

A.1
June 2007
Data Validation Reports

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratory: Microseeps

Data Package Numbers: P0706322, P0706349, P0706350, P0706351, P0706375, P0706376, 0706411, P0706412, P0706413, P0706414, P0706415, P0706416, P0706506, and P0706507

Reviewer: Stan Gladych

Peer Reviewer: Geoffrey Webb

Date Review Completed: 7/18/07

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003) and evaluation of laboratory criteria. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II sampling investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0706322				
EP-CPT06S-PZ	P0706322-01	6/18/2007	SA	X
EP-CPT12S-PZ	P0706322-02	6/18/2007	SA	X
EP-CPT74S-PZ	P0706322-03	6/18/2007	SA	X
EP-CPT55S-PZ	P0706322-04	6/18/2007	SA	X
EP-CPT04S-PZ	P0706322-05	6/18/2007	SA	X ^M
EP-CPT04S-PZ-FD ²	P0706322-08	6/18/2007	FD	X
EP-CPT09S-PZ ³	P0706322-09	6/18/2007	SA	X
EP-CPT70S-PZ	P0706322-10	6/18/2007	SA	X
EP-CPT67S-PZ	P0706322-11	6/18/2007	SA	X
P0706349				
EP-CPT31S-PZ	P0706349-01	6/19/2007	SA	X
EP-CPT36S-PZ	P0706349-02	6/19/2007	SA	X
EP-CPT23S-PZ	P0706349-03	6/19/2007	SA	X
EP-H52/57-WELL	P0706349-04	6/19/2007	SA	X
EP-H61-WELL	P0706349-05	6/19/2007	SA	X
EP-H62/63-WELL	P0706349-06	6/19/2007	SA	X
EP-H34-WELL	P0706349-07	6/19/2007	SA	X
EP-CPT33S-PZ	P0706349-08	6/19/2007	SA	X
P0706350				
EP-CPT10S-PZ	P0706350-01	6/19/2007	SA	X
EP-CPT44S-PZ	P0706350-02	6/19/2007	SA	X
EP-CPT30S-PZ	P0706350-03	6/19/2007	SA	X
P0706351				
EP-CPT50S-PZ	P0706351-01	6/19/2007	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
EP-CPT63S-PZ	P0706351-02	6/19/2007	SA	X
EP-CPT61S-PZ	P0706351-03	6/19/2007	SA	X
EP-CPT34S-PZ	P0706351-04	6/19/2007	SA	X
EP-CPT18S-PZ	P0706351-05	6/19/2007	SA	X
EP-CPT05S-PZ	P0706351-06	6/19/2007	SA	X
EP-CPT15S-PZ	P0706351-07	6/19/2007	SA	X
P0706375				
EP-CPT72S-PZ	P0706375-01	6/20/2007	SA	X ^M
EP-CPT59S-PZ	P0706375-04	6/20/2007	SA	X
EP-CPT08S-PZ	P0706375-05	6/20/2007	SA	X ^M
EP-CPT08S-PZ-FD	P0706375-08	6/20/2007	FD	X
EP-CPT84S-PZ	P0706375-09	6/20/2007	SA	X
EP-CPT86S-PZ	P0706375-10	6/20/2007	SA	X
EP-CPT07S-PZ	P0706375-11	6/20/2007	SA	X
P0706376				
EP-CPT14S-PZ	P0706376-01	6/20/2007	SA	X
EP-CPT17S-PZ	P0706376-02	6/20/2007	SA	X
EP-CPT01S-PZ-FD	P0706376-03	6/20/2007	FD	X
EP-CPT01S-PZ	P0706376-04	6/20/2007	SA	X ^M
EP-CPT11S-PZ	P0706376-07	6/20/2007	SA	X
EP-CPT60S-PZ-FD	P0706376-08	6/20/2007	FD	X
EP-CPT60S-PZ	P0706376-09	6/20/2007	SA	X
P0706411				
EP-H100-WELL	P0706411-01	6/21/2007	SA	X ^M
EP-H100-WELL-FD	P0706411-04	6/21/2007	FD	X
EP-L59-WELL	P0706411-05	6/21/2007	SA	X
EP-H101-WELL	P0706411-06	6/21/2007	SA	X
EP-H98-WELL	P0706411-07	6/21/2007	SA	X
EP-CPT57R-PZ	P0706411-08	6/21/2007	SA	X
EP-CPT57S-PZ	P0706411-09	6/21/2007	SA	X
P0706412				
EP-CPT91S-PZ	P0706412-01	6/21/2007	SA	X
EP-H66-WELL	P0706412-02	6/21/2007	SA	X
EP-H67-WELL	P0706412-03	6/21/2007	SA	X
EP-H64/65-WELL	P0706412-04	6/21/2007	SA	X
EP-CPT22S-PZ	P0706412-05	6/21/2007	SA	X
EP-CPT03S-PZ	P0706412-06	6/21/2007	SA	X
EP-CPT46S-PZ	P0706412-07	6/21/2007	SA	X
EP-CPT88S-PZ	P0706412-08	6/21/2007	SA	X
P0706413				
EP-CPT43S-PZ	P0706413-01	6/21/2007	SA	X
EP-CPT46D-PZ	P0706413-02	6/21/2007	SA	X
EP-CPT89S-PZ	P0706413-03	6/21/2007	SA	X
EP-CPT52S-PZ	P0706413-04	6/21/2007	SA	X
EP-CPT90S-PZ	P0706413-05	6/21/2007	SA	X
EP-CPT24S-PZ	P0706413-06	6/21/2007	SA	X
P0706414				
EP-CPT29S-PZ	P0706414-01	6/22/2007	SA	X
EP-CPT29D-PZ	P0706414-02	6/22/2007	SA	X
EP-CPT02S-PZ	P0706414-03	6/22/2007	SA	X
P0706415				
EP-CPT41S-PZ	P0706415-01	6/22/2007	SA	X
EP-CPT35S-PZ	P0706415-02	6/22/2007	SA	X
EP-CPT35D-PZ	P0706415-03	6/22/2007	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
EP-CPT26S-PZ	P0706415-04	6/22/2007	SA	X
EP-CPT26D-PZ	P0706415-05	6/22/2007	SA	X
EP-CPT41D-PZ	P0706415-06	6/22/2007	SA	X
EP-CPT65S-PZ	P0706415-07	6/22/2007	SA	X
P0706416				
EP-CPT54S-PZ	P0706416-01	6/22/2007	SA	X
EP-CPT56S-PZ	P0706416-02	6/22/2007	SA	X
EP-CPT45S-PZ	P0706416-03	6/22/2007	SA	X
EP-CPT45D-PZ	P0706416-04	6/22/2007	SA	X
EP-CPT66S-PZ	P0706416-05	6/22/2007	SA	X
EP-CPT85S-PZ	P0706416-06	6/22/2007	SA	X
EP-CPT69S-PZ	P0706416-07	6/22/2007	SA	X
EP-CPT64S-PZ	P0706416-08	6/22/2007	SA	X
P0706506				
EP-CPT87S-PZ	P0706506-01	6/26/2007	SA	X
EP-CPT62S-PZ	P0706506-02	6/26/2007	SA	X
EP-CPT48S-PZ	P0706506-03	6/26/2007	SA	X
EP-CPT49S-PZ	P0706506-04	6/26/2007	SA	X
EP-CPT58S-PZ	P0706506-05	6/26/2007	SA	X
EP-CPT53S-PZ	P0706506-06	6/26/2007	SA	X
P0706507				
EP-CPT21S-PZ	P0706507-01	6/27/2007	SA	X
EP-CPT13S-PZ	P0706507-02	6/27/2007	SA	X
EP-CPT16S-PZ	P0706507-03	6/27/2007	SA	X
EP-CPT32S-PZ	P0706507-04	6/27/2007	SA	X
EP-CPT28S-PZ	P0706507-05	6/27/2007	SA	X

SA = Sample

FD = Field duplicate

X^M = MS/MSD¹ For the purpose of data management the sampling date has been appended to the field ID in the database.² Sample name on the COC was entered as EP-CPTS04-PZ-FD. This was corrected to the standard format in the report and the database as EP-CPT04-PZ-FD.³ Sample name on the COC was entered as EP-CPTS06-PZ. This was corrected to the standard format in the report and the database as EP-CPT09-PZ.**General Usability Statement:**

- ☐ Data are usable without qualification.
- ☒ Data are usable with qualification (noted below).
- ☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	
Calibration blanks?	NA	
Surrogate recoveries?	NA	
Matrix spike recoveries? <ul style="list-style-type: none"> EP-CPT04S-PZ EP-CPT72S-PZ EP-CPT08S-PZ EP-CPT01S-PZ EP-H100-WELL 	Yes	MS/MSD results for all samples were within laboratory criteria. The results for ethane, methane, and propane from EP-H100-WELL were greater than four times the spike concentration and were not appropriate for assessing accuracy and precision.
Ambient (field) blank evaluation?	NA	
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	Yes	
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> EP-CPT04S-PZ-FD EP-CPT08S-PZ-FD EP-CPT01S-PZ-FD EP-CPT60S-PZ-FD EP-H100-WELL-FD 	No	For field duplicate pair EP-CPT60S-PZ/EP-CPT60S-PZ-FD, the RPDs between the parent sample results and the field duplicate results for ethane, propane, and methane exceeded the evaluation criteria of $\leq 30\%$ with RPDs of 121%, 116%, and 98%, respectively. Therefore, the ethane, ethene, and methane results for samples EP-CPT60S-PZ and EP-CPT60S-PZ-FD were qualified as estimated (J).
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD recoveries. Acceptable accuracy was attained with respect to the analytical method and sample matrix.
Are precision criteria met?	Yes	This was evaluated using the field duplicate pairs, MS/MSD pairs, and the LCS/LCSD pairs. With three exceptions, all precision criteria were met. Therefore, acceptable precision was attained with respect to the analytical method and sample matrix.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	Yes	
Were results received for all samples?	Yes	
Are any data qualified as unusable?	No	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	

Review Parameters	QAPP Criteria Met?	Comments
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

**FORT MORGAN CHARACTERIZATION
PHASE II WELL WATER AND AIR SAMPLING PROGRAM
DATA VERIFICATION REPORT**

Laboratories: SPL-Houston

Data Package Numbers: 07061021, 07061073, 07061148, 07061238, 07061307, and 07061499

Reviewer: Stan Gladych

Peer Reviewer: Geoffrey Webb

Date Review Completed: 8/23/2007

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003), evaluation of laboratory criteria, and reference to Functional Guidelines, as applicable to the method. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II well water and air sampling investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters that includes the review of six data packages for analytical data reported by SPL. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses			
				Dissolved Metals	General Chemistry	TDS, SO4, Cl	BTEX
07061021							
EP-CPT04S-PZ	07061021-01	6/18/2007	SA			X ^M	
EP-CPT04S-PZ-FD	07061021-02	6/18/2007	FD			X	
EP-CPT74S-PZ	07061021-03	6/18/2007	SA			X	
EP-CPT55S-PZ	07061021-04	6/18/2007	SA			X	
EP-CPT06S-PZ	07061021-05	6/18/2007	SA			X	
EP-CPT12S-PZ	07061021-06	6/18/2007	SA			X	
EP-CPT09S-PZ	07061021-07	6/18/2007	SA			X	X
EP-CPT67S-PZ	07061021-08	6/18/2007	SA			X	
EP-CPT70S-PZ	07061021-09	6/18/2007	SA			X	
07061073							
EP-CPT18S-PZ	07061073-01	6/19/2007	SA			X	
EP-CPT05S-PZ	07061073-02	6/19/2007	SA			X	X
EP-CPT15S-PZ	07061073-03	6/19/2007	SA			X	
EP-CPT61S-PZ	07061073-04	6/19/2007	SA			X ^M	
EP-CPT63S-PZ	07061073-05	6/19/2007	SA			X	
EP-CPT50S-PZ	07061073-06	6/19/2007	SA			X	
EP-CPT34S-PZ	07061073-07	6/19/2007	SA			X	
EP-H52/57-WELL	07061073-08	6/19/2007	SA	X	X ^M	X ^M	
EP-H61-WELL	07061073-09	6/19/2007	SA	X	X	X	

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses			
				Dissolved Metals	General Chemistry	TDS, SO ₄ , Cl	BTEX
EP-CPT31S-PZ	07061073-10	6/19/2007	SA			X	
EP-CPT10S-PZ	07061073-11	6/19/2007	SA			X	
EP-CPT30S-PZ	07061073-12	6/19/2007	SA	X	X	X ^M	
EP-CPT33S-PZ	07061073-13	6/19/2007	SA			X	
EP-CPT44S-PZ	07061073-14	6/19/2007	SA			X	X
EP-CPT23S-PZ	07061073-15	6/19/2007	SA			X	
EP-CPT36S-PZ	07061073-16	6/19/2007	SA			X	X
EP-H62/63-WELL	07061073-17	6/19/2007	SA	X	X ^M	X	
EP-H34-WELL	07061073-18	6/19/2007	SA	X	X	X	
07061148							
EP-CPT72S-PZ	07061148-01	6/20/2007	SA	X ^M	X ^M	X ^M	
EP-CPT59S-PZ	07061148-02	6/20/2007	SA			X	
EP-CPT08S-PZ	07061148-03	6/20/2007	SA	X ^M	X ^M	X ^M	
EP-CPT01S-PZ-FD	07061148-04	6/20/2007	FD	X	X	X	
EP-CPT01S-PZ	07061148-05	6/20/2007	SA	X ^M	X ^M	X ^M	
EP-CPT08S-PZ-FD	07061148-06	6/20/2007	FD	X	X	X	
EP-CPT84S-PZ	07061148-07	6/20/2007	SA	X	X	X	
EP-CPT86S-PZ	07061148-08	6/20/2007	SA	X	X	X	
EP-CPT07S-PZ	07061148-09	6/20/2007	SA	X	X	X	
EP-CPT14S-PZ	07061148-10	6/20/2007	SA	X	X	X	
EP-CPT17S-PZ	07061148-11	6/20/2007	SA	X	X	X	
EP-CPT11S-PZ	07061148-12	6/20/2007	SA	X	X	X	
EP-CPT60S-PZ	07061148-13	6/20/2007	SA	X	X	X	
EP-CPT60S-PZ-FD	07061148-14	6/20/2007	FD	X	X	X	
07061238							
EP-CPT46D-PZ	07061238-01	6/21/2007	SA	X	X ^M	X	X
EP-CPT89S-PZ	07061238-02	6/21/2007	SA	X	X	X	
EP-CPT52S-PZ	07061238-03	6/21/2007	SA			X	
EP-CPT90S-PZ	07061238-04	6/21/2007	SA			X	
EP-CPT24S-PZ	07061238-05	6/21/2007	SA	X	X	X	
EP-H100-WELL	07061238-06	6/21/2007	SA	X ^M	X ^M	X ^M	X ^M
EP-H100-WELL-FD	07061238-07	6/21/2007	FD	X	X	X	X
EP-L59-WELL	07061238-08	6/21/2007	SA	X	X	X	X
EP-H101-WELL	07061238-09	6/21/2007	SA	X	X	X	
EP-H98-WELL	07061238-10	6/21/2007	SA	X	X ^M	X	
EP-CPT91S-PZ	07061238-11	6/21/2007	SA	X	X	X	X
EP-CPT57R-PZ	07061238-12	6/21/2007	SA			X	X
EP-CPT57S-PZ	07061238-13	6/21/2007	SA			X	
EP-H66-WELL	07061238-14	6/21/2007	SA	X	X	X	
EP-H67-WELL	07061238-15	6/21/2007	SA	X	X ^M	X	
EP-H64/65-WELL	07061238-16	6/21/2007	SA	X	X	X	
EP-CPT22S-PZ	07061238-17	6/21/2007	SA	X	X	X	
EP-CPT03S-PZ	07061238-18	6/21/2007	SA	X	X	X	
EP-CPT46S-PZ	07061238-19	6/21/2007	SA			X	X
EP-CPT11S-PZ	07061238-20	6/21/2007	SA				X
EP-CPT88S-PZ	07061238-21	6/21/2007	SA	X	X ^M	X ^M	
EP-CPT43S-PZ	07061238-22	6/21/2007	SA	X	X ^M	X ^M	X
07061307							
EP-CPT85S-PZ	07061307-01	6/22/2007	SA	X	X ^M		X ^M
EP-CPT45S-PZ	07061307-02	6/22/2007	SA			X ^M	
EP-CPT69S-PZ	07061307-03	6/22/2007	SA	X	X ^M	X ^M	
EP-CPT45D-PZ	07061307-04	6/22/2007	SA	X	X	X	

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses			
				Dissolved Metals	General Chemistry	TDS, SO ₄ , Cl	BTEX
EP-CPT66S-PZ	07061307-05	6/22/2007	SA	X	X	X	
EP-CPT56S-PZ	07061307-06	6/22/2007	SA	X	X	X	
EP-CPT26S-PZ	07061307-07	6/22/2007	SA			X	
EP-CPT35D-PZ	07061307-08	6/22/2007	SA			X	X
EP-CPT41D-PZ	07061307-09	6/22/2007	SA			X ^M	X
EP-CPT26D-PZ	07061307-10	6/22/2007	SA	X	X	X	
EP-CPT35S-PZ	07061307-11	6/22/2007	SA			X	
EP-CPT41S-PZ	07061307-12	6/22/2007	SA			X	
EP-CPT54S-PZ	07061307-13	6/22/2007	SA	X	X	X	X
EP-CPT64S-PZ	07061307-14	6/22/2007	SA	X	X	X	
EP-CPT29S-PZ	07061307-15	6/22/2007	SA			X	
EP-CPT29D-PZ	07061307-16	6/22/2007	SA	X	X	X	
EP-CPT02S-PZ	07061307-17	6/22/2007	SA	X	X ^M	X	
EP-CPT65S-PZ	07061307-18	6/22/2007	SA	X	X ^M	X	
07061499							
EP-CPT87S-PZ	07061499-01	6/26/2007	SA			X ^M	
EP-CPT62S-PZ	07061499-02	6/26/2007	SA	X ^M	X ^M	X	
EP-CPT48S-PZ	07061499-03	6/26/2007	SA	X	X	X	
EP-CPT49S-PZ	07061499-04	6/26/2007	SA			X	
EP-CPT58S-PZ	07061499-05	6/26/2007	SA	X	X	X	
EP-CPT53S-PZ	07061499-06	6/26/2007	SA	X	X	X	X
EP-CPT21S-PZ	07061499-07	6/27/2007	SA	X	X	X ^M	
EP-CPT13S-PZ	07061499-08	6/27/2007	SA	X	X	X	
EP-CPT16S-PZ	07061499-09	6/27/2007	SA	X	X	X	
EP-CPT32S-PZ	07061499-10	6/27/2007	SA	X	X ^M	X	
EP-CPT28S-PZ	07061499-11	6/27/2007	SA			X ^M	
EP-CPT57S-PZ	07061499-12	6/27/2007	SA				X

SA = Sample FD = Field duplicate

Dissolved metals (6010 and 6020): Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium (total), Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

General Chemistry: Alkalinity suite, Br, PO₄, Fluoride, Iodide, NO₃, NO₂, and charge balance calculation.

X^M = Requested matrix spike and matrix spike duplicate and/or laboratory duplicate, as applicable to method

¹For the purpose of data management the sampling date has been appended to the field ID in the database.

General Usability Statement:

- ☐ Data are usable without qualification.
- ☒ Data are usable with qualification (noted below).
- ☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	No	With the exceptions listed in Table 3 below, no target analytes were detected in the method blanks.
Calibration blanks?	No	With the exceptions in listed Table 4 below, no target analytes were detected in the associated bracketing calibration blanks.
Surrogate recoveries?	Yes	
Matrix spike recoveries? <ul style="list-style-type: none"> • EP-CPT04S-PZ – SO₄ and Cl • EP-CPT61S-PZ – SO₄ and Cl • EP-H52/57-WELL – O-phos, Cl, SO₄, Fl, and Br • EP-CPT72S-PZ – Dissolved Metals, O-phos, Anions, NO₂, NO₃ • EP-CPT08S-PZ – Dissolved Metals, O-phos, Anions, NO₂, NO₃ • EP-CPT01S-PZ – Dissolved Metals, O-phos, Anions, NO₃, NO₂ • EP-H100-WELL – Dissolved metals, O-Phos, Anions, BTEX • EP-CPT46D-PZ – O-Phos, NO₂, NO₃ • EP-H98-Well - NO₂, NO₃, Anions • EP-CPT88S-PZ - Anions • EP-CPT43S-PZ – Anions • EP-CPT85S-PZ – BTEX, Br, Fl • EP-CPT69S-PZ – NO₂, NO₃, Cl, SO₄ • EP-CPT65S-PZ – NO₂, NO₃, Br Fl • EP-CPT41S-PZ – Cl, SO₄ • EP-CPT62S-PZ – Dissolved Metals, O-Phos • EP-CPT87S-PZ – Cl, SO₄ • EP-CPT21S-PZ – Cl, SO₄ • EP-CPT23S-PZ – Br, Fl 	No	Matrix spike (MS) / and matrix spike duplicate (MSD) were performed on the samples listed. MS/MSD results were not considered appropriate for assessing accuracy and precision if the parent result was greater than four times the spike amount. With the exceptions listed in Table 5, all recoveries were within the acceptance limits.
Serial Dilution %Difference? <ul style="list-style-type: none"> • EP-CPT72S-PZ • EP-CPT08S-PZ • EP-CPT01S-PZ • EP-H100-WELL 	No	With the exceptions listed in Table 6, all %Ds between the original sample results and the results obtained from the sample diluted 1:5 were ≤10% for analytical results that were appropriate for comparing to the evaluation criterion with concentrations greater than 50 times their respective MDLs.
Ambient (field) blank evaluation?	NA	
Trip Blank evaluation?	NA	

Review Parameters	QAPP Criteria Met?	Comments
Cation/Anion Balance?	No	<p>With the following exception, the %Ds between total cations and total anions were within the <13% for all samples and additionally, the ratio of measured TDS to calculated TDS was within the acceptance range of 0.5 to 1.5.</p> <p>The %D between total cations and total anions for sample EP-CPT24S-PZ exceeded the 13% limit with a %D of 26.16%. Therefore all individual ions included in the cation/anion balance were qualified as estimated. These include calcium, magnesium, potassium, sodium, and aluminum with a high bias and bicarbonate, carbonate, chloride, fluoride, sulfate, nitrate, nitrite, and orthophosphate with a low bias.</p>
Precision Evaluation		
<p>Laboratory duplicate criteria met?</p> <ul style="list-style-type: none"> EP-CPT04S-PZ - TDS EP-H52/57-WELL – TDS EP-CPT30S-PZ – TDS EP-H62/63-WELL – Alkalinity (total) EP-CPT72S-PZ – TDS, Iodide, Alkalinity EP-CPT08S-PZ – TDS, Iodide, Alkalinity EP-CPT01S-PZ – TDS, Iodide, Alkalinity EP-H100-WELL – Alkalinity (total), TDS EP-H67-Well – Alkalinity (total) EP-CPT88S-PZ –TDS EP-CPT43S-PZ – TDS EP-CPT45S-PZ – TDS EP-CPT02S-PZ –TDS, Iodide EP-CPT85S-PZ – O-Phos, Iodide, alkalinity EP-CPT69S-PZ – O-Phos EP-CPT87S-PZ – TDS EP-CPT28S-PZ – TDS EP-CPT62S-PZ – Iodide, Alkalinity 	Yes	Laboratory duplicates were performed on the samples listed. All results satisfied the applicable evaluation criterion.
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	No	All nitrite and nitrate analysis in SDG 07061307 exceeded hold time by one day. All nitrate and nitrite results in SDG 07061307 were qualified as estimated due to hold time exceedence.
Were sample preservation requirements met?	Yes	
<p>Field duplicate evaluation criteria met?</p> <ul style="list-style-type: none"> EP-CPT04S-PZ-FD EP-CPT01S-PZ-FD EP-CPT08S-PZ-FD 	No	<p>With the following exceptions all field duplicate results were acceptable.</p> <p>The manganese for samples EP-CPT08SPZ and EP-CPT08S-PZ-FD exceeded the 30% RPD criterion. As</p>

Review Parameters	QAPP Criteria Met?	Comments																																	
<ul style="list-style-type: none"> EP-CPT60S-PZ-FD EP-H100-WELL-FD 		<p>only one of five field duplicate pairs has a results that exceeded the evaluation criteria, only the field duplicate and the parent sample were qualified as estimated for the affected analyte.</p> <p>The orthophosphate for samples EP-CRT08S-PZ and EP-CRT08S-PZ-FD exceeded the 30% RPD criterion. As only one of five field duplicate pairs had a result that exceeded the evaluation criteria, only the field duplicate and the parent sample were qualified as estimated for the affected samples.</p>																																	
Sample collected per QAPP?	Yes																																		
Comparability Evaluation																																			
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs. With the two exceptions, all MS/MSD recoveries were within the acceptance limits indicating acceptable accuracy was attained with respect to the analytical method and sample matrix.																																	
Are precision criteria met?	Yes	This was evaluated using the field duplicate, laboratory duplicate, LCS/LCSD pairs, and the MS/MSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix.																																	
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes																																		
Completeness Evaluation																																			
Sample receipt completeness?	Yes	Sample EP-CPT85S-PZ on the COC was corrected to EP-CPT08S-Z to match the sample labels at the request of URS.																																	
Were results received for all samples?	Yes																																		
Are any data qualified as unusable?	No																																		
Sensitivity Evaluation																																			
Were project-required RLs obtained?	No	<p>The following results were reported as nondetect with an elevated reporting limit.</p> <table border="1"> <thead> <tr> <th>FieldID</th><th>Analyte</th><th>Dilution</th></tr> </thead> <tbody> <tr> <td>EP-CPT86S-PZ-062007</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT17S-PZ-062007</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-H98-WELL-062107</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT03S-PZ-062107</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT43S-PZ-062107</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT85S-PZ-062207</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT64S-PZ-062207</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT48S-PZ-062607</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT21S-PZ-062707</td><td>Nitrogen,Nitrite</td><td>4x</td></tr> <tr> <td>EP-CPT65S-PZ-062207</td><td>Iron</td><td>2x</td></tr> </tbody> </table> <p>Results reported as nondetect at elevated RLs will need to be evaluated by the end user of the data to determine if the results are considered usable for meeting project objectives.</p>	FieldID	Analyte	Dilution	EP-CPT86S-PZ-062007	Nitrogen,Nitrite	4x	EP-CPT17S-PZ-062007	Nitrogen,Nitrite	4x	EP-H98-WELL-062107	Nitrogen,Nitrite	4x	EP-CPT03S-PZ-062107	Nitrogen,Nitrite	4x	EP-CPT43S-PZ-062107	Nitrogen,Nitrite	4x	EP-CPT85S-PZ-062207	Nitrogen,Nitrite	4x	EP-CPT64S-PZ-062207	Nitrogen,Nitrite	4x	EP-CPT48S-PZ-062607	Nitrogen,Nitrite	4x	EP-CPT21S-PZ-062707	Nitrogen,Nitrite	4x	EP-CPT65S-PZ-062207	Iron	2x
FieldID	Analyte	Dilution																																	
EP-CPT86S-PZ-062007	Nitrogen,Nitrite	4x																																	
EP-CPT17S-PZ-062007	Nitrogen,Nitrite	4x																																	
EP-H98-WELL-062107	Nitrogen,Nitrite	4x																																	
EP-CPT03S-PZ-062107	Nitrogen,Nitrite	4x																																	
EP-CPT43S-PZ-062107	Nitrogen,Nitrite	4x																																	
EP-CPT85S-PZ-062207	Nitrogen,Nitrite	4x																																	
EP-CPT64S-PZ-062207	Nitrogen,Nitrite	4x																																	
EP-CPT48S-PZ-062607	Nitrogen,Nitrite	4x																																	
EP-CPT21S-PZ-062707	Nitrogen,Nitrite	4x																																	
EP-CPT65S-PZ-062207	Iron	2x																																	

Review Parameters	QAPP Criteria Met?	Comments
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	No	PRDL (Project Required Detection Limit) The results for the PRDL standard analysis were reviewed as part of the data validation process. With the exceptions listed in Table 7 below, as noted in the case narrative, all recoveries were within the 80 – 120% criterion. However, Functional Guidelines criteria (70-130% for most metals and 50-150% for Sb, Pb, and Tl by ICP and Co, Mn, and Zn for ICP-MS) were used as thresholds for the assignment of data qualification. Only PRDL results requiring data qualification were identified on Table 7. Associated results may potentially be affected for values reported close to the PRDL.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

Table 3 – Method Blanks Detections and Qualifications

Analyte	Concentration (mg/L)	Qualification
SPL SDG 07061073		
Antimony	0.000493	The antimony results for all samples were qualified as nondetected at the reporting limit.
Zinc	0.000499	None. The zinc results for the associated samples were greater than five times the MB concentration.
Aluminum	0.00427	The aluminum results for samples EP-H52/57-well, EP-H62/63-WELL, and EP-H34-WELL were qualified as nondetected at the reporting limit.
SPL SDG 07061148		
Selenium	0.000337	The selenium results for samples EP-CPT01S-PZ was qualified as nondetected at the at the reporting limit.
Aluminum	0.00427 0.00382	The aluminum results for samples EP-CPT72S-PZ, EP-CPT08S-PZ, EP-CPT01S-PZ-FD, EP-CPT01S-PZ, EP-CPT86S-PZ, EP-CPT07S-PZ, EP-CPT14S-PZ, EP-CPT17S-PZ, EP-CPT11S-PZ, EP-CPT60S-PZ, and EP-CPT60S-PZ-FD were qualified as nondetected at the reporting limited.
Antimony	0.000493	The antimony results for samples EP-CPT72S-PZ, EP-CPT01S-PZ-FD, EP-CPT08S-PZ-FD, EP-CPT84S-PZ, EP-CPT86S-PZ, EP-CPT07S-PZ, EP-CPT14S-PZ, EP-CPT17S-PZ, EP-CPT11S-PZ, EP-CPT60S-PZ, and EP-CPT60S-PZ-FD were qualified as nondetected at the reporting limited.

Zinc	0.000499	The associated results were reported as nondetected or greater than five times the reporting limit.
SPL SDG 07061238		
Antimony	0.000835	The antimony results for samples EP-CPT91S-PZ, EP-H66-WELL, EP-H67-WELL, EP-H64/65-WELL, EP-CPT22S-PZ, EP-CPT03S-PZ, EP-CPT88S-PZ, and EP-CPT43S-PZ were qualified as nondetected at the reporting limited.
Arsenic	0.00221	The arsenic results for samples EP-CPT46D-PZ, EP-CPT89S-PZ, EP-L59-WELL, EP-H101-WELL, EP-H98-WELL, EP-CPT91S-PZ, EP-H66-WELL, EP-H67-WELL, EP-H64/65-WELL, EP-CPT22S-PZ, EP-CPT03S-PZ, EP-CPT88S-PZ, and EP-CPT43S-PZ were qualified as nondetected at the reporting limited.
Zinc	0.000297	None. The listed analytical results in the associated samples were greater than five times the MB concentration.
SPL SDG 07061307		
Selenium	0.00037	None. The selenium results in the associated samples were reported as greater than five times the method blank concentration or as nondetect.
SPL SDG 07061499		
Manganese	0.000880	None. The listed analytical results in the associated samples were reported as greater than five times the MB concentration.

mg/l = milligrams per liter

MB = Method Blank

Table 4 – CCB Detections and Qualifications

Analyte	CCB	Concentration (mg/l)	Qualification
SPL SDG 07061073			
TJA_070627A			
Boron	CCB3	0.0048	The listed analytical results were reported in the associated samples were greater than five times the CCB concentrations. Data qualification was considered necessary.
Sodium	CCB4	0.088	
ICPMS_070630A			
Antimony	CCB17 CCB18	0.0037 0.0026	The antimony result for samples EP-CPT52/57S-PZ, EP-CPT61S-PZ, EP-CPT30S-PZ, EP-H62/63-WELL, and EP-H34-WELL were qualified as nondetect at the higher of the reporting limit. All other antimony results were reported as nondetect at the MDL.
Aluminum	CCB17	0.0034	The aluminum result for samples EP-H62/63-WELL, and EP-H34-WELL were qualified as nondetect at the higher of the reporting limit. All other aluminum results were reported as nondetect at the MDL.
Vanadium	CCB17 CCB18	0.0008 0.00063	The vanadium result for samples EP-H52/57-WELL, EP-H61-WELL, EP-H62/63-WELL, and EP-H34-WELL were qualified as nondetect at the higher of the reporting limit.
Beryllium	CCB17	0.00021	The listed analytical results in the associated samples were greater than five times the CCB concentration or reported as nondetect.
Silver	CCB17	0.00022	
Thallium	CCB17	0.00034	
Cadmium	CCB17	0.00023	
Selenium	CCB17	0.00038	
Zinc	CCB17	0.00018	
SPL SDG 07061148			
TJA_070627A			

Analyte	CCB	Concentration (mg/l)	Qualification
Boron	CCB2 CCB3 CCB8	0.0083 0.0056 0.0052	The listed analytical results in the associated samples were greater than five times the CCB concentration.
Sodium	CCB4 CCB8	0.088 0.022	
TJA_070702A			
Iron	CCB3	0.0067	The iron results for sample EP-CPT01S-PZ was qualified as nondetected at the reporting limit.
Sodium	CCB3	0.092	The listed analytical results in the associated samples were greater than five times the CCB concentration.
Boron	CCB4	0.0050	
TJA_070705A			
Calcium	CCB2	0.011	The listed analytical results in the associated samples were greater than five times the CCB concentration.
Iron	CCB2	0.0043	The iron results for sample EP-CPT08S-PZ was qualified as nondetected at the reporting limit.
ICPMS_070702A			
Selenium	CCB14 CCB15	0.00041 0.00028	The selenium results for samples EP-CPT08S-PZ and EP-CPT01S-PZ were qualified as nondetect (U) at the reporting limit.
ICPMS2-070702A			
Aluminum	CCB16 CCB17	0.0093 0.0034	The aluminum result for sample EP-CPT72S-PZ was qualified as nondetect (U) at the reporting limit.
ICPMS_070704A			
Antimony	CCB4 CCB5	0.00053 0.00055	None. The antimony results for samples EP-CPT08S-PZ and EP-CPT01S-PZ were reported as nondetect.
ICPMS2_070630A			
Antimony	CCB16 CCB17 CCB18 CCB19 CCB20	0.0024 0.0037 0.0026 0.0025 0.0023	The antimony results for samples EP-CPT72S-PZ EP-CPT01S-PZ-FD, EP-CPT08S-PZ-FD, EP-CPT84S-PZ, EP-CPT86S-PZ, EP-CPT07S-PZ, EP-CPT14S-PZ, EP-CPT17S-PZ, EP-CPT11S-PZ, EP-CPT60S-PZ, and EP-CPT60S-PZ-FD were qualified as nondetect (U) at the reporting limit. Other associated results were reported as nondetected or greater than five times the CCB concentration
Beryllium	CCB17	0.00021	The analytical results in the associated samples were greater than five times the CCB concentration or reported as nondetect.
Cadmium	CCB17	0.00023	
Selenium	CCB17	0.00038	
Silver	CCB17	0.00022	
Thallium	CCB17	0.00034	The thallium result for sample EP-CPT72S-PZ was qualified as nondetect (U) at the reporting limit.
Vanadium	CCB16 CCB17 CCB18 CCB19 CCB20	0.00052 0.00080 0.00063 0.00062 0.00045	The vanadium result for samples EP-CPT86S-PZ and EP-CPT17S-PZ were qualified as nondetect (U) at the reporting limit. Other associated results were reported as nondetected or greater than five times the CCB concentration

Analyte	CCB	Concentration (mg/l)	Qualification
Zinc	CCB16 CCB17 CCB20	0.00035 0.00018 0.00020	All associated sample results were reported as greater than five times the CCB concentration.
ICPMS2-070705A			
Beryllium	CCB17 CCB18 CCB19	0.00016 0.00018 0.00019	The beryllium result for sample EP-CPT01S-PZ was qualified as nondetect (U) at the reporting limit. Other associated results were reported as nondetected or greater than five times the CCB concentration
SPL SDG 07061238			
TJA_070705A			
Iron	CCB9	0.015	The iron results for samples EP-CPT89S-PZ, EP-CPT24S-PZ, EP-H100-WELL, EP-L59-WELL, EP-H101-WELL, and EP-H98-WELL were qualified as nondetect (U) at the reporting limit.
Sodium	CCB13 CCB14	0.041 0.030	None. The associated sodium result were reported as greater than five times the CCB concentration.
ICPMS_070703A			
Arsenic	CCB25 CCB26 CCB27 CCB28 CCB29	0.0014 0.0015 0.0014 0.0014 0.0013	The arsenic results for samples EP-CPT46D-PZ EP-CPT89S-PZ, EP-L59-WELL, EP-H101-WELL, EP-H98-WELL, EP-CPT91S-PZ, EP-H66-WELL, EP-H67-WELL, EP-H64/65-WELL, EP-CPT22S-PZ, EP-CPT03S-PZ, EP-CPT88S-PZ, and EP-CPT43S-PZ were qualified as nondetect (U) at the reporting limit.
Vanadium	CCB25	0.00041	The vanadium result for sample EP-H100-WELL was qualified as nondetect (U) at the reported concentration.
Zinc	CCB25 CCB28 CCB26 CCB27 CCB29	0.00039 0.00047 0.00044 0.00042 0.00041	None. The associated zinc results were reported at concentrations greater than five times the CCB concentration.
ICPMS_070704A			
Aluminum	CCB6	0.0035	None. The associated aluminum results were reported at concentrations greater than five times the CCB concentration.
Antimony	CCB2 CCB3 CCB6 CCB7	0.0035 0.0039 0.0031 0.0032	The antimony results for samples EP-CPT91S-PZ, EP-H66-WELL, EP-H67-WELL, EP-H64/65-WELL, EP-CPT22S-PZ EP-CPT03S-PZ, EP-CPT88S-PZ, and EP-CPT43S-PZ were qualified as nondetect (U/UJ) at the reporting limit.
Beryllium	CCB2 CCB3	0.0002 0.00028	None. The associated beryllium result is reported as nondetect.
Selenium	CCB2 CCB3 CCB4 CCB6 CCB7	0.00037 0.00053 0.00033 0.00033 0.00037	The selenium results for sample EP-CPT88S-PZ was qualified as nondetect at the reporting limit. All other results were reported at greater than five times the CCB concentration.
ICPMS_070705A			
Antimony	CCB14 CCB15	0.0026 0.0026	The antimony results for samples EP-CPT46D-PZ EP-CPT89S-PZ, EP-CPT24S-PZ, EP-H100-WELL-FD, EP-L59-WELL, EP-H101-WELL, and EP-H98-WELL were qualified as nondetect (U/UJ) at the reporting limit.
Beryllium	CCB14 CCB15 CCB16	0.00014 0.00014 0.00019	None. All beryllium results were reported as nondetect.

Analyte	CCB	Concentration (mg/l)	Qualification	
SPL SDG 07061307				
TJA_070702A				
Sodium	CCB5	0.046	None. The listed analytical results in the associated samples were greater than five times the CCB concentration or reported as nondetect.	
	CCB6	0.032		
	CCB7	0.038		
	CCB8	0.025		
Boron	CCB6	0.006		
Iron	CCB8	0.0077		
TJA_070705A				
Iron	CCB2	0.0043	The iron results for samples EP-CPT85S-PZ and EP-CPT56S-PZ were qualified as nondetect (U) at the reporting limit.	
ICPMS_070702A				
Selenium	CCB18	0.00065	The selenium results for samples EP-CPT54S-PZ and EP-CPT64S-PZ were qualified as nondetect (U) at the reporting limit.	
ICPMS_070704A				
Antimony	CCB5	0.00055	The antimony results for samples EP-CPT85S-PZ, EP-CPT69S-PZ, EP-CPT66S-PZ, EP-CPT26D-PZ, EP-CPT64S-PZ, and EP-CPT65S-PZ were qualified as nondetect (U) at the reporting limit.	
	CCB6	0.00041		
	CCB7	0.00040		
SPL SDG 07071499				
TJA_070706A				
Boron	CCB1	0.0095	None. The associated results were reported at concentrations greater than five times the amount in the CCBs.	
	CCB2	0.0067		
Calcium	CCB1	0.012		
	CCB2	0.0054		
	CCB3	0.016		
Manganese	CCB1	0.001.3		
Sodium	CCB2	0.049		
TJA_070709A				
Calcium	CCB6	0.0018	None. The associated results were reported at concentrations greater than five times the amount in the CCBs.	
ICPMS_070629A				
Antimony	CCB6	0.00037	None. The associated results were reported as nondetect.	
Selenium	CCB6	0.00029	None. The associated results were reported at concentrations greater than five times the amount in the CCBs.	
Zinc	CCB6	0.00013		
Thallium	CCB7	0.00027	The thallium results for sample EP-CPT62S-PZ was qualified as nondetected at the reporting limit. All other results were reported as nondetect and data qualification was not required.	
Arsenic	CCB8	0.0014	The arsenic results for samples EP-CPT48S-PZ, EP-CPT58S-PZ, EP-CPT53S-PZ, EP-CPT21S-PZ, EP-CPT13S-PZ, EP-CPT16S-PZ, and EP-CPT32S-PZ were qualified as nondetected at the reporting limit.	
ICPMS_070707A				
Beryllium	CCB1	0.00014	The beryllium results for sample EP-CPT62S-PZ was qualified as nondetected at the reporting limit. All other results were reported as nondetect and data qualification was not required.	
	CCB2	0.00013		
	CCB3	0.00015		
Aluminum	CCB3	0.0047	The aluminum results for samples EP-CPT48S-PZ, EP-CPT58S-PZ, EP-CPT53S-PZ, EP-CPT21S-PZ, EP-CPT13S-PZ, and EP-CPT32S-PZ were qualified as nondetected at the higher of the reporting limit or the detected value.	

mg/l = milligrams per liter

CCB – Continuing Calibration Blank

Table 5 – Matrix Spike Recoveries and Qualifications

Analyte	MS %R	MSD %R	PDS %R	Acceptance Range (%)	Qualification
SPL SDG 07061238					
Sample EP-H100-WELL					
Potassium	74.1	91.2	83.5% 86.0%	75-125	As the potassium MS/MSD recoveries were within the acceptance limits for 7 of 10 dissolved metals analyses, only the potassium result for sample EP-H100-WELL, EP-H100-WELL-FD, and EP-CPT62S-WELL were qualified as estimated (J) to reflect the potential low bias.
SPL SDG 07061499					
Sample EP-CPT62S-PZ					
Potassium	162	145	140% 129%	75-125	

MS – Matrix Spike

MSD – Matrix Spike Duplicate

PDS – Post-Digestion Spike

%R = percent recovery

NA – Not Applicable (sample concentration greater than four times the spike amount)

Table 6 – Serial Dilution and Qualifications

Analyte	%D	Qualification
SPL SDG 07061238		
Sample EP-H100-WELL		
Potassium	16.6	As three out of the four serial dilution results were within the acceptance criterion, only the potassium and sodium result for sample EP-H100-WELL and EP-H100-WELL-FD were qualified as estimated (J) to reflect the potential high bias.
Sodium	12.0	

%D = percent difference

Table 7 PRDL Outliers and Resultant Data Qualifications*

Metal	%R (%)	PRDL Concentration (mg/l)	CCV Concentration (mg/l)	Qualification
SPL SDG 07061073				
RUN: ICP TJA_070627A				
Boron	134	0.1	5	All associated boron results were qualified as estimated (J) to reflect the potential high bias as all results were reported as detected and the concentrations were below 0.356 mg/L.
SPL SDG 07061148				
RUN: TJA_070627A				
Boron	134	0.1	5	The boron results for samples EP-CPT72S-PZ, EP-CPT01S-PZ-FD, EP-CPT08S-PZ-FD, EP-CPT84S-PZ, EP-CPT86S-PZ, EP-CPT07S-PZ, EP-CPT14S-PZ, EP-CPT17S-PZ, EP-CPT11S-PZ, EP-CPT60S-PZ, and EP-CPT60S-PZ-FD were qualified as estimated to reflect the potential high bias as all results were reported as detected and the concentrations were below 0.605 mg/L.
RUN: TJA_070705A				
Iron	165	0.02	5	The iron result for sample EP-CPT08S-PZ was qualified as estimated to reflect the potential high bias as all results were reported as detected below the concentration of the PRDL standard
RUN: ICPMS_070702A				
Arsenic	137	0.005	0.1	The arsenic results for samples EP-CPT08S-PZ and EP-CPT01S-PZ were qualified as estimated to reflect the potential high bias as all results were reported as detected below the concentration of the PRDL standard
Cadmium	78%	0.005	0.1	The cadmium results for samples EP-CPT08S-PZ and EP-CPT01S-PZ were qualified as estimated (UJ) to reflect the potential low bias as all results were reported as nondetected.
RUN: ICPMS_070704A				
Copper	137 138	0.005	0.1	The copper results for sample EP-CPT01S-PZ was qualified as estimated to reflect the potential high bias as the results were reported as detected below the concentration of the PRDL standard
RUN: ICPMS_070704A				
Cadmium	63% 63%	0.005	0.1	The cadmium results for samples EP-CPT72S-PZ, EP-CPT01S-PZ-FD, EP-CPT08S-PZ-FD, EP-CPT84S-PZ, EP-CPT86S-PZ, EP-CPT07S-PZ, EP-CPT14S-PZ, EP-CPT17S-PZ, EP-CPT11S-PZ, EP-CPT60S-PZ, and EP-CPT60S-PZ-FD were qualified as estimated (UJ) to reflect the potential low bias as all results were reported as nondetected.
SPL SDG 07061238				
RUN: ICPMS_070703A				
Copper	139 142	0.005	0.050	The following copper results were qualified as estimated (J) to reflect the potential high bias: EP-CPT46D-PZ, EP-CPT89S-PZ, EP-CPT24S-PZ, EP-H100-WELL, EP-H100-WELL-FD, EP-L59-WELL, EP-H98-WELL, EP-CPT91S-PZ, EP-H66-WELL, EP-H67-WELL, EP-H64/65-WELL, EP-CPT22S-PZ, EP-CPT03S-PZ, EP-CPT88S-PZ, and EP-CPT43S-PZ. As the results were either reported as below or near the RL the samples were qualified estimated.

Metal	%R (%)	PRDL Concentration (mg/l)	CCV Concentration (mg/l)	Qualification
RUN: ICPMS2_070704A				
Aluminum	60 47	0.010	0.050	The following aluminum results were qualified as estimated (J) to reflect the potential low bias: EP-CPT46D-PZ, EP-CPT24S-PZ, EP-H100-WELL, EP-H100-WELL-FD, EP-L59-WELL, EP-H101-WELL, EP-H98-WELL, EP-CPT91S-PZ, EP-H67-WELL, EP-H64/65-WELL, EP-CPT22S-PZ, EP-CPT03S-PZ, EP-CPT88S-PZ, and EP-CPT43S-PZ. As the aluminum results were either reported as below or near the RL the samples were qualified estimated.
SPL SDG 07061307				
RUN: ICP TJA_070705A				
Iron	165	0.02	5	The iron results for EP-CPT85S-PZ and EP-CPT56S-PZ were qualified as estimated to reflect the potential high bias as both results were reported as detected near the concentration of the PRDL standard.
RUN: ICPMS_070702A				
Arsenic	137	0.005	0.100	The arsenic results for samples EP-CPT85S-PZ, EP-CPT54S-PZ, EP-CPT64S-PZ, EP-CPT29D-PZ, EP-CPT02S-PZ, and EP-CPT65S-PZ were qualified as estimated to reflect the potential high bias as the arsenic results were reported as detected near the concentration of the PRDL standard.
RUN: ICPMS_070704A				
Copper	137 138	0.005	0.050	All copper results were qualified as estimated to reflect the potential high bias as all copper results were reported as detected near the concentration of the PRDL standard.
RUN: ICPMS_070706A				
Aluminum	47 61	0.01	0.050	All aluminum results were qualified as estimated to reflect the potential low bias as all aluminum results were reported as nondetect or detected near the concentration of the PRDL standard.
SPL SDG 07071499				
RUN: ICP TJA_070706A				
Boron	133	0.1	5	All boron results were qualified as estimated (J) to reflect the potential high bias.
RUN: ICPMS_070629A				
Arsenic	134	0.005	0.100	The arsenic results for sample EP-CPT62S-PZ was qualified as estimated to reflect the potential high bias as the arsenic result was reported as detected near the concentration of the PRDL standard.

* The PRDL standard is analyzed the beginning and end of each analytical run or a minimum of twice per 8 hour shift, which ever is more frequent.

%R = percent recovery

CCV = Continuing Calibration Verification

mg/l = milligrams per liter

A.2
July 2007
Data Validation Reports

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratory: Microseeps

Data Package Numbers: P0707269, P0707291

Reviewer: Joseph Capotrio

Peer Reviewer: Geoffrey Webb

Date Review Completed: 8/9/07

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003) and evaluation of laboratory criteria. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II sampling investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in these data packages. Table 2 summarizes the results of the review of sample-specific parameters. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0707269				
EP-H29/30-WELL	P0707269-01	7/18/2007	SA	X
EP-H29/30-WELL MS	P0707269-02	7/18/2007	MS	X
EP-H29/30-WELL MSD	P0707269-03	7/18/2007	MSD	X
EP-H31-WELL	P0707269-04	7/18/2007	SA	X
EP-H67-WELL	P0707269-05	7/18/2007	SA	X
EP-H74/75-WELL	P0707269-06	7/18/2007	SA	X
EP-H69-WELL	P0707269-07	7/18/2007	SA	X
EP-H34-WELL	P0707269-08	7/18/2007	SA	X
EP-H76-WELL	P0707269-09	7/18/2007	SA	X
EP-H29/30-WELL-FD	P0707269-10	7/18/2007	FD	X
EP-H26-WELL	P0707269-11	7/18/2007	SA	X
EP-H61-WELL	P0707269-12	7/18/2007	SA	X
EP-H52/57-WELL	P0707269-13	7/18/2007	SA	X
EP-L59-WELL	P0707269-14	7/18/2007	SA	X
EP-H59W-WELL	P0707269-15	7/18/2007	SA	X
EP-H90/91-WELL	P0707269-16	7/18/2007	SA	X
EP-H48-WELL	P0707269-17	7/18/2007	SA	X
P0707291				
EP-H100-WELL	P0708291-01	7/19/2007	SA	X
EP-H98-WELL	P0708291-01	7/19/2007	SA	X
EP-H102-WELL	P0708291-01	7/19/2007	SA	X
EP-H101-WELL	P0708291-01	7/19/2007	SA	X
EP-H66-WELL	P0708291-01	7/19/2007	SA	X
EP-H64/65-WELL	P0708291-01	7/19/2007	SA	X

SA = Sample FD = Field duplicate MS = Matrix Spike MSD = Matrix Spike Duplicate

¹ For the purpose of data management the sampling date has been appended to the field ID in the database.

General Usability Statement:

- ☐ Data are usable without qualification.
- ☒ Data are usable with qualification (noted below).
- ☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	
Calibration blanks?	NA	
Surrogate recoveries?	NA	
Matrix spike recoveries? • EP-H29/30-WELL	Yes	MS/MSD results for all samples were within laboratory criteria.
Ambient (field) blank evaluation?	NA	
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	Yes	
Field duplicate evaluation criteria met? • EP-H29/30-WELL	Yes	The RPDs between the parent sample results and the field duplicate results for met the evaluation criteria.
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD recoveries. Acceptable accuracy was attained with respect to the analytical method and sample matrix.
Are precision criteria met?	Yes	This was evaluated using the field duplicate pairs, MS/MSD pairs, and the LCS/LCSD pairs. Precision criteria were met. Therefore, acceptable precision was attained with respect to the analytical method and sample matrix.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	Yes	The laboratory did not provide as sample receipt form. An evaluation of sample condition and temperature could not be performed.
Were results received for all samples?	Yes	
Are any data qualified as unusable?	No	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	

Review Parameters	QAPP Criteria Met?	Comments
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

A.3
August 2007
Data Validation Reports

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratory: Microseeps

Data Package Numbers: P0708462, P0708477, P0708505, and P0708529

Reviewer: Stan Gladych

Peer Reviewer: Geoffrey Webb

Date Review Completed: 9/13/2007

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003) and evaluation of laboratory criteria. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II sampling investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0708462				
EP-H62/63-WELL	P0708462-01	27-Aug-07	SA	X
EP-H34-WELL	P0708462-02	27-Aug-07	SA	X
EP-H61-WELL	P0708462-03	27-Aug-07	SA	X
EP-H52/57-WELL	P0708462-04	27-Aug-07	SA	X
EP-H98-WELL	P0708462-05	27-Aug-07	SA	X
EP-L59-WELL	P0708462-06	27-Aug-07	SA	X
EP-CPT45D-PZ	P0708462-07	27-Aug-07	SA	X
EP-CPT45S-PZ	P0708462-08	27-Aug-07	SA	X ^M
EP-CPT45S-PZ-FD	P0708462-11	27-Aug-07	FD	X
EP-CPT03S-PZ	P0708462-12	27-Aug-07	SA	X
EP-CPT07S-PZ	P0708462-13	27-Aug-07	SA	X ^M
EP-CPT07S-PZ-FD	P0708462-16	27-Aug-07	FD	X
EP-CPT14S-PZ	P0708462-17	27-Aug-07	SA	X
EP-CPT06S-PZ	P0708462-18	27-Aug-07	SA	X
EP-CPT52S-PZ	P0708462-19	27-Aug-07	SA	X
EP-H100-WELL	P0708462-20	27-Aug-07	SA	X ^M
EP-H100-WELL-FD	P0708462-23	27-Aug-07	FD	X
EP-H101-WELL	P0708462-24	27-Aug-07	SA	X
EP-H66-WELL	P0708462-25	27-Aug-07	SA	X
EP-CPT62S-PZ	P0708462-26	27-Aug-07	SA	X
P0708477				
EP-CPT60S-PZ	P0708477-01	28-Aug-07	SA	X
EP-CPT72S-PZ	P0708477-02	28-Aug-07	SA	X
EP-CPT12S-PZ	P0708477-03	28-Aug-07	SA	X
EP-CPT05S-PZ	P0708477-04	28-Aug-07	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
EP-CPT11S-PZ	P0708477-05	28-Aug-07	SA	X
EP-CPT10S-PZ	P0708477-06	28-Aug-07	SA	X
EP-CPT26D-PZ	P0708477-07	28-Aug-07	SA	X
EP-CPT88S-PZ	P0708477-08	28-Aug-07	SA	X
EP-CPT26S-PZ	P0708477-09	28-Aug-07	SA	X
EP-CPT56S-PZ	P0708477-10	28-Aug-07	SA	X
EP-CPT09S-PZ	P0708477-11	28-Aug-07	SA	X
EP-CPT08S-PZ	P0708477-12	28-Aug-07	SA	X
EP-CPT32S-PZ	P0708477-13	28-Aug-07	SA	X
EP-CPT59S-PZ	P0708477-14	28-Aug-07	SA	X
EP-CPT01S-PZ	P0708477-15	28-Aug-07	SA	X
EP-CPT35D-PZ	P0708477-16	28-Aug-07	SA	X
EP-CPT90S-PZ	P0708477-17	28-Aug-07	SA	X
EP-H67-WELL	P0708477-18	28-Aug-07	SA	X
EP-CPT33S-PZ	P0708477-19	28-Aug-07	SA	X
EP-CPT02S-PZ	P0708477-20	28-Aug-07	SA	X
EP-H64/65-WELL	P0708477-21	28-Aug-07	SA	X
EP-CPT35S-PZ	P0708477-22	28-Aug-07	SA	X
EP-CPT65S-PZ	P0708477-23	28-Aug-07	SA	X
EP-CPT66S-PZ	P0708477-24	28-Aug-07	SA	X
EP-CPT46D-PZ	P0708477-25	28-Aug-07	SA	X
EP-CPT46S-PZ	P0708477-26	28-Aug-07	SA	X
EP-CPT23S-PZ	P0708477-27	28-Aug-07	SA	X ^M
EP-CPT23S-PZ-FD	P0708477-30	28-Aug-07	FD	X
EP-CPT22S-PZ-FD	P0708477-31	28-Aug-07	FD	X
EP-CPT22S-PZ	P0708477-32	28-Aug-07	SA	X ^M
P0708505				
EP-CPT13S-PZ	P0708505-01	29-Aug-07	SA	X
EP-CPT29D-PZ	P0708505-02	29-Aug-07	SA	X
EP-CPT70S-PZ	P0708505-03	29-Aug-07	SA	X
EP-CPT49S-PZ	P0708505-04	29-Aug-07	SA	X
EP-CPT67S-PZ	P0708505-05	29-Aug-07	SA	X
EP-CPT85S-PZ	P0708505-06	29-Aug-07	SA	X
EP-CPT58S-PZ	P0708505-07	29-Aug-07	SA	X
EP-CPT87S-PZ	P0708505-08	29-Aug-07	SA	X
EP-CPT55S-PZ	P0708505-09	29-Aug-07	SA	X
EP-CPT91S-PZ	P0708505-10	29-Aug-07	SA	X
EP-CPT84S-PZ	P0708505-11	29-Aug-07	SA	X
EP-CPT28S-PZ	P0708505-12	29-Aug-07	SA	X
EP-CPT31S-PZ	P0708505-13	29-Aug-07	SA	X
EP-CPT74S-PZ	P0708505-14	29-Aug-07	SA	X
EP-CPT41D-PZ	P0708505-15	29-Aug-07	SA	X
EP-CPT30S-PZ	P0708505-16	29-Aug-07	SA	X
EP-CPT69S-PZ	P0708505-17	29-Aug-07	SA	X
EP-CPT24S-PZ	P0708505-18	29-Aug-07	SA	X
EP-CPT86S-PZ	P0708505-19	29-Aug-07	SA	X
EP-CPT29S-PZ	P0708505-20	29-Aug-07	SA	X
EP-CPT41S-PZ	P0708505-21	29-Aug-07	SA	X
EP-CPT50S-PZ	P0708505-22	29-Aug-07	SA	X
EP-CPT61S-PZ	P0708505-23	29-Aug-07	SA	X
EP-CPT63S-PZ	P0708505-24	29-Aug-07	SA	X
EP-CPT64S-PZ	P0708505-25	29-Aug-07	SA	X
EP-CPT48S-PZ	P0708505-26	29-Aug-07	SA	X
EP-CPT53S-PZ	P0708505-27	29-Aug-07	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
EP-CPT57S-PZ	P0708505-28	29-Aug-07	SA	X
EP-CPT57R-PZ	P0708505-29	29-Aug-07	SA	X
P0708529				
EP-CPT04S-PZ	P0708529-01	30-Aug-07	SA	X
EP-CPT15S-PZ	P0708529-02	30-Aug-07	SA	X
EP-CPT16S-PZ	P0708529-03	30-Aug-07	SA	X
EP-CPT17S-PZ	P0708529-04	30-Aug-07	SA	X
EP-CPT36S-PZ	P0708529-05	30-Aug-07	SA	X
EP-CPT43S-PZ	P0708529-06	30-Aug-07	SA	X
EP-CPT44S-PZ	P0708529-07	30-Aug-07	SA	X
EP-CPT54S-PZ	P0708529-08	30-Aug-07	SA	X
EP-CPT89S-PZ	P0708529-09	30-Aug-07	SA	X

SA = Sample

FD = Field duplicate

X^M = MS/MSD¹ For the purpose of data management the sampling date has been appended to the field ID in the database.**General Usability Statement:**

- _____ Data are usable without qualification.
- X Data are usable with qualification (noted below).
- _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	
Calibration blanks?	NA	
Surrogate recoveries?	NA	
Matrix spike recoveries? <ul style="list-style-type: none"> EP-CPT45S-PZ EP-CPT07S-PZ EP-H100-WELL EP-CPT23S-PZ EP-CPT22S-PZ 	Yes	MS/MSD results for all samples were within laboratory criteria. The results for ethane, methane, and propane from EP-H100-WELL were greater than four times the spike concentration and were not appropriate for assessing accuracy and precision.
Ambient (field) blank evaluation?	NA	
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	Yes	
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> EP-CPT45S-PZ-FD EP-CPT07S-PZ-FD 	No	For field duplicate pair EP-CPT45S-PZ/EP-CPT45S-PZ-FD, the RPDs between the parent sample results and the field duplicate results for

Review Parameters	QAPP Criteria Met?	Comments
<ul style="list-style-type: none"> EP-H100-WELL-FD EP-CPT23S-PZ-FD EP-CPT22S-PZ-FD 		<p>n-butane exceeded the evaluation criteria of 2xRL for samples less than five times the RL. Therefore, the n-butane results for samples EP-CPT45S-PZ and EP-CPT45S-PZ-FD were qualified as estimated (J/UJ).</p> <p>For field duplicate pair EP-CPT23S-PZ/ EP-CPT23S-PZ-FD, the RPDs between the parent sample results and the field duplicate results for ethane, ethene, and methane exceeded the evaluation criteria of $\leq 30\%$ with RPDs of 65%, 130%, and 117%, respectively. Therefore, the ethane, ethene, and methane results for samples EP-CPT23S-PZ and EP-CPT23S-PZ-FD were qualified as estimated (J).</p>
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD recoveries. Acceptable accuracy was attained with respect to the analytical method and sample matrix.
Are precision criteria met?	Yes	This was evaluated using the field duplicate pairs, MS/MSD pairs, and the LCS/LCSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	Yes	
Were results received for all samples?	Yes	
Are any data qualified as unusable?	No	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratories: SPL-Houston

Data Package Numbers: 07081384, 07081435, 07081510, 07081605

Reviewer: Stan Gladych

Peer Reviewer: Geoffrey Webb

Date Review Completed: 10/22/2007

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003), evaluation of laboratory criteria, and reference to Functional Guidelines, as applicable to the method. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters that includes the review of four data packages for analytical data reported by SPL. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses			
				Dissolved Metals	General Chemistry	TDS, SO4, Cl	BTEX
07081384							
EP-H62/63-WELL	07081384-01	27-Aug-07	SA	X	X	X	
EP-H61-WELL	07081384-02	27-Aug-07	SA	X	X	X	
EP-H34-WELL	07081384-03	27-Aug-07	SA	X	X	X	
EP-H52/57-WELL	07081384-04	27-Aug-07	SA	X	X	X	
EP-L59-WELL	07081384-05	27-Aug-07	SA	X	X	X	X
EP-H98-WELL	07081384-06	27-Aug-07	SA	X	X	X	
Trip 1-082707	07081384-07	27-Aug-07	TB				X
EP-CPT03S-PZ	07081384-08	27-Aug-07	SA	X	X	X	
EP-CPT45D-PZ	07081384-09	27-Aug-07	SA	X	X	X	
EP-CPT45S-PZ	07081384-10	27-Aug-07	SA			X ^M	
EP-CPT45S-PZ-FD	07081384-11	27-Aug-07	FD			X	
EP-CPT07S-PZ	07081384-12	27-Aug-07	SA	X ^M	X ^M	X ^M	
EP-CPT07S-PZ-FD	07081384-13	27-Aug-07	FD	X	X	X	
EP-CPT14S-PZ	07081384-14	27-Aug-07	SA	X	X	X	
EP-CPT06S-PZ	07081384-15	27-Aug-07	SA			X	
Trip Blank2-082707	07081384-16	27-Aug-07	TB				X
EP-H100-WELL	07081384-17	27-Aug-07	SA	X ^M	X ^M	X ^M	X ^M
EP-H100-WELL-FD	07081384-18	27-Aug-07	FD	X	X	X	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses			
				Dissolved Metals	General Chemistry	TDS, SO ₄ , Cl	BTEX
EP-CPT62S-PZ	07081384-19	27-Aug-07	SA	X	X	X	
EP-H66-WELL	07081384-20	27-Aug-07	SA	X	X	X	
EP-H101-WELL	07081384-21	27-Aug-07	SA	X	X	X ^M	
EP-CPT52S-PZ	07081384-22	27-Aug-07	SA			X	
07081435							
EP-H64/65-WELL	07081435-01	28-Aug-07	SA	X	X	X ^M	
EP-H67-WELL	07081435-02	28-Aug-07	SA	X	X	X	
EP-CPT02S-PZ	07081435-03	28-Aug-07	SA	X	X	X	
EP-CPT01S-PZ	07081435-04	28-Aug-07	SA	X	X	X	
EP-CPT59S-PZ	07081435-05	28-Aug-07	SA			X	
EP-CPT33S-PZ	07081435-06	28-Aug-07	SA			X	
EP-CPT35D-PZ	07081435-07	28-Aug-07	SA			X	X
EP-CPT90S-PZ	07081435-08	28-Aug-07	SA			X	
EP-CPT35S-PZ	07081435-09	28-Aug-07	SA			X	
Trip Blank 1-082807	07081435-10	28-Aug-07	TB				X
EP-CPT32S-PZ	07081435-11	28-Aug-07	SA	X	X	X	
EP-CPT72S-PZ	07081435-12	28-Aug-07	SA	X	X ^M	X	
EP-CPT60S-PZ	07081435-13	28-Aug-07	SA	X	X	X	
EP-CPT88S-PZ	07081435-14	28-Aug-07	SA	X	X ^M	X	
EP-CPT56S-PZ	07081435-15	28-Aug-07	SA	X	X	X	
EP-CPT26D-PZ	07081435-16	28-Aug-07	SA	X	X ^M	X	
EP-CPT10S-PZ	07081435-17	28-Aug-07	SA			X	
EP-CPT12S-PZ	07081435-18	28-Aug-07	SA			X	
EP-CPT11S-PZ	07081435-19	28-Aug-07	SA	X	X	X	X
EP-CPT09S-PZ	07081435-20	28-Aug-07	SA			X	X
EP-CPT26S-PZ	07081435-21	28-Aug-07	SA			X	
EP-CPT05S-PZ	07081435-22	28-Aug-07	SA			X ^M	X
EP-CPT08S-PZ	07081435-23	28-Aug-07	SA	X	X	X	
EP-CPT65S-PZ	07081435-24	28-Aug-07	SA	X	X	X	
EP-CPT66S-PZ	07081435-25	28-Aug-07	SA	X	X	X	
EP-CPT46D-PZ	07081435-26	28-Aug-07	SA	X	X	X	X
Trip Blank2-082807	07081435-27	28-Aug-07	TB				X
EP-CPT46S-PZ	07081435-28	28-Aug-07	SA			X	
EP-CPT22S-PZ	07081435-29	28-Aug-07	SA	X ^M	X ^M	X ^M	
EP-CPT22S-PZ-FD	07081435-30	28-Aug-07	FD	X	X	X	
EP-CPT23S-PZ	07081435-31	28-Aug-07	SA			X ^M	
EP-CPT23S-PZ-FD	07081435-32	28-Aug-07	FD			X	
07081510							
EP-CPT41D-PZ	07081510-01	29-Aug-07	SA			X	X
EP-CPT85S-PZ	07081510-02	29-Aug-07	SA	X	X ^M	X ^M	X
EP-CPT91S-PZ	07081510-03	29-Aug-07	SA	X	X ^M	X	X
EP-CPT64S-PZ	07081510-04	29-Aug-07	SA	X	X	X ^M	
EP-CPT53S-PZ	07081510-05	29-Aug-07	SA	X	X	X ^M	X
EP-CPT48S-PZ	07081510-06	29-Aug-07	SA	X	X ^M	X	
EP-CPT57S-PZ	07081510-07	29-Aug-07	SA			X	
EP-CPT57R-PZ	07081510-08	29-Aug-07	SA			X	X
TRIPBLANK1-082907	07081510-09	29-Aug-07	TB				X
EP-CPT29D-PZ	07081510-10	29-Aug-07	SA	X	X	X ^M	
EP-CPT29S-PZ	07081510-11	29-Aug-07	SA			X	
EP-CPT13S-PZ	07081510-12	29-Aug-07	SA	X	X	X ^M	
EP-CPT41S-PZ	07081510-13	29-Aug-07	SA			X	
EP-CPT86S-PZ	07081510-14	29-Aug-07	SA	X	X ^M	X ^M	

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses			
				Dissolved Metals	General Chemistry	TDS, SO ₄ , Cl	BTEX
EP-CPT69S-PZ	07081510-15	29-Aug-07	SA	X	X	X ^M	
EP-CPT30S-PZ	07081510-16	29-Aug-07	SA	X	X ^M	X	
EP-CPT24S-PZ	07081510-17	29-Aug-07	SA	X	X	X ^M	
EP-CPT31S-PZ	07081510-18	29-Aug-07	SA			X	
EP-CPT50S-PZ	07081510-19	29-Aug-07	SA			X	
EP-CPT74S-PZ	07081510-20	29-Aug-07	SA			X	
EP-CPT28S-PZ	07081510-21	29-Aug-07	SA			X ^M	
EP-CPT58S-PZ	07081510-22	29-Aug-07	SA	X	X	X	
EP-CPT84S-PZ	07081510-23	29-Aug-07	SA	X	X	X	
EP-CPT87S-PZ	07081510-24	29-Aug-07	SA			X	
EP-CPT70S-PZ	07081510-25	29-Aug-07	SA			X ^M	
EP-CPT67S-PZ	07081510-26	29-Aug-07	SA			X	
EP-CPT55S-PZ	07081510-27	29-Aug-07	SA			X ^M	
EP-CPT49S-PZ	07081510-28	29-Aug-07	SA			X	
EP-CPT61S-PZ	07081510-29	29-Aug-07	SA			X	
EP-CPT63S-PZ	07081510-30	29-Aug-07	SA			X	
07081605							
EP-CPT89S-PZ	07081605-01	30-Aug-07	SA	X ^M	X ^M	X ^M	
EP-CPT04S-PZ	07081605-02	30-Aug-07	SA			X ^M	
EP-CPT15S-PZ	07081605-03	30-Aug-07	SA			X ^M	
EP-CPT16S-PZ	07081605-04	30-Aug-07	SA	X	X	X	
EP-CPT17S-PZ	07081605-05	30-Aug-07	SA	X	X	X	
EP-CPT36S-PZ	07081605-06	30-Aug-07	SA			X	X
EP-CPT43S-PZ	07081605-07	30-Aug-07	SA	X	X ^M	X	X ^M
EP-CPT46S-PZ	07081605-08	30-Aug-07	SA				X
EP-CPT54S-PZ	07081605-09	30-Aug-07	SA	X	X ^M	X	X
EP-CPT44S-PZ	07081605-10	30-Aug-07	SA			X	X
TRIP BLANK1-083007	07081605-11	30-Aug-07	TB				X

SA = Sample FD = Field duplicate

Dissolved metals (6010 and 6020): Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium (total), Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

General Chemistry: Alkalinity suite, Br, PO₄, Fluoride, Iodide, NO₃, NO₂, and charge balance calculation.

X^M = Requested matrix spike and matrix spike duplicate and/or laboratory duplicate, as applicable to method

¹For the purpose of data management the sampling date has been appended to the field ID in the database.

General Usability Statement:

- ☐ Data are usable without qualification.
- ☒ Data are usable with qualification (noted below).
- ☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	No	With the exceptions listed in Table 3 below, no target analytes were detected in the method blanks.
Calibration blanks?	No	With the exceptions in listed Table 4 below, no target analytes were detected in the associated bracketing calibration blanks.
Surrogate recoveries?	Yes	
Matrix spike recoveries? <ul style="list-style-type: none"> • EP-CPT07S-PZ – metals, orthophosphate, NO₃, NO₂, Anions • EP-H100-WELL – metals, orthophosphate, NO₃, NO₂, Anions, BTEX • EP-CPT45S-PZ – Chloride, Sulfate • EP-CPT22S-PZ – Metals, orthophosphate, NO₂, NO₃, Anions • EP-CPT88S-PZ – orthophosphate, • EP-CPT72S-PZ – NO₂, NO₃ • EP-H64/65-WELL – Chloride, Sulfate • EP-CPT05S-PZ – Chloride, Sulfate • EP-CPT23S-PZ – Chloride, Sulfate • EP-CPT85S-PZ – orthophosphate, Bromide, Fluoride, NO₂, NO₃ • EP-CPT30S-PZ – orthophosphate • EP-CPT64S-PZ – Sulfate • EP-CPT53S-PZ – Chloride • EP-CPT29D-PZ – Chloride • EP-CPT13S-PZ – Sulfate • EP-CPT86S-PZ - Bromide, Fluoride, Chloride, NO₂, NO₃ • EP-CPT69S-PZ – Sulfate • EP-CPT24S-PZ – Chloride • EP-CPT70S-PZ – Chloride, Sulfate • EP-CPT91S-PZ – NO₂, NO₃ • EP-CPT43S-PZ – BTEX, Bromide, fluoride • EP-CPT89S-PZ – Metals, orthophosphate, NO₂, NO₃, 	No	Matrix spike (MS) / and matrix spike duplicate (MSD) were performed on the samples listed. MS/MSD results were not considered appropriate for assessing accuracy and precision if the parent result was greater than four times the spike amount. With the exceptions listed in Table 5, all recoveries were within the acceptance limits.

Review Parameters	QAPP Criteria Met?	Comments
Anions <ul style="list-style-type: none"> EP-CPT15S-PZ - Chloride 		
Serial Dilution/Post Digestion spike %Difference? <ul style="list-style-type: none"> EP-CPT07S-PZ (SD) EP-H100-WELL (SD&PDS) EP-CPT22S-PZ (SD&PDS) EP-CPT89S-PZ (SD&PDS) 	No	With the exceptions listed in Table 6, all %Ds between the original sample results and the results obtained from the sample diluted 1:5 were ≤10% for analytical results that were appropriate for comparing to the evaluation criterion with concentrations greater than 50 times their respective MDLs.
Ambient (field) blank evaluation?	NA	
Trip Blank evaluation?	NA	
Cation/Anion Balance?	Yes	The %Ds between total cations and total anions were within the <13% for all samples and additionally, the ratio of measured TDS to calculated TDS was within the acceptance range of 0.5 to 1.5.
Precision Evaluation		
Laboratory duplicate criteria met? <ul style="list-style-type: none"> EP-CPT07S-PZ – TDS, Iodide, Alkalinity EP-H100-WELL – TDS, Iodide, Alkalinity EP-CPT45S-PZ – TDS EP-H101-WELL – TDS EP-H64/65-WELL – Alkalinity EP-CPT22S-PZ – Alkalinity, Iodide, TDS EP-CPT26D-PZ – Iodide EP-CPT72S-PZ – TDS EP-CPT23S-PZ – TDS EP-CPT85S-PZ – Alkalinity EP-CPT30S-PZ – Alkalinity, Iodide EP-CPT48S-PZ – Iodide EP-CPT13S-PZ - TDS EP-CPT28S-PZ - TDS EP-CPT55S-PZ – TDS EP-CPT89S-PZ – Alkalinity EP-CPT54S-PZ – Iodide EP-CPT04S-PZ – TDS 	Yes	Laboratory duplicates were performed on the samples listed. All results satisfied the applicable evaluation criterion. Due to laboratory oversight duplicates were not performed on samples EP-CPT07S-PZ and EP-H100-WELL for TDS analysis. Samples EP-CPT45S-PZ and EP-H101-WELL were selected at random for duplicate analysis. As the QC frequency criteria were met data qualification was not required.
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	No	With the exceptions in listed Table 7 below, all sample were analyzed within holding time. Samples listed in Table 7 were qualified at estimated.
Were sample preservation requirements met?	Yes	
Field duplicate evaluation criteria met?	No	With the following exception all field duplicate results were acceptable.

Review Parameters	QAPP Criteria Met?	Comments																																										
<ul style="list-style-type: none"> EP-CPT45S-PZ-FD EP-CPT07S-PZ-FD EP-H100-WELL-FD EP-CPT22S-PZ-FD EP-CPT23S-PZ-FD 		The aluminum for samples EP-CPT22S-PZ-FD-082807 EP-CPT22S-PZ-082807 exceeded the 2x the RL for samples less than 5x the RL criterion. As only one of five field duplicate pairs has a results that exceeded the evaluation criteria, only the field duplicate and the parent sample were qualified as estimated for the affected analyte.																																										
Sample collected per QAPP?	Yes																																											
Comparability Evaluation																																												
Are accuracy criteria met?	No	This was evaluated using the LCS/LCSD and MS/MSD pairs. With the two exceptions (Table 5), all MS/MSD recoveries were within the acceptance limits indicating acceptable accuracy was attained with respect to the analytical method and sample matrix.																																										
Are precision criteria met?	No	This was evaluated using the field duplicate, laboratory duplicate, LCS/LCSD pairs, and the MS/MSD pairs. With one exception, acceptable precision was attained with respect to the analytical method and sample matrix. Aluminum exceeded the criteria for one of five field duplicates. The overall data quality is not considered to be affected.																																										
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes																																											
Completeness Evaluation																																												
Sample receipt completeness?	No	SDG 07081435: Sample Tripblank2-082807 was listed on the COC but was not selected for analysis. This trip blank was analyzed for VOC's per request of URS.																																										
Were results received for all samples?	Yes																																											
Are any data qualified as unusable?	No																																											
Sensitivity Evaluation																																												
Were project-required RLs obtained?	No	<p>The following results were reported as nondetect with an elevated reporting limit.</p> <table border="1"> <thead> <tr> <th>FieldID</th><th>Analyte</th><th>Dilution</th></tr> </thead> <tbody> <tr> <td>EP-CPT30S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT48S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT64S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT85S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT86S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT32S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>2x</td></tr> <tr> <td>EP-CPT65S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>2x</td></tr> <tr> <td>EP-CPT16S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT17S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-CPT43S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> <tr> <td>EP-H98-WELL-082707</td><td>Nitrogen,Nitrite (as N)</td><td>5x</td></tr> <tr> <td>EP-CPT72S-PZ</td><td>Nitrogen,Nitrite (as N)</td><td>2x</td></tr> <tr> <td>EP-H67-WELL-</td><td>Nitrogen,Nitrite (as N)</td><td>10x</td></tr> </tbody> </table> <p>Results reported as nondetect at elevated RLs will need to be evaluated by the end user of the data to determine if the</p>	FieldID	Analyte	Dilution	EP-CPT30S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT48S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT64S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT85S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT86S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT32S-PZ	Nitrogen,Nitrite (as N)	2x	EP-CPT65S-PZ	Nitrogen,Nitrite (as N)	2x	EP-CPT16S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT17S-PZ	Nitrogen,Nitrite (as N)	10x	EP-CPT43S-PZ	Nitrogen,Nitrite (as N)	10x	EP-H98-WELL-082707	Nitrogen,Nitrite (as N)	5x	EP-CPT72S-PZ	Nitrogen,Nitrite (as N)	2x	EP-H67-WELL-	Nitrogen,Nitrite (as N)	10x
FieldID	Analyte	Dilution																																										
EP-CPT30S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT48S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT64S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT85S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT86S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT32S-PZ	Nitrogen,Nitrite (as N)	2x																																										
EP-CPT65S-PZ	Nitrogen,Nitrite (as N)	2x																																										
EP-CPT16S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT17S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-CPT43S-PZ	Nitrogen,Nitrite (as N)	10x																																										
EP-H98-WELL-082707	Nitrogen,Nitrite (as N)	5x																																										
EP-CPT72S-PZ	Nitrogen,Nitrite (as N)	2x																																										
EP-H67-WELL-	Nitrogen,Nitrite (as N)	10x																																										

Review Parameters	QAPP Criteria Met?	Comments
		results are considered usable for meeting project objectives.
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	No	Some samples were reanalyzed at a dilution due to the reported concentrations above the calibration range. The diluted analyses were selected for reporting with the exception of when the dilution was analyzed at more than twice the holding time. Samples selected for reporting which exceed the calibration range are listed in Table 8.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	No	PRDL (Project Required Detection Limit) The results for the PRDL standard analysis were reviewed as part of the data validation process. With the exceptions listed in Table 9 below, as noted in the case narrative, all recoveries were within the 80 – 120% criterion. However, Functional Guidelines criteria (70-130% for most metals and 50-150% for Sb, Pb, and Tl by ICP and Co, Mn, and Zn for ICP-MS) were used as thresholds for the assignment of data qualification. Only PRDL results requiring data qualification were identified on Table 9. Associated results may potentially be affected for values reported close to the PRDL.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

Table 3 – Method Blanks Detections and Qualifications

Analyte	Concentration (mg/L)	Qualification
SPL SDG 07081384		
Manganese	0.0005 0.0011	The manganese results for samples EP-H34-WELL, EP-CPT07S-PZ, EP-CPT07S-PZ-FD, and EP-H66-WELL were qualified as nondetected at the reporting limit.
SPL SDG 07081435		
Arsenic	0.000993	The arsenic results for samples EP-H67-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT88S-PZ, EP-CPT26D-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT66S-PZ, EP-CPT46D-PZ, and EP-CPT22S-PZ-FD, were qualified as nondetected at the higher of the reporting limited or the detected concentration.
Selenium	0.00231	The arsenic results for samples EP-H67-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT88S-PZ, EP-CPT56S-PZ, EP-CPT26D-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, EP-CPT46D-PZ, EP-CPT22S-PZ, and EP-CPT22S-PZ-FD were qualified as nondetected at the higher of the reporting limited or the detected concentration.
Thallium	0.000133	The arsenic results for samples EP-H64/65-WELL and EP-CPT22S-PZ were qualified as nondetected at the higher of the reporting limited or the detected concentration.
SPL SDG 07081510		
Manganese	0.00268	The manganese results for associated samples were nondetect or greater then five times the blank concentration, data qualification not required.
SPL SDG 07081605		
Sodium	0.0725	The analyte results in the associated samples were reported as greater than five times the method blank concentration or as nondetect, data qualification not required.
Arsenic	0.000993	
Selenium	0.00231 0.00086	
Thallium	0.000289	
Zinc	0.000133 0.000315	

mg/l = milligrams per liter

MB = Method Blank

Table 4 – CCB Detections and Qualifications

Analyte	CCB	Concentration (mg/l)	Qualification
SPL SDG 07081384			
TJA_070905A			
Manganese	CCB6 CCB7 CCB12	0.00067 0.00091 0.00067	The manganese results for samples EP-H34-WELL, EP-CPT07S-PZ, EP-CPT07S-PZ-FD, and EP-H66-WELL were qualified as nondetect at the higher of the reporting limit or the reported concentration.
Potassium	CCB12	1.4	The potassium results for sample EP-CPT07S-PZ-FD was qualified as nondetect at the higher of the reporting limit or the reported concentration.
ICPMS2_070906A			
Selenium	CCB2 CCB4	0.00043 0.00049	The selenium result for samples EP-CPT07S-PZ, EP-CPT07S-PZ-FD, and EP-CPT14S-PZ, were qualified as nondetect at the higher of the reporting limit or the reported value.
Thallium	CCB20	0.00028	The thallium result for sample EP-CPT07S-PZ was qualified as nondetect at the higher of the reporting limit or the reported value.
Vanadium	CCB2 CCB3 CCB4	0.00077 0.00079 0.00085	The vanadium result for samples EP-H61-WELL, EP-H52/57-WELL, EP-CPT03S-PZ, EP-CPT45D-PZ, EP-H100-WELL, and EP-H100-WELL-FD were qualified as nondetect at the higher of the reporting limit or the reported value.
Zinc	CCB5	0.00014	The zinc result for sample EP-H100-WELL-FD was qualified as nondetect at the higher of the reporting limit or the reported value.
SPL SDG 07081435			
TJA_070927A			
Boron	CCB6	0.012	The thallium result for sample EP-CPT11S-PZ was qualified as nondetect at the higher of the reporting limit or the reported value.
ICPMS_070906A			
Arsenic	CCB13	0.0017	The arsenic results for samples EP-CPT66S-PZ, EP-CPT46D-PZ, and EP-CPT22S-PZ-FD, were qualified as nondetect at the higher of the reporting limit or the reported value.
Selenium	CCB9 CCB10	0.0024 0.0017	The selenium result for samples EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT88S-PZ, EP-CPT26D-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, EP-CPT46D-PZ, EP-CPT22S-PZ, and EP-CPT22S-PZ-FD, were qualified as nondetect at the higher of the reporting limit or the reported value.
Thallium	CCB10	0.000.62	The thallium result for samples EP-H64/65-WELL and EP-CPT22S-PZ were qualified as nondetect at the higher of the reporting limit or the reported value.
ICPMS_070907A			
Aluminum	CCB3	0.0098	The aluminum results for samples EP-CPT22S-PZ were qualified as nondetect at the higher of the reporting limit or the reported value.

Analyte	CCB	Concentration (mg/l)	Qualification
Zinc	CCB6	0.0073	The zinc result for samples EP-CPT60S-PZ, EP-CPT88S-PZ, EP-CPT56S-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, EP-CPT66S-PZ, EP-CPT22S-PZ, and EP-CPT22S-PZ-FD were qualified as nondetected at the higher of the reporting limit of the reported value.
SPL SDG 07081510			
ICPMS-070807A			
Selenium	CCB10 CCB11 CCB12	0.00058 0.00042 0.00038	The selenium result for samples EP-CPT64S-PZ and EP-CPT13S-PZ were qualified as nondetect at the higher of the reporting limit or the reported value.
SPL SDG 07081510			
ICPMS_070907A			
Antimony	CCB8 CCB9 CCB10	0.00072 0.00091 0.00066	The antimony result for samples EP-CPT89S-PZ, EP-CPT16S-PZ, and EP-CPT17S-PZ were qualified as nondetect at the higher of the reporting limit or the reported value.
Vanadium	CCB8 CCB9	0.00065 0.00066	The vanadium result for sample EP-CPT54S-PZ was qualified as nondetect at the higher of the reporting limit or the reported value.

mg/l = milligrams per liter

CCB – Continuing Calibration Blank

Table 5 – Matrix Spike Recoveries and Qualifications

Analyte	MS %R	MSD %R	%D	Acceptance Range (%)	% D Limit	Qualification
SPL SDG 07081510						
Sample EP-CPT64S-PZ						
Sulfate	--	72.6	--	80-120	20	The sulfate MS/MSD recoveries were outside of the acceptance limits for less than 35% of the MS/MSD results. Therefore, only the result for the parent samples was qualified as estimated to reflect the potential low bias.
Sample EP-CPT91S-PZ						
Nitrate	9.77%	8.98%	--	80-120	20	The nitrate MS/MSD recoveries were less than 10% and less than 35% of the MS/MSD results were outside of the acceptance limits. As the parent results was detected only the parent sample was qualified as estimated due to the potential low bias.

MS – Matrix Spike

MSD – Matrix Spike Duplicate

PDS – Post-Digestion Spike

%R = percent recovery

NA – Not Applicable (sample concentration greater than four times the spike amount)

Table 6 – Serial Dilution and Post digestion spike Qualifications

Analyte	SD %D	PDS %R	Qualification
SPL SDG 07091384			
Sample EP-H100-WELL			
Potassium	13.2	--	One of four serial dilutions results for potassium were outside of the acceptance criterion. As less than 35% of potassium serial dilutions were outside of the criteria only the potassium results for the parent EP-H100-WELL sample was qualified as estimated.
Vanadium	--	126	One of three post digestion spikes results for vanadium were outside of the acceptance criterion. As less than 35% of the vanadium post digestion spike results were outside of the criteria only the vanadium results for the parent EP-H100-WELL sample was qualified as estimated.
SPL SDG 07091435			
Sample EP-CPT22S-PZ			
Barium	31.8		One of three serial dilutions results for barium were outside of the acceptance criterion. As less than 35% of barium serial dilutions were outside of the criteria only the barium results for the parent sample EP-CPT22s-PZ was qualified as estimated.

%D = percent difference

Table 7 – Hold Time Exceedences

Analyte	Criterion	Affected Sample	Qualifications
SDG: 07081384			
Nitrogen,Nitrate (as N)	48 Hrs	EP-H61-WELL, EP-H34-WELL, EP-H52/57-WELL, EP-L59-WELL, EP-H98-WELL, EP-CPT03S-PZ, EP-CPT45D-PZ, EP-CPT07S-PZ, EP-CPT07S-PZ-FD, EP-CPT14S-PZ, EP-H100-WELL, EP-H100-WELL-FD, EP-CPT62S-PZ, EP-H66-WELL, EP-H101-WELL	All listed samples and analytes have been qualified as estimated (J) due to hold time exceedence.
TDS	7 Days	EP-H101-WELL, EP-CPT52S-PZ	
SDG: 07081435			
Nitrogen,Nitrate (as N)	48 Hrs	EP-H64/65-WELL, EP-H67-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT60S-PZ, EP-CPT88S-PZ, EP-CPT56S-PZ, EP-CPT26D-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, EP-CPT66S-PZ, EP-CPT46D-PZ, EP-CPT22S-PZ, EP-CPT22S-PZ-FD	All listed samples and analytes have been qualified as estimated (J) due to hold time exceedence.
SDG: 07081510			
Nitrogen,Nitrate (as N)	48 Hrs	EP-CPT30S-PZ, EP-CPT85S-PZ, EP-CPT86S-PZ	All listed samples and analytes have been qualified as estimated (J) due to hold time exceedence.
Total Dissolved Solids	7 Days	EP-CPT49S-PZ, EP-CPT55S-PZ, EP-CPT61S-PZ, EP-CPT63S-PZ	
SDG: 07081510			
Nitrogen,Nitrate (as N)	48 Hrs	EP-CPT16S-PZ, EP-CPT17S-PZ, EP-CPT43S-PZ, EP-CPT54S-PZ, EP-CPT89S-PZ	All listed samples and analytes have been qualified as estimated (J) due to hold time exceedence.
Total Dissolved Solids	7 Days	EP-CPT04S-PZ, EP-CPT15S-PZ, EP-CPT36S-PZ, EP-CPT44S-PZ	

Table 8 Data selected for reporting outside the calibration range

Analyte	Sample	Qualification
SDG: 07091384		The associated samples were qualified as estimated (J) because sample concentrations were reported above the calibration limit. Diluted analyses were not selected for reporting due to greater hold time exceedences.
Nitrogen, Nitrate (as N)	EP-H98-WELL	
SDG 07081435		
Nitrogen, Nitrate (as N)	EP-CPT72S-PZ	
	EP-CPT65S-PZ	
SDG 07081510		
Nitrogen, Nitrate (as N)	EP-CPT64S-PZ	

Table 9 PRDL Outliers and Resultant Data Qualifications*

Metal	%R (%)	PRDL Concentration (mg/l)	CCV Concentration (mg/l)	Qualification
SPL SDG 07091384				
RUN: ICP TJA_070905A				
Potassium	135%	2	25	The potassium results for sample EP-CPT14S-PZ was qualified as estimated (J) to reflect the potential high bias.
RUN: ICP TJA_070906A				
Potassium	139%	2	25	The potassium results for sample EP-H61-WELL was qualified as estimated (J) to reflect the potential high bias.
RUN: ICPMS2_070905A				
Aluminum	134%	0.01	0.05	The following aluminum results were qualified as estimated (J) to reflect the potential low bias: EP-H62/63-WELL, EP-H61-WELL, EP-H34-WELL, EP-H52/57-WELL, EP-L59-WELL, EP-H98-WELL, EP-CPT03S-PZ, EP-CPT07S-PZ-FD, EP-H100-WELL, EP-H100-WELL-FD, EP-H66-WELL, EP-CPT45D-PZ, and EP-H101-WELL. As the aluminum results were either reported as below or near the RL the samples were qualified estimated.
Cadmium	63%	0.005	0.05	All of the cadmium results for samples were qualified as estimated (UJ/J) to reflect the potential low bias as all results were reported as nondetected or near the PQL standard..
Copper	131%	0.005	0.05	The copper results for samples EP-H62/63-WELL, EP-H61-WELL, EP-H34-WELL, EP-H52/57-WELL, EP-L59-WELL, EP-H98-WELL, EP-CPT03S-PZ, EP-CPT07S-PZ-FD, EP-CPT14S-PZ, EP-H100-WELL, EP-H100-WELL-FD, EP-H66-WELL, and EP-H101-WELL. As the copper results were either reported as below or near the PQL standard the samples were qualified estimated.

Metal	%R (%)	PRDL Concentration (mg/l)	CCV Concentration (mg/l)	Qualification
SPL SDG 07081438				
RUN: TJA_070907A				
Manganese	132%	0.005	5	<p>The following manganese results were qualified as estimated (J) to reflect the potential low bias: EP-H64/65-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT60S-PZ, EP-CPT88S-PZ, EP-CPT56S-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, EP-CPT66S-PZ, EP-CPT46D-PZ, EP-CPT26D-PZ, and EP-CPT22S-PZ.</p> <p>As the manganese results were either reported as near or below RL the samples were qualified estimated.</p>
RUN: ICPMS_070906A				
Nickel	137%	0.005	0.05	<p>The following nickel results were qualified as estimated (J) to reflect the potential low bias: EP-H64/65-WELL, EP-H67-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT60S-PZ, EP-CPT88S-PZ, EP-CPT56S-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, EP-CPT66S-PZ, EP-CPT46D-PZ, EP-CPT22S-PZ, and EP-CPT22S-PZ-FD</p> <p>As the nickel results were either reported as near or below RL the samples were qualified estimated.</p>
Selenium	181%	0.005	0.05	<p>The following selenium results were qualified as estimated (J) to reflect the potential low bias: EP-H64/65-WELL, EP-CPT60S-PZ, and EP-CPT66S-PZ</p> <p>As the selenium results were either reported as near or below RL the samples were qualified estimated.</p>

Metal	%R (%)	PRDL Concentration (mg/l)	CCV Concentration (mg/l)	Qualification
RUN: ICPMS_070907A				
Barium	138%	0.005	0.1	The following barium results were qualified as estimated (J) to reflect the potential low bias: EP-H64/65-WELL, EP-H67-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT60S-PZ, EP-CPT56S-PZ, EP-CPT26D-PZ, EP-CPT11S-PZ, EP-CPT08S-PZ, EP-CPT65S-PZ, and EP-CPT46D-PZ. As the barium results were either reported as near or below RL the samples were qualified estimated.
Copper	131%	0.005	0.05	The following copper results were qualified as estimated (J) to reflect the potential low bias: EP-H64/65-WELL, EP-H67-WELL, EP-CPT02S-PZ, EP-CPT01S-PZ, EP-CPT32S-PZ, EP-CPT72S-PZ, EP-CPT60S-PZ, EP-CPT88S-PZ, EP-CPT56S-PZ, EP-CPT65S-PZ and EP-CPT46D-PZ As the copper results were either reported as near or below RL the samples were qualified estimated.
SPL SDG 07081510				
RUN: ICPMS-070807A				
Copper	131%	0.005	0.05	The following copper results were qualified as estimated (J) to reflect the potential low bias: EP-CPT85S-PZ, EP-CPT91S-PZ, EP-CPT64S-PZ, EP-CPT48S-PZ, EP-CPT29D-PZ, EP-CPT86S-PZ, EP-CPT69S-PZ, EP-CPT30S-PZ, EP-CPT24S-PZ, EP-CPT58S-PZ, and EP-CPT84S-PZ. As the copper results were either reported as near or below RL the samples were qualified estimated.
SPL SDG 07081605				
RUN: ICPMS_070907A				
Cadmium	69% 65%	0.005	0.05	All of the cadmium results for samples were qualified as estimated (UJ/J) to reflect the potential low bias as all results were reported as nondetected or near the PQL standard..
Copper	131%	0.005	0.100	The copper results for EP-CPT54S-PZ was qualified as estimated (J) to reflect the potential low bias. As the copper results were either reported as near or below RL the samples were qualified estimated.

* The PRDL standard is analyzed the beginning and end of each analytical run or a minimum of twice per 8 hour shift, which ever is more frequent.

%R = percent recovery

CCV = Continuing Calibration Verification

mg/l = milligrams per liter

A.4
September 2007
Data Validation Reports

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratory: Microseeps

Data Package Numbers: P0709411, P0709409, P0709418, P0709419, P0709454, P0709452, P0709453

Reviewer: Liz Kraak & Sheri O'Connor Peer Reviewer: Stacey Malerba

Date Review Completed: 11/6/07

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003) and evaluation of laboratory criteria. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II sampling investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0709411				
EP-CPT-49S-PZ-FD	P0709411-01	25-Sep-07	FD	X
EP-CPT-49S-PZ	P0709411-02	25-Sep-07	SA	X
EP-CPT-49S-PZ MS	P0709411-03	25-Sep-07	SA	X ^M
EP-CPT-49S-PZ MSD	P0709411-04	25-Sep-07	SA	X ^M
EP-CPT-58S-PZ	P0709411-05	25-Sep-07	SA	X
EP-CPT-53S-PZ	P0709411-06	25-Sep-07	SA	X
EP-CPT-09S-PZ	P0709411-07	25-Sep-07	SA	X
EP-CPT-11S-PZ	P0709411-08	25-Sep-07	SA	X
EP-CPT-05S-PZ	P0709411-09	25-Sep-07	SA	X
P0709409				
EP-CPT50S-PZ	P0709409-01	25-Sep-07	SA	X
EP-CPT74S-PZ	P0709409-02	25-Sep-07	SA	X
EP-CPT64S-PZ	P0709409-03	25-Sep-07	SA	X
EP-CPT63S-PZ	P0709409-04	25-Sep-07	SA	X
EP-H100-WELL	P0709409-05	25-Sep-07	SA	X
EP-H100-WELL MS	P0709409-06	25-Sep-07	SA	X ^M
EP-H100-WELL-MSD	P0709409-07	25-Sep-07	SA	X ^M
EP-H100-WELL-FD	P0709409-08	25-Sep-07	FD	X
EP-H101-WELL	P0709409-09	25-Sep-07	SA	X
P0709418				
EP-CPT41S-PZ	P0709418-01	26-Aug-07	SA	X
EP-CPT41D-PZ	P0709418-02	26-Aug-07	SA	X
EP-CPT35S-PZ	P0709418-03	26-Aug-07	SA	X
EP-CPT35D-PZ	P0709418-04	26-Aug-07	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0709419				
EP-CPT34S-PZ	P0709419-01	26-Sep-07	SA	X
EP-CPT71S-PZ	P0709419-02	26-Sep-07	SA	X
EP-CPT38S-PZ	P0709419-03	26-Sep-07	SA	X
EP-CPT47S-PZ	P0709419-04	26-Sep-07	SA	X
EP-CPT27S-PZ	P0709419-05	26-Sep-07	SA	X
P0709454				
EP-CPT-45S-PZ	P0709454-01	27-Sep-07	SA	X
EP-CPT-45D-PZ	P0709454-02	27-Sep-07	SA	X
EP-CPT-26S-PZ	P0709454-03	27-Sep-07	SA	X
EP-CPT-26D-PZ	P0709454-04	27-Sep-07	SA	X
EP-CPT-29S-PZ	P0709454-05	27-Sep-07	SA	X
EP-CPT-29D-PZ	P0709454-06	27-Sep-07	SA	X
EP-CPT-44S-PZ	P0709454-07	27-Sep-07	SA	X
EP-CPT-46S-PZ	P0709454-08	27-Sep-07	SA	X
EP-CPT-46D-PZ	P0709454-09	27-Sep-07	SA	X
EP-H64-65-WELL	P0709454-10	27-Sep-07	SA	X
P0709452				
EP-CPT-23S-PZ	P0709452-01	27-Sep-07	SA	X
EP-CPT-24S-PZ	P0709452-02	27-Sep-07	SA	X
EP-CPT-31S-PZ	P0709452-03	27-Sep-07	SA	X
EP-CPT-30S-PZ	P0709452-04	27-Sep-07	SA	X
EP-CPT-89S-PZ	P0709452-05	27-Sep-07	SA	X
EP-CPT-60S-PZ	P0709452-06	27-Sep-07	SA	X
EP-CPT-54S-PZ	P0709452-07	27-Sep-07	SA	X
EP-CPT-36S-PZ	P0709452-08	27-Sep-07	SA	X
EP-CPT-86S-PZ	P0709452-09	27-Sep-07	SA	X
EP-CPT-91S-PZ	P0709452-10	27-Sep-07	SA	X
EP-CPT-43S-PZ	P0709452-11	27-Sep-07	SA	X
EP-CPT-57R-PZ	P0709452-12	27-Sep-07	SA	X
P0709453				
EP-CPT-25S-PZ	P0709453-01	27-Sep-07	SA	X
EP-CPT-37S-PZ	P0709453-02	27-Sep-07	SA	X
EP-CPT-65S-PZ	P0709453-03	27-Sep-07	SA	X
EP-CPT-84S-PZ	P0709453-04	27-Sep-07	SA	X
EP-CPT-85S-PZ	P0709453-05	27-Sep-07	SA	X
EP-CPT-62S-PZ	P0709453-06	27-Sep-07	SA	X
EP-CPT-62S-PZ MS	P0709453-07	27-Sep-07	SA	X ^M
EP-CPT-62S-PZ MSD	P0709453-08	27-Sep-07	SA	X ^M
EP-CPT-62S-PZ-FD	P0709453-09	27-Sep-07	FD	X
EP-H62/63-WELL	P0709453-10	27-Sep-07	SA	X
EP-L59-WELL	P0709453-11	27-Sep-07	SA	X
EP-H59W-WELL	P0709453-12	27-Sep-07	SA	X
EP-H98-WELL	P0709453-13	27-Sep-07	SA	X
EP-H66-WELL	P0709453-14	27-Sep-07	SA	X

SA = Sample

FD = Field duplicate

X^M = MS/MSD¹ For the purpose of data management the sampling date has been appended to the field ID in the database.**General Usability Statement:**☐ Data are usable without qualification.☒ Data are usable with qualification (noted below).☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	
Calibration blanks?	NA	
Surrogate recoveries?	NA	
Matrix spike recoveries? <ul style="list-style-type: none"> EP-CPT-49S-PZ EP-H100-WELL EP-CPT-62S-PZ 	Yes	MS/MSD results for all samples were within laboratory criteria. The results for methane from EP-H100-WELL were greater than four times the spike concentration and were not appropriate for assessing accuracy and precision.
Ambient (field) blank evaluation?	NA	
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	No	P0709411: The cooler temperature upon receipt was $\geq 6^{\circ}\text{C}$. The samples reported in this package were received with the wrong sample container and were preserved with HCl. The laboratory was instructed to proceed with the analysis. Since the vials that were used did not have the gas tight septa, all results were qualified as estimated J P-I. If a bias in sample results exists, it is likely to be low.
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> EP-CPT-49S-PZ-FD EP-H100-WELL-FD EP-CPT-62S-PZ-FD 	Yes	
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD recoveries. Acceptable accuracy was attained with respect to the analytical method and sample matrix.
Are precision criteria met?	Yes	This was evaluated using the field duplicate pairs, MS/MSD pairs, and the LCS/LCSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	Yes	P0709454: The sampler inadvertently wrote

Review Parameters	QAPP Criteria Met?	Comments
		9/26/07 on the COC as the date collected. However, samples were collected on 9/27/07. The date was changed on the data sheet.
Were results received for all samples?	Yes	
Are data usable?	Yes	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	Yes	
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

**FORT MORGAN CHARACTERIZATION
PHASE II PROGRAM
DATA VERIFICATION REPORT**

Laboratories: SPL-Houston

Data Package Numbers: 07091161, 07091235, 07091327

Reviewer: Stan Gladych

Peer Reviewer: Geoffrey Webb

Date Review Completed: 10/29/2007

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003), evaluation of laboratory criteria, and reference to Functional Guidelines, as applicable to the method. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters that includes the review of three data packages for analytical data reported by SPL. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				BTEX
07091161				
EP-CPT49S-PZ-FD	07091161-01	25-Sep-07	FD	X
EP-CPT49S-PZ	07091161-02	25-Sep-07	SA	X ^M
EP-CPT58S-PZ	07091161-03	25-Sep-07	SA	X
EP-CPT53S-PZ	07091161-04	25-Sep-07	SA	X
EP-CPT09S-PZ	07091161-05	25-Sep-07	SA	X
EP-CPT11S-PZ	07091161-06	25-Sep-07	SA	X
EP-CPT05S-PZ	07091161-07	25-Sep-07	SA	X
Trip Blank-092507	07091161-08	25-Sep-07	TB	X
EP-CPT50S-PZ	07091161-09	25-Sep-07	SA	X
EP-CPT74S-PZ	07091161-10	25-Sep-07	SA	X
EP-CPT64S-PZ	07091161-11	25-Sep-07	SA	X
EP-CPT63S-PZ	07091161-12	25-Sep-07	SA	X
EP-H100-WELL	07091161-13	25-Sep-07	SA	X ^M
EP-H101-WELL	07091161-14	25-Sep-07	SA	X
EP-H100-WELL-FD	07091161-15	25-Sep-07	FD	X
07091235				
EP-CPT34S-PZ	07091235-01	26-Sep-07	SA	X ^M
EP-CPT71S-PZ	07091235-02	26-Sep-07	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				BTEX
EP-CPT38S-PZ	07091235-03	26-Sep-07	SA	X
EP-CPT47S-PZ	07091235-04	26-Sep-07	SA	X
EP-CPT27S-PZ	07091235-05	26-Sep-07	SA	X
EP-CPT35S-PZ	07091235-06	26-Sep-07	SA	X
EP-CPT35D-PZ	07091235-07	26-Sep-07	SA	X
EP-CPT41S-PZ	07091235-08	26-Sep-07	SA	X
EP-CPT41D-PZ	07091235-09	26-Sep-07	SA	X
Trip Blank-092607	07091235-10	26-Sep-07	TB	X
07091327				
EP-CPT25S-PZ	07091327-01	27-Sep-07	SA	X
EP-CPT37S-PZ	07091327-02	27-Sep-07	SA	X
EP-CPT65S-PZ	07091327-03	27-Sep-07	SA	X
EP-CPT84S-PZ	07091327-04	27-Sep-07	SA	X
EP-CPT85S-PZ	07091327-05	27-Sep-07	SA	X
EP-CPT62S-PZ	07091327-06	27-Sep-07	SA	X ^M
EP-CPT62S-PZ-FD	07091327-07	27-Sep-07	FD	X
EP-H62/63-WELL	07091327-08	27-Sep-07	SA	X
EP-L59-WELL	07091327-09	27-Sep-07	SA	X
EP-H59W-WELL	07091327-10	27-Sep-07	SA	X
EP-H98-WELL	07091327-11	27-Sep-07	SA	X
EP-H66-WELL	07091327-12	27-Sep-07	SA	X
EP-H64/65-WELL	07091327-13	27-Sep-07	SA	X
EP-CPT57R-PZ	07091327-14	27-Sep-07	SA	X
Trip Blank-092707	07091327-15	27-Sep-07	TB	X
EP-CPT45S-PZ	07091327-16	27-Sep-07	SA	X
EP-CPT45D-PZ	07091327-17	27-Sep-07	SA	X
EP-CPT26S-PZ	07091327-18	27-Sep-07	SA	X
EP-CPT26D-PZ	07091327-19	27-Sep-07	SA	X
EP-CPT29S-PZ	07091327-20	27-Sep-07	SA	X
EP-CPT29D-PZ	07091327-21	27-Sep-07	SA	X
EP-CPT44S-PZ	07091327-22	27-Sep-07	SA	X
EP-CPT46S-PZ	07091327-23	27-Sep-07	SA	X
EP-CPT46D-PZ	07091327-24	27-Sep-07	SA	X
EP-CPT43S-PZ	07091327-25	27-Sep-07	SA	X
EP-CPT23S-PZ	07091327-26	27-Sep-07	SA	X
EP-CPT24S-PZ	07091327-27	27-Sep-07	SA	X
EP-CPT31S-PZ	07091327-28	27-Sep-07	SA	X
EP-CPT30S-PZ	07091327-29	27-Sep-07	SA	X
EP-CPT89S-PZ	07091327-30	27-Sep-07	SA	X ^M
EP-CPT60S-PZ	07091327-31	27-Sep-07	SA	X
EP-CPT54S-PZ	07091327-32	27-Sep-07	SA	X
EP-CPT36S-PZ	07091327-33	27-Sep-07	SA	X
EP-CPT86S-PZ	07091327-34	27-Sep-07	SA	X
EP-CPT91S-PZ	07091327-35	27-Sep-07	SA	X

SA = Sample FD = Field duplicate TB = Trip Blank

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

X^M = Requested matrix spike and matrix spike duplicate and/or laboratory duplicate, as applicable to method¹For the purpose of data management the sampling date has been appended to the field ID in the database.

General Usability Statement:

- ☒ Data are usable without qualification.
- ☐ Data are usable with qualification (noted below).
- ☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	All target analytes were reported as nondetect in the method blanks. Data qualification was not considered necessary.
Calibration blanks?	NA	
Surrogate recoveries?	Yes	
Matrix spike recoveries? <ul style="list-style-type: none"> EP-CPT49S-PZ EP-H100-WELL EP-CPT34S-PZ EP-CPT62S-PZ EP-CPT89S-PZ 	Yes	All recoveries were within the acceptance limits. Data qualification was not considered necessary.
Serial Dilution/Post Digestion spike %Difference?	NA	
Ambient (field) blank evaluation?	NA	
Trip Blank evaluation? <ul style="list-style-type: none"> Trip Blank-092507 Trip Blank-092607 Trip Blank-092707 	No	No analysis was selected for Trip Blank-092607 on the COC. This trip blank sample was analyzed for BTEX at the request of URS. All trip blanks were reported as nondetect, data qualification was not required.
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	No	The following samples were not preserved with HCl or did not have a pH less than 2 at the time of analysis. at the laboratory: EP-CPT50S-PZ, EP-CPT74S-PZ, EP-CPT64S-PZ, EP-CPT63S-PZ, EP-H100-WELL, EP-H101-WELL, EP-H100-WELL-FD, and EP-CPT24S-PZ. As all of the samples were analyzed within seven days data qualification was not considered necessary.
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> EP-CPT49S-PZ-FD EP-H100-WELL-FD EP-CPT62S-PZ-FD 	Yes	All Field duplicate sample results were reported within the criteria. Data qualification was not required.
Sample collected per QAPP?	Yes	

Review Parameters	QAPP Criteria Met?	Comments
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS and MS/MSD pairs. All MS/MSD recoveries were within the acceptance limits indicating acceptable accuracy were attained with respect to the analytical method and sample matrix. Data qualification was not required.
Are precision criteria met?	Yes	This was evaluated using the field duplicate, laboratory duplicate, LCS/LCSD pairs, and the MS/MSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix. Data qualification was not required.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	Yes	
Were results received for all samples?	Yes	
Are any data qualified as unusable?	No	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

A.5
November 2007
Data Validation Reports

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratory: Microseeps

Data Package Numbers: P0711146, P0711109, P0711089

Reviewer: Liz Kraak

Peer Reviewer: Stacey Malerba

Date Review Completed: 11/27/07

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003) and evaluation of laboratory criteria. This data review has been performed to verify the usability of the analytical data in support of the Phase II, Task 4A investigation objectives. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0711146				
EP-CPT89S-PZ	P0711146-01	11/8/07	SA	X
EP-CPT31S-PZ	P0711146-02	11/8/07	SA	X
EP-CPT-30S-PZ	P0711146-03	11/8/07	SA	X
EP-CPT36S-PZ	P0711146-04	11/8/07	SA	X
EP-CPT-23S-PZ	P0711146-05	11/8/07	SA	X
EP-CPT43S-PZ	P0711146-06	11/8/07	SA	X
EP-CPT44S-PZ	P0711146-07	11/8/07	SA	X
EP-CPT35S-PZ	P0711146-08	11/8/07	SA	X
EP-CPT35D-PZ	P0711146-09	11/8/07	SA	X
EP-CPT26S-PZ	P0711146-10	11/8/07	SA	X
EP-CPT26D-PZ	P0711146-11	11/8/07	SA	X
EP-CPT90S-PZ	P0711146-12	11/8/07	SA	X
EP-CPT52S-PZ	P0711146-13	11/8/07	SA	X
TRIP BLANK	P0711146-14	11/8/07	TB	X
P0711109				
EP-CPT46S-PZ	P0711109-01	11/7/07	SA	X
EP-CPT46D-PZ	P0711109-02	11/7/07	SA	X
EP-CPT41S-PZ	P0711109-03	11/7/07	SA	X
EP-CPT41D-PZ	P0711109-04	11/7/07	SA	X
EP-CPT45S-PZ	P0711109-05	11/7/07	SA	X
EP-CPT45D-PZ	P0711109-06	11/7/07	SA	X
EP-CPT29S-PZ	P0711109-07	11/7/07	SA	X
EP-CPT29D-PZ	P0711109-08	11/7/07	SA	X
EP-CPT60S-PZ	P0711109-09	11/7/07	SA	X
EP-CPT53S-PZ	P0711109-10	11/7/07	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
EP-CPT71S-PZ	P0711109-11	11/7/07	SA	X
EP-CPT38S-PZ	P0711109-12	11/7/07	SA	X
EP-CPT47S-PZ	P0711109-13	11/7/07	SA	X
EP-CPT74S-PZ	P0711109-14	11/7/07	SA	X
EP-CPT64S-PZ	P0711109-15	11/7/07	SA	X
EP-CPT50S-PZ	P0711109-16	11/7/07	SA	X
EP-H101-WELL	P0711109-17	11/7/07	SA	X
EP-H101-WELL MS	P0711109-18	11/7/07	SA	X ^M
EP-H101-WELL MSD	P0711109-19	11/7/07	SA	X ^M
EP-H66-WELL	P0711109-20	11/7/07	SA	X
EP-H64/65-WELL	P0711109-21	11/7/07	SA	X
EP-CPT54S-PZ	P0711109-22	11/7/07	SA	X
TRIP BLANK	P0711109-23	11/7/07	TB	X
EP-CPT57R-PZ	P0711109-24	11/7/07	SA	X
EP-CPT91S-PZ	P0711109-25	11/7/07	SA	X
EP-H100-WELL	P0711109-26	11/7/07	SA	X
EP-H100-WELL-FD	P0711109-27	11/7/07	FD	X
EP-CPT58S-PZ	P0711109-28	11/7/07	SA	X
EP-H62/63-WELL	P0711109-29	11/7/07	SA	X
EP-L59-WELL	P0711109-30	11/7/07	SA	X
EP-H98-WELL	P0711109-31	11/7/07	SA	X
P0711089				
EP-CPT27S-PZ	P0711089-01	11/6/07	SA	X
EP-CPT25S-PZ	P0711089-02	11/6/07	SA	X
EP-CPT25S-PZ MS	P0711089-03	11/6/07	SA	X ^M
EP-CPT25S-PZ MSD	P0711089-04	11/6/07	SA	X ^M
EP-CPT25S-PZ-FD	P0711089-05	11/6/07	FD	X
EP-CPT34S-PZ	P0711089-06	11/6/07	SA	X
EP-CPT49S-PZ	P0711089-07	11/6/07	SA	X
EP-CPT37S-PZ	P0711089-08	11/6/07	SA	X
EP-CPT63S-PZ	P0711089-09	11/6/07	SA	X
EP-CPT85S-PZ	P0711089-10	11/6/07	SA	X
EP-CPT86S-PZ	P0711089-11	11/6/07	SA	X
EP-CPT84S-PZ	P0711089-12	11/6/07	SA	X
EP-CPT84S-PZ MS	P0711089-13	11/6/07	SA	X ^M
EP-CPT84S-PZ MSD	P0711089-14	11/6/07	SA	X ^M
EP-CPT65S-PZ	P0711089-15	11/6/07	SA	X
EP-CPT62S-PZ	P0711089-16	11/6/07	SA	X
TRIP BLANK	P0711089-17	11/6/07	TB	X
EP-CPT65S-PZ-FD	P0711089-18	11/6/07	FD	X
EP-CPT11S-PZ	P0711089-19	11/6/07	SA	X
EP-CPT11S-PZ FD	P0711089-20	11/6/07	FD	X
EP-CPT09S-PZ	P0711089-21	11/6/07	SA	X
EP-CPT09S-PZ MS	P0711089-22	11/6/07	SA	X ^M
EP-CPT09S-PZ MSD	P0711089-23	11/6/07	SA	X ^M
EP-CPT05S-PZ	P0711089-24	11/6/07	SA	X
EP-CPT24S-PZ	P0711089-25	11/6/07	SA	X

SA = Sample

FD = Field Duplicate

TB= Trip Blank

X^M = MS/MSD¹ For the purpose of data management the sampling date has been appended to the field ID in the database.

General Usability Statement:

- ☐ Data are usable without qualification.
☒ Data are usable with qualification (noted below).
☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	
Calibration blanks?	NA	
Surrogate recoveries?	NA	
Matrix spike recoveries? <ul style="list-style-type: none"> • EP-H101-WELL • EP-CPT25S-PZ • EP-CPT84S-PZ • EP-CPT09S-PZ 	No	<p>With the exceptions summarized below, MS/MSD results for all samples were within laboratory criteria.</p> <p>P0711089-01: The native sample result for ethane from EP-CPT09S-PZ was greater than four times the spike concentration and not appropriate for assessing accuracy and precision.</p> <p>The result for methane from EP-CPT09S-PZ exceeded the evaluation criteria of 70-130% with a percent recovery of 152%. Therefore, the methane result was qualified as estimated (J) and flagged with a reason code of MS. The bias is likely to be low due to variability between the methane concentrations in the three sample aliquots and the result for the native sample.</p>
Ambient (field) blank evaluation? Trip Blanks	No	With the exceptions summarized in Table 3 below, no target analytes were detected in the trip blanks.
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	Yes	
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> • EP-H100-WELL-FD • EP-CPT25S-PZ-FD • EP-CPT65S-PZ-FD • EP-CPT11S-PZ FD 	No	<p>With the exceptions summarized below, all field duplicates were within laboratory criteria.</p> <p>P0711089: For field duplicate pair EP-CPT65S-PZ - EP-CPT65S-PZ FD, the RPDs between the parent sample results and the field duplicate results for ethene and methane exceeded the evaluation criteria of $\leq 30\%$ with RPDs of 47%</p>

Review Parameters	QAPP Criteria Met?	Comments
		and 38% respectively. Therefore, the ethene and methane results for samples EP-CPT65S-PZ and EP-CPT65S-PZ FD were qualified as estimated (J) and flagged FD.
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD recoveries. Acceptable accuracy was attained with respect to the analytical method and sample matrix.
Are precision criteria met?	Yes	This was evaluated using the field duplicate pairs, MS/MSD pairs, and the LCS/LCSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	Yes	
Were results received for all samples?	Yes	
Are data usable?	Yes	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	Yes	
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J).

Table 3: Target Analytes Found in Trip Blanks

Data package	Analyte	Value (µg/L)	Affected Samples	Qualifier
P0711146	Ethane	0.021	EP-CPT89S-PZ EP-CPT31S-PZ EP-CPT26D-PZ	U, TB-I
	Methane	0.150	EP-CPT31S-PZ	
P0711109	Ethane	0.021	EP-CPT38S-PZ EP-CPT64S-PZ EP-H66-WELL EP-H64/65-WELL	U, TB-I
	Methane	0.150	EP-CPT38S-PZ EP-H66-WELL EP-H64/65-WELL	

P0711089	Ethane	0.009	EP-CPT27S-PZ EP-CPT25S-PZ EP-CPT25S-PZ-FD EP-CPT34S-PZ EP-CPT63S-PZ EP-CPT84S-PZ EP-CPT65S-PZ EP-CPT65S-PZ-FD	U, TB-I
	Ethene	0.008	EP-CPT85S-PZ	
	Methane	0.980	EP-CPT27S-PZ EP-CPT25S-PZ EP-CPT25S-PZ-FD EP-CPT34S-PZ EP-CPT49S-PZ EP-CPT37S-PZ EP-CPT63S-PZ EP-CPT84S-PZ EP-CPT65S-PZ EP-CPT65S-PZ-FD EP-CPT05S-PZ EP-CPT24S-PZ	
	Propane	0.020	EP-CPT27S-PZ EP-CPT34S-PZ EP-CPT49S-PZ EP-CPT37S-PZ EP-CPT85S-PZ EP-CPT84S-PZ EP-CPT65S-PZ-FD EP-CPT05S-PZ EP-CPT24S-PZ	

A.6
March 2008
Data Validation Reports

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratory: Microseeps

Data Package Numbers: P0803202, P0803249, P0803248

Reviewer: Liz Kraak

Peer Reviewer: Geoff Webb

Date Review Completed: 4/3/08

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003) and evaluation of laboratory criteria. This data review has been performed to verify the usability of the analytical data in support of the Phase II, Task 4A investigation objectives. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
P0803202				
EP-CPT84S-PZ	P0803202-01	03/19/2008	SA	X
EP-CPR85S-PZ	P0803202-02	03/19/2008	SA	X
EP-CPT86S-PZ	P0803202-03	03/19/2008	SA	X
EP-CPT26S-PZ	P0803202-04	03/19/2008	SA	X
EP-CPT26D-PZ	P0803202-05	03/19/2008	SA	X
EP-CPT24S-PZ	P0803202-06	03/19/2008	SA	X
EP-CPT27S-PZ	P0803202-07	03/19/2008	SA	X
EP-CPT17S-PZ	P0803202-08	03/19/2008	SA	X
EP-CPT50S-PZ	P0803202-09	03/19/2008	SA	X ^M
EP-CPT50S-PZ-FD	P0803202-10	03/19/2008	FD	X
EP-CPT34S-PZ	P0803202-11	03/19/2008	SA	X
EP-CPT18S-PZ	P0803202-12	03/19/2008	SA	X
P0803249				
EP-CPT88S-PZ	P0803249-01	03/18/2008	SA	X
EP-CPT06S-PZ-FD	P0803249-02	03/18/2008	FD	X
EP-CPT06S-PZ	P0803249-03	03/18/2008	SA	X ^M
EP-CPT09S-PZ	P0803249-04	03/18/2008	SA	X
EP-CPT10S-PZ	P0803249-05	03/18/2008	SA	X
EP-CPT05S-PZ	P0803249-06	03/18/2008	SA	X
EP-CPT11S-PZ	P0803249-07	03/18/2008	SA	X
EP-CPT29S-PZ	P0803249-08	03/18/2008	SA	X
EP-CPT45D-PZ	P0803249-09	03/18/2008	SA	X
EP-CPT35S-PZ	P0803249-10	03/18/2008	SA	X
EP-CPT45S-PZ	P0803249-11	03/18/2008	SA	X
EP-CPT35D-PZ	P0803249-12	03/18/2008	SA	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				Dissolved Gases
EP-CPT29D-PZ	P0803249-13	03/18/2008	SA	X
EP-CPT41S-PZ	P0803249-14	03/18/2008	SA	X
EP-CPT41D-PZ	P0803249-15	03/18/2008	SA	X
EP-CPT57R-PZ	P0803249-16	03/18/2008	SA	X
EP-CPT49S-PZ	P0803249-17	03/18/2008	SA	X
EP-H66-WELL	P0803249-18	03/18/2008	SA	X
EP-H64/H65-WELL	P0803249-19	03/18/2008	SA	X
EP-CPT53S-PZ	P0803249-20	03/18/2008	SA	X
EP-H62/63-WELL	P0803249-21	03/18/2008	SA	X
EP-H100-WELL	P0803249-22	03/18/2008	SA	X
EP-H100-WELL-FD	P0803249-23	03/18/2008	FD	X
EP-CPT63S-PZ	P0803249-24	03/18/2008	SA	X
EP-CT58S-PZ	P0803249-25	03/18/2008	SA	X
EP-H98-WELL	P0803249-26	03/18/2008	SA	X ^M
P0803248				
EP-CPT32S-PZ	P0803248-01	03/19/2008	SA	X
EP-CPT54S-PZ	P0803248-02	03/19/2008	SA	X
EP-CPT62S-PZ	P0803248-03	03/19/2008	SA	X
EP-CPT15S-PZ	P0803248-04	03/19/2008	SA	X
EP-CPT46D-PZ	P0803248-05	03/19/2008	SA	X
EP-CPT60-PZ	P0803248-06	03/19/2008	SA	X
EP-CPT46S-PZ	P0803248-07	03/19/2008	SA	X
EP-CPT22S-PZ	P0803248-08	03/19/2008	SA	X
EP-CPT89S-PZ	P0803248-09	03/19/2008	SA	X
EP-H101-WELL	P0803248-10	03/19/2008	SA	X
EP-CPT12S-PZ	P0803248-11	03/19/2008	SA	X
EP-CPT31S-PZ	P0803248-12	03/19/2008	SA	X ^M
EP-CPT31S-PZ-FD	P0803248-13	03/19/2008	FD	X
EP-CPT36S-PZ	P0803248-14	03/19/2008	SA	X
EP-CPT44S-PZ	P0803248-15	03/19/2008	SA	X
EP-CPT43S-PZ	P0803248-16	03/19/2008	SA	X
EP-CPT30S-PZ	P0803248-17	03/19/2008	SA	X

SA = Sample

FD = Field Duplicate

TB= Trip Blank

X^M = MS/MSD¹ For the purpose of data management the sampling date has been appended to the field ID in the database.**General Usability Statement:**

- ☐ Data are usable without qualification.
☒ Data are usable with qualification (noted below).
☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	
Calibration blanks?	NA	
Surrogate recoveries?	NA	

Review Parameters	QAPP Criteria Met?	Comments
Matrix spike recoveries? <ul style="list-style-type: none"> EP-CPT50S-PZ EP-CPT06S-PZ EP-H98-WELL EP-CPT31S-PZ 	Yes	All MS/MSD recoveries were within the determined laboratory acceptance limits. Therefore, data qualification was not necessary.
Ambient (field) blank evaluation? Trip Blanks	N/A	
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	Yes	
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> EP-CPT50S-PZ-FD EP-CPT06S-PZ-FD EP-H100-WELL-FD EP-CPT31S-PZ-FD 	No	<p>With the exceptions summarized below, all field duplicates were within the acceptance criteria.</p> <p>P0803202: For field duplicate pair EP-CPT50S-PZ - EP-CPT50S-PZ FD, the RPDs between the parent sample results and the field duplicate results for ethene exceeded the evaluation criteria of $\leq 30\%$ with an RPD of 38%. Therefore, the ethene results for samples EP-CPT50S-PZ and EP-CPT50S-PZ FD were qualified as estimated (J) and flagged FD.</p> <p>P0803249: For field duplicate pair EP-CPT06S-PZ – EP-CPT06S-PZ-FD, the RPDs between the parent sample results and the field duplicate results for ethane, methane and propane exceeded the evaluation criteria of $\leq 30\%$ with an RPD of 34%, 30.3% and 33% respectively. Also, the absolute difference between the parent sample result and field duplicate result for iso-Butane exceeded 2xPQL. Therefore, the ethane, methane, propane, and iso-Butane results were qualified as estimated (J) and flagged FD.</p> <p>P0803248: For the field duplicate pair EP-CPT31S-PZ – EP-CPT-31S-PZ-FD, the absolute difference between the parent sample results and field duplicate results for ethane, ethene, and methane exceeded 2xPQL. Therefore, the ethane, ethene, and methane results were qualified as estimated (J) and flagged FD.</p>
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD recoveries. Acceptable accuracy was attained with respect to the analytical method and sample matrix.

Review Parameters	QAPP Criteria Met?	Comments
Are precision criteria met?	Yes	This was evaluated using the field duplicate pairs, MS/MSD pairs, and the LCS/LCSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	No	P0803249 The laboratory noted that sample EP-CPT-63S-PZ was received preserved. Further action was not necessary.
Were results received for all samples?	No	Sample EP-CPT45S-PZ was inadvertently listed on the COC and was not received by the laboratory. Further action was not considered necessary.
Are data usable?	Yes	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	Yes	
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL) have been qualified as estimated (J).

FORT MORGAN CHARACTERIZATION PHASE II PROGRAM DATA VERIFICATION REPORT

Laboratories: SPL-Houston

Data Package Numbers: 08031133, 08031112, 08030980

Reviewer: Liz Kraak

Peer Reviewer: Geoffrey Webb

Date Review Completed: 4/30/2008

This review was conducted in accordance with the Quality Assurance Project Plan to Support Pipeline Remediation Activities (URS, September 2003), evaluation of laboratory criteria, and reference to Functional Guidelines, as applicable to the method. This data review has been performed to verify the usability of the analytical data in support of the objectives for the Phase II investigation. The scope of the review has included evaluation of the sample management process, blank information, QA/QC results, and assessment of any laboratory parameter issues identified in the data package case narrative. The scope of the review has not included a detailed review of calibration information, compound identification or quantification, and checking for transcription errors or recalculations.

Table 1 lists the samples and analyses reported in this data package. Table 2 summarizes the results of the review of sample-specific parameters that includes the review of three data packages for analytical data reported by SPL. If review of any laboratory parameters was necessary, the associated details are included in Table 2.

Table 1 – Sample Identification and Analysis Cross-Reference

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				BTEX
08031133				
Trip Blank ²	08031133-01	3/19/2008	TB	---
EP-CPT46S-PZ	08031133-02	3/19/2008	SA	X
EP-CPT54S-PZ	08031133-03	3/19/2008	SA	X
EP-CPT15S-PZ	08031133-04	3/19/2008	SA	X
EP-CPT12S-PZ	08031133-05	3/19/2008	SA	X
EP-CPT44S-PZ	08031133-06	3/19/2008	SA	X
EP-CPT43S-PZ	08031133-07	3/19/2008	SA	X
EP-CPT62S-PZ	08031133-08	3/19/2008	SA	X
EP-CPT46D-PZ	08031133-09	3/19/2008	SA	X
EP-H101-WELL	08031133-10	3/19/2008	SA	X
EP-CPT22S-PZ	08031133-11	3/19/2008	SA	X
EP-CPT60S-PZ	08031133-12	3/19/2008	SA	X
EP-CPT32S-PZ	08031133-13	3/19/2008	SA	X
EP-CPT36S-PZ	08031133-14	3/19/2008	SA	X
EP-CPT89S-PZ	08031133-15	3/19/2008	SA	X
EP-CPT31S-PZ	08031133-16	3/19/2008	SA	X ^m
EP-CPT30S-PZ	08031133-17	3/19/2008	SA	X
EP-CPT31S-FD	08031133-18	3/19/2008	FD	X

Field ID ¹	Lab ID	Sampling Date	QC Designations	Analyses
				BTEX
08031112				
EP-CPT05S-PZ	08031112-01	3/18/2008	SA	X
EP-CPT10S-PZ	08031112-02	3/18/2008	SA	X
EP-CPT06S-PZ	08031112-03	3/18/2008	SA	X ^m
EP-CPT06S-PZ-FD	08031112-04	3/18/2008	FD	X
EP-CPT88S-PZ	08031112-05	3/18/2008	SA	X
EP-CPT11S-PZ	08031112-06	3/18/2008	SA	X
EP-CPT09S-PZ	08031112-07	3/18/2008	SA	X
EP-H98-WELL	08031112-08	3/18/2008	SA	X ^m
EP-CPT58S-PZ	08031112-09	3/18/2008	SA	X
EP-H62/63-WELL	08031112-10	3/18/2008	SA	X
EP-CPT53S-PZ	08031112-11	3/18/2008	SA	X
EP-CPT49S-PZ	08031112-12	3/18/2008	SA	X
EP-CPT63S-PZ	08031112-13	3/18/2008	SA	X
EP-H01/H65-WELL	08031112-14	3/18/2008	SA	X
EP-H66-WELL	08031112-15	3/18/2008	SA	X
EP-H100-WELL-FD	08031112-16	3/18/2008	FD	X
EP-H100-WELL	08031112-17	3/18/2008	SA	X
EP-CPT45S-PZ	08031112-18	3/18/2008	SA	X
EP-CPT41S-PZ	08031112-19	3/18/2008	SA	X
EP-CPT29D-PZ	08031112-20	3/18/2008	SA	X
EP-CPT29S-PZ	08031112-21	3/18/2008	SA	X
EP-CPT35D-PZ	08031112-22	3/18/2008	SA	X
EP-CPT35S-PZ	08031112-23	3/18/2008	SA	X
EP-CPT45D-PZ	08031112-24	3/18/2008	SA	X
EP-CPT57R-PZ	08031112-25	3/18/2008	SA	X
Trip Blank	08031112-26	3/18/2008	TB	X
08030980				
EP-CPT84S-PZ	08030980-01	3/17/2008	SA	X
EP-CPT85S-PZ	08030980-02	3/17/2008	SA	X
EP-CPT86S-PZ	08030980-03	3/17/2008	SA	X
EP-CPT26S-PZ	08030980-04	3/17/2008	SA	X
EP-CPT26D-PZ	08030980-05	3/17/2008	SA	X
EP-CPT24S-PZ	08030980-06	3/17/2008	SA	X
EP-CPT27S-PZ	08030980-07	3/17/2008	SA	X
EP-CPT17S-PZ	08030980-08	3/17/2008	SA	X
EP-CPT50S-PZ	08030980-09	3/17/2008	SA	X ^m
EP-CPT18S-PZ	08030980-10	3/17/2008	SA	X
EP-CPT34S-PZ	08030980-11	3/17/2008	SA	X
Trip Blank	08030980-12	3/17/2008	TB	X
EP-CPT-50S-PZ-FD	08030980-13	3/17/2008	FD	X

SA = Sample

FD = Field duplicate

TB = Trip Blank

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

X^M = Requested matrix spike and matrix spike duplicate and/or laboratory duplicate, as applicable to method.

--- = Not analyzed for this parameter.

¹For the purpose of data management the sampling date has been appended to the field ID in the database.²This trip blank was listed on the COC, but was not received by the laboratory.

General Usability Statement:

- ☐ Data are usable without qualification.
☒ Data are usable with qualification (noted below).
☐ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: The case narrative indicated that there were no problems with sample analyses.

Table 2 – Sample Specific Data Review Summary

Review Parameters	QAPP Criteria Met?	Comments
Accuracy Evaluation		
Method blanks?	Yes	All target analytes were reported as nondetect in the method blanks. Data qualification was not considered necessary.
Calibration blanks?	NA	
Surrogate recoveries?	Yes	
Matrix spike recoveries? <ul style="list-style-type: none"> • EP-CPT31S-PZ • EP-CPT06S-PZ • EP-H98-WELL • EP-CPT50S-PZ 	Yes	All recoveries were within the acceptance limits. Data qualification was not considered necessary.
Serial Dilution/Post Digestion spike %Difference?	NA	
Ambient (field) blank evaluation?	NA	
Trip Blank evaluation? <ul style="list-style-type: none"> • Trip Blank (08031112-26) • Trip Blank (08030980-12) 	Yes	All trip blank results were reported as nondetect, data qualification was not required.
Precision Evaluation		
Laboratory duplicate criteria met?	NA	
Spiked-duplicate criteria met?	Yes	This was evaluated using the MS/MSD pairs.
Representativeness Evaluation		
Analyses completed within holding time limits?	Yes	
Were sample preservation requirements met?	No	08030980 Sample EP-CPT18S-PZ did not have a pH less than 2 at the time of analysis. As this sample was not analyzed within seven days, the results were qualified as estimated (UJ P).
Field duplicate evaluation criteria met? <ul style="list-style-type: none"> • EP-CPT31S-FD • EP-CPT06S-PZ-FD • EP-H100-WELL-FD • EP-CPT-50S-PZ-FD 	Yes	All Field duplicate sample results were reported within the applicable criteria. Data qualification was not required.
Sample collected per QAPP?	Yes	
Comparability Evaluation		
Are accuracy criteria met?	Yes	This was evaluated using the LCS/LCSD and MS/MSD pairs. All LCS/LCSD and MS/MSD recoveries were within the acceptance limits indicating acceptable accuracy were attained with

Review Parameters	QAPP Criteria Met?	Comments
		respect to the analytical method and sample matrix. Data qualification was not required.
Are precision criteria met?	Yes	This was evaluated using the field duplicate, LCS/LCSD pairs, and the MS/MSD pairs. Acceptable precision was attained with respect to the analytical method and sample matrix. Data qualification was not required.
Are measurement units and collection, analysis, and reporting methods consistent between data packages?	Yes	
Completeness Evaluation		
Sample receipt completeness?	No	<p>08031133</p> <p>Two of the three vials for sample EP-CPT22S-PZ were labeled with a collection time of 10:20. However, the other vial and the COC indicate a collection time of 10:22 for this sample. Per URS request, the collection time for all three vials and the COC were changed to 10:20.</p> <p>08031133</p> <p>The trip blank associated with data package 08031133 was listed on the COC, but was not received by the laboratory. As no target analytes were reported as detected for the other two trip blanks in this sampling event, it is considered that the potential for contamination during shipment for data package 08031133 is unlikely, and therefore, further action was not considered necessary.</p>
Were results received for all samples?	Yes	
Are any data qualified as unusable?	No	
Sensitivity Evaluation		
Were project-required RLs obtained?	Yes	
Review of Laboratory Performance Parameters		
Instrument tuning?	NR	No problems were noted in the case narrative.
Initial calibration?	NR	No problems were noted in the case narrative.
Continuing calibration?	NR	No problems were noted in the case narrative.
Laboratory control sample results?	NR	No problems were noted in the case narrative.
Compound identification?	NR	No problems were noted in the case narrative.
Compound quantitation?	NR	No problems were noted in the case narrative.
TIC evaluation?	NA	
Laboratory assigned qualifiers?	Yes	

NA = Not Applicable

NR = Not Required

Limitations on Data Usability: Trace level detections, reported between the method detection limit (MDL) and the practical quantitation limit (PQL), have been qualified as estimated (J). However, all data were reported as non-detect at the practical quantitation limit, and no qualification of data reported between the MDL and PQL was required.



URS Corporation
8181 East Tufts
Avenue
Denver, CO 80237

Borehole ID: MW-01

Project Name: CIG Fort Morgan

Hydrogeologist: Matt Spansky

Drilling Equipment: CME 55

Borehole Diameter: 8.5"

Date/Time Drilling Started: 6/17/08

Vertical Datum: NAVD 88

Horizontal Datum: NAD 83/92 CO North (Ground)

Water Level (ft bgs): 29

Location: Fort Morgan, CO

Project Number: 22239403.00700

Drilling Company/Driller: Drilling Engineers/ Rob Gehry

Drilling Method: Hollow Stem Auger

Date/Time Total Depth Reached: 6/17/08

Total Depth Drilled: 55'

Ground Elevation: 1325.203

Easting: 601209.516

Northing: 4449342.093

Depth (ft)	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
0.0						0-2.8' Soil Horizon
2.0			SILTY CLAY dark brown, silty clay, very stiff, dry to damp, root traces in upper 6"	CL		
4.0			SILTY SAND brown, silty sand, fine to very fine grained, very loose, damp, well sorted	SM		
			SILTY SAND gray brown, silty sand, very fine grained, medium dense, dry to damp, minor clay	CL		
6.0			SILTY SAND gray brown, silty sand, very fine grained, medium dense, dry to damp, minor clay	SM		
8.0			SILTY CLAY gray brown, silty clay, very stiff, damp	SW		
10.0			SAND yellow brown, sand, fine to medium grained, sub-rounded, very loose, damp, well sorted, some mica	CL		
12.0			SANDY CLAY gray brown, sandy clay with red mottling, damp to moist, sand is fine to very fine grained and represents 10% of interval	SW		
14.0			SAND tan to orange, sand, medium to coarse grained, sub-rounded, very loose, damp, well sorted, quartz, visually apparent lithics			
16.0			SAND tan, orange coloration in upper 6", sand, medium to coarse grained, sub-rounded, very loose, damp to moist, well sorted, quartz, visually apparent lithics			
18.0						
20.0						



URS Corporation
8181 East Tufts
Avenue
Denver, CO 80237

Borehole ID: MW-01

Project Name: CIG Fort Morgan

Hydrogeologist: Matt Spansky

Drilling Equipment: CME 55

Borehole Diameter: 8.5"

Date/Time Drilling Started: 6/17/08

Vertical Datum: NAVD 88

Horizontal Datum: NAD 83/92 CO North (Ground)

Water Level (ft bgs): 29

Location: Fort Morgan, CO

Project Number: 22239403.00700

Drilling Company/Driller: Drilling Engineers/ Rob Gehry

Drilling Method: Hollow Stem Auger

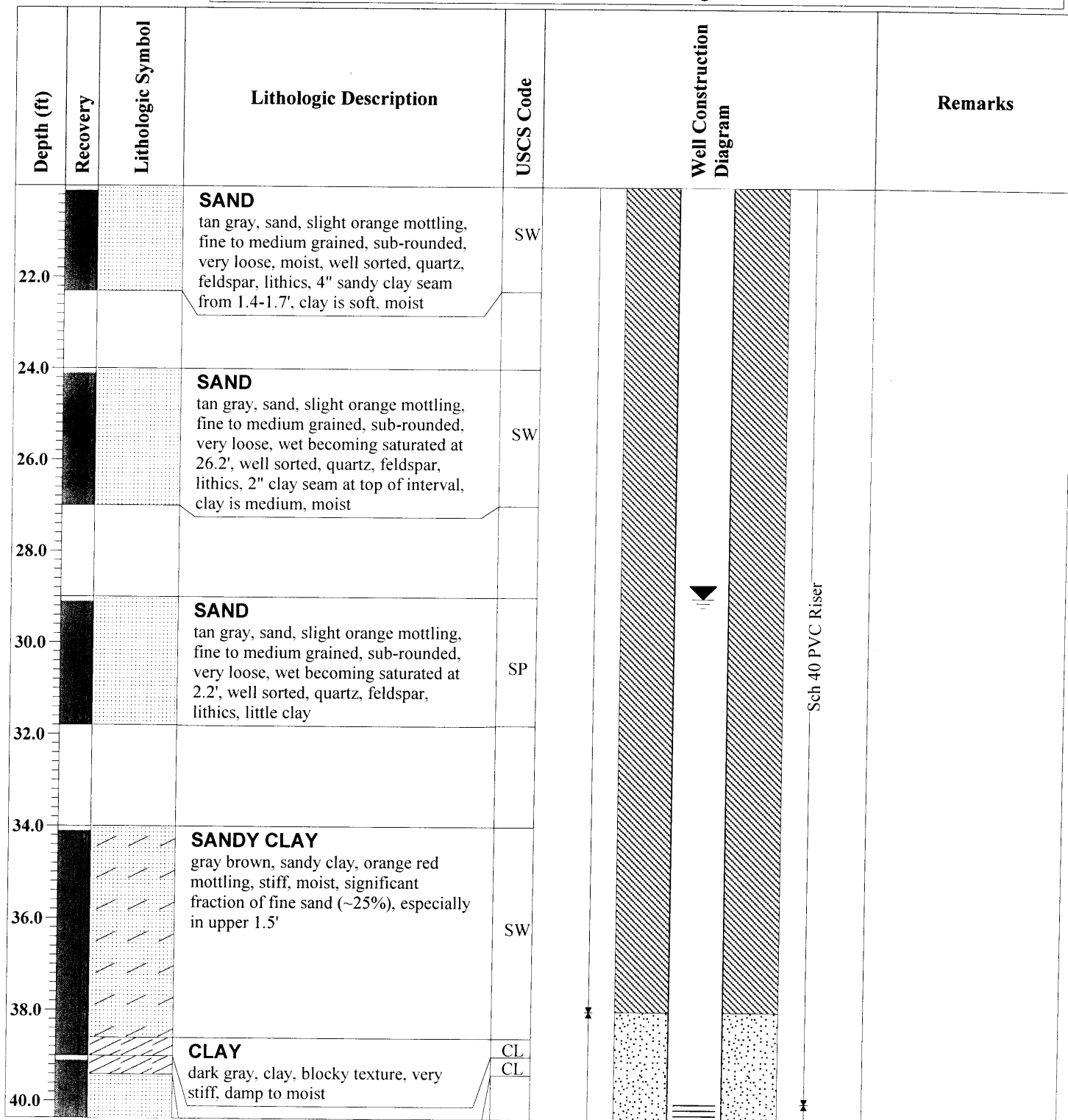
Date/Time Total Depth Reached: 6/17/08

Total Depth Drilled: 55'

Ground Elevation: 1325.203

Easting: 601209.516

Northing: 4449342.093





URS Corporation
8181 East Tufts
Avenue
Denver, CO 80237

Borehole ID: MW-01

Project Name: CIG Fort Morgan

Hydrogeologist: Matt Spansky

Drilling Equipment: CME 55

Borehole Diameter: 8.5"

Date/Time Drilling Started: 6/17/08

Vertical Datum: NAVD 88

Horizontal Datum: NAD 83/92 CO North (Ground)

Water Level (ft bgs): 29

Location: Fort Morgan, CO

Project Number: 22239403.00700

Drilling Company/Driller: Drilling Engineers/ Rob Gehry

Drilling Method: Hollow Stem Auger

Date/Time Total Depth Reached: 6/17/08

Total Depth Drilled: 55'

Ground Elevation: 1325.203

Easting: 601209.516

Northing: 4449342.093

Depth (ft)	Recovery	Lithologic Symbol	Lithologic Description	USCS Code	Well Construction Diagram	Remarks
42.0			CLAY dark gray, clay, blocky texture, very stiff, damp to moist	SW		<p>Drilled last segment 6'; still only 2.5' of recovery</p>
			SAND gray brown, sand, little clay, fine grained, very loose, sub-rounded, saturated, well sorted, muscovite mica visually apparent	CL SW		
44.0			SANDY CLAY light gray, sandy clay (40% very fine sand), very soft, moist to wet	SW		
46.0			SAND tan to light gray, sand, medium grained, sub-rounded, well sorted, very loose, wet, quartz, feldspar, lithics			
48.0			SAND tan to light gray, sand, medium grained, sub-rounded, well sorted, very loose, saturated, quartz, feldspar, lithics			
50.0			End of Boring Log			<p>Drilled 5 feet to advance past flowing sands.</p> <p>Total Depth= 55'</p>
52.0						
54.0						
56.0						
58.0						
60.0						