



Mount Polley Mining Corporation

an Imperial Metals company

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Community Update

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Mount Polley Mine: Care and Maintenance

- ◆ No changes to the environmental monitoring programs
- ◆ No closure research projects will be delayed
- ◆ Remediation of Hazeltine Creek will continue
- ◆ Workforce will be reduced to approximately ten people plus the environmental department

Winter Monitoring and Sampling



Field crew sampling through the ice on Quesnel Lake, February 2019

At Mount Polley, environmental monitoring and sampling does not stop once the snow falls and temperatures dip below zero. Every winter, the Environmental Department staff bundles up, straps on their snowshoes, and samples regular sites. It can be challenging as some water quality monitoring sites may be frozen; however, the field crews axe or auger through the ice and slush to check if sampling can occur.

Lake monitoring is different as there are many more factors that need to be taken into account. Safety of the field crews is priority. Sampling through the ice can also be very dangerous and there are specific safety protocols that must be followed, such as checking the thickness and integrity of the ice.

When a field crew samples on a frozen lake, mine rescue is notified and the team is put on standby in case a rescue is needed.

MPMC EVENTS

Quarter 1 2019

January 17:

Implementation Committee (IC) meeting with Williams Lake & Soda Creek Indian Bands

February 25:

Public Liaison Committee meeting (PLC) conference call

March 29:

Annual Report submitted to Ministry of Environment and Climate Change (ENV) and Ministry of Energy, Mines, and Petroleum Resources

March 29:

Remediation Plan submitted to ENV

Quarter 2 2019

May 29:

PLC conference call

May 31:

Mount Polley transitions into Care and Maintenance period



Snowpack station at Weather Station 1, on the north side of the mine, February 2019

Mount Polley maintains two climate stations on-site to monitor temperature, evaporation, precipitation, humidity, and wind speed. These weather stations automatically record data (except evaporation) every ten minutes.

In winter, the amount of snow has to be manually measured by using the federal standardized snowpack method in order to quantify the snow water equivalent (basically, how much water is present in the snow). This calculation helps Mount Polley anticipate its water management needs, especially during freshet.

Snowpack is measured by coring the snow and weighing it. This is done ten times at four different stations on site to average how much snow has

Hazeltine Remediation Planting Project Update

Mount Polley has been dedicated over the last five years to remediating Hazeltine Creek. In addition to rebuilding fish habitat, another very important part is creating land habitat and stability on the banks and upland areas near the creek. This is achieved by planting native trees, shrubs, and grasses.

What has been planted so far and how many?

- ◆ Shrubs (eg. Prickly rose): 355,112
- ◆ Conifers (eg. Douglas fir): 192,480
- ◆ Willow wattles: 10,500 to 21,000

Where have these plants been planted?

- ◆ Upper Hazeltine Creek from the Polley Lake weir to one kilometer downstream of the Gavin Lake road bridge
- ◆ Lower Hazeltine from the Ditch road bridge to Quesnel Lake
- ◆ Quesnel Lake shoreline

What is in the grass seed mix used and how much has been seeded?

- ◆ Mount Polley uses a proprietary native grass seed blend of:
 - 25 % Mountain Brome
 - 10 % Native Red Fescue
 - 14.31 % Rocky Mountain Fescue
 - 25 % Bluebunch Wheatgrass
 - 25 % Blue Wildrye
 - 0.014 % Fireweed
 - 0.68 % Big Leaf Lupine
- ◆ Total area seeded with native grass seed blend: 136 hectares



Examples of native species that have been planted in reclaimed areas on the Mine site. Clockwise from top left: willow wattles, black twinberry, prickly rose and red osier dogwood.

Please visit the Imperial Metals website for more information about MPMC's reports and ongoing projects:

<https://www.imperialmetals.com/our-operations/mount-polley-mine/mount-polley-updates>



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Community Update

Public Liaison Committee Tour and Meeting Report

The Public Liaison Committee (PLC) is comprised of representatives from local communities, public, government agencies, First Nations, and Mount Polley Mining Corporation (MPMC). The intended goal for this committee is for MPMC to provide members of the PLC with information about the mine's current operations and future plans. The PLC is required to meet on a quarterly basis, with the most recent meeting occurring on May 29, 2019 which also included a site tour.

Site Tour Summary

Eight people participated on the tour including one representative from the Ministry of Environment and Climate Change (ENV) and the Ministry of Energy, Mines and Petroleum Resources (EMPR) respectively, two Likely residents, three MPMC staff and the Chief Operating Officer (COO) from Imperial Metals. The tour included four stops:

- 1) Top of Reach 2 of Hazeltine Creek to view the creek remediation and new fish habitat.
- 2) Water Treatment Plant (WTP) influent pond.
- 3) WTP in operation. Samples of influent and effluent were collected in glass jars so that tour participants could see the clarity of the water.
- 4) Springer Pit dredging operation.



Tour group with additional MPMC environmental field staff explaining the different components of the WTP on top of the cells at the plant.

There was not enough time to visit the 5th stop, the Constructed Wetlands Treatment System (CWTS) pilot project, part of the mine's passive water treatment on-site research. This was postponed for another tour in Q3 or Q4.

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MPMC EVENTS

Quarter 2 2019

April 25:

Implementation Committee (IC) "extraordinary meeting" for permit amendment consultation

April 29:

PLC "extraordinary meeting" for permit amendment consultation

May 29:

Q2 PLC meeting including site tour & conference call

May 31:

Mount Polley into Care and Maintenance period

Quarter 3 2019

June 4:

Vernon High School and Quesnel Rivers Research Center tour

June 6:

Habitat Remediation Working Group meeting and tour

August 21:

Q3 PLC meeting

TBD:

Williams Lake and Soda Creek Indian Bands elders' tour

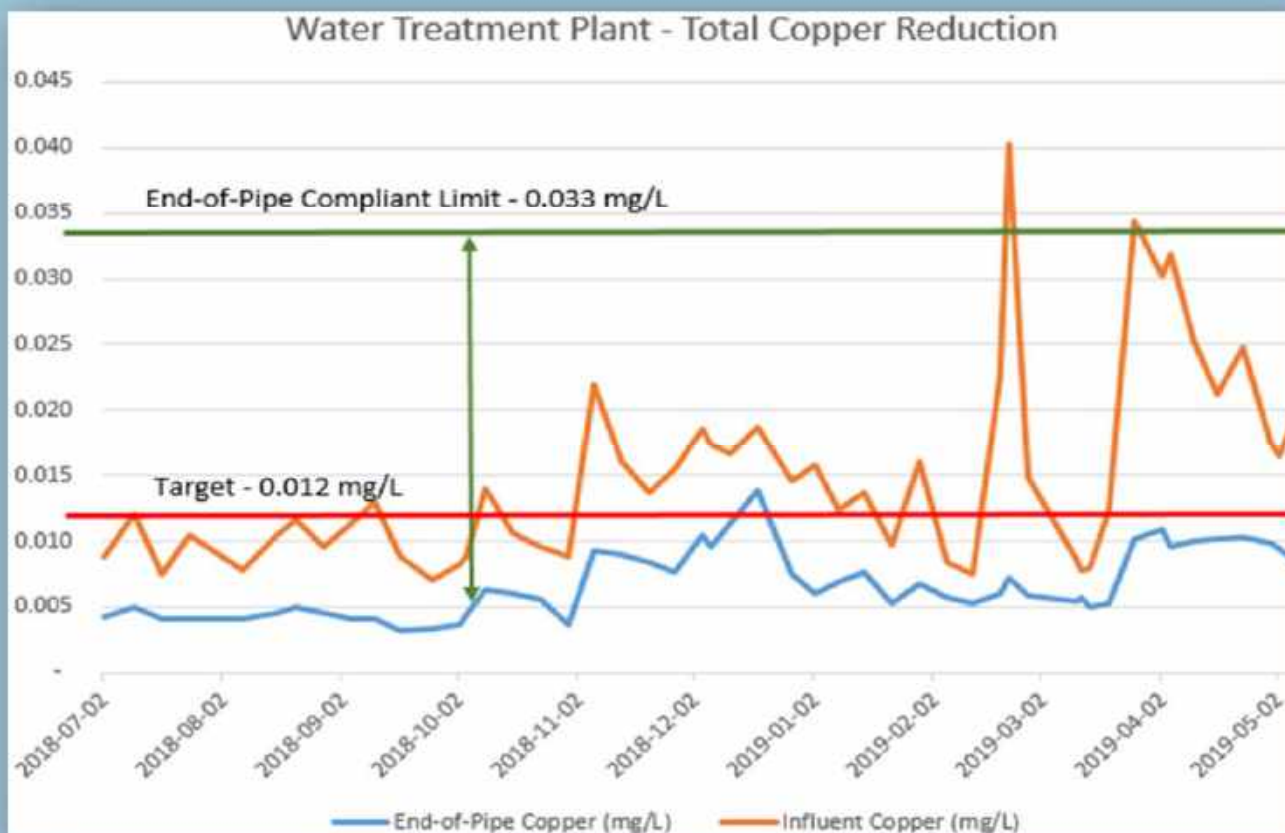
Water Treatment Update and Response to Williams Lake Tribune Letter to Editor

The COO provided a review of a Letter to the Editor sent to the Williams Lake Tribune by Doug Watt and corrected some inaccuracies associated with the letter.



Edney Creek Delta, August 2017

- 1) The photo used to illustrate the letter was of Hazeltine Creek delta immediately after the breach in August 2014. Don provided a more recent photo showing the cleaned up and replanted delta.
- 2) The letter refers to the mine discharging “untreated” effluent. This is incorrect. The mine has been operating the WTP for about 3.5 years. The WTP is a Veolia ACTIFLO™ system, which **actively** treats the water with



Copper concentrations at the influent and end-of-pipe (HAD-3), July 2018-May 2019

coagulant, flocculant, and microsand. The operating permit requires assessment and optimization of the treatment plant. A new system for enhanced copper treatment was tested during freshet in 2019, however, copper levels were so low that the additional treatment was not required. The system was installed in case the treatment is ever required. The mine's discharge permit limit is 0.033 mg/L, however, ENV requested that the mine attempt to meet a more ambitious target of 0.012 mg/L. The graph above shows that since July 2018, the treated discharge has only once been above this target, and this was still well below the mine's permit level of 0.033 mg/L.

- 3) The letter suggested that the mine had said in the 1990s that they would never need to discharge water. The original Socioeconomic Impact Assessment for the mine from January 1991 (on EMPR's website) noted that "When surface runoff is greater than can be diverted to the tailings area, it will be discharged via sediment ponds from the site."

Remediation and Monitoring

There are no changes planned to the mine's environmental monitoring program while the mine is on care and maintenance.



Spawning fish in remediated area of upper Hazeltine Creek (Reach 1), May 2019

Environmental monitoring update

- Bootjack, Polley, and Quesnel Lake sampling
 - ◊ 5 week intensive sampling at the initial dilution zone was completed in Quesnel Lake during spring turnover
- Weekly sampling at the end-of-pipe (HAD-3); no exceedances since May 2018.
- Other required monitoring completed: Hazeltine Creek, site water, and groundwater
- Biological monitoring completed by Minnow Environmental:
 - ◊ Spawning surveys and fish tissue - Hazeltine Creek & Bootjack Lake
 - ◊ Fish tissue, community, and population - Quesnel Lake

- ◇ Diffusive gradients in thin films (DGT) - Quesnel, Polley, and Bootjack Lakes
 - ◇ In Quesnel Lake, the DGT concentrations of copper are very stable, and very low. This is a very strong indication that the materials on the bottom of Quesnel Lake are not releasing metals.
 - ◇ Copper concentrations in Quesnel Lake are also well below levels that would have an effect on sensitive aquatic life.
- Terrestrial Ecosystem Monitoring by Environmental Dynamics Inc. (EDI)
 - ◇ Using a biogeoclimatic system to measure progress of indicator species in disturbed areas.

Remediation update

- Fish habitat construction for Reach 3 of Hazeltine Creek commenced at the beginning of June 2019.
- Tree, shrub, and willow planting started in May 2019 along floodplains of the Hazeltine Creek corridor.

ASK YOUR RESPECTIVE PLC MEMBER FOR MORE DETAILS ABOUT THE MINNOW, EDI, AND MOUNT POLLEY UPDATES FROM THE PLC MEETING ON MAY 29, 2019!

Future of Water Management

Based on three and a half years of research and monitoring data on the operation of the WTP and the discharge into Quesnel Lake, this approach to water treatment and management has been determined to be protective of aquatic life. The original Technical Assessment Report that was completed in support of the water discharge permit recommended this option as the Best Achievable Technology for the site. While the mine plans to continue passive treatment and distributed discharge studies, these technologies may not be able to manage all the water on site, and the best option at closure is probably going to be management and treatment of site water in pit lakes. Therefore, the mine is considering approaching ENV to extend the permit allowing the discharge into Quesnel Lake to continue beyond the Dec 31, 2022 deadline in the present permit. The option of discharge into Quesnel River was discussed with the PLC. In the options analysis, discharge into the river was deemed not protective of aquatic life as the provincial government fish biologists had identified the river as spawning habitat. Also, the engineers considered the river too shallow for the diffusers. The mine noted that community consultations and public meetings will be held when Mount Polley submits its amendment requests.

Care and Maintenance Update

- The mine is in care and maintenance as of May 31, 2019.
- Active mining ceased Dec 2018 and milling of stockpiled ore ceased on May 27, 2019.
- Dredging of the tailings remaining in Springer Pit restarted in June 2019.
- The WTP operated until June 18, 2019, with copper well below permit guidelines since July 2018.
- The care and maintenance crew consists of 11 people, plus the environmental team.
- Environmental monitoring and remediation activity is ongoing.



Black bear sighted on site, April 2019

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Sockeye Salmon Observed in Edney Creek!

Approximately 30 Sockeye salmon were observed in the reconstructed portion of Edney Creek on September 17th. The salmon were observed migrating through and spawning within the rehabilitated areas. Ongoing fish inventory surveys are conducted throughout ice free months in Edney Creek. Minnow trapping is conducted to determine the species present and their distribution. In 2019 the trapping program identified that Rainbow Trout, Coho Salmon, Long Nose Dace and Burbot are using the system. Currently fall spawning surveys are being conducted twice monthly. The salmon observed on Sept. 17 represent the most salmon observed in Edney Creek in quite awhile.

Exciting news.

Pollution Abatement Order

On September 12th, BC-ENV rescinded the Pollution Abatement Order 107416 issued on August 5, 2014 under the Environmental Management Act [SBC 2003] Chapter 53 pertaining to abatement of pollution causing substances into the environment. A BC-ENV inspection on July 29th confirmed that all outstanding requirements under the order had been complied with. MPMC would like to thank those who helped us reach this important milestone in remediation and water management.



Edney Creek looking towards Quesnel Lake

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MPMC EVENTS

Quarter 3 2019

September 5:

Global Tailings Review
Committee Tour

September 27:

School District 27 Teachers
Professional Development
Day Tour

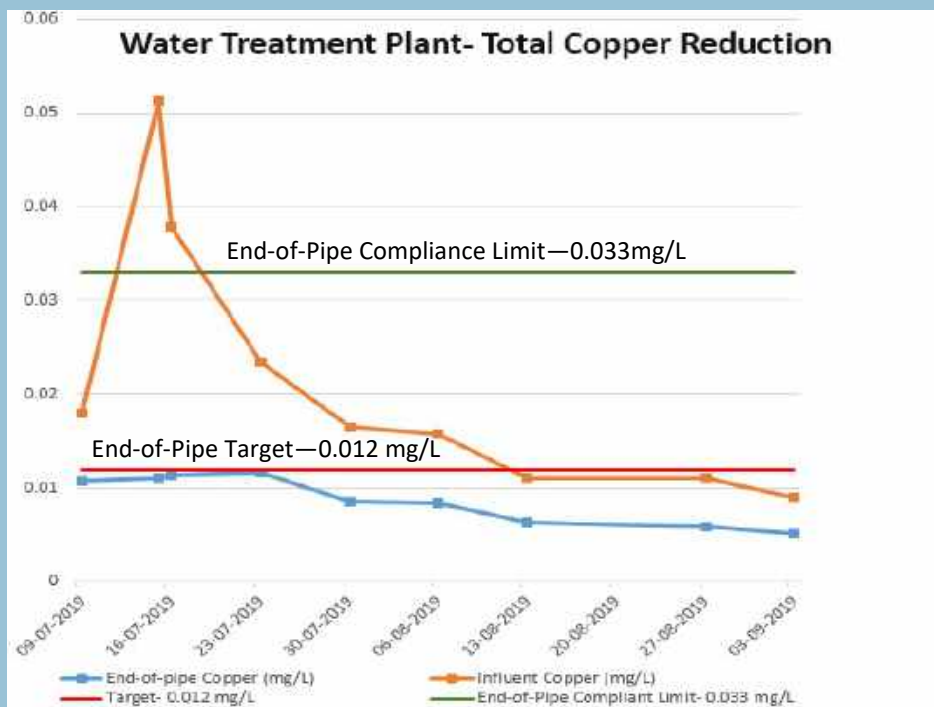
Quarter 4 2019

November 27:

BC Environment & Climate
Change Strategy
Open House Likely 4:30—7:30

Environmental Work Continues throughout Care and Maintenance

All environmental monitoring and investigatory work continues at Mount Polley Mine throughout the current care and maintenance period. There are 14 staff members still working at the site, and numerous contractors are addressing project work as well. There are 4 Environmental staff on site, and in addition to the staff, MPMC has hired DWB Consulting Services Ltd. to provide quality control and assurance and assist in addressing any compliance oversight. All environmental monitoring is continuing under the Comprehensive Environmental Monitoring Plan (CEMP) and the relevant mining and environmental permits. Monitoring activities include surface and ground water sampling, water treatment plant sampling, plankton sampling, lake sediment and benthos sampling, fish population monitoring, Hazeltine Creek monitoring and fish reintroduction, hydrological monitoring, construction monitoring, fish surveys, and various other inspections.



Dredging Suspended in the Springer Pit

Dredging of tailing materials in the Springer Pit finished at the end of October. MDG Contracting Services is demobilizing their 2 dredges. Dredged tailings were delivered via pipeline to the tailings storage facility (TSF).



The cutting head for the dredge is used to cut and agitate the materials before being sucked into the dredge and pumped to the TSF.

Hazeltine Creek Remediation Continues

Remediation efforts continue in the areas affected by the tailings dam breach. In 2019, ~119,000 seedlings were planted in the riparian and upland areas adjacent to Hazeltine Creek. The creek construction continued in Reach 3 with channel realignment, habitat features and lower floodplain/riparian habitat. By the end of the 2019 construction in Reach 3 will be completed. Seed collection and ground cover seeding is planned for this fall and early 2020 in areas disturbed by the construction in 2019. Final design work is being completed by Golder Associates and Envirowest for the remaining channel work to be completed in lower Hazeltine and Edney Creeks. The final design will include decommissioning of the sedimentation ponds and conjoining the two creeks close to where they historically met. Remediation work is expected to continue in 2020 with work planned for completion in the Lower Hazeltine Creek area.



Construction in Hazeltine Creek continues. In order to dewater the worksite a bypass is used to divert the flow of water around the worksite, shown here.



Constructed Wetland Treatment System

An on-site pilot scale constructed wetland treatment system was installed in late 2018 at the mine to explore options for treatment of water by passive means during mine operations and closure. The wetland has been developing its vegetative and microbial communities and progressing towards commissioning. The plant community is very select and undesirable plant growth is removed. The wetlands at Mount Polley contain primarily cattails and aquatic mosses. The first sets of water chemistry samples were taken in Q3 of 2019, the results are pending. There are some parameters that have not yet been met in order to declare the wetland operational, mainly dissolved oxygen in the water column. As this is a newly constructed wetland, the conditions within the wetland sediments are not yet anoxic enough due to a lack of decomposing materials.



The Constructed Wetland Treatment System at Mount Polley Mine is composed of 3 Series, each with 2 cells of differing characteristics all being fed by the same source water. This photo shows the forebay of Cell 2A full of straw, used to accelerate the reducing process..



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Community Update



MPMC Power and Communication Issues

Dec 23—Dec 31: No phones, internet including emails or network access. The mine site experienced intermittent power outages due to weather and continues to experience communication delays.

7 MONTHS INTO CARE AND MAINTENANCE (C&M)

The C&M activities include daily inspections/maintenance of water management infrastructure, monitoring of the Water Treatment Plant (WTP), snow removal and more snow removal and environmental monitoring including water sampling, snow-pack measurements, reporting and planning for upcoming months as well as data base management and data entry.

MPMC EVENTS

Quarter 4 2019

October 2:

Public Liaison Committee (PLC) Meeting at MPMC

November 20:

Implementation Committee Meeting

December 4:

Public Liaison Committee (PLC) Meeting in Williams Lake, BC

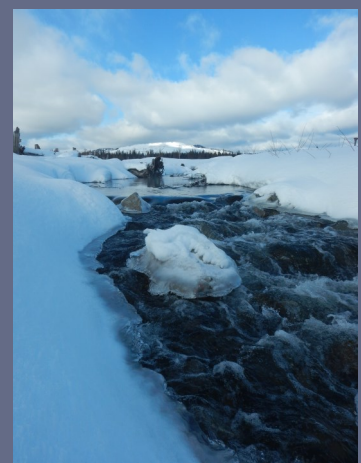
December 5:

Implementation Committee Meeting ~*Cancelled due to weather* ~

Quarter 1 2020

February 5:

Public Liaison Committee Meeting in Williams Lake, BC



Hazeltine Creek looking towards SERD Dump

Water Treatment Plant Update

The discharge at the Water Treatment Plant (WTP) in Quarter 4 was mainly continuous with intermittent operation at the end of December (30th & 31st). The environmental department performed weekly sampling at the effluent site, HAD-3.

The WTP measures turbidity in Nephelometric Units (NTU) in the discharge in real time. The NTU instrument is calibrated to report in Total Suspended Solids (TSS) for continuous monitoring. The average turbidity measurement for Quarter 4 was 2.23 NTU with a total of 1,215,978 m³ of water discharged in Quarter 4. With the TSS average for each month: October 8.81; November 9.79, and December 7.20.



Water Treatment Plant

2019 Environmental Update



Outlet of Hazeltine Creek at Quesnel Lake

Throughout 2019, the environmental department collected 1,115 water and soil samples. 336 surface water, 234 lake samples, 104 contact water, 77 groundwater, 181 seep, and 153 soil/other samples. The construction on Reach 3 of Hazeltine Creek concluded at the beginning of October and will re-commence at Lower Hazeltine in the Spring of 2020. Due to the winter months, the wetland project is on hold until early spring. The flow of Hazeltine Creek was monitored monthly. There are 3 on-site environmental technicians to do the water sampling, environmental monitoring, inspections including reporting, database, spreadsheet data entry, communication, and coordinating meetings/tours. Even though

environmental monitoring slows down in the winter months, the environmental staff remain busy in the office with reporting, data entry, database management, scheduling, meetings, shoveling snow and general cleaning duties.

Visit the [Mount Polley Remediation Facebook](#) page; [Mount Polley Remediation](#) webpages on Imperial's website (<https://www.imperialmetals.com/our-operations/mount-polley-mine/breach-overview>) for the latest information of the MPMC remediation activities.