Public Council Agenda

5:00 PM - Thursday, May 16, 2024
Council Chambers
Zoom Registration

1. Call to Order and Purpose of Meeting

a) Public Notice regarding Recording of Meetings 3

Recorded Meetings - Notice to Public

2. Chair's Opening Remarks

3. Traditional Land Acknowledgement

We begin this gathering by acknowledging and celebrating these traditional lands as a gathering place of the first peoples and their ancestors who are entrusted to care for Mother Earth since time immemorial. We do so respecting both the land and the Indigenous People who continue to walk with us through this world. Today, the Township of North Frontenac is committed to working with Indigenous Peoples and all residents to pursue a united path of reconciliation.

4. Approval of Agenda

a) Approval of the Agenda for the May 16, 2024 Public Meeting

Be It Resolved That Council approves the Agenda for the Public Meeting dated May 16, 2024 regarding the Hill's Lake culvert, as circulated.

5. Disclosure of Pecuniary Interest and General Nature Thereof

6. Presentation

a) Jewell Engineering re: Hill's Lake Culvert 4 - 25

Be It Resolved That Council receives for information a presentation from Bryon Keene, Jewell Engineering regarding the Hill's Lake Culvert and thanks him for his time spent today;
And That Council instructs the Public Works Manager to provide a report at a future meeting with recommendations for Council's consideration.

Presentation Buckshot Lake Road Culvert Replacement
Buckshot Lake Road Culvert Hydraulic Review 2024

7. Public Comments

8. Adjournment

a) Adjournment of the Meeting

Be It Resolved That Council adjourns the Public Meeting at _____

.m

Please be advised North Frontenac Council Meetings are recorded. By attending a public meeting of Council, you are consenting to your image, voice and comments being recorded.

The Chair and/or the Clerk have the discretion and authority at any time to direct the termination or interruption of the recording. Such direction will only be given in exceptional circumstances where deemed relevant. Circumstances may include instances where the content of debate is considered misleading, defamatory or potentially inappropriate to be published.

The Township shall not be responsible should technical difficulties prevent the recording of any meeting, or a portion thereof. Technical issues may include but are not limited to the availability of the internet connection, device failure or malfunction, unavailability of social media platforms or power outages. It should be noted that no protection is afforded to Council Members, Employees or the public for comments made during Meetings which are subsequently challenged in a court of law and/or determined to be defamatory.

Notice is hereby provided that under the authority of the Municipal Act, 2001 and in accordance with the Municipal Freedom of Information and Privacy Act (MFIPPA), that all information provided for at a public meeting or other public process are considered a public record.

Members of Council, Staff, Delegates and attendees should be mindful of using names of individuals or entities when discussing matters in public. Attendees are advised that they may be subject to legal action if their actions result in inappropriate and/or unacceptable behaviour or comments.

CULVERT ENGINEERING REVIEW

6253 BUCKSHOT LAKE ROAD

REPORT TO COUNCIL MAY 16, 2024

JEWELL ENGINEERING

Project Location

Project Description

Failed Culvert at 6253 Buckshot Lake Road

- Outlet of Hills Lake
- 800mm Corrugated Steel Pipe
- Candidate for “Like for Like” replacement

JEWELL ENGINEERING

Concern

Lake Residents are concerned with the water levels on Hills Lake

- Some concerned it is too low
- Some concerned it is too high
  - Summer levels – too low
  - Extreme flows – too high

Project Goals

Determine a replacement configuration that:

- Improves (raises) summer normal water level
- Provides benefit (reduces flooding) during extreme flow

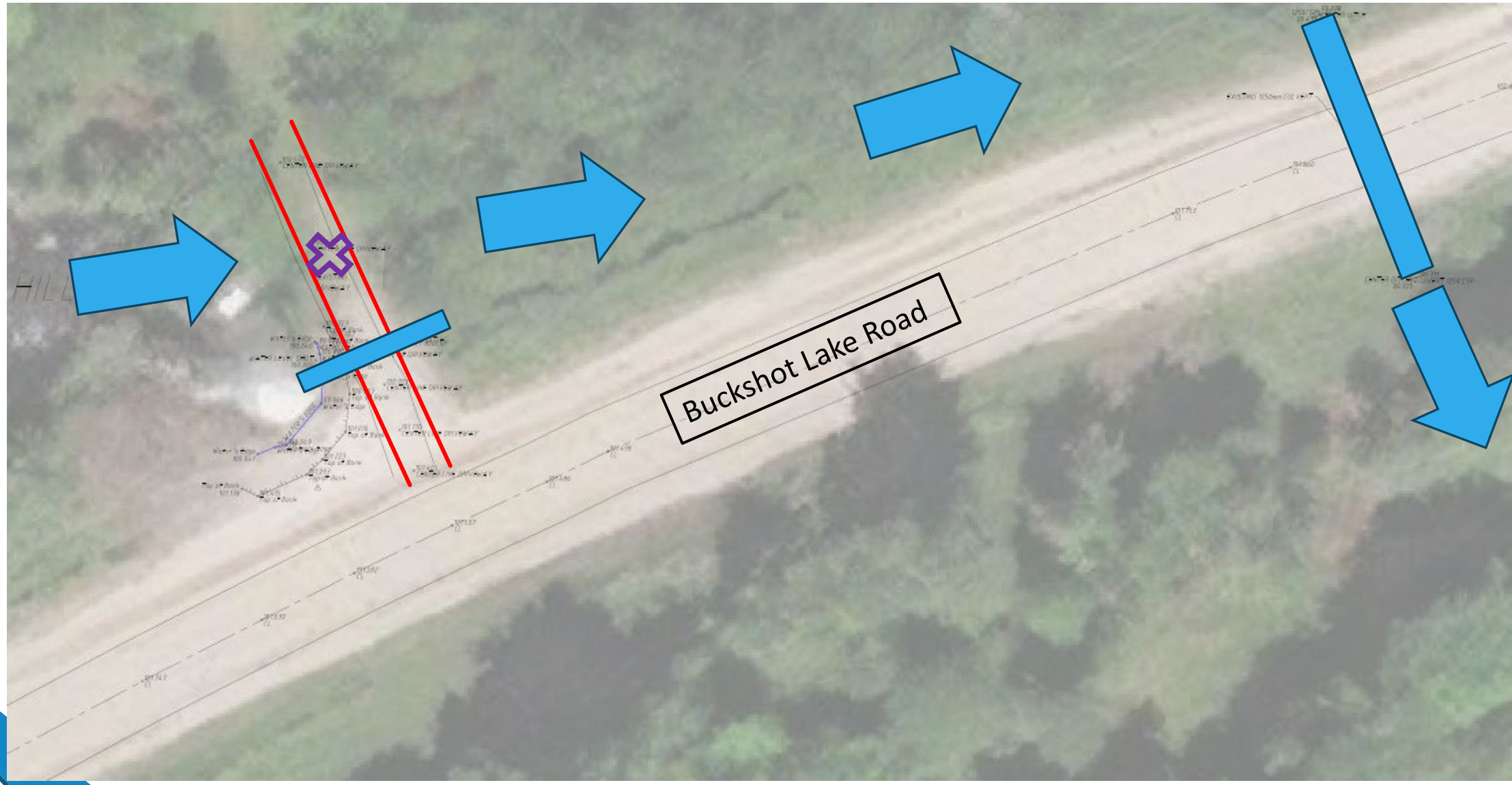
Survey

Topographic survey completed at the culvert and various properties around the lake September 2023.

Lake Level used as baseline

Survey

High Flows



Design Constraint

Determine a replacement configuration that:

- Improves (raises) summer normal water level
- Provides benefit (reduces flooding) during extreme flow
  - Safe Access – Private Driveway

Analysis Results

1. Low flows controlled by driveway culvert
2. High flows controlled mostly by cross culvert
3. Spill point in driveway is only 0.5m (18”) higher than water level
4. Very little opportunity to change water level

JEWELL ENGINEERING

Proposed Culvert Arrangement

Three – 600mm culverts

Proposed Arrangement

Proposed Culvert Arrangement

Three – 600mm culverts

- Raised 15cm (6”) above existing
- Least cover permissible (12”)
- Higher flow capacity before water spills

Maximum size that can fit without raising the driveway

Cannot raise the driveway – acts as a *dam*

Permits

Ministry of Natural Resources

- Agree the culverts and driveway - *dam*
- But, too minor to require a permit

Mississippi Valley Conservation Authority

- Requires a permit
- Content with the engineering

SUMMARY

- Proposed culverts will:
- Raise summer water levels as much as 6”
- Not increase flooding
  - minor flow improvement at private crossing
  - But, municipal cross culvert governs during high flows
- Access maintained for private crossing

JEWELL ENGINEERING

Questions

Uncertainties

Driveway culvert mostly missing during survey – could not verify the bottom elevation of upstream side.

New culvert will be 6” above the lake level at time of survey

Original 800mm culvert would have been lower due to larger size

Elevations

Lake Level	100.0m
800mm dwn invert	99.29m
Low point dwy	100.5m
Cross Culvert invert	99.48m
Cross Culvert size	1200mm – 1250mm
New Culverts invert	100.15m

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May 9, 2024

Township of North Frontenac
6648 Road 506
Plevna, ON
K0H 2M0

Attn: Darwin Sproule, P.Eng.
Public Works Manager

Re: Township of North Frontenac
RFQ No. 2023-26
Buckshot Lake Road Culvert Replacement
Our File 230-5280

Dear Mr. Sproule,

As requested by the Township of North Frontenac, Jewell completed a scoped hydraulic review of the failed 800mm CSP driveway culvert at 6253 Buckshot Lake Road that controls the outlet of Hills Lake.

The scope of the review was to investigate replacement options for the failed culvert such that the normal water level of Hills Lake could be controlled higher and that the extreme high-water level would not be increased.

The existing culvert has collapsed on the west side and at the time of our site visit a small 300mm culvert had been placed within the driveway in an attempt to provide some discharge capability from the lake. The downstream side of the 800mm culvert is still visible.

All flows leaving Hills Lake exit through this driveway culvert and follow the north side of Buckshot Lake Road flowing easterly to the next cross-culvert, which was measured as a 1250mm CSP. This second culvert is much larger than the driveway culvert, but it is placed relatively high such that it would cause water to back up through the driveway culvert and to Hills Lake.

The failed driveway culvert provides summer lake level control and the original plan to replace the culvert would have been to maintain the existing flow conditions. That is the summer level and extreme high

levels would be unchanged. This was not favourable to the community.

Jewell completed a topographic survey in September of 2023 using total station survey equipment. We were unable to acquire GPS signal and therefore the elevations we collected were based on an assumed 100m elevation for the lake level at the time of the visit.

The Concerns

Residents around the lake have expressed concerns that the water level is too high and that the water level is too low.

These concerns are interpreted as some residents would like to see the normal summer water levels to be maintained higher. Other residents are negatively affected by lake levels when they are at their highest.

It is also understood that the outlet through the private driveway is blocked by beaver requiring frequent maintenance by the municipal staff. Also the outlet may be frequently adjusted using boards by residents wanting the water levels increased or decreased.

The replacement of the failed culvert provides some opportunity to seek to alleviate some of the concerns.

Low Flows

During low flow conditions, the driveway culvert will maintain a minimum water level in Hills Lake. The invert (bottom) of the upstream side of the driveway culvert maintains the minimum lake level. If the bottom of the culvert is raised, the normal lake level would also be raised.

High Flows

During high flow conditions, water would leave the lake through the culvert until the culvert capacity was exceeded, then it would crest up and flow over the private driveway (that acts like a dam). But, since the water downstream is held back in the ditch by the configuration of the downstream cross culvert, the cross culvert takes over the control of the lake during extremely high flow conditions.

This means that the size and elevation of the private driveway culvert is less of an influence during high flow conditions.

Opportunities

Jewell reviewed opportunities to raise the normal lake level and still maintain the high lake level such that during extreme high lake levels there would be no increase in water level.

Given the downstream cross culvert controls the lake during high flows, there is no configuration that can be changed to reduce the lake level except lower the private driveway. Since the private driveway is frequently overtopped any lowering would negatively affect the use of the driveway and this solution is not preferred.

Given that the driveway is so low, any raising of the driveway would also raise the "damming" effect and cause more flooding. Any proposal that would include raising the driveway is not an acceptable solution.

There must be a minimum of 0.3m of gravel over the culvert(s) in order to protect the culverts from being crushed. So, raising the culverts is limited by the elevation of the top of the driveway. Lowering the driveway as part of any solution would push the culverts lower and consequently, the lake level lower.

The driveway then, cannot be raised or lowered as part of any solution.

Instead, various culvert configurations were reviewed and an optimal configuration was found using three 600mm culverts. This allowed a modest increase of 0.15m in lake level during normal conditions, but provided a slightly improved capacity during high flow conditions.

Preferred solution – three 600mm culverts placed at 100.15m (0.15m higher than the lake level at the time of our survey).

Permitting

The conservation authority and the Ministry of Natural Resources have permitting roles regarding work around the waterway.

Mississippi Valley Conservation Authority requires a permit pursuant to their regulatory role under the Conservation Authorities Act. Jewell met with representatives of MVCA to discuss the project and their concerns were that **no increase in flooding** be created by the culvert replacement. They were also concerned about the potential that the culverts and driveway could be a *dam* under the Lakes and Rivers Improvement Act. This is administered by MNRF.

Jewell met with MNRF representatives who reviewed the existing conditions as well as the proposed solution and they agreed that the outlet (driveway and culverts) meet the definition of a *dam* under the Act. However, they also explained that the Act has exceptions for small dams or small contributing areas and the subject crossing is exempted from requiring a permit. MNRF was satisfied that the proposal to replace the failed culvert with three 600mm culverts set 0.15m higher than the existing would not trigger permission from MNRF. This correspondence was relayed to municipal staff and MVCA.

Thus, only the MVCA permit is required.

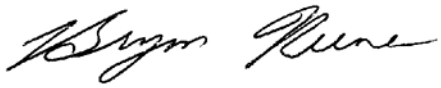
Summary

The driveway culvert is failed and must be replaced. The concerns noted by residents regarding summer water levels too low and flooding during high flow conditions were considered in the replacement design.

A preferred solution is to replace the failed culvert with three 600mm culverts set slightly higher than the original culvert. This will maintain summer water levels approximately 0.15m (6 inches) higher and have no impact on flooding levels.

A permit will be required from MVCA and they have indicated willingness to issue a permit for the preferred solution presented.

Sincerely,



Bryon Keene, P.Eng.
Jewell Engineering Inc.

BUCKSHOT LAKE ROAD CULVERT HYDRAULIC REVIEW 2023 NOV 16