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Hanford 100-D Area Biostimulation Soluble Substrate Field Test: Interim Data Summary for the Substrate Injection and Process Monitoring Phase of the Field Test

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June 2008



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Pacific Northwest National Laboratory
Richland, Washington 99352

Executive Summary

Pacific Northwest National Laboratory is conducting a treatability test designed to demonstrate that in situ biostimulation can be applied to help meet cleanup goals in the Hanford Site 100-D Area. The in situ biostimulation technology is intended to provide supplemental treatment upgradient of the In Situ Redox Manipulation (ISRM) barrier by reducing the concentration of the primary oxidizing species in groundwater (i.e., nitrate and dissolved oxygen) and chromate, thereby increasing the longevity of the ISRM barrier. This report summarizes the initial results from field testing of an in situ biological treatment zone implemented through injection of a soluble substrate. The field test is divided into operational phases that include substrate injection, process monitoring, and performance monitoring. The results summarized herein are for the substrate injection and process monitoring phase encompassing the first approximately 3 months of field testing. Performance monitoring is ongoing at the time this report was prepared and is planned to extend over approximately 18 months. As such, this report is an interim data summary report for the field test.

The treatability testing has multiple objectives focused on evaluating the performance of biostimulation as a reducing barrier for nitrate, oxygen, and chromate. The following conclusions related to these objectives are supported by the data provided in this report. Substrate was successfully distributed to a radius of about 15 m (50 ft) from the injection well. Monitoring data indicate that microbial growth initiated rapidly, and this rapid growth would limit the ability to inject substrate to significantly larger zones from a single injection well. As would be expected, the uniformity of substrate distribution was impacted by subsurface heterogeneity. However, subsequent microbial activity and ability to reduce the targeted species was observed throughout the monitored zone during the process monitoring period, and low nitrate and oxygen concentrations were maintained. Chromate concentrations in the treatment zone began to increase about 2 months after substrate injection, up to about 30% of the background concentration upgradient of the test site. The performance monitoring phase will provide additional data to interpret the performance of the biostimulation process and information for scale-up as a reducing barrier.

Acronyms and Abbreviations

DI	dionized water
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
ISRM	In Situ Redox Manipulation (barrier)
Lpm	liters per minute
NC	not calculated
ND	not detected
PNNL	Pacific Northwest National Laboratory
QC	quality control
RCRA	<i>Resource Conservation and Recovery Act</i>
RL	report limit
RPD	relative percent difference
SDG	sample delivery group
SOP	Standard Operating Procedure
TOC	total organic carbon

Contents

Executive Summary	iii
Acronyms and Abbreviations	v
1.0 Introduction	1.1
2.0 Objectives	2.1
3.0 Test Site Description	3.1
4.0 Summary of Testing Approach and Test Data Collection	4.1
4.1 Summary of Testing Approach	4.1
4.2 Test Data Collection	4.2
5.0 Injection Description and Results	5.1
6.0 Process Monitoring Results	6.1
6.1 Groundwater Chemistry	6.1
6.2 Chromate	6.14
6.3 Hydraulic Data	6.15
7.0 Summary Comparison of Laboratory Microcosm and Field Test Results	7.1
8.0 Summary of Interim Results Relative to Field Test Objectives	8.1
9.0 References	9.1
Appendix A – Field Test Data	A.1
Appendix B – Supplemental Organic Compound Concentration Data Plots	B.1

Figures

3.1	Test Location and Recent Chromate Concentration Data for the 100-D Area Unconfined Aquifer	3.1
3.2	Test Location and Nitrate Concentration Data for the 100-D Area Unconfined Aquifer	3.2
3.3	Well Layout for the Field Test	3.3
3.4	Cross Section View of the Field Test Site	3.4
4.1	Injection Equipment Schematic	4.2
5.1	Flow Rate of Injected Solution and Molasses During the Injection Period	5.1
5.2	Operational Parameters Measured at Injection Well 199-D5-107 During the Injection Phase of the Test	5.3
5.3	Operational Parameters Measured at Monitoring Well 199-D5-109 During Injection in 199-D5-107	5.3
5.4	Operational Parameters Measured at Monitoring Well 199-D5-110 During Injection in 199-D5-107	5.4
5.5	Operational Parameters Measured at Monitoring Well 199-D5-111 During Injection in 199-D5-107	5.4
5.6	Operational Parameters Measured at Monitoring Well 199-D5-112 During Injection in 199-D5-107	5.5
5.7	Operational Parameters Measured at Monitoring Well 199-D5-113 During Injection in 199-D5-107	5.5
6.1	Organic Compound Concentrations During the Process Monitoring Phase at the Injection Well 199-D5-107	6.2
6.2	Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-109	6.3
6.3	Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-110	6.4
6.4	Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-111	6.5
6.5	Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-112	6.6
6.6	Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-113	6.7
6.7	Process Monitoring Phase Data at Injection Well 199-D5-107	6.8
6.8	Process Monitoring Phase Data at Monitoring Well 199-D5-109	6.9
6.9	Process Monitoring Phase Data at Monitoring Well 199-D5-110	6.10
6.10	Process Monitoring Phase Data at Monitoring Well 199-D5-111	6.11
6.11	Process Monitoring Phase Data at Monitoring Well 199-D5-112	6.12
6.12	Process Monitoring Phase Data at Monitoring Well 199-D5-113	6.13
6.13	Chromate Concentrations Using Spectrophotometric Analysis	6.15

6.14	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for January 2007	6.16
6.15	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for February 2007	6.17
6.16	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for March 2007	6.17
6.17	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for April 2007	6.18
6.18	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for May 2007	6.18
6.19	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for June 2007	6.19
6.20	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for July 2007	6.19
6.21	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for August 2007	6.20
6.22	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for September 2007	6.20
6.23	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for October 2007	6.21
6.24	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for November 2007	6.21
6.25	Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for December 2007	6.22
6.26	Gradient Magnitude and Direction from Triangulation Analysis with Wells 199-D5-43, 199-D5-20, and 199-D5-38 and River Stage Data	6.22
6.27	Gradient Direction and Relative Magnitude at the Field Test Site for September 2007	6.23
6.28	Gradient Direction and Relative Magnitude at the Field Test Site for October 2007	6.23
6.29	Gradient Direction and Relative Magnitude at the Field Test Site for November 2007	6.24
6.30	Gradient Direction and Relative Magnitude at the Field Test Site for December 2007	6.24
7.1	Denitrification Observed When Microcosm was Spiked with Nitrate While Acetate Concentration was Greater Than 30 mM	7.2
7.2	Denitrification Observed When Microcosm was Spiked with Nitrate While Acetate Concentration was Less Than 5 mM	7.3

Tables

5.1	Total Organic Carbon Concentrations at the End of the Substrate Injection Period.....	5.6
6.1	Groundwater Hydraulic Information for the Monitoring Set of Wells 199-D5-43, 199-D5-20, and 199-D5-38.....	6.16
7.1	pH Response Over One Month of Fermentation with Molasses and Bicarbonate Buffer Added as Specified in the Table	7.1

1.0 Introduction

Pacific Northwest National Laboratory (PNNL) is conducting a treatability test designed to demonstrate that in situ biostimulation can be applied to help meet cleanup goals in the Hanford Site 100-D Area. This test is part of a strategy to couple multiple technologies to accelerate cleanup of chromium in the 100 Areas at the Hanford Site. The in situ biostimulation technology is intended to provide supplemental treatment upgradient of the In Situ Redox Manipulation (ISRM) barrier by reducing the concentration of the primary oxidizing species in groundwater (i.e., nitrate and dissolved oxygen) and chromate, thereby increasing the longevity of the ISRM barrier.

This report summarizes the initial results from field testing of an in situ biological treatment zone implemented through injection of a soluble substrate. Soluble substrates can be readily distributed in the subsurface over a relatively large areal extent. These substrates are consumed by bacteria in a relatively short time period (i.e., a few months). However, biomass produced from consumption of the substrate can provide long-term reducing conditions as the biomass decays (Sleep et al. 2005; Yang and McCarty 2000). Reduction of sediment iron or sulfate by bacteria may also create additional long-term reducing capacity. There are multiple dissolved-phase substrates that can be used to biostimulate an aquifer. Molasses was selected for use in the dissolved substrate test cell. Molasses has a high solubility and low cost, and is representative of the type of secondary waste substrates that may be available to minimize the long-term cost of the barrier (e.g., carbohydrate wastes). Molasses has also been used extensively for commercial field-scale biostimulation (AFCEE 2004) and has shown favorable results to support anaerobic bioremediation (Borden and Rodriguez 2006) and chromate reduction (Gemoets et al. 2003).

The results summarized herein are for the substrate injection and process monitoring phase of the testing as described in the treatability test plan (Truex et al. 2007). As such, this report provides an interim data summary of the field test. Additional evaluation of the field test will be documented in subsequent reports using data from the performance monitoring phase of the test.

2.0 Objectives

The soluble substrate portion of the 100-D Biostimulation Field Test is being conducted to evaluate whether an effective biobarrier could be installed using a substrate that is microbially degraded over a relatively short time frame when compared to the desired life-span of the barrier. Molasses was selected as the substrate for the field test. Specific objectives to be addressed in the field test are summarized below.

- Determine the effective radius of treatment
- Evaluate the uniformity of substrate distribution
- Identify operational needs for injection
- Induce fermentation reactions and reducing conditions and grow biomass
- Minimize permeability changes due to growth of biomass (assessed through comparison of pre/post hydraulic test results)
- Quantify the ability to obtain and maintain low oxygen and nitrate/nitrite concentrations (limit primary electron acceptor flux) and determine longevity of treatment
- Quantify the ability to obtain and maintain low chromate concentrations (augment chromate treatment) and determine longevity of treatment
- Compile information required for full scale design, including a description of the injection process and treatment performance, and couple this information with hydrogeology and electron flux information for the 100-D Area being collected by others.

3.0 Test Site Description

The treatability test site is located in the southwestern portion of the 100-D Area within the chromate and nitrate plumes (Figure 3.1 and Figure 3.2, respectively). Figure 3.3 shows the well network layout for the field test. The thickness of the aquifer at this location is approximately 6.1 m (20 ft), and the aquifer is present within the Ringold Formation (Figure 3.4).

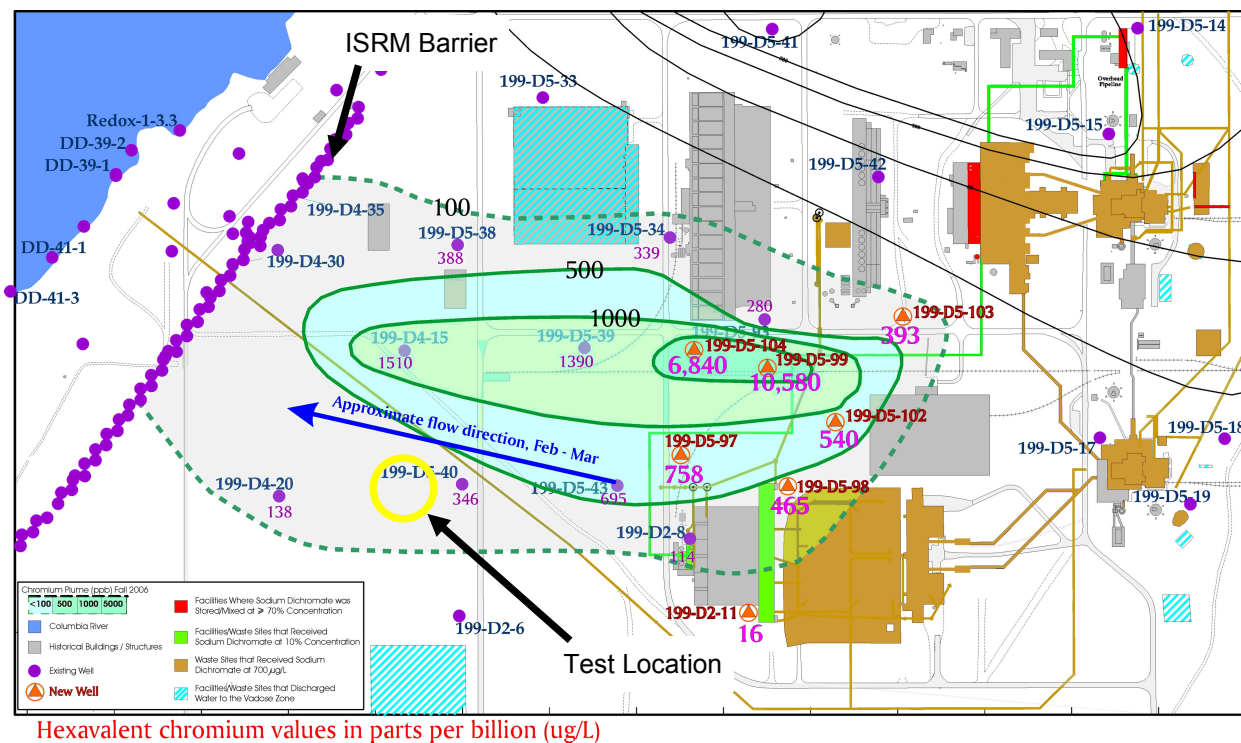
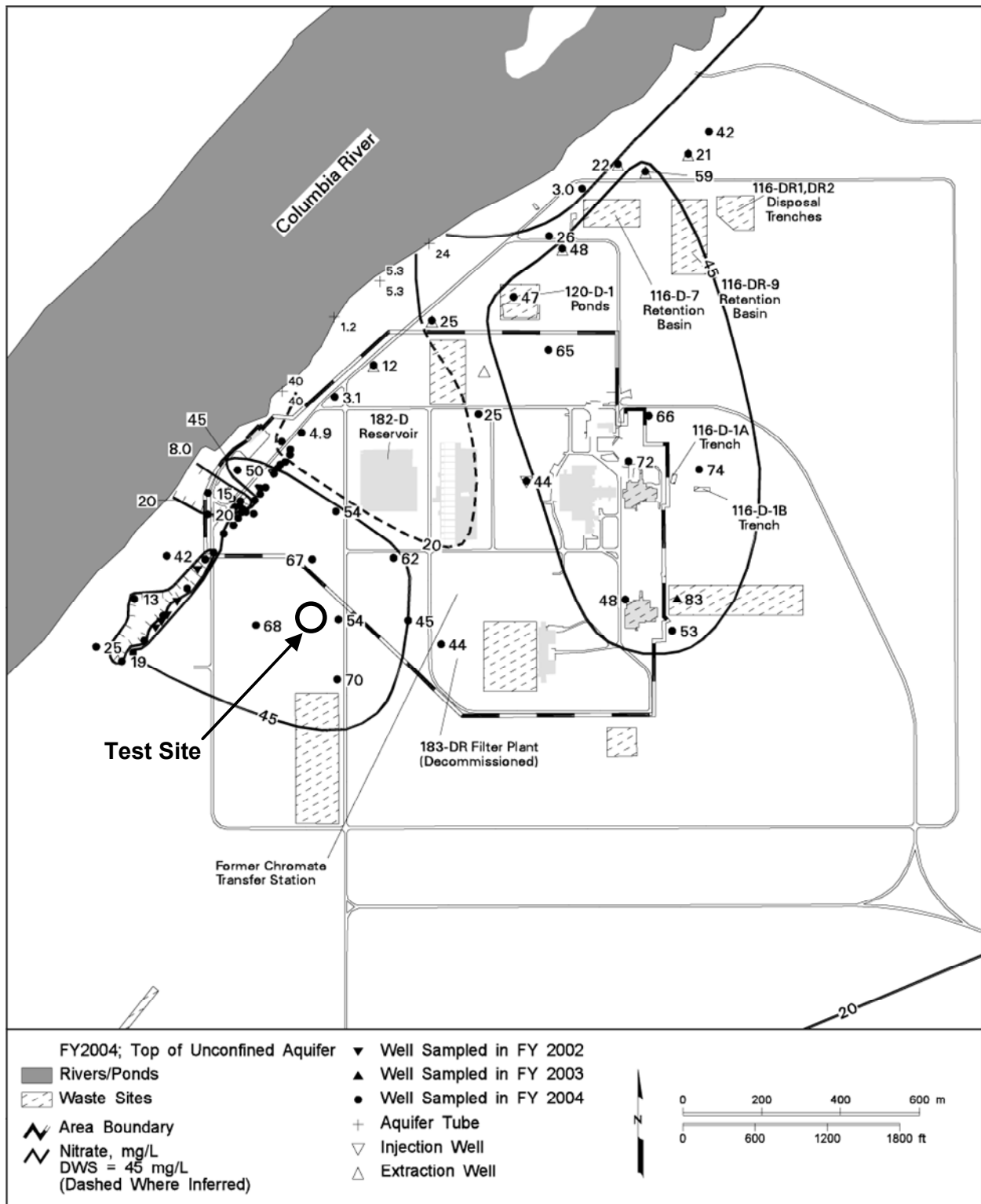


Figure 3.1. Test Location and Recent Chromate Concentration Data for the 100-D Area Unconfined Aquifer (personal communication, Scott Petersen, May 3, 2007)



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Figure 3.2. Test Location and Nitrate Concentration Data for the 100-D Area Unconfined Aquifer

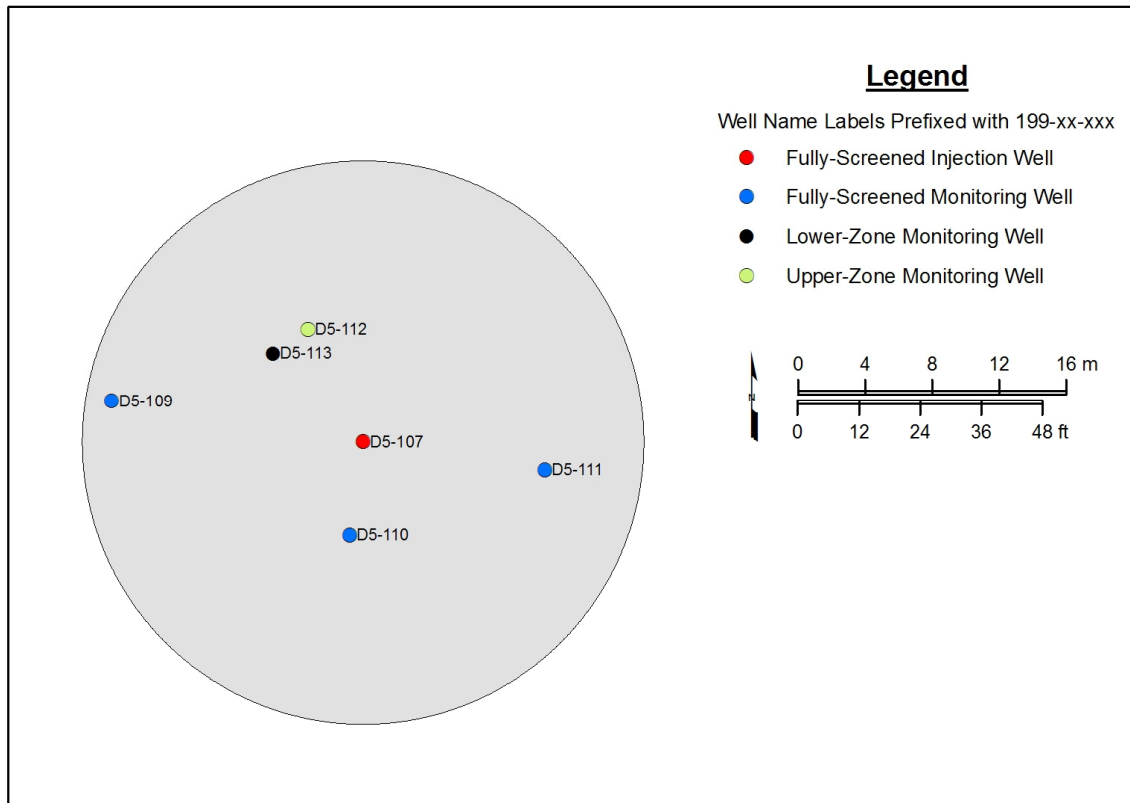


Figure 3.3. Well Layout for the Field Test

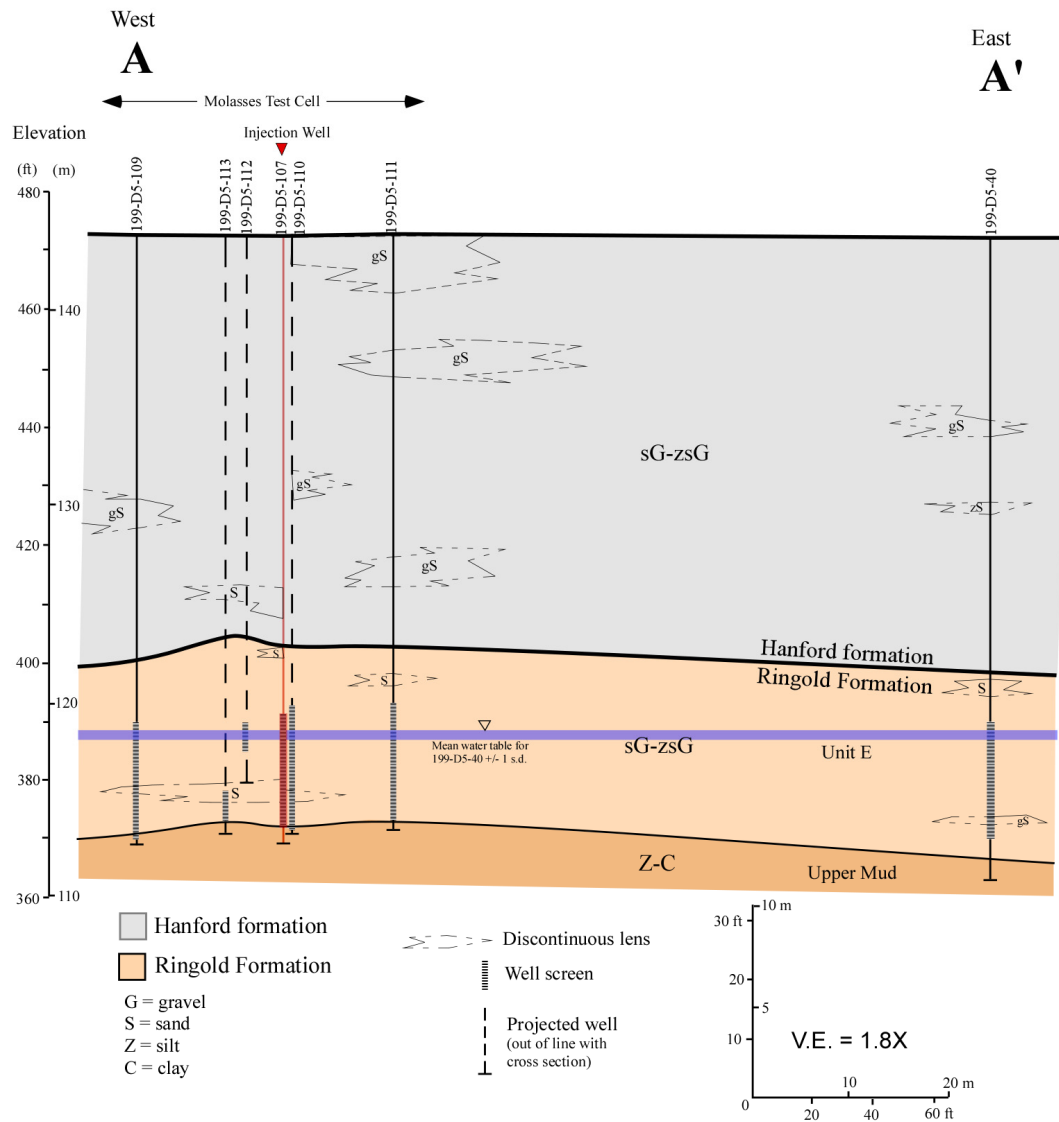


Figure 3.4. Cross Section View of the Field Test Site

4.0 Summary of Testing Approach and Test Data Collection

Summary level information about the testing approach is presented in this section to provide a context for the interim results and conclusions. The initial test data supporting the results presented herein also are presented.

4.1 Summary of Testing Approach

This section provides a summary of the primary field test operations. Operations were divided into distinct phases as described below. At the time this interim data summary report was prepared, the test preparations, pre-test monitoring, substrate injection, and process monitoring phases of the test had been completed. Performance monitoring is ongoing.

Test Preparations. Figure 4.1 shows a schematic of the equipment design for the substrate injection. In summary, injection operations required a source of pressurized process water (~50 psi) and metering pumps for the substrate, nutrients, and tracer to provide for in-line mixing of these substrates into the process water stream.

Pretest Monitoring. Before the test injection, hydraulic testing and baseline aqueous sampling were conducted. Hydraulic testing included slug interference and recovery testing, electronic borehole flow meter testing in each fully screened well, and a geophysical survey. Additional baseline monitoring included water level measurements at test cell monitoring and injection wells and other selected locations to determine the hydraulic gradient. Baseline sample analyses included total organic carbon (TOC), organic acids, nitrate, nitrite, sulfate, chromate, major cations and anions, metals covered by the *Resource Conservation and Recovery Act of 1976* (RCRA), and dissolved oxygen concentration at the test cell monitoring and injection wells and at well 199-D5-40, which is the upgradient monitoring well.

Substrate Injection. The substrate injection was conducted using process water injected at approximately 40 gpm amended with approximately 40 g/L molasses, 100 mg/L ammonium chloride, and 70 mg/L potassium bromide. Samples of the injected solution and at the test cell monitoring wells were collected periodically during injection and were analyzed for bromide, TOC, organic acids, nitrate, nitrite, sulfate, and chromate. At the end of the substrate injection, process water was injected for approximately an hour to clear the injection system of substrate. The decline in hydraulic head at the monitoring locations was monitored after injection flow was terminated to provide data to help evaluate hydraulic properties of the test zone. After the injection was completed, the injection system was disconnected and the injection well was converted to a monitoring location.

Process Monitoring. Process monitoring was conducted after injection to assess the formation of a reducing barrier. Samples were collected at each well in the test cell weekly for 8 weeks and analyzed for TOC, organic acids, nitrate, nitrite, sulfate, chromate, oxygen, oxidation reduction potential, bromide, and pH. To assess the impact of the injected solutions, slug tests and additional geophysical surveys were conducted during the process monitoring phase.

Performance Monitoring. After the process monitoring phase is completed, the test cell will be monitored to assess its performance as a reducing barrier. The goal of this monitoring phase is to

evaluate the conditions within the reducing zone and to determine when nitrate, chromate, and oxygen breakthrough occurs as an indication of barrier longevity. This performance monitoring consists of samples collected periodically for at least 12 months at each well in the test cell and at the upgradient monitoring well (199-D5-40). Samples will be analyzed for TOC, organic acids, bromide, nitrate, nitrite, sulfate, chromate, total chromium, oxygen, oxidation reduction potential, and pH. Additionally, major cations and anions, RCRA metals, and methane will be monitored for comparison to the baseline water quality determined in the pretest monitoring.

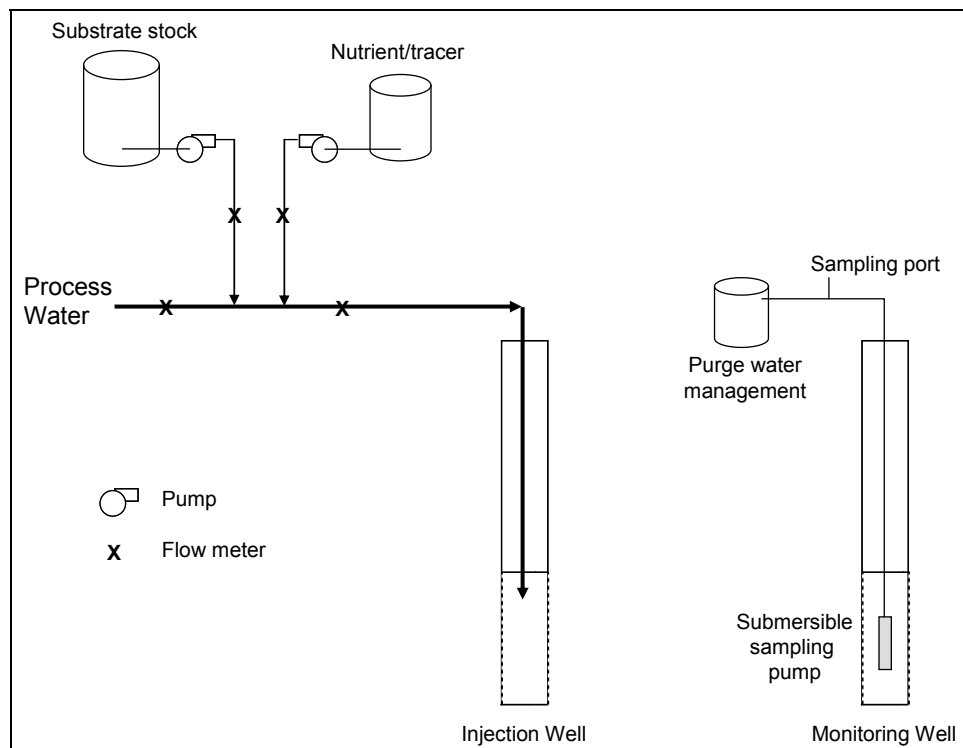


Figure 4.1. Injection Equipment Schematic

4.2 Test Data Collection

Data were collected during the injection and process monitoring phases of the field test according to the treatability test plan (Truex et al. 2007). There were no data quality issues that impacted interpretation of the results as presented in this report. Appendix A lists the field test data and data validation report to support the results reported herein.

5.0 Injection Description and Results

The concept for the substrate injection process was to obtain an injection radius of about 15 m (50 ft) with a uniform molasses concentration of about 50 g/L. Process water was used as the carrier medium for the substrate. An injection flow rate was selected so the substrate would be delivered over a period of about 3 days. This injection period minimized the possibility of accumulating excessive biomass near the injection well during the injection process. Laboratory tests showed that the lag time before significant microbial growth occurred was on the order of 5 days. A tracer was injected with the substrate to help identify the injection front.

The injection pressures monitored within the injection wellbore during substrate injection were higher than anticipated based on the observed pressure response during developmental pumping and an initial injection test using only water. The viscosity of the injected solution was 1.5 to 2 cP. Thus, only a small increase in the injection pressure was the result of the somewhat higher viscosity of the molasses-water mixture. It is likely the largest percentage of the increase resulted from incomplete dissolution of the concentrated molasses feed stock that may have initially caused temporary plugging in the injection well. During the first 24 hours of the test, the molasses feed was periodically stopped for short periods of time to allow process water only to pass through the well screen. Each time this operation was performed, injection pressures quickly decreased to below critical levels (i.e., pressures had built up to the point where water in the well bore was near ground surface) and a sustained reduction in injection pressure was realized. This response is consistent with the hypothesis that a film of molasses had accumulated in the screen openings, and potentially further out into the filter pack, thus increasing the pressure drop across this near-well zone. Injecting process water would dissolve any molasses accumulation on the screen. After about 24 hours of injection, the injection pressures stabilized, and the injection flow rate could be more readily maintained (Figure 5.1).

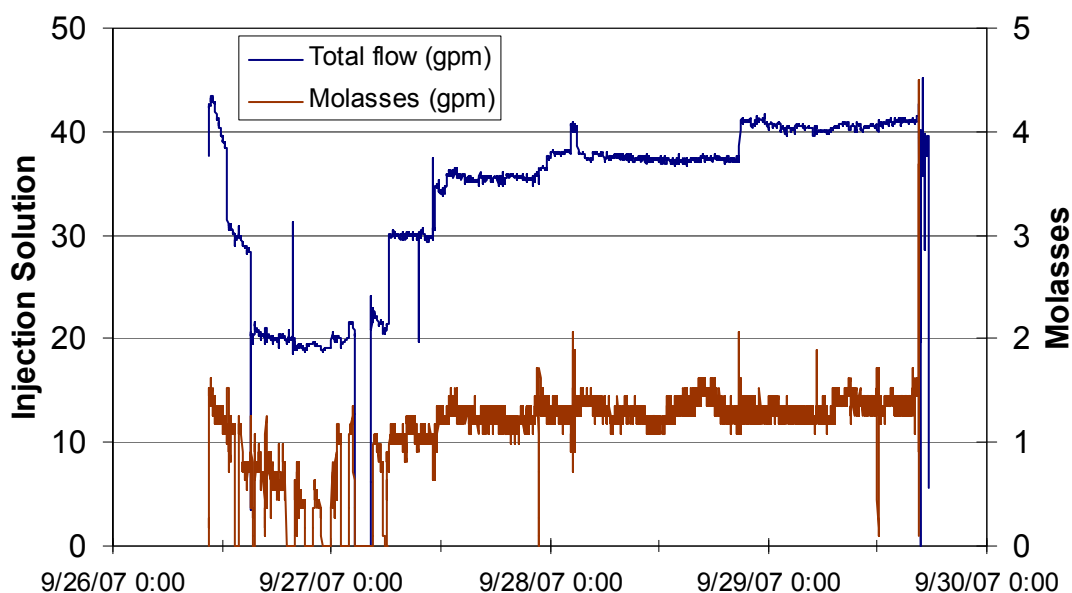


Figure 5.1. Flow Rate of Injected Solution and Molasses During the Injection Period

The following parameters describe the injection process.

- The average injection flow rate (water and all solutes) was approximately 125 Lpm (33 gpm).
- The average molasses injection flow rate was approximately 4.2 Lpm (1.1 gpm).
- Approximately 19,300 L (5100 gal) of molasses were injected.
- The total injection volume was about 594,000 L (157,000 gal)
- The average molasses concentration during injection was about 44 g/L.
- The injection duration was 3.25 days.
- Based on the injected volume, estimated aquifer properties (5.6-m [18-ft] thick at the time of injection with a porosity of 0.15), and an idealized radial geometry, the nominal injection radius was 15 m (50 ft).
- About 2500 gal of water was injected after the molasses injection was terminated to flush the injection system, injection wellbore, and filter pack.
- About 165 gal of sodium bromide tracer solution was injected, resulting in an average solution concentration of 69 mg/L as bromine based on the measured concentration in the stock solution, the volume of stock solution injected, and the total solution (i.e., water and molasses) volume injected.
- About 165 gal of ammonium chloride solution was injected resulting in an average solution concentration of 171 mg/L based on the measured concentration in the stock solution, the volume of stock solution injected, and the total solution (i.e., water and molasses) volume injected.
- Injection pressure was variable throughout the injection, but was typically about 25 psi.

Primary data collected to demonstrate substrate injection is depicted in Figure 5.2 through Figure 5.7. Note that the tracer and TOC concentration data, which are metrics for the quantity of solution and substrate respectively, follow similar breakthrough curves at each monitoring location, indicating there was no significant retardation of the injected substrate. These figures also show that the oxidation reduction potential dropped quickly with substrate injection. These data, along with the organic acid data presented later, suggest that substrate utilization by the in situ microbial population begins quickly and, subsequently, injection for a longer duration could be problematic because of the potential for excessive biomass formation near the injection well. Under the radial flow system created by this single-well injection, substrate flow is directed outward from the point of injection with flow velocities decreasing with radial distance. The well hydraulics associated with this radial flow system will place an upper bound on the rate at which fluids can be injected, and at the biostimulation treatability test site, 150 Lpm (40 gpm) was identified as the maximum rate that could be sustained. Another factor to consider is the volume of water required to increase the injection radius varies with the square of the radius. As an example, for a 150 Lpm (40 gpm) injection flow rate into an aquifer with a thickness of 5.6 m (18 ft) with a porosity of 0.15, about 3 days are required to inject to a radius of 15 m (50 ft). However, about 5.25 days would be required to inject to a radius of 20 m (66 ft). The field test data suggest that injection to a radius of 15 m (50 ft) is feasible. Injecting to a significantly larger radius (e.g., 20 m [66 ft]) may not be feasible because of the potential for biofouling.

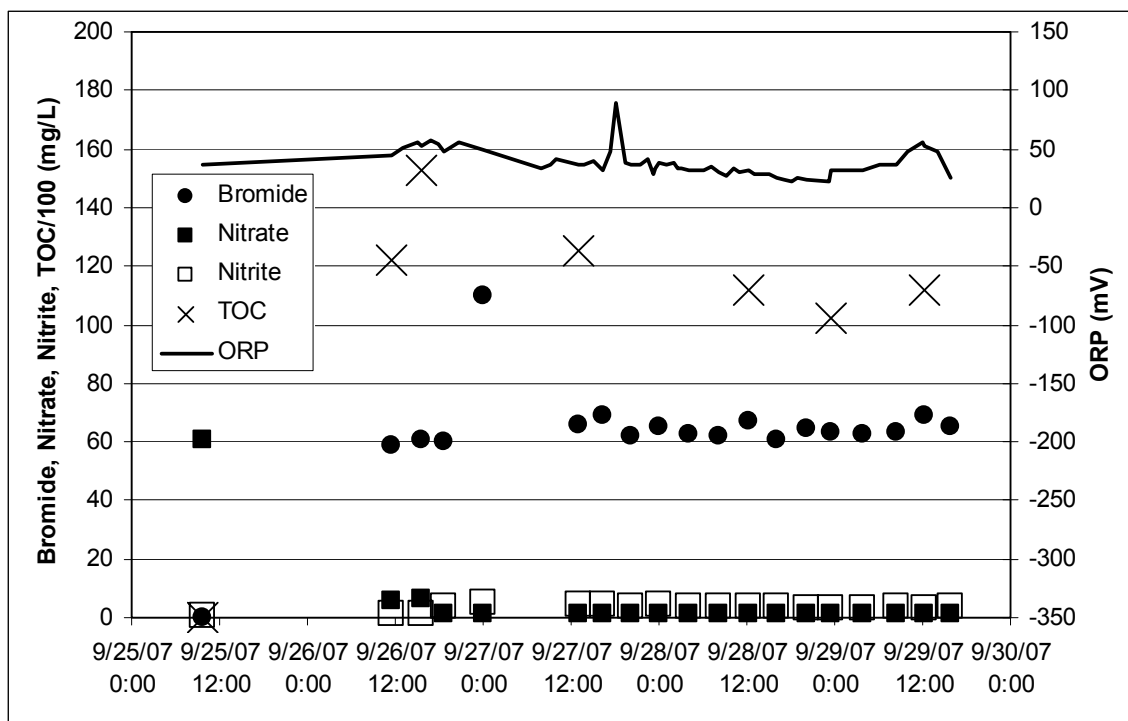


Figure 5.2. Operational Parameters Measured at Injection Well 199-D5-107 During the Injection Phase of the Test

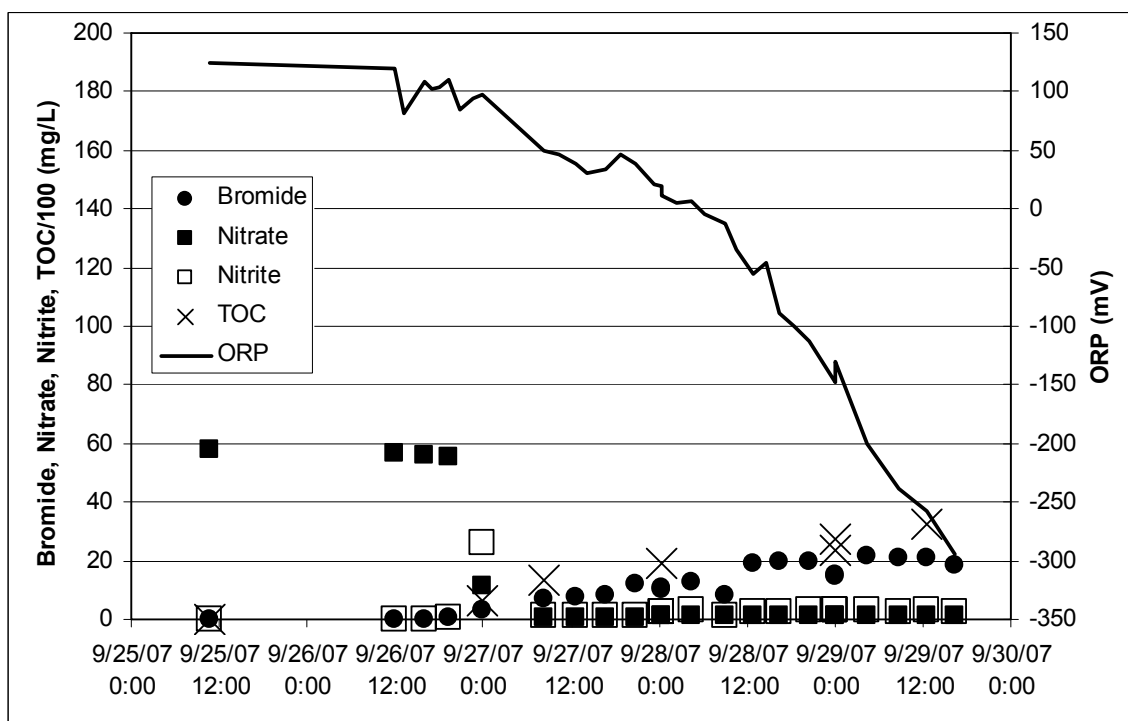


Figure 5.3. Operational Parameters Measured at Monitoring Well 199-D5-109 During Injection in 199-D5-107

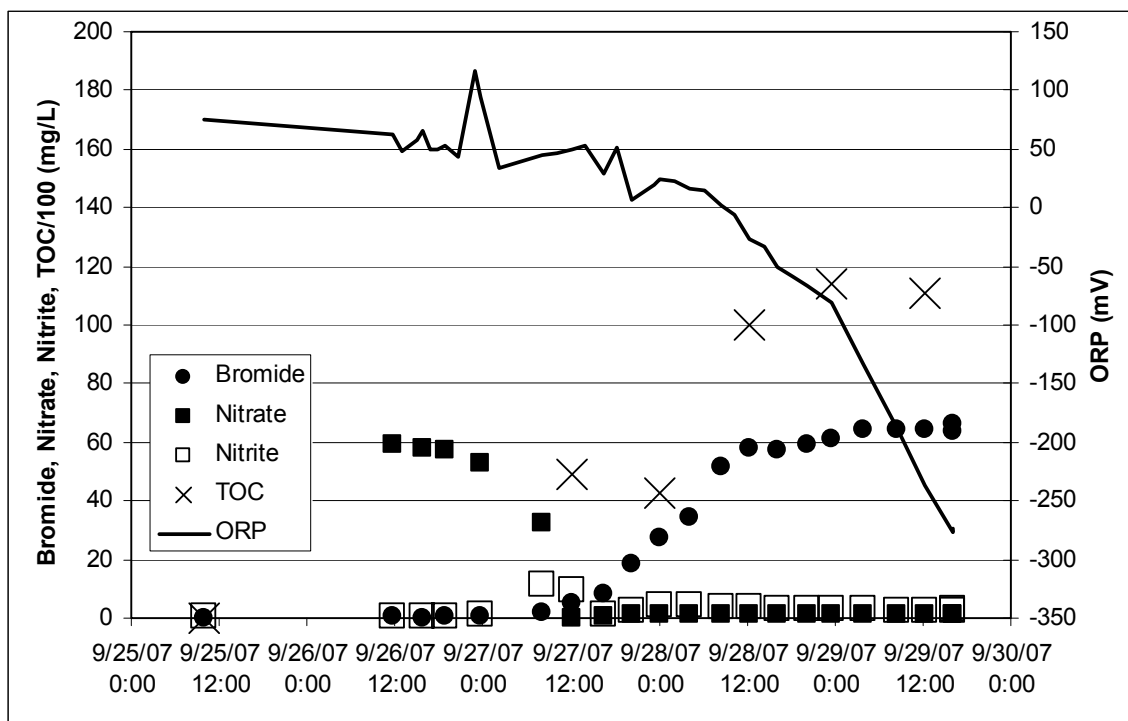


Figure 5.4. Operational Parameters Measured at Monitoring Well 199-D5-110 During Injection in 199-D5-107

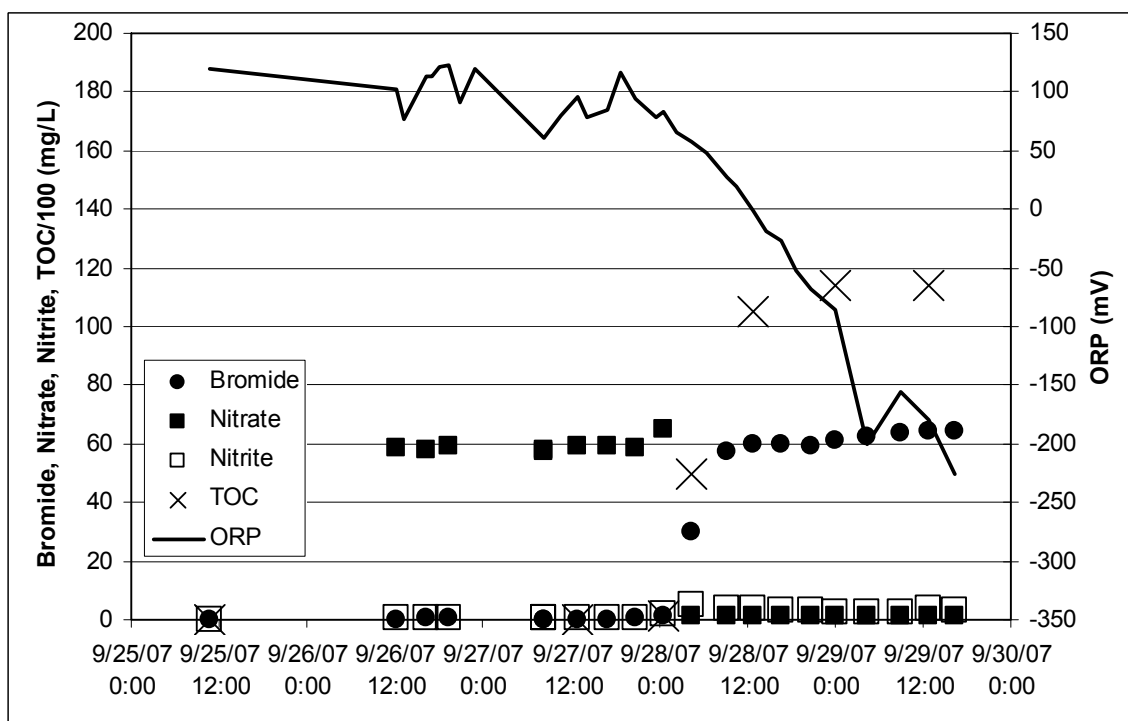


Figure 5.5. Operational Parameters Measured at Monitoring Well 199-D5-111 During Injection in 199-D5-107

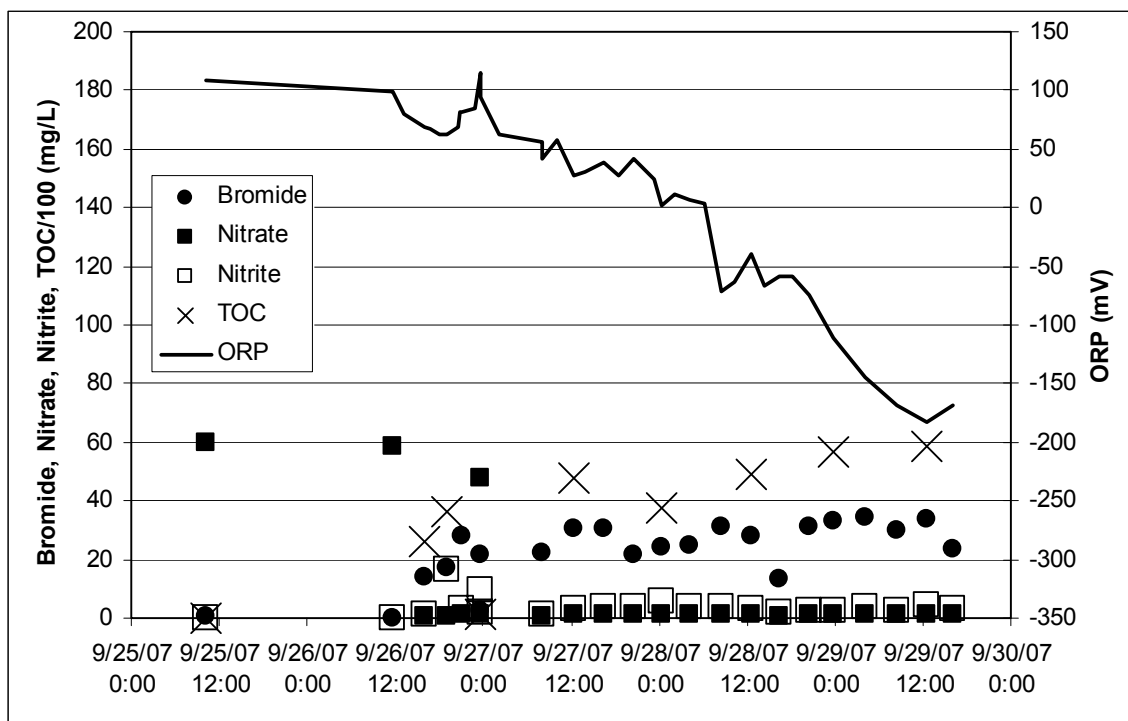


Figure 5.6. Operational Parameters Measured at Monitoring Well 199-D5-112 During Injection in 199-D5-107

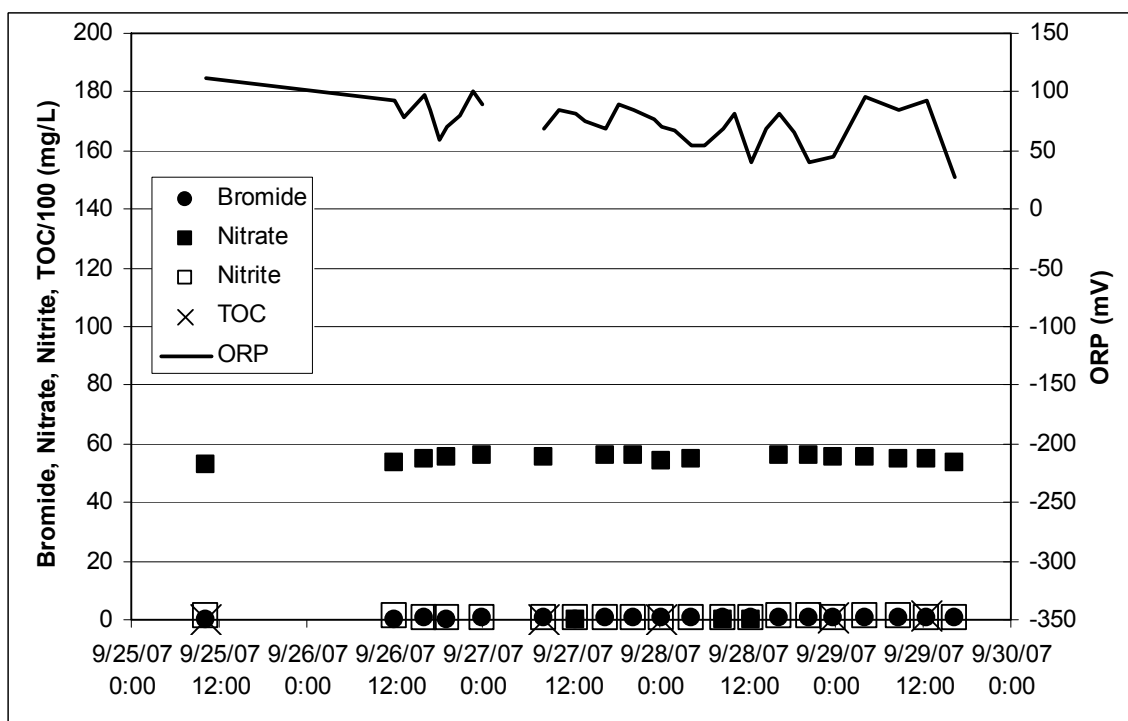


Figure 5.7. Operational Parameters Measured at Monitoring Well 199-D5-113 During Injection in 199-D5-107

TOC concentrations were monitored intermittently throughout the test, and the measurements collected at the end of the injection process were used to assess the uniformity of substrate distribution. Based on the estimated injection radius of 15 m (50 ft), monitoring wells 199-D5-110, -111, -112, and -113 should have had a TOC concentration comparable to the injected concentration by the end of the injection. Well 199-D5-109 should have been just on the fringe of the substrate injection. As shown in Table 5.1, TOC data at monitoring wells 199-D5-110, -111, and -109 are consistent with what would be expected for the substrate injection. TOC values are lower than expected at monitoring wells 199-D5-112 (upper zone monitoring) and 199-D5-113 (lower zone monitoring). Characterization data showed that the hydraulic conductivity over the screened interval for well 199-D5-112 was higher than what was observed at other locations. Substrate arrival data indicate that transport in the direction of wells 199-D5-112 and -113 moved predominantly through the upper more permeable zone and was diluted or otherwise diverted by this high conductivity layer, as indicated by the early tracer arrival that never reached full concentration. Very little substrate appeared in the lower interval at well 199-D5-113, although the TOC concentration did increase by a factor of 10 within a week after injection, possibly because of density sinking of the substrate. This information suggests that heterogeneities in the direction of wells 199-D5-112 and -113 impacted the initial distribution of substrate. Further observations during the process monitoring and performance monitoring phases will be used to determine how the variability in substrate injection impacts the ability of the bioremediation zone to reduce oxygen, nitrate, and chromate over time.

Table 5.1. Total Organic Carbon Concentrations at the End of the Substrate Injection Period

Well	Total Organic Carbon (g/L)
199-D5-107 (Injection well)	11
199-D5-109	3.2
199-D5-110	11
199-D5-111	11
199-D5-112	6
199-D5-113	0.1 (rising to 1.5 shortly after injection terminated)

In summary, the dissolved substrate (molasses) injection provided a large (~15 m radius) zone of substrate distributed around the injection well. Operations were relatively simple, although management of the injection pressure was initially problematic. While there was no apparent biofouling during injection (i.e., the injection mound did not continue to build significantly over time), there are indications that microbial activity had begun. Thus, it is likely that injection to larger radial distances (e.g., 20 m [66 ft]) may not be possible without use of a groundwater recirculation process that was able to significantly enhance interwell groundwater flow rates during an injection.

6.0 Process Monitoring Results

The goal of the process monitoring phase was 1) to assess the anticipated fermentation process induced by the injection of substrate, and 2) to evaluate the “drift” of the substrate and fermentation products downgradient because of the natural groundwater flow. At the end of the substrate injection phase, a suite of analytes were collected to define the starting conditions for fermentation. These analytes then were monitored weekly over the next 8 weeks. Key analytes are listed below:

- organic acids (fermentation products)
- anions including chromate, nitrate, nitrite, sulfate, and bromide (tracer)
- TOC
- field parameters such as pH, specific conductance, dissolved oxygen, and oxidation-reduction potential.

In addition, hydraulic head and aquifer hydraulic properties (through single-well slug and cross-well slug interference tests) were characterized.

In summary, results from process monitoring indicate that fermentation is rapidly induced through injection of the substrate and continues for over a month. The biological reduction zone appears to maintain reducing conditions with the initial influx of contaminated upgradient groundwater. However, while oxygen and nitrate/nitrite are maintained at low concentrations, chromate reduction appears to be incomplete. Initial hydraulic characterization of the site indicated that the northeastern portion of the site contained some higher permeability zones. The impact of these flow system heterogeneities will be further assessed when the results of geophysical, hydraulic, and tracer analyses are conducted using data collected during the process monitoring and performance monitoring phases of the test. Additional information about the process monitoring phase is provided below. This information represents interim test results. Further assessment will be conducted when performance monitoring phase data are available.

6.1 Groundwater Chemistry

Data showing the concentration of organic acids and indicators of the injected molasses (i.e., TOC, glucose, and fructose) over the approximately 60 days of process monitoring are shown in Figures 6.1 through 6.6. These figures all use the same scale on the axes. Appendix B contains additional plots that focus on the range of data at each specific well. These data show that fermentation occurs over this timeframe with acetate, butyrate, and propionate as the primary persistent products of the fermentation that are still present by the end of the monitoring period. Additional process monitoring data showing the nitrate, nitrite, sulfate, bromide, and field parameters are shown in Figures 6.7 through 6.12. These data show that oxygen, nitrate, and nitrite, the key targeted electron acceptors in the treatment zone, remain low during the process monitoring phase. Because process water was used as the carrier for the substrate injection, initially low nitrate and nitrite concentrations are expected. The pH dropped initially and then stabilized. This information also suggests that there may be some sulfate reduction being initiated at wells 199-D5-109, -112, and -113 later in the process monitoring period. The other wells do not show signs of significant sulfate reduction.

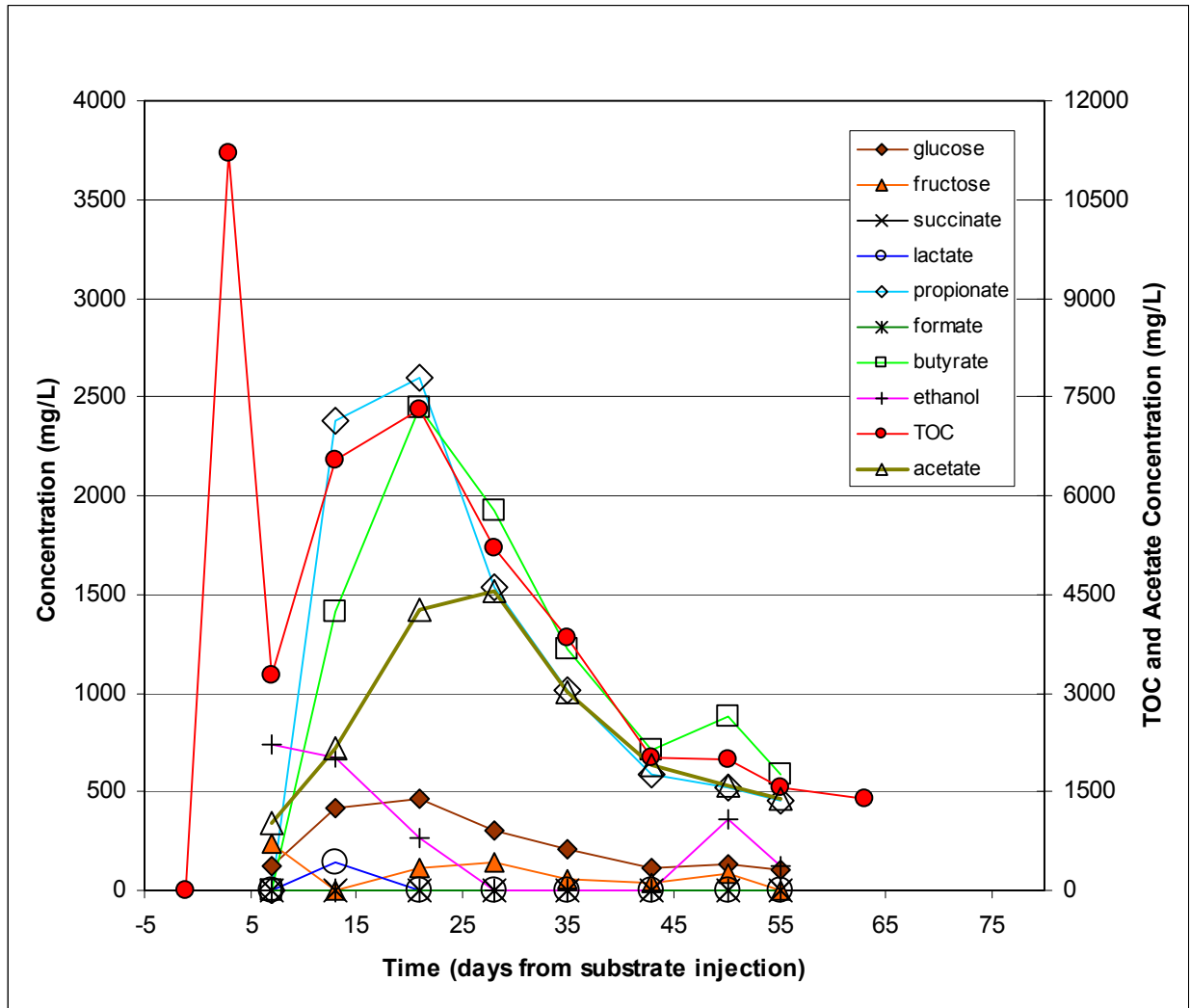


Figure 6.1. Organic Compound Concentrations During the Process Monitoring Phase at the Injection Well 199-D5-107

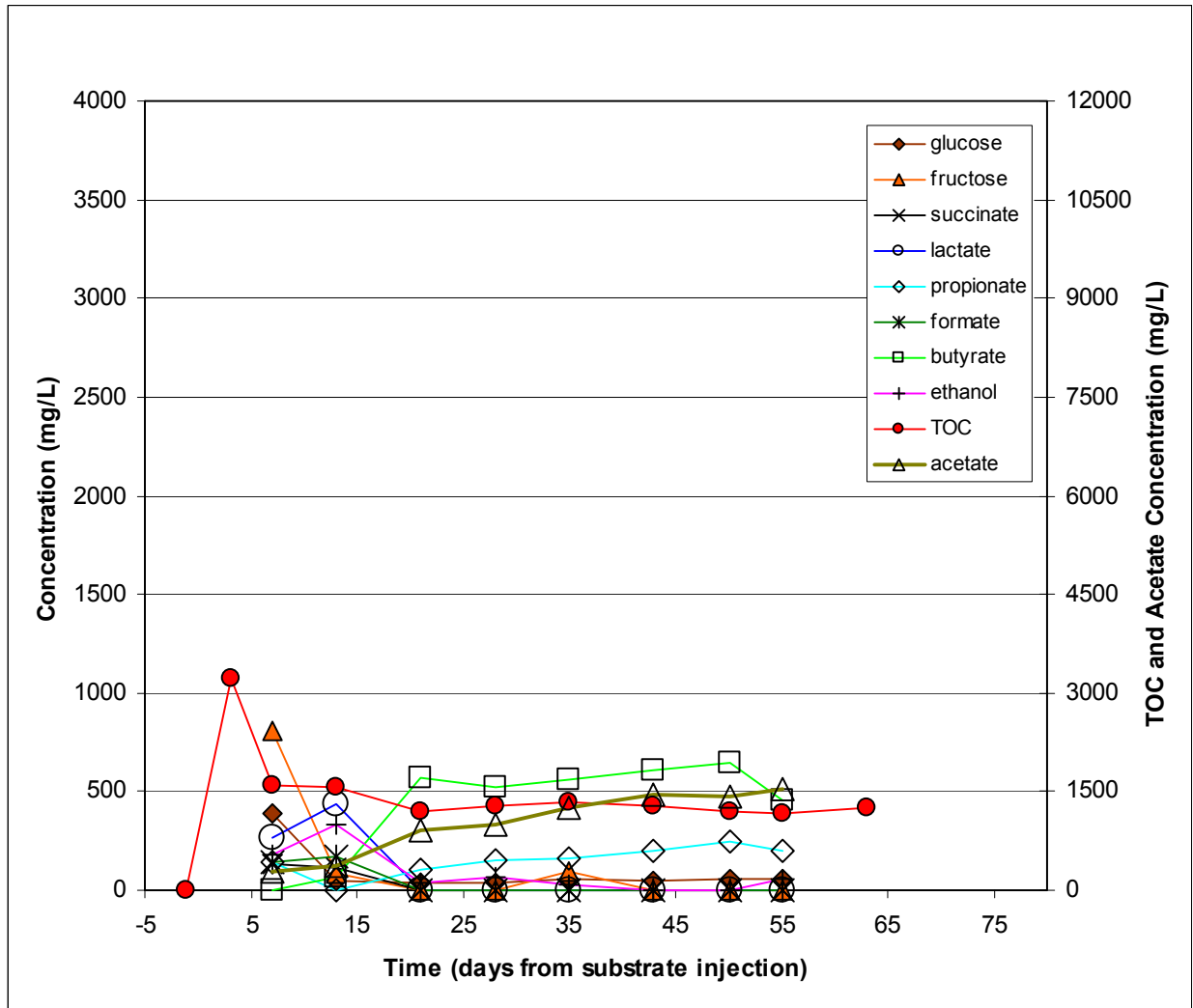


Figure 6.2. Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-109

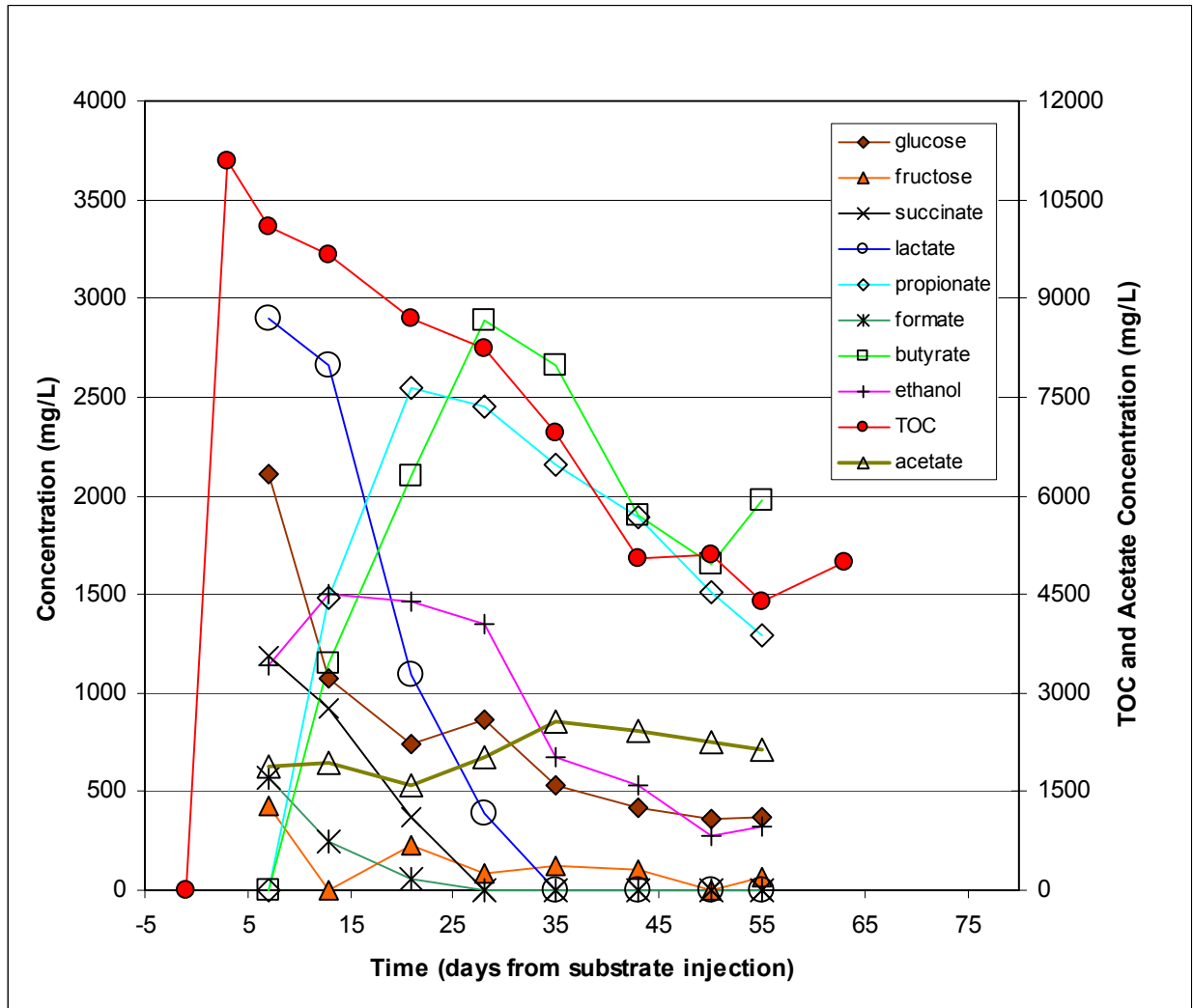


Figure 6.3. Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-110

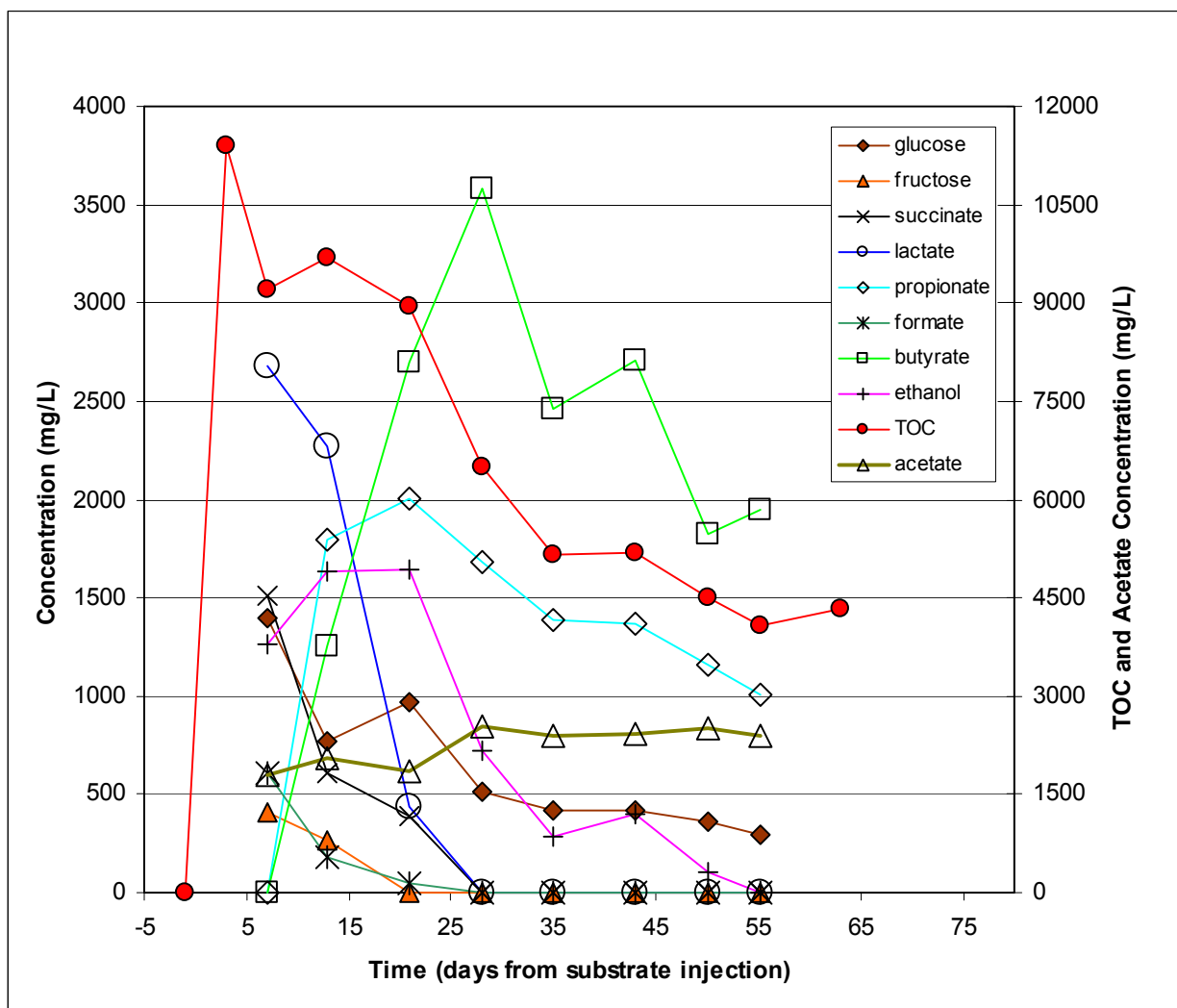


Figure 6.4. Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-111

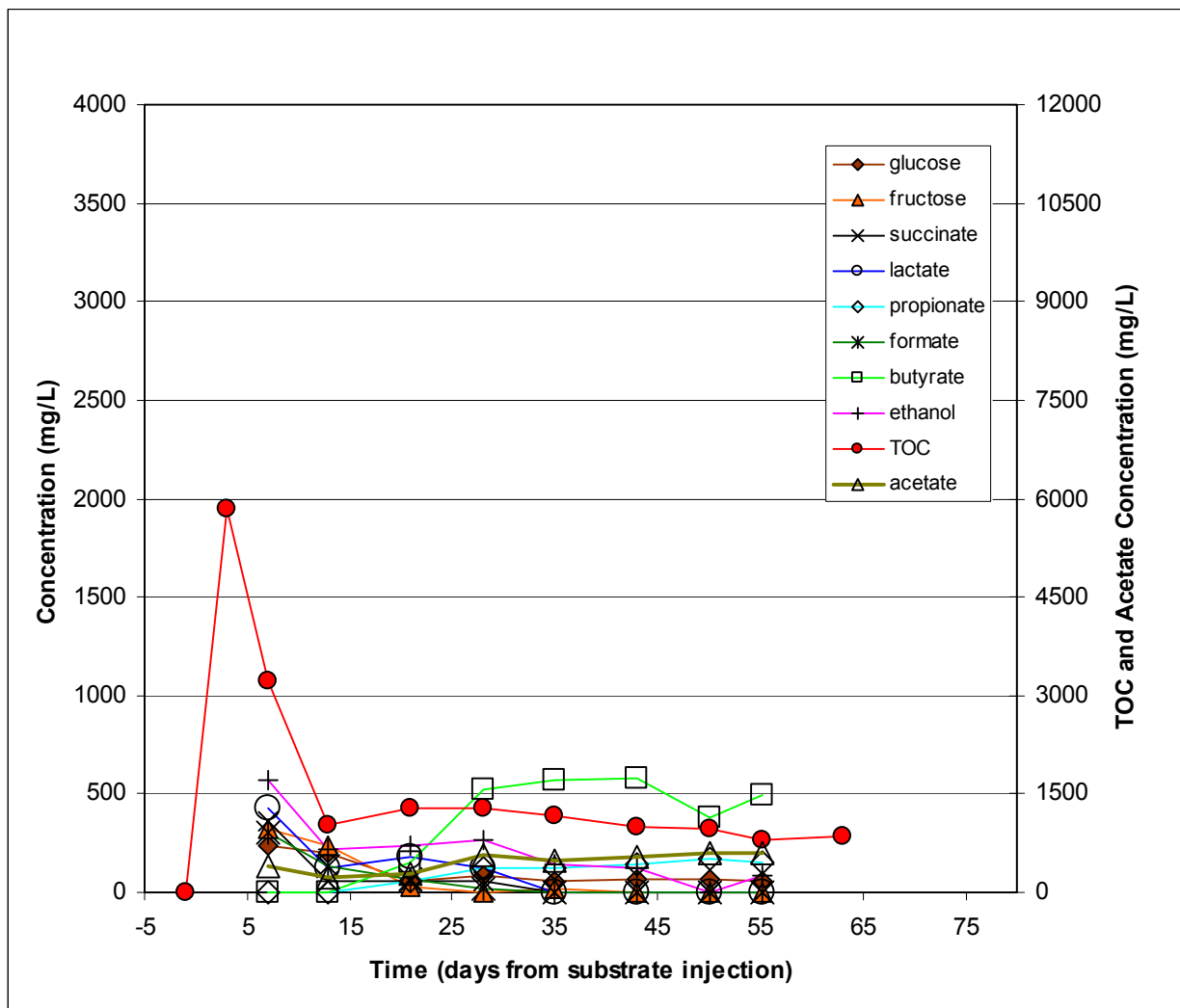


Figure 6.5. Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-112

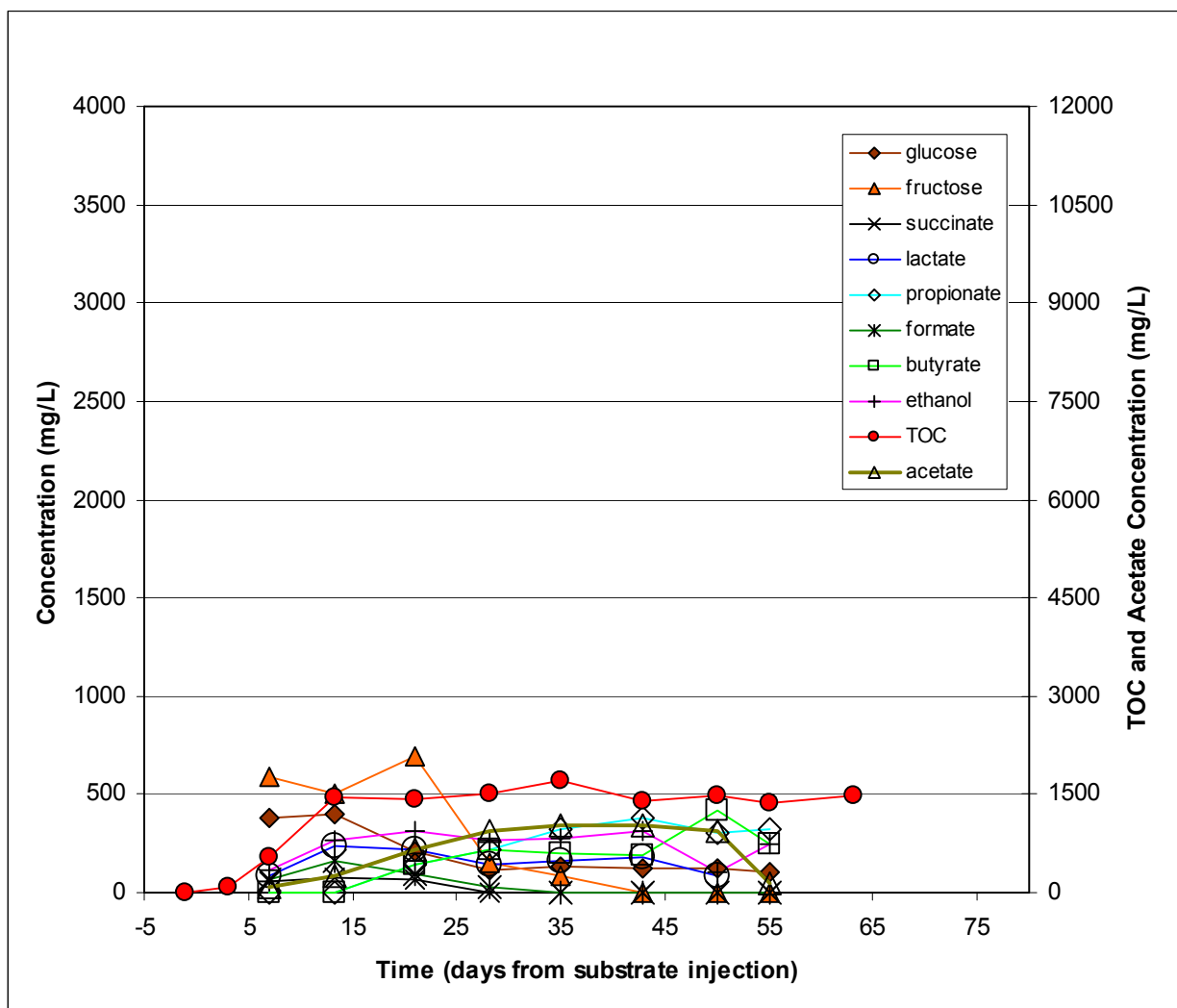


Figure 6.6. Organic Compound Concentrations During the Process Monitoring Phase at Monitoring Well 199-D5-113

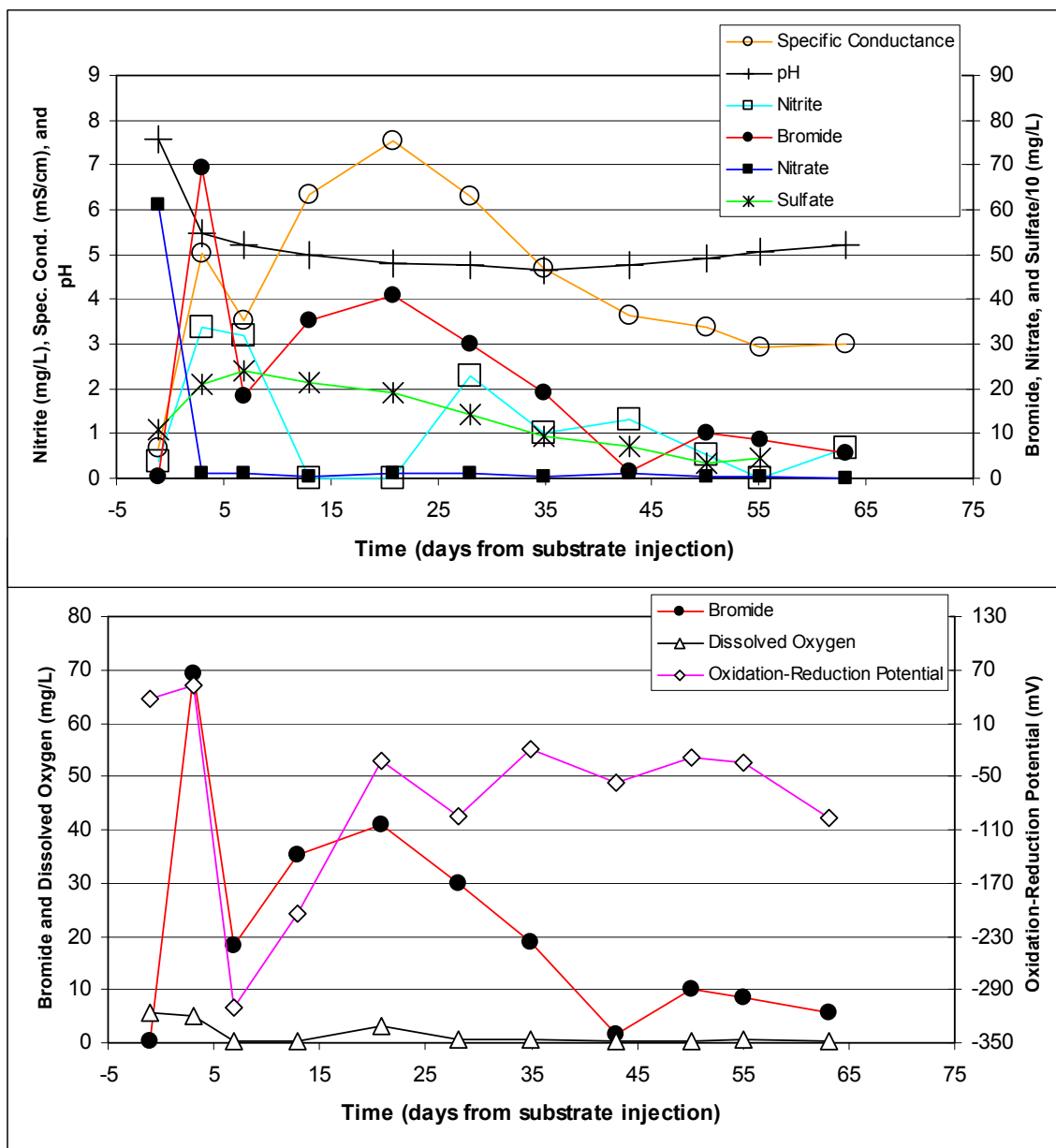


Figure 6.7. Process Monitoring Phase Data at Injection Well 199-D5-107

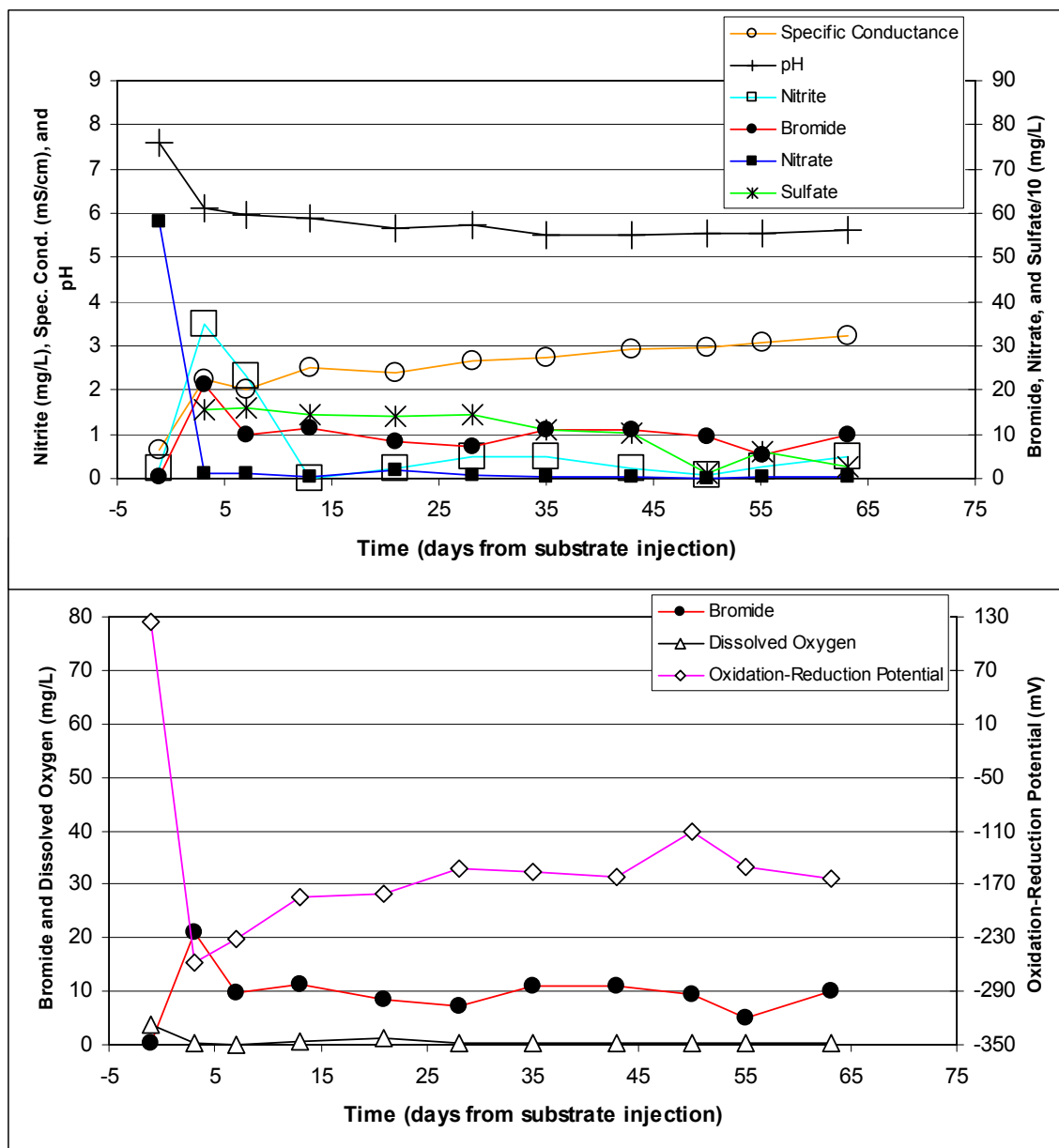


Figure 6.8. Process Monitoring Phase Data at Monitoring Well 199-D5-109

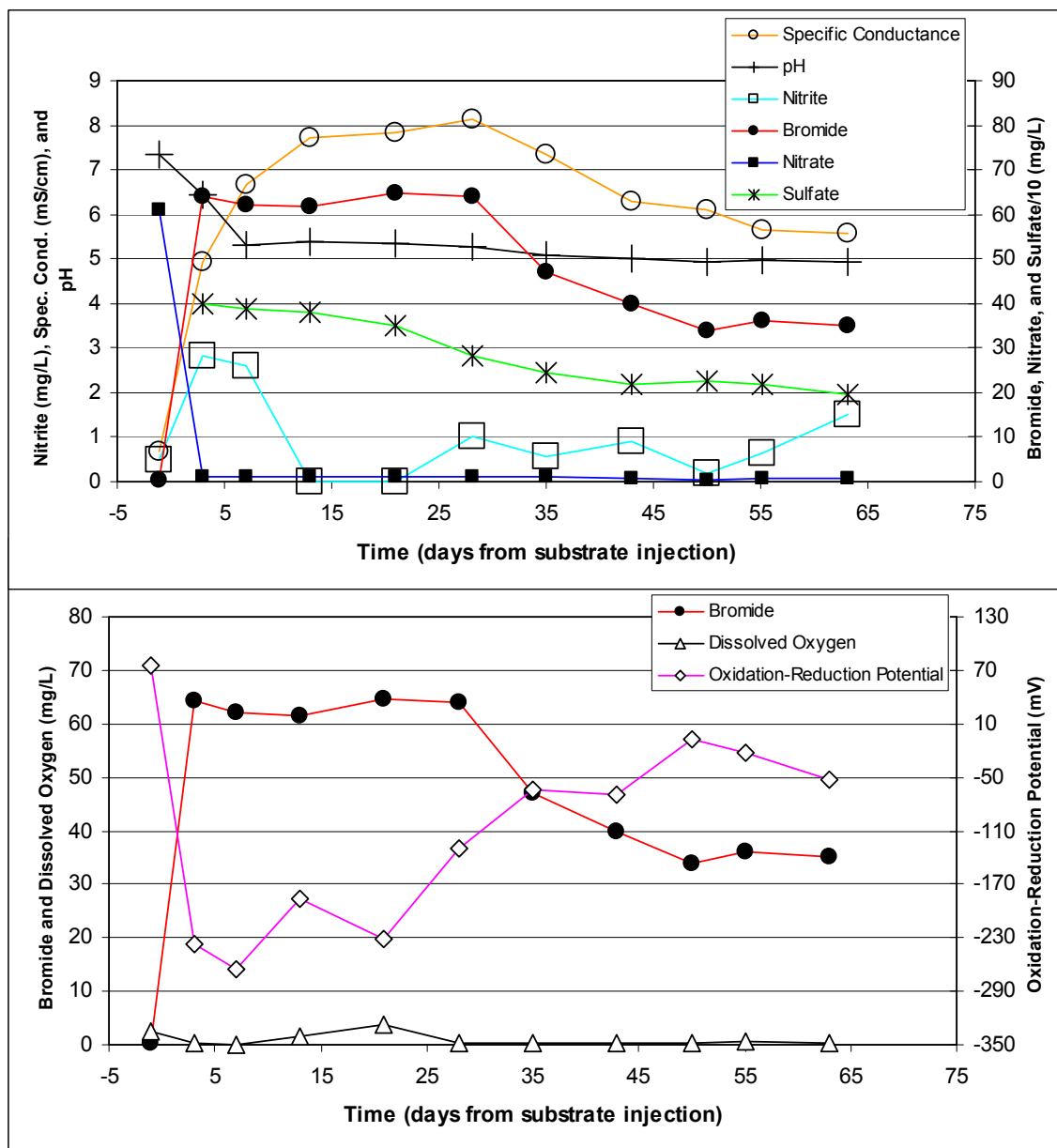


Figure 6.9. Process Monitoring Phase Data at Monitoring Well 199-D5-110

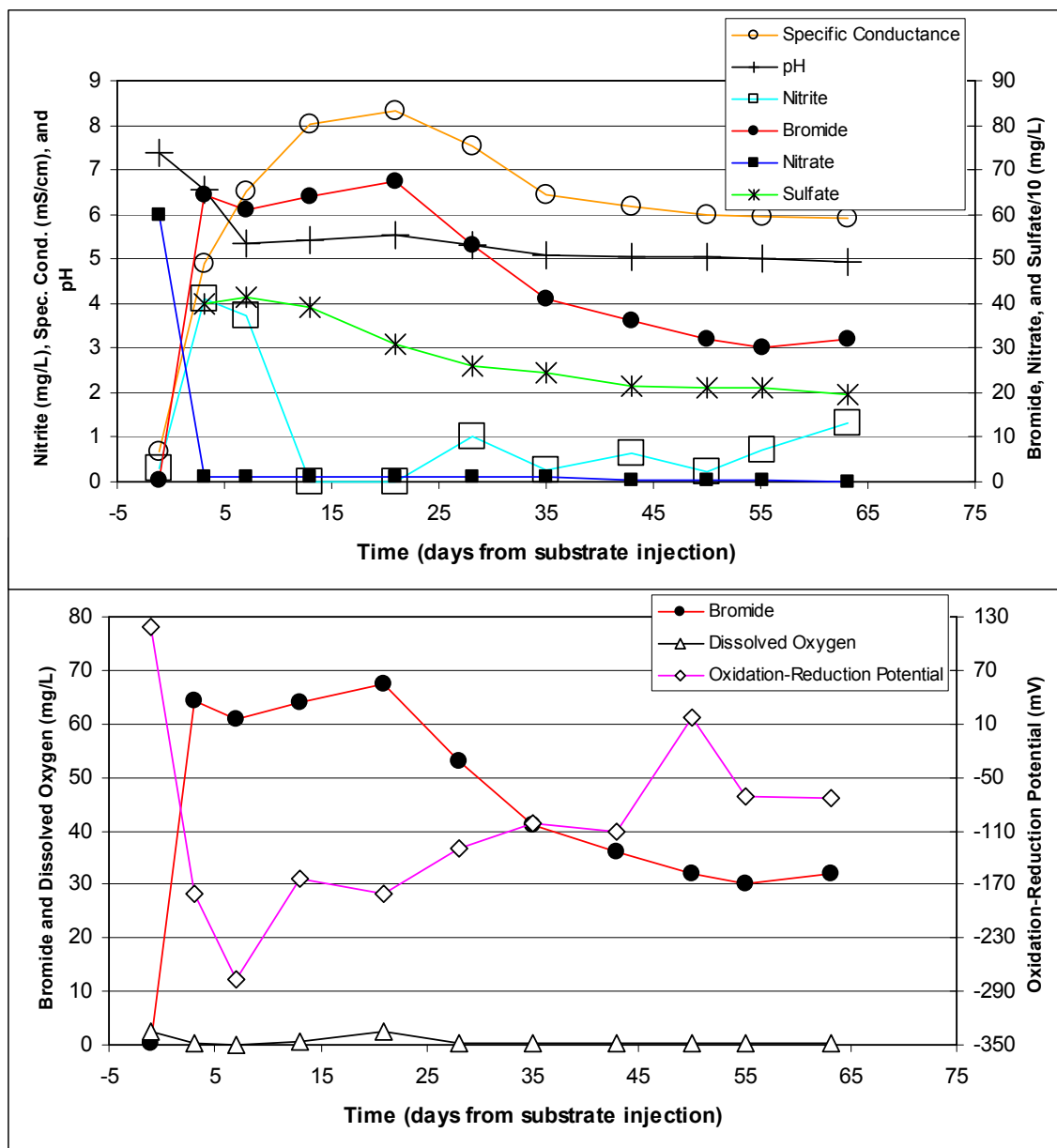


Figure 6.10. Process Monitoring Phase Data at Monitoring Well 199-D5-111

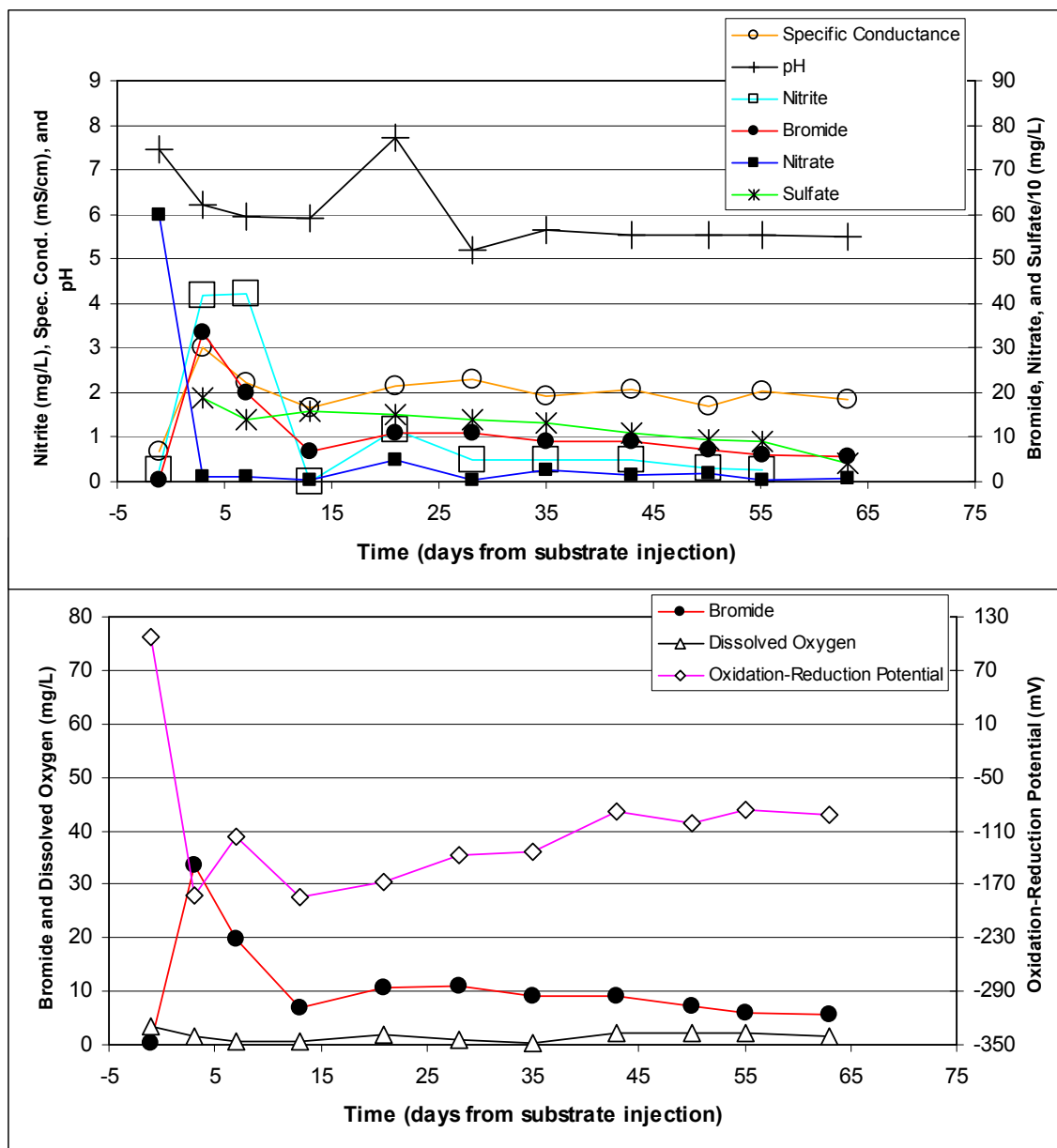


Figure 6.11. Process Monitoring Phase Data at Monitoring Well 199-D5-112

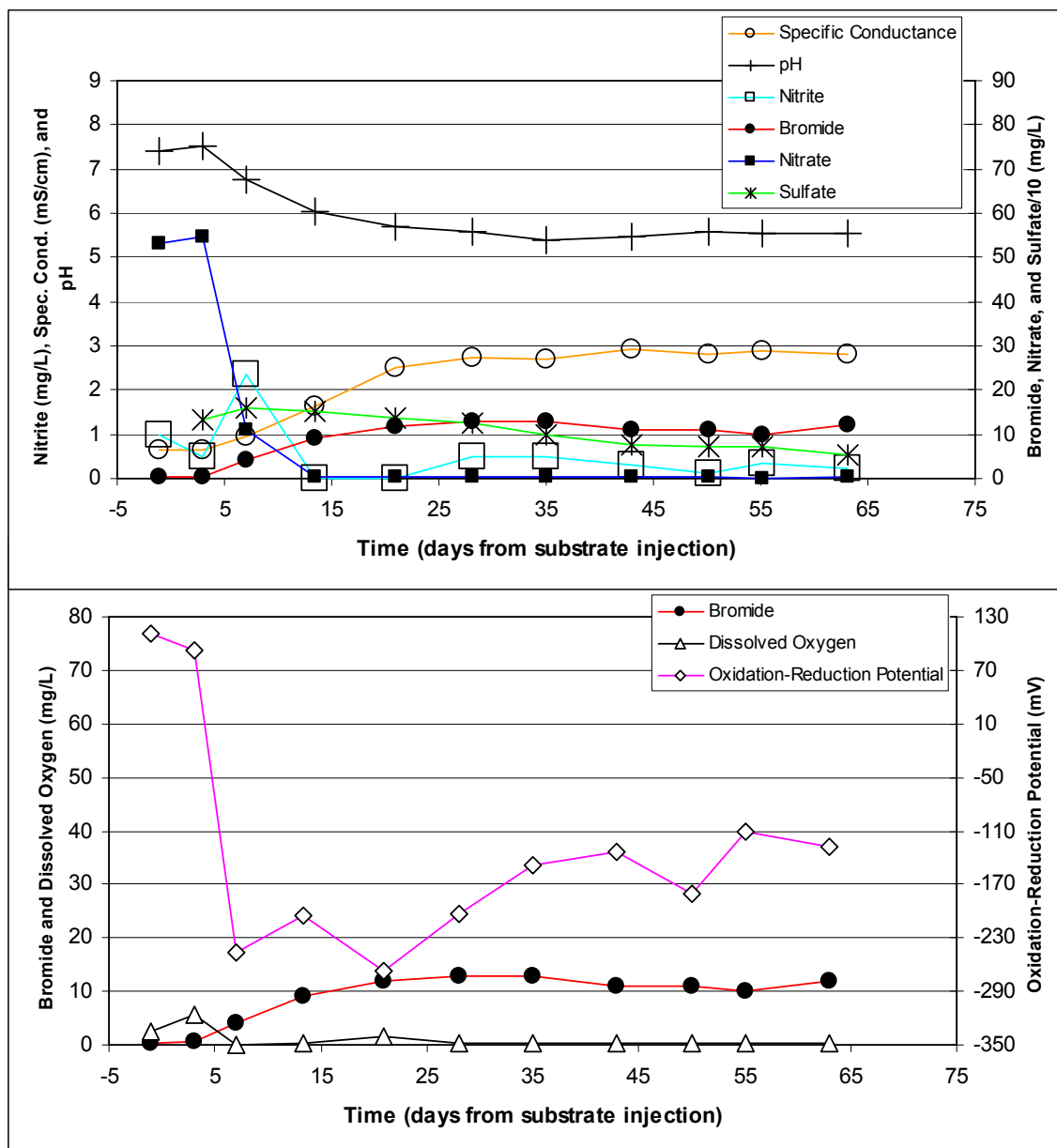


Figure 6.12. Process Monitoring Phase Data at Monitoring Well 199-D5-113

Examining the process monitoring data at different monitoring wells provides some insight into the processes occurring over the first 2 months following substrate injection. Comparing the organic acid data collected at injection well 199-D5-107 to that collected at monitoring wells 199-D5-110 and -111 indicates that fermentation reactions were likely occurring during injection. Initial data after injection at the injection well show high concentrations of ethanol and acetate with no lactate present. Data collected at wells 199-D5-110 and -111 show that fermentation occurred, initiating with high lactate concentrations (an initial fermentation product) and proceeding to other organic acids. Additionally, fructose and glucose concentrations are initially higher at wells 199-D5-110 and -111 than were observed at the injection well, indicating that fermentation may have been initiated earlier and was occurring for a longer period of time at the injection well because of longer exposure to molasses. With the exponential rate of

microbial growth, this “head start” could have caused the fermentation process to be more complete (e.g., to have more final end products such as acetate) at a much earlier time than at the outer wells. This process is another indicator that addition of a labile substrate initiates microbial activity quickly. If injection continues over too long a period, this activity could lead to significant microbial growth near the injection well, thus causing biofouling and limiting the radius of substrate distribution. Examining the organic acid and anion data at well 199-D5-109 indicates that data at this well reflects its downgradient location. For instance, acetate, propionate, and butyrate concentrations increase over time even after the “parent” fermentation compounds are gone. Well 199-D5-113 also shows evidence of being downgradient of a source of substrate. The organic acid and bromide data indicate that solutes continue to be transported to these monitoring locations from upgradient long after injection was terminated.

The observed decrease in bromide concentration is an indicator for displacement of the injected solution as upgradient groundwater begins to flow through the treatment zone. Bromide concentrations decreased from the initial concentrations in all of the monitoring wells except 199-D5-113, which is characterized by relatively low permeability conditions. However, the bromide concentrations did not decline to zero, indicating that the upgradient groundwater may not have fully displaced the substrate injection volume within the treatment zone over the duration of the process monitoring phase. Other potential explanations for this response include changes in groundwater flow direction and/or bromide being transported back into the treatment zone through preferential pathways that spread the injection solution to more distal locations during the injection phase. The decrease in bromide concentration was initiated after about 25 days at wells 199-D5-110 and -111, and while the rate of decrease was initially rapid, it slowed over time. Longer term monitoring of bromide data in conjunction with the hydraulic analysis of flow system heterogeneities, variability in groundwater velocity and flow direction, and any reduction in formation permeability are being conducted during the performance monitoring phase to continue the assessment of upgradient groundwater migration into and through the treatment zone. The process monitoring data showed that low oxygen, nitrate, and nitrite concentrations are maintained during the initial influx of upgradient groundwater.

6.2 Chromate

Hexavalent chromium (Cr^{6+}) in the form of the water soluble chromate ion (from onsite spectrophotometric analysis) and total chromium (from laboratory ICP-MS analysis) data were collected during the process monitoring phase. The onsite spectrophotometric analysis was intended as the primary process monitoring method with data shown in Figure 6.13. These data show an unexplained upward trend a few weeks before substrate injection began. After injection, chromate concentrations are below detection as would be expected because process water that contained no chromium contamination was used as a carrier medium for the substrate injection. After about 50 days, chromate begins to appear in some of the wells. Total chromium results from 70 days after the injection confirm that there is chromium at the test cell monitoring wells at a concentration of up to 30% of the upgradient concentration at that time. At the same time, the onsite spectrophotometric analysis indicated that chromate was below detection levels except at the upgradient well. Potential analytical interferences with the spectrophotometric method will be evaluated during the performance monitoring phase of the test by comparing the spectrophotometric results to the ICP-MS results obtained in the laboratory. The observed rebound in chromium concentration may indicate that chromate is only partially reduced in the treatment zone. Additional data will be collected during the performance monitoring phase of the test.

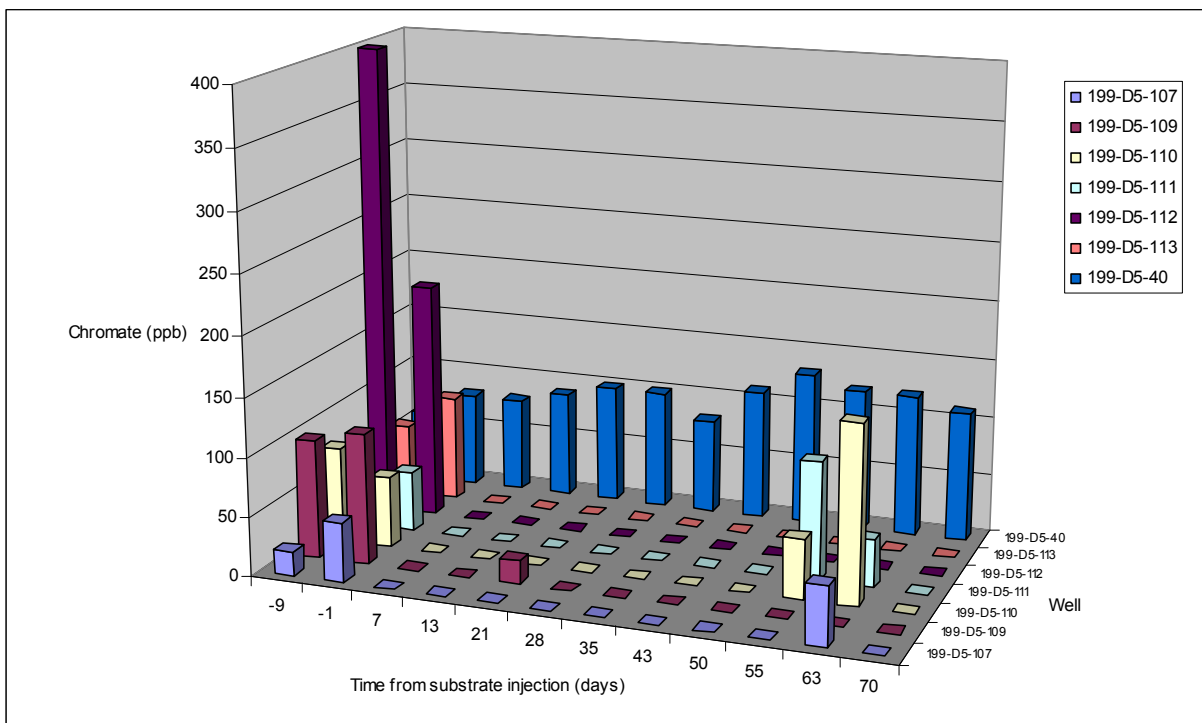


Figure 6.13. Chromate Concentrations Using Spectrophotometric Analysis (field test kit)

6.3 Hydraulic Data

Hydraulic analyses for the biostimulation test will include pre- and post-injection slug tests, injection pressure recovery analysis, electronic borehole flow meter tests, tracer response analysis, geophysical surveys, and hydraulic gradient/groundwater flow assessment during and following the test. These hydraulic analyses will be completed by the end of the performance monitoring phase of the test. This interim report provides an initial assessment of the hydraulic gradients relevant to the process monitoring phase of the test. Additional results will be reported at the end of the performance monitoring phase of the test.

The hydraulic gradient at and surrounding the field test site was evaluated over time using hydraulic-head triangulation. Figures 6.14 through 6.25 show the relative changes in the gradient magnitude and direction over an areal extent on the scale of the 100-D Area chromate plume. Note that hydraulic head data were not available for all time points in this series of figures. Continued hydraulic monitoring will be used to update the figures as new data are collected so that a full yearly cycle of data can be presented in the final report. The central triangle in the plume area formed by wells 199-D5-43, -20, and -38 (hereafter, central triangle) was used as the primary indicator of flow in the vicinity of the field test site. Table 6.1 shows the average monthly gradient magnitude and net direction for the central triangle over a 1-year period. Figure 6.26 shows the gradient magnitude and direction for the central triangle plotted with the river stage data over a period of about 3 years. These data show a consistent annual pattern of groundwater flow toward the river for about 8 months and a flow away from the river for about 4 months, which stagnates and diverts the flow in the central triangle. Fewer hydraulic-head temporal data points are available at the field test site, although these data continue to be collected.

Figure 6.27 through Figure 6.30 show results from an initial evaluation of gradient magnitude and direction. The field test site hydraulic data analysis uses hydraulic head data at wells 199-D5-40, 199-D5-111, and 199-D5-108 (located at the nearby immiscible substrate test cell).

Table 6.1. Groundwater Hydraulic Information for the Monitoring Set of Wells 199-D5-43, 199-D5-20, and 199-D5-38

Time Period	Average Hydraulic Gradient (m/m)	Net Direction (azimuth)	Percent of Data Missing for the Period ^(a)
January 2007	0.00030	303.8°	4.3%
February 2007	0.00026	337.3°	0.0%
March 2007	0.00031	321.7°	11.7%
April 2007	0.00033	65.7°	51.0%
May 2007	0.00072	66.4°	0.0%
June 2007	0.00067	62.4°	0.0%
July 2007	0.00042	25.3°	0.0%
August 2007	0.00040	354.3°	0.0%
September 2007	0.00061	315.4°	0.0%
October 2007	0.00098	309.8°	0.0%
November 2007	0.00089	300.2°	0.0%
December 2007	0.00058	291.4°	0.0%
January 2008	0.00041	294.3°	0.0%

(a) Gradient net direction and average magnitude were calculated only for when data were available. Therefore, the estimate of gradient direction and magnitude may not be representative for time periods with a significant percentage of missing data.

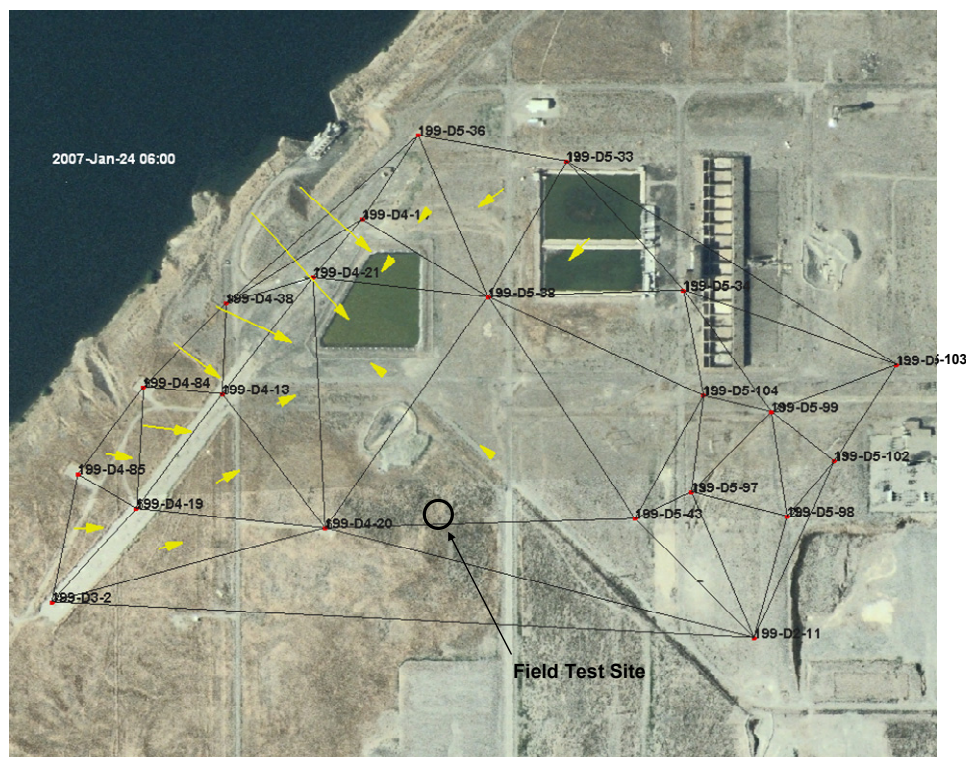


Figure 6.14. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for January 2007



Figure 6.15. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for February 2007

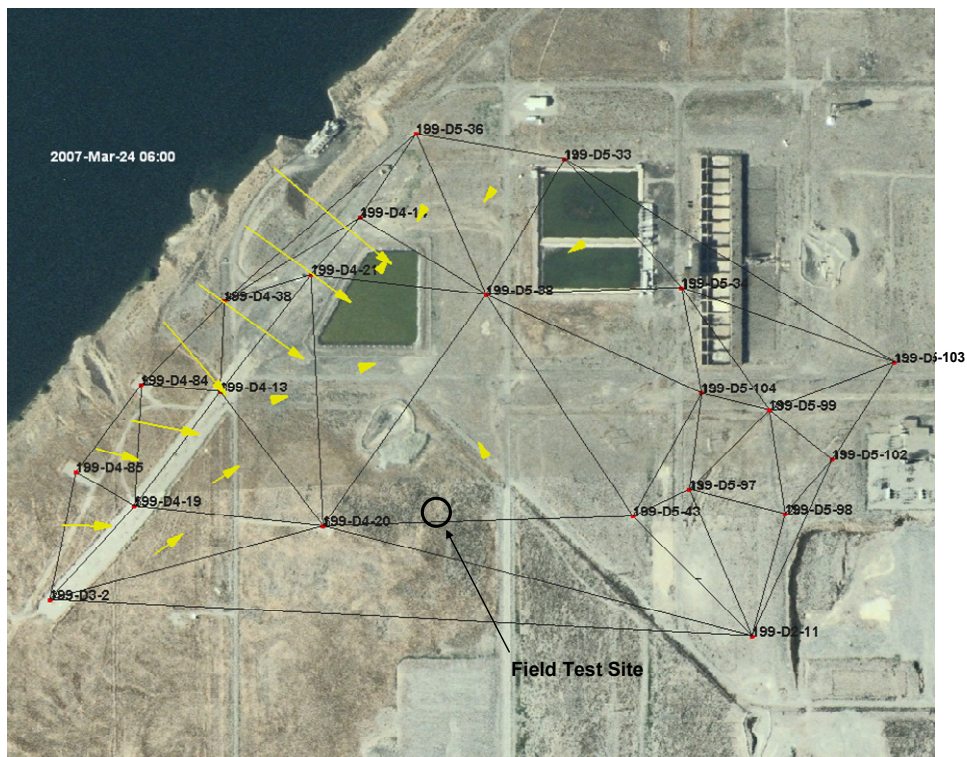


Figure 6.16. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for March 2007

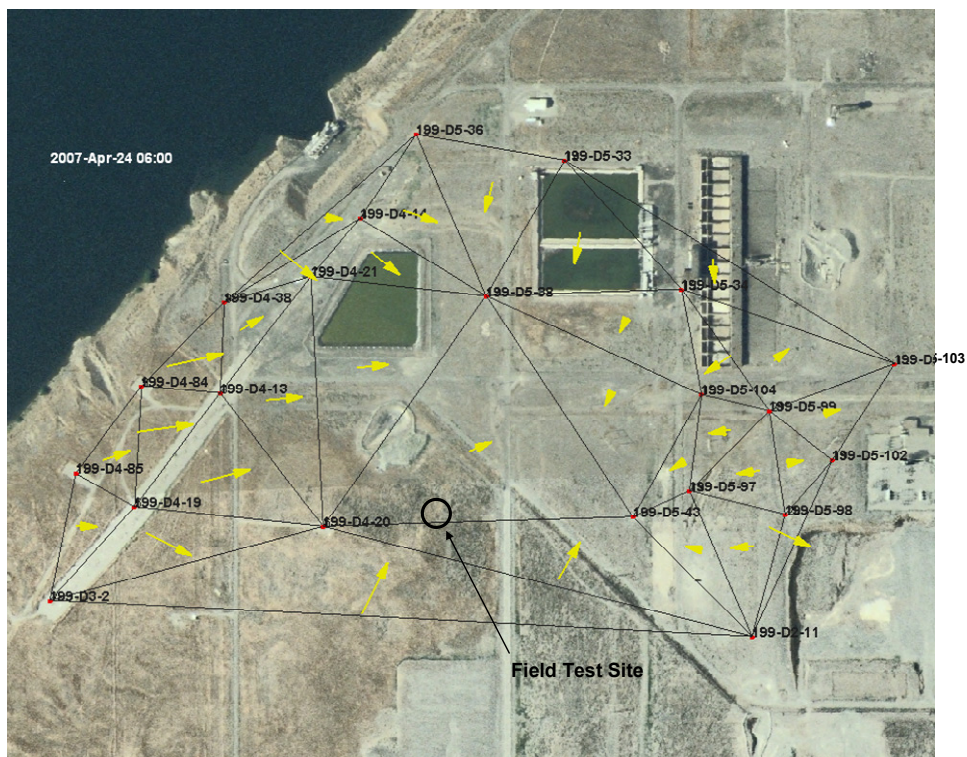


Figure 6.17. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for April 2007

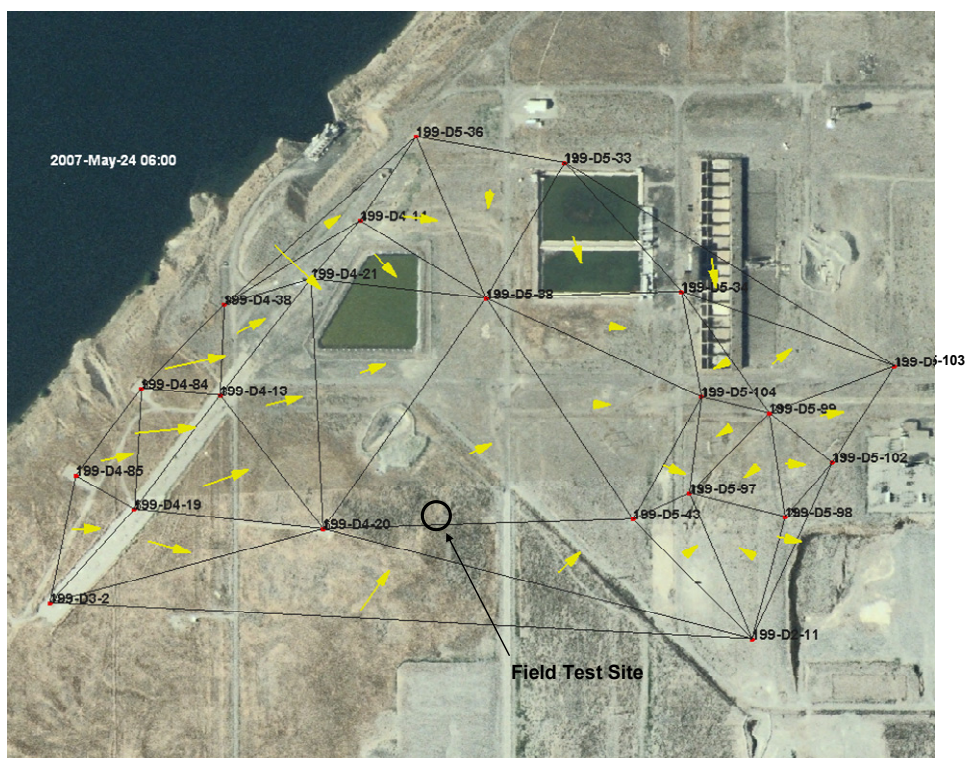


Figure 6.18. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for May 2007

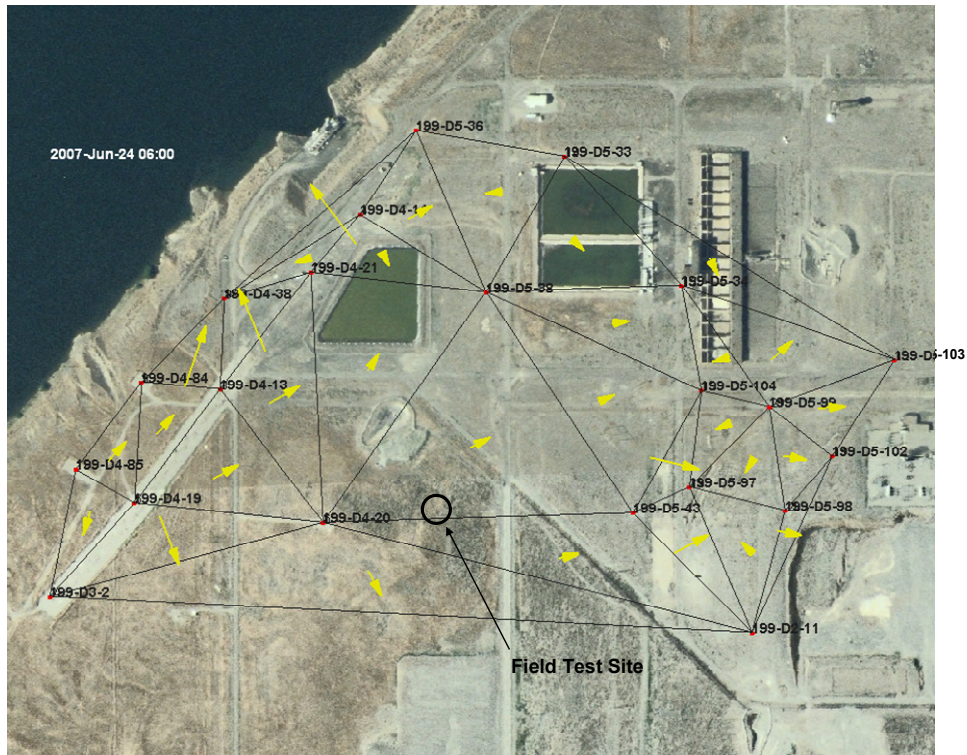


Figure 6.19. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for June 2007

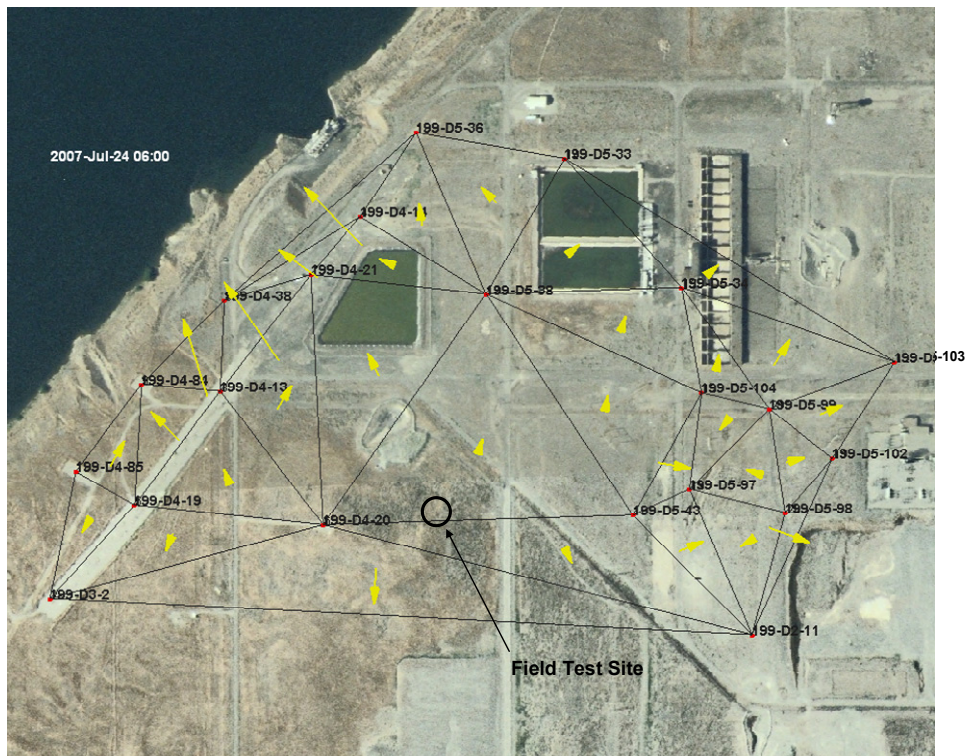


Figure 6.20. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for July 2007

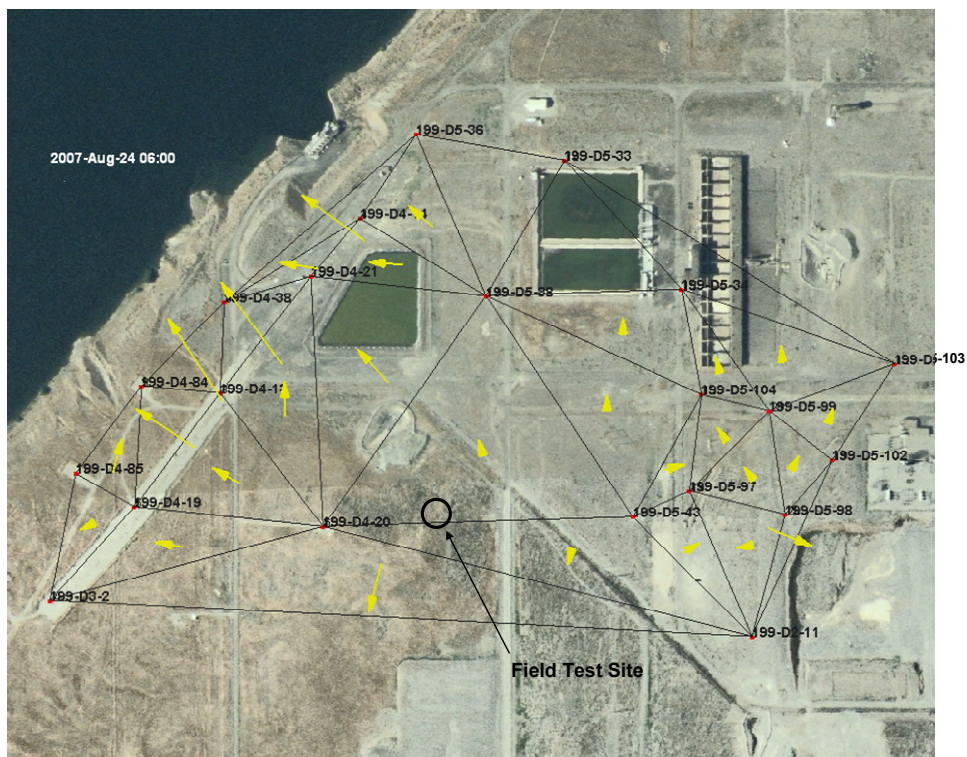


Figure 6.21. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for August 2007

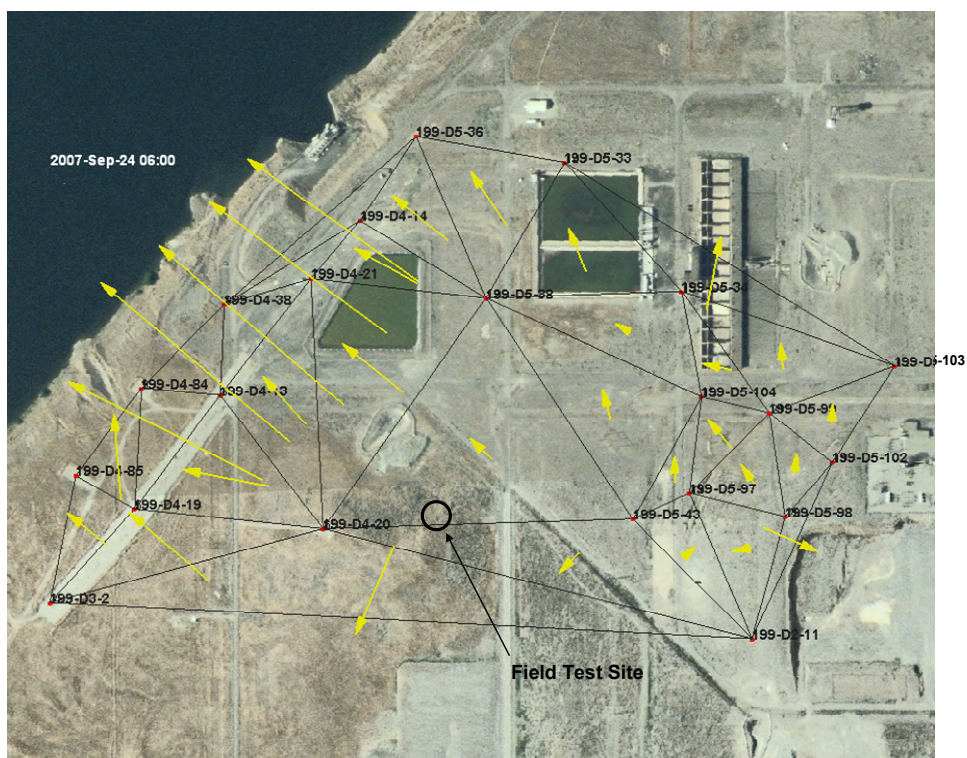


Figure 6.22. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for September 2007

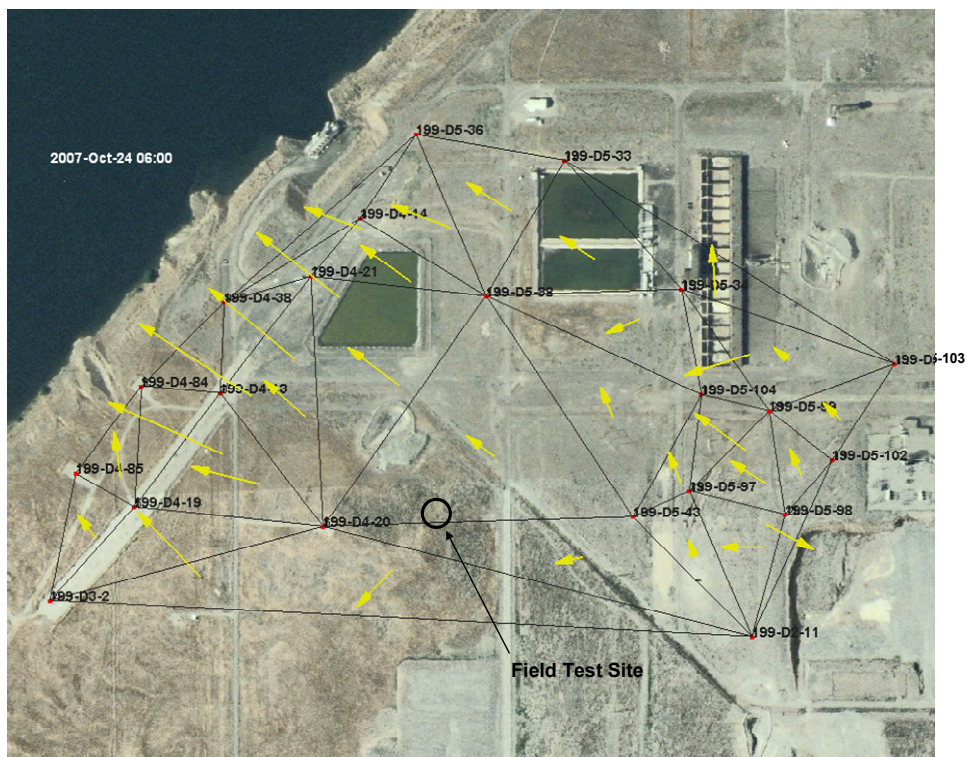


Figure 6.23. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for October 2007

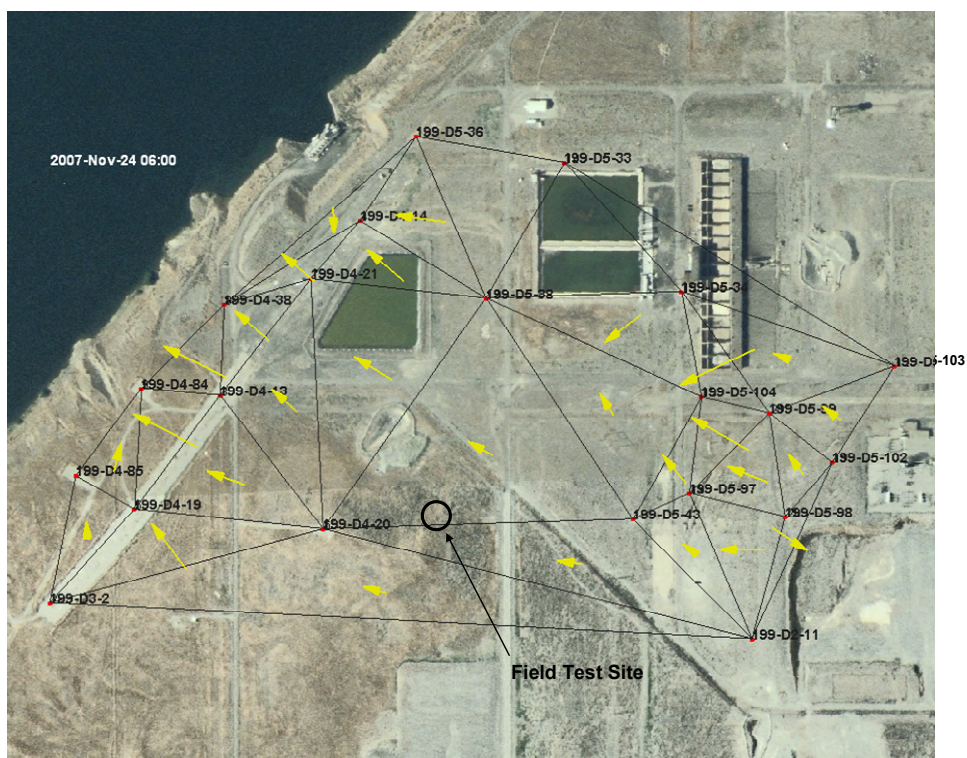


Figure 6.24. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for November 2007

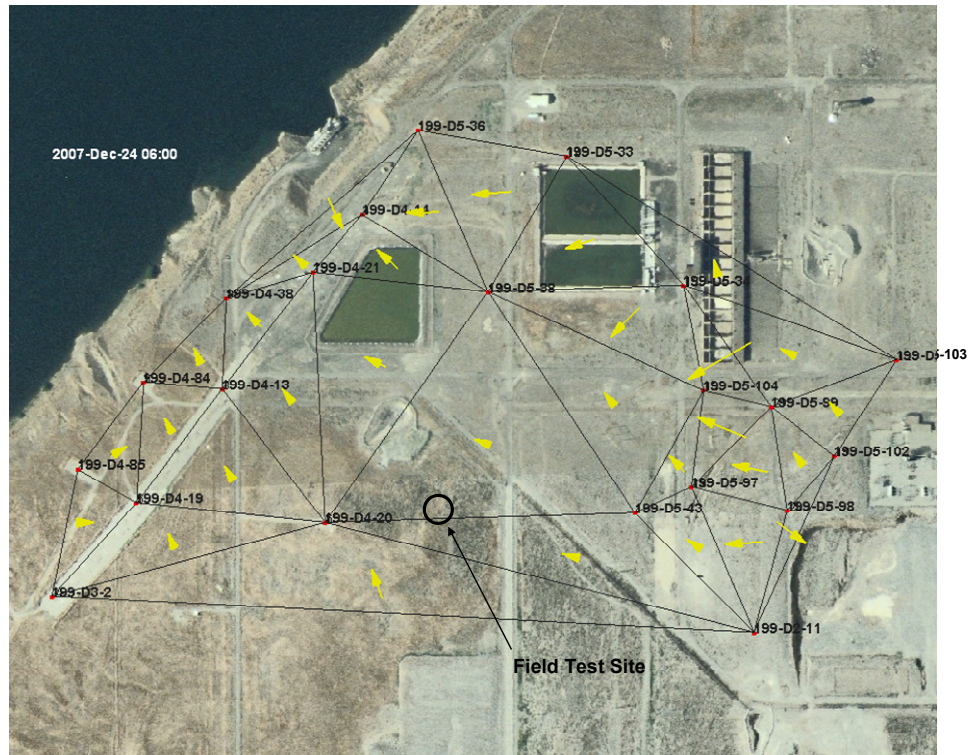


Figure 6.25. Gradient Direction and Relative Magnitude in the 100-D Chromate Plume for December 2007

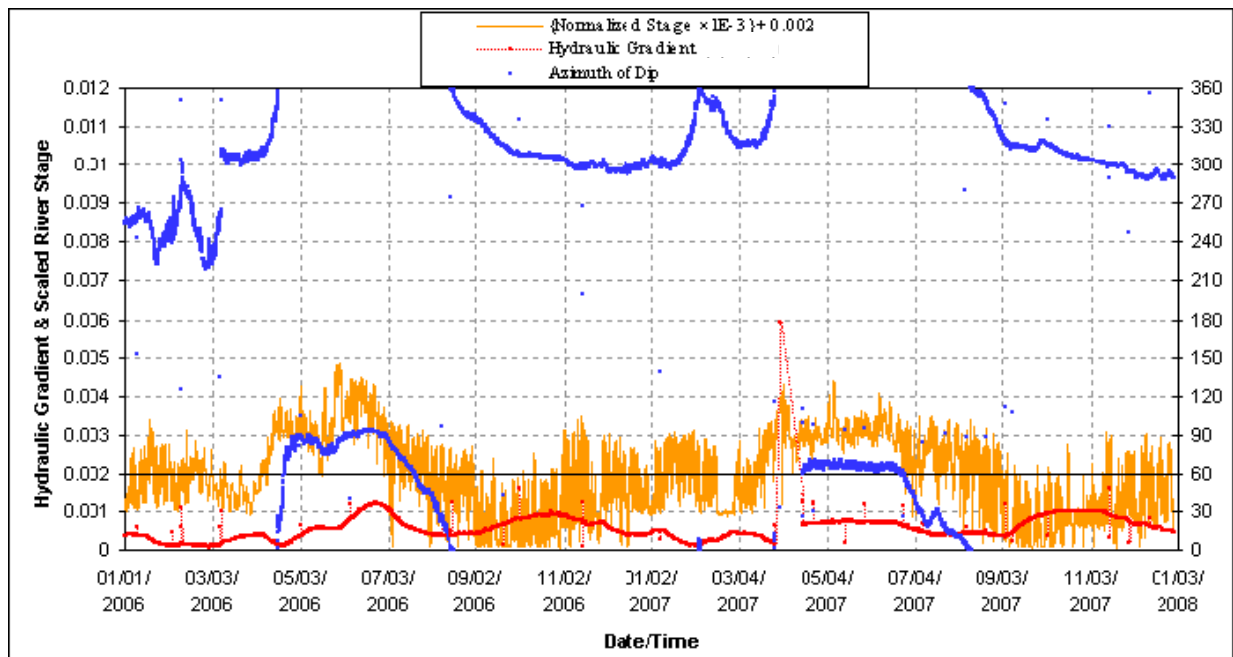


Figure 6.26. Gradient Magnitude and Direction from Triangulation Analysis with Wells 199-D5-43, 199-D5-20, and 199-D5-38 and River Stage Data

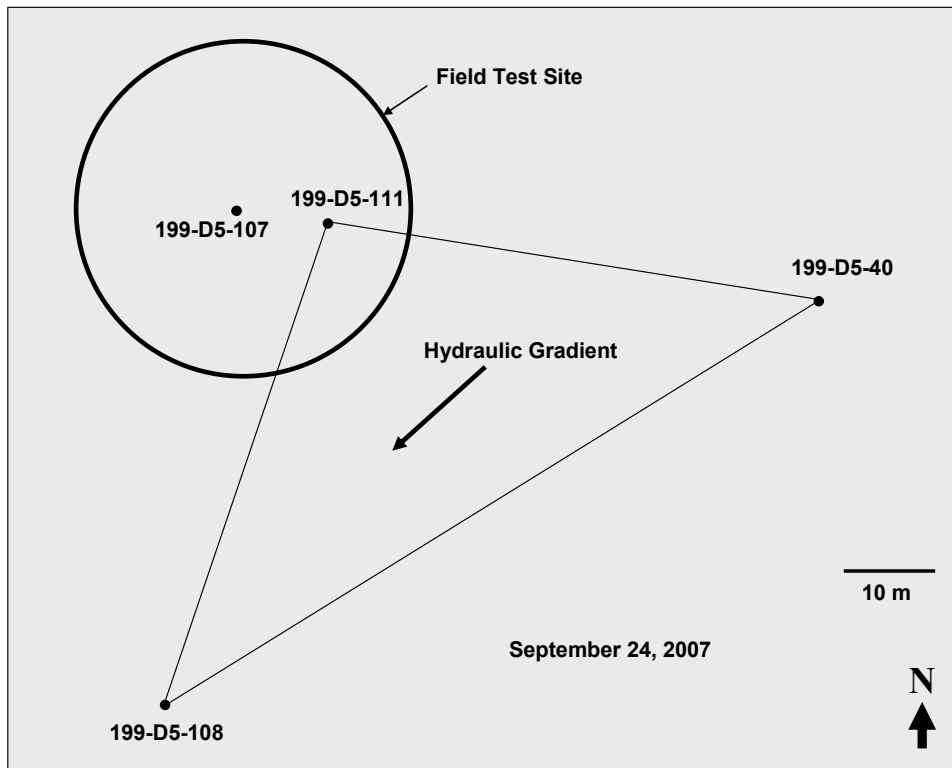


Figure 6.27. Gradient Direction and Relative Magnitude at the Field Test Site for September 2007

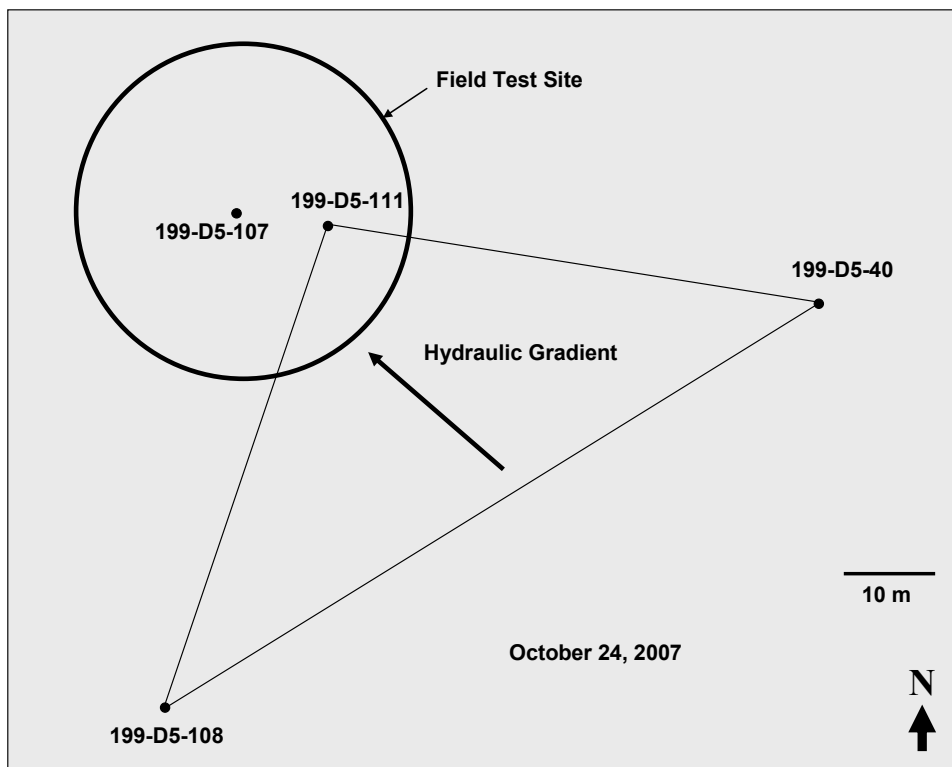


Figure 6.28. Gradient Direction and Relative Magnitude at the Field Test Site for October 2007

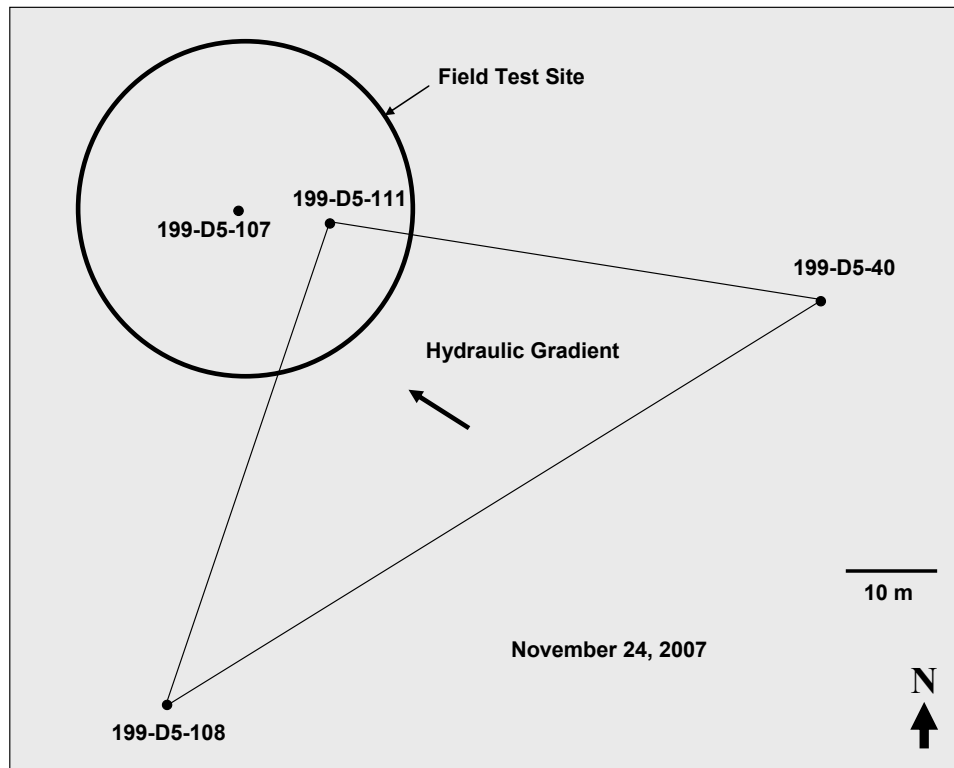


Figure 6.29. Gradient Direction and Relative Magnitude at the Field Test Site for November 2007

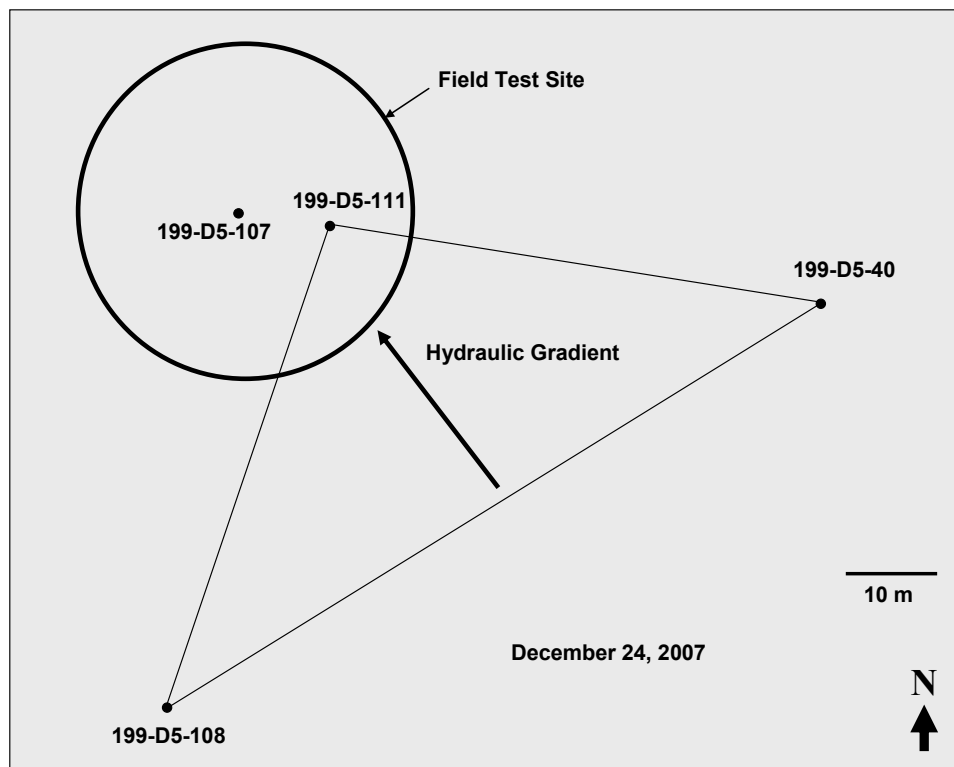


Figure 6.30. Gradient Direction and Relative Magnitude at the Field Test Site for December 2007

7.0 Summary Comparison of Laboratory Microcosm and Field Test Results

Laboratory microcosm tests showed that dominant products of substrate fermentation varied based on the initial substrate concentration. At an initial substrate concentration similar to the concentration injected at the field test site, the primary products of fermentation included succinate, lactate, propionate, acetate, formate, ethanol, and butyrate. The fermentation process proceeded over a period of two to three months. The initial substrate was typically gone after approximately one to two months, with fermentation of intermediate products continuing until acetate was the dominant remaining organic constituent. A similar mixture of fermentation products and fermentation timeframe was observed during the process monitoring phase of the field test.

Laboratory experiments also evaluated whether additional buffering capacity would be needed during substrate injection. Table 7.1 shows the pH changes occurring as a function of added bicarbonate buffer. Based on these results, no additional buffering was added during substrate injection because it was interpreted that the buffering available in the sediment was sufficient. However, the pH drop observed in the field was larger than expected and generally lowered the pH by 2 pH units during fermentation. The pH remained low during the process monitoring phase, although initial data for the performance monitoring phase shows that the pH is increased, moving again toward neutral. The pH drop in some of the subsequent microcosm experiments was also on the order of 2 pH units; however, fermentation and subsequent denitrification were still observed. It is likely the presence of carbonate minerals as buffering materials may be heterogeneously distributed, and the overall buffering capacity may be different than what was observed in the initial buffer tests.

Figure 7.1 and Figure 7.2 show typical responses for nitrate reduction in microcosm experiments. Note that denitrification occurs without significant production of a nitrite intermediate product. Similar results were observed during the field test where data suggested that nitrate reduction occurred and nitrite concentrations remained very low. Figure 7.1 and Figure 7.2 also show no sulfate reduction in the microcosm experiments over a period of about 75 days. In the field, sulfate reduction may have been initiated during the process monitoring phase at a few wells. Continued monitoring during the performance monitoring phase is needed to confirm that sulfate reduction occurs.

Table 7.1. pH Response Over One Month of Fermentation with Molasses (45 g/L) and Bicarbonate Buffer Added as Specified in the Table

	Bicarbonate Buffer Concentrations and Resulting pHs			
	1 mM	30 mM	100 mM	300 mM
Initial pH	6.8	6.8	7.6	9
Final pH	6.5	6.5	7.5	8

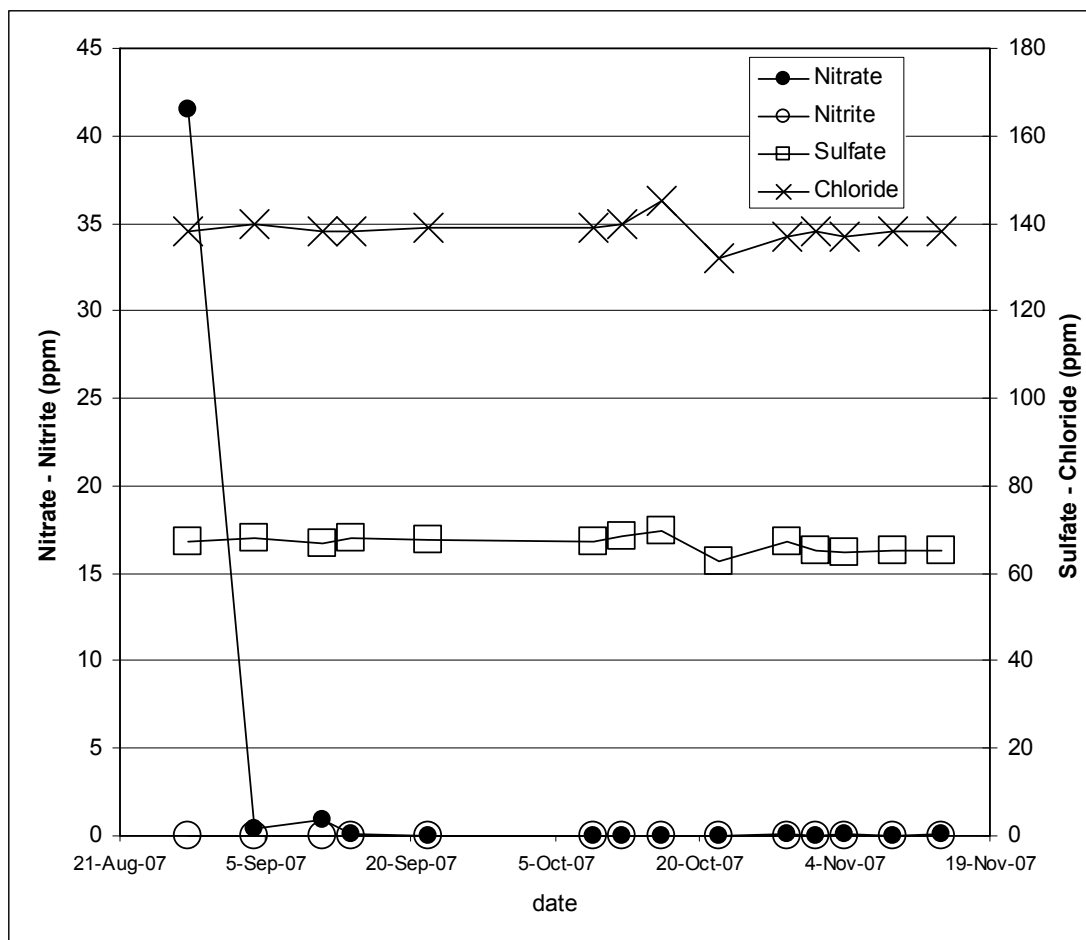


Figure 7.1. Denitrification Observed When Microcosm was Spiked with Nitrate While Acetate Concentration (the dominant remaining organic acid) was Greater Than 30 mM. Sulfate reduction was not observed over a period of about 75 days.

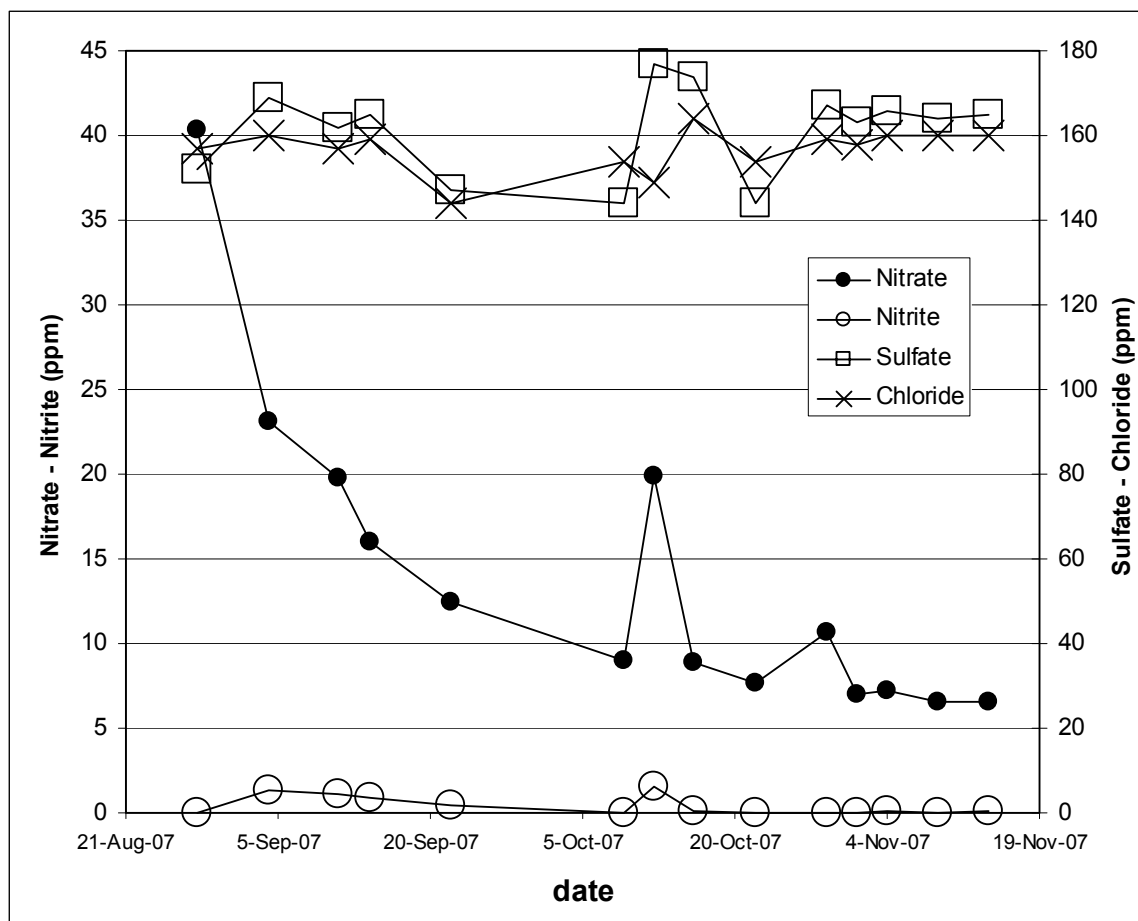


Figure 7.2. Denitrification Observed When Microcosm was Spiked with Nitrate While Acetate Concentration (the dominant remaining organic acid) was Less Than 5 mM. Sulfate reduction was not observed over a period of about 75 days.

8.0 Summary of Interim Results Relative to Field Test Objectives

The following is a brief interim summary of the field test results with respect to the objectives of the field test. These results will be updated when data from the performance monitoring phase of the test are available.

- Determine the effective radius of injection.

Result: A radius of injection of about 15 m (50 ft) from the injection well for a labile substrate is obtainable. It is unlikely that a radius greater than 20 m (66 ft) could be obtained because of the rapid initiation of microbial reactions and associated biomass buildup near the injection well. However, hydraulic properties would need to be evaluated at any proposed implementation location to determine if a higher injection rate, and thus a larger radial extent of treatment for a given time period, could be sustained. Additionally, use of a groundwater recirculation process that was able to significantly enhance interwell groundwater flow rates during an injection may also enable larger well spacing during full-scale deployment of the technology.

- Evaluate the uniformity of substrate distribution.

Result: Uniformity of substrate injection is, as expected, dependent on formational heterogeneities within and beyond the targeted treatment zone. However, the field test injection was able to distribute substrate to all of the monitoring locations, though at different concentrations. Subsequent microbial activity has been observed at all locations. Further information about the uniformity of treatment with respect to creation of an effective biological reducing barrier will be evaluated with the data from the performance monitoring phase of the test.

- Identify operational needs for injection.

Result: Relatively simple operations with the use of process water and substrate supplied in a tanker truck were demonstrated during the injection. One problem encountered was the initial injection pressure increase, which most likely resulted from molasses accumulation on the injection well screen or within the filter pack material. A mitigation approach was developed during the treatability test (i.e., short pulses of process water were used to dissolve molasses buildup on the screen openings), and similar approaches may be required during full-scale deployment of the technology.

- Induce fermentation reactions and reducing conditions and grow biomass.

Result: Process monitoring data showed that fermentation reactions and associated reducing conditions occurred at all of the monitoring locations and persisted for up to 60-plus days. Direct in situ biomass measurement is not possible, but indirect measurement with geophysical techniques and post-injection hydraulic testing will be conducted using data collected during the process monitoring and performance monitoring phases of the test.

- Minimize permeability changes resulting from biomass increases.

Result: Comparison of pre-and post-injection hydraulic conductivity measurements will be conducted using data collected during the process monitoring and performance monitoring phases of the test.

- Quantify the ability to obtain and maintain low oxygen and nitrate/nitrite concentrations (limit primary electron acceptor flux) and determine longevity of treatment.

Result: Low oxygen, nitrate, and nitrite concentrations were maintained over the duration of the process monitoring phase. Bromide data indicate that some upgradient contaminated water has penetrated the treatment zone over the duration of the process monitoring phase, suggesting that nitrate and oxygen associated with this groundwater has been reduced in the treatment zone.

- Quantify the ability to obtain and maintain low chromate concentrations (augment chromate treatment) and determine longevity of treatment.

Result: Low chromate concentrations were maintained through most of the process monitoring phase. After about 50 days, there have been indications that the chromate concentration at the monitoring locations are increasing. Bromide data indicate that some upgradient contaminated water has penetrated the treatment zone, suggesting that chromate contamination associated with this groundwater may not have been fully reduced in the treatment zone.

- Compile information for full-scale design considering the injection process, biobarrier performance, hydrogeology, and electron flux information at 100-D

Result: Results described above provide some of the information needed for a full-scale design. An assessment of full-scale design considerations will be provided after data from the performance monitoring phase has been collected and analyzed. The full-scale design also should consider commercial techniques for in situ biostimulation using carbohydrate substrates.

9.0 References

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Appendix A

Field Test Data

Appendix A

Field Test Data

Release of Validated Data

PROJECT: Hanford 100-D Area Treatability Demonstration: In situ Biostimulation for a Reducing Barrier
LABORATORY: Pacific Northwest National Laboratory (Richland, WA)
Laboratory Job Number: **M-Inj-01**
REVIEWER: Rebecca P. Elmore, Pacific Northwest National Laboratory (Richland, WA)
ANALYSE Hexavalent Chromium (Cr⁺⁶) by Hach Method 8023
Anions by Sigma V IC
Total Organic Carbon (TOC) by 9060A
MATRIX: 119 Water Samples
DATE: December 14, 2007

A.1 Introduction

Pacific Northwest National Laboratory (PNNL) collected five samples for hexavalent chromium analysis, 35 samples for the analysis of total organic carbon (TOC), and 119 samples for the analysis of anions. Samples were collected between 09/26/07 and 09/29/07. Field duplicate samples M-Inj-022, M-Inj-032, M-Inj-056, M-Inj-093, and M-Inj-115 were associated with this SDG. No trip blank samples were needed nor collected. Bromide concentration was measured in the field using an ion selective electrode, and those results are not discussed in this laboratory data review report. Sample ID numbers are as follows:

Sample ID	Sample Date	Sample Time	Sample Location	Sample Matrix	Sample Type	Related-FD Sample	Methods
M-Inj-001	9/26/2007	1130	107	GW	Primary	NA	A,B,T
M-Inj-002	9/26/2007	1140	110	GW	Primary	NA	A,B,C
M-Inj-003	9/26/2007	1145	112	GW	Primary	NA	A,B,C
M-Inj-004	9/26/2007	1150	113	GW	Primary	NA	A,B,C
M-Inj-005	9/26/2007	1155	109	GW	Primary	NA	A,B,C
M-Inj-006	9/26/2007	1205	111	GW	Primary	NA	A,B,C
M-Inj-007	9/26/2007	1542	107	GW	Primary	NA	A,B,T
M-Inj-008	9/26/2007	1548	110	GW	Primary	NA	A,B
M-Inj-009	9/26/2007	1554	112	GW	Primary	NA	A,B,T
M-Inj-010	9/26/2007	1600	113	GW	Primary	NA	A,B
M-Inj-011	9/26/2007	1605	109	GW	Primary	NA	A,B
M-Inj-012	9/26/2007	1610	111	GW	Primary	NA	A,B
M-Inj-013	9/26/2007	1858	107	GW	Primary	NA	A,B,T
M-Inj-014	9/26/2007	1844	110	GW	Primary	NA	A,B
M-Inj-015	9/26/2007	1847	112	GW	Primary	NA	A,B
M-Inj-016	9/26/2007	1910	113	GW	Primary	NA	A,B
M-Inj-017	9/26/2007	1918	109	GW	Primary	NA	A,B
M-Inj-018	9/26/2007	1924	111	GW	Primary	NA	A,B
M-Inj-019	9/26/2007	2100	112	GW	Primary	NA	A,B

Sample ID	Sample Date	Sample Time	Sample Location	Sample Matrix	Sample Type	Related-FD Sample	Methods
M-Inj-020	9/26/2007	2340	110	GW	Primary	NA	A,B
M-Inj-021	9/26/2007	2342	112	GW	Primary	NA	A,B,T
M-Inj-022	9/26/2007	2346	112	GW	FD	M-Inj-021	A,B
M-Inj-023	9/26/2007	2350	113	GW	Primary	NA	A,B
M-Inj-024	9/26/2007	2354	109	GW	Primary	NA	A,B,T
M-Inj-025	9/26/2007	0007	107	GW	Primary	NA	A,B
M-Inj-026	9/27/2007	0754	107	GW	Primary	NA	A,B
M-Inj-027	9/27/2007	0802	110	GW	Primary	NA	A,B
M-Inj-028	9/27/2007	0805	112	GW	Primary	NA	A,B
M-Inj-029	9/27/2007	0811	113	GW	Primary	NA	A,B,T
M-Inj-030	9/27/2007	0815	109	GW	Primary	NA	A,B,T
M-Inj-031	9/27/2007	0820	111	GW	Primary	NA	A,B
M-Inj-032	9/27/2007	0820	111	GW	FD	M-Inj-031	A,B
M-Inj-033	9/27/2007	1215	110	GW	Primary	NA	A,B,T
M-Inj-034	9/27/2007	1225	112	GW	Primary	NA	A,B,T
M-Inj-035	9/27/2007	1236	113	GW	Primary	NA	A,B
M-Inj-036	9/27/2007	1243	109	GW	Primary	NA	A,B
M-Inj-037	9/27/2007	1248	111	GW	Primary	NA	A,B,T
M-Inj-038	9/27/2007	1257	107	GW	Primary	NA	A,B,T
M-Inj-039	9/27/2007	1620	107	GW	Primary	NA	A,B
M-Inj-040	9/27/2007	1627	110	GW	Primary	NA	A,B
M-Inj-041	9/27/2007	1632	112	GW	Primary	NA	A,B
M-Inj-042	9/27/2007	1641	113	GW	Primary	NA	A,B
M-Inj-043	9/27/2007	1647	109	GW	Primary	NA	A,B
M-Inj-044	9/27/2007	1653	111	GW	Primary	NA	A,B
M-Inj-045	9/27/2007	2015	107	GW	Primary	NA	A,B
M-Inj-046	9/27/2007	2021	110	GW	Primary	NA	A,B
M-Inj-047	9/27/2007	2031	112	GW	Primary	NA	A,B
M-Inj-048	9/27/2007	2037	113	GW	Primary	NA	A,B
M-Inj-049	9/27/2007	2042	109	GW	Primary	NA	A,B
M-Inj-050	9/27/2007	2048	111	GW	Primary	NA	A,B
M-Inj-051	9/28/2007	0002	107	GW	Primary	NA	A,B
M-Inj-052	9/28/2007	0009	110	GW	Primary	NA	A,B,T
M-Inj-053	9/28/2007	0014	112	GW	Primary	NA	A,B,T
M-Inj-054	9/28/2007	0020	113	GW	Primary	NA	A,B,T
M-Inj-055	9/28/2007	0024	109	GW	Primary	NA	A,B,T
M-Inj-056	9/28/2007	0027	109	GW	FD	M-Inj-055	A,B
M-Inj-057	9/28/2007	0031	111	GW	Primary	NA	A,B,T
M-Inj-058	9/28/2007	0406	107	GW	Primary	NA	A,B
M-Inj-059	9/28/2007	0411	110	GW	Primary	NA	A,B
M-Inj-060	9/28/2007	0417	112	GW	Primary	NA	A,B
M-Inj-061	9/28/2007	0422	113	GW	Primary	NA	A,B
M-Inj-062	9/28/2007	0427	109	GW	Primary	NA	A,B
M-Inj-063	9/28/2007	0432	111	GW	Primary	NA	A,B,T
M-Inj-064	9/28/2007	0817	107	GW	Primary	NA	A,B
M-Inj-065	9/28/2007	0825	110	GW	Primary	NA	A,B
M-Inj-066	9/28/2007	0832	112	GW	Primary	NA	A,B
M-Inj-067	9/28/2007	0848	113	GW	Primary	NA	A,B
M-Inj-068	9/28/2007	0904	109	GW	Primary	NA	A,B
M-Inj-069	9/28/2007	0912	111	GW	Primary	NA	A,B

Sample ID	Sample Date	Sample Time	Sample Location	Sample Matrix	Sample Type	Related-FD Sample	Methods
M-Inj-070	9/28/2007	1212	107	GW	Primary	NA	A,B,T
M-Inj-071	9/28/2007	1220	110	GW	Primary	NA	A,B,T
M-Inj-072	9/28/2007	1230	112	GW	Primary	NA	A,B,T
M-Inj-073	9/28/2007	1236	113	GW	Primary	NA	A,B
M-Inj-074	9/28/2007	1243	109	GW	Primary	NA	A,B
M-Inj-075	9/28/2007	1250	111	GW	Primary	NA	A,B,T
M-Inj-076	9/28/2007	1603	107	GW	Primary	NA	A,B
M-Inj-077	9/28/2007	1608	110	GW	Primary	NA	A,B
M-Inj-078	9/28/2007	1618	112	GW	Primary	NA	A,B
M-Inj-079	9/28/2007	1625	113	GW	Primary	NA	A,B
M-Inj-080	9/28/2007	1631	109	GW	Primary	NA	A,B
M-Inj-081	9/28/2007	1641	111	GW	Primary	NA	A,B
M-Inj-082	9/28/2007	2010	107	GW	Primary	NA	A,B
M-Inj-083	9/28/2007	2015	110	GW	Primary	NA	A,B
M-Inj-084	9/28/2007	2025	112	GW	Primary	NA	A,B
M-Inj-085	9/28/2007	2030	113	GW	Primary	NA	A,B
M-Inj-086	9/28/2007	2035	109	GW	Primary	NA	A,B
M-Inj-087	9/28/2007	2040	111	GW	Primary	NA	A,B
M-Inj-088	9/28/2007	2335	107	GW	Primary	NA	A,B,T
M-Inj-089	9/28/2007	2340	110	GW	Primary	NA	A,B,T
M-Inj-090	9/28/2007	2345	112	GW	Primary	NA	A,B,T
M-Inj-091	9/28/2007	2355	113	GW	Primary	NA	A,B,T
M-Inj-092	9/29/2007	2400	109	GW	Primary	NA	A,B,T
M-Inj-093	9/29/2007	2401	109	GW	FD	M-Inj-092	A,B,T
M-Inj-094	9/29/2007	2405	111	GW	Primary	NA	A,B,T
M-Inj-095	9/29/2007	0345	107	GW	Primary	NA	A,B
M-Inj-096	9/29/2007	0350	110	GW	Primary	NA	A,B
M-Inj-097	9/29/2007	0405	112	GW	Primary	NA	A,B
M-Inj-098	9/29/2007	0410	113	GW	Primary	NA	A,B
M-Inj-099	9/29/2007	0420	109	GW	Primary	NA	A,B
M-Inj-100	9/29/2007	0425	111	GW	Primary	NA	A,B
M-Inj-101	9/29/2007	0819	107	GW	Primary	NA	A,B
M-Inj-102	9/29/2007	0827	110	GW	Primary	NA	A,B
M-Inj-103	9/29/2007	0833	112	GW	Primary	NA	A,B
M-Inj-104	9/29/2007	0841	113	GW	Primary	NA	A,B
M-Inj-105	9/29/2007	0848	109	GW	Primary	NA	A,B
M-Inj-106	9/29/2007	0856	111	GW	Primary	NA	A,B
M-Inj-107	9/29/2007	1216	107	GW	Primary	NA	A,B,T
M-Inj-108	9/29/2007	1221	110	GW	Primary	NA	A,B,T
M-Inj-109	9/29/2007	1221	112	GW	Primary	NA	A,B,T
M-Inj-110	9/29/2007	1234	113	GW	Primary	NA	A,B,T
M-Inj-111	9/29/2007	1239	109	GW	Primary	NA	A,B,T
M-Inj-112	9/29/2007	1244	111	GW	Primary	NA	A,B,T
M-Inj-113	9/29/2007	1555	107	GW	Primary	NA	A,B
M-Inj-114	9/29/2007	1605	110	GW	Primary	NA	A,B
M-Inj-115	9/29/2007	1606	110	GW	FD	M-Inj-114	A,B
M-Inj-116	9/29/2007	1610	112	GW	Primary	NA	A,B
M-Inj-117	9/29/2007	1615	113	GW	Primary	NA	A,B
M-Inj-118	9/29/2007	1618	109	GW	Primary	NA	A,B
M-Inj-119	9/29/2007	1625	111	GW	Primary	NA	A
Note: methods: A = anions, B = bromide, C = hexavalent chromium, and T = total organic carbon							

The data were reviewed for compliance with criteria specified in the method's standard operating procedures (SOP), and the project test plan. The hierarchy for acceptance is in the following priority: the test plan first, followed by the SOP. The overall quality of the data in this package was acceptable with the qualifications summarized below.

SUMMARY OF QUALIFICATIONS

Analysis	Sample	Compound	Qualifier	Reason for Qualification	Section
Anions	111 samples	Nitrate	J	Peak Interference	2.0
Anions	M-Inj-001	Phosphate	R	Peak Obscured	2.0
Anions	M-Inj-007	Phosphate	R	Peak Obscured	2.0
Anions	M-Inj-014	All	J	Outlier	2.0
Anions	10 samples	Phosphate	J	Method Blank	2.4
Anions	M-Inj-089	Nitrite & Nitrate	J	Laboratory Duplicate	2.5
Anions	M-Inj-021	All	J	Outlier	2.6
Anions	9 samples	Phosphate	J	Reported below RL	2.8
Anions	M-Inj-034	Nitrate	J	Reported below RL	2.8
Hexavalent Chromium	All	Hexavalent Chromium	J	No Associated QC	3.0

A.2 Data Qualifications

A.2.1 Sampling Documentation/Representativeness

After sample collection, samples were stored in a cooler in the field trailer. At the end of the day, samples were moved into a walk-in cooler, which maintained the temperature at 2°C, which met the U.S. Environmental Protection Agency (EPA)-recommended temperature range of 2°C to 6°C. All samples arrived in good condition, except for several vials collected for TOC analysis. Three vials were collected per sample for TOC analysis. One, two, or all three vials of 27 samples froze while they were stored in the field cooler. TOC vials were collected for all 119 samples, but after data review, it was decided that only 35 samples were needed for TOC analysis. Because there were a sufficient number of unbroken samples, the loss of some TOC samples did not impact the project. No qualifiers were applied to the data based on representativeness.

A.2.2 Anions by Sigma V IC

The addition of molasses to the groundwater resulted in nitrate peak interference for several samples. For 111 samples, the nitrate peak was detectable, but it was not possible to quantify the amount the interferent contributed to the peak height. These nitrate results are recommended qualified "J" and are identified as "INT" in the Comment column of the RESULTS table.

For samples M-Inj-001 and M-Inj-007, the peak for phosphate was completely obscured by an unknown compound. No result for phosphate could be calculated, and the result for phosphate for these two samples are qualified "R" for rejected.

The results for sample M-Inj-014 do not match previous or later results for this well. The results for sample M-Inj-014 are questionable based on historic data, are recommended qualified "J," and are identified as "O" in the Comment column of the RESULTS table.

A.2.2.1 Technical Holding Time

Samples were collected between 09/26/07 and 09/29/07, and analyzed between 10/02/07 and 10/11/07. The 14-day method analysis holding time criteria was met for all samples. No qualifiers were applied to the data based on the technical holding time.

A.2.2.2 Initial Calibration

Six calibration standards were used to generate a calibration curve for each target analyte. The regression coefficient r^2 was greater than 0.995 for all calibration curves. No qualifiers were applied to the data based on initial calibration.

A.2.2.3 Continuing Calibration

One quality control (QC) check standard was analyzed with the field samples during each analytical day. For the check standard, the percent difference (%D) between the true value and measured value for the target analytes was 2.0% or less. The QC check standard met all project QC criteria. No qualifiers were applied to the data based on the continuing calibration results.

A.2.2.4 Method Blank

Two method blanks were analyzed during each analytical day: one after the initial calibration standards, and one at the end of the analytical batch. No target compounds were reported above the report limit (RL) for the method blanks, except for phosphate and nitrite.

Nitrite was reported above the RL in the final method blank during analytical day 10/11/07, but the one associated field sample had reported results for nitrite more than five times this level. No qualifiers were applied to the data based on this method blank analysis.

Phosphate was reported above the RL in six method blanks. Ten results for phosphate were less than five times the associated blank contamination, and should be considered as estimated; these are recommended qualified "J" and are identified as "MB" in the Comment column of the RESULTS table. No other qualifiers were applied to the data based on the method blank analysis.

A.2.2.5 Laboratory Duplicate

One laboratory duplicate sample was analyzed with each daily analytical batch. Laboratory duplicate samples were selected by the laboratory personnel. Calculations are not performed for results that were below the project RL. The percent differences (%D) were 20% or less for all target analytes, except for nitrate and nitrite for laboratory duplicate M-Inj-089 selected for analytical day 10/11/07. Because sample M-Inj-089 was the only field sample analyzed that day, only the results for nitrate and nitrite for that sample are recommended qualified "J" and are identified as "LD" in the Comment column of the RESULTS table. No other qualifiers were recommended based on laboratory duplicate analysis.

A.2.2.6 Field Duplicate Sample

Five field duplicate samples (M-Inj-022, M-Inj-032, M-Inj-056, M-Inj-093, and M-Inj-115) were associated with this SDG. Relative percent difference (RPD) is not calculated (NC) for results reported as

estimated (J) or not detected (ND). The calculated RPD for target analytes met QC guidelines for a RPD equal to or less than 30%, with the exception of the field duplicate pair M-Inj-021/M-Inj-022. The results for sample M-Inj-021 do not match previous or later results for this well. The results for sample M-Inj-021 are questionable based on historic data and are recommended qualified “J” and are identified as “O” in the Comment column of the RESULTS table. No other qualifiers are applied to the data based on field duplicate analysis.

Sample ID (Primary/Field Duplicate)	Analyte	Primary ppm	Duplicate ppm	RPD
M-Inj-021/M-Inj-022	Bromide	2.6	22	157
	Chloride	67	279	123
	Nitrate	48	ND	NC
	Nitrite	9.3	2.0 J	NC
	Phosphate	ND	ND	NC
	Sulfate	115	178	43
M-Inj-031/M-Inj-032	Bromide	0.28	0.27	3.6
	Chloride	27	27	0.74
	Nitrate	57	58	1.2
	Nitrite	0.34 J	0.39 J	NC
	Phosphate	ND	ND	NC
	Sulfate	131	132	0.76
M-Inj-055/M-Inj-056	Bromide	11	10	10
	Chloride	146	131	10.8
	Nitrate	ND	ND	NC
	Nitrite	2.3 J	2.5 J	NC
	Phosphate	ND	ND	NC
	Sulfate	151	147	2.68
M-Inj-092/M-Inj-093	Bromide	15	15	2.7
	Chloride	184	170	7.91
	Nitrate	ND	ND	NC
	Nitrite	3.2 J	3.3 J	NC
	Phosphate	ND	ND	NC
	Sulfate	176	176	0.0
M-Inj-114/M-Inj-115	Bromide	67	64	4.3
	Chloride	846	816	3.6
	Nitrate	ND	ND	NC
	Nitrite	2.8 J	2.9 J	NC
	Phosphate	ND	ND	NC
	Sulfate	434	412	5.2

A.2.2.7 Matrix Spike

One matrix spike sample was analyzed with each daily analytical batch. Matrix spike samples were selected by the laboratory personnel. The percent recovery for all target analytes met project goals. No qualifiers were applied to the data based on the method blank analysis.

A.2.2.8 Tentatively Identified Compounds

Nitrate was detected in sample M-Inj-034, at a level that was below the RL. This result for nitrate should be considered estimated and is recommended qualified “J” and are identified as “RL” in the Comment column of the RESULTS table. Phosphate was detected in samples M-Inj-003, M-Inj-004, M-Inj-005, M-Inj-006, M-Inj-008, M-Inj-010, M-Inj-012, M-Inj-016, and M-Inj-018 at a level that was below the RL. Results for phosphate for these samples should be considered estimated and are recommended qualified “J” and are identified as “RL” in the Comment column of the RESULTS table. No other qualifications were applied to the data due to tentatively identified compounds.

A.2.3 Hexavalent Chromium (Cr⁺⁶) by Hach Method 8023

Five samples were collected for hexavalent chromium on 09/26/07. All samples were analyzed on the same day as they were collected. The 24-hour method analysis holding time criteria was met for all samples. No qualifiers were applied to the data based on the technical holding time.

These five samples were not scheduled, and were collected just for screening purposes, so associated QC samples (method blank, laboratory control standard [LCS] standard) were not analyzed. Because no QC was associated with the analyses, these results should be considered estimated and are recommended qualified “J” and are identified as “A” in the Comment column of the RESULTS table. No other qualifiers were applied to the data.

A.2.4 Total Organic Carbon Method PNL VOA-3

A.2.4.1 Technical Holding Time

Samples were collected between 09/26/07 and 09/29/07, and analyzed between 10/03/07 and 10/08/07. The 14-day method analysis holding time criteria was met for all samples. No qualifiers were applied to the data based on the technical holding time.

A.2.4.2 Initial Calibration

Five calibration standards were used to generate a calibration curve at the beginning of each of the three analytical days. The regression coefficient r^2 was reported as 0.995, 0.998, and 0.996, which was greater than the project QC requirement of $r^2 < 0.95$. No qualifiers were applied to the data based on the initial calibration.

A.2.4.3 Continuing Calibration

An LCS was analyzed with each analytical batch. The percent difference (%D) ranged from 10.3 to 12.8%. All LCS analyses met all project QC criteria. No qualifiers were applied to the data based on the continuing calibration results.

A.2.4.4 Method Blank

Two method blanks were analyzed during each analytical day: one after the initial calibration standards, and one at the end of the analytical batch. No target compounds were reported above the RL. No qualifiers were applied to the data based on the method blank analysis.

A.2.4.5 Laboratory Duplicate Analysis

All laboratory samples are analyzed in triplicate. The %RDS ranged from 0.13 to 12%. No qualifiers were recommended based on laboratory duplicate analysis.

A.2.4.6 Field Duplicate Sample

One field duplicate sample, M-Inj-093, was associated with this SDG. The calculated relative percent difference (RPD) for TOC was 16% , which met QC guidelines for an RPD equal to or less than 30%. No qualifiers are applied to the data based on field duplicate analysis.

Sample ID (Primary/Field Duplicate)	Analyte	Primary ppm	Duplicate ppm	RPD
M-Inj-092/M-Inj-093	TOC	2770	2360	16.0

A.2.4.7 Tentatively Identified Compounds

No samples had TOC results reported below the reporting limit. No qualifiers were applied to the data due to tentatively identified compounds.

A.2.5 Data Qualifier Definition

NO QUALIFIERS indicates that the data are acceptable both qualitatively and quantitatively.

Qualifier	Definition
J	The analyte was positively identified. Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.
U	The analyte was analyzed for, but was not detected above the RL. The associated number indicates approximate sample concentration necessary to be detected. The results are qualitatively acceptable.
R	The sample results are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound. Data are not acceptable for any purpose.

Key to abbreviations in comment column in RESULTS table

Abbreviation	Explanation
A	No QC associated with analysis
CT	Cooler temperature above 6°C
HT	Holding time exceeded
IC	Initial Calibration was outside QC criteria
INT	Peak Interference
LD	Laboratory Duplicate
MB	Analyte found in method blank & result less than 5x contamination
MS	Matrix Spike recover below project goal
O	Outlier, result not statistically valid
PRELIMINARY	Data not yet qualified
LCS	Associated LCS was outside QC criteria
RL	Result was below reporting limit but above method limit
TB	Analyte found in TB & result less than 5x contamination, or no TB

QUALIFIED RESULTS

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-001	107	Sigma V IC	10/2/2007	Bromide	10	59		ppm	0.50	
M-Inj-001	107	Sigma V IC	10/3/2007	Chloride	10	721		ppm	0.50	
M-Inj-001	107	Sigma V IC	10/2/2007	Nitrate	10	6.0		ppm	0.50	
M-Inj-001	107	Sigma V IC	10/2/2007	Nitrite	10	1.0	J	ppm	0.50	Int
M-Inj-001	107	Sigma V IC	10/2/2007	Phosphate	10		R	ppm	0.50	
M-Inj-001	107	Sigma V IC	10/2/2007	Sulfate	10	337		ppm	0.50	
M-Inj-002	110	Sigma V IC	10/2/2007	Bromide	2	0.38		ppm	0.10	
M-Inj-002	110	Sigma V IC	10/2/2007	Chloride	2	29		ppm	0.10	
M-Inj-002	110	Sigma V IC	10/2/2007	Nitrate	2	59		ppm	0.10	
M-Inj-002	110	Sigma V IC	10/2/2007	Nitrite	2	0.53	J	ppm	0.10	Int
M-Inj-002	110	Sigma V IC	10/2/2007	Phosphate	2	0.10	J	ppm	0.10	MB
M-Inj-002	110	Sigma V IC	10/2/2007	Sulfate	2	134		ppm	0.10	
M-Inj-003	112	Sigma V IC	10/2/2007	Bromide	2	0.26		ppm	0.10	
M-Inj-003	112	Sigma V IC	10/2/2007	Chloride	2	31		ppm	0.10	
M-Inj-003	112	Sigma V IC	10/2/2007	Nitrate	2	58		ppm	0.10	
M-Inj-003	112	Sigma V IC	10/2/2007	Nitrite	2	0.27	J	ppm	0.10	Int
M-Inj-003	112	Sigma V IC	10/2/2007	Phosphate	2	0.09	J	ppm	0.10	MB,RL
M-Inj-003	112	Sigma V IC	10/2/2007	Sulfate	2	122		ppm	0.10	
M-Inj-004	113	Sigma V IC	10/2/2007	Bromide	2	0.28		ppm	0.10	
M-Inj-004	113	Sigma V IC	10/2/2007	Chloride	2	25		ppm	0.10	
M-Inj-004	113	Sigma V IC	10/2/2007	Nitrate	2	54		ppm	0.10	
M-Inj-004	113	Sigma V IC	10/2/2007	Nitrite	2	1.5	J	ppm	0.10	Int
M-Inj-004	113	Sigma V IC	10/2/2007	Phosphate	2	0.02	J	ppm	0.10	MB,RL
M-Inj-004	113	Sigma V IC	10/2/2007	Sulfate	2	128		ppm	0.10	
M-Inj-005	109	Sigma V IC	10/2/2007	Bromide	2	0.22		ppm	0.10	
M-Inj-005	109	Sigma V IC	10/2/2007	Chloride	2	25		ppm	0.10	
M-Inj-005	109	Sigma V IC	10/2/2007	Nitrate	2	57		ppm	0.10	
M-Inj-005	109	Sigma V IC	10/2/2007	Nitrite	2	0.21	J	ppm	0.10	Int
M-Inj-005	109	Sigma V IC	10/2/2007	Phosphate	2	0.02	J	ppm	0.10	MB,RL
M-Inj-005	109	Sigma V IC	10/2/2007	Sulfate	2	128		ppm	0.10	
M-Inj-006	111	Sigma V IC	10/2/2007	Bromide	2	0.27		ppm	0.10	
M-Inj-006	111	Sigma V IC	10/2/2007	Chloride	2	27		ppm	0.10	
M-Inj-006	111	Sigma V IC	10/2/2007	Nitrate	2	59		ppm	0.10	
M-Inj-006	111	Sigma V IC	10/2/2007	Nitrite	2	0.40	J	ppm	0.10	Int
M-Inj-006	111	Sigma V IC	10/2/2007	Phosphate	2	0.05	J	ppm	0.10	MB,RL
M-Inj-006	111	Sigma V IC	10/2/2007	Sulfate	2	134		ppm	0.10	
M-Inj-007	107	Sigma V IC	10/2/2007	Bromide	10	61		ppm	0.50	
M-Inj-007	107	Sigma V IC	10/7/2007	Chloride	10	977		ppm	0.50	
M-Inj-007	107	Sigma V IC	10/2/2007	Nitrate	10	6.3		ppm	0.50	
M-Inj-007	107	Sigma V IC	10/2/2007	Nitrite	10	1.2	J	ppm	0.50	Int
M-Inj-007	107	Sigma V IC	10/2/2007	Phosphate	10		R	ppm	0.50	
M-Inj-007	107	Sigma V IC	10/2/2007	Sulfate	10	481		ppm	0.50	
M-Inj-008	110	Sigma V IC	10/2/2007	Bromide	2	0.28		ppm	0.10	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-008	110	Sigma V IC	10/2/2007	Chloride	2	28		ppm	0.10	
M-Inj-008	110	Sigma V IC	10/2/2007	Nitrate	2	58		ppm	0.10	
M-Inj-008	110	Sigma V IC	10/2/2007	Nitrite	2	0.74	J	ppm	0.10	Int
M-Inj-008	110	Sigma V IC	10/2/2007	Phosphate	2	0.09	J	ppm	0.10	MB,RL
M-Inj-008	110	Sigma V IC	10/2/2007	Sulfate	2	134		ppm	0.10	
M-Inj-009	112	Sigma V IC	10/4/2007	Bromide	10	14		ppm	0.50	
M-Inj-009	112	Sigma V IC	10/4/2007	Chloride	10	199		ppm	0.50	
M-Inj-009	112	Sigma V IC	10/4/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-009	112	Sigma V IC	10/4/2007	Nitrite	10	1.3	J	ppm	0.50	Int
M-Inj-009	112	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-009	112	Sigma V IC	10/4/2007	Sulfate	10	163		ppm	0.50	
M-Inj-010	113	Sigma V IC	10/3/2007	Bromide	2	0.32		ppm	0.10	
M-Inj-010	113	Sigma V IC	10/3/2007	Chloride	2	25		ppm	0.10	
M-Inj-010	113	Sigma V IC	10/3/2007	Nitrate	2	55		ppm	0.10	
M-Inj-010	113	Sigma V IC	10/3/2007	Nitrite	2	0.94	J	ppm	0.10	Int
M-Inj-010	113	Sigma V IC	10/3/2007	Phosphate	2	0.05	J	ppm	0.10	MB,RL
M-Inj-010	113	Sigma V IC	10/3/2007	Sulfate	2	129		ppm	0.10	
M-Inj-011	109	Sigma V IC	10/3/2007	Bromide	2	0.28		ppm	0.10	
M-Inj-011	109	Sigma V IC	10/3/2007	Chloride	2	26		ppm	0.10	
M-Inj-011	109	Sigma V IC	10/3/2007	Nitrate	2	56		ppm	0.10	
M-Inj-011	109	Sigma V IC	10/3/2007	Nitrite	2	0.27	J	ppm	0.10	Int
M-Inj-011	109	Sigma V IC	10/3/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-011	109	Sigma V IC	10/3/2007	Sulfate	2	128		ppm	0.10	
M-Inj-012	111	Sigma V IC	10/3/2007	Bromide	2	0.34		ppm	0.10	
M-Inj-012	111	Sigma V IC	10/3/2007	Chloride	2	28		ppm	0.10	
M-Inj-012	111	Sigma V IC	10/3/2007	Nitrate	2	58		ppm	0.10	
M-Inj-012	111	Sigma V IC	10/3/2007	Nitrite	2	0.43	J	ppm	0.10	Int
M-Inj-012	111	Sigma V IC	10/3/2007	Phosphate	2	0.03	J	ppm	0.10	MB,RL
M-Inj-012	111	Sigma V IC	10/3/2007	Sulfate	2	134		ppm	0.10	
M-Inj-013	112	Sigma V IC	10/3/2007	Bromide	10	17		ppm	0.50	
M-Inj-013	112	Sigma V IC	10/3/2007	Chloride	10	238		ppm	0.50	
M-Inj-013	112	Sigma V IC	10/3/2007	Nitrate	10	0.34		ppm	0.50	
M-Inj-013	112	Sigma V IC	10/3/2007	Nitrite	10	16		ppm	0.50	
M-Inj-013	112	Sigma V IC	10/3/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-013	112	Sigma V IC	10/3/2007	Sulfate	10	174		ppm	0.50	
M-Inj-014	107	Sigma V IC	10/3/2007	Bromide	30	60	J	ppm	1.5	O
M-Inj-014	107	Sigma V IC	10/3/2007	Chloride	30	730	J	ppm	1.5	O
M-Inj-014	107	Sigma V IC	10/3/2007	Nitrate	30	1.5	UJ	ppm	1.5	O
M-Inj-014	107	Sigma V IC	10/3/2007	Nitrite	30	4.0	J	ppm	1.5	Int,O
M-Inj-014	107	Sigma V IC	10/3/2007	Phosphate	30	1.5	UJ	ppm	1.5	O
M-Inj-014	107	Sigma V IC	10/3/2007	Sulfate	30	334	J	ppm	1.5	O
M-Inj-015	110	Sigma V IC	10/3/2007	Bromide	2	0.33		ppm	0.10	
M-Inj-015	110	Sigma V IC	10/3/2007	Chloride	2	28		ppm	0.10	
M-Inj-015	110	Sigma V IC	10/3/2007	Nitrate	2	58		ppm	0.10	
M-Inj-015	110	Sigma V IC	10/3/2007	Nitrite	2	0.85	J	ppm	0.10	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-015	110	Sigma V IC	10/3/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-015	110	Sigma V IC	10/3/2007	Sulfate	2	134		ppm	0.10	
M-Inj-016	113	Sigma V IC	10/3/2007	Bromide	2	0.28		ppm	0.10	
M-Inj-016	113	Sigma V IC	10/3/2007	Chloride	2	25		ppm	0.10	
M-Inj-016	113	Sigma V IC	10/3/2007	Nitrate	2	56		ppm	0.10	
M-Inj-016	113	Sigma V IC	10/3/2007	Nitrite	2	0.57	J	ppm	0.10	Int
M-Inj-016	113	Sigma V IC	10/3/2007	Phosphate	2	0.08	J	ppm	0.10	MB,RL
M-Inj-016	113	Sigma V IC	10/3/2007	Sulfate	2	129		ppm	0.10	
M-Inj-017	109	Sigma V IC	10/3/2007	Bromide	2	0.56		ppm	0.10	
M-Inj-017	109	Sigma V IC	10/3/2007	Chloride	2	29		ppm	0.10	
M-Inj-017	109	Sigma V IC	10/3/2007	Nitrate	2	55		ppm	0.10	
M-Inj-017	109	Sigma V IC	10/3/2007	Nitrite	2	0.43	J	ppm	0.10	Int
M-Inj-017	109	Sigma V IC	10/3/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-017	109	Sigma V IC	10/3/2007	Sulfate	2	130		ppm	0.10	
M-Inj-018	111	Sigma V IC	10/3/2007	Bromide	2	0.32		ppm	0.10	
M-Inj-018	111	Sigma V IC	10/3/2007	Chloride	2	27		ppm	0.10	
M-Inj-018	111	Sigma V IC	10/3/2007	Nitrate	2	60		ppm	0.10	
M-Inj-018	111	Sigma V IC	10/3/2007	Nitrite	2	0.41	J	ppm	0.10	Int
M-Inj-018	111	Sigma V IC	10/3/2007	Phosphate	2	0.04	J	ppm	0.10	MB,RL
M-Inj-018	111	Sigma V IC	10/3/2007	Sulfate	2	135		ppm	0.10	
M-Inj-019	112	Sigma V IC	10/3/2007	Bromide	30	28		ppm	1.5	
M-Inj-019	112	Sigma V IC	10/3/2007	Chloride	30	358		ppm	1.5	
M-Inj-019	112	Sigma V IC	10/3/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-019	112	Sigma V IC	10/3/2007	Nitrite	30	3.3	J	ppm	1.5	Int
M-Inj-019	112	Sigma V IC	10/3/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-019	112	Sigma V IC	10/3/2007	Sulfate	30	208		ppm	1.5	
M-Inj-020	110	Sigma V IC	10/3/2007	Bromide	2	0.49		ppm	0.10	
M-Inj-020	110	Sigma V IC	10/3/2007	Chloride	2	28		ppm	0.10	
M-Inj-020	110	Sigma V IC	10/3/2007	Nitrate	2	53		ppm	0.10	
M-Inj-020	110	Sigma V IC	10/3/2007	Nitrite	2	1.4		ppm	0.10	
M-Inj-020	110	Sigma V IC	10/3/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-020	110	Sigma V IC	10/3/2007	Sulfate	2	126		ppm	0.10	
M-Inj-021	112	Sigma V IC	10/3/2007	Bromide	10	2.6	J	ppm	0.50	O
M-Inj-021	112	Sigma V IC	10/3/2007	Chloride	10	67	J	ppm	0.50	O
M-Inj-021	112	Sigma V IC	10/3/2007	Nitrate	10	48	J	ppm	0.50	O
M-Inj-021	112	Sigma V IC	10/3/2007	Nitrite	10	9.3	J	ppm	0.50	O
M-Inj-021	112	Sigma V IC	10/3/2007	Phosphate	10	0.50	UJ	ppm	0.50	O
M-Inj-021	112	Sigma V IC	10/3/2007	Sulfate	10	115	J	ppm	0.50	O
M-Inj-022	112	Sigma V IC	10/3/2007	Bromide	30	22		ppm	1.5	
M-Inj-022	112	Sigma V IC	10/3/2007	Chloride	30	279		ppm	1.5	
M-Inj-022	112	Sigma V IC	10/3/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-022	112	Sigma V IC	10/3/2007	Nitrite	30	2.0	J	ppm	1.5	Int
M-Inj-022	112	Sigma V IC	10/3/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-022	112	Sigma V IC	10/3/2007	Sulfate	30	178		ppm	1.5	
M-Inj-023	113	Sigma V IC	10/3/2007	Bromide	2	0.32		ppm	0.10	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-023	113	Sigma V IC	10/3/2007	Chloride	2	25		ppm	0.10	
M-Inj-023	113	Sigma V IC	10/3/2007	Nitrate	2	56		ppm	0.10	
M-Inj-023	113	Sigma V IC	10/3/2007	Nitrite	2	0.48	J	ppm	0.10	Int
M-Inj-023	113	Sigma V IC	10/3/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-023	113	Sigma V IC	10/3/2007	Sulfate	2	129		ppm	0.10	
M-Inj-024	109	Sigma V IC	10/3/2007	Bromide	10	3.1		ppm	0.50	
M-Inj-024	109	Sigma V IC	10/3/2007	Chloride	10	59		ppm	0.50	
M-Inj-024	109	Sigma V IC	10/3/2007	Nitrate	10	11		ppm	0.50	
M-Inj-024	109	Sigma V IC	10/3/2007	Nitrite	10	26		ppm	0.50	
M-Inj-024	109	Sigma V IC	10/3/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-024	109	Sigma V IC	10/3/2007	Sulfate	10	133		ppm	0.50	
M-Inj-025	107	Sigma V IC	10/3/2007	Bromide	30	110		ppm	1.5	
M-Inj-025	107	Sigma V IC	10/3/2007	Chloride	30	591		ppm	1.5	
M-Inj-025	107	Sigma V IC	10/3/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-025	107	Sigma V IC	10/3/2007	Nitrite	30	4.9	J	ppm	1.5	Int
M-Inj-025	107	Sigma V IC	10/3/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-025	107	Sigma V IC	10/3/2007	Sulfate	30	202		ppm	1.5	
M-Inj-026	107	Sigma V IC	10/3/2007	Bromide	30	70		ppm	1.5	
M-Inj-026	107	Sigma V IC	10/3/2007	Chloride	30	844		ppm	1.5	
M-Inj-026	107	Sigma V IC	10/3/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-026	107	Sigma V IC	10/3/2007	Nitrite	30	7.4	J	ppm	1.5	Int
M-Inj-026	107	Sigma V IC	10/3/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-026	107	Sigma V IC	10/3/2007	Sulfate	30	401		ppm	1.5	
M-Inj-027	110	Sigma V IC	10/4/2007	Bromide	10	1.8		ppm	0.50	
M-Inj-027	110	Sigma V IC	10/4/2007	Chloride	10	41		ppm	0.50	
M-Inj-027	110	Sigma V IC	10/4/2007	Nitrate	10	32		ppm	0.50	
M-Inj-027	110	Sigma V IC	10/4/2007	Nitrite	10	11		ppm	0.50	
M-Inj-027	110	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-027	110	Sigma V IC	10/4/2007	Sulfate	10	116		ppm	0.50	
M-Inj-028	112	Sigma V IC	10/4/2007	Bromide	10	23		ppm	0.50	
M-Inj-028	112	Sigma V IC	10/4/2007	Chloride	10	267		ppm	0.50	
M-Inj-028	112	Sigma V IC	10/4/2007	Nitrate	10	0.50		ppm	0.50	
M-Inj-028	112	Sigma V IC	10/4/2007	Nitrite	10	1.2	J	ppm	0.50	Int
M-Inj-028	112	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-028	112	Sigma V IC	10/4/2007	Sulfate	10	171		ppm	0.50	
M-Inj-029	113	Sigma V IC	10/4/2007	Bromide	2	0.32		ppm	0.10	
M-Inj-029	113	Sigma V IC	10/4/2007	Chloride	2	26		ppm	0.10	
M-Inj-029	113	Sigma V IC	10/4/2007	Nitrate	2	55		ppm	0.10	
M-Inj-029	113	Sigma V IC	10/4/2007	Nitrite	2	0.41	J	ppm	0.10	Int
M-Inj-029	113	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-029	113	Sigma V IC	10/4/2007	Sulfate	2	127		ppm	0.10	
M-Inj-030	109	Sigma V IC	10/4/2007	Bromide	10	7.3		ppm	0.50	
M-Inj-030	109	Sigma V IC	10/4/2007	Chloride	10	102		ppm	0.50	
M-Inj-030	109	Sigma V IC	10/4/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-030	109	Sigma V IC	10/4/2007	Nitrite	10	1.1	J	ppm	0.50	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-030	109	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-030	109	Sigma V IC	10/4/2007	Sulfate	10	141		ppm	0.50	
M-Inj-031	111	Sigma V IC	10/4/2007	Bromide	2	0.28		ppm	0.10	
M-Inj-031	111	Sigma V IC	10/4/2007	Chloride	2	27		ppm	0.10	
M-Inj-031	111	Sigma V IC	10/4/2007	Nitrate	2	57		ppm	0.10	
M-Inj-031	111	Sigma V IC	10/4/2007	Nitrite	2	0.34	J	ppm	0.10	Int
M-Inj-031	111	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-031	111	Sigma V IC	10/4/2007	Sulfate	2	131		ppm	0.10	
M-Inj-032	111	Sigma V IC	10/4/2007	Bromide	2	0.27		ppm	0.10	
M-Inj-032	111	Sigma V IC	10/4/2007	Chloride	2	27		ppm	0.10	
M-Inj-032	111	Sigma V IC	10/4/2007	Nitrate	2	58		ppm	0.10	
M-Inj-032	111	Sigma V IC	10/4/2007	Nitrite	2	0.39	J	ppm	0.10	Int
M-Inj-032	111	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-032	111	Sigma V IC	10/4/2007	Sulfate	2	132		ppm	0.10	
M-Inj-033	110	Sigma V IC	10/4/2007	Bromide	10	5.0		ppm	0.50	
M-Inj-033	110	Sigma V IC	10/4/2007	Chloride	10	80		ppm	0.50	
M-Inj-033	110	Sigma V IC	10/4/2007	Nitrate	10	0.27		ppm	0.50	
M-Inj-033	110	Sigma V IC	10/4/2007	Nitrite	10	9.5		ppm	0.50	
M-Inj-033	110	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-033	110	Sigma V IC	10/4/2007	Sulfate	10	124		ppm	0.50	
M-Inj-034	112	Sigma V IC	10/4/2007	Bromide	30	31		ppm	1.5	
M-Inj-034	112	Sigma V IC	10/4/2007	Chloride	30	324		ppm	1.5	
M-Inj-034	112	Sigma V IC	10/4/2007	Nitrate	30	1.2	J	ppm	1.5	RL
M-Inj-034	112	Sigma V IC	10/4/2007	Nitrite	30	3.0	J	ppm	1.5	Int
M-Inj-034	112	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-034	112	Sigma V IC	10/4/2007	Sulfate	30	187		ppm	1.5	
M-Inj-035	113	Sigma V IC	10/4/2007	Bromide	2	0.26		ppm	0.10	
M-Inj-035	113	Sigma V IC	10/4/2007	Chloride	2	25		ppm	0.10	
M-Inj-035	113	Sigma V IC	10/4/2007	Nitrate	2	0.10	U	ppm	0.10	
M-Inj-035	113	Sigma V IC	10/4/2007	Nitrite	2	0.38	J	ppm	0.10	Int
M-Inj-035	113	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-035	113	Sigma V IC	10/4/2007	Sulfate	2	129		ppm	0.10	
M-Inj-036	109	Sigma V IC	10/4/2007	Bromide	10	7.5		ppm	0.50	
M-Inj-036	109	Sigma V IC	10/4/2007	Chloride	10	105		ppm	0.50	
M-Inj-036	109	Sigma V IC	10/4/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-036	109	Sigma V IC	10/4/2007	Nitrite	10	1.2	J	ppm	0.50	Int
M-Inj-036	109	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-036	109	Sigma V IC	10/4/2007	Sulfate	10	144		ppm	0.50	
M-Inj-037	111	Sigma V IC	10/4/2007	Bromide	2	0.25		ppm	0.10	
M-Inj-037	111	Sigma V IC	10/4/2007	Chloride	2	27		ppm	0.10	
M-Inj-037	111	Sigma V IC	10/4/2007	Nitrate	2	60		ppm	0.10	
M-Inj-037	111	Sigma V IC	10/4/2007	Nitrite	2	0.37	J	ppm	0.10	Int
M-Inj-037	111	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-037	111	Sigma V IC	10/4/2007	Sulfate	2	135		ppm	0.10	
M-Inj-038	107	Sigma V IC	10/4/2007	Bromide	30	66		ppm	1.5	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-038	107	Sigma V IC	10/4/2007	Chloride	30	890		ppm	1.5	
M-Inj-038	107	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-038	107	Sigma V IC	10/4/2007	Nitrite	30	4.4	J	ppm	1.5	Int
M-Inj-038	107	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-038	107	Sigma V IC	10/4/2007	Sulfate	30	405		ppm	1.5	
M-Inj-039	107	Sigma V IC	10/4/2007	Bromide	30	69		ppm	1.5	
M-Inj-039	107	Sigma V IC	10/4/2007	Chloride	30	930		ppm	1.5	
M-Inj-039	107	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-039	107	Sigma V IC	10/4/2007	Nitrite	30	4.2	J	ppm	1.5	Int
M-Inj-039	107	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-039	107	Sigma V IC	10/4/2007	Sulfate	30	409		ppm	1.5	
M-Inj-040	110	Sigma V IC	10/4/2007	Bromide	10	8.3		ppm	0.50	
M-Inj-040	110	Sigma V IC	10/4/2007	Chloride	10	115		ppm	0.50	
M-Inj-040	110	Sigma V IC	10/4/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-040	110	Sigma V IC	10/4/2007	Nitrite	10	1.3	J	ppm	0.50	Int
M-Inj-040	110	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-040	110	Sigma V IC	10/4/2007	Sulfate	10	128		ppm	0.50	
M-Inj-041	112	Sigma V IC	10/4/2007	Bromide	30	30		ppm	1.5	
M-Inj-041	112	Sigma V IC	10/4/2007	Chloride	30	327		ppm	1.5	
M-Inj-041	112	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-041	112	Sigma V IC	10/4/2007	Nitrite	30	3.9	J	ppm	1.5	Int
M-Inj-041	112	Sigma V IC	10/4/2007	Phosphate	30	4.4		ppm	1.5	
M-Inj-041	112	Sigma V IC	10/4/2007	Sulfate	30	195		ppm	1.5	
M-Inj-042	113	Sigma V IC	10/4/2007	Bromide	2	0.34		ppm	0.10	
M-Inj-042	113	Sigma V IC	10/4/2007	Chloride	2	26		ppm	0.10	
M-Inj-042	113	Sigma V IC	10/4/2007	Nitrate	2	56		ppm	0.10	
M-Inj-042	113	Sigma V IC	10/4/2007	Nitrite	2	0.37	J	ppm	0.10	Int
M-Inj-042	113	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-042	113	Sigma V IC	10/4/2007	Sulfate	2	128		ppm	0.10	
M-Inj-043	109	Sigma V IC	10/4/2007	Bromide	10	8.4		ppm	0.50	
M-Inj-043	109	Sigma V IC	10/4/2007	Chloride	10	112		ppm	0.50	
M-Inj-043	109	Sigma V IC	10/4/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-043	109	Sigma V IC	10/4/2007	Nitrite	10	1.5	J	ppm	0.50	Int
M-Inj-043	109	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-043	109	Sigma V IC	10/4/2007	Sulfate	10	143		ppm	0.50	
M-Inj-044	111	Sigma V IC	10/4/2007	Bromide	2	0.29		ppm	0.10	
M-Inj-044	111	Sigma V IC	10/4/2007	Chloride	2	27		ppm	0.10	
M-Inj-044	111	Sigma V IC	10/4/2007	Nitrate	2	59		ppm	0.10	
M-Inj-044	111	Sigma V IC	10/4/2007	Nitrite	2	0.39	J	ppm	0.10	Int
M-Inj-044	111	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-044	111	Sigma V IC	10/4/2007	Sulfate	2	133		ppm	0.10	
M-Inj-045	107	Sigma V IC	10/4/2007	Bromide	30	62		ppm	1.5	
M-Inj-045	107	Sigma V IC	10/4/2007	Chloride	30	794		ppm	1.5	
M-Inj-045	107	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-045	107	Sigma V IC	10/4/2007	Nitrite	30	4.1	J	ppm	1.5	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-045	107	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-045	107	Sigma V IC	10/4/2007	Sulfate	30	359		ppm	1.5	
M-Inj-046	110	Sigma V IC	10/4/2007	Bromide	30	18		ppm	1.5	
M-Inj-046	110	Sigma V IC	10/4/2007	Chloride	30	233		ppm	1.5	
M-Inj-046	110	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-046	110	Sigma V IC	10/4/2007	Nitrite	30	2.5	J	ppm	1.5	Int
M-Inj-046	110	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-046	110	Sigma V IC	10/4/2007	Sulfate	30	156		ppm	1.5	
M-Inj-047	112	Sigma V IC	10/4/2007	Bromide	30	22		ppm	1.5	
M-Inj-047	112	Sigma V IC	10/4/2007	Chloride	30	242		ppm	1.5	
M-Inj-047	112	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-047	112	Sigma V IC	10/4/2007	Nitrite	30	3.9	J	ppm	1.5	Int
M-Inj-047	112	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-047	112	Sigma V IC	10/4/2007	Sulfate	30	154		ppm	1.5	
M-Inj-048	113	Sigma V IC	10/4/2007	Bromide	2	0.34		ppm	0.10	
M-Inj-048	113	Sigma V IC	10/4/2007	Chloride	2	26		ppm	0.10	
M-Inj-048	113	Sigma V IC	10/4/2007	Nitrate	2	56		ppm	0.10	
M-Inj-048	113	Sigma V IC	10/4/2007	Nitrite	2	0.48	J	ppm	0.10	Int
M-Inj-048	113	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-048	113	Sigma V IC	10/4/2007	Sulfate	2	129		ppm	0.10	
M-Inj-049	109	Sigma V IC	10/4/2007	Bromide	10	12		ppm	0.50	
M-Inj-049	109	Sigma V IC	10/4/2007	Chloride	10	135		ppm	0.50	
M-Inj-049	109	Sigma V IC	10/4/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-049	109	Sigma V IC	10/4/2007	Nitrite	10	1.4	J	ppm	0.50	Int
M-Inj-049	109	Sigma V IC	10/4/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-049	109	Sigma V IC	10/4/2007	Sulfate	10	151		ppm	0.50	
M-Inj-050	111	Sigma V IC	10/4/2007	Bromide	2	0.33		ppm	0.10	
M-Inj-050	111	Sigma V IC	10/4/2007	Chloride	2	29		ppm	0.10	
M-Inj-050	111	Sigma V IC	10/4/2007	Nitrate	2	58		ppm	0.10	
M-Inj-050	111	Sigma V IC	10/4/2007	Nitrite	2	0.41	J	ppm	0.10	Int
M-Inj-050	111	Sigma V IC	10/4/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-050	111	Sigma V IC	10/4/2007	Sulfate	2	132		ppm	0.10	
M-Inj-051	107	Sigma V IC	10/4/2007	Bromide	30	65		ppm	1.5	
M-Inj-051	107	Sigma V IC	10/4/2007	Chloride	30	816		ppm	1.5	
M-Inj-051	107	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-051	107	Sigma V IC	10/4/2007	Nitrite	30	4.7	J	ppm	1.5	Int
M-Inj-051	107	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-051	107	Sigma V IC	10/4/2007	Sulfate	30	365		ppm	1.5	
M-Inj-052	110	Sigma V IC	10/4/2007	Bromide	30	27		ppm	1.5	
M-Inj-052	110	Sigma V IC	10/4/2007	Chloride	30	346		ppm	1.5	
M-Inj-052	110	Sigma V IC	10/4/2007	Nitrate	30	1.5	U	ppm	1.5	
M-Inj-052	110	Sigma V IC	10/4/2007	Nitrite	30	4.5	J	ppm	1.5	Int
M-Inj-052	110	Sigma V IC	10/4/2007	Phosphate	30	1.5	U	ppm	1.5	
M-Inj-052	110	Sigma V IC	10/4/2007	Sulfate	30	185		ppm	1.5	
M-Inj-053	112	Sigma V IC	10/7/2007	Bromide	20	24		ppm	1.0	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-053	112	Sigma V IC	10/7/2007	Chloride	20	280		ppm	1.0	
M-Inj-053	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-053	112	Sigma V IC	10/7/2007	Nitrite	20	5.6	J	ppm	1.0	Int
M-Inj-053	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-053	112	Sigma V IC	10/7/2007	Sulfate	20	193		ppm	1.0	
M-Inj-054	113	Sigma V IC	10/7/2007	Bromide	2	0.40		ppm	0.10	
M-Inj-054	113	Sigma V IC	10/7/2007	Chloride	2	26		ppm	0.10	
M-Inj-054	113	Sigma V IC	10/7/2007	Nitrate	2	54		ppm	0.10	
M-Inj-054	113	Sigma V IC	10/7/2007	Nitrite	2	0.44	J	ppm	0.10	Int
M-Inj-054	113	Sigma V IC	10/7/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-054	113	Sigma V IC	10/7/2007	Sulfate	2	126		ppm	0.10	
M-Inj-055	109	Sigma V IC	10/7/2007	Bromide	20	11		ppm	1.0	
M-Inj-055	109	Sigma V IC	10/7/2007	Chloride	20	146		ppm	1.0	
M-Inj-055	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-055	109	Sigma V IC	10/7/2007	Nitrite	20	2.3	J	ppm	1.0	Int
M-Inj-055	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-055	109	Sigma V IC	10/7/2007	Sulfate	20	151		ppm	1.0	
M-Inj-056	109	Sigma V IC	10/7/2007	Bromide	20	10		ppm	1.0	
M-Inj-056	109	Sigma V IC	10/7/2007	Chloride	20	131		ppm	1.0	
M-Inj-056	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-056	109	Sigma V IC	10/7/2007	Nitrite	20	2.5	J	ppm	1.0	Int
M-Inj-056	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-056	109	Sigma V IC	10/7/2007	Sulfate	20	147		ppm	1.0	
M-Inj-057	111	Sigma V IC	10/7/2007	Bromide	2	1.5		ppm	0.10	
M-Inj-057	111	Sigma V IC	10/7/2007	Chloride	2	65		ppm	0.10	
M-Inj-057	111	Sigma V IC	10/7/2007	Nitrate	2	65		ppm	0.10	
M-Inj-057	111	Sigma V IC	10/7/2007	Nitrite	2	1.7		ppm	0.10	
M-Inj-057	111	Sigma V IC	10/7/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-057	111	Sigma V IC	10/7/2007	Sulfate	2	148		ppm	0.10	
M-Inj-058	107	Sigma V IC	10/7/2007	Bromide	20	63		ppm	1.0	
M-Inj-058	107	Sigma V IC	10/7/2007	Chloride	20	904		ppm	1.0	
M-Inj-058	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-058	107	Sigma V IC	10/7/2007	Nitrite	20	3.6	J	ppm	1.0	Int
M-Inj-058	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-058	107	Sigma V IC	10/7/2007	Sulfate	20	420		ppm	1.0	
M-Inj-059	110	Sigma V IC	10/7/2007	Bromide	20	34		ppm	1.0	
M-Inj-059	110	Sigma V IC	10/7/2007	Chloride	20	445		ppm	1.0	
M-Inj-059	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-059	110	Sigma V IC	10/7/2007	Nitrite	20	4.2	J	ppm	1.0	Int
M-Inj-059	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-059	110	Sigma V IC	10/7/2007	Sulfate	20	242		ppm	1.0	
M-Inj-060	112	Sigma V IC	10/7/2007	Bromide	20	25		ppm	1.0	
M-Inj-060	112	Sigma V IC	10/7/2007	Chloride	20	291		ppm	1.0	
M-Inj-060	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-060	112	Sigma V IC	10/7/2007	Nitrite	20	3.8	J	ppm	1.0	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-060	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-060	112	Sigma V IC	10/7/2007	Sulfate	20	196		ppm	1.0	
M-Inj-061	113	Sigma V IC	10/7/2007	Bromide	2	0.43		ppm	0.10	
M-Inj-061	113	Sigma V IC	10/7/2007	Chloride	2	26		ppm	0.10	
M-Inj-061	113	Sigma V IC	10/7/2007	Nitrate	2	55		ppm	0.10	
M-Inj-061	113	Sigma V IC	10/7/2007	Nitrite	2	0.47	J	ppm	0.10	Int
M-Inj-061	113	Sigma V IC	10/7/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-061	113	Sigma V IC	10/7/2007	Sulfate	2	127		ppm	0.10	
M-Inj-062	109	Sigma V IC	10/7/2007	Bromide	20	13		ppm	1.0	
M-Inj-062	109	Sigma V IC	10/7/2007	Chloride	20	157		ppm	1.0	
M-Inj-062	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-062	109	Sigma V IC	10/7/2007	Nitrite	20	2.9	J	ppm	1.0	Int
M-Inj-062	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-062	109	Sigma V IC	10/7/2007	Sulfate	20	152		ppm	1.0	
M-Inj-063	111	Sigma V IC	10/7/2007	Bromide	20	30		ppm	1.0	
M-Inj-063	111	Sigma V IC	10/7/2007	Chloride	20	429		ppm	1.0	
M-Inj-063	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-063	111	Sigma V IC	10/7/2007	Nitrite	20	5.1	J	ppm	1.0	Int
M-Inj-063	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-063	111	Sigma V IC	10/7/2007	Sulfate	20	299		ppm	1.0	
M-Inj-064	107	Sigma V IC	10/7/2007	Bromide	20	62		ppm	1.0	
M-Inj-064	107	Sigma V IC	10/7/2007	Chloride	20	832		ppm	1.0	
M-Inj-064	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-064	107	Sigma V IC	10/7/2007	Nitrite	20	3.6	J	ppm	1.0	Int
M-Inj-064	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-064	107	Sigma V IC	10/7/2007	Sulfate	20	389		ppm	1.0	
M-Inj-065	110	Sigma V IC	10/7/2007	Bromide	20	52		ppm	1.0	
M-Inj-065	110	Sigma V IC	10/7/2007	Chloride	20	660		ppm	1.0	
M-Inj-065	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-065	110	Sigma V IC	10/7/2007	Nitrite	20	4.0	J	ppm	1.0	Int
M-Inj-065	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-065	110	Sigma V IC	10/7/2007	Sulfate	20	325		ppm	1.0	
M-Inj-066	112	Sigma V IC	10/7/2007	Bromide	20	32		ppm	1.0	
M-Inj-066	112	Sigma V IC	10/7/2007	Chloride	20	365		ppm	1.0	
M-Inj-066	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-066	112	Sigma V IC	10/7/2007	Nitrite	20	3.7	J	ppm	1.0	Int
M-Inj-066	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-066	112	Sigma V IC	10/7/2007	Sulfate	20	217		ppm	1.0	
M-Inj-067	113	Sigma V IC	10/7/2007	Bromide	2	0.65		ppm	0.10	
M-Inj-067	113	Sigma V IC	10/7/2007	Chloride	2	27		ppm	0.10	
M-Inj-067	113	Sigma V IC	10/7/2007	Nitrate	2	0.10	U	ppm	0.10	
M-Inj-067	113	Sigma V IC	10/7/2007	Nitrite	2	0.87		ppm	0.10	
M-Inj-067	113	Sigma V IC	10/7/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-067	113	Sigma V IC	10/7/2007	Sulfate	2	127		ppm	0.10	
M-Inj-068	109	Sigma V IC	10/8/2007	Bromide	20	8.5		ppm	1.0	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-068	109	Sigma V IC	10/8/2007	Chloride	20	116		ppm	1.0	
M-Inj-068	109	Sigma V IC	10/8/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-068	109	Sigma V IC	10/8/2007	Nitrite	20	1.6	J	ppm	1.0	Int
M-Inj-068	109	Sigma V IC	10/8/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-068	109	Sigma V IC	10/8/2007	Sulfate	20	144		ppm	1.0	
M-Inj-069	111	Sigma V IC	10/7/2007	Bromide	20	58		ppm	1.0	
M-Inj-069	111	Sigma V IC	10/7/2007	Chloride	20	748		ppm	1.0	
M-Inj-069	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-069	111	Sigma V IC	10/7/2007	Nitrite	20	4.1	J	ppm	1.0	Int
M-Inj-069	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-069	111	Sigma V IC	10/7/2007	Sulfate	20	392		ppm	1.0	
M-Inj-070	107	Sigma V IC	10/7/2007	Bromide	20	67		ppm	1.0	
M-Inj-070	107	Sigma V IC	10/7/2007	Chloride	20	793		ppm	1.0	
M-Inj-070	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-070	107	Sigma V IC	10/7/2007	Nitrite	20	3.5	J	ppm	1.0	Int
M-Inj-070	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-070	107	Sigma V IC	10/7/2007	Sulfate	20	362		ppm	1.0	
M-Inj-071	110	Sigma V IC	10/7/2007	Bromide	20	58		ppm	1.0	
M-Inj-071	110	Sigma V IC	10/7/2007	Chloride	20	748		ppm	1.0	
M-Inj-071	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-071	110	Sigma V IC	10/7/2007	Nitrite	20	3.8	J	ppm	1.0	Int
M-Inj-071	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-071	110	Sigma V IC	10/7/2007	Sulfate	20	356		ppm	1.0	
M-Inj-072	112	Sigma V IC	10/7/2007	Bromide	20	28		ppm	1.0	
M-Inj-072	112	Sigma V IC	10/7/2007	Chloride	20	339		ppm	1.0	
M-Inj-072	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-072	112	Sigma V IC	10/7/2007	Nitrite	20	2.9	J	ppm	1.0	Int
M-Inj-072	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-072	112	Sigma V IC	10/7/2007	Sulfate	20	206		ppm	1.0	
M-Inj-073	113	Sigma V IC	10/7/2007	Bromide	2	0.71		ppm	0.10	
M-Inj-073	113	Sigma V IC	10/7/2007	Chloride	2	31		ppm	0.10	
M-Inj-073	113	Sigma V IC	10/7/2007	Nitrate	2	0.10	U	ppm	0.10	
M-Inj-073	113	Sigma V IC	10/7/2007	Nitrite	2	0.47	J	ppm	0.10	Int
M-Inj-073	113	Sigma V IC	10/7/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-073	113	Sigma V IC	10/7/2007	Sulfate	2	133		ppm	0.10	
M-Inj-074	109	Sigma V IC	10/7/2007	Bromide	20	19		ppm	1.0	
M-Inj-074	109	Sigma V IC	10/7/2007	Chloride	20	223		ppm	1.0	
M-Inj-074	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-074	109	Sigma V IC	10/7/2007	Nitrite	20	2.5	J	ppm	1.0	Int
M-Inj-074	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-074	109	Sigma V IC	10/7/2007	Sulfate	20	187		ppm	1.0	
M-Inj-075	111	Sigma V IC	10/7/2007	Bromide	20	60		ppm	1.0	
M-Inj-075	111	Sigma V IC	10/7/2007	Chloride	20	780		ppm	1.0	
M-Inj-075	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-075	111	Sigma V IC	10/7/2007	Nitrite	20	3.9	J	ppm	1.0	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-075	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-075	111	Sigma V IC	10/7/2007	Sulfate	20	380		ppm	1.0	
M-Inj-076	107	Sigma V IC	10/7/2007	Bromide	20	61		ppm	1.0	
M-Inj-076	107	Sigma V IC	10/7/2007	Chloride	20	919		ppm	1.0	
M-Inj-076	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-076	107	Sigma V IC	10/7/2007	Nitrite	20	3.9	J	ppm	1.0	Int
M-Inj-076	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-076	107	Sigma V IC	10/7/2007	Sulfate	20	429		ppm	1.0	
M-Inj-077	110	Sigma V IC	10/7/2007	Bromide	20	57		ppm	1.0	
M-Inj-077	110	Sigma V IC	10/7/2007	Chloride	20	756		ppm	1.0	
M-Inj-077	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-077	110	Sigma V IC	10/7/2007	Nitrite	20	3.5	J	ppm	1.0	Int
M-Inj-077	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-077	110	Sigma V IC	10/7/2007	Sulfate	20	365		ppm	1.0	
M-Inj-078	112	Sigma V IC	10/7/2007	Bromide	10	13		ppm	0.50	
M-Inj-078	112	Sigma V IC	10/7/2007	Chloride	10	166		ppm	0.50	
M-Inj-078	112	Sigma V IC	10/7/2007	Nitrate	10	0.50	U	ppm	0.50	
M-Inj-078	112	Sigma V IC	10/7/2007	Nitrite	10	1.7	J	ppm	0.50	Int
M-Inj-078	112	Sigma V IC	10/7/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-078	112	Sigma V IC	10/7/2007	Sulfate	10	101		ppm	0.50	
M-Inj-079	113	Sigma V IC	10/8/2007	Bromide	10	0.56		ppm	0.50	
M-Inj-079	113	Sigma V IC	10/8/2007	Chloride	10	27		ppm	0.50	
M-Inj-079	113	Sigma V IC	10/8/2007	Nitrate	10	56		ppm	0.50	
M-Inj-079	113	Sigma V IC	10/8/2007	Nitrite	10	1.3	J	ppm	0.50	Int
M-Inj-079	113	Sigma V IC	10/8/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-079	113	Sigma V IC	10/8/2007	Sulfate	10	127		ppm	0.50	
M-Inj-080	109	Sigma V IC	10/7/2007	Bromide	20	20		ppm	1.0	
M-Inj-080	109	Sigma V IC	10/7/2007	Chloride	20	233		ppm	1.0	
M-Inj-080	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-080	109	Sigma V IC	10/7/2007	Nitrite	20	2.6	J	ppm	1.0	Int
M-Inj-080	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-080	109	Sigma V IC	10/7/2007	Sulfate	20	189		ppm	1.0	
M-Inj-081	111	Sigma V IC	10/7/2007	Bromide	20	60		ppm	1.0	
M-Inj-081	111	Sigma V IC	10/7/2007	Chloride	20	785		ppm	1.0	
M-Inj-081	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-081	111	Sigma V IC	10/7/2007	Nitrite	20	3.1	J	ppm	1.0	Int
M-Inj-081	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-081	111	Sigma V IC	10/7/2007	Sulfate	20	378		ppm	1.0	
M-Inj-082	107	Sigma V IC	10/7/2007	Bromide	20	64		ppm	1.0	
M-Inj-082	107	Sigma V IC	10/7/2007	Chloride	20	805		ppm	1.0	
M-Inj-082	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-082	107	Sigma V IC	10/7/2007	Nitrite	20	3.4	J	ppm	1.0	Int
M-Inj-082	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-082	107	Sigma V IC	10/7/2007	Sulfate	20	368		ppm	1.0	
M-Inj-083	110	Sigma V IC	10/7/2007	Bromide	20	59		ppm	1.0	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-083	110	Sigma V IC	10/7/2007	Chloride	20	773		ppm	1.0	
M-Inj-083	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-083	110	Sigma V IC	10/7/2007	Nitrite	20	2.9	J	ppm	1.0	Int
M-Inj-083	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-083	110	Sigma V IC	10/7/2007	Sulfate	20	377		ppm	1.0	
M-Inj-084	112	Sigma V IC	10/7/2007	Bromide	20	31		ppm	1.0	
M-Inj-084	112	Sigma V IC	10/7/2007	Chloride	20	385		ppm	1.0	
M-Inj-084	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-084	112	Sigma V IC	10/7/2007	Nitrite	20	2.6	J	ppm	1.0	Int
M-Inj-084	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-084	112	Sigma V IC	10/7/2007	Sulfate	20	221		ppm	1.0	
M-Inj-085	113	Sigma V IC	10/7/2007	Bromide	10	0.67		ppm	0.50	
M-Inj-085	113	Sigma V IC	10/7/2007	Chloride	10	27		ppm	0.50	
M-Inj-085	113	Sigma V IC	10/7/2007	Nitrate	10	56		ppm	0.50	
M-Inj-085	113	Sigma V IC	10/7/2007	Nitrite	10	1.2	J	ppm	0.50	Int
M-Inj-085	113	Sigma V IC	10/7/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-085	113	Sigma V IC	10/7/2007	Sulfate	10	127		ppm	0.50	
M-Inj-086	109	Sigma V IC	10/7/2007	Bromide	20	20		ppm	1.0	
M-Inj-086	109	Sigma V IC	10/7/2007	Chloride	20	229		ppm	1.0	
M-Inj-086	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-086	109	Sigma V IC	10/7/2007	Nitrite	20	3.0	J	ppm	1.0	Int
M-Inj-086	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-086	109	Sigma V IC	10/7/2007	Sulfate	20	181		ppm	1.0	
M-Inj-087	111	Sigma V IC	10/7/2007	Bromide	20	59		ppm	1.0	
M-Inj-087	111	Sigma V IC	10/7/2007	Chloride	20	795		ppm	1.0	
M-Inj-087	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-087	111	Sigma V IC	10/7/2007	Nitrite	20	3.2	J	ppm	1.0	Int
M-Inj-087	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-087	111	Sigma V IC	10/7/2007	Sulfate	20	379		ppm	1.0	
M-Inj-088	107	Sigma V IC	10/7/2007	Bromide	20	63		ppm	1.0	
M-Inj-088	107	Sigma V IC	10/7/2007	Chloride	20	738		ppm	1.0	
M-Inj-088	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-088	107	Sigma V IC	10/7/2007	Nitrite	20	3.4	J	ppm	1.0	Int
M-Inj-088	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-088	107	Sigma V IC	10/7/2007	Sulfate	20	339		ppm	1.0	
M-Inj-089	110	Sigma V IC	10/11/2007	Bromide	20	61		ppm	1.0	
M-Inj-089	110	Sigma V IC	10/11/2007	Chloride	20	820		ppm	1.0	
M-Inj-089	110	Sigma V IC	10/11/2007	Nitrate	20	3.7	J	ppm	1.0	LD
M-Inj-089	110	Sigma V IC	10/11/2007	Nitrite	20	3.0	J	ppm	1.0	Int,LD
M-Inj-089	110	Sigma V IC	10/11/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-089	110	Sigma V IC	10/11/2007	Sulfate	20	391		ppm	1.0	
M-Inj-090	112	Sigma V IC	10/7/2007	Bromide	20	33		ppm	1.0	
M-Inj-090	112	Sigma V IC	10/7/2007	Chloride	20	407		ppm	1.0	
M-Inj-090	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-090	112	Sigma V IC	10/7/2007	Nitrite	20	2.4	J	ppm	1.0	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-090	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-090	112	Sigma V IC	10/7/2007	Sulfate	20	232		ppm	1.0	
M-Inj-091	113	Sigma V IC	10/7/2007	Bromide	10	0.70		ppm	0.50	
M-Inj-091	113	Sigma V IC	10/7/2007	Chloride	10	29		ppm	0.50	
M-Inj-091	113	Sigma V IC	10/7/2007	Nitrate	10	55		ppm	0.50	
M-Inj-091	113	Sigma V IC	10/7/2007	Nitrite	10	0.94	J	ppm	0.50	Int
M-Inj-091	113	Sigma V IC	10/7/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-091	113	Sigma V IC	10/7/2007	Sulfate	10	129		ppm	0.50	
M-Inj-092	109	Sigma V IC	10/7/2007	Bromide	20	15		ppm	1.0	
M-Inj-092	109	Sigma V IC	10/7/2007	Chloride	20	184		ppm	1.0	
M-Inj-092	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-092	109	Sigma V IC	10/7/2007	Nitrite	20	3.2	J	ppm	1.0	Int
M-Inj-092	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-092	109	Sigma V IC	10/7/2007	Sulfate	20	176		ppm	1.0	
M-Inj-093	109	Sigma V IC	10/9/2007	Bromide	20	15		ppm	1.0	
M-Inj-093	109	Sigma V IC	10/9/2007	Chloride	20	170		ppm	1.0	
M-Inj-093	109	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-093	109	Sigma V IC	10/9/2007	Nitrite	20	3.3	J	ppm	1.0	Int
M-Inj-093	109	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-093	109	Sigma V IC	10/9/2007	Sulfate	20	176		ppm	1.0	
M-Inj-094	111	Sigma V IC	10/7/2007	Bromide	20	61		ppm	1.0	
M-Inj-094	111	Sigma V IC	10/7/2007	Chloride	20	821		ppm	1.0	
M-Inj-094	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-094	111	Sigma V IC	10/7/2007	Nitrite	20	2.7	J	ppm	1.0	Int
M-Inj-094	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-094	111	Sigma V IC	10/7/2007	Sulfate	20	393		ppm	1.0	
M-Inj-095	107	Sigma V IC	10/7/2007	Bromide	20	63		ppm	1.0	
M-Inj-095	107	Sigma V IC	10/7/2007	Chloride	20	744		ppm	1.0	
M-Inj-095	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-095	107	Sigma V IC	10/7/2007	Nitrite	20	3.3	J	ppm	1.0	Int
M-Inj-095	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-095	107	Sigma V IC	10/7/2007	Sulfate	20	337		ppm	1.0	
M-Inj-096	110	Sigma V IC	10/7/2007	Bromide	20	64		ppm	1.0	
M-Inj-096	110	Sigma V IC	10/7/2007	Chloride	20	827		ppm	1.0	
M-Inj-096	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-096	110	Sigma V IC	10/7/2007	Nitrite	20	2.9	J	ppm	1.0	Int
M-Inj-096	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-096	110	Sigma V IC	10/7/2007	Sulfate	20	402		ppm	1.0	
M-Inj-097	112	Sigma V IC	10/7/2007	Bromide	20	34		ppm	1.0	
M-Inj-097	112	Sigma V IC	10/7/2007	Chloride	20	430		ppm	1.0	
M-Inj-097	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-097	112	Sigma V IC	10/7/2007	Nitrite	20	3.9	J	ppm	1.0	Int
M-Inj-097	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-097	112	Sigma V IC	10/7/2007	Sulfate	20	239		ppm	1.0	
M-Inj-098	113	Sigma V IC	10/7/2007	Bromide	10	0.71		ppm	0.50	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-098	113	Sigma V IC	10/7/2007	Chloride	10	28		ppm	0.50	
M-Inj-098	113	Sigma V IC	10/7/2007	Nitrate	10	55		ppm	0.50	
M-Inj-098	113	Sigma V IC	10/7/2007	Nitrite	10	1.0	J	ppm	0.50	Int
M-Inj-098	113	Sigma V IC	10/7/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-098	113	Sigma V IC	10/7/2007	Sulfate	10	128		ppm	0.50	
M-Inj-099	109	Sigma V IC	10/9/2007	Bromide	20	22		ppm	1.0	
M-Inj-099	109	Sigma V IC	10/9/2007	Chloride	20	254		ppm	1.0	
M-Inj-099	109	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-099	109	Sigma V IC	10/9/2007	Nitrite	20	3.0	J	ppm	1.0	Int
M-Inj-099	109	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-099	109	Sigma V IC	10/9/2007	Sulfate	20	203		ppm	1.0	
M-Inj-100	111	Sigma V IC	10/7/2007	Bromide	20	63		ppm	1.0	
M-Inj-100	111	Sigma V IC	10/7/2007	Chloride	20	836		ppm	1.0	
M-Inj-100	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-100	111	Sigma V IC	10/7/2007	Nitrite	20	2.6	J	ppm	1.0	Int
M-Inj-100	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-100	111	Sigma V IC	10/7/2007	Sulfate	20	407		ppm	1.0	
M-Inj-101	107	Sigma V IC	10/7/2007	Bromide	20	63		ppm	1.0	
M-Inj-101	107	Sigma V IC	10/7/2007	Chloride	20	897		ppm	1.0	
M-Inj-101	107	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-101	107	Sigma V IC	10/7/2007	Nitrite	20	3.6	J	ppm	1.0	Int
M-Inj-101	107	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-101	107	Sigma V IC	10/7/2007	Sulfate	20	416		ppm	1.0	
M-Inj-102	110	Sigma V IC	10/7/2007	Bromide	20	64		ppm	1.0	
M-Inj-102	110	Sigma V IC	10/7/2007	Chloride	20	835		ppm	1.0	
M-Inj-102	110	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-102	110	Sigma V IC	10/7/2007	Nitrite	20	2.8	J	ppm	1.0	Int
M-Inj-102	110	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-102	110	Sigma V IC	10/7/2007	Sulfate	20	408		ppm	1.0	
M-Inj-103	112	Sigma V IC	10/7/2007	Bromide	20	30		ppm	1.0	
M-Inj-103	112	Sigma V IC	10/7/2007	Chloride	20	397		ppm	1.0	
M-Inj-103	112	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-103	112	Sigma V IC	10/7/2007	Nitrite	20	2.3	J	ppm	1.0	Int
M-Inj-103	112	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-103	112	Sigma V IC	10/7/2007	Sulfate	20	228		ppm	1.0	
M-Inj-104	113	Sigma V IC	10/7/2007	Bromide	10	0.65		ppm	0.50	
M-Inj-104	113	Sigma V IC	10/7/2007	Chloride	10	28		ppm	0.50	
M-Inj-104	113	Sigma V IC	10/7/2007	Nitrate	10	55		ppm	0.50	
M-Inj-104	113	Sigma V IC	10/7/2007	Nitrite	10	1.3	J	ppm	0.50	Int
M-Inj-104	113	Sigma V IC	10/7/2007	Phosphate	10	0.50	U	ppm	0.50	
M-Inj-104	113	Sigma V IC	10/7/2007	Sulfate	10	128		ppm	0.50	
M-Inj-105	109	Sigma V IC	10/7/2007	Bromide	20	21		ppm	1.0	
M-Inj-105	109	Sigma V IC	10/7/2007	Chloride	20	251		ppm	1.0	
M-Inj-105	109	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-105	109	Sigma V IC	10/7/2007	Nitrite	20	2.8	J	ppm	1.0	Int

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-105	109	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-105	109	Sigma V IC	10/7/2007	Sulfate	20	201		ppm	1.0	
M-Inj-106	111	Sigma V IC	10/7/2007	Bromide	20	64		ppm	1.0	
M-Inj-106	111	Sigma V IC	10/7/2007	Chloride	20	829		ppm	1.0	
M-Inj-106	111	Sigma V IC	10/7/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-106	111	Sigma V IC	10/7/2007	Nitrite	20	2.8	J	ppm	1.0	Int
M-Inj-106	111	Sigma V IC	10/7/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-106	111	Sigma V IC	10/7/2007	Sulfate	20	405		ppm	1.0	
M-Inj-107	107	Sigma V IC	10/9/2007	Bromide	20	69		ppm	1.0	
M-Inj-107	107	Sigma V IC	10/9/2007	Chloride	20	797		ppm	1.0	
M-Inj-107	107	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-107	107	Sigma V IC	10/9/2007	Nitrite	20	3.4	J	ppm	1.0	Int
M-Inj-107	107	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-107	107	Sigma V IC	10/9/2007	Sulfate	20	376		ppm	1.0	
M-Inj-108	110	Sigma V IC	10/9/2007	Bromide	20	64		ppm	1.0	
M-Inj-108	110	Sigma V IC	10/9/2007	Chloride	20	816		ppm	1.0	
M-Inj-108	110	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-108	110	Sigma V IC	10/9/2007	Nitrite	20	2.8	J	ppm	1.0	Int
M-Inj-108	110	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-108	110	Sigma V IC	10/9/2007	Sulfate	20	411		ppm	1.0	
M-Inj-109	112	Sigma V IC	10/9/2007	Bromide	20	34		ppm	1.0	
M-Inj-109	112	Sigma V IC	10/9/2007	Chloride	20	447		ppm	1.0	
M-Inj-109	112	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-109	112	Sigma V IC	10/9/2007	Nitrite	20	4.2	J	ppm	1.0	Int
M-Inj-109	112	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-109	112	Sigma V IC	10/9/2007	Sulfate	20	244		ppm	1.0	
M-Inj-110	113	Sigma V IC	10/9/2007	Bromide	2	0.56		ppm	0.10	
M-Inj-110	113	Sigma V IC	10/9/2007	Chloride	2	29		ppm	0.10	
M-Inj-110	113	Sigma V IC	10/9/2007	Nitrate	2	55		ppm	0.10	
M-Inj-110	113	Sigma V IC	10/9/2007	Nitrite	2	0.51	J	ppm	0.10	Int
M-Inj-110	113	Sigma V IC	10/9/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-110	113	Sigma V IC	10/9/2007	Sulfate	2	129		ppm	0.10	
M-Inj-111	109	Sigma V IC	10/9/2007	Bromide	20	21		ppm	1.0	
M-Inj-111	109	Sigma V IC	10/9/2007	Chloride	20	245		ppm	1.0	
M-Inj-111	109	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-111	109	Sigma V IC	10/9/2007	Nitrite	20	3.5	J	ppm	1.0	Int
M-Inj-111	109	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-111	109	Sigma V IC	10/9/2007	Sulfate	20	200		ppm	1.0	
M-Inj-112	111	Sigma V IC	10/9/2007	Bromide	20	64		ppm	1.0	
M-Inj-112	111	Sigma V IC	10/9/2007	Chloride	20	805		ppm	1.0	
M-Inj-112	111	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-112	111	Sigma V IC	10/9/2007	Nitrite	20	4.1	J	ppm	1.0	Int
M-Inj-112	111	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-112	111	Sigma V IC	10/9/2007	Sulfate	20	410		ppm	1.0	
M-Inj-113	107	Sigma V IC	10/9/2007	Bromide	20	65		ppm	1.0	

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Inj-113	107	Sigma V IC	10/9/2007	Chloride	20	823		ppm	1.0	
M-Inj-113	107	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-113	107	Sigma V IC	10/9/2007	Nitrite	20	3.6	J	ppm	1.0	Int
M-Inj-113	107	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-113	107	Sigma V IC	10/9/2007	Sulfate	20	390		ppm	1.0	
M-Inj-114	110	Sigma V IC	10/9/2007	Bromide	20	67		ppm	1.0	
M-Inj-114	110	Sigma V IC	10/9/2007	Chloride	20	846		ppm	1.0	
M-Inj-114	110	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-114	110	Sigma V IC	10/9/2007	Nitrite	20	2.8	J	ppm	1.0	Int
M-Inj-114	110	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-114	110	Sigma V IC	10/9/2007	Sulfate	20	434		ppm	1.0	
M-Inj-115	110	Sigma V IC	10/9/2007	Bromide	20	64		ppm	1.0	
M-Inj-115	110	Sigma V IC	10/9/2007	Chloride	20	816		ppm	1.0	
M-Inj-115	110	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-115	110	Sigma V IC	10/9/2007	Nitrite	20	2.9	J	ppm	1.0	Int
M-Inj-115	110	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-115	110	Sigma V IC	10/9/2007	Sulfate	20	412		ppm	1.0	
M-Inj-116	112	Sigma V IC	10/9/2007	Bromide	20	24		ppm	1.0	
M-Inj-116	112	Sigma V IC	10/9/2007	Chloride	20	322		ppm	1.0	
M-Inj-116	112	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-116	112	Sigma V IC	10/9/2007	Nitrite	20	2.9	J	ppm	1.0	Int
M-Inj-116	112	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-116	112	Sigma V IC	10/9/2007	Sulfate	20	200		ppm	1.0	
M-Inj-117	113	Sigma V IC	10/9/2007	Bromide	2	0.78		ppm	0.10	
M-Inj-117	113	Sigma V IC	10/9/2007	Chloride	2	31		ppm	0.10	
M-Inj-117	113	Sigma V IC	10/9/2007	Nitrate	2	53		ppm	0.10	
M-Inj-117	113	Sigma V IC	10/9/2007	Nitrite	2	0.65	J	ppm	0.10	Int
M-Inj-117	113	Sigma V IC	10/9/2007	Phosphate	2	0.10	U	ppm	0.10	
M-Inj-117	113	Sigma V IC	10/9/2007	Sulfate	2	130		ppm	0.10	
M-Inj-118	109	Sigma V IC	10/9/2007	Bromide	20	19		ppm	1.0	
M-Inj-118	109	Sigma V IC	10/9/2007	Chloride	20	223		ppm	1.0	
M-Inj-118	109	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-118	109	Sigma V IC	10/9/2007	Nitrite	20	2.6	J	ppm	1.0	Int
M-Inj-118	109	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-118	109	Sigma V IC	10/9/2007	Sulfate	20	189		ppm	1.0	
M-Inj-119	111	Sigma V IC	10/9/2007	Bromide	20	64		ppm	1.0	
M-Inj-119	111	Sigma V IC	10/9/2007	Chloride	20	835		ppm	1.0	
M-Inj-119	111	Sigma V IC	10/9/2007	Nitrate	20	1.0	U	ppm	1.0	
M-Inj-119	111	Sigma V IC	10/9/2007	Nitrite	20	3.1	J	ppm	1.0	Int
M-Inj-119	111	Sigma V IC	10/9/2007	Phosphate	20	1.0	U	ppm	1.0	
M-Inj-119	111	Sigma V IC	10/9/2007	Sulfate	20	427		ppm	1.0	
M-Inj-002	110	HACH 8023	9/26/2007	hex, chromium	1	60	J	ppb	10	A
M-Inj-003	112	HACH 8023	9/26/2007	hex, chromium	1	190	J	ppb	10	A
M-Inj-004	113	HACH 8023	9/26/2007	hex,	1	100	J	ppb	10	A

Sample ID	Location	Method	Date Analysis	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
				chromium						
M-Inj-005	109	HACH 8023	9/26/2007	hex, chromium	1	110	J	ppb	10	A
M-Inj-006	111	HACH 8023	9/26/2007	hex, chromium	1	50	J	ppb	10	A
M-Inj-001	107	Method 9060A	10/3/2007	TOC	1000	12200		ppm	1000	
M-Inj-007	107	Method 9060A	10/5/2007	TOC	1000	15300		ppm	1000	
M-Inj-009	112	Method 9060A	10/3/2007	TOC	200	2640		ppm	200	
M-Inj-013	112	Method 9060A	10/3/2007	TOC	200	3600		ppm	200	
M-Inj-021	112	Method 9060A	10/3/2007	TOC	200	152	J	ppm	200	RL
M-Inj-024	109	Method 9060A	10/3/2007	TOC	200	606		ppm	200	
M-Inj-029	113	Method 9060A	10/3/2007	TOC	1	5.5		ppm	1	
M-Inj-030	109	Method 9060A	10/3/2007	TOC	200	1310		ppm	200	
M-Inj-033	110	Method 9060A	10/5/2007	TOC	500	4890		ppm	500	
M-Inj-034	112	Method 9060A	10/3/2007	TOC	500	4760		ppm	500	
M-Inj-037	111	Method 9060A	10/5/2007	TOC	1	2.7		ppm	1	
M-Inj-038	107	Method 9060A	10/3/2007	TOC	500	12500		ppm	500	
M-Inj-052	110	Method 9060A	10/3/2007	TOC	200	4280		ppm	200	
M-Inj-053	112	Method 9060A	10/3/2007	TOC	200	3760		ppm	200	
M-Inj-054	113	Method 9060A	10/5/2007	TOC	1	12		ppm	1	
M-Inj-055	109	Method 9060A	10/5/2007	TOC	200	1910		ppm	200	
M-Inj-057	111	Method 9060A	10/8/2007	TOC	10	151		ppm	10	
M-Inj-063	111	Method 9060A	10/5/2007	TOC	500	5000		ppm	500	
M-Inj-070	107	Method 9060A	10/5/2007	TOC	500	11200		ppm	500	
M-Inj-071	110	Method 9060A	10/5/2007	TOC	500	10000		ppm	500	
M-Inj-072	112	Method 9060A	10/5/2007	TOC	500	4880		ppm	500	
M-Inj-075	111	Method 9060A	10/5/2007	TOC	500	10500		ppm	500	
M-Inj-088	107	Method 9060A	10/5/2007	TOC	500	10200		ppm	500	
M-Inj-089	110	Method 9060A	10/5/2007	TOC	500	11400		ppm	500	
M-Inj-090	112	Method 9060A	10/8/2007	TOC	500	5700		ppm	500	
M-Inj-091	113	Method 9060A	10/8/2007	TOC	50	72		ppm	50	
M-Inj-092	109	Method 9060A	10/8/2007	TOC	500	2770		ppm	500	
M-Inj-093	109	Method 9060A	10/8/2007	TOC	500	2360		ppm	500	
M-Inj-094	111	Method 9060A	10/8/2007	TOC	500	11400		ppm	500	
M-Inj-107	107	Method 9060A	10/8/2007	TOC	500	11200		ppm	500	
M-Inj-108	110	Method 9060A	10/8/2007	TOC	500	11100		ppm	500	
M-Inj-109	112	Method 9060A	10/8/2007	TOC	500	5850		ppm	500	
M-Inj-110	113	Method 9060A	10/8/2007	TOC	50	96		ppm	50	
M-Inj-111	111	Method 9060A	10/8/2007	TOC	500	3220		ppm	500	
M-Inj-112	111	Method 9060A	10/8/2007	TOC	500	11400		ppm	500	

RELEASE OF VALIDATED DATA

PROJECT: Hanford 100-D Area Treatability Demonstration: In situ Biostimulation for a Reducing Barrier

LABORATORY: Pacific Northwest National Laboratory (Richland, WA)
Laboratory Job Number: **M-Pro-01**

REVIEWER: Rebecca P. Elmore, Pacific Northwest National Laboratory (Richland, WA)

ANALYSES: Organic Acids by HPLC
Hexavalent Chromium (Cr⁺⁶) by Hach Method 8023
Anions by Sigma V IC
Total Organic Carbon (TOC) by 9060A

MATRIX: 71 Water Samples

DATE: April 11, 2008

A.3 Introduction

PNNL collected five water samples for the analysis of organic acids, and sixty-six groundwater samples for the analysis of organic acids, hexavalent chromium (Cr⁺⁶), TOC, and anions. Samples were collected between 10/03/07 and 11/28/07. Trip blanks samples M-Pro-009, M-Pro-027, M-Pro-057, M-Pro-067, and M-Pro-078 were associated with this sample delivery group (SDG) for organic acid analysis. Field duplicate samples M-Pro-008, M-Pro-046, and M-Pro-076 were associated with this SDG for all methods. Bromide concentration was measured in the field using an ion selective electrode, and those results are not discussed in this laboratory data review report. Sample information is provided below.

Sample ID	Sample Date	Sample Time	Sample Location	Sample Matrix	Sample Type	Related-FD Sample	Trip Blank	Methods
M-Pro-001	10/03/07	1025	107	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-002	10/03/07	1035	110	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-003	10/03/07	1045	112	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-004	10/03/07	1105	113	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-005	10/03/07	1110	109	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-006	10/03/07	1120	111	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-007	10/03/07	1155	D5-40	GW	Primary	NA	M-Pro-009	A,B,C,O,T
M-Pro-008	10/03/07	1158	D5-40	GW	FD	M-Pro-007	M-Pro-009	A,B,C,O,T
M-Pro-009	10/03/07		NA	ID Water	Trip Blank	NA	M-Pro-009	O
M-Pro-010	10/09/07	1010	107	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-011	10/09/07	1020	110	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-012	10/09/07	1025	112	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-013	10/09/07	1030	113	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-014	10/09/07	1033	109	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-015	10/09/07	1040	111	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-016	10/09/07	1050	D5-40	GW	Primary	NA	M-Pro-017	A,B,C,O,T
M-Pro-020	10/17/07	907	107	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-021	10/17/07	917	110	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-022	10/17/07	925	112	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-023	10/17/07	930	113	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-024	10/17/07	935	109	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-025	10/17/07	940	111	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-026	10/17/07	950	D5-40	GW	Primary	NA	M-Pro-027	A,B,C,O,T
M-Pro-027	10/17/07		NA	ID Water	Trip Blank	NA	M-Pro-027	O

Sample ID	Sample Date	Sample Time	Sample Location	Sample Matrix	Sample Type	Related-FD Sample	Trip Blank	Methods
M-Pro-030	10/24/07	1320	107	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-031	10/24/07	1330	110	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-032	10/24/07	1335	112	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-033	10/24/07	1340	113	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-034	10/24/07	1350	109	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-035	10/24/07	1355	111	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-036	10/24/07	1400	D5-40	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-040	10/31/07	1000	107	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-041	10/31/07	1015	110	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-042	10/31/07	1025	112	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-043	10/31/07	1040	113	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-044	10/31/07	1045	109	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-045	10/31/07	1050	111	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-046	10/31/07	1055	111	GW	FD	M-Pro-045	NA	A,B,C,O,T
M-Pro-047	10/31/07	1105	D5-40	GW	Primary	NA	NA	A,B,C,O,T
M-Pro-050	11/08/07	948	107	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-051	11/08/07	955	110	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-052	11/08/07	1000	112	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-053	11/08/07	1010	113	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-054	11/08/07	1015	109	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-055	11/08/07	1020	111	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-056	11/08/07	1025	D5-40	GW	Primary	NA	M-Pro-057	A,B,C,O,T
M-Pro-057	11/08/07	1030	NA	ID Water	Trip Blank	NA	M-Pro-057	O
M-Pro-060	11/15/07	1240	109	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-061	11/15/07	1300	D5-40	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-062	11/15/07	1310	111	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-063	11/15/07	1315	107	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-064	11/15/07	1320	110	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-065	11/15/07	1330	113	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-066	11/15/07	1340	112	GW	Primary	NA	M-Pro-067	A,C,O,T
M-Pro-067	11/15/07	1340	NA	ID Water	Trip Blank	NA	M-Pro-067	O
M-Pro-070	11/20/07	1350	107	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-071	11/20/07	1355	110	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-072	11/20/07	1400	112	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-073	11/20/07	1410	113	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-074	11/20/07	1415	109	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-075	11/20/07	1420	111	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-076	11/20/07	1421	111	GW	FD	M-Pro-075	M-Pro-078	A,C,O,T
M-Pro-077	11/20/07	1430	D5-40	GW	Primary	NA	M-Pro-078	A,C,O,T
M-Pro-078	11/20/07	1430	NA	ID Water	Trip Blank	NA	M-Pro-078	O
M-Pro-080	11/28/07	1230	107	GW	Primary	NA	NA	A,C,O,T
M-Pro-081	11/28/07	1240	110	GW	Primary	NA	NA	A,C,O,T
M-Pro-082	11/28/07	1250	112	GW	Primary	NA	NA	A,C,O,T
M-Pro-083	11/28/07	1300	113	GW	Primary	NA	NA	A,C,O,T
M-Pro-084	11/28/07	1310	109	GW	Primary	NA	NA	A,C,O,T
M-Pro-085	11/28/07	1320	111	GW	Primary	NA	NA	A,C,O,T
M-Pro-086	11/28/07	1330	D5-40	GW	Primary	NA	NA	A,C,O,T

Note: methods: A = anions, B = bromide, C = hexavalent chromium, O = organic acids, and T = TOC

The data were reviewed for compliance with criteria specified in the method's SOP, and the project's test plan. The hierarchy for acceptance is in the following priority: the test plan first, followed by the

SOP. The overall quality of the data in this package was acceptable with the qualifications summarized below.

SUMMARY OF QUALIFICATIONS

Analysis	Sample	Compound	Qualifier	Reason for Qualification	Section
Anions	18 samples	Nitrate	J	Peak Interference	2.0
Anions	14 samples	Nitrate	R	Peak Obscured	2.0
Anions	All samples	Phosphate	J	Method Blank	2.4
Anions	17 samples	Nitrite	J	Reported below RL	2.8
Anions	3 samples	Phosphate	J	Reported below RL	2.8
Anions	15 samples	Nitrate	J	Reported below RL	2.8
Organic Acids	15 samples	All	J	Holding Time	4.1

A.4 DATA QUALIFICATIONS

A.4.1 SAMPLING DOCUMENTATION/REPRESENTATIVENESS

All samples arrived in good condition. After sample collection, samples were first stored in a cooler in the field trailer. At the end of the day, samples were moved to a walk-in cooler that maintained the temperature at 2°C. The EPA-recommended temperature range of 2°C to 6°C was met. No qualifiers were applied to the data based on representativeness.

A.4.2 Anions by SIGMA V IC

The addition of molasses to the groundwater resulted in nitrate peak interference for several samples. For 18 samples, the nitrate peak was detectable, but it was not possible to quantify the amount the interferent contributed to the peak height. These nitrate results are recommended qualified "J" and are identified as "INT" in the Comment column of the RESULTS table.

For 14 samples, the peak for nitrite was completely obscured by an unknown compound. No result for nitrite could be calculated, and the result for nitrite for these samples are qualified "R" for rejected.

A.4.2.1 Technical Holding Time

Samples were collected between 10/03/07 and 11/28/07, and analyzed between 10/09/07 and 11/30/07. The 14-day method analysis holding time criteria was met for all samples. No qualifiers were applied to the data based on the technical holding time.

A.4.2.2 Initial Calibration

Six calibration standards were used to generate a calibration curve for each target analyte. The regression coefficient r^2 was greater than 0.995 for all calibration curves. No qualifiers were applied to the data based on initial calibration.

A.4.2.3 Continuing Calibration

One QC check standard was analyzed with the field samples during each analytical day. For the check standard, the percent difference (%D) between the true value and measured value for the target analytes was 2.0 percent or less. The QC check standard met all project QC criteria. No qualifiers were applied to the data based on the continuing calibration results.

A.4.2.4 Method Blank

Two method blanks were analyzed during each analytical day: one after the initial calibration standards, and one at the end of the analytical batch. No target compounds were reported above the RL of 0.05 ppm, except during the method blank analyses discussed below.

Sulfate was measured in the initial method blank during analytical day 11/30/08 at a value of 0.0535 ppm. Since all sulfate results for associated field samples were more than five times this value, no quantification of the data were recommended. Phosphate was measured at a value above the RL in all the second method blanks. All results for field samples for phosphate were less than five times the associated blank contamination. Thus all phosphate results should be considered as estimated, and are recommended qualified "J" and are identified as "MB" in the Comment column of the RESULTS table. No other qualifiers were applied to the data based on the method blank analysis.

A.4.2.5 Laboratory Duplicate

One laboratory duplicate sample was analyzed with each daily analytical batch. The percent differences (%D) were 20 percent or less for all target analytes, with the exception of analytical day 10/09/07, where the phosphate %D was calculated to be 26 percent. Since both results for phosphate were below five times the elevated blank result for phosphate, no qualifiers were recommended based on laboratory duplicate analysis.

A.4.2.6 Field Duplicate Sample

Three field duplicate samples, M-Pro-008, M-Pro-046, and M-Pro-076, were associated with this SDG. The relative percent difference (%RPD) is NC for results reported as not detected (ND) or estimated (J). The calculated RPD for target analytes met QC guidelines for a RPD equal to or less than 30 percent. No qualifiers are applied to the data based on field duplicate analysis.

Sample ID (Primary/Field Duplicate)	Analyte	Primary ppm	Duplicate ppm	RPD
M-Pre-007 / M-Pre-008	Bromide	0.18	0.22	20.0
	Chloride	25	25	0.0
	Nitrate	58	57	1.74
	Nitrite	0.49 J	0.52 J	NC
	Phosphate	ND	ND	NC
	Sulfate	131	131	0.00
M-Pre-045 / M-Pre-046	Bromide	40	41	2.47
	Chloride	489	501	2.42

	Nitrate	ND	ND	NC
Sample ID (Primary/Field Duplicate)	Analyte	Primary ppm	Duplicate ppm	RPD
	Nitrite	0.43 J	0.25 J	NC
	Phosphate	ND	ND	NC
	Sulfate	259	262	1.15
M-Pre-075 / M-Pre-076	Bromide	30	34	12.50
	Chloride	372	425	13.30
	Nitrate	0.32 J	0.29 J	NC
	Nitrite	0.73 J	0.50 J	NC
	Phosphate	1.0 U	1.0 U	NC
	Sulfate	209	222	6.03

A.4.2.7 Matrix Spike

One field sample was selected by the laboratory for matrix spike analysis for each analytical day. The percent recovery for all target analytes met project goals. No qualifiers were applied to the data based on the matrix spike analysis.

A.4.2.8 Tentatively Identified Compounds

Phosphate was reported for 3 samples at a level that was below the RL. Results for phosphate for these samples should be considered estimated and are recommended qualified “J” and are identified as “RL” in the Comment column of the RESULTS table. Nitrite was reported for 17 samples at a level that was below the RL. Results for nitrite for these samples should be considered estimated and are recommended qualified “J” and are identified as “RL” in the Comment column of the RESULTS table.

Nitrate was reported for 15 samples at a level that was below the RL. Results for nitrate for these samples should be considered estimated and are recommended qualified “J” and are identified as “RL” in the Comment column of the RESULTS table. No other qualifications were applied to the data due to tentatively identified compounds.

A.4.3 Hexavalent Chromium (Cr⁺⁶) by Hach Method 8023

A.4.3.1 Technical Holding Time

Samples were collected between 10/03/07 and 11/28/07, and all samples were analyzed on the same day as they were collected. The 24-hour method analysis holding time criteria was met for all samples. No qualifiers were applied to the data based on the technical holding time.

A.4.3.2 Continuing Calibration

One LCS was run each day with the filed samples. The true value of the LCS was 300 ppb. The measured values ranged from 280 through 300 ppb. The percent difference (%D) was calculated to be less than/or equal to 20%D. No qualifiers were applied to the data based on continuing calibration.

A.4.3.3 Method Blank

For each analytical day, one dionized (DI) water blank was analyzed. No detectable concentration of hexavalent chromium was reported in any blank. No qualifiers were applied to the data based on blank analysis.

A.4.3.4 Laboratory Duplicate Analysis

One laboratory duplicate sample was analyzed per every 10 field samples. Laboratory duplicate samples selected by the field personnel were: Samples M-Pro-002, M-Pro-016, M-Pro-026, M-Pro-036, M-Pro-046, and M-Pro-077. The percent difference (%D) ranged from 0.0 to 10 percent. No qualifiers were recommended based on laboratory duplicate analysis.

A.4.3.5 Field Duplicate Sample

Three field duplicate samples were associated with this SDG. The relative percent difference (%RPD) is not calculated (NC) for results reported as not detected (ND). Target analyte met QC guideline for a RPD equal to or less than 30 percent. No qualifiers are applied to the data based on field duplicate guidelines.

Sample ID (Primary/Field Duplicate)	Location	Primary ppb	Duplicate ppb	RPD
M-Pro-007 / M-Pro-008	D5-40	80	80	0.0
M-Pro-045 / M-Pro-046	111	ND	ND	NC
M-Pro-075 / M-Pro-076	111	100	100	0.0

A.4.4 HPLC ORGANIC ACIDS

A.4.4.1 Technical Holding Time

Samples were collected between 10/03/07 and 11/28/07, and analyzed between 10/12/07 and 12/12/07. The 14-day method analysis holding time criteria was met for all samples, except for 15 samples, M-Pro-020 through M-Pro-027, and M-Pro-030 through M-Pro-36. Results for these samples should be considered estimated and are recommended qualified “J” and are identified as “HT” in the Comment column of the RESULTS table. No others qualifiers were applied to the data based on the technical holding time.

A.4.4.2 Initial Calibration

Three calibration standards were used to generate a calibration curve for each target analyte for VWD HPLC. The regression coefficient r^2 ranged from 1.0 to 0.9998, which met the project QC target of 0.95. Standards were run in triplicate. The standard deviation among the triplicate runs ranged from 1.15 to 10.5. No qualifiers were applied to the data based on the initial calibration.

A.4.4.3 Continuing Calibration

LCSs were analyzed with this SDG. There are no project-specific requirements for LCS samples. All LCS results were within expected recoveries. No qualifiers were applied to the data based on the continuing calibration results.

A.4.4.4 Trip Blank

Trip blanks samples M-Pro-009, M-Pro-027, M-Pro-057, M-Pro-067, and M-Pro-078, were associated with this SDG. Trip blank samples had no target analytes reported above the RL. No qualifiers were applied to the data based on trip blank analysis.

A.4.4.5 Matrix Spike

One matrix spike sample was run with this SDG. The percent recoveries ranged from 99 to 102 percent, which met project goals of a 30% recovery. No qualifiers were applied to the data based on the method blank analysis.

A.4.4.6 Field Duplicate Sample

Three field duplicate samples were associated with this SDG. RPD is not calculated for results reported as not detected. RPDs ranged from 0.08 through 3.29%. No qualifiers are applied to the data based on field duplicate analysis.

Sample ID (Primary/Field Duplicate)	Analyte	Primary mg/L	Duplicate mg/L	RPD
M-Pro-007 / M-Pro-008	Acetate	ND	ND	NC
	Butyrate	ND	ND	NC
	Formate	ND	ND	NC
	Fructose	ND	ND	NC
	Glucose	ND	ND	NC
	Lactate	ND	ND	NC
	Propionate	ND	ND	NC
	Succinate	ND	ND	NC
M-Pro-045 / M-Pro-046	Acetate	2405	2416	0.11
	Butyrate	2458	2712	2.46
	Formate	ND	ND	NC
	Fructose	86	94	2.36
	Glucose	414	415	0.08
	Lactate	ND	ND	NC
	Propionate	1390	1368	0.40
	Succinate	ND	ND	NC
M-Pro-075 / M-Pro-076	Acetate	2382	2632	2.50
	Butyrate	1951	2226	3.29

Sample ID (Primary/Field Duplicate)	Analyte	Primary mg/L	Duplicate mg/L	RPD
	Formate	ND	ND	NC
	Fructose	ND	ND	NC
	Glucose	294	315	1.73
	Lactate	ND	ND	NC
	Propionate	1008	1148	3.26
	Succinate	ND	ND	NC
	Acetate	2382	2632	2.50
	Butyrate	1951	2226	3.29

A.4.5 TOTAL ORGANIC CARBON METHOD PNL VOA-3

A.4.5.1 Technical Holding Time

Samples were collected between 10/03/07 and 11/28/07, and analyzed between 10/11/07 and 11/29/07. The 14-day method analysis holding time criteria was met for all samples. No qualifiers were applied to the data based on the technical holding time.

A.4.5.2 Initial Calibration

Five calibration standards were used to generate a calibration curve at the beginning of each analytical day. The regression coefficient r^2 ranged from 0.9900 through 0.9990, which was greater than the project QC requirement of $r^2 < 0.95$. No qualifiers were applied to the data based on the initial calibration.

A.4.5.3 Continuing Calibration

An LCS was analyzed with each analytical batch. The percent difference (%D) ranged from 2.44 to 14.8%. All LCS analyses met all project QC criteria. No qualifiers were applied to the data based on the continuing calibration results.

A.4.5.4 Method Blank

Two method blanks were analyzed during each analytical day: one after the initial calibration standards, and one at the end of the analytical batch. No target compounds were reported above the RL. No qualifiers were applied to the data based on the method blank analysis.

A.4.5.5 Laboratory Duplicate Sample

There were eight laboratory duplicate samples associated with this SDG. The calculated RPD for TOC ranged from 0.03 through 0.93%, which met QC guidelines for a RPD equal to or less than 30 percent. No qualifiers are applied to the data based on field duplicate analysis.

Sample ID	Analyte	Primary ppm	Duplicate ppm	RPD
M-Pro-006	TOC	9200	9550	0.93
M-Pro-015	TOC	9700	9550	0.39
M-Pro-035	TOC	6500	6600	0.38
M-Pro-046	TOC	5600	5750	0.66
M-Pro-050	TOC	2020	2040	0.25
M-Pro-066	TOC	966	965	0.03
M-Pro-076	TOC	4290	4335	0.26
M-Pro-085	TOC	4335	4295	0.93

A.4.5.6 Field Duplicate Sample

Three field duplicate samples were associated with this SDG. The calculated RPD for TOC was 0.0 through 2.09 percent, which met QC guidelines for a RPD equal to or less than 30 percent. No qualifiers are applied to the data based on field duplicate analysis.

Sample ID (Primary/Field Duplicate)	Analyte	Primary ppm	Duplicate ppm	RPD
M-Pro-007 / M-Pro-008	TOC	1.9	1.9	0.0
M-Pro-045 / M-Pro-046	TOC	5150	5600	2.09
M-Pro-075 / M-Pro-076	TOC	4080	4290	1.25

A.4.5.7 Tentatively Identified Compounds

No field samples had TOC results reported below the reporting limit. No qualifiers were applied to the data due to tentatively identified compounds.

A.4.6 DATA QUALIFIER DEFINITION

NO QUALIFIERS indicates that the data are acceptable both qualitatively and quantitatively.

Qualifier	Definition
J	The analyte was positively identified. Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.
U	The analyte was analyzed for, but was not detected above the RL. The associated number indicates approximate sample concentration necessary to be detected. The results are qualitatively acceptable.
R	The sample results are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound. Data are not acceptable for any purpose.

Key to abbreviations in comment column in RESULTS table

Abbreviation	Explanation
A	No QC associated with analysis
CT	Cooler temperature above 6°C
E	Exceeded calibration range of standards
HT	Holding time exceeded
IC	Initial Calibration was outside QC criteria
INT	Peak Interference
LD	Laboratory Duplicate
MB	Analyte found in method blank & result less than 5x contamination
MS	Matrix Spike recover below project goal
O	Outlier, result not statistically valid
PRELIMINARY	Data not yet qualified
LCS	Associated LCS was outside QC criteria
RL	Result was below reporting limit but above method limit
TB	Analyte found in TB & result less than 5x contamination, or no TB

QUALIFIED RESULTS

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-001	107	HPLC	10/12/07	PNNL	Acetate	2	1018		mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Fructose	2	234		mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Glucose	2	123		mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-001	107	HPLC	10/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-001	107	Method 9060A	10/11/07	PNNL	TOC	500	3260		ppm	500	
M-Pro-001	107	HACH 8023	10/03/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-001	107	Sigma V IC	10/09/07	PNNL	Bromide	20	18		ppm	1.0	
M-Pro-001	107	Sigma V IC	10/09/07	PNNL	Chloride	20	242		ppm	1.0	
M-Pro-001	107	Sigma V IC	10/09/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-001	107	Sigma V IC	10/09/07	PNNL	Nitrite	20	3.2	J	ppm	1.0	Int
M-Pro-001	107	Sigma V IC	10/09/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-001	107	Sigma V IC	10/09/07	PNNL	Sulfate	20	110		ppm	1.0	
M-Pro-002	110	HACH 8023	10/03/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-002	110	HPLC	10/12/07	PNNL	Acetate	5	1879		mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Butyrate	5	150	U	mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Formate	5	567		mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Fructose	5	427		mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Glucose	5	2114		mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Lactate	5	2899		mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Propionate	5	150	U	mg/L	150	
M-Pro-002	110	HPLC	10/12/07	PNNL	Succinate	5	1191		mg/L	150	
M-Pro-002	110	Method 9060A	10/11/07	PNNL	TOC	500	10100		ppm	500	
M-Pro-002	110	Sigma V IC	10/09/07	PNNL	Bromide	20	62		ppm	1.0	
M-Pro-002	110	Sigma V IC	10/09/07	PNNL	Chloride	20	776		ppm	1.0	
M-Pro-002	110	Sigma V IC	10/09/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-002	110	Sigma V IC	10/09/07	PNNL	Nitrite	20	2.6	J	ppm	1.0	Int

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-002	110	Sigma V IC	10/09/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-002	110	Sigma V IC	10/09/07	PNNL	Sulfate	20	398		ppm	1.0	
M-Pro-003	112	HACH 8023	10/03/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-003	112	HPLC	10/12/07	PNNL	Acetate	3	398		mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Butyrate	3	90	U	mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Formate	3	307		mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Fructose	3	320		mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Glucose	3	241		mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Lactate	3	423		mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Propionate	3	90	U	mg/L	90	
M-Pro-003	112	HPLC	10/12/07	PNNL	Succinate	3	361		mg/L	90	
M-Pro-003	112	Method 9060A	10/11/07	PNNL	TOC	500	3210		ppm	500	
M-Pro-003	112	Sigma V IC	10/09/07	PNNL	Bromide	20	20		ppm	1.0	
M-Pro-003	112	Sigma V IC	10/09/07	PNNL	Chloride	20	263		ppm	1.0	
M-Pro-003	112	Sigma V IC	10/09/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-003	112	Sigma V IC	10/09/07	PNNL	Nitrite	20	4.2	J	ppm	1.0	Int
M-Pro-003	112	Sigma V IC	10/09/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-003	112	Sigma V IC	10/09/07	PNNL	Sulfate	20	187		ppm	1.0	
M-Pro-004	113	HACH 8023	10/03/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-004	113	HPLC	10/12/07	PNNL	Acetate	2	82		mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Formate	2	68		mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Fructose	2	592		mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Glucose	2	378		mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Lactate	2	82		mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-004	113	HPLC	10/12/07	PNNL	Succinate	2	61		mg/L	60	
M-Pro-004	113	Method 9060A	10/11/07	PNNL	TOC	200	536		ppm	200	
M-Pro-004	113	Sigma V IC	10/09/07	PNNL	Bromide	20	4.2		ppm	1.0	
M-Pro-004	113	Sigma V IC	10/09/07	PNNL	Chloride	20	58		ppm	1.0	
M-Pro-004	113	Sigma V IC	10/09/07	PNNL	Nitrate	20	11		ppm	1.0	
M-Pro-004	113	Sigma V IC	10/09/07	PNNL	Nitrite	20	2.4	J	ppm	1.0	Int

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-004	113	Sigma V IC	10/09/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-004	113	Sigma V IC	10/09/07	PNNL	Sulfate	20	134		ppm	1.0	
M-Pro-005	109	HACH 8023	10/03/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-005	109	HPLC	10/12/07	PNNL	Acetate	2	276		mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Formate	2	144		mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Fructose	2	808		mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Glucose	2	394		mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Lactate	2	268		mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Propionate	2	143		mg/L	60	
M-Pro-005	109	HPLC	10/12/07	PNNL	Succinate	2	131		mg/L	60	
M-Pro-005	109	Method 9060A	10/11/07	PNNL	TOC	500	1610		ppm	500	
M-Pro-005	109	Sigma V IC	10/09/07	PNNL	Bromide	20	9.8		ppm	1.0	
M-Pro-005	109	Sigma V IC	10/09/07	PNNL	Chloride	20	131		ppm	1.0	
M-Pro-005	109	Sigma V IC	10/09/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-005	109	Sigma V IC	10/09/07	PNNL	Nitrite	20	2.3	J	ppm	1.0	Int
M-Pro-005	109	Sigma V IC	10/09/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-005	109	Sigma V IC	10/09/07	PNNL	Sulfate	20	156		ppm	1.0	
M-Pro-006	111	HACH 8023	10/03/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-006	111	HPLC	10/12/07	PNNL	Acetate	5	1793		mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Butyrate	5	150	U	mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Formate	5	610		mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Fructose	5	404		mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Glucose	5	1399		mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Lactate	5	2678		mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Propionate	5	150	U	mg/L	150	
M-Pro-006	111	HPLC	10/12/07	PNNL	Succinate	5	1513		mg/L	150	
M-Pro-006	111	Method 9060A	10/11/07	PNNL	TOC	500	9200		ppm	500	
M-Pro-006	111	Sigma V IC	10/09/07	PNNL	Bromide	20	61		ppm	1.0	
M-Pro-006	111	Sigma V IC	10/09/07	PNNL	Chloride	20	758		ppm	1.0	
M-Pro-006	111	Sigma V IC	10/09/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-006	111	Sigma V IC	10/09/07	PNNL	Nitrite	20	3.7	J	ppm	1.0	Int

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-006	111	Sigma V IC	10/09/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-006	111	Sigma V IC	10/09/07	PNNL	Sulfate	20	400		ppm	1.0	
M-Pro-007	D5-40	HACH 8023	10/03/07	Field	hex, chromium	1	80		ppb	10	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Acetate	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Glucose	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-007	D5-40	HPLC	10/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-007	D5-40	Method 9060A	10/11/07	PNNL	TOC	1	1.9		ppm	1	
M-Pro-007	D5-40	Sigma V IC	10/09/07	PNNL	Bromide	2	0.18		ppm	0.10	
M-Pro-007	D5-40	Sigma V IC	10/09/07	PNNL	Chloride	2	25		ppm	0.10	
M-Pro-007	D5-40	Sigma V IC	10/09/07	PNNL	Nitrate	2	58		ppm	0.10	
M-Pro-007	D5-40	Sigma V IC	10/09/07	PNNL	Nitrite	2	0.49	J	ppm	0.10	Int
M-Pro-007	D5-40	Sigma V IC	10/09/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-007	D5-40	Sigma V IC	10/09/07	PNNL	Sulfate	2	131		ppm	0.10	
M-Pro-008	D5-40	HACH 8023	10/03/07	Field	hex, chromium	1	80		ppb	10	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Acetate	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Glucose	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-008	D5-40	HPLC	10/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-008	D5-40	Method 9060A	10/11/07	PNNL	TOC	1	1.9		ppm	1	
M-Pro-008	D5-40	Sigma V IC	10/09/07	PNNL	Bromide	2	0.22		ppm	0.10	
M-Pro-008	D5-40	Sigma V IC	10/09/07	PNNL	Chloride	2	25		ppm	0.10	
M-Pro-008	D5-40	Sigma V IC	10/09/07	PNNL	Nitrate	2	57		ppm	0.10	
M-Pro-008	D5-40	Sigma V IC	10/09/07	PNNL	Nitrite	2	0.52	J	ppm	0.10	Int

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-008	D5-40	Sigma V IC	10/09/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-008	D5-40	Sigma V IC	10/09/07	PNNL	Sulfate	2	131		ppm	0.10	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Acetate	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Glucose	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-009	NA	HPLC	10/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-010	107	HACH 8023	10/09/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-010	107	HPLC	10/12/07	PNNL	Acetate	3	2160		mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Butyrate	3	1412		mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Formate	3	90	U	mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Fructose	3	90	U	mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Glucose	3	420		mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Lactate	3	146		mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Propionate	3	2381		mg/L	90	
M-Pro-010	107	HPLC	10/12/07	PNNL	Succinate	3	90	U	mg/L	90	
M-Pro-010	107	Method 9060A	10/19/07	PNNL	TOC	500	6550		ppm	500	
M-Pro-010	107	Sigma V IC	10/16/07	PNNL	Bromide	10	35		ppm	0.50	
M-Pro-010	107	Sigma V IC	10/16/07	PNNL	Chloride	10	477		ppm	0.50	
M-Pro-010	107	Sigma V IC	10/16/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-010	107	Sigma V IC	10/16/07	PNNL	Nitrite	10		R	ppm	0.50	
M-Pro-010	107	Sigma V IC	10/16/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-010	107	Sigma V IC	10/16/07	PNNL	Sulfate	10	210		ppm	0.50	
M-Pro-011	110	HPLC	10/12/07	PNNL	Acetate	5	1926		mg/L	150	
M-Pro-011	110	HPLC	10/12/07	PNNL	Butyrate	5	1149		mg/L	150	
M-Pro-011	110	HPLC	10/12/07	PNNL	Formate	5	247		mg/L	150	
M-Pro-011	110	HPLC	10/12/07	PNNL	Fructose	5	150	U	mg/L	150	
M-Pro-011	110	HPLC	10/12/07	PNNL	Glucose	5	1074		mg/L	150	
M-Pro-011	110	HPLC	10/12/07	PNNL	Lactate	5	2661		mg/L	150	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-011	110	HPLC	10/12/07	PNNL	Propionate	5	1484		mg/L	150	
M-Pro-011	110	HPLC	10/12/07	PNNL	Succinate	5	923		mg/L	150	
M-Pro-011	110	Method 9060A	10/18/07	PNNL	TOC	500	9650		ppm	500	
M-Pro-011	110	HACH 8023	10/09/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-011	110	Sigma V IC	10/16/07	PNNL	Bromide	20	62		ppm	1.0	
M-Pro-011	110	Sigma V IC	10/16/07	PNNL	Chloride	20	769		ppm	1.0	
M-Pro-011	110	Sigma V IC	10/16/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-011	110	Sigma V IC	10/16/07	PNNL	Nitrite	20		R	ppm	1.0	
M-Pro-011	110	Sigma V IC	10/16/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-011	110	Sigma V IC	10/16/07	PNNL	Sulfate	20	387		ppm	1.0	
M-Pro-012	112	HACH 8023	10/09/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-012	112	HPLC	10/12/07	PNNL	Acetate	2	223		mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Formate	2	132		mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Fructose	2	241		mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Glucose	2	197		mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Lactate	2	120		mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-012	112	HPLC	10/12/07	PNNL	Succinate	2	53		mg/L	60	
M-Pro-012	112	Method 9060A	10/18/07	PNNL	TOC	200	1030		ppm	200	
M-Pro-012	112	Sigma V IC	10/16/07	PNNL	Bromide	10	6.9		ppm	0.50	
M-Pro-012	112	Sigma V IC	10/16/07	PNNL	Chloride	10	111		ppm	0.50	
M-Pro-012	112	Sigma V IC	10/16/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-012	112	Sigma V IC	10/16/07	PNNL	Nitrite	10		R	ppm	0.50	
M-Pro-012	112	Sigma V IC	10/16/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-012	112	Sigma V IC	10/16/07	PNNL	Sulfate	10	139		ppm	0.50	
M-Pro-013	113	HPLC	10/12/07	PNNL	Acetate	2	259		mg/L	60	
M-Pro-013	113	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-013	113	HPLC	10/12/07	PNNL	Formate	2	157		mg/L	60	
M-Pro-013	113	HPLC	10/12/07	PNNL	Fructose	2	504		mg/L	60	
M-Pro-013	113	HPLC	10/12/07	PNNL	Glucose	2	399		mg/L	60	
M-Pro-013	113	HPLC	10/12/07	PNNL	Lactate	2	239		mg/L	60	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-013	113	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-013	113	HPLC	10/12/07	PNNL	Succinate	2	78		mg/L	60	
M-Pro-013	113	Method 9060A	10/18/07	PNNL	TOC	200	1440		ppm	200	
M-Pro-013	113	HACH 8023	10/09/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-013	113	Sigma V IC	10/16/07	PNNL	Bromide	10	9.0		ppm	0.50	
M-Pro-013	113	Sigma V IC	10/16/07	PNNL	Chloride	10	120		ppm	0.50	
M-Pro-013	113	Sigma V IC	10/16/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-013	113	Sigma V IC	10/16/07	PNNL	Nitrite	10		R	ppm	0.50	
M-Pro-013	113	Sigma V IC	10/16/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-013	113	Sigma V IC	10/16/07	PNNL	Sulfate	10	159		ppm	0.50	
M-Pro-014	109	HACH 8023	10/09/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-014	109	HPLC	10/12/07	PNNL	Acetate	2	358		mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Butyrate	2	67		mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Formate	2	166		mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Fructose	2	87		mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Glucose	2	52		mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Lactate	2	441		mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-014	109	HPLC	10/12/07	PNNL	Succinate	2	111		mg/L	60	
M-Pro-014	109	Method 9060A	10/18/07	PNNL	TOC	500	1570		ppm	500	
M-Pro-014	109	Sigma V IC	10/16/07	PNNL	Bromide	10	11		ppm	0.50	
M-Pro-014	109	Sigma V IC	10/16/07	PNNL	Chloride	10	147		ppm	0.50	
M-Pro-014	109	Sigma V IC	10/16/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-014	109	Sigma V IC	10/16/07	PNNL	Nitrite	10		R	ppm	0.50	
M-Pro-014	109	Sigma V IC	10/16/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-014	109	Sigma V IC	10/16/07	PNNL	Sulfate	10	161		ppm	0.50	
M-Pro-015	111	HACH 8023	10/09/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-015	111	HPLC	10/12/07	PNNL	Acetate	5	2059		mg/L	150	
M-Pro-015	111	HPLC	10/12/07	PNNL	Butyrate	5	1252		mg/L	150	
M-Pro-015	111	HPLC	10/12/07	PNNL	Formate	5	180		mg/L	150	
M-Pro-015	111	HPLC	10/12/07	PNNL	Fructose	5	266		mg/L	150	
M-Pro-015	111	HPLC	10/12/07	PNNL	Glucose	5	771		mg/L	150	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-015	111	HPLC	10/12/07	PNNL	Lactate	5	2274		mg/L	150	
M-Pro-015	111	HPLC	10/12/07	PNNL	Propionate	5	1797		mg/L	150	
M-Pro-015	111	HPLC	10/12/07	PNNL	Succinate	5	610		mg/L	150	
M-Pro-015	111	Method 9060A	10/18/07	PNNL	TOC	500	9700		ppm	500	
M-Pro-015	111	Sigma V IC	10/16/07	PNNL	Bromide	20	64		ppm	1.0	
M-Pro-015	111	Sigma V IC	10/16/07	PNNL	Chloride	20	814		ppm	1.0	
M-Pro-015	111	Sigma V IC	10/16/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-015	111	Sigma V IC	10/16/07	PNNL	Nitrite	20		R	ppm	1.0	
M-Pro-015	111	Sigma V IC	10/16/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-015	111	Sigma V IC	10/16/07	PNNL	Sulfate	20	416		ppm	1.0	
M-Pro-016	D5-40	HACH 8023	10/09/07	Field	hex, chromium	1	90		ppb	10	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Acetate	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Butyrate	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Glucose	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Propionate	2	60	U	mg/L	60	
M-Pro-016	D5-40	HPLC	10/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-016	D5-40	Method 9060A	10/18/07	PNNL	TOC	1	2.3		ppm	1	
M-Pro-016	D5-40	Sigma V IC	10/16/07	PNNL	Bromide	2	0.27		ppm	0.10	
M-Pro-016	D5-40	Sigma V IC	10/16/07	PNNL	Chloride	2	25		ppm	0.10	
M-Pro-016	D5-40	Sigma V IC	10/16/07	PNNL	Nitrate	2	58		ppm	0.10	
M-Pro-016	D5-40	Sigma V IC	10/16/07	PNNL	Nitrite	2		R	ppm	0.10	
M-Pro-016	D5-40	Sigma V IC	10/16/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-016	D5-40	Sigma V IC	10/16/07	PNNL	Sulfate	2	133		ppm	0.10	
M-Pro-020	107	HACH 8023	10/17/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-020	107	HPLC	11/08/07	PNNL	Acetate	4	4274	J	mg/L	120	HT
M-Pro-020	107	HPLC	11/08/07	PNNL	Butyrate	4	2441	J	mg/L	120	HT
M-Pro-020	107	HPLC	11/08/07	PNNL	Formate	4	120	UJ	mg/L	120	HT
M-Pro-020	107	HPLC	11/08/07	PNNL	Fructose	4	120	UJ	mg/L	120	HT
M-Pro-020	107	HPLC	11/08/07	PNNL	Glucose	4	469	J	mg/L	120	HT

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-020	107	HPLC	11/08/07	PNNL	Lactate	4	120	UJ	mg/L	120	HT
M-Pro-020	107	HPLC	11/08/07	PNNL	Propionate	4	2595	J	mg/L	120	HT
M-Pro-020	107	HPLC	11/08/07	PNNL	Succinate	4	120	UJ	mg/L	120	HT
M-Pro-020	107	Method 9060A	10/19/07	PNNL	TOC	500	7300		ppm	500	
M-Pro-020	107	Sigma V IC	10/22/07	PNNL	Bromide	20	41		ppm	1.0	
M-Pro-020	107	Sigma V IC	10/22/07	PNNL	Chloride	20	525		ppm	1.0	
M-Pro-020	107	Sigma V IC	10/22/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-020	107	Sigma V IC	10/22/07	PNNL	Nitrite	20		R	ppm	1.0	
M-Pro-020	107	Sigma V IC	10/22/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-020	107	Sigma V IC	10/22/07	PNNL	Sulfate	20	241		ppm	1.0	
M-Pro-021	110	HACH 8023	10/17/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-021	110	HPLC	11/08/07	PNNL	Acetate	4	1584	J	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Butyrate	4	2097	J	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Formate	4	56	J	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Fructose	4	120	UJ	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Glucose	4	739	J	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Lactate	4	1092	J	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Propionate	4	2543	J	mg/L	120	HT
M-Pro-021	110	HPLC	11/08/07	PNNL	Succinate	4	373	J	mg/L	120	HT
M-Pro-021	110	Method 9060A	10/19/07	PNNL	TOC	500	8700		ppm	500	
M-Pro-021	110	Sigma V IC	10/22/07	PNNL	Bromide	20	65		ppm	1.0	
M-Pro-021	110	Sigma V IC	10/22/07	PNNL	Chloride	20	756		ppm	1.0	
M-Pro-021	110	Sigma V IC	10/22/07	PNNL	Nitrate	20	1.3		ppm	1.0	
M-Pro-021	110	Sigma V IC	10/22/07	PNNL	Nitrite	20		R	ppm	1.0	
M-Pro-021	110	Sigma V IC	10/22/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-021	110	Sigma V IC	10/22/07	PNNL	Sulfate	20	380		ppm	1.0	
M-Pro-022	112	HACH 8023	10/17/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-022	112	HPLC	11/08/07	PNNL	Acetate	1	276	J	mg/L	30	HT
M-Pro-022	112	HPLC	11/08/07	PNNL	Butyrate	1	148	J	mg/L	30	HT
M-Pro-022	112	HPLC	11/08/07	PNNL	Formate	1	63	J	mg/L	30	HT
M-Pro-022	112	HPLC	11/08/07	PNNL	Fructose	1	112	J	mg/L	30	HT
M-Pro-022	112	HPLC	11/08/07	PNNL	Glucose	1	58	J	mg/L	30	HT

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-022	112	HPLC	11/08/07	PNNL	Lactate	1	180	J	mg/L	30	HT
M-Pro-022	112	HPLC	11/08/07	PNNL	Propionate	1	55	J	mg/L	30	HT
M-Pro-022	112	HPLC	11/08/07	PNNL	Succinate	1	57	J	mg/L	30	HT
M-Pro-022	112	Method 9060A	10/19/07	PNNL	TOC	200	1290		ppm	200	
M-Pro-022	112	Sigma V IC	10/22/07	PNNL	Bromide	10	11		ppm	0.50	
M-Pro-022	112	Sigma V IC	10/22/07	PNNL	Chloride	10	150		ppm	0.50	
M-Pro-022	112	Sigma V IC	10/22/07	PNNL	Nitrate	10	5		ppm	0.50	
M-Pro-022	112	Sigma V IC	10/22/07	PNNL	Nitrite	10	1.2		ppm	0.50	
M-Pro-022	112	Sigma V IC	10/22/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-022	112	Sigma V IC	10/22/07	PNNL	Sulfate	10	159		ppm	0.50	
M-Pro-023	113	HACH 8023	10/17/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-023	113	HPLC	11/08/07	PNNL	Acetate	1	662	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Butyrate	1	144	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Formate	1	93	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Fructose	1	232	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Glucose	1	207	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Lactate	1	220	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Propionate	1	143	J	mg/L	30	HT
M-Pro-023	113	HPLC	11/08/07	PNNL	Succinate	1	66	J	mg/L	30	HT
M-Pro-023	113	Method 9060A	10/19/07	PNNL	TOC	200	1420		ppm	200	
M-Pro-023	113	Sigma V IC	10/22/07	PNNL	Bromide	10	12		ppm	0.50	
M-Pro-023	113	Sigma V IC	10/22/07	PNNL	Chloride	10	135		ppm	0.50	
M-Pro-023	113	Sigma V IC	10/22/07	PNNL	Nitrate	10	0.32	J	ppm	0.50	RL
M-Pro-023	113	Sigma V IC	10/22/07	PNNL	Nitrite	10		R	ppm	0.50	
M-Pro-023	113	Sigma V IC	10/22/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-023	113	Sigma V IC	10/22/07	PNNL	Sulfate	10	152		ppm	0.50	
M-Pro-024	109	HACH 8023	10/17/07	Field	hex, chromium	1	20		ppb	10	
M-Pro-024	109	HPLC	11/08/07	PNNL	Acetate	1	904	J	mg/L	30	HT
M-Pro-024	109	HPLC	11/08/07	PNNL	Butyrate	1	575	J	mg/L	30	HT
M-Pro-024	109	HPLC	11/08/07	PNNL	Formate	1	30	UJ	mg/L	30	HT
M-Pro-024	109	HPLC	11/08/07	PNNL	Fructose	1	27	J	mg/L	30	HT
M-Pro-024	109	HPLC	11/08/07	PNNL	Glucose	1	42	J	mg/L	30	HT

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-024	109	HPLC	11/08/07	PNNL	Lactate	1	30	UJ	mg/L	30	HT
M-Pro-024	109	HPLC	11/08/07	PNNL	Propionate	1	102	J	mg/L	30	HT
M-Pro-024	109	HPLC	11/08/07	PNNL	Succinate	1	30	UJ	mg/L	30	HT
M-Pro-024	109	Method 9060A	10/19/07	PNNL	TOC	200	1200		ppm	200	
M-Pro-024	109	Sigma V IC	10/22/07	PNNL	Bromide	10	8.5		ppm	0.50	
M-Pro-024	109	Sigma V IC	10/22/07	PNNL	Chloride	10	116		ppm	0.50	
M-Pro-024	109	Sigma V IC	10/22/07	PNNL	Nitrate	10	2.0		ppm	0.50	
M-Pro-024	109	Sigma V IC	10/22/07	PNNL	Nitrite	10	0.21	J	ppm	0.50	RL
M-Pro-024	109	Sigma V IC	10/22/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-024	109	Sigma V IC	10/22/07	PNNL	Sulfate	10	144		ppm	0.50	
M-Pro-025	111	HACH 8023	10/17/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-025	111	HPLC	11/08/07	PNNL	Acetate	4	1859	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Butyrate	4	2700	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Formate	4	47	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Fructose	4	693	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Glucose	4	965	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Lactate	4	438	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Propionate	4	2008	J	mg/L	120	HT
M-Pro-025	111	HPLC	11/08/07	PNNL	Succinate	4	394	J	mg/L	120	HT
M-Pro-025	111	Method 9060A	10/19/07	PNNL	TOC	500	8950		ppm	500	
M-Pro-025	111	Sigma V IC	10/22/07	PNNL	Bromide	20	68		ppm	1.0	
M-Pro-025	111	Sigma V IC	10/22/07	PNNL	Chloride	20	790		ppm	1.0	
M-Pro-025	111	Sigma V IC	10/22/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-025	111	Sigma V IC	10/22/07	PNNL	Nitrite	20		R	ppm	1.0	
M-Pro-025	111	Sigma V IC	10/22/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-025	111	Sigma V IC	10/22/07	PNNL	Sulfate	20	390		ppm	1.0	
M-Pro-026	D5-40	HACH 8023	10/17/07	Field	hex, chromium	1	100		ppb	10	
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Acetate	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Butyrate	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Formate	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Fructose	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Glucose	1	30	UJ	mg/L	30	HT

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Lactate	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Propionate	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	HPLC	11/08/07	PNNL	Succinate	1	30	UJ	mg/L	30	HT
M-Pro-026	D5-40	Method 9060A	10/19/07	PNNL	TOC	1	1.7		ppm	1	
M-Pro-026	D5-40	Sigma V IC	10/22/07	PNNL	Bromide	2	0.32		ppm	0.10	
M-Pro-026	D5-40	Sigma V IC	10/22/07	PNNL	Chloride	2	25		ppm	0.10	
M-Pro-026	D5-40	Sigma V IC	10/22/07	PNNL	Nitrate	2	57		ppm	0.10	
M-Pro-026	D5-40	Sigma V IC	10/22/07	PNNL	Nitrite	2		R	ppm	0.10	
M-Pro-026	D5-40	Sigma V IC	10/22/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-026	D5-40	Sigma V IC	10/22/07	PNNL	Sulfate	2	129		ppm	0.10	
M-Pro-027	NA	HPLC	11/08/07	PNNL	Acetate	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Butyrate	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Formate	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Fructose	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Glucose	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Lactate	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Propionate	1	30	UJ	mg/L	30	HT
M-Pro-027	NA	HPLC	11/08/07	PNNL	Succinate	1	30	UJ	mg/L	30	HT
M-Pro-030	107	HACH 8023	10/24/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-030	107	HPLC	11/08/07	PNNL	Acetate	2	4558	J	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Butyrate	2	1924	J	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Formate	2	60	UJ	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Fructose	2	60	UJ	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Glucose	2	308	J	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Lactate	2	60	UJ	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Propionate	2	1533	J	mg/L	60	HT
M-Pro-030	107	HPLC	11/08/07	PNNL	Succinate	2	60	UJ	mg/L	60	HT
M-Pro-030	107	Method 9060A	10/25/07	PNNL	TOC	500	5200		ppm	500	
M-Pro-030	107	Sigma V IC	10/26/07	PNNL	Bromide	20	30		ppm	1.0	
M-Pro-030	107	Sigma V IC	10/26/07	PNNL	Chloride	20	371		ppm	1.0	
M-Pro-030	107	Sigma V IC	10/26/07	PNNL	Nitrate	20	1.3		ppm	1.0	
M-Pro-030	107	Sigma V IC	10/26/07	PNNL	Nitrite	20	2.3	J	ppm	1.0	INT

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-030	107	Sigma V IC	10/26/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-030	107	Sigma V IC	10/26/07	PNNL	Sulfate	20	212		ppm	1.0	
M-Pro-031	110	HACH 8023	10/24/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-031	110	HPLC	11/08/07	PNNL	Acetate	4	2017	J	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Butyrate	4	2884	J	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Formate	4	120	UJ	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Fructose	4	735	J	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Glucose	4	869	J	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Lactate	4	393	J	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Propionate	4	2452	J	mg/L	120	HT
M-Pro-031	110	HPLC	11/08/07	PNNL	Succinate	4	120	UJ	mg/L	120	HT
M-Pro-031	110	Method 9060A	10/25/07	PNNL	TOC	500	8250		ppm	500	
M-Pro-031	110	Sigma V IC	10/26/07	PNNL	Bromide	20	64		ppm	1.0	
M-Pro-031	110	Sigma V IC	10/26/07	PNNL	Chloride	20	735		ppm	1.0	
M-Pro-031	110	Sigma V IC	10/26/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-031	110	Sigma V IC	10/26/07	PNNL	Nitrite	20	1.0	U	ppm	1.0	
M-Pro-031	110	Sigma V IC	10/26/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-031	110	Sigma V IC	10/26/07	PNNL	Sulfate	20	349		ppm	1.0	
M-Pro-032	112	HACH 8023	10/24/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-032	112	HPLC	11/08/07	PNNL	Acetate	1	565	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Butyrate	1	521	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Formate	1	16	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Fructose	1	146	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Glucose	1	84	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Lactate	1	119	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Propionate	1	122	J	mg/L	30	HT
M-Pro-032	112	HPLC	11/08/07	PNNL	Succinate	1	58	J	mg/L	30	HT
M-Pro-032	112	Method 9060A	10/25/07	PNNL	TOC	500	1280		ppm	500	
M-Pro-032	112	Sigma V IC	10/26/07	PNNL	Bromide	10	11		ppm	0.50	
M-Pro-032	112	Sigma V IC	10/26/07	PNNL	Chloride	10	148		ppm	0.50	
M-Pro-032	112	Sigma V IC	10/26/07	PNNL	Nitrate	10	0.39	J	ppm	0.50	RL
M-Pro-032	112	Sigma V IC	10/26/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-032	112	Sigma V IC	10/26/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-032	112	Sigma V IC	10/26/07	PNNL	Sulfate	10	152		ppm	0.50	
M-Pro-033	113	HACH 8023	10/24/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-033	113	HPLC	11/08/07	PNNL	Acetate	1	934	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Butyrate	1	216	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Formate	1	27	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Fructose	1	86	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Glucose	1	118	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Lactate	1	147	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Propionate	1	222	J	mg/L	30	HT
M-Pro-033	113	HPLC	11/08/07	PNNL	Succinate	1	30	UJ	mg/L	30	HT
M-Pro-033	113	Method 9060A	10/25/07	PNNL	TOC	500	1520		ppm	500	
M-Pro-033	113	Sigma V IC	10/26/07	PNNL	Bromide	10	13		ppm	0.50	
M-Pro-033	113	Sigma V IC	10/26/07	PNNL	Chloride	10	159		ppm	0.50	
M-Pro-033	113	Sigma V IC	10/26/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-033	113	Sigma V IC	10/26/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	
M-Pro-033	113	Sigma V IC	10/26/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-033	113	Sigma V IC	10/26/07	PNNL	Sulfate	10	135		ppm	0.50	
M-Pro-034	109	HACH 8023	10/24/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-034	109	HPLC	11/08/07	PNNL	Acetate	1	994	J	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Butyrate	1	522	J	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Formate	1	30	UJ	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Fructose	1	30	UJ	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Glucose	1	38	J	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Lactate	1	30	UJ	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Propionate	1	151	J	mg/L	30	HT
M-Pro-034	109	HPLC	11/08/07	PNNL	Succinate	1	30	UJ	mg/L	30	HT
M-Pro-034	109	Method 9060A	10/25/07	PNNL	TOC	500	1290		ppm	500	
M-Pro-034	109	Sigma V IC	10/26/07	PNNL	Bromide	10	7.1		ppm	0.50	
M-Pro-034	109	Sigma V IC	10/26/07	PNNL	Chloride	10	98.6		ppm	0.50	
M-Pro-034	109	Sigma V IC	10/26/07	PNNL	Nitrate	10	0.66		ppm	0.50	
M-Pro-034	109	Sigma V IC	10/26/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-034	109	Sigma V IC	10/26/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-034	109	Sigma V IC	10/26/07	PNNL	Sulfate	10	142		ppm	0.50	
M-Pro-035	111	HACH 8023	10/24/07	Field	hex, chromium	5	50	U	ppb	50	
M-Pro-035	111	HPLC	11/08/07	PNNL	Acetate	4	2532	J	mg/L	120	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Butyrate	4	3581	J	mg/L	120	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Formate	4	120	UJ	mg/L	120	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Fructose	4	148	J	mg/L	120	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Glucose	4	510	J	mg/L	120	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Lactate	4	30	UJ	mg/L	30	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Propionate	4	1680	J	mg/L	120	HT
M-Pro-035	111	HPLC	11/08/07	PNNL	Succinate	4	120	UJ	mg/L	120	HT
M-Pro-035	111	Method 9060A	10/25/07	PNNL	TOC	500	6500		ppm	500	
M-Pro-035	111	Sigma V IC	10/26/07	PNNL	Bromide	20	53		ppm	1.0	
M-Pro-035	111	Sigma V IC	10/26/07	PNNL	Chloride	20	629		ppm	1.0	
M-Pro-035	111	Sigma V IC	10/26/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-035	111	Sigma V IC	10/26/07	PNNL	Nitrite	20	1.0	U	ppm	1.0	
M-Pro-035	111	Sigma V IC	10/26/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-035	111	Sigma V IC	10/26/07	PNNL	Sulfate	20	307		ppm	1.0	
M-Pro-036	D5-40	HACH 8023	10/24/07	Field	hex, chromium	1	100		ppb	10	
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Acetate	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Butyrate	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Formate	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Fructose	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Glucose	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Lactate	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Propionate	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	HPLC	11/08/07	PNNL	Succinate	1	30	UJ	mg/L	30	HT
M-Pro-036	D5-40	Method 9060A	10/25/07	PNNL	TOC	1	2.3		ppm	1	
M-Pro-036	D5-40	Sigma V IC	10/26/07	PNNL	Bromide	2	0.29		ppm	0.10	
M-Pro-036	D5-40	Sigma V IC	10/26/07	PNNL	Chloride	2	24		ppm	0.10	
M-Pro-036	D5-40	Sigma V IC	10/26/07	PNNL	Nitrate	2	55		ppm	0.10	
M-Pro-036	D5-40	Sigma V IC	10/26/07	PNNL	Nitrite	2	0.10	U	ppm	0.10	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-036	D5-40	Sigma V IC	10/26/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-036	D5-40	Sigma V IC	10/26/07	PNNL	Sulfate	2	126		ppm	0.10	
M-Pro-040	107	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-040	107	HPLC	11/08/07	PNNL	Acetate	1	3003		mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Butyrate	1	1220		mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Glucose	1	210		mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Propionate	1	1015		mg/L	30	
M-Pro-040	107	HPLC	11/08/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-040	107	Method 9060A	11/05/07	PNNL	TOC	500	3830		ppm	500	
M-Pro-040	107	Sigma V IC	11/02/07	PNNL	Bromide	20	19		ppm	1.0	
M-Pro-040	107	Sigma V IC	11/02/07	PNNL	Chloride	20	248		ppm	1.0	
M-Pro-040	107	Sigma V IC	11/02/07	PNNL	Nitrate	20	0.20	J	ppm	1.0	RL
M-Pro-040	107	Sigma V IC	11/02/07	PNNL	Nitrite	20	1.0	U	ppm	1.0	
M-Pro-040	107	Sigma V IC	11/02/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-040	107	Sigma V IC	11/02/07	PNNL	Sulfate	20	190		ppm	1.0	
M-Pro-041	110	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-041	110	HPLC	11/08/07	PNNL	Acetate	2	2574		mg/L	60	
M-Pro-041	110	HPLC	11/08/07	PNNL	Butyrate	2	2663		mg/L	60	
M-Pro-041	110	HPLC	11/08/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-041	110	HPLC	11/08/07	PNNL	Fructose	2	173		mg/L	60	
M-Pro-041	110	HPLC	11/08/07	PNNL	Glucose	2	530		mg/L	60	
M-Pro-041	110	HPLC	11/08/07	PNNL	Lactate	2	30	U	mg/L	30	
M-Pro-041	110	HPLC	11/08/07	PNNL	Propionate	2	2155		mg/L	60	
M-Pro-041	110	HPLC	11/08/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-041	110	Method 9060A	11/05/07	PNNL	TOC	500	6950		ppm	500	
M-Pro-041	110	Sigma V IC	11/02/07	PNNL	Bromide	20	47		ppm	1.0	
M-Pro-041	110	Sigma V IC	11/02/07	PNNL	Chloride	20	570		ppm	1.0	
M-Pro-041	110	Sigma V IC	11/02/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-041	110	Sigma V IC	11/02/07	PNNL	Nitrite	20	0.57	J	ppm	1.0	INT,RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-041	110	Sigma V IC	11/02/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-041	110	Sigma V IC	11/02/07	PNNL	Sulfate	20	281		ppm	1.0	
M-Pro-042	112	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-042	112	HPLC	11/08/07	PNNL	Acetate	1	497		mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Butyrate	1	573		mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Fructose	1	55		mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Glucose	1	54		mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Propionate	1	120		mg/L	30	
M-Pro-042	112	HPLC	11/08/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-042	112	Method 9060A	11/05/07	PNNL	TOC	200	1160		ppm	200	
M-Pro-042	112	Sigma V IC	11/02/07	PNNL	Bromide	10	9.2		ppm	0.50	
M-Pro-042	112	Sigma V IC	11/02/07	PNNL	Chloride	10	133		ppm	0.50	
M-Pro-042	112	Sigma V IC	11/02/07	PNNL	Nitrate	10	2.6		ppm	0.50	
M-Pro-042	112	Sigma V IC	11/02/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	
M-Pro-042	112	Sigma V IC	11/02/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-042	112	Sigma V IC	11/02/07	PNNL	Sulfate	10	141		ppm	0.50	
M-Pro-043	113	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-043	113	HPLC	11/08/07	PNNL	Acetate	1	1036		mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Butyrate	1	195		mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Fructose	1	125		mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Glucose	1	132		mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Lactate	1	164		mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Propionate	1	322		mg/L	30	
M-Pro-043	113	HPLC	11/08/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-043	113	Method 9060A	11/05/07	PNNL	TOC	200	1710		ppm	200	
M-Pro-043	113	Sigma V IC	11/02/07	PNNL	Bromide	10	13		ppm	0.50	
M-Pro-043	113	Sigma V IC	11/02/07	PNNL	Chloride	10	163		ppm	0.50	
M-Pro-043	113	Sigma V IC	11/02/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-043	113	Sigma V IC	11/02/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-043	113	Sigma V IC	11/02/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-043	113	Sigma V IC	11/02/07	PNNL	Sulfate	10	125		ppm	0.50	
M-Pro-044	109	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-044	109	HPLC	11/08/07	PNNL	Acetate	1	1246		mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Butyrate	1	557		mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Fructose	1	20		mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Glucose	1	58		mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Propionate	1	160		mg/L	30	
M-Pro-044	109	HPLC	11/08/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-044	109	Method 9060A	11/05/07	PNNL	TOC	200	1340		ppm	200	
M-Pro-044	109	Sigma V IC	11/02/07	PNNL	Bromide	10	11		ppm	0.50	
M-Pro-044	109	Sigma V IC	11/02/07	PNNL	Chloride	10	143		ppm	0.50	
M-Pro-044	109	Sigma V IC	11/02/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-044	109	Sigma V IC	11/02/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	
M-Pro-044	109	Sigma V IC	11/02/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-044	109	Sigma V IC	11/02/07	PNNL	Sulfate	10	144		ppm	0.50	
M-Pro-045	111	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-045	111	HPLC	11/08/07	PNNL	Acetate	2	2405		mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Butyrate	2	2458		mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Fructose	2	86		mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Glucose	2	414		mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Propionate	2	1390		mg/L	60	
M-Pro-045	111	HPLC	11/08/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-045	111	Method 9060A	11/05/07	PNNL	TOC	500	5150		ppm	500	
M-Pro-045	111	Sigma V IC	11/02/07	PNNL	Bromide	20	40		ppm	1.0	
M-Pro-045	111	Sigma V IC	11/02/07	PNNL	Chloride	20	489		ppm	1.0	
M-Pro-045	111	Sigma V IC	11/02/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-045	111	Sigma V IC	11/02/07	PNNL	Nitrite	20	0.43	J	ppm	1.0	INT,RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-045	111	Sigma V IC	11/02/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-045	111	Sigma V IC	11/02/07	PNNL	Sulfate	20	259		ppm	1.0	
M-Pro-046	111	HACH 8023	10/31/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-046	111	HPLC	11/08/07	PNNL	Acetate	2	2416		mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Butyrate	2	2712		mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Fructose	2	94		mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Glucose	2	415		mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Propionate	2	1368		mg/L	60	
M-Pro-046	111	HPLC	11/08/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-046	111	Method 9060A	11/05/07	PNNL	TOC	500	5600		ppm	500	
M-Pro-046	111	Sigma V IC	11/02/07	PNNL	Bromide	20	41		ppm	1.0	
M-Pro-046	111	Sigma V IC	11/02/07	PNNL	Chloride	20	501		ppm	1.0	
M-Pro-046	111	Sigma V IC	11/02/07	PNNL	Nitrate	20	1.0	U	ppm	1.0	
M-Pro-046	111	Sigma V IC	11/02/07	PNNL	Nitrite	20	0.25	J	ppm	1.0	INT,RL
M-Pro-046	111	Sigma V IC	11/02/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-046	111	Sigma V IC	11/02/07	PNNL	Sulfate	20	262		ppm	1.0	
M-Pro-047	D5-40	HACH 8023	10/31/07	Field	hex, chromium	1	80		ppb	10	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Butyrate	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-047	D5-40	HPLC	11/08/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-047	D5-40	Method 9060A	11/05/07	PNNL	TOC	1	2.4		ppm	1	
M-Pro-047	D5-40	Sigma V IC	11/02/07	PNNL	Bromide	2	0.24		ppm	0.10	
M-Pro-047	D5-40	Sigma V IC	11/02/07	PNNL	Chloride	2	20		ppm	0.10	
M-Pro-047	D5-40	Sigma V IC	11/02/07	PNNL	Nitrate	2	45		ppm	0.10	
M-Pro-047	D5-40	Sigma V IC	11/02/07	PNNL	Nitrite	2	0.03	J	ppm	0.10	INT,RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-047	D5-40	Sigma V IC	11/02/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-047	D5-40	Sigma V IC	11/02/07	PNNL	Sulfate	2	107		ppm	0.10	
M-Pro-050	107	HACH 8023	11/08/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-050	107	HPLC	11/22/07	PNNL	Acetate	2	1916		mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Butyrate	2	709		mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Glucose	2	118		mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Propionate	2	589		mg/L	60	
M-Pro-050	107	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-050	107	Method 9060A	11/20/07	PNNL	TOC	200	2020		ppm	200	
M-Pro-050	107	Sigma V IC	11/13/07	PNNL	Bromide	20	1.5		ppm	1.0	
M-Pro-050	107	Sigma V IC	11/13/07	PNNL	Chloride	20	174		ppm	1.0	
M-Pro-050	107	Sigma V IC	11/13/07	PNNL	Nitrate	20	1.0		ppm	1.0	
M-Pro-050	107	Sigma V IC	11/13/07	PNNL	Nitrite	20	1.3	J	ppm	1.0	INT
M-Pro-050	107	Sigma V IC	11/13/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-050	107	Sigma V IC	11/13/07	PNNL	Sulfate	20	143		ppm	1.0	
M-Pro-051	110	HACH 8023	11/08/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-051	110	HPLC	11/22/07	PNNL	Acetate	4	2417		mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Butyrate	4	1899		mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Glucose	4	418		mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Propionate	4	1895		mg/L	120	
M-Pro-051	110	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-051	110	Method 9060A	11/20/07	PNNL	TOC	500	5050		ppm	500	
M-Pro-051	110	Sigma V IC	11/13/07	PNNL	Bromide	20	40		ppm	1.0	
M-Pro-051	110	Sigma V IC	11/13/07	PNNL	Chloride	20	467		ppm	1.0	
M-Pro-051	110	Sigma V IC	11/13/07	PNNL	Nitrate	20	0.85	J	ppm	1.0	RL
M-Pro-051	110	Sigma V IC	11/13/07	PNNL	Nitrite	20	0.92	J	ppm	1.0	INT,RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-051	110	Sigma V IC	11/13/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-051	110	Sigma V IC	11/13/07	PNNL	Sulfate	20	245		ppm	1.0	
M-Pro-052	112	HACH 8023	11/08/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-052	112	HPLC	11/22/07	PNNL	Acetate	2	532		mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Butyrate	2	583		mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Fructose	2	40		mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Glucose	2	65		mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Propionate	2	143		mg/L	60	
M-Pro-052	112	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-052	112	Method 9060A	11/20/07	PNNL	TOC	100	989		ppm	100	
M-Pro-052	112	Sigma V IC	11/13/07	PNNL	Bromide	10	9.1		ppm	0.50	
M-Pro-052	112	Sigma V IC	11/13/07	PNNL	Chloride	10	129		ppm	0.50	
M-Pro-052	112	Sigma V IC	11/13/07	PNNL	Nitrate	10	1.4		ppm	0.50	
M-Pro-052	112	Sigma V IC	11/13/07	PNNL	Nitrite	10	0.50	U	ppm	0.50	
M-Pro-052	112	Sigma V IC	11/13/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-052	112	Sigma V IC	11/13/07	PNNL	Sulfate	10	131		ppm	0.50	
M-Pro-053	113	HACH 8023	11/08/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-053	113	HPLC	11/22/07	PNNL	Acetate	2	1013		mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Butyrate	2	186		mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Fructose	2	108		mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Glucose	2	121		mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Lactate	2	181		mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Propionate	2	381		mg/L	60	
M-Pro-053	113	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-053	113	Method 9060A	11/20/07	PNNL	TOC	100	1410		ppm	100	
M-Pro-053	113	Sigma V IC	11/13/07	PNNL	Bromide	10	11		ppm	0.50	
M-Pro-053	113	Sigma V IC	11/13/07	PNNL	Chloride	10	138		ppm	0.50	
M-Pro-053	113	Sigma V IC	11/13/07	PNNL	Nitrate	10	0.29	J	ppm	0.50	RL
M-Pro-053	113	Sigma V IC	11/13/07	PNNL	Nitrite	10	0.32	J	ppm	0.50	INT,RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-053	113	Sigma V IC	11/13/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-053	113	Sigma V IC	11/13/07	PNNL	Sulfate	10	98		ppm	0.50	
M-Pro-054	109	HACH 8023	11/08/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-054	109	HPLC	11/22/07	PNNL	Acetate	2	1464		mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Butyrate	2	605		mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Glucose	2	50		mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Propionate	2	202		mg/L	60	
M-Pro-054	109	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-054	109	Method 9060A	11/20/07	PNNL	TOC	100	1280		ppm	100	
M-Pro-054	109	Sigma V IC	11/13/07	PNNL	Bromide	10	11		ppm	0.50	
M-Pro-054	109	Sigma V IC	11/13/07	PNNL	Chloride	10	138		ppm	0.50	
M-Pro-054	109	Sigma V IC	11/13/07	PNNL	Nitrate	10	0.30	J	ppm	0.50	RL
M-Pro-054	109	Sigma V IC	11/13/07	PNNL	Nitrite	10	0.21	J	ppm	0.50	INT,RL
M-Pro-054	109	Sigma V IC	11/13/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-054	109	Sigma V IC	11/13/07	PNNL	Sulfate	10	111		ppm	0.50	
M-Pro-055	111	HACH 8023	11/08/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-055	111	HPLC	11/22/07	PNNL	Acetate	4	2450		mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Butyrate	4	2353		mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Glucose	4	341		mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Propionate	4	1195		mg/L	120	
M-Pro-055	111	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-055	111	Method 9060A	11/20/07	PNNL	TOC	500	5200		ppm	500	
M-Pro-055	111	Sigma V IC	11/13/07	PNNL	Bromide	20	36		ppm	1.0	
M-Pro-055	111	Sigma V IC	11/13/07	PNNL	Chloride	20	446		ppm	1.0	
M-Pro-055	111	Sigma V IC	11/13/07	PNNL	Nitrate	20	0.21	J	ppm	1.0	RL
M-Pro-055	111	Sigma V IC	11/13/07	PNNL	Nitrite	20	0.64	J	ppm	1.0	INT,RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-055	111	Sigma V IC	11/13/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-055	111	Sigma V IC	11/13/07	PNNL	Sulfate	20	243		ppm	1.0	
M-Pro-056	D5-40	HACH 8023	11/08/07	Field	hex, chromium	1	110		ppb	10	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Butyrate	1	230		mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-056	D5-40	HPLC	11/22/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-056	D5-40	Method 9060A	11/20/07	PNNL	TOC	1	2.2		ppm	1	
M-Pro-056	D5-40	Sigma V IC	11/13/07	PNNL	Bromide	2	0.24		ppm	0.10	
M-Pro-056	D5-40	Sigma V IC	11/13/07	PNNL	Chloride	2	24		ppm	0.10	
M-Pro-056	D5-40	Sigma V IC	11/13/07	PNNL	Nitrate	2	53		ppm	0.10	
M-Pro-056	D5-40	Sigma V IC	11/13/07	PNNL	Nitrite	2	0.10	U	ppm	0.10	
M-Pro-056	D5-40	Sigma V IC	11/13/07	PNNL	Phosphate	2	0.04	J	ppm	0.10	RL
M-Pro-056	D5-40	Sigma V IC	11/13/07	PNNL	Sulfate	2	126		ppm	0.10	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Butyrate	1	124		mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-057	NA	HPLC	11/22/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-060	109	HACH 8023	11/15/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-060	109	HPLC	11/22/07	PNNL	Acetate	2	1426		mg/L	60	
M-Pro-060	109	HPLC	11/22/07	PNNL	Butyrate	2	650		mg/L	60	
M-Pro-060	109	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-060	109	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-060	109	HPLC	11/22/07	PNNL	Glucose	2	54		mg/L	60	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-060	109	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-060	109	HPLC	11/22/07	PNNL	Propionate	2	246		mg/L	60	
M-Pro-060	109	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-060	109	Method 9060A	11/21/07	PNNL	TOC	100	1210		ppm	100	
M-Pro-060	109	Sigma V IC	11/20/07	PNNL	Bromide	5	9.5		ppm	0.25	
M-Pro-060	109	Sigma V IC	11/20/07	PNNL	Chloride	5	133		ppm	0.25	
M-Pro-060	109	Sigma V IC	11/20/07	PNNL	Nitrate	5	0.10	J	ppm	0.25	RL
M-Pro-060	109	Sigma V IC	11/20/07	PNNL	Nitrite	5	0.06	J	ppm	0.25	RL
M-Pro-060	109	Sigma V IC	11/20/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-060	109	Sigma V IC	11/20/07	PNNL	Sulfate	5	103		ppm	0.25	
M-Pro-061	D5-40	HACH 8023	11/15/07	Field	hex, chromium	1	130		ppb	10	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Butyrate	1	362		mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-061	D5-40	HPLC	11/22/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-061	D5-40	Method 9060A	11/21/07	PNNL	TOC	1	2.5		ppm	1	
M-Pro-061	D5-40	Sigma V IC	11/20/07	PNNL	Bromide	2	0.25		ppm	0.10	
M-Pro-061	D5-40	Sigma V IC	11/20/07	PNNL	Chloride	2	24		ppm	0.10	
M-Pro-061	D5-40	Sigma V IC	11/20/07	PNNL	Nitrate	2	55		ppm	0.10	
M-Pro-061	D5-40	Sigma V IC	11/20/07	PNNL	Nitrite	2	0.10	U	ppm	0.10	
M-Pro-061	D5-40	Sigma V IC	11/20/07	PNNL	Phosphate	2	0.10	U	ppm	0.10	
M-Pro-061	D5-40	Sigma V IC	11/20/07	PNNL	Sulfate	2	125		ppm	0.10	
M-Pro-062	111	HACH 8023	11/15/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-062	111	HPLC	11/22/07	PNNL	Acetate	4	2510		mg/L	120	
M-Pro-062	111	HPLC	11/22/07	PNNL	Butyrate	4	1827		mg/L	120	
M-Pro-062	111	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-062	111	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-062	111	HPLC	11/22/07	PNNL	Glucose	4	360		mg/L	120	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-062	111	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-062	111	HPLC	11/22/07	PNNL	Propionate	4	1162		mg/L	120	
M-Pro-062	111	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-062	111	Method 9060A	11/21/07	PNNL	TOC	500	4500		ppm	500	
M-Pro-062	111	Sigma V IC	11/20/07	PNNL	Bromide	10	32		ppm	0.50	
M-Pro-062	111	Sigma V IC	11/20/07	PNNL	Chloride	10	413		ppm	0.50	
M-Pro-062	111	Sigma V IC	11/20/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-062	111	Sigma V IC	11/20/07	PNNL	Nitrite	10	0.23	J	ppm	0.50	RL
M-Pro-062	111	Sigma V IC	11/20/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-062	111	Sigma V IC	11/20/07	PNNL	Sulfate	10	216		ppm	0.50	
M-Pro-063	107	HACH 8023	11/15/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-063	107	HPLC	11/22/07	PNNL	Acetate	2	1586		mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Butyrate	2	886		mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Glucose	2	133		mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Propionate	2	518		mg/L	60	
M-Pro-063	107	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-063	107	Method 9060A	11/21/07	PNNL	TOC	200	1980		ppm	200	
M-Pro-063	107	Sigma V IC	11/20/07	PNNL	Bromide	10	10		ppm	0.50	
M-Pro-063	107	Sigma V IC	11/20/07	PNNL	Chloride	10	140		ppm	0.50	
M-Pro-063	107	Sigma V IC	11/20/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-063	107	Sigma V IC	11/20/07	PNNL	Nitrite	10	0.54		ppm	0.50	
M-Pro-063	107	Sigma V IC	11/20/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-063	107	Sigma V IC	11/20/07	PNNL	Sulfate	10	93		ppm	0.50	
M-Pro-064	110	HACH 8023	11/15/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-064	110	HPLC	11/22/07	PNNL	Acetate	4	2243		mg/L	120	
M-Pro-064	110	HPLC	11/22/07	PNNL	Butyrate	4	1649		mg/L	120	
M-Pro-064	110	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-064	110	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-064	110	HPLC	11/22/07	PNNL	Glucose	4	361		mg/L	120	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-064	110	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-064	110	HPLC	11/22/07	PNNL	Propionate	4	1507		mg/L	120	
M-Pro-064	110	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-064	110	Method 9060A	11/21/07	PNNL	TOC	500	5100		ppm	500	
M-Pro-064	110	Sigma V IC	11/20/07	PNNL	Bromide	10	34		ppm	0.50	
M-Pro-064	110	Sigma V IC	11/20/07	PNNL	Chloride	10	426		ppm	0.50	
M-Pro-064	110	Sigma V IC	11/20/07	PNNL	Nitrate	10	0.50	U	ppm	0.50	
M-Pro-064	110	Sigma V IC	11/20/07	PNNL	Nitrite	10	0.20	J	ppm	0.50	RL
M-Pro-064	110	Sigma V IC	11/20/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-064	110	Sigma V IC	11/20/07	PNNL	Sulfate	10	218		ppm	0.50	
M-Pro-065	113	HACH 8023	11/15/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-065	113	HPLC	11/22/07	PNNL	Acetate	2	950		mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Butyrate	2	422		mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Fructose	2	88		mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Glucose	2	124		mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Lactate	2	89		mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Propionate	2	304		mg/L	60	
M-Pro-065	113	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-065	113	Method 9060A	11/21/07	PNNL	TOC	100	1470		ppm	100	
M-Pro-065	113	Sigma V IC	11/20/07	PNNL	Bromide	5	11		ppm	0.25	
M-Pro-065	113	Sigma V IC	11/20/07	PNNL	Chloride	5	154		ppm	0.25	
M-Pro-065	113	Sigma V IC	11/20/07	PNNL	Nitrate	5	0.25	U	ppm	0.25	
M-Pro-065	113	Sigma V IC	11/20/07	PNNL	Nitrite	5	0.13	J	ppm	0.25	RL
M-Pro-065	113	Sigma V IC	11/20/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-065	113	Sigma V IC	11/20/07	PNNL	Sulfate	5	76		ppm	0.25	
M-Pro-066	112	HACH 8023	11/15/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-066	112	HPLC	11/22/07	PNNL	Acetate	2	600		mg/L	60	
M-Pro-066	112	HPLC	11/22/07	PNNL	Butyrate	2	380		mg/L	60	
M-Pro-066	112	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-066	112	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-066	112	HPLC	11/22/07	PNNL	Glucose	2	67		mg/L	60	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-066	112	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-066	112	HPLC	11/22/07	PNNL	Propionate	2	166		mg/L	60	
M-Pro-066	112	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-066	112	Method 9060A	11/21/07	PNNL	TOC	100	966		ppm	100	
M-Pro-066	112	Sigma V IC	11/20/07	PNNL	Bromide	6	7.2		ppm	0.30	
M-Pro-066	112	Sigma V IC	11/20/07	PNNL	Chloride	6	108		ppm	0.30	
M-Pro-066	112	Sigma V IC	11/20/07	PNNL	Nitrate	6	2.0		ppm	0.30	
M-Pro-066	112	Sigma V IC	11/20/07	PNNL	Nitrite	6	0.30	U	ppm	0.30	
M-Pro-066	112	Sigma V IC	11/20/07	PNNL	Phosphate	6	0.30	U	ppm	0.30	
M-Pro-066	112	Sigma V IC	11/20/07	PNNL	Sulfate	6	111		ppm	0.30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Butyrate	1	193		mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-067	NA	HPLC	11/22/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-070	107	HACH 8023	11/20/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-070	107	HPLC	11/22/07	PNNL	Acetate	2	1388		mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Butyrate	2	590		mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Glucose	2	106		mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Propionate	2	457		mg/L	60	
M-Pro-070	107	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-070	107	Method 9060A	11/27/07	PNNL	TOC	200	1570		ppm	200	
M-Pro-070	107	Sigma V IC	11/27/07	PNNL	Bromide	10	8.5		ppm	0.50	
M-Pro-070	107	Sigma V IC	11/27/07	PNNL	Chloride	10	122		ppm	0.50	
M-Pro-070	107	Sigma V IC	11/27/07	PNNL	Nitrate	10	0.21	J	ppm	0.50	RL
M-Pro-070	107	Sigma V IC	11/27/07	PNNL	Nitrite	10		R	ppm	0.50	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-070	107	Sigma V IC	11/27/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-070	107	Sigma V IC	11/27/07	PNNL	Sulfate	10	71		ppm	0.50	
M-Pro-071	110	HACH 8023	11/20/07	Field	hex, chromium	1	50		ppb	10	
M-Pro-071	110	HPLC	11/22/07	PNNL	Acetate	4	2132		mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Butyrate	4	1976		mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Glucose	4	375		mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Propionate	4	1289		mg/L	120	
M-Pro-071	110	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-071	110	Method 9060A	11/27/07	PNNL	TOC	500	4380		ppm	500	
M-Pro-071	110	Sigma V IC	11/27/07	PNNL	Bromide	20	36		ppm	1.0	
M-Pro-071	110	Sigma V IC	11/27/07	PNNL	Chloride	20	441		ppm	1.0	
M-Pro-071	110	Sigma V IC	11/27/07	PNNL	Nitrate	20	0.73	J	ppm	1.0	RL
M-Pro-071	110	Sigma V IC	11/27/07	PNNL	Nitrite	20	0.65	J	ppm	1.0	RL
M-Pro-071	110	Sigma V IC	11/27/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-071	110	Sigma V IC	11/27/07	PNNL	Sulfate	20	227		ppm	1.0	
M-Pro-072	112	HACH 8023	11/20/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-072	112	HPLC	11/22/07	PNNL	Acetate	2	596		mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Butyrate	2	495		mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Glucose	2	55		mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Propionate	2	154		mg/L	60	
M-Pro-072	112	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-072	112	Method 9060A	11/27/07	PNNL	TOC	100	798		ppm	100	
M-Pro-072	112	Sigma V IC	11/27/07	PNNL	Bromide	5	6.1		ppm	0.25	
M-Pro-072	112	Sigma V IC	11/27/07	PNNL	Chloride	5	94		ppm	0.25	
M-Pro-072	112	Sigma V IC	11/27/07	PNNL	Nitrate	5	0.34		ppm	0.25	
M-Pro-072	112	Sigma V IC	11/27/07	PNNL	Nitrite	5	0.25	U	ppm	0.25	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-072	112	Sigma V IC	11/27/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-072	112	Sigma V IC	11/27/07	PNNL	Sulfate	5	95		ppm	0.25	
M-Pro-073	113	HACH 8023	11/20/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-073	113	HPLC	11/22/07	PNNL	Acetate	2	157		mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Butyrate	2	250		mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Fructose	2	69		mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Glucose	2	108		mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Propionate	2	319		mg/L	60	
M-Pro-073	113	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-073	113	Method 9060A	11/27/07	PNNL	TOC	100	1370		ppm	100	
M-Pro-073	113	Sigma V IC	11/27/07	PNNL	Bromide	5	10		ppm	0.25	
M-Pro-073	113	Sigma V IC	11/27/07	PNNL	Chloride	5	142		ppm	0.25	
M-Pro-073	113	Sigma V IC	11/27/07	PNNL	Nitrate	5	0.06	J	ppm	0.25	RL
M-Pro-073	113	Sigma V IC	11/27/07	PNNL	Nitrite	5	0.33		ppm	0.25	
M-Pro-073	113	Sigma V IC	11/27/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-073	113	Sigma V IC	11/27/07	PNNL	Sulfate	5	74		ppm	0.25	
M-Pro-074	109	HACH 8023	11/20/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-074	109	HPLC	11/22/07	PNNL	Acetate	2	1553		mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Butyrate	2	454		mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Glucose	2	53		mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Propionate	2	197		mg/L	60	
M-Pro-074	109	HPLC	11/22/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-074	109	Method 9060A	11/27/07	PNNL	TOC	100	1160		ppm	100	
M-Pro-074	109	Sigma V IC	11/27/07	PNNL	Bromide	5	5.1		ppm	0.25	
M-Pro-074	109	Sigma V IC	11/27/07	PNNL	Chloride	5	78		ppm	0.25	
M-Pro-074	109	Sigma V IC	11/27/07	PNNL	Nitrate	5	0.25	U	ppm	0.25	
M-Pro-074	109	Sigma V IC	11/27/07	PNNL	Nitrite	5	0.25	U	ppm	0.25	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-074	109	Sigma V IC	11/27/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-074	109	Sigma V IC	11/27/07	PNNL	Sulfate	5	13		ppm	0.25	
M-Pro-075	111	HACH 8023	11/20/07	Field	hex, chromium	1	100		ppb	10	
M-Pro-075	111	HPLC	11/22/07	PNNL	Acetate	4	2382		mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Butyrate	4	1951		mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Glucose	4	294		mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Propionate	4	1008		mg/L	120	
M-Pro-075	111	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-075	111	Method 9060A	11/27/07	PNNL	TOC	500	4080		ppm	500	
M-Pro-075	111	Sigma V IC	11/27/07	PNNL	Bromide	20	30		ppm	1.0	
M-Pro-075	111	Sigma V IC	11/27/07	PNNL	Chloride	20	372		ppm	1.0	
M-Pro-075	111	Sigma V IC	11/27/07	PNNL	Nitrate	20	0.32	J	ppm	1.0	RL
M-Pro-075	111	Sigma V IC	11/27/07	PNNL	Nitrite	20	0.73	J	ppm	1.0	RL
M-Pro-075	111	Sigma V IC	11/27/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-075	111	Sigma V IC	11/27/07	PNNL	Sulfate	20	209		ppm	1.0	
M-Pro-076	111	HACH 8023	11/20/07	Field	hex, chromium	1	100		ppb	10	
M-Pro-076	111	HPLC	11/22/07	PNNL	Acetate	4	2632		mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Butyrate	4	2226		mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Fructose	4	120	U	mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Glucose	4	315		mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Propionate	4	1148		mg/L	120	
M-Pro-076	111	HPLC	11/22/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-076	111	Method 9060A	11/27/07	PNNL	TOC	500	4290		ppm	500	
M-Pro-076	111	Sigma V IC	11/27/07	PNNL	Bromide	20	34		ppm	1.0	
M-Pro-076	111	Sigma V IC	11/27/07	PNNL	Chloride	20	425		ppm	1.0	
M-Pro-076	111	Sigma V IC	11/27/07	PNNL	Nitrate	20	0.29	J	ppm	1.0	RL
M-Pro-076	111	Sigma V IC	11/27/07	PNNL	Nitrite	20	0.50	J	ppm	1.0	RL

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-076	111	Sigma V IC	11/27/07	PNNL	Phosphate	20	1.0	U	ppm	1.0	
M-Pro-076	111	Sigma V IC	11/27/07	PNNL	Sulfate	20	222		ppm	1.0	
M-Pro-077	D5-40	HACH 8023	11/20/07	Field	hex, chromium	1	120		ppb	10	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Butyrate	1	203		mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-077	D5-40	HPLC	11/22/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-077	D5-40	Method 9060A	11/27/07	PNNL	TOC	1	2.4		ppm	1	
M-Pro-077	D5-40	Sigma V IC	11/27/07	PNNL	Bromide	2	0.23		ppm	0.10	
M-Pro-077	D5-40	Sigma V IC	11/27/07	PNNL	Chloride	2	23		ppm	0.10	
M-Pro-077	D5-40	Sigma V IC	11/27/07	PNNL	Nitrate	2	52		ppm	0.10	
M-Pro-077	D5-40	Sigma V IC	11/27/07	PNNL	Nitrite	2	0.10	U	ppm	0.10	
M-Pro-077	D5-40	Sigma V IC	11/27/07	PNNL	Phosphate	2	0.04	J	ppm	0.10	RL
M-Pro-077	D5-40	Sigma V IC	11/27/07	PNNL	Sulfate	2	118		ppm	0.10	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Butyrate	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Fructose	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Glucose	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-078	NA	HPLC	11/22/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-080	107	HACH 8023	11/28/07	Field	hex, chromium	1	50		ppb	10	
M-Pro-080	107	HPLC	12/12/07	PNNL	Acetate	2	1082		mg/L	60	
M-Pro-080	107	HPLC	12/12/07	PNNL	Butyrate	2	317		mg/L	60	
M-Pro-080	107	HPLC	12/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-080	107	HPLC	12/12/07	PNNL	Fructose	2	30	U	mg/L	60	
M-Pro-080	107	HPLC	12/12/07	PNNL	Glucose	2	77		mg/L	60	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-080	107	HPLC	12/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-080	107	HPLC	12/12/07	PNNL	Propionate	2	325		mg/L	60	
M-Pro-080	107	HPLC	12/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-080	107	Method 9060A	11/29/07	PNNL	TOC	200	1400		ppm	200	
M-Pro-080	107	Sigma V IC	11/30/07	PNNL	Bromide	5	5.7		ppm	0.25	
M-Pro-080	107	Sigma V IC	11/30/07	PNNL	Chloride	5	92		ppm	0.25	
M-Pro-080	107	Sigma V IC	11/30/07	PNNL	Nitrate	5	0.06	J	ppm	0.25	RL
M-Pro-080	107	Sigma V IC	11/30/07	PNNL	Nitrite	5	0.66		ppm	0.25	
M-Pro-080	107	Sigma V IC	11/30/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-080	107	Sigma V IC	11/30/07	PNNL	Sulfate	5	35		ppm	0.25	
M-Pro-081	110	HACH 8023	11/28/07	Field	hex, chromium	1	150		ppb	10	
M-Pro-081	110	HPLC	12/12/07	PNNL	Acetate	4	2158		mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Butyrate	4	1689		mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Fructose	4	60	U	mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Glucose	4	382		mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Propionate	4	1174		mg/L	120	
M-Pro-081	110	HPLC	12/12/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-081	110	Method 9060A	11/29/07	PNNL	TOC	500	5000		ppm	500	
M-Pro-081	110	Sigma V IC	11/30/07	PNNL	Bromide	10	35		ppm	0.50	
M-Pro-081	110	Sigma V IC	11/30/07	PNNL	Chloride	10	459		ppm	0.50	
M-Pro-081	110	Sigma V IC	11/30/07	PNNL	Nitrate	10	0.71		ppm	0.50	
M-Pro-081	110	Sigma V IC	11/30/07	PNNL	Nitrite	10	1.5		ppm	0.50	
M-Pro-081	110	Sigma V IC	11/30/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-081	110	Sigma V IC	11/30/07	PNNL	Sulfate	10	220		ppm	0.50	
M-Pro-082	112	HACH 8023	11/28/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-082	112	HPLC	12/12/07	PNNL	Acetate	2	568		mg/L	60	
M-Pro-082	112	HPLC	12/12/07	PNNL	Butyrate	2	354		mg/L	60	
M-Pro-082	112	HPLC	12/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-082	112	HPLC	12/12/07	PNNL	Fructose	2	120	U	mg/L	60	
M-Pro-082	112	HPLC	12/12/07	PNNL	Glucose	2	39		mg/L	60	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-082	112	HPLC	12/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-082	112	HPLC	12/12/07	PNNL	Propionate	2	136		mg/L	60	
M-Pro-082	112	HPLC	12/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-082	112	Method 9060A	11/29/07	PNNL	TOC	100	862		ppm	100	
M-Pro-082	112	Sigma V IC	11/30/07	PNNL	Bromide	5	5.5		ppm	0.25	
M-Pro-082	112	Sigma V IC	11/30/07	PNNL	Chloride	5	86		ppm	0.25	
M-Pro-082	112	Sigma V IC	11/30/07	PNNL	Nitrate	5	0.86		ppm	0.25	
M-Pro-082	112	Sigma V IC	11/30/07	PNNL	Nitrite	5		R	ppm	0.25	
M-Pro-082	112	Sigma V IC	11/30/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-082	112	Sigma V IC	11/30/07	PNNL	Sulfate	5	91		ppm	0.25	
M-Pro-083	113	HACH 8023	11/28/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-083	113	HPLC	12/12/07	PNNL	Acetate	2	895		mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Butyrate	2	161		mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Fructose	2	68		mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Glucose	2	99		mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Lactate	2	75		mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Propionate	2	318		mg/L	60	
M-Pro-083	113	HPLC	12/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-083	113	Method 9060A	11/29/07	PNNL	TOC	100	1490		ppm	100	
M-Pro-083	113	Sigma V IC	11/30/07	PNNL	Bromide	5	12		ppm	0.25	
M-Pro-083	113	Sigma V IC	11/30/07	PNNL	Chloride	5	160		ppm	0.25	
M-Pro-083	113	Sigma V IC	11/30/07	PNNL	Nitrate	5	0.25	U	ppm	0.25	
M-Pro-083	113	Sigma V IC	11/30/07	PNNL	Nitrite	5	0.24	J	ppm	0.25	RL
M-Pro-083	113	Sigma V IC	11/30/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-083	113	Sigma V IC	11/30/07	PNNL	Sulfate	5	72		ppm	0.25	
M-Pro-084	109	HACH 8023	11/28/07	Field	hex, chromium	1	10	U	ppb	10	
M-Pro-084	109	HPLC	12/12/07	PNNL	Acetate	2	1744		mg/L	60	
M-Pro-084	109	HPLC	12/12/07	PNNL	Butyrate	2	448		mg/L	60	
M-Pro-084	109	HPLC	12/12/07	PNNL	Formate	2	60	U	mg/L	60	
M-Pro-084	109	HPLC	12/12/07	PNNL	Fructose	2	60	U	mg/L	60	
M-Pro-084	109	HPLC	12/12/07	PNNL	Glucose	2	46		mg/L	60	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-084	109	HPLC	12/12/07	PNNL	Lactate	2	60	U	mg/L	60	
M-Pro-084	109	HPLC	12/12/07	PNNL	Propionate	2	197		mg/L	60	
M-Pro-084	109	HPLC	12/12/07	PNNL	Succinate	2	60	U	mg/L	60	
M-Pro-084	109	Method 9060A	11/29/07	PNNL	TOC	100	1250		ppm	100	
M-Pro-084	109	Sigma V IC	11/30/07	PNNL	Bromide	5	10		ppm	0.25	
M-Pro-084	109	Sigma V IC	11/30/07	PNNL	Chloride	5	144		ppm	0.25	
M-Pro-084	109	Sigma V IC	11/30/07	PNNL	Nitrate	5	0.25	U	ppm	0.25	
M-Pro-084	109	Sigma V IC	11/30/07	PNNL	Nitrite	5	0.51		ppm	0.25	
M-Pro-084	109	Sigma V IC	11/30/07	PNNL	Phosphate	5	0.25	U	ppm	0.25	
M-Pro-084	109	Sigma V IC	11/30/07	PNNL	Sulfate	5	61		ppm	0.25	
M-Pro-085	111	HACH 8023	11/28/07	Field	hex, chromium	1	40		ppb	10	
M-Pro-085	111	HPLC	12/12/07	PNNL	Acetate	4	2828		mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Butyrate	4	1940		mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Formate	4	120	U	mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Fructose	4	60	U	mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Glucose	4	304		mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Lactate	4	120	U	mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Propionate	4	1028		mg/L	120	
M-Pro-085	111	HPLC	12/12/07	PNNL	Succinate	4	120	U	mg/L	120	
M-Pro-085	111	Method 9060A	11/29/07	PNNL	TOC	500	4340		ppm	500	
M-Pro-085	111	Sigma V IC	11/30/07	PNNL	Bromide	10	32		ppm	0.50	
M-Pro-085	111	Sigma V IC	11/30/07	PNNL	Chloride	10	415		ppm	0.50	
M-Pro-085	111	Sigma V IC	11/30/07	PNNL	Nitrate	10	0.13	J	ppm	0.50	RL
M-Pro-085	111	Sigma V IC	11/30/07	PNNL	Nitrite	10	1.3		ppm	0.50	
M-Pro-085	111	Sigma V IC	11/30/07	PNNL	Phosphate	10	0.50	U	ppm	0.50	
M-Pro-085	111	Sigma V IC	11/30/07	PNNL	Sulfate	10	212		ppm	0.50	
M-Pro-086	D5-40	HACH 8023	11/28/07	Field	hex, chromium	1	120		ppb	10	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Acetate	1	30	U	mg/L	30	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Butyrate	1	30	U	mg/L	30	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Formate	1	30	U	mg/L	30	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Fructose	1	120	U	mg/L	30	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Glucose	1	30	U	mg/L	30	

Sample ID	Sample Location	Method	Date Analysis	Laboratory	Parameter	Dilution	Result	Qualifier	Units	Reporting Limit	Comments
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Lactate	1	30	U	mg/L	30	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Propionate	1	30	U	mg/L	30	
M-Pro-086	D5-40	HPLC	12/12/07	PNNL	Succinate	1	30	U	mg/L	30	
M-Pro-086	D5-40	Method 9060A	11/29/07	PNNL	TOC	1	2.2		ppm	1	
M-Pro-086	D5-40	Sigma V IC	11/30/07	PNNL	Bromide	2	0.24		ppm	0.10	
M-Pro-086	D5-40	Sigma V IC	11/30/07	PNNL	Chloride	2	22		ppm	0.10	
M-Pro-086	D5-40	Sigma V IC	11/30/07	PNNL	Nitrate	2	50		ppm	0.10	
M-Pro-086	D5-40	Sigma V IC	11/30/07	PNNL	Nitrite	2	0.10	U	ppm	0.10	
M-Pro-086	D5-40	Sigma V IC	11/30/07	PNNL	Phosphate	2	0.04	J	ppm	0.10	RL
M-Pro-086	D5-40	Sigma V IC	11/30/07	PNNL	Sulfate	2	118		ppm	0.10	

Appendix B

Supplemental Organic Compound Concentration Data Plots

Appendix B

Supplemental Organic Compound Concentration Data Plots

The following data plots are the same as Figures 6.1 through 6.6 in the text except that the scale of the vertical axis has been changed to provide for additional interpretation of the data.

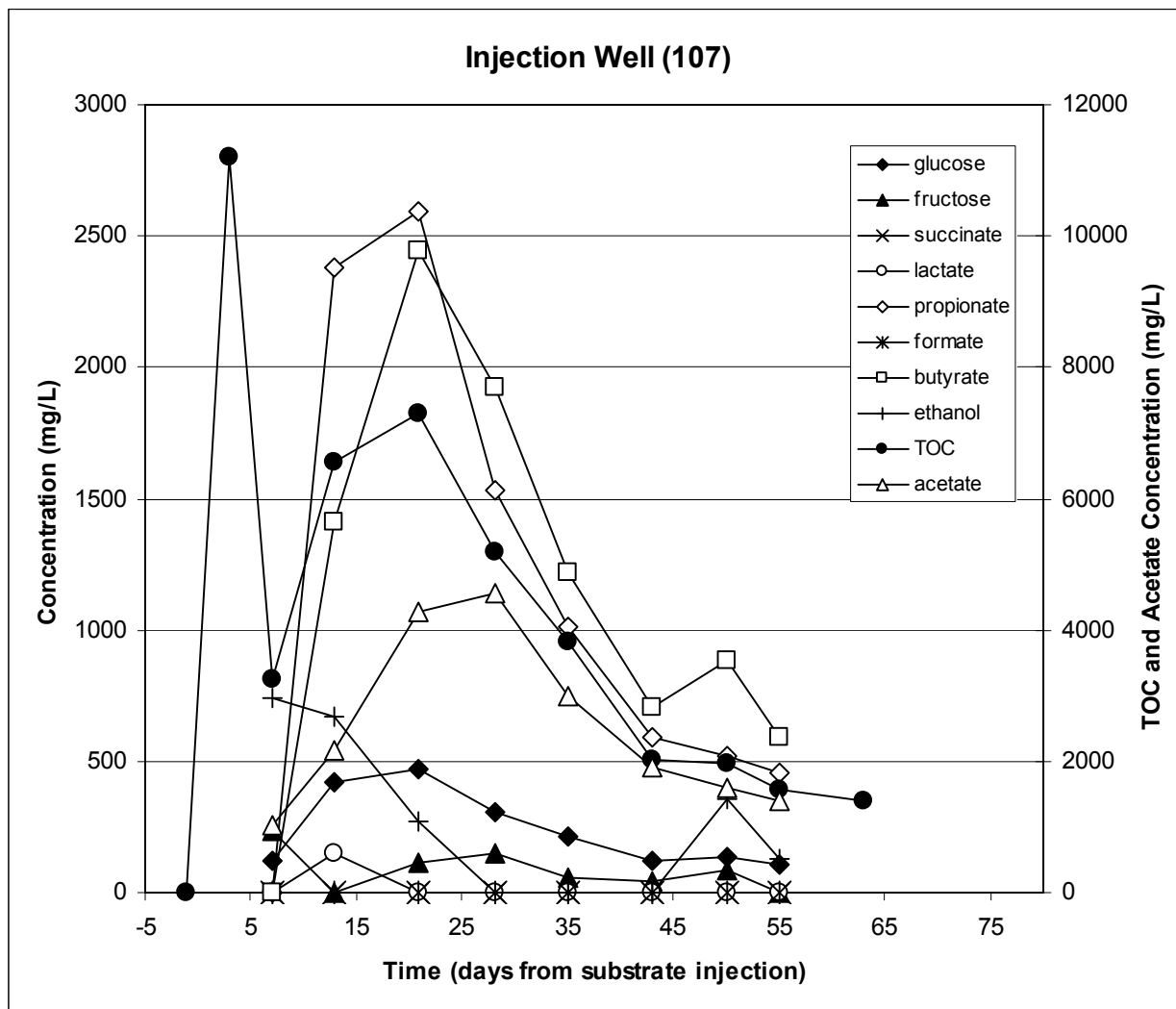


Figure B.1. Organic Compound Concentrations during the Process Monitoring Phase at Injection Well 199-D5-107

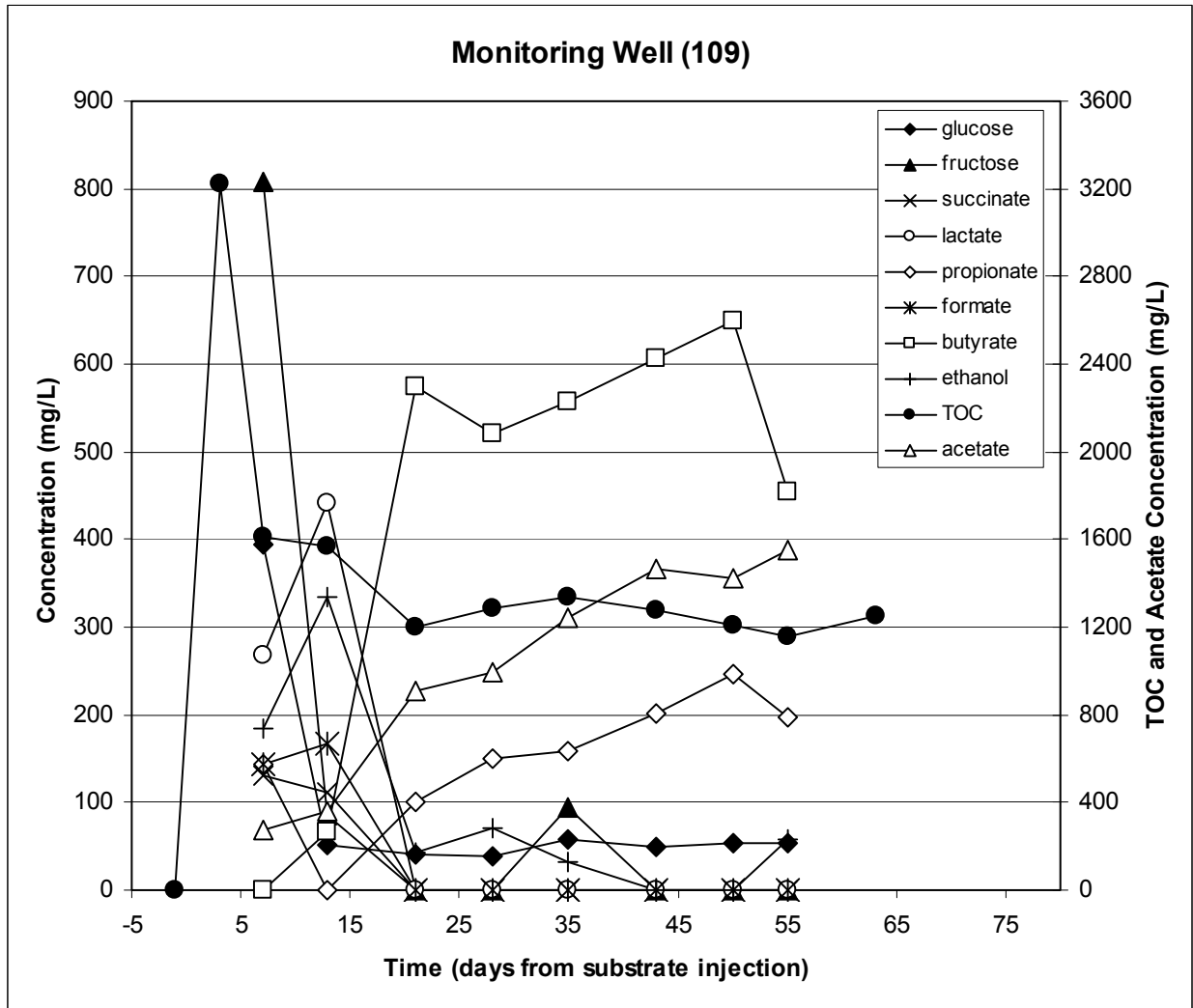


Figure B.2. Organic Compound Concentrations During the Process Monitoring Phase at Process Monitoring Well 199-D5-109

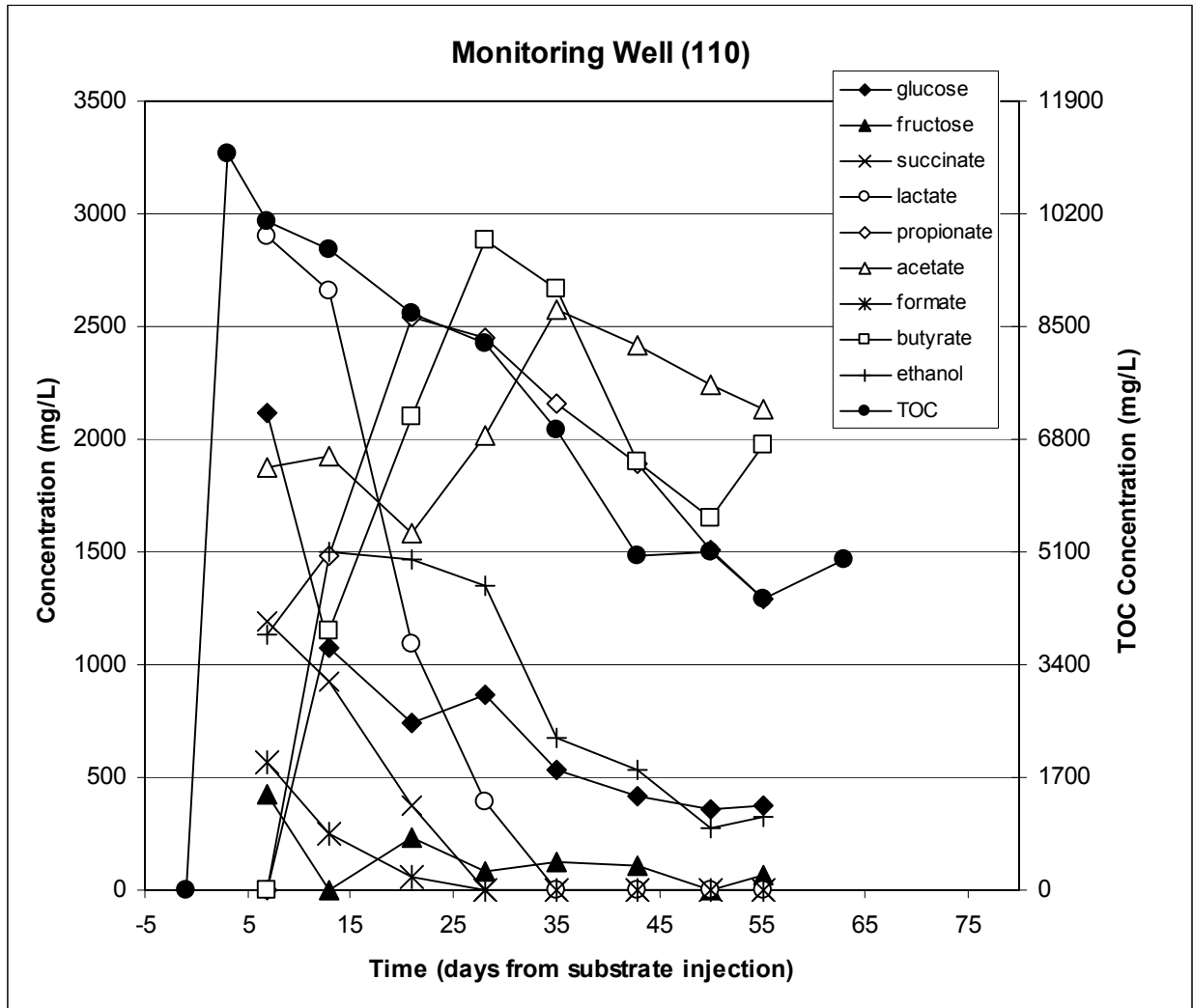


Figure B.3. Organic Compound Concentrations During the Process Monitoring Phase at Process Monitoring Well 199-D5-110

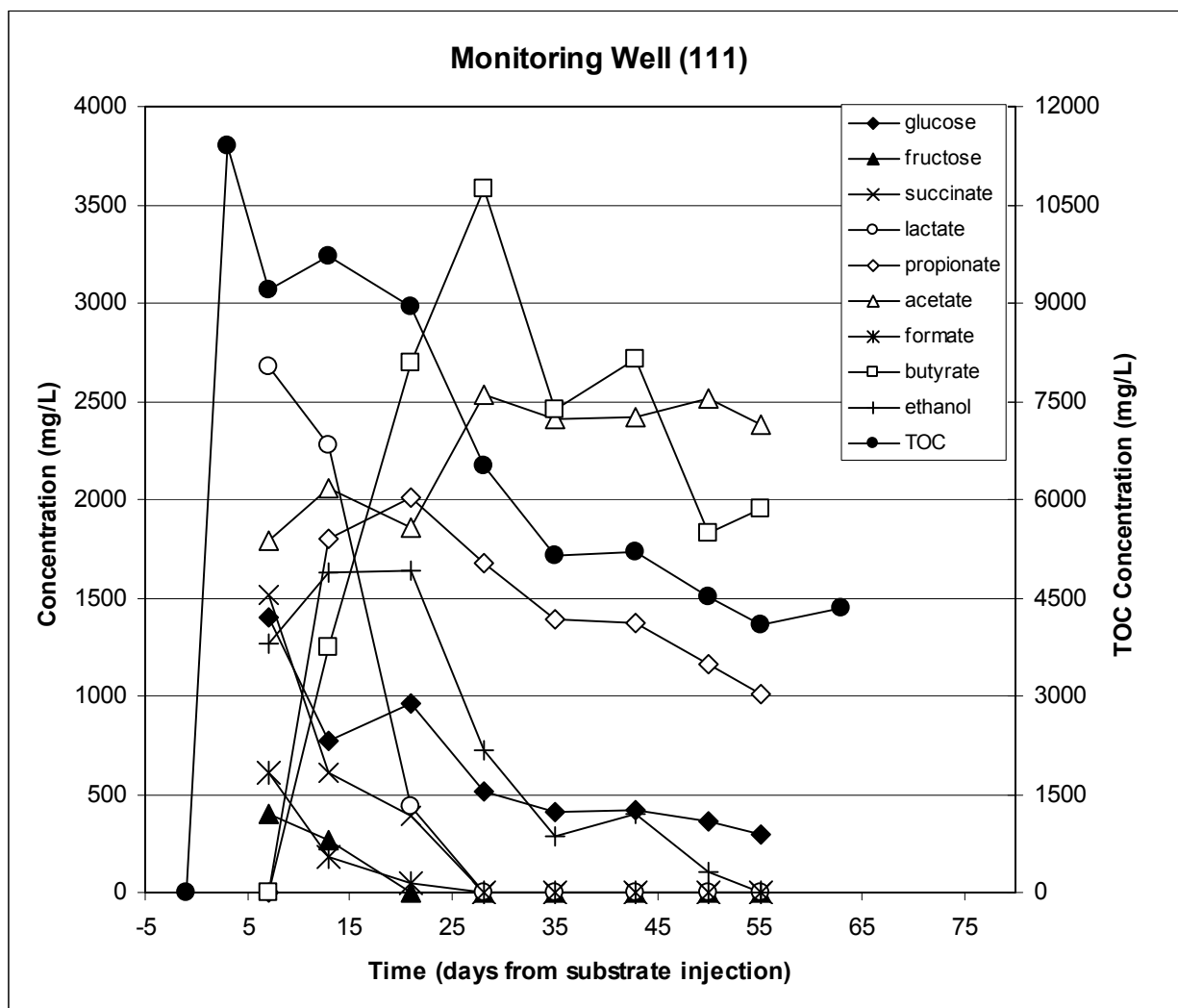


Figure B.4. Organic Compound Concentrations During the Process Monitoring Phase at Process Monitoring Well 199-D5-111

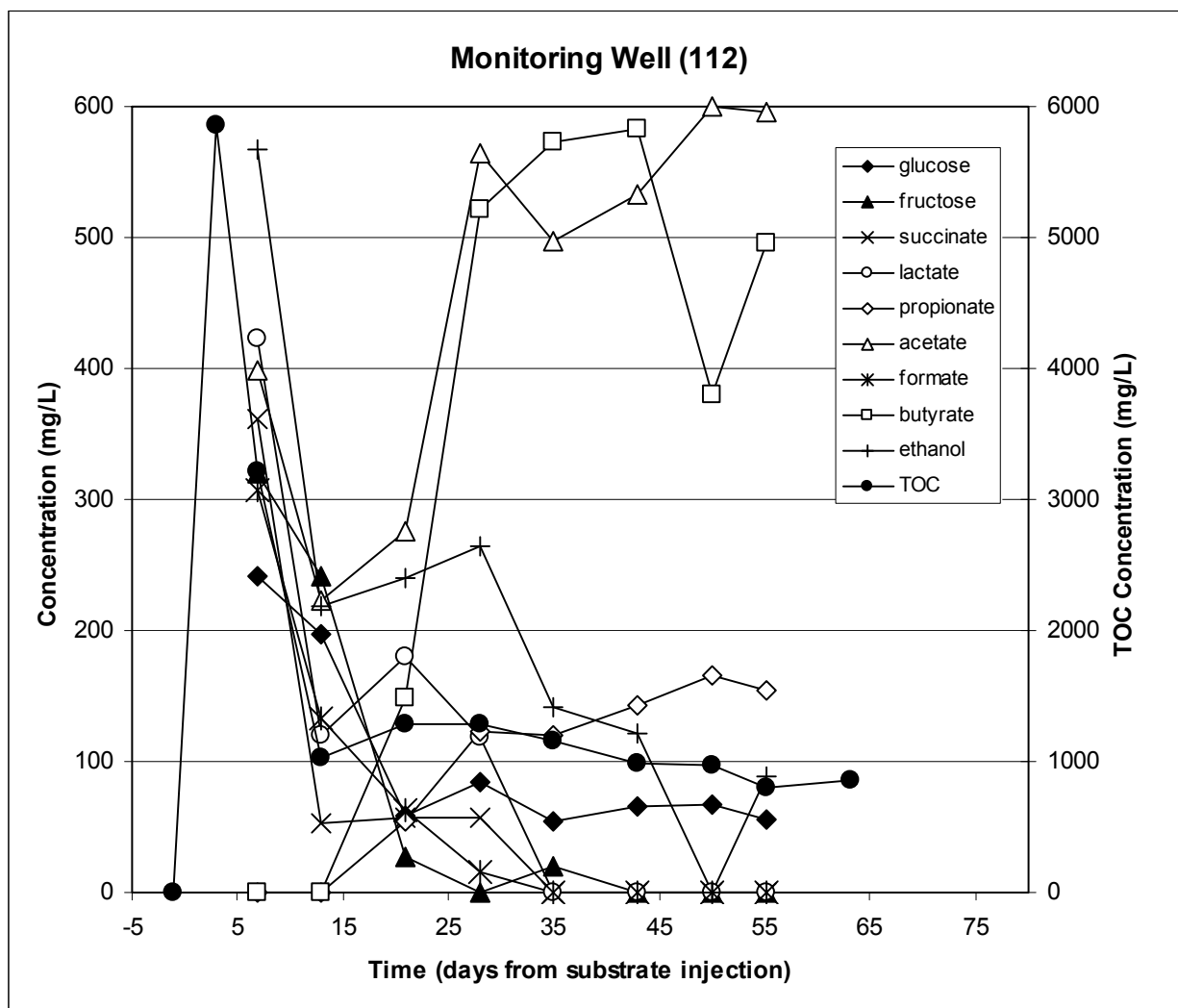


Figure B.5. Organic Compound Concentrations During the Process Monitoring Phase at Process Monitoring Well 199-D5-112

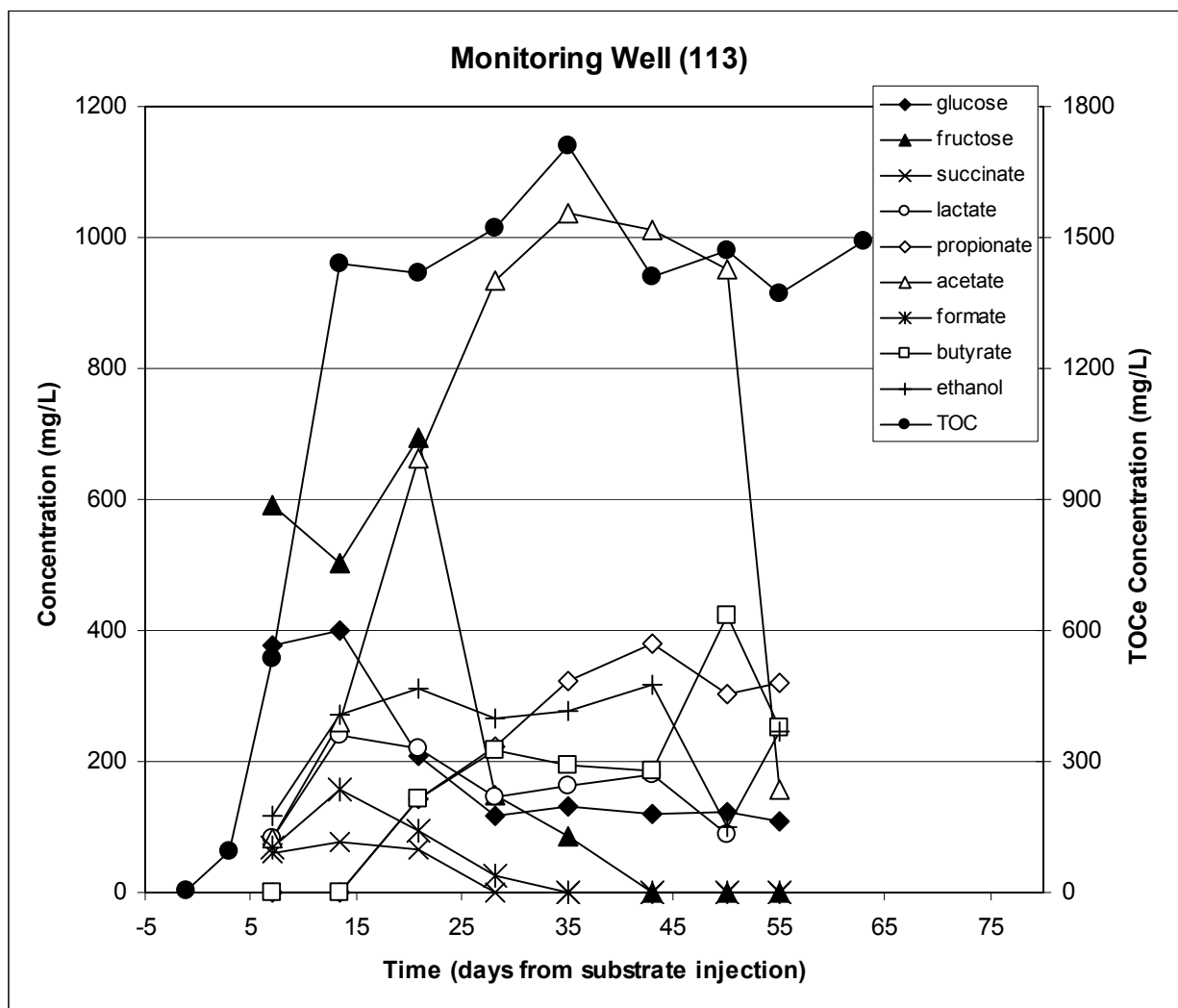


Figure B.6. Organic Compound Concentrations During the Process Monitoring Phase at Process Monitoring Well 199-D5-113

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