BIOLOGICAL CONSULTING SERVICES
OF NORTH FLORIDA, INC.

2020-06-30

Roving Blue
5220 St Patricks Rd
Lena, WI 54139
jgilmet@gmail.com
Client ID: Go 3 Protoype Bottle

BCS ID: 2006115

Project Name: RB 06292020 Bacteria and Virus Reduction Efficacy Testing

Dear Roving Blue,

We have completed the filtration efficacy study on the submitted units as outlined below. The contaminant species, study conditions, and water parameters utilized were based on client's request and adaptation of the guidance documents and protocols listed below:

Validation of Water Purifier Microbiological Reduction Efficacy: Testing of initial performance as per client's request; BCS SOP-F1 (ISO17025 accredited)

Report Conclusion: Test Conducted successfully as per Client's Request

Following, you will find our report on the results of the study conducted on the referenced samples. Should you have any questions, please do not hesitate to contact me.

Sincerely,

George Lukasik, Ph.D.
Laboratory Director

BCS LABORATORIES, INC. – GAINESVILLE
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WWW.MICROBIOSERVICES.COM
FL DOH E82924, ISO17025:2017 L2422 (ANAB), PA DEP 68-03950, EPA FL01147

Analysis: *E. coli (ATCC 11229) Reduction Efficacy* Test Water: General Test Water #1

Analysis Method: Spread Plating (Standard Method 9215)

Test Point: Initial Performance Efficacy **Test Point Conclusion: N/A**

Challenge Date: 2020-06-29 Challenge Analysts: Gabriela Parra M.Ed.

Initial Pres. (PSI): N/A Temp(C): 19.7

pH: 8.2 Turbidity (NTU): 0.2 TOC (ppm): 0.9 TDS(ppm): 165.5 Hardness(ppm): 127

Alkalinity(ppm): 40 Total Chlorine(ppm): 0.0 Polyphosphate (as ppm phosphorus): N/A

Start Conc: 6.0E+05 cfu/mL Ambient Temp(C): 23.2

Analysis Date: 2020-06-17 Analysts: Gabriela Parra M.Ed.

Test Notes: *E. coli b*acteria was not detected post treatment in both test trials. (Qualifier:U)

BCS Sample ID 1: 2006115 Client ID 1: Go 3 Prototype Bottle

Trial #1: End Conc 1: <3.0E-01 cfu/mL % Reduct : >99.99995 Log10 Reduct 1: >6.3

Trial #2: End Conc 2: <3.0E-01 cfu/mL % Reduct : >99.99995 Log10 Reduct 2: >6.3

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Analysis: *L. monocytogenes (ATCC 4488) Reduction Efficacy* Test Water: General Test Water #1

Analysis Method: Spread Plating (Standard Method 9215)

Test Point: Initial Efficacy **Test Point Conclusion: N/A**

Challenge Date: 2020-06-29 Challenge Analysts: Gabriela Parra M.Ed.

Initial Pres. (PSI): N/A Temp(C): 19.7

pH: 8.2 Turbidity (NTU): 0.2 TOC (ppm): 0.9 TDS(ppm): 165.5 Hardness(ppm): 127

Alkalinity(ppm): 40 Total Chlorine(ppm): 0.0 Polyphosphate (as ppm phosphorus): N/A

Start Conc: 1.2E+04 cfu/mL Ambient Temp(C): 23.2

Analysis Date: 2020-06-30 Analysts: Gabriela Parra M.Ed.

Test Notes: *L. monocytogenes* bacteria was not detected post treatment in both test trials. (Qualifier:U)

BCS Sample ID 1: 2006115 Client ID 1: Go 3 Prototype Bottle

Trial #1: End Conc 1: <3.0E-01 cfu/mL % Reduct : >99.998 Log10 Reduct 1: >4.6

Trial #2: End Conc 2: <3.0E-01 cfu/mL % Reduct : >99.998 Log10 Reduct 2: >4.6

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Analysis: *MS-2 Virus Reduction Efficacy* Test Water: General Test Water #1

Analysis Method: Plaque Assay (BCS SOP V-10)

Test Point: Initial Efficacy **Test Point Conclusion: N/A**

Challenge Date: 2020-06-29 Challenge Analysts: Gabriela Parra M.Ed.

Initial Pres. (PSI): N/A Temp(C): 24.1

pH: 8.1 Turbidity (NTU): 0.2 TOC (ppm): 0.8 TDS(ppm): 161.3 Hardness(ppm): 129

Alkalinity(ppm): 40.1 Total Chlorine (ppm) 0.0 Polyphosphate (as ppm phosphorus): N/A

Start Conc: 4.0E+05pfu/mL Ambient Temp(C): 22.1

Analysis Date: 2020-06-30 Analysts: Gabriela Parra M.Ed.

Test Notes: Virus was not detected post treatment in both test trials. (Qualifier:U)

BCS Sample ID 1: 2006115 Client ID 1: Go 3 Prototype Bottle

Trial #1: End Conc 1: <3.0E-01 cfu/mL % Reduct : >99.99992 Log10 Reduct 1: >6.1

Trial #2: End Conc 2: <3.0E-01 cfu/mL % Reduct : >99.99992 Log10 Reduct 2: >6.1

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Project: RB 06092020 Bacteria and Virus Reduction Efficacy Testing

Date Received: 2020-06-09 13:29 Test Start Date: 2020-06- 29 Test End Date:2020-06-30

System Type: Prototype Personal Water Purifier Bottle Est. Capacity: N/A

Performance Indicating Device: No Batch Volume: 1L Batch, number per day: N/A

Test Cycle (min): 3 Minutes Cycle On/Off (%): 100% Restricted Flow Rate: No

Test Duration (hr/day): N/A Test Conditioning: Test bottle rinsed 2 times with General Test Water

Report Notes:

The prototype bottle unit was received from the study sponsor and assigned the referenced BCS identifier number. The unit was fully charged using the provided USB cable prior to the start of the study. For the challenge, aliquots of *Escherichia coli* (ATCC 11229), *Listeria monocytogenes* (ATCC 4428), and MS-2 (ATCC 15597-B1) virus were added to General Test Water 1 (GTW1 (NSF P231); dechlorinated municipal water) and the water was homogenized separately for each contaminant. A sample of the challenge water was removed and enumerated for the respective microorganisms prior to challenge initiation. Each microorganism was tested individually and in duplicate 1L batches (Trial #1 and Trial #2). Briefly for each trial, 1-liter of the prepared test water was transferred into the provided Nalgene bottle, the Go3 cap was screwed on, and the bottle was inverted. The unit's power button was pressed and held for approximately 3 seconds to power on the unit. The power button was pressed a second time to start the unit's treatment cycle. A NIST traceable timer was started at the start of the cycle and was measured to be 3:00 minutes. For the duration of the 3 minute treatment cycle, the bottle was gently agitated with a rocking motion. Following the treatment cycle, the bottle was gently shaken again at 30-second intervals (for 5 seconds each time) for a total of a 3-minute rest period. Samples of the treated challenge water were then neutralized and analyzed fro the respective species. All analysis was conducted in triplicate at minimum at two dilutions. Study & analysis was conducted as per laboratory's accredited ISO17025:2017 methodology: bacteria as per SM 9215 (APHA 2012), virus as per EPA 1602 (Lab SOP V-10), turbidity as per SM2130B, pH as per SM4500HB, TOC as per SM5310C, Alkalinity as per SM2320B (if needed), TDS as per SM2540, chlorine as per SM4500-Cl G, & hardness as per SM2340C. Analysis was conducted using calibrated and/or validated instruments to traceable standards (NIST). All QC was within method acceptance limit. No general environmental conditions are specified in the standard or have been identified that could affect the test results or measurements. END OF REPORT NOTES.

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*I certify that I have examined and I am familiar with the information submitted herein. The results pertain only to the sample(s) tested, associated identifier #(s), and condition at receipt. Based on my inquiry of the individuals responsible for the analysis, I believe the data to be true, accurate, and complete. Unit descriptions and names were obtained from the submitted documents. The analysis was authorized and commissioned by the client or client's representative. The resulting data are representative of the analysis conducted on the collected samples and it's/their condition at the time of analysis. The data provided is strictly representative of the study conducted under laboratory conditions using the material/samples/articles provided by the client (or client's representative) and it's (their) condition at the time of test following receipt. The data obtained may not be representative or indicative of a real-life process and/or application. The sample(s) were analyzed in accordance with the appropriate method, however due to the inherent limitations of methods, microorganisms may avoid detection. BCS Laboratories offers no express or implied warranties concerning the quality, safety, and/or purity of any sample, batch, source, or the process they are derived from. Quality assurance controls were performed as outlined in the method and as per Good Laboratory Practices. Analyses were performed in accordance with laboratory practices and procedures set-forth by ISO 17025-2017 and NELAP/TNI accreditation standards unless otherwise noted. BCS makes no express or implied warranty regarding the ownership, merchantability, safety or fitness for a particular purpose of any such property or product.

Signature of Laboratory Director/Authorized Rep. _____ Date: 2020-06-30

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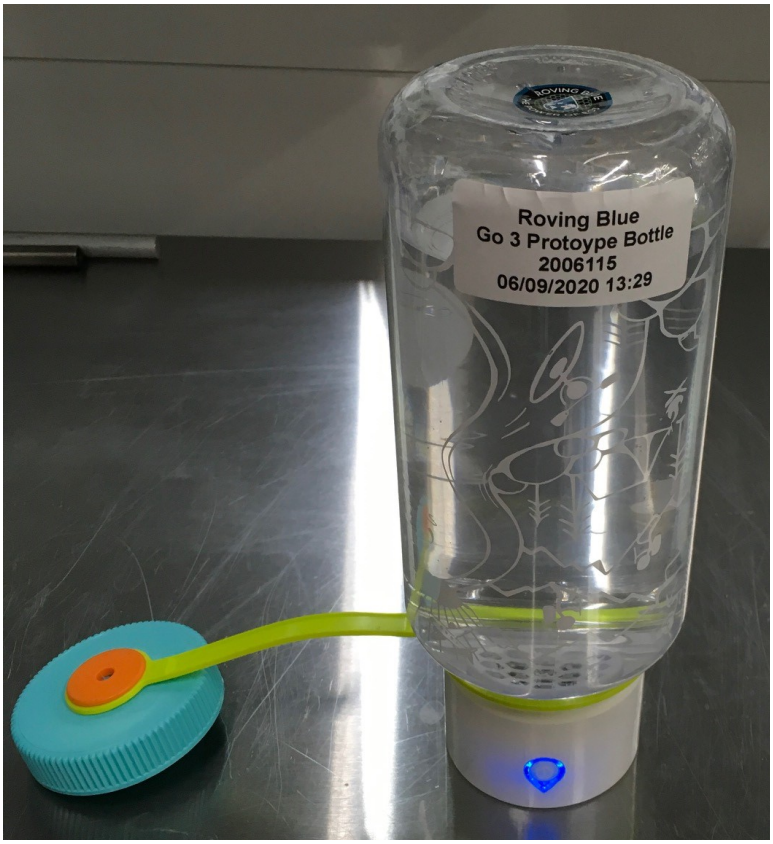
Pictures:



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*Balance ID: BL-10 Description: Sartorius Practum Precision Balance

Range of Function: 0-3100 g Instrument Reporting Limit: 0.01g

Last Servive Date: 2019-08-06 Service Due Date: 2020-08-31

Service Type: NIST Calibration NIST Validation Instrument: External Provided

*pH Meter ID: PH-09 Description: Orion Versa Star Pro Meter w/pH and Conductivity Modules

Range of Function: 0.001-12.000 Instrument Reporting Limit: 0.001

Last Service Date: 2019-09-23 Service Due Date: 2020-09-30

Service Type: Validation to NIST NIST Validation Instrument: NIST Standard Solution

*Conductivity Meter ID: CM-08 Description: Orion Versa Star Pro Meter w/pH and Conductivity Modules

Range of Function: 0.01-2400 ppm Instrument Reporting Limit: 0.01ppm

Last Service Date: 2019-09-23 Service Due Date: 2020-09-30

Service Type: Validation to NIST NIST Validation Instrument: NIST Standard Soutions

*Alkalinity Meter ID: ALK-04 Description: Alkaline Meter

Range of Function: 10-4000 mg/L Instrument Reporting Limit: 10 mg/L

Last Service Date: 2019-10-08 Service Due Date: 2020-10-08

Service Type: Validation to NIST NIST Validation Instrument: NIST standard solutions

*Hardness Meter ID: HARD-02 Description: Hach Total Hardness Test Kit 10-4,000 mg/L

Range of Function: 10-4000mg/L Instrument Reporting Limit: 10 mg/L

Last Service Date: 2020-05-21 Service Due Date: 2021-05-21

Service Type: Validation to NIST NIST Validation Instrument: NIST Standard solutions

*Turbidity Meter ID: TM-05 Description: Hach Turbidimeter

Range of Function: 0.00-999NTU Instrument Reporting Limit: 0.01NTU

Last Service Date: 2019-08-29 Service Due Date: 2020-08-29

Service Type: Manufacturer OEM NIST Validation Instrument: NIST Standard Solutions

*Spectrophotometer ID: SPEC-02 Description: Hach DR 3900 Spectrophotometer Colorimeter

Range of Function: 320-1000nm Instrument Reporting Limit: 0.01nm

Last Service Date: 2020-01-07 Service Due Date: 2021-01-07

Service Type: Manufacturer service NIST Validation Instrument: NIST Standard Solutions

Incubator ID: I-20 Description: Thermo Fisher Forma 29 cu. ft. Reach-In Incubator

Range of Function: 10-65C Instrument Reporting Limit: 0.1C

Last Service Date: 2019-09-23 Service Due Date: 2020-09-30

Service Type: Annual Service NIST Validation Instrument: External Provided

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**Flow Meter ID 1: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

**Flow Meter ID 2: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

**Flow Meter ID 3: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Microscope ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Refrigerator ID: FR-11 Description: Migali B Series Glass Door Refrigerator

Range of Function: 1-8C Instrument Reporting Limit: N/A

Last Service Date: 2019-09-23 Service Due Date: 2020-09-30

Service Type: Annual Service NIST Validation Instrument: External Provided

Centrifuge ID: C-12 Description: Eppendorf centrifuge w/ cell culture package

Range of Function: 0-4400 RPM Instrument Reporting Limit: 1 RPM

Last Service Date: 2019-09-23 Service Due Date: 2020-09-30

Service Type: Annual Service NIST Validation Instrument: TA-01

Pressure Source Pump ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Pressure Meter ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

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Cert. Pressure Meter ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

TOC Analyzer ID: TOC-01 Description: GE M5310C Lab TOC Analyzer

Range of Function: 40ppb-50ppm Instrument Reporting Limit: 0.01ppb

Last Service Date: 2020-05-13 Service Due Date: 2021-05-13

Service Type: Manufacuter Cal. NIST Validation Instrument: NIST Standard Solutions

Spectrograph ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Thermometer ID: IR-13 NIST Description: VWR Traceable Infrared Thermometer

Range of Function: -60-500C Instrument Reporting Limit: 0.01C

Last Service Date: 2020-03-20 Service Due Date: 2022-03-20

Service Type: Calibration NIST Validation Instrument: Manufactuer calibration

Particle Counter ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Timer ID: T-49 NIST Traceable Lap-Top Timer

NIST Expiration Date: 2021-11-04

*Validated at each day of use using NIST traceable standards. Other major equipment validated quarterly.

**Validated at each use using traceable volume and time measurements.

All above equipment with completed fields were used from Test Start Date to Test End Date unless otherwise noted. Service Date indicates PM or calibration by accredited service provider. Service Dates reported for latest period. If Last Service Date occurs during study duration, please contact us for the previous period's validation information.

END OF REPORT

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