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March 2023

Changing the World's Energy Future

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**Prepared for the
U.S. Department of Energy
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14517**

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Background

In anticipation of the Special Nuclear Material test bed (Beartooth), Idaho National Laboratory has developed a smaller, multi-sensor system for analyzing the solvent extraction process. These systems will enable research into nuclear fuel processing operations. Idaho National Laboratory's multi-sensor system consists of a row of centrifugal contactors and enables exploration of measurement sources not traditionally used in the solvent extraction process, including temperature, vibration, acoustics, pH, color, flow, and motor current.

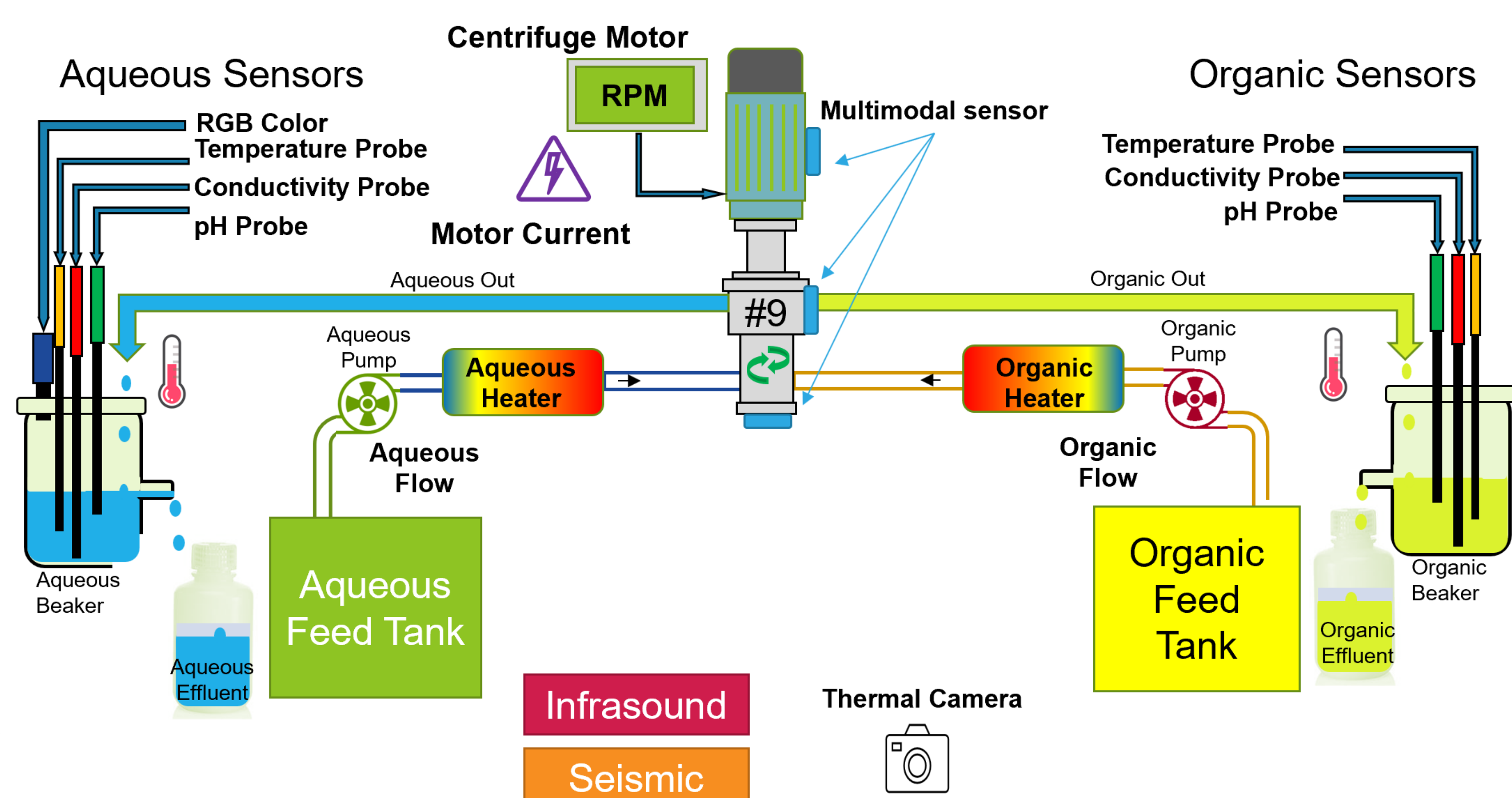
Motivation

This study aims to locate leaks by using non-traditional measurement sources then to utilize various techniques to identify which signals were of greatest importance in finding these leaks. The results can be used to help operators detect leaks, as well as to inform future test bed designers as to which sensors contain relevant, actionable information in leak scenarios.

Conclusion

Use of sensor data, such as vibration, acoustic, or chemical features, was not enough to detect faults. Must include sensors that are more apt for leak detection such as IR cameras for such small leak events.

Experimental Setup



Most Important Features

