Gunter, Jason

From: Nations, Mark <mnations@doerun.com>
Sent: Sunday, April 13, 2014 4:49 AM
To: Gunter, Jason
Cc: Yingling, Mark; Wohl, Matthew; robert.hinkson@dnr.mo.gov; brandon.wiles@dnr.mo.gov; Ty Morris (TMorris@barr.com)
Subject: Rivermines Progress Report
Attachments: RM_03-14[1].doc; March_Rivermines_Pilot_Test_Data[1].pdf; 2014-03-11 RM NPDES Pace Lab Report.pdf

Jason, attached is the March 2014 report.
Mark

OTCR 40454454 4.2

Superfund

OU02

THE DOE RUN COMPANY

Remediation Group

Mark Nations
Mining Properties Manager
mnations@doerun.com

April 11, 2014

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
11201 Renner Blvd.
Lenexa, KS 66219

Re: The Doe Run Company – Elvins/Rivermines Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 56 of the Unilateral Administrative Order (UAO) (CERCLA-07-2005-0169) for the referenced project and on behalf of The Doe Run Company, the progress report for the period March 1, 2014 through March 31, 2014 is enclosed. If you have any questions or comments, please call me at 573-518-0800.

Sincerely,

Mark Nations
Mining Properties Manager

Enclosures
c: Mark Yingling – TDRC (electronic only)
Matt Wohl – TDRC (electronic only)
Robert Hinkson – MDNR
Brandon Wiles – MDNR
Ty Morris – Barr Engineering

1221 Mill Street, Leadwood, MO 63653
Telephone: (573) 562-7793

Elvins/Rivermines Mine Tailings Site
Park Hills, Missouri
Removal Action - Monthly Progress Report
Period: March 1, 2014 – March 31, 2014

1. **Actions Performed and Problems Encountered This Period:**

   a. During the period, flow from the seepage pond was directed through the roughing filter, the iron filter, and then into the round tank, where it discharged directly into the effluent channel.

   b. No overflows of the roughing filter were observed during the period. Flow through the system remained under one gallon per minute during the entire duration of the period.

   c. Continued collecting analytical samples from the pilot test three times per week. Samples were taken from the seepage pond (system influent) and the ZVI filter effluent (RMP-Polish). Samples of the roughing filter effluent (RMP-Rough) were not taken due to low water elevations.

   d. Continued to take analytical samples from the seep pond effluent and the western treatment pond effluent to monitor the metals reduction of the treatment pond.

   e. Flow to the east treatment cell remained off throughout this period.

2. **Analytical Data and Results Received This Period:**

   a. Dissolved zinc concentrations in the polishing filter effluent ranged between 8.09 mg/L and 11.15 mg/L.

   b. Total zinc concentrations in the polishing filter effluent ranged between 8.67 mg/L and 10.63 mg/L.

   c. Total iron concentrations in the polishing filter effluent ranged between 0.036 mg/L and 0.112 mg/L.

   d. Total suspended solids concentrations in the polishing filter were non-detect in all samples.

   e. During this period, water samples were collected from just upstream of Old Missouri Highway 32, as well as from upstream and downstream of the confluence of the site discharge with Flat River. The analytical results for this event are included with this progress report.

   f. During this period, the Ambient Air Monitoring Report for December was completed. Any issues identified in this report are discussed below. A copy of this document has been sent to your attention.

      The December 2013 Ambient Air Monitoring Report noted the following:

      - The action levels for lead and dust were not exceeded.
      - No sample was taken on the Big River #4 TSP monitor on 12/03/13 and 12/04/13 due to the run time of the monitor being outside of the acceptable limits. This issue has been addressed.
      - No sample was taken on the Rivermines #3 (water plant) TSP monitor on 12/06/13 and 12/27/13 due to the run time of the monitor being outside of the acceptable limits. This issue has been addressed.
      - No sample was taken on the Rivermines #2 (Wood & Barton) TSP monitor on 12/17/13 and 12/27/13 due to the run time of the monitor being outside of the acceptable limits. This issue has been addressed.
      - No sample was taken on the Rivermines #1 (office) TSP monitor on 12/27/13 due to the run time of the monitor being outside of the acceptable limits. This issue has been addressed.
      - No samples were taken with the TSP monitors on 12/24/13, 12/25/13, or 12/31/13 due to the holiday.

3. **Developments Anticipated and Work Scheduled for Next Period:**

   a. Continue analytical sampling and field measurements three times a week.

b. Continue to operate the renovated pilot test.

c. Complete monthly water sampling activities as described in the Removal Action Work Plan.

d. Complete air monitoring activities as described in the Removal Action Work Plan.

e. Continue monitoring the western treatment pond to evaluate the hydraulics and the metals reduction.

f. Continue to work on a long-term surface water management plan for the site.

4. Changes in Personnel:

a. None.

5. Issues or Problems Arising This Period:

a. None.

6. Resolution of Issues or Problems Arising This Period:

a. None.

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/3/14	14-0631	RMP SEEP T	38.7	16650^	3.2	22.6	450.2	28.0	ND	159	839		7.65	4
		RMP SEEP D		17150^***					ND					
3/3/14	14-0632	RMP POLISH T	5.0	10550^	0.61	5.6	1364^	27.7	36.0	160	862	ND	7.62	2
		RMP POLISH D		11020^***					8.3					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-0631,L14-0001-0632

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/5/14	
Copper	ug/L	0.02	0.68	3/5/14	
Lead	ug/L	ND	2.27	3/5/14	
Zinc	ug/L	ND	2.02	3/5/14	
Nickel	ug/L	ND	0.54	3/5/14	
Thallium	ug/L	ND	1.56	3/5/14	
Iron	ug/L	ND	2.21	3/5/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	502	100%	85-115%	
Copper	ug/L	500	505	101%	85-115%	
Lead	ug/L	500	494	99%	85-115%	
Zinc	ug/L	500	505	101%	85-115%	
Nickel	ug/L	500	502	100%	85-115%	
Iron	ug/L	500	512	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-0631 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.08	500	500	502	498	100%	100%	70-130%	
Copper	ug/L	0.04	500	500	509	501	102%	100%	70-130%	
Lead	ug/L	0	500	500	494	489	99%	98%	70-130%	
Zinc	ug/L	166.5	500	500	670	662	101%	99%	70-130%	
Nickel	ug/L	5.2	500	500	506	502	100%	99%	70-130%	
Iron	ug/L	0	500	500	513	510	103%	102%	70-130%	

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43 Iron County Road No 1 Bldg 3
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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-0631,L14-0001-0632

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.99	5	3/5/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	100	100%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	99	99%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-0631

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	159	161	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.98	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.02	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.00	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	9.97	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	3.99	3.95-4.05	L13-0002-0040
Slope	98.4%	90-102%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0631,L14-0001-0632

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/5/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-0631

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	8.4	4	12.5	12.3	103%	98%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	10	9.1	91%	85-115	

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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JM
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/6/2014
Manager	Date
EJS	3/6/2014

The DOE RUN Company

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0632

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/5/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-0632

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	0.5	0.5	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/5/14	14-0633	RMP SEEP T	36.5	15800^	3.7	22.1	440.4	27.4	ND	162	865		7.64	1
		RMP SEEP D		15730^					ND					
3/5/14	14-0634	RMP POLISH T	6.7	10630	0.77	5.9	1395	28.9	58.4	163	810	ND	7.62	2
		RMP POLISH D		11150^***					37.7					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

The DOE RUN Company

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SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-0633,L14-0001-0634

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/5/14	
Copper	ug/L	0.02	0.68	3/5/14	
Lead	ug/L	ND	2.27	3/5/14	
Zinc	ug/L	ND	2.02	3/5/14	
Nickel	ug/L	ND	0.54	3/5/14	
Thallium	ug/L	ND	1.56	3/5/14	
Iron	ug/L	ND	2.21	3/5/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	502	100%	85-115%	
Copper	ug/L	500	505	101%	85-115%	
Lead	ug/L	500	494	99%	85-115%	
Zinc	ug/L	500	505	101%	85-115%	
Nickel	ug/L	500	502	100%	85-115%	
Iron	ug/L	500	512	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-0633 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.06	500	500	482	506	96%	101%	70-130%	
Copper	ug/L	0	500	500	490	502	98%	100%	70-130%	
Lead	ug/L	0	500	500	482	499	96%	100%	70-130%	
Zinc	ug/L	158	500	500	633	664	95%	101%	70-130%	
Nickel	ug/L	4.9	500	500	493	510	98%	101%	70-130%	
Iron	ug/L	0	500	500	502	516	100%	103%	70-130%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0633,L14-0001-0634

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/5/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-0633

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	8.6	4	11.7	11.8	78%	80%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	10	9.1	91%	85-115	

The DOE RUN Company

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-0633,L14-0001-0634

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.99	5	3/5/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	100	100%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	99	99%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-0633

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	162	163	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.98	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.02	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.00	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	9.97	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	3.99	3.95-4.05	L13-0002-0040
Slope	98.4%	90-102%	

The DOE RUN Company

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0634

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/5/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-0634

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	1.5	1.5	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

The DOE RUN Company

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JM
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/6/2014
Manager	Date
EJS	3/6/2014

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/14/14	14-0684	RMP SEEP T	32.2	14810^	2.8	19.9	382.3	2.8	ND	161	820		7.3	0
		RMP SEEP D		14450^***					ND					
3/14/14	14-0685	RMP POLISH T	4.5	9655^	0.56 J	2.7	972.1	4.0	56.2	173	799	ND	7.5	0
		RMP POLISH D		8967^					50.2					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

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(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-0684,L14-0001-0685

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/19/14	
Copper	ug/L	0.23	0.68	3/19/14	
Lead	ug/L	ND	2.27	3/19/14	
Zinc	ug/L	1.9	2.02	3/19/14	
Nickel	ug/L	0.08	0.54	3/19/14	
Thallium	ug/L	0.73	1.56	3/19/14	
Iron	ug/L	3.8	2.21	3/19/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	510	102%	85-115%	
Copper	ug/L	500	505	101%	85-115%	
Lead	ug/L	500	501	100%	85-115%	
Zinc	ug/L	500	502	100%	85-115%	
Nickel	ug/L	500	512	102%	85-115%	
Iron	ug/L	500	492	98%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-0684 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.09	500	500	483	484	97%	97%	70-130%	
Copper	ug/L	0.12	500	500	486	496	97%	99%	70-130%	
Lead	ug/L	0.21	500	500	468	471	94%	94%	70-130%	
Zinc	ug/L	148.1	500	500	607	607	92%	92%	70-130%	
Nickel	ug/L	4.8	500	500	480	482	95%	95%	70-130%	
Iron	ug/L	0	500	500	465	470	93%	94%	70-130%	

The DOE RUN Company

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0684,L14-0001-0685

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/14/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-0684

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	8.2	4	11.3	11.8	78%	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.6	92%	85-115	

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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-0684,L14-0001-0685

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.48	5	3/17/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	98	98%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-0684

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	161	162	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.03	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.02	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.04	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.03	3.95-4.05	L13-0002-0040
Slope	98.4%	90-102%	

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Quentin J. Schmidt Analytical Laboratory
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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0685

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/14/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-0685

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	0.5	0.5	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	CF
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/21/2014
Manager	Date
EJS	3/21/2014

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SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-692,L14-0001-693

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/19/14	
Copper	ug/L	0.23	0.68	3/19/14	
Lead	ug/L	ND	2.27	3/19/14	
Zinc	ug/L	1.9	2.02	3/19/14	
Nickel	ug/L	0.08	0.54	3/19/14	
Thallium	ug/L	0.73	1.56	3/19/14	
Iron	ug/L	3.8	2.21	3/19/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	510	102%	85-115%	
Copper	ug/L	500	505	101%	85-115%	
Lead	ug/L	500	501	100%	85-115%	
Zinc	ug/L	500	502	100%	85-115%	
Nickel	ug/L	500	512	102%	85-115%	
Iron	ug/L	500	492	98%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-692 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.02	500	500	493	482	99%	96%	70-130%	
Copper	ug/L	0.35	500	500	501	493	100%	99%	70-130%	
Lead	ug/L	0.16	500	500	484	474	97%	95%	70-130%	
Zinc	ug/L	139.2	500	500	615	603	95%	93%	70-130%	
Nickel	ug/L	4.8	500	500	488	477	97%	94%	70-130%	
Iron	ug/L	0	500	500	484	480	97%	96%	70-130%	

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SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/17/14	14-0692	RMP SEEP T	33.2	13920^	3.2	16.6	384.5	2.1	ND	164	737		7.33	2
		RMP SEEP D		14750^***					ND					
3/17/14	14-0693	RMP POLISH T	5.0	9371^	0.79	2.6	921.2	3.7	60.2	172	761	ND	7.12	0
		RMP POLISH D		9325^					53.0					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-692,L14-0001-693

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.48	5	3/17/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	98	98%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-0692

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	164	167	102%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.03	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.02	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.04	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.03	3.95-4.05	L13-0002-0040
Slope	98.4%	90-102%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-692,L14-0001-693

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/17/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-0692

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	7.4	4	11	11.8	90%	110%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	10	9.2	92%	85-115	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-693

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/17/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-0693

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	0	0	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H	Analysis conducted outside the EPA method holding time.
M	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R	RPD value was outside control limits.
NES	Not enough sample.

Method	Analysts
200.7	TLL
Alka	CF
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/21/2014
Manager	Date
EJS	3/21/2014

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SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/19/14	14-0702	RMP SEEP T	35.1	12890^	3.0	17.2	383.8	2.7	ND	173	825		7.39	1
		RMP SEEP D		13030^***					ND					
3/19/14	14-0702	RMP POLISH T	5.4	9060^	0.81	2.4	843.0	2.8	56.4	176	726	ND	7.41	0
		RMP POLISH D		8089^					47.4					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

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SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-702,L14-0001-0703

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/19/14	
Copper	ug/L	0.23	0.68	3/19/14	
Lead	ug/L	ND	2.27	3/19/14	
Zinc	ug/L	1.9	2.02	3/19/14	
Nickel	ug/L	0.08	0.54	3/19/14	
Thallium	ug/L	0.73	1.56	3/19/14	
Iron	ug/L	3.8	2.21	3/19/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	510	102%	85-115%	
Copper	ug/L	500	505	101%	85-115%	
Lead	ug/L	500	501	100%	85-115%	
Zinc	ug/L	500	502	100%	85-115%	
Nickel	ug/L	500	512	102%	85-115%	
Iron	ug/L	500	492	98%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-702 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	469	474	94%	95%	70-130%	
Copper	ug/L	0.18	500	500	469	475	94%	95%	70-130%	
Lead	ug/L	0.39	500	500	462	465	92%	93%	70-130%	
Zinc	ug/L	128.9	500	500	584	586	91%	91%	70-130%	
Nickel	ug/L	4.4	500	500	466	469	92%	93%	70-130%	
Iron	ug/L	0	500	500	459	463	92%	93%	70-130%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-702,L14-0001-0703

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.97	5	3/19/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	98	98%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	98	98%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-702

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	173	173	100%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.03	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.04	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.06	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.02	3.95-4.05	L13-0002-0040
Slope	97.1%	90-102%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-702,L14-0001-0703

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/19/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-702

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	8.2	4	12.5	12.2	108%	100%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	5.1	102%	85-115	

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(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	CF
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/21/2014
Manager	Date
EJS	3/21/2014

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-0703

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3-19-14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-703

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	1	1	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

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SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-721,L14-0001-722

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/25/14	
Copper	ug/L	0.30	0.68	3/25/14	
Lead	ug/L	ND	2.27	3/25/14	
Zinc	ug/L	ND	2.02	3/25/14	
Nickel	ug/L	0.05	0.54	3/25/14	
Thallium	ug/L	ND	1.56	3/25/14	
Iron	ug/L	ND	2.21	3/25/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	524	105%	85-115%	
Copper	ug/L	500	514	103%	85-115%	
Lead	ug/L	500	518	104%	85-115%	
Zinc	ug/L	500	528	106%	85-115%	
Nickel	ug/L	500	526	105%	85-115%	
Iron	ug/L	500	532	106%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-721 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.2	500	500	516	522	103%	104%	70-130%	
Copper	ug/L	0.32	500	500	502	510	100%	102%	70-130%	
Lead	ug/L	0	500	500	509	516	102%	103%	70-130%	
Zinc	ug/L	149.7	500	500	665	675	103%	105%	70-130%	
Nickel	ug/L	4.8	500	500	520	526	103%	104%	70-130%	
Iron	ug/L	0	500	500	521	531	104%	106%	70-130%	

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/21/14	14-0721	RMP SEEP T	38.6	14970^	3.3	20.6	416	26.6	1.4 J	171	815		7.56	0
		RMP SEEP D		15020^***					0.88 J					
3/21/14	14-0722	RMP POLISH T	6.1	8668^	1.4	4.4	955	29.1	52.7	180	777	ND	7.54	0
		RMP POLISH D		8661^					11.1					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-721,L14-0001-722

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.50	5	3/26/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	99	99%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	101	101%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-721

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	171	172	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.02	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.03	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.02	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.04	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.01	3.95-4.05	L13-0002-0040
Slope	98.7%	90-102%	

The DOE RUN Company

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-721,L14-0001-722

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/24/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-721

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	8.1	5	13.2	12.5	102%	88%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.92	98%	85-115	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-722

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/25/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-722

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	0.5	0	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

The DOE RUN Company

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Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JM
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/27/2014
Manager	Date
EJS	3/27/2014

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/26/14	14-742	RMP SEEP T	36.4	16340^	2.4	22.3	425.0	28.9	0.84 J	160	704		7.49	2
		RMP SEEP D		15660^					1.8J***					
3/26/14	14-743	RMP POLISH T	6.9	8995^	0.25 J	4.1	933.1	28.2	78.1	172	833	ND	7.53	0
		RMP POLISH D		8888^					63.1					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-742,L14-0001-743

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/27/14	
Copper	ug/L	ND	0.68	3/27/14	
Lead	ug/L	1.1	2.27	3/27/14	
Zinc	ug/L	0.47	2.02	3/27/14	
Nickel	ug/L	ND	0.54	3/27/14	
Thallium	ug/L	ND	1.56	3/27/14	
Iron	ug/L	ND	2.21	3/27/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	509	102%	85-115%	
Copper	ug/L	500	515	103%	85-115%	
Lead	ug/L	500	507	101%	85-115%	
Zinc	ug/L	500	515	103%	85-115%	
Nickel	ug/L	500	510	102%	85-115%	
Iron	ug/L	500	508	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-742 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.2	500	500	491	503	98%	101%	70-130%	
Copper	ug/L	0	500	500	495	509	99%	102%	70-130%	
Lead	ug/L	0.43	500	500	487	497	97%	99%	70-130%	
Zinc	ug/L	163.4	500	500	645	660	96%	99%	70-130%	
Nickel	ug/L	5	500	500	495	506	98%	100%	70-130%	
Iron	ug/L	0	500	500	496	515	99%	103%	70-130%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-742,L14-0001-743

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/26/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-742

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	10.1	4	13.7	14	90%	98%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	10	10.1	101%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-742,L14-0001-743

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.97	5	3/27/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104	104%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	103	103%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-742

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	160	161	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.02	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.01	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.03	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.01	3.95-4.05	L13-0002-0040
Slope	99.4%	90-102%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples:L14-0001-743

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/26/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-743

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	1	1	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
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(573) 244-8105

The DOE RUN Company

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
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G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JM
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/28/2014
Manager	Date
EJS	3/28/2014

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-769,L14-0001-770

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/31/14	
Copper	ug/L	0.06	0.68	3/31/14	
Lead	ug/L	0.28	2.27	3/31/14	
Zinc	ug/L	0.36	2.02	3/31/14	
Nickel	ug/L	NS	0.54	3/31/14	
Thallium	ug/L	NS	1.56	3/31/14	
Iron	ug/L	NS	2.21	3/31/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	510	102%	85-115%	
Copper	ug/L	500	503	101%	85-115%	
Lead	ug/L	500	503	101%	85-115%	
Zinc	ug/L	500	512	102%	85-115%	
Nickel	ug/L	500	508	102%	85-115%	
Iron	ug/L	500	511	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-769 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.16	500	500	521	527	104%	105%	70-130%	
Copper	ug/L	0.55	500	500	536	542	107%	108%	70-130%	
Lead	ug/L	0.02	500	500	507	516	101%	103%	70-130%	
Zinc	ug/L	145.8	500	500	664	671	104%	105%	70-130%	
Nickel	ug/L	4.4	500	500	517	523	103%	104%	70-130%	
Iron	ug/L	0	500	500	535	540	107%	108%	70-130%	

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/28/14	14-769	RMP SEEP T	35.4	14580^	3.9	23.6	395.6	16.9	ND	154	911		7.58	0
		RMP SEEP D		14770^***					ND					
3/28/14	14-770	RMP POLISH T	7.6	8960^	1.6	4.3	931.6	15.2	77.7	175	962	ND	7.72	0
		RMP POLISH D		9111^***					7.6					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-769,L14-0001-770

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/31/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-769

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	9.1	5	14.5	13.9	108%	96%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.7	94%	85-115	

The DOE RUN Company

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-769,L14-0001-770

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.98	5	4/1/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	106	106%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	106	106%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-769

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	154	155	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.97	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.00	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.01	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.03	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.00	3.95-4.05	L13-0002-0040
Slope	99.4%	90-102%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX: Water

Associated Lab Samples: L14-0001-770

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/31/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-770

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	1	1	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JM
IC	TLL

Report Acceptance	
QAO	Date
GWP	4/3/2014
Manager	Date
EJS	4/3/2014

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L14-0001-771,L14-0001-772

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.29	3/31/14	
Copper	ug/L	0.06	0.68	3/31/14	
Lead	ug/L	0.28	2.27	3/31/14	
Zinc	ug/L	0.36	2.02	3/31/14	
Nickel	ug/L	ND	0.54	3/31/14	
Thallium	ug/L	ND	1.56	3/31/14	
Iron	ug/L	ND	2.21	3/31/14	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	510	102%	85-115%	
Copper	ug/L	500	503	101%	85-115%	
Lead	ug/L	500	503	101%	85-115%	
Zinc	ug/L	500	512	102%	85-115%	
Nickel	ug/L	500	508	102%	85-115%	
Iron	ug/L	500	511	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 14-771 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.2	500	500	525	527	105%	105%	70-130%	
Copper	ug/L	0.22	500	500	544	545	109%	109%	70-130%	
Lead	ug/L	0	500	500	511	515	102%	103%	70-130%	
Zinc	ug/L	154.4	500	500	674	678	104%	105%	70-130%	
Nickel	ug/L	4.7	500	500	522	526	103%	104%	70-130%	
Iron	ug/L	0	500	500	541	540	108%	108%	70-130%	

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	TSS mg/l	pH mg/l	Turbidity FAU
3/31/14	14-771	RMP SEEP T	37.0	15450^	3.9	23.9	417.0	13.4	ND	160	915		7.73	0
		RMP SEEP D		15310^					ND					
3/31/14	14-772	RMP POLISH T	6.1	8836^	1.7	3.8	888.7	12.6	112.2	172	893	ND	7.77	0
		RMP POLISH D		8967^***					103.2					

RL	2.27	2.02	0.68	0.29	0.54	1.56	2.21
MDL	0.71	0.64	0.21	0.09	0.17	0.49	0.7

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L14-0001-771,L14-0001-772

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	1.98	5	4/1/14	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	106	106%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	106	106%	85-115%	

LABORATORY SAMPLE DUPLICATE 14-771

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	160	162	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.97	6.95-7.05	L13-0002-0038
ICV Buffer 4.00	4.00	3.95-4.05	L13-0002-0037
ICV Buffer 10.01	10.01	9.96-10.06	L13-0002-0039
CCV Buffer 10.0(	10.03	9.96-10.06	L13-0002-0044
CCV Buffer 4.05	4.00	3.95-4.05	L13-0002-0040
Slope	99.4%	90-102%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L14-0001-771,L14-0001-772

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	3/31/14	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME: 14-771

Parameter	Units	Results	MS Spike Conc	MS Results	MSD Results	% Rec	MSD % Rec	Rec Limits	Qual
Sulfate	mg/l	9.1	5	13.8	13.9	94%	96%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.7	94%	85-115	

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

The DOE RUN Company

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
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K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	JM
IC	TLL

Report Acceptance	
QAO	Date
GWP	4/3/2014
Manager	Date
EJS	4/3/2014

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX: Water

Associated Lab Samples: L14-0001-772

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	3/31/14	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 14-772

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	0.5	0.5	

LABORATORY CONTROL SAMPLE L14-0002-0002

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	5	100%	85-115	

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

March 19, 2014

Amy Sanders
The Doe Run Company
P. O. Box 500
Viburnum, MO 65566

RE: Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Dear Amy Sanders:
Enclosed are the analytical results for sample(s) received by the laboratory on March 12, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Kansas Certification IDs
9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-13-4
Utah Certification #: KS000212013-3
Illinois Certification #: 003097

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SAMPLE SUMMARY

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60164627001	RIVERMINES 001	Water	03/11/14 10:13	03/12/14 08:45
60164627002	RIVERMINES UPSTREAM	Water	03/11/14 10:25	03/12/14 08:45
60164627003	RIVERMINES DOWNSTREAM	Water	03/11/14 09:58	03/12/14 08:45

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SAMPLE ANALYTE COUNT

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60164627001	RIVERMINES 001	EPA 200.7	TDS	3	PASI-K
		SM 2540D	JMC1	1	PASI-K
		SM 2540F	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60164627002	RIVERMINES UPSTREAM	EPA 200.7	TDS	6	PASI-K
		EPA 200.7	TDS	3	PASI-K
		SM 2540D	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60164627003	RIVERMINES DOWNSTREAM	EPA 200.7	TDS	6	PASI-K
		EPA 200.7	TDS	3	PASI-K
		SM 2540D	JMC1	1	PASI-K
		EPA 300.0	OL	1	PASI-K

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ANALYTICAL RESULTS

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Sample: RIVERMINES 001 **Lab ID: 60164627001** Collected: 03/11/14 10:13 Received: 03/12/14 08:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Cadmium	**1.9J**	ug/L	5.0	0.56	1	03/13/14 09:00	03/13/14 15:38	7440-43-9	
Lead	**3.6J**	ug/L	5.0	2.2	1	03/13/14 09:00	03/13/14 15:38	7439-92-1	
Zinc	**12700**	ug/L	50.0	12.5	1	03/13/14 09:00	03/13/14 15:38	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D								
Total Suspended Solids	ND	mg/L	5.0	5.0	1		03/13/14 07:39		
2540F Total Settleable Solids	Analytical Method: SM 2540F								
Total Settleable Solids	ND	mL/L/hr	0.20	0.20	1		03/12/14 14:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**873**	mg/L	100	9.8	100		03/17/14 17:30	14808-79-8	

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ANALYTICAL RESULTS

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Sample: RIVERMINES UPSTREAM **Lab ID: 60164627002** Collected: 03/11/14 10:25 Received: 03/12/14 08:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Cadmium	ND	ug/L	5.0	0.56	1	03/13/14 09:00	03/13/14 15:45	7440-43-9	
Calcium	**39400**	ug/L	100	7.8	1	03/13/14 09:00	03/13/14 15:45	7440-70-2	
Lead	ND	ug/L	5.0	2.2	1	03/13/14 09:00	03/13/14 15:45	7439-92-1	
Magnesium	**24400**	ug/L	50.0	17.0	1	03/13/14 09:00	03/13/14 15:45	7439-95-4	
Total Hardness by 2340B	**199000**	ug/L	500		1	03/13/14 09:00	03/13/14 15:45		
Zinc	ND	ug/L	50.0	12.5	1	03/13/14 09:00	03/13/14 15:45	7440-66-6	
200.7 Metals, Dissolved (LF)	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Cadmium, Dissolved	ND	ug/L	5.0	0.56	1	03/12/14 14:00	03/13/14 10:57	7440-43-9	
Lead, Dissolved	ND	ug/L	5.0	2.2	1	03/12/14 14:00	03/13/14 10:57	7439-92-1	
Zinc, Dissolved	**21.4J**	ug/L	50.0	12.5	1	03/12/14 14:00	03/13/14 10:57	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D								
Total Suspended Solids	ND	mg/L	5.0	5.0	1		03/13/14 07:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**32.8**	mg/L	5.0	0.49	5		03/17/14 17:45	14808-79-8	

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ANALYTICAL RESULTS

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Sample: RIVERMINES DOWNSTREAM **Lab ID: 60164627003** Collected: 03/11/14 09:58 Received: 03/12/14 08:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Cadmium	ND	ug/L	5.0	0.56	1	03/13/14 09:00	03/13/14 15:47	7440-43-9	
Calcium	**44800**	ug/L	100	7.8	1	03/13/14 09:00	03/13/14 15:47	7440-70-2	
Lead	**4.3J**	ug/L	5.0	2.2	1	03/13/14 09:00	03/13/14 15:47	7439-92-1	
Magnesium	**25300**	ug/L	50.0	17.0	1	03/13/14 09:00	03/13/14 15:47	7439-95-4	
Total Hardness by 2340B	**216000**	ug/L	500		1	03/13/14 09:00	03/13/14 15:47		
Zinc	**387**	ug/L	50.0	12.5	1	03/13/14 09:00	03/13/14 15:47	7440-66-6	
200.7 Metals, Dissolved (LF)	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Cadmium, Dissolved	ND	ug/L	5.0	0.56	1	03/12/14 14:00	03/13/14 10:59	7440-43-9	
Lead, Dissolved	ND	ug/L	5.0	2.2	1	03/12/14 14:00	03/13/14 10:59	7439-92-1	
Zinc, Dissolved	**352**	ug/L	50.0	12.5	1	03/12/14 14:00	03/13/14 10:59	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D								
Total Suspended Solids	ND	mg/L	5.0	5.0	1		03/13/14 07:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**58.3**	mg/L	5.0	0.49	5		03/18/14 10:47	14808-79-8	

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QUALITY CONTROL DATA

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

QC Batch: MPRP/26437 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60164627001, 60164627002, 60164627003

METHOD BLANK: 1342984 Matrix: Water
Associated Lab Samples: 60164627001, 60164627002, 60164627003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium	ug/L	ND	5.0	03/13/14 15:18	
Calcium	ug/L	ND	100	03/13/14 15:18	
Lead	ug/L	ND	5.0	03/13/14 15:18	
Magnesium	ug/L	ND	50.0	03/13/14 15:18	
Total Hardness by 2340B	ug/L	ND	500	03/13/14 15:18	
Zinc	ug/L	ND	50.0	03/13/14 15:18	

LABORATORY CONTROL SAMPLE: 1342985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	1000	1030	103	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Lead	ug/L	1000	1050	105	85-115	
Magnesium	ug/L	10000	10300	103	85-115	
Total Hardness by 2340B	ug/L		67800			
Zinc	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1342986 1342987

Parameter	Units	60164625001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	ug/L	ND	1000	1000	1040	1030	104	103	70-130	1	10	
Calcium	ug/L	110000	10000	10000	112000	114000	28	38	70-130	1	9	M1
Lead	ug/L	5.4	1000	1000	1030	1020	103	102	70-130	1	10	
Magnesium	ug/L	60300	10000	10000	66000	67000	57	68	70-130	2	9	M1
Total Hardness by 2340B	ug/L	522000			553000	560000				1		
Zinc	ug/L	175	1000	1000	1170	1160	100	98	70-130	1	11	

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QUALITY CONTROL DATA

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

QC Batch: MPRP/26429 | Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 | Analysis Description: 200.7 Metals, Dissolved
Associated Lab Samples: 60164627002, 60164627003

METHOD BLANK: 1342671 | Matrix: Water
Associated Lab Samples: 60164627002, 60164627003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium, Dissolved	ug/L	ND	5.0	03/13/14 10:20	
Lead, Dissolved	ug/L	ND	5.0	03/13/14 10:20	
Zinc, Dissolved	ug/L	ND	50.0	03/13/14 10:20	

LABORATORY CONTROL SAMPLE: 1342672

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium, Dissolved	ug/L	1000	1020	102	85-115	
Lead, Dissolved	ug/L	1000	1030	103	85-115	
Zinc, Dissolved	ug/L	1000	1020	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1342673 1342674

Parameter	Units	60164625001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium, Dissolved	ug/L	ND	1000	1000	1060	1050	105	105	70-130	0	10	
Lead, Dissolved	ug/L	2.7J	1000	1000	1020	1020	102	102	70-130	0	10	
Zinc, Dissolved	ug/L	125	1000	1000	1120	1120	99	100	70-130	1	11	

SAMPLE DUPLICATE: 1344334

Parameter	Units	60164626003 Result	Dup Result	RPD	Max RPD	Qualifiers
Cadmium, Dissolved	ug/L	0.68J	ND		20	
Lead, Dissolved	ug/L	ND	ND		20	
Zinc, Dissolved	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

QC Batch: WET/46644 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 60164627001, 60164627002, 60164627003

METHOD BLANK: 1342880 Matrix: Water
Associated Lab Samples: 60164627001, 60164627002, 60164627003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	03/13/14 07:36	

SAMPLE DUPLICATE: 1342881

Parameter	Units	60164548003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

SAMPLE DUPLICATE: 1342882

Parameter	Units	60164626004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

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QUALITY CONTROL DATA

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

QC Batch: WETA/28630 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60164627001, 60164627002

METHOD BLANK: 1345188 | Matrix: Water
Associated Lab Samples: 60164627001, 60164627002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	03/17/14 14:40	

LABORATORY CONTROL SAMPLE: 1345189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1345190 1345191

Parameter	Units	60164625001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	243	100	100	336	335	93	92	80-120	0	15	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

QC Batch: WETA/28639 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60164627003

METHOD BLANK: 1345628 — Matrix: Water
Associated Lab Samples: 60164627003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	03/18/14 10:16	

LABORATORY CONTROL SAMPLE: 1345629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1345630 1345631

Parameter	Units	60164627003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	58.3	25	25	81.0	80.5	91	89	80-120	1	15	

MATRIX SPIKE SAMPLE: 1345632

Parameter	Units	60164717001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	147	500	655	101	80-120	

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QUALIFIERS

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NPDES MONTHLY (RIVERMINES)
Pace Project No.: 60164627

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60164627001	RIVERMINES 001	EPA 200.7	MPRP/26437	EPA 200.7	ICP/20148
60164627002	RIVERMINES UPSTREAM	EPA 200.7	MPRP/26437	EPA 200.7	ICP/20148
60164627003	RIVERMINES DOWNSTREAM	EPA 200.7	MPRP/26437	EPA 200.7	ICP/20148
60164627002	RIVERMINES UPSTREAM	EPA 200.7	MPRP/26429	EPA 200.7	ICP/20145
60164627003	RIVERMINES DOWNSTREAM	EPA 200.7	MPRP/26429	EPA 200.7	ICP/20145
60164627001	RIVERMINES 001	SM 2540D	WET/46644		
60164627002	RIVERMINES UPSTREAM	SM 2540D	WET/46644		
60164627003	RIVERMINES DOWNSTREAM	SM 2540D	WET/46644		
60164627001	RIVERMINES 001	SM 2540F	WET/46612		
60164627001	RIVERMINES 001	EPA 300.0	WETA/28630		
60164627002	RIVERMINES UPSTREAM	EPA 300.0	WETA/28630		
60164627003	RIVERMINES DOWNSTREAM	EPA 300.0	WETA/28639		

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Sample Condition Upon Receipt

WO#: 60164627

60164627

Optional
Proj Due Date:
Proj Name:

Client Name: Doe Run

Courier: Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other ☐

Tracking #: 7961 7064 3174 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☒ Bubble Bags ☐ Foam ☐ None ☐ Other ☐

Thermometer Used: T-239 / T-194 **Type of Ice:** Wet Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 1.8

Temperature should be above freezing to 6°C

Date and initials of person examining contents: 3/12/14

Chain of Custody present:	☒Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☒Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	6. Soil Solids
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☒Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC:	☒Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: water		13.
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	☒Yes ☐No	Initial when completed: JM Lot # of added preservative
Trip Blank present:	☐Yes ☐No ☒N/A	
Pace Trip Blank lot # (if purchased): NA		15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jenni Church Date: 3/12/14

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company:	The Doe Run Company
Address:	PO Box 500
	Viburnum, MO 65566
Email To:	asanders@doerun.com
Phone: 573-689-4535	Fax: 573-244-8179
Requested Due Date/TAT:	5 - 7 Days

Section B Required Project Information:

Report To:	Amy Sanders
Copy To:	
Purchase Order No.:	
Project Name:	NPDES Monthly (Rivermines)
Project Number:	

Section C Invoice Information:

Attention:	Amy Sanders
Company Name:	The Doe Run Company
Address:	PO Box 500, Viburnum, MO 65566
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☑ OTHER

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
	WP
	AR
	OT
	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	TSS	Settleable Solids	Sulfate	Cd, Pb, Zn - Total	Hardness	Cd, Pb, Zn - Dissolved	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Rivermines 001	WW	G			3/11/14	1013		3	2		1							x	X	x	x			N	60164627
2	Rivermines Upstream	W	G			3/11/14	1025		2	1		1							x		x	x	x	x	N	
3	Rivermines Downstream	W	G			3/11/14	0958		2	1		1							x		x	x	x	x	N	
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* 200.8 Total Recoeverable Metals	Larry Hopkins	3/11/14	1330	[signature]	3/12/14	845	1-8	Y	Y	Y
**analyzed within 24 hours with flagged data										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Larry Hopkins

SIGNATURE of SAMPLER: Larry Hopkins [signature] DATE Signed (MM/DD/YY): 3/11/14

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.