Yukon passive water treatment workshop

2016 Summary Report

YUKON RESEARCH CENTRE
Yukon College

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Last but not least, we wish to recognize the participants for your support and participation in this workshop. It was a wonderful opportunity to share knowledge and ideas and foster discussions between industry, regulators, and researchers.

EXECUTIVE SUMMARY

As passive water treatment technologies are increasingly being considered as a part of mine site closure in Yukon, it is important for industry to share with the government the questions they have, and vice versa. Efforts are currently underway by industry in partnership with the Industrial Research Chair in Mine Life Cycle at Yukon College to test passive water treatment technologies. The overall objective of this workshop was to understand how research on passive water treatment systems can be used to help industry achieve expectations set by First Nations and regulatory bodies.

Additional objectives of this workshop were to:

- Provide knowledge training to participants on passive water treatment systems
- Identify gaps that remain for the promoting and understanding of passive water treatment technologies in Yukon
- Engage with First Nations, branches of government, academia, and industry to share research on passive water treatment systems and how they have been used in Yukon and other northern climates

To achieve these objectives, the Passive Water Treatment Workshop provided the platform for open communication between academia, industry, government and First Nations regarding passive water treatment research, allowing connections to be strengthened and the potential for collaboration to be increased. In addition, two experts in passive water treatment systems provided a half day training session to workshop participants to help provide workshop participants with some key language and terminology that would assist them in navigating information surrounding treatment systems that may be at a technical level above their knowledge presented throughout the workshop. The following day in the workshop was an opportunity for industry, academia, First Nations, and government to come together and discuss projects using passive water treatment systems at Yukon mine sites.

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WORKSHOP PURPOSE

This workshop brought industry, regulators, First Nations, and researchers together to foster discussions or answer any questions they may have relative to furthering the development of passive water treatment in the Yukon. The workshop was a perfect opportunity to share experiences, both positive and negative, and for mine reclamation practitioners and land/water managers to learn about passive water treatment with a focus on biological treatment. With experts in passive water treatment systems in attendance throughout the workshop, questions concerning the treatment itself, as well as future implementation plans in Yukon were able to be answered. The workshop also provided the chance for the participants to partake in training exercises as a group. This is beneficial as the participants are able to gain knowledge that can be used in each of their various backgrounds. This workshop is a follow-up to the last Passive Water Treatment Workshop held in 2014 at Yukon College in Whitehorse, Yukon.

OVERVIEW OF WORKSHOP

The Passive Water Treatment Workshop provided the platform for face to face conversations and networking which will help with furthering relationships between the parties in attendance. Responses from participants described the workshop as a good opportunity to have meaningful discussions surrounding passive treatment systems and offered a safe space to speak candidly with all participants. This was a major priority for this workshop and goal of the organizers because it's a rare opportunity for academics, industry representatives, government respresentatives, regulators, and First Nations to be in the same room with open communication.

The half day training session was very informative and helped participants who may not have a strong science or technical background understand the fundamentals of passive water treatment. By beginning the workshop this way, it allowed for a basic foundation of bioremediation science to be shared with all participants as the different groups covered a wide array of passive water treatment knowledge levels. The goal of the training session was to demystify passive water treatment systems and provide workshop participants with some key language and terminology that would assist them in navigating information that may be at a technical level above their knowledge presented throughout the workshop. It was very helpful for participants as some presentations during the workshop the next day required a firm understanding of chemistry.

The full day workshop began with a presentation from the Na-Cho Nyak Dun First Nation (NNDFN) on the history of mining and the land, resources and cultural impacts of the mining industry on the NNDFN. It was a welcome addition to begin the day with a presentation from a First Nation perspective. It helped attendees from outside the territory understand the realities of mining here in Yukon by providing a Yukon context, such as illustrating the importance of working relationships between resource companies and First Nations. Following the presentation, a discussion occured on the history of mining and the First Nations relationship with the mining company in that region.

While the training session was very informative, it is important to continue to improve delivery methods of technical knowledge to participants that may not have a technical background. This could be resolved by providing the training instructors with more allotted time to present their information. With a full day dedicated to training, the instructors would be able to use more detailed case studies that could provide more historical context and visual aids with explanations of what worked and did not work and how it was adapted.

Industry representatives presented on projects where they are utilitizing research on passive water treatment (PWT) systems and provided a Yukon context by focusing on their experiences with protocols and regulations surrounding integrating PWT systems at mine sites in the territory. Industry representatives explained the ongoing collaborations with Yukon College's Industrial Research Chair in Mining Life Cycle and the applied research regarding PWT systems being completed in partnership with the industry partners. A question period followed where there was an open discussion with all parties on how research in PWT will be used to help the industry achieve the expectations set by First Nations and government regulations. There were discussions involving the expectations of industry by reglatory bodies and vise versa; expectations the industry has for the government.

The staff and facilities where the workshop was held were very professional, quickly resolving the double occupancy issue where the workshop was orginially booked with emails promptedly sent out to particpants.

After receiving feedback from the participants of the 2016 Passive Water Treatment (PWT) Workshop, the workshop has been deemed a success. By receiving feedback from the participates, organizers were

able to determine which areas of the workshop worked well for the audience and what lessons could be used to improve the format for the next workshop intended for 2018. The overall satisfaction with the workshop was very positive and met the expectations of both the participants and the organizers as it helped strengthen the connection with industry and increased the potential for collaboration and/or research partners.

PASSIVE WATER TREATMENT NEXT STEPS FROM 2014 WORKSHOP:

First Nations:

- Add to knowledge-sharing database
- Share traditional knowledge that will help design appropriate remediation technologies

Academia:

- Develop training courses at Yukon college for treatment technology monitoring and development
- Develop research projects that will help test new technologies
- Collaborate with industry and governments to ensure that research projects have applicable goals and objectives
- Help industry and government secure research funding

Government:

- Do more to endorse good mining practices
- Set up a database for knowledge sharing
- Clearly specify amount of information needed for technology to be proven

Industry:

- Restructure mine site protocol to allow better access by 3rd part individuals and pilot projects
- Adapt protocol that will encourage knowledge sharing
- Help academia secure research funding

Identify:

1. Where have we made progress?
2. Are the '2014 next steps' still relevant?
3. Where do we need to make progress?
4. Where can we make progress?
5. What are the barriers to progress?

BREAKOUT GROUP DICUSSION 2016: KEY MESSAGES

First Nations:

Where have we made progress?

- NSERC Industrial Research Chair
- Bridge between Industry and FN
- FN collaboration with science in the classroom

Are the '2014 next steps' still relevant?

- Yes
- Have a yearly workshop
- Continue helping academia to secure funding
- Seems that we have a better access by 3rd party individual to do pilot tests at Mine sites

Where do we need to make progress?

- How people access knowledge- need a database for knowledge sharing
- Sharing of knowledge between organizations
- Talks on climate change: permafrost & long term planning

Where can we make progress?

- Build community based monitoring program
- Including elder/traditional knowledge with planning
- Increase field monitoring /wildlife monitoring
- Drafting project proposals to funders
- Build relationships with college to secure funding
- Continue to develop research projects to help test new technologies

What are the barriers to progress?

- Land use plan
- Closure plan: need to be detailed enough before operation starts

Academia:

Where have we made progress?

- We are doing projects with applications
- Created successful partnerships with FN & industry
- Collaboration with industry (environmental monitoring program)

Are the '2014 next steps' still relevant?

- Yes, except we shouldn't be helping industry and government secure funding

Where do we need to make progress?

- Did build beneficial partnerships with industry & FN's but we could build further on those partnerships to include other stakeholders, such as government
- More access to funding
- Incentives for industry to use these technologies (CSR or cost savings)

Where can we make progress?

- Face to face meetings to better network
- Better relationships with government branches
- Get more advice from FN's on how to have better conversations and knowledge sharing

What are the barriers to progress?

- Funding for remote sensing technologies

Government:

Where have we made progress?

- Evolving- somewhat being covered with MLII program

Are the '2014 next steps' still relevant?

- Yes- continue to clarify expectations
- Better served by academia

Where do we need to make progress?

- Plan for closure; walk away is not always achievable
- Continue to define what the expectations are what's required when and to what body

What are the barriers to progress?

- Many intergovernmental agencies with overlapping process; multiple agencies involved with conflicting timelines
- Yukon successes but still no long term PWT technology in Yukon at this time

Industry:

Where have we made progress?

- Communication has improved with public and FN's
- Science has been advanced

Are the '2014 next steps' still relevant?

- Yes, all advancing

Where do we need to make progress?

- Design objectives of PWT systems (active design criteria)
- Regulators questions and responses
- Post closure ownership (discussion will move to relinquishment)

Where can we make progress?

- Expectations for developing technology
- Victoria Gold – approved for polishing pond

What are the barriers to progress?

- Expectations/communication
- Design (not research)

PASSIVE WATER TREATMENT NEXT STEPS FROM 2016 WORKSHOP:

First Nations:

- Continue to develop research projects
- Develop community based monitoring program
- Create knowledge sharing program

Academia:

- Build stronger relationships with government branches
- Create more opportunities for face to face networking
- Continue to work with YFN's to knowledge share

Government:

- Define expectations required: when and to what body
- Increase intergovernmental communication and streamline processes, implement MLII program

Industry:

- Develop better communication with regulators and determine expectations
- Manage expectations for developing technologies
- Advance design objectives of passive water treatment systems

PARTICPANT FEEDBACK

- Add a Workshop welcome reception
- Focus less on regulatory aspects and more case studies demonstrating what worked and what did not
- Add more case studies to provide Yukon historical context
- Conduct risk assessment of passive treatment versus active treatment systems
- Provide the option of a field trip: to a mine site if possible
- Provide the option of a visit to the Yukon Research Centre laboratory
- Use more laboratory and field pictures: it will help people see how the different activities relate
- Provide predictions of what passive water treatment systems will look like in the future
- Provide financial models/CBA
- Expand the ½ training course into a full 1 day course in order to provide a better understanding of passive and semi-passive treatment systems
- Reduce the amount of chemistry in the course and use plain language when explaining the systems

ORGANIZATIONAL TEAM FEEDBACK

Short Course on Passive Water Treatment (Training Session):

- Use more plain language and speak to the whole audience as not all participants have the same level of technical knowledge. Explain where the water gets collected; why do we need to treat it; what does a biological treatment plant look like
- Use more photos of site/ field pictures to provide a better of understanding of what a passive water treatment system will look like in the field now and in the future
- Lengthen the training session to allow for the instructors to go into more case studies
    - ½ hours preamble – introduce language and terminology
    - 1 day course (6-7 hours of course; instructors use drawing and schematics with visual examples to help explain)
    - Make the 1 day training course independent of the workshop with the option to do one day; can do the training session and not the full workshop, or the other way round.

Workshop:

- Good dialogue between participants; felt very open for participants to talk honestly
- Useful to make presentations relate more to Yukon case studies
- Would be nice to secure more Yukon companies that would present on their experiences
- Field trip/lab tour
    - If the wetlands are up and running at Yukon College before the workshop in 2018, then that option should be explored.
    - For participants who haven't had the experience of going to a mine site, that could be another option in addition to the training and workshop.
- Schedule: good amount of presentations but should allow presenters more time
- First Nation presentation: Interesting component, set the stage for a good discussion about a region with history of mining- good to highlight relationship between NND and Alexco
    - Helped with context for understanding the realities here in Yukon
    - Next workshop: could look at examples from another First Nation (e.g. TH and Kaminak)

Considerations for Passive Water Treatment Workshop 2018:

- In 2 years: review how MLII received/used feedbacks from industry
- Provide a recap for the last two workshops because participants will have moved and changed jobs.
    - Create a one-page review explaining key topics/discussions from 2014 and 2016 workshops so new participants don't feel overwhelmed and are given the opportunity to review what was gone over/discussed

APPENDIX 1: PARTICIPANT LIST

Name	Organization
Academic	
Sue Baldwin	University of British Colombia
Amelie Janin	Yukon College
Guillaume Nielsen	Yukon College- Institut National de la Recherche Scientifique
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Nina Piggott	Yukon College
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Cord Hamilton	Northland Earth & Water Consulting Inc.
Jim Cassie	BGC Engineering
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APPENDIX 2: WORKSHOP PROGRAM