MWH

BUILDING A BETTER WORLD

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SUBJECT: Wasatch Chemical Site
Progress Report No. 103

Dear Sam and Tony:

This semiannual report was prepared by MWH to summarize environmental remediation activities conducted at the Wasatch Chemical Site (Site) in Salt Lake City, Utah from January through June, 2015. Primary activities conducted during this reporting period include routine semiannual groundwater monitoring and wellhead maintenance.

This progress report includes the following sections:

1.0 Site Background and Summary of Progress
2.0 Activities Conducted During Current Reporting Period
3.0 Routine Groundwater Monitoring Results
4.0 Shallow Groundwater Analytical Data Evaluation
5.0 Deeper Groundwater Analytical Data Evaluation
6.0 Groundwater Natural Attenuation Assessment
7.0 Recommendations
8.0 Deliverables Submitted During Current Reporting Period
9.0 Actions to be Completed During Next Reporting Period

The April 2015 groundwater data verification report and historical time series groundwater data are attached as Appendices A and B, respectively. Statistical results used to evaluate plume stability are presented in Appendix C.

1.0 SITE BACKGROUND AND SUMMARY OF PROGRESS

A number of remedial actions have been implemented at the Site since 1985, for both soils and groundwater. A brief summary of background information and highlights of environmental remediation history at the Site are provided in this section; however, for a more thorough presentation of Site history refer to historical documents such as the *Record of Decision* (USEPA, 1991), the *Fourth Five-Year Review Report* (USEPA, 2012), the *Remedial Action Completion Report*

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(Interstate Land Company, 1998) and the *Draft Wasatch Chemical Site Natural Attenuation Evaluation* (MWH, 2011).

1.1 History

Beginning in 1957 the Site was used for producing, packaging, and distributing industrial chemical products such as pesticides, herbicides, fertilizers, industrial chemicals, and cleaners. A remedial investigation was conducted in the late 1980s and a feasibility study for both soil and groundwater remediation alternatives was completed in August 1990 (Harding Lawson, 1990 and 1990a). Selected remedies included in-situ vitrification of soils and sludges, landfarming of hydrocarbon contaminated soils, and extraction and treatment of contaminated shallow groundwater. A Record of Decision (ROD) (USEPA, 1991) and Consent Decree (U.S. District Court, 1991) were signed in 1991. The Site was added to the National Priorities List in 1991 and continues to be federally regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The United States Environmental Protection Agency (USEPA) and Utah Department of Environmental Quality (UDEQ) certified completion of the land farm remedy for soils in January 1994 and the in-situ vitrification remedial action work in May 1996 (Interstate Land, 1998). Shallow groundwater remediation and monitoring has been ongoing since 1995.

Performance standards for shallow groundwater remediation at the Site are outlined in the Consent Decree (U.S. District Court, 1991) and state that "indicator chemical" concentrations are to be reduced to established drinking water maximum contaminant levels (MCLs), or proposed Alternative Performance Standards. Additionally, concentrations were to be reduced within the first five years of remediation by at least 50 percent of baseline concentrations established at the beginning of the groundwater remedial action (March 1995). Groundwater remediation "indicator chemicals" identified in the ROD (USEPA, 1991) as performance monitoring parameters include tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), pentachlorophenol (PCP), and 2,4-dichlorophenoxyacetic acid (2,4-D).

1.2 Shallow Groundwater Remediation Progress

Concentrations of indicator chemicals in shallow groundwater (down to 25 feet below ground surface) have decreased by two and three orders of magnitude since 1995 as more than 99 percent of the estimated dissolved contaminant mass in the shallow groundwater was estimated to have been removed by 2011 (*Progress Report No. 95* [MWH, 2011a]). The 50 percent reduction requirement for shallow groundwater has been met for all monitoring locations and indicator chemicals established in the ROD. Groundwater concentrations of 2,4-D reached the performance standard (MCL) across the Site by 1996, and as approved by the regulatory agencies, this indicator chemical has not been monitored since 2004.

Significant progress has been made towards stabilizing the shallow groundwater plumes at the Site. Statistical analyses conducted for data collected through April 2015 indicate concentrations of the remaining groundwater indicator chemicals across the Site are either below MCLs, or above MCLs and stable (MWH, 2014). Foreseeing potential difficulties in meeting performance standards with pump-and-treat technology, the Site Consent Decree (U.S. District Court, 1991, Section VII, part 17) provides an avenue to "waive or modify" groundwater treatment performance standards that are demonstrated to be "technically impracticable from an engineering perspective" to achieve. To provide justification, the Consent Decree requires a demonstration for each contaminant for which a

waiver or modification is sought that illustrates contaminant concentrations remain "at statistically significant asymptotic values above MCLs" for at least the eight most recent data points.

1.2.1 Best Efforts

As outlined in the Site Consent Decree, "best efforts" to attain MCLs have been made to "maximize the performance of the shallow groundwater Remedial Action to attain the performance standards" (U.S. District Court, 1991). At the Site, "best efforts" have included implementation of three different groundwater remediation technologies:

- Groundwater extraction and treatment (including operation of extraction wells and trenches and modified system operations such as pulse pumping)
- Monitored natural attenuation (MNA)
- Enhanced biodegradation.

1.2.1.1. Groundwater Extraction and Treatment. An active pump-and-treat remedy was implemented for eight years until significant mass removal was no longer occurring and a period of MNA was approved by the USEPA. The history and performance of that system are included in progress reports submitted from 1995 to 2003.

1.2.1.2. Monitored Natural Attenuation. MNA was implemented beginning in 2003 to assess whether natural biodegradation processes could successfully decrease remaining contaminant mass in the shallow groundwater. Data collected since the groundwater extraction and treatment system was shut down in 2003, including the presence of degradation products that were not released at the Site (e.g., DCE isomers and vinyl chloride [VC]), indicate natural attenuation of chlorinated solvents has occurred and continues to occur at the Site. Since 2003, all indicator chemicals established in the ROD plus VC have been monitored and time series data evaluated. This list of chemicals (PCE, TCE, 1,1-DCE, VC, and PCP) is referred to as the primary constituents of concern (COCs) hereafter in this document.

1.2.1.3. Enhanced Biodegradation. In an effort to accelerate the degradation of chlorinated hydrocarbons at the Site, biodegradation enhancing products were injected near monitoring points across the core of the plume in 2004 and 2006, and monitoring was conducted to assess whether biodegradation was impacted as a result. Results from these pilot tests indicate substantial mass reductions of the COCs in portions of the aquifer with relatively higher permeability (such as the two gravel-filled extraction trenches), but very limited impact in the prevalent native silts and clays of the Site (*Progress Report No. 89* [MWH, 2008]).

1.2.2 Focused Feasibility Study for Shallow Groundwater

Due to the demonstrated limitations of the pump-and-treat remedy at the Site, a *Draft Groundwater Remediation Focused Feasibility Study* (FFS) (MWH, 2010) was prepared and submitted in February 2010 to evaluate alternative groundwater remediation technologies to remediate the remaining contaminants in the shallow groundwater at the Site. MNA along with maintenance of institutional controls as outlined in the Site Environmental Covenant (UDEQ, 2009) is one of the alternatives considered in the draft FFS. The potential to move to a MNA remedy prompted the development of the *Draft Natural Attenuation Evaluation* in October 2011 (MWH, 2011). The USEPA reviewed this report and provided comments to Questar in February 2013, and Questar submitted responses

to their comments in May 2013. Finalization of this evaluation report is currently on hold as MNA is reassessed as a potential alternative remedy for shallow groundwater at the Site.

1.3 Summary of Recent Findings and Activities – 2011 to Present

1.3.1 Installation of New Wells

Formal USEPA comments on the draft FFS for shallow groundwater were received in May 2011 and subsequent discussions between Questar and the regulatory agencies spurred additional groundwater investigation. Additional monitoring points were requested to better define the horizontal extent of contamination present on the west side of the Site. During subsequent conversations, USEPA and UDEQ requested installation of additional deeper monitoring wells to determine whether dense non-aqueous phase liquid (DNAPL) was present along or beneath potential preferential flow pathways (inferred subsurface sand channels), to assess the competency of the underlying clayey confining layer identified during the additional studies conducted in the early 1990s (Harding Lawson, 1993), and to provide deeper groundwater monitoring points at the Site. In addition, a shallow groundwater monitoring well was requested to be installed in the southwest area of the Site to aid in shallow groundwater plume and potentiometric surface delineation.

In response to these requests, four monitoring wells (MW-30, MW-31D, MW-32D, and MW-33D) were installed in October 2011, at locations requested by the USEPA. Three deeper wells were completed between 45 and 56 feet below ground surface (bgs) and the new shallow well was completed at 24 feet bgs. Well installation details are included in *Progress Report No. 96* (MWH, 2012) and the *Draft Final Groundwater Monitoring Well Installation Documentation* technical memorandum (MWH, 2011b). Well locations are shown in **Figure 1**.

Because VOC concentrations above MCLs were detected in the shallow well installed in 2011 (MW-30), an additional shallow groundwater monitoring well (MW-34) was installed in June 2013 immediately downgradient of MW-30 to better define the edge of the VOC plume boundaries in the southwestern area of the Site. VOC concentrations in this new sentry well (MW-34) have all been below MCLs.

1.3.2 Focused Shallow Soil and Deeper Groundwater Investigation

Data collected from the monitoring points installed in 2011 indicate both shallow soil (3.5 feet bgs) and deeper groundwater contamination (35 to 45 feet bgs) at one of the four new well locations (MW-33D). Therefore, additional investigation was warranted in the vicinity of MW-33D located in the southeast area of the Site, northeast of the Peterson Plumbing Supply warehouse as shown in **Figure 1**. Additional investigative steps to delineate the lateral extent of the soil contamination and the extent of deeper groundwater contamination discovered in the southeast area of the Site began in May 2013. The work has been conducted in the area shown in **Figure 1** in general accordance with the *Final Revision 2 Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan* (MWH, 2012a), and a draft shallow soil and deeper groundwater investigation report was submitted to the regulatory agencies in December 2014 (MWH, 2014a). Once comments are received, the report will be discussed and conclusions and recommendations will be deliberated at an on-board review meeting between Questar and the regulatory agencies.

1.3.2.1. Focused Shallow Soil Investigation. The focused shallow soil investigation was conducted in May 2013 to assess the nature and extent of impacted shallow subsurface soils in the

vicinity of monitoring well MW-33D (**Figure 1**) where concentrations above USEPA industrial screening levels were detected in samples collected at 3.5 feet bgs during October 2011 drilling activities. Direct-push soil borings were completed at a total of 53 locations, beginning adjacent to the MW-33D location and moving outward from locations where sampling results were above screening levels. PCE, TCE, ethylbenzene, xylenes, and/or PCP were detected at concentrations above screening levels in 18 of the 53 boring locations. Soil samples with constituent concentrations above screening levels were collected from borings along the north-south trending corridor east of Peterson Plumbing Supply warehouse and northward along the historical industrial process wastewater pipeline (process drain line) alignment that runs parallel to the Site boundary (**Figure 1**). All shallow soil data are presented and evaluated in the draft focused investigation report (MWH, 2014a) that is currently being reviewed by the regulators.

1.3.2.2. Focused Deeper Groundwater Investigation. The focused deeper groundwater investigation began in May 2013 with cone penetrometer testing (CPT) and direct-push groundwater sampling and was completed in July 2014, during the current reporting period. The purpose of the focused investigation was to assess the nature and extent of groundwater contamination identified at monitoring well MW-33D where VOCs were initially detected above MCLs in a deeper interval (35-45 feet bgs).

CPT methodology was used to profile subsurface characteristics and to collect direct-push groundwater samples at 12 locations at depths up to 160 feet bgs on the following dates:

May 20 through 24, 2013 (five locations)
July 23 and 24, 2013 (three locations)
August 19, 2013 (one location)
February 19, 2014 (two locations)
June 30 and July 1, 2014 (one location)

Direct-push groundwater samples were collected at the more hydraulically conductive intervals (typically interpreted as silts and sands) at two to five different depths at each of the twelve CPT boring locations. Laboratory analytical results include detections of some VOCs and/or PCP above MCLs at four locations, between depths of approximately 70 and 130 feet bgs. All lithological, groundwater, and pore dissipation test data are presented and evaluated in the draft focused investigation report that was submitted to the regulatory agencies in December 2014 (MWH, 2014a).

1.3.3 Indoor Air Sampling

Due to shallow groundwater VOC contamination near occupied buildings, the potential for vapor intrusion and potential health risk to workers were evaluated in the spring of 2012. Air samples collected with SUMMA® canisters in the three occupied buildings on the Site (**Figure 1**) were analyzed for TCE, DCE isomers and VC, and results were all below laboratory reporting limits. Therefore, no significant risk to worker health was concluded. A description of the investigation methods, results, and conclusions is presented in the *Final Indoor Air Investigation Summary Report* (MWH, 2013). One additional round of sampling is currently scheduled for December 2015 to assess to human health risk from potential vapor intrusion in the three buildings. The analyte list for the December 2015 indoor air sampling round has been expanded to include all VOCs detected in shallow soil in 2013 (within 100 feet of the Peterson Plumbing Warehouse) and benzene. Though benzene was not detected in shallow soil samples collected during the focused shallow soil

investigation, detection limits for benzene were above the industrial soil screening level for benzene in a number of the 2013 soil samples (MWH, 2015).

2.0 ACTIVITIES CONDUCTED DURING CURRENT REPORTING PERIOD

2.1 Shallow Groundwater Treatment System Operation

The groundwater extraction and treatment system was not operated during the reporting period. Operation of the groundwater extraction and treatment system was discontinued in January 2003 in accordance with the USEPA's approval letter dated January 9, 2003.

2.2 Groundwater Monitoring Activities

Overall, the monitoring program is designed to provide data to assess natural attenuation processes of contaminants in the shallow groundwater as described in the *Monitored Natural Attenuation Work Plan* (MWH, 2002) and to assess potential groundwater contaminant migration. Both hydrogeological and constituent concentration data were collected and evaluated. Routine semiannual groundwater monitoring was conducted in April 2015 at 17 monitoring locations for the shallow groundwater (with well screens installed to 25 feet bgs) and three deeper monitoring points (with well screens installed to 56 feet bgs). April 2015 groundwater monitoring results are presented in Section 3.0.

3.0 ROUTINE GROUNDWATER MONITORING RESULTS

3.1 Shallow Groundwater Level Monitoring Results

Shallow groundwater wells and piezometers at the Site are completed to depths of 25 feet bgs or less. Groundwater elevation contours drawn from shallow groundwater monitoring data collected on April 20, 2015 are illustrated in **Figure 2**. In general, groundwater elevations measured at the shallow monitoring points continue to indicate an overall groundwater flow direction of west to northwest. The average depth to shallow groundwater across the Site in April 2015 was approximately 3.3 feet bgs, which is 0.56 feet higher than the average depth reported for November 2014 and 0.20 feet higher than the average measured in April 2014. Shallower groundwater depths were measured on the southeast side of the Site (i.e., 2.46 and 2.26 feet bgs at EX-08 and ES-01, respectively), and greater depths were measured to the north and west (i.e., 5.11 and 5.25 feet bgs at EX-04 and EX-05, respectively).

3.2 Deeper Groundwater Level Monitoring Results

Groundwater level data for the deeper wells (MW-31D, MW-32D, and MW-33D completed to depths between 45 and 56 feet bgs) were collected on April 20, 2015. The average depth to water measured in the three deeper wells was approximately 2.5 feet bgs, which is 0.17 feet higher than the average depth measured in November 2014, and 0.15 feet higher than the average depth to water measured in April 2014. Water-level data from these three points indicate an overall direction of horizontal flow towards the northwest in these deeper zones. Groundwater level elevations for the deeper wells are shown in **Figure 3**.

Each deeper well is located close to a shallow well, providing three well pairs where the vertical component of groundwater flow can be assessed. Vertical hydraulic gradients and resulting directions of the vertical component of groundwater flow are listed in **Table 1**. Water-level data collected in April 2015 indicate an upward vertical component of groundwater flow for all three nested well pairs, indicating the deeper zones are under pressure.

3.3 Shallow Groundwater Sampling Results

Shallow groundwater samples were collected from 17 monitoring locations from April 21 through 23 for the first semiannual monitoring round of 2015. Samples were analyzed for the COCs PCE, TCE, DCE isomers, VC, PCP, plus geochemical parameters pertinent to the assessment of biotransformation of chlorinated solvents (sulfate, sulfide, nitrate, nitrite, and ferrous iron). Dissolved oxygen (DO), pH, and oxidation-reduction potential (ORP) were measured in the field during sampling activities. Laboratory analytical methods and sampling results for wells completed in the shallow zones for this sampling round are presented in **Table 2**. A detailed data verification report is included in **Appendix A** for all November 2014 laboratory analytical data, and time series data dating back to 1995 are presented in **Appendix B**. Shallow groundwater plumes were drawn using the April 2015 data for the indicator chemicals PCE, TCE, 1,1-DCE, PCP and for VC, as shown in **Figure 4** through **Figure 8**.

3.3.1 Shallow Groundwater VOC and PCP Results

A summary of November 2014 laboratory analytical results for shallow groundwater relative to MCLs and laboratory reporting limits are tabulated below. Maximum concentrations detected for each constituent are listed, with the corresponding monitoring point location indicated in parentheses.

Shallow Groundwater Analytical Data Summary
April 2015

Constituent	Drinking Water MCL (µg/l)	No. of Monitoring Points Sampled	No. of Results Above MCL	Maximum Concentration Detected (µg/l)	No. of Results at or Above Reporting Limit	No. of Results Below Reporting Limit
PCE	5	17	0	0.72 T (EX-07)	0	17
TCE	5	17	2	91 (EX-02)	3	14
1,1-DCE	7	17	1	11 (EX-05)	7	10
cis-1,2-DCE[a]	70	17	2	260 D (EX-02)	11	6
trans-1,2-DCE[a]	100	17	1	130 D (EX-05)	8	9
VC	2	17	8	72 D (EX-11)	8	9
PCP[b]	1	5	1	6.2 D (EX-02)	1	4

(a) Although cis- and trans- DCE isomers are not designated as "indicator chemicals" in the ROD (USEPA, 1991), they have been monitored since April 2009 to aid in the evaluation of natural attenuation processes.
(b) Based on historical data, the PCP monitoring network is limited to five monitoring points.

D Sample was diluted
T Analyte was positively identified but the reported concentration is estimated at a concentration less than the reporting limit, but greater than the method detection limit.

In general, the April 2015 data are very similar to those reported for both monitoring rounds conducted in 2014 ([MWH, 2014] and [MWH, 2015]).

3.3.2 Geochemical Parameters

Geochemical parameters including pH, ORP, DO, nitrate, nitrite, ferrous iron, sulfate, and sulfide were collected to assess whether conditions in the aquifer are conducive to biotransformation processes. April 2015 results for these parameters for shallow groundwater monitoring points are listed in **Table 2**. Data for pH, ORP, DO, nitrate, and ferrous iron throughout the Site indicate generally favorable conditions for anaerobic reductive dechlorination in shallow groundwater. Historically, ORP values have been low (typically negative millivolts), DO concentrations have been low (below 0.5 mg/l), and ferrous iron results have been relatively high (greater than 1 mg/l). April 2015 ORP values are generally consistent with historical results and are within the expected range that correlates to their respective April 2015 DO concentrations except for one unusually high DO value recorded for PZ-3 where an operational issue with the measuring probe is suspected. Ferrous iron concentrations are also generally consistent with the DO and ORP results, with the exception of one anomalously low ferrous iron result for ES-01.

3.4 Deeper Groundwater Sampling Results

Groundwater samples were collected on April 21 and 23, 2015 from the three wells completed in deeper zones. The three deeper wells, MW-31D, MW-32D, and MW-33D, were installed in 2011 and are screened at 38-48, 46-56, and 35-45 feet bgs, respectively. Groundwater samples collected from these three wells were analyzed for VOCs and geochemical parameters pertinent to the assessment of biotransformation of chlorinated solvents (sulfate, sulfide, nitrate, nitrite, and ferrous iron). Additionally, DO, pH, and ORP were measured in the field. Results and laboratory analytical methods used are presented in **Table 3** where concentrations of the primary COCs and additional VOCs initially detected in MW-33D groundwater samples (i.e., ethylbenzene, xylenes, toluene) are listed. Time series data for all three wells are presented in Exhibits B-15 through B-17 of **Appendix B**. Additionally, detailed sampling and data validation information is included in **Appendix A** where the complete list of VOC analytes for MW-33D is presented.

Consistent with historical data, VOCs were not detected above laboratory reporting limits in wells MW-31D and MW-32D, but were at MW-33D. Historical VOC and PCP data for MW-33D are summarized on **Figure 3**. VOC results for MW-33D have remained below MCLs over the past two years (see Exhibit B-17 for MW-33D time series data table and graphs). Hydrocarbon concentrations continued to be detected at MW-33D, though results continue to be orders of magnitude below Utah Leaking Underground Storage Tank Program (LUST) initial screening levels and drinking water MCLs, as listed in the table below:

April 2015 Hydrocarbon Concentrations Detected in MW-33D Groundwater Compared to Utah LUST Regulatory Limits and MCLs

Hydrocarbon Detected	April 2015 Concentration (µg/l)	Utah LUST Screening Level[(a)] and Federal/State MCL (µg/l)
Ethylbenzene	6.3	700
m,p,o-Xylene (sum of isomers)	12.7	10,000
Toluene	<0.5	1,000

[(a)] Guidelines for Utah's Corrective Action Process for Leaking Underground Storage Tank Sites, Updated March 2015.

Geochemical parameters measured in April 2015 for all three deeper wells illustrate conditions conducive to natural attenuation with consistently negative ORP readings, low DO concentrations, and neutral pH readings. Laboratory analytical results for nitrate, ferrous iron, and sulfate for MW-33D fall in the biodegradation indicator ranges presented in USEPA natural attenuation guidance (USEPA, 1998).

4.0 SHALLOW GROUNDWATER ANALYTICAL DATA EVALUATION

4.1 Introduction

Foreseeing potential difficulties in meeting performance standards with pump-and-treat technology, the Site Consent Decree (U.S. District Court, 1991, Section VII, part 17) provides an avenue to "waive or modify" groundwater treatment performance standards (equivalent to MCLs as defined in the ROD) that are demonstrated to be "technically impracticable from an engineering perspective" to achieve, as reflected in "asymptotic conditions" at the Site. To provide justification for a performance standard waiver or modification, the Consent Decree requires a demonstration for each contaminant for which a waiver or modification is sought that illustrates contaminant concentrations remain "at statistically significant asymptotic values above MCLs" for at least the eight most recent data points. Therefore, statistical analyses and shallow groundwater plume stability evaluations are currently conducted on an annual basis, after each spring monitoring round.

Evaluation of groundwater constituent concentration trends are useful for:

- Assessing overall plume stability
- Evaluating the groundwater monitoring program
- Identifying locations where constituent concentrations have stabilized above MCLs such that petitioning for Alternative Performance Standards may be justified as outlined in the Site Consent Decree (U.S. District Court, 1991).

As substantial contaminant mass reductions in the shallow groundwater have occurred at the Site, statistical methods have been applied to assess whether contaminant concentrations are stable at shallow groundwater monitoring points where contaminant concentrations remain above MCLs. From 2001 through 2012, linear regression analyses were used to evaluate trends at the Site in

accordance with the *Extraction System Performance Standards, Milestones, and Shutdown Procedures* document (Montgomery Watson, 2001). These trend analyses illustrated groundwater remediation progress and helped guide remediation strategy at the Site.

To look more closely at overall plume stability, beginning in 2013 Mann-Kendall and Theil-Sen statistical tests have been used to evaluate shallow groundwater COC concentrations. Results for the combination of Mann-Kendall and Theil-Sen statistical analyses of shallow groundwater data, using a confidence level of 99 percent in accordance with the Consent Decree, are summarized below in Section 4.1.

A summary of analyses and results based on current trends at individual wells, as well as historical trends for data extending back to 1995 are presented in the following subsections (4.2 and 4.3). From these results, the overall stability of the shallow plume was assessed.

4.2 Contaminant Trend Evaluation using Mann-Kendall and Theil-Sen Methods

Shallow groundwater data were evaluated for trends over the past eight monitoring events using Mann-Kendall and Theil-Sen analyses in accordance with USEPA Unified Guidance (USEPA, 2009). The Mann-Kendall test was used to test for a statistically significant slope (i.e., trend) in constituent concentration values over time. The Theil-Sen method was used in conjunction with the Mann-Kendall method to determine a slope, such as rate of change, of the trending data (Helsel, 2005). In addition to evaluation of trends and rates of change, the eight most recent data points were used to construct confidence intervals for non-trending data sets, and confidence bands for trending data, to determine whether current constituent concentrations are statistically above or below MCLs. More in-depth discussion of these methods is included in the statistical analyses technical memorandum included as Appendix C of *Progress Report No. 99* (MWH, 2013a).

A summary of shallow groundwater statistical results including mean, standard deviation, confidence limits, and trends for data sets that represent concentrations that are statistically above the MCLs is presented in **Table 4**. Results for all April 2015 analyses, including those that are not statistically above the MCLs, are included in **Appendix C**. Calculated mean concentrations and trends are comparable to those determined for the April 2014 data set presented in *Progress Report No. 101* (MWH, 2014).

To evaluate exceedances of non-trending data shown on **Table 4**, the 95% lower confidence limit of the mean of the eight most recent sample results was compared to the COC's MCL in accordance with USEPA guidance (USEPA, 2009). The presence (or absence) of a significant trend was determined at the 99% confidence level as indicated in the Consent Decree (U.S. District Court, 1991). No increasing or decreasing trends were identified for those data sets that are statistically above MCLs. Trend analysis results for monitoring locations where COCs are statistically above MCLs are identified on a Site map on **Figure 9**.

Statistical analysis results for trending data are presented in **Appendix C**, Section C2 (Trend Analysis Plots). Note that the computer-generated 99% confidence bands extend further positively and negatively than the actual magnitude of sample results. Consequently, some of the lower confidence bands enter theoretically negative values. This is a consequence of a statistical algorithm, that is valid in determining trends and slopes, but for practical use of these plots the reader should recognize that the lower bandwidth cannot represent the possibility of negative sample results.

4.3 Shallow Groundwater Plume Stability Evaluation Conclusions

The statistical analyses performed for the eight most recent data points for shallow groundwater across the Site demonstrate that all April 2015 shallow groundwater concentrations currently above MCLs are stable at a 99-percent confidence level. See **Figure 9** and **Table 4** for monitoring locations/COCs that indicate plume stability based on these results. Note that **Figure 9** shows trend analyses results only for wells for which a COC exceeds its MCL.

4.4 Shallow Groundwater Historical Time Series Data

Tables and graphs of historical time series data for the current monitoring network are included in **Appendix B** where very significant decreases in shallow groundwater concentrations over time are illustrated. Since 1995, contaminant concentrations have decreased two to four orders of magnitude for the original VOC indicator chemicals designated in the ROD (i.e., PCE, TCE, and 1,1-DCE). For example, TCE concentrations have decreased by four orders of magnitude at monitoring points EX-05 and MW-20 and by two orders of magnitude at EX-07 and EX-09. Also, concentrations of PCE have decreased by four orders of magnitude at monitoring points ES-01 and EX-11, and by two orders of magnitude at EX-05, EX-07, and MW-20. Concentrations at most wells have decreased exponentially over time, as shown in the B2 Exhibits (**Appendix B**).

5.0 DEEPER GROUNDWATER ANALYTICAL DATA EVALUATION

5.1 Statistical Analyses of Deeper Groundwater Data

Mann-Kendall and Thiel-Sens analyses were conducted for COCs detected at MW-33D, the only deeper monitoring location where COCs have been detected. Confidence limits were also calculated to assess whether the data sets are statistically above their respective MCLs. Results do not identify any statistically significant trends and indicate all COCs are statistically below MCLs. Statistical analysis results for MW-33D are included in Appendix C.

5.2 Deeper Groundwater Historical Time Series Data

As shown in **Figure 3** and in Exhibit B-17 of **Appendix B**, PCE and TCE were initially detected above their respective MCLs during the December 2011 and February 2012 sampling rounds. However, concentrations of these COCs have decreased to trace concentrations (below laboratory reporting limits) over the past four monitoring rounds. VC, though not detected initially, was detected above its MCL three times in the middle of the time series (August 2012, November 2012, and April 2013) and has been detected at concentrations below its MCL over the past four monitoring rounds. Ethylbenzene, xylenes and toluene have also been detected in groundwater samples from MW-33D, though at concentrations one to four orders of magnitude below their Utah LUST screening levels and drinking water MCLs as presented in Section 3.4 of this report.

6.0 NATURAL ATTENUATION ASSESSMENT

6.1 Shallow Groundwater

Geochemical parameters indicative of anaerobic microbial growth and reductive dechlorination of PCE and TCE are presented in **Table 2** as biodegradation indicators. April 2015 data shown in bold type in **Table 2** indicate favorable conditions for reductive dechlorination as defined in the USEPA's guidance on evaluating natural attenuation of chlorinated solvents (USEPA, 1998). As discussed in the Groundwater Sampling Results section of this report (Section 3.3), April 2015 values for ORP, nitrate, and DO are generally low and ferrous iron elevated in areas of contamination, indicating overall favorable conditions for reductive dechlorination at the Site. One anomalous reading for DO was recorded for PZ-03 for which an operational issue with the field equipment is suspected. The presence of reductive dechlorination daughter products (i.e., DCE isomers and VC) indicates natural attenuation has been occurring at the Site.

Though shallow groundwater data indicate that natural attenuation has been occurring at the Site and has contributed to overall shallow groundwater plume stability, MNA as an alternative remedy is currently being reassessed due to the presence of residual contamination in shallow soils at and near the water table northeast of the Peterson Plumbing Supply warehouse. Matrix diffusion of residual contamination can lengthen the remediation time frame for MNA, particularly for contaminated aquifers with inter-bedded low-permeability zones. Therefore, evaluating plume stability based on statistical analyses will continue to be conducted after each spring monitoring round, and the practicability of MNA as an alternative remedy will continue to be evaluated.

6.2 Deeper Groundwater

Groundwater data from the three monitoring wells completed between 35 and 56 feet bgs (MW-31D, MW-32D, and MW-33D) indicate the occurrence of reductive dechlorination in deeper groundwater. One anomalous reading for DO was recorded for MW-32D for which an operational issue with the field equipment is suspected. The anoxic environment, negative ORP conditions, nitrate, ferrous iron, and sulfate concentrations in all three deeper wells, plus the presence of daughter products TCE, cis-1,2-DCE, and VC at MW-33D indicate natural attenuation is occurring at deeper groundwater depths of the Site.

7.0 RECOMMENDATIONS

1. **Abandon Four Piezometers and One Monitoring Well.** Piezometers PZ-6, PZ-7, PZ-9, and PZ-10 and monitoring well MW-14 are recommended for abandonment. The four piezometers are located north of Peterson Plumbing Supply warehouse, and monitoring well MW-14 is located on the Intsel Steel West Property southeast of the Intsel Steel West warehouse, as shown in **Figure 10**. These monitoring points have been designed and used only for shallow groundwater level monitoring (not groundwater sampling), and water levels collected are redundant of those measured from nearby monitoring points.

   The four piezometers proposed for abandonment are located in a paved area where surface water ponding has been observed during wet weather events and potential stormwater infiltration into piezometer casings is a concern. Measurements from a number of shallow groundwater monitoring points (i.e., ES-01, EX-01, MW-09, MW-05, and EX-07) in the

vicinity of these four piezometers provide sufficient data to assess the groundwater levels in this area. The four piezometers are closely spaced around extraction trench ES-01, and were installed in 1997 to assess the groundwater table response during initial startup of the extraction trench, and have fulfilled their purpose.

Water-level measurements from monitoring well MW-14 are not necessary because data collected at nearby monitoring well MW-20 are sufficient to assess the shallow groundwater table and shallow groundwater flow direction. Access to MW-14 is located on the southeastern edge of Intsel's outdoor heavy steel storage yard and access is often obstructed.

Additional information in support of the well and piezometer abandonment is included in the technical memorandum attached as **Appendix D**.

2. **Shallow Groundwater Monitoring Network Modification.** Due to potential surface water infiltration issues, replacement of shallow groundwater monitoring point ES-01 (an extraction trench sump) with nearby piezometer PZ-8 is proposed. (Monitoring network locations are shown in **Figure 1**.) Standing water is typically observed in the ES-01 vault which is likely entering from groundwater and potentially surface water sources. Because the ES-01 concrete vault is 5 feet deep and groundwater typically ranges between 1.5 feet and 4 feet bgs, groundwater infiltrates into the vault. Additionally, the ES-01 extraction trench sump is susceptible to surface water infiltration because its surface completion was constructed flush with the asphalt pavement where surface water typically ponds during storm events. Due to the potential for surface water to infiltrate into the vault at this location, sealing of the vault lid with a water-tight sealant and removing ES-01 from the shallow groundwater monitoring network is recommended.

   Because groundwater concentrations of TCE and VC have periodically been detected above their MCLs at ES-01, adding a nearby piezometer to the shallow groundwater monitoring network is recommended. PZ-08 is located approximately 38 feet south of the ES-01 extraction trench sump, and is proposed to be retrofitted with an above-ground surface completion and added to the shallow groundwater sampling network in place of ES-01.

3. **Reduce Frequency of Shallow Groundwater Monitoring for Interior and Upgradient Shallow Wells.** A reduced shallow groundwater monitoring frequency is warranted because concentration data are stable and more than 50 data points have already been collected over a 20-year period for most shallow groundwater monitoring locations. Continuing to collect semiannual data, particularly in the central areas of the plumes, will not add value to Site remedial action performance evaluations.

   Reducing the sampling frequency for eight of the shallow groundwater monitoring points located in the central and upgradient areas of the shallow groundwater plumes is recommended. Interior wells are proposed to be monitored once a year in the springtime, while downgradient and sentry wells continue to be monitored semiannually. The proposed monitoring schedule is outlined below:

Shallow Groundwater
Proposed Sampling Frequency

Reduce Frequency to Annual (Sample spring only)	Frequency to Remain Semiannual (Sample spring and fall)
ES-01 (interior)	EX-04 (downgradient)
EX-02 (interior)	EX-05 (downgradient)
EX-07 (interior)	MW-06 (downgradient)
EX-08 (interior)	MW-30 (downgradient)
EX-09 (interior)	PZ-1 (downgradient
EX-11 (interior)	MW-34 (sentry)
MW-20 (interior)	MW-24A (sentry)
MW-23 (upgradient)	MW-25 (sentry)
	PZ-3 (sentry)

Data evaluations will be included in progress reports prepared after each spring monitoring round. These reports will include results of statistical analyses of shallow groundwater data (i.e., Mann-Kendall and Theil-Sen analyses) and shallow groundwater contaminant plume contour maps.

Continued semiannual monitoring is recommended for the three deeper groundwater monitoring wells (MW-31D, MW-32D, and MW-33D) at this time.

8.0 DELIVERABLES SUBMITTED DURING CURRENT REPORTING PERIOD

The following deliverables were submitted to the regulatory agencies during the reporting period.

- *Wasatch Chemical Site Progress Report No. 102* (MWH, 2015a) was submitted on January 20, 2015
- The *Final Indoor Air Sampling Work Plan* was submitted to regulatory agencies on April 10, 2015
- A *Well and Piezometer Abandonment Proposal* memorandum was submitted on March 26, 2015.

9.0 ACTIONS TO BE COMPLETED DURING NEXT REPORTING PERIOD

The following project activities are scheduled to be conducted within the next six-month reporting period.

1. **Conduct Focused Investigation On-Board Review Meeting.** A meeting to include participants from USEPA, UDEQ, Questar, and MWH is anticipated to be held in 2015. The objectives of this meeting are to discuss regulators' comments on the *Draft Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report* (MWH, 2014a) and to agree on recommended further action(s) based on the focused investigation and shallow sentry well installation results. Specific goals for this meeting include:

- Determine the locations and depths of proposed deep monitoring wells based on lithologic and groundwater sampling data collected during focused investigation activities in 2013-2014.
- Determine shallow soil remedial action levels, potential actions to address human health risks, and delineation of any impacted shallow soils recommended for further action.
- Discuss next steps for shallow groundwater remediation at the Site (shallow groundwater plumes have been defined with more certainty since the new shallow groundwater sentry well [MW-34] was installed in June 2013).

2. **Finalize the *Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Report*.** Incorporate comments made by UDEQ and USEPA and revise recommendations as agreed upon during the on-board review meeting (described above).

3. **Install New Deep Monitoring Wells.** New deep monitoring wells will be installed as agreed upon by Questar and the regulatory agencies based on the deeper groundwater investigation results presented in the draft investigation report (MWH, 2014a). Locations and depths will be determined during the focused investigation report on-board review meeting with the regulatory agencies described above.

4. **Finalize the Indoor Air Sampling Work Plan.** To assess potential vapor intrusion human health risks in occupied buildings at the Site, an additional round of indoor air sampling has been planned as outlined in the *Draft Indoor Air Sampling Work Plan* submitted in March 2013 (MWH, 2013b). Formal written comments have been received from UDEQ and the USEPA and conversations have been ongoing since July 2013. Once the analyte list is agreed upon between Questar and the regulatory agencies, the work plan will be finalized.

5. **Conduct Indoor Air Monitoring.** Indoor air monitoring at the three occupied buildings on the Site is expected to be conducted in December 2015. Twenty-four hour time-weighted whole air samples will be collected in each of the occupied buildings located above shallow groundwater and adjacent to shallow soil contamination, including KEPCO+ office building, Intsel office building, and Peterson Plumbing's office and warehouse building. Validated data from indoor air samples will be used to evaluate human health risks in occupied areas of the on-site buildings.

6. **Conduct Routine Groundwater Monitoring.** Groundwater contaminant concentrations, geochemical parameters, and water levels will continue to be monitored. Routine monitoring activities will include groundwater monitoring and sampling of both shallow and deeper groundwater compliance monitoring locations in November 2015 in accordance with the *Monitored Natural Attenuation Work Plan* (MWH, 2002), the *Final Quality Assurance Project Plan Revision 2.0* (MWH, 2012b), and recommendations for groundwater monitoring provided in this progress report.

7. **Progress Reports.** Site Progress reports will continue to be submitted semiannually for 6-month reporting periods of January through June and July through December. The second semiannual progress report for 2015 is scheduled to be submitted in January 2016.

8. **Monitoring Well and Piezometer Abandonment.** Once approved by the regulatory agencies, one monitoring well and four piezometers will be abandoned according to the State of Utah Water Well Handbook. (See Section 7.0 Recommendations for further details and rationale.)

If you have any questions or concerns, please do not hesitate to contact me at (801) 617-3242.

Sincerely,

MWH

Susan Eyzaguirre, P.E., P.G.
Project Manager

cc: S. Bassett, Questar Corp.
H. Pos, Parsons Behle & Latimer
Utah Dept. of Natural Resources

REFERENCES

Harding Lawson, 1990. Remedial Investigation Report, Wasatch Chemical Site, Salt Lake City, Utah. March 30, 1990.

Harding Lawson, 1990a. Feasibility Study Report, Wasatch Chemical Site, Salt Lake City, Utah. August 22, 1990.

Harding Lawson, 1993. Draft Final Additional Studies and Design Basis Report for Remedial Design and Remedial Action, Wasatch Chemical Site, Salt Lake City, Utah. Volume II of II. March 17, 1993.

Helsel, D.R., 2005. Nondetects and Data Analysis. New York: John Wiley & Sons.

Interstate Land Company, 1998. Remedial Action Completion Report, Wasatch Chemical Site, Salt Lake City, Utah. January 29, 1998.

Montgomery Watson, 2001. Final Extraction and Treatment System Performance Standards, Milestones and Shutdown Procedures, Wasatch Chemical Site. Prepared for Interstate Land, Inc., January 2001.

MWH, 2002. Monitored Natural Attenuation Work Plan, Wasatch Chemical Site Addendum to the Final Extraction and Treatment System Performance Standards, Milestones, and Shutdown Procedures. November 14, 2002.

MWH, 2008. Progress Report No. 89, Wasatch Chemical Site. Letter report submitted July 18, 2008.

MWH, 2010. Draft Groundwater Remediation Focused Feasibility Study Report, Wasatch Chemical Site. February 2010.

MWH, 2011. Draft Wasatch Chemical Site Natural Attenuation Evaluation, Wasatch Chemical Site. October 2011

MWH, 2011a. Progress Report No. 95, Wasatch Chemical Site. Letter report submitted July 27, 2011.

MWH, 2011b. Draft Final Groundwater Monitoring Well Installation Documentation technical memorandum, Wasatch Chemical Site. December 30, 2011.

MWH, 2012. Progress Report No. 96, Wasatch Chemical Site. Letter report submitted January 24, 2012.

MWH, 2012a. Final Revision 2 Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan. November 2012.

MWH, 2012b. Final Quality Assurance Project Plan Revision 2.0, Wasatch Chemical Site. July 2012.

MWH, 2013. Final Indoor Air Investigation Summary Report, Wasatch Chemical Site. January 2013.

MWH, 2013a. Progress Report No. 99, Wasatch Chemical Site. Letter report submitted July 30, 2013.

MWH, 2013b. Draft Indoor Air Sampling Work Plan, Wasatch Chemical Site. March 2013.

MWH, 2014. Progress Report No. 101, Wasatch Chemical Site. Letter report submitted July 25, 2014.

MWH, 2014a. Draft Focused Shallow Soil and Deeper Groundwater and Sentry Well Installation Report, Wasatch Chemical Site. December 2014.

MWH, 2015. Final Indoor Air Sampling Work Plan, Wasatch Chemical Site. April 2015.

MWH, 2015a. Progress Report No. 102, Wasatch Chemical Site. Letter report submitted January 20, 2015.

UDEQ, 2015. Guidelines for Utah's Corrective Action Process for Leaking Underground Storage Tank Sites, Updated March 2015.

UDEQ, 2009. Environmental Covenant entered into by Questar InfoComm, Inc., USEPA, and UDEQ pursuant to Utah Code Ann. 57-25-101. Recorded January 14, 2009.

U.S. District Court, 1991. Remedial Design / Remedial Action Consent Decree for Civil Actions No. 86-C-0023G and 91-C-11945. United States District Court for the District of Utah Central Division. Signed by Entrada Industries and the State of Utah on September 30, 1991.

USEPA, 1991. Record of Decision, Wasatch Chemical Site, Salt Lake City, Utah. March 29, 1991.

USEPA, 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water. EPA/600/R-98/128. September 1998.

USEPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance. March, 2009.

USEPA, 2012. Fourth Five-Year Review Report for Wasatch Chemical National Priority List Site, Salt Lake City, Utah. September 25, 2012.

TABLE 1
APRIL 2015 VERTICAL HYDRAULIC GRADIENT ASSESSMENT
USING DATA FROM NESTED SHALLOW AND DEEPER WELL PAIRS
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Well Pair Identification	Well	Screened Interval	Groundwater Elevation (ft)	Groundwater Elevation Difference[(a)] (ft)	Vertical Hydraulic Gradient[(b)] (ft/ft)	Vertical Component of Groundwater Flow Direction
Western	MW-06 MW-31D	14 - 24 ft bgs 38 - 48 ft bgs	4225.91 4227.57	1.66	0.07	Upward
Northern	PZ-3 MW-32D	5 - 25 ft bgs 46 - 56 ft bgs	4226.83 4227.08	0.25	0.01	Upward
Southeastern	EX-01 MW-33D	5 - 15 ft bgs 35 - 45 ft bgs	4228.25 4228.55	0.30	0.01	Upward

Water levels measured on April 20, 2015

(a) Calculated by subtracting the water level elevation of the shallow well from that of the deeper well.

(b) Calculated by dividing the difference in water-level elevations by the distance calculated between the middle of each screened interval. Vertical distances between the middle of screened intervals are 35, 24, and 30 ft for the Western, Northern, and Southeastern well pairs, respectively.

bgs - below ground surface
NA - data not available
ft - feet

TABLE 2
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2015
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results																	*Natural Attenuation Assessment*
Analyte/Parameter	**MCL**	**Sample Identification Date Collected**	**ES-01 4/22/15**	**EX-02 4/22/15**	**EX-04 4/22/15**	**EX-05 4/22/15**	**EX-07 4/23/15**	**EX-08 4/22/15**	**EX-09 4/23/15**	**EX-11 4/23/15**	**MW-06 4/23/15**	**MW-20 4/23/15**	**MW-23 4/21/15**	**MW-30 4/21/15**	**MW-34 4/22/15**	**PZ-1 4/21/15**	**MW-24A 4/21/15**	**MW-25 4/22/15**	**PZ-3[b] 4/21/15**	**Biodegradation Indicator**	**Purpose and/or Interpretation**
Volatile Organic Compounds (µg/l)		Analytical Method																			
Tetrachloroethene (PCE)	5	SW8260B	0.16 T	0.22 T	<1	<1	0.72 T	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Not Applicable	Indicator chemical[d]
Trichloroethene (TCE)	5	SW8260B	**11 T**	**91**	**0.21 T**	**0.39 T**	**2.6**	<1	0.17 T	**0.79 T**	**0.2 T**	**0.86 T**	<1	**0.88 T**	**0.32 T**	<1	<1	<1	<1	detection	Indicator chemical[d]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	**0.46 T**	**7**	**1**	**11**	**0.23 T**	<1	**2.1**	**0.28 T**	**4.1**	**1.3**	<1	**5.7**	<1	<1	<1	<1	<1	detection	Indicator chemical[d]; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	**4.3**	**260 D**	**18**	**170 D**	**5.7**	<1	**30**	**15**	**34**	**25**	<1	**40**	**2.8**	<1	<1	0.17 T	<1	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	**0.71 T**	**11**	**4.1**	**130 D**	**2.1**	<1	**9.1**	**49**	**6.9**	**10**	<1	**0.93 T**	**0.61 T**	<1	<1	<1	<1	detection	Degradation product of trichloroethene
Vinyl chloride (VC)	2	SW8260B	**3**	**49**	**0.51 T**	**9.8**	**3.2**	<1	<1	**72**	**1.2**	**2.2**	<1	**5.4**	<1	<1	<1	<1	<1	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																					
Pentachlorophenol (PCP)	1	SW8151A	<0.5	6.2 D	NA	NA	<0.5	**0.45 T**	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Applicable	Indicator chemical[d]
Geochemical Parameters																					
pH (standard units)	na	field measurement	**7.3**	**6.4**	**7.0**	**6.7**	**7.1**	**6.8**	**6.7**	**6.9**	**6.8**	**6.9**	**6.8**	**6.6**	**6.8**	**6.9**	**7.0**	**7.0**	**6.4**	5 to 9[c]	Optimal range for reductive pathway
Oxidation-reduction Potential (mV)	na	field measurement	**-144**	**-5**	**-87**	**-82**	**-73**	**-10**	**5**	**-138**	**-78**	**-56**	**-85**	**-127**	**-126**	**-129**	**-124**	**-102**	**-32**	<50[c]	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	**0.03**	0.73	**0.07**	**0.04**	0.54	**0.24**	0.62	**0.04**	**0.28**	0.63	**0.1**	**0.62**	**0.05**	**0.04**	**0.03**	**0.02**	1.26[c]	<0.5[c]	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	**0.203**	**0.282**	**0.871**	**<0.1**	**0.336**	13.3 D	**0.0595 T**	**<0.1**	**0.0473 T**	**1.73**	**0.136 TD**	**0.0472 T**	**<0.1**	**<0.1**	**<0.1**	**0.046 T**	**<0.1**	<1[c]	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.3 D	<0.1	<0.3 D	<0.1	<0.4 D	<0.1	<0.3 D	<0.1	<0.1	<1 D	0.0419 T	<0.1	<0.1	<0.1	<0.1	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l)[a]	na	Hach 8146	0.28	**2.02**	0.67	0.95	**1.0**	**1.38**	**2.75**	**2.34**	**2.68**	**3.07**	**>3.30**	**>3.30**	**>3.30**	**>3.30**	**>3.30**	**>3.30**	**>3.30**	>1[c]	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	29.7 D	1190 D	304 D	1410 D	139 D	583 D	1220 D	611 D	725 D	1090 D	417 D	763 D	785 D	342 D	216 D	476 D	2180 D	<20[c]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.344	<0.1	0.127 T	<0.1	<0.1	0.0191 T	<0.1	0.0487 T	0.307	<0.1	0.131	0.0752 T	0.0829 T	0.0331 T	0.0115 T	0.028 T	0.0127 T	>1[c]	Evidence of sulfate reduction

[a] Iron II was measured in the field using Hach kits; a number of samples exceeded the maximum instrument reading.

[b] Replacement monitoring point for MW-26A which was destroyed during construction activities on the SteelCo (now Intsel) property in October 2004. Data for piezometer PZ-3, located approximately 100 ft south of the location of former monitoring well MW-26A, is reported in place of data for MW-26A.

[c] From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

[d] The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

[c] Operational issue with the dissolved oxygen probe is suspected.

Laboratory results highlighted in yellow are greater than the analyte's MCL.

MCL	Regulatory drinking water maximum contaminant level
mg/l	milligrams per liter
mV	millivolts
µg/l	micrograms per liter
Bold	Values in bold suggest biodegradation is possible.
NA	Not analyzed
D	Sample dilution required for analysis; reported values reflect the dilution.
T	Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE 3
GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS FOR DEEPER WELLS INSTALLED IN 2011
APRIL 2015
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

			Analytical Results			*Natural Attenuation Assessment*	
	Sample Identification		**MW-31D**	**MW-32D**	**MW-33D**		
	Screened Interval (feet bgs)	**MCL**	**38 - 48**	**46 - 56**	**35 - 45**	**Biodegradation**	
	Date Collected		**4/23/15**	**4/21/15**	**4/21/15**	**Indicator**	**Purpose and/or Interpretation**
Volatile Organic Compounds (µg/l)	**Analytical Method**						
Tetrachloroethene (PCE)	SW8260B	5	<1	<1 UJ	0.27 TJ	na	Indicator chemical[(d)]
Trichloroethene (TCE)	SW8260B	5	<1	<1 UJ	0.3 TJ	detection	Indicator chemical[(d)]; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	SW8260B	7	<1	<1 UJ	<1 UJ	detection	Indicator chemical[(d)]; degradation product of TCE
cis-1,2-Dichloroethene (cis-1,2-DCE)	SW8260B	70	0.13 T	<1 UJ	1.5 J	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	SW8260B	100	<1	<1 UJ	<1 UJ	detection	Degradation product of trichloroethene
Vinyl chloride (VC)	SW8260B	2	<1	<1 UJ	0.47 TJ	detection	Degradation product of dichloroethenes
Ethylbenzene	SW8260B	700	NA	NA	6.3 J	na	na
m,p-Xylene (Sum of Isomers)	SW8260B	10,000[(b)]	NA	NA	7.7 J	na	na
o-Xylene	SW8260B	10,000[(b)]	NA	NA	5 J	na	na
Toluene	SW8260B	1,000	NA	NA	<0.5 UJ	na	na
Geochemical parameters							
pH (standard units)	field measurement	na	**8.1**	**7.6**	**7.8**	5 to 9[(c)]	Optimal range for reductive pathway
Oxidation-reduction Potential (mV)	field measurement	na	**-192**	**-82**	**-177**	<50[(c)]	Reductive pathway possible
Dissolved Oxygen (mg/l)	field measurement	na	**0.11**	2.11[(e)]	**0.08**	<0.5[(c)]	Reductive pathway possible
Nitrate (mg/l)	E300.0	10	**0.0508 T**	**0.0463T**	**0.0462 T**	<1[(c)]	Reductive pathway possible
Nitrite (mg/l)	E300.0	1	< 0.1	< 0.1	< 0.1	>1	Evidence of nitrate reduction
Iron II (mg/l)	Hach 8146	na	0.25	0.57	**1.08**	>1[(c)]	Reductive pathway possible
Sulfate (mg/l)	E300.0	na	**1.68**	**0.771**	**1.08**	<20[(c)]	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	E376.2	na	0.0462 T	0.0433 T	0.0548 T	>1[(c)]	Evidence of sulfate reduction

(a) Greater than the maximum reading on the field instrument.
(b) MCL listed is for the sum of o, m, and p xylenes
(c) From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.
(d) The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.
(e) An operational issue with the dissolved oxygen probe is suspected.

µg/l micrograms per liter
bgs below ground surface
Bold Values in bold suggest biodegradation is possible.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data estimated
MCL maximum contaminant level (regulatory limit)
mg/l milligrams per liter
mV millivolts
na Not applicable
NA Not analyzed
T Analyte was positively identified but reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte deemed not detected due to detection in associated blank sample.
UJ Potential low bias, possible false negative

TABLE 4
SHALLOW GROUNDWATER STATISTICAL ANALYSIS RESULTS
FOR APRIL 2015 DATA SETS DETERMINED TO BE STATISTICALLY ABOVE MCLs
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Monitoring Location	Constituent of Concern	Drinking Water MCL (µg/l)	Mean (µg/l)	Standard Deviation (µg/l)	Upper Confidence Limit[a]	Lower Confidence Limit[a]	Exceeds MCL[b]	Trend[c]	Indication	Recommendation
EX-02	TCE	5	108.0	67.0	265.0	57.0	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
	VC	2	62.1	11.4	69.7	54.4	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
	PCP	1	7.2	3.1	9.3	5.1	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
EX-05	1,1-DCE	7	9.5	1.7	13.0	8.2	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
	VC	2	11.1	1.5	12.1	10.1	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
EX-07	VC	2	4.7	2.1	6.1	3.3	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
EX-11	VC	2	337.0	194.0	466.9	207.3	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
MW-20	VC	2	3.2	1.8	3.9	2.2	Yes	No	Stable	Evaluate Alternate Performance Standard[d]
MW-30	VC	2	8.2	5.0	20.0	5.1	Yes	No	Stable	Evaluate Alternate Performance Standard[d]

Note: Analyses conducted for the eight most recent data points; refer to Appendix C for more detailed results and plots.

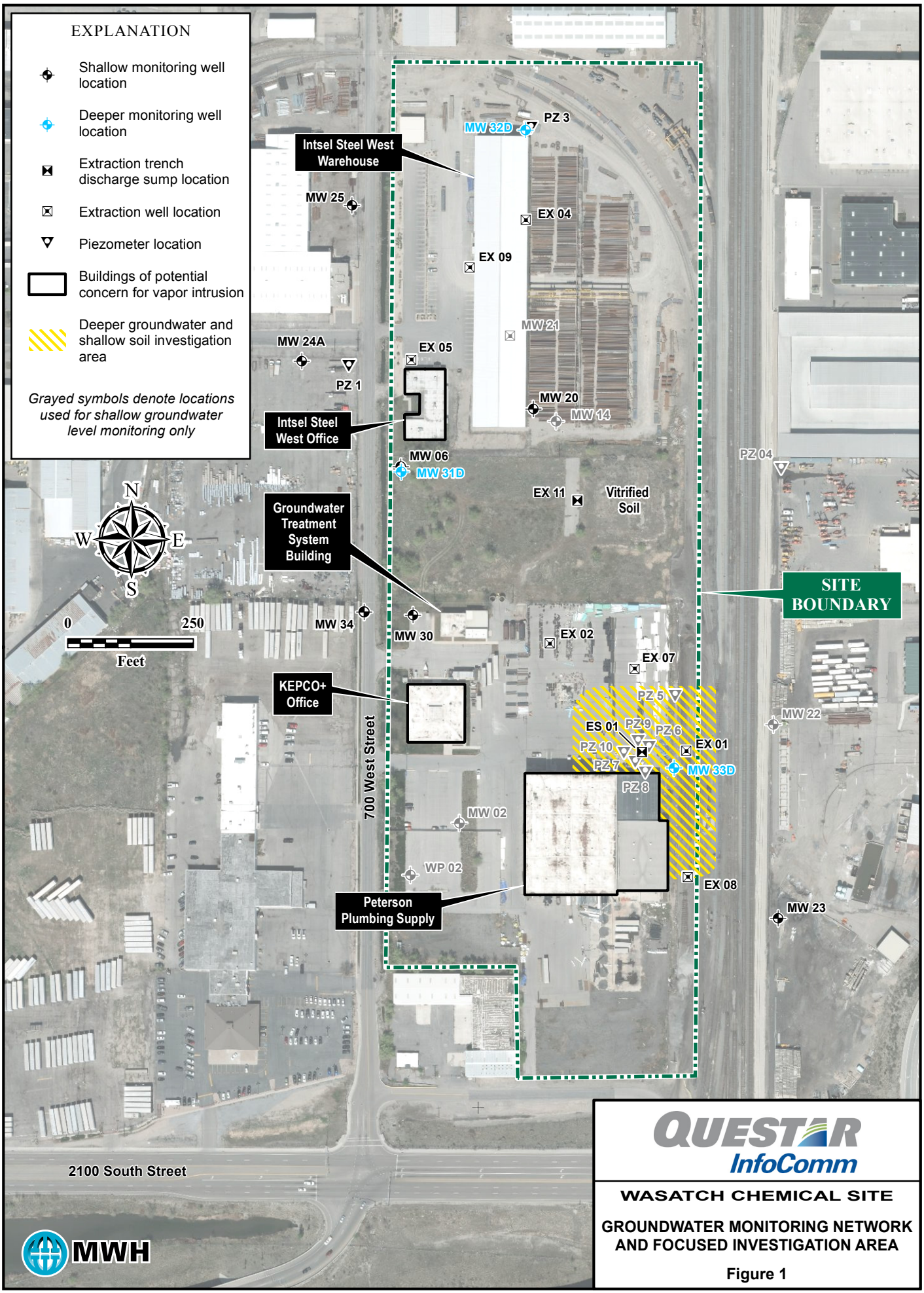
[a] Confidence limits determined using a 95% confidence level, in accordance with USEPA guidance (USEPA, 2009).

[b] For nontrending data sets, MCL exceedances were determined by comparing the lower confidence limit to the MCL; for trending data sets, the lower limit of the confidence band was compared to the MCL.

[c] Presence of significant trend determined using Mann-Kendall method, with 99% confidence level as indicated in the Site Consent Decree (U.S. District Court, 1991).

[d] Alternate Performance Standards are defined in the Site Consent Decree (U.S. District Court, 1991)

µg/l	micrograms per liter
MCL	maximum contaminant level
NA	not applicable



DRAWN BY D. Severson

17 June 2015

D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 1_Focused Investigation Area_Apr2015.mxd

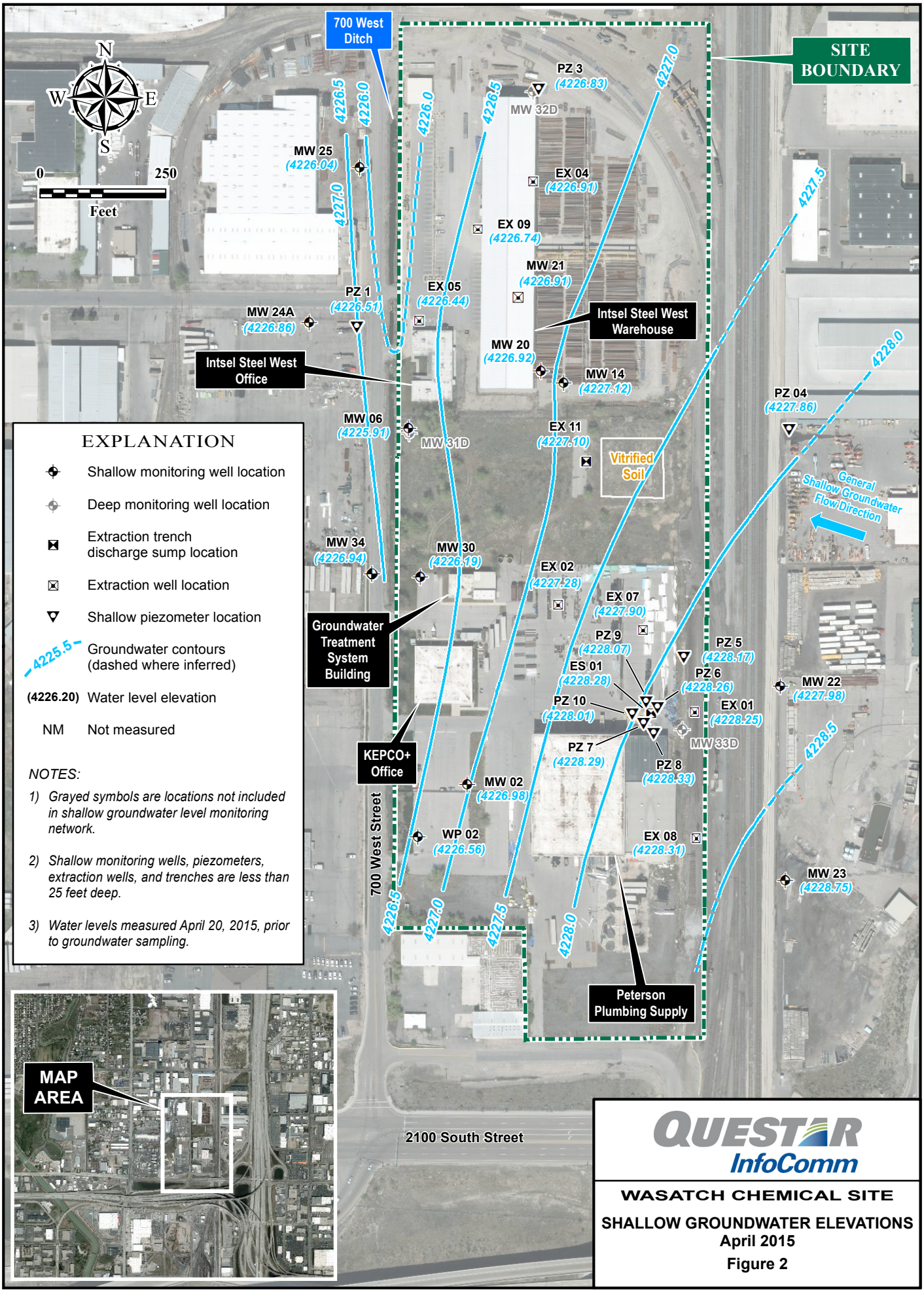
QUESTAR InfoComm

MWH

WASATCH CHEMICAL SITE

GROUNDWATER MONITORING NETWORK AND FOCUSED INVESTIGATION AREA

Figure 1



EXPLANATION

- Shallow monitoring well location
- Deep monitoring well location
- Extraction trench discharge sump location
- Extraction well location
- Shallow piezometer location
- 4225.5 — Groundwater contours (dashed where inferred)
- (4226.20) Water level elevation
- NM Not measured

NOTES:

1) *Grayed symbols are locations not included in shallow groundwater level monitoring network.*

2) *Shallow monitoring wells, piezometers, extraction wells, and trenches are less than 25 feet deep.*

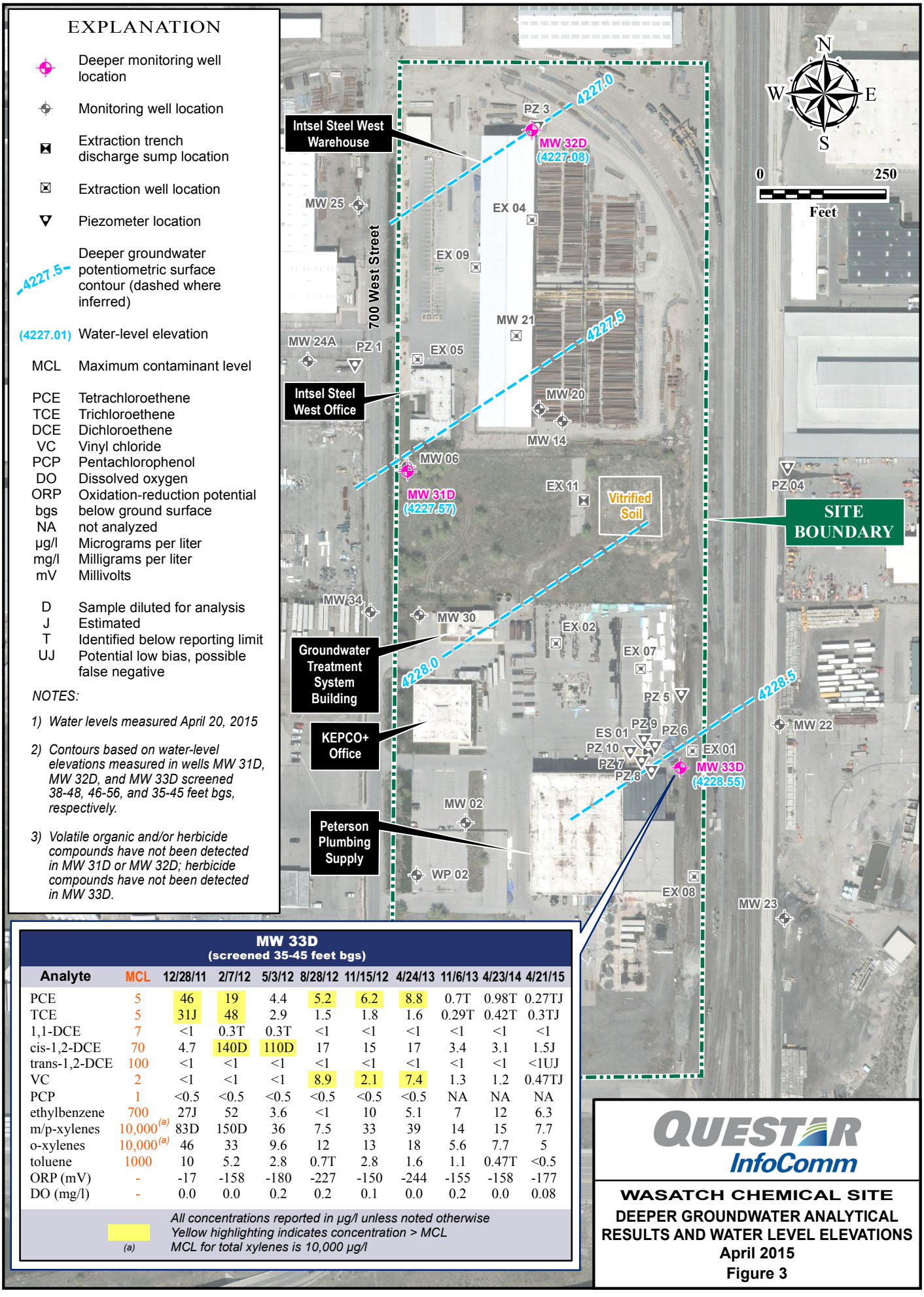
3) *Water levels measured April 20, 2015, prior to groundwater sampling.*

QUESTAR InfoComm

WASATCH CHEMICAL SITE

SHALLOW GROUNDWATER ELEVATIONS
April 2015
Figure 2

DRAWN BY D. Severson
17 Jun2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 2_Shallow_GW_Elev_Apr2015.mxd



MW 33D
(screened 35-45 feet bgs)

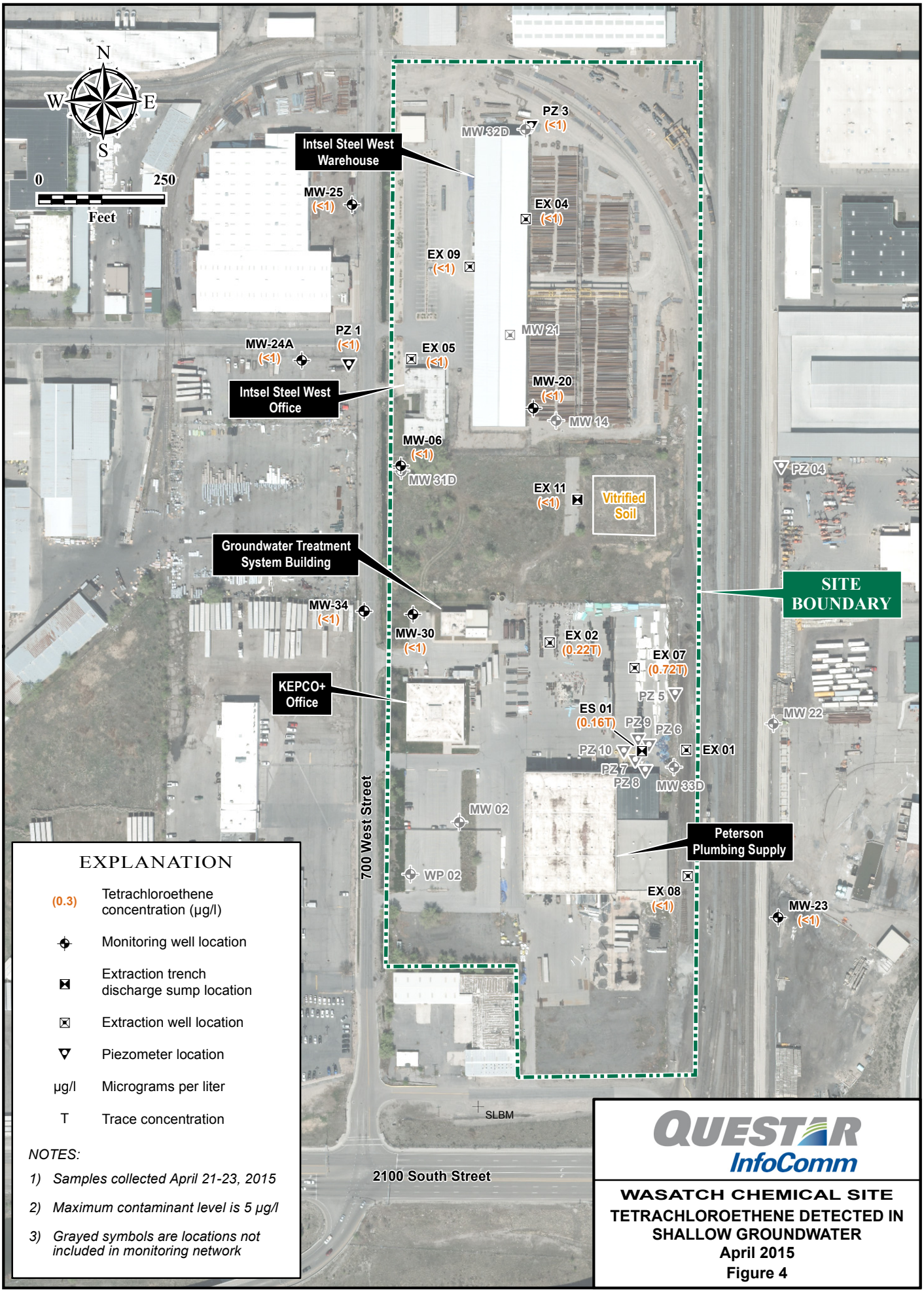
Analyte	MCL	12/28/11	2/7/12	5/3/12	8/28/12	11/15/12	4/24/13	11/6/13	4/23/14	4/21/15
PCE	5	46	19	4.4	5.2	6.2	8.8	0.7T	0.98T	0.27TJ
TCE	5	31J	48	2.9	1.5	1.8	1.6	0.29T	0.42T	0.3TJ
1,1-DCE	7	<1	0.3T	0.3T	<1	<1	<1	<1	<1	<1
cis-1,2-DCE	70	4.7	140D	110D	17	15	17	3.4	3.1	1.5J
trans-1,2-DCE	100	<1	<1	<1	<1	<1	<1	<1	<1	<1UJ
VC	2	<1	<1	<1	8.9	2.1	7.4	1.3	1.2	0.47TJ
PCP	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
ethylbenzene	700	27J	52	3.6	<1	10	5.1	7	12	6.3
m/p-xylenes	10,000[a]	83D	150D	36	7.5	33	39	14	15	7.7
o-xylenes	10,000[a]	46	33	9.6	12	13	18	5.6	7.7	5
toluene	1000	10	5.2	2.8	0.7T	2.8	1.6	1.1	0.47T	<0.5
ORP (mV)	-	-17	-158	-180	-227	-150	-244	-155	-158	-177
DO (mg/l)	-	0.0	0.0	0.2	0.2	0.1	0.0	0.2	0.0	0.08

All concentrations reported in µg/l unless noted otherwise
Yellow highlighting indicates concentration > MCL
(a) MCL for total xylenes is 10,000 µg/l

QUESTAR InfoComm

WASATCH CHEMICAL SITE
DEEPER GROUNDWATER ANALYTICAL RESULTS AND WATER LEVEL ELEVATIONS
April 2015
Figure 3

DRAWN BY D. Severson
17 June 2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 3_Deep_Groundwater_Apr2015.mxd



EXPLANATION

(0.3)	Tetrachloroethene concentration (µg/l)
⌖	Monitoring well location
⧓	Extraction trench discharge sump location
⊠	Extraction well location
▽	Piezometer location
µg/l	Micrograms per liter
T	Trace concentration

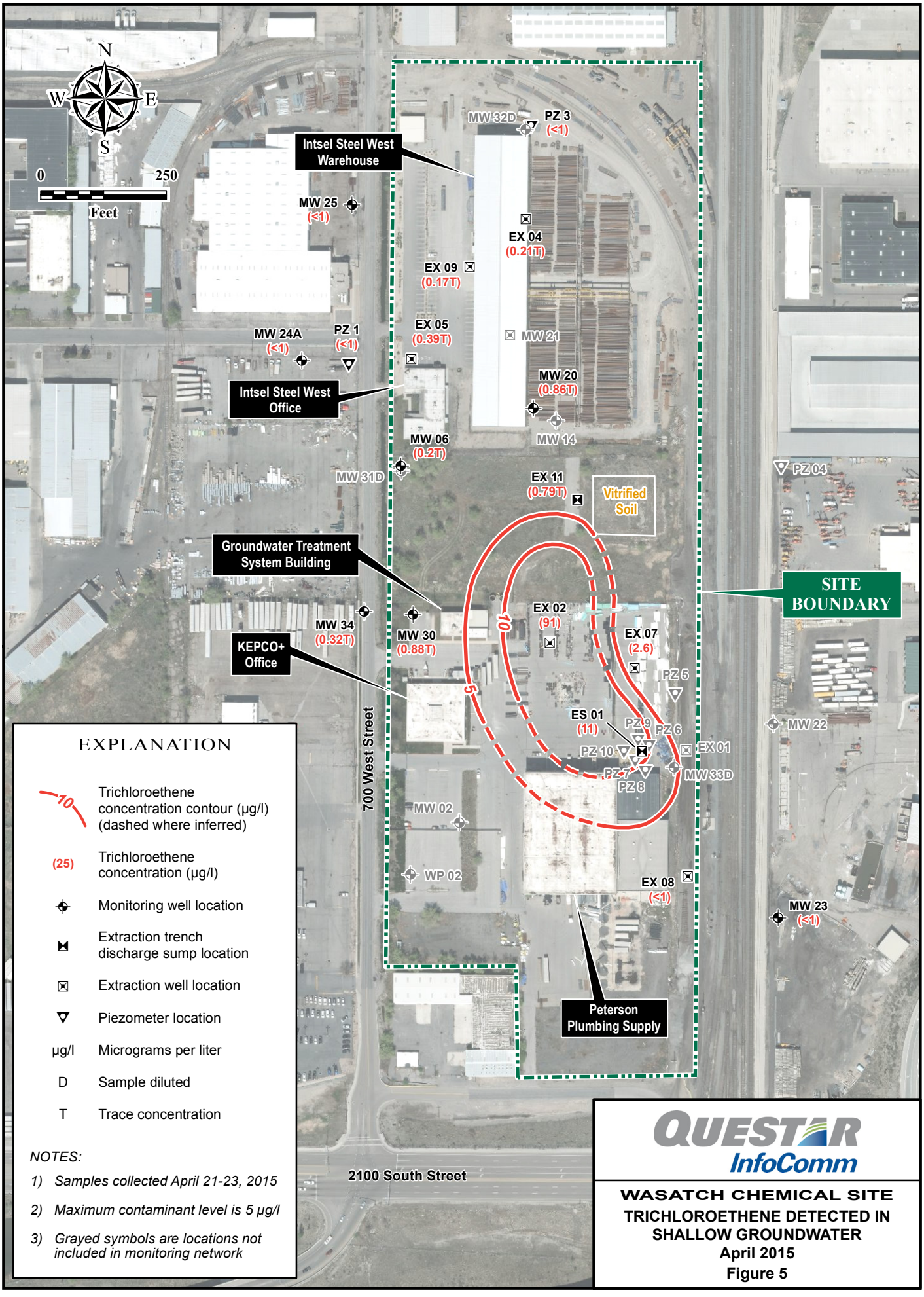
NOTES:

1) *Samples collected April 21-23, 2015*
2) *Maximum contaminant level is 5 µg/l*
3) *Grayed symbols are locations not included in monitoring network*

QUESTAR InfoComm

WASATCH CHEMICAL SITE
TETRACHLOROETHENE DETECTED IN SHALLOW GROUNDWATER
April 2015
Figure 4

DRAWN BY D. Severson
17 June 2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 4_Tetrachlor_Apr2015.mxd



EXPLANATION

10	Trichloroethene concentration contour (µg/l) (dashed where inferred)
(25)	Trichloroethene concentration (µg/l)
⊕	Monitoring well location
⊠	Extraction trench discharge sump location
⊠	Extraction well location
▽	Piezometer location
µg/l	Micrograms per liter
D	Sample diluted
T	Trace concentration

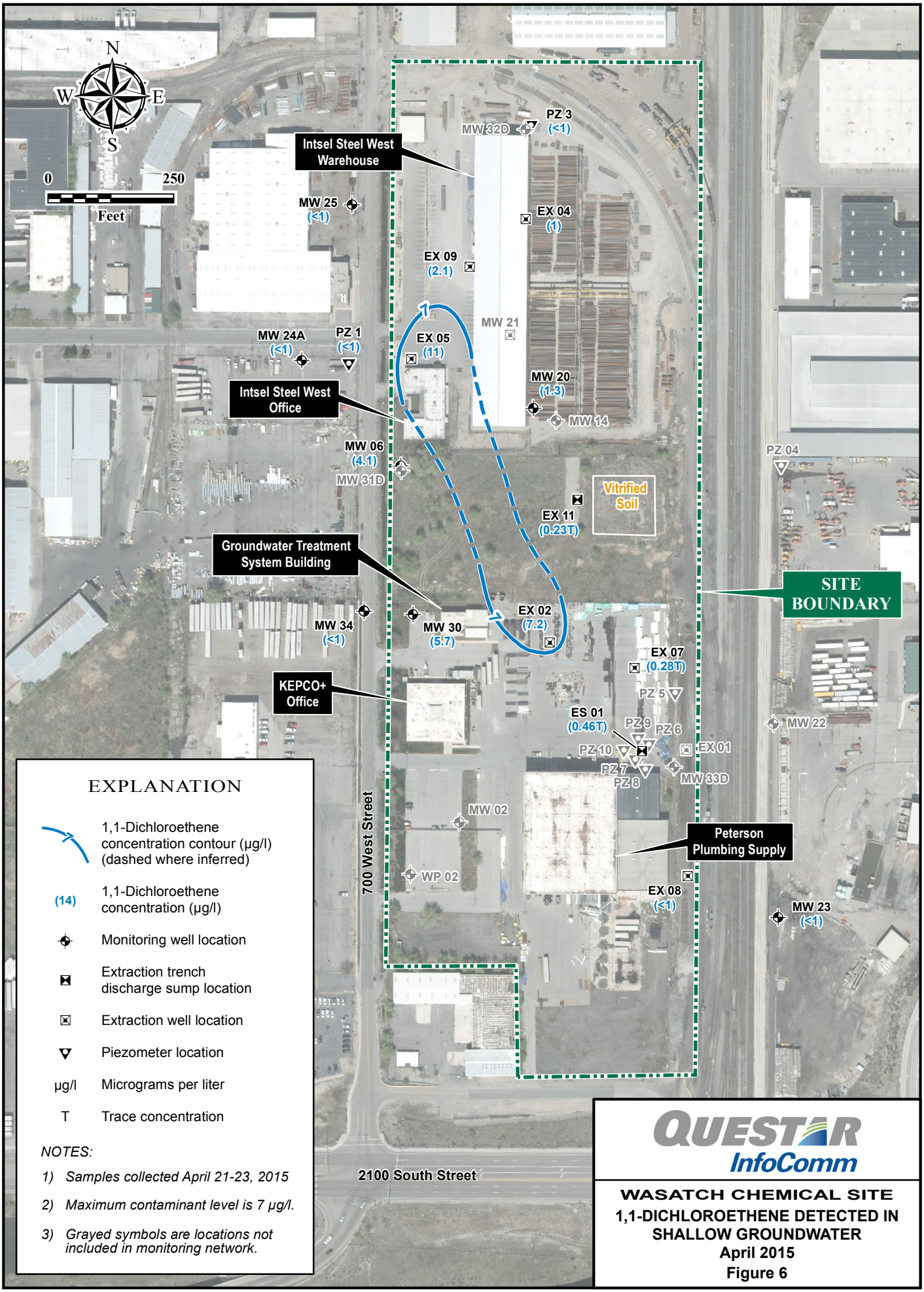
NOTES:

1) *Samples collected April 21-23, 2015*
2) *Maximum contaminant level is 5 µg/l*
3) *Grayed symbols are locations not included in monitoring network*

QUESTAR InfoComm

WASATCH CHEMICAL SITE
TRICHLOROETHENE DETECTED IN SHALLOW GROUNDWATER
April 2015
Figure 5

DRAWN BY D. Severson
14 July 2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 5_Trichloro_Apr2015.mxd



EXPLANATION

- 1,1-Dichloroethene concentration contour (µg/l) (dashed where inferred)
- (14) 1,1-Dichloroethene concentration (µg/l)
- Monitoring well location
- Extraction trench discharge sump location
- Extraction well location
- Piezometer location
- µg/l Micrograms per liter
- T Trace concentration

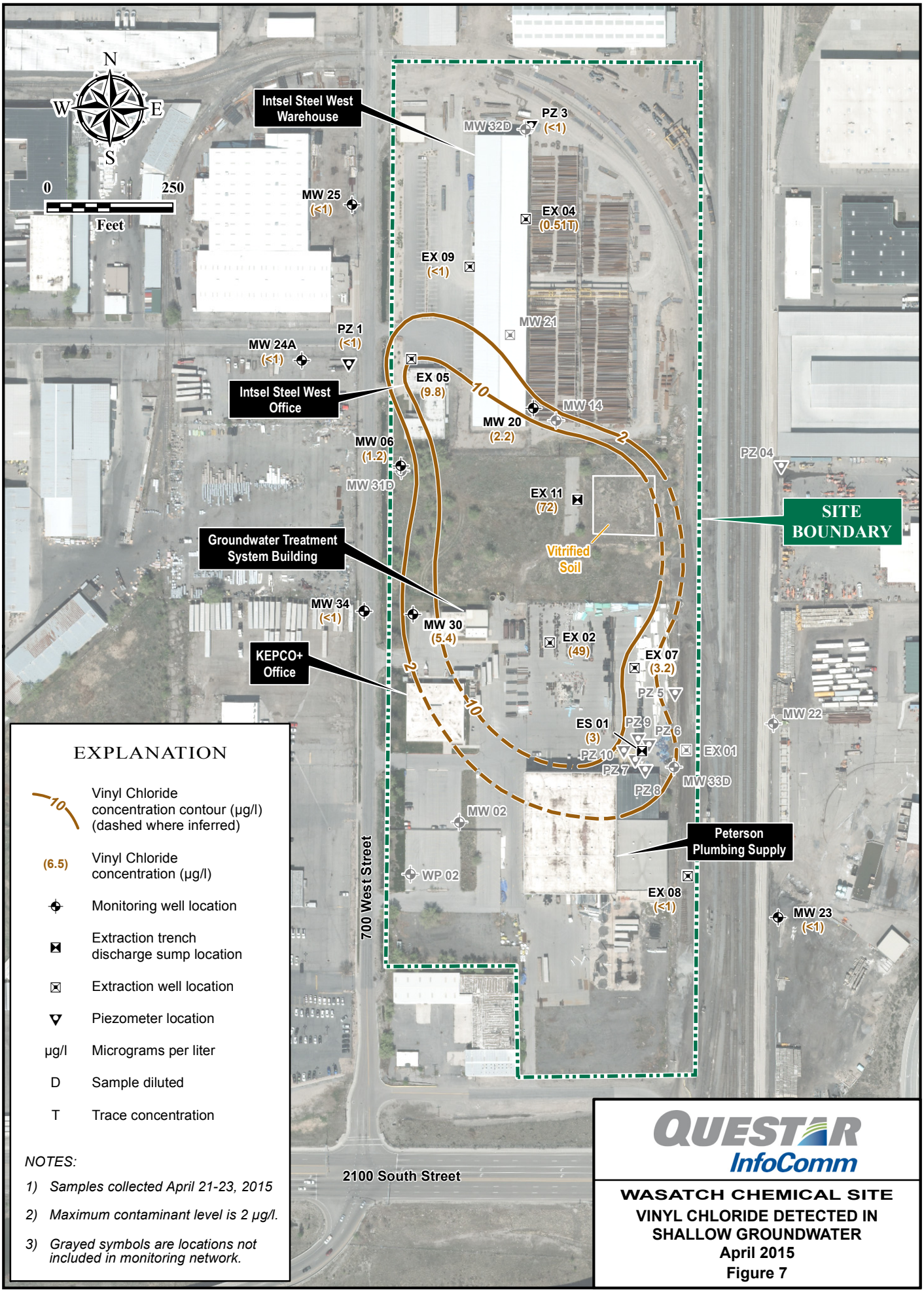
NOTES:

1) *Samples collected April 21-23, 2015*
2) *Maximum contaminant level is 7 µg/l.*
3) *Grayed symbols are locations not included in monitoring network.*

QUESTAR InfoComm

WASATCH CHEMICAL SITE
1,1-DICHLOROETHENE DETECTED IN SHALLOW GROUNDWATER
April 2015
Figure 6

DRAWN BY D. Severson
17 June 2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 6_Dichl_Apr2015.mxd



EXPLANATION

10	Vinyl Chloride concentration contour (µg/l) (dashed where inferred)
(6.5)	Vinyl Chloride concentration (µg/l)
	Monitoring well location
	Extraction trench discharge sump location
	Extraction well location
	Piezometer location
µg/l	Micrograms per liter
D	Sample diluted
T	Trace concentration

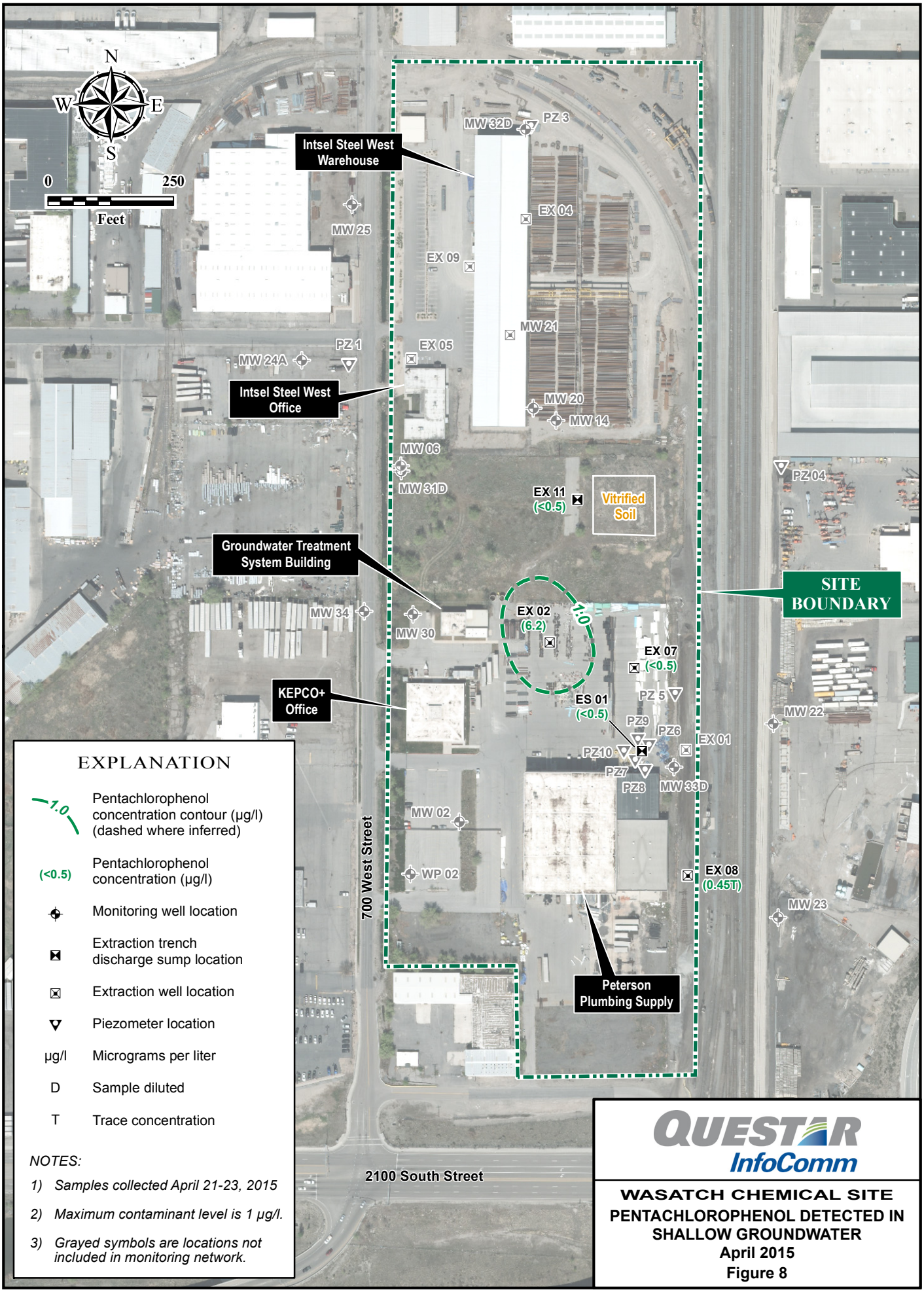
NOTES:

1) *Samples collected April 21-23, 2015*
2) *Maximum contaminant level is 2 µg/l.*
3) *Grayed symbols are locations not included in monitoring network.*

QUESTAR InfoComm

WASATCH CHEMICAL SITE
VINYL CHLORIDE DETECTED IN SHALLOW GROUNDWATER
April 2015
Figure 7

DRAWN BY D. Severson
18 June 2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 7_Vinyl Chloride_Apr2015.mxd



EXPLANATION

1.0	Pentachlorophenol concentration contour (µg/l) (dashed where inferred)
(<0.5)	Pentachlorophenol concentration (µg/l)
	Monitoring well location
	Extraction trench discharge sump location
	Extraction well location
	Piezometer location
µg/l	Micrograms per liter
D	Sample diluted
T	Trace concentration

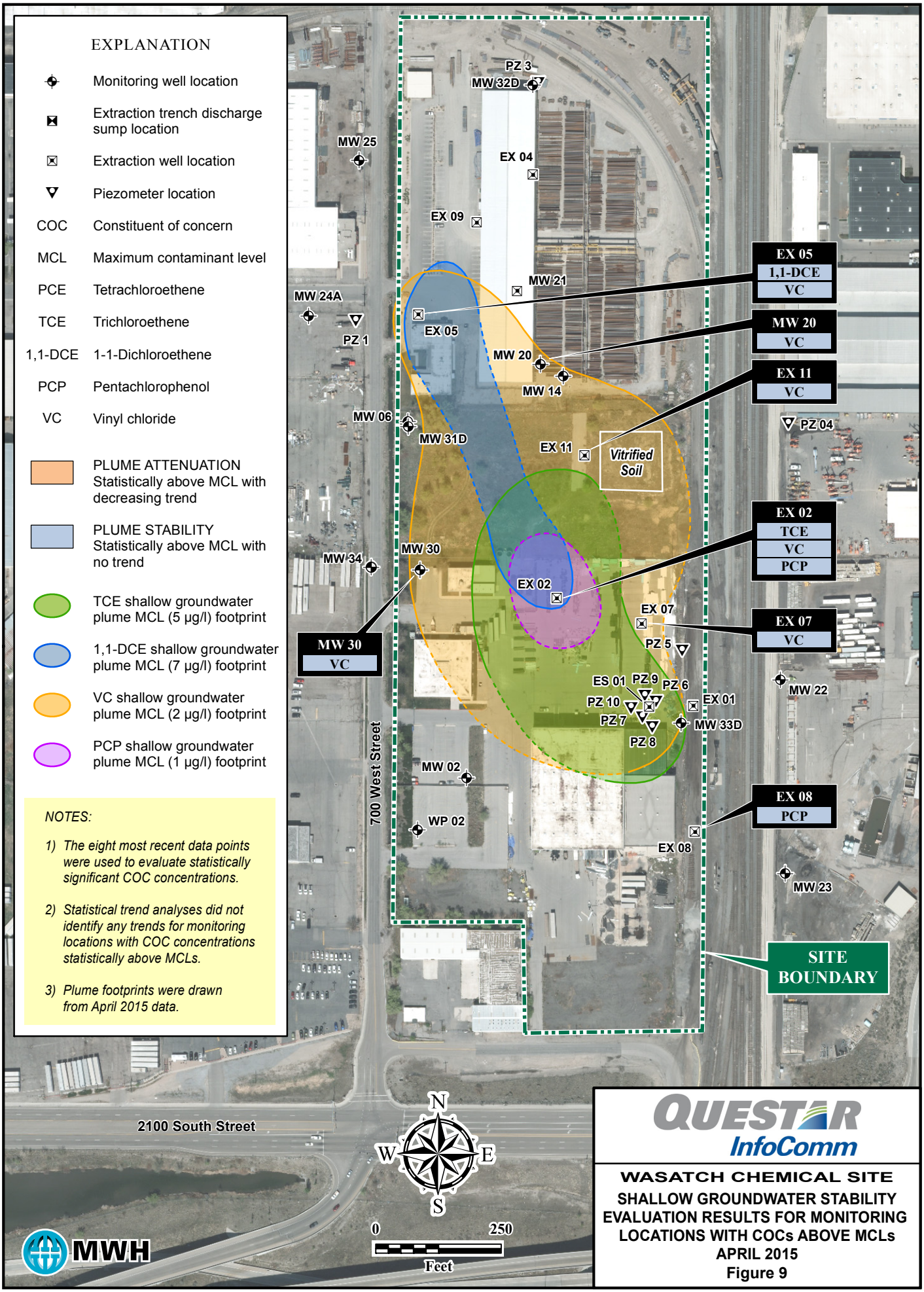
NOTES:

1) *Samples collected April 21-23, 2015*
2) *Maximum contaminant level is 1 µg/l.*
3) *Grayed symbols are locations not included in monitoring network.*

QUESTAR InfoComm

WASATCH CHEMICAL SITE
PENTACHLOROPHENOL DETECTED IN SHALLOW GROUNDWATER
April 2015
Figure 8

DRAWN BY D. Severson
18 June 2015
D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 8_Pentachl_Apr2015.mxd


EXPLANATION
Monitoring well location
Extraction trench discharge sump location
Extraction well location
Piezometer location
COC Constituent of concern
MCL Maximum contaminant level
PCE Tetrachloroethene
TCE Trichloroethene
1,1-DCE 1-1-Dichloroethene
PCP Pentachlorophenol
VC Vinyl chloride
PLUME ATTENUATION Statistically above MCL with decreasing trend
PLUME STABILITY Statistically above MCL with no trend
TCE shallow groundwater plume MCL (5 µg/l) footprint
1,1-DCE shallow groundwater plume MCL (7 µg/l) footprint
VC shallow groundwater plume MCL (2 µg/l) footprint
PCP shallow groundwater plume MCL (1 µg/l) footprint
NOTES:
1) The eight most recent data points were used to evaluate statistically significant COC concentrations.
2) Statistical trend analyses did not identify any trends for monitoring locations with COC concentrations statistically above MCLs.
3) Plume footprints were drawn from April 2015 data.
PZ 3
MW 32D
MW 25
EX 04
EX 09
EX 05
1,1-DCE
VC
MW 21
MW 24A
PZ 1
EX 05
MW 20
VC
MW 20
MW 14
EX 11
VC
MW 06
MW 31D
PZ 04
EX 11
Vitrified Soil
EX 02
TCE
VC
PCP
MW 34
MW 30
EX 02
EX 07
EX 07
VC
MW 30
VC
PZ 5
ES 01
PZ 9
PZ 6
MW 22
PZ 10
EX 01
PZ 7
MW 33D
PZ 8
700 West Street
MW 02
EX 08
PCP
WP 02
EX 08
MW 23
SITE BOUNDARY
2100 South Street
N
W
E
S
0
250
Feet
MWH
QUESTAR InfoComm
WASATCH CHEMICAL SITE
SHALLOW GROUNDWATER STABILITY EVALUATION RESULTS FOR MONITORING LOCATIONS WITH COCs ABOVE MCLs
APRIL 2015
Figure 9
DRAWN BY D. Severson
14 July 2015
FILE: D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No103\FIGURES\Fig 9_Shallow GW Stability Results for Mon Locs w COCs above MCL_Apr2015.mxd

APPENDIX A

DATA VERIFICATION

APPENDIX A

DATA VERIFICATION
SPRING 2015 GROUNDWATER SAMPLING

Introduction. Groundwater samples were collected as listed in Table A-1 at the Wasatch Chemical Site April 21 through 23, 2015. A summary of the analytical data is presented in Table A-2. The following paragraphs summarize the results of the data validation.

Sampling Procedures. All groundwater samples were collected as scheduled and in accordance with the Quality Assurance Project Plan (QAPP) Revision 2 (MWH, 2012) and the *Monitored Natural Attenuation Work Plan* (MWH, 2002).

Analytical Procedures and Detection Limits. All samples were analyzed in accordance with the methodology, detection limits, and quality control (QC) criteria specified in the project QAPP (MWH, 2012). EMAX Laboratories Inc. provided analytical services.

Holding times were evaluated and are presented in Table A-3. All holding times met method criteria with the exception of samples MW-32D and MW-33D with reanalyzed samples being run one day past hold. Initial runs are not reported due to internal standard and surrogate outside acceptance criteria. The qualified data summary is presented in Table A-5.

Two field duplicate (FD) samples were collected. A summary of the field duplicate results as compared with the normal sample results for these locations is presented in Table A-4. Requested matrix spike (MS) and/or matrix spike duplicate (MSD) analyses were performed on groundwater samples collected from MW-20. The additional MS listed in Table A-1 was analyzed for laboratory batch QC.

The following occurred during sample analysis resulting in flagged or qualified data; however, there is no impact to data usability:

- Dilutions were required during VOC and general chemistry analyses due to the high concentrations of analyte(s). The affected sample results are flagged with a “D” to indicate sample dilution in Table A-2.

- The ambient blank collected April 23, 2015 contained sulfate and the equipment blank collected in April 22, 2015 contained nitrate. The sulfate detection in sample MW-25 and the nitrate detection in sample MW-31D are flagged with a “UB” to indicate they are considered not detected based on the associated blank concentration. Results are presented in Table A-2. Qualified data summary is presented in Table A-5.

Data Verification Process. The data were validated based on the criteria specified in the project QAPP (MWH, 2012). The results of the data verification are summarized in the following tables:

- Table A-1, Summary of Groundwater Samples
- Table A-2, Sample Data Summary
- Table A-3, Holding Time Summary
- Table A-4, Field Duplicate Data Summary

All holding times, reporting limits, accuracy, precision, and representativeness criteria, as specified in the QAPP (MWH, 2012), were met with the exceptions presented in Table A-5.

Conclusions. Based on the results of the data verification, the data are considered precise, accurate, and representative, as qualified. Sampling completeness for this project is 100 percent, and analytical completeness for this sampling round is 100 percent, which meets the completeness goal of 85 percent.

References.

MWH, 1996. Final Ground-water Monitoring Plan, Wasatch Chemical Site. August 1996.

MWH, 2002. Monitored Natural Attenuation Work Plan, Wasatch Chemical Site Addendum to the Final Extraction and Treatment System Performance Standards, Milestones, and Shutdown Procedures document. November 14, 2002.

MWH, 2011. Final Groundwater Monitoring Well Installation and Sampling Plan, Wasatch Chemical Site. October 2011.

MWH, 2012. Quality Assurance Project Plan, Revision 2, Wasatch Chemical Site. March 2012.

TABLE A-1

SUMMARY OF GROUNDWATER SAMPLES
Q-81, APRIL 2015
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Location Identification		Field Sample Identification	Date Collected	Sample Matrix	Sampling Technique	Sample Type	VOCs SW-846 8260B	PCP SW-846 8151A	Anions E300	Sulfide E376.2
ES-01		ES-01-81	22-Apr-15	WG	G	N	X	X	X	X
EX-02		EX-02-81	22-Apr-15	WG	G	N	X	X	X	X
EX-04		EX-04-81	22-Apr-15	WG	G	N	X	NS	X	X
						LR	NS	NS	NS	X
						MS	NS	NS	NS	X
EX-05		EX-05-81	22-Apr-15	WG	G	N	X	NS	X	X
EX-07		EX-07-81	23-Apr-15	WG	G	N	X	X	X	X
EX-08		EX-08-81	22-Apr-15	WG	G	N	X	X	X	X
EX-09		EX-09-81	23-Apr-15	WG	G	N	X	NS	X	X
EX-11		EX-11-81	23-Apr-15	WG	G	N	X	X	X	X
		EX-13-81	23-Apr-15	WG	G	FD	X	X	X	X
MW-06		MW-06-81	23-Apr-15	WG	G	N	X	NS	X	X
MW-20		MW-20-81	23-Apr-15	WG	G	N	X	NS	X	X
		MW-91-81	23-Apr-15	WG	G	FD	X	NS	X	X
		MW-20-81	23-Apr-15	WG	G	LR	NS	NS	X	NS
						MS	X	NS	X	X
						SD	X	NS	NS	X
MW-23		MW-23-81	21-Apr-15	WG	G	N	X	NS	X	X
MW-24A		MW-24A-81	21-Apr-15	WG	G	N	X	NS	X	X
MW-25		MW-25-81	22-Apr-15	WG	G	N	X	NS	X	X
MW-30		MW-30-81	21-Apr-15	WG	G	N	X	NS	X	X
MW-31D		MW-31D-81	23-Apr-15	WG	G	N	X	NS	X	X
MW-32D		MW-32D-81	21-Apr-15	WG	G	N	X	NS	X	X
MW-33D		MW-33D-81	21-Apr-15	WG	G	N	X	NS	X	X
MW-34		MW-34-81	22-Apr-15	WG	G	N	X	NS	X	X
PZ-01		PZ-01-81	21-Apr-15	WG	G	N	X	NS	X	X
PZ-03		PZ-03-81	21-Apr-15	WG	G	N	X	NS	X	X
FIELDQC		EB-4-21-15	21-Apr-15	WQ	NA	EB	X	NS	X	X
		TB-4-21-15	21-Apr-15	WQ	NA	TB	X	NS	NS	NS
		EB-4-22-15	22-Apr-15	WQ	NA	EB	X	X	X	X
		FB-4-22-15	22-Apr-15	WQ	NA	AB	X	NS	X	X
		TB-4-22-15	22-Apr-15	WQ	NA	TB	X	NS	NS	NS
		FB-4-23-15	23-Apr-15	WQ	NA	AB	X	X	X	X
		TB-4-23-15	23-Apr-15	WQ	NA	TB	X	NS	NS	NS

AB	Ambient blank	MSD	Matrix spike duplicate	TB	Trip blank
EB	Equipment rinseate blank	N	Compliance sample	VOCs	Volatile organic compounds
FD	Field Duplicate	NA	Not applicable	WG	Groundwater
G	Grab sample	NS	Not sampled	WQ	Reagent Grade water or distilled water
LR	Laboratory replicate	PCP	Pentachlorophenol	X	Sampled
MS	Matrix spike				

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	ES-01	EX-02	EX-04	EX-05	EX-07
Field Sample Identification	ES-01-81	EX-02-81	EX-04-81	EX-05-81	EX-07-81
Sample Type	Normal	Normal	Normal	Normal	Normal
Date Collected	4/22/2015	4/22/2015	4/22/2015	4/22/2015	4/23/2015
Analyte/Methods (Units)					
Herbicides (µg/l)					
Pentachlorophenol	<0.5	**6.2**	--	--	<0.5
Chemistry Parameters (mg/l)					
Nitrogen, Nitrate (as N)	**0.203**	**0.282**	**0.871**	<0.1	**0.336**
Nitrogen, Nitrite	<0.1	<0.3 D	<0.1	<0.3 D	<0.1
Sulfate (as SO_4)	**29.7 D**	**1190 D**	**304 D**	**1410 D**	**139 D**
Sulfide	**0.344**	<0.1	**0.0127 T**	<0.1	<0.1
Volatile Organic Compounds (µg/l)					
1,1-Dichloroethene	**0.46 T**	**7.2**	**1**	**11**	**0.28 T**
Benzene	--	--	--	--	--
cis-1,2-Dichloroethene	**4.3**	**260 D**	**18**	**170 D**	**5.7**
Ethylbenzene	--	--	--	--	--
m,p-Xylene (Sum of isomers)	--	--	--	--	--
Naphthalene	--	--	--	--	--
o-Xylene (1,2-Dimethylbenzene)	--	--	--	--	--
Tetrachloroethene (PCE)	**0.16 T**	**0.22 T**	<1	<1	**0.72 T**
Toluene	--	--	--	--	--
trans-1,2-Dichloroethene	**0.71 T**	**11**	**4.1**	**130 D**	**2.1**
Trichloroethene (TCE)	**11**	**91**	**0.21 T**	**0.39 T**	**2.6**
Vinyl chloride	**3**	**49**	**0.51 T**	**9.8**	**3.2**

µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
-- Not scheduled.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	EX-08	EX-09	EX-11	EX-11 Dup	MW-06
Field Sample Identification	EX-08-81	EX-09-81	EX-11-81	EX-13-81	MW-06-81
Sample Type	Normal	Normal	Normal	Field Duplicate	Normal
Date Collected	4/22/2015	4/23/2015	4/23/2015	4/23/2015	4/23/2015
Analyte/Methods (Units)					
Herbicides (µg/l)					
Pentachlorophenol	**0.45 T**	--	<0.5	<0.5	--
Chemistry Parameters (mg/l)					
Nitrogen, Nitrate (as N)	**13.3 D**	**0.0595 T**	<0.1	<0.1	**0.0473 T**
Nitrogen, Nitrite	<0.4 D	<0.1	<0.3 D	<0.3 D	<0.1
Sulfate (as SO_4)	**583 D**	**1220 D**	**611 D**	**649 D**	**725 D**
Sulfide	**0.0191 T**	<0.1	**0.0487 T**	**0.0547 T**	**0.307**
Volatile Organic Compounds (µg/l)					
1,1-Dichloroethene	<1	**2.1**	**0.23 T**	**0.23 T**	**4.1**
Benzene	--	--	--	--	--
cis-1,2-Dichloroethene	<1	**30**	**15**	**16**	**34**
Ethylbenzene	--	--	--	--	--
m,p-Xylene (Sum of isomers)	--	--	--	--	--
Naphthalene	--	--	--	--	--
o-Xylene (1,2-Dimethylbenzene)	--	--	--	--	--
Tetrachloroethene (PCE)	<1	<1	<1	<1	<1
Toluene	--	--	--	--	--
trans-1,2-Dichloroethene	<1	**9.1**	**49**	**50**	**6.9**
Trichloroethene (TCE)	<1	**0.17 T**	**0.79 T**	**0.8 T**	**0.2 T**
Vinyl chloride	<1	<1	**72**	**77**	**1.2**

µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
-- Not scheduled.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	MW-20	MW-20	MW-23	MW-24A	MW-25
Field Sample Identification	MW-20-81	MW-91-81	MW-23-81	MW-24A-81	MW-25-81
Sample Type	Normal	Normal	Normal	Normal	Normal
Date Collected	4/23/2015	4/23/2015	4/21/2015	4/21/2015	4/22/2015
Analyte/Methods (Units)					
Herbicides (µg/l)					
Pentachlorophenol	--	--	--	--	--
Chemistry Parameters (mg/l)					
Nitrogen, Nitrate (as N)	**1.73**	**1.7**	**0.136 TD**	<0.1	0.046 TUB
Nitrogen, Nitrite	<0.1	<0.1	<1 D	<0.1	<0.1
Sulfate (as SO_4)	**1090 D**	**1100 D**	**417 D**	**216 D**	**476 D**
Sulfide	<0.1	<0.1	**0.131**	**0.0115 T**	**0.028 T**
Volatile Organic Compounds (µg/l)					
1,1-Dichloroethene	**1.3**	**1.3**	<1	<1	<1
Benzene	--	--	--	--	--
cis-1,2-Dichloroethene	**25**	**26**	<1	<1	**0.17 T**
Ethylbenzene	--	--	--	--	--
m,p-Xylene (Sum of isomers)	--	--	--	--	--
Naphthalene	--	--	--	--	--
o-Xylene (1,2-Dimethylbenzene)	--	--	--	--	--
Tetrachloroethene (PCE)	<1	<1	<1	<1	<1
Toluene	--	--	--	--	--
trans-1,2-Dichloroethene	**10**	**11**	<1	<1	<1
Trichloroethene (TCE)	**0.86 T**	**0.9 T**	<1	<1	<1
Vinyl chloride	**2.2**	**2.5**	<1	<1	<1

µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
-- Not scheduled.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	MW-30	MW-31D	MW-32D	MW-33D	MW-34
Field Sample Identification	MW-30-81	MW-31D-81	MW-32D-81	MW-33D-81	MW-34-81
Sample Type	Normal	Normal	Normal	Normal	Normal
Date Collected	4/21/2015	4/23/2015	4/21/2015	4/21/2015	4/22/2015
Analyte/Methods (Units)					
Herbicides (µg/l)					
Pentachlorophenol	--	--	--	--	--
Chemistry Parameters (mg/l)					
Nitrogen, Nitrate (as N)	**0.0472 T**	**0.0508 T**	**0.0463 T**	**0.0462 T**	<0.1
Nitrogen, Nitrite	**0.0419 T**	<0.1	<0.1	<0.1	<0.1
Sulfate (as SO_4)	**763 D**	1.68 UB	**0.771**	**1.08**	**785 D**
Sulfide	**0.0752 T**	**0.0462 T**	**0.0433 T**	**0.0548 T**	**0.0829 T**
Volatile Organic Compounds (µg/l)					
1,1-Dichloroethene	**5.7**	<1	<1 UJ	<1 UJ	<1
Benzene	--	--	--	<0.5 UJ	--
cis-1,2-Dichloroethene	**40**	**0.13 T**	<1 UJ	**1.5 J**	**2.8**
Ethylbenzene	--	--	--	**6.3 J**	--
m,p-Xylene (Sum of isomers)	--	--	--	**7.7 J**	--
Naphthalene	--	--	--	<1 UJ	--
o-Xylene (1,2-Dimethylbenzene)	--	--	--	**5 J**	--
Tetrachloroethene (PCE)	<1	<1	<1 UJ	**0.27 TJ**	<1
Toluene	--	--	--	<0.5 UJ	--
trans-1,2-Dichloroethene	**0.93 T**	<1	<1 UJ	<1 UJ	**0.61 T**
Trichloroethene (TCE)	**0.88 T**	<1	<1 UJ	**0.3 TJ**	**0.32 T**
Vinyl chloride	**5.4**	<1	<1 UJ	**0.47 TJ**	<1

µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
-- Not scheduled.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	PZ-01	PZ-03
Field Sample Identification	PZ-01-81	PZ-03-81
Sample Type	Normal	Normal
Date Collected	4/21/2015	4/21/2015
Analyte/Methods (Units)		
Herbicides (µg/l)		
Pentachlorophenol	--	--
Chemistry Parameters (mg/l)		
Nitrogen, Nitrate (as N)	<0.1	<0.1
Nitrogen, Nitrite	<0.1	<0.2 D
Sulfate (as SO_4)	**342 D**	**2180 D**
Sulfide	**0.0331 T**	**0.0127 T**
Volatile Organic Compounds (µg/l)		
1,1-Dichloroethene	<1	<1
Benzene	--	--
cis-1,2-Dichloroethene	<1	<1
Ethylbenzene	--	--
m,p-Xylene (Sum of isomers)	--	--
Naphthalene	--	--
o-Xylene (1,2-Dimethylbenzene)	--	--
Tetrachloroethene (PCE)	<1	<1
Toluene	--	--
trans-1,2-Dichloroethene	<1	<1
Trichloroethene (TCE)	<1	<1
Vinyl chloride	<1	<1

µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
-- Not scheduled.
D Sample dilution required for analysis; reported values reflect the dilution.
J Data are estimated due to associated quality control data.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.
UB Analyte considered not detected based on associated blank data.
UJ Potential low bias, possible false negative.

TABLE A-3

HOLDING TIME SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
ES-01	ES-01-81	22-Apr-15	1540	E300	N/A	N/A	N/A	23-Apr-15	1521	1	28
								27-Apr-15	1930	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1737	5	7
				SW8151A	27-Apr-15	5	7	27-Apr-15	2155	0	40
				SW8260B	25-Apr-15	3	7	25-Apr-15	752	3	7
EX-02	EX-02-81	22-Apr-15	1740	E300	N/A	N/A	N/A	23-Apr-15	1540	1	28
									1600	1	28
								27-Apr-15	1949	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1738	5	7
				SW8151A	27-Apr-15	5	7	27-Apr-15	2223	0	40
				SW8260B	25-Apr-15	3	7	25-Apr-15	824	3	7
				SW8260B	29-Apr-15	7	7	29-Apr-15	2120	7	7
EX-04	EX-04-81	22-Apr-15	1205	E300	N/A	N/A	N/A	23-Apr-15	1503	1	28
								27-Apr-15	1756	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1734	5	7
				SW8260B	25-Apr-15	3	7	25-Apr-15	643	3	7
EX-05	EX-05-81	22-Apr-15	1345	E300	N/A	N/A	N/A	23-Apr-15	1532	1	28
									1606	1	28
								27-Apr-15	1815	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1736	5	7
				SW8260B	25-Apr-15	3	7	25-Apr-15	718	3	7
				SW8260B	29-Apr-15	7	7	29-Apr-15	2047	7	7
EX-07	EX-07-81	23-Apr-15	910	E300	N/A	N/A	N/A	24-Apr-15	1127	1	28
									2355	1	28
				E376.2	N/A	N/A	N/A	28-Apr-15	1721	5	7
				SW8151A	28-Apr-15	5	7	29-Apr-15	829	1	40
				SW8260B	28-Apr-15	5	7	28-Apr-15	1420	5	7

TABLE A-3

HOLDING TIME SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
EX-08	EX-08-81	22-Apr-15	930	E300	N/A	N/A	N/A	23-Apr-15	1329	1	28
								27-Apr-15	1719	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1732	5	7
				SW8151A	27-Apr-15	5	7	27-Apr-15	2100	0	40
				SW8260B	25-Apr-15	3	7	25-Apr-15	536	3	7
EX-09	EX-09-81	23-Apr-15	1040	E300	N/A	N/A	N/A	24-Apr-15	1145	1	28
								25-Apr-15	14	2	28
				E376.2	N/A	N/A	N/A	28-Apr-15	1721	5	7
				SW8260B	28-Apr-15	5	7	28-Apr-15	1454	5	7
EX-11	EX-11-81	23-Apr-15	1145	E300	N/A	N/A	N/A	24-Apr-15	1204	1	28
									1702	1	28
								25-Apr-15	32	2	28
EX-11	EX-13-81	23-Apr-15	1145	E300	N/A	N/A	N/A	24-Apr-15	1223	1	28
									1758	1	28
								25-Apr-15	51	2	28
EX-11	EX-11-81	23-Apr-15	1145	E376.2	N/A	N/A	N/A	28-Apr-15	1721	5	7
EX-11	EX-13-81	23-Apr-15	1145	E376.2	N/A	N/A	N/A	28-Apr-15	1722	5	7
EX-11	EX-11-81	23-Apr-15	1145	SW8151A	28-Apr-15	5	7	29-Apr-15	903	1	40
EX-11	EX-13-81	23-Apr-15	1145	SW8151A	28-Apr-15	5	7	29-Apr-15	1012	1	40
EX-11	EX-11-81	23-Apr-15	1145	SW8260B	28-Apr-15	5	7	28-Apr-15	1527	5	7
EX-11	EX-13-81	23-Apr-15	1145	SW8260B	28-Apr-15	5	7	28-Apr-15	1602	5	7
MW-06	MW-06-81	23-Apr-15	1455	E300	N/A	N/A	N/A	24-Apr-15	1413	1	28
								25-Apr-15	225	2	28
				E376.2	N/A	N/A	N/A	28-Apr-15	1723	5	7
				SW8260B	28-Apr-15	5	7	28-Apr-15	1709	5	7
MW-20	MW-20-81	23-Apr-15	1250	E300	N/A	N/A	N/A	24-Apr-15	1451	1	28
								25-Apr-15	110	2	28

TABLE A-3

HOLDING TIME SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
MW-20	MW-91-81	23-Apr-15	1250	E300	N/A	N/A	N/A	24-Apr-15	1242	1	28
								25-Apr-15	206	2	28
MW-20	MW-20-81	23-Apr-15	1250	E376.2	N/A	N/A	N/A	28-Apr-15	1723	5	7
MW-20	MW-91-81	23-Apr-15	1250	E376.2	N/A	N/A	N/A	28-Apr-15	1723	5	7
MW-20	MW-20-81	23-Apr-15	1250	SW8260B	28-Apr-15	5	7	28-Apr-15	1818	5	7
MW-20	MW-91-81	23-Apr-15	1250	SW8260B	28-Apr-15	5	7	28-Apr-15	1635	5	7
MW-23	MW-23-81	21-Apr-15	1455	E300	N/A	N/A	N/A	23-Apr-15	1233	2	28
									1251	2	28
								27-Apr-15	1332	6	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1728	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	249	4	7
MW-24A	MW-24A-81	21-Apr-15	1620	E300	N/A	N/A	N/A	23-Apr-15	1240	2	28
								27-Apr-15	1351	6	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1729	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	323	4	7
MW-25	MW-25-81	22-Apr-15	1030	E300	N/A	N/A	N/A	23-Apr-15	1348	1	28
								27-Apr-15	1738	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1733	5	7
				SW8260B	25-Apr-15	3	7	25-Apr-15	609	3	7
MW-30	MW-30-81	21-Apr-15	1125	E300	N/A	N/A	N/A	23-Apr-15	1155	2	28
								27-Apr-15	1254	6	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1726	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	107	4	7
MW-31D	MW-31D-81	23-Apr-15	1520	E300	N/A	N/A	N/A	24-Apr-15	1432	1	28
				E376.2	N/A	N/A	N/A	28-Apr-15	1723	5	7
				SW8260B	28-Apr-15	5	7	28-Apr-15	1744	5	7

TABLE A-3

HOLDING TIME SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
MW-32D	MW-32D-81	21-Apr-15	1355	E300	N/A	N/A	N/A	23-Apr-15	1214	2	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1727	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	215	4	7
				SW8260B	29-Apr-15	8	7	29-Apr-15	2154	8	7
MW-33D	MW-33D-81	21-Apr-15	1750	E300	N/A	N/A	N/A	23-Apr-15	1310	2	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1730	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	431	4	7
				SW8260B	29-Apr-15	8	7	29-Apr-15	2228	8	7
MW-34	MW-34-81	22-Apr-15	750	E300	N/A	N/A	N/A	23-Apr-15	1332	1	28
								27-Apr-15	1700	5	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1732	5	7
				SW8260B	25-Apr-15	3	7	25-Apr-15	504	3	7
PZ-01	PZ-01-81	21-Apr-15	1715	E300	N/A	N/A	N/A	23-Apr-15	1257	2	28
								27-Apr-15	1641	6	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1729	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	357	4	7
PZ-03	PZ-03-81	21-Apr-15	1325	E300	N/A	N/A	N/A	23-Apr-15	1206	2	28
									1223	2	28
								27-Apr-15	1313	6	28
				E376.2	N/A	N/A	N/A	27-Apr-15	1727	6	7
				SW8260B	25-Apr-15	4	7	25-Apr-15	140	4	7
FIELDQC	EB-4-21-15	21-Apr-15	1755	E300	N/A	N/A	N/A	23-Apr-15	1315	2	28
	EB-4-22-15	22-Apr-15	945	E300	N/A	N/A	N/A	23-Apr-15	1349	1	28
	FB-4-22-15	22-Apr-15	1040	E300	N/A	N/A	N/A	23-Apr-15	1515	1	28
	FB-4-23-15	23-Apr-15	1155	E300	N/A	N/A	N/A	24-Apr-15	1300	1	28
	EB-4-21-15	21-Apr-15	1755	E376.2	N/A	N/A	N/A	27-Apr-15	1731	6	7
	EB-4-22-15	22-Apr-15	945	E376.2	N/A	N/A	N/A	27-Apr-15	1733	5	7

TABLE A-3

HOLDING TIME SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
FIELDQC	FB-4-22-15	22-Apr-15	1040	E376.2	N/A	N/A	N/A	27-Apr-15	1733	5	7
	FB-4-23-15	23-Apr-15	1155	E376.2	N/A	N/A	N/A	28-Apr-15	1722	5	7
	EB-4-22-15	22-Apr-15	945	SW8151A	27-Apr-15	5	7	27-Apr-15	2127	0	40
	FB-4-23-15	23-Apr-15	1155	SW8151A	28-Apr-15	5	7	29-Apr-15	938	1	40
	TB-4-21-15	21-Apr-15	745	SW8260B	29-Apr-15	8	7	29-Apr-15	2300	8	7
	EB-4-21-15	21-Apr-15	1755	SW8260B	27-Apr-15	6	7	27-Apr-15	1932	6	7
				SW8260B	29-Apr-15	8	7	29-Apr-15	1800	8	7
	TB-4-22-15	22-Apr-15	730	SW8260B	29-Apr-15	7	7	29-Apr-15	2334	7	7
	EB-4-22-15	22-Apr-15	945	SW8260B	29-Apr-15	7	7	29-Apr-15	1835	7	7
	FB-4-22-15	22-Apr-15	1040	SW8260B	29-Apr-15	7	7	29-Apr-15	1907	7	7
	TB-4-23-15	23-Apr-15	730	SW8260B	28-Apr-15	5	7	28-Apr-15	1313	5	7
	FB-4-23-15	23-Apr-15	1155	SW8260B	28-Apr-15	5	7	28-Apr-15	1347	5	7

N/A Not applicable

TABLE A-4

FIELD DUPLICATE GROUNDWATER SAMPLE DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH

Location Identification	EX-11	EX-11 Dup		MW-20	MW-20 Dup	
Field Sample Identification	EX-11-81	EX-13-81		MW-20-81	MW-91-81	
Sample Type	Normal	Field Duplicate		Normal	Field Duplicate	
Date Collected	4/23/2015	4/23/2015		4/23/2015	4/23/2015	
Analyte/Methods (Units)			**RPD**			**RPD**
Herbicides (µg/l)						
Pentachlorophenol	<0.5	<0.5	NC	--	--	NC
Chemistry Parameters (mg/l)						
Nitrogen, Nitrate (as N)	<0.1	<0.1	NC	**1.73**	**1.7**	1.75
Nitrogen, Nitrite	<0.3 D	<0.3 D	NC	<0.1	<0.1	NC
Sulfate (as SO_4)	**611 D**	**649 D**	6.03	**1090 D**	**1100 D**	0.91
Sulfide	**0.0487 T**	**0.0547 T**	11.6	<0.1	<0.1	NC
Volatile Organic Compounds (µg/l)						
1,1-Dichloroethene	**0.23 T**	**0.23 T**	0	**1.3**	**1.3**	0
cis-1,2-Dichloroethene	**15**	**16**	6.45	**25**	**26**	3.92
Tetrachloroethene (PCE)	<1	<1	NC	<1	<1	NC
trans-1,2-Dichloroethene	**49**	**50**	2.02	**10**	**11**	9.52
Trichloroethene (TCE)	**0.79 T**	**0.8 T**	1.26	**0.86 T**	**0.9 T**	4.55
Vinyl chloride	**72**	**77**	6.71	**2.2**	**2.5**	12.8

µg/l micrograms per liter.
mg/l milligrams per liter.
Bold Bolded result indicates positively identified compound.
NC Not calculated.
RPD relative percent difference
D Sample dilution required for analysis; reported values reflect the dilution.
T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE A-5

QUALIFIED DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL, SALT LAKE CITY, UTAH

Location Identification	Sample Identification	Sample Date	Analysis	Analyte	Sample Result	Sample Units	QC Type	QC Result	Qualifier	Bias	Comment
MW-25	MW-25-81	22-Apr-15	E300	Nitrate (as N)	0.046 T	mg/L	EB	0.0546 T mg/L	UB	High	Analyte considered not detected based on concentration in an associated blank.
MW-31D	MW-31D-81	23-Apr-15	E300	Sulfate (as SO4)	1.68	mg/L	AB	0.537 mg/L	UB	High	Analyte considered not detected based on concentration in an associated blank.
MW-32D	MW-32D-81	21-Apr-15	SW8260B	1,1-Dichloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-32D	MW-32D-81	21-Apr-15	SW8260B	cis-1,2-Dichloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-32D	MW-32D-81	21-Apr-15	SW8260B	trans-1,2-Dichloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-32D	MW-32D-81	21-Apr-15	SW8260B	Tetrachloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.

TABLE A-5

QUALIFIED DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL, SALT LAKE CITY, UTAH

Location Identification	Sample Identification	Sample Date	Analysis	Analyte	Sample Result	Sample Units	QC Type	QC Result	Qualifier	Bias	Comment
MW-32D	MW-32D-81	21-Apr-15	SW8260B	Trichloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-32D	MW-32D-81	21-Apr-15	SW8260B	Vinyl Chloride	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Benzene	<0.5	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Toluene	<0.5	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	1,1-Dichloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	cis-1,2-Dichloroethene	1.5	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.

TABLE A-5

QUALIFIED DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL, SALT LAKE CITY, UTAH

Location Identification	Sample Identification	Sample Date	Analysis	Analyte	Sample Result	Sample Units	QC Type	QC Result	Qualifier	Bias	Comment
MW-33D	MW-33D-81	21-Apr-15	SW8260B	trans-1,2-Dichloroethene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Ethylbenzene	6.3	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Naphthalene	<1	µg/L	HT	8 days	UJ	Low	Potential false negative. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Tetrachloroethene	0.27 T	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Trichloroethene	0.3 T	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.

TABLE A-5

QUALIFIED DATA SUMMARY
Q-81, APRIL 2015
WASATCH CHEMICAL, SALT LAKE CITY, UTAH

Location Identification	Sample Identification	Sample Date	Analysis	Analyte	Sample Result	Sample Units	QC Type	QC Result	Qualifier	Bias	Comment
MW-33D	MW-33D-81	21-Apr-15	SW8260B	Vinyl Chloride	0.47 T	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	m,p-Xylenes (sum of isomers)	7.7	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.
MW-33D	MW-33D-81	21-Apr-15	SW8260B	o-Xylene	5	µg/L	HT	8 days	J	Low	Datum is estimated; potential low bias. Holding time exceeded. Samples unpreserved.

µg/L micrograms per liter
mg/L milligrams per liter
AB ambient blank
EB equipment blank
HT holding time
QC quality control

APPENDIX B

HISTORICAL TIME SERIES
GROUNDWATER MONITORING DATA

APPENDIX B
GROUNDWATER ANALYTICAL DATA
HISTORICAL TIME SERIES TABLES AND PLOTS

WASATCH CHEMICAL SITE

List of Exhibits

APPENDIX B
LIST OF ACRONYMS AND DATA QUALIFIERS

µg/l	micrograms per liter
2,4-D	2,4-dichlorophenoxyacetic acid
B	Analyte was detected in associated blank sample
BZ	benzene
BZME	toluene
D	Sample dilution was conducted
DCE	dichloroethene
EBZ	ethylbenzene
G	Data qualifier definition is unknown
J	Value was estimated
J+	Value was estimated, biased high
J-	Value was estimated, biased low
PCE	tetrachloroethene
PCP	pentachlorophenol
T	Analyte was positively identified but reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit
TCE	trichloroethene
U	Analyte not detected above the method detection limit
UB	Analyte deemed not detected due to detection in associated blank sample
UJ	Potential low bias, possible false negative

EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01

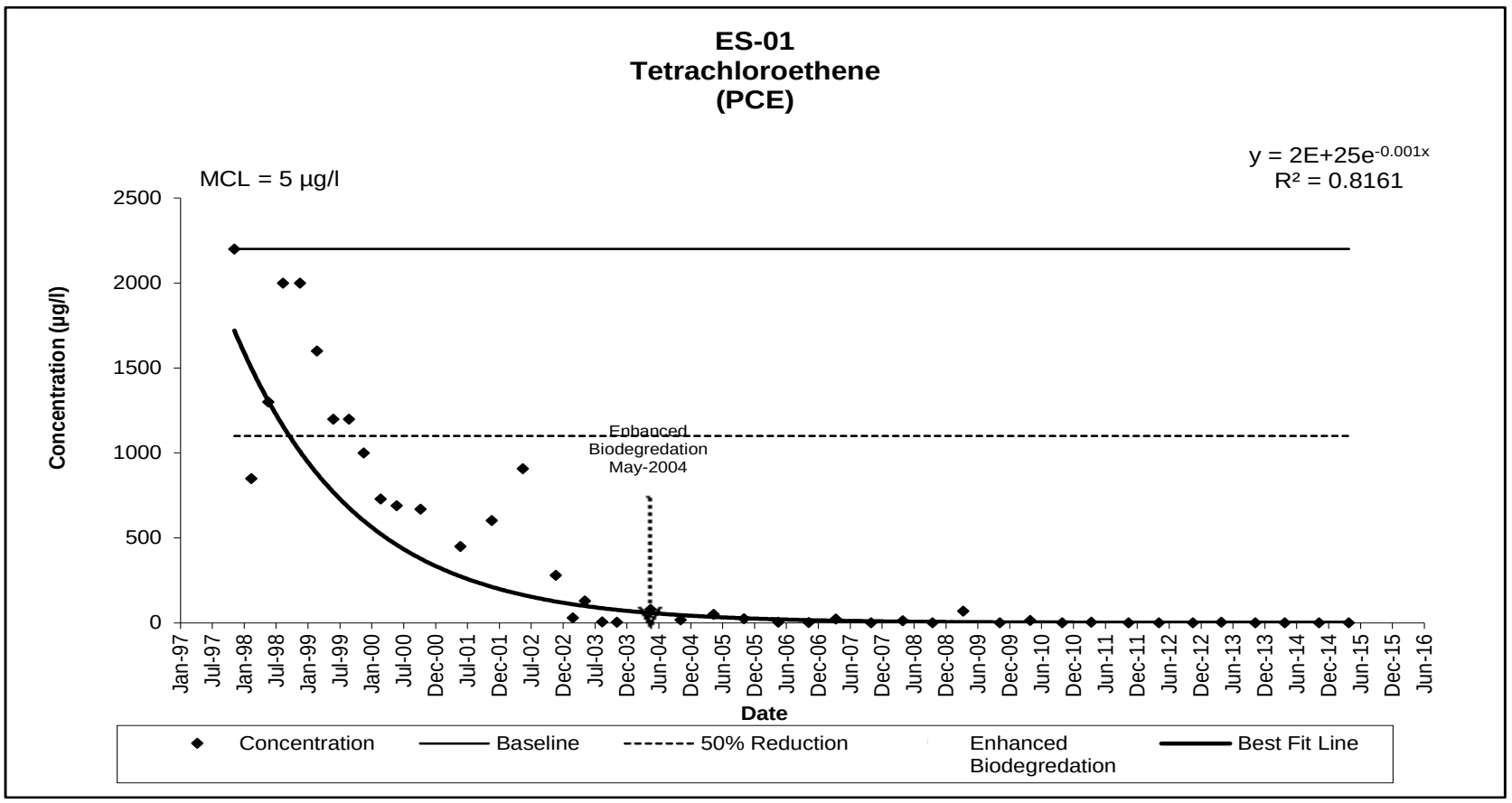
LABORATORY PARAMETERS

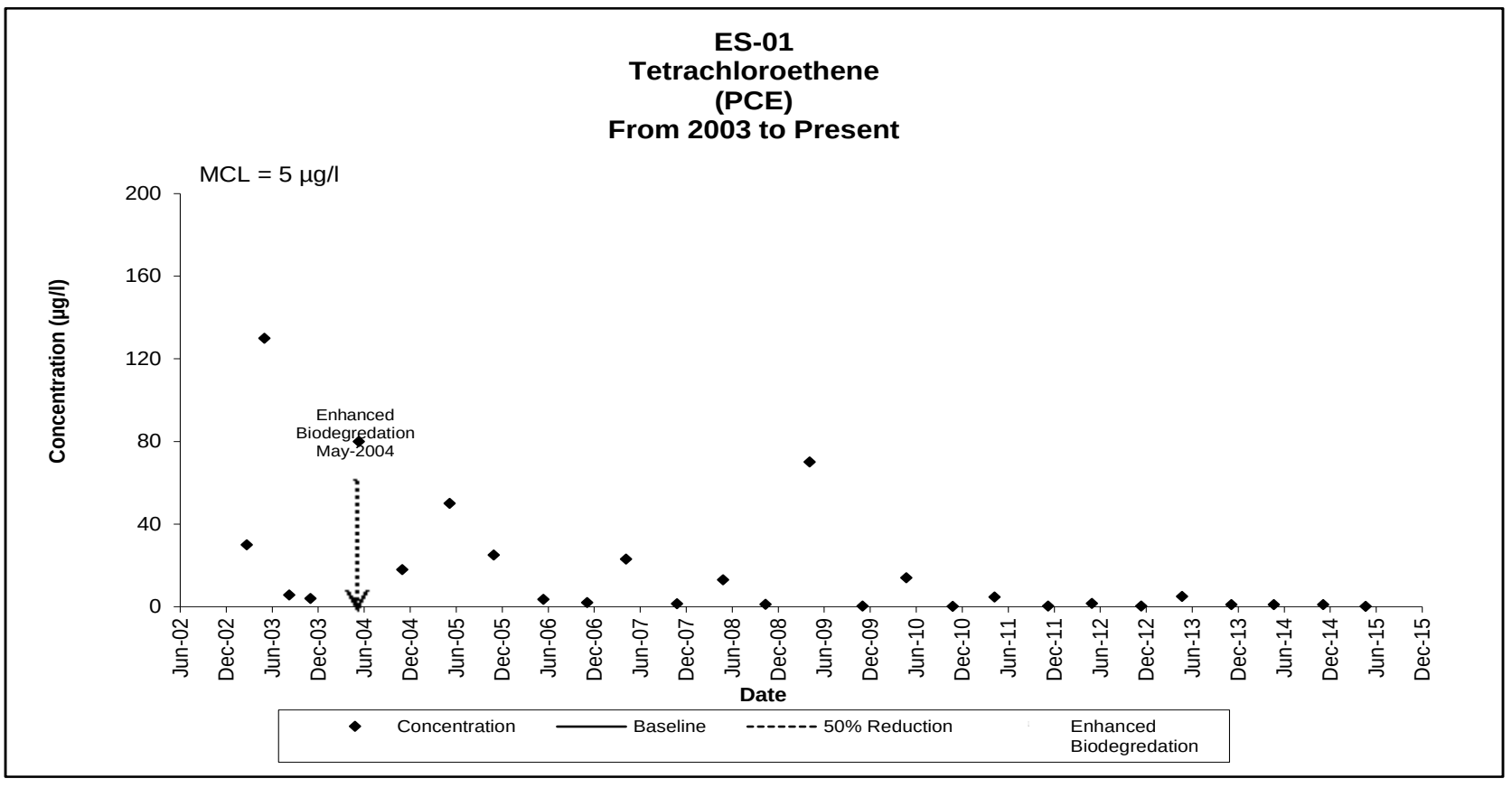
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
6-Nov-97	2200	890	270	--	--	--	260	4700
12-Feb-98	850 B	310 B	53	--	--	--	33	870 JG
19-May-98	1300	620	140	--	--	--	38	1100
12-Aug-98	2000	770	100	--	--	--	65	980
17-Nov-98	2000	690	87	--	--	--	48	1000
23-Feb-99	1600 J	750 J	82 J	--	--	--	30	670
26-May-99	1200	660	< 500 G	--	--	--	55	640
25-Aug-99	1200	410	33 T	--	--	--	35	240
17-Nov-99	1000	590	36 T	--	--	--	16	380
22-Feb-00	730	270	18 T	--	--	--	11.4	79
23-May-00	690	570	28 T	--	--	--	14.2	210
6-Oct-00	670 D	460 D	36 D	--	--	--	25 J	120 D
23-May-01	450 D	410 D	30 D	--	--	--	13	360 D
19-Nov-01	603 D	555 D	33 D	--	--	--	10	130
15-May-02	907 D	524 D	33 D	--	--	--	7.9	100
20-Nov-02	280 D	100 D	< 50 D	--	--	--	8.6	43 T
25-Feb-03	30	59	3.5	--	--	64	1.6	8 T
6-May-03	130 D	100 D	3 TD	--	--	31 D	1.7	1.3
12-Aug-03	5.7	14	2.2	--	--	505 D	< 0.5	0.3 TJ
5-Nov-03	4 TD	6 TD	< 10 D	--	--	51 D	< 2.4	0.07 TJ
14-May-04	80 DJ	106 D	9.7	--	--	80 D	--	21 D
3-Nov-04	18	19	0.7 T	--	--	6.1	--	3.2
10-May-05	< 50 D	35 TD	< 50 D	--	--	70 D	--	5.1 J
31-Oct-05	< 25 D	< 25 D	< 25 D	--	--	< 25 D	--	< 0.5
16-May-06	3.6	24	5.7	--	--	60 D	--	8 D
6-Nov-06	2	4.5	0.55 T	--	--	10 J-	--	< 0.5
9-Apr-07	23	39	1.9	--	--	11	--	1.5
29-Oct-07	1.4	2	< 1	--	--	2.4	--	0.11 T
28-Apr-08	13	62 D	6.1	--	--	85 D	--	16 D
14-Oct-08	1.2	2.4	< 1	--	--	1.6	--	< 0.5
7-Apr-09	70 D	150 D	10 J	210 D	1.8 J	75 D	--	42 TDJ
3-Nov-09	0.37 T	1.7	< 1	0.81 T	0.5 T	0.73 T	--	< 0.5
26-Apr-10	14	47	6.7	78	0.77 T	30 J	--	26 D
26-Oct-10	0.21 T	0.44 T	< 1	0.45 T	< 1	0.35 T	--	< 0.5
11-Apr-11	4.7	19	2.6	48	0.64 T	18	--	8.6 D
9-Nov-11	0.29 T	2.3	< 1	1.4	0.39 T	1.2	--	< 0.5
1-May-12	1.6	10	1.5	64	0.8 T	60 D	--	10 D
12-Nov-12	0.31 T	1.4	< 1	0.6 T	< 1	0.44 T	--	< 0.5
23-Apr-13	5	29	2.9	26	0.42 T	13	--	4 D
5-Nov-13	< 1	0.76 T	0.27 T	0.74 T	0.37 T	0.83 T	--	< 0.5
22-Apr-14	1.1	59	1.1	44	0.87 T	39	--	< 0.5
4-Nov-14	< 1	0.89 T	0.38 T	0.7 T	1.1	0.82 T	--	< 0.5
22-Apr-15	0.16 T	11	0.46 T	4.3	0.71 T	3	--	< 0.5

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01





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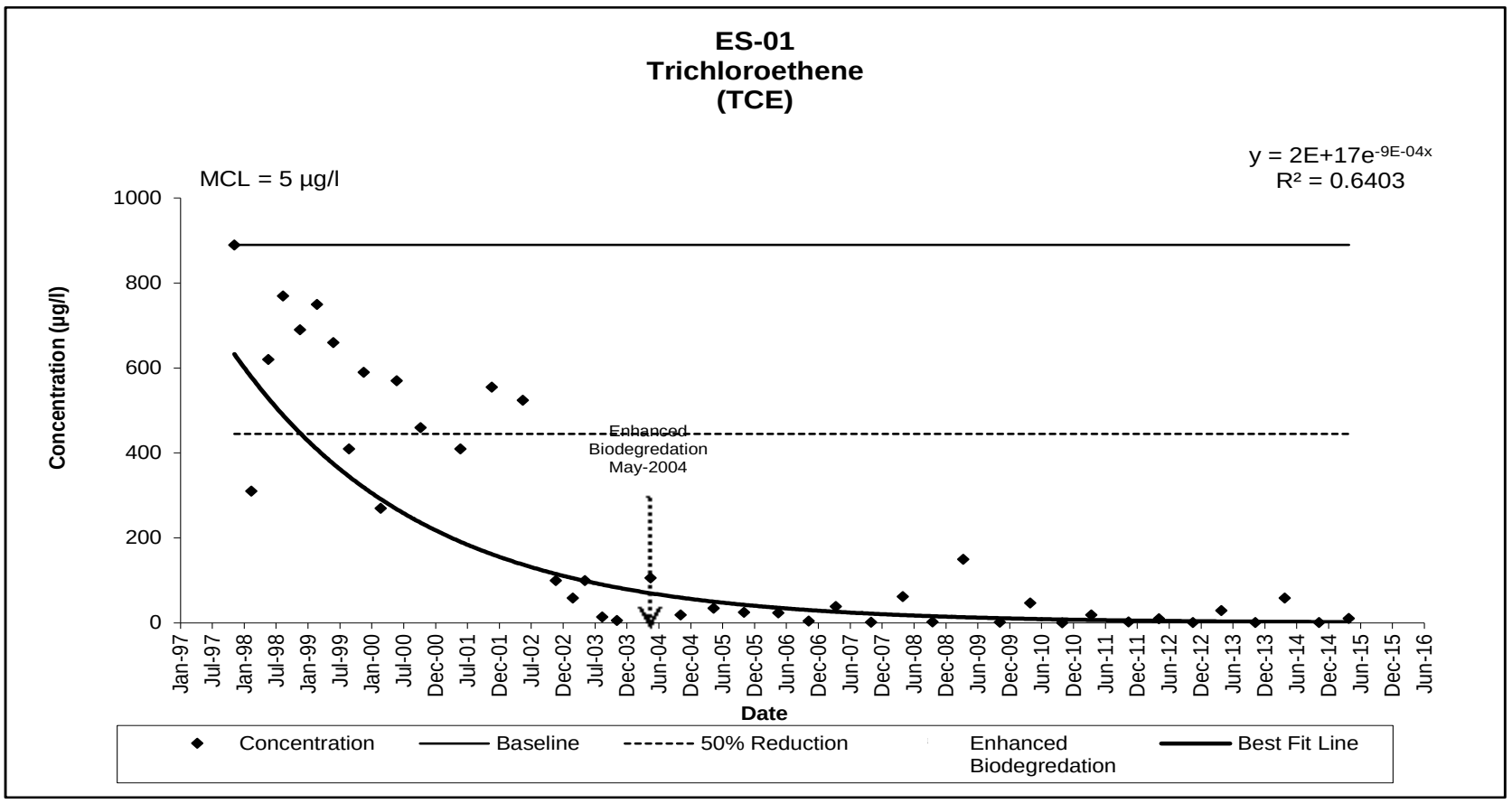
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01



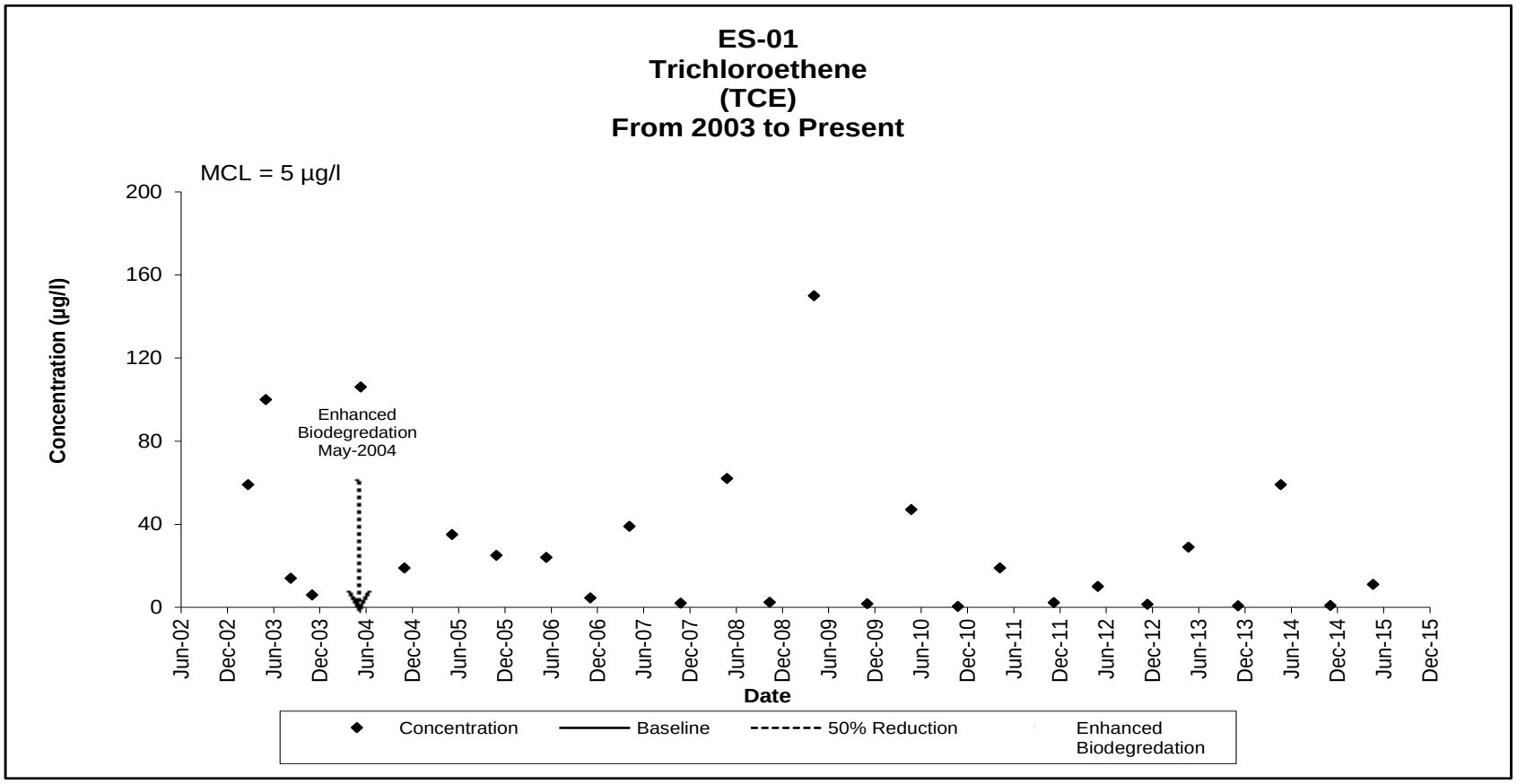
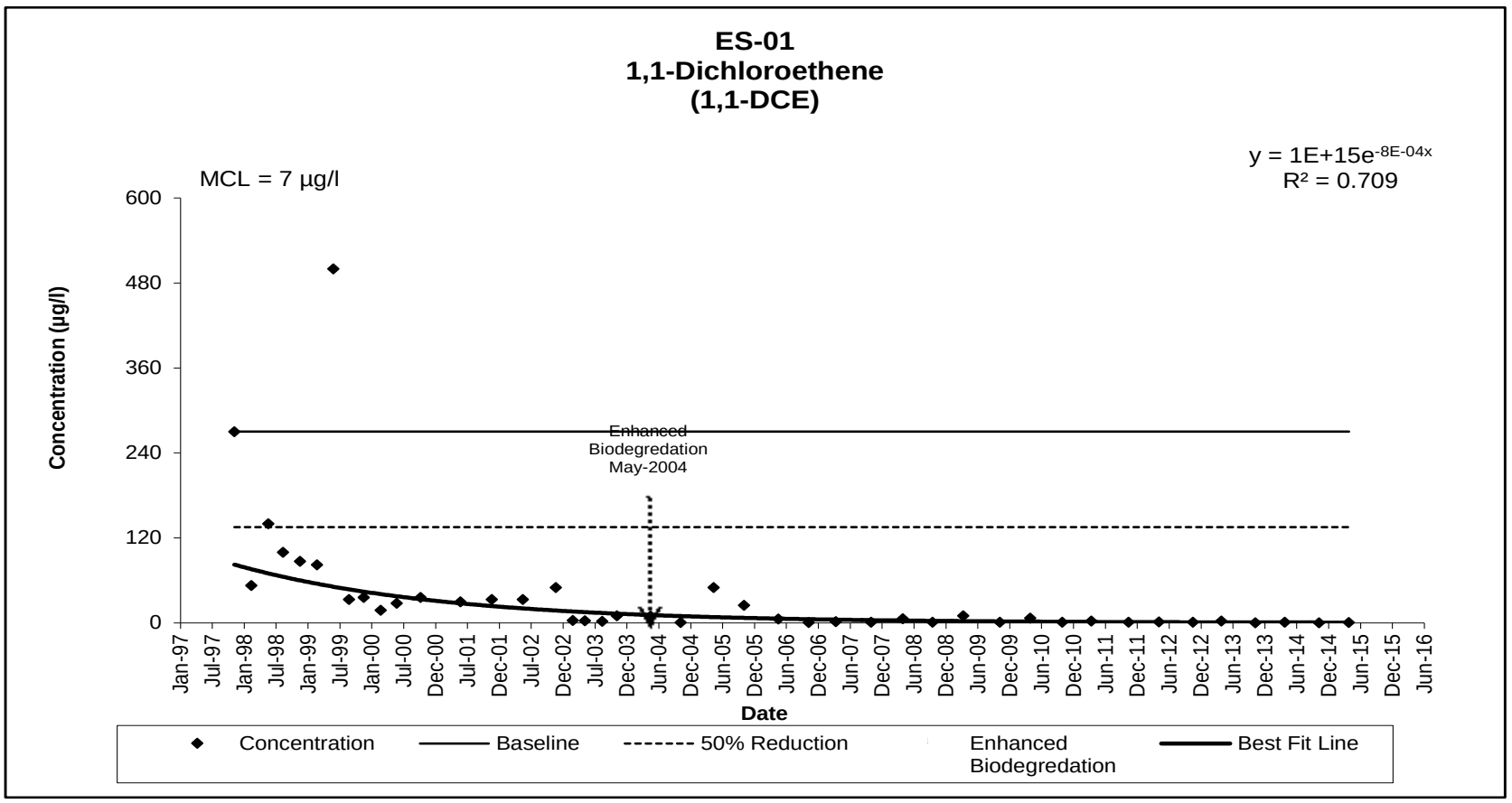
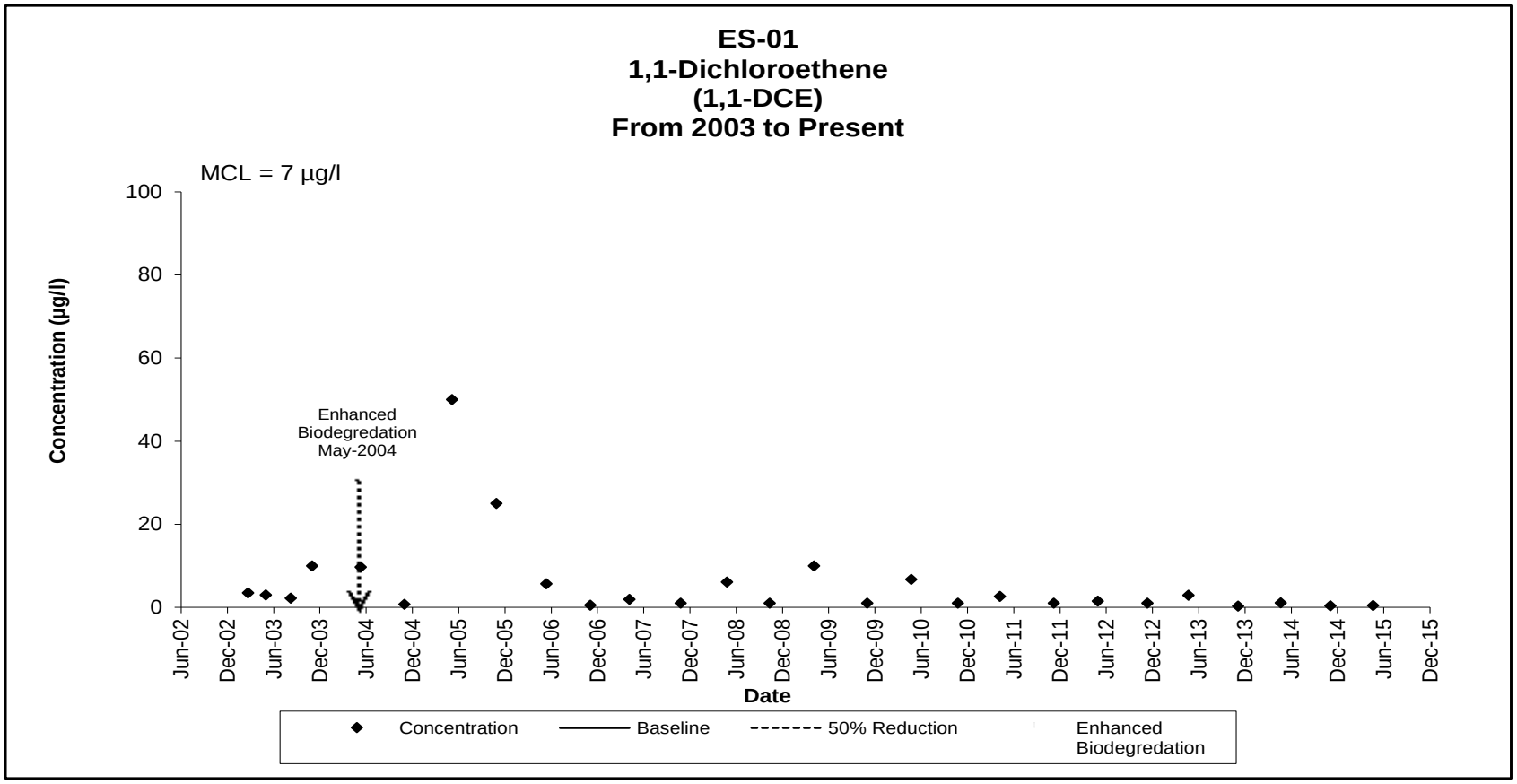


EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01





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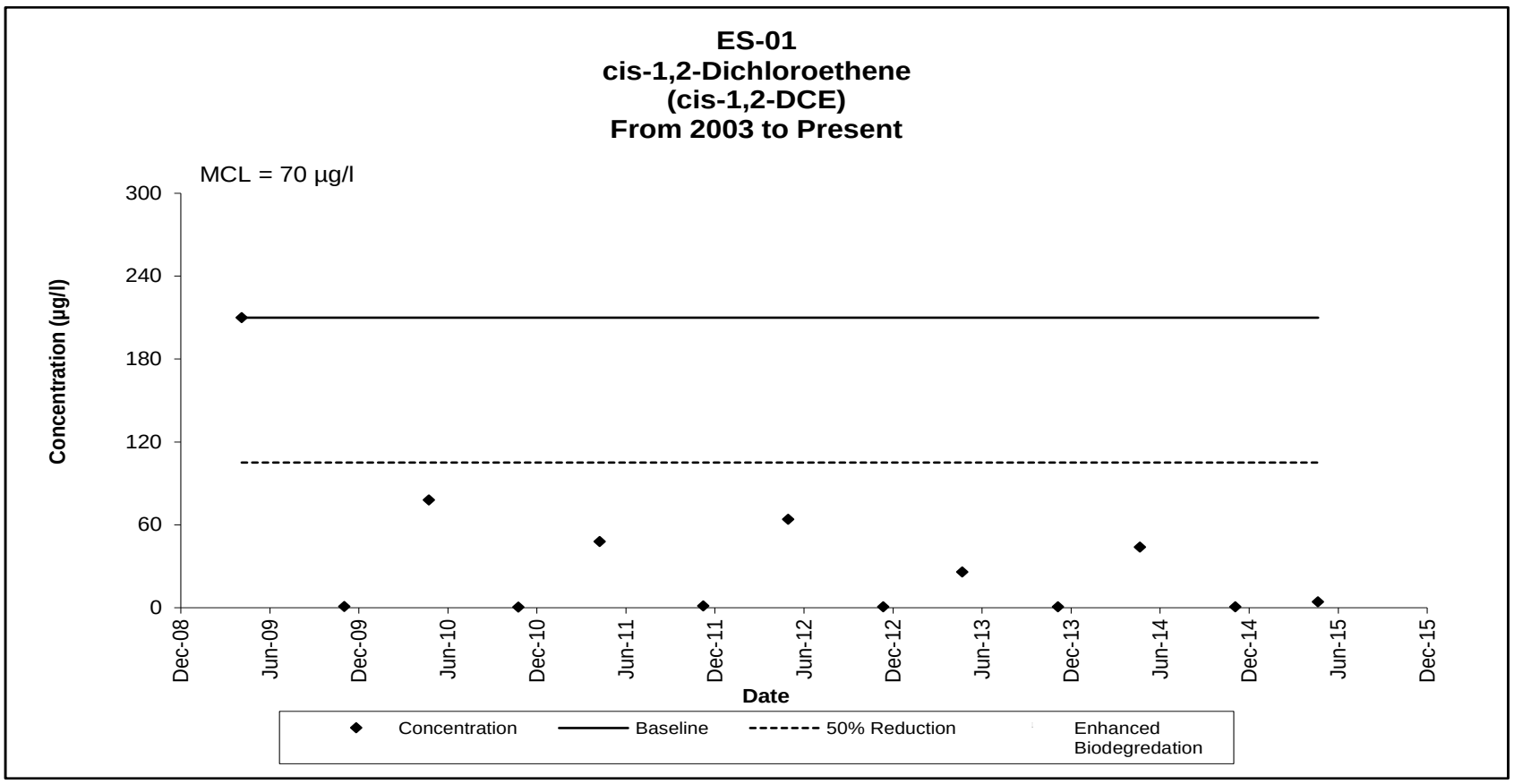
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01



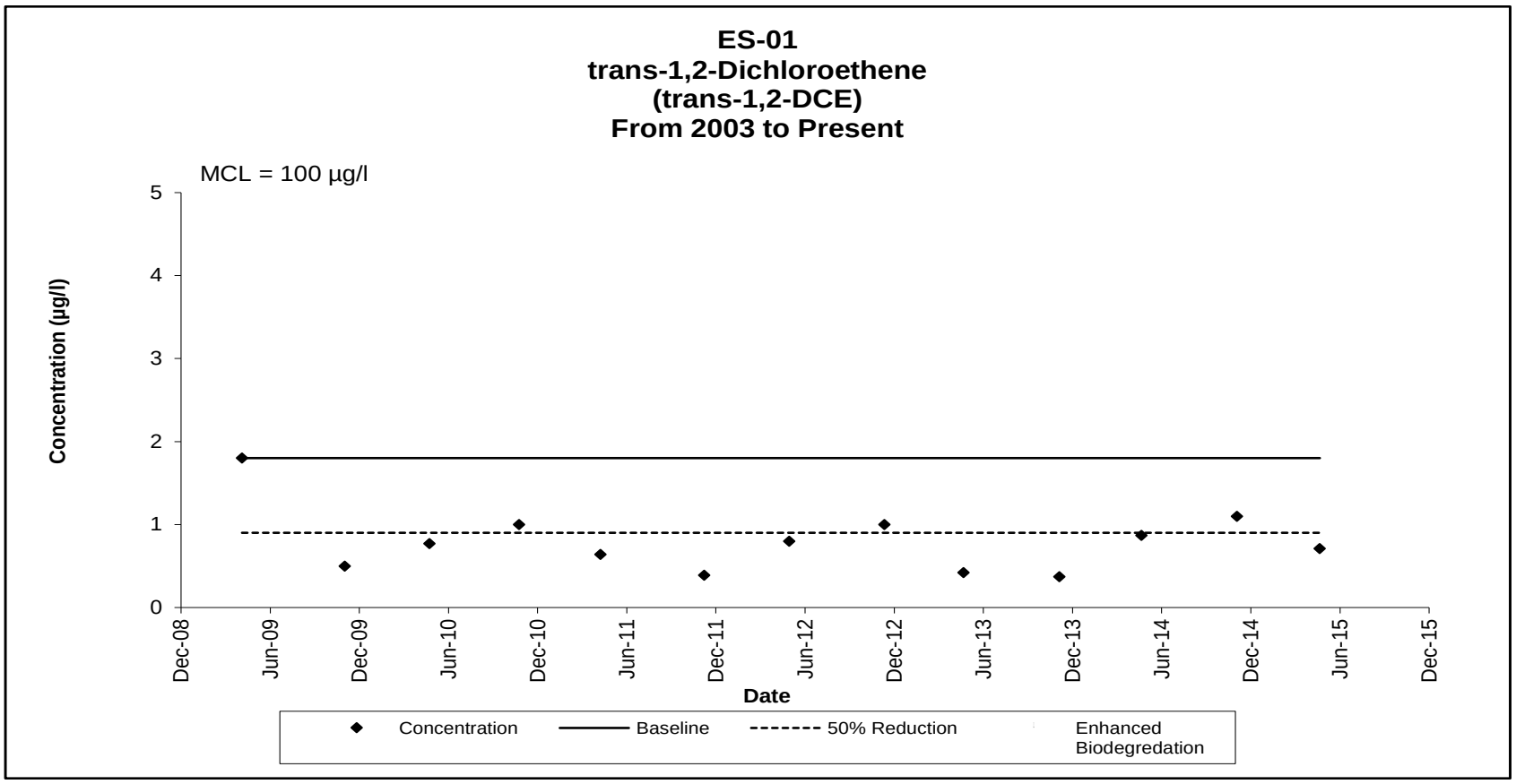
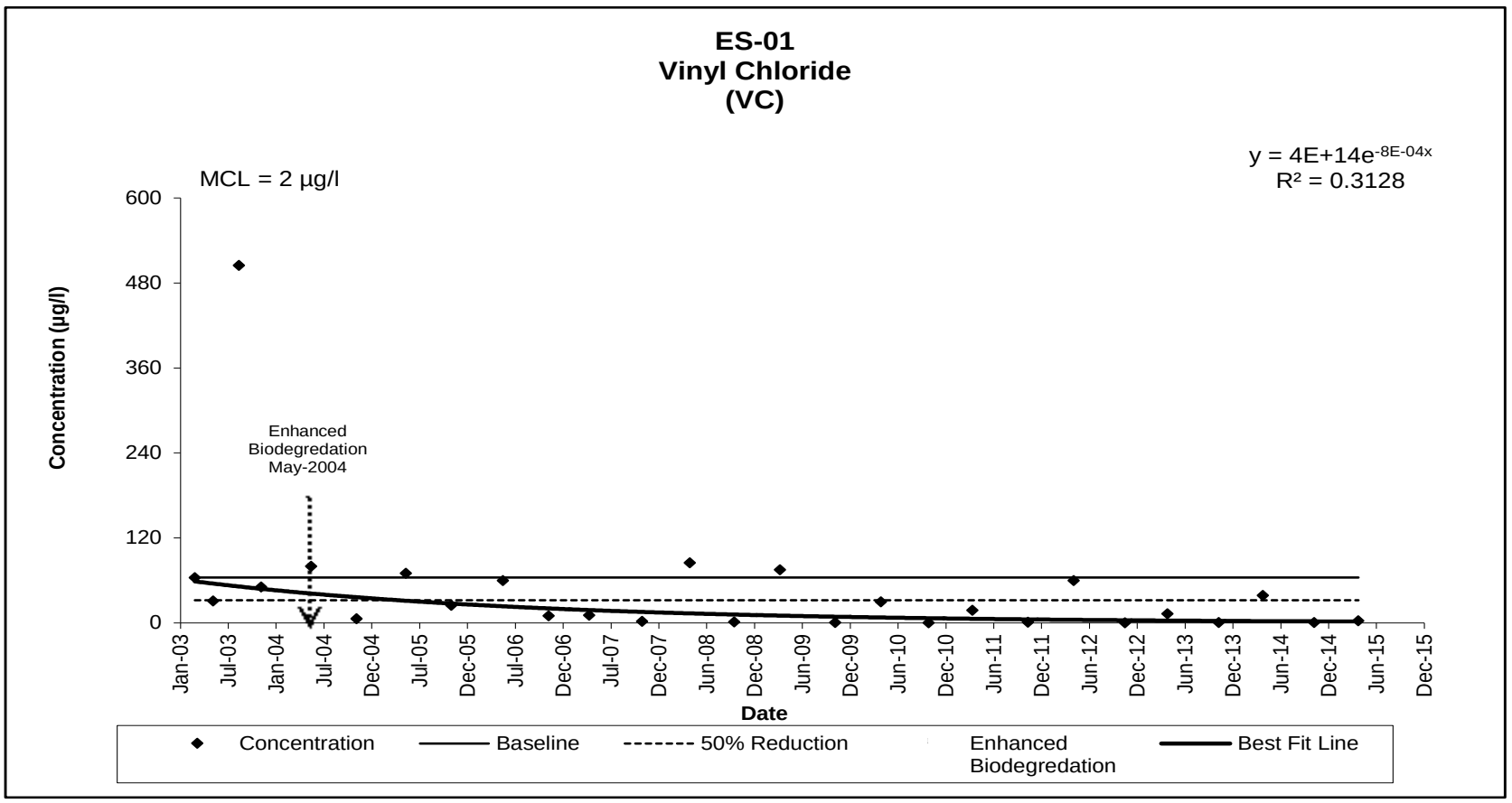


EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01



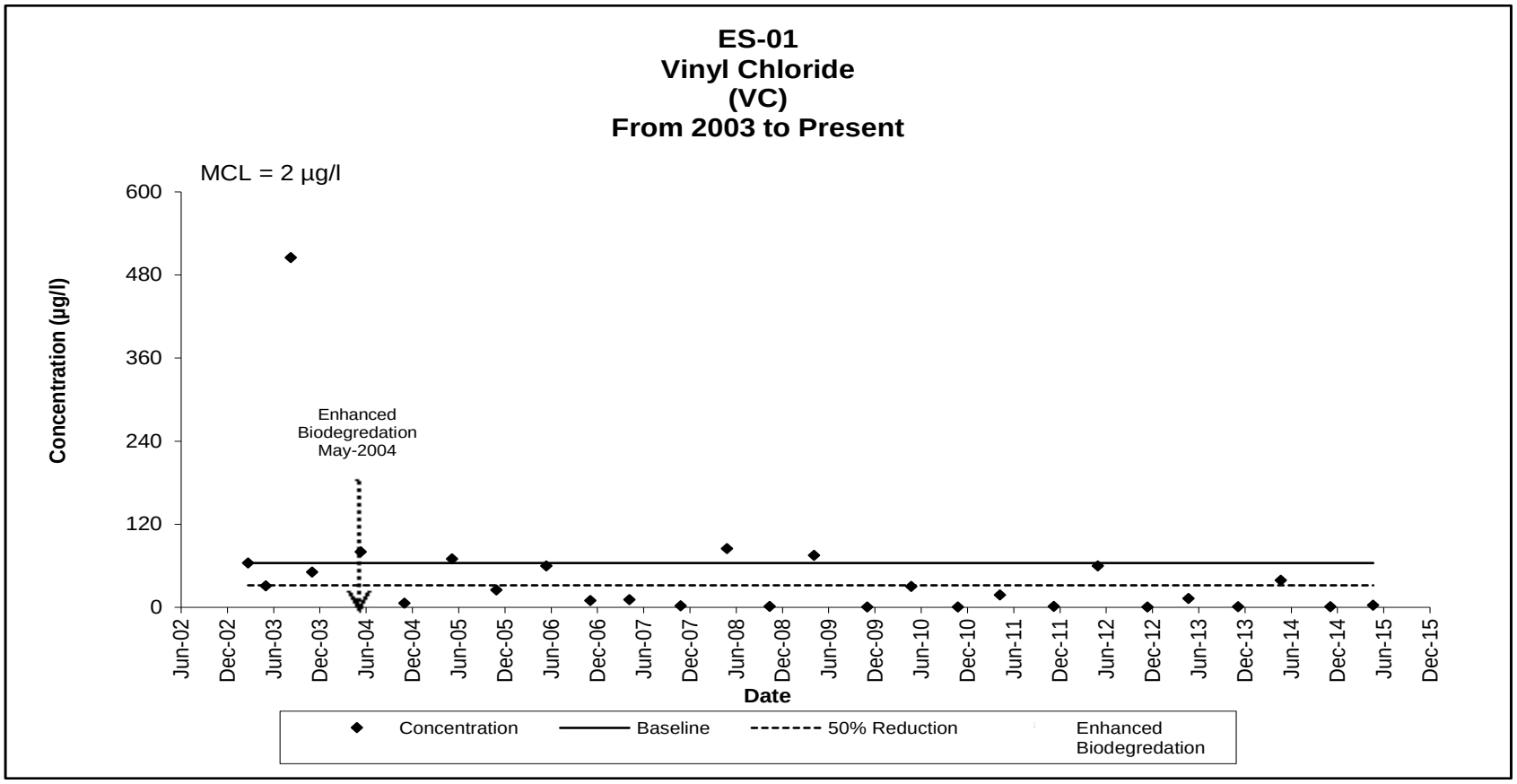
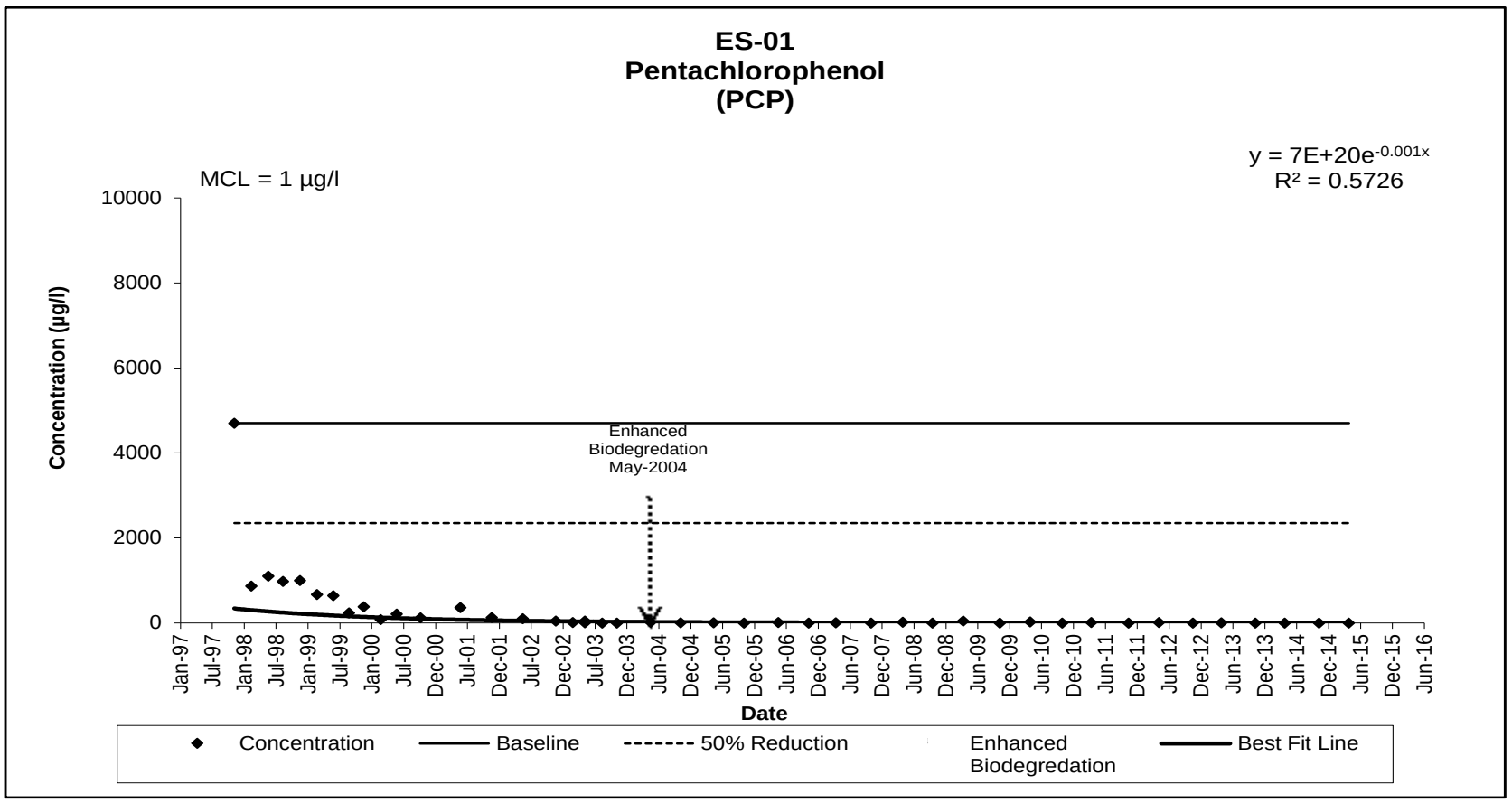


EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01



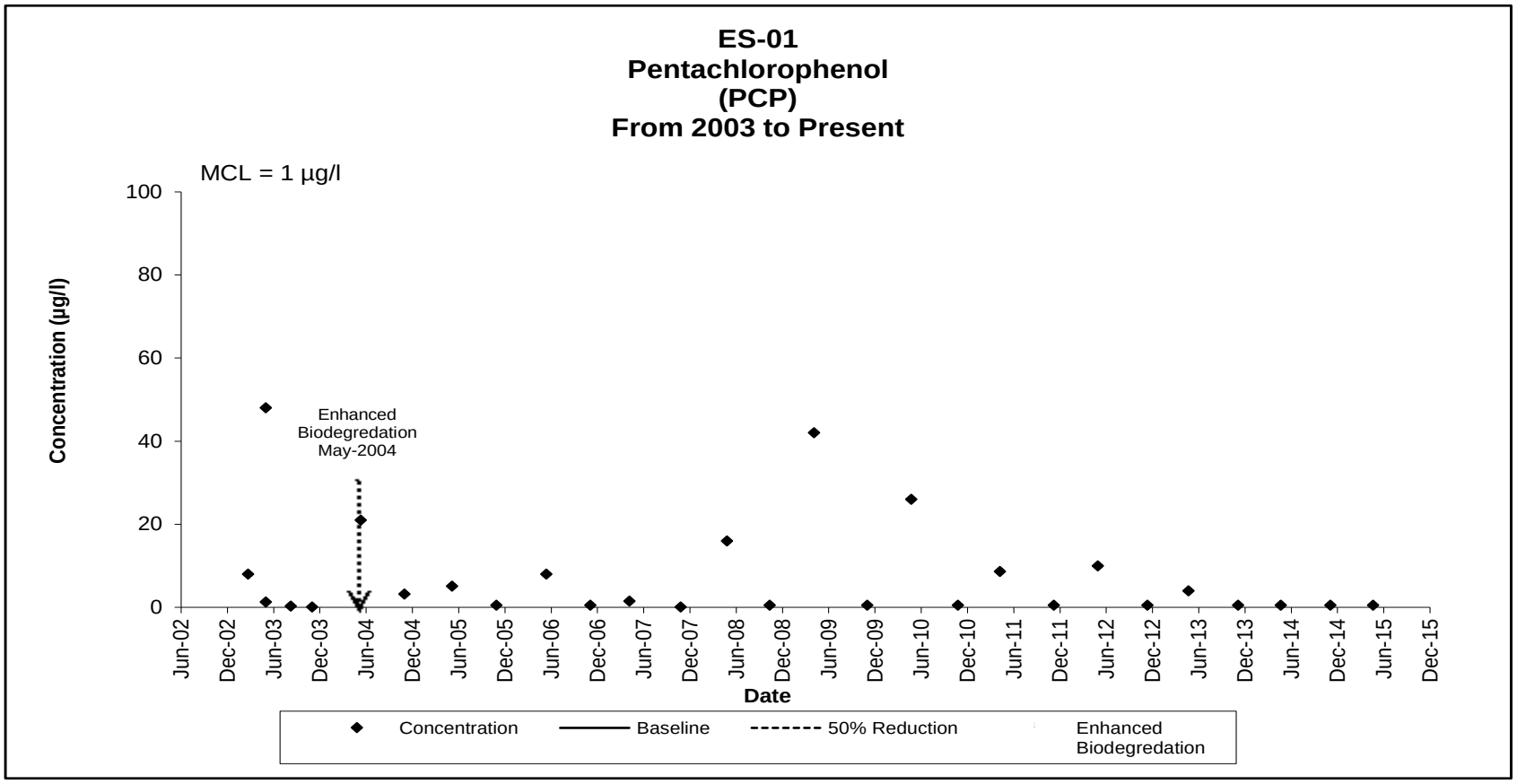


EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02

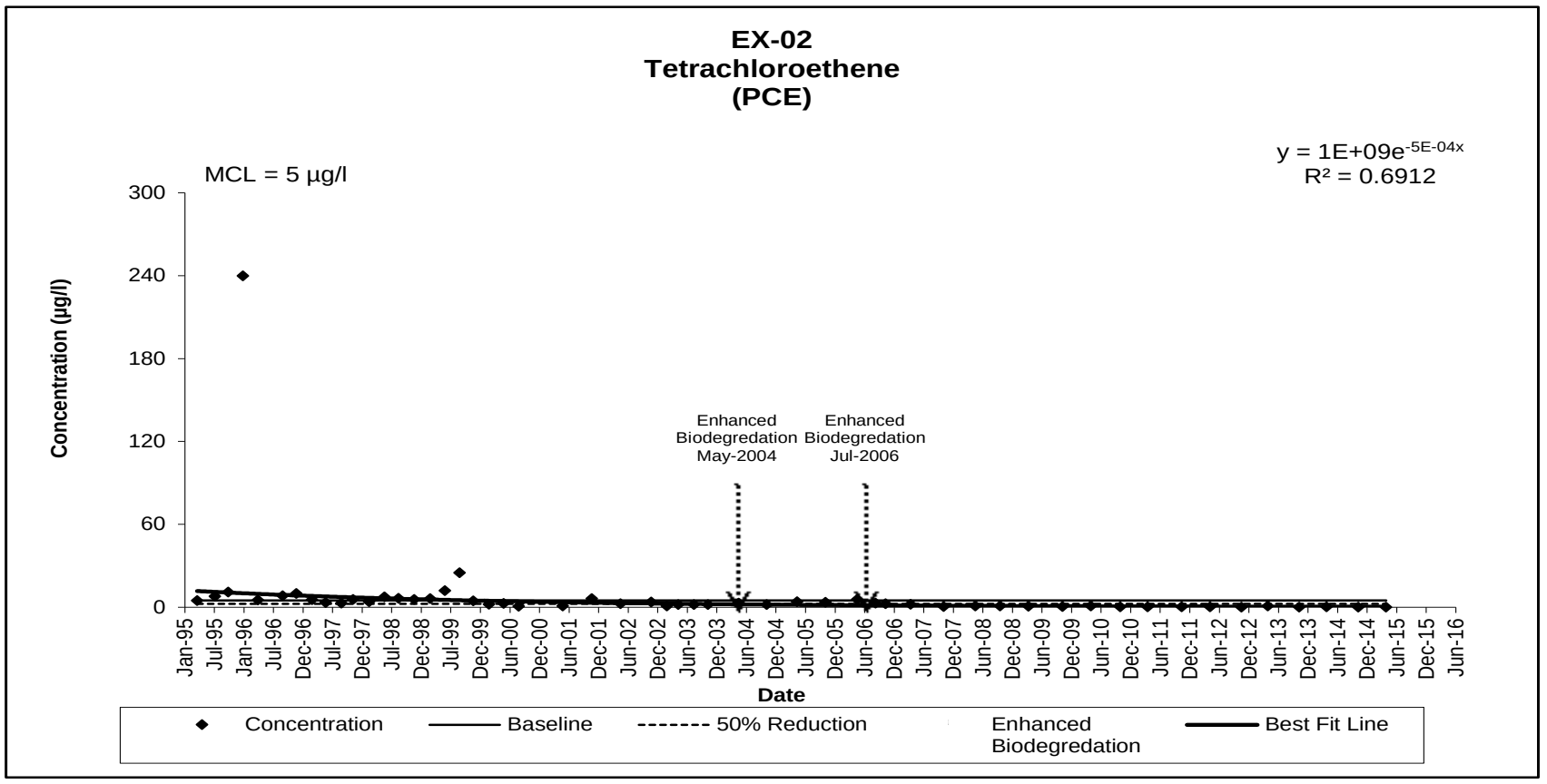
LABORATORY PARAMETERS

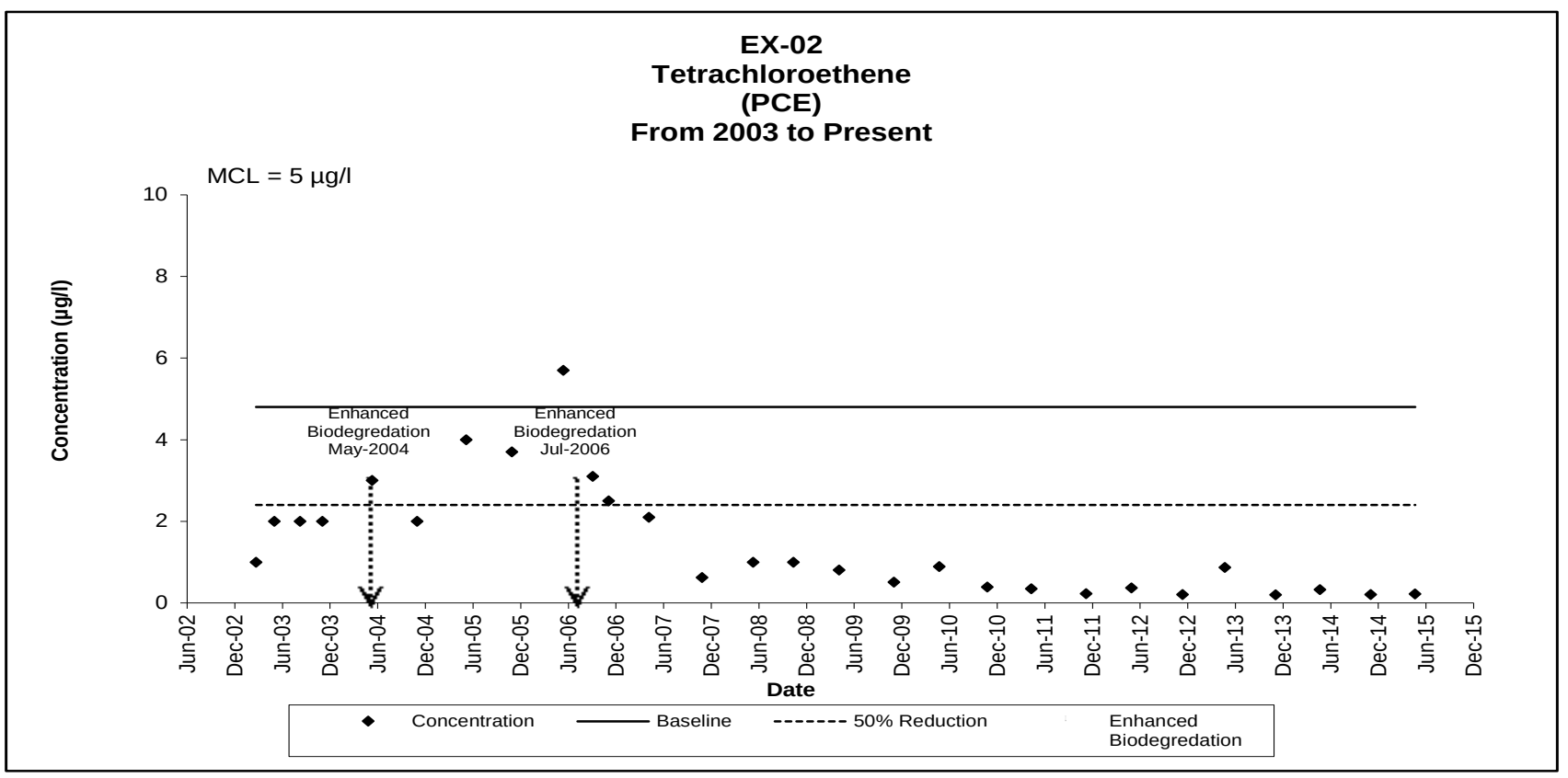
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	4.8	220	27	--	--	--	3.73	139 J
6-Jul-95	8	360	35	--	--	--	< 2 J	< 400 J
27-Sep-95	11	1000	140	--	--	--	< 2	< 20
27-Dec-95	240 J	22 J	7.8 J	--	--	--	< 2	32
28-Mar-96	5.2	170	8.7	--	--	--	< 2	2.5
28-Aug-96	8.4	530	43	--	--	--	< 10	3.6 J
21-Nov-96	9.9 T	420	25	--	--	34	3.1 J	7 J
26-Feb-97	5.5	290	14	--	--	--	3.2	5.1
21-May-97	3.4 T	200	11	--	--	--	< 2.5 G	4.5
26-Aug-97	3	130	7.7	--	--	--	< 2.5 G	3.8 B
6-Nov-97	5.7 B	260	15	--	--	--	< 2.5 G	9.4 J
12-Feb-98	4 B	150 B	8.2	--	--	--	0.77 J	3.2
19-May-98	7.5	300	21	--	--	--	< 1.5 G	3.8
12-Aug-98	6.5	350	23	--	--	--	2.9 J	4.3 J
17-Nov-98	5.7	330	26 J	--	--	--	< 2.5 G	4.3
24-Feb-99	6.2 JB	260 J	15 J	--	--	--	3.9	6.1
26-May-99	< 12 G	190	12	--	--	--	< 4 UJ	9.2
25-Aug-99	< 25 G	440	14 T	--	--	--	1.94	12.1
17-Nov-99	4.6 T	130	8.1	--	--	--	< 0.2	9.48 J
22-Feb-00	2.1 T	89	5.2	--	--	--	1.01	10.1
24-May-00	2.8 T	54	3.1 T	--	--	--	1.36 J	5.08 J
23-Aug-00	0.83 D	0.34 D	0.58 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	< 0.5	8.59 J
23-May-01	1	61	4.2	--	--	--	< 0.5	3.3
19-Nov-01	6.2 D	99 D	11 D	--	--	--	< 0.5	0.8
15-May-02	2.6	114 D	11	--	--	--	< 0.5	2.1
20-Nov-02	3.9	83 D	8.2	--	--	--	< 0.48	0.4 T
25-Feb-03	1	127	12	--	--	74	< 0.48	1.1
6-May-03	2 TD	145 D	12 D	--	--	78 D	< 0.5	1.1
12-Aug-03	2	136 D	10	--	--	48	< 0.5	1.8
6-Nov-03	2	197 D	16	--	--	74 D	< 2.4	1.1
14-May-04	3	390 D	32	--	--	201 D	--	0.7 B
3-Nov-04	2 TD	181 D	14 D	--	--	80 D	--	2.0 J
10-May-05	4 TD	251 D	20 D	--	--	110 D	--	< 0.5 UJ
31-Oct-05	3.7	201 D	15	--	--	87 D	--	1.1 J
16-May-06	5.7	200 D	14	--	--	65 D	--	2.4 D
6-Sep-06	3.1	170 D	14	--	--	82 D	--	--
6-Nov-06	2.5	190 D	14	--	--	95 D	--	0.39 T
10-Apr-07	2.1	130 D	14	--	--	120 D	--	3 D
30-Oct-07	0.62 T	120 D	11	--	--	170 DJ	--	1.5
30-Apr-08	--	--	--	--	--	--	--	1
13-May-08	1	200 D	12	--	--	180 D	--	2
14-Oct-08	1	140 D	12	--	--	180 D	--	--
7-Apr-09	0.81 T	140 D	13	96 D	11	220 D	--	8.3 D
3-Nov-09	0.51 T	99 D	7.9	73 D	7.6	140 D	--	7.9 D
26-Apr-10	0.89 T	130 D	9.6	94	11	210 D	--	6.7 D
26-Oct-10	0.39 T	110 D	9	100 D	11	110 D	--	7.9 D
13-Apr-11	0.35 T	120 D	8.6	84	11	210 D	--	3.5 D
9-Nov-11	0.23 T	74	7.2	110 D	8.8	68	--	7.7 D
1-May-12	0.37 T	130 D	10	170 D	8.6	82 D	--	13 D
12-Nov-12	0.21 T	85	10	220 D	11	70	--	7.8 D
23-Apr-13	0.87 T	300 D	10	320 D	8.3	55 D	--	6.3 D
4-Nov-13	0.2 T	72	6.4	200 D	9.9	67	--	1.8 D
22-Apr-14	0.33 T	87	8	240 D	11	53	--	8.2 D
3-Nov-14	0.21 T	57	5.2	230 D	9	55	--	6.5 D
22-Apr-15	0.22 T	91	7.2	260 D	11	49	--	6.2

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02





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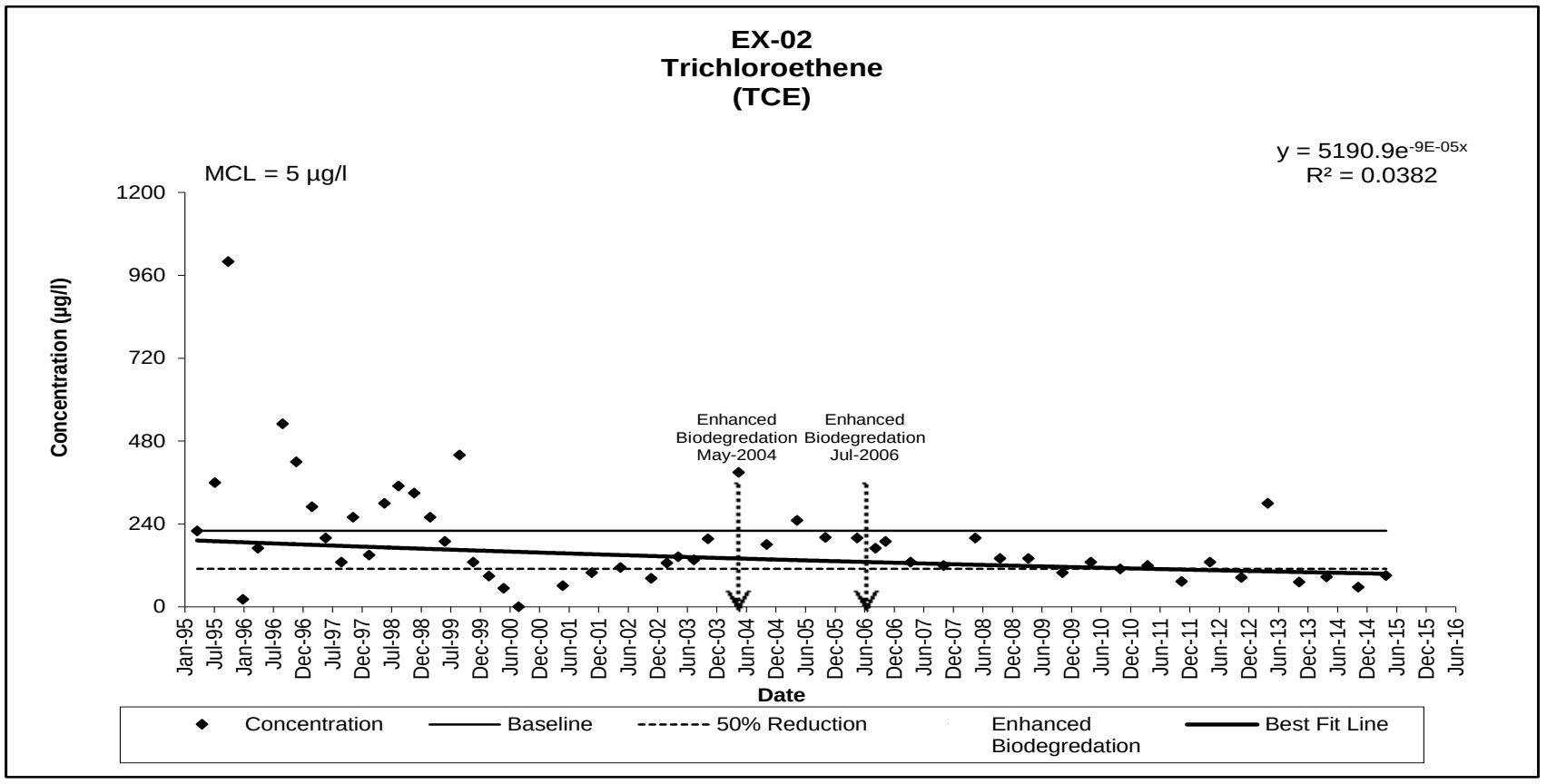
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02



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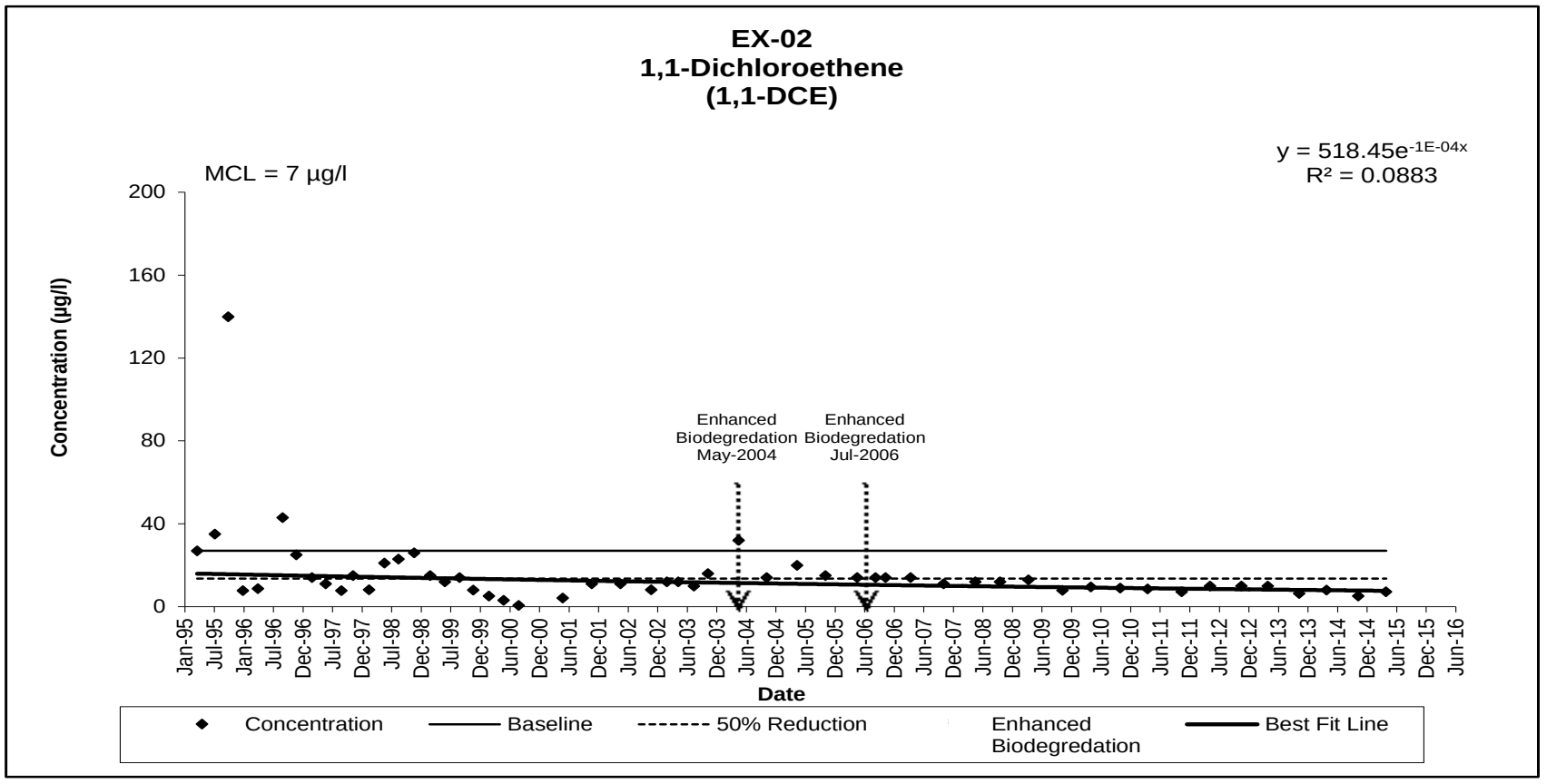
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02



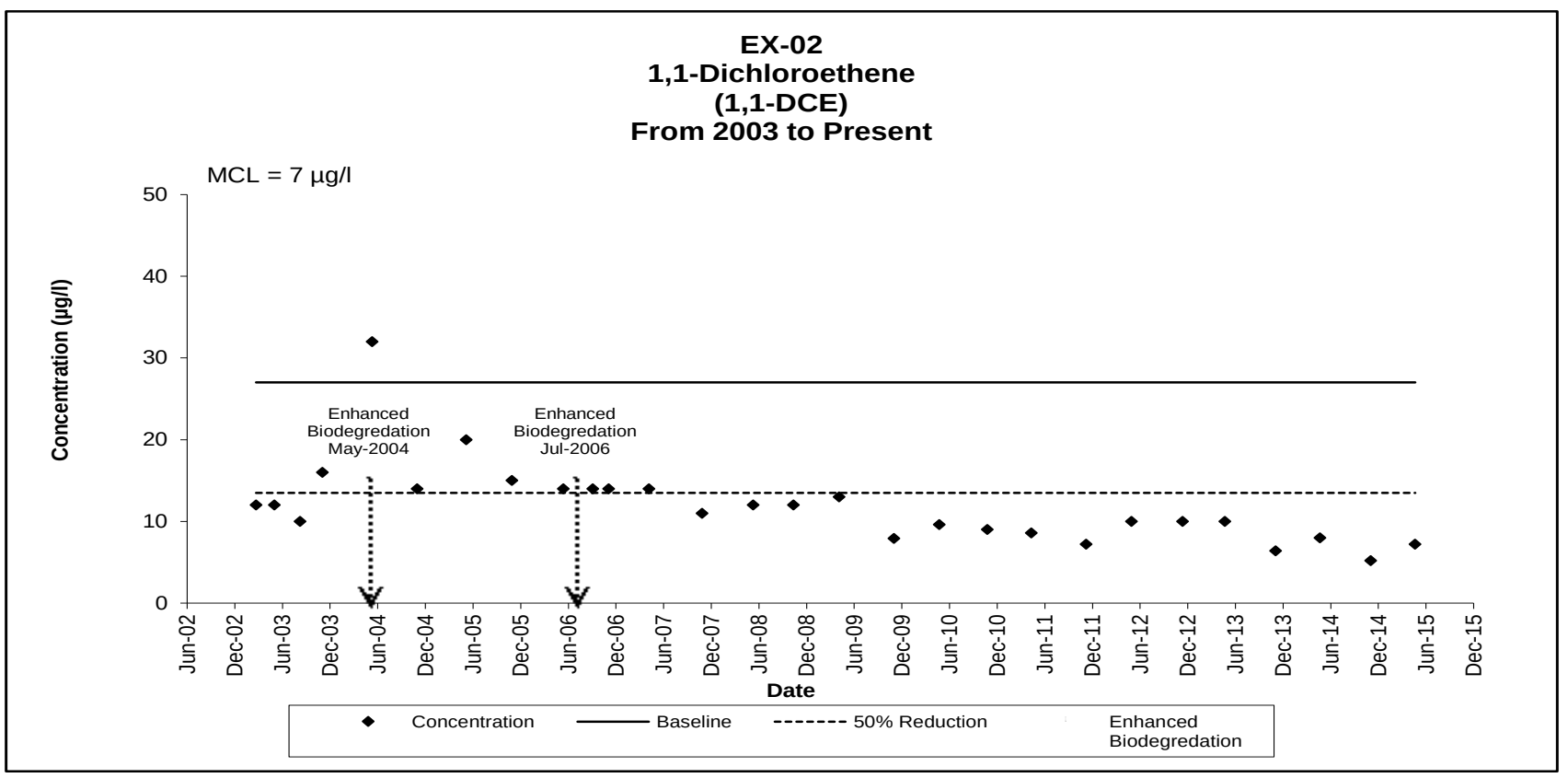
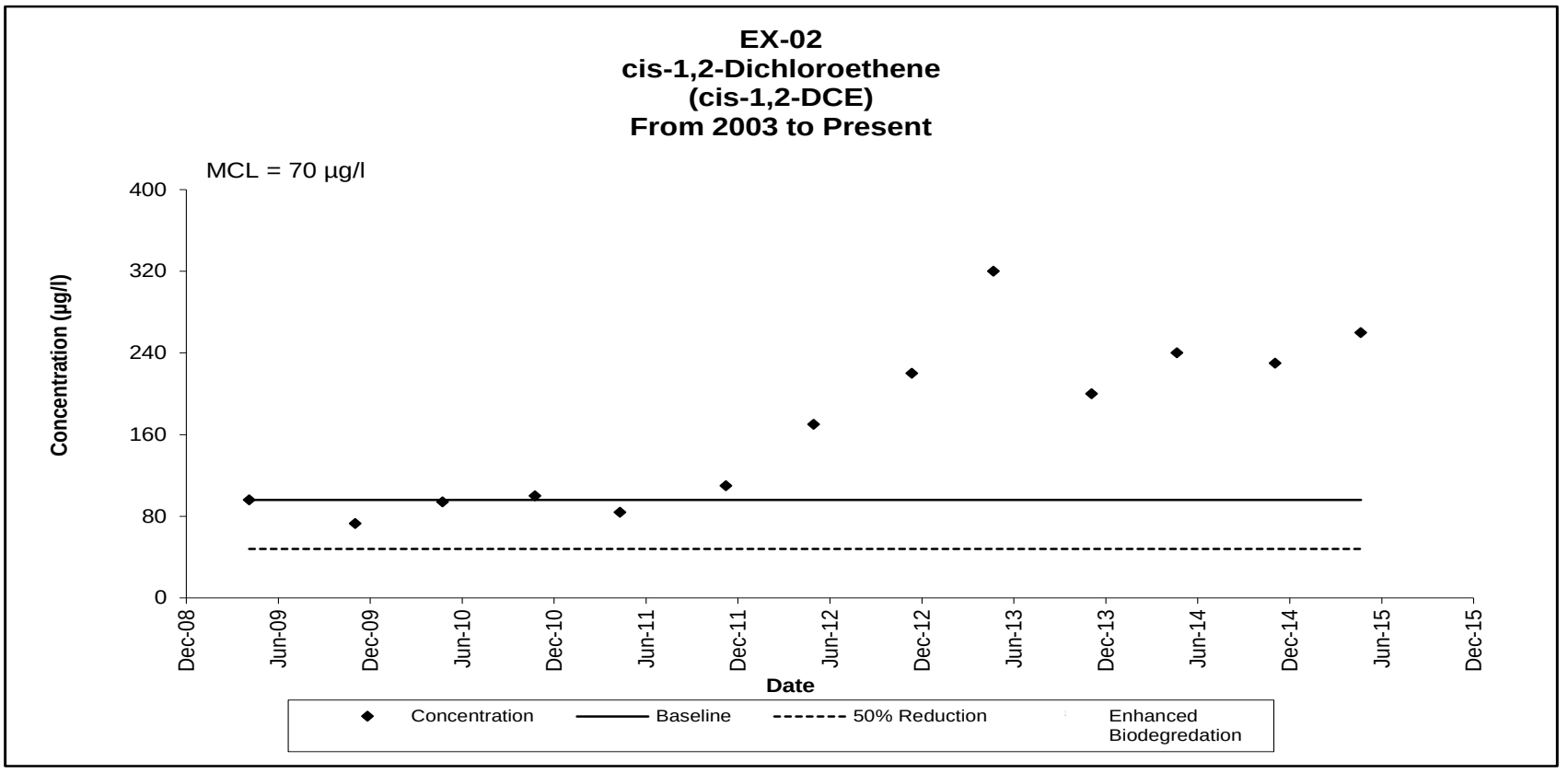


EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02



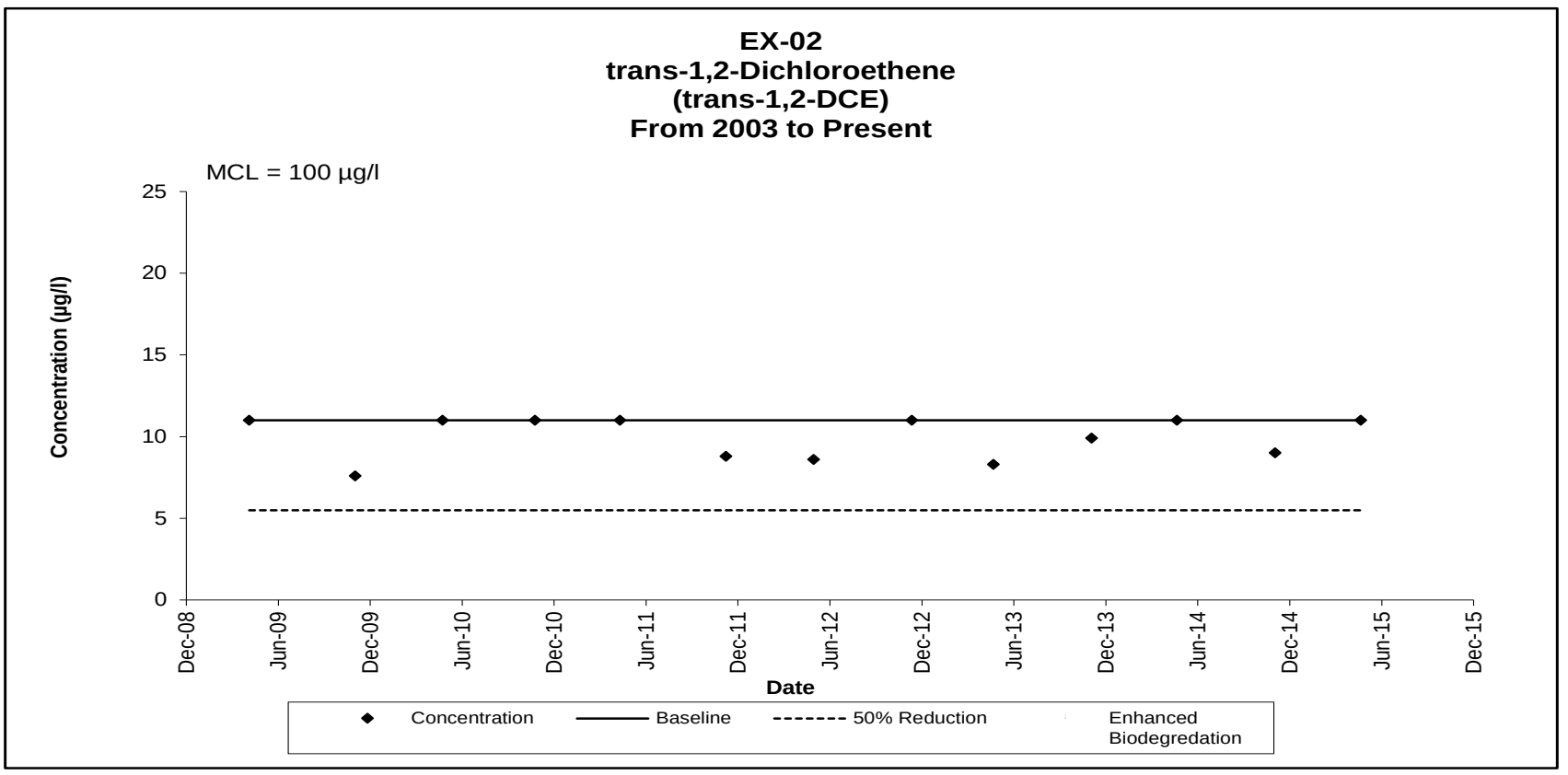
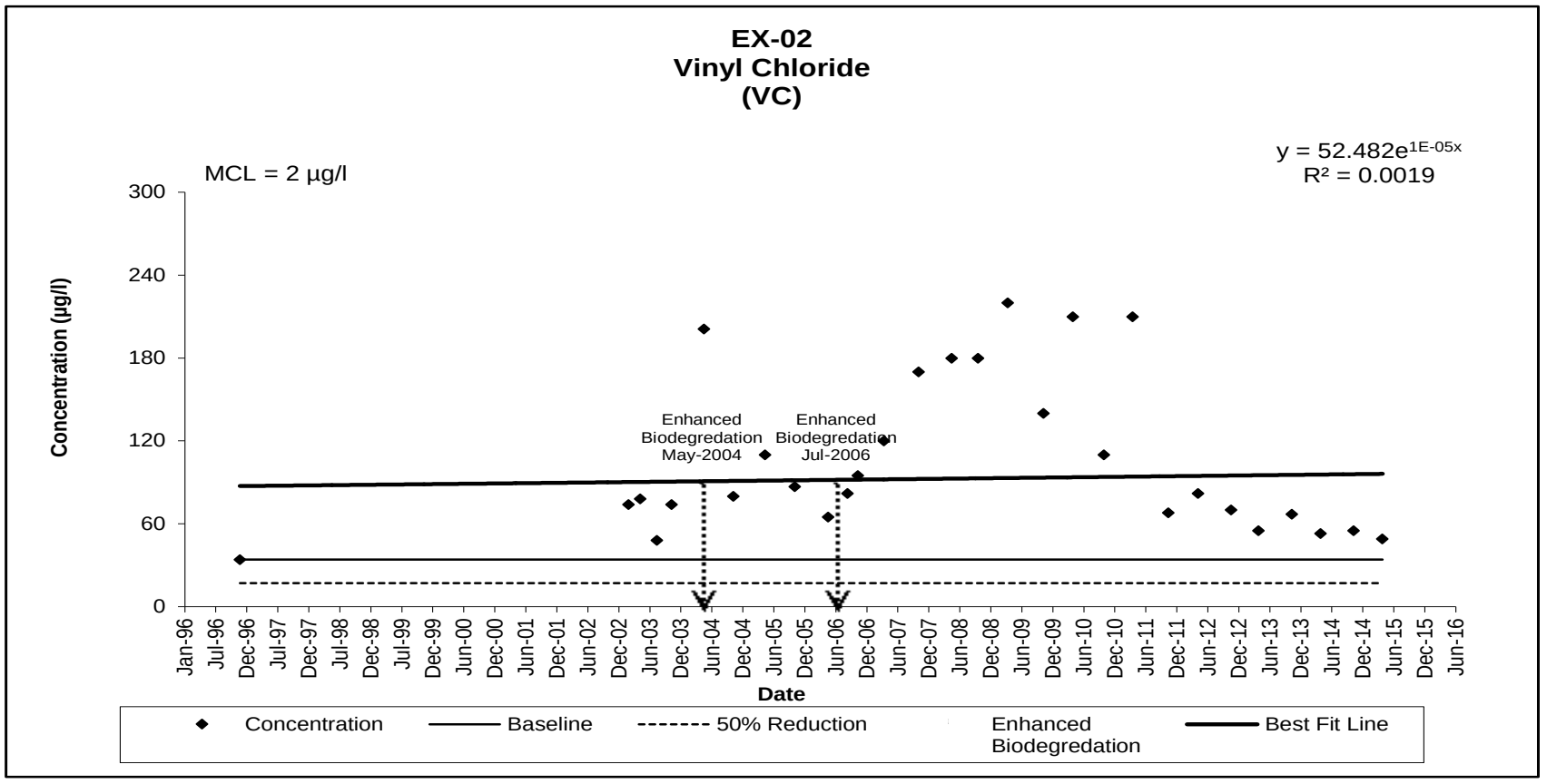


EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02



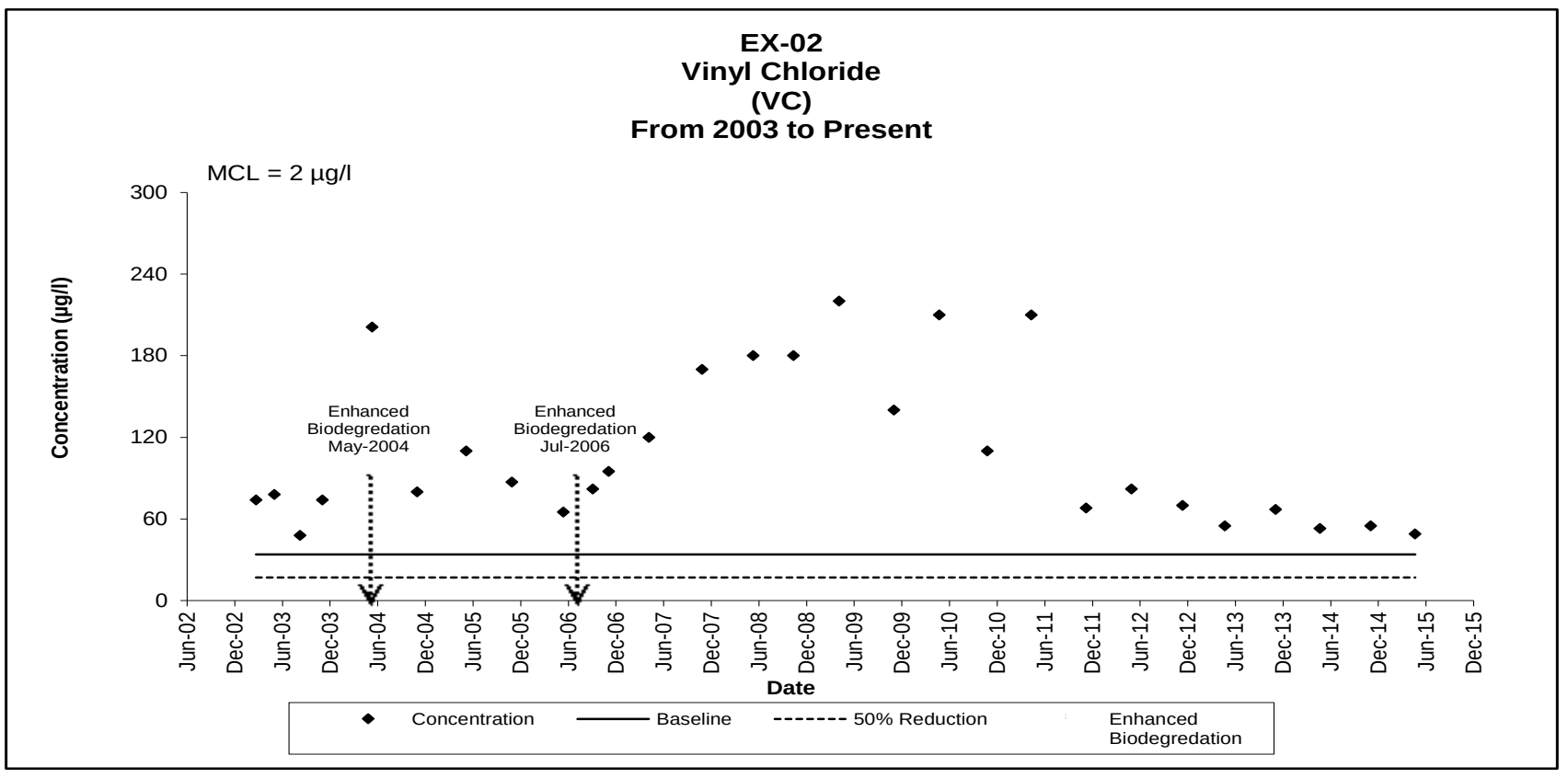
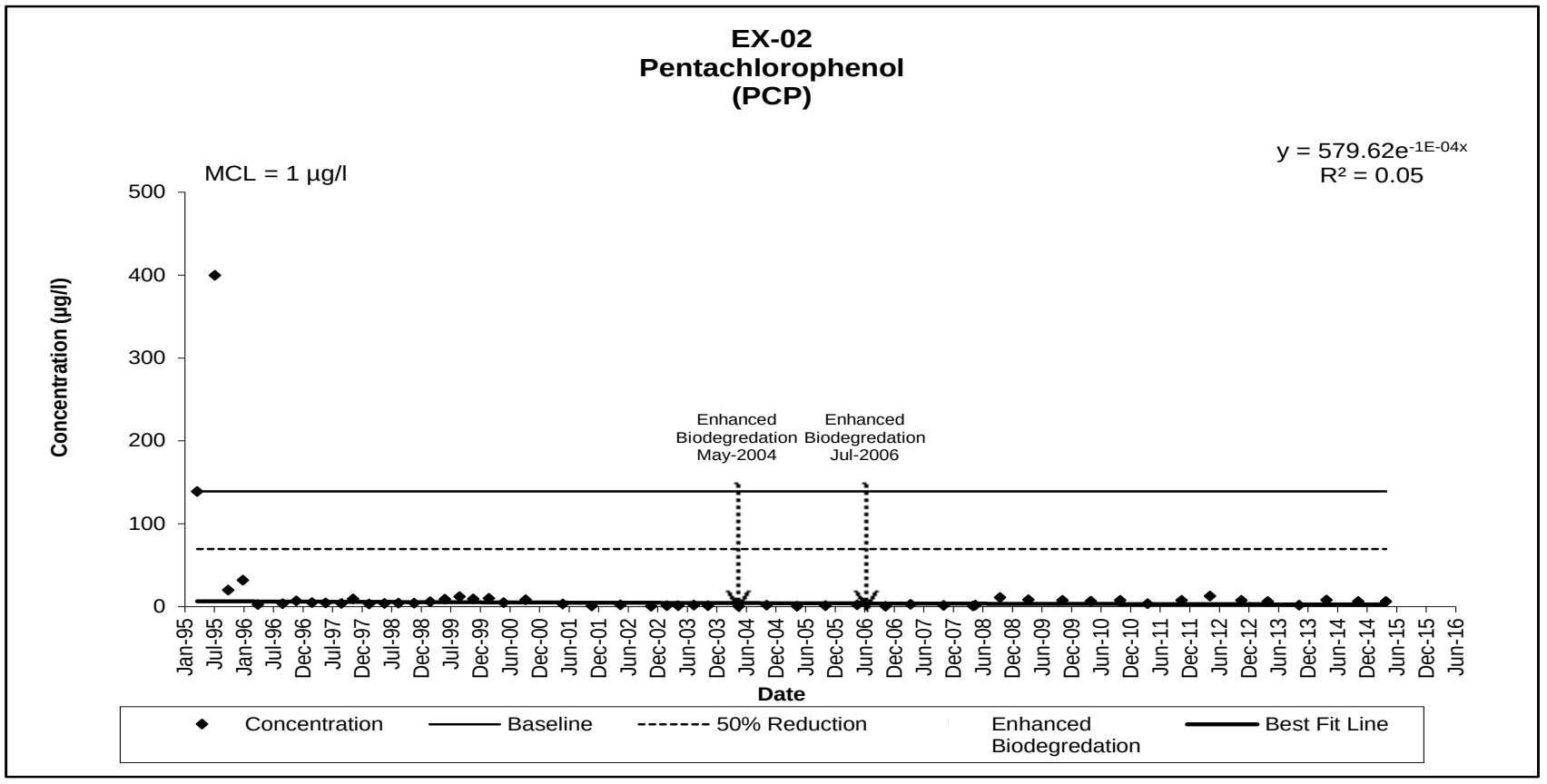


EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02



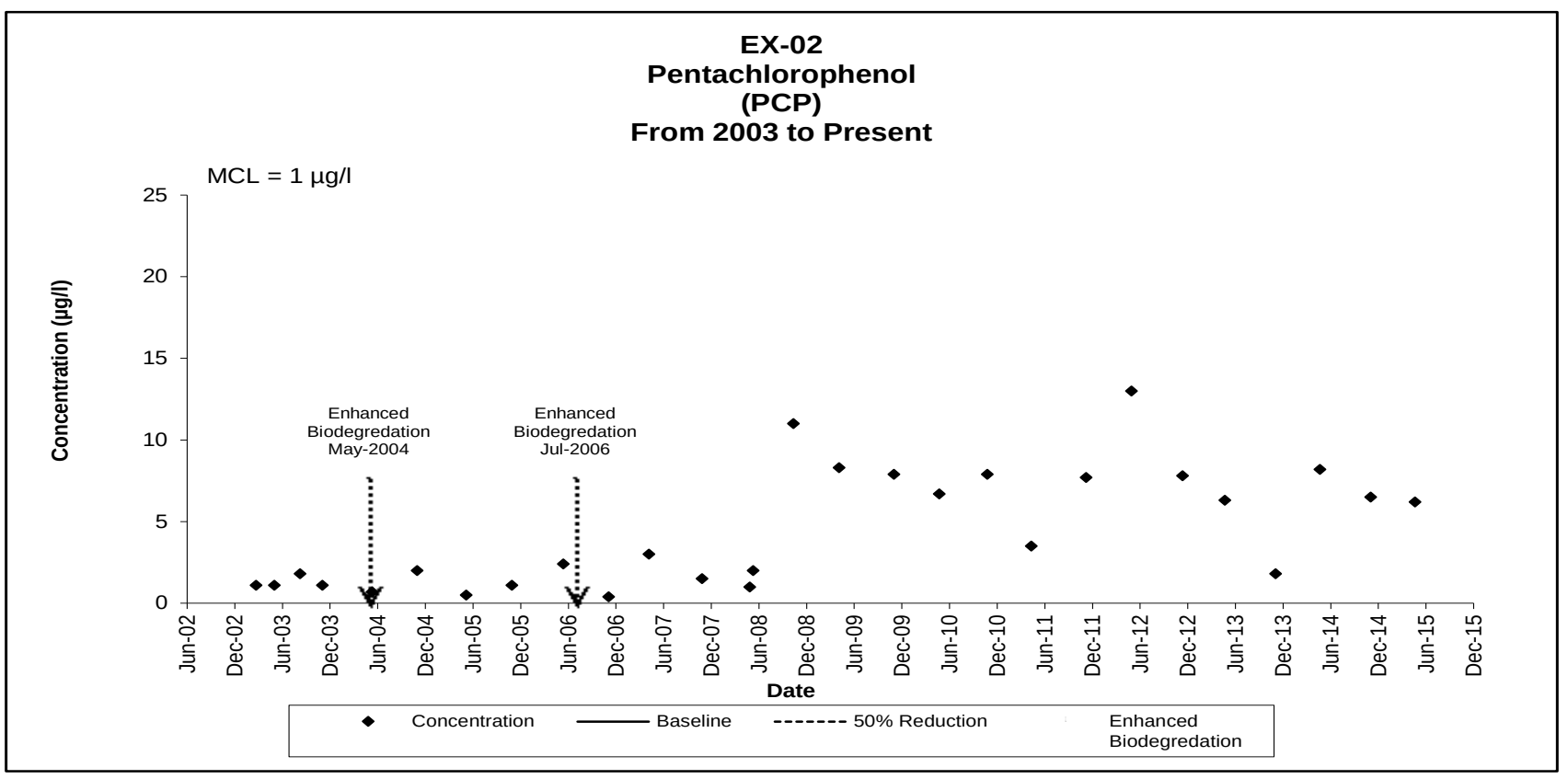


EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04

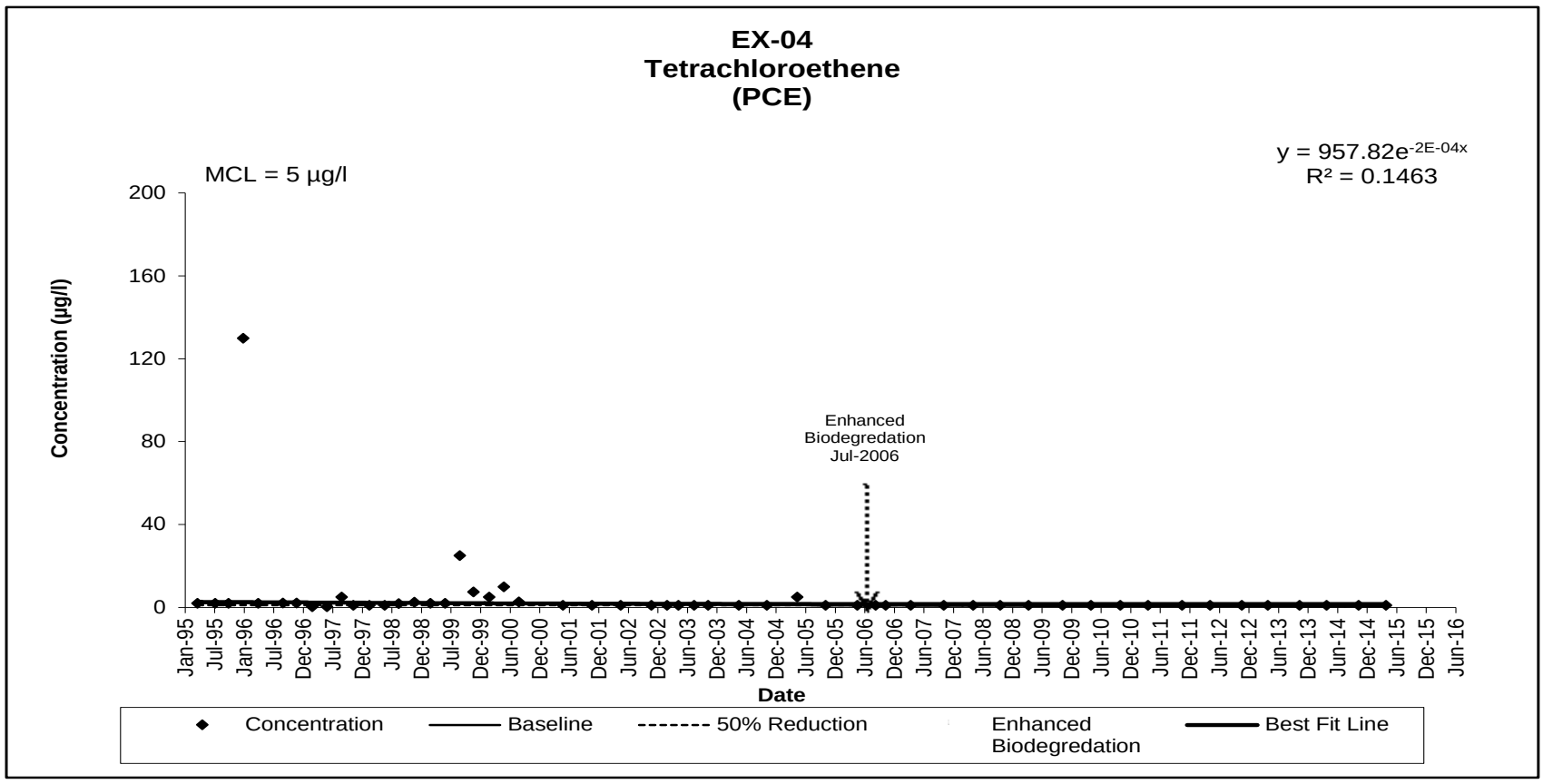
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	< 2 J	680	130	--	--	--	< 2	< 0.2 J
6-Jul-95	< 2	180	21	--	--	--	< 2 J	< 0.2 J
27-Sep-95	< 2	190	48	--	--	--	< 2	< 0.2
27-Dec-95	130	390	49	--	--	--	2.1	8.4
28-Mar-96	< 2	360	23	--	--	--	< 2	< 0.2
28-Aug-96	2.2	330	38	--	--	--	1.2 T	0.063 TJ
21-Nov-96	< 2.2 T	290	21	--	--	--	< 0.25	< 1 UJ
26-Feb-97	0.33 T	54	3.2	--	--	--	< 0.25	< 1
27-May-97	0.31 T	91	6.1	--	--	--	< 0.25	< 1
26-Aug-97	< 5	280	17	--	--	--	< 0.25	< 1
6-Nov-97	0.99	140	9	--	--	--	< 0.25	< 1
12-Feb-98	< 1	51	4	--	--	--	< 0.25	< 1
19-May-98	< 1	75	4.8	--	--	--	0.03 J	< 1
12-Aug-98	1.8 J	190	11	--	--	--	< 0.25	< 1
17-Nov-98	< 2.5	170	14	--	--	--	< 0.25	< 0.5
24-Feb-99	< 2	140	8.5	--	--	--	< 0.25	< 0.5
26-May-99	< 2	110	5.5 Q	--	--	--	< 4	< 0.5
25-Aug-99	< 25 G	120	7.6 T	--	--	--	< 0.2	< 0.1
17-Nov-99	7.5	200	11	--	--	--	< 0.2	0.5
22-Feb-00	< 5	110	8.8	--	--	--	< 0.2	< 0.1
24-May-00	< 10	96	5.4	--	--	--	< 0.2	< 0.1
23-Aug-00	2.7 D	150 D	13 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	0.63 J	< 0.5 UJ
23-May-01	< 1	59	8.4	--	--	--	< 0.5	0.4 T
19-Nov-01	< 1	35	9	--	--	--	< 0.5	< 0.5
15-May-02	< 1	76	10	--	--	--	< 0.5	0.09 T
20-Nov-02	< 1	50	12	--	--	--	< 0.48	< 0.48
25-Feb-03	< 1	59	9.9	--	--	< 1	< 0.48	< 0.48
6-May-03	< 1	61	8.2	--	--	< 1	< 0.5	< 0.5
12-Aug-03	< 1	56	8.8	--	--	2	< 0.5	< 0.5
6-Nov-03	< 1	74 D	10	--	--	< 1	< 2.4	< 0.48
14-May-04	< 1	88 D	15	--	--	< 1	--	< 0.48 UB
3-Nov-04	< 1	55	8.3	--	--	< 1	--	< 0.48
10-May-05	< 5 D	81 D	10 D	--	--	< 5 D	--	< 0.5
1-Nov-05	< 1	118 D	13	--	--	0.4 T	--	< 0.5
16-May-06	< 1	81 D	9.8	--	--	0.31 T	--	0.26 T
6-Sep-06	< 1	130 D	18	--	--	0.75 T	--	--
6-Nov-06	< 1	180 D	20	--	--	0.7 T	--	< 0.5 UJ
10-Apr-07	< 1	110 D	16	--	--	1	--	< 0.5
30-Oct-07	< 1	52 D	14	--	--	0.71 T	--	< 0.5
30-Apr-08	< 1	85 D	14	--	--	0.92 T	--	< 0.5
14-Oct-08	< 1	83 D	13	--	--	0.91 T	--	< 0.5
6-Apr-09	< 1	54 D	11	110 D	16	1.6	--	< 0.5
2-Nov-09	< 1	58 D	12	110 D	20	1.9	--	< 0.5
26-Apr-10	< 1	48	12	150 D	20	1.9	--	< 0.5
26-Oct-10	< 1	55	17	180 D	29	2.9	--	< 0.5
14-Apr-11	< 1	29	12	180 D	20	2.3	--	< 0.5
10-Nov-11	< 1	15	6.6	84	9.8	0.74 T	--	< 0.5
21-Dec-11	--	--	--	--	--	--	--	< 0.5
1-May-12	< 1	21	9.4	130 D	16	1.4	--	--
13-Nov-12	< 1	20	8.7	140 D	18	1.3	--	--
23-Apr-13	< 1	7.1	4.9	66	12	0.84 T	--	--
5-Nov-13	< 1	2.9	3	57 D	28	5.2	--	--
22-Apr-14	< 1	0.84 T	2.4	31	7.8	0.89 T	--	--
4-Nov-14	< 1	2.9	2.7	46	19	4.5	--	--
22-Apr-15	< 1	0.21 T	1	18	4.1	0.51 T	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04



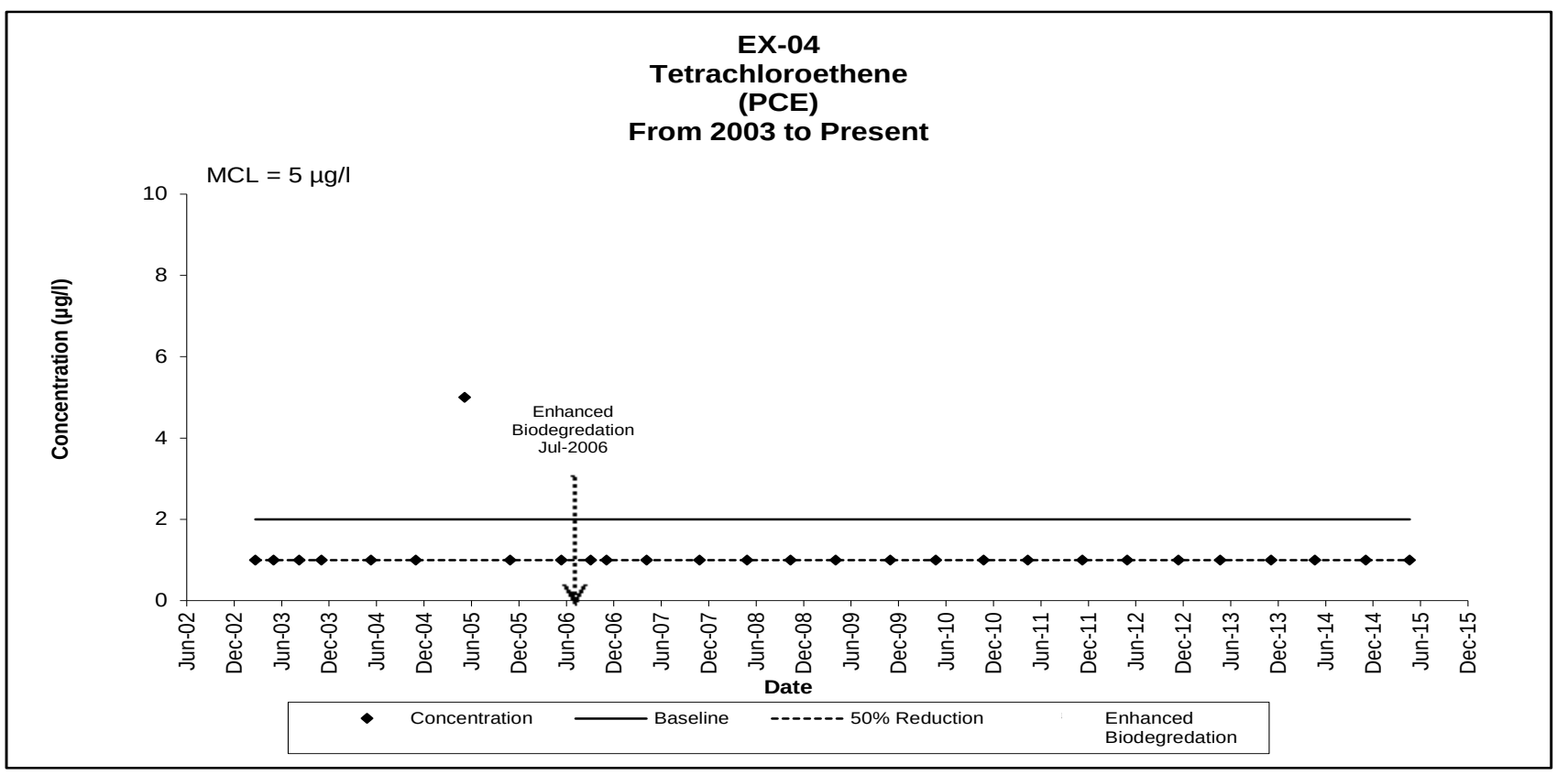


EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04

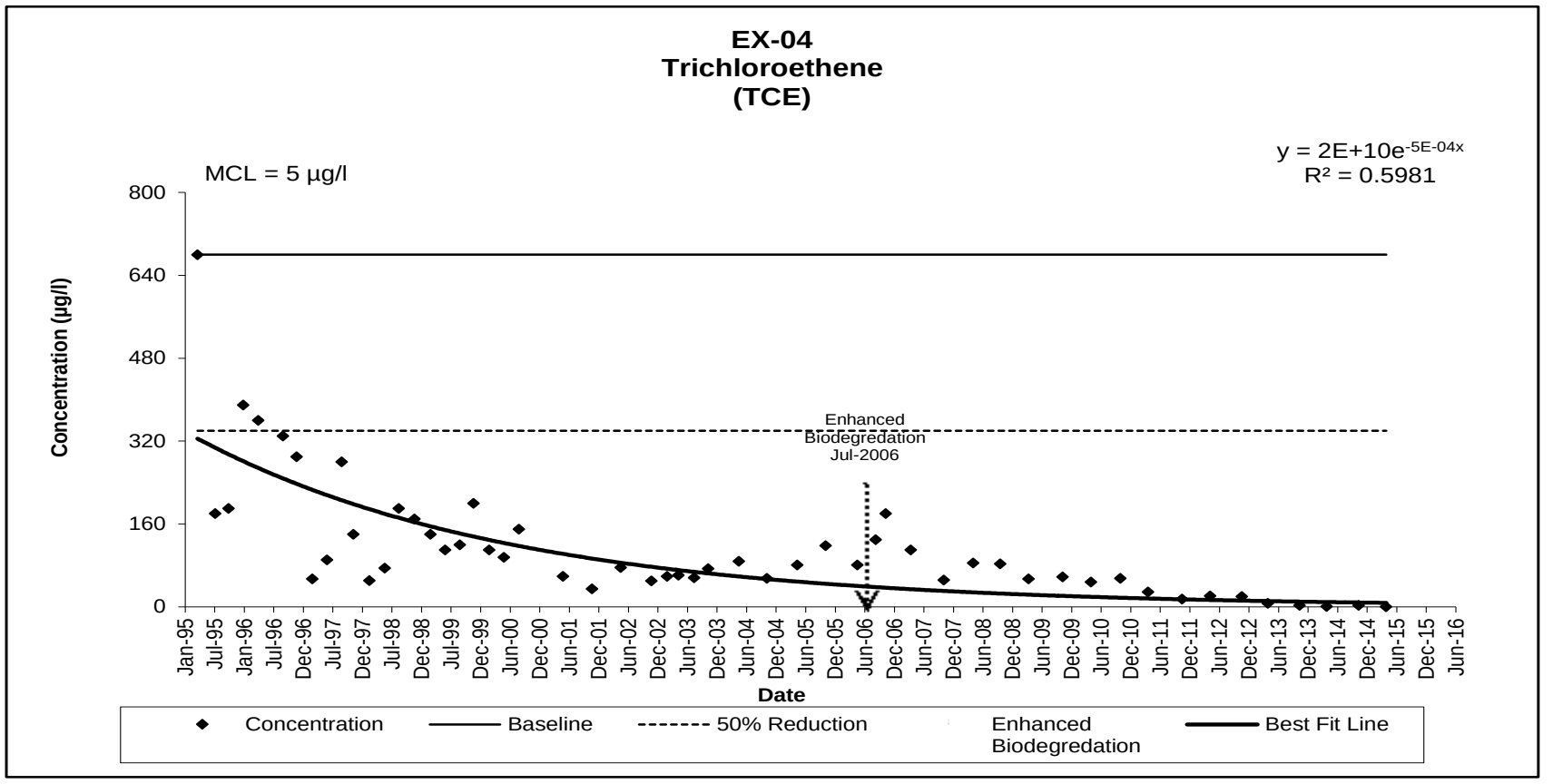
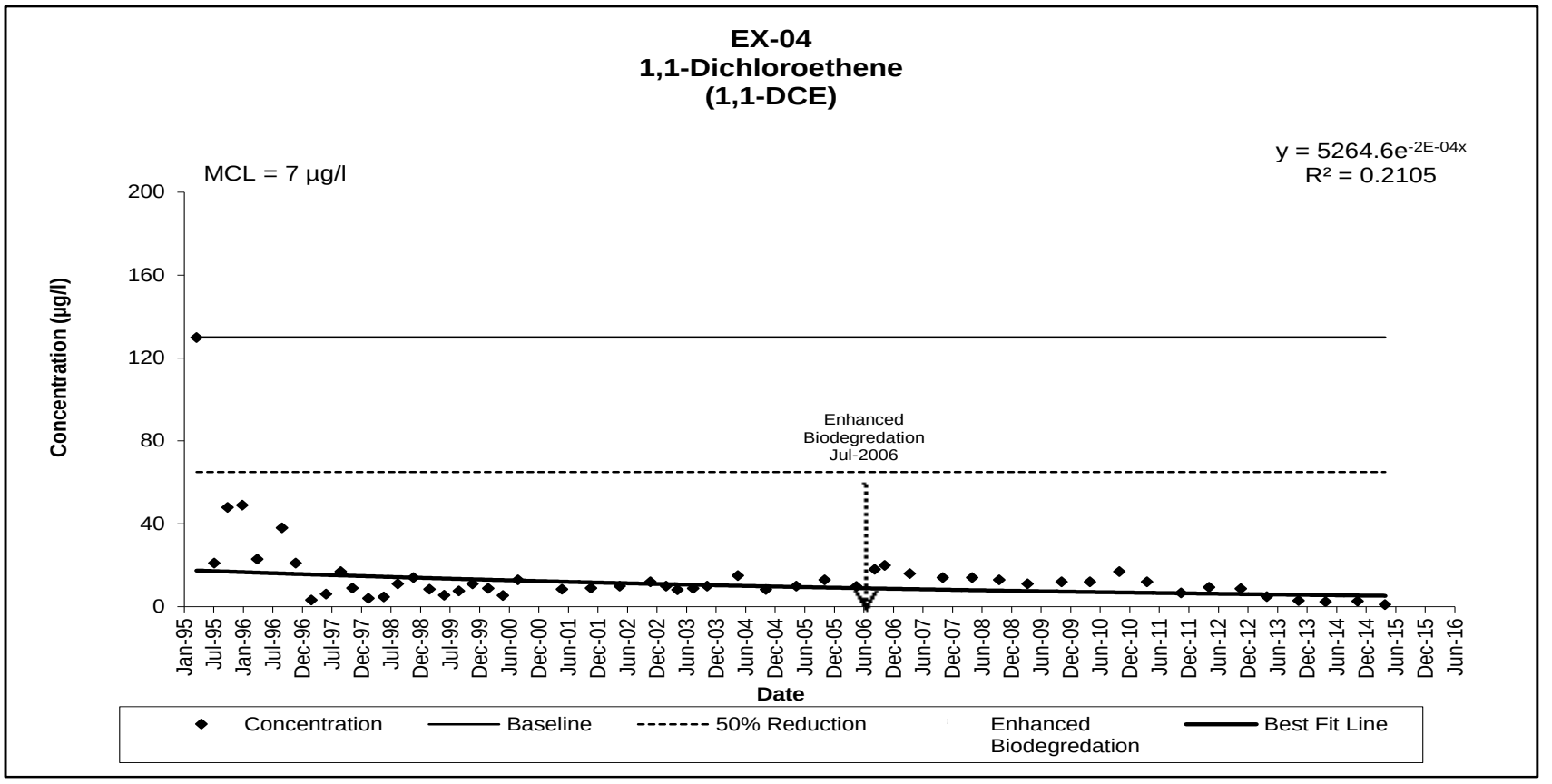


EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04



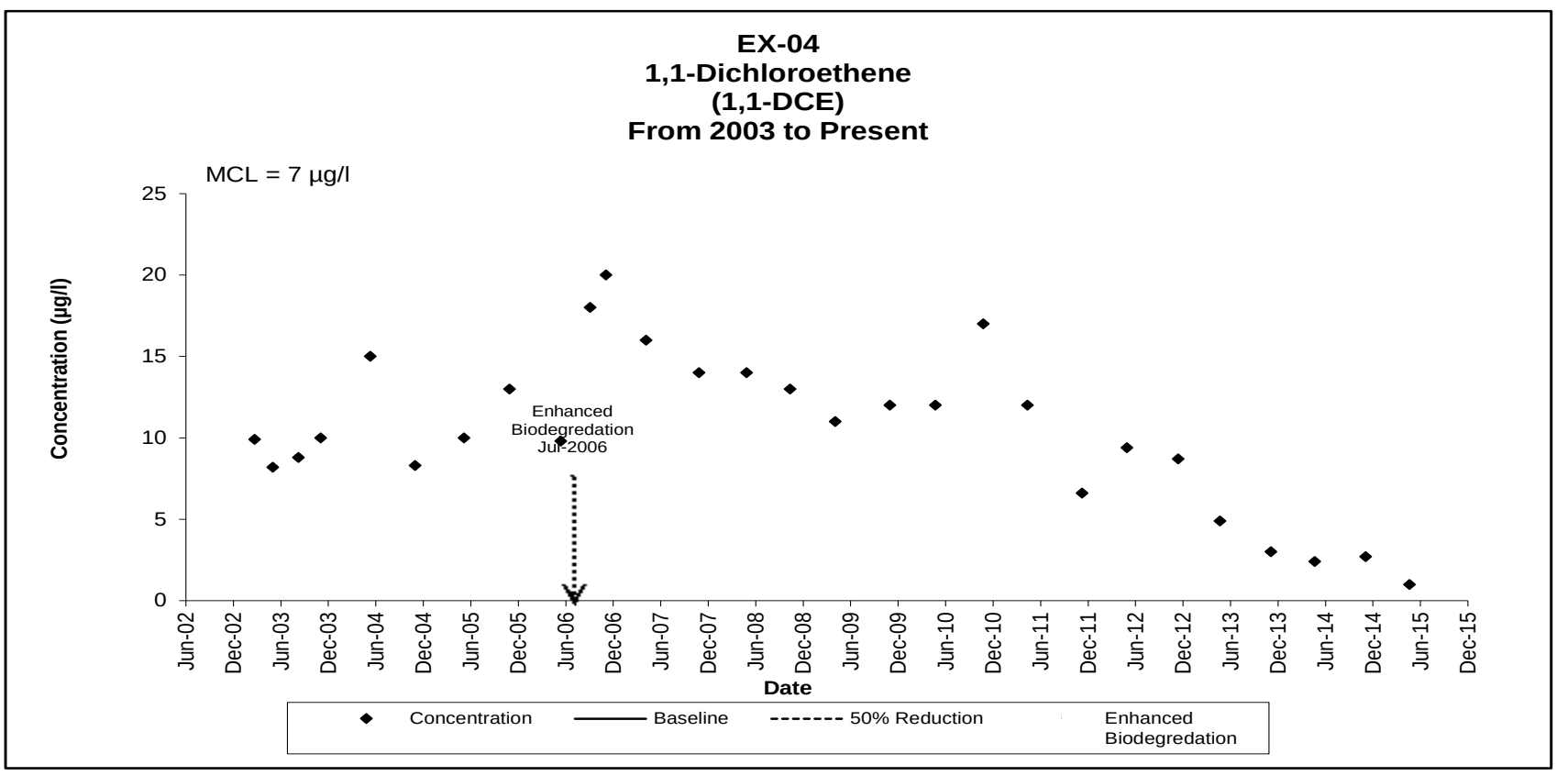
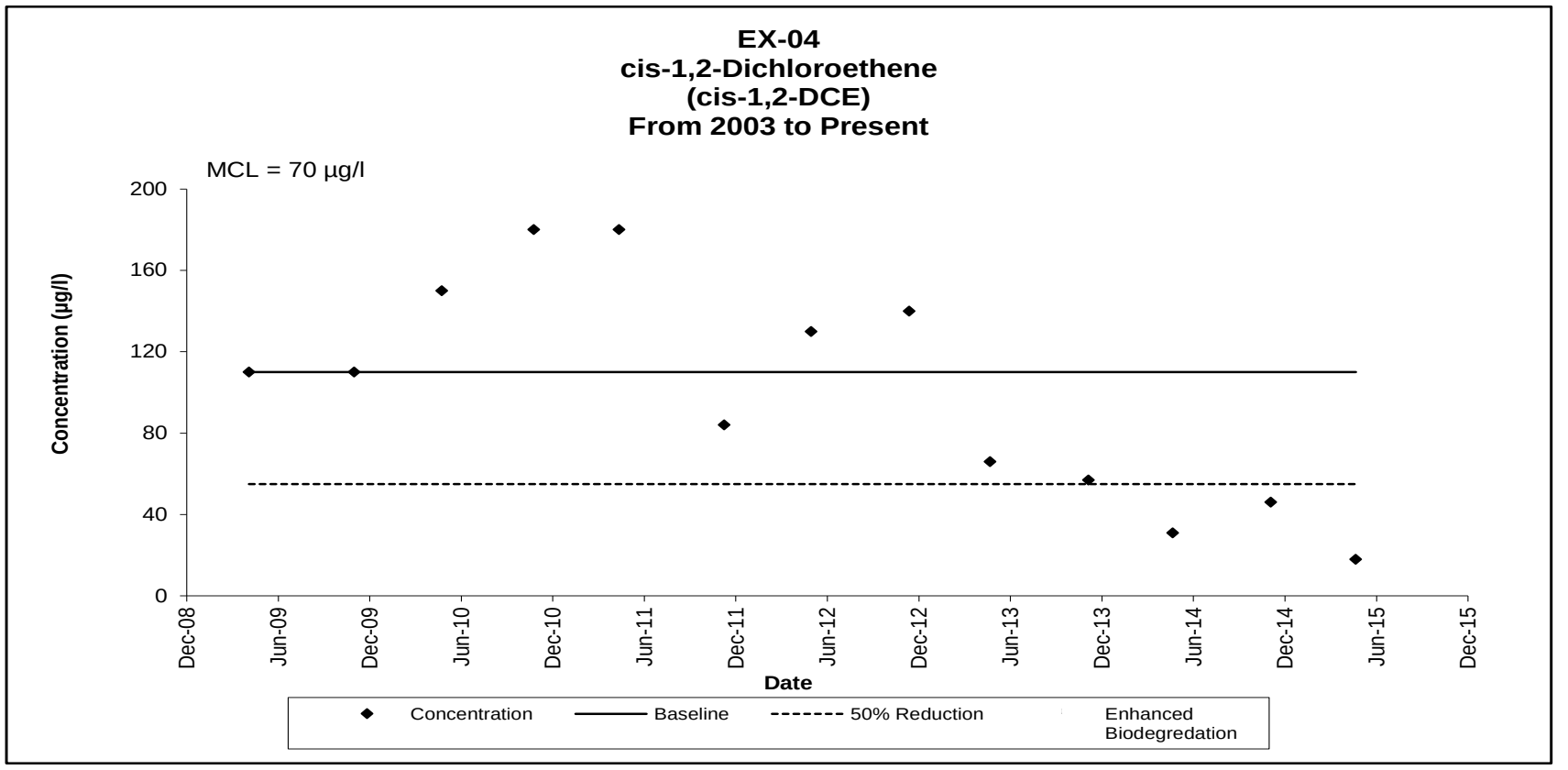


EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04



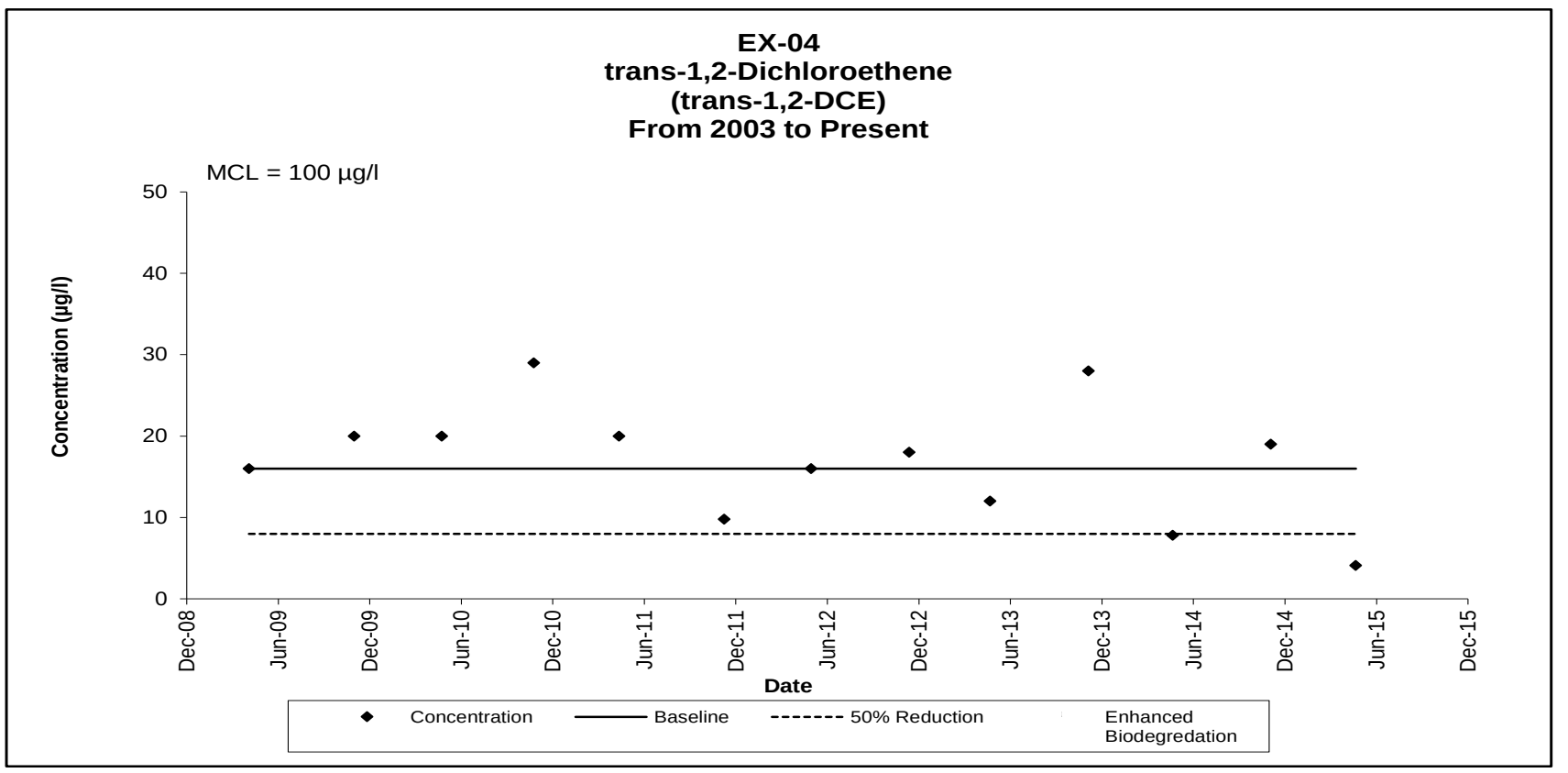


EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04

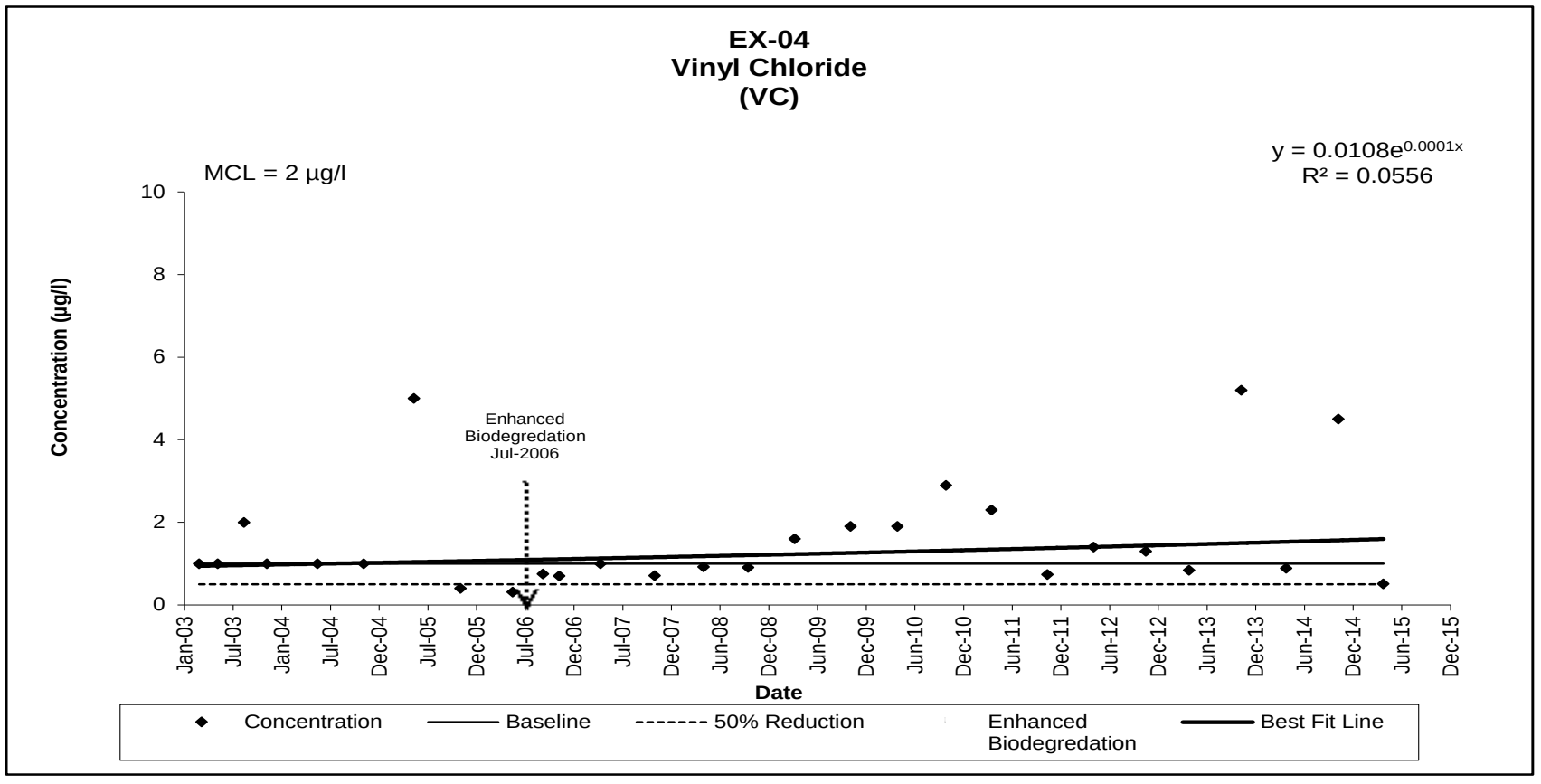


EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05

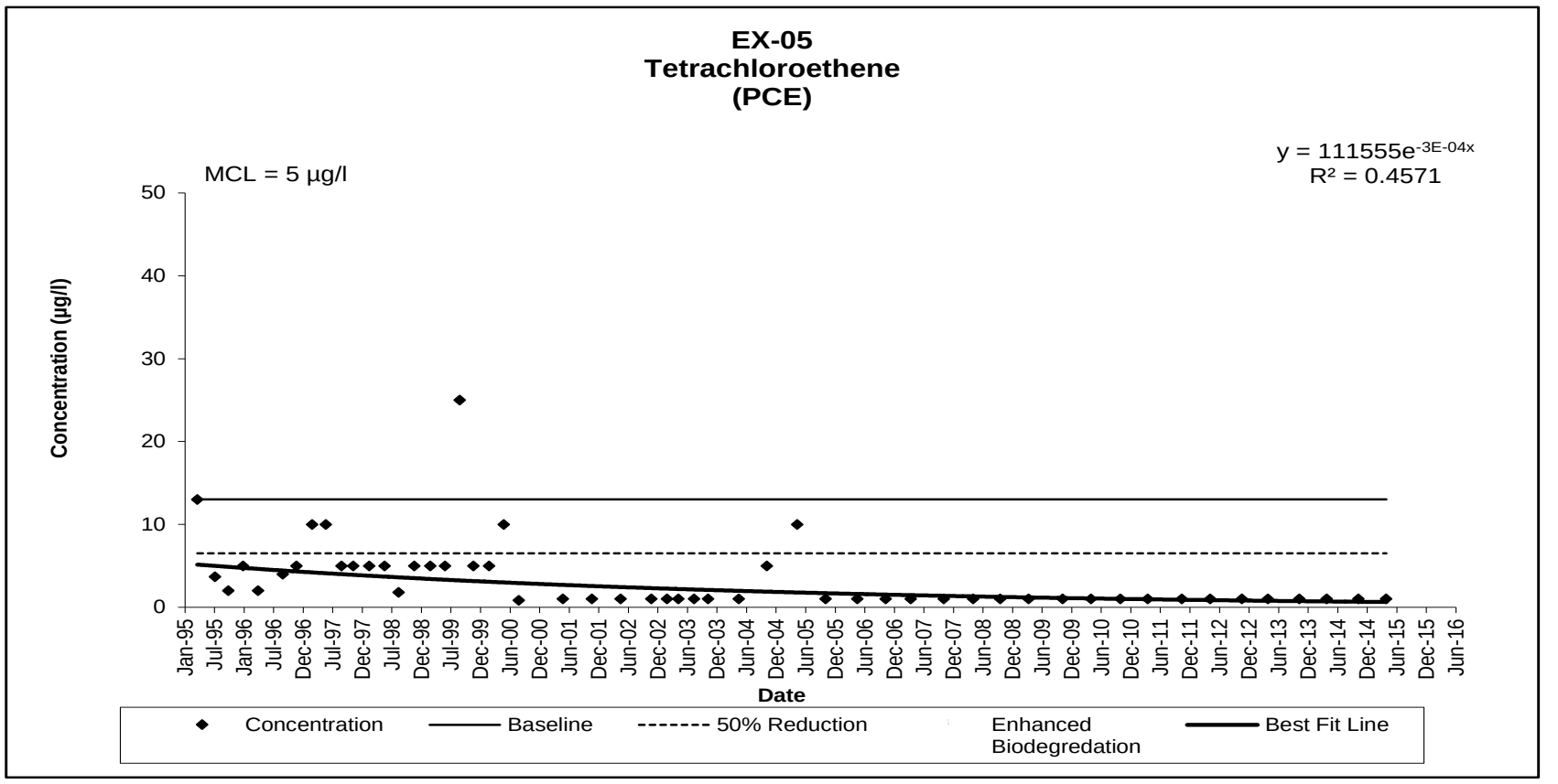
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	13	5500	450	--	--	--	< 20	< 2 J
6-Jul-95	3.7	1900	110	--	--	--	< 2	< 0.2
27-Sep-95	< 2	1900	320	--	--	--	< 2	< 0.2
27-Dec-95	< 5	1000	62	--	--	--	< 2	< 0.2
28-Mar-96	< 2	1100	55	--	--	--	< 2	< 0.2
28-Aug-96	< 4	180	9.5	--	--	--	< 10	< 0.2
21-Nov-96	< 5	200	10	--	--	1 T	< 0.25	< 1 UJ
26-Feb-97	< 10	520	23	--	--	--	< 0.25	< 1
21-May-97	< 10	850	43	--	--	--	< 0.25	1
26-Aug-97	< 5	250	13	--	--	--	< 0.25	1
6-Nov-97	< 5	260	11	--	--	--	< 0.25	< 1
12-Feb-98	< 5	430 B	27	--	--	--	< 0.25	< 1
19-May-98	< 5	280	16	--	--	--	< 0.25	< 1
12-Aug-98	1.8 J	190	11	--	--	--	< 0.25	< 1
17-Nov-98	< 5	360	20 J	--	--	--	< 0.25	< 0.5
24-Feb-99	< 5	330 JB	14 J	--	--	--	< 0.25	< 0.5
26-May-99	< 5 G	220 J	9.6	--	--	--	< 4 UJ	< 0.5
25-Aug-99	< 25 G	140	6.8 T	--	--	--	1.04	< 0.1
17-Nov-99	< 5	130	6.4	--	--	--	< 0.2	< 0.1
22-Feb-00	< 5	130	6.3	--	--	--	< 0.2	< 0.1
24-May-00	< 10	98	4	--	--	--	0.431	< 0.1
23-Aug-00	< 0.83 D	77 D	4.7 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	1.34 J	< 0.5 UJ
23-May-01	< 1	58	3	--	--	--	< 0.5	0.5
19-Nov-01	< 1	26	2	--	--	--	< 0.5	< 0.5
15-May-02	< 1	74 D	5	--	--	--	< 0.5	0.04 T
20-Nov-02	< 1	2	1	--	--	--	< 0.48	< 0.48
25-Feb-03	< 1	0.9 T	1	--	--	< 1	< 0.48	0.1 T
6-May-03	< 1	31	4.1	--	--	0.4 T	< 0.5	0.7
12-Aug-03	< 1	53	7.5	--	--	2.1	< 0.5	< 0.5
6-Nov-03	< 1	20	8.7	--	--	0.7 T	< 2.4	< 0.48
13-May-04	< 1	140 D	23	--	--	2.6	--	< 0.48
3-Nov-04	< 5 D	20 D	11 D	--	--	3 TD	--	< 0.48
10-May-05	< 10 D	34 D	10 D	--	--	< 10 D	--	< 0.5
1-Nov-05	< 1	2	13	--	--	0.9 T	--	< 0.5
16-May-06	< 1	6	12	--	--	0.68 T	--	< 0.5
7-Nov-06	< 1	0.6 T	19	--	--	1.1	--	< 0.5
9-Apr-07	< 1	0.76 T	20	--	--	2	--	< 0.5
30-Oct-07	< 1	0.5 T	17	--	--	9.3 J	--	< 0.5
29-Apr-08	< 1	0.37 T	10	--	--	44 D	--	< 0.5
14-Oct-08	< 1	0.45 T	13	--	--	40	--	< 0.5
7-Apr-09	< 1	0.44 T	12	180 D	210 D	47	--	< 0.5
2-Nov-09	< 1	0.43 T	8.5	150 D	170 D	27	--	< 0.5
26-Apr-10	< 1	0.44 T	5.8	140 D	130 D	20	--	< 0.5
26-Oct-10	< 1	0.5 T	9.9	170 D	170 D	16	--	< 0.5
13-Apr-11	< 1	0.37 T	9	140 D	150 D	17	--	< 0.5
9-Nov-11	< 1	0.36 T	8.6	140 D	150 D	12	--	< 0.5
1-May-12	< 1	0.47 T	8.3	150 D	140 D	13	--	--
13-Nov-12	< 1	0.53 T	9.1	150 D	150 D	11	--	--
23-Apr-13	< 1	0.51 T	9.3	150 D	160 D	11	--	--
4-Nov-13	< 1	0.32 T	8.2	130 D	120 D	8.2	--	--
22-Apr-14	< 1	0.38 T	13	180 D	180 D	12	--	--
3-Nov-14	< 1	0.37 T	8.4	180 D	150 D	11	--	--
22-Apr-15	< 1	0.39 T	11	170 D	130 D	9.8	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05



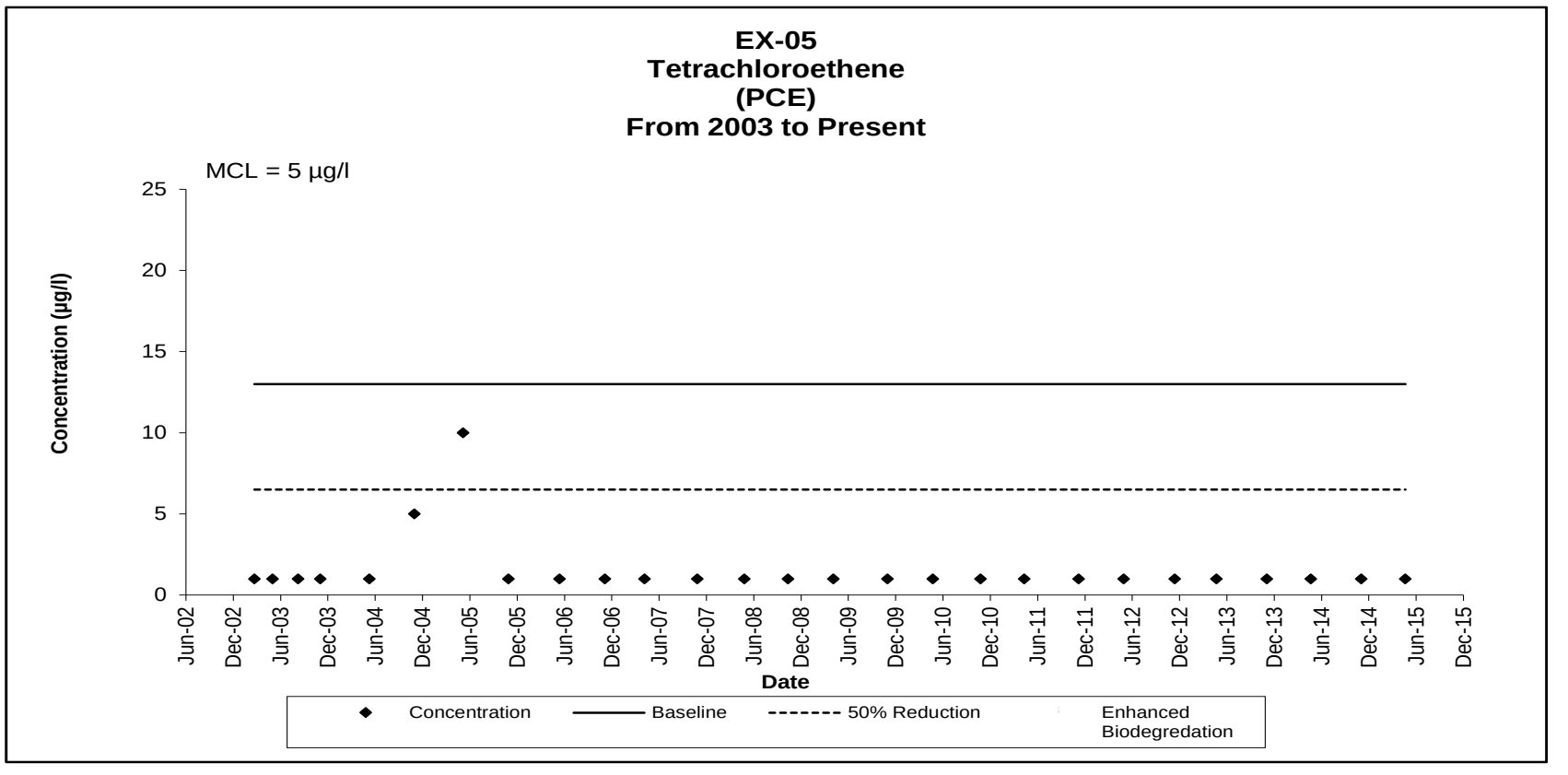
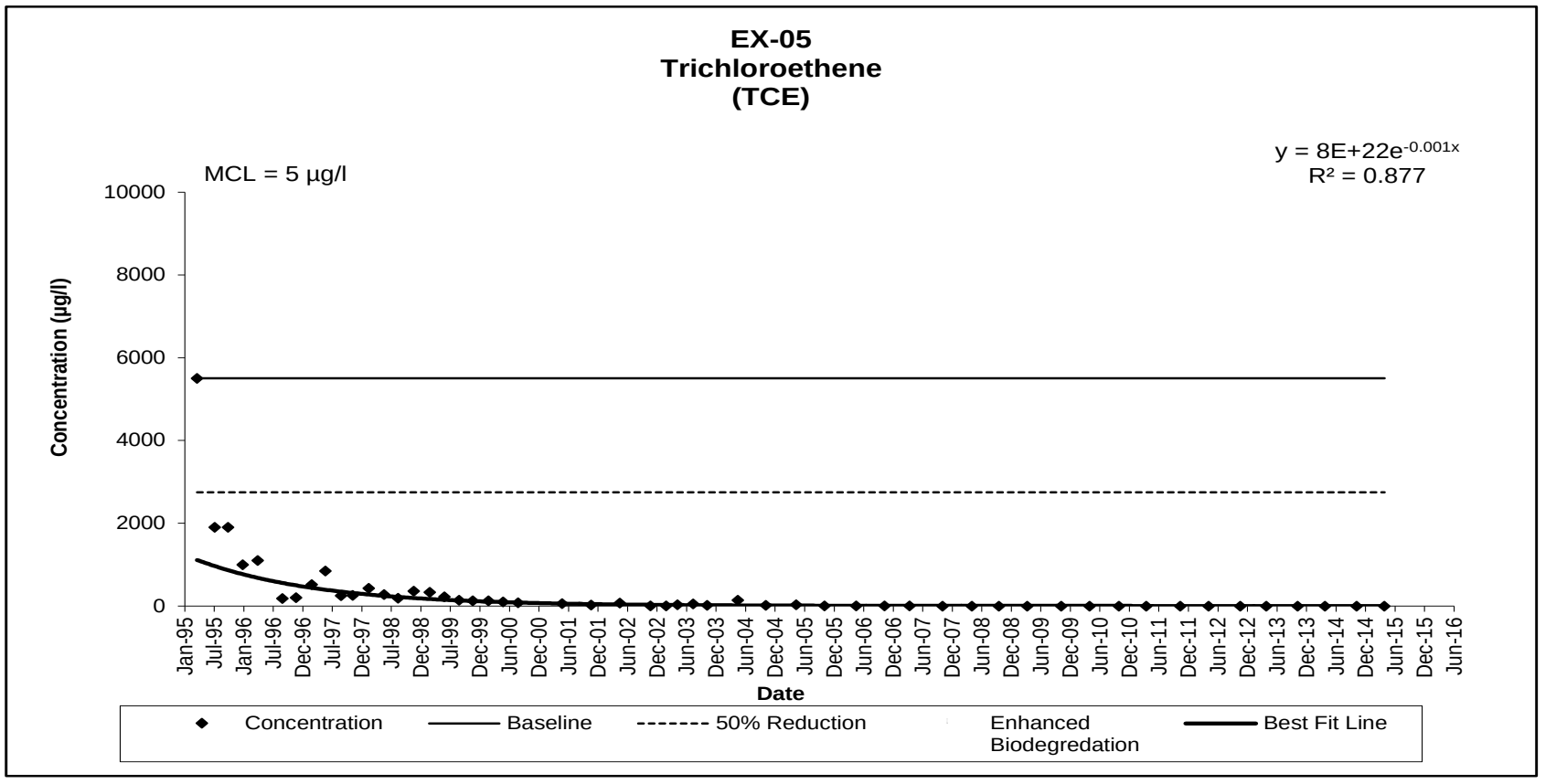


EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05



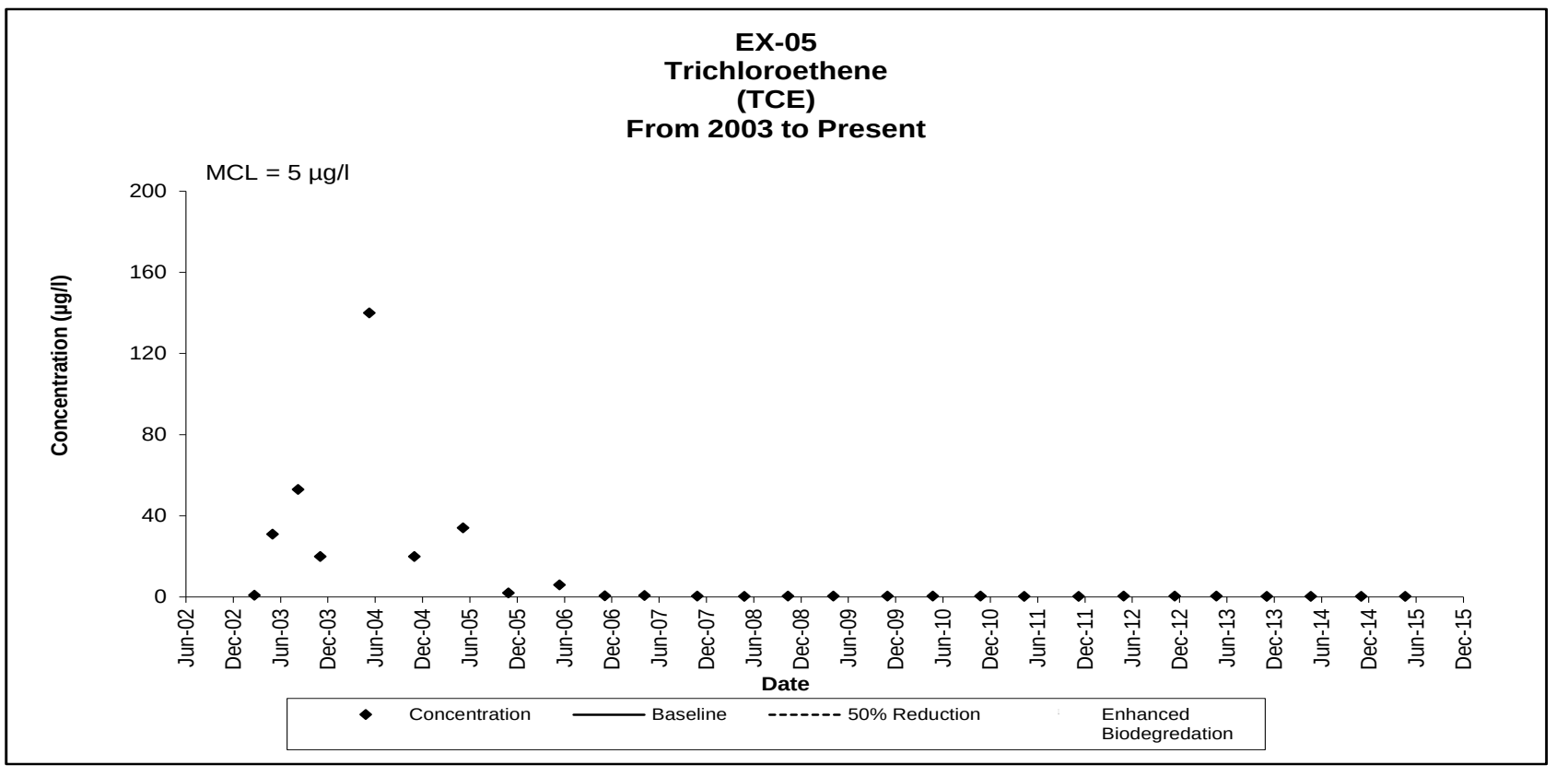


EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05

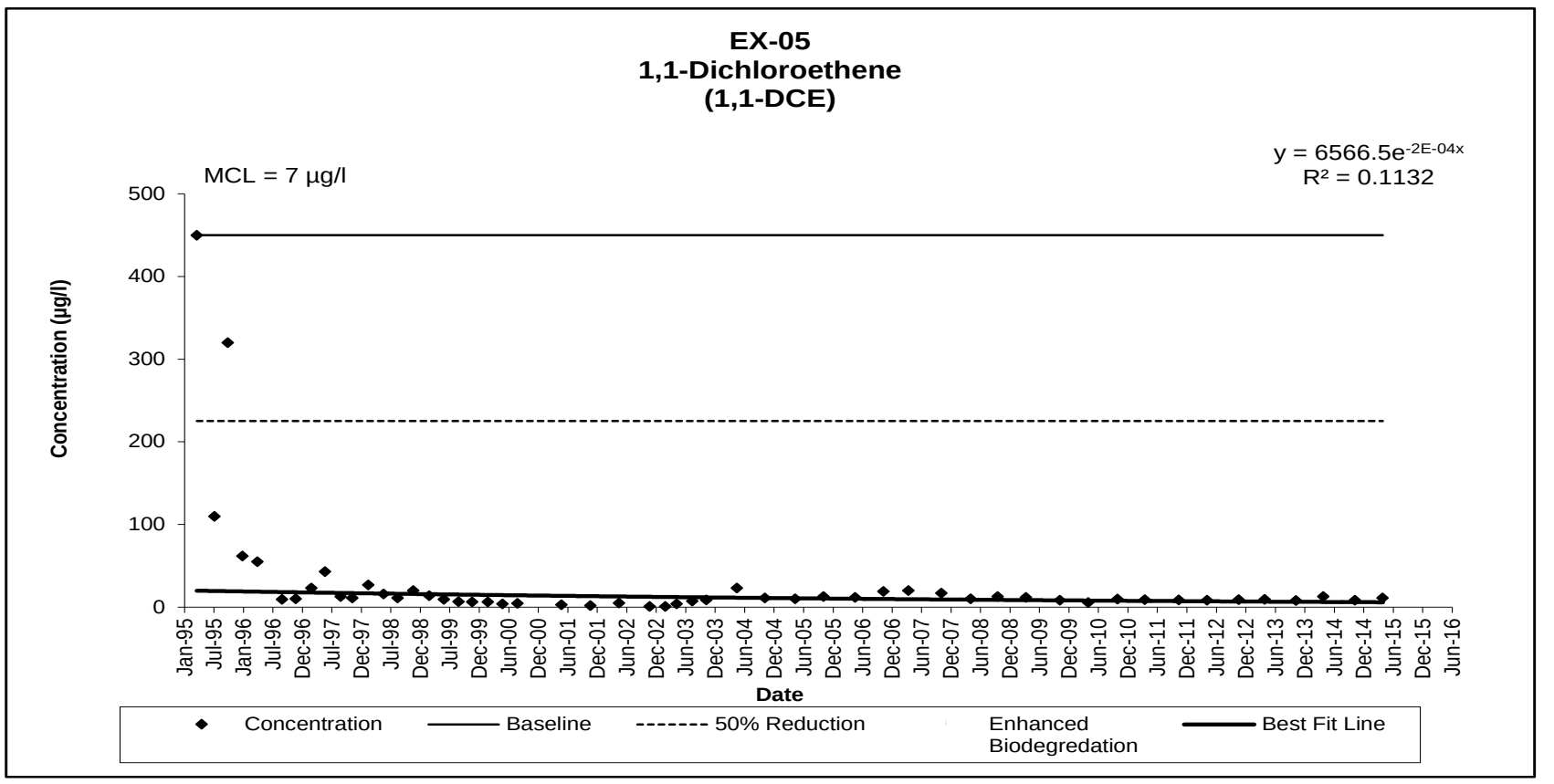


EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05

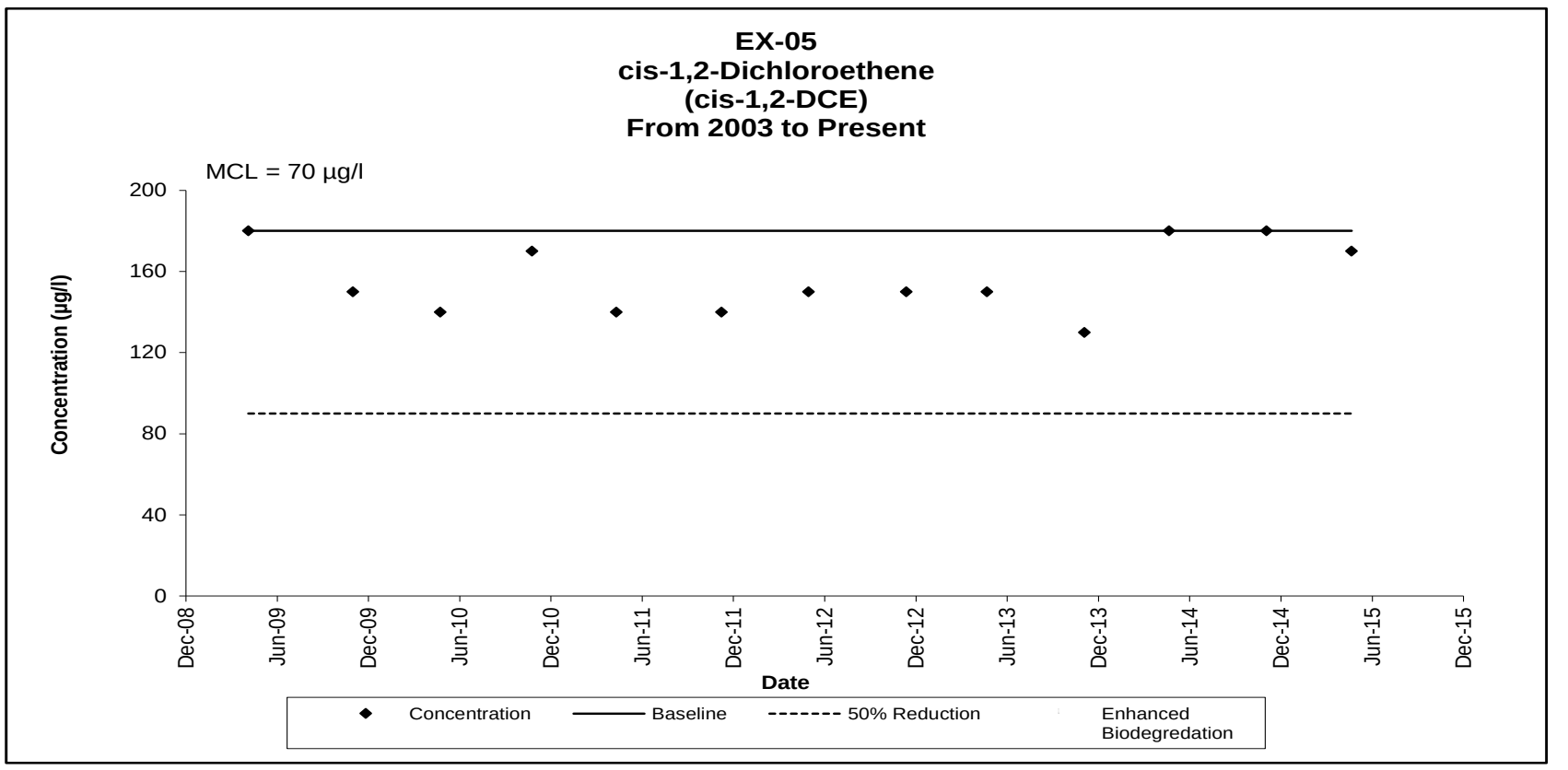


EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05

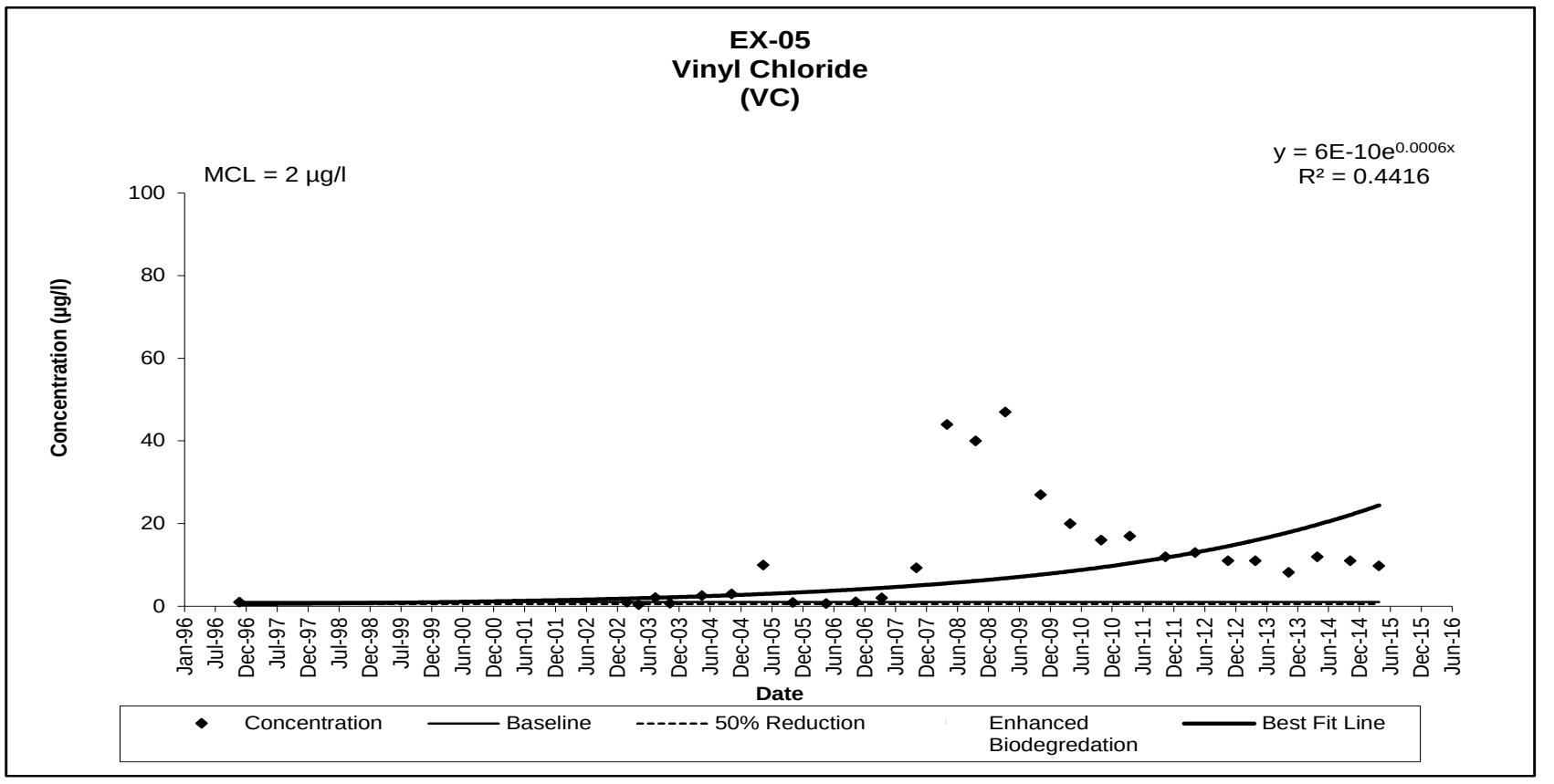


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07

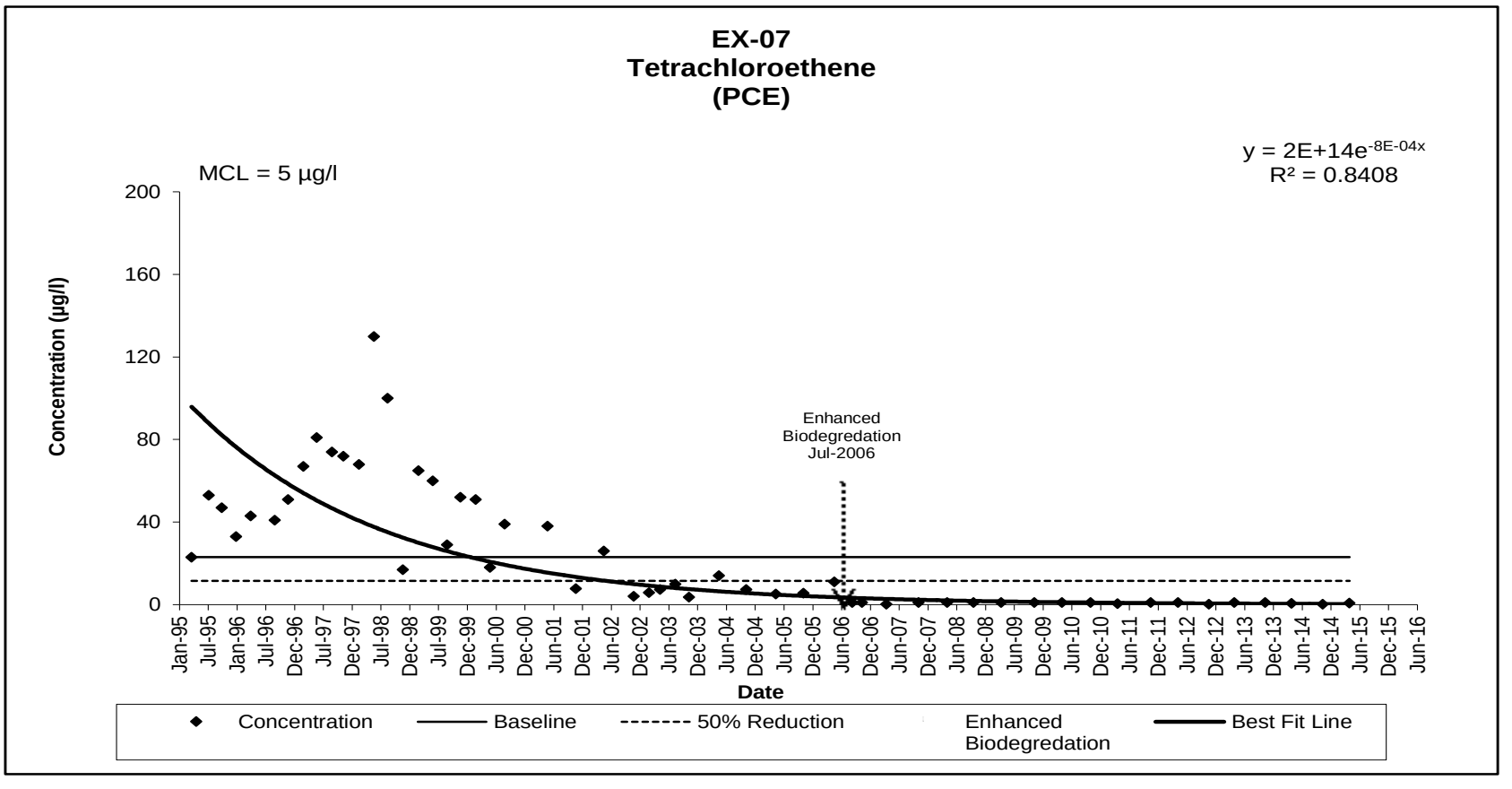
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	23	210	86	--	--	--	150	0.671 J
6-Jul-95	53	160	21	--	--	--	< 20	< 40
27-Sep-95	47	150	71	--	--	--	< 2	< 20
27-Dec-95	33	140	28	--	--	--	< 2	< 0.2
28-Mar-96	43	170	21	--	--	--	240	< 20
28-Aug-96	41	360	24	--	--	--	< 10	38 J
20-Nov-96	51	420	23	--	--	53	< 2.5	19 J
26-Feb-97	67	490	19	--	--	--	< 2.5	46
21-May-97	81	850	21	--	--	--	< 2.5	37 J
26-Aug-97	74	460	16	--	--	--	1.7 J	40 B
6-Nov-97	72	490	16	--	--	--	< 2.5	--
12-Feb-98	68 B	460 B	19	--	--	--	3.6	--
19-May-98	130	680	15	--	--	--	4.5	--
12-Aug-98	100	650	21	--	--	--	< 5.5	--
17-Nov-98	17	58	1.4 J	--	--	--	< 0.3 G	5.1
24-Feb-99	65 JB	190 J	4.2 J	--	--	--	< 2.5 G	7
26-May-99	60	160	< 5 G	--	--	--	< 4 UJ	16
25-Aug-99	29	210	10 T	--	--	--	1.53	4.78
17-Nov-99	52	210	9.4 T	--	--	--	< 0.2 J	28.8 J
22-Feb-00	51	110	2.9 J	--	--	--	0.13 J	16.7
24-May-00	18	71	2.6 T	--	--	--	< 0.2	4.92 J
23-Aug-00	39 D	96	5.5 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	< 0.5	0.77
23-May-01	38 D	141 D	7 D	--	--	--	< 0.5	5.4 D
19-Nov-01	7.8	59	3.9	--	--	--	< 0.5	2.4
15-May-02	26	96 D	4.1	--	--	--	< 0.5	8.4 D
20-Nov-02	4.1	46	3.7	--	--	--	< 0.48	2
26-Feb-03	5.8	36	2.1	--	--	17	0.1 TJ	3.2 J
6-May-03	7.4	24	< 1	--	--	1	< 0.5	1.4
12-Aug-03	10	65 D	4.8	--	--	32	< 0.5	2.4
6-Nov-03	3.6	21	2	--	--	10	< 2.4	1.3
14-May-04	14	42	< 1	--	--	3.1	--	0.4 TB
3-Nov-04	7.4	19	< 1	--	--	1	--	0.6
10-May-05	5.1	11	< 1	--	--	0.5 T	--	< 0.5
1-Nov-05	5.5	30	2.4	--	--	18	--	0.9
16-May-06	11	22	0.47 T	--	--	2.1	--	1.2
6-Sep-06	< 1	5.4	2.2	--	--	16 J+	--	--
6-Nov-06	< 1	7.9	2.2	--	--	17	--	0.27 T
10-Apr-07	0.2036 T	7.1	0.71 T	--	--	6.9	--	0.31 T
30-Oct-07	< 1	2.1	0.43 T	--	--	4.2	--	0.13 T
30-Apr-08	< 1	5	0.82 T	--	--	8.9	--	0.16 T
13-Oct-08	< 1	5	1.6	--	--	29	--	< 0.5
7-Apr-09	< 1	3	0.79 T	16	2.3	10	--	0.13 T
3-Nov-09	< 1	1.2	0.33 T	6	1.4	3.6	--	< 0.5
26-Apr-10	< 1	2	< 1	3.6	0.62 T	1.4	--	< 0.5
26-Oct-10	< 1	1.5	0.34 T	8.3	4	4.1	--	< 0.5
14-Apr-11	0.54 T	2.4	0.25 T	4	0.51 T	1.4	--	< 0.5
10-Nov-11	< 1	1.1	0.45 T	10	5	5.3	--	< 0.5
1-May-12	< 1	0.93 T	0.42 T	8.3	3.7	6.5	--	< 0.5
14-Nov-12	0.28 T	1.6	0.24 T	4.7	1.8	2.3	--	< 0.5
23-Apr-13	1.1	3.1	< 1	3.9	0.73 T	1.4	--	< 0.5
5-Nov-13	< 1	1.5	0.46 T	9.7	3	7.1	--	< 0.5
22-Apr-14	0.61 T	2.4	0.45 T	8.4	1.7	6.1	--	< 0.5
4-Nov-14	0.16 T	8	0.43 T	7.1	1.9	5.8	--	< 0.5
23-Apr-15	0.72 T	2.6	0.28 T	5.7	2.1	3.2	--	< 0.5

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07



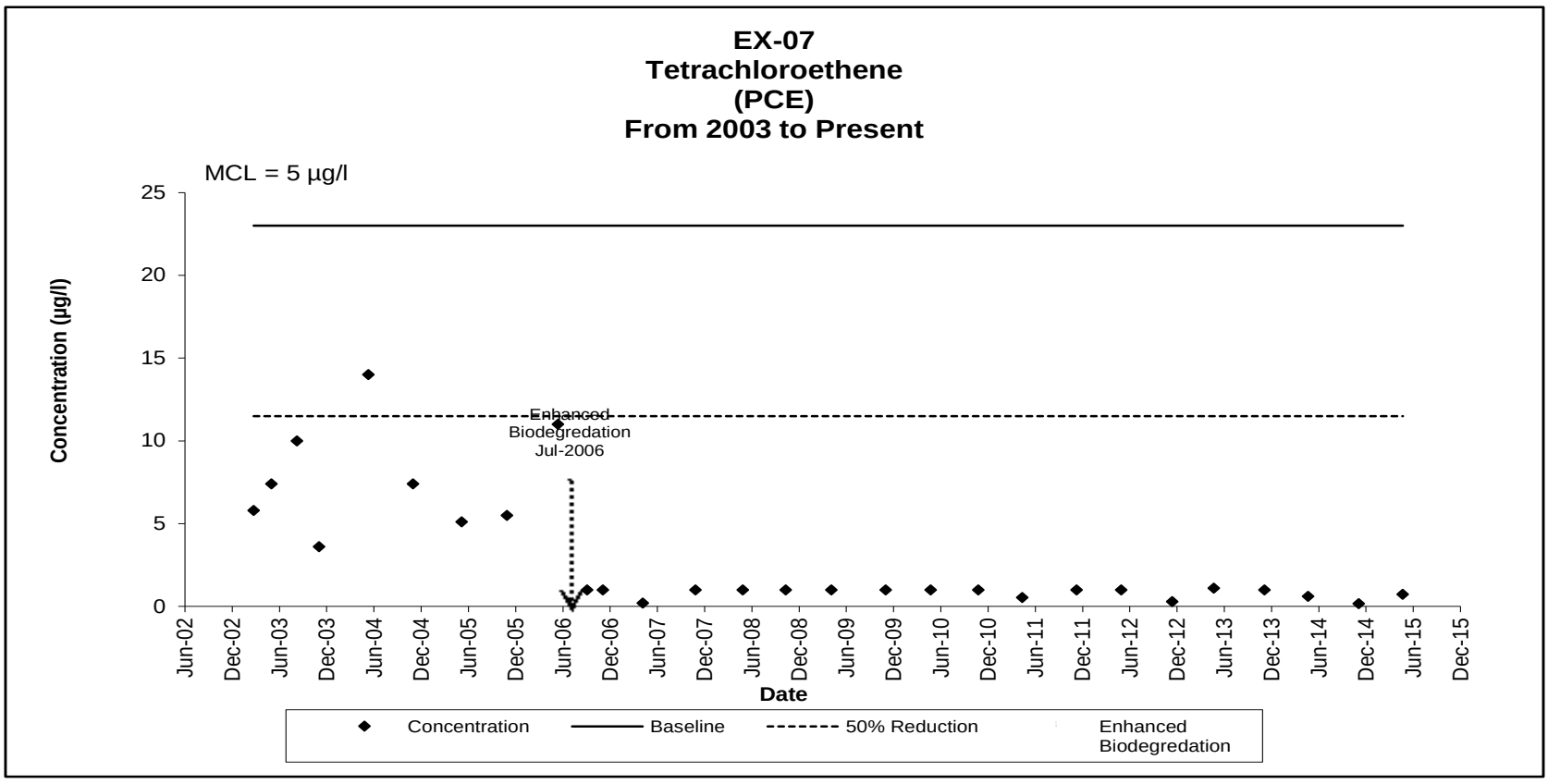
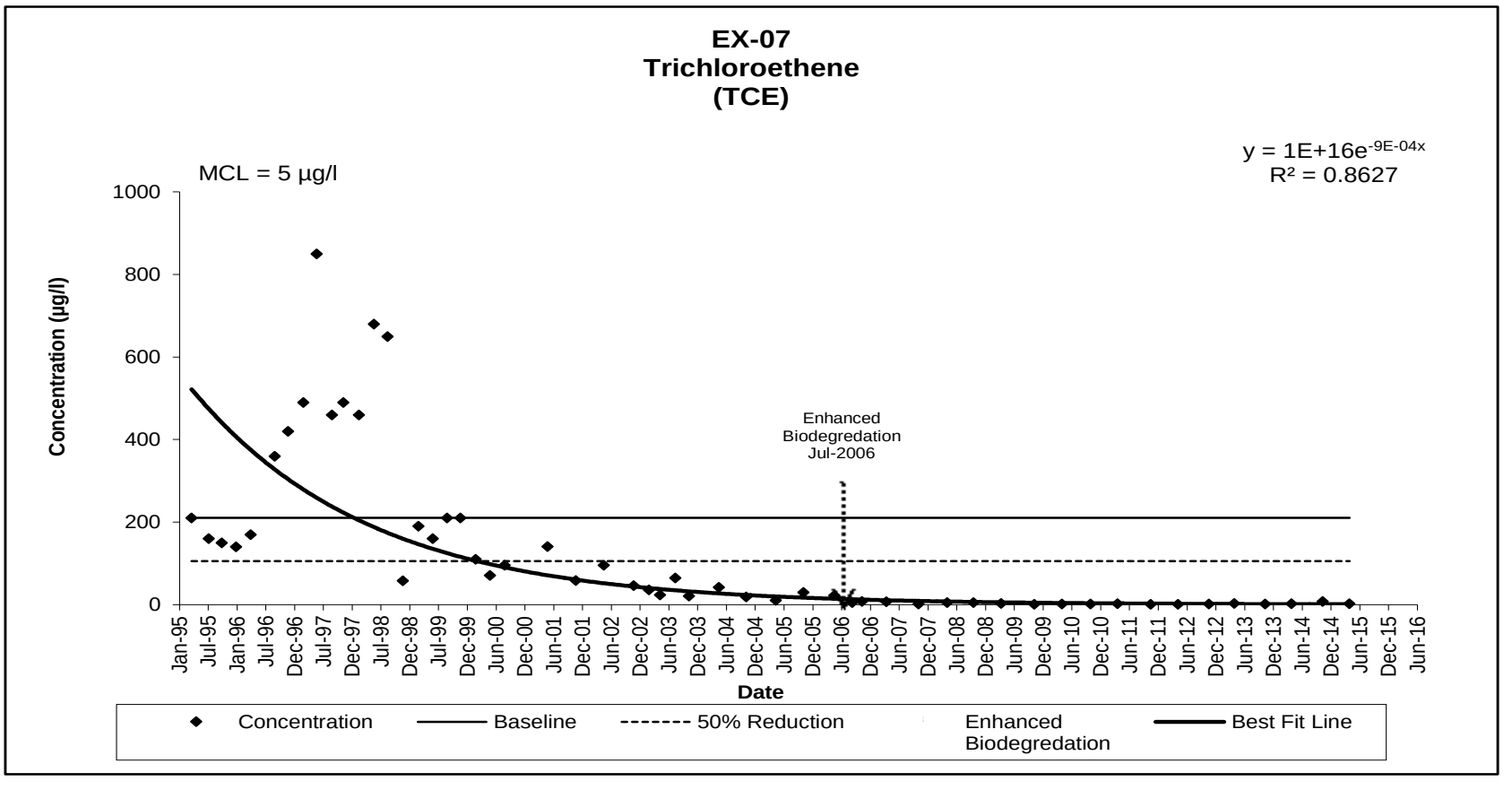


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07



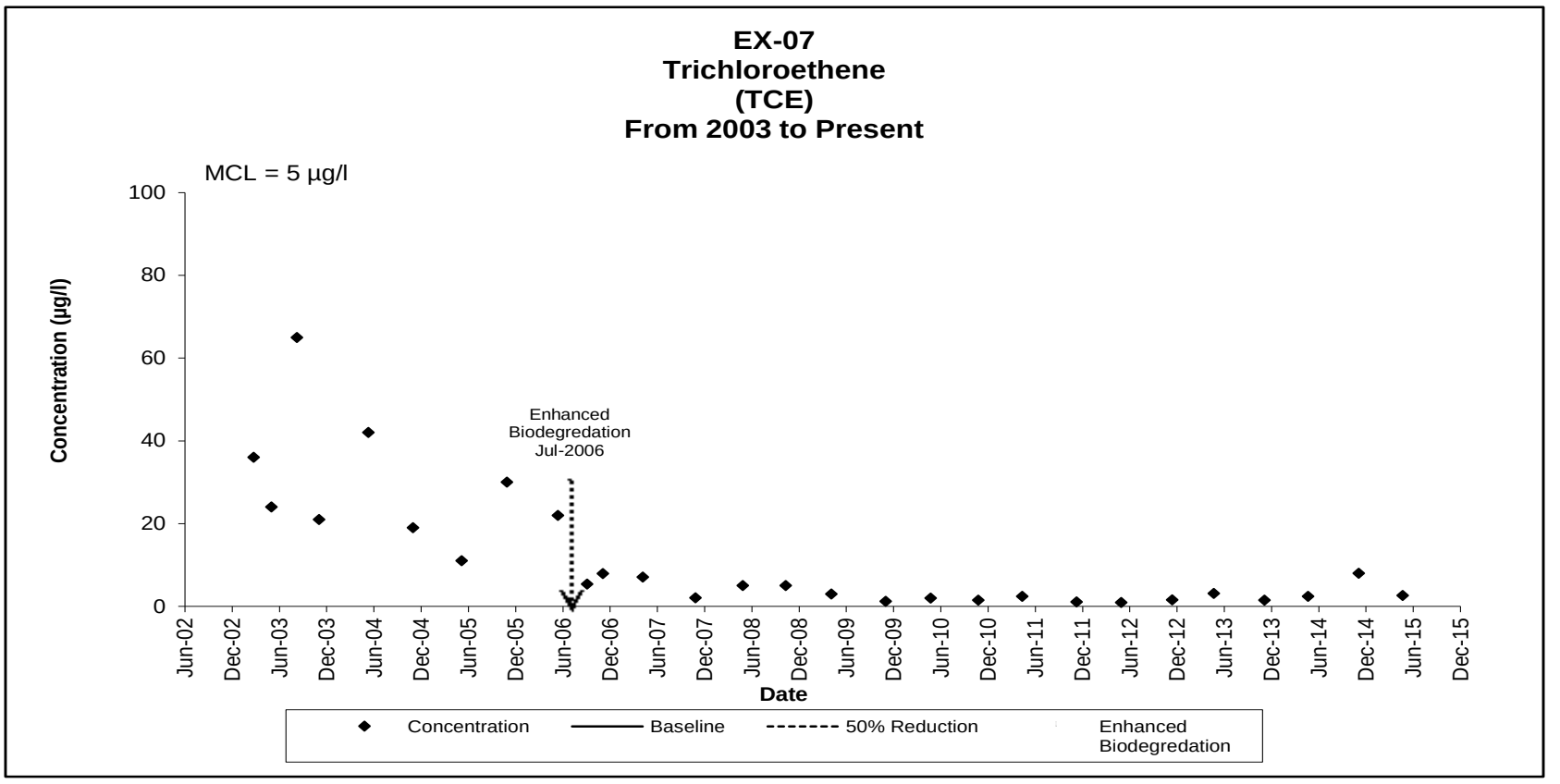
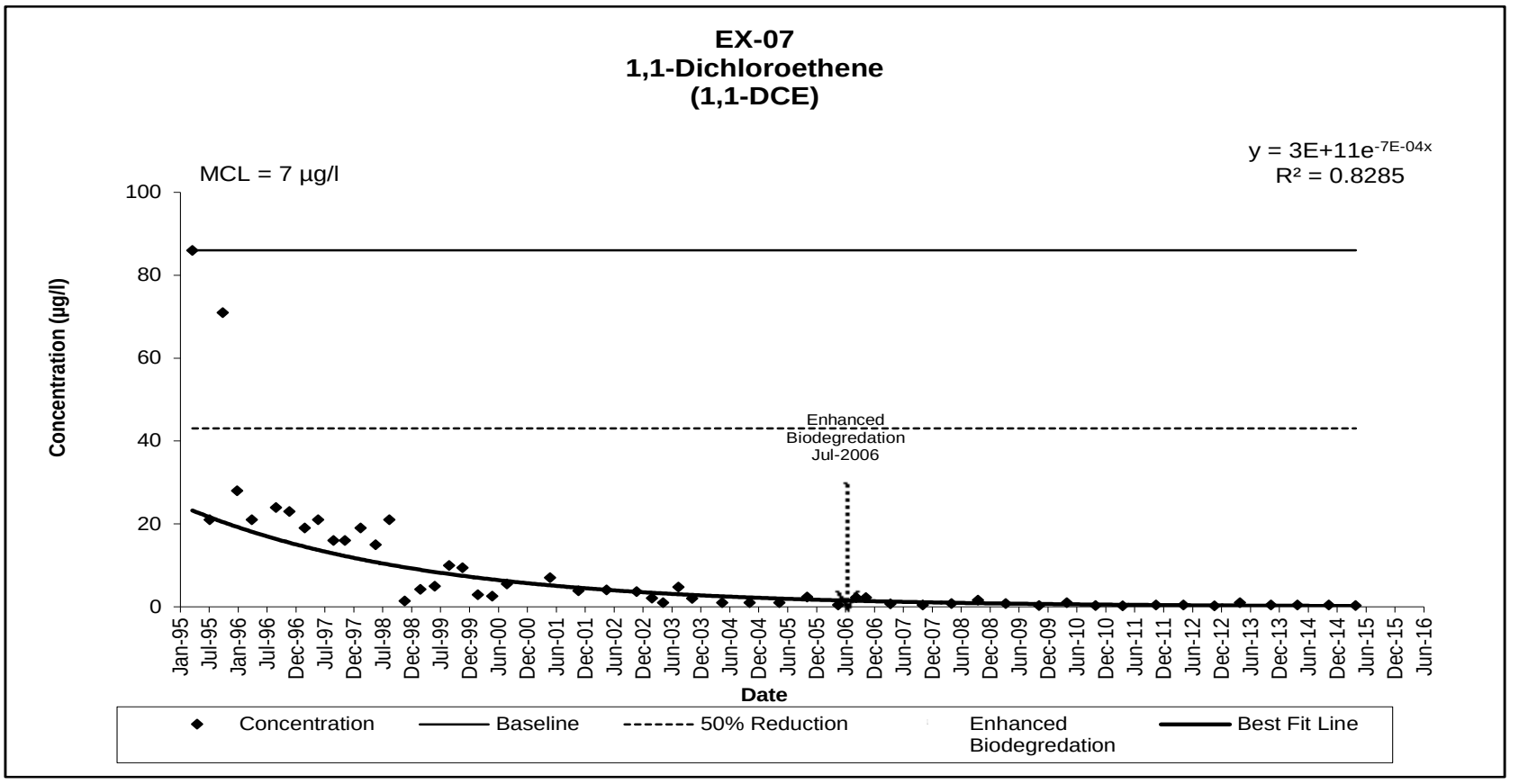


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07



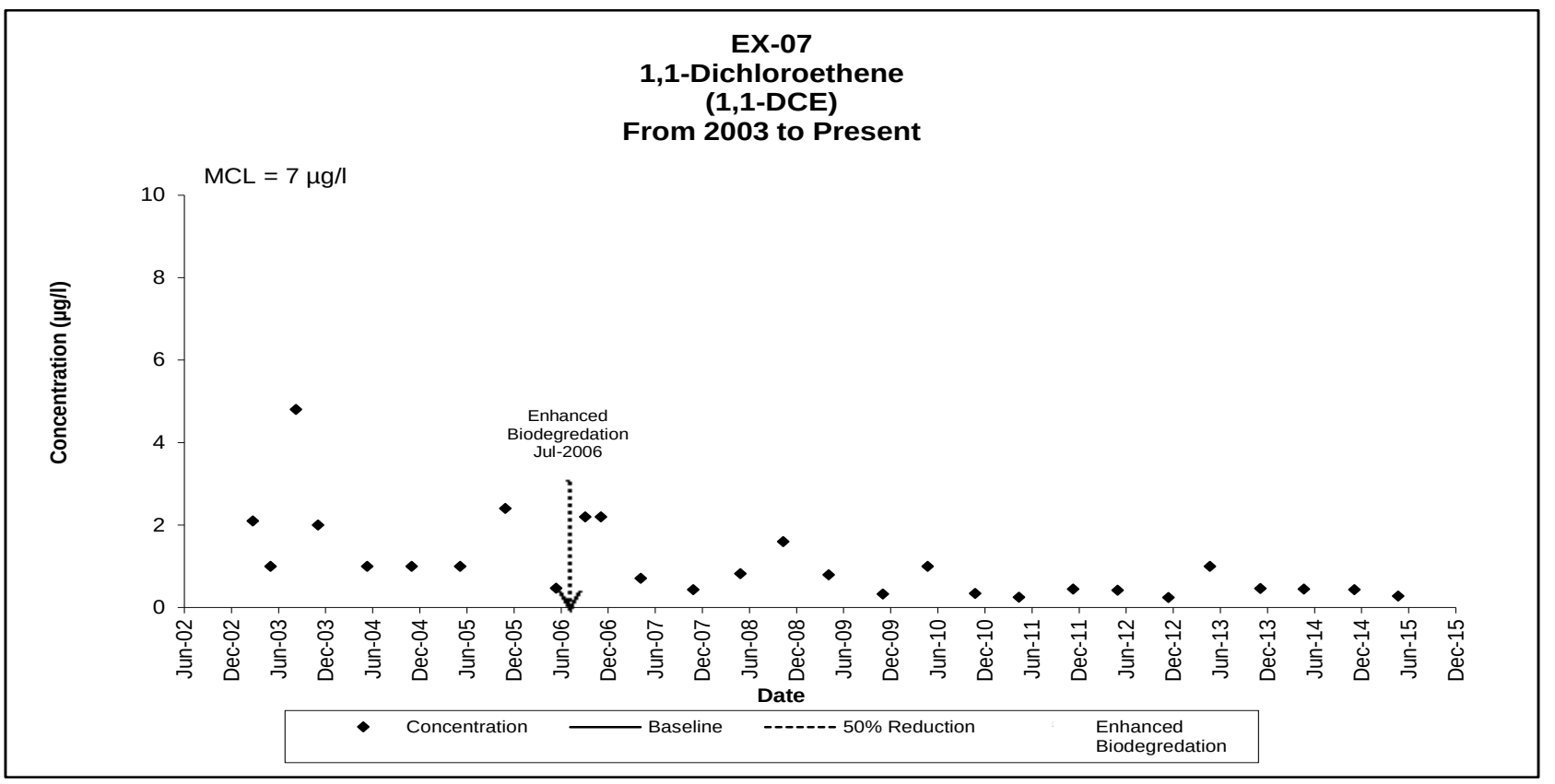


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07

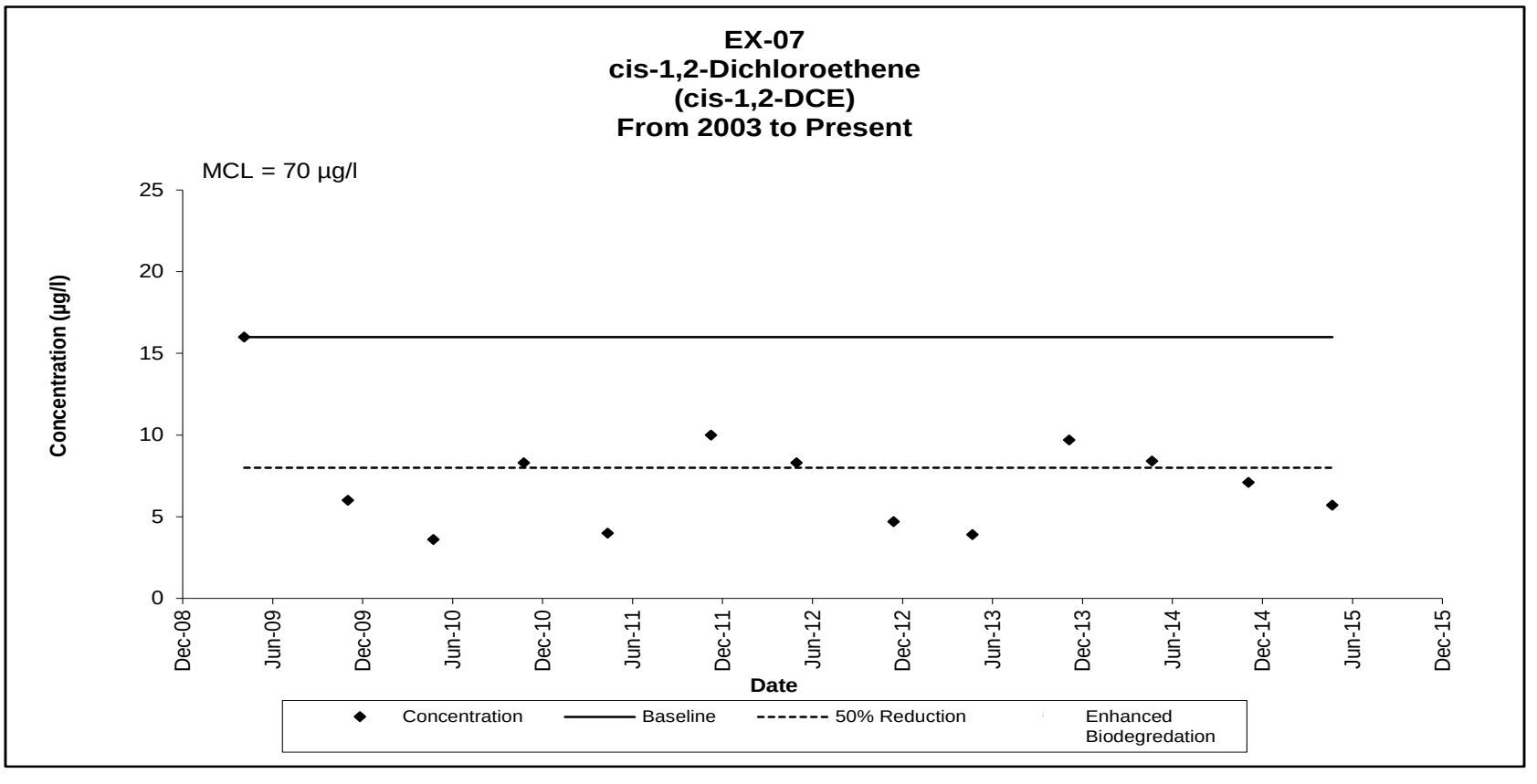
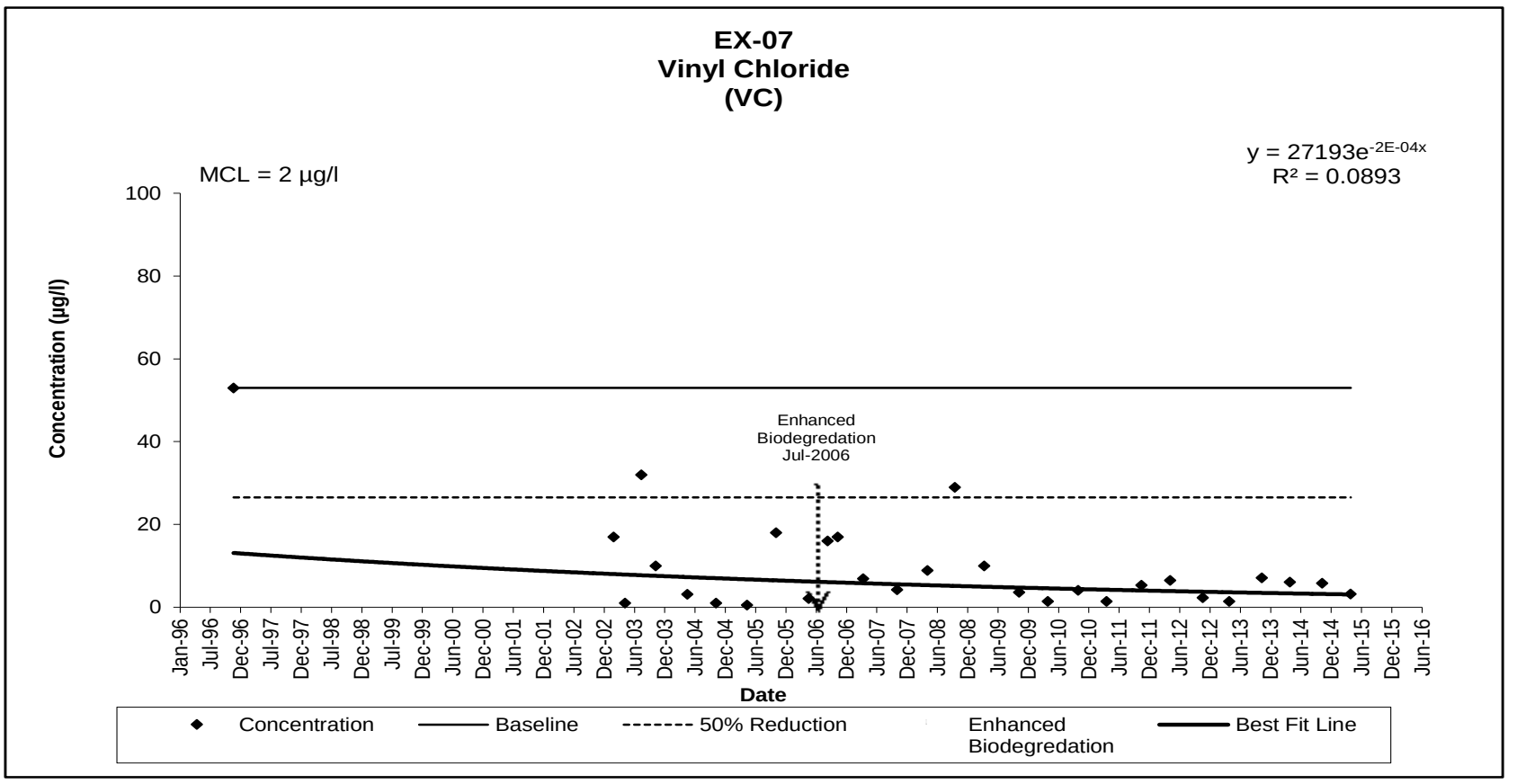


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07



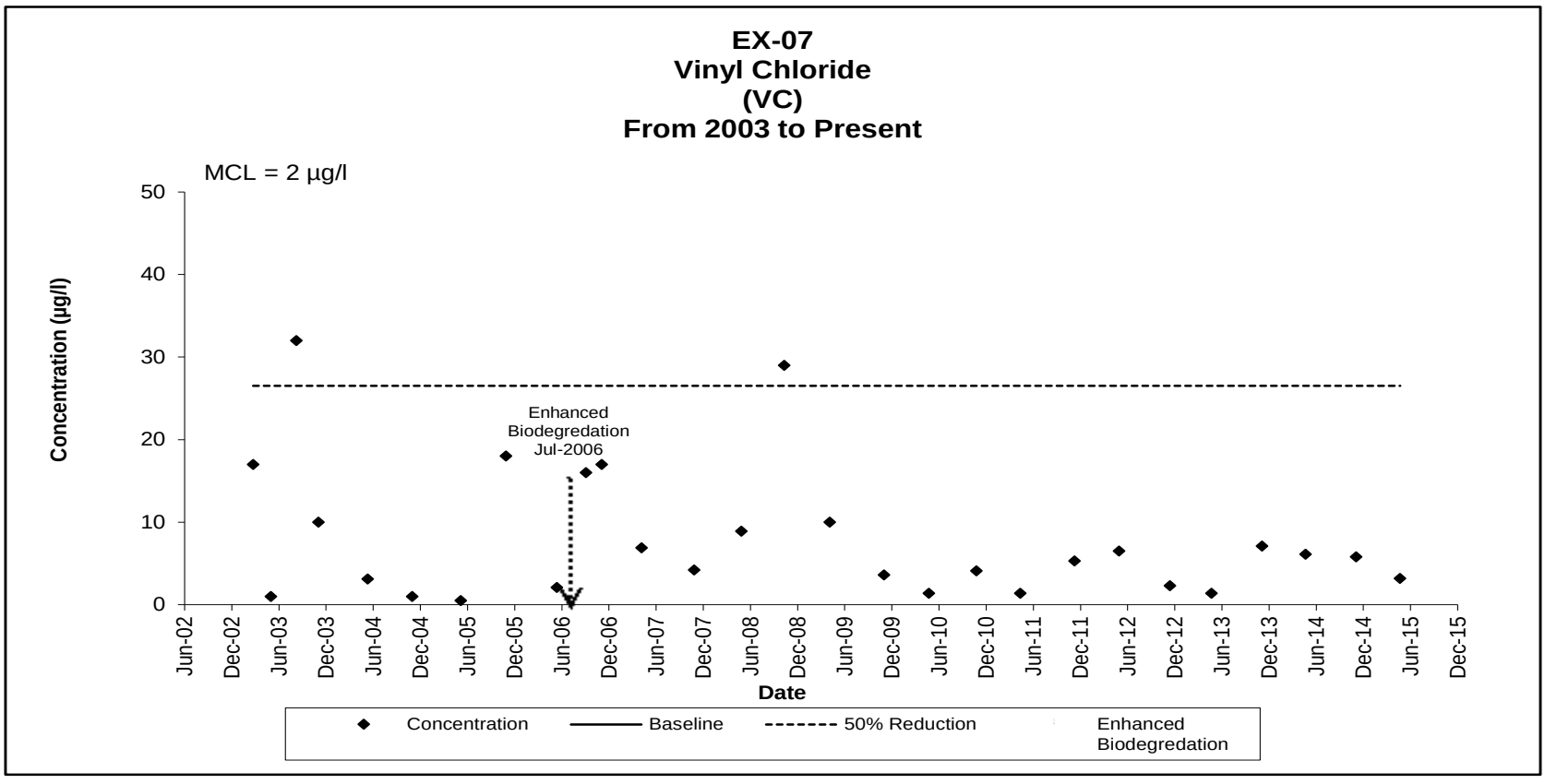
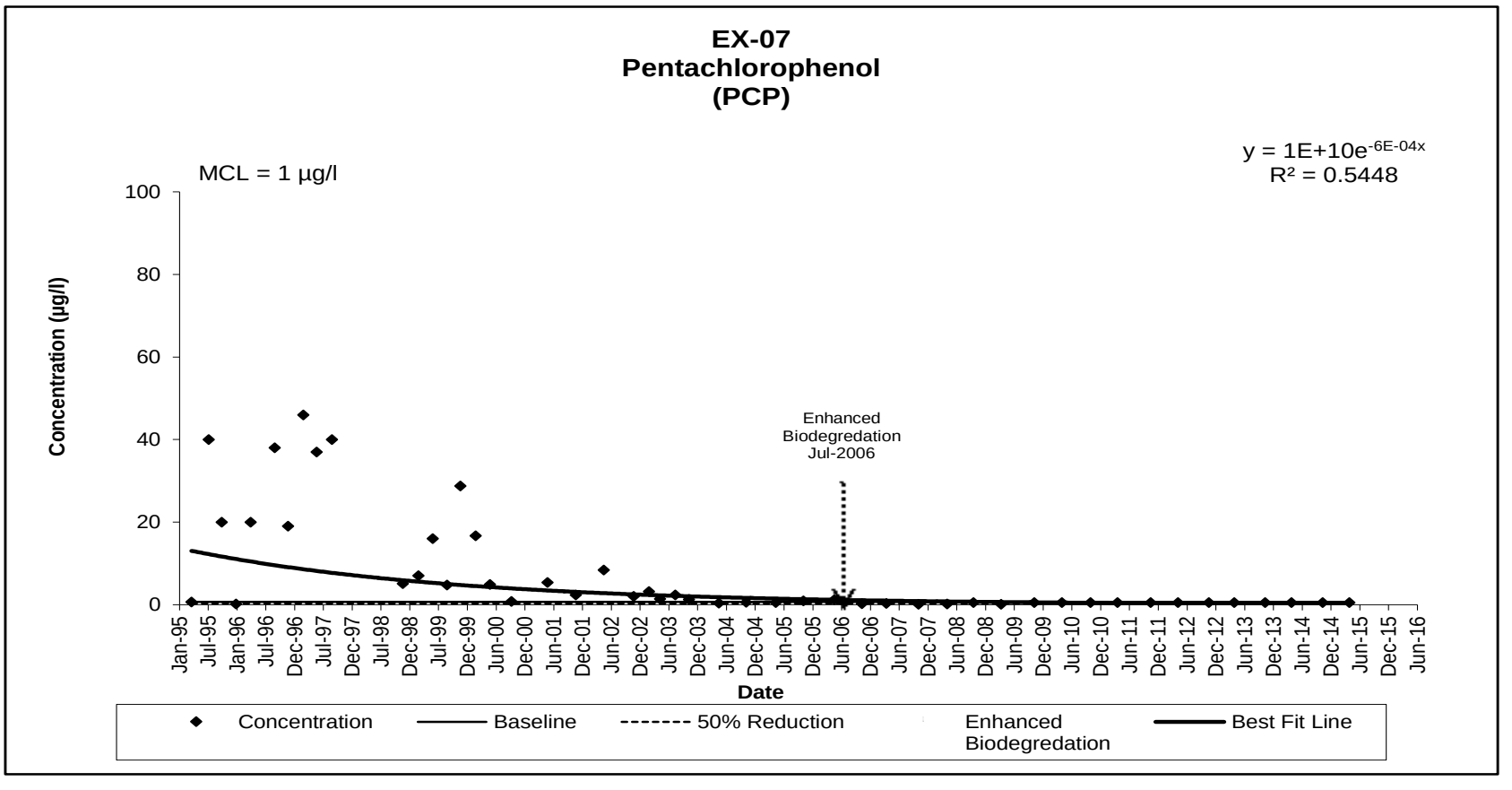


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07



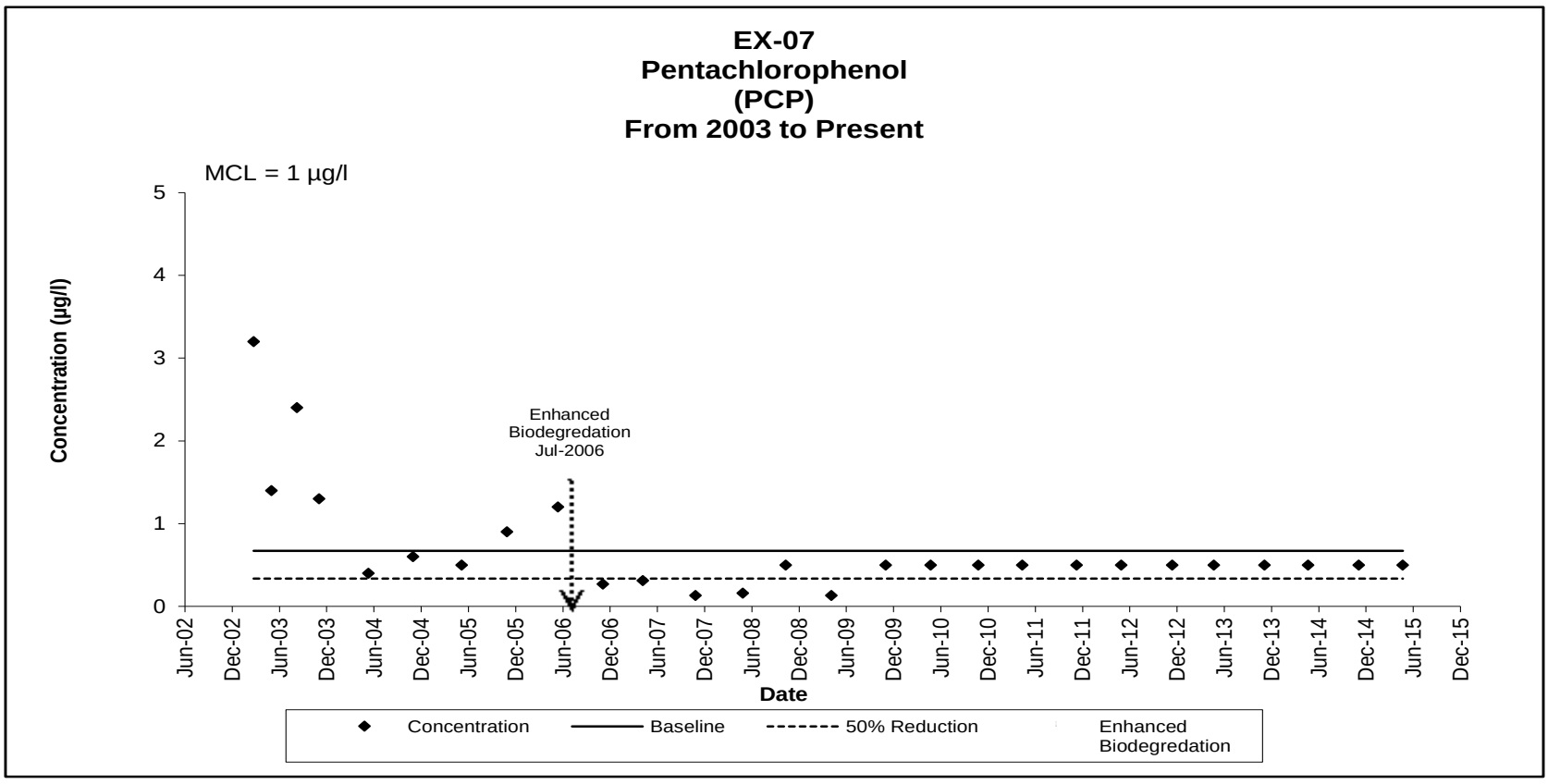


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08

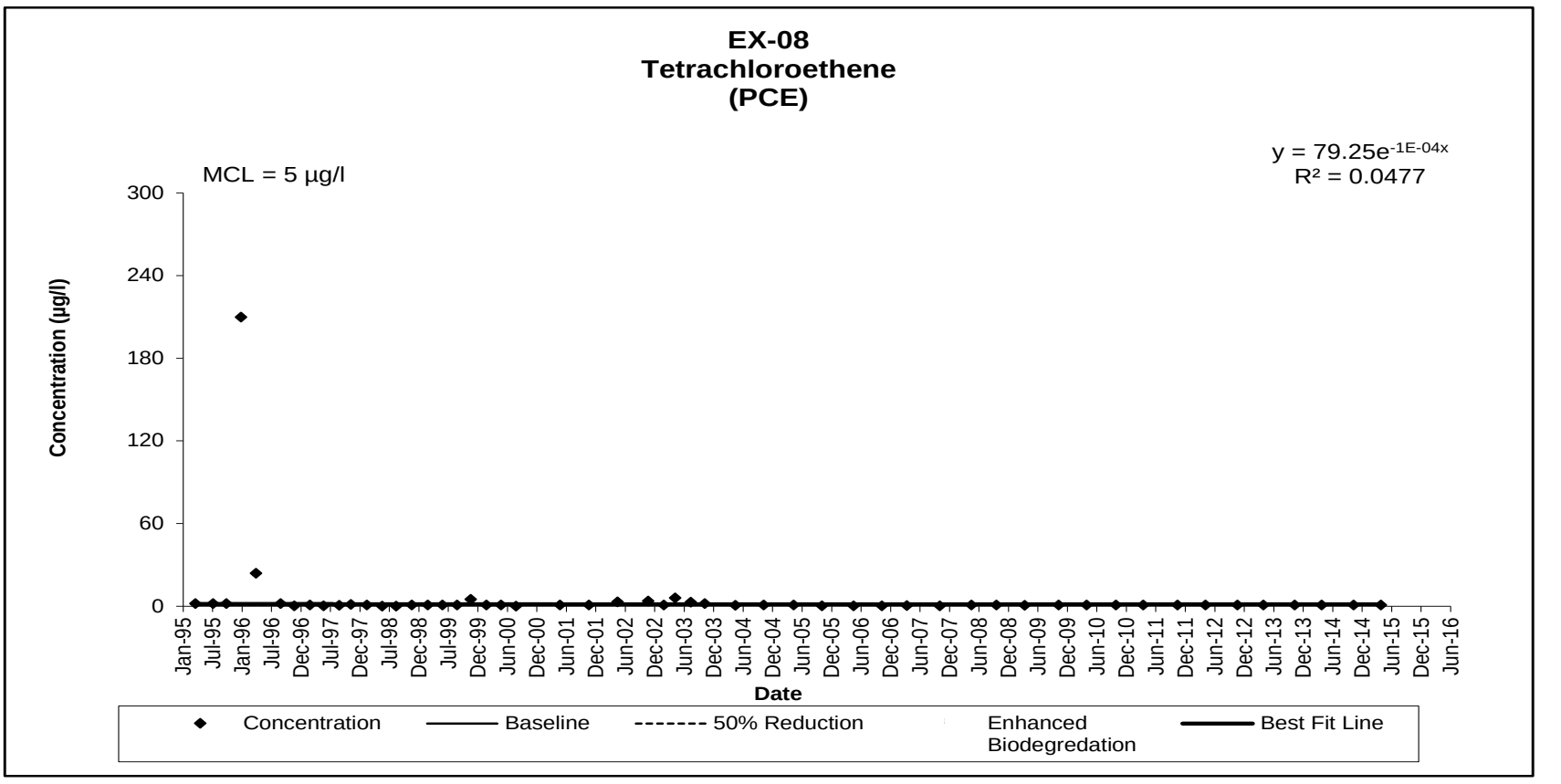
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	< 2	< 2	< 2	--	--	--	< 10	18.5 J
6-Jul-95	< 2	< 2	< 2	--	--	--	< 20	< 40
27-Sep-95	< 2	< 2	< 2	--	--	--	< 2	30
27-Dec-95	210	420	22	--	--	--	980	29
28-Mar-96	24	23	< 2	--	--	--	< 2	22
28-Aug-96	< 2	< 2	< 2	--	--	--	< 10	20 J
21-Nov-96	0.33 T	3.9	0.88 T	--	--	0.55	< 0.25 UJ	14
26-Feb-97	< 1	0.94 T	0.15 T	--	--	--	< 0.25	8.3
21-May-97	0.32 T	1.2	0.42 T	--	--	--	< 0.25	10 J
26-Aug-97	0.82 T	2	0.45 T	--	--	--	< 0.25	11 B
6-Nov-97	1.3 B	1.4	0.34	--	--	--	< 0.25	11 J
12-Feb-98	< 1	0.39 JB	< 1	--	--	--	< 0.25	3
19-May-98	0.21 J	0.34 J	< 1	--	--	--	< 0.25	2.8
12-Aug-98	0.2 J	0.59 J	< 1	--	--	--	< 0.25	3.5
17-Nov-98	< 1	0.48 J	< 1	--	--	--	< 0.25	3.4
24-Feb-99	< 1 UJ	< 1 UJ	< 1	--	--	--	< 0.25	2.8
26-May-99	< 1	< 1	< 1	--	--	--	< 5 UJ	3
25-Aug-99	< 1	0.49 T	< 1	--	--	--	< 0.2	2.71
17-Nov-99	< 5	0.53 T	< 5	--	--	--	< 0.2	3.08
22-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	1.85
24-May-00	< 1	0.31 T	< 1	--	--	--	< 0.2	2.77 J
23-Aug-00	< 0.166	0.45	< 0.116	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	2.28 J	0.28 J
23-May-01	< 1	0.5 T	< 1	--	--	--	< 0.5	0.6
19-Nov-01	< 1	0.7 T	< 1	--	--	--	< 0.5	0.2 T
15-May-02	3.3	16	0.7 T	--	--	--	< 0.5	0.4 T
20-Nov-02	3.8	20	< 1	--	--	--	< 0.48	0.3 T
26-Feb-03	1	2.8	< 1	--	--	< 1	0.2 T	0.3 T
6-May-03	6.1	25	0.4 T	--	--	6.5	< 0.5	0.2 T
12-Aug-03	3	9.5	< 1	--	--	3.6	< 0.5	0.2 TJ
6-Nov-03	2	4.2	< 1	--	--	0.8 T	< 2.4	0.5 T
14-May-04	0.7 T	2	< 1	--	--	< 1	--	0.2 TUB
4-Nov-04	< 1	1	< 1	--	--	< 1	--	0.4 T
10-May-05	< 1	0.5 T	< 1	--	--	< 1	--	< 0.5
1-Nov-05	0.4 T	1	< 1	--	--	< 1	--	< 0.5
16-May-06	0.25 T	0.49 T	< 1	--	--	< 1	--	0.74
7-Nov-06	0.39 T	1.5	< 1	--	--	0.54 T	--	0.92
10-Apr-07	0.43 T	1.3	< 1	--	--	0.54 T	--	0.82
30-Oct-07	0.36 T	1.6	< 1	--	--	1.9	--	1.1
13-May-08	< 1	0.22 T	< 1	--	--	< 1	--	1.2
15-Oct-08	< 1	0.22 T	< 1	--	--	< 1	--	1.4
8-Apr-09	0.83 T	4.7	0.92 T	16	1.5	11	--	1
4-Nov-09	< 1	0.4 T	< 1	0.94 T	< 1	0.35 T	--	2.7 D
27-Apr-10	< 1	0.27 T	< 1	< 1	< 1	< 1	--	1.8
25-Oct-10	< 1	0.44 T	< 1	< 1	< 1	< 1	--	3.4 D
12-Apr-11	< 1	0.28 T	< 1	< 1	< 1	< 1	--	1.2
10-Nov-11	< 1	0.28 T	< 1	0.83 T	< 1	0.88 T	--	2.9 D
2-May-12	< 1	< 1	< 1	0.23 T	< 1	< 1	--	2
15-Nov-12	< 1	0.29 T	< 1	< 1	< 1	< 1	--	2.4 D
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	0.87
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	0.89
21-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	0.48 T
5-Nov-14	< 1	0.11 T	< 1	< 1	< 1	< 1	--	0.86
22-Apr-15	< 1	< 1	< 1	< 1	< 1	< 1	--	0.45 T

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08



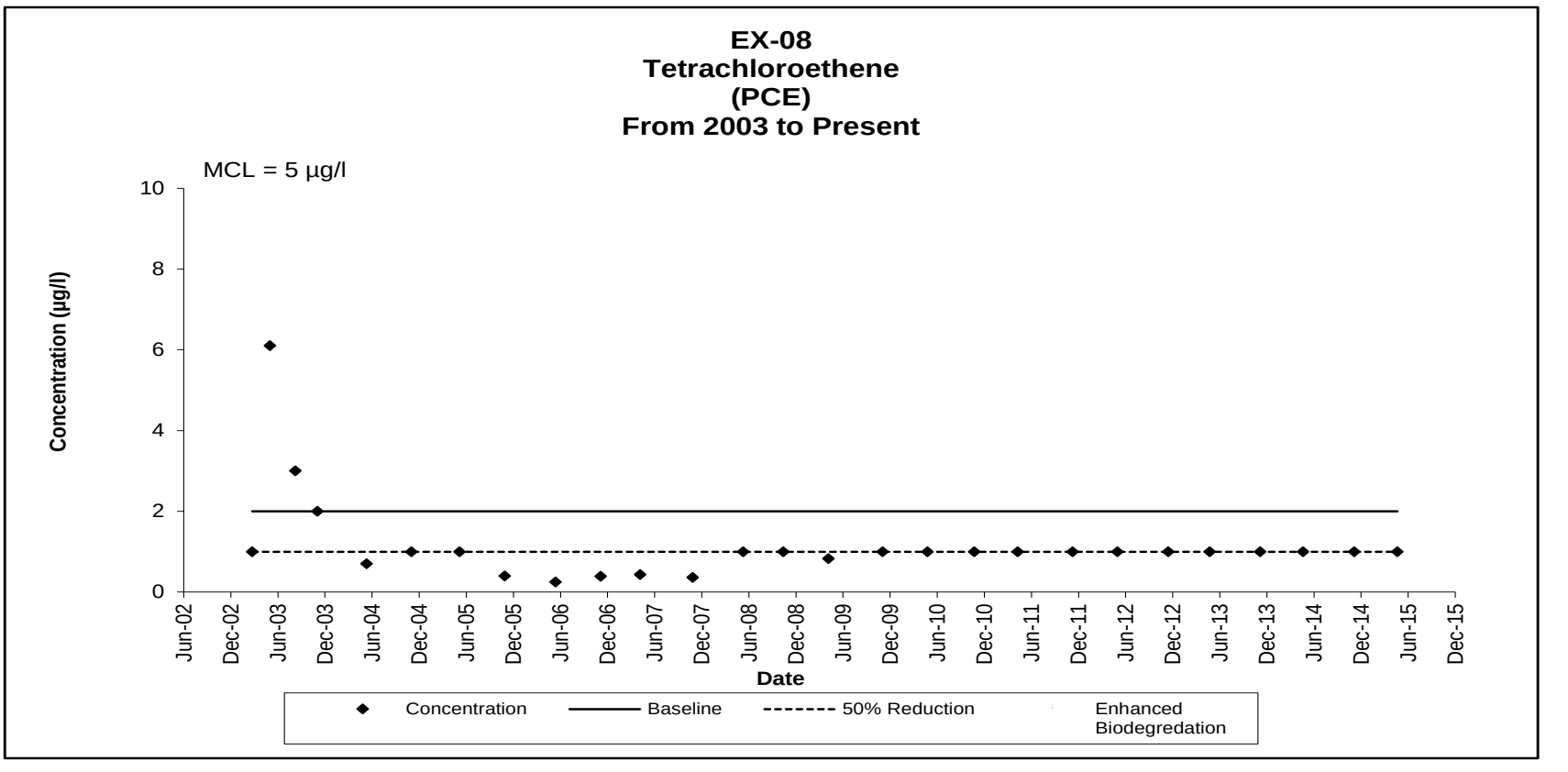
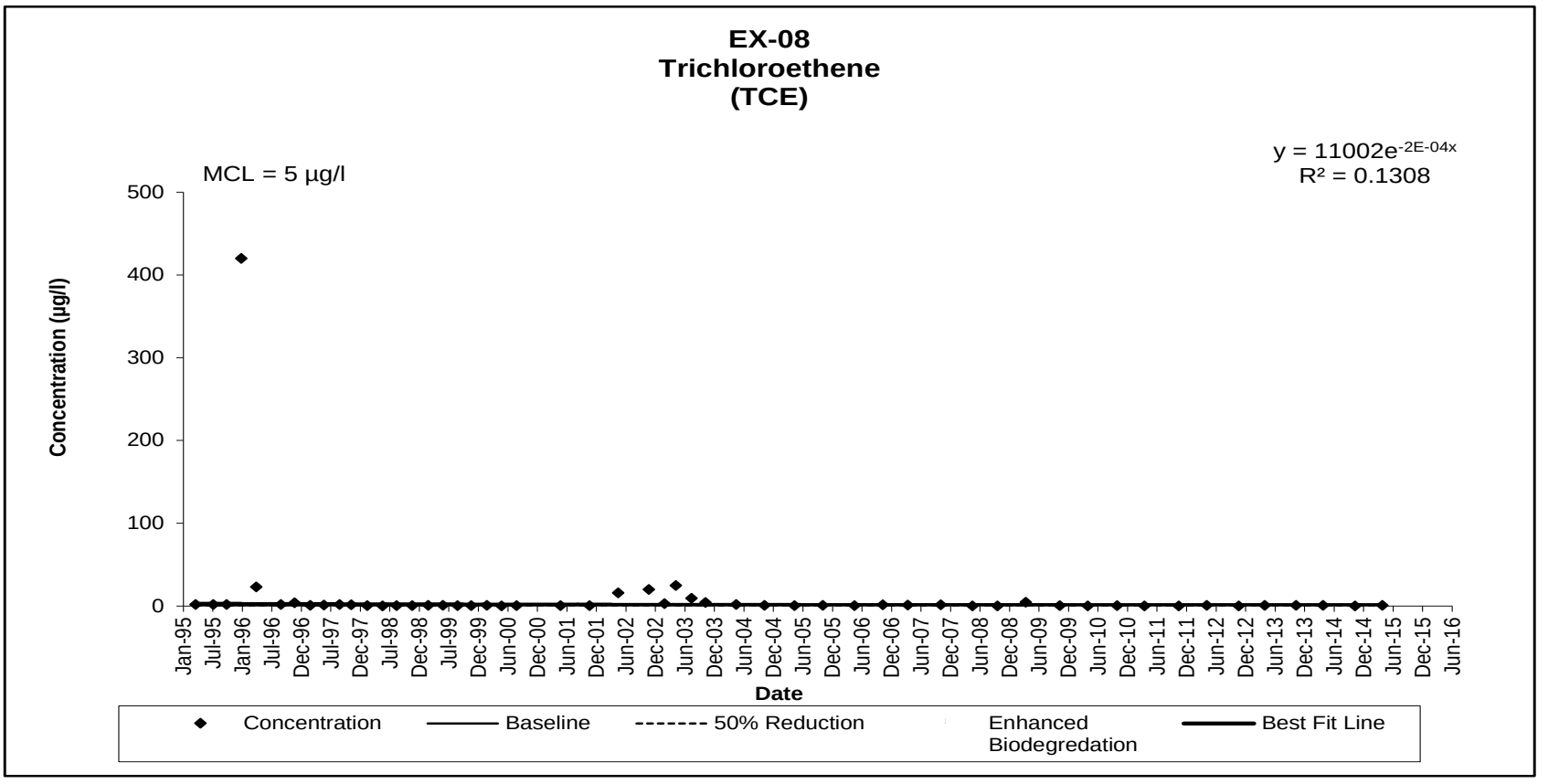


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08



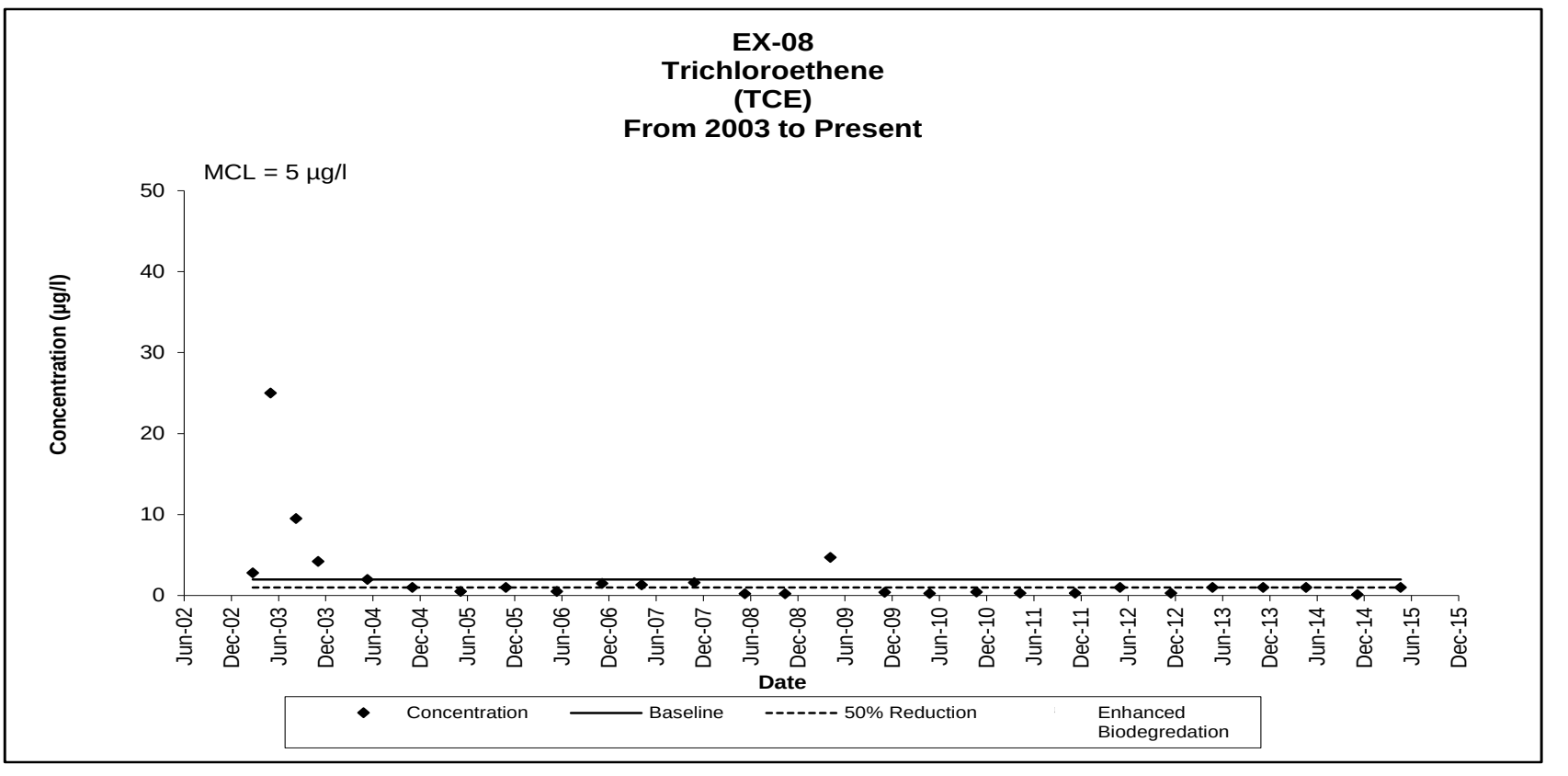
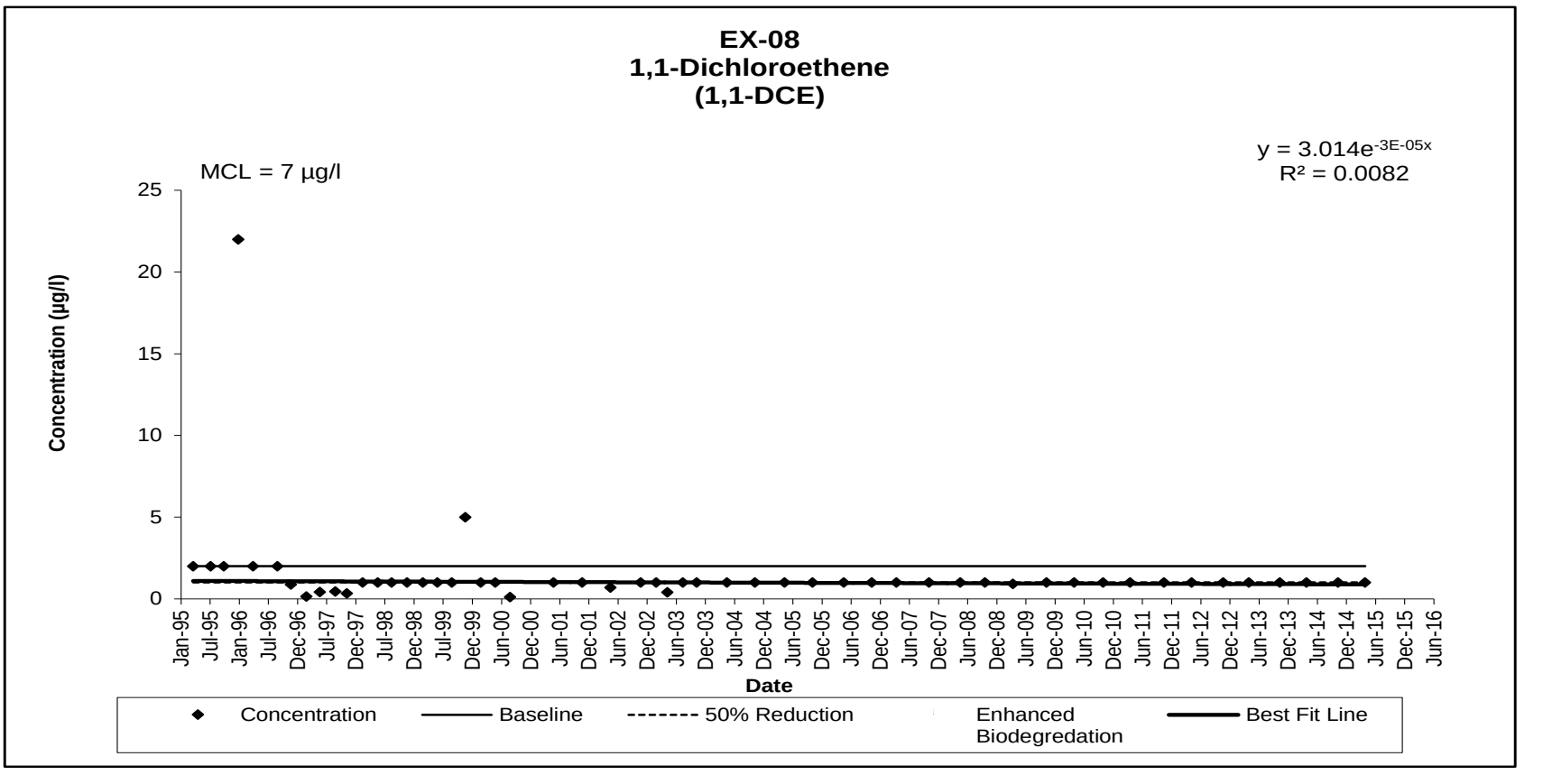


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08



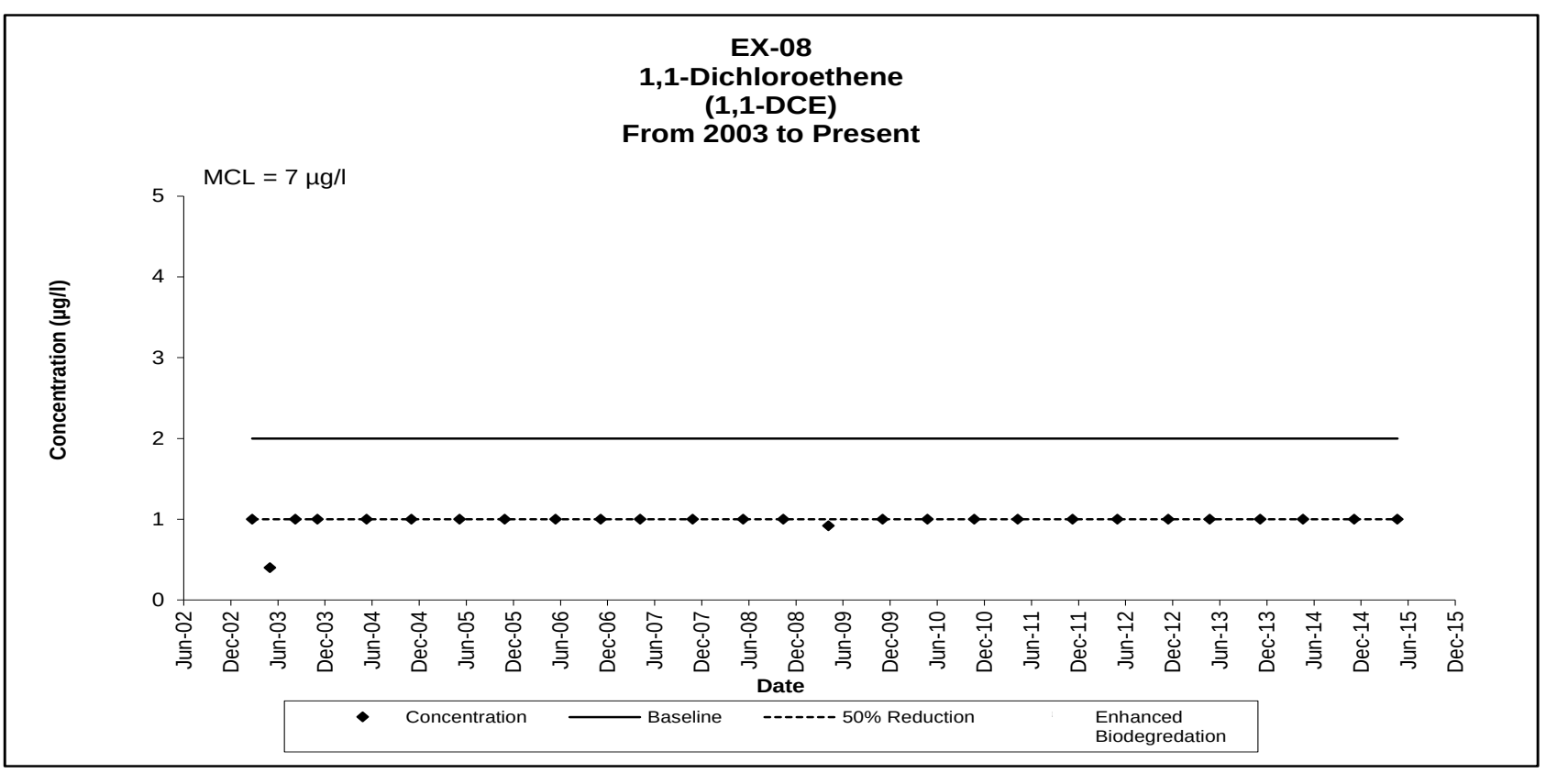


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08

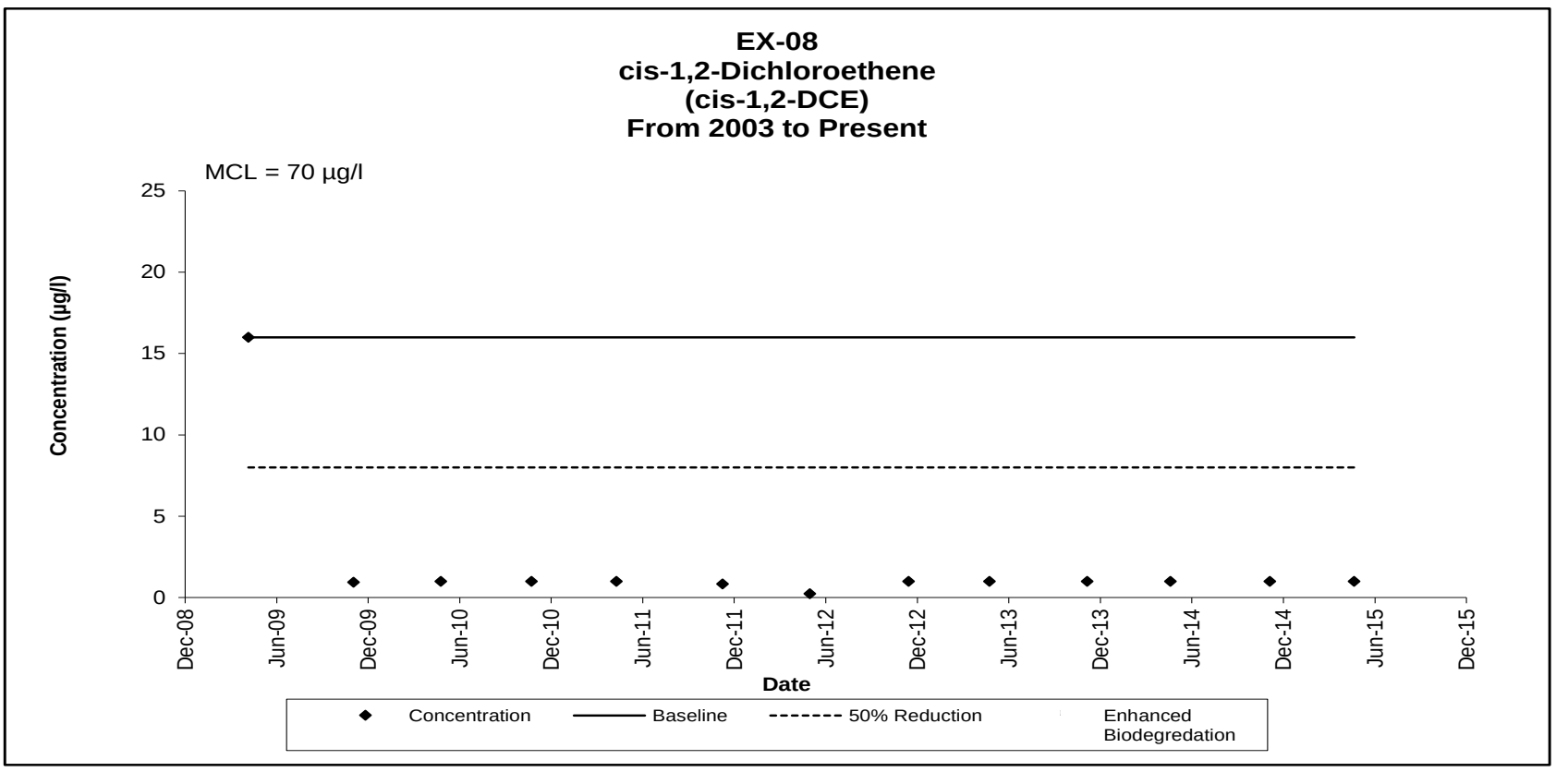
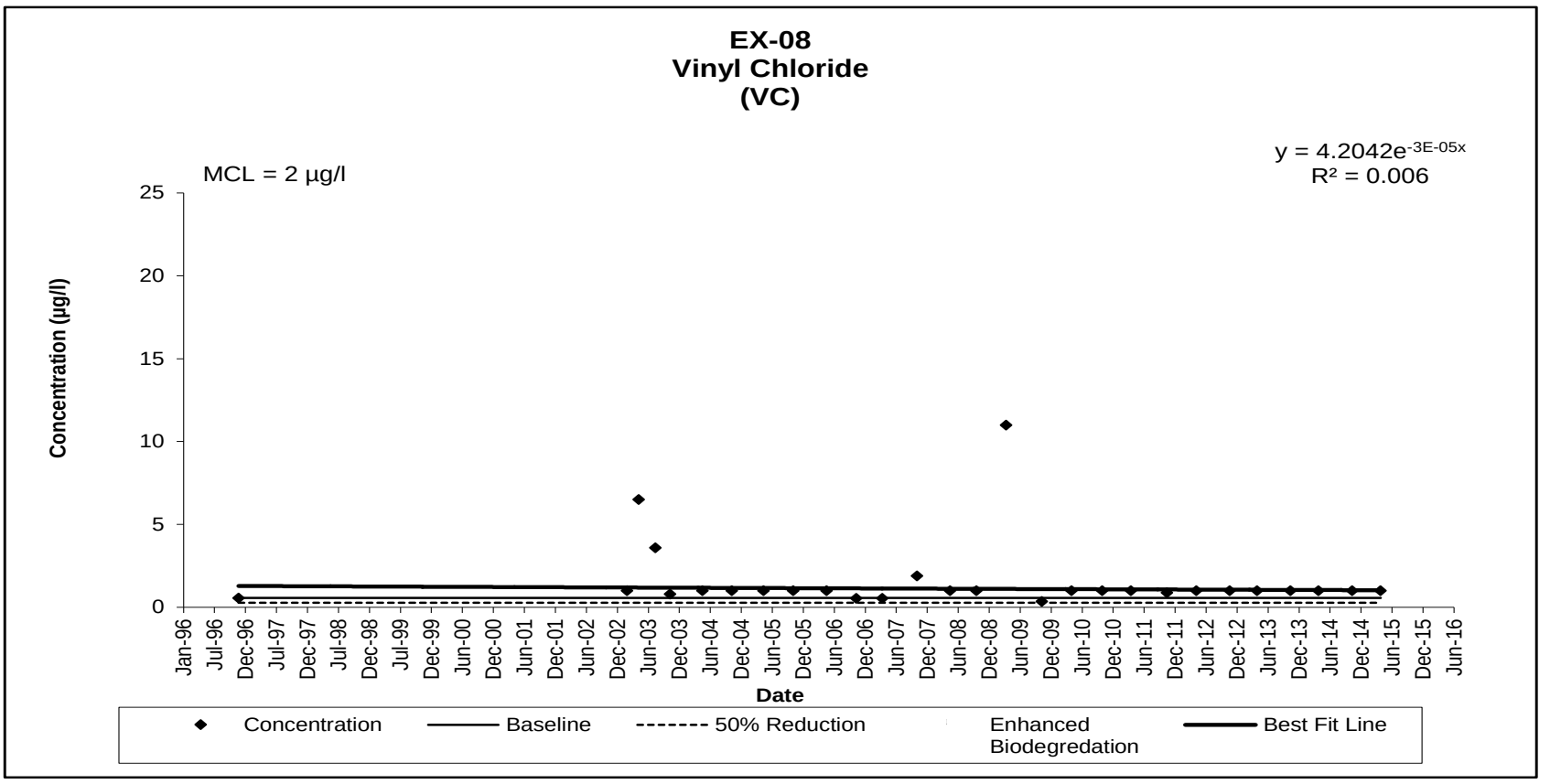


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08



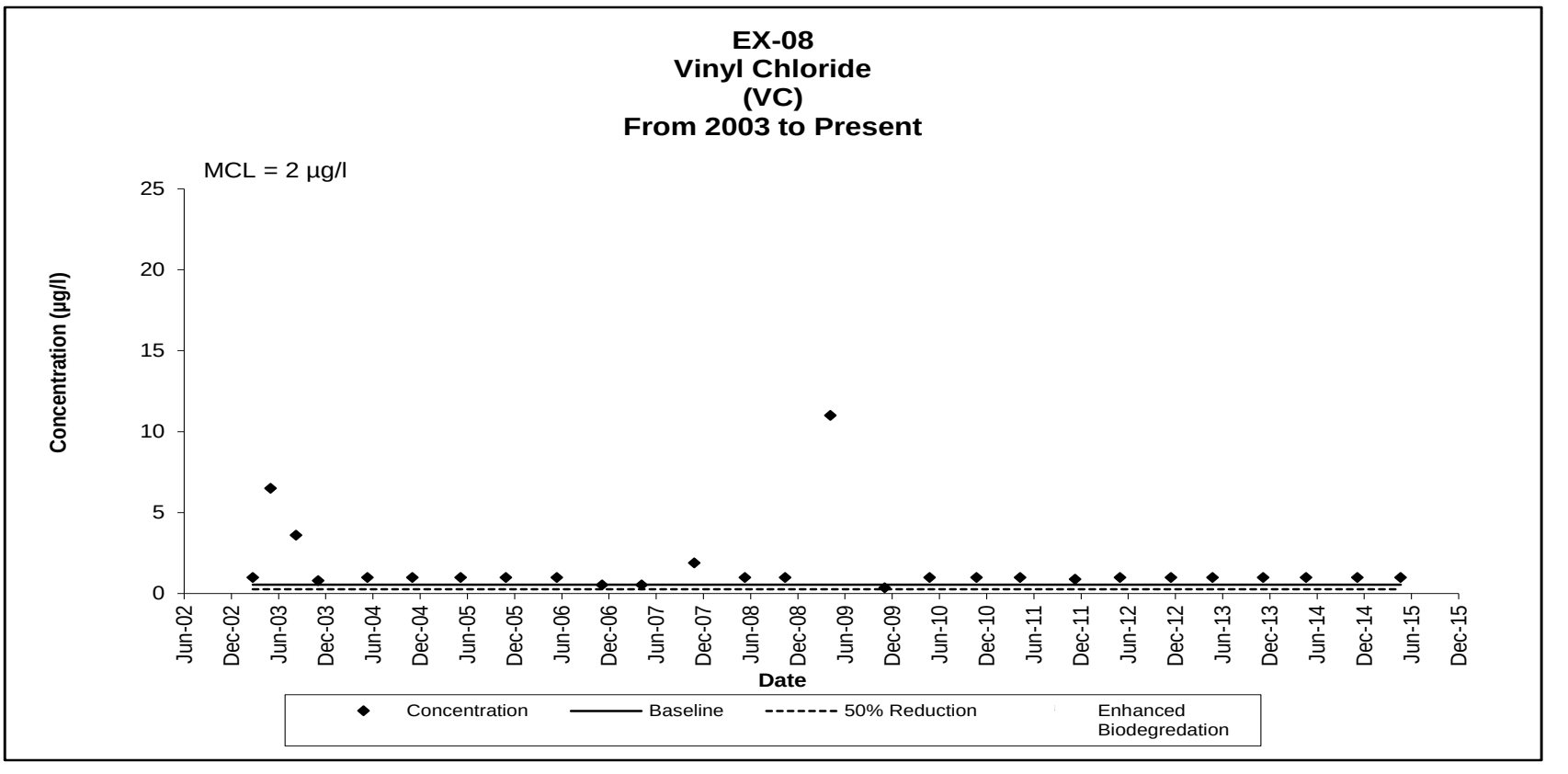
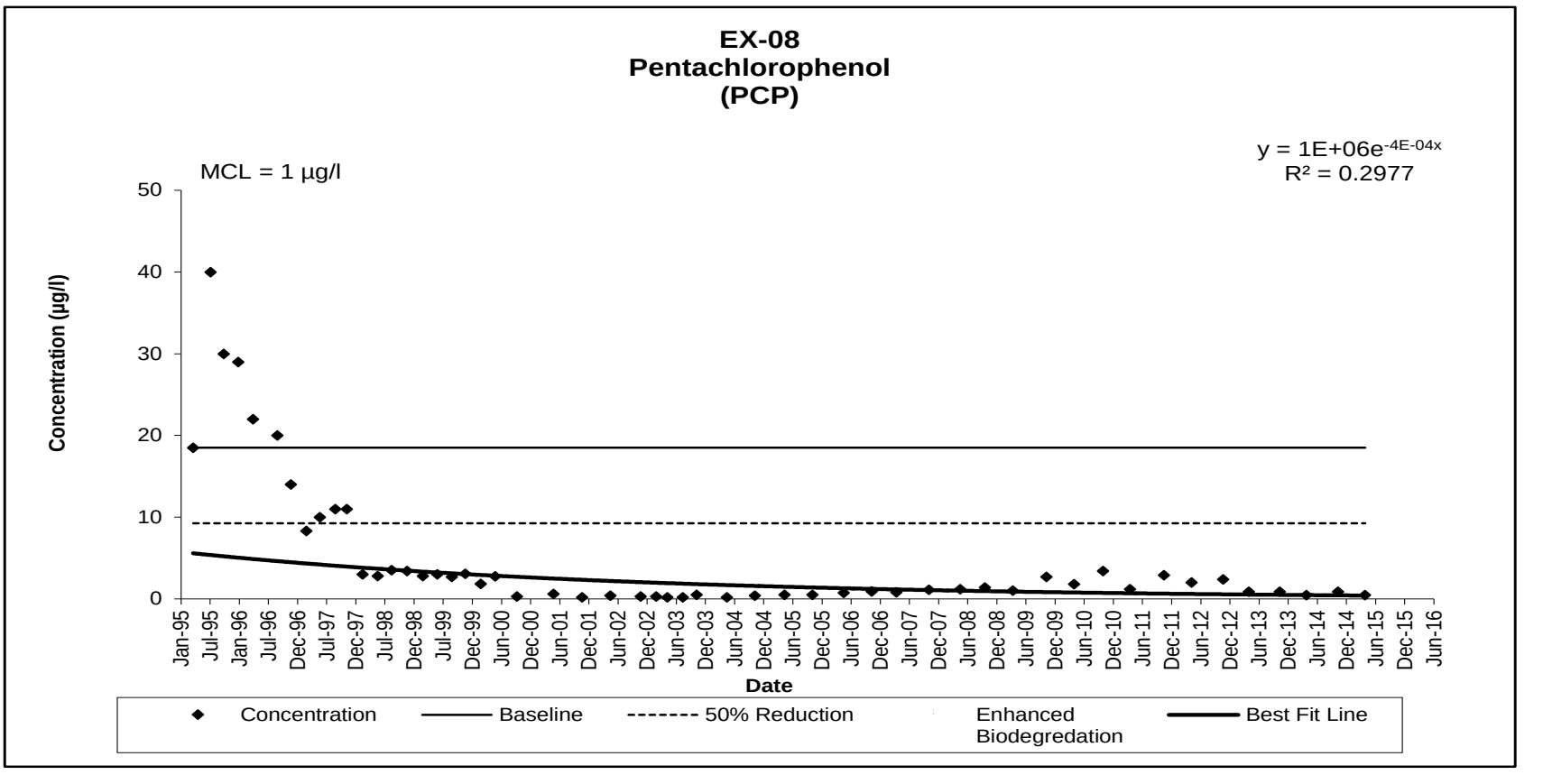


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08



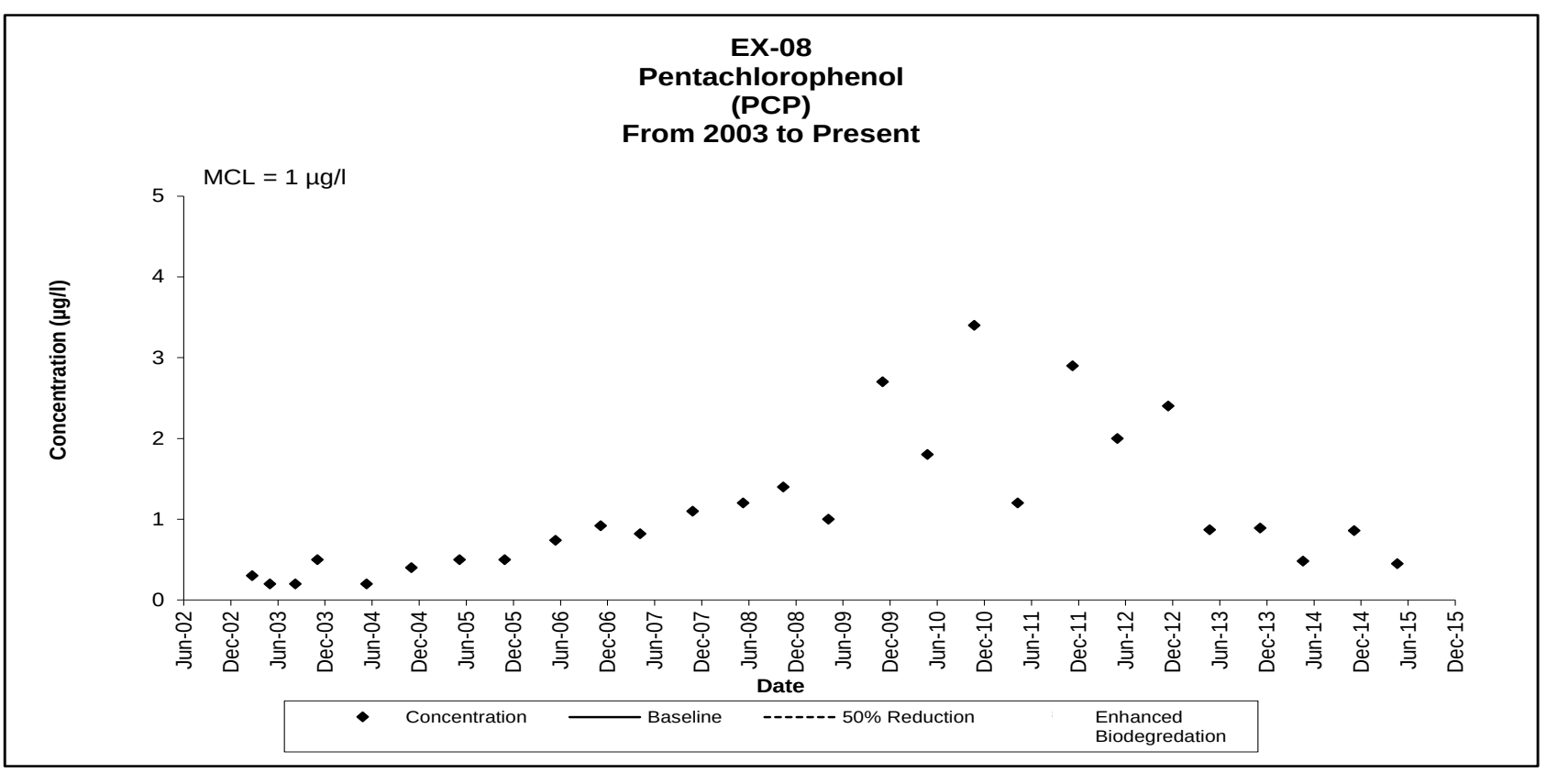


EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09

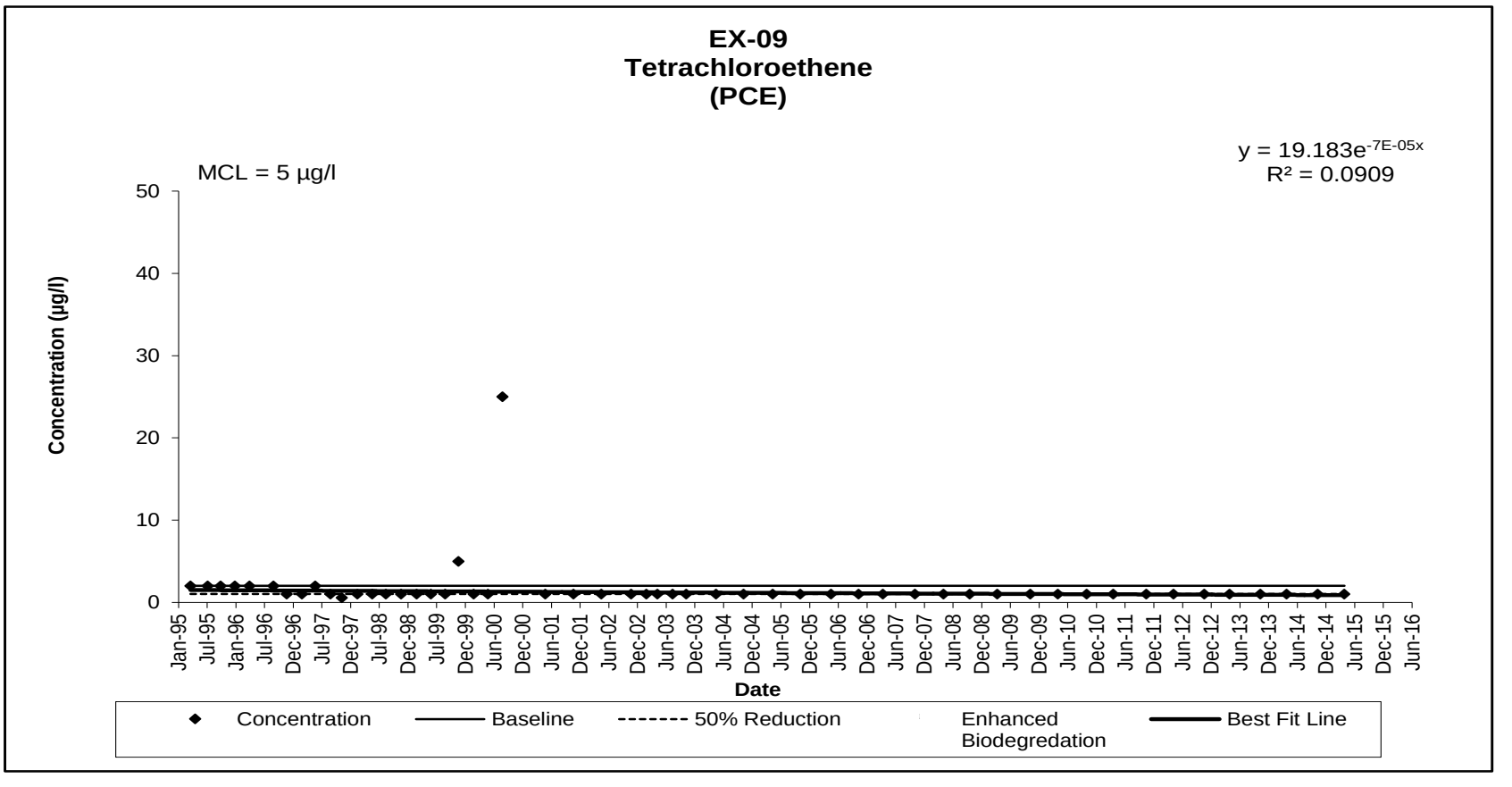
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	< 2	190	25	--	--	--	< 2	< 0.2 J
6-Jul-95	< 2	120	6.7	--	--	--	< 2 J	< 0.2 J
27-Sep-95	< 2	200	35	--	--	--	< 2	< 0.2
27-Dec-95	< 2	190	17	--	--	--	< 2	< 0.2
28-Mar-96	< 2	170	9.1	--	--	--	< 2	< 0.2
28-Aug-96	< 2	90	6.7	--	--	--	< 10	< 0.2
20-Nov-96	< 1	84	6.5	--	--	0.23	< 0.25	< 1
26-Feb-97	< 1	72	4.3	--	--	--	< 0.25	< 1
21-May-97	2	130	8	--	--	--	< 0.25	1
26-Aug-97	< 1	85	5.7	--	--	--	< 0.25	1
6-Nov-97	0.58 JB	60	4.1	--	--	--	< 0.25	< 1
12-Feb-98	< 1	19 B	1.9	--	--	--	< 0.25	< 1
19-May-98	< 1	38	3.5	--	--	--	< 0.25	< 1
12-Aug-98	< 1	73	5	--	--	--	< 0.25	< 1
17-Nov-98	< 1	29	2.8 J	--	--	--	< 0.25	< 0.5
24-Feb-99	< 1	30 J	2.3 J	--	--	--	< 0.25	< 0.5
26-May-99	< 1	12	1.1	--	--	--	< 4 UJ	< 0.5
25-Aug-99	< 1	35	2.7	--	--	--	< 0.2	< 0.1
17-Nov-99	< 5	21	1.9 T	--	--	--	< 0.2	< 0.1
22-Feb-00	< 1	9.2	1.4	--	--	--	< 0.2	< 0.1
24-May-00	< 1	17	1.7	--	--	--	< 0.2	< 0.1
23-Aug-00	25 D	310 D	19 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	0.43 J	< 0.5 UJ
23-May-01	< 1	5.9	0.8 T	--	--	--	< 0.5	< 0.5
19-Nov-01	< 1	4.6	1 T	--	--	--	< 0.5	< 0.5
15-May-02	< 1	2	< 1	--	--	--	< 0.5	< 0.5
20-Nov-02	< 1	2.9	1	--	--	--	< 0.48	< 0.48
26-Feb-03	< 1	2	0.8 T	--	--	< 1	< 0.48 UJ	< 0.48 UJ
6-May-03	< 1	1	1	--	--	< 1	< 0.5	< 0.5
12-Aug-03	< 1	0.8 T	1	--	--	< 1	< 0.5	< 0.5
5-Nov-03	< 1	1	2.4	--	--	< 1	< 2.4	< 0.48
13-May-04	< 1	0.5 T	< 1	--	--	< 1	--	0.1 T
4-Nov-04	< 1	0.7 T	0.7 T	--	--	< 1	--	< 0.48
10-May-05	< 1	0.5 T	< 1	--	--	< 1	--	< 0.5
1-Nov-05	< 1	0.4 T	0.6 T	--	--	< 1	--	< 0.5
16-May-06	< 1	0.42 T	0.32 T	--	--	< 1	--	< 0.5
7-Nov-06	< 1	0.7 T	1.3	--	--	< 1	--	< 0.5
10-Apr-07	< 1	0.27 T	1.7	--	--	0.22 T	--	< 0.5
30-Oct-07	< 1	0.6 T	1.8	--	--	1.2	--	< 0.5
30-Apr-08	< 1	< 1	0.61 T	--	--	< 1	--	< 0.5
13-Oct-08	< 1	0.36 T	1.8	--	--	< 1	--	< 0.5
7-Apr-09	< 1	0.29 T	2	24	6	< 1	--	< 0.5
3-Nov-09	< 1	0.33 T	1.6	19	5.8	< 1	--	< 0.5
27-Apr-10	< 1	0.28 T	2.8	35	10	< 1	--	< 0.5
27-Oct-10	< 1	0.25 T	1.7	26	8.2	< 1	--	< 0.5
14-Apr-11	< 1	0.21 T	1.2	17	5.6	< 1	--	< 0.5
10-Nov-11	< 1	0.24 T	1.2	15	5.3	< 1	--	< 0.5
21-Dec-11	--	--	--	--	--	--	--	< 0.5
1-May-12	< 1	0.21 T	2.1	25	7	0.22 T	--	--
13-Nov-12	< 1	0.29 T	2.5	35	9	0.22 T	--	--
23-Apr-13	< 1	0.23 T	2	25	7.5	< 1	--	--
5-Nov-13	< 1	0.26 T	2.2	28	8.8	< 1	--	--
22-Apr-14	< 1	< 1	2.7	31	10	0.24 T	--	--
4-Nov-14	< 1	0.22 T	2.3	30	11	0.21 T	--	--
23-Apr-15	< 1	0.17 T	2.1	30	9.1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09



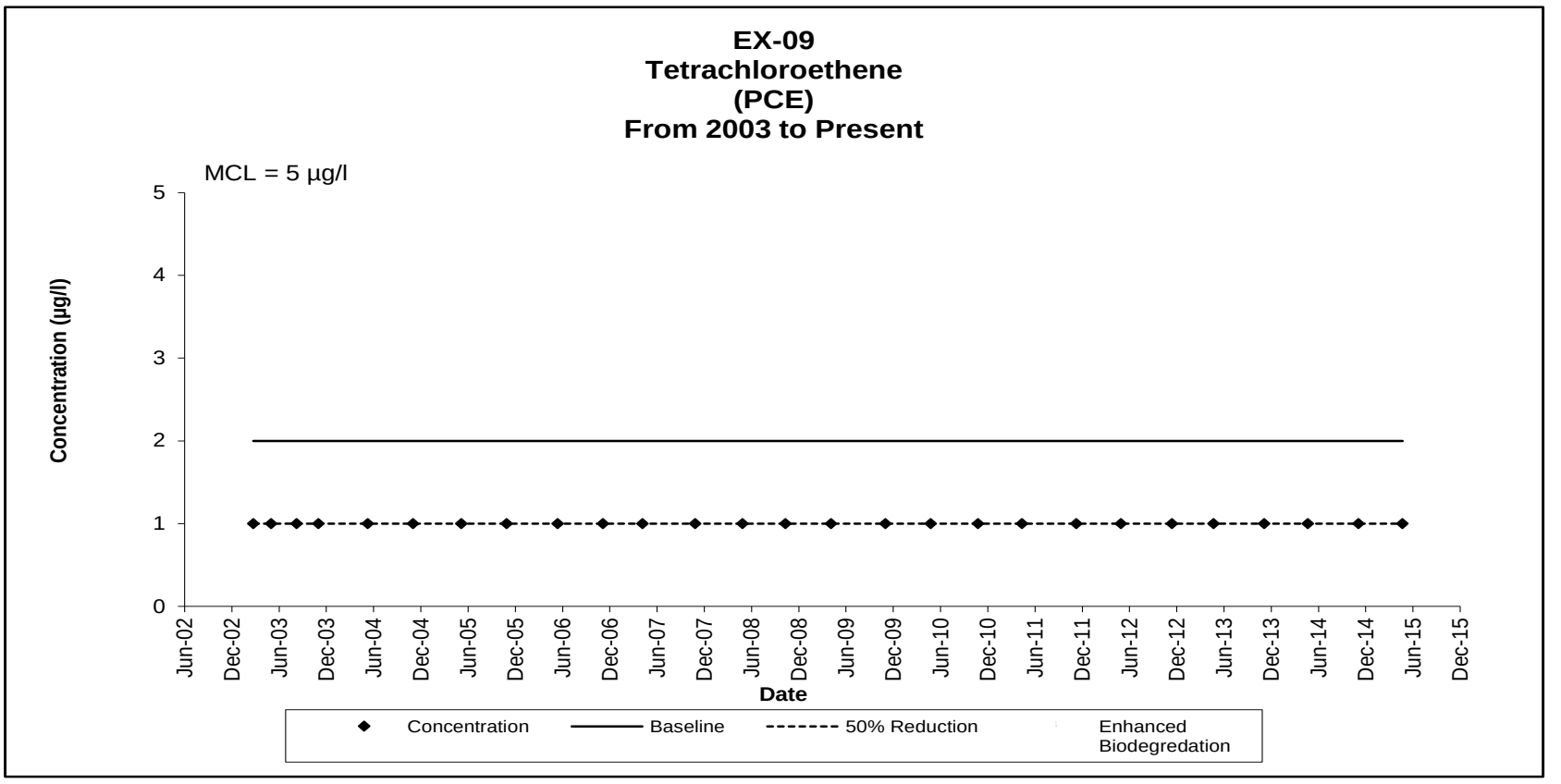
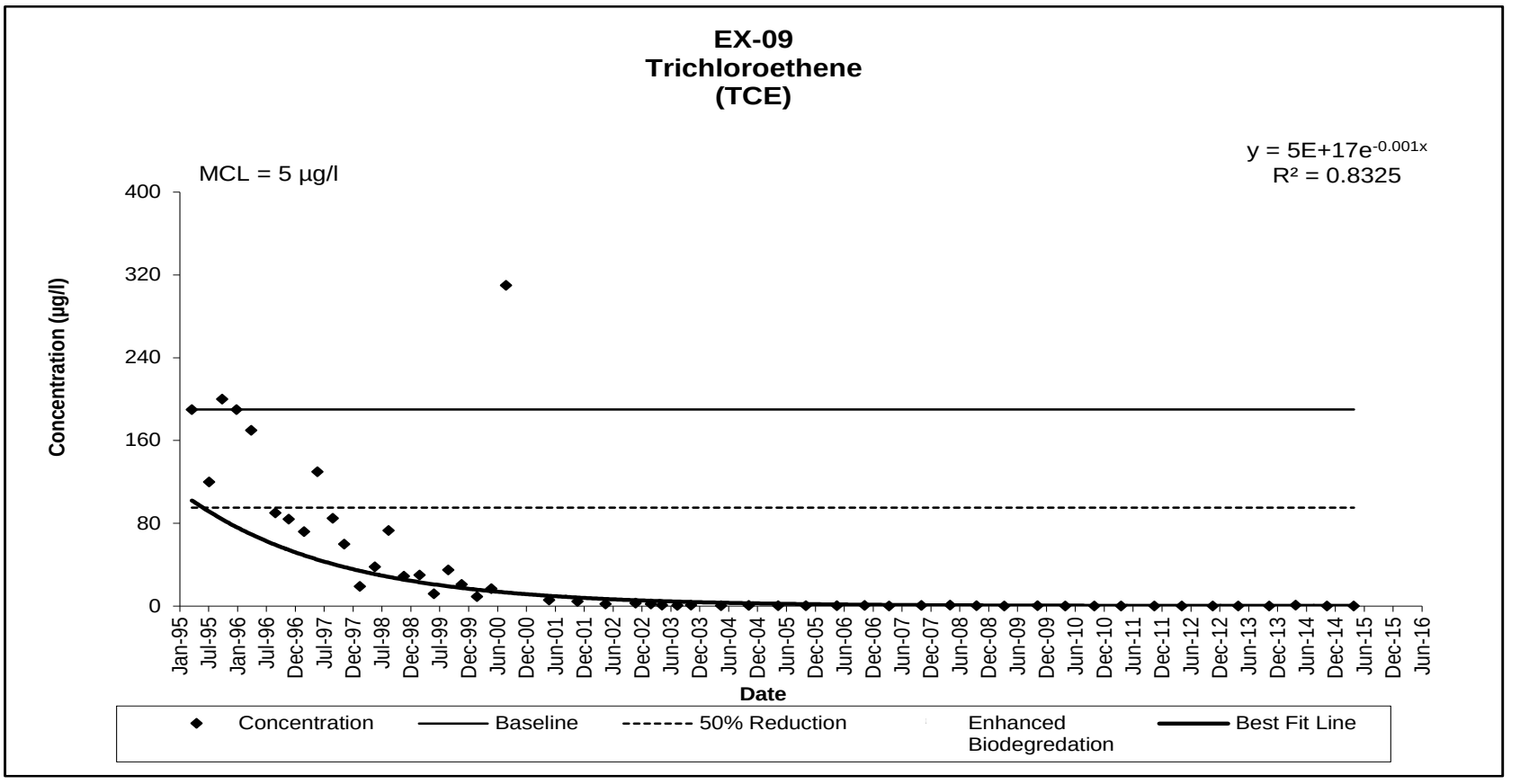


EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09



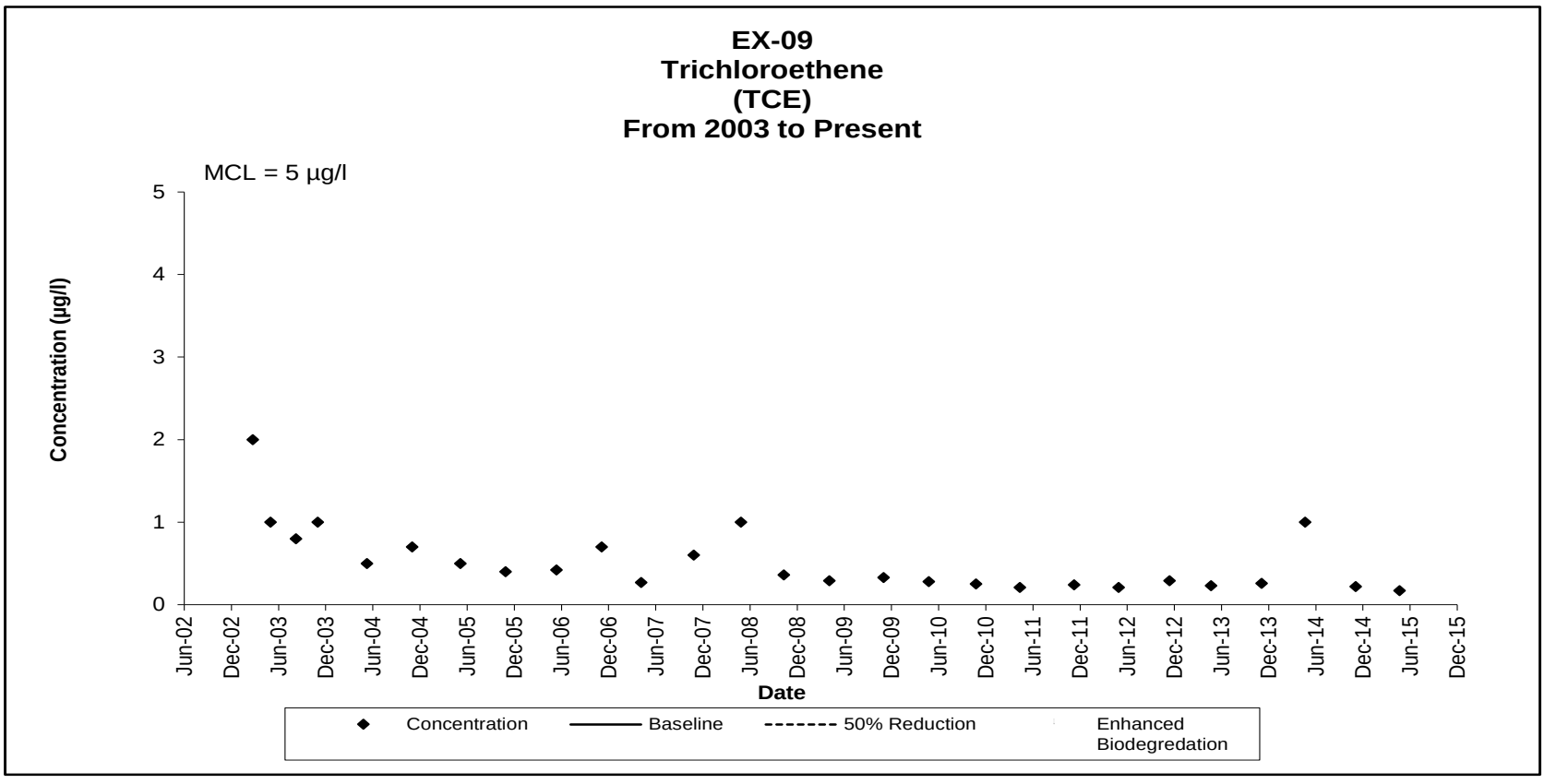
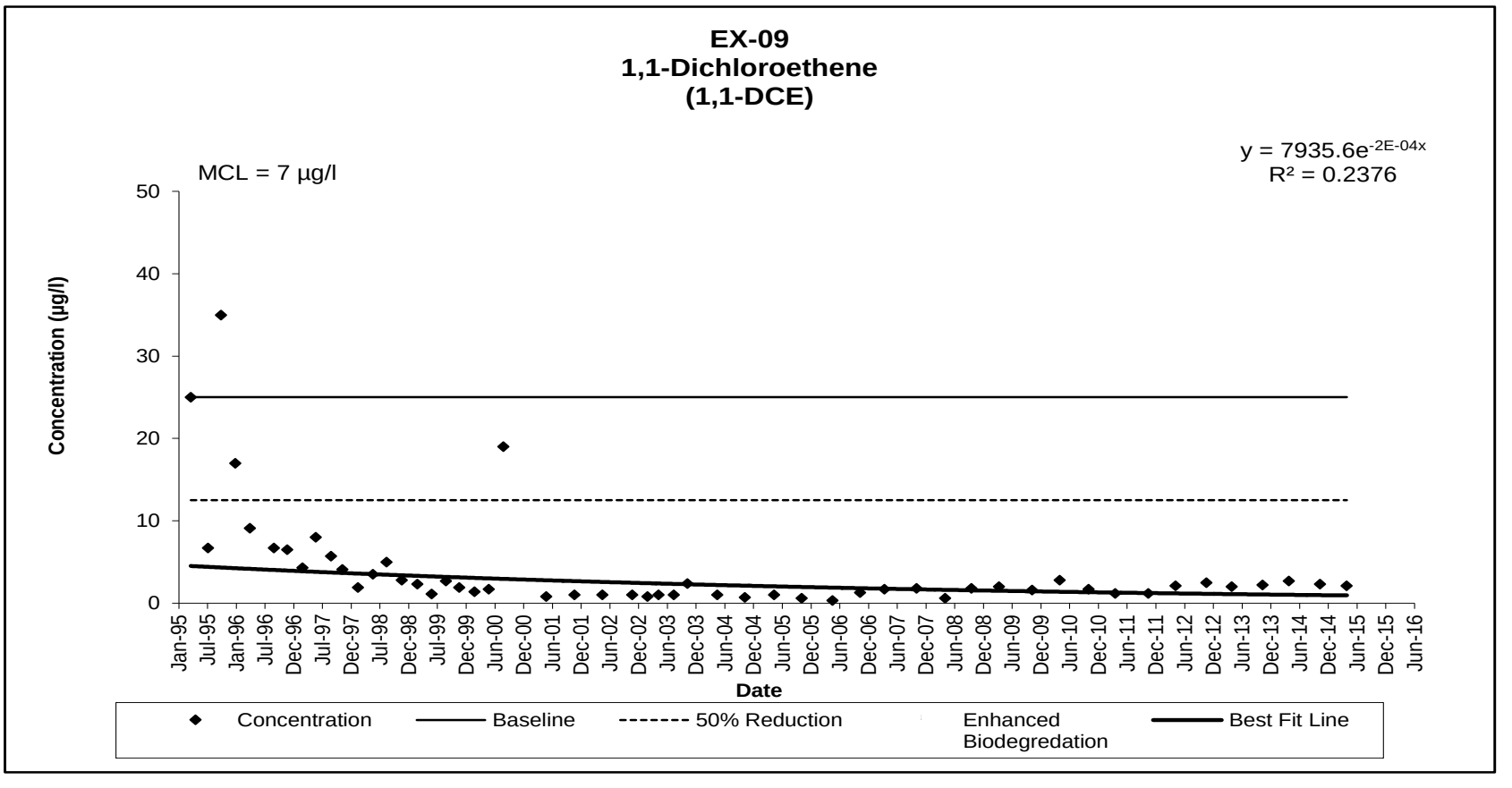


EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09



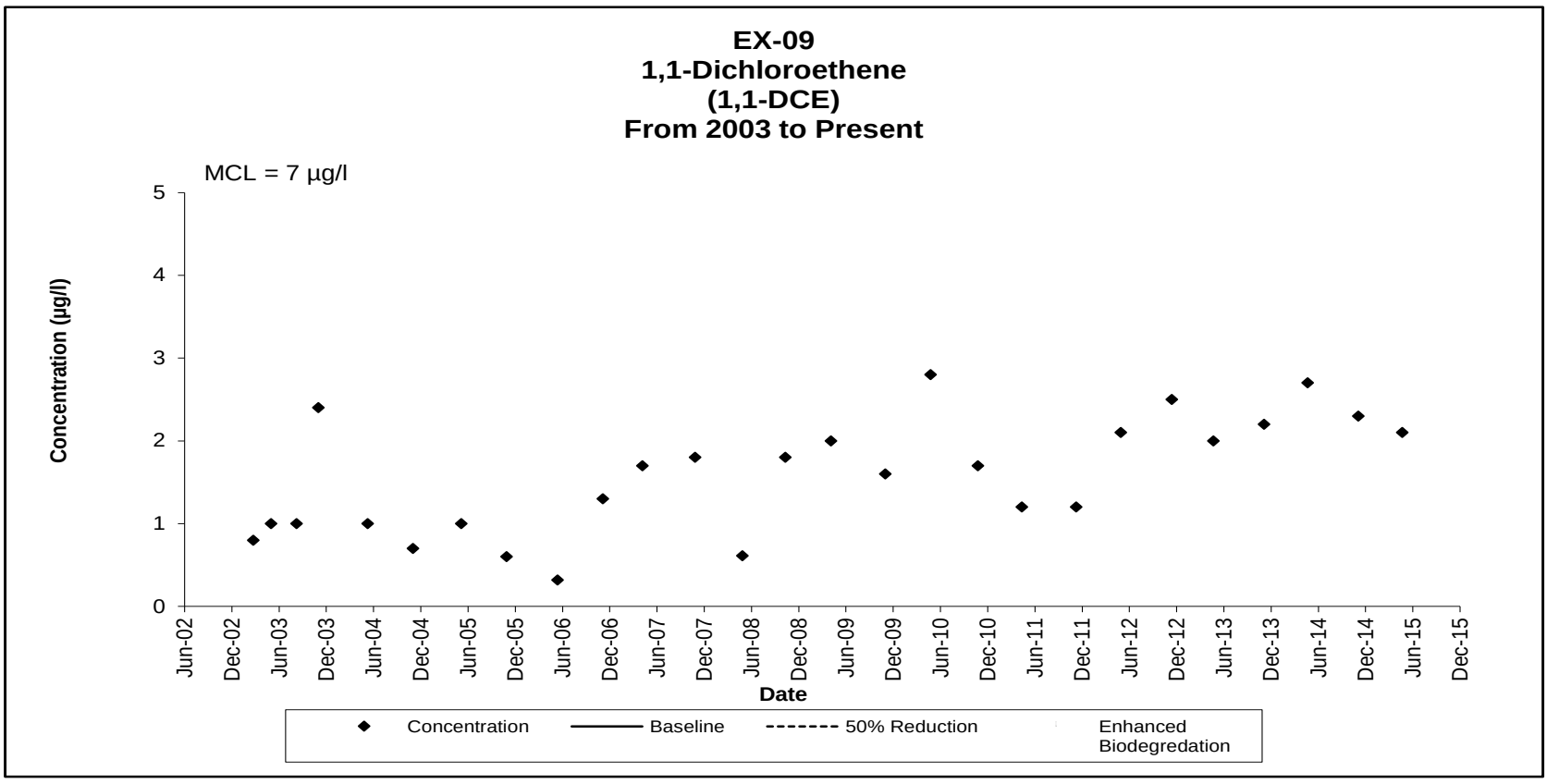
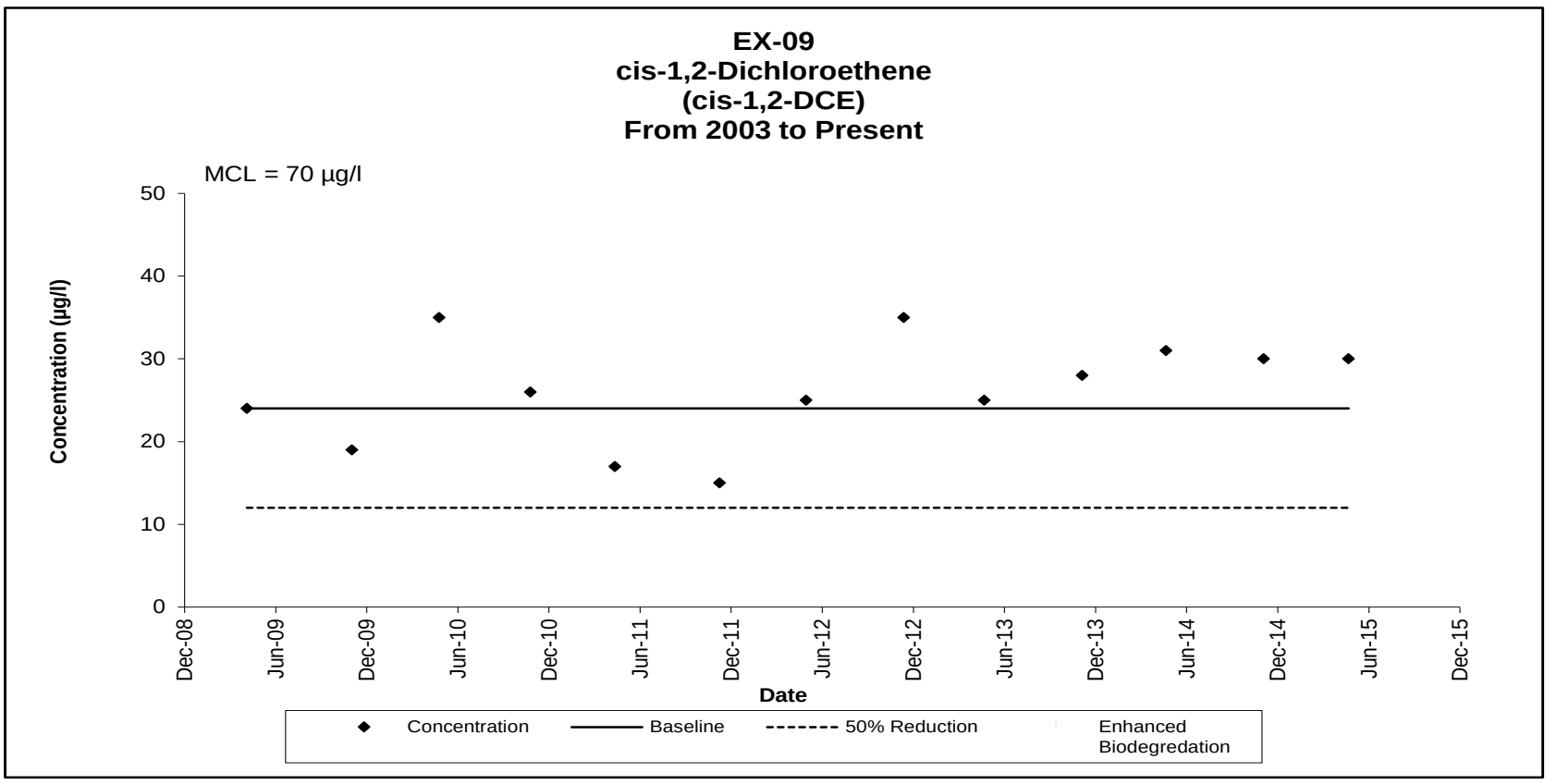


EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09



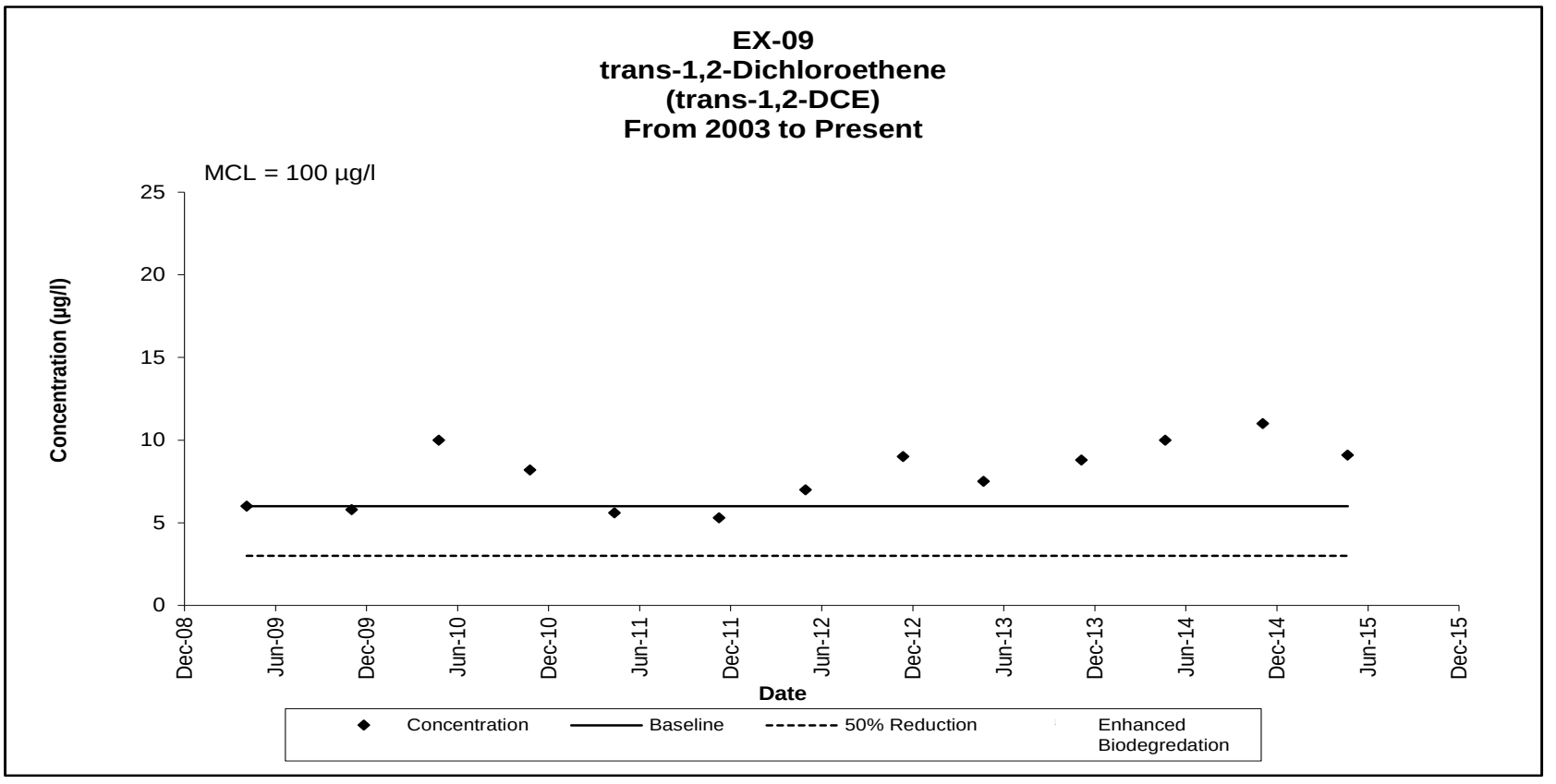
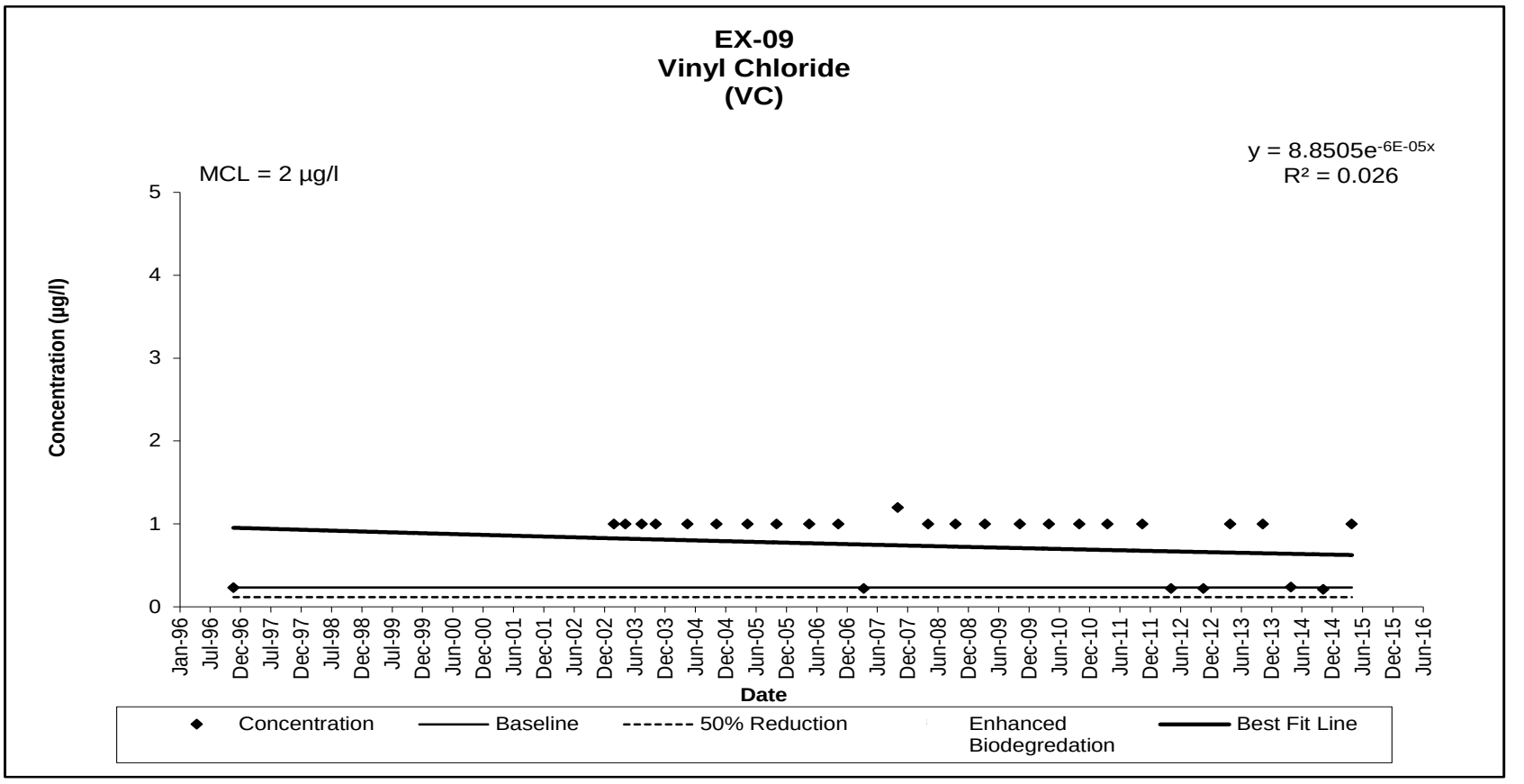


EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09



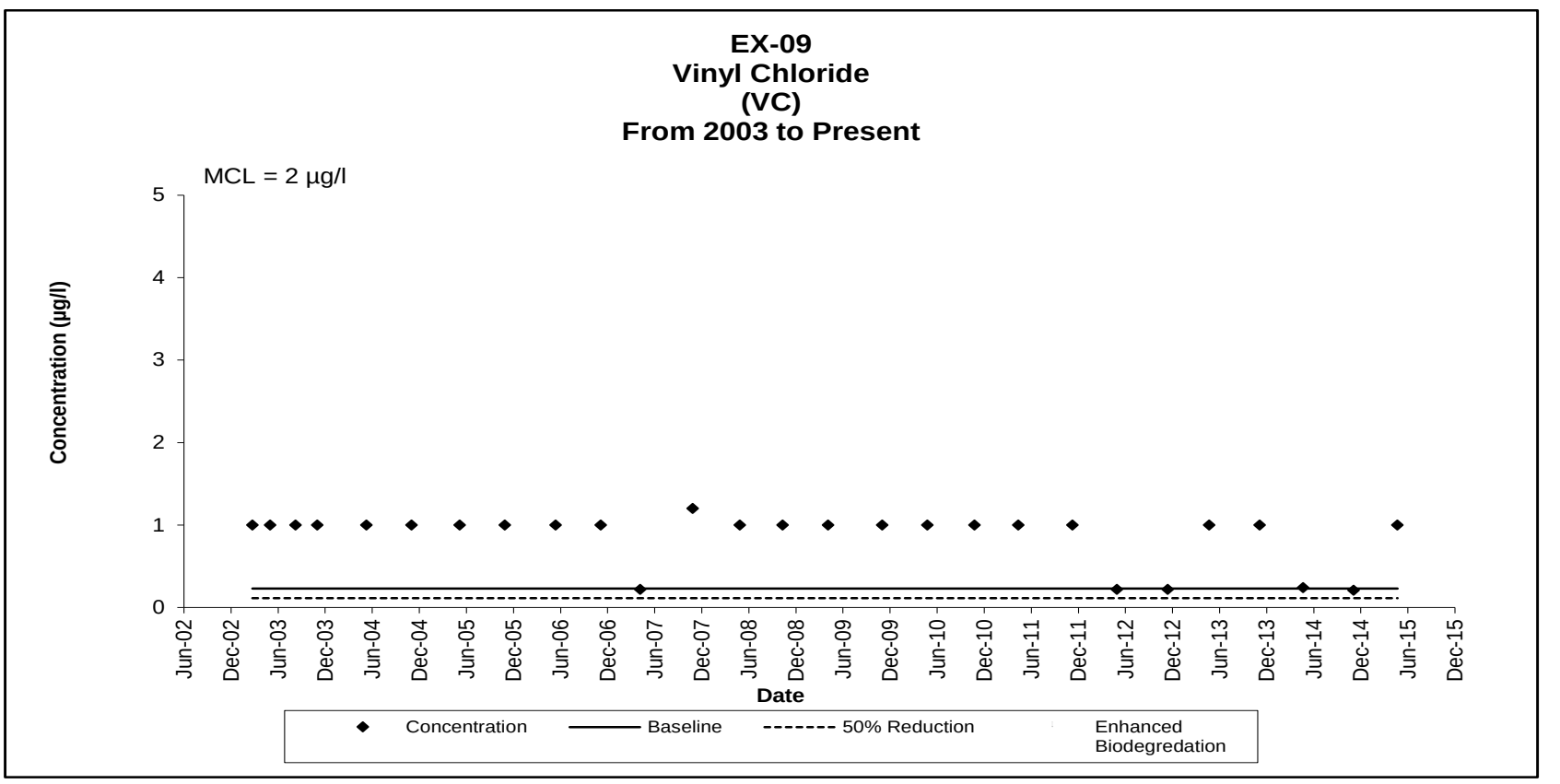


EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11

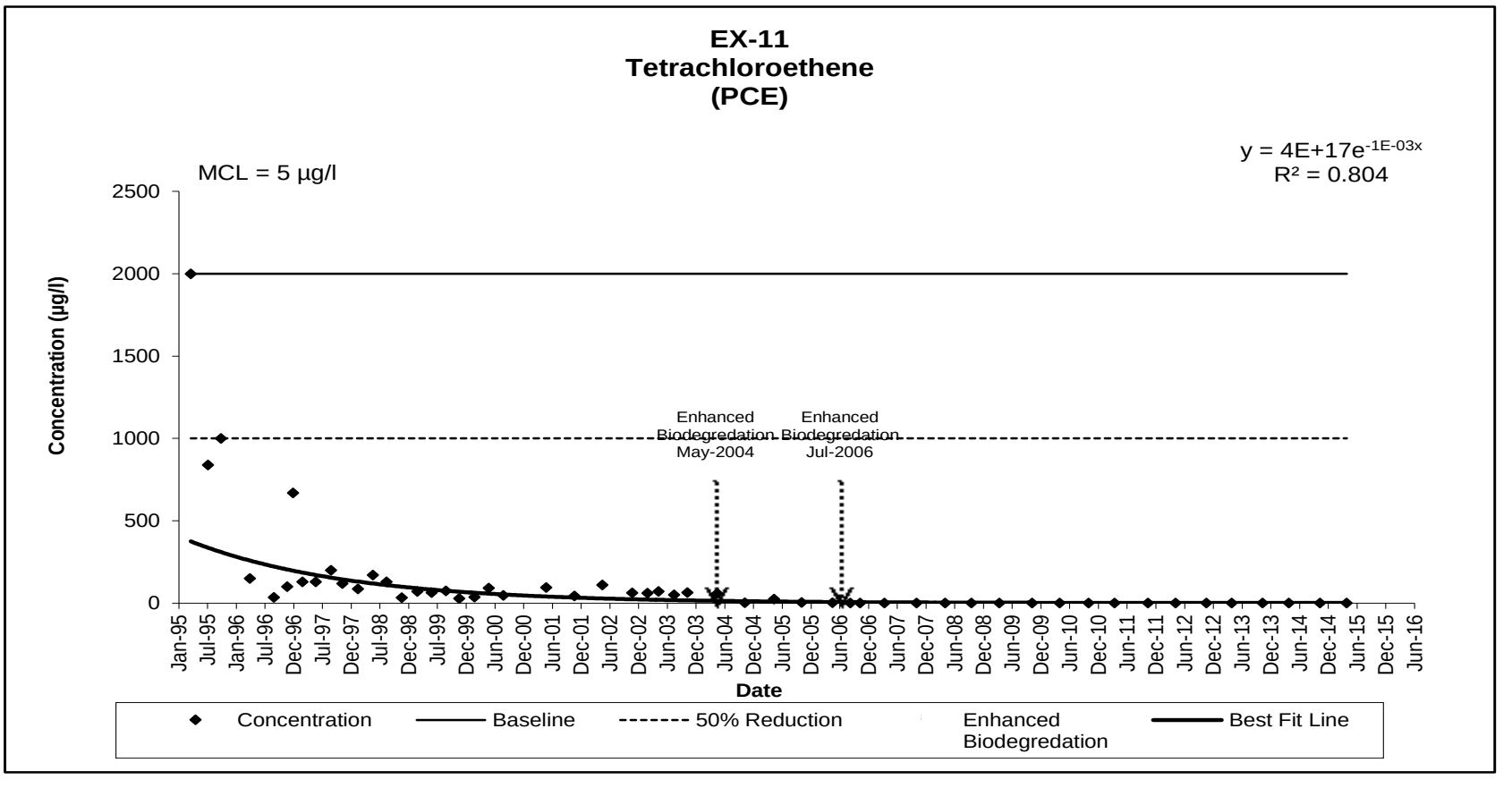
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	2000	5900	380	--	--	--	3.89 J	< 2 J
6-Jul-95	840	3200	< 200	--	--	--	< 20 J	< 0.2 J
27-Sep-95	1000	1600	210	--	--	--	< 2	< 0.2
28-Mar-96	150	380	28	--	--	--	< 2	< 0.2
28-Aug-96	36	390	36	--	--	--	< 10	< 0.2
20-Nov-96	100	560	34	--	--	130	< 0.6 UJ	< 1
27-Dec-96	670	920	63	--	--	--	< 2	< 0.2
26-Feb-97	130	470	25	--	--	--	< 0.25	< 1
21-May-97	130	300	33	--	--	--	< 0.25	1
26-Aug-97	200	560	39	--	--	--	< 2.5	1
6-Nov-97	120	560	33	--	--	--	< 2.5	< 1
12-Feb-98	86 B	330 B	26	--	--	--	< 0.25	< 1
19-May-98	170	420	34	--	--	--	< 0.25	< 1
12-Aug-98	130	420	35	--	--	--	< 0.55	< 1
17-Nov-98	34	400	31 J	--	--	--	< 2.5 G	< 0.6 G
24-Feb-99	72 J	530 J	30 J	--	--	--	< 2.5 G	< 0.5
26-May-99	65	250 J	15	--	--	--	< 4 UJ	< 0.5
25-Aug-99	74	420	23	--	--	--	5.68	0.631
17-Nov-99	29 T	480	26 T	--	--	--	< 0.2	< 0.1
22-Feb-00	37	400	24	--	--	--	< 0.2	< 0.1
24-May-00	91	480 J	22	--	--	--	< 0.2	< 0.1
23-Aug-00	47 D	420 D	21 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	4.66	0.45
23-May-01	95 D	382 D	27 D	--	--	--	< 0.5	0.1 T
19-Nov-01	43 D	392 D	29 D	--	--	--	< 0.5	< 0.5
15-May-02	110 D	402 D	27 D	--	--	--	< 0.48	< 0.48
20-Nov-02	62 DJ	347 D	31 DJ	--	--	--	< 0.48	< 0.48 UJ
26-Feb-03	61	339	24	--	--	170	< 0.48 UJ	< 0.48 UJ
6-May-03	72 D	420 D	24	--	--	247 D	< 0.5	< 0.5 UJ
13-Aug-03	50	374 D	35	--	--	271 D	< 0.5	< 0.5 J
5-Nov-03	64 D	362 D	35 D	--	--	394 D	< 2.4	< 0.48 UJ
13-May-04	59 J	460 D	51 J	--	--	658 D	--	0.1 TJ
4-Nov-04	2.7	120 D	12	--	--	617 DJ	--	< 0.48 UJ
10-May-05	< 25 D	120 D	19 TD	--	--	500 D	--	< 0.5 UJ
31-Oct-05	< 5 D	82 D	15 D	--	--	580 D	--	< 0.5 UJ
16-May-06	3.2	210 DJ	20	--	--	380 DJ	--	< 0.5
6-Sep-06	0.56 T	23	0.99 T	--	--	310 D	--	--
6-Nov-06	0.36 TJ+	13 J+	1.2 J+	--	--	160 D	--	< 0.5
10-Apr-07	0.29 T	15	3.6	--	--	300 D	--	< 0.5
30-Oct-07	< 1	4.3	0.74 T	--	--	480 DJ	--	< 0.5
30-Apr-08	1.2	64 D	18	--	--	920 D	--	< 0.5
14-Oct-08	< 1	3.8	1.1	--	--	520 D	--	< 0.5
8-Apr-09	< 1	83 D	23	1200 D	120 D	560 D	--	< 0.5
3-Nov-09	< 1	2.5	3.4	300 D	78 D	840 D	--	< 0.5
26-Apr-10	< 1	35	20	1300 D	100	550 D	--	< 0.5
27-Oct-10	< 1	2.3	4.1	420 D	87	790 DJ-	--	< 0.5
11-Apr-11	1.7	26	15	740 D	81	230 D	--	< 0.5
9-Nov-11	< 1	2	1.2	97	54	240 D	--	< 0.5
1-May-12	< 1	14	6.1	360 D	73	590 D	--	< 0.5
13-Nov-12	< 1	3	1.3	140 D	65	470 D	--	< 0.5
24-Apr-13	< 1	69	15	670 D	84	460 D	--	< 0.5
5-Nov-13	< 1	2.3	0.43 T	34	54 D	180 D	--	< 0.5
22-Apr-14	< 1	3.8	8.8	430 D	88	530 D	--	< 0.5
4-Nov-14	< 1	1.1	0.45 T	32	61	170 D	--	< 0.5
23-Apr-15	< 1	0.79 T	0.23 T	15	49	72	--	< 0.5

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11



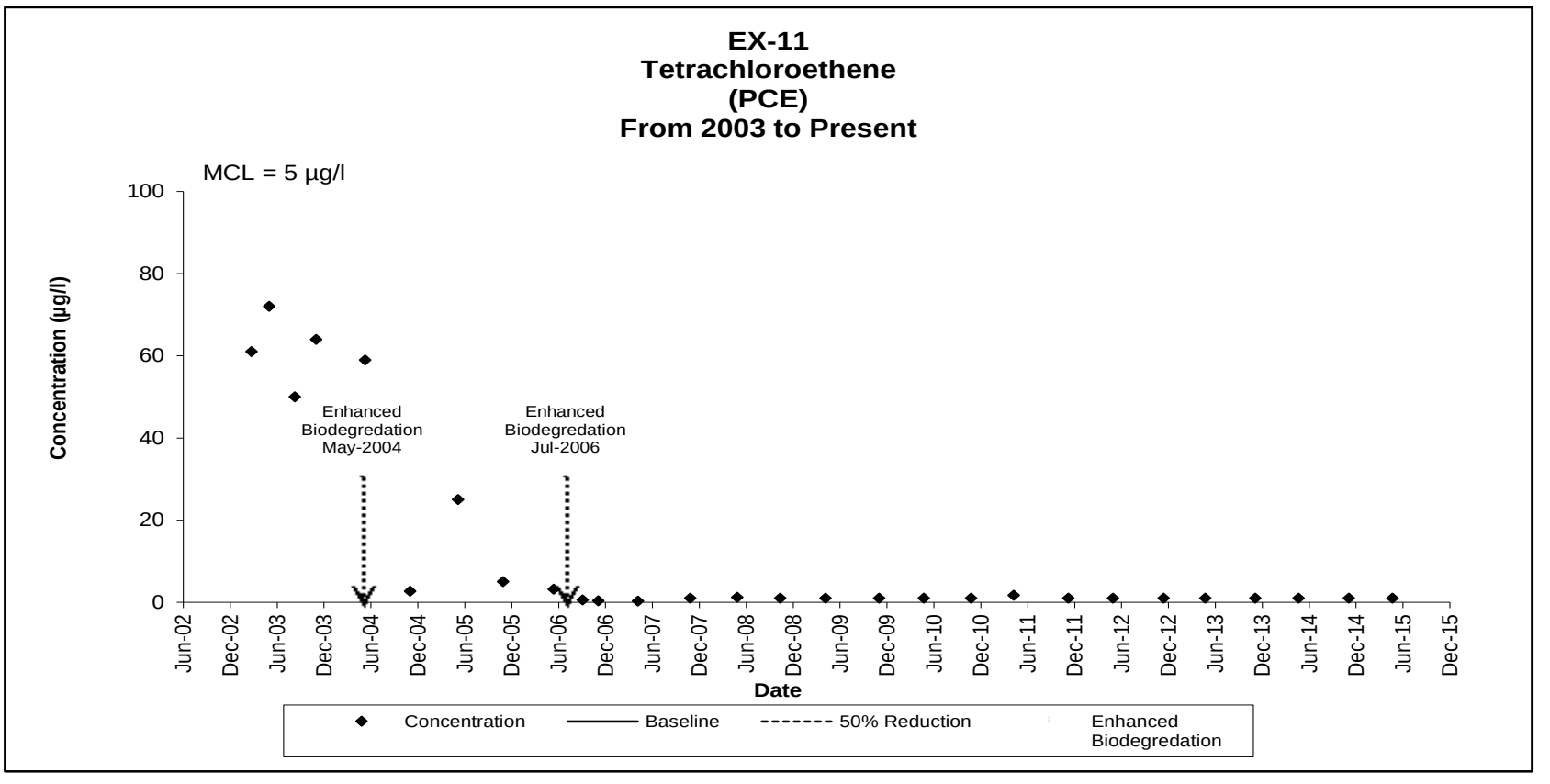


EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11

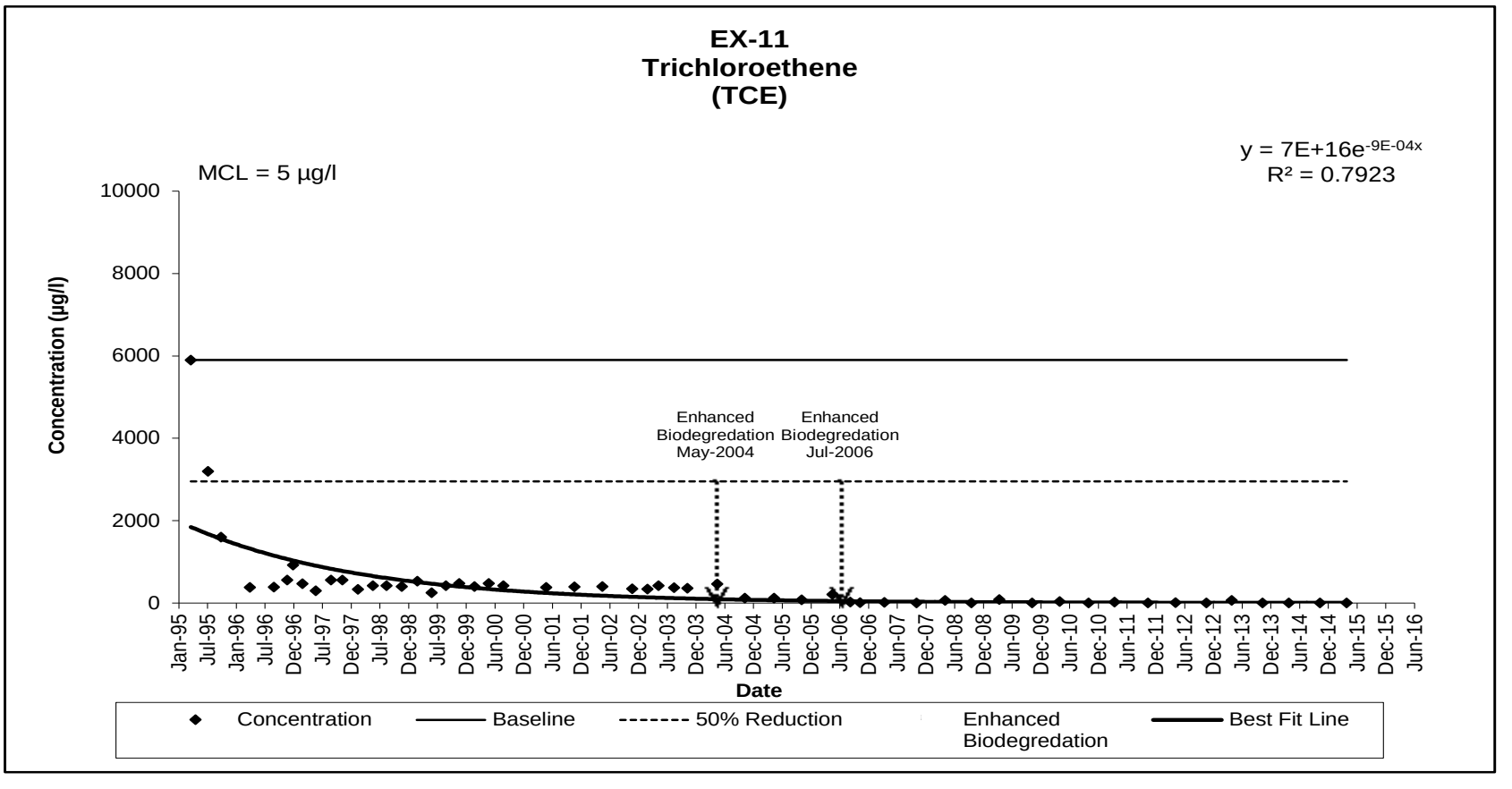
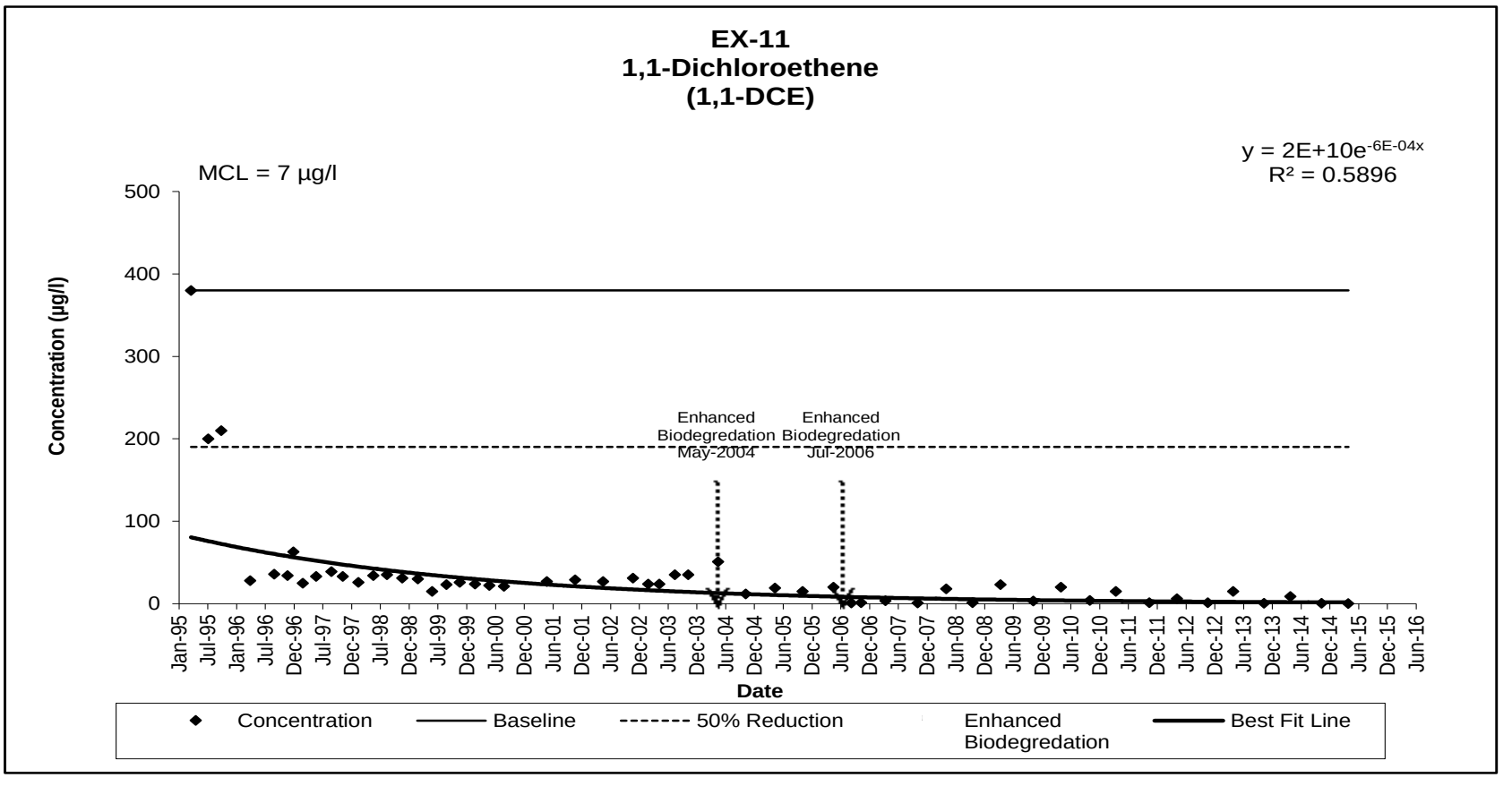


EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11



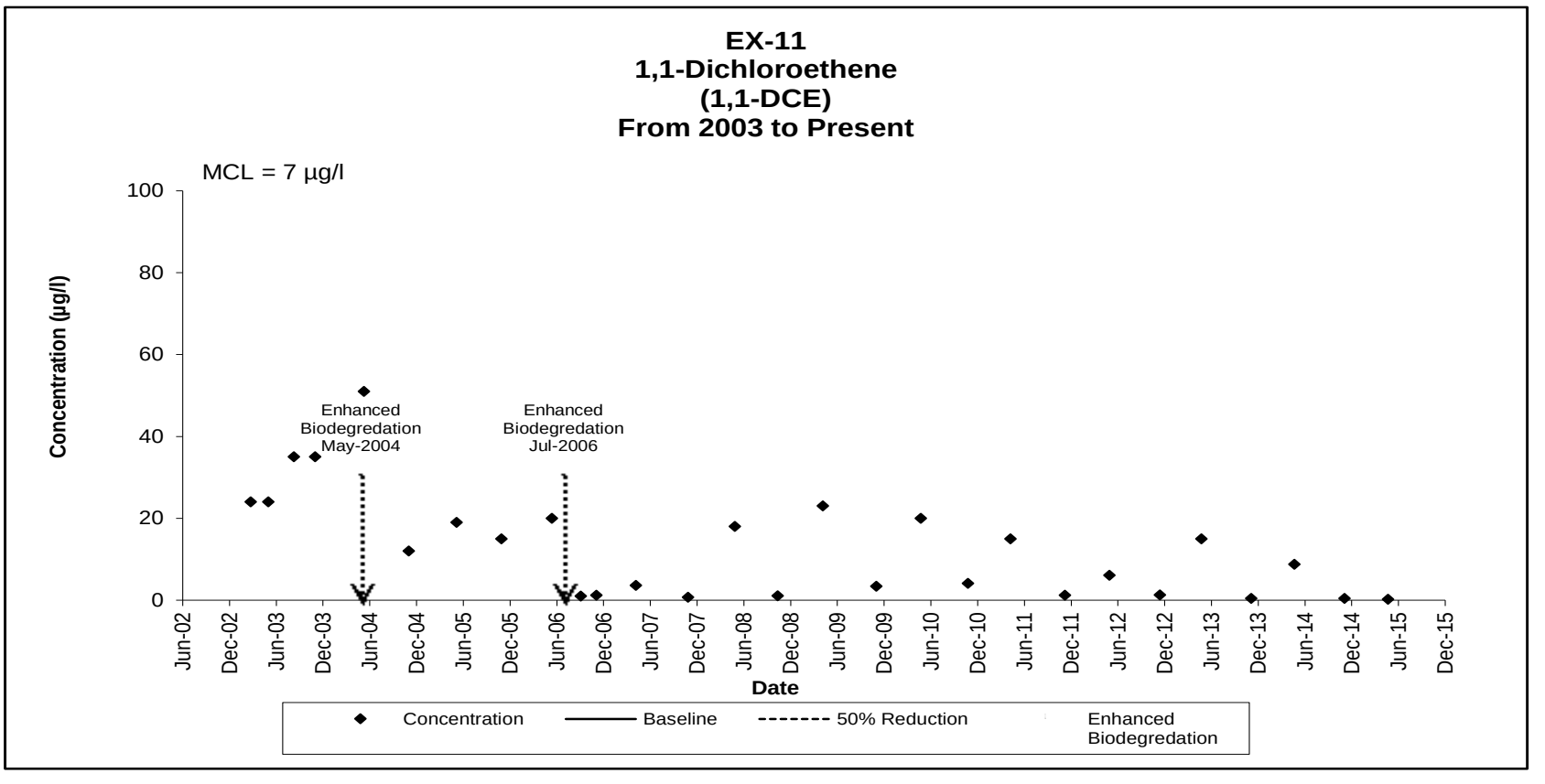
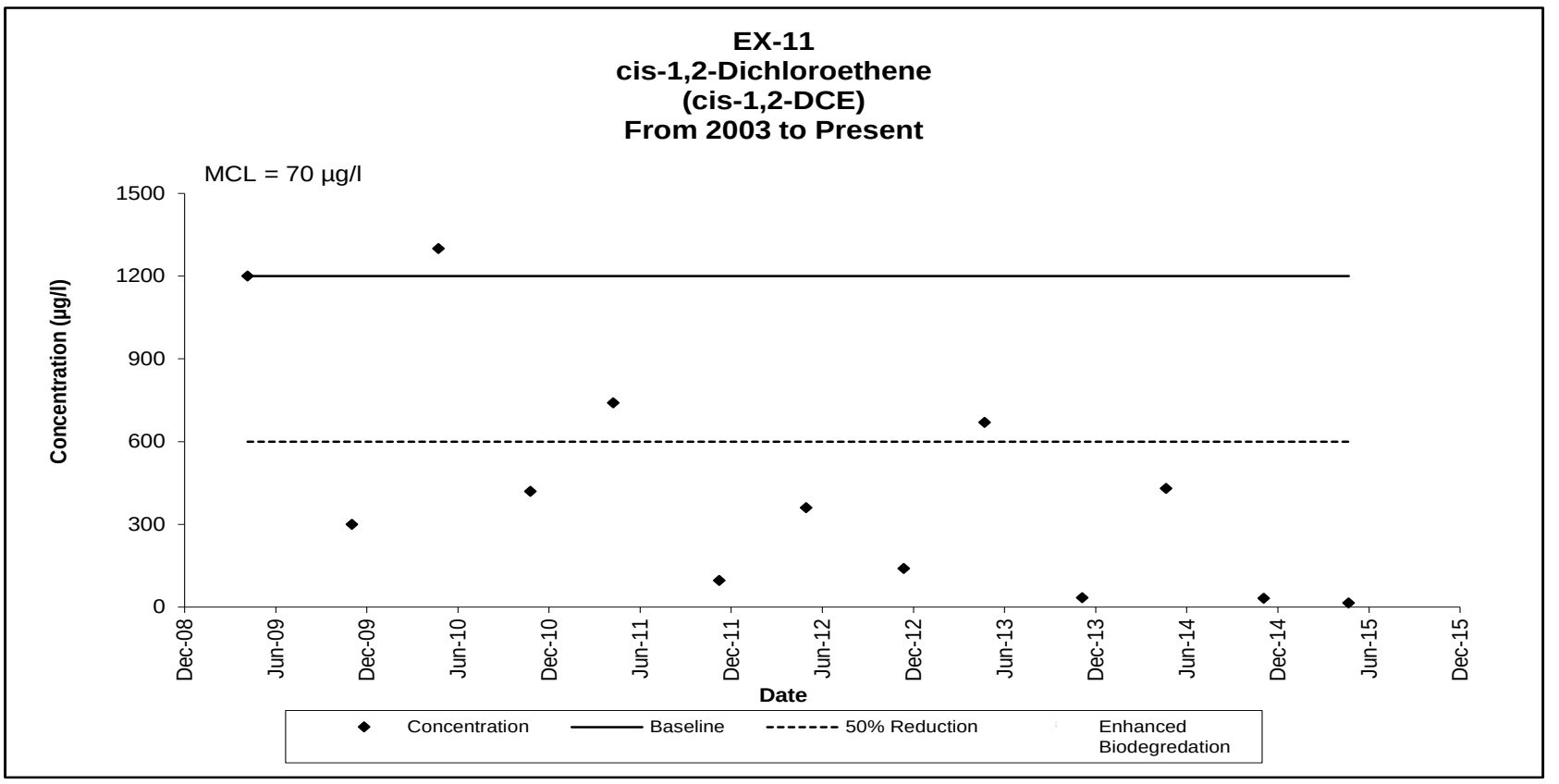


EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11



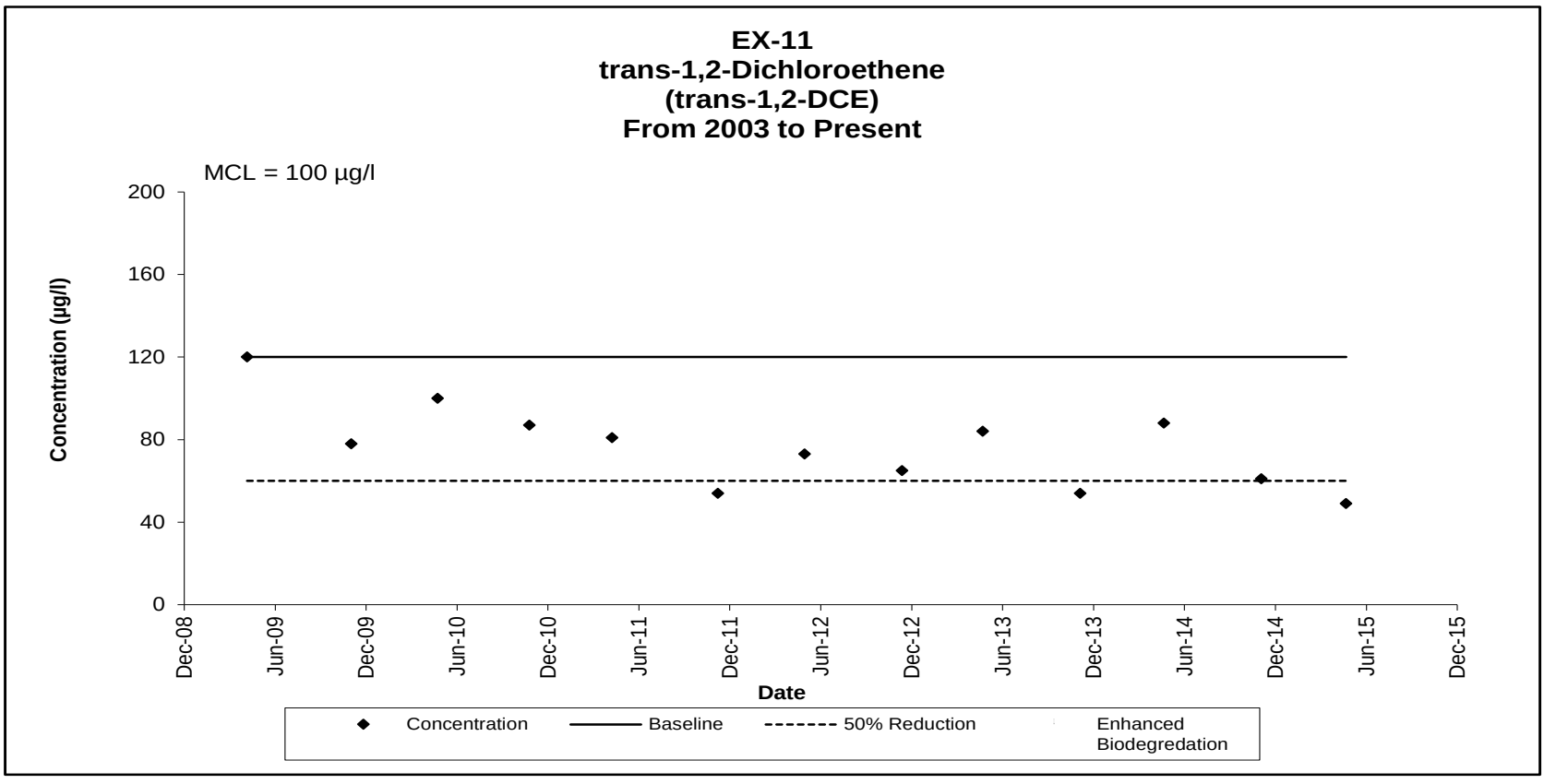
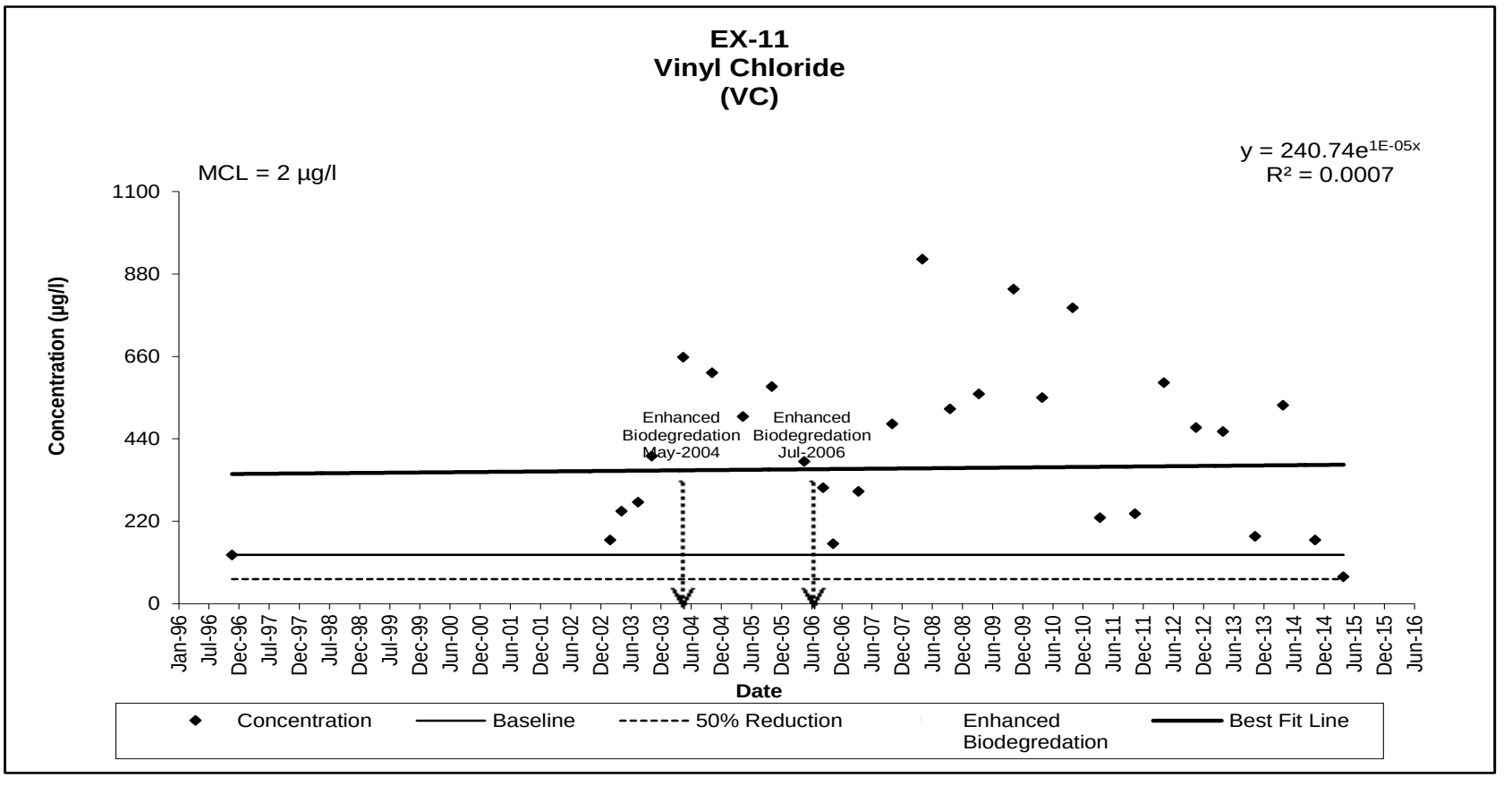


EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11



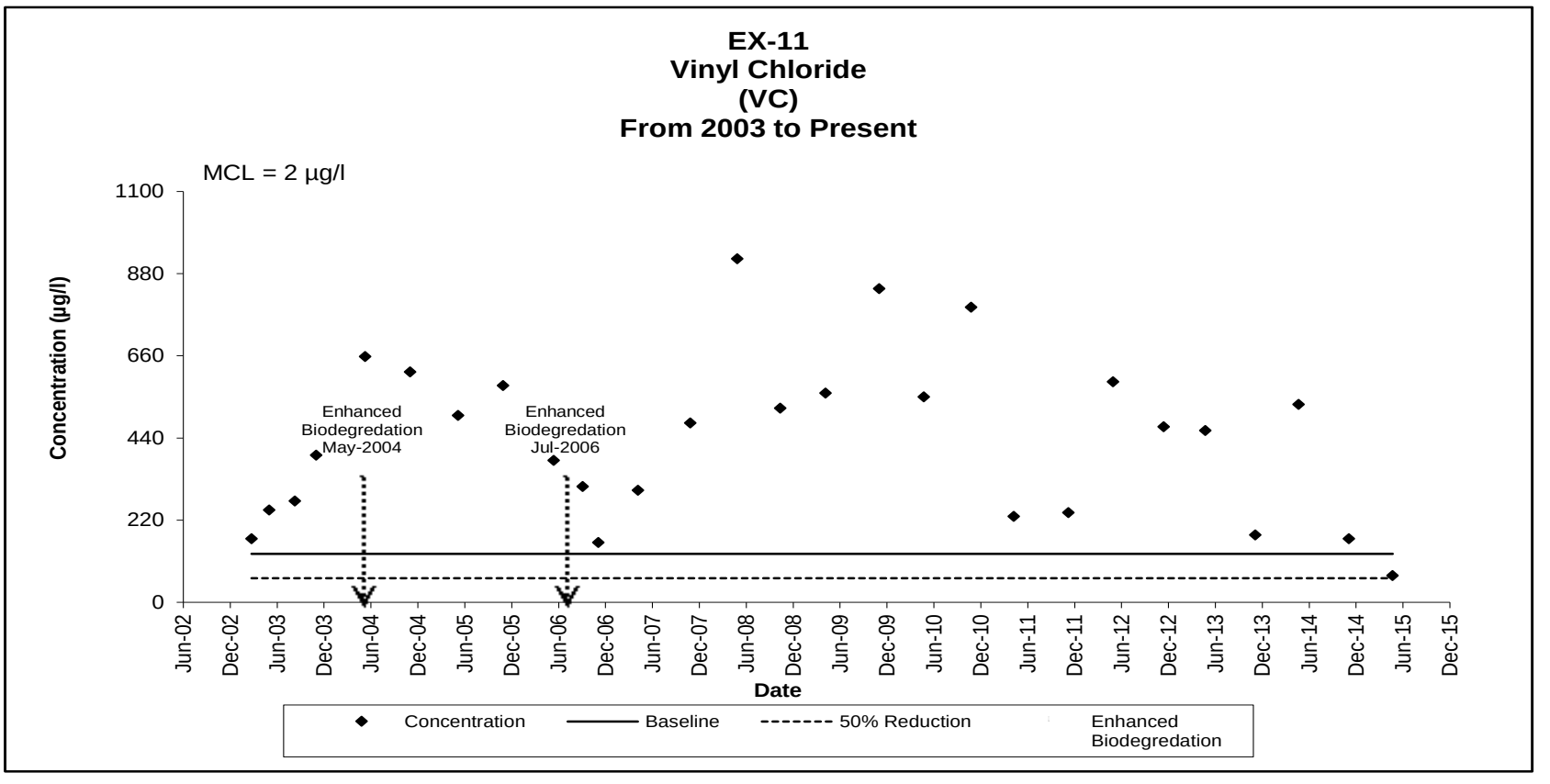


EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06

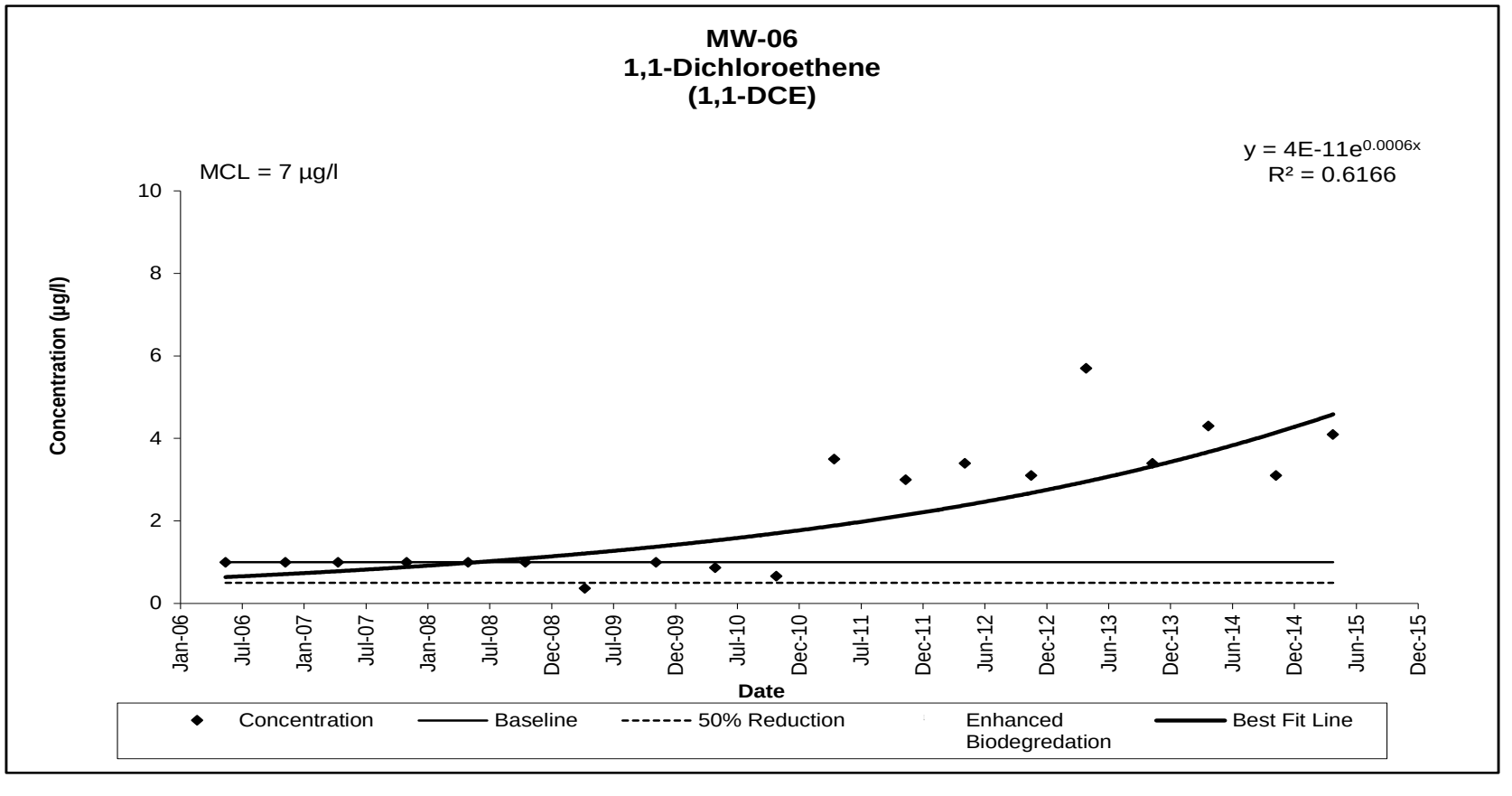
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	0.3 T	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	0.21 T	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	0.59 T	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	0.37 T	1.9	0.31 T	0.24 T	--	--
4-Nov-09	< 1	< 1	< 1	0.86 T	< 1	< 1	--	--
27-Apr-10	< 1	< 1	0.87 T	5.3	0.65 T	< 1	--	--
25-Oct-10	< 1	< 1	0.66 T	4.5	0.61 T	0.3 T	--	--
13-Apr-11	< 1	< 1	3.5	21	3.2	1.5	--	--
10-Nov-11	< 1	< 1	3	18	2.8	0.98 T	--	--
3-May-12	< 1	< 1	3.4	19	3.1	1.5	--	--
14-Nov-12	< 1	0.53 T	3.1	23	4.3	1.2	--	--
25-Apr-13	< 1	0.25 T	5.7	28	5.1	1.9	--	--
7-Nov-13	< 1	0.29 T	3.4	25	4.8	1.4	--	--
21-Apr-14	< 1	0.21 T	4.3	24	5.3	1.4	--	--
6-Nov-14	< 1	0.18 T	3.1	22	4.6	1.1	--	--
23-Apr-15	< 1	0.2 T	4.1	34	6.9	1.2	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06



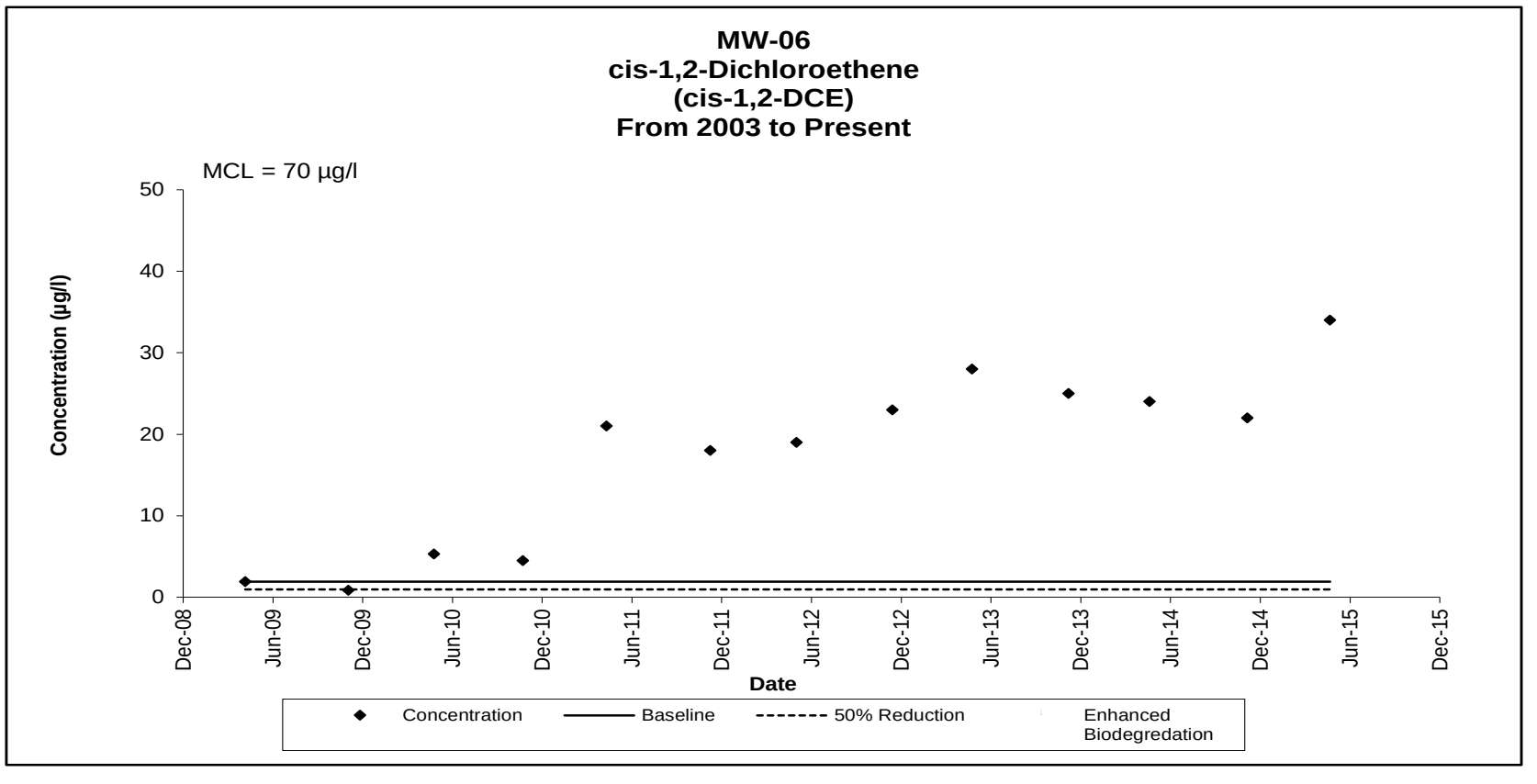


EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06

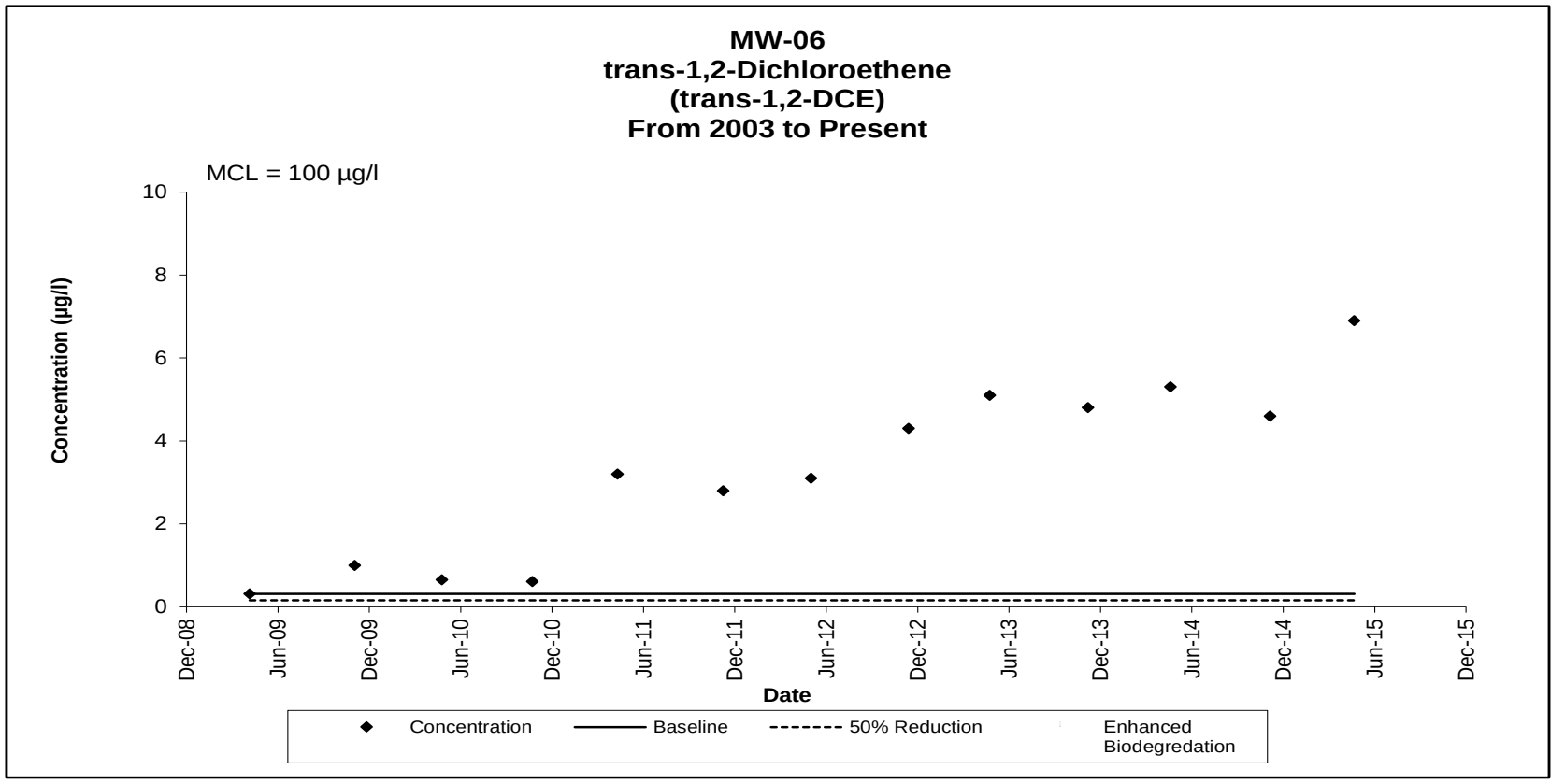


EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20

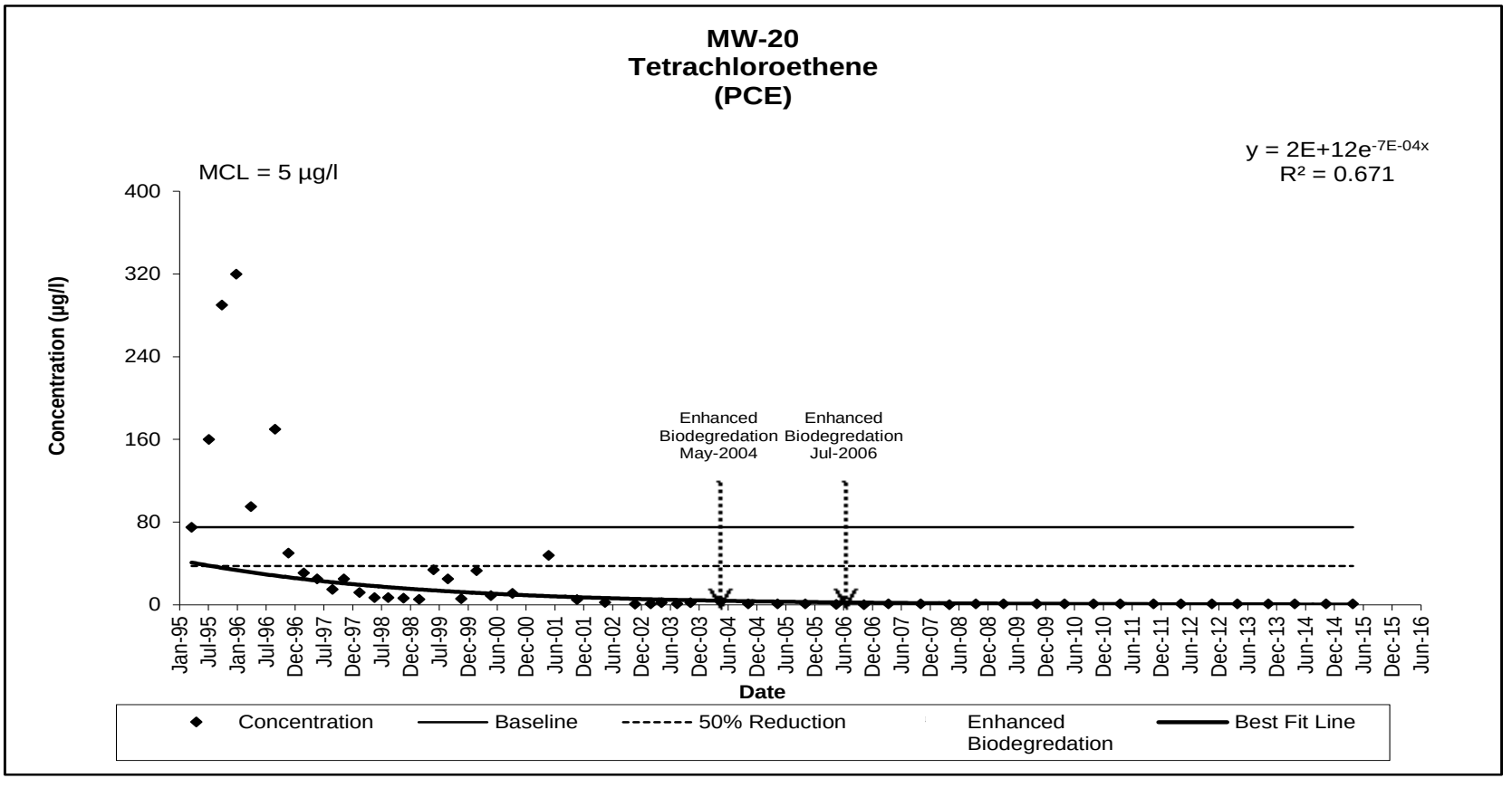
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	75 J	3600 J	350 J	--	--	--	< 2	< 0.2 J
6-Jul-95	160	3600	150	--	--	--	< 2	< 0.2
27-Sep-95	290	5500	580	--	--	--	< 2	< 0.2
27-Dec-95	320	3400	87	--	--	--	< 2	< 0.2
28-Mar-96	95	1700	45	--	--	--	< 2	< 0.2
28-Aug-96	170	2600	97	--	--	--	2.6 T	< 0.2
21-Nov-96	< 50	2700	100	--	--	50	< 1.5	< 1
26-Feb-97	31	1400	49	--	--	--	< 0.25	< 1
21-May-97	25	1000	40	--	--	--	< 0.25	< 1
26-Aug-97	15 T	1500	61	--	--	--	< 2.5	< 1
6-Nov-97	< 25	1400	50	--	--	--	< 0.25	< 1
12-Feb-98	< 12	630 B	35	--	--	--	< 0.25	< 1
19-May-98	7 J	830	35	--	--	--	< 0.25	< 1
12-Aug-98	7.1 J	810	36	--	--	--	< 0.25	< 1
17-Nov-98	6.4 J	510	25 J	--	--	--	< 0.25	< 0.5
24-Feb-99	5.3 JB	460 J	25 J	--	--	--	< 0.25	< 0.5
26-May-99	34	190	10	--	--	--	< 4 UJ	< 0.5
25-Aug-99	< 25 G	220	15 T	--	--	--	1.41	< 0.1
17-Nov-99	5.8 T	340	20 T	--	--	--	< 0.2 J	< 0.1 J
22-Feb-00	33	400	24	--	--	--	< 0.2	< 0.1
24-May-00	8.9 T	180	13	--	--	--	< 0.2	< 0.1
6-Oct-00	11 D	250 D	16 D	--	--	--	--	--
23-May-01	48 D	316 D	20 D	--	--	--	< 0.5	< 0.5
19-Nov-01	5 D	230 D	25 D	--	--	--	< 0.5	0.2 T
15-May-02	2.3	205 D	15	--	--	--	< 0.5	< 0.5
20-Nov-02	0.7 T	166 D	17	--	--	--	< 0.48	< 0.48
27-Feb-03	1	142	10	--	--	0.4 T	--	--
6-May-03	2	119 D	12	--	--	--	--	--
13-Aug-03	1	113 D	20	--	--	0.7 T	--	--
5-Nov-03	2	149 D	24	--	--	< 5 D	--	--
13-May-04	3.1	87 D	21	--	--	0.9 T	--	--
4-Nov-04	0.9 T	22	5.8	--	--	4.7	--	< 0.48
10-May-05	0.9 T	10	3.1	--	--	7.4	--	< 0.5
31-Oct-05	< 1	2.4	0.8 T	--	--	7.6	--	< 0.5
16-May-06	0.47 T	6.5	1	--	--	5.4	--	< 0.5
6-Nov-06	0.29 T	5.7	0.62 T	--	--	3.6	--	--
10-Apr-07	< 1	2.9	0.76 T	--	--	1.1	--	--
30-Oct-07	< 1	1.4	0.56 T	--	--	0.7 T	--	< 0.5
30-Apr-08	0.29 T	4.9	3.4	--	--	3.3	--	< 0.5
14-Oct-08	< 1	2.6	2	--	--	3.1	--	--
7-Apr-09	< 1	5.5	3.3	24	22	3	--	0.11 T
3-Nov-09	< 1	1.2	1.5	20	10	3.3	--	< 0.5
26-Apr-10	< 1	2.3	2.3	34	17	3.8	--	< 0.5
27-Oct-10	< 1	1	0.81 T	14	10	3.2	--	--
14-Apr-11	< 1	3.4	2	26	21	8.1	--	--
10-Nov-11	< 1	0.97 T	0.95 T	15	13	2.4	--	--
2-May-12	< 1	1.4	1.8	28	12	3	--	--
13-Nov-12	< 1	1.2	0.64 T	12	13	1.9	--	--
23-Apr-13	< 1	1.4	1.3	20	18	2.7	--	--
5-Nov-13	< 1	0.91 T	1.1	20	11	4	--	--
22-Apr-14	< 1	1	1.6	25	15	2.1	--	--
4-Nov-14	< 1	0.69 T	1.8	30	8.7	7.4	--	--
23-Apr-15	< 1	0.86 T	1.3	25	10	2.2	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20



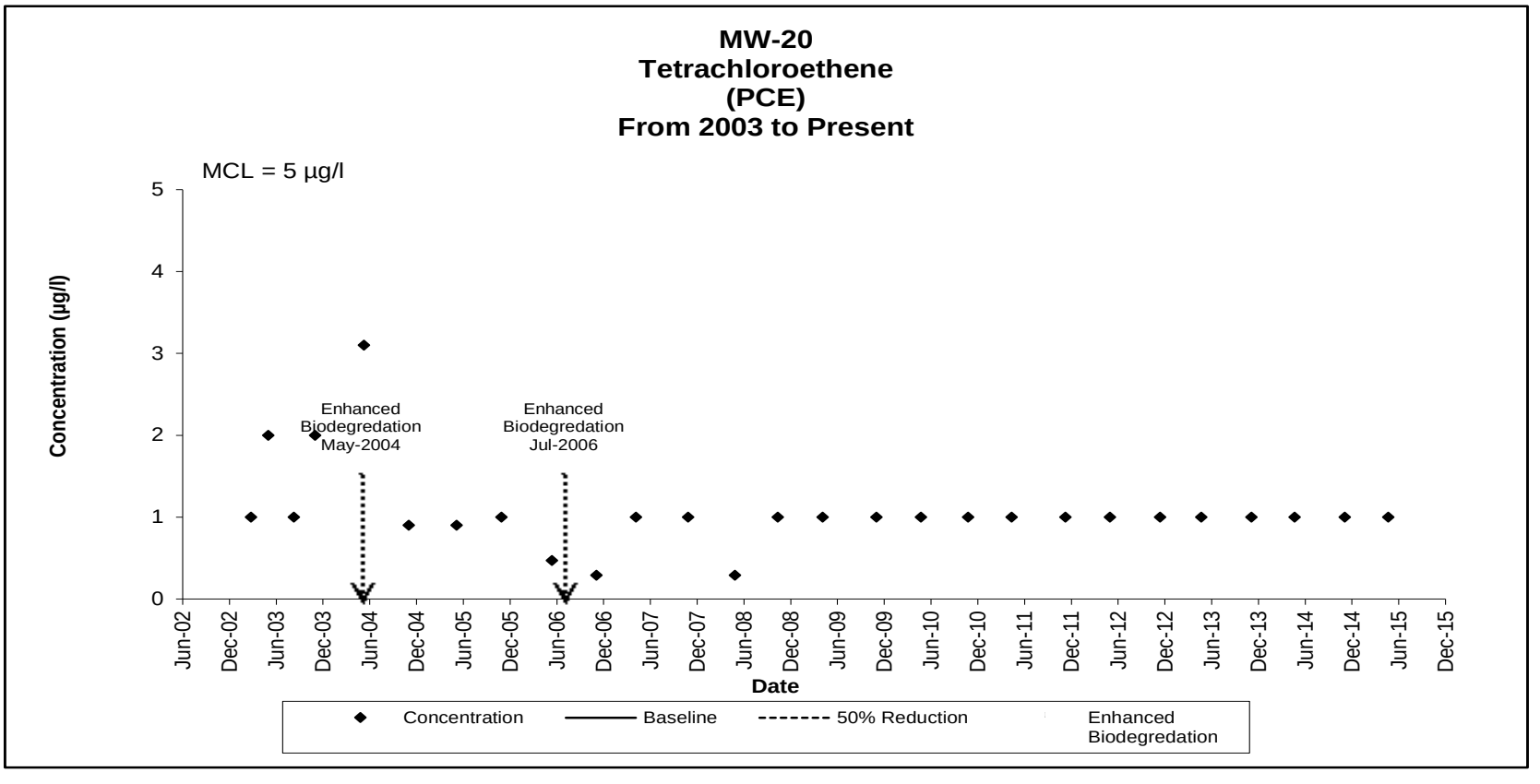
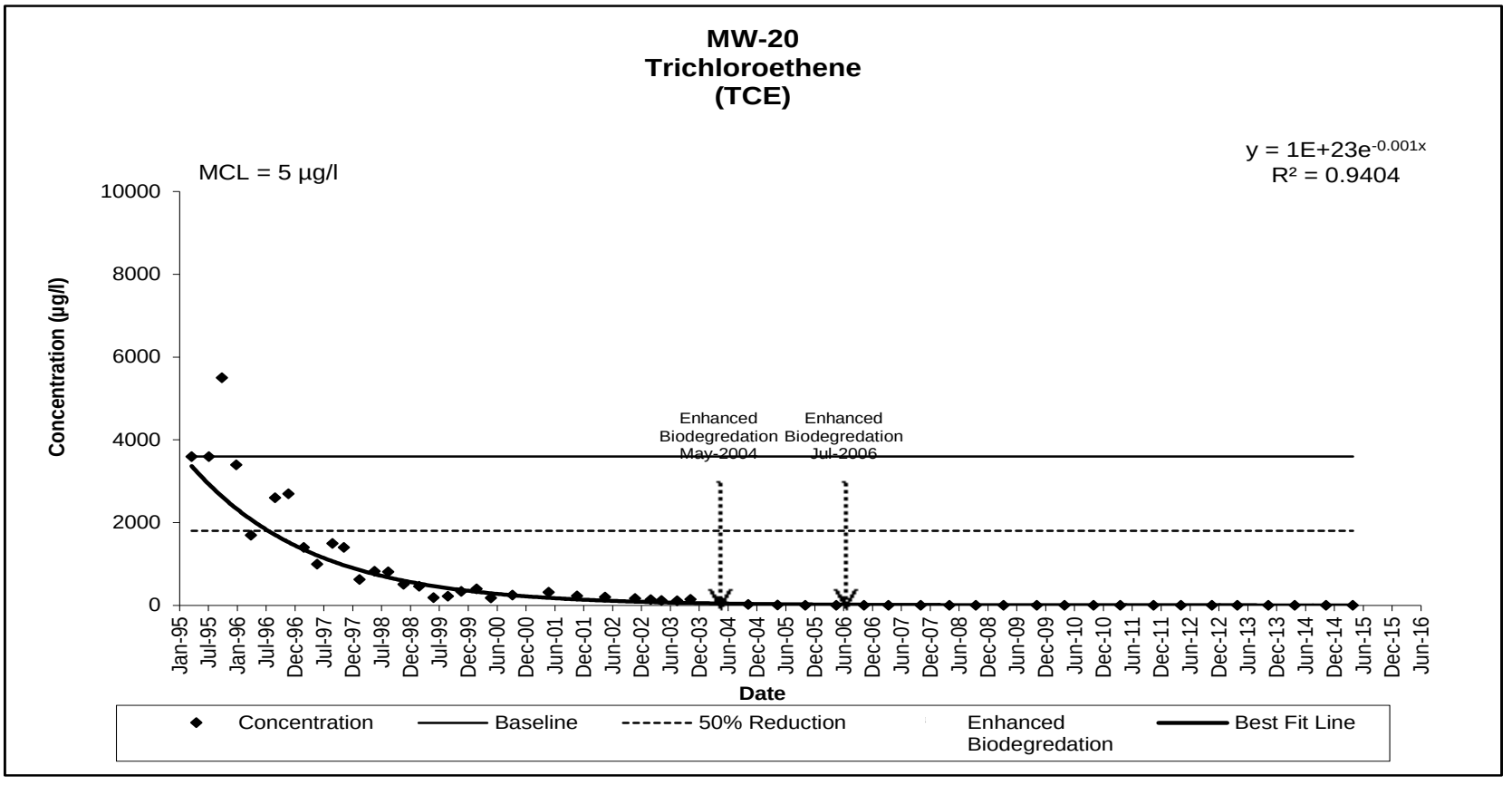


EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20



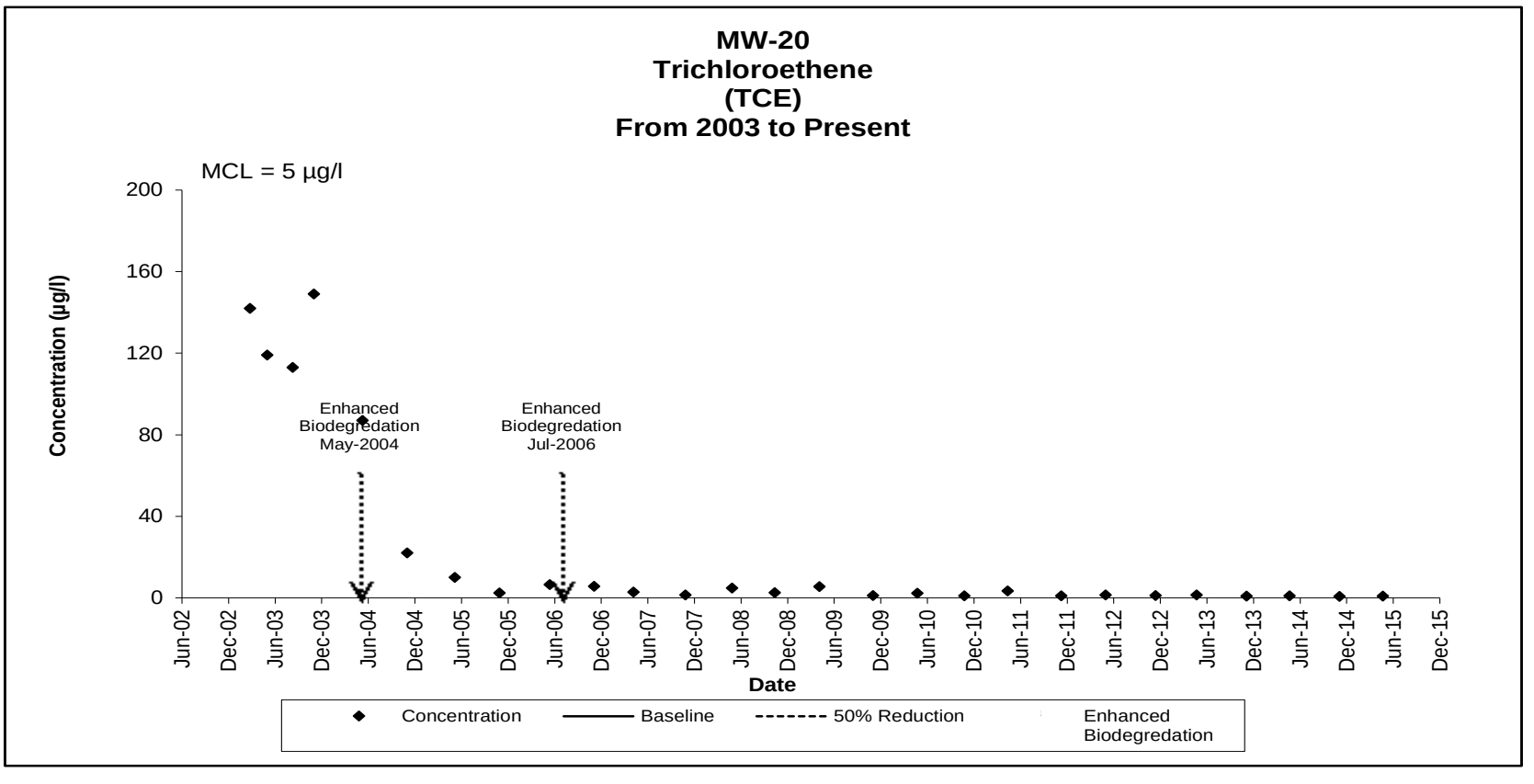
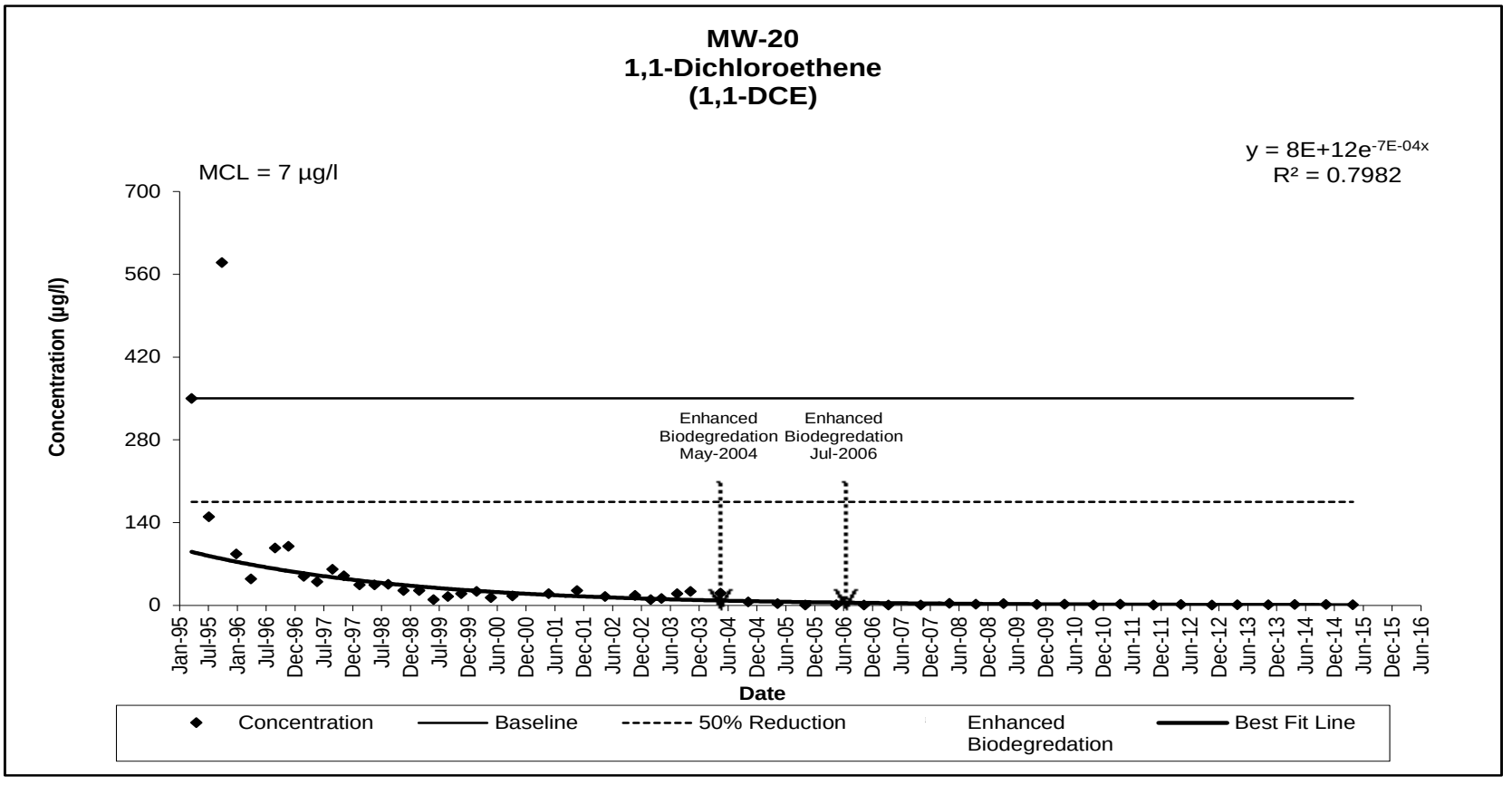


EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20



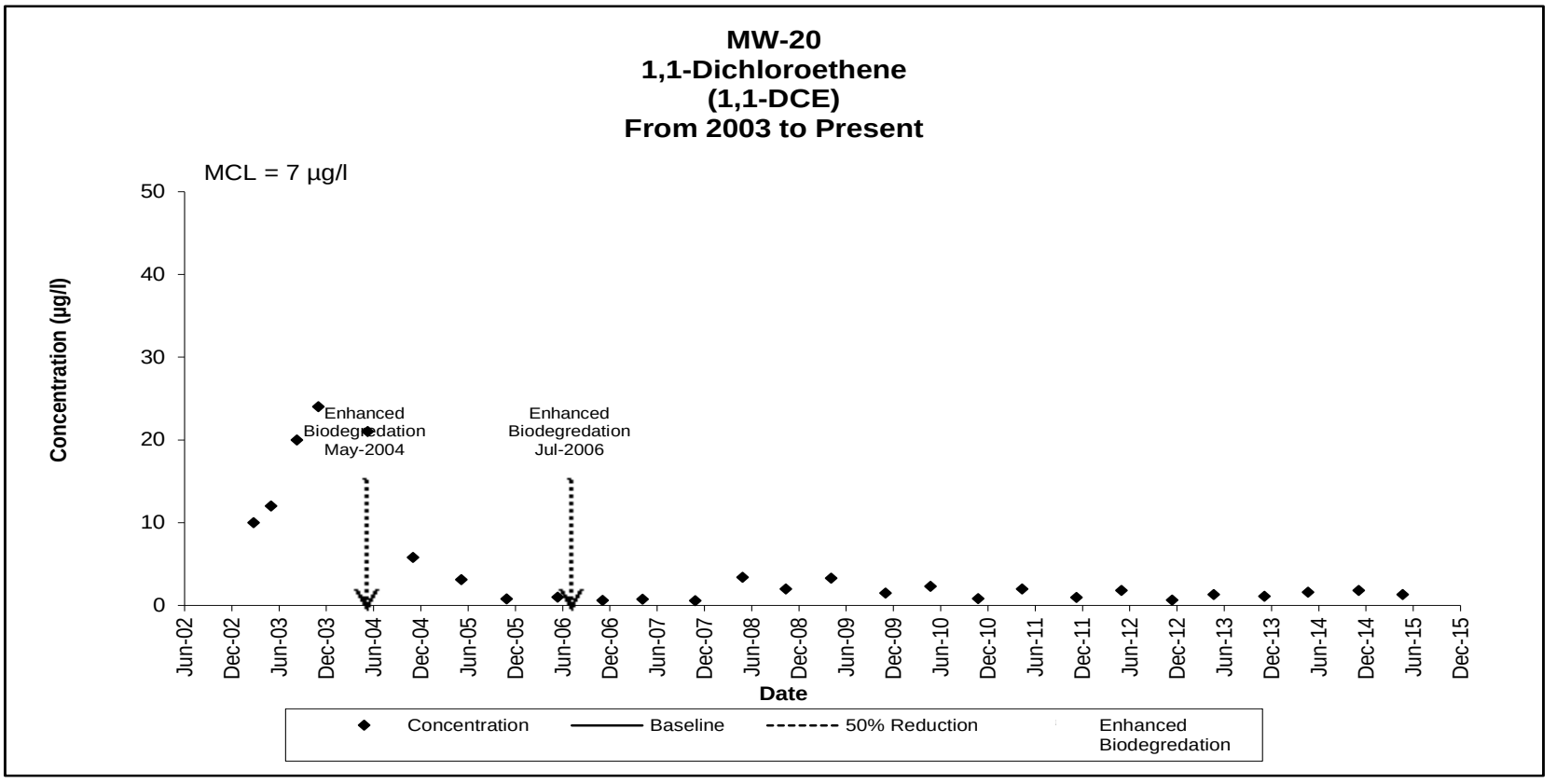
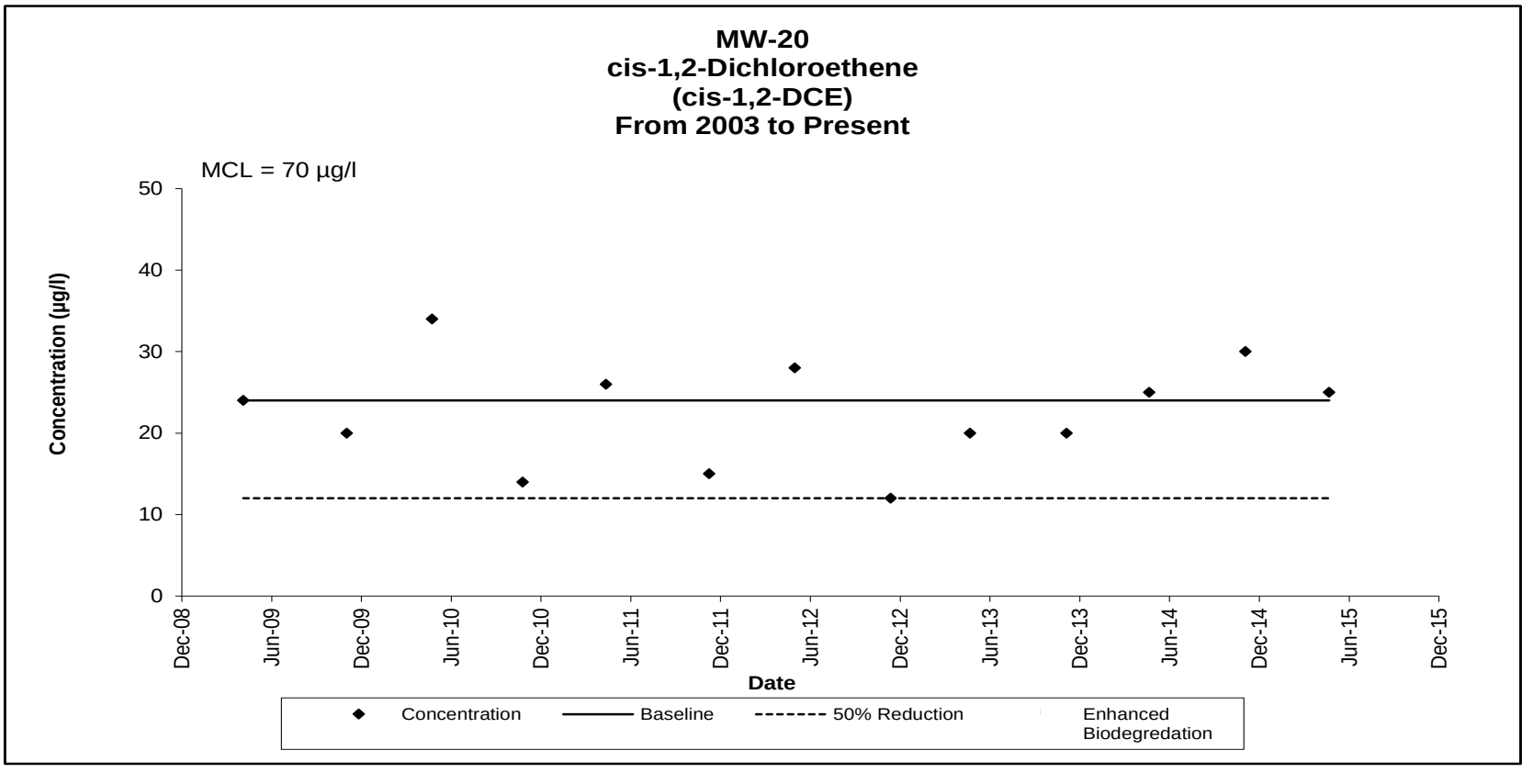


EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20



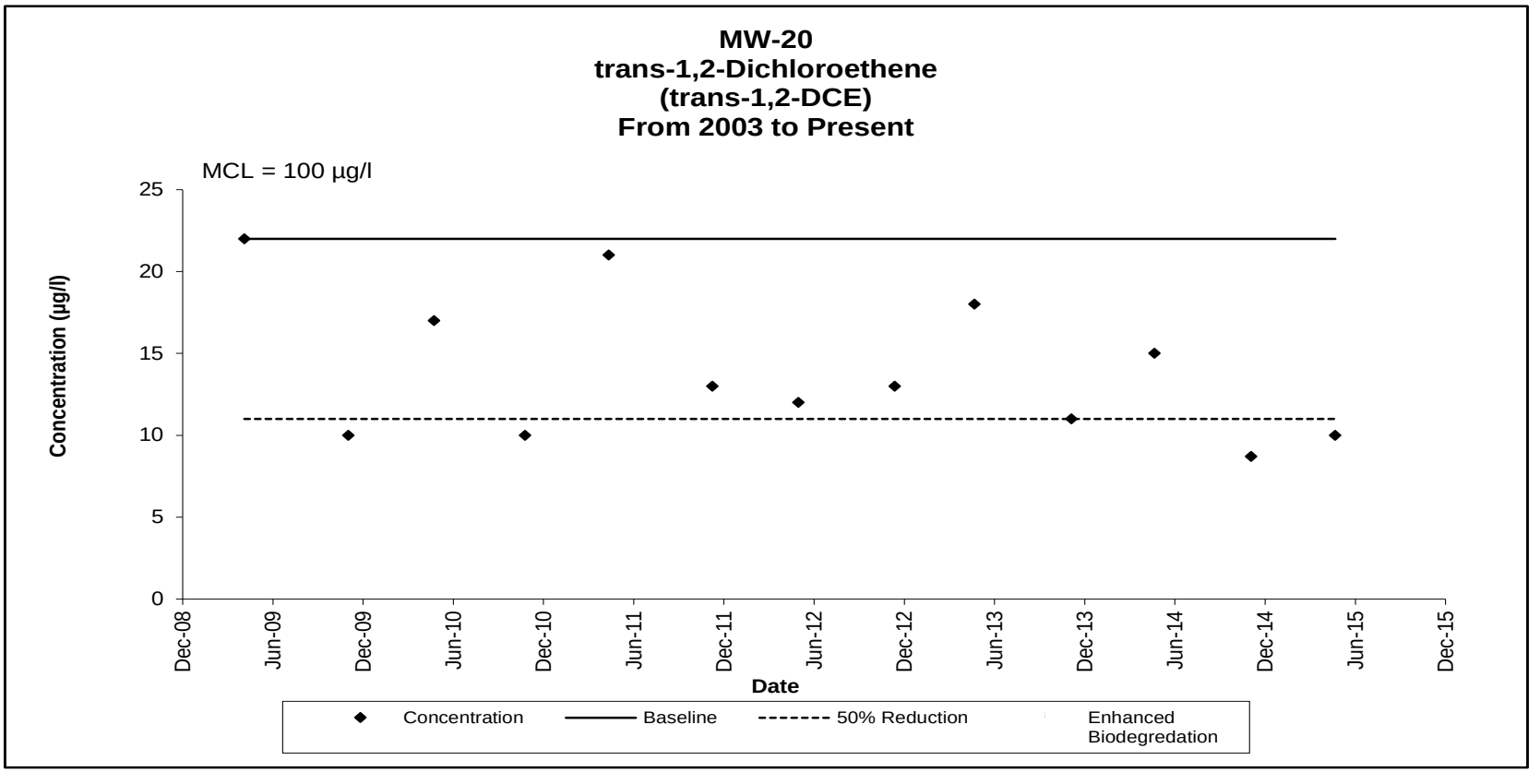
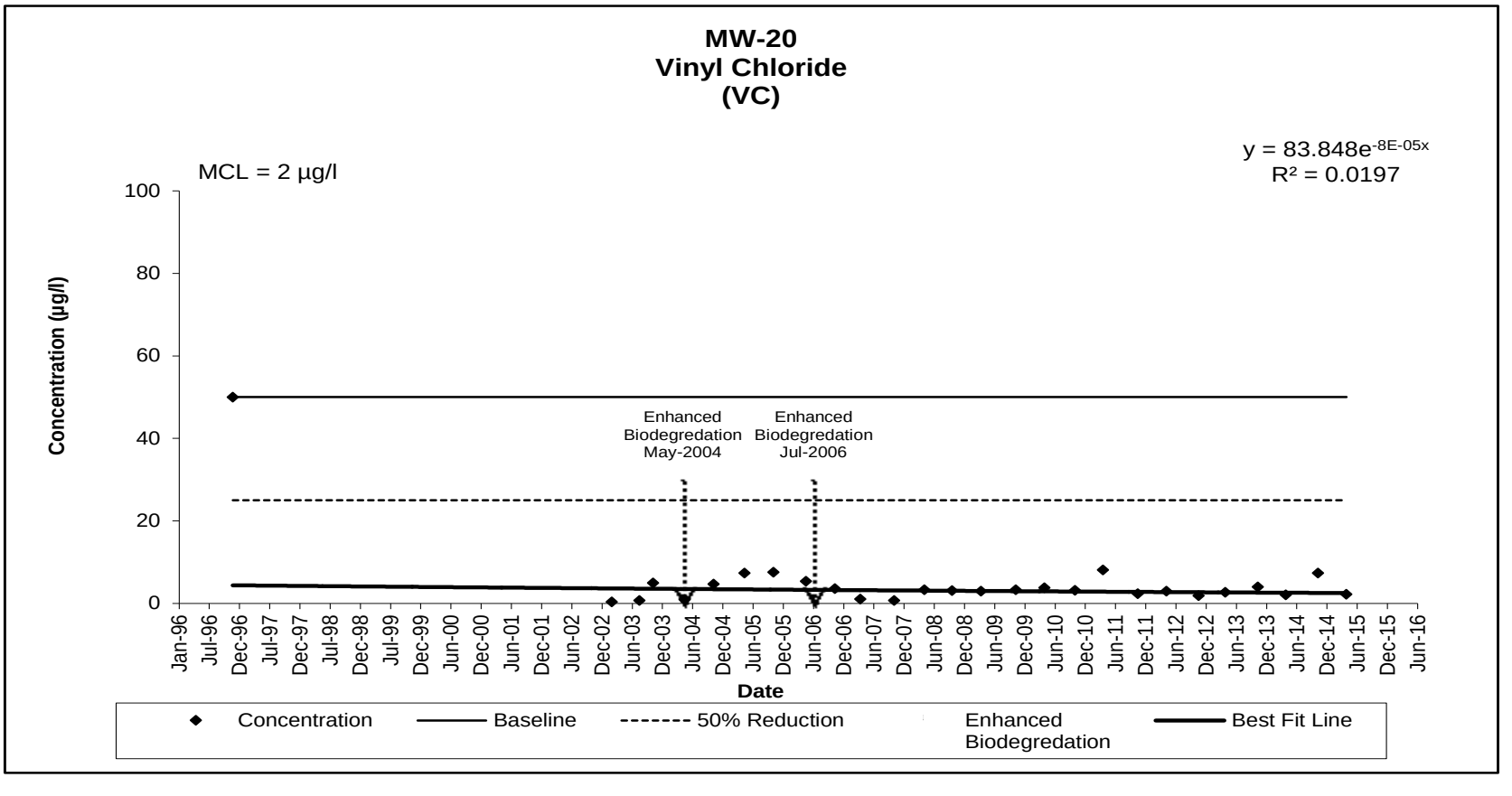


EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20



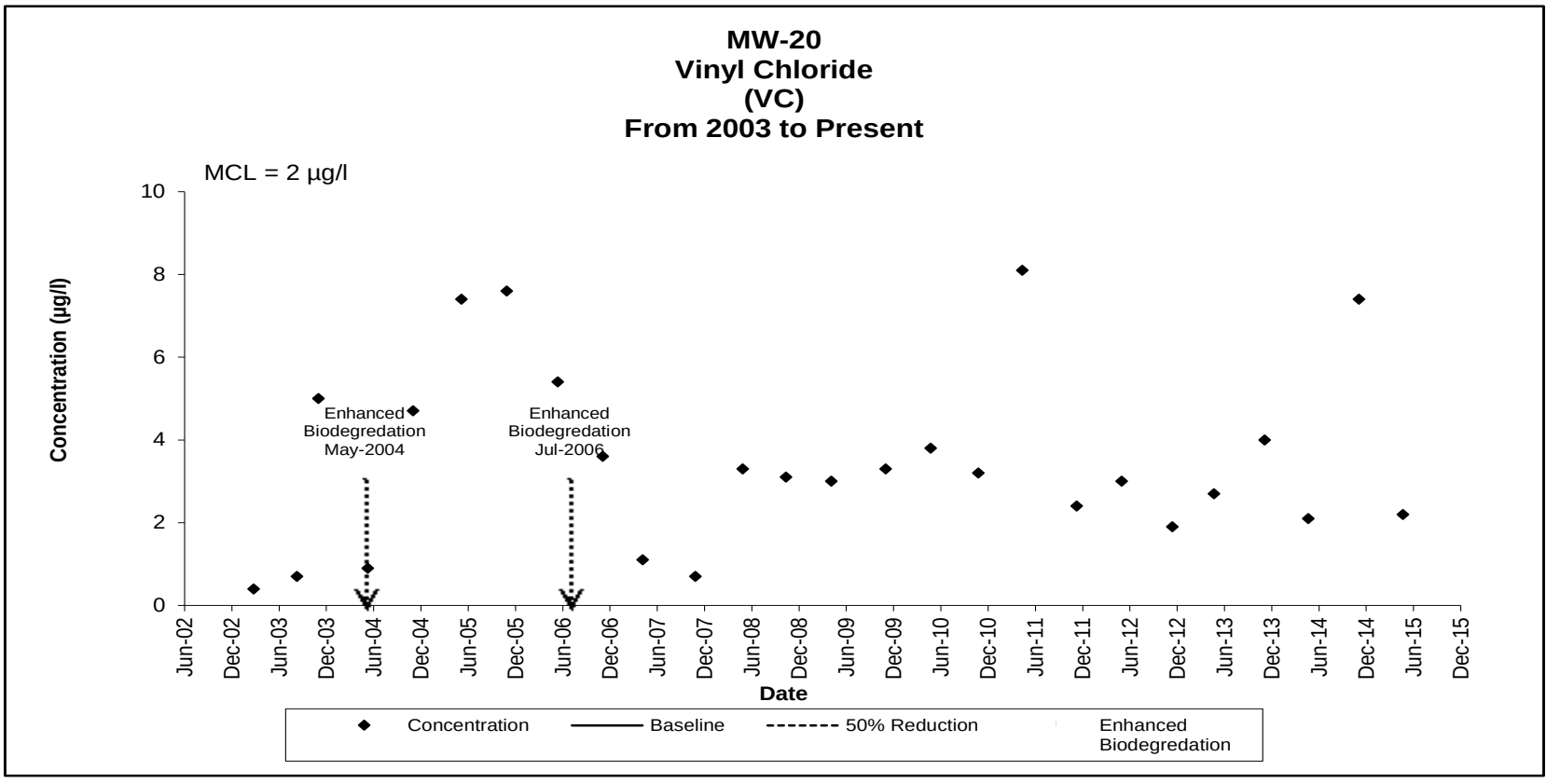


EXHIBIT B-11
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-23

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
9-Mar-95	< 2	< 2	< 2	--	--	--	< 10 J	< 1 J
6-Jul-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
29-Sep-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Dec-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
28-Mar-96	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Aug-96	< 2	< 2	< 2	--	--	--	< 10	< 0.2
21-Nov-96	< 1	< 1	< 1	--	--	1.4	< 0.25 UJ	< 1
25-Feb-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
20-May-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
25-Aug-97	< 1	0.14 T	< 1	--	--	--	< 0.25	< 1
5-Nov-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
12-Feb-98	< 1	< 1	< 1	--	--	--	< 0.25 J	< 1
18-May-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
11-Aug-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
16-Nov-98	< 1	< 1	< 1	--	--	--	0.9	< 0.5
23-Feb-99	< 1	< 1	< 1	--	--	--	0.57 J	< 0.5
25-May-99	< 1	< 1	< 1	--	--	--	< 4 UJ	< 0.5
26-Aug-99	< 1	< 1	< 1	--	--	--	5	< 0.1
18-Nov-99	< 5	< 5	< 5	--	--	--	< 0.2 J	< 0.1 J
23-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-May-00	< 1	< 1	< 1	--	--	--	0.741	< 0.1
23-Aug-00	< 0.166	< 0.0672	< 0.116	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	0.07	< 0.5
24-May-01	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
14-May-02	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
27-Feb-03	< 1	< 2	< 1	--	--	< 1	--	--
5-May-03	< 1	< 1	< 1	--	--	< 1	--	--
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
13-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
27-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
26-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
13-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
10-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
15-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
7-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-15	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-12
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-24A

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
9-Mar-95	< 2	< 2	< 2	--	--	--	< 10 J	< 1 J
6-Jul-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Sep-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
28-Dec-95	< 2	< 2	< 2	--	--	--	< 2	0.2
29-Mar-96	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Aug-96	< 2	< 2	< 2	--	--	--	< 10	< 0.2
21-Nov-96	< 1	< 1	< 1	--	--	1	< 0.25	< 1 UJ
25-Feb-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
20-May-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
25-Aug-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
5-Nov-97	0.32 J	< 1	< 1	--	--	--	< 0.25	< 1
12-Feb-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
18-May-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
11-Aug-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
16-Nov-98	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
23-Feb-99	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
25-May-99	< 1	< 1	< 1	--	--	--	< 4 UJ	< 0.5
26-Aug-99	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
18-Nov-99	< 5	< 5	< 5	--	--	--	< 0.2 J	< 0.1 J
23-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-May-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-Aug-00	< 0.166	< 0.0672	< 0.116	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	< 0.5	< 0.5
24-May-01	< 1	0.3 T	< 1	--	--	--	< 0.5	< 0.5
14-May-02	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
27-Feb-03	< 1	< 2	< 1	--	--	< 1	--	--
5-May-03	< 1	< 1	< 1	--	--	< 1	--	--
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
13-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
13-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
11-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
5-Nov-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-15	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-13
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-25

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
9-Mar-95	< 2	< 2	< 2	--	--	--	< 10 J	< 1
6-Jul-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
29-Sep-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
28-Dec-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
29-Mar-96	< 2	< 2	< 2	--	--	--	< 2	< 2.2
27-Aug-96	< 2	< 2	< 2	--	--	--	< 10	< 0.2
21-Nov-96	< 1	< 1	< 1	--	--	1	< 0.25	< 1 UJ
26-Feb-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
20-May-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
26-Aug-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
6-Nov-97	0.48 JB	< 1	< 1	--	--	--	< 0.25	< 10
12-Feb-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
18-May-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
11-Aug-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
16-Nov-98	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
23-Feb-99	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
25-May-99	< 1	< 1	< 1	--	--	--	< 4 UJ	< 0.5
26-Aug-99	< 1	< 1	< 1	--	--	--	1.74	< 0.1
18-Nov-99	< 5	< 5	< 5	--	--	--	< 0.2	< 0.1
23-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-May-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-Aug-00	< 0.166	< 0.0672	< 0.116	--	--	--	5.85 J	< 0.5 UJ
24-May-01	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
14-May-02	< 1	< 1	< 1	--	--	--	< 0.5	0.03 T
27-Feb-03	< 1	< 2	< 1	--	--	< 1	--	--
5-May-03	< 1	< 1	< 1	--	--	< 1	--	--
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
14-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
12-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
11-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
15-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
5-Nov-14	< 1	< 1	< 1	0.21 T	< 1	< 1	--	--
22-Apr-15	< 1	< 1	< 1	0.17 T	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30

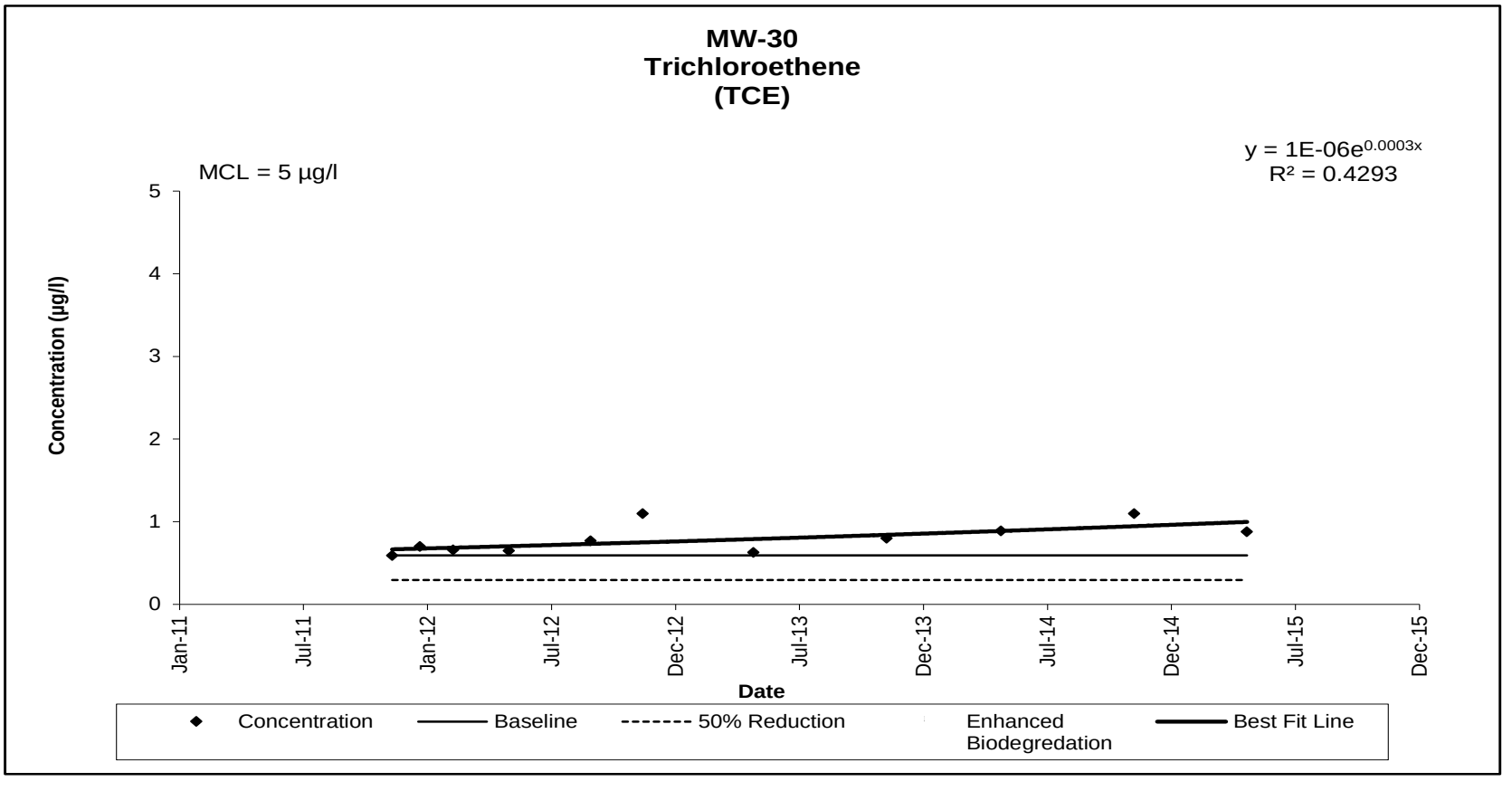
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
10-Nov-11	< 1	0.59 T	5.8	64	1.6	14	--	< 0.5
21-Dec-11	< 1	0.7 T	9	75	1.9	25	--	< 0.5
8-Feb-12	< 1	0.66 T	7.3	71	1.5	15	--	< 0.5
30-Apr-12	< 1	0.65 T	7.6	75	1.7	20	--	< 0.5
28-Aug-12	< 1	0.77 T	4.3	31	0.96 T	5.9	--	< 0.5
13-Nov-12	< 1	1.1	4.8	30	1	5.5	--	< 0.5
25-Apr-13	< 1	0.63 T	5.6	30	0.93 T	6.5	--	< 0.5
7-Nov-13	< 1	0.8 T	4.1	23	0.77 T	5.1	--	--
24-Apr-14	< 1	0.89 T	6	37	0.81 T	10	--	--
6-Nov-14	< 1	1.1	4.2	37	1	7.3	--	--
21-Apr-15	< 1	0.88 T	5.7	40	0.93 T	5.4	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30



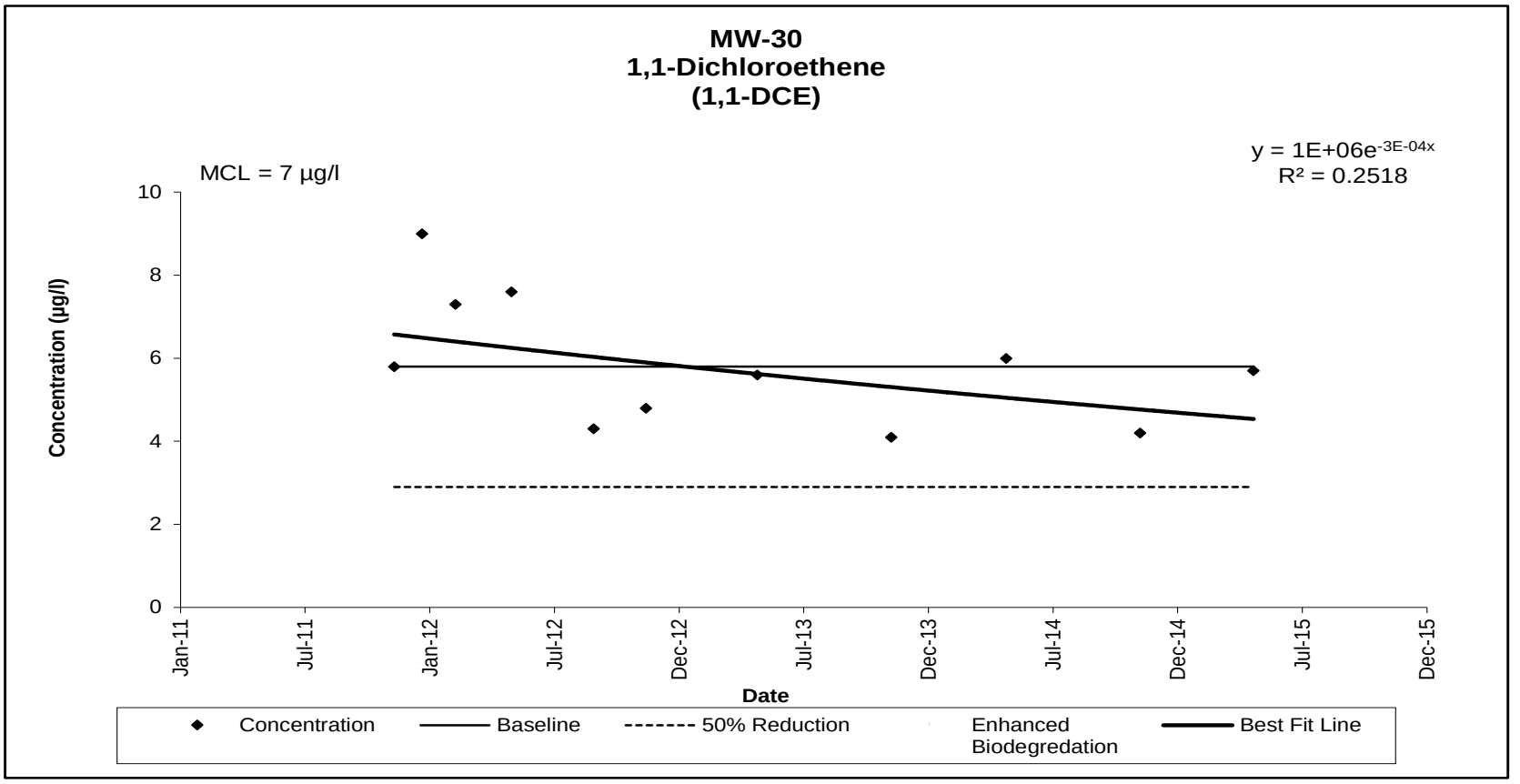
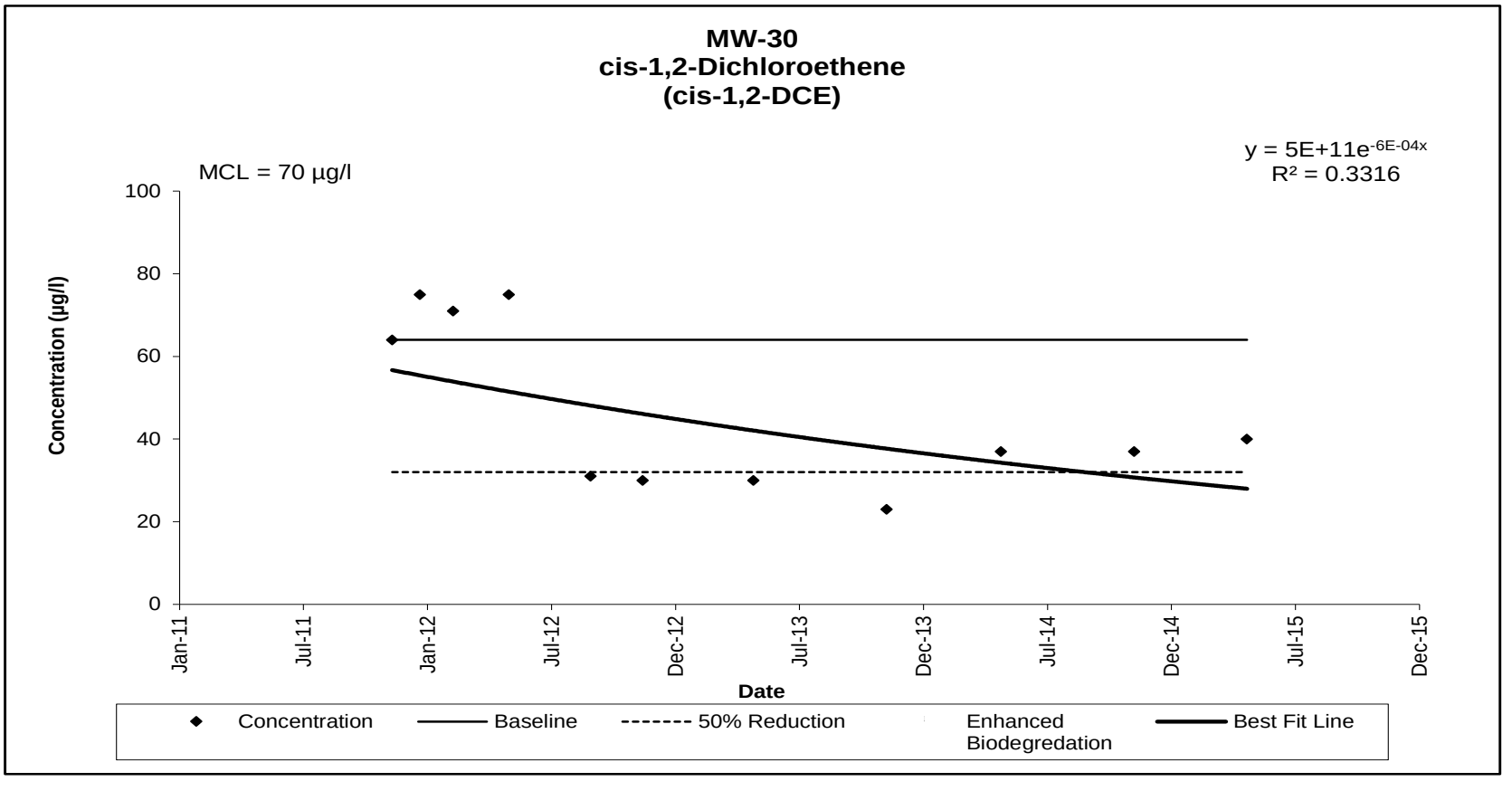


EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30



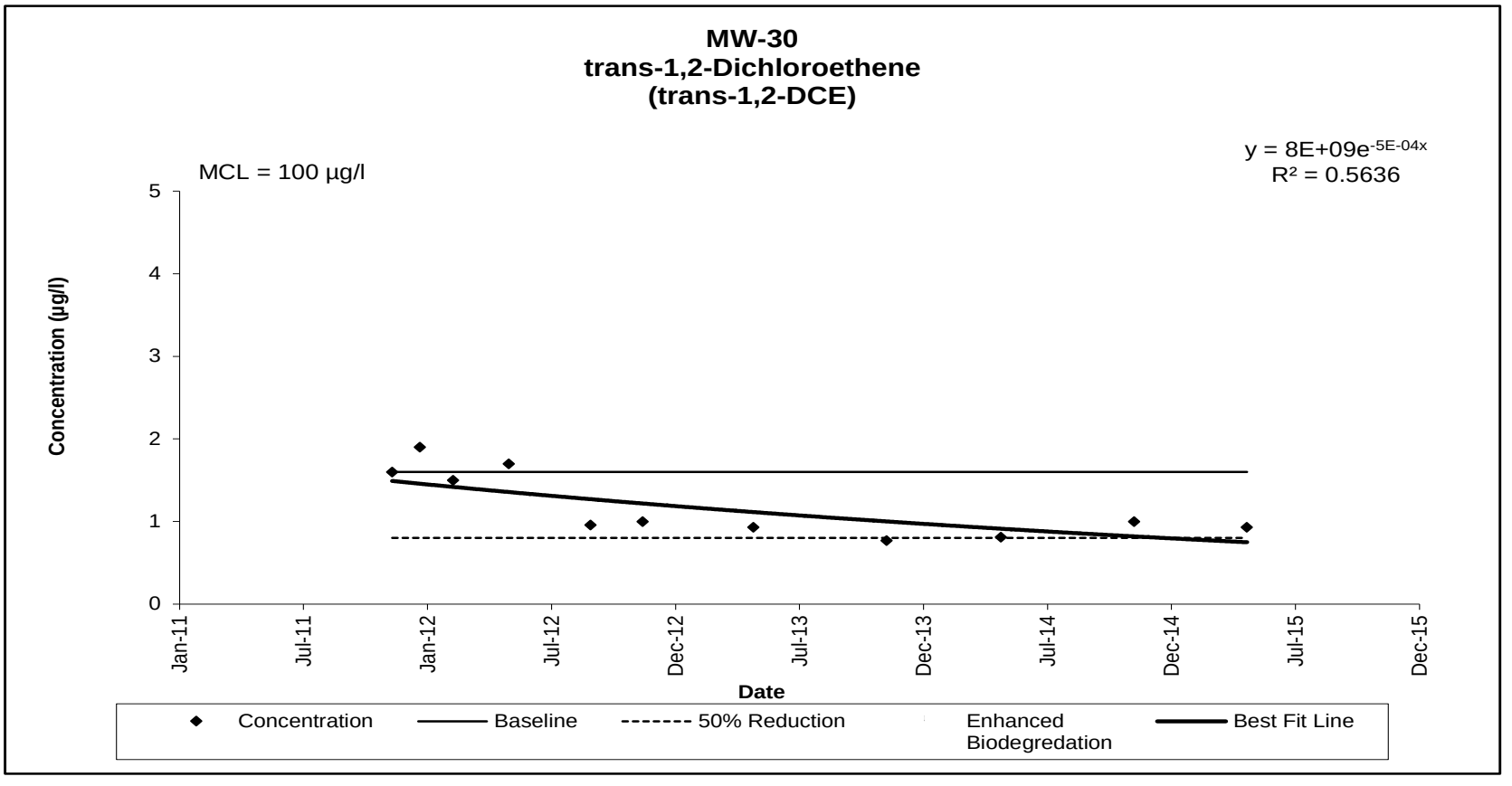


EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30

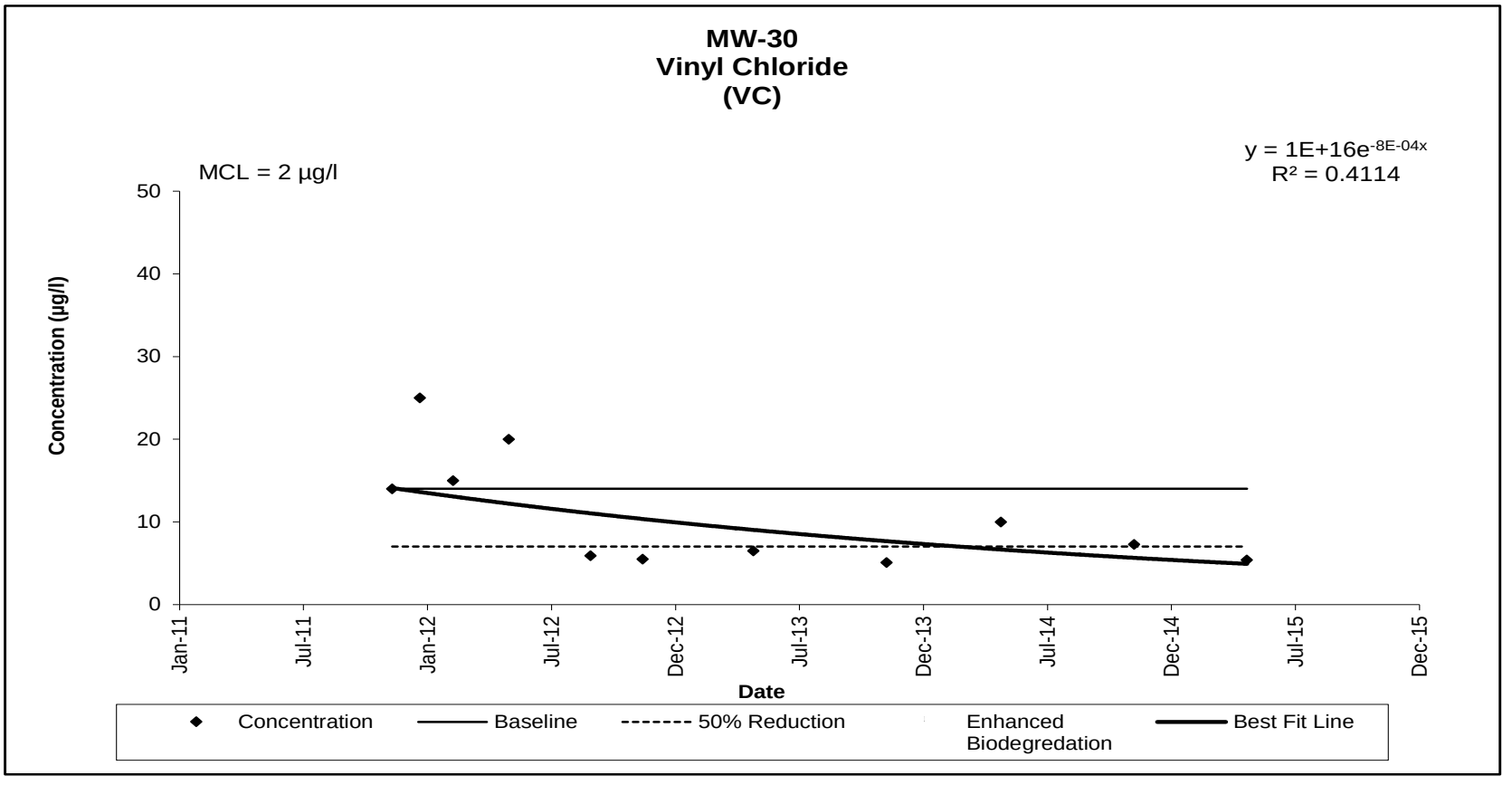


EXHIBIT B-15
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-31D

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Dec-11	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
7-Feb-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
3-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
29-Aug-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
7-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-15	< 1	< 1	< 1	0.13 T	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-16
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-32D

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Dec-11	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
7-Feb-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
3-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
29-Aug-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
5-Nov-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-15	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-17
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D

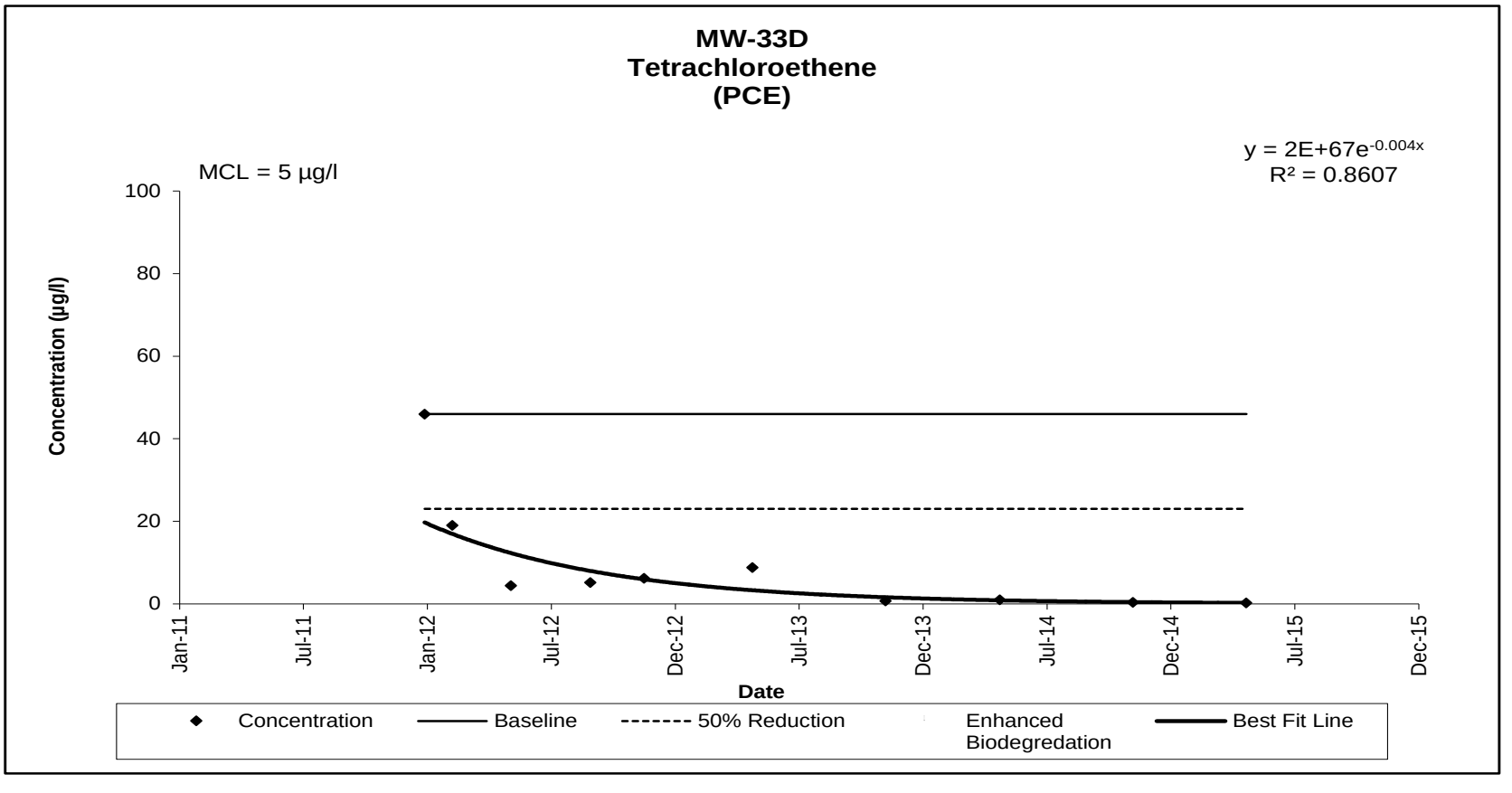
LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)	BZ (µg/l)	EBZ (µg/l)	m,p-Xylene (µg/l)	o-Xylene (µg/l)	BZME (µg/l)
12/28/2011	46	31	< 1	4.7	< 1	< 1	--	< 0.5	< 1	27	83 D	46	10
2/7/2012	19	48	0.3 T	140 D	< 1	< 1	--	< 0.5	< 0.5	52	150 D	33	5.2
5/3/2012	4.4	2.9	0.26 T	110 D	< 1	< 1	--	< 0.5	< 0.50	3.6	36	9.6	2.8
8/28/2012	5.2	1.5	< 1	17	< 1	8.9	--	< 0.5	< 0.5	< 1	7.5	12	0.71
11/15/2012	6.2	1.8	< 1	15	< 1	2.1	--	< 0.5	< 0.5	10	33	13	2.8
4/24/2013	8.8	1.6	< 1	17	< 1	7.4	--	< 0.5	< 0.5	5.1	39	18	1.6
11/6/2013	0.7 T	0.29 T	< 1	3.4	< 1	1.3	--	--	< 0.5	7	14	5.6	1.1
23-Apr-14	0.98 T	0.42 T	< 1	3.1	< 1	1.2	--	--	< 0.5	12	15	7.7	0.47 T
5-Nov-14	0.38 T	0.27 T	< 1	3.3	< 1	0.67 T	--	--	< 0.5	8.7	13	5.4	1.2
21-Apr-15	0.27 TJ	0.3 TJ	< 1 UJ	1.5 J	< 1 UJ	0.47 TJ	--	--	< 0.5 UJ	6.3 J	7.7 J	5 J	< 0.5 UJ

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-17
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D



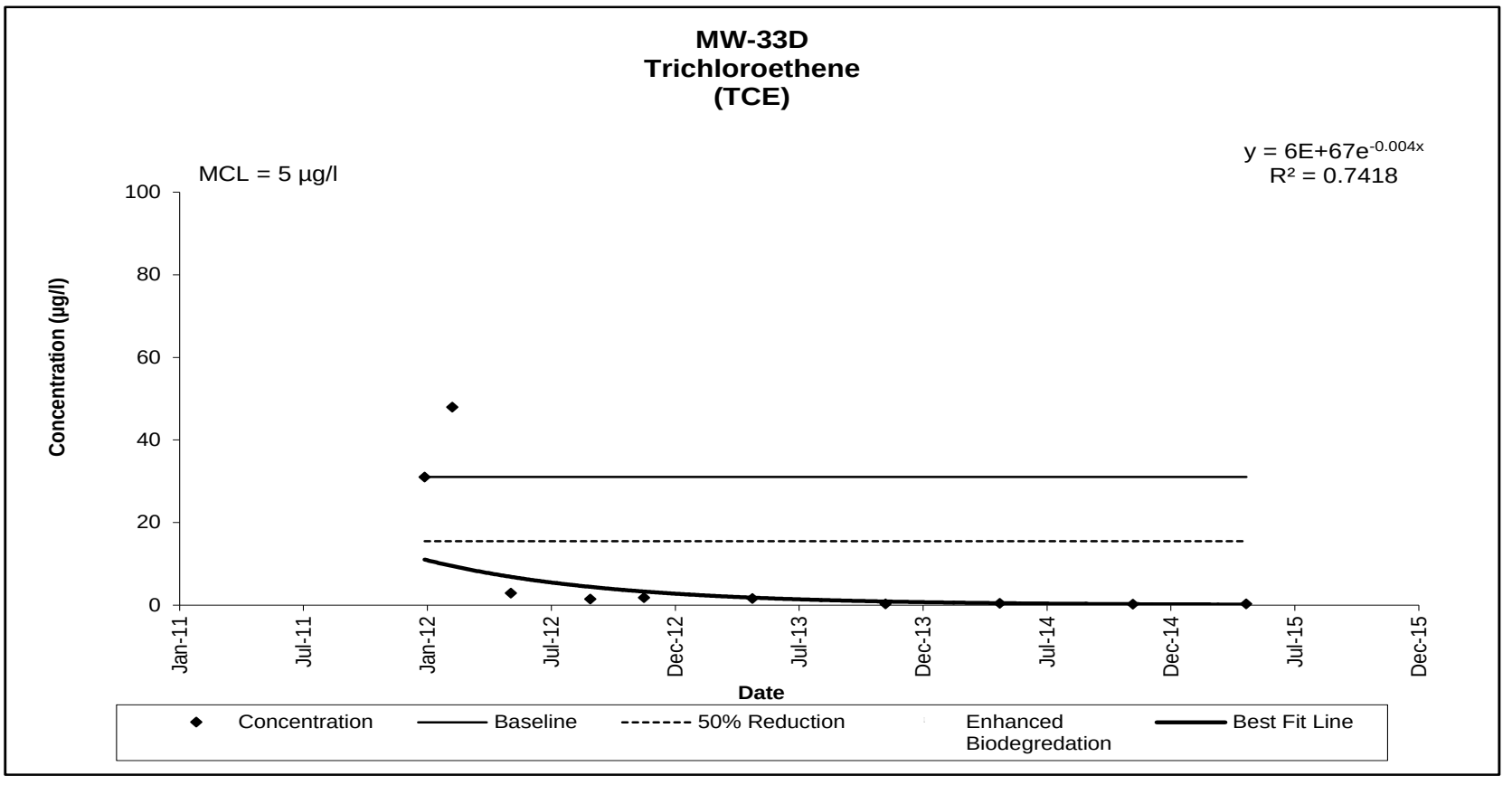
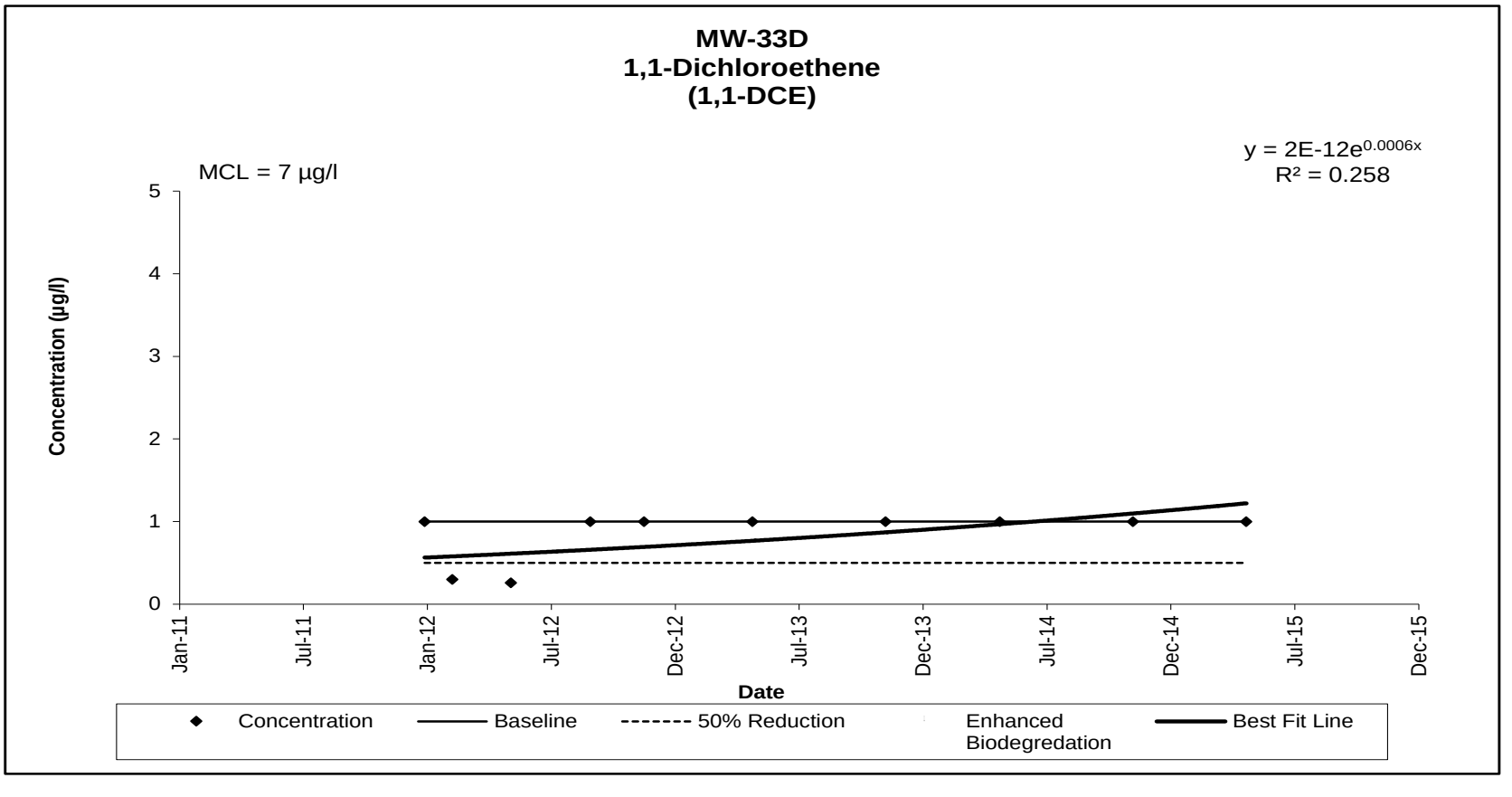


EXHIBIT B-17
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D



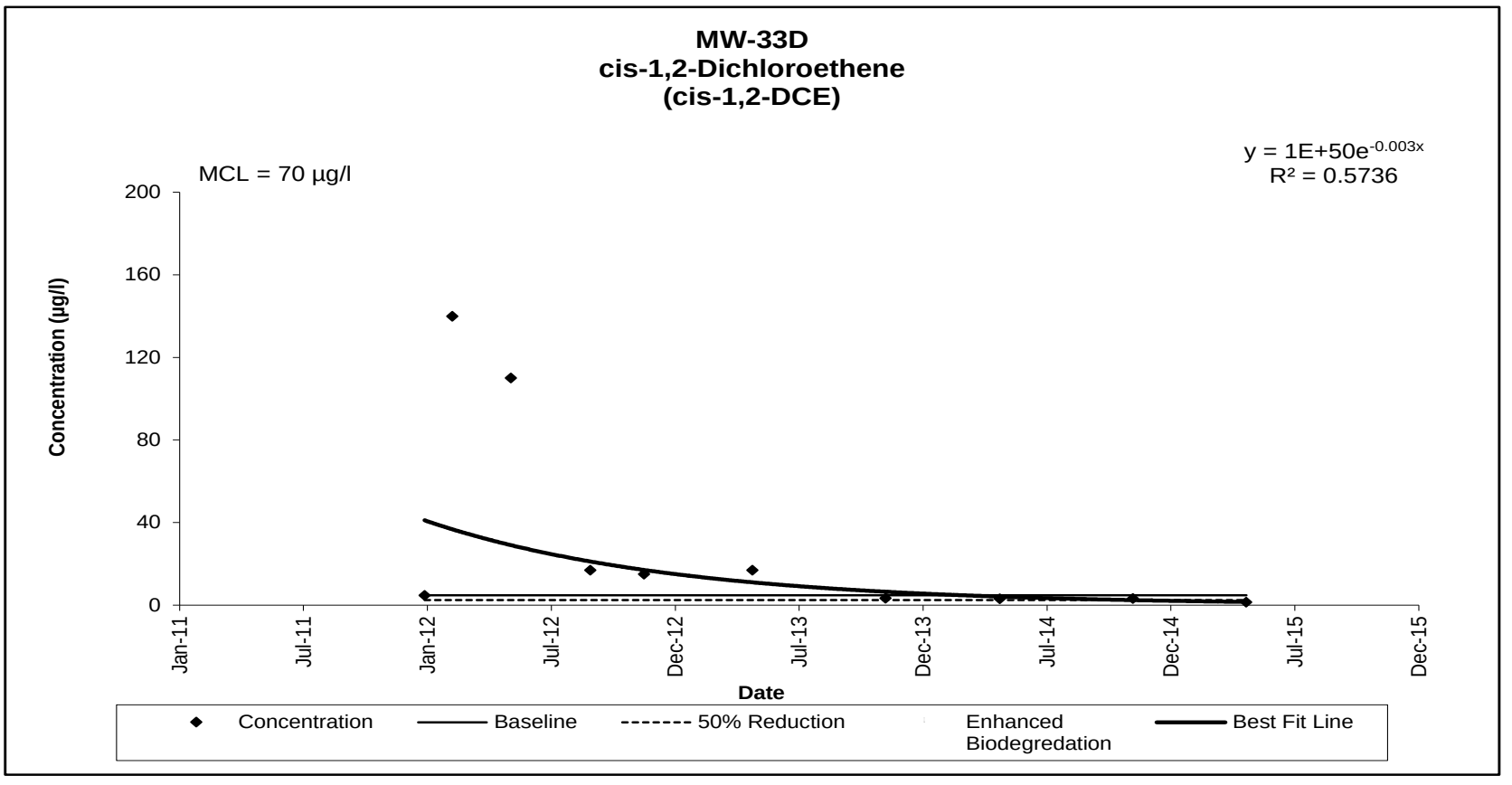


EXHIBIT B-17
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D

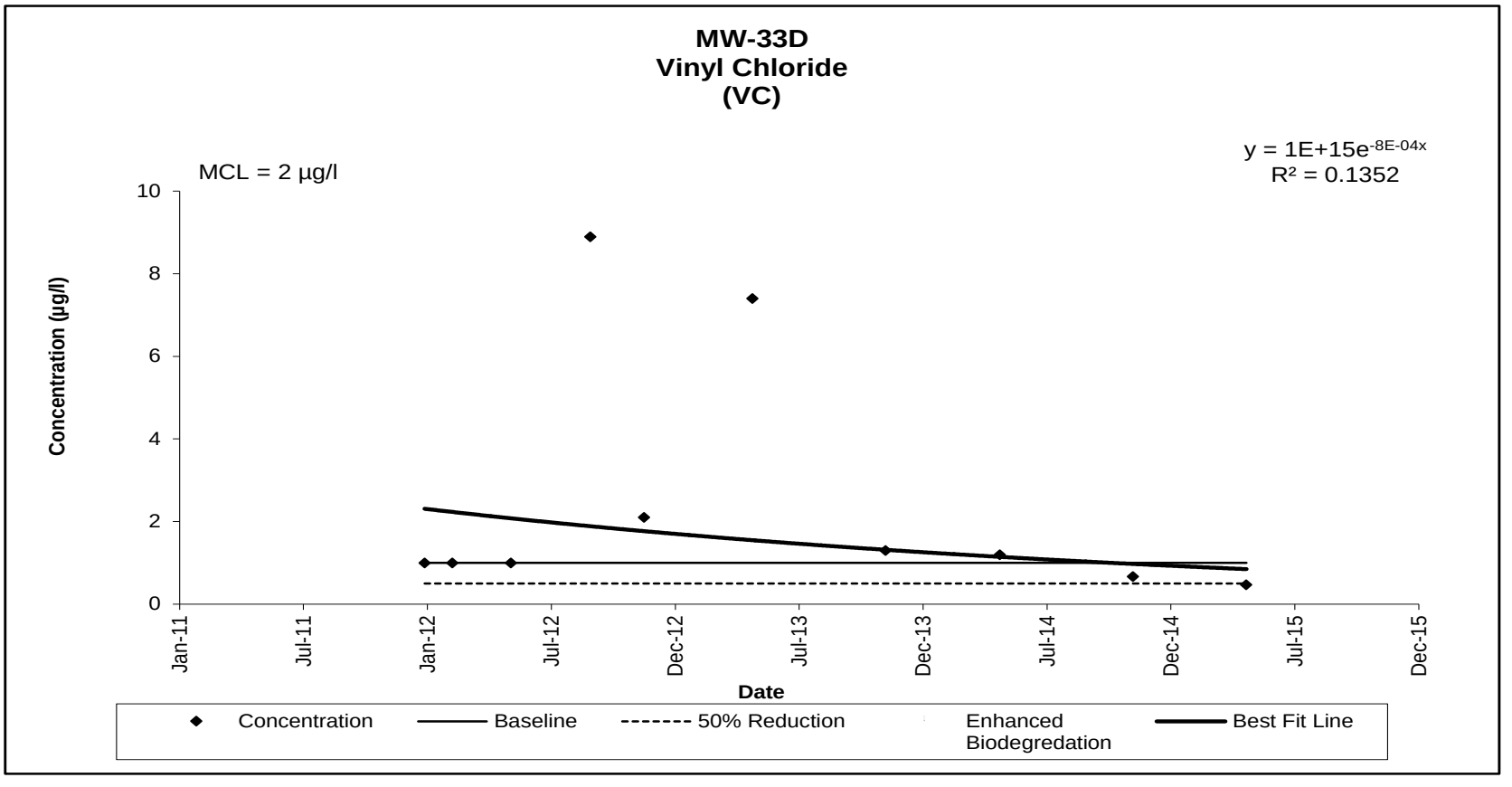


EXHIBIT B-18
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-34

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
13-Jun-13	< 1	0.24 T	< 1	1.7	0.48 T	< 1	--	< 0.5
28-Aug-13	< 1	0.31 T	< 1	1.6	0.5 T	< 1 UJ	--	< 0.5
7-Nov-13	< 1	0.33 T	< 1	2.2	0.58 T	< 1	--	< 0.5
20-Feb-14	< 1	0.32 T	< 1	3	0.69 T	< 1	--	< 0.5
24-Apr-14	< 1	0.24 T	< 1	1.6	0.46 T	< 1	--	--
6-Nov-14	< 1	0.3 T	< 1	2	0.6 T	< 1	--	--
22-Apr-15	< 1	0.32 T	< 1	2.8	0.61 T	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-19
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
PIEZOMETER PZ-1

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
14-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
13-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
10-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
15-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
5-Nov-14	< 1	< 1	< 1	0.11 T	< 1	< 1	--	--
21-Apr-15	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-20
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
PIEZOMETER PZ-3

LABORATORY PARAMETERS

Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
14-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
12-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
11-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
3-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
5-Nov-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-15	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

APPENDIX C

STATISTICAL EVALUATION RESULTS

APPENDIX C
STATISTICAL EVALUATION RESULTS

WASATCH CHEMICAL SITE

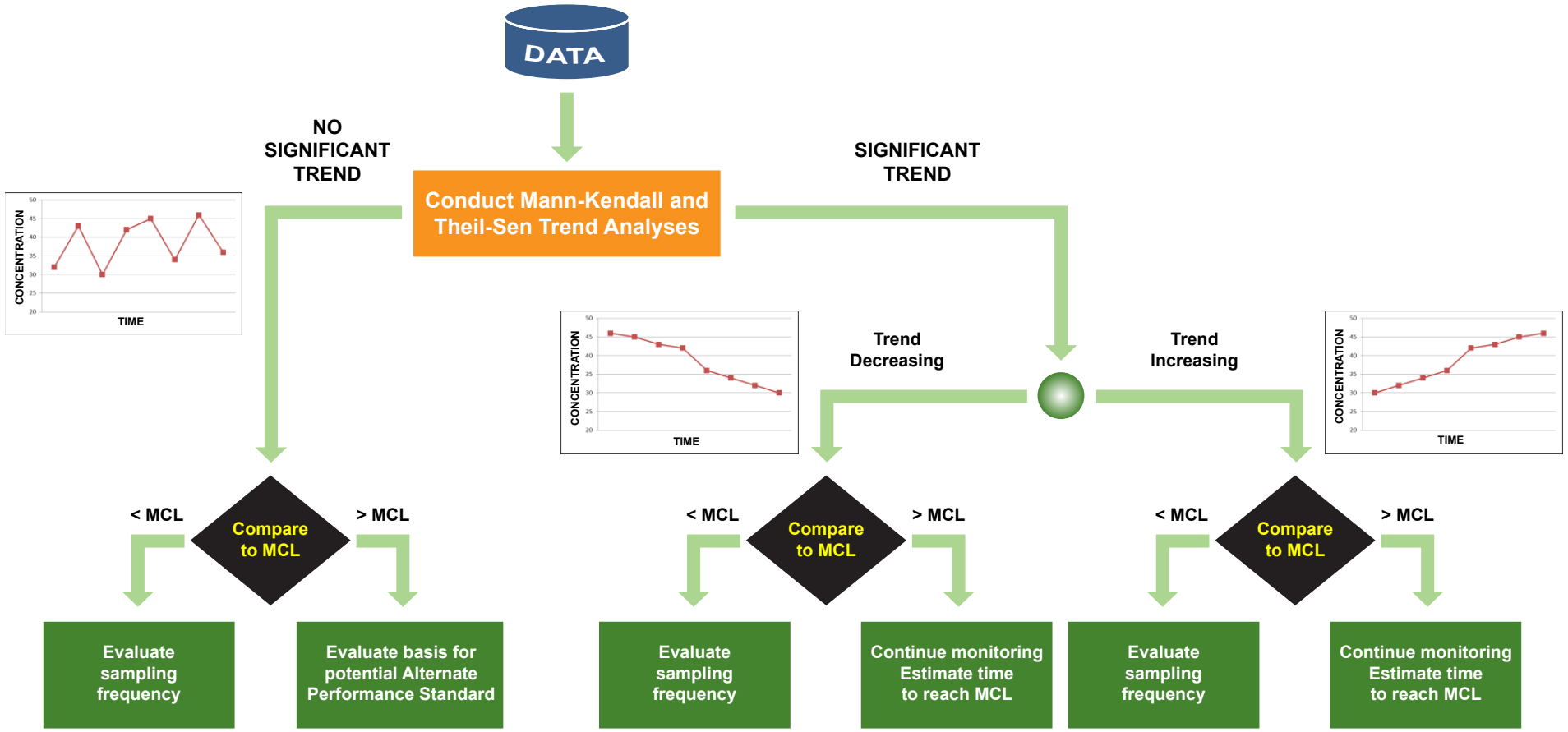
Figure C-1 Plume Stability Evaluation Flow Chart

Section C1: Statistical Analysis Results

Section C2: Trend Analysis Plots

Section C3: Confidence Interval Plots

FILE: *Fig C-1_Plume Stability Eval Flow Chart.ai* *19 July 2013*



MCL - Maximum Contaminant Level

MWH

QUESTAR InfoComm

WASATCH CHEMICAL SITE

PLUME STABILITY EVALUATION FLOW CHART

Figure C-1

Section C1

Statistical Analysis Results

TABLE C1-1
SHALLOW GROUNDWATER STATISTICAL RESULTS SUMMARY - APRIL 2015
USING THE EIGHT MOST RECENT DATA POINTS FOR CONSTITUENTS OF CONCERN
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Monitoring Location	COC	MCL (µg/l)	N	Mean (µg/l)	Standard Deviation (µg/l)	Data Distribution	% Non-detects	Trend at α 0.01[a]	Slope at α 0.01[b] (µg/l/year)	UCL (95% CL)	LCL (95% CL)	Exceeds MCL[c]	MCL Exceedance Determination Method	Indication	Recommendation
ES-01	PCE	5	8	1.08	1.68	ln(x)	25	No	NA	5	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	14.3	20.4	ln(x)	0	No	NA	21.6	1.869	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	0.851	0.965	ln(x)	25	No	NA	2.9	0.1	No	Confidence interval	Performance Standard met	B
	VC	2	8	14.8	22.5	ln(x)	0	No	NA	13.09	1.028	No	Confidence interval	Performance Standard met	B
	PCP	1	8	1.81	3.58	unknown	75	No	NA	10	0.05	No	Confidence interval	Performance Standard met	B
EX-02	PCE	5	8	0.338	0.249	unknown	0	No	NA	0.935	0.2	No	Confidence interval	Performance Standard met	B
	TCE	5	8	108	67.0	normal	0	No	NA	265	57	Yes	Confidence interval	Stability	C
	1,1-DCE	7	8	8.00	1.84	normal	0	No	NA	9.232	6.768	No	Confidence interval	Performance Standard met	B
	VC	2	8	62.1	11.4	normal	0	No	NA	69.72	54.41	Yes	Confidence interval	Stability	C
	PCP	1	8	7.19	3.09	normal	0	No	NA	9.255	5.12	Yes	Confidence interval	Stability	C
EX-04	PCE	5	8	0.094	0.012	unknown	100	No	NA	0.1	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	8.74	8.64	ln(x)	0	No	NA	13.12	2.162	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	4.84	3.10	normal	0	Yes	-1.881[d]	NA	NA	No	Confidence band	Performance Standard met	B
	VC	2	8	1.92	1.84	ln(x)	0	No	NA	2.4	0.7756	No	Confidence interval	Performance Standard met	B
EX-05	PCE	5	8	0.144	0.144	unknown	100	No	NA	0.5	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.416	0.076	normal	0	No	NA	0.4664	0.3648	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	9.53	1.68	unknown	0	No	NA	13	8.2	Yes	Confidence interval	Stability	C
	VC	2	8	11.1	1.49	normal	0	No	NA	12.06	10.07	Yes	Confidence interval	Stability	C
EX-07	PCE	5	8	0.396	0.374	ln(x)	37.5	No	NA	1.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	2.65	2.29	ln(x)	0	No	NA	3.578	1.31	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	0.354	0.132	unknown	12.5	No	NA	0.46	0.1	No	Confidence interval	Performance Standard met	B
	VC	2	8	4.71	2.12	normal	0	No	NA	6.132	3.293	Yes	Confidence interval	Stability	C
	PCP	1	8	0.088	0.023	unknown	100	No	NA	0.1	0.05	No	Confidence interval	Performance Standard met	B
EX-08	PCE	5	8	0.094	0.012	unknown	100	No	NA	0.1	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.141	0.091	unknown	62.5	No	NA	0.29	0.05	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	0.088	0.023	unknown	100	No	NA	0.1	0.05	No	Confidence interval	Performance Standard met	B
	VC	2	8	0.188	0.280	unknown	87.5	No	NA	0.88	0.06	No	Confidence interval	Performance Standard met	B
	PCP	1	8	1.36	0.939	ln(x)	0	Yes	-0.7215[d]	NA	NA	No	Confidence band	Performance Standard met	B
EX-09	PCE	5	8	0.094	0.012	unknown	100	No	NA	0.1	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.215	0.058	normal	12.5	No	NA	0.2541	0.1759	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	2.14	0.444	normal	0	No	NA	2.435	1.84	No	Confidence interval	Performance Standard met	B
	VC	2	8	0.156	0.072	unknown	50	No	NA	0.24	0.06	No	Confidence interval	Performance Standard met	B

TABLE C1-1
SHALLOW GROUNDWATER STATISTICAL RESULTS SUMMARY - APRIL 2015
USING THE EIGHT MOST RECENT DATA POINTS FOR CONSTITUENTS OF CONCERN
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Monitoring Location	COC	MCL (µg/l)	N	Mean (µg/l)	Standard Deviation (µg/l)	Data Distribution	% Non-detects	Trend at α 0.01[(a)]	Slope at α 0.01[(b)] (µg/l/year)	UCL (95% CL)	LCL (95% CL)	Exceeds MCL[(c)]	MCL Exceedance Determination Method	Indication	Recommendation
EX-11	PCE	5	8	0.394	0.851	unknown	100	No	NA	2.5	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	11.8	22.7	ln(x)	0	No	NA	9.996	1.438	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	4.13	5.24	ln(x)	0	No	NA	6.242	0.6776	No	Confidence interval	Performance Standard met	B
	VC	2	8	337	194	normal	0	No	NA	466.9	207.3	Yes	Confidence interval	Stability	C
	PCP	1	8	0.088	0.023	unknown	100	No	NA	0.1	0.05	No	Confidence interval	Performance Standard met	B
MW-06	PCE	5	8	0.094	0.012	unknown	100	No	NA	0.1	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.233	0.137	ln(x)	25	No	NA	0.53	0.1	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	3.76	0.916	ln(x)	0	No	NA	4.264	3.173	No	Confidence interval	Performance Standard met	B
	VC	2	8	1.34	0.286	normal	0	No	NA	1.527	1.143	No	Confidence interval	Performance Standard met	B
MW-20	PCE	5	8	0.094	0.012	unknown	100	No	NA	0.1	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	1.05	0.257	normal	0	No	NA	1.226	0.8817	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	1.31	0.412	normal	0	No	NA	1.587	1.035	No	Confidence interval	Performance Standard met	B
	VC	2	8	3.21	1.82	normal	0	No	NA	3.91	2.156	Yes	Confidence interval	Stability	C
MW-30	PCE	5	8	0.094	0.012	unknown	100	No	NA	0.1	0.075	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.853	0.179	normal	0	No	NA	0.9725	0.7325	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	5.29	1.19	normal	0	No	NA	6.085	4.49	No	Confidence interval	Performance Standard met	B
	VC	2	8	8.21	5.02	ln(x)	0	No	NA	20	5.1	Yes	Confidence interval	Stability	C
	PCP	1	4	0.100	0.000	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B

(a) Mann-Kendall method used to test for a statistically significant slope trend.
(b) Thiel-Sen method used to estimate the rate of change of the median concentration over time (slope).
(c) The mean of the eight-point data set is considered statistically above the MCL if lower confidence band is greater than the MCL for trending data sets, or if the lower confidence interval is above the MCL for nontrending data sets.
(d) A decreasing trend was identified for this data set; however, the data set is statistically below the MCL (the lower confidence band is below the MCL).

CL	confidence level
COC	constituent of concern; includes PCE, TCE, 1,1-DCE, VC, and PCP
LCL	lower confidence limit
ln(x)	logrithmic distribution
MCL	maximum contaminant level
N	number of data points used
NA	not applicable
PCE	tetrachloroethene
PCP	pentachlorophenol
TCE	trichloroethene
UCL	upper confidence limit
VC	vinyl chloride
1,1-DCE	1,1-dichloroethene
α	Defined as 1-confidence level; represents the percentage of cases for which a false conclusion is reached
µg/l	micrograms per liter

A	Continue monitoring
B	Evaluate sampling frequency
C	Evaluate basis for potential Alternative Performance Standard

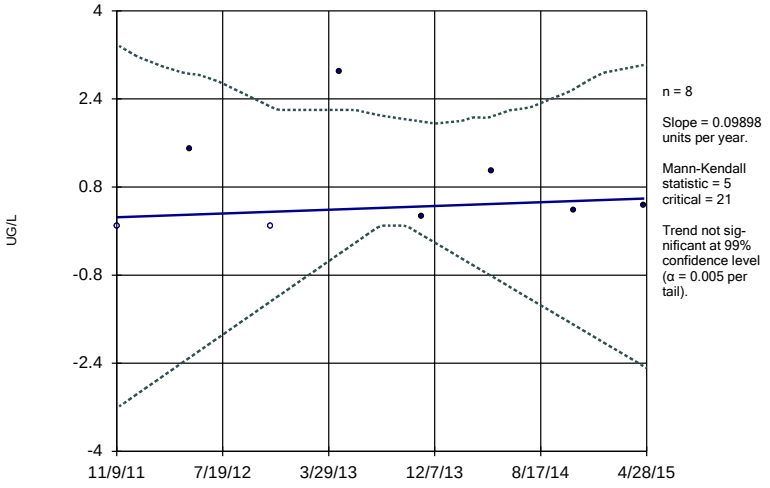
Section C2

Trend Analysis Plots

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

ES-01



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Data File: Wasatch Data for SANITAS

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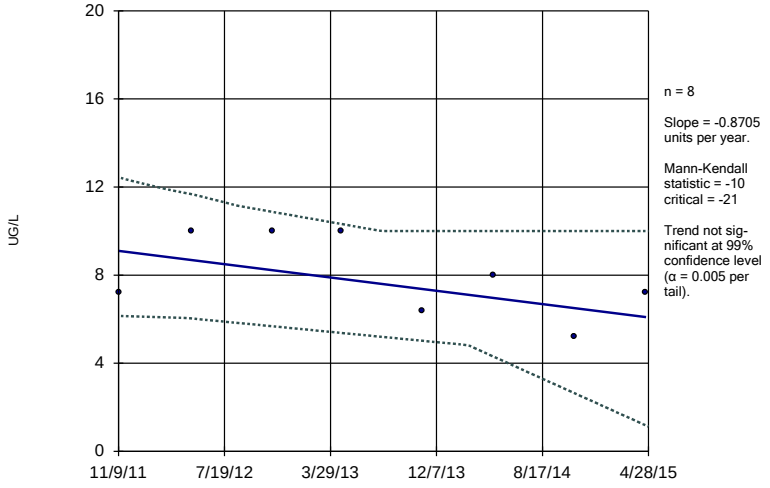
Sen's Slope and 99% Confidence Band

EX-02



Constituent: DCE11 Analysis Run 6/5/2015 10:50 AM

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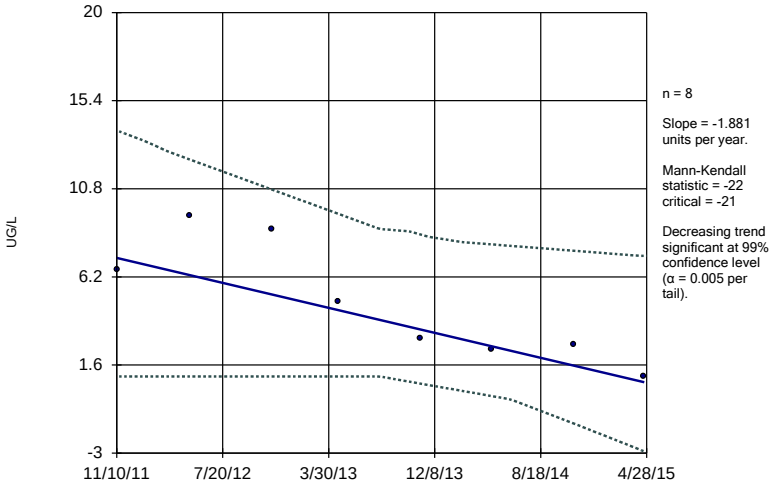
Sen's Slope and 99% Confidence Band

EX-04



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Data File: Wasatch Data for SANITAS

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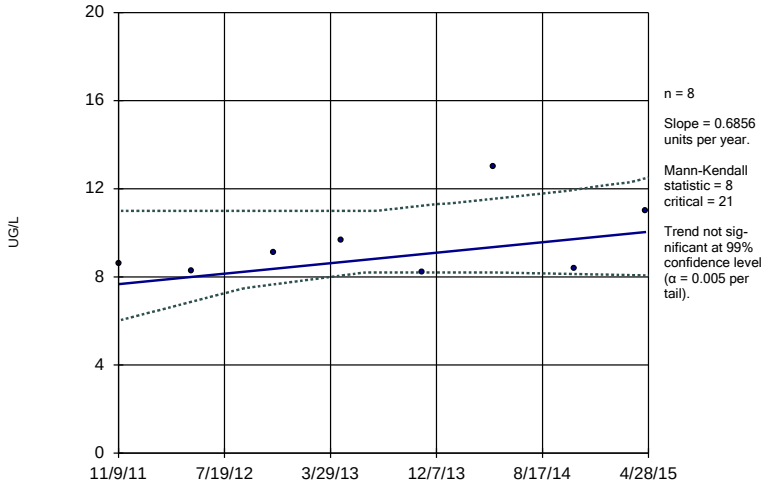
Sen's Slope and 99% Confidence Band

EX-05



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Data File: Wasatch Data for SANITAS

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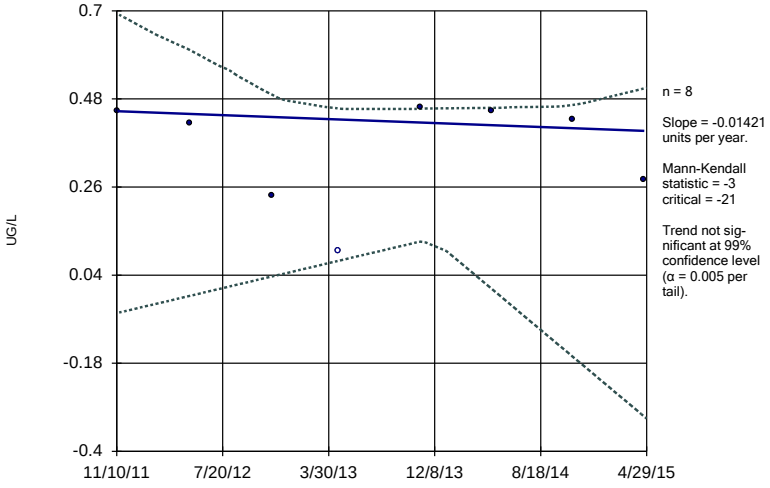
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-07



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Data File: Wasatch Data for SANITAS

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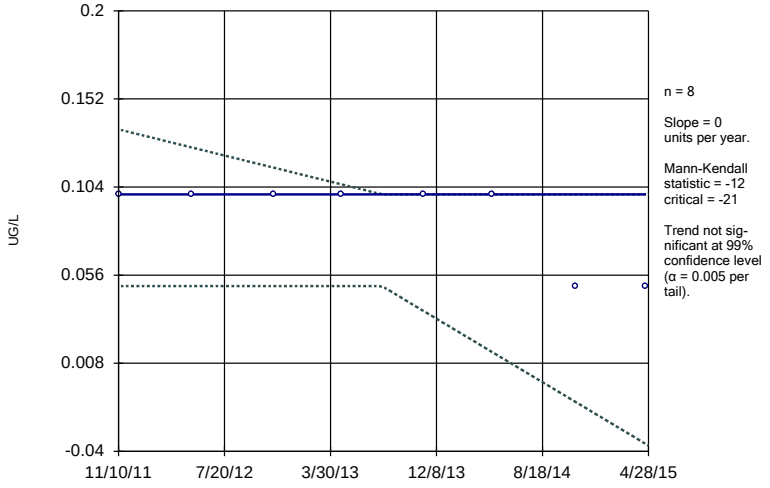
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-08



Constituent: DCE11 Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

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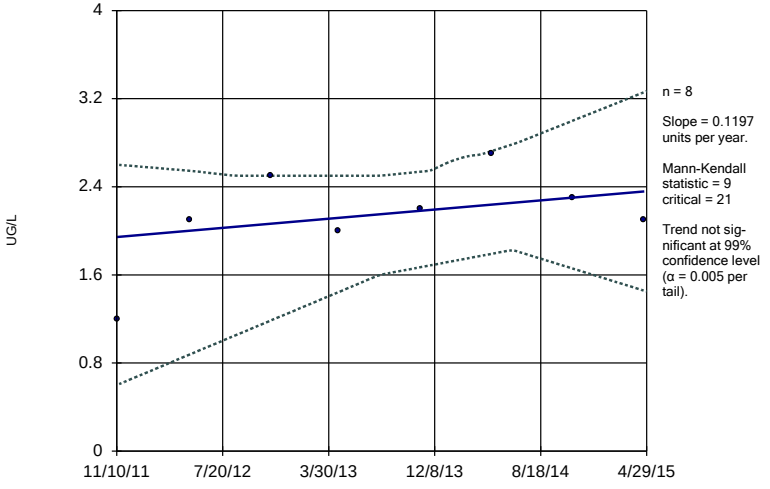
Sen's Slope and 99% Confidence Band

EX-09



Constituent: DCE11 Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

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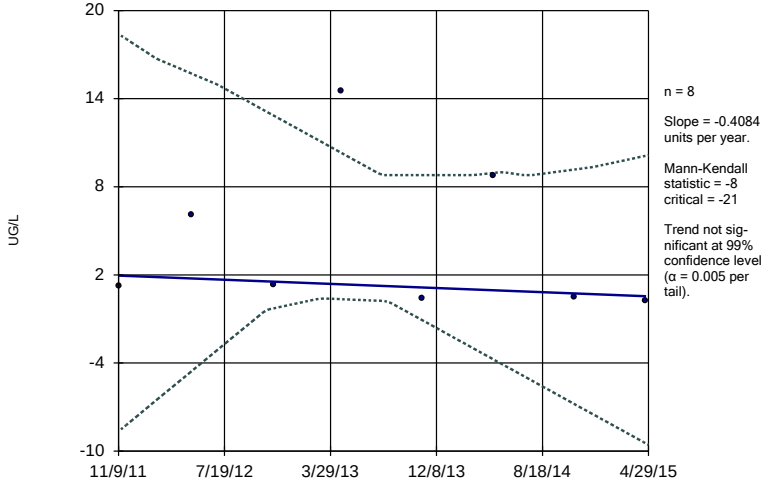
Sen's Slope and 99% Confidence Band

EX-11

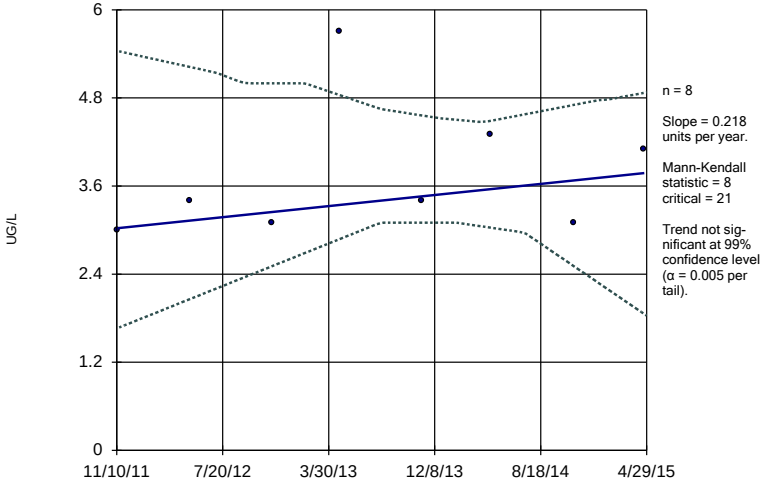


Constituent: DCE11 Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

MW-06



Constituent: DCE11 Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

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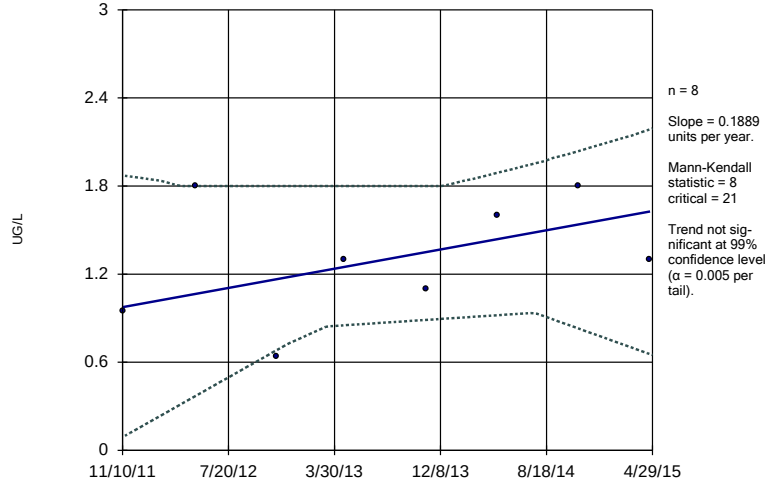
Sen's Slope and 99% Confidence Band

MW-20



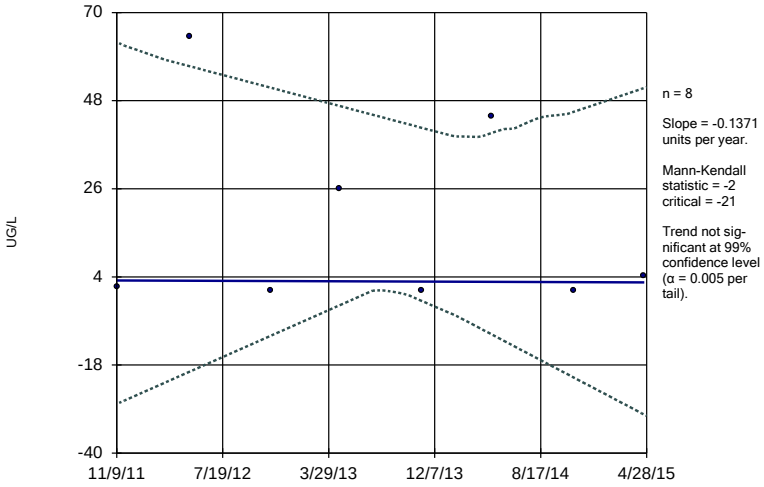
Constituent: DCE11 Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

ES-01



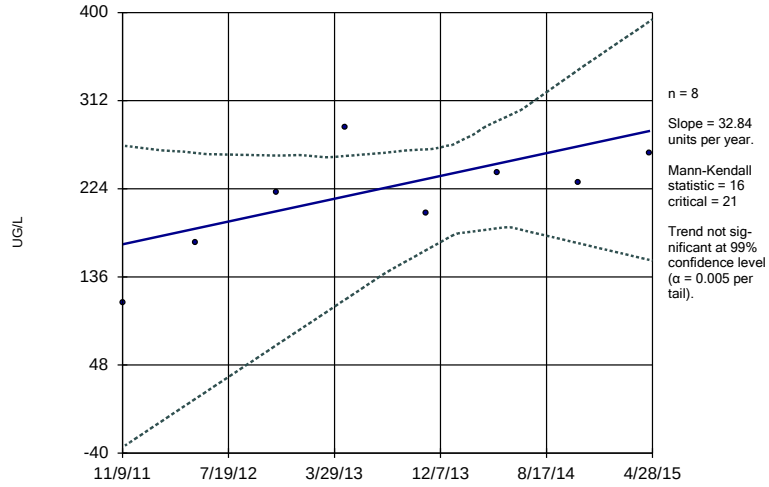
Constituent: DCE12C Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-02

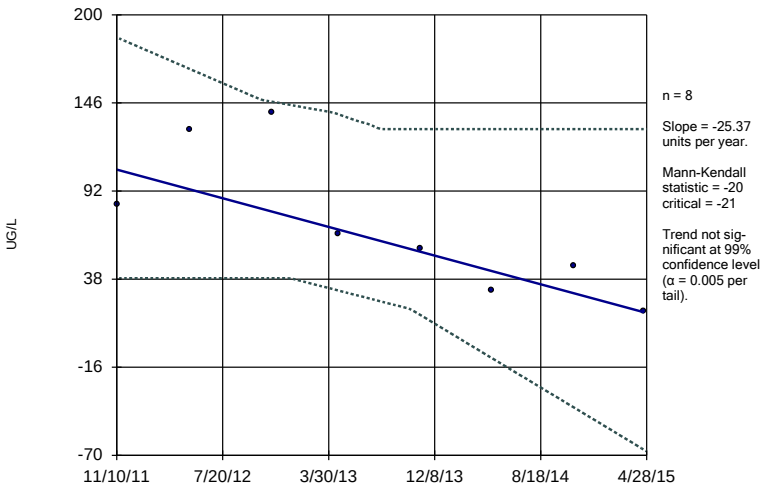


Constituent: DCE12C Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-04

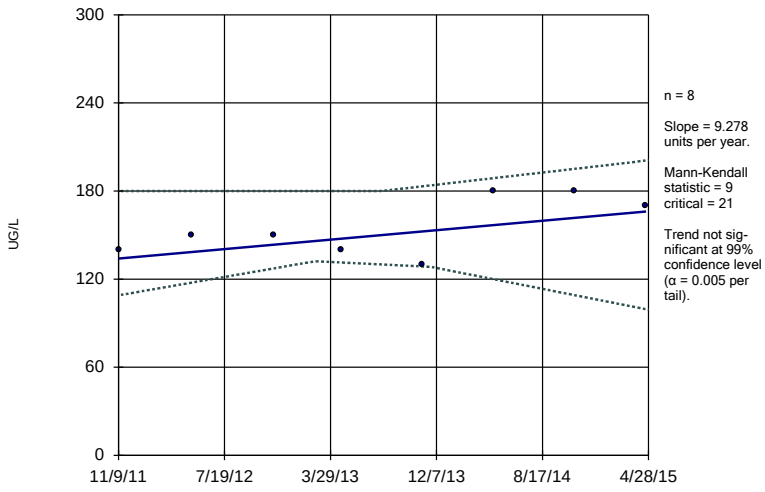


Constituent: DCE12C Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-05

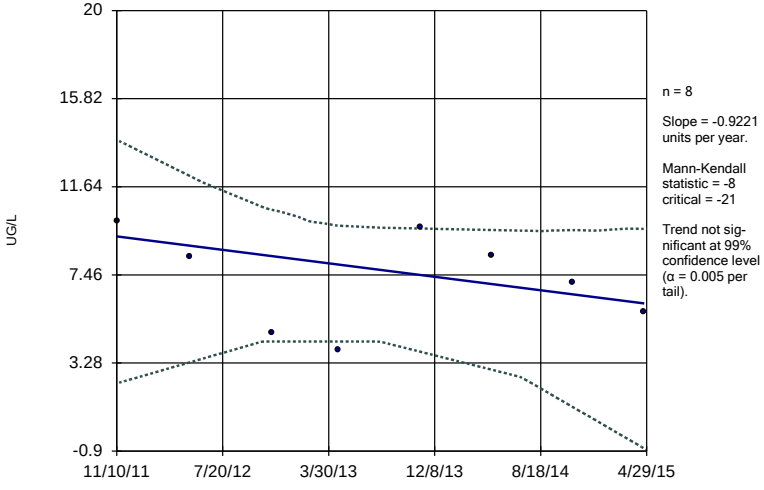


Constituent: DCE12C Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-07



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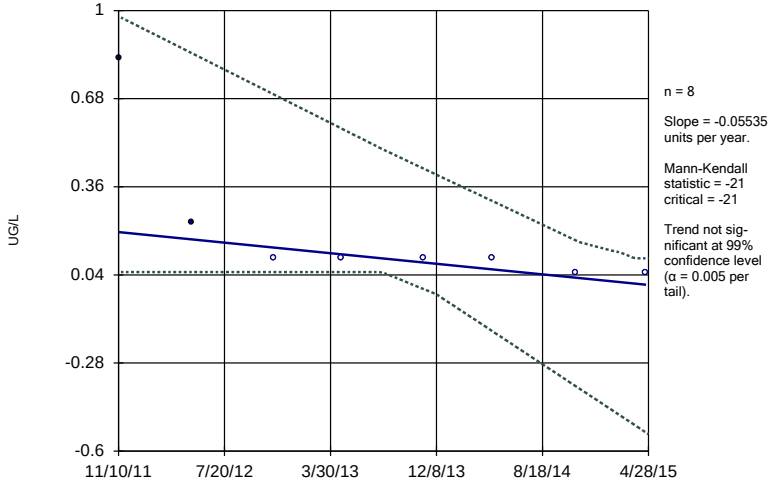
Data File: Wasatch Data for SANITAS

Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-08



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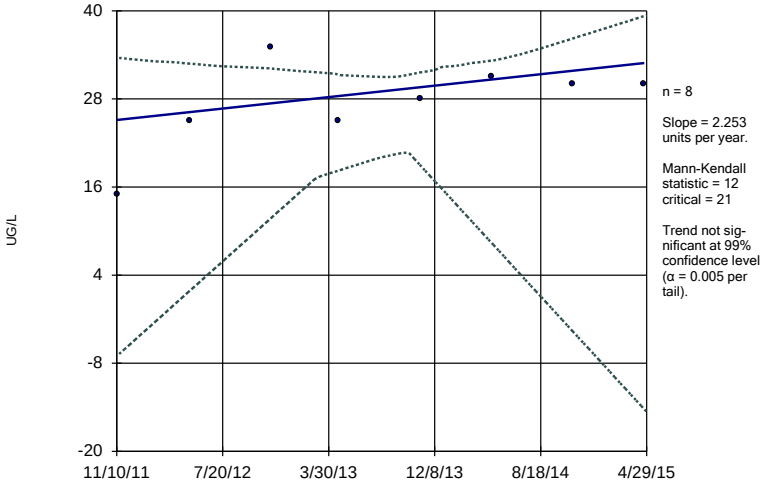
Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-09



Constituent: DCE12C Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

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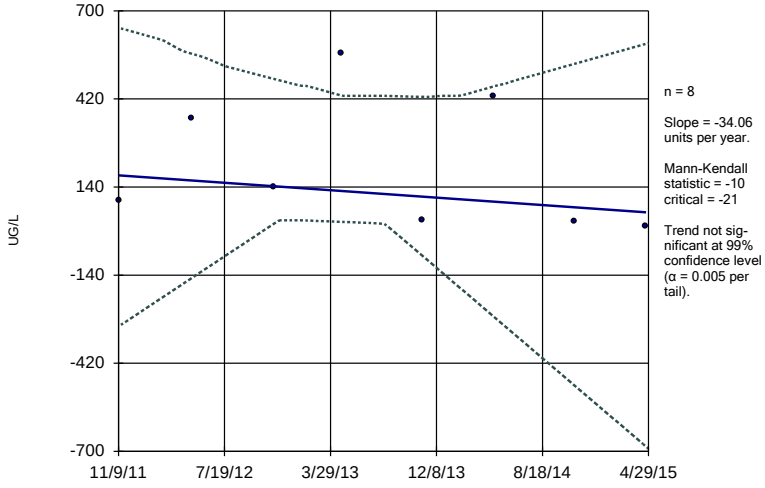
Sen's Slope and 99% Confidence Band

EX-11



Constituent: DCE12C Analysis Run 6/5/2015 10:50 AM

Data File: Wasatch Data for SANITAS

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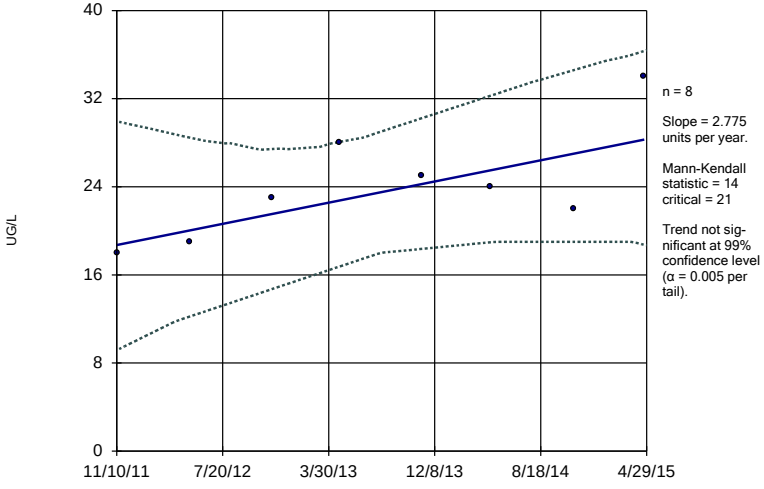
Sen's Slope and 99% Confidence Band

MW-06



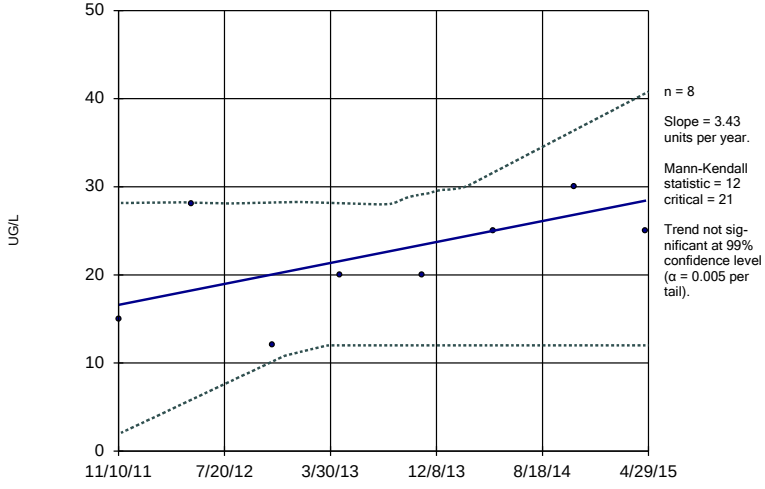
Constituent: DCE12C Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-20



Constituent: DCE12C Analysis Run 6/5/2015 10:51 AM

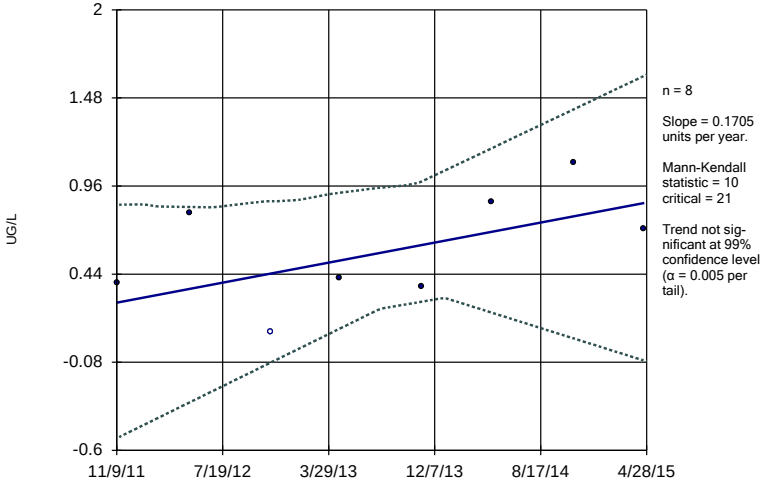
Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

ES-01



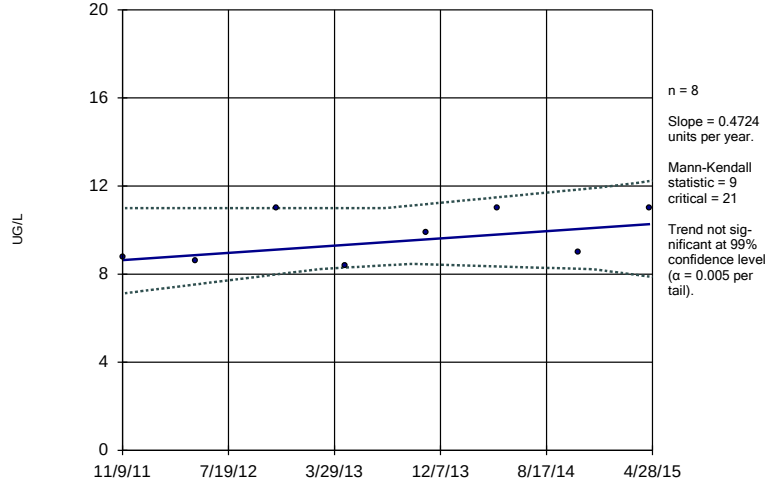
Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-02



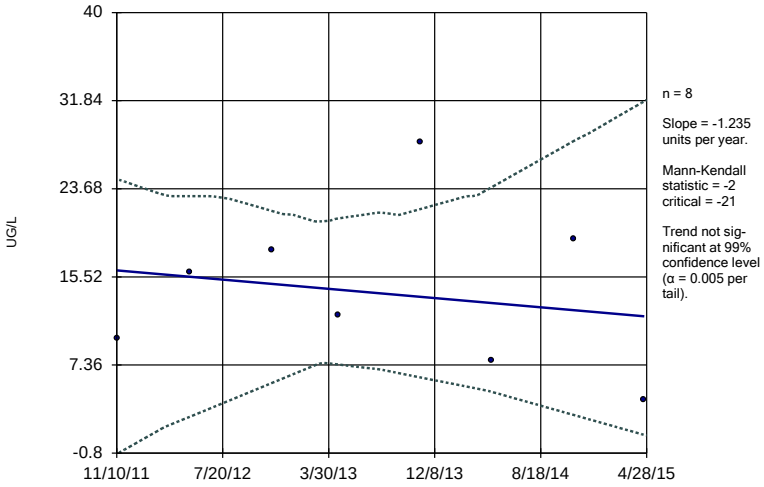
Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-04



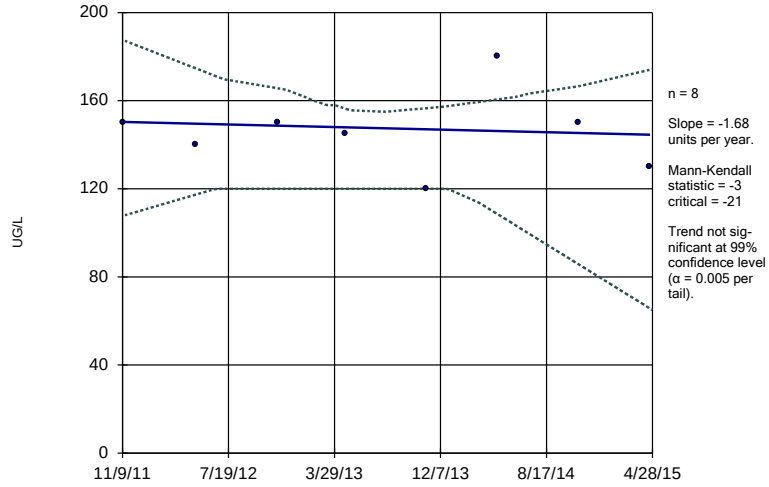
Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-05



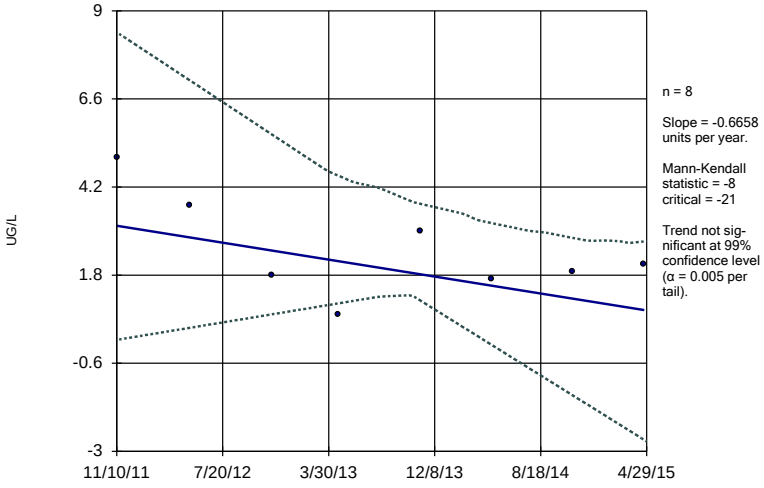
Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-07



n = 8

Slope = -0.6658 units per year.

Mann-Kendall statistic = -8 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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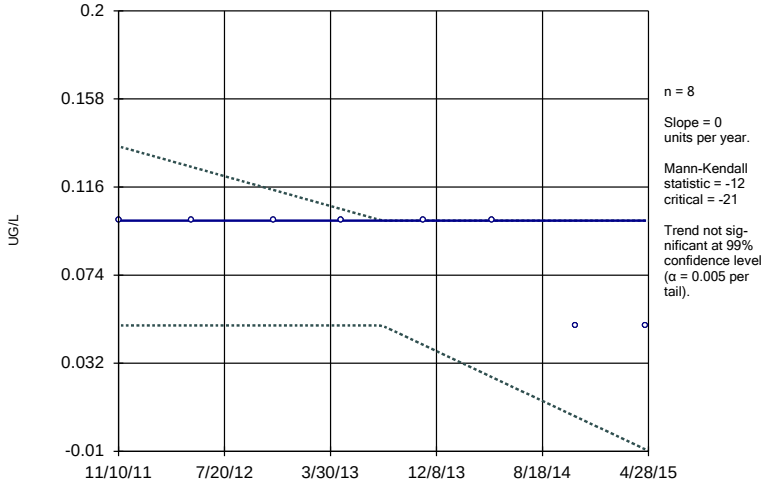
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-08



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -12 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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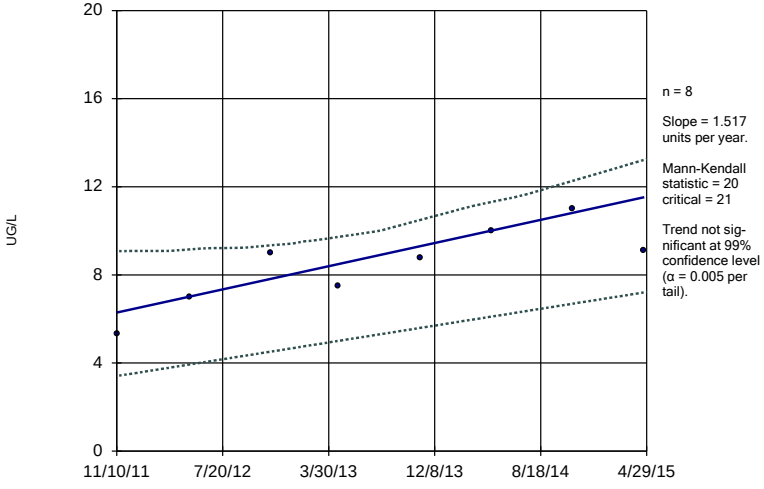
Sen's Slope and 99% Confidence Band

EX-09



n = 8

Slope = 1.517 units per year.

Mann-Kendall statistic = 20 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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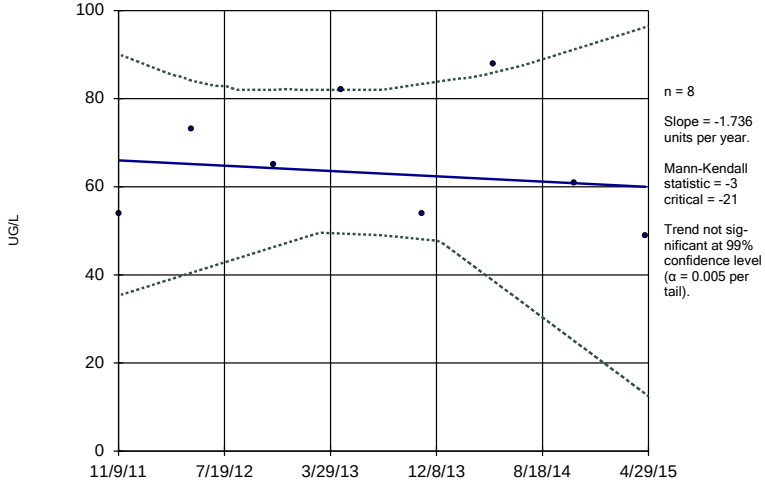
Sen's Slope and 99% Confidence Band

EX-11



n = 8

Slope = -1.736 units per year.

Mann-Kendall statistic = -3 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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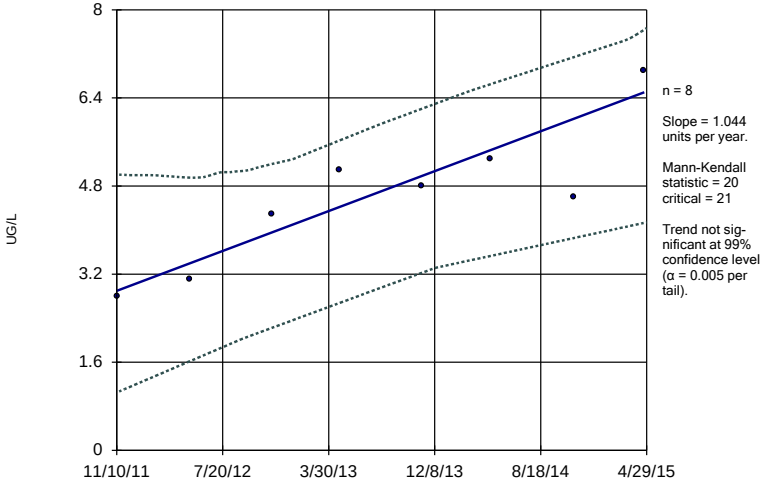
Sen's Slope and 99% Confidence Band

MW-06



Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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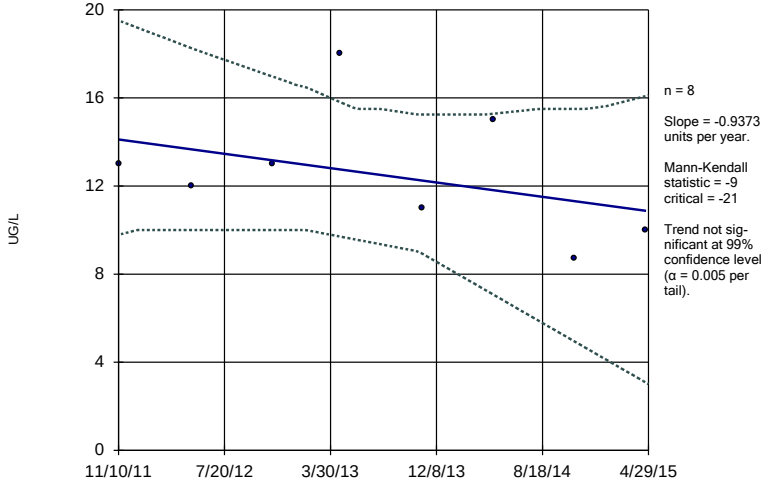
Sen's Slope and 99% Confidence Band

MW-20



Constituent: DCE12T Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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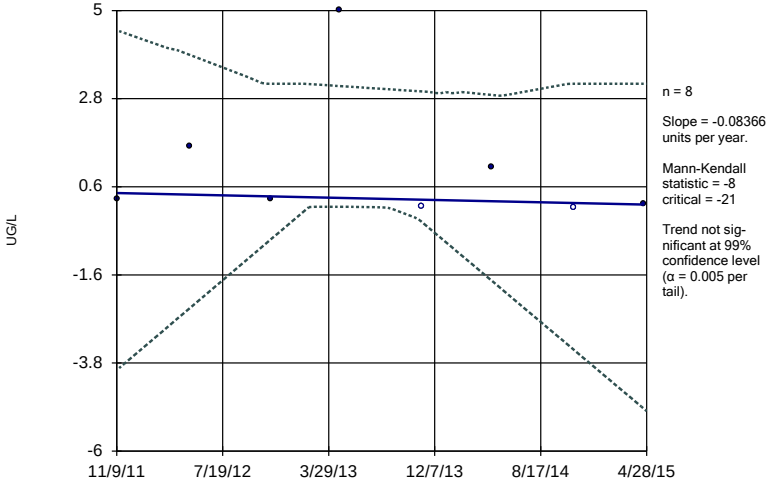
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

ES-01



Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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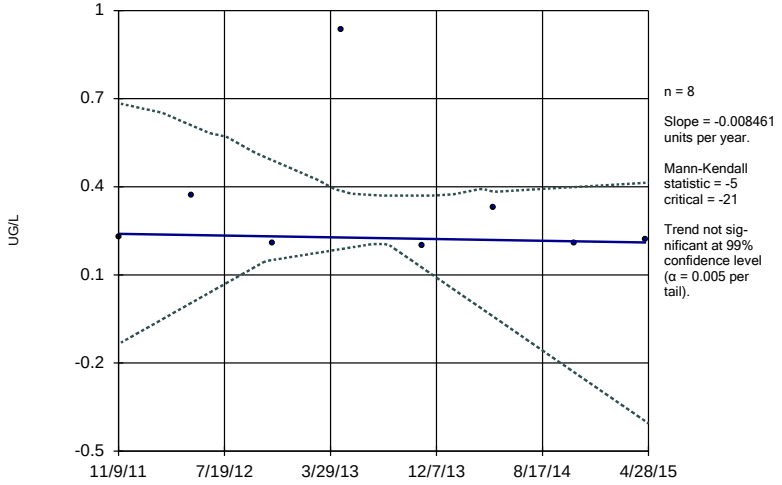
Sen's Slope and 99% Confidence Band

EX-02



Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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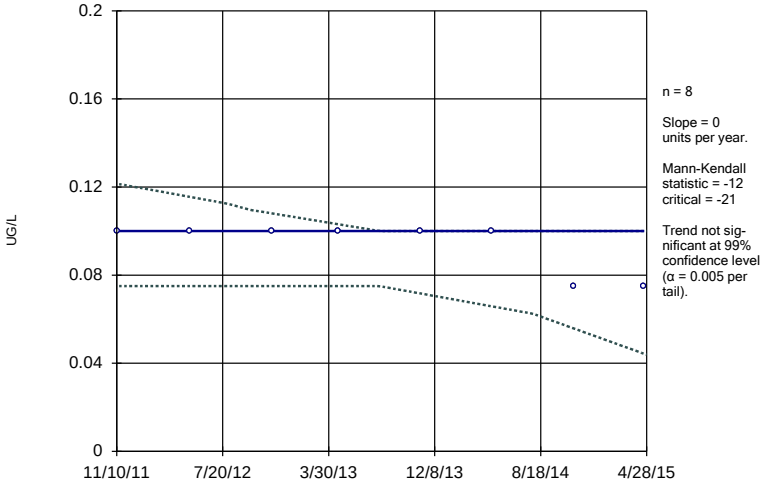
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-04



Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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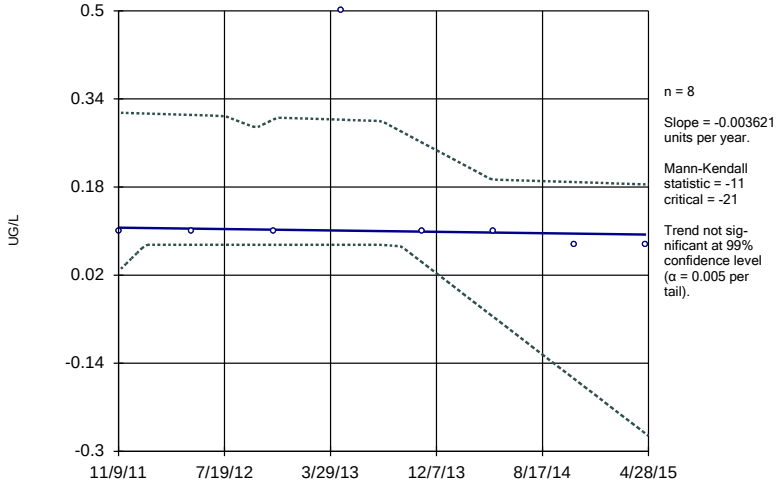
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-05



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Data File: Wasatch Data for SANITAS

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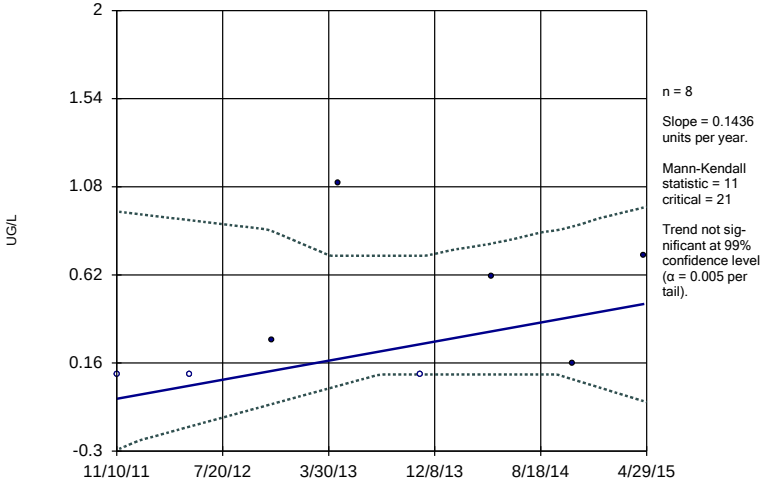
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-07



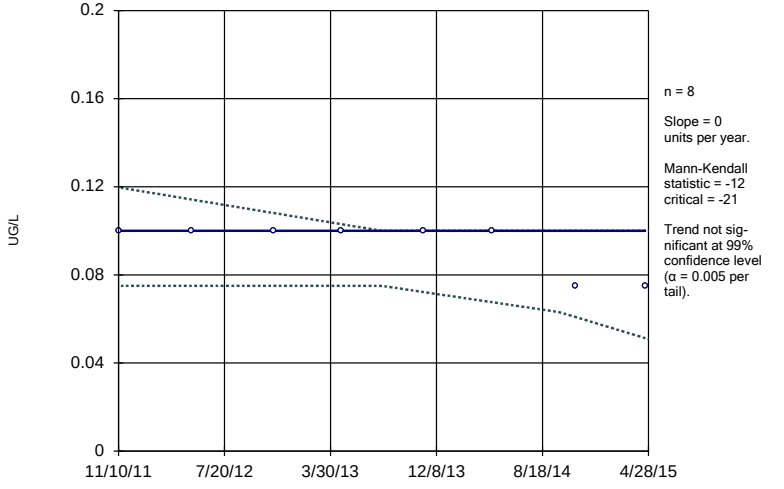
Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-08



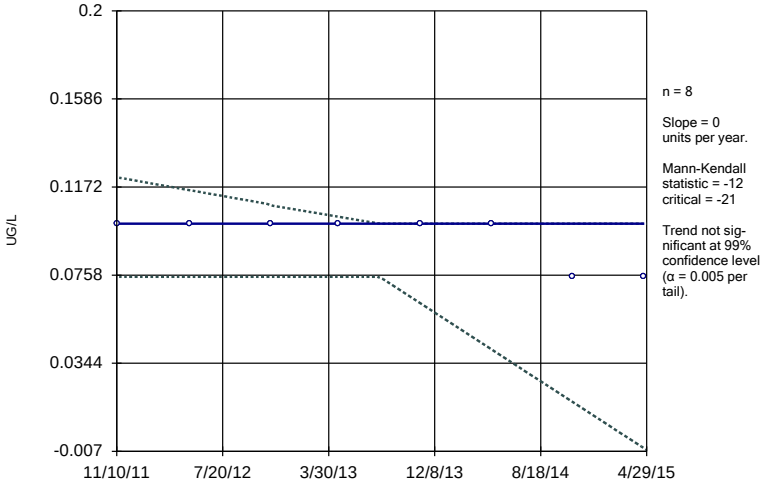
Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-09



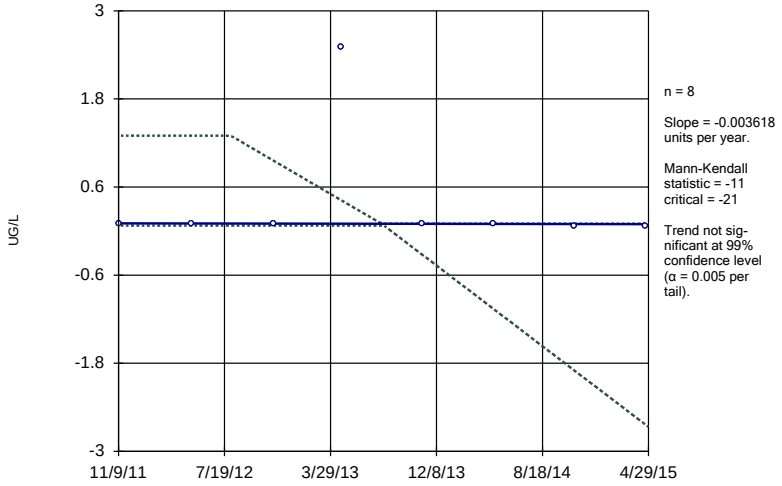
Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-11



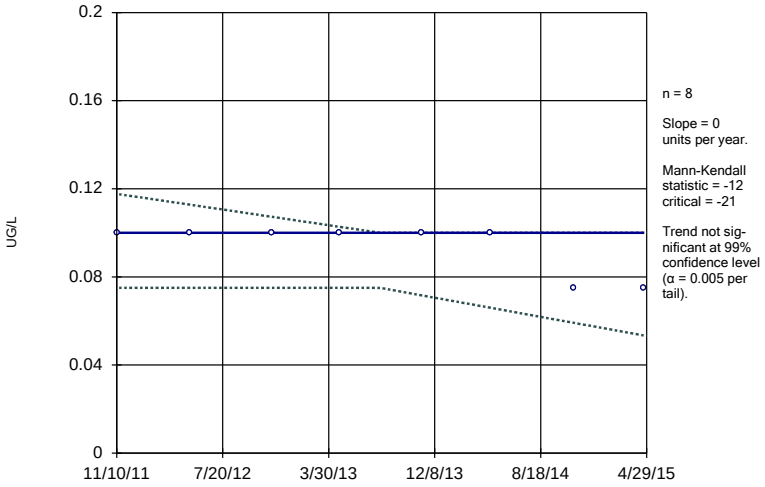
Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-06



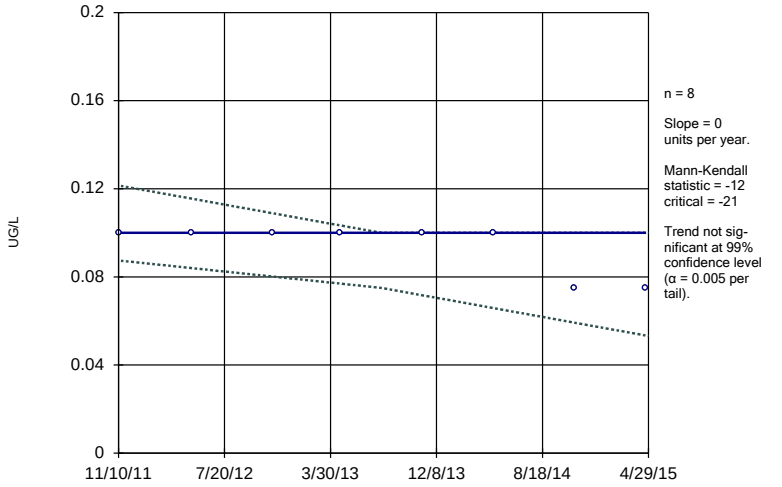
Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-20



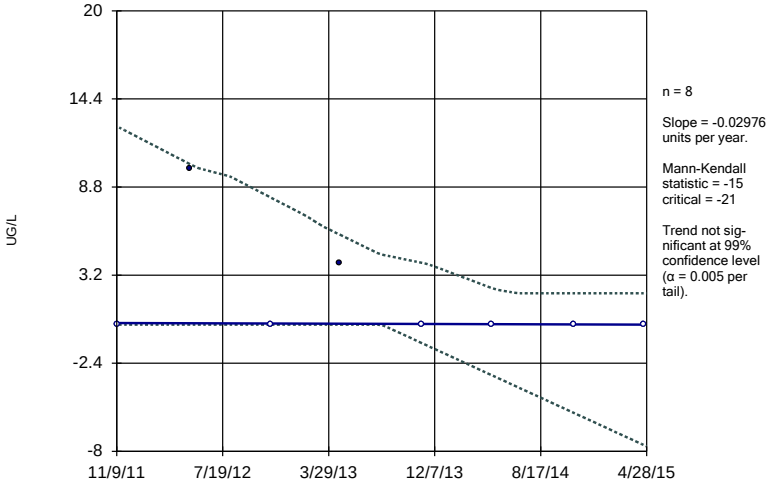
Constituent: PCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

ES-01



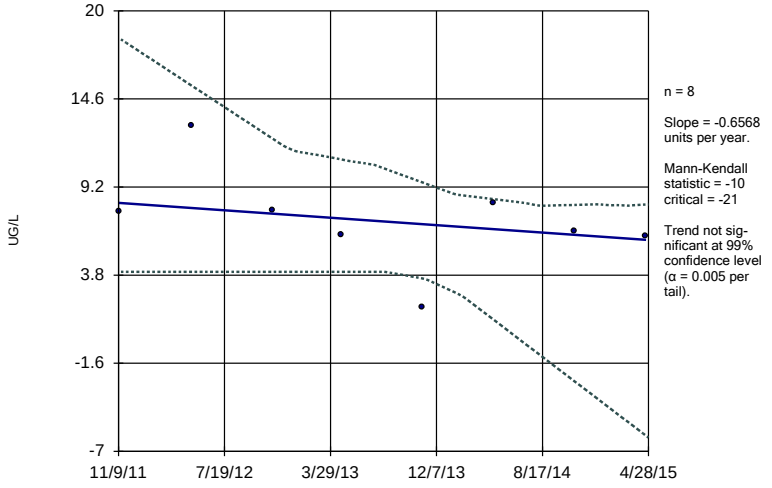
Constituent: PCP Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-02



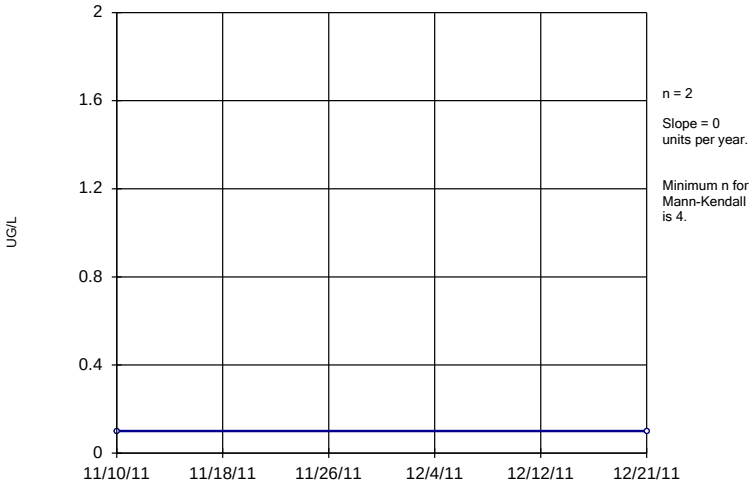
Constituent: PCP Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

EX-04



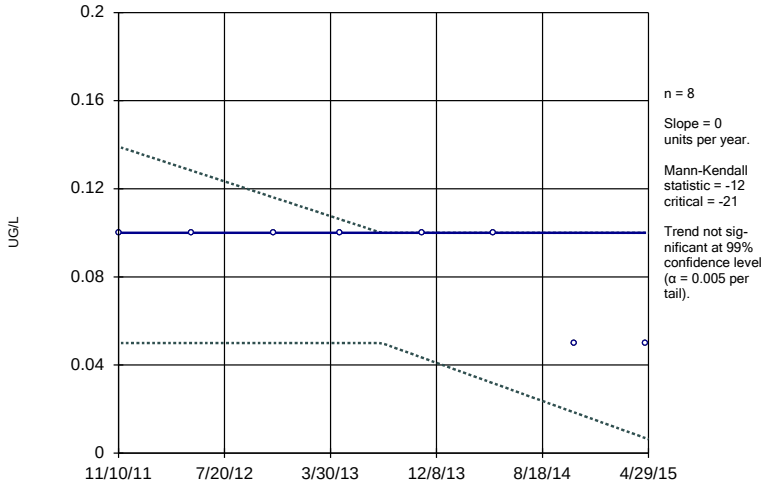
Constituent: PCP Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-07



Constituent: PCP Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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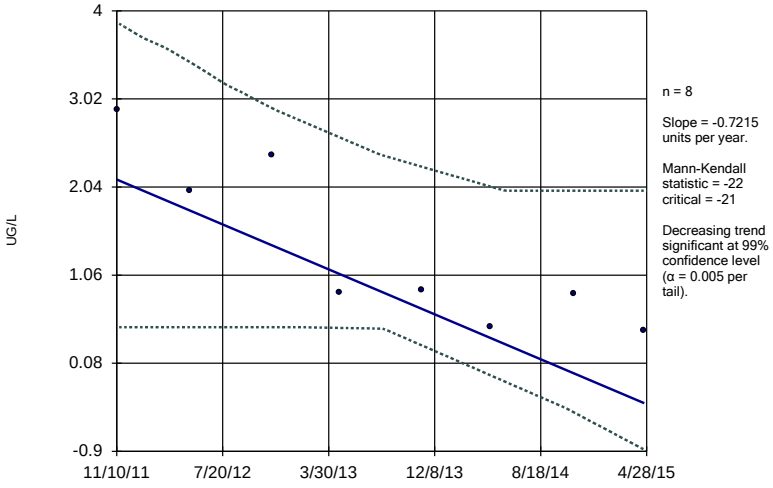
Sen's Slope and 99% Confidence Band

EX-08



n = 8

Slope = -0.7215 units per year.

Mann-Kendall statistic = -22 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: PCP Analysis Run 6/5/2015 10:51 AM

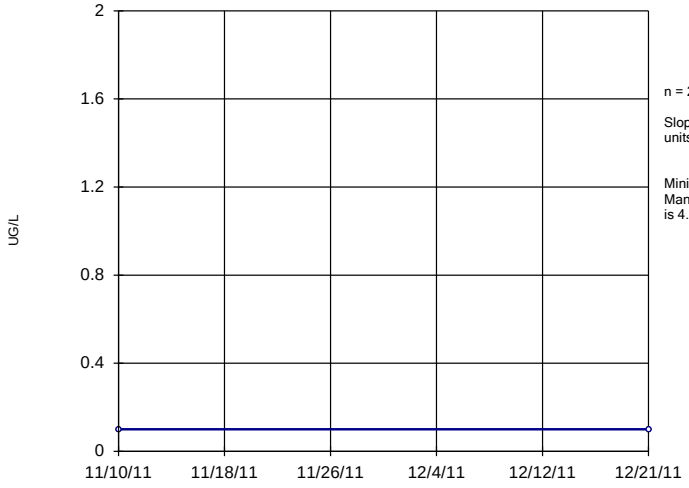
Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

EX-09



n = 2

Slope = 0 units per year.

Minimum n for Mann-Kendall is 4.

Constituent: PCP Analysis Run 6/5/2015 10:51 AM

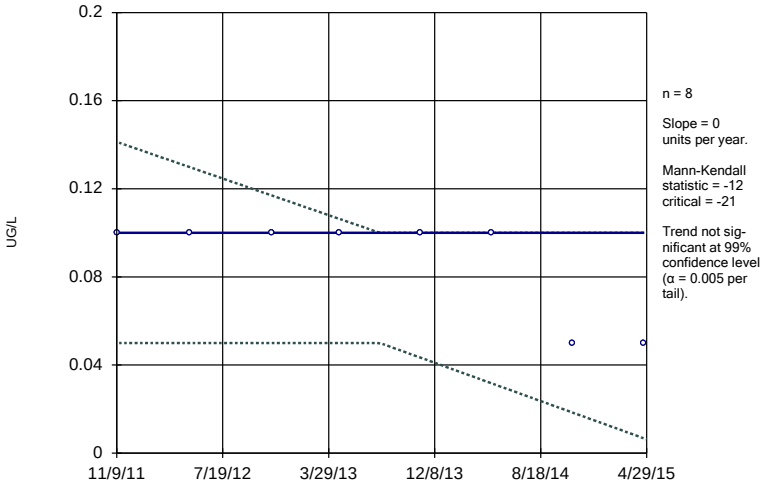
Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-11



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -12 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

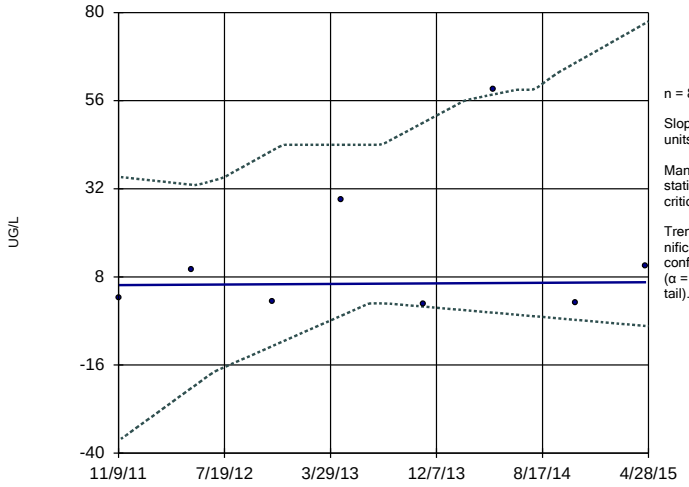
Constituent: PCP Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

ES-01



n = 8

Slope = 0.2332 units per year.

Mann-Kendall statistic = 2 critical = 21

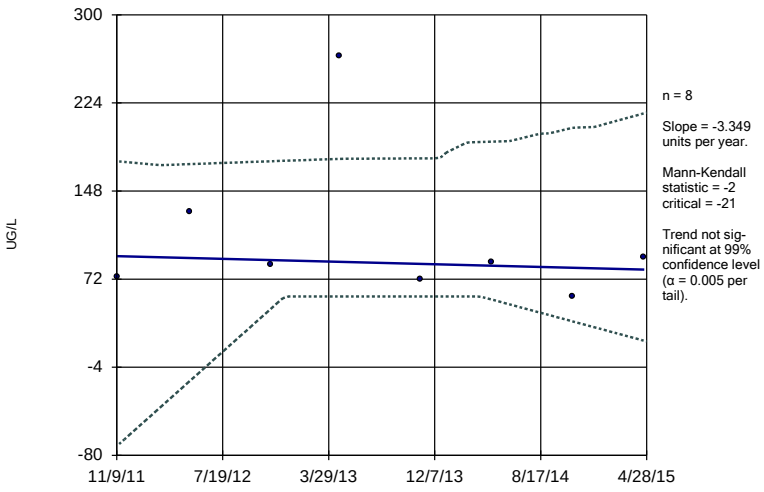
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-02



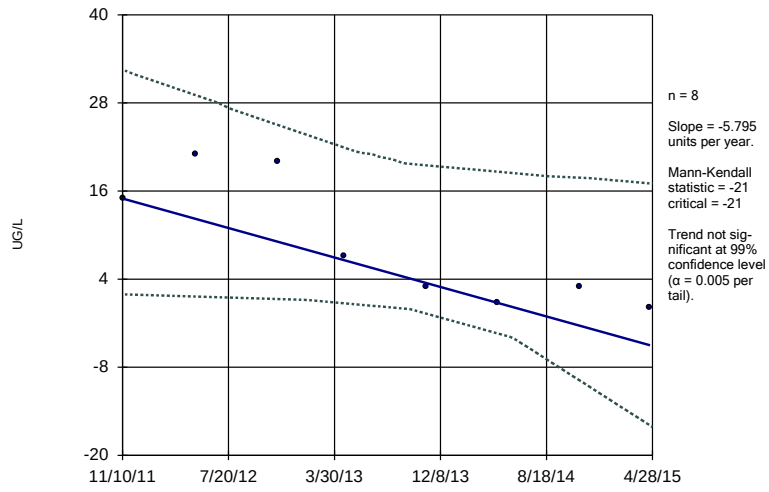
Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-04



Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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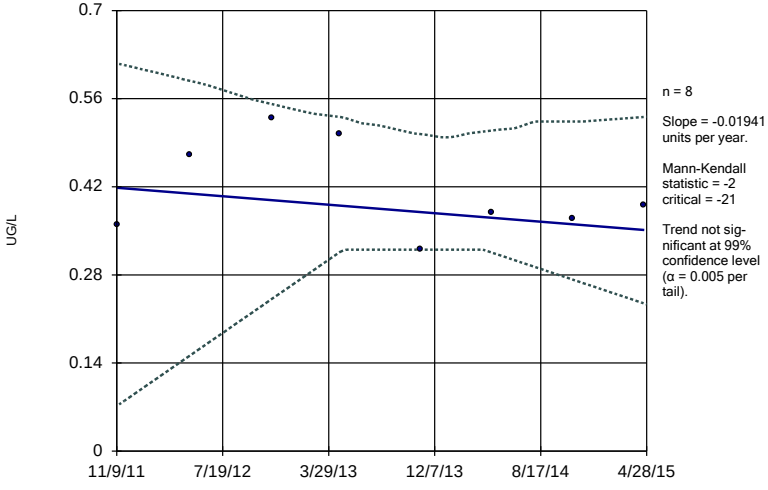
Sen's Slope and 99% Confidence Band

EX-05



Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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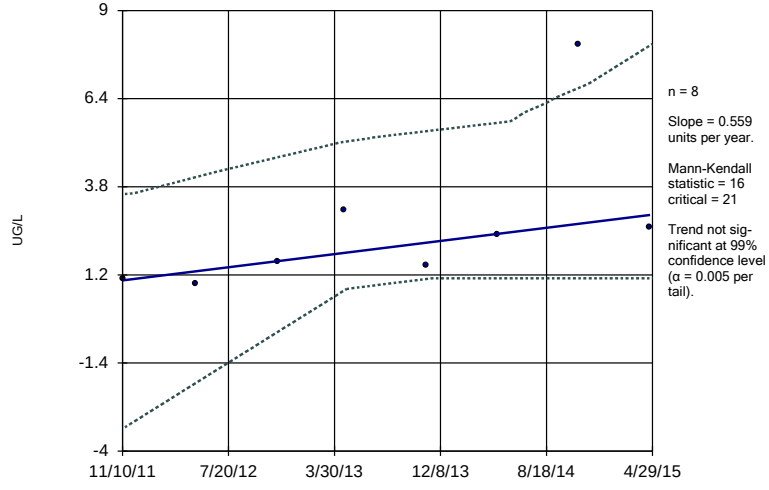
Sen's Slope and 99% Confidence Band

EX-07



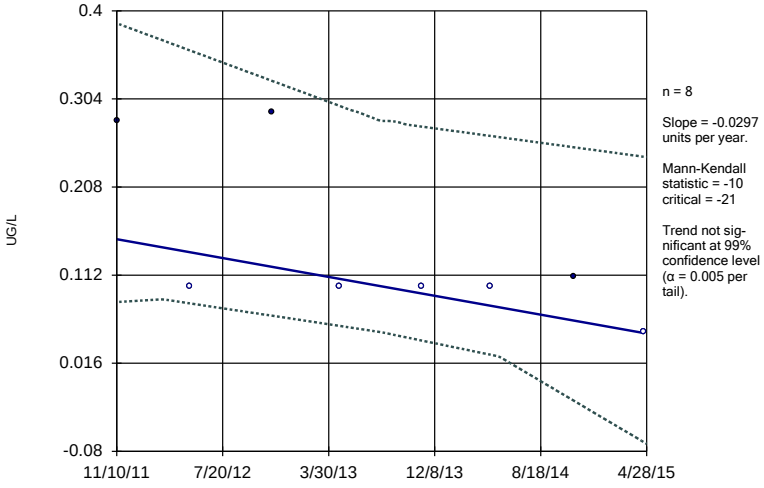
Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-08



n = 8

Slope = -0.0297 units per year.

Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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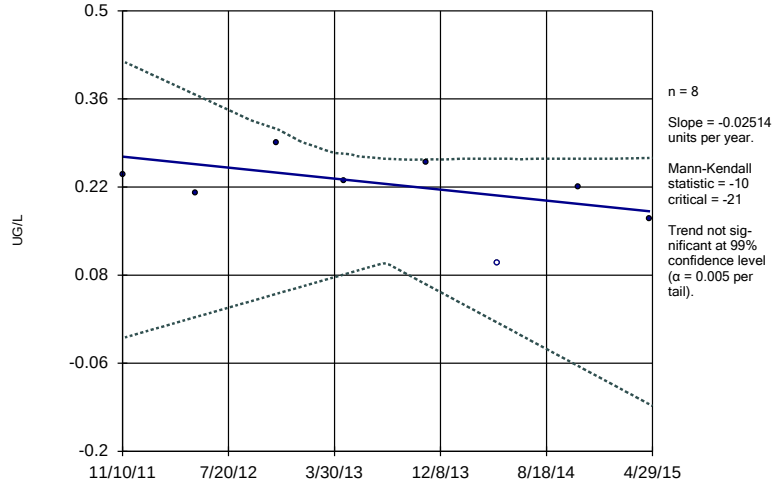
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-09



n = 8

Slope = -0.02514 units per year.

Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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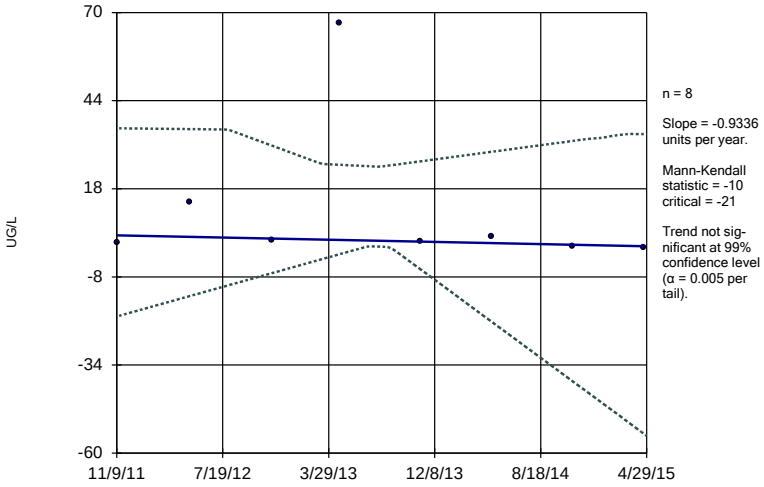
Sen's Slope and 99% Confidence Band

EX-11



n = 8

Slope = -0.9336 units per year.

Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

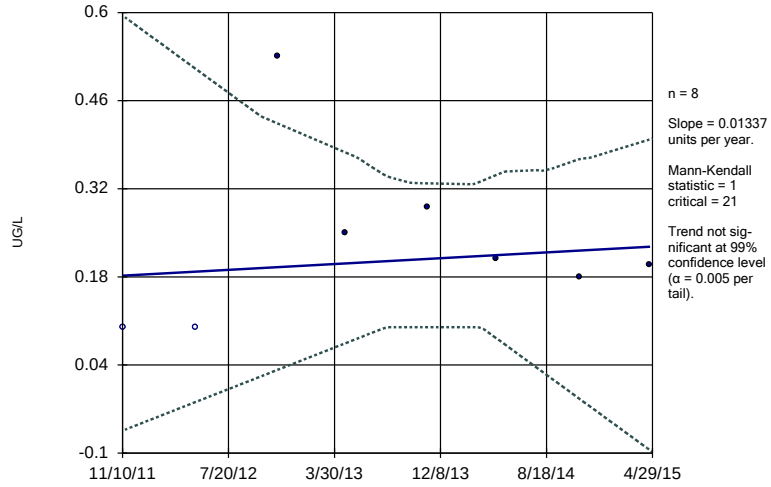
Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-06



n = 8

Slope = 0.01337 units per year.

Mann-Kendall statistic = 1
critical = 21

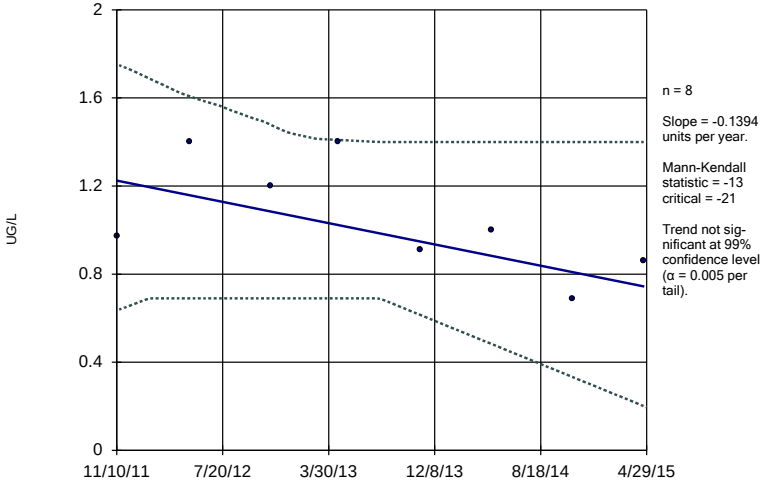
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

MW-20

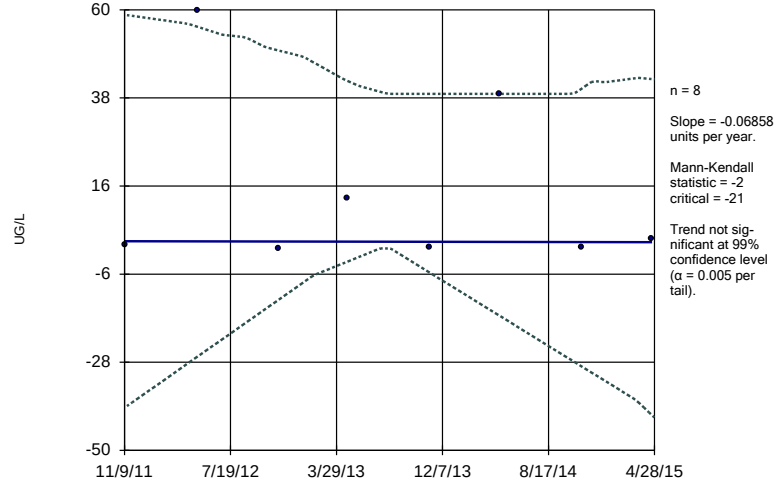


Constituent: TCE Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

ES-01

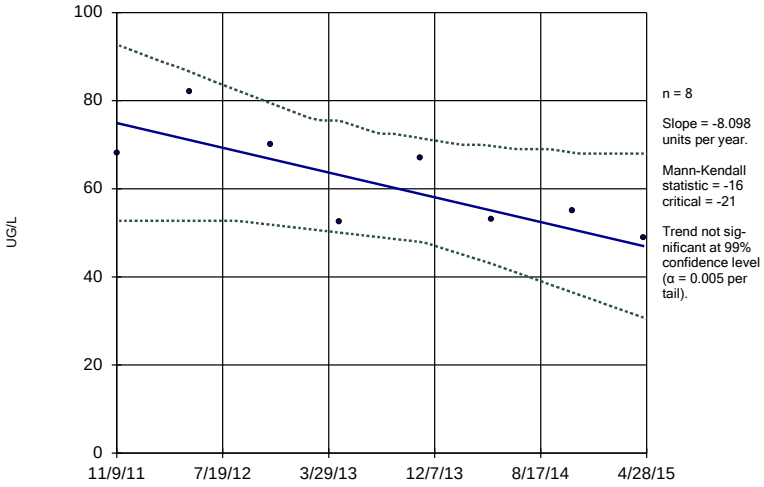


Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-02

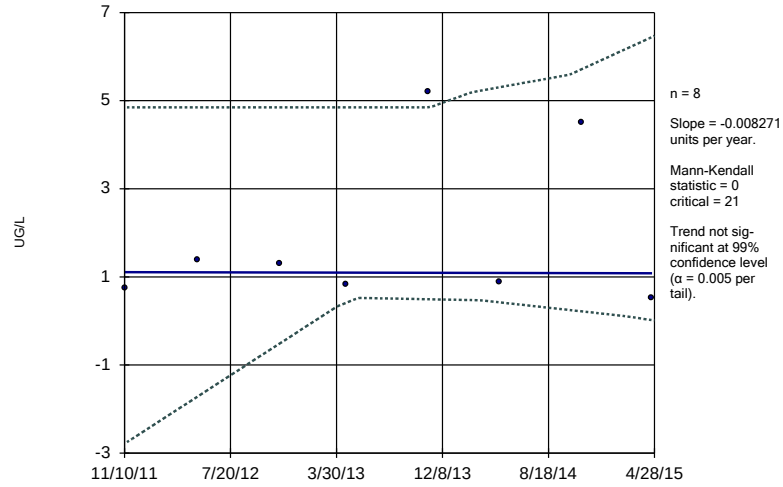


Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-04



Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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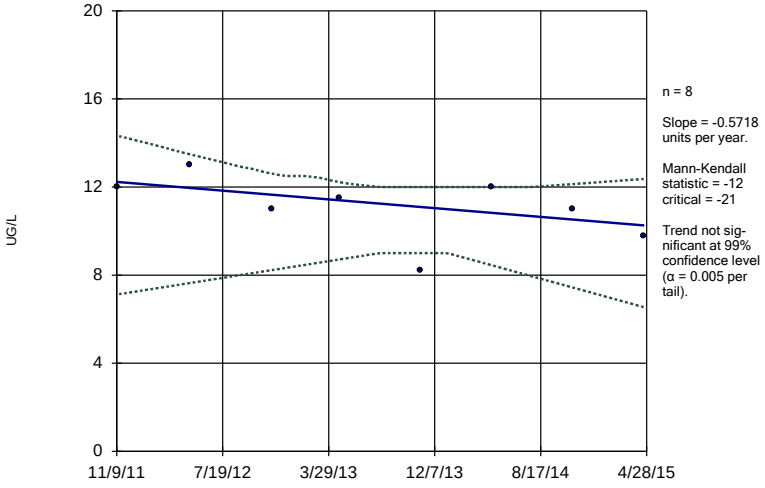
Sen's Slope and 99% Confidence Band

EX-05



n = 8

Slope = -0.5718 units per year.

Mann-Kendall statistic = -12
critical = -21

Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

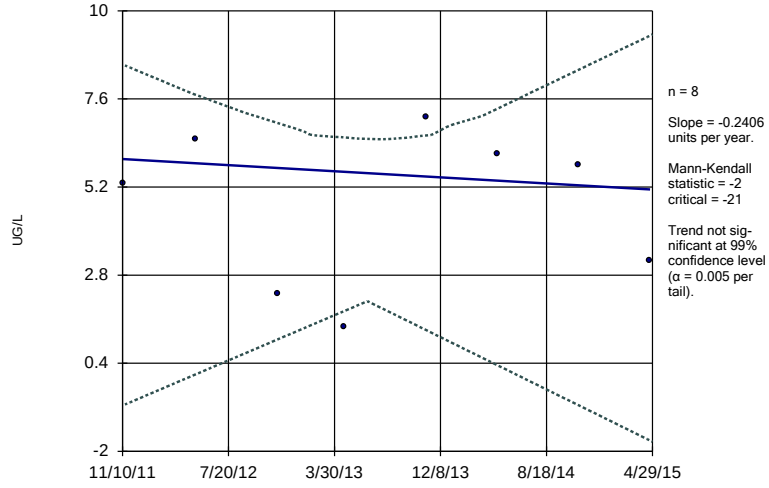
Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

EX-07



n = 8

Slope = -0.2406 units per year.

Mann-Kendall statistic = -2
critical = -21

Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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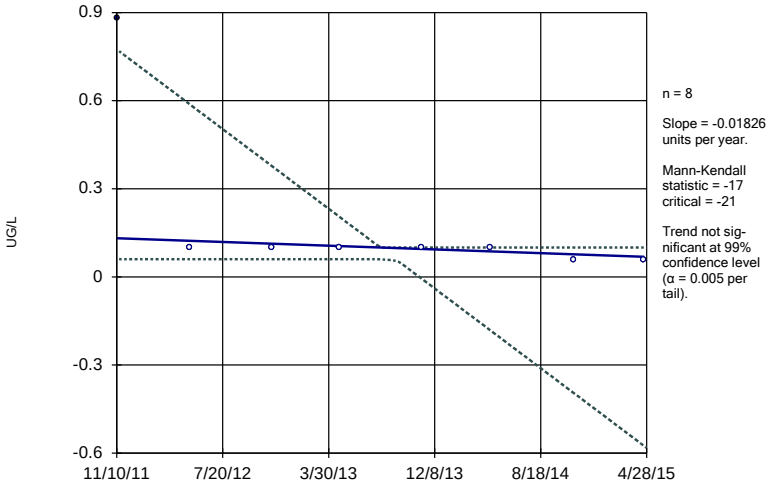
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-08



n = 8

Slope = -0.01826 units per year.

Mann-Kendall statistic = -17
critical = -21

Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

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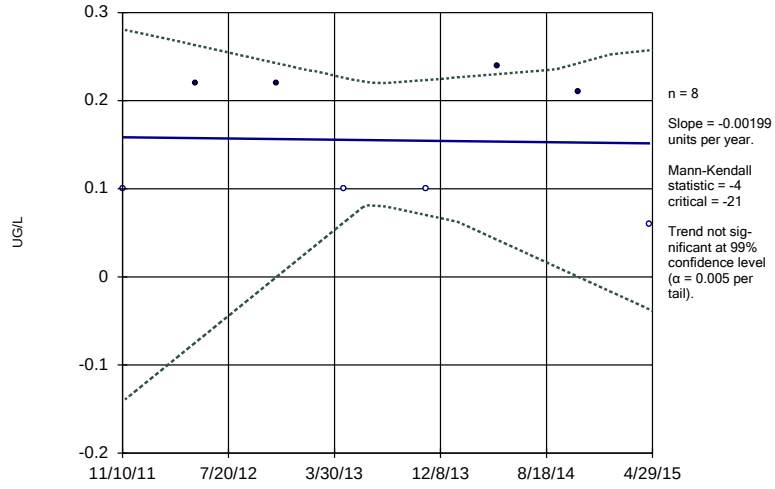
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

EX-09



n = 8

Slope = -0.00199 units per year.

Mann-Kendall statistic = -4
critical = -21

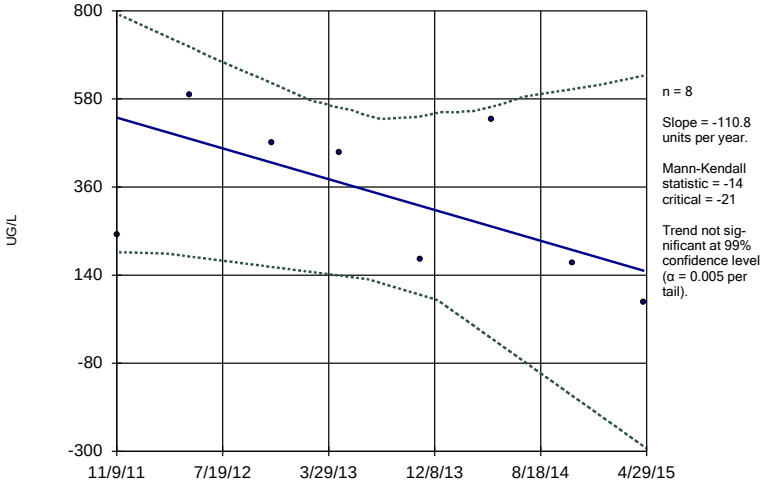
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: VC Analysis Run 6/5/2015 10:51 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

EX-11



Constituent: VC Analysis Run 6/5/2015 10:52 AM

Data File: Wasatch Data for SANITAS

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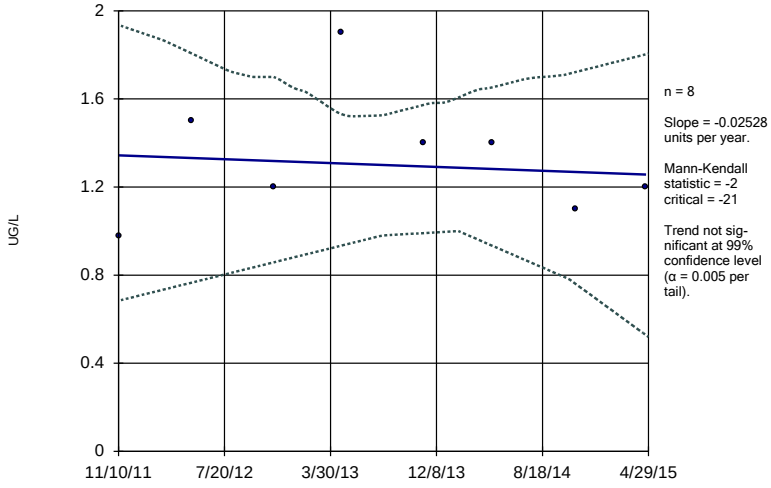
Sen's Slope and 99% Confidence Band

MW-06



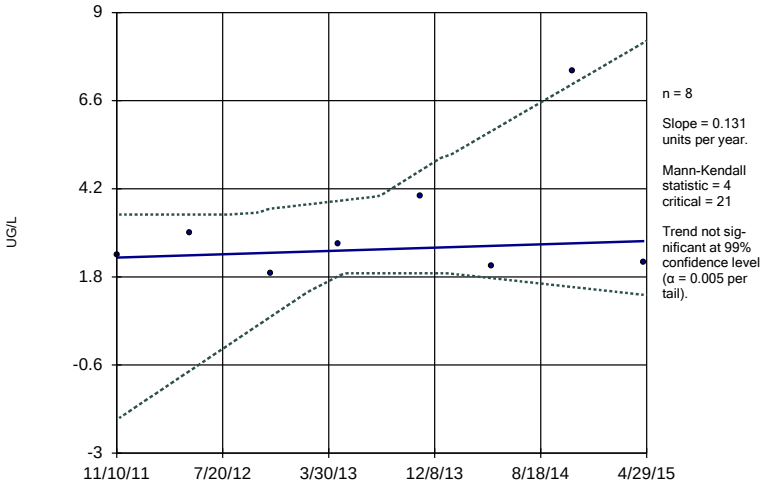
Constituent: VC Analysis Run 6/5/2015 10:52 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-20

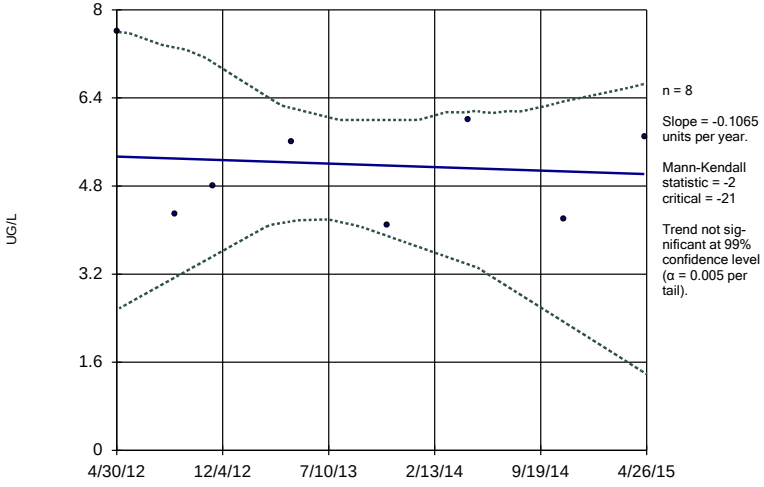


Constituent: VC Analysis Run 6/5/2015 10:52 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

MW-30

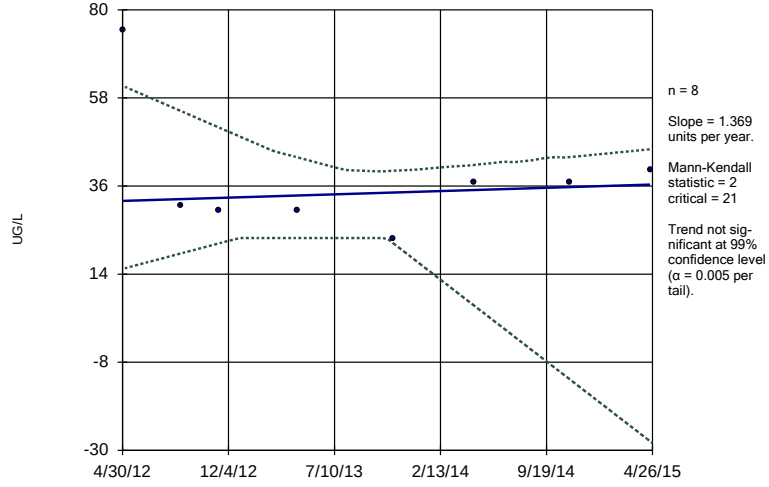


Constituent: DCE11 Analysis Run 6/4/2015 10:01 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

MW-30

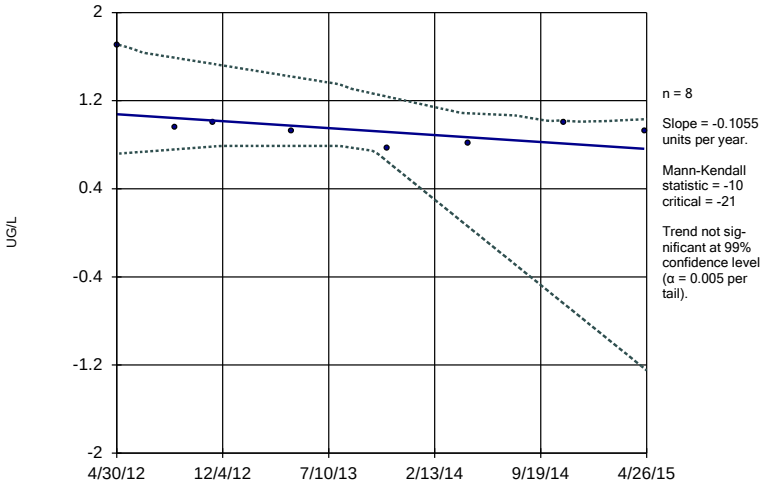


Constituent: DCE12C Analysis Run 6/4/2015 10:01 AM

Data File: Wasatch Data for SANITAS

Sen's Slope and 99% Confidence Band

MW-30



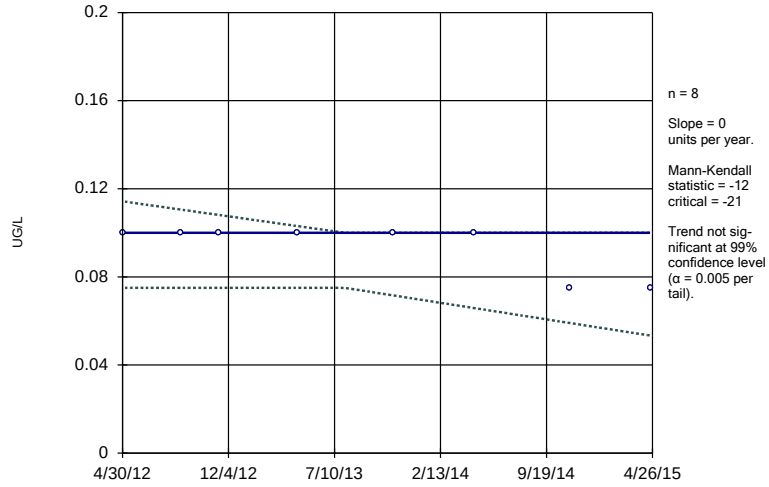
Constituent: DCE12T Analysis Run 6/4/2015 10:01 AM

Data File: Wasatch Data for SANITAS

Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-30



Constituent: PCE Analysis Run 6/4/2015 10:01 AM

Data File: Wasatch Data for SANITAS

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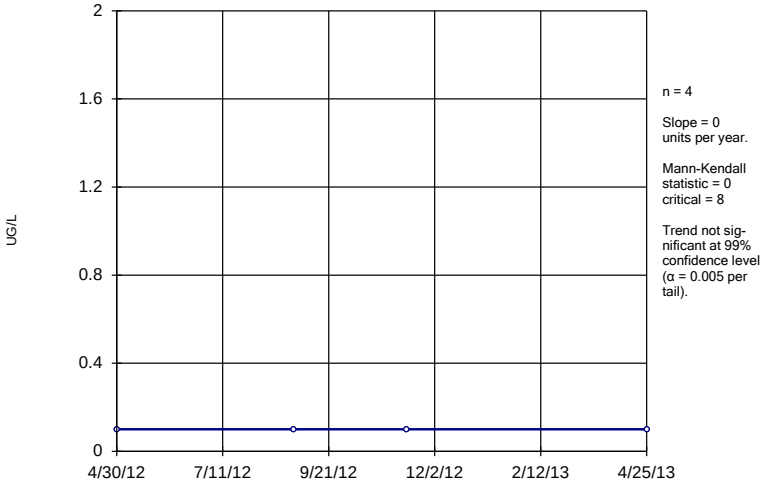
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-30

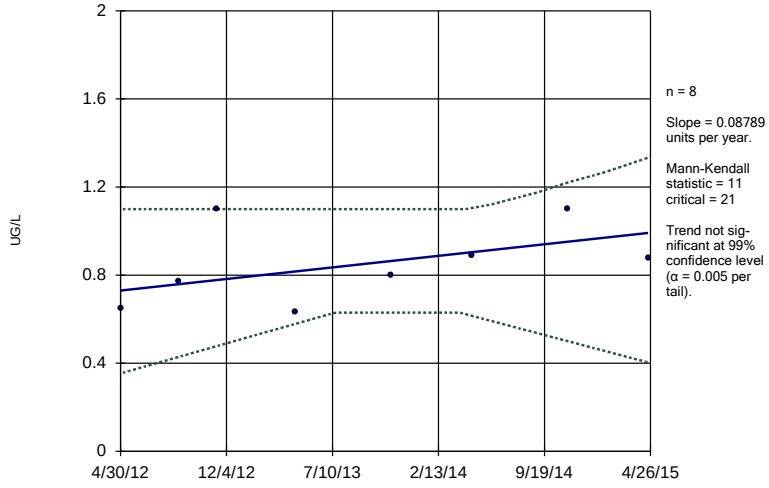


Constituent: PCP Analysis Run 6/4/2015 10:01 AM
Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-30

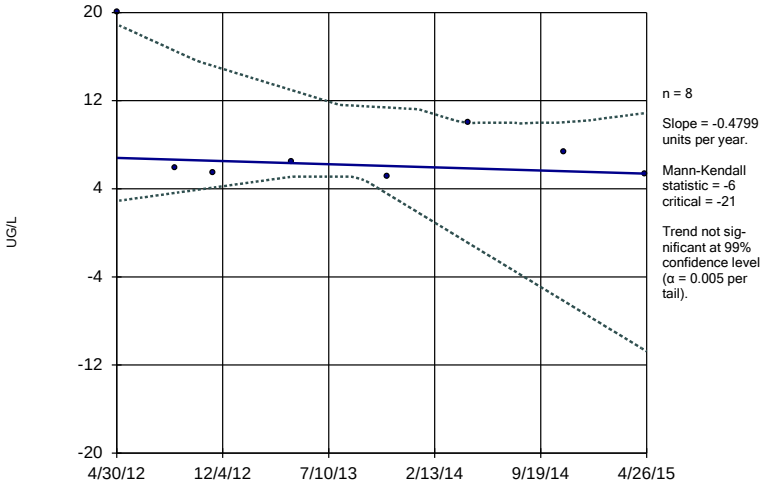


Constituent: TCE Analysis Run 6/4/2015 10:01 AM
Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-30



Constituent: VC Analysis Run 6/4/2015 10:01 AM
Data File: Wasatch Data for SANITAS

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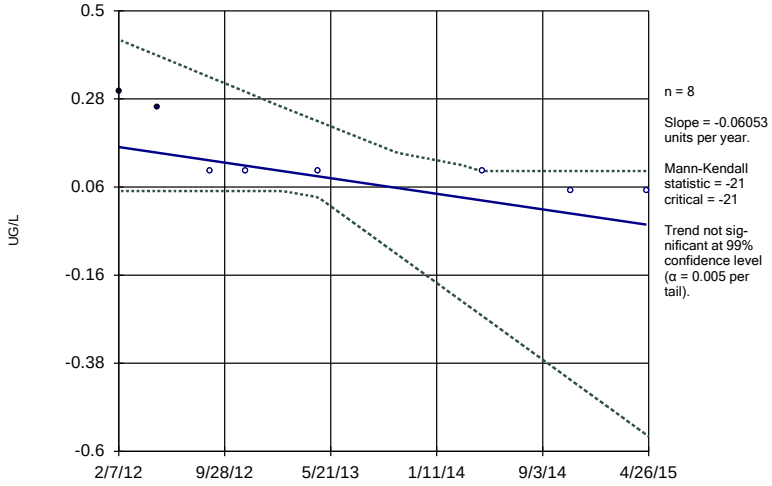
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-33D



n = 8

Slope = -0.06053 units per year.

Mann-Kendall statistic = -21
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

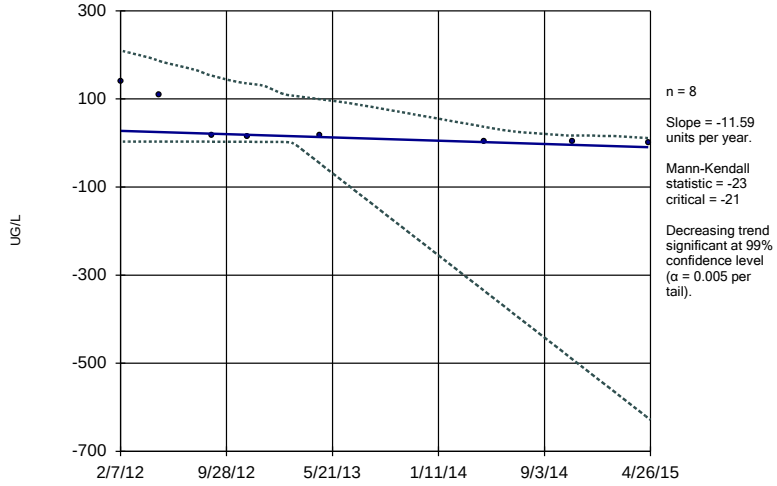
Constituent: DCE11 Analysis Run 6/4/2015 9:57 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-33D



n = 8

Slope = -11.59 units per year.

Mann-Kendall statistic = -23
critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

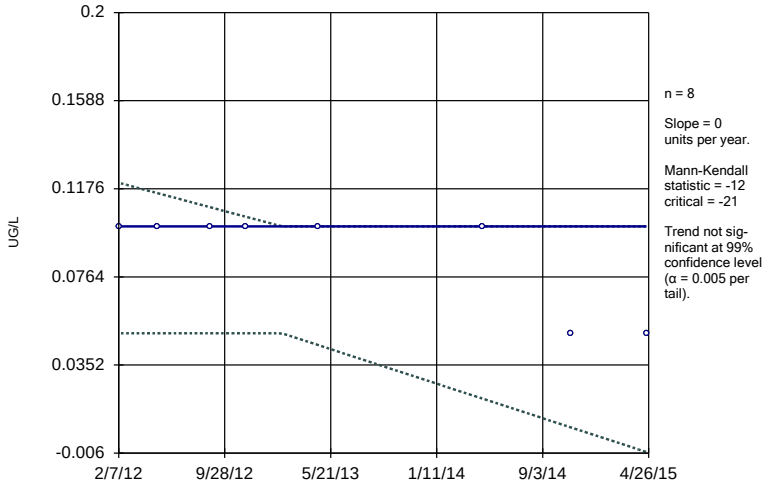
Constituent: DCE12C Analysis Run 6/4/2015 9:57 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-33D



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -12
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

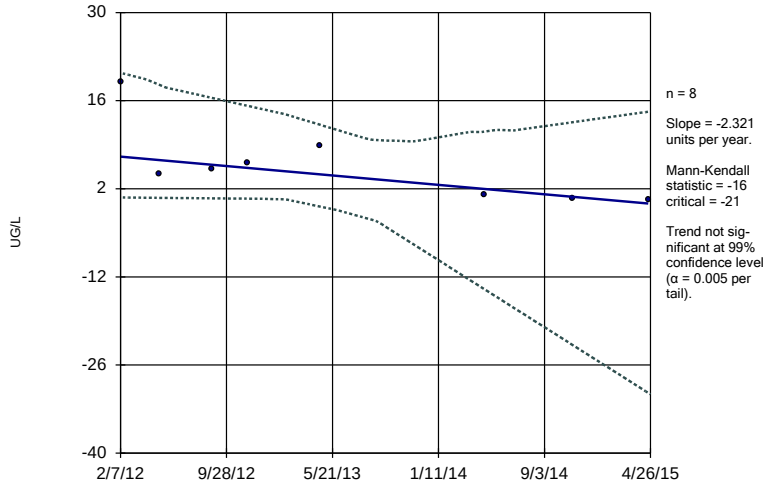
Constituent: DCE12T Analysis Run 6/4/2015 9:57 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-33D



n = 8

Slope = -2.321 units per year.

Mann-Kendall statistic = -16
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

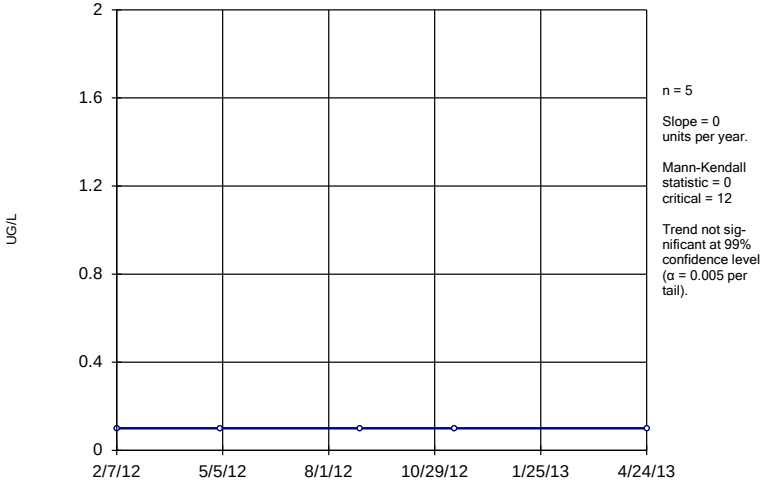
Constituent: PCE Analysis Run 6/4/2015 9:57 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-33D



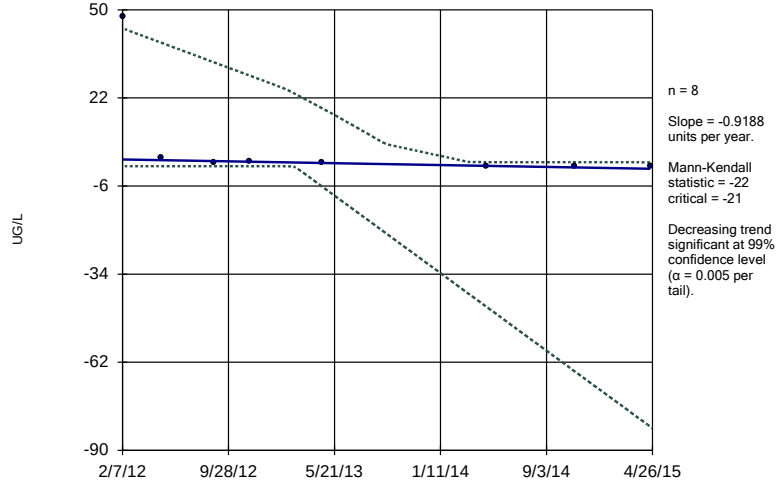
Constituent: PCP Analysis Run 6/4/2015 9:57 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG

Sen's Slope and 99% Confidence Band

MW-33D



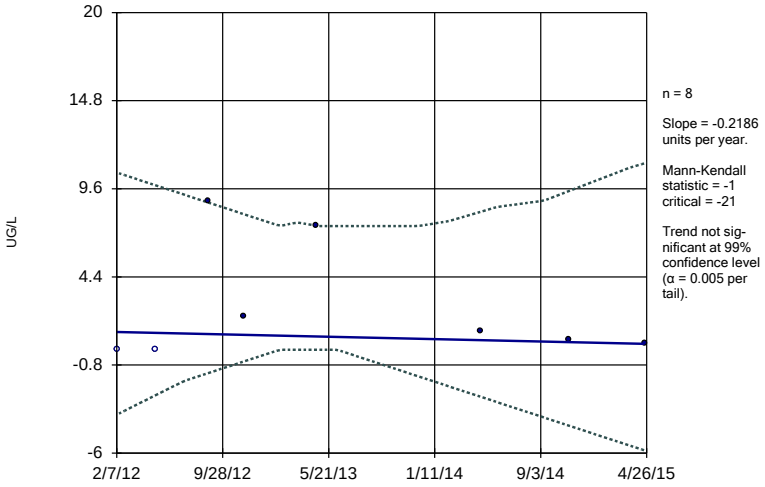
Constituent: TCE Analysis Run 6/4/2015 9:57 AM

Data File: Wasatch Data for SANITAS

Sanitas™ v.9.3.25 Software licensed to MWH. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-33D



Constituent: VC Analysis Run 6/4/2015 9:57 AM

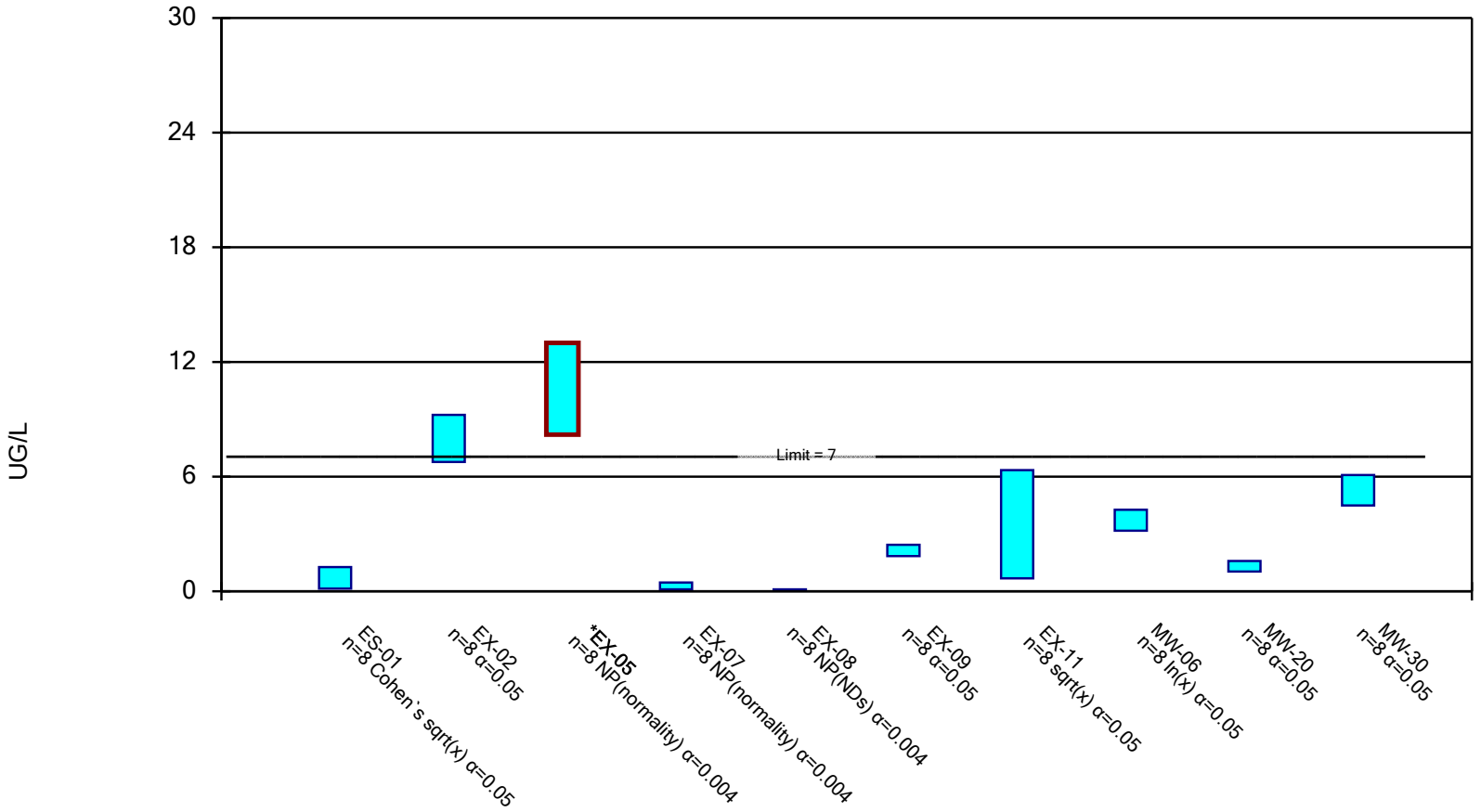
Data File: Wasatch Data for SANITAS

Section C3

Confidence Interval Plots

Parametric and Non-Parametric (NP) Confidence Interval

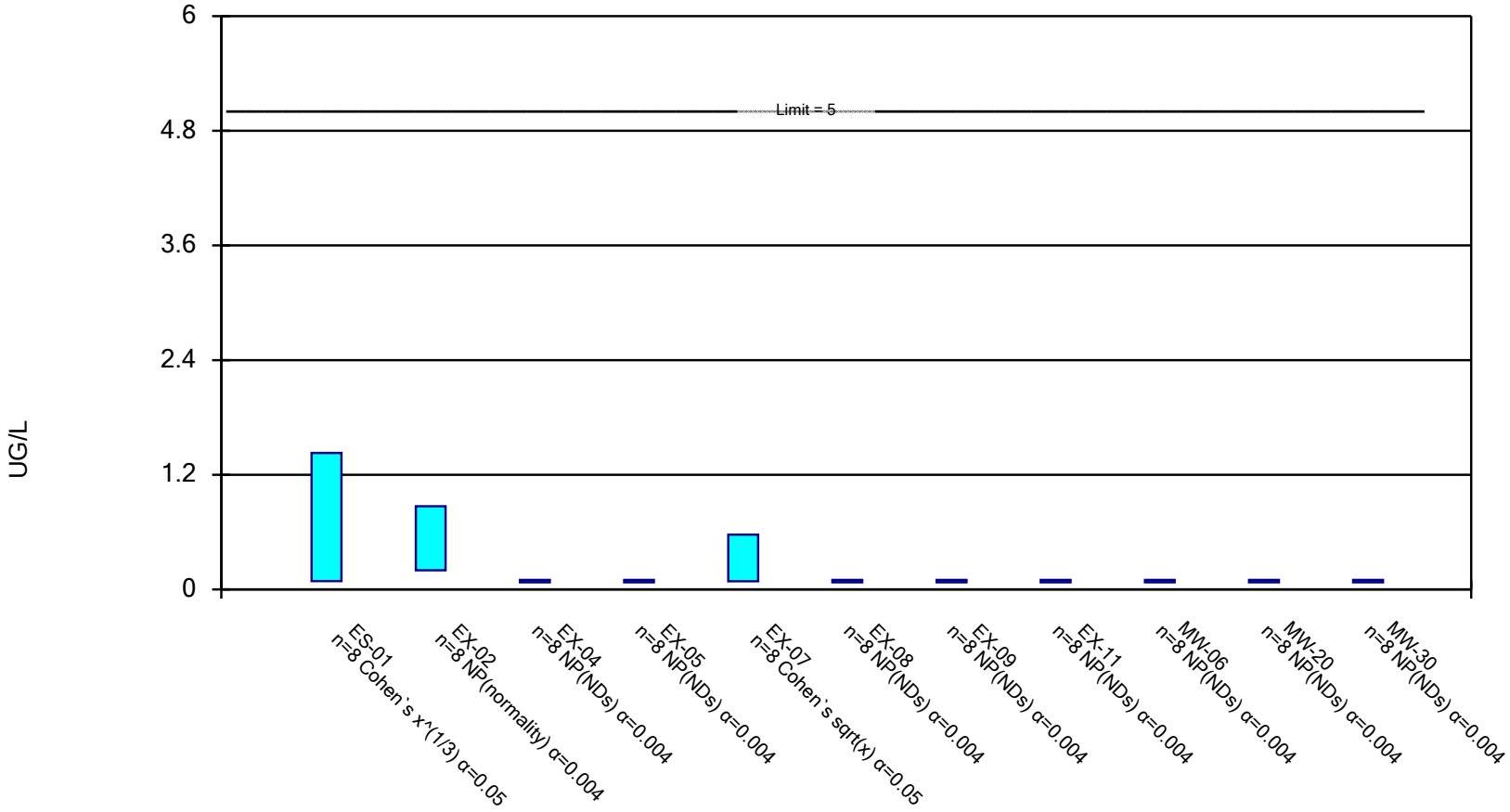
Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



Constituent: DCE11 Analysis Run 6/19/2015 1:25 PM

Parametric and Non-Parametric (NP) Confidence Interval

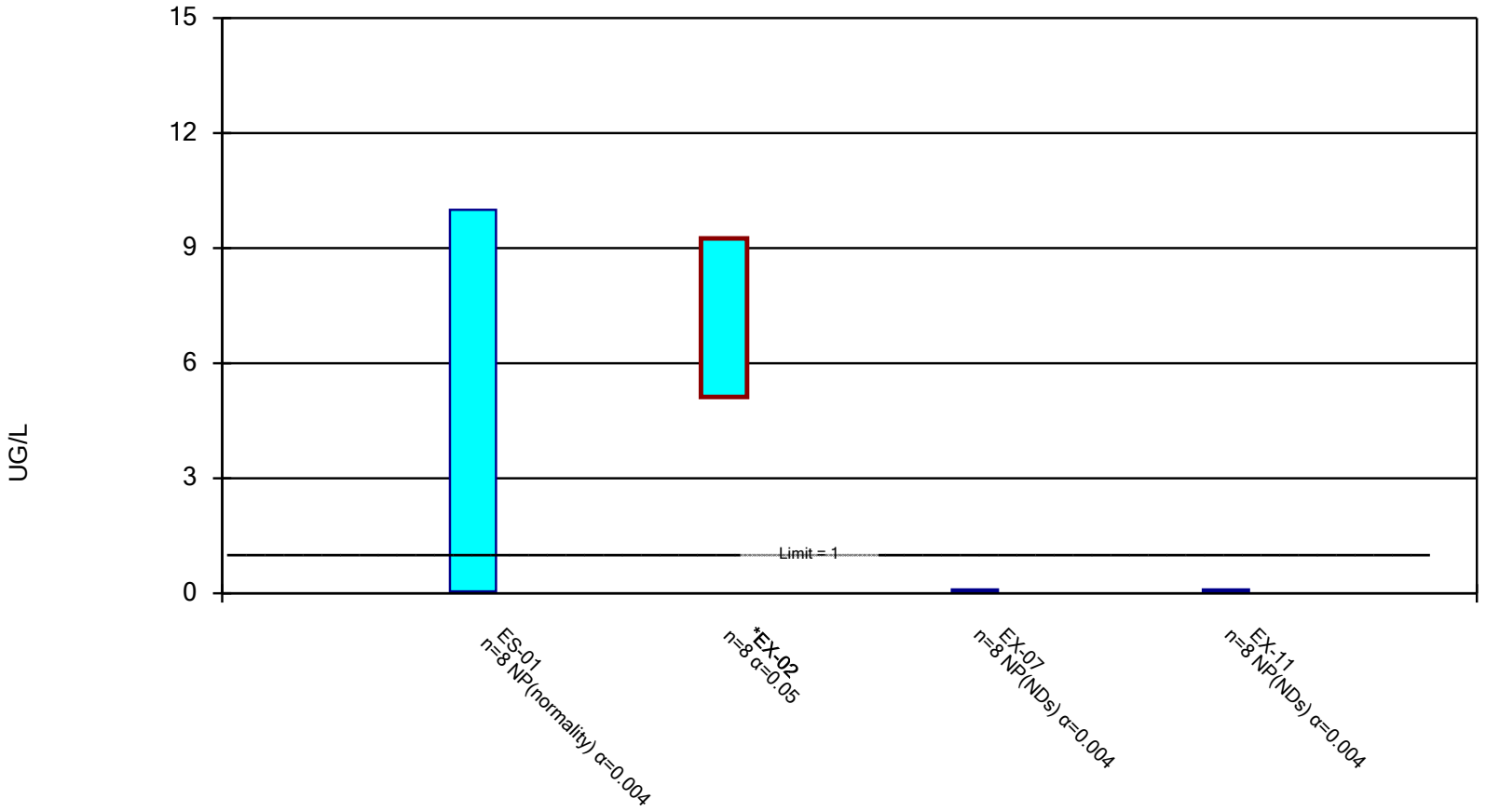
Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: PCE Analysis Run 6/19/2015 1:32 PM

Parametric and Non-Parametric (NP) Confidence Interval

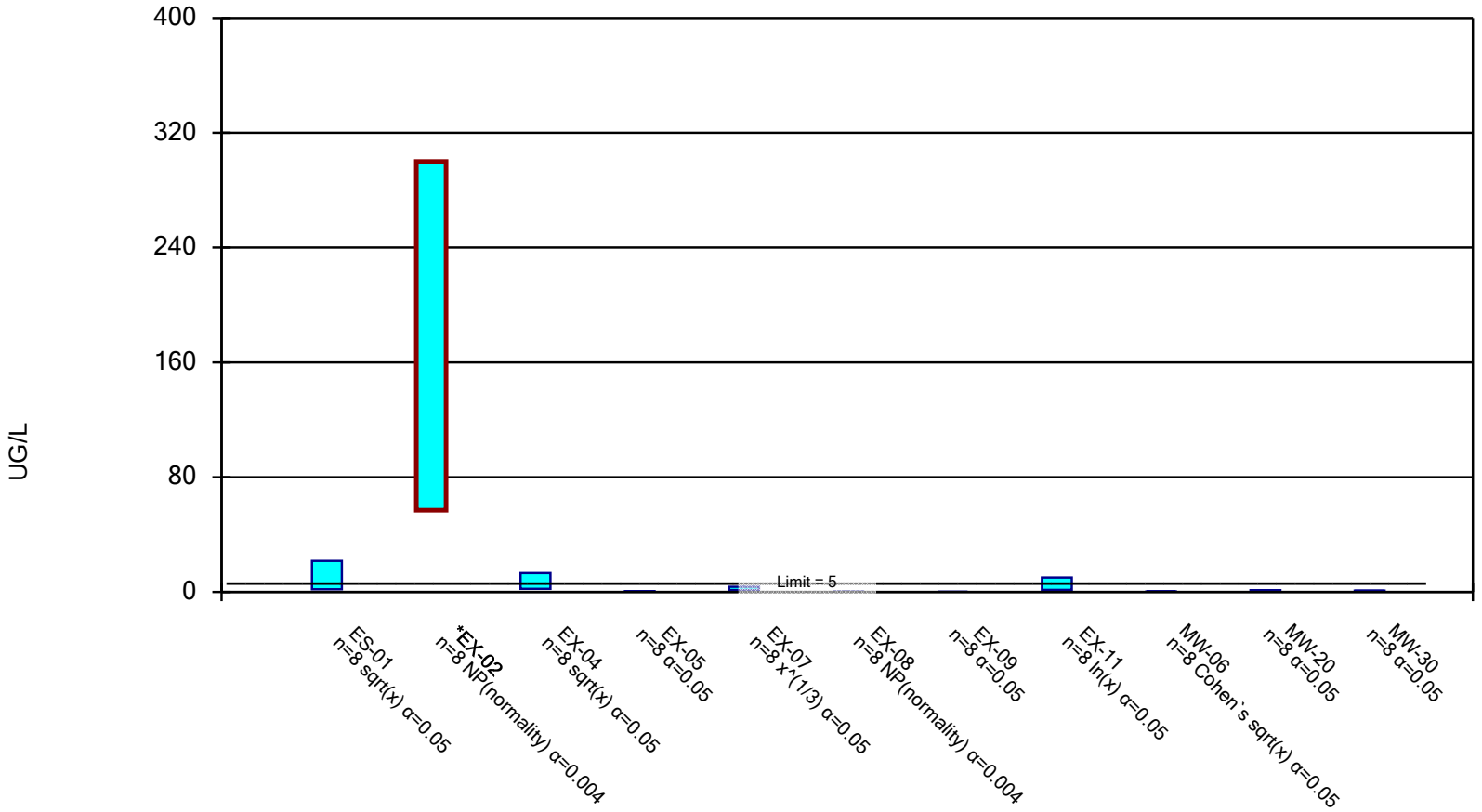
Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



Constituent: PCP Analysis Run 6/19/2015 1:30 PM

Parametric and Non-Parametric (NP) Confidence Interval

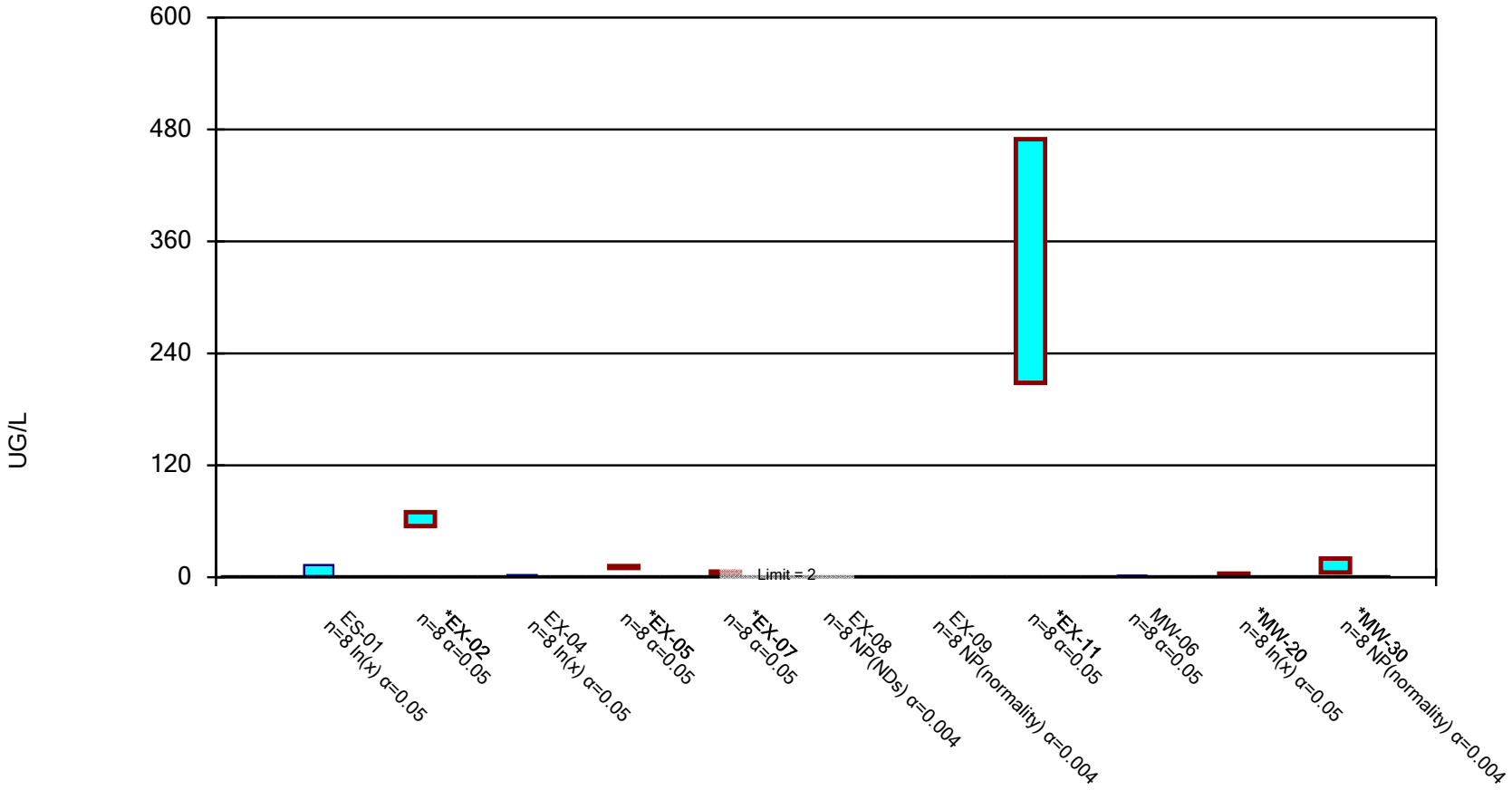
Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



Constituent: TCE Analysis Run 6/19/2015 1:33 PM

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



Constituent: VC Analysis Run 6/19/2015 1:34 PM