



December 19, 2024

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

RE: Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35924796

Dear Glenn Walker:

Enclosed are the analytical results for sample(s) received by the laboratory on December 13, 2024. 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.: 35924796

**Pace Analytical Services Ormond Beach**

8 East Tower Circle, Ormond Beach, FL 32174

Alaska DEC- CS/UST/LUST

Alabama Certification #: 41320

California Certification# 3096

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

Nevada Certification: FL NELAC Reciprocity

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

Utah

Utah 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.: 35924796

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
35924796001	121224-SO1	Water	12/12/24 10:05	12/13/24 11:10
35924796002	121224-EO1	Drinking Water	12/12/24 10:05	12/13/24 11:10

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### SAMPLE ANALYTE COUNT

Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35924796

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35924796001	121224-SO1	EPA 522	TCF	2	PASI-O
35924796002	121224-EO1	EPA 522	TCF	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.: 35924796

<b>Sample: 121224-SO1</b>									
<b>Lab ID: 35924796001</b>									
Collected: 12/12/24 10:05 Received: 12/13/24 11:10 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)	1.6	ug/L	0.20	0.12	1	12/16/24 17:20	12/18/24 12:54	123-91-1	
<b>Surrogates</b>									
1,4-Dioxane-d8 (S)	103	%	70-130		1	12/16/24 17:20	12/18/24 12:54		

<b>Sample: 121224-EO1</b>									
<b>Lab ID: 35924796002</b>									
Collected: 12/12/24 10:05 Received: 12/13/24 11:10 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)	2.0	ug/L	0.20	0.12	1	12/16/24 17:20	12/18/24 13:11	123-91-1	
<b>Surrogates</b>									
1,4-Dioxane-d8 (S)	106	%	70-130		1	12/16/24 17:20	12/18/24 13:11		

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**QUALITY CONTROL DATA**

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

Pace Project No.: 35924796

QC Batch:	1063628	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: 35924796001, 35924796002

METHOD BLANK: 5843332 Matrix: Water

Associated Lab Samples: 35924796001, 35924796002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.12 U	0.20	0.12	12/18/24 11:14	
1,4-Dioxane-d8 (S)	%	107	70-130		12/18/24 11:14	

LABORATORY CONTROL SAMPLE: 5843333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	20.3	102	70-130	
1,4-Dioxane-d8 (S)	%			104	70-130	

LABORATORY CONTROL SAMPLE: 5843334

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.2	0.24	120	50-150	
1,4-Dioxane-d8 (S)	%			104	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 5843335 5843336

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		92768833001 Result	Spike Conc.	Spike Conc.	Result						
1,4-Dioxane (p-Dioxane)	ug/L	0.37	20	20.1	20.7	102	106	70-130	4	20	
1,4-Dioxane-d8 (S)	%					108	112	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.: 35924796

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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

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.: 35924796

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35924796001	121224-SO1	EPA 522	1063628	EPA 522	1064017
35924796002	121224-EO1	EPA 522	1063628	EPA 522	1064017

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WO#: 35924796



35924796

**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:**  
 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

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

**Section C**  
**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	WT	G	12/12/2024	1005AM	12/12/2024	1005AM	1	522-1,4-Dioxane	1	12/13/24	1110	line 1
2	DW	G	12/12/2024	1005AM	12/12/2024	1005AM	1	522-1,4-Dioxane	1	12/13/24	1110	line 2
3												
4												
5												
6												

**ADDITIONAL COMMENTS**  
 BILLY BENTON/BRUNSWICK COUNTY UTILITIES

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: BILLY BENTON  
 SIGNATURE of SAMPLER: *[Signature]* 7/15/2024

TEMP in C  
 Received on  
 Ice (Y/N)  
 Custody Sealed (Y/N)  
 Cooler (Y/N)  
 Samples Intact (Y/N)

# Pace Container Order #1185886

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

Info			
<b>Project Name</b> <u>1,4-Dx-522</u>	<b>Due Date</b> <u>11/28/2024</u>	<b>Profile</b> <u>9551-1</u>	<b>Quote</b> _____
<b>Project Manager</b> <u>Baumgartner, Todd</u>	<b>Return Date</b> _____	<b>Carrier</b> <u>FedEx Standard Overnight</u>	<b>Location</b> <u>NC</u>

<b>Trip Blanks</b> <input type="checkbox"/> Include Trip Blanks	<b>Bottle Labels</b> <input type="checkbox"/> Blank <input checked="" type="checkbox"/> Pre-Printed No Sample IDs <input type="checkbox"/> Pre-Printed With Sample IDs	<b>Bottles</b> <input type="checkbox"/> Boxed Cases <input checked="" type="checkbox"/> Individually Wrapped <input type="checkbox"/> Grouped By Sample ID/Matrix
<b>Return Shipping Labels</b> <input type="checkbox"/> No Shipper <input type="checkbox"/> With Shipper	<b>Misc</b> <input type="checkbox"/> Sampling Instructions <input checked="" type="checkbox"/> Custody Seal <input checked="" type="checkbox"/> Temp. Blanks <input checked="" type="checkbox"/> Coolers <u>1</u> <input type="checkbox"/> Syringes _____	
<b>COC Options</b> <input type="checkbox"/> Number of Blanks _____ <input checked="" type="checkbox"/> Pre-Printed <u>special</u>	<input type="checkbox"/> Extra Bubble Wrap <input type="checkbox"/> Short Hold/Rush Stickers <input type="checkbox"/> DI Water <u>Liter(s)</u> <input type="checkbox"/> USDA Regulated Soils	

# 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	081224-1EVP/012224-3DII	

**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:**

<b>Ship Date :</b>	<u>11/16/2024</u>
<b>Prepared By:</b>	<u>KWT</u>
<b>Verified By:</b>	_____
<b>Tracking Num:</b>	_____

**CLIENT USE (Optional):**

<b>Date Rec'd:</b>	_____
<b>Received By:</b>	_____
<b>Verified By:</b>	_____



Sample Condition Upon Receipt Form (SCUR)

WO#: 35924796

PM: TAB Due Date: 12/26/24  
CLIENT: BRUNCOWS

Date and Initials of person:

Examining contents: KAMI

Verifying pH: \_\_\_\_\_  
Initials: AUT

Project #  
Project Manager:  
Client:

Thermometer Used: T-409

Date: 12-13-24 Time: 1128

State of Origin: \_\_\_\_\_  For WV projects, all containers verified to  $\leq 6$  °C

Cooler #1 Temp. °C 87 (Visual) 0 (Correction Factor) 3.7 (Actual)  
Cooler #2 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #3 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #4 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #5 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Cooler #6 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
Recheck for OOT °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

Tracking # 2831 7929 2818

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: <input type="checkbox"/> Yes <input type="checkbox"/> No   Filled Out: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampler Name: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	Relinquished To Pace: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampling Date(s): <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampling Time(s): <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples Arrived within Hold Time.	<input 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 type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Containers Intact.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments:
Sample Labels Match COC (Sample ID, Date/Time of Collection).	<input 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: <small>Exceptions: Vials, Microbiology, O&amp;G, PFAS</small>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Headspace in Volatile Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Preservation Information

Preservative: \_\_\_\_\_ Date: \_\_\_\_\_  
Lot / Trace: \_\_\_\_\_ Time: \_\_\_\_\_  
Amount added (mL): \_\_\_\_\_ Initials: \_\_\_\_\_

Comments / Resolutions (use back for additional comments):

Labeled by: KAMI

Reviewed by: AES

Delivered by: GAJ