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July 17, 2009

Mr. Andrew Fan
Project Manager
Technical Support Branch (3LC20)
Land and Chemicals Division
United States Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

RE: Transmittal of Semi-Annual Progress Report: January through June 2009
Former Chevron Facility 122208
5801 Riggs Road
Chillum, Maryland

Dear Mr. Fan:

Pursuant to Section VI, Paragraph E of the Administrative Order (U.S. Environmental Protection Agency [EPA] Docket Number RCRA-03-2008-0355TH), Chevron is submitting one copy of the referenced document for your review.

All data from the March/April 2009 semi-annual sampling event are provided, including trend analysis figures, groundwater potentiometric surface maps, and groundwater concentration contour maps.

If you have any questions, please call me at 770-984-3165.

Sincerely,

FOR

Denise Dixon
Project Manager

cc: Ms. B. Corman, DC
Ms. V. North, DDOE
Mr. Herb Meade, MDE
R. Scrafford, GF

SEMI-ANNUAL PROGRESS REPORT

FORMER CHEVRON FACILITY NO. 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND
JANUARY THROUGH JUNE 2009

1.0 INTRODUCTION

Pursuant to the U.S. Environmental Protection Agency (EPA) Administrative Order, Docket Number RCRA-03-2008-0355TH (AO), Chevron U.S.A. Inc. (Chevron) is conducting work at and adjacent to the former Chevron Service Station (Facility No. 122208) located at 5801 Riggs Road, Chillum, Maryland (the site). In accordance with Section VI, Paragraph E, subsection 3(c). of the AO, Chevron has prepared this Semi-Annual Progress Report (Report) to describe actions taken by Chevron pursuant to the AO. The reporting period for this report is January 2009 through June 2009.

The remainder of this Report is divided into the following seven sections and five appendices:

- Section 2.0 - Work Conducted During the Reporting Period
- Section 3.0 - Summary of Findings
- Section 4.0 - Permit Compliance
- Section 5.0 - Summary of Deviations from Approved Plans, Problems Encountered, and Corrective Actions Taken
- Section 6.0 - Summary of Meetings with Public and Government
- Section 7.0 - Changes in Key Personnel During the Reporting Period
- Section 8.0 - Projected Work for the Next Reporting Period
- Tables
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- Figures
  - Figure 1: Cumulative Total Hydrocarbons Recovered and Groundwater Treated Since 1990
  - Figures 2-7: Groundwater Contour and Iso-Concentration Maps
  - Figures 8-25: Benzene and MTBE Trend Analyses
- Appendix A - Dual-Phase Extraction System-Groundwater Extraction Data
  - Figure: Process and Instrumentation Diagram
  - Table A-1: Total Fluids Extraction System Data
  - Table A-2: Total Fluids Extraction System Influent Analytical Results
  - Table A-3: Total Fluids Extraction System Effluent Analytical Results
- Appendix B - Dual-Phase Extraction System-Soil Vapor Extraction Data
  - Figure: Process and Instrumentation Diagram
  - Table B-1: Soil Vapor Extraction System Data
  - Table B-2: Soil Vapor Extraction System Influent Analytical Results
  - Table B-3: Soil Vapor Extraction System Effluent Analytical Results
- Appendix C - Groundwater Monitoring Data
  - Table C-1: Groundwater Monitoring Report
- Appendix D - Soil Vapor Sampling Data
  - Table D-1: Soil Vapor Monitoring Report
- Appendix E- Vapor Mitigation System Data
  - Table E-1 VMS Monitoring Data

2.0 WORK CONDUCTED DURING THE REPORTING PERIOD

This section provides a summary of work conducted at the site during the reporting period.

2.1 Site Monitoring Work Conducted

The EPA-approved Interim Monitoring Sampling Plan calls for monthly gauging of ten monitoring wells, semi-annual gauging of all monitoring wells, semi-annual sampling of 72 monitoring wells, and semi-annual sampling of the four soil vapor wells (Table 1). Monthly groundwater gauging was conducted on January 26, February 24, March 18 (semi-annual), April 27, May 27, and June 15, 2009. The semi-annual groundwater sampling event was conducted from March 23 through April 7, 2009. Semi-annual soil vapor sampling was conducted on March 19, 2009.

2.2 Interim Measures Conducted

Several interim measures activities were conducted during the reporting period. These activities are listed below followed by a general description:

- Continued operation and maintenance of the Interim Dual Phase Extraction System (IDPES).

Overview of the Interim Dual Phase Extraction System

The Interim Dual Phase Extraction System (IDPES) consists of total fluids extraction and treatment and soil vapor extraction and treatment. A process and instrumentation diagram (P&ID) for the system is provided in **Appendix A**. Please refer to the P&ID for specific information, such as equipment models and sizes, piping sizes, controls, and other technical information.

Total Fluids Recovery and Treatment

Pneumatic total fluids (i.e., groundwater and Liquid Phase Hydrocarbons [LPH], if present) pumps are installed in seven Dual Phase Extraction (DPE) wells (RW-1, RW-2, RW-3, MW-7, MW-17, PTW-A, and PTW-B). Total fluids are pumped from wells through buried piping to the total fluids manifold located in the treatment system compound, adjacent to the service station. The total fluids manifold leads to a coalescing-type oil/water separator. Level sensors in the oil/water separator control a centrifugal pump that intermittently transfers the water to an air stripper. LPH accumulate in the separator and are periodically skimmed off mechanically (if present). Air from the air stripper is treated using three granular activated carbon (GAC) vessels in parallel and then discharges to the atmosphere in accordance with MDE Air Quality General Permit to Construct Identification No. 033-9-1160. Treated water from the air stripper is pumped through two bag filters and then through six GAC vessels arranged in three parallel banks of two. Each bank is composed of two GAC vessels in series. The polished effluent flows through buried pipe to a storm drain inlet located in Riggs Road near the intersection at Eastern Avenue, N.E. in accordance with Maryland General Discharge Permit No. 2008 OGR-8514.

Soil Vapor Recovery and Treatment

Soil vapor extraction (SVE) is conducted at eight wells (i.e., the seven DPE wells plus MP-7). An individual piping leg runs from each well to a common 3-inch manifold in the remediation system compound. The manifold leads to a moisture knockout tank and then to the blower. The blower is a rotary lobe, positive displacement blower controlled by a variable frequency drive. Soil vapor is blown from the blower to a catalytic oxidizer for treatment. Treated air is discharged to the atmosphere in accordance with MDE Air Quality General Permit to Construct Identification No. 033-9-1164.

Interim DPE System Monitoring

The IDPES was visited every week during the reporting period. The following activities were conducted during each site visit:

- Recorded groundwater and air flow rates;
- Measured air influent and effluent concentrations using a flame ionization detector;
- Recorded the manifold vacuum for the SVE system; and
- Conducted equipment maintenance tasks as needed including checking the oil level of the SVE blower and air compressor, changing out the bag filters, and skimming off LPH in the oil/water separator, if present.

The groundwater influent (SP-1) was sampled 5 times and the effluent (SP-3) was sampled 17 times for laboratory analysis (Tables A-2 and A-3, Appendix A). Effluent groundwater samples were analyzed by EPA Method 8260 for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), Methyl Tert-Butyl Ether (MTBE), tetrachloroethene, trichloroethene, and 1,2-cis-dichloroethene. The permit limits are 100 µg/L for total BTEX and 5 µg/L for benzene. The discharge permit requires reporting of MTBE, tetrachloroethene, trichloroethene, and 1,2-cis-dichloroethene concentrations without establishing limits.

The soil vapor extraction system influent (SP-100) and effluent (SP-200) were sampled four times for laboratory analysis during the reporting period to document compliance with the air discharge permit (Tables B-2 and B-3, Appendix B). Treated effluent (treated air) sampling port (SP-200) is located in the catalytic oxidizer effluent stack before discharge to the atmosphere. Samples were analyzed by EPA Method TO-3 for BTEX and total recoverable petroleum hydrocarbons (TRPH) in the C_4 to C_{10} range. The air permit discharge limits are 20 pounds of volatile organic compounds per day and 0.02 pounds of benzene per hour.

Operations and Maintenance of Vapor Mitigation Systems (VMS)

Three VMS systems were started during the reporting period and were monitored in accordance with the EPA-approved work plan. The VMS were installed at 5818 Eastern Avenue, 5824 Eastern Avenue, and 746 Oglethorpe Street.

The VMS are to be monitored once a month for the first three months of operation and quarterly thereafter. The VMS located at 5824 Eastern Avenue was started on January 6, 2009 and monitored monthly on February 9, 2009 and March 26, 2009. The first quarterly monitoring in the second quarter of 2009 was conducted on April 24, 2009. The VMS located at 5818

Eastern Avenue was started on March 26, 2009 and was monitored monthly on April 27, May 7, and June 29, 2009. The VMS at 746 Oglethorpe Street was started on March 31, 2009 and was then turned off by the resident.

Typical inspection and monitoring tasks include:

- Listening to the fan to ensure that it is running properly (no abnormal sounds);
- Ensuring that the knife valve is locked open;
- Ensuring that the electrical box is locked;
- Inspecting the discharge pipes for evidence of superficial damage;
- Ensuring that there are no damaged or exposed electrical wires;
- Inspecting the vent stack for proper attachment to the building wall;
- Confirming that the condensate drain is not blocked (e.g., with ice);
- Taking measurements of air velocity and flow from the discharge stack; and
- Taking measurements of cross-slab pressure differential.

2.3 Submittal of Deliverables

Chevron submitted the following deliverable to EPA during the reporting period.

Deliverable Title	Date of Submission to EPA
Fourth Quarter 2008 Progress Report	1/30/2009
CMI Work Plan	4/17/2009
Vapor Mitigation System Construction Completion Report	4/28/2009

3.0 SUMMARY OF FINDINGS

This section provides a summary of findings and results for the interim measures activities described in Section 2.2.

Ongoing Operation of the DPE System

The hour meters for both the total fluids and SVE portions of the DPE system were logged throughout the two quarters. For the period from January 1, 2009 through June 30, 2009, the total fluids extraction portion of the system was operating 69 percent of the time (2,895 hours on and 1,280 hours off) and the SVE portion was operating 45 percent of the time (1,971 hours on and 2,386 hours off).

Groundwater extraction system performance data are provided in **Appendix A** including date and time, on/off status, totalizer reading, cumulative gallons of hydrocarbons, operating extraction points, and maintenance information for the reporting period and the previous two quarters (July 1, 2008 through June 30, 2009) (Table A-1). Comments on the reason for system downtime and the type of maintenance performed are also provided in Table A-1. A detailed explanation of the tables is provided on the first page of **Appendix A**. A P&ID is also included in **Appendix A**.

The groundwater extraction portion of the DPE system recovered approximately 2,521,600 gallons of groundwater and 21.8 equivalent gallons of dissolved hydrocarbons during the reporting period. The average system flow rate over the period was 14.5 gallons per minute (gpm) when the system was pumping (not including system down time) and 10.1 gpm for the entire period (including down time). The total volume of groundwater pumped from this site since remediation began in 1989 is approximately 42,967,522 gallons.

The analytical results for groundwater samples collected at sample points SP-1 (system influent) (Appendix A, Table A-2) and SP-3 (treated groundwater that is discharged to the storm drain) (Appendix A, Table A-3) indicated concentrations of benzene and BTEX in the treated groundwater were below the permit limits (5 µg/L benzene and 100 µg/L BTEX) during the reporting period.

Soil vapor extraction system performance data for the reporting period are provided in **Appendix B** including date and time, manifold air flow reading, manifold vacuum reading, influent and effluent screening concentrations measured using a PID, cumulative gallons of hydrocarbons recovered, and other information. A detailed explanation of the tables is provided on the first page of **Appendix B**. A P&ID is included in **Appendix A**. The soil vapor extraction portion of the DPE system recovered 133 equivalent gallons of hydrocarbons in the vapor phase during the reporting period. The average air flow rate was 144.9 standard cubic feet per minute (scfm) when the system was on (excluding down time) and 65.6 scfm for the entire period (including down time).

The laboratory analytical results for monthly SVE system samples collected at sample points SP-100 (soil vapor influent) (Appendix B, Table B-2) and SP-200 (treated soil vapor that is discharged to the atmosphere) (Appendix B, Table B-3) indicates concentrations of benzene and TRPH in the treated soil vapor were well below the permit limits. The permit limits are

0.02 pounds per hour of benzene and 20 pounds per day of volatile organic compounds measured as TRPH.

Hydrocarbon Recovery Summary for Period and Cumulative Total for System

Period	Liquid-Phase Hydrocarbons (gallons)	Dissolved-Phase Hydrocarbons (eq. gallons)	Vapor-Phase Hydrocarbons (eq. gallons)	Cumulative Total Hydrocarbons (eq. gallons)
01/01/09-06/30/09	0.00	21.8	133.0	154.8
Cumulative Total for System	856.5	745.6	3,869.5	5,471.2

Figure 1 shows the volume of groundwater treated and the corresponding volume of hydrocarbons collected for the entire time the system has been operating on a quarter by quarter basis. The volume of hydrocarbons collected is directly proportional to the volume of groundwater treated.

Groundwater Monitoring

The analytical data from the September/October 2008 semi-annual sampling event are provided in **Appendix C.** The groundwater elevation data for the current period and the previous year are provided in Table C-1 in **Appendix C**. A detailed explanation of the table is provided on the first page of **Appendix C**.

Groundwater concentration maps were created using data collected during the March/April semi-annual sampling event (Figures 2 through 5).

Soil Vapor Monitoring

The soil vapor analytical results for the current period and the previous year are provided in Table D-1 in **Appendix D**. Water was present in the tubing of soil vapor well VW-4 during the March 2009 sampling event; therefore, no sample was collected.

Vapor Mitigation System Monitoring

The vapor mitigation system monitoring results for the current period are provided in Table E-1 in **Appendix E**. All cross-slab differential pressure readings were sufficiently negative for 5824 Eastern Avenue and 746 Oglethorpe Street, indicating that the systems were operating as designed.

During monthly monitoring of the vapor mitigation system at 5818 Eastern Avenue it was determined that the cross slab depressurization goal set in the work plan was not being met. During April monitoring, the cross slab differential pressure was neutral. GF technicians checked the sub-slab probe and determined that several fittings had come loose. The probe was repaired and the readings were rechecked and found to be negative, but still slightly below the depressurization goal. The readings were negative, therefore, the system was working as

designed to depressurize the area below the slab. This residence will be monitored on a monthly basis through August 2009.

4.0 PERMIT COMPLIANCE

Four permits are required for activities performed at the Chillum site. Two air discharge permits have been issued by MDE covering the effluent of the groundwater air stripping equipment and the effluent of the soil vapor extraction equipment. In addition, another permit was issued by MDE for discharge of treated groundwater. Permit requirements and compliance for the above MDE permits are discussed in Sections 2 and 3. An additional permit required for work in Washington, D.C. is issued by the D.C. Department of Transportation (DCDOT) for Above Ground Public Space occupancy to perform activities such as sampling and gauging of monitoring wells.

Permit numbers 033-9-1160 Air Quality General Permit for effluent of groundwater air stripping equipment and 033-9-1164 Air Quality General Permit for effluent of soil vapor extraction equipment were issued for the site. Neither of these permits has an expiration date. Sampling and monitoring requirements include periodic effluent monitoring as described in Sections 2 and 3.

Permit number 2008-OGR-8514 General Discharge Permit is effective for treated groundwater discharge for the site. This permit became effective on January 31, 2008 and expires on December 12, 2012. The permit requires weekly effluent sampling, system monitoring, and submission of a quarterly Discharge Monitoring Report.

Permit number PA 41221 for Above Ground Public Space Occupancy was issued to cover traffic control requirements for sampling and gauging. The permit expired on March 5, 2009 and was renewed for another six-month period.

5.0 Summary of Deviations from Approved Plans, Problems Encountered, and Corrective Actions Taken

- The air compressor motor failed on March 25 and was determined to need replacement. Chevron elected to replace the compressor with a larger capacity model that would be compatible with the expanded remediation system as planned in the CMI Work Plan. The system was off from March 25 to May 5, 2009 while the new compressor was on order, delivered and installed. As part of the installation, the control panel was required to be removed (unwired) and re-wired once the compressor was installed so the compressor would fit in the room.

- During monthly monitoring of the vapor mitigation system at 5818 Eastern Avenue it was determined that the cross slab depressurization goal set in the work plan was not being met. During April monitoring, the cross slab differential pressure was neutral. GF technicians checked the sub-slab probe and determined that several fittings were loose, likely causing the neutral reading. The probe was repaired and the readings were rechecked and found to be negative, but still slightly below the depressurization goal. With EPA approval, Chevron agreed to monitor this residence monthly for a second quarter to make sure the cross slab differential pressure remained negative, indicating that the system is functioning as designed. This residence will be monitored monthly through August.

- The vapor mitigation system at 746 Oglethorpe Street was turned off by the resident after receiving a larger than normal electric bill. EPA and DDOE were notified of this situation in writing on April 21, 2009, after Chevron was notified by the resident. The system has not been turned back on by the resident. Should the system be turned back on, it will be monitored by Chevron.

- The SVE blower motor was drawing too much power and started shutting down regularly in June. After extensive troubleshooting over the period of approximately a month, it was determined that it was likely that the blower motor or blower needed to be replaced. Chevron is currently evaluating options for either fixing the existing blower/motor or replacing the blower with a new one. EPA and DDOE will be notified of the schedule for returning this piece of equipment to working order. The groundwater extraction system will continue to operate in the meantime while the SVE system is off.

6.0 SUMMARY OF MEETINGS WITH PUBLIC AND GOVERNMENT

No meetings were conducted.

7.0 CHANGES IN KEY PERSONNEL DURING THE REPORTING PERIOD

There were no changes in key Gannett Fleming or Chevron personnel.

8.0 PROJECTED WORK FOR THE NEXT REPORTING PERIOD

The following list identifies projected work to be conducted during the next reporting period, which is July through December 2009 (semi-annual reporting).

- Monthly monitoring of the IDPES including influent and effluent sampling;
- Weekly sampling of the IDPES effluent to comply with water discharge permits;
- Monthly gauging of select wells near the service station to check for the presence of LPH and to document drawdown caused by the total fluids extraction system;
- Routine operations and maintenance activities for the remediation system and the vapor mitigation systems;
- Conduct semi-annual groundwater and soil vapor sampling event at the end of September 2009;
- Annual system monitoring sampling for the vapor mitigation systems;
- Submission of the Final Corrective Measures Implementation Work Plan;
- Begin remedial design and conduct pre-design investigations; and
- Renew DC public space occupancy permit.

TABLES

Gannett Fleming

Table 1
Summary of Groundwater and Soil Vapor Monitoring Program
Semi Annual Prgress Report January Through June 2009
Former Chevron Facility No. 122208, Chillum, Maryland

Well Identifier	Well Location Category	Petroleum Hydrocarbon Sampling Frequency[2]	Groundwater Gauging Frequency	Comment
GP-27A	Dual-Phase Extraction System	Semi-annual[3]	Monthly	
GP-30A	Dual-Phase Extraction System	Semi-annual	Monthly	
GP-35A	Dual-Phase Extraction System	Semi-annual	Monthly	
GP-38A	Dual-Phase Extraction System	Semi-annual	Monthly	
MP-7	Dual-Phase Extraction System	None	Monthly	Gauge only
MP-20	Dual-Phase Extraction System	None	Semi-annual	Gauge only
MP-30	Dual-Phase Extraction System	None	Semi-annual	Gauge only
MP-40	Dual-Phase Extraction System	None	Semi-annual	Gauge only
MW-5	Dual-Phase Extraction System	Semi-annual	Semi-annual	
MW-7	Dual-Phase Extraction System	Semi-annual	Monthly	Recovery Well
MW-15	Dual-Phase Extraction System	Semi-annual	Semi-annual	
MW-16	Dual-Phase Extraction System	Semi-annual	Monthly	
MW-17	Dual-Phase Extraction System	Semi-annual	Semi-annual	Recovery Well
MW-18	Dual-Phase Extraction System	Semi-annual	Monthly	
MW-22	Dual-Phase Extraction System	Semi-annual	Monthly	
MW-23	Dual-Phase Extraction System	Semi-annual	Semi-annual	
PTW-A	Dual-Phase Extraction System	Semi-annual	Semi-annual	Recovery Well
PTW-B	Dual-Phase Extraction System	Semi-annual	Semi-annual	Recovery Well
RW-1	Dual-Phase Extraction System	Semi-annual	Semi-annual	Recovery Well
RW-2	Dual-Phase Extraction System	Semi-annual	Semi-annual	Recovery Well
RW-3	Dual-Phase Extraction System	Semi-annual	Semi-annual	Recovery Well
GP-2E (45-50)	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-2E (55-60)	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-2F (45-50)	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-2F (50-55)	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-7A (30-35)	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-7A (35-40)	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-24A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-39A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-41A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
GP-44A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-24A	Dissolved Hydrocarbons	Semi-annual	Monthly	
MW-24B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-25A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-25B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-26A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-26B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-27A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-27B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-33A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	Added at the request of EPA
MW-33B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-33C	Dissolved Hydrocarbons	Semi-annual	Semi-annual	Added at the request of EPA
MW-33S	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-38	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-39R	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-40	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-43B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-44A	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-44B	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-45	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-46	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-47	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-49	Dissolved Hydrocarbons	Semi-annual	Semi-annual	
MW-50	Dissolved Hydrocarbons	Semi-annual	Semi-annual	

Gannett Fleming

Table 1
Summary of Groundwater and Soil Vapor Monitoring Program
Semi Annual Prgress Report January Through June 2009
Former Chevron Facility No. 122208, Chillum, Maryland

Well Identifier	Well Location Category	Petroleum Hydrocarbon Sampling Frequency[2]	Groundwater Gauging Frequency	Comment
GP-7A (20-25)	Sentinel	Semi-annual	Semi-annual	
GP-9A (20-25)	Sentinel	Semi-annual	Semi-annual	
GP-11A (20-25)	Sentinel	Semi-annual	Semi-annual	
MW-6	Sentinel	Semi-annual	Semi-annual	
MW-19	Sentinel	Semi-annual	Semi-annual	
MW-20	Sentinel	Semi-annual	Semi-annual	Upgradient
MW-21	Sentinel	Semi-annual	Semi-annual	
MW-28A	Sentinel	Semi-annual	Semi-annual	
MW-28B	Sentinel	Semi-annual	Semi-annual	
MW-29A	Sentinel	Semi-annual	Semi-annual	
MW-29B	Sentinel	Semi-annual	Semi-annual	
MW-30	Sentinel	Semi-annual	Semi-annual	Upgradient
MW-31B	Sentinel	Semi-annual	Semi-annual	
MW-41A	Sentinel	Semi-annual	Semi-annual	
MW-41B	Sentinel	Semi-annual	Semi-annual	
MW-42	Sentinel	Semi-annual	Semi-annual	Upgradient
MW-43A	Sentinel	Semi-annual	Semi-annual	
MW-48	Sentinel	Semi-annual	Semi-annual	
MW-51	Sentinel	Semi-annual	Semi-annual	
MW-53	Sentinel	Semi-annual	Semi-annual	
MW-54	Sentinel	Semi-annual	Semi-annual	
MW-55	Sentinel	Semi-annual	Semi-annual	
VW-1	Soil Vapor	Semi-annual	Semi-annual	
VW-2	Soil Vapor	Semi-annual	Semi-annual	
VW-3	Soil Vapor	Semi-annual	Semi-annual	
VW-4	Soil Vapor	Semi-annual	Semi-annual	

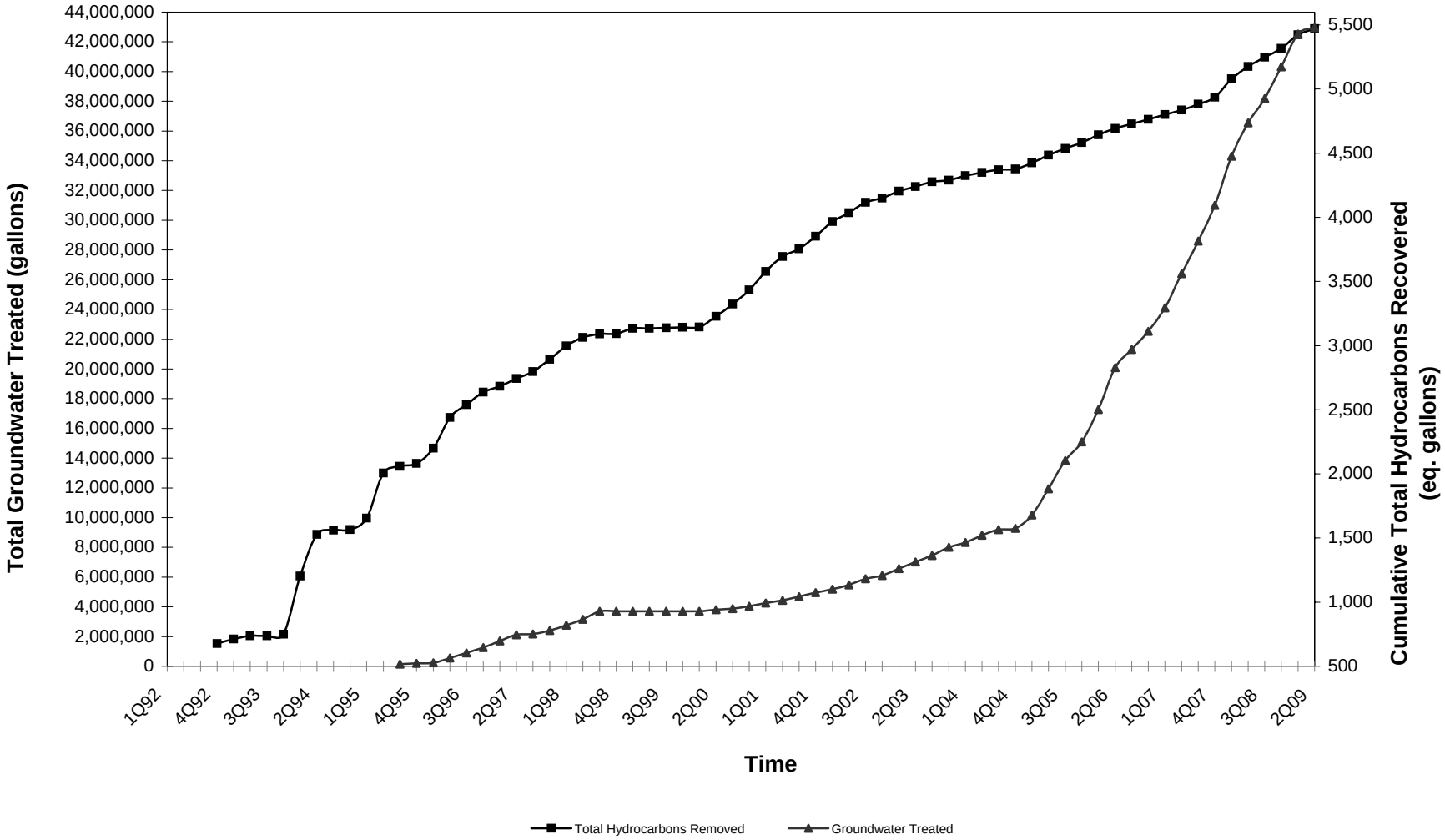
Notes:

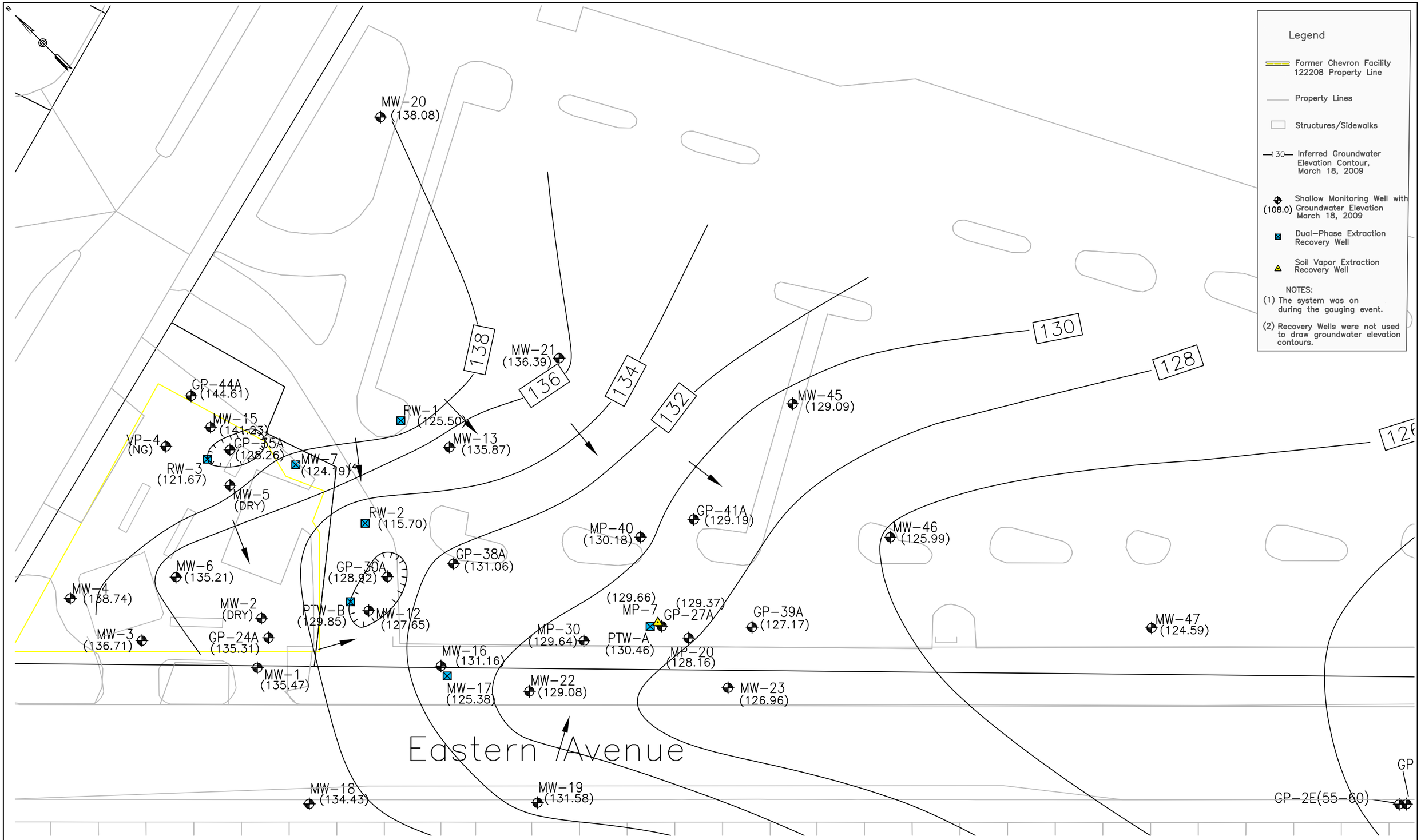
1. All groundwater wells will be gauged before they are sampled.
2. Sampling will be conducted in the spring and fall (low and high groundwater conditions).
3. All wells at the site will be gauged in the spring and fall (low and high groundwater conditions).
4. This table is adapted from the Interim Measures Sampling Plan, dated April, 2006.

FIGURES

Gannett Fleming

Figure 1
Cumulative Total Hydrocarbons Recovered and Groundwater Treated Since 1990
Semi-Annual Progress Report January 2009 Through June 2009
Former Chevron Facility 122208, Chillum, Maryland





NO.	DESCRIPTION	DATE	BY
REVISIONS			

DESIGNED	CADD	SCALE
DKB	DKB	1:40
CHECKED	APPROVED	APPROVED
JK	RWS	

Gannett Fleming
BALTIMORE, MARYLAND

2009 SEMI ANNUAL PROGRESS REPORT
FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Groundwater Potentiometric Surface Map
Remediation System Area
March 18, 2009

JOB NO.	FIGURE
50641	2
DATE: 07/06/09	
CAD FILE: GW CONTOURS 3Q 2008_blwup.dwg	

Eastern Avenue

8th Street

Oglethorpe Street

Nicholson Street

MW-4 (138.74)
MW-3 (136.71)
MW-6 (135.21)
MW-2 (DRY)
MW-5 (DRY)
MW-7 (124.19)
MW-15 (141.23)
GP-35A (128.26)
GP-44A (144.61)
VP-4 (NG)
RW-3 (121.67)
RW-1 (125.50)
RW-2 (115.70)
MW-13 (135.87)
MW-21 (136.39)
MW-45 (129.09)
GP-41A (129.19)
MP-40 (130.18)
GP-38A (131.06)
GP-30A (128.92)
MW-12 (127.65)
PTW-B (129.85)
GP-24A (135.31)
MW-1 (135.47)
MW-16 (131.16)
MW-17 (125.38)
MW-22 (129.08)
MW-23 (126.96)
MW-46 (125.99)
MW-47 (124.59)
MW-48 (123.04)
MW-50(1) (117.67)
MW-49 (113.34)
MW-51 (107.76)
GP-39A (127.17)
MP-7 (129.66)
GP-27A (129.37)
MP-30 (129.64)
PTW-A (130.46)
MP-20 (128.16)
MW-18 (134.43)
MW-19 (131.58)
GP-2E(50-55)
GP-2E(55-60)
GP-2E(45-50) (123.79)
GP-2F(50-55)
GP-2F(45-50) (113.88)
MW-25B
MW-25A (123.83)
MW-41B
MW-41A (116.78)
MW-30 (135.21)
MW-24A (136.34)
MW-24B
GP-7A(40-45)
GP-7A(35-40)
GP-7A(30-35)
GP-7A(25-30)
GP-7A(20-25) (137.13)
GP-9A(30-35)
GP-9A(25-30)
GP-9A(20-25) (139.87)
GP-11A(35-40)
GP-11A(30-35)
GP-11A(25-30)
GP-11A(20-25) (141.69)
MW-37 (DRY)
MW-38 (135.86)
MW-39R (128.70)
MW-39 (DRY)
MW-40 (121.79)
MW-42 (131.35)
MW-26B
MW-26A (130.70)
MW-43B
MW-43A (129.79)
MW-44B
MW-44A (120.04)
MW-27B
MW-27A (117.69)
MW-53 (109.62)
MW-29B
MW-29A (107.69)
106.86
103.28
130.56
127.67
MW-31B
MW-31A (129.15)
122.12
(129.32) MW-55
119.71
(122.74) MW-33S
(122.46) MW-33A
MW-33B
MW-33C
114.85
(124.12) MW-52
MW-28B
MW-28A (121.39)
111.24
110.47
MW-54 (116.63)
108.35
113.48
110.59

Legend

- Former Chevron Facility 122208 Property Line
- Property Lines
- Structures/Sidewalks
- Clay Body
- 114 Inferred Groundwater Elevation Contour, March 18, 2009
- (108.0) Shallow Monitoring Well with Groundwater Elevation March 18, 2009
- Dual-Phase Extraction Recovery Well
- Soil Vapor Extraction Recovery Well
- Sanitary Sewer Manhole
- Storm Drain Manhole
- Storm Drain Inlet
- Sanitary Sewer Pipe
- Storm Drain Pipe
- 102.18 Invert Elevation (Feet) NAVD 88 Sanitary Sewer
- 105.86 Invert Elevation (Feet) NAVD 88 Storm Drain
- The extent of the sanitary sewer & storm drain that likely intercept the water table

NOTES:
(1) MW-50 not contoured because the water elevation appears to be perched.
(2) The system was on during the gauging event.
(3) MW-20, MW-32, MW-34A, and MW-34B do not appear on this map.

0 50 100 Feet

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
DKB	DKB	1:100
CHECKED	APPROVED	APPROVED
JK	RWS	

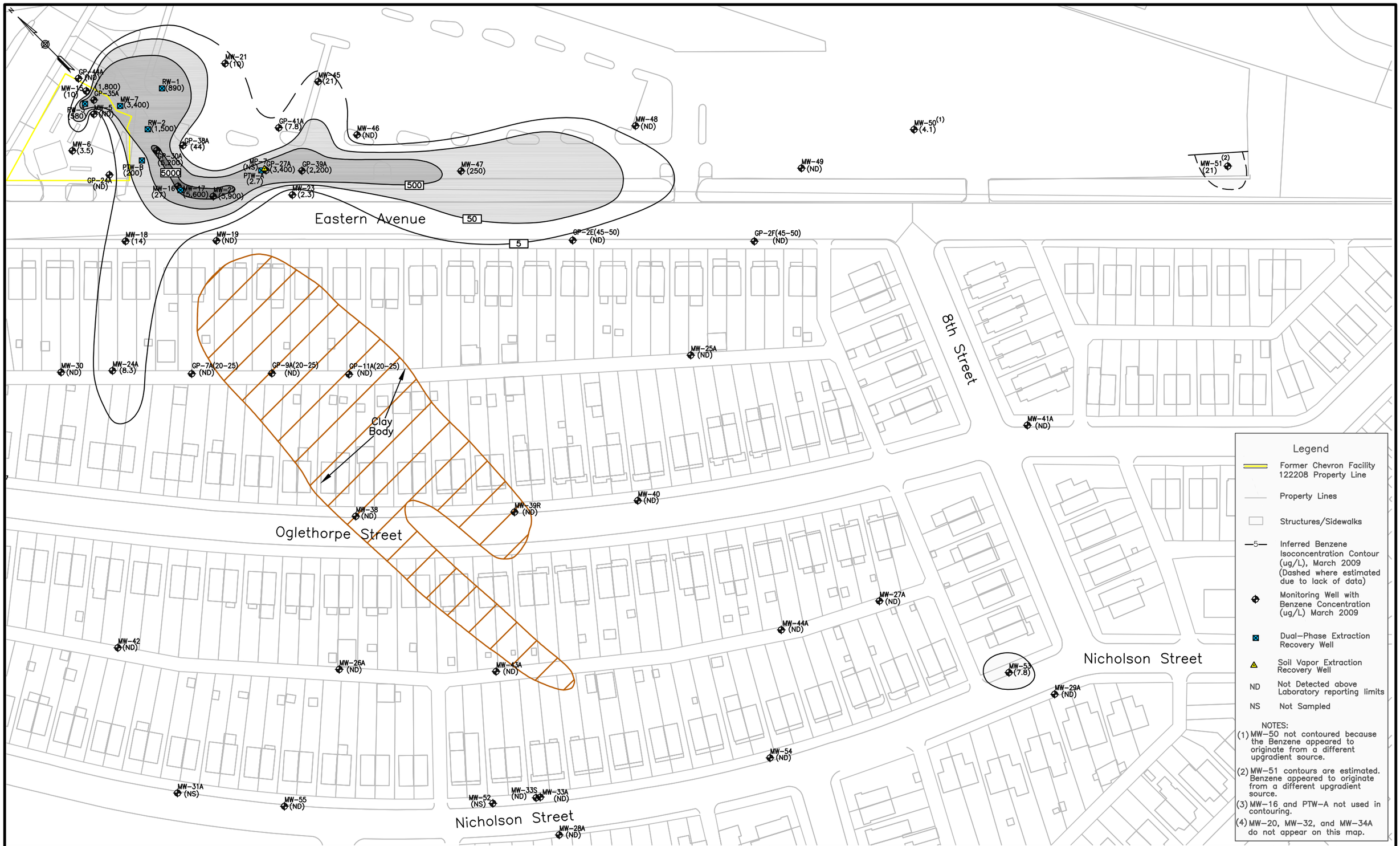
Gannett Fleming
BALTIMORE, MARYLAND

2009 SEMI-ANNUAL PROGRESS REPORT
FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Groundwater Potentiometric Surface Map
March 18, 2009

JOB NO. 50641
DATE 07/06/09
CAD FILE GW CONTOURS 1Q 2009.dwg

FIGURE 3



0 50 100 Feet

NO.	DESCRIPTION	DATE	BY
REVISIONS			

DESIGNED	CADD	SCALE
DKB	DKB	1:100
CHECKED	APPROVED	APPROVED
JK	RWS	

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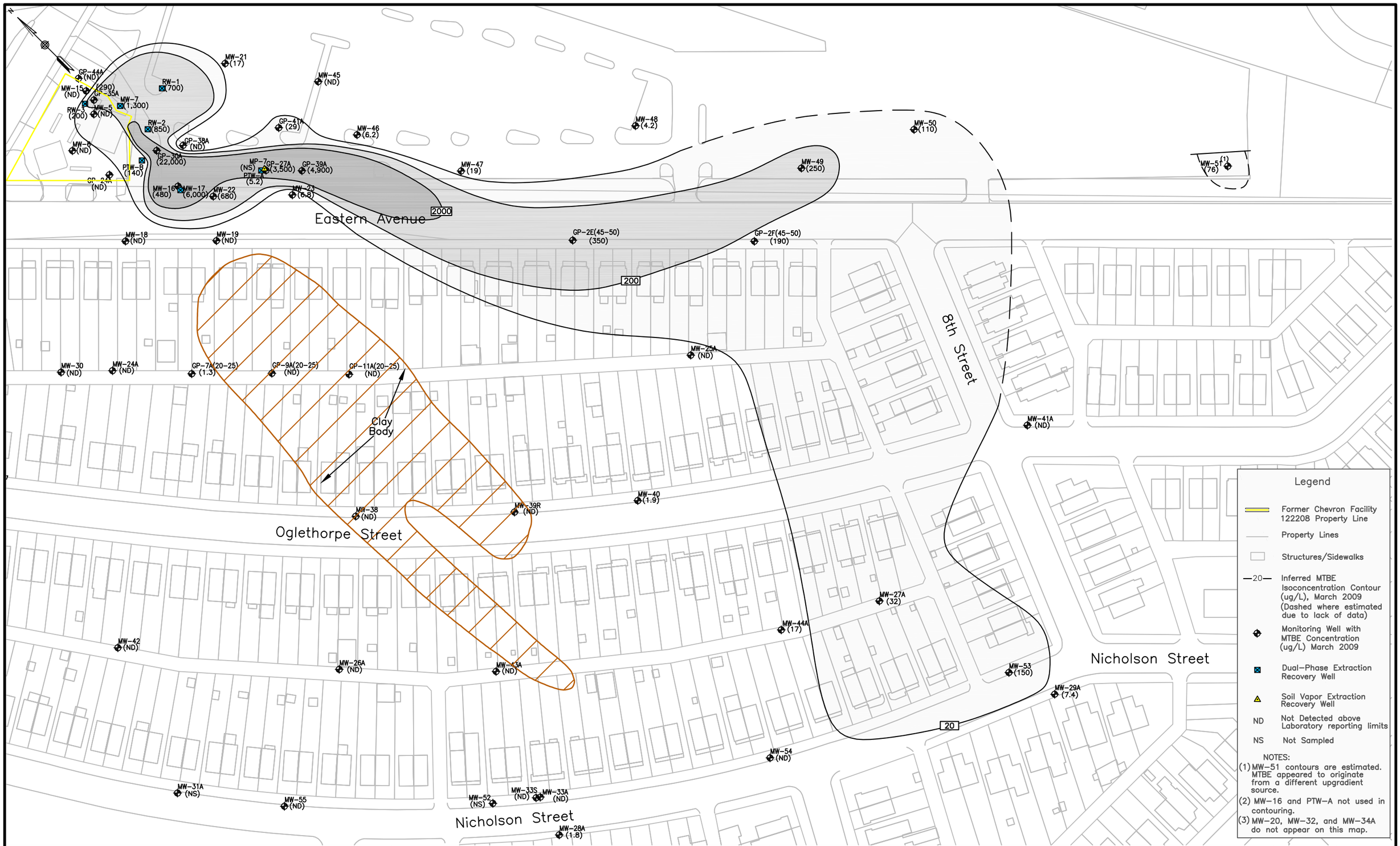
CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Benzene Concentrations in Shallow Monitoring Wells March 2009

JOB NO.	SHEET NO.
50641	4
DATE	
07/06/09	
CAD FILE	
Shallow Benzene	



0 50 100 Feet

NO.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
DKB	DKB	1:100
CHECKED	APPROVED	APPROVED
JK	RWS	

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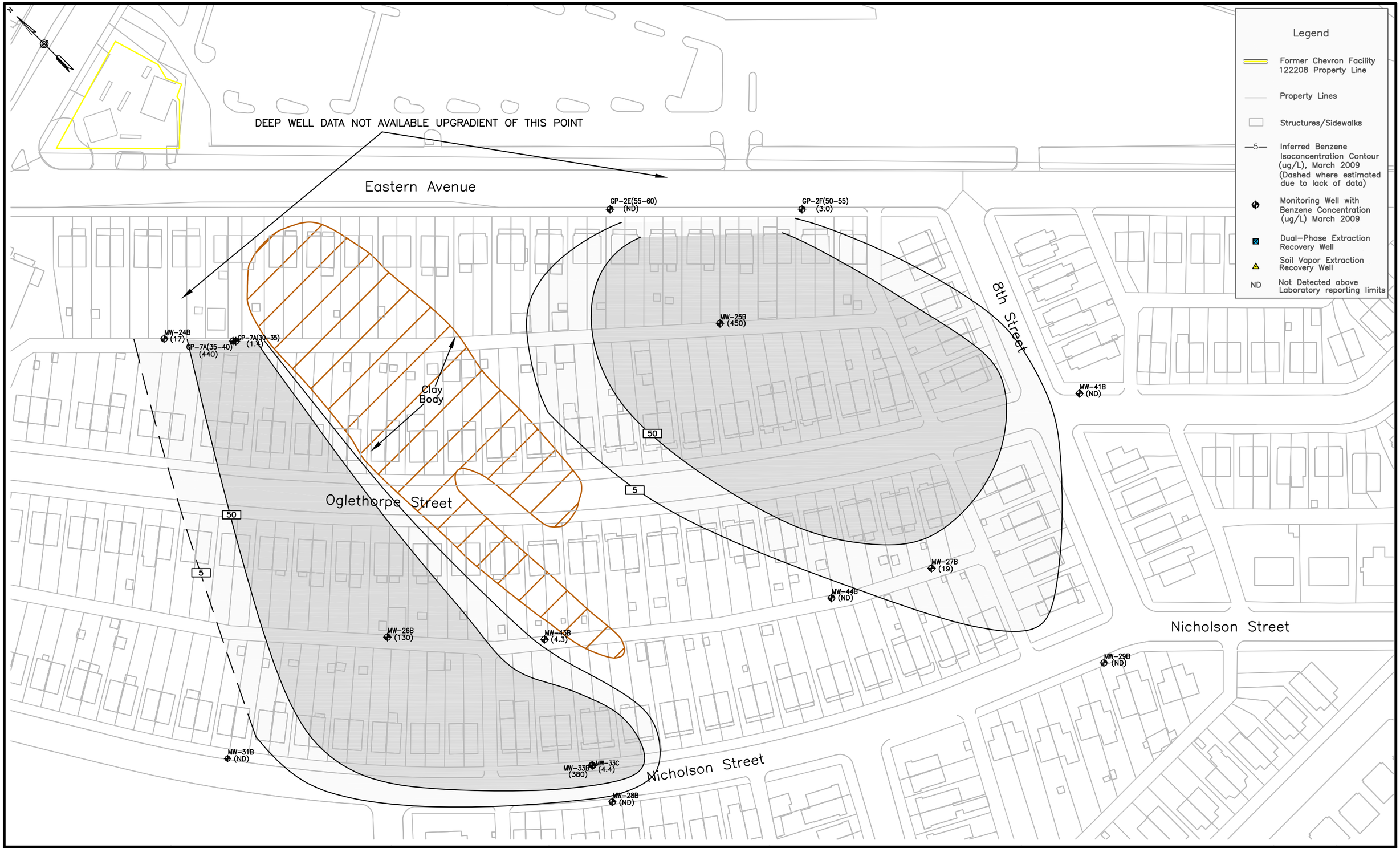
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

MTBE Concentrations in Shallow Monitoring Wells March 2009

JOB NO.	SHEET NO.
50641	5
DATE	
07/06/09	
CAD FILE	
Shallow MTBE	



0 50 100 Feet

NO.	DESCRIPTION	DATE	BY
REVISIONS			

DESIGNED	CADD	SCALE
DKB	DKB	1:100
CHECKED	APPROVED	APPROVED
JK	RWS	

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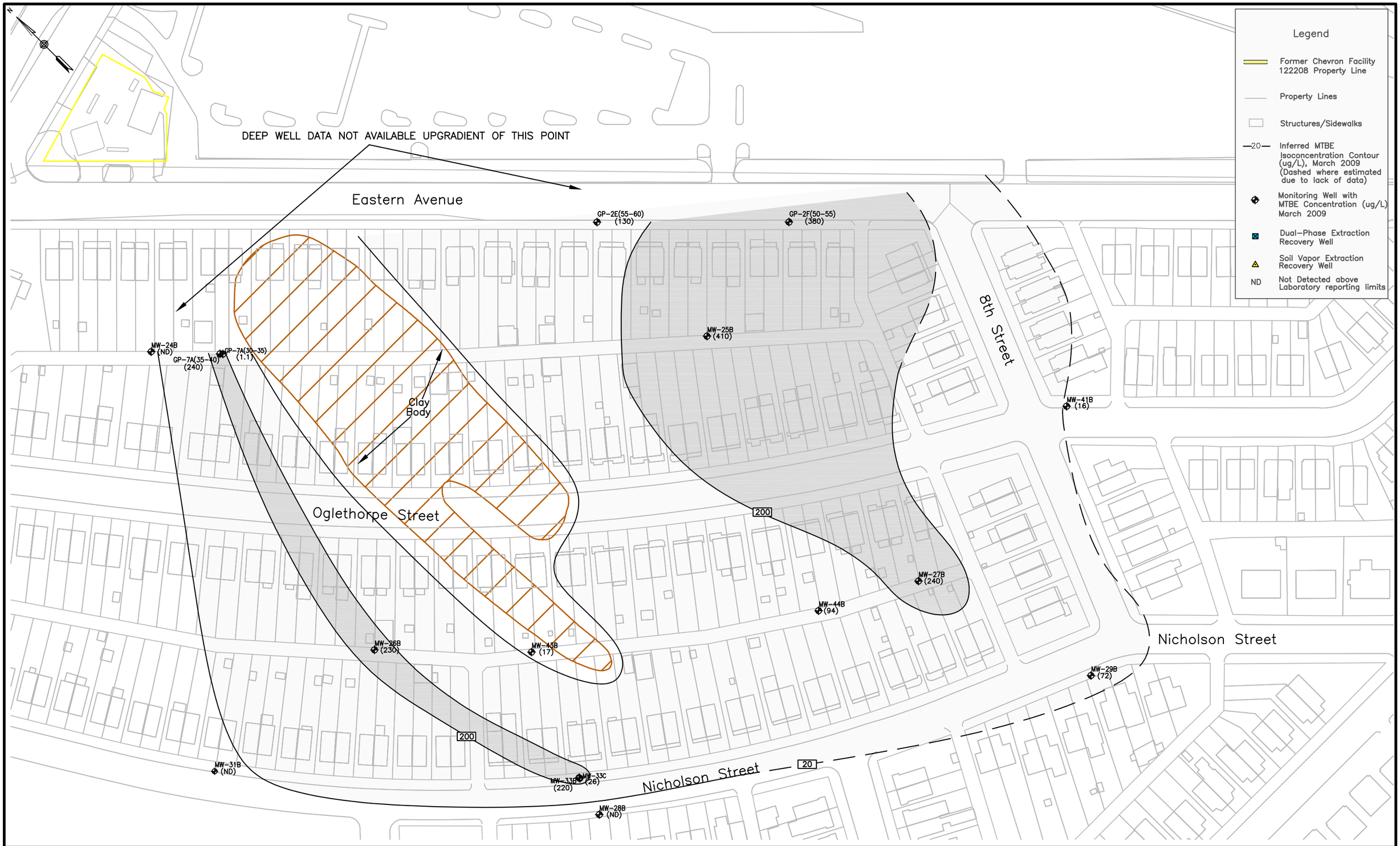
CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Benzene Concentrations in Deep Monitoring Wells March 2009

JOB NO.	DATE	CAD FILE
50641	07/06/09	Deep Benzene

SHEET NO. 6



0 50 100 Feet

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
DKB	DKB	1:100
CHECKED	APPROVED	APPROVED
JK	RWS	

Gannett Fleming
BALTIMORE, MARYLAND

CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

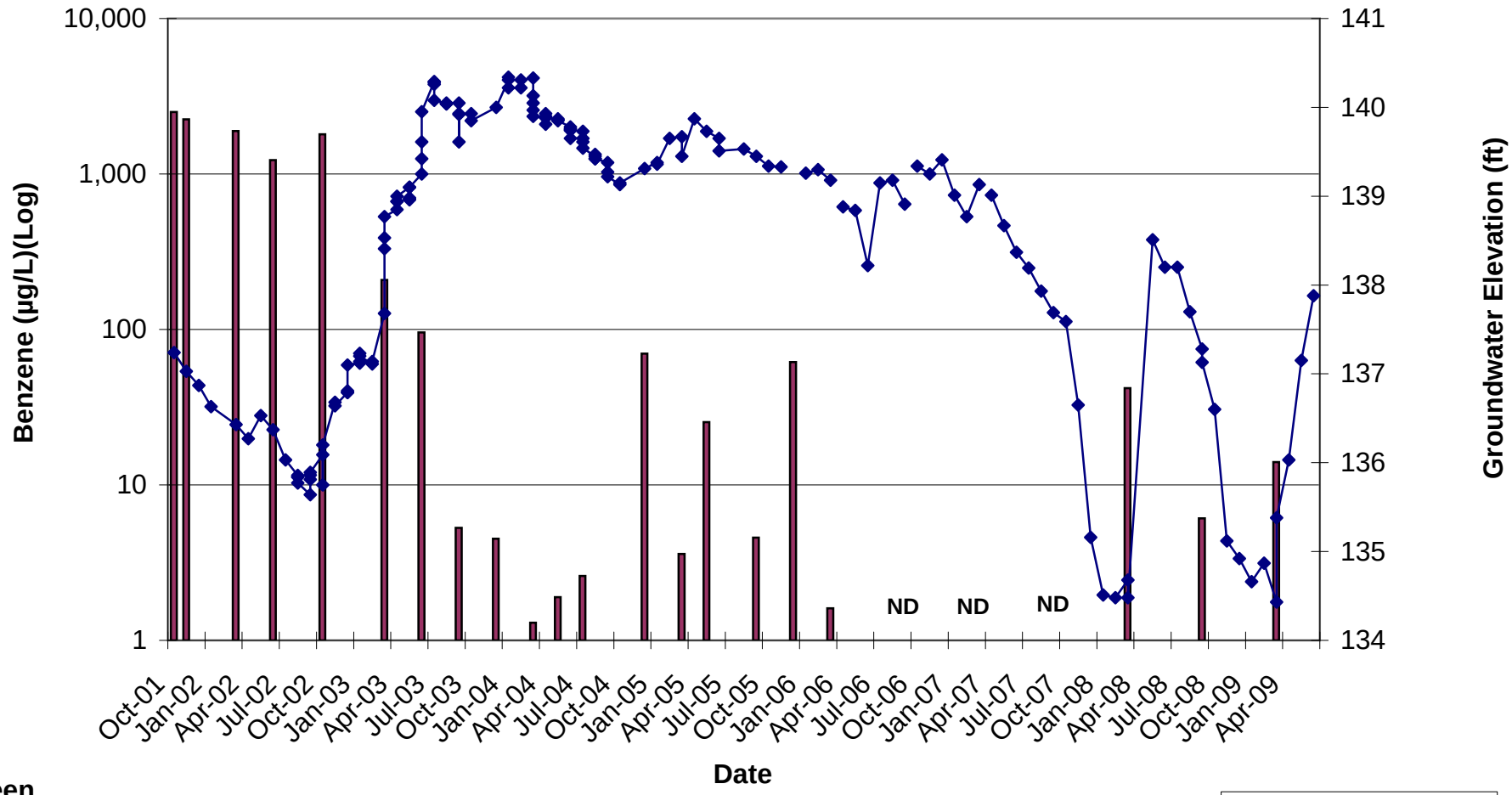
FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

MTBE Concentrations in Deep Monitoring Wells March 2009

JOB NO.	DATE	CAD FILE
50641	07/06/09	Deep MTBE

SHEET NO. 7

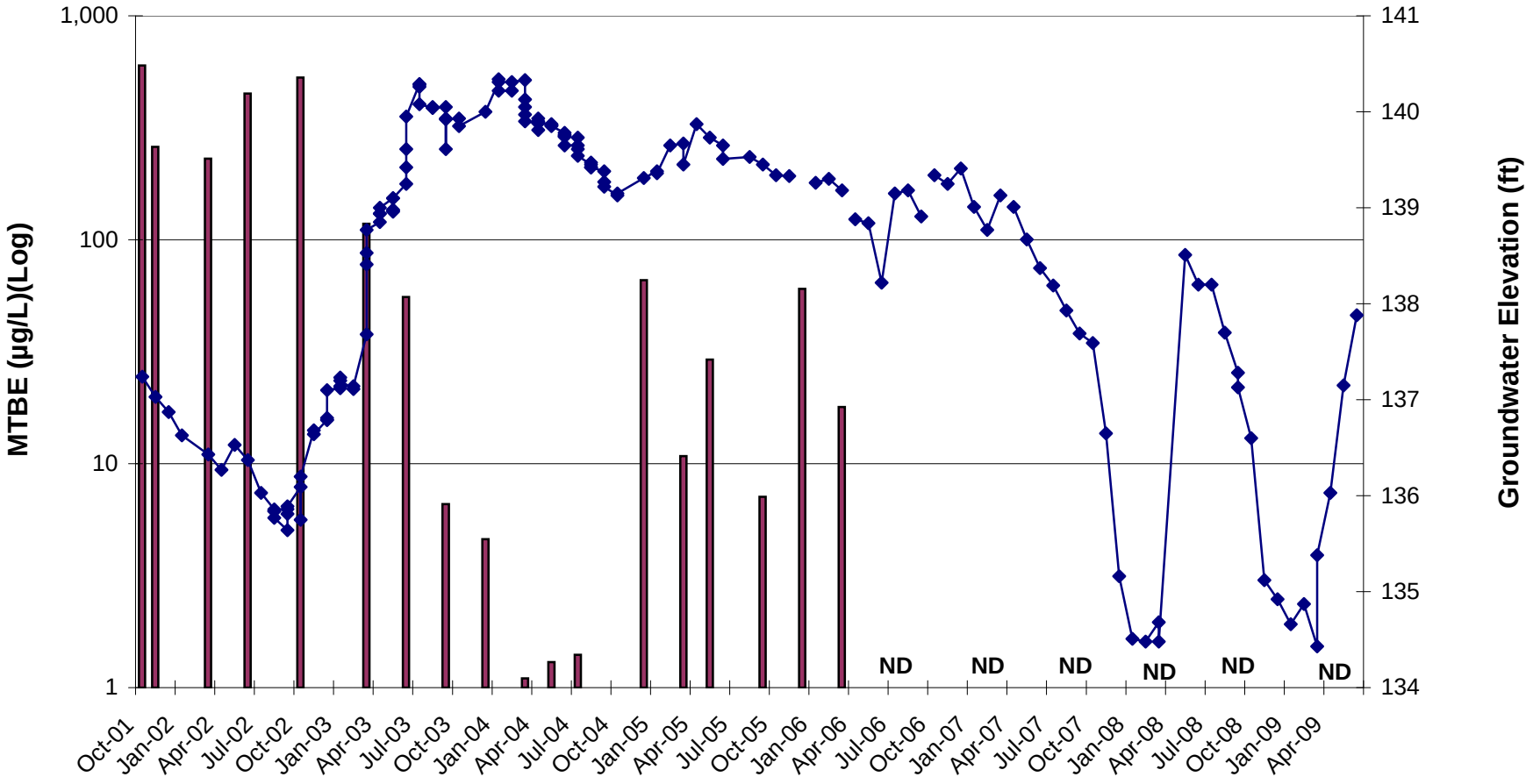
FIGURE 8: MW-18 BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
29-44 ft bgs
Screen Top: 139.45 ft
Screen Bottom: 124.45 ft

ND : Not Detected above the reporting limit

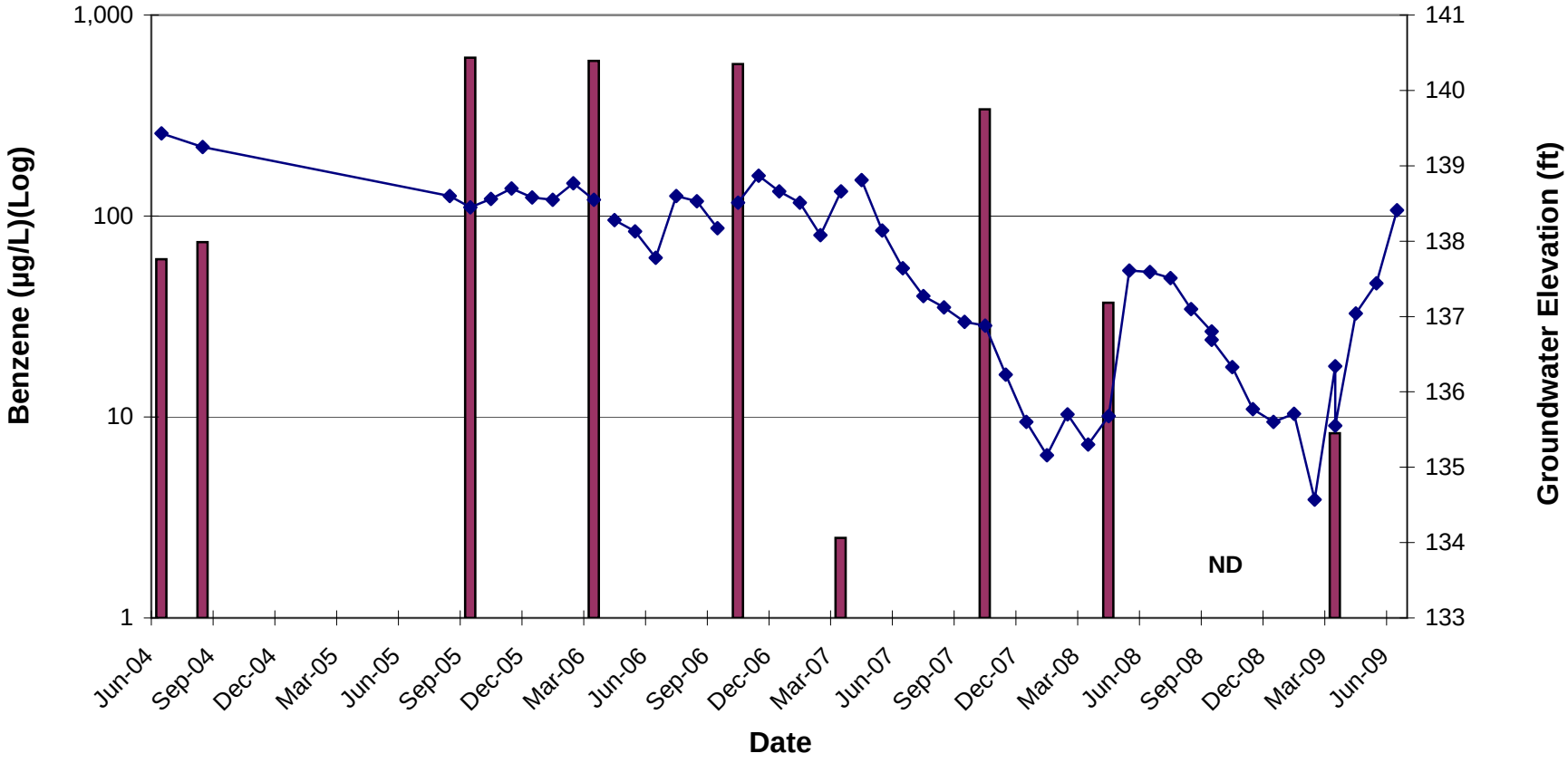
FIGURE 9: MW-18 MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
29-44 ft bgs
Screen Top: 139.45 ft
Screen Bottom: 124.45 ft

ND : Not Detected above the reporting limit

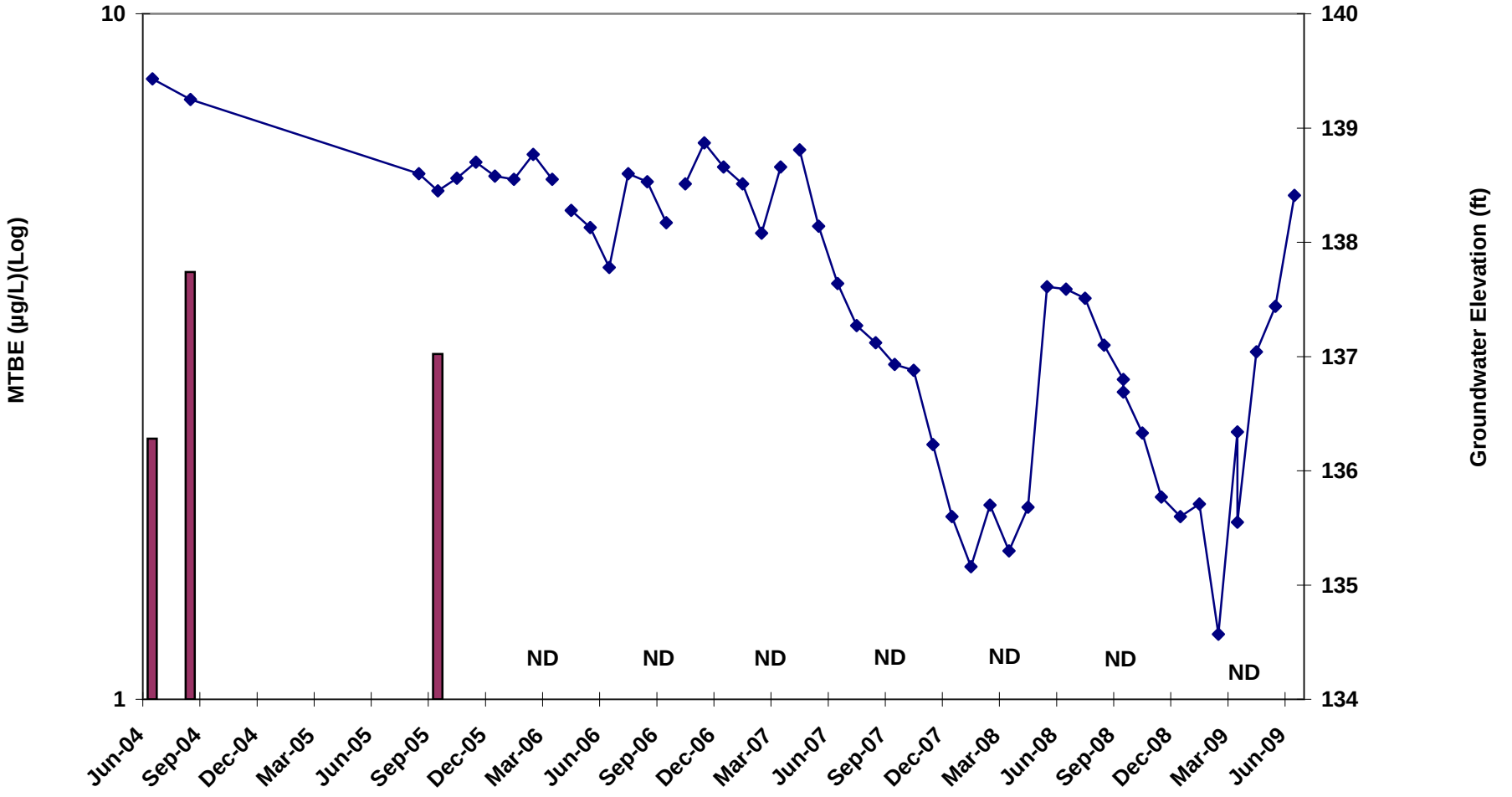
FIGURE 10: MW-24A BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
16-23.5 ft bgs
Screen Top: 141.4 ft
Screen Bottom: 133.9 ft

ND : Not Detected above the reporting limit

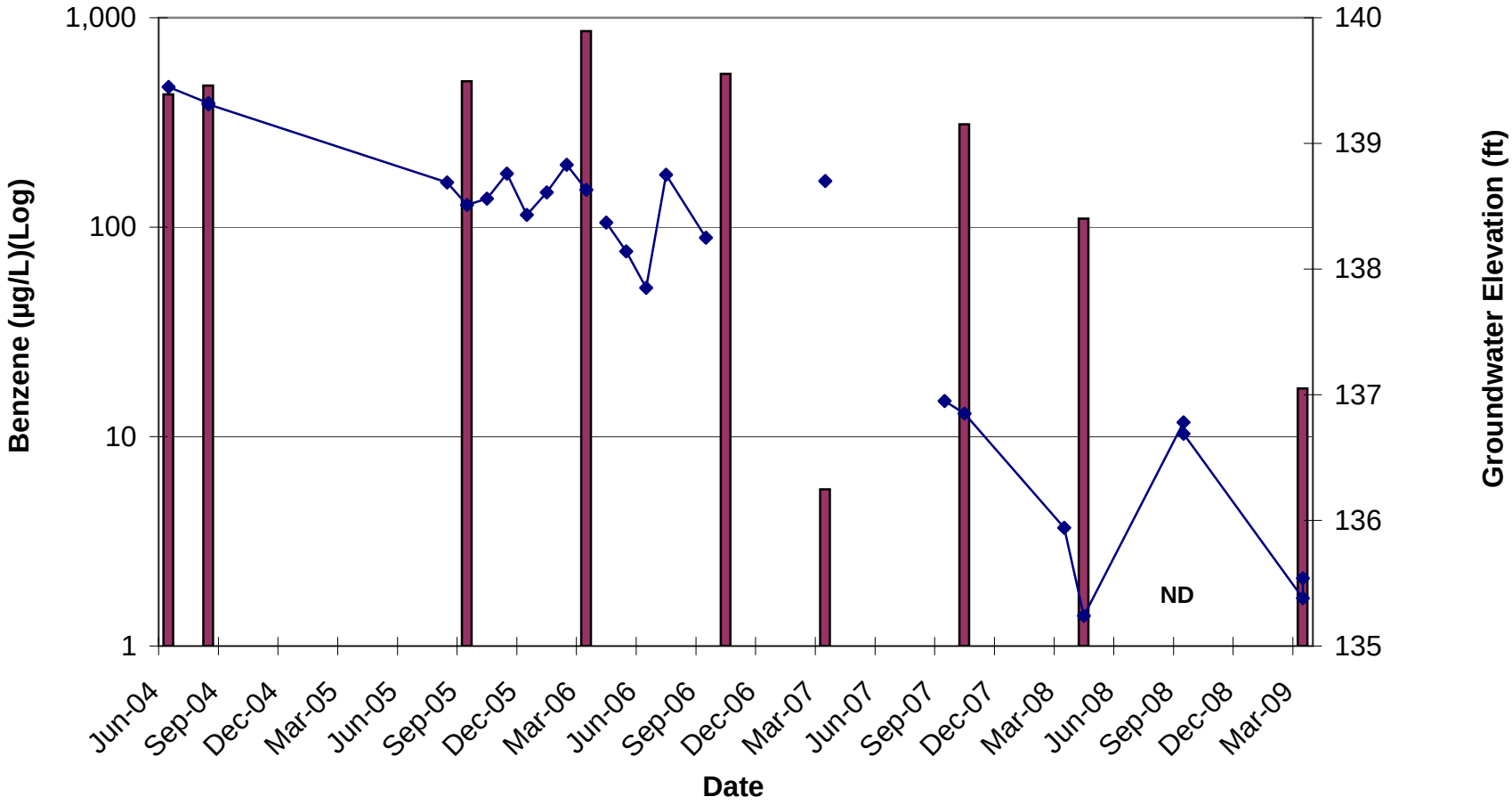
FIGURE 11: MW-24A MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
16-23.5 ft bgs
Screen Top: 141.4 ft
Screen Bottom: 133.9 ft

ND : Not Detected above the reporting limit

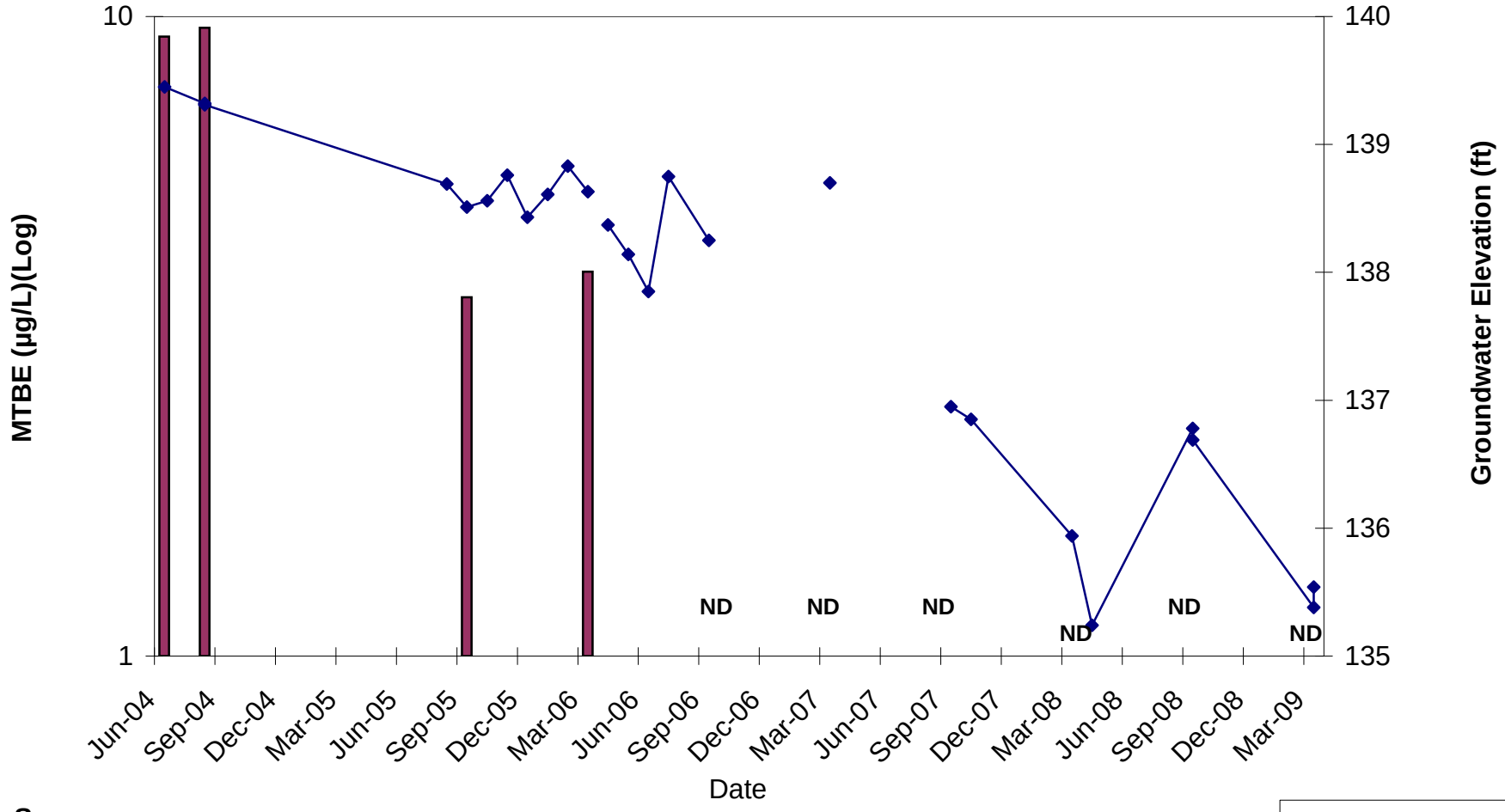
FIGURE 12: MW-24B BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
22.5-30 ft bgs
Screen Top: 134.95 ft
Screen Bottom: 127.45 ft

ND : Not Detected above the reporting limit

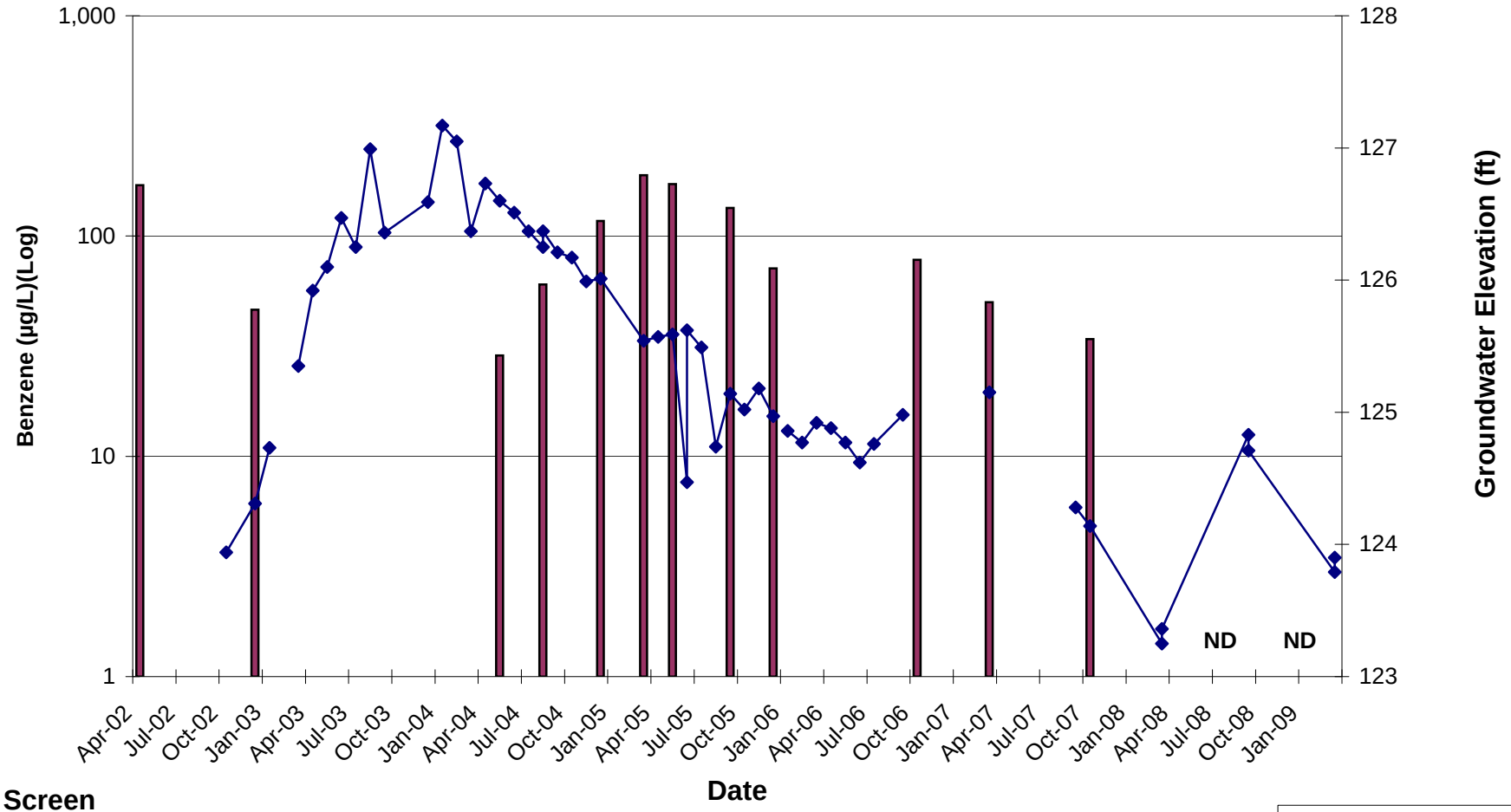
FIGURE 13: MW-24B MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
22.5-30 ft bgs
Screen Top: 134.95 ft
Screen Bottom: 127.45 ft

ND : Not Detected above the reporting limit

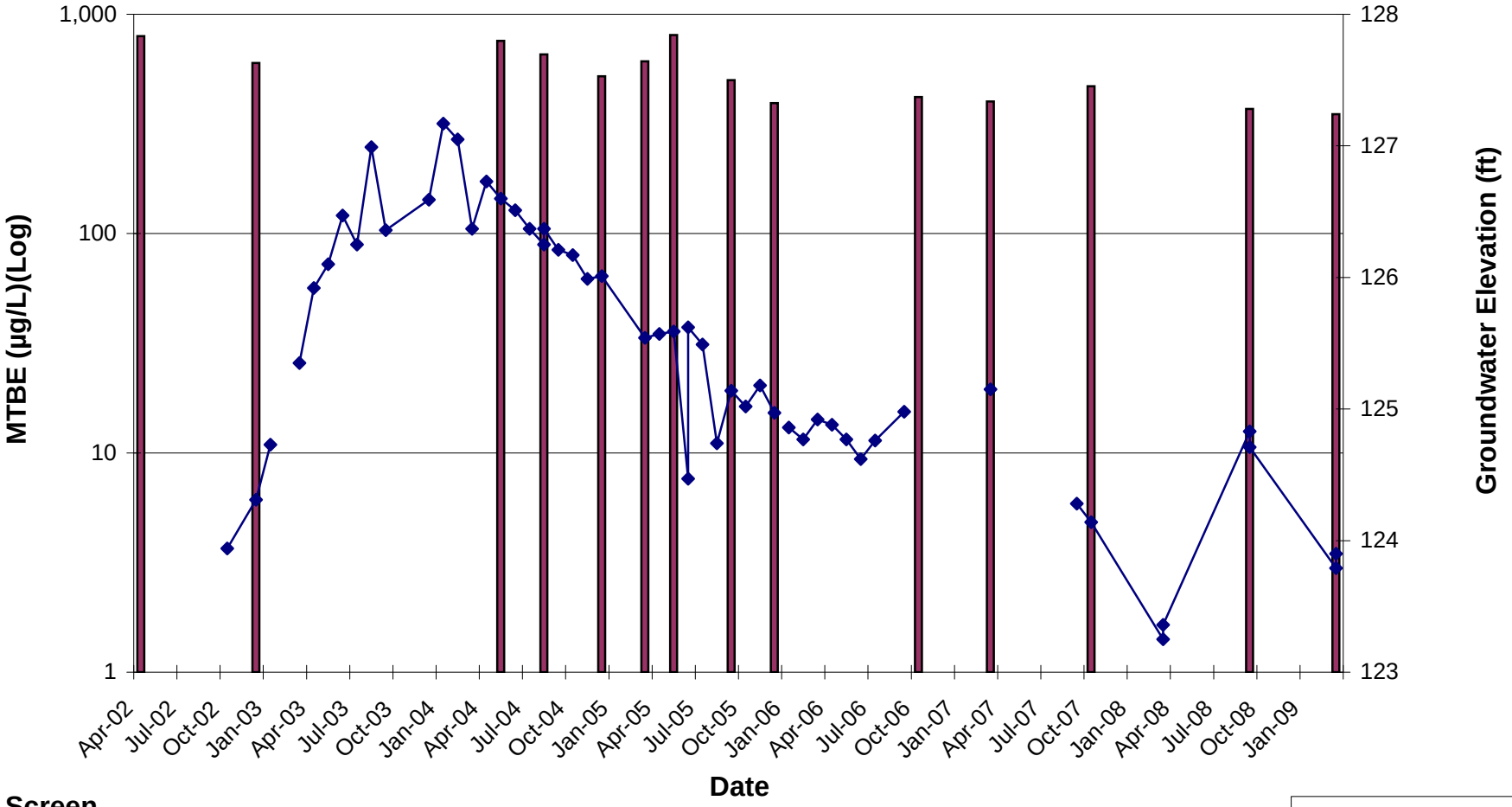
FIGURE 14: GP-2E (45-50) BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
45-50 ft bgs
Screen Top: 123.17 ft
Screen Bottom: 118.17 ft

ND : Not Detected above the reporting limit

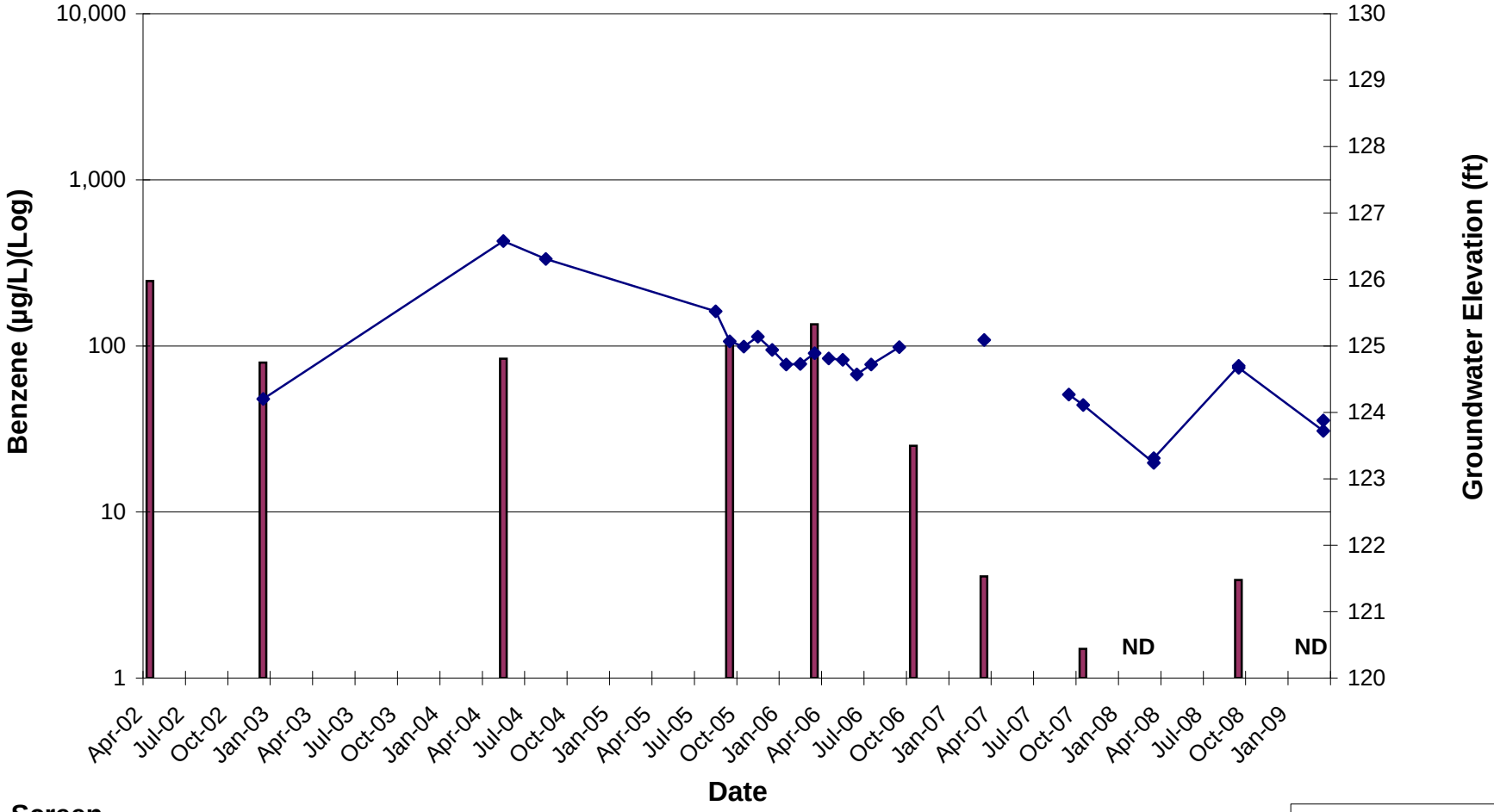
FIGURE 15: GP-2E (45-50) MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
45-50 ft bgs
Screen Top: 123.17 ft
Screen Bottom: 118.17 ft

ND : Not Detected above the reporting limit

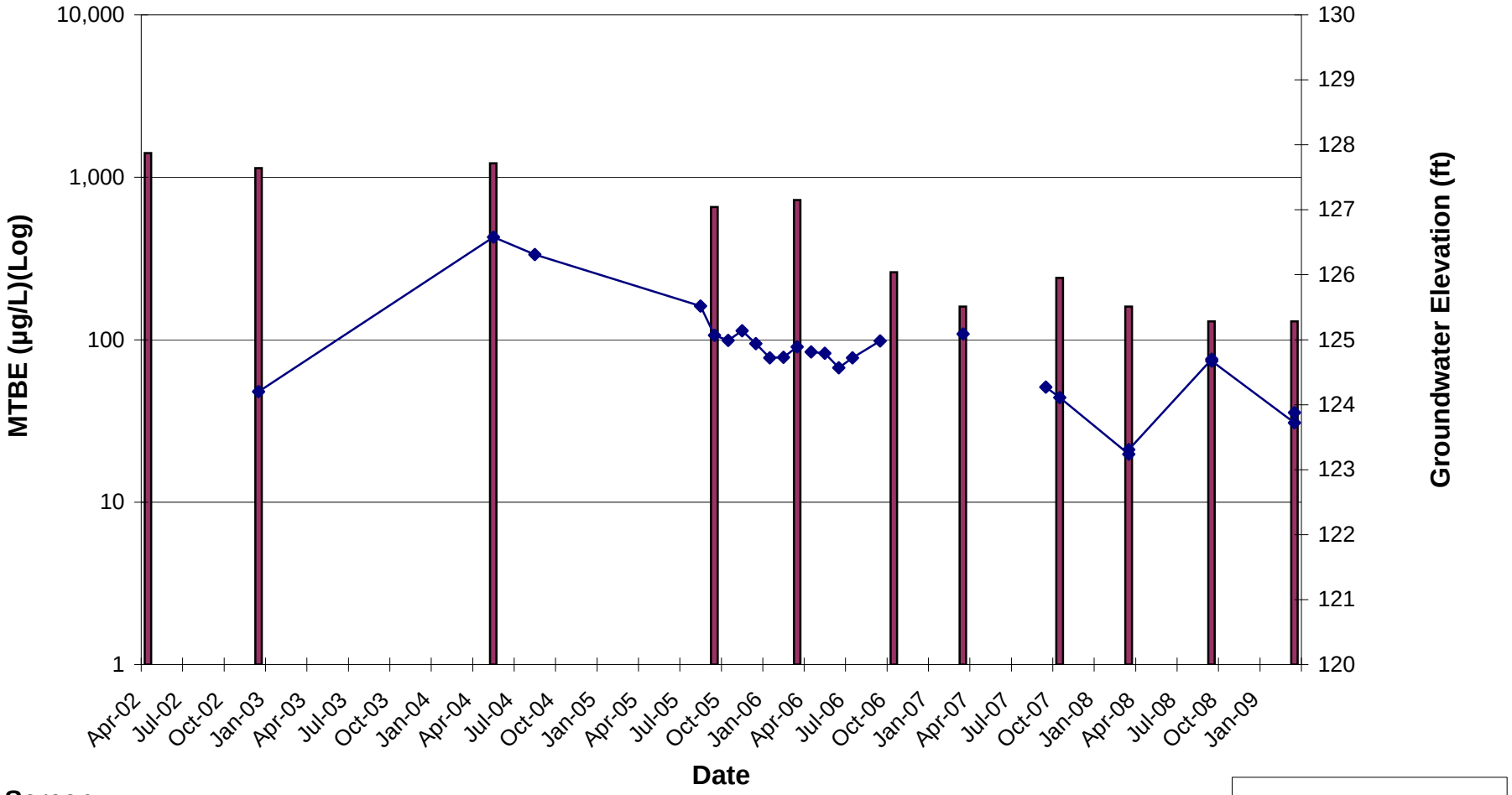
FIGURE 16: GP-2E (55-60) BENZNE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
55-60 ft bgs
Screen Top: 113.53 ft
Screen Bottom: 108.53 ft

ND : Not Detected above the reporting limit

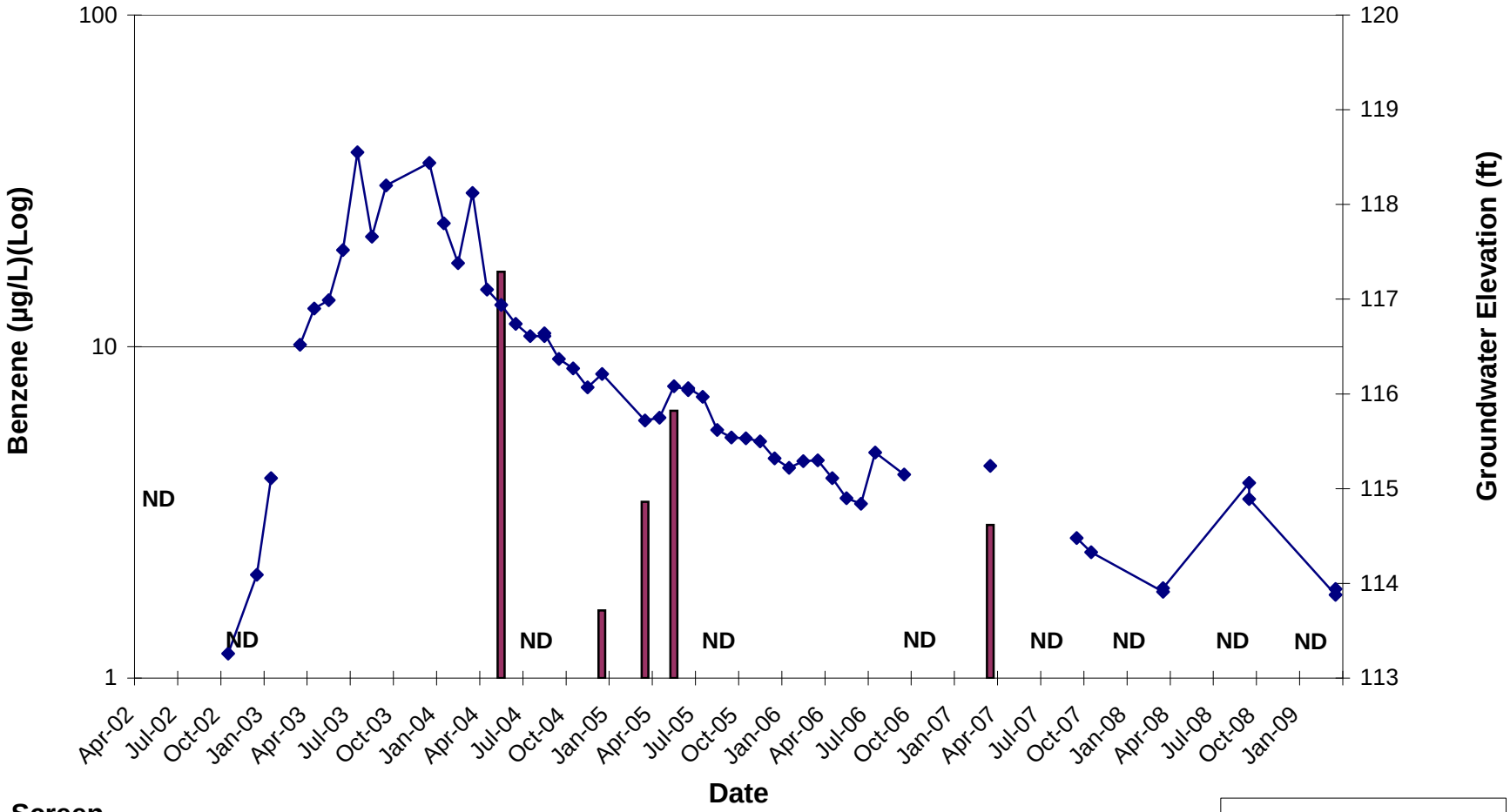
FIGURE 17: GP-2E (55-60) MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
55-60 ft bgs
Screen Top: 113.53 ft
Screen Bottom: 108.53 ft

ND : Not Detected above the reporting limit

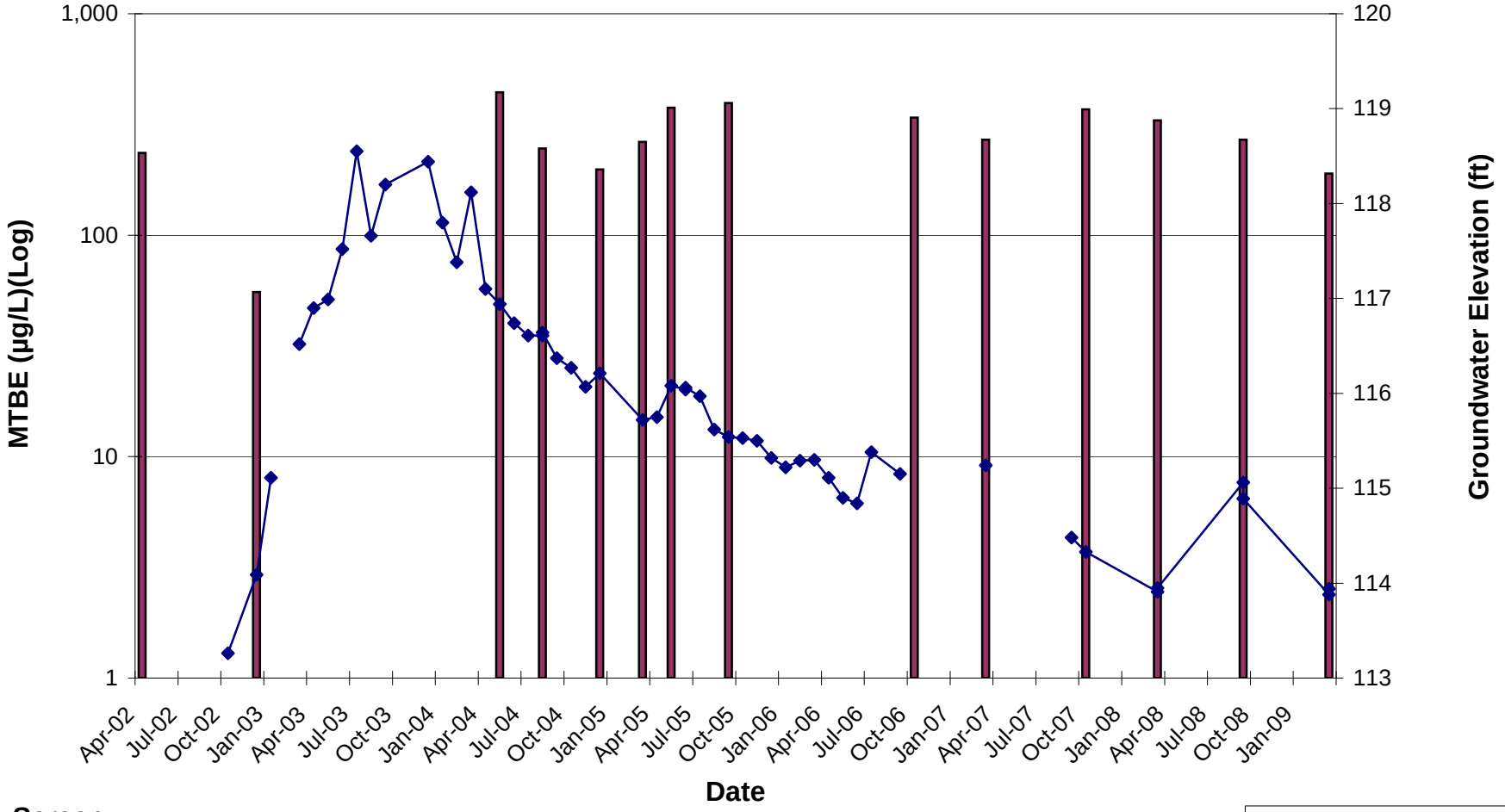
FIGURE 18: GP-2F (45-50) BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
45-50 ft bgs
Screen Top: 114.59 ft
Screen Bottom: 109.59 ft

ND : Not Detected above the reporting limit

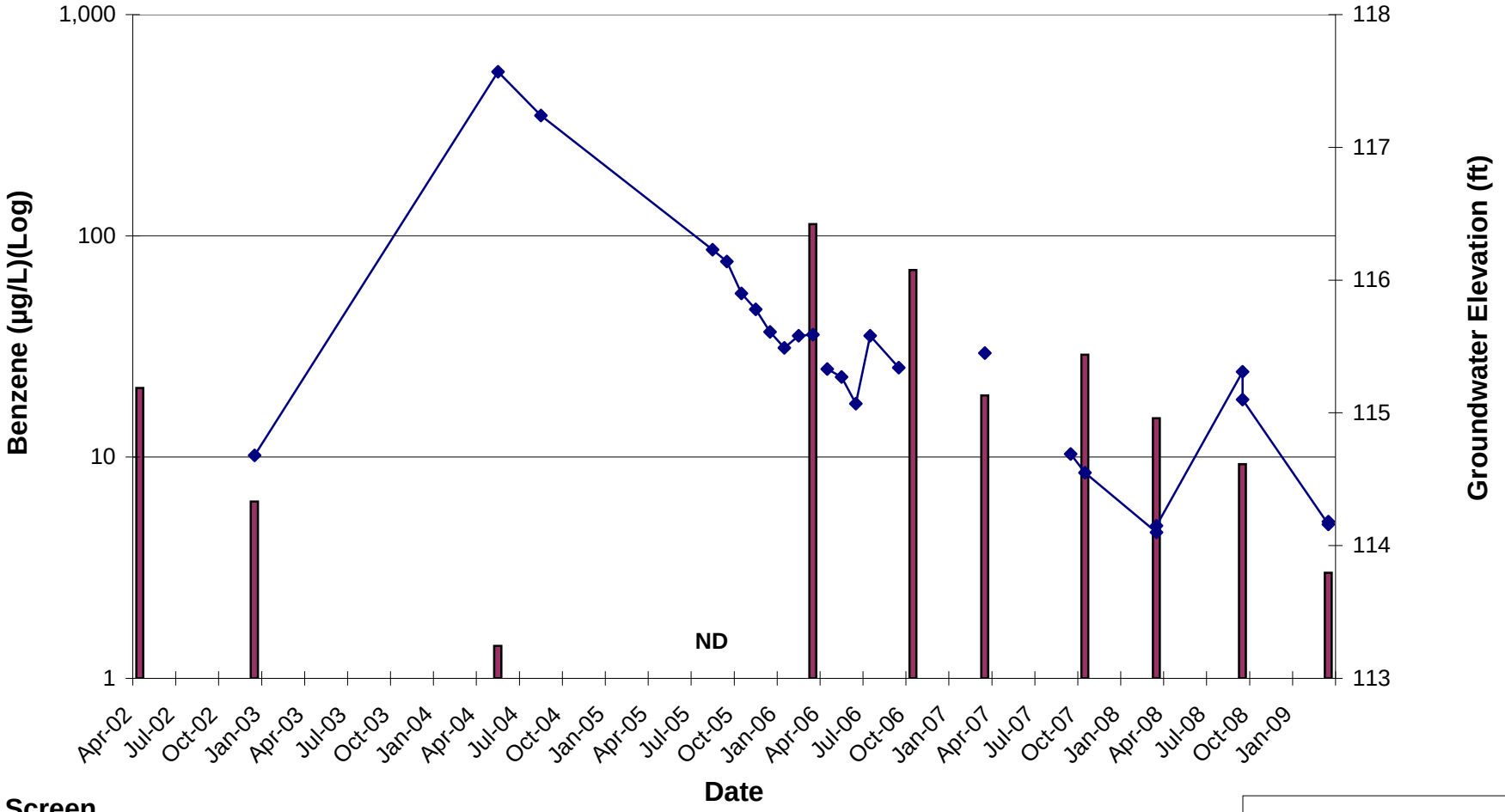
FIGURE 19: GP-2F (45-50) MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
45-50 ft bgs
Screen Top: 114.59 ft
Screen Bottom: 109.59 ft

ND : Not Detected above the reporting limit

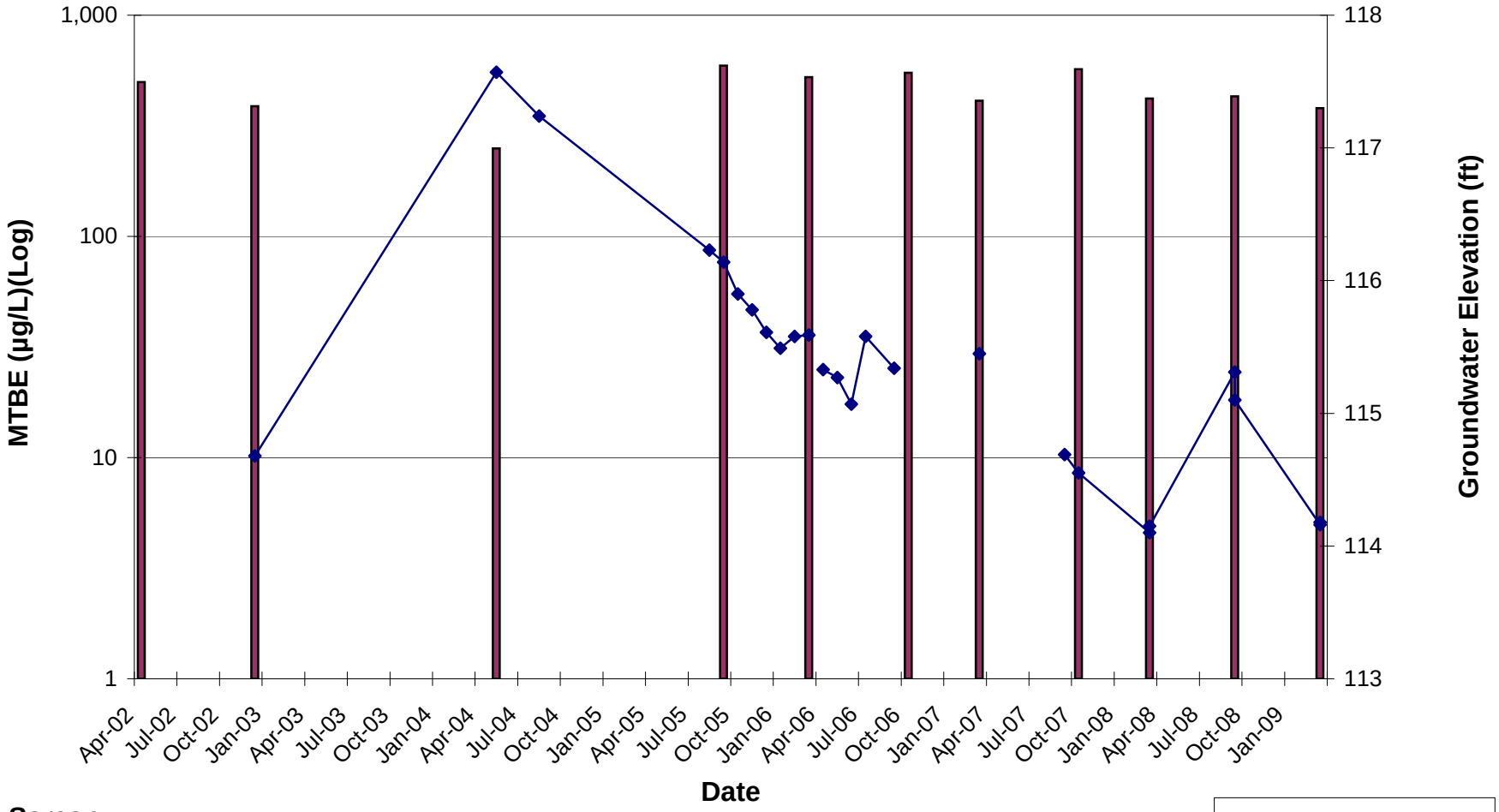
FIGURE 20: GP-2F (50-55) BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
50-55 ft bgs
Screen Top: 109.59 ft
Screen Bottom: 104.59 ft

ND : Not Detected above the reporting limit

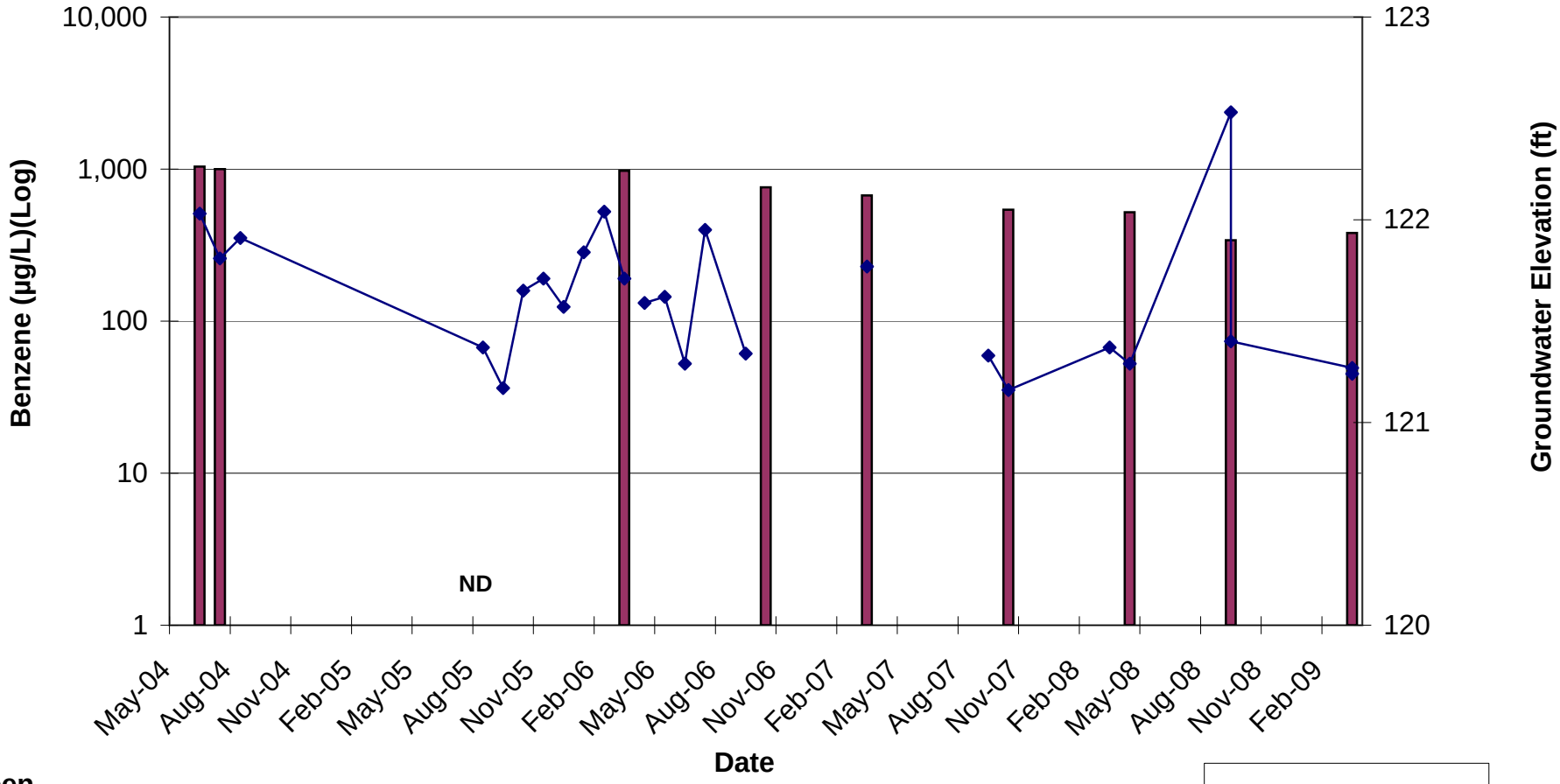
FIGURE 21: GP-2F (50-55) MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
50-55 ft bgs
Screen Top: 109.59 ft
Screen Bottom: 104.59 ft

ND : Not Detected above the reporting limit

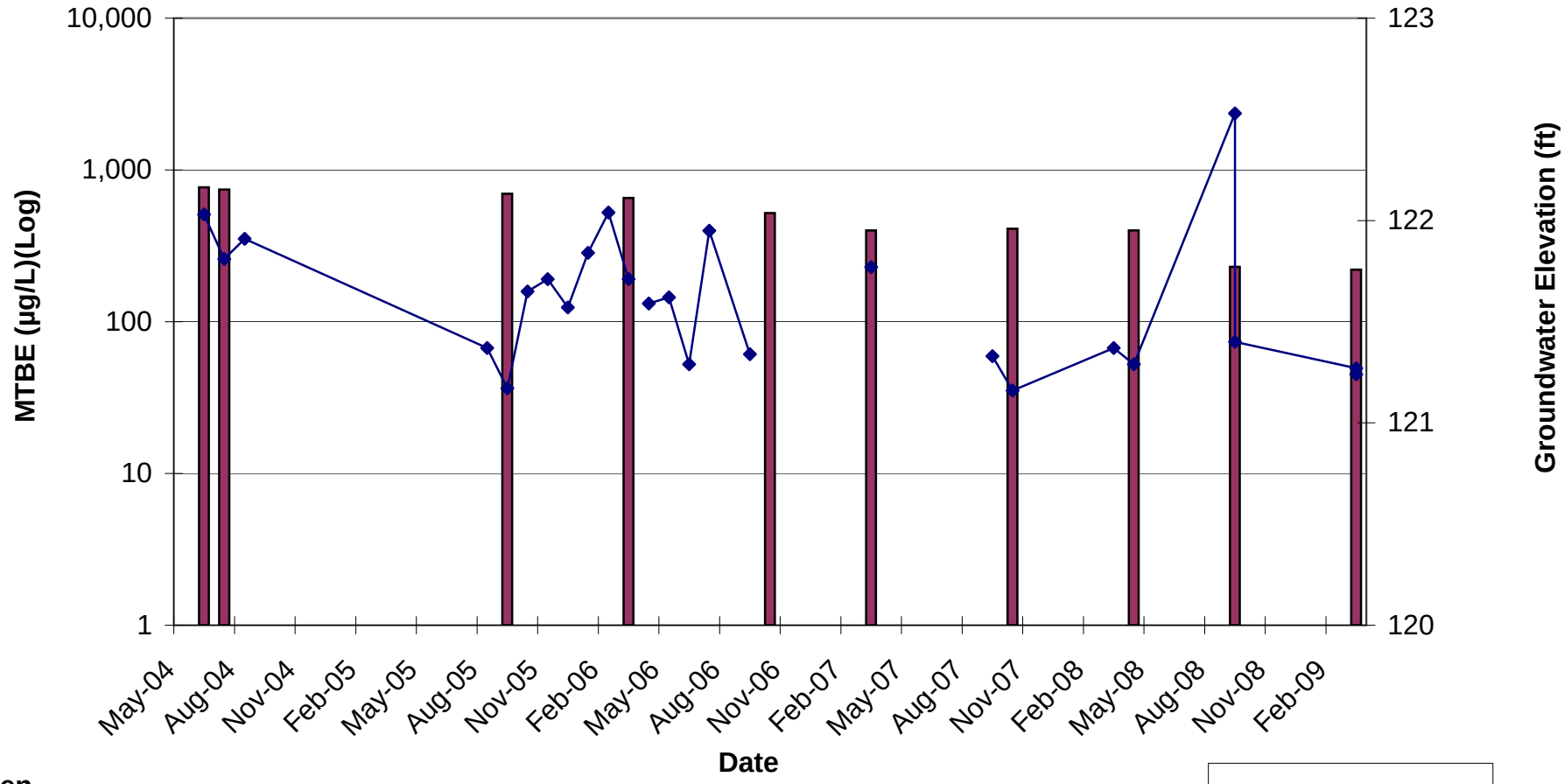
FIGURE 22: MW-33B BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
13-23 ft bgs
Screen Top: 113.16 ft
Screen Bottom: 103.13 ft

ND : Not Detected above the reporting limit

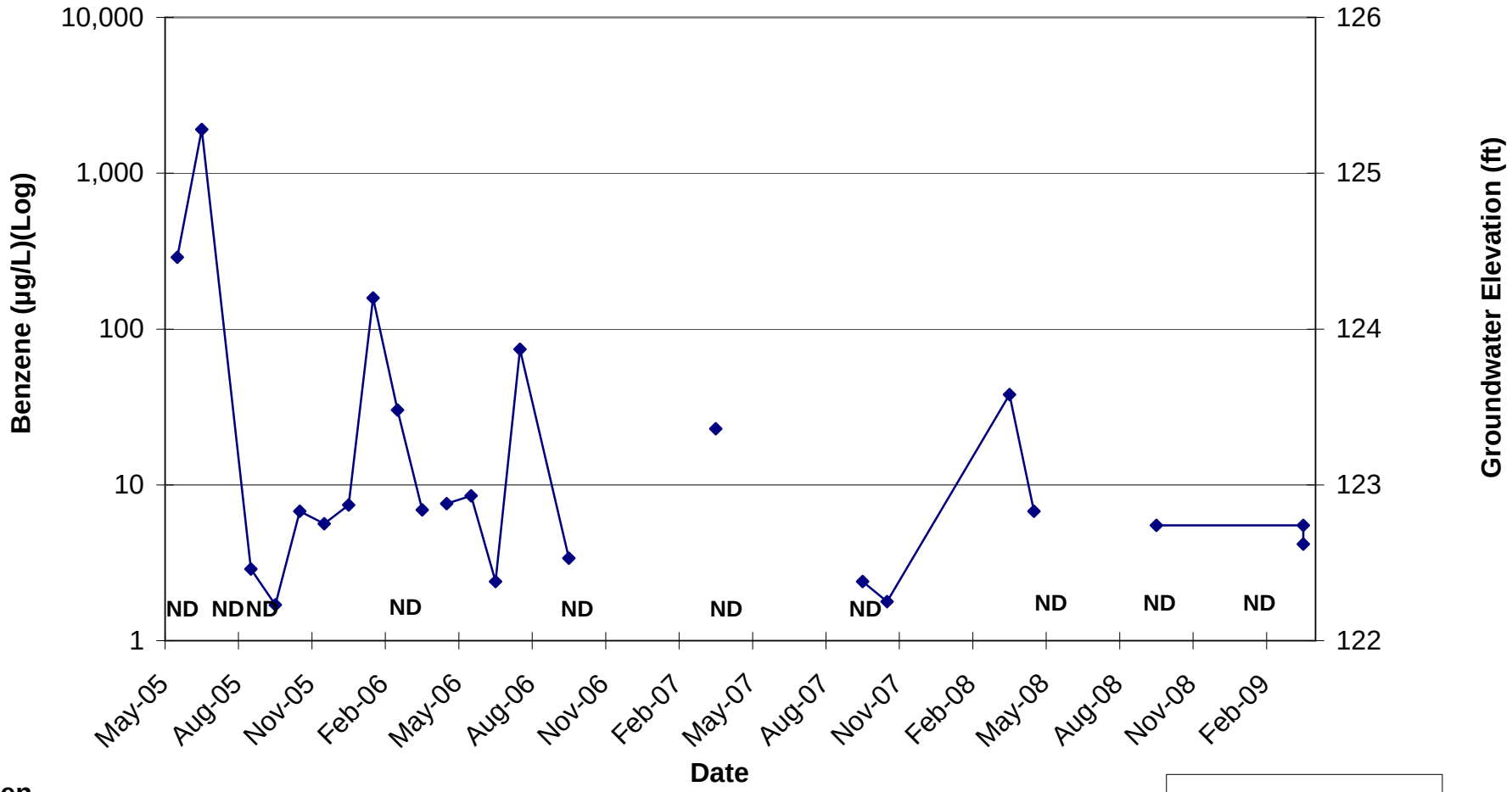
FIGURE 23: MW-33B MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
13-23 ft bgs
Screen Top: 113.16 ft
Screen Bottom: 103.13 ft

ND : Not Detected above the reporting limit

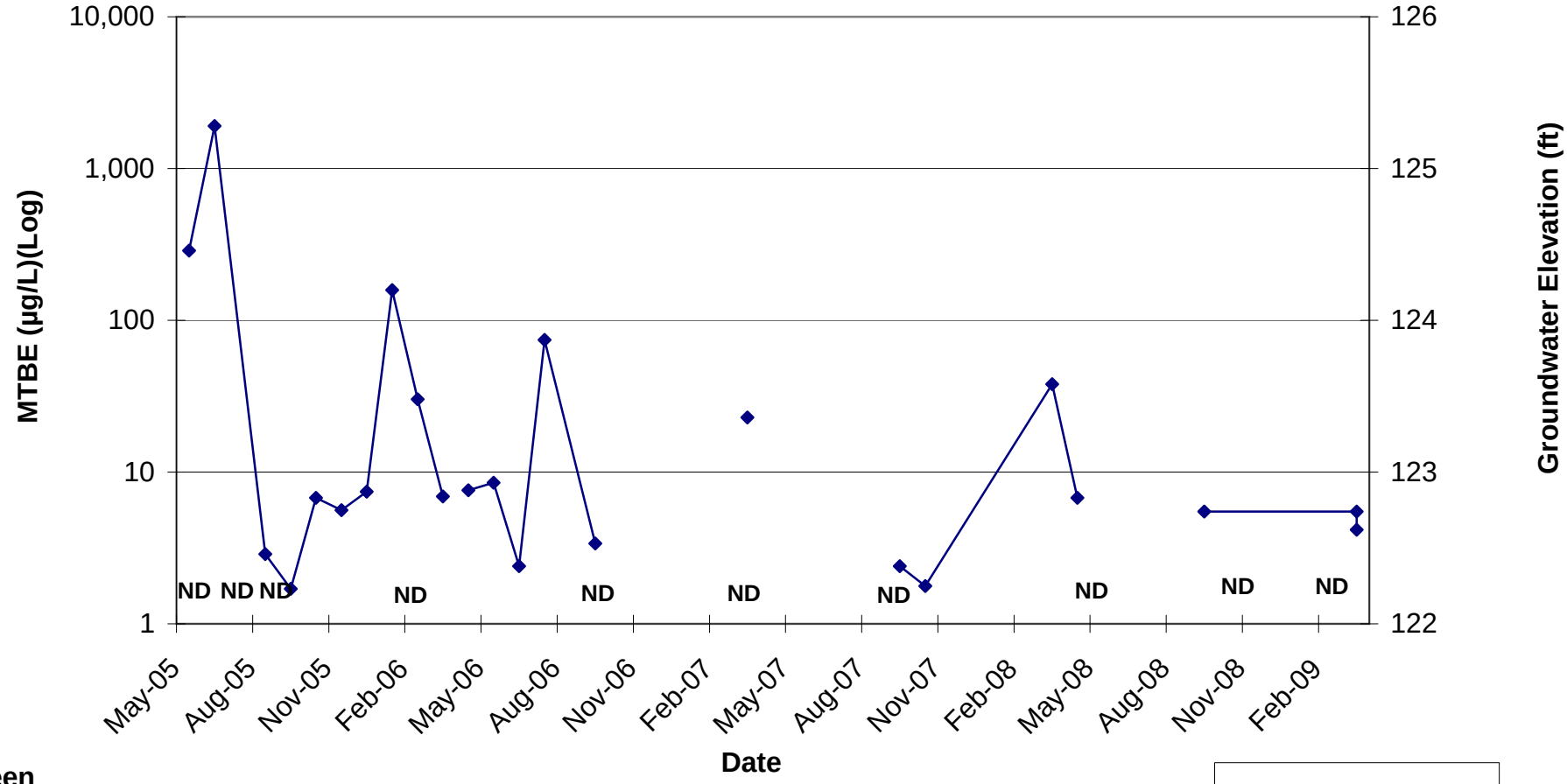
FIGURE 24: MW-33S BENZENE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
2-7 ft bgs
Screen Top: 124.58 ft
Screen Bottom: 117.58 ft

ND : Not Detected above the reporting limit

FIGURE 25: MW-33S MTBE TREND ANALYSIS
SEMI-ANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND



Screen
2-7 ft bgs
Screen Top: 124.58 ft
Screen Bottom: 117.58 ft

ND : Not Detected above the reporting limit

APPENDIX A

DUAL-PHASE EXTRACTION SYSTEM – TOTAL FLUIDS EXTRACTION DATA

APPENDIX A

DUAL-PHASE EXTRACTION SYSTEM – TOTAL FLUIDS EXTRACTION DATA

DESCRIPTION OF DATA TABLES

Chevron uses a central database to store remediation system data and laboratory analytical data. The tabulated data in Tables A-1, A-2, and A-3 is an exported summary of the total fluids extraction system data from the database. These data were recorded by the field technician during site visits. The analytical data for influent samples collected for laboratory analysis (Table A-2) are used to calculate the mass (and to estimate the volume) of hydrocarbons recovered in the dissolved phase. Effluent sample data are included in Table A-3 for comparison with permit limits.

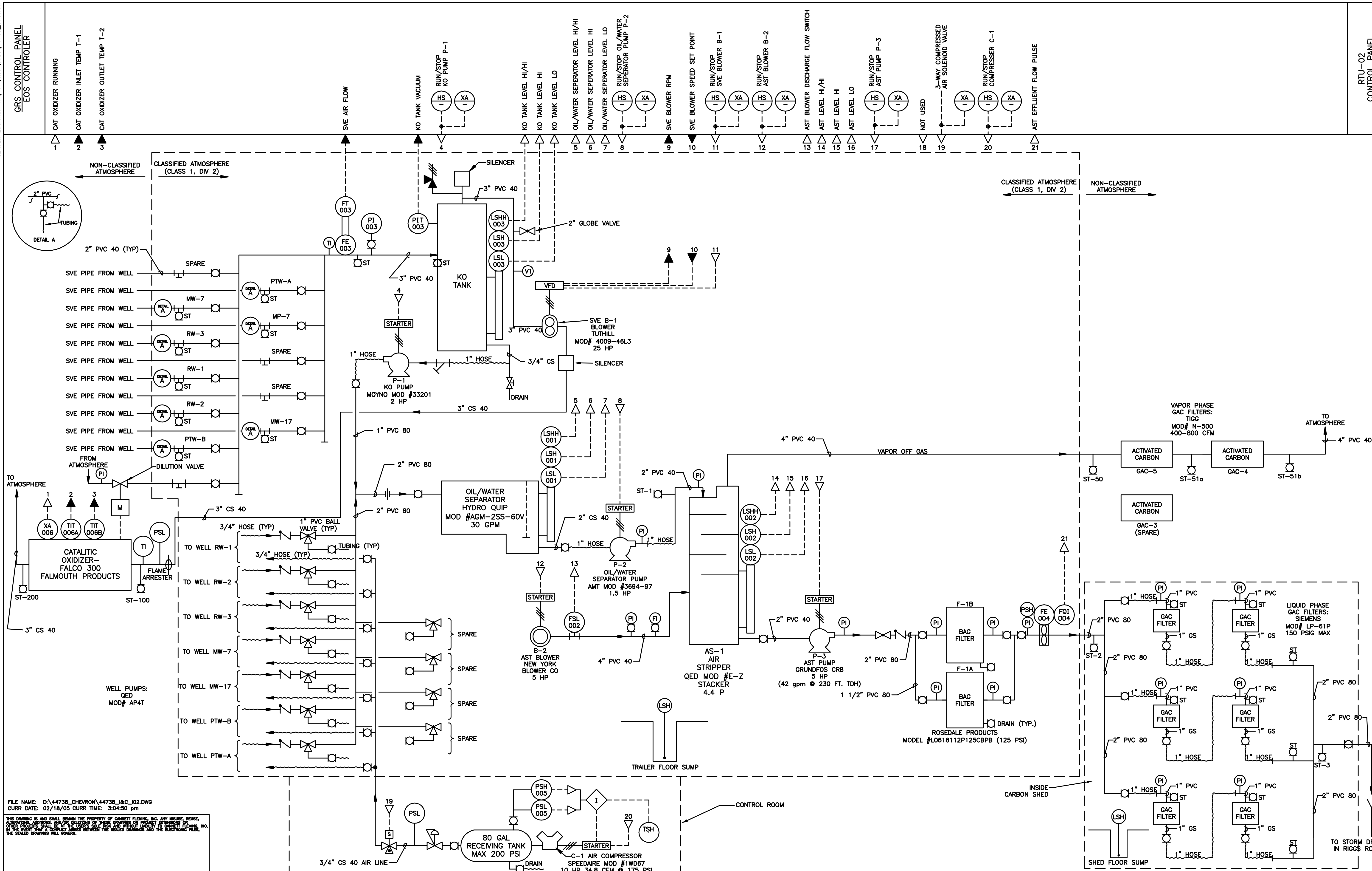
The data table includes all system data collected since July 1, 2008. Data collected prior to this date are available in previous progress reports.

The following table lists the column headings in the table with a brief description of each. Please refer to the Process and Instrumentation Diagram (next page) for a schematic of equipment and sample ports.

Column Heading	Description
Date / Time	Date and time data were recorded.
System Status	System ON or OFF when technician recorded the data.
Influent BTEX (µg/L)	Sum of benzene, toluene, ethylbenzene, and total xylenes from influent sample port SP-1.
Effluent BTEX (µg/L)	Sum of benzene, toluene, ethylbenzene, and total xylenes from effluent sample port SP-3.
Treatment Efficiency (%)	Equation: (Influent-Effluent) / (Influent).
Totalizer Reading (gallons)	Reading on the totalizing flow meter.
Pumped Period (gallons)	Equation: (current totalizer reading) – (previous totalizer reading).
Pumped Total (gallons)	Cumulative total gallons of groundwater recovered.
Period Average (GPM)	Equation: (Gallons Pumped During Period) / (current Date-Time – previous Date-Time)
Hydrocarbons Recovered Period (gallons)[1]	Equation: [Avg. Influent BTEX (ug/L)] * e^6 * (1/0.2) * (3.785 L/gal) * (1 lb/453.6 g) * (gallons pumped) * (1 gal/6.26 lbs). NOTE: Formula assumes BTEX equals 20% of gasoline.
Hydrocarbons Recovered Cumulative (gallons)	Equation: (Hydrocarbons Recovered During Period) + (Previous Cumulative)
Operating Extraction Points	Wells in operation during the reporting period.

Notes

(1) Assumptions: BTEX is 20% of hydrocarbon product by volume; density of hydrocarbon product is 6.26 pounds/gallon. The Average (Avg.) Influent BTEX concentration is defined as the mean of the influent concentration for the current and previous sampling events.



SERVER LOCATION K:\411\Inst\Jobs\44738_Chevron
GRS CONTROL PANEL
EOS CONTROLER
CAT OXIDIZER RUNNING
CAT OXIDIZER INLET TEMP T-1
CAT OXIDIZER OUTLET TEMP T-2
SVE AIR FLOW
KO TANK VACUUM
RUN/STOP KO PUMP P-1
KO TANK LEVEL HI/HI
KO TANK LEVEL HI
KO TANK LEVEL LO
OIL/WATER SEPERATOR LEVEL HI/HI
OIL/WATER SEPERATOR LEVEL HI
OIL/WATER SEPERATOR LEVEL LO
RUN/STOP OIL/WATER SEPERATOR PUMP P-2
SVE BLOWER RPM
SVE BLOWER SPEED SET POINT
RUN/STOP SVE BLOWER B-1
RUN/STOP AST BLOWER B-2
AST BLOWER DISCHARGE FLOW SWITCH
AST LEVEL HI/HI
AST LEVEL HI
AST LEVEL LO
RUN/STOP AST PUMP P-3
NOT USED
3-WAY COMPRESSED AIR SOLENOID VALVE
RUN/STOP COMPRESSER C-1
AST EFFLUENT FLOW PULSE
RTU-02 CONTROL PANEL
NON-CLASSIFIED ATMOSPHERE
CLASSIFIED ATMOSPHERE (CLASS 1, DIV 2)
DETAIL A
2" PVC 40 (TYP)
SVE PIPE FROM WELL
SPARE
PTW-A
MW-7
MP-7
RW-3
RW-1
RW-2
MW-17
PTW-B
FROM ATMOSPHERE
DILUTION VALVE
TO ATMOSPHERE
SILENCER
3" PVC 40
2" GLOBE VALVE
KO TANK
STARTER
VFD
SVE B-1 BLOWER TUTHILL MOD# 4009-46L3 25 HP
1" HOSE
P-1 KO PUMP MOYNO MOD #33201 2 HP
3/4" CS
DRAIN
3" CS 40
1" PVC 80
2" PVC 80
OIL/WATER SEPARATOR HYDRO QUIP MOD #AGM-2SS-60V 30 GPM
2" CS 40
P-2 OIL/WATER SEPARATOR PUMP AMT MOD #3694-97 1.5 HP
CATALITIC OXIDIZER- FALCO 300 FALMOUTH PRODUCTS
FLAME ARRESTER
ST-200
ST-100
3/4" HOSE (TYP)
1" PVC BALL VALVE (TYP)
TUBING (TYP)
TO WELL RW-1
TO WELL RW-2
TO WELL RW-3
TO WELL MW-7
TO WELL MW-17
TO WELL PTW-B
TO WELL PTW-A
WELL PUMPS: QED MOD# AP4T
4" PVC 40
VAPOR OFF GAS
B-2 AST BLOWER NEW YORK BLOWER CO 5 HP
AS-1 AIR STRIPPER QED MOD #E-Z STACKER 4.4 P
P-3 AST PUMP GRUNDFOS CR8 5 HP (42 gpm @ 230 FT. TDH)
1 1/2" PVC 80
BAG FILTER
F-1B
F-1A
DRAIN (TYP.)
ROSEDALE PRODUCTS MODEL #L0618112P125CBPB (125 PSI)
VAPOR PHASE GAC FILTERS: TIGG MOD# N-500 400-800 CFM
ACTIVATED CARBON
GAC-5
GAC-4
GAC-3 (SPARE)
ST-50
ST-51a
ST-51b
4" PVC 40
LIQUID PHASE GAC FILTERS: SIEMENS MOD# LP-61P 150 PSIG MAX
GAC FILTER
1" GS
1" HOSE
ST-2
ST-3
TO STORM DRAIN IN RIGGS ROAD
INSIDE CARBON SHED
SHED FLOOR SUMP
TRAILER FLOOR SUMP
CONTROL ROOM
80 GAL RECEIVING TANK MAX 200 PSI
C-1 AIR COMPRESSOR SPEEDAIRE MOD #1WD67 10 HP 34.8 CFM @ 175 PSI
3/4" CS 40 AIR LINE

FILE NAME: D:\44738_CHEVRON\44738_I&C_I02.DWG
CURR DATE: 02/18/05 CURR TIME: 3:04:50 pm

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Gannett Fleming
BALTIMORE, MARYLAND

CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

INSTRUMENTATION
PROCESS AND INSTRUMENTATION DIAGRAM

JOB No. 44738
DATE 12/20/07
SHEET No. 10
10 of 15

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TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
7/3/08 12:15	ON	NS	NS	-	26,092,114	0	36,624,836	0.00	-	702.28	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
7/29/08 9:30	ON	931	0	100.0	26,489,000	396,886	37,021,722	10.65	6.96	709.25	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
8/4/08 7:30	ON	NS	0	-	26,643,700	154,700	37,176,422	18.16	-	709.25	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
8/8/08 15:15	OFF	NS	NS	-	26,753,000	109,300	37,285,722	17.56	-	709.25	Manual shutdown by RWS
8/11/08 9:30	ON	NS	0	-	26,753,000	0	37,285,722	0.00	-	709.25	RW1 RW2 RW3 MW7 MW17 PTWA
8/19/08 7:00	ON	682	0	100.0	26,909,900	156,900	37,442,622	13.80	2.26	711.51	RW1 RW2 RW3 MW7 MW17 PTWA
8/25/08 11:00	ON	NS	0	-	27,033,200	123,300	37,565,922	13.89	-	711.51	RW1 RW2 RW3 MW7 MW17 PTWA
9/3/08 7:30	ON	NS	NS	-	27,214,800	181,600	37,747,522	14.24	-	711.51	RW1 RW2 RW3 MW7 MW17 PTWA
9/4/08 0:00	ON	NS	0	-	27,236,700	21,900	37,769,422	22.12	-	711.51	RW1 RW2 RW3 MW7 MW17 PTWA
9/8/08 7:00	ON	NS	0	-	27,316,400	79,700	37,849,122	12.90	-	711.51	RW1 RW2 RW3 MW7 MW17 PTWA
9/18/08 7:00	ON	562	0	100.0	27,515,100	198,700	38,047,822	13.80	2.51	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
9/25/08 14:15	ON	NS	0	-	27,644,039	128,939	38,176,761	12.26	-	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
10/1/08 6:00	ON	NS	NS	-	27,704,400	60,361	38,237,122	7.41	-	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
10/2/08 0:14	OFF	NS	NS	-	27,719,751	15,351	38,252,473	14.03	-	714.02	AST-HH Backwash Carbons
10/2/08 14:00	ON	NS	NS	-	27,728,600	8,849	38,261,322	10.71	-	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
10/6/08 7:00	ON	NS	0	-	27,783,500	54,900	38,316,222	10.28	-	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
10/13/08 6:00	ON	NS	0	-	27,884,300	100,800	38,417,022	10.06	-	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
10/16/08 16:30	OFF	NS	NS	-	27,932,500	48,200	38,465,222	9.74	-	714.02	Manual shutdown by RWS
10/17/08 12:00	ON	NS	NS	-	27,932,500	0	38,465,222	0.00	-	714.02	RW1 RW2 RW3 MW7 MW17 PTWA
10/20/08 7:00	ON	1,282	0	100.0	28,009,500	77,000	38,542,222	19.15	3.04	717.05	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
10/27/08 3:35	OFF	NS	NS	-	28,179,500	170,000	38,712,222	17.22	-	717.05	AST-HH Bag Filters
10/27/08 10:45	ON	NS	0	-	28,179,500	0	38,712,222	0.00	-	717.05	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
10/29/08 20:01	OFF	NS	NS	-	28,243,156	63,656	38,775,878	18.53	-	717.05	Control room hi temp - Air compressor fail
10/30/08 11:30	ON	NS	NS	-	28,243,156	0	38,775,878	0.00	-	717.05	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
11/3/08 8:30	ON	NS	0	-	28,341,800	98,644	38,874,522	17.68	-	717.05	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
11/10/08 7:00	ON	791	0	100.0	28,504,400	162,600	39,037,122	16.28	3.42	720.47	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
11/17/08 12:00	OFF	NS	NS	-	28,762,500	258,100	39,295,222	24.87	-	720.47	Off for routine maintenance
11/17/08 13:30	ON	NS	0	-	28,762,500	0	39,295,222	0.00	-	720.47	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
11/24/08 13:15	ON	NS	0	-	28,957,000	194,500	39,489,722	19.32	-	720.47	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
11/24/08 14:50	OFF	NS	NS	-	28,958,900	1,900	39,491,622	20.00	-	720.47	Bag filter piping failure
12/2/08 9:20	ON	NS	0	-	28,958,900	0	39,491,622	0.00	-	720.47	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
12/8/08 7:45	OFF	NS	NS	-	29,153,500	194,600	39,686,222	22.77	-	720.47	Off for routine maintenance
12/8/08 12:05	ON	773	0	100.0	29,153,500	0	39,686,222	0.00	3.38	723.86	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
12/15/08 12:20	ON	NS	0	-	29,378,800	225,300	39,911,522	22.32	-	723.86	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
12/22/08 11:30	ON	NS	NS	-	29,597,900	219,100	40,130,622	21.84	-	723.86	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
12/22/08 12:30	OFF	NS	NS	-	29,603,500	5,600	40,136,222	93.33	-	723.86	Off for GAC change

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TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
12/23/08 13:30	ON	NS	0	-	29,603,500	0	40,136,222	0.00	-	723.86	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
12/29/08 12:20	ON	NS	NS	-	29,784,600	181,100	40,317,322	21.13	-	723.86	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
12/31/08 13:55	ON	NS	NS	-	29,913,200	128,600	40,445,922	43.23	-	723.86	from EOS
1/5/09 11:25	ON	511	0	100.0	30,000,500	87,300	40,533,222	12.38	3.62	727.48	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
1/12/09 14:15	ON	NS	0	-	30,221,700	221,200	40,754,422	21.58	-	727.48	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
1/19/09 10:15	ON	NS	0	-	30,435,700	214,000	40,968,422	21.75	-	727.48	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
1/26/09 12:05	ON	NS	0	-	30,656,700	221,000	41,189,422	21.69	-	727.48	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
2/2/09 7:55	ON	948	0	100.0	30,866,200	209,500	41,398,922	21.31	4.21	731.69	RW1 RW2 RW3 MW17 PTWA PTWB
2/9/09 8:20	OFF	NS	NS	-	31,005,700	139,500	41,538,422	13.81	-	731.69	Off for vault plumbing repairs
2/9/09 8:50	ON	NS	0	-	31,005,700	0	41,538,422	0.00	-	731.69	RW1 RW2 RW3 MW17 PTWB
2/16/09 10:10	OFF	NS	NS	-	31,099,500	93,800	41,632,222	9.23	-	731.69	Off for routine maintenance
2/16/09 16:10	ON	NS	0	-	31,099,500	0	41,632,222	0.00	-	731.69	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
2/23/09 18:22	OFF	NS	NS	-	31,315,600	216,100	41,848,322	21.16	-	731.69	Low pressure air compressor - tripped motor starter
2/24/09 10:00	ON	NS	0	-	31,315,600	0	41,848,322	0.00	-	731.69	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/2/09 8:55	ON	550	0	100.0	31,506,300	190,700	42,039,022	22.24	3.20	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/4/09 6:45	OFF	NS	NS	-	31,563,800	57,500	42,096,522	20.91	-	734.89	Low pressure air compressor - tripped motor starter
3/5/09 12:40	ON	NS	NS	-	31,563,800	0	42,096,522	0.00	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/9/09 10:32	ON	NS	0	-	31,680,500	116,700	42,213,222	20.72	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/12/09 11:20	OFF	NS	NS	-	31,772,100	91,600	42,304,822	20.97	-	734.89	Off on OWS-HH
3/12/09 15:20	ON	NS	NS	-	31,772,100	0	42,304,822	0.00	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/16/09 8:25	OFF	NS	NS	-	31,884,900	112,800	42,417,622	21.10	-	734.89	Off to clean air stripper
3/16/09 12:15	ON	NS	NS	-	31,884,900	0	42,417,622	0.00	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/16/09 13:30	OFF	NS	NS	-	31,886,100	1,200	42,418,822	16.00	-	734.89	Off on AST_HH (clogged bag filters)
3/16/09 13:50	ON	NS	0	-	31,886,100	0	42,418,822	0.00	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/19/09 15:40	OFF	NS	NS	-	31,977,800	91,700	42,510,522	20.70	-	734.89	AST-HH (clogged bag filters)
3/23/09 10:50	ON	NS	0	-	31,977,800	0	42,510,522	0.00	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
3/24/09 8:30	OFF	NS	NS	-	31,994,900	17,100	42,527,622	13.15	-	734.89	Comp-Lo Compressor Needs to be Replaced
5/5/09 12:15	ON	NS	NS	-	31,994,900	0	42,527,622	0.00	-	734.89	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
5/11/09 7:00	OFF	NS	NS	-	32,055,600	60,700	42,588,322	7.29	-	734.89	Comp_Lo - Auto drain on compressor Replaced
5/11/09 12:30	ON	3,120	0	100.0	32,055,600	0	42,588,322	0.00	6.72	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
5/18/09 9:30	OFF	NS	NS	-	32,059,900	4,300	42,592,622	0.43	-	741.60	Comp_Lo
5/18/09 15:15	ON	NS	NS	-	32,059,900	0	42,592,622	0.00	-	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
5/20/09 10:28	OFF	NS	NS	-	32,075,500	15,600	42,608,222	6.02	-	741.60	SUMP - Off for OWS plumbing repairs

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TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

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Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
5/20/09 14:42	ON	NS	NS	-	32,075,500	0	42,608,222	0.00	-	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
5/26/09 7:30	OFF	NS	NS	-	32,079,700	4,200	42,612,422	0.51	-	741.60	VFD High AMP fault
5/26/09 7:59	ON	NS	0	-	32,079,700	0	42,612,422	0.00	-	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
5/30/09 23:59	ON	NS	NS	-	32,134,938	55,238	42,667,660	8.22	-	741.60	Estimated
6/3/09 9:00	ON	NS	NS	-	32,211,300	76,362	42,744,022	15.71	-	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
6/3/09 10:30	OFF	NS	NS	-	32,212,000	700	42,744,722	7.78	-	741.60	Off to replace fitting on OWS pump
6/3/09 11:10	ON	NS	0	-	32,212,000	0	42,744,722	0.00	-	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
6/8/09 7:59	OFF	NS	NS	-	32,262,000	50,000	42,794,722	7.13	-	741.60	SUMP - Off for OWS plumbing repairs
6/8/09 10:20	ON	NS	0	-	32,262,000	0	42,794,722	0.00	-	741.60	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
6/15/09 9:39	ON	975	0	100.0	32,353,000	91,000	42,885,722	9.06	4.06	745.66	RW1 RW2 RW3 MW7 MW17 PTWA PTWB
6/22/09 7:15	ON	NS	0	-	32,434,800	81,800	42,967,522	8.23	-	745.66	RW1 RW2 RW3 MW7 MW17 PTWA PTWB

Notes:

(1) Hydrocarbons Recovered Period (gallons) = (avg. inf. conc.) x (e-6) x (1/0.2) x (3.785 L/gal) x (1 lb/453.6 g) x (gallons pumped) x (1 gal/6.26 lbs).

(2) Formula assumes BTEX equals 20% of gasoline.

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TABLE A-2: TOTAL FLUIDS EXTRACTION SYSTEM INFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Date/Time	Benzene (µg/L)	Toluene (µg/L)	E. Benzene (µg/L)	Xylenes (µg/L)	BTEX (µg/L)	MTBE (µg/L)
7/24/08 14:50	240	390	31	270	931	240
8/19/08 10:35	190	280	22	190	682	240
9/18/08 10:55	160	240	17	145	562	260
10/20/08 10:40	360	510	52	360	1,282	300
11/10/08 13:30	200	300	28	263	791	250
12/8/08 13:30	170	310	30	263	773	170
1/5/09 12:40	130	210	18	153	511	210
2/2/09 15:25	220	380	38	310	948	300
3/2/09 9:45	120	220	19	191	550	210
5/11/09 13:05	810	1,300	130	880	3,120	500
6/15/09 12:03	240	390	35	310	975	410

Notes:
(1) ND: Not Detected above reporting limit.
(2) <##: Parameter not detected above the reporting limit.
(3) System was not operating in April 2009 due to compressor failure.

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TABLE A-3: TOTAL FLUIDS EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	BTEX (µg/L)	MTBE (µg/L)
7/24/08 14:25	< 1	< 1	< 1	< 3	0	6.6
8/4/08 12:25	< 1	< 1	< 1	< 3	0	7.3
8/11/08 14:00	<1	<1	<1	<3	0	8.5
8/19/08 10:10	<1	<1	<1	<3	0	6.4
8/25/08 11:40	<1	<1	<1	<3	0	6.8
9/4/08 16:05	<1	<1	<1	<3	0	7.7
9/8/08 14:25	<1	<1	<1	<3	0	7.1
9/18/08 10:30	<1	<1	<1	<3	0	6.2
9/25/08 14:15	<1	<1	<1	<3	0	4.6
10/6/08 7:00	<1	<1	<1	<3	0	3.6
10/13/08 10:45	<1	<1	<1	<3	0	3.9
10/20/08 10:15	<1	<1	<1	<3	0	4.3
10/27/08 11:25	<1	<1	<1	<3	0	4.7
11/3/08 9:00	<1	<1	<1	<3	0	4.4
11/10/08 13:05	<1	<1	<1	<3	0	6.4
11/17/08 15:00	<1	<1	<1	<3	0	5.6
11/24/08 14:25	<1	<1	<1	<3	0	6.4
12/2/08 10:30	<1	<1	<1	<3	0	16
12/8/08 13:05	<1	<1	<1	<3	0	9
12/15/08 14:25	<1	<1	<1	<3	0	13
12/23/08 14:10	<1	<1	<1	<3	0	<1
1/5/09 12:15	<1	<1	<1	<3	0	<1
1/12/09 14:35	<1	<1	<1	<3	0	<1
1/19/09 11:35	<1	<1	<1	<3	0	<1
1/26/09 12:00	<1	<1	<1	<3	0	1.7
2/2/09 15:00	<1	<1	<1	<3	0	2.1
2/9/09 14:25	<1	<1	<1	<3	0	2.1
2/16/09 17:10	<1	<1	<1	<3	0	2.1
2/24/09 13:05	<1	<1	<1	<3	0	3.1
3/2/09 9:20	<1	<1	<1	<3	0	4.6
3/9/09 11:10	<1	<1	<1	<3	0	4.5
3/16/09 13:10	<1	<1	<1	<3	0	4.7
3/23/09 11:40	<1	<1	<1	<3	0	3.8
5/11/09 13:09	<1	<1	<1	<3	0	8.4
5/26/09 12:22	<1	<1	<1	<3	0	6.1
6/3/09 11:37	<1	<1	<1	<3	0	11
6/8/09 15:27	<1	<1	<1	<3	0	9.6
6/15/09 12:12	<1	<1	<1	<3	0	9.6

Notes:
(1) ND: Not Detected above reporting limit.
(2) <##: Parameter not detected above the reporting limit.
(3) Remediation system was not operating in April 2009 due to compressor failure. System effluent samples were not collected during that time period.
(4) Only two effluent samples were collected in May 2009 due to low water discharge.

APPENDIX B

DUAL-PHASE EXTRACTION SYSTEM – SOIL VAPOR EXTRACTION DATA

APPENDIX B

DUAL-PHASE EXTRACTION SYSTEM – SOIL VAPOR EXTRACTION DATA

DESCRIPTION OF DATA TABLES

Overview

Chevron uses a central database to store remediation system data and laboratory analytical data. The tabulated data in Tables B-1, B-2 and B-3 is an exported summary of soil vapor extraction ("SVE") system data from the database. These data were recorded by the field technician during site visits. Analytical data for influent samples collected for laboratory analysis are included in Table B-2 to calculate the mass recovery rates of total petroleum hydrocarbons and benzene. Effluent sample data are included in Table B-3 for comparison with permit limits.

The data tables include all system data collected since July 1, 2008. Data collected prior to this date are available in previous progress reports.

The following table lists the column headings in the table with a brief description of each. Please refer to the Process and Instrumentation Diagram (Appendix A) for a schematic of equipment and sample ports.

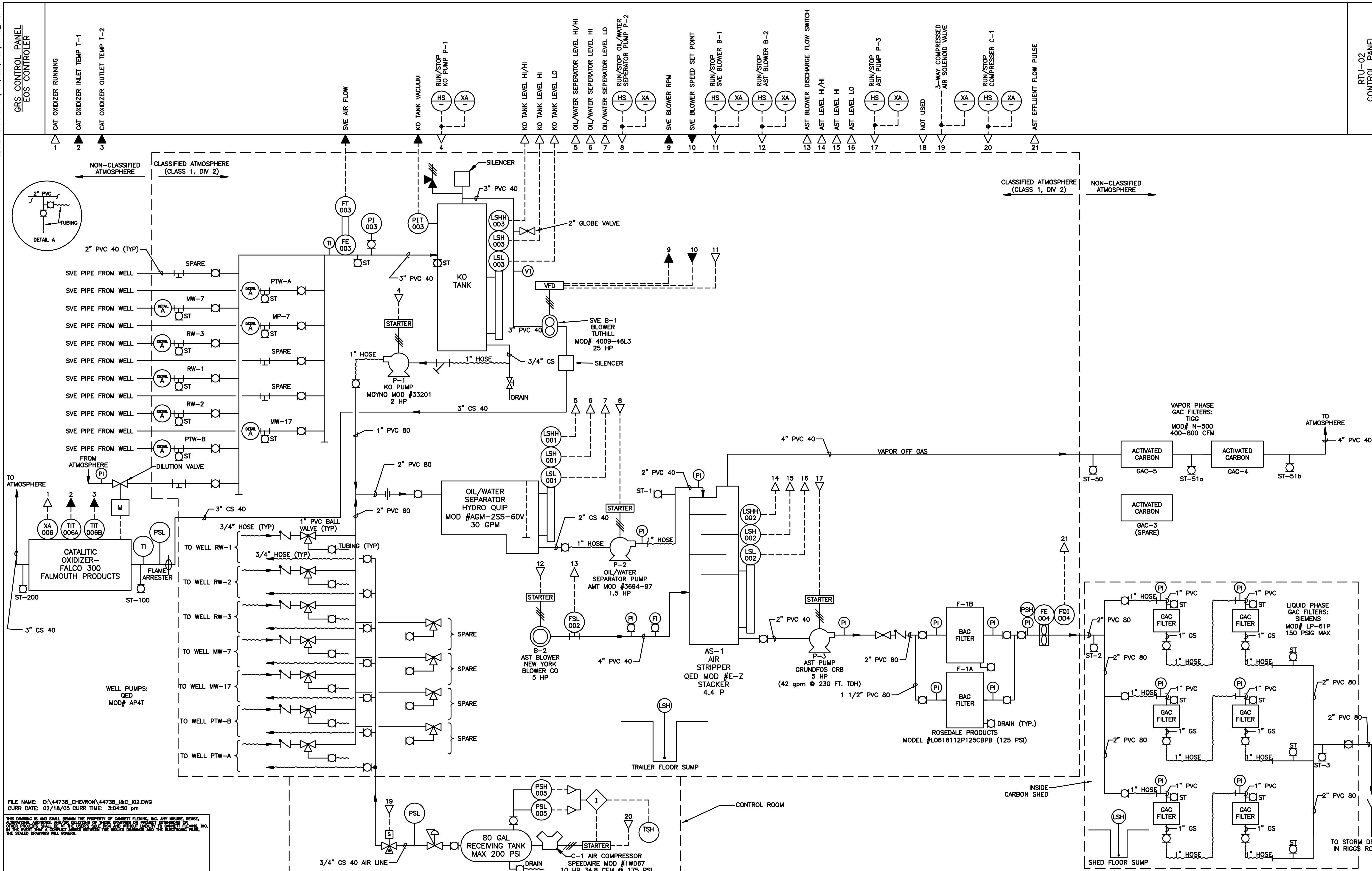
Column Heading	Description
Date / Time	Date and time data were recorded.
System Status	System ON or OFF when technician recorded the data.
Hour Meter (hours)	Field measurement of the hour meter.
Manifold Vacuum (in Hg)	Field measurement of vacuum in manifold.
Influent (ppmv)	Field measurement of vapor concentration prior to treatment using a photoionization detector.
Influent (cfm)	Field measurement of total vapor flow in manifold.
Effluent (ppmv)	Field measurement of vapor concentration after treatment using a photoionization detector.
Treatment Efficiency (%)	Equation: (Influent-Effluent) / (Influent).
Hydrocarbons Recovered (lbs/day) [1]	Equation: [(Influent) / (10^{-6})] * [Manifold Extraction-Flow Rate] * CV1
Hydrocarbons Recovered Period (gal)	Equation: [(Avg. Influent) x (10^{-6})] * [Avg. Manifold Extraction-Flow Rate]
Hydrocarbons Recovered Cumulative (gal)	Equation: (Avg. Influent BTEX) * (1 L / 0.26 gal) * (lb/454x10^{6} µg) * (current Total Gallons Pumped – previous Total Gallons Pumped on last sampling date) * (gal hydrocarbons / 6.48 lbs hydrocarbons) * (0.2 gal BTEX / gal hydrocarbons).
Operating Extraction Points	Wells in operation during the reporting period.

Notes

(1) Assumptions: Hydrocarbon molecular weight is 92 grams/mole; vapor behaves like an ideal gas; Average (Avg.) Influent (ppmv) and flow rate (Manifold Extraction in the table) are averages between the current and last events. Unit conversion factors (CV) equations are:

CV1 = (92 grams/mole) * (1 mol/24.45 L) * (28.32 L/ft^3) * (1440 min/day) * (1 lb/454 grams) = 338 min*lbs/day.

CV2 = (92 grams/mole) * (1 mol/24.45 L) * (28.32 L/ft^3) * (Runtime in minutes) * (1 lb/454 grams) = 0.235 min*lbs.



SERVER LOCATION K:\411\Inst\Jobs\44738_Chevron
GRS CONTROL PANEL
EOS CONTROLER
CAT OXIDIZER RUNNING
CAT OXIDIZER INLET TEMP T-1
CAT OXIDIZER OUTLET TEMP T-2
SVE AIR FLOW
KO TANK VACUUM
RUN/STOP KO PUMP P-1
KO TANK LEVEL HI/HI
KO TANK LEVEL HI
KO TANK LEVEL LO
OIL/WATER SEPERATOR LEVEL HI/HI
OIL/WATER SEPERATOR LEVEL HI
OIL/WATER SEPERATOR LEVEL LO
RUN/STOP OIL/WATER SEPERATOR PUMP P-2
SVE BLOWER RPM
SVE BLOWER SPEED SET POINT
RUN/STOP SVE BLOWER B-1
RUN/STOP AST BLOWER B-2
AST BLOWER DISCHARGE FLOW SWITCH
AST LEVEL HI/HI
AST LEVEL HI
AST LEVEL LO
RUN/STOP AST PUMP P-3
NOT USED
3-WAY COMPRESSED AIR SOLENOID VALVE
RUN/STOP COMPRESSER C-1
AST EFFLUENT FLOW PULSE
RTU-02 CONTROL PANEL
NON-CLASSIFIED ATMOSPHERE
CLASSIFIED ATMOSPHERE (CLASS 1, DIV 2)
DETAIL A
2" PVC
TUBING
2" PVC 40 (TYP)
SVE PIPE FROM WELL
SPARE
PTW-A
MW-7
MP-7
RW-3
RW-1
RW-2
MW-17
PTW-B
FROM ATMOSPHERE
DILUTION VALVE
TO ATMOSPHERE
CATALITIC OXIDIZER- FALCO 300 FALMOUTH PRODUCTS
FLAME ARRESTER
ST-200
ST-100
3" CS 40
SILENCER
3" PVC 40
KO TANK
2" GLOBE VALVE
VFD
SVE B-1 BLOWER TUTHILL MOD# 4009-46L3 25 HP
3/4" CS
1" HOSE
P-1 KO PUMP MOYNO MOD #33201 2 HP
STARTER
DRAIN
1" PVC 80
2" PVC 80
OIL/WATER SEPARATOR HYDRO QUIP MOD #AGM-2SS-60V 30 GPM
2" CS 40
P-2 OIL/WATER SEPARATOR PUMP AMT MOD #3694-97 1.5 HP
3/4" HOSE (TYP)
1" PVC BALL VALVE (TYP)
TUBING (TYP)
TO WELL RW-1
TO WELL RW-2
TO WELL RW-3
TO WELL MW-7
TO WELL MW-17
TO WELL PTW-B
TO WELL PTW-A
WELL PUMPS: QED MOD# AP4T
B-2 AST BLOWER NEW YORK BLOWER CO 5 HP
4" PVC 40
AS-1 AIR STRIPPER QED MOD #E-Z STACKER 4.4 P
P-3 AST PUMP GRUNDFOS CR8 5 HP (42 gpm @ 230 FT. TDH)
1 1/2" PVC 80
VAPOR OFF GAS
VAPOR PHASE GAC FILTERS: TIGG MOD# N-500 400-800 CFM
ACTIVATED CARBON
GAC-5
GAC-4
GAC-3 (SPARE)
ST-50
ST-51a
ST-51b
4" PVC 40
F-1B
F-1A
BAG FILTER
DRAIN (TYP.)
ROSEDALE PRODUCTS MODEL #L0618112P125CBPB (125 PSI)
TRAILER FLOOR SUMP
LIQUID PHASE GAC FILTERS: SIEMENS MOD# LP-61P 150 PSIG MAX
GAC FILTER
1" HOSE
1" PVC
1" GS
ST-2
ST-3
INSIDE CARBON SHED
SHED FLOOR SUMP
TO STORM DRAIN IN RIGGS ROAD
CONTROL ROOM
80 GAL RECEIVING TANK MAX 200 PSI
C-1 AIR COMPRESSOR SPEEDAIRE MOD #1WD67 10 HP 34.8 CFM @ 175 PSI
3/4" CS 40 AIR LINE
FILE NAME: D:\44738_CHEVRON\44738_I&C_I02.DWG
CURR DATE: 02/18/05 CURR TIME: 3:04:50 pm

No.	DESCRIPTION	DATE	BY
1	RE-DRAWN PER AS-BUILT CONDITIONS	12/20	RTC

REVISIONS

DESIGNED	CADD	SCALE
F.S.K.	J.A.W.	AS NOTED
CHECKED	APPROVED	APPROVED
F.S.K.	F.S.K.	K.G.

Gannett Fleming

BALTIMORE, MARYLAND

CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

INSTRUMENTATION
PROCESS AND INSTRUMENTATION DIAGRAM

JOB No. 44738
DATE 12/20/07
SHEET No. 10
10 of 15

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TABLE B-1: SOIL VAPOR EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	System Status	Hour Meter (hours)	Manifold Vacuum (in. H2O)	Influent (ppmv)	Influent (SCFM)	Effluent (ppmv)	Treatment Efficiency	Hydrocarbons Recovered (lbs/day)	Period (gallons)	Cumul. (gallons)	Operating Extraction Points
7/29/08 9:30	ON	23,532.2	14	50	74	19.0	62.0	1.3	8.5	3,670.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
8/4/08 7:30	ON	23,673.8	15	57	74	22.0	61.4	1.4	1.2	3,671.2	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
8/11/08 6:15	ON	23,776.6	16	51	74	24.0	52.9	1.3	0.9	3,672.1	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
8/19/08 7:00	ON	23,962.5	16	73	74	31.0	57.5	1.8	1.9	3,674.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
8/25/08 11:00	ON	24,108.5	16	65	74	29.0	55.4	1.6	1.6	3,675.6	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
9/3/08 7:30	ON	24,323.1	16	-	74	-	-	-	-	3,675.6	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
9/8/08 7:00	ON	24,442.9	16	39	74	17.0	56.4	1.0	0.8	3,676.4	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
9/18/08 7:00	ON	24,676.3	16	55	74	25.0	54.5	1.4	1.8	3,678.2	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
10/1/08 6:00	OFF	24,719.4					0.0	-	-	3,678.2	Catox display panel down
10/16/08 16:30	OFF	24,914.0	-	-	-	-	-	-	-	3,678.2	VFD Remotely set to 0 due to High Temp Differential
10/17/08 12:00	ON	24,914.0	15	53	135	21.0	60.4	2.4	3.0	3,681.1	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
10/20/08 7:00	ON	24,972.1	15	39	132	19.0	51.3	1.7	0.8	3,681.9	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
10/27/08 3:35	OFF	25,034.4	-	-	-	-	-	-	-	3,681.9	AST-HH
10/27/08 10:45	ON	25,034.4	14	49	71	24.0	51.0	1.2	0.6	3,682.5	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
10/29/08 20:01	OFF	25,091.5	-	-	-	-	-	-	-	3,682.5	Air Comp Fail
10/30/08 11:30	ON	25,091.5	13	55	91	26.0	52.7	1.7	0.5	3,683.1	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
10/30/08 16:00	OFF	25,094.4	-	-	-	-	-	-	-	3,683.1	Manual shutdown by KTG due to wiring issues
10/31/08 12:30	ON	25,094.4	-	-	-	-	-	-	-	3,683.1	System re-wired; SVE working
11/3/08 8:30	ON	25,163.6	14	48	112	21.0	56.3	1.8	0.8	3,683.9	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
11/6/08 8:09	OFF	25,234.4	-	-	-	-	-	-	-	3,683.9	Catox down - wires came loose
11/10/08 9:45	ON	25,234.4	12	40	118	19.0	52.5	1.6	0.8	3,684.7	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
11/17/08 12:00	OFF	25,401.0	-	-	-	-	-	-	-	3,684.7	Off for routine maintenance
11/17/08 13:30	ON	25,401.0	13	61	128	30.0	50.8	2.6	2.3	3,687.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
11/24/08 13:25	ON	25,572.9	13	105	132	53.0	49.5	4.7	4.1	3,691.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
11/24/08 14:50	OFF	25,574.5	-	-	-	-	-	-	-	3,691.0	Bag filter piping failure
12/2/08 10:00	ON	25,574.5	13	59	124	24.0	59.3	2.5	0.0	3,691.1	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
12/8/08 7:45	OFF	25,716.5	-	-	-	-	-	-	-	3,691.1	Off for routine maintenance
12/8/08 12:15	ON	25,716.5	13	103	126	47.0	54.4	4.4	3.2	3,694.2	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
12/15/08 12:20	ON	25,885.0	12	348	130	159.0	54.3	15.3	10.7	3,705.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
12/22/08 11:30	ON	26,052.2	13	475	128	200.0	57.9	20.5	19.6	3,724.5	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
12/22/08 12:30	OFF	26,053.2	-	-	-	-	-	-	-	3,724.5	Off for GAC Change & Stripper Clean
12/23/08 11:50	ON	26,053.2	14	446	129	172.0	61.4	19.4	0.1	3,724.7	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
12/29/08 12:20	ON	26,198.1	12	147	128	58.0	60.5	6.4	12.2	3,736.8	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
1/5/09 11:25	ON	26,365.1	12	107	132	49.0	54.2	4.8	6.1	3,742.9	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7

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TABLE B-1: SOIL VAPOR EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	System Status	Hour Meter (hours)	Manifold Vacuum (in. H2O)	Influent (ppmv)	Influent (SCFM)	Effluent (ppmv)	Treatment Efficiency	Hydrocarbons Recovered (lbs/day)	Period (gallons)	Cumul. (gallons)	Operating Extraction Points
1/12/09 14:15	ON	26,536.0	14	175	141	73.0	58.3	8.3	7.3	3,750.2	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
1/19/09 10:15	ON	26,699.9	14	210	130	89.0	57.6	9.2	9.4	3,759.6	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
1/26/09 12:05	ON	26,869.6	14	326	142	144.0	55.8	15.6	13.6	3,773.2	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
2/2/09 7:55	ON	27,033.4	14	241	139	133.0	44.8	11.3	14.4	3,787.6	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
2/9/09 8:20	OFF	27,202.3	-	-	-	-	-	-	-	3,787.6	Off to repair well vault plumbing
2/9/09 10:20	ON	27,202.3	14	109	144	49.0	55.0	5.3	9.2	3,796.8	RW1 RW2 RW3 MW7 MW17 PTWB MP7
2/16/09 10:10	OFF	27,371.6	-	-	-	-	-	-	-	3,796.8	Off for routine maintenance
2/16/09 16:10	ON	27,371.6	14	137	128	75.0	45.3	5.9	6.2	3,803.1	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
2/23/09 18:22	OFF	27,540.1	-	-	-	-	-	-	-	3,803.1	Low pressure air compressor - tripped motor starter
2/24/09 10:45	ON	27,540.1	14	136	133	62.0	54.4	6.1	6.6	3,809.7	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/2/09 8:55	ON	27,682.3	14	375	135	162.0	56.8	17.1	10.7	3,820.4	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/4/09 6:45	OFF	27,728.5	-	-	-	-	-	-	-	3,820.4	Low pressure air compressor - tripped motor starter
3/5/09 12:50	ON	27,728.5	14	123	133	64.0	48.0	5.5	3.4	3,823.8	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/9/09 10:30	ON	27,821.2	14	108	133	55.0	49.1	4.9	3.1	3,827.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/12/09 11:20	OFF	27,894.4	-	-	-	-	-	-	-	3,827.0	Off on OWS-HH
3/12/09 15:50	ON	27,894.4	15	124	131	66.0	46.8	5.5	2.5	3,829.4	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/16/09 8:25	OFF	27,982.7	-	-	-	-	-	-	-	3,829.4	Off to clean air stripper
3/16/09 13:00	ON	27,982.7	-	-	-	-	-	-	-	3,829.4	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/16/09 13:30	OFF	27,984.1	-	-	-	-	-	-	-	3,829.4	Off on AST_HH (clogged bag filters)
3/16/09 14:04	ON	27,984.1	14	-	129	-	-	-	-	3,829.4	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/19/09 15:40	OFF	28,058.4	-	-	-	-	-	-	-	3,829.4	Off on AST-HH (clogged bag filters)
3/23/09 10:52	ON	28,058.4	14	118	134	60.0	49.2	5.3	2.5	3,832.0	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
3/24/09 8:30	OFF	28,074.7	-	-	-	-	-	-	-	3,832.0	Off on Comp_Lo - Compressor Needs to be Replaced
5/5/09 12:18	ON	28,074.7	14	370	139	272.0	26.5	17.4	1.2	3,833.2	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
5/11/09 7:00	OFF	28,141.5	-	-	-	-	-	-	-	3,833.2	Off on Comp_Lo - Auto drain on compressor Replaced
5/11/09 12:30	ON	28,141.5	14	32	138	16.9	46.9	1.5	4.1	3,837.3	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
5/18/09 9:30	OFF	28,311.2	-	-	-	-	-	-	-	3,837.3	Off on Comp_Lo
5/18/09 15:18	ON	28,311.2	-	-	-	-	-	-	-	3,837.3	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
5/20/09 10:28	OFF	28,329.5	-	-	-	-	-	-	-	3,837.3	Off for plumbing repairs to OWS pump
5/20/09 14:42	ON	28,329.5	14	-	149	-	-	-	-	3,837.3	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7(Concentrations out of range for FID)
5/26/09 7:30	OFF	28,342.1	-	-	-	-	-	-	-	3,837.3	Off on VFD High AMP fault
5/26/09 8:02	ON	28,342.1	13	2,250	152	2,000.0	11.1	115.6	9.4	3,846.7	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
6/3/09 9:00	OFF	28,371.9	-	-	-	-	-	-	-	3,846.7	Off on VFD High AMP fault

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TABLE B-1: SOIL VAPOR EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	System Status	Hour Meter (hours)	Manifold Vacuum (in. H2O)	Influent (ppmv)	Influent (SCFM)	Effluent (ppmv)	Treatment Efficiency	Hydrocarbons Recovered (lbs/day)	Period (gallons)	Cumul. (gallons)	Operating Extraction Points
6/3/09 11:03	ON	28,371.9	12	2,320	157	2,050.0	11.6	123.1	23.2	3,869.9	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
6/8/09 7:00	OFF	28,380.7	-	-	-	-	-	-	-	3,869.9	Off on VFD High AMP fault
6/8/09 13:12	ON	28,380.7	-	-	-	-	-	-	-	3,869.9	RW1 RW2 RW3 MW7 MW17 PTWA PTWB MP7
6/8/09 14:22	OFF	28,385.4	-	-	-	-	-	-	-	3,869.9	Off on VFD High AMP fault
6/15/09 12:07	OFF	28,552.3	-	-	-	-	-	-	-	3,869.9	Off on VFD High AMP fault
6/22/09 7:20	OFF	28,552.3	-	-	-	-	-	-	-	3,869.9	Off on VFD High AMP fault

Notes:

(1) Hydrocarbons recovered are expressed as toluene (MW = 92 g/mol @ 77F).

(2) Hydrocarbons Recovered (lbs/day) = (inf. conc.) x (92 g/mol) x (mol/24.45 L) x (e-6) x (inf. flow) x (28.32 L/ft3) x (1440 min/day) x (1 lb/453.6 g).

(3) Hydrocarbons Recovered Period (gallons) = (avg. inf. conc.) x (92 g/mol) x (mol/24.45 L) x (e-6) x (avg. inf. flow) x (28.32 L/ft3) x (runtime in minutes) x (1 lb/453.6 g) x (gal/6.39 lb).

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TABLE B-2: SOIL VAPOR EXTRACTION SYSTEM INFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	TPH (µg/L)	Flow (SCFM)	Extraction Rate Benzene (lbs/hr)	Extraction Rate TPH (lbs/day)
7/29/08 13:10	3.00	7.00	1.00	8.00	340	74	0.0008	2.26
8/19/08 11:40	0.60	1.00	0.20	1.00	89	74	0.0002	0.59
9/18/08 10:30	2.00	5.00	0.60	4.00	650	74	0.0006	4.32
10/20/08 10:00	0.80	4.00	1.00	6.00	610	132	0.0004	7.24
11/10/08 12:55	0.80	2.00	0.70	5.00	330	118	0.0004	3.50
12/8/08 13:15	1.00	6.00	1.00	9.00	820	126	0.0005	9.29
1/5/09 12:10	3.00	13.00	2.00	21.00	1,100	132	0.0015	13.05
2/2/09 11:45	2.00	14.00	3.00	23.00	1,300	139	0.0010	16.25
3/2/09 9:55	3.00	15.00	3.00	29.00	1,400	133	0.0015	16.74
5/11/09 13:45	0.90	4.00	0.80	5.00	620	138	0.0005	7.69

Notes:
(1) Benzene (lbs/h) = (benzene conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (60 min/hr).
(2) TPH (lbs/day) = (TPH conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (1440 min/day).
(3) ug/L = (ppmv) x (MW g/mol) x (mol/24.45 L), where MW benzene = 78 and MW TPH = 92.

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TABLE B-3: SOIL VAPOR EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2008 - JUNE 2009

Chevron

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	TPH (µg/L)	Flow (SCFM)	Discharge Rate Benzene (lbs/hr)	Discharge Rate TPH (lbs/day)
7/29/08 13:05	<0.06	<0.08	<0.09	<0.09	30	74	<0.02	0.20
8/19/08 11:45	1	2	0.30	2.00	180	74	0.0003	1.20
9/18/08 10:35	0.70	2.00	0.30	2.00	360	74	0.0002	2.40
10/20/08 10:05	0.4	2	0.4	2	350	132	0.0002	4.15
11/10/08 13:00	0.2	0.5	0.1	0.8	120	118	0.0001	1.27
12/8/08 13:10	0.5	2	0.5	3	400	126	0.0002	4.53
1/5/09 12:05	0.8	4	0.6	5	510	131	0.0004	6.03
2/2/09 11:40	1	5	0.8	6	530	139	0.0005	6.64
3/2/09 9:50	0.2	2	0.3	3	150	133	0.0001	1.79
5/11/09 13:40	0.400	2	0.300	2	370	138	0.0002	4.59

Notes:

(1) Benzene (lbs/h) = (benzene conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (60 min/hr).

(2) TPH (lbs/day) = (TPH conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (1440 min/day).

(3) ug/L = (ppmv) x (MW g/mol) x (mol/24.45 L), where MW benzene = 78 and MW TPH = 92.

APPENDIX C

GROUNDWATER MONITORING DATA

APPENDIX C

GROUNDWATER MONITORING DATA

DESCRIPTION OF DATA TABLE

Overview

Chevron uses a central database to store groundwater monitoring data including laboratory analytical data. The tabulated data in **Appendix C** (Table C-1) is an exported summary of groundwater elevation data and analytical data for the period beginning on July 1, 2008, and ending on June 30, 2009 (reporting period plus previous two quarters). Groundwater elevation data were measured using an interface probe in wells near the Service Station and a water level indicator at all other locations.

The following table lists the column headings in the table with a brief description of each.

Column Heading	Description
Date	Date data were recorded.
DTL (ft)	Depth to LPH (ft)
DTW (ft)	Depth to groundwater (ft)
LPH Thick. (ft)	Equation: (DTW-DTL)
GW Elev. (ft)	Corrected water table elevation equation: (TOC) – (DTW) + [(0.75)*(LPH Thickness)]
LPH Recovery	Liquid Phase Hydrocarbons Recovery
Benzene (µg/L)	Laboratory reported concentration
Toluene (µg/L)	Laboratory reported concentration
Ethylbenzene (µg/L)	Laboratory reported concentration
Total Xylenes (µg/L)	Laboratory reported concentration
MTBE (µg/L)	Laboratory reported concentration
TPH-GRO (µg/L)	Laboratory reported concentration

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
GP-2E(45-50)		Screen: 45.0-50.0 ft bgs			TOC: 168.17 ft							
09/15/08	---	43.34	---	124.83		No Analytical Results						
09/25/08	---	43.46	---	124.71		ND (2)	ND (2)	ND (2)	ND (6)	ND	370.0 (2)	320.0 (100)
03/18/09	---	44.38	---	123.79		No Analytical Results						
03/30/09	---	44.27	---	123.90		ND (2)	ND (2)	ND (2)	ND (6)	ND	350.0 (2)	240.0 (100)
GP-2E(50-55)		Screen: 50.0-55.0 ft bgs			TOC: 168.27 ft							
09/15/08	---	43.46	---	124.81		No Analytical Results						
03/18/09	---	44.49	---	123.78		No Analytical Results						
GP-2E(55-60)		Screen: 55.0-60.0 ft bgs			TOC: 168.53 ft							
09/15/08	---	43.83	---	124.70		No Analytical Results						
09/25/08	---	43.86	---	124.67		3.9 (1)	ND (1)	ND (1)	ND (3)	3.9	130.0 (1)	180.0 (100)
03/18/09	---	44.81	---	123.72		No Analytical Results						
03/30/09	---	44.65	---	123.88		ND (1)	ND (1)	ND (1)	ND (3)	ND	130.0 (1)	140.0 (100)
GP-2F(45-50)		Screen: 45.0-50.0 ft bgs			TOC: 159.59 ft							
09/15/08	---	44.53	---	115.06		No Analytical Results						
09/25/08	---	44.70	---	114.89		ND (1)	ND (1)	ND (1)	ND (3)	ND	270.0 (1)	390.0 (100)
03/18/09	---	45.71	---	113.88		No Analytical Results						
03/30/09	---	45.65	---	113.94		No Analytical Results						
03/31/09						ND (1)	ND (1)	ND (1)	ND (3)	ND	190.0 (1)	190.0 (100)
GP-2F(50-55)		Screen: 50.0-55.0 ft bgs			TOC: 159.59 ft							
09/15/08	---	44.28	---	115.31		No Analytical Results						
09/25/08	---	44.49	---	115.10		9.3 (10)	ND (10)	ND (10)	ND (30)	9.3	430.0 (10)	490.0 (200)
03/18/09	---	45.43	---	114.16		No Analytical Results						
03/30/09	---	45.41	---	114.18		3.0 (2)	ND (2)	ND (2)	ND (6)	3.0	380.0 (2)	340.0 (100)
GP-7A(20-25)		Screen: 20.0-25.0 ft bgs			TOC: 158.11 ft							
09/15/08	---	19.07	---	139.04		No Analytical Results						

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
GP-7A(20-25)		Screen: 20.0-25.0 ft bgs			TOC: 158.11 ft							
09/24/08	---	19.24	---	138.87		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.0 (1)	ND (100)
03/18/09	---	20.98	---	137.13		No Analytical Results						
03/27/09	---	20.51	---	137.60		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.3 (1)	ND (100)
GP-7A(25-30)		Screen: 25.0-30.0 ft bgs			TOC: 158.08 ft							
09/15/08	---	19.31	---	138.77		No Analytical Results						
03/18/09	---	20.37	---	137.71		No Analytical Results						
GP-7A(30-35)		Screen: 30.0-35.0 ft bgs			TOC: 158.09 ft							
09/15/08	---	21.30	---	136.79		No Analytical Results						
09/24/08	---	21.47	---	136.62		1.7 (1)	ND (1)	ND (1)	ND (3)	1.7	1.8 (1)	ND (100)
03/18/09	---	22.58	---	135.51		No Analytical Results						
03/27/09	---	22.58	---	135.51		1.4 (1)	ND (1)	ND (1)	ND (3)	1.4	1.1 (1)	ND (100)
GP-7A(35-40)		Screen: 35.0-40.0 ft bgs			TOC: 158.09 ft							
09/15/08	---	21.69	---	136.40		No Analytical Results						
09/24/08	---	21.77	---	136.32		380.0 (5)	6.7 (5)	66.0 (5)	80.0 (15)	532.7	310.0 (5)	2,000.0 (100)
03/18/09	---	23.14	---	134.95		No Analytical Results						
03/27/09	---	22.79	---	135.30		440.0 (2)	6.2 (2)	69.0 (2)	55.0 (6)	570.2	240.0 (2)	2,200.0 (100)
GP-7A(40-45)		Screen: 40.0-45.0 ft bgs			TOC: 158.11 ft							
09/15/08	---	21.72	---	136.39		No Analytical Results						
03/18/09	---	23.05	---	135.06		No Analytical Results						
GP-9A(20-25)		Screen: 20.0-25.0 ft bgs			TOC: 158.86 ft							
09/15/08	---	17.86	---	141.00		No Analytical Results						
09/24/08	---	17.97	---	140.89		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	18.99	---	139.87		No Analytical Results						
03/27/09	---	19.11	---	139.75		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
GP-9A(25-30)		Screen: 25.0-30.0 ft bgs			TOC: 158.81 ft							
09/15/08	---	19.82	---	138.99				No Analytical Results				
03/18/09	---	21.35	---	137.46				No Analytical Results				
GP-9A(30-35)		Screen: 30.0-35.0 ft bgs			TOC: 158.76 ft							
09/15/08	---	21.87	---	136.89				No Analytical Results				
03/18/09	---	21.89	---	136.87				No Analytical Results				
GP-11A(20-25)		Screen: 20.0-25.0 ft bgs			TOC: 158.28 ft							
09/15/08	---	17.86	---	140.42				No Analytical Results				
09/24/08	---	17.86	---	140.42				No Analytical Results				
09/24/08						ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	16.59	---	141.69				No Analytical Results				
03/27/09	---	17.35	---	140.93				No Analytical Results				
03/30/09						ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
GP-11A(25-30)		Screen: 25.0-30.0 ft bgs			TOC: 158.43 ft							
09/15/08	---	19.96	---	138.47				No Analytical Results				
03/18/09		Cannot remove well cap										
GP-11A(30-35)		Screen: 30.0-35.0 ft bgs			TOC: 158.38 ft							
09/15/08	---	21.26	---	137.12				No Analytical Results				
03/18/09	---	21.31	---	137.07				No Analytical Results				
GP-11A(35-40)		Screen: 35.0-40.0 ft bgs			TOC: 158.38 ft							
09/15/08	---	29.20	---	129.18				No Analytical Results				
03/18/09	---	29.36	---	129.02				No Analytical Results				
GP-24A		Screen: 24.0-44.0 ft bgs			TOC: 170.83 ft							
09/15/08	---	32.03	---	138.80				No Analytical Results				
10/01/08	---	31.62	---	139.21		ND (1)	ND (1)	7.1 (1)	27.0 (3)	34.1	ND (1)	1,200.0 (100)
03/18/09	---	35.52	---	135.31				No Analytical Results				

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
GP-24A		Screen: 24.0-44.0 ft bgs			TOC: 170.83 ft							
04/01/09	---	34.25	---	136.58		ND (1)	ND (1)	1.3 (1)	12.1 (3)	13.4	ND (1)	270.0 (100)
GP-27A		Screen: 41.0-51.0 ft bgs			TOC: 172.06 ft							
07/24/08		Covered by car										
08/25/08	---	41.81	---	130.25		No Analytical Results						
09/15/08		Covered By Car										
09/30/08	---	41.08	---	130.98		5,200.0 (100)	16,000.0 (100)	2,500.0 (100)	13,900.0 (300)	37,600.0	3,100.0 (100)	110,000.0 (10000)
10/27/08	---	41.66	---	130.40		No Analytical Results						
11/24/08		Covered By Car										
12/15/08		Covered By Car										
01/26/09	---	41.79	---	130.27		No Analytical Results						
02/24/09	---	41.86	---	130.20		No Analytical Results						
03/18/09	---	42.69	---	129.37		No Analytical Results						
04/07/09	---	40.86	---	131.20		3,400.0 (50)	8,400.0 (50)	1,900.0 (50)	11,100.0 (150)	24,800.0	3,500.0 (50)	67,000.0 (10000)
04/27/09	---	40.97	---	131.09		No Analytical Results						
05/27/09	---	41.21	---	130.85		No Analytical Results						
06/15/09	---	40.97	---	131.09		No Analytical Results						
GP-30A		Screen: 29.0-49.0 ft bgs			TOC: 171.78 ft							
07/24/08	---	41.45	---	130.33		No Analytical Results						
08/25/08	---	39.65	---	132.13		No Analytical Results						
09/15/08	---	39.77	---	132.01		No Analytical Results						
09/30/08	---	36.87	---	134.91		14,000.0 (250)	14,000.0 (250)	600.0 (250)	6,200.0 (750)	34,800.0	47,000.0 (250)	130,000.0 (5000)
10/27/08	---	39.93	---	131.85		No Analytical Results						
11/24/08	---	43.22	---	128.56		No Analytical Results						
12/15/08	---	43.15	---	128.63		No Analytical Results						
01/26/09	---	43.10	---	128.68		No Analytical Results						
02/24/09	---	41.15	---	130.63		No Analytical Results						
03/18/09	---	42.86	---	128.92		No Analytical Results						
04/07/09	---	37.06	---	134.72		5,200.0 (100)	4,700.0 (100)	400.0 (100)	3,800.0 (300)	14,100.0	22,000.0 (100)	52,000.0 (5000)
04/27/09	---	36.71	---	135.07		No Analytical Results						

Notes:

1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:

DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
GP-30A		Screen: 29.0-49.0 ft bgs			TOC: 171.78 ft							
05/27/09	---	40.81	---	130.97				No Analytical Results				
06/15/09	---	39.56	---	132.22				No Analytical Results				
GP-35A		Screen: 25.0-45.0 ft bgs			TOC: 171.96 ft							
07/24/08	---	43.35	---	128.61				No Analytical Results				
08/25/08	---	39.29	---	132.67				No Analytical Results				
09/15/08	---	39.74	---	132.22				No Analytical Results				
10/01/08	---	35.19	---	136.77		4,400.0 (50)	8,500.0 (50)	880.0 (50)	4,600.0 (150)	18,380.0	1,100.0 (50)	34,000.0 (2000)
10/27/08	---	38.01	---	133.95				No Analytical Results				
11/24/08	---	44.81	---	127.15				No Analytical Results				
12/15/08	---	44.24	---	127.72				No Analytical Results				
01/26/09	---	43.92	---	128.04				No Analytical Results				
02/24/09	---	38.94	---	133.02				No Analytical Results				
03/18/09	---	43.70	---	128.26				No Analytical Results				
04/01/09	---	35.70	---	136.26		1,800.0 (20)	3,700.0 (20)	250.0 (20)	2,010.0 (60)	7,760.0	290.0 (20)	16,000.0 (2000)
04/27/09	---	34.65	---	137.31				No Analytical Results				
05/27/09	---	43.17	---	128.79				No Analytical Results				
06/15/09	---	37.15	---	134.81				No Analytical Results				
GP-38A		Screen: 29.0-49.0 ft bgs			TOC: 171.22 ft							
07/24/08	---	36.91	---	134.31				No Analytical Results				
08/25/08	---	36.84	---	134.38				No Analytical Results				
09/15/08	---	37.77	---	133.45				No Analytical Results				
09/30/08	---	35.56	---	135.66		3.4 (2)	5.1 (2)	4.0 (2)	208.0 (6)	220.5	ND (2)	6,000.0 (100)
10/27/08	---	37.62	---	133.60				No Analytical Results				
11/24/08	---	40.59	---	130.63				No Analytical Results				
12/15/08	---	40.68	---	130.54				No Analytical Results				
01/26/09	---	40.99	---	130.23				No Analytical Results				
02/24/09	---	39.40	---	131.82				No Analytical Results				
03/18/09	---	40.16	---	131.06				No Analytical Results				
04/07/09	---	35.11	---	136.11		44.0 (2)	6.8 (2)	4.6 (2)	144.0 (6)	199.4	ND (2)	4,700.0 (1000)

Notes:

1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:

DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
GP-38A		Screen: 29.0-49.0 ft bgs			TOC: 171.22 ft							
04/27/09	---	35.00	---	136.22				No Analytical Results				
05/27/09	---	35.55	---	135.67				No Analytical Results				
06/15/09	---	35.16	---	136.06				No Analytical Results				
GP-39A		Screen: 35.0-55.0 ft bgs			TOC: 172.46 ft							
09/15/08	---	44.07	---	128.39				No Analytical Results				
09/30/08	---	43.76	---	128.70		2,100.0 (25)	540.0 (25)	66.0 (25)	750.0 (75)	3,456.0	4,800.0 (25)	11,000.0 (2000)
03/18/09	---	45.29	---	127.17				No Analytical Results				
03/31/09	---	44.32	---	128.14		2,200.0 (25)	820.0 (25)	90.0 (25)	820.0 (75)	3,930.0	4,900.0 (25)	11,000.0 (2000)
GP-41A		Screen: 32.0-52.0 ft bgs			TOC: 172.28 ft							
09/15/08	---	41.98	---	130.30				No Analytical Results				
09/29/08	---	42.20	---	130.08		1.5 (1)	ND (1)	ND (1)	1.7 (3)	3.2	5.4 (1)	ND (100)
03/18/09	---	43.09	---	129.19				No Analytical Results				
03/31/09	---	42.55	---	129.73		7.8 (1)	ND (1)	ND (1)	11.0 (3)	18.8	29.0 (1)	280.0 (200)
GP-44A		Screen: 26.0-46.0 ft bgs			TOC: 176.20 ft							
09/15/08	---	30.41	---	145.79				No Analytical Results				
09/30/08	---	30.35	---	145.85		ND (5)	37.0 (5)	290.0 (5)	1,510.0 (15)	1,837.0	ND (5)	7,500.0 (500)
03/18/09	---	31.59	---	144.61				No Analytical Results				
04/01/09	---	31.01	---	145.19		ND (10)	54.0 (10)	230.0 (10)	1,430.0 (30)	1,714.0	ND (10)	7,700.0 (500)
MP-7		Screen: 35.0-55.0 ft bgs			TOC: 172.17 ft							
07/24/08	39.42	39.43	0.01	132.80				No Analytical Results				
08/25/08	---	38.66	---	133.56				No Analytical Results				
09/15/08	---	40.47	---	131.74				No Analytical Results				
10/27/08	---	38.87	---	133.35				No Analytical Results				
11/24/08	---	39.58	---	132.63				No Analytical Results				
12/15/08	---	39.63	---	132.58				No Analytical Results				
01/26/09	---	39.74	---	132.43				No Analytical Results				
02/24/09	---	39.71	---	132.46				No Analytical Results				

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MP-7	Screen: 35.0-55.0 ft bgs				TOC: 172.17 ft							
03/18/09	---	42.55	---	129.66				No Analytical Results				
04/27/09	---	41.02	---	131.15				No Analytical Results				
05/27/09	---	40.90	---	131.32				No Analytical Results				
06/15/09	---	41.16	---	131.01				No Analytical Results				
MP-20	Screen: 40.0-55.0 ft bgs				TOC: 172.16 ft							
09/15/08	Covered By Car											
03/18/09	---	44.00	---	128.16				No Analytical Results				
MP-30	Screen: 40.0-55.0 ft bgs				TOC: 171.57 ft							
09/15/08	---	40.60	---	130.97				No Analytical Results				
03/18/09	---	41.93	---	129.64				No Analytical Results				
MP-40	Screen: 40.0-55.0 ft bgs				TOC: 172.11 ft							
09/15/08	---	40.51	---	131.60				No Analytical Results				
03/18/09	---	41.93	---	130.18				No Analytical Results				
MW-1	Screen: 20.0-35.0 ft bgs				TOC: 170.46 ft							
09/15/08	---	31.97	---	138.49				No Analytical Results				
03/18/09	---	34.99	---	135.47				No Analytical Results				
MW-2	Screen: 20.0-35.0 ft bgs				TOC: 171.41 ft							
09/15/08	---	31.95	---	139.46				No Analytical Results				
03/18/09	Dry											
MW-3	Screen: 20.0-35.0 ft bgs				TOC: 170.41 ft							
09/15/08	---	31.28	---	139.13				No Analytical Results				
03/18/09	---	33.70	---	136.71				No Analytical Results				
MW-4	Screen: 20.0-35.0 ft bgs				TOC: 171.14 ft							
09/15/08	---	30.67	---	140.47				No Analytical Results				

Notes:

1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:

DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-4		Screen: 20.0-35.0 ft bgs			TOC: 171.14 ft							
03/18/09	---	32.40	---	138.74				No Analytical Results				
MW-5		Screen: 20.0-35.0 ft bgs			TOC: 172.31 ft							
09/15/08			Dry									
10/01/08	---	31.75	---	140.56		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09			Dry									
04/01/09	---	32.46	---	139.85		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-6		Screen: 30.0-45.0 ft bgs			TOC: 171.12 ft							
09/15/08	---	34.15	---	136.97				No Analytical Results				
10/01/08	---	33.17	---	137.95		1.9 (2)	4.9 (2)	48.0 (2)	126.0 (6)	180.8	ND (2)	1,900.0 (200)
03/18/09	---	35.91	---	135.21				No Analytical Results				
04/01/09	---	34.25	---	136.87				No Analytical Results				
04/02/09						3.5 (2)	12.0 (2)	100.0 (2)	166.0 (6)	281.5	ND (2)	2,300.0 (100)
MW-7		Screen: 20.0-68.0 ft bgs			TOC: 177.11 ft							
07/24/08	---	57.20	---	119.91				No Analytical Results				
08/25/08	---	57.20	---	119.91				No Analytical Results				
09/15/08	---	34.66	---	142.45				No Analytical Results				
10/01/08	---	34.66	---	142.45		ND (2)	230.0 (2)	17.0 (2)	206.0 (6)	453.0	240.0 (2)	1,200.0 (100)
10/27/08	---	57.20	---	119.91				No Analytical Results				
11/24/08	---	57.20	---	119.91				No Analytical Results				
12/15/08	---	57.20	---	119.91				No Analytical Results				
01/26/09	---	57.20	---	119.91				No Analytical Results				
02/24/09	---	57.20	---	119.91				No Analytical Results				
03/18/09	---	52.92	---	124.19				No Analytical Results				
04/01/09	---	43.71	---	133.40		3,400.0 (25)	5,300.0 (25)	670.0 (25)	2,770.0 (75)	12,140.0	1,300.0 (25)	23,000.0 (5000)
04/27/09	---	42.04	---	135.07				No Analytical Results				
05/27/09	---	48.50	---	128.61				No Analytical Results				
06/15/09	---	43.35	---	133.76				No Analytical Results				

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-12		Screen: 25.0-55.0 ft bgs			TOC: 171.50 ft							
09/15/08	---	37.57	---	133.93				No Analytical Results				
03/18/09	---	43.85	---	127.65				No Analytical Results				
MW-13		Screen: 25.0-40.0 ft bgs			TOC: 172.47 ft							
09/15/08	---	36.77	---	135.70				No Analytical Results				
03/18/09	---	36.60	---	135.87				No Analytical Results				
MW-15		Screen: 10.0-50.0 ft bgs			TOC: 172.34 ft							
09/15/08	---	30.21	---	142.13				No Analytical Results				
09/30/08	---	30.27	---	142.07		7.9 (1)	16.0 (1)	23.0 (1)	33.0 (3)	79.9	ND (1)	710.0 (100)
03/18/09	---	31.11	---	141.23				No Analytical Results				
04/01/09	---	30.80	---	141.54		10.0 (1)	38.0 (1)	16.0 (1)	57.0 (3)	121.0	ND (1)	830.0 (100)
MW-16		Screen: UNK			TOC: 171.05 ft							
07/24/08	---	39.03	---	132.02				No Analytical Results				
08/25/08	---	39.57	---	131.48				No Analytical Results				
09/15/08	---	39.69	---	131.36				No Analytical Results				
09/25/08	---	39.50	---	131.55		4,700.0 (100)	13,000.0 (100)	1,400.0 (100)	9,800.0 (300)	28,900.0	560.0 (100)	38,000.0 (2000)
10/27/08	---	39.79	---	131.26				No Analytical Results				
11/24/08	---	40.38	---	130.67				No Analytical Results				
12/15/08	---	40.31	---	130.74				No Analytical Results				
01/26/09	---	40.30	---	130.75				No Analytical Results				
02/24/09			Dry									
03/18/09	---	39.89	---	131.16				No Analytical Results				
03/30/09	---	39.03	---	132.02		27.0 (2)	6.4 (2)	ND (2)	4.3 (6)	37.7	480.0 (2)	490.0 (100)
04/27/09	---	37.56	---	133.49				No Analytical Results				
05/27/09	---	37.28	---	133.77				No Analytical Results				
06/15/09	---	37.95	---	133.10				No Analytical Results				
MW-17		Screen: 30.0-50.0 ft bgs			TOC: 170.67 ft							
09/15/08	---	42.80	---	127.87				No Analytical Results				

Notes:

1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:

DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-17		Screen: 30.0-50.0 ft bgs			TOC: 170.67 ft							
10/01/08	---	42.80	---	127.87		5,700.0 (50)	10,000.0 (50)	1,100.0 (50)	6,300.0 (150)	23,100.0	6,500.0 (50)	43,000.0 (2000)
03/18/09	---	45.29	---	125.38		No Analytical Results						
04/07/09	---	38.16	---	132.51		5,600.0 (50)	10,000.0 (50)	1,600.0 (50)	7,700.0 (150)	24,900.0	6,000.0 (50)	40,000.0 (10000)
MW-18		Screen: 29.0-44.0 ft bgs			TOC: 168.45 ft							
07/24/08	---	30.25	---	138.20		No Analytical Results						
08/25/08	---	30.75	---	137.70		No Analytical Results						
09/15/08	---	31.17	---	137.28		No Analytical Results						
09/25/08	---	31.32	---	137.13		6.1 (20)	670.0 (20)	270.0 (20)	6,900.0 (60)	7,846.1	ND (20)	27,000.0 (10000)
10/27/08	---	31.85	---	136.60		No Analytical Results						
11/24/08	---	33.33	---	135.12		No Analytical Results						
12/15/08	---	33.53	---	134.92		No Analytical Results						
01/26/09	---	33.79	---	134.66		No Analytical Results						
02/24/09	---	33.58	---	134.87		No Analytical Results						
03/18/09	---	34.02	---	134.43		No Analytical Results						
03/30/09	---	33.07	---	135.38		14.0 (20)	810.0 (20)	380.0 (20)	5,000.0 (60)	6,204.0	ND (20)	30,000.0 (5000)
04/27/09	---	32.42	---	136.03		No Analytical Results						
05/27/09	---	31.30	---	137.15		No Analytical Results						
06/15/09	---	30.57	---	137.88		No Analytical Results						
MW-19		Screen: 30.0-45.0 ft bgs			TOC: 169.56 ft							
09/15/08	---	35.93	---	133.63		No Analytical Results						
09/25/08	---	35.76	---	133.80		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	37.98	---	131.58		No Analytical Results						
03/30/09	---	37.22	---	132.34		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-20		Screen: 30.0-50.0 ft bgs			TOC: 176.27 ft							
09/15/08	---	37.61	---	138.66		No Analytical Results						
09/30/08	---	37.57	---	138.70		No Analytical Results						
10/01/08						2.3 (1)	5.5 (1)	2.7 (1)	15.1 (3)	25.6	ND (1)	420.0 (100)
03/18/09	---	38.19	---	138.08		No Analytical Results						

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-20		Screen: 30.0-50.0 ft bgs			TOC: 176.27 ft							
04/02/09	---	38.10	---	138.17		2.3 (1)	ND (1)	ND (1)	ND (3)	2.3	ND (1)	250.0 (100)
MW-21		Screen: 28.0-48.0 ft bgs			TOC: 173.37 ft							
09/15/08	---	36.47	---	136.89		No Analytical Results						
09/30/08	---	36.16	---	137.21		10.0 (1)	18.0 (1)	7.1 (1)	53.0 (3)	88.1	15.0 (1)	430.0 (100)
03/18/09	---	36.97	---	136.39		No Analytical Results						
04/02/09	---	36.20	---	137.17		10.0 (1)	ND (1)	ND (1)	8.7 (3)	18.7	17.0 (1)	260.0 (100)
MW-22		Screen: 31.5-51.5 ft bgs			TOC: 171.23 ft							
07/24/08	---	40.92	---	130.31		No Analytical Results						
08/25/08	---	40.27	---	130.96		No Analytical Results						
09/15/08	---	40.50	---	130.73		No Analytical Results						
09/25/08	---	40.09	---	131.14		1,100.0 (5)	730.0 (5)	95.0 (5)	630.0 (15)	2,555.0	1,100.0 (5)	4,400.0 (100)
10/27/08	---	40.55	---	130.68		No Analytical Results						
11/24/08	---	41.83	---	130.73		No Analytical Results						
12/15/08	---	44.11	---	130.73		No Analytical Results						
01/26/09	---	42.15	---	129.08		No Analytical Results						
02/24/09	---	41.58	---	129.65		No Analytical Results						
03/18/09	---	42.15	---	129.08		No Analytical Results						
03/30/09	---	39.48	---	131.75		5,900.0 (100)	16,000.0 (100)	1,500.0 (100)	10,100.0 (300)	33,500.0	680.0 (100)	55,000.0 (10000)
04/27/09	---	38.72	---	132.51		No Analytical Results						
05/27/09	---	39.76	---	131.47		No Analytical Results						
06/15/09	---	39.45	---	131.78		No Analytical Results						
MW-23		Screen: 32.0-52.0 ft bgs			TOC: 171.31 ft							
09/15/08	---	43.31	---	127.99		No Analytical Results						
09/25/08	---	43.52	---	127.79		6.5 (1)	ND (1)	ND (1)	ND (3)	6.5	16.0 (1)	ND (100)
03/18/09	---	44.34	---	126.96		No Analytical Results						
03/30/09	---	43.53	---	127.78		2.3 (1)	ND (1)	ND (1)	ND (3)	2.3	6.8 (1)	ND (100)

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
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DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-24A		Screen: 16.0-23.5 ft bgs			TOC: 157.38 ft							
07/24/08	---	19.87	---	137.51				No Analytical Results				
08/25/08	---	20.28	---	137.10				No Analytical Results				
09/15/08	---	20.58	---	136.80				No Analytical Results				
09/24/08	---	20.69	---	136.69		ND (20)	160.0 (20)	640.0 (20)	4,940.0 (60)	5,740.0	ND (20)	26,000.0 (1000)
10/27/08	---	21.05	---	136.33				No Analytical Results				
11/24/08	---	21.61	---	135.77				No Analytical Results				
12/15/08	---	21.78	---	135.60				No Analytical Results				
01/26/09	---	21.67	---	135.71				No Analytical Results				
02/24/09	---	22.81	---	134.57				No Analytical Results				
03/18/09	---	21.04	---	136.34				No Analytical Results				
03/27/09	---	21.83	---	135.55		8.3 (20)	52.0 (20)	610.0 (20)	3,290.0 (60)	3,960.3	ND (20)	46,000.0 (2500)
04/27/09	---	20.34	---	137.04				No Analytical Results				
05/27/09	---	19.94	---	137.44				No Analytical Results				
06/15/09	---	18.97	---	138.41				No Analytical Results				
MW-24B		Screen: 22.5-30.0 ft bgs			TOC: 157.45 ft							
09/15/08	---	20.67	---	136.78				No Analytical Results				
09/24/08	---	20.76	---	136.69		ND (20)	110.0 (20)	460.0 (20)	4,650.0 (60)	5,220.0	ND (20)	22,000.0 (500)
03/18/09	---	22.07	---	135.38				No Analytical Results				
03/27/09	---	21.91	---	135.54		17.0 (20)	190.0 (20)	290.0 (20)	2,150.0 (60)	2,647.0	ND (20)	12,000.0 (2500)
MW-25A		Screen: 22.0-29.5 ft bgs			TOC: 149.99 ft							
09/15/08	---	26.28	---	123.71				No Analytical Results				
09/24/08	---	26.32	---	123.67		ND (1)	ND (1)	ND (1)	ND (3)	ND	4.6 (1)	ND (100)
03/18/09	---	26.96	---	123.03				No Analytical Results				
03/27/09	---	27.01	---	122.98				No Analytical Results				
03/30/09						ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-25B		Screen: 45.0-55.0 ft bgs			TOC: 150.95 ft							
09/15/08	---	27.83	---	123.11				No Analytical Results				
09/24/08	---	26.94	---	124.01		240.0 (2)	ND (2)	ND (2)	29.0 (6)	269.0	350.0 (2)	990.0 (100)

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-25B		Screen: 45.0-55.0 ft bgs			TOC: 150.95 ft							
03/18/09	---	27.36	---	123.58				No Analytical Results				
03/27/09	---	27.72	---	123.23		450.0 (2)	ND (2)	ND (2)	83.0 (6)	533.0	410.0 (2)	1,800.0 (100)
MW-26A		Screen: 2.0-9.5 ft bgs			TOC: 135.62 ft							
09/15/08	---	4.44	---	131.17				No Analytical Results				
09/23/08	---	4.69	---	130.93		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	4.91	---	130.70				No Analytical Results				
03/25/09	---	4.97	---	130.65		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-26B		Screen: 21.5-26.5 ft bgs			TOC: 135.74 ft							
09/15/08	---	10.65	---	125.09				No Analytical Results				
09/23/08	---	3.48	---	132.26		110.0 (1)	ND (1)	ND (1)	5.3 (3)	115.3	200.0 (1)	490.0 (100)
03/18/09	---	6.44	---	129.30				No Analytical Results				
03/25/09	---	6.46	---	129.28		130.0 (1)	ND (1)	ND (1)	8.5 (3)	138.5	230.0 (1)	430.0 (100)
MW-27A		Screen: 8.0-15.5 ft bgs			TOC: 128.92 ft							
09/15/08	---	10.36	---	118.55				No Analytical Results				
09/23/08	---	10.49	---	118.43		ND (1)	ND (1)	ND (1)	ND (3)	ND	23.0 (1)	ND (100)
03/18/09	---	11.22	---	117.69				No Analytical Results				
03/25/09	---	11.27	---	117.65		ND (1)	ND (1)	ND (1)	ND (3)	ND	32.0 (1)	ND (100)
MW-27B		Screen: 30.5-40.5 ft bgs			TOC: 128.92 ft							
09/15/08	---	12.87	---	116.04				No Analytical Results				
09/23/08	---	12.47	---	116.45		37.0 (1)	ND (1)	ND (1)	5.4 (3)	42.4	240.0 (1)	380.0 (100)
03/18/09	---	13.56	---	115.35				No Analytical Results				
03/25/09	---	13.60	---	115.32		19.0 (1)	ND (1)	ND (1)	3.1 (3)	22.1	240.0 (1)	280.0 (100)
MW-28A		Screen: 3.0-10.5 ft bgs			TOC: 126.13 ft							
09/15/08	---	4.44	---	121.69				No Analytical Results				
09/22/08	---	4.59	---	121.54		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.8 (1)	ND (100)
03/18/09	---	4.74	---	121.39				No Analytical Results				

Notes:

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4) BTEX summed before rounding.

Abbreviations:

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DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

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TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-28A		Screen: 3.0-10.5 ft bgs			TOC: 126.13 ft							
03/23/09	---	4.76	---	121.37		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.8 (1)	ND (100)
MW-28B		Screen: 15.5-25.5 ft bgs			TOC: 125.49 ft							
09/15/08	---	4.31	---	121.18				No Analytical Results				
09/22/08	---	4.40	---	121.09		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	4.71	---	120.78				No Analytical Results				
03/23/09	---	4.70	---	120.79		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-29A		Screen: 5.0-12.5 ft bgs			TOC: 115.70 ft							
09/15/08	---	7.65	---	108.04				No Analytical Results				
09/22/08	---	7.73	---	107.97		ND (1)	ND (1)	ND (1)	ND (3)	ND	9.4 (1)	ND (100)
03/18/09	---	8.00	---	107.69				No Analytical Results				
03/23/09	---	8.07	---	107.63		ND (1)	ND (1)	ND (1)	ND (3)	ND	7.4 (1)	ND (100)
MW-29B		Screen: 19.0-29.0 ft bgs			TOC: 115.54 ft							
09/15/08	---	6.61	---	108.92				No Analytical Results				
09/22/08	---	6.54	---	109.00		ND (1)	ND (1)	ND (1)	ND (3)	ND	74.0 (1)	ND (100)
03/18/09	---	6.83	---	108.70				No Analytical Results				
03/23/09	---	6.97	---	108.57		ND (1)	ND (1)	ND (1)	ND (3)	ND	72.0 (1)	ND (100)
MW-30		Screen: 15.0-30.0 ft bgs			TOC: 156.87 ft							
09/15/08	---	20.26	---	136.61				No Analytical Results				
09/24/08	---	20.36	---	136.51		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	21.66	---	135.21				No Analytical Results				
03/27/09	---	21.38	---	135.49		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-31A		Screen: 4.0-11.5 ft bgs			TOC: 135.19 ft							
09/15/08	---	5.77	---	129.42				No Analytical Results				
03/18/09	---	6.04	---	129.15				No Analytical Results				

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SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-31B		Screen: 11.5-21.5 ft bgs			TOC: 135.81 ft							
09/15/08	---	8.14	---	127.67				No Analytical Results				
09/23/08	---	5.25	---	130.56		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.2 (1)	ND (100)
03/18/09	---	5.69	---	130.12				No Analytical Results				
03/24/09	---	5.60	---	130.21		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-32		Screen: 5.0-15.0 ft bgs			TOC: 128.47 ft							
09/15/08	---	5.49	---	122.98				No Analytical Results				
03/18/09	---	8.64	---	119.83				No Analytical Results				
MW-33A		Screen: 2.0-9.5 ft bgs			TOC: 126.35 ft							
09/15/08	---	3.55	---	122.80				No Analytical Results				
09/23/08	---	3.86	---	122.49		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.1 (1)	ND (100)
03/18/09	---	3.89	---	122.46				No Analytical Results				
03/24/09	---	4.00	---	122.35		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-33B		Screen: 13.0-23.0 ft bgs			TOC: 126.16 ft							
09/15/08	---	3.63	---	122.53				No Analytical Results				
09/23/08	---	4.76	---	121.40		340.0 (2)	ND (2)	ND (2)	9.8 (6)	349.8	230.0 (2)	1,000.0 (100)
03/18/09	---	4.89	---	121.27				No Analytical Results				
03/24/09	---	4.92	---	121.24		380.0 (2)	ND (2)	ND (2)	13.0 (6)	393.0	220.0 (2)	950.0 (100)
MW-33C		Screen: 23.0-33.0 ft bgs			TOC: 125.84 ft							
09/15/08	---	4.49	---	121.34				No Analytical Results				
09/23/08	---	4.60	---	121.24		12.0 (1)	ND (1)	ND (1)	ND (3)	12.0	35.0 (1)	ND (100)
03/18/09	---	4.87	---	120.96				No Analytical Results				
03/24/09	---	4.94	---	120.90		4.4 (1)	ND (1)	ND (1)	ND (3)	4.4	26.0 (1)	ND (100)
MW-33S		Screen: 2.0-7.0 ft bgs			TOC: 126.58 ft							
09/15/08		Could Not Find Well										
09/23/08	---	3.84	---	122.74		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	3.83	---	122.74				No Analytical Results				

Notes:

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4) BTEX summed before rounding.

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FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-33S		Screen: 2.0-7.0 ft bgs			TOC: 126.58 ft							
03/24/09	---	3.96	---	122.62		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-34A		Screen: 7.0-14.5 ft bgs			TOC: 107.41 ft							
09/15/08	---	9.07	---	98.34				No Analytical Results				
03/18/09	---	8.99	---	98.42				No Analytical Results				
MW-34B		Screen: 14.5-24.5 ft bgs			TOC: 107.40 ft							
09/15/08	---	8.79	---	98.61				No Analytical Results				
03/18/09	---	9.29	---	98.11				No Analytical Results				
MW-37		Screen: 8.0-15.5 ft bgs			TOC: 152.61 ft							
09/15/08			Dry									
03/18/09			Dry									
MW-38		Screen: 8.0-15.5 ft bgs			TOC: 146.91 ft							
09/15/08	---	10.25	---	136.65				No Analytical Results				
09/24/08	---	10.41	---	136.50		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	11.04	---	135.86				No Analytical Results				
03/27/09	---	11.02	---	135.89		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-39		Screen: 6.0-13.5 ft bgs			TOC: 146.01 ft							
09/15/08			Dry									
03/18/09			Dry									
MW-39R		Screen: 13.0-20.5 ft bgs			TOC: 146.01 ft							
09/15/08	---	16.42	---	129.59				No Analytical Results				
09/24/08	---	16.84	---	129.17		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	17.31	---	128.70				No Analytical Results				
03/27/09	---	17.32	---	128.69		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)

Notes:
1) Reporting limit shown in parenthesis.
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3) Analytical and LPH Recovery results were rounded.
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GW Elev: Groundwater Elevation
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FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-40		Screen: 20.0-27.5 ft bgs			TOC: 145.18 ft							
09/15/08	---	22.44	---	122.73				No Analytical Results				
09/24/08	---	22.58	---	122.60		ND (1)	ND (1)	ND (1)	ND (3)	ND	1.3 (1)	ND (100)
03/18/09	---	23.38	---	121.79				No Analytical Results				
03/27/09	---	23.36	---	121.82		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-41A		Screen: 17.0-24.5 ft bgs			TOC: 136.96 ft							
09/15/08	---	19.32	---	117.63				No Analytical Results				
09/24/08	---	18.91	---	118.05		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	20.17	---	116.78				No Analytical Results				
03/25/09	---	20.21	---	116.75		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-41B		Screen: 28.0-38.0 ft bgs			TOC: 136.82 ft							
09/15/08	---	18.83	---	117.99				No Analytical Results				
09/24/08	---	27.37	---	109.45		ND (1)	ND (1)	ND (1)	ND (3)	ND	20.0 (1)	ND (100)
03/18/09	---	20.53	---	116.29				No Analytical Results				
03/25/09	---	20.59	---	116.23		ND (1)	ND (1)	ND (1)	ND (3)	ND	16.0 (1)	ND (100)
MW-42		Screen: 2.0-9.5 ft bgs			TOC: 140.03 ft							
09/15/08	---	7.92	---	132.10				No Analytical Results				
09/23/08	---	8.02	---	132.01		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	8.67	---	131.35				No Analytical Results				
03/25/09	---	8.48	---	131.55		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-43A		Screen: 2.0-9.5 ft bgs			TOC: 133.98 ft							
09/15/08	---	4.20	---	129.78				No Analytical Results				
09/23/08	---	4.32	---	129.66		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	4.19	---	129.79				No Analytical Results				
03/25/09	---	4.35	---	129.63		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-43B		Screen: 21.0-31.0 ft bgs			TOC: 134.09 ft							
09/15/08	---	8.73	---	125.36				No Analytical Results				

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Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-43B		Screen: 21.0-31.0 ft bgs			TOC: 134.09 ft							
09/23/08	---	9.71	---	124.38		4.3 (1)	ND (1)	ND (1)	ND (3)	4.3	21.0 (1)	ND (100)
03/18/09	---	9.53	---	124.56		No Analytical Results						
03/25/09	---	9.43	---	124.66		4.3 (1)	ND (1)	ND (1)	ND (3)	4.3	17.0 (1)	ND (100)
MW-44A		Screen: 6.0-13.5 ft bgs			TOC: 130.22 ft							
09/15/08	---	9.51	---	120.71		No Analytical Results						
09/23/08	---	9.62	---	120.60		ND (1)	ND (1)	ND (1)	ND (3)	ND	42.0 (1)	ND (100)
03/18/09	---	10.18	---	120.04		No Analytical Results						
03/25/09	---	12.56	---	117.66		ND (1)	ND (1)	ND (1)	ND (3)	ND	17.0 (1)	ND (100)
MW-44B		Screen: 29.0-39.0 ft bgs			TOC: 130.24 ft							
09/15/08	---	11.96	---	118.28		No Analytical Results						
09/23/08	---	11.91	---	118.33		ND (1)	ND (1)	ND (1)	ND (3)	ND	95.0 (1)	120.0 (100)
03/18/09	---	12.49	---	117.75		No Analytical Results						
03/25/09	---	10.18	---	120.06		ND (1)	ND (1)	ND (1)	ND (3)	ND	94.0 (1)	100.0 (100)
MW-45		Screen: 35.0-55.0 ft bgs			TOC: 173.89 ft							
09/15/08	---	43.63	---	130.26		No Analytical Results						
09/29/08	---	42.61	---	131.28		30.0 (1)	ND (1)	ND (1)	16.0 (3)	46.0	ND (1)	680.0 (100)
03/18/09	---	44.80	---	129.09		No Analytical Results						
03/31/09	---	43.02	---	130.87		21.0 (1)	2.7 (1)	ND (1)	29.5 (3)	53.2	ND (1)	740.0 (500)
MW-46		Screen: 38.0-58.0 ft bgs			TOC: 174.12 ft							
09/15/08	---	47.11	---	127.00		No Analytical Results						
09/29/08	---	47.15	---	126.97		ND (1)	ND (1)	ND (1)	ND (3)	ND	21.0 (1)	ND (100)
03/18/09	---	48.12	---	125.99		No Analytical Results						
03/31/09	---	47.63	---	126.49		ND (1)	ND (1)	ND (1)	ND (3)	ND	6.2 (1)	ND (100)
MW-47		Screen: 40.0-60.0 ft bgs			TOC: 171.50 ft							
09/15/08	---	45.94	---	125.55		No Analytical Results						
09/29/08	---	45.92	---	125.58		230.0 (2)	51.0 (2)	1.3 (2)	48.7 (6)	331.0	15.0 (2)	1,000.0 (100)

Notes:
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2) Groundwater elevation corrected for presence of LPH.
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5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-47		Screen: 40.0-60.0 ft bgs			TOC: 171.50 ft							
03/18/09	---	46.90	---	124.59				No Analytical Results				
03/31/09	---	46.65	---	124.85		250.0 (2)	63.0 (1)	ND (1)	77.5 (3)	390.5	19.0 (1)	1,600.0 (500)
MW-48		Screen: 38.0-58.0 ft bgs			TOC: 165.96 ft							
09/15/08	---	42.00	---	123.95				No Analytical Results				
09/29/08	---	41.89	---	124.07		ND (1)	ND (1)	ND (1)	ND (3)	ND	3.5 (1)	ND (100)
03/18/09	---	42.91	---	123.04				No Analytical Results				
03/31/09	---	42.52	---	123.44		ND (1)	ND (1)	ND (1)	ND (3)	ND	4.2 (1)	ND (100)
MW-49		Screen: 33.0-53.0 ft bgs			TOC: 159.15 ft							
09/15/08	---	44.70	---	114.45				No Analytical Results				
09/29/08	---	42.83	---	116.32		14.0 (2)	ND (2)	ND (2)	1.7 (6)	15.7	270.0 (2)	350.0 (100)
03/18/09	---	45.81	---	113.34				No Analytical Results				
03/31/09	---	45.78	---	113.37		ND (2)	ND (2)	ND (2)	ND (6)	ND	250.0 (2)	210.0 (100)
MW-50		Screen: 31.0-51.0 ft bgs			TOC: 156.12 ft							
09/15/08	---	37.76	---	118.36				No Analytical Results				
09/29/08	---	37.80	---	118.32		4.4 (1)	ND (1)	ND (1)	ND (3)	4.4	130.0 (1)	240.0 (100)
03/18/09	---	38.45	---	117.67				No Analytical Results				
03/31/09	---	38.44	---	117.68		4.1 (1)	ND (1)	ND (1)	ND (3)	4.1	110.0 (1)	230.0 (100)
MW-51		Screen: 44.0-64.0 ft bgs			TOC: 158.12 ft							
09/15/08	---	49.41	---	108.70				No Analytical Results				
09/29/08	---	49.51	---	108.61		28.0 (1)	ND (1)	ND (1)	ND (3)	28.0	74.0 (1)	270.0 (100)
03/18/09	---	50.35	---	107.76				No Analytical Results				
03/31/09	---	55.30	---	102.82		21.0 (1)	ND (1)	ND (1)	ND (3)	21.0	76.0 (1)	240.0 (100)
MW-52		Screen: 2.0-7.0 ft bgs			TOC: 127.58 ft							
09/15/08	---	3.35	---	124.23				No Analytical Results				
03/18/09	---	3.46	---	124.12				No Analytical Results				

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
MW-53		Screen: 5.5-10.5 ft bgs			TOC: 116.18 ft							
09/15/08	---	6.09	---	110.09				No Analytical Results				
09/22/08	---	6.01	---	110.17		23.0 (1)	ND (1)	ND (1)	ND (3)	23.0	160.0 (1)	330.0 (100)
03/18/09	---	6.56	---	109.62				No Analytical Results				
03/23/09	---	6.54	---	109.64		7.8 (1)	ND (1)	ND (1)	1.7 (3)	9.5	150.0 (1)	150.0 (100)
MW-54		Screen: 2.0-7.0 ft bgs			TOC: 121.76 ft							
09/15/08	---	5.09	---	116.66				No Analytical Results				
09/22/08	---	5.20	---	116.56		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	5.12	---	116.63				No Analytical Results				
03/23/09	---	5.19	---	116.57		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
MW-55		Screen: 3.5-8.5 ft bgs			TOC: 131.49 ft							
09/15/08	---	1.53	---	129.95				No Analytical Results				
09/23/08	---	1.78	---	129.71		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
03/18/09	---	2.16	---	129.32				No Analytical Results				
03/24/09	---	2.32	---	129.17		ND (1)	ND (1)	ND (1)	ND (3)	ND	ND (1)	ND (100)
PTW-A		Screen: 40.0-65.0 ft bgs			TOC: 172.28 ft							
09/15/08	---	41.81	---	130.46				No Analytical Results				
10/01/08	---	41.81	---	130.47		9.3 (1)	ND (1)	ND (1)	7.2 (3)	16.5	23.0 (1)	ND (100)
03/18/09	---	41.81	---	130.46				No Analytical Results				
04/07/09	---	38.77	---	133.51		2.7 (1)	ND (1)	ND (1)	9.4 (3)	12.1	5.2 (1)	ND (100)
PTW-B		Screen: 34.0-54.0 ft bgs			TOC: 171.75 ft							
09/15/08	---	37.61	---	134.14				No Analytical Results				
10/01/08	---	37.61	---	134.14		270.0 (10)	1,200.0 (10)	410.0 (10)	3,900.0 (30)	5,780.0	23.0 (10)	13,000.0 (1000)
03/18/09	---	41.90	---	129.85				No Analytical Results				
04/02/09	---	37.50	---	134.25		200.0 (2)	460.0 (2)	57.0 (2)	600.0 (6)	1,317.0	140.0 (2)	2,700.0 (100)
RW-1		Screen: 34.0-54.0 ft bgs			TOC: 173.36 ft							
09/15/08	---	55.40	---	117.96				No Analytical Results				

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

Gannett Fleming

TABLE C-1. GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Chevron

PERIOD: 7/1/2008 - 6/30/2009

Date	DTL (ft)	DTW (ft)	LPH Thick. (ft)	GW Elev (ft)	LPH Recov. (gal)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	BTEX (µg/L)	MTBE (µg/l)	TPH-GRO (µg/L)
RW-1		Screen: 34.0-54.0 ft bgs			TOC: 173.36 ft							
10/01/08	---	55.40	---	117.96		1,700.0 (10)	2,500.0 (10)	110.0 (10)	1,740.0 (30)	6,050.0	1,100.0 (10)	11,000.0 (500)
03/18/09	---	47.86	---	125.50		No Analytical Results						
04/01/09	---	42.78	---	130.58		890.0 (5)	640.0 (5)	38.0 (5)	700.0 (15)	2,268.0	700.0 (5)	4,100.0 (100)
RW-2		Screen: 30.0-55.0 ft bgs			TOC: 172.21 ft							
09/15/08	---	45.86	---	126.35		No Analytical Results						
10/01/08	---	45.86	---	126.35		2,000.0 (20)	2,600.0 (20)	240.0 (20)	1,600.0 (60)	6,440.0	3,300.0 (20)	13,000.0 (1000)
03/18/09	---	56.51	---	115.70		No Analytical Results						
04/02/09	---	40.72	---	131.49		1,500.0 (20)	3,200.0 (20)	330.0 (20)	2,800.0 (60)	7,830.0	850.0 (20)	12,000.0 (500)
RW-3		Screen: 28.0-48.0 ft bgs			TOC: 171.62 ft							
09/15/08	---	36.21	---	135.41		No Analytical Results						
10/01/08	---	36.21	---	135.41		620.0 (20)	4,400.0 (20)	430.0 (20)	2,310.0 (60)	7,760.0	33.0 (20)	16,000.0 (1000)
03/18/09	---	49.95	---	121.67		No Analytical Results						
04/01/09	---	38.71	---	132.91		580.0 (10)	2,300.0 (10)	280.0 (10)	1,820.0 (30)	4,980.0	200.0 (10)	8,800.0 (1000)

Notes:
1) Reporting limit shown in parenthesis.
2) Groundwater elevation corrected for presence of LPH.
3) Analytical and LPH Recovery results were rounded.
4) BTEX summed before rounding.

Abbreviations:
DTL: Depth to LPH
DTW: Depth to Water
LPH: Liquid Phase Hydrocarbons
GW Elev: Groundwater Elevation
TOC: Top of Casing
ND: Not Detected above reporting limit
NA: Not Analyzed
UNK: Unknown

APPENDIX D

SOIL VAPOR MONITORING DATA

Gannett Fleming

TABLE D-1. SOIL VAPOR MONITORING REPORT
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2009
FORMER CHEVRON FACILITY 122208
5801 RIGGS ROAD CHILLUM, MARYLAND

PERIOD: 7/1/2008 - 6/30/2009

Date	Benzene µg/m³	Toluene µg/m³	Ethyl-benzene µg/m³	m,p-Xylene µg/m³	o-Xylene µg/m³	MTBE µg/m³	Difluoroethane µg/m³	Oxygen Percent	Carbon Dioxide Percent	Methane Percent
VW-1										
09/18/08	ND (3.9)	ND (4.6)	ND (5.4)	ND (5.4)	ND (5.4)	ND (4.4)	ND (13)	5.7	15.3	0.0
03/19/09	ND (4)	ND (4.8)	ND (5.5)	ND (5.5)	ND (5.5)	ND (4.6)	38 (14)	-	-	-
VW-2										
09/18/08	ND (7.7)	ND (9.1)	ND (10)	ND (10)	ND (10)	49 (8.7)	ND (26)	12.1	9.5	0.0
03/19/09	25 (4)	ND (4.7)	ND (5.4)	ND (5.4)	ND (5.4)	62.0 (4.5)	ND (14)	-	-	-
VW-03										
09/18/08	6.6 (3.7)	27 (4.4)	41 (5.0)	69 (5.0)	65 (5.0)	5.2 (4.2)	540 (12)	13.5	6.8	0.0
03/19/09	ND (3.9)	ND (4.6)	ND (5.2)	ND (5.2)	ND (5.2)	ND (4.4)	34 (13)	-	-	-

Notes:

1) Reporting limit shown in parenthesis.
2) Analytical results were rounded.
3) ND: Not Detected above reporting limit.
4) NS: Analyte was not sampled.
5) Well VW-03 was reinstalled in February 2008.
6) Well VW-04 was not sampled during the reporting period due to the presence of water.

APPENDIX E

VAPOR MITIGATION SYSTEM DATA

Gannett Fleming

Table E-1. Vapor Mitigation System Measurements
Semi-Annual Progress Report: January through June 2009
Former Chevron Facility No. 122208
5801 Riggs Road, Chillum, Maryland

Address	Date	Average Flow Velocity (ft/min)	Air Flow Rate (standard ft^3/min)	Cross-Slab Differential Pressure (in. H_2O)
5818 Eastern Avenue	03/26/09	144	13	-0.007
	04/27/09	182	16	0.000
	05/07/09	228	20	-0.006
	06/29/09	150	3	-0.011
5824 Eastern Avenue	01/06/09	97	8	-0.015
	02/09/09	530 [1]	46 [1]	-0.030
	03/26/09	195	17	-0.045
	04/24/09	551	48	-0.030
746 Oglethorpe Street	03/31/09	99	9	-0.039
			EPA Sub-Slab Depressurization Goal	-0.016
			ASTM Sub-Slab Depressurization Goal	-0.025

Notes:

1. The average flow velocity appears erroneous. The instrument reading was taken too close to the wall of the discharge pipe, creating turbulence and a falsely high reading.
2. Initial readings collected immediately following vapor mitigation system start-up.
3. The resident at 746 Oglethorpe Street turned the system off shortly after start up.