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

November 20, 2007

PAT HIGGINS
BURNS & MCDONNELL
9400 WARD PARKWAY
Kansas City, MO 64114

RE: Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

Dear PAT HIGGINS:
Enclosed are the analytical results for sample(s) received by the laboratory on November 12, 2007. The results relate only to the samples included in this report. 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,

Angie Brown

Angie.Brown@pacelabs.com
Project Manager

A2LA Certification Number: 2456.01
Arkansas Certification Number: 05-008-0
Illinois Certification Number: 001191
Iowa Certification Number: 118
Kansas/NELAP Certification Number: E-10116
Louisiana Certification Number: 03055
Oklahoma Certification Number: 9205/9935
Utah Certification Number: 9135995665

Enclosures

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SAMPLE SUMMARY

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

Lab ID	Sample ID	Matrix	Date Collected	Date Received
6031376001	**TW-01 END**	Water	11/11/07 07:15	11/12/07 09:55

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SAMPLE ANALYTE COUNT

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

Lab ID	Sample ID	Method	Analytes Reported
6031376001	**TW-01 END**	EPA 120.1	1
		EPA 180.1	1
		EPA 300.0	4
		EPA 6010	1
		EPA 6010	8
		SM 2320B	3
		SM 2540C	1
		SM 2540D	1
		SM 4500-H+B	1
		SM 5210B	1
		SM 5310C	1

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ANALYTICAL RESULTS

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

Sample: TW-01 END **Lab ID: 6031376001** Collected: 11/11/07 07:15 Received: 11/12/07 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Barium	**1240**	ug/L	10.0	1	11/13/07 00:00	11/13/07 14:49	7440-39-3	
Calcium	**150000**	ug/L	100	1	11/13/07 00:00	11/13/07 14:49	7440-70-2	
Iron	**12800**	ug/L	50.0	1	11/13/07 00:00	11/13/07 14:49	7439-89-6	
Magnesium	**35600**	ug/L	50.0	1	11/13/07 00:00	11/13/07 14:49	7439-95-4	
Manganese	**1320**	ug/L	5.0	1	11/13/07 00:00	11/13/07 14:49	7439-96-5	
Potassium	**4560**	ug/L	500	1	11/13/07 00:00	11/13/07 14:49	7440-09-7	
Sodium	**13000**	ug/L	500	1	11/13/07 00:00	11/13/07 14:49	7440-23-5	
Strontium	**834**	ug/L	10.0	1	11/13/07 00:00	11/15/07 16:25	7440-24-6	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	ND	ug/L	50.0	1	11/16/07 00:00	11/19/07 10:46	7439-89-6	
120.1 Specific Conductance	Analytical Method: EPA 120.1							
Specific Conductance	**923**	umhos/cm	1.0	1		11/13/07 00:00		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	**184**	NTU	5.0	1		11/12/07 16:15		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity,Bicarbonate (CaCO3)	**614**	mg/L	20.0	1		11/14/07 17:26		
Alkalinity, Carbonate (CaCO)	ND	mg/L	20.0	1		11/14/07 17:26		
Alkalinity, Total	**614**	mg/L	20.0	1		11/14/07 17:26		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**584**	mg/L	5.0	1		11/15/07 15:33		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**30.0**	mg/L	5.0	1		11/15/07 14:09		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.0**	Std. Units	0.10	1		11/12/07 16:00		H6
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	11/12/07 16:34	11/17/07 16:06		
300.0 IC Anions	Analytical Method: EPA 300.0							
Nitrate as N	ND	mg/L	1.0	1		11/12/07 15:33	14797-55-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**3.5**	mg/L	1.0	1		11/14/07 23:53	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	1		11/14/07 23:53	16984-48-8	
Sulfate	**9.0**	mg/L	1.0	1		11/14/07 23:53	14808-79-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**2.7**	mg/L	1.0	1		11/14/07 00:00	7440-44-0	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WETA/5780
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031376001

METHOD BLANK: 252989
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Nitrate as N	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 252990

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrate as N	mg/L	5	4.6	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 252992 252993

Parameter	Units	6031376001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrate as N	mg/L	ND	5	5	4.6	4.5	83	83	61-128	0	7	

SAMPLE DUPLICATE: 252991

Parameter	Units	6031376001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrate as N	mg/L	ND	.4J	2	11	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/9945
QC Batch Method: EPA 180.1
Analysis Method: EPA 180.1
Analysis Description: 180.1 Turbidity
Associated Lab Samples: 6031376001

METHOD BLANK: 253065
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Turbidity	NTU	ND	1.0	

LABORATORY CONTROL SAMPLE: 253066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	10	10.1	101	80-120	

SAMPLE DUPLICATE: 253067

Parameter	Units	6031376001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	184	184	1	10	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/9946
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 6031376001

SAMPLE DUPLICATE: 253068

Parameter	Units	6031376001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	5	H6

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/9947
QC Batch Method: SM 5210B
Analysis Method: SM 5210B
Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 6031376001

METHOD BLANK: 253069
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
BOD, 5 day	mg/L	ND	2.0	

LABORATORY CONTROL SAMPLE: 253070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	182	92	85-115	

SAMPLE DUPLICATE: 253071

Parameter	Units	6031376001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	ND	ND	33	17	D7

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WETA/5781
QC Batch Method: SM 5310C
Analysis Method: SM 5310C
Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 6031376001

METHOD BLANK: 253186
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 253187

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	5.2	104	79-126	

MATRIX SPIKE SAMPLE: 253188

Parameter	Units	6031330001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	2.6	10	12.8	102	42-141	

SAMPLE DUPLICATE: 253189

Parameter	Units	6031330002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	3.1	2.9	8	21	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: MPRP/5114
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 6031376001

METHOD BLANK: 253208
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Barium	ug/L	ND	10.0	
Calcium	ug/L	ND	100	
Iron	ug/L	ND	50.0	
Magnesium	ug/L	ND	50.0	
Manganese	ug/L	ND	5.0	
Potassium	ug/L	ND	500	
Sodium	ug/L	ND	500	
Strontium	ug/L	ND	10.0	

LABORATORY CONTROL SAMPLE: 253209

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	964	96	80-120	
Calcium	ug/L	10000	10800	108	80-120	
Iron	ug/L	10000	10100	101	80-120	
Magnesium	ug/L	10000	9540	95	80-120	
Manganese	ug/L	1000	1010	101	80-120	
Potassium	ug/L	10000	9620	96	80-120	
Sodium	ug/L	10000	9300	93	80-120	
Strontium	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 253210 253211

Parameter	Units	6031264001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	43.1	1000	1000	995	1000	95	96	75-125	1	7	
Calcium	ug/L	85700	10000	10000	95500	96000	97	102	75-125	1	8	
Iron	ug/L	18.6J	10000	10000	10000	10100	100	101	75-125	1	12	
Magnesium	ug/L	11900	10000	10000	21300	21500	94	95	75-125	1	7	
Manganese	ug/L	0.80J	1000	1000	1010	1020	101	102	75-125	1	9	
Potassium	ug/L	15800	10000	10000	25900	26000	101	102	75-125	0	7	
Sodium	ug/L	10000000	10000	10000	53800	54100	-99462	-99459	75-125	1	12	M0
Strontium	ug/L	892	1000	1000	1920	1880	103	99	75-125	2	11	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/9953 Analysis Method: EPA 120.1
QC Batch Method: EPA 120.1 Analysis Description: 120.1 Specific Conductance
Associated Lab Samples: 6031376001

METHOD BLANK: 253212
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	

SAMPLE DUPLICATE: 253213

Parameter	Units	6031085002 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	2000	2000	0	5	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/9962
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Associated Lab Samples: 6031376001

METHOD BLANK: 253424
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	20.0	
Alkalinity, Total	mg/L	ND	20.0	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	20.0	

LABORATORY CONTROL SAMPLE: 253425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total	mg/L	500	516	103	90-110	

SAMPLE DUPLICATE: 253426

Parameter	Units	6031085003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	ND	0	6	
Alkalinity, Total	mg/L	697	716	3	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	697	716	3	6	

SAMPLE DUPLICATE: 253427

Parameter	Units	6031192001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	53.5	53.1	1	6	
Alkalinity, Total	mg/L	68.6	70.3	2	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	17.2J	12	6	D7

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WETA/5791
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031376001

METHOD BLANK: 253624
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Chloride	mg/L	ND	1.0	
Fluoride	mg/L	ND	0.20	
Sulfate	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 253625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	5	5.0	100	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 253626 253627

Parameter	Units	6031374018 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	184	50	50	200	201	33	35	57-123	1	6	M0
Fluoride	mg/L	ND	50	50	51.5	51.7	101	101	80-120	0	10	
Sulfate	mg/L	54.0	50	50	93.0	92.1	78	76	60-133	1	12	

SAMPLE DUPLICATE: 253628

Parameter	Units	6031376001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.5	3.6	2	14	
Fluoride	mg/L	0.25	0.26	7	13	
Sulfate	mg/L	9.0	8.8	2	11	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/9991
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 6031376001

METHOD BLANK: 254221
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 254222

Parameter	Units	6031376001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	584	577	1	5	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: WET/10001
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 6031376001

METHOD BLANK: 254484
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 254485

Parameter	Units	6031261016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND	0	5	

SAMPLE DUPLICATE: 254486

Parameter	Units	6031337002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	33.0	33.0	0	5	

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QUALITY CONTROL DATA

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

QC Batch: MPRP/5155
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 6031376001

METHOD BLANK: 255416
Associated Lab Samples: 6031376001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iron	ug/L	ND	50.0	

LABORATORY CONTROL SAMPLE: 255417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	9940	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 255418 255419

Parameter	Units	6031330002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	ND	10000	10000	9800	9490	98	95	75-125	3	20	

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QUALIFIERS

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

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.

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

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

ANALYTE QUALIFIERS

D7	The sample and/or duplicate results for this parameter are less than the reporting limit, calculations are based on estimated values and may be statistically unreliable.
H6	Analysis initiated more than 15 minutes after sample collection.
M0	Matrix spike recovery was outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN 46691-CALLAWAY
Pace Project No.: 6031376

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
6031376001	**TW-01 END**	EPA 300.0	WETA/5780		
6031376001	**TW-01 END**	EPA 180.1	WET/9945		
6031376001	**TW-01 END**	SM 4500-H+B	WET/9946		
6031376001	**TW-01 END**	SM 5210B	WET/9947	SM 5210B	WET/9950
6031376001	**TW-01 END**	SM 5310C	WETA/5781		
6031376001	**TW-01 END**	EPA 3010	MPRP/5114	EPA 6010	ICP/4530
6031376001	**TW-01 END**	EPA 120.1	WET/9953		
6031376001	**TW-01 END**	SM 2320B	WET/9962		
6031376001	**TW-01 END**	EPA 300.0	WETA/5791		
6031376001	**TW-01 END**	SM 2540C	WET/9991		
6031376001	**TW-01 END**	SM 2540D	WET/10001		
6031376001	**TW-01 END**	EPA 3010	MPRP/5155	EPA 6010	ICP/4556

Burns & McDonnell SINCE 1898

021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

6031376

Burns & McDonnell Engineering 9400 Ward Parkway Kansas City, Missouri 64114 Phone: (816) 333-9400 Fax: (816) 822-3494 Attention: Angela Brown	Laboratory: PACE ANALYTICAL Address: 9608 Loiret Blvd. City/State/Zip: Lenexa, KS 66219 Telephone: 913/599-5665
Document Control No:	
Lab. Reference No. or Episode No.:	

Project Number: 46691 - Callaway

Client Name: Ameren

Sample Type — Matrix

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: BOD, Alk, Cond Anions	Analysis: Metals	Analysis: TDS, TSS, Turbidity, pH	Analysis: Iron, dissolved Lab filter	Analysis: TOC	Analysis: Silica	Remarks
	TW-01 End		—	—	—	—	11/11/07	0715	WT			6	X	X	X	X	X	X	001
													1(BP1N)	1(BP2N)	2(BP3N)	1(BP3S)	1(BP3N)		

Sampler (signature): Paul McCormick

Sampler (signature):

Special Instructions:

Relinquished By (signature): 1.	Date/Time	Received By (signature): P. Williams	Date/Time 0725 11-12	Ice Present in Container: Yes [X] No [ ]	Temperature Upon Receipt: 3±2 °C
Relinquished By (signature): 2. Mike Poole	Date/Time	Received By (signature):	Date/Time 11/12/07 0955	Laboratory Comments:	

Sample Condition Upon Receipt

Pace Analytical

Client Name: Burns + McDonnell Project # 6031376

Optional
Proj. Due Date: 11/19
Proj. Name: 46691 - Gilaway

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

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

Thermometer Used T-168 **Type of Ice:** ~~Wet~~ Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 3.2 °C **Biological Tissue is Frozen:** ~~Yes~~ ~~No~~

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: JMD 11/8/07

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 Hold Time:	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☒Yes	☐No	☐N/A	6. BOD, pH, TWB
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A	7.
Sufficient Volume:	☒Yes	☐No	☐N/A	8. SO - Silica NO
Correct Containers Used:	☒Yes	☐No	☐N/A	9.
-Pace Containers Used:	☒Yes	☐No	☐N/A	
Containers Intact:	☒Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A	11.
Sample Labels match COC:	☒Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: water				
All containers needing preservation have been checked.	☒Yes	☐No	☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes	☐No	☒N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☒Yes	☐No		Initial when completed JMS Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A	15.
Trip Blank Present:	☐Yes	☐No	☒N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased): N/A				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: PAT Higgins Date/Time: 11/14/07 10:09

Comments/ Resolution:

11/14/07 EXPLAINED TO PAT WE DID NOT RECOGNIZE AMMO-P AS ANION REQUIREMENT UNTIL PAST 48 HOUR HOLD TIME. PAT SAID ROUND 1 + 2 OF THIS SIGHT SHOULD HAVE SUFFICIENT INFO ON AMMO-P AND TO NOT ANALYZE OUTSIDE OF HOLD TIME. MS

Project Manager Review: 11/13/07 **Date:** _____

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)

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

November 16, 2007

Client Services
Pace Kansas
9608 Loiret Boulevard
Lenexa, KS 66219

RE: Project: 2076003
RE: Project ID: 6031376

Dear Client Services:

Enclosed are the analytical results for sample(s) received by the laboratory on November 12, 2007. 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,

Karen Brown

ACCREDITED IN ACCORDANCE WITH nelac

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
New Orleans Laboratory

Sample Cross Reference

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076003

Client: PASI Kansas

Project ID: 6031376

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
TW-01 END	60313760	Water	11/11/07 07:15	11/12/07 09:55

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New Orleans Laboratory

Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076003

Sample Receipt Condition:

All samples were received in accordance with EPA protocol.

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

All MS/MSD recoveries or duplicate RPDs were within QC limits.

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Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076003

Analytical Method	Batch	Sample used for QC
SM 4500-Si C	94226	Project sample TW-01 END

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from the a different client was used.

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Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client: PASI Kansas

Client ID: TW-01 END
Project: 2076003
Project ID: 6031376
Site: None
Lab ID: 6031376001
Matrix: Water
%Moisture: n/a
Description: None
Collected: 11/11/07
Received: 11/12/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Silica	SM 4500-Si	94226	5	D1	30.7	mg/L	5.00	15-Nov-07	15-Nov-07 13:22	TAE	

1 parameter(s) reported

11/16/2007 10:40:59

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Pace Analytical®
New Orleans Laboratory

Inorganics Quality Control

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076003

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Silica	94226	ND	1.00	mg/L	10	10.76	108	10	30.71	38.68		80			2	90 - 110	75 - 125	20	DI

* denotes recovery outside of QC limits.
ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

11/16/2007 10:41:01

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Pace Analytical®
New Orleans Laboratory

Qualifier Summary

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076003

Qualifier	Qualifier Description
D1	The analysis was performed at a dilution due to the high analyte concentration.

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

November 26, 2007

PAT HIGGINS
BURNS & MCDONNELL
9400 WARD PARKWAY
Kansas City, MO 64114

RE: Project: CALLAWAY 46691
Pace Project No.: 6031558

Dear PAT HIGGINS:
Enclosed are the analytical results for sample(s) received by the laboratory on November 15, 2007. The results relate only to the samples included in this report. 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,

Angie Brown

Angie.Brown@pacelabs.com
Project Manager

A2LA Certification Number: 2456.01
Arkansas Certification Number: 05-008-0
Illinois Certification Number: 001191
Iowa Certification Number: 118
Kansas/NELAP Certification Number: E-10116
Louisiana Certification Number: 03055
Oklahoma Certification Number: 9205/9935
Utah Certification Number: 9135995665

Enclosures

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

SAMPLE SUMMARY

Project: CALLAWAY 46691
Pace Project No.: 6031558

Lab ID	Sample ID	Matrix	Date Collected	Date Received
6031558001	**TW-02**	Water	11/14/07 10:30	11/15/07 14:25

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SAMPLE ANALYTE COUNT

Project: CALLAWAY 46691
Pace Project No.: 6031558

Lab ID	Sample ID	Method	Analytes Reported
6031558001	TW-02	EPA 120.1	1
		EPA 180.1	1
		EPA 300.0	4
		EPA 6010	1
		EPA 6010	8
		SM 2320B	3
		SM 2540C	1
		SM 2540D	1
		SM 5210B	1
		SM 5310C	1

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ANALYTICAL RESULTS

Project: CALLAWAY 46691
Pace Project No.: 6031558

Sample: TW-02 **Lab ID: 6031558001** Collected: 11/14/07 10:30 Received: 11/15/07 14:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Barium	**831**	ug/L	10.0	1	11/16/07 00:00	11/19/07 10:07	7440-39-3	
Calcium	**101000**	ug/L	100	1	11/16/07 00:00	11/19/07 10:07	7440-70-2	
Iron	**3850**	ug/L	50.0	1	11/16/07 00:00	11/19/07 10:07	7439-89-6	
Magnesium	**25500**	ug/L	50.0	1	11/16/07 00:00	11/19/07 13:13	7439-95-4	
Manganese	**244**	ug/L	5.0	1	11/16/07 00:00	11/19/07 10:07	7439-96-5	
Potassium	**3410**	ug/L	500	1	11/16/07 00:00	11/19/07 10:07	7440-09-7	
Sodium	**15300**	ug/L	500	1	11/16/07 00:00	11/19/07 10:07	7440-23-5	
Strontium	**557**	ug/L	10.0	1	11/16/07 00:00	11/19/07 10:07	7440-24-6	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	ND	ug/L	50.0	1	11/20/07 00:00	11/26/07 14:38	7439-89-6	
120.1 Specific Conductance	Analytical Method: EPA 120.1							
Specific Conductance	**685**	umhos/cm	1.0	1		11/19/07 00:00		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	**37.6**	NTU	5.0	1		11/16/07 09:30		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity,Bicarbonate (CaCO3)	**342**	mg/L	20.0	1		11/17/07 14:00		
Alkalinity, Carbonate (CaCO)	ND	mg/L	20.0	1		11/17/07 14:00		
Alkalinity, Total	**342**	mg/L	20.0	1		11/17/07 14:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**453**	mg/L	5.0	1		11/19/07 15:05		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**13.0**	mg/L	5.0	1		11/19/07 11:46		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	11/15/07 17:23	11/20/07 13:33		
300.0 IC Anions	Analytical Method: EPA 300.0							
Nitrate as N	ND	mg/L	1.0	1		11/16/07 03:57	14797-55-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**7.7**	mg/L	1.0	1		11/19/07 23:50	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	1		11/19/07 23:50	16984-48-8	
Sulfate	**32.7**	mg/L	1.0	1		11/19/07 23:50	14808-79-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.7**	mg/L	1.0	1		11/20/07 00:00	7440-44-0	

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QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WETA/5797
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031558001

METHOD BLANK: 254230
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Nitrate as N	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 254231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrate as N	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 254232 254233

Parameter	Units	6031510003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrate as N	mg/L	4.1	5	5	8.6	8.6	90	89	61-128	0	7	

SAMPLE DUPLICATE: 254234

Parameter	Units	6031512001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrate as N	mg/L	3.6	3.6	1	11	

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QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WET/10006
QC Batch Method: SM 5210B
Analysis Method: SM 5210B
Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 6031558001

METHOD BLANK: 254675
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
BOD, 5 day	mg/L	ND	2.0	

LABORATORY CONTROL SAMPLE: 254676

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	213	108	85-115	

SAMPLE DUPLICATE: 254677

Parameter	Units	6031548003 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	4.2	5.0	17	17	

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QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WET/10009
QC Batch Method: EPA 180.1
Analysis Method: EPA 180.1
Analysis Description: 180.1 Turbidity
Associated Lab Samples: 6031558001

METHOD BLANK: 254846
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Turbidity	NTU	ND	1.0	

LABORATORY CONTROL SAMPLE: 254847

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	10	10.3	103	80-120	

SAMPLE DUPLICATE: 254848

Parameter	Units	6031558001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	37.6	37.6	0	10	

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QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: MPRP/5144
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 6031558001

METHOD BLANK: 254866
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Barium	ug/L	ND	10.0	
Calcium	ug/L	ND	100	
Iron	ug/L	ND	50.0	
Magnesium	ug/L	ND	50.0	
Manganese	ug/L	ND	5.0	
Potassium	ug/L	ND	500	
Sodium	ug/L	ND	500	
Strontium	ug/L	ND	10.0	

LABORATORY CONTROL SAMPLE: 254867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	978	98	80-120	
Calcium	ug/L	10000	10000	100	80-120	
Iron	ug/L	10000	9960	100	80-120	
Magnesium	ug/L	10000	10200	102	80-120	
Manganese	ug/L	1000	1020	102	80-120	
Potassium	ug/L	10000	9470	95	80-120	
Sodium	ug/L	10000	9640	96	80-120	
Strontium	ug/L	1000	970	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 254868 254869

Parameter	Units	6031561001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	0.062 mg/L	1000	1000	979	1020	92	96	75-125	4	7	
Calcium	ug/L	31.1 mg/L	10000	10000	40600	42000	96	109	75-125	3	8	
Iron	ug/L	2.1 mg/L	10000	10000	10600	11100	85	90	75-125	4	12	
Magnesium	ug/L	10.2 mg/L	10000	10000	19400	20400	93	103	75-125	5	7	
Manganese	ug/L	0.019 mg/L	1000	1000	984	1030	96	101	75-125	4	9	
Potassium	ug/L	9.1 mg/L	10000	10000	18400	19300	93	101	75-125	4	7	
Sodium	ug/L	67.9 mg/L	10000	10000	76100	78900	81	110	75-125	4	12	
Strontium	ug/L	0.21 mg/L	1000	1000	1160	1200	95	99	75-125	4	11	

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(913)599-5665

QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WET/10021
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Associated Lab Samples: 6031558001

METHOD BLANK: 255085
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	20.0	
Alkalinity, Total	mg/L	ND	20.0	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	20.0	

LABORATORY CONTROL SAMPLE: 255086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total	mg/L	500	464	93	90-110	

SAMPLE DUPLICATE: 255087

Parameter	Units	6031261007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	ND	0	6	
Alkalinity, Total	mg/L	291	291	0	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	291	291	0	6	

SAMPLE DUPLICATE: 256169

Parameter	Units	6031558001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	ND	0	6	
Alkalinity, Total	mg/L	342	348	2	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	342	348	2	6	

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(913)599-5665

QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WET/10038
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solid s
Associated Lab Samples: 6031558001

METHOD BLANK: 256020
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 256021

Parameter	Units	6031530001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	116	106	9	5	R1

SAMPLE DUPLICATE: 256022

Parameter	Units	6031487003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	400	400	0	5	

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QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WETA/5816
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031558001

METHOD BLANK: 256056
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Chloride	mg/L	ND	1.0	
Fluoride	mg/L	ND	0.20	
Sulfate	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 256057

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	91	90-110	
Fluoride	mg/L	5	5.1	101	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 256059 256060

Parameter	Units	6031260006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	140	250	250	387	389	99	100	57-123	1	6	
Fluoride	mg/L	ND	250	250	281	283	112	113	80-120	1	10	
Sulfate	mg/L	1730	250	250	1950	1980	91	100	60-133	1	12	

SAMPLE DUPLICATE: 256058

Parameter	Units	6031261001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	112	110	1	14	
Fluoride	mg/L	0.67	0.65	2	13	
Sulfate	mg/L	52.6	52.7	0	11	

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(913)599-5665

QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WET/10042
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 6031558001

METHOD BLANK: 256070
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 256191

Parameter	Units	6031558001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	453	457	1	5	

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WET/10046
QC Batch Method: EPA 120.1
Analysis Method: EPA 120.1
Analysis Description: 120.1 Specific Conductance
Associated Lab Samples: 6031558001

METHOD BLANK: 256157
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	

SAMPLE DUPLICATE: 256159

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	616	617	0	5	

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: WETA/5824
QC Batch Method: SM 5310C
Analysis Method: SM 5310C
Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 6031558001

METHOD BLANK: 256545
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 256546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	6.2	125	79-126	

MATRIX SPIKE SAMPLE: 256548

Parameter	Units	6031651001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	15.2	25	55.8	162	42-141	M1

SAMPLE DUPLICATE: 256547

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	1.9	1.8	7	21	

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9608 Loiret Blvd.
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QUALITY CONTROL DATA

Project: CALLAWAY 46691
Pace Project No.: 6031558

QC Batch: MPRP/5175
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 6031558001

METHOD BLANK: 256791
Associated Lab Samples: 6031558001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iron	ug/L	ND	50.0	

LABORATORY CONTROL SAMPLE: 256792

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	10400	104	80-120	

MATRIX SPIKE SAMPLE: 256793

Parameter	Units	6031610003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L		10000	10100	100	75-125	

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QUALIFIERS

Project: CALLAWAY 46691
Pace Project No.: 6031558

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.

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

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

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CALLAWAY 46691
Pace Project No.: 6031558

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
6031558001	**TW-02**	EPA 300.0	WETA/5797		
6031558001	**TW-02**	SM 5210B	WET/10006	SM 5210B	WET/10008
6031558001	**TW-02**	EPA 180.1	WET/10009		
6031558001	**TW-02**	EPA 3010	MPRP/5144	EPA 6010	ICP/4551
6031558001	**TW-02**	SM 2320B	WET/10021		
6031558001	**TW-02**	SM 2540D	WET/10038		
6031558001	**TW-02**	EPA 300.0	WETA/5816		
6031558001	**TW-02**	SM 2540C	WET/10042		
6031558001	**TW-02**	EPA 120.1	WET/10046		
6031558001	**TW-02**	SM 5310C	WETA/5824		
6031558001	**TW-02**	EPA 3010	MPRP/5175	EPA 6010	ICP/4576

Burns & McDonnell SINCE 1898

021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention:

Laboratory: PACE ANALYTICAL
Address: 9608 Loiret Blvd.
City/State/Zip: Lenexa, KS 66219
Telephone: 913/563-1402

Document Control No: 6003158
Lab. Reference No. or Episode No.:

Project Number: 46691

Client Name: Calloway

Sample Type: Matrix

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: BOD, Alk, Cond, Anions	Analysis: Metals	Analysis: TDS, TSS, Turbidity, pH	Analysis: Iron, dissolved (lab filter)	Analysis: TOC	Analysis: Silica	Remarks
	TW-02		—		—		11/14/07	1030	WT			6	X	X	X	X	X	X	BP1U BP2U 2(BP3U) BP3S[1.5] BP3N[1.5]

Sampler (signature): Paul McDermick

Sampler (signature):

Special Instructions:

Relinquished By (signature):	Date/Time	Received By (signature):	Date/Time	Ice Present in Container: Yes [✓] No [ ]	Temperature Upon Receipt:
1.	11/15/07 0830		11/15/07 1425		2.2°C
Relinquished By (signature): 2.	Date/Time	Received By (signature):	Date/Time	Laboratory Comments:	

Sample Condition Upon Receipt

Pace Analytical

Client Name: BURNS & MCD Project # 6031550

Optional
Proj. Due Date: 11/29
Proj. Name: Callaway 46691

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals Intact: ☐ yes ☒ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☑ Other ZIPLOC

Thermometer Used 168 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 2.2 **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: BW 11/15

		Comments:
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 Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☒Yes ☐No ☐N/A	6. TURB BOD pH
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☒No ☐N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution:

11/16 - MISSED MS/MSD FOR OPHO-P.

Project Manager Review: Cmh for AKB **Date:** 11/16/07

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)

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

November 21, 2007

Client Services
Pace Kansas
9608 Loiret Boulevard
Lenexa, KS 66219

RE: Project: 2076197
RE: Project ID: 6031558

Dear Client Services:

Enclosed are the analytical results for sample(s) received by the laboratory on November 15, 2007. 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,

Karen Brown

ACCREDITED IN ACCORDANCE WITH nelac

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
New Orleans Laboratory

Sample Cross Reference

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076197

Client: PASI Kansas

Project ID: 6031558

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
TW-02	60315580	Water	11/14/07 10:30	11/15/07 14:25

Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076197

Sample Receipt Condition:

All samples were received in accordance with EPA protocol.

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

MS or MSD recoveries outside of QC limits are qualified in the Report of Quality Control section.

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Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076197

Analytical Method	Batch	Sample used for QC
SM 4500-Si C	94446	Client sample MW-5S from project 2076200

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from the a different client was used.

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Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client: PASI Kansas

Client ID: TW-02
Project ID: 6031558
Lab ID: 6031558001
Description: None

Project: 2076197
Site: None
Matrix: Water
%Moisture: n/a
Collected: 11/14/07
Received: 11/15/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Silica	SM 4500-Si	94446	5	D1	27.9	mg/L	5.00	20-Nov-07	20-Nov-07 17:21	TAE	

1 parameter(s) reported

11/21/2007 17:04:12

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

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New Orleans Laboratory

Inorganics Quality Control

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076197

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Silica	94446	ND	1.00	mg/L				10	11.75	17.37		56 *				-	75 - 125		Q1
Silica	94446			mg/L	10	10.91	109		11.75						1	90 - 110	-	20	

* denotes recovery outside of QC limits.
ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

11/21/2007 17:04:15

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Pace Analytical®
New Orleans Laboratory

Qualifier Summary

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076197

Qualifier	Qualifier Description
D1	The analysis was performed at a dilution due to the high analyte concentration.
Q1	The matrix spike recoveries are poor. Acceptable method performance for this analyte has been demonstrated by the laboratory control sample recovery.

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

November 27, 2007

PAT HIGGINS
BURNS & MCDONNELL
9400 WARD PARKWAY
Kansas City, MO 64114

RE: Project: AMEREN
Pace Project No.: 6031634

Dear PAT HIGGINS:
Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2007. The results relate only to the samples included in this report. 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,

Angie Brown

Angie.Brown@pacelabs.com
Project Manager

A2LA Certification Number: 2456.01
Arkansas Certification Number: 05-008-0
Illinois Certification Number: 001191
Iowa Certification Number: 118
Kansas/NELAP Certification Number: E-10116
Louisiana Certification Number: 03055
Oklahoma Certification Number: 9205/9935
Utah Certification Number: 9135995665

Enclosures

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

SAMPLE SUMMARY

Project: AMEREN
Pace Project No.: 6031634

Lab ID	Sample ID	Matrix	Date Collected	Date Received
6031634001	**TW02-MID**	Water	11/15/07 15:10	11/16/07 09:25

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SAMPLE ANALYTE COUNT

Project: AMEREN
Pace Project No.: 6031634

Lab ID	Sample ID	Method	Analytes Reported
6031634001	**TW02-MID**	EPA 120.1	1
		EPA 180.1	1
		EPA 300.0	4
		EPA 365.1	1
		EPA 6010	1
		EPA 6010	8
		SM 2320B	3
		SM 2540C	1
		SM 2540D	1
		SM 4500-H+B	1
		SM 5210B	1
		SM 5310C	1

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ANALYTICAL RESULTS

Project: AMEREN
Pace Project No.: 6031634

Sample: TW02-MID **Lab ID: 6031634001** Collected: 11/15/07 15:10 Received: 11/16/07 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Barium	**870**	ug/L	10.0	1	11/19/07 00:00	11/26/07 17:03	7440-39-3	
Calcium	**115000**	ug/L	100	1	11/19/07 00:00	11/26/07 17:03	7440-70-2	
Iron	**6970**	ug/L	50.0	1	11/19/07 00:00	11/26/07 17:03	7439-89-6	
Magnesium	**26200**	ug/L	50.0	1	11/19/07 00:00	11/27/07 12:09	7439-95-4	
Manganese	**272**	ug/L	5.0	1	11/19/07 00:00	11/26/07 17:03	7439-96-5	
Potassium	**3390**	ug/L	500	1	11/19/07 00:00	11/26/07 17:03	7440-09-7	
Sodium	**7140**	ug/L	500	1	11/19/07 00:00	11/26/07 17:03	7440-23-5	
Strontium	**587**	ug/L	10.0	1	11/19/07 00:00	11/26/07 17:03	7440-24-6	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	ND	ug/L	50.0	1	11/20/07 00:00	11/26/07 14:51	7439-89-6	
120.1 Specific Conductance	Analytical Method: EPA 120.1							
Specific Conductance	**616**	umhos/cm	1.0	1		11/19/07 00:00		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	**82.6**	NTU	5.0	1		11/16/07 16:15		
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity,Bicarbonate (CaCO3)	**383**	mg/L	20.0	1		11/20/07 15:59		
Alkalinity, Carbonate (CaCO)	ND	mg/L	20.0	1		11/20/07 15:59		
Alkalinity, Total	**383**	mg/L	20.0	1		11/20/07 15:59		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**421**	mg/L	5.0	1		11/20/07 15:41		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**9.0**	mg/L	5.0	1		11/20/07 11:35		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		11/16/07 15:00		H6
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	11/16/07 17:26	11/21/07 14:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Nitrate as N	ND	mg/L	1.0	1		11/16/07 19:47	14797-55-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**6.6**	mg/L	1.0	1		11/20/07 00:16	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	1		11/20/07 00:16	16984-48-8	
Sulfate	**26.2**	mg/L	1.0	1		11/20/07 00:16	14808-79-8	
365.1 Phosphate, Ortho as P	Analytical Method: EPA 365.1							
Orthophosphate as P	ND	mg/L	0.10	1		11/16/07 14:13		

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ANALYTICAL RESULTS

Project: AMEREN
Pace Project No.: 6031634

Sample: TW02-MID **Lab ID: 6031634001** Collected: 11/15/07 15:10 Received: 11/16/07 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.9**	mg/L	1.0	1		11/20/07 00:00	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WETA/5808
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031634001

METHOD BLANK: 254964
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Nitrate as N	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 254965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrate as N	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 254966 254967

Parameter	Units	6031600002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrate as N	mg/L	23.5	25	25	44.1	43.9	83	82	61-128	1	7	

SAMPLE DUPLICATE: 254968

Parameter	Units	6031604002 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrate as N	mg/L	3.5	3.5	0	11	

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WETA/5813
QC Batch Method: EPA 365.1
Analysis Method: EPA 365.1
Analysis Description: 365.1 Phosphorus, Ortho
Associated Lab Samples: 6031634001

METHOD BLANK: 255059
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Orthophosphate as P	mg/L	ND	0.10	

LABORATORY CONTROL SAMPLE: 255060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	2	1.9	93	90-110	

MATRIX SPIKE SAMPLE: 255061

Parameter	Units	6031613005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	ND	2	1.9	96	90-110	

SAMPLE DUPLICATE: 255062

Parameter	Units	6031613001 Result	Dup Result	RPD	Max RPD	Qualifiers
Orthophosphate as P	mg/L	ND	ND	0	20	

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10025
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 6031634001

SAMPLE DUPLICATE: 255176

Parameter	Units	6031615001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.2	8.2	0	5	H6

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10030
QC Batch Method: EPA 180.1
Analysis Method: EPA 180.1
Analysis Description: 180.1 Turbidity
Associated Lab Samples: 6031634001

METHOD BLANK: 255380
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Turbidity	NTU	ND	1.0	

LABORATORY CONTROL SAMPLE: 255381

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	10	10	100	80-120	

SAMPLE DUPLICATE: 255382

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	82.6	83.4	1	10	

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

QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10031
QC Batch Method: SM 5210B
Analysis Method: SM 5210B
Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 6031634001

METHOD BLANK: 255384
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
BOD, 5 day	mg/L	ND	2.0	

LABORATORY CONTROL SAMPLE: 255385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	191	97	85-115	

SAMPLE DUPLICATE: 255386

Parameter	Units	6031632001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	1180	1240	5	17	

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10035
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Associated Lab Samples: 6031634001

METHOD BLANK: 255959
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	20.0	
Alkalinity, Total	mg/L	ND	20.0	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	20.0	

LABORATORY CONTROL SAMPLE: 255960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total	mg/L	500	503	101	90-110	

SAMPLE DUPLICATE: 255962

Parameter	Units	6031630004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	12.9J	2	6	
Alkalinity, Total	mg/L	468	476	2	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	456	464	2	6	

SAMPLE DUPLICATE: 256855

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	ND	0	6	
Alkalinity, Total	mg/L	383	387	1	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	383	387	1	6	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WETA/5816
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031634001

METHOD BLANK: 256056
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Chloride	mg/L	ND	1.0	
Fluoride	mg/L	ND	0.20	
Sulfate	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 256057

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	91	90-110	
Fluoride	mg/L	5	5.1	101	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 256059 256060

Parameter	Units	6031260006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	140	250	250	387	389	99	100	57-123	1	6	
Fluoride	mg/L	ND	250	250	281	283	112	113	80-120	1	10	
Sulfate	mg/L	1730	250	250	1950	1980	91	100	60-133	1	12	

SAMPLE DUPLICATE: 256058

Parameter	Units	6031261001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	112	110	1	14	
Fluoride	mg/L	0.67	0.65	2	13	
Sulfate	mg/L	52.6	52.7	0	11	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: MPRP/5159
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 6031634001

METHOD BLANK: 256083
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Barium	ug/L	ND	10.0	
Calcium	ug/L	ND	100	
Iron	ug/L	ND	50.0	
Magnesium	ug/L	ND	50.0	
Manganese	ug/L	ND	5.0	
Potassium	ug/L	ND	500	
Sodium	ug/L	ND	500	
Strontium	ug/L	ND	10.0	

LABORATORY CONTROL SAMPLE: 256084

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	80-120	
Calcium	ug/L	10000	10900	109	80-120	
Iron	ug/L	10000	10500	105	80-120	
Magnesium	ug/L	10000	10700	107	80-120	
Manganese	ug/L	1000	1060	106	80-120	
Potassium	ug/L	10000	10300	103	80-120	
Sodium	ug/L	10000	10200	102	80-120	
Strontium	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 256085 256086

Parameter	Units	6031612002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	271	1000	1000	1210	1230	94	96	75-125	1	7	
Calcium	ug/L	128000	10000	10000	133000	136000	47	75	75-125	2	8	M0
Iron	ug/L	21000	10000	10000	29700	30200	87	91	75-125	2	12	
Magnesium	ug/L	10200	10000	10000	20100	20100	99	100	75-125	0	7	
Manganese	ug/L	1150	1000	1000	2080	2110	93	95	75-125	1	9	
Potassium	ug/L	3400	10000	10000	13400	13500	100	101	75-125	1	7	
Sodium	ug/L	27800	10000	10000	36400	36700	87	89	75-125	1	12	
Strontium	ug/L	233	1000	1000	1200	1210	96	98	75-125	1	11	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10046
QC Batch Method: EPA 120.1
Analysis Method: EPA 120.1
Analysis Description: 120.1 Specific Conductance
Associated Lab Samples: 6031634001

METHOD BLANK: 256157
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	

SAMPLE DUPLICATE: 256159

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	616	617	0	5	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10053
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 6031634001

METHOD BLANK: 256334
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 256335

Parameter	Units	6031612002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	40.0	40.0	0	5	

SAMPLE DUPLICATE: 256336

Parameter	Units	6031619001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	50.0	50.0	0	5	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WETA/5824
QC Batch Method: SM 5310C
Analysis Method: SM 5310C
Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 6031634001

METHOD BLANK: 256545
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 256546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	6.2	125	79-126	

MATRIX SPIKE SAMPLE: 256548

Parameter	Units	6031651001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	15.2	25	55.8	162	42-141	M1

SAMPLE DUPLICATE: 256547

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	1.9	1.8	7	21	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: WET/10060
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 6031634001

METHOD BLANK: 256744
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 256745

Parameter	Units	6031551001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	988	1000	1	5	

SAMPLE DUPLICATE: 256746

Parameter	Units	6031650001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2760	2780	1	5	

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QUALITY CONTROL DATA

Project: AMEREN
Pace Project No.: 6031634

QC Batch: MPRP/5175
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 6031634001

METHOD BLANK: 256791
Associated Lab Samples: 6031634001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iron	ug/L	ND	50.0	

LABORATORY CONTROL SAMPLE: 256792

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	10400	104	80-120	

MATRIX SPIKE SAMPLE: 256793

Parameter	Units	6031610003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	ND	10000	10100	100	75-125	

SAMPLE DUPLICATE: 256801

Parameter	Units	6031610003 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron	ug/L	ND	ND	63	20	R1

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QUALIFIERS

Project: AMEREN
Pace Project No.: 6031634

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.

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

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

ANALYTE QUALIFIERS

H6	Analysis initiated more than 15 minutes after sample collection.
M0	Matrix spike recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN
Pace Project No.: 6031634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
6031634001	TW02-MID	EPA 300.0	WETA/5808		
6031634001	TW02-MID	EPA 365.1	WETA/5813		
6031634001	TW02-MID	SM 4500-H+B	WET/10025		
6031634001	TW02-MID	EPA 180.1	WET/10030		
6031634001	TW02-MID	SM 5210B	WET/10031	SM 5210B	WET/10032
6031634001	TW02-MID	SM 2320B	WET/10035		
6031634001	TW02-MID	EPA 300.0	WETA/5816		
6031634001	TW02-MID	EPA 3010	MPRP/5159	EPA 6010	ICP/4563
6031634001	TW02-MID	EPA 120.1	WET/10046		
6031634001	TW02-MID	SM 2540D	WET/10053		
6031634001	TW02-MID	SM 5310C	WETA/5824		
6031634001	TW02-MID	SM 2540C	WET/10060		
6031634001	TW02-MID	EPA 3010	MPRP/5175	EPA 6010	ICP/4576

Burns & McDonnell SINCE 1898

021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: Paul McCormick

Laboratory: Pace Analytical Services, Inc.
Address: ~~908~~ 9608 Loiret Blvd.
City/State/Zip: Lenexa, KS 66219
Telephone: (913) 599-5665

Document Control No:

Lab. Reference No. or Episode No.: 6031634

Project Number: 466691

Sample Type GW

Client Name: Ameren

Sample Number			Sample Event		Sample Depth (in feet)		Sample Collected		Matrix			Number of Containers	Analysis						Remarks
Group or SWMU Name	Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas		Metals	BOD, ALK, COND, ANIONS	TDS, TSS, TURBIDITY, pH	TOC	SILICA		
		TW02-MID					11/15/07	~~1500~~ 1510	X				X	X	X	X	X	BP1U BP2U 2(BP3U) BP3N BP3S	001

Sampler (signature): Erin Lepper

Sampler (signature): Erin Lepper EL

Special Instructions:

Relinquished By (signature):	Date/Time	Received By (signature):	Date/Time
1. Erin Lepper	11/15/07 1510		11/16 9:25
Relinquished By (signature): 2.	Date/Time	Received By (signature):	Date/Time

Ice Present in Container: Yes ☑ No ☐

Temperature Upon Receipt: 0.5 °C

Laboratory Comments:

Sample Condition Upon Receipt

2054-1

Pace Analytical

Client Name: BURNS MCD Project # 60316347

Optional
Proj. Due Date: 11/30 11/27/06 @ 11/16
Proj. Name: Amaren 46691

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

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals Intact: ☐ yes ☒ no

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

Thermometer Used 168 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.5 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: BN 11/16

Temp should be above freezing to 6°C

		Comments:
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 Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☒Yes ☐No ☐N/A	6. BOD pH TURB
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7. NO_2/NO_3 + OPHOP
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☒No ☐N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): _____		BN

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** _____

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)

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

November 21, 2007

Client Services
Pace Kansas
9608 Loiret Boulevard
Lenexa, KS 66219

RE: Project: 2076201
RE: Project ID: 6031634

Dear Client Services:

Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2007. 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,

Karen Brown

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
New Orleans Laboratory

Sample Cross Reference

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076201

Client: PASI Kansas

Project ID: 6031634

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
TWO2-MID	60316340	Water	11/15/07 15:10	11/16/07 09:25

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New Orleans Laboratory

Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076201

Sample Receipt Condition:

All samples were received in accordance with EPA protocol.

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

MS or MSD recoveries outside of QC limits are qualified in the Report of Quality Control section.

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Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076201

Analytical Method	Batch	Sample used for QC
SM 4500-Si C	94446	Client sample MW-5S from project 2076200

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from the a different client was used.

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Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client: PASI Kansas

Client ID: TWO2-MID
Project: 2076201
Project ID: 6031634
Site: None
Lab ID: 6031634001
Matrix: Water
%Moisture: n/a
Description: None
Collected: 11/15/07
Received: 11/16/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Silica	SM 4500-Si	94446	5	D1	28.5	mg/L	5.00	20-Nov-07	20-Nov-07 17:19	TAE	

1 parameter(s) reported

11/21/2007 17:02:02

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Pace Analytical®
New Orleans Laboratory

Inorganics Quality Control

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076201

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Silica	94446	ND	1.00	mg/L				10	11.75	17.37		56 *				-	75 - 125		Q1
Silica	94446			mg/L	10	10.91	109		11.75						1	90 - 110	-	20	

* denotes recovery outside of QC limits.
ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

11/21/2007 17:02:05

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Qualifier Summary

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2076201

Qualifier	Qualifier Description
D1	The analysis was performed at a dilution due to the high analyte concentration.
Q1	The matrix spike recoveries are poor. Acceptable method performance for this analyte has been demonstrated by the laboratory control sample recovery.

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

November 28, 2007

PAT HIGGINS
BURNS & MCDONNELL
9400 WARD PARKWAY
Kansas City, MO 64114

RE: Project: Ameren 46691
Pace Project No.: 6031729

Dear PAT HIGGINS:
Enclosed are the analytical results for sample(s) received by the laboratory on November 17, 2007. The results relate only to the samples included in this report. 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,

Angie Brown

Angie.Brown@pacelabs.com
Project Manager

A2LA Certification Number: 2456.01
Arkansas Certification Number: 05-008-0
Illinois Certification Number: 001191
Iowa Certification Number: 118
Kansas/NELAP Certification Number: E-10116
Louisiana Certification Number: 03055
Oklahoma Certification Number: 9205/9935
Utah Certification Number: 9135995665

Enclosures

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

SAMPLE SUMMARY

Project: Ameren 46691
Pace Project No.: 6031729

Lab ID	Sample ID	Matrix	Date Collected	Date Received
6031729001	**TW-02END**	Water	11/17/07 07:25	11/17/07 17:00

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

SAMPLE ANALYTE COUNT

Project: Ameren 46691
Pace Project No.: 6031729

Lab ID	Sample ID	Method	Analytes Reported
6031729001	**TW-02END**	EPA 120.1	1
		EPA 180.1	1
		EPA 300.0	4
		EPA 365.1	1
		EPA 365.4	1
		EPA 6010	1
		EPA 6010	8
		SM 2320B	3
		SM 2540C	1
		SM 2540D	1
		SM 4500-H+B	1
		SM 5210B	1
		SM 5310C	1

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ANALYTICAL RESULTS

Project: Ameren 46691
Pace Project No.: 6031729

Sample: TW-02END **Lab ID: 6031729001** Collected: 11/17/07 07:25 Received: 11/17/07 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Barium	**870**	ug/L	10.0	1	11/19/07 00:00	11/26/07 17:11	7440-39-3	
Calcium	**114000**	ug/L	100	1	11/19/07 00:00	11/26/07 17:11	7440-70-2	
Iron	**7630**	ug/L	50.0	1	11/19/07 00:00	11/26/07 17:11	7439-89-6	
Magnesium	**25700**	ug/L	50.0	1	11/19/07 00:00	11/27/07 12:13	7439-95-4	
Manganese	**275**	ug/L	5.0	1	11/19/07 00:00	11/26/07 17:11	7439-96-5	
Potassium	**3350**	ug/L	500	1	11/19/07 00:00	11/26/07 17:11	7440-09-7	
Sodium	**7320**	ug/L	500	1	11/19/07 00:00	11/26/07 17:11	7440-23-5	
Strontium	**581**	ug/L	10.0	1	11/19/07 00:00	11/26/07 17:11	7440-24-6	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	ND	ug/L	50.0	1	11/20/07 00:00	11/26/07 14:55	7439-89-6	
120.1 Specific Conductance	Analytical Method: EPA 120.1							
Specific Conductance	**670**	umhos/cm	1.0	1		11/19/07 00:00		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	**103**	NTU	5.0	1		11/19/07 11:30		H1
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity,Bicarbonate (CaCO3)	**400**	mg/L	20.0	1		11/20/07 19:17		
Alkalinity, Carbonate (CaCO)	ND	mg/L	20.0	1		11/20/07 19:17		
Alkalinity, Total	**400**	mg/L	20.0	1		11/20/07 19:17		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**560**	mg/L	5.0	1		11/20/07 15:44		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**12.0**	mg/L	5.0	1		11/20/07 11:39		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		11/19/07 13:30		H6
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	11/19/07 13:34	11/24/07 10:23		H1
300.0 IC Anions	Analytical Method: EPA 300.0							
Nitrate as N	ND	mg/L	1.0	1		11/19/07 13:14	14797-55-8	H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**6.3**	mg/L	1.0	1		11/21/07 17:18	16887-00-6	
Fluoride	**0.34**	mg/L	0.20	1		11/21/07 17:18	16984-48-8	
Sulfate	**26.2**	mg/L	1.0	1		11/21/07 17:18	14808-79-8	
365.1 Phosphate, Ortho as P	Analytical Method: EPA 365.1							
Orthophosphate as P	ND	mg/L	0.10	1		11/19/07 11:30		H1

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ANALYTICAL RESULTS

Project: Ameren 46691
Pace Project No.: 6031729

Sample: TW-02END **Lab ID: 6031729001** Collected: 11/17/07 07:25 Received: 11/17/07 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
365.4 Total Phosphorus	Analytical Method: EPA 365.4							
Phosphorus	**0.32**	mg/L	0.10	1		11/27/07 18:08	7723-14-0	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**1.2**	mg/L	1.0	1		11/20/07 00:00	7440-44-0	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10036
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Associated Lab Samples: 6031729001

METHOD BLANK: 255963
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	20.0	
Alkalinity, Total	mg/L	ND	20.0	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	20.0	

LABORATORY CONTROL SAMPLE: 255964

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total	mg/L	500	462	92	90-110	

SAMPLE DUPLICATE: 255965

Parameter	Units	6031630005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Carbonate (CaCO)	mg/L	ND	ND	0	6	
Alkalinity, Total	mg/L	483	475	2	6	
Alkalinity,Bicarbonate (CaCO3)	mg/L	483	475	2	6	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WETA/5817
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031729001

METHOD BLANK: 256061
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Nitrate as N	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 256062

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrate as N	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 256064 256065

Parameter	Units	6031729001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrate as N	mg/L	ND	5	5	4.3	4.4	86	87	61-128	2	7	

SAMPLE DUPLICATE: 256063

Parameter	Units	6031729001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrate as N	mg/L	ND	ND	0	11	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: MPRP/5159
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 6031729001

METHOD BLANK: 256083
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Barium	ug/L	ND	10.0	
Calcium	ug/L	ND	100	
Iron	ug/L	ND	50.0	
Magnesium	ug/L	ND	50.0	
Manganese	ug/L	ND	5.0	
Potassium	ug/L	ND	500	
Sodium	ug/L	ND	500	
Strontium	ug/L	ND	10.0	

LABORATORY CONTROL SAMPLE: 256084

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	80-120	
Calcium	ug/L	10000	10900	109	80-120	
Iron	ug/L	10000	10500	105	80-120	
Magnesium	ug/L	10000	10700	107	80-120	
Manganese	ug/L	1000	1060	106	80-120	
Potassium	ug/L	10000	10300	103	80-120	
Sodium	ug/L	10000	10200	102	80-120	
Strontium	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 256085 256086

Parameter	Units	6031612002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	271	1000	1000	1210	1230	94	96	75-125	1	7	
Calcium	ug/L	128000	10000	10000	133000	136000	47	75	75-125	2	8	M0
Iron	ug/L	21000	10000	10000	29700	30200	87	91	75-125	2	12	
Magnesium	ug/L	10200	10000	10000	20100	20100	99	100	75-125	0	7	
Manganese	ug/L	1150	1000	1000	2080	2110	93	95	75-125	1	9	
Potassium	ug/L	3400	10000	10000	13400	13500	100	101	75-125	1	7	
Sodium	ug/L	27800	10000	10000	36400	36700	87	89	75-125	1	12	
Strontium	ug/L	233	1000	1000	1200	1210	96	98	75-125	1	11	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WETA/5818
QC Batch Method: EPA 365.1
Analysis Method: EPA 365.1
Analysis Description: 365.1 Phosphorus, Ortho
Associated Lab Samples: 6031729001

METHOD BLANK: 256130
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Orthophosphate as P	mg/L	ND	0.10	

LABORATORY CONTROL SAMPLE: 256131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	2	2.1	104	90-110	

MATRIX SPIKE SAMPLE: 256132

Parameter	Units	6031729001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	ND	2	2.0	102	90-110	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10043
QC Batch Method: EPA 180.1
Analysis Method: EPA 180.1
Analysis Description: 180.1 Turbidity
Associated Lab Samples: 6031729001

METHOD BLANK: 256134
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Turbidity	NTU	ND	1.0	

LABORATORY CONTROL SAMPLE: 256135

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	10	9.9	99	80-120	

SAMPLE DUPLICATE: 256136

Parameter	Units	6031729001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	103	100	2	10	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10044
QC Batch Method: SM 5210B
Analysis Method: SM 5210B
Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 6031729001

METHOD BLANK: 256143
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
BOD, 5 day	mg/L	ND	2.0	

LABORATORY CONTROL SAMPLE: 256144

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	206	104	85-115	

SAMPLE DUPLICATE: 256145

Parameter	Units	6031732003 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	116	102	13	17	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10045
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 6031729001

SAMPLE DUPLICATE: 256146

Parameter	Units	6031729001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10046
QC Batch Method: EPA 120.1
Analysis Method: EPA 120.1
Analysis Description: 120.1 Specific Conductance
Associated Lab Samples: 6031729001

METHOD BLANK: 256157
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	

SAMPLE DUPLICATE: 256159

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	616	617	0	5	

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QUALITY CONTROL DATA

Project:. Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10053
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solid s
Associated Lab Samples : 6031729001

METHOD BLANK: 256334
Associated Lab Samples : 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 256335

Parameter	Units	6031612002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	40.0	40.0	0	5	

SAMPLE DUPLICATE: 256336

Parameter	Units	6031619001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	50.0	50.0	0	5	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WETA/5824
QC Batch Method: SM 5310C
Analysis Method: SM 5310C
Analysis Description: 5310C Total Organic Carbon
Associated Lab Samples: 6031729001

METHOD BLANK: 256545
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 256546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	5	6.2	125	79-126	

MATRIX SPIKE SAMPLE: 256548

Parameter	Units	6031651001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	15.2	25	55.8	162	42-141	M1

SAMPLE DUPLICATE: 256547

Parameter	Units	6031634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Organic Carbon	mg/L	1.9	1.8	7	21	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WET/10060
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 6031729001

METHOD BLANK: 256744
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	

SAMPLE DUPLICATE: 256745

Parameter	Units	6031551001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	988	1000	1	5	

SAMPLE DUPLICATE: 256746

Parameter	Units	6031650001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2760	2780	1	5	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: MPRP/5175
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 6031729001

METHOD BLANK: 256791
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iron	ug/L	ND	50.0	

LABORATORY CONTROL SAMPLE: 256792

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	10400	104	80-120	

MATRIX SPIKE SAMPLE: 256793

Parameter	Units	6031610003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	ND	10000	10100	100	75-125	

SAMPLE DUPLICATE: 256801

Parameter	Units	6031610003 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron	ug/L	ND	ND	63	20	R1

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WETA/5833
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 6031729001

METHOD BLANK: 257025
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Chloride	mg/L	ND	1.0	
Fluoride	mg/L	ND	0.20	
Sulfate	mg/L	ND	1.0	

LABORATORY CONTROL SAMPLE: 257026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	101	90-110	
Fluoride	mg/L	2	2.1	107	90-110	
Sulfate	mg/L	15	14.1	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 257027 257028

Parameter	Units	6031470001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	98.8	100	100	216	214	117	115	57-123	1	6	
Fluoride	mg/L	ND	100	100	125	124	123	122	80-120	1	10	M0
Sulfate	mg/L	258	100	100	357	357	99	99	60-133	0	12	

SAMPLE DUPLICATE: 257029

Parameter	Units	6031710001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1020	1030	1	14	
Fluoride	mg/L	ND	5.7J	1	13	
Sulfate	mg/L	287	295	3	11	

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QUALITY CONTROL DATA

Project: Ameren 46691
Pace Project No.: 6031729

QC Batch: WETA/5845
QC Batch Method: EPA 365.4
Analysis Method: EPA 365.4
Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 6031729001

METHOD BLANK: 257965
Associated Lab Samples: 6031729001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Phosphorus	mg/L	ND	0.10	

LABORATORY CONTROL SAMPLE: 257966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	2.0	102	90-110	

MATRIX SPIKE SAMPLE: 257967

Parameter	Units	6031813001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	32.9	2	35.3	116	58-132	

SAMPLE DUPLICATE: 257968

Parameter	Units	6031729001 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	0.32	0.36	11	12	

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QUALIFIERS

Project: Ameren 46691
Pace Project No.: 6031729

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.

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

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ANALYTE QUALIFIERS

H1	Analysis conducted outside the EPA method holding time.
H6	Analysis initiated more than 15 minutes after sample collection.
M0	Matrix spike recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ameren 46691
Pace Project No.: 6031729

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
6031729001	**TW-02END**	SM 2320B	WET/10036		
6031729001	**TW-02END**	EPA 300.0	WETA/5817		
6031729001	**TW-02END**	EPA 3010	MPRP/5159	EPA 6010	ICP/4563
6031729001	**TW-02END**	EPA 365.1	WETA/5818		
6031729001	**TW-02END**	EPA 180.1	WET/10043		
6031729001	**TW-02END**	SM 5210B	WET/10044	SM 5210B	WET/10051
6031729001	**TW-02END**	SM 4500-H+B	WET/10045		
6031729001	**TW-02END**	EPA 120.1	WET/10046		
6031729001	**TW-02END**	SM 2540D	WET/10053		
6031729001	**TW-02END**	SM 5310C	WETA/5824		
6031729001	**TW-02END**	SM 2540C	WET/10060		
6031729001	**TW-02END**	EPA 3010	MPRP/5175	EPA 6010	ICP/4576
6031729001	**TW-02END**	EPA 300.0	WETA/5833		
6031729001	**TW-02END**	EPA 365.4	WETA/5845		

Burns & McDonnell SINCE 1898

021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

6031729

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: Paul McCormick

Laboratory: Pace Analytical
Address: 9608 Loiret Blvd
City/State/Zip: Lenexa KS 66219
Telephone: 913.599.5665

Document Control No:

Lab. Reference No. or Episode No.:

Project Number: 466091

Client Name: Ameren

Sample Type

Matrix

Sample Number			Sample Event		Sample Depth (in feet)		Sample Collected		Matrix			Number of Containers	Analysis							
Group or SWMU Name	Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas		Metals	Silica	TOC	TDS, TSS	Turbidity, pH BOD, ALK, COND, ANIONS	Dissolved Fe, H2S	Remarks	
		TW-02END					11/17/07	0725	X			6	X	X	X	X	X	X		001
																	2(BP3U) 1(BP2U)	1(BP1U) 1(BP3S)	1(BP3N)	

Sampler (signature): Erin Zeppen

Sampler (signature):

Special Instructions:

Relinquished By (signature): 1 Erin Zeppen — Date/Time: 11/17/07 1328 — Received By (signature): — Date/Time: 11/12/07 1700

Relinquished By (signature) 2. — Date/Time: — Received By (signature): — Date/Time:

Ice Present in Container: Yes [X] No [ ]

Temperature Upon Receipt: 3.6°C

Laboratory Comments:

Sample Condition Upon Receipt

Pace Analytical

Client Name: Burns + McDonnell Project # 6031729

Optional
Proj. Due Date: 11/27
Proj. Name: Ameren

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

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☑ no

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

Thermometer Used T-168 **Type of Ice:** ~~Wet~~ Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 3.6 **Biological Tissue is Frozen:** ~~Yes~~ No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: JMS 11/19/07

Comments:

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 Hold Time:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☒Yes	☐No	☐N/A	6. BOD, NO_2 NO_3, Turbidity, ortho-P
Rush Turn Around Time Requested:	☐Yes	~~☒~~No	☐N/A	7. out of hold
Sufficient Volume:	☑Yes	☐No	☐N/A	8.
Correct Containers Used:	☑Yes	☐No	☐N/A	9.
-Pace Containers Used:	☐Yes	☐No	☐N/A	
Containers Intact:	☒Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	~~☒~~No	☒N/A	11.
Sample Labels match COC:	☒Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: water				
All containers needing preservation have been checked.	☒Yes	☐No	☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes	☐No	☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☒Yes	☐No		Initial when completed JMS / Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	~~☑~~N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A	15.
Trip Blank Present:	☐Yes	☐No	☒N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased): N/A				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 11/19/07

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)

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

November 16, 2007

Client Services
Pace Kansas
9608 Loiret Boulevard
Lenexa, KS 66219

RE: Project: 2075996
RE: Project ID: 6031330

Dear Client Services:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2007. 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,

Karen Brown

ACCREDITED IN ACCORDANCE WITH nelac

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
New Orleans Laboratory

Sample Cross Reference

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2075996

Client: PASI Kansas

Project ID: 6031330

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
TW-01	60313300	Water	11/08/07 10:30	11/09/07 17:35
TW-01 MID	60313300	Water	11/08/07 13:00	11/09/07 17:35

Pace Analytical®
New Orleans Laboratory

Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2075996

Sample Receipt Condition:

All samples were received in accordance with EPA protocol.

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

All MS/MSD recoveries or duplicate RPDs were within QC limits.

Pace Analytical®
New Orleans Laboratory

Project Narrative

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2075996

Analytical Method	Batch	Sample used for QC
SM 4500-Si C	94226	Client sample TW-01 END from project 2076003

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from the a different client was used.

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New Orleans Laboratory

Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client: PASI Kansas

Client ID: TW-01
Project: 2075996
Project ID: 6031330
Site: None
Lab ID: 6031330001
Matrix: Water
%Moisture: n/a
Description: None
Collected: 11/08/07
Received: 11/09/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Silica	SM 4500-Si	94226	5	DI	31.3	mg/L	5.00	15-Nov-07	15-Nov-07 13:22	TAE	

1 parameter(s) reported

11/16/2007 10:42:01

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Pace Analytical®
New Orleans Laboratory

Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client: PASI Kansas

Client ID: TW-01 MID
Project: 2075996
Project ID: 6031330
Site: None
Lab ID: 6031330002
Matrix: Water
%Moisture: n/a
Description: None
Collected: 11/08/07
Received: 11/09/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Silica	SM 4500-Si	94226	5	D1	28.6	mg/L	5.00	15-Nov-07	15-Nov-07 13:22	TAE	

1 parameter(s) reported

11/16/2007 10:42:01

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
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Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Pace Analytical®
New Orleans Laboratory

Inorganics Quality Control

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2075996

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Silica	94226	ND	1.00	mg/L	10	10.76	108	10	30.71	38.68		80			2	90 - 110	75 - 125	20	D1

* denotes recovery outside of QC limits.
ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

11/16/2007 10:42:03

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Qualifier Summary

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2075996

Qualifier	Qualifier Description
D1	The analysis was performed at a dilution due to the high analyte concentration.

APPENDIX D

PUMPING TEST ANALYSIS CALCULATIONS

Average T & s Values
Calculated from Distance vs. Drawdown Plots

Line of Wells Parallel to River

Test Well TW-01

Test Elapsed Time	Transmissivity (gpd/ft)	Storage (unitless)
24 hours	466,000	0.155
48 hours	464,900	0.215
72 hours	462,500	0.262
Average	464,467	0.211

Test Well TW-02

Test Elapsed Time	Transmissivity (gpd/ft)	Storage (unitless)
24 hours	363,900	0.155
48 hours	372,400	0.282
72 hours	375,500	0.417*
Average	370,600	0.219

Line of Wells Perpendicular to River

Test Well TW-01

Test Elapsed Time	Transmissivity (gpd/ft)	Storage (unitless)
24 hours	426,200	0.118
48 hours	429,500	0.152
72 hours	436,000	0.169
Average	430,567	0.146

Test Well TW-02

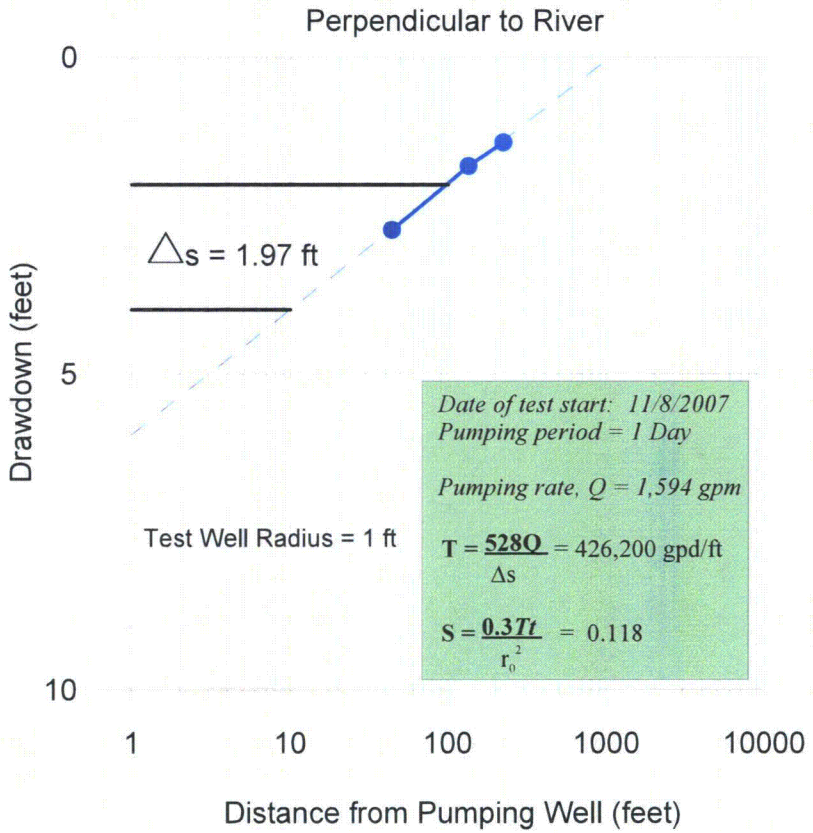
Test Elapsed Time	Transmissivity (gpd/ft)	Storage (unitless)
24 hours	426,100	0.190
48 hours	431,000	0.338
72 hours	434,000	0.482*
Average	430,367	0.264

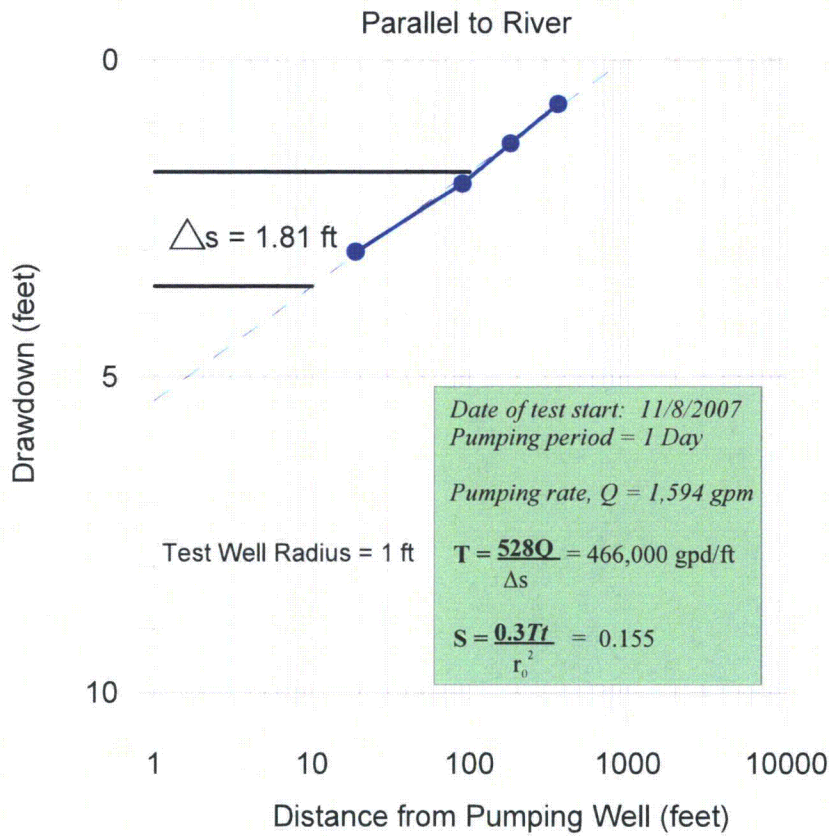
Overall Average =	**447,517**	**0.179**

Overall Average =	**400,483**	**0.241**

*Storativity values not included in average as they are artificially high.

TW-01 Distance vs. Drawdown Analysis
Drawdown Corrected for Drop in River Level





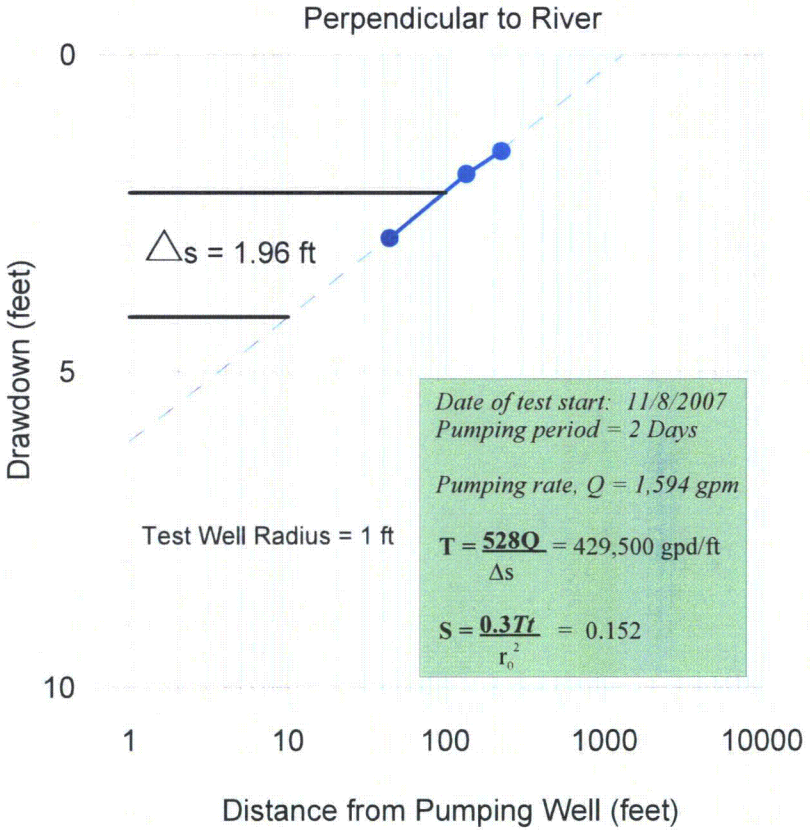
24 Hours

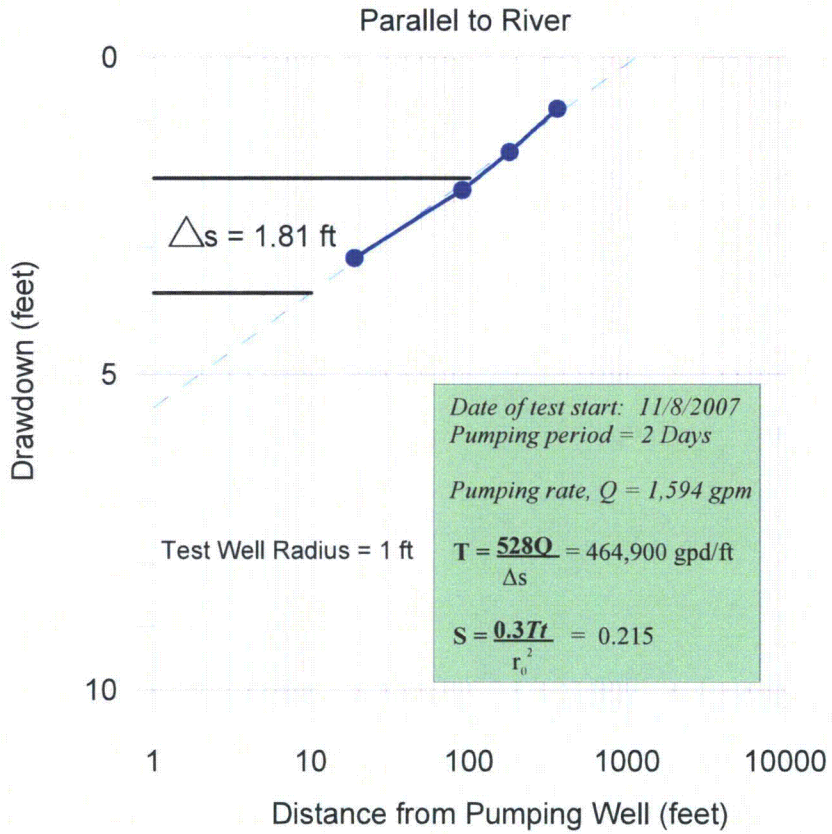
Burns & McDonnell
SINCE 1898

Distance vs. Drawdown
Test Well TW-01
72-hour Pumping Test
Callaway Plant

TW01 24 Dist vs Ddn Corr.grf 6/10/08

TW-01 Distance vs. Drawdown Analysis
Drawdown Corrected for Drop in River Level





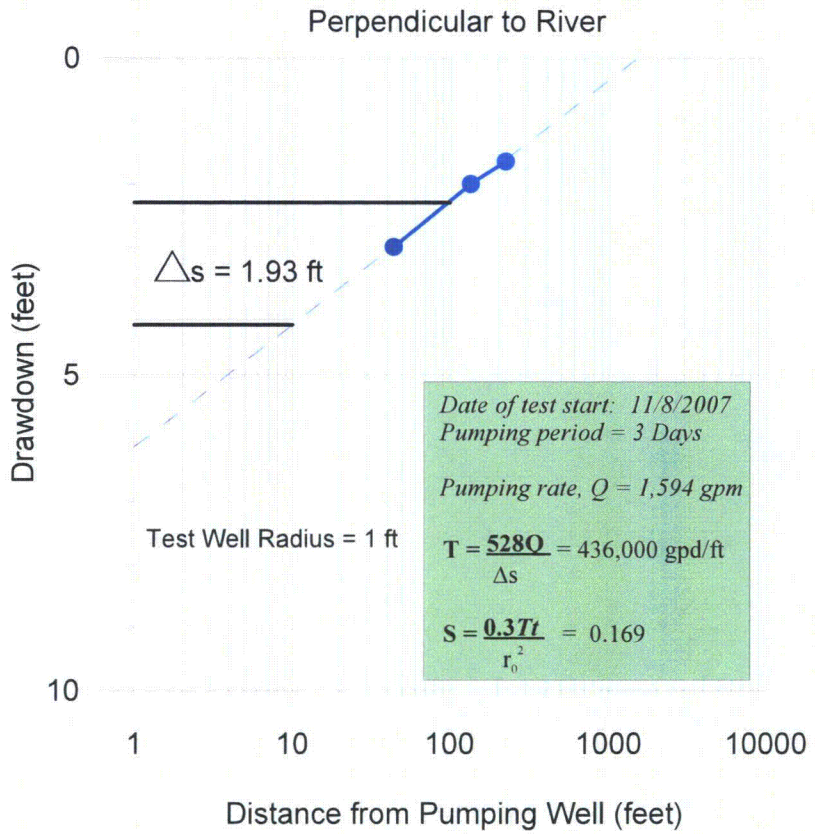
48 Hours

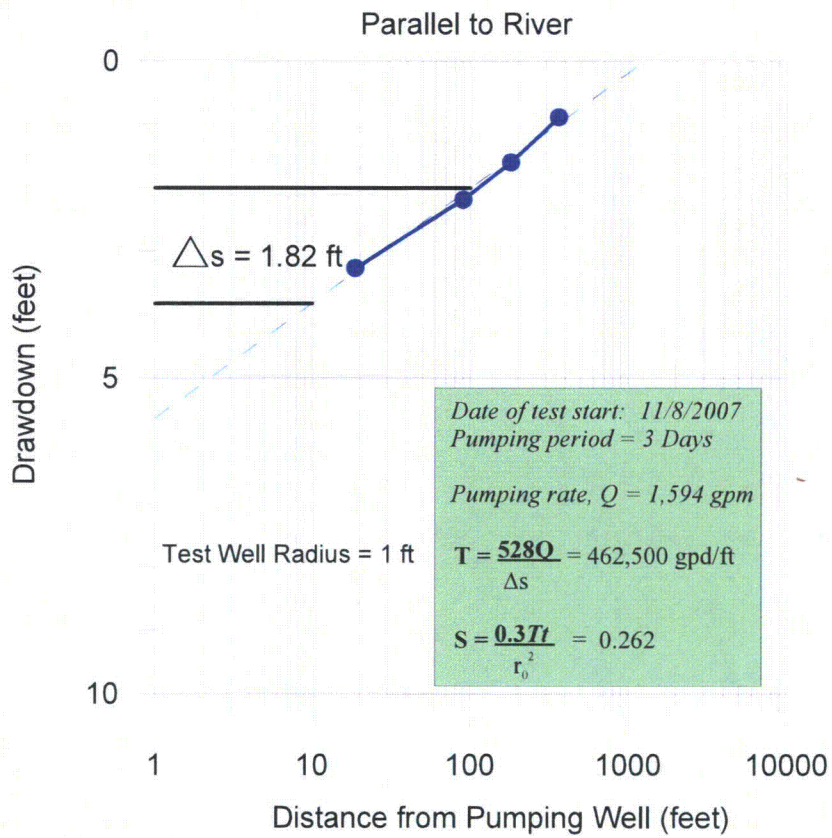
Burns & McDonnell
SINCE 1898

Distance vs. Drawdown
Test Well TW-01
72-hour Pumping Test
Callaway Plant

TW01 48 Dist vs Ddn Corr.grf 6/10/08

TW-01 Distance vs. Drawdown Analysis
Drawdown Corrected for Drop in River Level





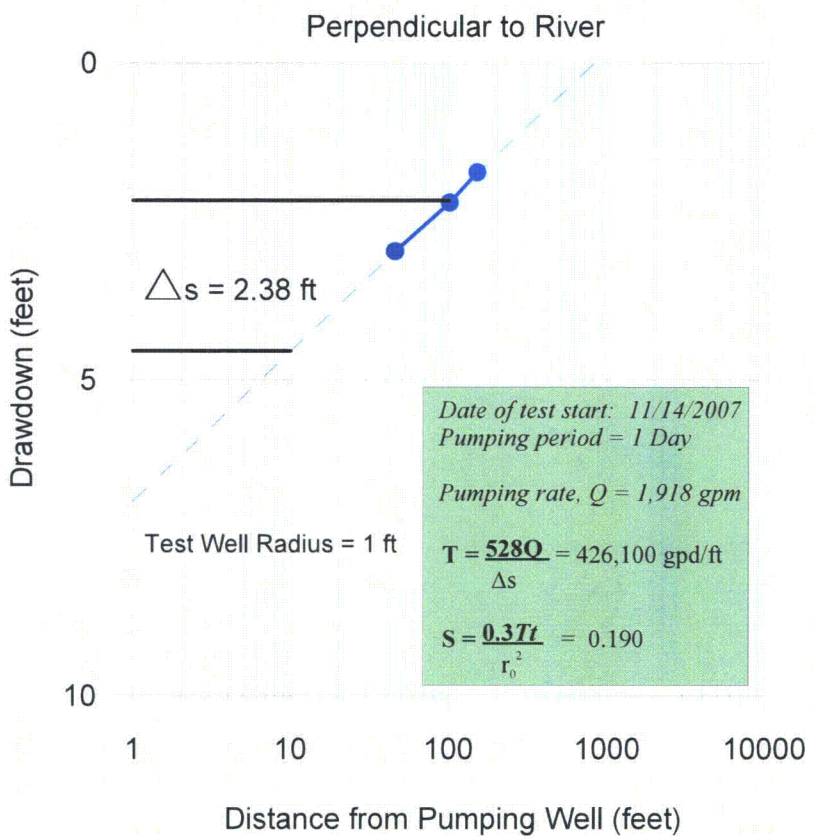
72 Hours

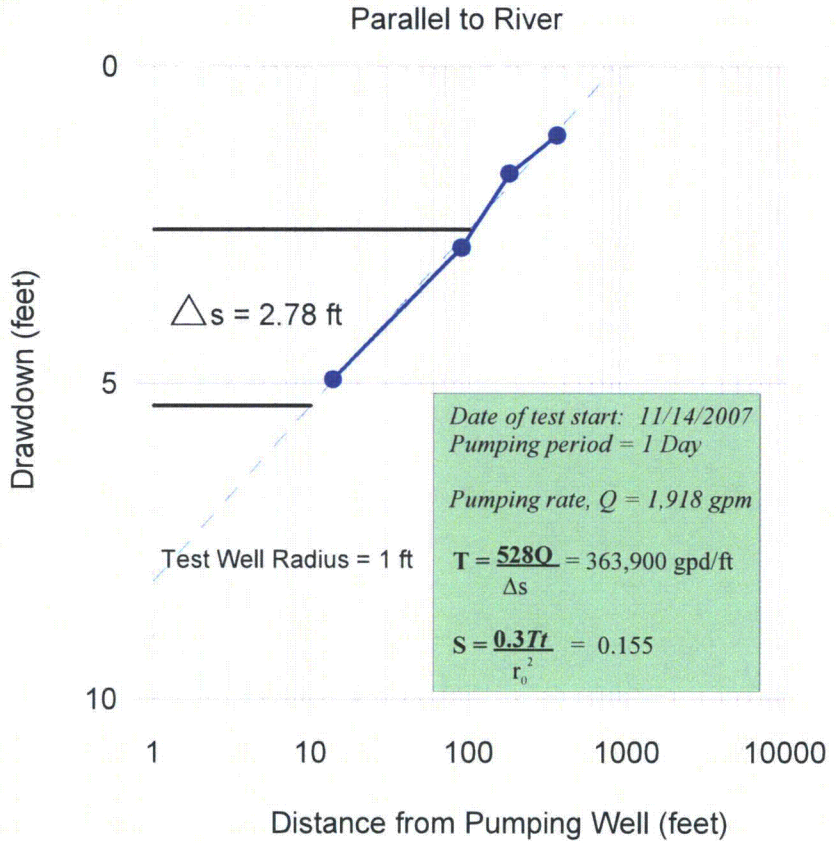
Burns & McDonnell
SINCE 1898

Distance vs. Drawdown
Test Well TW-01
72-hour Pumping Test
Callaway Plant

TW01 Dist vs Ddn Corr.grf 6/10/08

TW-02 Distance vs. Drawdown Analysis
Drawdown Corrected for Drop in River Level





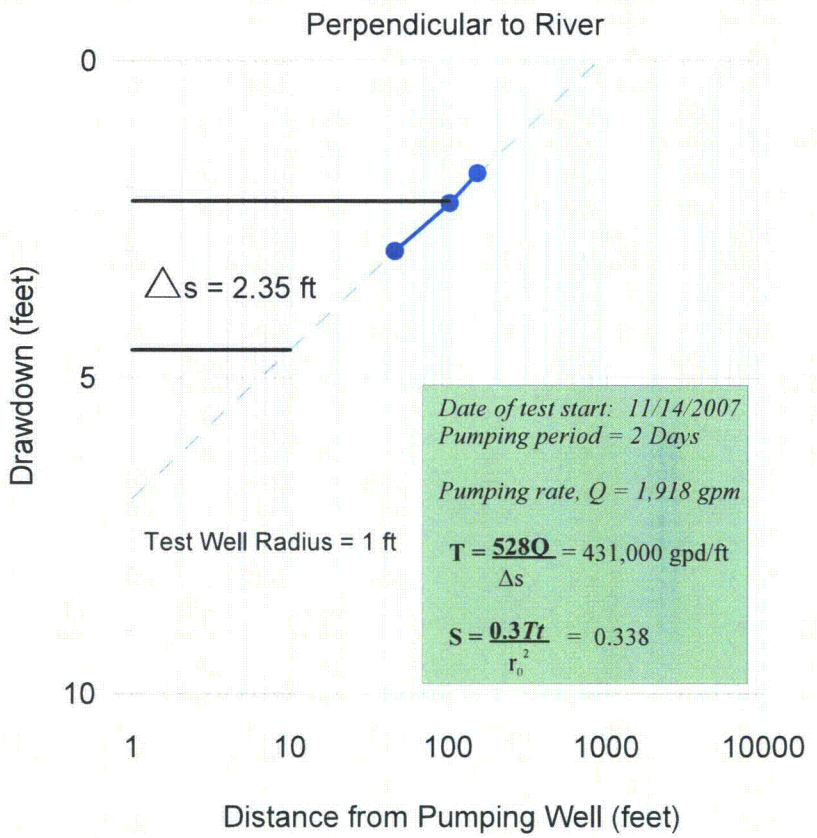
24 Hour

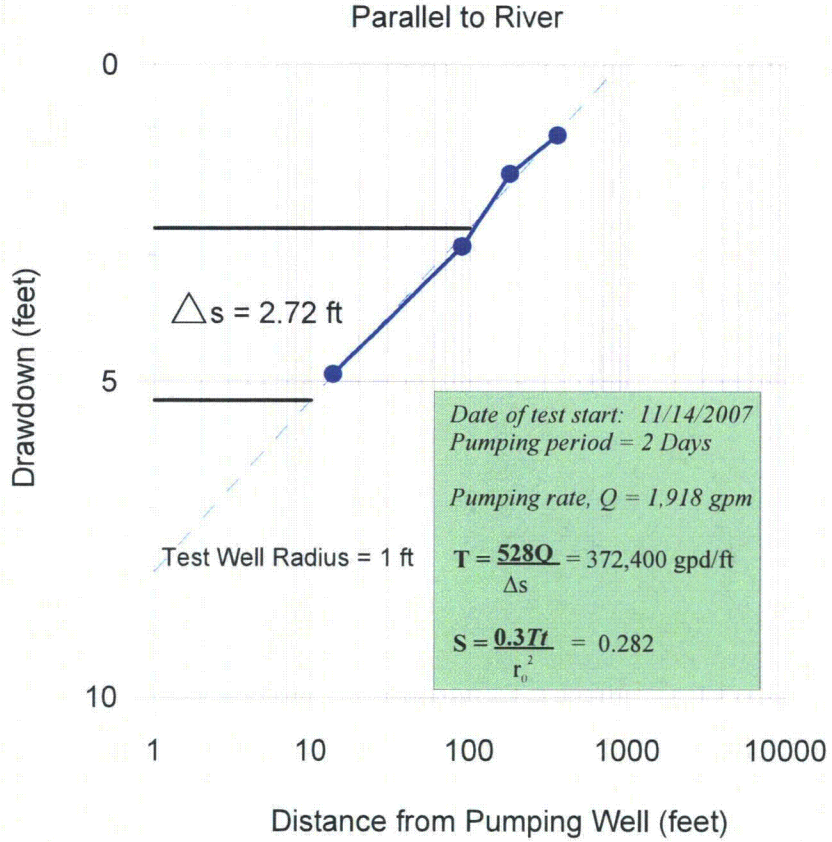
Burns & McDonnell SINCE 1898

Distance vs. Drawdown
Test Well TW-02
72-hour Pumping Test
Callaway Plant

TW02 Dist vs Ddn.grf 6/10/08

TW-02 Distance vs. Drawdown Analysis
Drawdown Corrected for Drop in River Level





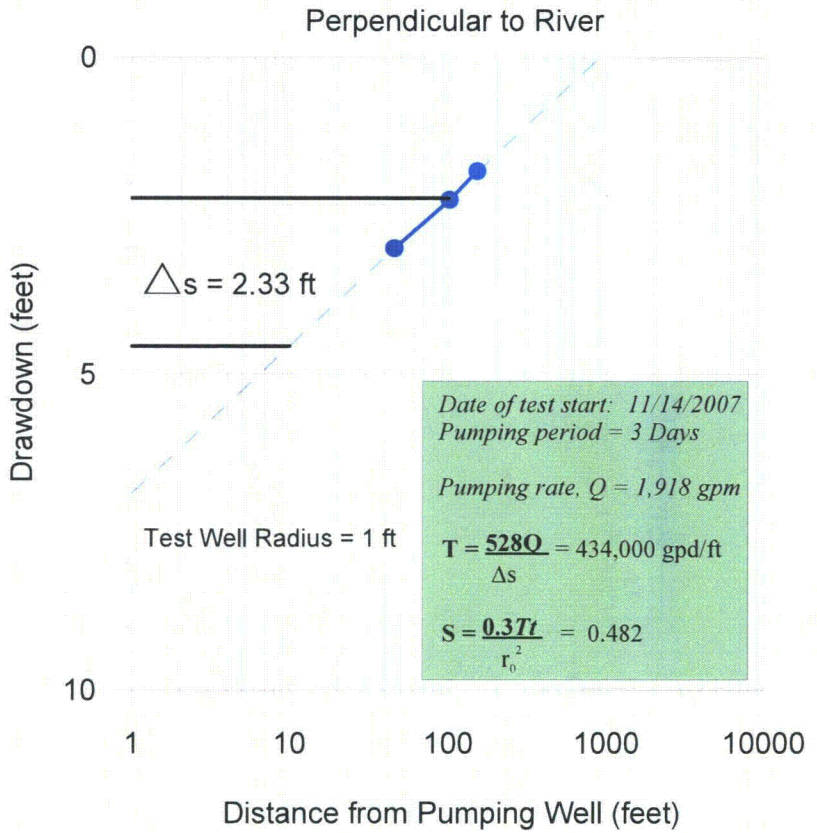
48 Hour

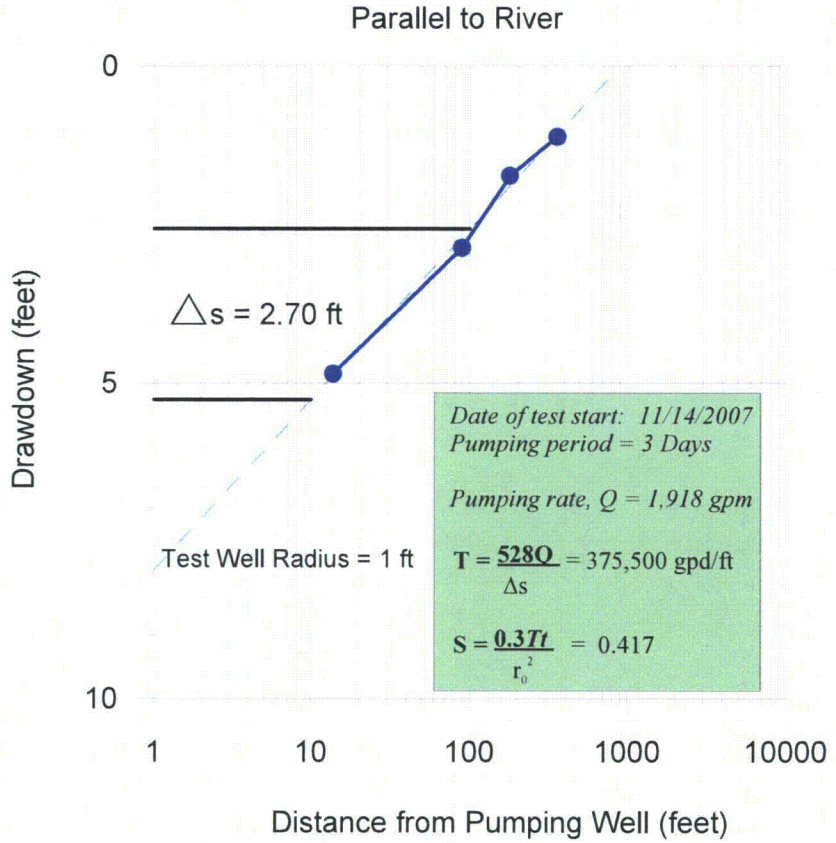
Burns & McDonnell SINCE 1898

Distance vs. Drawdown
Test Well TW-02
72-hour Pumping Test
Callaway Plant

TW02 Dist vs Ddn.grf 6/10/08

TW-02 Distance vs. Drawdown Analysis
Drawdown Corrected for Drop in River Level





72 Hours

Burns & McDonnell SINCE 1898

Distance vs. Drawdown
Test Well TW-02
72-hour Pumping Test
Callaway Plant

TW02 Dist vs Ddn.grf 6/10/08

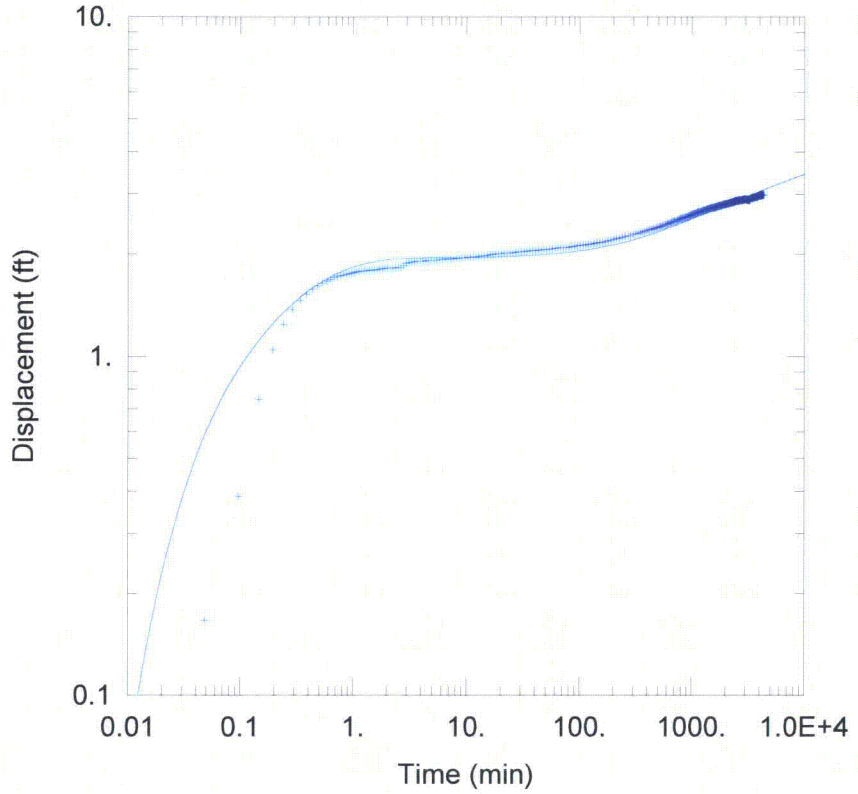
Time vs. Drawdown Analysis Summary

TW-01 Site

Well No.	Transmissivity (gpd/ft)	Storativity
TW-01	437,300	0.00141
FMW-07	301,900	0.00542
OB01-01	437,300	0.00141
OB01-02	403,600	0.01257
OB01-03	596,400	0.04075
OB01-04	821,600	0.00274
OB01-05	503,100	0.01029
OB01-06	527,800	0.00969
OB01-S1	324,500	0.00005
OB01-S2	406,900	0.00001
Averages		
OB01-01 to 06	548,300	0.0129
OB01-01, 05, 06	489,400	0.0071
OB01-02, 03	500,000	0.0267

TW-02 Site

Well No.	Transmissivity (gpd/ft)	Storativity
TW-02	754,000	0.00047
FMW-11	409,400	0.00066
OB02-01	754,000	0.00047
OB02-02	611,000	0.00025
OB02-03	490,200	0.00073
OB02-04	1,008,000	0.00054
OB02-05	448,000	0.00074
OB02-06	485,400	0.00139
OB02-S1	198,200	0.00055
OB02-S2	303,200	0.00038
Averages		
OB02-01 to 06	632,800	0.0007
OB02-01, 05, 06	562,500	0.0009
OB02-02, 03	550,600	0.0005



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-01.aqt
Date: 02/06/08 Time: 16:31:37

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.373E+5 gal/day/ft
S = 0.001405
Sy = 0.4185
ß = 0.03

AQUIFER DATA

Saturated Thickness: 80. ft

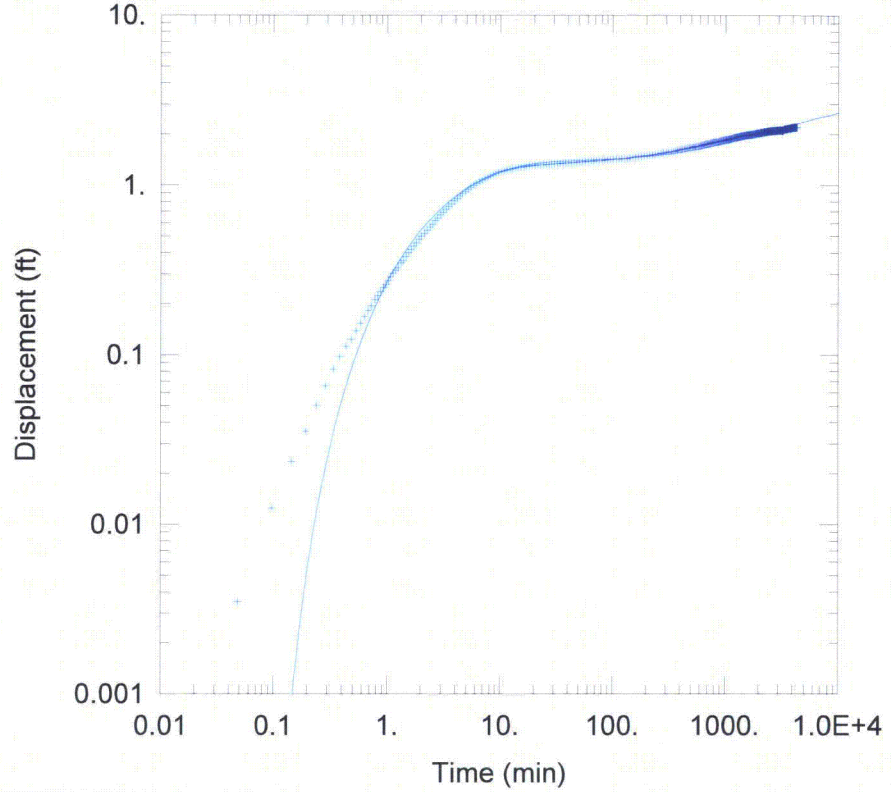
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-01	0	44



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-02.aqt
Date: 02/06/08 Time: 16:33:23

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.036E+5 gal/day/ft
S = 0.01257
Sy = 0.5582
ß = 0.1

AQUIFER DATA

Saturated Thickness: 80. ft

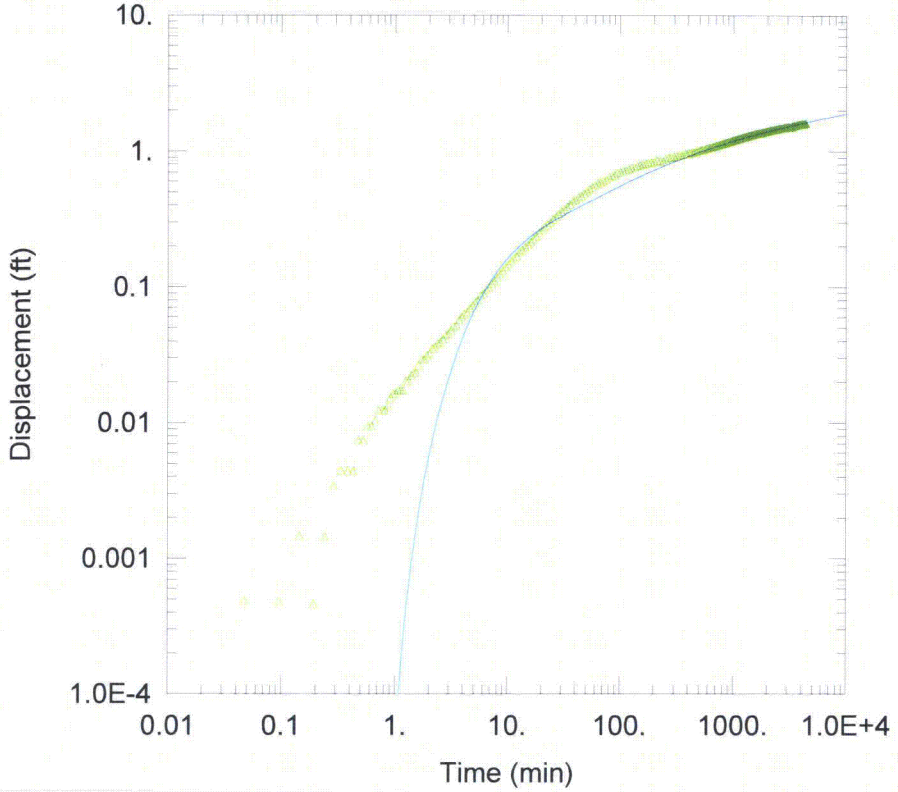
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-02	90	0



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-03.aqt
Date: 02/06/08 Time: 16:35:07

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 5.964E+5 gal/day/ft
S = 0.04075
Sy = 0.05178
ß = 0.6

AQUIFER DATA

Saturated Thickness: 80. ft

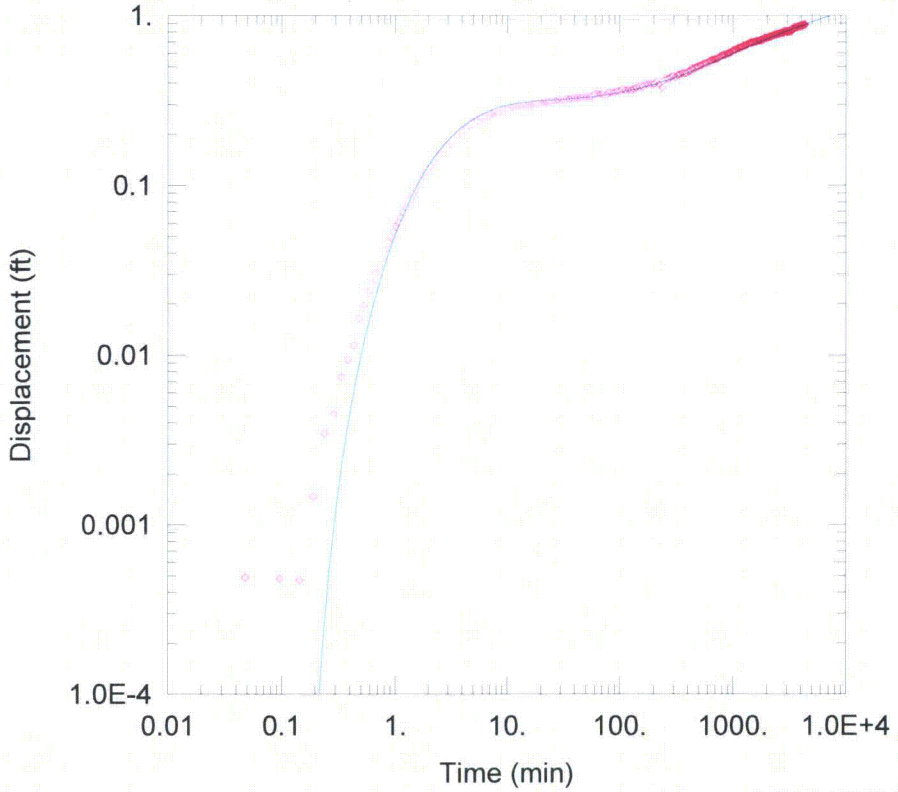
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-03	180	0



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-04.aqt
Date: 02/06/08 Time: 16:38:46

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 8.216E+5 gal/day/ft
S = 0.002744
Sy = 0.1296
ß = 0.4

AQUIFER DATA

Saturated Thickness: 80. ft

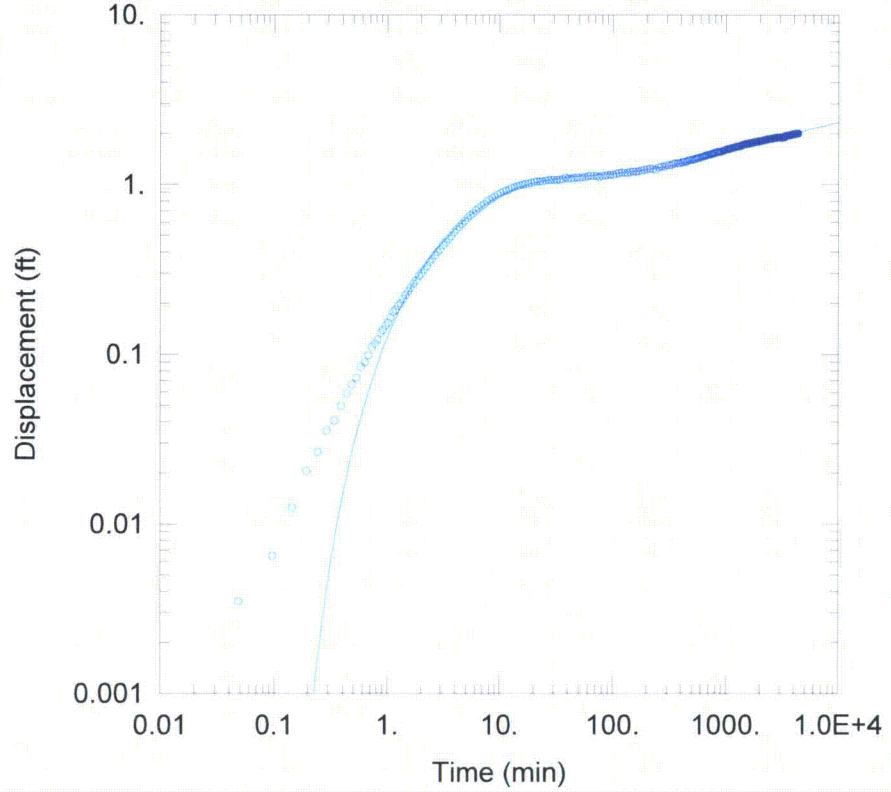
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-04	362	0



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-05.aqt
Date: 02/06/08 Time: 16:39:07

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 5.031E+5 gal/day/ft
S = 0.01029
Sy = 0.1783
ß = 0.1

AQUIFER DATA

Saturated Thickness: 80. ft

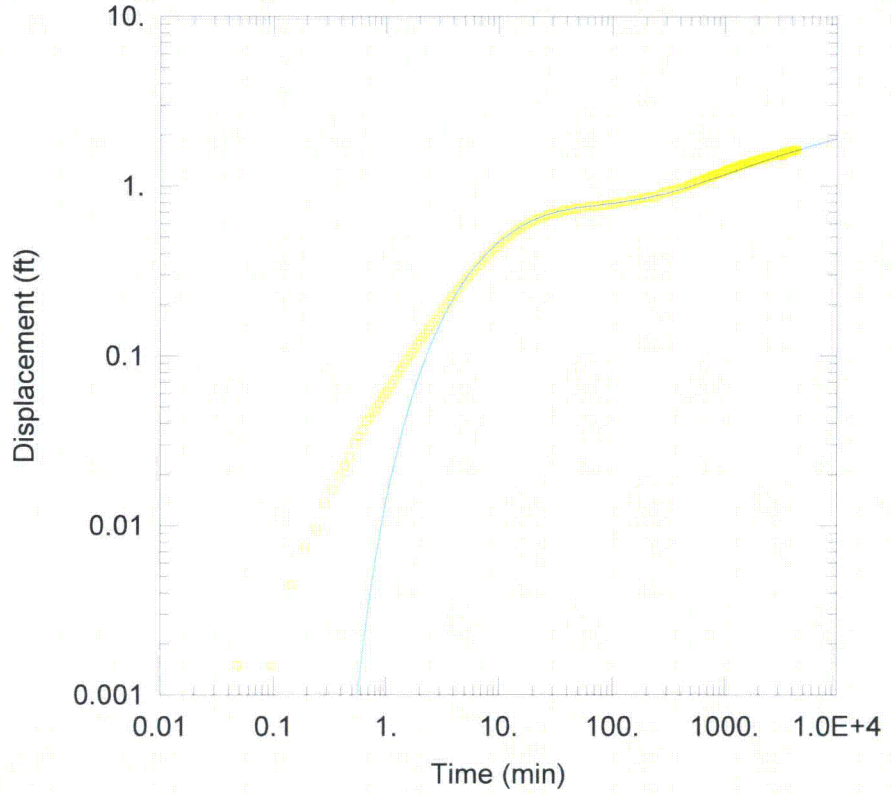
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-05	0	134.33



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-06.aqt
Date: 02/06/08 Time: 16:39:23

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 5.278E+5 gal/day/ft
S = 0.009688
Sy = 0.1269
ß = 0.2

AQUIFER DATA

Saturated Thickness: 80. ft

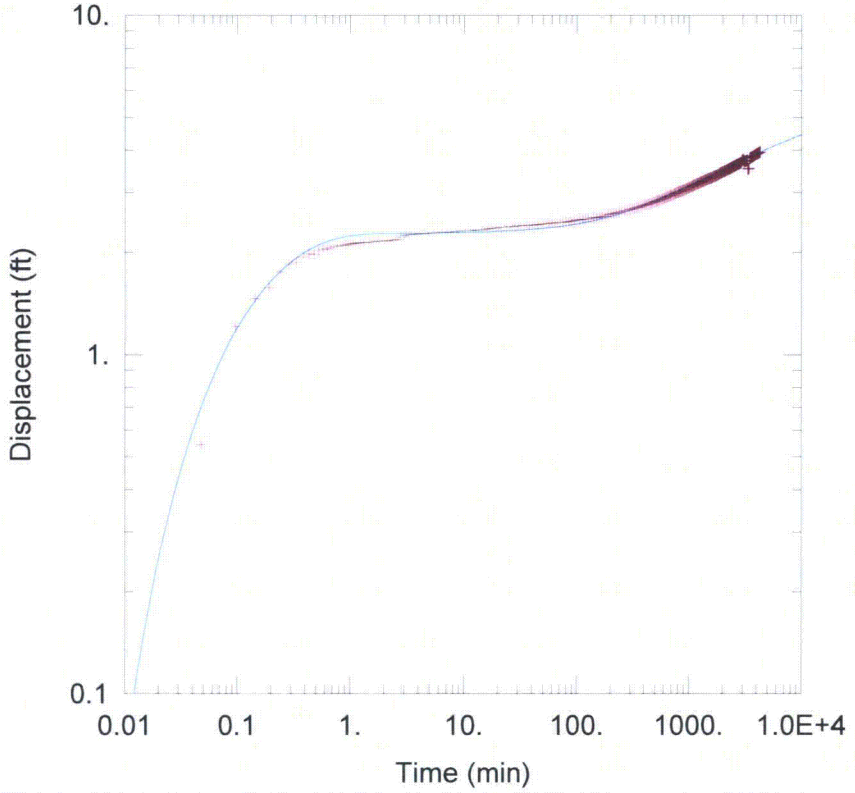
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-06	0	223.25



TW-01 CONSTANT RATE TEST

Data Set: J:\...\FMW-07.aqt
Date: 02/06/08 Time: 16:31:20

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 3.019E+5 gal/day/ft
S = 0.005421
Sy = 2.749
ß = 0.06

AQUIFER DATA

Saturated Thickness: 80. ft

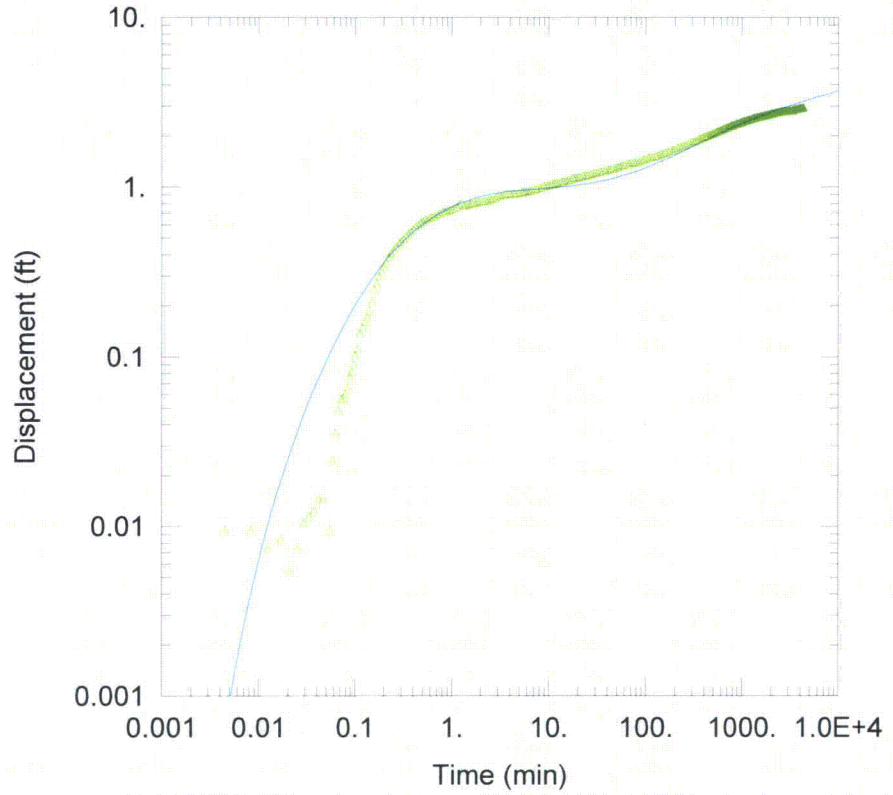
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
FMW-07	0	-18.75



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-S1.aqt
Date: 02/06/08 Time: 16:52:36

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 3.245E+5 gal/day/ft
S = 5.136E-5
Sy = 0.004478
ß = 0.001

AQUIFER DATA

Saturated Thickness: 80. ft

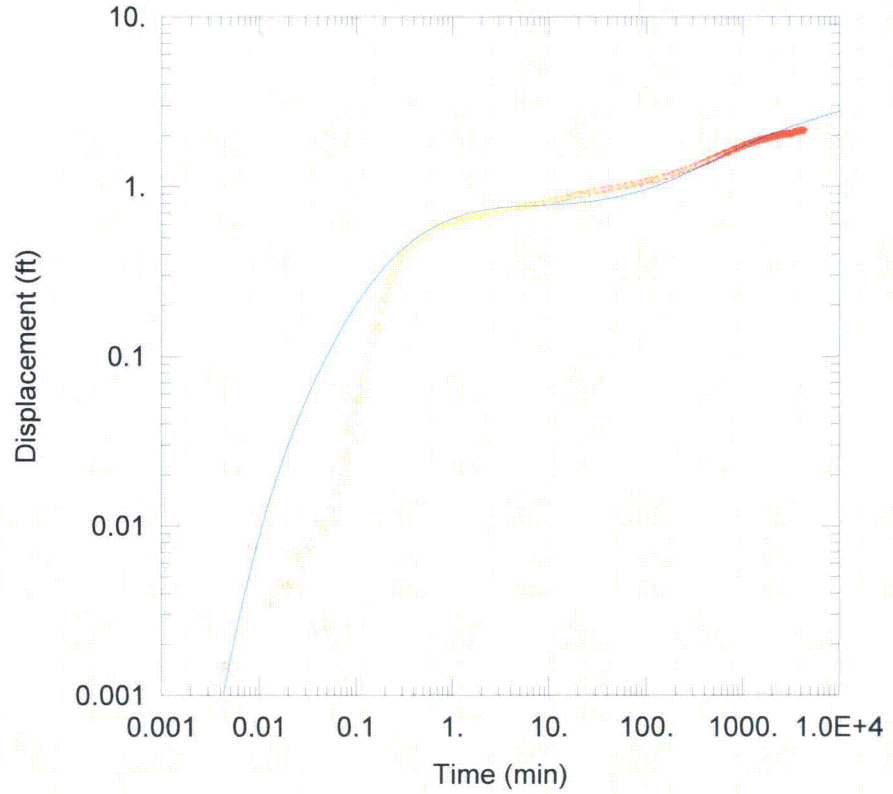
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-S1	0	53.83



TW-01 CONSTANT RATE TEST

Data Set: J:\...\OB01-S2.aqt
Date: 02/06/08 Time: 16:53:43

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-01
Test Date: November 8, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.069E+5 gal/day/ft
S = 1.449E-5
Sy = 0.00236
ß = 0.001

AQUIFER DATA

Saturated Thickness: 80. ft

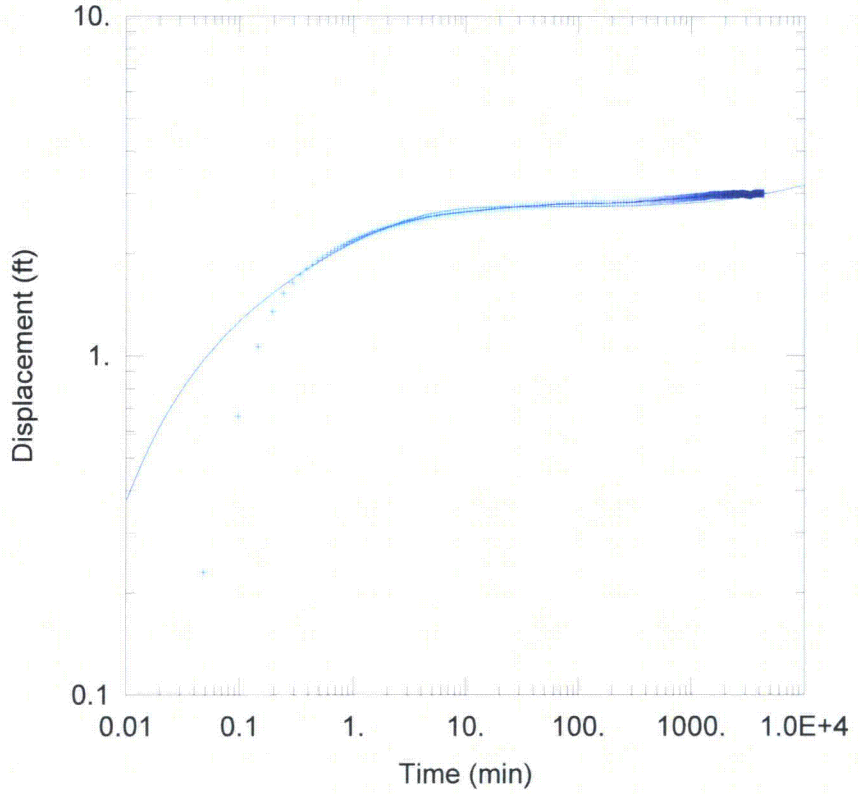
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-01	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB01-S2	100.08	0



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-01.aqt
Date: 02/07/08 Time: 14:25:29

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 7.54E+5 gal/day/ft
S = 0.000466
Sy = 0.2015
ß = 0.001

AQUIFER DATA

Saturated Thickness: 80. ft

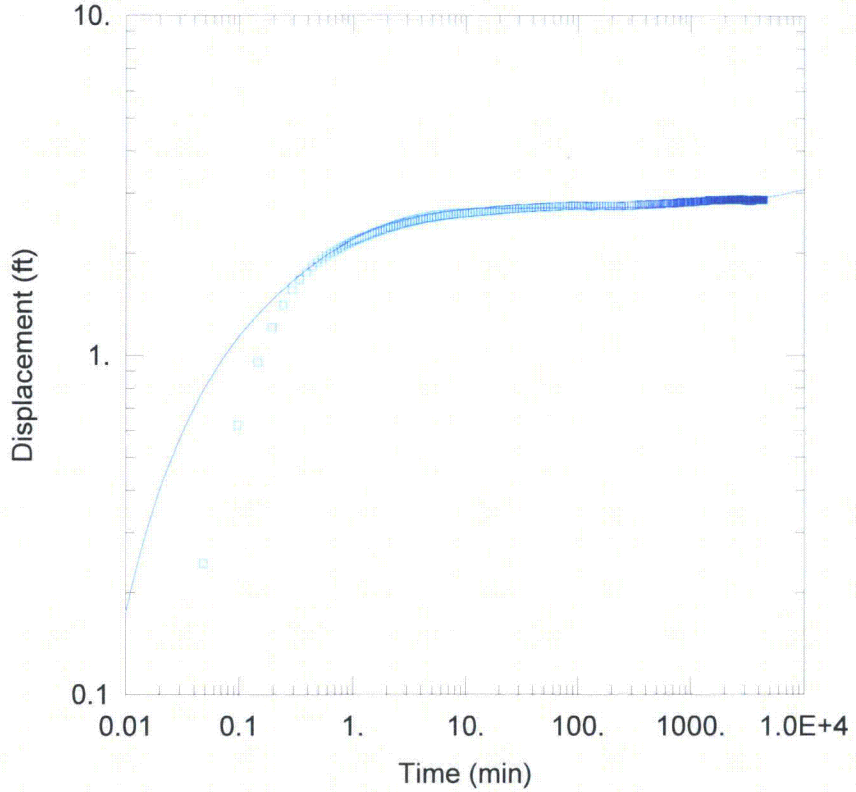
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-01	0	45.67



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-02.aqt
Date: 02/07/08 Time: 14:26:00

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 6.11E+5 gal/day/ft
S = 0.0002456
Sy = 0.31
ß = 0.004

AQUIFER DATA

Saturated Thickness: 80. ft

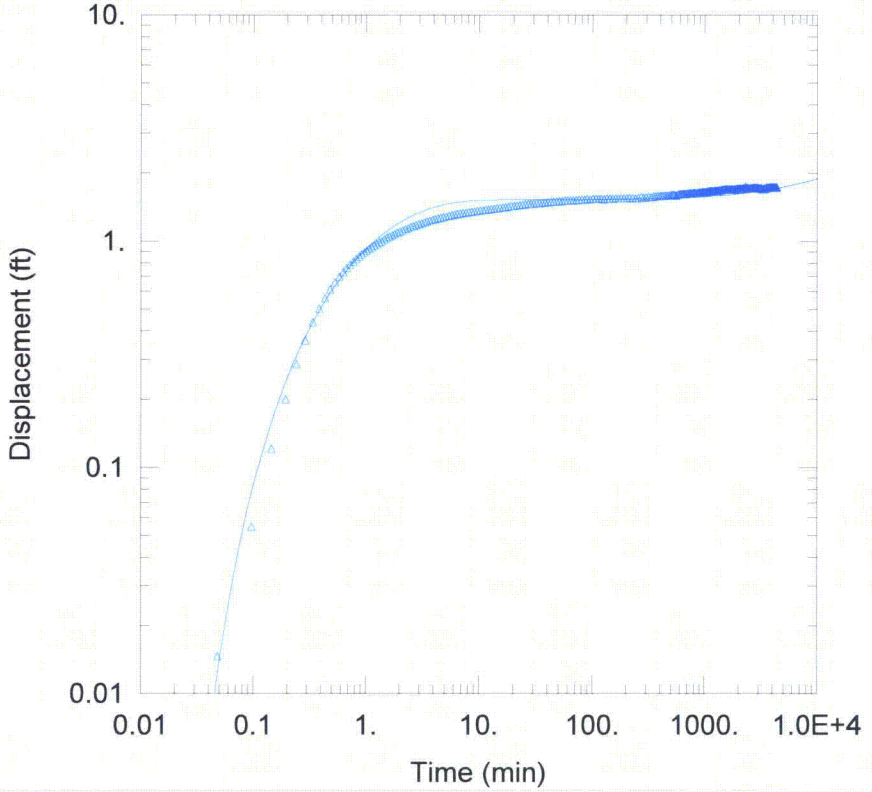
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-02	89.33	0



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-03.aqt
Date: 02/07/08 Time: 15:42:56

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.902E+5 gal/day/ft
S = 0.0007276
Sy = 1.253
ß = 0.06

AQUIFER DATA

Saturated Thickness: 80. ft

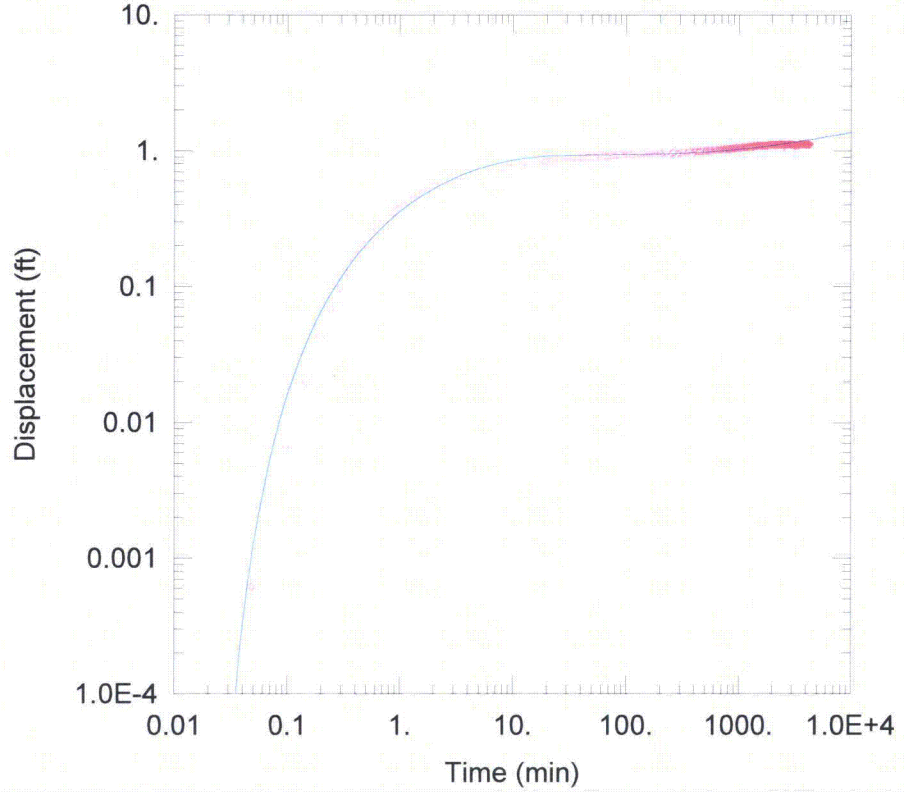
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-03	177.83	0



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-04.aqt
Date: 02/07/08 Time: 15:43:09

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 1.008E+6 gal/day/ft
S = 0.0005443
Sy = 0.06939
ß = 0.03

AQUIFER DATA

Saturated Thickness: 80. ft

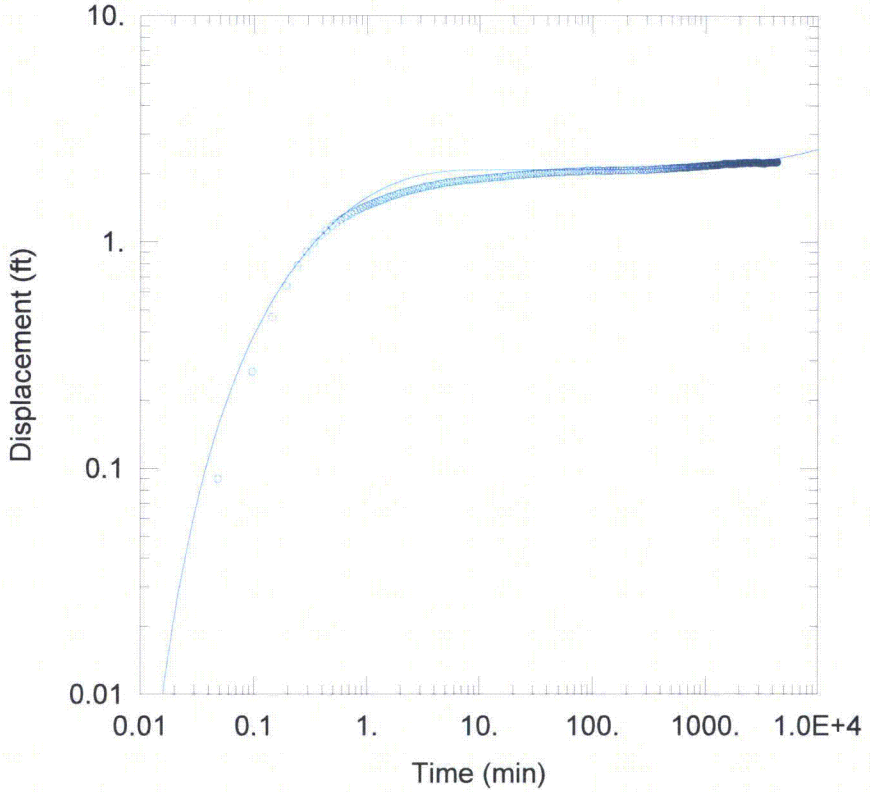
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-04	358.75	0



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-05.aqt
Date: 02/07/08 Time: 15:43:23

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.48E+5 gal/day/ft
S = 0.0007386
Sy = 1.388
ß = 0.03

AQUIFER DATA

Saturated Thickness: 80. ft

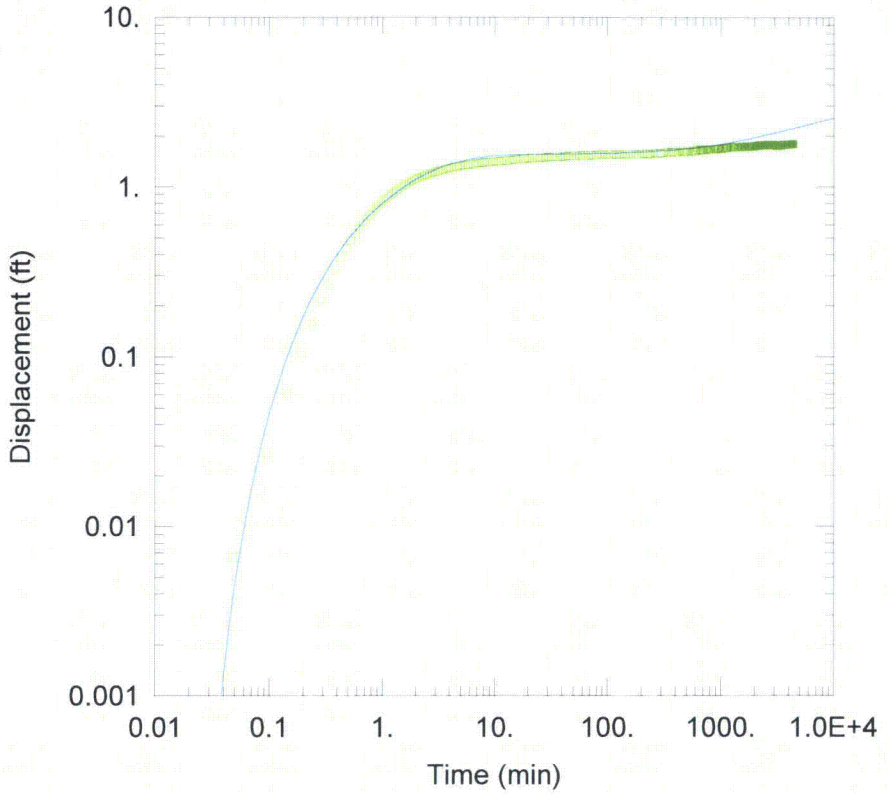
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-05	0	100.17



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-06.aqt
Date: 02/07/08 Time: 15:43:38

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.854E+5 gal/day/ft
S = 0.001388
Sy = 0.3069
ß = 0.06

AQUIFER DATA

Saturated Thickness: 80. ft

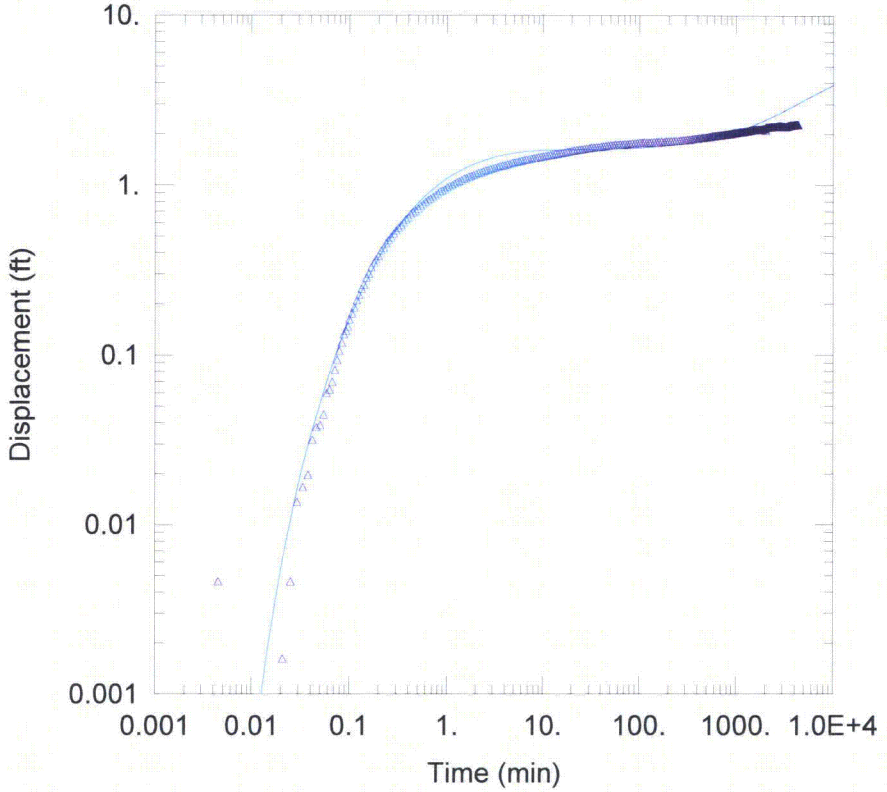
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-06	0	150.17



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-S1.aqt
Date: 02/07/08 Time: 15:43:53

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 1.982E+5 gal/day/ft
S = 0.000545
Sy = 0.5037
ß = 0.01

AQUIFER DATA

Saturated Thickness: 80. ft

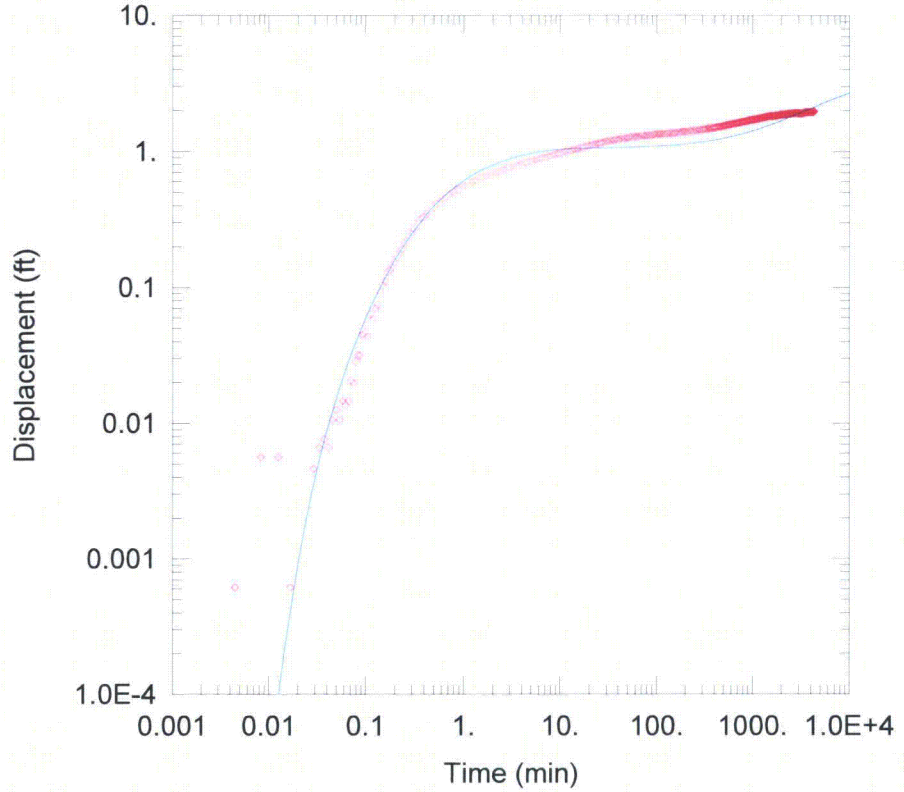
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ OB02-S1	0	55.33



TW-02 CONSTANT RATE TEST

Data Set: J:\...\OB02-S2.aqt
Date: 02/07/08 Time: 15:44:55

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 3.032E+5 gal/day/ft
S = 0.0003777
Sy = 0.1898
ß = 0.01

AQUIFER DATA

Saturated Thickness: 80. ft

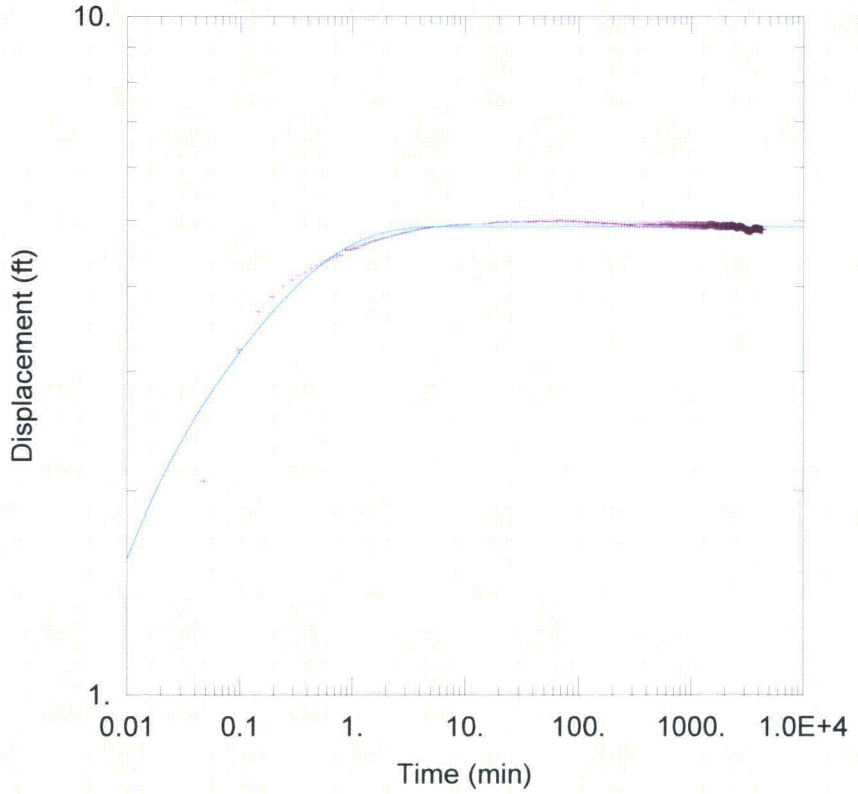
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
OB02-S2	99.5	0



TW-02 CONSTANT RATE TEST

Data Set: J:\...\FMW-11.aqt
Date: 02/07/08 Time: 15:46:51

PROJECT INFORMATION

Company: Burns & McDonnell
Client: Ameren Corporation
Project: 46691
Location: Callaway County, Missouri
Test Well: TW-02
Test Date: November 14, 2007

SOLUTION

Aquifer Model: Unconfined
Solution Method: Neuman

T = 4.094E+5 gal/day/ft
S = 0.0006612
Sy = 1730.2
ß = 0.001

AQUIFER DATA

Saturated Thickness: 80. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW-02	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
FMW-11	0	-13.83

APPENDIX E

PROJECTED COLLECTOR WELL YIELD ESTIMATE

Horizontal Collector Well Yield – Site 1

The yield of a horizontal collector well is a function of design (number and length of laterals), aquifer hydraulics (transmissivity, storativity, saturated thickness and areal extent) and recharge.
Based upon the recent hydrogeological investigation conducted, sites along the Missouri River near Calloway, Missouri would be favorable for development using a horizontal collector well. Evaluation of the aquifer testing indicates that the aquifer transmissivity near the test pumping well is in the range of 450,000 gpd/ft (57 ° F), with a saturated aquifer thickness of about 75 feet. The estimated yield of a horizontal collector well at the site was calculated using the following equation (Hantush and Papadopulos) and assumptions.

$$s_{cs} \geq \left(\frac{Q}{2\pi Kb}\right) \mathrm{Ln}\left[\frac{\Gamma^{\Gamma}}{\varepsilon^{\varepsilon}}\left(\frac{\left(\frac{b}{\pi r_w}\right)^2}{2\left(1 - \cos\frac{\pi}{b}\left(2z_i + r_w\right)\right)}\right)^{\frac{b}{\pi l}}\right]$$

where:

s_{cs}	=	Drawdown in collector well, ft
Q	=	Yield of collector, gpd
K	=	Hydraulic Conductivity, gpd/ft^2
b	=	Saturated thickness of aquifer, ft
Γ	=	$(2\ (a - r_c))/l$
a	=	Effective distance to a line of recharge, ft
l	=	Average length of laterals, ft
r_c	=	Radius of collector caisson, ft
ε	=	$(2a - r_c - l)/l$
r_w	=	Effective radius of each lateral, ft
z_i	=	Depth of lateral below static water level, ft

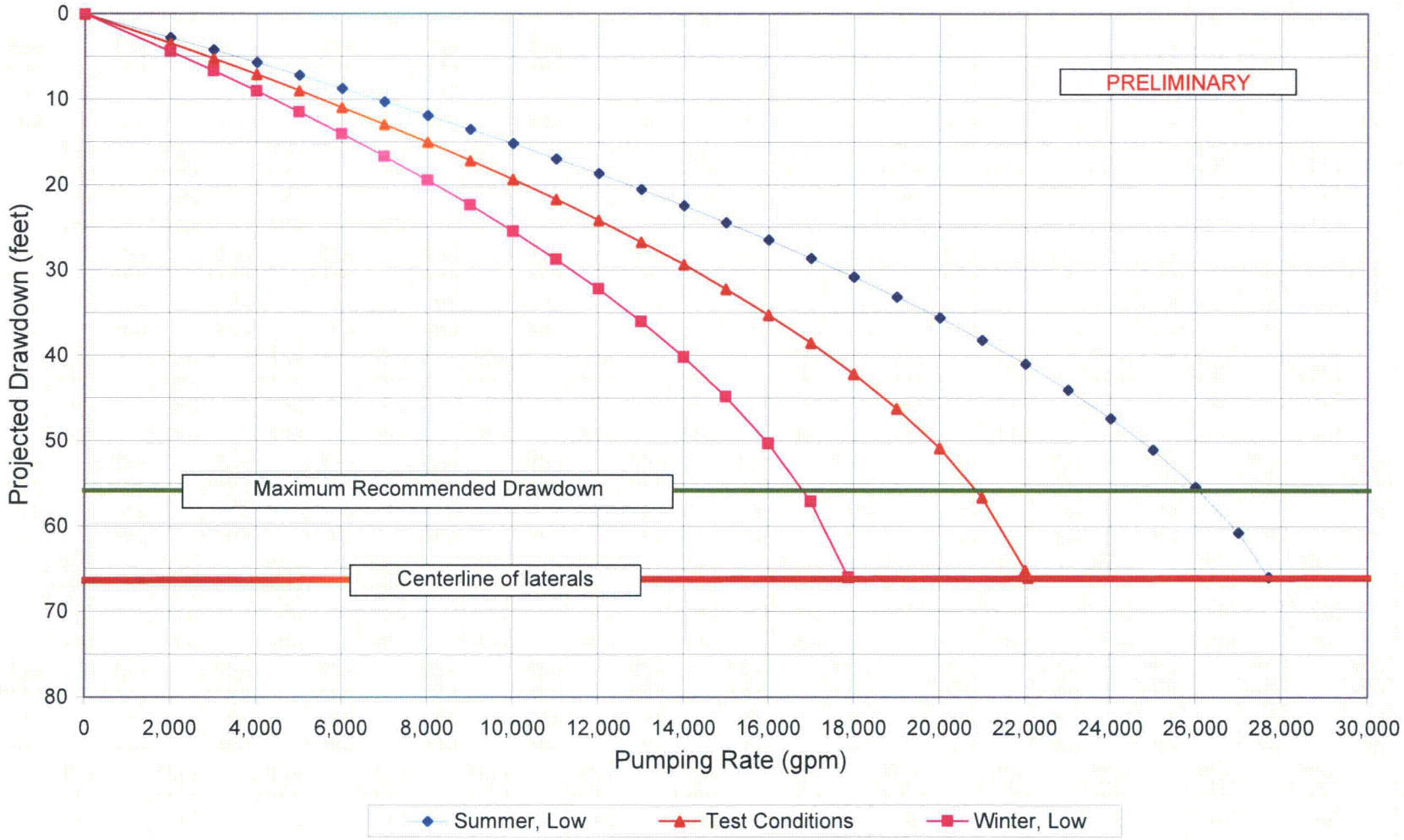
Using site-specific information and a variation of the above equation, the yields of a collector well at the test site was calculated using the following assumptions:

Top of Aquifer Elevation	25 feet below grade
Base of Aquifer	100 feet below grade
Centerline of Laterals	92 feet below grade
Inside Diameter of Caisson	20 feet
Static Water Level (test, low conditions)	20 feet below grade
Transmissivity	450,000 gpd/ft (57 ° F)
Hydraulic Conductivity	6,000 gpd/ft^2 (57 ° F)
Radius of Laterals	0.5 ft
Design distance to line source of recharge	1000 ft (test conditions) 1200 ft (winter, low) 900 FT (summer, low)
Average Lateral Length	200 ft
No. of Laterals	14

Calculated yields under three conditions (Test; Low, Winter - 45 ° F and Summer, Low – 65 ° F) are shown in Figure 1 (attached). As shown on Figure 1, yields between 25 and 40 MGD should be expected at the site from a horizontal collector well.

FIGURE 1

Projected Collector Well Drawdown
Site 1 - Ameren, Callaway, MO



TW-01 Distance to Recharge Boundary Calculations

Q = pumping rate gpm
r = distance from pumping well to obs well
a = distance to effective recharge
s = observed drawdown in obs well

T_c = calculated transmissivity with above parameters

Well No.	Dist	Ddn
OB01-01	44.00	2.985
OB01-02	90.00	2.191
OB01-03	180.00	1.604
OB01-04	362.00	0.888
OB01-05	134.33	1.995
OB01-06	223.25	1.604

Rorabaugh (1956) Parallel Analysis using OB01-02

Q =	1594 gpm	a =	668 feet	
r =	90 feet	$4a^2$		1784896
s =	2.191 feet	r^2		8100
		$4a^2+r^2$		1792996
adjust "a" until "T_c" matches target T		$Sqrt(4a^2+r^2)$		1339.028
T_c =	450,156 gpd/ft	$Sqrt(4a^2+r^2)/r$		14.878
Target T =	450,000 gpd/ft	$log(Sqrt(4a^2+r^2)/r)$		1.173

Rorabaugh (1956) Parallel Analysis using OB01-03

Q =	1594 gpm	a =	643 feet	
r =	180 feet	$4a^2$		1653796
s =	1.604 feet	r^2		32400
		$4a^2+r^2$		1686196
adjust "a" until "T_c" matches target T		$Sqrt(4a^2+r^2)$		1298.536
T_c =	450,039 gpd/ft	$Sqrt(4a^2+r^2)/r$		7.214
Target T =	450,000 gpd/ft	$log(Sqrt(4a^2+r^2)/r)$		0.858

Rorabaugh (1956) Parallel Analysis using OB01-04

Q =	1594 gpm	a =	510 feet	
r =	362 feet	$4a^2$		1040400
s =	0.888 feet	r^2		131044
		$4a^2+r^2$		1171444
adjust "a" until "T_c" matches target T		$Sqrt(4a^2+r^2)$		1082.333
T_c =	450,559 gpd/ft	$Sqrt(4a^2+r^2)/r$		2.990
Target T =	450,000 gpd/ft	$log(Sqrt(4a^2+r^2)/r)$		0.476

Rorabaugh (1956) Perpendicular Analysis using OB01-01 & OB01-05

a_i	465	*adjust a_i until it matches a_j*				
r_1	44 feet	a_j =			$(2a_i+r_2)$	1064.33
r_2	134.33 feet				$(2a_i+r_2)^k$	33824.740
s_1	2.985 feet				(r_1/r_2^k)	0.02878683
s_2	1.995 feet				$r_1/2$	22
k =	s_1/s_2	1.50	a_j=	$(0.5*(2a_i+r_2)^k \times (r_1/r_2^k)) - (r_1/2)$ =		**465** feet

Rorabaugh (1956) Perpendicular Analysis using OB01-01 & OB01-06

a_i	501 feet	*adjust a_i until it matches a_j*				
r_1	44 feet	a_j =			$(2a_i+r_2)$	1225.25
r_2	223.25 feet				$(2a_i+r_2)^k$	558600.697
s_1	2.985 feet				(r_1/r_2^k)	0.00187248
s_2	1.604 feet				$r_1/2$	22
k =	s_1/s_2	1.86	a_j=	$(0.5*(2a_i+r_2)^k \times (r_1/r_2^k)) - (r_1/2)$ =		**501** feet

Rorabaugh (1956) Perpendicular Analysis using OB01-05 & OB01-06

a_i	565 feet	*adjust a_i until it matches a_j*				
r_1	134.33 feet	a_j =			$(2a_i+r_2)$	1353.25
r_2	223.25 feet				$(2a_i+r_2)^k$	7846.938
s_1	1.995 feet				(r_1/r_2^k)	0.16100042
s_2	1.604 feet				$r_1/2$	67.165
k =	s_1/s_2	1.24	a_j=	$(0.5*(2a_i+r_2)^k \times (r_1/r_2^k)) - (r_1/2)$ =		**565** feet

Average Parallel a =	607
Average Perpendicular a =	510
Average a =	559

TW-02 Distance to Recharge Boundary Calculations

Q = pumping rate gpm
r = distance from pumping well to obs well
a = distance to effective recharge
s = observed drawdown in obs well

T_c = calculated transmissivity with above parameters

Well No.	Dist	Ddn
OB02-01	45.67	3.008
OB02-02	89.33	2.869
OB02-03	177.83	1.731
OB02-04	358.75	1.118
OB02-05	100.17	2.249
OB02-06	150.17	1.793

Rorabaugh (1956) Parallel Analysis using OB02-02

Q =	1906 gpm	a =	**617**	feet
r =	89.33 feet	$4a^2$	1522756	
s =	2.869 feet	r^2	7979.8489	
		$4a^2+r^2$	1530735.849	
adjust "a" until "T_c" matches target T		$Sqrt(4a^2+r^2)$	1237.229	
T_c =	400,163 gpd/ft	$Sqrt(4a^2+r^2)/r$	13.850	
Target T =	400,000 gpd/ft	$log(Sqrt(4a^2+r^2)/r)$	1.141	

Rorabaugh (1956) Parallel Analysis using OB02-03

Q =	1906 gpm	a =	**425**	feet
r =	177.83 feet	$4a^2$	722500	
s =	1.731 feet	r^2	31623.5089	
		$4a^2+r^2$	754123.5089	
adjust "a" until "T_c" matches target T		$Sqrt(4a^2+r^2)$	868.403	
T_c =	400,178 gpd/ft	$Sqrt(4a^2+r^2)/r$	4.883	
Target T =	400,000 gpd/ft	$log(Sqrt(4a^2+r^2)/r)$	0.689	

Rorabaugh (1956) Parallel Analysis using OB02-04

Q =	1906 gpm	a =	**466**	feet
r =	358.75 feet	$4a^2$	868624	
s =	1.118 feet	r^2	128701.5625	
		$4a^2+r^2$	997325.5625	
adjust "a" until "T_c" matches target T		$Sqrt(4a^2+r^2)$	998.662	
T_c =	400,003 gpd/ft	$Sqrt(4a^2+r^2)/r$	2.784	
Target T =	400,000 gpd/ft	$log(Sqrt(4a^2+r^2)/r)$	0.445	

Rorabaugh (1956) Perpendicular Analysis using OB02-01 & OB02-05

a_i	369	*adjust a_i until it matches a_j*				
r_1	45.67 feet		a_j =		$(2a_i+r_2)$	838.17
r_2	100.17 feet				$(2a_i+r_2)^k$	8126.583
s_1	3.008 feet				(r_1/r_2^k)	0.09631141
s_2	2.249 feet				$r_1/2$	22.835
k =	s_1/s_2	1.34	a_j=	$(0.5*(2a_i+r_2)^k \times (r_1/r_2^k)) - (r_1/2)$ =		**369** feet

Rorabaugh (1956) Perpendicular Analysis using OB02-01 & OB02-06

a_i	266 feet	*adjust a_i until it matches a_j*				
r_1	45.67 feet		a_j =		$(2a_i+r_2)$	682.17
r_2	150.17 feet				$(2a_i+r_2)^k$	56785.590
s_1	3.008 feet				(r_1/r_2^k)	0.01018869
s_2	1.793 feet				$r_1/2$	22.835
k =	s_1/s_2	1.68	a_j=	$(0.5*(2a_i+r_2)^k \times (r_1/r_2^k)) - (r_1/2)$ =		**266** feet

Rorabaugh (1956) Perpendicular Analysis using OB02-05 & OB02-06

a_i	167 feet	*adjust a_i until it matches a_j*				
r_1	100.17 feet		a_j =		$(2a_i+r_2)$	484.17
r_2	150.17 feet				$(2a_i+r_2)^k$	2332.668
s_1	2.249 feet				(r_1/r_2^k)	0.18646645
s_2	1.793 feet				$r_1/2$	50.085
k =	s_1/s_2	1.25	a_j=	$(0.5*(2a_i+r_2)^k \times (r_1/r_2^k)) - (r_1/2)$ =		**167** feet

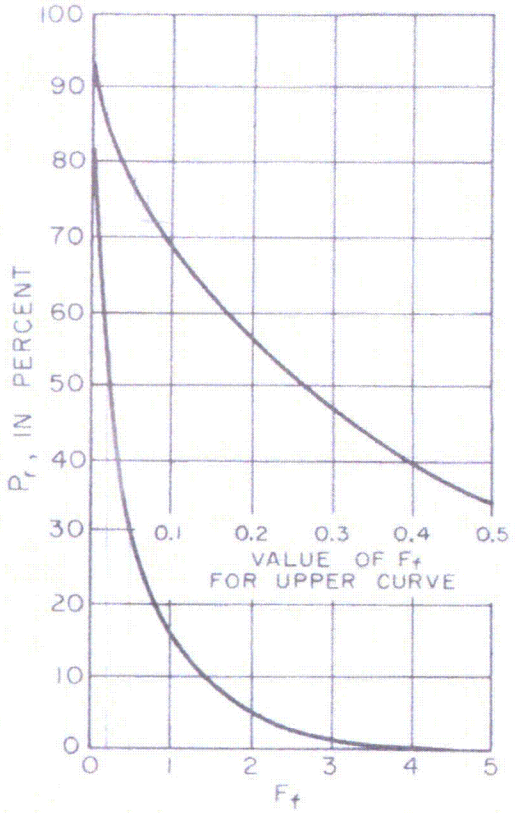
Average Parallel a =	503
Average Perpendicular a =	267
Average a =	385

TW-01 River Recharge Ratio Calculation

$F_f = 1.87a^2S/Tt$

a =	1000	feet	*distance from pumped well to recharge boundary*
S =	0.178		*Coefficient of Storage*
T =	450000	gpd/ft	*Transmissivity*
t =	24	days	*time after pumping started*
Pr =	85	%	*percentage of pumped water delivered from recharge source after t days*

	t (days)								
a (ft)	1	3	5	10	20	24	30	60	90
400	0.1184	0.0395	0.0237	0.0118	0.0059	0.0049	0.0039	0.0020	0.0013
450	0.1498	0.0499	0.0300	0.0150	0.0075	0.0062	0.0050	0.0025	0.0017
500	0.1849	0.0616	0.0370	0.0185	0.0092	0.0077	0.0062	0.0031	0.0021
550	0.2238	0.0746	0.0448	0.0224	0.0112	0.0093	0.0075	0.0037	0.0025
600	0.2663	0.0888	0.0533	0.0266	0.0133	0.0111	0.0089	0.0044	0.0030
650	0.3125	0.1042	0.0625	0.0313	0.0156	0.0130	0.0104	0.0052	0.0035
700	0.3624	0.1208	0.0725	0.0362	0.0181	0.0151	0.0121	0.0060	0.0040
750	0.4161	0.1387	0.0832	0.0416	0.0208	0.0173	0.0139	0.0069	0.0046
800	0.4734	0.1578	0.0947	0.0473	0.0237	0.0197	0.0158	0.0079	0.0053
850	0.5344	0.1781	0.1069	0.0534	0.0267	0.0223	0.0178	0.0089	0.0059
900	0.5991	0.1997	0.1198	0.0599	0.0300	0.0250	0.0200	0.0100	0.0067
950	0.6676	0.2225	0.1335	0.0668	0.0334	0.0278	0.0223	0.0111	0.0074
1000	0.7397	0.2466	0.1479	0.0740	0.0370	0.0308	0.0247	0.0123	0.0082
1050	0.8155	0.2718	0.1631	0.0816	0.0408	0.0340	0.0272	0.0136	0.0091
1100	0.8950	0.2983	0.1790	0.0895	0.0448	0.0373	0.0298	0.0149	0.0099
1150	0.9782	0.3261	0.1956	0.0978	0.0489	0.0408	0.0326	0.0163	0.0109
1200	1.0652	0.3551	0.2130	0.1065	0.0533	0.0444	0.0355	0.0178	0.0118
1250	1.1558	0.3853	0.2312	0.1156	0.0578	0.0482	0.0385	0.0193	0.0128
1300	1.2501	0.4167	0.2500	0.1250	0.0625	0.0521	0.0417	0.0208	0.0139
1350	1.3481	0.4494	0.2696	0.1348	0.0674	0.0562	0.0449	0.0225	0.0150
1400	1.4498	0.4833	0.2900	0.1450	0.0725	0.0604	0.0483	0.0242	0.0161

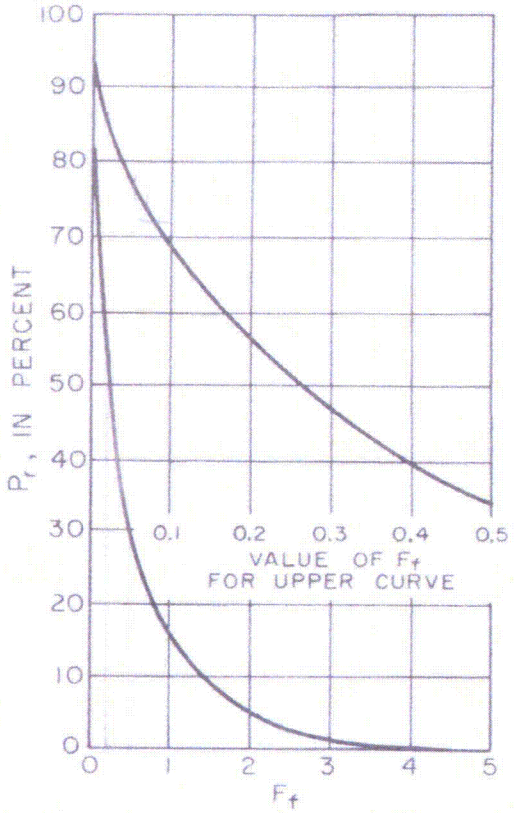


TW-02 River Recharge Ratio Calculation

$F_f = 1.87a^2S/Tt$

a =	825	feet	*distance from pumped well to recharge boundary*
S =	0.208		*Coefficient of Storage*
T =	400000	gpd/ft	*Transmissivity*
t =	23	days	*time after pumping started*
Pr =	85	%	*percentage of pumped water delivered from recharge source after t days*

	t (days)								
a (ft)	1	3	5	10	20	23	30	60	90
400	0.1556	0.0519	0.0311	0.0156	0.0078	0.0068	0.0052	0.0026	0.0017
450	0.1969	0.0656	0.0394	0.0197	0.0098	0.0086	0.0066	0.0033	0.0022
500	0.2431	0.0810	0.0486	0.0243	0.0122	0.0106	0.0081	0.0041	0.0027
550	0.2942	0.0981	0.0588	0.0294	0.0147	0.0128	0.0098	0.0049	0.0033
600	0.3501	0.1167	0.0700	0.0350	0.0175	0.0152	0.0117	0.0058	0.0039
650	0.4108	0.1369	0.0822	0.0411	0.0205	0.0179	0.0137	0.0068	0.0046
700	0.4765	0.1588	0.0953	0.0476	0.0238	0.0207	0.0159	0.0079	0.0053
750	0.5470	0.1823	0.1094	0.0547	0.0273	0.0238	0.0182	0.0091	0.0061
800	0.6223	0.2074	0.1245	0.0622	0.0311	0.0271	0.0207	0.0104	0.0069
850	0.7026	0.2342	0.1405	0.0703	0.0351	0.0305	0.0234	0.0117	0.0078
900	0.7876	0.2625	0.1575	0.0788	0.0394	0.0342	0.0263	0.0131	0.0088
950	0.8776	0.2925	0.1755	0.0878	0.0439	0.0382	0.0293	0.0146	0.0098
1000	0.9724	0.3241	0.1945	0.0972	0.0486	0.0423	0.0324	0.0162	0.0108
1050	1.0721	0.3574	0.2144	0.1072	0.0536	0.0466	0.0357	0.0179	0.0119
1100	1.1766	0.3922	0.2353	0.1177	0.0588	0.0512	0.0392	0.0196	0.0131
1150	1.2860	0.4287	0.2572	0.1286	0.0643	0.0559	0.0429	0.0214	0.0143
1200	1.4003	0.4668	0.2801	0.1400	0.0700	0.0609	0.0467	0.0233	0.0156
1250	1.5194	0.5065	0.3039	0.1519	0.0760	0.0661	0.0506	0.0253	0.0169
1300	1.6434	0.5478	0.3287	0.1643	0.0822	0.0715	0.0548	0.0274	0.0183
1350	1.7722	0.5907	0.3544	0.1772	0.0886	0.0771	0.0591	0.0295	0.0197
1400	1.9059	0.6353	0.3812	0.1906	0.0953	0.0829	0.0635	0.0318	0.0212



Preliminary Lateral Design

25.2 MGD =	17500 gpm =	2340 ft3/m
37.8 MGD =	26250 gpm =	3509 ft3/m

Screen Model = Johnson 12P
Screen OD = 12.68 inches
Wire Width = 0.152 inches

Design point is 40% retained for natural gravel pack
Based on average of grain size analysis from the FMW-06 through FMW-10 samples

x 40% Retained Grain Size (FMW-07) =	2.17 mm	=	0.085 inches
Average 40% Retained Grain Size =	1.50 mm	=	0.059 inches
n 40% Retained Grain Size (FMW-07) =	1.02 mm	=	0.040 inches

Results in 0.100 inch slot size

Open Area = slot size/(slot + wire width) = 39.7 %
Inlet Area = 37.7 x OD x OA = 189.70 sq in/ft of screen

No. of Laterals = 14
Lateral Screen Length = 190 feet
Total Screen Length = 2660 feet

Screen 50% plugged = 94.85 in2/ft

94.85 in2/ft x 2660 feet = 252296.8 in2 = 1752.1 ft2

Entrance Velocities

3509 ft3/m /	1752.1 ft2 =	**2.00** fpm
2340 ft3/m /	1752.1 ft2 =	**1.34** fpm

Mechanical Capacity at 2.0 feet per minute

Screen Size (inches)	Open Area	Inlet Area (in2/ft)	50% Plug (in2/ft)	Feet of Screen No. of Laterals 12	14	Mech Cap @ 2.0 fpm (MGD) No. of Laterals 6	8
0.01	0.062	29.51	14.75	2280	2660	5.0	5.9
0.02	0.116	55.59	27.79	2280	2660	9.5	11.1
0.03	0.165	78.80	39.40	2280	2660	13.4	15.7
0.04	0.208	99.59	49.80	2280	2660	17.0	19.8
0.05	0.248	118.33	59.16	2280	2660	20.2	23.5
0.06	0.283	135.29	67.65	2280	2660	23.1	26.9
0.07	0.315	150.73	75.37	2280	2660	25.7	30.0
0.08	0.345	164.84	82.42	2280	2660	28.1	32.8
0.09	0.372	177.78	88.89	2280	2660	30.3	35.4
0.1	0.397	189.70	94.85	2280	2660	32.4	37.7

06-5627.01
G-15150

MANAGEMENT SUMMARY
PHASE I ARCHAEOLOGICAL SURVEY

BLOWDOWN DISCHARGE PIPELINE
CALLAWAY NUCLEAR PLANT
CALLAWAY COUNTY, MISSOURI

By:
LaDonna A. Rogers
J. Emmett Brown

Prepared For:
PAUL C. RIZZO ASSOCIATES, INC.
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Prepared By:

MACTEC Engineering and Consulting, Inc.
Knoxville, Tennessee

J. Emmett Brown, RPA
Stephen C. Cole, Ph.D., RPA
Principal Investigators

August 31, 2007

MACTEC Project 3250075219 Task 01.21

ABSTRACT

MACTEC Engineering and Consulting, Inc. (MACTEC) carried out a Phase I archaeological survey along the proposed blowdown discharge pipeline on the Callaway Nuclear Power Facility in Callaway County, Missouri. The survey consisted of the excavation of 113 shovel tests, five backhoe trenches, and a pedestrian survey. No sites were identified during the survey. Additionally, this survey recorded no historic structures within the project area. Therefore, we recommend no additional cultural resources work in the study area prior to the installation of the proposed blowdown discharge pipeline.

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LIST OF FIGURES

I. INTRODUCTION

MACTEC Engineering and Consulting, Inc. (MACTEC) was contracted by Paul C. Rizzo Associates, Inc. to perform a Phase I archaeological survey for the placement of a discharge pipeline at the Callaway Nuclear Power Facility in Callaway County, Missouri. The proposed discharge pipeline will be placed approximately 20 feet east of an existing pipeline for the majority of the corridor until it nears the river where it will be located 20 feet to the north of the existing pipeline. The proposed new pipeline will extend an estimated 6.0 miles until it reaches its terminus at a new intake on the Missouri River. A segment of the proposed discharge pipeline will be placed within the present property boundaries of the facility while approximately 0.9 miles will be placed outside the facility's property boundaries. The area of potential effect (APE) extends from the point where the proposed pipeline crosses the Katy Trail southeastward to the Missouri River where it terminates (Figure 1). This new location constituted the study area and was the focus of the current Phase I archaeological investigation. A Phase I archaeological survey was previously carried out within the property boundaries owned by AmerenUE, and the results of this survey were reported in 1984 (Ray et al. 1984). The area in which the 1984 survey was conducted is situated primarily within the uplands and the current Phase I investigation did not resurvey this area. However, one previously identified site in the uplands, Site 23CY352, was reassessed due to the proximity of the proposed pipeline corridor to the known site boundaries.

The goal of this survey was to locate and identify archaeological resources within the APE and to evaluate the eligibility of any encountered sites for inclusion on the National Register of Historic Places (NRHP). The field survey began on July 9, 2007 and was completed on July 13, 2007. J. Emmett Brown and Stephen C. Cole served as Principal Investigators (Archaeologists in General Charge) and LaDonna A. Rogers served as Field Director (Archaeologist in Direct Charge) for the project. MACTEC Principal review was provided by Mr. Patrick H. Garrow. Ms. Rogers was assisted in the field by MACTEC employees Amanda M. Barton and Chad Caswell. Trenches were excavated using a backhoe, which was operated by Drew Kirby, of MACTEC's St. Louis, Missouri office. These trenches were excavated so that a soil analysis could be carried out by James J. Kocis from the Archaeological Research Lab at the University of Tennessee in Knoxville, Tennessee. Maria M. Tavaszi monitored drilling that was carried out around Site 23CY352.

PROJECT LOCATION AND SETTING

The APE is located approximately 100 miles from St. Louis and 18 miles from the town of Fulton, and consists of a corridor 2.1 miles in length and 30 meters in width. At the time of the survey, most of the APE was planted in soybeans and corn. Surface visibility in the soybean fields was less than 15 percent, but in the cornfield at the southernmost section of the study area visibility was greater than 25 percent.

Study Area Boundary

The northern limit of the current study area is defined by the Katy Trail, which is the approximate southern limit of the 1984 survey, and the southern limit of the current study area is defined by the Missouri River where the pipeline terminates.

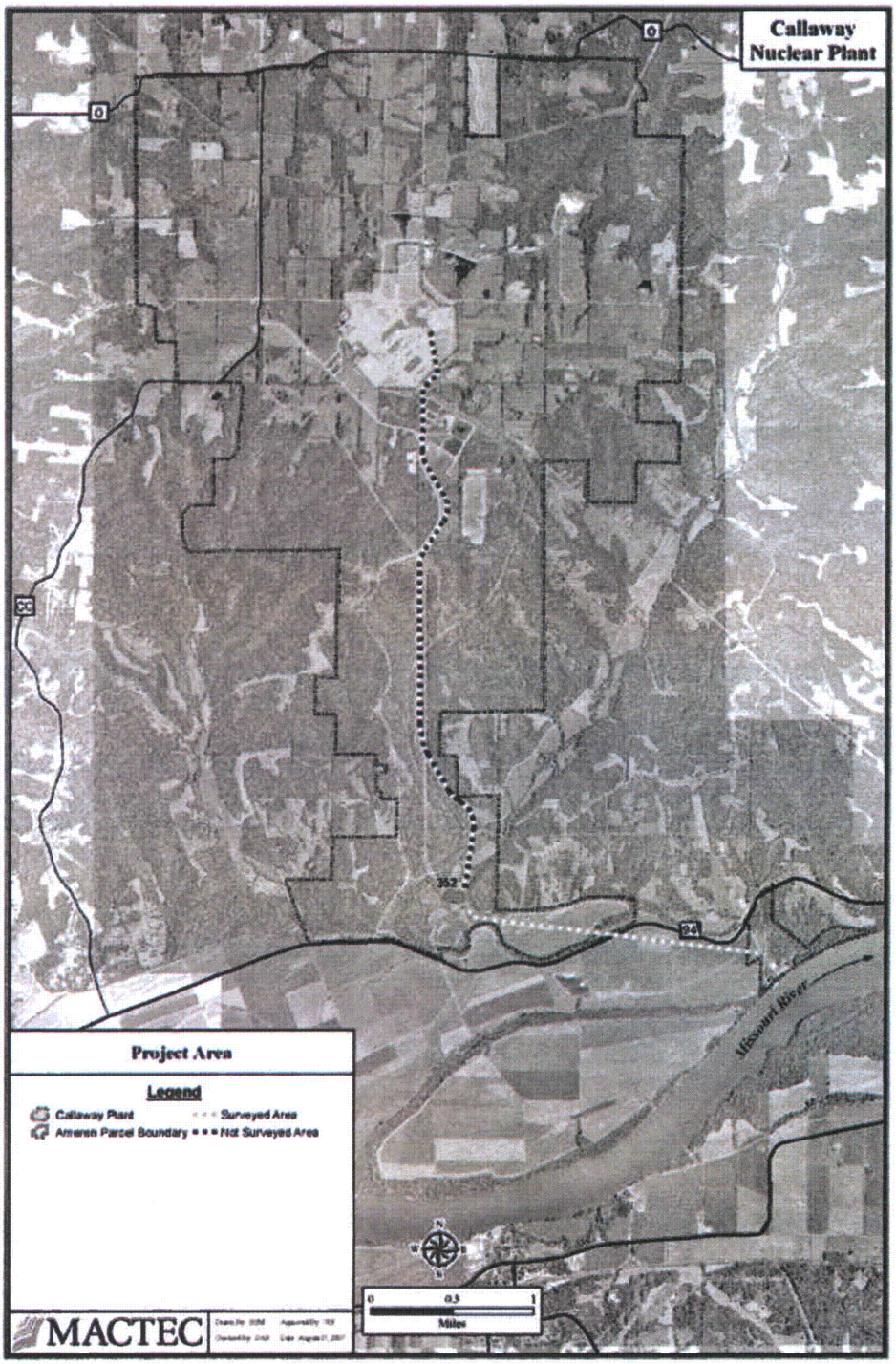


Figure 1. Project Area Location Map

II. METHODS

Background Research

A review of records on file at the Historic Preservation Program, Missouri Department of Natural Resources in Jefferson City was conducted. The United States Geological Survey (USGS) quadrangle map on file was consulted to see whether any archaeological sites have been recorded within one mile of the study area. All reports of cultural resource investigations in Callaway County were examined to determine whether they included any areas in or near the study area. Additional sources in the library of the Cultural Resources Office at MACTEC were consulted for general environmental, historical, and archaeological background.

Field Methods

The Phase I survey began with a driving and pedestrian tour of the project area to examine the terrain and ground cover. In general, the project area is used for agricultural purposes and ground cover varied between corn and soybeans. However, in areas adjacent to water sources and in the northern part of the project area where the elevation rises, hardwoods are prevalent. The field methodology was outlined in a study plan that was submitted to and approved by Judith Deel of the Missouri State Preservation Office.

Shovel Testing

Shovel tests were excavated at 15-meter intervals along one transect that was located at a distance of 20 feet from the existing pipeline's centerline. Each shovel test was approximately 30 centimeters (cm) in diameter and was excavated to sterile subsoil by natural strata or to a maximum of 80 cm below surface. Shovel test depths and soils were recorded on Shovel Test Forms designed by MACTEC. Soil colors and textures were assigned using Munsell color charts. All soils were screened through 0.25-inch (0.6 cm) wire hardware cloth. Color photographs were taken at the beginning of the transect, at the end of the transect, and in areas that were found to be representative of the terrain and ground cover.

Pedestrian Survey

The southernmost part of the transect ran through a cornfield before it continued to the Missouri River. Since the visibility within the cornfield exceeded 25 percent (Figure 2), this part of the project area was investigated by pedestrian survey with crew spaced five meters apart.

The study area was recorded by color photographs that show representative terrain and ground cover.

Figure 2. Surface visibility within the southern portion of the project area.

Geoarchaeological Investigation

A total of five backhoe trenches were excavated in areas selected by James J. Kocis of the University of Tennessee's Archaeological Research Laboratory. Each backhoe trench was excavated to the proposed depth of the new pipeline, approximately eight to nine feet and below surface. Each trench was stepped at four feet following Occupational Safety and Health Administration (OSHA) regulations. In addition to OSHA regulations, a safety officer from the Callaway Nuclear Power Facility was on site to ensure the safety of each trench prior to data gathering by Mr. Kocis. Each trench was recorded, which includes representative soil profiles from each trench. No artifacts or cultural features were identified during the deep testing and the majority of the soil was identified as historic alluvial deposits.

Reassessment of Site 23CY352

The discharge pipeline will be placed near the established boundaries of Site 23CY352, which was previously identified during the 1984 investigation (Ray et al. 1984). This site

was described as a moderate concentration of lithic artifacts and ceramic sherds recovered from the surface of a plowed field as well as from shovel tests. Ray et al. (1984) dated the site to the Late Woodland Period, Boone Phase, based on the recovery of sand- and grit-tempered pottery. Although the proposed pipeline is designed to avoid Site 23CY352, two soil borings were placed near the site to ensure that the pipeline will avoid Site 23CY352. Cultural material was not observed from these two soil borings, and based on this evidence, the proposed discharge pipeline will not adversely affect Site 23CY352.

Lab Methods

No artifacts were recovered through the Phase I survey that was carried out along the proposed location of the blowdown discharge pipeline at Callaway Nuclear Plant. Therefore, no artifacts were processed. Shovel test data were transferred from written field notes into tabular form. All field notes, field drawings and photographs are being held at MACTEC's Knoxville, Tennessee office. When the final curation facility has been selected, all documents will be prepared in accordance with that facility's curation standards.

III. RESULTS

As a result of the Phase I survey of the proposed location of the blowdown discharge pipeline at the Callaway Nuclear Power Facility, 113 shovel tests were excavated to an approximate depth of 80 cm below surface and an additional 14 shovel tests were not excavated due to disturbances such as road or levee construction. The geoarchaeological analysis of five trenches revealed that historic alluvial deposits are found across the study area and that they are at least eight to nine feet below surface. Since there was adequate visibility in the cornfield in the southeastern part of the project area (>25 percent), a pedestrian survey was carried out through this cornfield. Cultural material was not recorded through shovel testing, geoarchaeological analysis or pedestrian survey.

In conclusion, no new archaeological sites were identified through the Phase I survey that was carried out along the proposed blowdown discharge pipeline on the Callaway Nuclear Power Facility in Callaway County, Missouri. Therefore, additional archaeological investigations are not recommended.

IV. CONCLUSIONS AND RECOMMENDATIONS

A Phase I archaeological survey was carried out between July 9 and July 13, 2007 along the proposed location for the blowdown discharge pipeline at the Callaway Nuclear Power Facility in Callaway County, Missouri. The proposed project will involve digging a trench in which to lay new pipe alongside the existing pipeline on the property. A total of 113 shovel tests and 5 backhoe trenches were excavated and pedestrian survey was carried out, all of which did not produce archaeological material. Therefore, we do not recommend any further testing along the proposed site of the pipeline.

V. REFERENCES CITED

Ray, Jack H., Edward M. Morin, Michael J. McNerney and Gail White
1984 FINAL DRAFT REPORT A Phase I Cultural Resources Survey and Assessment on Residual Lands at Union Electric Company's Callaway Nuclear Power Plant, Callaway County, Missouri, prepared for Nuclear Regulatory Commission and Union Electric Company, prepared by American Resources Group, Ltd., Carbondale, Illinois, CRM Report #52.

06-3624.0;
G-23

LETTER REPORT OF CULTURAL RESOURCES MONITORING INSTALLATION OF TEST WELLS CALLAWAY NUCLEAR POWER FACILITY CALLAWAY COUNTY, MISSOURI

By:
LaDonna A. Rogers

Prepared For:

PAUL C. RIZZO ASSOCIATES, INC.
Monroeville, Pennsylvania

Prepared By:

MACTEC
MACTEC Engineering and Consulting, Inc.
Knoxville, Tennessee

MACTEC Project 3250-07-5219 Task 06.21

September 4, 2007

G-16

MACTEC

engineering and constructing a better tomorrow

September 4, 2007

Melissa Dubinsky
Paul C. Rizzo Associates, Inc.
105 Mall Boulevard
Suite 270-E
Monroeville, PA 15146

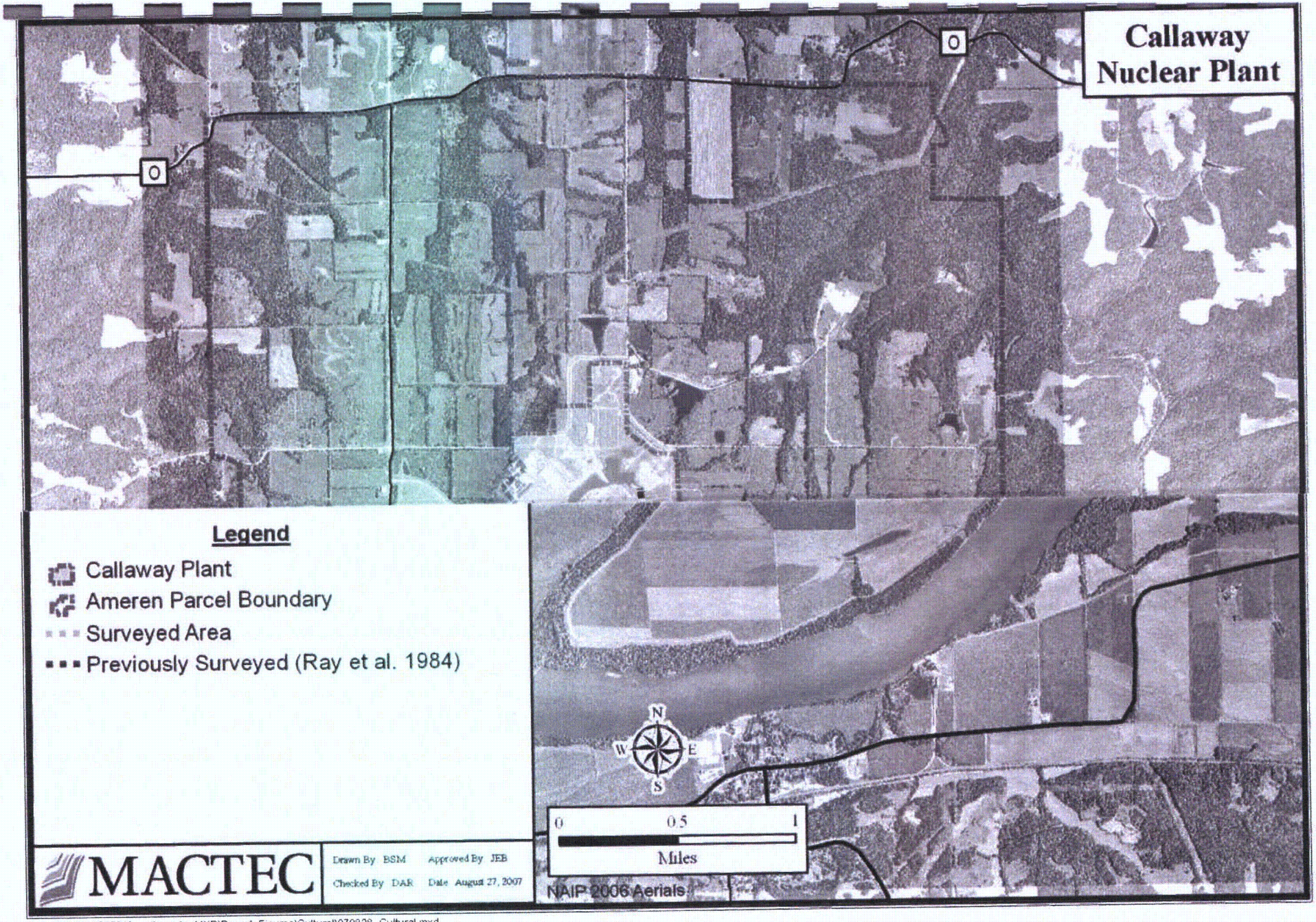
Subject: **Letter Report of Cultural Resources Monitoring**
Installation of Test Wells
Callaway Nuclear Power Facility
Callaway County, Missouri
MACTEC Project 3250-07-5219 Task 06.21

Dear Melissa:

We are pleased to submit this letter report of our archaeological investigation for the above-referenced project.

Introduction

MACTEC Engineering and Consulting, Inc. (MACTEC) was contracted by Paul C. Rizzo Associates, Inc. to perform cultural resources monitoring of soil borings that will be used for the placement of horizontal wells at the Callaway Nuclear Power Facility in Callaway County, Missouri. This task was carried out between July 15 and August 12, 2007, with MACTEC archaeologist, Maria M. Tavaszi, monitoring the soil borings. The test wells were drilled in order to carry out a feasibility study for the installation of horizontal intake wells to support the Callaway Nuclear Power Facility Combined License Application (COLA) near Reform in Callaway County, Missouri. The resulting soil borings were monitored as part of a Cultural Resources Discovery Plan that was developed through archaeological background research, an assessment of the geological setting of the project area and approved by the Missouri State Historic Preservation Officer (SHPO). No previously-recorded archaeological sites are located in the study area. The *ABANDONED SHIPWRECKS ON MISSOURI RIVER CHANNEL MAPS OF 1879 AND 1954* (US Army Corps of Engineers, Kansas City District 2000) was consulted to plot the supposed locations of historic shipwrecks to see their spatial relationship to the proposed placement of drilling locations. Several historic shipwrecks occurred on the Mollie Dozier Chute and include the Alert (1840), the Mollie Dozier (1866) and the George Spangler (1879). These shipwrecks are in the vicinity of the project area, but will not be affected by the proposed



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placement of horizontal wells. The GIS map that shows the supposed shipwreck locations and the drilling locations is depicted in Figure 1.

Project and Drilling Locations

The project area is located to the south of the Callaway Nuclear Power Facility, and is within Callaway and Osage counties. The eight monitored drilling sites are labeled FMW1S, FMW1D, FMW5, FMW11, FMW12, FSB2, FSB3A, FSB3B, FSB4, and FSB14 on Figure 1.

Methods

Prior to drilling, Mike Madcharo of Colog conducted magnetometer surveys across the areas planned for soil boring using a G-858 Magmapper by Geometrics. The drilling of the test wells was carried out by Aquadrill. MACTEC archaeologists LaDonna A. Rogers and Maria M. Tavaszi monitored magnetometer surveys while Maria M. Tavaszi monitored the drilling of all soil borings.

Drilling entailed two general techniques. The first 20 feet of soil was collected in five-foot segments in plastic tubing that measured three inches in diameter. The plastic tubing was set into a Continuous Sampling Tool that cored through the center of a Hollow Stem Auger as the auger was drilled into the ground. Below this (from 21 feet below surface to bedrock) soil was collected from the opening of the boring in a bucket in five-foot segments. Monitoring the drilling included a general observation of soils that were disturbed through the auguring process and then a thorough investigation of soils recovered during sampling. Figure 2 shows an example of soil boring. Ground surfaces such as roads or cleared fields within the immediate vicinity of the soil boring locations were surveyed for cultural material.

Results

No cultural material or features were observed during the monitoring of the drilling of the test wells. The magnetometer survey for the drilling location FSB3 indicated a large concentration of ferrous material (see Colog report in Appendix A). As a result the drilling location was moved to FSB3A where a fragment of wood was recovered from approximately 13 feet below surface. Once the wood was encountered, the soil boring site was relocated 10 feet west of the original boring, which resulted in soil boring FSB3B. Analysis of the sample of wood revealed that it was a cored portion of a natural log. Tree rings were evident as was a smooth exterior surface that revealed traces of decomposed bark. The sample of wood measures five centimeters in width and it measures 14 centimeters in length. FSB3B also produced a sample of wood from approximately 13 feet below surface along with natural coal deposits that were observed at 40 and 45 feet below surface. This type of coal was created by depositional stream or river activity and was observed in most of the soil borings. There are natural sources of coal at the headwaters of the Missouri River and as a naturally occurring material; coal is commonly observed during drilling along the Missouri River. In addition to these findings from the soil

borings, 12 wooden pilings were observed in a nearby pond (Figure 3). It is unclear what the pilings represent, and given their close proximity to the soil borings that produced wood samples, they may be associated. Due to the presence of a concentration of ferrous material and the recovery of coal, there is a medium potential for the area around boring sites around FSB3, FSB3A and FSB3B to contain a buried cultural resource. Although this area has been disturbed (a pond is located near FSB3), and is located to the west of known shipwreck locations, additional work in this area should proceed with caution. The magnetometer surveys conducted at the other drilling locations did not produce anomalies that would indicate buried cultural resources.

Conclusions and Recommendations

Magnetometer surveys and soil borings were monitored at the Callaway Nuclear Power Facility in Callaway County, Missouri. A total of 10 soil borings were drilled, producing no cultural material. However, an anomaly of ferrous material was identified via the magnetometer survey at FSB3 and a thin coal deposit was recovered from approximately 40 feet below surface in the same area. Although this is not sufficient evidence to indicate a shipwreck, it does require caution if horizontal wells are to be placed in this area. In light of this, we recommend that the area of the boring site FSB3 be avoided, but do not recommend any further testing in the vicinity of the other boring sites.

This report is intended for the use of Paul C. Rizzo Associates, Ltd. and Burns & McDonnell subject to the terms and conditions agreed upon between MACTEC and Paul C. Rizzo Associates, Ltd. The contents should not be relied upon by another party without the express written consent of MACTEC. This report presents project information, which includes our assessment procedures and our findings, conclusions and recommendations. Use of this report for purposes beyond those reasonably intended by Paul C. Rizzo Associates, Ltd., Burns & McDonnell, and MACTEC will be at the sole risk of the user.

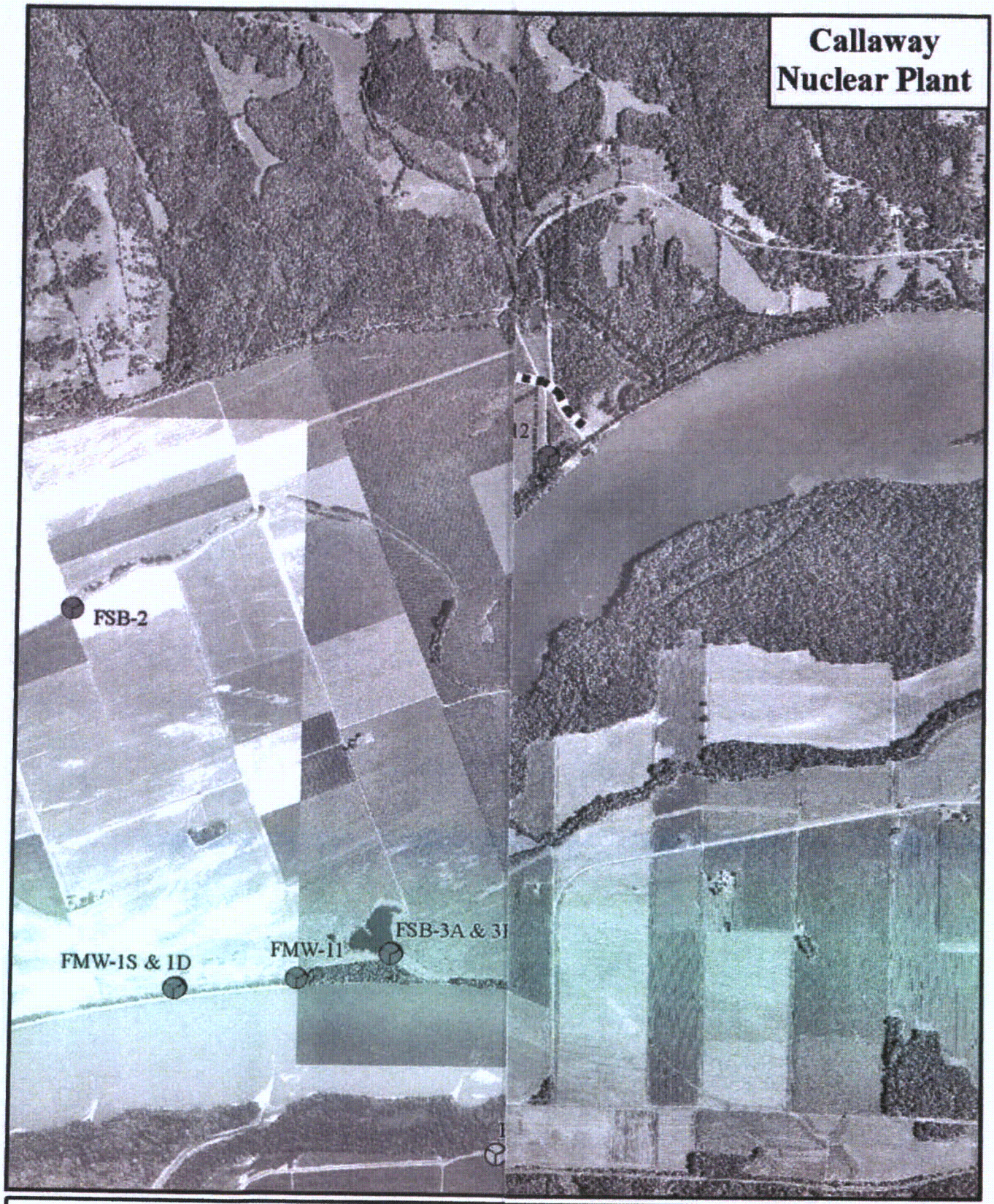
Melissa, we appreciate your selection of MACTEC for this project and we look forward to assisting you with other work. If you have any questions, please contact us at your convenience.

Sincerely,

MACTEC Engineering and Consulting, Inc.

LaDonna A. Rogers
Staff Archaeologist

Patrick H. Garrow, RPA
Principal Scientist



Legend

- Ameren Parcel Boundary
- Proposed Pipeline
- Monitored Sc
- Soil Boring

by: JEB

ust 30, 2007

EC

Figure 1.
Soil Borings
and Shipwrecks

K:_GIS\0250069219_callaway\a_MKT\Report_Figures\Cultural\070827_Ship-wreck_Soil-Borings.mxd

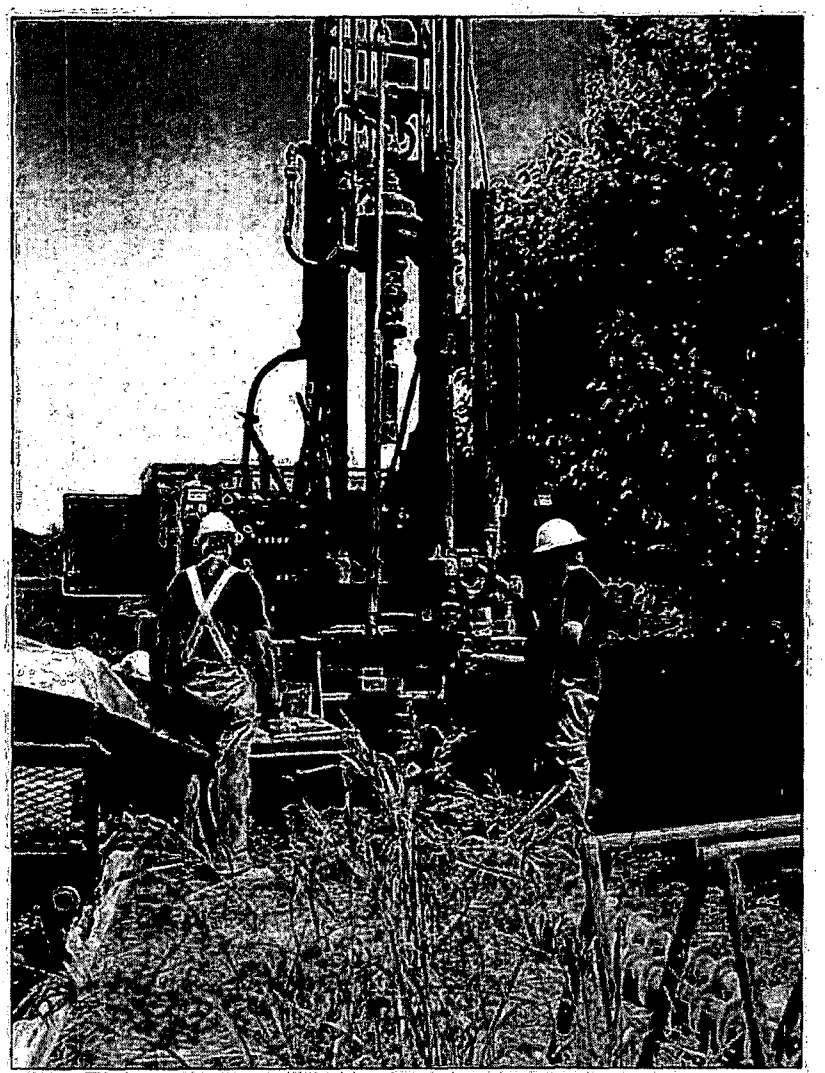


Figure 2. Example of a Soil Boring.

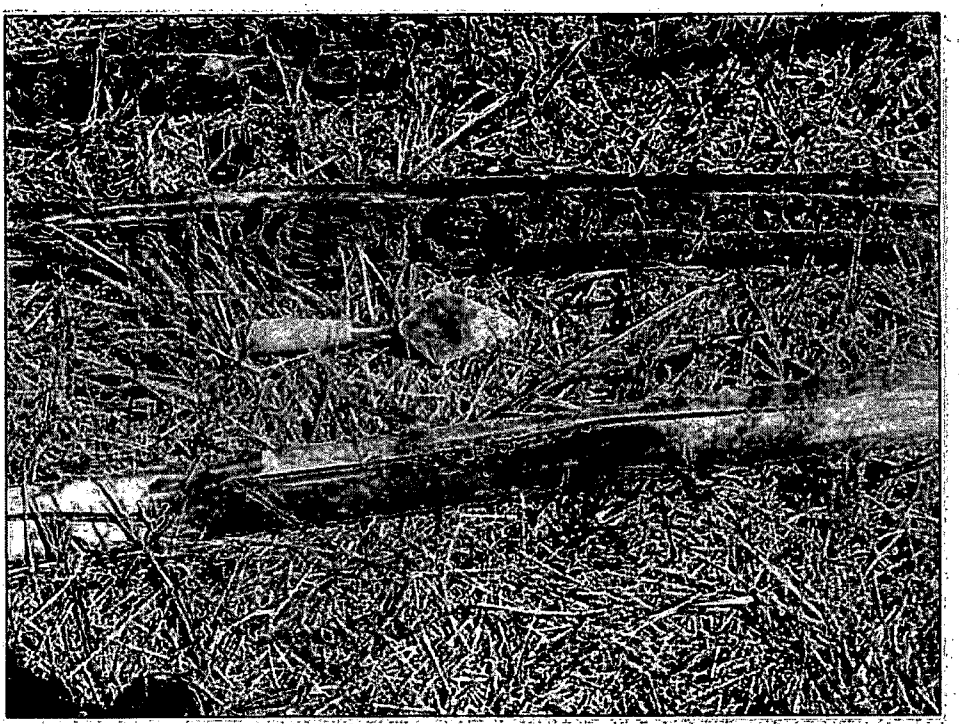


Figure 3. Examples of Soil Cores.

Figure 4. Wooden Pilings near Drilling Location FSB3.

APPENDIX A

MAGNETOMETER RESULTS CONDUCTED BY COLOG

Midwest Region
PO Box 81864
Lincoln, Nebraska 68501
Tel/Fax: 402-466-5997/466-6019

July 6, 2007

Mr. Anthony Fabina
Paul C. Rizzo Associates

Re: Ameren UE Magnetometer Surveys
Callaway County, Missouri

Dear Mr. Fabina:

This letter presents the results of magnetometer surveys completed at the referenced site. The purpose of the surveys was to clear proposed drilling locations of possible buried cultural artifacts. The possible presence of buried steamboat wrecks was a special concern. Study areas were identified by Rizzo Associates.

Site Conditions
The magnetometer surveys were carried out on the Missouri River floodplain. The floodplain is characterized by flat-lying agricultural land. Ground cover in the survey areas included crop, grass, and brush. Soils and sediments are sand, silt, and clay typical of floodplain areas. This alluvium extends to a depth of 100 feet or more, where it is underlain by Paleozoic carbonates and shales. Some of the surveys were completed in disturbed areas.

Field Methods
Field work was completed June 27-29, 2007. The location and orientation of the survey grids was identified by Rizzo. A 25 x 100-foot survey area was laid out at each location, with the 0N 0E and 25N 100E locations staked. Other control points were marked with high-visibility paint. Survey lines were spaced five feet apart. The start point of the survey was arbitrarily assigned the identifier 0N 0E. This point also served as a reference point for checking pre- and post-survey readings for instrument drift. Northings and Eastings called out in the survey do not correlated to compass headings, and only serve as local reference for x-y directions in the individual grids. A total of eight grids were marked and surveyed.

The magnetometer survey was completed with a Geonics G-858 gradiometer. The gradiometer consisted of two magnetometers spaced 2½ feet apart on a staff, with the upper unit 4½ feet above ground. Each instrument measured total magnetic field, and the difference between the upper and lower readings was used to calculate the magnetic gradient. The survey was performed by walking along the profile lines with the instrument set to record at one-second intervals. This provided a reading approximately every 3 to 3½ feet along the line. Magnetometer data were downloaded and reviewed in the field for completeness. Contour plots of total magnetic field and gradient were prepared (Surfer® v7.0) for presentation and evaluation of the data.

Findings

The background magnetic field measured at the eight sites ranged from 53320 to 53640 nanoTeslas (nT), with an average of 53490 nT. The background gradient ranged from 8.1 to 9.0 nT/foot, with an average of 8.1 nT/foot. Anomalies were identified by comparing observed magnetic data to background readings at each site. The criteria for total magnetic field readings were variations from background greater than +/- 10 nT, and for the magnetic gradient it was variations greater than +/- 1.5nT/foot.

Contour plots of magnetometer survey data for each of the grids are attached, along with a table summarizing the survey results.

Anomalies were observed at each of the survey grids, though they varied in size and intensity. The magnetically "cleanest" grids were located at Sites 1, 6, and 7. Only small, localized anomalies were observed at these locations. Sites 2 and 5 had observed cultural features that affected the magnetometer results (grain bin & buried culvert at Site 2, nearby discharge line at Site 5), though Site 2 also had an anomaly from an unknown source. Anomalies at Sites 3, 4, and 12 could not be correlated with observed surface or cultural features. At Site 3 the size and orientation of the anomalous readings suggest a large mass of ferrous material. At Sites 4 and 12 the source of the anomalies likely lie outside the survey grid, and their total extent are unknown. There is sufficient "magnetically clean" area at each site for well construction.

This geophysical survey was conducted according to generally accepted techniques and practices. The findings and interpretations are based on site information provided to Colog Division—Layne Christensen Company and information collected in the field. The findings and interpretations of this report should be reviewed and evaluated if additional site data are collected.

Please call me if you have any questions.

COLOG DIVISION
LAYNE CHRISTENSEN COMPANY

Mike Madcharo, PG

Attachments

Table 1: Summary of Results
Callaway County Magnetometer Survey

Location	Background Total Field	Background Gradient	Anomalous Readings	Comments
Site 1	53592	8.5	0N 57E 0N 85E to 100E	*Anomaly is highly localized *Weak anomaly, extends outside boundaries of grid
Site 2	53450	9.0	15N 10E	*Buried object *Buried steel culvert crosses grid from 0N 70E to 67N 25E, affects readings ~10-15 feet either side of culvert *Grain bin located 25 feet east of east end of survey grid, affects total field data to ~20E
Site 3	53510	9.0	0N 50E to 20N 100E 0N 0E to 10N 5E	*Strong total field & gradient anomalies *Small gradient anomalies
Site 4	53640	9.0	0N 70E to 25N 80E 0N 30E to 0N 80E	*Gradient anomaly crosses grid *Total field anomaly borders survey grid
Site 5	53475	8.5	0N 0E 80E to 100E	*Weak anomaly, originates outside boundaries of grid *Total field & gradient anomalies at north end of grid due to nearby buried discharge line
Site 6	53455	8.1	0N 0E	*Weak anomaly, originates outside boundaries of grid
Site 7	53465	8.2	0N 50E	*Anomaly is highly localized
Site 12	53320	8.5	20N 5 to 25E 15N 55E to 25N 100E	*May be dipole related to other anomaly in this grid *Total field effects extend south of identinfied anomaly

Notes:

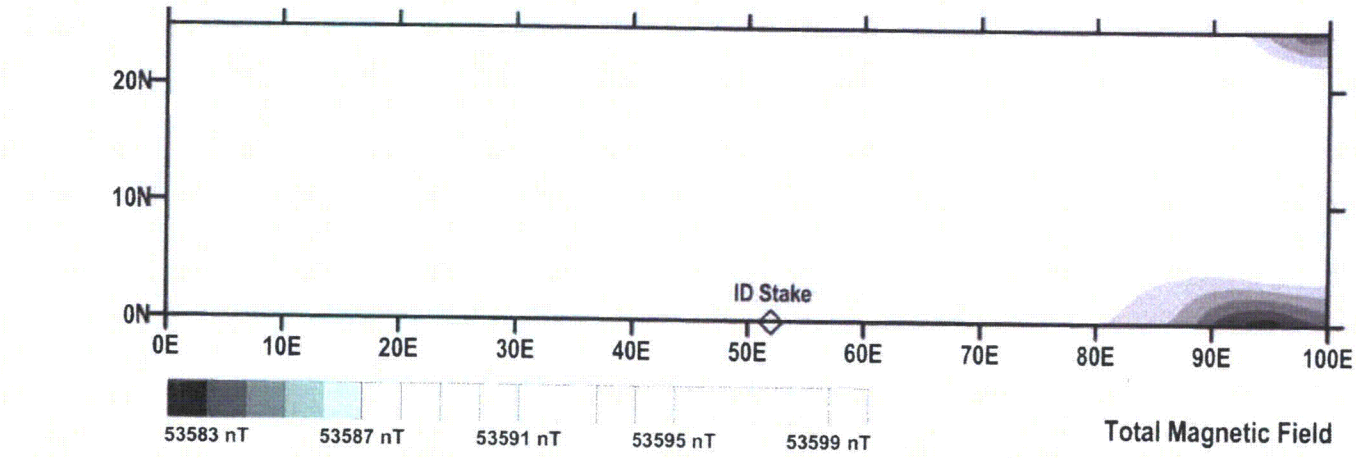
**All grids 25 x 100 feet, except for Site 7, which was 25 x 75 feet*

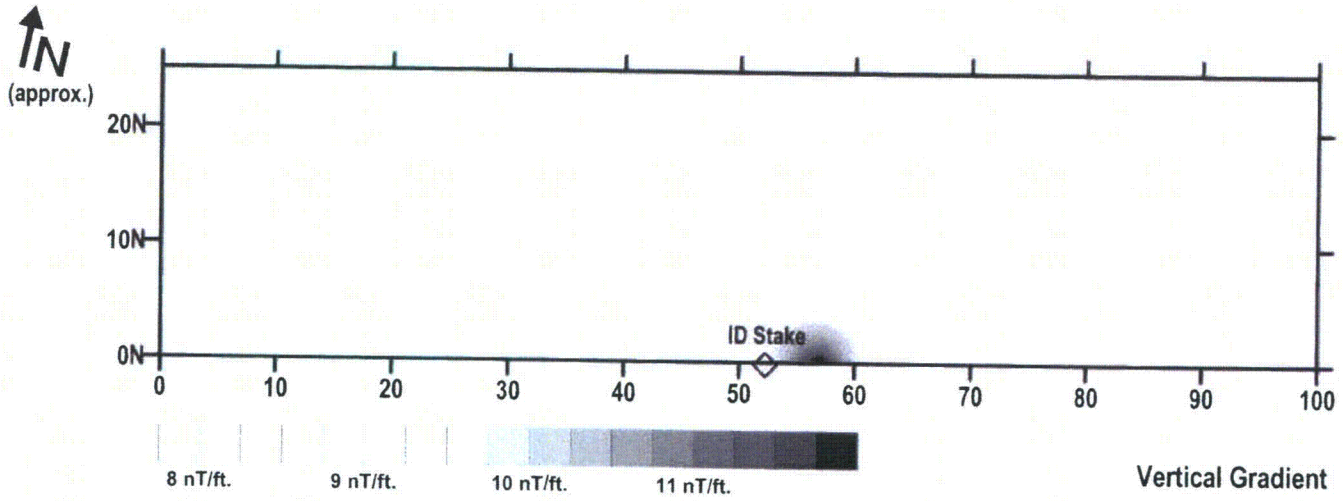
**Northings and Eastings are local reference only and are not correlated to compass headings*

**Anomaly defined as readings outside background range:*

Total Field: Background +/-10 nanoTeslas

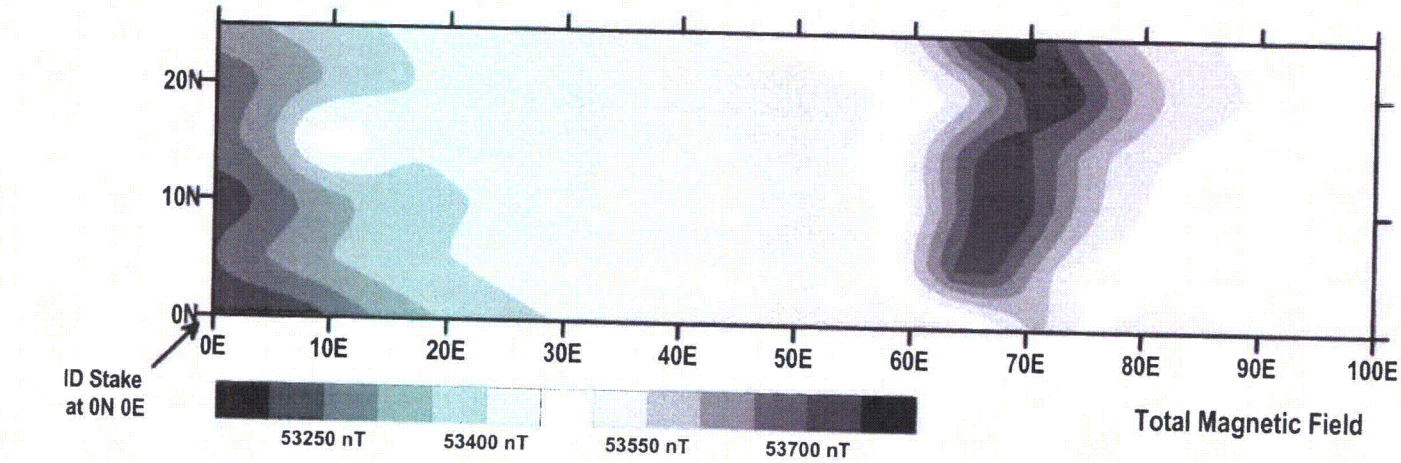
Gradient: Background +/- 1.5 nanoTeslas/foot

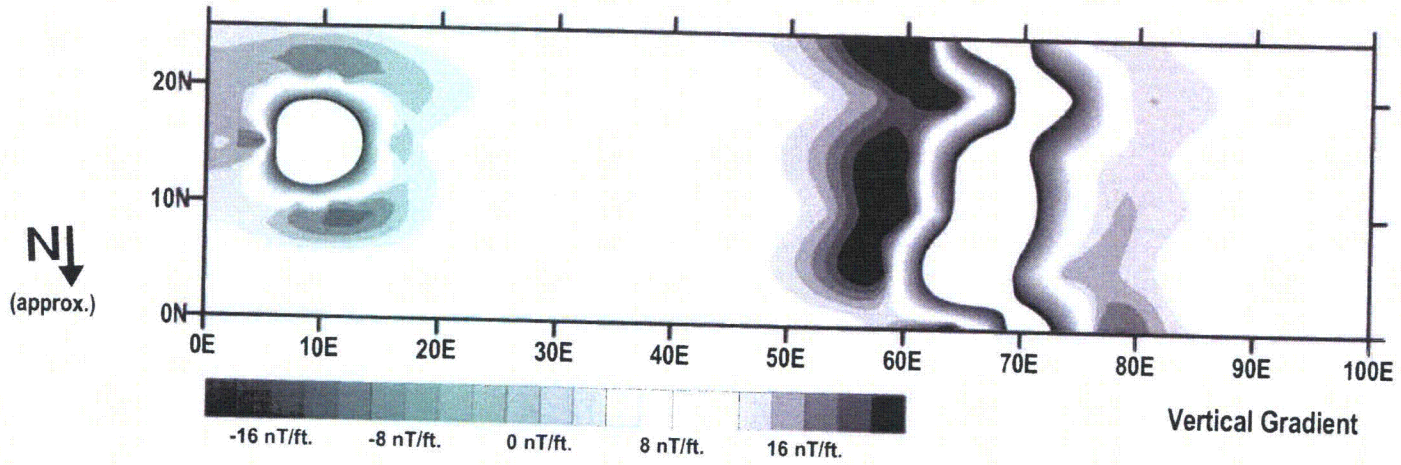




Site 1
Magnetometer Suvey Results

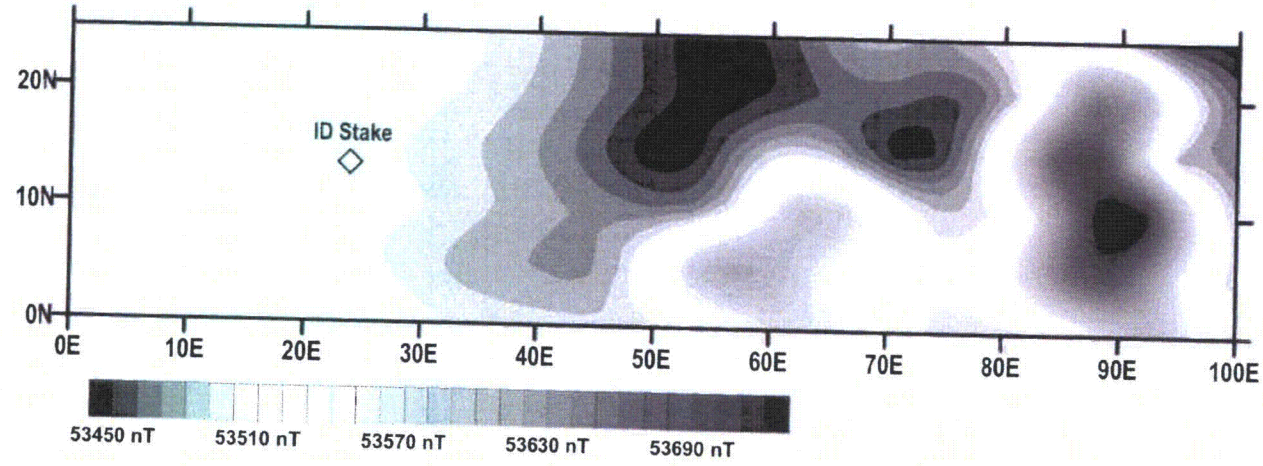
Rizzo Associates / Ameren UE
Callaway County, Missouri

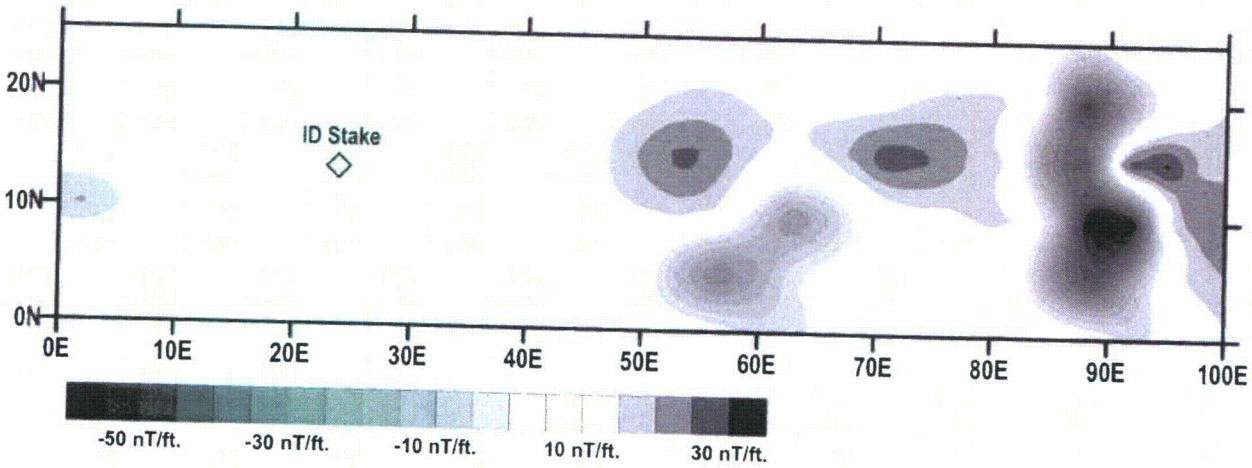




Site 2
Magnetometer Suvey Results

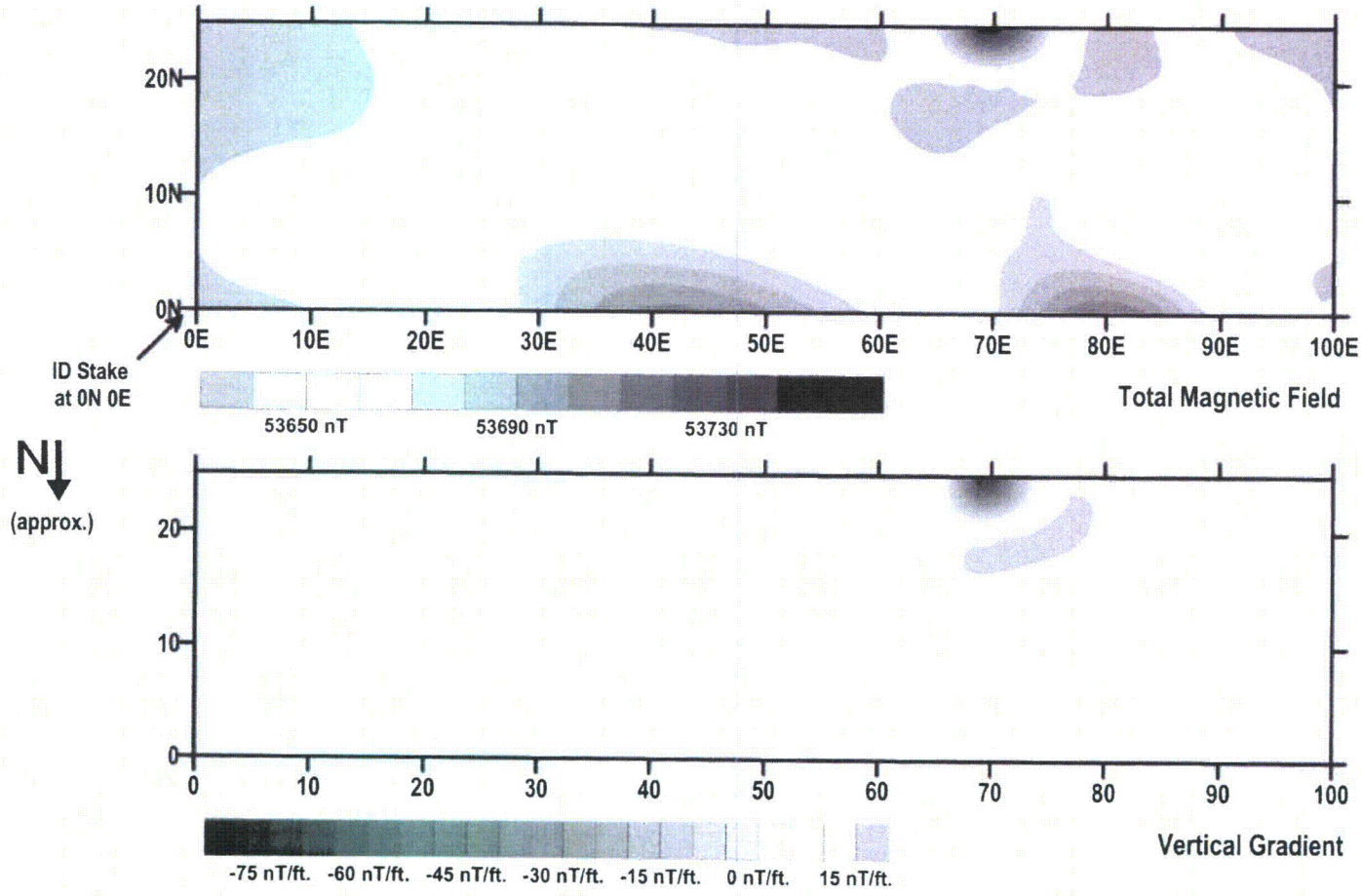
Rizzo Associates / Ameren UE
Callaway County, Missouri





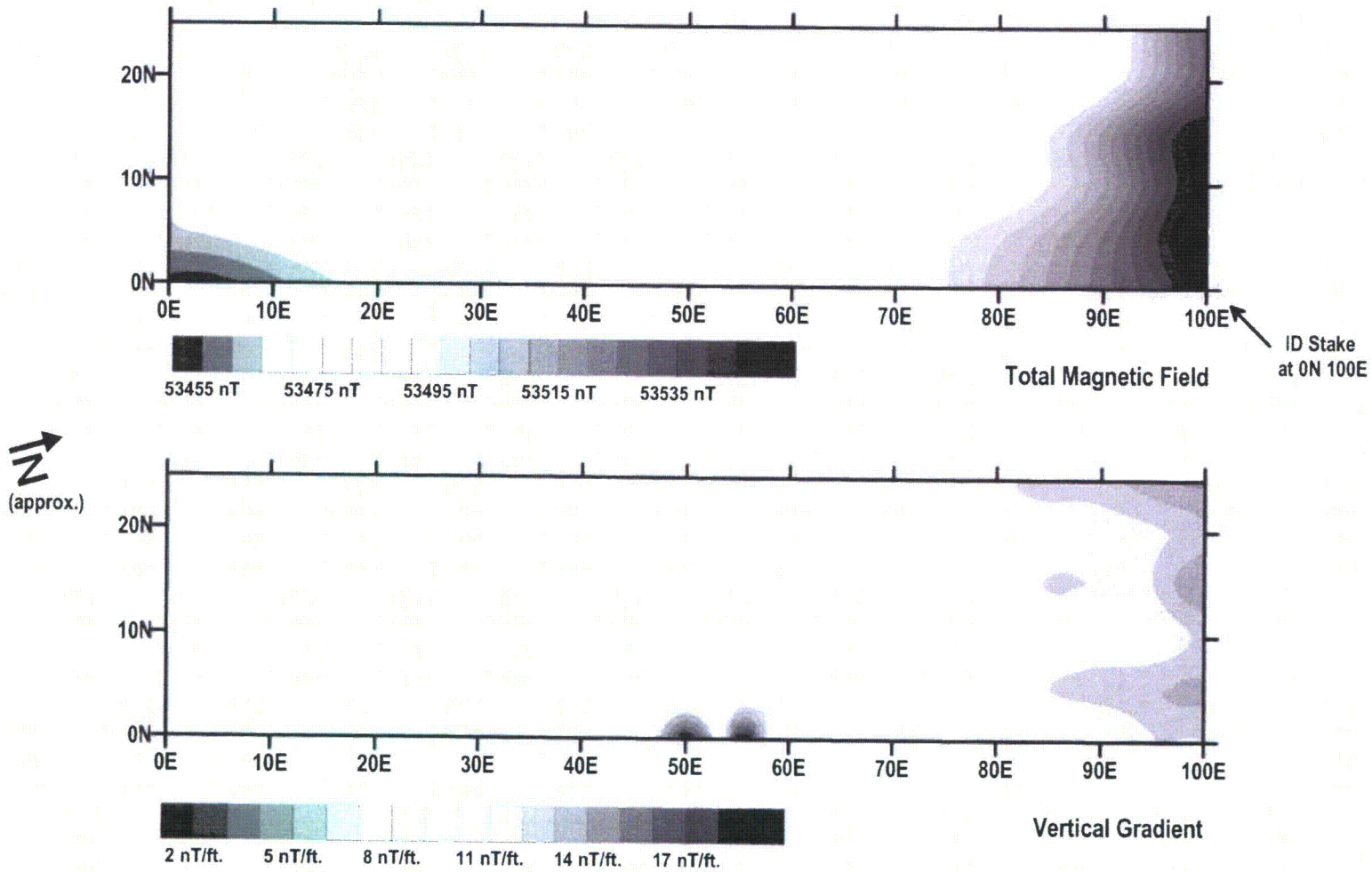
Site 3
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



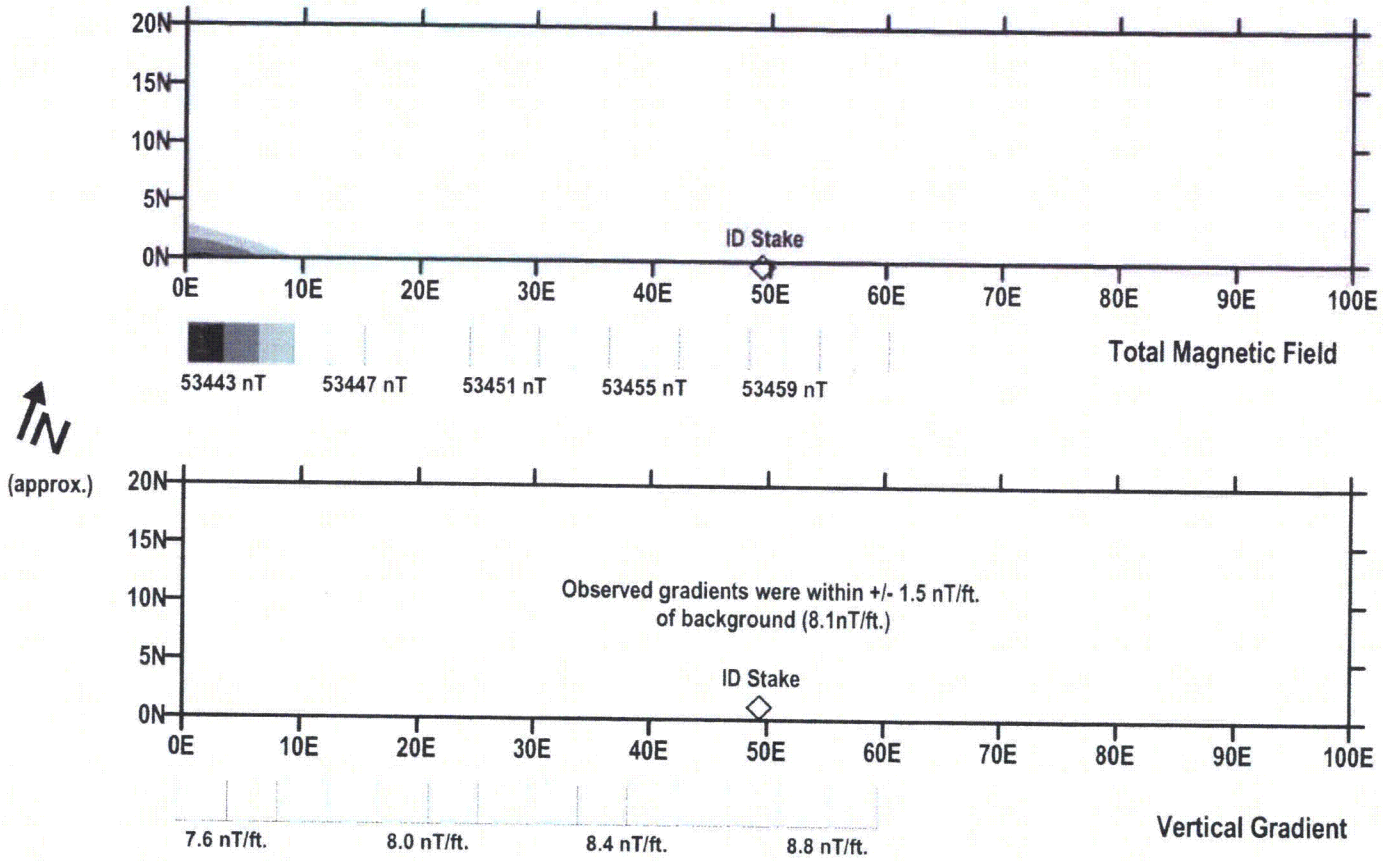
Site 4
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



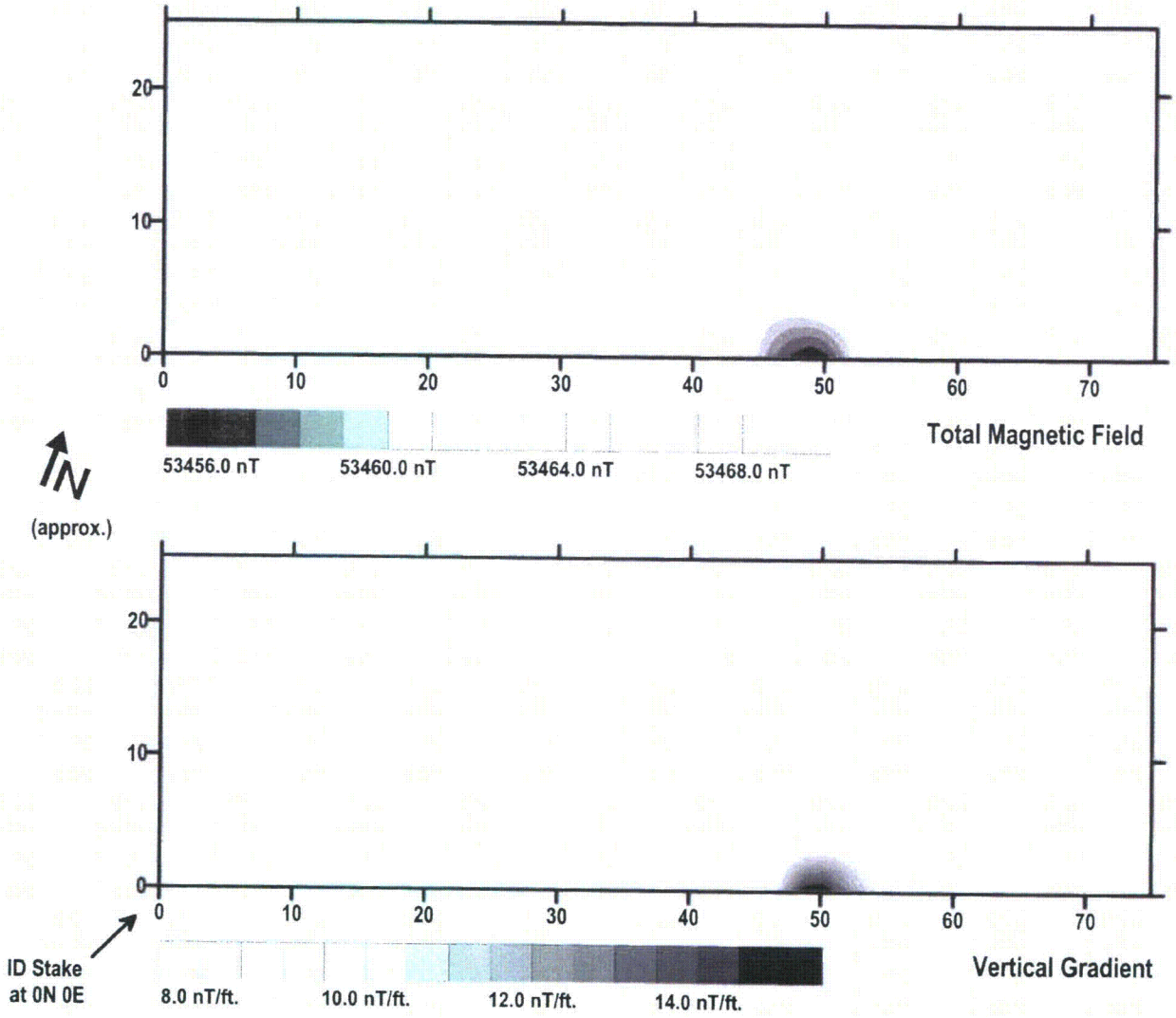
Site 5
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



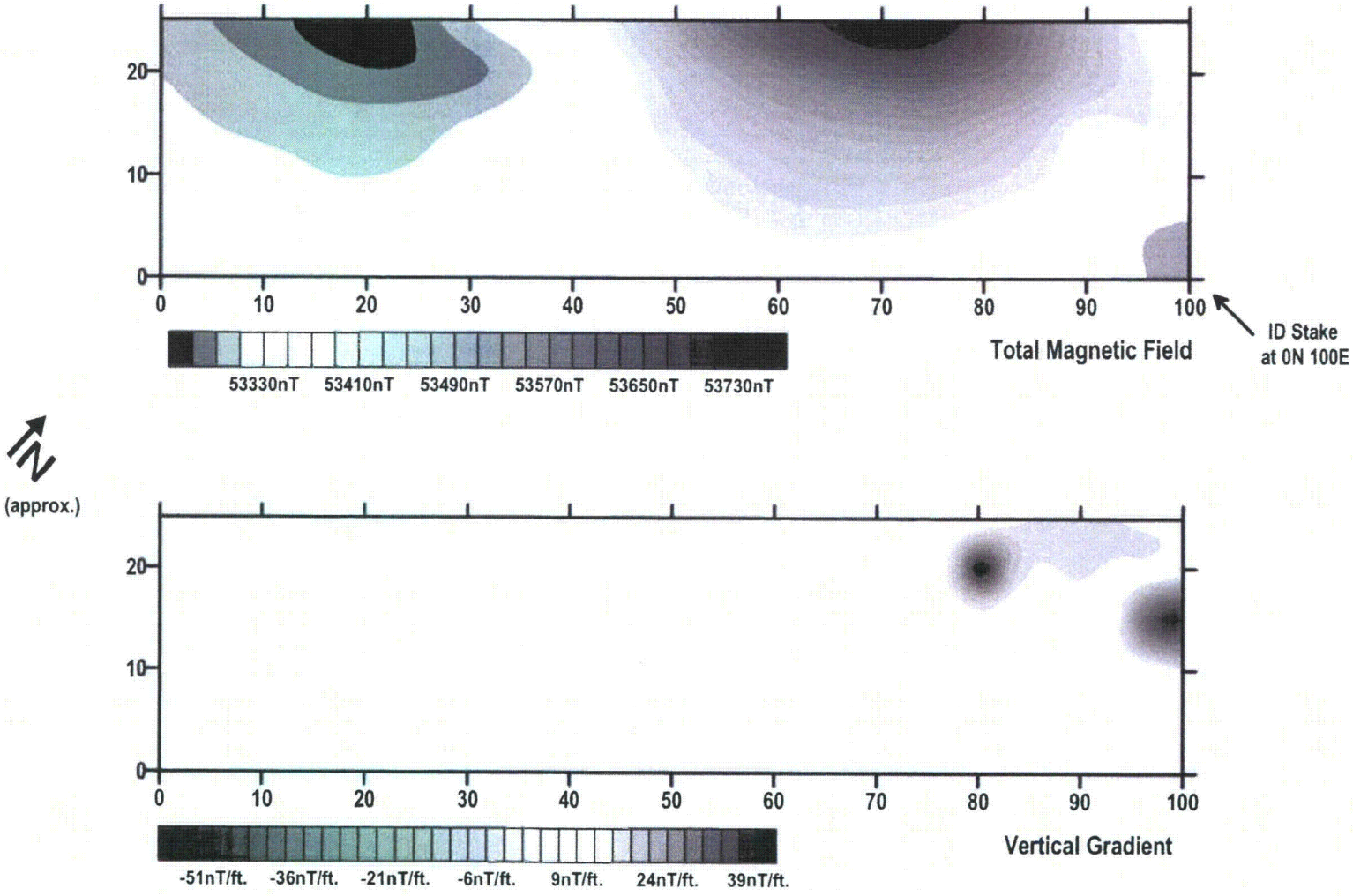
Site 6
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



Site 7
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



Site 12
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri

Midwest Region
PO Box 81864
Lincoln, Nebraska 68501
Tel/Fax: 402-466-5997/466-6019

July 23, 2007

Mr. Anthony Fabina
Paul C. Rizzo Associates

Re: Ameren UE Magnetometer Surveys
Callaway County, Missouri

Dear Mr. Fabina:

This letter presents the results of additional magnetometer surveys completed at the referenced site. These surveys were completed as a follow-up to surveys completed in June 2007. The results of those surveys were reported to Rizzo in our letter report dated July 6, 2007. Please refer to that report for a description of site conditions and field methods. Field work for the surveys reported here was completed on July 16-17, 2007.

Findings
The background magnetic field measured at the four sites ranged from 53441 to 53661 nanoTeslas (nT), with an average of 53490 nT. The background gradient ranged from -0.1 to 0.25 nT/foot, with an average of 0.04 nT/foot. Anomalies were identified by comparing observed magnetic data to background readings at each site. The criteria for total magnetic field readings were variations from background greater than +/- 10 nT, and for the magnetic gradient it was variations greater than +/- 1.5nT/foot.

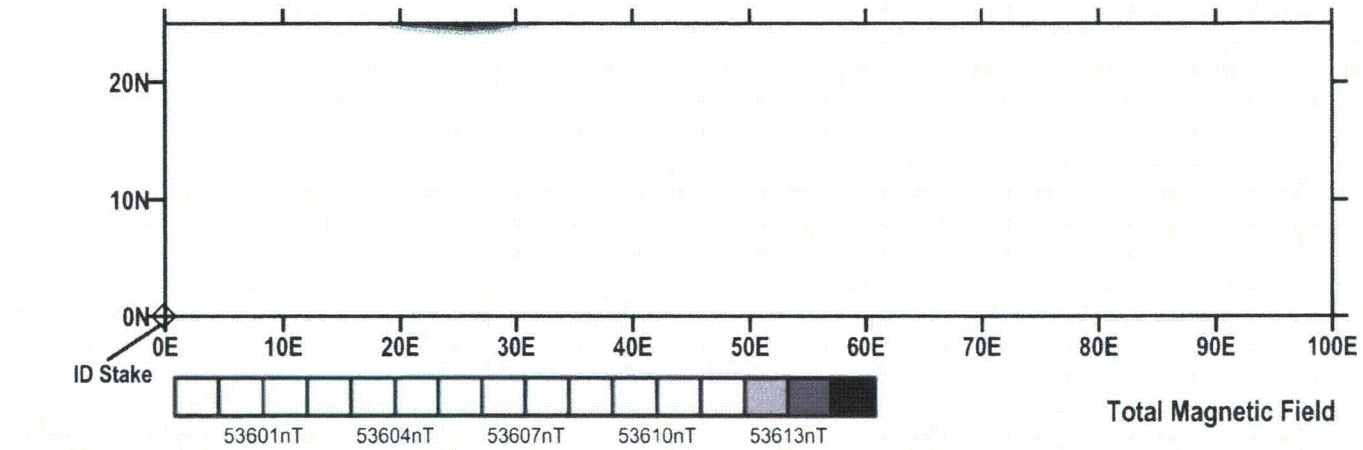
Contour plots of magnetometer survey data for each of the grids are attached. An anomaly was observed along the north border of Site 1D/1N from 20E to 30E. The source of this anomaly likely lies outside the survey area. An anomaly was also observed at Site 8. This anomaly was strongest at the northeast corner of the grid, and it generally lies north of the 80N line. Sites 9, 10 and 11 were "magnetically clean". There is sufficient "magnetically clean" area at each site for well construction.

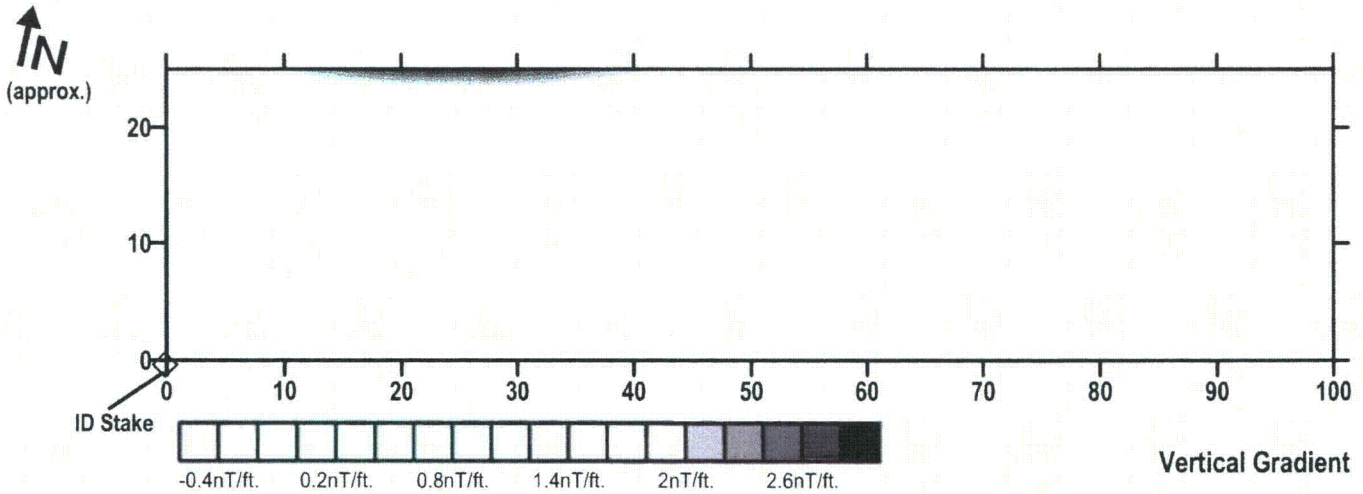
This geophysical survey was conducted according to generally accepted techniques and practices. The findings and interpretations are based on site information provided to Colog Division—Layne Christensen Company and information collected in the field. The findings and interpretations of this report should be reviewed and evaluated if additional site data are collected.

Please call me if you have any questions.

COLOG DIVISION
LAYNE CHRISTENSEN COMPANY

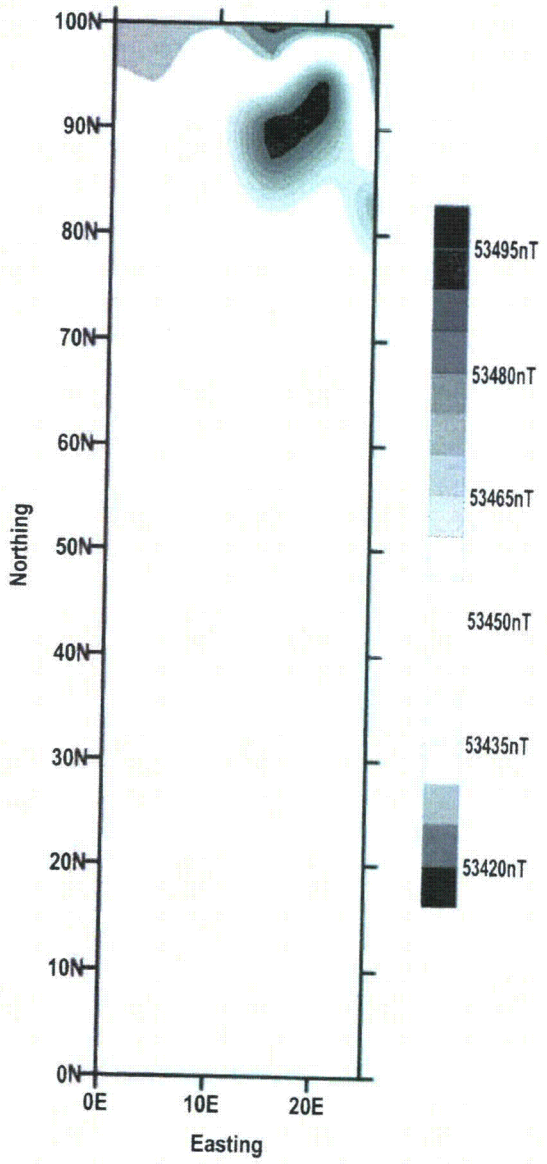
Mike Madcharo, PG
Attachments



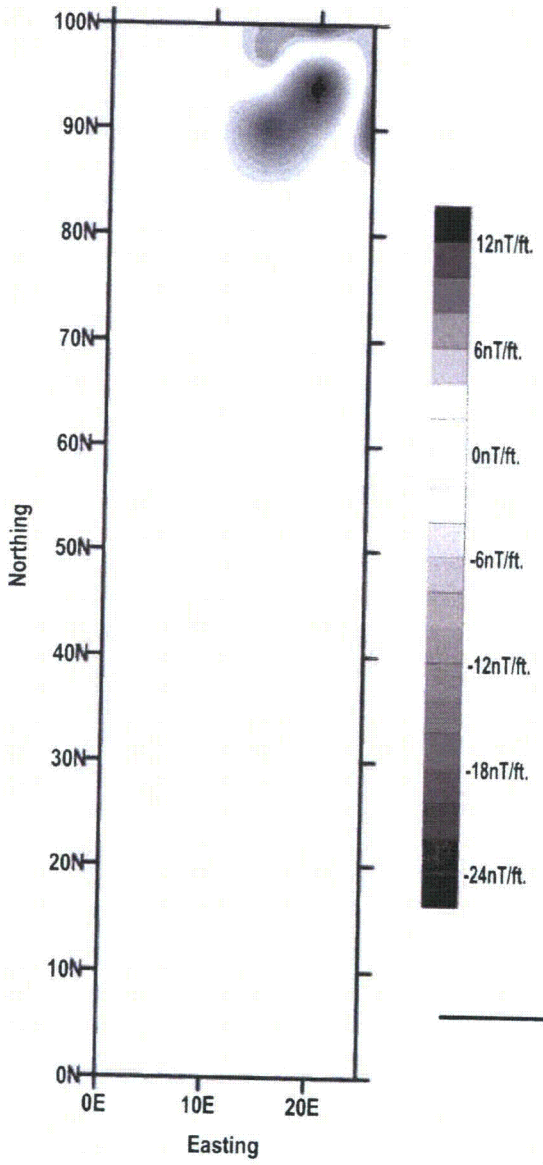


Site 1D/1N
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



Total Magnetic Field



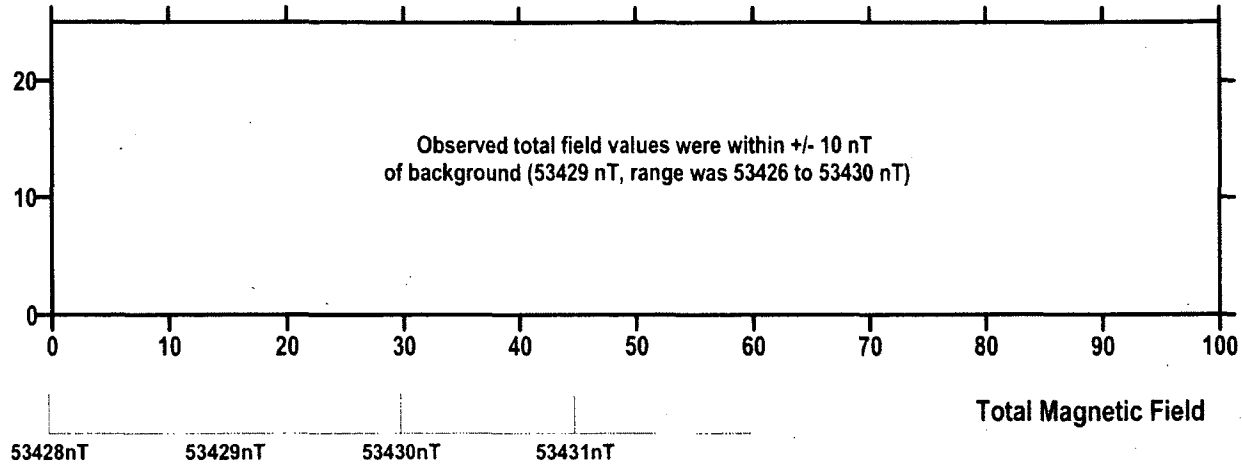
Vertical Gradient

N
(approx.)

ID Stake
at 0N 0E

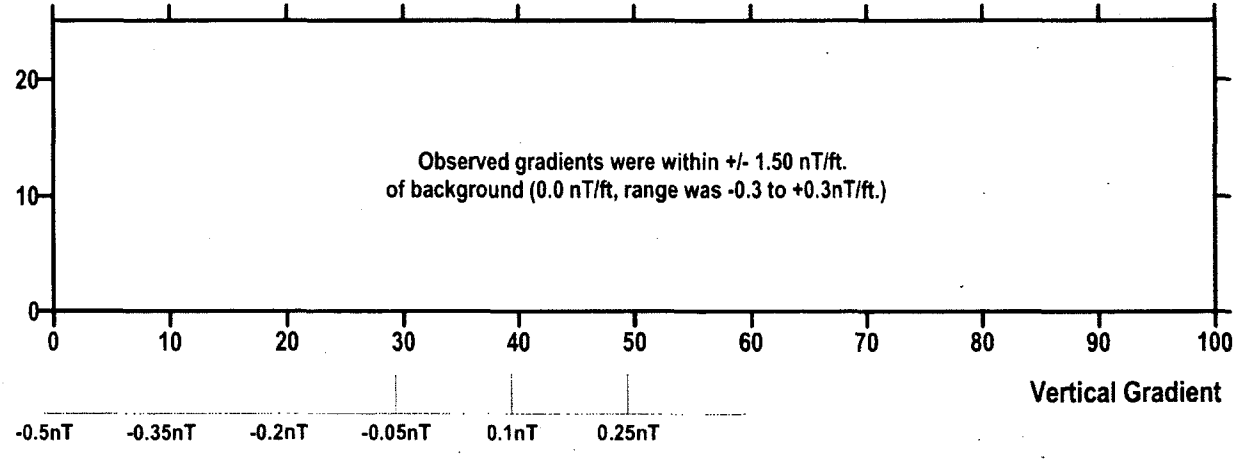
Site 8
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri



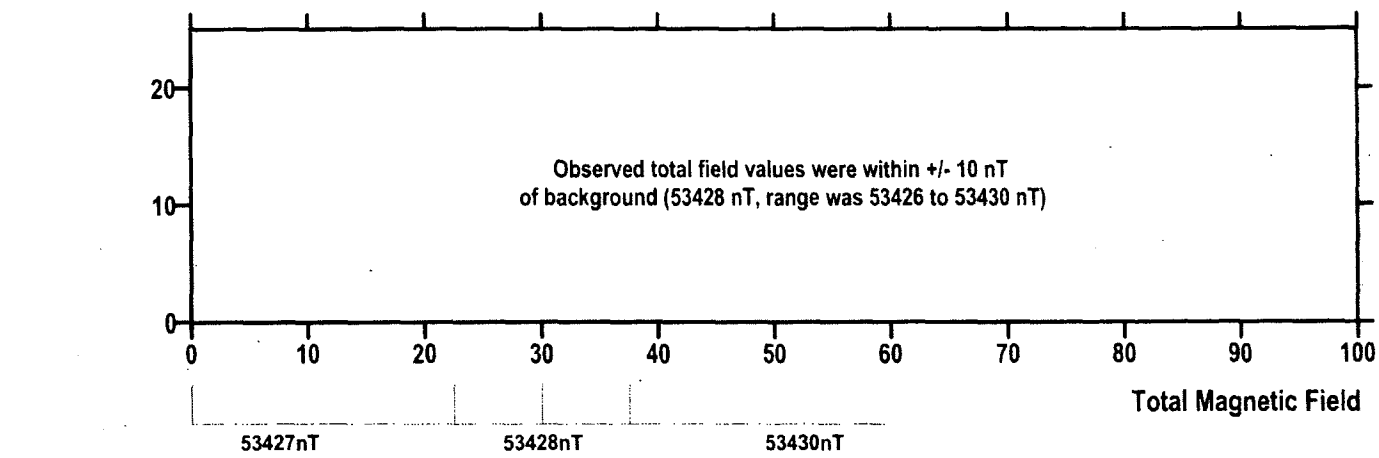
(approx.)

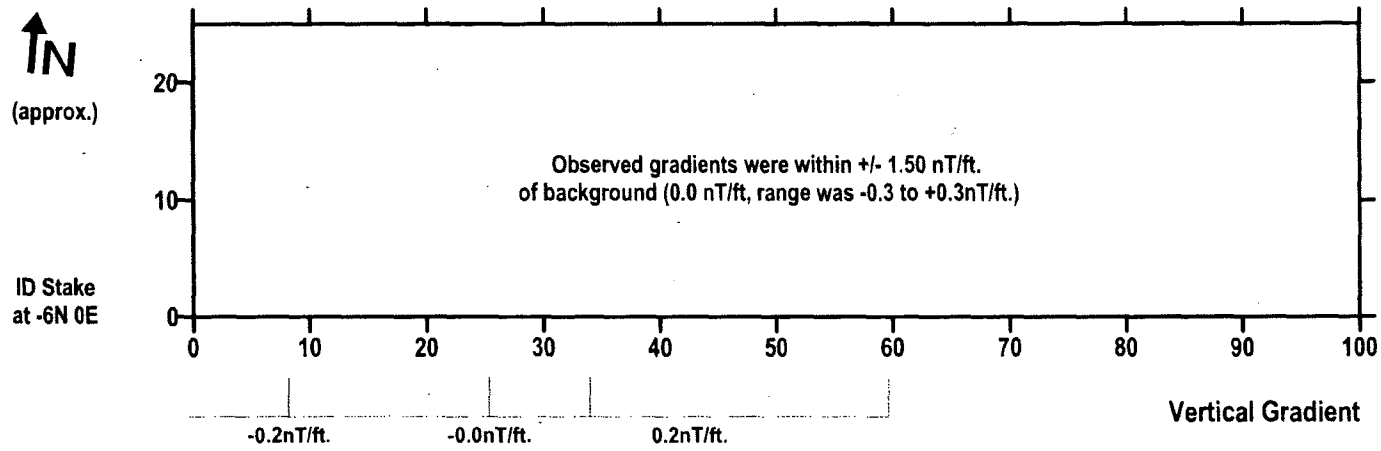
ID Stake
at -5N 0E



Site 9
Magnetometer Suvey Results

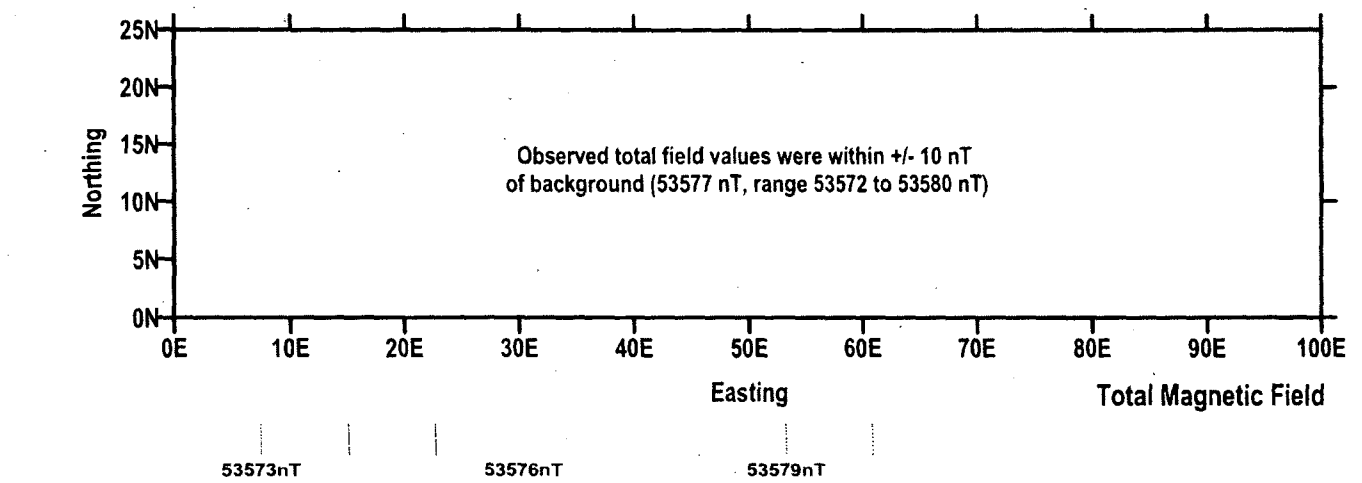
Rizzo Associates / Ameren UE
Callaway County, Missouri

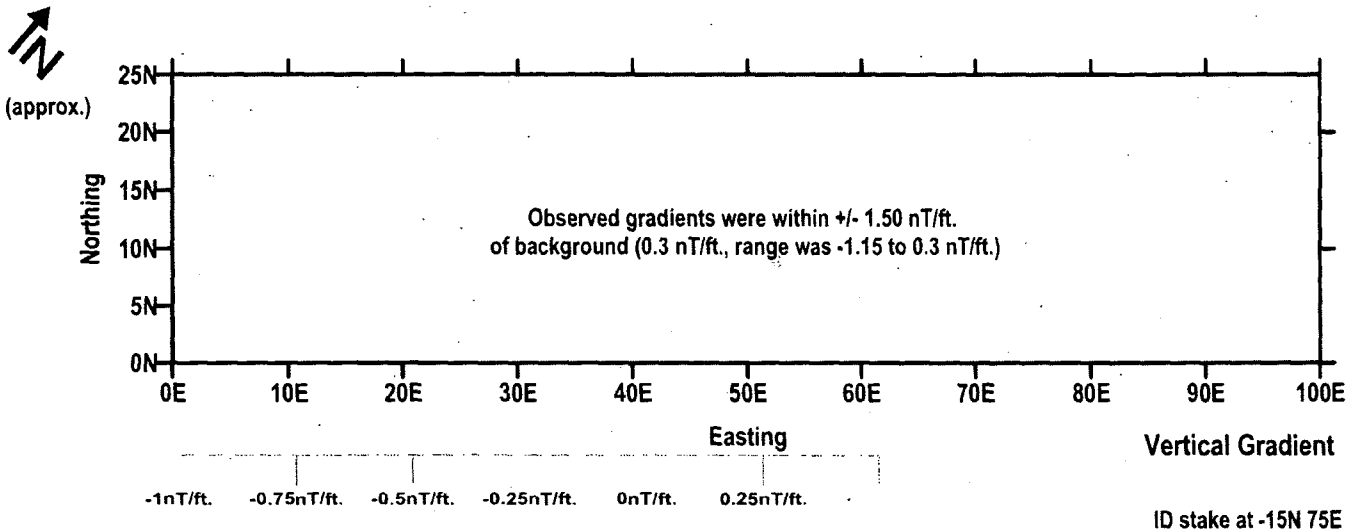




Site 10
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri





ID stake at -15N 75E

Site 11
Magnetometer Suvey Results

Rizzo Associates / Ameren UE
Callaway County, Missouri

Paul C. Rizzo Associates, Inc.
ENGINEERS & CONSULTANTS

CULTURAL RESOURCES DISCOVERY PLAN FOR ARCHAEOLOGICAL MONITORING OF SOIL BORINGS CALLAWAY NUCLEAR PLANT COLA, CALLAWAY COUNTY, MISSOURI

Prepared for:

AmerenUE
St. Louis, Missouri

Ameren

Prepared by:

MACTEC ENGINEERING AND CONSULTING, INC.
KNOXVILLE, TN

AND

PAUL C. RIZZO ASSOCIATES, INC.
MONROEVILLE, PA

May 2007
Project No. 06-3624

Paul C. Rizzo Associates, Inc. ENGINEERS & CONSULTANTS

CORPORATE HEADQUARTERS - PITTSBURGH
ExpoMart, Suite 270-E • 105 Mall Boulevard • Monroeville, PA 15146-2288
Phone (412) 856-9700 • Fax (412) 856-9749
www.rizzoassoc.com

May 31, 2007

Project No. 06-3624.04

Mr. Mark A. Miles
Director and Deputy State Historic Preservation Officer
State of Missouri
Department of Natural Resources
1101 Riverside Drive
Jefferson City, MO 65101

Transmittal of Discovery Plan
Callaway Nuclear Power Plant
Soil Boring Program

Dear Mr. Miles:

Attached for your review please find the proposed Discovery Plan developed by Paul C. Rizzo Associates, Inc. (RIZZO) and MACTEC Engineering and Consulting, Inc. (MACTEC) for the soil boring program on Bingelli Island on behalf of AmerenUE's Callaway Nuclear Power Plant. The Discovery Plan was developed following telephone consultations between Ms. Judith Deel of your office and Stephen Cole, Ph.D., Senior Archaeologist, of MACTEC.

AmerenUE wishes to embark on the boring program as soon as possible and we await your review and approval of this Discovery Plan in order to commence work. As you conduct your review, please do not hesitate to call myself (412-856-9700 x 1009) or Steve Cole (865-588-8544 x 1145) directly.

Very truly yours,
Paul C. Rizzo Associates, Inc.

Melissa L. Dubinsky, Ph.D.
Project Manager

Enc.

MLD/mdt

L10 063624.04/07

CULTURAL RESOURCES DISCOVERY PLAN FOR ARCHAEOLOGICAL MONITORING OF SOIL BORINGS CALLAWAY NUCLEAR PLANT COLA CALLAWAY COUNTY, MISSOURI

PROJECT NO: 06-3624.04
MAY 31, 2007

PREPARED BY

MACTEC ENGINEERING AND CONSULTING, INC.
1725 LOUISVILLE ROAD
KNOXVILLE, TN 37921
(865) 588-8544

AND

PAUL C. RIZZO ASSOCIATES, INC.
105 MALL BOULEVARD, SUITE 270-E
MONROEVILLE, PA 15146
(573) 676-6304
WWW.RIZZOASSOC.COM

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CULTURAL RESOURCES DISCOVERY PLAN FOR ARCHAEOLOGICAL MONITORING OF SOIL BORINGS CALLAWAY NUCLEAR PLANT COLA CALLAWAY COUNTY, MISSOURI

1.0 INTRODUCTION

The purpose of this Cultural Resources Discovery Plan is to provide a coordinated program for action in the event of the discovery of significant cultural resources or human remains during the proposed archaeological monitoring of exploratory soil borings. The soil borings are to be drilled during the first phase of a feasibility study for proposed horizontal intake wells to support the Callaway Nuclear Plant Combined License Application (COLA) near Reform in Callaway County, Missouri. Paul C. Rizzo Associates, Inc. (RIZZO) has been retained by AmerenUE to conduct the feasibility study and MACTEC Engineering and Consulting, Inc. (MACTEC) has been retained by RIZZO to plan, coordinate, and carry out cultural resources studies for the project as needed.

Fourteen soil boring (drilling) locations have been proposed. Archaeological monitoring will be carried out by one or more MACTEC Archaeologists and will consist of observing all soil and sediment removed from selected bore holes and identifying any historic properties, as well as identifying any historic properties that might be affected by movement of the drilling equipment through the project area to the soil boring locations. "Historic properties" is defined pursuant to 36 CFR Part 800 as any artifacts, sites, or cultural features that are listed on or eligible for listing on the National Register of Historic Places (National Register).

If historic properties are discovered inadvertently in the project area during the drilling project, the procedures outlined in this Discovery Plan will help ensure that they are preserved until a plan for avoidance or mitigation can be put into place. If human

remains are discovered, immediate consultation with Missouri state agencies and Native American tribal representatives will take place. This Plan identifies the individuals who will be contacted and the procedures to be followed in the event that historic properties or human remains are discovered during drilling activity in the project area.

2.0 PROJECT LOCATION

The Callaway Nuclear Plant is near Reform in Callaway County Missouri. The drilling locations are in Callaway and Osage Counties in the following sections: T. 45 N, R. 7 W, Section 6; T. 46 N, R. 7 W, Section 31; T 46 N, R. 8 W, Sections 35 and 36; T. 45 N, R. 8 W, Sections 1, 2, and 3; and T. 45 N, R. 8 W, Section 10 (***Figure 1***). Twelve soil borings will be located near the left descending bank of the Missouri River between river miles 115.2 and 120.0, and two will be located on the right descending bank, one opposite river mile 119.1 and one opposite river mile 116.9. Six of the soil borings will be located at the back side of a constructed levee on the south side of Bingelli Island, which faces the main channel of the Missouri River on the river's left descending bank. Five others will be placed near the river bank outside of Bingelli Island and three will be located near a creek approximately two miles north of the island.

3.0 REGULATORY SETTING AND BACKGROUND

Involvement of the Federal Energy Regulatory Commission (FERC) in the Callaway COLA requires compliance with the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations (36 CFR Part 800, as revised). The NHPA established the federal government's policy and programs on historic preservation, including the establishment of the National Register. Cultural resources that are listed or eligible for the National Register are called historic properties and their eligibility is recognition of their significance. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings, including funding, permitting and licensing on historic properties.

The Section 106 review process (36 CFR 800.3-800.6) consists of four steps: initiation, including consultation, identification of historic properties, assessment of adverse effects of the undertaking, and resolution of adverse effects. The lead agency completes these steps in consultation with the State Historic Preservation Officer (SHPO), any Indian tribe that attaches religious and cultural significance to historic properties that might be adversely affected, and interested member(s) of the public.

The need for archaeological monitoring of the drilling was identified after an informal consultation by RIZZO and MACTEC with the Missouri SHPO. The potential for buried historic properties in the project area extends far below the depths normally accessible by routine Phase I survey techniques such as shovel testing and backhoe testing. Therefore, it was determined that such techniques would be inadequate as identification tools in this situation. Archaeological monitoring is a technique that can be used in such situations to identify any cultural resources inadvertently discovered during drilling.

The purposes of this archaeological monitoring are as follows:

- Complete the Section 106 identification step;
- Evaluate possible adverse project effects to any buried cultural resources in the project area; and
- Prevent unnecessary adverse effects by halting drilling as soon as a significant discovery is made.

For the purposes of this archaeological monitoring, "significant discovery" will be defined as any evidence positively indicating the presence of an intact archaeological site, archaeological feature, or human burial that may be eligible for listing on the National Register. Such evidence could include (but is not limited to) milled timbers or lumber that is non-modern, diagnostic prehistoric artifacts combined with evidence of a cultural midden such as abundant charcoal and/or dense gastropod or mussel shell fragments, or human remains.

In the event that Native American burials or human remains are discovered in the project area, the drilling project also must comply with the Native American Graves Repatriation and Protection Act (NAGPRA) of 1990. This law requires agencies with undertakings that affect Native American burials, human remains, and artifacts associated with burials to inventory those items and make them available to Native American tribes for repatriation. Determining the party to whom such items should be offered for repatriation is the obligation of the lead agency and is done in consultation with SHPO and interested tribes.

4.0 POTENTIAL FOR DISCOVERY

The potential for discovery of archaeological remains was estimated by review of environmental characteristics of the project area, information about current land use, information gathered during the background research, and an assessment of the geological setting of the project area. MACTEC conducted a check of the site files and previous cultural resources surveys archived at the Missouri SHPO in Jefferson City. No previously recorded sites are located in the project area. Two cultural resources surveys intersected the project area, including a survey for a transmission line that crosses the eastern side of Bingelli Island (Evans and Ives 1979) and a recent survey for a proposed ferry landing and access road on the island (Warner 2005). Neither survey involved deep testing nor identified cultural resources within the project area. Other sources consulted include historical maps (Edwards Brothers 1876; Missouri River Commission 1892; Ogle and Company 1897, 1917; Callaway County plat maps dating to 1876, 1897, and 1930) and an atlas of shipwreck locations along the Missouri River (USACE 2000).

These historical maps document that the Missouri River has changed course repeatedly in historic times. According to an atlas showing historically documented shipwrecks along the Missouri River (USACE 2000), three historically recorded shipwrecks are located in Mollie Dozier Chute and in the general vicinity of some of the proposed drilling locations (***Figure 1***): the Alert (1840), the Mollie Dozier (1866), and the George Spangler (1879).

...e locations are shown on ***Figure 1*** because the two historical sources used to compile the shipwrecks atlas disagree on the locations of the Mollie Dozier and the George Spangler. All of the proposed drilling locations are more than 2,600 feet from the five possible shipwreck locations.

Based on a review of these sources and on general geological knowledge of the project setting, it has been determined that some of the proposed drilling locations have the potential to affect buried cultural resources in the project area. In addition, based on a soil boring previously drilled north of proposed drilling location FSB-2, a terminal Pleistocene glacial outwash deposit is located at approximately 85-90 feet below ground surface in the project area vicinity. This indicates a potential for the presence of historic and prehistoric materials of any age up to 13,000 years.

This information indicates potential for unknown buried shipwrecks throughout the project area. From data obtained concerning the historic channel locations in and around the Alluvial Plain, five proposed drilling locations (FMW-1D/1S, -6, -7, -12, and FSB-3) appear to be located within apparent historic channels, on the north side of the Missouri River and five other proposed drilling locations (FMW-8, -9, -10, -11 and FSB-13) are located at or near the edges of the existing river bank and may be within historic channels. One proposed drilling location (FSB-14) is near the right bank of the modern river channel. Three potential drilling locations (FMW-5 and FBS-2 and -4) are located along a meandering creek of unknown origin. In the opinion of MACTEC and RIZZO, all 14 of these locations have potential for buried shipwrecks. Therefore, we propose to perform a magnetometer survey at the 14 locations prior to the drilling operation to obtain additional information.

It is MACTEC's opinion that ten drilling locations have some potential for buried cultural resources other than shipwrecks. These include all but FSB-2, -4, -14, and FMW-5. We propose to carry out archaeological monitoring of all ten of those drilling locations. In contrast, the latter four locations are in areas that do not appear to have high potential for buried cultural resources due to modern disturbance and/or distance from the

modern and historic river channels. FSB-2 and -4 and FMW-5 are all located approximately 2,000 or 4,000 feet from the nearest historic or modern river bank along a meandering creek. The creek appears to have been significantly disturbed by dredging or channelization in modern times, or even to be an artificial drainage channel connecting Auxvasse Creek with Logan Creek, based on field observations by RIZZO personnel. Proposed drilling location FSB-14 is on relatively high ground near an electrical substation and MACTEC archaeologists believe the area is disturbed by modern construction. We propose to conduct no archaeological monitoring of these four proposed drilling locations.

5.0 METHODS OF DRILLING AND REMOTE SENSING

RIZZO proposes to subcontract COLOG to conduct a magnetometer survey at each of the 14 proposed drilling locations that have potential for buried shipwrecks. COLOG, a division of the Layne Christensen Company, has conducted many magnetometer surveys. These surveys typically aid in the location of steamboat wrecks. Iron from the boat's boilers, engines, and paddlewheels creates a strong anomaly in the magnetic field in the vicinity. A description of the technique is given by Arnold (1974).

The magnetometer surveys would be conducted prior to any drilling. RIZZO proposes to conduct fourteen (14) 50 x 100 foot magnetometer surveys, each of which would be centered on one of the proposed drilling locations. The surveys will help identify previously undetected buried masses, if any. Based on these surveys an attempt will be made to determine the depth to any potential buried magnetic anomaly. If an anomaly is identified that indicates the possible presence of a shipwreck or other large cultural feature, the drilling location will be moved a distance of at least 100 feet. In such an event, a second magnetometer survey will be conducted at the new proposed drilling location and the same procedure will be followed.

Once the magnetometer surveys have been completed and each location to be drilled has been shown to lack significant magnetic anomalies suggestive of large cultural features or

sites, the drilling will be initiated. The techniques and procedures to be used are as follows:

1. Initial advancement of the borehole will be conducted with the utilization of Hollow Stem Augers (HSA) to a depth of 20 feet, sampling with the 5-foot CME Continuous Sampling Tool (CST). The CST will provide a good overview of the upper 20 feet of material and the 3- inch diameter opening in the shoe of the CST will permit larger portions of material to be collected for cultural analysis than the standard 2-inch diameter split-spoons. The CST is pushed ahead of the lead auger whereas the split-spoon is driven with a 140 pound-per-inch blow, so the CST presents less damage to potential artifacts than the split spoon technique. The lower one half (1/2) foot of each 5-foot sample retrieved from the CST will be removed and set aside for possible grain-size analysis. To further decrease damage to possible buried artifacts, if the upper 20 feet of material is soft enough, the CST can be pushed 5 feet, retrieved, the contents examined, and then the HSA advanced 5 feet. This process can be repeated to the 20 foot depth, or, if desired (and the material is still soft enough) to a maximum depth of 25 feet, with the drilling technique proposed to change at a depth of 20 feet.
2. At a depth of 20 feet, surface casing will be set to stabilize the upper material of the borehole and drilling will be switched to mud rotary, with sampling conducted by grab samples at 5-foot intervals.
3. Subsurface lithology will be described on boring logs continuously from ground surface to a depth of 20 feet, then at 5-foot intervals from grab samples.
4. Approximately four or five selected soil samples from each of the boreholes at FMW-6 through FMW-12 will be collected and sent to a laboratory for grain-size analysis.
5. Up to ten Shelby tube samples will be collected and up to five samples will be sent for laboratory analysis of moisture content, unit weight, specific gravity, grain size, and permeability analyses.
6. If necessary split-spoon sampling will be available if requested by on-site archeologists or Burns & McDonnell geologists.
7. Upon reaching possible bedrock, the material will be penetrated by coring or rock drilling to ascertain that it is Dolomite (bedrock in this area). This will be carried out at several locations until a 'good feel' for the depth-to-bedrock can be determined. Once this depth is decided, rock penetration will only be conducted at locations where the depth to projected bedrock deviates from the norm, shallower as to deeper, or at the discretion of the Field Geologist.

8. If, upon reaching bedrock the borehole has remained open and portions have not collapsed in upon it, electrical resistivity, geophysical spontaneous potential (SP) and gamma logs will be run, and then a 2-inch diameter PVC well, with a 20-foot slotted screen section will be installed. However, if portions of the borehole have collapsed in upon it, then the bore hole will be re-reamed and a 2-inch diameter PVC well, with a 20-foot slotted screen section will be installed. Then geophysical induction and gamma logs will be run.

6.0 DISCOVERY PROCEDURES: GENERAL

The archaeological monitoring project presents two primary management issues: 1) Identification and treatment of undiscovered historic properties; and 2) treatment of human remains. A process for identification, evaluation and treatment for historic properties which the project may encounter is presented in the following sections.

7.0 POLICIES AND PROTOCOLS

As a general policy, and as far as practically feasible, cultural resources will be avoided and actively protected, including isolated artifacts and significant historic properties. Instances may arise where modification of the project to accommodate avoidance is not possible. In those instances, the property in question will be treated in the manner described below.

Collection of artifacts by employees, drilling personnel or others with access to the project is prohibited. MACTEC employees, AmerenUE employees, RIZZO employees, drilling subcontractors, and other workers in the project area will be informed that any artifacts they may happen to discover should be left in place and reported to the archaeological staff immediately.

8.0 BRIEFING

Prior to drilling, the Archaeologist will brief the Drilling Supervisor and drilling crew on cultural resource issues. The briefing will include information on the legal context of cultural resources protection and on the prehistoric and historic cultural resources likely to be present in the drilling project area. The primary goals of this briefing are to familiarize drilling personnel with the procedures that will followed in the event of discovery of cultural material (see below), and to provide contact protocols and information to the Drilling Supervisor.

9.0 PERSONNEL QUALIFICATIONS AND CHAIN OF COMMUNICATION

The archaeological staff will consist of the Archaeologist in General Charge (Archaeologist), a MACTEC Staff Archaeologist, and one Archaeological Technician. Dr. Stephen C. Cole will serve as Principal Investigator (Archaeologist in General Charge) and Donna Rogers, RPA will serve as Field Director (Archaeologist in Direct Charge, or "Archaeologist") for the Project. All MACTEC Archaeologists meet The Secretary of the Interior's Professional Qualifications Standards. The Archaeologist will ensure that the provisions of this document are carried out and will be on-site throughout the duration of the Archaeological Monitoring Project. The Archaeologist will be the primary point-of-contact (POC) for MACTEC employees, AmerenUE, and RIZZO. The Archaeologist will be responsible for reporting daily work and documentation of any discoveries.

Any MACTEC Archaeologist on-site will have the authority to temporarily halt drilling activities while examining possible discoveries. The Archaeologist will have the responsibility to notify the Drilling Supervisor immediately of any discoveries judged to be significant as defined above. The Archaeologist will also have the responsibility to ensure that representatives from AmerenUE, RIZZO, and the MDNR SHPO are notified of any significant discoveries in a timely fashion. At the completion of the field survey, a

technical report will be prepared describing the results and presenting conclusions and recommendations. The report will be submitted to the SHPO for review and concurrence with conclusions and recommendations.

Anthony G. Fabina, P.G. (RIZZO Senior Project Geologist) will serve as the Field Team Leader. Mr. Fabina has over thirty years of experience and has conducted over several dozen similar field investigation campaigns.

Key personnel contact information is provided in ***Table 1*** below.

TABLE 1

PERSONNEL CONTACT LIST

CONTACT NAME	CONTACT PHONE NUMBER
Paul C. Rizzo Associates, Inc.	
Anthony G. Fabina, P.G., Senior Geologist	(573) 676-6304
Melissa Dubinsky, Ph.D., Project Manager	(412) 856-9700 ext. 1009
MACTEC Engineering and Consulting, Inc.	
Bill Elzinga, Senior Project Manager	(314) 209-5957
Steve Cole, Ph.D., Archaeologist in General Charge	(865) 588-8544 ext. 1145
Donna Rogers, Archaeologist in Direct Charge	(865) 771-1972 (cell)
Callaway County	
Emergency	911
Sheriff's Department	(573) 642-7291
Boone/Callaway County Medical Examiner	(573) 474-2700
AmerenUE	
Pat Cryderman	(573) 676-8299
Kenny Lynn	(314) 554-2978
Missouri State Historic Preservation Office	
Judith Deel, Archaeologist	(573) 751-7862

10.0 DISCOVERY PROCEDURES: SPECIFIC

1. The archaeological staff will examine cuttings and spoils excavated by the soil drilling equipment and any ground disturbed by the transport of the equipment within the project area, to identify any cultural remains or human remains.

2. If there is a discovery, the Archaeologist will ensure proper documentation and assessment of the discovery. The Archaeologist will record on standard forms all prehistoric and historic cultural material that is discovered. The initial effort will focus on establishing the nature, provenience and integrity of any discovery. Documentation methods will include photographs, sketches, scaled drawings, and written descriptions. Samples may be taken and transported to MACTEC's archaeological laboratory in Knoxville, Tennessee for identification or special analysis.

3. The primary goals of archaeological monitoring will be discovery and documentation of cultural material in the project that are inadvertently discovered by drilling activities, and avoidance of unnecessary adverse effects on historic properties from drilling activities.

4. In the event of a significant archaeological discovery, the Archaeologist will immediately contact the equipment operator, ask that drilling be suspended, and arrange for re-direction or the halt of drilling as needed until preliminary documentation can be completed. If this preliminary analysis leads the Archaeologist to conclude that the discovery is not significant, the Archaeologist may decide to allow drilling to continue. However, if the Archaeologist determines that the discovery is significant, the Archaeologist may assume that it is eligible for purposes of Section 106 and resolution of adverse effects [36 CFR 800.13 (c)]. If, in this instance, it is determined that continued drilling would cause an adverse effect on the historic property, the Archaeologist shall ask the Drilling Supervisor to cease drilling at the soil boring where the discovery was made.

5. All significant discoveries will be reported by the Archaeologist to the Drilling Supervisor immediately. The Archaeologist will ensure that the RIZZO Project Manager is fully briefed on the discovery in a timely fashion. The Archaeologist will assemble documentation and a preliminary assessment of significance that will accompany draft site records supplied to the Missouri SHPO. Criteria and integrity requirements for listing on the National Register (36 CFR 60.4) will provide the standards for identification and evaluation of significance for cultural material.

6. If a discovery is made during drilling and the Archaeologist determines that the discovery is significant, then she shall contact the Archaeologist in General Charge and the RIZZO Project Manager to notify them of the discovery. RIZZO will promptly notify AmerenUE, who will notify the property owner if not AmerenUE. SHPO will be notified of the discovery by the technical report, which will be issued after the archaeological fieldwork has been completed.

7. If project activities expose human remains, either burials or isolated teeth or bones, or other mortuary items, drilling activities in the vicinity of the find will be immediately stopped. The Archaeologist will assess whether the remains are modern or historic/prehistoric. She will inform the Drilling Supervisor and the RIZZO Project Manager of the discovery and her assessment of its age. If the Archaeologist cannot rule out that the find may be modern, the RIZZO Project Manager will ensure that the Callaway County Medical Examiner and local law enforcement are contacted. The County Medical Examiner will examine the remains and determine whether they constitute forensic evidence. If the remains are determined to be forensic evidence, the Medical Examiner will take charge of the discovery. Work at the drilling location where the discovery was made may continue only after permission has been given by the Medical Examiner and/or law enforcement officials.

8. If the remains are determined by the Archaeologist or the Medical Examiner to be historic or prehistoric, then the RIZZO Project Manager will contact AmerenUE officials, who will then see that any concerned Native American Tribes are consulted in a timely manner. This consultation will include information about the nature of the discovery and a request that any concerns be presented to the consulting agency and AmerenUE during the 30-day consultation period. Exposed burials or other human remains will be treated with respect and temporarily re-buried or backfilled pending development of a treatment plan by MDNR in consultation with the Missouri SHPO and any concerned Tribes. In no case will additional excavation be undertaken prior to Native American consultation, and no exposed human remains will be left unattended. The ultimate disposition of the remains will be determined in consultation.

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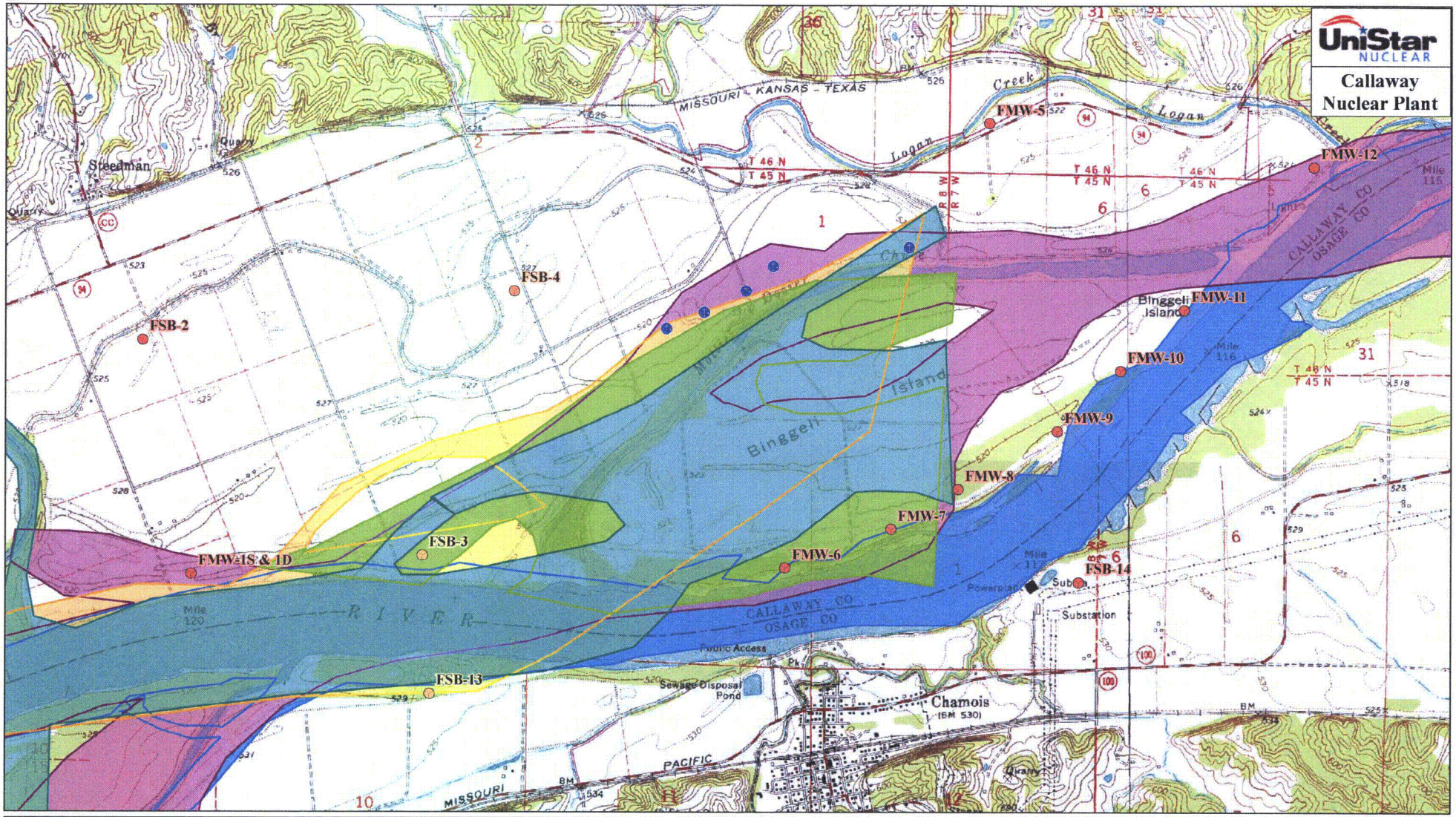

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MACTEC

engineering and constructing a better tomorrow

May 14, 2009

Mr. Mark Miles
Director and Deputy State Historic Preservation Officer
State of Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Subject: **Report of Phase I Archaeological Survey**
Selected Portions of an Access Road/Pipeline Corridor and Transmission Line Corridor
Callaway and Osage Counties, Missouri
MACTEC Project 3250-07-5219-23.11

Dear Mr. Miles:

Please find enclosed two copies of our report *Report of Phase I Archaeological Survey, Selected Portions of an Access Road/Pipeline Corridor and Transmission Line Corridor, Callaway and Osage Counties, Missouri* on behalf of Paul C. Rizzo & Associates and AmerenUE for your review. The purpose of our survey was to determine if significant cultural resources were located within the proposed location at certain on the proposed access road/pipeline and transmission corridor at the Callaway Plant in Callaway County, Missouri.

If you have any questions please feel free to call Emmett Brown (865) 218-1984.

Sincerely,

MACTEC Engineering and Consulting, Inc.

J. Emmett Brown, RPA
Senior Archaeologist
CR Group Leader

Patrick H. Garrow, RPA for Pat Garrow with permission
Senior Principal Archaeologist

JEB/PHG:sjm

Enclosure

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