



DEPARTMENT:

Physical and Environmental Sciences

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PROJECT TITLE:

Methods of E. Coli and Selenium Tracing in Adobe and Leech Creeks

Background

Leech and Adobe Creek

- Colorado River tributaries in Western Colorado
- Begin as ephemeral streams north of the Grand Valley.
- Below the Highline Canal, the streams flow as irrigation outflows.
- Have been listed as impaired by the EPA.



Fig 1. Location of Leech and Adobe creeks within the grand valley

Selenium issues

- Se naturally occurring metalloid in local geologic formations.
- Bioaccumulates in the food chain
- Variety of problems in large predatory fish and waterfowl
- Liver necrosis, white muscle disease, multiple organ degenerations and cancer
- Birth defects in fish and waterfowl populations where Se bioaccumulates
- Effects are more noticeable downstream
- Difficult to control

E coli issues

- One of the most common causes of surface water impairment
- Variety of health hazards for any organisms utilizing water as a resource
- Variety of issue, mainly gastrointestinal illness with symptoms such as diarrhea, nausea, vomiting, fever, abdominal pain, and in severe instances, death
- Difficult to locate source
- Known that E coli is from the waste of humans and animals, the source in these creeks is unknown.

Methods

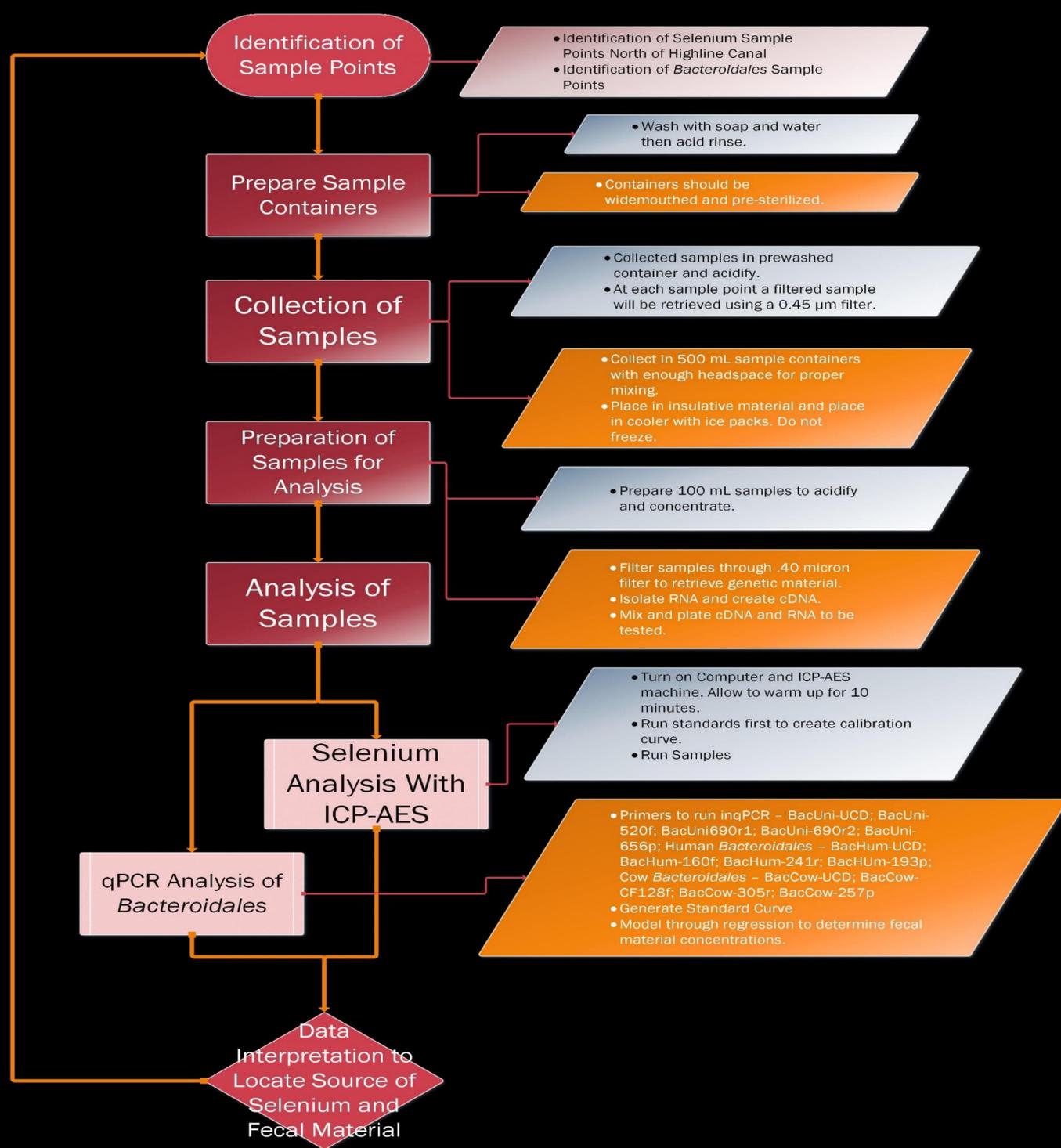


Fig 2. Proposed Se sampling locations for Adobe Creek north of Highline Canal



Fig 3. Proposed Se sampling locations for Leech Creek north of Highline Canal

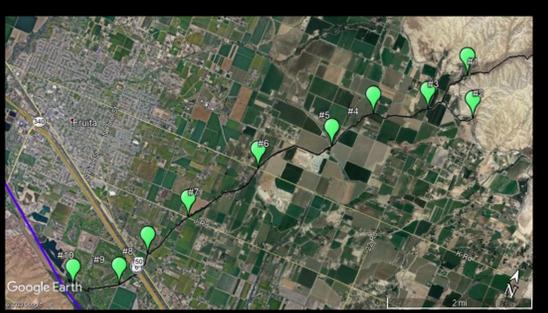


Fig 4. Proposed sampling locations for e. coli in Adobe Creek



Fig 5. Proposed e. coli sampling locations for Leech Creek

Goals and Objectives

Goal: Describe in detail the methods that would be utilized for analyzing the Se and Escherichia coli (E. coli) concentrations in the surface waters of Leech and Adobe Creek.

Objective: Develop a work plan and firm understanding of the methods needed to be used for collecting and analyzing Se and E. coli in Adobe and Leech Creeks

Implications and the Future of the Study

The qPCR analysis of bacteroidales is a new method for Mesa County. The use of this method will help determine the source of the E. coli contamination. One possible future of this study is that it may be carried out in the future by another Capstone team or by Mesa County and Cities of Grand Junction and Fruita. This design is put together in a way that a future team may take this material and conduct the sampling and analysis portion of the study.

Acknowledgements

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