Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

July 19, 2023

Glenn Walker
Brunswick County Water Systems
PO Box 249
Bolivia, NC 28422

RE: Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

Dear Glenn Walker:

Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 2023. 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 - Ormond Beach

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

Sincerely,

Shelby Sharpe
shelby.sharpe@pacelabs.com
(386)672-5668
Project Manager

Enclosures

cc: Billy Benton, BRUNSWICK COUNTY PUBLIC UTILITIES

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CERTIFICATIONS

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

Pace Analytical Services Ormond Beach
8 East Tower Circle, Ormond Beach, FL 32174
Alaska DEC- CS/UST/LUST
Alabama Certification #: 41320
Colorado Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
DoD-ANAB #:ADE-3199
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maine Certification #: FL01264
Maryland Certification: #346
Massachusetts Certification #: M-FL1264
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
New Hampshire Certification #: 2958
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Ohio DEP 87780
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

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SAMPLE SUMMARY

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35813509001	**071323-SO1**	Water	07/13/23 07:10	07/17/23 11:50
35813509002	**071323-EO1**	Drinking Water	07/13/23 07:10	07/17/23 11:50

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SAMPLE ANALYTE COUNT

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35813509001	**071323-SO1**	EPA 522	BMH	2	PASI-O
35813509002	**071323-EO1**	EPA 522	BMH	2	PASI-O

PASI-O = Pace Analytical Services - Ormond Beach

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ANALYTICAL RESULTS

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

Sample: 071323-SO1 **Lab ID: 35813509001** Collected: 07/13/23 07:10 Received: 07/17/23 11:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
522 MSS 1,4 Dioxane	Analytical Method: EPA 522 Preparation Method: EPA 522 Pace Analytical Services - Ormond Beach								
1,4-Dioxane (p-Dioxane)	**0.16 I**	ug/L	0.20	0.12	1	07/17/23 16:39	07/18/23 15:46	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	93	%	70-130		1	07/17/23 16:39	07/18/23 15:46		

Sample: 071323-EO1 **Lab ID: 35813509002** Collected: 07/13/23 07:10 Received: 07/17/23 11:50 Matrix: Drinking Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
522 MSS 1,4 Dioxane	Analytical Method: EPA 522 Preparation Method: EPA 522 Pace Analytical Services - Ormond Beach								
1,4-Dioxane (p-Dioxane)	**0.22**	ug/L	0.20	0.12	1	07/17/23 16:39	07/18/23 16:04	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	92	%	70-130		1	07/17/23 16:39	07/18/23 16:04		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

QC Batch: 934160
QC Batch Method: EPA 522
Analysis Method: EPA 522
Analysis Description: 522 MSS 1,4 Dioxane
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35813509001, 35813509002

METHOD BLANK: 5134298 Matrix: Water
Associated Lab Samples: 35813509001, 35813509002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.12 U	0.20	0.12	07/18/23 14:20	
1,4-Dioxane-d8 (S)	%	93	70-130		07/18/23 14:20	

LABORATORY CONTROL SAMPLE: 5134299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	18.2	91	70-130	
1,4-Dioxane-d8 (S)	%			93	70-130	

LABORATORY CONTROL SAMPLE: 5134300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.2	0.17 I	86	50-150	
1,4-Dioxane-d8 (S)	%			89	70-130	

MATRIX SPIKE SAMPLE: 5134404

Parameter	Units	35813181002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	9.9	19.7	29.2	98	70-130	
1,4-Dioxane-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 5134405

Parameter	Units	35813181003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.41	0.42	1	20	
1,4-Dioxane-d8 (S)	%	87	96			

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

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

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.

ANALYTE QUALIFIERS

I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Compound was analyzed for but not detected.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1,4-Dx-522 (Weekly)
Pace Project No.: 35813509

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35813509001	**071323-SO1**	EPA 522	934160	EPA 522	934386
35813509002	**071323-EO1**	EPA 522	934160	EPA 522	934386

WO# : 35813509

35813509

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	
Company:	Brunswick County Water Systems	Report To: Glenn Walker	Attention: Accounts Payable	
Address:	PO Box 249	Copy To:	Company Name: See Section A	
	Bolivia, NC 28422		Address:	
Email To:	Glenn Walker	Purchase Order #:	Pace Quote:	
Phone: 910-371-3490	Fax:	Project Name: 1,4-Dx-522 (Weekly)	Pace Project Manager: Lisa Harvey	
Requested Due Date:	W007	Project #:	Pace Profile #: 9551-1 (SO1) , -2 (EO1)	

Regulatory Agency
NC
State / Location
NC

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Sodium sulfite and sodium bisulfate	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: 522 - 1,4 - Dioxane	522 - 1,4 - Dioxane	Residual Chlorine (Y/N)	
1	071323-SO1	WT	G	7/13/2023	0710AM	7/13/2023	0710AM		1								1		1			line 1
2	071323-EO1	DW	G	7/13/2023	0710AM	7/13/2023	0710AM		1								1			1		line 2
3																						
4																						
5																						
6																						

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	BILLY BENTON	7/13/2023		ESpace	7/17/23	1150	30.4	n	y	y

SO1 is Raw Water (WT)

EO1 is Potable DWTR (DW)

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler	Samples Intact (Y/N)
PRINT Name of SAMPLER:	BILLY BENTON				
SIGNATURE of SAMPLER:	7/13/2023				

Pace Container Order #705442

Addresses

Order By :		Ship To :		Return To:	
Company	Brunswick County Water System	Company	Brunswick County Water System	Company	Pace Analytical Ormond Beach
Contact	- Bottles, Glenn	Contact	- Bottles, Glenn	Contact	,
Email	glenn.walker@brunswickcountync.gov	Email	glenn.walker@brunswickcountync.gov	Email	lisa.harvey@pacelabs.com
Address	3954 Clearwell Dr. NE	Address	3954 Clearwell Dr. NE	Address	8 East Tower Circle
Address 2		Address 2		Address 2	
City	Leland	City	Leland	City	Ormond Beach
State	NC Zip 28451	State	NC Zip 28451	State	FL Zip 32174
Phone	910-371-3490	Phone	910-371-3490	Phone	(386) 672-5668

Info

Project Name 1,4-Dx-522 (Weekly) **Due Date** 12/14/2022 **Profile** 9551-1 **Quote**

Project Manager , **Return Date** **Carrier** FedEx Ground **Location** NC

Trip Blanks

- [ ] Include Trip Blanks

Bottle Labels

- [ ] Blank
- [X] Pre-Printed No Sample IDs
- [ ] Pre-Printed With Sample IDs

Bottles

- [ ] Boxed Cases
- [X] Individually Wrapped
- [ ] Grouped By Sample ID/Matrix

Return Shipping Labels

- [ ] No Shipper
- [ ] With Shipper

COC Options

- [ ] Number of Blanks
- [X] Pre-Printed special

Misc

- [ ] Sampling Instructions
- [X] Custody Seal
- [X] Temp. Blanks
- [X] Coolers 1
- [ ] Syringes
- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush Stickers
- [ ] DI Water Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
2	WT	1,4-dioxane, method 522	1-1L Amber Glass, Sodium sulfite & Na bisulfate	2	0	111422-1CEO	

Hazard Shipping Placard In Place : NO

*Sample receiving hours are Mon-Fri 8:00am-6:00pm and Sat 10:00am-6:00pm unless special arrangements are made with your project manager.

*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.

*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage/disposal.

*Payment term are net 30 days.

*Please include the proposal number on the chain of custody to insure proper billing.

LAB USE:

Ship Date :	12/09/2022
Prepared By:	AJ
Verified By:	

Sample

weekly sampling; 2-locations per week; ; Special COC attached; ;

CLIENT USE (Optional):

Date Rec'd:	
Received By:	
Verified By:	

Pace

Sample Condition Upon Receipt Form (SCUR)

WO# : 35813509

PM: SS1 **Due Date: 07/27/23**

CLIENT: BRUNCOWS

Project #

Project Manager:

Client:

Date and Initials of person:

Examining contents: _____

Label: _____

Deliver: _____

pH: _____

Thermometer Used: T-414 Date: 7/17/23 Time: 1158 Initials: EAS1

State of Origin: _____ ☐ For WV projects, all containers verified to ≤6 °C

Cooler #1 Temp.°C	30.4 (Visual)	0 (Correction Factor)	30.4 (Actual)	☐Samples on ice, cooling process has begun.
Cooler #2 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐Samples on ice, cooling process has begun.
Cooler #3 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐Samples on ice, cooling process has begun.
Cooler #4 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐Samples on ice, cooling process has begun.
Cooler #5 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐Samples on ice, cooling process has begun.
Cooler #6 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐Samples on ice, cooling process has begun.
Recheck for OOT °C	28.3 (Visual)	0 (Correction Factor)	28.3 (Actual)	Time: 1158 Initials: NPI

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

Shipping Method: ☑Standard Overnight ☐First Overnight ☐Priority Overnight ☐Ground ☐International Priority ☐Other: _____

Billing: ☐Recipient ☐Sender ☑Third Party ☐Credit Card ☐Unknown

Tracking # 7811 0381 5926

Custody Seal Present: ☑Yes ☐No **Seal properly placed and intact:** ☑Yes ☐No **Ice:** ☐Wet ☐Blue ☐Dry ☐None ☑Melted

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

Samples shorted to lab: ☐Yes ☐No (If yes, complete the following)

Shorted Date: _____ **Shorted Time:** _____

Bottle Quantity / Type:

Chain of Custody:	**Present:** ☑Yes ☐No | **Filled Out:** ☑Yes ☐No ☐N/A | **Relinquished From Pace:** ☐Yes ☐No ☑N/A | **Sampler Name:** ☑Yes ☐No ☐N/A			
	Relinquished To Pace: ☑Yes ☐No ☐N/A | **Sampling Date(s):** ☑Yes ☐No ☐N/A | **Sampling Time(s):** ☑Yes ☐No ☐N/A			
Samples Arrived within Hold Time.	☑Yes	☐No	☐N/A	Comments:
Rush Turnaround Requested on COC.	☑Yes	☐No	☐N/A	Comments: W007
Sufficient Volume.	☑Yes	☐No	☐N/A	Comments:
Correct Containers Used.	☑Yes	☐No	☐N/A	Comments:
Containers Intact.	☑Yes	☐No	☐N/A	Comments:
Sample Labels Match COC (Sample ID, Date/Time of Collection).	☑Yes	☐No	☐N/A	Comments:
All containers needing acid / base preservation have been checked.	☑Yes	☐No	☐N/A	**Preservation Information**
All containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: Vials, Microbiology, O&G, PFAS	☑Yes	☐No	☐N/A	**Preservative:** _____ **Date:** _____ **Lot / Trace:** _____ **Time:** _____ **Amount added (mL):** _____ **Initials:** _____
Headspace in Volatile Vials? (>6mm):	☐Yes	☐No	☑N/A	
Trip Blank Present:	☐Yes	☐No	☑N/A	

Comments / Resolutions (use back for additional comments): OOT