

This is the 2<sup>nd</sup> Affidavit  
of Chris Jackson in this case  
and was made on 26/MAY/2015

FILE: 2015-WAT-004

**ENVIRONMENTAL APPEAL BOARD FOR BRITISH COLUMBIA**

**IN THE MATTER OF AN APPEAL UNDER SECTION 92 OF THE *WATER ACT*, R.S.B.C. 1996,  
c. 483**

**BETWEEN:**

**CITY OF NANAIMO**

**APPELLANT**

**AND:**

**COMPTROLLER OF WATER RIGHTS, *WATER ACT***

**RESPONDENT**

**AFFIDAVIT**


I, Chris Jackson, Legislative Services Manager and Corporate Officer of 455 Wallace Street, Nanaimo, BC V9R 5J6, City Manager, SWEAR THAT:

1. I have personal knowledge of the matters hereinafter deposed to save and except where those matters are stated to be based on information and belief, and to such latter matters I verily believe the same to be true.
2. I am the Legislative Services Manager and Corporate Officer for the City of Nanaimo (the "City") and have held this role since November 2013. As such I am responsible for ensuring that the minutes, bylaws and other records of the business of the council and council committees are maintained and kept safe. From October 2012 to November 2013 I was the City's Manager of Community Planning.

3. The City of Nanaimo (the "City") is a municipality under the *Community Charter* and the *Local Government Act*. The City's municipal hall is located at 455 Wallace Street, Nanaimo, BC V9R 5J6.
4. I am swearing this affidavit in support of the City's application for a stay of the order of Glen Davidson, P.Eng., Comptroller of Water Rights (the "Comptroller"), Water Management Branch, Dam Safety Section, Ministry of Forests, Lands and Natural Resource Operations issued on April 29, 2015 (the "April 29 Order"). Attached to this Affidavit and marked as **Exhibit A** is a copy of the April 29 Order.
5. For convenience I am using the same defined terms as I did in my first affidavit made in this proceeding on May 21, 2015.
6. At the special open meeting of Council on April 27, 2015, Council considered an addendum item and received a report providing an update on the Colliery Dams. Council adopted a number of resolutions including one that directed "Staff to engage engineering consultants (Golder Associates, Herold Engineering, GeoStabilization International and/or others) to assist the City in the preparation of engineering designs, costs and timelines to review the remediation options." The minutes for that Council meeting have not yet been adopted. Attached to this Affidavit and marked as **Exhibit B** is a copy of the draft minutes of the April 27, 2015 special open meeting of Council. Attached to this Affidavit and marked as **Exhibit C** is a copy of the addenda item and accompanying staff report considered by Council at the April 27, 2015 special open meeting.

SWORN (OR AFFIRMED) BEFORE ME at  
Nanaimo, British Columbia, on 26 /May/2015.

  
\_\_\_\_\_  
A Commissioner for taking Affidavits for British Columbia  
*Ian Howat*

}   
\_\_\_\_\_  
CHRIS JACKSON



This is Exhibit "A" referred to in the affidavit of CHRIS JACKSON sworn before me at NANAIMO in the Province of British Columbia this 26 day of May A.D. 2015

[Signature]  
A Commissioner for taking Affidavits within British Columbia  
IAN HOWAT

**ORDER**  
Sections 87 and 88  
Water Act of British Columbia

Dam File No.: 76915-20/D720001-00 & D720002-00  
Water Licence File No.: 0355097 & 0355174

**IN THE MATTER OF** Conditional Water Licences C061424 and C061423, held by the City of Nanaimo (the City), which authorize the storage of 75 acre feet of water behind the Middle Chase River Dam (Middle Dam) and 140 acre feet of water behind Lower Chase River Dam (Lower Dam), as part of the Colliery Dam system on Chase River.

**WHEREAS** engineering consultant, Golder Associates (Golder), was retained by the City to be technical advisor to the City's Colliery Dam Technical Committee (TC). The TC's mandate was to identify an environmentally minimally invasive, cost and time effective remediation solution for the Colliery (Middle and Lower) Dam system that meets safety standards, among other things. The mandate also included the development of a permanent solution to be put in place in 2014 if possible, but not later than 2015, with shorter term mitigation put in place, if required, in 2014;

**WHEREAS** the focus was primarily on the remediation of Lower Dam as Golder had determined that Middle and Lower Dams act together as a system, with Lower Dam largely controlling downstream consequences. For this reason, Golder determined that the remediation of Lower Dam would provide greatest reduction in risk to those living downstream of the dams, and remediation of this dam should be given highest priority. Golder indicated, in its report, Dam Remediation Options (August 29, 2014), that the remediation of the Middle Dam would be addressed separately at a later date;

**WHEREAS** Golder undertook a number of studies and produced several reports including their Hydrology, Hydraulics and Middle Dam Breach Analysis (July 25, 2014) which determined that Middle and Lower Dam's spillways both have inadequate flood routing capacity to pass the design flood event which could result in the dams overtopping. The report states (pg i, Executive Summary):

*"These calculations have determined that the spillway for the Middle Dam has the capacity to convey the flows associated with approximately the 50-year (2% annual exceedance probability) rainfall event. Storms larger than the 50-year overtop the dam embankment. The spillway for the Lower Dam has the capacity to convey the flows associated with approximately the 25-year (4% annual exceedance probability) rainfall event. Storms larger than the 25-year overtop the dam embankment."*

**WHEREAS** Golder calculated the existing flood routing capacity of Lower Dam to be 55.0 cubic meters per second (cms), equivalent to a 1 in 25 year flood event;

**WHEREAS** Golder reviewed the failure consequence classification for Lower Dam and concluded that a *very high* classification was appropriate;

**WHEREAS** in Canada, current practice for selection of the design flood event for dam safety is suggested in Table 6-1B in the Canadian Dam Association's (CDA) Dam Safety Guidelines (2013);

**WHEREAS**, with respect to flood routing capacity for Lower Dam, Golder states (pg. 17, Colliery Dams, Nanaimo, BC, Report on Dam Remediation Options, Golder, August 29, 2014):

*"...the risk of dam collapse due to flood events is significant and must be addressed by dam remediation to improve flood routing characteristics of the dam. The required flood routing capacity is given by the Table 6.1 CDA Guidelines, and is based on the Consequence Classification of the dam. For a Very High consequence dam, the dam must be able to pass a flood at least the equivalent of 2/3 of the way between a 1000 year and a PMF flood..."*

**WHEREAS** in accordance with CDA Table 6-1B Golder calculated the design flood event of Lower Dam, a *very high* consequence dam, to be a total peak outflow of 144.0 cms. A total peak outflow of 144.0 cms is 2.6 times greater than the calculated 55.0 cms flood routing capacity of Lower Dam's current spillway;

**WHEREAS** insufficient flood routing capacity is considered a *potential safety hazard* as it may lead to overtopping and possible failure of the dams;

**WHEREAS** the City has completed numerous studies and evaluated several options to address the dam safety issues at Lower Dam and Middle Dam, two of which options for Lower Dam are conceptually acceptable to this office: the (a) labyrinth spillway design and the (b) auxiliary spillway design;

**WHEREAS** on February 25, 2015, under Section 7.1 of the B.C. Dam Safety Regulation, the City was requested to undertake certain steps by no later than March 27, 2015 but did not comply with the requested steps and therefore is not in compliance with the B.C. Dam Safety Regulation, *Water Act*;

**WHEREAS** the City was issued an order on April 9, 2015 to correct the potential safety hazard of Middle Dam and Lower Dam by:

1. Immediately undertaking the necessary steps to increase the flood routing capacity of Lower Dam to 144.0 cms, as calculated by Golder, in order to meet an annual exceedance probability design flood event level that is 2/3 of the way between a 1 in 1000 year flood and the Probable Maximum Flood (PMF) in respect of Lower Dam, by:
  - a. Selecting one of the two following Lower Dam remediation options (as described by Golder) in order to address the potential safety hazard of Lower Dam:
    - i. the Labyrinth Spillway Design (Report on Dam Remediation Options, Golder, August 29, 2014); or
    - ii. the Auxiliary Spillway Design (Auxiliary Spillway - Conceptual Design, Golder, January 16, 2015);
  - b. Notifying this office of the selected option by **May 1, 2015**;
  - c. Preparing and submitting a design report and construction plans, for approval under Section 4 of the B.C. Dam Safety Regulation by **May 22, 2015**;
  - d. Substantially completing the chosen remediation option by **October 15, 2015**; and
2. Once the chosen remediation option for Lower Dam has been completed (as required by Section 1 of this Order), the City must undertake the following actions:
  - a. Prepare and submit to this office by **the end of 2015**, a revised conceptual plan that identifies and prioritizes any actions required to correct the potential safety hazard with Middle Dam, along with a timeline for taking those actions within a reasonably expeditious time frame, timed to follow after completion of actions to correct the potential safety hazard with Lower Dam; and,
  - b. Implement the revised plan, based on the priorities identified in the plan, within a reasonably expeditious time frame **but no later than the end of 2017**, and in accordance with Section 4 of the B.C. Dam Safety Regulation, as applicable to any alteration, improvement or replacement to all or any part of the dam intended to correct a potential safety hazard and which must be implemented in a timely manner.

**WHEREAS**, at the request of the City, this office met with City officials on April 22, 2015 to discuss requirements for a proposal with respect to a possible third option;

**WHEREAS**, on April 28, 2015, the City requested an additional 30 days to retain professional engineering consultants to prepare a proposal with respect to a possible third option which would involve the installation of overtopping protection to these dams, as well as other features, to address the potential safety hazards;

**WHEREAS**, this office is prepared to accede to the request for additional time in order to allow the City to prepare such a proposal for submission to this office.

**NOW THEREFORE, I, Glen Davidson, Comptroller of Water Rights, pursuant to Section 87 and Section 88(1)(d) of the *Water Act*, revoke my April 9, 2015 order and replace it with the following order to the City of Nanaimo, and hereby direct the City to correct the potential safety hazard of Middle Dam and Lower Dam:**

1. By immediately undertaking the necessary steps to increase the flood routing capacity of Lower Dam to 144.0 cms, as calculated by Golder, in order to meet an annual exceedance probability design flood event level that is 2/3 of the way between a 1 in 1000 year flood and the Probable Maximum Flood (PMF) in respect of Lower Dam (the "flood routing capacity"), by:

- a) selecting one of the following Lower Dam remediation options in order to address the potential safety hazard of Lower Dam:
  - i. the labyrinth spillway design (Report on Dam Remediation Options, Golder, August 29, 2014),
  - ii. the auxiliary spillway design (Auxiliary Spillway - Conceptual Design, Golder, January 16, 2015, or
  - iii. an overtopping protection approach which, combined with other features as may be required (together the "overtopping protection approach"), would provide a level of protection comparable to that provided by the other two options, the technical details for which approach to be set out in an acceptable alternative proposal as described in paragraph b), below;
- b) notifying this office of the selected remediation option by **June 1, 2015** and, if proceeding with the overtopping protection approach, the notification must be accompanied by a report from an independent expert, satisfactory to this office, with the following qualifications and experience, in accordance with Section 12 of the BC Dam Safety Regulation:
  - i. in dam design, construction and analysis, and
  - ii. in hydraulic, hydrological, geological, geotechnical and structural engineering, and
  - iii. in the design, construction and performance of overtopping protection alternatives for embankment dams;

The report of the independent expert must confirm the technical feasibility of the proposal to meet the flood routing capacity at Lower Dam and that the proposal meets recognized dam safety guidelines (e.g. CDA Dam Safety Guidelines, 2013), as well as current best practice for the design and construction of overtopping protection for dams (e.g., US FEMA Technical Manual: Overtopping Protection for Dams, 2014);

- c) preparing a design report and construction plans for the selected remediation option and submitting them to this office, for approval under Sections 4 and 7.1 of the BC Dam Safety Regulation by **June 22, 2015**;
- d) substantially completing the selected remediation option by **November 15, 2015**; and

2. The City must undertake the following actions in relation to Middle Dam:

- a) Prepare and submit to this office **by the end of 2015**, a revised conceptual plan that identifies and prioritizes any actions required to correct the potential safety hazard with Middle Dam, along with a timeline for taking those actions within a reasonably expeditious time frame, timed to follow after completion of actions to correct the potential safety hazard with Lower Dam; and,
- b) Implement the revised plan for Middle Dam, based on the priorities identified in the plan, within a reasonably expeditious time frame but **no later than the end of 2017**, and in accordance with Section 4 and 7.1 of the B.C. Dam Safety Regulation, as applicable to any alteration, improvement or replacement to all or any part of the dam intended to correct a potential safety hazard and which must be implemented in a timely manner.

Dated at Victoria, British Columbia this 29th day of April, 2015.



Glen Davidson, P. Eng.  
Comptroller of Water Rights

**MINUTES**  
**SPECIAL OPEN COUNCIL MEETING**  
**SHAW AUDITORIUM, 80 COMMERCIAL STREET, NANAIMO, BC**  
**MONDAY, 2015-APR-27, AT 4:30 P.M.**

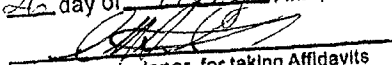
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PRESENT: His Worship Mayor W. B. McKay, Chair

Members: Councillor W. L. Bestwick  
Councillor G. W. Fuller  
Councillor J. Hong  
Councillor J. A. Kipp  
Councillor W. L. Pratt  
Councillor I. W. Thorpe  
Councillor W. M. Yoachim

Absent: Councillor M. D. Brennan

Staff: E. C. Swabey, City Manager  
T. P. Seward, Director of Social & Protective Services  
B. E. Clemens, Director of Finance  
D. Lindsay, Director of Community Development  
G. Goodall, Director of Engineering & Public Works  
P. Cooper, Communications Manager  
D. Stevens, Senior Applications Analyst  
C. Jackson, Manager of Legislative Services  
P. Humphreys, Steno, Legislative Services  
S. Snelgrove, Recording Secretary

This is Exhibit "B" referred to in the  
affidavit of Chris Jackson  
sworn before me at Nanaimo  
in the Province of British Columbia this  
26 day of May A.D., 2015  
  
A Commissioner for taking Affidavits  
within British Columbia

IAN HOWAT

1. CALL THE SPECIAL OPEN MEETING TO ORDER:

The Special Open Meeting was called to order at 4:30 p.m.

2. INTRODUCTION OF LATE ITEMS:

- (a) Add Colliery Dams Update report and delegations Mr. Jeff Solomon and Mr. Leon Cake.

3. ADOPTION OF AGENDA:

03315 It was moved and seconded that the Agenda, as amended, be adopted. The motion carried unanimously.



4. ADMINISTRATION:

(a) Colliery Dams Update

Delegations:

1. Mr. Jeff Solomon spoke regarding the Colliery Dams.
2. Mr. Leon Cake spoke regarding a water pipeline and the Colliery Dams.

03415 It was moved and seconded that Council direct Staff to request that the Comptroller of Water Rights amend his Order of 2015-APR-09 to allow the City additional time to explore a third remediation option for the Colliery Dams as follows:

- (a) submit selected remediation option to the Comptroller by 2015-JUN-01;
- (b) prepare and submit a design report and construction plans for approval under Section 4 of the BC Dam Safety Regulation by 2015-JUN-22; and
- (c) substantially complete chosen remediation by 2015-NOV-15.

The motion carried unanimously.

03515 It was moved and seconded that Council direct Staff to explore a third remediation option that includes hardening the downstream embankment of the Lower Dam and improvements to the Lower Dam as noted in the design presented to Council on 2015-APR-13 (Attachment A). Undertake no upgrades to the Middle Dam at this time. The motion carried unanimously.

03615 It was moved and seconded that Council direct Staff to engage engineering consultants (Golder Associates, Herold Engineering, GeoStabilization International and/or others) to assist the City in the preparation of engineering designs, costs and timelines to review the remediation options. The motion carried.  
Opposed: *Councillor Fuller*

03715 It was moved and seconded that Council allocate up to \$400,000 to undertake work required, up to preparation of tendering contracts to meet timelines noted in Resolution No. 03415. The motion carried unanimously.

03815 It was moved and seconded that Council direct Staff to amend the draft letter dated 2015-APR-28 addressed to Mr. Glen Davidson, Comptroller of Water Rights, re: Middle and Lower Chase River Dams (Colliery Dams) Nanaimo, by adding under section a. iii. *"The design presented has two components (concrete bench berm and accessible ramp) that are not specific to the overtopping design. These elements could be installed as part of this proposal or delayed for consideration at a future date."* As well as adding under section b. *"Notifying this office formally of the selected option, by or before June 1, 2015;"* and send the amended letter to the Office of the Comptroller of Water Rights. The motion carried unanimously.

5. QUESTION PERIOD:

- Mr. Fred Taylor, re: Pipeline, Colliery Dams.
- Mr. Gary Chandler, re: GSI, Dam failure.
- Mr. Leon Cake, re: GSI, Golder Associates.
- Ms. Janet Irvine, re: Colliery Dams Technical Committee.
- Mr. Kevin Storrie, re: Colliery Dams Stay and Appeal.
- Mr. Leon Cake, re: Colliery Dams Technical Committee.
- Ms. Brunie Brunie, re: Colliery Dams.
- Ms. Janet Irvine, re: Colliery Dams Technical Committee.
- Mr. Ron Stead, re: Colliery Dams.

6. ADJOURNMENT:

03915 It was moved and seconded at 7:17 p.m. that the meeting terminate. The motion carried unanimously.

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MAYOR

CERTIFIED CORRECT:

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CORPORATE OFFICER

**ADDENDUM**  
SPECIAL OPEN COUNCIL MEETING  
SHAW AUDITORIUM, 80 COMMERCIAL STREET, NANAIMO, BC  
MONDAY, 2015-APR-27, AT 4:30 P.M.

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3.	<b>ADMINISTRATION:</b>	<b>PAGES</b>
	(a) Add Colliery Dams Update.	2-8

*Purpose: To provides a follow up to the meeting with the Comptroller of Water Rights 2015-APR-22 and the report to Council on 2015-APR-22 and the subsequent motions made by Council regarding this file.*


Delegations:

1. Mr. Jeff Solomon
2. Mr. Leon Cake

Staff Recommendation: That Council direct Staff to:

1. request that the Comptroller of Water Rights amend his Order of 2015-APR-09 to allow the City additional time to explore a third remediation option for the Colliery Dams as follows:
  - (a) submit selected remediation option to the Comptroller by 2015-JUN-01;
  - (b) prepare and submit a design report and construction plans for approval under Section 4 of the BC Dam Safety Regulation by 2015-JUN-22; and
  - (c) substantially complete chosen remediation by 2015-NOV-15.
2. explore a third remediation option that includes hardening the downstream embankment of the Lower Dam and improvements to the Lower Dam as noted in the design presented to Council on 2015-APR-13 (Attachment A). Undertake no upgrades to the Middle Dam at this time.
3. engage engineering consultants (Golder Associates, Herold Engineering, GeoStabilization International and/or others) to assist the City in the preparation of engineering designs, costs and timelines to review the remediation options.
4. allocate up to \$400,000 to undertake work required, up to preparation of tendering contracts to meet timelines noted in 1 above.

This is Exhibit "C" referred to in the affidavit of Chris Jackson sworn before me at Nanaimo in the Province of British Columbia this 26 day of May A.D. 2015

  
A Commissioner for taking Affidavits  
within British Columbia

IAN HOWAT

**City of Nanaimo**  
**REPORT TO COUNCIL**

DATE OF MEETING: 2015-APR-27

AUTHORED BY: TOBY SEWARD, ACTING GENERAL MANAGER  
COMMUNITY DEVELOPMENT & PROTECTIVE SERVICES

RE: COLLIERY DAMS UPDATE

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STAFF RECOMMENDATION:

That Council direct staff to:

1. Request that the Comptroller of Water Rights amend his Order of 2015-APR-09 to allow the City additional time to explore a third remediation option for the Colliery Dams as follows:
  - (a) submit selected remediation option to the Comptroller by 2015-JUN-01;
  - (b) prepare and submit a design report and construction plans for approval under Section 4 of the BC Dam Safety Regulation by 2015-JUN-22; and
  - (c) substantially complete chosen remediation by 2015-NOV-15.
2. Explore a third remediation option that includes hardening the downstream embankment of the Lower Dam and improvements to the Lower Dam as noted in the design presented to Council on 2015-APR-13 (Attachment A). Undertake no upgrades to the Middle Dam at this time.
3. Engage engineering consultants (Golder Associates, Herold Engineering, GeoStabilization International and/or others) to assist the City in the preparation of engineering designs, costs and timelines to review the remediation options.
4. Allocate up to \$400,000 to undertake work required, up to preparation of tendering contracts to meet timelines noted in 1 above.

PURPOSE:

This report provides a follow up to the meeting with the Comptroller of Water Rights 2015-APR-22 and the report to Council on 2015-APR-22 and the subsequent motions made by Council regarding this file.

BACKGROUND:

Correspondence was received 2015-APR-09 from the Comptroller of Water Rights ordering the following:

- "a. Selecting one of the two following Lower Dam remediation options (as described by Golder) in order to address the potential safety hazard of the Lower Dam:
  - i. The Labyrinth Spillway Design (Report on Dam Remediation Options, Golder, 2014-AUG-29); or

Council  
 Committee.....  
 Open Meeting *Spoked*  
 In-Camera Meeting  
Meeting Date: *2015-04-27*

- ii. The Auxiliary Spillway Design (Auxiliary Spillway – Conceptual Design, Golder, 2015-JAN-16)
- b. Notifying this office of the selected option by May 1, 2015;
- c. Preparing and submitting a design report and construction plans, for approval under Section 4 of the B.C. Dam Safety Regulation by May 22, 2015;
- d. Substantially completing the chosen remediation option by October 15, 2015."

***Meeting with Comptroller 2015-APR-22***

On 2015-APR-22, three members of Council, an engineer, and staff met with the Comptroller of Water Rights and Dam Safety Section staff to request an amendment to the 2015-APR-09 Order from the Comptroller. At the meeting, the City made a presentation to the Comptroller outlining a design concept the City wished to consider as a third option to remediate the Colliery Dams. During the meeting, it was decided to modify the proposal as presented to explore a third remediation option that included hardening the downstream embankment of the Lower Dam and improvements to the Lower Dam as noted in the design presented to Council 2015-APR-13. The design presented has two components (concrete bench berm and accessible ramp) that are not specific to the overtopping design. These elements could be installed as part of this proposal or delayed for consideration at a future date. Also, it was decided not to undertake upgrades to the Middle Dam at this time.

The Comptroller advised he would consider the request for amendment that would include extensions to the timelines noted in his 2015-APR-09 Order, and he requested that the City provide the request for amendment to his Order in writing. Attached to this Order (Attachment B) is a draft of a letter requesting the amendment. Staff recommends sending this correspondence to the Comptroller 2015-APR-28 to support the request for an amendment. The Comptroller advised that he would consider the request for amendment immediately, plus also suggested that the City continue with the dual process of applying for an appeal and stay with the Environmental Appeal Board (EAB), to allow the parallel processes to proceed at the same time.

***Council Meeting 2015-APR-22***

At its meeting of 2015-APR-22, Council endorsed recommendations to continue with the appeal and stay request to the EAB, for legal counsel to engage the services of engineers to prepare the appeal and the stay, meet with the Comptroller of Water Rights (already completed), and to return to Council prior to 2015-MAY-01 to advise Council on the Comptroller's response and the next steps required after receipt of the Comptroller's response.

***Request for Amendment/Apply for Appeal and Stay of Comptroller's Order***

As noted above, staff has prepared a request for an amendment to the Comptroller's Order. This amendment includes consideration of a third option and extended timeline, noted in the recommendation, to submit selected remediation options to the Comptroller by 2015-JUN-01; submission of a design report and construction plans by 2015-JUN-22 and substantial completion of the chosen remediation option by 2015-NOV-15.

As directed by Council, staff continues to work with the City solicitor to prepare for submission of an appeal and stay to the EAB, which may not be required if the City is successful in achieving an amendment of the Comptroller's Order and, at a later date, receiving acceptance of the remediation option proposed. Continuing with the appeal and stay application could be stopped; however, if the process of selecting a remediation option, submitting design drawings, and completing construction prior to 2015-NOV-15 is not successful, the appeal and stay would

be the City's fallback position. Filing an appeal and stay has to commence in 30 days, and therefore cannot be done later.

## DISCUSSION

Provided the Comptroller accepts the amendment to his 2015-APR-09 Order, as documented in the staff recommendation, there is a substantial amount of work needed to be undertaken to provide information to Council to assist in selecting a remediation option by 2015-JUN-01, and to prepare a design report and construction plan for the selected remediation option by 2015-JUN-22. These initial steps include preparation of design, permits, and referrals. Once the remediation option has been selected and design information has been generated, staff will return to Council seeking direction on tendering/sole-sourcing of the work to be undertaken.

Following is a list of key items for consideration:

### **1. *Engineering Consultants***

In order to assist the City in preparation of engineering designs, costs, and timelines to review the remediation options, including development of the proposed overtopping option, the City needs to engage a number of engineering consultants to prepare the information needed for submission to the Comptroller. This will include further engaging Golder Associates to address dam engineering issues, Herold Engineering to address structural design issues, GeoStabilization International (GSI) (or alternate) to address hardening of the dam embankment, and others as needed to complete the designs, costs, and permitting process for the remediation. Discussions have taken place with GSI to determine if they would undertake the overall dam engineering component of the designs, however, they advise that they are experts in soil erosion solutions/embankment stabilization and therefore are not in a position to be the lead consultant for completion of the dam engineering.

### **2. *Costs Estimates***

The initial estimates to undertake engineering work to prepare information to assist in the selection of a remediation option by 2015-JUN-01 is \$30,000-\$60,000. For full preparation of design drawings and specifications that could be used for tendering/sole sourcing is estimated at approximately 10% of the overall construction cost. As design specifications and associated costs have not been developed for the overtopping option, the range of costs has been estimated at \$3.0-\$7.0 million, with corresponding engineering costs between \$300,000 and \$700,000. Initially, the cost of engineering services is estimated for budgeting purposes at \$400,000.

Costs for the Auxiliary Spillway are estimated at \$3.0-\$6.0 million (which will be further reviewed by 2015-JUN-01) and for the Labyrinth Spillway at \$8.1 million.

The estimated legal fees for preparation for the appeal and stay are \$25,000-\$40,000.

### **3. *Middle Dam***

In Golder's analysis of the Lower and Middle Dams, it has been determined that the priority is for remediation of the Lower Dam, as once the spillway capacity deficiency has been addressed, it is more likely that it would withstand a failure of the Middle Dam during a severe storm event. Given this information, the first priority is to address the Lower Dam spillway capacity deficiency. Work on the Middle Dam is not proposed in

2015. The spillway capacity of the Middle Dam is also undersized to handle a severe storm event; however, it is not considered as significant a hazard as the Lower Dam. City staff are recommending proceeding with addressing the Lower Dam and evaluating improvements to the Middle Dam by 2017 as outlined in the Comptroller's Order dated 2015-APR-09, as well as reserving funds in the 2017 budget in case there is a necessity to upgrade the Middle Dam in the future.

#### 4. **Budget**

In 2014, Council directed staff to allocate \$2.5 million from reserves (2012 surplus) to the Colliery Dams project. Up until the Colliery Dams Technical Committee was established in October 2013, approximately \$1 million was spent on costs for the project. Costs from October 2013 to date are approximately \$1.35 million; therefore, \$2.35 million of the \$2.5 million originally reserved for the project has now been spent.

Currently, no funds for expenditures for further investigations or dam remediation are budgeted. Staff provided a report to Council on 2013-NOV-18 outlining possible funding sources for remediation of the Colliery Dams. In that report, staff advised that Council has a number of tools available to finance the proposed remediation works. These tools are likely to include a combination of some of the following options:

- (a) Current general revenue taxation (2016-2020 Financial Plan)
- (b) Reserve and reserve from balances
- (c) Short-term borrowing
- (d) Long-term borrowing (elector assent)

Once Council direction is provided regarding the preferred remediation option, a more detailed estimate of the required budget will be determined and a review of the funding options, noted above, will be provided to Council for consideration.

#### 5. **Schedule**

The dates proposed in the request for an amendment to the Comptroller's Order make it extremely difficult or impossible to complete the works in 2015. A review of the requested dates in the amendment is as follows:

- (a) Select option by 2015-JUN-01. This date is achievable; however, a considerable amount of work is required to assist staff in preparing a report for Council's consideration of remediation options prior to 2015-JUN-01.
- (b) Submit design report and construction plans by 2015-JUN-22. This date is difficult to achieve, as usually design preparation will take 2-4 months. Staff will work with engineers to advance design drawings as far as possible for submission by 2015-JUN-22.
- (c) Complete remediation by 2015-NOV-15. Completion of work by this date is very difficult to achieve, as design, permitting, referrals, tendering, and construction are dependent on multiple issues, such as engineers'/contractors' availability, unknown site conditions, permit approvals, weather, etc. Methods to expedite the process, including sole-sourcing/selecting bidders, concurrent phases, fast tracking design, etc. as all may contribute to speeding up the process, although these processes are often more costly.

**6. *Snuneymuxw First Nation (SFN)***

The Dam Safety Section has also advised that they would be seeking SFN input in the referral process that would take place during the application approval of various permits needed prior to undertaking the work.

The SFN has been involved throughout the review process. City staff continues to update SFN staff regarding the current status of the Colliery Dam review process. Once further direction is received from City Council, City staff will further review the direction with SFN.

**7. *Permits***

Permits will likely be required to address environmental, archaeological, fishery, water management, and other issues that may arise depending on the option chosen. City staff will also be involved in permitting any tree removal required.

Respectfully submitted,



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TOBY SEWARD  
ACTING GENERAL MANAGER  
COMMUNITY DEVELOPMENT & PROTECTIVE SERVICES

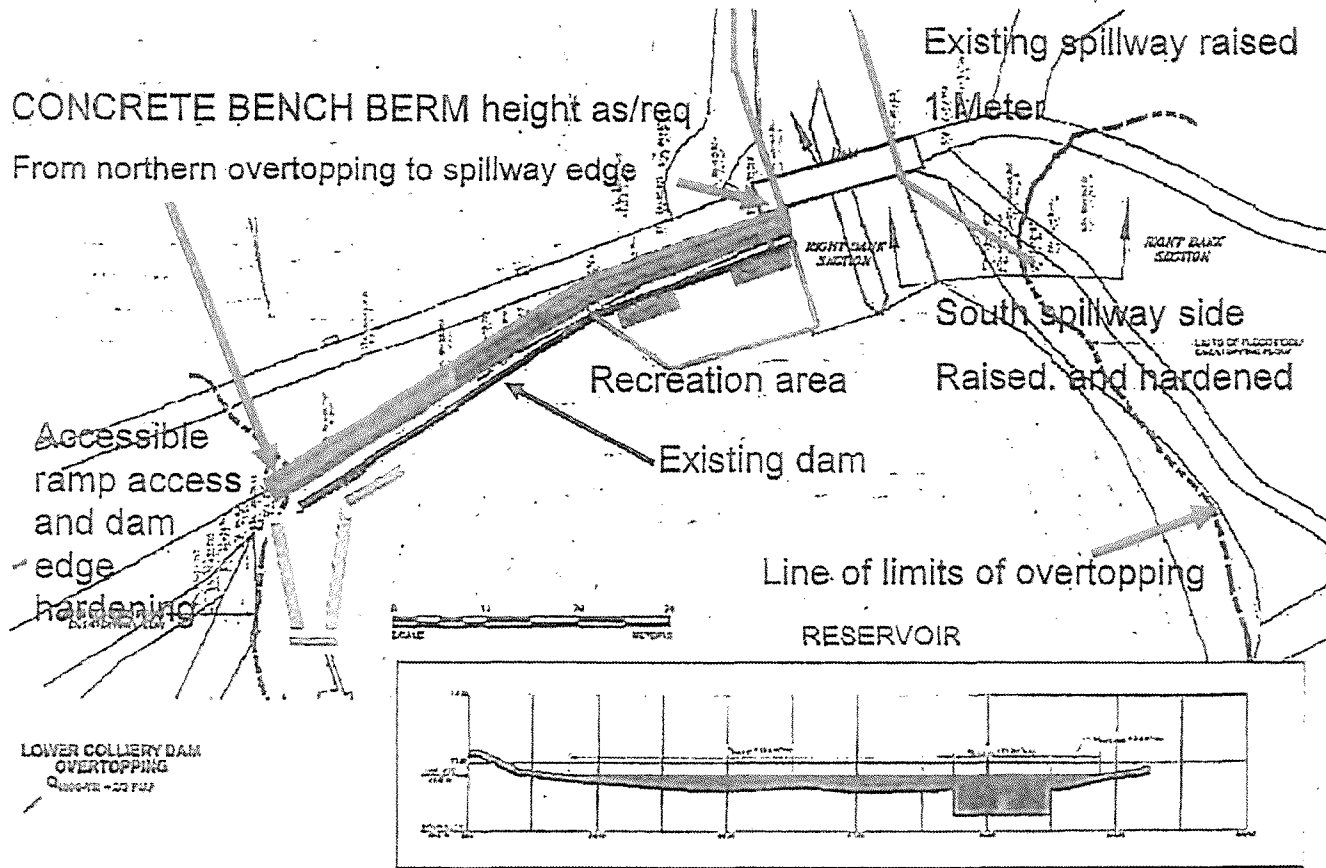
CITY MANAGER COMMENT:

I concur with the staff recommendation.

Drafted: 2015-APR-22  
G:/2015 Files/Colliery Dam Park/Reports/2015-APR-27 Colliery Dams Update  
TS/hp/kb



# Hardening, Stabilization and Beautification



7

## ATTACHMENT B

2015-APR-28

Province of British Columbia  
Ministry of Forests, Lands & Natural Resource Operations  
Office of the Comptroller of Water Rights  
Water Management Branch  
P.O. Box 9340 Stn Prov Govt  
VICTORIA, BC V9W 9M1

**DRAFT**

ATTENTION: Mr. Glen Davidson, P. Eng., Comptroller of Water Rights

Dear Mr. Davidson:

**RE: MIDDLE AND LOWER CHASE RIVER DAMS (COLLIERY DAMS) NANAIMO**

Thank you for meeting with City representatives 2015-APR-22 regarding the City's request for amendments to your Order regarding the Colliery Dams dated 2015-APR-09.

At its meeting 2015-APR-27, Council directed staff to seek an amendment to the Order as follows:

- a. Selecting one of the three following Lower Dam remediation options (Items i and ii as described by Golder) in order to address the potential safety hazard of the Lower Dam:
  - i. the Labyrinth Spillway Design (Report on Dam Remediation Options, Golder, August 29, 2014);
  - ii. the Auxiliary Spillway Design (Auxiliary Spillway – Conceptual Design, Golder, January 16, 2015); or
  - iii. the Overtopping option (as presented at the City's meeting with you April 22, 2015, which includes hardening of the Lower Colliery Dam embankment and improvements to the Lower Colliery Dam spillway and dam as per sketch labeled as Attachment A).
- b. Notifying this office of the selected option by June 1, 2015;
- c. Preparing and submitting a design report and construction plans, for approval under Section 4 of the B.C. Dam Safety Regulation by June 22, 2015;
- d. Substantially completing the chosen remediation option by November 15, 2015.

Please advise if you will amend the Order as requested above.

Sincerely,

Ted Swabey  
City Manager

TSS/kb

cc: Toby Seward, Acting General Manager of Community Development & Protective Services  
Ian Howat, General Manager of Corporate Services  
Tom Hickey, General Manager of Community Services