI_EAccept_RedTrends.mxd

FIGURE 4-12a. NESTED VAPOR MONITORING WELL VW-18 TVPH AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO





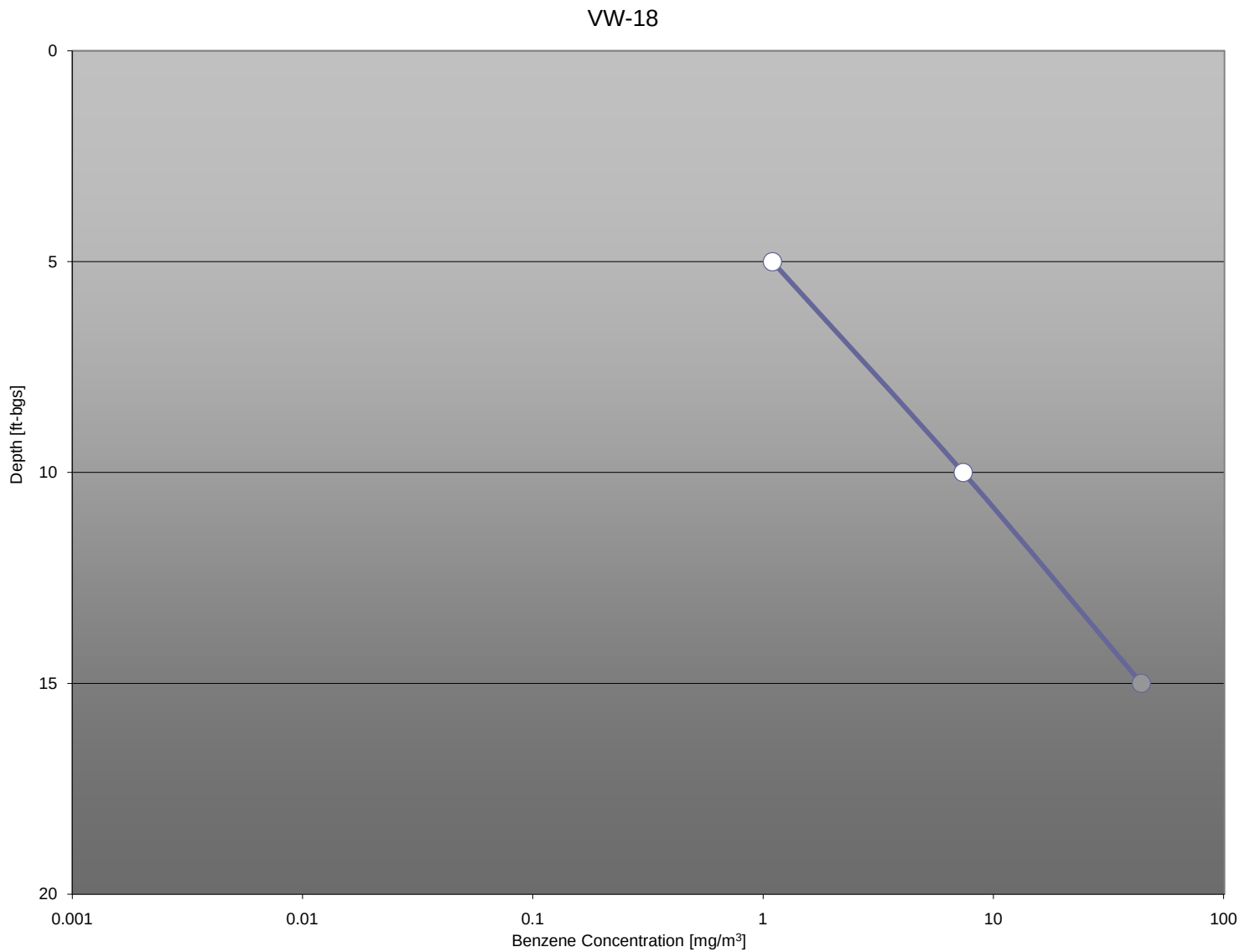


EXPLANATION:
1. Open symbol designates a non-detect value
2. TVPH - Total volatile petroleum hydrocarbons as gasoline

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

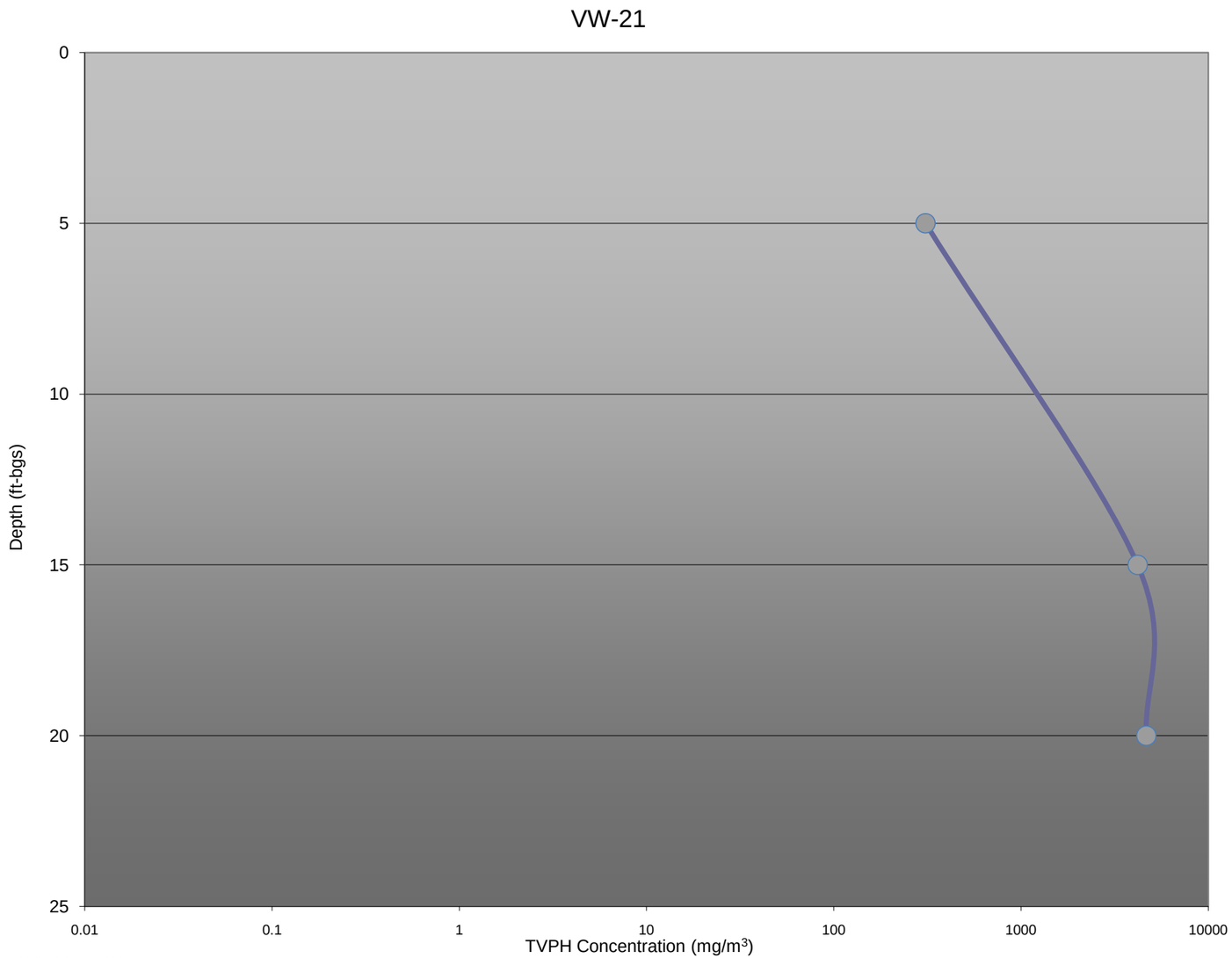
FIGURE 4-12b. NESTED VAPOR MONITORING WELL VW-18 BENZENE PROFILE
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

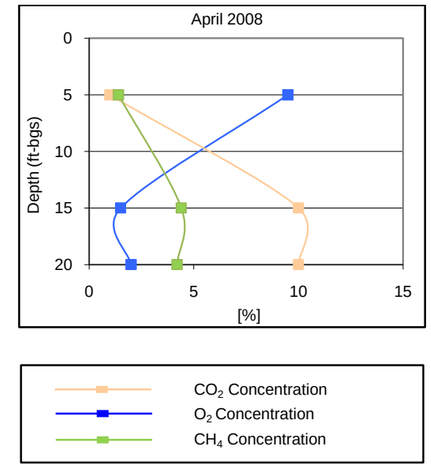


EXPLANATION:
1. Open symbol designates a non-detect value

200904_Spring08_On-SiteNestedProfiles_FIG-4-12,13,14VW-18 Benzene

FIGURE 4-13a. NESTED VAPOR MONITORING WELL VW-21 TVPH AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



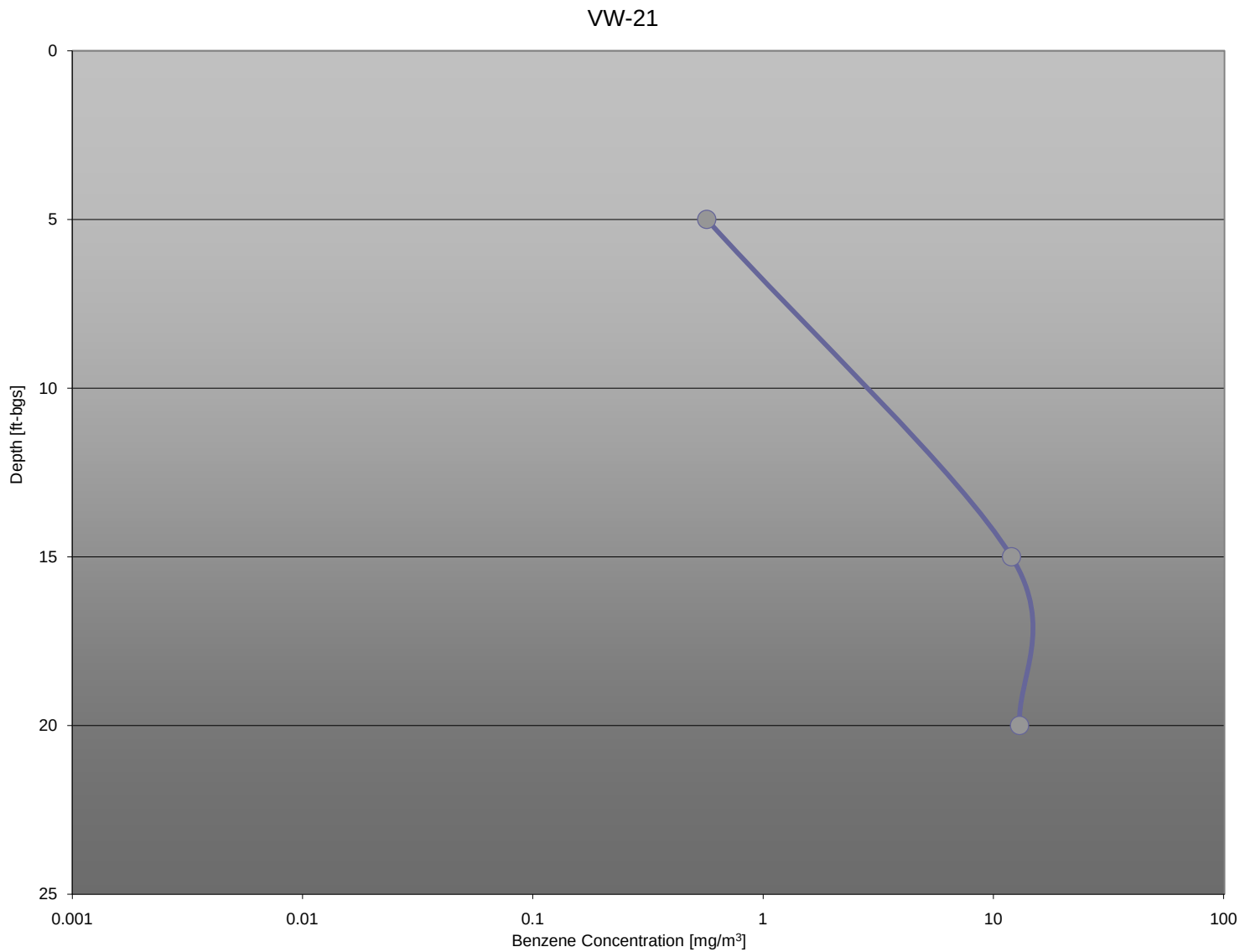


EXPLANATION:
1. Open symbol designates a non-detect value
2. TVPH - Total volatile petroleum hydrocarbons as gasoline

US EPA ARCHIVE DOCUMENT

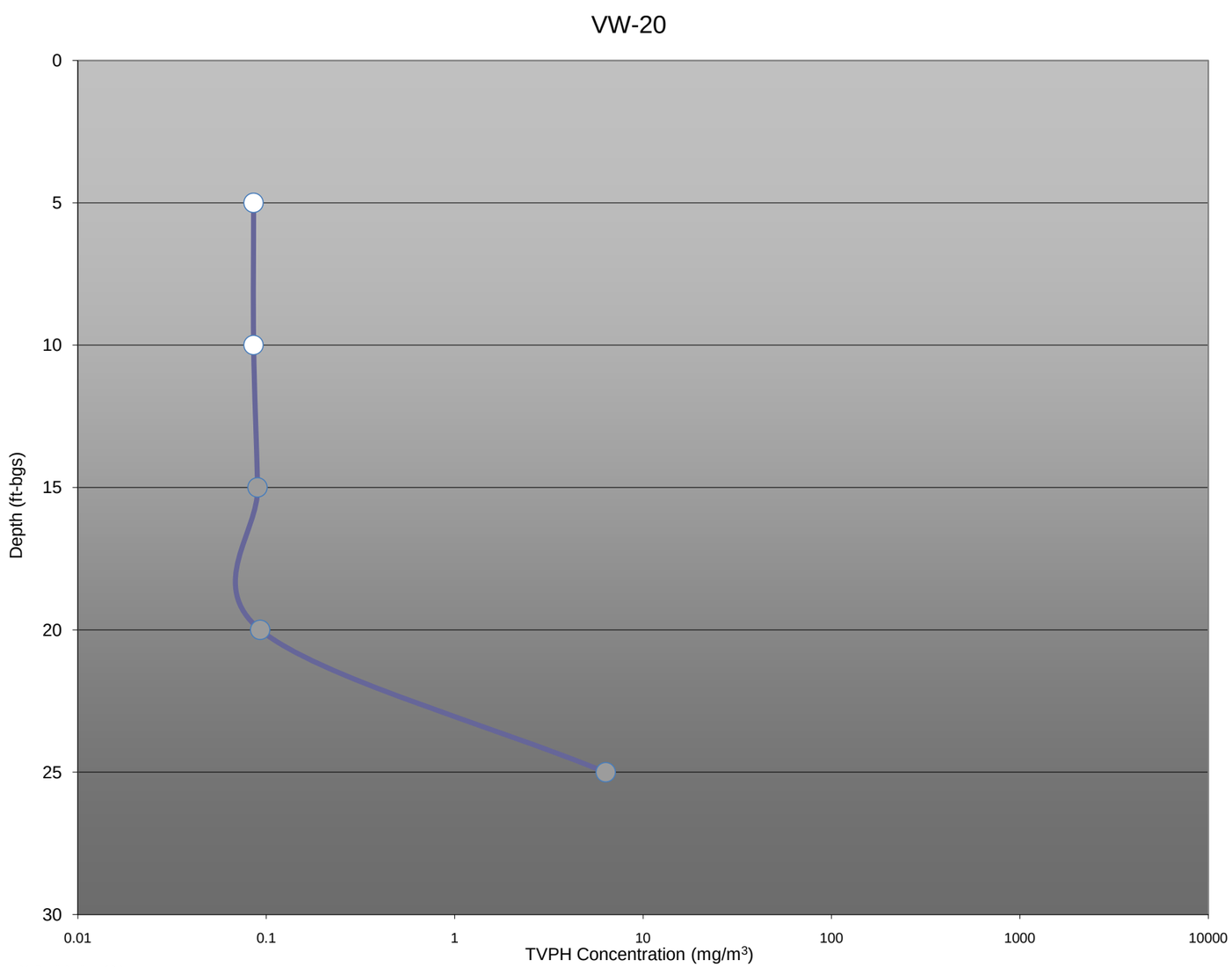
US EPA ARCHIVE DOCUMENT

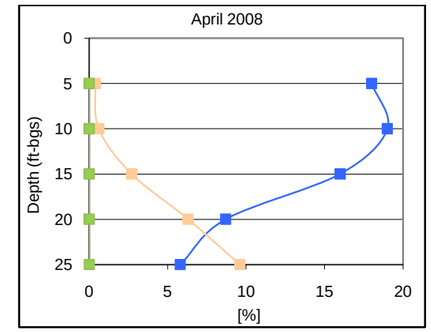
FIGURE 4-13b. NESTED VAPOR MONITORING WELL VW-21 BENZENE PROFILE
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

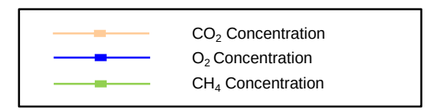


EXPLANATION:
1. Open symbol designates a non-detect value

FIGURE 4-14a. NESTED VAPOR MONITORING WELL VW-20 TVPH AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO







EXPLANATION:
1. Open symbol designates a non-detect value
2. TVPH - Total volatile petroleum hydrocarbons as gasoline

US EPA ARCHIVE DOCUMENT

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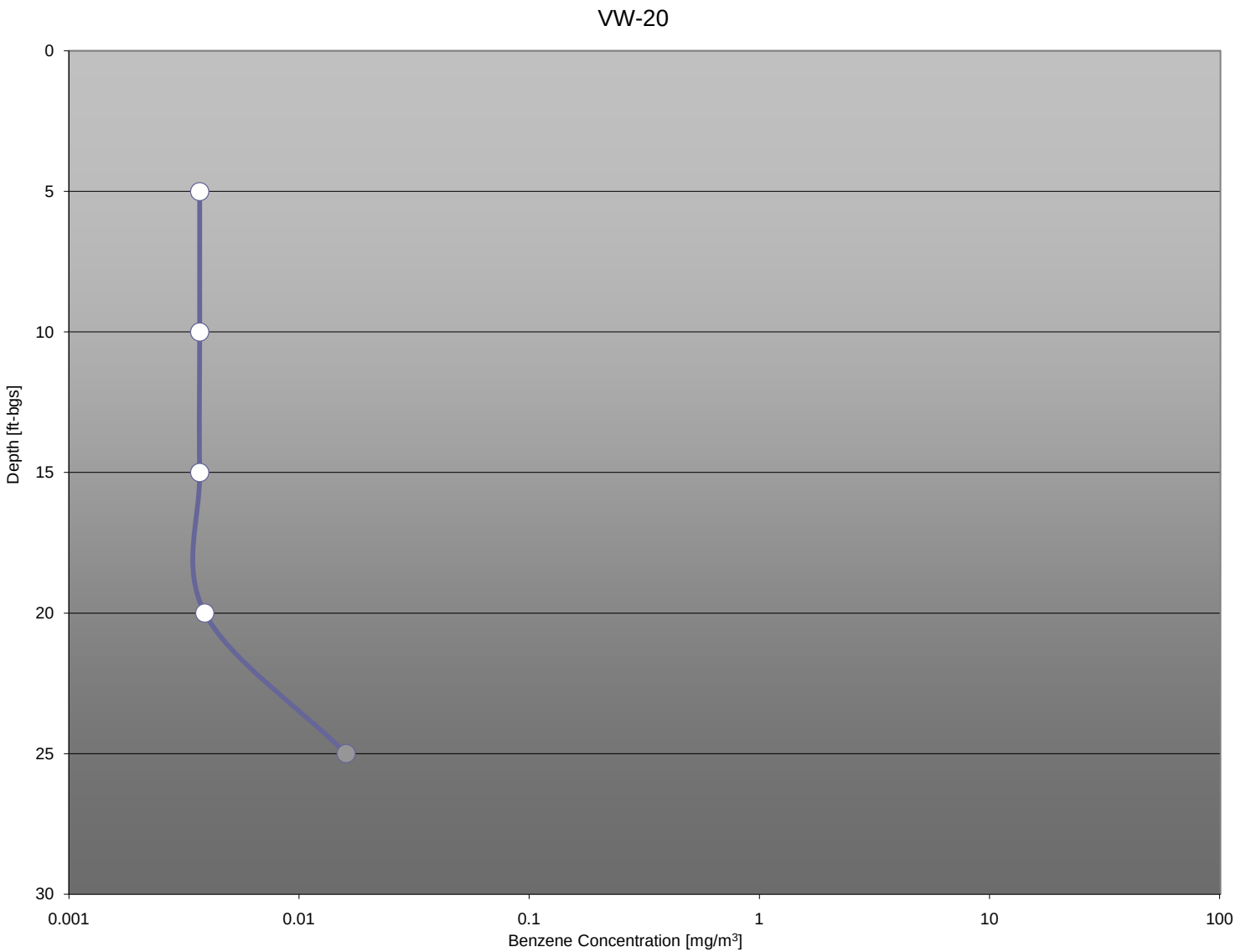
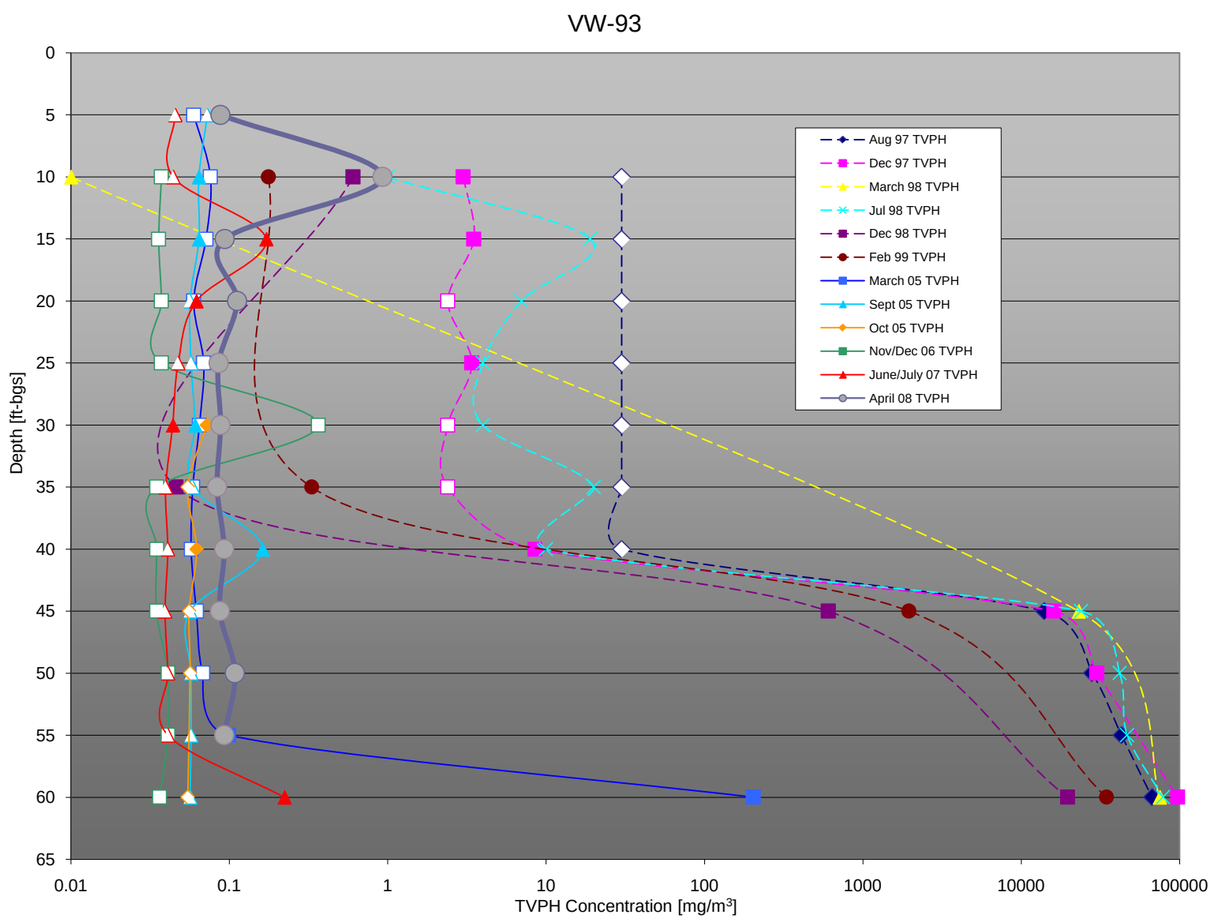
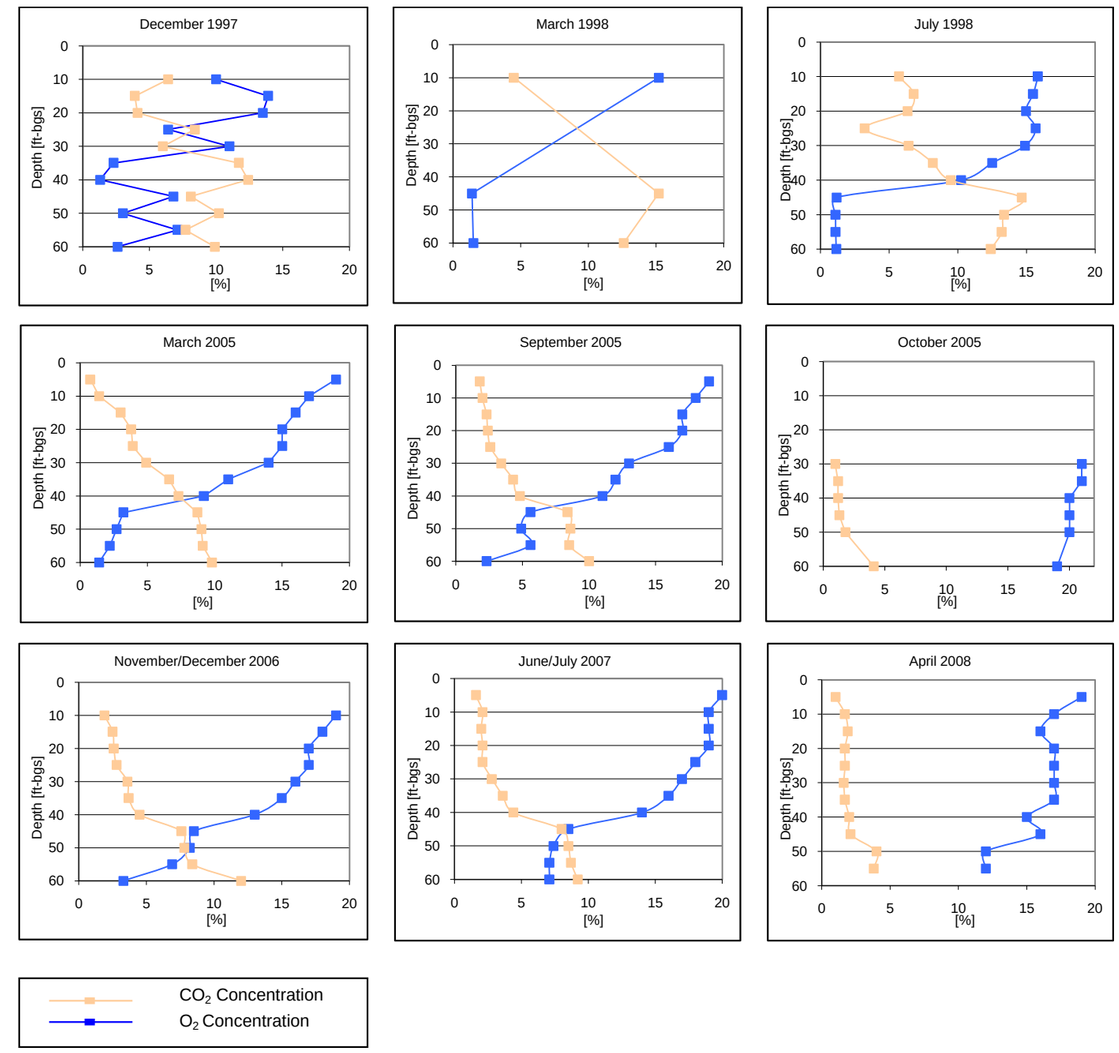
FIGURE 4-14b. NESTED VAPOR MONITORING WELL VW-20 BENZENE PROFILE
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:
1. Open symbol designates a non-detect value

FIGURE 4-15a. NESTED VAPOR MONITORING WELL VW-93 TVPH AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



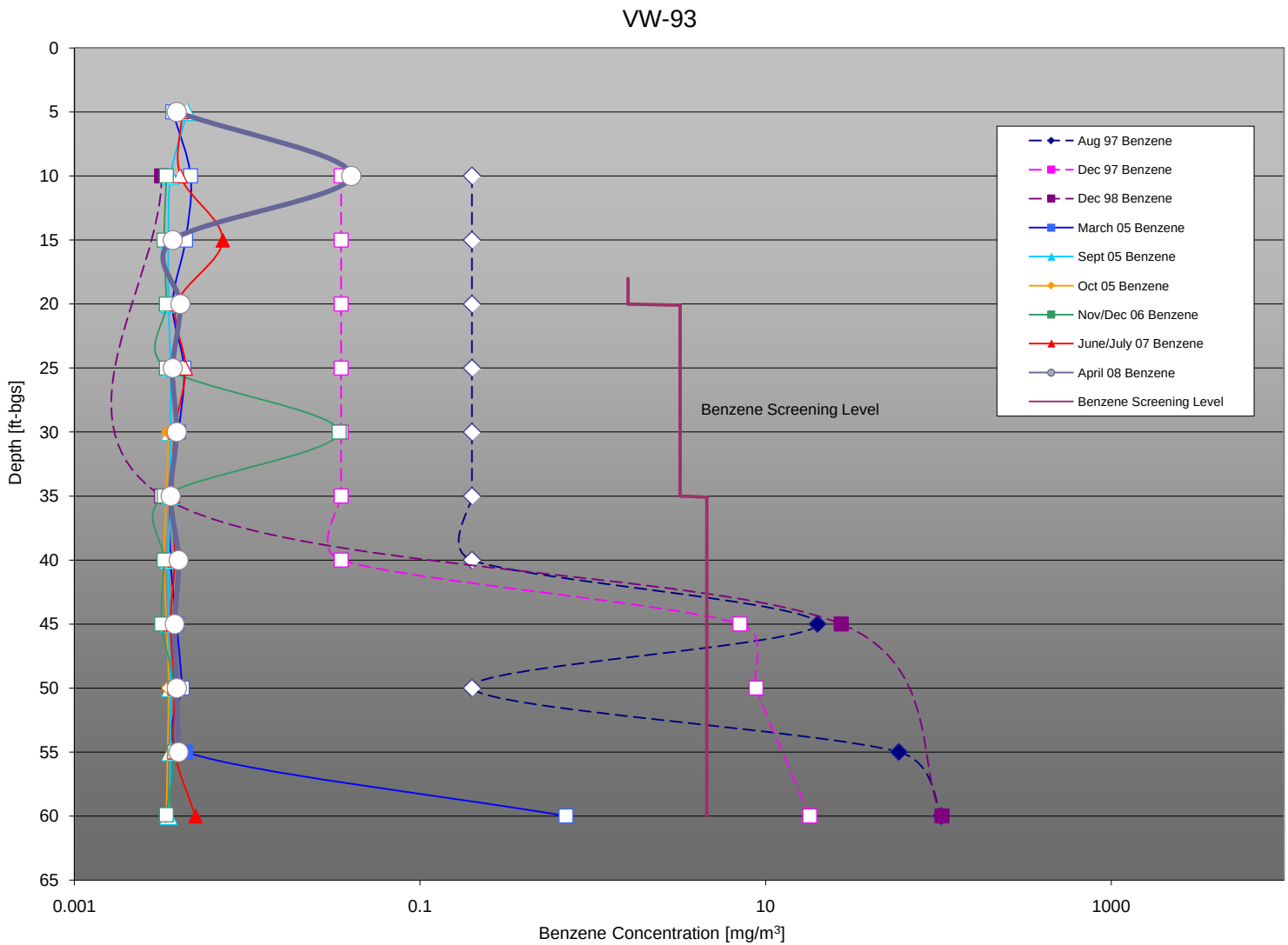


EXPLANATION:
1. Open symbol designates a non-detect value
2. The HSVE system was operating during the sampling conducted in October 2005
3. TVPH - Total volatile petroleum hydrocarbons as gasoline

US EPA ARCHIVE DOCUMENT

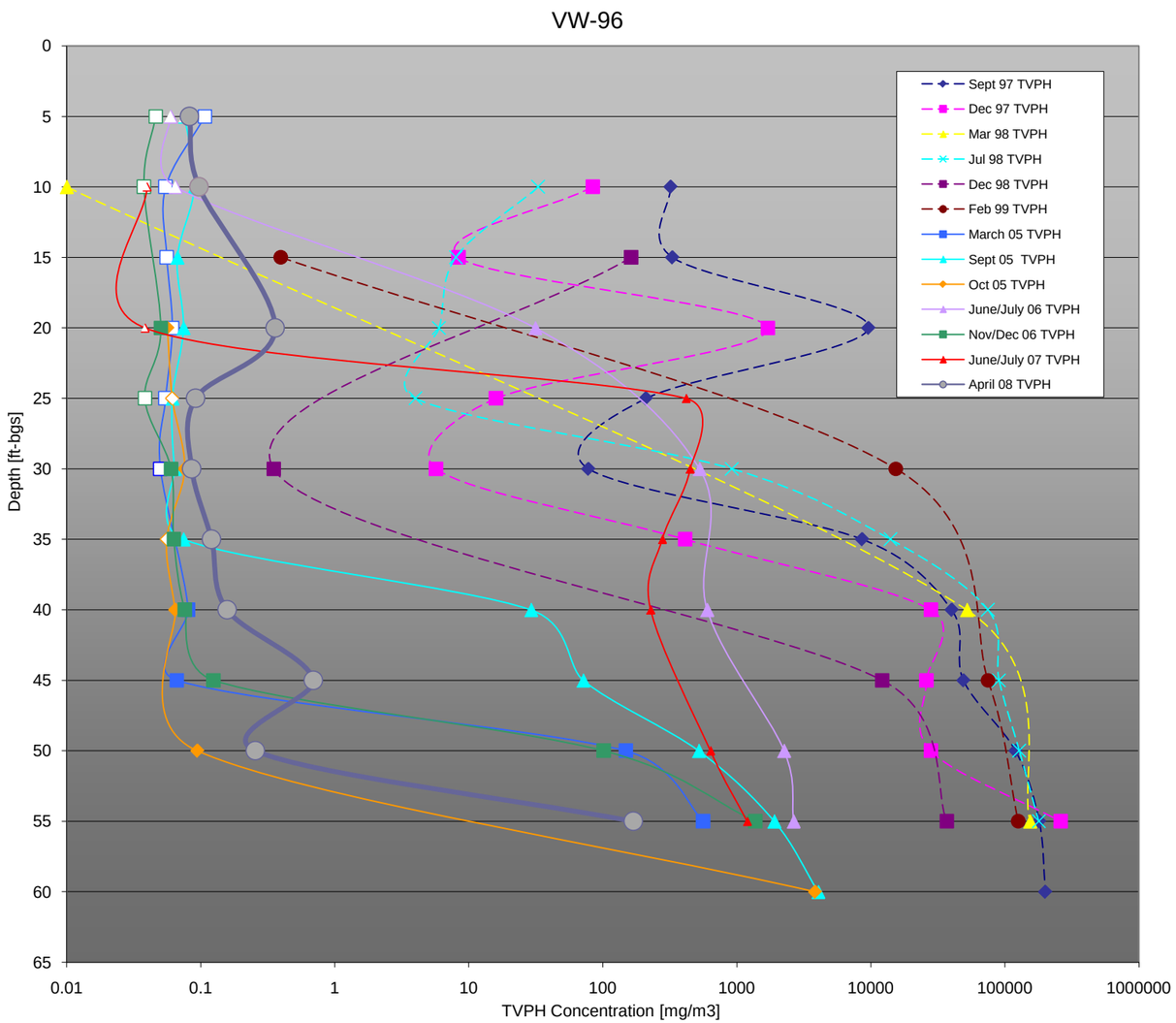
US EPA ARCHIVE DOCUMENT

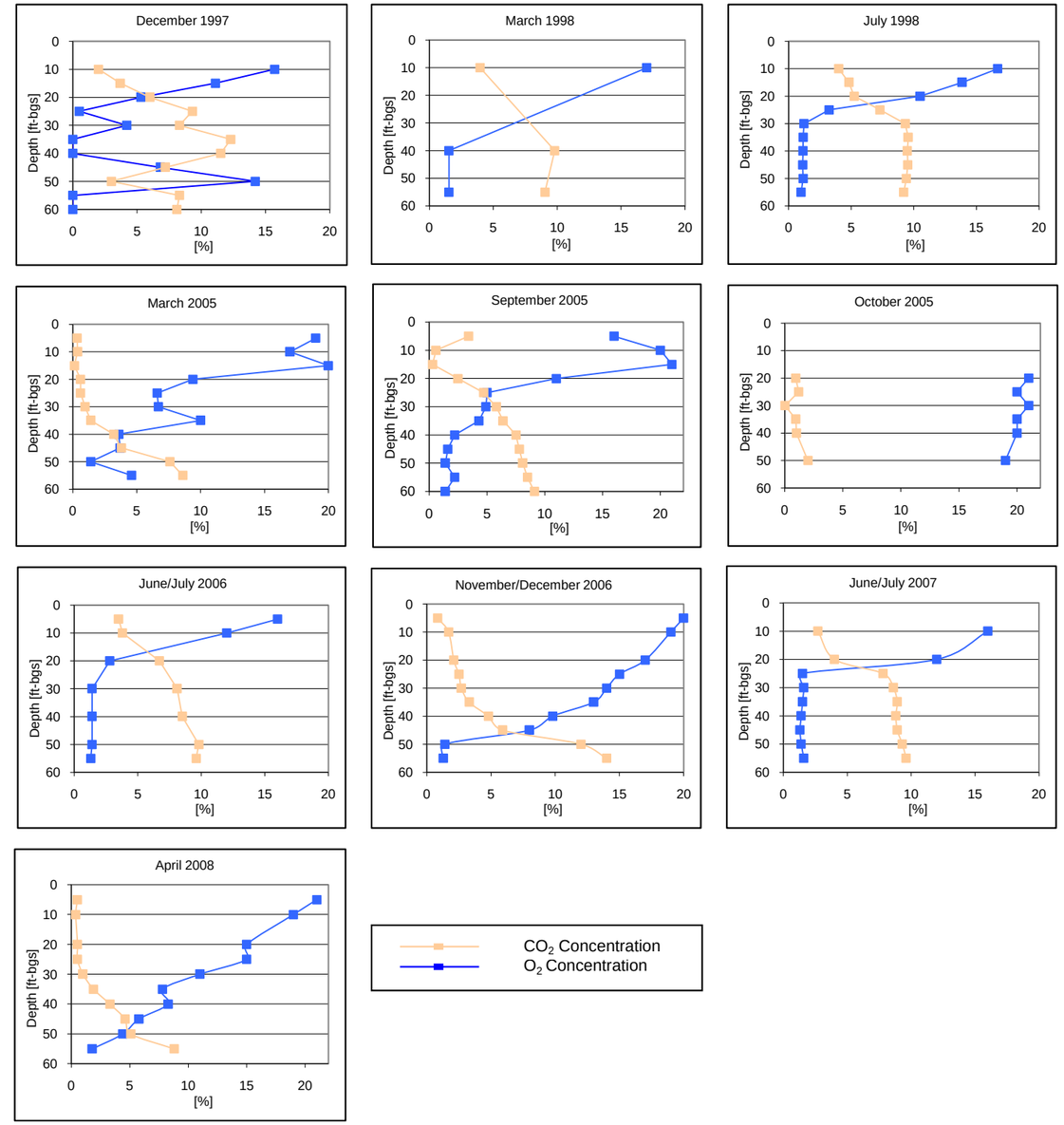
FIGURE 4-15b. NESTED VAPOR MONITORING WELL VW-93 BENZENE PROFILE
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:
1. Open symbol designates a non-detect value
2. The HSVE system was operating during the sampling conducted in October 2005

FIGURE 4-16a. NESTED VAPOR MONITORING WELL VW-96 TVPH AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO





EXPLANATION:
1. Open symbol designates a non-detect value.
2. The HSVE system was operating during the sampling conducted in October 2005.
3. TVPH - Total volatile petroleum hydrocarbons as gasoline
4. Resampling of the 30, 35, and 55 ft-bgs probes was conducted in May 2005. The profile shown for March 2005 includes only March data

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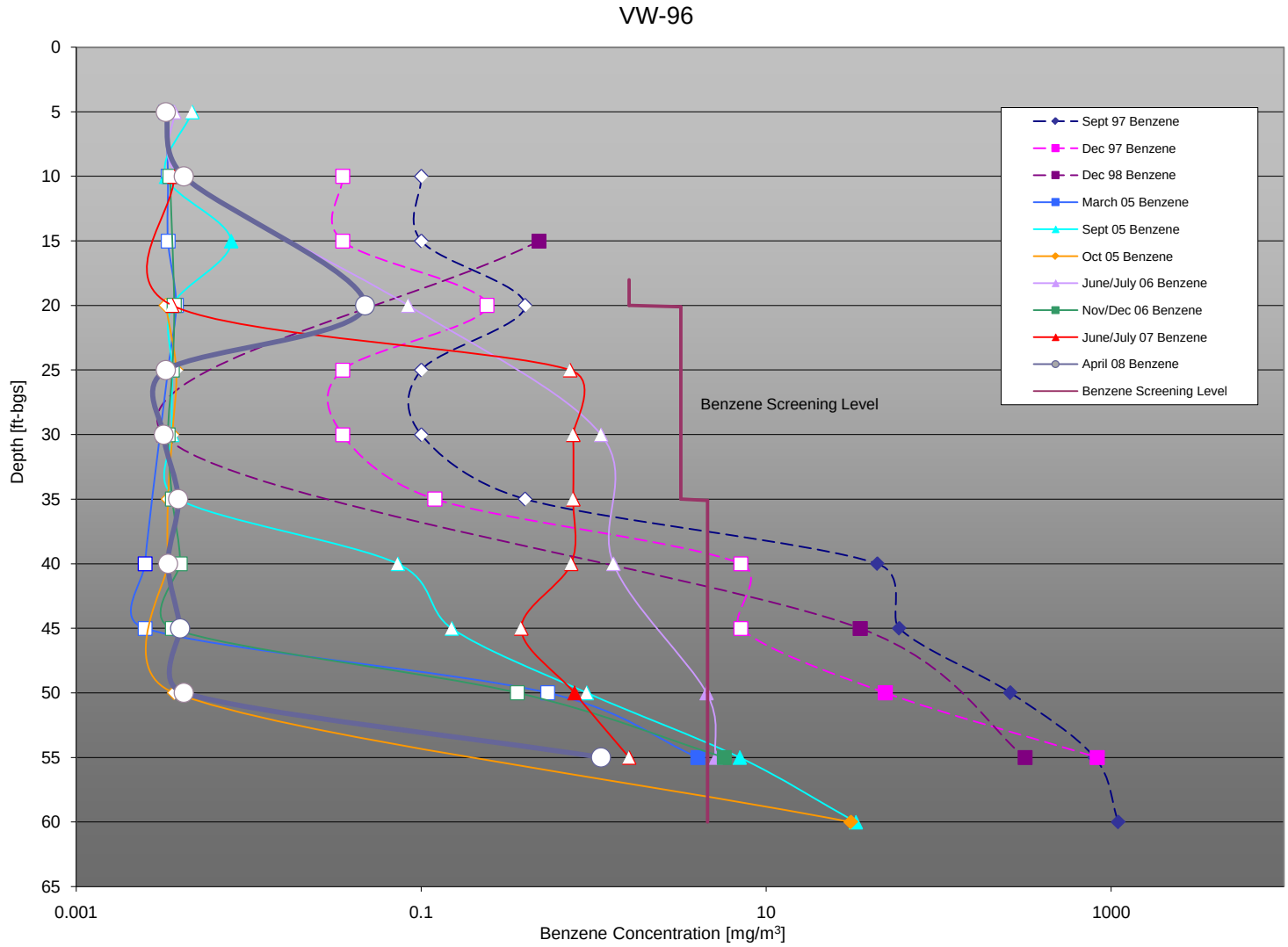
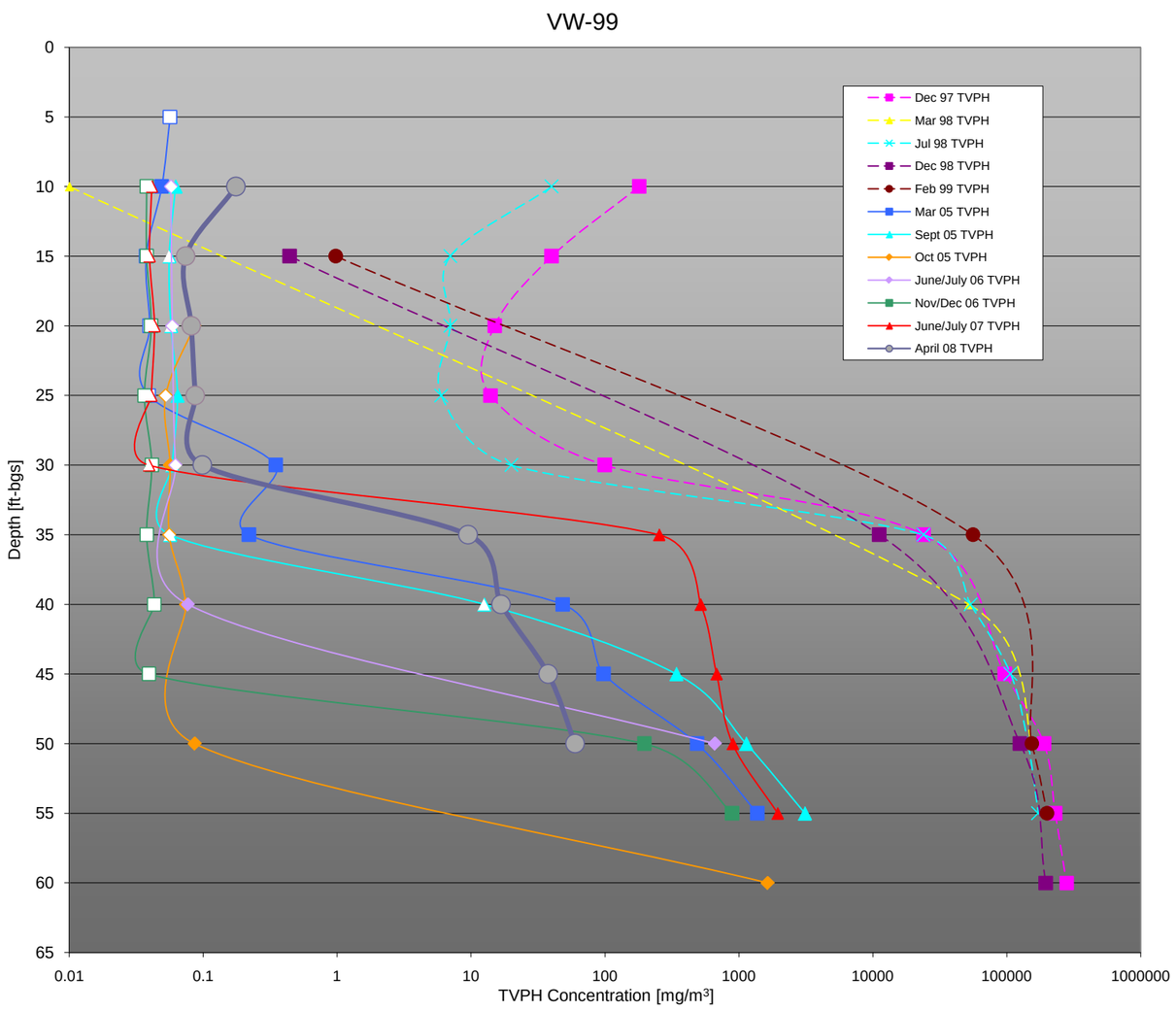
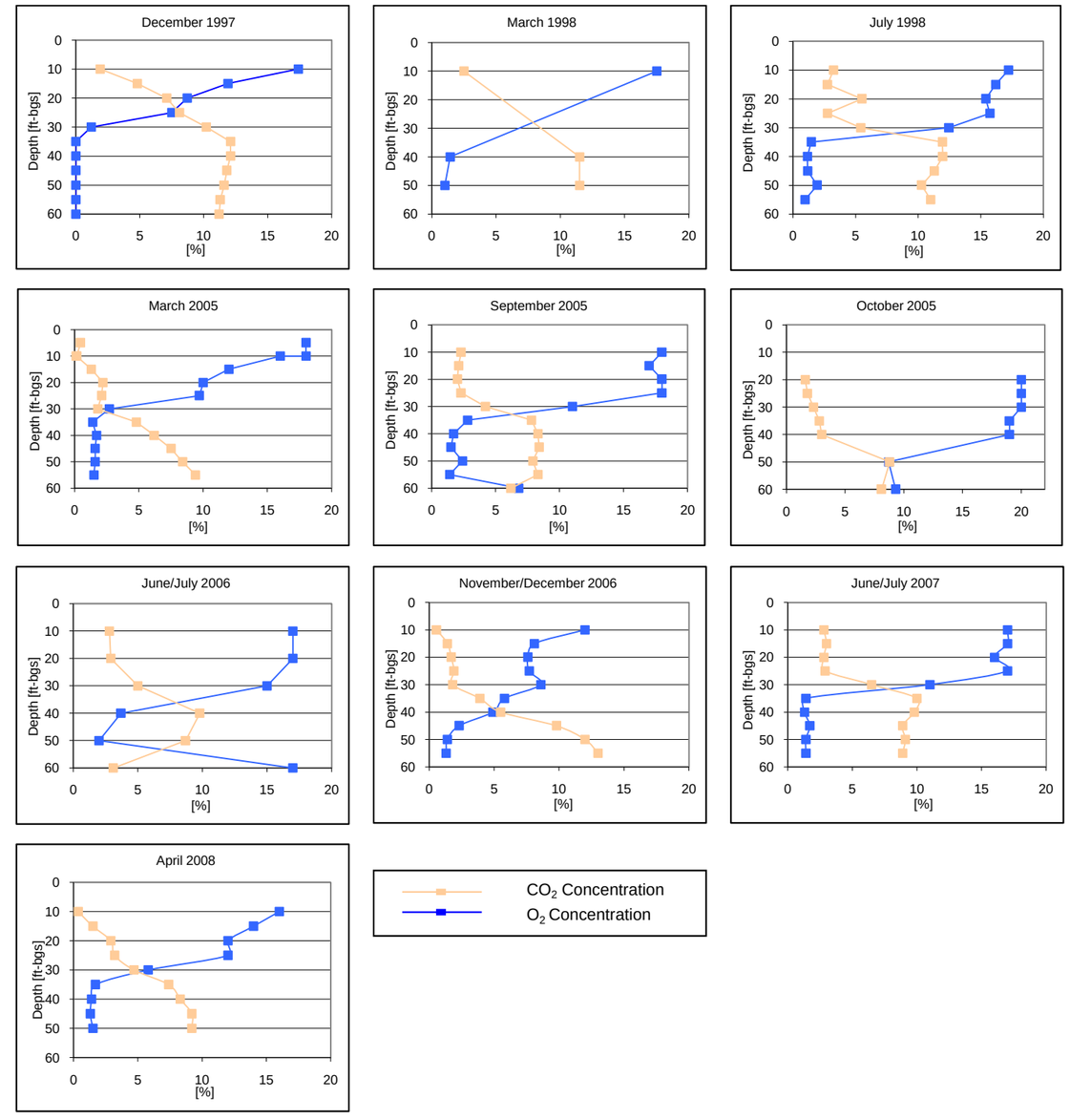
FIGURE 4-16b. NESTED VAPOR MONITORING WELL VW-96 BENZENE PROFILE, FIRST 2008 SEMIANNUAL MONITORING EVENT CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:
1. Open symbol designates a non-detect value
2. The HSVE system was operating during the sampling conducted in October 2005
3. Resampling of the 30, 35, and 55 ft-bgs probes was conducted in May 2005. The profile shown for March 2005 includes only March data

FIGURE 4-17a. NESTED VAPOR MONITORING WELL VW-99 TVPH AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO





EXPLANATION:
1. Open symbol designates a non-detect value
2. The HSVE system was operating during the sampling conducted in October 2005
3. TVPH - Total volatile petroleum hydrocarbons as gasoline
4. Data from the 60 ft-bgs probe is not used for the September 2005 and June/July 2006 profiles due to dilution

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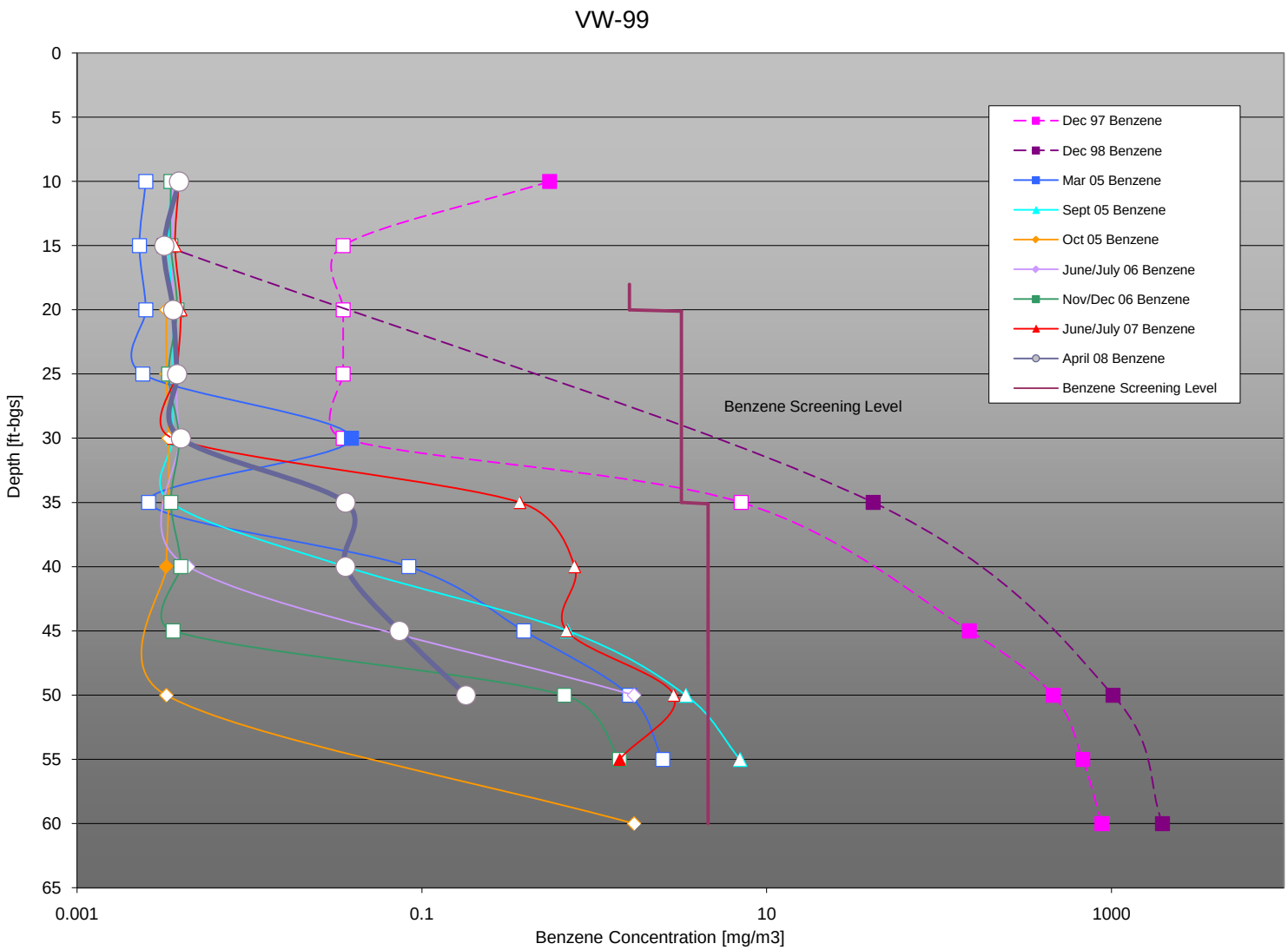
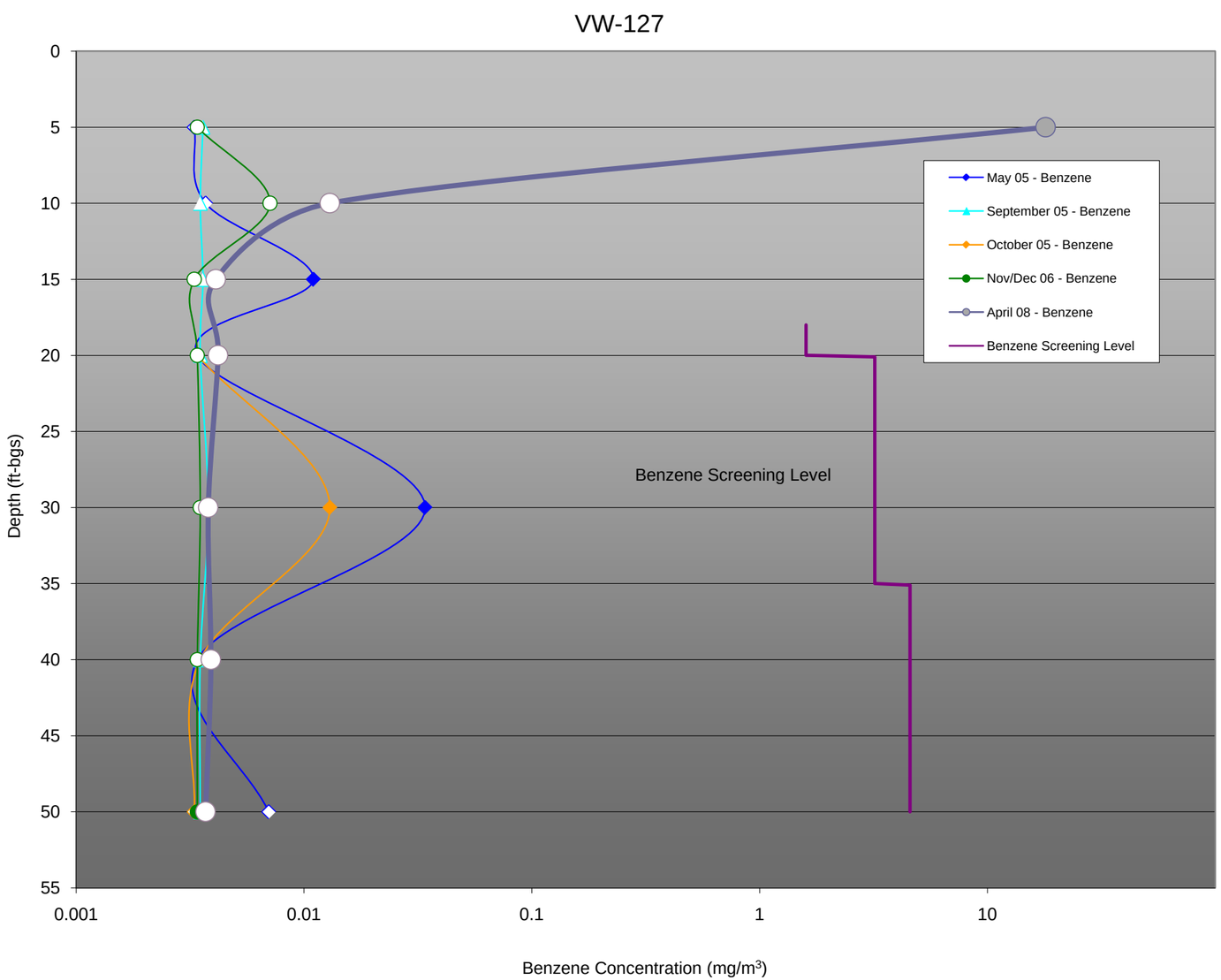
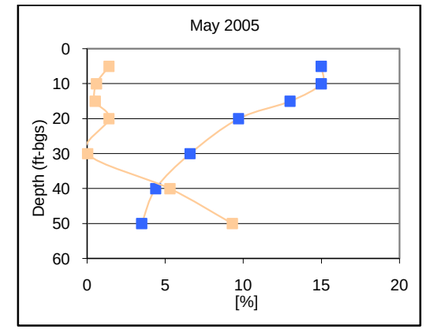
FIGURE 4-17b. NESTED VAPOR MONITORING WELL VW-99 BENZENE PROFILE
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

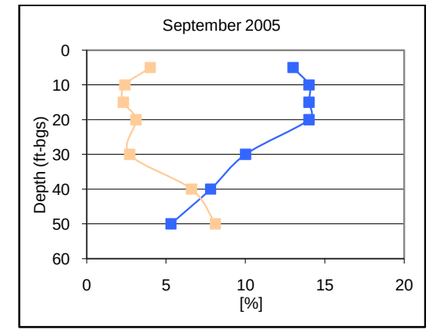


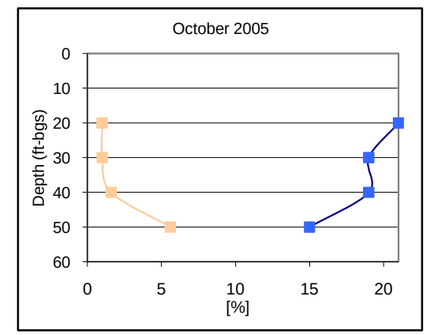
EXPLANATION:
1. Open symbol designates a non-detect value
2. The HSVE system was operating during the sampling conducted in October 2005
3. Data from the 60 ft-bgs probe is not used for the September 2005 and June/July 2006 profiles due to dilution

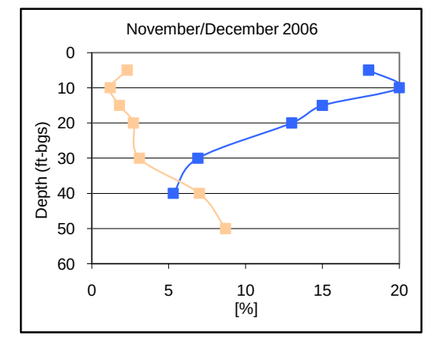
FIGURE 4-18. NESTED VAPOR MONITORING WELL VW-127 BENZENE AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

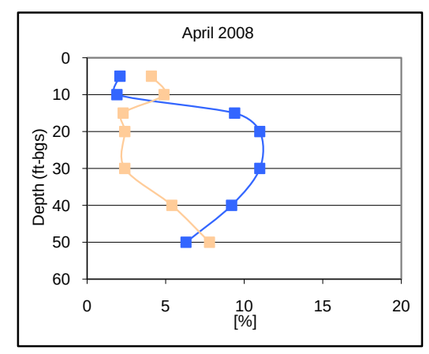


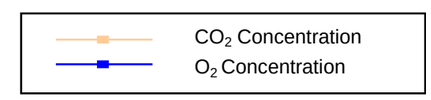








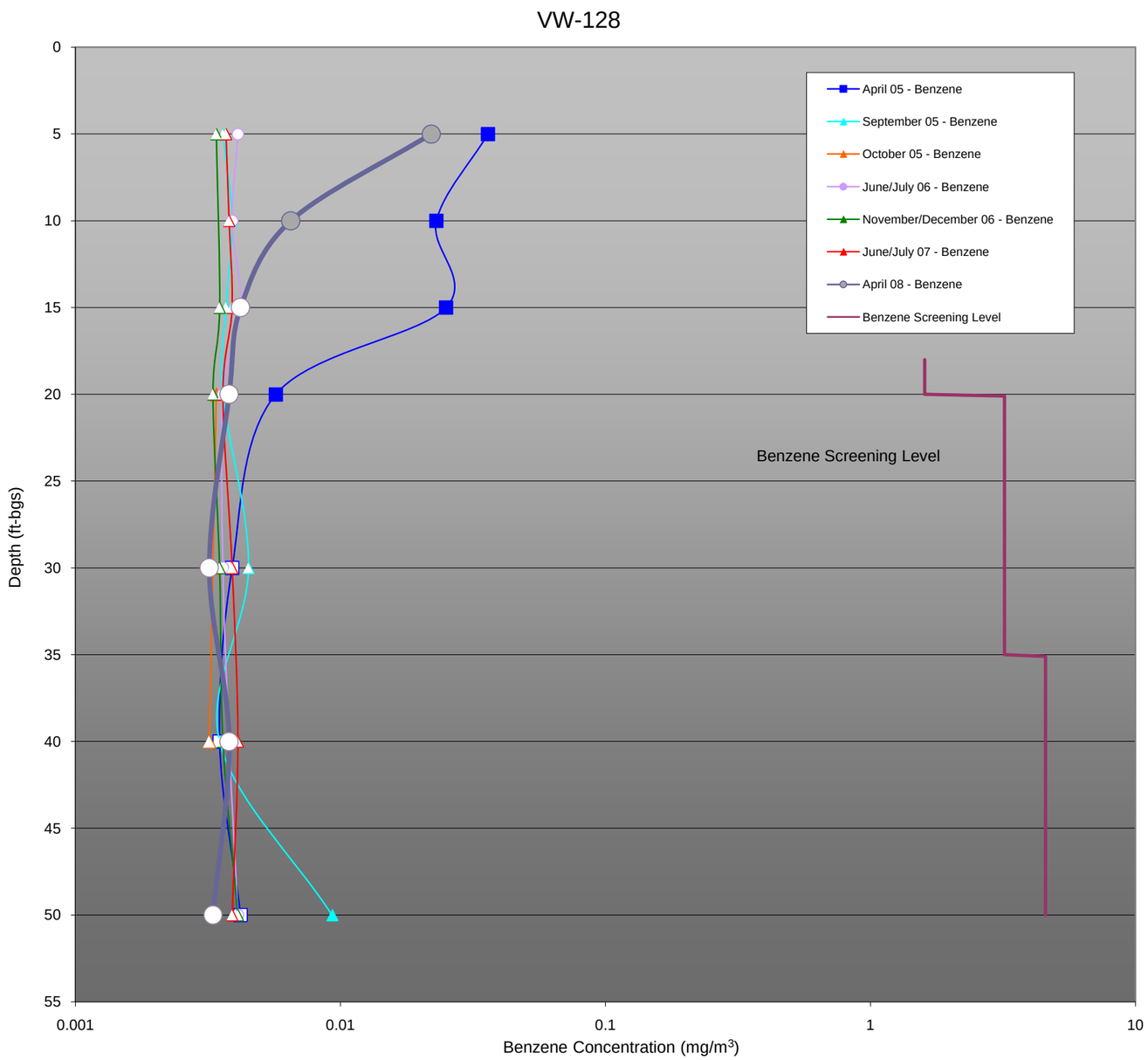


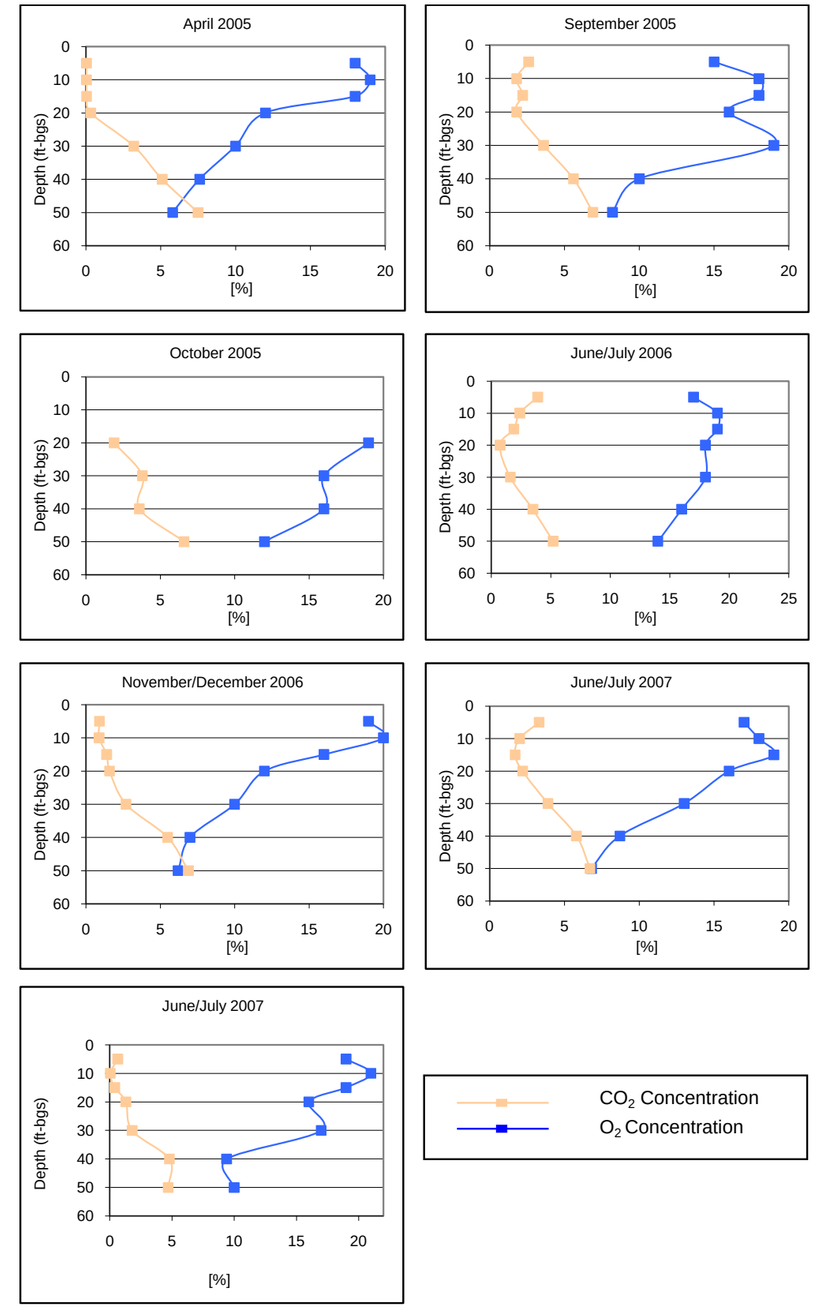


EXPLANATION:
1. Open symbol designates a non-detect value
2. The HSVE system was operating during the October 2005 soil gas sampling event

US EPA ARCHIVE DOCUMENT

FIGURE 4-19. NESTED VAPOR MONITORING WELL VW-128 BENZENE AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

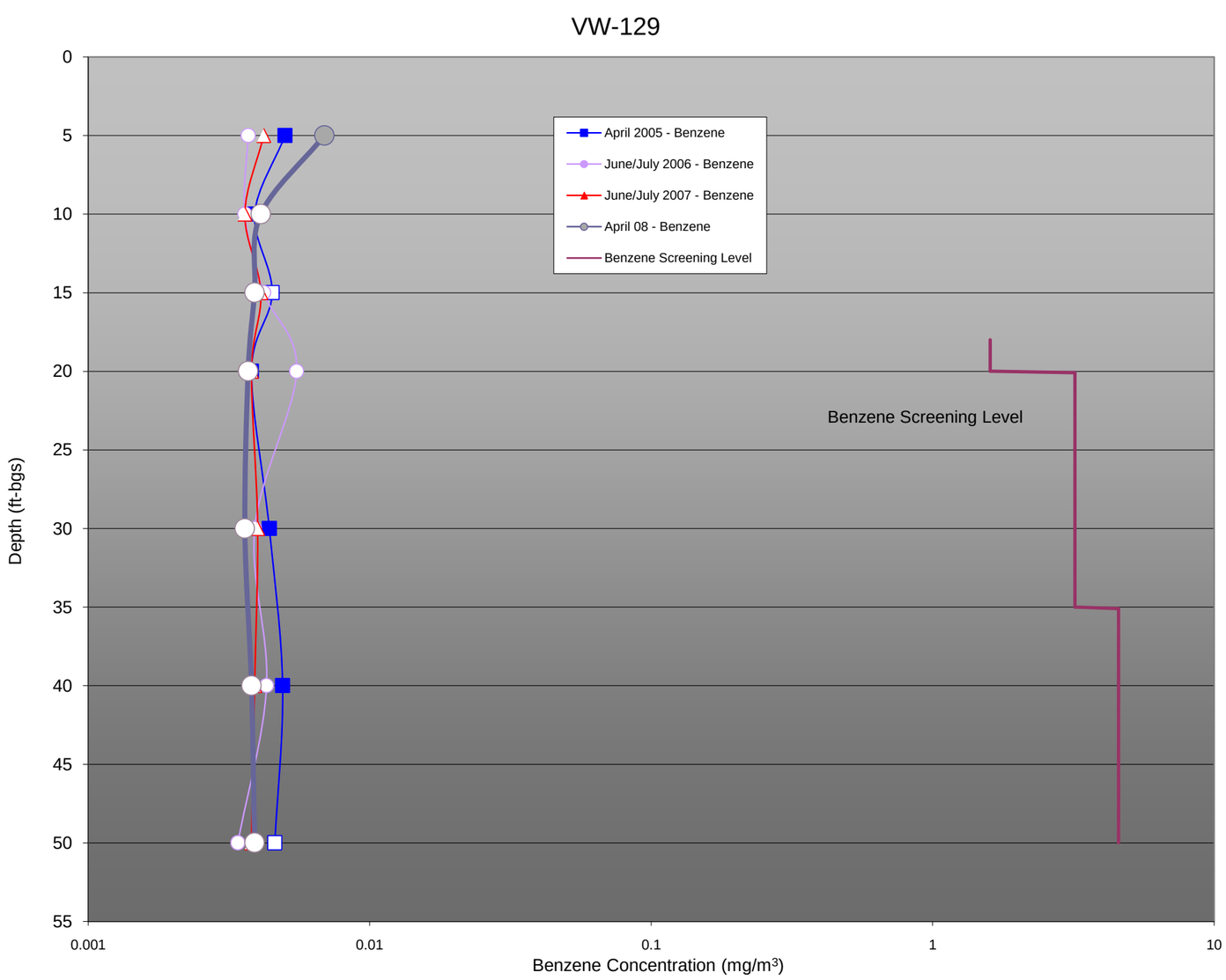


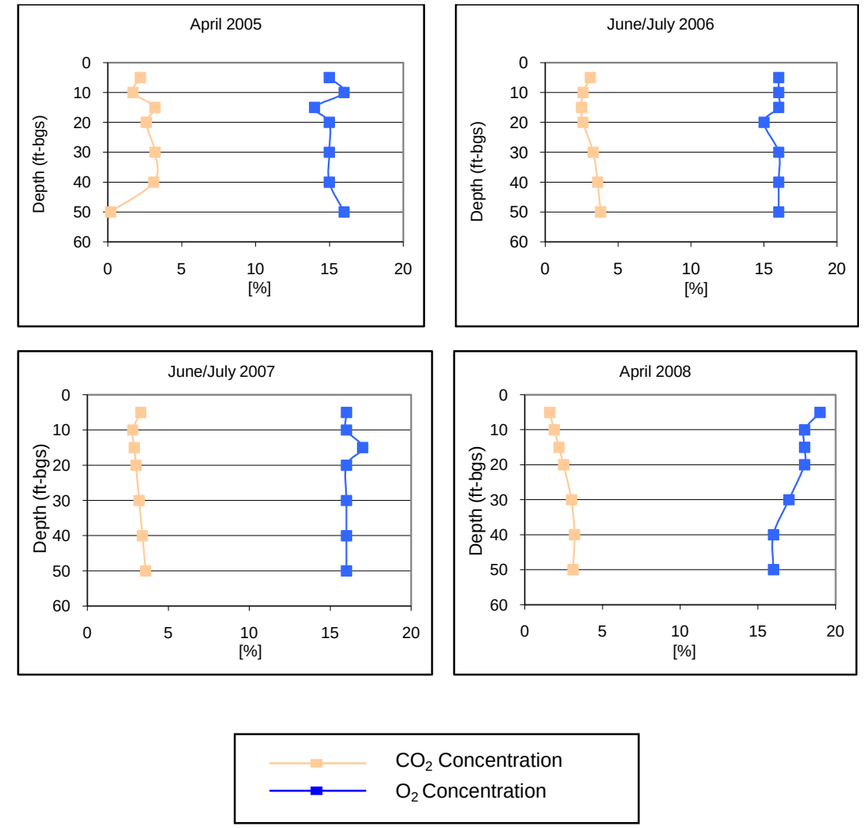


EXPLANATION:
1. Open symbol designates a non-detect value

US EPA ARCHIVE DOCUMENT

FIGURE 4-20. NESTED VAPOR MONITORING WELL VW-129 BENZENE AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

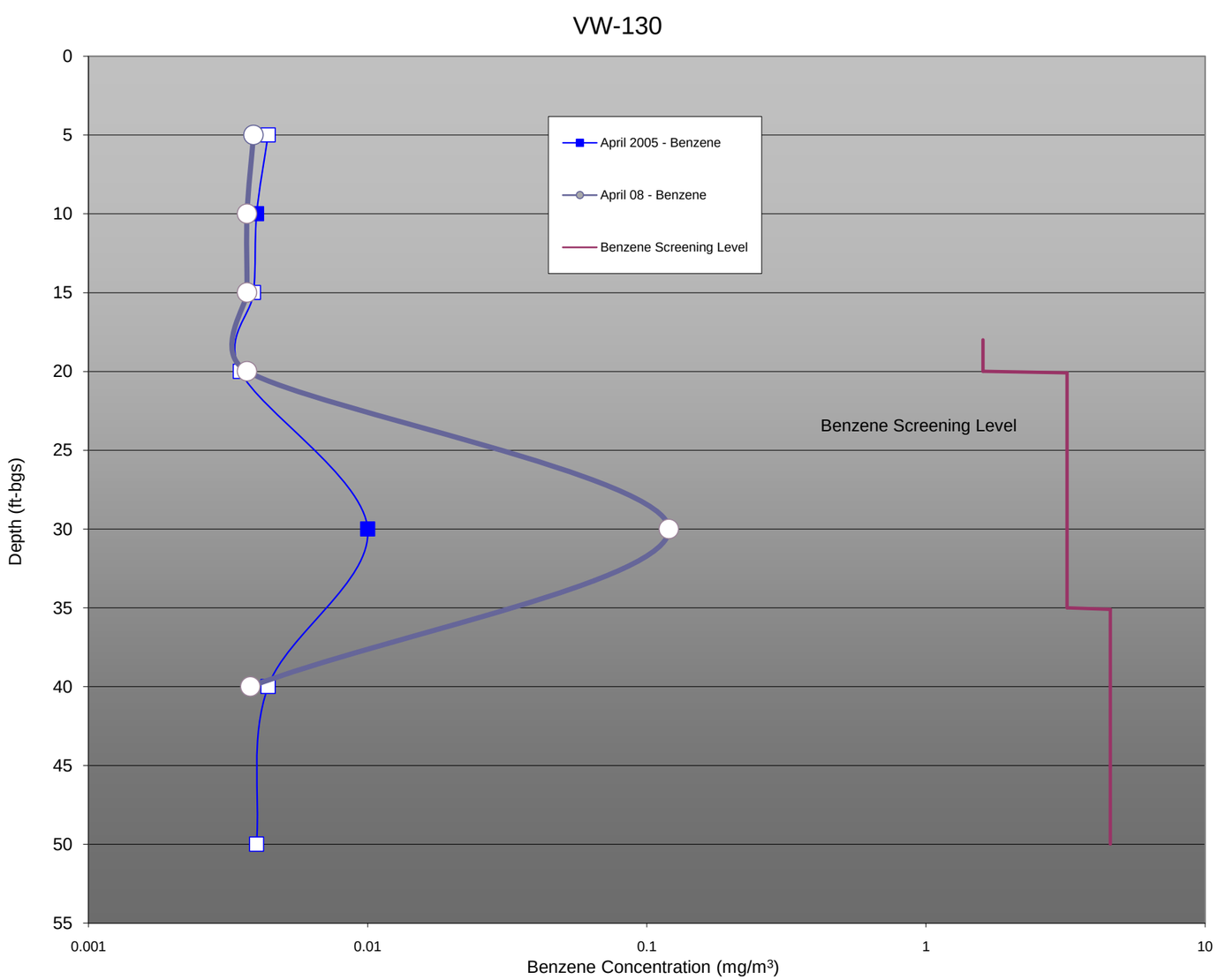


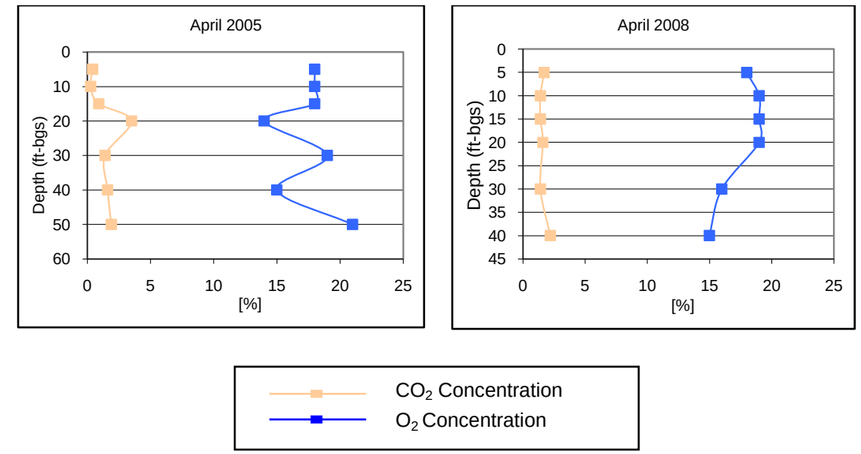


EXPLANATION:
1. Open symbol designates a non-detect value

US EPA ARCHIVE DOCUMENT

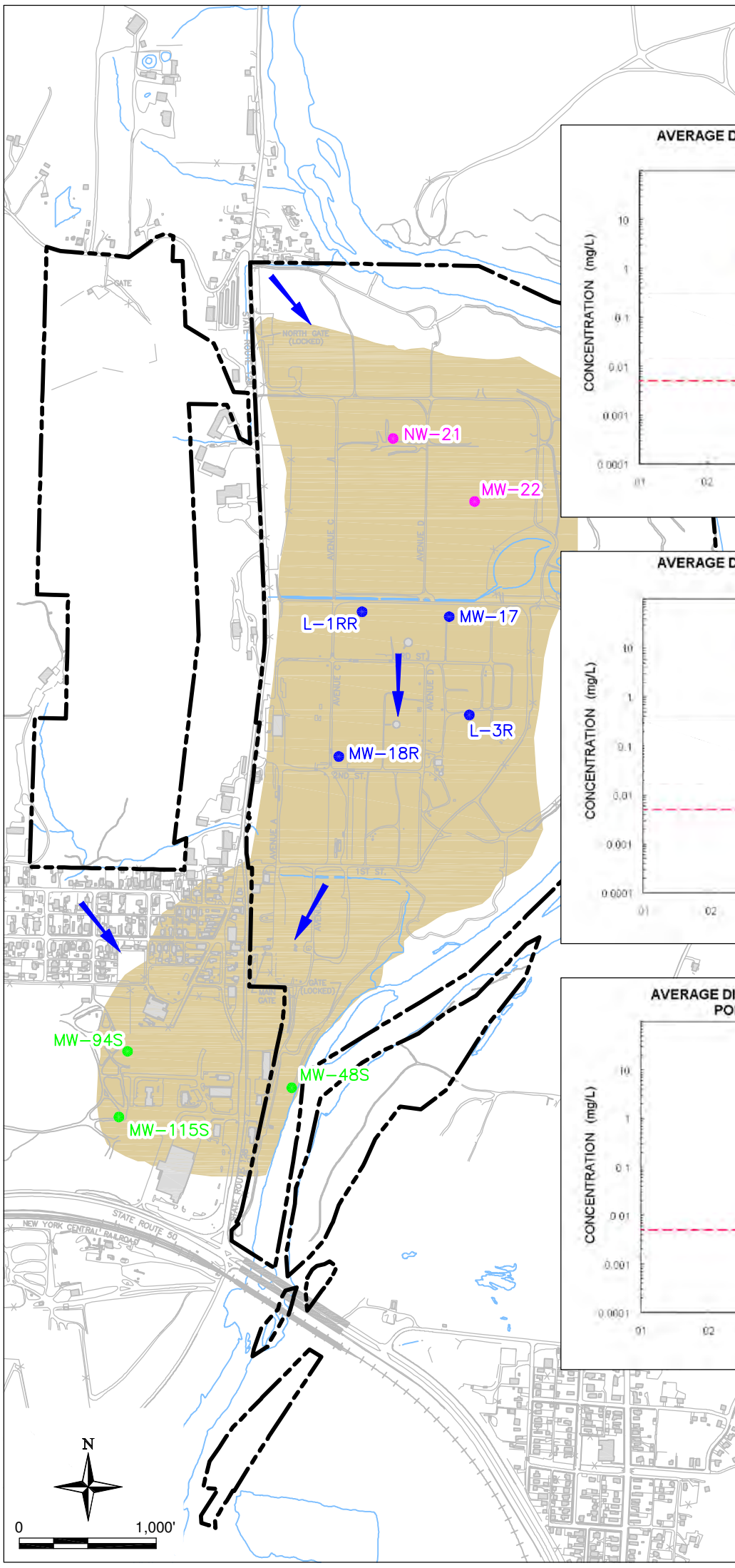
FIGURE 4-21. NESTED VAPOR MONITORING WELL VW-130 BENZENE AND O_2/CO_2 PROFILES
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

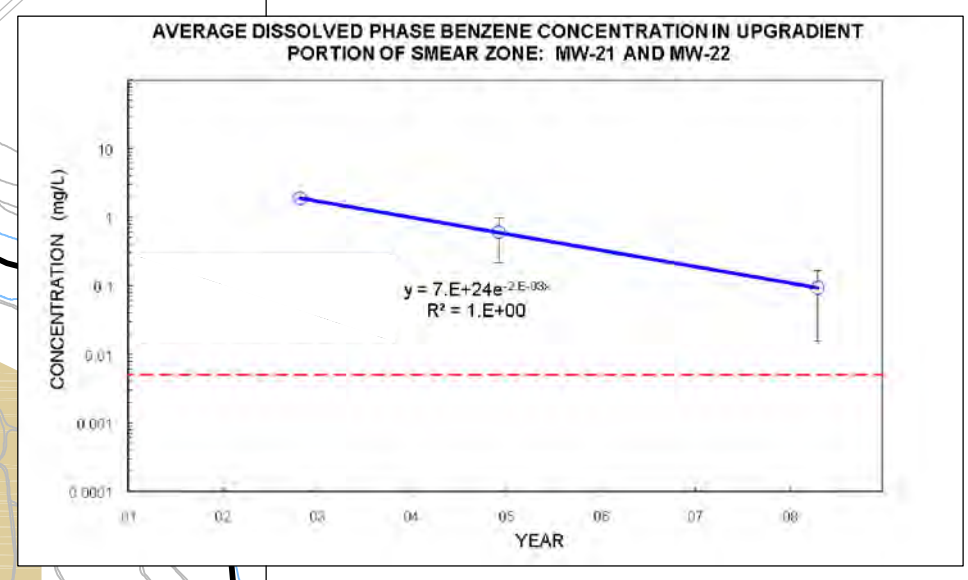


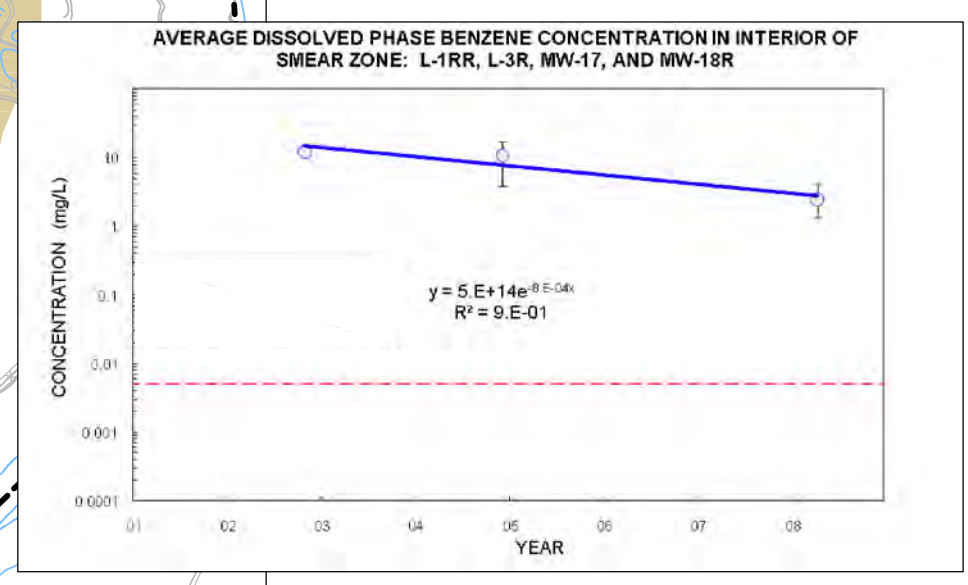


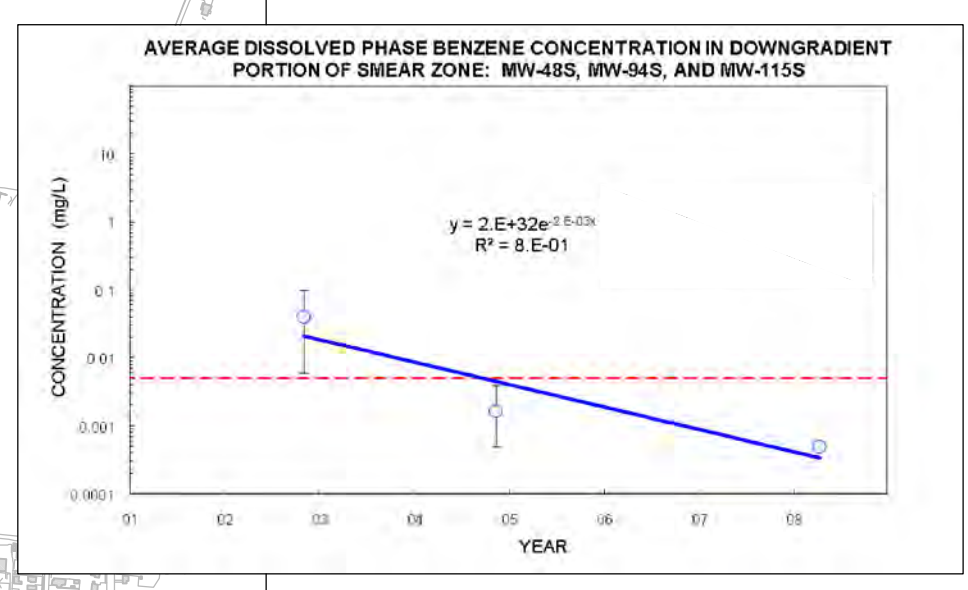
EXPLANATION:
1. Open symbol designates a non-detect value

US EPA ARCHIVE DOCUMENT









EXPLANATION

- MW−22 — UPGRADIENT MONITORING WELL AND DESIGNATION
- MW−17 — INTERIOR MONITORING WELL AND DESIGNATION
- MW−48S — DOWNGRADIENT MONITORING WELL AND DESIGNATION
- PROPERTY BOUNDARY
- FENCE
- STREAM
- GROUNDWATER CLEANUP LEVEL
- GENERAL GROUNDWATER FLOW DIRECTION
- BUILDING, TANK OR OTHER STRUCTURE
- SMEAR ZONE

NOTES:

1. ERROR BARS REPRESENT MINIMUM AND MAXIMUM CONCENTRATIONS MEASURED DURING SAMPLING EVENT
2. NON-DETECT CONCENTRATIONS SET TO REPORTING LIMIT FOR AVERAGING
3. SAMPLING EVENTS DISPLAYED: FALL 2002, FALL 2004, AND SPRING 2008

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FIGURE 4-22

DISSOLVED PHASE BENZENE CONCENTRATIONS VERSUS TIME FOR SELECTED WELLS WITHIN SMEAR ZONE

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: BM	Scale: AS SHOWN	Date: 4/9/09	File: 500SPATIO200904

US EPA ARCHIVE DOCUMENT

KEY TRANSDUCER MONITORING WELLS USED DURING 2007 HIGH-GRADE EVENT
MW-20S
MW-96S
MW-99S
MW-112
PROD_19
SELECT TRANSDUCER MONITORING WELLS USED DURING 2007 HIGH-GRADE EVENT
MW-4
MW-10
MW-17
MW-40
MW-44S
MW-62
MW-81S
MW-88
MW-93S
MW-98S
RBGP-44

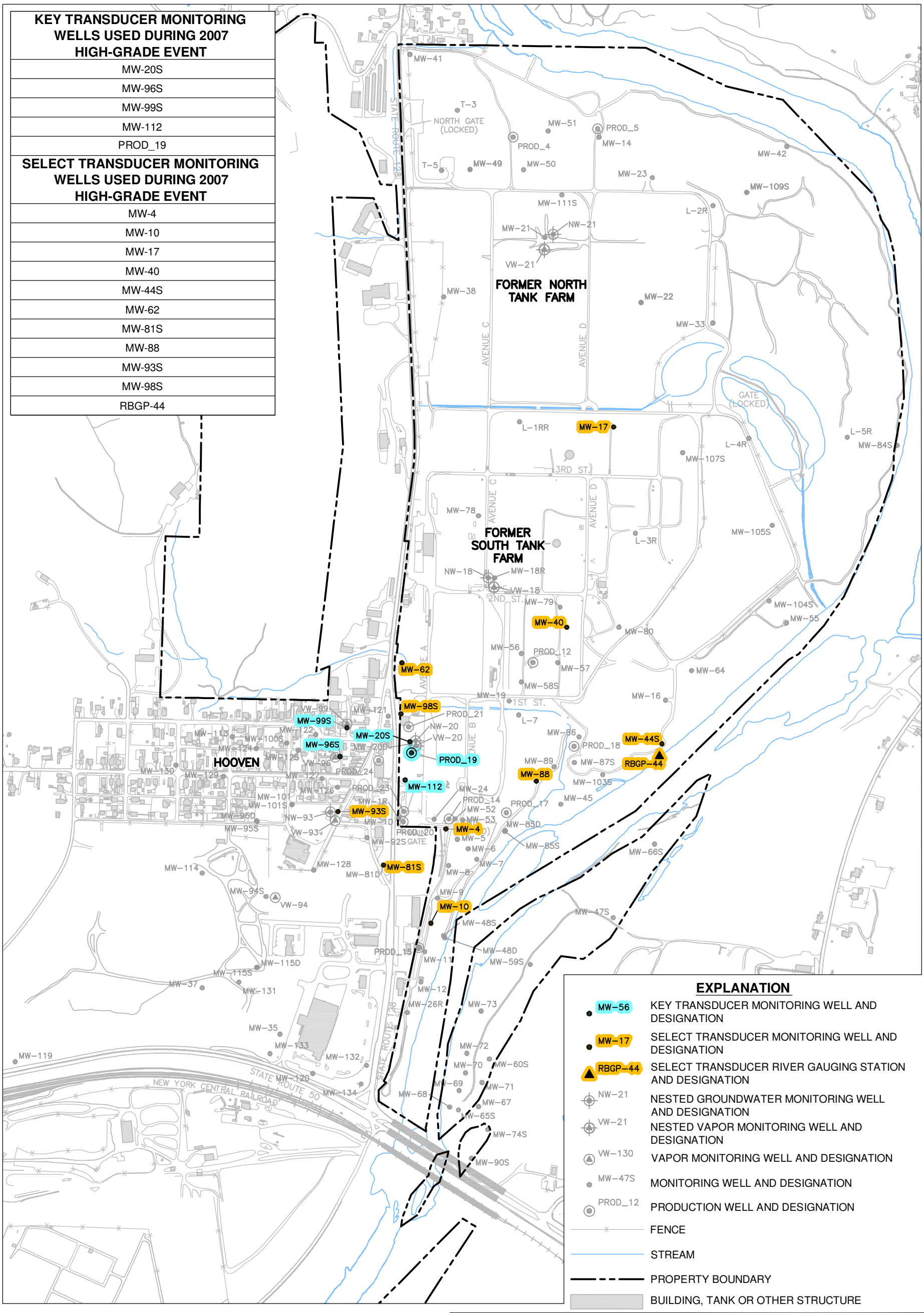

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FIGURE 5-1

KEY AND SELECT TRANSDUCER MONITORING WELLS DURING 2007 HIGH-GRADE EVENT

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PM	Scale: 1" = 650'	Date: 12/27/07	File: 500HG07TRANWELLS200904

US EPA ARCHIVE DOCUMENT

KEY TRANSDUCER MONITORING WELLS FOR SOUTHWESTERN HIGH-GRADE AREA	KEY TRANSDUCER MONITORING WELLS FOR CENTRAL HIGH-GRADE AREA
MW-20S	MW-19
MW-96S	MW-56
MW-99S	MW-57
MW-112	MW-58S
PROD_19	PROD_12
SELECT TRANSDUCER MONITORING WELLS FOR SOUTHWESTERN HIGH-GRADE AREA	**SELECT TRANSDUCER MONITORING WELLS FOR CENTRAL HIGH-GRADE AREA**
MW-4	MW-17
MW-10	MW-18R
MW-17	MW-20S
MW-18R	MW-40
MW-44S	MW-44S
MW-81S	MW-62
MW-93S	MW-88
RBGP-44	MW-98S
	RBGP-44

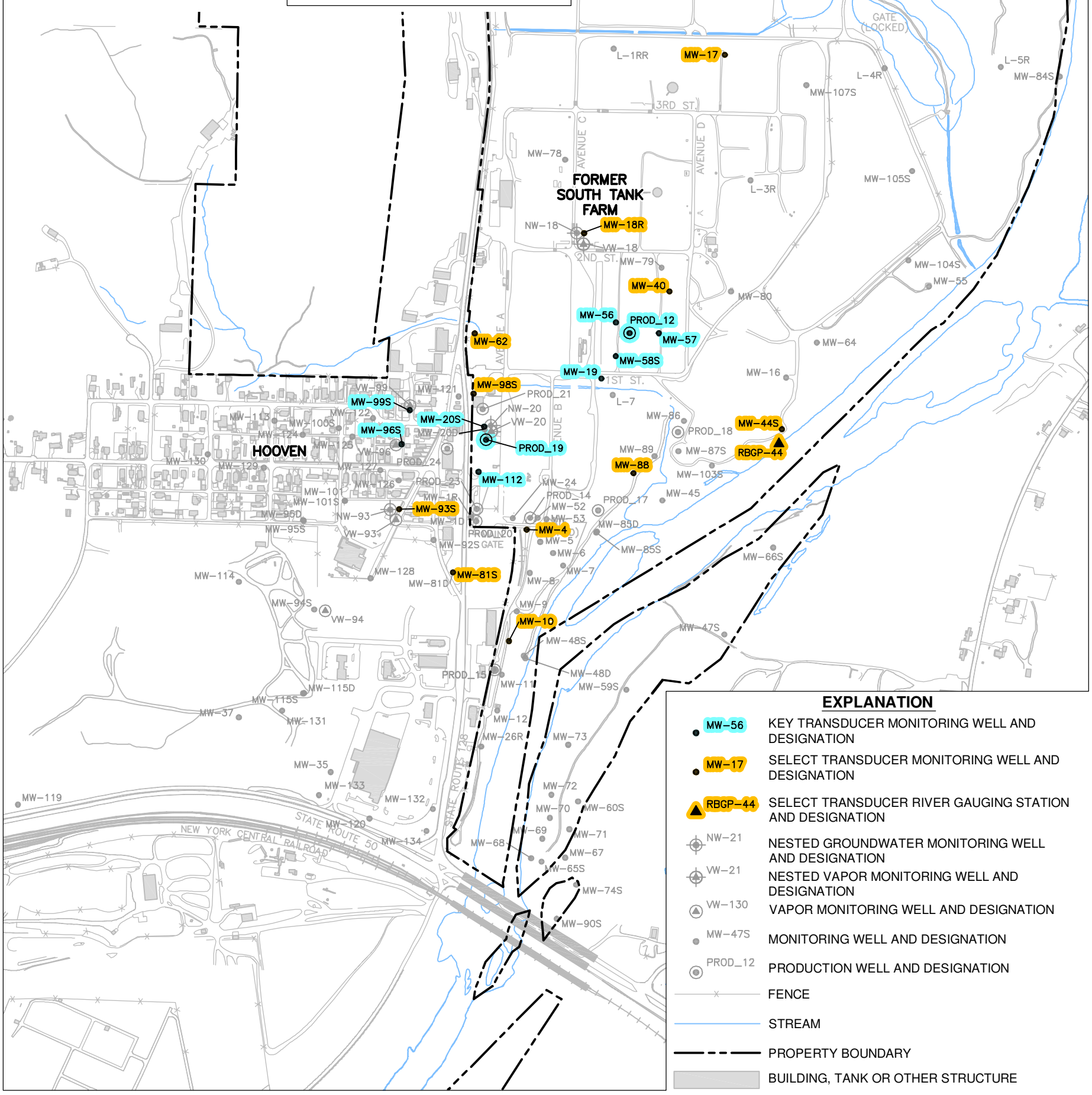

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FIGURE 5-2

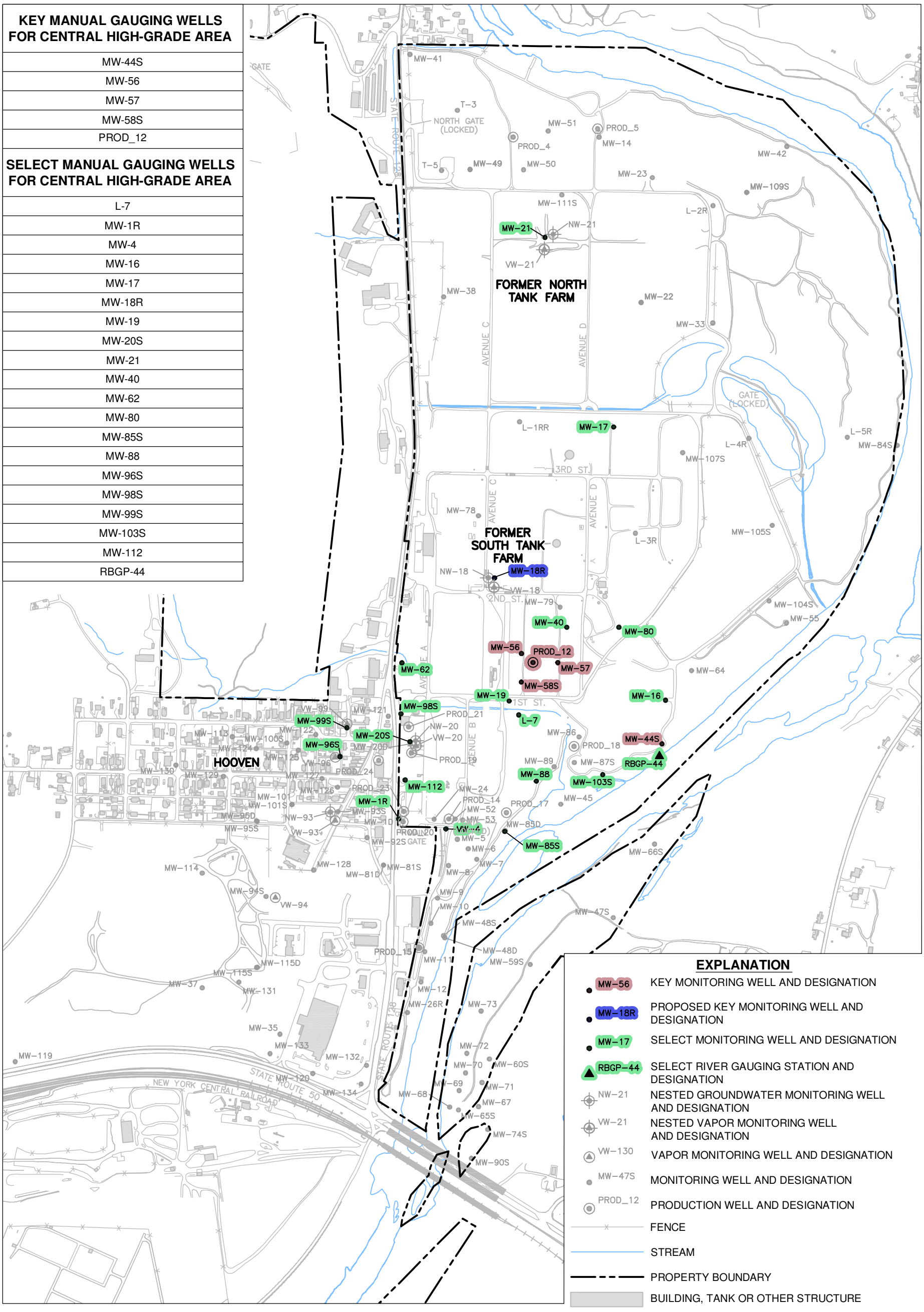
PROPOSED KEY AND SELECT TRANSDUCER MONITORING WELLS IN THE CENTRAL AND SOUTHWESTERN HIGH-GRADE AREAS

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PM	Scale: 1" = 650'	Date: 12/27/07	File: 500PROPTRANWELLS200904

US EPA ARCHIVE DOCUMENT

KEY MANUAL GAUGING WELLS FOR CENTRAL HIGH-GRADE AREA
MW-44S
MW-56
MW-57
MW-58S
PROD_12
SELECT MANUAL GAUGING WELLS FOR CENTRAL HIGH-GRADE AREA
L-7
MW-1R
MW-4
MW-16
MW-17
MW-18R
MW-19
MW-20S
MW-21
MW-40
MW-62
MW-80
MW-85S
MW-88
MW-96S
MW-98S
MW-99S
MW-103S
MW-112
RBGP-44



EXPLANATION

MW-56	KEY MONITORING WELL AND DESIGNATION
MW-18R	PROPOSED KEY MONITORING WELL AND DESIGNATION
MW-17	SELECT MONITORING WELL AND DESIGNATION
RBGP-44	SELECT RIVER GAUGING STATION AND DESIGNATION
NW-21	NESTED GROUNDWATER MONITORING WELL AND DESIGNATION
VW-21	NESTED VAPOR MONITORING WELL AND DESIGNATION
VW-130	VAPOR MONITORING WELL AND DESIGNATION
MW-47S	MONITORING WELL AND DESIGNATION
PROD_12	PRODUCTION WELL AND DESIGNATION
	FENCE
	STREAM
	PROPERTY BOUNDARY
	BUILDING, TANK OR OTHER STRUCTURE

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FIGURE 5-3

KEY AND SELECT MANUAL MONITORING WELLS IN THE CENTRAL HIGH-GRADE AREA

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PM	Scale: 1" = 650'	Date: 12/27/07	File: 500P12MGAGEWELLS200805

US EPA ARCHIVE DOCUMENT

KEY MANUAL GAUGING WELLS FOR SOUTHWESTERN HIGH-GRADE AREA
MW-20S
MW-85S
MW-96S
MW-99S
PROD_19
SELECT MANUAL GAUGING WELLS FOR SOUTHWESTERN HIGH-GRADE AREA
L-7
MW-1R
MW-4
MW-10
MW-17
MW-20D
MW-44S
MW-62
MW-81S
MW-88
MW-92S
MW-93S
MW-100S
MW-101
MW-112
MW-121
MW-126
MW-128
MW-129
RBGP-44

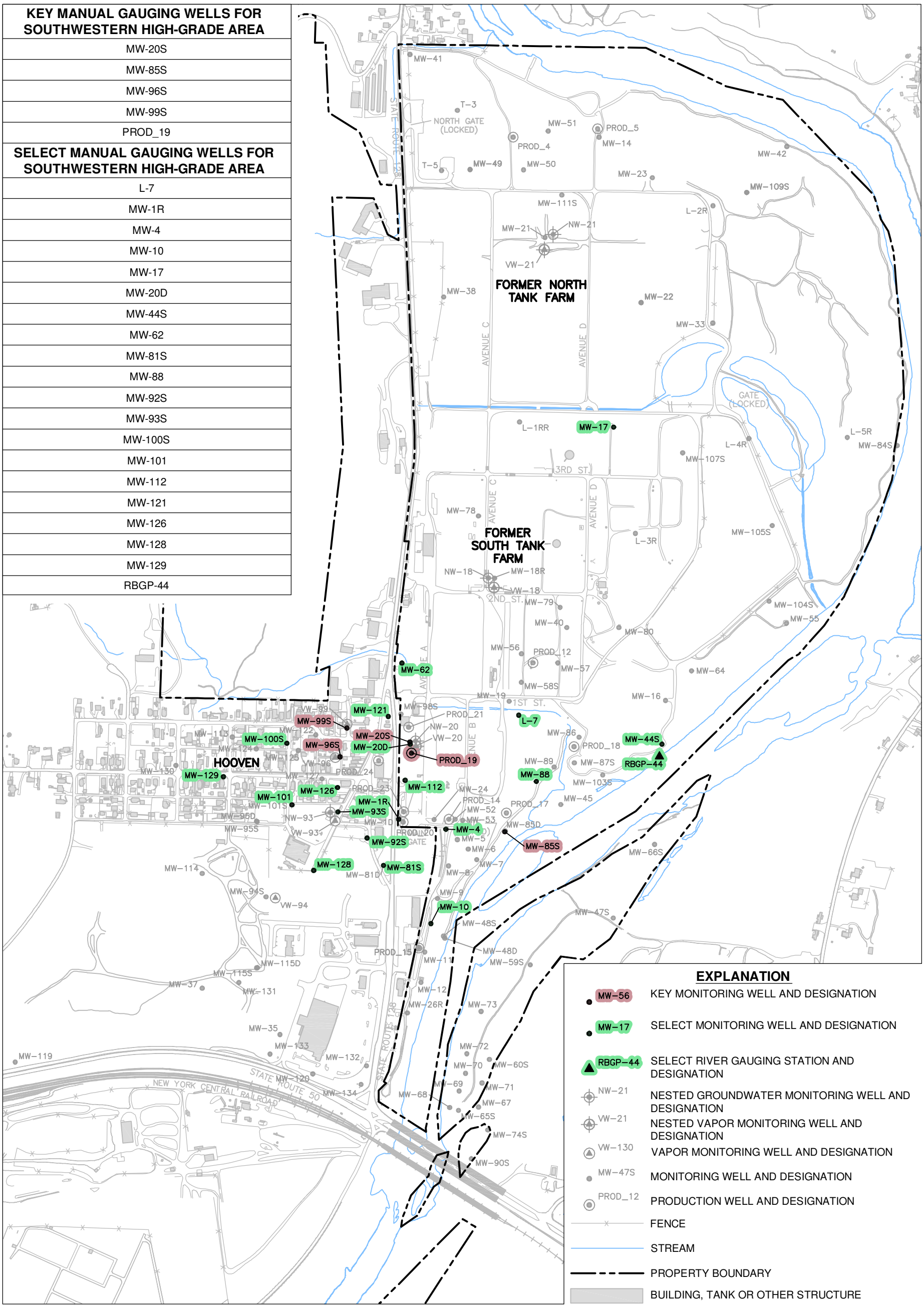

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FIGURE 5-4

KEY AND SELECT MANUAL MONITORING WELLS IN THE SOUTHWESTERN HIGH-GRADE AREA

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PM	Scale: 1" = 650'	Date: 12/27/07	File: 500P19MGAGEWELLS200805

US EPA ARCHIVE DOCUMENT

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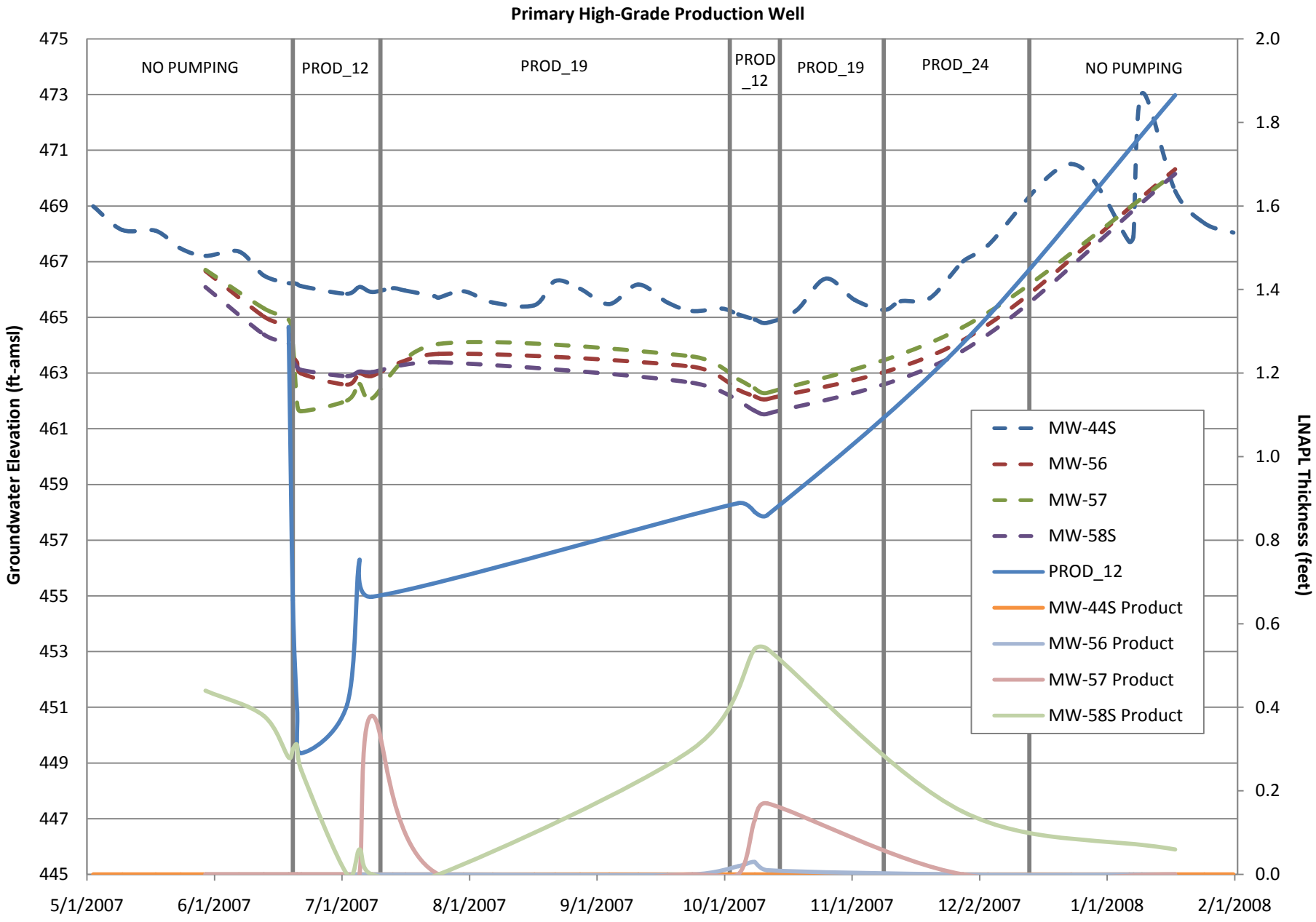
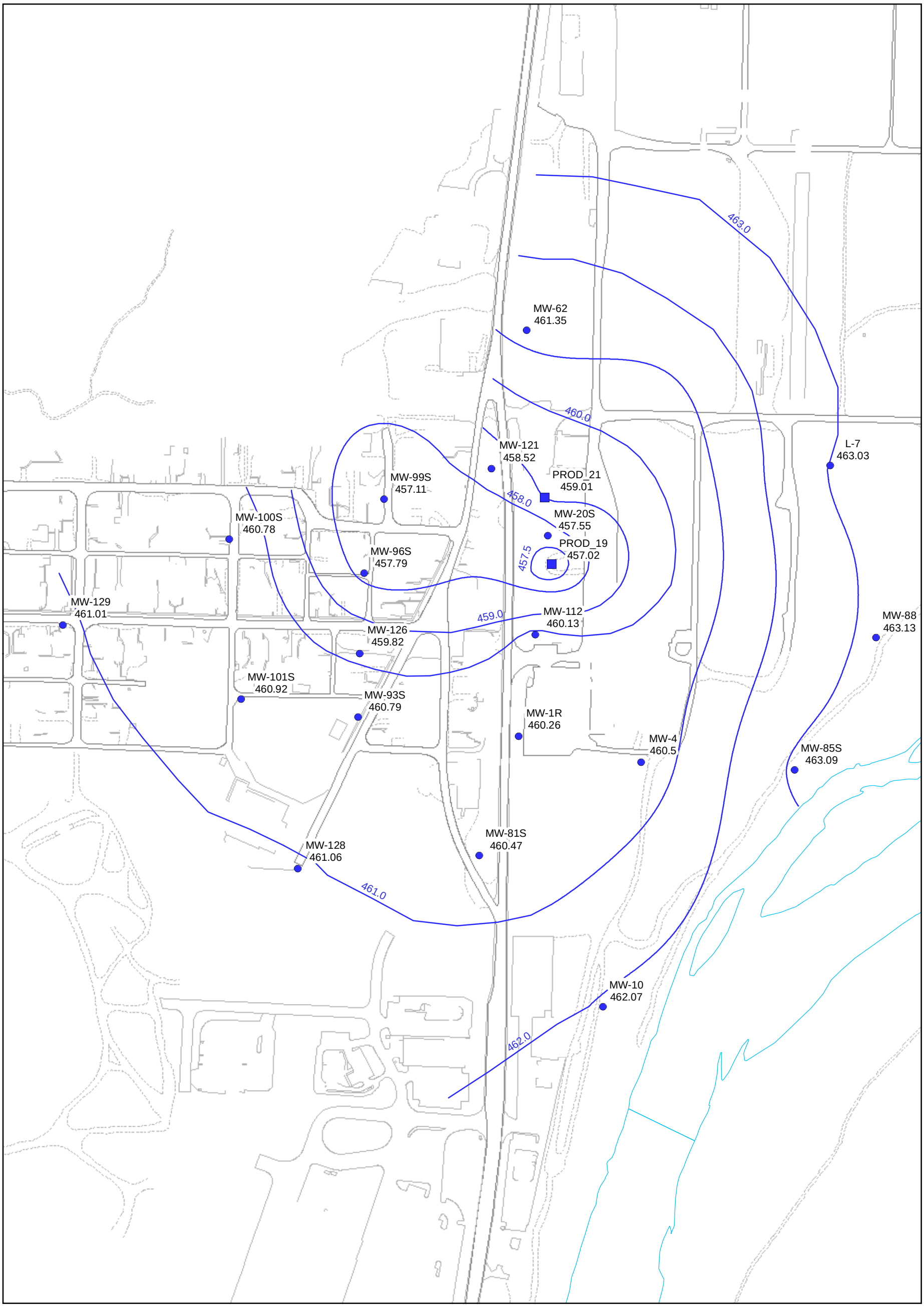
FIGURE 5-5. HYDROGRAPHS FOR KEY MONITORING WELLS IN CENTRAL HIGH-GRADE RECOVERY AREA
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO





EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Sea Level
Contour Interval is variable

N

0 250'

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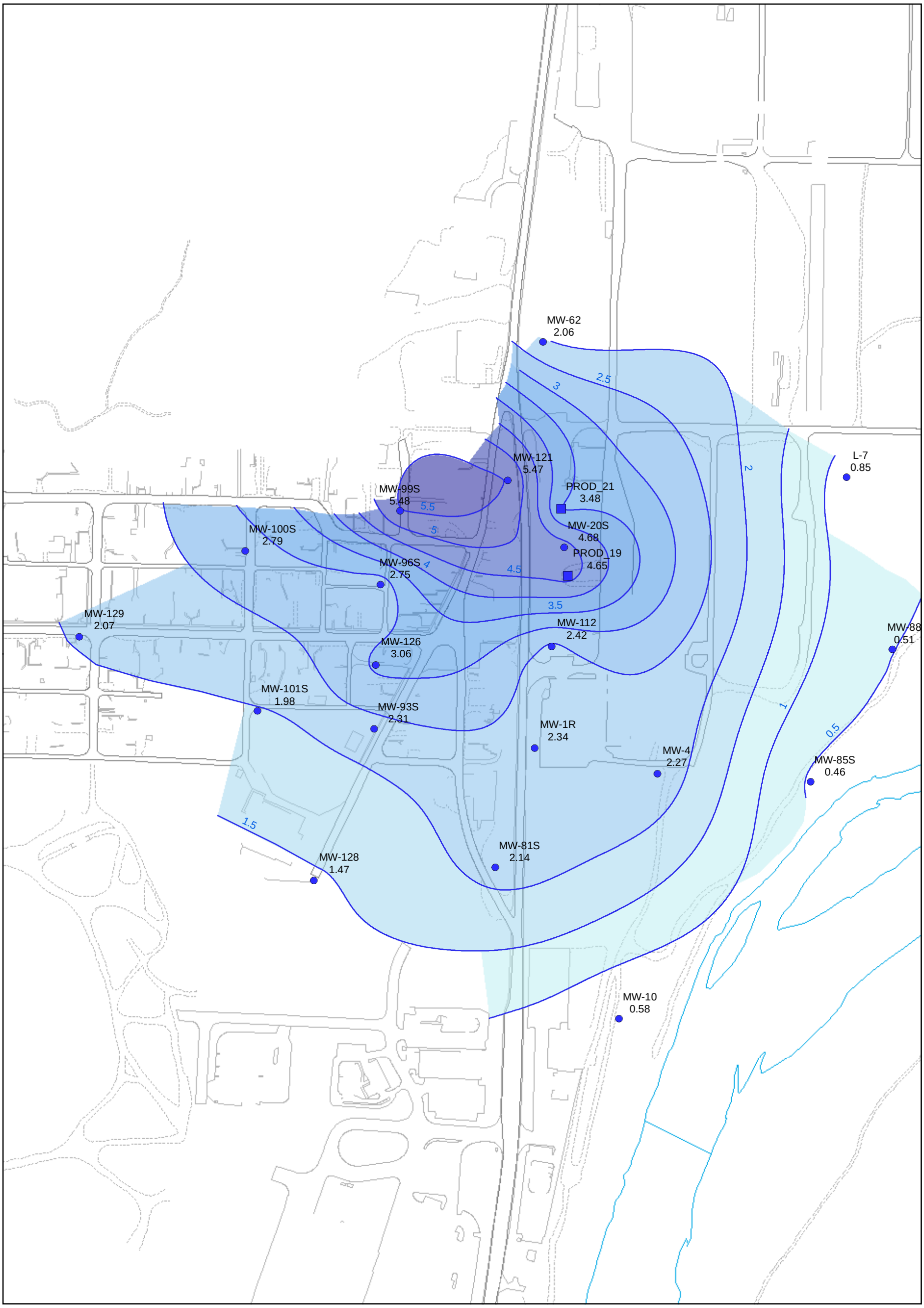
FIGURE 5-6

HIGH-GRADE POTENTIOMETRIC SURFACE MAP, OCTOBER 1, 2007

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 250'	Date: 04/03/09	File: Oct_01_07_Potsurface.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

CONTOUR LINE OF EQUAL DRAWDOWN IN FEET

AREA OF EQUAL DRAWDOWN IN FEET

0.5 — 5.5

N

0 — 250'

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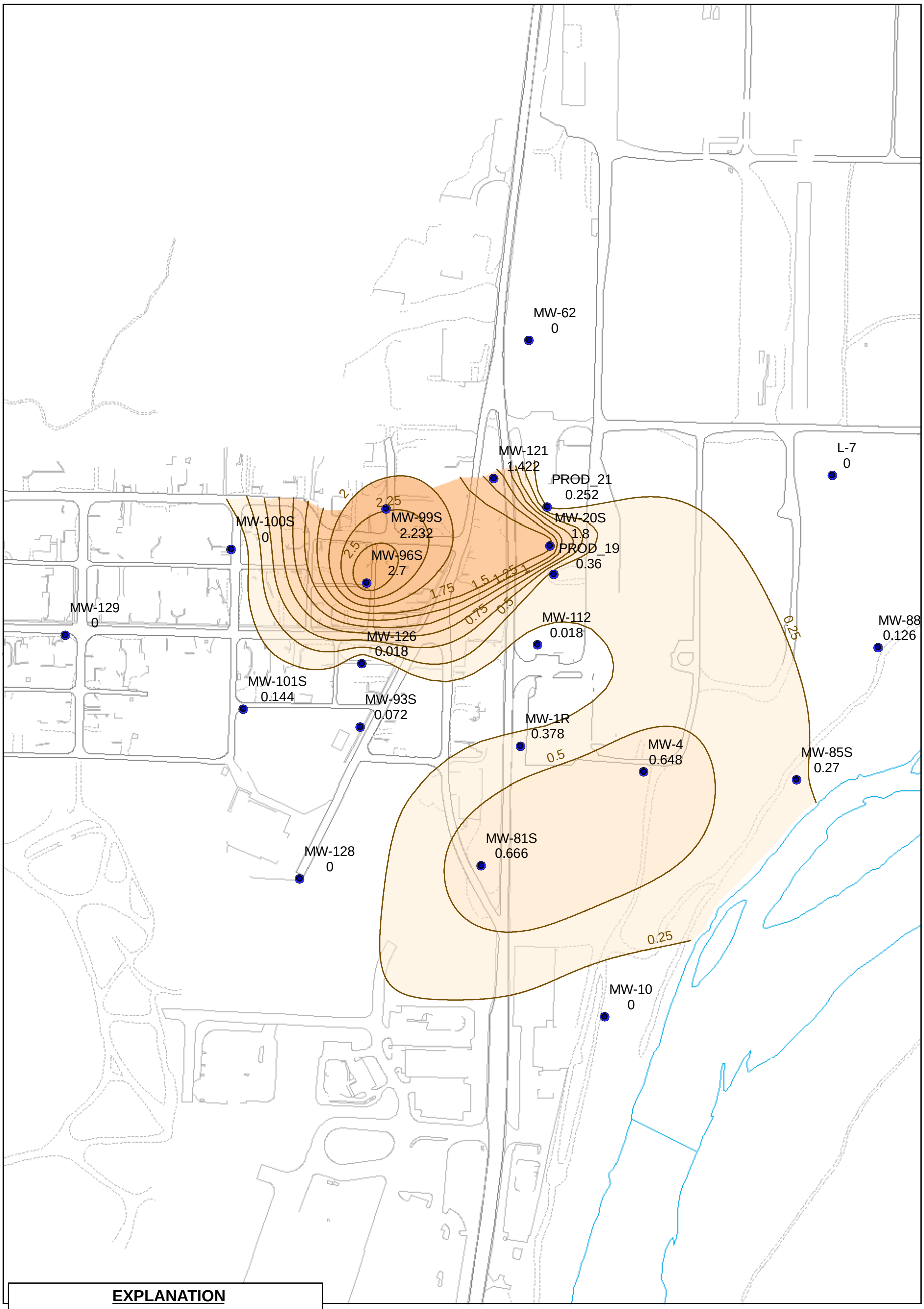
FIGURE 5-7

HIGH-GRADE DRAWDOWN MAP, OCTOBER 1, 2007

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 250'	Date: 04/03/09	File: Oct_01_07_DrawDown.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

EQUIPOTENTIAL CONTOUR LINE OF LNAPL THICKNESS, CONTOUR INTERVAL IS 0.25 FEET

AREA OF EQUAL LNAPL THICKNESS IN FEET

0.25 — 2.5

N

0 — 250'

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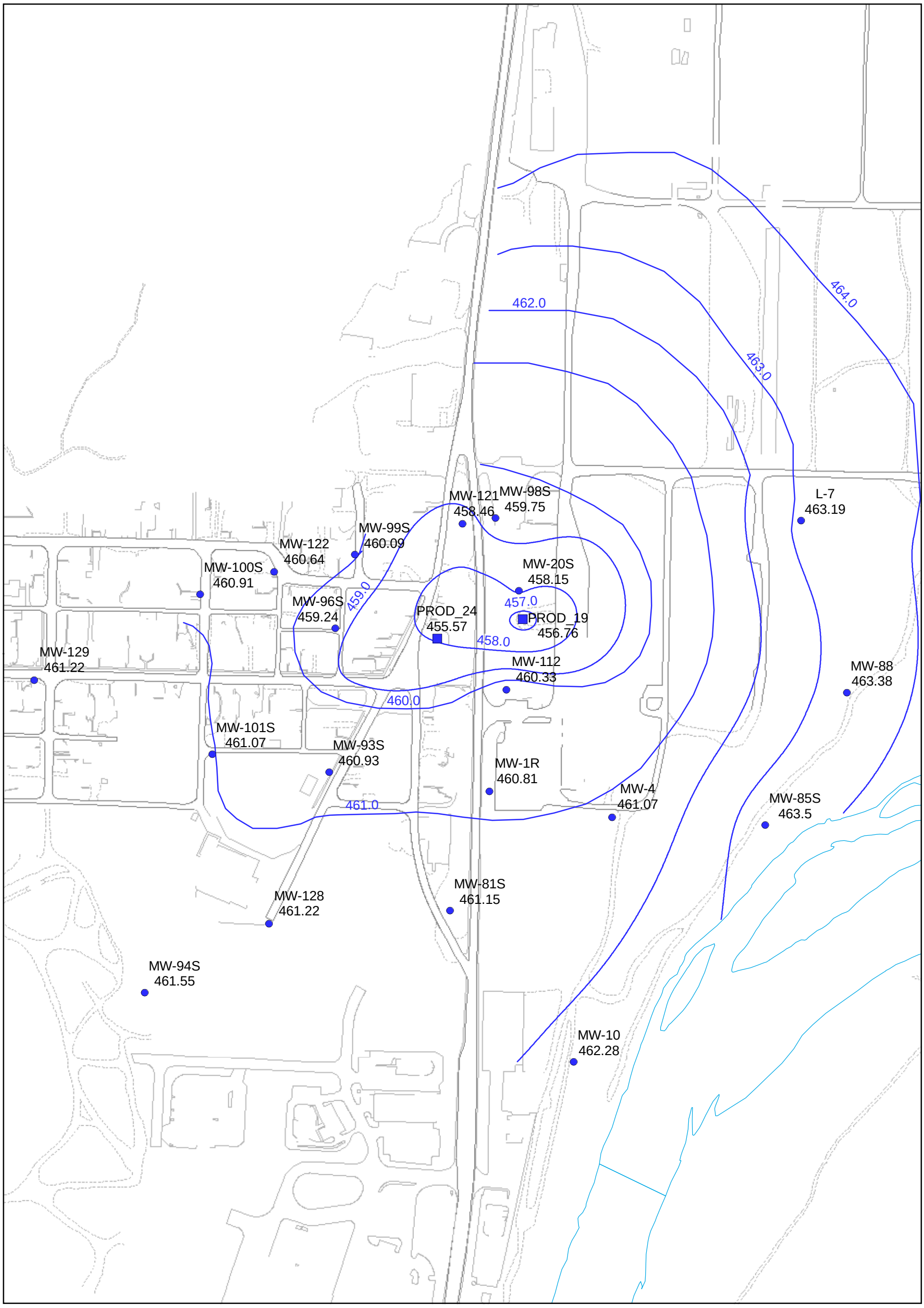
FIGURE 5-8

HIGH-GRADE LNAPL THICKNESS MAP, OCTOBER 1, 2007

FIRST 2008 SEMIANNUAL MONITORING EVENT CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 250'	Date: 04/03/09	File: Oct_01_07_NAPL_Thkn.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Sea Level
Contour Interval is 1.0 feet
(Line Dashed where approximate)

N

0 250'

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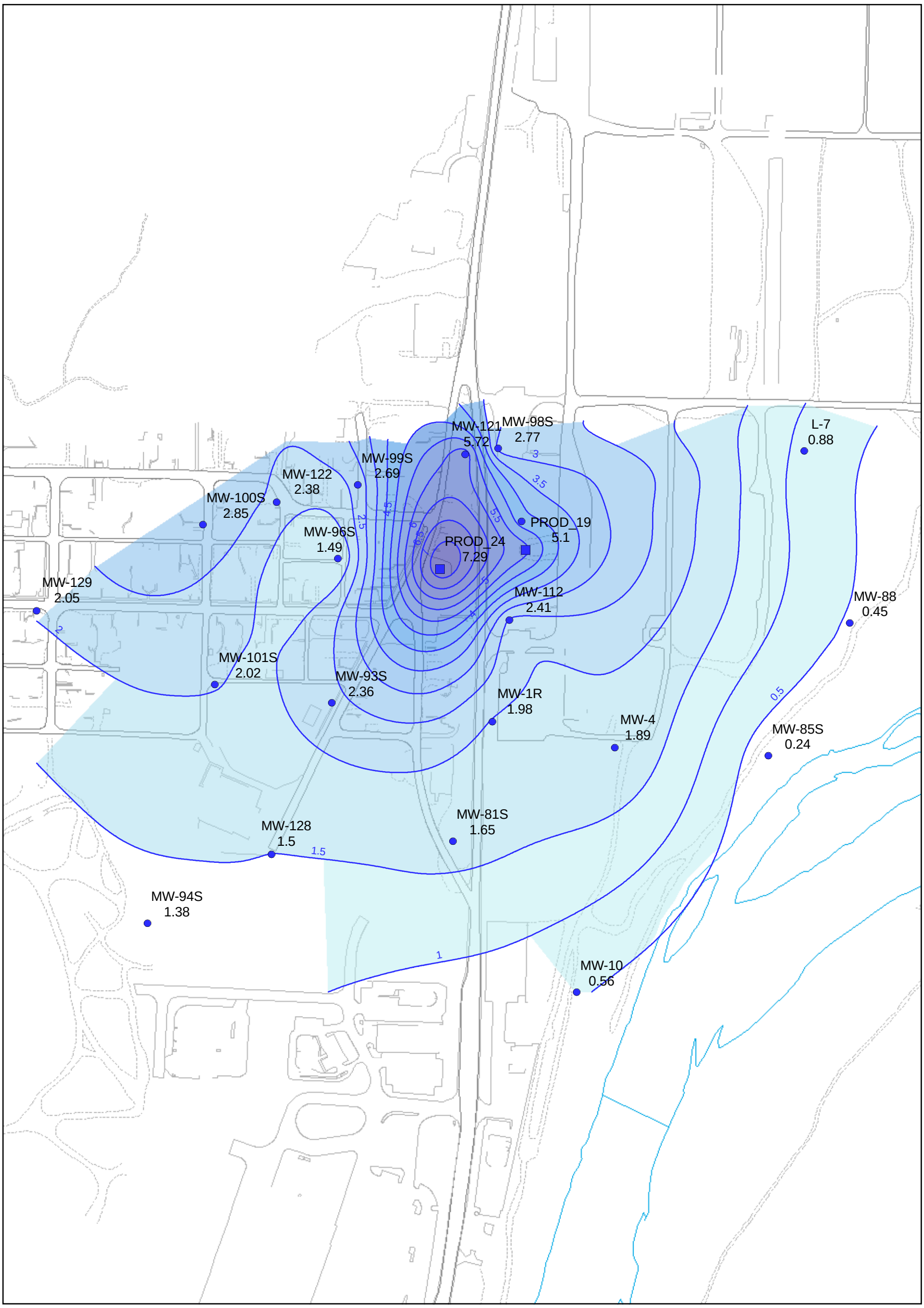
FIGURE 5-9

HIGH-GRADE POTENTIOMETRIC SURFACE MAP, NOVEMBER 13, 2007

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 250'	Date: 04/03/09	File: Nov_13_07_Potsurface.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

CONTOUR LINE OF EQUAL DRAWDOWN IN FEET

AREA OF EQUAL DRAWDOWN IN FEET

0.5 — 7.0

N

0 — 250'

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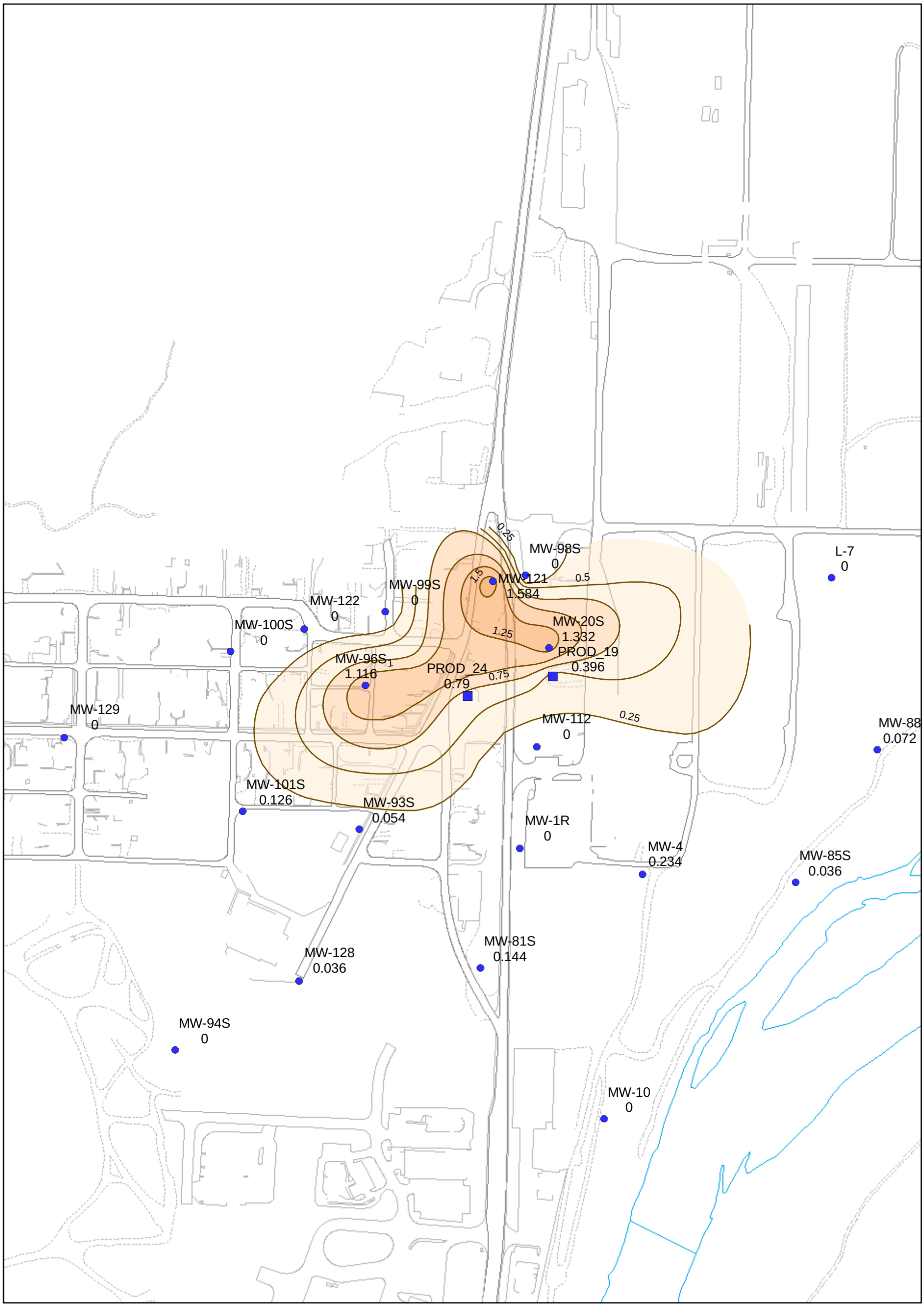
FIGURE 5-10

HIGH-GRADE DRAWDOWN MAP, NOVEMBER 13, 2007

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 250'	Date: 04/03/09	File: Nov_13_07_DrawDown.mxd

US EPA ARCHIVE DOCUMENT



EXPLANATION

EQUIPOTENTIAL CONTOUR LINE OF LNAPL THICKNESS IN FEET

AREA OF EQUAL LNAPL THICKNESS IN FEET

0.25 — 1.50

N

0 — 250'

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FIGURE 5-11

HIGH-GRADE LNAPL THICKNESS MAP, NOVEMBER 13, 2007

FIRST 2008 SEMIANNUAL MONITORING EVENT CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 250'	Date: 04/03/09	File: Noc_13_07_NAPL_Thkn.mxd

US EPA ARCHIVE DOCUMENT

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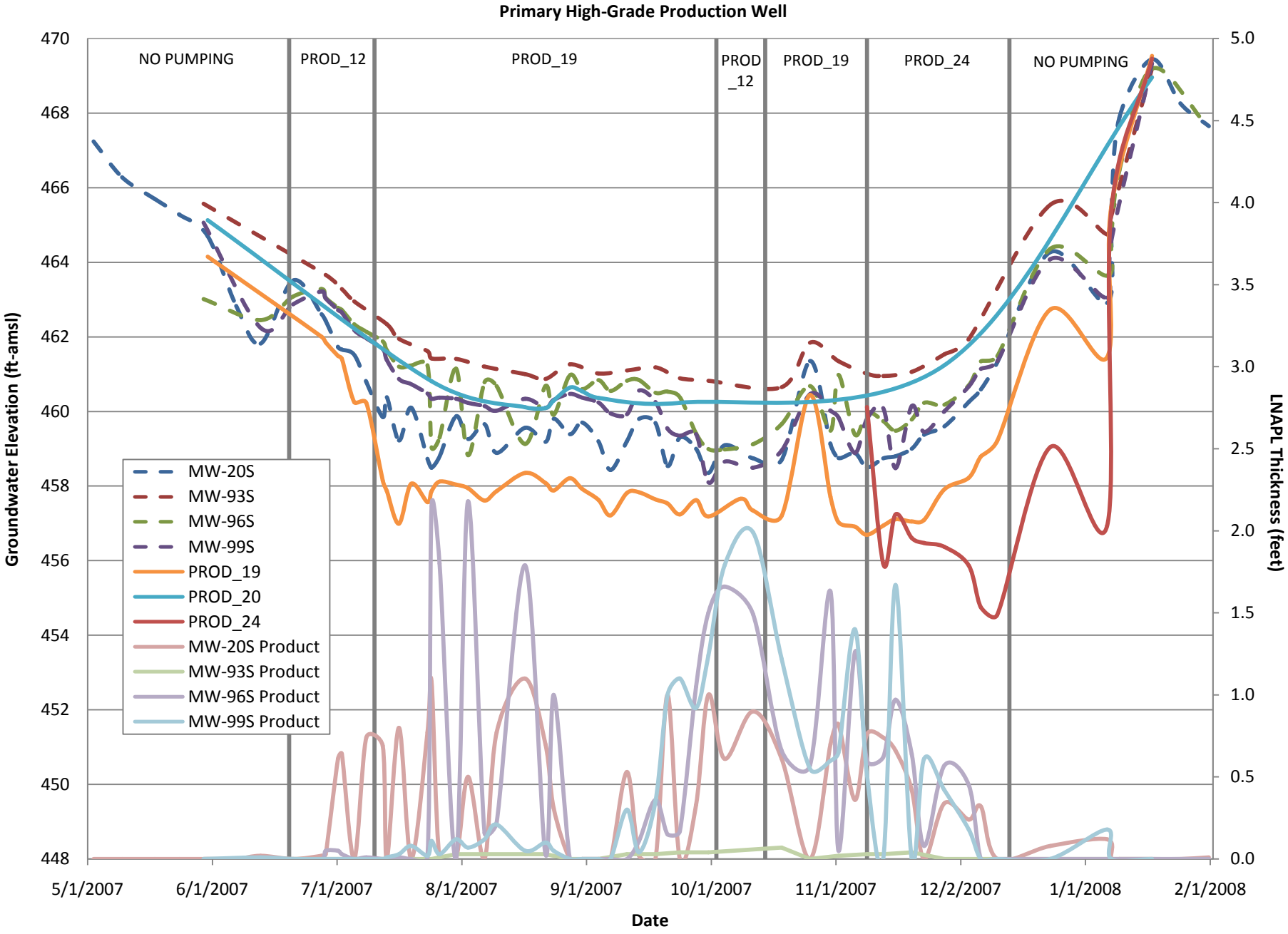
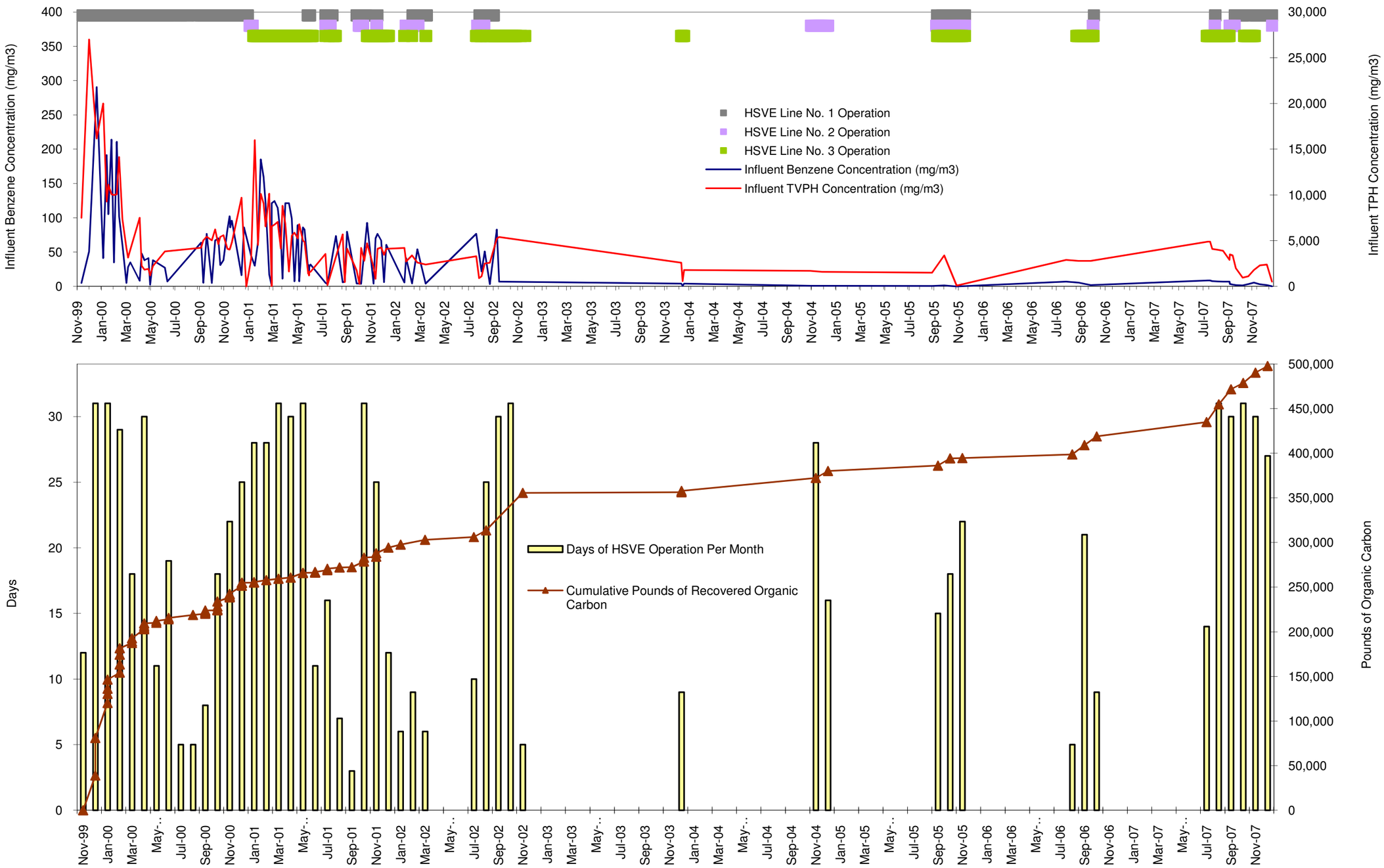
FIGURE 5-12. HYDROGRAPHS FOR KEY MONITORING WELLS IN SOUTHWESTERN HIGH-GRADE RECOVERY AREA
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



US EPA ARCHIVE DOCUMENT

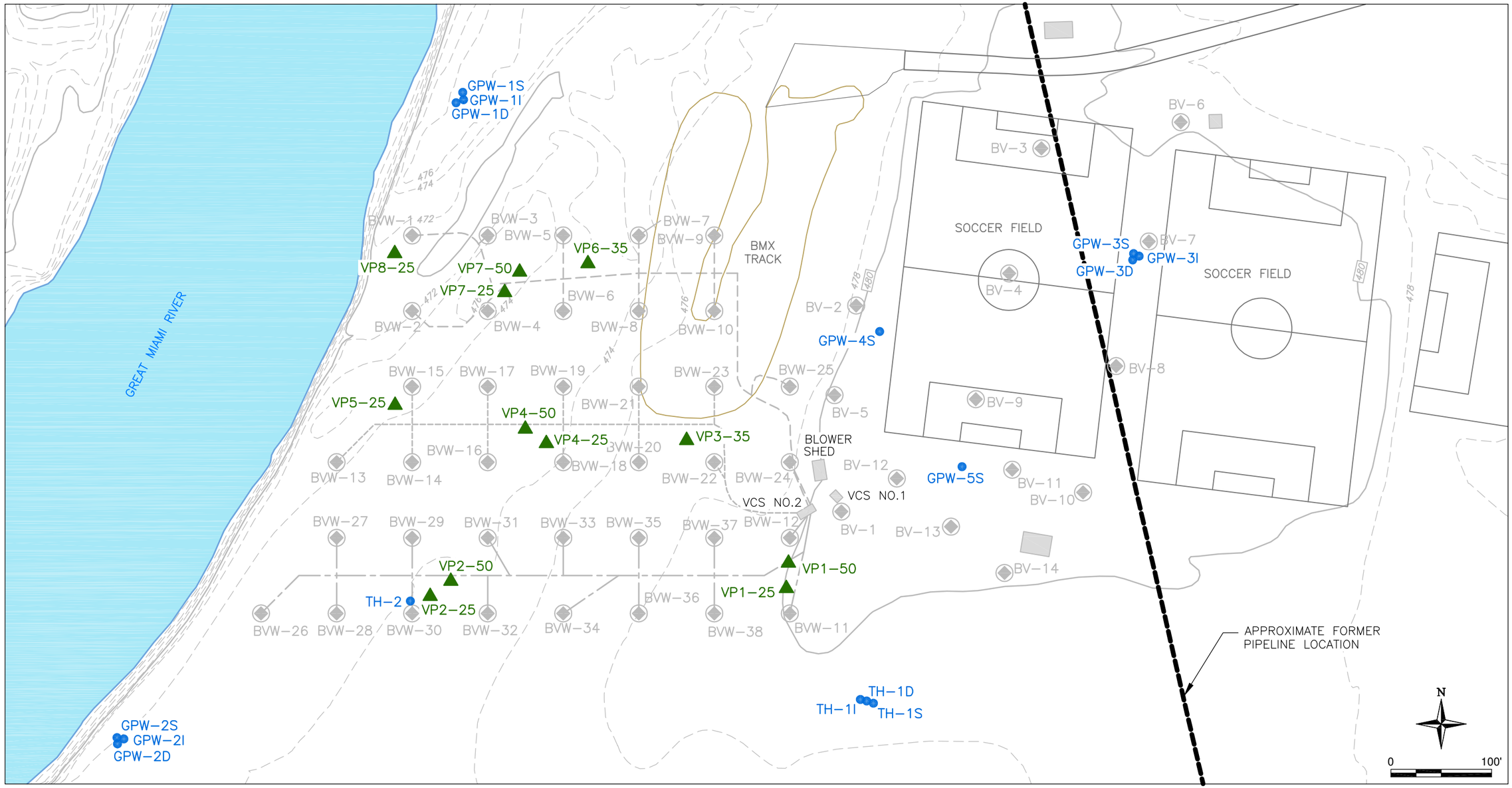
FIGURE 5-13 HIGH-GRADE PRODUCTION RATES AND EFFECTIVE DRAWDOWN
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

FIGURE 5-14. HSVE OPERATION, INFLUENT CONCENTRATION, AND CUMULATIVE POUNDS OF RECOVERED ORGANIC CARBON
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT



EXPLANATION

- GPW-2D — GROUNDWATER MONITORING WELL AND DESIGNATION
- VP2-25 — VAPOR MONITORING POINT
- BVW-26 — BIOVENT WELL AND DESIGNATION
- EXPANDED BIOVENTING SYSTEM PIPE RUN #1
- EXPANDED BIOVENTING SYSTEM PIPE RUN #2
- EXPANDED BIOVENTING SYSTEM PIPE RUN #3
- 480 — GENERAL TOPOGRAPHIC CONTOUR (FT-AMSL, INTERVAL 2 FEET, DASHED WHERE INFERRED)
- BUILDING, TANK OR OTHER STRUCTURE
- ROAD
- VCS — VALVE CONTROL SHED
- FT AMSL — FEET ABOVE MEAN SEA LEVEL

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FIGURE 6-1

GULF PARK LAYOUT

FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: JP	Checked By: PM	Scale: 1"=100'	Date: 3/30/09	File: 500GP_LAYOUT

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FIGURE 6-2. HYDROGRAPHS AND TRIGGER LEVELS FOR MONITORING WELLS GPW-5S AND TH-2
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

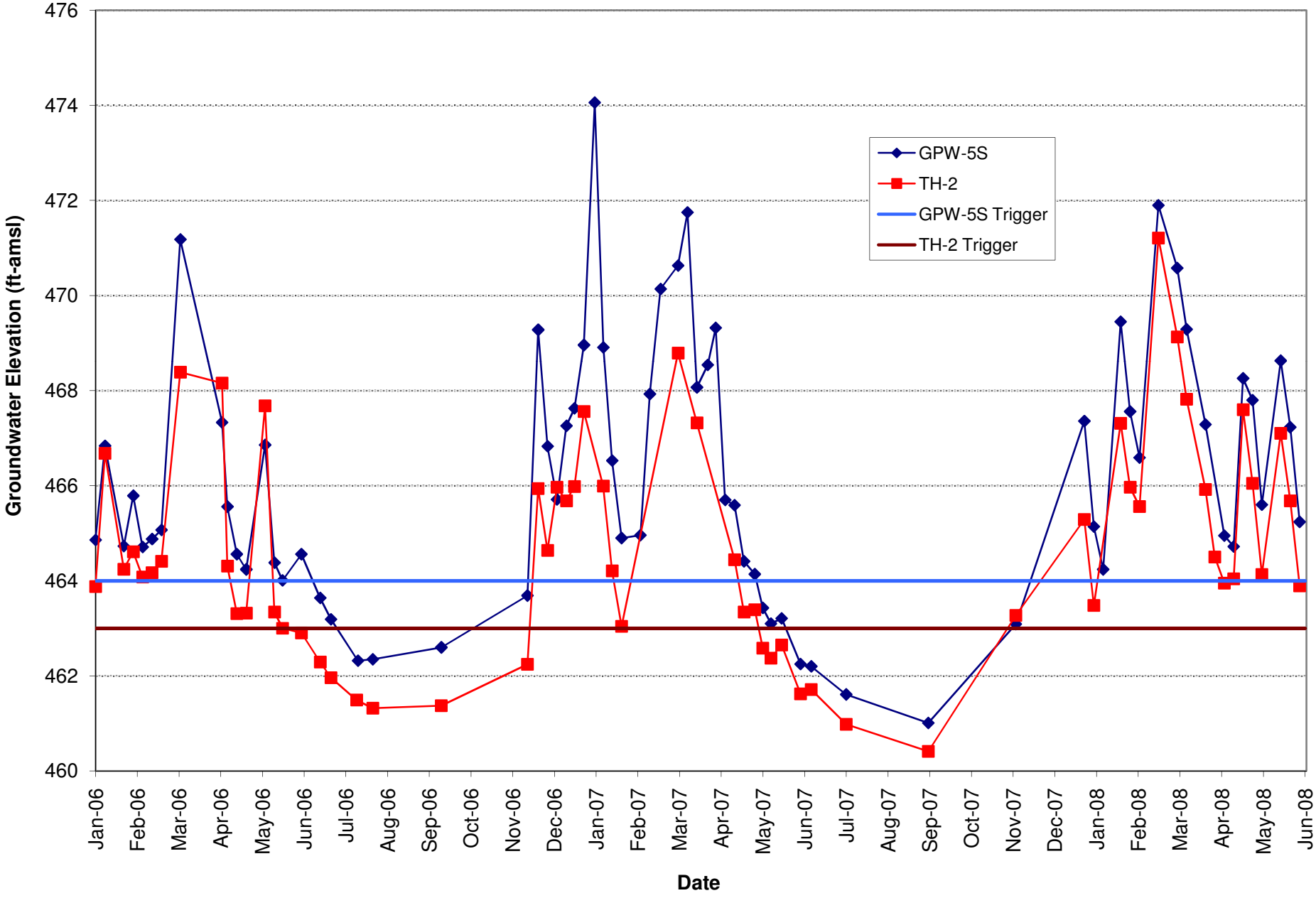

FIGURE 6-3. FIXED GAS CONCENTRATION VERSUS TIME AT VP1-25S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

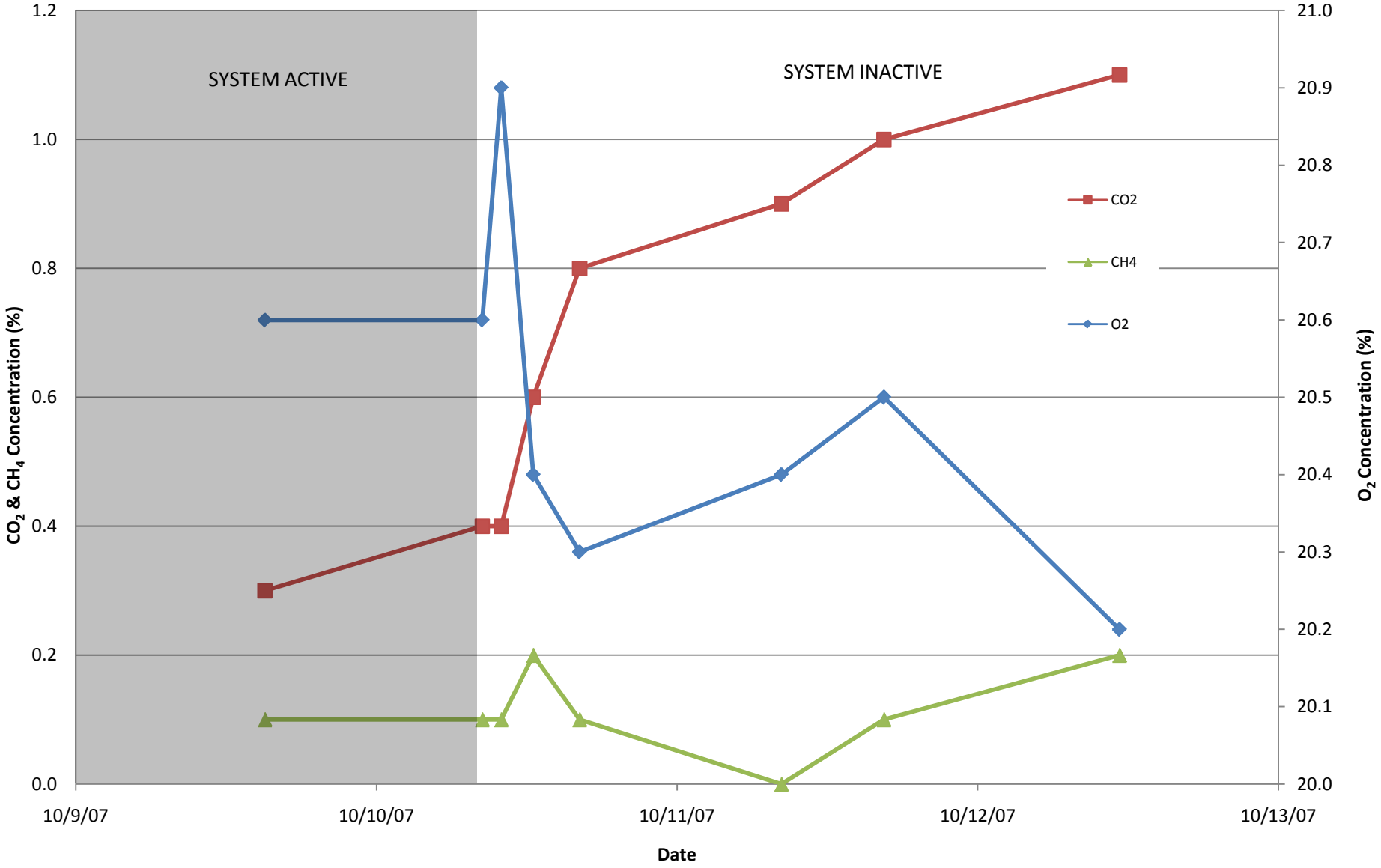

FIGURE 6-4. FIXED GAS CONCENTRATION VERSUS TIME AT VP1-25D (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

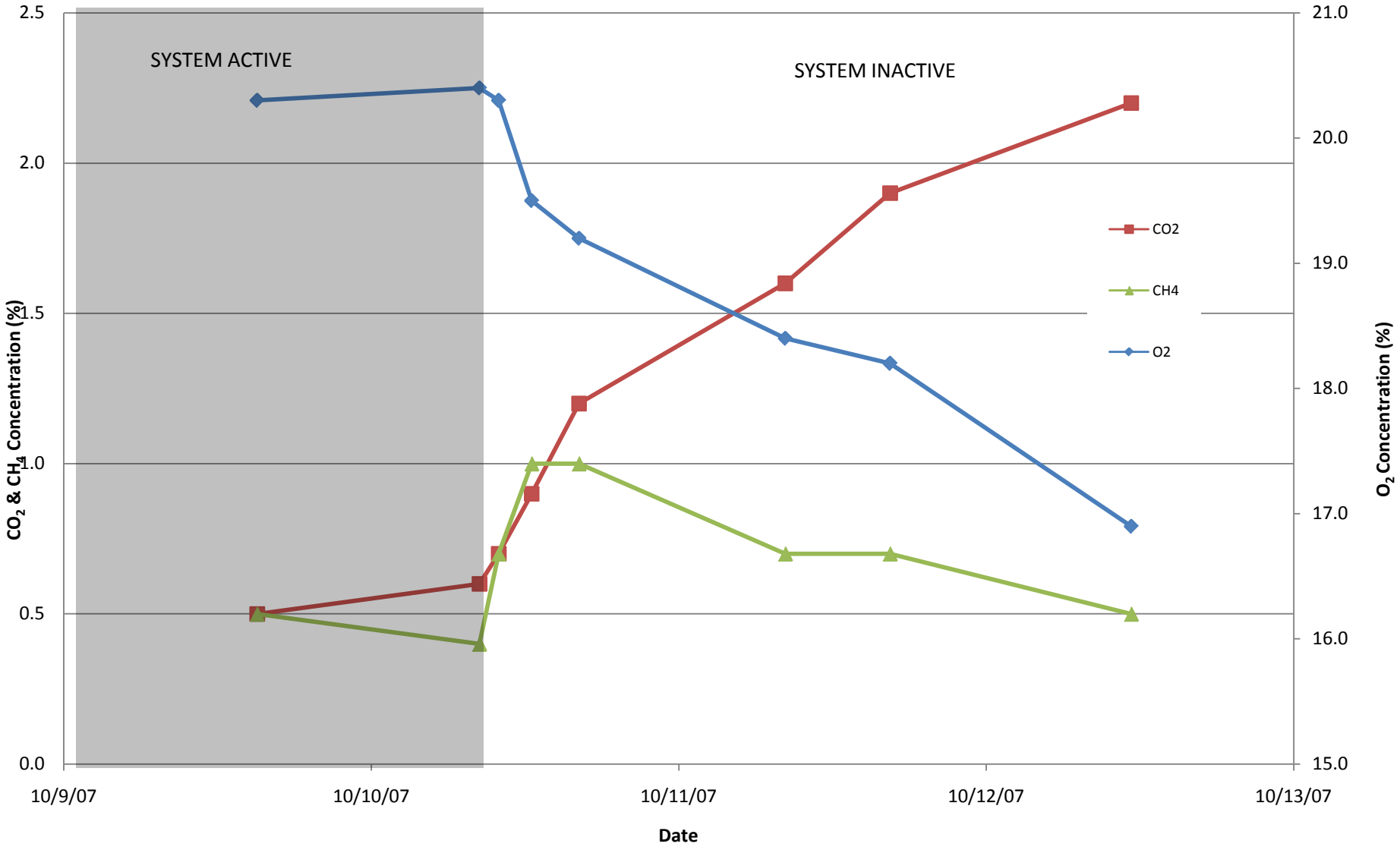

FIGURE 6-5. FIXED GAS CONCENTRATION VERSUS TIME AT VP1-50S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

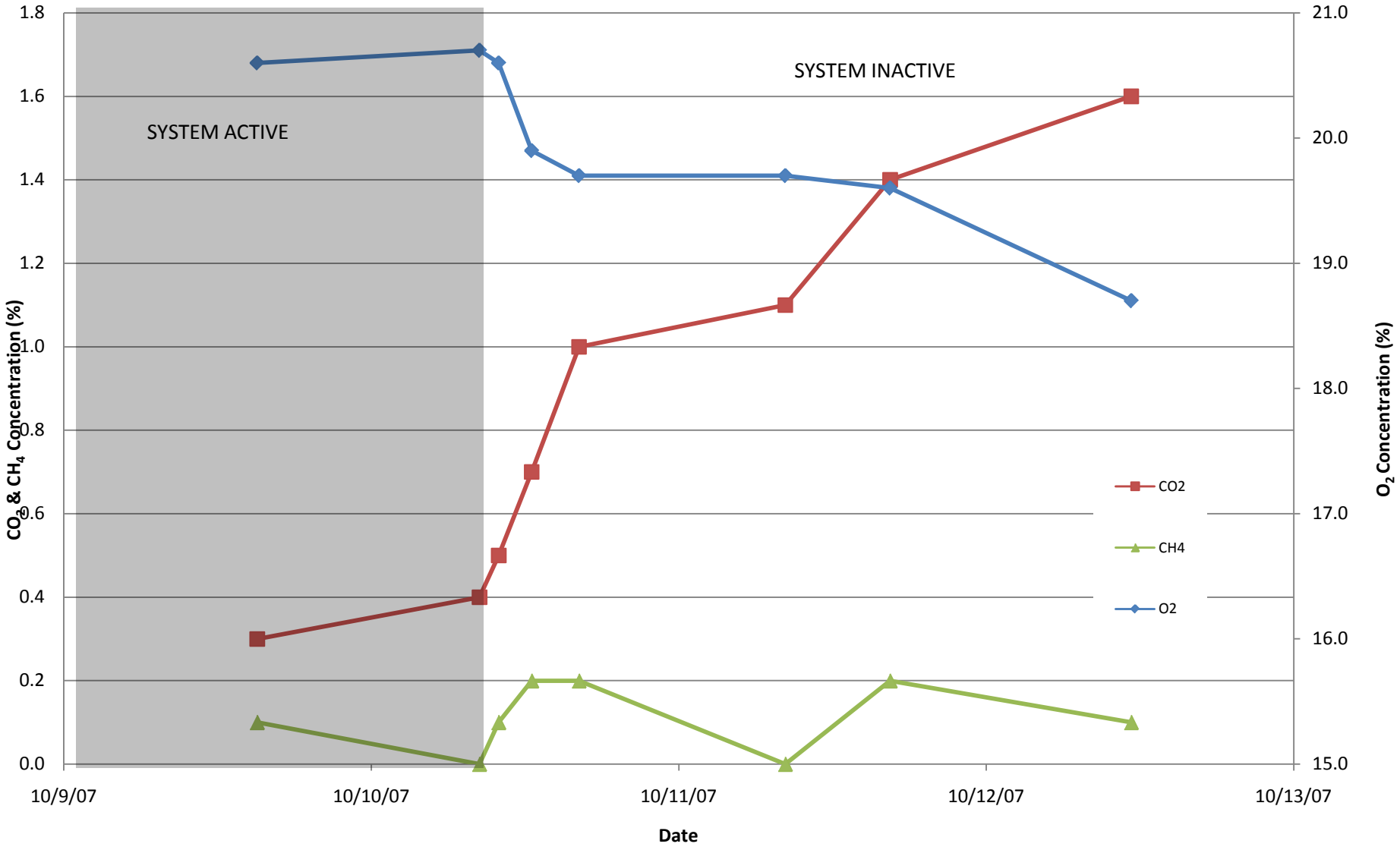

FIGURE 6-6. FIXED GAS CONCENTRATION VERSUS TIME AT VP1-50D (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

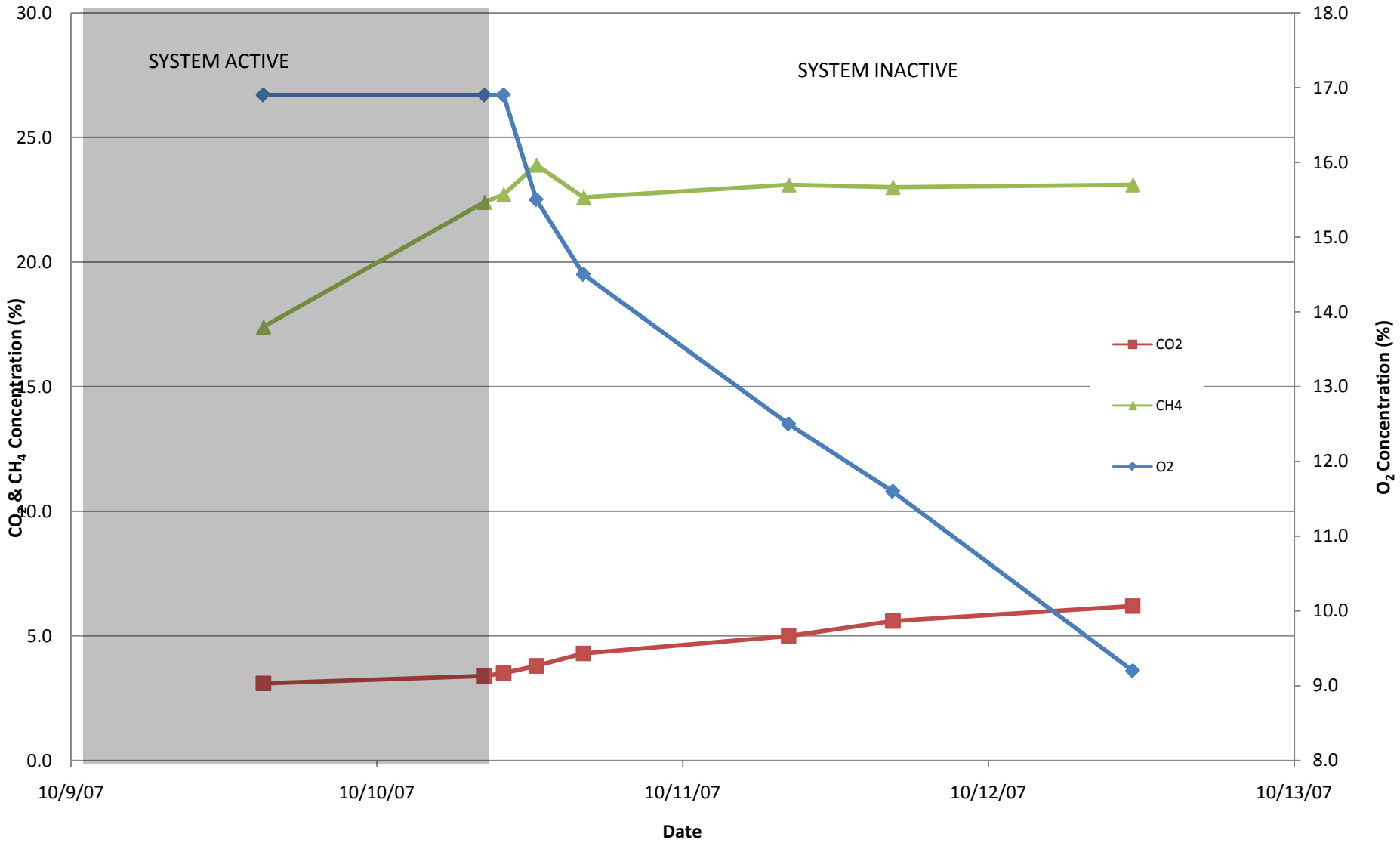

FIGURE 6-7. FIXED GAS CONCENTRATION VERSUS TIME AT VP2-25S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

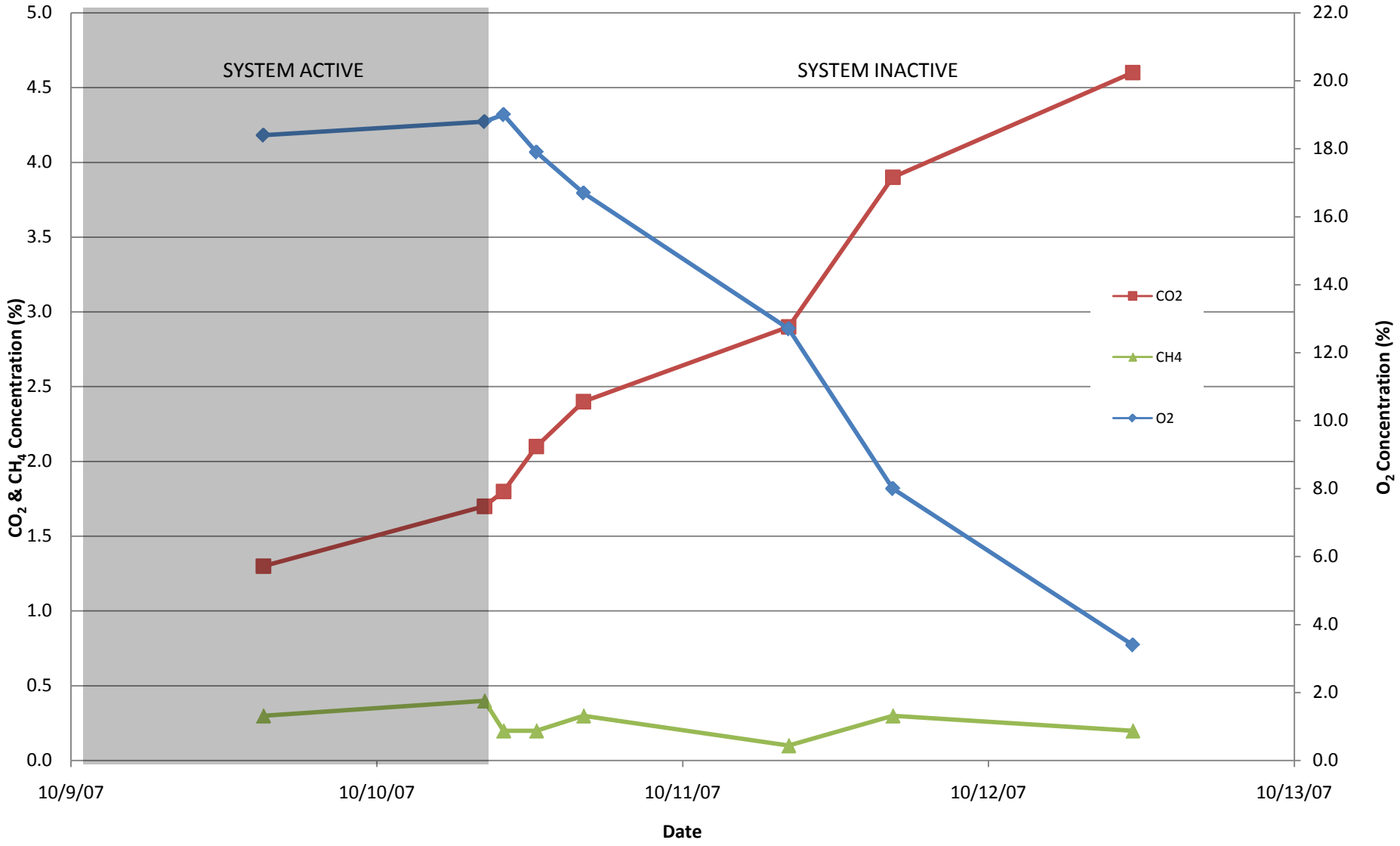

FIGURE 6-8. FIXED GAS CONCENTRATION VERSUS TIME AT VP2-50S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

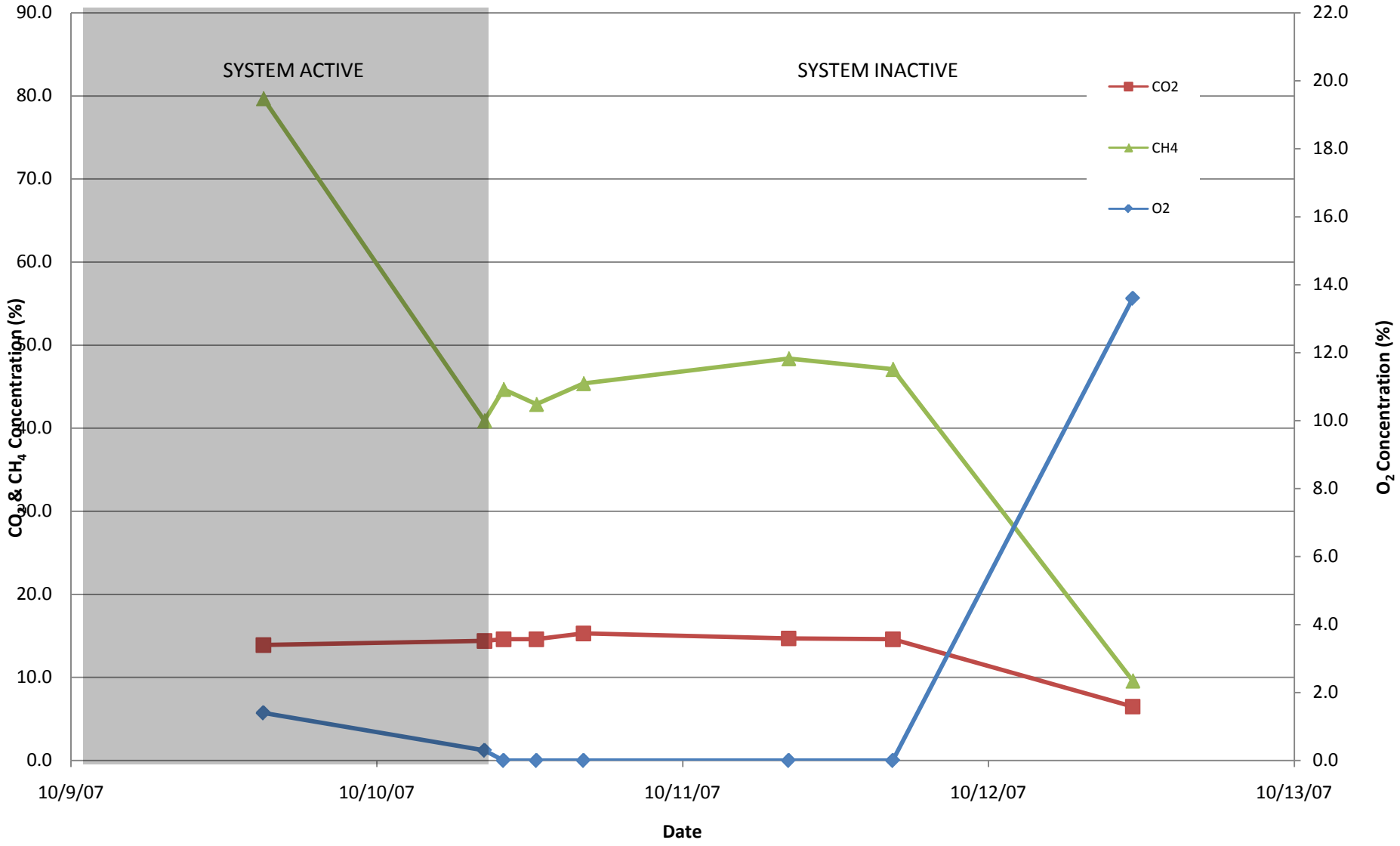

FIGURE 6-9. FIXED GAS CONCENTRATION VERSUS TIME AT VP2-50D
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

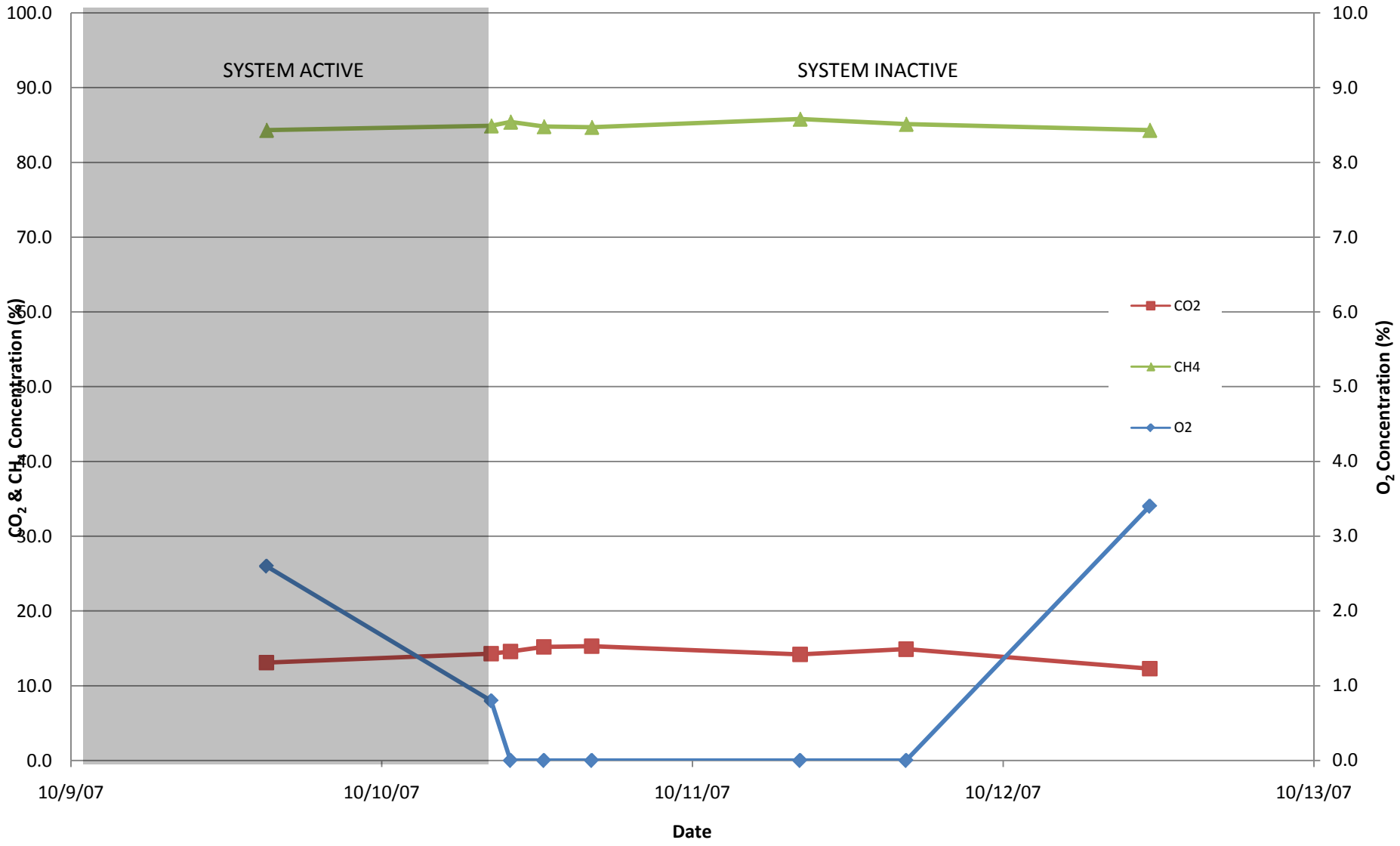

FIGURE 6-10. FIXED GAS CONCENTRATION VERSUS TIME AT VP3-35S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

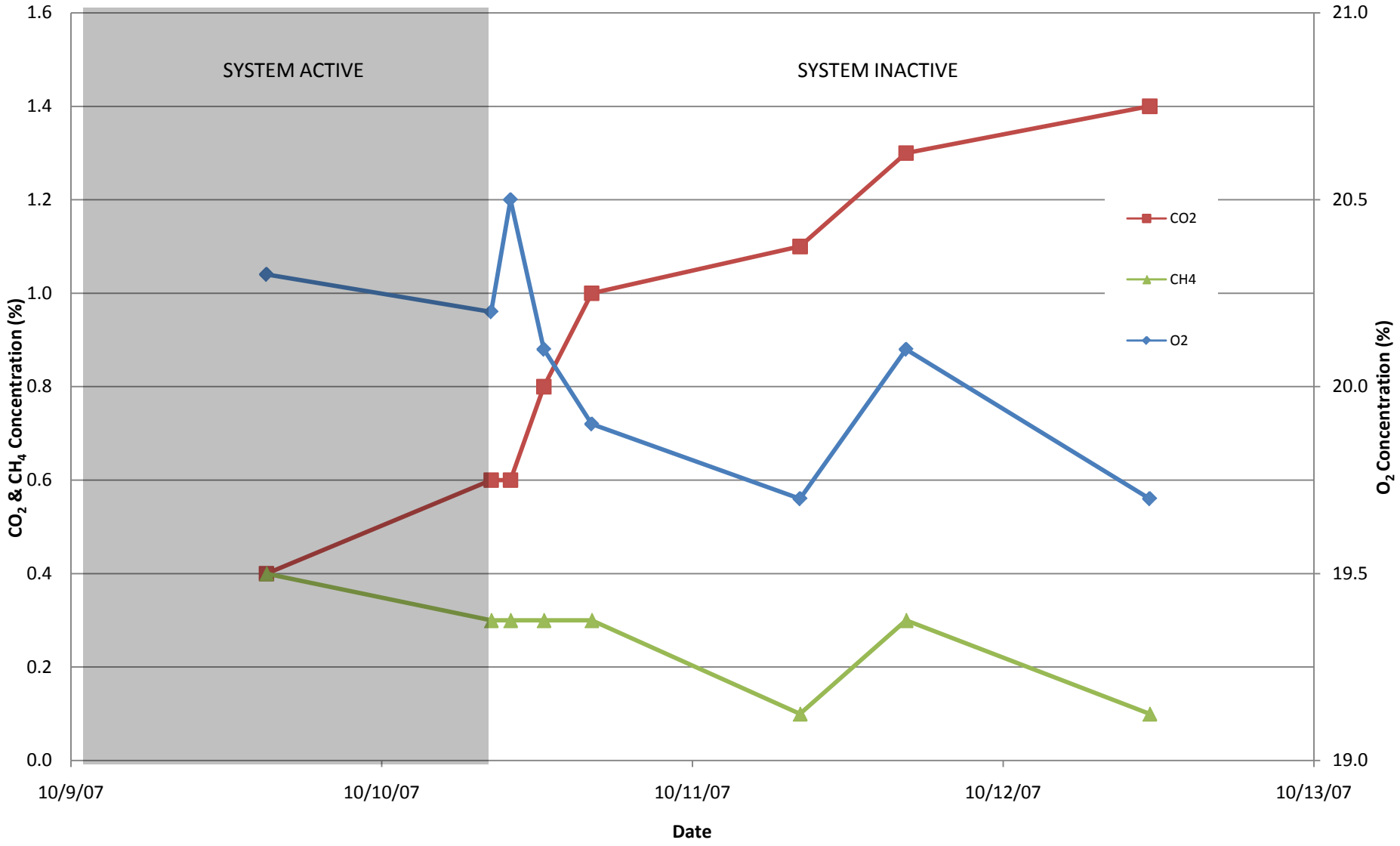

FIGURE 6-11. FIXED GAS CONCENTRATION VERSUS TIME AT VP3-35D (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

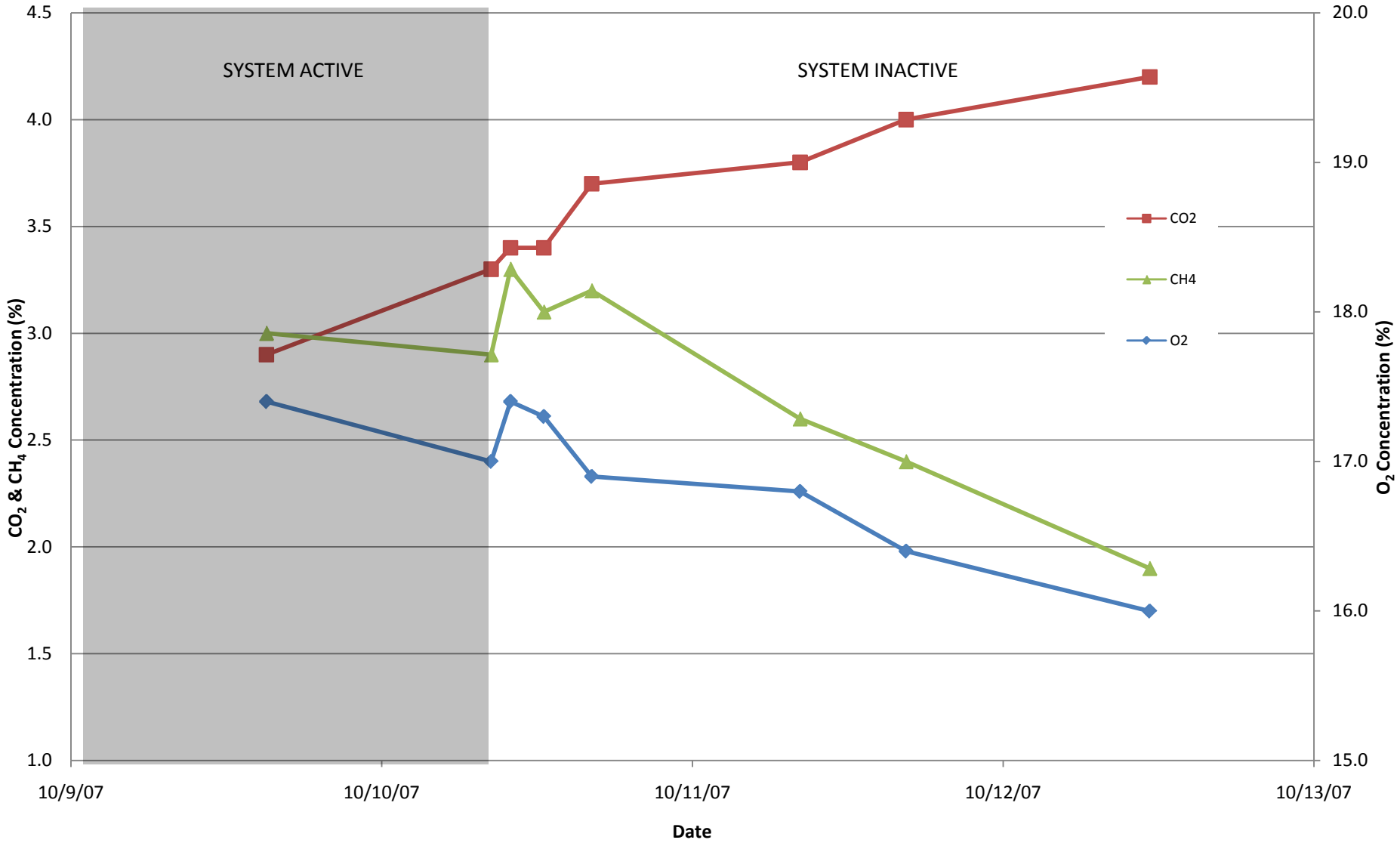

FIGURE 6-12. FIXED GAS CONCENTRATION VERSUS TIME AT VP4-25S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

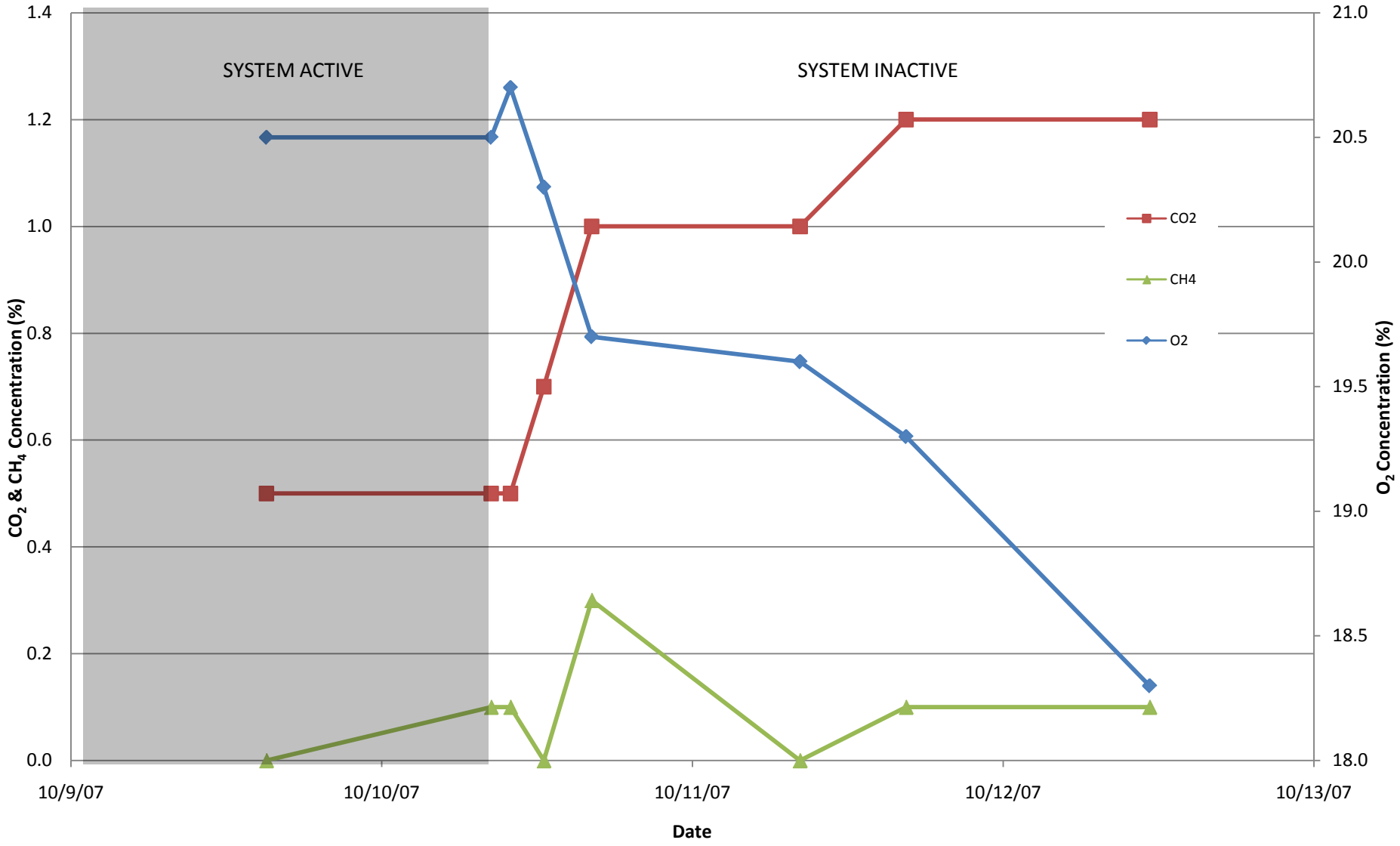

FIGURE 6-13. FIXED GAS CONCENTRATION VERSUS TIME AT VP4-25D (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

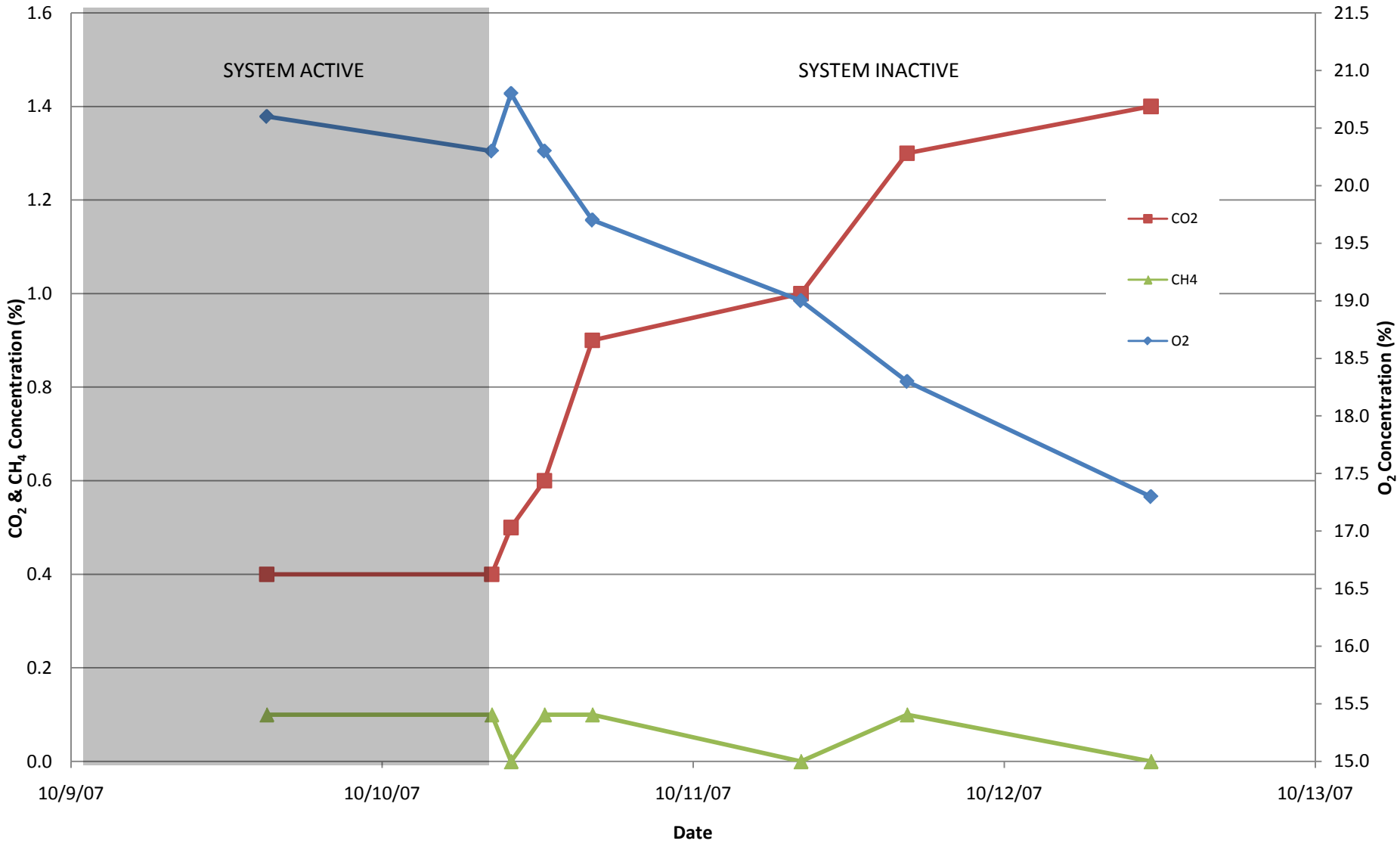

FIGURE 6-14. FIXED GAS CONCENTRATION VERSUS TIME AT VP5-25S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

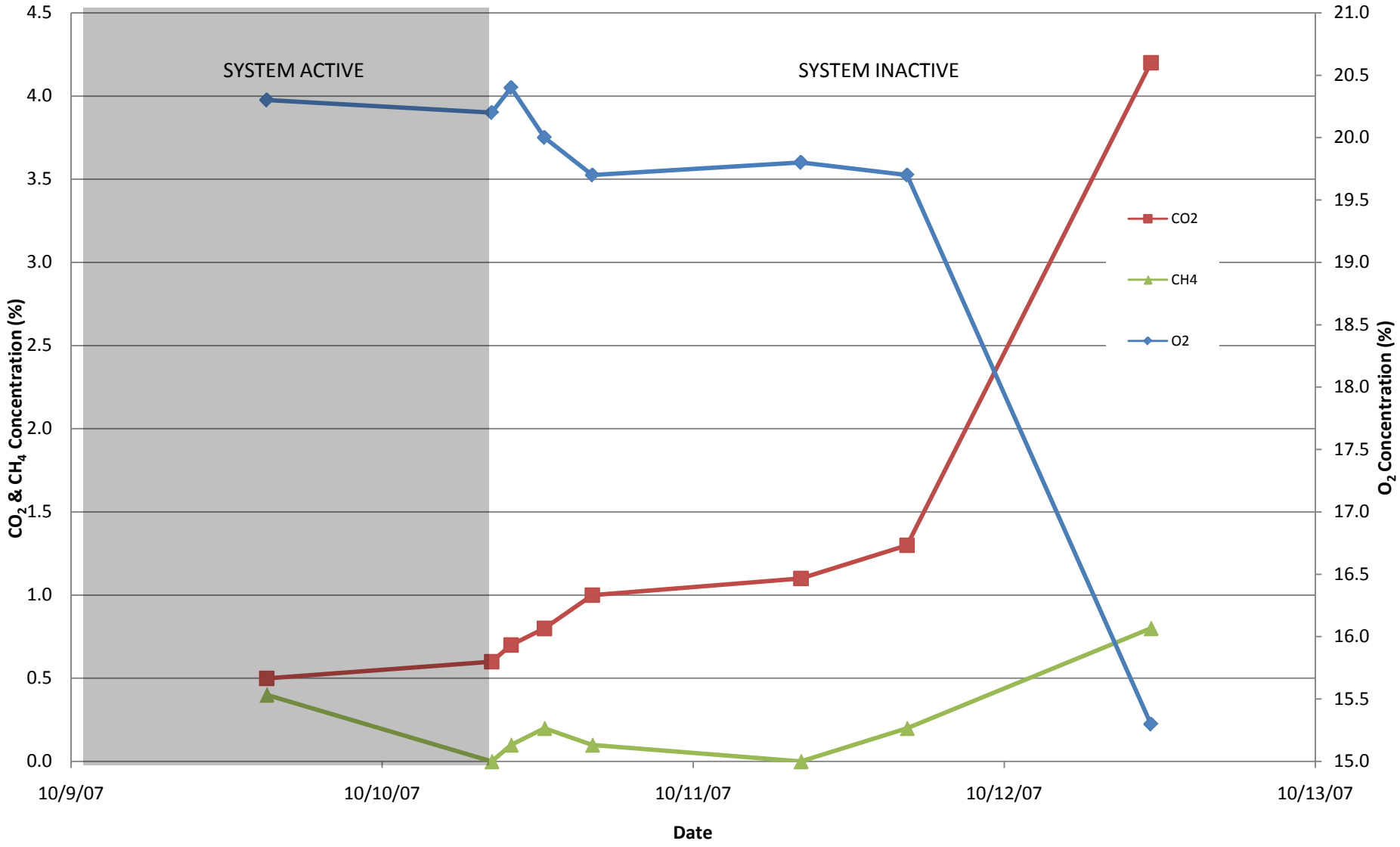

FIGURE 6-15. FIXED GAS CONCENTRATION VERSUS TIME AT VP5-25D (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

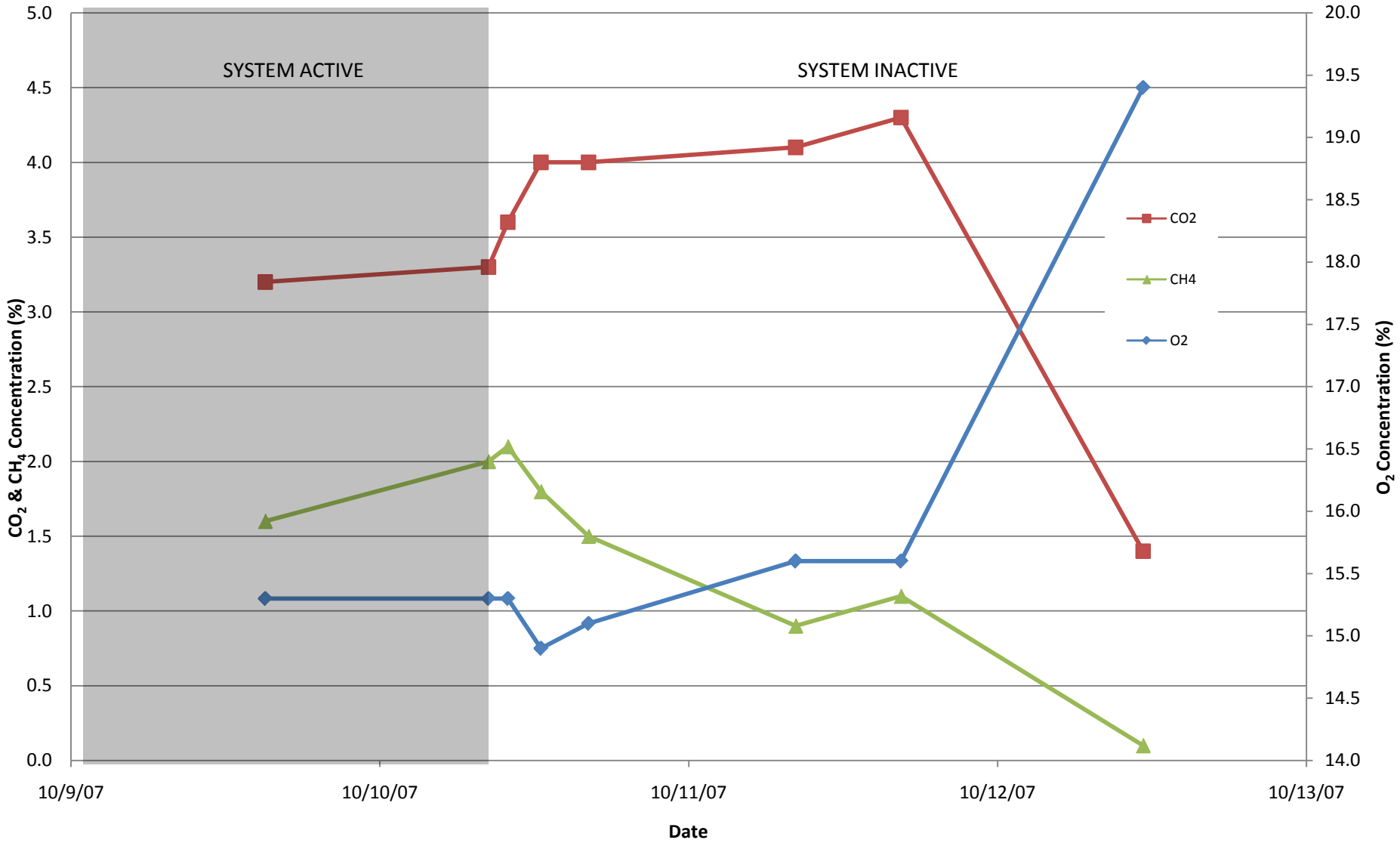

FIGURE 6-16. FIXED GAS CONCENTRATION VERSUS TIME AT VP6-35S (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

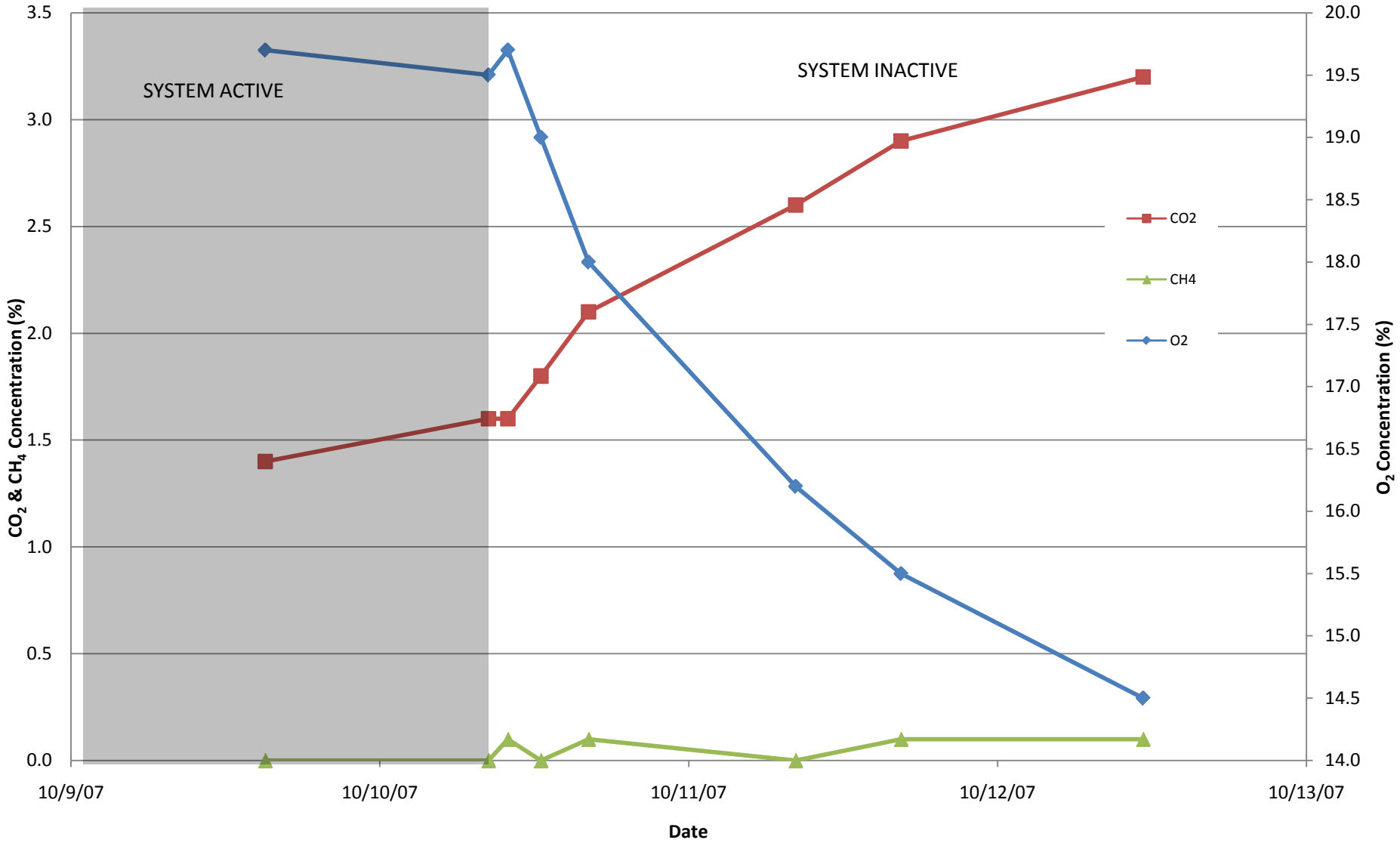

FIGURE 6-17. FIXED GAS CONCENTRATION VERSUS TIME AT VP7-25D (OCTOBER 2007)
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

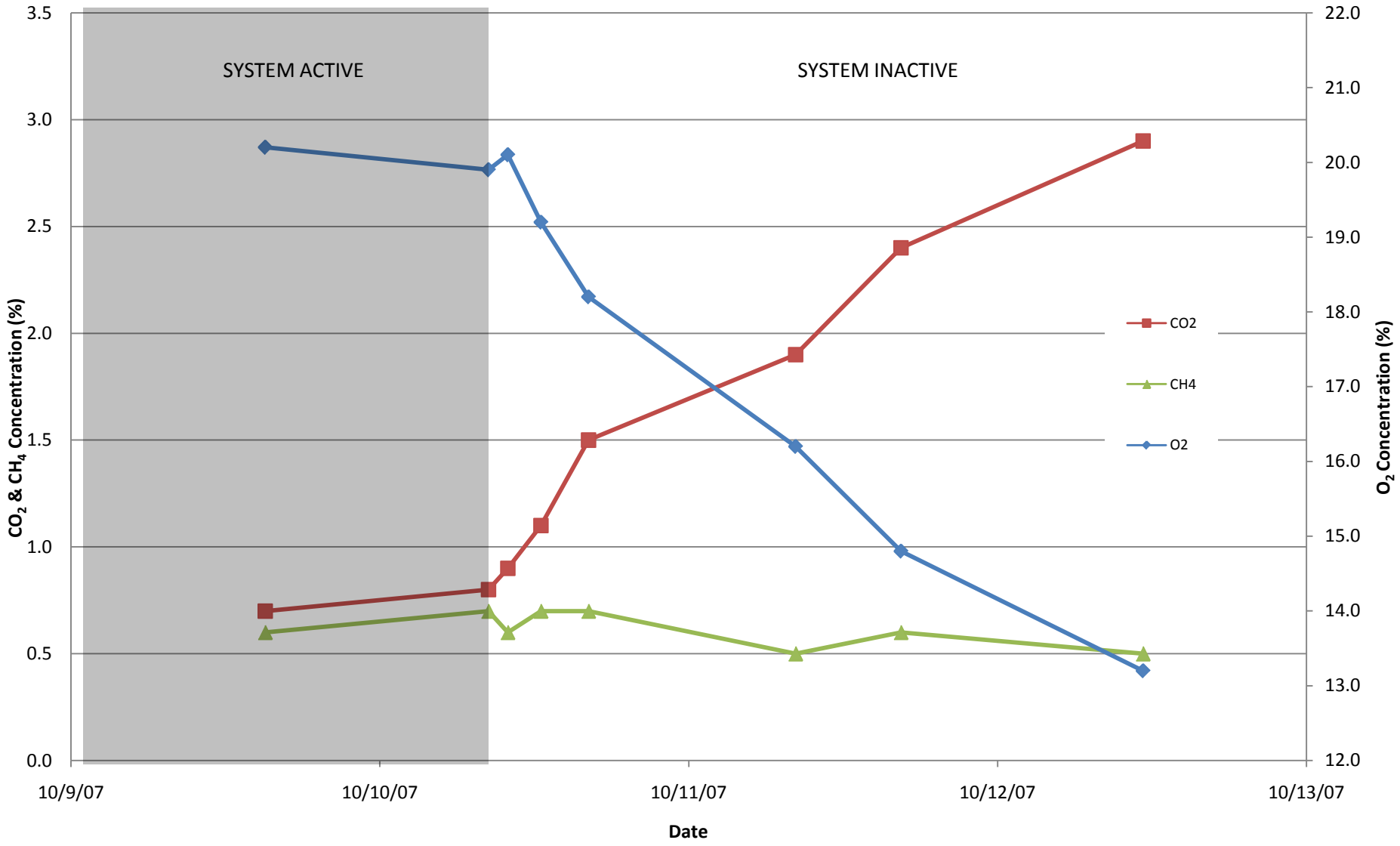

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FIGURE 6-18. TOTAL BTEX CONCENTRATION VERSUS TIME FOR MONITORING WELL TH-1S
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

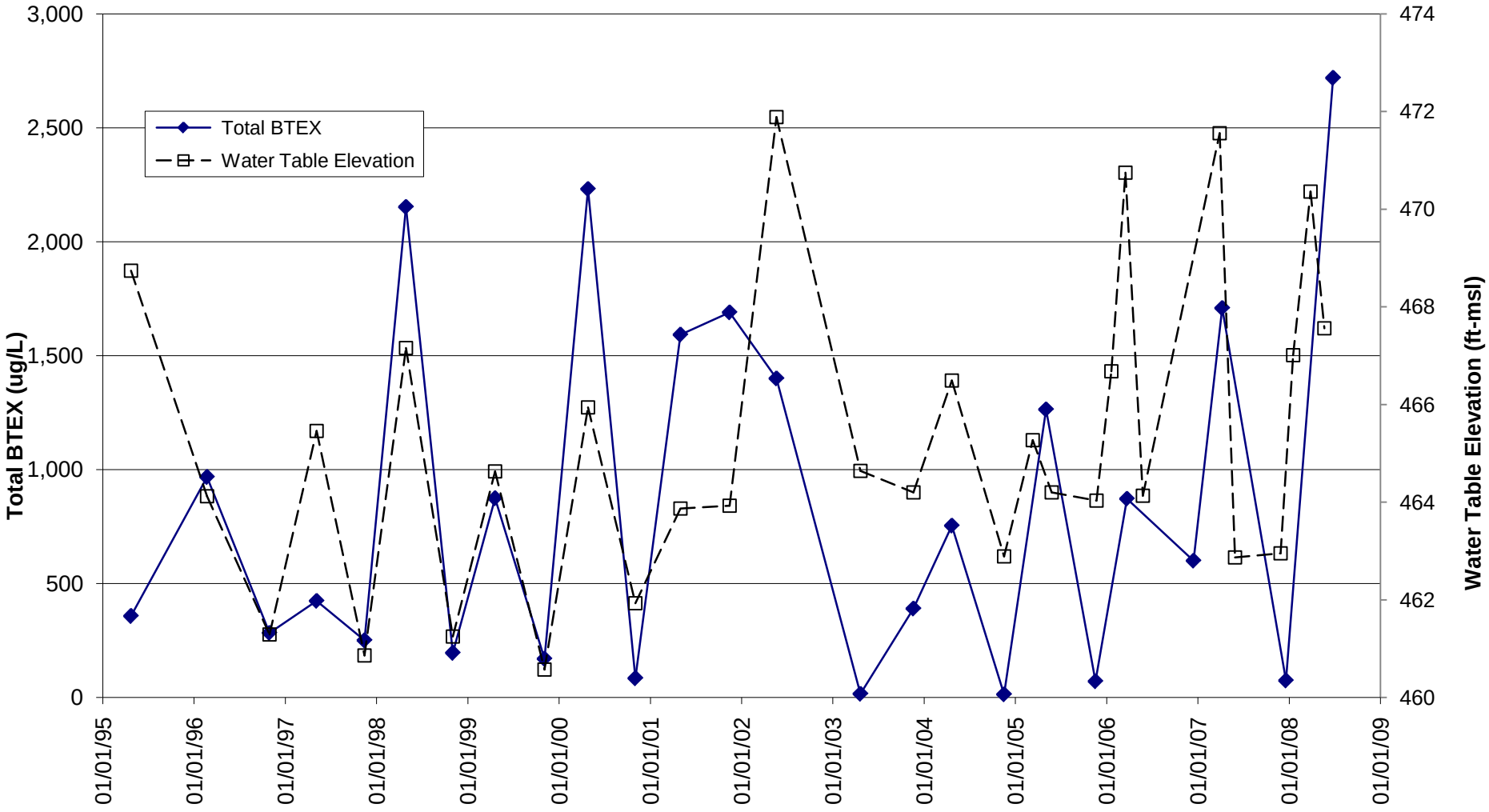

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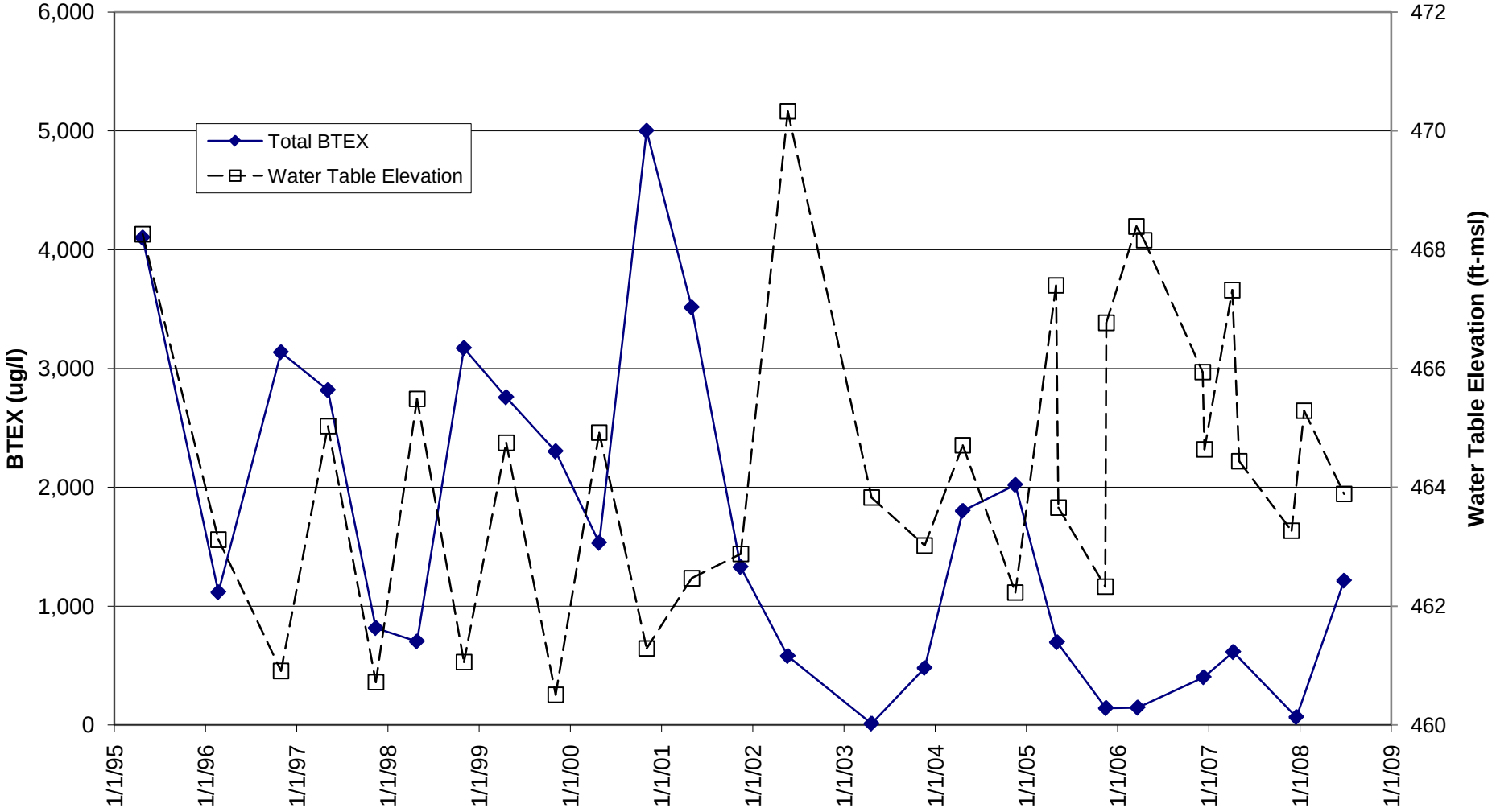
FIGURE 6-19. TOTAL BTEX CONCENTRATION VERSUS TIME FOR MONITORING WELL TH-2
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



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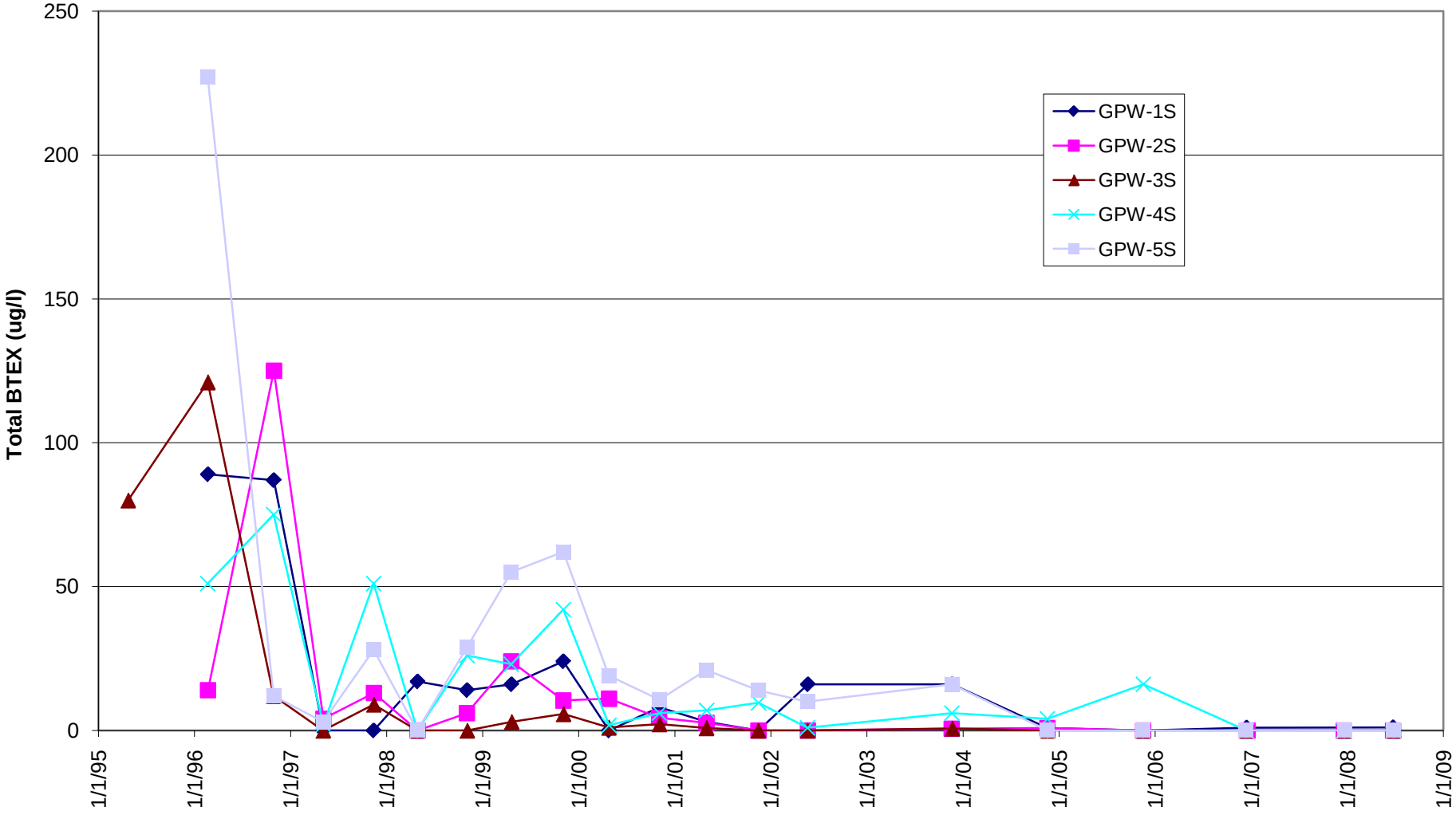
FIGURE 6-20. TOTAL BTEX CONCENTRATION VERSUS TIME FOR MONITORING WELLS GPW-1S, GPW-2S, GPW-3S, GPW-4S, AND GPW-5S
FIRST 2008 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO