



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: The Effects of the Run-Off from Mine Tailings on Daphnia Magna

Finalist's Name: Juakin Sawatzky

School and City: Liberty School, Joes

Sponsor's Name: Linda Fogale

Category: Earth & Environmental Sciences (EAEV)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

In this project the mine tailings from various mines around Colorado were tested. These mine tailings were put into small containers and attached to bigger containers. The smaller containers had holes poked into the bottom and microfilters put over them to reduce tailings getting in the water. The bigger containers had holes poked into the side near the bottom and microfilter put over it to keep the daphnia from draining out. The mine tailings were massed out at 50g each. Each tub and pump tub was filled with 800 ml of purified water. Then pumps were put near the drain and pumped into the smaller tubs which from there the water would drain with the heavy metal ions in the water. This water would drain into the bigger containers and affect the life of the daphnia. It would either have an increase or decrease in population and reproduction. The mines that showed the most amount of decrease in population would be prioritized for cleanup. The data was analyzed by coupled mass spectrometry, which shines light on the compounds and identifies what elements are in the mine tailings. The hypothesis of this experiment was that if mine tailings are introduced into an aquatic environment then the Daphnia Magna would be negatively affected due to the presence of heavy metal ions. As the metal ions are present the Daphnia shown loss in population and in reproduction. The tests were taken and the evidence that the heavy metals had a negative effect is apparent.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

3/1/24

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.