UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
GREAT LAKES NATIONAL PROGRAM OFFICE
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Mr. Donald Zelazny
Great Lakes Programs Coordinator
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2915

Dear Mr. Zelazny:

Thank you for your June 12, 2020 request to remove the *"Tainting of Fish and Wildlife Flavor"* Beneficial Use Impairment (BUI) at the Buffalo River Area of Concern (AOC), Buffalo, New York. As you know, we share your desire to restore all the Great Lakes AOCs and to formally delist them. Based upon a review of your submittal and supporting data, the U.S. Environmental Protection Agency (EPA) hereby approves your request to remove this BUI from the Buffalo River AOC. EPA will notify the International Joint Commission of this significant positive environmental change at this AOC.

We congratulate you and your staff as well as the many federal, state, and local partners who have been instrumental in achieving this environmental improvement. Removal of this BUI will benefit not only the people who live and work in the AOC, but all the residents of New York and the Great Lakes basin as well.

We look forward to the continuation of this productive relationship with your agency, the Buffalo Niagara Waterkeeper, Erie County, and the rest of the Buffalo River Remedial Advisory Committee as we work together to delist this AOC in the years to come. If you have any further questions, please contact me at (312) 353-8320 or your staff can contact Leah Medley at (312) 886-1307.

Sincerely,

CHRISTOPHER KORLESKI
Digitally signed by CHRISTOPHER KORLESKI
Date: 2020.06.25 10:26:04 -05'00'

Chris Korleski, Director
Great Lakes National Program Office

cc: Margaux Valenti, Buffalo Niagara Waterkeeper
Kristen Guadagno, Erie County Department of Environment & Planning
Dave Gianturco, Buffalo River RAC Chair
Michael Kuzia-Carmel, NYSDEC
Richard Balla, US EPA, Region 2
Raj Bejankiwar, IJC

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Great Lakes Programs
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June 12, 2020

Mr. Chris Korleski, Director
Great Lakes National Program Office
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

Dear Mr. Korleski:

I would like to request the U.S. Environmental Protection Agency's concurrence with the removal of the Buffalo River Area of Concern (AOC) Tainting of Fish and Wildlife Flavor Beneficial Use Impairment (BUI). Buffalo Niagara Waterkeeper (BNW), and the New York State Department of Environmental Conservation (NYSDEC) have determined that this impairment has been restored in the Buffalo River AOC.

The enclosed BUI Removal Report describes BNW and NYSDEC's evaluation of the current status of the impairment, which is based largely upon the results of focused water quality monitoring conducted by NYSDEC throughout the AOC. NYSDEC has determined that water quality conditions in the Buffalo River that are associated with this BUI are comparable to waterways throughout the state. NYSDEC, with the assistance of BNW, developed the enclosed removal report in accordance with the process contained in New York State's *Guidance for Delisting (Redesignation) of AOCs and their BUI Indicators*, which is consistent the U.S. Policy Committee's *Delisting Principles and Guidelines* document.

The Buffalo River Remedial Advisory Committee (RAC) fully supports the removal of this BUI. In addition, BNW and NYSDEC held a public meeting on removal of the BUI. The comments received were addressed as documented in the enclosed report.

If you need further information, please contact either Mr. Michael Kuzia-Carmel, NYSDEC State AOC Coordinator, at 518-402-7231 or Ms. Margaux Valenti, BNW Buffalo River AOC Coordinator, at 716-852-7483 ext. 28. Thank you for your consideration of this request.

Sincerely,
// (electronically signed)

Donald Zelazny
Great Lakes Programs Coordinator

Enclosure

cc: Mr. Richard Balla, USEPA Region 2
Ms. Aisha Sexton-Sims, USEPA Region 2
Ms. Elizabeth VanRabenswaay, USEPA Region 2
Mr. Marc Tuchman, USEPA GLNPO
Ms. Amy Pelka, USEPA GLNPO
Ms. Mary Beth Giancarlo, USEPA GLNPO
Ms. Leah Medley, USEPA GLNPO
Mr. Michael Kuzia-Carmel, NYSDEC
Ms. Margaux Valenti, BNW
Ms. Claudia Rosen, BNW
Ms. Katherine Winkler, BNW
Ms. Kristen Guadagno, Erie County Department of Environment & Planning
Mr. Dave Gianturco, Buffalo River RAC Chair

BUFFALO RIVER AREA OF CONCERN

Tainting of Fish & Wildlife Flavor Beneficial Use Impairment Removal Report

JUNE 2020

Photo courtesy of United States Geological Survey (B. Baldigo/S. George)

Buffalo River Area Of Concern

Tainting of Fish & Wildlife Flavor

Beneficial Use Impairment (BUI) Removal Report

June 2020

Prepared by:
Ryan Tomko, P.E. – NYSDEC, Great Lakes Programs
&
Michael Kuzia-Carmel – NYSDEC, Great Lakes Programs

Prepared for:
Buffalo River AOC – Remedial Advisory Committee (RAC)

This Beneficial Use Impairment (BUI) Removal Report was prepared by the New York State Department of Environmental Conservation (NYSDEC) in cooperation with Buffalo Niagara Waterkeeper (BNW) and was substantially funded by the United States Environmental Protection Agency (USEPA) through the Great Lakes Restoration Initiative (GLRI). The NYSDEC and BNW acknowledge the significant efforts of the Remedial Advisory Committee (RAC) in engaging stakeholders and the public throughout the BUI removal process. For more information, please contact either the Remedial Action Plan (RAP) Coordinator at BNW or the AOC Coordinator at NYSDEC Division of Water.

Table of Contents

I. Introduction and Report Purpose

This Beneficial Use Impairment (BUI) Removal Report identifies the background, criteria, supporting data, and rationale to remove the "Tainting of Fish & Wildlife Flavor" BUI from the Buffalo River Area of Concern (AOC). The status of this BUI is currently designated as "Impaired" due primarily to concerns regarding phenolic compounds in the water column throughout the Buffalo River AOC.

To assess the status of this BUI, the Remedial Advisory Committee (RAC) developed removal criteria that are directly linked to water quality concerns associated with fish and wildlife flavor tainting within the AOC. The current removal criteria were developed by the RAC to reflect Title 6 of the New York Codes, Rules and Regulations, or 6 NYCRR, Part 703.5 - *Water quality standards for taste-, color- and odor-producing, toxic, and other deleterious substances*.

The Buffalo River RAC has identified and largely fulfilled those management actions and commitments that directly address the water quality concerns associated with the Tainting of Fish and Wildlife Flavor BUI. Additionally, this BUI has been specifically investigated through targeted water quality monitoring conducted both within the Buffalo River AOC and at reference locations.

Following an evaluation of applicable data sets and evidence gathered to address this impairment, the New York State Department of Environmental Conservation (NYSDEC) has determined that the level of phenolic compounds in the Buffalo River AOC are statistically comparable to similar waterways throughout New York State and therefore are not indicative of degraded ecologic conditions unique to the Buffalo River AOC. Therefore, NYSDEC recommends that the Tainting of Fish and Wildlife Flavor BUI be removed. The Buffalo River RAC is in agreement with this determination and fully supports the removal of this BUI. Accordingly, the intent of this removal report is to present the supporting evidence and rationale which justifies the removal of the Tainting of Fish & Wildlife Flavor BUI from the Buffalo River AOC.

II. Background

A. Buffalo River Area of Concern

Under Annex One of the Great Lakes Water Quality Agreement (GLWQA), the International Joint Commission (IJC) has identified 43 AOCs in the Great Lakes Basin where pollution from past industrial production and waste disposal practices has caused significant ecological degradation. Up to fourteen BUIs, or indicators of poor water quality, are used to evaluate the condition of an AOC.

The Buffalo River AOC is located in the City of Buffalo, Erie County, in Western New York State. The Buffalo River flows from the east and discharges into Lake Erie near the head of the Niagara River. The Buffalo River AOC extends from the mouth of the Buffalo River to the farthest point upstream at which the backwater condition exists during Lake Erie's highest monthly average lake level. The extent of the Buffalo River AOC is depicted in **Figure 1**. The impact area is 6.2 miles (10 km) in length, and the AOC also includes the entire 1.4 mile (2.3 km) stretch of the City

Ship Canal, located adjacent to the River. The Buffalo River drainage area is 446 mi^2 (1155 km^2). The primary upstream tributaries which feed the Buffalo River are Buffalo Creek, Cazenovia Creek, and Cayuga Creek.

Buffalo, New York was a prominent city for industry throughout the nineteenth and twentieth centuries and many industrial facilities found their homes along the banks of the Buffalo River. These industries released aniline-based dyes, oil, and chemicals of concern (COCs) directly into the River. Industrial pollutants discharged into the River became adsorbed or stuck to sediments along the river bottom. Contaminated bottom sediments have served as a primary contributing factor to poor water quality and degraded ecological health throughout the Buffalo River AOC. They can often become re-suspended in the water column, and bioaccumulate throughout the food web.

The suite of chemical compounds commonly referred to as COCs in the Buffalo River include: polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), lead (Pb), and mercury (Hg). Additional pollutants included: oil slicks, raw sewage discharge from combined sewer overflows (CSOs), thermal pollution from industrial cooling, pesticides (such as chlordane, DDT and its metabolites), ammonia (NH_3), and acids leading to low pH.

Under Annex One of the GLWQA, all AOCs are mandated to develop a Remedial Action Plan (RAP) in three stages;

- Stage I which collectively identifies specific BUIs and their causes,
- Stage II which outlines the restoration work needed to address the root problems and restore the identified BUIs, and
- Stage III which documents the fulfillment of the commitments made in Stage II and recommends the delisting of the AOC.

In 1989, a group of concerned citizens, scientists, and stakeholders, along with NYSDEC formed the Buffalo River Remedial Advisory Committee (RAC) to address issues within the AOC. Collectively, the RAC developed and published a combined Stage I and II RAP for the Buffalo River AOC in 1989. The goal of the RAP is: “to restore and maintain the chemical, physical, and biological integrity of the Buffalo River ecosystem in accordance with the Great Lakes Water Quality Agreement” (NYSDEC & Buffalo River RAC, 1989).

Through the combined Stage I and Stage II RAP and subsequent RAP addenda, the Buffalo River RAC has designated nine out of the possible fourteen BUIs as being impaired for the Buffalo River AOC. The Tainting of Fish and Wildlife Flavor BUI was initially designated as likely impaired in the 1989 Stage I and Stage II RAP.

The Great Lakes Legacy Act (GLLA) has facilitated removal and encapsulation of contaminated sediments within the Buffalo River. The GLLA remediation efforts were completed in 2015 and the two-year verification monitoring was completed in 2017. The five-year verification monitoring is currently scheduled for 2020 to determine if any remaining remedial action is necessary to meet the overall remedial goals.

B. Tainting of Fish and Wildlife Flavor BUI

1. Original Designation in Stage I/Stage II RAP

In the 1989 joint Stage I/Stage II RAP, the Tainting of Fish and Wildlife Flavor BUI was initially designated as likely impaired due primarily to phenols, and particularly chlorinated phenols in the water column. Phenols or phenolics are organic compounds that can have significant effects on the senses (e.g., smell and taste). Phenolic compounds are most commonly found in the natural environment within the water column, although they can also be present in soil and in sediment, and can also bioaccumulate in wildlife. Phenols are a common by-product of many anthropogenic processes including fossil fuel combustion, run-off from asphalt paved roadways, and also occur naturally.

In investigating the connection between phenols in the water column and fish flavor impacts, NYSDEC and BNW reviewed several research papers on this subject that date back to the 1950s. This initial research empirically established the basis for linking chemical concentrations in the water column to impacts on fish flavor. Subsequent experiments were conducted to establish flavor-impact thresholds for specific chemical compounds, including phenols. The research papers reviewed by NYSDEC and BNW are included in **Appendix A** of this report.

The RAP states that phenols in the water column may taint fish flesh at levels above 5 µg/L, and chlorinated phenols are food-tainting at levels above 1 µg/L. Although phenols in the Buffalo River weren't observed above the 5 µg/L level, the mean value of phenols within the Buffalo River was found to be 1.2 µg/L. This value reflected a mixture of both chlorinated and unchlorinated phenolic compounds (NYSDEC and Buffalo River RAC, 1989).

Additionally, the Stage I/Stage II RAP references Polycyclic Aromatic Hydrocarbons (PAHs) in bottom sediments as an indirect line of evidence supporting the Tainting of Fish and Wildlife Flavor BUI as being Likely Impaired. PAHs are organic compounds that are commonly produced through the incomplete combustion of organic matter (e.g., fossil fuels, wood). Industrial activities associated with significant production of PAHs include processes used in the iron and steel industry, heating and power generation, and petroleum refining. Most PAHs are insoluble in water, and in an aqueous environment like the Buffalo River tend to become attached to bottom sediments. The RAP reported a noticeable PAH odor observed in the stomach contents of fish taken from the river. The PAH concentrations in the bottom sediments were reportedly high enough to cause tainting of flavor among bottom feeding species.

Although the Stage I/Stage II RAP provided two lines of evidence supporting the designation of the Tainting of Fish and Wildlife BUI as Likely Impaired, the RAC did not consider these lines of evidence to be compelling enough to formally designate the BUI as Impaired. Additionally, the RAP indicated that no relevant contaminant data were available for wildlife along the Buffalo River. Hunting and trapping of wildlife is not allowed within the limits of the City of Buffalo or within the Buffalo River AOC. Therefore, the potential impacts described in the original RAP were limited exclusively to fish flavor tainting.

2. Subsequent Re-designation

In March 2011, the Interim Buffalo River Area of Concern (AOC) Strategic Plan for Beneficial Use Impairment (BUI) Delisting document was prepared by Ecology and Environment, Inc. for the United States Army Corps of Engineers (USACE) and the Buffalo River RAC. This document was intended to provide a comprehensive set of recommendations with the goal of improving relevant conditions in the Buffalo River AOC and documenting the restoration and protection of beneficial uses in support of the eventual delisting of the AOC (Ecology and Environment, 2011). This document included a review of the status of all BUIs identified as either impaired or likely impaired in the RAP, including the Tainting of Fish and Wildlife Flavor.

The 2011 interim delisting strategy document recommended that the Tainting of Fish and Wildlife Flavor BUI be designated as impaired in subsequent RAP addenda. The presumed causes and sources for the impairment were listed as elevated levels of many contaminants in the sediments, continued CSOs, seasonally poor water quality and other factors. The 2011 interim delisting strategy recommended removal criteria for the Tainting of Fish and Wildlife Flavor BUI. The recommended removal criteria included in the report were;

1. *For a period of 3 consecutive years, no exceedances of water quality standards or criteria for compounds associated with tainting within the AOC; AND*
2. *For a period of 3 consecutive years, no reports of tainting from fish and wildlife officials of informed public observers.*

Subsequently, in the Stage II RAP Addendum published in December 2011, the status of the Tainting of Fish and Wildlife Flavor BUI was formally changed from likely impaired to impaired by the RAC, citing elevated levels of PAHs in sediments as the reason for the change in designation. However, the removal criteria recommended in the 2011 interim delisting strategy document were not formally adopted in the 2011 Stage II RAP Addendum. Although the criteria referenced above were never formally accepted by the RAC nor incorporated into any RAP documents, they were used as a basis for developing a means of scientifically assessing the status of the Tainting of Fish and Wildlife Flavor BUI.

C. Current Removal Criteria

1. Review of Prior Removal Criteria

In 2012, the Buffalo River RAC formed the Water Quality Sub-Group with the goal of reviewing existing removal criteria and developing removal criteria modifications for multiple BUIs that were logical, specific, and attainable. The Water Quality Sub-Group met from June 2012 through June 2013 to discuss the Tainting of Fish and Wildlife Flavor BUI. Subsequently, the following conclusions regarding the removal criteria originally proposed in the 2011 interim delisting strategy document for this BUI were submitted and approved by the Buffalo River RAC:

1. The reporting of fish flavor tainting from fish & wildlife officials and informed public observers was too subjective and should be removed from the removal criteria;
2. The specific compounds associated with tainting (Phenols and Chlorinated Benzenes) should be included in the removal criteria; and
3. 6 NYCRR Part 703.5 water quality standards should be included in the removal criteria.

As a result of this review, the ecological indicator linked exclusively to the Tainting of Fish and Wildlife Flavor BUI was water quality in the Buffalo River, specifically with regards to compounds associated with fish flavor tainting. Although water quality is essentially an indirect means of assessing chemical impacts to fish flavor, it was chosen by the Water Quality Sub-Group because it is aligned with established standards and is overall a conservative means of assessing the BUI. As indicated in section II.B.1, historic research (Albersmeyer, W., Von Erichsen, L., 1961), (Boëtius, J., 1954), (Schulze, E., 1961), (Shumway, D.L., Palensky, J.R., 1973) has established the connection between chemical compounds, specifically phenolics, dissolved in the water column and impacts to fish flavor.

Water quality analysis provides conservative controls on variables including: chemical fate and transport in the natural environment, differential rates of bioaccumulation between fish species, and differential degrees of impact between fish species. Additionally, this rationale is largely in alignment with the IJC listing guidelines for the Tainting of Fish and Wildlife Flavor BUI, which state: “When ambient water quality standards, objectives, or guidelines, for the anthropogenic substance(s) known to cause tainting, are being exceeded or survey results have identified tainting of fish or wildlife flavor” (IJC, 1991). These factors guided the Water Quality Sub-Group throughout the decision-making process and informed the removal criteria ultimately established for the Tainting of Fish and Wildlife Flavor BUI.

Notably, the 2011 interim delisting strategy document signified a shift from referencing PAHs as being the root problem associated with this BUI to focusing on the suite of compounds known to be associated with flavor impacts, including phenolics and chlorinated benzenes. As indicated in the 2011 interim delisting strategy document, both PAHs as well as phenolics and chlorinated benzenes are associated with the same industrial processes (e.g., oil refineries, gas plants, plastic manufacturing, etc.). Additionally, New York State does not have established standards for other relevant ecological indicators (e.g., sediment, fish tissue) with regards to potential flavor impacts. Therefore, it wouldn’t be feasible to directly and scientifically assess the risks of fish flavor impacts associated with PAHs in bottom sediments. In combination with the first conclusion listed above, the Water Quality Sub-Group used the 2011 interim delisting strategy document as a basis for making both their second and third conclusions, which ultimately ended up informing the removal criteria that were established for this BUI.

2. Establishment of Current Removal Criteria

The current removal criteria for the Tainting of Fish and Wildlife Flavor BUI were established in 2014 as part of the Buffalo River Area of Concern: A Monitoring Plan of the Delisting of “Impaired” Beneficial Use Impairments report. In this document, the criteria are listed as:

1. “No exceedances of water quality standards within the AOC (6 NYCRR Part 703.5) for compounds (Phenolic compounds and Chlorobenzenes) associated with tainting.”

The above referenced removal criteria were formally adopted by the Buffalo River RAC in the 2014 Monitoring Plan and represent the current removal criteria for the Tainting of Fish and Wildlife Flavor BUI.

3. A Note on Fish and Wildlife Consumption Advisories

The “Restrictions on Fish and Wildlife Consumption” BUI has also been designated as impaired for the Buffalo River AOC. The New York State Department of Health (NYSDOH) has issued a fish consumption advisory for the Buffalo River and Outer Harbor. Specifically, PCBs are the identified contaminant of concern associated with the consumption advisory for the Buffalo River and Outer Harbor. While some of the management actions described within this report will also address the problems at the root of the Restrictions on Fish and Wildlife Consumption BUI, it is important to note a few fundamental differences between these use impairments.

The contaminants associated with the fish consumption advisories (PCBs) differ from those associated with fish flavor tainting (phenolic compounds and chlorobenzenes). Fish consumption advisories are based primarily upon contaminant concentrations measured in fish tissue, whereas fish flavor impacts are based upon established water quality standards. Finally, and perhaps most importantly, removal of the Tainting of Fish and Wildlife Flavor BUI has no bearing on the NYSDOH fish consumption advisory for the Buffalo River and Outer Harbor. Put another way, this report does not indicate that fish from the Buffalo River are safe to consume. Fish consumption advisories remain in effect throughout New York State and are available online at the following webpage: https://www.health.ny.gov/environmental/outdoors/fish/health_advisories/.

D. Removal Strategy

1. Applicable BUI Removal Scenarios

In December 2001, the Restoring United States Areas of Concern: Delisting Principles and Guidelines document developed by USEPA was adopted by the United States Policy Committee (USPC). This document was intended in part to "guide the restoration and maintenance of beneficial uses and the subsequent formal delisting in order to achieve a measure of consistency across the basin" (USPC, 2001). This document describes multiple scenarios under which a beneficial use impairment can be removed:

- A delisting target has been met through remedial actions which confirms that the beneficial use has been restored.
- It can be demonstrated that the beneficial use impairment is due to natural rather than human causes.
- It can be demonstrated that the impairment is not limited to the local geographic extent, but rather is typical of lakewide, region-wide, or area-wide conditions (under this situation, the beneficial use may not have been originally needed to be recognized as impaired).
- The impairment is caused by sources outside the AOC. The impairment is not restored but the impairment classification can be removed or changed to "impaired-not due to local sources." Responsibility for addressing "out of AOC" sources is given to another party (i.e., LAMPs). (USPC, 2001)

2. RAC Selection of a Removal Scenario

Beginning in 2018, the Buffalo River RAC reviewed the status of the Tainting of Fish and Wildlife Flavor BUI. Based on an assessment of the relevant restoration actions conducted in the Buffalo River AOC, as well as data from the 2013 – 2015 NYSDEC-led water quality monitoring program, the RAC determined that the appropriate removal scenario for this BUI was: "It can be demonstrated that the impairment is not limited to the local geographic extent, but rather is typical of lakewide, region-wide, or area-wide conditions."

The reasoning for this strategy is based on the apparent ubiquitous nature of total recoverable phenolics in New York State waterways. This is supported by data collected through the NYSDEC's Rotating Integrated Basin Surveys (RIBS) program. The RIBS program collects water quality data on a variety of chemical parameters, including phenolics, in waterways throughout New York State. A comparison of data collected through the RIBS program to data collected through the 2013 – 2015 water quality monitoring program in the Buffalo River AOC served as a basis for determining the removal strategy for this BUI. The 2013-2015 monitoring data, the RIBS data, and the restoration actions relevant to the Tainting of Fish and Wildlife Flavor BUI are discussed later in this report.

In selecting this strategy for removal, the RAC was clear that it would be inappropriate to include the parenthetical portion indicating in part that "the beneficial use may not have originally needed to be recognized as impaired" (USPC, 2001). This language implies that there may not have been a fish and wildlife tainting problem to begin with and would contradict prior impairment designations for this BUI based on known water quality issues in the Buffalo River AOC as identified in the RAP documents.

This removal strategy does not state that the waters in the Buffalo River AOC are "clean", but that they are similar in condition to other urban waterways throughout New York State. The Buffalo River AOC is still designated as a class C waterway which recommends its use to fishing and primary and secondary recreational contact only. Class C waterways are also suitable for fish, shellfish and wildlife propagation and survival. The removal of the Tainting of Fish and Wildlife Flavor BUI does not affect the Buffalo River's classification and all appropriate advisories should be checked prior to any use in and on the waters within the AOC.

III. Assessments and Management Actions Supporting BUI Removal

A. NYSDEC 2013-2015 Water Quality Monitoring Study

The 2011 interim delisting strategy document recommended that surface water monitoring be conducted throughout the Buffalo River, specifically targeting phenols as well as chlorobenzene, dichlorobenzenes, and trichlorobenzenes. In accordance with the suggested removal criteria provided, the water quality monitoring project was conducted over a three-year period. The proposed surface water monitoring would provide a scientific assessment of the relevant ecological indicator, surface water chemistry, originally associated with the Tainting of Fish and Wildlife Flavor BUI in the Stage I & Stage II RAP.

Subsequently, a water quality monitoring program was conducted in 2013-2015 by NYSDEC within and upstream of the Buffalo River AOC. This assessment was funded by USEPA through the Great Lakes Restoration Initiative (GLRI). Sample locations, located both inside and outside of the Buffalo River AOC boundaries, are shown below in **Figure 1** and are described below:

- BFRV-A was located near the bridge on Michigan Avenue.
- BFRV-B was located at the river bend between Katherine Street and Ensign Street.
- BFRV-C was located near the bridge on South Park Avenue.
- BFRV-D was located upstream of the AOC boundary near the bridge on Seneca Street.
- CAZCR-A was located on Cazenovia Creek, a primary tributary, near the bridge on Southside Parkway.

The sample locations were selected to provide an accurate representation of the water quality both within and outside the AOC. The three sites located within the boundary of the AOC were selected based on their proximity to potential sources of contamination, flow of the river, and their ability to allow for safe access and collection of samples. The two sites located upstream of the AOC were selected in order to represent the upstream boundary conditions of chemical contaminants. No sample locations were selected within the City Ship Canal because its isolated hydrologic connection to the Buffalo River does not adequately represent the overall environmental conditions of the AOC.

Figure 1: Buffalo River AOC and 2013-2015 Monitoring Locations

The sampling was conducted in the Spring, Summer and Fall from 2013 through 2015 in accordance with the project Quality Assurance Project Plan (NYSDEC, Revised 2014). All samples collected were analyzed for total recoverable phenolics via EPA Method 420.4, chlorinated phenols via EPA Method 625, unchlorinated phenols via EPA Method 625, and seven chlorinated benzenes via EPA Method 624/625. EPA Method 625, for analysis of chlorinated and unchlorinated phenols, is specific to only fifteen compounds and includes all of the Priority Pollutant phenolic compounds defined under the Clean Water Act (40 CFR Part 423, Appendix A). The chemical parameters included in the 2013-2015 water quality monitoring project, along with their respective analytical methods and applicable water quality standards per 6 NYCRR Part 703.5 are included in **Table 1** below.

Analytical Method	Chemical Parameters	Applicable NYS Water Quality Standard (per 6 NYCRR Part 703.5)
EPA Method 420.4	Total Recoverable Phenolics	1 µg/L (for total phenols)
EPA Method 625	Chlorinated Phenols: 2-chlorophenol 2,4-dichlorophenol 2,4,5-trichlorophenol 2,4,6-trichlorophenol 4-chloro-3-methylphenol pentachlorophenol Unchlorinated Phenols: 2-methylphenol 2-nitrophenol 2,4-dimethylphenol 2,4-dinitrophenol 3&4-methylphenol 4-nitrophenol 4,6-dinitro-2-methylphenol Phenol	1 µg/L (refers to the sum of all chlorinated phenols) 5 µg/L (refers to the sum of all unchlorinated phenols)
EPA Method 624/625	Chlorinated Benzenes: chlorobenzene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2,3-trichlorobenzene 1,2,4-trichlorobenzene 1,3,5-trichlorobenzene	50 µg/L (applies to each individual compound)

Table 1: Chemical Parameters, Associated Analytical Methods and applicable NYS Water Quality Standards from the 2013-2015 Water Quality Monitoring Project in the Buffalo River AOC

The complete report produced as a result of the 2013-2015 water quality monitoring project is included as **Appendix B** of this document.

B. NYSDEC Rotating Integrated Basin Studies (RIBS) from 2012-2015

The RIBS program produces a statewide picture of water quality conditions across all of the flowing waters of New York State. The program documents good quality waters, identifies water quality problems, identifies long-term water quality trends, characterizes naturally occurring background conditions, and establishes baseline conditions. The RIBS program trends on a five-year rotating cycle with three major watersheds surveyed every year. Sample locations are categorized into “screening network” and “routine network” sites across the state. Routine network sites are sampled annually regardless of screening network basin rotation. The Buffalo River was sampled annually from 2012 to 2015 as part of the RIBS Program.

Historic RIBS data were collected from 2012 through and including 2015 to compare to the results of the NYS DEC monitoring. The data collected was for RIBS sample locations throughout New York State. **Figure 2** below shows the locations of all of the RIBS sites sampled and whose data are used for comparison in this report. Data from 2012 to 2015 was selected to be able to compare results to the 2013-2015 NYSDEC water quality monitoring program in the Buffalo River.

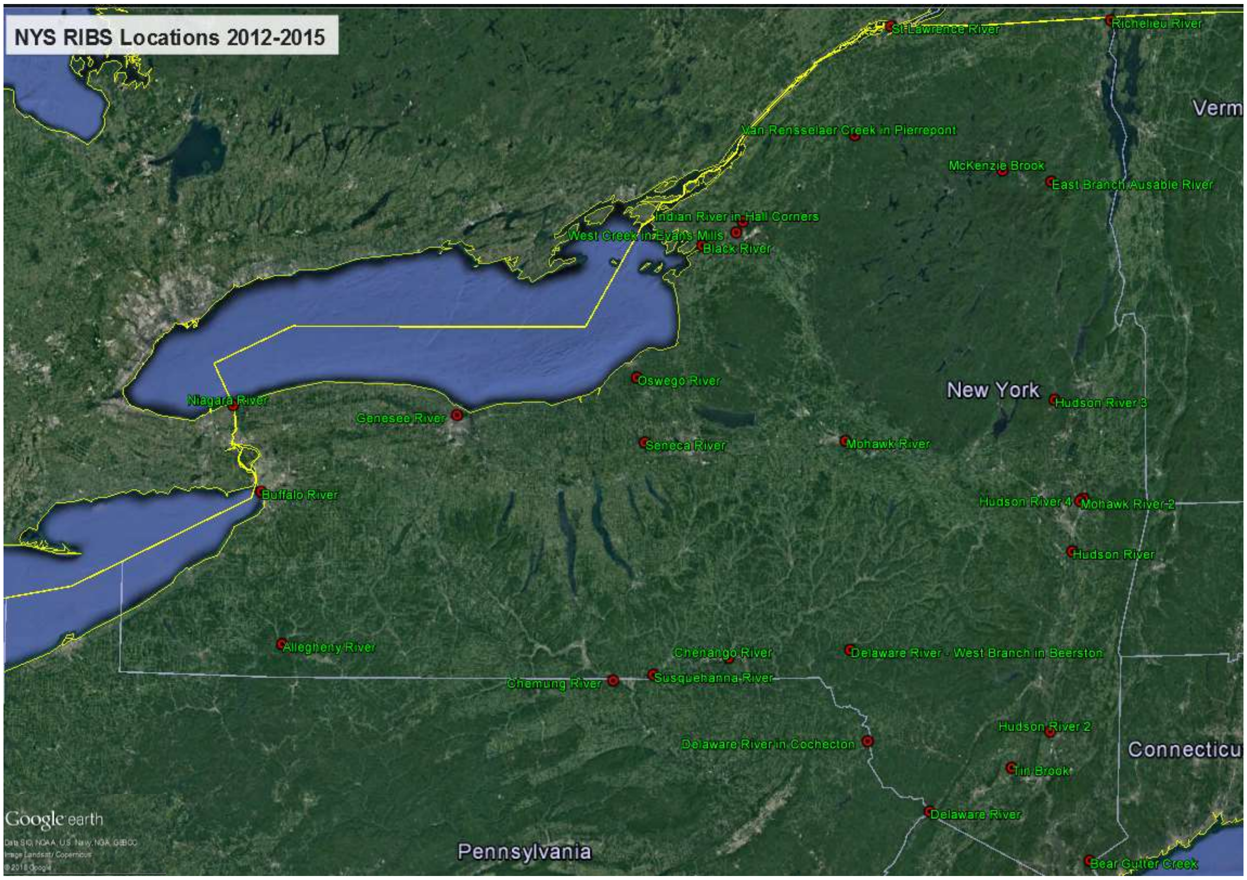

Figure 2 – NYS RIBS Sample Locations 2012-2015

C. Great Lakes Legacy Act Work

The Great Lakes Legacy Act (GLLA) was authorized in 2002 to address contaminated sediments in the U.S. Great Lakes AOCs. Contaminated sediment remediation in the Buffalo River AOC was funded in part by the GLLA. This remedial action, which occurred in two phases, was initiated in 2011 and was completed in 2015.

Phase I was led by the USACE and consisted of dredging within the authorized federal navigation channel of the Buffalo River. USACE was able to leverage GLRI funding to dredge and remove over 550,000 cubic yards of contaminated sediment from the navigation channel from 2011 to 2012.

To implement Phase II, a partnership between EPA, Honeywell, the City of Buffalo, BNW, NYSDEC, and USACE was formed. Under the GLLA program, EPA and Honeywell split the costs associated with the remedial action 50/50. Approximately 453,000 cubic yards of contaminated sediment were removed from the nearshore and within the navigation channel of the Buffalo River under Phase II of the remedial action.

The four contaminants of primary concern addressed through the remediation were total PAHs, Lead, Mercury and total PCBs. As a result of the phased remediation in the Buffalo River, over 1,000,000 cubic yards of contaminated sediment were either dredged and removed from the Buffalo River or were capped (covered) with stable and clean material.

Although phenols are primarily found in and associated with the water column, PAH-contaminated bottom sediments have also been linked to the Tainting of Fish and Wildlife Flavor BUI. Remediation of contaminated sediments in the Buffalo River, either through dredging and removal or through capping does directly address multiple sources of chemical contamination that have been associated with fish flavor impacts. While the remedial dredging was not targeted for nor included testing for phenols, a side benefit is the removal of potential sources of chemical contamination to the Buffalo River AOC.

D. Inactive Hazardous Waste Site Remediation

There are numerous sites around the AOC in the Buffalo River watershed that have been designated as inactive hazardous waste sites. The nature and extent of the contamination from inactive hazardous waste sites within the Buffalo River AOC was comprehensively assessed by USEPA in the early 1990s (Taylor, 1994). NYSDEC issues different classifications for these sites based on the nature and extent of the site-specific contamination, as well as the potential impacts to human health and the environment. To address contamination at inactive hazardous waste sites, there are numerous programs that are administered at both the federal and state levels. In New York State, these programs include the state Superfund program, the Brownfields Cleanup Program, and the Voluntary Cleanup Program.

Sites identified in the Buffalo River watershed were subsequently entered into appropriate state programs in order to facilitate remediation of site-specific contamination. Remediation at most of the inactive hazardous waste sites in the vicinity of the Buffalo River AOC has been completed. At sites where remedial activities are ongoing, measures are in place to prevent the migration of contaminants off-site, and to mitigate potential human health and environmental impacts. It should be noted that it is possible and perhaps even likely that there remain sites in the vicinity of the Buffalo River where contamination exists but has not yet been documented and characterized, let alone remediated or otherwise addressed. At these locations, the state and federal programs referenced above provide a mechanism whereby, on a case-by-case basis, the nature and extent of the contamination is determined and an appropriate remedial strategy is subsequently designed.

The overall benefit of the site-specific remediation that has been completed and is ongoing at inactive hazardous waste sites is to mitigate additional potential sources of contamination to the Buffalo River AOC. This directly addresses those problems first identified in the Stage I/Stage II RAP as being linked to multiple BUIs, including the Tainting of Fish and Wildlife Flavor.

E. SPDES Program Permitting and Monitoring

Within the Buffalo River watershed, there are municipal wastewater treatment plants and industrial facilities that discharge wastewater effluent directly to waterways. Some of these facilities have effluent discharges that contain phenols. Through the State Pollutant Discharge Elimination System (SPDES) permit program, NYSDEC regulates the discharge of surface stormwater and wastewater effluent to waterways throughout New York State.

The SPDES program is intended to eliminate the pollution of New York State waters and to maintain the highest quality of water possible consistent with the protection of public health, public enjoyment of water resources, the protection and propagation of fish and wildlife, and industrial development throughout the state. NYSDEC administers the SPDES program through reviewing permit applications from prospective permittees, approving SPDES permits, and enforcing the requirements established in individual permits.

NYSDEC constantly monitors SPDES permitted discharges in order to verify that the water quality standards established in the permits are met. Essentially, the SPDES program serves as an institutional control on industrial and municipal wastewater point sources discharging phenols to the Buffalo River and will continue to function as such in perpetuity.

IV. Monitoring Success of Assessments and Actions Supporting BUI Removal

A. NYSDEC 2013-2015 Water Quality Monitoring Results

None of the seven chlorinated benzene or the fourteen chlorinated and unchlorinated phenolic compounds listed in **Table 1** were detected in any of the samples collected as part of the 2013-2015 water quality monitoring project. These compounds correspond to those associated with EPA Methods 624 and 625 and are listed above in Section III.A of this report. Total recoverable phenolics were detected in the samples collected, and the data are shown below in **Table 2**. Samples at all five of the sampling locations showed results above the applicable water quality standard of 1 µg/L.

Location	April 2013	July 2013	October 2013	May 2014	July 2014	October 2014	May 2015	July 2015	October 2015	Average
BFRV-A	1.3 U	1.0 U	2.1	1.8	1.9 U	2.5	1.8	3.5	5.3	2.4
BFRV-B	1.0 U	1.0 U	2.7	1.5	1.6 U	1.3 U	2.8	2.5	7.0	2.4
BFRV-C	1.9 U	1.0 U	2.7	1.8	1.6 U	1.3 U	5.3	2.2	6.4	2.7
BFRV-D	1.9 U	1.0 U	2.4	1.8	1.9 U	1.6	6.1	2.2	6.6	2.8
CAZCR-A	1.0 U	1.0 U	3.5	1.8	1.3 U	1.3 U	5.3	2.0	4.7	2.4
U - Not detected in the sample above the numerical method detection limit listed. All results have units of µg/L (ppb)										

Table 2: Total Recoverable Phenolics Concentration by USEPA Method 420.4; all units are micrograms per liter (µg/L)

Some of the results in **Table 2** show that the numerical method detection limit was above the 1 µg/L water quality standard. It is not possible to determine whether the actual concentration of total recoverable phenolics was above 1 µg/L, rather that the concentration was not above the method detection limit, which ranged from 1.3 µg/L1 to 1.9 µg/L. Average concentrations of total recoverable phenolics for all five locations were 2.4 µg/L to 2.8 µg/L. The average concentration was calculated using all samples, including samples not detected above the numerical method detection limit. Samples not detected above the numerical method detection limit were included in the average with a value equal to the method detection limit.

The results show that the concentrations of total phenolics within the Buffalo River AOC do not appear to be any different than the concentrations immediately upstream of the AOC boundary.

This suggests that any phenolic compounds are likely originating upstream of the AOC and are not due to sources within the AOC.

B. NYSDEC Rotating Integrated Basin Studies (RIBS) Sample results from 2012-2015

The RIBS data collected from waterways across New York State from 2012 to 2015 were averaged using the same method in the 2013-2015 NYSDEC Monitoring report by averaging all data for a particular waterway and including samples not detected above the numerical method detection limit. **Table 3** below shows the average total recoverable phenolics concentrations for the waterways used for comparison to the Buffalo River. The average total recoverable phenolics concentrations in waterways across New York State ranges from 0 µg/L to 4.18 µg/L. Taking the dataset as a whole, the median value of total recoverable phenolics concentrations is 2.22 µg/L, and the mean value of the total recoverable phenolics concentrations is 2.31 µg/L. From the 2013-2015 NYSDEC Monitoring, average concentrations of total recoverable phenolics for all five sampling locations within and just upstream of the Buffalo River AOC ranged from 2.4 µg/L to 2.8 µg/L.

Using the complete RIBS dataset from 2012 to 2015, as well as the complete dataset from the 2013-2015 NYSDEC Monitoring in the Buffalo River, a basic statistical comparison was conducted via a t-test using the software ProUCL Version 5.1. Basically, a t-test compares the average values of two datasets in order to determine if there is a statistically significant difference between the two. In this case, the average values of the phenolics data gathered through the RIBS program, as well as the data from the 2013-2015 NSYDEC Monitoring project were compared. As a result of the test, the two datasets were found to be statistically comparable. The report from the t-test, as well as the two raw datasets used as the basis for comparison, are included in **Appendix C** of this report.

Location Name	Average Concentration µg/L(ppb)	Location Name	Average Concentration µg/L(ppb)
Allegheny River	2.12	Hudson River 4	2.45
Bear Gutter Creek	2.28	Indian River in Hall Corners	3.92
Black River	2.53	McKenzie Brook	2.27
Buffalo River	2.15	Mohawk River	2.38
Chemung River	2.14	Mohawk River 2	2.13
Chenango River	2.41	Niagara River	1.87
Delaware River	3.70	Oswego River	2.60
Delaware River - West Branch in Beerston	0.50	Richelieu River	2.01
Delaware River in Cochecton	0.00	Seneca River	3.00
East Branch Ausable River	2.03	St Lawrence River	1.98
Genesee River	2.84	Susquehanna River	2.77
Hudson River	2.23	Tin Brook	2.20
Hudson River 2	2.11	Van Rensselaer Creek in Pierrepont	4.18
Hudson River 3	2.09	West Creek in Evans Mills	1.74

Table 3 – Average Total Recoverable Phenol Concentrations in Waters Throughout NYS

C. Contextualizing the Water Quality Data

The established removal criteria for the Tainting of Fish and Wildlife Flavor BUI are: *"No exceedances of water quality standards within the AOC (6 NYCRR Part 703.5) for compounds (Phenolic compounds and Chlorobenzenes) associated with tainting."* As previously indicated in **Table 1** of this document, and per NYCRR Part 703.5, the applicable water standards are:

- 1 µg/L for total phenols,
- 1 µg/L for the sum of all chlorinated phenols,
- 5 µg/L for the sum of all unchlorinated phenols, and
- 50 µg/L for each individual chlorinated benzene compound.

Data from the 2013 – 2015 water quality monitoring project show that none of the chlorobenzenes, nor any of the individual chlorinated and unchlorinated phenolic compounds were detected in exceedance of their respective water quality standards. In fact, none of these compounds were detected at any point throughout the project. However, this does not necessarily mean that these compounds are not present in the Buffalo River. One of the limits inherent in water quality analysis is that chemical compounds can only be detected at or above their method detection limits. While the method detection limits for the analyses performed throughout the water quality monitoring are very low (on the order of *parts per billion*), chemical compounds hypothetically present below these method detection limits would be reported by the lab as "non-detects."

The detections throughout the 2013 – 2015 water quality monitoring project with regards to total recoverable phenolics via EPA Method 420.4 represent the entire possible range of phenolic compounds, both naturally occurring and of anthropogenic origin. Therefore, it is impossible to determine with certainty which specific phenolic compounds are present within the Buffalo River. What can be said with certainty is that phenolic compounds are present within the Buffalo River generally at concentrations between 2.4 and 2.8 µg/L, and that these concentrations are statistically similar to urban waterways throughout New York State.

V. Public Consultation

NYSDEC, in partnership with BNW, Erie County Department of Environment and Planning, USEPA, and the Buffalo River RAC, hosted a virtual public meeting on April 15, 2020 to present the case for removing the "Tainting of Fish and Wildlife Flavor" BUI to local stakeholders. The meeting kicked off a 30-day period during which public comments were collected on the BUI removal report. In conjunction with this virtual meeting, a draft of the BUI removal report was hosted on the BNW website throughout the public comment period.

During the virtual public meeting, NYSDEC responded to questions asked by attendees in real time. No additional comments were received following the virtual public meeting. BNW has prepared a summary of the public meeting comments reflecting the public's general desire to understand a very complicated topic and acceptance of the RAC/DEC conclusions without any opposition noted. This summary is included as **Appendix D**.

VI. Conclusions

A. Impairment Status Summary

Throughout the history of the Buffalo River AOC, there has been a fair amount of uncertainty regarding the Tainting of Fish and Wildlife Flavor BUI. In the initial Stage I/Stage II RAP, not only was the original impairment designation Likely Impaired, but this designation was based on a combination of understood risk factors (phenols and other chemicals present in the water column) associated with known root problems (PAH-contaminated bottom sediments, effluent discharges to the river), as well as anecdotal evidence of the impaired condition (observed PAH odor in fish stomach contents). In fact, when the impairment designation was officially changed to Impaired in the December 2011 Stage II RAP Addendum, it was indicated that this decision hadn't been based on any newly available data, but rather an acknowledgement of the prevalence of the root causes associated with the impairment.

Of the fourteen BUIs included in the GLWQA, the Tainting of Fish and Wildlife Flavor BUI lends itself to an elevated degree of ambiguity in assessing the status of the impairment. Through the Water Quality Sub-Group, the Buffalo River RAC decided to focus on those lines of evidence that could be empirically and quantifiably investigated. This drove the RAC's ultimate decision to develop removal criteria based on established water quality standards rather than on more subjective indicators such as anecdotal reports of fish flavor impacts. Subsequently, the 2013-2015 water quality monitoring project was designed with the intent to assess the status of the Tainting of Fish and Wildlife Flavor BUI in as scientific a manner as possible.

Ultimately, the 2013-2015 water quality monitoring project did not confirm that the established BUI removal criteria for the Tainting of Fish and Wildlife Flavor BUI had been met for all of the target chemical compounds. Although the removal criteria were met for all of the individual chlorinated benzenes, chlorinated phenols, and unchlorinated phenols that were part of the analysis, the total recoverable phenolics analyte was regularly detected at levels (on average 2.4 µg/L to 2.8 µg/L) above the removal criteria (1 µg/L). These levels are similar to those cited in the initial Stage I/Stage II RAP.

Given that phenols have both natural and anthropogenic sources, and that it would be unfeasible to determine which specific phenolic compounds comprised the detections from the 2013-2015 study, it is reasonable to infer that phenols will continue to be present within the water column throughout the Buffalo River at levels above the established water quality standard for total recoverable phenolics. Therefore, some of the understood risk factors associated with the Tainting of Fish and Wildlife Flavor that were first identified in the Stage I/Stage II RAP will continue to be present, despite the restoration actions undertaken to address the root causes associated with this impairment. However this risk is no longer greater in the Buffalo River than in many other urban waterways across New York State.

B. Restoration Actions Addressing Root Causes

Since the publication of the Stage I/Stage II RAP, many of the root problems identified within the Buffalo River AOC have been addressed through a variety of actions, initiatives, and programs. Chief among these are:

- The phased sediment remediation within the Buffalo River completed from 2011 through 2015 through the USACE's navigational dredging as well as through the GLLA;

- The completed and ongoing remediation at inactive hazardous waste sites adjacent to the Buffalo River through multiple state and federal programs; and
- The continued regulation of discharges to the Buffalo River through New York State's SPDES program.

The above-referenced efforts represent a multi-pronged approach to confronting, resolving, and mitigating the ecological impacts associated with legacy pollution from past industrial activity. Buffalo's industrial history significantly contributed to the widespread degradation throughout the Buffalo River that facilitated the original designation of the river as an AOC.

Indeed, the direct contamination of the Buffalo River ecosystem from industrial activity underlies many of the identified BUIs, including the Tainting of Fish and Wildlife Flavor. On the other hand, the efforts described above represent only part of the broader initiative to restore the Buffalo River, and to write a new chapter in its history based on the restoration of aquatic and riparian habitat for native fish and wildlife species, the establishment of a positive relationship between the river and local stakeholders, and the overall ecological recovery of the Buffalo River. The restoration efforts described in this report have substantially fulfilled the commitments made in the RAP to address the problems at the root of the Tainting of Fish and Wildlife Flavor BUI.

C. Removal Statement

The Tainting of Fish and Wildlife Flavor BUI was originally listed as Likely Impaired due to the presence of phenols and other chemical compounds in the water column in the Buffalo River, a condition associated with contaminated bottom sediments, as well as direct inputs from CSOs and other effluent discharges to the Buffalo River. Through the RAP process, the Buffalo River RAC officially confirmed the impairment and established specific removal criteria for this BUI. Parallel to that, restoration efforts have substantially addressed the root problems associated with this BUI that were identified in the RAP. A water quality monitoring study conducted in the Buffalo River found that the established removal criteria were met for all target chemical compounds, with the exception of total recoverable phenolics. Through a comparison with water quality data available statewide via the RIBS program, the concentrations of phenolic compounds in the Buffalo River were found to be statistically comparable to similar rivers throughout New York State. Therefore, it can be demonstrated that the presence of phenols at low concentrations in the water column is not a condition unique to the Buffalo River AOC, but rather is a condition common to waterways throughout New York State. Given this, NYSDEC has determined that the Tainting of Fish and Wildlife Flavor BUI can be removed from the list of designated impairments for the Buffalo River AOC, in accordance with established EPA guidance and the GLWQA. The Buffalo River RAC fully supports the removal of this BUI.

D. Post-Removal Responsibilities

1. New York State Department of Environmental Conservation

New York State will continue to monitor water quality in the Buffalo River through a variety of statewide programs and initiatives, including the State Pollutant Discharge Elimination System (SPDES) permitting and the Rotating Integrated Basin Studies (RIBS) programs. Additionally, New York State will continue to provide regulatory oversight for those inactive hazardous waste sites within the Buffalo River watershed that have not yet completed remedial activities.

2. United States Environmental Protection Agency

USEPA will continue to provide funding for RAP/RAC coordination and technical assistance to the extent that resources are available to support the removal of remaining BUIs and ultimately the delisting of the Buffalo River AOC. NYSDEC Great Lakes Program staff will continue to assist with these efforts.

3. Buffalo Niagara Waterkeeper

With EPA/GLRI funding, Buffalo Niagara Waterkeeper (BNW) will continue to serve as the RAP coordinator for the Buffalo River AOC. As RAP coordinator, BNW facilitates RAC meetings, provides technical and administrative assistance for AOC documentation, serves as the primary public point of contact for the AOC, and coordinates the overall implementation of the RAP for the Buffalo River AOC.

4. Erie County Department of Environment and Planning

With EPA/GLRI funding, the Erie County Department of Environment and Planning will continue to partner with BNW in implementing the responsibilities associated with the Buffalo River RAP. Erie County staff participate in RAC meetings, provide feedback on AOC-related documentation and progress reports, and capacity support for the Buffalo River AOC.

Appendix A – References

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Appendix B – NYSDEC 2013-2015 Water Quality Monitoring Project Report

Technical Report
2013-2015 Water Quality Monitoring Program
Tainting of Fish and Wildlife Flavor Beneficial Use Impairment
Buffalo River AOC

Prepared by NYSDEC

Background

The International Joint Commission (IJC) has designated the Buffalo River as an Area of Concern (AOC) under the U.S. and Canada Great Lakes Water Quality Agreement (Annex 2 of the 1987 Protocol). This designation indicates that the area has been identified as exhibiting the degradation of environmental conditions, to the extent in which beneficial uses of the water and/or biota are considered "impaired."

The Buffalo River AOC is located in the Western section of New York State, within the City of Buffalo. The river is fed primarily by three major tributaries, Buffalo Creek, Cayuga Creek, and Cazenovia Creek; and has a contributing watershed of approximately 444 square miles. The Buffalo River flows towards the West, where it ultimately discharges into Lake Erie. The AOC includes the entire 1.4 mile stretch of the City Ship Canal and continues up from the mouth of the Buffalo River, for approximately 6.2 miles. The AOC also includes a stretch of Cazenovia Creek from its confluence with the Buffalo River upstream to the Southside Parkway bridge.

The Tainting of Fish and Wildlife flavor Beneficial Use Impairment (BUI) exists within the Buffalo River AOC as a result of "elevated levels of many contaminants in sediment, continued combined sewer overflow (CSO) inputs, seasonally poor water quality, and other factors" (Ecology & Environment [E&E], March 2011). The criteria developed for removing this BUI, as listed in the E&E report, required that: "For a period of three consecutive years, no exceedances of water quality standards or criteria for compounds associated with tainting within the AOC; and, for a period of three consecutive years, no reports of tainting from fish and wildlife officials or informed public observers." The compounds associated with tainting of fish flavor identified in the E&E report, and for which there are applicable NYS water quality standards, included chlorinated and unchlorinated phenolics and chlorinated benzenes. It has been recognized that any tainting that may exist within the AOC only pertains to fish flavor; there is no evidence that it affects the flavor of other wildlife. It should also be noted that there have been no known, documented reports of tainted fish flavor in recent years.

In 2013-2014, through consultations between the Buffalo River AOC Remedial Advisory Committee (RAC), NYSDEC, USEPA, water quality experts and interested stakeholders, it was determined that the removal criteria for all of the BUIs needed to be updated to reflect current data and to assure that the goals were reasonable and obtainable. For the Tainting of Fish and Wildlife Flavor BUI, the new criterion (superseding the criteria cited in the 2011 E&E report) is as follows: "*No exceedances of water quality standards within the AOC (6NYCRR Part 703.5) for compounds*

(Phenolic compounds and Chlorobenzenes) associated with tainting" (Buffalo Niagara Riverkeeper [BNR], June 2014).

Project Description

In order to assess the status of the BUI within the Buffalo River AOC, a water quality monitoring program was conducted in 2013-2015 by NYSDEC within, and upstream of, the AOC. This assessment was funded by USEPA through the Great Lakes Restoration Initiative (GLRI). Sample locations were selected both inside and outside of the Buffalo River AOC boundaries (Figure 1 and Table 1 below) to allow for a comparison of chemical contaminant concentrations inside and

immediately upstream of the AOC. Three locations (BFRV-A, -B and –C) were located within the AOC boundary, and two locations were a short distance upstream of the AOC within the Buffalo River (BFRV-D) and Cazenovia Creek, a primary tributary (CAZCR-A).

Figure 1: Buffalo River AOC and 2013-2015 Monitoring Locations

Table 1: Sampling Locations				
Stream	**Station ID**	**Approximate Latitude**	**Approximate Longitude**	**Description**
Sampling Locations Within AOC Boundary				
Buffalo River	BFRV-A	42.871560	-78.872594	Near Bridge on Michigan Ave.
Buffalo River	BFRV-B	42.857683	-78.853847	At river bend between Katherine Street and Ensign Street.
Buffalo River	BFRV-C	42.861097	-78.828145	Near Bridge on South Park Ave.
Sampling Locations Upstream of AOC Boundary				
Cazenovia Creek	CAZCR-A	42.859364	-78.822125	Near Bridge on Southside Pkwy.
Buffalo River	BFRV-D	42.863914	-78.820656	Near Bridge on Seneca St.

Sampling was conducted three times per year (Spring, Summer and Fall) from 2013 through 2015 in accordance with the project *Quality Assurance Project Plan* (NYSDEC, revised 2014). It should be noted here that this monitoring program was planned and initiated based on the previous (no longer current) BUI removal criterion from the 2011 E&E report which required an assessment over a three-year period. The updated (and current) BUI removal criterion (BNR, 2014), which was developed while the monitoring program was ongoing, does not include a specific period of time over which the BUI should be assessed. However, it is believed that the three-year program that has now been completed, meets the intent of the criterion and provides sufficient water quality information to allow for an accurate assessment of the current BUI status. The chemical contaminants associated with the BUI, phenolics and chlorinated benzenes, did not change with the updated BUI removal criteria so, in that regard, the update had no impact on the scope or implementation of the monitoring program.

All samples collected during the 2013-2015 program were analyzed for phenolic compounds using two different analytical methodologies. The first was an analysis for total recoverable phenolics by EPA Method 420.4 (ALS Environmental, Rochester, NY). The second analytical procedure was EPA Method 625 (TestAmerica, Amherst, NY), which includes all of the Priority Pollutant phenolic compounds defined under the Clean Water Act (40 CFR Part 423, Appendix A). This is one of the most commonly used analytical procedures for identifying phenolic compounds in water samples, providing a higher level of specificity (differentiation between chlorinated and unchlorinated phenols) and generally lower detection limits than EPA Method 420.4. However, a limitation of this method is that it only includes 15 phenolic compounds, a relatively small subset of the phenolic compounds that could exist in the environment. TestAmerica also analyzed the samples for seven chlorinated benzenes by USEPA Methods 624/625. All of the individual parameters analyzed in the samples, along with the applicable NYS water quality standards against which the analytical results were compared, are shown in Table 2 below.

Table 2: Analytical Procedures Used for NYSDEC 2013-2015 Water Quality Monitoring		
Analytical Method	**Chemical Parameters**	**Applicable NYS Water Quality Standard* (micrograms per liter, µg/L)**
EPA 420.4	Total Recoverable Phenolics	1 µg/L (for total phenols)
EPA 625	Chlorinated Phenols: 2-chlorophenol, 2,4-dichlorophenol 2,4,5-trichlorophenol 2,4,6-trichlorophenol 4-chloro-3-methylphenol pentachlorophenol	1 µg/L (refers to sum of all chlorinated phenols)
	Unchlorinated Phenols: 2-methylphenol 2-nitrophenol 2,4-dimethylphenol 2,4-dinitrophenol 3&4-methylphenol 4-nitrophenol 4,6-dinitro-2-methylphenol Phenol	5 µg/L (refers to sum of all unchlorinated phenols)
EPA 624/625	Chlorinated Benzenes: chlorobenzene 1,2-dichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2,3-trichlorobenzene 1,2,4-trichlorobenzene 1,3,5-trichlorobenzene	50 µg/L (applies to each individual compound)

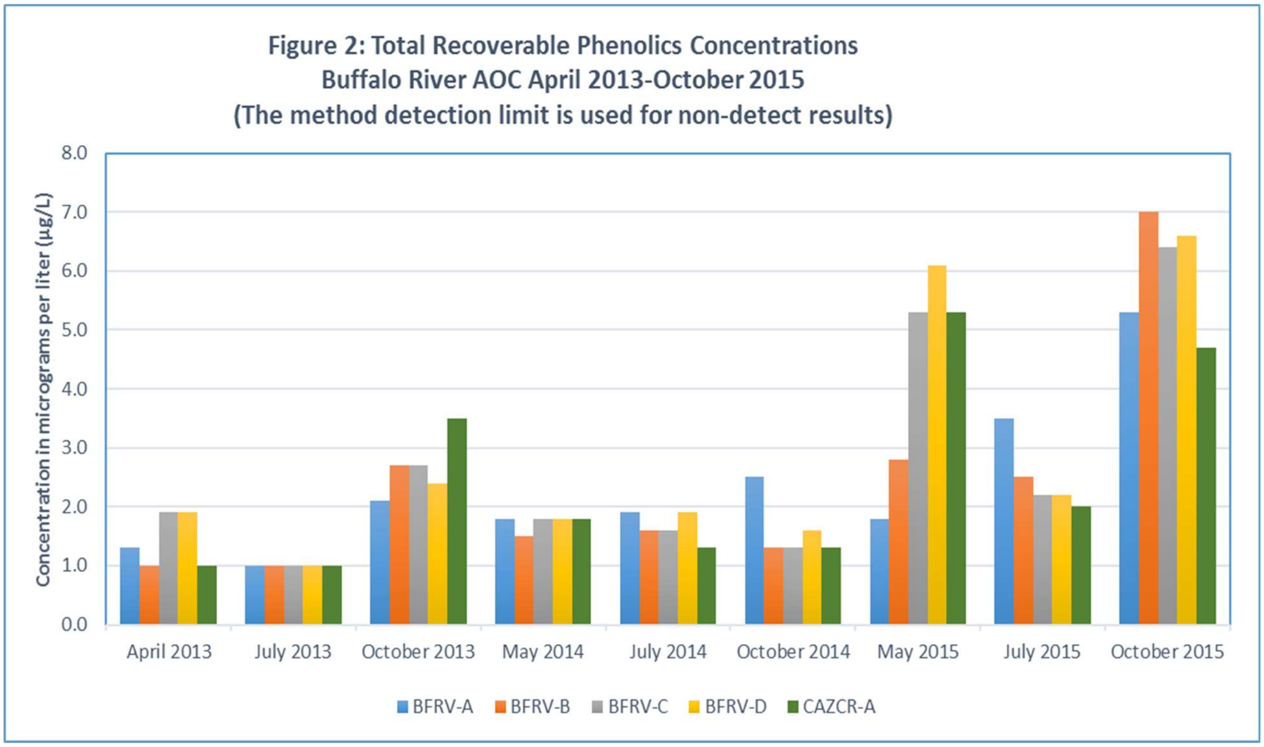
* Type: E(FS) - Protection from aesthetic food source considerations (6 NYCRR Part 703.5). The Buffalo River has been classified by NYS as a Class C water body. However, Type E(FS) water quality standards for the contaminants of concern do not exist for Class C waters, therefore Class D standards are being used.

Analytical Results Discussion

The total recoverable phenolics data (EPA Method 420.4) from the 2013-2015 monitoring program are summarized on Table 3 and Figure 2 below. The full data set is also provided in Attachment A. Concentration trends should not be inferred from the graphical representation on Figure 2 due to the limited number of sampling events conducted each year (3), and the extended period of time (2-7 months) between each of the events. However, the graphic is useful for general comparisons of sample results between locations and from one event to another. It should also be noted that non-detect results shown on Table 3 are included in the graphical representation on Figure 2 using the reported laboratory method detection limit.

Table 3: Total Recoverable Phenolics Concentration by USEPA Method 420.4; all units are micrograms per liter (µg/L)

Location	April 2013	July 2013	October 2013	May 2014	July 2014	October 2014	May 2015	July 2015	October 2015	Average
BFRV-A	1.3 U	1.0 U	2.1	1.8	1.9 U	2.5	1.8	3.5	5.3	2.4
BFRV-B	1.0 U	1.0 U	2.7	1.5	1.6 U	1.3 U	2.8	2.5	7.0	2.4
BFRV-C	1.9 U	1.0 U	2.7	1.8	1.6 U	1.3 U	5.3	2.2	6.4	2.7
BFRV-D	1.9 U	1.0 U	2.4	1.8	1.9 U	1.6	6.1	2.2	6.6	2.8
CAZCR-A	1.0 U	1.0 U	3.5	1.8	1.3 U	1.3 U	5.3	2.0	4.7	2.4
U - Not detected in the sample above the numerical method detection limit listed.										



Similar total recoverable phenolics concentration patterns and averages were exhibited for all five sampling locations during the 2013-2015 monitoring program. The highest average concentration over the entire monitoring program was exhibited at BFRV-D (2.8 µg/L), which is upstream of the AOC boundary. The individual location exhibiting the highest concentration varied from one monitoring event to another; in fact, all of the locations except BFRV-C exhibited the highest concentration during at least one event, and all five locations exhibited concentrations exceeding the applicable water quality standard of 1 µg/L on multiple occasions.

The USEPA Method 624 and 625 analyses included 15 individual phenolic compounds and seven chlorinated benzene compounds. None of these 22 compounds were detected at any of the locations during any sampling event. Due to the size of the data set, and the fact that these compounds were not detected in any of the samples, the results are not presented here in tabular or graphical format. However, the full data set is provided in Attachment B. One item of note from this data set is that during the last four monitoring events (covering October 2014-October 2015), the laboratory method detection limit for some of the individual chlorinated phenolic compounds exceeded the water quality standard of 1 µg/L (ranging from 1.1 to 1.6 µg/L). These instances represent approximately 5% of the entire EPA Method 624/625 data set for all nine events from 2013-2015. It is not possible to determine whether the affected chlorinated phenolic compounds may have been present in the samples at a concentration above 1 µg/L during the October 2014-October 2015 events; rather, it can only be said that they were not present above the detection limit, which ranged from 1.1 to 1.6 µg/L.

BUI Removal Criterion Assessment

The BUI removal criterion of "*No exceedances of water quality standards within the AOC (6NYCRR Part 703.5) for compounds (Phenolic compounds and Chlorobenzenes) associated with tainting*" (BNR, 2014) has not been met at any of the sampling locations using the total recoverable phenolics data set (EPA Method 420.4). Though all sites had exceedences of the water quality standard, similar concentrations between non-AOC and AOC locations indicate that any phenolics within the AOC boundary likely originated from upstream sources. This was demonstrated using ProUCL5.1 statistical software to perform hypothesis tests on the means of the AOC and non-AOC pooled data sets. Using both parametric and nonparametric methods, there are no statistical differences in the total recoverable phenolics concentrations between the AOC and non-AOC locations. The results and output files from this analysis are provided in Attachment C.

The BUI removal criterion has been met for all five locations using the EPA Method 624/625 data set for individual chlorinated phenolics, unchlorinated phenolics and chlorinated benzenes, with the caveat that there is some uncertainty with meeting the criterion for the limited portion (approximately 5%) of the total data set as described above, where the detection limit for some chlorinated phenolic compounds exceeded the water quality standard.

While the two data sets (EPA Method 420.4 vs. EPA methods 624/625) resulted in different assessments of water quality conditions relative to applicable water quality standards, the two sets were consistent in showing that conditions within the AOC portion of the Buffalo River do not appear to be any different than those at locations immediately upstream of the AOC boundary. This suggests that any phenolic compounds (which were only detected using EPA Method 420.4) are likely originating upstream of the AOC, and are not due to sources within the AOC.

REFERENCES

Interim Buffalo River Area of Concern (AOC) Strategic Plan for Beneficial Use Impairment (BUI) Delisting, Ecology & Environment, Inc. prepared for the United States Army Corps of Engineers, March 2011.

Buffalo River Area of Concern: A Monitoring Plan for the Delisting of "Impaired" Beneficial Use Impairments, Buffalo Niagara Riverkeeper, June 2014.

Quality Assurance Plan for the Buffalo River Area of Concern Water Quality Assessment Designed to Assess Beneficial Use Impairment #2: "Tainting of Fish and Wildlife Flavor," Version 2, NYSDEC, October 2014.

ATTACHMENT A

ANALYTICAL RESULTS for EPA METHOD 420.4

Final Buffalo River Tainting Assessment Analytical Results

Total Recoverable Phenolics by EPA Method 420.4

Result Qualifiers:

U = not detected above the reported numerical value (lab detection limit)

J = the reported concentration is an estimated value

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
4/30/2013	BFRV-A	Phenolics, Total Recoverable	1.3	U
4/30/2013	BFRV-B	Phenolics, Total Recoverable	1	U
4/30/2013	BFRV-C	Phenolics, Total Recoverable	1.9	U
4/30/2013	BFRV-D	Phenolics, Total Recoverable	1.9	U
4/30/2013	CAZCR-A	Phenolics, Total Recoverable	1	U
7/16/2013	BFRV-D	Phenolics, Total Recoverable	1	U
7/16/2013	CAZCR-A	Phenolics, Total Recoverable	1	U
7/16/2013	BFRV-A	Phenolics, Total Recoverable	1	U
7/16/2013	BFRV-B	Phenolics, Total Recoverable	1	U
7/16/2013	BFRV-C	Phenolics, Total Recoverable	1	U
10/17/2013	BFRV-A	Phenolics, Total Recoverable	2.1	
10/17/2013	BFRV-B	Phenolics, Total Recoverable	2.7	
10/17/2013	BFRV-C	Phenolics, Total Recoverable	2.7	
10/17/2013	BFRV-D	Phenolics, Total Recoverable	2.4	
10/17/2013	CAZCR-A	Phenolics, Total Recoverable	3.5	
5/8/2014	BFRV-A	Phenolics, Total Recoverable	1.8	J
5/8/2014	BFRV-B	Phenolics, Total Recoverable	1.5	J
5/8/2014	BFRV-C	Phenolics, Total Recoverable	1.8	J
5/8/2014	BFRV-D	Phenolics, Total Recoverable	1.8	J
5/8/2014	CAZCR-A	Phenolics, Total Recoverable	1.8	J
7/29/2014	BFRV-A	Phenolics, Total Recoverable	1.9	U
7/29/2014	BFRV-B	Phenolics, Total Recoverable	1.6	U
7/29/2014	BFRV-C	Phenolics, Total Recoverable	1.6	U
7/29/2014	BFRV-D	Phenolics, Total Recoverable	1.9	U
7/29/2014	CAZCR-A	Phenolics, Total Recoverable	1.3	U
10/14/2014	BFRV-A	Phenolics, Total Recoverable	2.5	
10/14/2014	BFRV-B	Phenolics, Total Recoverable	1.3	U
10/14/2014	BFRV-C	Phenolics, Total Recoverable	1.3	U
10/14/2014	BFRV-D	Phenolics, Total Recoverable	1.6	J
10/14/2014	CAZCR-A	Phenolics, Total Recoverable	1.3	U
5/12/2015	BFRV-A	Phenolics, Total Recoverable	1.8	J
5/12/2015	BFRV-B	Phenolics, Total Recoverable	2.8	
5/12/2015	BFRV-C	Phenolics, Total Recoverable	5.3	
5/12/2015	BFRV-D	Phenolics, Total Recoverable	6.1	
5/12/2015	CAZCR-A	Phenolics, Total Recoverable	5.3	
7/22/2015	BFRV-A	Phenolics, Total Recoverable	3.5	
7/22/2015	BFRV-B	Phenolics, Total Recoverable	2.5	
7/22/2015	BFRV-C	Phenolics, Total Recoverable	2.2	
7/22/2015	BFRV-D	Phenolics, Total Recoverable	2.2	
7/22/2015	CAZCR-A	Phenolics, Total Recoverable	2	
10/1/2015	BFRV-A	Phenolics, Total Recoverable	5.3	
10/1/2015	BFRV-B	Phenolics, Total Recoverable	7	
10/1/2015	BFRV-C	Phenolics, Total Recoverable	6.4	
10/1/2015	BFRV-D	Phenolics, Total Recoverable	6.6	
10/1/2015	CAZCR-A	Phenolics, Total Recoverable	4.7	

ATTACHMENT B

ANALYTICAL RESULTS for EPA METHODS 624/625

Final Buffalo River Tainting Assessment Analytical Results
Phenolics and Chlorinated Benzenes by EPA Methods 624/625

Result Qualifiers:
U = not detected above the reported numerical value (lab detection limit) J = the reported concentration is an estimated value

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
4/30/2013	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
4/30/2013	BFRV-A	1,2,4-Trichlorobenzene	0.47	U
4/30/2013	BFRV-A	1,2-Dichlorobenzene	0.44	U
4/30/2013	BFRV-A	1,3,5-Trichlorobenzene	0.54	U
4/30/2013	BFRV-A	1,3-Dichlorobenzene	0.54	U
4/30/2013	BFRV-A	1,4-Dichlorobenzene	0.51	U
4/30/2013	BFRV-A	2,4,5-Trichlorophenol	0.96	U
4/30/2013	BFRV-A	2,4,6-Trichlorophenol	0.22	U
4/30/2013	BFRV-A	2,4-Dichlorophenol	0.29	U
4/30/2013	BFRV-A	2,4-Dimethylphenol	0.13	U
4/30/2013	BFRV-A	2,4-Dinitrophenol	0.8	U
4/30/2013	BFRV-A	2-Chlorophenol	0.15	U
4/30/2013	BFRV-A	2-Methylphenol (O-Cresol)	0.2	U
4/30/2013	BFRV-A	2-Nitrophenol	0.14	U
4/30/2013	BFRV-A	4,6-Dinitro-2-Methylphenol	0.73	U
4/30/2013	BFRV-A	4-Chloro-3-Methylphenol	0.53	U
4/30/2013	BFRV-A	4-Nitrophenol	1.3	U
4/30/2013	BFRV-A	Chlorobenzene	0.48	U
4/30/2013	BFRV-A	Cresols, M & P	0.59	U
4/30/2013	BFRV-A	Pentachlorophenol	0.39	U
4/30/2013	BFRV-A	Phenol	0.12	U
4/30/2013	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
4/30/2013	BFRV-B	1,2,4-Trichlorobenzene	0.47	U
4/30/2013	BFRV-B	1,2-Dichlorobenzene	0.44	U
4/30/2013	BFRV-B	1,3,5-Trichlorobenzene	0.54	U
4/30/2013	BFRV-B	1,3-Dichlorobenzene	0.54	U
4/30/2013	BFRV-B	1,4-Dichlorobenzene	0.51	U
4/30/2013	BFRV-B	2,4,5-Trichlorophenol	0.96	U
4/30/2013	BFRV-B	2,4,6-Trichlorophenol	0.22	U
4/30/2013	BFRV-B	2,4-Dichlorophenol	0.29	U
4/30/2013	BFRV-B	2,4-Dimethylphenol	0.13	U
4/30/2013	BFRV-B	2,4-Dinitrophenol	0.8	U
4/30/2013	BFRV-B	2-Chlorophenol	0.15	U
4/30/2013	BFRV-B	2-Methylphenol (O-Cresol)	0.2	U
4/30/2013	BFRV-B	2-Nitrophenol	0.14	U
4/30/2013	BFRV-B	4,6-Dinitro-2-Methylphenol	0.73	U
4/30/2013	BFRV-B	4-Chloro-3-Methylphenol	0.53	U
4/30/2013	BFRV-B	4-Nitrophenol	1.3	U
4/30/2013	BFRV-B	Chlorobenzene	0.48	U
4/30/2013	BFRV-B	Cresols, M & P	0.59	U
4/30/2013	BFRV-B	Pentachlorophenol	0.39	U
4/30/2013	BFRV-B	Phenol	0.12	U
4/30/2013	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
4/30/2013	BFRV-C	1,2,4-Trichlorobenzene	0.47	U
4/30/2013	BFRV-C	1,2-Dichlorobenzene	0.44	U
4/30/2013	BFRV-C	1,3,5-Trichlorobenzene	0.54	U
4/30/2013	BFRV-C	1,3-Dichlorobenzene	0.54	U
4/30/2013	BFRV-C	1,4-Dichlorobenzene	0.51	U
4/30/2013	BFRV-C	2,4,5-Trichlorophenol	0.97	U
4/30/2013	BFRV-C	2,4,6-Trichlorophenol	0.22	U
4/30/2013	BFRV-C	2,4-Dichlorophenol	0.29	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
4/30/2013	BFRV-C	2,4-Dimethylphenol	0.13	U
4/30/2013	BFRV-C	2,4-Dinitrophenol	0.8	U
4/30/2013	BFRV-C	2-Chlorophenol	0.15	U
4/30/2013	BFRV-C	2-Methylphenol (O-Cresol)	0.21	U
4/30/2013	BFRV-C	2-Nitrophenol	0.14	U
4/30/2013	BFRV-C	4,6-Dinitro-2-Methylphenol	0.73	U
4/30/2013	BFRV-C	4-Chloro-3-Methylphenol	0.53	U
4/30/2013	BFRV-C	4-Nitrophenol	1.3	U
4/30/2013	BFRV-C	Chlorobenzene	0.48	U
4/30/2013	BFRV-C	Cresols, M & P	0.6	U
4/30/2013	BFRV-C	Pentachlorophenol	0.39	U
4/30/2013	BFRV-C	Phenol	0.12	U
4/30/2013	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
4/30/2013	BFRV-D	1,2,4-Trichlorobenzene	0.48	U
4/30/2013	BFRV-D	1,2-Dichlorobenzene	0.44	U
4/30/2013	BFRV-D	1,3,5-Trichlorobenzene	0.55	U
4/30/2013	BFRV-D	1,3-Dichlorobenzene	0.54	U
4/30/2013	BFRV-D	1,4-Dichlorobenzene	0.51	U
4/30/2013	BFRV-D	2,4,5-Trichlorophenol	0.99	U
4/30/2013	BFRV-D	2,4,6-Trichlorophenol	0.23	U
4/30/2013	BFRV-D	2,4-Dichlorophenol	0.3	U
4/30/2013	BFRV-D	2,4-Dimethylphenol	0.13	U
4/30/2013	BFRV-D	2,4-Dinitrophenol	0.83	U
4/30/2013	BFRV-D	2-Chlorophenol	0.15	U
4/30/2013	BFRV-D	2-Methylphenol (O-Cresol)	0.21	U
4/30/2013	BFRV-D	2-Nitrophenol	0.14	U
4/30/2013	BFRV-D	4,6-Dinitro-2-Methylphenol	0.75	U
4/30/2013	BFRV-D	4-Chloro-3-Methylphenol	0.55	U
4/30/2013	BFRV-D	4-Nitrophenol	1.3	U
4/30/2013	BFRV-D	Chlorobenzene	0.48	U
4/30/2013	BFRV-D	Cresols, M & P	0.61	U
4/30/2013	BFRV-D	Pentachlorophenol	0.41	U
4/30/2013	BFRV-D	Phenol	0.12	U
4/30/2013	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
4/30/2013	CAZCR-A	1,2,4-Trichlorobenzene	0.47	U
4/30/2013	CAZCR-A	1,2-Dichlorobenzene	0.44	U
4/30/2013	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
4/30/2013	CAZCR-A	1,3-Dichlorobenzene	0.54	U
4/30/2013	CAZCR-A	1,4-Dichlorobenzene	0.51	U
4/30/2013	CAZCR-A	2,4,5-Trichlorophenol	0.96	U
4/30/2013	CAZCR-A	2,4,6-Trichlorophenol	0.22	U
4/30/2013	CAZCR-A	2,4-Dichlorophenol	0.29	U
4/30/2013	CAZCR-A	2,4-Dimethylphenol	0.13	U
4/30/2013	CAZCR-A	2,4-Dinitrophenol	0.8	U
4/30/2013	CAZCR-A	2-Chlorophenol	0.15	U
4/30/2013	CAZCR-A	2-Methylphenol (O-Cresol)	0.2	U
4/30/2013	CAZCR-A	2-Nitrophenol	0.14	U
4/30/2013	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.72	U
4/30/2013	CAZCR-A	4-Chloro-3-Methylphenol	0.53	U
4/30/2013	CAZCR-A	4-Nitrophenol	1.3	U
4/30/2013	CAZCR-A	Chlorobenzene	0.48	U
4/30/2013	CAZCR-A	Cresols, M & P	0.59	U
4/30/2013	CAZCR-A	Pentachlorophenol	0.39	U
4/30/2013	CAZCR-A	Phenol	0.12	U
7/16/2013	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
7/16/2013	BFRV-A	1,2,4-Trichlorobenzene	0.46	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
7/16/2013	BFRV-A	1,2-Dichlorobenzene	0.44	U
7/16/2013	BFRV-A	1,3,5-Trichlorobenzene	0.53	U
7/16/2013	BFRV-A	1,3-Dichlorobenzene	0.54	U
7/16/2013	BFRV-A	1,4-Dichlorobenzene	0.51	U
7/16/2013	BFRV-A	2,4,5-Trichlorophenol	0.96	U
7/16/2013	BFRV-A	2,4,6-Trichlorophenol	0.22	U
7/16/2013	BFRV-A	2,4-Dichlorophenol	0.28	U
7/16/2013	BFRV-A	2,4-Dimethylphenol	0.13	U
7/16/2013	BFRV-A	2,4-Dinitrophenol	0.79	U
7/16/2013	BFRV-A	2-Chlorophenol	0.15	U
7/16/2013	BFRV-A	2-Methylphenol (O-Cresol)	0.2	U
7/16/2013	BFRV-A	2-Nitrophenol	0.14	U
7/16/2013	BFRV-A	4,6-Dinitro-2-Methylphenol	0.72	U
7/16/2013	BFRV-A	4-Chloro-3-Methylphenol	0.53	U
7/16/2013	BFRV-A	4-Nitrophenol	1.3	U
7/16/2013	BFRV-A	Chlorobenzene	0.48	U
7/16/2013	BFRV-A	Cresols, M & P	0.59	U
7/16/2013	BFRV-A	Pentachlorophenol	0.39	U
7/16/2013	BFRV-A	Phenol	0.11	U
7/16/2013	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
7/16/2013	BFRV-B	1,2,4-Trichlorobenzene	0.47	U
7/16/2013	BFRV-B	1,2-Dichlorobenzene	0.44	U
7/16/2013	BFRV-B	1,3,5-Trichlorobenzene	0.54	U
7/16/2013	BFRV-B	1,3-Dichlorobenzene	0.54	U
7/16/2013	BFRV-B	1,4-Dichlorobenzene	0.51	U
7/16/2013	BFRV-B	2,4,5-Trichlorophenol	0.97	U
7/16/2013	BFRV-B	2,4,6-Trichlorophenol	0.22	U
7/16/2013	BFRV-B	2,4-Dichlorophenol	0.29	U
7/16/2013	BFRV-B	2,4-Dimethylphenol	0.13	U
7/16/2013	BFRV-B	2,4-Dinitrophenol	0.8	U
7/16/2013	BFRV-B	2-Chlorophenol	0.15	U
7/16/2013	BFRV-B	2-Methylphenol (O-Cresol)	0.21	U
7/16/2013	BFRV-B	2-Nitrophenol	0.14	U
7/16/2013	BFRV-B	4,6-Dinitro-2-Methylphenol	0.73	U
7/16/2013	BFRV-B	4-Chloro-3-Methylphenol	0.53	U
7/16/2013	BFRV-B	4-Nitrophenol	1.3	U
7/16/2013	BFRV-B	Chlorobenzene	0.48	U
7/16/2013	BFRV-B	Cresols, M & P	0.6	U
7/16/2013	BFRV-B	Pentachlorophenol	0.39	U
7/16/2013	BFRV-B	Phenol	0.12	U
7/16/2013	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
7/16/2013	BFRV-C	1,2,4-Trichlorobenzene	0.48	U
7/16/2013	BFRV-C	1,2-Dichlorobenzene	0.44	U
7/16/2013	BFRV-C	1,3,5-Trichlorobenzene	0.55	U
7/16/2013	BFRV-C	1,3-Dichlorobenzene	0.54	U
7/16/2013	BFRV-C	1,4-Dichlorobenzene	0.51	U
7/16/2013	BFRV-C	2,4,5-Trichlorophenol	0.98	U
7/16/2013	BFRV-C	2,4,6-Trichlorophenol	0.23	U
7/16/2013	BFRV-C	2,4-Dichlorophenol	0.29	U
7/16/2013	BFRV-C	2,4-Dimethylphenol	0.13	U
7/16/2013	BFRV-C	2,4-Dinitrophenol	0.81	U
7/16/2013	BFRV-C	2-Chlorophenol	0.15	U
7/16/2013	BFRV-C	2-Methylphenol (O-Cresol)	0.21	U
7/16/2013	BFRV-C	2-Nitrophenol	0.14	U
7/16/2013	BFRV-C	4,6-Dinitro-2-Methylphenol	0.74	U
7/16/2013	BFRV-C	4-Chloro-3-Methylphenol	0.54	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
7/16/2013	BFRV-C	4-Nitrophenol	1.3	U
7/16/2013	BFRV-C	Chlorobenzene	0.48	U
7/16/2013	BFRV-C	Cresols, M & P	0.61	U
7/16/2013	BFRV-C	Pentachlorophenol	0.4	U
7/16/2013	BFRV-C	Phenol	0.12	U
7/16/2013	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
7/16/2013	BFRV-D	1,2,4-Trichlorobenzene	0.48	U
7/16/2013	BFRV-D	1,2-Dichlorobenzene	0.44	U
7/16/2013	BFRV-D	1,3,5-Trichlorobenzene	0.55	U
7/16/2013	BFRV-D	1,3-Dichlorobenzene	0.54	U
7/16/2013	BFRV-D	1,4-Dichlorobenzene	0.51	U
7/16/2013	BFRV-D	2,4,5-Trichlorophenol	0.98	U
7/16/2013	BFRV-D	2,4,6-Trichlorophenol	0.23	U
7/16/2013	BFRV-D	2,4-Dichlorophenol	0.29	U
7/16/2013	BFRV-D	2,4-Dimethylphenol	0.13	U
7/16/2013	BFRV-D	2,4-Dinitrophenol	0.81	U
7/16/2013	BFRV-D	2-Chlorophenol	0.15	U
7/16/2013	BFRV-D	2-Methylphenol (O-Cresol)	0.21	U
7/16/2013	BFRV-D	2-Nitrophenol	0.14	U
7/16/2013	BFRV-D	4,6-Dinitro-2-Methylphenol	0.74	U
7/16/2013	BFRV-D	4-Chloro-3-Methylphenol	0.54	U
7/16/2013	BFRV-D	4-Nitrophenol	1.3	U
7/16/2013	BFRV-D	Chlorobenzene	0.48	U
7/16/2013	BFRV-D	Cresols, M & P	0.6	U
7/16/2013	BFRV-D	Pentachlorophenol	0.4	U
7/16/2013	BFRV-D	Phenol	0.12	U
7/16/2013	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
7/16/2013	CAZCR-A	1,2,4-Trichlorobenzene	0.47	U
7/16/2013	CAZCR-A	1,2-Dichlorobenzene	0.44	U
7/16/2013	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
7/16/2013	CAZCR-A	1,3-Dichlorobenzene	0.54	U
7/16/2013	CAZCR-A	1,4-Dichlorobenzene	0.51	U
7/16/2013	CAZCR-A	2,4,5-Trichlorophenol	0.96	U
7/16/2013	CAZCR-A	2,4,6-Trichlorophenol	0.22	U
7/16/2013	CAZCR-A	2,4-Dichlorophenol	0.29	U
7/16/2013	CAZCR-A	2,4-Dimethylphenol	0.13	U
7/16/2013	CAZCR-A	2,4-Dinitrophenol	0.8	U
7/16/2013	CAZCR-A	2-Chlorophenol	0.15	U
7/16/2013	CAZCR-A	2-Methylphenol (O-Cresol)	0.2	U
7/16/2013	CAZCR-A	2-Nitrophenol	0.14	U
7/16/2013	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.72	U
7/16/2013	CAZCR-A	4-Chloro-3-Methylphenol	0.53	U
7/16/2013	CAZCR-A	4-Nitrophenol	1.3	U
7/16/2013	CAZCR-A	Chlorobenzene	0.48	U
7/16/2013	CAZCR-A	Cresols, M & P	0.59	U
7/16/2013	CAZCR-A	Pentachlorophenol	0.39	U
7/16/2013	CAZCR-A	Phenol	0.12	U
10/17/2013	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
10/17/2013	BFRV-A	1,2,4-Trichlorobenzene	0.47	U
10/17/2013	BFRV-A	1,2-Dichlorobenzene	0.44	U
10/17/2013	BFRV-A	1,3,5-Trichlorobenzene	0.54	U
10/17/2013	BFRV-A	1,3-Dichlorobenzene	0.54	U
10/17/2013	BFRV-A	1,4-Dichlorobenzene	0.51	U
10/17/2013	BFRV-A	2,4,5-Trichlorophenol	0.96	U
10/17/2013	BFRV-A	2,4,6-Trichlorophenol	0.22	U
10/17/2013	BFRV-A	2,4-Dichlorophenol	0.29	U
10/17/2013	BFRV-A	2,4-Dimethylphenol	0.13	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
10/17/2013	BFRV-A	2,4-Dinitrophenol	0.8	U
10/17/2013	BFRV-A	2-Chlorophenol	0.15	U
10/17/2013	BFRV-A	2-Methylphenol (O-Cresol)	0.2	U
10/17/2013	BFRV-A	2-Nitrophenol	0.14	U
10/17/2013	BFRV-A	4,6-Dinitro-2-Methylphenol	0.72	U
10/17/2013	BFRV-A	4-Chloro-3-Methylphenol	0.53	U
10/17/2013	BFRV-A	4-Nitrophenol	1.3	U
10/17/2013	BFRV-A	Chlorobenzene	0.48	U
10/17/2013	BFRV-A	Cresols, M & P	0.59	U
10/17/2013	BFRV-A	Pentachlorophenol	0.39	U
10/17/2013	BFRV-A	Phenol	0.12	U
10/17/2013	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
10/17/2013	BFRV-B	1,2,4-Trichlorobenzene	0.47	U
10/17/2013	BFRV-B	1,2-Dichlorobenzene	0.44	U
10/17/2013	BFRV-B	1,3,5-Trichlorobenzene	0.54	U
10/17/2013	BFRV-B	1,3-Dichlorobenzene	0.54	U
10/17/2013	BFRV-B	1,4-Dichlorobenzene	0.51	U
10/17/2013	BFRV-B	2,4,5-Trichlorophenol	0.96	U
10/17/2013	BFRV-B	2,4,6-Trichlorophenol	0.22	U
10/17/2013	BFRV-B	2,4-Dichlorophenol	0.29	U
10/17/2013	BFRV-B	2,4-Dimethylphenol	0.13	U
10/17/2013	BFRV-B	2,4-Dinitrophenol	0.8	U
10/17/2013	BFRV-B	2-Chlorophenol	0.15	U
10/17/2013	BFRV-B	2-Methylphenol (O-Cresol)	0.2	U
10/17/2013	BFRV-B	2-Nitrophenol	0.14	U
10/17/2013	BFRV-B	4,6-Dinitro-2-Methylphenol	0.72	U
10/17/2013	BFRV-B	4-Chloro-3-Methylphenol	0.53	U
10/17/2013	BFRV-B	4-Nitrophenol	1.3	U
10/17/2013	BFRV-B	Chlorobenzene	0.48	U
10/17/2013	BFRV-B	Cresols, M & P	0.59	U
10/17/2013	BFRV-B	Pentachlorophenol	0.39	U
10/17/2013	BFRV-B	Phenol	0.12	U
10/17/2013	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
10/17/2013	BFRV-C	1,2,4-Trichlorobenzene	0.47	U
10/17/2013	BFRV-C	1,2-Dichlorobenzene	0.44	U
10/17/2013	BFRV-C	1,3,5-Trichlorobenzene	0.54	U
10/17/2013	BFRV-C	1,3-Dichlorobenzene	0.54	U
10/17/2013	BFRV-C	1,4-Dichlorobenzene	0.51	U
10/17/2013	BFRV-C	2,4,5-Trichlorophenol	0.96	U
10/17/2013	BFRV-C	2,4,6-Trichlorophenol	0.22	U
10/17/2013	BFRV-C	2,4-Dichlorophenol	0.29	U
10/17/2013	BFRV-C	2,4-Dimethylphenol	0.13	U
10/17/2013	BFRV-C	2,4-Dinitrophenol	0.8	U
10/17/2013	BFRV-C	2-Chlorophenol	0.15	U
10/17/2013	BFRV-C	2-Methylphenol (O-Cresol)	0.2	U
10/17/2013	BFRV-C	2-Nitrophenol	0.14	U
10/17/2013	BFRV-C	4,6-Dinitro-2-Methylphenol	0.73	U
10/17/2013	BFRV-C	4-Chloro-3-Methylphenol	0.53	U
10/17/2013	BFRV-C	4-Nitrophenol	1.3	U
10/17/2013	BFRV-C	Chlorobenzene	0.48	U
10/17/2013	BFRV-C	Cresols, M & P	0.59	U
10/17/2013	BFRV-C	Pentachlorophenol	0.39	U
10/17/2013	BFRV-C	Phenol	0.12	U
10/17/2013	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
10/17/2013	BFRV-D	1,2,4-Trichlorobenzene	0.47	U
10/17/2013	BFRV-D	1,2-Dichlorobenzene	0.44	U
10/17/2013	BFRV-D	1,3,5-Trichlorobenzene	0.54	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
10/17/2013	BFRV-D	1,3-Dichlorobenzene	0.54	U
10/17/2013	BFRV-D	1,4-Dichlorobenzene	0.51	U
10/17/2013	BFRV-D	2,4,5-Trichlorophenol	0.96	U
10/17/2013	BFRV-D	2,4,6-Trichlorophenol	0.22	U
10/17/2013	BFRV-D	2,4-Dichlorophenol	0.29	U
10/17/2013	BFRV-D	2,4-Dimethylphenol	0.13	U
10/17/2013	BFRV-D	2,4-Dinitrophenol	0.8	U
10/17/2013	BFRV-D	2-Chlorophenol	0.15	U
10/17/2013	BFRV-D	2-Methylphenol (O-Cresol)	0.21	U
10/17/2013	BFRV-D	2-Nitrophenol	0.14	U
10/17/2013	BFRV-D	4,6-Dinitro-2-Methylphenol	0.73	U
10/17/2013	BFRV-D	4-Chloro-3-Methylphenol	0.53	U
10/17/2013	BFRV-D	4-Nitrophenol	1.3	U
10/17/2013	BFRV-D	Chlorobenzene	0.48	U
10/17/2013	BFRV-D	Cresols, M & P	0.6	U
10/17/2013	BFRV-D	Pentachlorophenol	0.39	U
10/17/2013	BFRV-D	Phenol	0.12	U
10/17/2013	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
10/17/2013	CAZCR-A	1,2,4-Trichlorobenzene	0.47	U
10/17/2013	CAZCR-A	1,2-Dichlorobenzene	0.44	U
10/17/2013	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
10/17/2013	CAZCR-A	1,3-Dichlorobenzene	0.54	U
10/17/2013	CAZCR-A	1,4-Dichlorobenzene	0.51	U
10/17/2013	CAZCR-A	2,4,5-Trichlorophenol	0.96	U
10/17/2013	CAZCR-A	2,4,6-Trichlorophenol	0.22	U
10/17/2013	CAZCR-A	2,4-Dichlorophenol	0.29	U
10/17/2013	CAZCR-A	2,4-Dimethylphenol	0.13	U
10/17/2013	CAZCR-A	2,4-Dinitrophenol	0.8	U
10/17/2013	CAZCR-A	2-Chlorophenol	0.15	U
10/17/2013	CAZCR-A	2-Methylphenol (O-Cresol)	0.2	U
10/17/2013	CAZCR-A	2-Nitrophenol	0.14	U
10/17/2013	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.72	U
10/17/2013	CAZCR-A	4-Chloro-3-Methylphenol	0.53	U
10/17/2013	CAZCR-A	4-Nitrophenol	1.3	U
10/17/2013	CAZCR-A	Chlorobenzene	0.48	U
10/17/2013	CAZCR-A	Cresols, M & P	0.59	U
10/17/2013	CAZCR-A	Pentachlorophenol	0.39	U
10/17/2013	CAZCR-A	Phenol	0.12	U
5/8/2014	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
5/8/2014	BFRV-A	1,2,4-Trichlorobenzene	0.47	U
5/8/2014	BFRV-A	1,2-Dichlorobenzene	0.44	U
5/8/2014	BFRV-A	1,3,5-Trichlorobenzene	0.53	U
5/8/2014	BFRV-A	1,3-Dichlorobenzene	0.54	U
5/8/2014	BFRV-A	1,4-Dichlorobenzene	0.51	U
5/8/2014	BFRV-A	2,4,5-Trichlorophenol	0.96	U
5/8/2014	BFRV-A	2,4,6-Trichlorophenol	0.22	U
5/8/2014	BFRV-A	2,4-Dichlorophenol	0.28	U
5/8/2014	BFRV-A	2,4-Dimethylphenol	0.13	U
5/8/2014	BFRV-A	2,4-Dinitrophenol	0.8	U
5/8/2014	BFRV-A	2-Chlorophenol	0.15	U
5/8/2014	BFRV-A	2-Methylphenol (O-Cresol)	0.2	U
5/8/2014	BFRV-A	2-Nitrophenol	0.14	U
5/8/2014	BFRV-A	4,6-Dinitro-2-Methylphenol	0.72	U
5/8/2014	BFRV-A	4-Chloro-3-Methylphenol	0.53	U
5/8/2014	BFRV-A	4-Nitrophenol	1.3	U
5/8/2014	BFRV-A	Chlorobenzene	0.48	U
5/8/2014	BFRV-A	Cresols, M & P	0.59	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
5/8/2014	BFRV-A	Pentachlorophenol	0.39	U
5/8/2014	BFRV-A	Phenol	0.11	U
5/8/2014	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
5/8/2014	BFRV-B	1,2,4-Trichlorobenzene	0.47	U
5/8/2014	BFRV-B	1,2-Dichlorobenzene	0.44	U
5/8/2014	BFRV-B	1,3,5-Trichlorobenzene	0.53	U
5/8/2014	BFRV-B	1,3-Dichlorobenzene	0.54	U
5/8/2014	BFRV-B	1,4-Dichlorobenzene	0.51	U
5/8/2014	BFRV-B	2,4,5-Trichlorophenol	0.96	U
5/8/2014	BFRV-B	2,4,6-Trichlorophenol	0.22	U
5/8/2014	BFRV-B	2,4-Dichlorophenol	0.29	U
5/8/2014	BFRV-B	2,4-Dimethylphenol	0.13	U
5/8/2014	BFRV-B	2,4-Dinitrophenol	0.8	U
5/8/2014	BFRV-B	2-Chlorophenol	0.15	U
5/8/2014	BFRV-B	2-Methylphenol (O-Cresol)	0.2	U
5/8/2014	BFRV-B	2-Nitrophenol	0.14	U
5/8/2014	BFRV-B	4,6-Dinitro-2-Methylphenol	0.72	U
5/8/2014	BFRV-B	4-Chloro-3-Methylphenol	0.53	U
5/8/2014	BFRV-B	4-Nitrophenol	1.3	U
5/8/2014	BFRV-B	Chlorobenzene	0.48	U
5/8/2014	BFRV-B	Cresols, M & P	0.59	U
5/8/2014	BFRV-B	Pentachlorophenol	0.39	U
5/8/2014	BFRV-B	Phenol	0.11	U
5/8/2014	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
5/8/2014	BFRV-C	1,2,4-Trichlorobenzene	0.47	U
5/8/2014	BFRV-C	1,2-Dichlorobenzene	0.44	U
5/8/2014	BFRV-C	1,3,5-Trichlorobenzene	0.53	U
5/8/2014	BFRV-C	1,3-Dichlorobenzene	0.54	U
5/8/2014	BFRV-C	1,4-Dichlorobenzene	0.51	U
5/8/2014	BFRV-C	2,4,5-Trichlorophenol	0.96	U
5/8/2014	BFRV-C	2,4,6-Trichlorophenol	0.22	U
5/8/2014	BFRV-C	2,4-Dichlorophenol	0.29	U
5/8/2014	BFRV-C	2,4-Dimethylphenol	0.13	U
5/8/2014	BFRV-C	2,4-Dinitrophenol	0.8	U
5/8/2014	BFRV-C	2-Chlorophenol	0.15	U
5/8/2014	BFRV-C	2-Methylphenol (O-Cresol)	0.2	U
5/8/2014	BFRV-C	2-Nitrophenol	0.14	U
5/8/2014	BFRV-C	4,6-Dinitro-2-Methylphenol	0.72	U
5/8/2014	BFRV-C	4-Chloro-3-Methylphenol	0.53	U
5/8/2014	BFRV-C	4-Nitrophenol	1.3	U
5/8/2014	BFRV-C	Chlorobenzene	0.48	U
5/8/2014	BFRV-C	Cresols, M & P	0.59	U
5/8/2014	BFRV-C	Pentachlorophenol	0.39	U
5/8/2014	BFRV-C	Phenol	0.11	U
5/8/2014	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
5/8/2014	BFRV-D	1,2,4-Trichlorobenzene	0.46	U
5/8/2014	BFRV-D	1,2-Dichlorobenzene	0.44	U
5/8/2014	BFRV-D	1,3,5-Trichlorobenzene	0.53	U
5/8/2014	BFRV-D	1,3-Dichlorobenzene	0.54	U
5/8/2014	BFRV-D	1,4-Dichlorobenzene	0.51	U
5/8/2014	BFRV-D	2,4,5-Trichlorophenol	0.95	U
5/8/2014	BFRV-D	2,4,6-Trichlorophenol	0.22	U
5/8/2014	BFRV-D	2,4-Dichlorophenol	0.28	U
5/8/2014	BFRV-D	2,4-Dimethylphenol	0.13	U
5/8/2014	BFRV-D	2,4-Dinitrophenol	0.79	U
5/8/2014	BFRV-D	2-Chlorophenol	0.15	U
5/8/2014	BFRV-D	2-Methylphenol (O-Cresol)	0.2	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
5/8/2014	BFRV-D	2-Nitrophenol	0.14	U
5/8/2014	BFRV-D	4,6-Dinitro-2-Methylphenol	0.72	U
5/8/2014	BFRV-D	4-Chloro-3-Methylphenol	0.52	U
5/8/2014	BFRV-D	4-Nitrophenol	1.3	U
5/8/2014	BFRV-D	Chlorobenzene	0.48	U
5/8/2014	BFRV-D	Cresols, M & P	0.59	U
5/8/2014	BFRV-D	Pentachlorophenol	0.39	U
5/8/2014	BFRV-D	Phenol	0.11	U
5/8/2014	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
5/8/2014	CAZCR-A	1,2,4-Trichlorobenzene	0.47	U
5/8/2014	CAZCR-A	1,2-Dichlorobenzene	0.44	U
5/8/2014	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
5/8/2014	CAZCR-A	1,3-Dichlorobenzene	0.54	U
5/8/2014	CAZCR-A	1,4-Dichlorobenzene	0.51	U
5/8/2014	CAZCR-A	2,4,5-Trichlorophenol	0.96	U
5/8/2014	CAZCR-A	2,4,6-Trichlorophenol	0.22	U
5/8/2014	CAZCR-A	2,4-Dichlorophenol	0.29	U
5/8/2014	CAZCR-A	2,4-Dimethylphenol	0.13	U
5/8/2014	CAZCR-A	2,4-Dinitrophenol	0.8	U
5/8/2014	CAZCR-A	2-Chlorophenol	0.15	U
5/8/2014	CAZCR-A	2-Methylphenol (O-Cresol)	0.2	U
5/8/2014	CAZCR-A	2-Nitrophenol	0.14	U
5/8/2014	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.72	U
5/8/2014	CAZCR-A	4-Chloro-3-Methylphenol	0.53	U
5/8/2014	CAZCR-A	4-Nitrophenol	1.3	U
5/8/2014	CAZCR-A	Chlorobenzene	0.48	U
5/8/2014	CAZCR-A	Cresols, M & P	0.59	U
5/8/2014	CAZCR-A	Pentachlorophenol	0.39	U
5/8/2014	CAZCR-A	Phenol	0.11	U
7/29/2014	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
7/29/2014	BFRV-A	1,2,4-Trichlorobenzene	0.47	U
7/29/2014	BFRV-A	1,2-Dichlorobenzene	0.44	U
7/29/2014	BFRV-A	1,3,5-Trichlorobenzene	0.53	U
7/29/2014	BFRV-A	1,3-Dichlorobenzene	0.54	U
7/29/2014	BFRV-A	1,4-Dichlorobenzene	0.51	U
7/29/2014	BFRV-A	2,4,5-Trichlorophenol	0.96	U
7/29/2014	BFRV-A	2,4,6-Trichlorophenol	0.22	U
7/29/2014	BFRV-A	2,4-Dichlorophenol	0.29	U
7/29/2014	BFRV-A	2,4-Dimethylphenol	0.13	U
7/29/2014	BFRV-A	2,4-Dinitrophenol	0.8	U
7/29/2014	BFRV-A	2-Chlorophenol	0.15	U
7/29/2014	BFRV-A	2-Methylphenol (O-Cresol)	0.2	U
7/29/2014	BFRV-A	2-Nitrophenol	0.14	U
7/29/2014	BFRV-A	4,6-Dinitro-2-Methylphenol	0.72	U
7/29/2014	BFRV-A	4-Chloro-3-Methylphenol	0.53	U
7/29/2014	BFRV-A	4-Nitrophenol	1.3	U
7/29/2014	BFRV-A	Chlorobenzene	0.48	U
7/29/2014	BFRV-A	Cresols, M & P	0.59	U
7/29/2014	BFRV-A	Pentachlorophenol	0.39	U
7/29/2014	BFRV-A	Phenol	0.11	U
7/29/2014	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
7/29/2014	BFRV-B	1,2,4-Trichlorobenzene	0.47	U
7/29/2014	BFRV-B	1,2-Dichlorobenzene	0.44	U
7/29/2014	BFRV-B	1,3,5-Trichlorobenzene	0.54	U
7/29/2014	BFRV-B	1,3-Dichlorobenzene	0.54	U
7/29/2014	BFRV-B	1,4-Dichlorobenzene	0.51	U
7/29/2014	BFRV-B	2,4,5-Trichlorophenol	0.96	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
7/29/2014	BFRV-B	2,4,6-Trichlorophenol	0.22	U
7/29/2014	BFRV-B	2,4-Dichlorophenol	0.29	U
7/29/2014	BFRV-B	2,4-Dimethylphenol	0.13	U
7/29/2014	BFRV-B	2,4-Dinitrophenol	0.8	U
7/29/2014	BFRV-B	2-Chlorophenol	0.15	U
7/29/2014	BFRV-B	2-Methylphenol (O-Cresol)	0.2	U
7/29/2014	BFRV-B	2-Nitrophenol	0.14	U
7/29/2014	BFRV-B	4,6-Dinitro-2-Methylphenol	0.72	U
7/29/2014	BFRV-B	4-Chloro-3-Methylphenol	0.53	U
7/29/2014	BFRV-B	4-Nitrophenol	1.3	U
7/29/2014	BFRV-B	Chlorobenzene	0.48	U
7/29/2014	BFRV-B	Cresols, M & P	0.59	U
7/29/2014	BFRV-B	Pentachlorophenol	0.39	U
7/29/2014	BFRV-B	Phenol	0.12	U
7/29/2014	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
7/29/2014	BFRV-C	1,2,4-Trichlorobenzene	0.47	U
7/29/2014	BFRV-C	1,2-Dichlorobenzene	0.44	U
7/29/2014	BFRV-C	1,3,5-Trichlorobenzene	0.54	U
7/29/2014	BFRV-C	1,3-Dichlorobenzene	0.54	U
7/29/2014	BFRV-C	1,4-Dichlorobenzene	0.51	U
7/29/2014	BFRV-C	2,4,5-Trichlorophenol	0.96	U
7/29/2014	BFRV-C	2,4,6-Trichlorophenol	0.22	U
7/29/2014	BFRV-C	2,4-Dichlorophenol	0.29	U
7/29/2014	BFRV-C	2,4-Dimethylphenol	0.13	U
7/29/2014	BFRV-C	2,4-Dinitrophenol	0.8	U
7/29/2014	BFRV-C	2-Chlorophenol	0.15	U
7/29/2014	BFRV-C	2-Methylphenol (O-Cresol)	0.2	U
7/29/2014	BFRV-C	2-Nitrophenol	0.14	U
7/29/2014	BFRV-C	4,6-Dinitro-2-Methylphenol	0.72	U
7/29/2014	BFRV-C	4-Chloro-3-Methylphenol	0.53	U
7/29/2014	BFRV-C	4-Nitrophenol	1.3	U
7/29/2014	BFRV-C	Chlorobenzene	0.48	U
7/29/2014	BFRV-C	Cresols, M & P	0.59	U
7/29/2014	BFRV-C	Pentachlorophenol	0.39	U
7/29/2014	BFRV-C	Phenol	0.12	U
7/29/2014	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
7/29/2014	BFRV-D	1,2,4-Trichlorobenzene	0.47	U
7/29/2014	BFRV-D	1,2-Dichlorobenzene	0.44	U
7/29/2014	BFRV-D	1,3,5-Trichlorobenzene	0.54	U
7/29/2014	BFRV-D	1,3-Dichlorobenzene	0.54	U
7/29/2014	BFRV-D	1,4-Dichlorobenzene	0.51	U
7/29/2014	BFRV-D	2,4,5-Trichlorophenol	0.96	U
7/29/2014	BFRV-D	2,4,6-Trichlorophenol	0.22	U
7/29/2014	BFRV-D	2,4-Dichlorophenol	0.29	U
7/29/2014	BFRV-D	2,4-Dimethylphenol	0.13	U
7/29/2014	BFRV-D	2,4-Dinitrophenol	0.8	U
7/29/2014	BFRV-D	2-Chlorophenol	0.15	U
7/29/2014	BFRV-D	2-Methylphenol (O-Cresol)	0.2	U
7/29/2014	BFRV-D	2-Nitrophenol	0.14	U
7/29/2014	BFRV-D	4,6-Dinitro-2-Methylphenol	0.73	U
7/29/2014	BFRV-D	4-Chloro-3-Methylphenol	0.53	U
7/29/2014	BFRV-D	4-Nitrophenol	1.3	U
7/29/2014	BFRV-D	Chlorobenzene	0.48	U
7/29/2014	BFRV-D	Cresols, M & P	0.59	U
7/29/2014	BFRV-D	Pentachlorophenol	0.39	U
7/29/2014	BFRV-D	Phenol	0.12	U
7/29/2014	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
7/29/2014	CAZCR-A	1,2,4-Trichlorobenzene	0.47	U
7/29/2014	CAZCR-A	1,2-Dichlorobenzene	0.44	U
7/29/2014	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
7/29/2014	CAZCR-A	1,3-Dichlorobenzene	0.54	U
7/29/2014	CAZCR-A	1,4-Dichlorobenzene	0.51	U
7/29/2014	CAZCR-A	2,4,5-Trichlorophenol	0.96	U
7/29/2014	CAZCR-A	2,4,6-Trichlorophenol	0.22	U
7/29/2014	CAZCR-A	2,4-Dichlorophenol	0.29	U
7/29/2014	CAZCR-A	2,4-Dimethylphenol	0.13	U
7/29/2014	CAZCR-A	2,4-Dinitrophenol	0.8	U
7/29/2014	CAZCR-A	2-Chlorophenol	0.15	U
7/29/2014	CAZCR-A	2-Methylphenol (O-Cresol)	0.2	U
7/29/2014	CAZCR-A	2-Nitrophenol	0.14	U
7/29/2014	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.72	U
7/29/2014	CAZCR-A	4-Chloro-3-Methylphenol	0.53	U
7/29/2014	CAZCR-A	4-Nitrophenol	1.3	U
7/29/2014	CAZCR-A	Chlorobenzene	0.48	U
7/29/2014	CAZCR-A	Cresols, M & P	0.59	U
7/29/2014	CAZCR-A	Pentachlorophenol	0.39	U
7/29/2014	CAZCR-A	Phenol	0.12	U
10/14/2014	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
10/14/2014	BFRV-A	1,2,4-Trichlorobenzene	0.78	U
10/14/2014	BFRV-A	1,2-Dichlorobenzene	0.44	U
10/14/2014	BFRV-A	1,3,5-Trichlorobenzene	0.53	U
10/14/2014	BFRV-A	1,3-Dichlorobenzene	0.54	U
10/14/2014	BFRV-A	1,4-Dichlorobenzene	0.51	U
10/14/2014	BFRV-A	2,4,5-Trichlorophenol	1.3	U
10/14/2014	BFRV-A	2,4,6-Trichlorophenol	0.95	U
10/14/2014	BFRV-A	2,4-Dichlorophenol	0.73	U
10/14/2014	BFRV-A	2,4-Dimethylphenol	1.3	U
10/14/2014	BFRV-A	2,4-Dinitrophenol	4.7	U
10/14/2014	BFRV-A	2-Chlorophenol	0.63	U
10/14/2014	BFRV-A	2-Methylphenol (O-Cresol)	0.77	U
10/14/2014	BFRV-A	2-Nitrophenol	0.66	U
10/14/2014	BFRV-A	4,6-Dinitro-2-Methylphenol	0.63	U
10/14/2014	BFRV-A	4-Chloro-3-Methylphenol	1	U
10/14/2014	BFRV-A	4-Nitrophenol	9.5	U
10/14/2014	BFRV-A	Chlorobenzene	0.48	U
10/14/2014	BFRV-A	Cresols, M & P	0.79	U
10/14/2014	BFRV-A	Pentachlorophenol	1.5	U
10/14/2014	BFRV-A	Phenol	0.33	U
10/14/2014	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
10/14/2014	BFRV-B	1,2,4-Trichlorobenzene	0.78	U
10/14/2014	BFRV-B	1,2-Dichlorobenzene	0.44	U
10/14/2014	BFRV-B	1,3,5-Trichlorobenzene	0.53	U
10/14/2014	BFRV-B	1,3-Dichlorobenzene	0.54	U
10/14/2014	BFRV-B	1,4-Dichlorobenzene	0.51	U
10/14/2014	BFRV-B	2,4,5-Trichlorophenol	1.3	U
10/14/2014	BFRV-B	2,4,6-Trichlorophenol	0.95	U
10/14/2014	BFRV-B	2,4-Dichlorophenol	0.73	U
10/14/2014	BFRV-B	2,4-Dimethylphenol	1.3	U
10/14/2014	BFRV-B	2,4-Dinitrophenol	4.7	U
10/14/2014	BFRV-B	2-Chlorophenol	0.62	U
10/14/2014	BFRV-B	2-Methylphenol (O-Cresol)	0.77	U
10/14/2014	BFRV-B	2-Nitrophenol	0.66	U
10/14/2014	BFRV-B	4,6-Dinitro-2-Methylphenol	0.62	U
10/14/2014	BFRV-B	4-Chloro-3-Methylphenol	1	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
10/14/2014	BFRV-B	4-Nitrophenol	9.5	U
10/14/2014	BFRV-B	Chlorobenzene	0.48	U
10/14/2014	BFRV-B	Cresols, M & P	0.79	U
10/14/2014	BFRV-B	Pentachlorophenol	1.5	U
10/14/2014	BFRV-B	Phenol	0.33	U
10/14/2014	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
10/14/2014	BFRV-C	1,2,4-Trichlorobenzene	0.78	U
10/14/2014	BFRV-C	1,2-Dichlorobenzene	0.44	U
10/14/2014	BFRV-C	1,3,5-Trichlorobenzene	0.53	U
10/14/2014	BFRV-C	1,3-Dichlorobenzene	0.54	U
10/14/2014	BFRV-C	1,4-Dichlorobenzene	0.51	U
10/14/2014	BFRV-C	2,4,5-Trichlorophenol	1.3	U
10/14/2014	BFRV-C	2,4,6-Trichlorophenol	0.95	U
10/14/2014	BFRV-C	2,4-Dichlorophenol	0.73	U
10/14/2014	BFRV-C	2,4-Dimethylphenol	1.3	U
10/14/2014	BFRV-C	2,4-Dinitrophenol	4.7	U
10/14/2014	BFRV-C	2-Chlorophenol	0.63	U
10/14/2014	BFRV-C	2-Methylphenol (O-Cresol)	0.77	U
10/14/2014	BFRV-C	2-Nitrophenol	0.66	U
10/14/2014	BFRV-C	4,6-Dinitro-2-Methylphenol	0.63	U
10/14/2014	BFRV-C	4-Chloro-3-Methylphenol	1	U
10/14/2014	BFRV-C	4-Nitrophenol	9.5	U
10/14/2014	BFRV-C	Chlorobenzene	0.48	U
10/14/2014	BFRV-C	Cresols, M & P	0.79	U
10/14/2014	BFRV-C	Pentachlorophenol	1.5	U
10/14/2014	BFRV-C	Phenol	0.33	U
10/14/2014	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
10/14/2014	BFRV-D	1,2,4-Trichlorobenzene	0.78	U
10/14/2014	BFRV-D	1,2-Dichlorobenzene	0.44	U
10/14/2014	BFRV-D	1,3,5-Trichlorobenzene	0.54	U
10/14/2014	BFRV-D	1,3-Dichlorobenzene	0.54	U
10/14/2014	BFRV-D	1,4-Dichlorobenzene	0.51	U
10/14/2014	BFRV-D	2,4,5-Trichlorophenol	1.3	U
10/14/2014	BFRV-D	2,4,6-Trichlorophenol	0.95	U
10/14/2014	BFRV-D	2,4-Dichlorophenol	0.73	U
10/14/2014	BFRV-D	2,4-Dimethylphenol	1.3	U
10/14/2014	BFRV-D	2,4-Dinitrophenol	4.8	U
10/14/2014	BFRV-D	2-Chlorophenol	0.63	U
10/14/2014	BFRV-D	2-Methylphenol (O-Cresol)	0.77	U
10/14/2014	BFRV-D	2-Nitrophenol	0.67	U
10/14/2014	BFRV-D	4,6-Dinitro-2-Methylphenol	0.63	U
10/14/2014	BFRV-D	4-Chloro-3-Methylphenol	1	U
10/14/2014	BFRV-D	4-Nitrophenol	9.5	U
10/14/2014	BFRV-D	Chlorobenzene	0.48	U
10/14/2014	BFRV-D	Cresols, M & P	0.79	U
10/14/2014	BFRV-D	Pentachlorophenol	1.5	U
10/14/2014	BFRV-D	Phenol	0.33	U
10/14/2014	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
10/14/2014	CAZCR-A	1,2,4-Trichlorobenzene	0.78	U
10/14/2014	CAZCR-A	1,2-Dichlorobenzene	0.44	U
10/14/2014	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
10/14/2014	CAZCR-A	1,3-Dichlorobenzene	0.54	U
10/14/2014	CAZCR-A	1,4-Dichlorobenzene	0.51	U
10/14/2014	CAZCR-A	2,4,5-Trichlorophenol	1.3	U
10/14/2014	CAZCR-A	2,4,6-Trichlorophenol	0.95	U
10/14/2014	CAZCR-A	2,4-Dichlorophenol	0.73	U
10/14/2014	CAZCR-A	2,4-Dimethylphenol	1.3	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
10/14/2014	CAZCR-A	2,4-Dinitrophenol	4.8	U
10/14/2014	CAZCR-A	2-Chlorophenol	0.63	U
10/14/2014	CAZCR-A	2-Methylphenol (O-Cresol)	0.77	U
10/14/2014	CAZCR-A	2-Nitrophenol	0.67	U
10/14/2014	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.63	U
10/14/2014	CAZCR-A	4-Chloro-3-Methylphenol	1	U
10/14/2014	CAZCR-A	4-Nitrophenol	9.5	U
10/14/2014	CAZCR-A	Chlorobenzene	0.48	U
10/14/2014	CAZCR-A	Cresols, M & P	0.79	U
10/14/2014	CAZCR-A	Pentachlorophenol	1.5	U
10/14/2014	CAZCR-A	Phenol	0.33	U
5/12/2015	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
5/12/2015	BFRV-A	1,2,4-Trichlorobenzene	0.81	U
5/12/2015	BFRV-A	1,2-Dichlorobenzene	0.44	U
5/12/2015	BFRV-A	1,3,5-Trichlorobenzene	0.56	U
5/12/2015	BFRV-A	1,3-Dichlorobenzene	0.54	U
5/12/2015	BFRV-A	1,4-Dichlorobenzene	0.51	U
5/12/2015	BFRV-A	2,4,5-Trichlorophenol	1.4	U
5/12/2015	BFRV-A	2,4,6-Trichlorophenol	0.99	U
5/12/2015	BFRV-A	2,4-Dichlorophenol	0.76	U
5/12/2015	BFRV-A	2,4-Dimethylphenol	1.4	U
5/12/2015	BFRV-A	2,4-Dinitrophenol	5	U
5/12/2015	BFRV-A	2-Chlorophenol	0.65	U
5/12/2015	BFRV-A	2-Methylphenol (O-Cresol)	0.8	U
5/12/2015	BFRV-A	2-Nitrophenol	0.69	U
5/12/2015	BFRV-A	4,6-Dinitro-2-Methylphenol	0.65	U
5/12/2015	BFRV-A	4-Chloro-3-Methylphenol	1.1	U
5/12/2015	BFRV-A	4-Nitrophenol	9.9	U
5/12/2015	BFRV-A	Chlorobenzene	0.48	U
5/12/2015	BFRV-A	Cresols, M & P	0.82	U
5/12/2015	BFRV-A	Pentachlorophenol	1.6	U
5/12/2015	BFRV-A	Phenol	0.35	U
5/12/2015	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
5/12/2015	BFRV-B	1,2,4-Trichlorobenzene	0.79	U
5/12/2015	BFRV-B	1,2-Dichlorobenzene	0.44	U
5/12/2015	BFRV-B	1,3,5-Trichlorobenzene	0.54	U
5/12/2015	BFRV-B	1,3-Dichlorobenzene	0.54	U
5/12/2015	BFRV-B	1,4-Dichlorobenzene	0.51	U
5/12/2015	BFRV-B	2,4,5-Trichlorophenol	1.3	U
5/12/2015	BFRV-B	2,4,6-Trichlorophenol	0.96	U
5/12/2015	BFRV-B	2,4-Dichlorophenol	0.74	U
5/12/2015	BFRV-B	2,4-Dimethylphenol	1.3	U
5/12/2015	BFRV-B	2,4-Dinitrophenol	4.8	U
5/12/2015	BFRV-B	2-Chlorophenol	0.63	U
5/12/2015	BFRV-B	2-Methylphenol (O-Cresol)	0.78	U
5/12/2015	BFRV-B	2-Nitrophenol	0.67	U
5/12/2015	BFRV-B	4,6-Dinitro-2-Methylphenol	0.63	U
5/12/2015	BFRV-B	4-Chloro-3-Methylphenol	1.1	U
5/12/2015	BFRV-B	4-Nitrophenol	9.6	U
5/12/2015	BFRV-B	Chlorobenzene	0.48	U
5/12/2015	BFRV-B	Cresols, M & P	0.8	U
5/12/2015	BFRV-B	Pentachlorophenol	1.5	U
5/12/2015	BFRV-B	Phenol	0.34	U
5/12/2015	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
5/12/2015	BFRV-C	1,2,4-Trichlorobenzene	0.83	U
5/12/2015	BFRV-C	1,2-Dichlorobenzene	0.44	U
5/12/2015	BFRV-C	1,3,5-Trichlorobenzene	0.57	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
5/12/2015	BFRV-C	1,3-Dichlorobenzene	0.54	U
5/12/2015	BFRV-C	1,4-Dichlorobenzene	0.51	U
5/12/2015	BFRV-C	2,4,5-Trichlorophenol	1.4	U
5/12/2015	BFRV-C	2,4,6-Trichlorophenol	1	U
5/12/2015	BFRV-C	2,4-Dichlorophenol	0.78	U
5/12/2015	BFRV-C	2,4-Dimethylphenol	1.4	U
5/12/2015	BFRV-C	2,4-Dinitrophenol	5.1	U
5/12/2015	BFRV-C	2-Chlorophenol	0.67	U
5/12/2015	BFRV-C	2-Methylphenol (O-Cresol)	0.82	U
5/12/2015	BFRV-C	2-Nitrophenol	0.71	U
5/12/2015	BFRV-C	4,6-Dinitro-2-Methylphenol	0.67	U
5/12/2015	BFRV-C	4-Chloro-3-Methylphenol	1.1	U
5/12/2015	BFRV-C	4-Nitrophenol	10	U
5/12/2015	BFRV-C	Chlorobenzene	0.48	U
5/12/2015	BFRV-C	Cresols, M & P	0.84	U
5/12/2015	BFRV-C	Pentachlorophenol	1.6	U
5/12/2015	BFRV-C	Phenol	0.36	U
5/12/2015	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
5/12/2015	BFRV-D	1,2,4-Trichlorobenzene	0.82	U
5/12/2015	BFRV-D	1,2-Dichlorobenzene	0.44	U
5/12/2015	BFRV-D	1,3,5-Trichlorobenzene	0.57	U
5/12/2015	BFRV-D	1,3-Dichlorobenzene	0.54	U
5/12/2015	BFRV-D	1,4-Dichlorobenzene	0.51	U
5/12/2015	BFRV-D	2,4,5-Trichlorophenol	1.4	U
5/12/2015	BFRV-D	2,4,6-Trichlorophenol	1	U
5/12/2015	BFRV-D	2,4-Dichlorophenol	0.77	U
5/12/2015	BFRV-D	2,4-Dimethylphenol	1.4	U
5/12/2015	BFRV-D	2,4-Dinitrophenol	5	U
5/12/2015	BFRV-D	2-Chlorophenol	0.66	U
5/12/2015	BFRV-D	2-Methylphenol (O-Cresol)	0.81	U
5/12/2015	BFRV-D	2-Nitrophenol	0.7	U
5/12/2015	BFRV-D	4,6-Dinitro-2-Methylphenol	0.66	U
5/12/2015	BFRV-D	4-Chloro-3-Methylphenol	1.1	U
5/12/2015	BFRV-D	4-Nitrophenol	10	U
5/12/2015	BFRV-D	Chlorobenzene	0.48	U
5/12/2015	BFRV-D	Cresols, M & P	0.83	U
5/12/2015	BFRV-D	Pentachlorophenol	1.6	U
5/12/2015	BFRV-D	Phenol	0.35	U
5/12/2015	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
5/12/2015	CAZCR-A	1,2,4-Trichlorobenzene	0.79	U
5/12/2015	CAZCR-A	1,2-Dichlorobenzene	0.44	U
5/12/2015	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
5/12/2015	CAZCR-A	1,3-Dichlorobenzene	0.54	U
5/12/2015	CAZCR-A	1,4-Dichlorobenzene	0.51	U
5/12/2015	CAZCR-A	2,4,5-Trichlorophenol	1.3	U
5/12/2015	CAZCR-A	2,4,6-Trichlorophenol	0.96	U
5/12/2015	CAZCR-A	2,4-Dichlorophenol	0.74	U
5/12/2015	CAZCR-A	2,4-Dimethylphenol	1.3	U
5/12/2015	CAZCR-A	2,4-Dinitrophenol	4.8	U
5/12/2015	CAZCR-A	2-Chlorophenol	0.64	U
5/12/2015	CAZCR-A	2-Methylphenol (O-Cresol)	0.78	U
5/12/2015	CAZCR-A	2-Nitrophenol	0.67	U
5/12/2015	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.64	U
5/12/2015	CAZCR-A	4-Chloro-3-Methylphenol	1.1	U
5/12/2015	CAZCR-A	4-Nitrophenol	9.6	U
5/12/2015	CAZCR-A	Chlorobenzene	0.48	U
5/12/2015	CAZCR-A	Cresols, M & P	0.8	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
5/12/2015	CAZCR-A	Pentachlorophenol	1.5	U
5/12/2015	CAZCR-A	Phenol	0.34	U
7/22/2015	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
7/22/2015	BFRV-A	1,2,4-Trichlorobenzene	0.78	U
7/22/2015	BFRV-A	1,2-Dichlorobenzene	0.44	U
7/22/2015	BFRV-A	1,3,5-Trichlorobenzene	0.53	U
7/22/2015	BFRV-A	1,3-Dichlorobenzene	0.54	U
7/22/2015	BFRV-A	1,4-Dichlorobenzene	0.51	U
7/22/2015	BFRV-A	2,4,5-Trichlorophenol	1.3	U
7/22/2015	BFRV-A	2,4,6-Trichlorophenol	0.95	U
7/22/2015	BFRV-A	2,4-Dichlorophenol	0.73	U
7/22/2015	BFRV-A	2,4-Dimethylphenol	1.3	U
7/22/2015	BFRV-A	2,4-Dinitrophenol	4.8	U
7/22/2015	BFRV-A	2-Chlorophenol	0.63	U
7/22/2015	BFRV-A	2-Methylphenol (O-Cresol)	0.77	U
7/22/2015	BFRV-A	2-Nitrophenol	0.67	U
7/22/2015	BFRV-A	4,6-Dinitro-2-Methylphenol	0.63	U
7/22/2015	BFRV-A	4-Chloro-3-Methylphenol	1	U
7/22/2015	BFRV-A	4-Nitrophenol	9.5	U
7/22/2015	BFRV-A	Chlorobenzene	0.48	U
7/22/2015	BFRV-A	Cresols, M & P	0.79	U
7/22/2015	BFRV-A	Pentachlorophenol	1.5	U
7/22/2015	BFRV-A	Phenol	0.33	U
7/22/2015	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
7/22/2015	BFRV-B	1,2,4-Trichlorobenzene	0.78	U
7/22/2015	BFRV-B	1,2-Dichlorobenzene	0.44	U
7/22/2015	BFRV-B	1,3,5-Trichlorobenzene	0.54	U
7/22/2015	BFRV-B	1,3-Dichlorobenzene	0.54	U
7/22/2015	BFRV-B	1,4-Dichlorobenzene	0.51	U
7/22/2015	BFRV-B	2,4,5-Trichlorophenol	1.3	U
7/22/2015	BFRV-B	2,4,6-Trichlorophenol	0.95	U
7/22/2015	BFRV-B	2,4-Dichlorophenol	0.73	U
7/22/2015	BFRV-B	2,4-Dimethylphenol	1.3	U
7/22/2015	BFRV-B	2,4-Dinitrophenol	4.8	U
7/22/2015	BFRV-B	2-Chlorophenol	0.63	U
7/22/2015	BFRV-B	2-Methylphenol (O-Cresol)	0.77	U
7/22/2015	BFRV-B	2-Nitrophenol	0.67	U
7/22/2015	BFRV-B	4,6-Dinitro-2-Methylphenol	0.63	U
7/22/2015	BFRV-B	4-Chloro-3-Methylphenol	1	U
7/22/2015	BFRV-B	4-Nitrophenol	9.5	U
7/22/2015	BFRV-B	Chlorobenzene	0.48	U
7/22/2015	BFRV-B	Cresols, M & P	0.79	U
7/22/2015	BFRV-B	Pentachlorophenol	1.5	U
7/22/2015	BFRV-B	Phenol	0.33	U
7/22/2015	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
7/22/2015	BFRV-C	1,2,4-Trichlorobenzene	0.78	U
7/22/2015	BFRV-C	1,2-Dichlorobenzene	0.44	U
7/22/2015	BFRV-C	1,3,5-Trichlorobenzene	0.54	U
7/22/2015	BFRV-C	1,3-Dichlorobenzene	0.54	U
7/22/2015	BFRV-C	1,4-Dichlorobenzene	0.51	U
7/22/2015	BFRV-C	2,4,5-Trichlorophenol	1.3	U
7/22/2015	BFRV-C	2,4,6-Trichlorophenol	0.95	U
7/22/2015	BFRV-C	2,4-Dichlorophenol	0.73	U
7/22/2015	BFRV-C	2,4-Dimethylphenol	1.3	U
7/22/2015	BFRV-C	2,4-Dinitrophenol	4.8	U
7/22/2015	BFRV-C	2-Chlorophenol	0.63	U
7/22/2015	BFRV-C	2-Methylphenol (O-Cresol)	0.77	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
7/22/2015	BFRV-C	2-Nitrophenol	0.67	U
7/22/2015	BFRV-C	4,6-Dinitro-2-Methylphenol	0.63	U
7/22/2015	BFRV-C	4-Chloro-3-Methylphenol	1	U
7/22/2015	BFRV-C	4-Nitrophenol	9.5	U
7/22/2015	BFRV-C	Chlorobenzene	0.48	U
7/22/2015	BFRV-C	Cresols, M & P	0.79	U
7/22/2015	BFRV-C	Pentachlorophenol	1.5	U
7/22/2015	BFRV-C	Phenol	0.33	U
7/22/2015	BFRV-D	1,2,3-Trichlorobenzene	0.41	U
7/22/2015	BFRV-D	1,2,4-Trichlorobenzene	0.78	U
7/22/2015	BFRV-D	1,2-Dichlorobenzene	0.44	U
7/22/2015	BFRV-D	1,3,5-Trichlorobenzene	0.53	U
7/22/2015	BFRV-D	1,3-Dichlorobenzene	0.54	U
7/22/2015	BFRV-D	1,4-Dichlorobenzene	0.51	U
7/22/2015	BFRV-D	2,4,5-Trichlorophenol	1.3	U
7/22/2015	BFRV-D	2,4,6-Trichlorophenol	0.95	U
7/22/2015	BFRV-D	2,4-Dichlorophenol	0.73	U
7/22/2015	BFRV-D	2,4-Dimethylphenol	1.3	U
7/22/2015	BFRV-D	2,4-Dinitrophenol	4.7	U
7/22/2015	BFRV-D	2-Chlorophenol	0.63	U
7/22/2015	BFRV-D	2-Methylphenol (O-Cresol)	0.77	U
7/22/2015	BFRV-D	2-Nitrophenol	0.66	U
7/22/2015	BFRV-D	4,6-Dinitro-2-Methylphenol	0.63	U
7/22/2015	BFRV-D	4-Chloro-3-Methylphenol	1	U
7/22/2015	BFRV-D	4-Nitrophenol	9.5	U
7/22/2015	BFRV-D	Chlorobenzene	0.48	U
7/22/2015	BFRV-D	Cresols, M & P	0.79	U
7/22/2015	BFRV-D	Pentachlorophenol	1.5	U
7/22/2015	BFRV-D	Phenol	0.33	U
7/22/2015	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
7/22/2015	CAZCR-A	1,2,4-Trichlorobenzene	0.78	U
7/22/2015	CAZCR-A	1,2-Dichlorobenzene	0.44	U
7/22/2015	CAZCR-A	1,3,5-Trichlorobenzene	0.53	U
7/22/2015	CAZCR-A	1,3-Dichlorobenzene	0.54	U
7/22/2015	CAZCR-A	1,4-Dichlorobenzene	0.51	U
7/22/2015	CAZCR-A	2,4,5-Trichlorophenol	1.3	U
7/22/2015	CAZCR-A	2,4,6-Trichlorophenol	0.95	U
7/22/2015	CAZCR-A	2,4-Dichlorophenol	0.73	U
7/22/2015	CAZCR-A	2,4-Dimethylphenol	1.3	U
7/22/2015	CAZCR-A	2,4-Dinitrophenol	4.7	U
7/22/2015	CAZCR-A	2-Chlorophenol	0.63	U
7/22/2015	CAZCR-A	2-Methylphenol (O-Cresol)	0.77	U
7/22/2015	CAZCR-A	2-Nitrophenol	0.66	U
7/22/2015	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.63	U
7/22/2015	CAZCR-A	4-Chloro-3-Methylphenol	1	U
7/22/2015	CAZCR-A	4-Nitrophenol	9.5	U
7/22/2015	CAZCR-A	Chlorobenzene	0.48	U
7/22/2015	CAZCR-A	Cresols, M & P	0.79	U
7/22/2015	CAZCR-A	Pentachlorophenol	1.5	U
7/22/2015	CAZCR-A	Phenol	0.33	U
10/1/2015	BFRV-A	1,2,3-Trichlorobenzene	0.41	U
10/1/2015	BFRV-A	1,2,4-Trichlorobenzene	0.79	U
10/1/2015	BFRV-A	1,2-Dichlorobenzene	0.44	U
10/1/2015	BFRV-A	1,3,5-Trichlorobenzene	0.54	U
10/1/2015	BFRV-A	1,3-Dichlorobenzene	0.54	U
10/1/2015	BFRV-A	1,4-Dichlorobenzene	0.51	U
10/1/2015	BFRV-A	2,4,5-Trichlorophenol	1.3	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
10/1/2015	BFRV-A	2,4,6-Trichlorophenol	0.96	U
10/1/2015	BFRV-A	2,4-Dichlorophenol	0.74	U
10/1/2015	BFRV-A	2,4-Dimethylphenol	1.3	U
10/1/2015	BFRV-A	2,4-Dinitrophenol	4.8	U
10/1/2015	BFRV-A	2-Chlorophenol	0.63	U
10/1/2015	BFRV-A	2-Methylphenol (O-Cresol)	0.78	U
10/1/2015	BFRV-A	2-Nitrophenol	0.67	U
10/1/2015	BFRV-A	4,6-Dinitro-2-Methylphenol	0.63	U
10/1/2015	BFRV-A	4-Chloro-3-Methylphenol	1.1	U
10/1/2015	BFRV-A	4-Nitrophenol	9.6	U
10/1/2015	BFRV-A	Chlorobenzene	0.48	U
10/1/2015	BFRV-A	Cresols, M & P	0.8	U
10/1/2015	BFRV-A	Pentachlorophenol	1.5	U
10/1/2015	BFRV-A	Phenol	0.34	U
10/1/2015	BFRV-B	1,2,3-Trichlorobenzene	0.41	U
10/1/2015	BFRV-B	1,2,4-Trichlorobenzene	0.82	U
10/1/2015	BFRV-B	1,2-Dichlorobenzene	0.44	U
10/1/2015	BFRV-B	1,3,5-Trichlorobenzene	0.56	U
10/1/2015	BFRV-B	1,3-Dichlorobenzene	0.54	U
10/1/2015	BFRV-B	1,4-Dichlorobenzene	0.51	U
10/1/2015	BFRV-B	2,4,5-Trichlorophenol	1.4	U
10/1/2015	BFRV-B	2,4,6-Trichlorophenol	0.99	U
10/1/2015	BFRV-B	2,4-Dichlorophenol	0.77	U
10/1/2015	BFRV-B	2,4-Dimethylphenol	1.4	U
10/1/2015	BFRV-B	2,4-Dinitrophenol	5	U
10/1/2015	BFRV-B	2-Chlorophenol	0.66	U
10/1/2015	BFRV-B	2-Methylphenol (O-Cresol)	0.81	U
10/1/2015	BFRV-B	2-Nitrophenol	0.7	U
10/1/2015	BFRV-B	4,6-Dinitro-2-Methylphenol	0.66	U
10/1/2015	BFRV-B	4-Chloro-3-Methylphenol	1.1	U
10/1/2015	BFRV-B	4-Nitrophenol	9.9	U
10/1/2015	BFRV-B	Chlorobenzene	0.48	U
10/1/2015	BFRV-B	Cresols, M & P	0.83	U
10/1/2015	BFRV-B	Pentachlorophenol	1.6	U
10/1/2015	BFRV-B	Phenol	0.35	U
10/1/2015	BFRV-C	1,2,3-Trichlorobenzene	0.41	U
10/1/2015	BFRV-C	1,2,4-Trichlorobenzene	0.8	U
10/1/2015	BFRV-C	1,2-Dichlorobenzene	0.44	U
10/1/2015	BFRV-C	1,3,5-Trichlorobenzene	0.55	U
10/1/2015	BFRV-C	1,3-Dichlorobenzene	0.54	U
10/1/2015	BFRV-C	1,4-Dichlorobenzene	0.51	U
10/1/2015	BFRV-C	2,4,5-Trichlorophenol	1.4	U
10/1/2015	BFRV-C	2,4,6-Trichlorophenol	0.98	U
10/1/2015	BFRV-C	2,4-Dichlorophenol	0.75	U
10/1/2015	BFRV-C	2,4-Dimethylphenol	1.4	U
10/1/2015	BFRV-C	2,4-Dinitrophenol	4.9	U
10/1/2015	BFRV-C	2-Chlorophenol	0.65	U
10/1/2015	BFRV-C	2-Methylphenol (O-Cresol)	0.79	U
10/1/2015	BFRV-C	2-Nitrophenol	0.68	U
10/1/2015	BFRV-C	4,6-Dinitro-2-Methylphenol	0.65	U
10/1/2015	BFRV-C	4-Chloro-3-Methylphenol	1.1	U
10/1/2015	BFRV-C	4-Nitrophenol	9.8	U
10/1/2015	BFRV-C	Chlorobenzene	0.48	U
10/1/2015	BFRV-C	Cresols, M & P	0.81	U
10/1/2015	BFRV-C	Pentachlorophenol	1.6	U
10/1/2015	BFRV-C	Phenol	0.34	U
10/1/2015	BFRV-D	1,2,3-Trichlorobenzene	0.41	U

SAMPLE DATE	SAMPLE LOCATION	CHEMICAL NAME	Result (micrograms per liter)	Result Qualifier
10/1/2015	BFRV-D	1,2,4-Trichlorobenzene	0.78	U
10/1/2015	BFRV-D	1,2-Dichlorobenzene	0.44	U
10/1/2015	BFRV-D	1,3,5-Trichlorobenzene	0.54	U
10/1/2015	BFRV-D	1,3-Dichlorobenzene	0.54	U
10/1/2015	BFRV-D	1,4-Dichlorobenzene	0.51	U
10/1/2015	BFRV-D	2,4,5-Trichlorophenol	1.3	U
10/1/2015	BFRV-D	2,4,6-Trichlorophenol	0.95	U
10/1/2015	BFRV-D	2,4-Dichlorophenol	0.73	U
10/1/2015	BFRV-D	2,4-Dimethylphenol	1.3	U
10/1/2015	BFRV-D	2,4-Dinitrophenol	4.8	U
10/1/2015	BFRV-D	2-Chlorophenol	0.63	U
10/1/2015	BFRV-D	2-Methylphenol (O-Cresol)	0.77	U
10/1/2015	BFRV-D	2-Nitrophenol	0.67	U
10/1/2015	BFRV-D	4,6-Dinitro-2-Methylphenol	0.63	U
10/1/2015	BFRV-D	4-Chloro-3-Methylphenol	1	U
10/1/2015	BFRV-D	4-Nitrophenol	9.5	U
10/1/2015	BFRV-D	Chlorobenzene	0.48	U
10/1/2015	BFRV-D	Cresols, M & P	0.79	U
10/1/2015	BFRV-D	Pentachlorophenol	1.5	U
10/1/2015	BFRV-D	Phenol	0.33	U
10/1/2015	CAZCR-A	1,2,3-Trichlorobenzene	0.41	U
10/1/2015	CAZCR-A	1,2,4-Trichlorobenzene	0.78	U
10/1/2015	CAZCR-A	1,2-Dichlorobenzene	0.44	U
10/1/2015	CAZCR-A	1,3,5-Trichlorobenzene	0.54	U
10/1/2015	CAZCR-A	1,3-Dichlorobenzene	0.54	U
10/1/2015	CAZCR-A	1,4-Dichlorobenzene	0.51	U
10/1/2015	CAZCR-A	2,4,5-Trichlorophenol	1.3	U
10/1/2015	CAZCR-A	2,4,6-Trichlorophenol	0.96	U
10/1/2015	CAZCR-A	2,4-Dichlorophenol	0.74	U
10/1/2015	CAZCR-A	2,4-Dimethylphenol	1.3	U
10/1/2015	CAZCR-A	2,4-Dinitrophenol	4.8	U
10/1/2015	CAZCR-A	2-Chlorophenol	0.63	U
10/1/2015	CAZCR-A	2-Methylphenol (O-Cresol)	0.77	U
10/1/2015	CAZCR-A	2-Nitrophenol	0.67	U
10/1/2015	CAZCR-A	4,6-Dinitro-2-Methylphenol	0.63	U
10/1/2015	CAZCR-A	4-Chloro-3-Methylphenol	1.1	U
10/1/2015	CAZCR-A	4-Nitrophenol	9.6	U
10/1/2015	CAZCR-A	Chlorobenzene	0.48	U
10/1/2015	CAZCR-A	Cresols, M & P	0.79	U
10/1/2015	CAZCR-A	Pentachlorophenol	1.5	U
10/1/2015	CAZCR-A	Phenol	0.33	U

ATTACHMENT C

ProUCL5.1 OUTPUT FILE DATA

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/8/2017 3:38:23 PM
From File	BR_Phenol_stats_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: AOC

Sample 2 Data: NonAOC

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	18
Number of Distinct Observations	15	13
Minimum	1	1
Maximum	7	6.6
Mean	2.474	2.633
Median	1.9	1.9
SD	1.649	1.809
SE of Mean	0.317	0.426

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	618
WMW U-Stat	240
Standardized WMW U-Stat	-0.0698
Mean (U)	243
SD(U) - Adj ties	43.07
Approximate U-Stat Critical Value (0.025)	-1.96
Approximate U-Stat Critical Value (0.975)	1.96
P-Value (Adjusted for Ties)	0.944

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

	A	B	C	D	E	F	G	H	I	J	K	L
1	**t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs**											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.19/8/2017 1:18:44 PM								
5	From File			BR_Phenol_stats_a.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			99%								
8	Substantial Difference (S)			0.000								
9	Selected Null Hypothesis			Sample 1 Mean = Sample 2 Mean (Two Sided Alternative)								
10	Alternative Hypothesis			Sample 1 Mean <> Sample 2 Mean								
11												
12												
13	**Sample 1 Data: AOC**											
14	**Sample 2 Data: NonAOC**											
15												
16												
17	**Raw Statistics**											
18					Sample 1	Sample 2						
19	Number of Valid Observations				27	18						
20	Number of Distinct Observations				15	13						
21	Minimum				1	1						
22	Maximum				7	6.6						
23	Mean				2.474	2.633						
24	Median				1.9	1.9						
25	SD				1.649	1.809						
26	SE of Mean				0.317	0.426						
27												
28	**Sample 1 vs Sample 2 Two-Sample t-Test**											
29												
30	**H0: Mean of Sample 1 = Mean of Sample 2**											
31					t-Test	Lower C.Val	Upper C.Val					
32	Method			DF	Value	t (0.005)	t (0.995)	P-Value				
33	Pooled (Equal Variance)			43	-0.305	-2.695	2.695	0.762				
34	Welch-Satterthwaite (Unequal V			34.2	-0.300	-2.728	2.728	0.766				
35	Pooled SD: 1.714											
36	Conclusion with Alpha = 0.010											
37	Student t (Pooled): Do Not Reject H0, Conclude Sample 1 = Sample 2											
38	Welch-Satterthwaite: Do Not Reject H0, Conclude Sample 1 = Sample 2											
39												
40	**Test of Equality of Variances**											
41												
42	Variance of Sample 1				2.718							
43	Variance of Sample 2				3.272							
44												
45	Numerator DF		Denominator DF		F-Test Value		P-Value					
46	17		26		1.204		0.654					
47	Conclusion with Alpha = 0.01											
48	Two variances appear to be equal											
49												

AOC	Non-AOC
1.3	1.9
1.0	1.0
2.1	2.4
1.8	1.8
1.9	1.9
2.5	1.6
1.8	6.1
3.5	2.2
5.3	6.6
1.0	1.0
1.0	1.0
2.7	3.5
1.5	1.8
1.6	1.3
1.3	1.3
2.8	5.3
2.5	2.0
7.0	4.7
1.9	
1.0	
2.7	
1.8	
1.6	
1.3	
5.3	
2.2	
6.4	

Appendix C – Statistical Comparison of NYSDEC RIBS Data and 2013-2015 Water Quality Monitoring Project Data (and Raw RIBS Data)

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.111/20/2019 11:18:09 AM
From File	Phenols (RIBS & AOC).xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Sample 1 Mean = Sample 2 Mean (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean <> Sample 2 Mean

Sample 1 Data: AOC

Sample 2 Data: RIBS

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	45	464
Number of Distinct Observations	20	43
Minimum	1	0
Maximum	7	31.2
Mean	2.538	2.372
Median	1.9	2
SD	1.696	2.058
SE of Mean	0.253	0.0955

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 = Mean of Sample 2

		t-Test	Lower C.Val	Upper C.Val	
Method	DF	Value	t (0.025)	t (0.975)	P-Value
Pooled (Equal Variance)	507	0.523	-1.965	1.965	0.601
Welch-Satterthwaite (Unequal Varian	57.4	0.613	-2.002	2.002	0.542

Pooled SD: 2.029

Conclusion with Alpha = 0.050

Student t (Pooled): Do Not Reject H0, Conclude Sample 1 = Sample 2

Welch-Satterthwaite: Do Not Reject H0, Conclude Sample 1 = Sample 2

Test of Equality of Variances

Variance of Sample 1	2.876
Variance of Sample 2	4.235

Numerator DF	Denominator DF	F-Test Value	P-Value
463	44	1.472	0.114

Conclusion with Alpha = 0.05

Two variances appear to be equal

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Allegheny River	10/6/2015	0.0020	0.0019	0.0025	2.5	
Allegheny River	8/11/2015	0.002	0.0019	0.0049	4.9	
Allegheny River	6/23/2015	0.0020	0.0013	0.0027	2.7	
Allegheny River	4/28/2015	0.0020	0.0013		0	U
Allegheny River	10/7/2014	0.0020	0.0013	0.0021	2.1	
Allegheny River	8/12/2014	0.0020	0.0013	0.002	2	U
Allegheny River	6/24/2014	0.0020	0.0013	0.002	2	U
Allegheny River	4/29/2014	0.0020	0.0013	0.002	2	U
Allegheny River	10/7/2013	0.0020	0.0008	0.0026	2.6	
Allegheny River	9/17/2013	0.0020	0.0008	0.002	2	U
Allegheny River	7/2/2013	0.0020	0.0010	0.002	2	U
Allegheny River	5/28/2013	0.0020	0.0010	0.002	2	U
Allegheny River	4/16/2013	0.0020	0.0010	0.002	2	U
Allegheny River	10/9/2012	0.0020	0.0010	0.002	2	U
Allegheny River	10/9/2012	0.0020	0.0010	0.002	2	U
Allegheny River	9/18/2012	0.0020	0.0010	0.002	2	U
Allegheny River	9/18/2012	0.0020	0.0010	0.002	2	U
Allegheny River	7/19/2012	0.0020	0.0010	0.002	2	U
Allegheny River	6/20/2012	0.0020	0.0010	0.002	2	U
Allegheny River	6/20/2012	0.0020	0.0010	0.002	2	U
Allegheny River	5/10/2012	0.0020	0.0010	0.002	2	U
Allegheny River	5/10/2012	0.0020	0.0010	0.002	2	
Allegheny River	4/24/2012	0.0020	0.0006	0.002	2	U
Allegheny River	4/24/2012	0.0020	0.0006	0.002	2	U
Bear Gutter Creek	10/28/2014	0.0020	0.0013	0.0027	2.7	
Bear Gutter Creek	6/16/2014	0.0020	0.0013	0.002	2	U
Bear Gutter Creek	8/4/2014	0.0020	0.0013	0.002	2	U
Bear Gutter Creek	5/12/2014	0.0020	0.0013	0.0027	2.7	
Bear Gutter Creek	4/23/2014	0.0020	0.0013	0.002	2	U
Black River	10/6/2015	0.0020	0.0019	0.0061	6.1	
Black River	8/10/2015	0.002	0.0019	0.0023	2.3	
Black River	6/22/2015	0.0020	0.0013	0.0054	5.4	
Black River	4/28/2015	0.0020	0.0013	0.0031	3.1	
Black River	10/7/2014	0.0020	0.0013	0.003	3	
Black River	8/14/2014	0.0020	0.0013	0.002	2	U
Black River	6/26/2014	0.0020	0.0013	0.002	2	U
Black River	4/30/2014	0.0020	0.0013	0.002	2	U
Black River	10/22/2013	0.0020	0.0008	0.0025	2.5	*
Black River	10/22/2013	0.0020	0.0008	0.003	3	
Black River	8/5/2013	0.0020	0.0010	0.002	2	U
Black River	7/15/2013	0.0020	0.0010	0.002	2	U
Black River	7/15/2013	0.0020	0.0010	0.002	2	U
Black River	6/10/2013	0.0020	0.0010	0.002	2	U
Black River	6/10/2013	0.0020	0.0010	0.002	2	U
Black River	5/13/2013	0.0020	0.0010	0.002	2	U
Black River	4/8/2013	0.0020	0.0010	0.002	2	U
Black River	4/8/2013	0.0020	0.0010	0.0021	2.1	
Black River	9/5/2012	0.0020	0.0010	0.0022	2.2	
Black River	7/2/2012	0.0020	0.0010	0.002	2	U
Black River	6/12/2012	0.0020	0.0010	0.0022	2.2	
Black River	5/22/2012	0.0020	0.0010	0.0023	2.3	
Black River	5/22/2012	0.0020	0.0010	0.0025	2.5	
Black River	4/18/2012	0.0020	0.0006	0.002	2	U
Buffalo River	10/6/2015	0.0020	0.0019	0.0046	4.6	
Buffalo River	8/11/2015	0.002	0.0019	0.0029	2.9	
Buffalo River	6/23/2015	0.0020	0.0013	0.003	3	
Buffalo River	4/28/2015	0.0020	0.0013		0	U
Buffalo River	10/7/2014	0.0020	0.0013	0.002	2	U
Buffalo River	8/12/2014	0.0020	0.0013	0.002	2	U
Buffalo River	6/24/2014	0.0020	0.0013	0.002	2	U
Buffalo River	4/29/2014	0.0020	0.0013	0.002	2	U

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Buffalo River	10/7/2013	0.0020	0.0008	0.0023	2.3	
Buffalo River	9/17/2013	0.0020	0.0008	0.002	2	U
Buffalo River	7/2/2013	0.0020	0.0010	0.002	2	U
Buffalo River	5/28/2013	0.0020	0.0010	0.002	2	U
Buffalo River	4/16/2013	0.0020	0.0010	0.002	2	U
Buffalo River	10/15/2012	0.0020	0.0010	0.002	2	U
Buffalo River	9/4/2012	0.0020	0.0010	0.002	2	U
Buffalo River	7/2/2012	0.0020	0.0010	0.002	2	U
Buffalo River	6/11/2012	0.0020	0.0010	0.002	2	U
Buffalo River	5/23/2012	0.0020	0.0010	0.002	2	U
Buffalo River	4/17/2012	0.0020	0.0006	0.002	2	U
Chemung River	10/6/2015	0.0020	0.0019	0.0027	2.7	
Chemung River	8/11/2015	0.002	0.0019	0.0025	2.5	
Chemung River	6/23/2015	0.0020	0.0013	0.003	3	
Chemung River	4/28/2015	0.0020	0.0013		0	U
Chemung River	10/6/2014	0.0020	0.0013	0.002	2	U
Chemung River	8/11/2014	0.0020	0.0013	0.002	2	U
Chemung River	6/23/2014	0.0020	0.0013	0.002	2	U
Chemung River	4/28/2014	0.0020	0.0013	0.002	2	U
Chemung River	10/21/2013	0.0020	0.0008	0.002	2	U
Chemung River	8/6/2013	0.0020	0.0010	0.002	2	U
Chemung River	7/15/2013	0.0020	0.0010	0.002	2	U
Chemung River	7/15/2013	0.0020	0.0010	0.002	2	U
Chemung River	6/12/2013	0.0020	0.0010	0.002	2	U
Chemung River	6/12/2013	0.0020	0.0010	0.002	2	U
Chemung River	5/13/2013	0.0020	0.0010	0.002	2	U
Chemung River	4/11/2013	0.0020	0.0010	0.0036	3.6	
Chemung River	4/11/2013	0.0020	0.0010	0.0036	3.6	
Chemung River	10/16/2012	0.0020	0.0010	0.002	2	U
Chemung River	9/6/2012	0.0020	0.0010	0.002	2	U
Chemung River	7/5/2012	0.0020	0.0010	0.002	2	U
Chemung River	7/5/2012	0.0020	0.0010	0.002	2	U
Chemung River	4/17/2012	0.0020	0.0006	0.002	2	U
Chemung River	6/14/2012	0.0020	0.0010	0.002	2	U
Chemung River	5/24/2012	0.0020	0.0010	0.002	2	U
Chenango River	10/7/2015	0.0020	0.0019	0.0031	3.1	
Chenango River	8/11/2015	0.002	0.0019	0.0075	7.5	
Chenango River	6/24/2015	0.0020	0.0013	0.0032	3.2	
Chenango River	4/29/2015	0.0020	0.0013		0	U
Chenango River	10/20/2014	0.0020	0.0013	0.0034	3.4	
Chenango River	7/28/2014	0.0020	0.0013	0.002	2	U
Chenango River	6/10/2014	0.0020	0.0013	0.002	2	U
Chenango River	4/14/2014	0.0020	0.0008	0.002	2	U
Chenango River	10/9/2013	0.0020	0.0008	0.0029	2.9	
Chenango River	9/17/2013	0.0020	0.0008	0.002	2	U
Chenango River	7/2/2013	0.0020	0.0010	0.002	2	U
Chenango River	5/29/2013	0.0020	0.0010	0.002	2	U
Chenango River	5/7/2013	0.0020	0.0010	0.002	2	U
Chenango River	4/16/2013	0.0020	0.0010	0.002	2	U
Chenango River	10/16/2012	0.0020	0.0010	0.002	2	U
Chenango River	9/6/2012	0.0020	0.0010	0.002	2	U
Chenango River	7/5/2012	0.0020	0.0010	0.002	2	U
Chenango River	6/14/2012	0.0020	0.0010	0.002	2	U
Chenango River	5/24/2012	0.0020	0.0010	0.002	2	U
Chenango River	4/17/2012	0.0020	0.0006	0.002	2	U
Delaware River	10/22/2015	0.0020	0.0010		0	U
Delaware River	7/30/2015	0.0020	0.0019	0.009	9	
Delaware River	6/11/2015	0.0020	0.0013	0.0022	2.2	
Delaware River	4/16/2015	0.0020	0.0013	0.0023	2.3	
Delaware River	10/6/2014	0.0020	0.0013	0.002	2	U
Delaware River	8/12/2014	0.0020	0.0013	0.0026	2.6	

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Delaware River	6/23/2014	0.0020	0.0013	0.002	2	U
Delaware River	4/28/2014	0.0020	0.0013	0.002	2	U
Delaware River	10/7/2013	0.0020	0.0008	0.0023	2.3	
Delaware River	9/16/2013	0.0020	0.0008	0.002	2	U
Delaware River	7/1/2013	0.0020	0.0010	0.002	2	U
Delaware River	7/1/2013	0.0020	0.0010	0.002	2	U
Delaware River	5/28/2013	0.0020	0.0010	0.002	2	U
Delaware River	4/16/2013	0.0020	0.0010	0.002	2	U
Delaware River	9/4/2012	0.0020	0.0010	0.002	2	U
Delaware River	7/5/2012	0.0020	0.0010	0.002	2	U
Delaware River	6/11/2012	0.0020	0.0010	0.002	2	U
Delaware River	6/11/2012	0.0020	0.0010	0.002	2	U
Delaware River	5/21/2012	0.0020	0.0010	0.0312	31.2	
Delaware River	5/21/2012	0.0020	0.0010	0.002	2	U
Delaware River	4/17/2012	0.0020	0.0006	0.002	2	U
Delaware River - West Branch in Beerston	10/19/2015	0.0020	0.0010		0	U
Delaware River - West Branch in Beerston	7/27/2015	0.0020	0.0019	0.0025	2.5	
Delaware River - West Branch in Beerston	6/8/2015	0.0020	0.0013		0	U
Delaware River - West Branch in Beerston	5/4/2015	0.0020	0.0013		0	U
Delaware River - West Branch in Beerston	4/13/2015	0.0020	0.0013		0	U
Delaware River in Cochecton	10/21/2015	0.0040	0.0020		0	U
Delaware River in Cochecton	7/29/2015	0.0020	0.0019		0	U
Delaware River in Cochecton	6/10/2015	0.0020	0.0013		0	U
Delaware River in Cochecton	5/6/2015	0.0020	0.0013		0	U
Delaware River in Cochecton	4/15/2015	0.0020	0.0013		0	U
East Branch Ausable River	10/29/2014	0.0020	0.0013	0.002	2	U
East Branch Ausable River	6/19/2014	0.0020	0.0013	0.002	2	U
East Branch Ausable River	9/23/2014	0.0020	0.0013	0.002	2	U
East Branch Ausable River	8/7/2014	0.0020	0.0013	0.002	2	U
East Branch Ausable River	5/14/2014	0.0020	0.0013	0.002	2	U
East Branch Ausable River	4/24/2014	0.0020	0.0013	0.0022	2.2	
Genesee River	10/27/2015	0.0020	0.0010	0.0029	2.9	
Genesee River	8/5/2015	0.0020	0.0019	0.0022	2.2	
Genesee River	6/17/2015	0.0020	0.0013	0.0041	4.1	
Genesee River	4/21/2015	0.0020	0.0013	0.0087	8.7	
Genesee River	10/7/2014	0.0020	0.0013	0.002	2	U
Genesee River	8/11/2014	0.0020	0.0013	0.002	2	U
Genesee River	4/28/2014	0.0020	0.0013	0.002	2	U
Genesee River	10/8/2013	0.0020	0.0008	0.0068	6.8	
Genesee River	9/18/2013	0.0020	0.0008	0.002	2	U
Genesee River	7/2/2013	0.0020	0.0010	0.002	2	U
Genesee River	5/28/2013	0.0020	0.0010	0.002	2	U
Genesee River	4/16/2013	0.0020	0.0010	0.0021	2.1	
Genesee River	10/16/2012	0.0020	0.0010	0.002	2	U
Genesee River	9/4/2012	0.0020	0.0010	0.002	2	U
Genesee River	7/17/2012	0.0020	0.0010	0.0023	2.3	
Genesee River	6/13/2012	0.0020	0.0010	0.002	2	U
Genesee River	5/22/2012	0.0020	0.0010	0.002	2	U
Genesee River	4/17/2012	0.0020	0.0006	0.002	2	U
Hudson River	10/6/2015	0.0020	0.0019	0.0031	3.1	
Hudson River	8/11/2015	0.002	0.0019	0.004	4	
Hudson River	6/23/2015	0.0020	0.0013	0.0044	4.4	
Hudson River	4/28/2015	0.0020	0.0013	0.002	2	
Hudson River	10/7/2014	0.0020	0.0013	0.002	2	U

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Hudson River	6/24/2014	0.0020	0.0013	0.002	2	U
Hudson River	4/30/2014	0.0020	0.0013	0.002	2	
Hudson River	9/11/2013	0.0020	0.0008	0.002	2	
Hudson River	8/11/2014	0.0020	0.0013	0.002	2	U
Hudson River	9/11/2013	0.0020	0.0008	0.002	2	U
Hudson River	7/31/2013	0.0020	0.0010	0.002	2	U
Hudson River	7/31/2013	0.0020	0.0010	0.002	2	U
Hudson River	7/10/2013	0.0020	0.0010	0.002	2	U
Hudson River	7/10/2013	0.0020	0.0010	0.002	2	U
Hudson River	6/5/2013	0.0020	0.0010	0.002	2	U
Hudson River	6/5/2013	0.0020	0.0010	0.002	2	U
Hudson River	4/24/2013	0.0020	0.0010	0.002	2	U
Hudson River	4/24/2013	0.0020	0.0010	0.002	2	U
Hudson River	9/4/2012	0.0020	0.0010	0.002	2	U
Hudson River	7/2/2012	0.0020	0.0010	0.002	2	U
Hudson River	6/11/2012	0.0020	0.0010	0.002	2	U
Hudson River	5/21/2012	0.0020	0.0010	0.002	2	U
Hudson River	4/16/2012	0.0020	0.0006	0.002	2	U
Hudson River 2	10/6/2015	0.0020	0.0019	0.0025	2.5	
Hudson River 2	8/11/2015	0.002	0.0019	0.0025	2.5	
Hudson River 2	6/23/2015	0.0020	0.0013	0.003	3	
Hudson River 2	4/28/2015	0.0020	0.0013	0.0026	2.6	
Hudson River 2	10/7/2014	0.0020	0.0013	0.0021	2.1	
Hudson River 2	8/12/2014	0.0020	0.0013	0.002	2	U
Hudson River 2	6/23/2014	0.0020	0.0013	0.002	2	U
Hudson River 2	4/29/2014	0.0020	0.0013	0.002	2	U
Hudson River 2	10/30/2013	0.0020	0.0008	0.002	2	U
Hudson River 2	10/30/2013	0.0020	0.0008	0.002	2	U
Hudson River 2	9/11/2013	0.0020	0.0008	0.002	2	U
Hudson River 2	9/11/2013	0.0020	0.0008	0.002	2	U
Hudson River 2	7/31/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	7/31/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	7/10/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	6/5/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	6/5/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	4/24/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	4/24/2013	0.0020	0.0010	0.002	2	U
Hudson River 2	10/15/2012	0.0020	0.0010	0.002	2	U
Hudson River 2	10/15/2012	0.0020	0.0010	0.002	2	U
Hudson River 2	9/4/2012	0.0020	0.0010	0.002	2	U
Hudson River 2	9/4/2012	0.0020	0.0010	0.002	2	U
Hudson River 2	7/2/2012	0.0020	0.0010	0.002	2	U
Hudson River 2	6/11/2012	0.0020	0.0010	0.002	2	U
Hudson River 2	5/21/2012	0.0020	0.0010	0.0023	2.3	
Hudson River 2	4/16/2012	0.0020	0.0006	0.002	2	U
Hudson River 3	10/5/2015	0.0020	0.0019	0.0044	4.4	
Hudson River 3	8/10/2015	0.002	0.0019	0.0023	2.3	
Hudson River 3	6/22/2015	0.0020	0.0013	0.0032	3.2	
Hudson River 3	4/27/2015	0.0020	0.0013		0	U
Hudson River 3	10/6/2014	0.0020	0.0013	0.002	2	U
Hudson River 3	8/11/2014	0.0020	0.0013	0.002	2	U
Hudson River 3	6/24/2014	0.0020	0.0013	0.002	2	U
Hudson River 3	4/29/2014	0.0020	0.0013	0.002	2	U
Hudson River 3	10/7/2013	0.0020	0.0008	0.002	2	U
Hudson River 3	9/16/2013	0.0020	0.0008	0.0021	2.1	
Hudson River 3	7/1/2013	0.0020	0.0010	0.002	2	U
Hudson River 3	5/29/2013	0.0020	0.0010	0.002	2	U
Hudson River 3	5/6/2013	0.0020	0.0010	0.002	2	U
Hudson River 3	5/6/2013	0.0020	0.0010	0.002	2	U
Hudson River 3	4/15/2013	0.0020	0.0010	0.002	2	U
Hudson River 3	10/9/2012	0.0020	0.0010	0.002	2	U

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Hudson River 3	9/17/2012	0.0020	0.0010	0.002	2	U
Hudson River 3	9/17/2012	0.0020	0.0010	0.002	2	
Hudson River 3	7/16/2012	0.0020	0.0010	0.002	2	
Hudson River 3	7/16/2012	0.0020	0.0010	0.002	2	U
Hudson River 3	10/9/2012	0.0020	0.0010	0.0021	2.1	
Hudson River 3	6/19/2012	0.0020	0.0010	0.002	2	U
Hudson River 3	5/7/2012	0.0020	0.0006	0.002	2	U
Hudson River 3	4/23/2012	0.0020	0.0006	0.002	2	U
Hudson River 4	10/5/2015	0.0020	0.0019	0.0036	3.6	
Hudson River 4	8/10/2015	0.002	0.0019	0.0051	5.1	
Hudson River 4	6/22/2015	0.0020	0.0013	0.0042	4.2	
Hudson River 4	4/27/2015	0.0020	0.0013	0.0028	2.8	
Hudson River 4	10/6/2014	0.0020	0.0013	0.0027	2.7	
Hudson River 4	8/11/2014	0.0020	0.0013	0.002	2	U
Hudson River 4	6/24/2014	0.0020	0.0013	0.002	2	U
Hudson River 4	4/30/2014	0.0020	0.0013	0.0021	2.1	
Hudson River 4	10/7/2013	0.0020	0.0008	0.0021	2.1	
Hudson River 4	9/16/2013	0.0020	0.0008	0.002	2	U
Hudson River 4	7/1/2013	0.0020	0.0010	0.002	2	U
Hudson River 4	5/29/2013	0.0020	0.0010	0.002	2	U
Hudson River 4	5/6/2013	0.0020	0.0010	0.002	2	
Hudson River 4	4/15/2013	0.0020	0.0010	0.002	2	U
Hudson River 4	10/9/2012	0.0020	0.0010	0.002	2	U
Hudson River 4	9/17/2012	0.0020	0.0010	0.002	2	U
Hudson River 4	7/16/2012	0.0020	0.0010	0.0021	2.1	
Hudson River 4	6/19/2012	0.0020	0.0010	0.002	2	U
Hudson River 4	6/19/2012	0.0020	0.0010	0.002	2	U
Hudson River 4	5/7/2012	0.0020	0.0006	0.002	2	
Hudson River 4	5/7/2012	0.0020	0.0006	0.0023	2.3	
Hudson River 4	4/24/2012	0.0020	0.0006	0.0028	2.8	
Indian River in Hall Corners	10/26/2015	0.0020	0.0010	0.004	4	
Indian River in Hall Corners	9/24/2015	0.0020	0.0019	0.0039	3.9	
Indian River in Hall Corners	8/3/2015	0.0020	0.0019	0.0027	2.7	
Indian River in Hall Corners	6/15/2015	0.0020	0.0013	0.0043	4.3	
Indian River in Hall Corners	5/14/2015	0.0020	0.0013	0.0033	3.3	
Indian River in Hall Corners	4/22/2015	0.0020	0.0013	0.0053	5.3	
McKenzie Brook	10/28/2014	0.0020	0.0013	0.0024	2.4	
McKenzie Brook	6/18/2014	0.0020	0.0013	0.002	2	U
McKenzie Brook	9/22/2014	0.0020	0.0013	0.0031	3.1	
McKenzie Brook	8/6/2014	0.0020	0.0013	0.002	2	U
McKenzie Brook	5/13/2014	0.0020	0.0013	0.0021	2.1	
McKenzie Brook	4/23/2014	0.0020	0.0013	0.002	2	U
Mohawk River	10/6/2015	0.0020	0.0019	0.0033	3.3	
Mohawk River	8/11/2015	0.002	0.0019	0.0023	2.3	
Mohawk River	6/23/2015	0.0020	0.0013	0.0071	7.1	
Mohawk River	4/29/2015	0.0020	0.0013		0	U
Mohawk River	10/7/2014	0.0020	0.0013	0.002	2	U
Mohawk River	8/12/2014	0.0020	0.0013	0.002	2	U
Mohawk River	6/23/2014	0.0020	0.0013	0.002	2	U
Mohawk River	4/29/2014	0.0020	0.0013	0.002	2	U
Mohawk River	10/8/2013	0.0020	0.0008	0.006	6	
Mohawk River	9/18/2013	0.0020	0.0008	0.002	2	U
Mohawk River	9/17/2013	0.0020	0.0008	0.002	2	U
Mohawk River	7/1/2013	0.0020	0.0010	0.002	2	U
Mohawk River	5/28/2013	0.0020	0.0010	0.002	2	U
Mohawk River	4/16/2013	0.0020	0.0010	0.002	2	U
Mohawk River	4/16/2013	0.0020	0.0010	0.002	2	U
Mohawk River	10/16/2012	0.0020	0.0010	0.002	2	
Mohawk River	9/5/2012	0.0020	0.0010	0.002	2	U
Mohawk River	7/2/2012	0.0020	0.0010	0.002	2	U
Mohawk River	6/12/2012	0.0020	0.0010	0.002	2	U

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Mohawk River 2	10/5/2015	0.0020	0.0019	0.0031	3.1	
Mohawk River 2	8/10/2015	0.002	0.0019	0.0023	2.3	
Mohawk River 2	6/22/2015	0.0020	0.0013	0.003	3	
Mohawk River 2	4/27/2015	0.0020	0.0013	0.002	2	
Mohawk River 2	10/6/2014	0.0020	0.0013	0.002	2	U
Mohawk River 2	8/12/2014	0.0020	0.0013	0.002	2	U
Mohawk River 2	6/23/2014	0.0020	0.0013	0.002	2	U
Mohawk River 2	4/30/2014	0.0020	0.0013	0.002	2	U
Mohawk River 2	10/7/2013	0.0020	0.0008	0.002	2	U
Mohawk River 2	9/16/2013	0.0020	0.0008	0.002	2	U
Mohawk River 2	7/1/2013	0.0020	0.0010	0.002	2	U
Mohawk River 2	5/29/2013	0.0020	0.0010	0.002	2	U
Mohawk River 2	5/6/2013	0.0020	0.0010	0.002	2	U
Mohawk River 2	4/15/2013	0.0020	0.0010	0.002	2	U
Mohawk River 2	9/4/2012	0.0020	0.0010	0.002	2	U
Mohawk River 2	7/2/2012	0.0020	0.0010	0.002	2	U
Mohawk River 2	6/11/2012	0.0020	0.0010	0.002	2	U
Mohawk River 2	5/21/2012	0.0020	0.0010	0.002	2	U
Mohawk River 2	4/16/2012	0.0020	0.0006	0.002	2	U
Niagara River	10/6/2015	0.0020	0.0019	0.0029	2.9	
Niagara River	8/11/2015	0.002	0.0019	0.0027	2.7	
Niagara River	6/23/2015	0.0020	0.0013		0	U
Niagara River	4/28/2015	0.0020	0.0013		0	U
Niagara River	10/7/2013	0.0020	0.0008	0.002	2	U
Niagara River	9/17/2013	0.0020	0.0008	0.002	2	U
Niagara River	7/2/2013	0.0020	0.0010	0.002	2	U
Niagara River	5/28/2013	0.0020	0.0010	0.002	2	U
Niagara River	5/28/2013	0.0020	0.0010	0.002	2	U
Niagara River	4/16/2013	0.0020	0.0010	0.002	2	U
Niagara River	4/16/2013	0.0020	0.0010	0.002	2	U
Niagara River	10/15/2012	0.0020	0.0010	0.002	2	U
Niagara River	9/4/2012	0.0020	0.0010	0.002	2	U
Niagara River	7/2/2012	0.0020	0.0010	0.002	2	U
Niagara River	7/2/2012	0.0020	0.0010	0.002	2	U
Niagara River	6/11/2012	0.0020	0.0010	0.002	2	U
Niagara River	5/23/2012	0.0020	0.0010	0.002	2	U
Niagara River	4/17/2012	0.0020	0.0006	0.002	2	U
Oswego River	10/6/2015	0.0020	0.0019	0.0048	4.8	
Oswego River	8/10/2015	0.002	0.0019	0.0103	10.3	
Oswego River	6/23/2015	0.0020	0.0013	0.0035	3.5	
Oswego River	4/28/2015	0.0020	0.0013	0.0031	3.1	
Oswego River	10/6/2014	0.0020	0.0013	0.0024	2.4	
Oswego River	8/11/2014	0.0020	0.0013	0.002	2	U
Oswego River	6/23/2014	0.0020	0.0013	0.002	2	U
Oswego River	5/1/2014	0.0020	0.0013	0.002	2	U
Oswego River	10/8/2013	0.0020	0.0008	0.002	2	U
Oswego River	9/17/2013	0.0020	0.0008	0.0023	2.3	
Oswego River	7/1/2013	0.0020	0.0010	0.002	2	U
Oswego River	5/28/2013	0.0020	0.0010	0.002	2	U
Oswego River	4/15/2013	0.0020	0.0010	0.0021	2.1	
Oswego River	10/22/2012	0.0020	0.0010	0.002	2	U
Oswego River	9/12/2012	0.0020	0.0010	0.002	2	U
Oswego River	9/12/2012	0.0020	0.0010	0.002	2	U
Oswego River	8/16/2012	0.0020	0.0010	0.002	2	U
Oswego River	8/16/2012	0.0020	0.0010	0.002	2	U
Oswego River	8/16/2012	0.0020	0.0010	0.002	2	U
Oswego River	7/10/2012	0.0020	0.0010	0.002	2	U
Oswego River	7/10/2012	0.0020	0.0010	0.002	2	U
Oswego River	6/4/2012	0.0020	0.0010	0.002	2	U
Oswego River	5/2/2012	0.0020	0.0006	0.002	2	U
Oswego River	7/10/2012	0.0020	0.0010	0.002	2	U

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
Richelieu River	10/7/2015	0.0020	0.0019	0.0025	2.5	
Richelieu River	8/13/2015	0.002	0.0019		0	U
Richelieu River	6/24/2015	0.0020	0.0013	0.0027	2.7	
Richelieu River	4/21/2015	0.0020	0.0013	0.003	3	
Richelieu River	10/28/2014	0.0020	0.0013	0.002	2	U
Richelieu River	10/7/2014	0.0020	0.0013	0.0021	2.1	
Richelieu River	8/12/2014	0.0020	0.0013	0.002	2	U
Richelieu River	6/24/2014	0.0020	0.0013	0.002	2	U
Richelieu River	4/29/2014	0.0020	0.0013	0.002	2	U
Richelieu River	4/29/2014	0.0020	0.0013	0.002	2	U
Richelieu River	10/7/2013	0.0020	0.0008	0.002	2	U
Richelieu River	9/16/2013	0.0020	0.0008	0.002	2	U
Richelieu River	7/1/2013	0.0020	0.0010	0.002	2	U
Richelieu River	5/30/2013	0.0020	0.0010	0.002	2	U
Richelieu River	5/30/2013	0.0020	0.0010	0.002	2	U
Richelieu River	4/15/2013	0.0020	0.0010	0.002	2	U
Richelieu River	9/5/2012	0.0020	0.0010	0.002	2	U
Richelieu River	7/2/2012	0.0020	0.0010	0.002	2	U
Richelieu River	6/14/2012	0.0020	0.0010	0.002	2	U
Richelieu River	5/23/2012	0.0020	0.0010	0.002	2	U
Richelieu River	4/17/2012	0.0020	0.0006	0.002	2	U
Seneca River	10/6/2015	0.0020	0.0019	0.0031	3.1	
Seneca River	8/10/2015	0.002	0.0019	0.0242	24.2	
Seneca River	6/23/2015	0.0020	0.0013	0.0037	3.7	
Seneca River	4/28/2015	0.0020	0.0013	0.0026	2.6	
Seneca River	10/6/2014	0.0020	0.0013	0.0021	2.1	
Seneca River	8/11/2014	0.0020	0.0013	0.002	2	U
Seneca River	6/23/2014	0.0020	0.0013	0.002	2	U
Seneca River	5/1/2014	0.0020	0.0013	0.002	2	U
Seneca River	10/8/2013	0.0020	0.0008	0.0021	2.1	
Seneca River	9/17/2013	0.0020	0.0008	0.0023	2.3	
Seneca River	7/1/2013	0.0020	0.0010	0.002	2	U
Seneca River	7/1/2013	0.0020	0.0010	0.002	2	U
Seneca River	5/28/2013	0.0020	0.0010	0.002	2	U
Seneca River	5/6/2013	0.0020	0.0010	0.002	2	U
Seneca River	4/15/2013	0.0020	0.0010	0.0026	2.6	
Seneca River	10/22/2012	0.0020	0.0010	0.002	2	U
Seneca River	10/22/2012	0.0020	0.0010	0.002	2	U
Seneca River	10/22/2012	0.0020	0.0010	0.002	2	U
Seneca River	9/12/2012	0.0020	0.0010	0.002	2	
Seneca River	9/12/2012	0.0020	0.0010	0.0023	2.3	
Seneca River	8/16/2012	0.0020	0.0010	0.002	2	U
Seneca River	7/10/2012	0.0020	0.0010	0.002	2	U
Seneca River	6/4/2012	0.0020	0.0010	0.002	2	U
Seneca River	6/4/2012	0.0020	0.0010	0.002	2	U
Seneca River	6/4/2012	0.0020	0.0010	0.002	2	U
Seneca River	5/2/2012	0.0020	0.0006	0.002	2	U
Seneca River	5/2/2012	0.0020	0.0006	0.002	2	U
St Lawrence River	10/27/2015	0.0020	0.0010	0.0021	2.1	
St Lawrence River	8/4/2015	0.0020	0.0019	0.0027	2.7	
St Lawrence River	6/16/2015	0.0020	0.0013		0	U
St Lawrence River	4/23/2015	0.0020	0.0013	0.0024	2.4	
St Lawrence River	10/7/2014	0.0020	0.0013	0.0024	2.4	
St Lawrence River	8/14/2014	0.0020	0.0013	0.002	2	U
St Lawrence River	6/23/2014	0.0020	0.0013	0.002	2	U
St Lawrence River	4/29/2014	0.0020	0.0013	0.002	2	U
St Lawrence River	10/7/2013	0.0020	0.0008	0.002	2	U
St Lawrence River	10/7/2013	0.0020	0.0008	0.002	2	U
St Lawrence River	9/17/2013	0.0020	0.0008	0.002	2	U
St Lawrence River	7/1/2013	0.0020	0.0010	0.002	2	U
St Lawrence River	9/17/2013	0.0020	0.0008	0.002	2	U

Location Name	Sample Date	Quantitation Limit (ppm)	Method Detection Limit (ppm)	Results in ppm (mg/L)	Results in ppb (ug/L)	Result Qualifier
St Lawrence River	5/29/2013	0.0020	0.0010	0.002	2	U
St Lawrence River	4/15/2013	0.0020	0.0010	0.002	2	U
St Lawrence River	9/5/2012	0.0020	0.0010	0.002	2	U
St Lawrence River	7/2/2012	0.0020	0.0010	0.002	2	U
St Lawrence River	6/13/2012	0.0020	0.0010	0.002	2	U
St Lawrence River	5/21/2012	0.0020	0.0010	0.002	2	U
Susquehanna River	10/7/2015	0.0020	0.0019	0.0029	2.9	
Susquehanna River	8/11/2015	0.002	0.0019	0.0136	13.6	
Susquehanna River	6/24/2015	0.0020	0.0013	0.0027	2.7	
Susquehanna River	4/29/2015	0.0020	0.0013		0	U
Susquehanna River	10/22/2014	0.0020	0.0013	0.0034	3.4	
Susquehanna River	6/11/2014	0.0020	0.0013	0.002	2	U
Susquehanna River	4/17/2014	0.0020	0.0013	0.002	2	U
Susquehanna River	10/9/2013	0.0020	0.0008	0.0032	3.2	
Susquehanna River	9/18/2013	0.0020	0.0008	0.002	2	U
Susquehanna River	7/2/2013	0.0020	0.0010	0.002	2	U
Susquehanna River	5/29/2013	0.0020	0.0010	0.002	2	U
Susquehanna River	5/7/2013	0.0020	0.0010	0.002	2	U
Susquehanna River	4/16/2013	0.0020	0.0010	0.002	2	U
Susquehanna River	9/6/2012	0.0020	0.0010	0.002	2	U
Susquehanna River	7/5/2012	0.0020	0.0010	0.002	2	U
Susquehanna River	6/14/2012	0.0020	0.0010	0.002	2	U
Susquehanna River	5/24/2012	0.0020	0.0010	0.002	2	U
Susquehanna River	4/17/2012	0.0020	0.0006	0.002	2	U
Tin Brook	10/29/2013	0.0020	0.0008	0.003	3	
Tin Brook	9/18/2013	0.0020	0.0008	0.002	2	U
Tin Brook	7/30/2013	0.0020	0.0010	0.002	2	U
Tin Brook	7/9/2013	0.0020	0.0010	0.002	2	U
Tin Brook	4/23/2013	0.0020	0.0010	0.002	2	U
Van Rensselaer Creek in Pierrepont	9/22/2015	0.0020	0.0019	0.0046	4.6	
Van Rensselaer Creek in Pierrepont	8/5/2015	0.0020	0.0019	0.0038	3.8	
Van Rensselaer Creek in Pierrepont	6/18/2015	0.0020	0.0013	0.0048	4.8	
Van Rensselaer Creek in Pierrepont	5/13/2015	0.0020	0.0013	0.0036	3.6	
Van Rensselaer Creek in Pierrepont	4/20/2015	0.0020	0.0013	0.0041	4.1	
West Creek in Evans Mills	9/24/2015	0.0020	0.0019	0.0035	3.5	
West Creek in Evans Mills	8/3/2015	0.0020	0.0019		0	U
West Creek in Evans Mills	6/15/2015	0.0020	0.0013	0.0031	3.1	
West Creek in Evans Mills	5/14/2015	0.0020	0.0013		0	U
West Creek in Evans Mills	4/22/2015	0.0020	0.0013	0.0021	2.1	

Appendix D. Summary of Comments from Virtual Public Meeting

Buffalo River Area of Concern

Tainting of Fish and Wildlife Flavor Beneficial Use Impairment Public Meeting

Virtual Meeting held on April 15th 2020

Public Comment Period: April 15th – May 15th 2020

A virtual public meeting was held on April 15th 2020 to provide information to the public regarding the Buffalo River Area of Concern Tainting of Fish and Wildlife Flavor Beneficial Use Impairment Removal Report. The Buffalo River Remedial Advisory Committee formed a subcommittee to plan this outreach event, and worked closely with the New York State Department of Health to develop a presentation that would address the existing fish consumption advisories within the Buffalo River. Michael Kuzia-Carmel (NYSDEC) gave the presentation detailing the removal of the Tainting of Fish and Wildlife Flavor Beneficial Use Impairment from the Buffalo River Area of Concern. Michael answered questions submitted by participants using the chat function on the Web-ex platform. The removal report, public meeting presentation slides and recording, and the public comment submission form are available on the Buffalo Niagara Waterkeeper website: https://bnwaterkeeper.org/bui-2/ The virtual public meeting was attended by 84 people, approximately 59 of which were members of the public. A total of 20 comments and questions were received from the online submission form and the chat during the virtual public meeting.

Many of the questions and comments were focused on water quality and sediment health, fish consumption advisories, and how to get involved. The Web-ex platform allowed for a sharing of comments, questions, and resources from a diverse community of partners located across New York State. Participants were provided with online resources to learn more, and ways to get engaged and participate in stewardship events and activities.

Resources provided to participants:

- Fish consumption advisory website: www.health.ny.gov/fish
- Buffalo Niagara Waterkeeper website: https://bnwaterkeeper.org/
- Submit your public comments here: https://bnwaterkeeper.org/bui-2/
- More information on the Great Lakes Legacy Act project in the Buffalo River: https://www.dec.ny.gov/chemical/54166.html
- Buffalo River background information: https://bnwaterkeeper.org/background-buffalo-river/
- Questions? Contact: michael.kuzia-carmel@dec.ny.gov
- Questions about stewardship events along the Buffalo River? Contact: crosen@bnwaterkeeper.og
- Presentation slides and recording available here: https://bnwaterkeeper.org/bui-2/

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Public Comments

Public comments received during the virtual public meeting were answered verbally after the presentation. To hear the answers to the questions listed below, please watch the virtual public meeting here:
https://meetny.webex.com/webappng/sites/meetny/recording/play/4afb266d786a4525924da12019a9e20d

1. My question is in regard to the determination that of fish impairment. I may have heard wrong, but it sounded like the conclusion was made that impairments were mitigated due to water quality standards proving to have improved, even though tainted meat and odorless meat was still found. Is this assessment correct? And is this an inaccurate conclusion that the quality of fish is improving, despite the tainted meat?
2. Do these improved water quality test results mean anything in terms of the safety of eating these fish, when we are still finding tainted fish meat with odors
3. Thank you Henry, are the PCB's a sediment based contaminant? and hence why they are unrelated to the water quality tests
4. Related to the question above, should sediment contamination be prioritized since that is what causes the dangers of fish consumption. Especially since these water quality tests suggest improved water quality
5. Is there a way you can send out this powerpoint so we can share it with our co-workers who were unable to attend this?
6. The information presented involves only water quality correct? Is there information on what chemicals are present in the sediment as well?
7. What are the technologies that have been used to improve water quality. Solar Powered Floating Barge Units with treatment system on Deck may be an option
8. What are the fish-eating guidelines now and is swimming going to be allowed?
9. Could you please explain what you mean by comparable? Is the concentration of total recoverable phenols low, or just the same throughout the state?
10. Are current mitigation efforts affected by the COVID-19 social restrictions? What can we as individuals do to help these efforts?
11. How can more of us get involved? Can you tell me more about Buffalo River Stewardship? Historical contamination aside, what are current sources of contamination?
12. What were or are the original sources for the phenol contaminate?
13. Mycoremediation (using mushrooms for remediating habitat and water quality) has been used both locally by NYS Parks and globally for cleaning cleaning up bacteria, chemicals, etc. Might future mycoremediation projects be possible locally at brownfield sites, sewage overflow sites, etc.? Are any such projects currently planned?
14. Is the DEC accepting formal public comments on the removal of this BUI?

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Comments submitted online before the virtual public meeting were addressed during the presentation. There were no public comments or questions received after the virtual public meeting. Comments received via online submission are presented below anonymously.

15. Everyone who helped put this together did a good job and deserves a pat on the back!
16. I dont have any questions
17. Will the asian carp effect our water shed if the carp get into the great lakes.
18. What was the total cost of the Buffalo River restoration project?
19. What will you be talking about today?
20. How did they replace the wildlife that died in the river?

Community and agency partners attended the virtual public meeting and provided additional information to participants using the chat function on the Web-ex platform. Below are comments given during the question and answer section of the virtual public meeting

1. Henry Spliethoff (NYSDOH): The health risks associated with eating fish are based on PCB results in fish. They are not assessed on water quality tests.
2. Jim Lehnen (NYSDEC): Mike/others - it is worth noting that this BUI is narrowly focused on tainting of fish flavor (an aesthetic concern only - not health related), and that other contaminant-related issues (sediment, fish consumption, recreational contact, etc.) are all being addressed as part of other AOC/BUI efforts.
3. Caitie Nigrelli (Illinois-Indiana Sea Grant): To learn more about sediment remediation across the Great Lakes through this program you can visit www.greatlakesmud.org. There is a page for Buffalo River.

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Virtual Public Meeting Attendee Report

Total attendees: 84
Number of public attendees: 59

Buffalo River RAC Members and Agency Attendees:

Name	Organization
Claudia Rosen	Buffalo Niagara Waterkeeper
Liz Cute	Buffalo Niagara Waterkeeper
Marcus Rosten	Buffalo Niagara Waterkeeper
Margaux Valenti	Buffalo Niagara Waterkeeper
Ron Zietz	Buffalo Niagara Waterkeeper
Wendy Paterson	Buffalo Niagara Waterkeeper
Katherine Winkler	Buffalo Niagara Waterkeeper
Helen Toledo	Buffalo Niagara Waterkeeper
Michael Kuzia Carmel	NYSDEC- NYS AOC Coordinator
Don Zelazny	NYSDEC- Region 9
Dr. J Kennedy	NYSDEC
TJ Pignataro	NYSDEC
Betsy Trometer	U.S. Fish and Wildlife Services
Denise Clay	U.S. Fish and Wildlife Services
Marybeth Giancarlo	USEPA
Vicki Haas	Erie County
Bonnie Lawrence	Erie County
Tyler Hamilton	Erie County
Kristen Guandagno	Erie County
Jim Lehen	NYSDEC
Henry Spliethoff	NYSDOH
Catie Nigrelli	Illinois-Indiana Sea Grant
Stephany Antonov	NYSDEC- Region 9
Jennifer Dunn	NYSDEC- Region 9

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