

LEGGETTE, BRASHEARS & GRAHAM, INC.

PROFESSIONAL GROUNDWATER AND ENVIRONMENTAL ENGINEERING SERVICES

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ST. PAUL, MN 55112
(651) 490-1405
FAX (651) 490-1006
www.lbgweb.com

MEMORANDUM

TO:	Kristina Handt, City of Scandia
FROM:	Dave Hume, LBG
CC:	Sherri Buss, TKDA Roscoe Sopiwnik, LBG Jed Chesnut - WCD
DATE:	October 9, 2015
RE:	Groundwater Monitoring Update (January 2015 through June 2015) Zavoral Mining and Reclamation Project Scandia, MN

The purpose of this correspondence is to provide the City of Scandia (City) with a summary of the groundwater monitoring results from the Zavoral Mining and Reclamation Project (Site). This memorandum includes the results from January through June 2015, and is referred to herein as the reporting period. The monitoring results from January through December 2014 were provided in Leggette, Brashears & Graham, Inc.'s (LBG's) June 2014 and January 2015 Groundwater Monitoring Update memorandums, dated June 20, 2014 and January 16, 2015. Groundwater monitoring well installation, monitoring procedures, and 2013 results were provided in LBG's *2013 Groundwater Monitoring Summary* letter report dated January 15, 2014.

GROUNDWATER MONITORING ACTIVITIES

The following groundwater monitoring activities were conducted:

- Pace Analytical Services, Inc. (Pace) collected a groundwater sample from MW-1 on January 15, 2015;
- LBG conducted Site visits on January 15th and June 4, 2015 to manually measure water levels and download water level data from the data loggers in the four observation wells (MW-1, PZ-1, PZ-2, and Trails End Well), and download water quality parameter data from the logger in MW-1;
- Obtained the surface water monitoring data from the Washington County Conservation District (WCD) and provided WCD with groundwater data; and,
- Updated the water quality data plots and well hydrographs.

GROUNDWATER MONITORING RESULTS

Groundwater Level Measurements

Groundwater levels across the Site decreased from approximately 0.4 to 0.7 feet from January through June 2015 in all monitored wells. These trends follow the same general patterns observed in 2013 and 2014 and are typical of seasonal variations caused by variable precipitation and subsequent recharge.

Groundwater Flow Direction

The groundwater surface contour map is shown on Figure 1 for measurements collected on June 4, 2015. The hydraulic gradient and flow direction is consistent with the 2013 and 2014 results. Flow is southeast toward the Saint Croix River.

Mining Depth and Groundwater Levels

According to Tiller staff, active mining excavation and reclamation activities occurred during the reporting period during the months of January, February, and March 2015 followed by a period of inactivity. It is anticipated that mining and reclamation activities will resume late summer to early fall 2015. The maximum mining depth during the reporting period placed the bottom of the mine floor at elevations ranging between 845 and 855 feet amsl, which is between 5 and 15 feet above the minimum permitted depth of 840 feet amsl. The Site was flown by Tiller to obtain the topographic surface. The resulting topography data confirmed the minimum mining elevation on May 5, 2015 at 845 feet amsl. This maintains the required 25 feet minimum separation distance from the water table as required by the condition outlined in the Conditional Use Permit (CUP).

Zavoral Site Well

The Zavoral Site Well was pumped briefly on May 19th and May 21st to ensure proper equipment operation after an extended period of no operation. The total volume pumped was less than 50 gallons. According to Tiller staff, this was the only groundwater withdrawn during the reporting period. Groundwater levels in the uppermost aquifer below the site were not affected by pumping.

Groundwater Quality - Petroleum Parameters (MW-1)

The results from the January 2015 Pace sampling event show petroleum compounds (benzene, toluene, ethylbenzene, and xylene), and diesel range organics (DRO) were not detected at or above the method detection limit. The results are summarized in Table 1 and the analytical report is included in Attachment 1. The results are consistent with the samples collected on September 10, 2013, and January 15, 2014. The sampling plan and protocol is consistent with Tiller's *Groundwater Quality Protection Plan* (GWQPP).

Groundwater Quality – Indicator Parameters (MW-1)

The water quality indicators recorded by the logger in MW-1 are presented in Attachment 2. The values are generally in the range of those recorded in 2013 during the pre-Tiller mining period and those

recorded during 2014. The data plots show increasing conductivity, salinity, and total dissolved solids (TDS) during the reporting period. The changes in concentrations, although slightly more or less pronounced depending on the year, are following the seasonal variations observed during the 2013 and 2014 monitoring periods.

The abrupt change in conductivity, salinity, and TDS levels observed on the graphs immediately following the Pace January 2015 sampling event is a result of the logger being removed from the well during the sampling activities. This type of signature was also observed during the September 10, 2013 sampling event. After sampling was completed, the logger was placed back in the well and the levels returned to pre-sample conditions.

SUMMARY AND RECOMMENDATIONS

Based on the groundwater monitoring data from this most recent and prior reporting periods, mining and reclamation operations have not impacted groundwater below the Site.

Based on LBG's review and evaluation of the monitoring procedures and data from 2013 through June 2015, all CUP conditions related to groundwater monitoring have been met by Tiller. At this time, LBG recommends the conditions of the CUP remain in place and the GWQPP continue to be followed.

TABLE

TABLE 1

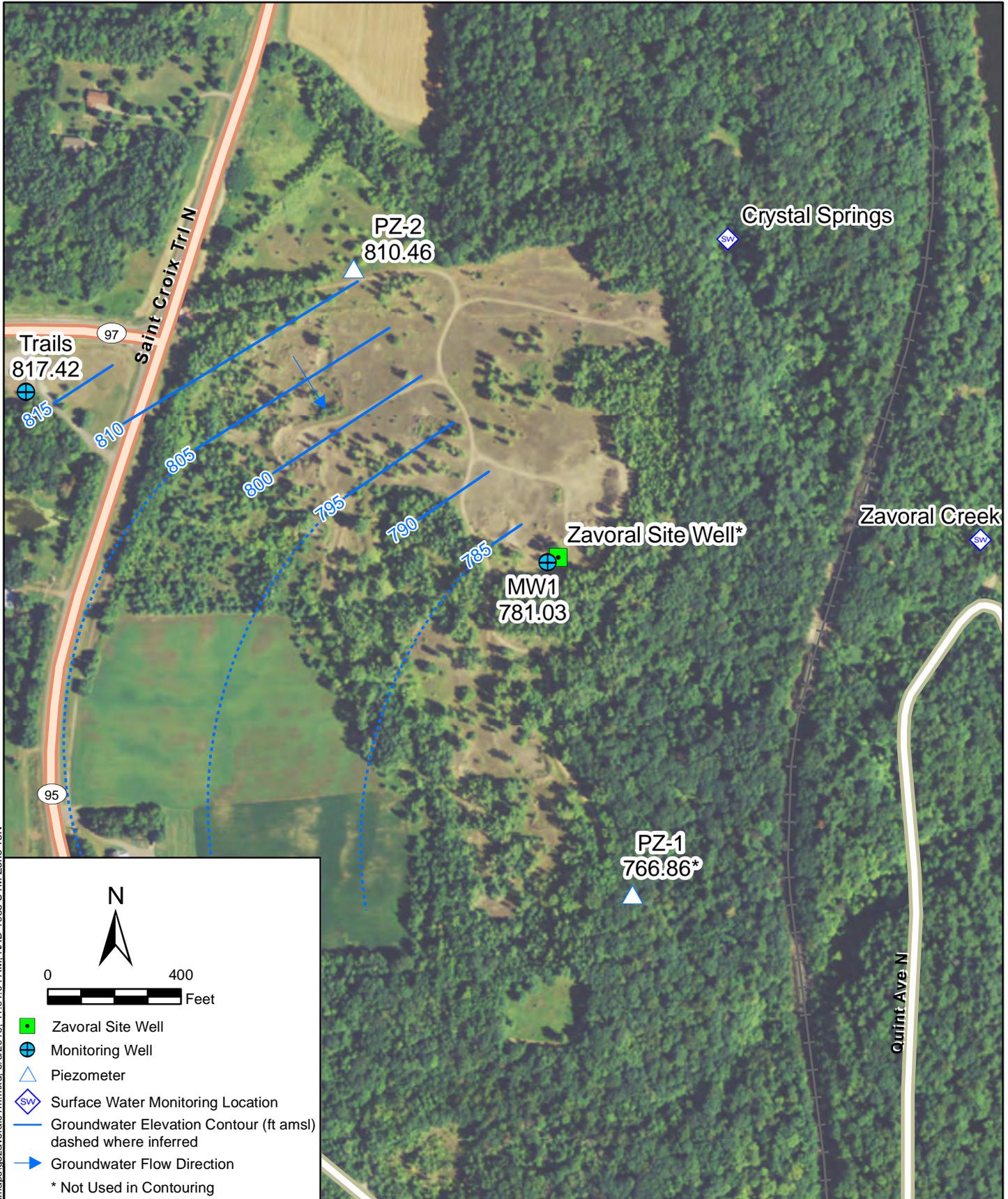
**ZAVORAL AGGREGATE MINING AND RECLAMATION PROJECT
SCANDIA, MN**

**MW-1 GROUNDWATER ANALYTICAL RESULTS
THROUGH JANUARY 2015**

Sample Date	Diesel Range Organics (DRO)	Benzene	Ethylbenzene	Toluene	Xylene (Total)
Units	mg/L	ug/L	ug/L	ug/L	ug/L
Method Detection Limit	0.10	1.0	1.0	1.0	3.0
10-Sep-13	<0.10	<1.0	<1.0	<1.0	<3.0
15-Jan-14	<0.10	<1.0	<1.0	<1.0	<3.0
15-Jan-15	<0.10	<1.0	<1.0	<1.0	<3.0

mg/L: Milligrams per Liter
ug/L: Micrograms per Liter

FIGURE



G:\GIS\Tiler_Zavoral_Mine\maps\g3zavoral01m.mxd, 6/8/2015, 11:01:04 AM, NAD 1983 UTM Zone 15N

0 400
Feet

- Zavoral Site Well
- ⊕ Monitoring Well
- ▲ Piezometer
- ◇ Surface Water Monitoring Location
- Groundwater Elevation Contour (ft amsl)
dashed where inferred
- ➔ Groundwater Flow Direction
- * Not Used in Contouring

Source: LIDAR DEM from Minnesota Geospatial Information Office. Well Locations Located by LBG. Surface Water Monitoring Locations from MNWCD.



Prepared By:
LEGGETTE, BRASHEARS & GRAHAM, INC.
 Professional Groundwater and
 Environmental Engineering Services
 8 Pine Tree Drive, Suite 250
 St. Paul, Minnesota 55112
 (651) 470-1405

CITY OF SCANDIA SCANDIA, MINNESOTA		
GROUNDWATER ELEVATIONS JUNE 4, 2015		
FILE: g3zavoral01m.MXD	DATE: 6/8/2015	FIGURE: 1

ATTACHMENT 1
PACE SAMPLING RESULTS



Pace Analytical Services, Inc.
1700 Elm Street SE, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

January 23, 2015

Mr. Mike Caron
Barton Sand and Gravel
P.O. Box 1480
Maple Grove, MN 55311-6480

RE: Pace Project No. 15-0011
Client Project ID: Barton Sand and Gravel- Zavoral Pit 744

Dear Mr. Caron:

Enclosed are the analytical results for the sample(s) received by the laboratory on January 15, 2015 for the annual sampling and analysis at Zavoral Pit 744.

Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

David Anderson
Project Manager
612-607-6377

State of Minnesota Laboratory No. 027-053-137

CC: Mr. Paul Schultz

Well Description and Presampling Information

Client: Barton Sand & Gravel Project: Pit 744, Zavoral Project #: 15-0011

Monitoring Point ID MW-1 (772842) Labeled 772842
 Inside Diameter 2 (inches) Key # 2106 Locked Not Locked
 Casing Material: PVC Steel Stainless Steel

Depth Measurement and Elevations (from top of well casing)

Top of Casing Elevation 867.43 Feet
 Well depth 92.44 Feet
 Static water level measurement before purging 85.97 Feet
 Static water level measurement at time of sampling 86.07 Feet
 Static Water Level Elevation Before Purging 781.46 Feet
 Purge Method 2" Grundfos rediflo sub pump
 Date Purged 1-15-15 Water Column 6.47 Feet
 Time Purged 1015-1024 One Casing Volume 1.1 Gallons
 Pump Rate 0.5 (GPM) LPM Volume Purged 4.5 Gallons

Field Sampling Data

Date Sampled 1-15-15
 Time Sampled 1030
 Sampling Equip. above pump
 Analyzed by DJA

Field Parameter Measurements of Sample	
pH <u>6.8</u> (units)	D.O. <u>NA</u> (mg/l)
Spec. Cond. <u>450</u> (µmhos/cm)	Turbidity <u>NA</u> (NTU)
Temp. <u>10.0</u> (°C)	Eh <u>NA</u> (mV)
Other <u>NA</u>	

Field Measurements Temp. Corrected: Yes No NA
 Sample for Soluble Metals Filtered in Field: Yes No NA
 Weather Conditions During Sampling: 27° + cloudy, wind 5-10
 Sample Description: clear + odorless
 Observations: DJA 1-15-15

Stabilization Test

Time	pH (units)	Specific Conductance (µmhos/cm)	Temp (°C)	D.O. (mg/l)	Turbidity (NTU)	Eh (mV)	Volume Purged (cumulative gal)
<u>1018</u>	<u>6.7</u>	<u>450</u>	<u>10.0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>1.5</u>
<u>1021</u>	<u>6.8</u>	<u>450</u>	<u>10.0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>3.0</u>
<u>1024</u>	<u>6.8</u>	<u>450</u>	<u>10.0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>4.5</u>
<u>DATA 1/15/15</u>							

Form Revised: 01/24/2012

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical
 Lead Technician Signature: David Anderson Date: 1-15-15

Client Name: Barton Sand and Gravel Project #: 15-0011

Project Description: Zavoral Pit 744 Annual MW

pH Meter							
Date	Meter #	Technician	Calibration Buffer Results (s.u.)			Temp (°C)	Comments
1-15-15	Sonde 5	DJA	4= 4.00	7= 7.00	10= 10.00	20.0	
			4=	7=	10=		
			4=	7=	10=		

4 Buffer (manufacturer / lot # / expiration date): Fisher / 131596 / 03/2015 7 Buffer (manufacturer / lot # / expiration date): Fisher / 136886 / 10/2015 10 Buffer (manufacturer / lot # / expiration date): Fisher / 140281 / 02/2016

Specific Conductance Meter					
Date	Meter #	Technician	Reference Standard (umhos/cm)	Meter Display (umhos/cm)	Comments
1-15-15	Sonde 5	DJA	1000	1000	

Standard info (manufacturer / lot # / expiration date): Ricca / Lot 4403506 / Exp. 09/2015

Dissolved Oxygen Meter						
Date	Meter #	Technician	Temp (°C)	Barometric Pressure (mmHg)	D.O. Results (mg/L)	Comments

Redox Potential (Eh) Meter					
Date	Meter #	Technician	Reference Standard (mV)	Meter Display (mV)	Comments

Standard info (manufacturer / lot # / expiration date): DJA / 1515

Temperature Probe or Thermometer					
Date	ID #	Technician	Reference Temp (°C)	Result (°C)	Comments

Performance check once per monitoring event. Reference thermometer info:

Turbidity Meter					
Date	Meter #	Tech	Instrument Scaled to Reference Std. For Each Analysis (circle)		Comments
			Yes	No	
			Yes	No	
			Yes	No	

Standard info (manufacturer / lot # / expiration date):

Form revised: 0211/08

Name/Affiliation of Sampler(s): David Anderson / Pace Analytical

Lead Technician Signature: David Anderson Date: 1-15-15

January 22, 2015

Mr. David Anderson
Pace Analytical Services, Inc.
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 15-0011BrtnSndGrvIzavoralPt744
Pace Project No.: 10294061

Dear Mr. Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on January 15, 2015. 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,



Denna Mohamed
denna.mohamed@pacelabs.com
Project Manager

Enclosures

cc: Pace Analytical - Field, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: 15-0011BrtnSndGrvlZavoralPt744
Pace Project No.: 10294061

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 15-0011BrtnSndGrvlZavoralPt744
Pace Project No.: 10294061

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10294061001	MW-1 (772842)	Water	01/15/15 10:30	01/15/15 12:08

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SAMPLE ANALYTE COUNT

Project: 15-0011BrtnSndGrvlZavoralPt744

Pace Project No.: 10294061

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10294061001	MW-1 (772842)	WI MOD DRO	JRH	2
		WI MOD GRO	LLC	5

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ANALYTICAL RESULTS

Project: 15-0011BrtnSndGrvlZavoralPI744
Pace Project No.: 10294061

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: MW-1 (772842) Lab ID: 10294061001 Collected: 01/15/15 10:30 Received: 01/15/15 12:08 Matrix: Water								
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/L	0.10	1	01/15/15 13:52	01/17/15 11:51		
Surrogates								
n-Triacontane (S)	86 %		50-150	1	01/15/15 13:52	01/17/15 11:51	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO								
Benzene	ND	ug/L	2.5	1		01/20/15 15:16	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		01/20/15 15:16	100-41-4	
Toluene	ND	ug/L	1.0	1		01/20/15 15:16	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		01/20/15 15:16	1330-20-7	
Surrogates								
a,a,a-Trifluorotoluene (S)	98 %		80-150	1		01/20/15 15:16	98-08-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 15-0011BrtnSndGrvlZavoralPt744
Pace Project No.: 10294061

QC Batch: GCV/13235 Analysis Method: WI MOD GRO
QC Batch Method: WI MOD GRO Analysis Description: WIGRO GCV Water
Associated Lab Samples: 10294061001

METHOD BLANK: 1883821 Matrix: Water
Associated Lab Samples: 10294061001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	2.5	01/20/15 13:22	
Ethylbenzene	ug/L	ND	1.0	01/20/15 13:22	
Toluene	ug/L	ND	1.0	01/20/15 13:22	
Xylene (Total)	ug/L	ND	3.0	01/20/15 13:22	
a,a,a-Trifluorotoluene (S)	%	96	80-150	01/20/15 13:22	

LABORATORY CONTROL SAMPLE & LCSD: 1883822 1883823

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	100	109	101	109	101	80-120	8	20	
Ethylbenzene	ug/L	100	105	95.4	105	95	80-120	9	20	
Toluene	ug/L	100	103	94.5	103	94	80-120	9	20	
Xylene (Total)	ug/L	300	306	283	102	94	80-120	8	20	
a,a,a-Trifluorotoluene (S)	%				106	100	80-150			

SAMPLE DUPLICATE: 1884839

Parameter	Units	10294105009 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	ND		20	
Toluene	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%	97	95	2		pH

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 15-0011BrtnSndGrvlZavoralPt744
Pace Project No.: 10294061

QC Batch: OEXT/27897 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10294061001

METHOD BLANK: 1881900 Matrix: Water
Associated Lab Samples: 10294061001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/L	ND	0.10	01/17/15 10:42	
n-Triacontane (S)	%	81	50-150	01/17/15 10:42	

LABORATORY CONTROL SAMPLE & LCSD: 1881901

1881902

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	2	1.7	1.6	85	82	75-115	4	20	
n-Triacontane (S)	%				89	87	50-150			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 15-0011BrtnSndGrv/ZavoralPt744
Pace Project No.: 10294061

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.

PQL - Practical Quantitation 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.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

pH Post-analysis pH measurement indicates insufficient VOA sample preservation.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 15-0011BrtnSndGrvlZavoralPt744
Pace Project No.: 10294061

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10294061001	MW-1 (772842)	WI MOD DRO	OEXT/27897	WI MOD DRO	GCSV/14884
10294061001	MW-1 (772842)	WI MOD GRO	GCV/13235		

REPORT OF LABORATORY ANALYSIS

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RUSH 1/15/15

CHAIN-OF-CUSTODY / Analytical Request Document

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

10194061

Section A
 Required Client Information:
 Company: Barton Sand and Gravel
 Address: c/o Pace MW Field
 Requested Due Date (DAT): 5 DAY TAT / 1-21-15

Section B
 Required Project Information:
 Report To: David Anderson
 Copy To: _____
 Purchase Order No.: _____
 Project Name: 15-0011, Barton Sand and Gravel - 2 gravel pit 744
 Project Number: _____

Section C
 Invoice Information:
 Attention: C. J. Ruitkio
 Company Name: _____
 Address: _____
 Pass Quote Reference: DJA
 Face Project Manager: Denna Mohamed
 Face Profile #: _____

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER _____
 Site Location: _____
 STATE: _____

Page: 1 of 1
 1750797

ITEM #	Section D Required Client Information		Matrix Codes MATRIX I CODE		MATRIX CODE (see valid codes to left)		SAMPLE TYPE (G=GRAB C=COMP)		COLLECTED		SAMPLE TEMP AT COLLECTION		# OF CONTAINERS		Preservatives		Analysis Test		Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
	Matrix Codes Drinking Water Water Waste Water Product Soli/Solid Oil Wipe Air Tissue Other	MATRIX I CODE DW WT WW P SL OL WP AR TS OT	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME		
1	MW-1 (772842)	WT	1/15/15	1200	1/15/15	1200	72	5	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	*PATH (HOLD)	WT DRO	N	10194061
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS
 *5 DAY TAT on DRO. David Anderson for Pace 1/15/15 1205
 PATH on hold until DRO analysis is complete
 FF DRO present. We will analyze for PATH.
 ORIGINAL

RECEIVED BY / AFFILIATION
 DATE / TIME
 1-15-15 1208
 PACE

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

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: David Anderson
 SIGNATURE of SAMPLER: David Anderson
 DATE Signed (MM/DD/YYYY): 1/15/15

Sample Condition Upon Receipt

Client Name: Barton Sand & Gravel

Project #:
WO# : 10294061

 10294061

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermom. Used: B88A9130516413 B88A912167504 B88A9132521491 **Type of Ice:** Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read (°C): 4.6 **Cooler Temp Corrected (°C):** 4.7 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** JP 1/16/15

Comments:

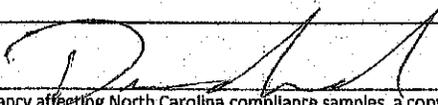
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	1.	
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	2.	
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	3.	
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	4.	
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	5.	
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/>	6.	
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	7.	
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	8.	
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	9.	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	10.	
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/>	11.	
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	12.	
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>				
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13.	<input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A		Sample #
Exceptions: <input checked="" type="checkbox"/> Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	14.	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	15.	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ **Date/Time:** _____

Comments/Resolution: _____

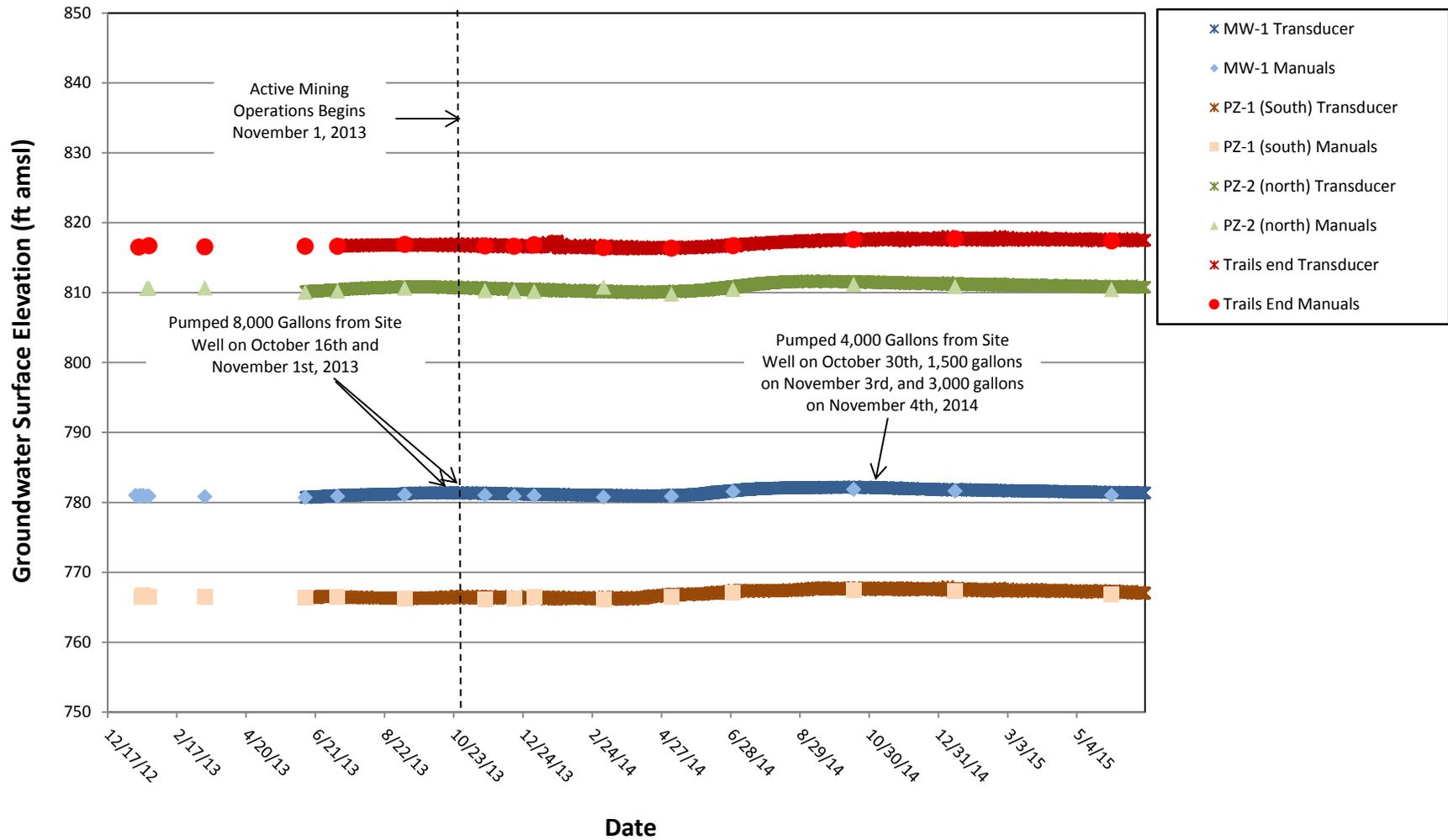
Project Manager Review:  **Date:** 01/19/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

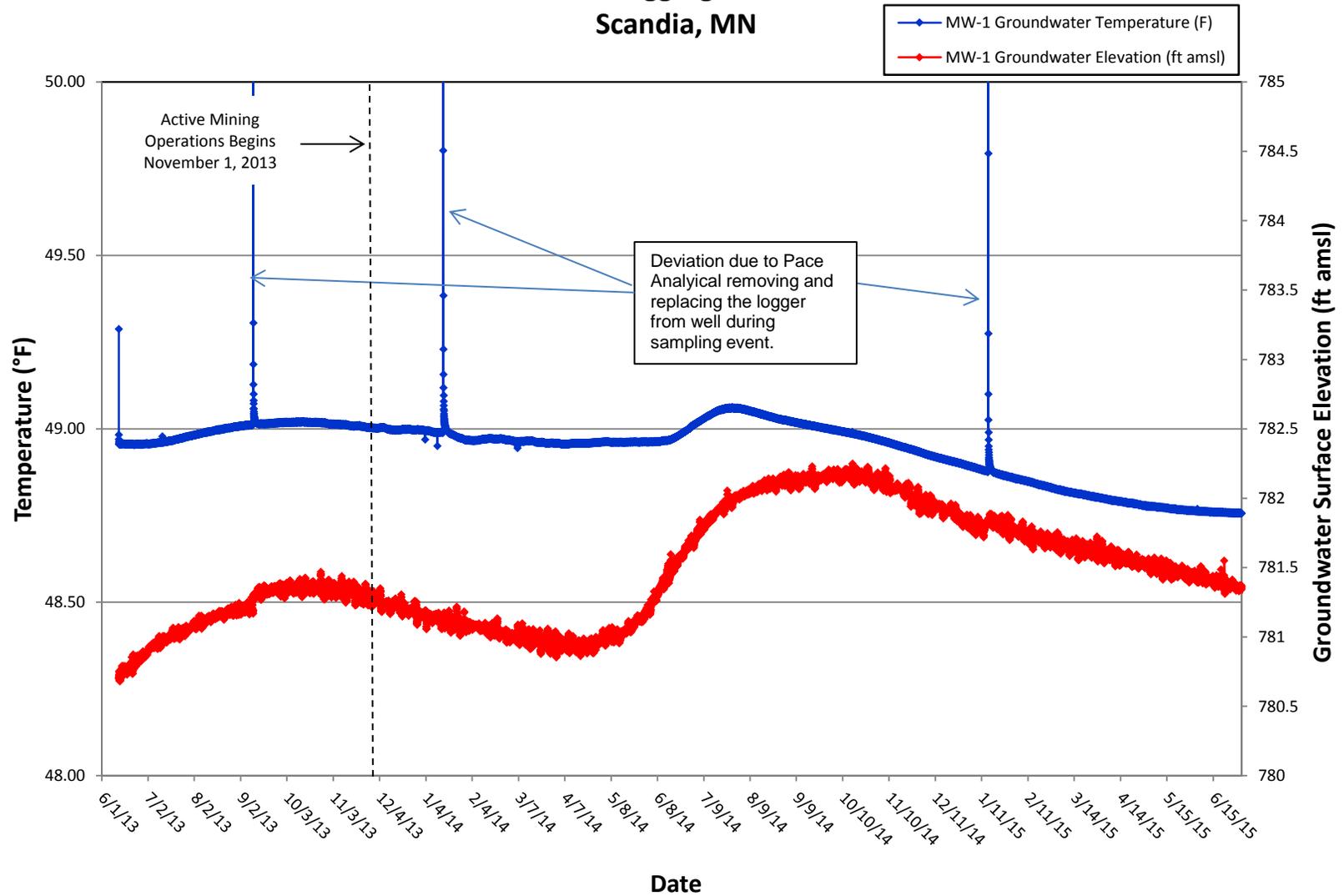
ATTACHMENT 2

**WELL HYDROGRAPHS AND
WATER QUALITY INDICATOR PARAMETER DATA PLOTS**

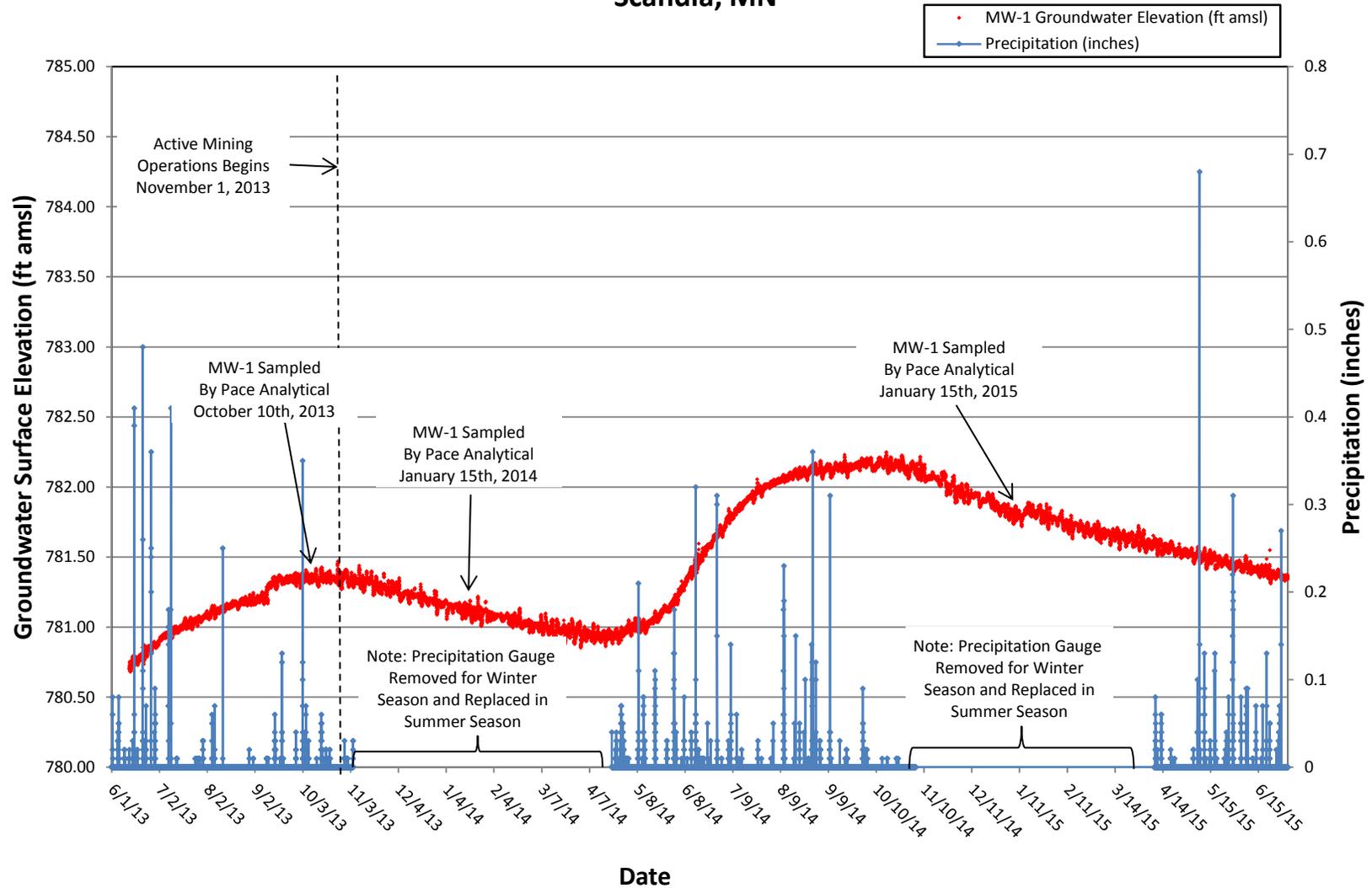
**MW-1 Monitoring Well and PZ-1, PZ-2, and Trails End Observation Wells
Groundwater Surface Elevation vs. Time
Zavoral Aggregate Mining and Reclamation Project
Scandia, Minnesota**



MW-1
Temperature and Groundwater Elevation vs. Time
Zavoral Aggregate Mine
Scandia, MN



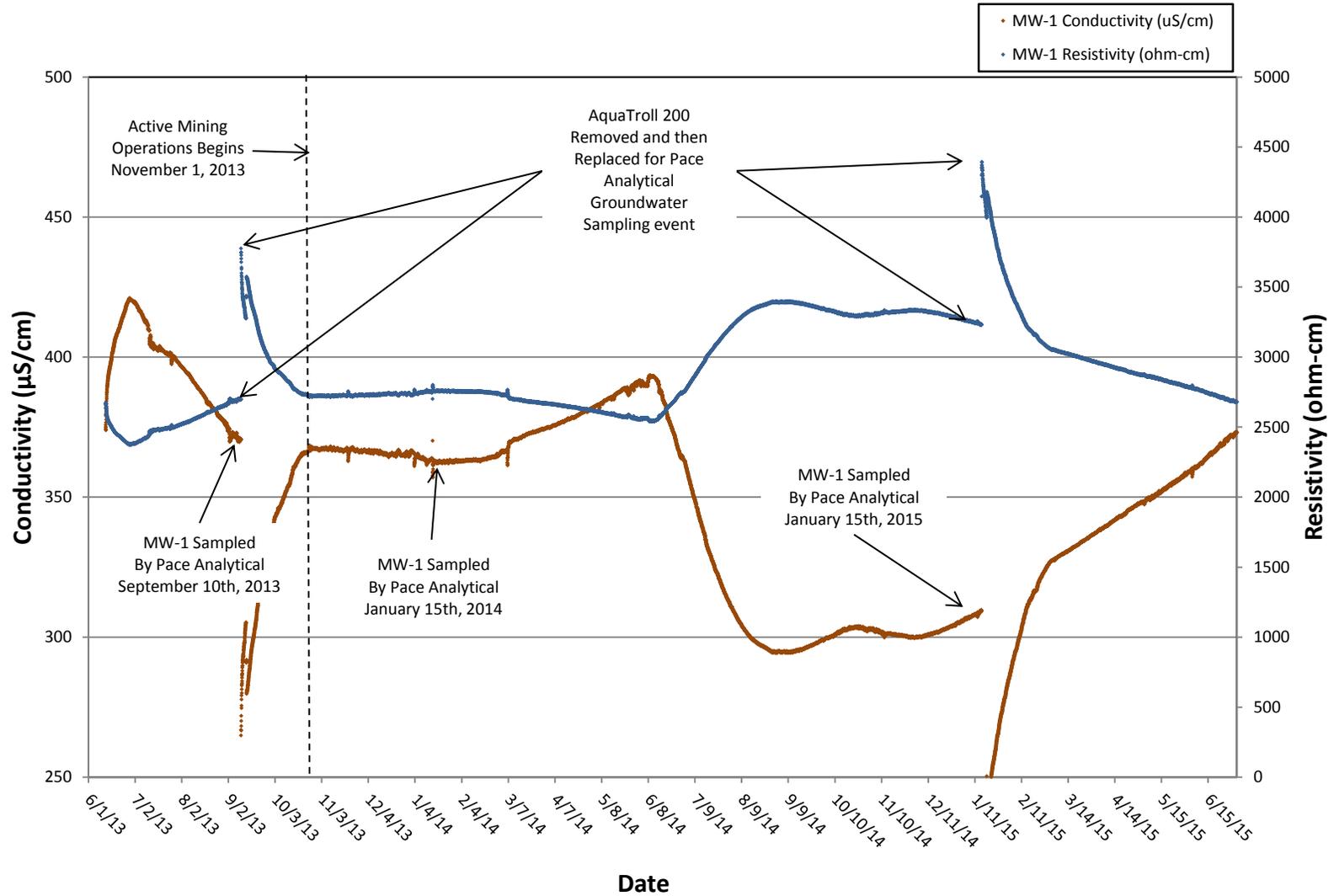
MW-1 Groundwater Surface Elevation and Precipitation vs. Time Zavoral Mining and Reclamation Project Scandia, MN



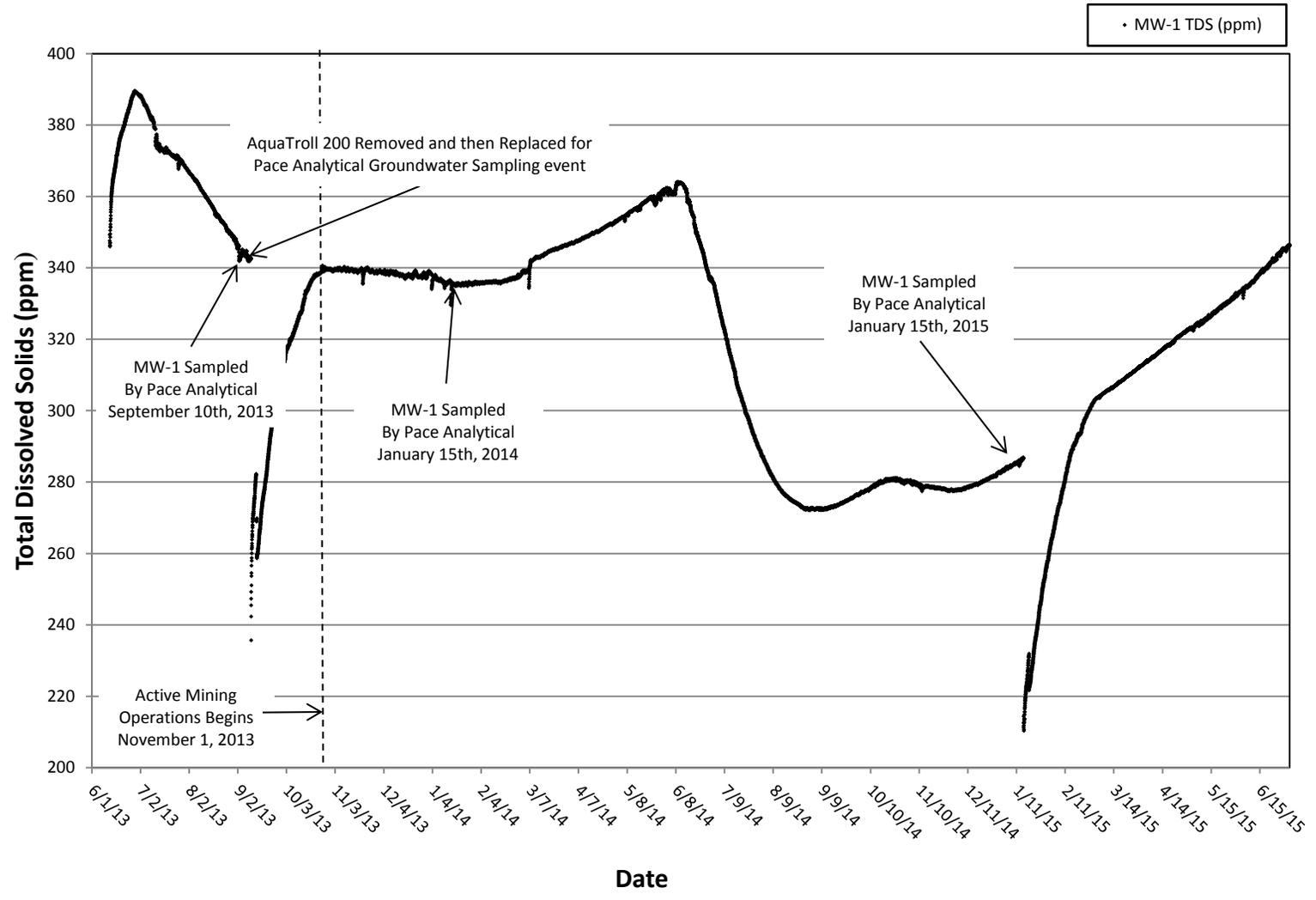
MW-1

Conductivity and Resistivity vs. Time

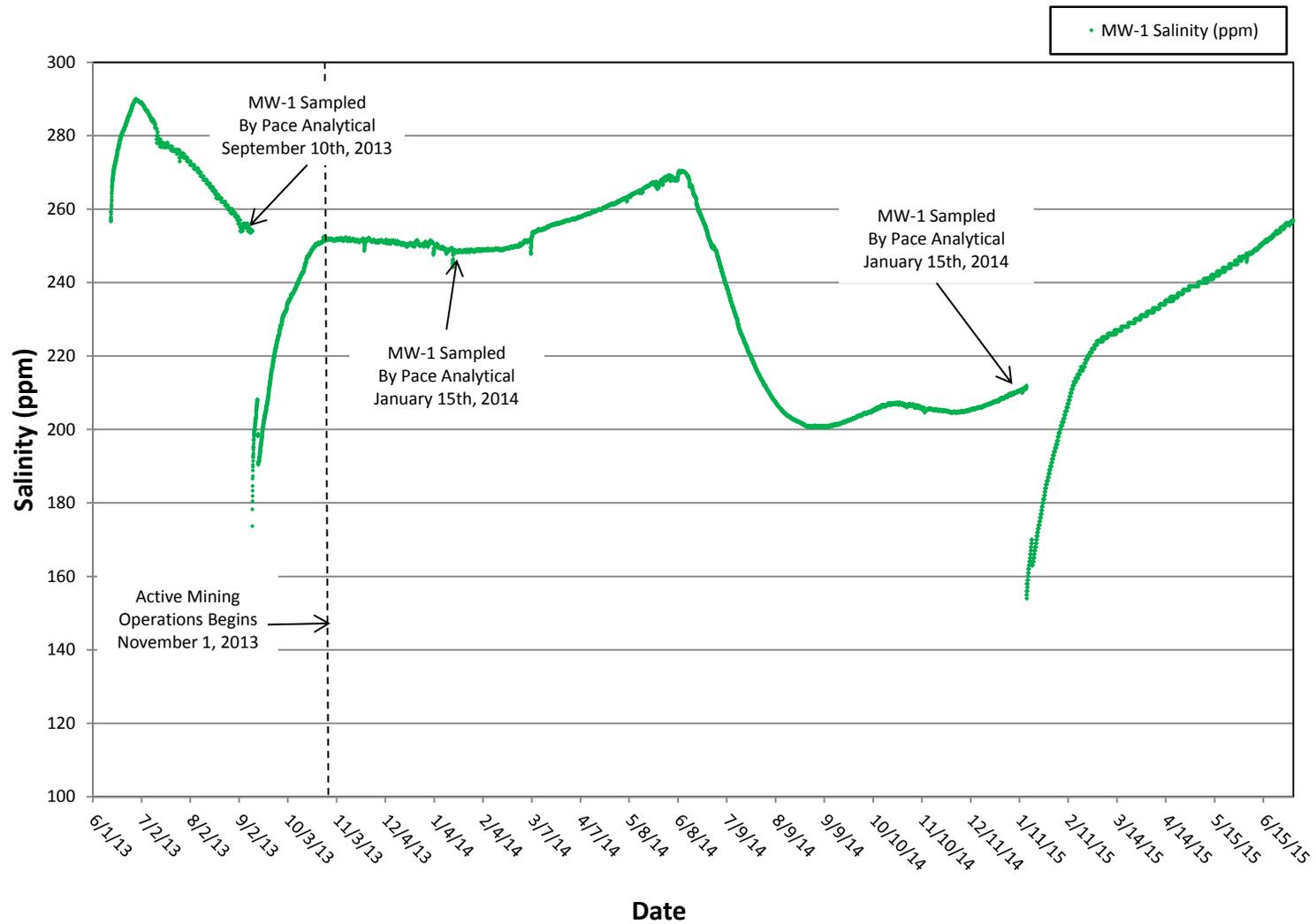
Zavoral Mining and Reclamation Project Scandia, MN



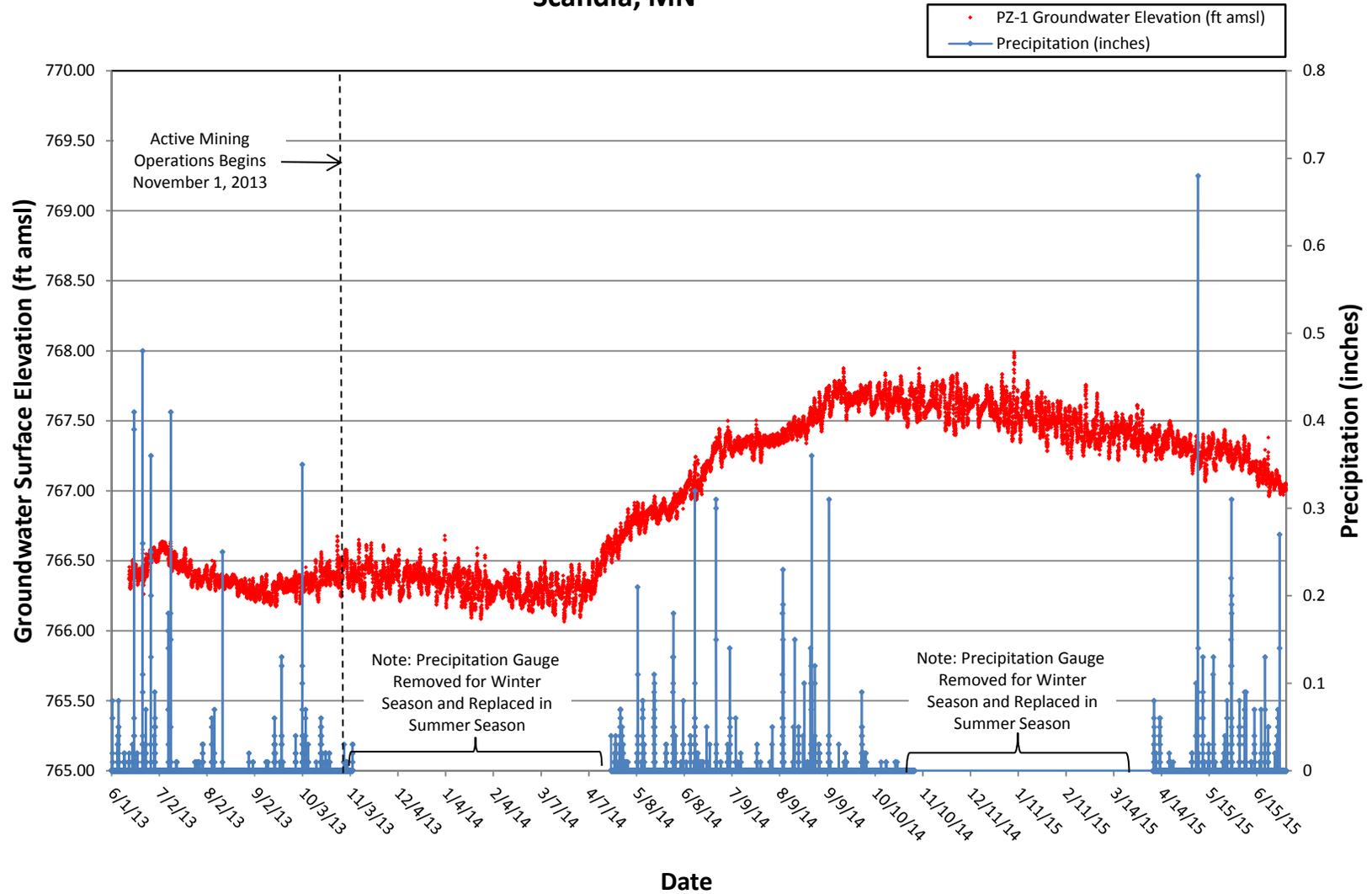
MW-1
Total Dissolved Solids vs. Time
Zavoral Mining and Reclamation Project
Scandia, MN



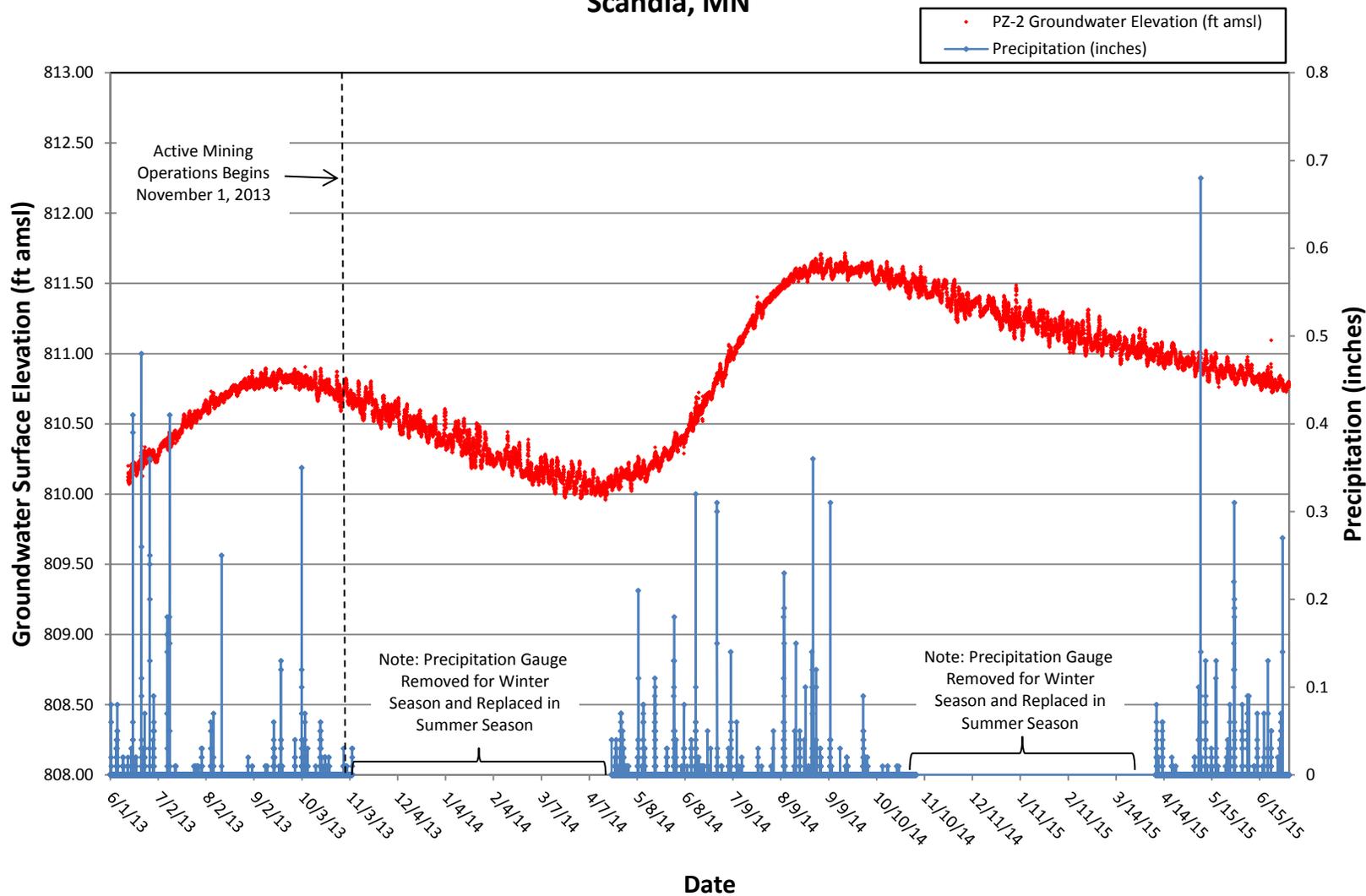
MW-1 Salinity vs. Time Zavoral Mining and Reclamation Project Scandia, MN



PZ-1
Groundwater Surface Elevation and Precipitation vs. Time
Zavoral Mining and Reclamation Project
Scandia, MN



PZ-2
Groundwater Surface Elevation and Precipitation vs. Time
Zavoral Mining and Reclamation Project
Scandia, MN



Trails End Groundwater Surface Elevation and Precipitation vs. Time Zavoral Mining and Reclamation Project Scandia, MN

