



Mount Polley Mining Corporation

an Imperial Metals company
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Community Update

Introduction

Welcome to Mount Polley Mining Corporation’s (MPMC) December 2017 Community Update newsletter providing the local communities with information about what is happening at the mine.

If you have any ideas for information that you would like to have included in the upcoming Community Updates, please do not hesitate to send an email to Colleen Hughes at chughes@mountpolley.com.



Wildlife at Mount Polley: Northern Pygmy Owl



Northern Pygmy Owl observed on the Quesnel Lake shoreline, December 2017

The Northern Pygmy Owl (*Glaucidium gnoma*), pictured left, is native to North America. There are four recognized subspecies:

- ◆ G.g. swartha
- ◆ G.g. grenelli
- ◆ G.g. californicum
- ◆ G.g. pincola

G.g. californicum is the most widespread sub-species, ranging from the northern interior of British Columbia into Alberta and reaching south to Nevada and California.

These owls reach a length of approximately 7—7.5 inches and weigh 2.2 – 2.6 ounces. They lack ear tufts and have distinctive white spots on its brown head. These owls have two black patches on its nape which resemble a pair of eyes. They hunt by day and are most active at dawn and dusk. The subspecies, G.g. swarthy, is listed as species of special concern in BC.

References: <http://www.owling.com/northern-pygmy-owl-biology/>
Fenger et al. *Wildlife & Trees in British Columbia*. Lone Pine, 2006.



Bull moose near Hazeltine Creek, November 2017

Inside this issue

Introduction	1
Wildlife at Mount Polley: Northern Pygmy Owl	1
Safety at Mount Polley: Safety Achievement Program	2
Mine Rescue	2
2017 MPMC past events	2
Reclamation Update: Hazeltine Creek Rehabilitation	3
Polley Flats	3
Planting	3
Personnel Profile—Stephen Monninger	4

Fall 2017 MPMC Events:

September 7:

Site Tour — Mount Polley

September 29:

Communication Plan
consultation—Likely, BC

October 5:

Public Liaison Committee
meeting, and update —
Mount Polley

November 16:

Public Liaison Committee
meeting, and update —
Mount Polley

November 16:

Public meeting to review
the Conceptual
Remediation Plan—
Williams Lake, BC

November 17:

Public meeting to review
the Human Health and
Ecological Risk
Assessments—Likely, BC

2018 MPMC Events:

MPMC events will continue
in 2018. Stay tuned!

Safety at Mount Polley

Safety Achievement Program

The Safety Department has implemented a Safety Achievement Program (SAP) for all on-site employees at MPMC. The SAP is based on a system that recognizes team and individual safety performance. When a level of safety performance is achieved, employees receive a gift card as a safety achievement award. Between August and October 2017, MPMC was pleased to have given out over 1000 gift cards.

In addition, there are draws for bigger prizes including quads, boats, trips and events. These draws are quarterly for the hourly employees, and bi-annually for staff. The next draw prize will be held in January 2018 for both staff and hourly employees.



A Mine Rescue team member rescuing the training mannequin from a “working at height” scenario.

Mine Rescue

Twice a year, MPMC provides certification training for employees interested in Mine Rescue response. 2017 saw 17 new members to our Mine Rescue response team bringing our total to over 70. Mine Rescue personnel practice on a regular basis to prepare for response to aid fellow co-workers in times of need. These ladies and gentlemen train hard to ensure the safety of their fellow workers and are well prepared to rescue those in need.

MPMC sends a Mine Rescue team to the annual Mine Rescue competition. Last year, they placed first in the Mine Rescue First Aid and third overall for their zone.



Crews planting native shrubs along Reach 2 of upper Hazeltine Creek, October 2017

Reclamation Update

Hazeltine Creek Rehabilitation

This year's Hazeltine Creek channel re-orientation and habitat installation with guidance from Steve Hocquard, Golder Associates and Envirowest is complete. The 2017 work extended from Reach 1 (completed in 2016) to immediately upstream of the Gavin Lake Road bridge (Reach 2) for a distance of approximately 1.25 kilometers.

Long Term Water Discharge

Quesnel Lake Pipeline Installation

Construction of the direct pipeline from the water treatment plant (WTP) to Quesnel Lake was completed at the end of November; this pipeline separates Hazeltine Creek from the diffuser ports.

Treated water from the WTP will no longer be deposited into Hazeltine Creek due to the completion of the Quesnel Lake pipeline. This is an important step into returning Hazeltine Creek to its, once again, fish bearing state.

As required by the *Environmental Management Act* Permit 11678, the pipeline must undergo a pressure and leak test performed by a qualified professional and approved by the Director prior to service.

The 6.5 kilometer buried pipeline will be regularly inspected and maintained as outlined in Metal Mining Effluent Regulations requirement and Permit 11678.

Polley Flats

Approximately 350,000 tonnes of tailings were removed from 13.9 hectares in the Polley Flats. This removal exposed native topsoil, peat, and subsoil which enabled surface roughening, mounding, application of coarse woody debris, and installation of small mammal and avian habitat features.

Planting

Upland areas in Reach 2 of Hazeltine Creek have been prepared for planting. The work included removal of tailings residues, placement of coarse woody debris, and installation of avian perching and small mammal denning sites.

Fall planting and seeding commenced in October. Native seeds have been collected for direct seeding and seedling production for future upland and lower floodplain planting.

An invasive plant inventory survey was completed and this data will be used to develop future invasive plant management strategies.

MPMC Personnel Profile—Stephen Monninger

Welcome to the MPMC Personnel Profile of the Community Update Newsletter. This section features a member of the MPMC workforce and focus on their contribution to the company and community.



Stephen Monninger joined MPMC as the Environmental Superintendent on October 2, 2017. Although Stephen is a US citizen, he has lived and worked in Canada for the last 6 years: 2 years of consulting in Vancouver followed by 4 years as Environmental Manager at a diamond mine in northern Ontario. In a career that has spanned almost 40 years (yes, he is old), Stephen has experience in mine operations, engineering/planning, and mine geology. Following a 2-year break to obtain a Master's Degree in Environmental Engineering, his career then turned to Environmental Management within both the mining and the oil & gas industry as well as work on SuperFund sites (Contaminated Lands).

During his career, Stephen has lived in various places around the western US where he was able to pursue his passion, fly fishing the great trout waters of the west as well as a few places around the globe. He has guided in both Montana and Wyoming but pursues his passion just because it's so much fun. Stephen is eager to explore the waters of his new home and is looking for folks who share his passion for fly fishing, to show him all their secret spots.

He recently bought a house in Likely within throwing distance of the Quesnel River and considers that to be a sign from heaven and a good way to start his latest adventure in the Cariboo.

Mount Polley Mining Corporation wishes everyone Happy Holidays!

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

Introduction

Welcome to Mount Polley Mining Corporation’s (MPMC) August 2017 Community Update newsletter providing local communities with information about what is happening at the mine.

Due to the current wildfire situation in the Cariboo, the site tour originally scheduled for July 13, 2017 was canceled. MPMC has rescheduled the tour and the visit will highlight the ongoing Hazeltine Creek Rehabilitation Project. If you would like to participate in the site tour, please send an email to Vanessa Bremner (Receptionist) at vbremner@mountpolley.com or Colleen Hughes (Environmental Supervisor) at chughes@mountpolley.com with your name, address and phone number, and **MP Site Tour** in the subject line of the email. Please note that seating is limited and registration is on a first come first served basis. The tour is also restricted to only those above the age of 16. Additional information will be sent out upon registration.

Also, if you have any ideas for information that you would like to have included in the upcoming Community Updates, please do not hesitate to send an email to the addresses above.



Operations at MPMC

Operations at MPMC were limited as of July 7, 2017 as the wildfires in the Cariboo region impacted many of MPMC’s work force that reside in Williams Lake and the surrounding areas of Big Lake, 150 Mile House, and Soda Creek.

(Continued on page 2)



A Pacific tree frog safely relocated from the Hazeltine Creek work area, August 2017.



Two Sandhill cranes and a black bear crossing the Bootjack FSR, August 2017



Sucker in lower Edney Creek, June 2017

Inside this issue

Introduction.....	1
Operations at MPMC.....	1-2
MPMC Personnel Profile— Gabriel Holmes.....	2
Community Engagement ...	2
Mount Polley Geology.....	3
Reclamation Update: Hazeltine Creek Fish Habitat.....	4
Amphibian Salvage.....	4
Planting.....	4
Fish quotas in local surrounding lakes.....	4

MPMC Personnel Profile— Gabriel Holmes

Welcome to the first MPMC Personnel Profile. This section will feature an employee of MPMC and focus on their contribution to the company and community.

The first employee to be featured is Gabriel Holmes. Gabe started at MPMC as a student in 1997 then worked onsite as a contractor in 2004/2005. In 2012, he became a full-time employee in the Environmental Department.



Gabe has a background in silviculture and forestry that has proved invaluable in reclamation projects pre and post Tailings Storage Facility (TSF) failure. He has been integral to the reclamation of inactive rock disposal sites and the Hazeltine Creek terrestrial rehabilitation project due to his knowledge of native plants and survey experience. He is a very valued team member (often jovially referred to as 'Sasquatch'), and is always prepared to assist in any type of sampling and/or monitoring event with a smile.

Mr. Holmes is a father, BC local and has resided in the community of Likely for the majority of his life. He is an ardent supporter of community values and is a director of the Likely Community Forest Society board, Likely-Xatsull Community Forest Ltd. board and with the Likely and District Chamber of Commerce.

(Continued from page 1)

During the first week of the wildfires, MPMC provided water totes and a water truck to the Big Lake fire center, and dust masks for the community of Likely and firefighters, until the evacuation order was issued.

During the evacuation order, six dedicated employees remained on site for fire watch and to meet compliance requirements. Employees returned to work on July 31 and MPMC officially resumed full operations on August 2, 2017.

Discharge from the water treatment plant (WTP) ceased on July 10, 2017, as MPMC was unable to ship samples within the recommended hold times to the analytical lab due to road closures. As the wildfire threat continues in and around the Cariboo region, the WTP will not discharge until the situation stabilizes and samples can arrive at the lab within the appropriate time.

During the alert and order period, MPMC Environmental Department staff continued to adhere to the requirements of all government licenses and permits.



Community Engagement

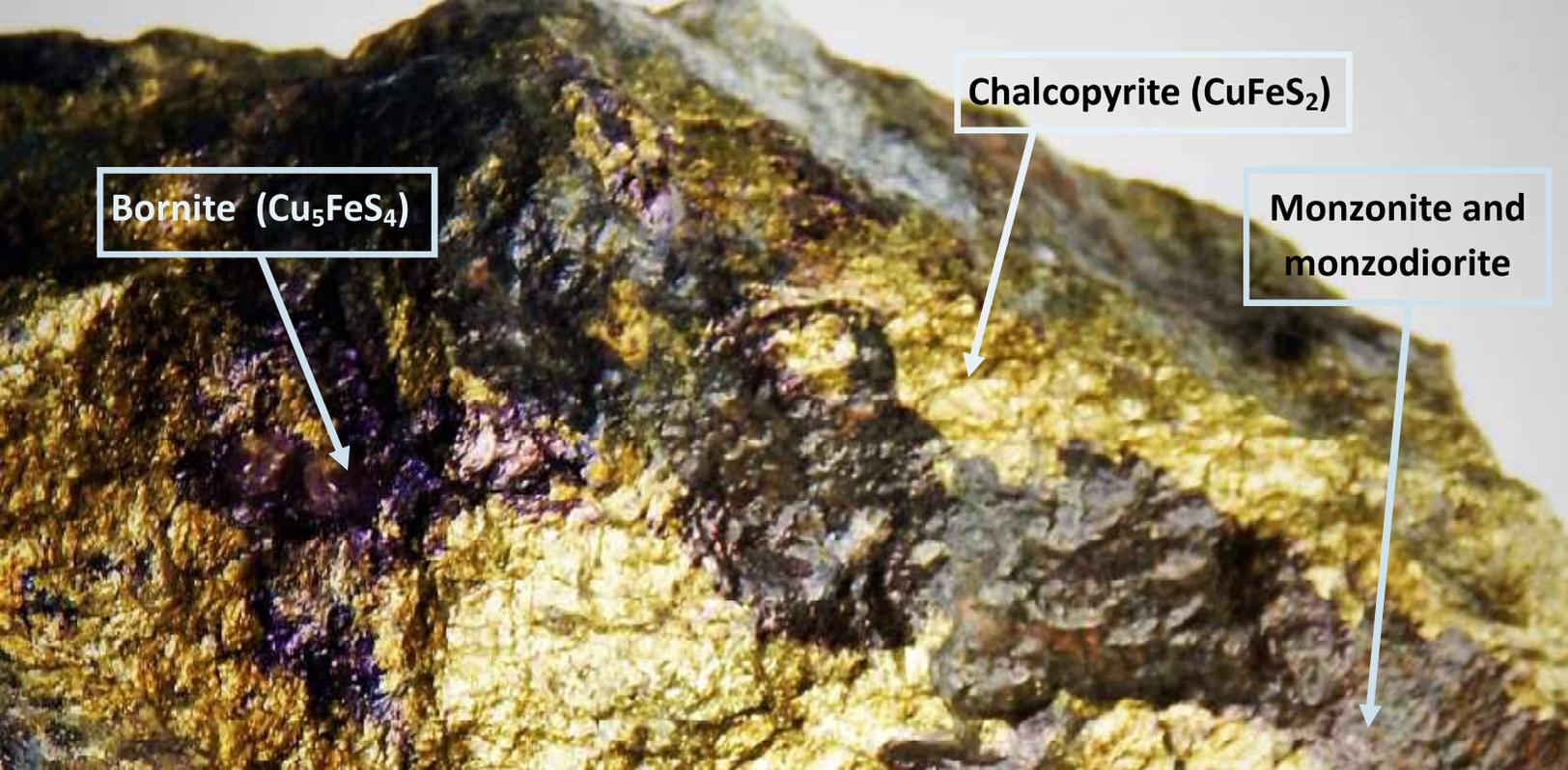
MPMC continues to promote community outreach and engagement with the local residents of Likely and its surrounding areas, as well as the First Nations.

MPMC and Imperial Metals recently sponsored the Plato Island Resort and Marina Fish Derby. This event took place on Quesnel Lake from June 9-11, 2017. The first place Lake Trout weighed 12.52 lbs and took home the winning prize of \$1,500 cash with second and third place award \$700 and \$300 respectively.

In addition to sponsoring local events, MPMC donated boom logs to Plato Island Resort following the big windstorm in May. The boom logs will help rebuild their pier that was damaged during the storm.

In June, MPMC met with the Public Liaison Committee (PLC) and the elders from Soda Creek and Williams Lake Indian Bands to discuss the ongoing remediation activities in Hazeltine Creek and site monitoring updates.

As mentioned on page 1, the MPMC site tour has been rescheduled and will showcase the ongoing rehabilitation project of Hazeltine Creek to members of the public.



Chalcopyrite (CuFeS_2)

Bornite (Cu_5FeS_4)

Monzonite and
monzodiorite

Geology of the Mount Polley Deposit

The Mount Polley deposit is an alkalic porphyry copper-gold deposit hosted within brecciated plagioclase porphyry. The intrusive complex is about five to six kilometres long and three kilometres wide, lying between Polley and Bootjack Lakes. The intrusions are typically monzodiorite, but range from diorite (oldest) to monzonite (youngest). Copper mineralization is concentrated in zones of strong hydrothermal fracturing or brecciation. Although mineralization varies among the different zones, the dominant copper sulphide mineral is disseminated chalcopyrite. Minor chalcopyrite also occurs in fractures and veinlets, and minor bornite and trace quantities of covellite, chalcocite, and digenite also occur. Copper oxides and carbonates are also present (such as chrysocolla, azurite and malachite), and are the dominant copper minerals in portions of the Springer and Cariboo Pits. Both gold and silver are closely correlated with chalcopyrite, although there are a few gold-only zones with the gold possibly associated with pyrite or epidote.

Definitions of rock names :

Monzodiorite: a coarse-grained igneous rock consisting of essential plagioclase feldspar, orthoclase feldspar, hornblende, and biotite, with or without pyroxene.

Diorite: an intermediate, coarse-grained igneous rock with up to 10% quartz. Plagioclase feldspars are of the oligoclase-andesine varieties; and ferromagnesian minerals, e.g. pyroxenes or hornblende, are present.

Monzonite: a coarse-grained igneous rock consisting of essential plagioclase feldspar, orthoclase feldspar, pyroxene and biotite. The plagioclase feldspar and the orthoclase feldspar are in roughly equal proportions. (aka syenodiorite)

Note, the majority (90%) of the minerals in the Mount Polley Mine tailings are plagioclase feldspar, orthoclase feldspar, biotite, and pyroxene, the main rock-forming minerals in the host monzonite and monzodiorite, plus magnetite, epidote and calcite, related to the hydrothermal brecciation and alteration.

References:

- July 2009 TAR, Mount Polley Mine Technical Assessment Report for a Proposed Discharge of Mine Effluent
- A Dictionary of Earth Sciences, Encyclopædia.com

Reclamation Update



Upper Hazeltine Creek fish habitat project Reach 1, August 2017.

Hazeltine Creek Fish Habitat

Fish habitat construction project in the upper areas (Reaches 1 and 2) in the Hazeltine Creek corridor is ongoing. MPMC Environmental Department crews are onsite daily to monitor the progress and provide sediment and erosion control if necessary. This project includes the construction of approximately 1.4 km of fish habitat in Upper Hazeltine Creek and is anticipated to be completed in late fall 2017. This is an extension of the 1 km fish habitat completed in 2016.

Amphibian Salvage

Any ponds located near the creek construction project containing amphibians have been excluded by fencing and deemed a no-work zone. Any amphibians located in the work area are documented and moved (with proper handling protocols and in accordance with the *Wildlife Act*) to a release site. Between the end of April and middle of August, 464 amphibians have been relocated. Amphibian salvaging will continue until all ponds have been cleared as amphibian free.

Planting

Spring planting of native shrubs (black twinberry, prickly rose, and alder) in upper and lower Hazeltine Creek was completed in June 2017. Fall planting of the same species will commence in September, weather permitting. To date, over 200,000 shrubs have been planted in the Hazeltine Creek corridor.

Fish quotas in local surrounding lakes

Quesnel Lake:

In November 2016, the Ministry of Forest, Lands and Natural Resource Operations (FLNRO) raised the daily quota of lake trout from 3 (any size) to 5 (any size). This decision resulted from data collected over the last four years suggesting that the exploitation of lake trout is low and that an increased harvest is sustainable.

The increase of any daily fish quota in a habitat suggests that the population of the species is healthy. This change is beneficial to the local angling community, especially during fish derbies like the one at Plato Island Resort (see page 2).

Note that the quotas for rainbow trout have not changed.

For more information, please visit: <http://apps.nrs.gov.bc.ca/pub/ahte/angling/quesnel-lake-lake-trout-daily-quota>

Bootjack, Polley and Morehead Lakes:

No changes have been approved by FLNRO. The daily trout quota remains at 8.

For more information, please visit: http://www.env.gov.bc.ca/fw/fish/regulations/docs/1719/fishing_synopsis_2017-19_region5.pdf

Mount Polley Mining Corporation wishes everyone well during this difficult wildfire season.

Please visit the Imperial Metals website for more information about MPMC's reports and ongoing projects: <https://www.imperialmetals.com/our-operations-and-projects/operations/mount-polley-mine/mount-polley-updates/>



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Community Update



Introduction

Welcome to Mount Polley Mining Corporation’s (MPMC) May 2017 Community Update newsletter providing the local communities with information about what is happening at the mine.

MPMC plans to host another site visit this summer to give local community members an opportunity to tour the mine site and observe the remediation activity around Hazeltine Creek. If you would like to participate in the site tour, please send an email to Vanessa Bremner (Receptionist) at vbremner@mountpolley.com or Colleen Hughes (Environmental Supervisor) at chughes@mountpolley.com with your name, address and phone number, with **MP Site Tour** in the subject line of the email. We will contact you when a date has been set for the tour.

Also, if you have any ideas for information that you would like to have included in the upcoming Community Updates, please do not hesitate to send an email to the addresses above.

Operations at MPMC

MPMC is an open pit copper-gold mine located approximately 56 kilometers north-east of Williams Lake. There are presently over 370 people employed at the mine, most of whom live in the communities of Williams Lake, Horsefly, Big Lake, Likely, Quesnel, Soda Creek, Sugar Cane and the surrounding areas of the Cariboo region.

MPMC spends approximately \$5.8 million per month on salaries and over \$3.6 million per month on contractors, consultants, consumables and fuel to operate the mine. The majority of MPMC’s monthly expenditure goes directly into the economy of the Cariboo.

MPMC also sponsors a number of local community events in the area, including this summer’s Plato Island Resort Fishing Derby (June 9, 10, and 11) on Quesnel Lake. For more information, please visit: <http://www.platoislandresort.com/fishing-derby-june-9-11-2017/>

Inside this issue

- Introduction.....1
- Operations at MPMC.....1
- How many shrubs were planted in Hazeltine Creek corridor in 2015-16.....2
- Water Management at MPMC.....2
- Tailings in Quesnel Lake.....3
- Habitat Restoration—Edney Creek.....4
- Habitat Restoration—Upper Hazeltine.....4



How many shrubs have been planted in the Hazeltine Creek corridor in 2015-16?

- Total planted:
185,617

Including but not limited to:

- Scouler's willow wattles: **5,740**
- Sitka alder: **41,180**
- Red osier dogwood: **59,850**
- Prickly rose: **44,970**
- Black twinberry: **24,670**
- Douglas fir: **3,105**

Total terrestrial area to be remediated: ~ 2 km²



Upside down tree along Hazeltine Creek to promote avian habitat.



Red osier dogwood seedlings planted along Quesnel Lake shoreline in 2016.

Water Management at MPMC

MPMC has been discharging treated (cleaned) site contact water via the water treatment plant (WTP) into Quesnel Lake since December 2015.

Ongoing monitoring of the water in Quesnel Lake has shown that the discharge is not having a negative effect on the uses of the lake. The water in Quesnel Lake is safe for:

- Swimming;
- Drinking (as per Interior Health Authority guidelines for use of surface water for drinking sources);
- Fishing; and
- Aquatic life.

No solid mining waste is being released into Quesnel Lake. All solid waste, including tailings, is captured on site and tailings are deposited into the repaired Tailings Storage Facility (TSF). Process water used in the mill is discharged into the TSF with the tailings and is recycled from the TSF back to the mill.

The majority of water being discharged from the mine does not come from the mill but from site contact water (eg. runoff water that comes off the mine property). This site contact water is collected and piped through the WTP before it is discharged into Hazeltine Creek. At the outlet of Hazeltine Creek, the water is conveyed through two pipes and dispersed by diffusers located at 35 and 40 meters deep in Quesnel Lake off the Hazeltine Creek delta.



Hazeltine Creek through the canyon upstream of the Ditch road (Likely-Horsefly FSR) bridge.

Tailings in Quesnel Lake

MPMC (including its management and employees) are very aware of the concerns brought forth from regulators, First Nations and the general public about the tailings remaining at the bottom of Quesnel Lake.

MPMC has contracted a number of chemical and biological studies to determine the stability of the tailings in the lake. The results of this research, particularly the water quality data, indicates that the tailings are stable, and levels of copper are not increasing in the overlying lake water.

Extensive monitoring of the water quality, sediments, benthic organisms and fish in Quesnel Lake is ongoing, and sediment trap studies have shown that natural sediments are now depositing and covering the tailings on the bottom of the lake. MPMC will continue to monitor the lake very closely and is presently completing a risk assessment to determine the best approach to dealing with the tailings in the lake.



Quesnel Lake shoreline looking northwest, April 2017.



Lower Edney Creek May 2017

Habitat Remediation—Edney Creek

The employees and contractors at MPMC have completed extensive remediation work to repair the damage to Hazeltine and Edney Creeks resulting from the TSF embankment failure.

Edney Creek is the larger of the two creeks and was identified by a collaborative fish habitat working group (including representation from MPMC, provincial and federal agencies and First Nations) as a priority for remediation in order to re-establish a connection to Quesnel Lake for potential fish spawners who would be returning in the fall 2015.

Fish habitat in lower Edney Creek was rebuilt in 2015, and results of fish sampling from fall 2015 in the remediated section show that it was providing habitat as intended, with observed species including: juvenile Interior Coho salmon (endangered), Rainbow trout, Longnose dace, Northern pike minnow, Longnose sucker, Redside shiner and Burbot. During a visual inspection in November 2016, an adult Interior Coho and an adult Kokanee spawner were both observed in the restored Edney Creek channel.



A juvenile Rainbow trout caught in Edney Creek during a fish inspection survey in 2016.



Upper Hazeltine May 2017

Habitat Restoration—Upper Hazeltine Creek

Fish habitat was reconstructed in the upper reaches of the Hazeltine Creek channel in fall 2016. MPMC relocated over 75,000 toads and other amphibians from the area of spilled tailings that were scheduled for removal in order for the creek habitat construction to proceed. This year, a 4km exclusion fence has been built to keep amphibians from breeding in the areas around upper Hazeltine where tailings removal and channel construction is set to continue.

The remainder of Hazeltine Creek fish habitat reconstruction had been on hold until the water discharge permit amendment was granted and the pipeline built. This permit amendment now allows discharge of treated water through a pipe from the mine's water treatment plant to Quesnel Lake, rather than using Hazeltine Creek. Once the pipeline is installed, MPMC crews will have access to the rest of Hazeltine Creek and be able to complete the fish habitat restoration work. This will ultimately allow reintroduction of Rainbow trout and other fish from Polley Lake into upper Hazeltine Creek, and from Quesnel Lake into lower Hazeltine Creek.

Mount Polley Mining Corporation wishes everyone a wonderful summer!

Please visit the Imperial Metals website for more information about MPMC's reports and ongoing projects: <https://www.imperialmetals.com/our-operations-and-projects/operations/mount-polley-mine/mount-polley-updates/remediation-and-monitoring>



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Community Update

Introduction

Welcome to Mount Polley Mining Corporation’s (MPMC) new Community Update Newsletter. Four to five times per year, a newsletter will be issued to provide the local communities with updates about what is happening at the mine. In addition, MPMC plans to host an annual site visit in the summer, to give local community members an opportunity to tour the mine site and observe the remediation activity around Quesnel Lake.

If you would like to participate in the site tour, please send an email to vbremner@mountpolley.com or chughes@mountpolley.com.

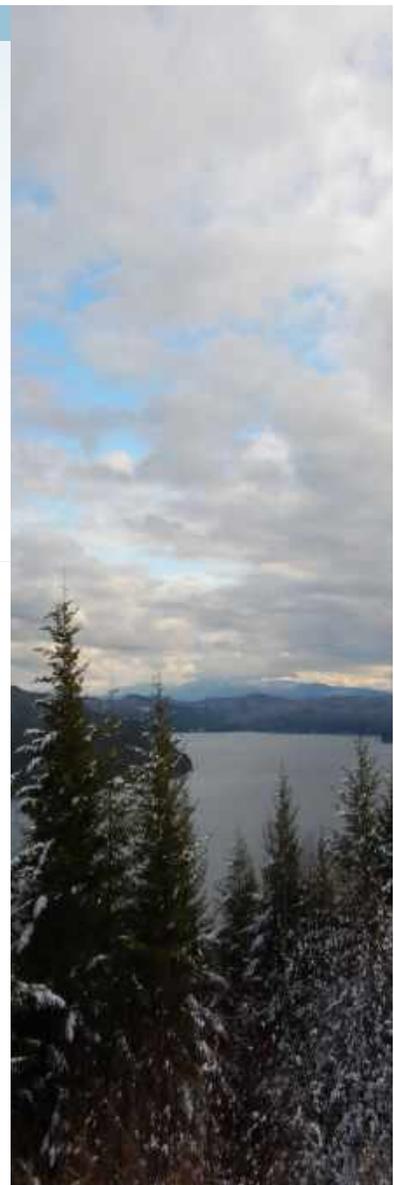
Also, if you have any ideas for information that you would like to have included in the upcoming Community Updates, please do not hesitate to send an email to the addresses above.

Quesnel Lake Monitoring in Mitchell Bay

Mount Polley Mining Corporation (MPMC) continues to monitor a variety of sites in Quesnel Lake following the breach in August 2014. According to the Comprehensive Environmental Monitoring Plan (CEMP), there are five monthly sampling sites, including those along the immediate location of the treated water discharge, and one reference station sampled seasonally by the MPMC environmental staff. In addition to these sampling events, other sites may be visited due to seasonal changes or public concern.

The potential impacts on the water quality in Mitchell Bay has been a source of interest from a few local residents since the breach. The Ministry of Environment (MOE) established a site in Mitchell Bay in August 2014 which included collecting water at multiple depths and water column profiles. Since September 2015, MPMC has sampled and profiled the water column at the Mitchell Bay

(Continued on page 2)



Inside this issue

- Introduction.....1
- Quesnel Lake Monitoring in Mitchell Bay 1-3
- How many samples were taken in 2016?.....2
- Remediation Update—Upper Hazel-tine Creek4
- What does lake monitoring entail?4
- Equipment Profile—Secchi disk.....4

How many samples were taken in 2016?

- Total samples:
3246

Including:

- Quesnel Lake and River samples: **260**
- Hazeltine Creek and discharge samples: **370**
- Toxicity testing samples at outlet of Hazeltine Creek and discharge: **39**
- Polley Lake samples: **113**
- Water Treatment Plant samples (sent to laboratory): **418**
- Groundwater samples: **162**



Quesnel Lake and shoreline August 2016

(Continued from page 1)

site (labeled as QUL-42) eight (8) times at the surface (0m), mid-depth (10m) and bottom(20m); with the most recent occurring on October 26th, 2016. All the recent results at all three depths are below the British Columbia Water Quality Guidelines (BCWQG) for drinking water (see Table 1 on page 3) set by the MOE.

In addition to QUL-42, the table displays the water quality results taken from QUL-58 at 30m depth on October 5th, 2016. This site is situated along the discharge location, and the analysis concludes that the water also meets the drinking water guidelines. The water quality for the discharge site below the water treatment plant in Hazeltine Creek (HAD-3) is also included; only three parameters, total dissolved solids, sulphate and selenium exceed the drinking water guidelines in the sample taken on October 24th, 2016.

For comparative purposes, water quality results from a residential tap sample taken on December 7th, 2016 in Williams Lake is included. Williams Lake draws water from an aquifer located below the lake and both results meet the BCWQG for drinking water. Note that the BCWQG for total phosphorous concentration only extends to lakes used as drinking sources, therefore does not apply to the total phosphorous result from the Williams Lake tap sample.

All water chemistry samples taken by MPMC (including the Williams Lake tap water) were analyzed by ALS laboratories in Burnaby, BC.

References:

BC Water Quality Guidelines, Approved Water Quality Guidelines <http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines/approved-water-quality-guidelines>

Williams Lake Building Maintenance and Utilities <http://www.williamslake.ca/278/Building-Maintenance-Utilities>

Table 1. Comparison of Quesnel Lake, MPMC treated water discharge, and Williams Lake Tap Water

		Quesnel Lake – Mitchell Bay site			Quesnel Lake— Discharge Location	MPMC Site	Other sources
Sample Locations	BC WQG – Drinking Water (Maximum)	QUL-42-0m	QUL-42-10m	QUL-42-20m	QUL-58-30m	HAD-3 Dis- charge Pipe	Williams Lake Tap Water
Date		26-Oct-16	26-Oct-16	26-Oct-16	5-Oct-16	24-Oct-16	7-Dec-16
Parameters							
Conductivity (µS/cm)	-	106	107	108	121	1130	775
Hardness (as CaCO ₃) (mg/L)	-	49.5	49.4	49.4	59.2	481	327
pH (pH)	6.5 ¹ -8.5	7.76	7.75	7.78	7.8	7.84	8.16
Total Dissolved Solids (mg/L)	500	68	64	71	85	882	461
Total Suspended Solids (mg/L)	-	<1.0	<1.0	<1.0	<1.0	1.4	<1.0
Turbidity (ntu)	-	0.28	0.43	0.27	0.26	1.09	0.3
Alkalinity (CaCO ₃) (mg/L)	-	49	49.1	49.2	51.5	51.9	335
Ammonia (as N) (mg/L)	-	<0.0050	<0.0050	0.0071	<0.0050	0.0311	0.0914
Chloride (Cl) (mg/L)	250	<0.50	<0.50	<0.50	<0.50	12.3	22.5
Fluoride (F) (mg/L)	-	0.032	0.032	0.032	0.038	0.62	0.14
Nitrate (as N) (mg/L)	10	0.0806	0.0806	0.0802	0.24	8.82	<0.025
Nitrite (as N) (mg/L)	1	<0.0010	<0.0010	<0.0010	<0.0010	0.0521	0.0113
Phosphorus (P) Total (mg/L)	0.01 ²	<0.0020	0.0022	0.0023	0.0035	0.0086	0.257
Sulphate (mg/L)	500	6.52	6.54	6.56	12.9	548	73.4
Total Nitrogen (mg/L)	-	0.174	0.148	0.148	0.27	8.93	0.367
Dissolved Organic Carbon (mg/L)	-	1.73	1.65	1.74	1.83	2.11	6.76
Aluminum (Al)-Total (mg/L)	-	0.0126	0.0187	0.0224	0.022	0.0942	<0.0030
Antimony (Sb)-Total (mg/L)	0.014	<0.00010	<0.00010	<0.00010	<0.00010	0.00182	<0.00010
Arsenic (As)-Total (mg/L)	0.025	0.00011	0.0001	0.00011	0.00012	0.00111	0.0055
Barium (Ba)-Total (mg/L)	-	0.00501	0.00517	0.00504	0.00636	0.0615	0.0116
Boron (B)-Total (mg/L)	5	<0.010	<0.010	<0.010	<0.010	0.147	0.05
Cadmium (Cd)-Total (mg/L)	0.005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000020	<0.0000050
Calcium (Ca)-Total (mg/L)	-	16.8	16.7	16.8	20.7	147	33.9
Chromium (Cr)-Total (mg/L)	0.05	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total (mg/L)	0.5	0.00051	0.00092	0.00081	0.00152	0.00621	0.00918
Iron (Fe)-Total (mg/L)	-	<0.030	<0.030	<0.030	<0.030	0.061	0.053
Lead (Pb)-Total (mg/L)	0.05	<0.000050	0.000196	0.000146	0.000378	<0.000050	0.000103
Lithium (Li)-Total (mg/L)	-	<0.0010	<0.0010	<0.0010	0.0013	0.016	0.0015
Magnesium (Mg)-Total (mg/L)	-	1.91	1.86	1.87	2.32	29.1	59.3
Manganese (Mn)-Total (mg/L)	-	0.00087	0.00102	0.0012	0.00195	0.0159	0.137
Mercury (Hg)-Total (mg/L)	-	-	-	-		<0.0000050	-
Molybdenum (Mo)-Total (mg/L)	0.25	0.000349	0.000351	0.000365	0.00265	0.174	0.00787
Nickel (Ni)-Total (mg/L)	-	<0.00050	<0.00050	<0.00050	<0.00050	0.00055	0.00135
Potassium (K)-Total (mg/L)	-	0.497	0.484	0.484	0.712	16.5	6.4
Selenium (Se)-Total (mg/L)	0.01	0.000096	0.000091	0.000107	0.000476	0.0345	<0.000050
Silicon (Si)-Total (mg/L)	-	1.57	1.59	1.6	1.88	4.11	13.3
Silver (Ag)-Total (mg/L)	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total (mg/L)	-	0.92	0.903	0.911	1.7	59.8	48.5
Strontium (Sr)-Total (mg/L)	-	0.131	0.132	0.132	0.173	2.44	0.159
Uranium (U)-Total (mg/L)	-	0.000157	0.000154	0.000158	0.000187	0.00129	0.001
Vanadium (V)-Total (mg/L)	-	<0.00050	<0.00050	<0.00050	<0.00050	0.00119	0.00058
Zinc (Zn)-Total (mg/L)	5	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

¹ the minimum BC Water Quality Guideline – Drinking Water;

² this guideline is only for lakes used a source of drinking water



Remediation Update— Upper Hazeltine Creek

The purpose of the upper Hazeltine Creek remediation project was to add fish habitat and spawning features to allow future use of the creek by Polley Lake fish. The work included rebuilding and recontouring of the creek channel to create additional meanders, and installation of fish habitat features such as spawning gravels, riffles, pools, and woody covering. The construction extended from the Polley Lake weir to the outlet of the water treatment plant discharge pipe and was completed in early October 2016. Planting of 7,800 sitka alder seedlings continued during the fall of 2016 and covered approximately 6.5 hectares of the creek bank.

The rehabilitation of Hazeltine Creek floodplain will be an ongoing project set to continue from the discharge pipe location to the canyon in 2017 once the discharge is removed from the creek.

Did you know that MPMC collected and relocated approximately 75,200 western toads, 315 long-toed salamanders and 89 Columbia spotted frogs during the amphibian salvage in the spring/summer of 2016 prior to the upper Hazeltine Creek restoration project?

Equipment Profile— Secchi Disk

Secchi depth is a commonly used method to measure water clarity. It involves lowering a black and white disk into the water and recording the depth (usually in metres) until it is no longer visible.



What does lake monitoring entail?

Monitoring a lake includes many things—sampling the water column at various depths is one of the most effective ways. This may be time consuming and require expensive equipment. However, there are many ways for interested individuals to get involved in monitoring their lake, like becoming a member of the British Columbia Lake Stewardship Society (BCLSS). BCLSS coordinates a yearly event called the Secchi Dip-In that occurs during Lakes Appreciation Month in July. The Secchi disk provides a measurement of water transparency according to the depth. In 2016, the deepest Secchi reading was 21.4m at Gun Lake in the Thompson-Nicola region.

What is your lake's Secchi reading?

To learn more, please visit:

BC Lake Stewardship Society <http://www.bclss.org/>

Secchi Dip-In <http://www.secchidipin.org/>

Please visit the Imperial Metals website for more information about MPMC's reports and ongoing projects: <https://www.imperialmetals.com/our-operations-and-projects/operations/mount-polley-mine/mount-polley-updates/remediation-and-monitoring>

All data is available for download on the MOE EMS site: <https://catalogue.data.gov.bc.ca/dataset/bc-environmental-monitoring-system-results>