Additional Q&As

For additional Questions and Answers related to a particular area of interest concerning the Lower and Middle Colliery Dams, please review the information below. Having reviewed each Question and Answer, if you require additional information that is not found on this website, please call 250-754-4251 and a representative from the City will speak with you

Note: If you are a parent with children who attend John Barsby Community School and you seek information regarding the school's emergency plan; please call the school at 250-753-8211.

General Questions

I know somebody who lives in Harewood who did not get the information package that was delivered to residents. Where can they get one?
Copies of the information package were delivered to Harewood Residents Tuesday, October 30, 2012. To obtain a copy of that package, click on the following link - Harewood Residents Information Package.

Where are the Middle and Lower Colliery Dams located?
The Lower and Middle Colliery Dams, also known as the Chase River Dams, are located in Colliery Dam Park, adjacent to Nanaimo Lakes Road, south of Sixth Street and north of Seventh Street. The Park is best accessed from the parking lot at Sixth and Wakesiah.

What type of dam structure are the dams?
Each dam consists of a concrete core wall, varying in thickness from two feet to four feet. The concrete core is protected on both sides by an earth shell consisting of loosely placed rock fill.

When were the dams constructed?
The dams were constructed between 1910 and 1911.

Who built the dams and why?
The Middle and Lower Colliery Dams were constructed by Nanaimo's former mining industry, Western Fuel Company, for the specific purpose of storing water for washing coal on Nanaimo's waterfront.

Who own the dams now?
The dams are owned by the City of Nanaimo.

What function do the dams serve today?
Today the dams provide recreational lake amenities to park users, such as swimming and fishing.

Why do we need to remove the current dams?
The dams are at the end of their service life - they are one hundred years old. Recent studies have shown that they pose an unacceptable risk to the community living downstream during a significant earthquake or extreme rainfall event.

Can the lakes behind the Colliery Dams be filled with dirt, gravel, sand or rock so as to lower the current water level, and in doing so, reduce the downstream consequences of flooding should the dams breach during a major earthquake or extreme rainfall event?
This common question contains three distinct considerations.

First, while filling the lakes behind the dams would indeed reduce the volume of water, the structures themselves would still be classified as dams and would still have a consequence that includes potential for loss of life. Adding fill does not change the main challenge surrounding the dams themselves, i.e.) the dams will remain 100 year old deteriorating structures that are saturated with water and which still require seismic upgrading.

Second, seismic upgrading only protects downstream residents during a major earthquake event. To protect these same residents during an extreme rainfall event, new channels would need to be built to divert water around the lakes and down the Chase River. The current standard to which these channels would need to be built would involve constructing a structure (channel) that is 10 metres deep, 11 metres wide and running the full length of the park, the path of which would need to be cut through existing forest.

Third, while filling the lakes behind the dams would retain the familiar aesthetic the park is known for today, the revised lake depth will influence the type of water ecosystem the lakes can support. Shallow lakes are typically warmer than deeper lakes, the outcome of which is an aquatic habitat that is poor for supporting fish but good for supporting algae. Also, filling the reservoirs will result in a permanent loss of the man-made habitat and will require compensation. This loss is the worst for salmonids - the spawning barriers (the dams) would remain in place while warmer water temperature and water quality degradation would affect downstream salmon habitat.

The City believes the objective in raising this question is to preserve the current aesthetics and recreational amenities of the park, but as can be imagined, this objective also creates challenges that impact the surrounding environment while also upsetting the aquatic ecosystem we know and love today, ironically the very thing people wish to see protected. Likewise, the consequence rating applied to the dams would still carry a high standard to reduce the risk to safety, property damage and environmental degradation. In contrast, while the removal of the dams will also result in changes to the park via the loss of the lakes, the full intent of the restoration process would leave a naturalized, forest-lined river channel with potential pools, improved salmon access and an enhanced trail network while also meeting the City's primary objective of removing the risk to life safety and property damage.

Who is working with the City of Nanaimo to address the challenges associated with the dams?
The City is working with the Dam Safety Section of the Provincial Government, local first nations and interested community groups.

Dam Safety Issues

Do the current dams meet safety standards?
The dams are maintained and continually monitored by the City; however because the dams were constructed a hundred years ago, they no longer meet current safety standards.

What is the current condition of the dams?
The dams are stable in their current state; however a disturbance due to a significant earthquake or extreme rainfall event could negatively affect them. As noted, the dams have reached the end of their service life; hence it's prudent to remove them before they deteriorate further.

Is there a potential for loss of life, injury or property damage should the current dams breach?
As noted in the 2012 Associated Engineering report, there is an estimated number of fatalities associated with dam failure, ranging from 60 to 130, depending on the event triggering the failure.

What measures are in place to alert the community should the current dams show signs of breaching?
The City has implemented an Emergency Action Plan that would see the Emergency Command Centre activated in the event of a possible breach. The City will order an evacuation of the downstream area should the dams appear to be in imminent danger of failure. Also, public education using letters, maps, website, social media, question and answers, open houses and school liaison are has been carried out.

Are the current dams at risk of failure due to delayed or poor maintenance?
The dams are not at risk of failure due to delayed or poor maintenance; as noted, the City regularly maintains, inspects and reviews the dams' conditions.

How will community safety be improved once the current dams are replaced?
Replacing the dams will significantly reduce the risk to the community's safety that currently exists.

Is it still safe to use Colliery Dam Park?
Colliery Dam Park is still safe to use. As noted, the dams are stable in their current condition; in the event of a significant earthquake or extreme rainfall event, it would be prudent to stay clear of the Park.

Who regulates dam safety, maintenance, construction and dam removal in British Columbia?
Dams are subject to the Dam Safety Regulation administered by the Dam Safety Section, Water Management Branch, an arm of the Provincial Government.

In addition to the Middle and Lower Colliery dams, are there other dam structures in or near Colliery Dam Park? If so, what is the status of these structures?
A third dam - the Upper Colliery Dam - is in a secure state and poses no risk to the public. This structure will remain in place. Only the Lower and Middle Colliery dams must be removed. Water Reservoir #1 has been seismically upgraded to current standards and poses no risk to the public.

Are there other dams that pose an unacceptable risk during either a significant earthquake or extreme rainfall event?
At this time, the City is not aware of any other dam structures that pose a risk to the residents of Nanaimo.

Emergency Preparedness
What is the exact area of Nanaimo that will be flooded should the current dams breach during a significant earthquake or extreme rainfall event? Where is the evacuation area?
A dam breach will directly impact the area of Nanaimo known as Harewood. To determine if your property or residence is located inside or outside of the evacuation area, please review the map included with this package.

How do I prepare if I am in the evacuation area?

Be Informed - Knowing the risk, making sure an emergency action plan is in place and evacuating when directed by emergency response officials are the most important steps you can take to staying safe. This involves knowing your escape route, having a grab and go kit ready and signing up for the City of Nanaimo Emergency Call Alert System.
Make a Plan - Prepare a plan and be ready for emergencies. Review disaster routes provided by the City and know where the closest high ground marshalling area is relative to where you live. Make sure that all your family members are aware of these locations and where they should go if you are not together.
Build a Grab and Go Kit - In the event of an evacuation have a Grab and Go Kit ready so that you can leave the premises immediately.

What is the Nanaimo Emergency Call Alert System?

The City of Nanaimo Emergency Call Alert System alerts residents to community safety matters by sending a recorded phone call to members of the public who sign up.

I live or do business in Harewood -what will I be notified of if I have to evacuate?

Should an evacuation be ordered, you will be notified of the following two events:

1. Earthquake

- In the event of an earthquake, failure of Colliery Dams is a possibility
    - During the Earthquake, Drop Cover and Hold on. When the shaking stops immediately self evacuate your home or business.
    - Follow the Evacuation Route to the designated Reception Centre immediately as indicated on the Harewood Evacuation Routes map.

2. Major Rainstorm

- In the event of an extreme rain storm event, failure of Colliery Dams is possible.
    - An Evacuation Alert will be provided to warn you of the potential hazards and allow you some time to get your grab and go kit and prepare your family and home for evacuation

For both events, the City of Nanaimo will advise residents of the risk through several means:

- Emergency Call Alert System - This is a mass dial system and will be your first point of contact.
- Media - Radio 102.3 and 106.9
- TV - CTV News

What do I do if I receive an evacuation alert?
Shut all windows and doors. Gather essential items such as medications, eyeglasses, valuable papers (i.e. insurance), immediate care needs for dependants and, if you choose, keepsakes (photographs, etc). Lock all doors when you leave. You may also need to consider:

- Preparing to move any disabled persons and/or children.
- Getting Pets.
- Arranging to transport your household members or co-workers.
- Arranging accommodation for your family - Note: in the event of an evacuation, reception centres will be available for use.
- Monitoring news sources for information on evacuation orders and locations of reception centres.

Where do I go?
Follow the evacuation routes provided by the City of Nanaimo and go to one of the two designated reception centres:

- If you live North of the Chase River - Evacuate to **Bowen Park Complex** - 500 Bowen Road via Wakesiah Avenue or Terminal Avenue
- If you live South of the Chase River - Evacuate to **Beban Park Complex** - 2300 Bowen Road via the Nanaimo Parkway
- At the reception centres additional information will be provided to you about the nature of the emergency and what you can expect.

If you do not have access to a vehicle, make your way to the closest high point marshalling area as identified on the Harewood Evacuation Routes map. Arrangements will be made to transport you to a reception centre.

Environmental Issues

What is the current condition of the ecological system in Colliery Dam Park?
Following the conclusion of coal mining operations, this area has been allowed to renaturalize.

Will any species be negatively impacted once the dams are removed and replaced?
It is unknown at this time whether any species will be impacted once the dams are removed and replaced; environmental studies should reveal this.

Will the removal and replacement of the dams affect any of the existing forest in the surrounding area?
Yes, it is anticipated that some trees will need to be removed. Replanting of trees will occur where opportunities are available. but many more will be planted as part of the revegetation and renaturalization of the Chase River ravine area.

Will the removal and replacement of the dams trigger the introduction of any invasive species?
It is unknown at this time whether specific invasive species will be introduced following the replacement of the dams. Every year the City of Nanaimo endeavours to keep invasive species out of its parks through vegetation management.

Are there any contaminated sediments currently located behind the dam walls that need to be removed?
It is believed that the sediments, located within the reservoirs and behind the dams, are naturally occurring silt runoff from the Chase River. It is not anticipated that the sediment is contaminated.

Will removing the current dams cause sediments to wash down stream?
The Chase River channel will be protected to the point where it will not cause any more sediment downstream other than what is naturally being carried by the Chase River.

Will the removal and replacement of the dams lead to a net gain or loss in wetlands?
It is anticipated that wetland conditions will remain similar to their current state at the project's completion.

What is the relationship between the current dams and the watershed?
The dams store water that drains from the Chase River watershed. The dams and the supply of water stored behind have no relationship with the City's drinking water supply in the Nanaimo River watershed.

How will drinking water supplies be affected?
The dams do not play a role in the current drinking water supply system and removal of the dams will have no impact on the drinking water supply.

What is the best time of year to remove the dams?
It is best to remove the dams in the summer when water flows are low and the lakes can be drained.

What will the lakes look like following the completion of the new dams?
The Colliery Lakes will remain similar to their current state, with noticeable changes occurring surrounding the newly constructed dams.

What will happen to the fish that are currently stocked in the lakes behind both dams?
We will work with Provincial stakeholders to determine the most appropriate way to relocate the trout that have been stocked in the two man-made lakes.

Legal and Administrative Issues

Will removing the current dams create inconsistencies with laws or regulations designed to protect current ecosystems?
No, removing the dams will enhance the environment for the Chase River and potentially expand the availability of the channel for salmon; so there's no inconsistency with current laws or regulations.

Will removing the current dams interfere with laws or regulations designed to protect historical or cultural ways of life?
Protecting cultural and historical ways of life is not anticipated to be an issue. Both dams and lakes are manmade features; hence their removal will restore the Chase River valley to its natural state.

What permits must be secured prior to removing the current dams?
The City needs to obtain approval from the Dam Safety Section, Water Management Branch in Victoria. The Dam Safety Regulation is contained within the Water Act. Under this process, there may be referrals to other agencies as well as a need for certain environmental or fisheries permits.

Community Issues
Will access to, and recreational opportunities currently associated with, Colliery Dam Park change?
Most visitors to the Park use the trails for walking and biking. There will however be a temporary loss of swimming and fishing as current water features are replaced. Also, during the deconstruction phase, access to the park will be limited for safety reasons.

How many anglers or other recreational users will be impacted?
It is unknown how many anglers or recreational users will be impacted. The majority of the visitors to this park use it for biking, dog walking and hiking, and will be able to continue to do so in the future.

What steps will the City of Nanaimo take to ensure residents and businesses aren't inconvenienced during the dam's deconstruction and reconstruction phase?
There will be some disruption during deconstruction, in that the trails that currently cross the reservoirs will need to be temporarily closed or rerouted. There will also be some truck traffic in that same period of time. To ensure that park visitors and local residents are kept informed of all deconstruction activities and schedules, the City will take steps to post awareness signs and distribute information as required.

Do the dams honor someone?
The dams represent a tangible link with Nanaimo's coal mining legacy built in 1911 by the Western Fuel Company to supply water for washing coal.

Do the dams or water stored behind them hold any historical significance?
The dams, as mentioned above, are part of the legacy of coal mining in Nanaimo and are one of the last visible remnants we have. There is no historical significance linked to the water stored behind the dams.

Solutions
Can the dams be filled in with material as a way of keeping the lakes?
While the City recognizes the opportunity this solution provides in terms of retaining the current appearance of the park, we'd like to highlight a number of requirements outlined in Dam Safety Legislation that prevent it from becoming a viable alternative to removing the dams.

- We agree that filling the lakes does reduce the volume of water held behind the dams and potentially reduces the impact to public safety and loss of life; however, despite this preventive measure, the City's primary objective - eliminating risks to public safety and loss of life as a result of a dam breach - is not met. In summary, adding fill to the lakes does not change the state of the dams, i.e. the dams continue to function as deteriorating load bearing water structures that will not withstand a major earthquake. This presents an unaccepted level risk to the residents of Nanaimo.
- If seismic upgrading to the dams were possible, this only protects residents living downstream during an earthquake. To protect these same residents during an extreme rainfall event, channels would need to be carved into the park to divert water around the lakes and down the Chase River. To create such a channel, the City would need to excavate a channel through the rock 10 metres deep, 11 metres wide and have it run the length of the park. Building such a channel would require the destruction of a sizable number of trees.

- While partially filling in the man-made lakes would retain the familiar appearance the park is known for today, the new shallow depth will influence the ecosystem the lakes can support. Shallow lakes are typically warmer than deeper lakes resulting in a habitat that is poor for supporting fish, poor for swimming and can be expected to support algae.

The proposed solution to partially fill the lakes stems from a desire to preserve the current appearance and recreational amenities of the park.

Can we drill a lower level outlet through the bottom of the dam to help release water?

Unfortunately, this solution is not practical for the following two reasons:

1. The structure of the Colliery Dams consists of old concrete with many cold joints and no reinforcing, all buttressed by uncompacted rubble and fill. Drilling a hole would through this material would destabilize the structures and make them vulnerable to collapse.
2. The dams are required to manage water levels during an extreme weather event. This would normally be handled by the overflow spillway. While having a hole at the bottom of the dam would help keep the water levels low during seasonal periods of heavy rain, an extreme weather event would overwhelm both the low level outlet and the existing spillway. Note: the current spillway is undersized by a factor of 8-10.

Please explain the various solutions that were available to the City.
Build new dams - Given the public safety risks associated with any dam in this location, new dams would need to be built to an 'extreme' consequence classification level. To reduce the probability of failure to as low as reasonably practicable, any new structures would likely need to be constructed entirely of concrete. They would also need to be constructed downstream of the existing structures making them larger. And finally, the existing structures would still need to be removed. To undertake this effort, construction would be extensive, causing considerable disruption to the park. Also, the required regulatory process to build the dams would be long thereby leaving the risk to public safety in place even longer.
Rehabilitation - There are two components that need to be addressed with rehabilitation: the structure needs to be brought to a standard such that it can withstand an 'extreme' earthquake event, and it needs to be able to pass flooding from an extreme weather event. City engineers have a low level of confidence that regulatory approval could be obtained for this option, due to many uncertainties with the existing structures and underlying geology. If a seismic upgrade was feasible to reduce the risk to public life safety low enough, it would result in extensive permanent disruption to the park.
Dam removal - This is the only practical option to remove the risk to public life safety. This option also has the least permanent disruption to the park, and in fact provides for an enhancement to the park. It is true that removing the man-made lakes created by the dams will change the park; however the intent of the project is to move aggressively in replanting and restoring the natural areas left by the lakes' footprints. Initial thoughts include planting various ages of undercover and forest material (hundreds of trees) to get as close to 'nature' as quickly as possible. As well, the City will investigate the ability to incorporate pools and riffles in the restored stream course to provide for fishing and salmon passage.

Economic Issues
What are the long-term and short-term costs of maintaining the dams versus the cost of removing the dams?
The City has ongoing maintenance and repair costs associated with maintaining the dam through its lifecycle. However, these costs are relatively small in comparison to the potential economic loss that could occur should one or both dams fail.

Have all the costs of removing the dams been identified?
The City is working toward finalizing the costs associated with dam removal and building new dams. At this time the total cost of the project has not yet been identified; however estimated figures based on preliminary concepts have been estimated at $11.2 million.

Where is the money to remove the dams coming from - who pays?
The residents of the City of Nanaimo will pay for the removal of the dams. The removal will be financed through short term borrowing over 5 years.

Who is financially responsible for the dams and for any damage that might occur if the dams were breached?
The Dam Safety Regulation makes it very clear that the City of Nanaimo and its residents are responsible and liable for any damage that might occur if the dams were to fail. This includes the direct property costs as well as the cleanup costs.

How will property values be affected for residents and business owners located below the dams?
Removal and replacement of the dams should have no positive or negative impact on the property values of residents and business owners.

Public Involvement and Decision Making

What plans have been made to involve the public?

The City has developed a communication plan which emphasises 1) connecting with all impacted residents, 2) educating members of the public who may be affected in an emergency event and, 3) educating the general public by (originally) discussing the rationale behind the need to remove the current dam structures and (more recently) engaging in a 30-day community dialogue to gather relevant information, hear perspectives and work to build on common interests towards a collaborative outcome on the future of the Middle and Lower Colliery dams.

Has the public been notified?

The public in the immediate area below the dams has been notified and, in the event that there is a dam failure between now and when the dam is removal, provided information on evacuation routes.

What opportunities have been organized by the City to allow community members an opportunity to discuss public safety concerns or matters pertaining to the removal and replacement of the Colliery Dams?

Following Council's October 29, 2012 announcement outlining their decision to remove the Lower and Middle Colliery Dams, the following opportunities to meet with community members have been organized:

- November 5, 2012 - first public information session held at the Nanaimo Aquatics Centre
- November 8, 2012 - second public information session held at the Harewood Activity Centre
- December 6, 2012 - first meeting with the Colliery Dams Preservation Society
- January 28, 2013 - second meeting with the Colliery Dam Preservation Society

In addition to these opportunities, community members have also presented information directly to Council members at the following scheduled meetings:

- November 26, 2012 - Committee of the Whole (go to - 23:40)
  https://new.nanaimo.ca/meetings/VideoPlayer/Index/COW121126V
- December 17, 2012 - Council Meetings (go to - 01:07:50)
  https://new.nanaimo.ca/meetings/VideoPlayer/Index/C121217V
- January 21, 2013 - Committee of the Whole (go to - 01:42:30)
  https://new.nanaimo.ca/meetings/VideoPlayer/Index/COW130121V

Members of Council have also attended the following independently organized meetings held by community members interested in preserving the two lakes located behind the Lower and Upper Colliery Dams.

- November 20, 2012 - first community meeting held at John Barsby Community School
- January 31, 2013 - second community meeting held at John Barsby Community School

Who are the primary local, regional, provincial and federal stakeholders?

The primary stakeholders in the dam removal project are: the Dam Safety Section, the residents of Nanaimo and City Council, along with Provincial and Federal Environmental Agencies and Snuneymuxw First Nation.

How will information on the dam removal and replacement project be communicated to residents?

Prior to and during the removal of the dams, the City will distribute information and updates to residents regarding the dam removal project. Public safely information concerning the immediate risks is also being sent to identified homes and businesses.

Who made the decision to remove and replace the dams?

The Dam Safety Section, Water Management Branch has informed the City that taking no action is not an option. Accordingly, City Council made the decision to remove and replace the dams based on advice from City staff, the Dam Safety Section and two separate engineering firms with expertise in dam safety.

What were the main factors in the decision making process to remove the dams?

The main factors in making the decision to remove the dams were, 1) public safety, and 2) the level of unacceptable risk posed to the public.

Did the City make the decision to remove the dams on account of recent earthquakes along the West Coast of BC?

No. The recent decision to remove the dams was arrived at after several years of building a body of knowledge about the dams, including scientific certainty on the consequences of failure. As reported in May 2010, the dams are unable to withstand an earthquake. More recently, after modelling of various modes of failure, experts determined the risk to public safety, environmental degradation, economic loss and social disruption would be unacceptably high.