



# THERMAL WATER ANALYSIS PROGRAM



## Industry Challenge

## Your Partner in Science

## Typical Sampling Points

## Parameters Tested

*“With our new Thermal Water Analysis Program, customers will have the data they need to safeguard their assets and improve ROI.”*

*– Phil Heaton, B.Sc., P.Chem.  
General Manager  
Oil Sands and Upgrading*

## Analytical Testing Services

### Industry Challenge

A significant problem for thermal oil operations is the risk of increased corrosion, sediment and scale build-up within thermal water treatment facilities and steam generators. If operators don't accurately know the condition of their boiler tubes, they could be running in 'safe' mode, throttling back on their steam generation and losing production to ensure they don't have an emergency shutdown. In order to increase bitumen production operators might then be overspending on filters and/ or chemicals in an effort to reduce the likelihood of sediment build-up and corrosion in their facilities.

### Your Partner in Science

In 2012, Maxxam partnered with the Oil Sands Leadership Initiative (now COSIA) to undertake a comprehensive sampling and analysis program to expand the body of knowledge available regarding the amount and character of dissolved inorganic and organic material in thermally produced water in SAGD facilities. Our investment in this research initiative has led to an improved understanding of migration patterns and the fate of these inorganics and organics in thermal water systems.

As a conclusion to the project, the key recommendations to successfully collecting and using thermal water chemistry data include the following:

- Generate high quality analytical data regularly and rapidly enough that it can be acted on in a timely manner, typically through the use of a suitably equipped on-site laboratory.
- Ensure that analytical equipment and methods are fit for purpose and accommodate the challenges of thermal waters containing high amounts of dissolved inorganic and organic material.
- Establish baselines for more complex water chemistry from time to time through the use of more sophisticated analytical techniques, typically only available at off-site laboratories.

# THERMAL WATER ANALYSIS PROGRAM



## Typical Sampling Points

Maxxam's purpose-built Thermal Water Analysis Program begins with a baseline evaluation of the thermal water chemistry on select parameters. The sampling points will vary slightly depending on plant configuration, but will generally include these four stages:

- De-Oiled Produced Water;
- Boiler Feed Water;
- OTSG Boiler Blowdown;
- LP Separator Flash Blowdown

## Parameters Tested

We provide analytical data that customers can ultimately use to take corrective action and to optimize operational parameters. The reports provide detailed results that are organized in two main groups – one to address corrosion and the other to address scale, sludge and foaming.

**Table 1 - Analyses Used to Diagnose Thermal Water Issues**

Issue	Test for presence of:
<b>Corrosion</b>	Dissolved and Total Dissolved Metals Iron and Magnesium Ammonia Dissolved Oxygen Alkalinity (P&T) Conductivity Napthenic acids Chloride
<b>Scale, Sludge and Foaming issues</b>	Organics (BTEX and F1, F2-F4, Phenols) Silica (reactive) and Silica (as SiO <sub>2</sub> ) TOC /TIC/DOC Oil and Grease pH and Alkalinity (P&T) Hardness due to Calcium and Magnesium

By comparing their thermal water results to our proprietary dataset of thermal water chemistry parameters, clients can begin to develop best practices and improved solutions to optimize their operations and reduce the risk of a catastrophic failure.

For more information on our Thermal Water Analysis Program, please contact your account manager or visit [www.maxxam.ca/thermal](http://www.maxxam.ca/thermal)

Maxxam is the Canadian market leader in analytical services and solutions to the energy, environmental, food and DNA industries and a member of the Bureau Veritas Group of companies – a world leader in testing, inspection and certification services. We support critical decisions made by our customers through the application of rigorous science and the knowledge and expertise of our over 2500 employees.

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