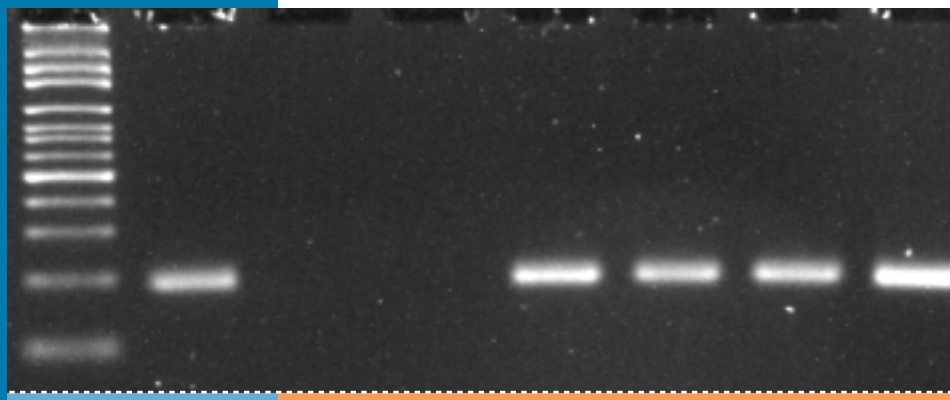
RESEARCH & TESTING SERVICES

The Research and Testing Services (RTS) group at Matrix Solutions Inc. evaluates new and emerging technologies for environmental monitoring and assessment. RTS adds value to the products and services we provide to our clients through innovation and forward thinking. Our clients include environmental and engineering consulting firms, universities, commercial laboratories, industry, government and the private sector. RTS collaborates with partners to solve problems with new and innovative technologies. We share the risk through creative problem solving and applied science.



DNA gel showing positive samples.

RTS Facility

Our facility is fully equipped to conduct applied testing and research in a number of areas in support of project work. We offer a full suite of microbiological, biochemical and molecular testing for soil and vegetation surveys, wildlife and fisheries, air and water quality. Some of the tests that can be performed in the RTS Facility include:

- Organic matter concentration for soil or sediment samples
- Fish presence/absence in a water body. This test can be done in 24 hours for emergency spill response
- Trophic Diatom Index, periphyton scraped from rocks in a stream can indicate the amount of eutrophication occurring downstream of a discharge, measure the length of the plume impact, or help determine when conditions have returned to the former functionality after a release.
- Plant disease diagnosis, bacterial and fungal plant diseases from diseased plant parts submitted to the lab, will give disease control recommendations.
- Identification of bats, fish, plants, etc. using DNA analysis for species which are difficult to identify in the field.

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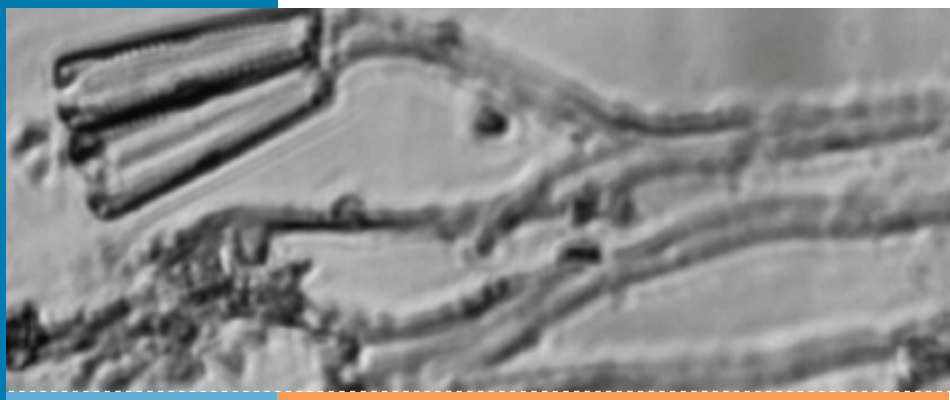
Organism Detection

The RTS group has developed DNA-based tests for detecting:

- Whether or not a stream is fish-bearing from a water filter in 24 hours
- White-nose fungus from swabbing bats
- Very low levels of waterborne bacteria including Bacteroides, Campylobacter and Salmonella from a water sample
- Giardia and Campylobacter from a water sample
- Club-root fungus in soil
- Many other organisms are possible



Diatoms on filaments. (1,000X magnification)

Organism Profiling

The RTS group can use DNA based tests to determine:

- Trout species and whether or not the trout is a hybrid from a fin clip
- Plant species from leaves and stems, even if the plant is dead
- Plant hybridization between two species
- Bat species from a wing membrane clip
- Lichen and moss species from a fragment of tissue
- What fish species are present in a water body from filtering the water, even if no fish are seen or caught
- Plant Disease Diagnosis – Microscopic, antibody-based or culture-based analyses
- To diagnose fungal or bacterial plant diseases – if a plant doesn't look right, the RTS lab may be able to determine why
- Many other organism profiles are possible

Fin clipping sample.

Water Quality

- Water quality analysis based on biological criteria and microscopic analysis.
- Diatom analysis to determine trophic status can be used to determine where an effect is no longer detectable (end of plume)
- Can be used to determine remediation end-point: when a stream affected by a release has gone back to its former functionality
- Diatom Lake core analysis to determine historical trophic or pH status of a lake

Periphyton on a rock.

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