

OSIS 2019 – Call for Abstracts

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Review Process

- Abstracts will undergo a peer-review process.
- The Technical Program Committee will assess each abstract based on its adherence to format, scientific merit, and alignment with the overall Conference themes.
- Authors of abstracts selected for presentation will be contacted via email by Friday, March 15, 2019 and invited to present either a poster or oral presentation at the Conference.
- All selected abstracts will be made available to the Conference participants.

Abstract Format

Please use the following guide to help structure your abstract:

- Summary of the research or idea and what need it addresses (1500 character max).
- Complete abstract details including: results, implications and conclusion resulting from research (3000 character max).

Abstract Form Submission

- Abstracts must be submitted electronically using the official online submission form – found here: <https://www.cvent.com/c/abstracts/ff3dd586-6fbc-46f4-b6b9-1779648044d2>
- Please use standard abbreviations. Place special or unusual abbreviations in parenthesis after the full word when it appears for the first time.
- Minimize the use of charts as this detail is not used to evaluate the merit of your abstract.
- An individual may submit more than one abstract. One official online submission is required for each abstract.
- There is no fee to submit abstract(s).
- Edits to submitted abstracts may be made up to the submission deadline.

Presentation at the Conference

A small number of abstracts will be selected for oral presentation at the Conference; indicate on the submission form your preference for being considered for an oral presentation or poster presentation.

If an abstract is accepted for oral or poster presentation, the presenter(s) agree(s) to register for the Conference and pay the appropriate Conference registration fee.

Further details on the technical specifications for digital posters, as well as the presentation times and format, will be provided to accepted poster presenters upon notification of their acceptance.

Conference Themes

Water

Oil Sands Innovation Infrastructure Resources

Technological innovation enabled the unlocking of the oils sands as a global hydrocarbon resource, and technology innovation will continue to drive environmental performance improvement. Success requires a robust technical, scientific and financial innovation infrastructure to maintain the pipeline of new technologies and solutions available to producers. This theme is intended to profile key infrastructure resources developed to support and accelerate water related oil sands innovation.

How Continuous Improvement is Helping Reduce In Situ Water Use Intensity and Cost

Continuous improvement, the sharing of best practices and lessons learned, are important for enabling producers to quickly add value to their daily operation, and reduce water use intensity and costs. Areas covered include: de-oiling, water treatment, steam generation, alternate water uses and asset integrity. Examples of solutions include: new treatment media, ion exchange resins, chemicals (scaling, corrosion, emulsion breakers reverse emulsion breakers) and coatings (ion exchange regeneration vessel and exchange coating to reduce fouling.)

Improving and Adapting In Situ Water Treatment and Steam Generation Technologies

Under the current economic climate In Situ Producers are looking for easy-to-implement and cost effective technologies that improve the performance of existing water treatment and steam generation equipment. This topic will include technologies and processes that producers are testing at their facilities.

Future Water Treatment and Steam Generation Technologies

This topic will share research and projects in development on next generation technologies including ground-breaking water treatment, steam generation and waste management technologies that are smaller, less complex and modular, with lower environmental impact and costs.

Understanding Cumulative Impacts and Watershed Modeling

This theme is intended to profile results from applied research and modeling in the areas of surface water, ground water, hydrogeology and natural versus anthropogenic inputs to the Athabasca River watershed that advance our understanding of water in the region and how mining and in situ oil sands are working to achieve balanced outcomes.

Oil Sands Process Affected Water Composition and Toxicity

In oil sands mining operations, hot water is used to extract bitumen from the ore. The resulting process water is called oil sands process water (OSPW) and contains trace amounts of naturally-occurring organic compounds such as naphthenic acids which render the water acutely toxic to aquatic life without treatment. Projects on analytical methods, toxicity and treatment are increasing our knowledge of OSPW. This topic will share learnings from the latest projects.

Managing Oil Sands Process Water– How to Leverage Natural Systems and Processes

This theme will showcase results from applied research and technology projects that address the technical challenges of mine water return. As oil sands mines progressively reclaim sites and approach the end of mining, the return of OSPW is necessary to achieve closure and reclamation outcomes. Areas of interest include passive and semi-passive OSPW treatment systems, pit lake research and site water chemistry modeling.

Process Control and Automation; Digital Innovation and Artificial Intelligence

Advanced process control and automation including use of Artificial Intelligence (AI) offers the possibility of improved performance and reduced environmental footprint with little or no changes to the existing process flowsheet. This topic will share research and projects in development on use of soft sensors, advanced process control and application of AI in the oil sands.

Greenhouse Gases Topics

CO₂ Capture Technology

Oil sands producers are seeking breakthrough technologies that significantly lower the cost of post- and pre-combustion CO₂ capture. COSIA's CO₂ Capture Challenge describes the solution being sought. This topic is intended to include technology developers making significant advancements, as well as emerging technologies.

CO₂ Conversion

Oil sands operations are remote and use natural gas for steam generation as well as consume electricity from a higher GHG intensity electricity grid in Alberta. This topic is intended to explore some of the conversion technologies and initiatives underway to convert the CO₂ in the flue gas into a useable product while reducing the overall cost of capture in an oil sands context.

GHG Area Fugitives from Tailings Ponds and Mine Faces

GHG emissions from oil sands tailings ponds and mine faces are difficult to measure and mitigate due to the low volume releases over a large surface area. This topic is intended to explore technologies and approaches to reduce area fugitive emissions from tailings ponds and mine faces. In addition, this topic includes technologies described in COSIA's Area Fugitive Quantification Challenge, which seeks transformative, cost-effective, technologies to accurately quantify wide area fugitive greenhouse gas emissions.

Mining Technologies to Reduce GHGs

Mineable oil sands currently use a truck-and-shovel approach to remove near-surface bitumen. Alternatives to ore handling (and materials, such as overburden) are sought, as well as opportunities to reduce GHG emissions from the mobile fleet activities and extraction processes.

In Situ Optimization and Novel Steam Production Technologies

Between now and 2030, oil sands in situ production is expected to increase presenting a significant opportunity to improve the design of in situ facilities and lower the energy intensity (steam-oil-ratio) and carbon emissions through decreasing steam use or increasing recovery. Best practices as well as new approaches and technologies will be shared. Low cost, high efficiency novel steam generation systems are of interest as well as opportunities to increase the efficiency of a facility, such as burner technology advancements.

Low Carbon Heat and Power

The oil sands industry is interested in exploring the how emerging technologies can provide lower GHG intensity energy than what is currently used for oil sands production and upgrading activities, including, natural gas, grid electricity and/or heat and electricity produced via cogeneration. This topic includes decarbonizing fossil fuels before they are combusted and economic renewable energy options. This topic is intended to highlight technologies that apply novel approaches to providing lower carbon heat and/or power in an oil sands context.

Novel In-Situ Non-Aqueous Production

Alternative and novel methods of producing bitumen from deposits >200m below surface that reduce GHGs and water use are of interest for presentations on this topic. Currently steam is generated using natural gas after treating water with a high silica content and injected into the subsurface to mobilize dense bitumen.

Bitumen Upgrading and Novel Pipeline Technologies

Diluent, a higher value refined product, is added to bitumen to transport it over long distances. Alternatively, bitumen can be fully or partially upgraded prior to being transported and sold to refineries. Upgrading can be energy intensive, requiring hydrogen, steam, and power. Alternatives to upgrading for the purposes of improving product quality, eliminating the use of diluent, and reducing environmental impacts, while maximizing the overall resource value are of interest. Lower cost, safe, pipeline technologies that can reduce the need for diluent are also of interest.

In Situ Fundamentals

Recovery Strategies

Steam-based in-situ recovery processes are continually seeking to be more efficient. A significant amount of energy can be lost to non-oil bearing zones, including shale bodies, thief zones, and the overburden. In addition, as pads enter the "late-life" stage, productivity can be reduced and energy intensity per barrel increases. Techniques and technologies that help extend the economic life of in situ

assets and improve the recovery of the resource while reducing emissions and water intensity are of interest

Production Optimization

Optimizing in-situ steam injection and production is crucial for maximizing recovery and ensuring energy efficiency. Steam circulation and start-up play a critical role in ramp up performance and in achieving steam chamber conformance. Opportunity to optimize conformance continues through the life of the well, particularly as industry moves to more challenging reservoirs. Additionally, subcool management is central to production, efficiency, and asset integrity. Techniques and technologies that affect these elements of in-situ production optimization are of interest.

Complex Reservoirs

Oil sands reservoirs are inherently complex. Additional challenges, such as thief zones and barriers further contribute to reservoir complexity and impair energy efficiency as well as bitumen recovery. Advancements in tools that improve reservoir description, more accurately model reservoir behaviour and more accurately predict production performance are of interest and will lead to better recovery strategies for complex reservoirs and will accelerate new recovery technologies.

Mine Extraction Fundamentals

Extraction efficiency

Ore is blended to control the average parameters of the ore feed to meet the plant design, prevent process upsets, maximize extraction efficiency, and optimize mine sequencing. After primary extraction, additional facilities or equipment are used to recovery bitumen not separated in primary water based extraction process. Methods or technologies that improve ore blending and extraction while improving, or at least not reducing, reliability are of interest.

In-pit/at face mining operations

Ore is typically crushed, milled and screened to prepare it for transport and processing. In-pit and at face mining operations require moving material such as ore, waste, earth construction materials and overburden materials from one site to another. Methods that result in reduced ore size leading to more economic modes of transport and methods that minimize material movement or improve the efficiency of material movement are of interest.

Digital Mine

Mining operations rely heavily on instrumented data collection for decision making and process control. The trend towards digital learning, autonomy, and remote sensing create a number of new opportunities to improve oil sands mining operations overall. Novel, yet robust and reliable analyzers, instrumentation and measurement combined with advanced analytics, machine learning, and artificial intelligence will contribute to insights not available today. Technologies and methods that contribute to this digital transformation of mining are of interest.

Land

Biodiversity

Presentations relating to this topic will review how recent and current environmental monitoring and research initiatives help industry identify potential pathways of effects on key species and ecosystems and leads to continuous improvement of environmental management and performance. Abstracts will be evaluated on the basis of quality, innovation opportunity and alignment/contribution to themes. Specific focus areas of interest may include monitoring (including community-based), modelling, climate adaptation and traditional ecological knowledge.

Caribou

The Federal Species at Risk Act and Alberta's Wildlife Act identify Woodland Caribou as a threatened species in Alberta. A combination of habitat restoration and population management tools are being used and developed by industry, academia and government to address the decreasing number of caribou in many of the herds in Alberta. This topic will explore the context, tools and path forward for stakeholders. Abstracts will be evaluated on the basis of quality, innovation opportunity and alignment/contribution to themes. Specific focus areas of interest may include monitoring (including community-based), modelling, climate adaptation and traditional ecological knowledge.

In Situ Footprint

In situ oil sands development and operations disturb land from its natural state. Operators monitor and continuously evaluate and implement new technologies and approaches to reduce the amount of land that is disturbed for oil sands activities. Examples include setting a Performance Goal within COSIA and incenting innovation towards “zero land disturbance exploration” using a Challenge approach. Practices to reduce land use intensity for in situ projects will be highlighted. Abstracts will be evaluated on the basis of quality, innovation opportunity and alignment/contribution to themes. Specific focus areas of interest may include monitoring (including community-based), modelling, climate adaptation and traditional ecological knowledge.

Uplands, Soil and Vegetation

Oil sands producers work to ensure the land's capability after development is equivalent to pre-development. Presentations on this topic will highlight reconstruction of landforms using natural and modified materials (including tailings), re-establishment of hydrologic processes, and reclamation of the land surface with soil covers and re-vegetation strategies. Abstracts will be evaluated on the basis of quality, innovation opportunity and alignment/contribution to themes. Specific focus areas of interest may include monitoring (including community-based), modelling, climate adaptation and traditional ecological knowledge.

Wetlands

Wetlands play a critical role in the establishment of a functional reconstructed landscape by providing ecosystem functions (e.g., hydrologic) and supporting biodiversity. This topic recognizes the biological, physical and chemical aspects of the reconstructed landscape and the role of water within the landscape to influence the surface of the land. It may also delve into the subjects of understanding reference boreal systems, developing watershed monitoring and modelling tools and approaches, and supporting

the establishment of functioning upland, wetland and lake systems. Abstracts will be evaluated on the basis of quality, innovation opportunity and alignment/contribution to themes. Specific focus areas of interest may include monitoring (including community-based), modelling, climate adaptation and traditional ecological knowledge.

Tailings

Tailings Technology Fundamentals

The fundamental science that underpins tailings treatment and deposit performance is extremely complex, and not fully understood in spite of all the work in this area over the past 40 years. Understanding tailings fundamentals is often essential to improving the performance of commercial tailings treatment processes and deposition methods. This topic will address key elements relating to tailings technology fundamentals.

Treatment of Fluid Tailings in Pit Lakes

This topic will address how the treatment of fluid tailings before or after placement in pit lakes can increase the storage capacity of pit lakes and facilitate reclamation into a pit lake capable of supporting an aquatic ecosystem.

Novel Tailings Treatments

This topic is intended to highlight novel tailings treatment technologies that have the potential to produce a better environmental net effect and are more robust than existing processes. The topic will include technologies undergoing testing by oil sands mining operators.

Harvesting Fluid Fine Tailings

FFT stored in settling basins are "harvested" by dredge or submersible pump prior to treatment. This topic is particularly interested in two primary areas of attention: a more effective debris management approach that would reduce outages attributed to debris blockages, and a reduction in the dilution of FFT due to "coning" of FFT near suction intake.

Capping of Tailings Deposits

All tailings deposits intended for terrestrial reclamation will need to be capped prior to placing reclamation materials. Challenges include selection of capping materials, cap design, placement of capping materials and drainage through the cap. This topic will cover assessment of the optimal methods for capping different tailings deposit types.

Froth Treatment Tailings Aspects

Froth treatment tailings present several challenges to tailings operations, including enrichment in naturally-occurring radioactive materials (NORMs), Acid Rock Drainage (ARD) potential, emission of odours, and anaerobic biological degradation in sub-aqueous deposits leading to methane formation. This topic seeks to facilitate a better understanding of the behaviour of froth treatment tailings in settling basins and deposits, and better adaptive management methods.

Consolidation Enhancement and Adaptive Management

Accelerating the speed at which initial settling and subsequent consolidation of tailings deposits progresses can speed the reclamation process. This topic is intended to highlight more cost effective and robust ideas as well as operating practices that will enhance and accelerate the consolidation and stabilization of large-scale tailings deposits.

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