



December 01, 2023

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

RE: Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35843878

Dear Glenn Walker:

Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 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,

Todd Baumgartner  
todd.baumgartner@pacelabs.com  
(386)672-5668  
Project Manager

Enclosures

cc: Billy Benton, Brunswick County Public Utilities



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35843878

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### 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.: 35843878

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35843878001	112723-S01	Water	11/27/23 09:30	11/28/23 10:50
35843878002	112723-E01	Drinking Water	11/27/23 09:30	11/28/23 10:50

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### SAMPLE ANALYTE COUNT

Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35843878

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35843878001	112723-S01	EPA 522	BMH	2	PASI-O
35843878002	112723-E01	EPA 522	BMH	2	PASI-O

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PASI-O = Pace Analytical Services - Ormond Beach

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### ANALYTICAL RESULTS

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35843878

Sample: 112723-S01		Lab ID: 35843878001		Collected: 11/27/23 09:30	Received: 11/28/23 10:50	Matrix: Water			
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>522 MSS 1,4 Dioxane</b>		Analytical Method: EPA 522 Preparation Method: EPA 522 Pace Analytical Services - Ormond Beach							
1,4-Dioxane (p-Dioxane)	2.8	ug/L	0.20	0.12	1	11/28/23 23:18	11/30/23 20:14	123-91-1	
<b>Surrogates</b>									
1,4-Dioxane-d8 (S)	83	%	70-130		1	11/28/23 23:18	11/30/23 20:14		

Sample: 112723-E01		Lab ID: 35843878002		Collected: 11/27/23 09:30	Received: 11/28/23 10:50	Matrix: Drinking Water			
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>522 MSS 1,4 Dioxane</b>		Analytical Method: EPA 522 Preparation Method: EPA 522 Pace Analytical Services - Ormond Beach							
1,4-Dioxane (p-Dioxane)	3.1	ug/L	0.20	0.12	1	11/28/23 23:18	11/30/23 20:31	123-91-1	
<b>Surrogates</b>									
1,4-Dioxane-d8 (S)	92	%	70-130		1	11/28/23 23:18	11/30/23 20:31		

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**QUALITY CONTROL DATA**

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35843878

QC Batch: 969442	Analysis Method: EPA 522
QC Batch Method: EPA 522	Analysis Description: 522 MSS 1,4 Dioxane
	Laboratory: Pace Analytical Services - Ormond Beach

Associated Lab Samples: 35843878001, 35843878002

METHOD BLANK: 5331683 Matrix: Water

Associated Lab Samples: 35843878001, 35843878002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.12 U	0.20	0.12	11/30/23 18:11	
1,4-Dioxane-d8 (S)	%	97	70-130		11/30/23 18:11	

LABORATORY CONTROL SAMPLE: 5331684

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	2	1.8	90	70-130	
1,4-Dioxane-d8 (S)	%			94	70-130	

LABORATORY CONTROL SAMPLE: 5331685

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.2	0.18 I	90	50-150	
1,4-Dioxane-d8 (S)	%			88	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 5331686 5331687

Parameter	Units	5331686		5331687		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,4-Dioxane (p-Dioxane)	ug/L	0.14 I	2	2	1.9	1.9	89	87	70-130	1	20
1,4-Dioxane-d8 (S)	%						98	96	70-130		

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.: 35843878

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### 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.: 35843878

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35843878001	112723-S01	EPA 522	969442	EPA 522	970035
35843878002	112723-E01	EPA 522	969442	EPA 522	970035

### REPORT OF LABORATORY ANALYSIS

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WO#: 35843878



35843878

**CHAIN-OF-CUSTODY / Analytical Request Document**

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

**Section C**

**Required Client Information:**  
 Company: Brunswick County Water Systems  
 Address: PO Box 249  
 Bolivia, NC 28422  
 Email To: Glenn Walker  
 Phone: 910-371-3490 Fax  
 Requested Due Date: **W007**

**Required Project Information:**  
 Report To: Glenn Walker  
 Copy To:  
 Purchase Order #: **1,4-Dx-522 (Weekly)**  
 Project Name: **9551-1 (SO1) , -2 (EO1)**  
 Project #:

**Invoice Information:**  
 Attention: Accounts Payable  
 Company Name: See Section A  
 Address:  
 Pace Quote:  
 Pace Project Manager: Lisa Harvey  
 Pace Profile #: **9551-1 (SO1) , -2 (EO1)**

Regulatory Agency: NC  
 State / Location: NC

ITEM #	MATRIX	CODE	COLLECTED		DATE	TIME	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
			START	END								
1	Drinking Water	DW			11/27/2023	0930AM	11/27/2023	0930AM	1	11-28-291 DSO 2.1	11/27	line 1
2	Waste Water	WW			11/27/2023	0930AM	11/27/2023	0930AM	1	522 - 1,4 - Dioxane		line 2
3	Product	P										
4	Soil/Solid	SL										
5	Oil	OL										
6	Wipe	WP										
	Air	AR										
	Other	OT										
	Tissue	TS										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Requested Analysis Filtered (Y/N)
	BILLY BENTON/BRUNSWICK COUNTY UTILITIES	11/27/2023		NO Pan	11-28-291 DSO 2.1		

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: BILLY BENTON  
 SIGNATURE of SAMPLER: *[Signature]*  
 11/27/2023

SO1 is Raw Water (WT)

EO1 is Potable DWTR (DW)

# Pace Container Order #1143304

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

Info			
<b>Project Name</b> <u>1,4-Dx-522 (Weekly)</u>	<b>Due Date</b> <u>10/27/2023</u>	<b>Profile</b> <u>9551-1</u>	<b>Quote</b> _____
<b>Project Manager</b> _____	<b>Return Date</b> _____	<b>Carrier</b> <u>FedEx Ground</u>	<b>Location</b> <u>NC</u>

**Trip Blanks**

Include Trip Blanks

**Bottle Labels**

Blank

Pre-Printed No Sample IDs

Pre-Printed With Sample IDs

**Bottles**

Boxed Cases

Individually Wrapped

Grouped By Sample ID/Matrix

**Return Shipping Labels**

No Shipper

With Shipper

**Misc**

<input type="checkbox"/> Sampling Instructions	<input type="checkbox"/> Extra Bubble Wrap
<input checked="" type="checkbox"/> Custody Seal	<input type="checkbox"/> Short Hold/Rush Stickers
<input checked="" type="checkbox"/> Temp. Blanks	<input type="checkbox"/> DI Water <input type="text" value="Liter(s)"/>
<input checked="" type="checkbox"/> Coolers <input type="text" value="1"/>	<input type="checkbox"/> USDA Regulated Soils
<input type="checkbox"/> Syringes <input type="text"/>	

**COC Options**

Number of Blanks

Pre-Printed

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

**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 ensure proper billing.

**Sample Notes :**

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

**LAB USE:**

**Ship Date :**

**Prepared By:**

**Verified By:**

**Tracking Num:**

**CLIENT USE (Optional):**

**Date Rec'd:**

**Received By:**

**Verified By:**

Pace

Sample Condition Upon Receipt Form (SCUR)

WO#: 35843878

PM: TAB Due Date: 12/08/23  
CLIENT: BRUNCOWS

Project #  
Project Manager:  
Client:

Date and Initials of person:  
Examining contents:  
Label:  
Deliver: NPI  
pH:  
Initials: NPI

Thermometer Used: T-409

Date: 11-28-23 Time: 1101

State of Origin: \_\_\_\_\_  
 For WV projects, all containers verified to  $\leq 6^{\circ}\text{C}$   
Cooler #1 Temp.  $^{\circ}\text{C}$  2.2 (Visual) -0.1 (Correction Factor) 2.1 (Actual)  
Cooler #2 Temp.  $^{\circ}\text{C}$  \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #3 Temp.  $^{\circ}\text{C}$  \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #4 Temp.  $^{\circ}\text{C}$  \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #5 Temp.  $^{\circ}\text{C}$  \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #6 Temp.  $^{\circ}\text{C}$  \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Recheck for OOT  $^{\circ}\text{C}$  \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)

Samples on ice, cooling process has begun.  
 Samples on ice, cooling process has begun.  
Time: \_\_\_\_\_ Initials: \_\_\_\_\_

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  Other

Tracking # 7870 2762 7478  
Custody Seal Present:  Yes  No Seal properly placed and intact:  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other  
Ice:  Wet  Blue  Dry  None  Melted

Samples shorted to lab:  Yes  No (if yes, complete the following)  
Shorted Date: \_\_\_\_\_

Bottle Quantity / Type: \_\_\_\_\_ Shorted Time: \_\_\_\_\_

Chain of Custody:	Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   Filled Out: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampler Name: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	Relinquished To Pace: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampling Date(s): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampling Time(s): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples Arrived within Hold Time.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Rush Turnaround Requested on COC.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Sufficient Volume.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Correct Containers Used.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Containers Intact.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Sample Labels Match COC (Sample ID, Date/Time of Collection).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
All containers needing acid / base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
All containers needing preservation are found to be in compliance with EPA recommendation:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Exceptions: Vials, Microbiology, O&G, PFAS	
leadspace in Volatile Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
rip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Comments / Resolutions (use back for additional comments):	

Preservation Information	
Preservative: _____	Date: _____
Lot / Trace: _____	Time: _____
Amount added (mL): _____	Initials: _____