

October 26, 2021

Tony Brown City of Siloam Springs 975 Anderson Avenue Siloam Springs, AR 72761

RE: Project: 4TH QTR WET Pace Project No.: 60382801

Dear Tony Brown:

Enclosed are the analytical results for sample(s) received by the laboratory between October 12, 2021 and October 18, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services Kansas City
- Pace Analytical Services SE Kansas

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

Sincerely,

This Wood

Nolie Wood nolie.wood@pacelabs.com 1(913)563-1401 Project Manager

Enclosures





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

CERTIFICATIONS

Project: 4TH QTR WET Pace Project No.: 60382801

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Inorganic Drinking Water Certification #: 10090 Arkansas Drinking Water Arkansas Certification #: 20-020-0 Arkansas Drinking Water Illinois Certification #: 2000302021-3 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212019-9 Illinois Certification #: 004592 Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070

Pace Analytical Services Southeast Kansas 808 West McKay, Frontenac, KS 66763

Arkansas Certification #: 18-016-0 lowa Certification #: 118 Kansas/NELAP Certification #: E-10426 Louisiana Certification #: 03055 Oklahoma Certification #: 9935 Texas Certification #: T104704407 Utah Certification #: KS00021



SAMPLE SUMMARY

Project: 4TH QTR WET

Pace Project No.: 60382801

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60382801001	CITY OF SILOAM SPRINGS	Water	10/11/21 09:00	10/12/21 08:00
60382801002	CITY OF SILOAM SPRINGS WASTEWA	Water	10/11/21 09:00	10/12/21 18:10
60382801003	649833	Water	10/13/21 09:13	10/14/21 19:15
60382801004	649830	Water	10/15/21 09:00	10/18/21 18:00



SAMPLE ANALYTE COUNT

Project:4TH QTR WETPace Project No.:60382801

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60382801001	CITY OF SILOAM SPRINGS	EPA 821/R-02/013	MEB	1	PASI-SE
60382801002	CITY OF SILOAM SPRINGS WASTEWA	EPA 200.8	JGP	12	PASI-K
60382801003	649833	EPA 200.8	JGP	12	PASI-K
60382801004	649830	EPA 200.8	JGP	12	PASI-K

PASI-K = Pace Analytical Services - Kansas City

PASI-SE = Pace Analytical Services - SE Kansas



Project: 4TH QTR WET

Pace Project No.: 60382801

Sample: CITY OF SILOAM SPRINGS	Lab ID: 6	0382801001	Collected: 10/	1/21 09	9:00	Received: 10	/12/21 08:00	Matrix: Water	
Parameters	Results	Units	Report Lim	t D	F	Prepared	Analyzed	CAS No.	Qual
Chronic Toxicity	y Analytical Method: EPA 82 Pace Analytical Services -								
Toxicity, Chronic	Complete		1	.0 1	1		10/12/21 10:5	0	



Project: 4TH QTR WET

Pace Project No.: 60382801

Sample: CITY OF SILOAM SPRINGS WASTEWA	Lab ID: 60	382801002	Collected: 10/11/2	1 09:00) Received: 10	/12/21 18:10 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Me	ethod: EPA 20	0.8 Preparation Met	hod: El	PA 200.8			
	Pace Analyti	cal Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7440-36-0	
Arsenic	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7440-38-2	
Beryllium	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 07:58	7440-41-7	
Cadmium	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 07:58	7440-43-9	
Chromium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7440-47-3	
Copper	1.3	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7440-50-8	
Lead	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7439-92-1	
Nickel	1.9	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7440-02-0	
Selenium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7782-49-2	
Silver	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 07:58	7440-22-4	
Thallium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 07:58	7440-28-0	
Zinc	35.2	ug/L	10.0	1	10/20/21 13:32	10/25/21 07:58	7440-66-6	



Project: 4TH QTR WET

Pace Project No.: 60382801

Sample: 649833	Lab ID: 6038	32801003	Collected: 10/13/2	1 09:13	Received: 10	/14/21 19:15 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Meth	od: EPA 200	0.8 Preparation Met	hod: EP	A 200.8			
	Pace Analytica	I Services - I	Kansas City					
Antimony	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7440-36-0	
Arsenic	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7440-38-2	
Beryllium	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 08:15	7440-41-7	
Cadmium	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 08:15	7440-43-9	
Chromium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7440-47-3	
Copper	1.3	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7440-50-8	
Lead	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7439-92-1	
Nickel	1.9	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7440-02-0	
Selenium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7782-49-2	
Silver	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 08:15	7440-22-4	
Thallium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:15	7440-28-0	
Zinc	31.7	ug/L	10.0	1	10/20/21 13:32	10/25/21 08:15	7440-66-6	



Project: 4TH QTR WET

Pace Project No.: 60382801

Sample: 649830	Lab ID: 603	82801004	Collected: 10/15/2	21 09:00	Received: 10)/18/21 18:00 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Meth	nod: EPA 20	0.8 Preparation Met	hod: EF	PA 200.8			
	Pace Analytica	I Services -	Kansas City					
Antimony	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7440-36-0	
Arsenic	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7440-38-2	
Beryllium	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 08:20	7440-41-7	
Cadmium	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 08:20	7440-43-9	
Chromium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7440-47-3	
Copper	1.2	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7440-50-8	
Lead	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7439-92-1	
Nickel	1.2	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7440-02-0	
Selenium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7782-49-2	
Silver	ND	ug/L	0.50	1	10/20/21 13:32	10/25/21 08:20	7440-22-4	
Thallium	ND	ug/L	1.0	1	10/20/21 13:32	10/25/21 08:20	7440-28-0	
Zinc	14.5	ug/L	10.0	1	10/20/21 13:32	10/25/21 08:20	7440-66-6	



QUALITY CONTROL DATA

Project:	4TH QTR WET					
Pace Project No.:	60382801					
QC Batch:	750764		Analysis Meth	od: Ef	PA 200.8	
QC Batch Method:	EPA 200.8		Analysis Desc	ription: 20	0.8 MET	
			Laboratory:	Pa	ace Analytical Servi	ces - Kansas City
Associated Lab Sar	mples: 60382801	002, 6038280100	3, 60382801004			
METHOD BLANK:	3006164		Matrix:	Water		
Associated Lab Sar	mples: 60382801	002, 6038280100	3, 60382801004			
			Blank	Reporting		
Para	meter	Units	Result	Limit	Analyzed	Qualifiers
Antimony		ug/L	 ND	1.0	10/25/21 07:52	
Arsenic		ug/L	ND	1.0	10/25/21 07:52	
Beryllium		ug/L	ND	0.50	10/25/21 07:52	
Cadmium		ug/L	ND	0.50	10/25/21 07:52	
Chromium		ug/L	ND	1.0	10/25/21 07:52	
Copper		ug/L	ND	1.0	10/25/21 07:52	
					10/05/01 05 50	

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	10/25/21 07:52	
Arsenic	ug/L	ND	1.0	10/25/21 07:52	
Beryllium	ug/L	ND	0.50	10/25/21 07:52	
Cadmium	ug/L	ND	0.50	10/25/21 07:52	
Chromium	ug/L	ND	1.0	10/25/21 07:52	
Copper	ug/L	ND	1.0	10/25/21 07:52	
Lead	ug/L	ND	1.0	10/25/21 07:52	
Nickel	ug/L	ND	1.0	10/25/21 07:52	
Selenium	ug/L	ND	1.0	10/25/21 07:52	
Silver	ug/L	ND	0.50	10/25/21 07:52	
Thallium	ug/L	ND	1.0	10/25/21 07:52	
Zinc	ug/L	ND	10.0	10/25/21 07:52	

LABORATORY CONTROL SAMPLE: 3006165

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	40	38.4	96	85-115	
Arsenic	ug/L	40	40.0	100	85-115	
Beryllium	ug/L	40	39.8	99	85-115	
admium	ug/L	40	39.8	99	85-115	
hromium	ug/L	40	39.1	98	85-115	
opper	ug/L	40	42.5	106	85-115	
ead	ug/L	40	36.4	91	85-115	
ckel	ug/L	40	40.3	101	85-115	
elenium	ug/L	40	39.5	99	85-115	
lver	ug/L	20	19.0	95	85-115	
hallium	ug/L	40	35.7	89	85-115	
inc	ug/L	100	104	104	85-115	

MATRIX SPIKE & MATRIX S		CATE: 3006	166		3006167							
	6	0382801002	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	ug/L	ND	40	40	40.0	39.3	99	97	70-130	2	20	
Arsenic	ug/L	ND	40	40	41.1	40.9	102	102	70-130	0	20	
Beryllium	ug/L	ND	40	40	40.3	40.8	101	102	70-130	1	20	
Cadmium	ug/L	ND	40	40	38.7	38.6	97	96	70-130	0	20	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 4TH QTR WET Pace Project No.: 60382801

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	ATE: 3006	166		3006167							
			MS	MSD								
	6	0382801002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chromium	ug/L	ND	40	40	39.2	38.9	97	97	70-130	1	20	
Copper	ug/L	1.3	40	40	39.3	39.3	95	95	70-130	0	20	
Lead	ug/L	ND	40	40	38.7	38.3	96	95	70-130	1	20	
Nickel	ug/L	1.9	40	40	39.7	39.3	94	94	70-130	1	20	
Selenium	ug/L	ND	40	40	38.4	38.2	95	95	70-130	0	20	
Silver	ug/L	ND	20	20	17.9	17.9	89	89	70-130	0	20	
Thallium	ug/L	ND	40	40	37.7	37.4	94	94	70-130	1	20	
Zinc	ug/L	35.2	100	100	130	130	95	95	70-130	0	20	

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



QUALIFIERS

Project: 4TH QTR WET

Pace Project No.: 60382801

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 4TH QTR WET Pace Project No.: 60382801

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60382801001	CITY OF SILOAM SPRINGS	EPA 821/R-02/013	750989		
60382801002	CITY OF SILOAM SPRINGS WASTEWA	EPA 200.8	750764	EPA 200.8	750910
60382801003 60382801004	649833 649830	EPA 200.8 EPA 200.8	750764 750764	EPA 200.8 EPA 200.8	750910 750910



Sample Condition Upon Receipt

WO#:60382801

Client Name: Silcam springs		
Courier: FedEx 🗆 UPS 🗆 VIA 💋 Clay 🗆		Pace 🗆 Xroads 🗆 Client 🗔 Other 🗖
Tracking #: P	ace Shipping Label Use	d? Yes □ Nø □
Custody Seal on Cooler/Box Present: Yes Z No 🗆	Seals intact: Yes	
Packing Material: Bubble Wrap Bubble Bage		None 🗆 Other 🗆
	of Ice: We Blue No	Date and initials of parson
Cooler Temperature (°C): As-read $2 \cdot 9$ Corr. Fa	ctor ~~? Correc	ted <u>2.6</u> examining contents:
Temperature should be above freezing to 6°C		10/19/21
Chain of Custody present:	Yes No N/A	
Chain of Custody relinquished:		
Samples arrived within holding time:		
Short Hold Time analyses (<72hr):		
Rush Turn Around Time requested:		
Sufficient volume:		
Correct containers used;		
Pace containers used:		
Containers intact:		
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?		
Filtered volume received for dissolved tests?		
Sample labels match COC: Date / time / ID / analyses		
Samples contain multiple phases? Matrix: \mathcal{WT}	□Yes No □N/A	
Containers requiring pH preservation in compliance?		List sample IDs, volumes, lot #'s of preservative and the
(HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#	603173	date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	Yes No	
Trip Blank present:	Yes No TN/A	
Headspace in VOA vials (>6mm):	Yes No N/A	
Samples from USDA Regulated Area: State:		
Additional labels attached to 5035A / TX1005 vials in the fiel	Id? 🗆 Yes 🗋 No 🖉 N/A	
Client Notification/ Resolution: Copy COC	to Client? Y / N	Field Data Required? Y / N
	/Time:	
Comments/ Resolution:		

Project Manager Review:

Date:



CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

City of Siloam Springs Report To Tony Brown Invoce Information 975 Anderson Avenue Copy To abrown@siloamsprings.com Attention 975 Siloam Springs, AR Copy To abrown@siloamsprings.com Company Name. Siloam Springs, AR Address Address Barown@siloamsprings.com Pase Doole V 975 228-2000 Fax Project Name Hth OTR WET 975 228-2000 Fax Project Name Ath OTR WET 976 DateTAT: Project Number Floged Site I	Section A Required Ch	Section A Required Chent Information:	Section B Required Project Information	Section C		
975 Anderson Avenue Corp Ts Attention 975 Anderson Avenue Corp Ts abrown@siloamsprings.com 975 Anderson Avenue Corp Ts abrown@siloamsprings.com 975 Anderson Avenue Corp Ts Brown@siloamsprings.com 876 Anderson Avenue Company Name. REGULATORY AGENCY 810am Springs.AR Purchase Order No. Pare Coule 810am Springs.com Purchase Order No. Pare Coule 810am Springs.com Pare Coule Notes 810a BaterTAT: Project Number Pare Project	Company		Paront To Tomi Pi	Invoice Information	Page:	ო
975 Anderson Avenue Company Name Enderson Avenue Company Name Enderson Recultatory AGENCY Siloam Springs, AR Zopy Ta Address Recultatory AGENCY Recultatory AGENCY Siloam Springs, AR Eventse Pare Quide Pare Quide Pare Cuide Pare Cuide 479-228-2000 Fax Project Name Ath QTR WET Pare Project Note Wood Pare Project Project Name 4 Due DaterTAT: Project Number Pare Project Note 10809 AR AR		OB	LIND FLOW	Attention		
Siloam Springs, AR ReGULATORY AGENCY abrown@siloamsprings.com Pare Quote abrown@siloamsprings.com Pare Quote 479-228-2000 Fax Pare DaterTAT: Project Number Abrown@siloamsprings.com Pare Quote Pare DaterTAT: Project Number	sendress	975 Anderson Avenue	Copy To abrown@siloamsprings.com	Company Name		
Address Address Address abrom/@siloamsprings.com Purchase Order No. Purchase Order No. 479-228-2000 Fax Project Name Abroad Project Name Project Name Abroad Project Name Site Location Abroad Project Name Project Name		Siloam Springe AD			REGULATORY AGENCY	
abrown@siloarmsprings.com Purchase Order No. Bare Oude V NPDES GROLIND WATER 479-228-2000 Fair Project Name 4th QTR WET Pase Project Nolie Vood 1 UST RCRA 4 Due DaterTAT: Project Number Pase Project Nolie Vood Site Location AR		NC 'shaudo amoun		Address		
479-228-2000 Fac. Project Name 4th OTR WET Pace Date Abso Date/TAT: Project Number 0010 Wood Site Location	Tial To	abrown@silnamenrine nom	Distance Owners		Ē,	1
479-228-2000 Fax Project Name 4th QTR WET Reference I UST R.CRA 479-228-2000 Fax Project Number Management Note Woold I UST R.CRA		MONTO RETURNED TO AND THE REAL PROPERTY OF	THURSDAY UNDER MO.	Pace Quote		
Project Number 4th QTR WET Pace Project Notife Wood Site Location AR	Tone 47		Developed Marries 111 American	Retenence	5	OTUCE
Project Number Sits Location Sits Location			more warres 4th QTR WET			
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				Pace Profile # 10809	AR	A DESCRIPTION OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNE

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-	City of Siloam Springs Wastewater Plant		NWN	+	+	-	201	-	-	н	_		0 N	1					вЯ	Pace	Project	Pace Project No./ Lab I.D.
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semples	'samples have a 24 hour hold time!						+			Ť	k				NON		DATE	TIME		SAMP	SAMPLE CONDITIONS	SNOL
return se	return samples to the Frontenac Lab on ice!						-	10/15/21	9:21	-	Leel.	10 M	200		y	101	1951	OSEI	0.	>	7	2
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ge 14						SIGN	SIGNATURE of SAMPLER:	AMPLER:	10	much	1641	1		DAT	DATE Signed		PUREMA		Temp	19099) 901	(poter nelooC) Alqme
1 -	Important Note: By similar this 644													1111	12100		1011012					²S

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

F-ALL-Q-020rev.08, 12-Oct-2007

Pace Analytical Sample Condition	Upon R	ece	ipt	
1				
				Leg3
Client Name: 5/10am Spring	5			<u> </u>
	РЕХП	F		Pace 🗆 Xroads 🗆 Client 🗆 Other 🗆
Tracking #: Pa	ace Shippi			
Custody Seal on Cooler/Box Present: Yes X No 🗆			t: Yes	
Packing Material: Bubble Wrap Bubble Bags		F	oam 🗆	None X Other
	ofice: We			
Cooler Temperature (°C): As-read 3.0 Corr. Fac	tor <u>-1.1</u>		Corre	cted 1.9 Date and initials of person examining contents:
Temperature should be above freezing to 6°C				TS10/15/21/250
Chain of Custody present:	XYes			
Chain of Custody relinguished:	Yes			
Samples arrived within holding time:	Yes	DNo		
Short Hold Time analyses (<72hr):	XYes	ΠNO	□n/a	
Rush Turn Around Time requested:	□Yes	XNo	□n/a	
Sufficient volume:	XYes	ΩNo	□n/a	
Correct containers used	XYes	ΠNo	⊡n/a	
Pace containers used:	XYes	⊡No	□n/a	
Containers intact:	XYes	□No		
Jnpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes	ΩNo	X _{N/A}	
Filtered volume received for dissolved tests?	□Yes	□No	X _{N/A}	
Sample labels match COC: Date / time / ID / analyses	XYes	INo	⊡n/A	
Samples contain multiple phases? Matrix:	□Yes 2	XNo	⊡ N/A	
containers requiring pH preservation in compliance?	□Yes [□No	X _{N/A}	List sample IDs, volumes, lot #'s of preservative and the
HNO ₃ , H ₂ SO ₄ , HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)				date/time added
yanide water sample checks				
ead acetate strip turns dark? (Record only) otassium iodide test strip turns blue/purple? (Preserve)	□Yes [
	Yes [
rip Blank present:	□Yes [∃No	Xn/A	
eadspace in VOA vials (>6mm):	□Yes [JNo	XN/A	
amples from USDA Regulated Area: State:	□Yes □			
dditional labels attached to 5035A / TX1005 vials in the field? lient Notification/ Resolution: Copy COC to		_		
		Y]	Ν	Field Data Required? Y Z N
Date/T	ime:			

REFERENCE #60382801

CHRONIC TOXICITY TEST FOR City of Siloam Springs

PERMIT # AR0020273 AFIN # 04-00106

PERFORMED ON:

Pimephales promelas

and

Ceriodaphnia dubia

PREPARED FOR:

City of Siloam Springs Attn: Tony Brown 975 Anderson Avenue Siloam Springs, AR 1-479-228-2000

PREPARED BY: Pace Analytical Services, Inc. 808 West McKay Frontenac, KS 66763 1-620-235-0003

October 21, 2021

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REFERENCE #60382801

SUMMARY

A Chronic Whole Effluent Toxicity Test using the 7-day chronic fathead minnows (<u>Pimephales promelas</u>), static renewal larval survival and growth test, and three brood 7-day chronic Cladoceran (<u>Ceriodaphnia dubia</u>), static renewal survival and reproduction test, was conducted on effluent discharge water collected at the City of Siloam Springs effluent discharge from October 11, 2021 to October 15, 2021. All the test methods followed are as listed in <u>EPA 821-R-02-013</u>, "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms."

Statistically significant (p<0.05) mortality is determined by Dunnet's procedure using average percent survival of each test concentration versus the average survival of the controls. If significant mortality occurs, median lethal concentrations are calculated using effluent concentrations and their corresponding percent mortality data. The 95% confidence intervals are calculated where appropriate by the Spearman-Karber method. Statistical analysis is accomplished by following steps in <u>EPA 821-R-02-013</u>, February 2002 and by use of Toxstat version 3.4.

In minnow section of testing, it was observed that the effluent had no significant effect on the survival of the larvae at the 100% concentration. No significant mortality was observed in the other effluent concentrations after the 7-day exposure period. The No Observed Effect Concentration (NOEC) was determined to be 100% for survival. No significant reduction in growth was observed in the 100% effluent concentration. The Toxic Units is <1. The IC25 is >100. The NOEC for growth in effluent was determined to be 100%. The PMSD was 12.5.

In Cladoceran section of testing, it was observed that the effluent had no significant effect on the survival of the organisms in the 100% effluent concentration. No significant mortality was observed in the other effluent concentrations after the 7-day exposure period. The No Observed Effect Concentration (NOEC) was determined to be 100% for survival. No significant reduction in reproduction was observed in the 100% effluent concentrations. The Toxic Units is <1. The IC25 is >100. The NOEC for reproduction in effluent was determined to be 100%. The PMSD was 15.2.

The chronic toxicity exhibited by the fathead minnows and the <u>Ceriodaphnia</u> treated by the effluent sampled from October 11 to October 15 from the City of Siloam Springs effluent discharge, is acceptable as described in <u>EPA 821-R-02-013</u>.

INTRODUCTION

Pace Analytical was contracted to perform this chronic toxicity test on effluent from the City of Siloam Springs effluent discharge. Chronic toxicity was measured using the <u>Pimephales promelas</u> at larval for survival and growth test and the <u>Ceriodaphnia dubia</u> survival and reproduction test described in <u>EPA 821-</u> <u>R-02-013</u>, "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." The raw data of the study is stored at Pace Analytical Services, INC. 808 West McKay, Frontenac, KS 66763.

TEST MATERIAL

City of Siloam Springs personnel collected sampling of the effluent. A sample of the effluent was delivered to Pace by commercial carrier on 10-12-21. Subsequent samples followed by delivery on 10-14-21, and on 10-16-21. All samples were stored at \leq 6° Celsius. Moderately Hard Synthetic Water was used as a control and also to make the required dilutions in the test as described in EPA 821-R-02-013.

TEST METHODS

Pace used EPA test method 1000.0 for conducting the Fathead Minnow, <u>Pimephales promelas</u>, Larval Survival and Growth Test. EPA test method 1002.0 was used for conducting the Cladoceran, <u>Ceriodaphnia dubia</u>, Survival and Reproduction Test. The tests were conducted to estimate the NOEC, and LOEC for survival, growth, and reproduction of these test species.

The <u>Pimephales</u> and <u>Ceriodaphnia</u> tests were initiated on 10-12-21 and carried out until 10-19-21. The Pimephales tests were conducted in 500 ml plastic jars with 250 ml of test solution. Ten larvae were placed in each of at least 5 replicates to make a total of 50 larvae per sample concentration. The <u>Ceriodaphnia</u> tests were carried out in 35ml vials containing 25 ml of test solution. One Neonate was placed in each of 10 replicates to make a total of 10 neonates per sample concentration.

TEST ORGANISMS

The organisms used in these tests were cultured at Pace under controlled temperature and photoperiod conditions and/or were purchased from an external supplier. Pace maintains records of all culture techniques used in producing organisms.

TABLE 1

Permittee: City of Siloam Springs Effluent discharge.

Date Sampled	No. 1: 10-11-21	9:00
	No. 2: 10-13-21	9:13
	No. 3: 10-14-21	9:00
Test Initiated: 10:50 Test End: 10:40	Date: 10-12-21 Date: 10-19-21	

RESULTS

Critical Dilution:	100%		
Ceriodaphnia dubia	Results		
TLP3B	0		
TGP3B	0		
ТОРЗВ	100		
ТРРЗВ	100		
TQP3B	15.87		
Pimephales promelas	Results		
TLP6C	0		
TGP6C	0		
TOP6C	100		
TPP6C	100		
TQP6C	9.44		

REFERENCE #60382801

Dilution Water used: Moderately Hard Synthetic Water

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL (<u>Pimephales promelas</u>)

	DATA	I ABLE F	OR GROV	VIH OF F.	ATHEAD	MINNOVVS	
Effluent Concentration (%)	Averag A		eight in Mi te Chamb [,] C	lligrams in ers D	E	Mean Dry Weight (mg)	CV% *
Control 0%	0.471	0.462	0.578	0.479	0.510	0.500	9.44
Dilution 1 32%	0.492	0.497	0.459	0.427	0.506	0.476	6.87
Dilution 2 42%	0.490	0.581	0.468	0.420	0.488	0.489	11.94
Dilution 3 56%	0.505	0.510	0.493	0.544	0.516	0.514	3.70
Dilution 4 75%	0.533	0.451	0.510	0.602	0.614	0.529	9.96
Dilution 5 100%	0.561	0.589	0.541	0.523	0.536	0.550	4.68

DATA TABLE FOR GROWTH OF FATHEAD MINNOWS

* Coefficient of Variation = Standard Deviation X 100 / Mean

FATHEAD MINNOW SURVIVAL

Conc. %	Pe		urvival i Chambe	n Replica	ate	Mean	Percent S	Survival	CV %
	А	В	С	D	Е	24hr	48hr	7 day	
Control 0%	100	100	100	100	100	100	100	100	0.00
Dilution 1 32%	100	100	100	90	100	100	100	98	5.28
Dilution 2 42%	100	100	100	90	100	100	100	98	5.28
Dilution 3 56%	100	100	100	100	100	100	100	100	0.00
Dilution 4 75%	100	100	100	100	100	100	100	100	0.00
Dilution 5 100%	100	100	100	100	100	100	100	100	0.00

Permittee: City of Siloam Springs Effluent discharge.

CERIODAPHNIA SURVIVAL AND REPRODUCTION

Replicate	Control	Dilution 1	Dilution 2	Dilution 3	Dilution 4	Dilution 5
	0%	32%	42%	56%	75%	100%
1	16	24	20	19	25	19
2	24	19	23	16	16	24
3	19	17	18	24	19	18
4	20	23	15	25	20	21
5	19	23	20	22	21	17
6	21	27	16	20	19	23
7	24	22	19	24	23	17
8	23	20	21	22	26	25
9	25	19	20	17	21	20
10	16	19	22	22	24	26
Mean	20.7	21.3	19.4	21.1	21.4	21.0
SD	3.268	3.020	2.503	3.035	3.098	3.333
CV %	15.79	14.18	12.90	14.38	14.48	15.87

DATA TABLE FOR <u>CERIODAPHNIA</u> YOUNG PRODUCTION

CERIODAPHNIA MEAN PERCENT SURVIVAL

		Perc	cent Effluent	: (%)		
Time	Control	Dilution 1	Dilution 2	Dilution 3	Dilution 4	Dilution 5
Elapsed	0%	32%	42%	56%	75%	100%
24 hrs	100	100	100	100	100	100
48 hrs	100	100	100	100	100	100
7-day	100	100	100	100	100	100
SD	0.000	0.000	0.000	0.000	0.000	0.000
CV %	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 2 SUMMARY OF TEST CONDITIONS FOR THE FATHEAD MINNOW (Pimephales promelas) LARVAL SURVIVAL AND GROWTH TEST

	SURVIVAL AND GROWTH TEST
1. Test type	Static renewal
2. Temperature	25 degrees Celsius
3. Light quality	Ambient laboratory light
4. Light intensity	Ambient laboratory levels
5. Photoperiod	16 hr light, 8 hr dark
6. Test chamber size	500 ml
7. Test solution volume	250 ml
8. Renewal of test concentrations	Daily
9. Age of test organism	< 24 hours
10. No. larvae/chamber	10
11. No. replicates/concentration	5
12. No. larvae/concentration	50
13. Feeding regime	Feed 0.15 g newly hatched brine shrimp nauplii two times daily. Larvae are not fed 12 hours prior to termination of test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None
16. Dilution Water	Moderately Hard Synthetic Water prepared with MILLI-Q deionized water and reagent grade chemicals
17. Effluent concentrations	0%, 32%, 42%, 56%, 75%, 100%
18. Test duration	7 days
19. Endpoints	Survival and growth
20. Test acceptability	80% or greater survival in the controls, Average dry weight in controls >0.25 mg, Coefficient of variation in the control must not exceed 40%.

TABLE 2 (CONT.) SUMMARY OF TEST CONDITIONS FOR THE CLADOCERAN (Ceriodaphnia dubia) SURVIVAL AND REPRODUCTION TEST

	AL AND REPRODUCTION TEST
1. Test type	Static renewal
2. Temperature	25 degrees Celsius
3. Light quality	Ambient laboratory light
4. Light intensity	Ambient laboratory levels
5. Photoperiod	16 hr light, 8 hr dark
6. Test chamber size	30 ml
7. Test solution volume	25 ml
8. Renewal of test concentrations	Daily
9. Age of test organism	< 24 hours
10. No. larvae/chamber	1
11. No. replicates/concentration	10
12. No. larvae/concentration	10
13. Feeding regime	Feed 0.1 ml YCT and 0.1 ml of Algae daily. Larvae are not fed 12 hours prior to termination of test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None
16. Dilution Water	Moderately Hard Synthetic Water prepared with MILLI-Q deionized water and reagent grade chemicals
17. Effluent concentrations	0%, 32%, 42%, 56%, 75%, 100%
18. Test duration	Until 60% or more surviving control females have three broods or a maximum of 8 days.
19. Endpoints	Survival and Reproduction
20. Test acceptability	80% or greater survival in the controls, Average reproduction rate of 15 young / adult. Coefficient of variation in the control must not exceed 40%.

BIOMONITORING CHRONIC TOXICITY REPORT FATHEAD MINNOW (<u>Pimephales promelas</u>) CHEMICAL PARAMETERS CHART

Permittee: City of Siloam Springs Effluent discharge.

ANALYSTS: Pace Analytical Services, Inc. Timothy Harrell Mike Bollin

TABLE 2 (SECTION 2)INITIAL WATER QUALITYEFFLUENT CONCENTRATION

	Control	100%
PH	7.6	7.5
D.O.	8.0	8.1
Temp	25.0	25.0
Alk	64	76
Hard	86	192
Cond	322	859
Chlorine	<0.1	<0.1

* D.O. is reported as mg/L Alkalinity is reported as mg/L CaCO3 Hardness is reported as mg/L CaCO3 Conductance is reported as umhos Ammonia is reported as mg/L Chlorine is reported as mg/L

TEST WATER QUALITY

24-Hour Water Quality Measurements

Effluent Concentration (%)	PH	D.O. (mg/l)	Temperature (C)
0% Control	7.7	7.1	24.7
32% Effluent	7.7	7.2	24.6
42% Effluent	7.7	7.3	24.6
56% Effluent	7.7	7.4	24.6
75% Effluent	7.7	7.5	24.6
100% Effluent	7.6	7.6	24.6

48-Hour Water Quality Measurements

Effluent	PH	D.O.	Temperature
Concentration (%)		(mg/l)	(C)
0% Control	7.6	7.1	24.6
32% Effluent	7.6	7.1	24.7
42% Effluent	7.6	7.1	24.7
56% Effluent	7.7	7.2	24.7
75% Effluent	7.7	7.2	24.7
100% Effluent	7.8	7.3	24.7

FINAL WATER QUALITY

EFFLUENT CONCENTRATION

	Control	100%			
pН	7.6	7.9			
D.O.	7.0	7.0			
Temp	25.0	25.0			
Alk	62	78			
Hard	94	186			
Cond	383	911			

D.O. is reported as mg/L
 Alkalinity is reported as mg/L CaCO3
 Hardness is reported as mg/L CaCO3
 Conductance is reported as umhos

TEST VALIDITY

The <u>Pimephales promelas</u> control survival rate was 100. The mean dry weight (growth) of the <u>Pimephales promelas</u> was determined at 0.500 g/organism in the controls. The percent coefficient of variation (%CV) values for the fathead minnow control for survival and growth were 0.00 and 9.44. The <u>Ceriodaphnia</u> dubia survival rates were 100 in the control. The <u>Ceriodaphnia</u> in the control produced an average of 20.7 young over the seven-day exposure period. Percent CV values for <u>Ceriodaphnia</u> dubia control survival and reproduction was 0.00 and 15.79. Control data met or exceeded all criteria set out by <u>EPA 821-R-02-013</u> for test acceptance.

REFERENCE TOXICANTS

The absence of significant control mortality during this test indicated the health of the organisms and indicated that any significant mortality in the test concentrations was not due to contaminants or variations in testing conditions.

Reference toxicity testing is routinely performed by staff members in our biomonitoring - bioassay laboratory.

Start: 9/14/21 1	11:30	End: 9/21/21 12:	10	
Reference Toxic	cant (NaCl)	Pimephale	es promelas	
Concentration		Avg. # of Live O	rganisms/replica	te
of Toxicant				
	0 hrs	24 hrs	48 hrs	7 days
10 g/l	40	7	1	0
8 g/l	40	35	14	4
6 g/l	40	40	36	26
4 g/l	40	40	40	40
2 g/l	40	40	40	39
1005 (545 11)				

IC25 (5.15 g/l Sodium Chloride)

Survival NOEC: 4.0 g/l

Reference Toxicar	t (NaCl)	Ceriodaphr			
Concentration of Toxicant		Avg. # of Live Organisms/replicate			
	0 hrs	24 hrs	48 hrs	7 days	
2.5 g/l	10	8	3	0	
2.0 g/l	10	10	9	2	
1.5 g/l	10	10	10	10	
1.0 g/l	10	10	10	10	
0.5 g/l	10	10	10	10	

IC25 (1.24 g/l Sodium Chloride)

Survival NOEC: 1.5 g/l

Submitted By: Jim Harrell

Timothy Harrell, Technical Director

60382801 Siloam Springs FATHEAD SURVIVAL File: 6382801A Transform: ARC SINE(SQUARE ROOT(Y))									
Chi-square t	test for no	rmality: actual a	and expected free	quencies					
	INTERVAL <-1.5 -1.5 to <-0.5 -0.5 to 0.5 >0.5 to 1.5 >1.5								
EXPECTED OBSERVED	2.010 2	7.260 0	11.460 28	7.260 0	2.010				
		goodness of fit t (alpha = 0.01) =		40.4019					
Data FAIL no	ormality te	est. Try another t	ransformation.						
		hree homogeneity ould not be perfo		tive to non-nor	mal				
		s FATHEAD SURVIVA Transform: ARC SIN))					
Shapiro - W	ilk's test	for normality	· · · · · · · · · · · · · · · · · · ·						
D = 0.042									
W = 0.547									
Critical W (P = 0.05) (n = 30) = 0.927 Critical W (P = 0.01) (n = 30) = 0.900									
Data FAIL normality test. Try another transformation.									
Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.									

603828	301	Siloam	Springs	FATHEAD	SURVJ	IVAL	
File:	638	32801A	TI	ransform:	ARC	SINE (SQUARE	ROOT(Y))

SUMMARY	STATISTICS	ON	TRANSFORMED	DATA	TABLE	1	of	2	
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GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	5	1.412	1.412	1.412
2	32%	5	1.249	1.412	1.379
3	42%	5	1.249	1.412	1.379
4	56%	5	1.412	1.412	1.412
5	75%	5	1.412	1.412	1.412
6	100%	5	1.412	1.412	1.412
5	700 1	2			~ • ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

60382801 Siloam Springs FATHEAD SURVIVAL File: 6382801A Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	CONTROL	0.000	0.000	0.000	0.00
2	32%	0.005	0.073	0.033	5.28
3	42%	0.005	0.073	0.033	5.28
4	56%	0.000	0.000	0.000	0.00
5	75%	0.000	0.000	0.000	0.00
6	100%	0.000	0.000	0.000	0.00

60382801 Siloam Springs FATHEAD SURVIVAL File: 6382801A Transform: ARC SINE(SQUARE ROOT(Y))

		ANOVA TABLE		
SOURCE	DF	SS	MS	F
Between	5	0.007	0.001	0.800
Within (Error)	24	0.042	0.002	
Total	29	0.050		
Critical F val Since F < Cri		52 (0.05,5,24) FAIL TO REJECT Ho: All	equal	

60382801 Siloam Springs FATHEAD SURVIVAL File: 6382801A Transform: ARC SINE(SQUARE ROOT(Y))

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	I T STAT	SIG
1 2 3 4 5	CONTROL 32% 42% 56% 75%	1.412 1.379 1.379 1.412 1.412	1.000 0.980 0.980 1.000 1.000	1.225 1.225 0.000 0.000	
6 Dunnett	100% table value = 2.36	1.412 (1 Tailed V	1.000 alue, P=0.05, df=24	0.000	

60382801 Siloam Springs FATHEAD SURVIVAL File: 6382801A Transform: ARC SINE(SQUARE ROOT(Y))

	DUNNETT'S TEST -	TABLE 2 O	F 2 Ho	:Control<	Treatment
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	CONTROL	5			
2	32%	5	0.023	2.3	0.020
3	428	5	0.023	2.3	0.020
4	56%	5	0.023	2.3	0.000
5	75%	5	0.023	2.3	0.000
6	100%	5	0.023	2.3	0.000

60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION Shapiro - Wilk's test for normality D = 0.042 W = 0.973Critical W (P = 0.05) (n = 30) = 0.927Critical W (P = 0.01) (n = 30) = 0.900______ _____ Data PASS normality test at P=0.01 level. Continue analysis. 60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION ______ Bartlett's test for homogeneity of variance Calculated B1 statistic = 6.12 _____ Table Chi-square value = 15.09 (alpha = 0.01, df = 5) Table Chi-square value = 11.07 (alpha = 0.05, df = 5) Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	5	0.462	0.578	0.500
2	32%	5	0.427	0.506	0.476
3	42%	5	0.420	0.581	0.489
4	56%	5	0.493	0.544	0.514
- 5	75%	5	0.451	0.589	0.529
6	100%	5	0.523	0.589	0.550

60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

1 CONTROL 0.002 0.047 0.021 9.44 2 32% 0.001 0.033 0.015 6.87 3 42% 0.003 0.058 0.026 11.94 4 56% 0.000 0.019 0.008 3.70 5 75% 0.003 0.053 0.024 9.96 6 100% 0.001 0.026 0.012 4.68	GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
232%0.0010.0330.0156.87342%0.0030.0580.02611.94456%0.0000.0190.0083.70575%0.0030.0530.0249.96	1			0.047	0.021	9.44
4 56% 0.000 0.019 0.008 3.70 5 75% 0.003 0.053 0.024 9.96	2					
5 75% 0.003 0.053 0.024 9.96	3	42%	0.003	0.058	0.026	11.94
	4	56%	0.000	0.019	0.008	3.70
6 100% 0.001 0.026 0.012 4.68	5	75%	0.003	0.053	0.024	9.96
	6	100%	0.001	0.026	0.012	4.68

60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION

SOURCE	DF	SS	MS	F
Between	5	0.018	0.004	2.074
Within (Error)	24	0.042	0.002	
Total	29	0.060		

Since F < Critical F FAIL TO REJECT Ho: All equal

60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION ______

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1 2 3 4 5 6	CONTROL 32% 42% 56% 75% 100%	0.500 0.476 0.489 0.514 0.529 0.550	0.500 0.476 0.489 0.514 0.529 0.550	0.899 0.400 -0.514 -1.088 -1.889	
Dunnett	table value = 2.36	(1 Tailed V	alue, P=0.05, df=24,	5)	

60382801 Siloam Springs FATHEAD GROWTH File: 6382801B Transform: NO TRANSFORMATION

	DUNNETT'S TEST -	TABLE 2 C	DF 2 Hc	:Control<	Treatment
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	CONTROL	5			
2	32%	5	0.062	12.5	0.024
3	42%	5	0.062	12.5	0.011
4	56%	5	0.062	12.5	-0.014
5	75%	5	0.062	12.5	-0.029
6	100%	5	0.062	12.5	-0.050

FISHER'S EXACT TEST					
	NUMBER OF				
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS		
CONTROL	10	0	10		
32%	10	0	10		
TOTAL	20	0	20		

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

FI	SHER'S EXACT	TEST		
	NUMBER OF			
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS	
CONTROL	10	0	10	
42%	10	0	10	
TOTAL	20	0	20	

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

	FISHER'S EXACT	TEST	
		NUMBE	
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS
CONTROL	10	0	10
56%	10	0	10

TOTAL	20	0	20		
CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.					
FISHER'S EXACT TEST					
		NUMBE	ER OF		
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS		
CONTROL	10	0	10		
75%	10	0	10		
TOTAL	20	0	20		
CRITICAL FISHER'S VALUE (10 Since b is greater than 6 t between CONTROL and TREATMENT	here is no sign	nificant diff 7el.			
***************************************		NUMBE			
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS		
CONTROL	10	0	10		
100%	10	0	10		
TOTAL	20	0	20		
CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.					

SUMMARY OF FISHER'S EXACT TESTS

NUMBER

NUMBER SIG

GROUP	IDENTIFICATION	EXPOSED	DEAD	(P=.05)
	CONTROL	10	0	
1	32%	10	0	
2	42%	10	0	
3	56%	10	0	
4	75%	10	0	
5	100%	10	0	

60382801 Siloam Springs CERIODAPHNIA DUBIA SUR File: 6382801D Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	10	1.000	1.000	1.000
2	32%	10	1.000	1.000	1.000
3	42%	10	1.000	1.000	1.000
4	56%	10	1.000	1.000	1.000
5	75%	10	1.000	1.000	1.000
б	100%	10	1.000	1.000	1.000

60382801 Siloam Springs CERIODAPHNIA DUBIA SUR File: 6382801D Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	CONTROL	0.000	0.000	0.000	0.00
2	32%	0.000	0.000	0.000	0.00
3	42%	0.000	0.000	0.000	0.00
4	56%	0.000	0.000	0.000	0.00
5	75%	0.000	0.000	0.000	0.00
6	100%	0.000	0.000	0.000	0.00

60382801 Siloam Springs CERIODAPHNIA DUBIA REP File: 6382801E								
	Chi-square test for normality: actual and expected frequencies							
INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5			
EXPECTED OBSERVED		14.520 18	22.920 17					
	-	goodness of fit t e (alpha = 0.01) =		7.7826				
Data PASS n	ormality te	est. Continue anal	ysis.					
		gs CERIODAPHNIA DU Fransform: NO TRAN						
Bartlett's test for homogeneity of variance Calculated B1 statistic = 0.83								
Table Chi-s	quare value	e = 15.09 (alph e = 11.07 (alph	a = 0.01, df =	5)				
Data PASS B1 homogeneity test at 0.01 level. Continue analysis.								

60382801 Siloam Springs CERIODAPHNIA DUBIA REP File: 6382801E Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	10	16.000	25.000	20.700
2	32%	10	17.000	27.000	21.300
3	42%	10	15.000	23.000	19.400
4	56%	10	16.000	25.000	21.100
5	75%	10	16.000	26.000	21.400
6	100%	10	17.000	26.000	21.000

60382801 Siloam Springs CERIODAPHNIA DUBIA REP File: 6382801E Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
		$\cdots = \cdots =$			$(a_1,a_2,\ldots,a_n) = (a_1,a_2,\ldots,a_n) = (a_1,a_2,\ldots$
1	CONTROL	10.678	3.268	1.033	15.79
2	32%	9.122	3.020	0.955	14.18
3	428	6.267	2.503	0.792	12.90
4	56%	9.211	3.035	0.960	14.38
5	75%	9.600	3.098	0.980	14.48
6	100%	11.111	3.333	1.054	15.87

60382801 Siloam Springs CERIODAPHNIA DUBIA REP File: 6382801E Transform: NO TRANSFORM

		ANOVA TABLE		
SOURCE	DF	SS	MS	F
Between	5	27.083	5.417	0.580
Within (Error)	54	503.900	9.331	
Total	59	530.983		
Critical F val Since F < Cri		45 (0.05,5,40) FAIL TO REJECT Ho: All	equal	

60382801 Siloam Springs CERIODAPHNIA DUBIA REP File: 6382801E Transform: NO TRANSFORM

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT SIG	47
1 2 3 4 5 6	CONTROL 32% 42% 56% 75% 100%	20.700 21.300 19.400 21.100 21.400 21.000	20.700 21.300 19.400 21.100 21.400 21.000	-0.439 0.952 -0.293 -0.512 -0.220	
Dunnett	table value = 2.31	(1 Tailed V	alue, P=0.05, df=40,	5)	÷.

60382801 Siloam Springs CERIODAPHNIA DUBIA REPFile:6382801ETransform:NO TRANSFORM

	DUNNETT'S TEST -	TABLE 2 C	F 2 Ho	:Control<	Treatment
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
	CONTROL	10			
2	32%	10	3.156	15.2	-0.600
3	42%	10	3.156	15.2	1.300
4	56%	10	3.156	15.2	-0.400
5	75%	10	3.156	15.2	-0.700
6	100%	10	3.156	15.2	-0.300

Conc. ID		1 2	3	4	5	6
Conc. Tes	ted	0 32	42	56	75	100
	2 .4 3 .5 4 .4 5 .5	71 .492 62 .497 578 .459 579 .427 510 .506 entration Percent 50382801 Siloam	.581 .468 .420 .488 tage Estimate	.505 .510 .493 .544 .516	.533 .451 .510 .602 .614	.561 .589 .541 .523 .536
Test Star Test Spec	t Date: 10/ ies: Fathea	12/21 Test End 1d		/19/21		
Test Dura DATA FILE		7 days				
Conc. ID R	Number eplicates	Concentration %	Response Means	Std. Dev.		oled se Means
1 2 3 4 5	5 5 5 5 5 5 5	$\begin{array}{c} 0.000\\ 32.000\\ 42.000\\ 56.000\\ 75.000\end{array}$	0.500 0.476 0.489 0.514 0.542	0.04 0.03 0.05 0.01 0.06	3 0. 8 0. 9 0. 7 0.	512 512 512 512 512 512
6	5	100.000	0.550	0.02	6 0.	512

*** No Linear Interpolation Estimate can be calculated from the input data since none of the (possibly pooled) group response means were less than 75% of the control response mean.

1	2	3	4	5	6
0	32	42	56	75	100
nt: 6038280 : 10/12/21 . dubia	1 Siloam S Test End	prings		25 16 19 20 21 19 23 26 21 24	19 24 18 21 17 23 17 25 20 26
r Conce tes	ntration %	Response Means	Std. Dev.		ooled Nse Means
	42.000 56.000 75.000	20.700 21.300 19.400 21.100 21.400 21.000	3.268 3.020 2.503 3.035 3.098 3.333	21. 20. 20. 20.	000 000 725 725 725 725 725
	0 16 24 19 20 19 21 24 23 25 16 Concentration nt: 6038280 : 10/12/21 . dubia 7 r Concentration tes	0 32 16 24 24 19 19 17 20 23 19 23 21 27 24 22 23 20 25 19 16 19 Concentration Percent nt: 60382801 Siloam S : 10/12/21 Test End . dubia 7 days r Concentration tes %	0 32 42 16 24 20 24 19 23 19 17 18 20 23 15 19 23 20 21 27 16 24 22 19 23 20 21 25 19 20 16 19 22 Concentration Percentage Estimate 10 nt: 60382801 Siloam Springs : 10/12/21 Test Ending Date: 10 . dubia 7 days r Concentration Response tes % Means 0.000 20.700 32.000 21.300 42.000 19.400 56.000 21.100 75.000 21.400	0 32 42 56 16 24 20 19 24 19 23 16 19 17 18 24 20 23 15 25 19 23 20 22 21 27 16 20 24 22 19 24 23 20 21 22 24 22 19 24 23 20 21 22 25 19 20 17 16 19 22 22 Concentration Percentage Estimate *** nt: 60382801 Siloam Springs : 10/12/21 Test Ending Date: 10/19/21 . dubia 7 days r Concentration Response Std. tes % Means Dev. 0.000 20.700 3.268 32.000 21.300 3.020 42.000 19.400 2.503 56.000 21.100 3.035 75.000 21.400 <t< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></t<>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

*** No Linear Interpolation Estimate can be calculated from the input data since none of the (possibly pooled) group response means were less than 75% of the control response mean.

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CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A	Section A Bearing Clear Information	Section B						Section C	S S									L				1
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Address:	975 Anderson Avenue	Copy To: abro	wn@s	abrown@siloamsprings.com	ngs.com			Compar	Company Name:						REG	ULATO	REGULATORY AGENCY	ACH				
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Phone:	479-228-2000 Fax	Project Name:	4th Q1	4th QTR WET				Pace Project	-	Nolie Wood	poo				Sth	Site Location	L					The second s
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8	Important Note: By signing this form you are accepting Pace's NET 30 day payment larms and agreeting to late-charges of 4.6% per-month for any invoices not paid within 30 days.	sce's NET 30 day pay	ment tem	DS. and agree	ing to late c	1809es of 1.5%	-per-month-to	r any invoice	rs mot park	witchin 30	r days					Ť		F-A	F-AI I -O-020tev 08 12-Oct-2007	mev OB		

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SIGNATURE of SAMPLER: DATE Signed Temple	ge 48		PRINT Namo	of SAMPLER: TON	y Brown							D• ni (
	5 of 4		SIGNATURE	SAMPLER:	S Same	Alle		DA	TE Signed	and a		Temp			

F-ALL-Q-020rev.08, 12-Oct-2007

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

Pace Analytical Sample Condition	n Upon Receipt	
Custody Seal on Cooler/Box Present: Yes X No I Packing Material: Bubble Wrap I Bubble Bag Thermometer Used: T-243 Type	of Ice Wet Blue N	X No □ None X Other □ one
Cooler Temperature (°C): As-read <u><u>4</u> Z Corr. Fa Temperature should be above freezing to 6°C</u>	actor <u>-1.1</u> Corre	
Chain of Custody present:	· · · · · · · · · · · · · · · · · · ·	BP 10/14/21
Chain of Custody relinquished:	XYes INO IN/A	0.0
Samples arrived within holding time:		
Short Hold Time analyses (<72hr):	XYes No N/A	
Rush Turn Around Time requested:	□Yes XNo □N/A	
Sufficient volume:	XYes No N/A	
Correct containers used:	XYes □No □N/A	
Pace containers used:	XYes No N/A	
Containers intact:	XYes No N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No XN/A	•
Filtered volume received for dissolved tests?	□Yes □No XN/A	
Sample labels match COC: Date / time / ID / analyses	XYes No N/A	
Samples contain multiple phases? Matrix:	□¥es XNo □N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCI<2; NaOH>9,Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks:	□Yes □No XN/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
ead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No □Yes □No	
rip Blank present:	□Yes □No XN/A	
eadspace in VOA vials (>6mm):	□Yes □No XN/A	
amples from USDA Regulated Area: State:	□Yes □No XN/A	
dditional labels attached to 5035Å / TX1005 vials in the field	and the second se	
Copy COC to Copy C	o Client? Y / N	Field Data Required? Y / N

[>]roject Manager Review:

F.

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Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A	n A 1	Section B						. ถึง	Section C	υ.										Lä	Page:		ຕ ເ		
3	Cilent Information:	Required Project Information:		ormation:				Ē	voice In	Invoice Information:	E														
Company:	City of Siloam Springs	Report To: Tony Brown	ony Br	rown				¥	Attention:									_							
Address.	975 Anderson Avenue	Copy To: ab)rown(abrown@siloamsprings.com	springs.(com		ŭ	Company Name:	Name:							REGUL	ATOR	REGULATORY AGENCY	<u>ک</u>					
	Siloam Springs, AR							Ac	Address:							ſ	P P	NPDES	В СК	GROUND WATER	VATER		DRINKING WATER	VATER	T
Email To:	abrown@siloamsprings.com	Purchase Order No	er No					Pa	Pace Quote Reference:	0							L UST	F	RCRA	5A		T0 _	OTHER		
Phone;	479-228-2000 Fax	Project Name:	I .	4th QTR WET	ET			Pa	ce Proje nager	I	Nolie Wood	Vood				Ì	Site Location	cation			and and	and the second second	Survey of the local division of the local di	The state of the s	11
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															Reque	sted A	nalysis	Filter	Requested Analysis Filtered (Y/N)						
	Section D Valid Matrix Codes Required Client Information MATRIX COL		<u> </u>			COLLECTED			-	Å Å	eserv	Preservatives		1 N /A						F					
	DRINKIMG WATER WATER WATER WATER PRODUCT SOILSOLID OIL		-CC-CO		COMPOSITE START	END	COMPOSITE END/GRAB		e						ļse						(N/A) €	2	M		1
# WƏL	SAMPLE ID WIFE (A-Z, 0-9 / ,-) OTHER Sample IDS MUST BE UNIQUE TISSUE				H H		H H	SAMPLE TEMP AT C	Jupreserved + OF CONTAINER	[€] ON⊦ *OS ² H	ICI	Na2S2O3	Methanol Methanol	lesT eisγlsnA↓	T TEW Shronic	nZ-sisten					sesidual Chlorine		tooid M	Dace Broint Mo (1 sh I)	
ı -	City of Siloam Springs Wastewater Plant			÷	-	╇	-	-	1	1	1	1			_		F	T	$\left \right $	F	S	CURROO	301	י רמח ויח.	T
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12	ADDITIONAL COMMENTS	-	ELINQL	RELINQUISHED BY / AFFILIATION	1 AFFILI	ATION	DATE	-	TIME	+		Act -	EPTED	BY/A	ACCEPTED BY / AFFILIATION	- N		DATE		-	-	SAMPLE	SAMPLE CONDITIONS	ŝ	T
sampl	samples have a 24 hour hold time!						10/15/01	<u>,</u>	0.0	1	1	1	5				K	Nich	1~	0	Ļ	É	1	5	
etum	*return samples to the Frontenac Lab on ice!							1	2.5		Y	P	8	1	4		5	100oc		~					1
1	CR = 0.03 mg/L							$\left \right $		$\left \right $							$\left \cdot \right $			$\left + \right $	$\left \cdot \right $	\vdash			TT
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Page					SAM	SAMPLER NAME.	AND SIGNATURE	TURE												0.1		(N/	V/V)	intact ()	
- 47						PRINT N	PRINT Name of SAMPLER: TONY Brown	ER: T	ony Br	umo.										ui qm	ceived	1/X) ec	oler ()	N/X) səlqr	
014						SIGNATI	SIGNATURE OF SAMPLER:	ER:	mu	13	Burn	J			DATE Signed (MM/DD/YY):	λγ): γγγ		10/15/21	21		-	 0]	000	meS	
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F-ALL-Q-020rev.08, 12-Oct-2007

"important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month for any involces not pald within 30 days.

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oject Manager Review:	3		Date	:e	·		
mments/Resolution:							
srson Contacted: Date/Tin							
ient Notification/ Resolution: Copy COC to C			N	Field D:	Data Required?	N / Å	
Iditional labels attached to 5035A / TX1005 vials in the field?	S9Y□ S	°N□	A/x				
seight from USDA Regulated Area: State:	səY□	оNП	∀/N				
:(mmð<) slsiv AOV ni 95sqsbs	səY 🗌	°N□	A/N				
p Blank present:	sə∀□	°N□	A/N				
tassium iodide test strip turns blue/purple? (Preserve)	səY	°N□					
ad acetate strip turns dark? (Record only)	s∋Y□	°N□					
ددeptions: VOA, Micro, O&G, KS TPH, OK-DRO) همانطو water sample checks:							
VO3, H₂SO4, HCI<2; NaOH>9 S Uffide, NaOH>10 Cyanide)							
intainers requiring pH preservation in compliance?	səY	°N⊟		e amit/ateb	e IDs, volumes added.	lasald io s # 10	อนา อนุย อุณาศ
imples contain multiple phases? Matrix:	səY 🗌		A/N				odt bae ovite
nple اهbels match COC: Date / time / ID / analyses	səyX		∀/N				
tered volume received for dissolved tests?	səY 🗌		A/N				
preserved 5035A \ TX1005\005 acids flos 3001\2001XT \ A∂503 bevresarg	səY		∀/N				
intainers intact:	^{s∋,} X	°N□	A\N				
ce containers used:	səYX	°N[]	∀/N				
rtect containers used:	səY X	°N□	- A/N				
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ort Hold Time analyses (<זצאר):	səYX	°N□	A\N				
mples arrived within holding time:	sə, X	°N⊟	A\N				
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	səY X	°N□	∀/N				
D°3 of grind be above freezing to 6°C					ISL	81181911	0
oler Temperature (°C): As-read Z, Corr. Factor	n۱.۱)	ətəən	L'I pa	9	nətroə grinima	
ermometer Used: T-243 Type of Ic				-	IJ	te and initials o	Derson
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Pace Analytical Sample Condition Upo	əЯ noq	diəc					
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