NPDES Permit #IDS027561
Permit Appendix B - Annual Report Form

This Annual Report is due no later than **January 30** of each year, beginning in Calendar Year 2023, and reflects the relevant reporting period, **starting October 1, 2021**. See Permit Part 6.4.2

Annual Reports and any attachments must be sent to IDEQ by U.S. Postal Mail to the following address:

Regional Administrator
Idaho Department of Environmental
Quality Attn: Water Quality Program
Boise Regional Office
1445 N. Orchard St.
Boise, ID 83706

Complete Sections 1 through IV. Do not leave any questions blank.

MS4 Permittee Name/Organization: Ada County Highway District

Permit Number: IDS027561

Reporting Period:

- (●) **Year 1 Reporting Period:** Oct. 1, 2021 – Sept. 30, 2022 – **Annual Report due date:** January 30, 2023
- ( ) **Year 2 Reporting Period:** Oct. 1, 2022 – Sept. 30, 2023 – **Annual Report due date**: January 30, 2024
- ( ) **Year 3 Reporting Period** Oct. 1, 2023 – Sept. 30, 2024 – **Annual Report due date:** January 30, 2025
- ( ) **Year 4 Reporting Period** Oct. 1, 2024 – Sept. 30, 2025 – **Annual Report due date:** January 30, 2026
- ( ) **Year 5 Reporting Period** Oct. 1, 2025 – Sept. 30, 2026 – **Annual Report due date: September 30, 2026**
- ( ) Other

Certification: *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

Signature:

Printed Name: Bruce S. Wong

Title: Director

Date: 27 JAN 2023

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Section I. General Information

MS4 Facility Site Name: Ada County Highway District MS4

MS4 Facility Organization Formal Name: Ada County Highway District

MS4 Facility Contact Name: Erica Anderson Maguire

Title: Environmental Manager

MS4 Contact Telephone: 208-387-6254

MS4 Contact Email Address: emaguire@achdidaho.org

MS4 Facility Contact Type (all that apply): ☐ Owner ☐ Operator ☑ Main Contact

MS4 Facility Site Address: 1301 North Orchard Street, Suite 200

MS4 Facility Site City, State, Zip Code: Boise, ID, 83706

MS4 Facility Site Mailing Address: ***if different from above*** 3775 Adams St, Garden City, ID, 83714

Is the MS4 Facility Site Located On Tribal Land? ○ Yes ◉ No

MS4 Facility Jurisdiction Type (check all that apply):

- ☐ Federal
- ☐ State
- ☐ College or University
- ☐ State Highway Department
- ☐ Municipal:
- ☐ County
- ☐ City or Town
- ☑ Highway District
- ☐ Tribal
- ☐ Other

List All Receiving Water(s) For the MS4 Discharges:

See Attachment A of this report for Phase I permit area receiving waters and ownership.

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Section II. Permittee Responsibility:
Please answer all questions. If the answer is "No," or "Not Applicable" and no other direction is provided, use the Comments field at the end of this section to explain the reason and the expected date(s) that the requirement will be met, and/or to explain why the requirement does not apply.

1. **This Permittee organization shares implementation responsibility for Permit compliance with one or more Permittees.**

   (●) *Yes* ( ) *No* ( ) *Not Applicable*

   Is the agreement between the Permittees described/cited in the Stormwater Management Program (SWMP) Document?

   (●) *Yes* ( ) *No* ( ) *Not Applicable*

2. **This Permittee organization shares implementation responsibility for Permit compliance with one or more outside (non-Permittee) entities.**

   Is the agreement with these other entity(ies) described/cited in the SWMP Document?

   ( ) *Yes* (●) *No* ( ) *Not Applicable*

3. **This Permittee organization maintains relevant ordinances or other regulatory mechanisms to control pollutant discharges into and from the MS4 to meet the requirements of the Permit.**

   (●) *Yes* ( ) *No* ( ) *Not Applicable*

   (If "No," use the Comment field to specify on overall progress to adopt adequate ordinances or utilizing available regulatory mechanisms.)

4. **This Permittee organization's SWMP Document is posted on a publicly accessible website.**

   (●) *Yes*

   Identify the URL for the webpage where the SWMP Document can be accessed:

   http:// https://www.achdidaho.org/Departments/Engineering/Stormwater/resources.aspx

   ( ) *No*

   ( ) *Not Applicable*

5. **The Permittee organization provided a summary of total costs associated with SWMP implementation over the reporting period.**

   (●) *Yes*

   Note: Permit Part 6.4.2.2.5 requires Permittees to provide annual expenditures for the reporting period, and estimated budget for the reporting period following each Annual Report.

   ( ) *No*

   ( ) *Not Applicable*

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6. This Permittee organization regularly tracks certain activities to set priorities and assess compliance with the Permit requirements.

(●) *Yes* ○ *No* ○ *Not Applicable*

7. During the reporting period, responsibility for SMWP implementation has changed due to a Transfer of Ownership or Operational Authority over a geographic portion of the MS4.

This Permittee's SWMP Document has been updated to reflect these changes in responsibility for any new or transferred areas served by the MS4.

○ *Yes*

If yes, use the Comments field to provide a brief statement summarizing the change in ownership or operational authority.

○ *No*

(●) *Not Applicable*

Section II Comments:

See Attachment E, Phase I MS4 Permit Annual Report Responses *1 - *7.

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Section III. Status of SWMP Control Measures
Please answer all questions for each SWMP control measure and associated component activity. In the Comments field, cite any relevant information and/or statistics that helps illustrate the Permittee's implementation of the required action/activity.

If the answer is "No," use the Comments field to explain the reason, and outline the expected dates that the requirement will be met.

If the requirement does not apply to the Permittee's organization, mark "NA" and explain why it does not apply in the Comments field.

Public Education, Outreach and Involvement Program (Permit Part 3.1)

8. **This Permittee organization conducts an education, outreach, and public involvement program based on stormwater issues of significance in the Permittee's jurisdiction.**
   - ○ *Yes, this organization conducts the education, outreach, and involvement activities required by the Permit*
   - ◉ *Yes, this organization works through contract with other entities to conduct the education, outreach, and involvement activities required by the Permit*
   - ○ *No*
   - ○ *Not Applicable*

9. **Target Audience: During the reporting period, this Permittee organization focused its education, outreach, and public involvement messages to the following audience(s):**
   - [x] ***General Public*** *(including homeowners, homeowner's associations, landscapers, and property managers)*
   - [x] ***Business/Industrial/Commercial/Institutions*** *(including home based and mobile businesses)*
   - [x] ***Construction/Development*** *(e.g., Engineers, Contractors, Developers, Landscape Architects, Site Design Professionals)*
   - [x] ***Elected Officials, Land Use Policy and Planning Staff***
   - [ ] Other *(describe in Comments section below)*

10. **Topics: During the reporting period, this Permittee organization focused its education, outreach, and public involvement messages on the following topics** *(select all that apply)*:
    - [x] General impacts of stormwater flows into surface water, and appropriate actions to prevent adverse impacts;
    - [x] Impacts from impervious surfaces, techniques to avoid adverse impacts;
    - [x] Yard care techniques protective of water quality, such as composting;
    - [ ] Proper use, application & storage of pesticides, herbicides, and fertilizers;

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- [x] Litter & trash control and recycling programs;
- [x] BMPs for power washing, carpet cleaning, auto repair &maintenance;
- [x] Low Impact Development/green infrastructure techniques, including site design, pervious paving, retention of mature trees/vegetation, landscaping and vegetative buffers;
- [x] Maintenance of landscape features providing water quality benefits;
- [x] Stormwater treatment and volume control practices;
- [x] Technical standards for stormwater site plans; including appropriate selection, installation, and use of required construction site control measures
- [x] Source control BMPs and environmental stewardship;
- [x] Impacts of illicit discharges and how to report them;
- [x] Actions and opportunities for pet waste control/disposal,
- [x] Water wise landscaping, water conservation, water efficiency
- [x] BMPs for use and storage of automotive chemicals, hazardous cleaning supplies, vehicle wash soaps and other hazardous materials;

11. During the reporting period, this Permittee organization began and/or continued distribution of the selected messages/activities to the intended target audience.

◉ *Yes*

Please summarize the message/activity conducted during the reporting period in the Comments section below.

○ *No*

Note: Permit Part 3.1.3 requires Permittees to conduct at least eight (8) educational messages or activities no later than ***September 30, 2026.***

○ *Not Applicable*

12. During this reporting period, this Permittee organization assessed, or participated in efforts to assess, the understanding and adoption of intended behaviors by the target audience.

◉ *Yes; In the Comments section below, please summarize efforts to assess the selected education, outreach and public involvement activities conducted during the reporting period. If information is available, describe how this information is used to improve the education/outreach efforts.*

○ *No*

○ *Not Applicable*

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13. During this reporting period, this Permittee organization offered (or worked with others to offer) training/education regarding construction site runoff control measures to site operators working in the Permittee's jurisdiction.

(●) *Yes*

( ) *No*

*Note: Permit Part 3.1.7.1 requires Permittees to offer outreach/training on construction site control measures at least once per year during the permit term, no later than **September 30, 2026.***

( ) *Not Applicable*

14. During this reporting period, this Permittee organization offered (or worked with others to offer) training/education regarding permanent stormwater controls to audiences working in the Permittee's jurisdiction.

(●) *Yes*

( ) *No*

*Note: Permit Part 3.1.7.2 requires Permittees to offer outreach/training on permanent stormwater controls at least once per year during the permit term, no later than **September 30, 2026.***

( ) *Not Applicable*

15. This Permittee organization maintains and promotes a publicly-accessible website that provides current SWMP-related information cited in Permit Part 3.1.8. This website was recently updated prior to submitting this Report.

(●) *Yes*

URL for the Permittee's webpage:

http:// https://www.partnersforcleanwater.org/ (Permittee Partner's website hosted by Boise City)
https://www.achdidaho.org/Departments/Engineering/Stormwater/resources.aspx (ACHD's website)

( ) *No*

( ) *Not Applicable*

Comments on Public Education, Outreach, and Involvement Program:
Use this Comments field to explain or discuss unique implementation schedules, summarize nature of the education, outreach, and public involvement activities conducted during the reporting period

See Attachment E - Phase I MS4 Permit Annual Report Responses, *8 - *14. A comprehensive summary of the 2022 Public Education, Outreach and Involvement Program is provided in Attachment C.

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Illicit Discharge Detection and Elimination Program (Permit Part 3.2)

16. To the extent allowable pursuant to authority granted under Idaho law, this Permittee organization conducts and enforces a program to detect and eliminate illicit discharges into the MS4.

- (●) *Yes*
- ( ) *No*

  *Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary to comply with Permit Parts 3.2.2 through 3.2.9 no later than **April 3, 2026.***

- ( ) *Not Applicable*

17. This Permittee organization maintains a current MS4 Map and Outfall Inventory as described in Permit Part 3.2.2.

- (●) *Yes*
- ( ) *No*

  *Note: Permit Part 3.2 requires Permittees to update their Map(s) and Inventory no later than **April 3, 2026.***

- ( ) *Not Applicable*

18. To the extent allowable pursuant to authority granted under Idaho law, this Permittee organization prohibits non-storm water discharges into the MS4 (*except those identified in Permit Part 2.4*) through an ordinance or other regulatory mechanism.

- (●) *Yes – if yes, please provide citation/web address to the ordinance/regulatory mechanism:*

  http://www.achdidaho.org/Documents/ACHDpolicyManual/7000to9000/Section8000_DrainageStormwaterManagement.pdf (Section 8006 - Legal Authority for Stormwater Management) and Boise City Code 10-6-2.

- ( ) *No*

  *Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary no later than **April 3, 2026.***

- ( ) *Not Applicable*

19. This Permittee organization maintains a dedicated telephone number, email address, and/or other means for the public to report illicit discharges,

- (●) *Yes – if yes, please provide phone number/web address:*

  Stormwater Pollution Hotline: 208-395-8888, ACHD Tell Us: https://www.achdidaho.org/AboutACHD/contactUs.aspx

- ( ) *No*

  *Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary no later than **April 3, 2026.***

- ( ) *Not Applicable*

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20. **This Permittee organization responds and investigates illicit discharge complaints or reports within two working days.**

(●) *Yes*

( ) *No*

Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary no later than ***April 3, 2026.***

( ) *Not Applicable*

21. **Number of Public Complaints/Reports Received During this Reporting Period:**
21

22. **Number of Illicit Discharge Complaints/Reports Investigated through field visits, sampling or other follow-up action** 41

23. **Number of Illicit Discharge Complaints/Reports Resolved** 41

24. **This Permittee organization conducts a dry weather analytical and field screening monitoring program to identify non-stormwater flows from MS4 outfalls.**

(●) *Yes* ( ) *No* ( ) *Not Applicable*

25. **During the reporting period, this Permittee organization used its written protocols to prioritize and identify MS4 outfalls for dry weather discharge investigation.**

(●) *Yes* ( ) *No* ( ) *Not Applicable*

26. **Total Number of MS4 Outfalls in the Permittee's jurisdiction of the Permit Area:**
866

27. **During the reporting period, this Permittee organization completed visual dry weather screening on at least 20% of MS4 outfalls.**

(●) *Yes*

( ) *No* – Total # outfalls < 7, so only one outfall screened this reporting period

( ) *Not Applicable*

28. **Of the 20% of MS4 outfalls screened during the reporting period:**

How many outfalls were discharging during dry weather? 41

How many of these identified dry weather discharges were sampled or otherwise investigated to determine the discharge source? 41

How many of the identified dry weather discharges resulted in the Permittee action to address and eliminate the discharge source? 0

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29. During this reporting period, how many of the Permittee's MS4 outfalls have been identified as having dry weather flows caused by irrigation return flow or ground water seepage?

Number of outfalls identified this reporting period 0

Total number of MS4 outfalls identified to date, as having dry weather flows from irrigation or groundwater seepage 21

Note: Permit Part 3.2.6 requires Permittees to provide a complete list of MS4 outfalls locations identified as having dry weather flows caused by irrigation return flow or ground water seepage as part of the Permit Renewal Application no later than ***April 3, 2026.***

30. This Permittee organization maintains written spill response procedures and coordinates appropriate spill prevention, containment and response activities with other organizations in the Permit Area to ensure maximum water quality protection at all times.

(●) *Yes* ( ) *No* ( ) *Not Applicable*

31. This Permittee organization coordinates with appropriate local entities to educate employees and the public of the proper management and disposal or recycling of used oil, vehicle fluids, toxic materials, and other household hazardous wastes.

(●) *Yes* ( ) *No* ( ) *Not Applicable*

32. This Permittee organization's staff responsible for investigating, identifying and eliminating illicit discharges, spills, and illicit connections into the MS4 are trained to conduct such activities

(●) *Yes* ( ) *No* ( ) *Not Applicable*

Comments on Illicit Discharge Detection and Elimination Program:
Use this Comments field to explain any unique implementation schedules, highlight investigation results or follow-up actions, discuss subsequent enforcement actions, etc. that were conducted during the relevant reporting period.

See Attachment E - Phase I MS4 Permit Annual Report Responses, *21 - *31.

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Construction Site Runoff Control Program (Permit Part 3.3)

33. This Permittee organization uses an ordinance or other regulatory mechanism to require erosion, sediment, and waste material management controls at construction project site activity that results in land disturbance of one (1) or more acres and discharges to the MS4.

(●) *Yes*

( ) *No*

Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

34. This Permittee organization requires construction site operators to submit construction site plans for Permittee review.

(●) *Yes*

( ) *No*

Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

35. This Permittee organization inspects construction sites to ensure compliance with applicable requirements for erosion, sediment and waste material management controls.

(●) *Yes*

( ) *No*

Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

36. This Permittee organization inspects construction sites using an inspection prioritization system.

(●) *Yes*

( ) *No*

Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

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37. This Permittee organization implements a written escalating enforcement response policy or plan (ERP) for construction site runoff control.

- (●) *Yes*
- ( ) *No*

  *Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026.***

- ( ) *Not Applicable*

38. This Permittee organization ensures that all persons responsible for preconstruction site plan review, site inspections, and enforcement of construction site runoff control requirements are appropriately trained to conduct such activities – specifically, this organization provides orientation and training for new staff working on construction runoff control issues within the first six (6) months of employment.

- (●) *Yes*
- ( ) *No*

  *Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026.***

- ( ) *Not Applicable*

Comments on Construction Site Runoff Control:
Use this Comments field to explain unique implementation schedules, summarize the number of site inspections, follow-up actions, and/or any subsequent enforcement actions, etc that were conducted during the relevant reporting period.

See Attachment E - Phase I MS4 Permit Annual Report Responses,*37 and Construction Site Runoff Control Program.

Post Construction Stormwater Management in New Development & Redevelopment (Permit Part 3.4)

39. Through ordinance or other regulatory mechanism, this Permittee organization requires the installation and long-term maintenance of permanent stormwater controls at new development and redevelopment project sites that result from land disturbance of 5,000 square feet or more, excluding individual one- or two-family dwelling development or redevelopment and the infill or redevelopment of public pedestrian infrastructure projects. Required controls are sufficient to retain onsite the runoff volume produced from the first 0.6 inches of rainfall from a 24-hour event preceded by 48 hours of no measurable precipitation, and/or require runoff treatment providing equal or greater level of water quality benefit as this onsite retention standard.

(●) *Yes*

Please cite to the ordinance containing the permanent stormwater control requirements:

https://www.achdidaho.org/Documents/ACHDpolicyManual/7000to9000/Section8000_DrainageStormwaterManagement.pdf (Section 8007.2) and Boise City Code 10-6-3

( ) *No*

Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

40. This Permittee organization requires permanent storm water controls through written specifications.

(●) *Yes*

Please cite to the document containing the permanent stormwater control requirements:

www.achdidaho.org/Documents/ACHDpolicyManual/7000to9000/Section8200_StormwaterDesignManual.pdf

( ) *No*

Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

41. This Permittee organization requires preconstruction site plan review and approval for permanent storm water controls at new development and redevelopment sites.

(●) *Yes*

( ) *No*

Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than ***April 3, 2026.***

( ) *Not Applicable*

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41.b This Permittee organization cooperates in the implementation of the Green Infrastructure Strategy to employ innovative approaches to control stormwater quality and quantity in the Lower Boise River watershed.

Use this field below to describe any relevant Permittee actions during the reporting period, as applicable. .

See Attachment E - Phase I MS4 Permit Annual Report Responses, *41.b.

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42. **This Permittee organization has identified high priority locations in the jurisdiction where the Permittee regularly inspects the installation, and long-term operation, of permanent stormwater controls.**

- ○ *Yes*
- ◉ *No*

  Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than ***April 3, 2026.***

- ○ *Not Applicable*

43. **This Permittee organization has an enforcement strategy to ensure and maintain the functional integrity of permanent stormwater controls within this jurisdiction.**

- ◉ *Yes*
- ○ *No*

  Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than ***April 3, 2026.***

- ○ *Not Applicable*

44. **This Permittee organization uses a database inventory to track and manage the operational condition of permanent stormwater controls within this jurisdiction.**

- ◉ *Yes*
- ○ *No*

  Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than ***April 3, 2026.***

- ○ *Not Applicable*

45. **This Permittee organization requires enforceable and transferable O&M Agreements, where parties other than this Permittee organization are responsible for operation and maintenance of permanent storm water controls?**

- ◉ *Yes*
- ○ *No - Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than* ***April 3, 2026.***
- ○ *Not Applicable*

46. **This Permittee organization ensures that all persons responsible for reviewing site plans for permanent stormwater controls and/or for inspecting the installation and operation of permanent controls are trained to conduct such activities**

- ◉ *Yes*
- ○ *No - Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than* ***April 3, 2026.***
- ○ *Not Applicable*

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Comments on Post Construction Stormwater Management in New Development and Redevelopment

Use this Comments field as necessary to explain any unique implementation schedules, summarize inspections, actions, etc. that were conducted during the relevant reporting period.

See Attachment E - Phase I MS4 Permit Annual Report Responses, *42 and Inspection and Maintenance Activities.

Stormwater Infrastructure and Street Management (Permit Part 3.5)

47. This Permittee organization inspects all MS4 catch basins and inlets in the jurisdiction at least once every two years and takes appropriate maintenance or cleaning action based on those inspections.

- ○ *Yes*
- ○ *No – Permittee uses an alternate inspection & maintenance schedule as outlined in the SWMP Document.*
- ◉ *No*

  Note: Permit Part 3.5 requires Permittees to update their pollution prevention and good housekeeping *as needed to properly operate and maintain their MS4s no later than* ***April 3, 2026.***
- ○ *Not Applicable*

Total Number of catch basins and inlets inspected this reporting period 2,229.0

48. This Permittee organization operates and maintains Streets, Roads, Highways and/or Parking Lots in its jurisdiction in a manner that protects water quality and reduces the discharge of pollutants through the MS4.

- ◉ *Yes*
- ○ *No*

  Note: Permit Part 3.5 requires Permittees to update their pollution prevention and good housekeeping as needed to properly operate and maintain their MS4s no later than ***April 3, 2026.***
- ○ *Not Applicable*

49. This Permittee organization operates all street/road maintenance material storage locations in a manner that prevents pollutants in stormwater runoff from discharging to the MS4 or into any receiving waterbody. A description of each Material Storage Location is included in the SWMP Document, as required by Permit Part 3.5.4

- ◉ *Yes*
- ○ *No*

  Note: Permit Part 3.5 requires Permittees to update their pollution prevention and good housekeeping as needed to properly operate and maintain their MS4s no later than ***April 3, 2026.***
- ○ *Not Applicable*

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50. **This Permittee organization sweeps all streets, roads, highways, and parking lots according to a sweeping management plan and the sweeping schedule outlined in Permit Part 3.5.5.**

- ○ *Yes*
- ◉ *No*

  Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than ***April 3, 2026***

- ○ *Not Applicable*

51. **This Permittee organization has reviewed its operation and maintenance activities for the types of activities listed below and confirms that all such activities are conducted in a manner that protects water quality and reduces the discharge of pollutants through the MS4**. Municipal Activities to be addressed include: *grounds/park and open space maintenance operations; fleet maintenance and vehicle washing operations; building maintenance; snow disposal site operation and maintenance; solid waste transfer activities; municipal golf course maintenance; materials storage; hazardous materials storage; used oil recycling; and spill control and prevention measures for municipal refueling facilities.*

- ◉ *Yes*
- ○ *No*

  Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than ***April 3, 2026***

- ○ *Not Applicable*

52. **This Permittee organization ensures appropriate practices to reduce the discharge of pollutants to the MS4 associated with the application, storage and disposal of pesticides, herbicides and fertilizers. All employees or contractors applying pesticides, etc. are instructed to follow all label requirements, including those regarding application methods, rates, number of applications allowed, and disposal of the pesticide/herbicide/fertilizer and rinsate.**

- ◉ *Yes*
- ○ *No*

  Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than ***April 3, 2026.***

- ○ *Not Applicable*

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53. This Permittee organization uses site specific Storm Water Pollution Prevention Plans for all Permittee-owned material storage facilities, heavy equipment storage areas, and maintenance yards located in the Permit Area.

- ○ *Yes*
- ◉ *No*

  *Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026.***
- ○ *Not Applicable*

54. This Permittee organization ensures that all persons responsible for municipal operations and maintenance activities are trained to conduct such activities

- ◉ *Yes*
- ○ *No*

  *Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026.***
- ○ *Not Applicable*

Comments on Stormwater Infrastructure and Street Management

Use this Comments field as necessary to explain any unique implementation schedules, summarize inspections, actions, etc. that were conducted during the relevant reporting period

See Attachment E - Phase I MS4 Permit Annual Report Responses, *47-*53.

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Industrial and Commercial Stormwater Discharge Management (Permit Part 3.6)

55. This Permittee organization maintains an inventory of industrial & commercial facilities within the Permit Area, and inspects such facilities on a prioritized basis as required by Permit Part 3.6.

Use this comment box to summarize Permittee activities related to Permit Part 3.6.

See Attachment E - Phase I MS4 Permit Annual Reponses, Industrial and Commerical Stormwater Discharge Management (Permit Part 3.6).

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Section V. Response To Excursions Above Idaho Water Quality Standards

56. During this or any prior reporting period, did the Permittee submit written notification to EPA and IDEQ regarding MS4 discharge that are causing or contributing to an excursion above the WQS as directed by Permit Part 5.1?

- ○ *Yes – if yes, proceed to Q.57*
- ◉ *No*
- ○ *Not Applicable*

57. During this or any prior reporting period, did the Permittee submit an Adaptive Management Report to EPA and IDEQ, as directed by Permit Part 5.2?

- ○ *Yes – if yes, proceed to Q.58*
- ◉ *No*
- ○ *Not Applicable*

58. Provide a summary of the Permittee's efforts to date that address the MS4 discharges contributing to the original water quality excursion, including the results of any monitoring, assessment, or evaluation efforts conducted during the reporting period.

Not Applicable.

See Appendix E - Phase I MS4 Permit Annual Report Responses, Temperature Monitoring (Permit Part 4.1) and Stormwater Monitoring and Evaluation Program (Permit Part 6.2).

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59. List any attachments submitted as part of this Annual Report:

Note: Part 6.2.1 requires an updated *Stormwater Outfall Monitoring Plan* to be submitted as part of the Year 1 Annual Report, due January 30, 2023.

Attachment A - Phase I Receiving Waters and Outfall Ownership
Attachment B - NPDES Budget Summary
Attachment C - 2022 Public Education, Outreach and Involvement Program
Attachment D - Dry Weather Outfall Inspection Summary, Map, and Analytical Results WY2022
Attachment E - Phase I MS4 Permit Annual Report Form Responses
Attachment F - CSDC Enforcement Response Policy
Attachment G - Erosion Sediment Control Plan Reviews, Inspections and Map
Attachment H - ACHD Vegetated Basins, Bioretention Swales, and GSI Program Activities
Attachment I - Stormwater Outfall Monitoring Summary WY 2022
Attachment J - Americana Subwatershed Monitoring Summary WY 2022
Attachment K- Temperature Monitoring Summary WY 2022
Attachment L - Stormwater Outfall Monitoring Plan and NPDES Phase I Temperature Monitoring Approach

Attachment A: Phase I Receiving Waters and Outfall Ownership

PHASE I PERMIT AREA RECEIVING WATERS AND OUTFALL OWNERSHIP WY2022

RECEIVING WATER	OUTFALL OWNERSHIP		OUTFALL TOTAL
	ACHD	NON-ACHD	
Ash Lateral	2	0	2
Bennett Lateral	2	0	2
Boise City Canal	55	2	57
Boise City Canal-drain of	0	4	4
Boise River	39	24	63
Boise Valley Canal	3	4	7
Bubb Canal	7	3	10
Chaffin Drain	1	1	2
Cloverdale Lateral	1	2	3
Cottonwood Creek	3	5	8
Cottonwood Creek-Trib of	2	0	2
Crane Creek	22	2	24
Crane Gulch	2	1	3
Davis Drain	30	17	47
Drain A	0	2	2
Drain B	0	6	6
Drain D	0	3	3
Drain E	0	2	2
Dry Creek Canal	9	14	23
Eaggers Lateral	2	0	2
Eagle Drain	46	11	57
Eagle Drain-lateral of	3	0	3
Eightmile Creek	6	0	6
Electric Light Lateral	3	2	5
Elmore Drain	12	2	14
Eureka Canal	0	8	8
Farmers Lateral	15	8	23
Farmers Union Canal	12	6	18
Finch Lateral	3	0	3
Fitz Lateral	1	0	1
Fivemile Creek	33	19	52
Fivemile Creek - Intermittent	15	0	15
Fivemile Creek-Trib. to	8	3	11
Gallagher Canal	1	0	1
Gruber Lateral	1	0	1
Helm Lateral	1	1	2
Hulls Gulch	8	2	10
Hulls Gulch-Lateral	1	0	1
Huntington Lateral	2	0	2
Hyatt Lateral	1	0	1
Julia Davis Pond	3	10	13
Karnes Lateral	11	4	15
Lake Elmore	1	1	2

RECEIVING WATER	OUTFALL OWNERSHIP		OUTFALL TOTAL
	ACHD	NON-ACHD	
Lake Heron	1	3	4
Lake Heron Creek-north fork	0	4	4
Lake Heron Creek-south fork	1	2	3
Lake Heron-lateral of	1	2	3
Lateral 41	8	0	8
Lateral 49	1	0	1
Logger Creek	12	15	27
Lowell Drain	1	0	1
McMillan #2 Lateral	2	0	2
McMillan Lateral	7	0	7
Milk Lateral	5	0	5
New York Canal	9	2	11
North Slough	70	15	85
Penitentiary Canal	5	0	5
Penninger Lateral	3	0	3
Pierce Creek	6	0	6
Pierce Gulch	1	0	1
Polecat Gulch	31	0	31
Powell Lateral	1	0	1
Ridenbaugh Canal	79	22	101
Ridenbaugh Ditch	10	4	14
Rust Lateral	4	1	5
Sargent Drain	9	0	9
Seaman Gulch	1	0	1
Settlers Canal	37	9	46
Shavrer Lateral	2	1	3
Snider Lateral	1	0	1
South Slough	16	30	46
Stewart Gulch	8	2	10
Threemile Creek	7	2	9
Threemile Lateral	7	1	8
Thurman Drain	1	0	1
Thurman Mill Canal	17	14	31
Thurman Mill Canal-Lateral	4	0	4
Tuttle Lateral	1	0	1
Unnamed	96	17	113
Walling Creek	1	0	1
Warm Springs Canal	18	13	31
Wilson Fruit Lateral	1	0	1
Zinger Lateral	14	0	14
Total 83	**866**	**328**	**1194**

Attachment B: NPDES Budget Summary

Table 1. ACHD NPDES MS4 Permit Expenditures FY2021-2022

EXPENSE CATEGORY	SUBTOTAL	TOTAL COST
Environmental Department		
Stormwater Quality Staff	867,400.00	
Monitoring	169,800.00	
Water Quality Programs	456,100.00	
Environmental Total		1,493,300.00
Maintenance Department		
Storm Drain System Cleaning		
Staff	736,000.00	
Equipment & Materials	493,000.00	
Contracts	1,000.00	
Storm Drain Cleaning Totals	*1,230,000.00*	
Street Sweeping		
Staff	964,000.00	
Equipment & Materials	1,031,000.00	
Contracts	4,000.00	
Street Sweeping Totals	*1,999,000.00*	
Basin Maintenance	91,000.00	
Maintenance & Operations Totals		3,320,000.00
Total		**$4,813,300.00**

Table 2. ACHD NPDES MS4 Permit Budget FY2022-2023

BUDGET CATEGORY	SUBTOTAL	TOTAL COST
Environmental Department		
Stormwater Quality Staff	922,500.00	
Monitoring	197,000.00	
Water Quality Programs	413,200.00	
Environmental Total		1,532,700.00
Maintenance Department		
Storm Drain System Cleaning		
Staff	773,000.00	
Equipment & Materials	517,000.00	
Contracts	1,000.00	
Storm Drain Cleaning Totals	*1,291,000.00*	
Street Sweeping		
Staff	1,011,000.00	
Equipment & Materials	1,083,000.00	
Contracts	4,000.00	
Street Sweeping Totals	*2,098,000.00*	
Basin Maintenance	95,000.00	
Maintenance & Operations Totals		3,484,000.00
Total		**$5,016,700.00**

Attachment C: 2022 Public Education, Outreach and Involvement Program

1. Overview

The City of Boise, Ada County Highway District, Garden City, Ada County Drainage District #3, Idaho Transportation Department District #3, and Boise State University formed Partners for Clean Water (Partners) to develop a cooperative approach to educating the public on stormwater and water quality issues and ensure compliance with the Permit. The City of Boise is the lead agency for this control measure of the Permit with support from the other Partners. The overarching goal of the program is to educate the public on stormwater issues to change specific behaviors that contribute to nutrient, bacteria, temperature, and sediment pollution to the MS4 and local receiving waters.

The City's Stormwater Public Education and Outreach Program is guided by a step-by-step process when developing educational opportunities.

1. Define goals and desired outcomes
2. Identify and analyze target audiences
3. Create messaging for selected audiences
4. Distribute message through chosen methods of outreach
5. Assess the results in order to direct future efforts

The Partners conduct multiple outreach activities and messaging campaigns each year, designed to reach the various target audiences identified in the Permit and focus on stormwater issues of significance in the Permit area. The co-permittees collaborate each year on which topics and relevant messages the program will focus their efforts on. These activities and messages are further developed and built upon based on feedback and public participation.

For the first half of 2022, a winter spike in Covid-19 cases prevented in-person gatherings and events. The Partners focused our fall and winter messaging to media buys that reached a broad audience across the Treasure Valley. Once Covid-19 cases leveled and the community was able to safely gather, we began events and in-person activities in the spring.

Target audiences in Permit Year 1 included the general public, businesses, homeowners, pet owners, landscapers, property managers, engineers, contractors, developers, plan review staff, and students. Specific details that meet Permit Part 3.1 requirements can be found below.

2. Ongoing Efforts (throughout Permit term):

Annual Media Campaign

The Partners continue to participate in an annual media campaign which utilize messaging opportunities with radio advertisements and public service announcements, billboards, and online ads. The media campaign reaches all target audiences with general messages on water quality with a continued focus on pet waste and yard waste in 2022.

Manuals and Reference Materials

Manuals, fact sheets and other education and outreach reference materials are available on the Partners for Clean Water website. These materials are targeted, based on content, to all our targeted audiences. Examples of these documents include 'Stormwater Facility Maintenance Best Management Practices', 'Stormwater Pollution Prevention: Commercial Landscaping', 'Operation and Maintenance of Stormwater Systems', 'Drainage Plan Checklist' and 'Stormwater Management Resource Guide', among others.

Website

The website (partnersforcleanwater.org) reaches all target audiences with specific messaging based on audience. Please see Section 7 below for more details.

Boise WaterShed Environmental Education Center

The Boise WaterShed Environmental Education Center opened in May, 2008, and is designed to promote water stewardship by teaching people of all ages how to protect and conserve our precious resource for future generations.

The staff at the Boise WaterShed incorporates stormwater pollution prevention and stormwater management information into the programs, water renewal facility tours, and lessons offered to visitors. Education of personal impacts to water quality via stormwater, wastewater and pollution prevention tips are integrated throughout most exhibits, lessons, tours, and the center's library resources.

Partners staff participate in events at the WaterShed, including WaterShed Weekends, Earth Day events, and summer programs.

The facility also provides an outdoor River Campus which presents a new dimension to water education with exterior exhibits that show the big picture of the Treasure Valley's water resources. Presented to simulate the workings of the Lower Boise Watershed, the interactive, walk-able, park-like setting takes visitors on a journey from Lucky Peak Reservoir and Dam, through Boise's urban streets, and the Water Renewal Facility. From here they watch cleaned water returned to the Boise River and see it flow downstream to the agricultural zone that sustains our food industry. Ultimately, visitors realize that what we do upstream not only affects downstream users, but also ultimately the overall health of the Snake River.

Social Media

The Partners are active on social media through a Partners Instagram page, as well as each permittee's social media pages. The City of Boise regularly posts messaging on Twitter, Facebook, and Instagram regarding stormwater, water quality, household hazardous waste collection, leaf litter pick up information, etc. to help distribute these messages to the community through a variety of avenues.

3. 2022 Outreach Events and Activities:

Stormwater Education Videos

In November 2022, two stormwater educational videos were filmed and put on the Partners website. They focused on general stormwater education and green stormwater infrastructure. Our target audience for these videos were the general public, homeowners, HOA's, developers, and landscapers. These videos can be found on the main page of the Partners website.

Pet Waste/Leaf Litter Media Campaign

Since in-person events and activities were limited during the first half of Permit Year 1, the Partners led a significant media campaign in the fall of 2021 to reach people virtually. These messages were broadcast on billboards, Pandora ads, radio ads, and social media posts. These messages were meant to target not only our Permit area, but the entirety of the Treasure Valley.

One of the messages highlighted was the importance of picking up pet waste, since many people acquired dogs during Covid-19 and there was an increase in trail/Greenbelt usage. This message was broadcast on the radio, pandora, social media, and a billboard.

Figure 1. 2022 Pet Waste Billboard and Pandora graphic

Another message that was broadcast was the importance of raking leaves in your yard and neighborhood. Not only do leaves have the potential to clog storm drains, but they can deliver excess nutrients to the river. This message was broadcast on the radio, pandora, social media, and a billboard.

Figure 2. 2022 Yard Waste Billboard and Pandora graphic

Data from the Pandora advertising showed a total of 84,044 accounts were reached in the region.

Around 600 radio ads were aired on radio stations including KIZN 92.3, KKGL 96.9, KQXR 100.3, KSAS 103.5, KOOL 101.5, KSRV 96.1, KDBI 106.7, KPDA 100.7, Boise State Public Radio, and Radio Boise. Radio ads were broadcast in English and Spanish.

Bus Wrap

Partners coordinated with Valley Regional Transit to create a stormwater educational bus wrap to display on a regional bus from September 13, 2021 to December 5, 2021. This was a general stormwater message of 'Down the drain today, in the River tomorrow'. This is a slogan that is meant to help people understand that stormwater does not get treated before entering a waterway or groundwater.

Figure 3. 2022 Bus Wrap

Idaho IceWorld

The Idaho IceWorld is an indoor ice skating/hockey rink located in Boise. The facility has banner space (dasher boards) along the inside of the rinks for sponsors and other messaging. A stormwater banner was produced and is located at the rink to promote the Partners' message and website.

Figure 4. 2022 Idaho IceWorld banner

Pool Draining Brochure

Due to multiple calls for information on how to drain pools properly, a handout was created to place at local pool/spa stores in Boise and Garden City explaining the guidelines for draining a pool or spa. This will reduce the potential for chlorine and unnecessary background flow getting to the Boise River.

STORMWATER
POLLUTION PREVENTION

Draining Swimming Pools and Spas

Water from swimming pools and hot tubs may contain high levels of chlorine and other chemicals. Keeping these pollutants out of our storm drain system protects our local waterways and the Boise River.

PARTNERS FOR CLEAN WATER

TO DRAIN YOUR POOL OR SPA, please follow these guidelines:

OPTION 1:
USE FOR IRRIGATION

1. Stop adding chemicals
2. Ensure chlorine levels have dissipated and pH is neutral (let water sit for at least a week)
3. Drain all water to landscape or vegetated areas on your property

OPTION 2:
SEWER LINE DISCHARGE

Contact Boise City Public Works Pretreatment Program to discharge water to the sewer system. 208-608-7569

1. Shut off the pool's filtration system and turn off the automatic water fill valve.
2. Find your home's sewer clean-out port to access the sewer line.
3. Run a drainage hose from the sewer clean-out port to the pool and connect it to a submersible pump.
4. Drain the pool. Monitor flow to ensure water does not back up into your home

IF OPTION 1 OR 2 ARE NOT FEASIBLE:

1. Let water neutralize (see Option 1)
2. Drain as much water as possible to landscape or vegetation
3. Contact ACHD to discharge any additional water to a storm drain, 208-387-6250
4. Ensure flow path to the storm drain is swept and free of debris

Saltwater Pools

Saltwater should never enter a storm drain. Always use the sewer system method to drain saltwater pools.

For more information visit
partnersforcleanwater.org
or call **208-608-7565**

Figure 5. Pool draining brochure

2022 Events

Several events were held during Permit Year 1 for stormwater education and outreach purposes.

1. WaterShed Earth Day: The WaterShed held an Earth Day celebration that attracted over 500 people. The topics covered included general stormwater education, yard maintenance, promotion of Partners for Clean Water organization and resources to website.

Figure 6. WaterShed Earth Day Celebration

2. BSU Environmental Studies Course Outreach: This event was coordinated by Boise Parks and Recreation with a BSU class. Partners staff spoke about stormwater pollution reduction, the effects of nitrogen and phosphorus on water quality, and the major water quality issues in the region. A green stormwater infrastructure tour was given around the Harrison Hollow trailhead. After the lesson, students picked up pet waste and conducted some trail maintenance to prevent trail erosion.

3. DEQ Water Education Fair: Partners participated in DEQ's Water Education Fair on 6/28/2022. The event was mostly focused on general stormwater information. Interest was gauged in storm drain marking events, as well as an email sign up list for more information in the future. Partners owns an 'Enviro-scape', a model city that demonstrates the concept of stormwater and stormwater pollution.

Figure 7. Partners table at DEQ Water Education Fair

4. Storm Drain Marking: Several storm drain marking events were conducted in 2022 with local schools. These events are scheduled based on interest and calls from local teachers that are interested in marking storm drains around their respective schools with markers that read ‘DUMP NO WASTE. DRAINS TO RIVER’ or ‘DUMP NO WASTE. DRAINS TO GROUNDWATER’. This reminds the public that they should not be dumping anything in their local storm drains. Partners staff introduce the activity to the students with a stormwater presentation.
   There have been large storm drain marking campaigns in the past. It has been about a decade since the last large campaign to mark storm drains, and now we are seeing these previous markers falling off and needing to be replaced. More attention will be given to storm drain marking events in the coming years, especially in the downtown area and areas closer to the river that are connected to the MS4.

Figure 8. Storm Drain Marking event with local students

4. Assessment

The Partners are in the beginning stages of assessing the public's understanding of our public outreach messages and the adoption of behaviors that reduce stormwater pollution by our target audiences.

Assessment that is currently being conducted includes surveys at events that measure general stormwater knowledge to evaluate which topics are being conveyed already, and which topics need additional messaging and awareness. These surveys also resolve which media avenues are most useful to the respondents to guide our outreach in the future.

Data from website usage, radio ads, and billboard viewership is also used to assess which programs and messages are reaching the most people. The Partners website is updated based on which pages are most viewed and clicked on, in order to make popular topics more accessible (Appendix 1).

The results of these continual assessments constantly shape the future of our public outreach and education programming. Focus will be given to programs that are successful in changing the public's behaviors and practices to reduce stormwater pollution. Other assessment strategies that the Partners are considering for the future include pilot programs, neighborhood focus groups, water quality trends, training assessments, and social media quizzes/polls.

5. Tracking

A tracking spreadsheet is used by the City of Boise to track and maintain all records of our stormwater education and outreach activities, events, and trainings. This spreadsheet is shared with other permittees during regularly scheduled permittee meetings and is open to feedback and discussion. The tracking spreadsheet is used to compile each annual report.

6. Education on SWMP Control Measures

Construction Site Runoff Control Training

To provide the regional construction community with erosion and sediment control and stormwater pollution prevention education, the city and our Partners have developed the Erosion and Sediment Control (ESC) Responsible Person (RP) training and certification program. The class promotes awareness of the impact of polluted construction site runoff and soil erosion on the MS4 and the Boise River. The class curriculum covers local and state stormwater regulations, principles of ESC Best Management Practices (BMPs), installation and maintenance of common erosion and sediment controls, fugitive dust control, stormwater pollution prevention practices, dewatering, how to conduct the required construction site inspections and updating the ESC plan or SWPPP for the site.

The instructors for the City Responsible Person classes must be qualified and approved by the city. Instructors are required to submit a resume to the city detailing their educational history and experience in erosion control. They must also be able to demonstrate knowledge of the principles of erosion; sediment transport; erosion and sediment control technology, implementation, and maintenance; and local and federal ordinances regulating erosion and sediment control.

Courses are offered through third party entities: Engineering with a Mission LLC, Eagle One LLC, Jones Erosion Control, the College of Western Idaho, and Syman Company throughout the year in various locations in the Treasure Valley as well as online offerings. Boise State University's Construction Management Program also presents the class material to their students, who may receive certification if desired. Additionally, the Nampa school district has a vocational construction site program that utilizes the ESC training presentation. The ESC Inspectors also present the RP course quarterly to train local agency personnel involved in construction projects so that they may implement BMPs on public projects and notify ESC Inspectors if they see runoff pollution and other violations at construction sites. As part of the training participants receive education materials including an illustrated ESC Field Guide to Best Management Practices specific to Idaho.

Construction site operators and contractors must renew their RP certification every 3 years by attending the training and passing an examination. The class is updated regularly to present new ideas and methods in ESC and SWPPP. The Planning and Development permitting system maintains a database of certified RPs. The database is utilized by the City of Boise, ACHD, Garden City, the City of Nampa, and City of Caldwell to verify that construction sites have an individual with ESC training onsite. The RP name and contact information is required to be listed prior to permit issuance, and the RP must have operational control to make corrective actions and knowledge to implement BMPs and work with ESC Inspectors to keep sites in compliance.

In 2022, 938 Responsible Person licenses were issued or renewed.

City staff provide ongoing awareness, education and outreach through the website, annual events, and also can provide site specific training as needed to interested parties and industry groups.

Permanent Stormwater Controls Training

The Partners worked with Practical Stormwater Solutions, LLC to develop and conduct a permanent stormwater controls training in September 2022. The goal of this training was to provide guidance to local audiences on the operation and maintenance activities performed on various stormwater facilities. The training emphasized the importance of maintaining stormwater facilities to prevent stormwater pollution. It covered local ordinances, O&M requirements, and context for property O&M agreements.

7. Publicly Accessible Website

The City of Boise, on behalf of the Partners for Clean Water, maintains a website (partnersforcleanwater.org) that educates the public on stormwater issues for multiple audiences. The website is a key source for stormwater information in Boise and the Treasure Valley.

The website contains relevant contacts for each permittee, as well as each permittee's annual reports, SWMPs, and other relevant compliance and regulation materials. The Intergovernmental Agreement (IGA) that outlines permittee responsibilities is posted, as well as the IPDES permit and the MS4 map. Regularly scheduled permittee meeting agendas and meeting notes are also posted.

The website has topics for varying target audiences, such as homeowners, pet owners, engineers, surveyors, developers, mobile businesses, landscapers, and property maintenance companies. Manuals, checklists, fact sheets and guidance documents are organized into the target audience's respective pages. Individual permittee sites are also linked for more information. Information regarding training, events, and other topics pertinent to educating the community on how to reduce stormwater pollution is easily accessible.

The website continues to be an important way to educate our target audiences and provide a central location for public education and permit compliance information. The Partners continuously develop new outreach materials to post on the website and hand out at events. QR codes that link to the Partners website will be used more frequently on outreach materials.

Appendix 1

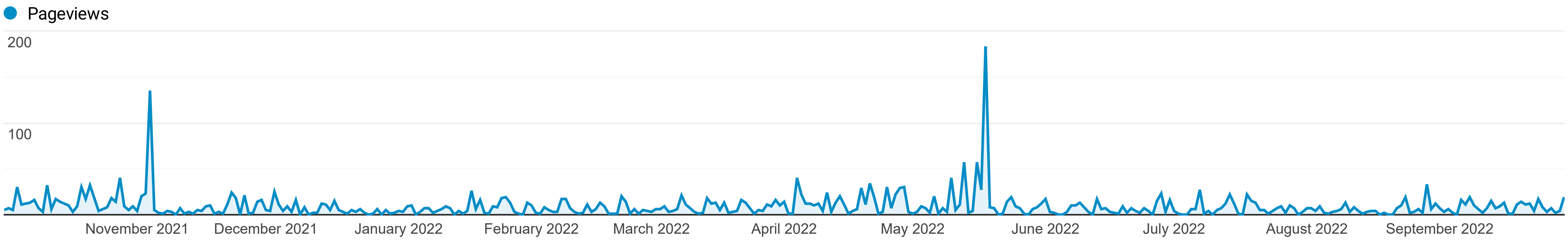
Partners website data

Overview

All Users
100.00% Pageviews

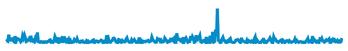
Oct 1, 2021 - Sep 30, 2022

Overview



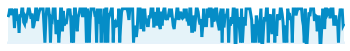
Pageviews
3,376

Unique Pageviews
2,790

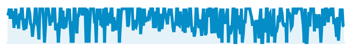


Avg. Time on Page
00:01:32

Bounce Rate
73.52%



% Exit
53.47%



	Page	Pageviews	% Pageviews
1.	/	1,328	39.34%
2.	/aboutpartners/city-of-boise/	175	5.18%
3.	/residents/general-information/	159	4.71%
4.	/aboutpartners/achd/	153	4.53%
5.	/residents/pest-control/gophers/	124	3.67%
6.	/businesses/general-information/	117	3.47%
7.	/report-an-issue/	117	3.47%
8.	/aboutpartners/annual-report/	111	3.29%
9.	/residents/landscaping-gardening-and-home-maintenance/	106	3.14%
10.	/aboutpartners/drainage-district-3/	86	2.55%

Analytics PartnersForCleanWater PartnersForCleanWater

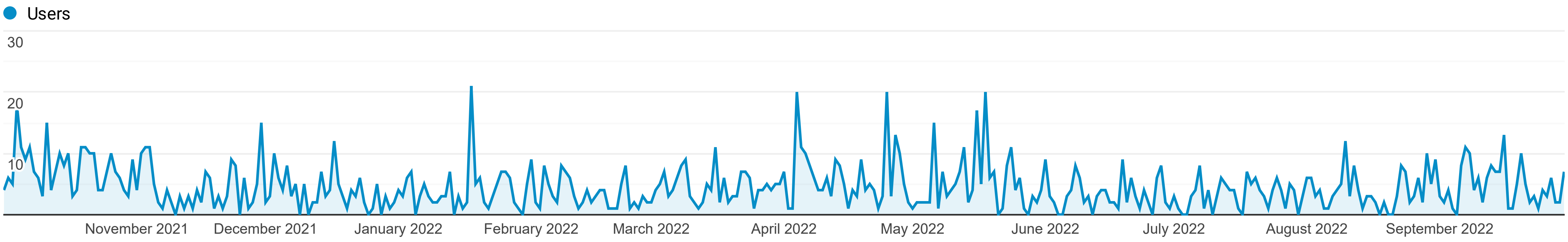
Go to report

Audience Overview

All Users
100.00% Users

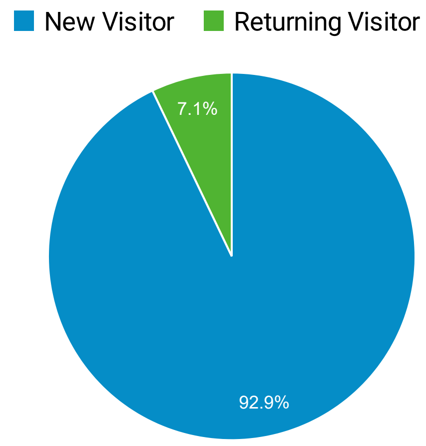
Oct 1, 2021 - Sep 30, 2022

Overview



Users	New Users	Sessions	Number of Sessions per User
1,358	1,346	1,805	1.33

Pageviews	Pages / Session	Avg. Session Duration	Bounce Rate
3,376	1.87	00:01:20	73.52%



	Language	Users	% Users
1.	en-us	1,036	76.29%
2.	zh-cn	255	18.78%
3.	en-us.utf-8	24	1.77%
4.	en	14	1.03%
5.	en-ca	6	0.44%
6.	c	4	0.29%
7.	en-gb	4	0.29%
8.	it-it	3	0.22%
9.	it	2	0.15%
10.	nl	2	0.15%

Analytics | PartnersForCleanWater
PartnersForCleanWater

Go to report

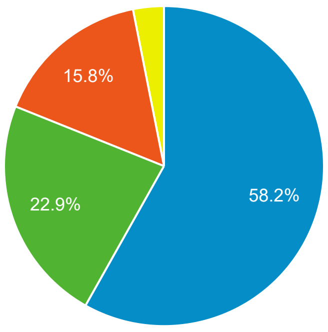
Acquisition Overview

All Users
100.00% Users

Oct 1, 2021 - Sep 30, 2022

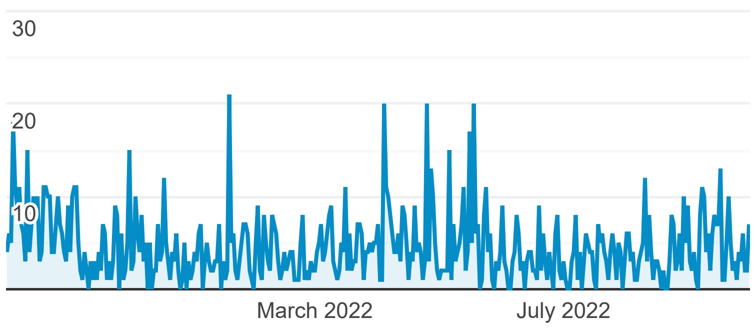
Primary Dimension: Top Channels
Conversion: All Goals
Edit Channel Grouping

Top Channels

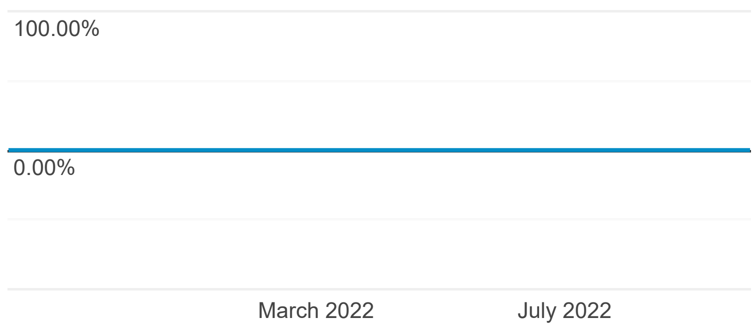


- Direct
- Organic Search
- Referral
- Social

Users



Conversions



	Acquisition			Behavior		
	Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
	1,358	1,346	1,805	73.52%	1.87	00:01:20
1 Direct	802			84.92%		
2 Organic Search	316			58.69%		
3 Referral	218			63.16%		
4 Social	43			95.35%		

Conversions

Set up a goal.

To see outcome metrics, define one or more goals.

GET STARTED

To see all 4 Channels click here.

Attachment D: Dry Weather Outfall Inspection Summary, Map, and Analytical Results WY2022

Table 1. Dry Weather Outfall Inspection Summary October 1, 2021 - September 30, 2022

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
1	2n3e07_006	Fivemile Creek	15	2/11/2022	Good	None	No
2	3n1e01_005	Fitz Lateral	12	2/11/2022	Good	None	No
3	3n1e01_010	North Slough	24	1/13/2022 3/8/2022 7/5/2022 8/9/2022	Good Good Good Good	None None Yes Yes	No No No Yes
4	3n1e01_011	North Slough	6	2/11/2022	Good	None	No
5	3n1e01_016	Eaggers Lateral	12	2/11/2022	Good	None	No
6	3n1e02_005	North Slough	12	2/15/2022	--	None	No
7	3n1e02_012	North Slough	12	2/15/2022	Good	None	No
8	3n1e02_034	Unnamed	12	2/17/2022	Good	None	No
9	3n1e02_036	Sargent Drain	15	2/17/2022	Good	None	No
10	3n1e02_040	Sargent Drain	12	2/17/2022	Good	None	No
11	3n1e03_013	South Slough	8	2/17/2022	Good	None	No
12	3n1e03_017	South Slough	36	12/17/2021 3/8/2022 5/24/2022 7/26/2022	Good Good Good Good	None None Yes None	No No No No
13	3n1e03_019	Sargent Drain	12	2/18/2022	Good	None	No
14	3n1e10_004	Gruber Lateral	18	2/18/2022	Good	None	No
15	3n1e11_004	South Slough	24	2/18/2022	Good	None	No
16	3n1e11_005	Cloverdale Lateral	12	2/22/2022	Good	None	No
17	3n1e11_007	Ridenbaugh Canal	18	2/22/2022	Good	None	No
18	3n1e11_009	Finch Lateral	15	10/29/2021 2/24/2022 3/8/2022 5/24/2022	Good Good Good Good	None None None None	No No No No
19	3n1e11_014	Unnamed	12	2/24/2022	Good	None	No
20	3n1e12_022	Ridenbaugh Canal	12	2/24/2022	Good	None	No
21	3n1e12_023	Ridenbaugh Canal	12	2/24/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
22	3n1e12_024	Ridenbaugh Canal	18	2/25/2022	Good	None	No
23	3n1e12_050	South Slough	6	2/25/2022	Good	None	No
24	3n1e14_005	Huntington Lateral	12	2/25/2022	Good	None	No
25	3n1e14_012	Unnamed	12	3/4/2022 3/34/2022	Good Good	None None	No No
26	3n1e15_001	Ridenbaugh Canal	12	10/22/2021 3/8/2022 5/24/2022	Good Good Good	None None None	No No No
27	3n1e15_005	Fivemile Creek	12	3/4/2022 3/24/2022 7/15/2022	Good Good Good	None None None	No No No
28	3n1e15_008	Ridenbaugh Canal	16	11/18/2021 3/8/2022 5/24/2022 6/23/2022	Good Good Good Good	None None Yes Yes	No No No Yes
29	3n1e15_009	Ridenbaugh Canal	12	3/24/2022	Fair	None	No
30	3n1e15_013	Fivemile Creek	12	3/24/2022 7/15/2022	Good Good	None None	No No
31	3n1e16_013	Fivemile Creek	24	3/24/2022 7/15/2022	Good Good	None None	No No
32	3n1e22_009	Eightmile Creek	12	3/24/2022 7/15/2022	Good Good	None Yes	No No
33	3n1e22_012	Eightmile Creek	12	3/24/2022 7/15/2022	Good Fair	None None	No No
34	3n1e23_004	Fivemile Creek	36	10/22/2021 3/10/2022 7/5/2022 7/13/2022	Good Good -- Good	None None Yes None	No No No No
35	3n1e23_007	Fivemile Creek	12	3/25/2022	Good	None	No
36	3n1e23_010	Fivemile Creek	12	3/25/2022	Good	None	No
37	3n1e23_011	Fivemile Creek	12	3/25/2022	Good	None	No
38	3n1e23_013	Fivemile Creek	12	10/22/2021 3/3/2022 3/10/2022 7/5/2022 7/13/2022	Good Good Good Good Good	None None None Yes Yes	No No No No Yes
39	3n1e24_006	Fivemile Creek	12	3/25/2022	Good	None	No
40	3n1e24_008	Fivemile Creek	0	5/6/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
41	3n2e02_001	Unnamed	12	5/6/2022	Good	None	No
42	3n2e03_001	Boise City Canal	12	5/6/2022	Good	None	No
43	3n2e03_002	Boise City Canal	10	5/6/2022	Good	None	No
44	3n2e03_007	Boise City Canal	6	5/6/2022	Good	None	No
45	3n2e03_016	Boise City Canal	12	5/6/2022	Good	None	No
46	3n2e04_008	Boise River	10	5/6/2022	Good	None	No
47	3n2e04_010	Boise River	36	5/6/2022	Good	Yes	No
48	3n2e04_017	Boise City Canal	6	5/17/2022	Good	None	No
49	3n2e04_021	Boise City Canal	6	5/17/2022	Good	None	No
50	3n2e04_027	Crane Creek	15	7/13/2022	Good	Yes	Yes
51	3n2e05_001	Davis Drain	24	11/5/2021 3/3/2022 3/10/2022 5/17/2022 7/5/2022 7/19/2022	Good Good -- Good Good Good	None None None Yes Yes Yes	No No No No No Yes
52	3n2e05_011	Boise River	18	11/5/2021 3/3/2022 3/10/2022 5/17/2022 6/23/2022	Good Good Good -- Fair	None None None Yes Yes	No No No No Yes
53	3n2e05_012	Thurman Mill Canal	0	5/17/2022	Good	Yes	No
54	3n2e05_013	Settlers Canal	16	7/21/2022	Good	None	No
55	3n2e05_027	Davis Drain	24	1/13/2022 3/10/2022 7/20/2022 8/23/2022	Good Good Good Good	None None Yes Yes	No No No Yes
56	3n2e05_028	Thurman Mill Canal	12	7/21/2022	Good	None	No
57	3n2e05_030	Davis Drain	12	8/23/2022	Good	None	No
58	3n2e05_039	Davis Drain	10	8/23/2022	Good	None	No
59	3n2e05_040	Thurman Mill Canal	12	7/27/2022 8/23/2022	-- Good	None None	No No
60	3n2e05_042	Davis Drain	12	7/21/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
61	3n2e05_043	Davis Drain	12	7/21/2022	Good	None	No
62	3n2e06_006	North Slough	12	7/21/2022	Good	None	No
63	3n2e06_008	North Slough	18	7/21/2022	Good	None	No
64	3n2e06_011	Davis Drain	24	1/13/2022 3/11/2022 6/21/2022	Good Good Good	None None Yes	No No Yes
65	3n2e06_013	North Slough	12	7/21/2022	Fair	None	No
66	3n2e06_019	Davis Drain	24	1/13/2022 3/11/2022 7/20/2022 8/9/2022	Good Good Good Good	None None Yes Yes	No No No Yes
67	3n2e06_021	Davis Drain	12	7/27/2022	Good	None	No
68	3n2e07_001	North Slough	8	7/27/2022	Fair	None	No
69	3n2e07_009	Ridenbaugh Canal	24	12/21/2021 3/3/2022 3/11/2022 7/5/2022 7/13/2022	Good Good Good Good Good	None None None Yes Yes	No No No No Yes
70	3n2e07_020	North Slough	30	12/21/2021 3/4/2022 3/11/22 8/2/2022	Good Good Good Good	None None None Yes	No No No Yes
71	3n2e08_009	North Slough	12	7/8/2022	Good	None	No
72	3n2e08_017	North Slough	12	7/25/2022	Good	None	No
73	3n2e08_018	North Slough	12	7/25/2022	Fair	None	No
74	3n2e08_019	Settlers Canal	24	12/17/2021 3/4/2022 3/29/2022 7/6/2022	Good Good Good Good	None None None None	No No No No
75	3n2e08_023	North Slough	24	7/27/2022	Good	None	No
76	3n2e08_033	South Slough	12	12/21/2021 3/29/2022 7/6/2022	Good Good Good	None None None	No No No
77	3n2e08_034	Unnamed	12	9/26/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
78	3n2e09_024	Boise River	48	2/3/2022 2/10/2022 3/29/2022 3/31/2022 7/5/2022 7/6/2022	Good Good Good Good Good Good	Yes Yes Yes Yes Yes Yes	No Yes No Yes Yes Yes
79	3n2e09_025	Boise River	42	2/3/2022 2/10/2022 3/29/2022 3/31/2022 7/6/2022 7/12/2022	Good -- Good Good Good Good	Yes Yes Yes Yes Yes Yes	No Yes No Yes Yes Yes
80	3n2e09_027	Boise River	10	7/27/2022	Good	None	No
81	3n2e09_028	Boise River	24	7/25/2022	Good	None	No
82	3n2e10_002	Boise City Canal	15	7/25/2022	Good	None	No
83	3n2e10_003	Boise City Canal	15	9/28/2022	Good	None	No
84	3n2e10_010	Julia Davis Pond	12	7/25/2022	Fair	None	No
85	3n2e10_012	Boise River	30	10/29/2021 11/30/2021 4/1/2022 7/5/2022 7/20/2022	Good Fair Good -- Good	Yes None None Yes None	No No No No No
86	3n2e10_019	Boise River		3/31/2022	Good	Yes	Yes
87	3n2e10_022	Boise River	72	12/21/2021 4/1/2022 6/29/2022	Fair Good Good	None None Yes	No No Yes
88	3n2e10_031	Boise River	36	12/3/2021 4/1/2022 8/9/2022	Good -- Good	None None None	No No No
89	3n2e10_037	Boise City Canal	15	12/21/2021 4/8/2022 4/21/2022 7/7/2022 7/20/2022	Good Good -- Good Good	None Yes Yes Yes Yes	No No Yes No Yes
90	3n2e10_038	Boise City Canal	0	7/25/2022	Good	None	No
91	3n2e11_002	Boise City Canal	24	7/27/2022	Good	None	No
92	3n2e13_005	Boise City Canal	12	7/25/2022	Good	None	No
93	3n2e14_002	Logger Creek	12	7/27/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
94	3n2e14_012	Boise River	42	10/20/2021 10/21/2022 4/8/2022 4/20/2022 6/29/2022	Good Good Good Good Good	Yes Yes Yes Yes Yes	No Yes No Yes Yes
95	3n2e14_013	Boise River	30	10/20/2021 4/20/2022 6/29/2022	Good Good Good	None Yes Yes	No Yes Yes
96	3n2e14_017	Boise River	24	11/30/2021 1/18/2022 4/8/2022 4/21/2022 8/1/2022	Good -- Good Good Good	Yes Yes Yes Yes Yes	Yes Yes No Yes Yes
97	3n2e15_004	Ridenbaugh Canal	18	9/28/2022	Good	None	No
98	3n2e15_029	Unnamed	12	8/5/2022	Good	None	No
99	3n2e15_030	Bubb Canal	12	9/28/2022	Good	None	No
100	3n2e16_010	Ridenbaugh Canal	10	8/5/2022	Good	None	No
101	3n2e16_021	Ridenbaugh Canal	18	10/29/2021 4/8/2022 7/5/2022 8/2/2022	Good Good Good Good	None Yes Yes Yes	No No No Yes
102	3n2e16_028	Unnamed	12	8/5/2022	Good	None	No
103	3n2e16_032	Bennett Lateral	12	8/5/2022	Good	Yes	No
104	3n2e17_002	Ridenbaugh Canal		7/8/2022	--	None	No
105	3n2e17_006	Ridenbaugh Canal	12	7/8/2022	Good	None	No
106	3n2e17_013	Rust Lateral	24	1/11/2022 4/8/2022 7/21/2022	Good Good Good	None None None	No No No
107	3n2e17_016	Ridenbaugh Canal	10	10/22/2021 7/6/2022	Good Good	None None	No No
108	3n2e17_017	Farmers Lateral	18	1/11/2022 7/19/2022	Good Good	None Yes	No Yes
109	3n2e17_021	Farmers Lateral	21	1/13/2022 7/19/2022	Fair Good	None Yes	No Yes
110	3n2e17_037	Ridenbaugh Ditch	24	9/26/2022 9/27/2022	-- --	None Yes	No No
111	3n2e17_047	Ridenbaugh Ditch	15	7/8/2022	Good	None	No
112	3n2e17_048	Unnamed	12	8/5/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
113	3n2e17_049	Unnamed	12	8/17/2022	Good	None	No
114	3n2e18_002	Ridenbaugh Canal	36	8/17/2022	Good	None	No
115	3n2e18_013	Farmers Lateral	15	10/22/2021 7/5/2022 7/12/2022	Good Good Good	None Yes Yes	No No Yes
116	3n2e18_015	Farmers Lateral	12	8/17/2022	Good	None	No
117	3n2e19_002	Unnamed	15	7/8/2022	Good	None	No
118	3n2e20_010	Threemile Lateral	0	7/28/2022	Good	None	No
119	3n2e20_022	Unnamed	15	8/17/2022	Good	None	No
120	3n2e21_004	Unnamed	24	7/28/2022	Good	None	No
121	3n2e22_002	Ridenbaugh Canal	15	10/29/2021 7/5/2022	Good Good	None None	No No
122	3n2e22_016	Ridenbaugh Canal	12	8/23/2022	Good	None	No
123	3n2e23_001	Logger Creek	12	8/23/2022	Good	None	No
124	3n2e23_002	Logger Creek	15	11/5/2021 7/20/2022	Good Good	Yes None	No No
125	3n2e23_003	Logger Creek	24	8/23/2022	Good	None	No
126	3n2e23_006	Bubb Canal	12	8/23/2022	Good	None	No
127	3n2e23_014	Bubb Canal	12	8/23/2022	Good	None	No
128	3n2e23_015	Bubb Canal	10	8/23/2022	Good	None	No
129	3n2e24_006	Boise River	12	10/20/2021 4/20/2022 7/7/2022 8/1/2022	-- Good Good Good	None Yes Yes Yes	No Yes No Yes
130	3n2e24_019	Unnamed	0	8/23/2022 9/28/2022	-- Good	Yes None	No No
131	3n2e24_025	Logger Creek	21	10/20/2021 7/19/2022 8/3/2022	Good Good Good	None Yes Yes	No No Yes
132	3n2e24_042	Gallagher Canal	12	9/27/2022	Good	None	No
133	3n2e25_002	Ridenbaugh Canal	18	9/27/2022	Good	None	No
134	3n2e25_003	New York Canal	12	9/27/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
135	3n2e26_002	Ridenbaugh Canal	12	9/27/2022	Good	None	No
136	3n2e27_002	New York Canal	12	9/27/2022	Good	None	No
137	3n2e27_005	New York Canal	24	9/27/2022	Good	None	No
138	3n2e27_007	Unnamed	10	7/28/2022	Fair	None	No
139	3n2e34_001	Fivemile Creek	18	9/27/2022	Good	None	No
140	3n2e36_004	Fivemile Creek-Trib. to	12	9/27/2022	Good	None	No
141	3n2e36_005	Fivemile Creek-Trib. to	12	7/25/2022	Good	None	No
142	3n2e36_009	Fivemile Creek-Trib. to	12	9/27/2022	Good	None	No
143	3n2e36_010	Fivemile Creek-Trib. to	0	9/27/2022 9/28/2022	Good Good	None None	No No
144	3n2e36_014	Fivemile Creek	24	9/27/2022	Good	None	No
145	3n3e19_002	Unnamed	12	10/20/2021	Good	None	No
146	3n3e19_005	Penitentiary Canal	12	8/8/2022	Good	None	No
147	3n3e19_009	Unnamed	12	9/28/2022	Good	None	No
148	3n3e19_013	Unnamed	24	9/27/2022	Good	None	No
149	3n3e29_002	Ridenbaugh Canal	12	8/5/2022	Fair	None	No
150	3n3e31_004	Fivemile Creek - Intermittent	12	7/25/2022	Good	None	No
151	3n3e32_003	Fivemile Creek - Intermittent	15	7/25/2022	Good	None	No
152	4n1e13_001	Eagle Drain	16	9/6/2022	Good	None	No
153	4n1e13_004	Eagle Drain	24	9/6/2022	Good	None	No
154	4n1e13_006	Eagle Drain	48	10/13/2021 4/19/2022 6/16/2022 6/22/2022	-- Good Good Good	None None Yes Yes	No No No Yes
155	4n1e13_007	Eagle Drain	24	10/13/2021 10/29/2021 6/16/2022 6/22/2021	Good Good Good Good	Yes Yes Yes Yes	No No Yes Yes

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
156	4n1e13_009	Eagle Drain	12	11/5/2021 4/19/2022 6/16/2022 7/26/2022	Good -- Good --	None None Yes Yes	No No No Yes
157	4n1e13_010	Eagle Drain	12	11/5/2021 1/11/2022 4/19/2022 6/16/2022 8/2/2022	Good Good Good Good Good	Yes None None Yes Yes	No No No No Yes
158	4n1e13_019	Eagle Drain	12	9/6/2022	Good	None	No
159	4n1e13_020	Eagle Drain	12	9/6/2022	Good	None	No
160	4n1e13_021	Unnamed	10	1/11/2022 4/19/2022 7/6/2022	Good Good Good	None None None	No No No
161	4n1e14_004	Eagle Drain	24	9/6/2022 9/20/2022 9/22/2022	Good Good Good	Yes Yes Yes	No No Yes
162	4n1e14_006	Eagle Drain	30	10/13/2021 10/22/2022 4/28/2022 6/16/2022 6/22/2022	Good Good Good Good Good	Yes Yes None Yes Yes	No Yes No No Yes
163	4n1e14_010	Eagle Drain	12	6/16/2022 10/13/2022 4/19/2022	Good Good Good	None None None	No No No
164	4n1e14_012	Eagle Drain	12	9/6/2022	Good	None	No
165	4n1e23_016	Dry Creek Canal	12	9/13/2022	Good	None	No
166	4n1e24_001	Eagle Drain-lateral of	12	9/6/2022	--	None	No
167	4n1e24_002	Eagle Drain-lateral of	12	9/6/2022	Good	None	No
168	4n1e24_007	Elmore Drain	0	9/20/2022	--	None	No
169	4n1e24_023	Elmore Drain	12	9/13/2022	Good	None	No
170	4n1e24_025	Elmore Drain	12	9/13/2022	Good	None	No
171	4n1e25_036	Warm Springs Canal	12	8/30/2022	Good	None	No
172	4n1e25_040	Unnamed	0	8/30/2022	Good	None	No
173	4n1e26_004	Thurman Mill Canal	15	8/30/2022 9/26/2022	Good Good	None None	No No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
174	4n1e26_007	Settlers Canal	0	11/18/2021 4/19/2022 6/30/2022	Good Good Fair	None None Yes	No No Yes
175	4n1e26_009	Warm Springs Canal	12	8/30/2022	Good	None	No
176	4n1e26_015	Thurman Mill Canal	15	1/11/2022 2/8/2022 2/10/2022 6/9/2022	Good Good Good Good	Yes Yes Yes None	No No Yes No
177	4n1e27_004	Zinger Lateral	10	7/28/2022	Good	None	No
178	4n1e28_005	McMillan Lateral	15	7/28/2022	Fair	None	No
179	4n1e33_007	North Slough	10	8/8/2022	--	None	No
180	4n1e33_008	North Slough	8	8/8/2022	Good	None	No
181	4n1e34_014	North Slough	24	8/8/2022	Good	None	No
182	4n1e34_019	Karnes Lateral	15	12/17/2021 2/1/2022 4/19/2022 4/20/2022 6/9/2022 7/26/2022	Good Good Good Good Good Good	None None Yes Yes Yes None	No No No Yes No No
183	4n1e34_023	Karnes Lateral	12	8/8/2022	Good	None	No
184	4n1e34_025	Karnes Lateral	0	8/8/2022	Good	None	No
185	4n1e35_001	Zinger Lateral	12	2/1/2022 4/19/2022 6/9/2022	Good Good Good	None None None	No No No
186	4n1e35_003	Settlers Canal	8	9/13/2022	Good	None	No
187	4n1e35_011	Unnamed	12	9/20/2022	Removed	None	No
188	4n1e36_001	Settlers Canal	15	9/13/2022	Good	None	No
189	4n1e36_005	Settlers Canal	10	7/28/2022	Good	None	No
190	4n1e36_006	Settlers Canal	24	10/29/2021 4/19/2022 6/9/2022 8/9/2022	Good Good Good Good	None None Yes Yes	No No No Yes
191	4n1e36_008	Settlers Canal	12	7/28/2022	Good	None	No
192	4n1e36_014	Settlers Canal	48	2/3/2022 4/19/2022 6/9/2022 8/3/2022	Good Good Good Good	None None Yes Yes	No No No Yes

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
193	4n2e18_003	Pierce Creek	15	9/6/2022	Good	None	No
194	4n2e18_005	Pierce Creek	15	9/13/2022	Good	None	No
195	4n2e18_007	Eagle Drain	15	9/6/2022	Good	None	No
196	4n2e19_003	Eagle Drain	12	9/6/2022	Good	None	No
197	4n2e19_010	Eagle Drain	15	10/19/2021 4/28/2022 6/16/2022 6/30/2022	Good Good Good Good	Yes Yes Yes Yes	Yes No No Yes
198	4n2e19_013	Eagle Drain	0	9/6/2022	Good	None	No
199	4n2e19_014	Eagle Drain	24	11/18/2021 4/19/2022 6/16/2022	Good Good Fair	None None None	No No No
200	4n2e19_021	Eagle Drain	30	9/13/2022	Good	None	No
201	4n2e19_028	Eagle Drain	12	9/6/2022	Removed	None	No
202	4n2e19_033	Unnamed	10	9/6/2022	Good	None	No
203	4n2e20_007	Polecat Gulch	0	9/20/2022	Good	None	No
204	4n2e20_011	Polecat Gulch	12	9/13/2022	Good	None	No
205	4n2e20_015	Polecat Gulch	24	8/10/2022	Good	None	No
206	4n2e20_019	Polecat Gulch	0	8/10/2022	Good	None	No
207	4n2e20_023	Polecat Gulch	0	9/20/2022	Good	None	No
208	4n2e20_027	Polecat Gulch	0	9/20/2022	Good	None	No
209	4n2e20_028	Polecat Gulch	12	12/3/2021 7/20/2022	Good Good	None None	No No
210	4n2e20_031	Polecat Gulch	0	9/20/2022	Good	None	No
211	4n2e28_010	Stewart Gulch	0	9/20/2022	Good	None	No
212	4n2e29_004	Eagle Drain	24	8/10/2022	Good	None	No
213	4n2e29_006	Farmers Union Canal	12	8/10/2022	Good	None	No
214	4n2e29_011	Lateral 49	12	9/20/2022	Good	None	No
215	4n2e29_015	Boise City Canal	0	9/20/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
216	4n2e29_019	Unnamed	12	9/20/2022	Good	None	No
217	4n2e29_023	Unnamed	12	9/20/2022	Good	None	No
218	4n2e30_007	Stewart Gulch	24	9/20/2022	Good	Yes	No
219	4n2e31_006	Davis Drain	18	2/3/2022 7/6/2022 7/20/2022 9/26/2022 9/27/2022	Good Good Good Good Good	None Yes Yes Yes Yes	No No Yes No Yes
220	4n2e31_023	Davis Drain	12	9/26/2022	Good	None	No
221	4n2e31_030	Thurman Mill Canal	24	7/6/2022 2/8/2022	Good Good	None None	No No
222	4n2e32_010	Farmers Union Canal	12	9/19/2022	Good	None	No
223	4n2e32_011	Farmers Union Canal	15	9/19/2022	Good	None	No
224	4n2e32_014	Farmers Union Canal	12	11/18/2021 6/16/2022	Good Good	None None	No No
225	4n2e32_015	Boise River	24	11/18/2021 6/16/2022 6/22/2022	Good Good Good	None Yes Yes	No No Yes
226	4n2e32_017	Farmers Union Canal	12	9/19/2022	Poor	None	No
227	4n2e33_005	Boise City Canal	12	9/20/2022	Good	None	No
228	4n2e33_010	Boise City Canal	6	8/30/2022	Good	None	No
229	4n2e33_012	Unnamed	12	8/30/2022	Good	None	No
230	4n2e33_015	Boise City Canal	12	8/30/2022	Good	None	No
231	4n2e34_002	Crane Creek	19	9/20/2022	Good	None	No
232	4n2e34_005	Crane Creek	10	9/20/2022	Good	None	No
233	4n2e34_006	Crane Creek	12	9/20/2022	Good	None	No
234	4n2e34_008	Crane Creek	12	12/3/2021 1/18/2022 4/21/2022 7/6/2022 8/3/2022	Good Good Good Good Good	Yes Yes Yes Yes Yes	No Yes Yes No Yes
235	4n2e34_014	Crane Creek	18	9/20/2022	Good	None	No

#	OUTFALL ID	RECEIVING WATER	PIPE DIAMETER	INSPECTION DATE	STRUCTURE CONDITION	FLOW	SAMPLES COLLECTED?
236	4n2e34_019	Crane Creek	15	12/3/2021 1/18/2022 4/21/2022 7/6/2022 8/3/2022	Good Good Good Good Good	Yes Yes Yes Yes Yes	No Yes Yes No Yes
237	4n2e34_022	Crane Creek	36	7/7/2022	--	None	No
238	4n2e34_023	Hulls Gulch	18	9/20/2022	Good	None	No

Notes

-- No data available

[1]Results from sampled sites are found in the Analytical Results Table in Attachment D.

Phase I Inspected and Sampled Outfalls
October 1, 2021 - September 30, 2022

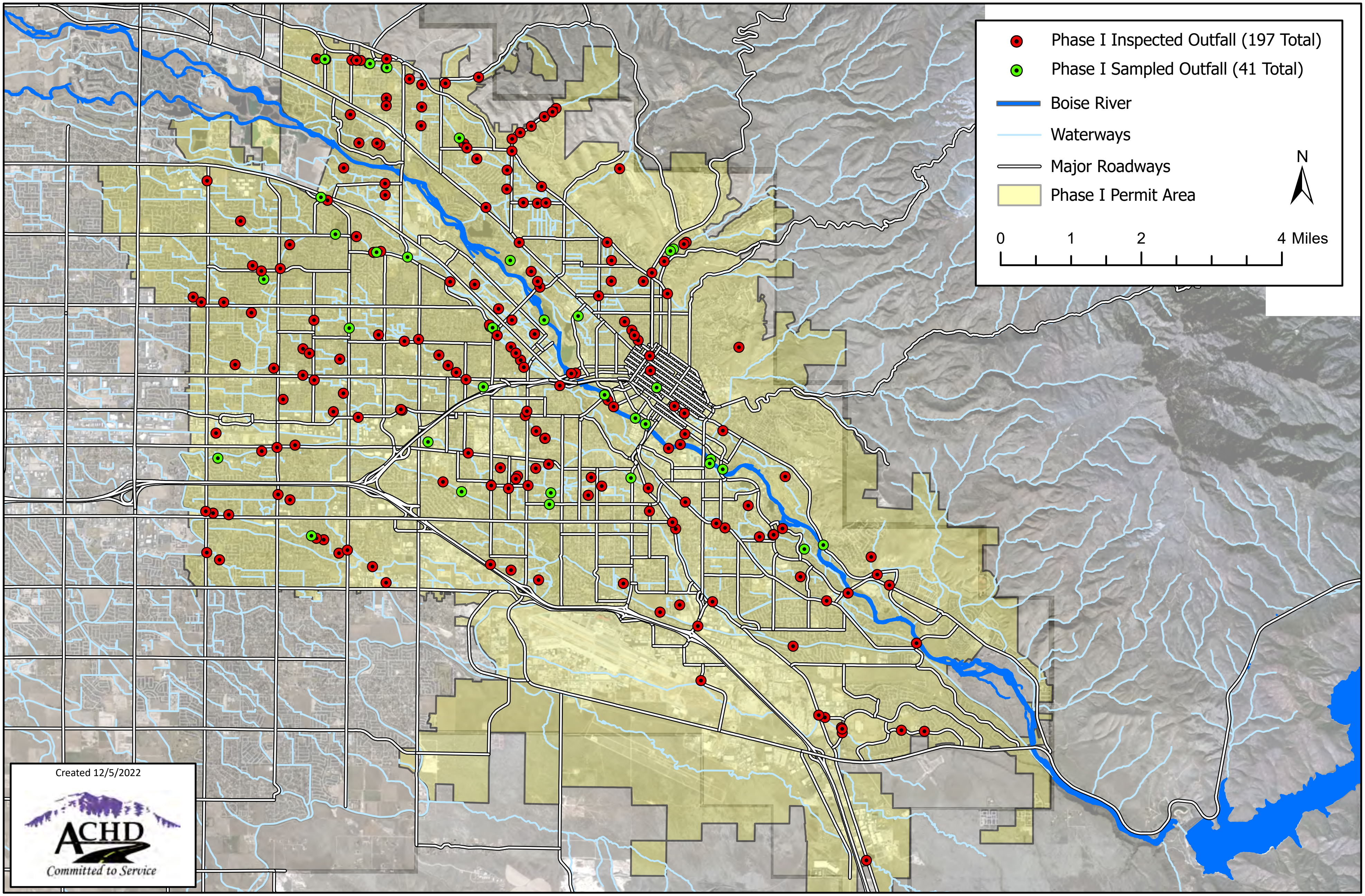


Table 2. Dry Weather Outfall Analytical Results

Monitoring Period	Outfall ID	Receiving Water	Date	Land Use	Drainage Area	Field Parameters								Laboratory Analyses				
						Temp	DO	pH	Cond.	Turbidity	Cl	Cu	Phenols	Surfactants	TSS	DOP	TP	Ecoli
					acre	°C	mg/L	SU	uS	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL
Post Irrigation Time Period 10/1/21 - 3/5/22	4n2e19_010	Eagle Drain	10/19/2021	Res. Old, Public, IR	15	14.15	7.72	5.46	359.3	0.53	<0.1	<0.1	<0.1	0.02	2.47	0.136	0.154	3.1
	4n1e13_007	Eagle Drain	10/19/2021	Res. - New	34.05	15.12	9.21	4.88	0.6	0.2	<0.1	<0.1	<0.1	0.01	<0.900	0.0956	0.0967	<1.0
	3n2e14_012	Boise River	10/21/2021	C/I, Res. - Old	518	14.31	9.27	8.31	722.9	0.6	<0.1	<0.1	<0.1	0.02	<0.900	0.0541	0.0601	3
	4n1e14_006	Eagle Drain	10/21/2021	Res. - New	25	16.64	7.41	7.53	246.1	0.28	<0.1	<0.1	<0.1	0.01	<0.900	0.0719	0.0751	1
	3n2e14_017	Boise River	11/30/2021	C/I, Res. - Old	291.5	14.66	5.79	6.38	371.9	1.82	<0.1	<0.1	<0.1	<0.01	1.1	0.0689	0.103	2419.6
	3n2e14_017	Boise River	1/18/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	461.1
	3n2e14_017	Boise River	1/25/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e14_017	Boise River	2/1/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	4520
	3n2e14_017	Boise River	2/8/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	387.3
	3n2e14_017	Boise River	2/15/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	5540
	3n2e14_017	Boise River	2/22/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	727
																	Geomean[1]	1723.176097
	4n2e34_019	Crane Creek	1/18/2022	Res. - Old	11.37	13.67	8.96	5.94	460.9	0.42	<0.1	<0.1	<0.1	<0.01	6.17	0.207	0.214	46.4
	4n2e34_008	Crane Creek	1/18/2022	Res. - New	1.94	--	--	--	--	0.18	<0.1	<0.1	<0.1	0.01	<0.900	0.235	0.253	<1.0
	3n2e09_024	Boise River	2/10/2022	C/I	855.5	14.38	10.23	7.4	669.18	1.42	<0.1	<0.1	<0.1	0.01	1.17	0.0518	0.0516	22.8
	3n2e09_025	Boise River	2/10/2022	C/I	15.97	11.13	9.77	7.99	188.3	0.44	<0.1	<0.1	<0.1	0.01	<0.900	0.0269	0.0268	32.3
	4n1e26_015	Thurman Mill Canal	2/10/2022	Res. - New	77	7.97	11.04	8.08	334.52	0.29	0.1	<0.1	<0.1	0.01	<0.900	0.149	0.168	<1.0
Pre-Irrigation Time Period 3/5/2022 - 4/30/2022	3n2e09_024	Boise River	3/31/2022	C/I	855.5	17.73	9.01	7.42	578.15	--	<0.1	<0.1	<0.1	0.01	<0.900	0.0564	0.0546	37.9
	3n2e09_025	Boise River	3/31/2022	C/I	15.97	14.1	8.98	8.25	198.49	--	<0.1	<0.1	<0.1	0.01	<0.900	0.0317	0.0228	1
	3n2e10_019	Boise River	3/31/2022	C/I	15.48	12.61	9.54	8.17	568.57	--	<0.1	<0.1	<0.1	0.01	<0.900	0.027	0.0847	8.6
	3n2e14_013	Boise River	4/20/2022	C/I	53.76	13.85	9.08	6.18	307	0.12	<0.1	<0.1	<0.1	<0.01	<0.900	0.0132	0.00849	<1.0
	3n2e14_012	Boise River	4/20/2022	C/I, Res. - Old	518	11.05	9.9	6.97	712.8	2.23	<0.1	<0.1	<0.1	0.02	1.83	0.0295	0.0421	39.3
	3n2e24_006	Boise River	4/20/2022	Res. - New	61.13	8	11.13	7.94	1439.8	1.36	<0.1	<0.1	<0.1	0.02	9.43	0.112	0.123	13.5
	4n1e34_019	Karnes Lateral	4/20/2022	Res. - Old	75.8	10.68	10.4	8.06	132.4	3.26	<0.1	<0.1	<0.1	0.02	27.7	0.0267	0.0425	3.1
	3n2e10_037	Boise City Canal	4/21/2022	C/I	856.73	19.01	6.17	7.54	339.2	2.55	<0.1	<0.1	<0.1	<0.01	2.4	0.0109	0.0294	1
	4n2e34_008	Crane Creek	4/21/2022	Res. - New	1.94	12.53	7.92	7.67	528.6	0.37	<0.1	<0.1	<0.1	0.01	<0.900	0.216	0.22	<1.0
	4n2e34_019	Crane Creek	4/21/2022	Res. - Old	11.37	12.8	8.74	7.58	482.8	0.33	<0.1	<0.1	<0.1	0.01	<0.900	0.194	0.212	4.1
	3n2e14_017	Boise River	4/21/2022	C/I, Res. - Old	291.5	13.800	6.600	7.540	392.300	1.890	<0.1	<0.1	<0.1	0.02	1.770	0.0408	0.0695	1203.3
	3n2e14_017	Boise River	4/28/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	980.4
Irrigation Time Period 5/1/2022 - 9/30/2022	3n2e14_017	Boise River	5/3/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e14_017	Boise River	5/10/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	1890
	3n2e14_017	Boise River	5/17/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	1732.9
																	Geomean[1]	1563.692021
	3n2e14_017	Boise River	5/24/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e14_017	Boise River	5/31/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	1986.3
	3n2e14_017	Boise River	6/8/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e14_017	Boise River	6/15/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	6130
	3n2e14_017	Boise River	6/21/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e14_017	Boise River	6/28/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	5630
																	Geomean[1]	3146.835735
	3n2e06_011	Davis Drain	6/21/2022	Res. - New	81.00	16	8.82	5.56	66.33	2.41	<0.1	<0.1	<0.1	0.01	3.83	0.0172	0.022	185
	4n2e32_015	Boise River	6/22/2022	C/I, Res. - Old	421.31	15.43	8.7	7.23	132.68	2.47	<0.1	<0.1	<0.1	0.01	2.17	0.0283	0.038	115.3
	4n1e14_006	Eagle Drain	6/22/2022	Res. - New	25.00	14.13	7.96	7.22	63.52	0.27	<0.1	<0.1	<0.1	0.01	<0.900	0.0628	0.0722	228.2
	4n1e13_006	Eagle Drain	6/22/2022	Res. - Old	29.8	13.1	8.08	7.58	72.17	2.34	<0.1	<0.1	<0.1	0.01	2.37	0.0253	0.0435	114.5
	4n1e13_007	Eagle Drain	6/22/2022	Res. - New	34.05	15.74	6.09	7.11	428.18	0.35	<0.1	<0.1	<0.1	0.01	1	0.092	0.108	9.7
	3n2e05_011	Boise River	6/23/2022	C/I	97.00	18.04	7.44	8.16	62.19	5.49	<0.1	<0.1	<0.1	0.01	2.77	0.0115	0.019	11
	3n1e15_008	Ridenbaugh Canal	6/23/2022	Res. - New	144.8	20.92	4.71	7.08	82.22	8.33	<0.1	<0.1	<0.1	0.01	12.3	0.0259	0.0645	218.7
	3n2e10_022	Boise River	6/29/2022	C/I, Res. - Old	219.00	21.54	17.17	6.73	718.88	1.63	<0.1	<0.1	<0.1	0.01	0.9	0.0313	0.131	2
	3n2e14_013	Boise River	6/29/2022	C/I	53.76	15.42	7.51	7.27	386.9	0.24	<0.1	<0.1	<0.1	0.01	<0.900	0.0128	0.00758	<1.0
	3n2e14_012	Boise River	6/29/2022	C/I, Res. - Old	518.00	15.92	8.28	7.6	190.46	2.65	<0.1	<0.1	<0.1	<0.01	3.03	0.0257	0.0373	488.4
	3n2e14_012	Boise River	7/5/2022	C/I, Res. - Old	518.00	--	--	--	--	--	--	--	--	--	--	--	--	686.7
	3n2e14_012	Boise River	7/12/2022	C/I, Res. - Old	518.00	--	--	--	--	--	--	--	--	--	--	--	--	101.4
	3n2e14_012	Boise River	7/19/2022	C/I, Res. - Old	518.00	--	--	--	--	--	--	--	--	--	--	--	--	110
	3n2e14_012	Boise River	7/26/2022	C/I, Res. - Old	518.00	--	--	--	--	--	--	--	--	--	--	--	--	86
																	Geomean	200.2139615
	4n2e19_010	Eagle Drain	6/30/2022	Res. Old, Public, IR	15.00	20.41	5.91	7.67	399.02	0.33	<0.1	<0.1	<0.1	0.01	<0.900	0.132	0.15	8.6
	4n1e26_007	Settlers Canal	6/30/2022	Res. - Old	7.37	19.36	7.24	7.93	58.71	5.45	<0.1	<0.1	<0.1	0.01	41.8	0.0161	0.0338	365.4

	3n2e09_024	Boise River	7/5/2022	C/I	855.5	20.31	8.25	7.05	493.57	1.87	<0.1	<0.1	<0.1	0.02	<0.900	0.067	0.0955	148.3
	3n2e09_024	Boise River	7/6/2022	C/I	855.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e09_024	Boise River	7/12/2022	C/I	855.5	--	--	--	--	--	--	--	--	--	--	--	--	139.6
Irrigation Time Period 5/1/2022 - 9/30/2022 continued	3n2e09_024	Boise River	7/19/2022	C/I	855.5	--	--	--	--	--	--	--	--	--	--	--	--	93.3
	3n2e09_024	Boise River	7/26/2022	C/I	855.5	--	--	--	--	--	--	--	--	--	--	--	--	2419.6
	3n2e09_024	Boise River	8/1/2022	C/I	855.5	--	--	--	--	--	--	--	--	--	--	--	--	4.1
																	Geomean[1]	189.5381062
	3n2e09_025	Boise River	7/6/2022	C/I	15.97	--	--	--	--	--	--	--	--	--	--	--	--	25.3
	3n2e09_025	Boise River	7/12/2022	C/I	15.97	21.78	7.59	6.09	67.96	0.25	<0.1	<0.1	<0.1	<0.01	<0.900	0.0316	0.0295	307.6
	3n2e18_013	Farmers Lateral	7/12/2022	Res. - New	112.00	18.46	7.86	7.26	19.67	5.53	<0.1	<0.1	<0.1	<0.01	12.8	0.0151	0.0252	161.6
	3n1e23_013	Fivemile Creek	7/13/2022	Res. - New	7.3	19.4	7.48	7.78	23.02	2.13	<0.1	<0.1	<0.1	<0.01	1.33	0.0134	0.0192	178.5
	3n2e07_009	Ridenbaugh Canal	7/13/2022	C/I, Recreation	64.00	17.49	8.37	7.7	20.74	5.72	<0.1	<0.1	<0.1	<0.01	9.63	0.00899	0.0189	122.3
	3n2e04_027	Crane Creek	7/13/2022	Res. - Old	40.14	--	--	--	--	--	--	--	--	--	--	--	--	98.7
	3n2e05_001	Davis Drain	7/19/2022	Res. - Old	55.00	17.13	8.38	7.58	20.49	2.39	<0.1	<0.1	<0.1	0.01	2.93	0.00789	0.0119	75.9
	3n2e17_017	Farmers Lateral	7/19/2022	Res. - Old	4.98	17.09	8.43	7.04	20.82	1.48	<0.1	<0.1	<0.1	0.01	0.93	0.00887	0.00904	2
	3n2e17_021	Farmers Lateral	7/19/2022	Res. - Old	6.44	17.53	8.64	6.8	21.82	1.36	<0.1	<0.1	<0.1	0.01	<0.900	0.0114	0.0118	1
	3n2e10_037	Boise City Canal	7/20/2022	C/I	856.73	25.54	4.31	7.14	132.55	1.62	<0.1	<0.1	<0.1	<0.01	2.47	0.0152	0.0268	1
	4n2e31_006	Davis Drain	7/20/2022	Res. - Old	7.27	21.17	8.26	7.42	27.78	2.86	<0.1	<0.1	<0.1	0.01	15.6	0.0177	0.0262	307.6
	4n1e13_009	Eagle Drain	7/26/2022	Res. - New	21.28	20.38	6.52	5.73	87.47	0.86	<0.1	<0.1	<0.1	0.02	<0.900	0.181	0.19	209.8
	3n2e24_006	Boise River	8/1/2022	Res. - New	61.13	20.56	7.86	7.49	550.86	3.14	<0.1	<0.1	<0.1	0.02	16.2	0.169	0.169	214.2
	3n2e14_017	Boise River	8/1/2022	C/I, Res. - Old	291.50	19.98	6.84	7.72	102.68	1.84	<0.1	<0.1	<0.1	0.01	1.83	0.0367	0.0496	866.4
	3n2e14_017	Boise River	8/8/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	178
	3n2e14_017	Boise River	8/15/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	146.7
	3n2e14_017	Boise River	8/18/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	53
	3n2e14_017	Boise River	8/22/2022	C/I, Res. - Old	291.5	--	--	--	--	--	--	--	--	--	--	--	--	110
Irrigation Time Period 5/1/2022 - 9/30-2022 Continued																	Geomean	167.5125782
	3n2e07_020	North Slough	8/2/2022	C/I	326.51	20.06	7.77	7.94	25.27	2.24	<0.1	<0.1	<0.1	0.01	3.97	0.0138	0.0189	142.1
	3n2e16_021	Ridenbaugh Canal	8/2/2022	C/I, Res. - Old	81.5	24.44	8.27	7.67	241.31	0.45	<0.1	<0.1	<0.1	0.01	<0.900	0.181	0.196	<1.0
	4n1e13_010	Eagle Drain	8/2/2022	Res. - New	57.86	18.74	4.2	7.84	175.44	0.38	<0.1	<0.1	<0.1	0.01	<0.900	0.0865	0.0906	172.2
	4n2e34_019	Crane Creek	8/3/2022	Res. - Old	11.37	21.1	7.6	7.58	101.04	10.1	<0.1	<0.1	<0.1	0.03	25.2	0.19	0.233	<1.0
	4n2e34_008	Crane Creek	8/3/2022	Res. - New	1.94	19	8.1	7.66	189.63	1.8	<0.1	<0.1	<0.1	0.02	35.9	0.389	0.404	<1.0
	3n2e24_025	Logger Creek	8/3/2022	Res. Old, Public	51.4	21.9	7.26	7.69	132.35	1.5	<0.1	<0.1	<0.1	0.01	60.6	0.1	0.126	48
	3n2e06_019	Davis Drain	8/9/2022	C/I, Res. - Old	7.73	20.68	7.49	5.25	26.76	2.12	<0.1	<0.1	<0.1	<0.01	10.5	0.00973	0.0175	14.6
	4n1e36_006	Settlers Canal	8/9/2022	Res. - Old	19.00	19.12	7.83	5.49	26.42	3.18	<0.1	<0.1	<0.1	<0.01	11	0.0141	0.0253	114.5
	3n1e01_010	North Slough	8/9/2022	Res. - New	261.64	19.36	8.31	5.77	25.76	2.03	<0.1	<0.1	<0.1	0.01	2.27	0.0124	0.0186	218.7
	4n1e36_014	Settlers Canal	8/23/2022	Res. - Old	69.76	21.46	7.98	6.52	45.74	2.65	<0.1	<0.1	<0.1	0.01	74.4	0.0329	0.0538	93.3
	3n2e05_027	Davis Drain	8/23/2022	C/I, Res. - New	66.64	18.63	8.6	5.99	32.95	3.26	<0.1	<0.1	<0.1	0.01	49.1	0.0126	0.0477	770.1
	3n2e05_027	Davis Drain	8/30/2022	C/I, Res. - New	66.64	--	--	--	--	--	--	--	--	--	--	--	--	238.2
	3n2e05_027	Davis Drain	9/6/2022	C/I, Res. - New	66.64	--	--	--	--	--	--	--	--	--	--	--	--	410.6
	3n2e05_027	Davis Drain	9/12/2022	C/I, Res. - New	66.64	--	--	--	--	--	--	--	--	--	--	--	--	248.1
	3n2e05_027	Davis Drain	9/19/2022	C/I, Res. - New	66.64	--	--	--	--	--	--	--	--	--	--	--	--	185
																	Geomean	321.9150371
	4n1e14_004	Eagle Drain	9/22/2022	Res. - New	17.7	17.67	6.58	6.38	206.7	1.23	<0.1	<0.1	<0.1	0.02	85.3	0.163	0.2	5.1
	4n2e31_006	Davis Drain	9/27/2022	Res. - Old	7.27	19.5	8.49	5.66	94.9	1.8	<0.1	<0.1	<0.1	0.01	1.93	0.0141	0.0178	27.2
Benchmark						<19	>6	6.5 - 9	50-1500	<50	<0.011	<1	<21	0	<80	<0.07	<0.07	<406
Evaluation Point						--	--	--	< 55 / >1350	>45	0.0099	0.9	18.9	>0	72	0.063	0.063	365.4

Notes

-- No data available

[1] *Geomean value is biased low due to >2419.6 MPN and >1.0 MPN Lab Result*

Red *values indicate a detection above the benchmark level.*

Attachment E: Phase I MS4 Permit Annual Report Form Responses

APPENDIX E

PHASE I MS4 PERMIT ANNUAL REPORT RESPONSES

List All Receiving Water(s) For the MS4 Discharges:

See Attachment A of this report for Phase I permit area receiving waters and outfall ownership.

Section II. Permittee Responsibility:
Please answer all questions. If the answer is "No," or "Not Applicable" and no other direction is provided, use the Comments field at the end of this section to explain the reason and the expected date(s) that the requirement will be met, and/or to explain why the requirement does not apply.

*1 - The Amended and Restated Intergovernmental Agreement for Roles and Responsibilities Under the NPDES Permit #IDS027561 and Operating Guidelines were updated in September 2022 and executed in December 2022. These documents are available in ACHD's SWMP, Appendix A.

*2 - ACHD works cooperatively with other State and local entities as described in the ACHD Stormwater Management Program (SWMP) Table 9, Coordinated Compliance Activities.

*5 - A budget summary of annual expenditures for reporting year 1 (fiscal year 2022), and estimated expenditures for reporting year 2 (fiscal year 2023) is provided in this annual report, Attachment B. The numbers reflect those of the Environmental Department and Maintenance Department, the two primary groups responsible for Permit implementation. Environmental personnel expenditures for FY 2021-2022 consist of nine Full-Time Equivalent (FTE) positions and one student intern. The FY 2021-2022 expenses and the budget for FY 2022-2023 include Maintenance staff, equipment and materials, and contract costs associated with street sweeping, storm drain cleaning, and basin maintenance. Stormwater related FTEs in the Maintenance Department include 14 FTEs dedicated to stormwater system cleaning and maintenance, and 26 FTEs dedicated to street sweeping activities. These maintenance positions also perform maintenance activities such as utility pot-holing, chip removal during chip sealing activities (June – August), and winter maintenance as weather conditions demand. Stormwater related capital project expenditures and budget are not included in these financials. Permittee cost share reimbursements are also not included.

*7 - ACHD implements the Phase I and Phase II SWMPs throughout Ada County. City annexations, if any, are evaluated annually and mapping updated. Whereas City boundaries may change slightly, this does not impact ACHD's overall jurisdiction and implementation of control measures.

Section III. Status of SWMP Control Measures
Please answer all questions for each SWMP control measure and associated component activity. In the Comments field, cite any relevant information and/or statistics that helps illustrate the Permittee's implementation of the required action/activity.

If the answer is "No," use the Comments field to explain the reason, and outline the expected dates that the requirement will be met.

If the requirement does not apply to the Permittee's organization, mark "NA" and explain why it does not apply in the Comments field.

Public Education, Outreach and Involvement Program (Permit Part 3.1)

Comments on Public Education, Outreach, and Involvement Program:
Use this Comments field to explain or discuss unique implementation schedules, summarize nature of the education, outreach, and public involvement activities conducted during the reporting period

*8 – ACHD conducts education, outreach, and involvement activities throughout Ada County. Additionally, the City of Boise is the lead Permittee responsible for implementing the education, outreach and involvement activities required by the Permit throughout the Phase I permit area, according to the Intergovernmental Agreement and Operating Guidelines provided in ACHD's SWMP, Appendix A. A comprehensive summary of the 2022 Public Education, Outreach and Involvement Program is provided in this Annual Report, Attachment C.

*9 – Check mark specifies elected officials were a target audience, not land use policy and planning staff.

*11 – In addition to the Partners for Clean Water messaging provided in Attachment C, ACHD staff address education and outreach on stormwater topics through daily interactions with the public, contractors, and other agencies throughout Ada County. The primary methods of distributing stormwater education materials are through verbal communication, websites, and fact sheets. The ACHD maintains an inventory of fact sheets that address the following topics:

- General stormwater education.
- Permanent stormwater control maintenance and inspection.
- Best management practices for construction activities, dewatering, landscape maintenance, sidewalk and street cleaning, automobile maintenance, pest control, and mobile businesses; and
- Identification and reporting of stormwater pollution.

Fact sheets are available on the ACHD website and PDF files are frequently emailed or distributed to the public via hardcopy in response to questions and complaints.

*12 – Current assessment of public education and outreach understanding is described in Attachment C (Section 4, pg.9) of this report.

*14 – The ACHD offers educational and technical resources to residents, homeowner's associations, property management groups, and the design, construction and development communities. These resources address design, inspection, maintenance, and identification of permanent stormwater controls and include ACHD Policy 8200 – Stormwater Design Manual, Inspection Checklist for Basins and Swales, and Caring for Neighborhood Basins and Swales factsheet. Distribution of permanent stormwater control resources is typically conducted verbally and by email and ACHD provides access to the ACHD Policy Manual and factsheets on the ACHD website.

Illicit Discharge Detection and Elimination Program (Permit Part 3.2)

Comments on Illicit Discharge Detection and Elimination Program:
Use this Comments field to explain any unique implementation schedules, highlight investigation results or follow-up actions, discuss subsequent enforcement actions, etc. that were conducted during the relevant reporting period.

*21 - Only 21 of the 41 illicit discharge or potential illicit discharge complaints received in the Phase I permit area originated from the public. The remaining complaints were received from ACHD staff and/or routed through other agencies/departments.

*22 &*23 - A location map depicting where the illicit discharges occurred, a list of complaints received, and a summary of follow-up actions taken are included in Appendix F of the Phase I SWMP. Table 11 in the Phase I SWMP summarizes complaints received by pollutant type and category.

*26 – The Phase I permit area outfall inventory and map is included in the Phase I SWMP, Appendix D.

*28 – A total of 238 outfalls were screened during the reporting period. Forty-one of the 238 outfalls were flowing during dry weather and sampled. A map of the outfalls sampled, outfall inspection summary, and analytical results for reporting year 1 (October 1, 2021 – September 31, 2022) are provided in this annual report, Attachment D.

*29 - Phase I MS4 outfall locations with confirmed irrigation or groundwater dry weather flows are listed in the Phase I SWMP, Appendix D.

*31 - ACHD provides educational Fact Sheets to the public and directs the public to the Partners for Clean Water website (https://www.partnersforcleanwater.org/) and ACHD's website (http://www.achdidaho.org/Departments/Engineering/Stormwater/pubOutreach.aspx) for information on proper waste disposal and pollution prevention measures for routine activities around the home and yard. ACHD has developed several waste material collection, storage, and disposal planning and guidance documents for internal staff for ACHD facilities such as the Cloverdale Waste Management Plan, Adams Waste Management Plan, and ACHD site specific stormwater management pollution prevention plans. The ACHD Maintenance and Operations Stormwater Best Management Practices (BMPs) Manual was developed to document the BMPs used by ACHD Maintenance and Traffic Operations staff depending on the work activity being performed and as a training resource for new Maintenance and Operations staff.

Construction Site Runoff Control Program (Permit Part 3.3)

Comments on Construction Site Runoff Control:
Use this Comments field to explain unique implementation schedules, summarize the number of site inspections, follow-up actions, and/or any subsequent enforcement actions, etc that were conducted during the relevant reporting period.

*37 – The Construction Site Discharge Control (CSDC) Enforcement Response Policy (ERP) was revised in May 2022 and approved by the ACHD Commission in September 2022 for incorporation into the CSDC Program and ACHD Policy. The CSDC ERP is available in this annual report, Attachment F.

ACHD implements the Construction Site Runoff Control Program county-wide. In reporting year 2021-2022, qualified ACHD staff reviewed 191 Site Specific Erosion and Sediment Control (ESC) Plans in the Phase I permit area. Sixty-six construction site ESC inspections were conducted by ACHD staff or ACHD contractors in the Phase I permit area during the 2021-2022 reporting year. Of the 66 inspections conducted, 46 did not require additional follow-up actions and 20 required corrective actions by the construction site responsible person. ACHD issued one Notice of Violation (NOV) as a result of these inspections. Attachment G to this annual report provides a summary of ESC plan reviews and inspections by month and a map illustrating the locations of these activities.

Post Construction Stormwater Management in New Development & Redevelopment (Permit Part 3.4)

> ***41.b This Permittee organization cooperates in the implementation of the Green Infrastructure Strategy to employ innovative approaches to control stormwater quality and quantity in the Lower Boise River watershed.*** *Use this field below to describe any relevant Permittee actions during the reporting period, as applicable.*

In 2017, ACHD included Green Stormwater Infrastructure (GSI) Best Management Practices (BMPs) into ACHD's stormwater management design standards and has since programmed funding for GSI implementation annually. All new, rebuilt, and retrofitted ACHD stormwater basins are vegetated to mitigate stormwater pollutants and GSI opportunities are explored for all new roadway projects. In the Phase I Permit area, ACHD owns and actively manages 66 stormwater tree cells and 30 vegetated basins and bioretention swales. ACHD works cooperatively through an agreement with the City of Boise to maintain stormwater tree cells located in the Greater Downtown Boise Area (Phase I SWMP, Appendix A). ACHD maintains and cleans the stormwater tree cell inlets and distribution pipe and the City of Boise maintains the soil and trees. In reporting year 2021-2022, four basins were selected for improvements and 12 GSI projects were designed or constructed. ACHD continues development and implementation of the GSI Program through piloting and refining strategies and processes to improve the success of newly constructed GSI facilities and basin retrofits. GSI Program updates and project descriptions are provided in Attachment H of this annual report in the following tables:

- Table 1 – Phase I ACHD-Owned Vegetated Basins and Bioretention Swales 2016-2022
- Table 2 – Phase I ACHD Basin Improvement Projects 2021-2022
- Table 3 - GSI Projects Designed or Constructed 2021-2022
- Table 4 – Phase I ACHD GSI Program Updates 2021-2022

More information on activities ACHD conducts to address requirements for post-construction stormwater management for new development and redevelopment is described in the Phase I SWMP, Section 5.4.2.2.

*42 - ACHD has not specifically identified permanent stormwater controls (PSCs) at new development and redevelopment sites (of at least one or more acres) as "high priority" for annual inspection. Development of this SWMP control measure will be implemented as required in Permit Part 3.4.5. no later than April 3, 2026.

> ***Comments on Post Construction Stormwater Management in New Development and Redevelopment***
> *Use this Comments field as necessary to explain any unique implementation schedules, summarize inspections, actions, etc. that were conducted during the relevant reporting period.*

A description of ACHD's current compliance activities for plan review, inspections, and maintenance of PSCs are summarized in the Phase I SWMP, Section 5.4.2. Inspection of PSCs varies depending on several factors. These factors include stage of development (under construction or existing), if the PSC can be inspected from the surface or subsurface, and ownership of the PSC.

Inspection and Maintenance Activities

ACHD Subdivision Inspectors perform inspections on PSCs under construction in new subdivisions during three periods: construction/installation, post construction, and at the end of the two-year warranty period. ACHD will not accept roadways within a subdivision unless PSCs are functioning as designed. During reporting year 2021-2022, 139 PSC related inspections were conducted within the Phase I permit area by Subdivision

Inspection staff. ACHD Project Inspectors also perform inspections on ACHD capital projects. The inspections focus on ensuring the PSC is installed/constructed according to the ACHD capital project design plans.

Maintenance staff perform ongoing maintenance and inspection of existing PSCs in the ACHD right-of-way. Stormwater facilities such as storm drain inlets, pipes, sand and grease traps, and ACHD-owned basins are maintained according to ACHD designated maintenance areas (228 in Ada County). Privately-owned surface PSCs that accept right-of-way runoff, such as basins and swales, are inspected and maintained on a complaint basis and as needed. Drainage maintenance activities performed by ACHD crews during reporting year 2021-2022 are detailed in the Phase I SWMP, Table 15.

Environmental staff oversee a Basin and Swale Revegetation Maintenance Services contract annually, for revegetation inspection and maintenance services of select ACHD-owned vegetated basins and swales. In reporting year 2021-2022, 619 inspection/maintenance activities were performed on ACHD facilities under this contract. Lastly, seven inspections were performed on Homeowner Association (HOA) basins that have been prioritized as high priority due to the possibility of discharge to surface waters in the Phase I permit area.

Stormwater Infrastructure and Street Management (Permit Part 3.5)

Comments on Stormwater Infrastructure and Street Management
Use this Comments field as necessary to explain any unique implementation schedules, summarize inspections, actions, etc. that were conducted during the relevant reporting period

*47 - ACHD is committed to compliance and data collection necessary to optimize efficiency and effectiveness of this program. ACHD implements a county-wide inspection and cleaning program. The program is conducted according to ACHD designated maintenance areas (228 in Ada County). Inspection and cleaning are completed in one maintenance area before moving to another or on a complaint basis. In reporting year 2021-2022, a total of 2,229 storm drain inlets were inspected or cleaned in the Phase I area. The 2,229 storm drain inlets represent approximately 17% of all inlets in the Phase I permit area. A summary of drainage maintenance activities conducted by ACHD crews during reporting year 2021-2022 are listed in Table 15, Phase I SWMP. Since May 2022, ACHD has worked with a consultant to evaluate the inlet cleaning and inspection program with the goal of increasing efficiency and effectiveness of the program through a maintenance prioritization and implementation schedule to meet Permit requirements. A technical memo documenting the findings of the evaluation was completed in December 2022 (step 1) and a final implementation plan for ACHD's Inlet Inspection and Cleaning Program is expected by March 2023. Key outcomes of this evaluation that will increase operation efficiency and effectiveness in 2023 are 1) inlet prioritization based on connection to the Phase I MS4 (more work concentrated in high priority areas, 2) development of a field app tailored for inspection and cleaning operations, and 3) dedicated inspection staff.

*49 and *53 – ACHD currently operate two maintenance yards and four equipment and material storage areas within the Phase I Permit area. The location of these facilities and maintenance yard Stormwater Pollution Prevention Plans (SWPPPs) are in the Phase I SWMP, Appendix C and Appendix I, respectively.

*50 – ACHD is excited to report that reporting year 2021-2022 was the first year ACHD was able to analyze a year-long record of electronic sweeping data based on automated vehicle locating (AVL) systems installed on 10 of the 16 ACHD sweepers that operate in the Phase I permit area. The AVL data is obtained using global positioning system (GPS) satellites and enables staff to calculate the frequency of sweeping to meet Permit required schedules based on roadway type (Permit Part 3.5.5.1). Based on AVL data on 10 sweepers that operated during the complete reporting year 2021-2022, ACHD accomplished between 62%-66% of compliance sweeping goals depending on roadway type. Of the six sweepers that were only operating for part of the year, three were added to the sweeper fleet in March of 2022, one in April 2022 and two in June 2022. The new sweepers are scheduled to be installed with AVL systems. As with the inlet cleaning and inspection ACHD is committed to meeting compliance requirements. This includes conducting an evaluation of the sweeping program and updating the ACHD Street Sweeping Plan early this year. This evaluation will build upon the inlet prioritization analyses and lessons learned through the inlet inspection and cleaning evaluation described in question 47. Similar to the inlet inspection and cleaning program, the goal of the sweeping program will be to meet compliance goals by increasing effectiveness and efficiencies in operation. A description of the street sweeping plan will be available in the Phase I SWMP no later than April 3, 2026.

*51 and *52 - Section 5.5 of the Phase I SWMP describes activities ACHD implements to address pollution prevention and good housekeeping for MS4 operations. Winter maintenance materials and fertilizer, herbicide, and pesticide usage are presented in Table 17 and Table 18, respectively. ACHD will review, update, and develop planning and guidance documents and implement as needed to ensure ACHD's stormwater infrastructure and management program includes the required SWMP control measure components described in Permit Parts 3.5.2 through 3.5.10.

*53 – SWPPPs for ACHD maintenance yards in the Phase I permit area have been updated recently; the Cloverdale Maintenance Facility SWPPP was updated in November 2020 and the Adam's Street Maintenance Facility in March 2021. Site-specific SWPPPs will be developed for material storage facilities in the Phase I permit area by April 3, 2026.

Industrial and Commercial Stormwater Discharge Management (Permit Part 3.6)

55. This Permittee organization maintains an inventory of industrial & commercial facilities within the Permit Area, and inspects such facilities on a prioritized basis as required by Permit Part 3.6.

Use this comment box to summarize Permittee activities related to Permit Part 3.6.

ACHD's jurisdiction is limited to public right of way and does not include private property. To implement the commerical and industrial monitoring program, ACHD contracts with the City of Boise and City of Garden City to maintain an inventory of industrial and commercial facilities described in Permit Part 3.6.2. A narrative description of the inventories and additional information on ACHD's Industrial and Commercial Stormwater Discharge Management Program is provided in the Phase I SWMP, Section 5.6. An inspection summary table and facility inspection reports for reporting year 2021-2022 are in the Phase I SWMP, Appendix J.

Section V. Response to Excursions Above Idaho Water Quality Standards

58. Provide a summary of the Permittee's efforts to date that address the MS4 discharges contributing to the original water quality excursion, including the results of any monitoring, assessment, or evaluation efforts conducted during the reporting period.

Not Applicable

Temperature Monitoring (Permit Part 4.1) and Stormwater Monitoring and Evaluation Program (Permit Part 6.2)

ACHD, on behalf of the Permittees, continued to conduct wet weather stormwater monitoring and subwatershed monitoring as required under the Stormwater Monitoring and Evaluation Program requirements in Permit Part 6.2. Annual monitoring summaries for activities conducted in reporting year 2021-2022 are provided in the following attachments to this annual report:

Attachment I - Stormwater Outfall Monitoring Summary WY 2022
Attachment J - Americana Subwatershed Monitoring Summary WY 2022
Attachment K - Temperature Monitoring Summary WY 2022

Additional monitoring activities included in reporting year 2021-2022 includes an update to the Stormwater Outfall Monitoring Plan and NPDES Phase I Temperature Monitoring Approach. These documents are provided as Attachment L to this report.

59. List any attachments submitted as part of the Annual Report:

Note: Part 6.2.1 requires an updated *Stormwater Outfall Monitoring Plan* to be submitted as part of the Year 1 Annual Report, due January 30, 2023.

Attachment A - Phase I Receiving Waters and Outfall Ownership
Attachment B - NPDES Budget Summary
Attachment C - 2022 Public Education, Outreach and Involvement Program
Attachment D - Dry Weather Outfall Inspection Summary, Map, and Analytical Results WY 2022
Attachment E - Phase I MS4 Permit Annual Report Form Responses
Attachment F - CSDC Enforcement Response Policy
Attachment G - Erosion and Sediment Control Reviews, Inspections, and Map
Attachment H - ACHD Vegetated Basins, Bioretention Swales, and GSI Program Activities
Attachment I - Stormwater Outfall Monitoring Summary WY 2022
Attachment J - Americana Subwatershed Monitoring Summary WY 2022
Attachment K - Temperature Monitoring Summary WY 2022
Attachment L - Stormwater Outfall Monitoring Plan and NPDES Phase I Temperature Monitoring Approach

Attachment F: Construction Site Discharge Control Enforcement Response Policy

CONSTRUCTION SITE DISCHARGE CONTROL ENFORCEMENT RESPONSE POLICY

ADA COUNTY HIGHWAY DISTRICT
3775 ADAMS STREET
GARDEN CITY IDAHO 83714
PHONE: 208-387-6264
FAX: 208-387-6391

(REVISED MAY 2022)

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ACRONYMS

ACHD	Ada County Highway District
BMP	Best Management Practice
CGP	Construction General Permit
CSDC	Construction Site Discharge Control
ERP	Enforcement Response Policy
ESC	Erosion Sediment Control
IDDE	Illicit Discharge Detection Elimination
IDEQ	Idaho Department of Environmental Quality
IPDES	Idaho Pollutant Discharge Elimination System Discharge Permit
NOV	Notice of Violation
NPDES	National Pollution Discharge Elimination System
ROW	Right of Way
RP	Responsible Person
SWO	Stop Work Order
SWPPP	Stormwater Pollution Prevention Plan
SWQS	Stormwater Quality Specialist

1. INTRODUCTION

This Construction Site Discharge Control (CSDC) Enforcement Response Policy (ERP) provides guidance to Ada County Highway District (ACHD) staff who respond to non-compliance issues with relation to the CSDC Program and related ACHD Policies. The following document outlines the CSDC Program, ACHD's legal authority, staff roles and duties, factors influencing enforcement actions, and type of enforcement actions and processes. The approach described in this document is based on a tiered system of enforcement.

1.1 PURPOSE

ACHD implements and enforces the CSDC Program throughout Ada County to fulfill National Pollutant Discharge Elimination System Permit (NPDES Permit) requirements. ACHD is regulated through a NPDES Phase I Permit (IDS027561) that covers the Boise and Garden City area and a Phase II NPDES Permit (IDS0281185) that covers the cities of Eagle, Meridian, and urbanized Ada County. To comply with the NPDES Permits, ACHD must develop, implement, and maintain a written escalating ERP or plan appropriate to its organization's CSDC Program (NPDES Permit 3.3.6). The ERP must:

- Address enforcement of construction site runoff controls for all construction projects in ACHD's jurisdictions, to the extent allowable under Idaho state law (NPDES Permit 3.3.6.1).
- Describe ACHD's potential response to violations with appropriate educational or enforcement responses (NPDES Permit 3.3.6.2).
- Address repeat violations through progressively stricter responses, as needed, to achieve compliance (NPDES Permit 3.3.6.2).
- Describe how ACHD will use its available techniques to ensure compliance, such as: verbal warnings; written notices; escalated enforcement measures such as stop work orders, monetary penalties; and/or other escalating measures to the extent allowable under Idaho state law (NPDES Permit 3.3.6.2).

1.2 CONSTRUCTION SITE DISCHARGE CONTROL PROGRAM OVERVIEW

ACHD implements the CSDC Program through ACHD Policy (Policy) 6000, Permits and Inspection, and Policy 8300, Construction Site Discharge Control Program. Any person who desires to perform any work on a highway or public right-of-way (ROW) or encroaches on a highway or public ROW shall first apply for and obtain a Temporary Highway Use Permit or "permit" through ACHD (Policy 6007.1.1). Additionally, any person desiring to develop and construct a new subdivision which will have infrastructure dedicated to ACHD shall, prior to commencing work, be required to enter into a Subdivision Inspection Agreement and a Subdivision Improvement Agreement (Policy 6007.19.1). The contractor performing the work shall be required to obtain a permit pursuant to Policy (Policy 6007.19.2). All permit applicants must provide an approved Erosion and Sediment Control (ESC) Plan for the proposed work before a permit can be obtained by the applicant (Policy 8303.1). An ESC Plan means a plan, either a Small Project ESC Plan or a Site Specific ESC Plan, containing provisions, at a minimum, addressing material containment, pollutant spill prevention and setting forth best management practices (BMPs) to be utilized during construction activity or land disturbing activity. Site Specific ESC Plans must be reviewed by ACHD for completeness before the plan is approved. All permit applicants must also designate a Responsible Person (RP) who serves as the point of contact for all ESC issues. A RP means any person with operational control over site activities and day-to-day operational control of the approved ESC Plan requirements and permit conditions at the site of any construction activity or land disturbing activity who has received certification from the City of Boise.

The permittee must comply with the standards outlined in Policy 8300. Additionally, the permittee must comply with the approved ESC Plan and all conditions of the permit. The following actions constitute a non-compliance issue:

- Failure to meet any requirement of Policy or approved ESC Plan.
- Allowing or causing a condition that threatens to injure public health, the environment, or public or private property.
- Failure to correct ineffective erosion, sediment, and pollutant control measures after being notified via a Notice of Violation to do so.

Typical construction site violations are related to the following situations:

- Poor project phasing and sequencing.
- Inappropriate concrete washout discharges.
- Unstabilized construction entrances and parking areas.
- Failure to stabilize bare areas.
- Lack of slope protection (mulch/straw, vegetation, silt fencing, etc.).
- Unauthorized activities near intermittent and perennial streams and wetlands.
- Sediment trackout onto paved ROW.
- Poorly planned trenching operations.
- Lack of inlet and outlet protection.
- Non-functional sediment basins and traps.
- Airborne dust.
- Inappropriate housekeeping practices.
- Inadequate documentation and recordkeeping.

2. LEGAL AUTHORITY

ACHD is the governing agency responsible for construction and maintenance of all local roads, including the storm drain system, in Ada County, Idaho. ACHD's legal authority is based upon the laws of the State of Idaho. Specific authority is found in Title 40, Idaho Code, Chapters 13 and 14 https://legislature.idaho.gov/statutesrules/idstat/title40/. Because of the limited purpose of ACHD, as defined by the State Code, such legal authorities and provisions are interpreted as intended for facilities and operation and maintenance within the jurisdictional right-of-way of ACHD. ACHD does not provide police or enforcement power and must rely on the powers of municipal government. Specific legal authority granted to ACHD through state code includes the following:

- **Powers and Duties of Highway Commissioners, Idaho Code 40-1406** ACHD Commissioners are empowered to pass ordinances, rules, and regulations as necessary for carrying into effect or discharging all powers and duties conferred to a Countywide highway district by state code.
  https://legislature.idaho.gov/statutesrules/idstat/title40/t40ch14/

- **Drainage Authority, Idaho Code 40-1451(1)(d)**
  ACHD has authority over drainage where it is necessary for motorist safety or necessary for right-of-way maintenance. This code provision limits the extent and nature of authority in which ACHD is empowered.
  https://legislature.idaho.gov/statutesrules/idstat/title40/t40ch14/
- **Subdivision Plat Review, Acceptance and Approval, Idaho Code 40-1415(6)**
  Subdivision plats are required to be submitted to ACHD for acceptance and approval for highway design, drainage provisions, and traffic conditions.
  https://legislature.idaho.gov/statutesrules/idstat/Title40/T40CH14/SECT40-1415/
- **Common Law Authority**
  ACHD has certain common law authority to control discharges of stormwater into any storm drains which are located within the public right-of-way by means of ACHD's control and owner's interest in the public right-of-way.
- **Authority as a Municipal Corporation**
  ACHD may have certain inherent authority as a municipal corporation by virtue of its ordinance authority to regulate discharges of stormwater into ACHD's stormwater system.

3. DISCOVERY OF NON-COMPLIANCE

ACHD staff conduct regular inspections of all permitted construction activities. Subdivision, Bridge, Project, and Zone Inspectors perform a variety of construction related inspections. These staff members, who spend the most time observing these sites, may identify and follow up on CSDC violations observed at their inspection sites. These inspectors shall discuss the observations with the site operator and specify compliance requirements. They may also issue an Informal Notice (see *Section 5.1*) and document the observed conditions. Documentation is necessary in the event that a higher level of enforcement becomes necessary. Typically, if further CSDC enforcement or guidance is needed, the inspectors will request assistance from a Stormwater Quality Specialist (SWQS).

As a part of the CSDC Program, a SWQS or an ACHD Erosion Control Contractor performs regular site inspections to ensure construction site operators are following CSDC Program and Policy requirements. The inspection frequency is based upon project prioritization ratings calculated during the initial ESC Plan review process. All sites over 1 acre are inspected at least once every 6 months over the permit period.

ACHD staff may also receive CSDC complaints from external sources. Outside agencies and departments who observe or are notified of an issue on an ACHD permitted project may contact ACHD administrative staff or the SWQS directly to report an issue. ACHD staff may receive public complaints in person, over the phone, or through reporting tools such as TellUs or the Stormwater Pollution Hotline. All reports should be investigated. If the complaint is in regard to an ACHD Capital Project, depending on the severity, the Project Inspector, the Capital Projects Construction Coordinator, or the Capital Projects Construction Supervisor will be contacted depending on who is lead of the respective project. If a complaint is found to not involve an ACHD permitted construction activity, the complaint is handled through ACHD's Illicit Discharge Detection and Elimination Program or referred to the appropriate entity. For resolution, the initial reporter should be informed once the reported issue has been addressed.

4. FACTORS INFLUENCING ENFORCEMENT ACTIONS

The approach to making a violation determination involves using the language in Policy and/or permit conditions as a guide to determine whether the information collected demonstrates that a violation has occurred. CSDC compliance determinations must be based solely on the factual information collected and professional judgment.

A determination of the appropriate enforcement action is based on the nature and severity of the CSDC violation and other relevant factors. These factors, relating to the impact of the violation and to the responsible party are summarized in Section 4.1 and Section 4.2, respectively. The relevant factors must be considered when a violation has occurred to promote consistent and timely use of enforcement remedies. A summary of CSDC risk categories, compliance areas, and indicators is provided in *Table 1*.

4.1 FACTORS RELATING TO IMPACT OF VIOLATION

- Magnitude of the violation.
- Imminent endangerment to human health/welfare or to the environment.
- Duration of the violation.
- Effect of the violation on the receiving water.
- Whether circumstances beyond the control of the responsible party exist, such as unpredictable accidents or unexpected acts of nature.
- Causes a violation of the NPDES permit.
- Has a toxic effect on the aquatic life uses of the receiving water body?

4.2 FACTORS RELATING TO RESONSIBLE PARTY

- Compliance history of the responsible party.
- Economic benefit realized by the responsible party while operating in non-compliance with the requirements.
- Chronic violations by responsible party.
- Good faith of the responsible party.
- Honest intention to remedy non-compliance coupled with actions that support intention.

Table 1: Summary of CSDC Risk Categories, Compliance Areas, and Indicators

Risk Category	Compliance Area	Lower Risk Indicators	Higher Risk Indicators
Site Conditions	Environment-ally Sensitive Sites	• Site slopes <10% • Waterways not immediately adjacent to or within site	• Site slopes>10% • Waterways within 50’ of site • Project on Brownfield Site • Project discharges to 303d impaired waterway
Site Operator	Compliance History	• Operator is usually in compliance with rules • Operator responds to notes within time frame • Operator is cooperative and not argumentative	• Operator has multiple violations • Operator frequently misses compliance deadlines • Operator is uncooperative, argumentative

Risk Category	Compliance Area	Lower Risk Indicators	Higher Risk Indicators
Administrative Requirements	Permit Coverage	• Operator has obtained Permit coverage through ACHD and has an approved ESC Plan	• Operator has not obtained Permit coverage through ACHD and does not have an approved ESC Plan
BMP Installation	Plan BMP Installation	• All BMPs listed on the approved ESC Plan are in place. • BMPs are installed correctly	• All BMPs listed on the approved ESC Plan are not in place. • BMPs are not installed correctly
	Plan BMP Adequacy	• BMPs are functioning properly • BMPs are adequately controlling stormwater • Erosion and sedimentation issues are minimal • Additional BMPs are not required	• BMPs are functioning poorly • BMPs are not controlling stormwater • Excessive erosion • Additional BMPs are needed to manage the site
BMP Maintenance	BMP Maintenance	• BMPs are maintained • Sediment buildup at BMPs is not excessive • Erosion prevention BMPs fully functional	• BMPs require substantial maintenance • Excessive sediment ate BMPs notes • Poor erosion prevention
Housekeeping	Materials Management	• Materials that may leach pollutants are covered • Materials stored away from drainage system	• Materials leaching pollutant are not covered • Materials stored near storm drain inlets
	Waste Management	• Solid waste collected and stored properly • Concrete, other washwater managed properly	• Poorly managed solid waste, litter present • Washwater on ground or discharged illegally
	Spill Prevention	• Spill prevention practices and material present	• Fuel, oil, or other spills observed
Offsite Discharges	Sediment in Waterway	• No sediment discharges through dewatering or above ground flows to waterways	• Sediment discharges to waterways observed
	Sediment on Ground	• No sediment discharges to offsite areas	• Mud/sediment track-out observed on paved roads
	Airborne Dust	• No observable dust leaving the site	• Airborne dust leaving the site
Project Completion	Site Closeout	• All bare areas stabilized • Vegetation is at least 70% density • All temporary BMPs removed	• Bare areas observed on site • Vegetation is less than 70% density • Temporary BMPs still present

5. TYPE OF ENFORCMENT ACTIONS

In the event of non-compliance, ACHD shall proceed with enforcement action (Policy 8310) described in detail in this section. Enforcement actions are intended to be commensurate with the violation. Minor violations are typically handled through Informal Notices. Major violations are addressed, in order of increasing severity, by issuance of a Notice of Violation, Administrative Fines, Stop Work Order and/or Administrative Cost Recovery. ACHD's enforcement actions are provided in order of escalation in the CSDC ERP flow chart located in *Appendix A*. If the severity of the situation warrants it, ACHD may escalate the enforcement as quickly as needed.

5.1 INFORMAL NOTICE

ACHD shall issue an Informal Notice to the project RP for minor violations. An Informal Notice may be issued verbally or non-verbally (e.g., during sampling and/or inspection visits, over a telephone call, in an informal meeting, or through email). Informal Notices should: 1) identify noncompliant conditions to construction site personnel, 2) provide information on the action(s) needed to bring the situation into compliance, and 3) specify a deadline (1-3 days) for completing compliance activities.

5.2 NOTICE OF VIOLATION

More serious violations, including disregard of an Informal Notice or failing to make corrective actions within the specified compliance period, are subject to a written Notice of Violation (NOV). NOVs are formal written notices to the RP found violating ACHD policy or permit requirements. An NOV is required prior to the issuance of an Administrative Fine.

NOVs include the name and address of the RP, the observed violation, the date and time of the violation, the location, compliance action(s) required, deadline for required compliance (1-2 days), and the signature of a SWQS or inspector. The standard compliance deadlines for BMP violations are listed in *Table 2*. The NOV, example provided in *Appendix B*, is presented to the RP, through hand delivery, mail, email, or other means. A NOV Fact Sheet (*Appendix C*) should be provided to all first-time offenders.

NOVs are entered into TRAKiT, a workflow management tool, with documentation of site conditions, photographs, plans, maps, and/or other items as appropriate. The procedure to enter this information into TRAKiT is provided in *Appendix D*. Inspection staff can see if an NOV has been attached to the TRAKiT project file. However, all ACHD staff involved in the day-today oversite of the project should be notified of any enforcement action above an informal notice. An inspector may hold off on other non-CSDC inspections of the site until the violation has been resolved.

Table 2: BMP Compliance Deadlines per Violation Type

BMP Issue	Violation	Compliance Deadline
Drop Inlet Protection	BMP Not Present	24 Hours
	BMP Inadequate	24 Hours
	BMP Not Maintained	End of business
Spill Containment	BMP Not Present	48 Hours
	BMP Inadequate	24 Hours
	BMP Not Maintained	48 Hours
Dust Abatement	BMP Not Present	End of business
	BMP Inadequate	End of business
	BMP Not Maintained	End of business
Construction Entrance	BMP Not Present	48 Hours
	BMP Inadequate	48 Hours
	BMP Not Maintained	48 Hours
Slope Stabilization	BMP Not Present	72 Hours
	BMP Inadequate	48 Hours
	BMP Not Maintained	End of business
Erosion Control	BMP Not Present	48 Hours
	BMP Inadequate	48 Hours
	BMP Not Maintained	End of business

BMP Issue	Violation	Compliance Deadline
Sediment Control	BMP Not Present	24 Hours
	BMP Inadequate	24 Hours
	BMP Not Maintained	End of business

5.3 ADMINISTRATIVE FINES

If the RP does not correct all CSDC violations by the deadline provided on an issued NOV, ACHD may issue an administrative fine to the permit holder. Administrative fines provide funds for compliance investigations and subsequent contract management that may be necessary to correct deficient work. The issuance of administrative fines is limited to violation types listed in the most current ACHD Approved Fee Schedule. Violation types applicable to the CSDC Program are listed in *Table 3*. This fee, in total, may be recovered by ACHD by making claim against the Permittee's Surety Bond posted in accordance with the provisions of Policy 6007.7.

Table 3: CSDC Violations and Associated Fees

Violation	Associated Fee
Working without a permit (Policy 6007.4.3)	$500.00
Unacceptable debris or material on the Construction Site Within the ROW (Policy 6007.12.5)	$250.00 per instance not to exceed two instances per day
Failure to cover and properly secure all loads of gravel, sand, dirt, landscape bark or other loose material (Policy 6007.12.6)	$250.00 per instance not to exceed two instances per day
Failure to stop work (Policy 6007.18.3)	$2,000.00 Per day

Note: Associated Fees listed refer to the maximum allowed amount. Reduced amounts shall be determined at the discretion of the Deputy Director.

5.4 STOP WORK ORDER

A Stop Work Order (SWO) may be issued for a violation deemed significant enough to warrant immediate action, failure to correct a problem, or repeated violations. A SWO written on a NOV is effective immediately. A SWO should be presented and documented in the same manner as an NOV. Revoking the Temporary Use Permit is equivalent to a SWO (Policy 8311). ACHD may issue a temporary or permanent injunction in an emergency situation (Policy 6007.21.4).

5.5 ADMINISTRATIVE COST RECOVERY

ACHD can initiate corrective action and assess the actual and administrative costs against the permit holder (Policy 6007.25). The violator may be required to pay all costs of investigation, administrative overhead, out-of-pocket expenses, the cost of administrative hearings, the costs of suit, and reasonable attorney's fees. If the RP makes no reasonable effort to correct the violation, or if the situation is an emergency, the ACHD may initiate the corrective action and assess the actual and administrative costs against the permit holder. Additionally, with coordination of ACHD Permit staff, the permit holder's bond can be sought or revoked to pay for cleanup costs and to prevent the contractor from starting new jobs within ACHD ROW.

6. JOINT AND/OR OUTSIDE ENFORCEMENT AUTHORITY

The municipal governments of Boise and Garden City do have specific stormwater ordinances related to illicit discharge and construction site discharge control to address enforcement authority requirements within their jurisdictions. Additionally, ACHD (and the other Phase I NPDES Permittees) have Interagency Agreements for the Enforcement of Stormwater Management in Boise City and Garden City included in *Appendix E* of this ERP.

- **City of Boise**
  Ordinance (Chapter 9-14-2– Erosion Control Regulations and Requirements
  https://codelibrary.amlegal.com/codes/boiseid/latest/boise_id/0-0-0-11668
- **Garden City**
  Ordinance (Chapter 15, 4-15-2) – Erosion Control Regulations and Requirements
  https://www.codepublishing.com/ID/GardenCity/html/GardenCity04/GardenCity0415.html#4-15

The municipal governments of Meridian, Eagle, and Ada County do not have specific stormwater ordinances related to illicit discharge and construction site discharge control. However, these entities do have the following general nuisance related ordinances that can be used to assist ACHD in addressing stormwater related issues.

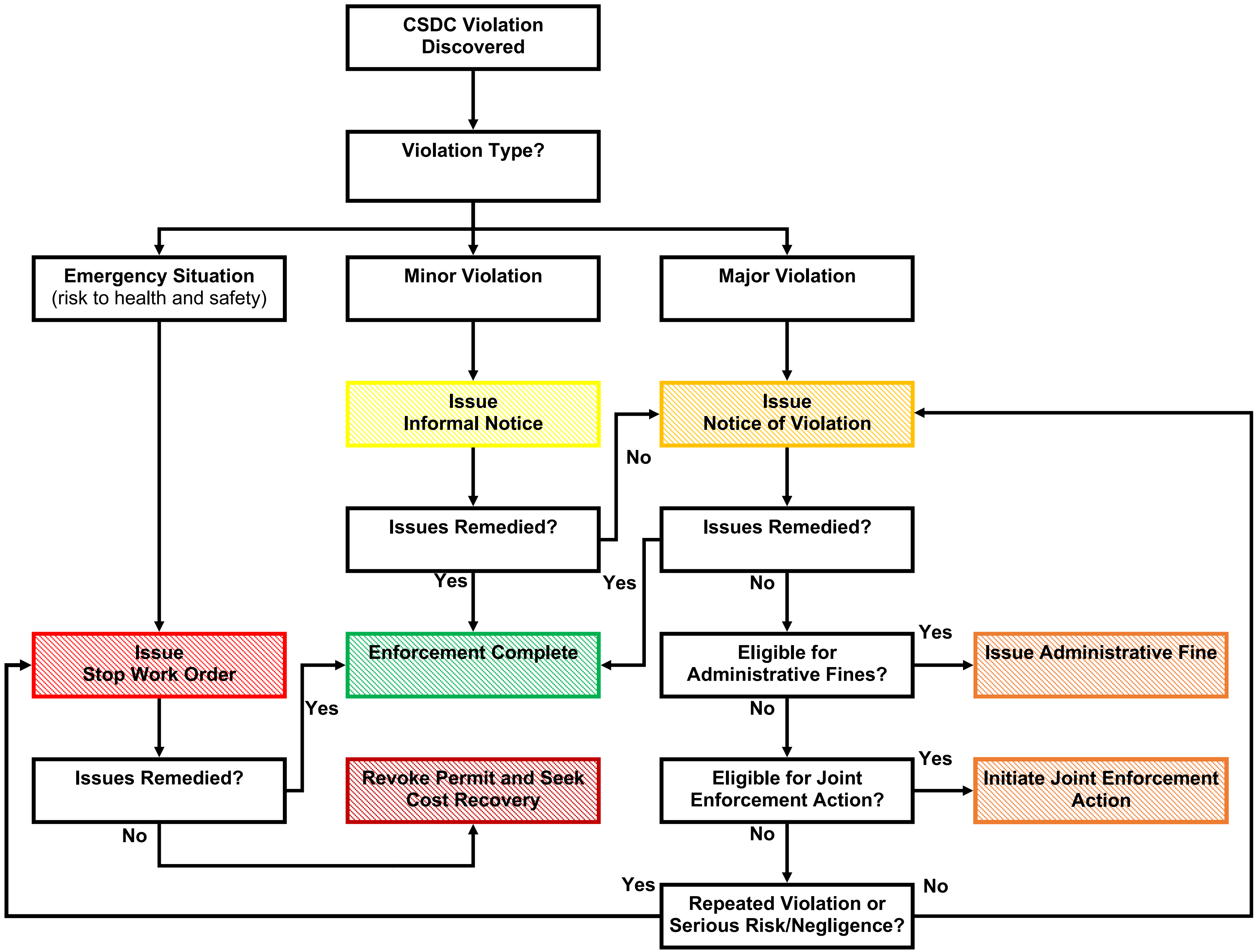
- **City of Eagle**
  Ordinance No. 4-1-4 – General Nuisance; Procedures and Penalties
  https://codelibrary.amlegal.com/codes/eagleid/latest/eagle_id/0-0-0-1193
- **City of Meridian**
  Ordinance (Chapter 2, 4-2-1) - Public Health and Safety, Nuisances
  https://library.municode.com/id/meridian/codes/code_of_ordinances?nodeId=TIT4PUHESA_CH2NU
- **Ada County**
  Ordinance No. 5-2-4-2B – Deposit of Waste or Lighted Material on Public Ways
  https://codelibrary.amlegal.com/codes/adacountyid/latest/adacounty_id/0-0-0-1423

7. CONSTRUCTION GENERAL PERMIT VIOLATION REFERRAL

For construction projects which are subject to the Idaho Pollutant Discharge Elimination System Discharge Permit (IPDES) Construction General Permit (CGP) and do not respond to educational efforts and joint enforcement actions, ACHD may provide to Idaho Department of Environmental Quality (IDEQ) information regarding the construction project. This applies to projects where operators cannot demonstrate that they have appropriate IPDES permit coverage and/or site operators are deemed by ACHD as not complying with CGP requirements. Information may be submitted to an IDEQ CGP Compliance Officer and include, at a minimum, the following information:

- Construction project location and description.
- Name and contact information of project owner/ operator.
- Estimated construction project disturbance size.
- An account of information provided by the Permittee to the project owner/ operator regarding NPDES filing requirements.

APPENDIX A – CSDC ERP FLOW CHART


CSDC Violation Discovered
Violation Type?
Emergency Situation (risk to health and safety)
Minor Violation
Major Violation
Issue Informal Notice
Issue Notice of Violation
No
Issues Remedied?
Issues Remedied?
Yes
Yes
No
Issue Stop Work Order
Enforcement Complete
Eligible for Administrative Fines?
Yes
Issue Administrative Fine
Yes
No
Issues Remedied?
Revoke Permit and Seek Cost Recovery
Eligible for Joint Enforcement Action?
Yes
Initiate Joint Enforcement Action
No
No
Yes
Repeated Violation or Serious Risk/Negligence?
No

APPENDIX B – NOTICE OF VIOLATION

ACHD

NOTICE OF VIOLATION 1955

DATE & TIME ____________________

PERMIT NUMBER ____________________

PERMITTEE ____________________

RESPONSIBLE PERSON ____________________ **PHONE** ____________________

ACHD INSPECTOR (PRINT) ____________________ **PHONE** ____________________

MARK ALL AREAS WHERE BMPS ARE NOT PRESENT, INADEQUATE, OR NOT MAINTAINED. PROVIDE SPECIFIC DETAILS IN THE COMMENT SECTION AS NEEDED. GIVE A COPY OF THIS DOCUMENT TO THE RESPONSIBLE PERSON LISTED ON THE ACHD PERMIT.	BMP not present	BMP inadequate	BMP not maintained
STORM DRAIN INLET			
SPILL PREVENTION/ CONTAINMENT			
DUST ABATEMENT			
CONSTRUCTION ENTRANCE			
SLOPE STABILIZATION			
EROSION CONTROL			
SEDIMENT CONTROL			

COMMENTS:

SIGNATURE OF ACHD INSPECTOR ____________________

COMPLIANCE DEADLINE ____________________

RE-INSPECTION

DATE & TIME ____________________ **COMPLIANCE** Y☐ N☐

SIGNATURE OF ACHD INSPECTOR ____________________

SECTION 8310 OF ACHD POLICY MANUAL - ENFORCEMENT/STOP WORK ORDER INDEPENDENT
In the event the provisions set forth under the Approved Site Plan have not been met, the Responsible Person will be given a written notice of the violation and a time period in which to correct the deficiencies causing the violation. If the corrections have not been made within the designated time period or additional violations occur, District may issue a stop work order. ACHD may issue a stop work order solely for failure to comply with the Approved Site Plan, regardless of any other violation that may or may not have occurred under the Temporary Highway Use Permit.

APPENDIX C – NOTICE OF VIOLATION FACT SHEET

Why are NOVs issued?

- Provide consistent notification of deficiencies on ACHD permitted work.
- Provide the contractor with written notice and a time period in which to correct the violation of the approved erosion and sediment control plan.
- Requirement of ACHD's IPDES Permit with Idaho Department of Environmental Quality.

NOTICE OF VIOLATION 1955

DATE & TIME

PERMIT NUMBER

PERMITTEE

RESPONSIBLE PERSON PHONE

ACHD INSPECTOR (PRINT) PHONE

MARK ALL AREAS WHERE BMPS ARE NOT PRESENT, INADEQUATE, OR NOT MAINTAINED. PROVIDE SPECIFIC DETAILS IN THE COMMENT SECTION AS NEEDED. GIVE A COPY OF THIS DOCUMENT TO THE RESPONSIBLE PERSON LISTED ON THE ACHD PERMIT	BMP not present	BMP Inadequate	BMP not maintained
STORM DRAIN INLET			
SPILL PREVENTION/ CONTAINMENT			
DUST ABATEMENT			
CONSTRUCTION ENTRANCE			
SLOPE STABILIZATION			
EROSION CONTROL			
SEDIMENT CONTROL			

COMMENTS:

SIGNATURE OF ACHD INSPECTOR

COMPLIANCE DEADLINE

RE-INSPECTION

DATE & TIME COMPLIANCE Y☐ N☐

SIGNATURE OF ACHD INSPECTOR

SECTION 8310 OF ACHD POLICY MANUAL - ENFORCEMENT/STOP WORK ORDER INDEPENDENT
In the event the provisions set forth under the Approved Site Plan have not been met, the Responsible Person will be given a written notice of the violation and a time period in which to correct the deficiencies causing the violation. If the corrections have not been made within the designated time period or additional violations occur, District may issue a stop work order. ACHD may issue a stop work order solely for failure to comply with the Approved Site Plan, regardless of any other violation that may or may not have occurred under the Temporary Highway Use Permit.

Who will receive an NOV?

Any violation of the approved erosion and sediment control plan will result in the receipt of a NOV. All permitted work in the ACHD right-of-way may be inspected. NOVs are issued to the Responsible Person listed on the project's permit.

Does this cost me anything?

- If the violation is corrected by the compliance deadline noted on the NOV, there will be no additional costs.
- If the violation continues, administrative fines may be applicable per the most recent Fee Schedule.
- If ACHD is forced to correct the problem, funds will be recovered from the permittee.

What if I do not correct the problem?

- If the violation continues or additional violations occur, ACHD may issue a stop work order.
- If violations continue to occur, the District may start proceedings to revoke a permit.

What if I have questions?

- If you have questions about a particular NOV, contact the inspector listed on the NOV.
- If you have question about the Construction Site Discharge Control Program, contact an ACHD Stormwater Quality Specialist, at 208-387-6264.
- Copies of ACHD Policies 6000 and 8300 are available at Construction Services permitting desk and online at http://www.achdidaho.org/

APPENDIX D – NOV PROCEDURE GUIDENCE

APPENDIX E – INTERAGENCY AGREEMENTS FOR THE ENFORCEMENT OF STORMWATER MANAGEMENT

Attachment G: Erosion and Sediment Control Reviews, Inspections, and Map

Table 1. ESC Inspections Performed & Notice of Violations Issued
October 1, 2021 – September 30, 2022

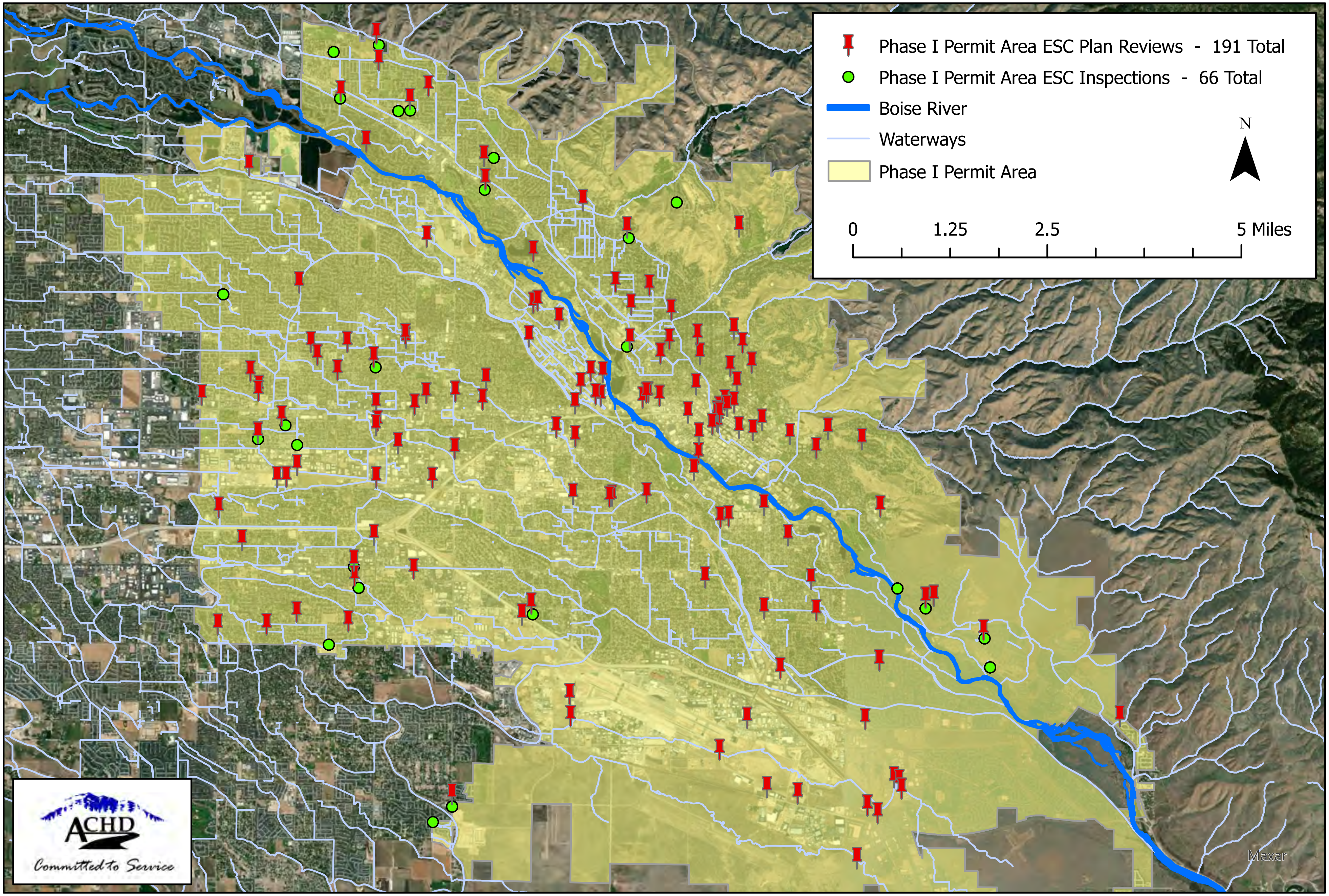
ACTIVITY	TOTAL
ESC Inspections[1]	66
Capital Project SWPPP[2] Inspections	100
Notice of Violations Issued	1

[1]ESC Inspections Performed by ACHD Environmental staff and contracted inspection staff.
[2]Stormwater Pollution Prevention Plan

Table 2. ESC Plan Review, Inspection, and Notice of Violation Summary by Month
October 1, 2021 – September 30, 2022

MONTH	SITE SPECIFIC PLANS REVIEWED	SITE SPECIFIC PLANS WITH DEFICIENCIES	ESC INSPECTIONS COMPLETED	NOTICE OF VIOLOATIONS ISSUED
October	15	2	8	0
November	22	10	4	0
December	11	1	2	0
January	16	3	2	0
February	28	6	3	0
March	14	4	14	0
April	16	4	2	1
May	12	2	4	0
June	14	2	7	0
July	12	3	3	0
August	17	7	11	0
September	14	2	6	0
Total	**191**	**46**	**66**	**1**

Erosion and Sediment Control (ESC) Plan Review and Site Inspections
October 1, 2021 - September 30, 2022



Attachment H: ACHD Vegetated Basins, Bioretention Swales, and GSI Program Activities

Table 1. Phase I ACHD-Owned Vegetated Basins and Bioretention Swales 2016 – 2022

STORMWATER FACILITY ID	FACILITY TYPE	NEAREST INTERSECTION	AREA (SQFT)	YEAR BUILT	STRUCTURAL RETROFIT DATE	VEGETATION RETROFIT DATE	NEW GSI VEGETATION INSTALLATION DATE	CITY
Basin 63	Detention-Dry	W. Albion St & S Garden St	10,924	1997	-	2019	-	Boise
Basin 65	Detention-Wet	W. Ustick Rd & N. Curtis Rd	143,161	1997	-	TBD	-	Boise
Basin 294	Detention-Dry	N. Alworth St. & N. Sayer Ave	87,579	1999	-	TBD	-	Boise
Basin 322	Detention-Dry	W Airway Ct & S Cole Rd	37,764	2003	-	2018	-	Boise
Basin 327	Retention-Wet	E. Boise Ave & S. Betsy Ross Way	15,199	1976	2022	2022	-	Boise
Basin 331	Detention-Dry	N Steelhead Way & W Emerald St	21,432	2007	-	2018	-	Boise
Basin 332	Detention-Dry	W Irving St & N Maple Grove Rd	23,462	2007	-	2018	-	Boise
Basin 333	Detention-Wet	N. Maple Grove & Hyatt Wetlands Park	20,856	2006	-	TBD	-	Boise
Basin 334	Retention-Dry	W Ustick Rd & N Chatterton Wy	38,883	2006	-	2019	-	Boise
Basin 371	Retention	W. Victory Rd & S. Fry St.	157,482	2004	-	TBD	-	Boise
Basin 628	Retention-Dry	N Five Mile Rd & W Milclay St	19,531	2012	-	2016	-	Boise
Basin 674	Retention-Dry	858 N. Whitewater Park Boulevard	18,764	2013	-	2018	-	Boise
Basin 677	Detention-Dry	N Pierce Park Ln & W Hammermill Dr	14,680	2013	-	2017	-	Boise
Basin 685	Detention-Dry	W Emerald St. Dr & N Five Mile Rd	17,508	2014	-	2017	-	Boise
Basin 694/695	Retention-Dry	W Hill Rd & Catalpa	8,013	2013	-	2018	-	Boise
Basin 696	Retention-Dry	W Hill Rd & N 36th St	5,757	2016	-	2017	-	Boise
Basin 697	Retention-Dry	E Gowen Rd & S Eisenman Rd	5,144	2016	-	2018	-	Boise
Basin 882	Retention-Dry	E Gowen Rd & S Eisenman Rd	3,586	2016	-	2018	-	Boise
Basin 883	Retention-Dry	E Gowen Rd & S Eisenman Rd	3,440	2016	-	2018	-	Boise
Basin 1321	Detention-Wet	N VMP & W. Glendale Rd	31,652	2019	-	2019	-	Boise
Basin 1324	Detention-Dry	N Cloverdale & W Bowmont St	11,992	2019	2022	2019	-	Boise
Basin 1338	Retention-Dry	W. Glendale St. & N Stilson Rd	4,399	2019	-	2018	-	Boise
Basin 1339	Retention-Dry	W Alameda St & N. VMP	14,951	2019	-	2018	-	Boise
Basin 1370	Retention-Dry	N Arthur St & W State St	2,115	2019	-	2018	-	Boise
Basin 1372	Retention-Dry	S Cole Rd & W Lake Hazel Rd	45,619	2019	-	2020	-	Boise
Basin 1373	Retention-Dry	W Franklin Rd & Cole Rd	32,400	2019	-	2020	-	Boise
Basin 1374	Retention-Dry	N. Cloverdale Rd & W. Edna St.	18,370	2019	-	2019	-	Boise
Basin 1440	Retention-Dry	N Collister Dr & Collister Access	2,786	2019	-	2019	-	Boise
Basin 1441	Retention-Dry	N Collister Dr & Collister Access	3,207	2019	-	2019	-	Boise
Collister Swales	Bioretention Swales	N Collister Dr & W State St	4,746	2019	-	2019	-	Boise

Table 2. Phase I ACHD - Basin Improvement Projects 2021 - 2022

FACILITY NAME AND LOCATION	IMPROVEMENT	DESCRIPTION
Basin 63 (S. Garden St & W. Albion St)	Plant Installation (2-gal)	Increase basin's resiliency, plant diversity, vegetation stability, and aesthetics. (Shrubs and Forbs)
	Damage Prevention	Split rail fence - prevent unauthorized maintenance, discourage pedestrian traffic, and dog waste issues.
	Exterior Area	Expanded vegetation maintenance activities to include exterior areas to improve aesthetics, weed control, and desirable plant establishment in and around the basin.
Basin 322 (S. Cole Rd & W. Airway Court)	Damage Prevention	Landscape boulders along the access road to protect the upper slopes from vehicle damage.
Basin 1324 (N Cloverdale & W Bowmont St)	Structural Retrofit	Replace forebay with deposition pool and added microtopography.
Basin 327 (E. Boise Ave & S. Betsy Ross Way)	Structural Retrofit	Repair inlets. Remove channelization between inlets and outlet. Install microtopography and irrigation.
	Vegetation Retrofit	Seeding and 2-gal plants.

Table 3. GSI Projects Designed or Constructed 2021 - 2022

PROJECT NAME	GSI TYPE	GSI COUNT	DESIGNED	CONSTRUCTED	AREA TREATED (ACRES)
Whittier School	Stormwater Tree Cells	2	2018	2021	0.17
St. Luke's	Stormwater Tree Cell	1	2018	2021	0.14
6th St Condo	Stormwater Tree Cells	2	2018	2021	0.11
Whitewater Station	Stormwater Tree Cell	1	2019	2021	0.06
2019 Streetscapes	Stormwater Tree Cell	1	2019	2021	0.01
Cartee Apts.	Stormwater Tree Cells	3	2019	2022	0.21
11th & Idaho Building	Stormwater Tree Cells	2	2019	2022	0.33
Front St. Bldg	Stormwater Tree Cell	1	2020	2022	0.21
6th & Grove Bldg.	Stormwater Tree Cell	1	2020	2022	0.19
CDG Bldg	Stormwater Tree Cell	2	2020	2022	0.11
11th St Bikeway & Streetscape	Stormwater Tree Cells	13	2022	In Progress	1.79
Lusk St. Apts.	Stormwater Tree Cell	1	2022	In Progress	0.12
11th St Bikeway & Streetscape	Permeable Pavers	6	2021	In Progress	0.48

Table 4. Phase I ACHD GSI Program Updates 2021 - 2022

GSI PROGRAM AREA	GSI PROGRAM ACTIVITY	DESCRIPTION
Planning and Design	Basin Retrofit and Vegetation Plan	Update in progress to match current goals, objectives, and procedural practices.
	Basin Retrofit Priority List	Developing a prioritization system and facility evaluation criteria for facilities constructed prior to 2019.
	Integrated Vegetation Management Guide	Updated to include desirable and non-desirable species found within vegetated GSIs. A total of 295 species were added. (87 Non-desirable species and 208 desirable species.)
	GSI Designs	Evaluating basin and bioretention swale designs and making design adjustments per project to improve stormwater management. Future work will include design specification updates to policy 82000.
	Build and Grow Partnerships	Includes Endangered Species Coalition, Ada County Soil and Water Conservation District, and local native nurseries.
Construction	Plant Establishment Plans	Site specific maintenance plans are developed by ACHD for newly constructed or retrofitted GSIs. The guides contractors and sub-contractors on proper vegetation maintenance during the 1-year warranty period.
	Plant Establishment Plan Site Evaluations	Evaluations are used to determine if of the contractors and sub-contractors successfully fulfill the Plant Establishment Contract.
	Plant Establishment Standardized Survival Rate	Developed standardized approach to determine the acceptable survival rate for installed plants at the end of the warranty period outlined in Plant Establishment Plan.
	Capital Project GSI Electronic Maintenance Activity Report	Developed activity report to track all maintenance activities completed by contractors and sub-contractors. Maintenance data will be viewable in real time. - Pilot in FY2023.
Facility Maintenance	Stormwater Vegetation Management Contract	Expanded maintenance tasks and altered maintenance timing to improve plant health, aesthetics, and functional capability of GSIs.
	Maintenance Prioritization List	Helps the contractor prioritize efforts if labor, weather, etc. limits the number of visits that can be completed within a month.
	Site Specific Maintenance Plans	Guides site planning and maintenance efforts at each vegetated GSI. - Pilot Project
	Maintenance Site Plan Maps	For used by maintenance contractor - Include more details for on specific maintenance activities in each vegetated GSI.
	Electronic Maintenance Activity Report	Continued use of electronic maintenance activity report. Used to track all maintenance activities completed by stormwater contractors. Maintenance data is viewable in real time.
	Seasonal Photos of Facilities	Visually track the effects of management techniques over time and helps to determine overall success and site completion status.
	Exterior Area - Vegetation Management	Expanded planting and vegetation maintenance activities to include exterior areas. To improve aesthetics, weed control, and desirable plant establishment on the entire parcel.

GSI PROGRAM AREA	GSI PROGRAM ACTIVITY	DESCRIPTION
Inventory	Stormwater Tree Cell Inventory	Located and mapped all stormwater tree cells.
	Stormwater Tree Cells Maintenance Plan	Developing maintenance methods and frequency for maintaining stormwater tree cells.
	Permeable Paving Inventory	Locating and mapping all ACHD maintained permeable paving structures.
Implementation	Use of Site Plans and Planting Plans	Documentation for all site alterations and planting location of all containerized plants.
	Plant Records for Each Facility	Document all species planted and/or seeded within each vegetated GSI.
	Plant Identification	Identified plants within vegetated GSIs and determined desirability status (desirable/non-desirable).
	Species Selection - Upland Area	Evaluated species success rates in upland areas for seeded and installed 2-gal plants to improve vegetation establishment in future vegetated GSIs.
	Planting Techniques	Installing watering wells around 2-gal plants to improve survival rates, retain water around roots, and prevent erosion. - Pilot Project
	Use of Watering Truck	Hand-watered installed gallon sized plants in non-irrigated facilities once a week from May - September. - Pilot Project
	Compost - Turning Materials	Tested equipment, ability to achieve desired product, and evaluated the labor needs to turn large quantities of compostable material monthly. - Feasibility Test
	Downed Woody Debris and Landscape Boulders	Provides habitat for beneficial species that contribute to the function of the stormwater facility. Improves aesthetics and naturalized appearance of vegetated GSIs.

Attachment I: Stormwater Outfall Monitoring Summary WY 2022

Stormwater Outfall Monitoring Summary WY 2022

Ada County Highway District

12/22/2022

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1. Introduction

Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Permittees) were issued a third-cycle National Pollutant Discharge Elimination System Phase I Permit #IDS027561 (Permit) on October 1, 2021. The Permit authorizes the Permittees to discharge from municipal separate storm sewer system (MS4) outfalls to the Boise River and its tributaries. According to Permit Part 6.2.1, *Wet Weather Stormwater Outfall Monitoring,* Permittees are required to monitor wet weather stormwater discharges according to the NPDES Phase I Stormwater Outfall Monitoring Plan (SWOMP) (ACHD, 2022). The following summary covers wet weather outfall monitoring activities during water year (WY) 2022 (October 1, 2021 – September 30, 2022). WY 2022 represents the first year of monitoring under the new Permit cycle.

The SWOMP was developed in line with the Quality Assurance Project Plan for NPDES Stormwater Permit Monitoring (QAPP) (ACHD, 2022) and describes the overall approach to stormwater outfall monitoring. Details about specific site characteristics, equipment, data collection and sample handling procedures, analytical methods, and quality assurance/quality control (QA/QC) methodology are found in the SWOMP.

In WY 2022, data collection for the Stormwater Outfall Monitoring Program included precipitation, flow, and water quality samples. Four outfall sites within the Permit area (Lucky, Whitewater, Main, and Americana) were monitored for flow and water quality. The water quality samples were collected from wet weather discharges and included grab samples with corresponding field parameters and composite samples, which were collected throughout the duration of a storm. Additionally, four rain gauge sites (East, Front, Cynthia Mann, and Whitewater) were maintained to provide localized precipitation data. Each rain gauge site represents one of the monitored subwatersheds and are used to verify that storm criteria were met.

2. Monitoring Sites, Equipment, and Sample Type

The Stormwater Outfall Monitoring Program consists of four monitored subwatersheds: Lucky, Whitewater, Main, and Americana. Monitoring stations for each subwatershed are located near the outfalls with dedicated equipment installed at each location. Table 2-1 depicts the equipment types and referenced rain gauge site for each subwatershed. A vicinity map illustrating the location of each subwatershed, monitoring station, and rain gauge site is found in Figure 1.

Table 2-1. Monitoring Station Equipment

	Lucky	Whitewater	Main	Americana
Sampler Type	Hach AS950	ISCO 6712	Hach AS950	ISCO 6712
Flowmeter Type	Hach AV9000	ISCO Signature	Hach AV9000	ISCO Signature
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front and East
Rain Gauge Equipment Types	Global Water tipping bucket/ HOBO event logger	Hach tipping bucket/ ISCO Signature	Global Water tipping bucket/ HOBO event logger	Global Water tipping bucket/ HOBO event logger

2.1 Sample Types

The sample types collected during WY 2022 include grab samples and composite samples. Grab samples represent a discrete measurement from the overall storm discharge while composite samples represent the entire discharge.

Grab samples were manually collected from the discharge stream using a swing sampler. The grab samples were submitted to the Boise City Water Quality Laboratory (WQL) and analyzed for *E.coli*. At the time that the grab samples were collected, field parameters (temperature, pH, dissolved oxygen (DO), and conductivity) were measured using In-Situ smarTroll or In-Situ aquaTroll handheld instruments.

Composite samples were collected using automatic samplers, which worked in conjunction with flowmeters. After a predetermined volume of flow was discharged, the flowmeters triggered the samplers to collect a subsample. Each subsample was deposited into a 15-liter carboy, resulting in a flow-proportional composite sample. The composite samples were submitted to WQL, where they were split for analysis. The following constituents were analyzed: biological oxygen demand, 5-day (BOD_5); chemical oxygen demand (COD); hardness as calcium carbonate ($CaCO_3$); turbidity; total suspended solids (TSS); total dissolved solids (TDS); total phosphorus (TP); orthophosphate, as P (ortho-P); ammonia; nitrate + nitrite (NOx); total Kjeldahl nitrogen (TKN); total arsenic (As); dissolved and total cadmium (Cd); dissolved and total copper (Cu); dissolved and total lead (Pb); dissolved and total mercury (Hg); and dissolved zinc (Zn).

3. Stormwater Outfall Monitoring Results

Wet weather stormwater samples were collected according to the procedures listed in the SWOMP. A goal of the Stormwater Outfall Monitoring Program is to collect three accepted (unqualified) grab and composite samples from each monitoring station. In WY 2022, samples were collected from seven storms to meet this goal. A summary of the storm dates and sample types collected are shown in Table 3-1. Storm setup and sampling information are included in Table 1. Storm Event Reports were created after each stormwater sampling event to monitor the status of the Stormwater Outfall Monitoring Program and discuss the hydrological and analytical data from the grab and composite samples. These Storm Event Reports include details about the storm and weather monitoring, hydrographs, sample collection times, and water quality results. Individual Storm Event Reports for the seven sampling events during WY 2022 are included in Appendix A.

Table 3-1. Storm Events and Sample Types

	Lucky	Whitewater	Main	Americana
October 22, 2021	G	G	G, FD, FB, C	G, C
November 9, 2021	C	C		
March 15, 2022	G, C	G, C	G, FD, FB, C	G, C
April 4, 2022		G, FD, FB		G
May 27, 2022	G[1,2]		G[1], FD, FB, C	C
June 5, 2022	C	C[3]	CB	C[3]
June 12, 2022	G, FD, FB	C, CS	G	

Sample types: G-grab, C-composite
QC sample types: FD-field duplicate, FB-field blank; CD-composite duplicate; CB-composite blank
[1]Qualified due to exceeded hold time
[2]Qualified due to insufficient precipitation
[3]Rejected due to lack of representativeness

3.1 Wet Weather Analytical Results

Field parameter results are presented in Table 2 and analytical results are presented in Table 3. The following assessment provides minimum and maximum measured values for WY 2022. Qualified data are included in the range of measured/reported values and included in the data analysis. Rejected data are not included in the analysis or data discussion below; however, they are presented in the tables. All measurements were recorded in accordance with QAPP and SWOMP procedures.

Dissolved Oxygen and Oxygen Demand

- DO ranged from 5.86 to 10.57 milligrams per liter (mg/L).
- Biological oxygen demand, 5-day (BOD_5) concentrations ranged from 15.2 to 84.7 mg/L.
- Chemical oxygen demand concentrations ranged from 73.0 to 303 mg/L.

pH, Temperature, Conductivity, and Hardness

- pH values ranged from 5.87 to 7.43 standard units.
- Temperature ranged from 9.30 to 21.8 degrees Celsius.
- Conductivity ranged from 44.8 to 738 micro-Siemens per centimeter.
- Hardness ranged from 14.9 to 146 mg/L as $CaCO_3$.

Bacteria

- *E.coli* ranged from 24.3 to 8,600 most probable number per 100 milliliters (MPN/100mL).

Sediment

- Turbidity ranged from 14.4 to 175 nephelometric turbidity units (NTU).
- TSS ranged from 27.3 to 315 mg/L.
- TDS ranged from 48.8 to 394 mg/L.

Nitrogen

- Ammonia ranged from 0.149 to 1.33 mg/L as N.
- Nitrate + nitrite ranged from 0.0872 to 0.989 mg/L as N.
- TKN ranged from 1.07 to 7.04 mg/L.

Phosphorus

- TP ranged from 0.40 to 1.14 mg/L
- Orthophosphate ranged from 0.143 to 0.803 mg/L as P.

Metals

- Total arsenic ranged from 0.91 micrograms per liter (µg/L) to 5.9 µg/L.
- Dissolved cadmium ranged from below the method detection limit (MDL) of <0.0250 to 0.034 µg/L.
- Total cadmium ranged from 0.040 to 0.25 µg/L.
- Dissolved copper ranged from 2.3 to 14.0 µg/L.

- Dissolved lead ranged from 0.092 to 0.94 µg/L.
- Total lead ranged from 0.84 to 17 µg/L.
- Total mercury ranged from below the MDL of <0.0100 to 0.0410 µg/L.
- Dissolved zinc ranged from 20.7 to 59.0 µg/L.

3.2 Monitored Event Pollutant Loading Results

Pollutant loading estimates in pounds were calculated for the following constituents of concern: TSS, TP, ammonia, nitrate + nitrite, and TKN. Reported concentrations were combined with runoff volumes measured during the storm event at each monitoring station. Formulas used, including conversion factors, are described in the SWOMP. Table 4 presents the estimated pollutant loading of the constituents for each monitored storm. The pollutant loading contributions for each site are shown graphically in Figure 6. Table 5 is a summary of event loading estimates in pounds per acre for comparison between monitored drainage areas. A summary of the ranges of loading pounds per acre (lbs/ac) as calculated for the storm events monitored during WY 2022 is presented below.

- TSS loading estimates ranged from 0.252 to 2.51 lbs/ac.
- TP loading estimates ranged from 0.00122 to 0.0138 lbs/ac.
- Ammonia loading estimates ranged from 0.00181 to 0.0138 lbs/ac.
- Nitrate + nitrite loading estimates ranged from 0.00101 to 0.0146 lbs/ac.
- TKN loading estimates ranged from 0.00679 to 0.0613 lbs/ac.

3.3 Precipitation Results

Precipitation data from the Front, East, Cynthia Mann, and Whitewater rain gauges were used to validate all targeted storms during WY 2022. Each monitoring station is associated with a rain gauge. Precipitation data recorded for each of the targeted storms can be found in Table 1. Monthly totals for WY 2022 are shown in Figure 7. A severed cable at the Front rain gauge caused a data gap from October 22, 2021 – October 29, 2021, resulting in a low monthly total compared to the other three rain gauge sites.

4. Quality Assurance/Quality Control

Quality assurance (QA) and quality control (QC) measures for the Stormwater Outfall Monitoring Program are presented in detail in the QAPP and SWOMP. No deviations from the QAPP and SWOMP occurred during WY 2022. QA and QC measures conducted during the WY are discussed below.

4.1 Data Quality Discussion

A data validation review process was used to evaluate the analytical and field parameter results. These checklists were used to compare monitoring methods and all monitoring data collected against performance criteria established to meet the data quality objectives described in the QAPP. Field parameter results and analytical results that were qualified are identified in Table 3 and Table 4, respectively. Further information regarding qualified samples is included in the Storm Event Reports located in Appendix A.

The following program criteria are used to identify storm events and representative composite samples.

- Storm criteria are met when the precipitation amount is greater than 0.10 inch and the storm was preceded by a minimum 72 hours of dry weather from the previous measurable storm event (rainfall greater than 0.10 inch).
- Composite samples are considered representative of stormwater runoff when aliquots represent greater than 75 percent of total runoff volume from the storm or greater than 6 hours of the storm, including the first hour of runoff.

For WY 2022, the grab sample collected from the Lucky monitoring station on May 27, 2022 was qualified due to an exceeded holding time (>8 hours) and insufficient rainfall. From the same storm event, the grab sample collected from the Main monitoring station was also qualified due to an exceeded holding time. The composite samples collected on June 5, 2022 from the Whitewater and Americana monitoring stations were rejected due to lack or representativeness.

4.2 QC Sample Results

QC sampling during WY 2022 consisted of a combination of field QC samples, laboratory QC samples, and equipment QC samples. Field QC sampling intervals followed a predetermined schedule, included in the SWOMP. Equipment QC samples were collected during fall maintenance. Sample results for all QC samples are included in Table 6.

4.2.1 Field QC Samples

Field QC samples include field duplicates, field blanks, and composite blanks.

Field duplicates are field grab samples that were taken alongside a parent grab sample to compare the accuracy of the data. For *E.coli*, the allowable logarithmic relative percent difference (RPD) between the duplicate sample and the parent sample is 40 percent. All field duplicate samples collected during WY 2022 met the RPD standard.

Analytical results from field blanks and composite blanks are expected to be less than the MDL. If a water quality parameter is detected in a field or composite blank, all analytical results associated with the blank that exhibit a concentration of less than five times the concentration detected in the blank, are qualified. All field blank samples collected had a result less than the MDL. TKN and dissolved copper were detected in the composite blank collected on May 27, 2022. No TKN or dissolved copper results during the WY were less than five times the concentration detected in the composite blank.

4.2.2 Laboratory QC Samples

Laboratory QC samples are composite duplicate samples that are split at WQL. This type of sample serves as a check on the laboratory's ability to representatively split a composite sample and is a test of analytical precision. The allowable RPD for all parameters is 20 percent. All parameters from the composite duplicate sample collected during WY 2022 met the RPD standard.

4.2.3 Equipment QC Samples

Equipment QC samples include an equipment blank and a rinsate blank, both serving as a check on equipment decontamination procedures.

The equipment blank is collected before sampling for the WY begins, when new equipment is installed. For WY 2022, the equipment blank was collected on September 15, 2021 at the Main monitoring station. TKN, TP, dissolved copper, and dissolved zinc were detected in the sample. Dissolved copper results that were collected throughout the WY that are less than five times the value detected in the blank have been qualified and are considered estimates. All other results were greater than five times the detected value in the blank and are unqualified.

The rinsate blank is collected after sampling for the WY has been completed. The rinsate blank for WY 2022 was collected on August 29, 2022 at the Americana subwatershed monitoring station. Dissolved copper was detected in the sample, however, no dissolved copper results during the WY were less than five times the concentration detected in the rinsate blank.

Appendix A: Figures

Figure 1. Vicinity Map

Figure 2. WY 2022 *E.coli* Results

Figure 3. WY 2022 TSS, TDS, and Turbidity Results

Figure 4. WY 2022 Ammonia, Nitrate + Nitrite, and TKN Results

Figure 5. WY 2022 Total Phosphorus and Orthophosphate Results

Figure 6. WY 2022 Pollutant Loadings

Figure 7. WY 2022 Monthly Precipitation

Figure 1: Vicinity Map
Phase I NPDES Outfall Sampling Stations

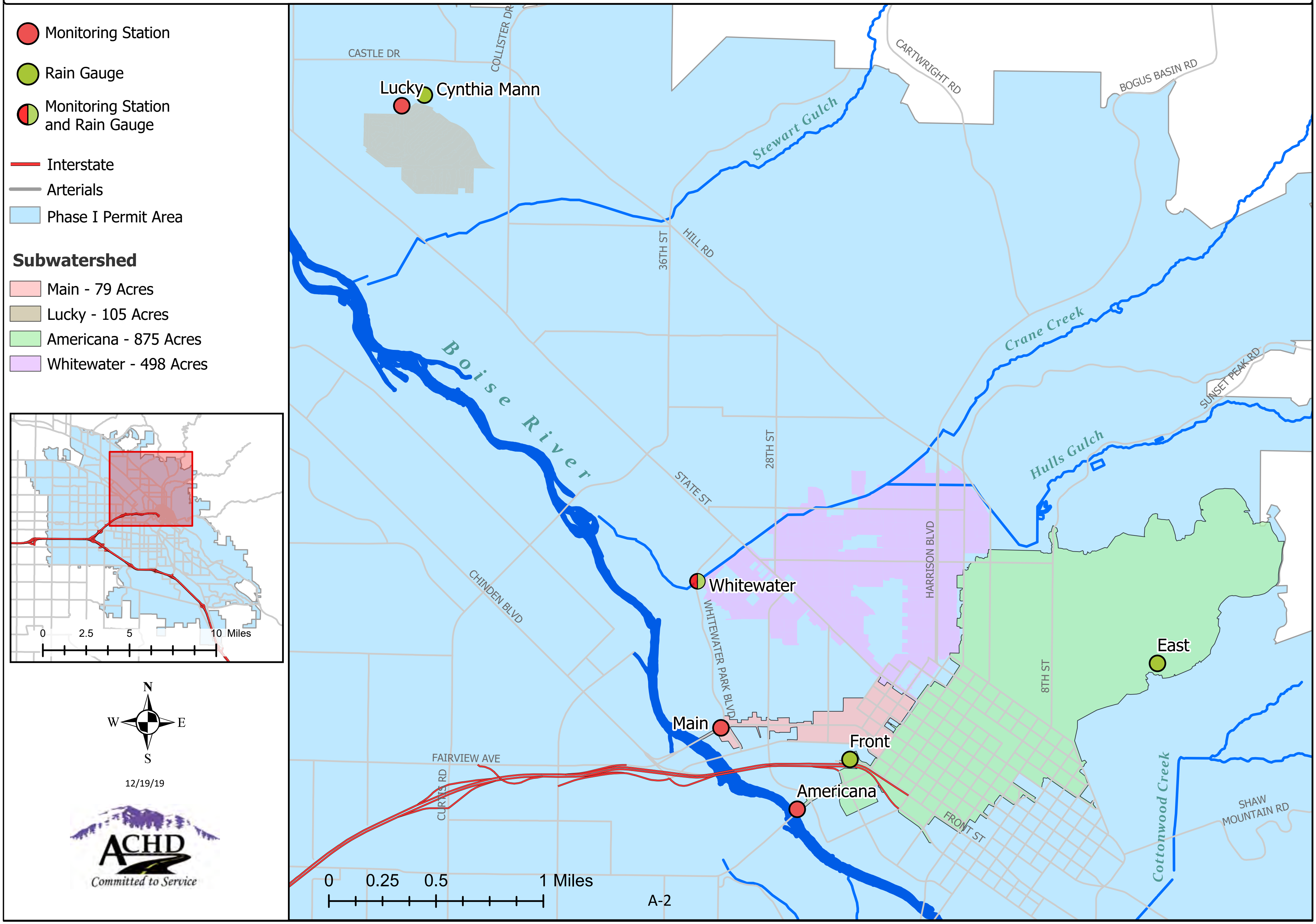


Figure 2: WY22 E. coli Results

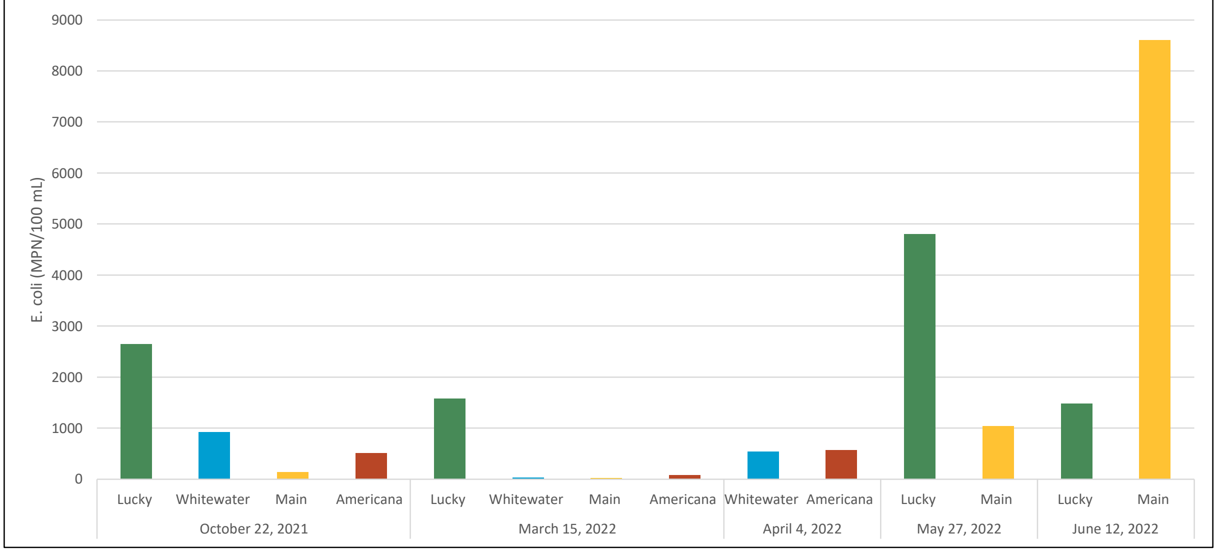
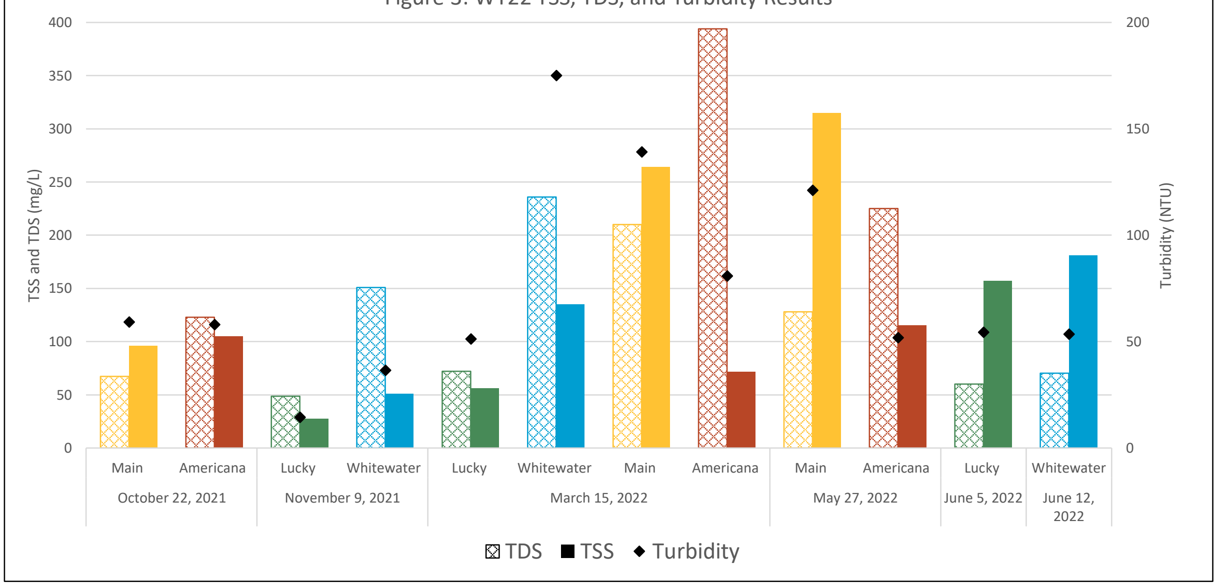


Figure 3: WY22 TSS, TDS, and Turbidity Results



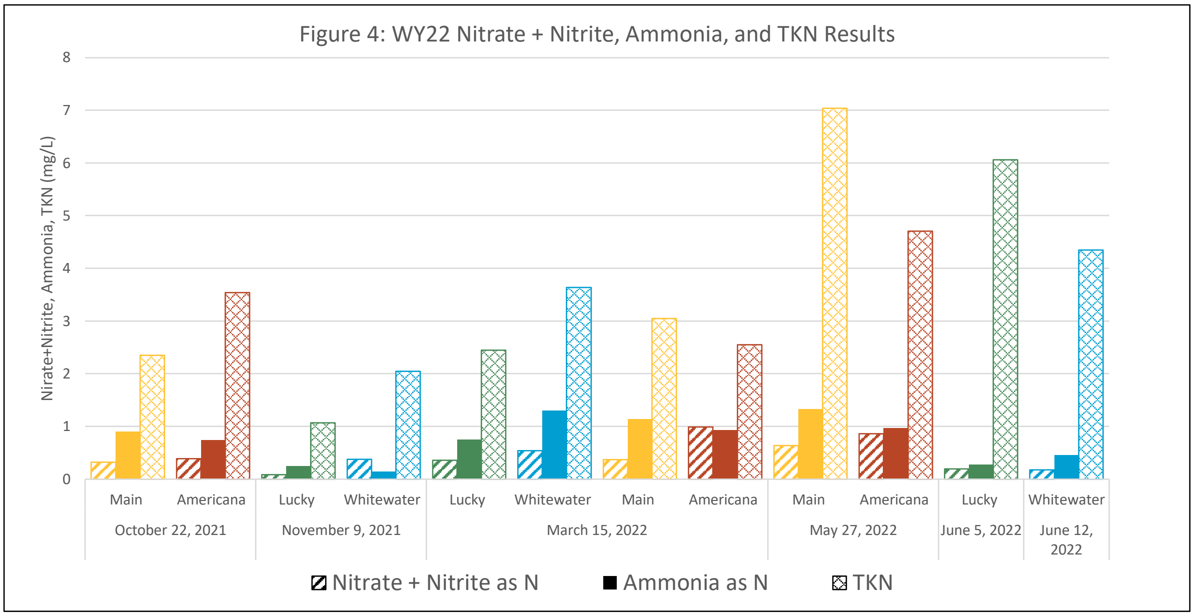


Figure 4: WY22 Nitrate + Nitrite, Ammonia, and TKN Results
Nirate+Nitrite, Ammonia, TKN (mg/L)
0
1
2
3
4
5
6
7
8
Main
Americana
Lucky
Whitewater
Lucky
Whitewater
Main
Americana
Main
Americana
Lucky
Whitewater
October 22, 2021
November 9, 2021
March 15, 2022
May 27, 2022
June 5, 2022
June 12, 2022
Nitrate + Nitrite as N
Ammonia as N
TKN

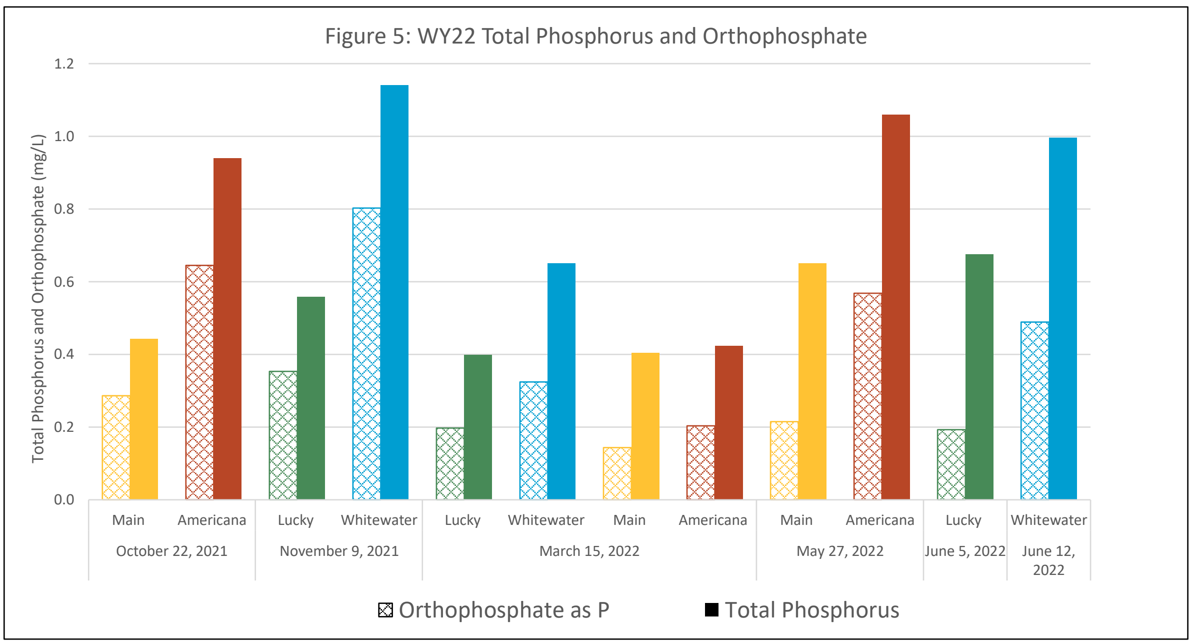


Figure 5: WY22 Total Phosphorus and Orthophosphate
Total Phosphorus and Orthophosphate (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Main
Americana
Lucky
Whitewater
Lucky
Whitewater
Main
Americana
Main
Americana
Lucky
Whitewater
October 22, 2021
November 9, 2021
March 15, 2022
May 27, 2022
June 5, 2022
June 12, 2022
Orthophosphate as P
Total Phosphorus

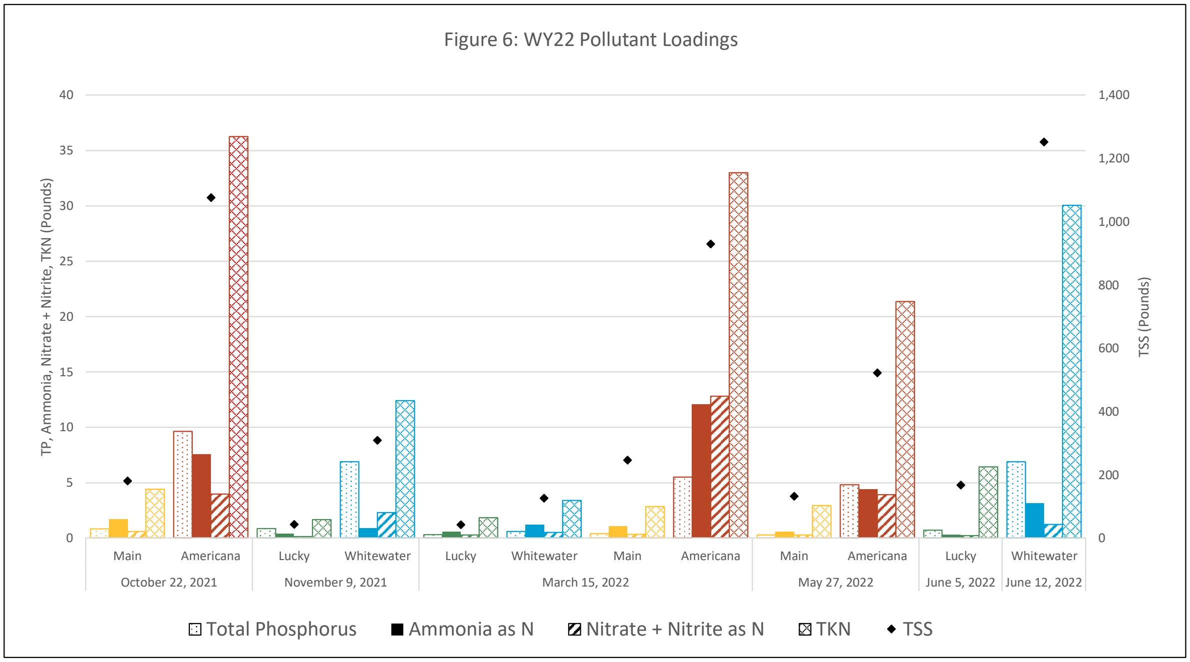


Figure 6: WY22 Pollutant Loadings
TP, Ammonia, Nitrate + Nitrite, TKN (Pounds)
TSS (Pounds)
0
5
10
15
20
25
30
35
40
0
200
400
600
800
1,000
1,200
1,400
Main
Americana
Lucky
Whitewater
Lucky
Whitewater
Main
Americana
Main
Americana
Lucky
Whitewater
October 22, 2021
November 9, 2021
March 15, 2022
May 27, 2022
June 5, 2022
June 12, 2022
Total Phosphorus
Ammonia as N
Nitrate + Nitrite as N
TKN
TSS

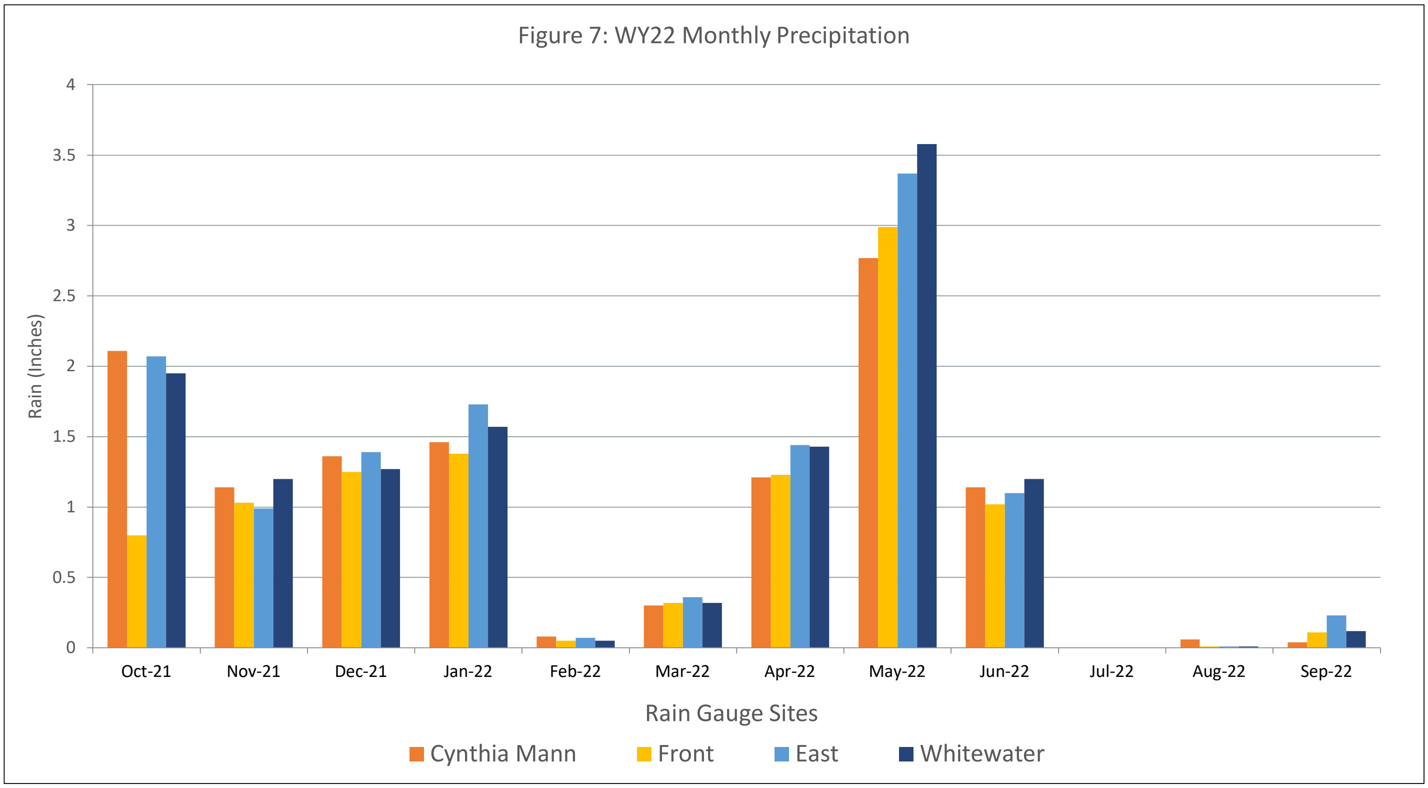


Figure 7: WY22 Monthly Precipitation
Rain (Inches)
4
3.5
3
2.5
2
1.5
1
0.5
0
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Rain Gauge Sites
Cynthia Mann
Front
East
Whitewater

Appendix B: Tables

Table 1. Monitored Storms and Samples Collected

Table 2. Field Parameter Summary

Table 3. Analytical Results Summary

Table 4. Event Loading for Monitored Drainages in Pounds

Table 5. Event Loading in Pounds per Acre

Table 6. QC Sample Summary

Table 1. Monitored Storms and Samples Collected					
Event Date	Sampling Information	Lucky	Whitewater	Main	Americana
October 22, 2021	Grab samples collected and submitted?	Yes	Yes	Yes	Yes
	Composite samples collected and submitted?	No	No	Yes	Yes
	Trigger volume	2,895 gal	800 ft^3	3,411 gal	2,960 ft^3
	Sampler enable condition (in)	level > 3.40	level > 3.75	level > 2.00	level > 3.85
	Percent of storm flow sampled	–	–	79%	84%
	Composite sample duration (hrs.)	–	–	4.0	5.5
	Storm precipitation (in)	0.42	0.43	0.37	0.37/0.39
November 9, 2021	Grab samples collected and submitted?	NO	NO	NO	NO
	Composite samples collected and submitted?	YES	YES	NO	NO
	Trigger volume	2,895 gal	800 ft^3	–	–
	Sampler enable condition (in)	level > 2.3	level > 2.3	–	–
	Percent of storm flow sampled	90%	70%	–	–
	Composite sample duration (hrs.)	7.5	8.0	–	–
	Storm precipitation (in)	0.45	0.41	0.38	0.38/0.44
March 15, 2022	Grab samples collected and submitted?	YES	YES	YES	YES
	Composite samples collected and submitted?	YES	YES	YES	YES
	Trigger volume	5,004 gal	1,600 ft^3	5,894 gal	5,112 ft^3
	Sampler enable condition (in)	level > 1.5	level > 0.5	level > 3.5	level > 6.5
	Percent of storm flow sampled	98%	95%	98%	61%
	Composite sample duration (hrs.)	9.0	8.0	9.0	6.5
	Storm precipitation (in)	0.30	0.32	0.30	0.30/0.36
April 4, 2022	Grab samples collected and submitted?	NO	YES	NO	YES
	Composite samples collected and submitted?	NO	NO	NO	NO
	Trigger volume	–	–	–	–
	Sampler enable condition (in)	–	–	–	–
	Percent of storm flow sampled	–	–	–	–
	Composite sample duration (hrs.)	–	–	–	–
	Storm precipitation (in)	0.26	0.25	0.21	0.21/0.28
May 27, 2022	Grab samples collected and submitted?	YES	NO	YES	NO
	Composite samples collected and submitted?	NO	NO	YES	YES
	Trigger volume	2,895 gal	800 ft^3	3,411 gal	2,960 ft^3
	Sampler enable condition (in)	level > 2.3	level > 1.5	level > 2.8	level > 6.2
	Percent of storm flow sampled	–	–	94%	99%
	Composite sample duration (hrs.)	–	–	6.5	11.0
	Storm precipitation (in)	0.10	0.15	0.15	0.15/0.14
June 5, 2022	Grab samples collected and submitted?	NO	NO	NO	NO
	Composite samples collected and submitted?	YES	YES	NO	YES
	Trigger volume	2,895 gal	800 ft^3	–	2,960 ft^3
	Sampler enable condition (in)	level > 3.1	level > 2.0	–	level > 11.25
	Percent of storm flow sampled	62%	17%	–	35%
	Composite sample duration (hrs.)	7.5	1.0	–	4.0
	Storm precipitation (in)	0.22	0.17	0.20	0.20/0.16
June 12, 2022	Grab samples collected and submitted?	YES	NO	YES	NO
	Composite samples collected and submitted?	NO	YES	NO	NO
	Trigger volume	–	1,600 ft^3	–	–
	Sampler enable condition (in)	–	level > 2.0	–	–
	Percent of storm flow sampled	–	91%	–	–
	Composite sample duration (hrs.)	–	6.0	–	–
	Storm precipitation (in)	0.69	0.68	0.62	0.62/0.68

Notes:

-- = no data

Table 2. Field Parameter Results					
Event Date	Monitoring Station	Field Parameters			
		Dissolved Oxygen	Temperature	pH	Conductivity
		mg/L	C	S.U.	uS/cm
October 22, 2021	Lucky	8.54	16.41	6.94	82.1
	Whitewater	8.93	14.36	7.19	163.2
	Main	9.10	14.35	6.28	88.8
	Americana	9.22	13.83	6.63	87.5
March 15, 2022	Lucky	9.04	12.21	5.87	83.3
	Whitewater	8.68	9.70	6.10	671.8
	Main	10.57	9.30	6.11	511.8
	Americana	10.55	10.17	6.32	737.6
April 4, 2022	Lucky	–	–	–	–
	Whitewater	9.19	10.59	7.43	205.4
	Main	–	–	–	–
	Americana	10.05	11.55	7.25	349.1
May 27, 2022	Lucky	5.86 [2J]	20.53 [2J]	7.42 [2J]	189.1 [2J]
	Whitewater	–	–	–	–
	Main	6.02	21.82	6.92	156.7
	Americana	–	–	–	–
June 12, 2022	Lucky	7.58	18.38	6.09	49.6
	Whitewater	–	–	–	–
	Main	7.92	19.4	6.45	44.8
	Americana	–	–	–	–

Notes:

-- = no data

[2J] Data qualified due to insufficient precipitation.

Table 3. Analytical Results																						
			Analytical Parameters																			
Event Date	Monitoring Station	Sample ID	E. coli	BOD_5	COD	Hardness as $CaCO_3$	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			MPN/100 mL	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
October 22, 2021	Lucky	211022-03-WG	2650	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Whitewater	211022-11-WG	921	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Main	211022-12-WG/WC	137.6	35.0	142	20.5	59.1	95.8	67.2	0.442	0.286	0.907	0.322	2.35	1.6	<0.0250	0.13	7.5 [1]	0.48	10	0.0219	51.3
	Americana	211022-14-WG/WC	517.2	80.3	212	38.2	57.9	105	123	0.940	0.645	0.740	0.389	3.54	2.6	<0.0250	0.14	8.4	0.28	7.1	0.0191	49.6
November 9, 2021	Lucky	21109-03-WC	–	18.3	73.0	14.9	14.4	27.3	48.8	0.558	0.353	0.248	0.0872	1.07	0.91	<0.0250	0.040	2.3 [1]	0.16	0.84	0.0115	31.0
	Whitewater	211109-11-WC	–	41.1	159	52.3	36.4	51.0	151	1.14	0.803	0.149	0.380	2.05	2.3	<0.0250	0.060	5.0 [1]	0.94	4.2	<0.0100	20.7
	Main	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Americana	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
March 15, 2022	Lucky	220315-03-WG/WC	1580	15.2	121	20.7	51.1	55.8	72.0	0.4	0.197	0.750	0.359	2.45	2.0	<0.0250	0.076	5.0 [1]	0.11	2.2	0.0107	32.3
	Whitewater	220315-11-WG/WC	30.1	27.2	197	84.3	175	135	236	0.7	0.324	1.30	0.541	3.64	3.4	<0.0250	0.13	8.6	0.25	8.9	0.0192	41.8
	Main	220315-12-WG/WC	24.3	18.9	215	81	139	264	210	0.404	0.143	1.14	0.372	3.05	3.2	0.034	0.20	6.7 [1]	0.092	12.5	0.0285	53.7
	Americana	220315-14-WG/WC	88.2	19.8	118	146	80.8	71.8	394	0.424	0.203	0.935	0.989	2.55	4.9	0.033	0.13	4.6 [1]	0.18	6.8	0.0155	43.9
April 4, 2022	Lucky	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Whitewater	220404-11-WG	547.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Main	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Americana	220404-14-WG	579.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
May 27, 2022	Lucky	220527-03-WG	4810 [1J, 2J]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Whitewater	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Main	220527-12-WG/WC	1046 [1J]	49.9	303	45.2	121	315	128	0.650	0.215	1.33	0.636	7.04	3.7	0.031	0.25	13.7	0.29	17.0	0.0410	59.0
	Americana	220527-14-WC	–	84.7	224	96.4	51.8	115	225	1.060	0.568	0.970	0.863	4.71	5.9	<0.0250	0.13	14.0	0.28	5.5	0.0196	47.9
June 5, 2022	Lucky	220605-03-WC	–	18.7	130	21.3	54.3	157	60.0	0.676	0.193	0.277	0.196	6.06	1.8	<0.0250	0.11	6.5 [1]	0.11	3.8	0.0153	31.8
	Whitewater	220605-11-WC	–	20.3 [1R]	172 [1R]	57.1 [1R]	108 [1R]	451 [1R]	85.2 [1R]	1.7 [1R]	0.0541 [1R]	<0.0350 [1R]	0.181 [1R]	4.14 [1R]	6.1 [1R]	<0.0250 [1R]	0.90 [1R]	2.9 [1, 1R]	0.12 [1R]	201 [1R]	0.0315 [1R]	13.4 [1R]
	Main	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Americana	220605-14-WC	–	9.19 [1R]	138 [1R]	50.4 [1R]	27.6 [1R]	70.6 [1R]	112 [1R]	0.218 [1R]	0.0128 [1R]	0.211 [1R]	0.266 [1R]	1.72 [1R]	3.0 [1R]	<0.0250 [1R]	0.069 [1R]	2.7 [1, 1R]	0.054 [1R]	4.5 [1R]	<0.0100 [1R]	12.4 [1R]
June 12, 2022	Lucky	220612-03-WG	1480	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Whitewater	220612-11-WC	–	53.0	195	23.7	53.5	181	70.2	0.997	0.489	0.458	0.176	4.35	2.6	<0.0250	0.11	5.5 [1]	0.27	8.8	0.0194	24.2
	Main	220612-12-WG	8600	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Americana	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Notes:

– = no data

[1] Data considered an estimate since the results are less than five times the dissolved copper in the equipment blank.

[1J] Sample qualified due to exceeded hold time.

[2J] Data qualified due to insufficient precipitation.

[1R] Data rejected due to lack of representativeness.

WG = Wet grab sample.

WC = Wet composite sample.

Table 4. Event Loading for Monitored Drainages in Pounds						
Event Date	Monitoring Station	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
October 22, 2021	Lucky	–	–	–	–	–
	Whitewater	–	–	–	–	–
	Main	180	0.829	1.70	0.604	4.41
	Americana	1,075	9.62	7.58	3.98	36.2
November 9, 2021	Lucky	42.2	0.863	0.384	0.135	1.655
	Whitewater	308	6.89	0.900	2.30	12.4
	Main	–	–	–	–	–
	Americana	–	–	–	–	–
March 15, 2022	Lucky	41.8	0.298	0.562	0.269	1.84
	Whitewater	125	0.605	1.21	0.503	3.38
	Main	245	0.375	1.06	0.346	2.83
	Americana	929	5.49	12.1	12.8	33.0
May 27, 2022	Lucky	–	–	–	–	–
	Whitewater	–	–	–	–	–
	Main	131	0.271	0.553	0.265	2.93
	Americana	521	4.80	4.40	3.91	21.3
June 5, 2022	Lucky	167	0.718	0.294	0.208	6.43
	Whitewater	794 [1R]	2.99 [1R]	0.00 [1R, U]	0.319 [1R]	7.29 [1R]
	Main	–	–	–	–	–
	Americana	888 [1R]	2.74 [1R]	2.65 [1R]	3.35 [1R]	21.6 [1R]
June 12, 2022	Lucky	–	–	–	–	–
	Whitewater	1,250	6.89	3.16	1.22	30.1
	Main	–	–	–	–	–
	Americana	–	–	–	–	–

Notes:

-- = no data

[1R] Data rejected due to lack of representativeness.

[U] Concentrations are at or below the method detection limit (MDL). A value of half the MDL was used in calculations.

Table 5. Event Loading in Pounds/Acre						
Event Date	Monitoring Station	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
October 22, 2021	Lucky	–	–	–	–	–
	Whitewater	–	–	–	–	–
	Main	1.37	0.00633	0.0130	0.00461	0.0336
	Americana	1.23	0.0110	0.00866	0.00455	0.0414
November 9, 2021	Lucky	0.402	0.00822	0.00365	0.00128	0.0158
	Whitewater	0.619	0.0138	0.00181	0.00461	0.0249
	Main	–	–	–	–	–
	Americana	–	–	–	–	–
March 15, 2022	Lucky	0.398	0.00284	0.00535	0.00256	0.0175
	Whitewater	0.252	0.00122	0.00243	0.00101	0.0068
	Main	1.87	0.00287	0.00809	0.00264	0.0216
	Americana	1.06	0.00627	0.0138	0.0146	0.0377
May 27, 2022	Lucky	–	–	–	–	–
	Whitewater	–	–	–	–	–
	Main	1.000	0.00207	0.00422	0.00202	0.0224
	Americana	0.596	0.00549	0.00503	0.00447	0.0244
June 5, 2022	Lucky	1.59	0.00684	0.00280	0.00198	0.0613
	Whitewater	1.59 [1R]	0.00600[1R]	0.0000 [1R, U]	0.000641 [1R]	0.0146 [1R]
	Main	–	–	–	–	–
	Americana	1.01 [1R]	0.00313 [1R]	0.00303 [1R]	0.00383 [1R]	0.0247 [1R]
June 12, 2022	Lucky	–	–	–	–	–
	Whitewater	2.51	0.0138	0.00635	0.00244	0.0603
	Main	–	–	–	–	–
	Americana	–	–	–	–	–

Notes:

-- = no data

[1R] Data rejected due to lack of representativeness.

[U] Concentrations are at or below the method detection limit (MDL). A value of half the MDL was used in calculations.

Table 6. QC Sample Results

Event Date	Parent Sample	Sample ID	QC Sample Type	Analytical Parameters																			
				E. coli	BOD_5	COD	Hardness as $CaCO_3$	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
				mpn/100 mL	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
October 22, 2021	Main grab	211022-12-001	Field blank	<1.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Main grab	211022-12-101	Field duplicate	141	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Calculated parent/duplicate RPD			**0.4%**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
March 15, 2022	Main grab	220315-12-001	Field blank	<1.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Main grab	220315-12-101	Field duplicate	15.8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Calculated parent/duplicate RPD			**10%**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
May 27, 2022	Main grab	211022-12-001	Field blank	<1.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Main grab	211022-12-101	Field duplicate	727	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Calculated parent/duplicate RPD			**4%**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
June 5, 2022	Main composite	220605-12-002	Composite blank	–	<2.00	<13.0	<0.115	<0.3	<0.900	<25.0	<6.00E-3	<2.00E-3	<0.0350	<0.0250	0.147	<0.0400	<0.0250	<0.0250	0.180	<0.0500	<0.0500	<0.0100	<0.780
June 12, 2022	Lucky grab	220612-03-001	Field blank	<1.0	–	–	–	–	–	–	–	–	–	–	–	–	--	–	–	–	–	–	–
	Lucky grab	220612-03-101	Field duplicate	1120	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Calculated parent/duplicate RPD			**3%**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
June 12, 2022	Whitewater composite	220612-11-103	Composite split	–	52.5	187	23.7	53.9	170	79.8	0.994	0.475	0.433	0.177	4.1	2.5	<0.0250	0.11	5.4	0.29	8.2	0.0188	24
	Calculated parent/duplicate RPD			**–**	**0.9%**	**4%**	**0.0%**	**0.7%**	**6%**	**13%**	**0.3%**	**3%**	**6%**	**0.6%**	**7%**	**4%**	**0.0%**	**0.0%**	**2%**	**7%**	**7%**	**3%**	**0.8%**
August 29, 2022	–	220829-206-004	Rinsate blank	–	<2.00	<13.0	<0.115	<0.3	<0.900	<25.0	<6.00E-3	<2.00E-3	<0.0350	<0.0250	<0.100	<0.0400	<0.0250	<0.0250	0.19	<0.0500	<0.0500	<0.0100	<0.780
September 15, 2021	–	210915-12-003	Equipment blank	–	<2.00	<13.0	<0.115	<0.3	<0.900	<25.0	0.00491	<2.00E-3	<0.0350	<0.0250	0.135	<0.0400	<0.0250	<0.0250	1.6	<0.0500	<0.0500	<0.0100	2.4
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%

– = No data

Cells highlighted in gray are flagged for discussion.

Appendix C: Storm Event Reports

Technical Memorandum

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Boise, ID 83702

Phone: 208-389-7700

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for October 22, 2021

Date: January 5, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 4, 2021. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the October 22, 2021 storm event.

Section 2: Project Status

Table 1-1 is a summary of the sample types collected to date for water year 2022 Phase I Stormwater Outfall Monitoring.

Table 1-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
Collected:	1G	1G	1G, 1C	1G, 1C	1G, 1C

Notes:

C = composite sample.

G = grab sample.

Section 3: Storm Event Summary

The October, 2021 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A detailed summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form from October 21, 2021, is included in Attachment A for reference.

Thursday, October 21, 2021

- The morning of Thursday, October 21, the National Weather Service issued a forecast for widespread rain in the Boise area Friday afternoon. Rainshadowing was not expected. The chance of precipitation was 80 percent, with as much as 0.25 inch of precipitation forecasted.
- Setup was accomplished Thursday afternoon. An expected precipitation depth of 0.11 inch was used to set trigger volumes at monitoring stations.

Friday, October 22, 2021

- Light showers started around 1500 Friday afternoon and continued for approximately an hour. Around 1600, precipitation greatly intensified through the area.
- Precipitation totals ranged between 0.37 and 0.43 inch at local rain gauges.

Flow measurements and precipitation data are included in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Main, Americana, and AS_6 monitoring stations were set up the afternoon of Thursday, October 21, to collect flow proportional composite samples during the storm. Site-specific velocity cutoff values were calculated and programmed into the flowmeters. Setup and sampling information is included in Table 1.

Grab Samples

Two, two-member teams mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on the afternoon of October 22, 2021. Grab samples were collected at Lucky, Whitewater, Main, Americana, and AS_6. All grab samples were submitted to the West Boise Water Quality Lab (WQL) at 1918 on October 22. Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment C.

Composite Samples

Composite samples were collected at Main, Americana, and AS_6 monitoring stations. Volumes of composite samples submitted were sufficient for all parameters. All composite samples were submitted to the WQL on October 22 at 2250. Analytical results are included in Table 2. Pollutant loading estimates for the event are included in Table 3. There were no qualifiers. The Whitewater and Lucky composite samples were discarded and not submitted to the WQL due to equipment issues; more information can be found in Section 5.

Section 4: Quality Assurance/Quality Control

A summary of quality control (QC) samples collected during the October 22, 2021, storm event is presented below in Table 3-1. A field blank and a field duplicate were collected from the Main monitoring station. Analytical results for these samples are included in Table 4.

Table 3-1. QC Samples for October 10, 2020

Sample ID	Sample Type	Parent Sample	Conclusions
201010-12-001	Field blank	Main grab	No *E. coli* detection was reported in the field blank.
201010-12-101	Field duplicate	Main grab	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. All acceptance and performance criteria for analytical and non-analytical data were met for this storm event.

Section 5: Notes and Recommendations

Notes from the October 22, 2021 sampling event and recommendations for future sampling events can be found below.

Whitewater

During the storm event, the Whitewater composite sampler started to pull air during sampling, indicated by a "no more liquid" error message. The team suspected the sampler tubing was clogged with debris. The sampler was purged during the sampling event, but the clog was not removed. The composite sample was discarded and not submitted to the WQL. During shutdown, the debris was successfully removed from the tubing.

Lucky

Lucky monitoring station lost power between 1713 – 1811. Since the monitoring station lost power during the peak of the storm event, the composite sample was discarded and not submitted to the WQL.

Data Tables

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	Yes	Yes	Yes	Yes	Yes
Composite samples collected and submitted?	No	No	Yes	Yes	Yes
Trigger volume	2895 gal	800 ft^3	3411 gal	2960 ft^3	221 ft^3
Velocity cutoff (fps)	-	-	-	-	0.02
Sampler enable condition (in)	level > 3.40	level > 3.75	level > 2.00	level > 3.85	-
Runoff start time	16:00	16:15	16:00	15:54	17:18
Grab sample collection time	17:24	17:33	16:46	17:04	17:24
Composite sample stop time	-	--	20:44	21:58	21:12
Runoff stop time	22:00	0:00	21:58	11:59	23:00
Volume of discharge sampled (ft^3)	-	-	23,822	138,265	11,422
Total runoff volume (ft^3)	-	-	30,053	164,039	12,867
Percent of storm flow sampled (%)	-	-	79%	84%	89%
Composite sample duration (hrs)	-	-	4.0	5.5	3.5
Storm Precipitation (in)	0.42	0.43	0.37	0.37/0.39	0.37/0.39
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	-	-	45	48	54
Number of composite bottles filled	-	-	2	2	3
Composite sample volume (Approx.; ml)	-	-	26,500	32,500	32,250

Notes:

– = no data.

Table 2. Field and Analytical Data Summary - Wet Samples

Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				Analytical Parameters																				
			Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	Sample ID Composite	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate, as P	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	10/22/2021	211022-03-WG	8.54	6.94	82.07	16.41	2650.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Whitewater	10/22/2021	211022-11-WG	8.93	7.19	163.21	14.36	920.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Main	10/22/2021	211022-12-WG	9.10	6.28	88.8	14.35	137.6	211022-12-WC	35.0	142	20.5	59.1	95.8	67.2	0.442	0.286	0.907	0.322	2.35	1.6	<0.0250	0.13	7.5	0.48	10	0.0219	51.3
Americana	10/22/2021	211022-14-WG	9.22	6.63	87.5	13.83	517.2	211022-14-WC	80.3	212	38.2	57.9	105	123	0.940	0.645	0.740	0.389	3.54	2.6	<0.0250	0.14	8.4	0.28	7.1	0.0191	49.6
AS_6	10/22/2021	211022-206-WG	8.48	6.45	208.9	13.58	235.9	211022-206-WC	214	487	47.1	126	186	278	2.51	1.94	0.805	0.276	6.91	4.2	0.048	0.16	15.0	2.3	11.8	0.0339	111

Notes:

– = no data.

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia	Nitrate + Nitrite (N)	TKN
Lucky	10/22/2021	-	-	-	-	-
Whitewater	10/22/2021	-	-	-	-	-
Main	10/22/2021	180	0.829	1.70	0.604	4.41
Americana	10/22/2021	1075	9.62	7.58	3.98	36.24
AS_6	10/22/2021	149	2.02	0.646	0.222	5.55

Notes:

– = no data.

Table 4. QC Sample Summary				
Date	Parent Sample	Sample ID	Type	E. coli
				mpn/100 mL
10/22/2021	Main Grab	211022-12-001	Field Blank	< 1.0
10/22/2021	Main Grab	211022-12-101	Field Duplicate	141.4
Calculated parent/duplicate RPD				0.37%
Allowable RPD				40%

Notes:

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 21 Oct 2021 **Time:** 9:13 AM **Initials:** TL

Sampling Event Determination

Is there a targeted sampling event expected during the next 36 hours?
(Or, if it is Friday, is a targeted event expected before 5:00 PM on Monday?)

◉ Yes ◯ Maybe ◯ No

If YES or MAYBE, then call BC. Include discussion of reasons for "Maybe" below.

- ☑ Date and Time of Expected Event — 10/22 12:00 pm - midnight
- ☑ Expected Amount of Precipitation
- ☑ Percent Chance of Precipitation — 80% 0.15"

Targeted Stations & Samples

Americana
- ☑ Grab
- ☑ Composite

Main
- ☑ Grab
- ☑ Composite

Lucky
- ☑ Grab
- ☑ Composite

AS-6
- ☑ Grab
- ☑ Composite

Whitewater
- ☑ Grab
- ☑ Composite

Phase II
State
- ☐ Grab
- ☐ Composite

Type of Forecasted Precipitation

- ☐ Light Rain
- ☐ Rain
- ☐ Scattered Showers
- ☐ Thunder Showers
- ☐ Snow Melt
- ☐ Rain on Snow
- ☐ Other (Describe below)

Reasons for Not Targeting a Forecasted Storm or Targeting Selected Stations/Samples

- ☐ Equipment Concerns (Describe below)
- ☐ Holiday
- ☐ Other (Describe below)
- ☐ Waiting on Antecedent Dry Period. Expires:

Comments

Past 72 hr precip: 0.00"
I spoke with Josh at NWS. He said there is a little disagreement in the models on when the precip will begin, but his best guess is around 2pm. The bulk of the precip is looking to come in between 7pm and 9pm, and all precip ending around midnight. It will be a widespread rain with no chance of thunderstorms. There is a very little chance of rainshadowing, but he doesn't expect it to be much of an issue because it is a westerly system. Totals are around 0.15".

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 2:21 am MDT Oct 21, 2021

Today: Mostly sunny, with a high near 75. Southeast wind 3 to 7 mph.
Tonight: Partly cloudy, with a low around 51. Southeast wind 5 to 7 mph becoming calm after midnight.
Friday: Rain after 1pm. High near 69. Calm wind becoming southeast 5 to 8 mph in the morning. Chance of precipitation is 80%.
Friday Night: Rain, mainly before 1am. Low around 44. West wind 5 to 9 mph becoming calm after midnight. Chance of precipitation is 80%. New precipitation amounts between a tenth and quarter of an inch possible.
Saturday: A 30 percent chance of rain after 1pm. Cloudy, with a high near 58. Calm wind.
Saturday Night: A 40 percent chance of rain. Mostly cloudy, with a low around 45.
Sunday: Rain, mainly after 7am. High near 58. Chance of precipitation is 80%. New precipitation amounts between a tenth and quarter of an inch possible.
Sunday Night: Rain. Low around 48. Chance of precipitation is 90%.
Monday: Rain. High near 56. Chance of precipitation is 90%.
Monday Night: Rain likely, mainly before 7pm. Mostly cloudy, with a low around 41. Chance of precipitation is 70%.
Tuesday: Rain likely. Mostly cloudy, with a high near 53. Chance of precipitation is 60%.
Tuesday Night: Rain likely. Mostly cloudy, with a low around 43. Chance of precipitation is 60%.
Wednesday: A 40 percent chance of rain. Mostly cloudy, with a high near 55.

Comments

Area Forecast Discussion
National Weather Service Boise ID
248 AM MDT Thu Oct 21 2021

.SHORT TERM...Today through Saturday night...Sprinkles in western Idaho will end before morning as a weak warm front exits northeast. An upper ridge will amplify rapidly over our area today bringing mostly sunny and warmer weather with high temps in the 60s in the mountains and eastern Oregon, to the mid 70s in the lower southwest Idaho valleys. The ridge will shift east tonight as a Pacific trough with a lot of moisture comes inland. Rain will begin in Harney and Baker Counties toward morning. **The full surge of moisture along a cold front will spread across eastern Oregon Friday and into western Idaho Friday afternoon.** South-central Idaho will stay dry and warm through Friday. **The cold front and main rain will shift eastward across Idaho north of the Snake Basin Friday evening.** Rain will decrease in Valley and northern Elmore Counties overnight and generally end elsewhere. But another Pacific trough will already be spreading more rain into Harney County before dawn Saturday, and the rest of eastern Oregon Saturday morning, and then western Idaho Saturday afternoon. Again, south-central Idaho will largely miss out on this rain. Light rain will continue in other areas through Saturday night, but will increase yet again in Harney County toward Sunday morning as another strong Pacific storm comes inland. High temperatures will cool to normal Friday, but lows will stay above normal. The snow level will be above 8000 feet through Friday, then lower to 6000-6500 feet Friday night through Saturday night. Winds today will be light to moderate southeasterly in Idaho but southwesterly 20 to 30 mph in Oregon this afternoon. The same is expected Friday, except a little stronger in Idaho. Light to moderate southeast to southwest winds in all areas Saturday and Saturday night.

.LONG TERM...Sunday through Thursday...**A very active, wet pattern will continue Sunday and into next week. A strong atmospheric river event will arrive on Sunday as a large trough approaches the Pacific Northwest. This trough will ingest significant subtropical moisture that will spread into the forecast area Sunday and Monday**. Snow levels will remain high with this flow, keeping accumulations generally above 7000 feet MSL. Liquid precipitation totals have the potential to reach over an inch for the mountains and around a **half inch for the lower elevations during this time-frame.** Therefore, high elevation snowfall rates and accumulations could be considerable. The colder air associated with the trough will move over the region on Tuesday as west-northwest flow develops aloft, and snow levels will briefly lower to around 5500 ft MSL before gradually rising again. Temperatures will also lower to around 10 degrees below normal by Tuesday. Thereafter, the west-northwest flow aloft will bring a chance for additional precipitation Wednesday. A break in the active pattern is possible on Thursday as a weak ridge builds over the area, though forecast confidence remains low.

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth = 0.11 in
Square Feet per Acre = 43560 ft^2/ac
Inches per Foot= 12 in/ft
Aliquots per Sample= 17

Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

Site	Area (ac)	Using RC Based on Land Use			Using Manually-entered RC		
		RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)	RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.4605	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.7624	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7759.9962	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.8	**2960**
Theoretical	80	0.200	6389		0.000		
0	0	0.050	0	**0**		0	0
0	0	0.050	0	**0**		0	0

NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]

all values taken from historically corrected runoff coefficents

total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)

Measured runoff

RC = measured runoff / total runoff

Storm Event QA/QC Checklist

STORM DATE: 10.22.21				Circle one: Phase I (circled) Phase II
A. Event and Data Completeness	**Yes**	**No**	**N/A**	**Notes**
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed	X			
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member	X			
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Storm/Sample Value	Program Criteria	Met	Qualify	Reject	Notes
1. Precipitation (inches)	0.37 – 0.43	> 0.10 in.	X			
2. Antecedent dry period (hours)	325	< 0.11 in. in 72 hrs	X			
3. Days since last sampling event	134	>= 30 days	X			
4. Sampled amount as % of total run-off	79 – 92	>= 75%	X			
5. Ecoli sample holding time	~4 hrs	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X			
6. Filtering of samples for dissolved parameter analysis	<24 hrs	<= 24 hrs: no qualifier > 24 hrs.: reject	X			

D. Notes:

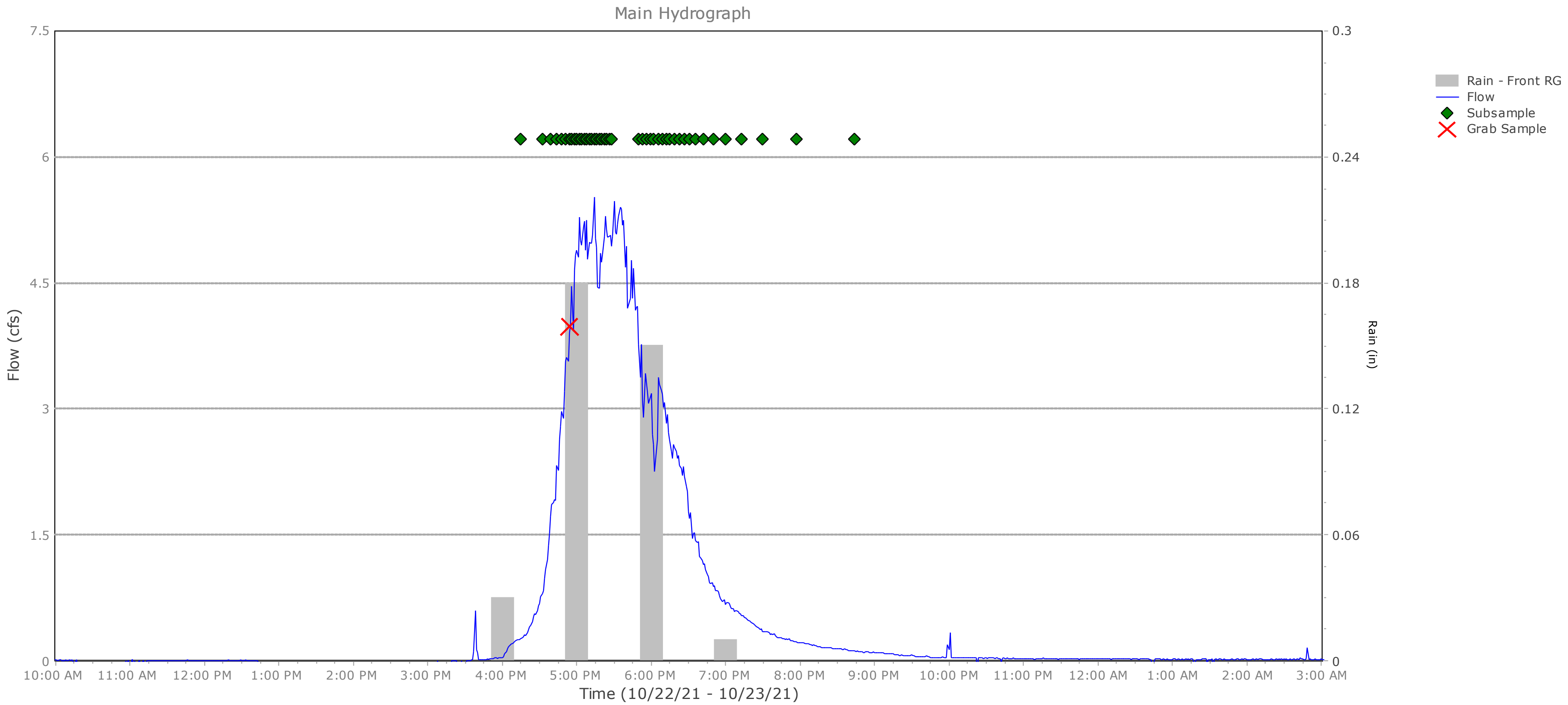
• Lucky had a power failure – no comp. collected.

• Whitewater had a clogged sampler line – no comp. collected.

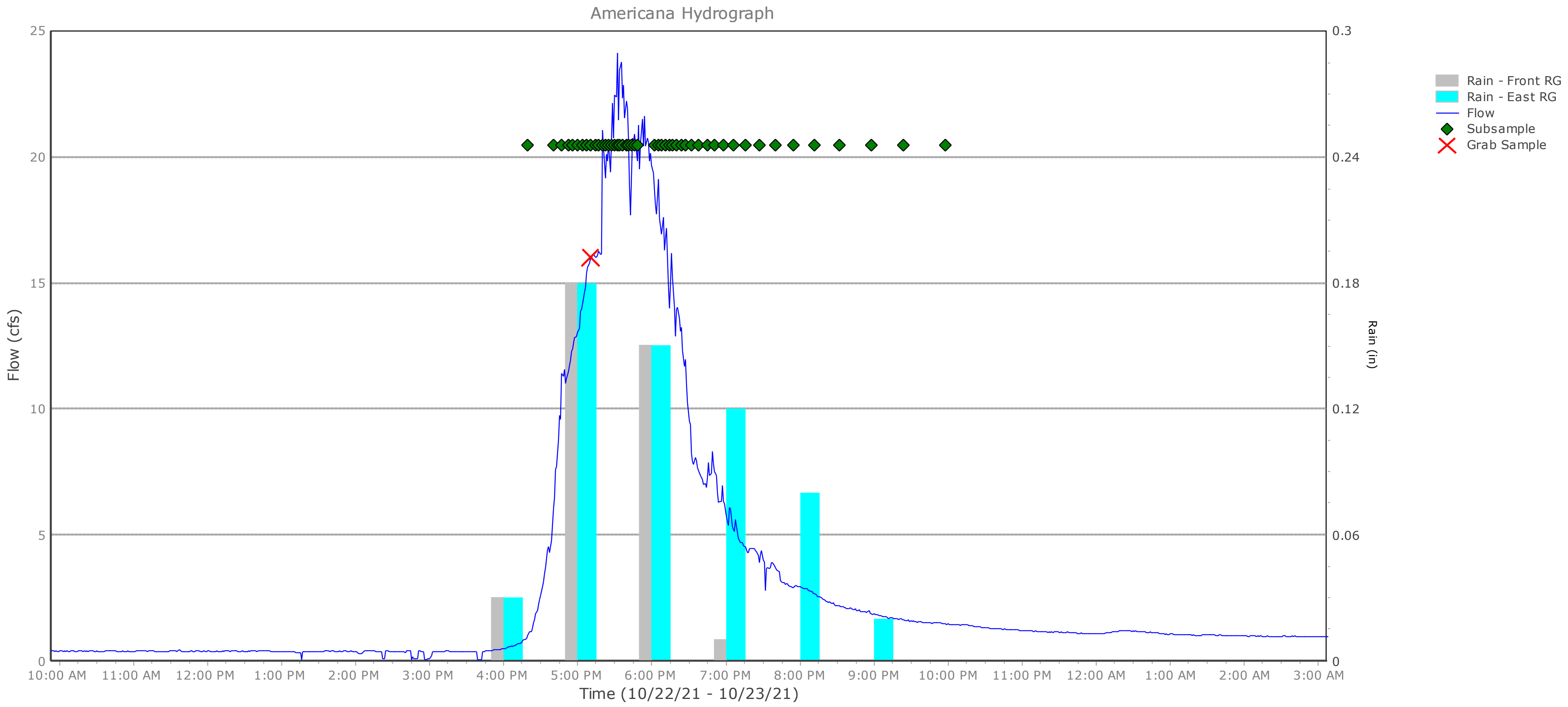
Reviewed by Tamara Lighter Date 11.29.21 Approved by Monica O Lowe Date 12-3-21

Updated 210824 TL

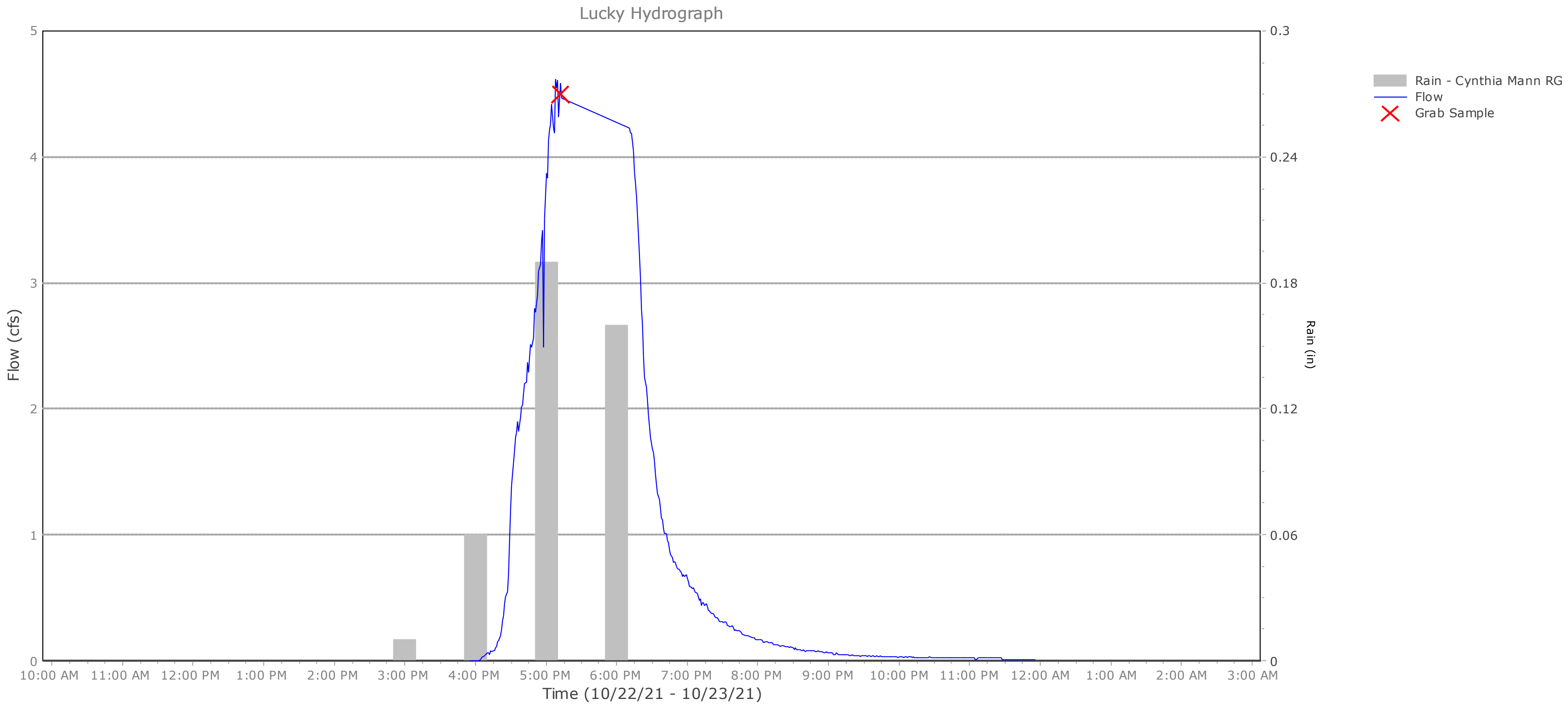
Attachment B: Storm Event Hydrographs



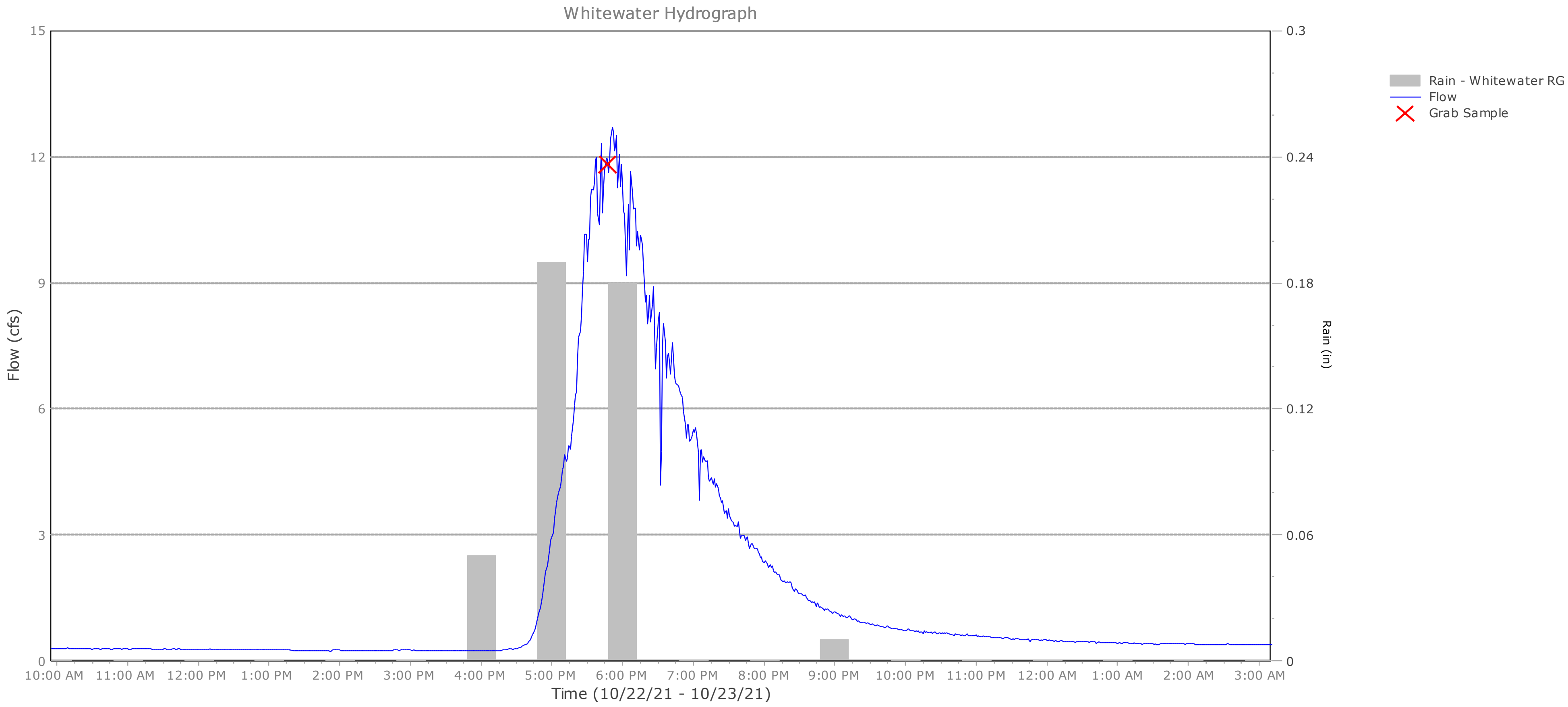
Main Hydrograph
Flow (cfs)
Rain (in)
7.5
6
4.5
3
1.5
0
0.3
0.24
0.18
0.12
0.06
0
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
Time (10/22/21 - 10/23/21)
Rain - Front RG
Flow
Subsample
Grab Sample



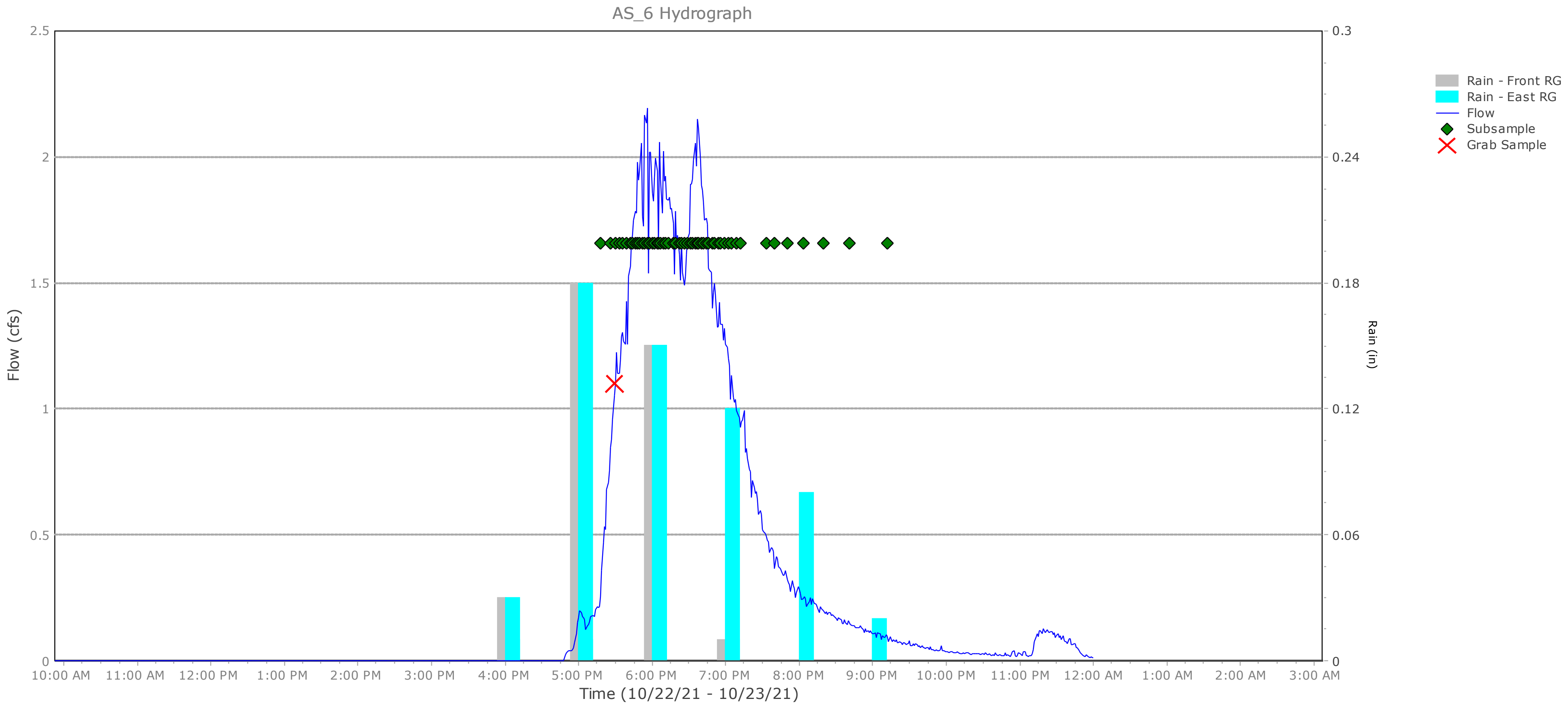
Americana Hydrograph
Flow (cfs)
Rain (in)
Time (10/22/21 - 10/23/21)
25
20
15
10
5
0
0.3
0.24
0.18
0.12
0.06
0
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
Rain - Front RG
Rain - East RG
Flow
Subsample
Grab Sample



Lucky Hydrograph
Flow (cfs)
Rain (in)
Time (10/22/21 - 10/23/21)
Rain - Cynthia Mann RG
Flow
Grab Sample
0
1
2
3
4
5
0
0.06
0.12
0.18
0.24
0.3
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM



Whitewater Hydrograph
15
12
9
6
3
0
0.3
0.24
0.18
0.12
0.06
0
Flow (cfs)
Rain (in)
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
Time (10/22/21 - 10/23/21)
Rain - Whitewater RG
Flow
Grab Sample


AS_6 Hydrograph
Flow (cfs)
Rain (in)
Time (10/22/21 - 10/23/21)
Rain - Front RG
Rain - East RG
Flow
Subsample
Grab Sample
2.5
2
1.5
1
0.5
0
0.3
0.24
0.18
0.12
0.06
0
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM

Attachment C: Storm Event Analytical Reports

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00180-01	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-12-WG						
AC00180-02	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-12-101						
AC00180-03	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-12-001						
AC00180-04	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-14-WG						
AC00180-05	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-206-WG						
AC00180-06	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-03-WG						
AC00180-07	ACST1B	ACHD Stormwater Phase 1 Bacteria Grab	Water		10/22/2021	10/22/2021
Comments: 211022-11-WG						

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	ACHD Stormwater Phase 1 Bacteria Grab
Date/Time Collected:	10/22/2021 16:46		
Lab Number:	AC00180-01	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	137.6	MPN/100 mL	1.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	ACHD Stormwater Phase 1 Bacteria Grab
Date/Time Collected:	10/22/2021 12:00		
Lab Number:	AC00180-02	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	141.4	MPN/100 mL	1.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	H
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 10/22/2021 12:00
Lab Number: AC00180-03
Sample Type: Grab

Location Description: ACHD Stormwater Phase 1 Bacteria Grab
Sample Collector: S.K
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	<1.0	MPN/100 mL	1.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	H U
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	ACHD Stormwater Phase 1 Bacteria Grab
Date/Time Collected:	10/22/2021 17:04		
Lab Number:	AC00180-04	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	517.2	MPN/100 mL	1.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

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Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	ACHD Stormwater Phase 1 Bacteria Grab
Date/Time Collected:	10/22/2021 17:24		
Lab Number:	AC00180-05	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	235.9	MPN/100 mL	1.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Report Date: 11/02/2021 10:53

Analysis Report

Location:	ACST1B	Location Description:	ACHD Stormwater Phase 1 Bacteria Grab
Date/Time Collected:	10/22/2021 17:24		
Lab Number:	AC00180-06	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	2650.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	D
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	ACHD Stormwater Phase 1 Bacteria Grab
Date/Time Collected:	10/22/2021 17:33		
Lab Number:	AC00180-07	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B214027	920.8	MPN/100 mL	1.0	1.0	IDEXX - Colilert	10/22/21 20:01	10/23/21 20:15	KMR	
Wet Chemistry										
Chlorine Screen	B214040	Absent				SM 4500-CL G-2000 mod	10/22/21	10/22/21 19:32	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 11/02/2021 10:53

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B214027									
Blank (B214027-BLK1)									
E. Coli	Absent						10/23/2021	LRF	
LCS (B214027-BS1)									
E. Coli				Present			10/23/2021	LRF	
Duplicate (B214027-DUP1) Source ID: WB01406-06									
E. Coli					Pass	128	10/23/2021	LRF	

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Report Date: 11/02/2021 10:53

Notes and Definitions

Item	Definition
D	Data reported from a dilution
H	Hold time Exceeded.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District
Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): ALD + TLL
ZL + SMK
(Tammy Lightle
Andrea Duran
Zuly Lapa
Shannon Kronz)

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 -EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
AC00180-01	10/22/21	10/22/21	1646		211022-12-WG	ALD/TLL	X	X												X					
-02			1200		211022-12-101		X	X												X					
-03			1200		211022-12-001		X	X												X					
-04			1704		211022-14-WG		X	X												X					
-05			1724		211022-206-WG		X	X												X					
-06	10/22	10/22	1724		211022-03-WG	ZL	X	X												X					
-07			1733		211022-11-WG	ZL	X	X												X					

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Shannon Kronz	10/22/21 7:18pm	[signature] 1919 ~~0719~~ 10-22-21	AC00180

coc_wql-pi

WY22

AC00180

Report Date: 11/16/2021 14:19

Boise City Public Works
Water Quality Laboratory
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Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00181-01	ACST1C	211022-12-WC	Water		10/22/2021	10/23/2021
AC00181-02	ACST1C	211022-14-WC	Water		10/22/2021	10/23/2021
AC00181-03	ACST1C	211022-206-WC	Water		10/22/2021	10/23/2021

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Analysis Report

Location:	ACST1C	Location Description:	211022-12-WC
Date/Time Collected:	10/22/2021 16:15 - 10/22/2021 20:44		
Lab Number:	AC00181-01	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B214210	0.907	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	11/05/21	11/5/21 11:14	GKH	
BOD5	B214046	35.0	mg/L	2.00	2.00	SM 5210 B-2011	10/23/21	10/28/21 12:21	CJP	
COD	B214043	142	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	10/23/21	10/23/21 10:31	BAK	
Nitrate-Nitrite, as N	B214078	0.322	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	10/26/21	10/26/21 11:46	JAL	
TKN	B214157	2.35	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	11/02/21	11/3/21 10:11	ALN	
Total Dissolved Solids	B214065	67.2	mg/L	25.0	25.0	SM 2540 C-2011	10/25/21	10/27/21 9:17	CJP	
Total Suspended Solids	B214039	95.8	mg/L	0.900	0.900	SM 2540 D-2011	10/23/21	10/23/21 12:28	LRF	
Turbidity	B214044	59.1	NTU	0.6	0.3	EPA 180.1, Rev. 2.0 (1993)	10/23/21	10/23/21 11:00	JAL	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B214041	0.286	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	10/23/21	10/23/21 9:59	JAL	
Total Metals										
Mercury	B214063	0.0219	ug/L	0.0100	0.0100	EPA 245.2	10/26/21	10/27/21 8:41	SAS	
Arsenic	B214117	1.6	ug/L	0.040	0.040	EPA 200.8	10/29/21	10/30/21 14:30	DMW	
Cadmium	B214117	0.13	ug/L	0.025	0.025	EPA 200.8	10/29/21	10/30/21 14:30	DMW	
Calcium	B214111	5.80	mg/L	0.0460	0.0460	EPA 200.7	10/28/21	10/29/21 15:49	AMO	
Lead	B214117	10	ug/L	0.050	0.050	EPA 200.8	10/29/21	10/30/21 14:30	DMW	
Magnesium	B214111	1470	ug/L	50.0	50.0	EPA 200.7	10/28/21	10/29/21 15:49	AMO	
Phosphorus as P	B214111	0.442	mg/L	6.00E-3	6.00E-3	EPA 200.7	10/28/21	10/29/21 15:49	AMO	
Hardness	B214111	20.5	mg/L	0.115	0.115	EPA 200.7	10/28/21	10/29/21 15:49	AMO	
Dissolved Metals										
Cadmium	B214222	<0.0250	ug/L	0.025	0.025	EPA 200.8	11/06/21	11/6/21 16:14	DMW	U
Copper	B214222	7.5	ug/L	0.15	0.15	EPA 200.8	11/06/21	11/6/21 16:14	DMW	
Lead	B214222	0.48	ug/L	0.050	0.050	EPA 200.8	11/06/21	11/6/21 16:14	DMW	
Zinc	B214222	51.3	ug/L	0.78	0.78	EPA 200.8	11/06/21	11/6/21 16:14	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Analysis Report

Location:	ACST1C	Location Description:	211022-14-WC
Date/Time Collected:	10/22/2021 16:19 - 10/22/2021 21:58		
Lab Number:	AC00181-02	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B214210	0.740	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	11/05/21	11/5/21 11:27	GKH	
BOD5	B214046	80.3	mg/L	2.00	2.00	SM 5210 B-2011	10/23/21	10/28/21 12:05	CJP	
COD	B214043	212	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	10/23/21	10/23/21 10:31	BAK	
Nitrate-Nitrite, as N	B214078	0.389	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	10/26/21	10/26/21 11:51	JAL	
TKN	B214157	3.54	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	11/02/21	11/3/21 10:16	ALN	
Total Dissolved Solids	B214065	123	mg/L	25.0	25.0	SM 2540 C-2011	10/25/21	10/27/21 9:18	CJP	
Total Suspended Solids	B214039	105	mg/L	0.900	0.900	SM 2540 D-2011	10/23/21	10/23/21 12:29	LRF	
Turbidity	B214044	57.9	NTU	0.6	0.3	EPA 180.1, Rev. 2.0 (1993)	10/23/21	10/23/21 11:03	JAL	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B214041	0.645	mg/L	4.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	10/23/21	10/23/21 10:10	JAL	D
Total Metals										
Mercury	B214063	0.0191	ug/L	0.0100	0.0100	EPA 245.2	10/26/21	10/27/21 8:27	SAS	
Arsenic	B214117	2.6	ug/L	0.040	0.040	EPA 200.8	10/29/21	10/30/21 14:32	DMW	
Cadmium	B214117	0.14	ug/L	0.025	0.025	EPA 200.8	10/29/21	10/30/21 14:32	DMW	
Calcium	B214111	11.0	mg/L	0.0460	0.0460	EPA 200.7	10/28/21	10/29/21 15:44	AMO	
Lead	B214117	7.1	ug/L	0.050	0.050	EPA 200.8	10/29/21	10/30/21 14:32	DMW	
Magnesium	B214111	2600	ug/L	50.0	50.0	EPA 200.7	10/28/21	10/29/21 15:44	AMO	
Phosphorus as P	B214111	0.940	mg/L	6.00E-3	6.00E-3	EPA 200.7	10/28/21	10/29/21 15:44	AMO	
Hardness	B214111	38.2	mg/L	0.115	0.115	EPA 200.7	10/28/21	10/29/21 15:44	AMO	
Dissolved Metals										
Cadmium	B214222	<0.0250	ug/L	0.025	0.025	EPA 200.8	11/06/21	11/6/21 16:16	DMW	U
Copper	B214222	8.4	ug/L	0.15	0.15	EPA 200.8	11/06/21	11/6/21 16:16	DMW	
Lead	B214222	0.28	ug/L	0.050	0.050	EPA 200.8	11/06/21	11/6/21 16:16	DMW	
Zinc	B214222	49.6	ug/L	0.78	0.78	EPA 200.8	11/06/21	11/6/21 16:16	DMW	

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Analysis Report

Location:	ACST1C	Location Description:	211022-206-WC
Date/Time Collected:	10/22/2021 17:18 - 10/22/2021 21:12		
Lab Number:	AC00181-03	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B214210	0.805	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	11/05/21	11/5/21 11:22	GKH	
BOD5	B214046	214	mg/L	2.00	2.00	SM 5210 B-2011	10/23/21	10/28/21 11:59	CJP	
COD	B214043	487	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	10/23/21	10/23/21 11:25	BAK	
Nitrate-Nitrite, as N	B214078	0.276	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	10/26/21	10/26/21 11:52	JAL	
TKN	B214157	6.91	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	11/02/21	11/3/21 10:18	ALN	
Total Dissolved Solids	B214065	278	mg/L	25.0	25.0	SM 2540 C-2011	10/25/21	10/27/21 9:18	CJP	
Total Suspended Solids	B214039	186	mg/L	0.900	0.900	SM 2540 D-2011	10/23/21	10/23/21 12:42	LRF	
Turbidity	B214044	126	NTU	1.5	0.3	EPA 180.1, Rev. 2.0 (1993)	10/23/21	10/23/21 11:04	JAL	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B214041	1.94	mg/L	0.0100	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	10/23/21	10/23/21 10:11	JAL	D
Total Metals										
Mercury	B214063	0.0339	ug/L	0.0100	0.0100	EPA 245.2	10/26/21	10/27/21 8:44	SAS	
Arsenic	B214117	4.2	ug/L	0.040	0.040	EPA 200.8	10/29/21	10/30/21 14:35	DMW	
Cadmium	B214117	0.16	ug/L	0.025	0.025	EPA 200.8	10/29/21	10/30/21 14:35	DMW	
Calcium	B214111	12.3	mg/L	0.0460	0.0460	EPA 200.7	10/28/21	10/29/21 15:38	AMO	
Lead	B214117	11.8	ug/L	0.050	0.050	EPA 200.8	10/29/21	10/30/21 14:35	DMW	
Magnesium	B214111	3990	ug/L	50.0	50.0	EPA 200.7	10/28/21	10/29/21 15:38	AMO	
Phosphorus as P	B214111	2.51	mg/L	6.00E-3	6.00E-3	EPA 200.7	10/28/21	10/29/21 15:38	AMO	
Hardness	B214111	47.1	mg/L	0.115	0.115	EPA 200.7	10/28/21	10/29/21 15:38	AMO	
Dissolved Metals										
Cadmium	B214222	0.048	ug/L	0.025	0.025	EPA 200.8	11/06/21	11/6/21 16:19	DMW	
Copper	B214222	15.0	ug/L	0.15	0.15	EPA 200.8	11/06/21	11/6/21 16:19	DMW	
Lead	B214222	2.3	ug/L	0.050	0.050	EPA 200.8	11/06/21	11/6/21 16:19	DMW	
Zinc	B214222	111	ug/L	0.78	0.78	EPA 200.8	11/06/21	11/6/21 16:19	DMW	

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B214039									
Blank (B214039-BLK1)									
Total Suspended Solids	<0.9	mg/L					10/23/2021	LRF	U
LCS (B214039-BS1)									
Total Suspended Solids			97.5	90-110			10/23/2021	LRF	
Duplicate (B214039-DUP1) Source ID: BB01593-01									
Total Suspended Solids					5.65	20	10/23/2021	LRF	
Batch: B214043									
Blank (B214043-BLK1)									
COD	<7	mg/L					10/23/2021	BAK	U
LCS (B214043-BS1)									
COD			97.3	90-110			10/23/2021	BAK	
Duplicate (B214043-DUP1) Source ID: AC00181-02									
COD					1.41	10	10/23/2021	BAK	
Batch: B214044									
Blank (B214044-BLK1)									
Turbidity	<0.3	NTU					10/23/2021	JAL	U
LCS (B214044-BS1)									
Turbidity			101	90-110			10/23/2021	JAL	
Duplicate (B214044-DUP1) Source ID: AC00181-01									
Turbidity					0.226	25	10/23/2021	JAL	D
Batch: B214046									
Blank (B214046-BLK1)									
BOD5	<2	mg/L					10/28/2021	CJP	U
LCS (B214046-BS1)									
BOD5			102	84.6-115.4			10/28/2021	CJP	
LCS (B214046-BS2)									
BOD5			103	84.6-115.4			10/28/2021	CJP	
Duplicate (B214046-DUP1) Source ID: BB01594-01									
BOD5					3.86	30	10/28/2021	CJP	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B214065									
Blank (B214065-BLK1)									
Total Dissolved Solids	<25	mg/L					10/27/2021	CJP	U
LCS (B214065-BS1)									
Total Dissolved Solids			98.5	90-110			10/27/2021	CJP	
Duplicate (B214065-DUP1) Source ID: EN00022-02									
Total Dissolved Solids					0.562	10	10/27/2021	CJP	
Batch: B214078									
Blank (B214078-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					10/26/2021	JAL	U
Blank (B214078-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					10/26/2021	JAL	U
Blank (B214078-BLK3)									
Nitrate-Nitrite, as N	<0.025	mg/L					10/26/2021	JAL	U
LCS (B214078-BS1)									
Nitrate-Nitrite, as N			99.3	90-110			10/26/2021	JAL	
LCS (B214078-BS2)									
Nitrate-Nitrite, as N			98.8	90-110			10/26/2021	JAL	
LCS (B214078-BS3)									
Nitrate-Nitrite, as N			102	90-110			10/26/2021	JAL	
Duplicate (B214078-DUP1) Source ID: AC00181-01									
Nitrate-Nitrite, as N					0.896	10	10/26/2021	JAL	
Duplicate (B214078-DUP2) Source ID: BB01577-01									
Nitrate-Nitrite, as N					NR	10	10/26/2021	JAL	U
Duplicate (B214078-DUP3) Source ID: NP00033-01									
Nitrate-Nitrite, as N					0.0544	10	10/26/2021	JAL	
Duplicate (B214078-DUP4) Source ID: WB01406-07									
Nitrate-Nitrite, as N					30.0	10	10/26/2021	JAL	QC-02
Duplicate (B214078-DUP5) Source ID: WB01428-01RE1									
Nitrate-Nitrite, as N					2.19	10	10/26/2021	JAL	D
Matrix Spike (B214078-MS1) Source ID: AC00181-01									
Nitrate-Nitrite, as N			99.0	90-110			10/26/2021	JAL	
Matrix Spike (B214078-MS2) Source ID: BB01577-01									
Nitrate-Nitrite, as N			101	90-110			10/26/2021	JAL	
Matrix Spike (B214078-MS3) Source ID: NP00033-01									
Nitrate-Nitrite, as N			98.7	90-110			10/26/2021	JAL	
Matrix Spike (B214078-MS4) Source ID: WB01406-07									
Nitrate-Nitrite, as N			98.4	90-110			10/26/2021	JAL	
Matrix Spike (B214078-MS5) Source ID: WB01428-01RE1									
Nitrate-Nitrite, as N			102	90-110			10/26/2021	JAL	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B214078 (Continued)									
Matrix Spike (B214078-MS6) Source ID: WB01425-02									
Nitrate-Nitrite, as N			99.4	90-110			10/26/2021	JAL	
Matrix Spike (B214078-MS7) Source ID: WB01425-03									
Nitrate-Nitrite, as N			103	90-110			10/26/2021	JAL	
Matrix Spike Dup (B214078-MSD1) Source ID: AC00181-01									
Nitrate-Nitrite, as N			99.2	90-110	0.134	10	10/26/2021	JAL	
Matrix Spike Dup (B214078-MSD2) Source ID: BB01577-01									
Nitrate-Nitrite, as N			100	90-110	0.352	10	10/26/2021	JAL	
Matrix Spike Dup (B214078-MSD3) Source ID: NP00033-01									
Nitrate-Nitrite, as N			95.1	90-110	1.14	10	10/26/2021	JAL	
Matrix Spike Dup (B214078-MSD4) Source ID: WB01406-07									
Nitrate-Nitrite, as N			100	90-110	1.63	10	10/26/2021	JAL	
Matrix Spike Dup (B214078-MSD5) Source ID: WB01428-01RE1									
Nitrate-Nitrite, as N			102	90-110	0.0184	10	10/26/2021	JAL	D
Batch: B214157									
Blank (B214157-BLK1)									
TKN	<0.1	mg/L					11/03/2021	ALN	U
Blank (B214157-BLK2)									
TKN	<0.1	mg/L					11/03/2021	ALN	U
LCS (B214157-BS1)									
TKN			96.2	80-120			11/03/2021	ALN	
LCS (B214157-BS2)									
TKN			97.1	80-120			11/03/2021	ALN	
Duplicate (B214157-DUP1) Source ID: AC00181-01									
TKN					5.23	20	11/03/2021	ALN	
Duplicate (B214157-DUP2) Source ID: LS00886-02									
TKN					4.95	20	11/03/2021	ALN	D
Duplicate (B214157-DUP3) Source ID: WB01406-07									
TKN					1.02	20	11/03/2021	ALN	D
Matrix Spike (B214157-MS1) Source ID: AC00181-01									
TKN			98.4	80-120			11/03/2021	ALN	
Matrix Spike (B214157-MS2) Source ID: LS00886-02									
TKN			97.3	80-120			11/03/2021	ALN	D
Matrix Spike (B214157-MS3) Source ID: WB01406-07									
TKN			99.4	80-120			11/03/2021	ALN	D
Matrix Spike Dup (B214157-MSD1) Source ID: AC00181-01									
TKN			96.6	80-120	1.26	20	11/03/2021	ALN	
Matrix Spike Dup (B214157-MSD2) Source ID: LS00886-02									
TKN			88.0	80-120	3.36	20	11/03/2021	ALN	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B214157 (Continued)									
Matrix Spike Dup (B214157-MSD3) Source ID: WB01406-07									
TKN			101	80-120	0.428	20	11/03/2021	ALN	D
Batch: B214210									
Blank (B214210-BLK1)									
Ammonia, as N	<0.035	mg/L					11/05/2021	GKH	U
LCS (B214210-BS1)									
Ammonia, as N			101	90-110			11/05/2021	GKH	
Duplicate (B214210-DUP1) Source ID: BB01588-01									
Ammonia, as N					3.37	10	11/05/2021	GKH	
Duplicate (B214210-DUP2) Source ID: LS00888-02									
Ammonia, as N					2.32	10	11/05/2021	GKH	
Matrix Spike (B214210-MS1) Source ID: BB01588-01									
Ammonia, as N			95.8	80-120			11/05/2021	GKH	
Matrix Spike (B214210-MS2) Source ID: LS00888-02									
Ammonia, as N			107	80-120			11/05/2021	GKH	
Matrix Spike Dup (B214210-MSD1) Source ID: BB01588-01									
Ammonia, as N			99.9	80-120	2.93	10	11/05/2021	GKH	
Matrix Spike Dup (B214210-MSD2) Source ID: LS00888-02									
Ammonia, as N			106	80-120	0.727	10	11/05/2021	GKH	
Dissolved Wet Chemistry									
Batch: B214041									
Blank (B214041-BLK1)									
Orthophosphate, as P	<0.002	mg/L					10/23/2021	JAL	U
LCS (B214041-BS1)									
Orthophosphate, as P			97.0	90-110			10/23/2021	JAL	
Duplicate (B214041-DUP1) Source ID: AC00181-01									
Orthophosphate, as P					0.639	10	10/23/2021	JAL	
Matrix Spike (B214041-MS1) Source ID: AC00181-01									
Orthophosphate, as P			109	90-110			10/23/2021	JAL	
Matrix Spike Dup (B214041-MSD1) Source ID: AC00181-01									
Orthophosphate, as P			105	90-110	0.906	10	10/23/2021	JAL	

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Water Quality Laboratory
11818 Joplin Road
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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B214063									
Blank (B214063-BLK1)									
Mercury	<0.01	ug/L					10/27/2021	SAS	U
Blank (B214063-BLK2)									
Mercury	<0.01	ug/L					10/27/2021	SAS	U
Blank (B214063-BLK3)									
Mercury	<0.01	ug/L					10/27/2021	SAS	U
LCS (B214063-BS1)									
Mercury			102	85-115			10/27/2021	SAS	
Duplicate (B214063-DUP1) Source ID: AC00181-02									
Mercury					2.07	20	10/27/2021	SAS	
Duplicate (B214063-DUP2) Source ID: EP00119-02									
Mercury					NR	20	10/27/2021	SAS	U
Matrix Spike (B214063-MS1) Source ID: AC00181-02									
Mercury			98.3	70-130			10/27/2021	SAS	
Matrix Spike (B214063-MS2) Source ID: EP00119-02									
Mercury			99.6	70-130			10/27/2021	SAS	
Matrix Spike Dup (B214063-MSD1) Source ID: AC00181-02									
Mercury			103	70-130	3.93	20	10/27/2021	SAS	
Matrix Spike Dup (B214063-MSD2) Source ID: EP00119-02									
Mercury			96.6	70-130	3.08	20	10/27/2021	SAS	
Batch: B214111									
Blank (B214111-BLK1)									
Calcium	<0.046	mg/L					10/29/2021	AMO	U
Magnesium	<50	ug/L					10/29/2021	AMO	U
Phosphorus as P	<0.006	mg/L					10/29/2021	AMO	U
LCS (B214111-BS1)									
Calcium			100	85-115			10/29/2021	AMO	
Magnesium			101	85-115			10/29/2021	AMO	
Phosphorus as P			103	85-115			10/29/2021	AMO	
Duplicate (B214111-DUP1) Source ID: AC00181-01									
Calcium					0.363	20	10/29/2021	AMO	
Magnesium					5.60	20	10/29/2021	AMO	
Phosphorus as P					5.15	20	10/29/2021	AMO	
Duplicate (B214111-DUP2) Source ID: ME00137-02									
Calcium					0.181	20	10/29/2021	AMO	
Magnesium					4.93	20	10/29/2021	AMO	
Phosphorus as P					2.14	20	10/29/2021	AMO	
Matrix Spike (B214111-MS1) Source ID: AC00181-01									
Calcium			101	70-130			10/29/2021	AMO	
Magnesium			98.9	70-130			10/29/2021	AMO	
Phosphorus as P			106	70-130			10/29/2021	AMO	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B214111 (Continued)									
Matrix Spike (B214111-MS2) Source ID: ME00137-02									
Calcium			97.6	70-130			10/29/2021	AMO	
Magnesium			102	70-130			10/29/2021	AMO	
Phosphorus as P			107	70-130			10/29/2021	AMO	
Matrix Spike Dup (B214111-MSD1) Source ID: AC00181-01									
Calcium			106	70-130	2.94	20	10/29/2021	AMO	
Magnesium			105	70-130	5.44	20	10/29/2021	AMO	
Phosphorus as P			104	70-130	1.44	20	10/29/2021	AMO	
Matrix Spike Dup (B214111-MSD2) Source ID: ME00137-02									
Calcium			98.3	70-130	0.163	20	10/29/2021	AMO	
Magnesium			97.3	70-130	2.52	20	10/29/2021	AMO	
Phosphorus as P			107	70-130	0.294	20	10/29/2021	AMO	
Batch: B214117									
Blank (B214117-BLK1)									
Arsenic	<0.040	ug/L					10/30/2021	DMW	U
Cadmium	<0.025	ug/L					10/30/2021	DMW	U
Lead	<0.050	ug/L					10/30/2021	DMW	U
LCS (B214117-BS1)									
Arsenic			99.7	85-115			10/30/2021	DMW	
Cadmium			102	85-115			10/30/2021	DMW	
Lead			102	85-115			10/30/2021	DMW	
Duplicate (B214117-DUP1) Source ID: WB01414-10									
Arsenic					2.09	20	10/30/2021	DMW	
Cadmium					NR	20	10/30/2021	DMW	U
Lead					2.55	20	10/30/2021	DMW	
Matrix Spike (B214117-MS1) Source ID: WB01414-10									
Arsenic			102	70-130			10/30/2021	DMW	
Cadmium			101	70-130			10/30/2021	DMW	
Lead			99.7	70-130			10/30/2021	DMW	
Matrix Spike Dup (B214117-MSD1) Source ID: WB01414-10									
Arsenic			98.8	70-130	2.68	20	10/30/2021	DMW	
Cadmium			99.0	70-130	2.41	20	10/30/2021	DMW	
Lead			98.1	70-130	1.57	20	10/30/2021	DMW	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B214222									
Blank (B214222-BLK1)									
Cadmium	<0.025	ug/L					11/06/2021	DMW	U
Copper	<0.15	ug/L					11/06/2021	DMW	U
Lead	<0.050	ug/L					11/06/2021	DMW	U
Zinc	<0.78	ug/L					11/06/2021	DMW	U
LCS (B214222-BS1)									
Cadmium			98.2	85-115			11/06/2021	DMW	
Copper			99.3	85-115			11/06/2021	DMW	
Lead			99.8	85-115			11/06/2021	DMW	
Zinc			100	85-115			11/06/2021	DMW	
Duplicate (B214222-DUP1) Source ID: ES00148-05									
Cadmium					NR	10	11/06/2021	DMW	U
Copper					3.97	10	11/06/2021	DMW	
Lead					0.456	10	11/06/2021	DMW	
Zinc					NR	10	11/06/2021	DMW	U
Matrix Spike (B214222-MS1) Source ID: ES00148-05									
Cadmium			96.2	70-130			11/06/2021	DMW	
Copper			93.7	70-130			11/06/2021	DMW	
Lead			96.7	70-130			11/06/2021	DMW	
Zinc			96.0	70-130			11/06/2021	DMW	
Matrix Spike Dup (B214222-MSD1) Source ID: ES00148-05									
Cadmium			97.2	70-130	0.968	10	11/06/2021	DMW	
Copper			94.6	70-130	0.926	10	11/06/2021	DMW	
Lead			96.6	70-130	0.0790	10	11/06/2021	DMW	
Zinc			98.3	70-130	2.35	10	11/06/2021	DMW	

Report Date: 11/16/2021 14:19

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Notes and Definitions

Item	Definition
D	Data reported from a dilution
QC-02	The RPD is greater than the method acceptance criteria. At least one of the values used to calculate the RPD, is less than or equal to the PQL.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK
Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle
Shannon Krantz

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B ✓	COD - Hach 8000 ✓	TSS - SM 2540 D ✓	TDS - SM 2540 C ✓	TKN - EPA 351.2 ✓	TP - EPA 200.7 — Not Split UCF ✓	Orthophosphate - EPA 365.1 ✓	Total As, Cd, Pb - EPA 200.8 ✓	Diss. Cd Cu, Pb, Zn - EPA 200.8 ✓	Total Hg - EPA 245.2 ✓	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1 ✓	Hardness - EPA 200.7 ✓✓✓	NO_3+NO_2 - EPA 353.2 ✓	NH_3 - SM 4500 NH_3 - D ✓	Total Containers
AC00181-01	10.22.21	10.22.21	1615	2044	211022-12-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	2
-02			1619	2158	211022-14-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	2
-03			1718	2112	211022-206-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	3

Relinquished by (sign)	Date & Time Transferred	Received by (sign)
Tammy Lightle	211022 / 2250	[signature] 10/23/21 0645

Comments/Special Instructions:

* 3 bottles are in AntMan and 4 bottles are in wonder woman.

coc_wql-pi

WY22

AC00181

Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 208-389-7700

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for November 9, 2021

Date: January 5, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 4, 2021. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the November 9, 2021 storm event.

Section 2: Project Status

Table 1-1 is a summary of the sample types collected to date for WY 2022 Phase I Stormwater Outfall Monitoring.

Table 1-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
November 9, 2021	C	C	-	-	-
Collected:	1G, 1C	1G, 1C	1G, 1C	1G, 1C	1G, 1C

Notes:

C = composite sample.

G = grab sample.

Section 3: Storm Event Summary

The November 9, 2021 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form from November 8, 2021, is included in Attachment A for reference.

Monday, November 8, 2021

- The morning of Monday, November 8, 2021, the National Weather Service issued a forecast for widespread rain in the Boise area early Tuesday morning and extending into the afternoon. A slight chance of rainshadowing was expected. The chance of precipitation was 100 percent, with as much as 0.25 inch of precipitation forecasted.
- Setup was accomplished Monday afternoon. An expected precipitation depth of 0.19 inch was initially used to set trigger volumes at monitoring stations.

Tuesday, November 9, 2021

- Light showers started around 0530 Tuesday afternoon and continued for a few hours. Light showers did not produce runoff by 0700, therefore, the trigger volumes were reduced from 0.19 to 0.11 inch. Around 0930, precipitation greatly intensified through the area.
- Precipitation totals ranged between 0.38 and 0.45 inch at local rain gauges.

Flow measurements and precipitation data are included in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky and Whitewater monitoring stations were set up the afternoon of Monday, November 8, 2021, to collect flow proportional composite samples during the storm. Site-specific velocity cutoff values were calculated and programmed into the flowmeters. Setup and sampling information is included in Table 1.

Composite Samples

Composite samples were collected at Lucky and Whitewater monitoring stations. Volumes of composite samples submitted were sufficient for all parameters. All composite samples were submitted to the WQL on November 9 at 1758. Analytical results are included in Table 2. Pollutant loading estimates for the event are included in Table 3.

Section 4: Quality Assurance/Quality Control

No quality control samples collected during the November 9, 2021 storm event.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. All acceptance and performance criteria for analytical and non-analytical data were met for this storm event.

Data Tables

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	NO	NO	NO	NO	NO
Composite samples collected and submitted?	YES	YES	NO	NO	NO
Trigger volume	2895 gal	800 ft^3	-	-	-
Velocity cutoff (fps)	-	-	-	-	-
Sampler enable condition (in)	level > 2.3	level > 2.3	-	-	-
Runoff start time	6:25	6:29	-	-	-
Grab sample collection time	-	-	-	-	-
Composite sample stop time	17:24	17:00	-	-	-
Runoff stop time	20:18	21:30	-	-	-
Volume of discharge sampled (ft^3)	22,382	67,626	-	-	-
Total runoff volume (ft^3)	24,780	96,818	-	-	-
Percent of storm flow sampled (%)	90%	70%	-	-	-
Composite sample duration (hrs)	7.5	8.0	-	-	-
Storm Precipitation (in)	0.45	0.41	0.38	0.38/0.44	0.38/0.44
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	54	88	-	-	-
Number of composite bottles filled	3	4	-	-	-
Composite sample volume (Approx.; ml)	28,500	51,500	-	-	-

Notes:

Table 2. Field and Analytical Data Summary - Wet Samples

Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				Analytical Parameters																						
			Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	Sample ID Composite	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate, as P	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	11/9/2021	-	-	-	-	-	-	211109-03-WC	18.3	73	14.9	14.4	27.3	48.8	0.558	0.353	0.248	0.0872	1.07	0.91	<0.0250	0.040	2.3	0.16	0.84	0.0115	31.0
Whitewater	11/9/2021	-	-	-	-	-	-	211109-11-WC	41.1	159	52.3	36.4	51.0	151	1.14	0.803	0.149	0.380	2.05	2.3	<0.0250	0.060	5.0	0.94	4.2	<0.0100	20.7

Notes:

– = no data.

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia	Nitrate + Nitrite (N)	TKN
Lucky	11/9/2021	42.2	0.863	0.384	0.135	1.65
Whitewater	11/9/2021	308	6.89	0.900	2.30	12.4

Notes:

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 8 Nov 2021 **Time:** 7:52 AM **Initials:** TL

Sampling Event Determination

Is there a targeted sampling event expected during the next 36 hours?
(Or, if it is Friday, is a targeted event expected before 5:00 PM on Monday?)

(●) Yes ( ) Maybe ( ) No

If YES or MAYBE, then call BC. Include discussion of reasons for "Maybe" below.

- [x] Date and Time of Expected Event — 11/8 11PM
- [x] Expected Amount of Precipitation — 80% - 100%
- [x] Percent Chance of Precipitation — 0.15" - 0.30"

Targeted Stations & Samples

Americana
- [ ] Grab
- [ ] Composite

Main
- [ ] Grab
- [ ] Composite

Lucky
- [ ] Grab
- [x] Composite

AS-6
- [ ] Grab
- [ ] Composite

Whitewater
- [ ] Grab
- [x] Composite

Phase II
State
- [ ] Grab
- [ ] Composite

Type of Forecasted Precipitation

- [ ] Light Rain
- [ ] Rain
- [ ] Scattered Showers
- [ ] Thunder Showers
- [ ] Snow Melt
- [ ] Rain on Snow
- [ ] Other (Describe below)

Reasons for Not Targeting a Forecasted Storm or Targeting Selected Stations/Samples

- [ ] Equipment Concerns (Describe below)
- [ ] Holiday
- [ ] Other (Describe below)
- [ ] Waiting on Antecedent Dry Period. Expires:

Comments

Past 72 hr precip: 0.02"
I spoke with Bill from NWS and he said that the models are in good agreement of both timing and totals. They are predicting between 0.25" and 0.30" of rain. The onset of the storm looks like 3-4am, with the bulk of the precip between 7am and noon tomorrow. After noon, precip tapers off with a slight chance of afternoon showers. It will be a fast moving system with little chance of thunderstorms.
NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 2:22 am MST Nov 8, 2021

Today: Sunny, with a high near 53. Calm wind becoming southeast around 5 mph in the afternoon.
Tonight: Rain after 11pm. Steady temperature around 46. Southeast wind 7 to 9 mph. Chance of precipitation is 80%.
Tuesday: Rain, mainly before 11am. High near 53. South southeast wind 5 to 10 mph becoming light and variable in the afternoon. Chance of precipitation is 100%. New precipitation amounts between a tenth and quarter of an inch possible.
Tuesday Night: A 20 percent chance of rain before 11pm. Mostly cloudy, with a low around 35. Calm wind.
Wednesday: A slight chance of rain and snow before 11am. Mostly cloudy, with a high near 50. Light northwest wind. Chance of precipitation is 20%.
Wednesday Night: A 40 percent chance of rain, mainly after 11pm. Mostly cloudy, with a low around 35.
Veterans Day: A 20 percent chance of rain before 11am. Partly sunny, with a high near 51.
Thursday Night: Partly cloudy, with a low around 37.
Friday: Partly sunny, with a high near 55.
Friday Night: Mostly cloudy, with a low around 40.
Saturday: Partly sunny, with a high near 55.
Saturday Night: Mostly cloudy, with a low around 39.
Sunday: Partly sunny, with a high near 56.

Comments

Area Forecast Discussion
National Weather Service Boise ID
245 AM MST Mon Nov 8 2021

.SHORT TERM...Today through Wednesday night...Clear, cold weather this morning will become sunny and cool this afternoon as a Pacific short-wave upper ridge moves across our CWA. **Behind the ridge is a strong upper trough that has raced across the Pacific since Saturday**. As the trough approaches, southeast winds in our CWA will increase, especially in the Snake Basin. **Clouds will increase tonight leading to rain** and snow in eastern Oregon, and **into western Idaho before sunrise Tuesday**. Snow levels will initially be at valley floors in eastern Oregon and in Idaho north of the Snake Basin, but will rise rapidly to near 4000 feet north and 6000 feet by sunrise, then 5500 feet north to 7000 feet south Tuesday afternoon. Earlier models earlier showed shadowing of precipitation in the Snake Basin due to the Owyhee Mountains but **latest hi-res models have increased PoPs and decreased the shadowing signal. So now all of southwestern Idaho should be wet by sunrise Tuesday. Precipitation will be moderate or even briefly heavy for a couple hours Tuesday morning, but should taper to showers later Tuesday.** Total QPF and snowfall from late tonight through Tuesday evening has been lowered slightly from previous forecast, now **around .15 to .30 inch QPF in the southern valleys** and about .30 to .60 inch in the mountains. Total snowfall in the mountains will range between 2 and 6 inches. McCall should get two inches. Pre-frontal southeast winds will increase to 20 to 30 mph in the Snake Basin late tonight and Tuesday morning, with southwest winds at similar speeds in eastern Oregon. After Tuesday`s storm moves through, scattered showers mainly of rain will continue into Wednesday and Wednesday night, but gradually shifting northward as an upper ridge builds over the western states. The ridge will keep temperatures slightly above normal.

.LONG TERM...Thursday through Monday...A warm-frontal passage on Thursday will continue the chances for precipitation. Snow levels around 3000-4000 feet MSL Thursday morning will increase to 5500 feet MSL Thursday evening. Precipitation will mainly fall in Baker County/OR. through Adams, Washington, and Valley Counties in ID. As the ridge builds in Friday morning, snow levels will steadily rise from 6000-7000 feet MSL to 8000-9000 feet MSL for the weekend. The storm track will remain just to the north of the forecast area which will keep a threat for precipitation around the Central Mountains, while middle and high clouds filter into southeast Oregon and southwest Idaho into Saturday. The ridge will amplify northward on Sunday keeping the area dry and allowing temperatures to be above normal.

Storm Event QA/QC Checklist

STORM DATE: 211109				Circle one: Phase I Phase II
A. Event and Data Completeness	**Yes**	**No**	**N/A**	**Notes**
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed			X	
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member			X	
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Storm/Sample Value	Program Criteria	Met	Qualify	Reject	Notes
1. Precipitation (inches)	0.41 – 0.45	> 0.10 in.	X			
2. Antecedent dry period (hours)	198	< 0.11 in. in 72 hrs	X			
3. Days since last sampling event	152	>= 30 days	X			since last comps.
4. Sampled amount as % of total run-off	70 - 90	>= 75%	X			
5. Ecoli sample holding time	N/A	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	N/A			
6. Filtering of samples for dissolved parameter analysis	< 24 hrs	<= 24 hrs: no qualifier > 24 hrs.: reject	X			

D. Notes:

- Whitewater composite represents 70% of total flow over a duration of 8 hours, so the sample is accepted.

Reviewed by Tamara Lighta **Date** 12.07.21

Approved by Monica Lowe **Date** 12/10/21

Updated 210824 TL

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth =	0.11	in
Square Feet per Acre =	43560	ft^2/ac
Inches per Foot=	12	in/ft
Aliquots per Sample=	17	

Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

Site	Area (ac)	Using RC Based on Land Use: RC	Using RC Based on Land Use: Expected Vol. (ft^3)	Using RC Based on Land Use: Trigger Vol. (ft^3)	Using Manually-entered RC: RC	Using Manually-entered RC: Expected Vol. (ft^3)	Using Manually-entered RC: Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.4605	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.7624	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7759.9962	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.8	**2960**
Theoretical	80	0.200	6389		0.000		
0	0	0.050	0	**0**		0	0
0	0	0.050	0	**0**		0	0

NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]

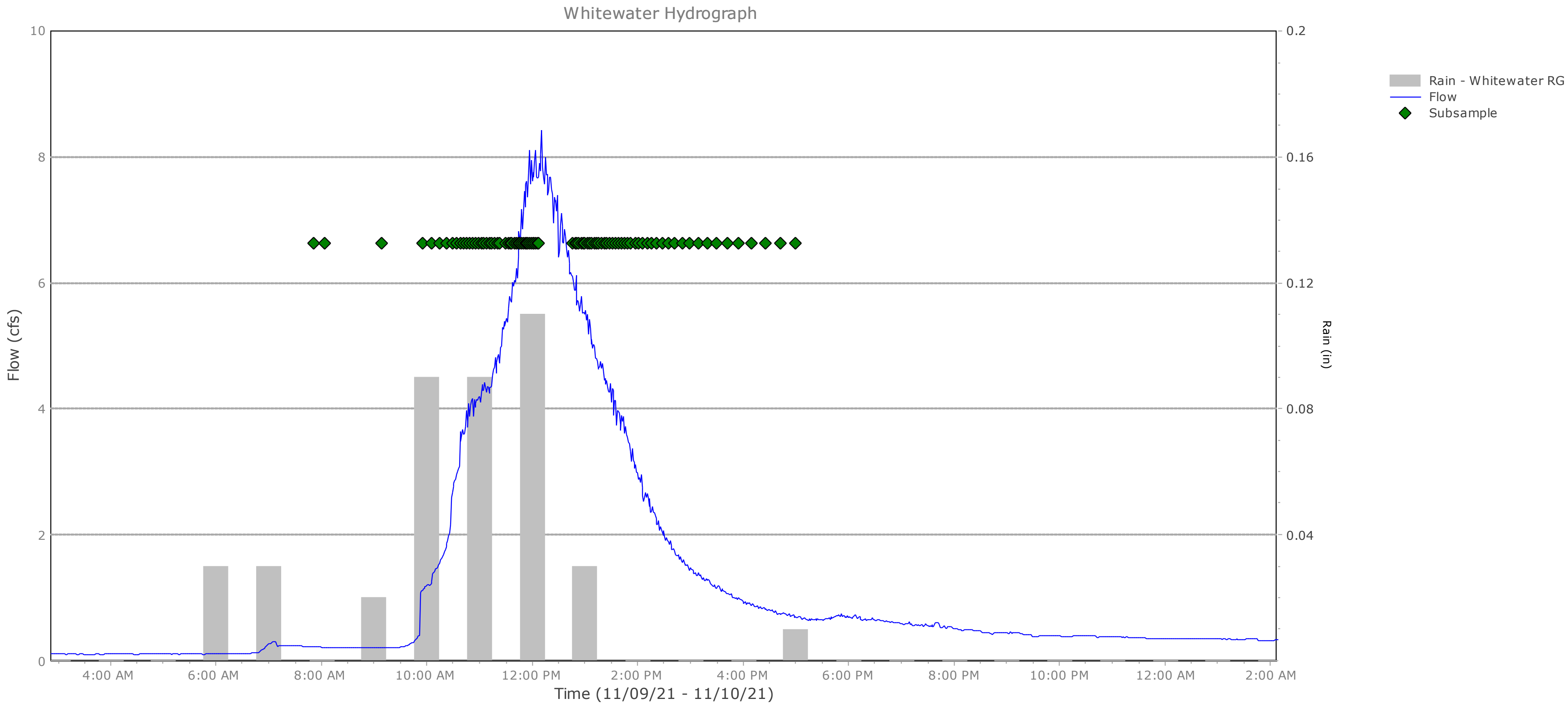
all values taken from historically corrected runoff coefficents

total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)

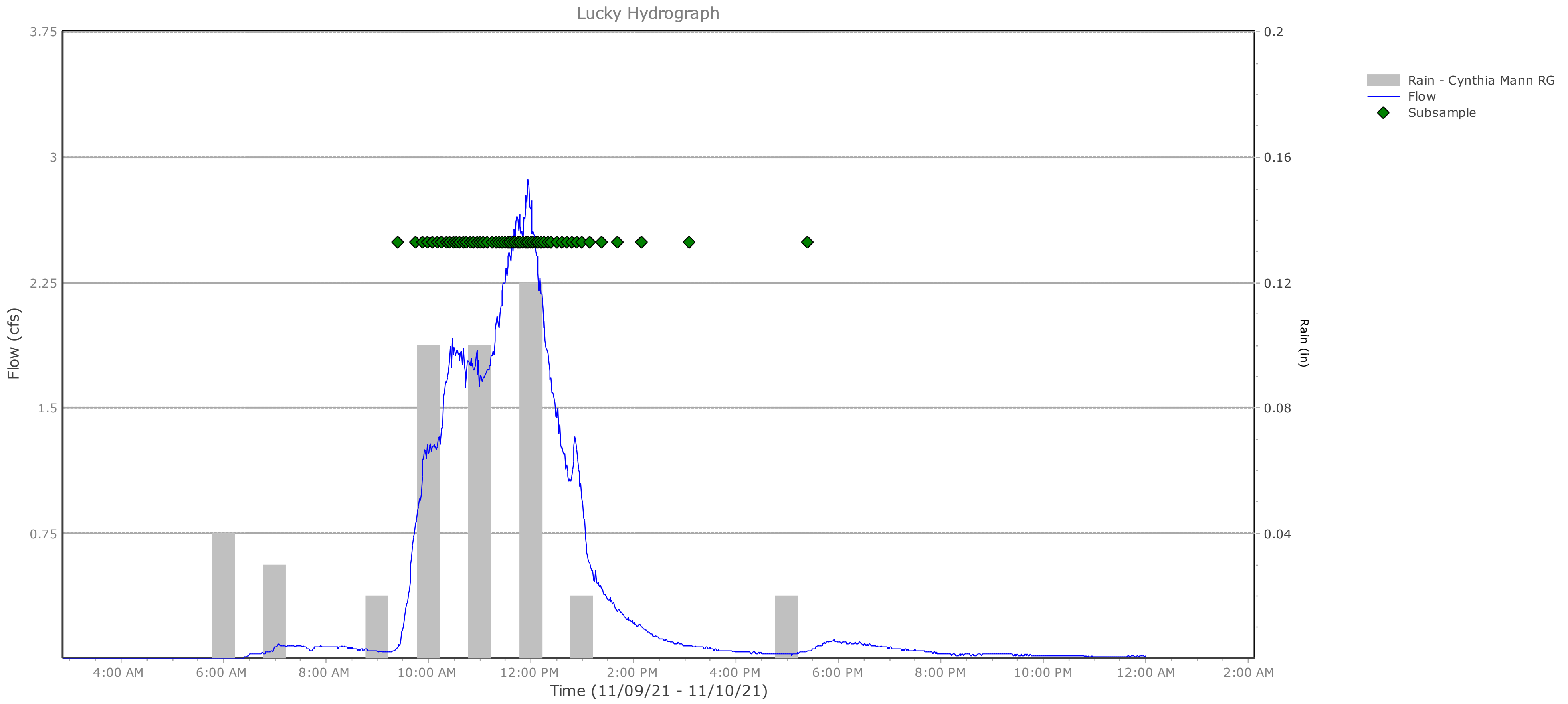
Measured runoff

RC = measured runoff / total runoff

Attachment B: Storm Event Hydrographs



Whitewater Hydrograph
Flow (cfs)
Rain (in)
10
8
6
4
2
0
0.2
0.16
0.12
0.08
0.04
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
2:00 AM
Time (11/09/21 - 11/10/21)
Rain - Whitewater RG
Flow
Subsample



Lucky Hydrograph
Flow (cfs)
3.75
3
2.25
1.5
0.75
Rain (in)
0.2
0.16
0.12
0.08
0.04
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
2:00 AM
Time (11/09/21 - 11/10/21)
Rain - Cynthia Mann RG
Flow
Subsample

Attachment C: Storm Event Analytical Reports

Report Date: 12/02/2021 15:43

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00183-01	ACST1C	211109-03-WC	Water		11/09/2021	11/09/2021
AC00183-02	ACST1C	211109-11-WC	Water		11/09/2021	11/09/2021

Report Date: 12/02/2021 15:43

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Analysis Report

Location:	ACST1C	Location Description:	211109-03-WC
Date/Time Collected:	11/09/2021 09:24 - 11/09/2021 17:24		
Lab Number:	AC00183-01	Sample Collector:	S.K
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B214509	0.248	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	11/27/21	11/27/21 11:08	BAK	
BOD5	B214276	18.3	mg/L	2.00	2.00	SM 5210 B-2011	11/10/21	11/15/21 10:32	MER	Cust-01
COD	B214278	73.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/10/21	11/10/21 10:22	ASE	
Nitrate-Nitrite, as N	B214393	0.0872	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/18/21	11/18/21 12:58	BAK	
TKN	B214456	1.07	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	11/23/21	11/24/21 11:20	ALN	
Total Dissolved Solids	B214283	48.8	mg/L	25.0	25.0	SM 2540 C-2011	11/10/21	11/13/21 8:10	CJP	
Total Suspended Solids	B214273	27.3	mg/L	0.900	0.900	SM 2540 D-2011	11/10/21	11/10/21 10:28	SMC	
Turbidity	B214284	14.4	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/10/21	11/10/21 13:08	CJP	
Dissolved Wet Chemistry										
Orthophosphate, as P	B214279	0.353	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/10/21	11/10/21 14:57	BAK	M-06
Total Metals										
Mercury	B214331	0.0115	ug/L	0.0100	0.0100	EPA 245.2	11/16/21	11/17/21 8:40	SAS	
Arsenic	B214350	0.91	ug/L	0.040	0.040	EPA 200.8	11/17/21	11/18/21 13:28	DMW	
Cadmium	B214350	0.040	ug/L	0.025	0.025	EPA 200.8	11/17/21	11/18/21 13:28	DMW	
Calcium	B214325	4.52	mg/L	0.0460	0.0460	EPA 200.7	11/16/21	11/18/21 12:46	AMO	
Lead	B214350	0.84	ug/L	0.050	0.050	EPA 200.8	11/17/21	11/18/21 13:28	DMW	
Magnesium	B214325	870	ug/L	50.0	50.0	EPA 200.7	11/16/21	11/18/21 12:46	AMO	
Phosphorus as P	B214325	0.558	mg/L	6.00E-3	6.00E-3	EPA 200.7	11/16/21	11/18/21 12:46	AMO	
Hardness	B214325	14.9	mg/L	0.115	0.115	EPA 200.7	11/16/21	11/18/21 12:46	AMO	
Dissolved Metals										
Cadmium	B214352	<0.0250	ug/L	0.025	0.025	EPA 200.8	11/17/21	11/17/21 14:31	DMW	U
Copper	B214352	2.3	ug/L	0.15	0.15	EPA 200.8	11/17/21	11/17/21 14:31	DMW	
Lead	B214352	0.16	ug/L	0.050	0.050	EPA 200.8	11/17/21	11/17/21 14:31	DMW	
Zinc	B214352	31.0	ug/L	0.78	0.78	EPA 200.8	11/17/21	11/17/21 14:31	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/02/2021 15:43

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Analysis Report

Location:	ACST1C	Location Description:	211109-11-WC
Date/Time Collected:	11/09/2021 07:51 - 11/09/2021 17:00		
Lab Number:	AC00183-02	Sample Collector:	S.K
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B214509	0.149	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	11/27/21	11/27/21 10:57	BAK	
BOD5	B214276	41.1	mg/L	2.00	2.00	SM 5210 B-2011	11/10/21	11/15/21 10:28	MER	Cust-01
COD	B214278	159	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/10/21	11/10/21 10:22	ASE	
Nitrate-Nitrite, as N	B214393	0.380	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/18/21	11/18/21 12:59	BAK	
TKN	B214456	2.05	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	11/23/21	11/24/21 11:25	ALN	
Total Dissolved Solids	B214283	151	mg/L	25.0	25.0	SM 2540 C-2011	11/10/21	11/12/21 10:07	CJP	
Total Suspended Solids	B214273	51.0	mg/L	0.900	0.900	SM 2540 D-2011	11/10/21	11/10/21 11:20	SMC	
Turbidity	B214284	36.4	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/10/21	11/10/21 13:15	CJP	
Dissolved Wet Chemistry										
Orthophosphate, as P	B214279	0.803	mg/L	4.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/10/21	11/10/21 15:00	BAK	D
Total Metals										
Mercury	B214331	<0.0100	ug/L	0.0100	0.0100	EPA 245.2	11/16/21	11/17/21 8:54	SAS	U
Arsenic	B214350	2.3	ug/L	0.040	0.040	EPA 200.8	11/17/21	11/18/21 13:31	DMW	
Cadmium	B214350	0.060	ug/L	0.025	0.025	EPA 200.8	11/17/21	11/18/21 13:31	DMW	
Calcium	B214325	15.4	mg/L	0.0460	0.0460	EPA 200.7	11/16/21	11/18/21 12:52	AMO	
Lead	B214350	4.2	ug/L	0.050	0.050	EPA 200.8	11/17/21	11/18/21 13:31	DMW	
Magnesium	B214325	3370	ug/L	50.0	50.0	EPA 200.7	11/16/21	11/18/21 12:52	AMO	
Phosphorus as P	B214325	1.14	mg/L	6.00E-3	6.00E-3	EPA 200.7	11/16/21	11/18/21 12:52	AMO	
Hardness	B214325	52.3	mg/L	0.115	0.115	EPA 200.7	11/16/21	11/18/21 12:52	AMO	
Dissolved Metals										
Cadmium	B214352	<0.0250	ug/L	0.025	0.025	EPA 200.8	11/17/21	11/17/21 14:40	DMW	U
Copper	B214352	5.0	ug/L	0.15	0.15	EPA 200.8	11/17/21	11/17/21 14:40	DMW	
Lead	B214352	0.94	ug/L	0.050	0.050	EPA 200.8	11/17/21	11/17/21 14:40	DMW	
Zinc	B214352	20.7	ug/L	0.78	0.78	EPA 200.8	11/17/21	11/17/21 14:40	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B214273									
Blank (B214273-BLK1)									
Total Suspended Solids	<0.9	mg/L					11/10/2021	SMC	U
LCS (B214273-BS1)									
Total Suspended Solids			103	90-110			11/10/2021	SMC	
Duplicate (B214273-DUP1) Source ID: LS00909-02									
Total Suspended Solids					7.43	20	11/10/2021	SMC	
Duplicate (B214273-DUP2) Source ID: BB01659-01									
Total Suspended Solids					10.4	20	11/10/2021	SMC	
Batch: B214276									
Blank (B214276-BLK1)									
BOD5	<2	mg/L					11/15/2021	MER	Cust-01, Seed-01, U
LCS (B214276-BS1)									
BOD5			101	84.6-115.4			11/15/2021	MER	Cust-01
LCS (B214276-BS2)									
BOD5			110	84.6-115.4			11/15/2021	MER	Cust-01
Duplicate (B214276-DUP1) Source ID: BB01668-05									
BOD5					3.46	30	11/15/2021	MER	Cust-01, D
Batch: B214278									
Blank (B214278-BLK1)									
COD	<7	mg/L					11/10/2021	ASE	U
LCS (B214278-BS1)									
COD			98.7	90-110			11/10/2021	ASE	
Duplicate (B214278-DUP1) Source ID: AC00183-01									
COD					2.70	10	11/10/2021	ASE	
Batch: B214283									
Blank (B214283-BLK1)									
Total Dissolved Solids	<25	mg/L					11/12/2021	CJP	U
LCS (B214283-BS1)									
Total Dissolved Solids			97.5	90-110			11/12/2021	CJP	
Duplicate (B214283-DUP1) Source ID: AC00183-02									
Total Dissolved Solids					0.165	10	11/12/2021	CJP	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B214284									
Blank (B214284-BLK1)									
Turbidity	<0.3	NTU					11/10/2021	CJP	U
LCS (B214284-BS1)									
Turbidity			102	90-110			11/10/2021	CJP	
Duplicate (B214284-DUP1) Source ID: AC00183-01									
Turbidity					2.06	25	11/10/2021	CJP	
Batch: B214393									
Blank (B214393-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					11/18/2021	BAK	U
LCS (B214393-BS1)									
Nitrate-Nitrite, as N			97.4	90-110			11/18/2021	BAK	
Duplicate (B214393-DUP1) Source ID: BB01676-01									
Nitrate-Nitrite, as N					1.83	10	11/18/2021	BAK	
Duplicate (B214393-DUP2) Source ID: WR00002-02									
Nitrate-Nitrite, as N					0.0853	10	11/18/2021	BAK	
Matrix Spike (B214393-MS1) Source ID: BB01676-01									
Nitrate-Nitrite, as N			98.3	90-110			11/18/2021	BAK	
Matrix Spike (B214393-MS2) Source ID: WR00002-02									
Nitrate-Nitrite, as N			97.8	90-110			11/18/2021	BAK	
Matrix Spike (B214393-MS3) Source ID: WR00002-01									
Nitrate-Nitrite, as N			90.6	90-110			11/18/2021	BAK	
Matrix Spike (B214393-MS4) Source ID: WR00003-01									
Nitrate-Nitrite, as N			96.5	90-110			11/18/2021	BAK	
Matrix Spike (B214393-MS5) Source ID: WR00004-02									
Nitrate-Nitrite, as N			95.2	90-110			11/18/2021	BAK	
Matrix Spike (B214393-MS6) Source ID: WR00004-03									
Nitrate-Nitrite, as N			94.9	90-110			11/18/2021	BAK	
Matrix Spike (B214393-MS8) Source ID: WR00004-01RE1									
Nitrate-Nitrite, as N			101	90-110			11/18/2021	BAK	D
Matrix Spike Dup (B214393-MSD1) Source ID: BB01676-01									
Nitrate-Nitrite, as N			99.4	90-110	0.477	10	11/18/2021	BAK	
Matrix Spike Dup (B214393-MSD2) Source ID: WR00002-02									
Nitrate-Nitrite, as N			96.1	90-110	0.642	10	11/18/2021	BAK	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B214456									
Blank (B214456-BLK1)									
TKN	<0.1	mg/L					11/24/2021	ALN	U
Blank (B214456-BLK2)									
TKN	<0.1	mg/L					11/24/2021	ALN	U
LCS (B214456-BS1)									
TKN			94.0	80-120			11/24/2021	ALN	
LCS (B214456-BS2)									
TKN			96.0	80-120			11/24/2021	ALN	
Duplicate (B214456-DUP1) Source ID: AC00183-01									
TKN					14.5	20	11/24/2021	ALN	
Duplicate (B214456-DUP2) Source ID: BB01636-01									
TKN					1.16	20	11/24/2021	ALN	D
Duplicate (B214456-DUP3) Source ID: LS00904-02									
TKN					2.13	20	11/24/2021	ALN	D
Matrix Spike (B214456-MS1) Source ID: AC00183-01									
TKN			107	80-120			11/24/2021	ALN	
Matrix Spike (B214456-MS2) Source ID: BB01636-01									
TKN			99.8	80-120			11/24/2021	ALN	D
Matrix Spike (B214456-MS3) Source ID: LS00904-02									
TKN			103	80-120			11/24/2021	ALN	D
Matrix Spike (B214456-MS5) Source ID: BB01664-02RE2									
TKN			105	80-120			11/24/2021	ALN	D
Matrix Spike Dup (B214456-MSD1) Source ID: AC00183-01									
TKN			120	80-120	7.91	20	11/24/2021	ALN	
Matrix Spike Dup (B214456-MSD2) Source ID: BB01636-01									
TKN			116	80-120	8.28	20	11/24/2021	ALN	D
Matrix Spike Dup (B214456-MSD3) Source ID: LS00904-02									
TKN			95.5	80-120	3.01	20	11/24/2021	ALN	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B214509									
Blank (B214509-BLK1)									
Ammonia, as N	<0.035	mg/L					11/27/2021	BAK	U
LCS (B214509-BS1)									
Ammonia, as N			103	90-110			11/27/2021	BAK	
Duplicate (B214509-DUP1) Source ID: BB01686-01									
Ammonia, as N					1.23	10	11/27/2021	BAK	D
Duplicate (B214509-DUP2) Source ID: WB01450-05									
Ammonia, as N					1.10	10	11/27/2021	BAK	
Matrix Spike (B214509-MS1) Source ID: BB01686-01									
Ammonia, as N			108	80-120			11/27/2021	BAK	D
Matrix Spike (B214509-MS2) Source ID: WB01450-05									
Ammonia, as N			116	80-120			11/27/2021	BAK	
Matrix Spike Dup (B214509-MSD1) Source ID: BB01686-01									
Ammonia, as N			106	80-120	1.77	10	11/27/2021	BAK	D
Matrix Spike Dup (B214509-MSD2) Source ID: WB01450-05									
Ammonia, as N			114	80-120	0.729	10	11/27/2021	BAK	
Dissolved Wet Chemistry									
Batch: B214279									
Blank (B214279-BLK1)									
Orthophosphate, as P	<0.002	mg/L					11/10/2021	BAK	U
LCS (B214279-BS1)									
Orthophosphate, as P			98.4	90-110			11/10/2021	BAK	
Duplicate (B214279-DUP1) Source ID: BB01686-01									
Orthophosphate, as P					0.356	10	11/10/2021	BAK	D
Duplicate (B214279-DUP2) Source ID: LS00909-02									
Orthophosphate, as P					1.15	10	11/10/2021	BAK	D
Matrix Spike (B214279-MS1) Source ID: BB01686-01									
Orthophosphate, as P			101	90-110			11/10/2021	BAK	D
Matrix Spike (B214279-MS2) Source ID: LS00909-02									
Orthophosphate, as P			103	90-110			11/10/2021	BAK	D
Matrix Spike Dup (B214279-MSD1) Source ID: BB01686-01									
Orthophosphate, as P			103	90-110	0.979	10	11/10/2021	BAK	D
Matrix Spike Dup (B214279-MSD2) Source ID: LS00909-02									
Orthophosphate, as P			102	90-110	0.392	10	11/10/2021	BAK	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B214325									
Blank (B214325-BLK1)									
Calcium	<0.046	mg/L					11/18/2021	AMO	U
Magnesium	<50	ug/L					11/18/2021	AMO	U
Phosphorus as P	<0.006	mg/L					11/18/2021	AMO	U
LCS (B214325-BS1)									
Calcium			101	85-115			11/18/2021	AMO	
Magnesium			101	85-115			11/18/2021	AMO	
Phosphorus as P			113	85-115			11/18/2021	AMO	
Duplicate (B214325-DUP1) Source ID: ME00144-03									
Calcium					2.32	20	11/18/2021	AMO	
Magnesium					3.08	20	11/18/2021	AMO	
Phosphorus as P					0.821	20	11/18/2021	AMO	
Duplicate (B214325-DUP2) Source ID: AC00183-02									
Calcium					15.2	20	11/18/2021	AMO	
Magnesium					15.4	20	11/18/2021	AMO	
Phosphorus as P					6.24	20	11/18/2021	AMO	
Matrix Spike (B214325-MS1) Source ID: ME00144-03									
Calcium			89.6	70-130			11/18/2021	AMO	
Magnesium			105	70-130			11/18/2021	AMO	
Phosphorus as P			105	70-130			11/18/2021	AMO	
Matrix Spike (B214325-MS2) Source ID: AC00183-02									
Calcium			123	70-130			11/18/2021	AMO	
Magnesium			118	70-130			11/18/2021	AMO	
Phosphorus as P			123	70-130			11/18/2021	AMO	
Matrix Spike Dup (B214325-MSD1) Source ID: ME00144-03									
Calcium			79.8	70-130	3.28	20	11/18/2021	AMO	
Magnesium			101	70-130	2.42	20	11/18/2021	AMO	
Phosphorus as P			115	70-130	8.49	20	11/18/2021	AMO	
Matrix Spike Dup (B214325-MSD2) Source ID: AC00183-02									
Calcium			111	70-130	6.55	20	11/18/2021	AMO	
Magnesium			110	70-130	6.34	20	11/18/2021	AMO	
Phosphorus as P			117	70-130	3.45	20	11/18/2021	AMO	

Report Date: 12/02/2021 15:43

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B214331									
Blank (B214331-BLK1)									
Mercury	<0.01	ug/L					11/17/2021	SAS	U
Blank (B214331-BLK2)									
Mercury	<0.01	ug/L					11/17/2021	SAS	U
Blank (B214331-BLK3)									
Mercury	<0.01	ug/L					11/17/2021	SAS	U
LCS (B214331-BS1)									
Mercury			98.1	85-115			11/17/2021	SAS	
Duplicate (B214331-DUP1) Source ID: AC00183-01									
Mercury					NR	20	11/17/2021	SAS	U
Matrix Spike (B214331-MS1) Source ID: AC00183-01									
Mercury			94.9	70-130			11/17/2021	SAS	
Matrix Spike Dup (B214331-MSD1) Source ID: AC00183-01									
Mercury			85.5	70-130	9.26	20	11/17/2021	SAS	
Batch: B214350									
Blank (B214350-BLK1)									
Arsenic	<0.040	ug/L					11/18/2021	DMW	U
Cadmium	<0.025	ug/L					11/18/2021	DMW	U
Lead	<0.050	ug/L					11/18/2021	DMW	U
LCS (B214350-BS1)									
Arsenic			97.7	85-115			11/18/2021	DMW	
Cadmium			100	85-115			11/18/2021	DMW	
Lead			102	85-115			11/18/2021	DMW	
Duplicate (B214350-DUP1) Source ID: WB01450-10									
Arsenic					0.206	20	11/18/2021	DMW	
Cadmium					NR	20	11/18/2021	DMW	U
Lead					1.10	20	11/18/2021	DMW	
Matrix Spike (B214350-MS1) Source ID: WB01450-10									
Arsenic			99.7	70-130			11/18/2021	DMW	
Cadmium			98.7	70-130			11/18/2021	DMW	
Lead			98.1	70-130			11/18/2021	DMW	
Matrix Spike Dup (B214350-MSD1) Source ID: WB01450-10									
Arsenic			96.9	70-130	2.16	20	11/18/2021	DMW	
Cadmium			96.4	70-130	2.33	20	11/18/2021	DMW	
Lead			97.8	70-130	0.346	20	11/18/2021	DMW	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B214352									
Blank (B214352-BLK1)									
Cadmium	<0.025	ug/L					11/17/2021	DMW	U
Copper	<0.15	ug/L					11/17/2021	DMW	U
Lead	<0.050	ug/L					11/17/2021	DMW	U
Zinc	<0.78	ug/L					11/17/2021	DMW	U
LCS (B214352-BS1)									
Cadmium			101	85-115			11/17/2021	DMW	
Copper			106	85-115			11/17/2021	DMW	
Lead			103	85-115			11/17/2021	DMW	
Zinc			102	85-115			11/17/2021	DMW	
Duplicate (B214352-DUP1) Source ID: AC00183-01									
Cadmium					NR	10	11/17/2021	DMW	U
Copper					1.64	10	11/17/2021	DMW	
Lead					2.11	10	11/17/2021	DMW	
Zinc					2.27	10	11/17/2021	DMW	
Matrix Spike (B214352-MS1) Source ID: AC00183-01									
Cadmium			99.7	70-130			11/17/2021	DMW	
Copper			97.7	70-130			11/17/2021	DMW	
Lead			99.2	70-130			11/17/2021	DMW	
Zinc			94.9	70-130			11/17/2021	DMW	
Matrix Spike Dup (B214352-MSD1) Source ID: AC00183-01									
Cadmium			99.8	70-130	0.0828	10	11/17/2021	DMW	
Copper			99.1	70-130	1.15	10	11/17/2021	DMW	
Lead			99.8	70-130	0.666	10	11/17/2021	DMW	
Zinc			96.6	70-130	0.828	10	11/17/2021	DMW	

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Notes and Definitions

Item	Definition
Cust-01	Blank recovery was above acceptable limits. The batch was accepted because DUP and LCS were within method acceptance criteria.
D	Data reported from a dilution
M-06	The reported result has been confirmed by reanalysis.
Seed-01	The seed depletion is greater than that recommended by the method. The LCS is acceptable showing the seed supports the method.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK
Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle
Shannon Kronz

Lab# ACDD183	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 -EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers C-75
-01	11/9/21	11/9/21	09:24	17:24	211109-03-WC	SK	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	~~#~~3
-02	11/9/21	11/9/21	07:51	1700	211109-11 -WC	SK	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	4

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Shannon Kronz	11/9/21 17:58	AMcPherson 11-9-21 17:58	#

ACDD183

Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 208-389-7700

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for March 15, 2022

Date: May 24, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the March 15, 2022 storm event.

Section 2: Project Status

Table 1-1 is a summary of the sample types collected to date for WY 2022 Phase I Stormwater Outfall Monitoring.

Table 1-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
November 9, 2021	C	C	-	-	-
March 15, 2022	G, C	G, C	G, C	G, C	G, C
Collected:	2G, 2C	2G, 2C	2G, 2C	2G, 2C	2G, 2C

Notes:

C = composite sample.

G = grab sample.

After the March 15, 2022 storm event, ACHD still needs to collect one grab sample and one composite sample from each Phase I monitoring site.

Section 3: Storm Event Summary

The March 15, 2022 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A detailed summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form that describes the forecast and summarizes the decision-making process from March 14, 2022 is included in Attachment A for reference.

Monday, March 14, 2022

- The afternoon of Monday, March 14, 2022, the National Weather Service issued a forecast for widespread rain in the Boise area. A slight chance of rainshadowing was expected. The chance of precipitation was 100% percent, with a total of 0.30 inch of precipitation forecasted.
- Setup was accomplished on Monday, March 14, 2022. An expected precipitation depth of 0.19 inch was used to set trigger volumes at monitoring stations.

Tuesday, March 15, 2022

- Rain started around 0830 and continued until 1100. A weaker second wave of precipitation started around 1200 and continued until 1500. A stronger third wave of rain of rain started around 1630 and continued until 1800.
- Precipitation totals ranged between 0.30 and 0.36 inch at local rain gauges.

Flow measurements and precipitation data are summarized in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Main, Americana, and AS_6 monitoring stations were set up the afternoon of Monday, March 14, 2022, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programed into the Lucky, Whitewater, Main, and Americana flowmeters. A site-specific velocity cutoff value was programmed into the AS_6 flowmeter. Setup and sampling information is included in Table 1. The field forms completed during setup/shut down and sampling can be found in Appendix D.

Grab Samples

Two, two-member teams mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on the morning on March 15, 2022. Grab samples were submitted to the West Boise Water Quality Lab (WQL) at 1054 on March 15, 2022. Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment C.

Composite Samples

Composite samples were collected at Lucky, Whitewater, Main, Americana, and AS_6 monitoring stations. Volumes of composite samples submitted were sufficient for all parameters. All composite samples were submitted to the WQL on March 15, 2022 at 2127. Analytical results are attached in Table 2. Pollutant loading estimates for the event are detailed in Table 3.

Section 4: Quality Assurance/Quality Control

A summary of quality control (QC) samples collected during the March 15, 2022, storm event is presented below in Table 3-1. A field blank and a field duplicate were collected from the Main monitoring station. Analytical results for these samples are included in Table 4.

Table 3-1. QC Sample Details

Sample ID	Sample Type	Parent Sample	Conclusions
220315-12-001	Field Blank	Main Grab	No E. coli detection was reported in the field blank.
220315-12-101	Field Duplicate	Main Grab	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. Acceptance and performance criteria for analytical and non-analytical data were met for this storm event.

Data Tables

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	YES	YES	YES	YES
Composite samples collected and submitted?	YES	YES	YES	YES	YES
Trigger volume	5004 gal	1600 ft^3	5894 gal	5112 ft^3	382 ft^3
Velocity cutoff (fps)	--	--	--	--	0.02
Sampler enable condition (in)	level > 1.5	level > 0.5	level > 3.5	level > 6.5	--
Runoff start time	8:49	10:21	8:49	8:13	9:20
Grab sample collection time	9:54	10:31	9:35	9:52	10:09
Composite sample stop time	18:00	18:21	18:03	14:37	17:23
Runoff stop time	20:57	20:42	19:56	20:13	20:11
Volume of discharge sampled (ft^3)	11,779	27,239	14,587	125,596	9,341
Total runoff volume (ft^3)	12,005	28,655	14,893	207,280	10,416
Percent of storm flow sampled (%)	98%	95%	98%	61%	90%
Composite sample duration (hrs)	9	8	9	6.5	8
Storm Precipitation (in)	0.30	0.32	0.30	0.30/0.36	0.30/0.36
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	17	17	18	24	24
Number of composite bottles filled	1	1	1	1	1
Composite sample volume (Approx.; ml)	9,500	10,250	11,000	14,000	14,000

Table 2. Field and Analytical Data Summary - Wet Samples

			Field Parameters				Analytical Parameters																				
Monitoring Station	Sample Date	Sample ID Grab	Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	Sample ID Composite	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate, as P	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	3/15/2022	220315-03-WG	9.04	5.87	83.3	12.21	1580.0	220315-03-WC	15.2	121	20.7	51.1	55.8	72.0	0.398	0.197	0.750	0.359	2.45	2.0	<0.0250	0.076	5.0	0.11	2.2	0.0107	32.3
Whitewater	3/15/2022	220315-11-WG	8.68	6.1	671.8	9.70	30.1	220315-11-WC	27.2	197	84.3	175	135	236	0.651	0.324	1.30	0.541	3.64	3.4	<0.0250	0.13	8.6	0.25	8.9	0.0192	41.8
Main	3/15/2022	220315-12-WG	10.57	6.11	511.8	9.30	24.3	220315-12-WC	18.9	215	80.9	139	264	210	0.404	0.143	1.14	0.372	3.05	3.2	0.034	0.20	6.7	0.092	12.5	0.0285	53.7
Americana	3/15/2022	220315-14-WG	10.55	6.32	737.6	10.17	88.2	220315-14-WC	19.8	118	146	80.8	71.8	394	0.424	0.203	0.935	0.989	2.55	4.9	0.033	0.13	4.6	0.18	6.8	0.0155	43.9
AS_6	3/15/2022	220315-206-WG	9.63	6.48	756.2	8.58	613.1	220315-206-WC	35.3	292	69.3	248	297	252	1.05	0.474	1.06	0.413	5.26	5.3	0.030	0.17	7.6	0.49	17.1	0.0389	38.4

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia	Nitrate + Nitrite (N)	TKN
Lucky	3/15/2022	41.8	0.298	0.562	0.269	1.84
Whitewater	3/15/2022	125	0.605	1.21	0.503	3.38
Main	3/15/2022	245	0.375	1.06	0.346	2.83
Americana	3/15/2022	929	5.49	12.1	12.8	33.0
AS_6	3/15/2022	193	0.683	0.689	0.268	3.42

Table 4. QC Sample Summary				
Date	Parent Sample	Sample ID	Type	E. coli mpn/100 mL
3/15/2022	220315-12-WG	220315-12-001	Field Blank	<1.0
3/15/2022	220315-12-WG	220315-12-101	Field Duplicate	15.8
Calculated parent/duplicate RPD				10%
Allowable RPD				40%

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 14 Mar 2022 **Time:** 7:48 AM **Initials:** TL

Sampling Event Determination

Is there a targeted sampling event expected during the next 36 hours?
(Or, if it is Friday, is a targeted event expected before 5:00 PM on Monday?)

◉ Yes ○ Maybe ○ No

If YES or MAYBE, then call BC. Include discussion of reasons for "Maybe" below.

- ☑ Date and Time of Expected Event — 3/15 6am - 6pm
- ☑ Expected Amount of Precipitation
- ☑ Percent Chance of Precipitation — 100%, 0.30"

Targeted Stations & Samples

Americana	Main	Lucky	AS-6	Whitewater
☑ Grab	☑ Grab	☑ Grab	☑ Grab	☑ Grab
☑ Composite	☑ Composite	☑ Composite	☑ Composite	☑ Composite

Phase II
State
- ☑ Grab
- ☑ Composite

Type of Forecasted Precipitation

- ☐ Light Rain
- ☑ Rain
- ☐ Scattered Showers
- ☐ Thunder Showers
- ☐ Snow Melt
- ☐ Rain on Snow
- ☐ Other (Describe below)

Reasons for Not Targeting a Forecasted Storm or Targeting Selected Stations/Samples

- ☐ Equipment Concerns (Describe below)
- ☐ Holiday
- ☐ Other (Describe below)
- ☐ Waiting on Antecedent Dry Period. Expires:

Comments

Past 72 hr precip: 0.00"
I talked with Anna at NWS. The Storm will begin tomorrow morning between 6am-8am. Slight chance of rainshadowing at the beginning but will be quickly overcome because there is plenty of moisture in the atmosphere. The models are in good agreement on totals being around 0.30", with 0.15-0.20 from 6am - noon.

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 3:11 am MDT Mar 14, 2022

Today: Partly sunny, with a high near 57. Light east southeast wind becoming southeast 5 to 10 mph in the afternoon.
Tonight: A 30 percent chance of rain after midnight. Mostly cloudy, with a low around 44. East southeast wind 11 to 14 mph.
Tuesday: Rain. High near 54. Southeast wind 7 to 9 mph. Chance of precipitation is 100%. New precipitation amounts between a quarter and half of an inch possible.
Tuesday Night: Rain likely before midnight. Mostly cloudy, with a low around 34. Southwest wind around 5 mph becoming light and variable. Chance of precipitation is 60%.
Wednesday: Partly sunny, with a high near 53. Light north northwest wind becoming northwest 5 to 10 mph in the afternoon.
Wednesday Night: Mostly clear, with a low around 31.
Thursday: Mostly sunny, with a high near 57.
Thursday Night: Mostly cloudy, with a low around 37.
Friday: Partly sunny, with a high near 62.
Friday Night: Mostly cloudy, with a low around 41.
Saturday: A 30 percent chance of rain. Mostly cloudy, with a high near 64.
Saturday Night: Rain likely. Cloudy, with a low around 38. Chance of precipitation is 60%.
Sunday: A 40 percent chance of rain. Mostly cloudy, with a high near 53.

Area Forecast Discussion
National Weather Service Boise ID
302 AM MDT Mon Mar 14 2022

.SHORT TERM...Today through Wednesday night...Drier, warmer conditions expected across the forecast area today under a ridge. Expect some gusty wind across the area, especially eastern Oregon beginning this afternoon. The next approaching trough will begin to impact the region Monday evening, with a few showers noted across eastern Oregon and into the West Central Mountains of Idaho. **The stronger moisture push will make its arrival Tuesday morning, with more widespread moisture across the area.** Snow levels will be around 6000-7000 ft, resulting in some mountain snow and rain otherwise. **Shower activity will continue into Wednesday morning with activity weakening generally from west to east Wednesday.** Snowfall of 4 to 8 inches anticipated over the higher terrain, with **rain amounts up to around 0.30" for the lower elevations.** Gusty to breezy winds will accompany this system, with winds weakening as the system departs on Wednesday. Drier, though cooler conditions then expected Wednesday.

.LONG TERM...Thursday through Monday...A weak ridge will move over the region on Thursday, bringing dry conditions and normal temperatures for the region. Zonal flow will continue through Friday and a shortwave trough to the north will bring areas of precipitation to higher elevations in Baker County and Harney County in Oregon and the Owyhee and West Central Mountains in Idaho. The relatively zonal flow will ensure temperatures remain slightly above normal through the rest of the week. Models still depict a deep upper level trough moving through the region this weekend. Uncertainty still remains on the timing of arrival and accumulation of precipitation for the region, but widespread precipitation is expected on Sunday. Snow levels will drop from 5000-6000 feet MSL to 3000-4000 feet MSL on Sunday. Breezy northwest winds will strengthen through Sunday afternoon after frontal passage. Precipitation will move out of the region on Monday, with some lingering snow showers on Monday in the West Central Mountains.

Storm Event QA/QC Checklist

STORM DATE: 220315				Circle one: Phase I (circled) Phase II
A. Event and Data Completeness	**Yes**	**No**	**N/A**	**Notes**
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed	X			
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member			X	
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Storm/Sample Value	Program Criteria	Met	Qualify	Reject	Notes
1. Precipitation (inches)	0.30-0.36	> 0.10 in.	X			
2. Antecedent dry period (hours)	1,272	< 0.11 in. in 72 hrs	X			
3. Days since last sampling event	126	>= 30 days	X			
4. Sampled amount as % of total run-off	61% - 98%	>= 75%	X			
5. Ecoli sample holding time	3 hrs	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X			
6. Filtering of samples for dissolved parameter analysis	≤17 hrs	<= 24 hrs: no qualifier > 24 hrs.: reject	X			

D. Notes:

Americana composite represents 61% of the total storm over 6.5 hrs so the sample is accepted. All of the other sites represented 90% - 98% of the total storm.

Reviewed by Tamara Lighte **Date** 04.20.22

Approved by Monica Lowe **Date** 4/27/22

Updated 210824 TL

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth =	0.11	in
Square Feet per Acre =	43560	ft^2/ac
Inches per Foot=	12	in/ft
Aliquots per Sample=	17	

Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

Site	Area (ac)	Using RC Based on Land Use			Using Manually-entered RC		
		RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)	RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.46	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.76	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7760.00	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.80	**2960**
#206 AS_6	204	0.257	20935	**1231**	0.046	3747.03	**221**
#18 State	34	0.419	5688	**335**	0.144	1954.97	**122**
Theoretical	80	0.200	6389		0.000		

NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]

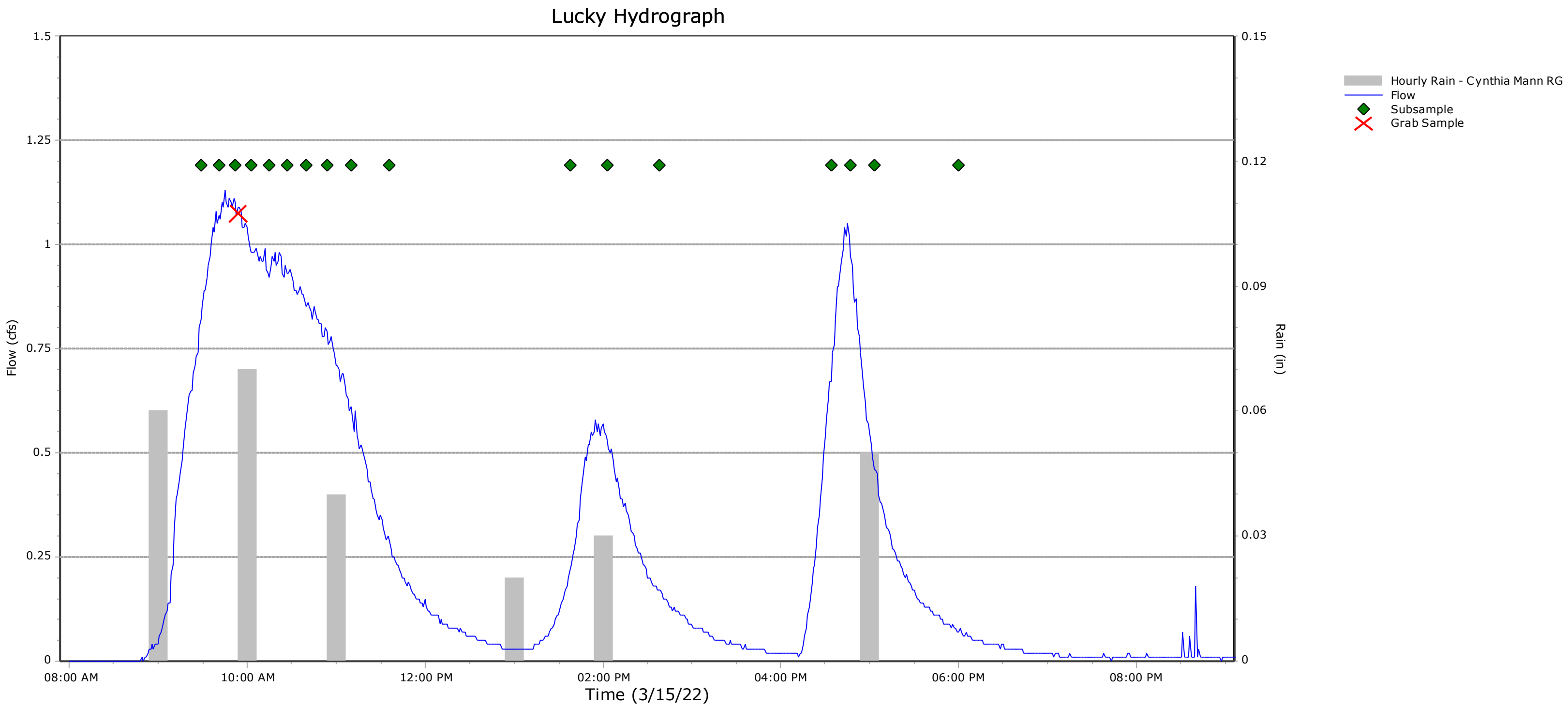
all values taken from historically corrected runoff coefficents

total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)

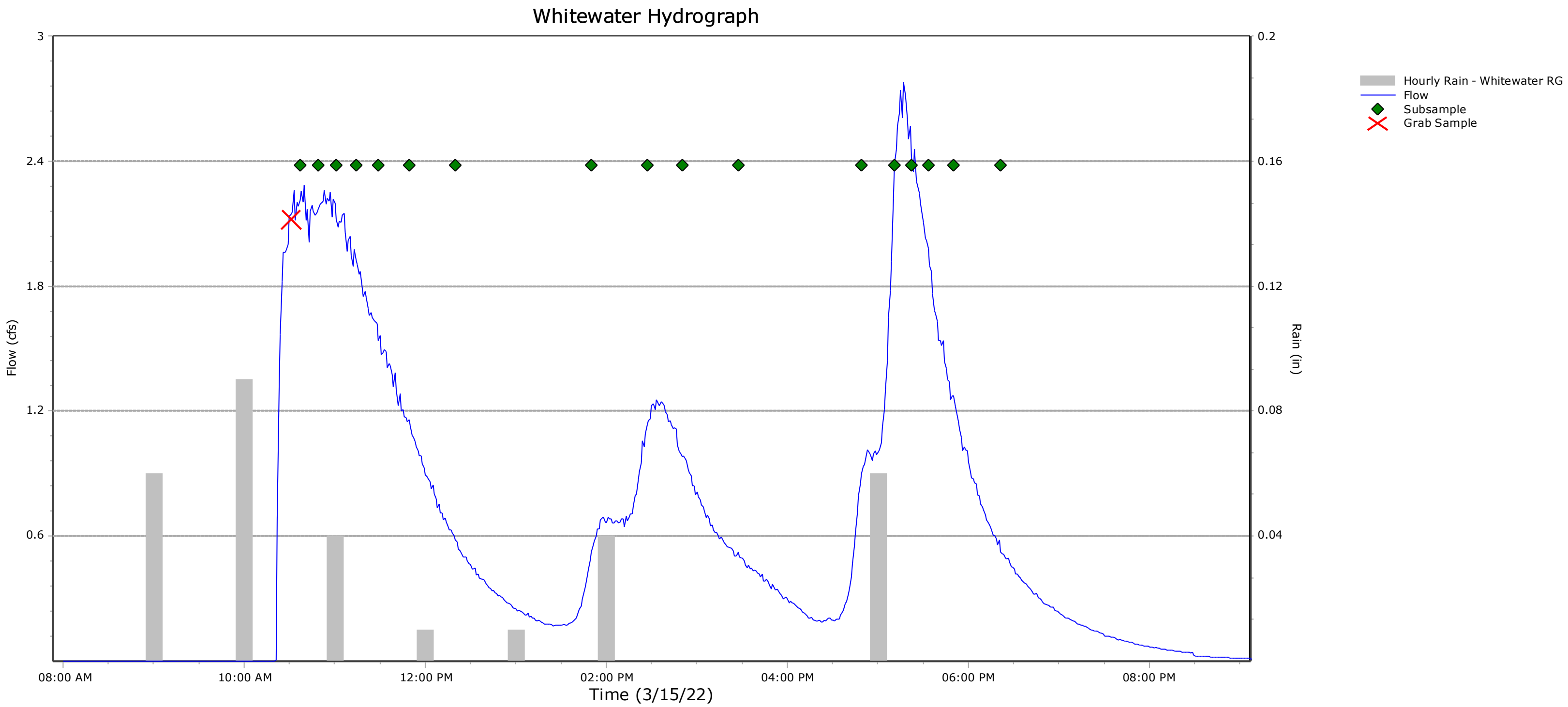
Measured runoff

RC = measured runoff / total runoff

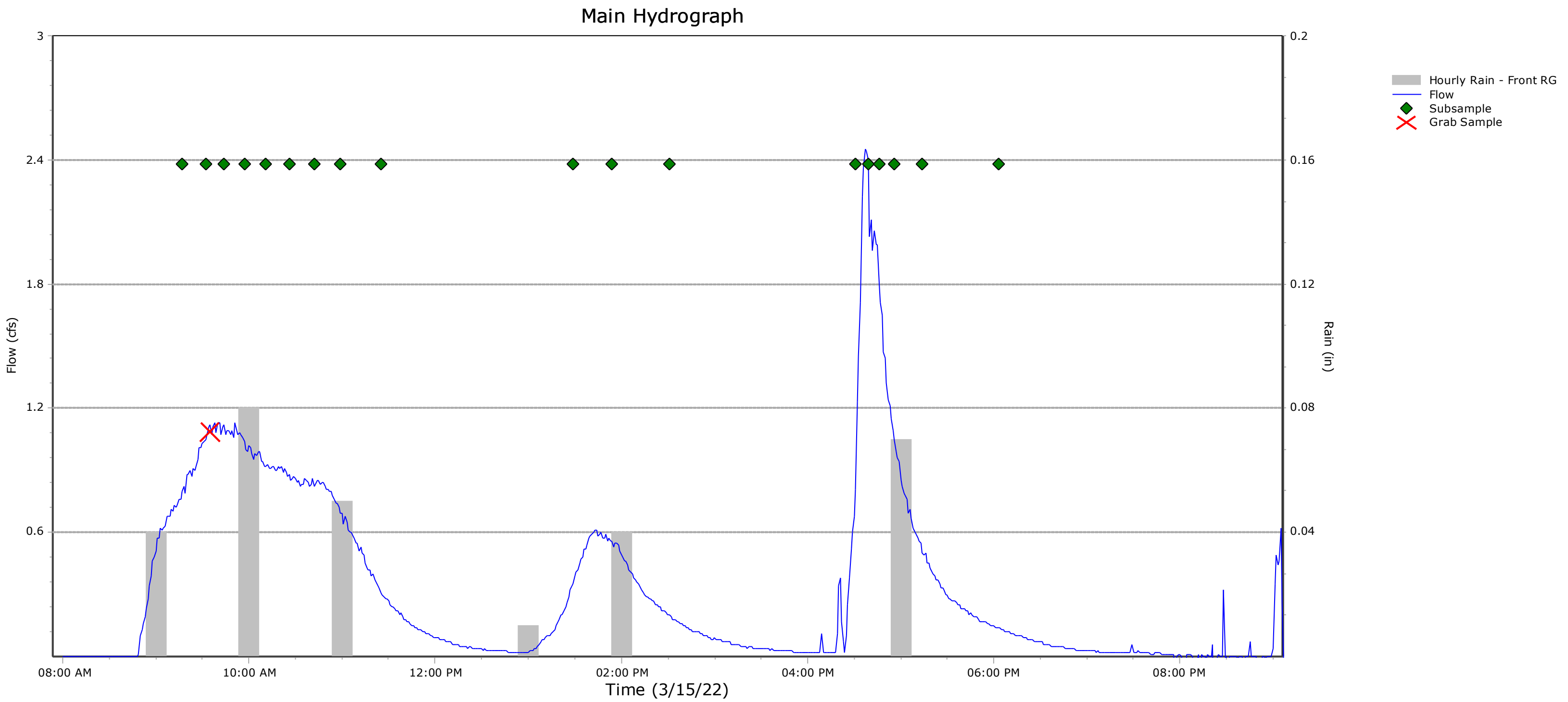
Attachment B: Storm Event Hydrographs



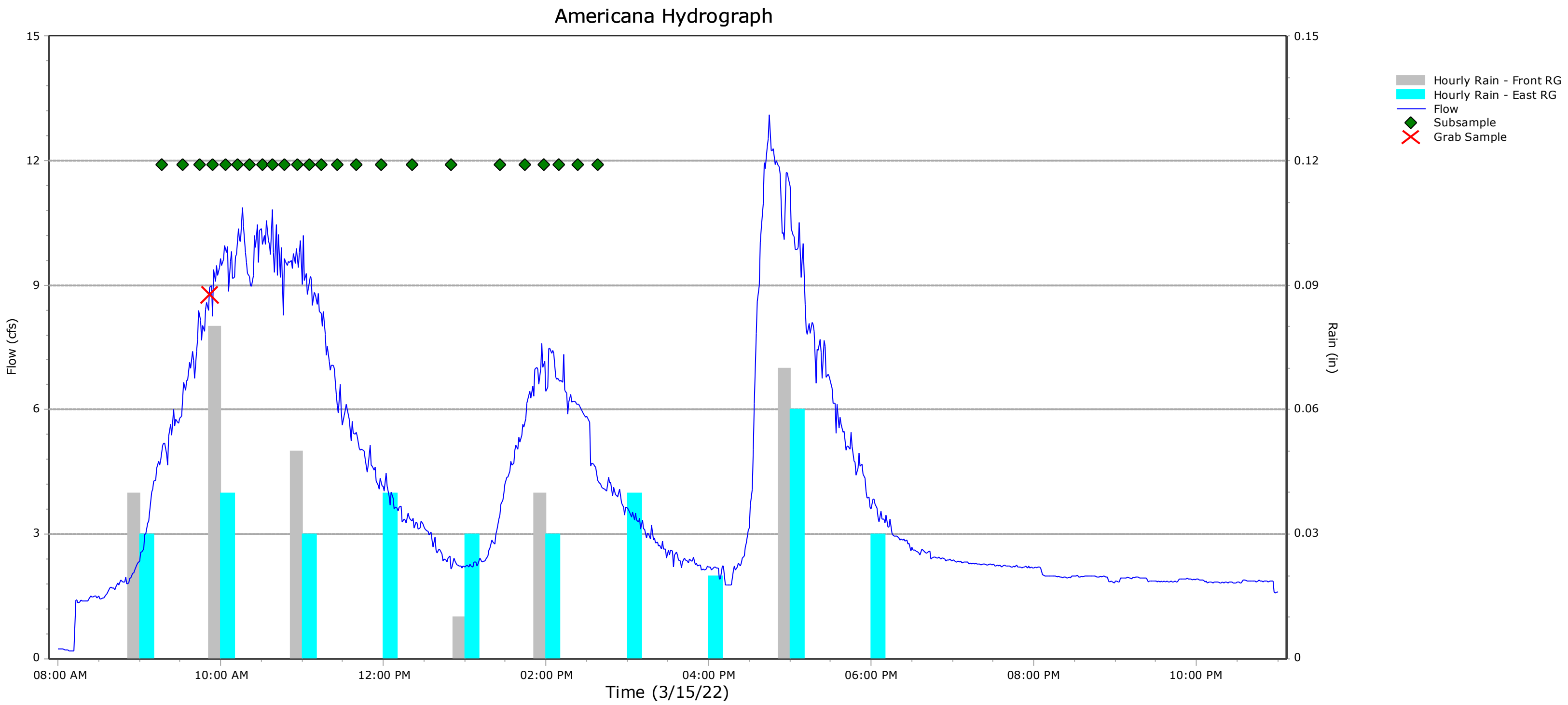
Lucky Hydrograph
1.5
1.25
1
0.75
0.5
0.25
0
Flow (cfs)
0.15
0.12
0.09
0.06
0.03
0
Rain (in)
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
Time (3/15/22)
Hourly Rain - Cynthia Mann RG
Flow
Subsample
Grab Sample



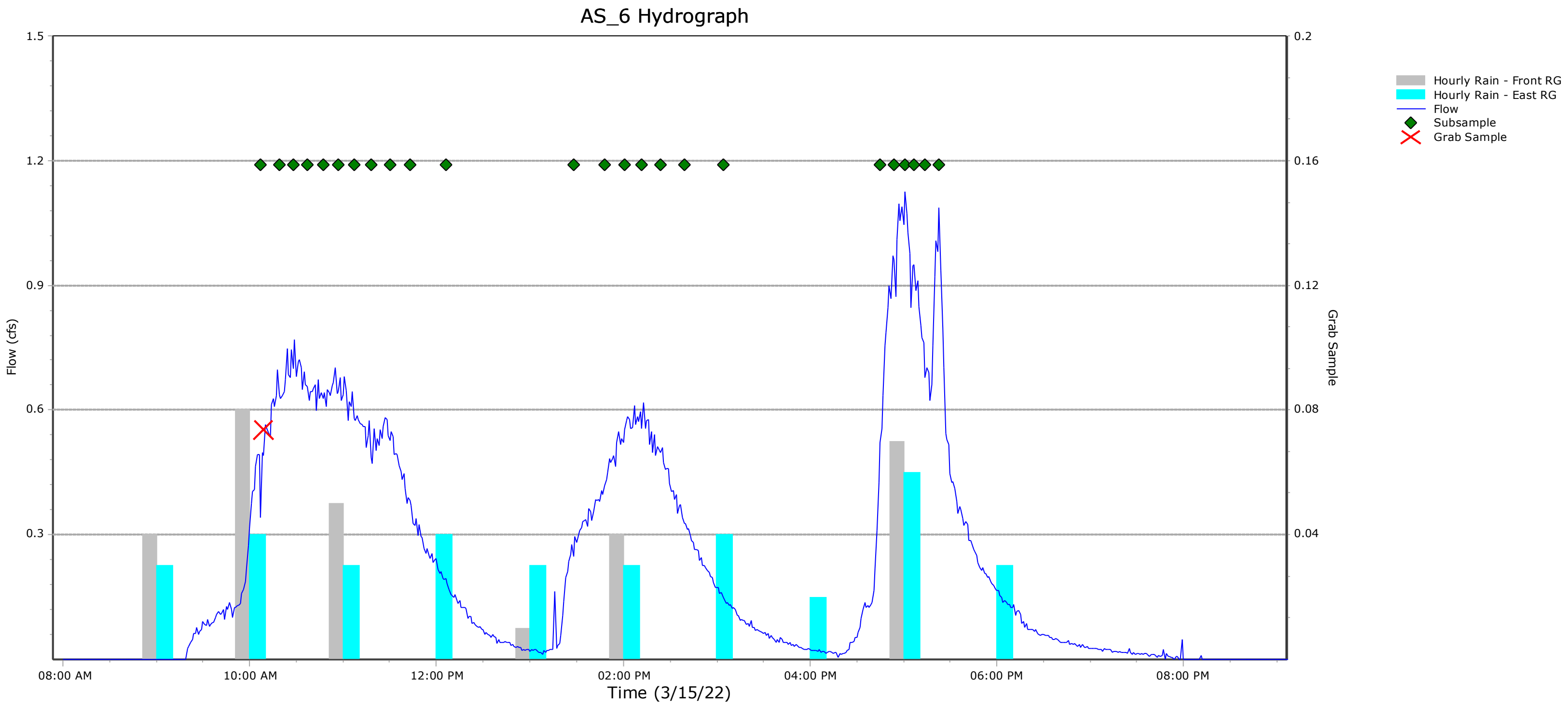
Whitewater Hydrograph
3
2.4
1.8
1.2
0.6
Flow (cfs)
0.2
0.16
0.12
0.08
0.04
Rain (in)
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
Time (3/15/22)
Hourly Rain - Whitewater RG
Flow
Subsample
Grab Sample



Main Hydrograph
Flow (cfs)
Rain (in)
Time (3/15/22)
3
2.4
1.8
1.2
0.6
0.2
0.16
0.12
0.08
0.04
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
Hourly Rain - Front RG
Flow
Subsample
Grab Sample



Americana Hydrograph
Flow (cfs)
Rain (in)
Time (3/15/22)
15
12
9
6
3
0
0.15
0.12
0.09
0.06
0.03
0
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
10:00 PM
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Subsample
Grab Sample



AS_6 Hydrograph
Flow (cfs)
Grab Sample
Time (3/15/22)
1.5
1.2
0.9
0.6
0.3
0.2
0.16
0.12
0.08
0.04
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Subsample
Grab Sample

Attachment C: Storm Event Analytical Reports

Report Date: 04/06/2022 15:29

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00195-01	ACST1B	220315-03-WG	Water		03/15/2022	03/15/2022
AC00195-02	ACST1B	220315-11-WG	Water		03/15/2022	03/15/2022
AC00195-03	ACST1B	220315-12-WG	Water		03/15/2022	03/15/2022
AC00195-04	ACST1B	220315-12-101	Water		03/15/2022	03/15/2022
AC00195-05	ACST1B	220315-12-001	Water		03/15/2022	03/15/2022
AC00195-06	ACST1B	220315-14-WG	Water		03/15/2022	03/15/2022
AC00195-07	ACST1B	220315-206-WG	Water		03/15/2022	03/15/2022

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Report Date: 04/06/2022 15:29

Analysis Report

Location:	ACST1B	Location Description:	220315-03-WG
Date/Time Collected:	03/15/2022 09:54		
Lab Number:	AC00195-01	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	1580.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	D
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:34	LRF	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Report Date: 04/06/2022 15:29

Analysis Report

Location:	ACST1B	Location Description:	220315-11-WG
Date/Time Collected:	03/15/2022 10:31		
Lab Number:	AC00195-02	Sample Collector:	S.K
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	30.1	MPN/100 mL	1.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:34	LRF	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 04/06/2022 15:29

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Analysis Report

Location:	ACST1B	Location Description:	220315-12-WG
Date/Time Collected:	03/15/2022 09:35		
Lab Number:	AC00195-03	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	24.3	MPN/100 mL	1.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:34	LRF	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 04/06/2022 15:29

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Analysis Report

Location:	ACST1B	Location Description:	220315-12-101
Date/Time Collected:	03/15/2022 12:00		
Lab Number:	AC00195-04	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	15.8	MPN/100 mL	1.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:34	LRF	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Report Date: 04/06/2022 15:29

Analysis Report

Location:	ACST1B	Location Description:	220315-12-001
Date/Time Collected:	03/15/2022 12:00		
Lab Number:	AC00195-05	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	<1.0	MPN/100 mL	1.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	U
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:37	LRF	

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Report Date: 04/06/2022 15:29

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Analysis Report

Location:	ACST1B	Location Description:	220315-14-WG
Date/Time Collected:	03/15/2022 09:52		
Lab Number:	AC00195-06	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	88.2	MPN/100 mL	1.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:37	LRF	

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Boise City Public Works
Water Quality Laboratory
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Analysis Report

Location:	ACST1B	Location Description:	220315-206-WG
Date/Time Collected:	03/15/2022 10:09		
Lab Number:	AC00195-07	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B220950	613.1	MPN/100 mL	1.0	1.0	IDEXX - Colilert	03/15/22 12:41	3/16/22 12:52	LRF	
Wet Chemistry										
Chlorine Screen	B220986	Absent				SM 4500-CL G-2000 mod	03/16/22	3/16/22 11:37	LRF	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Boise City Public Works
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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B220950									
Blank (B220950-BLK1)									
E. Coli	Absent						03/16/2022	LRF	
LCS (B220950-BS1)									
E. Coli				Present			03/16/2022	LRF	
Duplicate (B220950-DUP1)	Source ID: WB01719-06								
E. Coli					Pass	128	03/16/2022	LRF	
Duplicate (B220950-DUP2)	Source ID: AC00194-01								
E. Coli					Pass	128	03/16/2022	LRF	

Report Date: 04/06/2022 15:29

Boise City Public Works
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Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK
Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle, Hannah Johnson, Shannon Kranz, Zuiy Lapa

C-107

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
C00195-01	3/15/22		0954		220315-03-WG	SK	X	X												X					1
-02			1031		220315-11-WG	SK	X	X												X					1
-03			0935		220315-12-WG	TL	X	X												X					1
					~~[illegible]~~	~~[illegible]~~	~~X~~																		~~1~~
-04			1200 ~~[illegible]~~		220315-12-101	TL	X	X												X					1
-05			1200 ~~[illegible]~~		220315-12-001	TL	X	X												X					1
-06			0952		220315-14-WG	TL	X	X												X					1
-07			1009		220315-206-WG	TL	X	X												X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Tammy Lightle	3/15/22 / 1054	[signature] 3/15/22 / 1054	
[signature]	3/15/22 1115	[signature] 3/15/22 1116	#AC00195

coc_wql-pi

WY22

AC00195

Report Date: 04/04/2022 09:09

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00197-01	ACST1C	220315-03-WC	Water		03/15/2022	03/16/2022
AC00197-02	ACST1C	220315-11-WC	Water		03/15/2022	03/16/2022
AC00197-03	ACST1C	220315-12-WC	Water		03/15/2022	03/16/2022
AC00197-04	ACST1C	220315-14-WC	Water		03/15/2022	03/16/2022
AC00197-05	ACST1C	220315-206-WC	Water		03/15/2022	03/16/2022

Boise City Public Works
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Fax (208) 608-7319

Report Date: 04/04/2022 09:09

Analysis Report

Location:	ACST1C	Location Description:	220315-03-WC
Date/Time Collected:	03/15/2022 09:29 - 03/15/2022 18:00		
Lab Number:	AC00197-01	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B221097	0.750	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	03/24/22	3/24/22 11:25	ALN	
BOD5	B220980	15.2	mg/L	2.00	2.00	SM 5210 B-2011	03/16/22	3/21/22 10:09	ASE	
COD	B220979	121	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	03/16/22	3/16/22 13:08	MER	
Nitrate-Nitrite, as N	B220985	0.359	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	03/16/22	3/16/22 15:09	JAL	
TKN	B221170	2.45	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/29/22	3/30/22 10:02	ALN	
Total Dissolved Solids	B221011	72.0	mg/L	25.0	25.0	SM 2540 C-2011	03/17/22	3/19/22 8:51	LRF	
Total Suspended Solids	B221000	55.8	mg/L	0.900	0.900	SM 2540 D-2011	03/17/22	3/17/22 9:32	CJP	
Turbidity	B220976	51.1	NTU	0.6	0.3	EPA 180.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:16	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B220981	0.197	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:32	JAL	
Total Metals										
Mercury	B221180	0.0107	ug/L	0.0100	0.0100	EPA 245.2	03/30/22	3/31/22 8:36	SAS	
Arsenic	B221038	2.0	ug/L	0.040	0.040	EPA 200.8	03/20/22	3/23/22 14:53	DMW	
Cadmium	B221038	0.076	ug/L	0.025	0.025	EPA 200.8	03/20/22	3/23/22 14:53	DMW	
Calcium	B221019	5.15	mg/L	0.0460	0.0460	EPA 200.7	03/18/22	3/24/22 12:19	AMO	
Lead	B221038	2.2	ug/L	0.050	0.050	EPA 200.8	03/20/22	3/23/22 14:53	DMW	
Magnesium	B221019	1900	ug/L	50.0	50.0	EPA 200.7	03/18/22	3/24/22 12:19	AMO	
Phosphorus as P	B221019	0.398	mg/L	6.00E-3	6.00E-3	EPA 200.7	03/18/22	3/24/22 12:19	AMO	
Hardness	B221019	20.7	mg/L	0.115	0.115	EPA 200.7	03/18/22	3/24/22 12:19	AMO	
Dissolved Metals										
Cadmium	B221012	<0.0250	ug/L	0.025	0.025	EPA 200.8	03/18/22	3/18/22 14:42	DMW	U
Copper	B221012	5.0	ug/L	0.15	0.15	EPA 200.8	03/18/22	3/18/22 14:42	DMW	
Lead	B221012	0.11	ug/L	0.050	0.050	EPA 200.8	03/18/22	3/18/22 14:42	DMW	
Zinc	B221012	32.3	ug/L	0.78	0.78	EPA 200.8	03/18/22	3/18/22 14:42	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 04/04/2022 09:09

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1C	Location Description:	220315-11-WC
Date/Time Collected:	03/15/2022 10:37 - 03/15/2022 18:21		
Lab Number:	AC00197-02	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B221097	1.30	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	03/24/22	3/24/22 11:40	ALN	
BOD5	B220980	27.2	mg/L	2.00	2.00	SM 5210 B-2011	03/16/22	3/21/22 10:03	ASE	
COD	B220979	197	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	03/16/22	3/16/22 13:08	MER	
Nitrate-Nitrite, as N	B220985	0.541	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	03/16/22	3/16/22 15:10	JAL	
TKN	B221170	3.64	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/29/22	3/30/22 10:03	ALN	
Total Dissolved Solids	B221011	236	mg/L	25.0	25.0	SM 2540 C-2011	03/17/22	3/19/22 8:52	LRF	
Total Suspended Solids	B220971	135	mg/L	0.900	0.900	SM 2540 D-2011	03/16/22	3/16/22 12:39	CJP	
Turbidity	B220976	175	NTU	3.0	0.3	EPA 180.1, Rev. 2.0 (1993)	03/16/22	3/16/22 10:58	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B220981	0.324	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:33	JAL	
Total Metals										
Mercury	B221180	0.0192	ug/L	0.0100	0.0100	EPA 245.2	03/30/22	3/31/22 8:40	SAS	
Arsenic	B221038	3.4	ug/L	0.040	0.040	EPA 200.8	03/20/22	3/23/22 14:55	DMW	
Cadmium	B221038	0.13	ug/L	0.025	0.025	EPA 200.8	03/20/22	3/23/22 14:55	DMW	
Calcium	B221019	14.3	mg/L	0.0460	0.0460	EPA 200.7	03/18/22	3/24/22 12:24	AMO	
Lead	B221038	8.9	ug/L	0.050	0.050	EPA 200.8	03/20/22	3/23/22 14:55	DMW	
Magnesium	B221019	11800	ug/L	50.0	50.0	EPA 200.7	03/18/22	3/24/22 12:24	AMO	
Phosphorus as P	B221019	0.651	mg/L	6.00E-3	6.00E-3	EPA 200.7	03/18/22	3/24/22 12:24	AMO	
Hardness	B221019	84.3	mg/L	0.115	0.115	EPA 200.7	03/18/22	3/24/22 12:24	AMO	
Dissolved Metals										
Cadmium	B221012	<0.0250	ug/L	0.025	0.025	EPA 200.8	03/18/22	3/18/22 14:44	DMW	U
Copper	B221012	8.6	ug/L	0.15	0.15	EPA 200.8	03/18/22	3/18/22 14:44	DMW	
Lead	B221012	0.25	ug/L	0.050	0.050	EPA 200.8	03/18/22	3/18/22 14:44	DMW	
Zinc	B221012	41.8	ug/L	0.78	0.78	EPA 200.8	03/18/22	3/18/22 14:44	DMW	

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Report Date: 04/04/2022 09:09

Analysis Report

Location:	ACST1C	Location Description:	220315-12-WC
Date/Time Collected:	03/15/2022 09:17 - 03/15/2022 18:03		
Lab Number:	AC00197-03	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B221097	1.14	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	03/24/22	3/24/22 11:32	ALN	
BOD5	B220980	18.9	mg/L	2.00	2.00	SM 5210 B-2011	03/16/22	3/21/22 9:58	ASE	
COD	B220979	215	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	03/16/22	3/16/22 13:08	MER	
Nitrate-Nitrite, as N	B220985	0.372	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	03/16/22	3/16/22 15:11	JAL	
TKN	B221170	3.05	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/29/22	3/30/22 10:05	ALN	
Total Dissolved Solids	B221011	210	mg/L	25.0	25.0	SM 2540 C-2011	03/17/22	3/19/22 8:53	LRF	
Total Suspended Solids	B220971	264	mg/L	0.900	0.900	SM 2540 D-2011	03/16/22	3/16/22 12:37	CJP	
Turbidity	B220976	139	NTU	3.0	0.3	EPA 180.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:08	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B220981	0.143	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:34	JAL	
Total Metals										
Mercury	B221180	0.0285	ug/L	0.0100	0.0100	EPA 245.2	03/30/22	3/31/22 8:00	SAS	
Arsenic	B221038	3.2	ug/L	0.040	0.040	EPA 200.8	03/20/22	3/23/22 14:57	DMW	
Cadmium	B221038	0.20	ug/L	0.025	0.025	EPA 200.8	03/20/22	3/23/22 14:57	DMW	
Calcium	B221019	17.1	mg/L	0.0460	0.0460	EPA 200.7	03/18/22	3/24/22 12:29	AMO	
Lead	B221038	12.5	ug/L	0.050	0.050	EPA 200.8	03/20/22	3/23/22 14:57	DMW	
Magnesium	B221019	9310	ug/L	50.0	50.0	EPA 200.7	03/18/22	3/24/22 12:29	AMO	
Phosphorus as P	B221019	0.404	mg/L	6.00E-3	6.00E-3	EPA 200.7	03/18/22	3/24/22 12:29	AMO	
Hardness	B221019	80.9	mg/L	0.115	0.115	EPA 200.7	03/18/22	3/24/22 12:29	AMO	
Dissolved Metals										
Cadmium	B221012	0.034	ug/L	0.025	0.025	EPA 200.8	03/18/22	3/18/22 14:47	DMW	
Copper	B221012	6.7	ug/L	0.15	0.15	EPA 200.8	03/18/22	3/18/22 14:47	DMW	
Lead	B221012	0.092	ug/L	0.050	0.050	EPA 200.8	03/18/22	3/18/22 14:47	DMW	
Zinc	B221012	53.7	ug/L	0.78	0.78	EPA 200.8	03/18/22	3/18/22 14:47	DMW	

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Report Date: 04/04/2022 09:09

Analysis Report

Location:	ACST1C	Location Description:	220315-14-WC
Date/Time Collected:	03/15/2022 09:15 - 03/15/2022 14:37		
Lab Number:	AC00197-04	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B221097	0.935	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	03/24/22	3/24/22 11:05	ALN	
BOD5	B220980	19.8	mg/L	2.00	2.00	SM 5210 B-2011	03/16/22	3/21/22 9:50	ASE	
COD	B220979	118	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	03/16/22	3/16/22 11:35	MER	
Nitrate-Nitrite, as N	B220985	0.989	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	03/16/22	3/16/22 15:12	JAL	
TKN	B221170	2.55	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/29/22	3/30/22 10:06	ALN	
Total Dissolved Solids	B221011	394	mg/L	25.0	25.0	SM 2540 C-2011	03/17/22	3/19/22 8:54	LRF	
Total Suspended Solids	B220971	71.8	mg/L	0.900	0.900	SM 2540 D-2011	03/16/22	3/16/22 10:04	CJP	
Turbidity	B220976	80.8	NTU	1.5	0.3	EPA 180.1, Rev. 2.0 (1993)	03/16/22	3/16/22 10:19	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B220981	0.203	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:35	JAL	
Total Metals										
Mercury	B221180	0.0155	ug/L	0.0100	0.0100	EPA 245.2	03/30/22	3/31/22 8:47	SAS	
Arsenic	B221038	4.9	ug/L	0.040	0.040	EPA 200.8	03/20/22	3/23/22 15:00	DMW	
Cadmium	B221038	0.13	ug/L	0.025	0.025	EPA 200.8	03/20/22	3/23/22 15:00	DMW	
Calcium	B221019	36.1	mg/L	0.0460	0.0460	EPA 200.7	03/18/22	3/24/22 12:40	AMO	
Lead	B221038	6.8	ug/L	0.050	0.050	EPA 200.8	03/20/22	3/23/22 15:00	DMW	
Magnesium	B221019	13500	ug/L	50.0	50.0	EPA 200.7	03/18/22	3/24/22 12:40	AMO	
Phosphorus as P	B221019	0.424	mg/L	6.00E-3	6.00E-3	EPA 200.7	03/18/22	3/24/22 12:40	AMO	
Hardness	B221019	146	mg/L	0.115	0.115	EPA 200.7	03/18/22	3/24/22 12:40	AMO	
Dissolved Metals										
Cadmium	B221012	0.033	ug/L	0.025	0.025	EPA 200.8	03/18/22	3/18/22 14:49	DMW	
Copper	B221012	4.6	ug/L	0.15	0.15	EPA 200.8	03/18/22	3/18/22 14:49	DMW	
Lead	B221012	0.18	ug/L	0.050	0.050	EPA 200.8	03/18/22	3/18/22 14:49	DMW	
Zinc	B221012	43.9	ug/L	0.78	0.78	EPA 200.8	03/18/22	3/18/22 14:49	DMW	

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Report Date: 04/04/2022 09:09

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Analysis Report

Location:	ACST1C	Location Description:	220315-206-WC
Date/Time Collected:	03/15/2022 10:07 - 03/15/2022 17:23		
Lab Number:	AC00197-05	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B221097	1.06	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	03/24/22	3/24/22 11:15	ALN	
BOD5	B220980	35.3	mg/L	2.00	2.00	SM 5210 B-2011	03/16/22	3/21/22 9:42	ASE	
COD	B220989	292	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	03/17/22	3/17/22 10:03	MER	
Nitrate-Nitrite, as N	B220985	0.413	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	03/16/22	3/16/22 15:13	JAL	
TKN	B221170	5.26	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/29/22	3/30/22 10:07	ALN	
Total Dissolved Solids	B221011	252	mg/L	25.0	25.0	SM 2540 C-2011	03/17/22	3/19/22 8:54	LRF	
Total Suspended Solids	B220971	297	mg/L	0.900	0.900	SM 2540 D-2011	03/16/22	3/16/22 11:10	CJP	
Turbidity	B220976	248	NTU	3.0	0.3	EPA 180.1, Rev. 2.0 (1993)	03/16/22	3/16/22 10:36	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B220981	0.474	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/16/22	3/16/22 11:40	JAL	
Total Metals										
Mercury	B221180	0.0389	ug/L	0.0100	0.0100	EPA 245.2	03/30/22	3/31/22 8:50	SAS	
Arsenic	B221038	5.3	ug/L	0.040	0.040	EPA 200.8	03/20/22	3/23/22 15:02	DMW	
Cadmium	B221038	0.17	ug/L	0.025	0.025	EPA 200.8	03/20/22	3/23/22 15:02	DMW	
Calcium	B221019	10.5	mg/L	0.0460	0.0460	EPA 200.7	03/18/22	3/24/22 12:35	AMO	
Lead	B221038	17.1	ug/L	0.050	0.050	EPA 200.8	03/20/22	3/23/22 15:02	DMW	
Magnesium	B221019	10500	ug/L	50.0	50.0	EPA 200.7	03/18/22	3/24/22 12:35	AMO	
Phosphorus as P	B221019	1.05	mg/L	6.00E-3	6.00E-3	EPA 200.7	03/18/22	3/24/22 12:35	AMO	
Hardness	B221019	69.3	mg/L	0.115	0.115	EPA 200.7	03/18/22	3/24/22 12:35	AMO	
Dissolved Metals										
Cadmium	B221012	0.030	ug/L	0.025	0.025	EPA 200.8	03/18/22	3/18/22 14:52	DMW	
Copper	B221012	7.6	ug/L	0.15	0.15	EPA 200.8	03/18/22	3/18/22 14:52	DMW	
Lead	B221012	0.49	ug/L	0.050	0.050	EPA 200.8	03/18/22	3/18/22 14:52	DMW	
Zinc	B221012	38.4	ug/L	0.78	0.78	EPA 200.8	03/18/22	3/18/22 14:52	DMW	

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B220971									
Blank (B220971-BLK1)									
Total Suspended Solids	<0.9	mg/L					03/16/2022	CJP	U
LCS (B220971-BS1)									
Total Suspended Solids			98.7	90-110			03/16/2022	CJP	
Duplicate (B220971-DUP1)	Source ID: LS01074-02								
Total Suspended Solids					2.59	20	03/16/2022	CJP	
Duplicate (B220971-DUP2)	Source ID: WB01721-07								
Total Suspended Solids					0.243	20	03/16/2022	CJP	
Batch: B220976									
Blank (B220976-BLK1)									
Turbidity	<0.3	NTU					03/16/2022	LRF	U
LCS (B220976-BS1)									
Turbidity			100	90-110			03/16/2022	LRF	
Duplicate (B220976-DUP1)	Source ID: AC00196-01								
Turbidity					5.38	25	03/16/2022	LRF	D
Batch: B220979									
Blank (B220979-BLK1)									
COD	<13	mg/L					03/16/2022	MER	U
LCS (B220979-BS1)									
COD			99.0	90-110			03/16/2022	MER	
Batch: B220980									
Blank (B220980-BLK1)									
BOD5	<2	mg/L					03/21/2022	ASE	U
LCS (B220980-BS1)									
BOD5			113	84.6-115.4			03/21/2022	ASE	
LCS (B220980-BS2)									
BOD5			106	84.6-115.4			03/21/2022	ASE	
Duplicate (B220980-DUP1)	Source ID: BB01951-01								
BOD5					5.34	30	03/21/2022	ASE	D
Duplicate (B220980-DUP2)	Source ID: LS01074-02								
BOD5					8.33	30	03/21/2022	ASE	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B220985									
Blank (B220985-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					03/16/2022	JAL	U
Blank (B220985-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					03/16/2022	JAL	U
LCS (B220985-BS1)									
Nitrate-Nitrite, as N			98.2	90-110			03/16/2022	JAL	
LCS (B220985-BS2)									
Nitrate-Nitrite, as N			98.6	90-110			03/16/2022	JAL	
Duplicate (B220985-DUP1) Source ID: AC00196-01									
Nitrate-Nitrite, as N					0.103	10	03/16/2022	JAL	
Duplicate (B220985-DUP2) Source ID: BB01903-01									
Nitrate-Nitrite, as N					0.306	10	03/16/2022	JAL	
Duplicate (B220985-DUP3) Source ID: BB01943-01									
Nitrate-Nitrite, as N					0.208	10	03/16/2022	JAL	
Duplicate (B220985-DUP4) Source ID: LS01071-02									
Nitrate-Nitrite, as N					NR	10	03/16/2022	JAL	
Matrix Spike (B220985-MS1) Source ID: AC00196-01									
Nitrate-Nitrite, as N			94.7	90-110			03/16/2022	JAL	
Matrix Spike (B220985-MS2) Source ID: BB01903-01									
Nitrate-Nitrite, as N			95.8	90-110			03/16/2022	JAL	
Matrix Spike (B220985-MS3) Source ID: BB01943-01									
Nitrate-Nitrite, as N			96.6	90-110			03/16/2022	JAL	
Matrix Spike (B220985-MS4) Source ID: LS01071-02									
Nitrate-Nitrite, as N			99.0	90-110			03/16/2022	JAL	
Matrix Spike Dup (B220985-MSD1) Source ID: AC00196-01									
Nitrate-Nitrite, as N			95.6	90-110	0.613	10	03/16/2022	JAL	
Matrix Spike Dup (B220985-MSD2) Source ID: BB01903-01									
Nitrate-Nitrite, as N			96.0	90-110	0.179	10	03/16/2022	JAL	
Matrix Spike Dup (B220985-MSD3) Source ID: BB01943-01									
Nitrate-Nitrite, as N			96.4	90-110	0.0907	10	03/16/2022	JAL	
Matrix Spike Dup (B220985-MSD4) Source ID: LS01071-02									
Nitrate-Nitrite, as N			98.3	90-110	0.749	10	03/16/2022	JAL	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B220989									
Blank (B220989-BLK1)									
COD	<13	mg/L					03/17/2022	MER	U
LCS (B220989-BS1)									
COD			98.3	90-110			03/17/2022	MER	
Duplicate (B220989-DUP1) Source ID: AC00197-05RE1									
COD					0.687	10	03/17/2022	MER	
Batch: B221000									
Blank (B221000-BLK1)									
Total Suspended Solids	<0.9	mg/L					03/17/2022	CJP	U
LCS (B221000-BS1)									
Total Suspended Solids			106	90-110			03/17/2022	CJP	
Duplicate (B221000-DUP1) Source ID: BB01953-02									
Total Suspended Solids					0.417	20	03/17/2022	CJP	
Batch: B221011									
Blank (B221011-BLK1)									
Total Dissolved Solids	<25	mg/L					03/19/2022	LRF	U
LCS (B221011-BS1)									
Total Dissolved Solids			94.8	90-110			03/19/2022	LRF	
Duplicate (B221011-DUP1) Source ID: AC00196-01									
Total Dissolved Solids					0.356	10	03/19/2022	LRF	
Batch: B221097									
Blank (B221097-BLK1)									
Ammonia, as N	<0.035	mg/L					03/24/2022	ALN	U
Blank (B221097-BLK2)									
Ammonia, as N	<0.035	mg/L					03/24/2022	ALN	U
LCS (B221097-BS1)									
Ammonia, as N			100	90-110			03/24/2022	ALN	
LCS (B221097-BS2)									
Ammonia, as N			105	90-110			03/24/2022	ALN	
Duplicate (B221097-DUP1) Source ID: BB01943-01									
Ammonia, as N					0.713	10	03/24/2022	ALN	
Duplicate (B221097-DUP2) Source ID: EP00127-02									
Ammonia, as N					0.178	10	03/24/2022	ALN	D
Duplicate (B221097-DUP3) Source ID: BB01952-01									
Ammonia, as N					1.43	10	03/24/2022	ALN	
Matrix Spike (B221097-MS1) Source ID: BB01943-01									
Ammonia, as N			103	80-120			03/24/2022	ALN	
Matrix Spike (B221097-MS2) Source ID: EP00127-02									
Ammonia, as N			109	80-120			03/24/2022	ALN	D

Report Date: 04/04/2022 09:09

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B221097 (Continued)									
Matrix Spike (B221097-MS3) Source ID: BB01952-01									
Ammonia, as N			109	80-120			03/24/2022	ALN	
Matrix Spike Dup (B221097-MSD1) Source ID: BB01943-01									
Ammonia, as N			105	80-120	1.53	10	03/24/2022	ALN	
Matrix Spike Dup (B221097-MSD2) Source ID: EP00127-02									
Ammonia, as N			109	80-120	0.169	10	03/24/2022	ALN	D
Matrix Spike Dup (B221097-MSD3) Source ID: BB01952-01									
Ammonia, as N			114	80-120	3.91	10	03/24/2022	ALN	
Batch: B221170									
Blank (B221170-BLK1)									
TKN	<0.1	mg/L					03/30/2022	ALN	U
Blank (B221170-BLK2)									
TKN	<0.1	mg/L					03/30/2022	ALN	U
LCS (B221170-BS1)									
TKN			104	80-120			03/30/2022	ALN	
LCS (B221170-BS2)									
TKN			103	80-120			03/30/2022	ALN	
Duplicate (B221170-DUP1) Source ID: AC00196-01									
TKN					0.502	20	03/30/2022	ALN	
Duplicate (B221170-DUP2) Source ID: BB01954-01									
TKN					13.8	20	03/30/2022	ALN	D
Duplicate (B221170-DUP3) Source ID: NP00039-01									
TKN					0.848	20	03/30/2022	ALN	
Matrix Spike (B221170-MS1) Source ID: AC00196-01									
TKN			101	80-120			03/30/2022	ALN	
Matrix Spike (B221170-MS2) Source ID: BB01954-01									
TKN			113	80-120			03/30/2022	ALN	D
Matrix Spike (B221170-MS3) Source ID: NP00039-01									
TKN			103	80-120			03/30/2022	ALN	
Matrix Spike Dup (B221170-MSD1) Source ID: AC00196-01									
TKN			103	80-120	0.792	20	03/30/2022	ALN	
Matrix Spike Dup (B221170-MSD2) Source ID: BB01954-01									
TKN			110	80-120	0.842	20	03/30/2022	ALN	D
Matrix Spike Dup (B221170-MSD3) Source ID: NP00039-01									
TKN			93.6	80-120	2.23	20	03/30/2022	ALN	

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Fax (208) 608-7319

Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Wet Chemistry									
Batch: B220981									
Blank (B220981-BLK1)									
Orthophosphate, as P	<0.002	mg/L					03/16/2022	JAL	U
LCS (B220981-BS1)									
Orthophosphate, as P			96.2	90-110			03/16/2022	JAL	
Duplicate (B220981-DUP1) Source ID: AC00197-04									
Orthophosphate, as P					0.477	10	03/16/2022	JAL	
Duplicate (B220981-DUP2) Source ID: WB01721-05									
Orthophosphate, as P					0.285	10	03/16/2022	JAL	D
Matrix Spike (B220981-MS1) Source ID: AC00197-04									
Orthophosphate, as P			104	90-110			03/16/2022	JAL	
Matrix Spike (B220981-MS2) Source ID: WB01721-05									
Orthophosphate, as P			102	90-110			03/16/2022	JAL	D
Matrix Spike Dup (B220981-MSD1) Source ID: AC00197-04									
Orthophosphate, as P			100	90-110	1.10	10	03/16/2022	JAL	
Matrix Spike Dup (B220981-MSD2) Source ID: WB01721-05									
Orthophosphate, as P			102	90-110	0.231	10	03/16/2022	JAL	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B221019									
Blank (B221019-BLK1)									
Calcium	<0.046	mg/L					03/24/2022	AMO	U
Magnesium	<50	ug/L					03/24/2022	AMO	U
Phosphorus as P	<0.006	mg/L					03/24/2022	AMO	U
LCS (B221019-BS1)									
Calcium			100	85-115			03/24/2022	AMO	
Magnesium			102	85-115			03/24/2022	AMO	
Phosphorus as P			108	85-115			03/24/2022	AMO	
Duplicate (B221019-DUP1) Source ID: AC00197-04									
Calcium					2.72	20	03/24/2022	AMO	
Magnesium					3.19	20	03/24/2022	AMO	
Phosphorus as P					1.09	20	03/24/2022	AMO	
Duplicate (B221019-DUP2) Source ID: ME00166-06									
Calcium					1.19	20	03/24/2022	AMO	
Magnesium					0.635	20	03/24/2022	AMO	
Phosphorus as P					1.71	20	03/24/2022	AMO	
Matrix Spike (B221019-MS1) Source ID: AC00197-04									
Calcium			96.0	70-130			03/24/2022	AMO	
Magnesium			98.6	70-130			03/24/2022	AMO	
Phosphorus as P			106	70-130			03/24/2022	AMO	
Matrix Spike (B221019-MS2) Source ID: ME00166-06									
Calcium			95.1	70-130			03/24/2022	AMO	
Magnesium			100	70-130			03/24/2022	AMO	
Phosphorus as P			113	70-130			03/24/2022	AMO	
Matrix Spike Dup (B221019-MSD1) Source ID: AC00197-04									
Calcium			93.8	70-130	1.21	20	03/24/2022	AMO	
Magnesium			96.8	70-130	1.25	20	03/24/2022	AMO	
Phosphorus as P			109	70-130	2.19	20	03/24/2022	AMO	
Matrix Spike Dup (B221019-MSD2) Source ID: ME00166-06									
Calcium			95.7	70-130	0.269	20	03/24/2022	AMO	
Magnesium			100	70-130	0.175	20	03/24/2022	AMO	
Phosphorus as P			112	70-130	1.39	20	03/24/2022	AMO	

Report Date: 04/04/2022 09:09

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B221038									
Blank (B221038-BLK1)									
Arsenic	<0.040	ug/L					03/23/2022	DMW	U
Cadmium	<0.025	ug/L					03/23/2022	DMW	U
Lead	<0.050	ug/L					03/23/2022	DMW	U
LCS (B221038-BS1)									
Arsenic			103	85-115			03/23/2022	DMW	
Cadmium			103	85-115			03/23/2022	DMW	
Lead			105	85-115			03/23/2022	DMW	
Duplicate (B221038-DUP1) Source ID: AC00196-01									
Arsenic					2.59	20	03/23/2022	DMW	
Cadmium					4.43	20	03/23/2022	DMW	
Lead					1.43	20	03/23/2022	DMW	
Matrix Spike (B221038-MS1) Source ID: AC00196-01									
Arsenic			104	70-130			03/23/2022	DMW	
Cadmium			102	70-130			03/23/2022	DMW	
Lead			96.8	70-130			03/23/2022	DMW	
Matrix Spike Dup (B221038-MSD1) Source ID: AC00196-01									
Arsenic			102	70-130	1.38	20	03/23/2022	DMW	
Cadmium			103	70-130	0.784	20	03/23/2022	DMW	
Lead			95.7	70-130	0.737	20	03/23/2022	DMW	
Batch: B221180									
Blank (B221180-BLK1)									
Mercury	<0.01	ug/L					03/31/2022	SAS	U
LCS (B221180-BS1)									
Mercury			104	85-115			03/31/2022	SAS	
Duplicate (B221180-DUP1) Source ID: WR00020-03									
Mercury					NR	20	03/31/2022	SAS	U
Duplicate (B221180-DUP2) Source ID: AC00197-03									
Mercury					29.0	20	03/31/2022	SAS	QC-02
Matrix Spike (B221180-MS1) Source ID: WR00020-03									
Mercury			95.3	70-130			03/31/2022	SAS	
Matrix Spike (B221180-MS2) Source ID: AC00197-03									
Mercury			94.4	70-130			03/31/2022	SAS	
Matrix Spike Dup (B221180-MSD1) Source ID: WR00020-03									
Mercury			92.9	70-130	2.32	20	03/31/2022	SAS	
Matrix Spike Dup (B221180-MSD2) Source ID: AC00197-03									
Mercury			99.3	70-130	3.88	20	03/31/2022	SAS	

Report Date: 04/04/2022 09:09

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B221012									
Blank (B221012-BLK1)									
Cadmium	<0.025	ug/L					03/18/2022	DMW	U
Copper	<0.15	ug/L					03/18/2022	DMW	U
Lead	<0.050	ug/L					03/18/2022	DMW	U
Zinc	<0.78	ug/L					03/18/2022	DMW	U
LCS (B221012-BS1)									
Cadmium			100	85-115			03/18/2022	DMW	
Copper			101	85-115			03/18/2022	DMW	
Lead			100	85-115			03/18/2022	DMW	
Zinc			98.9	85-115			03/18/2022	DMW	
Duplicate (B221012-DUP1) Source ID: AC00196-01									
Cadmium					NR	10	03/18/2022	DMW	U
Copper					0.0170	10	03/18/2022	DMW	
Lead					0.103	10	03/18/2022	DMW	
Zinc					0.0124	10	03/18/2022	DMW	
Matrix Spike (B221012-MS1) Source ID: AC00196-01									
Cadmium			97.6	70-130			03/18/2022	DMW	
Copper			97.3	70-130			03/18/2022	DMW	
Lead			95.3	70-130			03/18/2022	DMW	
Zinc			103	70-130			03/18/2022	DMW	
Matrix Spike Dup (B221012-MSD1) Source ID: AC00196-01									
Cadmium			96.4	70-130	1.28	10	03/18/2022	DMW	
Copper			96.1	70-130	0.905	10	03/18/2022	DMW	
Lead			94.3	70-130	1.02	10	03/18/2022	DMW	
Zinc			104	70-130	0.457	10	03/18/2022	DMW	

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Notes and Definitions

Item	Definition
D	Data reported from a dilution
QC-02	The RPD is greater than the method acceptance criteria. At least one of the values used to calculate the RPD, is less than or equal to the PQL.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK
Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle
Shannon Krooz

Lab# AC00197	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
-01	3/15/22	3/15/22	0929	1800	220315-03-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-02			1037	1821	220315-11-WC		X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-03			0917	1803	220315-12-WC		X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-04			0915	1437	220315-14-WC		X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-05			1007	1723	220315-206-WC		X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
[signature]	3/15/22 2127	[signature] 3-16-22 0650	* 3 bottles in Wonder Woman / 2 bottles in Superman

C-124

coc_wql-pi

AC00197

WY22

AC00197

Attachment D: Field Forms

Set Up/ Shut Down Form – HACH

STATION: Lucky

SET UP

Personnel: TLL, SMK

Date/Time On-Site: 3/14/22 @ 14:08

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
14 13	-0.01	0.00	0.00	13.0
	Downloaded to:			
	Velocity Cutoff:	>1.5 in deadband=1 in		
	Trigger Volume:	5004 gal		

- ☑ Download flowmeter, if program is running
- ☑ Install batteries on flowmeter and sampler
- ☐ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Verify all cable and tubing connections
- ☑ Check date and time on flowmeter and sampler
- ☑ Set flowmeter program and sampler program parameters
- ☑ Set logging interval to 1 minute
- ☑ Start flowmeter program and sampler program
- ☑ Verify running

Comments:

SHUT DOWN

Personnel: TL

Date/Time On-Site: 03.18.22 / 1021

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1023	0.68	0	0		12.4
Downloaded to:		USB Ø3			

If flow monitoring is complete:
- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:
- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Lucky **Bottle** 1 **of** 1
Personnel: TLL, SMK **Date/Time On-Site:** 20:18 3/15/22

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220315 – 03 -WC
Approx Sample Volume (mL):	9500
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Dark Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	3/15 09:29	Success	13	14:38 3/15	
2	09:41		14	16:34	
3	09 52		15	16:47	
4	10:03		16	1703	
5	10'15		17	1800	
6	10:27		18		
7	10:40		19		
8	1054		20		
9	11:10		21		
10	11:36		22		
11	13:38		23		
12	14:03		24		

Comments:

If sampling is complete:	**If continuing sampling (sample bottle change-out):**
☑ Power off sampler	☐ Keep flowmeter running
☑ Verify flowmeter is running	☐ Install new 15L bottle, add ice
☑ Add ice to sample transport cooler	☐ Restart program from beginning
☑ Complete COC form; arrange transport to lab	**Date/Time Restarted:** ________
	☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: Lucky

Personnel: SMK ZL **Date/Time On-Site:** 3/15/22 9:44

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
10:02	6.68	44631	1.22	13.0		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220315-03-WG	3/15/22	9:54	☑
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP08	9:59	12.21	9.04	5.87	83.3

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Revised 210924 TL

Set Up/ Shut Down Form – ISCO

STATION: Whitewater

SET UP

Personnel: SMK, TLL

Date/Time On-Site: 3/14/22 13:47

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1049	-0.00	0.00	0.00	N/A
13:50	0.00	0	0	N/A

Downloaded to:	
Enable Condition:	level > 0.5", hysteresis = 0.4"
Flow Pulse Interval:	1600 cf

On-Site
- ☑ Replace flowmeter battery, install sampler battery
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Set Sampler program parameters
- ☑ Check date/time on Sampler
- ☑ Verify all cable and tubing connections
- ☑ Verify Sampler Program is running

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote; Date/time 3/14 1044
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments: Changed flowmeter time for time change

SHUT DOWN

Personnel: TL

Date/Time On-Site: 03.18.22 / 1011

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1011	-0.01	0	0	N/A

Downloaded to:	—

On-Site
- ~~☐ Replace~~ flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote; Date/time 3/18 1113
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: White Water **Bottle** 1 **of** 1
Personnel: TLL, SMK **Date/Time On-Site:** 20:03 3/15/22

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220315 - 11 -WC
Approx Sample Volume (mL):	10,250
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	3/15 10:37	Success	13	17:11	
2	10:49		14	17:22	
3	11:01		15	17:33	
4	11:14		16	17:50	
5	11:29		17	18:21	
6	11:49		18		
7	12:20		19		
8	13:50		20		
9	14:27		21		
10	14:56		22		
11	15:27		23		
12	16:49		24		

Comments:

If sampling is complete:	**If continuing sampling (sample bottle change-out):**
☒ Power off sampler	☐ Keep flowmeter running
☒ Verify flowmeter is running	☐ Install new 15L bottle; add ice
☒ Add ice to sample transport cooler	☐ Restart program from beginning
☑ Complete COC form; arrange transport to lab	**Date/Time Restarted:** ______
	☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: Whitewater

Personnel: SMK ZL **Date/Time On-Site:** 3/15/22 10:26

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
10:26	5.03	1.73	1.88		10:20 3/15	0.18

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	230315-11 -WG	3/15/22	10:31	☑
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP08	10:34	9.70	8.68	6.76	671.8

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Set Up/ Shut Down Form – HACH

STATION: Main

SET UP

Personnel: TLL SMK

Date/Time On-Site: 3/14/22 12:45

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1247	1.37	0	0	12.9

Downloaded to:	
Velocity Cutoff:	level > 3.5" hysteresis = 1.45"
Trigger Volume:	5894 gal

- ~~☐ Download flowmeter, if program is running~~
- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments: changed time

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 03.18.22 / 0928

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
0929	1.19	0	0		12.0

Downloaded to:	VSB Ø5

If flow monitoring is complete:
- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:
- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Main
Personnel: TLL, SMK

Bottle 1 of 1
Date/Time On-Site: 3/15/22 19:29

☑ Halt Sampler program
☑ Put lid on sample bottle; label sample bottle

Sample ID:	220315 - 12 -WC
Approx Sample Volume (mL):	11,000mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Gray
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	3/15 09:17	Success	13	3/15 16:31	
2	09:32		14	16:39	
3	09:44		15	16:46	
4	09:57		16	16:56	
5	10:11		17	17:14	
6	10:26		18	18:03	
7	10:42		19		
8	10:59		20		
9	11:25		21		
10	13:29		22		
11	13:54		23		
12	14:31		24		

Comments:

If sampling is complete:
- ☒ Power off sampler
- ☑ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☑ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: ______________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: Main

Personnel: TLL + HRJ **Date/Time On-Site:** 3/15/22, 9:31 am

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
0941	5.98	508 gpm	1.62	12.7		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220315-12 -WG	3/15/22	0935	☒
Field Duplicate *E.Coli*	220315-12 -101	3/15/22	0936	☒
Field Blank *E.Coli*	220315-12 -001	3/15/22	0940	☒

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	0943	9.3	10.57	6.11	511.8

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	2

Comments:

Set Up/ Shut Down Form – ISCO

STATION: Americana

SET UP

Personnel: TLL, SMK

Date/Time On-Site: 3/14/22 13:07

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1043	5.44	0.24	0.306	11.59
13 09	5.57	0.38	0.473	12.28

Downloaded to:	
Enable Condition:	level > 6.5" hysteresis = 1.0"
Flow Pulse Interval:	5112 cf

On-Site
- ☑ Replace flowmeter battery, install sampler battery
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Set Sampler program parameters
- ☑ Check date/time on Sampler
- ☑ Verify all cable and tubing connections
- ☑ Verify Sampler Program is running

Flowlink (Refer to Flowlink Instructions, if needed)
- ☑ Direct or Remote; Date/time 3/14 1036
- ☒ Retrieve data and review recent flow history
- ☑ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments: * Updated clock for daylight savings

SHUT DOWN

Personnel: TL

Date/Time On-Site: 03.18.22 / 0944

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)

Downloaded to:	

On-Site
- ☒ Replace flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote; Date/time 3/18 1117
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Americana
Personnel: TLL SMK

Bottle 1 **of** 1
Date/Time On-Site: 19 38 3/15/22

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220315 - 14 -WC
Approx Sample Volume (mL):	14,000 mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	3/15 09:15	Success	13	3/15 11:13	
2	09:31		14	11:25	
3	09:43		15	11:39	
4	09:53		16	11:57	
5	10:02		17	12:20	
6	10:11		18	12:49	
7	10:20		19	13:25	
8	10:30		20	13:43	
9	10:37		21	13:57	
10	10:46		22	14:09	
11	10:55		23	14:22	
12	11:04		24	14:37	

Comments:

If sampling is complete:
- ☒ Power off sampler
- ☒ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☒ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: ______________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5”	400 mL	**3.0”**	3500 mL	**5.5”**	7250 mL	**8.0”**	11000 mL	**10.5”**	14750 mL
1.0”	800 mL	**3.5”**	4250 mL	**6.0”**	8000 mL	**8.5”**	11750 mL	**11.0”**	15500 mL
1.5”	1400 mL	**4.0”**	5000 mL	**6.5”**	8750 mL	**9.0”**	12500 mL	**11.5”**	16250 mL
2.0”	2000 mL	**4.5”**	5750 mL	**7.0”**	9500 mL	**9.5”**	13250 mL	**After 12”**	1” = 1500 mL
2.5”	2750 mL	**5.0”**	6500 mL	**7.5”**	10250 mL	**10.0”**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: Americana

Personnel: TLL & HRJ **Date/Time On-Site:** 3/15/22, 9:48

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
0949	12.22	7.89	3.119	12.06		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220315-14 -WG	3/15/22	0952	☒
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	0955	10.17	10.55	6.32	737.0

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	3

Comments:

Set Up/ Shut Down Form – HACH

STATION: AS-6

SET UP

Personnel: TLL, SMK

Date/Time On-Site: 3/14/22 13:25

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
13:28	0	0	0	12.6

Downloaded to:	
Velocity Cutoff:	
Trigger Volume:	382 cf

- ☐ Download flowmeter, if program is running
- ☑ Install batteries on flowmeter and sampler
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Verify all cable and tubing connections
- ☑ Check date and time on flowmeter and sampler
- ☑ Set flowmeter program and sampler program parameters
- ☑ Set logging interval to 1 minute
- ☑ Start flowmeter program and sampler program
- ☑ Verify running

Comments:

Changed time

SHUT DOWN

Personnel: TL

Date/Time On-Site: 03.18.22 / 0953

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
0954	0	0	0	10415	12.1
Downloaded to:	R7				

If flow monitoring is complete:	If continuing to monitor flow:
☒ Halt program on flowmeter	☐ Replace flowmeter battery
☒ Download flowmeter data	☐ Reset logging interval to 15 minutes
☒ Remove flowmeter battery	☐ Change velocity cutoff to 0.02 fps
	☐ Start program
	☐ Verify running

Comments:

Composite Sample Collection

STATION: AS-6 **Bottle** 1 **of** 1
Personnel: TLL, SMK **Date/Time On-Site:** 19:50 3/15/22

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220315-206 -WC
Approx Sample Volume (mL):	14,000
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Dark brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	3/15 10:07	Success	13	3/15 13:48	
2	10:19		14	14:01	
3	10:28		15	14:12	
4	10:37		16	14:24	
5	10:47		17	14:39	
6	10:57		18	15:04	
7	11:07		19	16:45	
8	11:18		20	16:54	
9	11:30		21	17:01	
10	11:43		22	17:07	
11	12:06		23	17:14	
12	13:28		24	17:23	

Comments:

If sampling is complete:

- ☑ Power off sampler
- ☒ Verify flowmeter is running
- ☑ Add ice to sample transport cooler
- ☑ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: ______________

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: AS-6

Personnel: TLL + HRJ **Date/Time On-Site:** 3/15/22 1005

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1005	4.003	0.45	1.41	12.3		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220315-206-WG	3/15/22	1009	☒
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	1011	8.58	9.03	6.48	756.2

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	1

Comments:

Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 208-389-7700

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for April 4, 2022

Date: June 2, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the April 4, 2022 storm event.

Section 2: Project Status

Table 1-1 is a summary of the sample types collected to date for WY 2022 Phase I Stormwater Outfall Monitoring.

Table 1-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
November 9, 2021	C	C	-	-	-
March 15, 2022	G, C	G, C	G, C	G, C	G, C
April 4, 2022	-	G	-	G	-
Collected:	2G, 2C	3G, 2C	2G, 2C	3G, 2C	2G, 2C

Notes:
C = composite sample.
G = grab sample.

After the April 4, 2022 storm event, ACHD still needs to collected one grab sample from Lucky, Main, and AS_6 monitoring sites and one composite sample from all Phase I monitoring sites.

Section 3: Storm Event Summary

The April 4, 2022 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A detailed summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form that describes the forecast and summarizes the decision-making process from April 4, 2022 is included in Attachment A for reference.

Monday, April 4, 2022

- The National Weather Service issued a forecast for widespread rain in the Boise area early in the morning of April 4, 2022. No chance of rainshadowing was expected. The chance of precipitation was 90% percent, with a precipitation total of 0.11 inch forecasted.
- A light rain started around 0730 and continued for two hours. Heavy rain began at 0930 and continued until 1400.
- Precipitation totals ranged between 0.21 and 0.28 inch at local rain gauges.

Flow measurements and precipitation data are included in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Since only grab samples were taken during the storm event, no setup was necessary. Sampling information is included in Table 1. The field forms completed during sampling can be found in Attachment D.

Grab Samples

One, two-member team mobilized to collect stormwater runoff grab samples during the morning of April 4, 2022. Grab samples were submitted to the West Boise Water Quality Lab (WQL) at 1205 on April 4th. Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment C.

Section 4: Quality Assurance/Quality Control

A summary of quality control (QC) samples collected during the April 4, 2022 storm event is presented below in Table 3-1. A field blank and a field duplicate were collected from the Whitewater monitoring station. Analytical results for these samples are included in Table 3.

Table 3-1. QC Samples			
Sample ID	Sample Type	Parent Sample	Conclusions
220404-11-001	Field Blank	Whitewater Grab	No E. coli detection was reported in the field blank.
220404-11-101	Field Duplicate	Whitewater Grab	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. Acceptance and performance criteria for analytical and non-analytical data were met for this storm event.

Data Tables

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	NO	YES	NO	YES	NO
Composite samples collected and submitted?	NO	NO	NO	NO	NO
Trigger volume	-	-	-	-	-
Velocity cutoff (fps)	-	-	-	-	-
Sampler enable condition (in)	-	-	-	-	-
Runoff start time	-	09:30	-	08:45	-
Grab sample collection time	-	11:28	-	11:13	-
Composite sample stop time	-	-	-	-	-
Runoff stop time	-	21:15	-	20:30	-
Volume of discharge sampled (ft^3)	-	-	-	-	-
Total runoff volume (ft^3)	-	16,820	-	149,320	-
Percent of storm flow sampled (%)	-	-	-	-	-
Composite sample duration (hrs)	-	-	-	-	-
Storm Precipitation (in)	0.26	0.25	0.21	0.21/0.28	0.21/0.28
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	-	-	-	-	-
Number of composite bottles filled	-	-	-	-	-
Composite sample volume (Approx.; ml)	-	-	-	-	-

Notes:

– = no data.

Table 2. Field and Analytical Data Summary - Wet Samples							
Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				Analytical Parameters
			Dissolved Oxygen	pH	Conductivity	Temperature	E. coli
			mg/L	S.U.	uS/cm	C	mpn/100 mL
Whitewater	4/4/2022	220404-11-WG	9.19	7.43	205.44	10.59	547.5
Americana	4/4/2022	220404-14-WG	10.05	7.25	349.14	11.55	579.4

Table 3. QC Sample Summary				
Date	Parent Sample	Sample ID	Type	E. coli mpn/100 mL
4/4/2022	220404-11-WG	220404-11-001	Field Blank	<1.0
4/4/2022	220404-11-WG	220404-11-101	Field Duplicate	686.7
Calculated parent/duplicate RPD				2%
Allowable RPD				40%

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 4 Apr 2022 **Time:** 7:47 AM **Initials:** TL

Sampling Event Determination

Is there a targeted sampling event expected during the next 36 hours?
(Or, if it is Friday, is a targeted event expected before 5:00 PM on Monday?)

◉ Yes ○ Maybe ○ No

If YES or MAYBE, then call BC. Include discussion of reasons for "Maybe" below.

☑ Date and Time of Expected Event — 4/4/22 7am - 12pm
☑ Expected Amount of Precipitation
☑ Percent Chance of Precipitation — 90%, 0.11"

Targeted Stations & Samples

Americana	Main	Lucky	AS-6	Whitewater
☑ Grab	☐ Grab	☐ Grab	☐ Grab	☑ Grab
☐ Composite	☐ Composite	☐ Composite	☐ Composite	☐ Composite

Phase II
State
☑ Grab
☐ Composite

Type of Forecasted Precipitation

☐ Light Rain ☐ Thunder Showers ☐ Other (Describe below)
☑ Rain ☐ Snow Melt
☐ Scattered Showers ☐ Rain on Snow

Reasons for Not Targeting a Forecasted Storm or Targeting Selected Stations/Samples

☐ Equipment Concerns (Describe below) ☐ Holiday ☐ Other (Describe below)

☐ Waiting on Antecedent Dry Period. Expires:

Comments

Past 72 hr precip: 0.00"
NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 3:27 am MDT Apr 4, 2022

Wind Advisory

Today: Showers, mainly before noon. High near 60. Light east wind becoming east southeast 5 to 10 mph in the morning. Chance of precipitation is 90%. New precipitation amounts between a tenth and quarter of an inch possible.
Tonight: A slight chance of rain showers before midnight, then a slight chance of rain and snow showers. Mostly cloudy, with a low around 33. Breezy, with a northwest wind 17 to 22 mph decreasing to 11 to 16 mph after midnight. Winds could gust as high as 36 mph. Chance of precipitation is 20%.
Tuesday: Partly sunny, with a high near 49. Breezy, with a west northwest wind 9 to 14 mph increasing to 15 to 20 mph in the afternoon.
Tuesday Night: Mostly clear, with a low around 26. Northwest wind 11 to 16 mph becoming light north northwest after midnight. Winds could gust as high as 25 mph.
Wednesday: Sunny, with a high near 56. Calm wind becoming west northwest around 6 mph in the afternoon.
Wednesday Night: Mostly clear, with a low around 31.
Thursday: Sunny, with a high near 71.
Thursday Night: Mostly clear, with a low around 42.
Friday: Mostly sunny, with a high near 79.
Friday Night: Partly cloudy, with a low around 43.
Saturday: Mostly sunny, with a high near 64.
Saturday Night: Partly cloudy, with a low around 34.
Sunday: Mostly sunny, with a high near 51.

Area Forecast Discussion
National Weather Service Boise ID
415 AM MDT Mon Apr 4 2022

.SHORT TERM...Today through Wednesday night...Winds and precipitation are advancing eastward this morning as a strong Pacific storm moves onshore. On the large scale, little change in the forecast as the axis of a strong upper jet settles over the region today, acting as a conduit to transport deep Pacific moisture into the interior NW. Mountains are still on track to see a widespread 0.4-0.8 inches of liquid with higher mountain peaks approaching an inch. This will stay a wet snow above 5500-6000 feet, so snow totals could approach a foot at higher elevations. Mountain valleys will see snow this morning, mixing with or changing to rain during the afternoon. The current Winter Weather Advisory remains in place, mostly for combination of gusty winds and snow at higher elevations this afternoon and evening. The wet snow and gusty winds (up to 55 mph off valley floors) could lead to tree damage and possible power outages as well.

At lower elevations the best chance of rain is through this morning, though many sites will remain dry as this is mostly an orographic precipitation event. Winds remain on track to be strongest across southeast Oregon, with Harney county and higher terrain of Malheur and Baker county taking the brunt of the wind gusts. Winds ramp up mid-morning and continue into early evening. Expect to see blowing dust with some reduction in visibility, especially downstream of dry lake beds like Harney Lake and the Alvord Desert. In southwest Idaho winds will increase across higher terrain by mid-morning while lagging some in the Snake Plain. A frontal passage and late-day mixing will increase the winds in the Treasure and western Magic valleys in the late afternoon and evening. Winds will remain gusty across s-central Idaho Monday night while showers linger in the mountains.

Storm Event QA/QC Checklist

STORM DATE: 220404				Circle one: Phase I Phase II
A. Event and Data Completeness	**Yes**	**No**	**N/A**	**Notes**
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed	X			
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member			X	
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Storm/Sample Value	Program Criteria	Met	Qualify	Reject	Notes
1. Precipitation (inches)	0.24	> 0.10 in.	X			
2. Antecedent dry period (hours)	480	< 0.11 in. in 72 hrs	X			
3. Days since last sampling event	20 days	>= 30 days	X			
4. Sampled amount as % of total run-off	N/A	>= 75%	—	—	—	no comps for this event
5. Ecoli sample holding time	2 hrs	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X			
6. Filtering of samples for dissolved parameter analysis	N/A	<= 24 hrs: no qualifier > 24 hrs.: reject	—	—	—	

D. Notes:

Reviewed by Tanan [illegible] Date 05.03.22

Approved by Monica L. Lowe Date 5/17/22

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth =	0.11	in
Square Feet per Acre =	43560	ft^2/ac
Inches per Foot=	12	in/ft
Aliquots per Sample=	17	

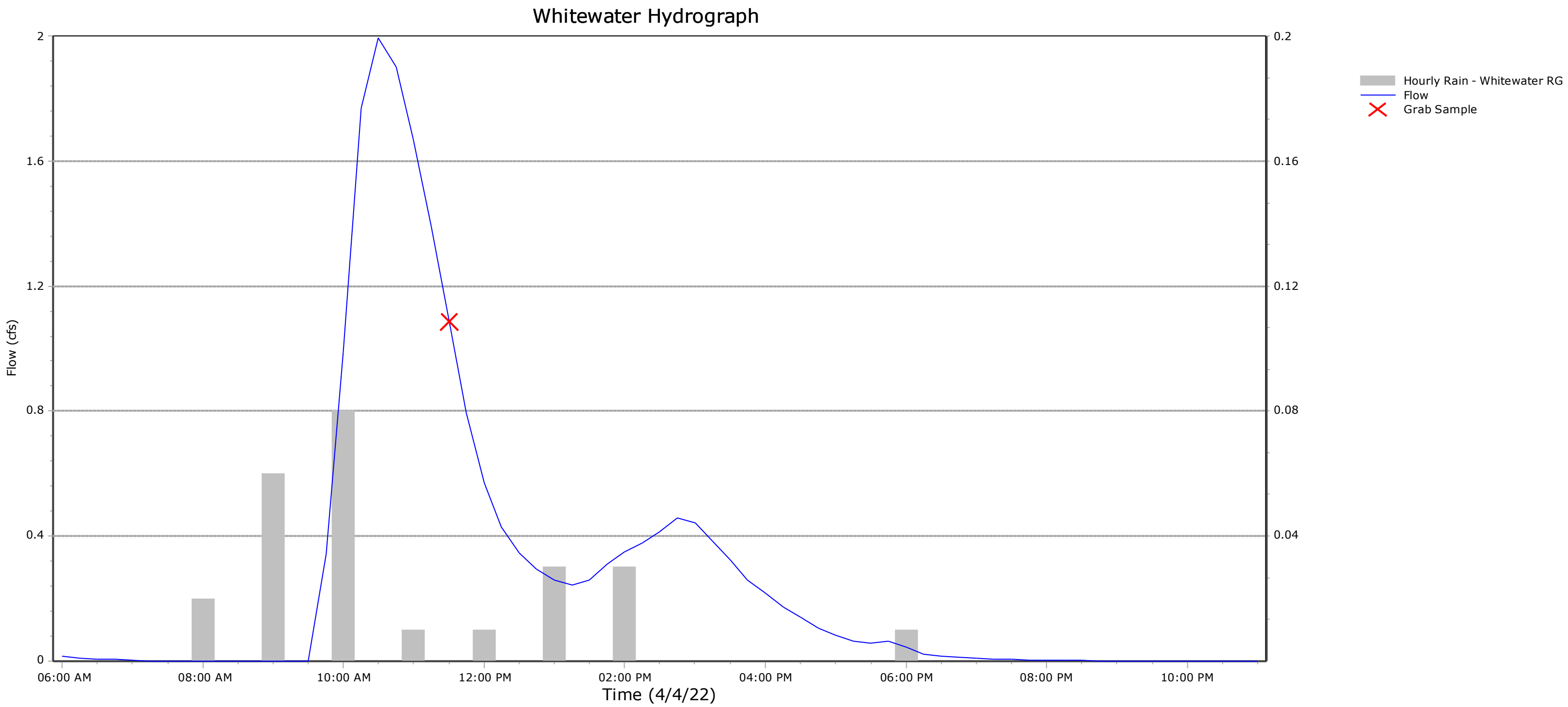
Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

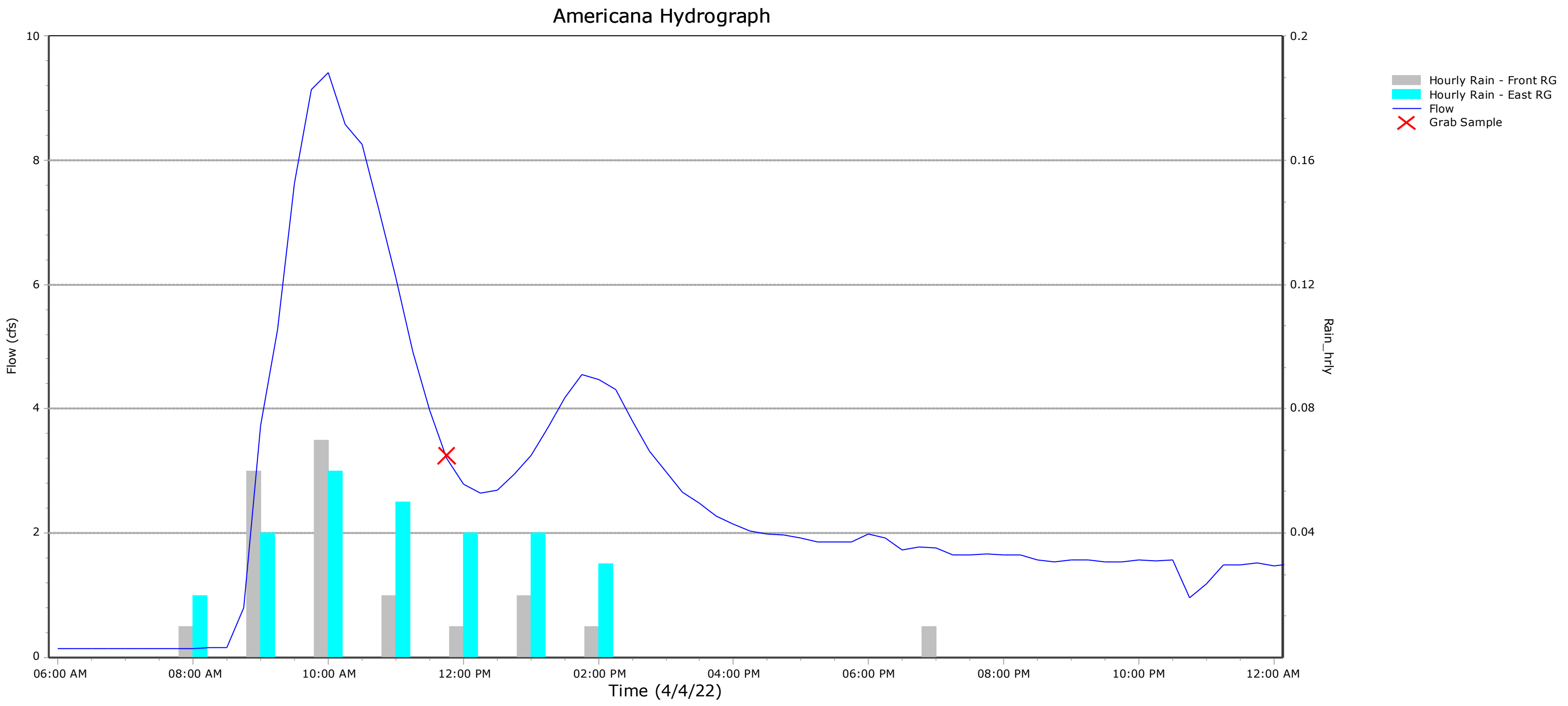
Site	Area (ac)	Using RC Based on Land Use			Using Manually-entered RC		
		RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)	RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.46	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.76	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7760.00	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.80	**2960**
#206 AS_6	204	0.257	20935	**1231**	0.046	3747.03	**221**
#18 State	34	0.419	5688	**335**	0.144	1954.97	**122**
Theoretical	80	0.200	6389		0.000		

NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]
all values taken from historically corrected runoff coefficents
total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)
Measured runoff
RC = measured runoff / total runoff

Attachment B: Storm Event Hydrographs


Whitewater Hydrograph
Flow (cfs)
2
1.6
1.2
0.8
0.4
0
0.2
0.16
0.12
0.08
0.04
06:00 AM
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
10:00 PM
Time (4/4/22)
Hourly Rain - Whitewater RG
Flow
Grab Sample


Americana Hydrograph
Flow (cfs)
Rain_hrly
Time (4/4/22)
10
8
6
4
2
0
0.2
0.16
0.12
0.08
0.04
06:00 AM
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
06:00 PM
08:00 PM
10:00 PM
12:00 AM
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Grab Sample

Attachment C: Storm Event Analytical Reports

Report Date: 04/12/2022 11:25

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00199-01	ACST1B	220404-11-WG	Water		04/04/2022	04/04/2022
AC00199-02	ACST1B	220404-11-101	Water		04/04/2022	04/04/2022
AC00199-03	ACST1B	220404-11-001	Water		04/04/2022	04/04/2022
AC00199-04	ACST1B	220404-14-WG	Water		04/04/2022	04/04/2022

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Report Date: 04/12/2022 11:25

Analysis Report

Location:	ACST1B	Location Description:	220404-11-WG
Date/Time Collected:	04/04/2022 11:28		
Lab Number:	AC00199-01	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B221245	547.5	MPN/100 mL	1.0	1.0	IDEXX - Colilert	04/04/22 13:15	4/5/22 13:51	ALG	
Wet Chemistry										
Chlorine Screen	B221255	Absent				SM 4500-CL G-2000 mod	04/04/22	4/4/22 12:43	CJP	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220404-11-101
Date/Time Collected:	04/04/2022 12:00		
Lab Number:	AC00199-02	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B221245	686.7	MPN/100 mL	1.0	1.0	IDEXX - Colilert	04/04/22 13:15	4/5/22 13:51	ALG	
Wet Chemistry										
Chlorine Screen	B221255	Absent				SM 4500-CL G-2000 mod	04/04/22	4/4/22 12:43	CJP	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 04/12/2022 11:25

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220404-11-001
Date/Time Collected:	04/04/2022 12:00		
Lab Number:	AC00199-03	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B221245	<1.0	MPN/100 mL	1.0	1.0	IDEXX - Colilert	04/04/22 13:15	4/5/22 13:51	ALG	U
Wet Chemistry										
Chlorine Screen	B221255	Absent				SM 4500-CL G-2000 mod	04/04/22	4/4/22 12:43	CJP	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 04/12/2022 11:25

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220404-14-WG
Date/Time Collected:	04/04/2022 11:33		
Lab Number:	AC00199-04	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B221245	579.4	MPN/100 mL	1.0	1.0	IDEXX - Colilert	04/04/22 13:15	4/5/22 13:51	ALG	
Wet Chemistry										
Chlorine Screen	B221255	Absent				SM 4500-CL G-2000 mod	04/04/22	4/4/22 12:43	CJP	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 04/12/2022 11:25

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B221245									
Blank (B221245-BLK1)									
E. Coli	Absent						04/05/2022	ALG	
LCS (B221245-BS1)									
E. Coli				Present			04/05/2022	ALG	
Duplicate (B221245-DUP1)	Source ID: LS01096-10								
E. Coli					Pass	128	04/05/2022	ALG	
Duplicate (B221245-DUP2)	Source ID: PK00079-01								
E. Coli					ND	128	04/05/2022	ALG	U

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Notes and Definitions

Item	Definition
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

C-163

Ada County Highway District

Attn: Monica Lowe
775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tamara Lightle
Melissa Jannusch

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
200199 01	4/4/22		1128		220404-11-WG	TL	X	X												X					1
-02			1200		220404-11-101															X					1
-03			1200		220404-11-001															X					1
-04			1133		220404-14-WG															X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
[signature]	220404 / 1205	[signature]	04/04/22 1207
R	04/04/22		

coc_wql-pi

AC00199

WY22

AC00199

Attachment D: Field Forms

Grab Sample Data Form

STATION: Whitewater

Personnel: Tammy L. Melissa J. **Date/Time On-Site:** 4-4-2022

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
11:35	3.69	0.84	1.41	NA		0.17

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220404- 11 - -WG	04-04-2022	1128	☑
Field Duplicate *E.Coli*	220404 - 11 -101	04-04-2022	1129	☑
Field Blank *E.Coli*	220404 - 11 -001	04-04-2022	1133	☑

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
HP09	~~1133~~ 1134	10.59	9.19	7.43	205.44

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Revised 210924 TL

Grab Sample Data Form

STATION: Americana

Personnel: Tammy L & Melissa S **Date/Time On-Site:** 04-04-2022 1108

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
11:10	9.77	4.79	2.626	11.7		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220404-14 -WG	04-04-2022	11:13	☑
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP09	1116	11.55	10.05	7.25	349.14

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 208-389-7700

Technical Memorandum

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for May 27, 2022

Date: August 1, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the May 27, 2022 storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2022 Phase I Stormwater Outfall Monitoring.

Table 2-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
November 9, 2021	C	C	-	-	-
March 15, 2022	G, C	G, C	G, C	G, C	G, C
April 4, 2022	-	G	-	G	-
May 27, 2022	G[1]	-	G[1], C	C	G[1], C[2]
Collected:	2G, 2C	3G, 2C	2G, 3C	3G, 3C	2G, 2C

Notes:

C = composite sample.

G = grab sample.

[1] E. Coli sample qualified due to exceeded hold time

[2] No data on dissolved parameters or NO_x due to low composite sample volume

After the May 27, 2022 storm event, ACHD still needs to collect one grab sample from Lucky, Main, and AS_6 and one composite sample from Lucky, Whitewater, and AS_6.

Section 3: Storm Event Summary

The May 27, 2022 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A detailed summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form that describes the forecast and summarizes the decision-making process from May 27, 2022 is included in Attachment A for reference.

Friday, May 27, 2022

- The morning of Friday, May 27, 2022, the National Weather Service issued a forecast for convective thunderstorms in the Boise area Friday night. No chance of rainshadowing was expected. The chance of precipitation was 70 percent, with precipitation amounts between a tenth and a quarter of an inch forecasted.
- Setup was accomplished Friday morning. An expected precipitation depth of 0.11 inch was used to set trigger volumes at monitoring stations.
- Rain started later Friday evening around 6:30 pm and continued until 7:30 pm. Another wave of rain started around 11:00 pm and continued until 12:30 am.
- Precipitation totals ranged between 0.10 in and 0.15 inch at local rain gauges.

Flow measurements and precipitation data are included in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

All Phase I monitoring stations were set up the morning on May 27, 2022, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programed into the Lucky, Whitewater, Main, and Americana flowmeters. A site-specific velocity cutoff value was programmed into the AS_6 flowmeter. Setup and sampling information is included in Table 1. The field forms completed during setup/shut down and sampling can be found in Attachment D.

Grab Samples

Two, two-member teams mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on the evening of May 27, 2022. Grab samples were submitted to the West Boise Water Quality Lab (WQL) at 2054 on May 27. Results for grab samples, including field parameter and analytical data, are detailed in Table 2. Laboratory analytical reports are included in Attachment C.

Composite Samples

Composite samples were collected at all monitoring stations. The Lucky monitoring station received marginal rainfall during the storm event (0.10 inch) which led to insufficient volume in the composite sample. The Lucky composite sample was not submitted to the lab. At the Whitewater monitoring station, the majority of the subsamples had “no liquid detect” error messages due to a clog in the sampler line. The team purged the line in an attempt to unclog the sampler tubing. The team then restarted the program, but the sampler continued to have “no liquid detect” error messages. The Whitewater composite sample was not submitted to the lab. The AS_6, Americana, and Main composite samples were submitted to the WQL on May 28 at 0956. Dissolved metals, ortho-phosphate, or NO_x concentrations were not analyzed in the AS_6 sample due to low volume. The composite volume of the Americana and Main composite samples were sufficient for all parameters. Analytical results are included in Table 2. Pollutant loading estimates for the event are included in Table 3.

Section 4: Quality Assurance/Quality Control

A summary of quality control (QC) samples collected during the May 27, 2022 storm event is presented below in Table 4-1. A field blank and a field duplicate were collected from the Main monitoring station. Analytical results for these samples are included in Table 4.

Table 4-1. Quality Control Samples

Sample ID	Sample Type	Parent Sample	Conclusions
220527-12-001	Field Blank	Main Grab	No E. coli detection was reported in the field blank.
220527-12-101	Field Duplicate	Main Grab	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. Grab samples collected during this event were qualified due to the exceeded hold time. The field parameters collect at Lucky are also qualified due to the low storm precipitation measured at the Cynthia Mann rain gauge which is the closest rain gauge to the monitoring site.

Data Tables

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	NO	YES	NO	YES
Composite samples collected and submitted?	NO	NO	YES	YES	YES
Trigger volume	2,895 gal	800 ft^3	3,411 gal	2,960 ft^3	221 ft^3
Velocity cutoff (fps)	--	--	--	--	0.02
Sampler enable condition (in)	level > 2.3	level > 1.5	level > 2.8	level > 6.2	--
Runoff start time	5/27/22 18:34	--	5/27/22 18:13	5/27/22 18:17	5/27/22 18:31
Grab sample collection time	5/27/22 19:57	--	5/27/22 19:24	--	5/27/22 19:50
Composite sample stop time	--	--	5/28/22 0:42	5/28/22 5:15	5/28/22 2:14
Runoff stop time	5/28/22 3:35	--	5/28/22 2:32	5/28/22 5:31	5/28/22 3:39
Volume of discharge sampled (ft^3)	--	--	6,664	71,747	1,557
Total runoff volume (ft^3)	2,523	--	7,075	72,613	1,824
Percent of storm flow sampled (%)	--	--	94%	99%	85%
Composite sample duration (hrs)	--	--	6.5	11.0	8.0
Storm Precipitation (in)	0.10	0.15	0.15	0.15/0.14	0.15/0.14
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	--	--	15	24	7
Number of composite bottles filled	--	--	1	1	1
Composite sample volume (Approx.; ml)	--	--	8,750	14,000	5,000

Notes:

– = no data

Table 2. Field and Analytical Data Summary - Wet Samples

			Field Parameters				Analytical Parameters																				
Monitoring Station	Sample Date	Sample ID Grab	Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	Sample ID Composite	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate, as P	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	5/27/2022	220527-03-WG	5.86 [2J]	7.42 [2J]	189.1 [2J]	20.53 [2J]	4810 [1J, 2J]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Whitewater	5/27/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Main	5/27/2022	220527-12-WG	6.02	6.92	156.7	21.82	1046 [1J]	220527-12-WC	49.9	303	45.2	121	315	128	0.65	0.215	1.33	0.636	7.04	3.7	0.031	0.25	13.7	0.29	17	0.0410	59.0
Americana	5/27/2022	--	--	--	--	--	--	220527-14-WC	84.7	224	96.4	51.8	115	225	1.06	0.568	0.97	0.863	4.71	5.9	<0.025	0.13	14.0	0.28	5.5	0.0196	47.9
AS_6	5/27/2022	2220527-206-WG	4.04	6.31	356.6	18.80	2750 [1J]	220527-206-WC	314	634	66.9	62.5	77.3	385	3.93	-- [3]	2.38	-- [3]	10.7	4.5	-- [3]	0.12	-- [3]	-- [3]	5.1	0.0260	-- [3]

Notes:

– = no data

[1J] Sample qualified due to exceeded hold time

[2J] Data qualified due to insufficient precipitation

[3] No data for dissolved parameters or NO_X due to low composite sample volume

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia	Nitrate + Nitrite (N)	TKN
Main	5/27/2022	131	0.3	0.55	0.26	2.9
Americana	5/27/2022	521	4.8	4.4	3.91	21.3
AS_6	5/27/2022	7.5	0.38	0.23	-- [1]	1.04

Notes:

– = no data

[1] No data for dissolved parameters or NO_X due to low composite sample volume

Table 4. QC Sample Summary				
Date	Parent Sample	Sample ID	Type	E. coli
5/27/2022	Main Grab	211022-12-001	Field Blank	<1.0
5/27/2022	Main Grab	211022-12-101	Field Duplicate	727
Calculated parent/duplicate RPD				4%
Allowable RPD				40%

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 5/27/2022	Time: 7:49 AM	Initials: TL
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Yes

Past 72 hr Precip	0.00”
Date and time of expected event	5/27 midnight – 5/28 noon, 5/28 6pm – 12am
Expected amount of precipitation	0.10” Friday, 0.18” saturday
Percent chance of precipitation	70% - 90%
Percent chance of >0.10” over 12 hours	24% - 60%

NWS Update

I spoke with Josh from NWS this morning. He said that tonight’s system is convective (scattered thunderstorms) and the probability of getting over 0.10” is 30% but really depends on if the thunderstorms cross over Boise. Saturday afternoon through evening is a better chance because the low is centered right on Boise and will produce more widespread rain. Totals during that time are 0.20” – 0.30”.

Targeted Station & Samples

Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☐ Grab	☒ Grab	☐ Grab	☒ Grab	☐ Grab
☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite	☐ Composite

Type of Forecasted Precipitation

☐ Light Rain ☒ Rain ☐ Rain on Snow
☒ Scattered Showers ☒ Thunder Showers ☐ Snowmelt
☐ Other:

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday
☐ Waiting on Antecedent Dry Period – Expires:
☐ Equipment Concerns:
☐ Other:

Text Forecast

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 3:04 am MDT May 27, 2022

Today: Scattered showers and thunderstorms after noon. Some of the storms could produce gusty winds. Increasing clouds, with a high near 75. Northwest wind 5 to 7 mph becoming southwest in the afternoon. Chance of precipitation is 30%.

Tonight: A chance of showers and thunderstorms, then showers likely after midnight. Some of the storms could produce gusty winds. Cloudy, with a low around 50. North wind 5 to 8 mph, with gusts as high as 20 mph. Chance of precipitation is 70%. New precipitation amounts between a tenth and quarter of an inch, except higher amounts possible in thunderstorms.

Saturday: Showers likely, with thunderstorms also possible after noon. Mostly cloudy, with a high near 64. West northwest wind 3 to 7 mph. Chance of precipitation is 60%.

Saturday Night: Showers and possibly a thunderstorm. Low around 44. West wind 6 to 10 mph. Chance of precipitation is 90%. New rainfall amounts between a quarter and half of an inch possible.

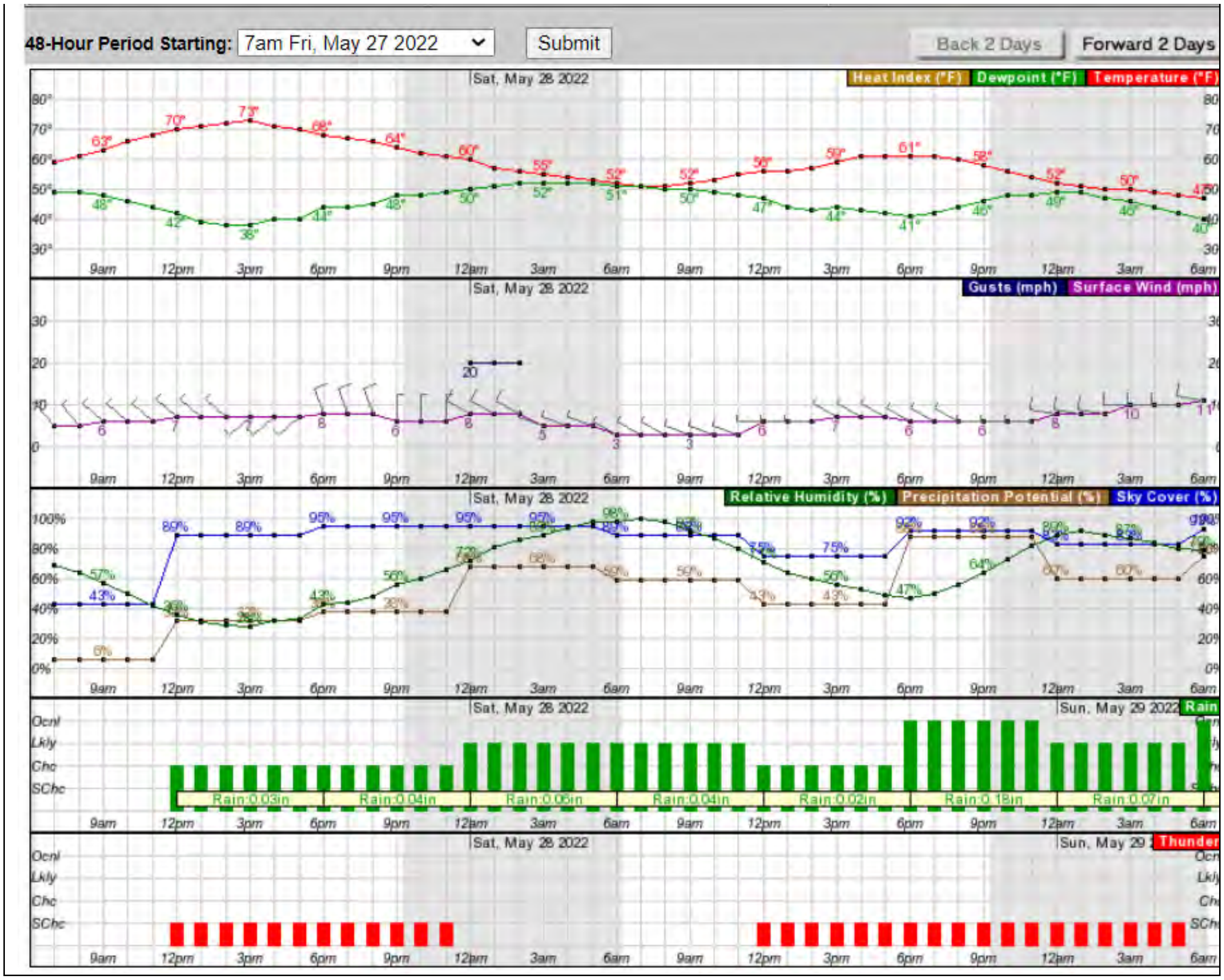
Sunday: Showers. High near 54. West wind 11 to 14 mph. Chance of precipitation is 80%. New precipitation amounts between a tenth and quarter of an inch possible.
Sunday Night: Showers likely, mainly after midnight. Mostly cloudy, with a low around 42. Chance of precipitation is 60%. New precipitation amounts between a tenth and quarter of an inch possible.
Memorial Day: A chance of showers, with thunderstorms also possible after noon. Mostly cloudy, with a high near 63. Chance of precipitation is 50%.
Monday Night: Mostly cloudy, with a low around 46.
Tuesday: Partly sunny, with a high near 71.
Tuesday Night: Mostly clear, with a low around 49.
Wednesday: Mostly sunny, with a high near 78.
Wednesday Night: Partly cloudy, with a low around 54.
Thursday: Mostly sunny, with a high near 85.

Forecast Discussion
Area Forecast Discussion
National Weather Service Boise ID
346 AM MDT Fri May 27 2022

.SHORT TERM...Today through Sunday night...**Unsettled weather will persist through the period** as a broad upper trough takes up position over the Pacific NW. the combination of daytime instability and embedded shortwave energy will bring periods of precipitation to the region through Saturday. **Afternoon showers and thunderstorms will produce brief heavy rain and gusty winds up to 45 mph this afternoon.** Stronger winds aloft will increase the gust potential Saturday afternoon, especially across SE Oregon. **Saturday night into Sunday will see widespread precipitation develop as a closed low moves into the interior NW.** The cold air aloft will lower snow levels from 7500-8500 feet on Saturday to 4500-5500 feet Sunday night. This will allow for accumulations of 1 to 4 inches above 6500 feet Sunday into Sunday night. Minor accumulations are possible down to 5500 Sunday night. **Total liquid amounts over the weekend will range from 0.25-0.50 inches in the valleys** to 0.50-1.00 in the mountains. After near normal highs today, temperatures will bottom out at 15 to 20 degrees below normal on Sunday.

.LONG TERM...Monday through Friday...A large and complex upper level trough over the Western U.S. will slowly move eastward on Memorial Day**. Scattered rain showers and high elevation mountain show showers will linger over the area on Memorial Day** with temperatures running 10 to 15 degrees below normal. Drier conditions and a warming trend will begin on Tuesday as a more zonal flow with some weak upper level ridging develops over the area. Temperatures will warm to near normal by Wednesday and a few degrees above normal by Thursday and Friday.

Hourly Forecast


48-Hour Period Starting: 7am Fri, May 27 2022
Submit
Back 2 Days
Forward 2 Days
Sat, May 28 2022
Heat Index (°F)
Dewpoint (°F)
Temperature (°F)
Gusts (mph)
Surface Wind (mph)
Relative Humidity (%)
Precipitation Potential (%)
Sky Cover (%)
Sun, May 29 2022
Rain
Thunder
Ocnl
Lkly
Chc
SChc
Rain:0.03in
Rain:0.04in
Rain:0.06in
Rain:0.04in
Rain:0.02in
Rain:0.18in
Rain:0.07in
9am
12pm
3pm
6pm
9pm
12am
3am
6am

Storm Event QA/QC Checklist

STORM DATE: 220404				Circle one: Phase I Phase II
A. Event and Data Completeness	**Yes**	**No**	**N/A**	**Notes**
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed	X			
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member			X	
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Storm/Sample Value	Program Criteria	Met	Qualify	Reject	Notes
1. Precipitation (inches)	0.24	> 0.10 in.	X			
2. Antecedent dry period (hours)	480	< 0.11 in. in 72 hrs	X			
3. Days since last sampling event	20 days	>= 30 days	X			
4. Sampled amount as % of total run-off	N/A	>= 75%				no comps for this event
5. Ecoli sample holding time	2 hrs	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X			
6. Filtering of samples for dissolved parameter analysis	N/A	<= 24 hrs: no qualifier > 24 hrs.: reject				

D. Notes:

Reviewed by Tanan gra Date 05.03.22

Approved by Monica L. Lowe Date 5/17/22

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth =	0.11	in
Square Feet per Acre =	43560	ft^2/ac
Inches per Foot=	12	in/ft
Aliquots per Sample=	17	

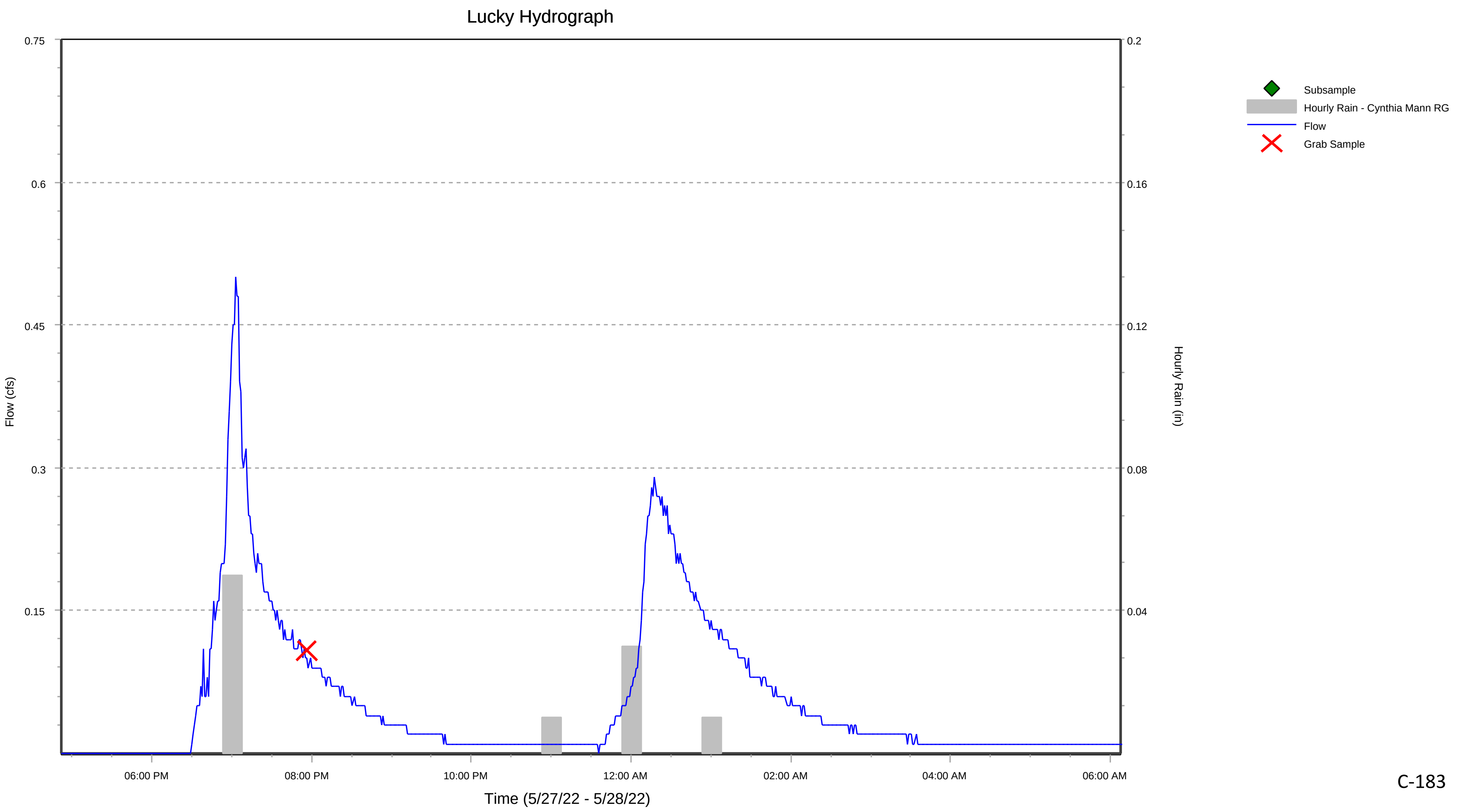
Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

Site	Area (ac)	Using RC Based on Land Use			Using Manually-entered RC		
		RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)	RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.46	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.76	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7760.00	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.80	**2960**
#206 AS_6	204	0.257	20935	**1231**	0.046	3747.03	**221**
#18 State	34	0.419	5688	**335**	0.144	1954.97	**122**
Theoretical	80	0.200	6389		0.000		

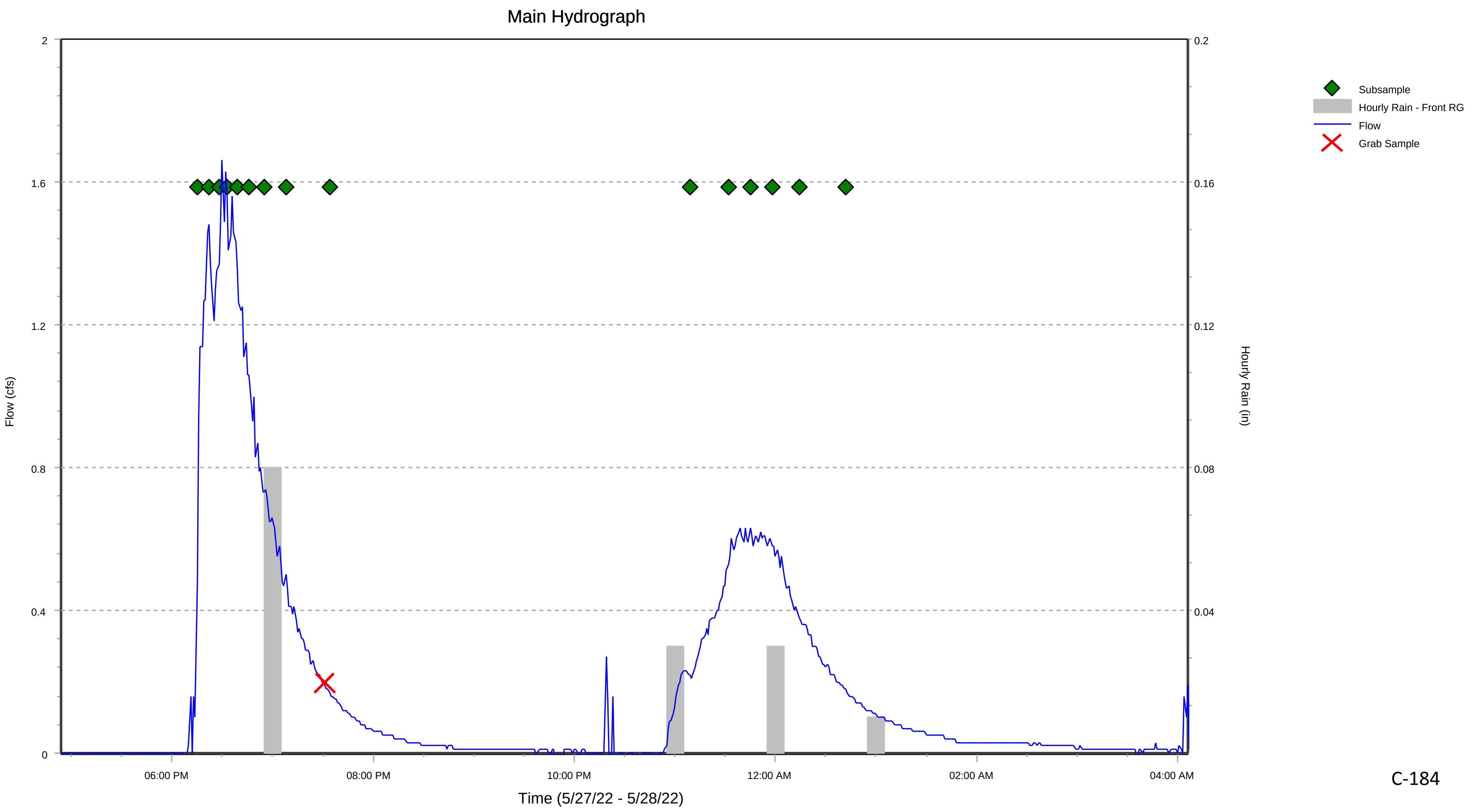
NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

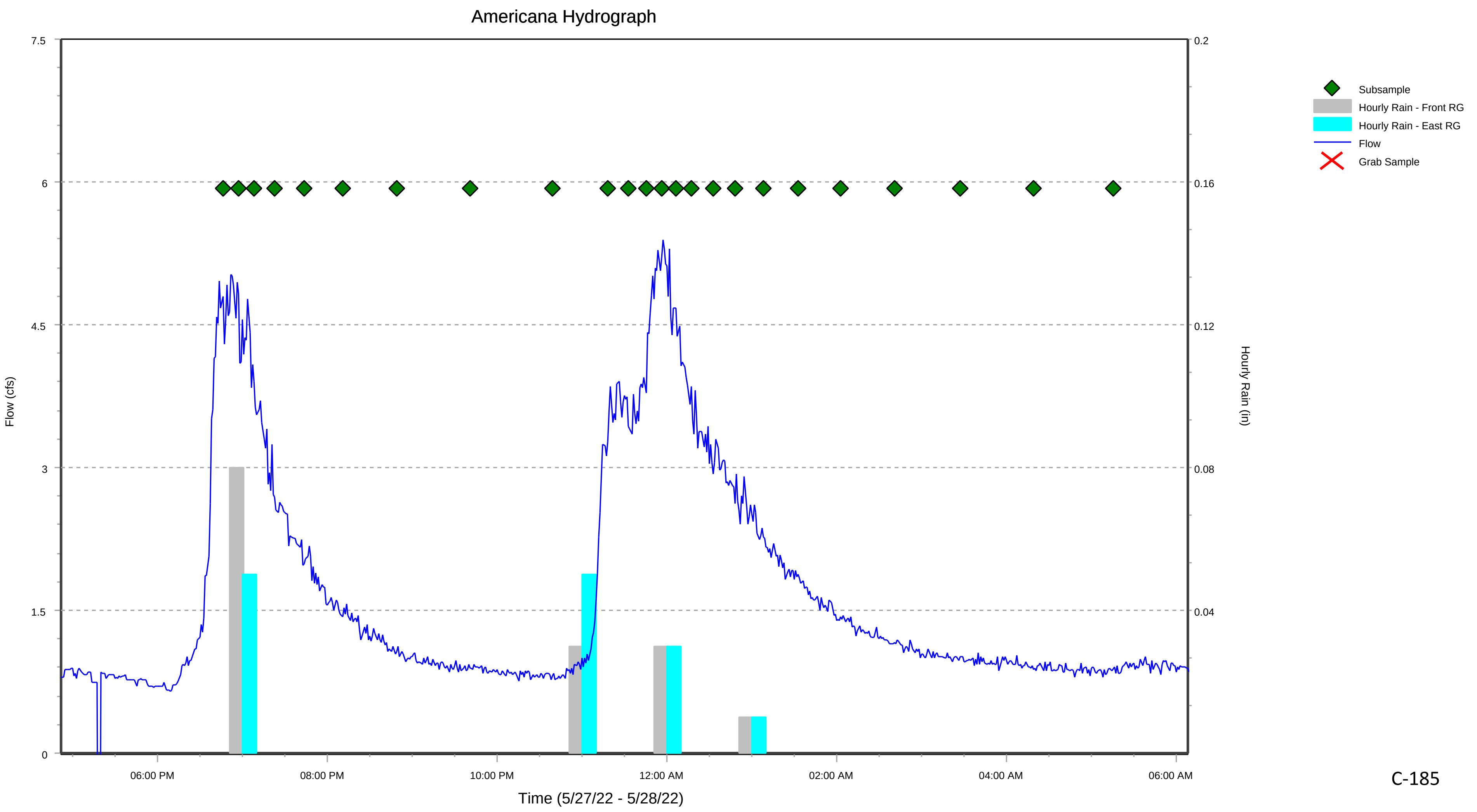
Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]
all values taken from historically corrected runoff coefficents
total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)
Measured runoff
RC = measured runoff / total runoff

Attachment B: Storm Event Hydrographs

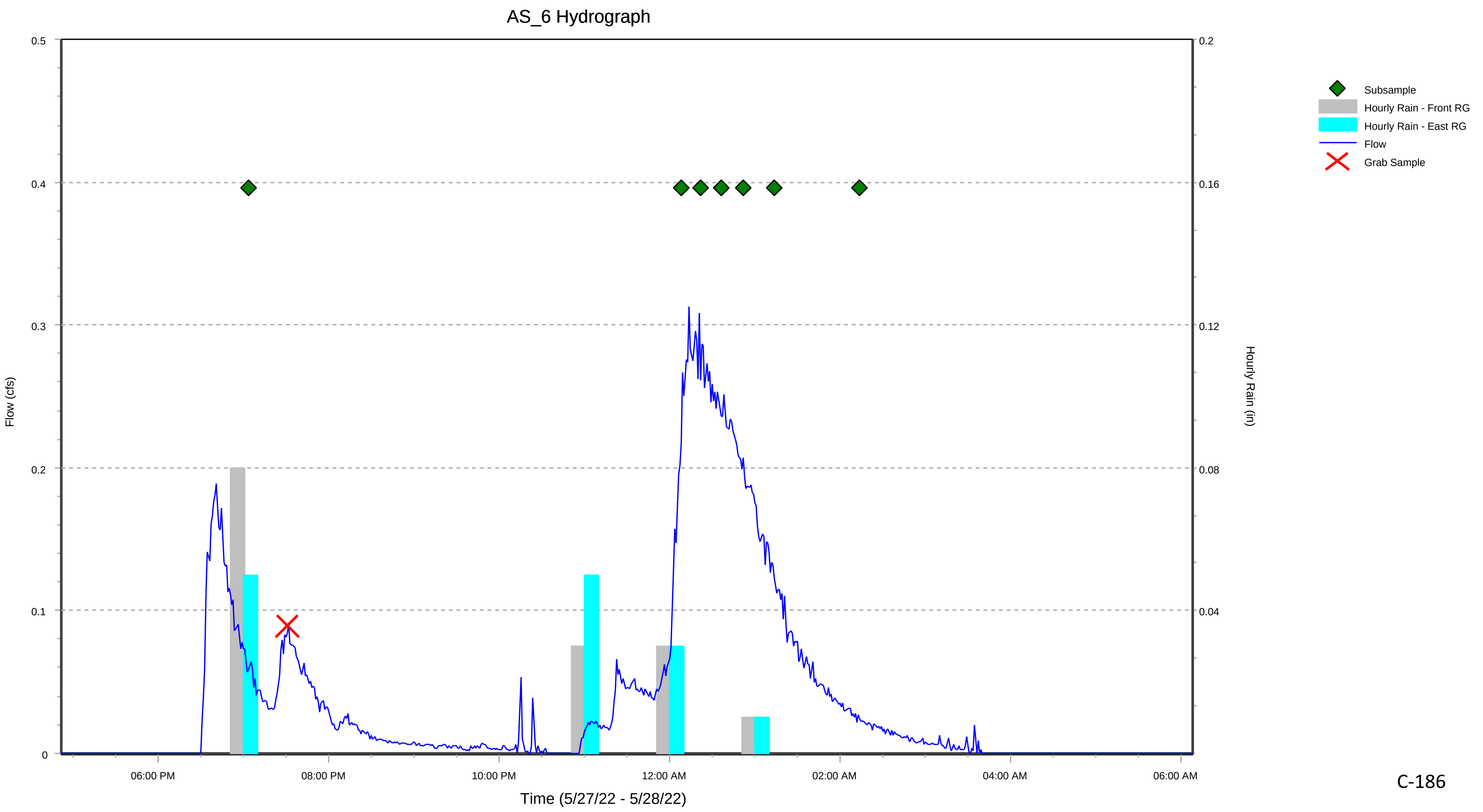


Lucky Hydrograph
0.75
0.6
0.45
0.3
0.15
Flow (cfs)
0.2
0.16
0.12
0.08
0.04
Hourly Rain (in)
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
06:00 AM
Time (5/27/22 - 5/28/22)
Subsample
Hourly Rain - Cynthia Mann RG
Flow
Grab Sample


Main Hydrograph
Flow (cfs)
Hourly Rain (in)
2
1.6
1.2
0.8
0.4
0
0.2
0.16
0.12
0.08
0.04
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
Time (5/27/22 - 5/28/22)
Subsample
Hourly Rain - Front RG
Flow
Grab Sample



Americana Hydrograph
Flow (cfs)
Hourly Rain (in)
Time (5/27/22 - 5/28/22)
7.5
6
4.5
3
1.5
0
0.2
0.16
0.12
0.08
0.04
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
06:00 AM
Subsample
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Grab Sample


AS_6 Hydrograph
Flow (cfs)
0.5
0.4
0.3
0.2
0.1
0
Hourly Rain (in)
0.2
0.16
0.12
0.08
0.04
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
06:00 AM
Time (5/27/22 - 5/28/22)
Subsample
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Grab Sample

Attachment C: Storm Event Analytical Reports

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00211-01	ACST1B	220527-03-WG	Water		05/27/2022	05/28/2022
AC00211-02	ACST1B	220527-12-WG	Water		05/27/2022	05/28/2022
AC00211-03	ACST1B	220527-12-101	Water		05/27/2022	05/28/2022
AC00211-04	ACST1B	220527-12-001	Water		05/27/2022	05/28/2022
AC00211-05	ACST1B	220527-206-WG	Water		05/27/2022	05/28/2022

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220527-03-WG
Date/Time Collected:	05/27/2022 19:57		
Lab Number:	AC00211-01	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222058	4810.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	05/28/22 08:30	5/29/22 8:48	ASE	H D
Wet Chemistry										
Chlorine Screen	B222059	Absent				SM 4500-CL G-2000 mod	05/28/22	5/28/22 8:36	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220527-12-WG
Date/Time Collected:	05/27/2022 19:24		
Lab Number:	AC00211-02	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222058	1046.2	MPN/100 mL	1.0	1.0	IDEXX - Colilert	05/28/22 08:30	5/29/22 8:48	ASE	H
Wet Chemistry										
Chlorine Screen	B222059	Absent				SM 4500-CL G-2000 mod	05/28/22	5/28/22 8:36	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220527-12-101
Date/Time Collected:	05/27/2022 12:00		
Lab Number:	AC00211-03	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222058	727.0	MPN/100 mL	1.0	1.0	IDEXX - Colilert	05/28/22 08:30	5/29/22 8:48	ASE	H
Wet Chemistry										
Chlorine Screen	B222059	Absent				SM 4500-CL G-2000 mod	05/28/22	5/28/22 8:36	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220527-12-001
Date/Time Collected:	05/27/2022 12:00		
Lab Number:	AC00211-04	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222058	<1.0	MPN/100 mL	1.0	1.0	IDEXX - Colilert	05/28/22 08:30	5/29/22 8:48	ASE	H U
Wet Chemistry										
Chlorine Screen	B222059	Absent				SM 4500-CL G-2000 mod	05/28/22	5/28/22 8:36	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	220527-206-WG
Date/Time Collected:	05/27/2022 19:50		
Lab Number:	AC00211-05	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222058	2750.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	05/28/22 08:30	5/29/22 8:48	ASE	H D
Wet Chemistry										
Chlorine Screen	B222059	Absent				SM 4500-CL G-2000 mod	05/28/22	5/28/22 8:36	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 06/07/2022 13:04

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B222058									
Blank (B222058-BLK1)									
E. Coli	Absent						05/29/2022	ASE	
LCS (B222058-BS1)									
E. Coli				Present			05/29/2022	ASE	
Duplicate (B222058-DUP2) Source ID: AC00211-01RE1									
E. Coli					Pass	128	05/29/2022	ASE	

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Notes and Definitions

Item	Definition
D	Data reported from a dilution
H	Hold time Exceeded.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK
Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): [illegible]
[illegible]
[illegible]
Josh Ebnoff

C-196

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
AC00211-01	5/27/22	—	1957		220527-03-WG	TZ	X	X												X					1
-02			1924		220527-12-WG		X	X												X					1
-03			1200		220527-12-101		X	X												X					1
-04			1200		220527-12-001		X	X												X					1
-05			1950		220527-20C-WG		X	X												X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)
[illegible]	05.27.22 / 2024	[illegible] 5/27/22 2035
[illegible]	5/27/22 2123	[illegible] 5.28.22 0700

Comments/Special Instructions:

AC00211

Report Date: 06/23/2022 13:13

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00212-01	ACST1C	220527-12-WC	Water		05/28/2022	05/28/2022
Comments:	220527-12-WC					
AC00212-02	ACST1C	220527-14-WC	Water		05/28/2022	05/28/2022
Comments:	220527-14-WC					
AC00212-03	ACST1C	220527-206-WC	Water		05/28/2022	05/28/2022
Comments:	Low sample volume, no dissolved parameters were split					

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Report Date: 06/23/2022 13:13

Analysis Report

Location:	ACST1C	Location Description:	220527-12-WC
Date/Time Collected:	05/27/2022 18:15 - 05/28/2022 00:42		
Lab Number:	AC00212-01	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222094	1.33	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/01/22	6/1/22 10:28	ALN	
BOD5	B222063	49.9	mg/L	2.00	2.00	SM 5210 B-2011	05/28/22	6/2/22 9:47	CJP	
COD	B222062	303	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	05/28/22	5/28/22 13:14	MER	
Nitrate-Nitrite, as N	B222313	0.636	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:36	ALN	
TKN	B222143	7.04	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/06/22	6/7/22 8:58	ALN	
Total Dissolved Solids	B222092	128	mg/L	25.0	25.0	SM 2540 C-2011	06/01/22	6/3/22 8:14	MER	
Total Suspended Solids	B222064	315	mg/L	0.900	0.900	SM 2540 D-2011	05/28/22	5/28/22 12:43	MER	
Turbidity	B222066	121	NTU	1.5	0.3	EPA 180.1, Rev. 2.0 (1993)	05/28/22	5/28/22 12:33	JAL	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222065	0.215	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	05/28/22	5/28/22 11:53	JAL	
Total Metals										
Mercury	B222108	0.0410	ug/L	0.0100	0.0100	EPA 245.2	06/02/22	6/3/22 9:57	AMO	
Arsenic	B222138	3.7	ug/L	0.040	0.040	EPA 200.8	06/05/22	6/11/22 15:08	DMW	
Cadmium	B222138	0.25	ug/L	0.025	0.025	EPA 200.8	06/05/22	6/11/22 15:08	DMW	
Calcium	B222072	12.0	mg/L	0.0460	0.0460	EPA 200.7	05/30/22	6/7/22 19:46	EDM	
Lead	B222138	17.0	ug/L	0.050	0.050	EPA 200.8	06/05/22	6/11/22 15:08	DMW	
Magnesium	B222072	3710	ug/L	50.0	50.0	EPA 200.7	05/30/22	6/7/22 19:46	EDM	
Phosphorus as P	B222072	0.652	mg/L	6.00E-3	6.00E-3	EPA 200.7	05/30/22	6/7/22 19:46	EDM	
Hardness	B222072	45.2	mg/L	0.115	0.115	EPA 200.7	05/30/22	6/7/22 19:46	EDM	
Dissolved Metals										
Cadmium	B222142	0.031	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 13:38	DMW	
Copper	B222142	13.7	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 13:38	DMW	
Lead	B222142	0.29	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 13:38	DMW	
Zinc	B222142	59.0	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 13:38	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

C-198

Report Date: 06/23/2022 13:13

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1C	Location Description:	220527-14-WC
Date/Time Collected:	05/27/2022 18:46 - 05/28/2022 05:15		
Lab Number:	AC00212-02	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222094	0.972	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/01/22	6/1/22 10:53	ALN	
BOD5	B222063	84.7	mg/L	2.00	2.00	SM 5210 B-2011	05/28/22	6/2/22 9:39	CJP	Chlor-01
COD	B222062	224	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	05/28/22	5/28/22 13:15	MER	
Nitrate-Nitrite, as N	B222313	0.863	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:41	ALN	
TKN	B222143	4.71	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/06/22	6/7/22 8:59	ALN	
Total Dissolved Solids	B222092	225	mg/L	25.0	25.0	SM 2540 C-2011	06/01/22	6/3/22 8:15	MER	
Total Suspended Solids	B222064	115	mg/L	0.900	0.900	SM 2540 D-2011	05/28/22	5/28/22 13:12	MER	
Turbidity	B222066	51.8	NTU	1.5	0.3	EPA 180.1, Rev. 2.0 (1993)	05/28/22	5/28/22 12:41	JAL	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222065	0.568	mg/L	4.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	05/28/22	5/28/22 12:02	JAL	D
Total Metals										
Mercury	B222108	0.0196	ug/L	0.0100	0.0100	EPA 245.2	06/02/22	6/3/22 10:11	AMO	
Arsenic	B222138	5.9	ug/L	0.040	0.040	EPA 200.8	06/05/22	6/11/22 15:10	DMW	
Cadmium	B222138	0.13	ug/L	0.025	0.025	EPA 200.8	06/05/22	6/11/22 15:10	DMW	
Calcium	B222072	28.8	mg/L	0.0460	0.0460	EPA 200.7	05/30/22	6/7/22 19:51	EDM	
Lead	B222138	5.5	ug/L	0.050	0.050	EPA 200.8	06/05/22	6/11/22 15:10	DMW	
Magnesium	B222072	5950	ug/L	50.0	50.0	EPA 200.7	05/30/22	6/7/22 19:51	EDM	
Phosphorus as P	B222072	1.06	mg/L	6.00E-3	6.00E-3	EPA 200.7	05/30/22	6/7/22 19:51	EDM	
Hardness	B222072	96.4	mg/L	0.115	0.115	EPA 200.7	05/30/22	6/7/22 19:51	EDM	
Dissolved Metals										
Cadmium	B222142	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 13:48	DMW	U
Copper	B222142	14.0	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 13:48	DMW	
Lead	B222142	0.28	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 13:48	DMW	
Zinc	B222142	47.9	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 13:48	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Report Date: 06/23/2022 13:13

Analysis Report

Location:	ACST1C	Location Description:	220527-206-WC
Date/Time Collected:	05/27/2022 19:04 - 05/28/2022 02:14		
Lab Number:	AC00212-03	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222094	2.38	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/01/22	6/1/22 10:40	ALN	
BOD5	B222063	314	mg/L	2.00	2.00	SM 5210 B-2011	05/28/22	6/2/22 9:34	CJP	
COD	B222062	634	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	05/28/22	5/28/22 13:17	MER	
TKN	B222143	10.7	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/06/22	6/7/22 9:01	ALN	
Total Dissolved Solids	B222092	385	mg/L	25.0	25.0	SM 2540 C-2011	06/01/22	6/3/22 8:16	MER	
Total Suspended Solids	B222064	77.3	mg/L	0.900	0.900	SM 2540 D-2011	05/28/22	5/28/22 13:13	MER	
Turbidity	B222066	62.5	NTU	1.5	0.3	EPA 180.1, Rev. 2.0 (1993)	05/28/22	5/28/22 12:38	JAL	D
Total Metals										
Mercury	B222108	0.0260	ug/L	0.0100	0.0100	EPA 245.2	06/02/22	6/3/22 10:14	AMO	
Arsenic	B222138	4.5	ug/L	0.040	0.040	EPA 200.8	06/05/22	6/11/22 15:13	DMW	
Cadmium	B222138	0.12	ug/L	0.025	0.025	EPA 200.8	06/05/22	6/11/22 15:13	DMW	
Calcium	B222072	18.0	mg/L	0.0460	0.0460	EPA 200.7	05/30/22	6/7/22 19:56	EDM	
Lead	B222138	5.1	ug/L	0.050	0.050	EPA 200.8	06/05/22	6/11/22 15:13	DMW	
Magnesium	B222072	5290	ug/L	50.0	50.0	EPA 200.7	05/30/22	6/7/22 19:56	EDM	
Phosphorus as P	B222072	3.93	mg/L	6.00E-3	6.00E-3	EPA 200.7	05/30/22	6/7/22 19:56	EDM	
Hardness	B222072	66.9	mg/L	0.115	0.115	EPA 200.7	05/30/22	6/7/22 19:56	EDM	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Report Date: 06/23/2022 13:13

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B222062									
Blank (B222062-BLK1)									
COD	<13	mg/L					05/28/2022	MER	U
LCS (B222062-BS1)									
COD			96.3	90-110			05/28/2022	MER	
Duplicate (B222062-DUP1) Source ID: AC00212-01									
COD					0.662	10	05/28/2022	MER	
Batch: B222063									
Blank (B222063-BLK1)									
BOD5	<2	mg/L					06/02/2022	CJP	U
LCS (B222063-BS2)									
BOD5			105	84.6-115.4			06/02/2022	CJP	
Duplicate (B222063-DUP1) Source ID: AC00212-01									
BOD5					10.3	30	06/02/2022	CJP	
Batch: B222064									
Blank (B222064-BLK1)									
Total Suspended Solids	<0.9	mg/L					05/28/2022	MER	U
LCS (B222064-BS1)									
Total Suspended Solids			98.7	90-110			05/28/2022	MER	
Duplicate (B222064-DUP1) Source ID: AC00212-01									
Total Suspended Solids					2.52	20	05/28/2022	MER	
Batch: B222066									
Blank (B222066-BLK1)									
Turbidity	<0.3	NTU					05/28/2022	JAL	U
LCS (B222066-BS1)									
Turbidity			99.7	90-110			05/28/2022	JAL	
Duplicate (B222066-DUP1) Source ID: AC00212-01									
Turbidity					1.92	25	05/28/2022	JAL	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222092									
Blank (B222092-BLK1)									
Total Dissolved Solids	<25	mg/L					06/03/2022	MER	U
LCS (B222092-BS1)									
Total Dissolved Solids			100	90-110			06/03/2022	MER	
Duplicate (B222092-DUP1) Source ID: AC00212-02									
Total Dissolved Solids					NR	10	06/03/2022	MER	
Batch: B222094									
Blank (B222094-BLK1)									
Ammonia, as N	<0.035	mg/L					06/01/2022	ALN	U
LCS (B222094-BS1)									
Ammonia, as N			97.9	90-110			06/01/2022	ALN	
Duplicate (B222094-DUP1) Source ID: WB01875-07									
Ammonia, as N					1.24	10	06/01/2022	ALN	
Duplicate (B222094-DUP2) Source ID: WB01959-01									
Ammonia, as N					1.25	10	06/01/2022	ALN	
Matrix Spike (B222094-MS1) Source ID: WB01875-07									
Ammonia, as N			104	80-120			06/01/2022	ALN	
Matrix Spike (B222094-MS2) Source ID: WB01959-01									
Ammonia, as N			100	80-120			06/01/2022	ALN	
Matrix Spike Dup (B222094-MSD1) Source ID: WB01875-07									
Ammonia, as N			105	80-120	0.492	10	06/01/2022	ALN	
Matrix Spike Dup (B222094-MSD2) Source ID: WB01959-01									
Ammonia, as N			97.6	80-120	1.82	10	06/01/2022	ALN	
Batch: B222143									
Blank (B222143-BLK1)									
TKN	<0.1	mg/L					06/07/2022	ALN	U
Blank (B222143-BLK2)									
TKN	<0.1	mg/L					06/07/2022	ALN	U
LCS (B222143-BS1)									
TKN			105	80-120			06/07/2022	ALN	
LCS (B222143-BS2)									
TKN			97.4	80-120			06/07/2022	ALN	
Duplicate (B222143-DUP1) Source ID: AC00212-03									
TKN					3.97	20	06/07/2022	ALN	
Duplicate (B222143-DUP2) Source ID: BB02122-02									
TKN					4.63	20	06/07/2022	ALN	D
Duplicate (B222143-DUP3) Source ID: WB01890-07									
TKN					2.74	20	06/07/2022	ALN	D
Matrix Spike (B222143-MS1) Source ID: AC00212-03									
TKN			109	80-120			06/07/2022	ALN	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222143 (Continued)									
Matrix Spike (B222143-MS2) Source ID: BB02122-02									
TKN			95.5	80-120			06/07/2022	ALN	D
Matrix Spike (B222143-MS3) Source ID: WB01890-07									
TKN			87.3	80-120			06/07/2022	ALN	D
Matrix Spike Dup (B222143-MSD1) Source ID: AC00212-03									
TKN			107	80-120	0.611	20	06/07/2022	ALN	
Matrix Spike Dup (B222143-MSD2) Source ID: BB02122-02									
TKN			110	80-120	4.96	20	06/07/2022	ALN	D
Matrix Spike Dup (B222143-MSD3) Source ID: WB01890-07									
TKN			96.0	80-120	3.58	20	06/07/2022	ALN	D
Batch: B222313									
Blank (B222313-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
Blank (B222313-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
Blank (B222313-BLK3)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
LCS (B222313-BS1)									
Nitrate-Nitrite, as N			96.0	90-110			06/16/2022	ALN	
LCS (B222313-BS2)									
Nitrate-Nitrite, as N			95.7	90-110			06/16/2022	ALN	
LCS (B222313-BS3)									
Nitrate-Nitrite, as N			95.2	90-110			06/16/2022	ALN	
Duplicate (B222313-DUP1) Source ID: AC00212-01									
Nitrate-Nitrite, as N					0.194	10	06/16/2022	ALN	
Duplicate (B222313-DUP2) Source ID: BB02120-01									
Nitrate-Nitrite, as N					0.276	10	06/16/2022	ALN	
Duplicate (B222313-DUP3) Source ID: BB02130-01									
Nitrate-Nitrite, as N					0.773	10	06/16/2022	ALN	
Duplicate (B222313-DUP4) Source ID: BB02136-04									
Nitrate-Nitrite, as N					0.212	10	06/16/2022	ALN	
Duplicate (B222313-DUP5) Source ID: LS01194-02									
Nitrate-Nitrite, as N					NR	10	06/16/2022	ALN	U
Duplicate (B222313-DUP6) Source ID: WB01908-07									
Nitrate-Nitrite, as N					NR	10	06/16/2022	ALN	U
Matrix Spike (B222313-MS1) Source ID: AC00212-01									
Nitrate-Nitrite, as N			96.0	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS2) Source ID: BB02120-01									
Nitrate-Nitrite, as N			91.9	90-110			06/16/2022	ALN	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222313 (Continued)									
Matrix Spike (B222313-MS3) Source ID: BB02130-01									
Nitrate-Nitrite, as N			96.5	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS4) Source ID: BB02136-04									
Nitrate-Nitrite, as N			94.2	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS5) Source ID: LS01194-02									
Nitrate-Nitrite, as N			94.7	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS6) Source ID: WB01908-07									
Nitrate-Nitrite, as N			95.1	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS7) Source ID: WQ00115-08									
Nitrate-Nitrite, as N			95.4	90-110			06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD1) Source ID: AC00212-01									
Nitrate-Nitrite, as N			95.5	90-110	0.373	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD2) Source ID: BB02120-01									
Nitrate-Nitrite, as N			92.2	90-110	0.0919	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD3) Source ID: BB02130-01									
Nitrate-Nitrite, as N			95.9	90-110	0.537	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD4) Source ID: BB02136-04									
Nitrate-Nitrite, as N			93.6	90-110	0.200	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD5) Source ID: LS01194-02									
Nitrate-Nitrite, as N			95.4	90-110	0.700	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD6) Source ID: WB01908-07									
Nitrate-Nitrite, as N			95.1	90-110	0.0336	10	06/16/2022	ALN	
Dissolved Wet Chemistry									
Batch: B222065									
Blank (B222065-BLK1)									
Orthophosphate, as P	<0.002	mg/L					05/28/2022	JAL	U
LCS (B222065-BS1)									
Orthophosphate, as P			99.2	90-110			05/28/2022	JAL	
Duplicate (B222065-DUP1) Source ID: AC00212-01									
Orthophosphate, as P					0.761	10	05/28/2022	JAL	
Matrix Spike (B222065-MS1) Source ID: AC00212-01									
Orthophosphate, as P			107	90-110			05/28/2022	JAL	
Matrix Spike Dup (B222065-MSD1) Source ID: AC00212-01									
Orthophosphate, as P			106	90-110	0.456	10	05/28/2022	JAL	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B222072									
Blank (B222072-BLK1)									
Calcium	<0.046	mg/L					06/07/2022	EDM	U
Magnesium	<50	ug/L					06/07/2022	EDM	U
Phosphorus as P	<0.006	mg/L					06/07/2022	EDM	U
LCS (B222072-BS1)									
Calcium			101	85-115			06/07/2022	EDM	
Magnesium			104	85-115			06/07/2022	EDM	
Phosphorus as P			112	85-115			06/07/2022	EDM	
Duplicate (B222072-DUP1) Source ID: AC00212-03									
Calcium					0.247	20	06/07/2022	EDM	
Magnesium					0.190	20	06/07/2022	EDM	
Phosphorus as P					0.557	20	06/07/2022	EDM	
Matrix Spike (B222072-MS1) Source ID: AC00212-03									
Calcium			99.2	70-130			06/07/2022	EDM	
Magnesium			101	70-130			06/07/2022	EDM	
Phosphorus as P			98.6	70-130			06/07/2022	EDM	
Matrix Spike Dup (B222072-MSD1) Source ID: AC00212-03									
Calcium			97.6	70-130	0.652	20	06/07/2022	EDM	
Magnesium			101	70-130	0.462	20	06/07/2022	EDM	
Phosphorus as P			116	70-130	3.48	20	06/07/2022	EDM	
Batch: B222108									
Blank (B222108-BLK1)									
Mercury	<0.01	ug/L					06/03/2022	AMO	U
LCS (B222108-BS1)									
Mercury			103	85-115			06/03/2022	AMO	
Duplicate (B222108-DUP1) Source ID: WR00029-01									
Mercury					NR	20	06/03/2022	AMO	U
Duplicate (B222108-DUP2) Source ID: AC00212-01									
Mercury					16.1	20	06/03/2022	AMO	
Matrix Spike (B222108-MS1) Source ID: WR00029-01									
Mercury			108	70-130			06/03/2022	AMO	
Matrix Spike (B222108-MS2) Source ID: AC00212-01									
Mercury			97.2	70-130			06/03/2022	AMO	
Matrix Spike Dup (B222108-MSD1) Source ID: WR00029-01									
Mercury			101	70-130	7.43	20	06/03/2022	AMO	
Matrix Spike Dup (B222108-MSD2) Source ID: AC00212-01									
Mercury			97.3	70-130	0.0578	20	06/03/2022	AMO	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B222138									
Blank (B222138-BLK1)									
Arsenic	<0.040	ug/L					06/11/2022	DMW	U
Cadmium	<0.025	ug/L					06/11/2022	DMW	U
Lead	<0.050	ug/L					06/11/2022	DMW	U
LCS (B222138-BS1)									
Arsenic			101	85-115			06/11/2022	DMW	
Cadmium			102	85-115			06/11/2022	DMW	
Lead			104	85-115			06/11/2022	DMW	
Duplicate (B222138-DUP1) Source ID: WB01890-10									
Arsenic					0.813	20	06/11/2022	DMW	
Cadmium					NR	20	06/11/2022	DMW	U
Lead					1.07	20	06/11/2022	DMW	
Matrix Spike (B222138-MS1) Source ID: WB01890-10									
Arsenic			100	70-130			06/11/2022	DMW	
Cadmium			99.4	70-130			06/11/2022	DMW	
Lead			98.9	70-130			06/11/2022	DMW	
Matrix Spike Dup (B222138-MSD1) Source ID: WB01890-10									
Arsenic			103	70-130	2.29	20	06/11/2022	DMW	
Cadmium			100	70-130	1.02	20	06/11/2022	DMW	
Lead			99.6	70-130	0.687	20	06/11/2022	DMW	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B222142									
Blank (B222142-BLK1)									
Cadmium	<0.025	ug/L					06/09/2022	DMW	U
Copper	<0.15	ug/L					06/09/2022	DMW	U
Lead	<0.050	ug/L					06/09/2022	DMW	U
Zinc	<0.78	ug/L					06/09/2022	DMW	U
LCS (B222142-BS1)									
Cadmium			105	85-115			06/09/2022	DMW	
Copper			105	85-115			06/09/2022	DMW	
Lead			106	85-115			06/09/2022	DMW	
Zinc			107	85-115			06/09/2022	DMW	
Duplicate (B222142-DUP1) Source ID: AC00212-01									
Cadmium					6.50	10	06/09/2022	DMW	
Copper					0.713	10	06/09/2022	DMW	
Lead					0.0662	10	06/09/2022	DMW	
Zinc					0.121	10	06/09/2022	DMW	
Matrix Spike (B222142-MS1) Source ID: AC00212-01									
Cadmium			104	70-130			06/09/2022	DMW	
Copper			99.9	70-130			06/09/2022	DMW	
Lead			102	70-130			06/09/2022	DMW	
Zinc			104	70-130			06/09/2022	DMW	
Matrix Spike Dup (B222142-MSD1) Source ID: AC00212-01									
Cadmium			100	70-130	4.12	10	06/09/2022	DMW	
Copper			97.8	70-130	0.880	10	06/09/2022	DMW	
Lead			98.6	70-130	3.69	10	06/09/2022	DMW	
Zinc			100	70-130	1.25	10	06/09/2022	DMW	

Report Date: 06/23/2022 13:13

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Notes and Definitions

Item	Definition
Chlor-01	The sample exhibited a false positive for the chlorine screen.
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero/or Azubike Emenari
QA/QC Coordinator

C-208

C-209

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
AC00212-01	5/27/22	5/28/22	1815	0042	220527-12-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-02	5/27/22	5/28/22	1846	0515	220527-14-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-03	5/27/22	5/28/22	1904	0214	220527-206-WC	TL	X		X	X	X	X	X	X	X	~~X~~ dropped	X	~~X~~ dropped	X		X	X	X	X	1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Tammy Lightle	220528 / 0956	5.28.22 1003	Sample 220527-206-WC has low volume. If unable to run all tests, drop diss. metals (Cd, Cu, Pb, Zn). If still unable, drop Ortho-P.

AC00212

ACHD Sample Filtration, Splitting, and Compositing for Metals

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split		Comments
Lims#: AC00212-02 Location: ACSTIC Sample Date: 5-28-22 Sample ID: 14-WC	Split Date: 5-28-22 Start Split: 1017 2x Start Filter: 1017 2x Comp Time: — Analyst: AMO DKT DMW	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:____	Coll Jug: CC00027-62 Comp Jug: — SS Tubing: CC00027-81 SS Helper: ↓ (SSA2) Stir Bar: CC00027-57 Connector: CC00027-58	☒Teflon Total ☒Teflon Diss (F) ☒Hg CVAA ☒BOD ☒TSS ☒TDS ☒COD	☒TKN ☒NH_3 ☒NO_x (F) ☒ortho-P (F) ☒Turb ☐____ ☐____	
Lims#: AC00212-01 Location: ACSTIC Sample Date: 5-28-22 Sample ID: 12-WC	Split Date: 5-28-22 Start Split: 1030 Start Filter: 1030 Comp Time: — Analyst: AMO DKT DMW	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☒Other: 10.0µm	Coll Jug: CC00027-58 Comp Jug: — SS Tubing: CC00027-59 SS Helper: ↓ (SSA5) Stir Bar: CC00027-95 Connector: CC00027-58 (x2)	☒Teflon Total ☒Teflon Diss (F) ☒Hg CVAA ☒BOD ☒TSS ☒TDS ☒COD	☒TKN ☒NH_3 ☒NO_x (F) ☒ortho-P (F) ☒Turb ☐____ ☐____	
Lims#: AC00212-03 Location: ACSTIC Sample Date: 5-28-22 Sample ID: 206-WC	Split Date: 5-28-22 Start Split: 1051 Start Filter: 1051 Comp Time: — Analyst: AML DTK DMW	Filter: ☒~~Voss~~ DT ☒~~0.45µm~~ DT ☐1.0µm ☒~~5.0µm~~ DT ☒Other: NONE	Coll Jug: CC00026-59 Comp Jug: — SS Tubing: CC00027-81 SS Helper: ↓ (SSA6) Stir Bar: CC00027-95 Connector: CC00027-58	☒Teflon Total ☒~~Teflon Diss (F)~~ ☒Hg CVAA DT ☒BOD ☒TSS ☒TDS ☒COD	☒TKN ☒NH_3 ☒~~NO_x (F)~~ DT ☒~~ortho-P (F)~~ DT ☒Turb ☐____ ☐____	No Diss Parameters Split; Insufficient Sample
Lims#:____ Location:____ Sample Date:____ Sample ID:____	Split Date:____ Start Split:____ Start Filter:____ Comp Time:____ Analyst:____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:____	Coll Jug:____ DT Comp Jug:____ SS Tubing: CC00028-13 SS Helper: ↓ (SSA7) Stir Bar: CC00027-95 Connector: CC00027-58	☒Teflon Total ☒Teflon Diss (F) ☒Hg CVAA ☒BOD ☒TSS ☒TDS ☒COD	☒TKN ☒NH_3 ☒NO_x (F) ☒ortho-P (F) ☒Turb ☐____ ☐____	Only (3) composite samples for this event
Lims#:____ Location:____ Sample Date:____ Sample ID:____	Split Date:____ Start Split:____ Start Filter:____ Comp Time:____ Analyst:____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:____	Coll Jug:____ DT Comp Jug:____ SS Tubing: CC00027-81 SS Helper: ↓ (SS17) Stir Bar: CC00028-12 Connector: CC00027-58	☒Teflon Total ☒Teflon Diss (F) ☒Hg CVAA ☒BOD ☒TSS ☒TDS ☒COD	☒TKN ☒NH_3 ☒NO_x (F) ☒ortho-P (F) ☒Turb ☐____ ☐____	

ACHD Sample Filtration, Splitting, and Compositing for Metals

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ____ ☒COD ☐ ____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ____ ☒COD ☐ ____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ____ ☒COD ☐	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ____ ☒COD ☐ ____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ____ ☒COD ☐ ____	

Attachment D: Field Forms

Grab Sample Data Form

STATION: Lucky

Personnel: J. Ekhoff, Z. Lapa **Date/Time On-Site:** 19:43 5-27-22

Flow Meter Current Status						
Time	Level (in)	Flow ~~(cfs)~~ gpm	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
19:57	3.15	42.75	0.35	12.08	5/27/22 11:08	

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220527-03-WG	5/27/22	19:57	☒
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP09	19:57	20.53	5.86	7.42	189.07

Sampler Current Status	
First Subsample Date/Time	5/27/22 11:08
Last Subsample Date/Time	5/27/22 19:39
# of Subsamples taken	4

Comments:

Set Up/ Shut Down Form – HACH

TATION: Lucky

SET UP

Personnel: TLL MMJ

Date/Time
On-Site: 220527 1021

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1021	1.8	0	0	12.9
Downloaded to:				
Velocity Cutoff:	~~2.3~~ level greater than 2.3			
Trigger Volume:	2895 gal			

Deadband 1 in

- ☐ Download flowmeter, if program is running
- ☑ Install batteries on flowmeter and sampler
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Verify all cable and tubing connections
- ☑ Check date and time on flowmeter and sampler
- ☑ Set flowmeter program and sampler program parameters
- ☑ Set logging interval to 1 minute
- ☑ Start flowmeter program and sampler program
- ☑ Verify running

Comments:

SHUT DOWN

Personnel: TLL

Date/Time
On-Site: 220531 / 1052

Time	Level (in)	Flow ~~(cfs)~~ gpm	Velocity (fps)	Total (cf)	Battery (V)
1055	1.90	0 ~~103.71~~	0		12.3
Downloaded to:		USB – green one			

If flow monitoring is complete:	If continuing to monitor flow:
☒ Halt program on flowmeter	☐ Replace flowmeter battery
☒ Download flowmeter data	☐ Reset logging interval to 15 minutes
☒ Remove flowmeter battery	☐ Change velocity cutoff to 0.02 fps
	☐ Start program
	☐ Verify running

Comments:

Composite Sample Collection

STATION: Lucky **Bottle** 1 **of** Φ
Personnel: RL **Date/Time On-Site:** 220528 / 0913

☒ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	~~3500 mL~~ RL 5000 mL
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	5/27 1108	Success	13		
2	1841		14		
3	1907		15		
4	1939		16		
5	2125		17		
6	5/28 0024		18		
7	0058		19		
8	0218		20		
9			21		
10			22		
11			23		
12			24		

Comments:

The 1st subsample was ~~to~~ not storm flow, and due to small amount of subsamples it makes up for 12.5% of the composite. The sample will be rejected anyway, so it was dumped - nothing submitted to lab.

If sampling is complete:
- ☐ Power off sampler
- ☒ Verify flowmeter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: ______
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5”	400 mL	~~**3.0”**~~	3500 mL	**5.5”**	7250 mL	**8.0”**	11000 mL	**10.5”**	14750 mL
1.0”	800 mL	**3.5”**	4250 mL	**6.0”**	8000 mL	**8.5”**	11750 mL	**11.0”**	15500 mL
1.5”	1400 mL	**4.0”**	5000 mL	**6.5”**	8750 mL	**9.0”**	12500 mL	**11.5”**	16250 mL
2.0”	2000 mL	**4.5”**	5750 mL	**7.0”**	9500 mL	**9.5”**	13250 mL	**After 12”**	1” = 1500 mL
2.5”	2750 mL	**5.0”**	6500 mL	**7.5”**	10250 mL	**10.0”**	14000 mL	**Lab min**	8,000 mL

Set Up/ Shut Down Form – ~~Phase II~~ ISCO

STATION: Whitewater

UP

Personnel: TLL MMJ

Date/Time On-Site: 220527 1055

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
220527	1055	-0.04	0	0	0	NA

Downloaded to:	
Trigger Condition:	level > 1.5" hysteresis = 1"
Flow Pulse Interval:	800 cf

On-Site

- ☒ Replace battery if v<11.9 NA
- ☑ Perform Decon. Cycle
- ☑ Place 15L sample bottle in cooler, with ice
- ☑ Remove jar lid and put in clean re-sealable plastic bag
- ☒ Set Sampler program parameters (refer Table 103)
- ☑ Verify all cable and tubing connections
- ☑ Verify Sampler Program is running
- ☑ Verify latches are secure

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 220527 / 0816
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, and Flow
- ☒ Enable Sampler: On Trigger, and set velocity equation
- ☐ ~~Set Latch~~
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

Date/Time Off-Site: 220527 1107

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 220531 / 1024

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
5/31	1029	-0.02	0	0		
Downloaded to:	—					

On-Site

- ☐ ~~Replace battery if v<11.9~~
- ☒ Remove battery from Sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 220531 / 1537
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, and Flow
- ☒ Enable Sampler: Never

Comments:

Date/Time Off-Site: ______________

Composite Sample Collection

STATION: Whitewater **Bottle** ∅ **of** ∅

Personnel: TLL **Date/Time On-Site:** 220528 / 0855

☐ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	5/27 2055	No liquid detected	13		
2	5/28 0000	↓	14		
3	↓ 0034	↓	15		
4	↓ 0054	↓	16		
5	↓ 0120	↓	17		
6	↓ 0205	↓	18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

This is the 2nd bottle — but neither worked. Nothing to submit to lab.

*For the 1st bottle, the team on-site noticed that the majority of the 17 attempted samples had "no liquid detected" errors. They tried purging and then successfully grabbed liquid. The sample program was restarted to see if the clog was gone.

If Sampling is Complete:

- ☐ Power off Samplers
- ☐ Disable Flow Meter pacing
- ☐ Resume Flow Meter program
- ☐ Verify Flow Meter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab
- ☐ Current **Velocity Cutoff (fps):** ____________

If Continuing Sampling (sample bottle change-out):

- ☐ Keep Flow Meter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning;

Date/Time Restarted: ________________

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: Main

Personnel: JLL MMJ **Date/Time On-Site:** 220527 1920

Flow Meter Current Status						
Time	Level (in)	Flow ~~(cfs)~~	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1932	3.35	79.26 gpm	0.59	13.0		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220527-12 -WG	220527	1924	☑
Field Duplicate *E.Coli*	220527-12 -101	220527	1926	☑
Field Blank *E.Coli*	220527-12 -001	220527	1929	☑

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP08	1931	21.82	6.02	6.92	156.7

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	9

Comments:

Set Up/ Shut Down Form – HACH

STATION: Main

SET UP

Personnel: TLL MMJ

Date/Time On-Site: 220527 857

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
220527 0901	1.34	0	0	12.9

Downloaded to:	
Velocity Cutoff:	level greater than 2.8 Deadband 1.45
Trigger Volume:	3411 gal

- ☐ Download flowmeter, if program is running
- ☑ Install batteries on flowmeter and sampler
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Verify all cable and tubing connections
- ☑ Check date and time on flowmeter and sampler
- ☑ Set flowmeter program and sampler program parameters
- ☑ Set logging interval to 1 minute
- ☑ Start flowmeter program and sampler program
- ☑ Verify running

Comments:

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 220531 / 0900

Time	Level (in)	Flow ~~(cfs)~~ gpm	Velocity (fps)	Total (cf)	Battery (V)
0902	1.96	6.20	0.10		12.3

Downloaded to:	USB - green one

If flow monitoring is complete:	If continuing to monitor flow:
☒ Halt program on flowmeter ☒ Download flowmeter data ☒ Remove flowmeter battery	☐ Replace flowmeter battery ☐ Reset logging interval to 15 minutes ☐ Change velocity cutoff to 0.02 fps ☐ Start program ☐ Verify running

Comments:

Composite Sample Collection

STATION: Main **Bottle** 1 **of** 1

Personnel: TL **Date/Time On-Site:** 220528 / 0838

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	220527-12 -WC
Approx Sample Volume (mL):	8750 mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	5/27 0928	Rinse Error	13	5/27 2345	Success
2	1815	Success	14	2358	
3	1822		15	5/28 0014	
4	1828		16	0042	
5	1833		17	0329	Rinse Error
6	1839		18		
7	1846		19		
8	1855		20		
9	1908		21		
10	1934		22		
11	2309		23		
12	2332		24		

Comments:

If sampling is complete:
- ☒ Power off sampler
- ☒ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☒ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: ________________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Set Up/ Shut Down Form – ~~Phase II~~ ISCO

STATION: Americana

UP

Personnel: TLL MMJ5 **Date/Time On-Site:** 220527 919

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
220527	919	4.69	0.83	1.322	NA	11.98

Downloaded to:	
Trigger Condition:	level > 6.2" hysteresis 1.5"
Flow Pulse Interval:	2960 cf

On-Site

- ☑ Replace battery if v<11.9
- ☑ Perform Decon. Cycle
- ☑ Place 15L sample bottle in cooler, with ice
- ☑ Remove jar lid and put in clean re-sealable plastic bag
- ☑ Set Sampler program parameters (refer Table 103)
- ☑ Verify all cable and tubing connections
- ☑ Verify Sampler Program is running
- ☑ Verify latches are secure

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 220527 / 825
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, and Flow
- ☒ Enable Sampler: On Trigger, and set velocity equation
- ☐ ~~Set~~ Latch
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

Date/Time Off-Site: 220527 932

SHUT DOWN

Personnel: TLL **Date/Time On-Site:** 220531 / 0912

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
5/31	0912	5.67	0.84	1.003		11.53
Downloaded to:						

On-Site

- ☐ Replace battery if v<11.9
- ☒ Remove battery from Sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote Date/time 220531 / 1540
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, and Flow
- ☒ Enable Sampler: Never

Comments: Forgot to bring a new batt – will do later.

Date/Time Off-Site:

Composite Sample Collection

STATION: Americana **Bottle** 1 **of** 1

Personnel: TLL **Date/Time On-Site:** 220528 / 0802

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	220527 -14 -WC
Approx Sample Volume (mL):	14000 mL
Clarity (ex. Clear, Cloudy, Silty):	~~S.~~ cloudy-pollen
Color (ex. Clear, Gray, Tan, Brown, Black):	light brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	5/27 1846	Success	13	5/27 2356	Success
2	1857		14	5/28 0006	
3	1908		15	0017	
4	1922		16	0032	
5	1943		17	0048	
6	2011		18	0108	
7	2049		19	0132	
8	2141		20	0202	
9	2239		21	0241	
10	2318		22	0327	
11	2332		23	0419	
12	2345		24	0515	

Comments:

If Sampling is Complete:
- ☒ Power off Samplers
- ☐ Disable Flow Meter pacing
- ☐ Resume Flow Meter program
- ☐ Verify Flow Meter is running
- ☒ Add ice to sample transport cooler
- ☒ Complete COC form; arrange transport to lab
- ☐ Current **Velocity Cutoff (fps):** ________

If Continuing Sampling (sample bottle change-out):
- ☐ Keep Flow Meter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning;

Date/Time Restarted: ________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Form 1

Grab Sample Data Form – Phase I , Phase II

STATION: AS 6

Personnel: JL MMS **Date/Time On-Site:** 220527 1940

Flow Meter Current Status						
Level (in)	Flow (cfs)	Total Flow (cf)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1.547	0.03	394	0.38	12.6		

Grab Information				
	Site ID	Date	Time	Labeled?
Site *E.Coli*	220527-206 -WG	220527	1950	☑
Field Duplicate *E.Coli*	-101	~~220527~~		☐
Field Blank *E.Coli*	-001	~~220527~~		☐

Field Parameters						
Meter number	Date	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	Cond (uS/cm)
MP08	~~1955~~ 220527	1955	18.8	4.04	6.31	356.6

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	1

Comments:
220527-206-WG Very dark ~~tan~~ brown.

Date/Time Off-Site: ____________________

Set Up/ Shut Down Form – HACH

TATION: A5 6

SET UP

Personnel: TLL MMJ

Date/Time On-Site: 220527 941

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
950	0	0	0	12.6
Downloaded to:				
Velocity Cutoff:	0.02			
Trigger Volume:	271 cf			

- ☐ Download flowmeter, if program is running
- ☑ Install batteries on flowmeter and sampler
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Verify all cable and tubing connections
- ☑ Check date and time on flowmeter and sampler
- ☑ Set flowmeter program and sampler program parameters
- ☑ Set logging interval to 1 minute
- ☑ Start flowmeter program and sampler program
- ☑ Verify running

Comments:

SHUT DOWN

Personnel: TZL

Date/Time On-Site: 220531 / 0922

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
0922	0.506	0	0	35568	12.3
Downloaded to:		R16			

If flow monitoring is complete:
- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:
- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: AS-6 **Bottle** 1 **of** 1

Personnel: RL **Date/Time On-Site:** 220528 / 0820

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	220527-206 -WC
Approx Sample Volume (mL):	5000 mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	5/27 1904	Success	13		
2	2046	Rinse Error	14		
3	5/28 0008	Success	15		
4	0022		16		
5	0036		17		
6	0052		18		
7	0114		19		
8	0214		20		
9			21		
10			22		
11			23		
12			24		

Comments:

low volume

If sampling is complete:
- ☒ Power off sampler
- ☒ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☒ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: ______
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5”	400 mL	**3.0”**	3500 mL	**5.5”**	7250 mL	**8.0”**	11000 mL	**10.5”**	14750 mL
1.0”	800 mL	**3.5”**	4250 mL	**6.0”**	8000 mL	**8.5”**	11750 mL	**11.0”**	15500 mL
1.5”	1400 mL	**4.0”**	5000 mL	**6.5”**	8750 mL	**9.0”**	12500 mL	**11.5”**	16250 mL
2.0”	2000 mL	**4.5”**	5750 mL	**7.0”**	9500 mL	**9.5”**	13250 mL	**After 12”**	1” = 1500 mL
2.5”	2750 mL	**5.0”**	6500 mL	**7.5”**	10250 mL	**10.0”**	14000 mL	**Lab min**	8,000 mL

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 208-389-7700

Technical Memorandum

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for June 5, 2022

Date: August 18, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the June 5, 2022 storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2022 Phase I Stormwater Outfall Monitoring.

Table 2-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
November 9, 2021	C	C	-	-	-
March 15, 2022	G, C	G, C	G, C	G, C	G, C
April 4, 2022	-	G	-	G	-
May 27, 2022	G[1]	-	G[1], C	C	G[1], C[2]
June 5, 2022	C	C[3]	-	C[3]	C
Collected:	2G, 3C	3G, 2C	2G, 3C	3G, 3C	2G, 3C

Notes:

C = composite sample.

G = grab sample.

[1] E. coli sample qualified due to exceeded hold time

[2] No data on dissolved parameters or NO_x due to low composite sample volume

[3] Composite samples rejected due to lack of representativeness

After the June 5, 2022 storm event, ACHD still needs to collect one grab sample from Lucky, Main, and AS_6 and one composite sample from Whitewater.

Section 3: Storm Event Summary

The June 5, 2022 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A detailed summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form that describes the forecast and summarizes the decision-making process from June 3, 2022 is included in Attachment A for reference.

Friday, June 3, 2022

- The morning of June 3, 2022 the National Weather Service issued a forecast for rain showers and convective thunderstorms in the Boise area on Sunday, June 5, 2022. Rainshadowing was not expected. The chance of precipitation was 90 percent, with 0.12 in of precipitation forecasted.
- Setup was accomplished the afternoon of Friday, June 3. An expected precipitation depth of 0.19 inch was initially used to set trigger volumes at monitoring stations. Due to a change in the forecast, the precipitation depth was changed to 0.11 inch the evening of Saturday, June 4.

Sunday, June 5, 2022

- Light rain started around 1600 and continued for a half an hour. Another wave of light rain started around 1800 and continued for a half an hour. Heavy rain from convective thunderstorms started around 2300 and continued for an hour.
- Precipitation totals ranged between 0.16 and 0.22 inch at local rain gauges.

Flow measurements and precipitation data are included in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Americana, and AS_6 monitoring stations were set up the afternoon of June 3, 2022 to collect flow proportional composite samples during the storm. Sampler enable conditions were programed into the Lucky, Whitewater, and Americana flowmeters. A site-specific velocity cutoff value was programmed into the AS_6 flowmeter. Setup and sampling information is included in Table 1. The field forms completed during setup/shut down and sampling can be found in Attachment D.

Composite Samples

Composite samples were collected at the Lucky, Whitewater, Americana, and AS_6 monitoring stations. The Americana composite sampler was disabled from 20:22 - 23:40 since only background flow was present, not stormwater flow, during that time frame. All composite samples were submitted to the WQL on June 6, 2022 at 1204. Analytical results are included in Table 2. Pollutant loading estimates for the event are included in Table 3.

Section 4: Quality Assurance/Quality Control

A summary of quality control (QC) samples collected during the June 5, 2022 storm event is presented below in Table 4-1. A composite blank was collected from the Main monitoring station. Analytical results for these samples are included in Table 4.

Table 4-1. QC Samples

Sample ID	Sample Type	Conclusions
220605-12-002	Composite Blank	TKN and dissolved copper were detected in the sample

TKN and dissolved copper were detected in the Main composite blank. According to the Quality Assurance Project Plan (QAPP), when an analytical parameter is detected in a blank, all analytical results associated with the blank exhibiting a concentration of less than five times the concentration of the blank will be qualified. All concentrations above five times the blank value will be considered valid because any blank contamination is well below the sample concentration. TKN and dissolved copper detected in the Lucky, Whitewater, Americana, and AS_6 composite samples were greater than five times of the concentration detected in the blank, therefore, the Lucky, Whitewater, Americana, and AS_6 composite samples will be accepted.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. Acceptance and performance criteria for analytical and non-analytical data were met for the Lucky and AS_6 composite samples. Acceptance and performance criteria for analytical and non-analytical data were not met for the Whitewater and Americana composite samples since the composite samples did not represent greater than 75% of the storm and the composite sampling duration was less than six hours.

Data Tables

Table 1. Sampling and Flow Summary				
	Lucky	Whitewater	Americana [1]	AS_6
Grab samples collected and submitted?	NO	NO	NO	NO
Composite samples collected and submitted?	YES	YES	YES	YES
Trigger volume	2895 gal	800 ft^3	2960 ft^3	221 ft^3
Velocity cutoff (fps)	--	--	--	0.02
Sampler enable condition (in)	level > 3.1	level > 2.0	level > 11.25	--
Runoff start time	6/5/22 16:17	6/5/22 23:08	6/5/22 17:38	6/5/22 17:55
Grab sample collection time	--	--	--	--
Composite sample stop time	6/5/22 23:58	6/6/22 0:25	6/5/22 23:40	6/6/22 0:38
Runoff stop time	6/6/22 2:53	6/6/22 4:41	6/6/22 2:03	6/6/22 3:02
Volume of discharge sampled (ft^3)	10,589	4,857	70,671	5,370
Total runoff volume (ft^3)	17,012	28,199	201,600	6,806
Percent of storm flow sampled (%)	62%	17%	35%	79%
Composite sample duration (hrs)	7.5	1.0	4.0	6.5
Storm Precipitation (in)	0.22	0.17	0.20/0.16	0.20/0.16
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front/East	Front/East
Sampler messages (counts): Success	24	5	24	24
Number of composite bottles filled	1	1	1	1
Composite sample volume (Approx.; ml)	12,500	7,250	14,750	15,500

Notes:

[1] The sampler at Americana was disabled from 20:22 - 23:40

Table 2. Field and Analytical Data Summary - Wet Samples

Monitoring Station	Sample Date	Sample ID Grab	Field Parameters: Dissolved Oxygen	pH	Conductivity	Temperature	Analytical Parameters: E. coli	Sample ID Composite	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L
Lucky	6/5/2022	--	--	--	--	--	--	220605-03-WC	18.7	130	21.3	54.3	157	60.0
Whitewater	6/5/2022	--	--	--	--	--	--	220605-11-WC	20.3 [1R]	172 [1R]	57.1 [1R]	108 [1R]	451 [1R]	85.2 [1R]
Americana	6/5/2022	--	--	--	--	--	--	220605-14-WC	9.19 [1R]	138 [1R]	50.4 [1R]	27.6 [1R]	70.6 [1R]	112 [1R]
AS_6	6/5/2022	--	--	--	--	--	--	220605-206-WC	73.3	321	38.4	110	421	114

Monitoring Station	Total Phosphorus	Dissolved Orthophosphate, as P	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	0.676	0.193	0.277	0.196	6.06	1.8	<0.0250	0.11	6.5	0.11	3.8	0.0153	31.8
Whitewater	1.7 [1R]	0.0541 [1R]	<0.0350 [1R]	0.181 [1R]	4.14 [1R]	6.1 [1R]	<0.0250 [1R]	0.9 [1R]	2.9 [1R]	0.12 [1R]	201 [1R]	0.0315 [1R]	13.4 [1R]
Americana	0.218 [1R]	0.0128 [1R]	0.211 [1R]	0.266 [1R]	1.72 [1R]	3.0 [1R]	<0.0250 [1R]	0.069 [1R]	2.7 [1R]	0.054 [1R]	4.5 [1R]	<0.0100 [1R]	12.4 [1R]
AS_6	1.31	0.294	<0.0350	<0.250	10.4	3.9	<0.0250	0.22	6.2	0.55	18.6	0.0321	36.6

Notes:

– = no data.

[1R] Data rejected due to lack of representativeness

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia	Nitrate + Nitrite (N)	TKN
Lucky	6/5/2022	167	0.718	0.294	0.208	6.43
Whitewater	6/5/2022	794 [1R]	2.99 [1R]	0.00 [1R, U]	0.319 [1R]	7.29 [1R]
Americana	6/5/2022	888	2.74	2.65	3.3	21.6
AS_6	6/5/2022	179 [1R]	0.556 [1R]	0.00743 [1R, U]	0.0531 [1R, U]	4.42 [1R]

Notes:

– = no data.

[1R] Data rejected due to lack of representativeness

[U] Concentrations are at or below the method detection limit (MDL). A value of half the MDL was used in calculations.

Table 4. QC Sample Summary																					
Date	Sample ID	Type	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
6/5/2022	220605-12-002	Composite Blank	<2.00	<13.0	<0.115	<0.3	<0.900	<25.0	<6.00E-3	<2.00E-3	<0.0350	<0.0250	0.147	<0.0400	<0.0250	<0.0250	0.18	<0.0500	<0.0500	<0.0100	<0.780

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 6/3/2022	Time: 7:53 AM	Initials: TL
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)	Yes	

Past 72 hr Precip	0.00”
Date and time of expected event	6/5 6am – 11pm
Expected amount of precipitation	0.12” from 12pm – 6pm
Percent chance of precipitation	90%
Percent chance of >0.10” over 12 hours	46%

NWS Update

I spoke with Bill at NWS this morning. He said that there is some rain coming in Saturday, but totals are looking lower – around 0.05”. The better storm is coming Sunday. For Sunday’s storm, the models are in good agreement in getting >0.10”. There is not much of a chance of rainshadowing.

Targeted Station & Samples

Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☐ Grab	☒ Grab	☐ Grab	☒ Grab	☐ Grab
☒ Composite	☒ Composite	☐ Composite	☒ Composite	☒ Composite	☐ Composite

Type of Forecasted Precipitation

☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☒ Thunder Showers	☐ Snowmelt
☐ Other:		

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday
☐ Waiting on Antecedent Dry Period – Expires:
☐ Equipment Concerns:
☐ Other:

Text Forecast

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 6:47 am MDT Jun 3, 2022

Today: A 20 percent chance of showers and thunderstorms after noon. Some of the storms could produce gusty winds. Partly sunny, with a high near 82. Calm wind becoming west 5 to 7 mph in the afternoon.
Tonight: A 20 percent chance of showers after midnight. Mostly cloudy, with a low around 58. North northwest wind around 5 mph becoming calm in the evening.
Saturday: Showers likely. Cloudy, with a high near 70. North northwest wind 5 to 7 mph. Chance of precipitation is 70%.
Saturday Night: A 30 percent chance of showers, mainly after midnight. Mostly cloudy, with a low around 55. East wind 3 to 8 mph.
Sunday: Showers and possibly a thunderstorm. High near 71. Calm wind becoming south southeast around 5 mph in the morning. Chance of precipitation is 90%. New rainfall amounts between a tenth and quarter of an inch, except higher amounts possible in thunderstorms.
Sunday Night: Showers likely and possibly a thunderstorm before midnight, then a slight chance of showers. Mostly cloudy, with a low around 51. Chance of precipitation is 60%.

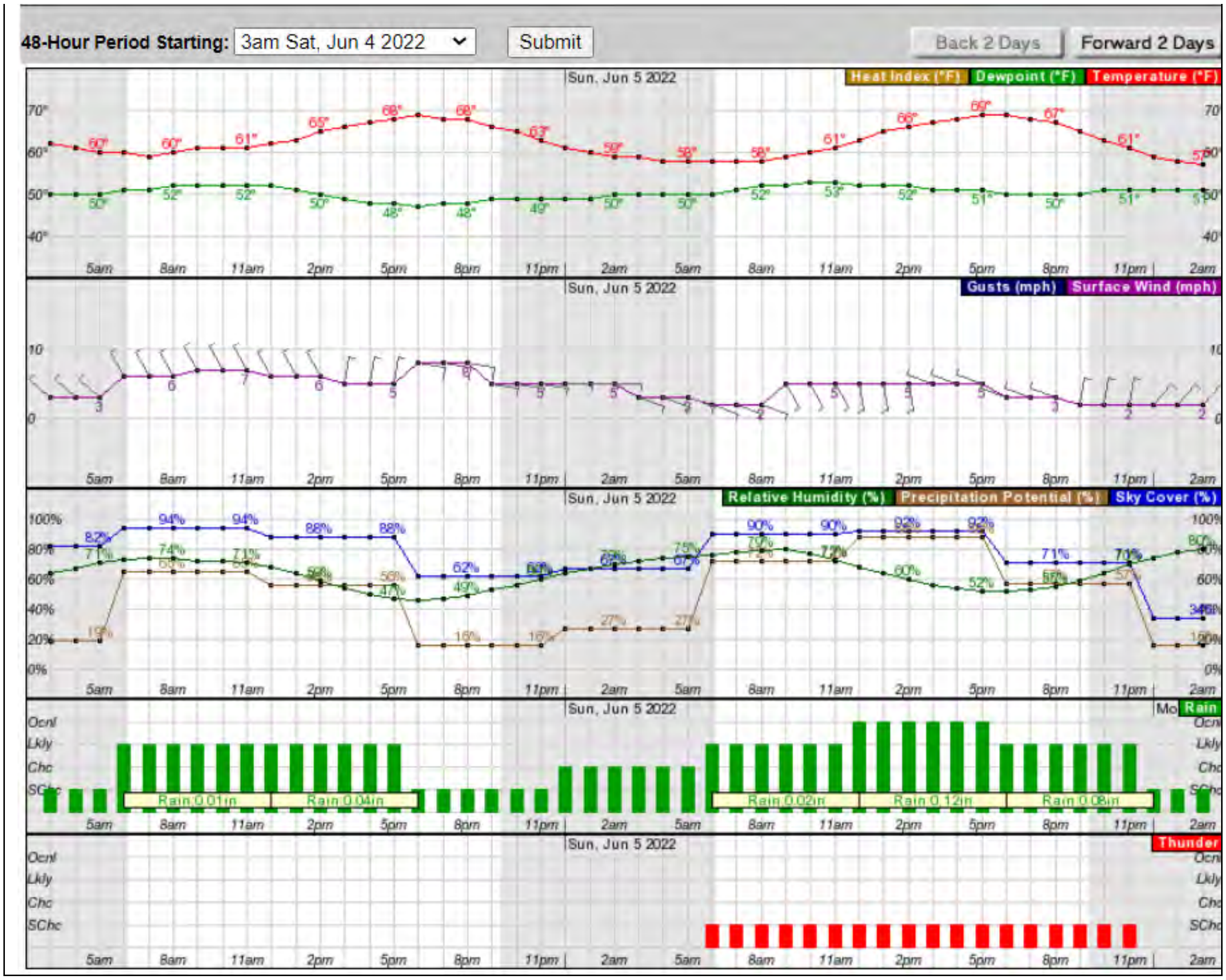
Monday: A 20 percent chance of showers. Mostly sunny, with a high near 73.
Monday Night: Mostly clear, with a low around 49.
Tuesday: Sunny, with a high near 76.
Tuesday Night: Partly cloudy, with a low around 54.
Wednesday: Mostly cloudy, with a high near 81.
Wednesday Night: Mostly cloudy, with a low around 55.
Thursday: Partly sunny, with a high near 82.

Forecast Discussion
Area Forecast Discussion
National Weather Service Boise ID
300 AM MDT Fri Jun 3 2022

.SHORT TERM...Today through Sunday night...Showers continue to move through the region this morning. Models indicate moisture will linger with a returning opportunity for thunderstorms this afternoon and evening. Though conditions look most favorable for storms across eastern Oregon and the central Idaho mountains, indications remain in place for a few storms to move through valley locations as well. Gusty winds and brief heavy rain could accompany any storm activity. **The next disturbance will send a more potent push of moisture across the forecast area on Saturday, though instability is lacking keeping the thunderstorm threat minimal.** Precipitable water amounts across the region however do indicate periods of heavy rain with the incoming showers. After a brief break overnight, **another system will bring additional showers and thunderstorms across the forecast area on Sunday afternoon and evening. Similar threats of gusty wind and heavy rain remain.** The thunderstorm threat will weaken through the evening, with showers lingering across Baker County through the central Idaho mountains into Sunday night. Temperatures remain around 5 degrees above normal today. The onset of a cooling trend on Saturday will bring values a few degrees below normal for Saturday and Sunday.

.LONG TERM...Monday through Friday...Unsettled conditions with near normal temperatures are expected early in the week as a trough of low pressure moves through the region. The best chance for additional precipitation looks to be Monday, with a focus on higher terrain. There is general agreement among the operational and ensemble models that a high pressure ridge will begin to build into the Intermountain West later in the week. While the models agree on this trend, there are significant variations in the strength of the ridge. So, while **a drying and warming trend can be expected Wednesday into next weekend**, the extent of the warming is still uncertain.

Hourly Forecast


48-Hour Period Starting: 3am Sat, Jun 4 2022
Submit
Back 2 Days
Forward 2 Days
Sun, Jun 5 2022
Heat Index (°F)
Dewpoint (°F)
Temperature (°F)
Gusts (mph)
Surface Wind (mph)
Relative Humidity (%)
Precipitation Potential (%)
Sky Cover (%)
Rain
Thunder
Rain 0.01in
Rain 0.04in
Rain 0.02in
Rain 0.12in
Rain 0.08in
Ocnl
Lkly
Chc
SChc
5am
8am
11am
2pm
5pm
8pm
11pm
2am

Storm Event QA/QC Checklist – Phase I

STORM DATE 220605

A. Event and Data Completeness	Yes	No	N/A	Notes
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed			X	none collected
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member	X			
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)	0.10	0.08	—	0.08	0.08	< 0.11" in 72 hrs	X		
2. Precipitation (inches)	0.22	0.17	0.20	0.20/0.16 ~~0.18~~	0.20/0.16 ~~0.18~~	> 0.10"	X		
3. Sampled amount (% of total run-off)	62	17	—	35	79	>= 75% or >= 6 hrs: no qualifier >= 50% and <75%: qualify < 50%: reject	Lucky AS-6		WW Amer
4. Composite sample duration (hours)	7.5	1.0	—	4.0	6.5				
4. Ecoli sample holding time (hours)	N/A					<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject			
5. Filtering of samples for dissolved parameter analysis (hours)	12	12	—	13	12	<= 24 hrs: no qualifier > 24 hrs.: reject	X		

D. Notes

WW intake tubing clogged during the event. After the event, on 6.9.22, the intake tubing was moved to a new location to avoid future sediment clogging.

Reviewed by Tamara Lighthe **Date** 07.18.22

Approved by Monica Love **Date** 7/25/22

Updated 220718 TL

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth =	0.11	in
Square Feet per Acre =	43560	ft^2/ac
Inches per Foot=	12	in/ft
Aliquots per Sample=	17	

Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

Site	Area (ac)	Using RC Based on Land Use			Using Manually-entered RC		
		RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)	RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.46	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.76	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7760.00	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.80	**2960**
#206 AS_6	204	0.257	20935	**1231**	0.046	3747.03	**221**
#18 State	34	0.419	5688	**335**	0.144	1954.97	**122**
Theoretical	80	0.200	6389		0.000		

NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]

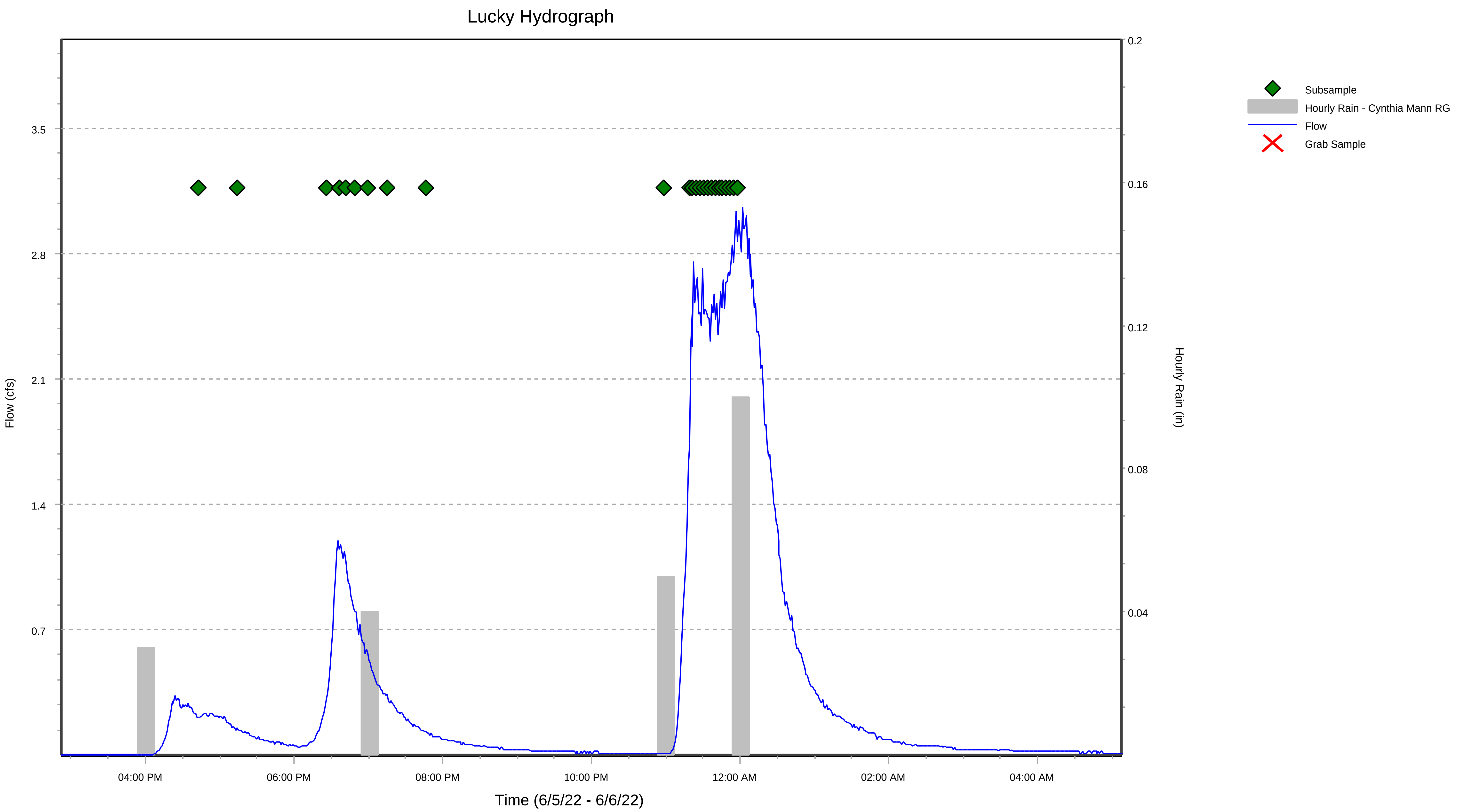
all values taken from historically corrected runoff coefficents

total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)

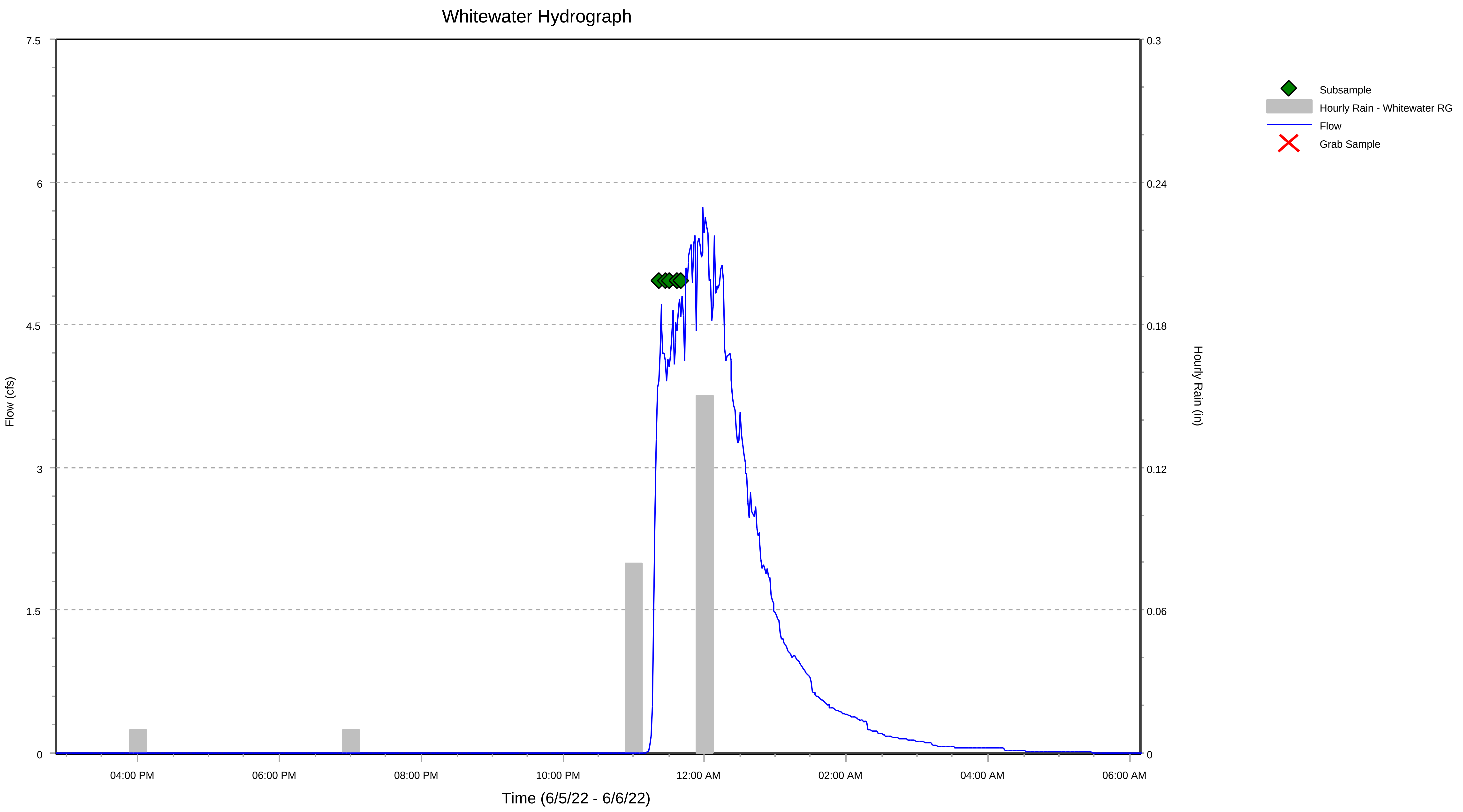
Measured runoff

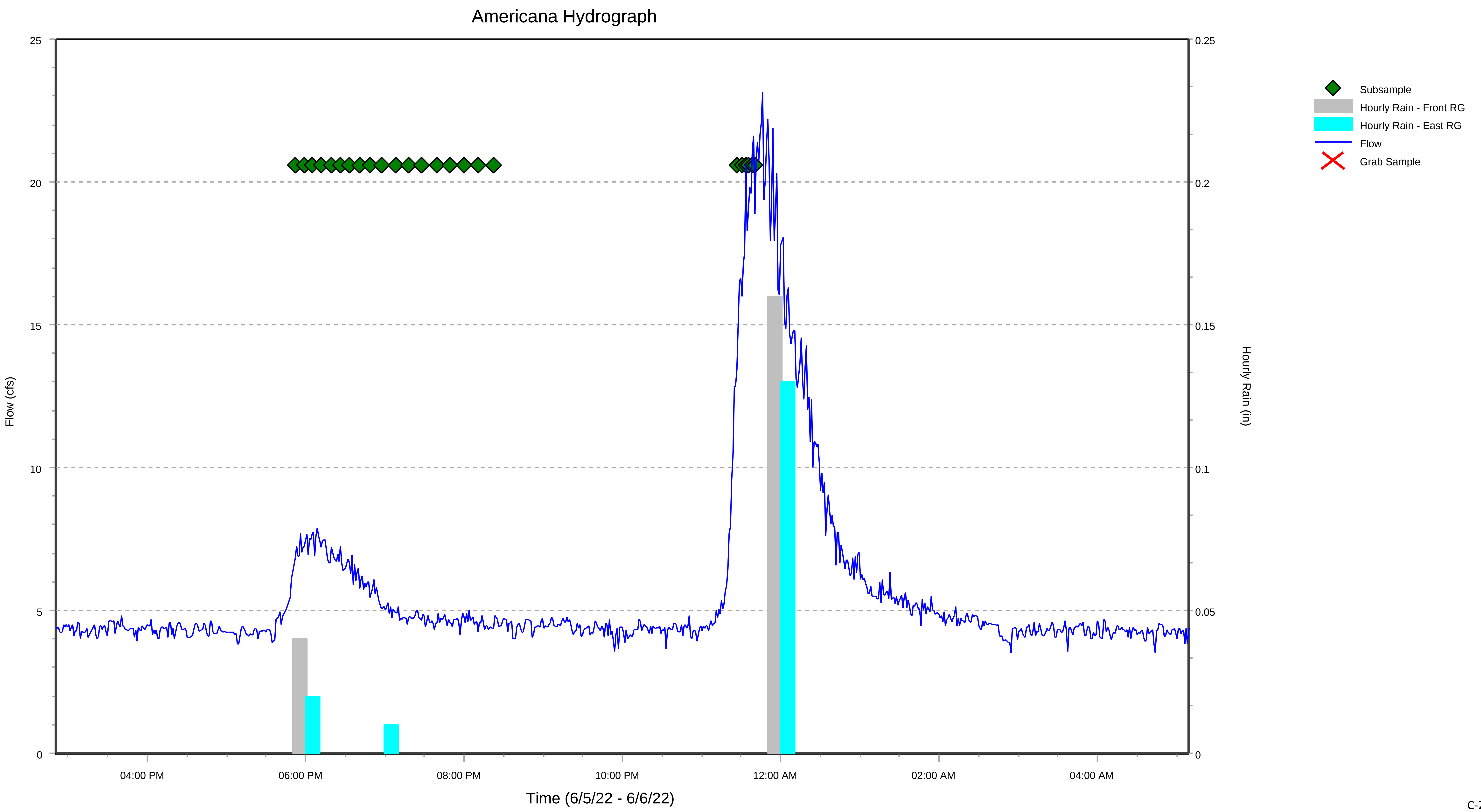
RC = measured runoff / total runoff

Attachment B: Storm Event Hydrographs

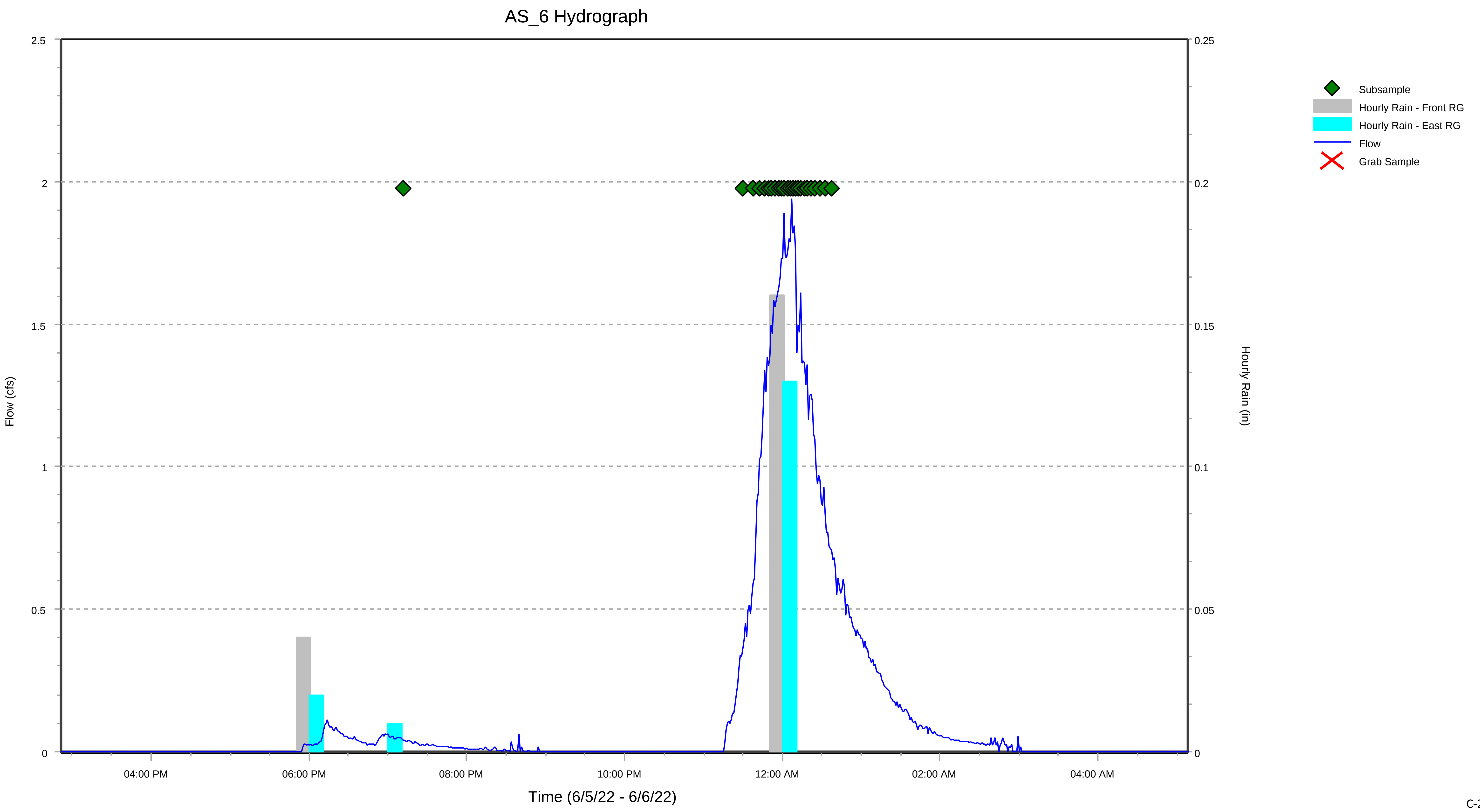


Lucky Hydrograph
Subsample
Hourly Rain - Cynthia Mann RG
Flow
Grab Sample
Flow (cfs)
3.5
2.8
2.1
1.4
0.7
Hourly Rain (in)
0.2
0.16
0.12
0.08
0.04
04:00 PM
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
Time (6/5/22 - 6/6/22)


Whitewater Hydrograph
Flow (cfs)
Hourly Rain (in)
7.5
6
4.5
3
1.5
0
0.3
0.24
0.18
0.12
0.06
0
04:00 PM
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
06:00 AM
Time (6/5/22 - 6/6/22)
Subsample
Hourly Rain - Whitewater RG
Flow
Grab Sample



Americana Hydrograph
Flow (cfs)
Hourly Rain (in)
Time (6/5/22 - 6/6/22)
0
5
10
15
20
25
0
0.05
0.1
0.15
0.2
0.25
04:00 PM
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
Subsample
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Grab Sample


AS_6 Hydrograph
Flow (cfs)
Hourly Rain (in)
2.5
2
1.5
1
0.5
0
0.25
0.2
0.15
0.1
0.05
0
04:00 PM
06:00 PM
08:00 PM
10:00 PM
12:00 AM
02:00 AM
04:00 AM
Time (6/5/22 - 6/6/22)
Subsample
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Grab Sample

Attachment C: Storm Event Analytical Reports

Report Date: 07/12/2022 14:43

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00214-01	ACST1C	220605-12-002	Water		06/05/2022	06/06/2022
AC00214-02	ACST1C	220605-14-WC	Water		06/05/2022	06/06/2022
AC00214-03	ACST1C	220605-206-WC	Water		06/06/2022	06/06/2022
AC00214-04	ACST1C	220605-11-WC	Water		06/06/2022	06/06/2022
AC00214-05	ACST1C	220605-03-WC	Water		06/05/2022	06/06/2022

Report Date: 07/12/2022 14:43

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
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Analysis Report

Location:	ACST1C	Location Description:	220605-12-002
Date/Time Collected:	06/05/2022 12:00		
Lab Number:	AC00214-01	Sample Collector:	MMJ
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222182	<0.0350	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/08/22	6/8/22 12:01	GKH	U
BOD5	B222166	<2.00	mg/L	2.00	2.00	SM 5210 B-2011	06/07/22	6/12/22 12:43	BAK	Prep-02 U
COD	B222161	<13.0	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/06/22	6/6/22 15:37	KMR	U
Nitrate-Nitrite, as N	B222313	<0.0250	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:42	ALN	U
TKN	B222201	0.147	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/09/22	6/10/22 9:45	ALN	
Total Dissolved Solids	B222169	<25.0	mg/L	25.0	25.0	SM 2540 C-2011	06/07/22	6/9/22 9:44	CJP	U
Total Suspended Solids	B222168	<0.900	mg/L	0.900	0.900	SM 2540 D-2011	06/07/22	6/7/22 10:03	HAL	U
Turbidity	B222158	<0.3	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	06/06/22	6/6/22 13:28	CJP	U
Dissolved Wet Chemistry										
Orthophosphate, as P	B222175	<2.00E-3	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/07/22	6/7/22 12:42	BAK	H U
Total Metals										
Mercury	B222171	<0.0100	ug/L	0.0100	0.0100	EPA 245.2	06/07/22	6/8/22 9:05	SAS	U
Arsenic	B222234	<0.0400	ug/L	0.040	0.040	EPA 200.8	06/16/22	6/17/22 13:27	DMW	U
Cadmium	B222234	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/17/22 13:27	DMW	U
Calcium	B222178	<0.0460	mg/L	0.0460	0.0460	EPA 200.7	06/07/22	6/30/22 18:52	EDM	U
Lead	B222234	<0.0500	ug/L	0.050	0.050	EPA 200.8	06/16/22	6/17/22 13:27	DMW	U
Magnesium	B222178	<50.0	ug/L	50.0	50.0	EPA 200.7	06/07/22	6/30/22 18:52	EDM	U
Phosphorus as P	B222178	<6.00E-3	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/07/22	6/30/22 18:52	EDM	U
Hardness	B222178	<0.115	mg/L	0.115	0.115	EPA 200.7	06/07/22	6/30/22 18:52	EDM	U
Dissolved Metals										
Cadmium	B222142	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 13:51	DMW	U
Copper	B222142	0.18	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 13:51	DMW	
Lead	B222142	<0.0500	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 13:51	DMW	U
Zinc	B222142	<0.780	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 13:51	DMW	U

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 07/12/2022 14:43

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
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Analysis Report

Location:	ACST1C	Location Description:	220605-14-WC
Date/Time Collected:	06/05/2022 17:52 - 06/05/2022 23:40		
Lab Number:	AC00214-02	Sample Collector:	MMJ
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222182	0.211	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/08/22	6/8/22 12:08	GKH	
BOD5	B222166	9.19	mg/L	2.00	2.00	SM 5210 B-2011	06/07/22	6/12/22 12:38	BAK	
COD	B222161	138	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/06/22	6/6/22 15:37	KMR	
Nitrate-Nitrite, as N	B222313	0.266	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:43	ALN	
TKN	B222201	1.72	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/09/22	6/10/22 9:46	ALN	
Total Dissolved Solids	B222169	112	mg/L	25.0	25.0	SM 2540 C-2011	06/07/22	6/9/22 9:45	CJP	
Total Suspended Solids	B222168	70.6	mg/L	0.900	0.900	SM 2540 D-2011	06/07/22	6/7/22 10:04	HAL	
Turbidity	B222158	27.6	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	06/06/22	6/6/22 13:37	CJP	
Dissolved Wet Chemistry										
Orthophosphate, as P	B222175	0.0128	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/07/22	6/7/22 13:00	BAK	
Total Metals										
Mercury	B222171	<0.0100	ug/L	0.0100	0.0100	EPA 245.2	06/07/22	6/8/22 9:02	SAS	U
Arsenic	B222234	3.0	ug/L	0.040	0.040	EPA 200.8	06/16/22	6/17/22 13:29	DMW	
Cadmium	B222234	0.069	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/17/22 13:29	DMW	
Calcium	B222178	15.7	mg/L	0.0460	0.0460	EPA 200.7	06/07/22	6/30/22 18:58	EDM	
Lead	B222234	4.5	ug/L	0.050	0.050	EPA 200.8	06/16/22	6/17/22 13:29	DMW	
Magnesium	B222178	2740	ug/L	50.0	50.0	EPA 200.7	06/07/22	6/30/22 18:58	EDM	
Phosphorus as P	B222178	0.218	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/07/22	6/30/22 18:58	EDM	
Hardness	B222178	50.4	mg/L	0.115	0.115	EPA 200.7	06/07/22	6/30/22 18:58	EDM	
Dissolved Metals										
Cadmium	B222142	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 13:53	DMW	U
Copper	B222142	2.7	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 13:53	DMW	
Lead	B222142	0.054	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 13:53	DMW	
Zinc	B222142	12.4	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 13:53	DMW	

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Report Date: 07/12/2022 14:43

Analysis Report

Location:	ACST1C	Location Description:	220605-206-WC
Date/Time Collected:	06/05/2022 19:12 - 06/06/2022 00:38		
Lab Number:	AC00214-03	Sample Collector:	MMJ
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222182	<0.0350	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/08/22	6/8/22 12:35	GKH	U
BOD5	B222166	73.3	mg/L	2.00	2.00	SM 5210 B-2011	06/07/22	6/12/22 12:32	BAK	
COD	B222161	321	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/06/22	6/6/22 15:37	KMR	
Nitrate-Nitrite, as N	B222313	<0.0250	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:45	ALN	U
TKN	B222201	10.4	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/09/22	6/10/22 9:47	ALN	
Total Dissolved Solids	B222169	114	mg/L	25.0	25.0	SM 2540 C-2011	06/07/22	6/9/22 9:46	CJP	
Total Suspended Solids	B222168	421	mg/L	0.900	0.900	SM 2540 D-2011	06/07/22	6/7/22 11:02	HAL	
Turbidity	B222158	110	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	06/06/22	6/6/22 13:45	CJP	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222175	0.294	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/07/22	6/7/22 12:45	BAK	
Total Metals										
Mercury	B222171	0.0321	ug/L	0.0100	0.0100	EPA 245.2	06/07/22	6/8/22 8:34	SAS	
Arsenic	B222234	3.9	ug/L	0.040	0.040	EPA 200.8	06/16/22	6/17/22 13:32	DMW	
Cadmium	B222234	0.22	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/17/22 13:32	DMW	
Calcium	B222178	10.8	mg/L	0.0460	0.0460	EPA 200.7	06/07/22	6/30/22 19:03	EDM	
Lead	B222234	18.6	ug/L	0.050	0.050	EPA 200.8	06/16/22	6/17/22 13:32	DMW	
Magnesium	B222178	2790	ug/L	50.0	50.0	EPA 200.7	06/07/22	6/30/22 19:03	EDM	
Phosphorus as P	B222178	1.31	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/07/22	6/30/22 19:03	EDM	
Hardness	B222178	38.4	mg/L	0.115	0.115	EPA 200.7	06/07/22	6/30/22 19:03	EDM	
Dissolved Metals										
Cadmium	B222142	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 13:56	DMW	U
Copper	B222142	6.2	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 13:56	DMW	
Lead	B222142	0.55	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 13:56	DMW	
Zinc	B222142	36.6	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 13:56	DMW	

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Report Date: 07/12/2022 14:43

Analysis Report

Location:	ACST1C	Location Description:	220605-11-WC
Date/Time Collected:	06/05/2022 23:20 - 06/06/2022 00:25		
Lab Number:	AC00214-04	Sample Collector:	MMJ
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222182	<0.0350	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/08/22	6/8/22 12:29	GKH	U
BOD5	B222166	20.3	mg/L	2.00	2.00	SM 5210 B-2011	06/07/22	6/12/22 12:21	BAK	
COD	B222161	172	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/06/22	6/6/22 15:37	KMR	
Nitrate-Nitrite, as N	B222313	0.181	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:46	ALN	
TKN	B222201	4.14	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/09/22	6/10/22 9:49	ALN	
Total Dissolved Solids	B222169	85.2	mg/L	25.0	25.0	SM 2540 C-2011	06/07/22	6/9/22 9:47	CJP	
Total Suspended Solids	B222168	451	mg/L	0.900	0.900	SM 2540 D-2011	06/07/22	6/7/22 11:03	HAL	
Turbidity	B222158	108	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	06/06/22	6/6/22 13:56	CJP	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222175	0.0541	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/07/22	6/7/22 12:46	BAK	
Total Metals										
Mercury	B222171	0.0315	ug/L	0.0100	0.0100	EPA 245.2	06/07/22	6/8/22 9:09	SAS	
Arsenic	B222234	6.1	ug/L	0.040	0.040	EPA 200.8	06/16/22	6/17/22 13:34	DMW	
Cadmium	B222234	0.90	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/17/22 13:34	DMW	
Calcium	B222178	16.1	mg/L	0.0460	0.0460	EPA 200.7	06/07/22	6/30/22 19:08	EDM	
Lead	B222234	201	ug/L	0.25	0.050	EPA 200.8	06/16/22	6/17/22 13:42	DMW	M-06, D
Magnesium	B222178	4080	ug/L	50.0	50.0	EPA 200.7	06/07/22	6/30/22 19:08	EDM	
Phosphorus as P	B222178	1.70	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/07/22	6/30/22 19:08	EDM	
Hardness	B222178	57.1	mg/L	0.115	0.115	EPA 200.7	06/07/22	6/30/22 19:08	EDM	
Dissolved Metals										
Cadmium	B222142	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 13:58	DMW	U
Copper	B222142	2.9	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 13:58	DMW	
Lead	B222142	0.12	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 13:58	DMW	
Zinc	B222142	13.4	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 13:58	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 07/12/2022 14:43

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Analysis Report

Location:	ACST1C	Location Description:	220605-03-WC
Date/Time Collected:	06/05/2022 16:42 - 06/05/2022 23:58		
Lab Number:	AC00214-05	Sample Collector:	MMJ
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222182	0.277	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/08/22	6/8/22 12:24	GKH	
BOD5	B222166	18.7	mg/L	2.00	2.00	SM 5210 B-2011	06/07/22	6/12/22 12:15	BAK	
COD	B222161	130	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/06/22	6/6/22 15:37	KMR	
Nitrate-Nitrite, as N	B222313	0.196	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:47	ALN	
TKN	B222201	6.06	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/09/22	6/10/22 9:51	ALN	
Total Dissolved Solids	B222169	60.0	mg/L	25.0	25.0	SM 2540 C-2011	06/07/22	6/9/22 9:48	CJP	
Total Suspended Solids	B222168	157	mg/L	0.900	0.900	SM 2540 D-2011	06/07/22	6/7/22 11:09	HAL	
Turbidity	B222158	54.3	NTU	0.6	0.3	EPA 180.1, Rev. 2.0 (1993)	06/06/22	6/6/22 14:06	CJP	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222175	0.193	mg/L	2.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/07/22	6/7/22 13:01	BAK	
Total Metals										
Mercury	B222171	0.0153	ug/L	0.0100	0.0100	EPA 245.2	06/07/22	6/8/22 9:12	SAS	
Arsenic	B222234	1.8	ug/L	0.040	0.040	EPA 200.8	06/16/22	6/17/22 13:36	DMW	
Cadmium	B222234	0.11	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/17/22 13:36	DMW	
Calcium	B222178	6.23	mg/L	0.0460	0.0460	EPA 200.7	06/07/22	6/30/22 19:14	EDM	
Lead	B222234	3.8	ug/L	0.050	0.050	EPA 200.8	06/16/22	6/17/22 13:36	DMW	
Magnesium	B222178	1400	ug/L	50.0	50.0	EPA 200.7	06/07/22	6/30/22 19:14	EDM	
Phosphorus as P	B222178	0.676	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/07/22	6/30/22 19:14	EDM	
Hardness	B222178	21.3	mg/L	0.115	0.115	EPA 200.7	06/07/22	6/30/22 19:14	EDM	
Dissolved Metals										
Cadmium	B222142	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/09/22	6/9/22 14:01	DMW	U
Copper	B222142	6.5	ug/L	0.15	0.15	EPA 200.8	06/09/22	6/9/22 14:01	DMW	
Lead	B222142	0.11	ug/L	0.050	0.050	EPA 200.8	06/09/22	6/9/22 14:01	DMW	
Zinc	B222142	31.8	ug/L	0.78	0.78	EPA 200.8	06/09/22	6/9/22 14:01	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B222158									
Blank (B222158-BLK1)									
Turbidity	<0.3	NTU					06/06/2022	CJP	U
LCS (B222158-BS1)									
Turbidity			100	90-110			06/06/2022	CJP	
Duplicate (B222158-DUP1) Source ID: AC00214-02									
Turbidity					2.98	25	06/06/2022	CJP	
Batch: B222161									
Blank (B222161-BLK1)									
COD	<13	mg/L					06/06/2022	KMR	U
LCS (B222161-BS1)									
COD			97.3	90-110			06/06/2022	KMR	
Duplicate (B222161-DUP1) Source ID: AC00214-05									
COD					5.97	10	06/06/2022	KMR	
Batch: B222166									
Blank (B222166-BLK1)									
BOD5	<2	mg/L					06/12/2022	BAK	U
LCS (B222166-BS1)									
BOD5			90.0	84.6-115.4			06/12/2022	BAK	
LCS (B222166-BS2)									
BOD5			101	84.6-115.4			06/12/2022	BAK	
Duplicate (B222166-DUP1) Source ID: BB02124-01									
BOD5					2.58	30	06/12/2022	BAK	
Batch: B222168									
Blank (B222168-BLK1)									
Total Suspended Solids	<0.9	mg/L					06/07/2022	HAL	U
LCS (B222168-BS1)									
Total Suspended Solids			99.5	90-110			06/07/2022	HAL	
Duplicate (B222168-DUP1) Source ID: BB02123-01									
Total Suspended Solids					8.12	20	06/07/2022	HAL	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222169									
Blank (B222169-BLK1)									
Total Dissolved Solids	<25	mg/L					06/09/2022	CJP	U
LCS (B222169-BS1)									
Total Dissolved Solids			106	90-110			06/09/2022	CJP	
Duplicate (B222169-DUP1) Source ID: AC00214-05									
Total Dissolved Solids					0.830	10	06/09/2022	CJP	
Batch: B222182									
Blank (B222182-BLK1)									
Ammonia, as N	<0.035	mg/L					06/08/2022	GKH	U
Blank (B222182-BLK2)									
Ammonia, as N	<0.035	mg/L					06/08/2022	GKH	U
LCS (B222182-BS1)									
Ammonia, as N			102	90-110			06/08/2022	GKH	
LCS (B222182-BS2)									
Ammonia, as N			105	90-110			06/08/2022	GKH	
Duplicate (B222182-DUP1) Source ID: WB01963-01									
Ammonia, as N					3.36	10	06/08/2022	GKH	
Duplicate (B222182-DUP2) Source ID: WB01895-07									
Ammonia, as N					2.35	10	06/08/2022	GKH	
Duplicate (B222182-DUP3) Source ID: WB01898-05									
Ammonia, as N					5.88	10	06/08/2022	GKH	
Matrix Spike (B222182-MS1) Source ID: WB01963-01									
Ammonia, as N			98.6	80-120			06/08/2022	GKH	
Matrix Spike (B222182-MS2) Source ID: WB01895-07									
Ammonia, as N			99.3	80-120			06/08/2022	GKH	
Matrix Spike (B222182-MS3) Source ID: WB01898-05									
Ammonia, as N			105	80-120			06/08/2022	GKH	
Matrix Spike Dup (B222182-MSD1) Source ID: WB01963-01									
Ammonia, as N			101	80-120	1.89	10	06/08/2022	GKH	
Matrix Spike Dup (B222182-MSD2) Source ID: WB01895-07									
Ammonia, as N			99.0	80-120	0.240	10	06/08/2022	GKH	
Matrix Spike Dup (B222182-MSD3) Source ID: WB01898-05									
Ammonia, as N			95.0	80-120	6.53	10	06/08/2022	GKH	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222201									
Blank (B222201-BLK1)									
TKN	<0.1	mg/L					06/10/2022	ALN	U
Blank (B222201-BLK2)									
TKN	<0.1	mg/L					06/10/2022	ALN	U
LCS (B222201-BS1)									
TKN			85.4	80-120			06/10/2022	ALN	
LCS (B222201-BS2)									
TKN			106	80-120			06/10/2022	ALN	
Duplicate (B222201-DUP1) Source ID: BB02122-01									
TKN					9.03	20	06/10/2022	ALN	D
Duplicate (B222201-DUP2) Source ID: BB02124-01									
TKN					4.39	20	06/10/2022	ALN	D
Duplicate (B222201-DUP3) Source ID: BB02126-04									
TKN					1.08	20	06/10/2022	ALN	D
Matrix Spike (B222201-MS1) Source ID: BB02122-01									
TKN			94.7	80-120			06/10/2022	ALN	D
Matrix Spike (B222201-MS2) Source ID: BB02124-01									
TKN			92.2	80-120			06/10/2022	ALN	D
Matrix Spike (B222201-MS3) Source ID: BB02126-04									
TKN			119	80-120			06/10/2022	ALN	D
Matrix Spike (B222201-MS4) Source ID: WQ00115-01									
TKN			93.2	80-120			06/10/2022	ALN	D
Matrix Spike Dup (B222201-MSD1) Source ID: BB02122-01									
TKN			104	80-120	5.86	20	06/10/2022	ALN	D
Matrix Spike Dup (B222201-MSD2) Source ID: BB02124-01									
TKN			100	80-120	3.82	20	06/10/2022	ALN	D
Matrix Spike Dup (B222201-MSD3) Source ID: BB02126-04									
TKN			105	80-120	6.70	20	06/10/2022	ALN	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222313									
Blank (B222313-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
Blank (B222313-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
Blank (B222313-BLK3)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
LCS (B222313-BS1)									
Nitrate-Nitrite, as N			96.0	90-110			06/16/2022	ALN	
LCS (B222313-BS2)									
Nitrate-Nitrite, as N			95.7	90-110			06/16/2022	ALN	
LCS (B222313-BS3)									
Nitrate-Nitrite, as N			95.2	90-110			06/16/2022	ALN	
Duplicate (B222313-DUP1) Source ID: AC00212-01									
Nitrate-Nitrite, as N					0.194	10	06/16/2022	ALN	
Duplicate (B222313-DUP2) Source ID: BB02120-01									
Nitrate-Nitrite, as N					0.276	10	06/16/2022	ALN	
Duplicate (B222313-DUP3) Source ID: BB02130-01									
Nitrate-Nitrite, as N					0.773	10	06/16/2022	ALN	
Duplicate (B222313-DUP4) Source ID: BB02136-04									
Nitrate-Nitrite, as N					0.212	10	06/16/2022	ALN	
Duplicate (B222313-DUP5) Source ID: LS01194-02									
Nitrate-Nitrite, as N					NR	10	06/16/2022	ALN	U
Duplicate (B222313-DUP6) Source ID: WB01908-07									
Nitrate-Nitrite, as N					NR	10	06/16/2022	ALN	U
Matrix Spike (B222313-MS1) Source ID: AC00212-01									
Nitrate-Nitrite, as N			96.0	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS2) Source ID: BB02120-01									
Nitrate-Nitrite, as N			91.9	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS3) Source ID: BB02130-01									
Nitrate-Nitrite, as N			96.5	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS4) Source ID: BB02136-04									
Nitrate-Nitrite, as N			94.2	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS5) Source ID: LS01194-02									
Nitrate-Nitrite, as N			94.7	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS6) Source ID: WB01908-07									
Nitrate-Nitrite, as N			95.1	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS7) Source ID: WQ00115-08									
Nitrate-Nitrite, as N			95.4	90-110			06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD1) Source ID: AC00212-01									
Nitrate-Nitrite, as N			95.5	90-110	0.373	10	06/16/2022	ALN	

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Quality Control Report
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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222313 (Continued)									
Matrix Spike Dup (B222313-MSD2) Source ID: BB02120-01									
Nitrate-Nitrite, as N			92.2	90-110	0.0919	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD3) Source ID: BB02130-01									
Nitrate-Nitrite, as N			95.9	90-110	0.537	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD4) Source ID: BB02136-04									
Nitrate-Nitrite, as N			93.6	90-110	0.200	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD5) Source ID: LS01194-02									
Nitrate-Nitrite, as N			95.4	90-110	0.700	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD6) Source ID: WB01908-07									
Nitrate-Nitrite, as N			95.1	90-110	0.0336	10	06/16/2022	ALN	
Dissolved Wet Chemistry									
Batch: B222175									
Blank (B222175-BLK1)									
Orthophosphate, as P	<0.002	mg/L					06/07/2022	BAK	U
LCS (B222175-BS1)									
Orthophosphate, as P			97.6	90-110			06/07/2022	BAK	
Duplicate (B222175-DUP1) Source ID: BB02124-01									
Orthophosphate, as P					1.81	10	06/07/2022	BAK	D
Duplicate (B222175-DUP2) Source ID: WB01898-07									
Orthophosphate, as P					0.395	10	06/07/2022	BAK	D
Matrix Spike (B222175-MS1) Source ID: BB02124-01									
Orthophosphate, as P			99.0	90-110			06/07/2022	BAK	D
Matrix Spike (B222175-MS2) Source ID: WB01898-07									
Orthophosphate, as P			104	90-110			06/07/2022	BAK	D
Matrix Spike Dup (B222175-MSD1) Source ID: BB02124-01									
Orthophosphate, as P			100	90-110	0.512	10	06/07/2022	BAK	D
Matrix Spike Dup (B222175-MSD2) Source ID: WB01898-07									
Orthophosphate, as P			102	90-110	1.20	10	06/07/2022	BAK	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B222171									
Blank (B222171-BLK1)									
Mercury	<0.01	ug/L					06/08/2022	SAS	U
LCS (B222171-BS1)									
Mercury			101	85-115			06/08/2022	SAS	
Duplicate (B222171-DUP1) Source ID: AC00214-03									
Mercury					12.1	20	06/08/2022	SAS	
Matrix Spike (B222171-MS1) Source ID: AC00214-03									
Mercury			100	70-130			06/08/2022	SAS	
Matrix Spike Dup (B222171-MSD1) Source ID: AC00214-03									
Mercury			99.1	70-130	1.09	20	06/08/2022	SAS	
Batch: B222178									
Blank (B222178-BLK1)									
Calcium	<0.046	mg/L					06/30/2022	EDM	U
Magnesium	<50	ug/L					06/30/2022	EDM	U
Phosphorus as P	<0.006	mg/L					06/30/2022	EDM	U
LCS (B222178-BS1)									
Calcium			92.6	85-115			06/30/2022	EDM	
Magnesium			93.7	85-115			06/30/2022	EDM	
Phosphorus as P			107	85-115			06/30/2022	EDM	
Duplicate (B222178-DUP1) Source ID: AC00214-05									
Calcium					1.66	20	06/30/2022	EDM	
Magnesium					0.603	20	06/30/2022	EDM	
Phosphorus as P					2.24	20	06/30/2022	EDM	
Matrix Spike (B222178-MS1) Source ID: AC00214-05									
Calcium			91.1	70-130			06/30/2022	EDM	
Magnesium			94.7	70-130			06/30/2022	EDM	
Phosphorus as P			103	70-130			06/30/2022	EDM	
Matrix Spike Dup (B222178-MSD1) Source ID: AC00214-05									
Calcium			92.9	70-130	1.28	20	06/30/2022	EDM	
Magnesium			95.4	70-130	0.646	20	06/30/2022	EDM	
Phosphorus as P			111	70-130	3.30	20	06/30/2022	EDM	

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Quality Control Report
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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B222234									
Blank (B222234-BLK1)									
Arsenic	<0.040	ug/L					06/17/2022	DMW	U
Cadmium	<0.025	ug/L					06/17/2022	DMW	U
Lead	<0.050	ug/L					06/17/2022	DMW	U
LCS (B222234-BS1)									
Arsenic			98.5	85-115			06/17/2022	DMW	
Cadmium			101	85-115			06/17/2022	DMW	
Lead			102	85-115			06/17/2022	DMW	
Duplicate (B222234-DUP1) Source ID: ST00013-01									
Arsenic					1.46	20	06/17/2022	DMW	
Cadmium					NR	20	06/17/2022	DMW	U
Lead					4.91	20	06/17/2022	DMW	
Matrix Spike (B222234-MS1) Source ID: ST00013-01									
Arsenic			98.7	70-130			06/17/2022	DMW	
Cadmium			100	70-130			06/17/2022	DMW	
Lead			97.8	70-130			06/17/2022	DMW	
Matrix Spike Dup (B222234-MSD1) Source ID: ST00013-01									
Arsenic			98.7	70-130	0.0403	20	06/17/2022	DMW	
Cadmium			98.3	70-130	1.87	20	06/17/2022	DMW	
Lead			97.7	70-130	0.102	20	06/17/2022	DMW	
Batch: B222344									
Blank (B222344-BLK1)									
Lead	<0.050	ug/L					06/30/2022	DMW	U
LCS (B222344-BS1)									
Lead			103	85-115			06/30/2022	DMW	
Duplicate (B222344-DUP1) Source ID: WR00032-04									
Lead					NR	20	06/30/2022	DMW	U
Matrix Spike (B222344-MS1) Source ID: WR00032-04									
Lead			99.4	70-130			06/30/2022	DMW	
Matrix Spike Dup (B222344-MSD1) Source ID: WR00032-04									
Lead			101	70-130	1.49	20	06/30/2022	DMW	

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Quality Control Report
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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B222142									
Blank (B222142-BLK1)									
Cadmium	<0.025	ug/L					06/09/2022	DMW	U
Copper	<0.15	ug/L					06/09/2022	DMW	U
Lead	<0.050	ug/L					06/09/2022	DMW	U
Zinc	<0.78	ug/L					06/09/2022	DMW	U
LCS (B222142-BS1)									
Cadmium			105	85-115			06/09/2022	DMW	
Copper			105	85-115			06/09/2022	DMW	
Lead			106	85-115			06/09/2022	DMW	
Zinc			107	85-115			06/09/2022	DMW	
Duplicate (B222142-DUP1) Source ID: AC00212-01									
Cadmium					6.50	10	06/09/2022	DMW	
Copper					0.713	10	06/09/2022	DMW	
Lead					0.0662	10	06/09/2022	DMW	
Zinc					0.121	10	06/09/2022	DMW	
Matrix Spike (B222142-MS1) Source ID: AC00212-01									
Cadmium			104	70-130			06/09/2022	DMW	
Copper			99.9	70-130			06/09/2022	DMW	
Lead			102	70-130			06/09/2022	DMW	
Zinc			104	70-130			06/09/2022	DMW	
Matrix Spike Dup (B222142-MSD1) Source ID: AC00212-01									
Cadmium			100	70-130	4.12	10	06/09/2022	DMW	
Copper			97.8	70-130	0.880	10	06/09/2022	DMW	
Lead			98.6	70-130	3.69	10	06/09/2022	DMW	
Zinc			100	70-130	1.25	10	06/09/2022	DMW	

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Notes and Definitions

Item	Definition
D	Data reported from a dilution
H	Hold time Exceeded.
M-06	The reported result has been confirmed by reanalysis.
Prep-02	Sample pH was adjusted to be within method pH range.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero, or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): SMK
MMJ

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
AC00214																									
-01	220605	220605	1200	1200	220605-12-002	MMJ	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-02	220605	220605	1752	2340	220605-14-WC	MMJ	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-03	220605	220606	1912	0038	220605-206-WC	MMJ	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-04	220605	220606	2320	0025	220605-11-WC	MMJ	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1
-05	220605	220605	1642	2355	220605-03-WC	MMJ	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	1

C-262

Relinquished by (sign)	Date & Time Transferred	Received by (sign)
[signature]	220606 1204	[signature] 6-6-22 1206

Comments/Special Instructions:

220605-11-WC since low sample volume prioritize total over dissolved.

ALL ANALYTES WERE SPLIT AND LOGGED IN. [initials]

ACHD Sample Filtration, Splitting, and Compositing for Metals

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: ACO0214-01 Location: ACSTIC Sample Date: 6-5-22 Sample ID: 12-002	Split Date: 6-6-22 Start Split: 1210 Start Filter: 1210 Comp Time: — Analyst: Amo/DKT	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:	Coll Jug: CC00026-71 Comp Jug: — SS Tubing: CC00030-06 SS Helper: (SSA2) ↓ Stir Bar: CC00025-10 Connector: CC00027-58	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	-Clear (Blank) used (2) VOSS
Lims#: ACO0214-05 Location: ACSTIC Sample Date: 6-5-22 Sample ID: -03	Split Date: 6-6-22 Start Split: 1223 Start Filter: 1223 Comp Time: — Analyst: Amo/DKT	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☒Other: 10.0µm	Coll Jug: CC00026-71 Comp Jug: — SS Tubing: CC00022-81 (SSA3) SS Helper: CC00027-97 Stir Bar: 112112C Connector: CC00027-58 (x2)	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	- Dirty used (3) VOSS
Lims#: ACO0214-04 Location: ACSTIC Sample Date: 6-6-22 Sample ID: -11	Split Date: 6-6-22 Start Split: 1238 Start Filter: 1238 Comp Time: — Analyst: Amo/DKT	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☒Other: 10.0µm	Coll Jug: CC00026-51 Comp Jug: — SS Tubing: CC00030-06 SS Helper: (SSA5) ↓ Stir Bar: CC00014-57 Connector: CC00027-58 (x2)	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	-Dirty used (3) VOSS
Lims#: ACO0214-02 Location: ACSTIC Sample Date: 6-5-22 Sample ID: -14	Split Date: 6-6-22 Start Split: 1300 Start Filter: 1300 Comp Time: — Analyst: Amo/DKT	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:	Coll Jug: CC00027-56 Comp Jug: — SS Tubing: CC00030-06 SS Helper: (SSA6) ↓ Stir Bar: CC00014-57 Connector: CC00027-58	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	- Lt. Brown color used (2) VOSS
Lims#: ACO0214-03 Location: ACSTIC Sample Date: 6-6-22 Sample ID: -206	Split Date: 6-6-22 Start Split: 1314 Start Filter: 1314 Comp Time: — Analyst: Amo/DKT	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☒Other: 10.0µm ☒ Other: 0.45 Max capacity	Coll Jug: CC00027-56 Comp Jug: — SS Tubing: CC00029-AF SS Helper: (SSA4) ↓ Stir Bar: CC00030-04 Connector: CC00027-58 CC00030-03	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	-Very Dirty used (4) VOSS (including (1) max capacity

ACHD Sample Filtration, Splitting, and Compositing for Metals

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: ACOO Location: ACSTIC Sample Date: ____ Sample ID: ____	Split Date: 6-6-22 Start Split: ____ Start Filter: ____ Comp Time: — Analyst: Amo/DKT	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: — SS Tubing: CC00029-AF SS Helper: (559) ↓ Stir Bar: CC00030-04 Connector: CC00027-58	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	didn't need (NO OUP) REC'D
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	

Attachment D: Field Forms

Set Up/ Shut Down Form – HACH

TATION: Lucky

SET UP

Personnel: SMK, TLL

Date/Time On-Site: 6/13 13:56

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1403	1.62	0	0	12.9
Downloaded to:	—			
Sample Enable ~~Velocity Cutoff~~:	level > 3.1", deadband 1.5"			
Trigger Volume:	~~2950~~ gal 2895			

- ~~☐ Download flowmeter, if program is running~~
- ☑ Install batteries on flowmeter and sampler
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program 6/13 18:50
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 6/17 1018

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1020	1.69	0	0		12.4
Downloaded to:	Green USB				

If flow monitoring is complete:	If continuing to monitor flow:
~~☐ Halt~~ program on flowmeter	☐ Replace flowmeter battery
☒ Download flowmeter data	☐ Reset logging interval to 15 minutes
☒ Remove flowmeter battery	☐ Change velocity cutoff to 0.02 fps
	☐ Start program
	☐ Verify running

Comments:

Composite Sample Collection

STATION: LUCKY

Personnel: GMK MMJ

Bottle 1 **of** 1

Date/Time On-Site: 06/06 9:34

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220605-03 -WC
Approx Sample Volume (mL):	12500
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	220605 1642	NA	13	2325	NA
2	1714		14	2328	
3	1826		15	2331	
4	1836		16	2334	
5	1842		17	~~2334~~ 2337	
6	1849		18	2340	
7	1859		19	2343	
8	1915		20	2346	
9	1946		21	2349	
10	2258		22	2352	
11	2317		23	2355	
12	2320		24	2358	

Comments:

If sampling is complete:
- ☑ Power off sampler
- ☐ Verify flowmeter is running
- ☑ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out): NA
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: ______________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5”	400 mL	**3.0”**	3500 mL	**5.5”**	7250 mL	**8.0”**	11000 mL	**10.5”**	14750 mL
1.0”	800 mL	**3.5”**	4250 mL	**6.0”**	8000 mL	**8.5”**	11750 mL	**11.0”**	15500 mL
1.5”	1400 mL	**4.0”**	5000 mL	**6.5”**	8750 mL	**9.0”**	12500 mL	**11.5”**	16250 mL
2.0”	2000 mL	**4.5”**	5750 mL	**7.0”**	9500 mL	**9.5”**	13250 mL	**After 12”**	1” = 1500 mL
2.5”	2750 mL	**5.0”**	6500 mL	**7.5”**	10250 mL	**10.0”**	14000 mL	**Lab min**	8,000 mL

Set Up/ Shut Down Form – ISCO

TATION: Whitewater

SET UP

Personnel: SML, TLL

Date/Time On-Site: 6/3/22 13:28

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
13:28	0.26	0.00	0.08	–
Downloaded to:	–			
Enable Condition:	level > 2", hysteresis 1.5"			
Flow Pulse Interval:	~~1200~~ cf 800			

On-Site

- ☑ Replace flowmeter battery, install sampler battery
- ☑ Perform decon. cycle
- ☐ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Set Sampler program parameters
- ☑ Check date/time on Sampler
- ☐ Verify all cable and tubing connections
- ☑ Verify Sampler Program is running 6/4 17:40

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 6/3 1143
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 6/7 0958

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
0917	-0.26	0	0	–
Downloaded to:	–			

On-Site

- ~~☐ Replace flowmeter battery~~
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 6/7 0915
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: WhitewatER **Bottle** 1 **of** 1
Personnel: SHK MMJ **Date/Time On-Site:** 220606 1010

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220605 - 11 -WC
Approx Sample Volume (mL):	7250mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	gray
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	6/05 2320		13	2355	" "
2	2323	"no liquid detected"	14	2357	" "
3	2326		15	6/6 0000	" "
4	2329		16	0002	" "
5	2333	"no more liquid"	17	0005	" "
6	2336		18	0007	" "
7	2339		19	0010	" "
8	2341	"no more liquid"	20	0013	" "
9	2344	" "	21	0015	" "
10	2347	" "	22	0018	" "
11	2350	"no liquid detected"	23	0022	" "
12	2352	" "	24	0025	" "

Comments:

If sampling is complete:	**If continuing sampling (sample bottle change-out):** NA
☑ Power off sampler	☐ Keep flowmeter running
☑ Verify flowmeter is running	☐ Install new 15L bottle; add ice
☑ Add ice to sample transport cooler	☐ Restart program from beginning
☐ Complete COC form; arrange transport to lab	**Date/Time Restarted:** ______
	☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Composite Sample Collection

STATION: MAIN **Bottle** 1 **of** 1

Personnel: SMK MMS **Date/Time On-Site:** 220606 1023

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	220605-12-002 ~~-103-~~ (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	220605 NA	NA	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

This ~~was~~ is a blank sample.

If sampling is complete:	If continuing sampling (sample bottle change-out):
☑ Power off sampler	☐ Keep flowmeter running
☐ Verify Flowmeter is running	☐ Install new 15L bottle; add ice
☐ Add ice to sample transport cooler	☐ Restart program from beginning
☐ Complete COC form; arrange transport to lab	**Date/Time Restarted:** ______
	☐ Verify running

NA

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Set Up/ Shut Down Form – ~~Phase II~~ ISCO

STATION: Americana

UP

Personnel: TZL, SMK **Date/Time On-Site:** 6-3-22 / 1500

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
6/3	1500	9.95	0.83	0.434		12.47
Downloaded to:						
Trigger Condition:	level > 11.25", hysteresis 1.5"					
Flow Pulse Interval:	~~4020~~ cf 2960					

On-Site
- ☒ Replace battery if v<11.9
- ☒ Perform Decon. Cycle
- ☒ Place 15L sample bottle in cooler, with ice
- ☒ Remove jar lid and put in clean re-sealable plastic bag
- ☒ Set Sampler program parameters (refer Table 103)
- ☒ Verify all cable and tubing connections
- ☒ Verify Sampler Program is running 6/4 1709
- ☒ Verify latches are secure

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote; Date/time 6/3 1130
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, and Flow
- ☒ Enable Sampler: On Trigger, and set velocity equation
- ~~☐ Set Latch~~
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

Date/Time Off-Site: __________

SHUT DOWN

Personnel: TZL **Date/Time On-Site:** 6/7 1206

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
6/7	0919	10.17	0.92	0.526		11.85
Downloaded to:						

On-Site
- ☒ Replace battery if v<11.9
- ☒ Remove battery from Sampler

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote Date/time 6/7 0919
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, and Flow
- ☒ Enable Sampler: Never

Comments:

Date/Time Off-Site: __________

Composite Sample Collection

STATION: Americana **Bottle** 1 **of** 1
Personnel: NMJ SMK **Date/Time On-Site:** 220606 1041

☑ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	220605-14-WC
Sample ID:	~~220606-14~~ ~~WC~~
Approx Sample Volume (mL):	14750 mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	220506 1752		13	1928	
2	1759		14	1939	
3	1805		15	1949	
4	1812		16	2000	
5	1819		17	2011	
6	1826		18	2022	~~Program disabled~~ TL Success
7	1833		19	2326	~~Program enabled~~ TL Success
8	1841		20	2330	
9	1849		21	2333	
10	1858		22	2335	
11	1908		23	2338	
12	1918		24	2340	

Comments:

Subsamples 18 and 19 were successful.

If Sampling is Complete:
- ☑ Power off Samplers
- ☐ Disable Flow Meter pacing
- ☐ Resume Flow Meter program
- ☑ Verify Flow Meter is running
- ☑ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab
- ☐ Current **Velocity Cutoff (fps):** ____________

If Continuing Sampling (sample bottle change-out):
- ☐ Keep Flow Meter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning;

Date/Time Restarted: ________________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Set Up/ Shut Down Form – HACH

TATION: AS-6

SET UP

Personnel: TLL, SMK

Date/Time On-Site: 06.03.22 /1431

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
14:34	0.0	0.0	0.0	12.6

Downloaded to:	
Velocity Cutoff:	0.02
Trigger Volume:	~~302~~ cf 221

- ~~☐ Download flowmeter, if program is running~~
- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments: Flowmeter restarted w/ new trigger volume
Sampler started 6/4 1726

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 6/7 1130

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1034	0	0	0	6778	12.5
Downloaded to:	R6				

If flow monitoring is complete:	If continuing to monitor flow:
☐ Halt program on flowmeter	☐ Replace flowmeter battery
☒ Download flowmeter data	☐ Reset logging interval to 15 minutes
☒ Remove flowmeter battery	☐ Change velocity cutoff to 0.02 fps
	☐ Start program
	☐ Verify running

Comments:

Composite Sample Collection

STATION: ASG
Personnel: SMK MMJ

Bottle 1 **of** 1
Date/Time On-Site: 220606 1105

☑ Halt Sampler program	
☑ Put lid on sample bottle; label sample bottle	
Sample ID:	220605-206 -WC
Approx Sample Volume (mL):	15500mL
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Dark Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	220605 1912	NA	13	0006	
2	2330		14	0008	
3	2338		15	0010	
4	2343		16	0012	
5	2347		17	0014	
6	2350		18	0017	
7	2352		19	0019	
8	2355		20	0022	
9	2357		21	0025	
10	2359		22	0029	
11	220606 0001		23	0033	
12	0004		24	0038	

Comments:

If sampling is complete:
- ☑ Power off sampler
- ☑ Verify flowmeter is running
- ☑ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning
- **Date/Time Restarted:** ________
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 208-389-7700

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2022

Project No.: 157527

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for June 12, 2022

Date: August 16, 2022

To: Tammy Lightle

Cc: Monica Lowe

From: Shannon Kronz, Project Engineer

Prepared by: Shannon Kronz, Project Engineer

Reviewed by: Erin Cox, Project Manager

Section 1: Introduction

The EPA Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, the Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2022. The following storm event report summarizes the stormwater sampling results from the June 12, 2022 storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2022 Phase I Stormwater Outfall Monitoring.

Table 2-1. WY 2022 Samples Collected

Date	Lucky	Whitewater	Main	Americana	AS_6
October 22, 2021	G	G	G, C	G, C	G, C
November 9, 2021	C	C	-	-	-
March 15, 2022	G, C	G, C	G, C	G, C	G, C
April 4, 2022	-	G	-	G	-
May 27, 2022	G[1]	-	G[1], C	C	G[1], C[2]
June 5, 2022	C	C[3]	-	C[3]	C
June 12, 2022	G	C	G	-	G
Collected:	3G, 3C	3G, 3C	3G, 3C	3G, 3C	3G, 3C

Notes:

C = composite sample.

G = grab sample.

[1] E. coli sample qualified due to exceeded hold time

[2] No data on dissolved parameters or NO_x due to low composite sample volume

[3] Composite samples rejected due lack of representativeness

After the June 12, 2022 storm event, ACHD completed the stormwater monitoring requirements for Phase I monitoring sites for WY 2022.

Section 3: Storm Event Summary

The June 12, 2022 storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A detailed summary of the forecast on which monitoring decisions were based is included below. The sampling event communication form that describes the forecast and summarizes the decision-making process from June 12, 2022 is included in Attachment A for reference.

Friday, June 10, 2022

- On the morning of June 10, 2022 the National Weather Service issued a forecast for convective thunderstorms in the Boise area on Sunday, June 12, 2022. Rainshadowing was not expected. The chance of precipitation was 90 percent, with 0.39 inches of precipitation forecasted.
- Setup was accomplished on June 10, 2022. An expected precipitation depth of 0.19 inch was used to set trigger volumes at monitoring stations.

Sunday, June 12, 2022

- Rain started around 0800 and continued for two hours. A second wave of rain started around 1100 and continued for an hour. A third, heavy wave of rain started around 1400 and continued for an hour.
- Precipitation totals ranged between 0.62 and 0.69 inch at local rain gauges.

Flow measurements and precipitation data are included in Table 1 along with a sampling summary. Hydrographs showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

The Whitewater monitoring station was set up the morning of June 10, 2022 to collect flow proportional composite samples during the storm. A sample enable condition was programed into the Whitewater flowmeter. Setup and sampling information is included in Table 1. The field forms completed during setup/shut down and sampling can be found in Attachment D.

Grab Samples

One, two-member team mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on the morning of June 12, 2022. Grab samples were submitted to the West Boise Water Quality Lab (WQL) at 1101 on June 12. Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are located in Attachment C.

Composite Samples

A composite sample was collected at the Whitewater monitoring station. The volume of the composite sample submitted was sufficient for all parameters. The composite sample was submitted to the WQL on June 12 at 1602. Analytical results are included in Table 2. Pollutant loading estimates for the event are included in Table 3.

Section 4: Quality Assurance/Quality Control

A summary of quality control (QC) samples collected during the June 12, 2022 storm event is presented below in Table 4-1. A field blank and a field duplicate were collected from the Lucky monitoring station. The

Whitewater composite sample was divided into a composite split at the WQL. Analytical results for these samples are included in Table 4.

Table 4-1. QC Samples			
Sample ID	Sample Type	Parent Sample	Conclusions
220612-03-001	Field Blank	Lucky Grab	No E. coli detection was reported in the field blank.
220612-03-101	Field Duplicate	Lucky Grab	Relative percent difference was within the acceptable range.
220612-11-103	Composite Split	Whitewater Composite	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. Acceptance and performance criteria for analytical and non-analytical data were met for this storm event.

Data Tables

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	NO	YES	NO	YES
Composite samples collected and submitted?	NO	YES	NO	NO	NO
Trigger volume (ft^3)	--	1,600	--	--	--
Velocity cutoff (fps)	--	--	--	--	--
Sampler enable condition (in)	--	level > 2.0"	--	--	--
Runoff start time	8:37	9:01	8:36	--	8:50
Grab sample collection time	9:51	--	9:24	--	10:22
Composite sample stop time	--	15:27	--	--	--
Runoff stop time	17:08	17:50	17:47	--	17:46
Volume of discharge sampled (ft^3)	--	100,411	--	--	--
Total runoff volume (ft^3)	50,626	110,696	62,831	--	34,941
Percent of storm flow sampled (%)	--	91%	--	--	--
Composite sample duration (hrs)	--	6.0	--	--	--
Storm Precipitation (in)	0.69	0.68	0.62	0.62/0.68	0.62/0.68
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	--	63	--	--	--
Number of composite bottles filled	--	3	--	--	--
Composite sample volume (Approx.; ml)	--	38,250	--	--	--

Notes:

– = no data.

Table 2. Field and Analytical Data Summary - Wet Samples

Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				Analytical Parameters																				
			Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	Sample ID Composite	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate, as P	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	6/12/2022	220612-03-WG	7.58	6.09	49.6	18.38	1480.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Whitewater	--	--	--	--	--	--	--	220612-11-WC	53.0	195	23.7	53.5	181	70.2	0.997	0.489	0.458	0.176	4.35	2.6	<0.0250	0.11	5.5	0.27	8.8	0.0194	24.2
Main	6/12/2022	220612-12-WG	7.92	6.45	44.8	19.4	8600.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AS_6	6/12/2022	220612-206-WG	6.64	6.42	87.2	18.21	5120.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

– = no data.

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia	Nitrate + Nitrite (N)	TKN
Whitewater	6/12/2022	1250	6.89	3.16	1.22	30.1

Table 4. QC Sample Summary

Date	Parent Sample	Sample ID	Type	E. coli	BOD_5	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
				mpn/100 mL	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
6/12/2022	Lucky Grab	220612-03-001	Field Blank	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6/12/2022	Lucky Grab	220612-03-101	Field Duplicate	1119.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calculated parent/duplicate RPD				3%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
6/12/2022	Whitewater Composite	220612-11-103	Composite Split	--	52.5	187	24	53.9	170	79.8	0.994	0.475	0.433	0.177	4.06	2.5	<0.0250	0.11	5.4	0.29	8.2	0.0188	24.0
Calculated parent/duplicate RPD				--	0.9%	4.2%	0%	0.7%	6.3%	12.8%	0.3%	2.9%	5.6%	0.6%	6.9%	3.9%	0%	0%	1.8%	7.1%	7.1%	3.1%	0.8%
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%

Notes:

– = no data.

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 6/10/2022	Time: 7:42 AM	Initials: TL
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Yes

Past 72 hr Precip	0.01”
Date and time of expected event	6/12 6am – midnight
Expected amount of precipitation	0.39”
Percent chance of precipitation	90%
Percent chance of >0.10” over 12 hours	54%

NWS Update

I spoke with Steven at NWS this morning. The models are all showing totals greater than 0.10” on Sunday, but the timing of that differs between models. The official forecast is 0.09” from 6am-noon, 0.16” from noon-6pm, and 0.14” from 6pm-midnight. There is a 20% chance of t-storms starting Saturday afternoon, and if we happen to get that then we will likely get >0.10” during the t-storm. The instability associated with this system should negate any chance of rainshadowing.

Targeted Station & Samples

Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☐ Grab	☒ Grab	☐ Grab	☒ Grab	☐ Grab
☐ Composite	☒ Composite	☐ Composite	☐ Composite	☐ Composite	☐ Composite

Type of Forecasted Precipitation

☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☒ Thunder Showers	☐ Snowmelt
☐ Other:		

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday
☐ Waiting on Antecedent Dry Period – Expires:
☐ Equipment Concerns:
☐ Other:

Text Forecast

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 3:45 am MDT Jun 10, 2022

Today: Mostly sunny and hot, with a high near 90. Light and variable wind.
Tonight: Partly cloudy, with a low around 65. Calm wind becoming northwest around 6 mph.
Saturday: A 20 percent chance of showers and thunderstorms after noon. Some of the storms could produce small hail and gusty winds. Partly sunny, with a high near 83. Calm wind becoming northwest 5 to 9 mph in the afternoon.
Saturday Night: A slight chance of showers and thunderstorms. Some of the storms could produce small hail and gusty winds. Mostly cloudy, with a low around 59. North northwest wind 5 to 8 mph becoming calm after midnight. Chance of precipitation is 20%.
Sunday: Showers likely, then showers and possibly a thunderstorm after noon. Some of the storms could produce small hail, gusty winds, and heavy rain. High near 77. Calm wind becoming southeast 5 to 8 mph in

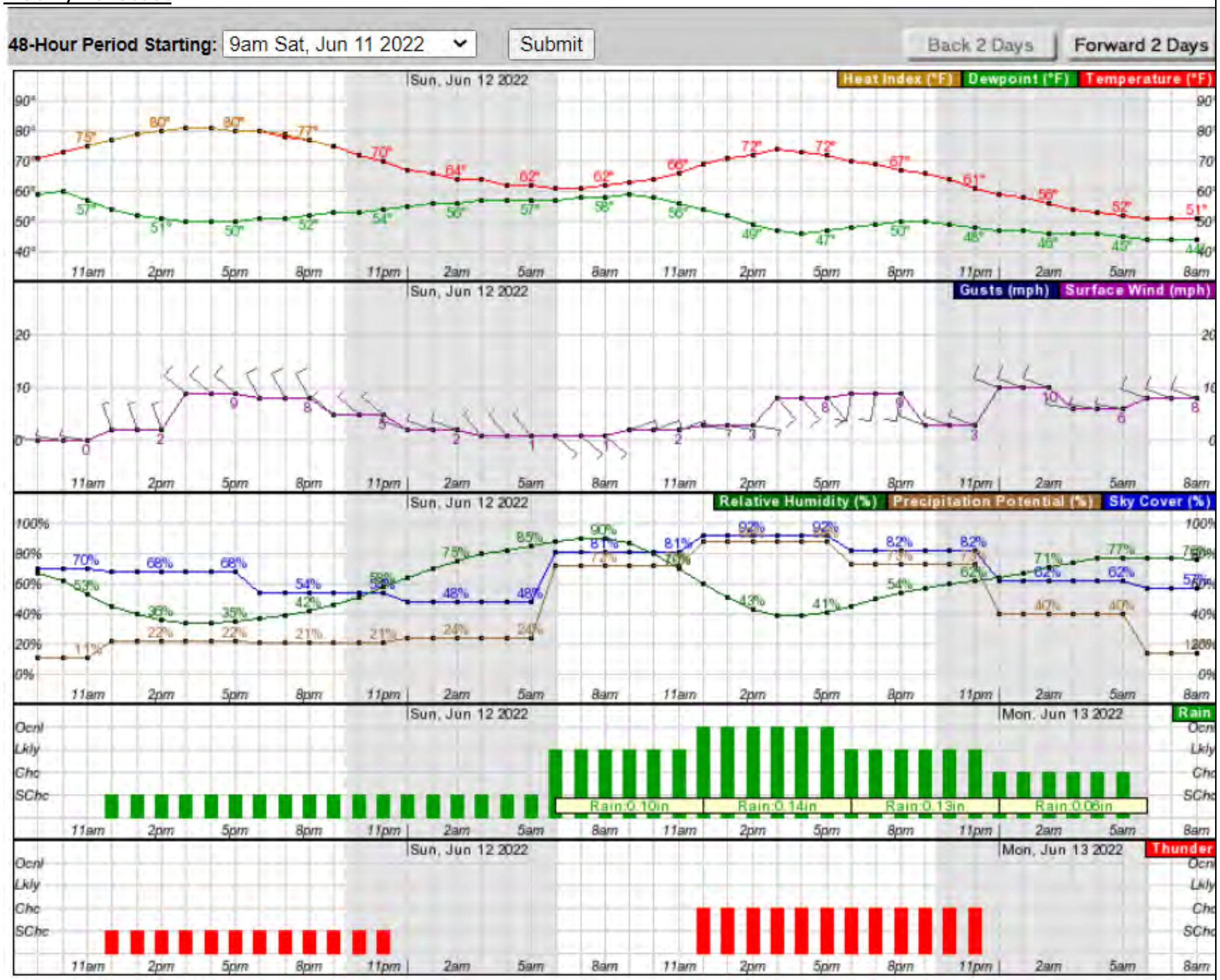
the afternoon. Chance of precipitation is 90%. New rainfall amounts between a tenth and quarter of an inch, except higher amounts possible in thunderstorms.
Sunday Night: Showers likely and possibly a thunderstorm before midnight, then a chance of showers. Some of the storms could produce small hail, gusty winds, and heavy rain. Mostly cloudy, with a low around 48. Chance of precipitation is 70%. New precipitation amounts between a tenth and quarter of an inch, except higher amounts possible in thunderstorms.
Monday: Mostly sunny, with a high near 64.
Monday Night: Mostly clear, with a low around 44.
Tuesday: Sunny, with a high near 68.
Tuesday Night: Mostly clear, with a low around 46.
Wednesday: Sunny, with a high near 80.
Wednesday Night: Mostly clear, with a low around 55.
Thursday: Sunny and hot, with a high near 90.

Forecast Discussion
Area Forecast Discussion
National Weather Service Boise ID
359 AM MDT Fri Jun 10 2022

.SHORT TERM...Today through Sunday night...Southwest flow aloft will continue through the weekend. Pacific moisture streaming into the Northwest will shift far enough south today for scattered showers and isolated afternoon thunderstorms across the north (Baker County to the West Central Mountains). Otherwise, expect mostly clear skies and warmer temperatures. Highs will be in the upper 80s to lower 90s across the lower valleys. **The moist plume will shift a little further south on Saturday for a better chance for showers and thunderstorms**, with widespread showers expected across the far north. **Instability will become more favorable for thunderstorms capable of producing gusty winds and small hail.** Temperatures will be several degrees cooler. **An upper disturbance will move through the region Sunday through Sunday night. The disturbance will enhance the rainfall rates with the convection. Locally heavy rainfall is possible - especially in the northern mountainous areas** (Baker County and central Idaho). **In addition to the heavy rainfall, gusty winds and small hail may once again accompany the stronger thunderstorms.** Temperatures will be even cooler with highs within a few degrees of normal.

.LONG TERM...Monday through Friday...Slightly cooler and windy across the region on Monday as (the drier half of) a large trough continues to make its way through the area, exiting by Wednesday morning. **Some persistent moisture will be available across the Boise and West Central Mountains making them the focal point for any shower activity through late afternoon Tuesday. There is a slight chance for afternoon thunderstorms on Monday.** Shower coverage is expected to gradually lessen. Gusty winds will be a factor throughout the forecast period, initially associated with the exiting low, tapering off on Wednesday. They are expected to pick back up again Thursday afternoon with the approach of the next strong low pressure system. Look for fair to partly cloudy skies throughout most of the region through most of the period with increasing clouds and the chance for showers back in the forecast by Friday with the approach of the next system. High temperatures are expected to start off in the mid to upper 60`s and then rapidly shoot up to around the 80`s and 90`s starting Wednesday.

Hourly Forecast



Storm Event QA/QC Checklist – Phase I

STORM DATE 220612

A. Event and Data Completeness	Yes	No	N/A	Notes
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed	X			
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member			X	
6. All analytical reports from lab received	X			
B. Validation and Verification Methods	**Yes**	**No**	**N/A**	**Notes**
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria	Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)	∅	∅	∅	∅	∅	< 0.11" in 72 hrs	X		
2. Precipitation (inches)	0.69	0.68	0.62	0.62/0.68 ~~0.65~~	0.62/0.68 ~~0.65~~ TL	> 0.10"	X		
3. Sampled amount (% of total run-off)	—	91	—	—	—	>= 75% or >= 6 hrs: no qualifier >= 50% and <75%: qualify < 50%: reject	X		
4. Composite sample duration (hours)	—	6.0	—	—	—				
4. Ecoli sample holding time (hours)	3	—	3	—	2	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X		
5. Filtering of samples for dissolved parameter analysis (hours)	—	1	—	—	—	<= 24 hrs: no qualifier > 24 hrs.: reject	X		

D. Notes

Reviewed by Tamara Lighte **Date** 07.19.22

Approved by Monica Lowe **Date** 7/25/22

C-288

Updated 220718 TL

Storm Runoff Estimates and Trigger Volumes

ACHD Storm Water Monitoring Water Year 2022

Simple Method

Expected Precipitation Depth =	0.11	in
Square Feet per Acre =	43560	ft^2/ac
Inches per Foot=	12	in/ft
Aliquots per Sample=	17	

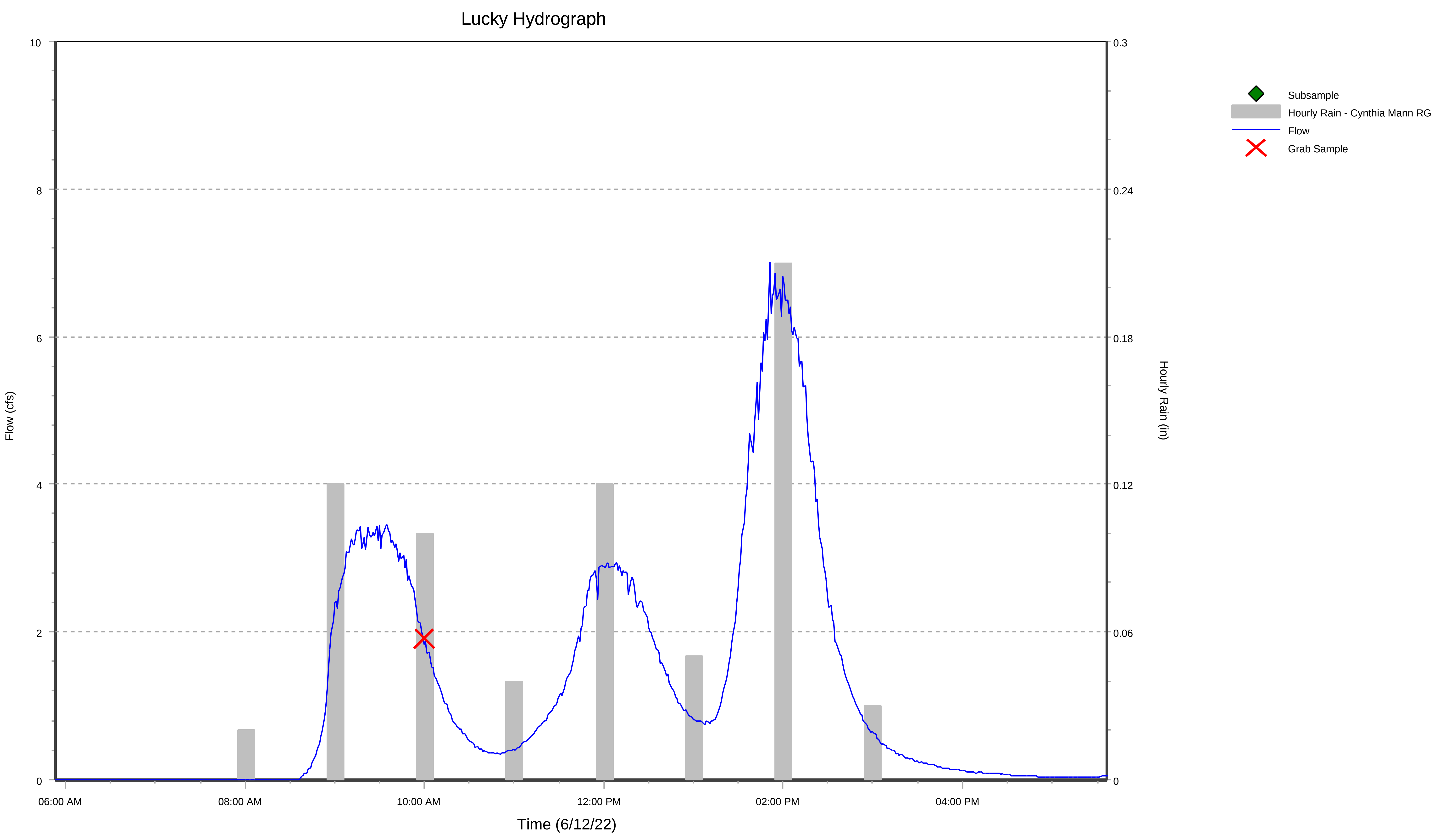
Step 1. Enter runoff coefficients in yellow cells.
Step 2. Enter expected precipitation depth in inches in blue cell.
Step 3. Read trigger volumes (**bold**) in green cells.

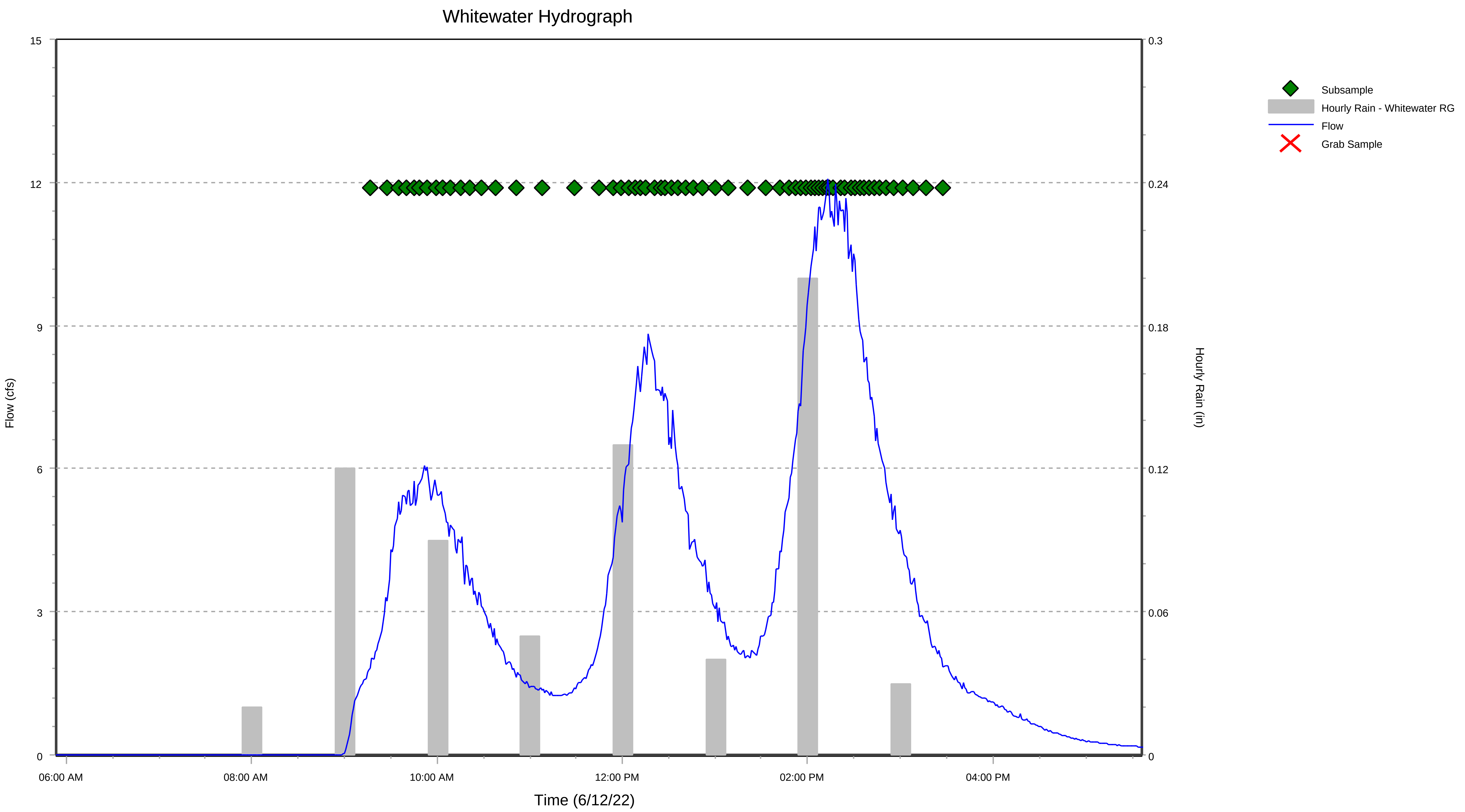
Site	Area (ac)	Using RC Based on Land Use RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)	Using Manually-entered RC RC	Expected Vol. (ft^3)	Trigger Vol. (ft^3)
#3 Lucky	105	0.401	16813	**989**	0.157	6582.46	**387**
#11 Whitewater	498	0.437	86898	**5112**	0.116	23066.76	**1357**
#12 Main	79	0.437	13785	**811**	0.246	7760.00	**456**
#14 Americana	875	0.446	155827	**9166**	0.144	50311.80	**2960**
#206 AS_6	204	0.257	20935	**1231**	0.046	3747.03	**221**
#18 State	34	0.419	5688	**335**	0.144	1954.97	**122**
Theoretical	80	0.200	6389		0.000		

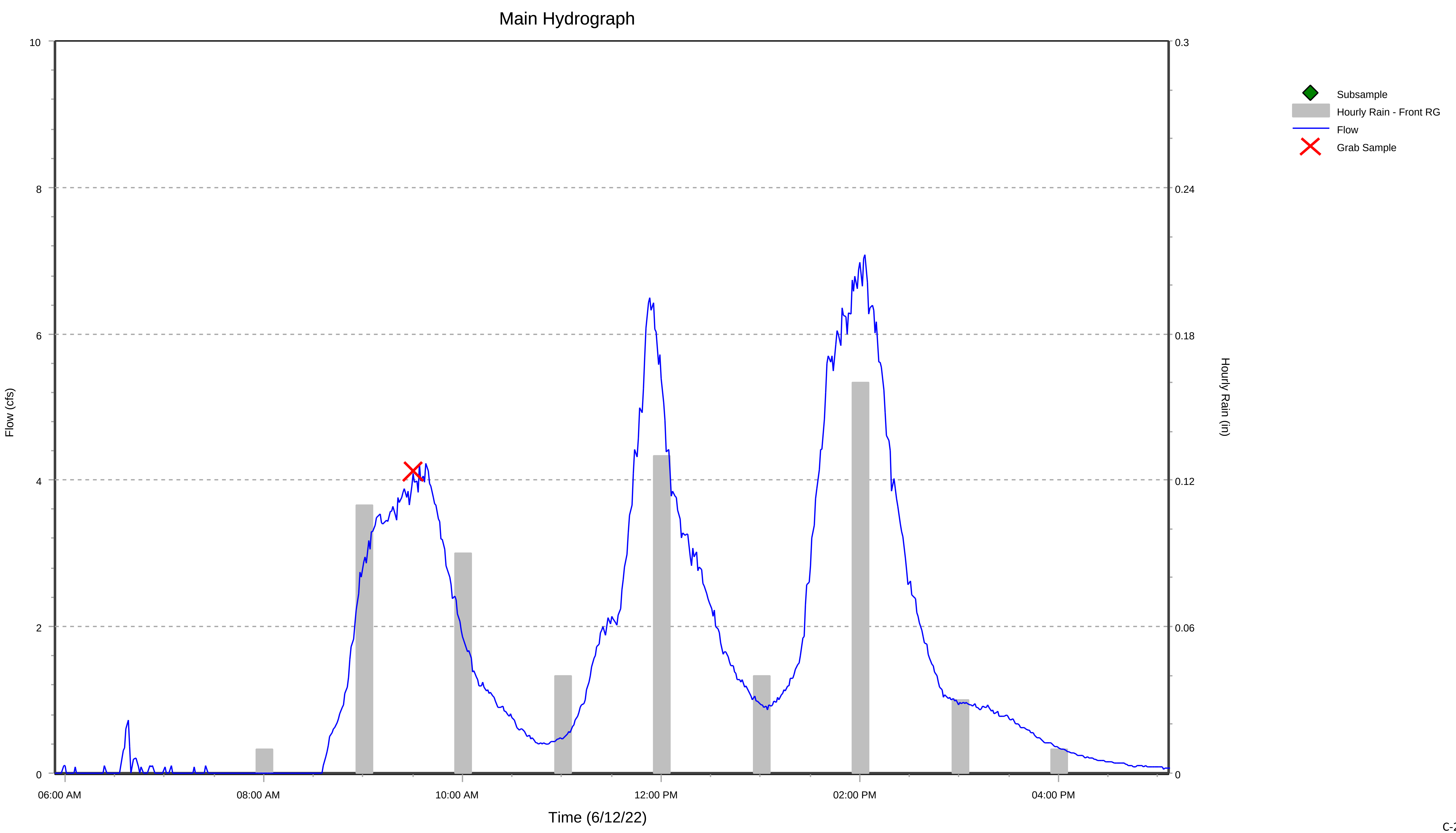
NOTES: 1. Land usage data, watershed area, and % imp are from ACHD 2013 GIS analysis.

Runoff Coefficient = Runoff Volume (ft^3) ÷ [Storm Depth (ft) x Area (ft^2)]
all values taken from historically corrected runoff coefficents
total acreage*total precip = total runoff (unit conversion factor from acre inches to cubic feet 3630)
Measured runoff
RC = measured runoff / total runoff

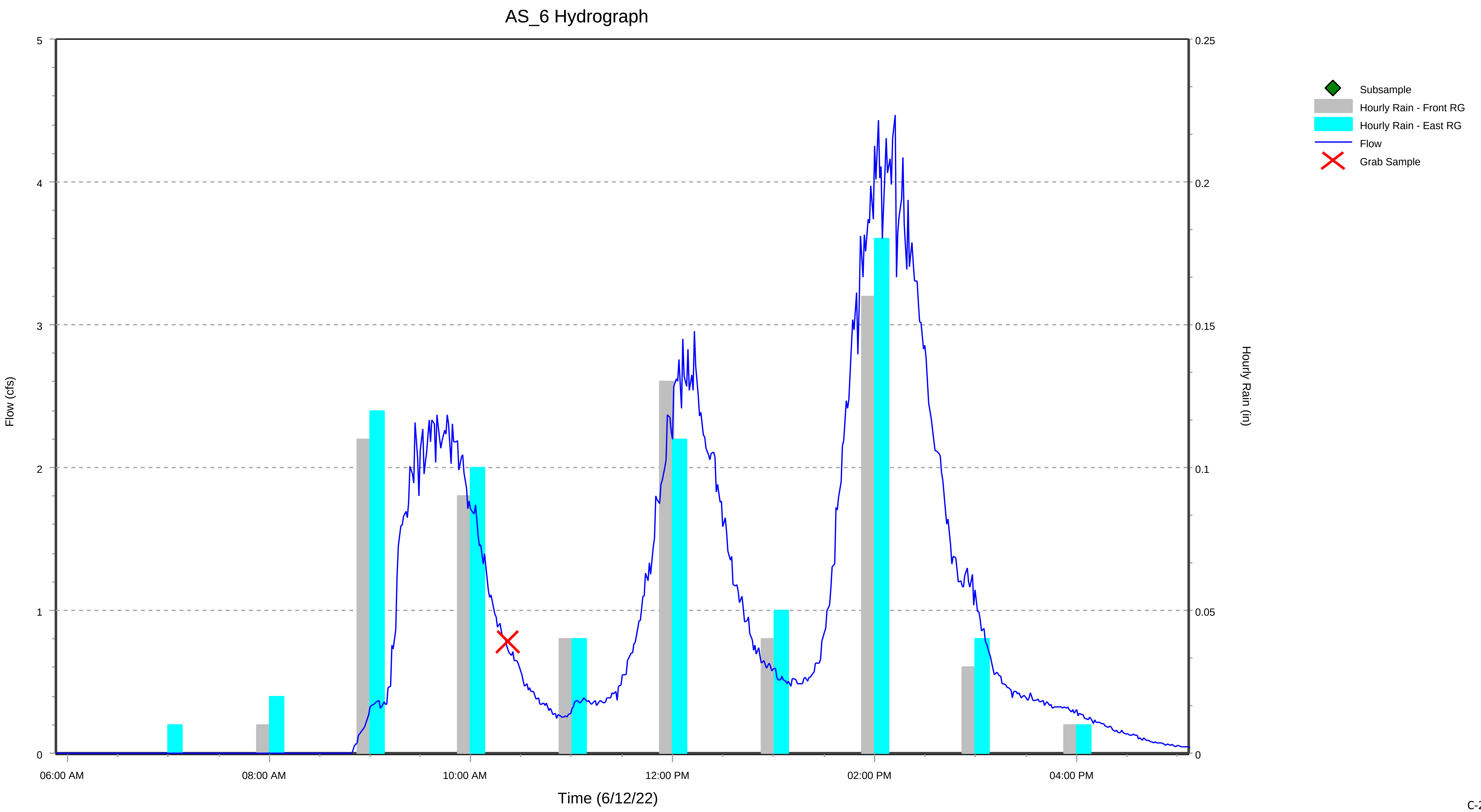
Attachment B: Storm Event Hydrographs


Lucky Hydrograph
Flow (cfs)
Hourly Rain (in)
Time (6/12/22)
10
8
6
4
2
0
0.3
0.24
0.18
0.12
0.06
0
06:00 AM
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
Subsample
Hourly Rain - Cynthia Mann RG
Flow
Grab Sample


Whitewater Hydrograph
Flow (cfs)
Hourly Rain (in)
Time (6/12/22)
15
12
9
6
3
0
0.3
0.24
0.18
0.12
0.06
0
06:00 AM
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
Subsample
Hourly Rain - Whitewater RG
Flow
Grab Sample


Main Hydrograph
Flow (cfs)
Hourly Rain (in)
Time (6/12/22)
10
8
6
4
2
0
0.3
0.24
0.18
0.12
0.06
0
06:00 AM
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
Subsample
Hourly Rain - Front RG
Flow
Grab Sample

C-293


AS_6 Hydrograph
Flow (cfs)
Hourly Rain (in)
Time (6/12/22)
06:00 AM
08:00 AM
10:00 AM
12:00 PM
02:00 PM
04:00 PM
0
1
2
3
4
5
0
0.05
0.1
0.15
0.2
0.25
Subsample
Hourly Rain - Front RG
Hourly Rain - East RG
Flow
Grab Sample

Attachment C: Storm Event Analytical Reports

Report Date: 06/28/2022 14:21

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00216-01	ACST1B	220612-03-WG	Water		06/12/2022	06/12/2022
AC00216-02	ACST1B	220612-03-101	Water		06/12/2022	06/12/2022
AC00216-03	ACST1B	220612-03-001	Water		06/12/2022	06/12/2022
AC00216-04	ACST1B	220612-12-WG	Water		06/12/2022	06/12/2022
AC00216-05	ACST1B	220612-206-WG	Water		06/12/2022	06/12/2022

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Report Date: 06/28/2022 14:21

Analysis Report

Location:	ACST1B	Location Description:	220612-03-WG
Date/Time Collected:	06/12/2022 09:51		
Lab Number:	AC00216-01	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222238	1480.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	06/12/22 12:42	6/13/22 13:26	ASE	D
Wet Chemistry										
Chlorine Screen	B222241	Absent				SM 4500-CL G-2000 mod	06/12/22	6/12/22 11:51	ASE	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 06/28/2022 14:21

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Analysis Report

Location:	ACST1B	Location Description:	220612-03-101
Date/Time Collected:	06/12/2022 12:00		
Lab Number:	AC00216-02	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222238	1119.9	MPN/100 mL	1.0	1.0	IDEXX - Colilert	06/12/22 12:42	6/13/22 13:26	ASE	
Wet Chemistry										
Chlorine Screen	B222241	Absent				SM 4500-CL G-2000 mod	06/12/22	6/12/22 11:51	ASE	

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Report Date: 06/28/2022 14:21

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Analysis Report

Location:	ACST1B	Location Description:	220612-03-001
Date/Time Collected:	06/12/2022 12:00		
Lab Number:	AC00216-03	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222238	<1.0	MPN/100 mL	1.0	1.0	IDEXX - Colilert	06/12/22 12:42	6/13/22 13:26	ASE	U
Wet Chemistry										
Chlorine Screen	B222241	Absent				SM 4500-CL G-2000 mod	06/12/22	6/12/22 11:51	ASE	

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Report Date: 06/28/2022 14:21

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Analysis Report

Location:	ACST1B	Location Description:	220612-12-WG
Date/Time Collected:	06/12/2022 09:24		
Lab Number:	AC00216-04	Sample Collector:	T.L
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222238	8600.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	06/12/22 12:42	6/13/22 13:26	ASE	D
Wet Chemistry										
Chlorine Screen	B222241	Absent				SM 4500-CL G-2000 mod	06/12/22	6/12/22 11:51	ASE	

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Report Date: 06/28/2022 14:21

Analysis Report

Location:	ACST1B	Location Description:	220612-206-WG
Date/Time Collected:	06/12/2022 10:22		
Lab Number:	AC00216-05	Sample Collector:	J.E
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Microbiology										
E. Coli	B222238	5120.0	MPN/100 mL	100.0	1.0	IDEXX - Colilert	06/12/22 12:42	6/13/22 13:26	ASE	D
Wet Chemistry										
Chlorine Screen	B222241	Absent				SM 4500-CL G-2000 mod	06/12/22	6/12/22 11:51	ASE	

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Report Date: 06/28/2022 14:21

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B222238									
Blank (B222238-BLK1)									
E. Coli	Absent						06/13/2022	ASE	
LCS (B222238-BS1)									
E. Coli				Present			06/13/2022	ASE	
Duplicate (B222238-DUP1) Source ID: AC00216-02									
E. Coli					Pass	128	06/13/2022	ASE	

Report Date: 06/28/2022 14:21

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Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

C-303

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle
Josh Ekhoff

C-304

Lab# AC00216	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
-01	6/12/22		0951		220612-03-WG	TL	X	X												X					1
-02			1200		220612-03-101		X	X												X					1
-03			1200		220612-03-001		X	X												X					1
-04			0924		220612-12-WG		X	X												X					1
-05			1022		220612-206-WG	JE	X	X												X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Tam [signature]	6.12.22 / 1101	[signature] / 1105	

coc_wql-pi

WY22

AC00216

Report Date: 07/05/2022 12:48

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00217-01	ACST1C	220612-11-WC	Water		06/12/2022	06/12/2022
AC00217-02	ACST1C	220612-11-103	Water		06/12/2022	06/12/2022

Report Date: 07/05/2022 12:48

Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
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Analysis Report

Location:	ACST1C	Location Description:	220612-11-WC
Date/Time Collected:	06/12/2022 09:15 - 06/12/2022 15:27		
Lab Number:	AC00217-01	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222354	0.458	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/21/22	6/21/22 11:01	CJP	
BOD5	B222248	53.0	mg/L	2.00	2.00	SM 5210 B-2011	06/13/22	6/18/22 9:29	MER	
COD	B222246	195	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/13/22	6/13/22 10:15	ALN	
Nitrate-Nitrite, as N	B222313	0.176	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:48	ALN	
TKN	B222385	4.35	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/22/22	6/23/22 10:37	JAL	
Total Dissolved Solids	B222255	70.2	mg/L	25.0	25.0	SM 2540 C-2011	06/13/22	6/17/22 12:56	LRF	
Total Suspended Solids	B222251	181	mg/L	0.900	0.900	SM 2540 D-2011	06/13/22	6/13/22 11:45	HAL	
Turbidity	B222258	53.5	NTU	0.6	0.3	EPA 180.1, Rev. 2.0 (1993)	06/13/22	6/13/22 13:03	CJP	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222247	0.489	mg/L	8.00E-3	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/13/22	6/13/22 13:19	SMC	D
Total Metals										
Mercury	B222272	0.0194	ug/L	0.0100	0.0100	EPA 245.2	06/14/22	6/15/22 8:38	SAS	
Arsenic	B222342	2.6	ug/L	0.040	0.040	EPA 200.8	06/18/22	6/19/22 15:06	DMW	
Cadmium	B222342	0.11	ug/L	0.025	0.025	EPA 200.8	06/18/22	6/19/22 15:06	DMW	
Calcium	B222269	6.68	mg/L	0.0460	0.0460	EPA 200.7	06/14/22	6/28/22 15:53	EDM	
Lead	B222342	8.8	ug/L	0.050	0.050	EPA 200.8	06/18/22	6/19/22 15:06	DMW	
Magnesium	B222269	1710	ug/L	50.0	50.0	EPA 200.7	06/14/22	6/28/22 15:53	EDM	
Phosphorus as P	B222269	0.997	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/14/22	6/28/22 15:53	EDM	
Hardness	B222269	23.7	mg/L	0.115	0.115	EPA 200.7	06/14/22	6/28/22 15:53	EDM	
Dissolved Metals										
Cadmium	B222299	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/16/22 13:20	DMW	U
Copper	B222299	5.5	ug/L	0.15	0.15	EPA 200.8	06/16/22	6/16/22 13:20	DMW	
Lead	B222299	0.27	ug/L	0.050	0.050	EPA 200.8	06/16/22	6/16/22 13:20	DMW	
Zinc	B222299	24.2	ug/L	0.78	0.78	EPA 200.8	06/16/22	6/16/22 13:20	DMW	

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Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Report Date: 07/05/2022 12:48

Analysis Report

Location:	ACST1C	Location Description:	220612-11-103
Date/Time Collected:	06/12/2022 12:00		
Lab Number:	AC00217-02	Sample Collector:	T.L
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared Time	Analysis Time	Analyst Initials	Qual
Wet Chemistry										
Ammonia, as N	B222354	0.433	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	06/21/22	6/21/22 10:58	CJP	
BOD5	B222248	52.2	mg/L	2.00	2.00	SM 5210 B-2011	06/13/22	6/18/22 9:25	MER	
COD	B222246	187	mg/L	13.0	13.0	HH 8000, Standard Method 5220 D	06/13/22	6/13/22 10:15	ALN	
Nitrate-Nitrite, as N	B222313	0.177	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	06/16/22	6/16/22 13:49	ALN	
TKN	B222385	4.06	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	06/22/22	6/23/22 10:42	JAL	
Total Dissolved Solids	B222255	79.8	mg/L	25.0	25.0	SM 2540 C-2011	06/13/22	6/17/22 12:57	LRF	
Total Suspended Solids	B222251	170	mg/L	0.900	0.900	SM 2540 D-2011	06/13/22	6/13/22 11:46	HAL	
Turbidity	B222258	53.9	NTU	0.6	0.3	EPA 180.1, Rev. 2.0 (1993)	06/13/22	6/13/22 12:54	CJP	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B222247	0.475	mg/L	0.0160	2.00E-3	EPA 365.1, Rev. 2.0 (1993)	06/13/22	6/13/22 14:52	SMC	D
Total Metals										
Mercury	B222272	0.0188	ug/L	0.0100	0.0100	EPA 245.2	06/14/22	6/15/22 8:18	SAS	
Arsenic	B222342	2.5	ug/L	0.040	0.040	EPA 200.8	06/18/22	6/19/22 15:09	DMW	
Cadmium	B222342	0.11	ug/L	0.025	0.025	EPA 200.8	06/18/22	6/19/22 15:09	DMW	
Calcium	B222269	6.70	mg/L	0.0460	0.0460	EPA 200.7	06/14/22	6/28/22 15:47	EDM	
Lead	B222342	8.2	ug/L	0.050	0.050	EPA 200.8	06/18/22	6/19/22 15:09	DMW	
Magnesium	B222269	1680	ug/L	50.0	50.0	EPA 200.7	06/14/22	6/28/22 15:47	EDM	
Phosphorus as P	B222269	0.994	mg/L	6.00E-3	6.00E-3	EPA 200.7	06/14/22	6/28/22 15:47	EDM	
Hardness	B222269	23.7	mg/L	0.115	0.115	EPA 200.7	06/14/22	6/28/22 15:47	EDM	
Dissolved Metals										
Cadmium	B222299	<0.0250	ug/L	0.025	0.025	EPA 200.8	06/16/22	6/16/22 13:23	DMW	U
Copper	B222299	5.4	ug/L	0.15	0.15	EPA 200.8	06/16/22	6/16/22 13:23	DMW	
Lead	B222299	0.29	ug/L	0.050	0.050	EPA 200.8	06/16/22	6/16/22 13:23	DMW	
Zinc	B222299	24.0	ug/L	0.78	0.78	EPA 200.8	06/16/22	6/16/22 13:23	DMW	

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B222246									
Blank (B222246-BLK1)									
COD	<13	mg/L					06/13/2022	ALN	U
LCS (B222246-BS1)									
COD			99.0	90-110			06/13/2022	ALN	
Duplicate (B222246-DUP1) Source ID: AC00217-01									
COD					6.93	10	06/13/2022	ALN	
Batch: B222248									
Blank (B222248-BLK1)									
BOD5	<2	mg/L					06/18/2022	MER	U
LCS (B222248-BS1)									
BOD5			93.3	84.6-115.4			06/18/2022	MER	
LCS (B222248-BS2)									
BOD5			110	84.6-115.4			06/18/2022	MER	
Duplicate (B222248-DUP1) Source ID: WB01912-07									
BOD5					3.47	30	06/18/2022	MER	
Batch: B222251									
Blank (B222251-BLK1)									
Total Suspended Solids	<0.9	mg/L					06/13/2022	HAL	U
LCS (B222251-BS1)									
Total Suspended Solids			96.0	90-110			06/13/2022	HAL	
Duplicate (B222251-DUP1) Source ID: BB02142-02									
Total Suspended Solids					0.479	20	06/13/2022	HAL	
Batch: B222255									
Blank (B222255-BLK1)									
Total Dissolved Solids	<25	mg/L					06/17/2022	LRF	U
LCS (B222255-BS1)									
Total Dissolved Solids			101	90-110			06/17/2022	LRF	
Duplicate (B222255-DUP1) Source ID: WR00033-01									
Total Dissolved Solids					0.226	10	06/17/2022	LRF	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222258									
Blank (B222258-BLK1)									
Turbidity	<0.3	NTU					06/13/2022	CJP	U
LCS (B222258-BS1)									
Turbidity			104	90-110			06/13/2022	CJP	
Duplicate (B222258-DUP1) Source ID: AC00217-01									
Turbidity					17.5	25	06/13/2022	CJP	D
Batch: B222313									
Blank (B222313-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
Blank (B222313-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
Blank (B222313-BLK3)									
Nitrate-Nitrite, as N	<0.025	mg/L					06/16/2022	ALN	U
LCS (B222313-BS1)									
Nitrate-Nitrite, as N			96.0	90-110			06/16/2022	ALN	
LCS (B222313-BS2)									
Nitrate-Nitrite, as N			95.7	90-110			06/16/2022	ALN	
LCS (B222313-BS3)									
Nitrate-Nitrite, as N			95.2	90-110			06/16/2022	ALN	
Duplicate (B222313-DUP1) Source ID: AC00212-01									
Nitrate-Nitrite, as N					0.194	10	06/16/2022	ALN	
Duplicate (B222313-DUP2) Source ID: BB02120-01									
Nitrate-Nitrite, as N					0.276	10	06/16/2022	ALN	
Duplicate (B222313-DUP3) Source ID: BB02130-01									
Nitrate-Nitrite, as N					0.773	10	06/16/2022	ALN	
Duplicate (B222313-DUP4) Source ID: BB02136-04									
Nitrate-Nitrite, as N					0.212	10	06/16/2022	ALN	
Duplicate (B222313-DUP5) Source ID: LS01194-02									
Nitrate-Nitrite, as N					NR	10	06/16/2022	ALN	U
Duplicate (B222313-DUP6) Source ID: WB01908-07									
Nitrate-Nitrite, as N					NR	10	06/16/2022	ALN	U
Matrix Spike (B222313-MS1) Source ID: AC00212-01									
Nitrate-Nitrite, as N			96.0	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS2) Source ID: BB02120-01									
Nitrate-Nitrite, as N			91.9	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS3) Source ID: BB02130-01									
Nitrate-Nitrite, as N			96.5	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS4) Source ID: BB02136-04									
Nitrate-Nitrite, as N			94.2	90-110			06/16/2022	ALN	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222313 (Continued)									
Matrix Spike (B222313-MS5) Source ID: LS01194-02									
Nitrate-Nitrite, as N			94.7	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS6) Source ID: WB01908-07									
Nitrate-Nitrite, as N			95.1	90-110			06/16/2022	ALN	
Matrix Spike (B222313-MS7) Source ID: WQ00115-08									
Nitrate-Nitrite, as N			95.4	90-110			06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD1) Source ID: AC00212-01									
Nitrate-Nitrite, as N			95.5	90-110	0.373	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD2) Source ID: BB02120-01									
Nitrate-Nitrite, as N			92.2	90-110	0.0919	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD3) Source ID: BB02130-01									
Nitrate-Nitrite, as N			95.9	90-110	0.537	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD4) Source ID: BB02136-04									
Nitrate-Nitrite, as N			93.6	90-110	0.200	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD5) Source ID: LS01194-02									
Nitrate-Nitrite, as N			95.4	90-110	0.700	10	06/16/2022	ALN	
Matrix Spike Dup (B222313-MSD6) Source ID: WB01908-07									
Nitrate-Nitrite, as N			95.1	90-110	0.0336	10	06/16/2022	ALN	
Batch: B222354									
Blank (B222354-BLK1)									
Ammonia, as N	<0.035	mg/L					06/21/2022	CJP	U
Blank (B222354-BLK2)									
Ammonia, as N	<0.035	mg/L					06/21/2022	CJP	U
LCS (B222354-BS1)									
Ammonia, as N			107	90-110			06/21/2022	CJP	
LCS (B222354-BS2)									
Ammonia, as N			96.7	90-110			06/21/2022	CJP	
Duplicate (B222354-DUP1) Source ID: BB02133-01									
Ammonia, as N					1.10	10	06/21/2022	CJP	
Duplicate (B222354-DUP2) Source ID: LS01197-02									
Ammonia, as N					6.25	10	06/21/2022	CJP	
Duplicate (B222354-DUP3) Source ID: BB02145-04									
Ammonia, as N					1.50	10	06/21/2022	CJP	
Matrix Spike (B222354-MS1) Source ID: BB02133-01									
Ammonia, as N			100	80-120			06/21/2022	CJP	
Matrix Spike (B222354-MS2) Source ID: LS01197-02									
Ammonia, as N			91.7	80-120			06/21/2022	CJP	
Matrix Spike (B222354-MS3) Source ID: BB02145-04									
Ammonia, as N			99.2	80-120			06/21/2022	CJP	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B222354 (Continued)									
Matrix Spike Dup (B222354-MSD1) Source ID: BB02133-01									
Ammonia, as N			102	80-120	0.833	10	06/21/2022	CJP	
Matrix Spike Dup (B222354-MSD2) Source ID: LS01197-02									
Ammonia, as N			90.8	80-120	0.692	10	06/21/2022	CJP	
Matrix Spike Dup (B222354-MSD3) Source ID: BB02145-04									
Ammonia, as N			98.6	80-120	0.495	10	06/21/2022	CJP	
Batch: B222385									
Blank (B222385-BLK1)									
TKN	<0.1	mg/L					06/23/2022	JAL	U
Blank (B222385-BLK2)									
TKN	<0.1	mg/L					06/23/2022	JAL	U
LCS (B222385-BS1)									
TKN			101	80-120			06/23/2022	JAL	
LCS (B222385-BS2)									
TKN			100	80-120			06/23/2022	JAL	
Duplicate (B222385-DUP1) Source ID: AC00217-01									
TKN					14.0	20	06/23/2022	JAL	
Duplicate (B222385-DUP2) Source ID: NP00043-01									
TKN					2.89	20	06/23/2022	JAL	
Duplicate (B222385-DUP3) Source ID: WR00032-01									
TKN					0.873	20	06/23/2022	JAL	
Matrix Spike (B222385-MS1) Source ID: AC00217-01									
TKN			103	80-120			06/23/2022	JAL	
Matrix Spike (B222385-MS2) Source ID: NP00043-01									
TKN			103	80-120			06/23/2022	JAL	
Matrix Spike (B222385-MS3) Source ID: WR00032-01									
TKN			101	80-120			06/23/2022	JAL	
Matrix Spike Dup (B222385-MSD1) Source ID: AC00217-01									
TKN			109	80-120	2.82	20	06/23/2022	JAL	
Matrix Spike Dup (B222385-MSD2) Source ID: NP00043-01									
TKN			104	80-120	0.642	20	06/23/2022	JAL	
Matrix Spike Dup (B222385-MSD3) Source ID: WR00032-01									
TKN			102	80-120	0.910	20	06/23/2022	JAL	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Wet Chemistry									
Batch: B222247									
Blank (B222247-BLK1)									
Orthophosphate, as P	<0.002	mg/L					06/13/2022	SMC	U
LCS (B222247-BS1)									
Orthophosphate, as P			95.6	90-110			06/13/2022	SMC	
Duplicate (B222247-DUP2) Source ID: BB02142-01									
Orthophosphate, as P					1.47	10	06/13/2022	SMC	D
Duplicate (B222247-DUP5) Source ID: AC00217-02RE3									
Orthophosphate, as P					0.738	10	06/13/2022	SMC	D
Matrix Spike (B222247-MS2) Source ID: BB02142-01									
Orthophosphate, as P			99.2	90-110			06/13/2022	SMC	D
Matrix Spike (B222247-MS5) Source ID: AC00217-02RE3									
Orthophosphate, as P			109	90-110			06/13/2022	SMC	D
Matrix Spike Dup (B222247-MSD2) Source ID: BB02142-01									
Orthophosphate, as P			101	90-110	0.572	10	06/13/2022	SMC	D
Matrix Spike Dup (B222247-MSD5) Source ID: AC00217-02RE3									
Orthophosphate, as P			110	90-110	0.738	10	06/13/2022	SMC	D

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B222269									
Blank (B222269-BLK1)									
Calcium	<0.046	mg/L					06/28/2022	EDM	U
Magnesium	<50	ug/L					06/28/2022	EDM	U
Phosphorus as P	<0.006	mg/L					06/28/2022	EDM	U
LCS (B222269-BS1)									
Calcium			95.2	85-115			06/28/2022	EDM	
Magnesium			96.0	85-115			06/28/2022	EDM	
Phosphorus as P			108	85-115			06/28/2022	EDM	
Duplicate (B222269-DUP1) Source ID: AC00217-01									
Calcium					1.22	20	06/28/2022	EDM	
Magnesium					1.84	20	06/28/2022	EDM	
Phosphorus as P					2.00	20	06/28/2022	EDM	
Matrix Spike (B222269-MS1) Source ID: AC00217-01									
Calcium			96.7	70-130			06/28/2022	EDM	
Magnesium			97.5	70-130			06/28/2022	EDM	
Phosphorus as P			120	70-130			06/28/2022	EDM	
Matrix Spike Dup (B222269-MSD1) Source ID: AC00217-01									
Calcium			95.1	70-130	1.07	20	06/28/2022	EDM	
Magnesium			96.4	70-130	1.05	20	06/28/2022	EDM	
Phosphorus as P			105	70-130	4.71	20	06/28/2022	EDM	
Batch: B222272									
Blank (B222272-BLK1)									
Mercury	<0.01	ug/L					06/15/2022	SAS	U
LCS (B222272-BS1)									
Mercury			109	85-115			06/15/2022	SAS	
Duplicate (B222272-DUP1) Source ID: AC00217-02									
Mercury					4.17	20	06/15/2022	SAS	
Duplicate (B222272-DUP2) Source ID: EP00137-02									
Mercury					NR	20	06/15/2022	SAS	U
Matrix Spike (B222272-MS1) Source ID: AC00217-02									
Mercury			104	70-130			06/15/2022	SAS	
Matrix Spike (B222272-MS2) Source ID: EP00137-02									
Mercury			98.5	70-130			06/15/2022	SAS	
Matrix Spike Dup (B222272-MSD1) Source ID: AC00217-02									
Mercury			90.6	70-130	11.5	20	06/15/2022	SAS	
Matrix Spike Dup (B222272-MSD2) Source ID: EP00137-02									
Mercury			106	70-130	7.65	20	06/15/2022	SAS	

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Report Date: 07/05/2022 12:48

Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B222342									
Blank (B222342-BLK1)									
Arsenic	<0.040	ug/L					06/19/2022	DMW	U
Cadmium	<0.025	ug/L					06/19/2022	DMW	U
Lead	<0.050	ug/L					06/19/2022	DMW	U
LCS (B222342-BS1)									
Arsenic			100	85-115			06/19/2022	DMW	
Cadmium			102	85-115			06/19/2022	DMW	
Lead			104	85-115			06/19/2022	DMW	
Duplicate (B222342-DUP1) Source ID: ME00188-02									
Arsenic					2.99	20	06/19/2022	DMW	
Cadmium					NR	20	06/19/2022	DMW	U
Lead					5.24	20	06/19/2022	DMW	
Matrix Spike (B222342-MS1) Source ID: ME00188-02									
Arsenic			101	70-130			06/19/2022	DMW	
Cadmium			98.6	70-130			06/19/2022	DMW	
Lead			98.5	70-130			06/19/2022	DMW	
Matrix Spike Dup (B222342-MSD1) Source ID: ME00188-02									
Arsenic			99.6	70-130	1.37	20	06/19/2022	DMW	
Cadmium			100	70-130	1.71	20	06/19/2022	DMW	
Lead			98.0	70-130	0.495	20	06/19/2022	DMW	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Date Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B222299									
Blank (B222299-BLK1)									
Cadmium	<0.025	ug/L					06/16/2022	DMW	U
Copper	<0.15	ug/L					06/16/2022	DMW	U
Lead	<0.050	ug/L					06/16/2022	DMW	U
Zinc	<0.78	ug/L					06/16/2022	DMW	U
LCS (B222299-BS1)									
Cadmium			103	85-115			06/16/2022	DMW	
Copper			103	85-115			06/16/2022	DMW	
Lead			104	85-115			06/16/2022	DMW	
Zinc			110	85-115			06/16/2022	DMW	
Duplicate (B222299-DUP1) Source ID: ES00186-03									
Cadmium					NR	10	06/16/2022	DMW	U
Copper					0.0315	10	06/16/2022	DMW	
Lead					NR	10	06/16/2022	DMW	U
Zinc					2.64	10	06/16/2022	DMW	
Matrix Spike (B222299-MS1) Source ID: ES00186-03									
Cadmium			97.5	70-130			06/16/2022	DMW	
Copper			95.8	70-130			06/16/2022	DMW	
Lead			96.8	70-130			06/16/2022	DMW	
Zinc			99.6	70-130			06/16/2022	DMW	
Matrix Spike Dup (B222299-MSD1) Source ID: ES00186-03									
Cadmium			94.7	70-130	2.95	10	06/16/2022	DMW	
Copper			94.1	70-130	1.65	10	06/16/2022	DMW	
Lead			95.0	70-130	1.88	10	06/16/2022	DMW	
Zinc			96.2	70-130	3.23	10	06/16/2022	DMW	

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Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

for JFK

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s): Tammy Lightle
Josh Ekhoff

C-317

Lab# AC00217	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers
-01	6/12/22	6/12/22	0915	1527	220612-11-WC	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	3
-02	6/12/22	6/12/22	1200	1200	220612-11-103	TL	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Tam Lightle	6/12/22/1602	ASE 1605 6/12/22	Please split sample for a duplicate and name it 220612-11-103.

coc_wql-pi

WY22

AC00217

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

C-318

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: ACOD217-01 Location: 220612-11-WC Sample Date: 6-12-22 Sample ID: ACST1C	Split Date: 6-12-22 Start Split: 1615 Start Filter: 1615 Comp Time: 1610 Analyst: DW	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☒Other: 10	Coll Jug: Comp Jug: 22-77 SS Tubing: 30-25 SS Helper: Stir Bar: 23-59 Connector: 27-58	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	"COLL JUGS (3)" 26-71 26-71 22-84
Lims#: ACOD217-02 Location: 220612-11-103 Sample Date: 6-12-22 Sample ID: DUP	Split Date: 6-12-22 Start Split: 16-45 Start Filter: 16-45 Comp Time: 1610 Analyst: DW	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other: 10	Coll Jug: Comp Jug: 22-77 SS Tubing: 30-25 SS Helper: Stir Bar: 23-58 Connector: 30-28	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	" "
Lims#: Location: Sample Date: Sample ID:	Split Date: Start Split: Start Filter: Comp Time: Analyst:	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:	Coll Jug: Comp Jug: SS Tubing: SS Helper: Stir Bar: Connector:	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	
Lims#: Location: Sample Date: Sample ID:	Split Date: Start Split: Start Filter: Comp Time: Analyst:	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:	Coll Jug: Comp Jug: SS Tubing: SS Helper: Stir Bar: Connector:	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	
Lims#: Location: Sample Date: Sample ID:	Split Date: Start Split: Start Filter: Comp Time: Analyst:	Filter: ☒Voss ☒0.45µm ☐1.0µm ☒5.0µm ☐Other:	Coll Jug: Comp Jug: SS Tubing: SS Helper: Stir Bar: Connector:	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐ ☒COD ☐	

ACHD Sample Filtration, Splitting, and Compositing for Metals

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45μm ☐1.0μm ☒5.0μm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45μm ☐1.0μm ☒5.0μm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45μm ☐1.0μm ☒5.0μm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45μm ☐1.0μm ☒5.0μm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	
Lims#: ____ Location: ____ Sample Date: ____ Sample ID: ____	Split Date: ____ Start Split: ____ Start Filter: ____ Comp Time: ____ Analyst: ____	Filter: ☒Voss ☒0.45μm ☐1.0μm ☒5.0μm ☐Other: ____	Coll Jug: ____ Comp Jug: ____ SS Tubing: ____ SS Helper: ____ Stir Bar: ____ Connector: ____	☒Teflon Total ☒TKN ☒Teflon Diss (F) ☒NH_3 ☒Hg CVAA ☒NO_x (F) ☒BOD ☒ortho-P (F) ☒TSS ☒Turb ☒TDS ☐____ ☒COD ☐____	

Attachment D: Field Forms

Grab Sample Data Form

STATION: Lucky

Personnel: TLL, JJE **Date/Time On-Site:** 6.12.22 / 0946

Flow Meter Current Status						
Time	Level (in)	Flow gpm ~~(cfs)~~	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
0950	10.30	1244	1.86	12.6		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220612-03 -WG	6/12/22	0951	☐
Field Duplicate *E.Coli*	220612-03 -101	↓	0952	☒
Field Blank *E.Coli*	220612-03 -001	↓	0954	☐

***Note: time on bottle for QC samples is 1200**

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP08	1000	18.38	7.58	6.09	49.6

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Revised 210924 TL
C-321

Set Up/ Shut Down Form – ISCO

TATION: Whitewater

SET UP

Personnel: RL, JRB

Date/Time On-Site: 06.10.22 0925

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
0931	0.09	0.00	0.03	NA

Downloaded to:	
Enable Condition:	level > 2.00" hysteresis = 1.5
Flow Pulse Interval:	1600 cf

On-Site
- ☑ Replace flowmeter battery, install sampler battery
- ☑ Perform decon. cycle
- ☑ Install 15L sample bottle, with ice
- ☑ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☑ Set Sampler program parameters
- ☑ Check date/time on Sampler
- ☑ Verify all cable and tubing connections
- ☑ Verify Sampler Program is running

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote; Date/time 6/10 0901
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: TLL

Date/Time On-Site: 06.13.22 / 1020

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)

Downloaded to:	—

On-Site
- ~~☐ Replace flowmeter battery~~
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)
- ☒ Direct or Remote; Date/time 6/13 1138
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: White water **Bottle** 1 **of** 3
Personnel: TLL / JJE **Date/Time On-Site:** 6-12-22 1032

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	220612-11 -WC
Approx Sample Volume (mL):	14750 mL
Clarity (ex. Clear, Cloudy, Silty):	Clear
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan
QA/QC Sample ID:	220612-11 -103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	6/12/22 0915	Success	13	6/12/22 1028	Success
2	0927		14	" 1037	"
3	0934		15	1050	
4	0939		16	1107	
5	0944		17	1128	
6	0948		18	1144	
7	0953		19	1153	
8	0958		20	1158	
9	1003		21	1203	
10	1008		22	1207	
11	1014		23	1211	
12	1020		24	1214	

Comments:

If sampling is complete:
- ☐ Power off sampler
- ☐ Verify flowmeter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):
- ☒ Keep flowmeter running
- ☒ Install new 15L bottle; add ice
- ☒ Restart program from beginning

Date/Time Restarted: 6/12 1219
- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Composite Sample Collection

STATION: Whitewater | **Bottle** 2 **of** 3

Personnel: TLL, JJE | **Date/Time On-Site:** 6/12/22 1417

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	220612-11 -WC
Approx Sample Volume (mL):	14750 mL
Clarity (ex. Clear, Cloudy, Silty):	Clear
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan
QA/QC Sample ID:	220612-11 -103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	6/12 1220	Success	13	6/12 1341	Success
2	1224		14	1347	
3	1227		15	1351	
4	1231		16	1355	
5	1235		17	1358	
6	1240		18	1401	
7	1245		19	1404	
8	1251		20	1406	
9	1259		21	1409	
10	1308		22	1411	
11	1319		23	1413	
12	1332		24	1416	

Comments:

If sampling is complete:

- ☐ Power off sampler
- ☐ Verify flowmeter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle; add ice
- ☒ Restart program from beginning

Date/Time Restarted: 6/12 1420

- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Composite Sample Collection

STATION: Whitewater **Bottle** 3 **of** 3
Personnel: TLL, JJE **Date/Time On-Site:** 6/12 1527

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	220612-11 -WC
Approx Sample Volume (mL):	8750 mL
Clarity (ex. Clear, Cloudy, Silty):	Clear
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan
QA/QC Sample ID:	220612-11 -103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	6/12 1420	Success	13	6/12 1507	Success
2	1422		14	1516	
3	1427		15	1527	
4	1430		16		
5	1433		17		
6	1436		18		
7	1439		19		
8	1442		20		
9	1446		21		
10	1450		22		
11	1455		23		
12	1501		24		

Comments:

We accidently bumped the power button on the sampler after 2 subsamples were collected. The program was immediately restarted.

If sampling is complete:	**If continuing sampling (sample bottle change-out):**
☒ Power off sampler	☐ Keep flowmeter running
☒ Verify Flowmeter is running	☐ Install new 15L bottle; add ice
☒ Add ice to sample transport cooler	☐ Restart program from beginning
☒ Complete COC form; arrange transport to lab	**Date/Time Restarted:** ________
	☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	**3.0"**	3500 mL	**5.5"**	7250 mL	**8.0"**	11000 mL	**10.5"**	14750 mL
1.0"	800 mL	**3.5"**	4250 mL	**6.0"**	8000 mL	**8.5"**	11750 mL	**11.0"**	15500 mL
1.5"	1400 mL	**4.0"**	5000 mL	**6.5"**	8750 mL	**9.0"**	12500 mL	**11.5"**	16250 mL
2.0"	2000 mL	**4.5"**	5750 mL	**7.0"**	9500 mL	**9.5"**	13250 mL	**After 12"**	1" = 1500 mL
2.5"	2750 mL	**5.0"**	6500 mL	**7.5"**	10250 mL	**10.0"**	14000 mL	**Lab min**	8,000 mL

Grab Sample Data Form

STATION: Main

Personnel: TLL / SJE **Date/Time On-Site:** 6-12-22 0922

Flow Meter Current Status						
Time	Level (in)	Flow ~~(cfs)~~	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
0934	10.56	19.04 gpm	2.75	12.7		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220612 -12 -WG	6/12	0924	☒
Field Duplicate *E.Coli*	220612 -12 -101	6/12	0925	☒
Field Blank *E.Coli*	220612 -12 -001	6/12	0926	☒

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP03	0932	19.41	7.92	6.45	44.8

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

This was the alternative QC site. 220612-12-101 and 220612-12-001 were not needed, and were not submitted to the lab.

Grab Sample Data Form

STATION: AS-6

Personnel: TZL, TJE **Date/Time On-Site:** 6.12.22 /1019

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1021	4.878	0.72	1.66	12.4		—

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	220612-206 -WG	6/12/22	1022	☒
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP08	1028	18.21	6.64	6.42	87.2

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Attachment J: Americana Subwatershed Monitoring Summary WY 2022

Americana Subwatershed Monitoring Summary WY 2022

Ada County Highway District

12/21/2022

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Appendix A: Tables A-1

Appendix B: Figures B-1

1. Introduction

Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Permittees) were issued a National Pollutant Discharge Elimination System Phase I Permit #IDS027561 (Permit) on October 1, 2021. The Permit authorizes the Permittees to discharge from municipal separate storm sewer system (MS4) outfalls to the Boise River and its tributaries. According to Permit Part 6.2.2, *Subwatershed Monitoring,* Permittees are required to conduct monitoring within the Americana subwatershed to better define wet weather and dry weather flow volumes, sources, and pollutant loads.

The Americana subwatershed is one of the largest urban subwatersheds on the lower Boise River and drains a significant portion of downtown Boise and the North End and Foothills residential areas. Stormwater discharge monitoring (flow measurement and analytical sample collection) is currently conducted at the Americana outfall as identified in the Stormwater Outfall Monitoring Plan (SWOMP) (ACHD, 2022). While data collected at the outfall is important for understanding discharges to the Boise River, the dataset does not provide much information about the pollutant load and dry weather sources further up in the storm drain system. Guided by the Americana Subwatershed Plan (ACHD, 2020), the Americana subwatershed is divided into subcatchments at major nodes in the system to parse out non-stormwater flow sources and characterize pollutant contributions. The following summary describes Americana subwatershed monitoring activities during water year (WY) 2022 (October 1, 2021 – September 30, 2022).

In WY 2022, data collection throughout the Americana subwatershed included precipitation, water level, flow, and water quality samples. Precipitation data were collected at two representative locations and water level data were collected at five subwatershed locations and at the Americana monitoring station. The water level data were compared to the precipitation data to look for anomalies in the MS4 system, such as instances when the water level in-pipe increases or decreases without a corresponding precipitation event and when the water level increases from isolated subcatchment areas. Additionally, water quality data from wet weather discharges were collected from one subcatchment site (Site 206) to compare with the Americana outfall site (Site 14). The water quality data, along with flow data, were used to calculate pollutant loads and identify pollutants discharging from Site 206 that are disproportionately high compared to Site 14.

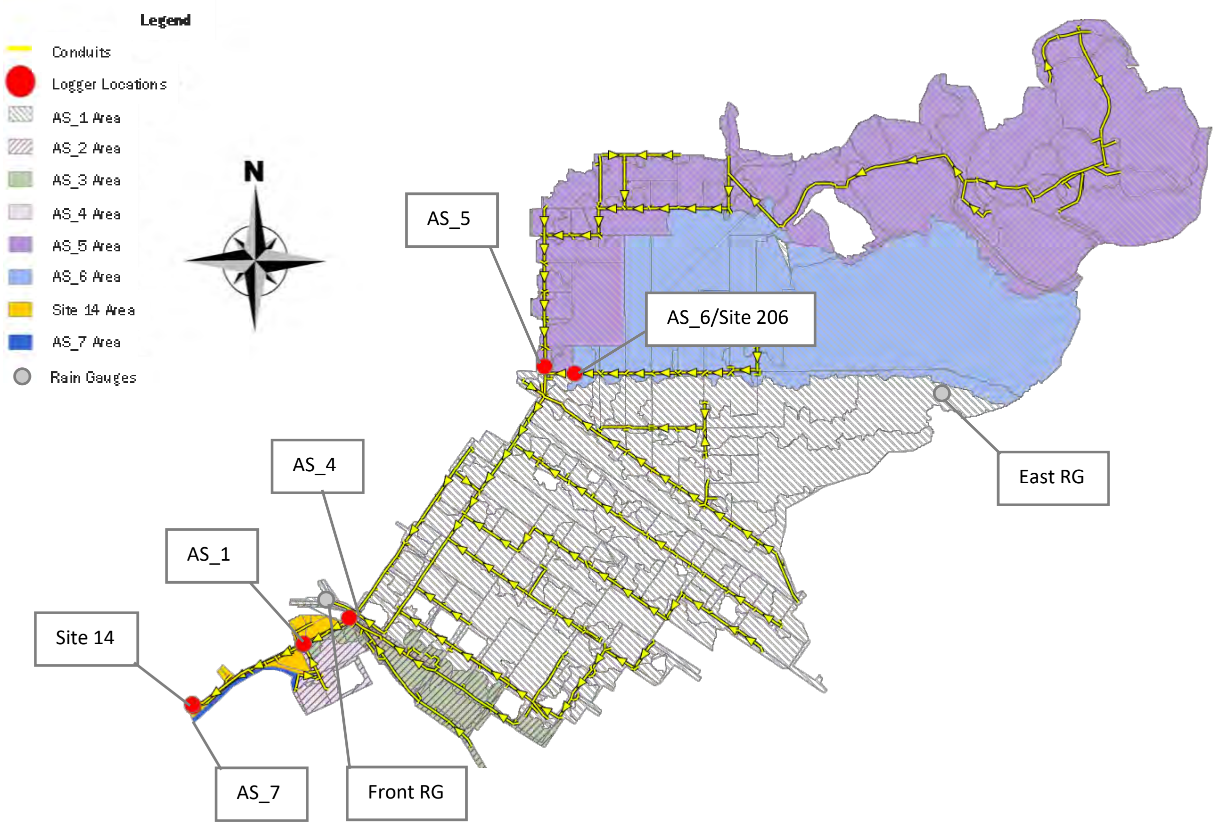


Figure 1 Americana Subwatershed Monitoring Sites for WY 2022

2. Monitoring Sites, Equipment, and Sample Types

Data was collected at the following monitoring sites during WY 2022: AS_1, AS_4, AS_5, AS_6, AS_7, Site 14, Site 206, Front, and East (Figure 1). Details on each of the monitoring sites, including subcatchment areas, pipe characteristics, and equipment deployment dates, are found in Table 1. Figure 2 shows the locations of the monitoring sites in relation to each other using a conceptual layout of the storm drain system.

Site 14 is the Americana outfall monitoring station used in the NPDES Phase I Stormwater Outfall Monitoring program. This monitoring site is equipped with a flowmeter and sampler to collect water level, velocity, flow, and composite samples.

Site 206 is a subcatchment of the Americana subwatershed. Similar to Site 14, it is equipped with a flowmeter and sampler to collect flow and water quality data during targeted storm events.

AS_7 is a secondary outfall to Site 14, with a connection between storm drain pipes further up in the system. This site is equipped with a flowmeter to capture continuous water level, velocity, and flow data.

AS_1, AS_4, AS_5, and AS_6 represent subcatchment areas within the Americana subwatershed. Each site is equipped with a water level logger to collect in-pipe water level data. The loggers continuously record pressure readings at 5-minute intervals. The pressure readings are corrected using local barometric pressure and converted to water level.

Front and East are rain gauge sites and are equipped with tipping bucket rain gauges. The rain gauges collect continuous precipitation data in 0.01-inch increments using event data loggers. The precipitation data are used to determine the date and times of wet weather storm events and dry weather periods.

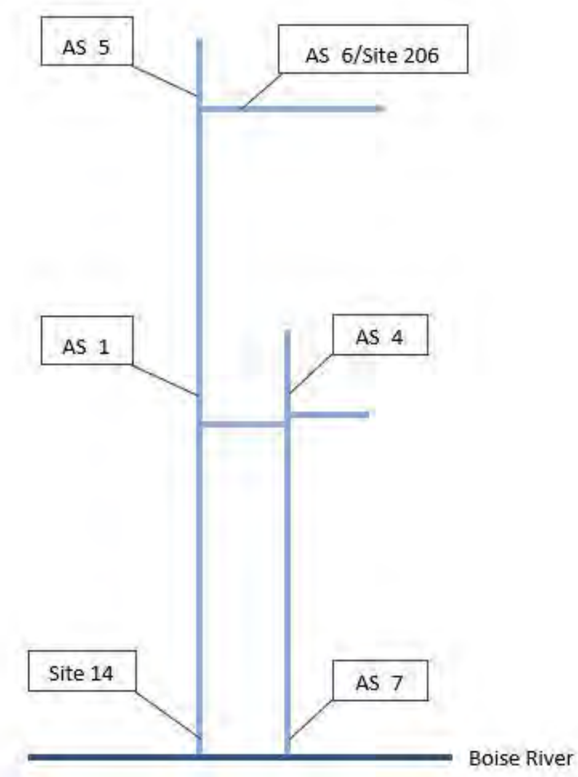


Figure 2 Conceptual Layout of Monitoring Sites

2.1 Water Quality Sample Types

The sample types collected during WY 2022 include grab samples and composite samples. Grab samples represent a discrete measurement from the overall storm discharge while composite samples represent the entire discharge.

Grab samples were manually collected from the discharge stream using a swing sampler. The grab samples were submitted to the Boise City Water Quality Laboratory (WQL) and analyzed for *E.coli*. At the time that the grab samples were collected, field parameters (temperature, pH, dissolved oxygen (DO), and conductivity) were measured using In-Situ smarTroll or In-Situ aquaTroll handheld instruments.

Composite samples were collected using automatic samplers, which worked in conjunction with flowmeters. After a predetermined volume of flow was discharged, the flowmeters triggered the sampler to collect a subsample. Each subsample was deposited into a 15-liter carboy, resulting in a flow-proportional composite sample. The composite samples were submitted to WQL, where they were split for analysis. The following constituents were analyzed: biological oxygen demand, 5-day (BOD_5); chemical oxygen demand (COD); hardness as calcium carbonate ($CaCO_3$); turbidity; total suspended solids (TSS); total dissolved solids (TDS); total phosphorus (TP); orthophosphate, as P (ortho-P); ammonia; nitrate + nitrite (NOx); total Kjeldahl nitrogen (TKN); total arsenic (As); dissolved and total cadmium (Cd); dissolved and total copper (Cu); dissolved and total lead (Pb); dissolved and total mercury (Hg); and dissolved zinc (Zn).

3. Americana Subwatershed Monitoring Results

3.1 Water Level Monitoring Results

For WY 2022, water level data from six monitoring sites (AS_1, AS_4, AS_5, AS_6, AS_7, and Site 14) were evaluated for occurrences of increasing or decreasing water level which are not attributed to precipitation. Though the pipe size at each site differs, the change in water level is still evident in the data. When a change in water level is seen at one or more sites, the discharge must originate from the site that is furthest 'up-pipe' in the storm drain system. Figures 3 – 6 show hydrographs for each quarter of WY 2022. Color bands were applied to the hydrographs to indicate time periods where no rain was recorded, but the water level fluctuated at one or more sites. The following conclusions were extracted from visually inspecting the hydrographs:

- Concurrent water level increases and decreases are measured at AS_1, AS_4, AS_7, and Site 14. Using the conceptual pipe layout in Figure 2 as a reference, it becomes apparent that there must be another piped connection between the AS_1 and AS_4 subcatchments.
- Sudden water level increases and decreases were observed, which are likely caused by human-related activities such as turning on a pump or opening a headgate.
- Extended time periods of non-stormwater flow originating from the AS_1 subcatchment (which includes downtown Boise) occurred December 2, 2021 – April 20, 2022 (140 days), May 16 – May 23 (8 days), and June 2, 2022 – June 16, 2022 (15 days).
- In addition to the extended time periods listed in the previous bullet, non-stormwater contributions originating from the AS_1 subcatchment occurred fifteen more times with an average duration of 7 hours.
- Non-stormwater discharge originated from the AS_4 subcatchment on fourteen occasions with an average duration of 9 hours.

3.2 Water Quality Monitoring Results

During WY 2022, water quality samples from wet weather discharges were collected from one subcatchment site (Site 206) to compare with the Americana outfall site (Site 14). Samples were collected from six storm events. A summary of the storm dates and sample types collected are in Table 3-1. Attempts were made to collect samples from both Site 14 and Site 206 during the same storm event. When paired samples were successfully collected from both sites, the water quality results were directly compared to one another. Results from samples that were collected from only one of the two sites were omitted from the subsequent discussion, however the values will be used when calculating statistics for the final report. Comprehensive analytical results from all samples collected are included in Table 2, attached.

Table 3-1. Storm Event Summary		
Storm Event Date	**Site 14**	**Site 206**
10/22/21	Grab, Composite	Grab, Composite
03/15/22	Grab, Composite	Grab, Composite
04/04/22	Grab	
05/27/22	Composite	Grab[1], Composite[2]
06/05/22	Composite[3]	Composite
06/12/22		Grab
[1]Grab sample is qualified due to an exceeded holding time *[2]Composite sample had low volume, so nitrate + nitrite and dissolved parameters were not analyzed* *[3]Compsite sample is rejected due to representativeness*		

3.2.1 Grab Samples

Paired grab samples were collected from Site 14 and Site 206 on October 22, 2021 and March 15, 2022 and were analyzed for *E.coli*, temperature, pH, DO, and conductivity. Notable conclusions from each storm event are provided below.

October 22, 2021

- *E.coli* at Site 14 was two times higher than at Site 206.
- Conductivity at Site 206 was two times higher than at Site 14.

March 15, 2022

- *E.coli* at Site 206 was seven times higher than at Site 14.

3.2.2 Composite Samples

Paired composite samples were collected from Site 14 and Site 206 on October 22, 2021; March 15, 2021; and May 27, 2022. Due to low composite sample volume, the May 27, 2022 composite from Site 206 was not analyzed for NOx or any dissolved parameters.

Event-specific pollutant loads for each analyzed constituent were calculated by multiplying the volume of discharge as measured at the site by the constituent concentration. The pollutant loads, in pounds, are in Table 3.

To evaluate the contribution Site 206 had on the overall pollutant load discharging from the Americana outfall, the percentage of the pollutant load was compared to the percentage of discharge volume. When the percentage of the pollutant load is greater than the percentage of discharge volume, the pollutant load discharging from the subcatchment is disproportionately high. This logic statement is illustrated below.

$$\begin{gathered} IF \\ \frac{pollutant\ load\ (lbs) from\ subcatchment}{pollutant\ load\ (lbs) from\ outfall} > \frac{discharge\ volume\ (cf) from\ subcatchment}{discharge\ volume\ (cf) from\ outfall} \\ THEN \\ pollutant\ load\ from\ subcatchment\ is\ disproportionately\ high \end{gathered}$$

The percent contribution of pollutant load and the percent contribution of discharge volume was calculated for both Site 206 and Site 14 from each storm event (Figures 7-9). The graphs include a vertical red line indicating the value for the percent of discharge. Constituent loads that exceed the red line are disproportionately high. Noteworthy outcomes from each paired storm event are presented below.

October 22, 2021

- Load contributions from Site 206 were disproportionately high for all constituents except NOx.
- The percent of dissolved lead load from Site 206 was 8.2 times higher than the percent of discharge volume.
- The percent of dissolved cadmium load from Site 206 was 3.8 times higher than the percent of discharge volume.
- The percent pollutant load from Site 206 was more than 2 times higher than the percent discharge volume for the following parameters: BOD_5, COD, TP, ortho-P, total Hg.

March 15, 2022

- Load contributions from Site 206 were disproportionately high for all parameters except for the following: hardness as $CaCO_3$, TDS, NOx, dissolved Cd, dissolved Zn.
- The percent of TSS load from Site 206 was 4.2 times higher than the percent of discharge volume.
- The percent pollutant load from Site 206 was more than 2 times higher than the percent of discharge volume for the following parameters: COD, TP, ortho-P, total Hg, total Pb, and dissolved Pb.

May 27, 2022

- Dissolved parameters and NOx were not analyzed from Site 206, therefore were not compared to Site 14.
- Load contributions from Site 206 were disproportionately high for all analyzed parameters except for the following: hardness as $CaCO_3$, TSS, total As, total Cd, total Pb.
- The percent of BOD_5 load from Site 206 was 3.7 times higher than the percent of discharge volume.
- The percent of TP load from Site 206 was 3.2 times higher than the percent of discharge volume.
- The percent pollutant load from Site 206 was more than 2 times higher than the percent of discharge volume for the following parameters: COD, and ammonia.

Appendix A: Tables

Table 1. Monitoring Site Information

Table 2. Field and Analytical Data Summary

Table 3. Event Pollutant Loading Estimates in Pounds

Table 1. Monitoring Site Information

Location Name	Study ID	Latitude/ Longitude	Manhole ID (SWMM File)	Manhole ID (Americana Manholes Files)	Subcatchment Total Area (acres)	Subcatchment Impervious Area (acres)	Pipe Diameter (in)	Pipe Construction	Manning's Coefficient (n value)	Pipe Slope	Water Level During Installation (in)	Equipment ID	Equipment Deploy Start Date	Equipment Deploy End Date	Installation Notes
Americana Monitoring Station	Site 14	Americana Monitoring Station	NA	NA	915	291	48	concrete	NA	NA	NA	Hach Flowmeter (FL-23)	2013	9/8/2020	
												Hach Sampler (SA-17)	2013	9/8/2020	
												ISCO Signature Flowmeter (FL-29)	9/8/2020	NA	
												ISCO 6712 Sampler (SA-20)	9/8/2020	NA	
16th & Front St	AS_1	43°37'7.57"N 116°12'52.66"W	J87872	33634	869	255	42	concrete	0.015	0.0001	4.13	HOBO logger (SN:20029104)	8/10/2018	NA	Logger installed downstream of manhole with conduit facing downstream
											NA	ISCO 2150 Flowmeter (FL-21)	10/25/2019	1/24/2020	
Americana_River_South	AS_2	43°37'4.63"N 116°13'0.20"W	J5567	35568	39	28	42	concrete	0.015	0.0001	1.5	HOBO logger (SN:20029109)	8/10/2018	4/28/2020	Large pipe downstream of manhole (south) that leads to secondary outfall with conduit facing downstream flow
Americana_River_East	AS_3	43°37'4.63"N 116°13'0.20"W	J5567	35568	10	5	16	concrete	0.015	0.0001	2	HOBO logger (SN:20029106)	8/10/2018	1/6/2021	Small pipe upstream of manhole (east) with conduit facing upstream
Americana_River St	AS_4	43°37'4.63"N 116°13'0.20"W	J5567	35568	29	23	42	concrete	0.015	0.0001	2	HOBO logger (SN:20029101)	8/10/2018	NA	Large pipe upstream of manhole (north) with conduit perpendicular to flow
											1.7	ISCO 2150 Flowmeter (FL-21)	7/10/2020	3/5/2021	Water level at installation: 2.7 inches
15th & Resseguie	AS_5	43°37'36.17"N 116°12'21.10"W	J5577	23810	289	49	30	concrete	0.015	0.0001	1.5	HOBO logger (SN:20029105)	8/10/2018	NA	Logger installed downstream of manhole with conduit facing downstream
Resseguie & 14th	AS_6/Site 206	43°37'35.73"N 116°12'16.60"W	J16834	13187	206	23	22	corrugated metal	0.024	0.0001	NA	HOBO logger (SN:20029102)	8/17/2018	NA	Installed downstream of vault
					203	22	22	corrugated metal	0.024	0.0001	NA	Hach Flowmeter (FL-25)	1/23/2020	NA	Installed upstream of vault, has smaller drainage area than HOBO logger
												Hach Sampler (SA-11)	1/23/2020	10/9/2020	Installed upstream of vault, has smaller drainage area than HOBO logger
												Hach Sampler (SA-13)	10/9/2020	NA	
Southeast Americana Outfall	AS_7	43°36'57.66"N 116°13'17.75"W	NA	NA	40	30	42	concrete	0.015	0.0001	NA	ISCO 2150 Flowmeter (FL-20)	1/11/2019	NA	ISCO flowmeter installed

Table 2. Field and Analytical Data Summary - Wet Samples

			Field Parameters				Analytical Parameters																				
Sample Date	Monitoring Station	Sample ID Grab	Dissolved Oxygen mg/L	pH S.U.	Conductivity uS/cm	Temperature C	E. coli mpn/100 mL	Sample ID Composite	BOD_5 mg/L	COD mg/L	Hardness as $CaCO_3$ mg/L	Turbidity NTU	TSS mg/L	TDS mg/L	Total Phosphorus mg/L	Dissolved Orthophosphate as P mg/L	Ammonia mg/L	Nitrate + Nitrite as N mg/L	TKN mg/L	Arsenic, total ug/L	Cadmium, dissolved ug/L	Cadmium, total ug/L	Copper, dissolved ug/L	Lead, dissolved ug/L	Lead, total ug/L	Mercury, total ug/L	Zinc, dissolved ug/L
10/22/2021	Site 14	211022-14-WG	9.22	6.63	87.5	13.83	517.2	211022-14-WC	80.3	212	38.2	57.9	105	123	0.940	0.645	0.740	0.389	3.54	2.6	<0.0250	0.14	8.4	0.28	7.1	0.0191	49.6
	Site 206	211022-206-WG	8.48	6.45	208.9	13.58	235.9	211022-206-WC	214	487	47.1	126	186	278	2.51	1.94	0.805	0.276	6.91	4.2	0.048	0.16	15.0	2.3	11.8	0.0339	111
3/15/2022	Site 14	220315-14-WG	10.55	6.32	737.6	10.17	88.2	220315-14-WC	19.8	118	146	80.8	71.8	394	0.424	0.203	0.935	0.989	2.55	4.9	0.033	0.13	4.6	0.18	6.8	0.0155	43.9
	Site 206	220315-206-WG	9.63	6.48	756.2	8.58	613.1	220315-206-WC	35.3	292	69.3	248	297	252	1.05	0.474	1.06	0.413	5.26	5.3	0.030	0.17	7.6	0.49	17.1	0.0389	38.4
5/27/2022	Site 14	--	--	--	--	--	--	220527-14-WC	84.7	224	96.4	51.8	115	225	1.06	0.568	0.97	0.863	4.71	5.9	<0.025	0.13	14.0	0.28	5.5	0.0196	47.9
	Site 206	--	--	--	--	--	--	220527-206-WC	314	634	66.9	62.5	77.3	385	3.93	--[1]	2.38	--[1]	10.7	4.5	--[1]	0.12	--[1]	--[1]	5.1	0.0260	--[1]
6/5/2022	Site 14	--	--	--	--	--	--	220605-14-WC	9.19[1R]	138[1R]	50.4[1R]	27.6[1R]	70.6[1R]	112[1R]	0.218[1R]	0.0128[1R]	0.211[1R]	0.266[1R]	1.72[1R]	3.0[1R]	<0.0250[1R]	0.069[1R]	2.7[1R]	0.054[1R]	4.5[1R]	<0.0100[1R]	12.4[1R]
	Site 206	--	--	--	--	--	--	220605-206-WC	73.3	321	38.4	110	421	114	1.31	0.294	<0.0350	<0.250	10.4	3.9	<0.0250	0.22	6.2	0.55	18.6	0.0321	36.6
6/12/2022	Site 206	220612-206-WG	6.64	6.42	87.2	18.21	5120.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

– = No data

[1] No data for dissolved parameters or NO_X due to low composite sample volume

[1R] Data rejected due to lack of representativeness

Table 3. Event Pollutant Loading Estimates in Pounds

Event Date	BOD_5		COD		Hardness as $CaCO_3$		TSS		TDS		Total Phosphorus		Dissolved Orthophosphate as P	
	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206
10/22/2021	822	172	2170	391	391	37.8	1075	149	1259	223	9.62	2.02	6.60	1.56
3/15/2022	256	22.9	1526	190	1889	45.0	929	193	5097	164	5.49	0.683	2.63	0.308
5/27/2022	384	35.7	1015	72.2	437	7.62	521	7.51	1020	43.8	4.80	0.38	2.57	--[1]

Event Date	Ammonia		Nitrate + Nitrite as N		TKN		Arsenic, total		Cadmium, dissolved		Cadmium, total	
	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206
10/22/2021	7.58	0.646	3.98	0.222	36.2	5.55	0.027	0.0034	0.00013[U]	0.000039	0.0014	0.00013
3/15/2022	12.1	0.689	12.8	0.268	33.0	3.42	0.063	0.0034	0.00043	0.000020	0.0017	0.00011
5/27/2022	4.40	0.231	3.91	--[1]	21.3	1.04	0.027	0.00051	0.00039[U]	--[1]	0.00059	0.000014

Event Date	Copper, dissolved		Lead, dissolved		Lead,total		Mercury, total		Zinc, dissolved	
	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206
10/22/2021	0.086	0.012	0.0029	0.0018	0.073	0.0095	0.000196	0.0000272	0.508	0.0891
3/15/2022	0.060	0.0049	0.0023	0.00032	0.088	0.0111	0.000201	0.0000253	0.568	0.0250
5/27/2022	0.063	--[1]	0.0013	--[1]	0.025	0.00058	0.0000888	0.00000296	0.217	--[1]

Notes:

– = No data

[1] No data for dissolved parameters or NO_x due to low composite sample volume

[U] Concentrations are at or below the method detection limit (MDL). A value of half the MDL was used in calculations.

Appendix B: Figures

Figure 3. Americana Subwatershed Water Level WY 2022 October – December

Figure 4. Americana Subwatershed Water Level WY 2022 January – March

Figure 5. Americana Subwatershed Water Level WY 2022 April – June

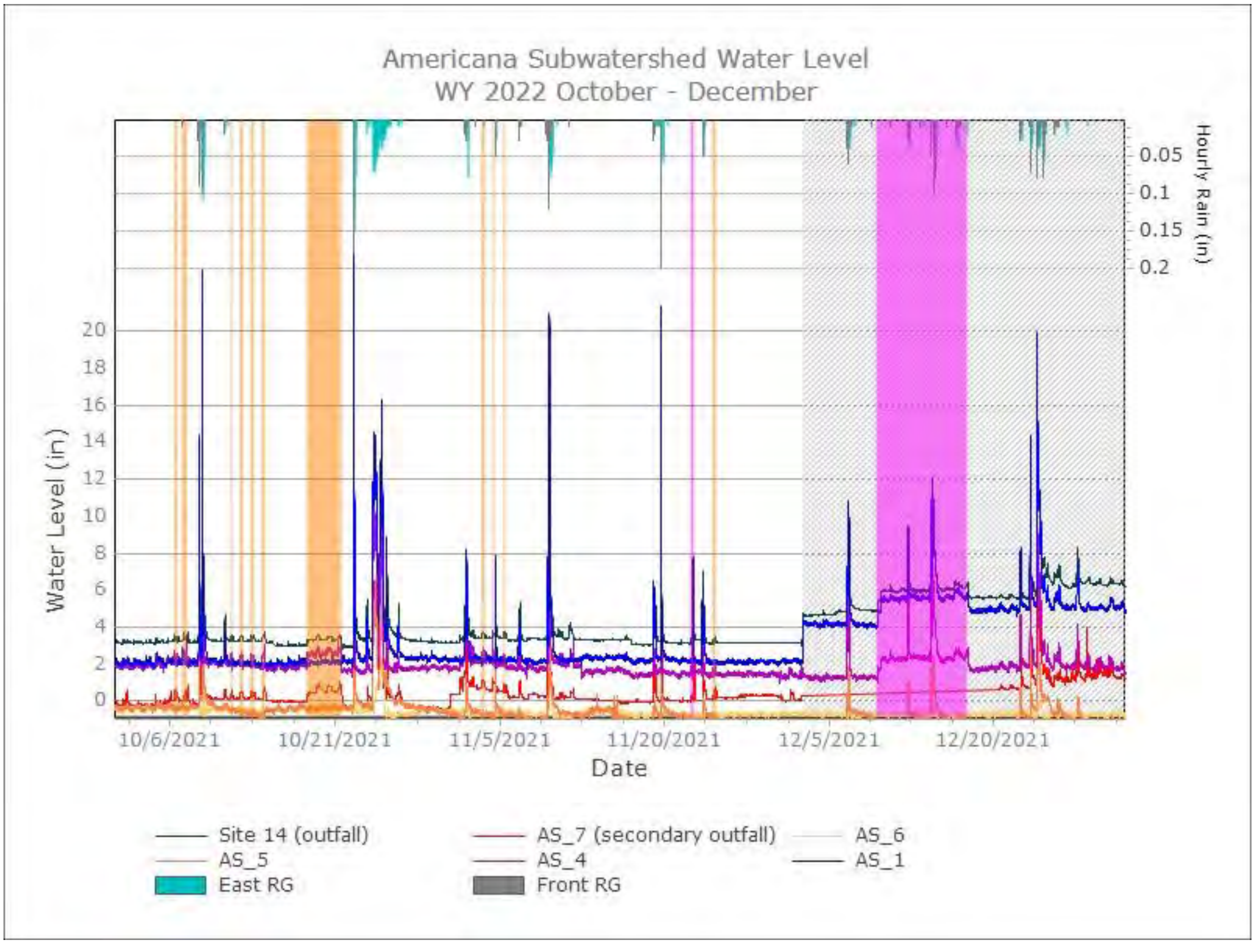
Figure 6. Americana Subwatershed Water Level WY 2022 July – September

Figure 7. Percent Contribution October 22, 2022

Figure 8. Percent Contribution March 15, 2022

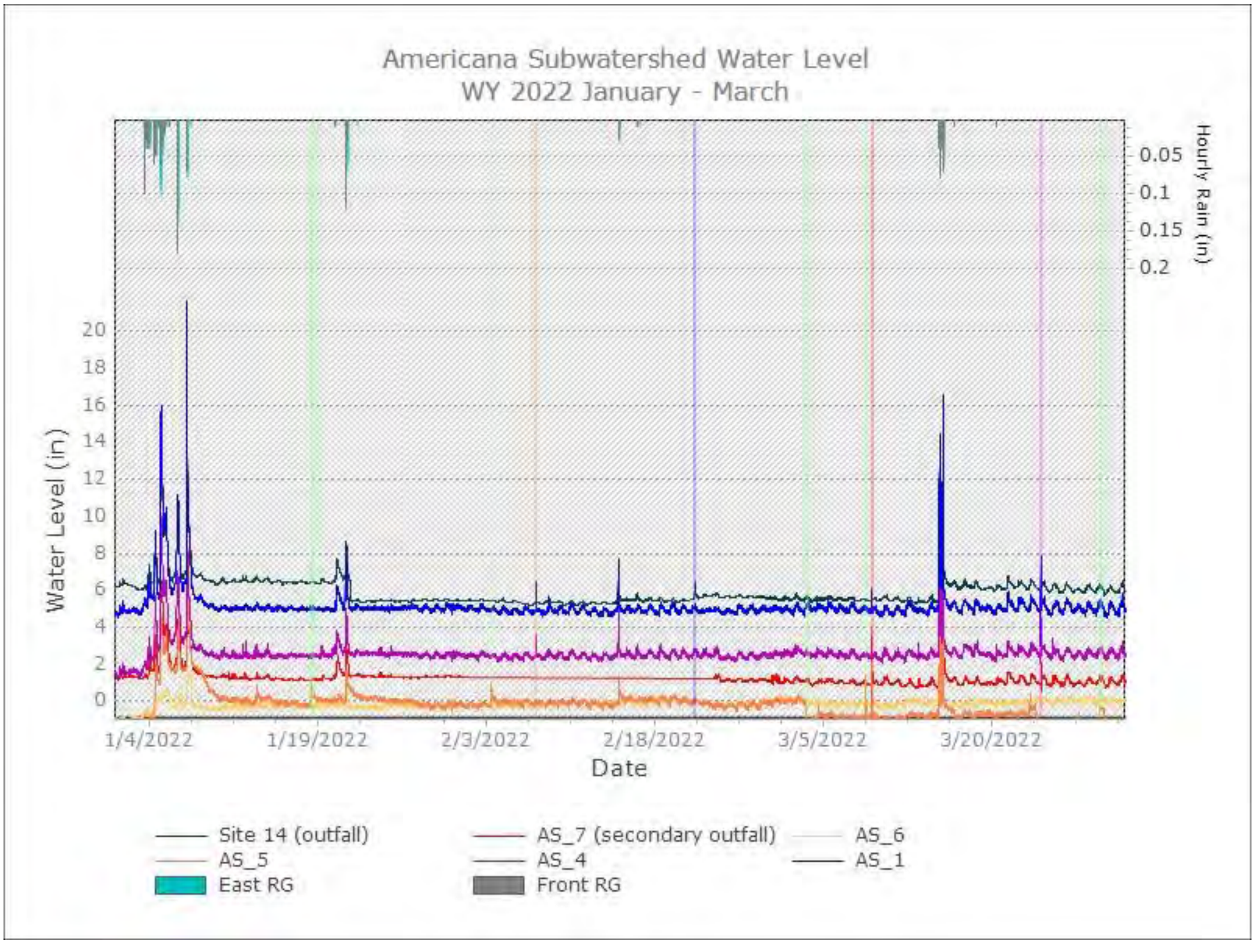
Figure 9. Percent Contribution May 27, 2022

Figure 3.



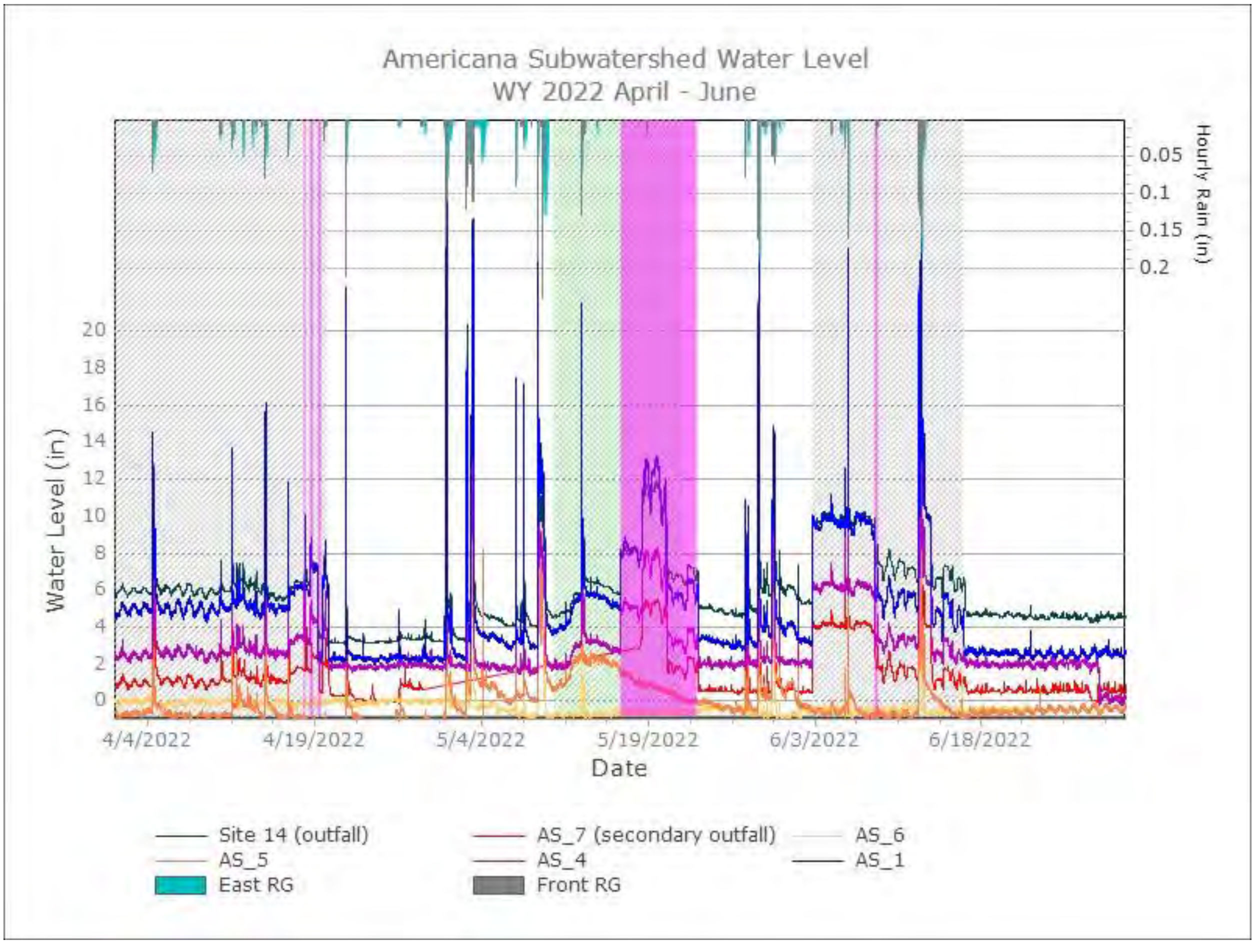
Color Code	Beginning DateTime	Duration (hrs)	Sites Included	Non-stormwater source
	10/04/21 15:00	3	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/06/21 08:00	11	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/07/21 04:00	13	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/11/21 11:00	9	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/12/21 08:30	9	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/13/21 08:00	10	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/14/21 09:00	9	AS_4, AS_7, Site 14	AS_4 subcatchment
	10/18/21 11:00	29	AS_4, AS_7, Site 14	AS_4 subcatchment
	11/03/21 08:00	10	AS_4, AS_7, Site 14	AS_4 subcatchment
	11/04/21 08:00	4.5	AS_4, AS_7, Site 14	AS_4 subcatchment
	11/05/21 08:30	6.5	AS_4, AS_7, Site 14	AS_4 subcatchment
	11/22/21 10:00	9.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	11/24/21 08:30	9.5	AS_4, AS_7, Site 14	AS_4 subcatchment
	12/02/21 14:00	3328.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	12/09/21 08:00	200	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment

Figure 4.



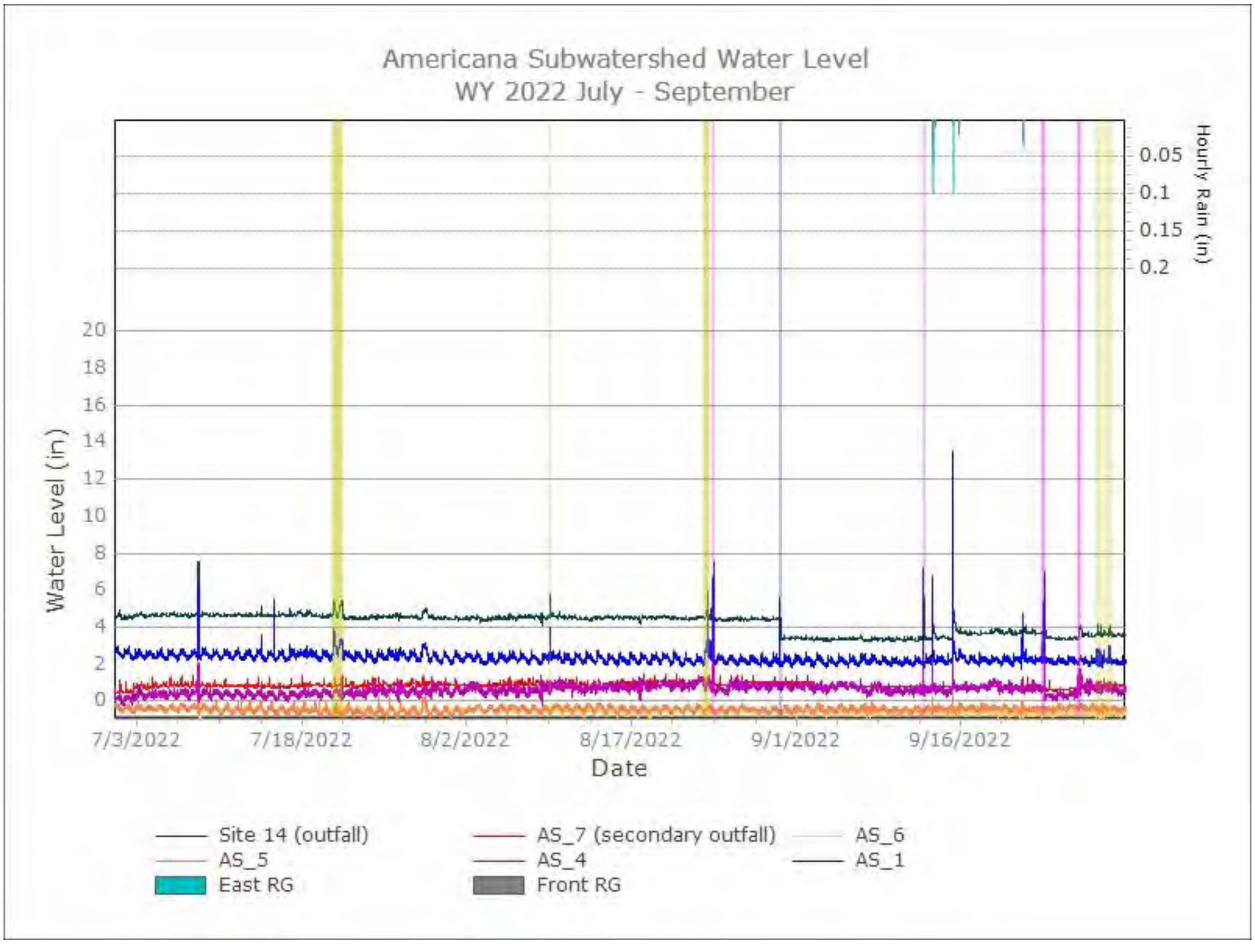
Color Code	Beginning DateTime	Duration (hrs)	Sites Included	Non-stormwater source
	12/02/21 14:00	3328.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	01/18/22 10:00	12	AS_5	AS_5 subcatchment
	02/03/22 10:00	5.5	AS_5	AS_5 subcatchment
	02/07/22 10:45	1	AS_4, AS_7, Site 14	AS_4 subcatchment
	02/21/22 14:00	2.5	Site 14	Site 14 subcatchment
	03/03/22 11:00	13	AS_5	AS_5 subcatchment
	03/08/22 20:00	2	AS_5	AS_5 subcatchment
	03/09/22 09:00	2	AS_4, AS_7, Site 14	AS_4 subcatchment
	03/24/22 09:45	3	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	03/29/22 16:30	9.5	AS_5	AS_5 subcatchment

Figure 5.



Color Code	Beginning DateTime	Duration (hrs)	Sites Included	Non-stormwater source
	12/02/21 14:00	3328.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	04/18/22 01:00	5.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	04/18/22 14:00	8.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	04/19/22 06:00	10.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	05/10/22 10:00	283	AS_5	Hull's Gulch
	05/16/22 10:45	169	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	06/02/22 18:15	629	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	06/08/22 10:15	8	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment

Figure 6.



Color Code	Beginning DateTime	Duration (hrs)	Sites Included	Non-stormwater source
	07/15/22 09:45	2	AS_1, Site 14	AS_1 subcatchment
	07/20/22 18:15	26	AS_1, Site 14	AS_1 subcatchment
	08/09/22 12:45	5	AS_1, Site 14	AS_1 subcatchment
	08/23/22 14:00	17	AS_1, Site 14	AS_1 subcatchment
	08/24/22 09:30	6.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	08/30/22 11:00	1	Site 14	Level calibration during maintenance
	09/12/22 13:30	2.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	09/23/22 09:00	8	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	09/26/22 14:30	10.5	AS_1, AS_4, AS_7, Site 14	AS_1 subcatchment
	09/28/22 08:00	3	AS_1, Site 14	AS_1 subcatchment
	09/28/22 15:00	3.5	AS_1, Site 14	AS_1 subcatchment
	09/29/22 00:00	2.5	AS_1, Site 14	AS_1 subcatchment
	09/29/22 08:30	2.5	AS_1, Site 14	AS_1 subcatchment
	09/29/22 13:30	3	AS_1, Site 14	AS_1 subcatchment

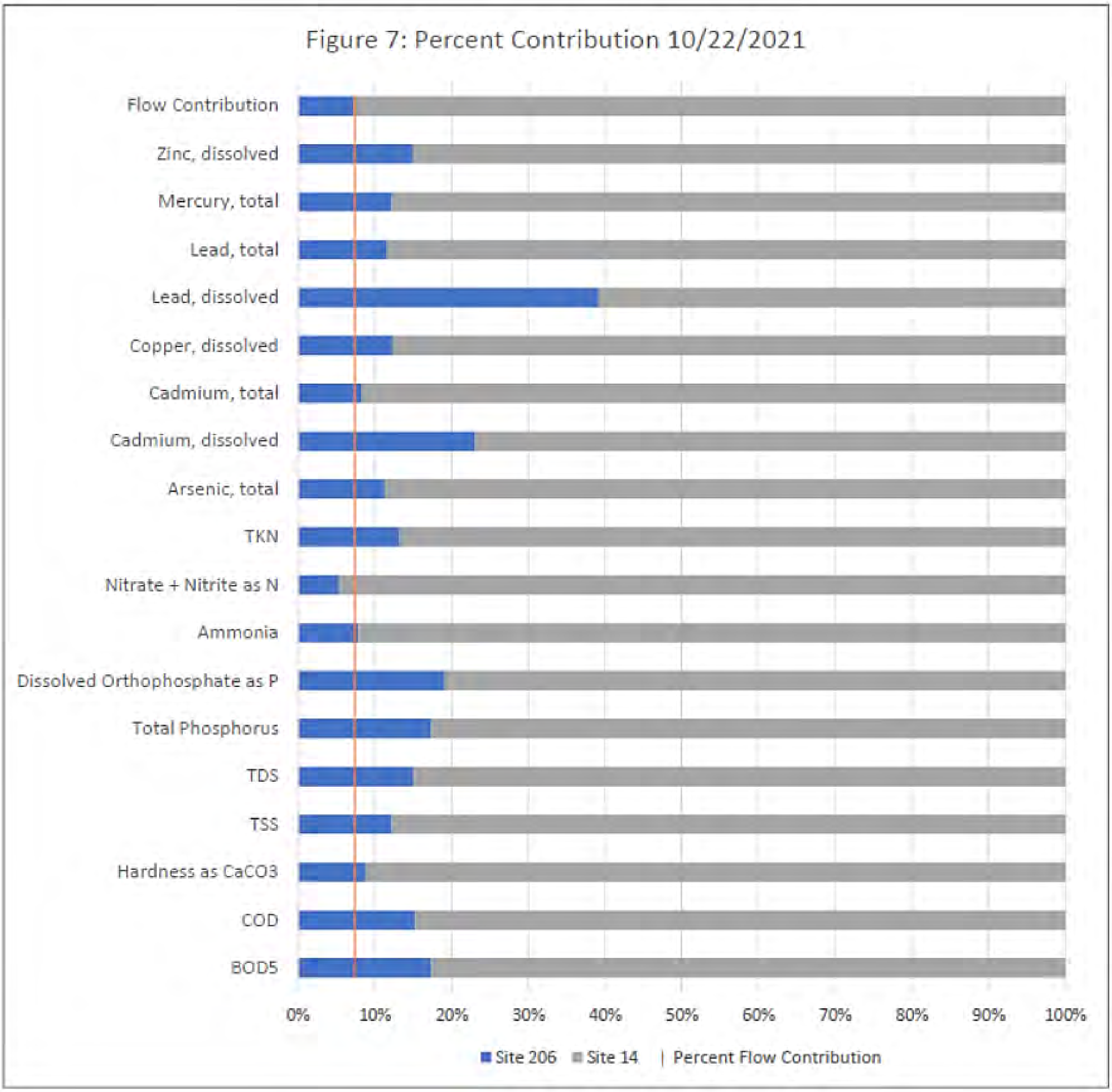


Figure 7: Percent Contribution 10/22/2021
Flow Contribution
Zinc, dissolved
Mercury, total
Lead, total
Lead, dissolved
Copper, dissolved
Cadmium, total
Cadmium, dissolved
Arsenic, total
TKN
Nitrate + Nitrite as N
Ammonia
Dissolved Orthophosphate as P
Total Phosphorus
TDS
TSS
Hardness as CaCO3
COD
BOD5
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Site 206
Site 14
Percent Flow Contribution

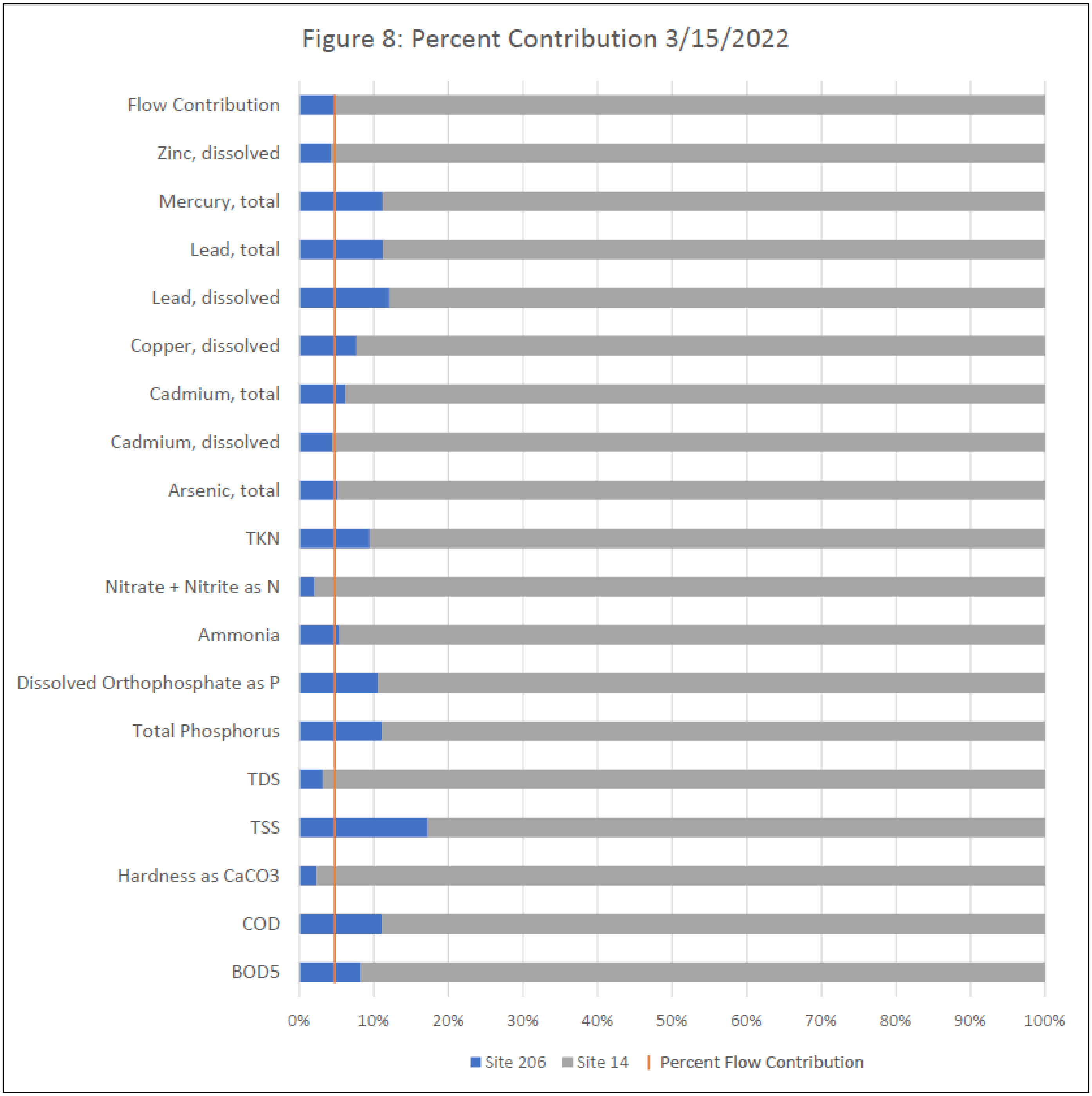
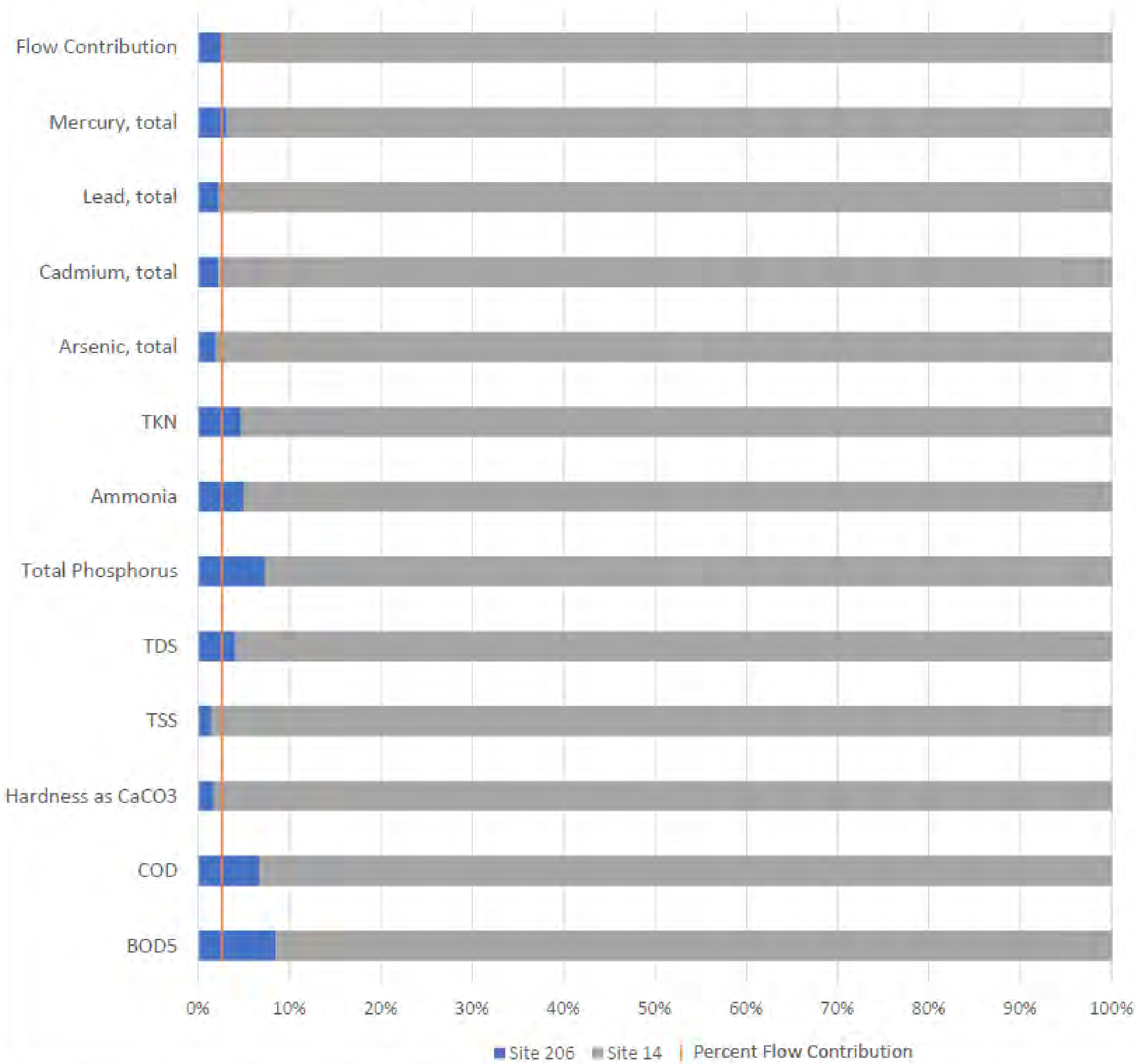


Figure 8: Percent Contribution 3/15/2022
Flow Contribution
Zinc, dissolved
Mercury, total
Lead, total
Lead, dissolved
Copper, dissolved
Cadmium, total
Cadmium, dissolved
Arsenic, total
TKN
Nitrate + Nitrite as N
Ammonia
Dissolved Orthophosphate as P
Total Phosphorus
TDS
TSS
Hardness as CaCO3
COD
BOD5
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Site 206
Site 14
Percent Flow Contribution

Figure 9: Percent Contribution 5/27/2022



Attachment K: Temperature Monitoring Summary WY 2022

Temperature Monitoring Summary WY 2022

Ada County Highway District

12/19/2022

Table of Contents

1. Introduction 1

2. Monitoring Sites, Equipment, and Sample Type.. 1

3. Results.. 1

Appendix A: Figures A-1

1. Introduction

Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Permittees) were issued a National Pollutant Discharge Elimination System Phase I Permit #IDS027561 (Permit) on October 1, 2021. The Permit authorizes the Permittees to discharge from municipal separate storm sewer (MS4) outfalls to the Boise River and its tributaries. According to Permit Part 4.1, *Temperature Monitoring,* Permittees must monitor temperature in stormwater discharges from the MS4 to the Boise River including assessment units 17050114SW005_06, 17050114SW005_06a, and 17050114SW005_06b. The Boise River assessment units (AU) within the Permit area are 17050114SW011a_06 and 17050114SW005_06. The remaining two AUs, 17050114SW005_06a and 17050114SW005_06b, are not in the Permit area therefore do not receive any Permittee stormwater contributions. The following summary provides temperature data collected during water year (WY) 2022 (October 1, 2021 – September 20, 2022).

2. Monitoring Sites, Equipment, and Sample Type

Temperature monitoring occurred at outfalls that discharge to both the Boise River and other waterways. Temperature measurements are collected as either discrete or continuous. Discrete measurements represent one instance in time and were measured manually using an In-Situ aquaTroll or smarTroll handheld instrument. Continuous measurements were taken at a specified interval by equipment that is installed at the outfall site. In WY 2022, all continuous temperature readings were taken using an area-velocity sensor. Table 2-1 below shows the number of outfalls where temperature data was collected, along with the receiving water and sample type. Figure 1 is a map of the sampled outfall locations.

Table 2-1. Temperature Monitored Outfalls

Receiving Water	Assessment Unit	# of Temperature Monitored Outfalls	Sample Type
Boise River	17050114SW011a_06	1	Discrete
	17050114SW005_06	6	Discrete
		3	Discrete and Continuous
Other Waterways	n/a	32	Discrete
		2	Discrete and Continuous

3. Results

Discrete temperature results are depicted in Figure 2. These results were derived from both wet weather and dry weather discharges, which are symbolized by a circle or a star, respectively. Temperature measurements for discharges directly into the Boise River are blue, while measurements for discharges into other waterways are red. Table 3-1 contains all discrete measurements by outfall site.

Graphs of continuous temperature results are found in Figures 3-8. The graph from each site displays water temperature and presents the water level and hourly precipitation for reference. Similar to the discrete measurements, the continuous temperature in discharges directly to the Boise River are shown as blue while discharges to other waterways are shown as red.

Table 3-1. Discrete Temperature Results

Outfall ID (Station Name)	Date	Weather	Temperature (C)
3n1e01_010	08/09/22	Dry Weather	19.36
3n1e15_008	06/23/22	Dry Weather	20.92
3n1e23_013	07/13/22	Dry Weather	19.40
3n2e04_010 (Main)	10/22/21	Wet Weather	14.35
	03/15/22	Wet Weather	9.30
	05/27/22	Wet Weather	21.82
	06/12/22	Wet Weather	19.41
3n2e04_016 (Whitewater)	10/22/21	Wet Weather	14.36
	03/15/22	Wet Weather	9.70
	04/04/22	Wet Weather	10.59
3n2e05_001	07/19/22	Dry Weather	17.13
3n2e05_011	06/23/22	Dry Weather	18.04
3n2e05_027	08/23/22	Dry Weather	18.63
3n2e06_011	06/21/22	Dry Weather	16.00
3n2e06_019	08/09/22	Dry Weather	20.68
3n2e07_009	07/13/22	Dry Weather	17.49
3n2e07_020	08/02/22	Dry Weather	20.06
3n2e09_024 (Americana)	10/22/21	Wet Weather	13.88
	02/10/22	Dry Weather	14.38
	03/15/22	Wet Weather	10.17
	03/31/22	Dry Weather	17.73
	04/04/22	Wet Weather	11.55
	07/05/22	Dry Weather	20.31
3n2e09_025 (AS_7)	02/10/22	Dry Weather	11.13
	03/31/22	Dry Weather	14.10
	07/12/22	Dry Weather	21.78
3n2e10_019	03/31/22	Dry Weather	12.61
3n2e10_022	06/29/22	Dry Weather	21.54
3n2e10_034	05/25/22	Dry Weather	17.23
3n2e10_037	04/21/22	Dry Weather	19.01
	07/20/22	Dry Weather	25.54
3n2e14_012	10/21/21	Dry Weather	14.31
	04/20/22	Dry Weather	11.05
	06/29/22	Dry Weather	15.92
3n2e14_013	04/20/22	Dry Weather	13.85
	06/29/22	Dry Weather	15.42
3n2e14_017	11/30/21	Dry Weather	14.66

	04/21/22	Dry Weather	13.08
	08/01/22	Dry Weather	19.98
3n2e16_021	08/02/22	Dry Weather	24.44
3n2e17_017	07/19/22	Dry Weather	17.09
3n2e17_021	07/19/22	Dry Weather	17.53
3n2e18_013	07/12/22	Dry Weather	18.46
3n2e24_006	04/20/22	Dry Weather	8.00
	08/01/22	Dry Weather	20.56
3n2e24_025	08/03/22	Dry Weather	21.90
4n1e13_006	06/22/22	Dry Weather	13.10
4n1e13_007	10/19/21	Dry Weather	15.12
	06/22/22	Dry Weather	15.74
4n1e13_009	07/26/22	Dry Weather	20.38
4n1e13_010	08/02/22	Dry Weather	18.74
4n1e14_004	09/22/22	Dry Weather	17.67
4n1e14_006	10/21/21	Dry Weather	16.64
	06/22/22	Dry Weather	14.13
4n1e26_007	06/30/22	Dry Weather	19.36
4n1e26_015	02/10/22	Dry Weather	7.97
4n1e34_019	04/20/22	Dry Weather	10.68
4n1e36_006	08/09/22	Dry Weather	19.12
4n1e36_014	08/23/22	Dry Weather	21.46
4n2e19_010	10/19/21	Dry Weather	14.15
	06/30/22	Dry Weather	20.41
4n2e19_021 (Lucky)	10/22/21	Wet Weather	16.41
	03/15/22	Wet Weather	12.21
	05/27/22	Wet Weather	20.53
	06/12/22	Wet Weather	18.38
4n2e31_006	07/20/22	Dry Weather	21.17
	09/27/22	Dry Weather	19.50
4n2e32_015	06/22/22	Dry Weather	15.43
4n2e34_008	04/21/22	Dry Weather	12.53
	08/03/22	Dry Weather	19.00
4n2e34_019	01/18/22	Dry Weather	13.67
	04/21/22	Dry Weather	12.80
	08/03/22	Dry Weather	21.10

Appendix A: Figures

Figure 1. Overview Map

Figure 2. Discrete Temperature Results

Figure 3. Continuous Temperature Results – Main

Figure 4. Continuous Temperature Results – Americana

Figure 5. Continuous Temperature Results – AS_7

Figure 6. Continuous Temperature Results – Whitewater

Figure 7. Continuous Temperature Results – Lucky

Figure 1.

WY2022 Temperature Monitored Outfalls

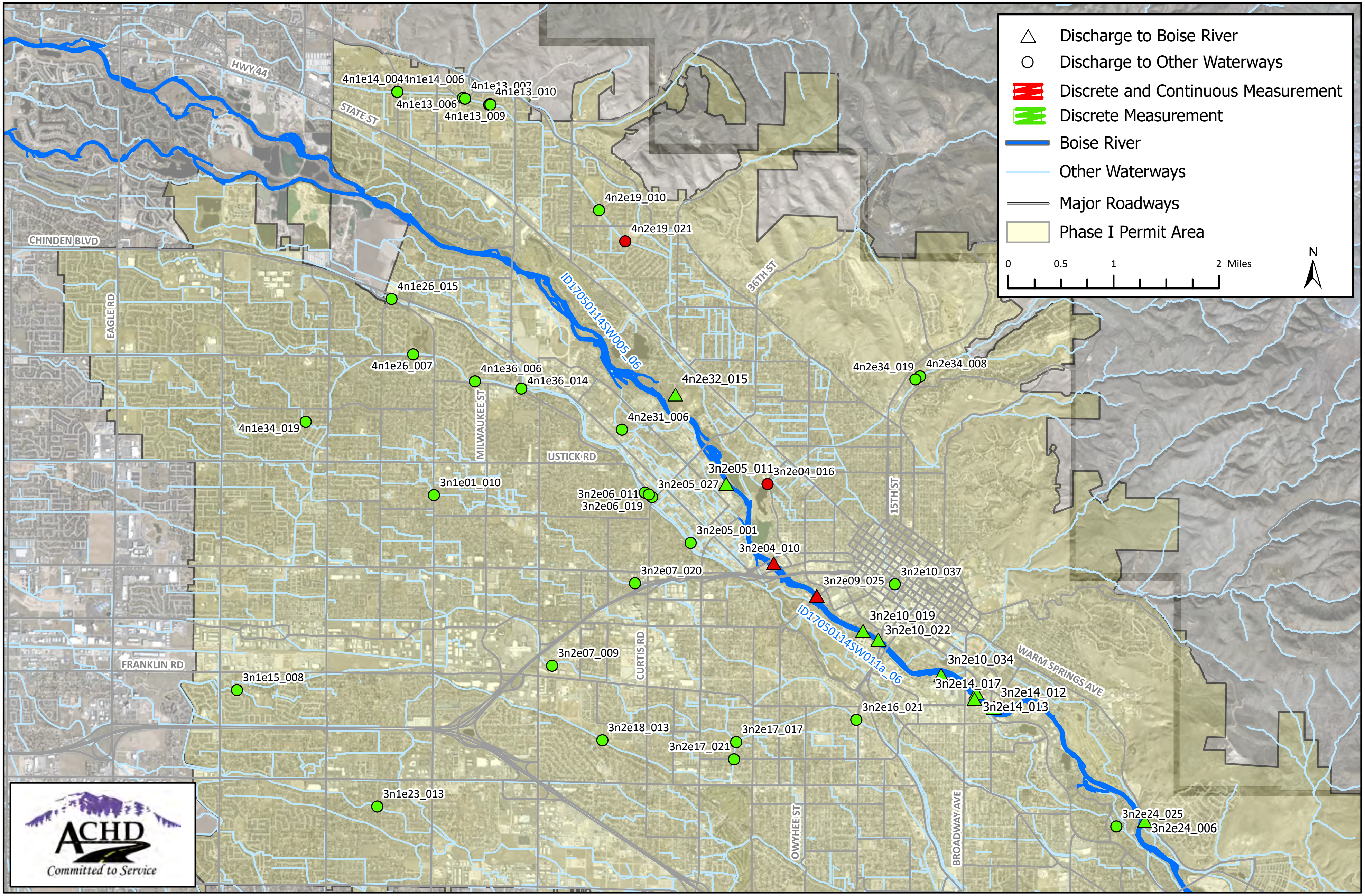
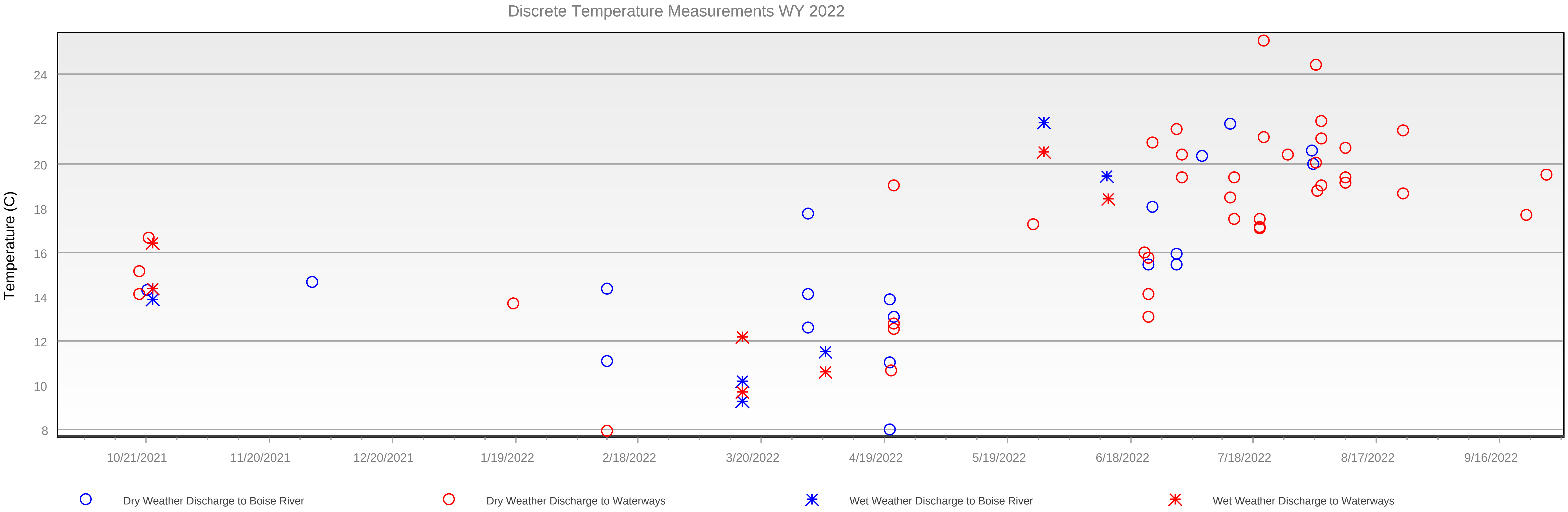


Figure 2.



Discrete Temperature Measurements WY 2022
Temperature (C)
24
22
20
18
16
14
12
10
8
10/21/2021
11/20/2021
12/20/2021
1/19/2022
2/18/2022
3/20/2022
4/19/2022
5/19/2022
6/18/2022
7/18/2022
8/17/2022
9/16/2022
Dry Weather Discharge to Boise River
Dry Weather Discharge to Waterways
Wet Weather Discharge to Boise River
Wet Weather Discharge to Waterways

Figure 3.

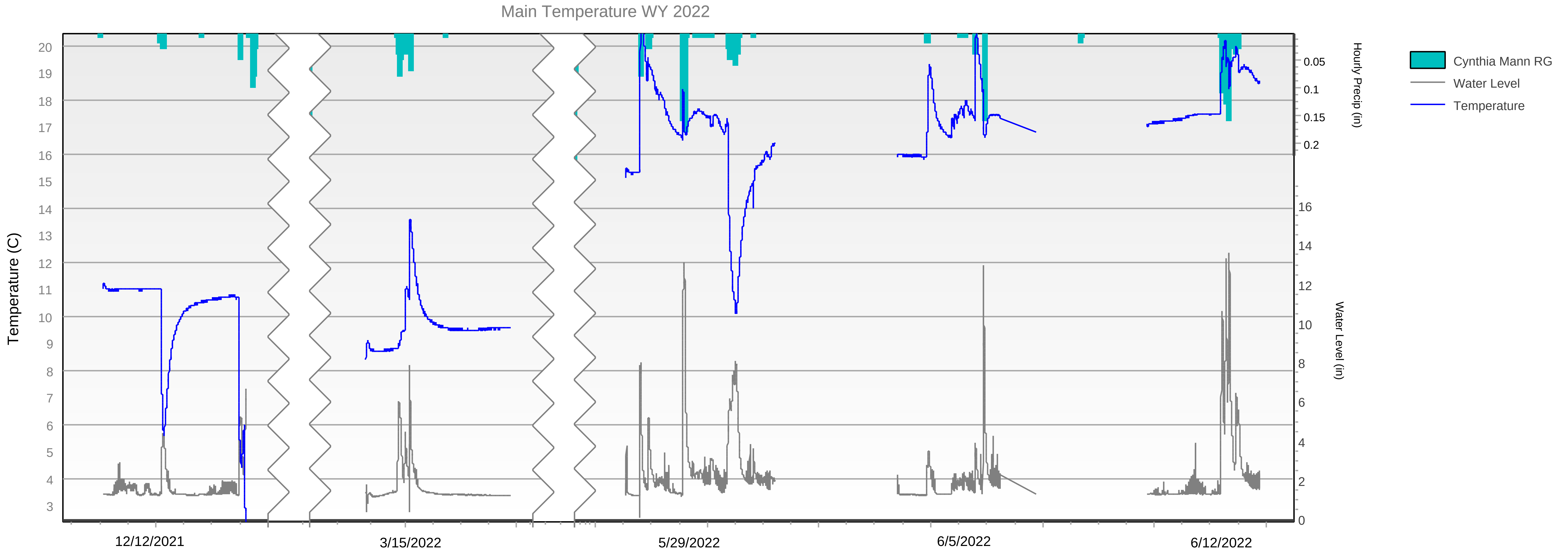
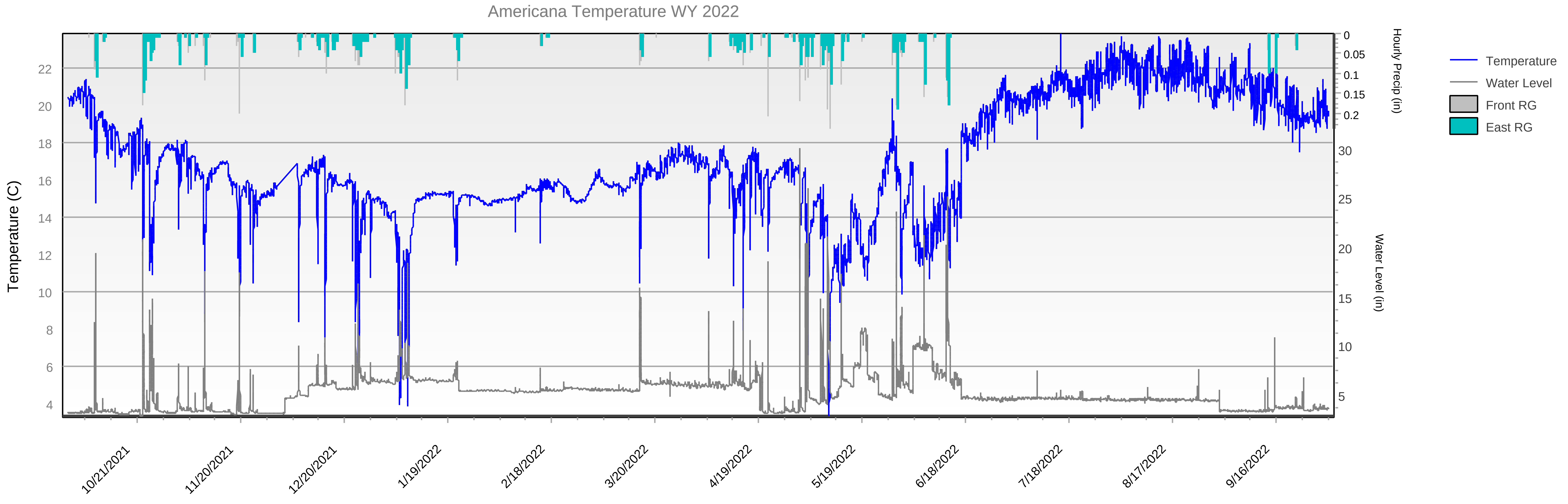
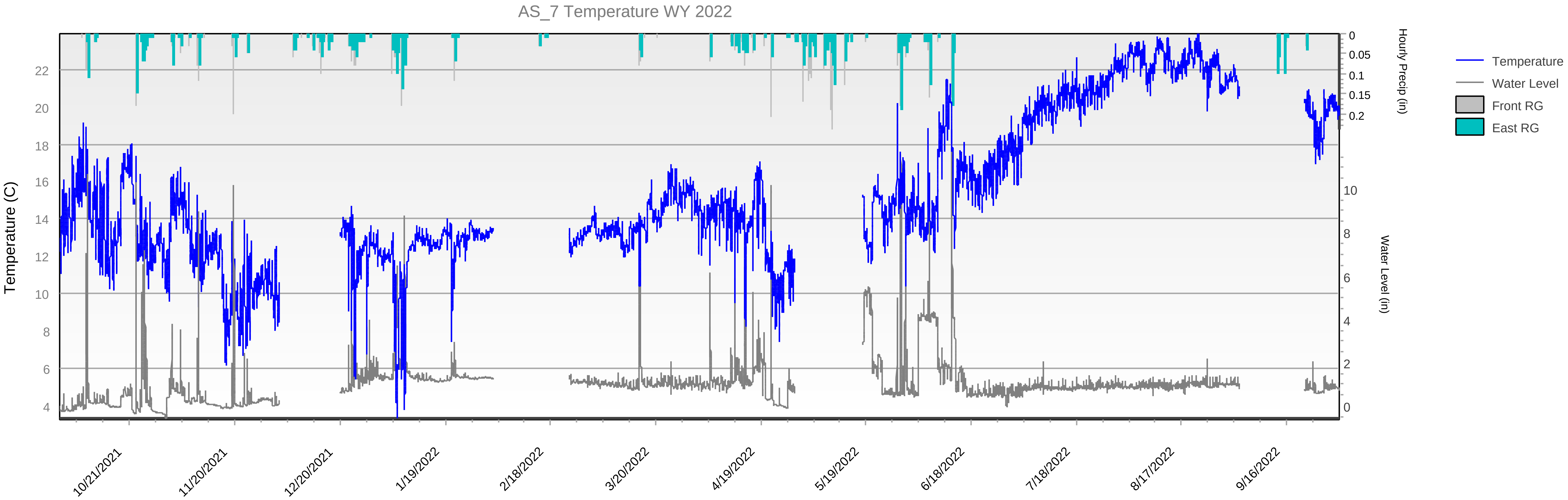

Main Temperature WY 2022
Temperature (C)
Hourly Precip (in)
Water Level (in)
Cynthia Mann RG
Water Level
Temperature
12/12/2021
3/15/2022
5/29/2022
6/5/2022
6/12/2022

Figure 4.



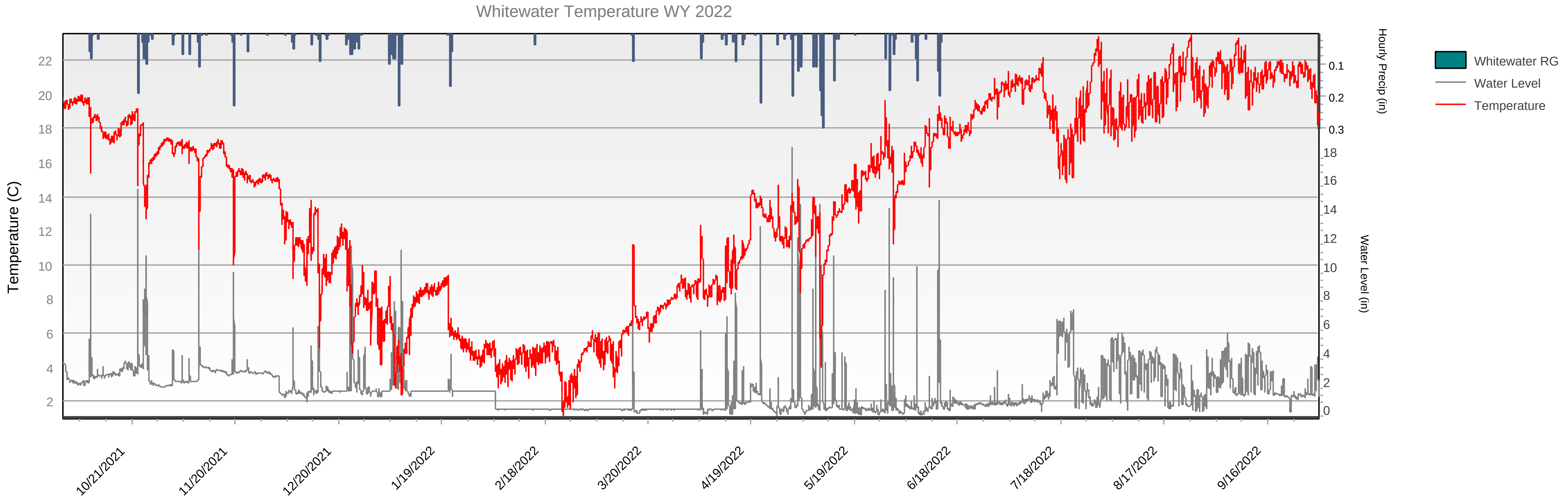
Americana Temperature WY 2022
Temperature (C)
Hourly Precip (in)
Water Level (in)
Temperature
Water Level
Front RG
East RG
10/21/2021
11/20/2021
12/20/2021
1/19/2022
2/18/2022
3/20/2022
4/19/2022
5/19/2022
6/18/2022
7/18/2022
8/17/2022
9/16/2022

Figure 5.



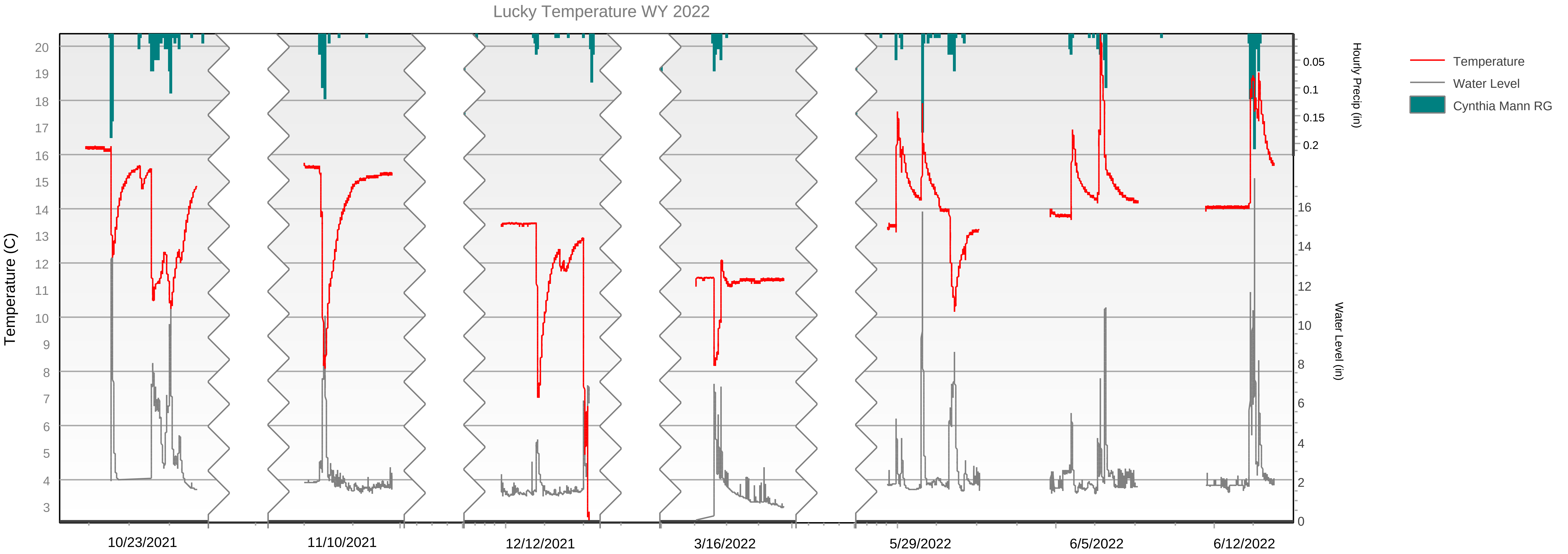
AS_7 Temperature WY 2022
Temperature (C)
22
20
18
16
14
12
10
8
6
4
Hourly Precip (in)
0
0.05
0.1
0.15
0.2
Water Level (in)
10
8
6
4
2
0
10/21/2021
11/20/2021
12/20/2021
1/19/2022
2/18/2022
3/20/2022
4/19/2022
5/19/2022
6/18/2022
7/18/2022
8/17/2022
9/16/2022
Temperature
Water Level
Front RG
East RG

Figure 6.



Whitewater Temperature WY 2022
Temperature (C)
22
20
18
16
14
12
10
8
6
4
2
Hourly Precip (in)
0.1
0.2
0.3
Water Level (in)
18
16
14
12
10
8
6
4
2
0
10/21/2021
11/20/2021
12/20/2021
1/19/2022
2/18/2022
3/20/2022
4/19/2022
5/19/2022
6/18/2022
7/18/2022
8/17/2022
9/16/2022
Whitewater RG
Water Level
Temperature

Figure 7.


Lucky Temperature WY 2022
Temperature (C)
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
Hourly Precip (in)
0.05
0.1
0.15
0.2
Water Level (in)
16
14
12
10
8
6
4
2
0
10/23/2021
11/10/2021
12/12/2021
3/16/2022
5/29/2022
6/5/2022
6/12/2022
Temperature
Water Level
Cynthia Mann RG

Attachment L: Stormwater Outfall Monitoring Plan and NPDES Phase I Temperature Monitoring Approach

NPDES Phase I Stormwater Outfall Monitoring Plan

Ada County Highway District
Boise, Idaho
8/11/2022

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List of Abbreviations

ACHD	Ada County Highway District
ac	acres
AV	Area Velocity
BC	Brown and Caldwell
BOD5	Biological Oxygen Demand – 5 day
CaCO3	Calcium Carbonate
CFR	Code of Federal Regulations
COC	Chain of Custody
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DQI	Data Quality Indicator
DQO	Data Quality Objective
EPA	Environmental Protection Agency
ft	feet
GI	Green Infrastructure
GSI	Green Stormwater Infrastructure
HDPE	High Density Polyethylene
IDEQ	Idaho Department of Environmental Quality
IPDES	Idaho Pollutant Discharge Elimination System
in	inches
LDPE	Low Density Polyethylene
L	liter
MDL	Method Detection Limit
mL	Milliliter
MS4	Municipal Separate Storm Sewer System
NH3	Ammonia
NO2	Nitrite
NO3	Nitrate
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
PMEP	Project Monitoring and Evaluation Plan
PRDL	Project Required Detection Limit
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Program Plan
RPD	Relative Percent Difference
SWOMP	Stormwater Outfall Monitoring Plan
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids

WQL	Boise City Public Works Water Quality Laboratory

Executive Summary

The Environmental Protection Agency, Region 10 (EPA) issued the third cycle National Pollutant Discharge Elimination System (NPDES) Municipal Storm Separate Sewer System (MS4) Phase I Permit No. IDS-027561 (Permit) effective October 1, 2021, to Ada County Highway District (ACHD), Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3, referred to as the “Permittees.” Starting July 1, 2021, the Idaho Department of Environmental Quality (IDEQ) acquired Permit authority through the Idaho Pollutant Discharge Elimination System (IPDES) Program. The Permit authorizes stormwater discharges from MS4 outfalls to waters of the United States in accordance with the conditions and requirements of the Permit. Under this permit, the Permittees are required to update the existing Stormwater Outfall Monitoring Plan to be consistent with the stormwater monitoring and evaluation program objectives as described in Permit Part 6.2.

This Stormwater Outfall Monitoring Plan (SWOMP) has been developed in line with the Quality Assurance Project Plan for NPDES Stormwater Permit Monitoring (QAPP) (ACHD, 2021). The SWOMP describes the overall approach to stormwater outfall monitoring and provides site and drainage area descriptive details for each monitoring station. The SWOMP also provides guidance for data collection efforts, including descriptions of meteorological and hydrological data collection procedures and use, as well as analytical data collection and sample handling procedures.

Certain Quality Assurance/Quality Control (QA/QC) procedures that have been identified using United States Environmental Protection Agency (EPA) guidance for QAPPs are also included in this plan. The QA/QC procedures are designed to ensure data collected meet specific data quality objectives developed specifically for Permit-required monitoring activities. This plan documents QC sampling procedures, storm event acceptance criteria, and data management details specific to the SWOMP.

Section 1

Introduction

1.1 Basis for Monitoring Plan

The Permit requires that the SWOMP be consistent with the stormwater monitoring and evaluation program objectives as described in Permit Part 6.2 and are the following:

- Broadly estimate reductions in annual pollutant loads of sediment, bacteria, phosphorus and temperature discharged to impaired receiving waters from the MS4s, occurring as a result of the implementation of SWMP activities;
- Characterize the quality of stormwater discharges from the MS4; and
- Identify and prioritize those portions of the MS4 where additional controls can be accomplished to reduce the volume of stormwater discharged and/or reduce pollutants in MS4 discharges to waters of the U.S.

1.2 SWOMP Objectives

The SWOMP is designed to address the minimum permit requirements for wet weather stormwater outfall monitoring as listed in Permit Part 6.2.1. The SWOMP serves as guidance for data acquisition, management, and reporting efforts undertaken by the Permittees.

This document outlines the SWOMP approach and includes specific QAPP elements recommended by the EPA. EPA-recommended QAPP elements are addressed as either program elements or monitoring plan elements.

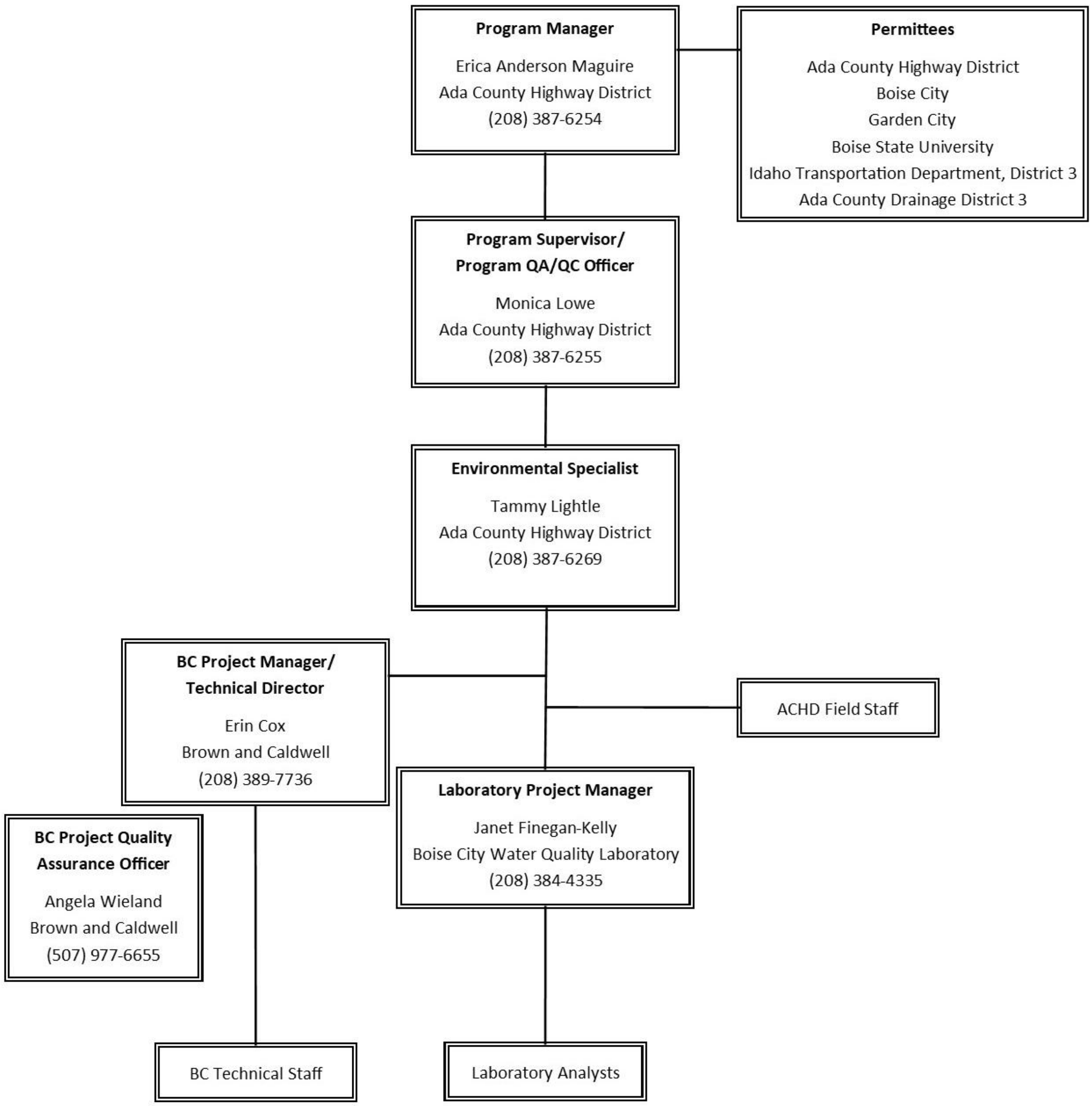
Monitoring plan elements are described in full in this document, while program elements are addressed in the QAPP. Monitoring plan elements are those components that contain details specific to each individual monitoring plan. Program elements consist of the standardized monitoring components that all individual monitoring plans developed under the Permit reference. A list of program and monitoring plan elements is included in Table 1-1.

Table 1-1. QAPP Element Document Reference		
EPA Recommended QAPP Elements	QAPP Element	SWOMP Element; Section
Group A: Project Management		
A1 – Title and Approval Sheet	X	
A2 – Table of Contents	X	
A3 – Distribution List	X	
A4a – Project Organization	X	
A4b – Task Organization		X; 1.3
A5 – Problem Definition/Background	X	
A6 – Project/Task Description		X; 1.2
A7a – Quality Objectives and Criteria for Measurement Data	X	

Table 1-1. QAPP Element Document Reference		
EPA Recommended QAPP Elements	QAPP Element	SWOMP Element; Section
A7b – Method Dependent Criteria for Measurement Data		X; 5.2
A8 – Special Training Needs/Certification	X	
A9 – Documents and Records	X	
Group B: Data Generation and Acquisition		
B1 – Sampling Process and Design		X; 2
B2 – Sampling Methods		X; 3, 4
B3 – Sample Handling and Custody		X; 4.6, 4.7
B4 – Analytical Methods		X; 4.2
B5a – Quality Control	X	
B5b – QA/QC Sampling Schedule		X; 5.1
B6 – Instrument/Equipment Testing, Inspection, and Maintenance		X; 3
B7 – Instrument/Equipment Calibration and Frequency		X; 3
B8 – Inspection/Acceptance of Supplies and Consumables	X	
B9 – Non-direct Measurements	X	
B10 – Data Management	X	
Group C: Assessment and Oversight		
C1 – Assessments and Response Actions	X	
C2 – Reports to Management	X	
Group D: Data Validation and Usability		
D1 – Data Review, Verification, and Validation	X	
D2 – Verification and Validation Methods	X	
D3 – Reconciliation and User Requirements	X	

1.3 Task Organization

ACHD is the lead agency for stormwater outfall monitoring under the Permit, and a consultant team assists with the monitoring program. Key roles and job functions are described in the QAPP. The stormwater outfall monitoring program organization chart is presented in Figure 1-1.



*Staff list subject to change. If changes occur, contact current staff member in corresponding role.

Figure 1-1. Stormwater Outfall Monitoring Organization Chart

Section 2

Sampling Process Design

The sampling process design consists of the collection of data at monitoring stations set up on representative drainages throughout the MS4 to present a picture of the impact of pollutant prevention efforts and the potential for pollutant loading reduction in the permit area. Data to be collected includes a combination of site-specific continuous rainfall data, continuous flow data from background sources, and stormwater discharges and water quality data. Section 2.1 provides an overview of the methods used to obtain this data and more detail is provided in sections 3 and 4. Drainage area characteristics integral to the sampling process design include land use, impervious ground cover percentage, canopy cover, vegetated area, stormwater controls, and stormwater infrastructure.

The process the permittees used for selecting monitoring sites is outlined below in Section 2.2. Detailed site description information is included in Section 2.3.

2.1 Data Collection Overview

Data collection at each monitoring station will be facilitated by a combination of automated sampling and measurement equipment and manual sampling, observation, and characterization activities. Automated sampling equipment includes a flowmeter with an area velocity (AV) sensor installed in the storm drain pipe. The flowmeter will record stormwater discharge, instantaneous and cumulative flow volumes, as well as background flows as applicable. Flow will be monitored continuously at sites that have consistent background flows.

The flowmeter is connected via a data cable to the automatic sampler. The automatic sampler and flowmeter are programmed to collect site specific, flow-weighted composite samples. Throughout a sampling event, the flowmeter triggers the sampler to initiate pumping at a pre-programmed volume interval to collect a representative composite sample of the stormwater discharge.

Each monitoring station is associated with a rain gauge to collect precipitation data to use in conjunction with sampling and flow data for analysis and quality assurance. Additionally, forecasts, weather, and hourly precipitation data for the weather station located at the Boise Airport are available from the National Weather Service (NWS) website.

Water quality data collection will be accomplished through a variety of sampling and analysis methods. Discrete grab samples will be collected for laboratory analysis and analysis of field parameters. Composite samples will be split at the laboratory for analysis. Discharges from three separate storm events will be sampled during each water year.

Monitoring equipment operation and maintenance descriptions are included in Section 3. Specific descriptions of sampling procedures are described in Section 4.

2.2 Site Selection

The Permit requirement for wet weather stormwater outfall monitoring is to continue the monitoring program that was implemented under the 2012 NPDES Phase I Permit. As such, four monitoring stations (Lucky, Whitewater, Main, Americana) will continue to be the sampling locations for this SWOMP. For more information on how these stations were selected, refer to the *Storm Water Outfall Monitoring Plan* (ACHD, 2014a).

A vicinity map (Figure 1) showing each monitored drainage area within the Phase I Permit area is included in the Figures section at the end of the document. Site maps showing land uses and associated impervious area percentages by land use are also included in the Figures section.

2.3 Site Descriptions

Table 2-1 provides a summary overview of the monitoring station locations and associated subwatersheds. A summary of each monitoring site and a description of the monitoring equipment is included in the sections to follow. Subwatershed area, monitoring station maps, and pictures are included in the Figures section at the end of the document.

Table 2-1. Monitoring Station Information

	Lucky (Site ID: 3)	Whitewater (Site ID: 11)	Main (Site ID: 12)	Americana (Site ID: 14)
Outfall ID	4n2e19_021	3n2e04_016	3n2e04_010	3n2e09_024
Location	5590 West Lucky Drive (northwest Boise)	East side of Whitewater Park Boulevard (west of downtown Boise)	303 West Main Street (west of downtown Boise)	1661 Shoreline Avenue (downtown Boise)
Station GPS Coordinates	43.6634612,-116.2583125	43.631432, -116.230644	43.621493, -116.228274	43.616150, -116.221257
Subwatershed Area	105 ac.	498 ac.	79 ac.	875 ac.
Percent Impervious Groundcover[1,2]	40	43	55	39
Land Uses (percentage)[1,3]	Right of Way (22%) Residential Med (78%)	Right of Way (36%) Commercial (4%) Residential Med (50%) Residential High (7%) Public and Schools (3%)	Right of Way (43%) Commercial (37%) Residential Med (14%) Residential High (5%) Public (1%)	Right of Way (30%) Commercial (13%) Residential (Hi/Med/Low) (39%) Parks and Open Space (14%) Public and Schools (4%)
Receiving Water	Eagle Drain	Crane Creek	Boise River	Boise River
Assessment Unit	N/A	ID17050114SW012-02	ID17050114SW011a_06	ID17050114SW011a_06
Distance from Station to Outfall	350 ft	140 ft	500 ft	108 ft
Rain Gauge Location	Cynthia Mann	Whitewater (at monitoring station)	Front	Front and East
Rain Gauge GPS Coordinates	43.664185, -116.256289	43.631432, -116.230644	43.619429, -116.216409	43.619429, -116.216409 43.626046, -116.187601
Rain Gauge Distance from Station	620 ft	0 ft	3,200 ft	1,730 ft and 9,600 ft

Table 2-1. Monitoring Station Information				
	Lucky (Site ID: 3)	Whitewater (Site ID: 11)	Main (Site ID: 12)	Americana (Site ID: 14)
Pipe Construction	30 in, circular, corrugated metal pipe	38 in, ellipsoid, corrugated metal pipe	30 in, circular, concrete pipe	48 in, circular, concrete pipe
Power Source	40 Ahr battery	Commercial power	40 Ahr battery	40 Ahr battery
Parking	Park next to sidewalk at 5590 West Lucky Drive	Park in pullout south of enclosure	Park in lot southwest of enclosure	Park in space northwest of enclosure in parking lot
Equipment Location	Below ground in manhole in yard	In enclosure	In enclosure	In enclosure
Sampling Considerations	Swing sampler needed for grabs through manhole	Swing sampler needed for grabs through manhole	Swing sampler needed for grabs through manhole	Swing sampler needed for grabs through manhole
Data Considerations	Consistent standing water in manhole and pipe	Background flow usually present	Surcharges when Boise River stage is high	Background flow present year-round, Surcharges when Boise River stage is high
Watershed BMP Summary	Catch basins, sand and grease traps	Catch basins, sand and grease traps, ditches	Catch basins	Catch basins, sand and grease traps, seepage beds, bioretention planters, permeable pavers, stormwater tree cells

[1]Source: ACHD, 2014b.

[2]Impervious cover includes roads and streets, rooftops, and parking lots.

[3]Land uses as delineated are defined as follows (ACHD, 2014c):

- Right of Way – Land reserved for transportation purposes managed by the Ada County Highway District. Not part of a recorded parcel by the Ada County Assessors office.
- High Density Residential – 8 residential units/acre or above. Multifamily units such as duplex, condos, apartments.
- Medium Density Residential – 3 -7 residential units/acre. Typical single family residential on 0.15 to 0.49 acre lots.
- Low Density Residential – Less than 3 residential units/acre. Single family residential on lots 0.50 acres and larger.
- Commercial – Includes commercial retail and office space.
- Industrial – Includes manufacturing, warehousing, distribution other non-retail uses.
- Parks and Open Space – Includes public parks and open/undeveloped spaces.
- Public and Schools – Includes public buildings/facilities and schools including associated grounds.

2.3.1 Lucky

The Lucky monitoring station is located at 5590 West Lucky Drive in northwest Boise (Figure 2). Access to the sampling location is through a manhole located in the front yard near the sidewalk on West Lucky Drive (Figure 3). The manhole is located within a drainage and utility easement and is an access point for the stormwater conveyance system that carries stormwater from the Jordan's Landing Subdivision into Eagle Drain. The Lucky site is influenced by infiltration into the storm drain system from groundwater and the Boise City Canal in the nearby vicinity but does not have consistent background flow. Historically, there are around 2 inches of standing water in the pipe at the AV sensor. Surcharge conditions have not been a factor at the monitoring station.

The Lucky monitoring station is the only site that was previously monitored under both the 2000 NPDES Phase I Permit and the 2012 NPDES Phase I Permit.

Lucky Flow Measurement and Configuration

The AV sensor and sampler intake tubing are installed just downstream (northwest) of the manhole in the stormwater conveyance pipe. Grab samples are collected at the inlet to the stormwater conveyance pipe on the downstream side of the vault just before the sampler intake tubing. The flowmeter and sampler are installed in the manhole vault and sit on a platform suspended by cables that are secured to the inside collar of the vault.

2.3.2 Whitewater

The Whitewater monitoring station is located on the east side of Whitewater Park Boulevard (Figure 4). The sampling location is accessed through a manhole located in the sidewalk (Figure 5). Background flows are frequently present at the monitoring station and may consist of infiltration from Crane Creek, Boise City Canal, groundwater, and possibly other irrigation sources. The Whitewater subwatershed discharges into Crane Creek which begins in the foothills and flows to the northwest and intersects with the Farmer's Union Canal about 2,100 feet downstream from the monitoring station. During winter a temporary dike, which directs flows into a side channel of the Boise River, is installed at the intersection of the creek and the canal. Throughout irrigation season (typically early April through late September) the dike is removed and water flows to both the Farmers Union Canal and the side channel of the Boise River.

Upstream of the monitoring station, irrigation water from the Boise City Canal can overflow into the storm drain system via headgates that can be opened when irrigation flows are high. The Boise City Canal was developed in 1866 and is managed and operated by the Boise City Canal Company.

Whitewater Flow Measurement and Configuration

The flowmeter and sampler are installed in a locked enclosure that is mounted to a concrete pad. The sampler intake tubing and AV sensor are connected to the equipment in the enclosure via a conduit that extends through the concrete pad to the inside top of the pipe. Grab samples are collected in the manhole.

This station has commercial power, and the flowmeter is continuously measuring level and velocity and calculating flow. To calculate flow from velocity and level measurements in an ellipsoid pipe, the pipe dimensions (length and width) are programmed into the flowmeter. The flowmeter also records measurements from the rain gauge installed adjacent to the enclosure.

2.3.3 Main

The Main monitoring station is located at 303 West Main Street, west of the intersection of Main Street and Whitewater Park Boulevard (Figure 6). The sampling location is accessed through a manhole located in the sidewalk on the south side of Main Street (Figure 7). Background flows have not been recorded at this monitoring station to date, however, the pipe does surcharge during seasonal high river flows.

Main Flow Measurement and Configuration

The sampler intake tubing and AV sensor are installed just upstream (northeast) of the manhole vault. The flowmeter and sampler are installed in an enclosure next to the manhole. Grab samples are collected in the storm drain manhole located in the sidewalk.

2.3.4 Americana

The Americana monitoring station is located at the landscaped area on the west side of Americana Boulevard near the southeast corner of the parking lot for the office building located at 1661 Shoreline Avenue (Figure 8). The monitoring station is located on land owned by Riverwalk Partners, LLC with a dedicated storm drain easement. A license agreement was executed prior to the construction of the monitoring station between ACHD and Riverwalk Partners, LLC. The sampling location is accessed through a manhole located just west of the sidewalk that runs along the west side of Americana Boulevard (Figure 9).

Americana Flow Measurement and Configuration

Background flow is typically present at the Americana monitoring station. Background flow sources include groundwater infiltration, irrigation runoff, overflow from Hulls Gulch, return water from geothermal heating, intermittent discharges from the Boise Ice Company, and other sources to be investigated as monitoring progresses. The flowmeter's AV sensor and sampler intake tubing are installed just upstream (north) of the manhole in the stormwater conveyance pipe. Grab samples are also collected from the manhole.

Section 3

Monitoring Equipment

3.1 Monitoring Equipment Operation and Calibration

3.1.1 Flowmeters

Each monitoring station is equipped with a flowmeter. Depending on site configurations, an ISCO Signature flowmeter or a Hach AV9000 flow module is used. The flowmeters are used to record temperature, level, velocity, and flow. The flowmeter utilizes an AV sensor that is mounted to the invert of the pipe by means of a mounting band. The AV sensor includes both a depth sensor and an acoustic Doppler velocity sensor. The flowmeter calculates flow using the measured depth and velocity along with pre-programmed pipe geometry. During storm events the flowmeters are programmed to send a signal to an automatic sampler after a specified volume of runoff has passed the AV sensor.

3.1.1.1 Calibration and Maintenance

Routine maintenance of flowmeters, including level calibration, will be performed semi-annually according to the procedures listed in Appendix A. More frequent maintenance or calibration will be performed as warranted by equipment performance.

Calibration of the level requires only offsetting the initial depth of water. Typically, no field calibration of the velocity sensor is required. Additional checks on the accuracy of the velocity meter can, however, be conducted using a manual current meter to measure velocity. Depth can be checked by simple measurement and comparison to the recorded value. Readings showing deviations can be corrected using the flowmeter interface while in the field.

3.1.2 Automatic Samplers

Composite sampling is carried out at each of the monitoring stations using either ISCO 6712 samplers or Hach AS950 samplers. Sample aliquots are pumped from the stormwater conveyance to a 15-litercarboy by a peristaltic pump. The discharge tubing of the pump is routed into the sample container which is secured in the insulated base of the sampler with ice to maintain target sample temperature.

For each sampling event, the automatic sampler is programmed to collect samples based upon flow-paced signals received from the flowmeter via a control cable. The sampler collects one sample for each signal from the flowmeter. Sample aliquot volumes are programmed and calibrated to produce a flow-weighted composite sample of the storm event discharge consisting of a targeted 24 subsamples. A record of the sampler's operations (e.g., execution data and sample times) is stored on the hard drive of both the sampler and the flowmeter and may be downloaded to a portable computer at any time.

3.1.2.1 Calibration and Maintenance

Routine maintenance of the automatic samplers, including cleaning and calibration, will be performed semi-annually, or more frequently as warranted by equipment performance, according to the procedures listed in Appendix A.

The sampler is calibrated by comparing the collected sample volume (measured using a graduated cylinder) with the required volume that was programmed into the sampler program. The sampler microprocessor will adjust the pump run time to either increase or decrease the sample volume. This process is repeated until the sampler delivers a volume that is within ±10 percent of the requested sample volume.

3.1.3 Rain Gauges

ACHD currently maintains four rain gauge sites representative of the monitored drainage areas. The rain gauges are deployed to collect continuous precipitation data throughout the water year. The program utilizes tipping-bucket style rain gauges that measure rainfall depths in 0.01-inch increments. Each tipping-bucket is connected to either Hobo event data loggers or an ISCO Signature flowmeter via a cable. At sites equipped with Hobo data loggers, a primary and a back-up data logger are used to record tip measurements.

A vicinity map (Figure 1) showing the location of each rain gauge is included in the Figures section at the end of the document. Figure 10 includes pictures of the rain gauges, which are located in the following areas:

- **Cynthia Mann Rain Gauge:** Cynthia Mann Elementary School in northwest Boise.
- **East Rain Gauge:** At the intersection of West Eastway Drive and Rainier Lane in a Boise foothills neighborhood.
- **Whitewater Rain Gauge:** At the Whitewater monitoring station on Whitewater Boulevard.
- **Front Rain Gauge:** At an ACHD maintenance storage area at the intersection of South 17th Street and Front Street.

The data collected on the rain gauge data loggers will be downloaded to a portable laptop computer on a bi-monthly basis. Additionally, sampling personnel will download rain gauge data during station shutdown following monitored storm events. The data will be compared to the NWS rainfall data to identify geographic variations, revise estimates of runoff coefficients, and analyze and evaluate the stormwater quality data.

In addition to using rainfall totals as acceptance criteria for storm event qualification, other program data derived from rainfall records include storm event antecedent dry periods, total rainfall distribution during sampling events, and rainfall intensity during monitored storm events.

3.1.3.1 Calibration and Maintenance

The rain gauges and data loggers will be inspected and maintained biannually. Troubleshooting and any non-routine maintenance will be performed as necessary. Calibration is not typically required for the tipping bucket rain gauges. If needed, calibration procedures are outlined in the rain gauge equipment manual. Inspection, maintenance, and downloading procedures are listed in Appendix A.

3.1.4 Handheld Field Parameter Instruments

During grab sample collection, specific parameters will be measured directly in the field using a variety of handheld instruments to collect readings including pH, conductivity, dissolved oxygen, and temperature. Each sampling team will have a dedicated set of instruments and will record measurements as soon after sample collection as feasible. Field parameter instruments will be rinsed with distilled water between measurements. After the sampling event has ended, these instruments will be allowed to air-dry and will be kept indoors between sampling events.

Handheld Field Parameter Instruments include the following:

- In-Situ Multiparameter meter
- Horiba D-21 pH/temperature meter and Horiba D-51 pH/temperature meter
- Oakton 300 pH/DO/temperature meter
- YSI-85 DO/salinity/conductivity/temperature meter

Safety Monitoring Instruments:

- Hazardous vapor monitors including BW GasAlert Max XT II and Sperian PhD6

3.1.4.1 Calibration and Maintenance

Maintenance will be conducted per manufacturers' recommendations and the procedures listed in Appendix A, or more frequently as warranted by equipment performance. Instruments will be inspected and calibrated prior to each monitoring event. All calibration records will be kept in the ACHD Stormwater Lab for reference.

Section 4

Sampling Procedures

4.1 Analytical Sample Collection Frequency

The stormwater monitoring, including the collection of stormwater discharge samples for laboratory analysis, is conducted at a minimum frequency of three wet weather events per year at each of the four sites. Attempts will be made to separate sampling events by a minimum of 30 days to represent seasonal variability.

4.2 Stormwater Parameter Analysis

The analytical methods planned for use in stormwater outfall monitoring are presented in Table 4-1 below. The NPDES Permit requires that sample collection, preservation, and analysis be conducted according to sufficiently sensitive methods/test procedures approved under 40 Code of Federal Regulations (CFR) Part 136, 40 CFR subchapters N or O, or an alternative method that has been approved by EPA. As such, the methods identified below are the selected and preferred options. However, sample, laboratory, or instrument conditions may require the substitution of an alternate Part 136 method. Field parameter measurements provide pH, temperature, conductivity, and dissolved oxygen (DO) data. Additional water quality data is provided by laboratory analyses of both grab and composite samples. Table 4-1 identifies the components to be collected by grab sampling and as flow-weighted composite samples, along with the analytical methods to be used.

Table 4-1. Analytical Methods for Stormwater Constituents in Wet Weather Samples

Constituent	Analytical Method	Sample Collection Type
Ammonia (NH_3)	SM 4500-NH3 D	C
5-Day Biological Oxygen Demand (BOD5)	SM 5210 B	C
Chemical Oxygen Demand (COD)	HH 8000	C
Nitrite plus Nitrate (NO_2+NO_3)	EPA 353.2	C
Total Kjeldahl Nitrogen (TKN)	EPA 351.2, 10-107-06-2-M	C
Total Dissolved Solids (TDS)	SM 2540 C	C
Total Suspended Solids (TSS)	SM 2540 D	C
Turbidity	EPA 180.1	C
Dissolved Orthophosphate	EPA 365.1	C
Total Phosphorus	EPA 200.7	C
E. coli	IDEXX Colilert	G
Mercury – Total	EPA 245.2	C
Arsenic – Total	EPA 200.8	C
Cadmium – Total and Dissolved	EPA 200.8	C
Calcium – Total	EPA 200.7	C
Lead – Total and Dissolved	EPA 200.8	C
Magnesium – Total	EPA 200.7	C

Table 4-1. Analytical Methods for Stormwater Constituents in Wet Weather Samples		
Constituent	Analytical Method	Sample Collection Type
Hardness (as Calcium Carbonate [$CaCO_3$])	EPA 200.7	C
Copper – Dissolved	EPA 200.8	C
Zinc – Dissolved	EPA 200.8	C
Conductivity	EPA 120.1	G,f
DO	In-Situ Method 1002-8-2009	G,f
Temperature	EPA 170.1	G,f*
pH	EPA 150.2	G,f
Flow/Discharge Volume	Non Specific	f

C – Constituent analysis will be conducted using a composite sample.

G – Constituent analysis will be conducted using a grab sample.

f – Analysis will be conducted in the field.

f - Temperature is recorded during field parameter measurement and is recorded continuously by the AV sensor.*

4.3 Weather Forecast and Storm Selection

The Environmental Specialist (or designee) will obtain up-to-date information on a storm's anticipated physical characteristics from the NWS. Information obtained for each forecast will include the probability of precipitation, the expected amount of precipitation, and the expected arrival time of the storm. Weather forecasts and information will ordinarily be obtained via the Internet and supplemented as needed by telephone conversations with the NWS meteorologist on duty. The Environmental Specialist will review weather forecasts daily and compare them with the established storm selection criteria to determine the likelihood of initiating stormwater sampling.

The EPA's definition of a representative storm event (EPA, 1983) states that the storm precipitation total must be greater than 0.10 inch and that the storm be preceded by a minimum of 72 hours from the previously measurable (greater than 0.10 inch) event.

With the Permit requirements and EPA guidance considered, ACHD will use the following criteria to assist in decision making for selecting forecasted storms to target under typical conditions:

- 70 percent or greater probability of precipitation forecasted
- Quantitative precipitation forecast predicted precipitation of greater than 0.10 inch in a 12-hour period
- Event separated by a minimum of 72 hours of dry weather from the previous measurable storm event (rainfall greater than 0.10 inch)
- At least 30-day separation from the previous sampling event

Criteria for snow conditions include the following:

- Forecasted precipitation in the form of snowfall will be evaluated in the context of the greater weather forecast to determine the likelihood of runoff occurring at the outfall.
- Though snowmelt is considered stormwater runoff, sampling events will not be initiated for collection of discharge from snowmelt alone when criteria for a representative storm are not forecasted to be met.

These criteria represent the general approach to storm event targeting used for this program. Ultimately, the Environmental Specialist will use these criteria in conjunction with additional forecast information, sampling program and staffing requirements, and other factors to make the decision to target a particular storm.

The Environmental Specialist will communicate the sampling status to the consultant Field Coordinator daily by means of the Sampling Event Communication Form (included in Appendix B). The Sampling Event Communication Form will also be sent to laboratory project personnel and ACHD field sampling staff.

If storm selection criteria appear to be met, the Environmental Specialist will confer with the consultant Field Coordinator. If both parties agree, the consultant Field Coordinator will initiate storm event preparation by advising the sampling team of the upcoming sampling event. At this time, all necessary sample containers will be prepared and organized by site.

4.4 Monitoring Station Set-up

Prior to a sampling event, the Environmental Specialist or the consultant Field Coordinator will be responsible for readying the flowmeters and automatic samplers at the monitoring stations following the procedures listed on the Setup/Shutdown Form (Appendix B). Whenever possible, setup will be conducted by two trained staff. The Environmental Specialist (or designee) will be responsible for calibrating the handheld field parameter equipment, ensuring that adequate sampling supplies are available, and notifying the laboratory of the possible sampling event

Monitoring station set-up activities include the following:

- flushing the polyethylene sampler intake line and silicone discharge tubing with a dilute hydrochloric acid solution
- checking the condition of sampler harness and platform (if applicable), and sampler humidity indicator
- inspecting electrical and tubing connections for tightness
- installing recharged batteries
- freeing sampler tubing of twists, pinches, or cracks and replacing if needed
- loading bottles and ice into automatic samplers
- programming the samplers and flowmeters
- initiating the sampling program
- recording set-up information on field data sheets

4.4.1 Flowmeter Programming

Sampler Enable Condition

The flowmeter will be programmed to enable the sampler based on the water level in the pipe. The level condition will be programmed after a review of the previous 72 hours of level readings. Once runoff begins and water level increases, the sampler will enable and total flow will be computed toward the trigger volume, described below. Using the sampler enable condition allows for the sampler program to be initiated without the flowmeter triggering sample collection until storm runoff begins.

Runoff Coefficients and Trigger Volumes

To collect a flow-weighted composite sample throughout a storm, estimates will be calculated for the runoff volume expected at each station. The expected runoff volume will be divided by the planned number of sample aliquots, and the resulting value is used as the trigger volume for programming the flowmeter. The trigger volume is the amount of flow that will be measured before the automatic sampler is triggered to collect a subsample. Therefore, the number of samples collected over the course of a storm is a result of the runoff volume expected for the total storm as forecasted at the time of station set-up.

Calculating the total estimated runoff is a function of the weighted rainfall amount expected and the site-specific runoff coefficient. Precipitation amounts are weighted by multiplying the predicted rainfall amount by the probability of precipitation as forecasted by the NWS. The site-specific runoff coefficients are derived from the percentage of impervious ground cover in the subwatershed and empirical values from observed storm data.

Historical data suggests that multiple variables factor into the actual volume of runoff measured at each monitoring station. These variables include the size, duration, and intensity of a storm, along with irregularities within the drainage area including soil moisture, temperature, snow cover, and irrigation influences. Recorded runoff volumes from each station will be used to continually refine runoff coefficients over the course of the program.

4.5 Sample Collection

4.5.1 Sampling Teams

Sampling team assignments will be decided once the decision is made to target a storm for a sampling event. At least two teams will be formed, each consisting of two persons, a sample team leader and a sample technician. One sample team leader will serve as the site safety officer during sampling events. Each team will be responsible for collecting samples at their assigned stations.

When storm event runoff begins, the consultant Field Coordinator will confer with the Environmental Specialist and mobilize sampling teams. All sampling personnel will meet at the ACHD Stormwater Lab for a briefing on field conditions, QA/QC samples to be targeted, and safety reminders and concerns. Sampling teams will be responsible for the following:

- Collecting field parameter measurements
- Collecting laboratory analytical grab samples
- Verifying operation of the automated sampling equipment
- Collecting sample duplicates and/or preparing field blanks, as required
- Returning grab sampling equipment to ACHD
- Arranging transportation of samples for submittal to Boise City Public Works Water Quality Laboratory (WQL)

4.5.2 Grab Sample Collection

Grab sample collection at each monitoring station will be accomplished by the sample team leader. The sample team leader will fill grab sample bottles for each analysis from a point near the center of the flow at each monitoring station in accordance with the applicable procedures listed in Appendix A. Immediately following sample collection, the sample technician will record the collection date, time, and sample identification on the sample containers and on a Grab Sample Data Form (Appendix B). Additional sampling information recorded on the Grab Sample Data Form includes field parameter measurements and the corresponding meter used, status of the automated sampler, and other comments and observations.

Field parameters including temperature, pH, conductivity, and DO will be measured in the field using handheld instruments to avoid changes that may occur between the time when the sample is collected and the time of the analysis. Measurements from these field tests will be recorded on the Grab Sample Data Form included in Appendix B.

4.5.3 Composite Sample Collection

Collecting flow-weighted samples throughout a storm event is facilitated using automated sampling equipment. Each monitoring station is equipped with an automatic sampler. During station setup, samplers are programmed for a site- and event-specific trigger volume. At each monitoring station, the automatic sampler is linked to the flowmeter via a data cable. When the flowmeter records the trigger volume amount, the integrated peristaltic pump on the automatic sampler engages and draws a sample through the tubing installed in the invert of the storm drain pipe. The sample aliquot is pumped into the composite sample bottle secured in the base of the automatic sampler.

The sampler program will end automatically after the last programmed subsample has been collected (typical target of 24 subsamples). Immediately following collection of the sample container, the sample team will record the collection date, time, and sample identification on the sample bottle and the Composite Sample Collection Form (Appendix B).

Variability between expected runoff amounts and measured runoff amounts are common. To increase the probability of collecting a representative sample, a conservative approach to programming the sampler is used. The minimum volume required by WQL to run the analyses identified in Table 4.1 is 8 liters. In order to collect a representative composite sample, the sampler is programmed to collect 24 aliquots at 620 mL per aliquot. This approach will provide 13 subsamples to achieve the minimum volume, with a conservative estimate of forecasted rainfall. This will also provide additional capacity to collect up to 11 more aliquots in the event the intensity and duration of the storm is more than expected.

4.6 Sample Handling Procedures

The required types of containers and holding times for the stormwater outfall monitoring component are dependent upon the components to be analyzed. Table 4-2 includes container types and holding times for each parameter group.

Preservation techniques in the field are limited to cooling samples to a target sample temperature of less than 6°C, but above freezing. Five to ten pounds of food-grade ice will be placed in the coolers of the automatic samplers during station setup. Sufficient ice will also be placed in coolers used for grab and composite sample transport to maintain the samples at a maximum temperature of 6°C. Composite samples will be collected for the majority of analytical parameters in stormwater samples. Composite samples will be collected in a 15-liter Nalgene LDPE carboy.

No chemical preservation measures are required in the sample collection process. WQL will add chemical preservatives after the composite samples are split as necessary for analysis, i.e. metals analysis. In the 15-liter carboy, composite samples have a holding time of 48 hours. Analysis of composite samples will include the parameters listed in Table 4-2.

Parameters to be measured in the field include DO, conductivity, pH, and temperature. Parameters will be measured on-site using portable handheld meters immediately following sample collection. Field parameter samples will be collected and measured in a 1-liter (L) glass jar.

Special Handling Considerations

4.6.1 E. coli

Due to the variable nature of storm event timing, *E. coli* grab samples are sometimes analyzed outside of sample holding times required by the standard method (eight hours). WQL has committed to providing *E. coli* analysis within the holding time for samples submitted during normal business hours (Monday–Friday), and within 12–16 hours if samples are submitted after hours. *E. coli* samples analyzed within the 8–16 hour timeframe will be qualified as estimated in the context of the program-established data quality objectives discussed in Section 5.2. If analysis is not initiated within 16 hours of collection, results will be rejected.

4.6.2 Dissolved Metals

Current regulations under the EPA Method Rule Update issued on May 18, 2012, require that samples collected for the analysis of dissolved metals including dissolved orthophosphate be filtered within 15 minutes of collection of a grab sample or the last subsample of a composite sample. Dissolved metals are a constituent of the composite sample for the stormwater outfall monitoring program.

WQL has committed to splitting composites and filtering dissolved metals samples at the time of submission to the laboratory when they are submitted during normal business hours, and within 24 hours when samples are submitted after hours. Samples filtered within the 24-hour timeframe will not be qualified as estimates in the context of the program-established data quality objectives discussed in Section 5.2. If filtration is not accomplished within 24 hours of collection, results will be rejected.

Table 4-2. Sample Handling Requirements

Constituent	Container	Holding Time
Composite Samples		
Ammonia (NH3) 5-Day Biological Oxygen Demand (BOD5) Chemical Oxygen Demand (COD) Nitrite plus Nitrate (NO_2+NO_3) Total Kjeldahl Nitrogen (TKN) Total Dissolved Solids (TDS) Total Suspended Solids (TSS) Turbidity Total Phosphorus Mercury -Total Arsenic – Total Cadmium – Total Calcium - Total Lead – Total Magnesium - Total Hardness (as $CaCO_3$)	15-liter LDPE carboy	48 hours (in carboy)
Dissolved Orthophosphate Cadmium – Dissolved Copper – Dissolved Lead – Dissolved Zinc - Dissolved		24 hours (in carboy)
Grab Samples		
E. coli	500 mL sterilized HDPE	8 hours
Field Parameters		
Dissolved Oxygen Temperature pH Conductivity	1 L glass	Field analysis; 15 minutes

LDPE – Low Density Polyethylene

4.7 Chain-of-Custody Procedures

Standard chain of custody (COC) forms, shown in Appendix B, will be completed prior to submittal of samples to the laboratory. Information recorded on the COC includes the following:

- Sample collection team member names
- Sample identification
- Sample type (grab or composite)
- Analyses requested
- Sample start and end times
- Sample start and end dates

A sample is “in custody” if it is either in actual physical possession of authorized personnel or in a secured area that is restricted to authorized personnel. Such areas include laboratory refrigerators, the ACHD Stormwater Lab, ACHD vehicles, and consultant vehicles. Automatic samplers at monitoring stations are installed in locked enclosures or in manholes. Where samplers are installed in manholes, the sample container base will be locked to secure access to the sample. All transfers of custody will be recorded by signature, date, and time by both the individual relinquishing custody and the one receiving custody. This information is placed in the designated area on the bottom of the COC form.

The transferal of grab samples collected during a storm event between the sampling team leader who collected the sample and the field coordinator or designee who will deliver the samples to the lab must be recorded on the COC form. The field coordinator will record his/her signature with the date and time the samples were received on the associated COC form.

Samples may be stored overnight (in coolers with ice) at the ACHD Stormwater Lab or vehicles while awaiting submittal to the laboratory. The COC forms must be reviewed and signed by at least one of the persons who collected the samples listed on the COC form. The COC forms will be delivered to the laboratory with the samples.

If samples are submitted to the laboratory during business hours, samples are relinquished to laboratory personnel in person for immediate receipt with signature, date, and time. ACHD has after-hour access to the laboratory to accommodate sample submittal. When sample delivery occurs after hours, grab samples are placed in a locked refrigerator and composite samples are stored in coolers or sample bases and packed with ice. The team delivering the samples will notify a laboratory representative that the samples have been dropped off and the time the earliest samples were collected. A signed COC form is left in the locked laboratory for morning receipt by laboratory personnel.

Analytical samples will be named using the date of the event, followed by the station number, followed by WG or WC for “Wet Grab” or “Wet Composite,” respectively. For example, a composite sample collected at Whitewater on October 15, 2021, would be labeled 211015-11-WC.

Sample collection times for QC samples will be recorded as 12:00 on the COC form to maintain duplicates as laboratory blind samples. The actual collection time will be recorded on the field form. The QAPP includes detail on the approach to data validation as it pertains to holding times and laboratory qualifiers for QC samples.

4.8 Monitoring Station Shut Down

Post-sampling activities include downloading data from flowmeters, samplers, and rain gauges according to the applicable procedures listed in Appendix A; removing/replacing batteries where necessary; and reviewing the overall condition of the equipment. Equipment shutdown will be conducted by ACHD personnel and may occur as late as two weeks after sample collection to accommodate hydrologic data collection.

WQL will analyze the samples for the components of concern identified in Table 4-1. Quality assessment activities, to be performed by the Program QA/QC Officer, will include review of field notes and COC documents, as well as validation of data packages received from the laboratory. QA/QC procedures are discussed in further detail in Section 5.

Section 5

Quality Assurance/Quality Control

5.1 QC Sampling Schedule

The QC sampling schedule developed for the SWOMP consists of a combination of field QC samples and laboratory QC samples. Field QC sample types are described in the QAPP. Field QC sampling intervals will follow the schedule detailed in Table 5-1. Laboratory QC sample results are included in each analytical report.

Table 5-1. Field QC Sample Collection

QC Sample Method[1]	Sampling Frequency	Percent of Total Data Represented[4]
Grab sample duplicate and field blank	1 set per event	20%
Composite sample duplicate[2]	1 composite per year	7%
Composite sample field blank	1 composite per year	7 %
Composite sample equipment blank[3]	1 composite per year	7%
Composite sample rinsate blank[3]	1 composite per year	7%

[1]Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.

[2]The composite sample duplicate will be collected at the earliest opportunity, and is contingent upon sample volumes.

[3]Blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

[4]Percentages are calculated based on 5 sites (4 outfall monitoring sites and 1 subwatershed monitoring site)

Random number generation was used to develop a QC sample schedule for each water year. The schedule establishes the targeted QC site for each event, as well as an alternate QC site with the goal of collecting one set of QC samples for each event. Each site is assigned a number and a random number generator equation is run for each event. If the selected site cannot be sampled for any given event, the predetermined alternate site will be used. The full QC schedule is included in Appendix C.

ACHD may choose to conduct additional QA/QC to address data discrepancies, potential sample contamination, or other QA/QC issues. These events will be handled on an as-needed basis, depending on the issue(s) involved.

5.2 Data Quality Objectives (DQO)

The DQO for ACHD stormwater monitoring can be summarized by the following statement:

Monitoring efforts will provide data of sufficient quality and quantity in accordance with permit requirements to characterize the quality of stormwater discharges from the MS4 and evaluate overall effectiveness of stormwater management practices.

5.2.1 Data Quality Indicators (DQIs)

DQIs have been established to set measurable qualitative and quantitative goals for data acceptance that meet the program DQO described above. Each DQI is described below. DQIs are the basis for addressing field and laboratory analytical instrument performance, as well as sample collection and handling procedures. QA/QC samples provide input for several of the DQIs. QA/QC sample collection procedures are included in Section 2.1 of the QAPP.

DQIs are described fully in Section 1.8.1 of the QAPP. A brief description of each DQI is included in the list below.

- **Project Required Detection Limits (PRDL):** Achieving appropriate reported constituent concentration results at values that allow for comparison to baseline data and water quality standards.
- **Accuracy:** The accuracy of the data is a measure of the extent to which a measured value represents the true value.
- **Precision:** Precision is a measurement of the reproducibility of the analytical data.
- **Bias:** Bias is minimized by using standard data collection and analytical methods and protocols, as well as standard sample preservation, transport, and storage procedures.
- **Representativeness:** Representativeness is a measure of the degree to which data accurately and precisely indicate environmental conditions.
- **Comparability:** The comparability of a data set is the extent to which data accurately and precisely indicate environmental conditions.
- **Completeness:** Completeness is a comparison between the amount of usable data collected versus the total amount of data collected.
- **Sufficiency:** Data set sufficiency is the amount of data required to perform the level or type of analysis necessary for each monitoring element.

Analysis-specific data quality indicators include PRDLs and precision evaluated as relative percent difference (RPD). The target values for these indicators are listed in Table 5-2 below.

Table 5-2. Data Quality Indicator Targets				
Constituent	Analytical Method	PRDL[1,2]	Units	Precision[3,4] (RPD)
Temperature	EPA 170.1	0.01	ºC	NA
pH	EPA 150.2	0.01	S.U.	NA
Dissolved Oxygen	In-Situ Method 1002-8-2009	0.01	mg/L	NA
Conductivity	EPA 120.1	0.1	µS/cm	NA
Ammonia (NH_3)	SM 4500 NH3 D	0.0350	mg/L	20%
5-Day Biological Oxygen Demand (BOD5)	SM 5210 B	2.00	mg/L	20%
Chemical Oxygen Demand (COD)	HH 8000	7.00	mg/L	20%
Nitrite plus Nitrate (NO_2+NO_3)	EPA 353.2	0.0500	mg/L	20%
Total Kjeldahl Nitrogen (TKN)	EPA 351.2, 10-107-06-2-M	0.100	mg/L	20%
Total Dissolved Solids (TDS)	SM 2540 C	25.0	mg/L	20%
Total Suspended Solids (TSS)	SM 2540 D	0.900	mg/L	20%
Turbidity	EPA 180.1	0.3	NTU	20%
Orthophosphate, as P	EPA 365.1	2.00E-3	mg/L	20%
Total Phosphorus	EPA 200.7	6.00E-3	mg/L	20%
E. coli	IDEXX Colilert	1.0	MPN/100mL	40%[5]
Mercury – Total	EPA 245.2	0.0100	µg/L	20%
Arsenic – Total	EPA 200.8	0.040	µg/L	20%
Cadmium – Total	EPA 200.8	0.025	µg/L	20%
Calcium – Total	EPA 200.7	0.0460	mg/L	20%
Lead – Total	EPA 200.8	0.050	µg/L	20%
Magnesium – Total	EPA 200.7	39.5	µg/L	20%
Hardness (as $CaCO_3$)	EPA 200.7	0.115	mg/L	20%
Cadmium – Dissolved	EPA 200.8	0.025	µg/L	20%
Copper – Dissolved	EPA 200.8	0.15	µg/L	20%
Lead – Dissolved	EPA 200.8	0.050	µg/L	20%
Zinc – Dissolved	EPA 200.8	0.78	µg/L	20%
Flow/Discharge Volume	Non Specific	0.001	cfs	NA
Precipitation	Non Specific	0.01	in	NA

[1]Field instrument resolution values are listed in lieu of a PRDL for field parameter measurements.

[2]PRDL is defined as the effective method detection limit (MDL) as reported by the analytical laboratory.

[3]Precision calculations based on field duplicate samples.

[4]In cases where one value is reported at the MDL and the other value is less than five times the MDL, the samples will be considered within acceptable precision limits.

[5]E. coli is evaluated using the RPD of logarithmic parent and duplicate values. The acceptable RPD between the two values is also higher than other constituents. These changes are in place to accommodate the inherent variability in E.Coli samples.

Anticipated issues with optimal performance for DQIs include high potential for holding time exceedances with *E. coli* as well as meeting the method-required filtration window for dissolved orthophosphate in composite samples. These issues will be monitored closely from the outset of the stormwater outfall monitoring program to track and understand the impact these deviations may have on DQIs.

5.2.2 Storm Event Acceptance Criteria

Acceptance criteria for a representative storm are derived from Permit requirements for representative sampling as listed in Section 6.2.4 and target volume and duration goals established for this program. Storm data used to evaluate acceptance, including antecedent dry period, precipitation amount, and flow volumes, will be measured based on data records at the site-specific rain gauges and flowmeters.

The acceptance criteria for composite samples are based on the total amount of runoff represented by the composite sample. Ideally, upon completion of the sampler program, a flow-weighted composite sample is collected that represents the entire duration of the storm. However, in some cases, high rainfall amounts result in the automatic sampler program finishing before capturing the entire storm. When this situation occurs, the full composite bottle is removed from the sampler, a second bottle is installed, and the sampler program is restarted. During the bottle change, there can be an unavoidable gap in collection time of the flow-weighted composite sample because of logistical constraints in reaching each monitoring station at the exact time the first sample bottle is full. All sample bottles filled at a particular station will be composited at the WQL. This composite sample is flow-weighted for the portion of the storm event that was sampled.

The percentage of the storm event that is represented by the composite sample can be determined from a review of the storm hydrograph at each location. The sample will be considered valid and unqualified when the composite sample represents at least 75 percent of the total hydrograph with the first hour of runoff included, or the sample represents the first six hours of the discharge. If the composite sample represents between 50 and 75 percent of the measured flow volume associated with the storm, then the sample will be qualified, and data will be considered an estimate based on the DQIs outlined earlier in this section. If the composite sample represents less than 50 percent of the total hydrograph, then it will be rejected. Another storm may be targeted to replace it if possible.

On a limited number of historic occasions, an automatic sampler has triggered before the beginning of storm event runoff. In the event of this occurrence, the extraneous aliquots will be considered not to have compromised the entire composite sample if it represents less than 10 percent of the total composite sample volume (typically one to two subsamples). In the event of this occurrence, the composite sample will be qualified based on the DQIs outlined earlier in this section. If the composite sample is determined to be comprised of 10 percent or more non-stormwater subsamples, the entire composite sample will be rejected.

Section 6

Data Management and Reporting

All data collected as part of the SWOMP will be stored in electronic format for secure storage and timely and accurate retrieval for data interpretation, graphing, and reporting. Data collected as part of the sampling program will include rainfall data, runoff volumes, runoff coefficients, field analytical data, laboratory analytical data, QA/QC results, and some qualitative observations. Specific management and reporting procedures are provided below.

6.1 Data Acquisition Requirements (Non-Direct Measurements)

Weather forecasts and hourly precipitation totals will be typically obtained from the NWS Boise airport station website. Additional forecasts or weather reports may be retrieved from local media, community, or commercial weather services. When obtaining weather forecasts for storm events, the Environmental Specialist will typically call the NWS Boise airport station for additional details if it appears that an approaching storm may meet the sampling criteria. Pertinent details of these conversations will be recorded on the Sampling Event Communication Form (Appendix B).

6.2 Data Management System

Seveno DataSight (DataSight) data management software is used for handling data collected from stormwater monitoring programs. DataSight provides a safe and secure platform for storing, viewing, validating, and analyzing data. Program data will be imported into the database according to established procedures listed in Appendix A. The database will assist with implementation of the QAPP and the individual monitoring plans guiding each monitoring program.

The DataSight database is configured in three tiers or “levels” under which data is stored and related. The database structure and level dependencies for the stormwater outfall monitoring program are illustrated in Figure 6-1 below.

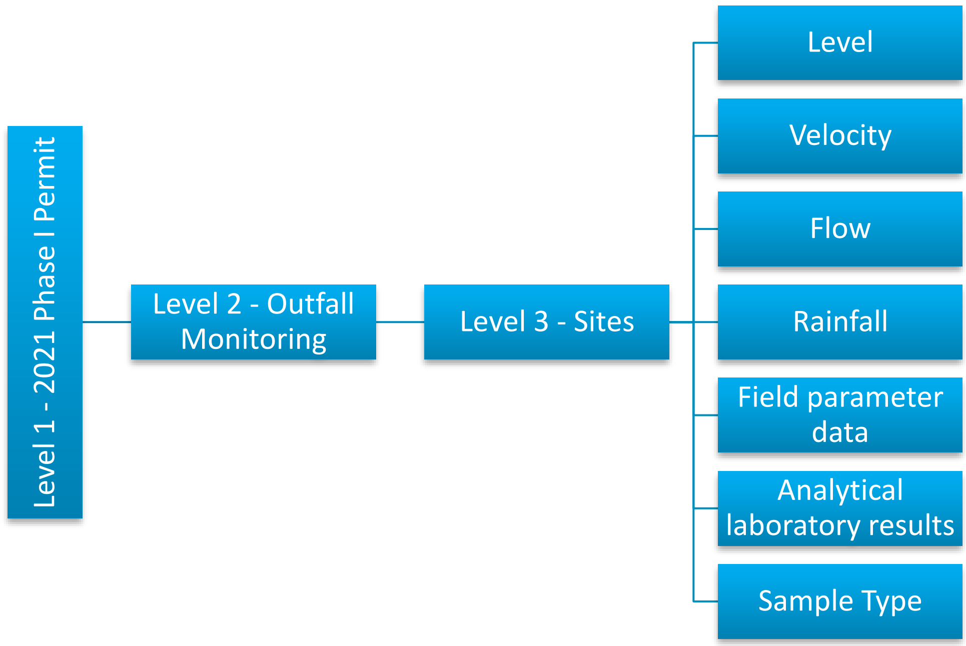


Figure 6-1: Database Levels Setup

6.3 Data Reporting

6.3.1 Storm Event Reporting

Following each sampling event, a storm event report summarizing the results of all sampling conducted will be prepared by the consultant. The report will also provide a specific summary of the storm characteristics and monitoring activities at each of the targeted stations and will include the following level 2 data and control documents:

- Storm Event Information
  - date and time span of the storm
  - antecedent dry period
  - a qualitative description of the forecast and storm
  - composite sample volumes
  - trigger volumes
- Water Quality Data
  - field parameter measurements
  - laboratory analytical data
  - QC sample results
  - storm event pollutant loading estimates from each site (described below)

- Flow Data
  - storm event flow totals
- Rain Data
  - storm event precipitation totals
- Control Documents
  - laboratory analytical report
  - data validation checklist

Additionally, each storm event report will include the following report elements:

- Project status summary table
- Discussion of QA/QC analysis
  - storm acceptance criteria
  - results of the data validation review for the event
- Narrative summary of notes from the current event and recommendations for the next event
- Event hydrograph for each monitoring station

Storm Event Pollutant Loading Estimates

Pollutant loading estimates for each event will be calculated using the following formula when complete runoff volume measurements are available.

$$L = 6.24E^{-5} * F * C$$

Where:

L = Event Load (pounds)

F = Event Runoff (cubic feet)

C = Pollutant Concentration (mg/L)

$6.24\ E^{-5}$ = Unit conversion factor

When runoff volume must be estimated due to incomplete flow measurements, the Simple Method approved by the EPA for simple pollutant loading estimations for urban stormwater will be used. The following is the equation that will be used to estimate the event pollutant loads if measured flow volumes are not available or are incomplete.

Simple Method

$$L = 0.226 * R * C * A$$

Where:

L = Event Load

R = Event Runoff (inches)

C = Pollutant Concentration (mg/L)

A = Area (acres)

0.226 = Unit conversion factor

Runoff Calculation

$$R = P * Pj * Rv$$

Where:

R = Event Runoff (inches)

P = Event Rainfall (inches)

Pj = Fraction of annual rainfall events that produce runoff (0.9)

Rv = Runoff Coefficient

The site-specific runoff coefficient (Rv), as presented in the EPA formula, is equal to the percent of impervious surface in the drainage area represented as a decimal. However, this does not account for impervious areas in areas without curb and gutter, canopy cover and interception, or stormwater controls in the drainage area. Therefore, the runoff coefficient variable in the equation will be refined as understanding of the drainage area is expanded.

6.3.2 Stormwater Outfall Monitoring Annual Reporting

A Stormwater Outfall Monitoring summary will be attached to the MS4 Annual Report Form (NPDES Phase I Permit Appendix B) submitted to IDEQ annually. This summary will include the results from each storm event and any monitoring, assessment, or evaluation efforts conducted during the reporting period (October 1 – September 30).

6.3.3 Stormwater Outfall Monitoring Final Report

As required by Permit Part 6.4.3, a final report summarizing all monitoring data collected during the permit term will be submitted as an attachment to the Permit Renewal Application (April 3, 2026). The report will be based upon the storm event reports and will include a comprehensive evaluation of all the data collected. If data have been qualified as part of the QA/QC process, this will be noted in the appropriate table(s). The data evaluation will include the following:

- A statistical summary for analytical parameters with five or more data points
- A yearly comparison of the median concentrations for each monitoring site
- An estimate of event mean concentrations for each parameter sampled for each storm event
- Event Mean Concentration trend analyses demonstrating pollutant loading over time
- A discussion of data quality including qualified data points and deviations from program plans
- A discussion of pollutant reduction efforts and results
- A discussion and analysis of sampling analytical performance against DQOs including discussion of any planned changes to the current plan based on QA/QC issues, site conditions, or program conditions

6.3.4 Evaluation and Assessment

Evaluation and assessment of the stormwater outfall monitoring data will follow the general guidance identified in the QAPP. For the SWOMP, pollutant loads will be estimated based on measured flow and concentrations throughout the system. Data will be compiled with the objective to obtain sufficient data points for statistical and trend analyses to evaluate the effectiveness of stormwater management efforts at reducing pollutant loads from the MS4.

Section 7

References

Ada County Highway District (ACHD), Storm Water Outfall Monitoring Plan, 2014a.

———–, Treasure Valley 2013 Urban Tree Canopy analysis, modified in 2014 based on 2013 aerial photography, 2014b.

———–, E-mail Correspondence with Jason Korn, ACHD Stormwater Quality Specialist, 2014c.

———, Quality Assurance Program Plan for NPDES Storm Water Permit Monitoring Boise and Garden City, Idaho, 2021.

Brown & Caldwell (BC). ACHD Database Guidance Document, 2014

U.S. Environmental Protection Agency (EPA). *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020, March 1983. Cincinnati, Ohio: U.S. Environmental Protection Agency Environmental Monitoring and Support Laboratory, 1983.

———, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System, 48 FR 14153, 40 CFR 122.21(g)(7)(ii), 1983.

———, Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8), EPA 240-R-02-004, Office of Environmental Information, 2002.

———, Guidance on Systematic Planning Using the Data Quality Objective Process, EPA Bulletin # EPA 240-B-06-001, 2006.

———, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, Analysis and Sampling Procedures; Final Rule, Federal Register Vol. 77 No. 97. 40 CFR Parts 136, 260, et al., 2022.

Seveno, DataSight Users Manual, Version 3.10.4, 2022.

Figures

Monitoring Area

Lucky

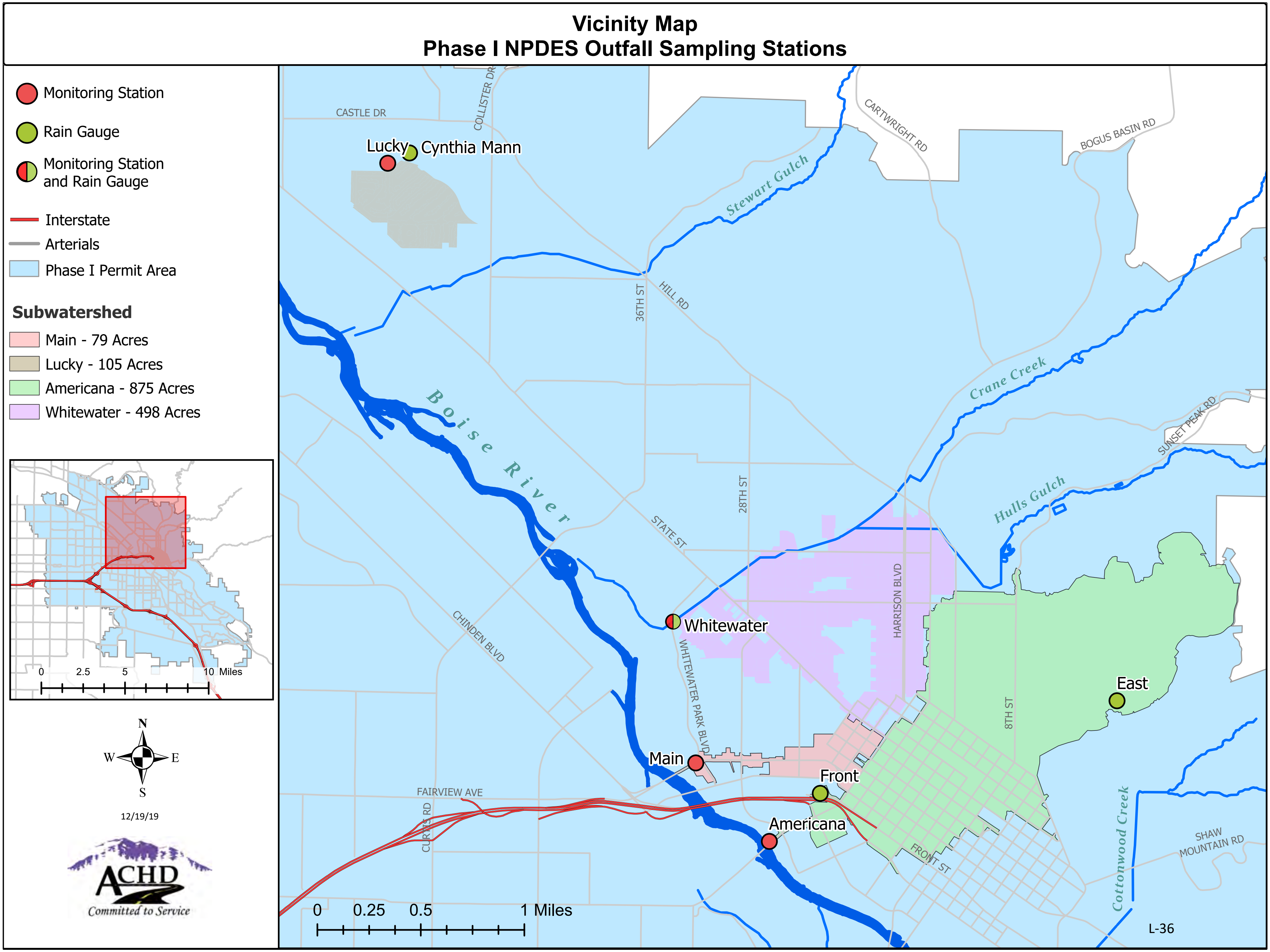
Whitewater

Main

Americana

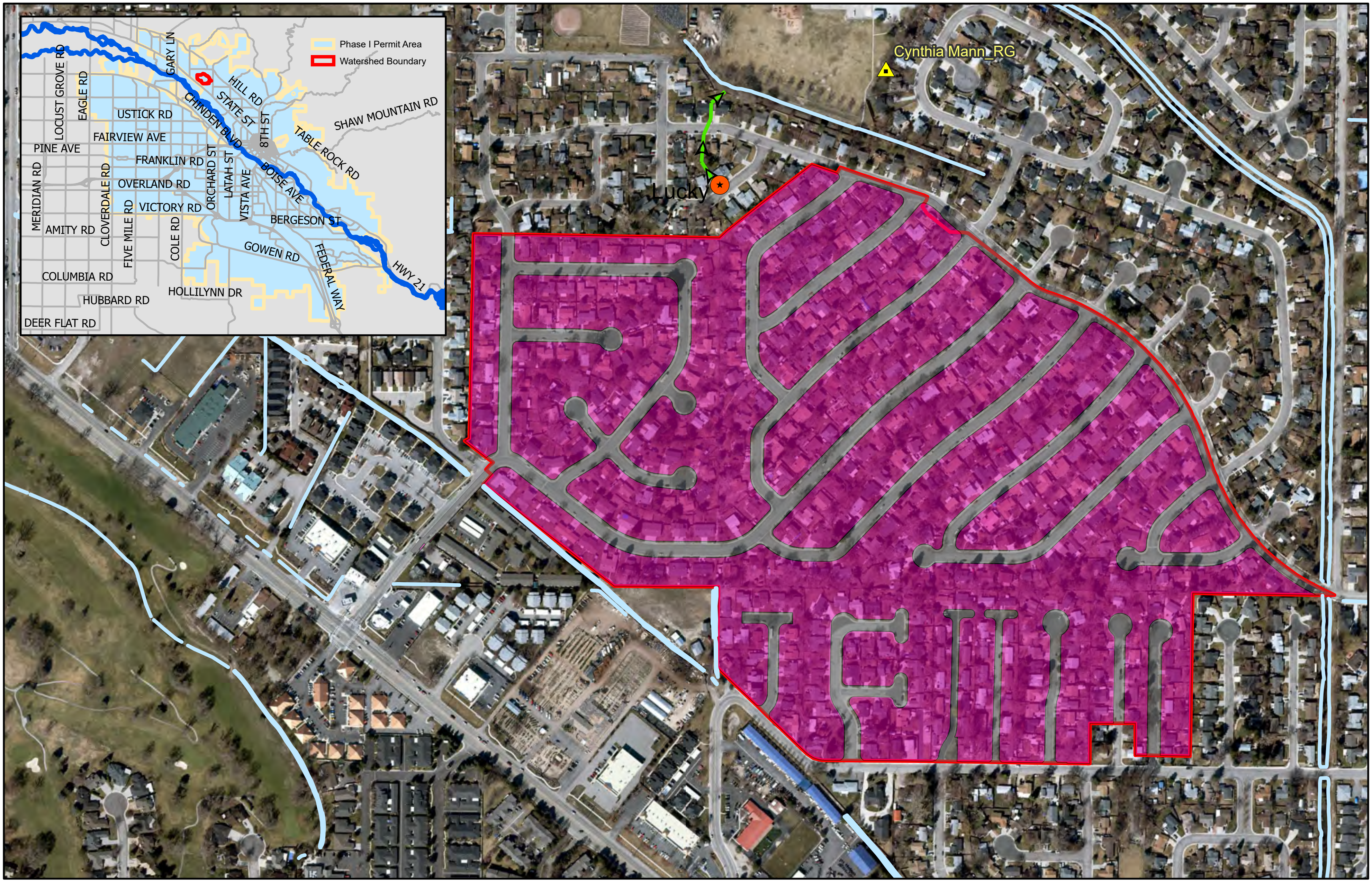
Rain Gauges

Figure 1



Vicinity Map
Phase I NPDES Outfall Sampling Stations
Monitoring Station
Rain Gauge
Monitoring Station and Rain Gauge
Interstate
Arterials
Phase I Permit Area
Subwatershed
Main - 79 Acres
Lucky - 105 Acres
Americana - 875 Acres
Whitewater - 498 Acres
0
2.5
5
10 Miles
N
W
E
S
12/19/19
ACHD
Committed to Service
CASTLE DR
COLLISTER DR
Lucky
Cynthia Mann
CARTWRIGHT RD
BOGUS BASIN RD
Stewart Gulch
HILL RD
36TH ST
Boise River
Crane Creek
SUNSET PEAK RD
Hulls Gulch
28TH ST
STATE ST
HARRISON BLVD
Whitewater
WHITEWATER PARK BLVD
CHINDEN BLVD
8TH ST
East
Main
Front
FAIRVIEW AVE
CURTIS RD
Americana
FRONT ST
Cottonwood Creek
SHAW MOUNTAIN RD
0
0.25
0.5
1 Miles
L-36

Figure 2



File Location: \\APPWSUS\ACHDFiles\Groups\DVS\STORMWATER\Maps\Phase I Monitoring\Lucky

Lucky Monitoring Station
105 Acres
40% Impervious

Land Use Percentages (percent impervious in parentheses)

Right of Way - 22% (83%)

Residential Medium - 78% (23%)

source: 2013 Urban Tree Canopy Analysis, modified in 2014 based on 2013 aerial photography

Outfall Sampling Stations

Rain Gauges

Canals/Waterways

Watershed Boundary

Outfall Conveyance

Date: 7/15/2021

N

ACHD
Committed to Service

0 390 780 Feet

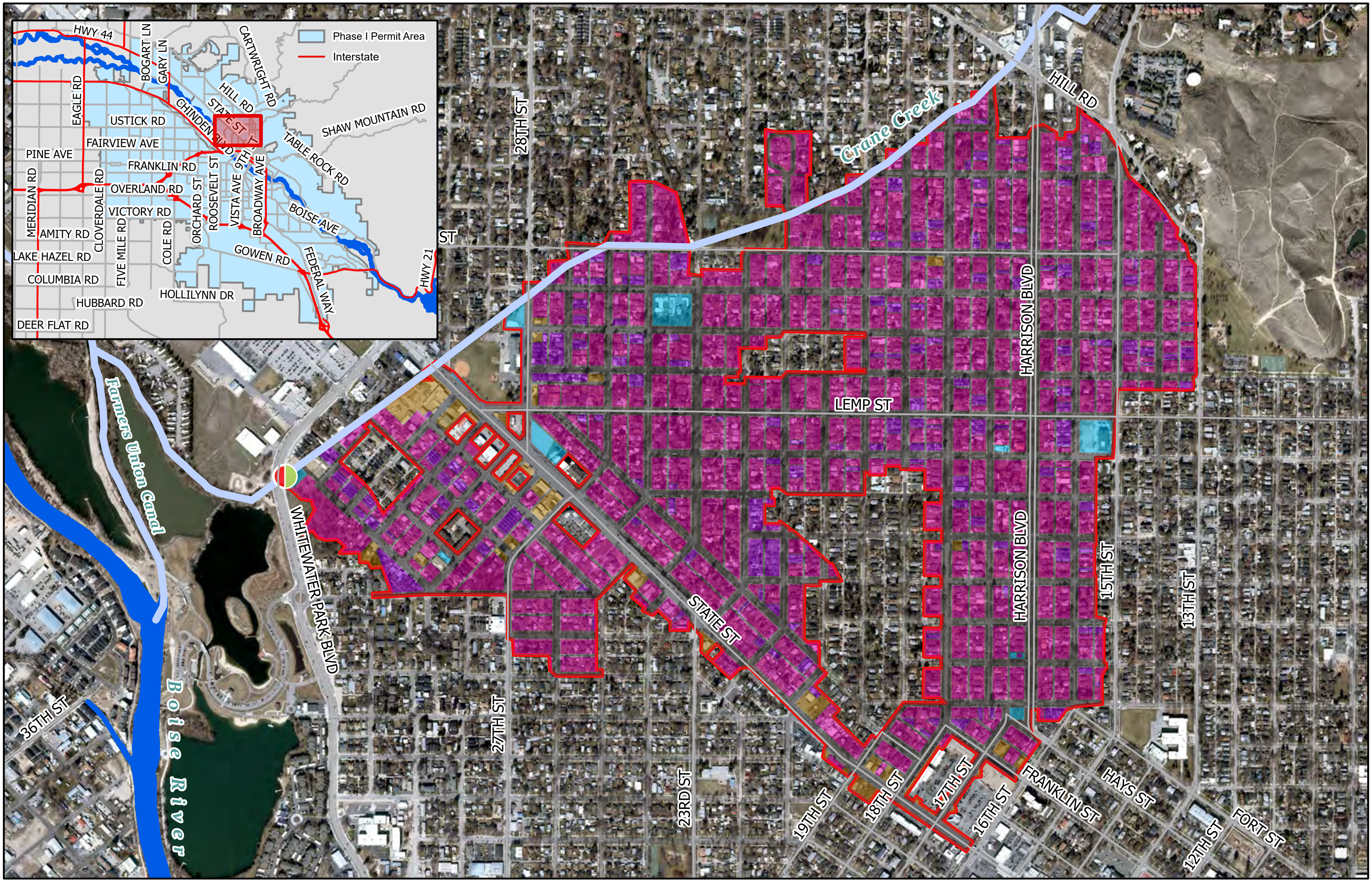
L-37

Lucky Monitoring Station

Station setting looking northwest – equipment in manhole

Inside manhole

Figure 4



Whitewater Monitoring Station
498 Acres
43% Impervious

Land Use Percentages (percent impervious in parentheses)

- Right of Way - 36% (70%)
- Commercial - 4% (41%)
- Residential Medium - 50% (25%)
- Residential High - 7% (31%)
- Public and Schools - 3% (51%)

- Monitoring Station and Rain Gauge
- Waterways
- Watershed Boundary

source: 2013 Urban Tree Canopy Analysis, modified in 2014 based on 2013 aerial photography

Date: 7/7/2021

N

ACHD
Committed to Service

0 750 1,500 Feet

L-39

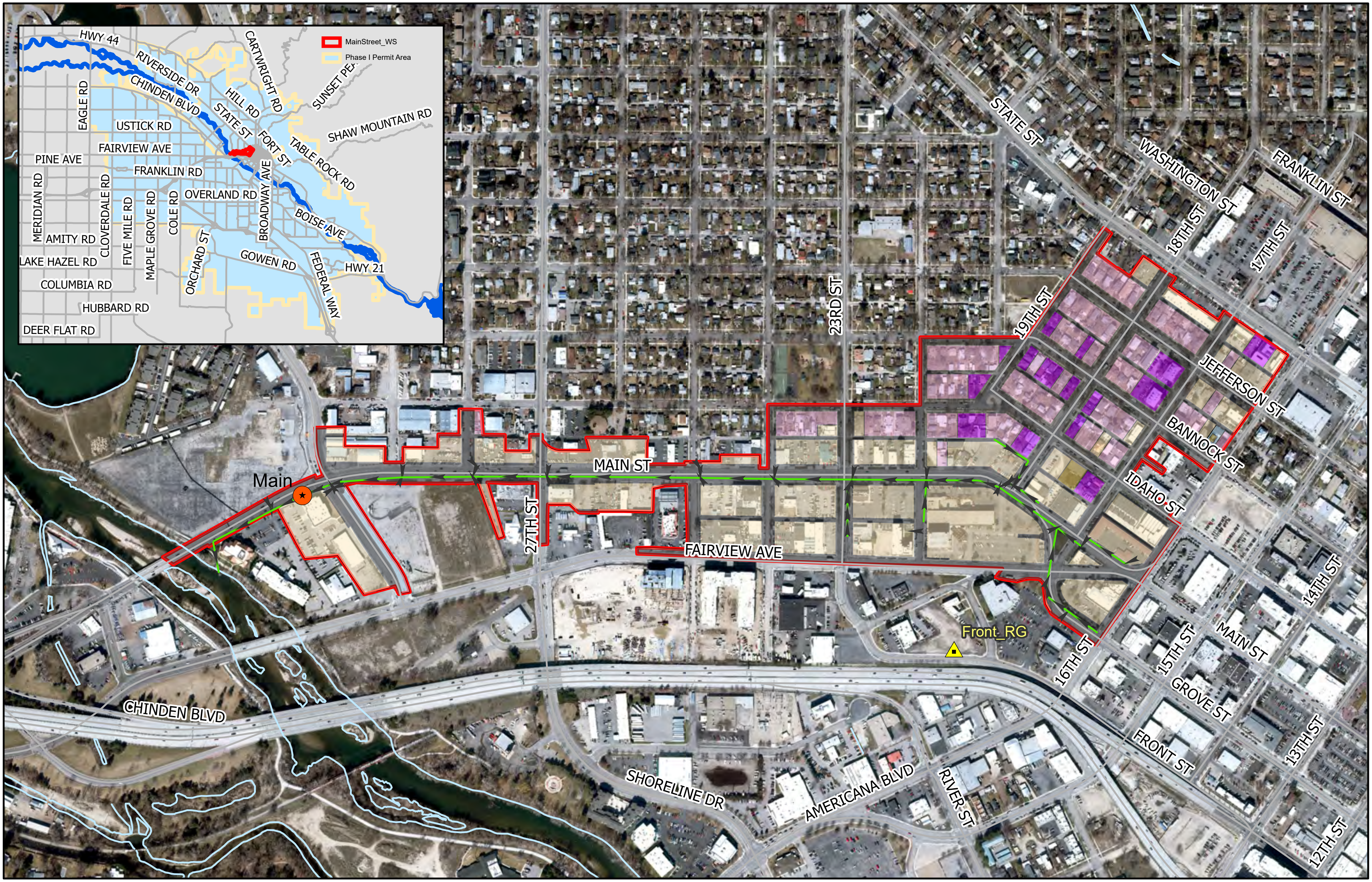
File Location: \\APPWSUS\ACHDFiles\Groups\DVS\STORMWATER\Maps\Phase I Monitoring\Whitewater

Whitewater Monitoring Station

Station setting looking north

Inside cabinet

Figure 6



Main Monitoring Station
79 Acres
55% Impervious

Land Use Percentages (percent impervious in parentheses)

- Right of Way - 43% (66%)
- Commercial - 37% (55%)
- Residential Medium - 14% (30%)
- Residential High - 5% (39%)
- Public - 1% (0%)

source: 2013 Urban Tree Canopy Analysis, modified in 2014 based on 2013 aerial photography

- Outfall Sampling Stations
- Rain Gauges
- Canals/Waterways
- Watershed Boundary
- Outfall Conveyance

Date: 7/15/2021

ACHD
Committed to Service

0 500 1,000 Feet

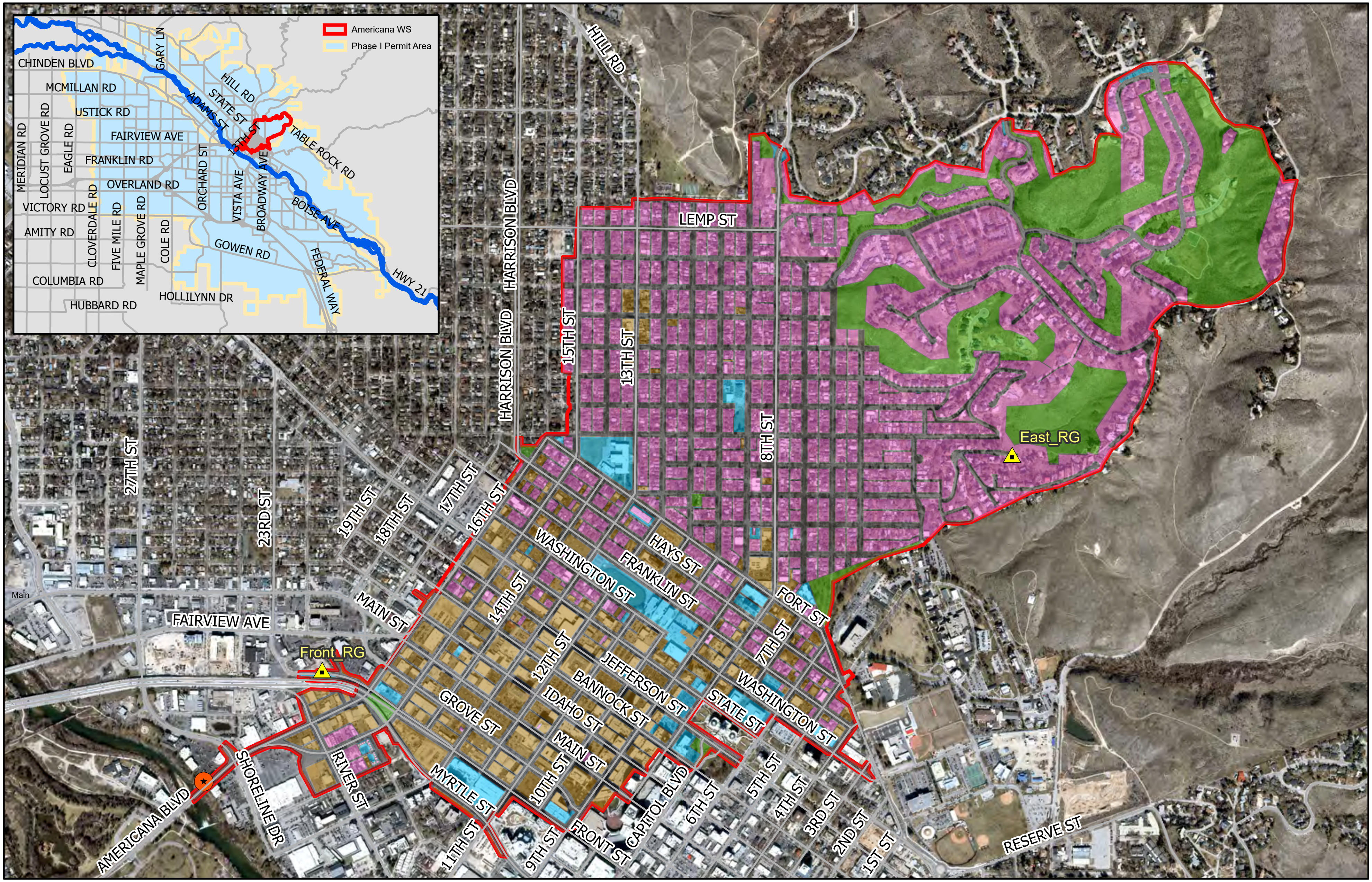
File Location: \\APPWSUS\ACHDFiles\Groups\DVS\STORMWATER\Maps\Phase I Monitoring\Main

Main Monitoring Station

Station setting looking northwest

Inside cabinet

Figure 8



Americana
Monitoring Station
875 Acres
39% Impervious

Land Use Percentages (percent impervious in parentheses)

- Right of Way - 30% (69%)
- Commercial - 13% (56%)
- Residential (Hi/Med/Low) 39% (23%)
- Parks and Open Space - 14% (2%)
- Public and Schools - 4% (45%)

source: 2013 Urban Tree Canopy Analysis, modified in 2014 based on 2013 aerial photography

- Outfall Sampling Stations
- Rain Gauges
- Canals/Waterways
- Watershed Boundary
- Outfall Conveyance

Date: 7/15/2021

ACHD
Committed to Service

0 1,000 2,000 Feet

File Location:

Americana Monitoring Station

Station setting looking southwest

Inside cabinet

Phase I Rain Gauges

Cynthia Mann Rain Gauge

Front Rain Gauge

East Rain Gauge

Whitewater Rain Gauge

Appendix A: Standard Operating Procedure and Procedure Guidance Documents

The following Standard Operating Procedure (SOP) and Procedure Guidance (PG) documents will be referenced as needed to assist with implementation of the Stormwater Outfall Monitoring Plan. The SOPs and PGs listed below are readily accessible by ACHD and consultant personnel for use in the field or in the office to complete tasks associated with the acquisition and management of data under the ACHD Stormwater Outfall Monitoring Program.

SOP 110: Discrete grab sample collection

SOP 111: Low flow grab sample collection

SOP 112: Large volume grab sample

SOP 312a: YSI Model 85 dissolved oxygen and conductivity meter operation, calibration, and maintenance

SOP 312b: YSI Pro 2030 dissolved oxygen meter operation, calibration, and maintenance

SOP 313: Horiba pH meter operation, calibration, and maintenance

SOP 314: Gas detector operation

SOP 322: In-Situ multiparameter sonde calibration and maintenance

SOP 323: In-Situ multiparameter sonde operation

PG 210: Hach 950 flowmeter download using Insight software

PG 211: HOBO equipment download using HoboWare

PG 212: ISCO equipment data access and download

PG 214: Hach AS950 data download

PG 315: Hach equipment semi-annual maintenance

PG 319: Rain gauge inspection and maintenance

PG 324: ISCO equipment semi-annual maintenance

PG 512: Exporting data from Flowlink Pro

PG 530: Exporting data from HoboWare

PG 531: Importing and exporting from FSData

PG 532: Transferring from Flowlink LE to Flowlink Pro

PG 533: Importing data into DataSight

PG 534: QAQC Procedures in DataSight

PG 537: Exporting data from InSight to CSV file

Appendix B: Communication and Field Forms

Grab Sample Data Form

Composite Sample Collection Form

Set Up/Shut Down Form – ISCO

Set Up/Shut Down Form - HACH

Chain-of-Custody Form

Sampling Event Communication Form

Grab Sample Data Form

STATION: ___________________________________

Personnel: _____________________________ **Date/Time On-Site:** ____________________________

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)

Grab Information				
	Sample ID	Date	Time	Labeled?
Site *E.Coli*	-WG			☐
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Composite Sample Collection

STATION: ______________________________ **Bottle _____ of ______**

Personnel: _______________________________ **Date/Time On-Site: ___________________________**

☐ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete:	**If continuing sampling (sample bottle change-out):**
☐ Power off sampler	☐ Keep flowmeter running
☐ Verify flowmeter is running	☐ Install new 15L bottle; add ice
☐ Add ice to sample transport cooler	☐ Restart program from beginning
☐ Complete COC form; arrange transport to lab	**Date/Time Restarted: ________________**
	☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5”	400 mL	**3.0”**	3500 mL	**5.5”**	7250 mL	**8.0”**	11000 mL	**10.5”**	14750 mL
1.0”	800 mL	**3.5”**	4250 mL	**6.0”**	8000 mL	**8.5”**	11750 mL	**11.0”**	15500 mL
1.5”	1400 mL	**4.0”**	5000 mL	**6.5”**	8750 mL	**9.0”**	12500 mL	**11.5”**	16250 mL
2.0”	2000 mL	**4.5”**	5750 mL	**7.0”**	9500 mL	**9.5”**	13250 mL	**After 12”**	1” = 1500 mL
2.5”	2750 mL	**5.0”**	6500 mL	**7.5”**	10250 mL	**10.0”**	14000 mL	**Lab min**	8,000 mL

Set Up/ Shut Down Form – ISCO

STATION: ________________________________

SET UP

Personnel: ____________________________

Date/Time
On-Site: ________________________________

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)

Downloaded to:	
Enable Condition:	
Flow Pulse Interval:	

On-Site
- ☐ Replace flowmeter battery, install sampler battery
- ☐ Perform decon. cycle
- ☐ Install 15L sample bottle, with ice
- ☐ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☐ Set Sampler program parameters
- ☐ Check date/time on Sampler
- ☐ Verify all cable and tubing connections
- ☐ Verify Sampler Program is running

Flowlink (Refer to Flowlink Instructions, if needed)
- ☐ Direct or Remote; Date/time ____________________
- ☐ Retrieve data and review recent flow history
- ☐ Change Wireless Power Control to Storm Event
- ☐ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☐ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☐ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: ____________________________

Date/Time
On-Site: ________________________________

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)

Downloaded to:	

On-Site
- ☐ Replace flowmeter battery
- ☐ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)
- ☐ Direct or Remote; Date/time ____________________
- ☐ Retrieve data
- ☐ Change Wireless Power Control to Dry Weather
- ☐ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☐ Enable Sampler: Never

Comments:

Set Up/ Shut Down Form – HACH

STATION: ________________________________

SET UP

Personnel: ___________________________

Date/Time
On-Site: ______________________________

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
	Downloaded to:			
	Velocity Cutoff:			
	Trigger Volume:			

- ☐ Download flowmeter, if program is running
- ☐ Install batteries on flowmeter and sampler
- ☐ Perform decon. cycle
- ☐ Install 15L sample bottle, with ice
- ☐ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☐ Verify all cable and tubing connections
- ☐ Check date and time on flowmeter and sampler
- ☐ Set flowmeter program and sampler program parameters
- ☐ Set logging interval to 1 minute
- ☐ Start flowmeter program and sampler program
- ☐ Verify running

Comments:

SHUT DOWN

Personnel: ______________________

Date/Time
On-Site: ________________________

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
	Downloaded to:				

If flow monitoring is complete:	If continuing to monitor flow:
☐ Halt program on flowmeter	☐ Replace flowmeter battery
☐ Download flowmeter data	☐ Reset logging interval to 15 minutes
☐ Remove flowmeter battery	☐ Change velocity cutoff to 0.02 fps
	☐ Start program
	☐ Verify running

Comments:

Ada County Highway District

Attn: Tammy Lightle
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: 63058181
Project: Stormwater-PI
Sampler(s):

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix: Water	Type: Grab	Type: Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Collilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:

SAMPLING EVENT COMMUNICATION FORM

Date: 5/12/2022	Time: 7:51 AM	Initials: TL
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		No

Past 72 hr Precip	0.10”
Date and time of expected event	
Expected amount of precipitation	
Percent chance of precipitation	
Percent chance of >0.10” over 12 hours	

NWS Update

Targeted Station & Samples

Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☐ Grab	☒ Grab	☐ Grab	☒ Grab	☐ Grab
☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite	☐ Composite

Type of Forecasted Precipitation

☐ Light Rain
☐ Scattered Showers
☐ Other:
☐ Rain
☐ Thunder Showers
☐ Rain on Snow
☐ Snowmelt

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday
☒ Waiting on Antecedent Dry Period – Expires: 5/12 10:46 AM
☐ Equipment Concerns:
☐ Other:

Text Forecast

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 4:55 am MDT May 12, 2022

Today: Partly sunny, with a high near 62. Light and variable wind.
Tonight: Showers likely, mainly after midnight. Mostly cloudy, with a low around 44. Southwest wind around 5 mph becoming calm in the evening. Chance of precipitation is 60%.
Friday: A 20 percent chance of showers before noon. Mostly cloudy, with a high near 63. Calm wind becoming west northwest 5 to 7 mph in the afternoon.
Friday Night: A 50 percent chance of showers after midnight. Mostly cloudy, with a low around 48. North northwest wind around 5 mph becoming calm in the evening.
Saturday: A 50 percent chance of showers, mainly before noon. Cloudy, with a high near 69. Calm wind.
Saturday Night: Partly cloudy, with a low around 49.
Sunday: Mostly sunny, with a high near 82.
Sunday Night: A 20 percent chance of showers and thunderstorms before midnight. Partly cloudy, with a low around 53.
Monday: Mostly sunny, with a high near 78.
Monday Night: Partly cloudy, with a low around 52.
Tuesday: Mostly sunny, with a high near 76.

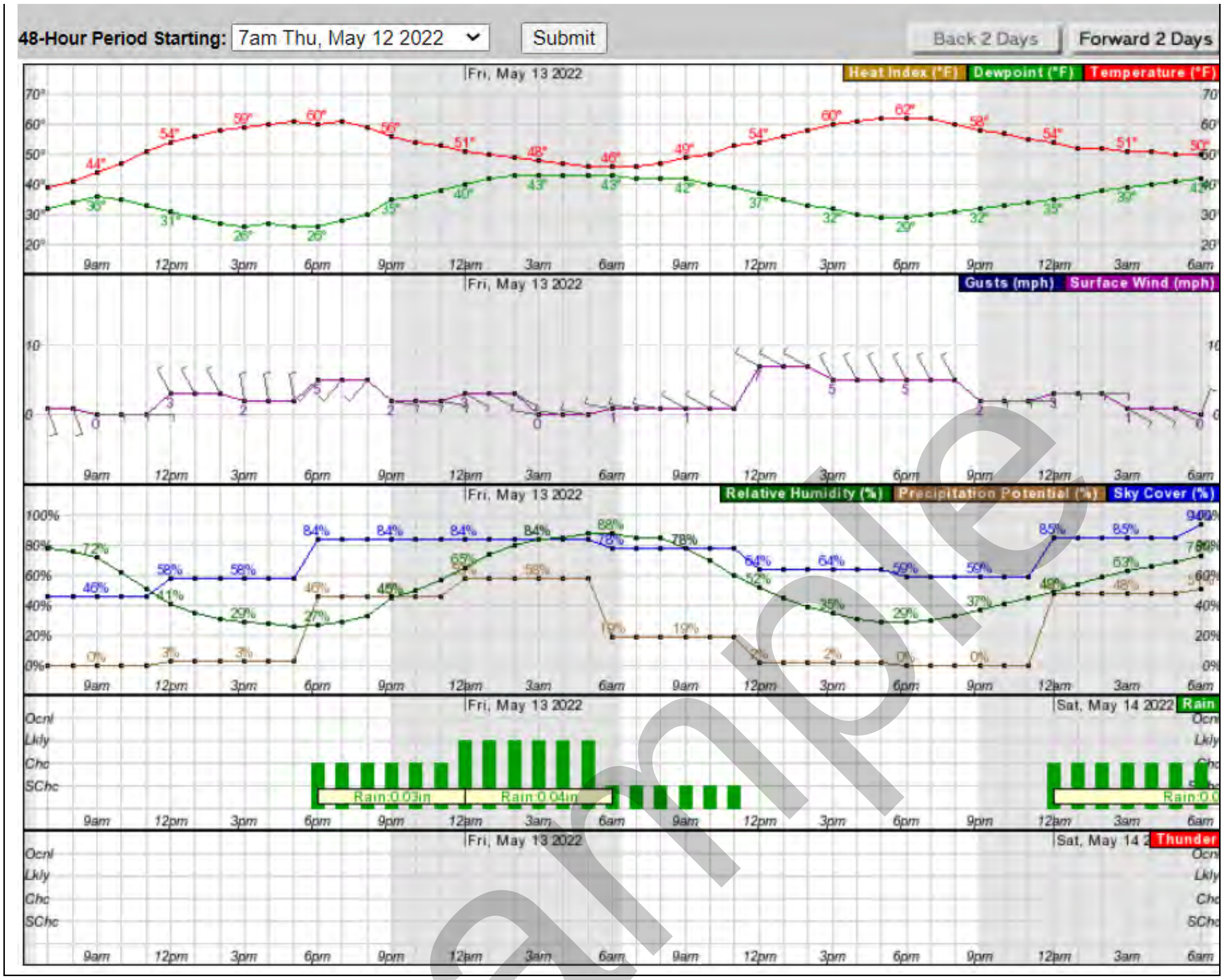
Tuesday Night: Partly cloudy, with a low around 47.
Wednesday: Partly sunny, with a high near 69.

Forecast Discussion
Area Forecast Discussion
National Weather Service Boise ID
342 AM MDT Thu May 12 2022

.SHORT TERM...Today through Saturday night...Zonal flow will continue mostly dry and mild conditions to the region through Thursday morning. **Precipitation ahead of a weaker upper level trough will move into** southeast Oregon on Thursday afternoon, and then into the **southwest Idaho on Thursday evening**. Isolated thunderstorms are expected in northwest Baker and Harney Counties in Oregon as this system pushes in on Thursday afternoon. Snow showers are expected above 5500 feet MSL, with snow amounts totaling 1-3 inches for higher elevations. Showers will linger in southwest Idaho through early Friday morning, but areas south of the Owyhee Mountains are expected to stay dry through this event. **Another push of moisture ahead of a weak shortwave trough will move into** Baker County, OR, the West Central Mountains, and **Upper Treasure Valley on Friday evening, bringing light rain and snow showers to the northern half of our region.** Snow levels will elevate to 6500-7500 feet MSL overnight on Friday, bringing snow mainly to the high peaks. Thunderstorms are also possible on Saturday afternoon in the northern reaches of our CWA with this second system. A ridge will build into the region on Saturday night, bringing dry and mostly clear conditions overnight. Temperatures will remain 5-10 degrees below normal through Friday night, but ridging from our southwest will warm temperatures to near normal on Saturday.

.LONG TERM...Much warmer Sunday after passage of a warm front Saturday night. Pacific cold front late Sunday and Sunday evening will bring showers and (possibly strong) thunderstorms mainly to northern areas, gusty winds, and cooler temps. Clearing and cooler Monday morning but a second, weaker cold front will bring another chance of showers and thunderstorms to Baker County and the mountains in Idaho later Monday and Monday evening. Partly cloudy, windy, and cool Tuesday under strong westerly flow aloft, with a slight chance of rain and high-mountain snow showers in the Idaho central mountains. Next Pacific cold front Wednesday with showers and thunderstorms (mainly north), gusty winds, and further cooling, then showery in all areas Thursday with snow in the mountains and even cooler temps as the upper trough passes through.

Hourly Forecast



48-Hour Period Starting:
7am Thu, May 12 2022
Submit
Back 2 Days
Forward 2 Days
Fri, May 13 2022
Heat Index (°F)
Dewpoint (°F)
Temperature (°F)
Gusts (mph)
Surface Wind (mph)
Relative Humidity (%)
Precipitation Potential (%)
Sky Cover (%)
Sat, May 14 2022
Rain
Thunder
Rain:0.03in
Rain:0.04in

Appendix C: Full QA/QC Sampling Schedule

Phase I QC Sample[1,2] Schedule for WY22

Site Name	Assigned #
Lucky	1
Whitewater	2
Main	3
Americana	4
AS_6	5

Wet Grab Sample Schedule						
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Plan	Main	Main	Lucky	Main	Lucky	Lucky
Alt 1	AS_6	Americana	AS_6	AS_6	Whitewater	AS_6
Alt 2	Whitewater	Lucky	Whitewater	Whitewater	Main	Americana
Alt 3	Americana	AS_6	Americana	Lucky	Americana	Whitewater

Composite Duplicate Schedule[3]	
Plan	AS_6
Alt 1	Americana
Alt 2	Lucky
Alt 3	Whitewater

Composite Field Blank Schedule	
Plan	Main
Alt 1	Whitewater
Alt 2	Lucky
Alt 3	AS_6

Equipment Blank Schedule[4]	
Collect in Fall 2021, for WY22	
Plan	Main
Alt 1	Whitewater
Alt 2	Lucky
Alt 3	Americana

Rinsate Blank Schedule[4]	
Collect in Fall 2021, for WY22	
Plan	Main
Alt 1	Whitewater
Alt 2	AS_6
Alt 3	Americana

Notes:
[1] Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.
[2] The first site listed is the planned QC site. The next three sites are the alternate sites and are prioritized in the order listed.
[3] The composite sample duplicate will be collected at the earliest opportunity and is contingent upon sample volumes.
[4] Blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

Phase I QC Sample[1,2] Schedule for WY23

Site Name	Assigned #
Lucky	1
Whitewater	2
Main	3
Americana	4
AS_6	5

Wet Grab Sample Schedule						
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Plan	Lucky	Main	AS_6	Lucky	Lucky	Main
Alt 1	Americana	Lucky	Whitewater	AS_6	Main	AS_6
Alt 2	Whitewater	AS_6	Main	Whitewater	AS_6	Lucky
Alt 3	AS_6	Americana	Lucky	Main	Whitewater	Whitewater

Composite Duplicate Schedule[3]	
Plan	Whitewater
Alt 1	Main
Alt 2	AS_6
Alt 3	Americana

Composite Field Blank Schedule	
Plan	AS_6
Alt 1	Main
Alt 2	Lucky
Alt 3	Americana

Equipment Blank Schedule[4]	
Collect in Fall 2022, for WY23	
Plan	AS_6
Alt 1	Americana
Alt 2	Main
Alt 3	Lucky

Rinsate Blank Schedule[4]	
Collect in Fall 2022, for WY23	
Plan	AS_6
Alt 1	Lucky
Alt 2	Americana
Alt 3	Main

Notes:

[1] Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.

[2] The first site listed is the planned QC site. The next three sites are the alternate sites and are prioritized in the order listed.

[3] The composite sample duplicate will be collected at the earliest opportunity and is contingent upon sample volumes.

[4] Blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

Phase I QC Sample[1,2] Schedule for WY24

Site Name	Assigned #
Lucky	1
Whitewater	2
Main	3
Americana	4
AS_6	5

Wet Grab Sample Schedule						
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Plan	AS_6	Americana	Lucky	Main	Whitewater	Main
Alt 1	Lucky	AS_6	Main	Whitewater	Main	Americana
Alt 2	Americana	Whitewater	Whitewater	Lucky	AS_6	Lucky
Alt 3	Main	Main	Americana	AS_6	Americana	AS_6

Composite Duplicate Schedule[3]	
Plan	Americana
Alt 1	Main
Alt 2	Whitewater
Alt 3	Lucky

Composite Field Blank Schedule	
Plan	Lucky
Alt 1	AS_6
Alt 2	Americana
Alt 3	Main

Equipment Blank Schedule[4]	
Collect in Fall 2023, for WY24	
Plan	Main
Alt 1	Whitewater
Alt 2	AS_6
Alt 3	Americana

Rinsate Blank Schedule[4]	
Collect in Fall 2023, for WY24	
Plan	Americana
Alt 1	Whitewater
Alt 2	AS_6
Alt 3	Main

Notes:
[1] Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.
[2] The first site listed is the planned QC site. The next three sites are the alternate sites and are prioritized in the order listed.
[3] The composite sample duplicate will be collected at the earliest opportunity and is contingent upon sample volumes.
[4] Blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

Phase I QC Sample[1,2] Schedule for WY25

Site Name	Assigned #
Lucky	1
Whitewater	2
Main	3
Americana	4
AS_6	5

Wet Grab Sample Schedule						
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Plan	Americana	AS_6	Whitewater	Main	AS_6	AS_6
Alt 1	Main	Main	Main	Lucky	Whitewater	Americana
Alt 2	AS_6	Americana	Lucky	Whitewater	Lucky	Lucky
Alt 3	Whitewater	Whitewater	Americana	Americana	Main	Whitewater

Composite Duplicate Schedule[3]	
Plan	Lucky
Alt 1	Whitewater
Alt 2	Americana
Alt 3	AS_6

Composite Field Blank Schedule	
Plan	AS_6
Alt 1	Main
Alt 2	Americana
Alt 3	Lucky

Equipment Blank Schedule[4]	
Collect in Fall 2024, for WY25	
Plan	AS_6
Alt 1	Lucky
Alt 2	Americana
Alt 3	Whitewater

Rinsate Blank Schedule[4]	
Collect in Fall 2024, for WY25	
Plan	Americana
Alt 1	Lucky
Alt 2	Main
Alt 3	Whitewater

Notes:
[1] Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.
[2] The first site listed is the planned QC site. The next three sites are the alternate sites and are prioritized in the order listed.
[3] The composite sample duplicate will be collected at the earliest opportunity and is contingent upon sample volumes.
[4] Blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

Phase I QC Sample[1,2] Schedule for WY26

Site Name	Assigned #
Lucky	1
Whitewater	2
Main	3
Americana	4
AS_6	5

Wet Grab Sample Schedule						
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Plan	Whitewater	Main	Lucky	Lucky	Main	AS_6
Alt 1	AS_6	AS_6	Americana	Americana	Lucky	Whitewater
Alt 2	Americana	Lucky	AS_6	Whitewater	Americana	Main
Alt 3	Main	Americana	Main	Main	Whitewater	Lucky

Composite Duplicate Schedule[3]	
Plan	AS_6
Alt 1	Whitewater
Alt 2	Lucky
Alt 3	Main

Composite Field Blank Schedule	
Plan	Whitewater
Alt 1	Main
Alt 2	AS_6
Alt 3	Americana

Equipment Blank Schedule[4]	
Collect in Fall 2025, for WY26	
Plan	AS_6
Alt 1	Lucky
Alt 2	Main
Alt 3	Americana

Rinsate Blank Schedule[4]	
Collect in Fall 2025, for WY26	
Plan	Lucky
Alt 1	Whitewater
Alt 2	Americana
Alt 3	Main

Notes:
[1] Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.
[2] The first site listed is the planned QC site. The next three sites are the alternate sites and are prioritized in the order listed.
[3] The composite sample duplicate will be collected at the earliest opportunity and is contingent upon sample volumes.
[4] Blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

NPDES Phase I Temperature Monitoring Approach

Ada County Highway District

12/7/2022

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1. Introduction

The Environmental Protection Agency, Region 10 (EPA) issued the third cycle National Pollutant Discharge Elimination System (NPDES) Municipal Storm Separate Sewer System (MS4) Phase I Permit No. IDS027561 (Permit) effective October 1, 2021, to Ada County Highway District (ACHD), Boise State University (BSU), City of Boise, City of Garden City, Drainage District #3, and Idaho Transportation Department District #3 (ITD), referred to as the "Permittees." Starting July 1, 2021, the Idaho Department of Environmental Quality (IDEQ) acquired Permit authority through the Idaho Pollutant Discharge Elimination System (IPDES) Program. The Permit authorizes stormwater discharges from MS4 outfalls to waters of the United States in accordance with the conditions and requirements of the Permit. Under this permit, the Permittees are required to monitor temperature in stormwater discharges from the MS4 to the Boise River including assessment units (AU) 17050114SW005_06, 17050114SW005_06a, 17050114SW005_06b, to quantify stormwater impacts to this waterbody (Permit Part 4.1).

The Boise River AUs that are included within the Phase I permit area are 17050114SW011a_06 (Diversion Dam to Veteran's Memorial Parkway (VMP) bridge) and 17050114SW005_06 (Veteran's Memorial Parkway bridge to Star Road bridge). The remaining AUs listed in the Permit (17050114SW005_06a and 17050114SW005_06b) are outside of the permit area, and therefore do not have Permittee stormwater contribution.

Temperature monitoring has been incorporated into all NPDES monitoring projects conducted to date, in both dry weather and wet weather stormwater discharges. The majority of sampling under existing monitoring plans is completed at outfalls that discharge to the Boise River between Diversion Dam and VMP bridge (AU 17050114SW011a_06). To meet the additional requirement specific to AU 17050114SW005_06, outfall 4n2e30_012 was equipped with a temperature logger and data collection began under the *Plantation Lane Temperature Monitoring Plan* (Appendix A).

All NPDES monitoring plans were developed in line with the Quality Assurance Project Plan for NPDES Stormwater Permit Monitoring (QAPP) (ACHD, 2021) and contain details specific to the monitored outfall locations, procedures, and equipment. A summary of each monitoring plan with respect to temperature is provided below. Figure 1 shows a map of the location of each outfall, and the associated monitoring plan(s). Table 1 depicts the type and frequency of temperature readings from each monitored outfall.

1.1 Stormwater Outfall Monitoring Plan (SWOMP)

The *Stormwater Outfall Monitoring Plan* provides the methods for stormwater outfall monitoring and includes site and drainage area descriptive details for each monitoring station. Temperature data is collected in multiple ways at outfalls monitored under this plan. During monitored storm events, temperature is collected continuously, and a discrete temperature reading is collected as a grab sample. Additionally, continuous temperature data are collected year-round from stations that are known to have dry weather discharges.

1.2 Dry Weather Outfall Screening Plan (DWOSP)

The *Dry Weather Outfall Screening Plan* explains the process for dry weather outfall screening and provides comprehensive guidance for outfall investigation efforts. Under this plan, discrete temperature data are collected at outfalls that have dry weather discharge. Discrete samples are collected from outfalls with known dry weather flows up to three times per year, assuming flow is present.

1.3 Americana Subwatershed Monitoring Plan

The *Americana Subwatershed Monitoring Plan* describes the procedures for subwatershed monitoring within the Americana Subwatershed to determine sources of non-stormwater flow and areas of elevated pollutant loads. As a part of this plan, continuous temperature data are collected year-round at one outfall.

1.4 Plantation Lane Temperature Monitoring Plan

The *Plantation Lane Temperature Monitoring Plan* was developed to address temperature monitoring specific to the Boise River AU 17050114SW005_06. Under this plan, continuous temperature data are collected year-round at one outfall.

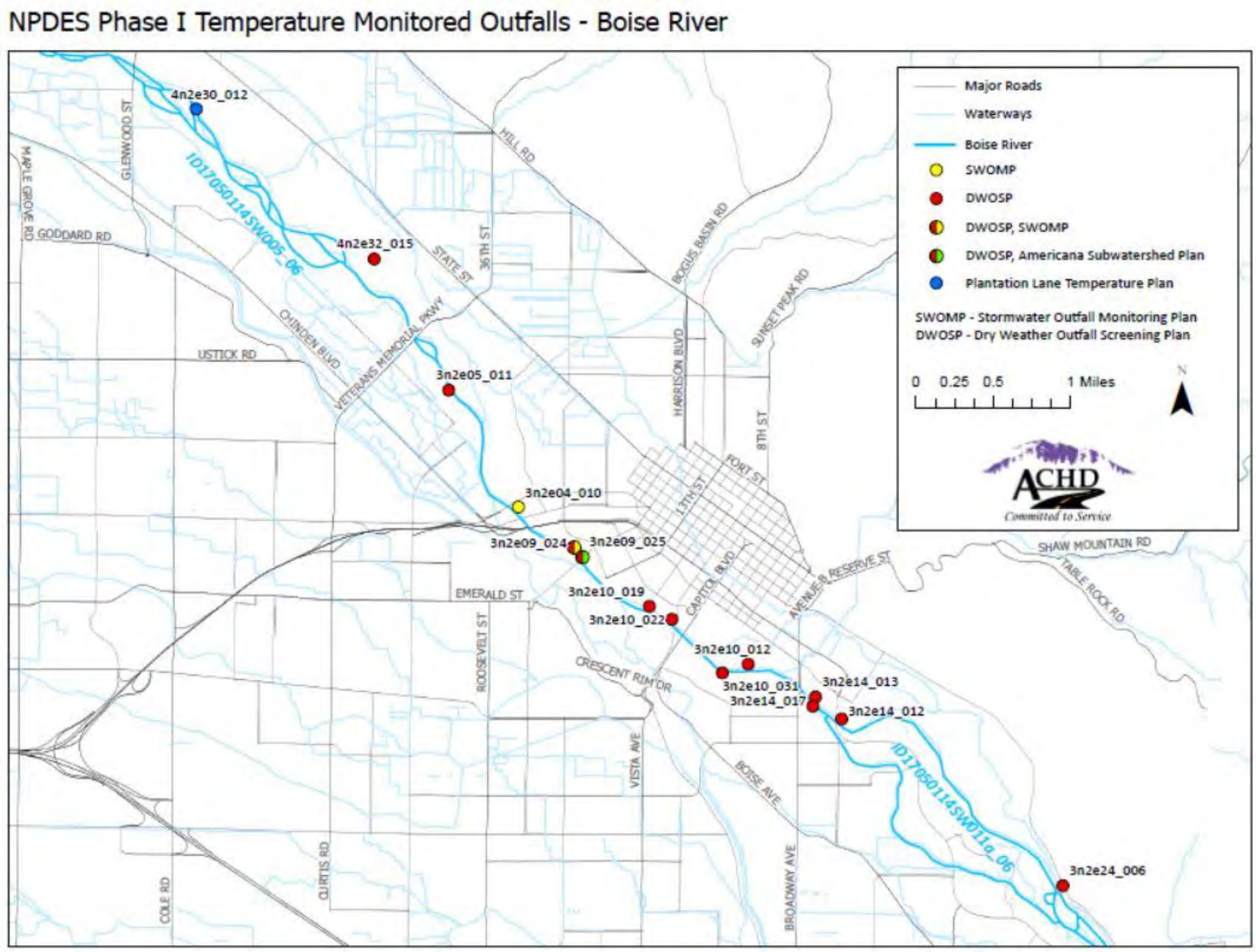

Figure 1 Temperature Monitored Outfalls

Table 1 NPDES Phase I Temperature Monitored Outfalls

Outfall ID (Station Name)	Boise River AU	Monitoring Plan	Equipment	Sample Type, Interval	Frequency
3n2e04_010 (Main)	17050114SW011a_06	SWOMP	Hach Submerged Area Velocity Sensor	Continuous, 15-minute	During monitored events
			In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	During monitored events
3n2e05_011	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e09_024 (Americana)	17050114SW011a_06	SWOMP	ISCO TIENet 350	Continuous, 15-minute	Year-round
			In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	During monitored events
		DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e09_025 (AS_7)	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
		Americana Subwatershed	ISCO 2150 Area Velocity Sensor	Continuous, 5-minute	Year-round
3n2e10_012	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e10_019	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e10_022	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e10_031	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e14_012	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e14_013	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e14_017	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
3n2e24_006	17050114SW011a_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present
4n2e30_012 (Plantation Lane)	17050114SW005_06	Plantation Lane Temperature Plan	HOBO MX2203	Continuous, 15-minute	Year-round
4n2e32_015	17050114SW005_06	DWOSP	In-Situ AquaTroll 400 In-Situ SmarTroll MP	Discrete	3x/year, if discharge is present

2. Methods

The method used to obtain all temperature readings, both discrete and continuous, for NPDES Phase I monitoring is EPA 170.1. Continuous samples are collected from a fixed location by equipment that is installed in the invert of the storm drain pipe. Discrete samples are collected from the discharge stream using a hand-held instrument. Detailed information about each equipment type is found in the relevant monitoring plans.

2.1 Equipment Inspection and Calibration

Visual inspections of the equipment are completed on a regular basis, during routine maintenance events and data downloads. An annual accuracy check will be performed by comparing the field equipment to a precision thermometer certified by the National Institute of Standards and Technology.

3. Data Management

Temperature data will be imported into Seveno DataSight (DataSight), a data management software used for handling data collected from all ACHD stormwater monitoring programs. DataSight provides a safe and secure platform for storing, viewing, validating, and analyzing data.

3.1 Data Validation

Raw data will be subject to review on a routine basis. The inspection of temperature trends will include physical logger range limits, practical environmental range units, and rates of temperature change. In the event of suspected erroneous data, the data will be flagged in DataSight using the appropriate flag discussed in QAPP section 4.2.2.

Appendix A – Plantation Lane Temperature Monitoring Plan

Plantation Lane Temperature Monitoring Plan

Ada County Highway District

Boise, Idaho

11/22/2022

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1. Introduction

1.1 Basis for Monitoring Plan

The Environmental Protection Agency, Region 10 (EPA) issued the third cycle National Pollutant Discharge Elimination System (NPDES) Municipal Storm Separate Sewer System (MS4) Phase I Permit No. IDS027561 (Permit) effective October 1, 2021, to Ada County Highway District (ACHD), Boise State University, City of Boise, City of Garden City, Drainage District #3, and Idaho Transportation Department District #3, referred to as the "Permittees." Starting July 1, 2021, the Idaho Department of Environmental Quality (IDEQ) acquired Permit authority through the Idaho Pollutant Discharge Elimination System (IPDES) Program. The Permit authorizes stormwater discharges from MS4 outfalls to waters of the United States in accordance with the conditions and requirements of the Permit. Under this permit, the Permittees are required to monitor temperature in stormwater discharges from the MS4 to the Boise River including assessment units (AU) 17050114SW005_06, 17050114SW005_06a, 17050114SW005_06b, to quantify stormwater impacts to this waterbody (Permit part 4.1).

ACHD has identified outfall '4n2e30_012' to address stormwater temperature monitoring into the Boise River AU 17050114SW005_06. The remaining two AUs listed in the Permit (17050114SW005_06a and 17050114SW005_06b) are outside of the Permit area, and therefore do not have Permittee stormwater contribution.

This Plantation Lane Temperature Monitoring Plan (Plan) has been developed in line with the *Quality Assurance Project Plan for NPDES Stormwater Permit Monitoring* (QAPP) (ACHD, 2021a). The Plan describes the overall approach to monitoring temperature in stormwater discharges and provides site and drainage area details for the monitoring station.

Certain Quality Assurance/Quality Control (QA/QC) procedures that have been identified using EPA guidance for QAPPs are also included in this plan. The QA/QC procedures are designed to ensure data collected meet specific data quality objectives developed specifically for Permit-required monitoring activities. The QC procedures and data management details included in this document are specific to this Plan.

1.2 Monitoring Plan Objective

The primary objective, derived from Permit part 4.1, is as follows:

- Quantify the temperature impacts of stormwater discharges from the MS4 to the Boise River AU 17050114SW005_06.

The data collected under this plan will help determine if water temperatures from stormwater discharges comply with temperature criteria for the protection of aquatic life (IDAPA 58.01.02.250.(b),(f)).

1.3 Monitoring Plan Elements

This document outlines the Plan's approach and includes specific QAPP elements recommended by the EPA. EPA-recommended QAPP elements are addressed as either program elements or monitoring plan elements.

Monitoring plan elements are described in full in this document, while program elements are addressed in the QAPP. Monitoring plan elements are those components that contain details specific to each individual monitoring plan. Program elements consist of the standardized monitoring components that all individual monitoring plans developed under the Permit reference. A list of program and monitoring plan elements is included in Table 1.

Table 1 QAPP Element Document Reference

EPA Recommended QAPP Elements	QAPP Element	Plan Element; Section
Group A: Project Management		
A1 – Title and Approval Sheet	x	
A2 – Table of Contents	x	x
A3 – Distribution List	x	
A4a – Project Organization	x	
A4b – Task Organization		x; 1.4
A5 – Problem Definition/Background	x	
A6 – Project/Task Description		x; 1
A7a – Quality Objectives and Criteria for Measurement Data	x	
A7b – Method Dependent Criteria for Measurement Data	x	
A8 – Special Training Needs/Certification	x	
A9 – Documents and Records	x	
Group B: Data Generation and Acquisition		
B1 – Sampling Process and Design		x; 2
B2 – Sampling Methods		x; 3
B3 – Sample Handling and Custody		n/a
B4 – Analytical Methods		n/a
B5 – Quality Control	x	x; 4
B6 – Instrument/Equipment Testing, Inspection, Maintenance		x; 3.1
B7 – Instrument/Equipment Calibration and Frequency		x; 3.1
B8 – Inspection/Acceptance of Supplies and Consumables	x	
B9 – Non-direct Measurements	x	
B10 – Data Managment	x	x; 3.2
Group C: Assessment and Oversight		
C1 – Assessments and Response Actions	x	
C2 – Reports to Management	x	
Group D: Data Validation and Useability		
D1 – Data Review, Verification, and Validation	x	
D2 – Verification and Validation Methods	x	
D3 – Reconciliation and User Requirements	x	

1.5 Task Organization

ACHD is the lead agency for monitoring under the Permit. Key roles and job functions are described in the QAPP. The organization chart for this Plan is presented in Figure 1.

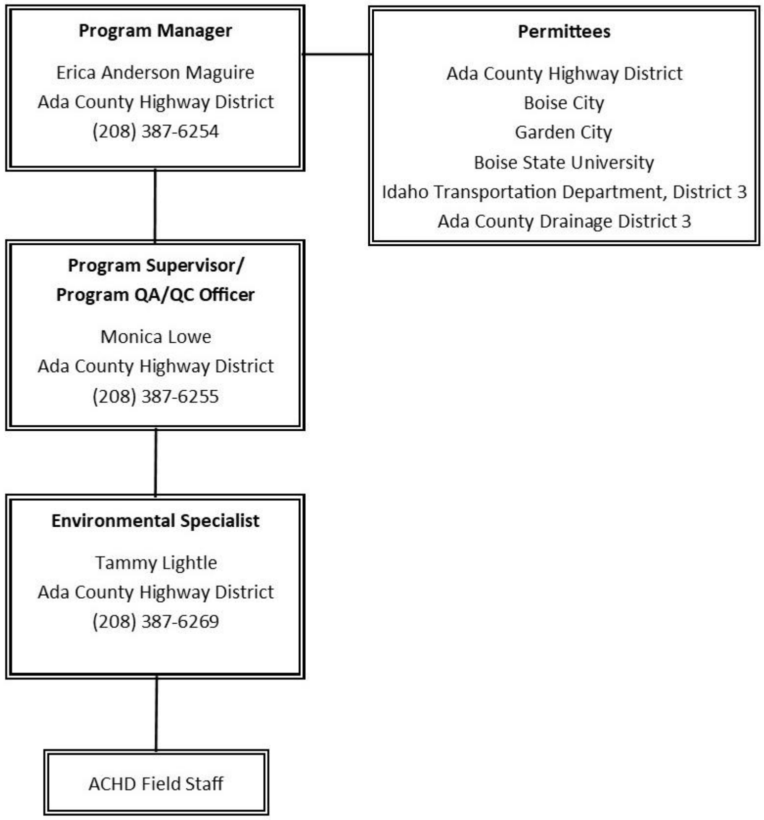

Figure 1 4n2e30_012 Temperature Monitoring Organization Chart

2. Study Area and Monitoring Location

The Boise River AU 17050114SW005_06 spans from Veterans Memorial Parkway bridge to Star Road bridge. Within this AU, ACHD owns and maintains six outfalls, and the remaining Permittees do not own any.

2.1 Site Description

Continuous water temperature monitoring of stormwater discharges will occur at one site within the Boise River assessment unit: outfall 4n2e30_012. The outfall is located at 6553 West Plantation Lane in northwest Boise. Access to the monitoring location is through a manhole located in Plantation Lane. To date, dry weather flows have not been observed from this subwatershed. Monitoring station and associated subwatershed information is provided in Table 2. A map of the monitored subwatershed is provided in Attachment A.

Table 2 Monitoring Station Information

Outfall ID (Station Name)	**4n2e30_012 (Plantation)**
Location	6553 W. Plantation Ln.
GPS Coordinates	43.657674, -116.270547
Subwatershed Area	22.43 acres
Receiving Water	Boise River
Assessment Unit	17050114SW005_06
Distance from Station to Outfall	331 ft
Pipe Construction	18 in, circular PVC
Equipment Location	In manhole

3. Methods

3.1 Equipment

Temperature monitoring will be accomplished using a HOBO® TidbiT® MX2203 temperature logger. The MX2203 has an internal temperature thermistor and two external screws which allow the logger to detect the presence of water. The logger is installed in a fixed location on a mounting band on the invert of the storm drain pipe.

3.1.1 Inspection and Calibration

The temperature logger will be visually inspected on a regular basis. An annual accuracy check will be performed by comparing the logger reading to a precision thermometer certified by the National Institute of Standards and Technology. A correction factor will be applied to the logger data if there is a discrepancy between the two temperature readings.

3.2 Data Collection and Management

Temperature readings will be collected at 15-minute intervals, logged by the data logger. Additionally, the logger checks for the presence of water every 15 seconds and records an event when the status changes. Data transfer will regularly occur using Bluetooth and a mobile device equipped with the HOBOconnect® application. The data will be imported into Seveno DataSight (DataSight), a data management software used for handling data collected from all ACHD stormwater monitoring programs. DataSight provides a safe and secure platform for storing, viewing, validating, and analyzing data.

4. Quality Assurance/Quality Control

Raw data will be subject to review on a routine basis. The inspection of temperature trends will include physical logger range limits, practical environmental range limits, and rates of temperature change. In the event of suspected erroneous data, the data will be flagged in DataSight using the appropriate flag discussed in QAPP section 4.2.2.

4.1 Data Quality Objective (DQO)

The DQO for ACHD stormwater temperature monitoring can be summarized by the following statement:

Monitoring efforts will provide data of sufficient quality and quantity in accordance with Permit requirements to characterize the impact of stormwater discharges on the water temperature of the Boise River.

4.2 Data Quality Indicators (DQIs)

DQIs have been established to set measurable qualitative and quantitative goals for data acceptance that meet the program DQO described above. Each DQI is summarized below. DQIs are the basis for addressing field and laboratory analytical instrument performance, as well as sample collection and handling procedures.

DQIs are described fully in Section 1.8.1 of the QAPP. A brief description of each DQI is included in the list below.

- Project Required Detection Limits (resolution): Achieving appropriate reported constituent concentration results at values that allow for comparison to baseline data and water quality standards.
- Accuracy: The accuracy of the data is a measure of the extent to which a measured value represents the true value.
- Representativeness: Representativeness is a measure of the extent of the degree to which data accurately and precisely indicate environmental conditions.
- Comparability: The comparability of a data set is the extent to which data accurately and precisely indicate environmental conditions.
- Completeness: Completeness is a comparison between the amount of usable data collected versus the total amount of data collected.
- Sufficiency: Data set sufficiency is the amount of data required to perform the level or type of analysis necessary for each monitoring element.

The target values for these indicators are listed in Table 3 below.

Table 3 Data Quality Indicator Targets

Constituent	Analytical Method	Resolution	Accuracy
Temperature	EPA 170.1	0.01°C	±0.25 °C from -20°C to 0°C ±0.2°C from 0°C to 70°C

5. Annual Reporting

A summary of stormwater temperature data from outfall 4n2e30_012 will be included in the MS4 Annual Report Form (NPDES Phase I Permit Appendix B) submitted to IDEQ annually. This summary will include a graph of the water temperature data collected during the reporting period (October 1 – September 30).

6. References

Ada County Highway District. (2021a). *Quality Assurance Project Plan for NPDES Stormwater Permit Monitoring.*

Ada County Highway District. (2021b). *Stormwater Outfall Monitoring Plan*.

Code of Federal Regulations. (2022). *40 CFR Part 136.* Retrieved from https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-136.

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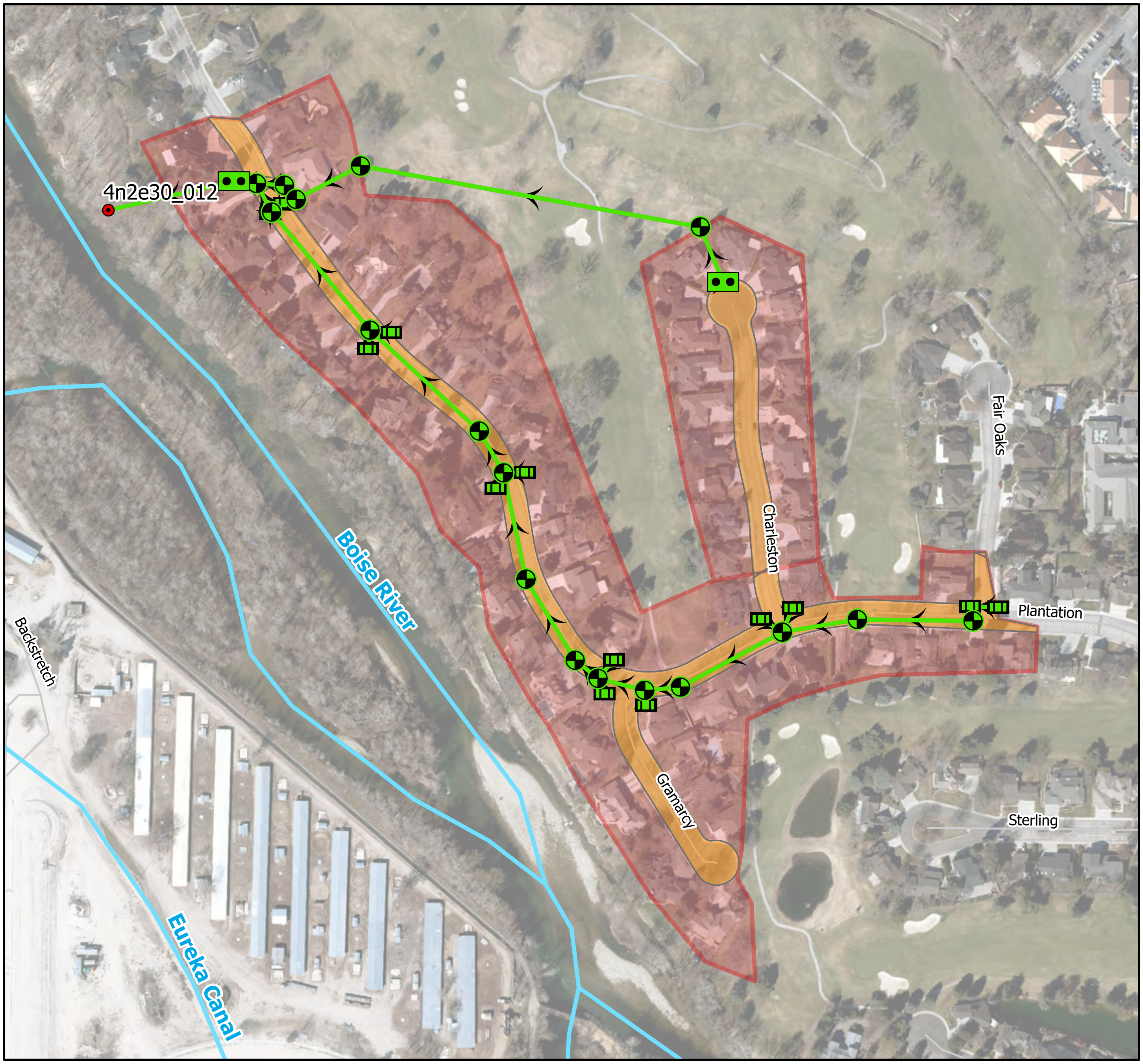
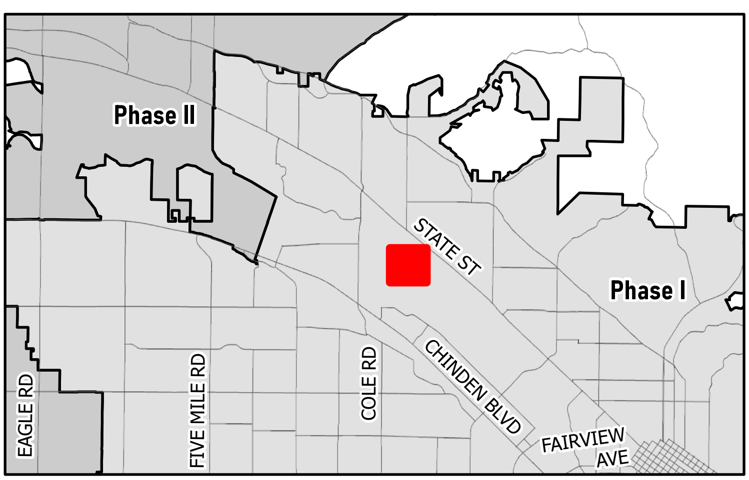
Onset Computer Corporation. (2017-2021). *HOBO® TidbiT® MX Temp 400 (MX2203) and Temp 5000 (MX2204) Logger Manual.* Retrieved from https://www.onsetcomp.com/sites/default/files/resources-documents/21537-M%20MX2203%20and%20MX2204%20Manual.pdf.

Appendix A - Map

Plantation Lane Monitoring Station (outfall 4n2e30_012)





- Outfall
- Storm Drain Inlet
- Storm Drain Manhole
- Sand and Grease Trap
- Right-of-Way Drainage = 3.19 Acres
- Drainage Area = 22.43 Acres
- Storm Drain Pipe
- Waterways
- Roadway

N

0 125 250 500 Feet

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