

Research Matters for Oct. 6

with mug shot of Lori Phillips, fourth year Bachelor of Science student majoring in environmental biology and ecology.

ONE OF the simplest organisms to inhabit the earth may prove to be a powerhouse in fighting a giant toxic waste site that blights a pristine area of the Pacific Northwest.

One wouldn't expect anything to grow in the Berkley Pit in Butte, Montana, formally an open pit copper and silver mine that's been the collection area for a deadly-mix of ground water and mine tailings over the past two decades.

Certain aspects of nature have been defiant, however. In 1994, Montana-based scientist Dr. Grant Mitman discovered several types of green algae that not only flourish at the site, but could also aid in cleaning up the highly acidic water. Since then, he and small team of researchers have been studying the algae to determine its ability to survive and attract metals in the water.

While Mitman investigates the potential for algae blooms in the Berkley Pit, a Canadian counterpart from The University College of the Cariboo is studying the one-celled organisms to record their reactions to certain types of chemicals.

Lori Phillips, a fourth year Bachelor of Science student at UCC, says being part of the project is a tremendous opportunity from a research point of view, given the burgeoning field of biological remediation.

"There has been lots of experimentation with plants in this field and this is the same sort of thing," said Phillips, who became part of the study as of this September.

She described her role as "playing around with the algae," an investigation that could become a vital part to combating Butte's environmental disaster.

"I'll be looking at what metals are being taken up, how fast they are absorbed, in what quantities and where they are sequestered in the cell."



Phillips learned of the bio remediation research in Butte through an article in Discovery Magazine. It outlined the site's history and the work of Mitman, who completed his PhD in algae studies and currently works at the Montana Tech of the University of Montana.

Coincidentally, while discussing the article with one of her UCC professors, Dr. Ron Smith, Phillips learned that he had a connection with Mitman — the two had completed post-graduate work together.

Phillips' enthusiasm for the study prompted Smith to contact Mitman, who accepted a proposal for the UCC student to come on board. Phillips will use the research as credit toward Directed Studies Biology, a fourth year honours course.

While petri dishes carrying the important organisms haven't arrived to Kamloops yet, Phillips is expecting them any day now. In the meantime, she is developing a methodology plan and over the next several months will investigate and record the (function?) of three to four types of green algae that live in the Berkley Pit.

The first step will be to isolate the specific types of algae and house them in separate flasks that will serve as modified aquariums. Chemicals and minerals such as copper, zinc, arsenic, cadmium, lead and aluminum will all be introduced to the organisms, which have proven to thrive in the highly acidic water (ph 2.5).

By comparison, hundreds of migrating snow geese that landed on the Berkley Pit in November of 1995, died overnight after being exposed to the toxic waste.

Phillips said if the research is successful, the algae could potentially be used in other water bodies where pollution exists. At the end of the year, she must complete a report on her findings and present it to her classmates. However, she may continue to study the algae next year, depending on her course load.

For more information on the Berkley Pit algae study, visit <http://www.mtech.edu/biology/GRANT.HTM>

Side bar

Fact File

**What:** Berkley Pit

**Where:** Butte, Montana

**When:** Opened in 1955 as an open pit mining operation (mostly copper) and closed in 1982. Since then it's been named a Super Fund site by the U.S. government, a title reserved for areas that have become environmental concerns. The pit has grown into a toxic lake after years of groundwater collecting in the giant hole, which contains mining tailings.

**Why:** Cost of mining copper became prohibitive and the operation was abandoned leaving a potentially disastrous toxic waste site. The government, mine owners (Atlantic Richfield Company) and scientific researchers are working to find ways to clean up the site that runs 1.5 miles east/west, 1 mile north south and is about 1,700 feet deep. It's believed if water continues to collect there, it could begin mixing with local groundwater within 10 to 20 years.

**How:** The government and mining interests are considering building a filtration plant at the pit to clean up the water and possibly recover some of the heavy metals that are in it. Meanwhile, a group of scientists is studying algae that survives in the water and may also have the propensity to clean it up. UCC science student Lori Phillips is part of the research team.