Our File: 2231-37011-01

TECHNICAL MEMO

To:	From
Attn: Halyna Tataryn, P.Eng. **British Columbia Ferry Services Inc.**	Mathew MacDonald, P.Eng. McElhanney Ltd.
Re	**Date**
Gabriola Island Ferry Terminal Water and Sanitary Assessment	January 09, 2020

ISSUED AS DRAFT

1. Introduction

McElhanney Ltd (McElhanney) was retained by British Columbia Ferry Services Inc. (BCF) to complete an assessment of the water and wastewater systems that currently service the ferry terminal in Descanso Bay on Gabriola Island. The assessment includes the feasibility of alternative wastewater systems and a recommendation on future operations.

2. Background

BCF submitted an application to Islands Trust to amend the Official Community Plan (OCP) and Land Use Bylaw (LUB) to permit redevelopment of the Descanso Bay BCF terminal. Included in the application were two memoranda related to the potable water and wastewater considerations of the BCF development. The memoranda are titled *Potable Water Consideration* and *Wastewater Considerations*, both are dated January 7, 2019 and authored by Tomasz Zolyniak of Stantec Inc. Both memoranda are included in the LUB amendment application.

Gabriola Island Local Trust Committee held a regular meeting on July 11, 2019 where the BCF application was reviewed by the committee and a decision rendered. Concern about the current water agreement was raised at the meeting and the following motions relevant to the water and wastewater systems were carried:

> **"GB-2019-068**
>
> **It was MOVED and SECONDED**
>
> that the Gabriola Island Local Trust Committee requests the applicant for GB-RZ-2019.1 (BC Ferries) to provide planning Staff with:

a) a copy of the approved water licence to service the proposed terminal redevelopment site;

b) details on the rights-of-way required to secure easements for any necessary water lines to provide water to the proposed terminal redevelopment site;

⋮

d) a copy of an assessment report and recommendations prepared by a qualified professional engineer, with expertise in wastewater treatment for non-domestic systems;

⋮

CARRIED”

3. Potable Water System

3.1. EXISTING POTABLE WATER SYSTEM

Operating Permit

The existing water systems that supplies the Descanso Bay Ferry Terminal with potable water is called the Fiddlehead Spring Water System (FSWS). The FSWS is permitted by Vancouver Island Health Authority (VIHA) to operate a potable water system with up to 14 service connections. A copy of the ‘Permit to Operate’ is attached to this memo.

The FSWS is required to operate in accordance with the Drinking Water Protection Act and in accordance with the conditions of the operating permit. Routine testing and inspections are required to be carried out by the water system operator and reported to VIHA to remain in compliance with the operating permit.

Water License

The water source for the FSWS is Fiddlehead Spring. A copy of the Fiddlehead Spring water license and plan is attached to this memo. The water license and plan describe the specific lands on which the water is licensed to be used.

Distribution System & Easements

The distribution system consists of a 50mm PVC watermain originating from the reservoir located near 440 North Road and continues west across the adjacent property, Lot 5 of Plan 32840, then continues along North Road towards the BCF terminal. The watermain crosses Easthom Road near the intersection of North Road, then continues through the BCF Lot A property before entering an easement over 340 Easthom Road. Refer to Figure 1 for a map of the approximate location of the watermain and service connection.

An easement exists for the portion of watermain that crosses Lot 5 of Plan 32840, a copy of the plan is attached to this memo. An easement is not required for the portion of watermain along North Road as it is a public highway.

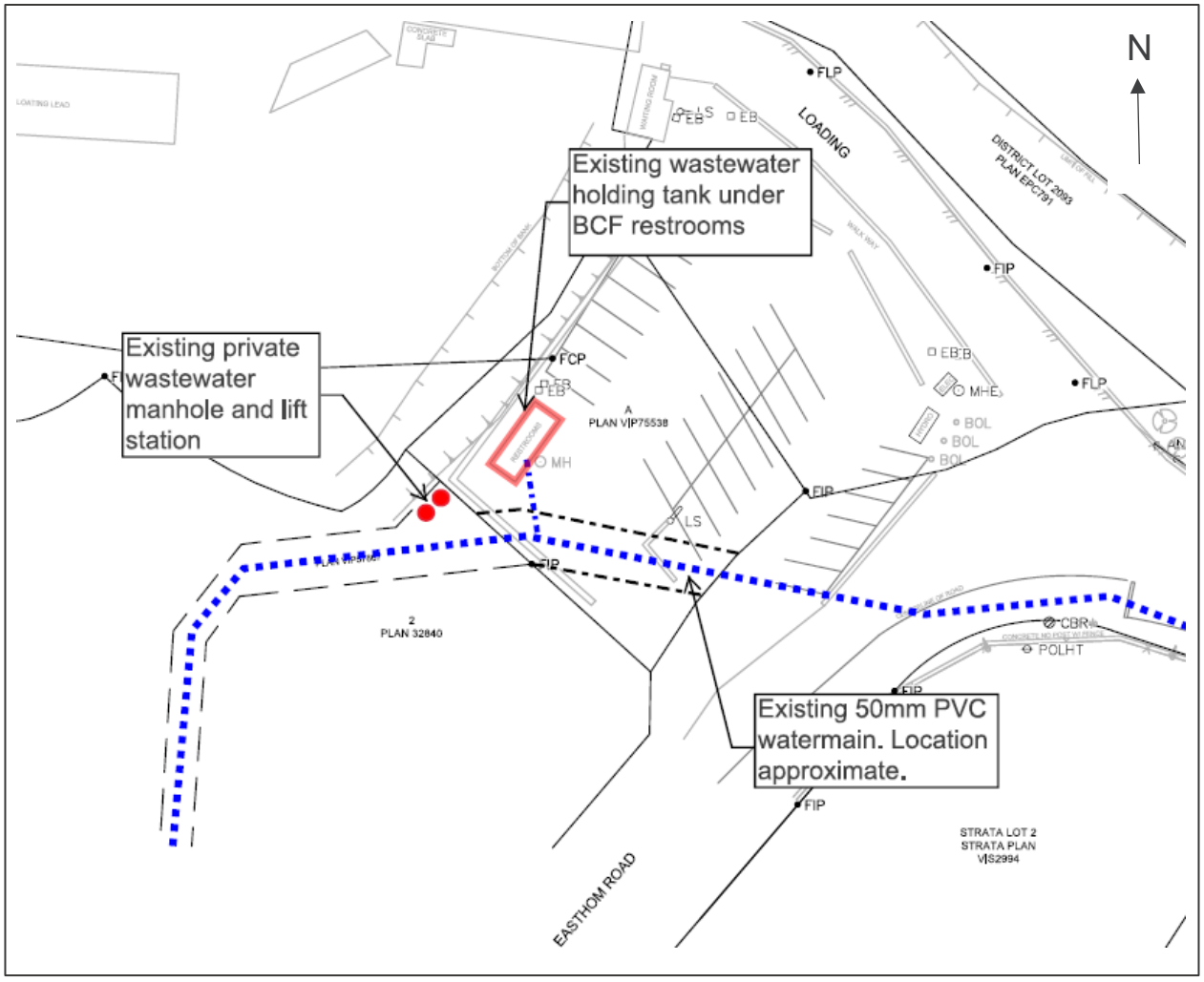


Figure 1 Existing Servicing

3.2. WATER SYSTEM OPTIONS

The Stantec Potable Water memorandum presents and discusses three options for supplying potable water to the redeveloped BCF terminal site. The three options presented are:

1. Existing Water Supply – Continue to purchase water from the FSWS
2. Other Existing Well – Acquire water from other nearby sources
3. New Water Well Onsite – Procure, permit and operate their own potable water source and system

The preferred option recommended by Stantec is to continue sourcing water from the FSWS.

3.3. WATER SYSTEM DISCUSSION

Option 1: Existing Water Supply

The existing potable water supply is operating with a valid water license and operating permit. The most recent inspection report from May 2019 and filed with the Vancouver Island Health Authority assess the water system with a hazard rating of Low. A rating of Low is defined as:

> "The water system was found to be in general compliance with the Drinking Water Protection Act and Regulation. No significant problems or presence of hazards were identified."

A hazard rating of Low is the best rating available.

Option 2: Other Existing Well

A well database search shows 12 wells within 500 m of the ferry terminal. Connecting to an existing well would require:

- An operating permit;
- A water license;
- Routine inspection, operations and maintenance; and
- Infrastructure; treatment, reservoir, and distribution piping.

In searching available public information, no operating permits or water license were found for the nearby wells.

Option 3: New Water Well Onsite

Developing a new water well on the site has three important considerations:

1. *Proximity to wastewater infrastructure*
   The Public Health Act, Sewerage System Regulation requires water well to be a minimum distance of 15m from a holding tank and 30m from a sewerage system. Locating a well on site will be restricted by the wastewater infrastructure and where it is located on site. If in-ground sewage disposal is pursued an on-site well is not likely feasible.

2. *Water quality and quantity*
   The quality and quantity of water from an onsite well is not known and can only be confirmed with certainty through further site investigations.

3. *Site infrastructure*
   An onsite well would require a site footprint of approximately 20m^2 for the well, pressure tank, shed, and reservoir.

An opinion on the feasibility of developing an onsite well is provided as an attachment to this memo and is titled; *Gabriola Island Terminal: On-site Groundwater Supply Source Feasibility Assessment.*

The high-level costs to develop an on-site well, treatment plant and storage is $50,000 to $100,000. In addition to the capital infrastructure a permitted and licensed groundwater well requires routine maintenance, testing and inspections. The operating cost is estimated at $50,000 to $100,000 range assuming a part-time operator.

4. Wastewater System

4.1. EXISTING WASTEWATER SYSTEM

BCF currently stores wastewater generated from the restroom facilities in an underground 1,000 US gallon tank. The tank is emptied regularly as required and hauled away for off-site disposal at an approved facility.

4.2. WASTEWATER SYSTEM OPTIONS

The Stantec wastewater memorandum presents and discusses three options for supplying potable water to the redeveloped BCF terminal. The three options presented are:

1. In-ground disposal
2. Marine disposal
3. Pump for off-site disposal

The option recommended by Stantec is to store wastewater in an on-site storage tank and pump out and haul off-site for disposal, similar to the current operation.

An option that is not discussed in the Stantec memorandum is to connect to the existing, privately owned and operated wastewater collection and disposal system that services the surrounding properties as shown in Figure 2.

The owner of the FSWS is the same owner as the private wastewater collection and disposal system.

This system is a mixture of gravity drain and force main. A chamber and lift station pump are located on the property adjacent to Lot A. From there wastewater is pumped to the south to a disposal site. The infrastructure, capacity and operational details of the system are not known.

An assessment of the wastewater options and recommendations, prepared by a qualified professional engineer with expertise in wastewater treatment for non-domestic systems, is provided as an attachment to this memo and is titled; *Gabriola Island Terminal: Wastewater Management Options – Feasibility Assessment.*

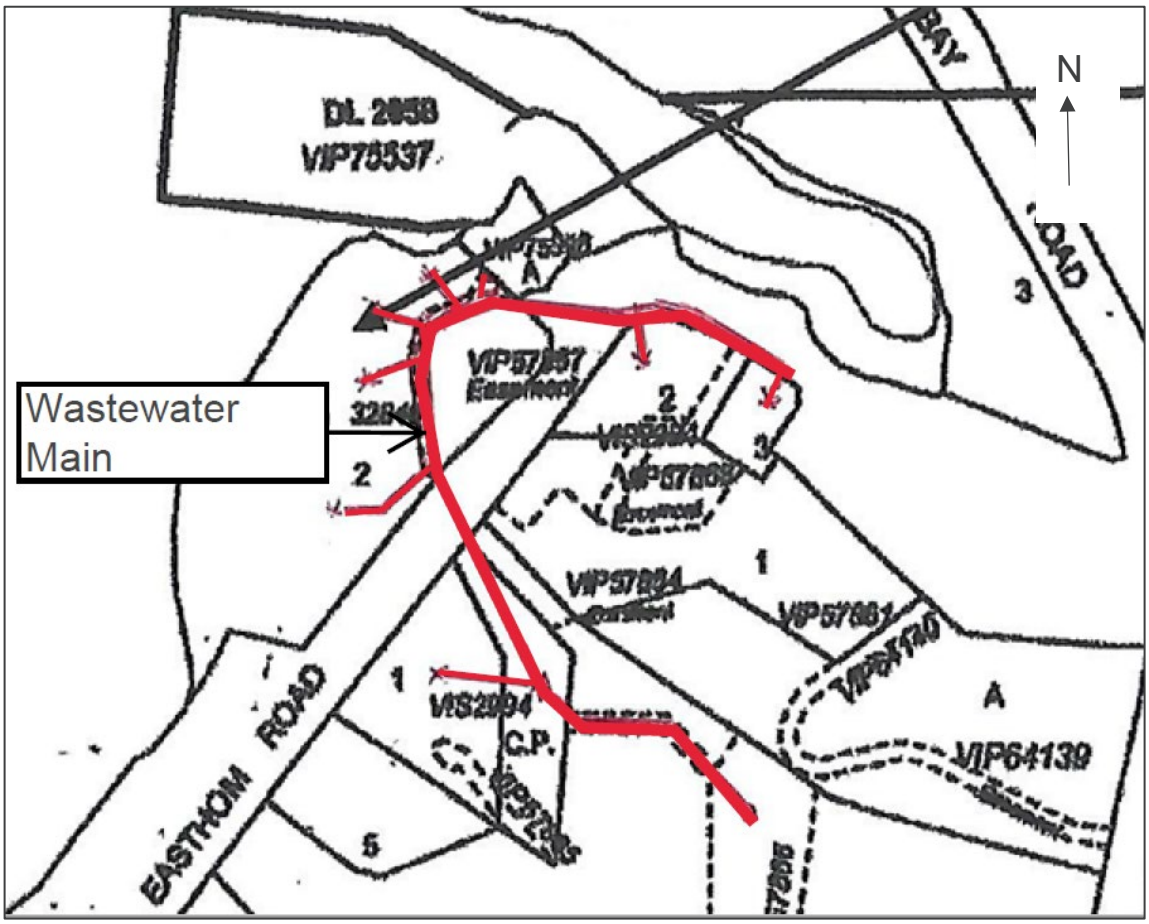


Figure 2 Existing Wastewater Collection and Disposal System

5. Recommendations

Water

McElhanney makes the following recommendations to BCF with respect to the future operations and sourcing of potable water:

1. Continue to procure water from the Fiddlehead Spring Water System for potable water needs.

Wastewater

McElhanney makes the following recommendations to BCF with respect to the future operations and disposal of wastewater:

2. Continue to operate a storage, pump and haul system for wastewater with an on-site, underground tank.

6. CLOSURE

This report was prepared by McElhanney Ltd. (the Consultant) for use by BC Ferries. The material in it reflects the best judgement of the Consultant in light of the information available to the Consultant at the time of preparation. Any use that any third party makes of the report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

7. Attachments

1. Fiddlehead Spring Water System Permit to Operate
2. Fiddlehead Spring Water License and attached plan
3. *Gabriola Island Terminal: On-site Groundwater Supply Source Feasibility Assessment (McElhanney, November 2019)*
4. *Gabriola Island Terminal: Wastewater Management Options – Feasibility Assessment (McElhanney, November 2019)*
5. *Registered Easement Plan through Lot 5, Plan 32840*

island health

HEALTH PROTECTION

PERMIT

to OPERATE

A WATER SUPPLY SYSTEM

Water System Name:	**FIDDLEHEAD SPRING**
Premises Number:	13177
Premises Address:	355 North Road Gabriola Island, BC V0R 1X0
Water System Owner:	Gabriola General Construction Co. LTD

Gabriola General Construction Co. LTD is hereby permitted to operate the above potable water supply system and is required to operate this system in accordance with the Drinking Water Protection Act and in accordance with the conditions set out in this operating permit and conditions established as part of any construction permit.

The water supply system for which this operating permit applies is generally described as:

Service Delivery Area:	Gabriola Island
Source Water:	Fiddle Head Spring
Water Treatment methods are:	Cartridge Filters
Water Disinfection methods are:	UV, Chlorination
Number of Connections	2-14 (DWS)

Operating conditions specific to this water supply system are in Appendix A.

Date: July 1, 1999

Issued By:
Environmental Health Officer

island health Expires March 2020 0486

island health Expires March 2019 0369

island health Expires March 2018 0398

This permit must be displayed in a conspicuous place and is not transfera

BRITISH COLUMBIA

Water Act

CONDITIONAL WATER LICENCE

The owners of the land to which this licence is appurtenant are hereby authorized as follows:

(a) The stream on which the rights are granted is Fiddlehead Spring.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 15th May, 1985.

(d) The purpose for which this licence is issued is industrial (resort).

(e) The maximum quantity of water which may be diverted is 2,000 gallons a day.

(f) The period of the year during which the water may be used is the whole year.

(g) The land upon which the water is to be used and to which this licence is appurtenant is Lot 2, Plan 32840 and Lots 2 and 3, Plan VIS2994, all of Section 20, Gabriola Island, Nanaimo District.

(h) The works authorized to be constructed are diversion structure, sump, reservoir, and pipe, which shall be located approximately as shown on the attached plan.

(i) The construction of the said works has been completed and the water is being beneficially used. The licensee shall continue to make a regular, beneficial use of the water in the manner authorized herein.

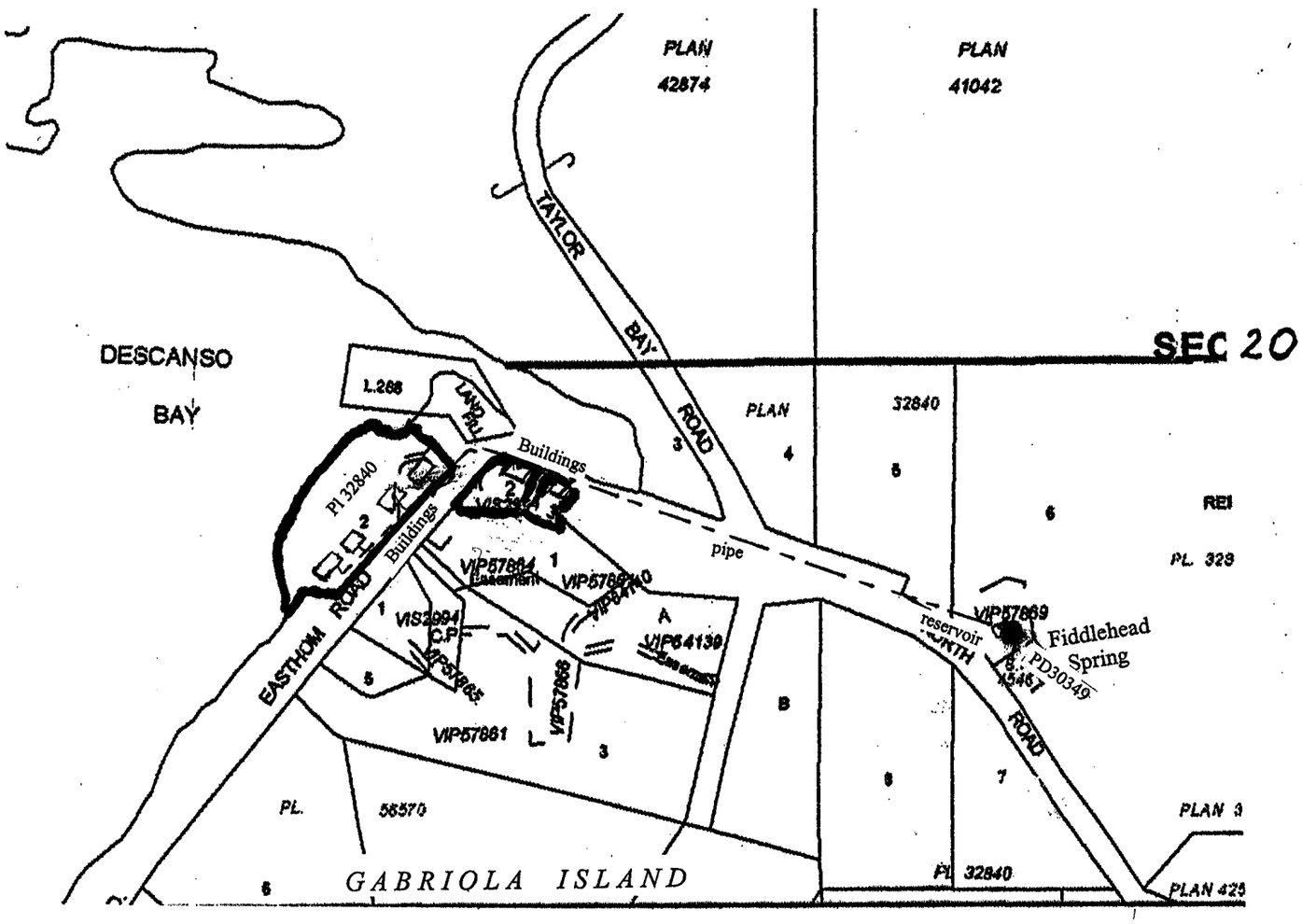
(k) This licence authorizes the use of water for industrial purpose in six resort buildings, located approximately as shown on the attached plan.

(l) This licence is issued in substitution of Conditional Licence 65735, under Section 18, Water Act RSBC 1996, Chap. 483.

George Bryden
Assistant Regional Water Manager

File: 1000472 Issued: March 31, 2003 Conditional Licence: 118247

BRITISH COLUMBIA



WATER DISTRICT	: NANAIMO
PRECINCT	: NANAIMO
LAND DISTRICT	: NANAIMO
Scale	: Not to scale
Point of Diversion	: ●
Pipe	: — · — · — · —
The boundaries of the land to which this licence is appurtenant are shown thus	: ———

CL 118247 for CL 65735

File: 1000472

Date: March 31, 2003

Signature George Byden

TITLE SEARCH PRINT 2019-10-24, 16:43:35

File Reference: 2231-37011-01 Requestor: Tyson Quocksister

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Land Title District VICTORIA
Land Title Office VICTORIA

Title Number EV136740
From Title Number CROWN

Application Received 2003-11-12

Application Entered 2003-11-27

Registered Owner in Fee Simple
Registered Owner/Mailing Address: BC TRANSPORTATION FINANCING AUTHORITY
BOX 9900, STN. PROV. GOVT.
VICTORIA, BC
V8W 9R1

Taxation Authority Nanaimo/Cowichan Assessment Area

Description of Land
Parcel Identifier: 025-798-103
Legal Description:
LOT A SECTION 20 GABRIOLA ISLAND NANAIMO DISTRICT PLAN VIP75538

Legal Notations
NOTICE OF INTEREST SEC.3(2) BUILDERS LIEN ACT EV154632 FILED 18/12/2003

Charges, Liens and Interests
Nature: LEASE
Registration Number: EW17899
Registration Date and Time: 2004-02-16 10:24
Registered Owner: BRITISH COLUMBIA FERRY SERVICES INC.
INCORPORATION NO. 667014
Remarks: WITH RIGHT TO RENEW

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

TECHNICAL MEMO

To Halyna Tataryn, P.Eng. British Columbia Ferry Services Inc.	**From** Mike Harris, P.Geo., ROWP, Senior Geoscientist
Company McElhanney Ltd.	**Branch** 2233 - Duncan
Re BC Ferries Gabriola Island Terminal: On-Site Groundwater Supply Source Feasibility Assessment	**Date** November 22nd, 2019 **File Number** 2231-37011-01

McElhanney Ltd. was requested by British Columbia Ferry Services Inc. (BCF) to provide an opinion on the feasibility of developing a new potable groundwater supply source on the BCF Gabriola Island terminal site in Descanso Bay (the site). The site is currently supplied with potable water by Gabriola General Construction Co. Ltd. that draws water from Fiddlehead Spring, a licensed surface water point-of-diversion 365 m to the east-southeast of the site.

Background

In order to evaluate the possibility of developing a new potable groundwater supply source on the site, it is necessary to characterize the site's physiographic, geological, and hydrogeological settings.

Physiography

The site is located on the southeast side of Descanso Bay, approximately 1.9 km south-southeast of the northwest corner of Gabriola Island. The site is topographically situated on a 10 m high, northeast-facing planar bench at the northwest end of a broad northwest-trending, linear valley. A second narrow, northeast-trending, linear valley that hosts Mallett Creek is located approximately 300 m north of the site.

Google Earth and RDN Map[1] imageries indicate that elevations on the site range from 13 m above mean sea level at its east end to sea level at its west end and the terminal car ramp. Surrounding elevations to the south and east rise to between 70 and 90 m above mean sea level within 600 m of the site.

[1] "*RDN Map Website*" Regional District of Nanaimo
https://map.rdn.bc.ca/OPGIS/WebPages/Map/FundyViewer.aspx?s=B57F83BE24D1A5D4B2A501DE22E3B9DE84528F3F

Geology

The BC Geological Survey's MapPlace website[2] and recent scientific literature sources[3,4,5,6,7] indicate that the site is underlain by northeast-dipping sedimentary rocks of the Cretaceous-aged Nanaimo Group, which include the uppermost Gabriola Formation (primarily sandstone), intercalated Spray (primarily mudstone and shale) and Geoffrey (sandstone and conglomerate) Formations, and lowermost Northumberland Formation (primarily shale). These rock units locally display a west-northwest trending structural fabric.

The site is approximately 300 m south of the inferred west terminus of a northeast-trending thrust fault that extends across Gabriola Island from Leboeuf Bay to Cox's Bay.

Hydrogeology

BCENV's Water Resource Atlas website[7] indicates that the site is underlain by BCENV-registered Aquifer #709, which is a low-productivity, bedrock-hosted, unconfined to semi-confined aquifer that covers most of the southeast two-thirds of Gabriola Island, is subject to moderate demand, and is highly vulnerable to surface contamination.

Unconfined groundwater flow in the vicinity of the site within Aquifer #709 likely follows topographic trends from elevated terrain south of the site towards the north to northeast. Groundwater likely occurs primarily in bedrock fractures, along sedimentary bedding planes, and at lithological contacts. Due to its proximity to the marine shoreline, fresh groundwater (i.e. with low TDS and/or chloride levels) in the vicinity of the site likely occurs within a surface lens bounded and underlain by salt water, with the size and shape of the freshwater lens being highly sensitive to precipitation levels and the density of local groundwater development.

There are 12 BCENV-registered, bedrock-hosted water wells within a 500 m radius of the site's centre, with the nearest well being 40 m to the southeast. Installed well depths range from 39.6 to 163.7 m bgs with an average depth of 74.9 m bgs. Driller airlift yields range from 0.06 to 3.15 L/s with an average yield of 0.45 L/s. Static water levels in the wells range from 0.9 to 42.7 m bgs with an average depth of 12.2 m bgs. Water quality appears to be generally good except for three wells installed adjacent to the north side of Descanso Bay 400 m northwest of the site that reported elevated TDS and/or chloride levels.

Recent scientific literature sources indicate that the bedrock-hosted aquifer underlying the site may receive recharge primarily from the infiltration of precipitation. Groundwater chemistry on Gabriola Island is chemically similar to other parts of eastern Vancouver Island underlain by Nanaimo Group sedimentary rocks with the main dissolved constituents being sodium (from 30 to 200 mg/L with an average of 110 mg/L) and bicarbonate (from 50 to 250 mg/L with an average of 140 mg/L) with lesser amounts of chloride, calcium, and sulphate (average concentrations of 31, 19, and 17 mg/L, respectively). The pH of groundwater on Gabriola Island ranges from under 6.0 to 9.0, with an average of 7.3. Approximately 8% of the wells on Gabriola Island sampled by previous workers report fluoride and selenium concentrations that exceed the Canadian Drinking Water Quality Guidelines[8,] maximum allowable concentrations, as well as locally elevated levels of aluminum, iron, manganese, sulphur, and hydrogen sulphide gas.

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[2] "*BCGS Geoscience MapPlace 1 Website"*. BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources http://webmap.em.gov.bc.ca/mapplace/minpot/bcgs.asp

[3] "*The Hydrogeology of Gabriola Groundwater*" Pierce et al (2010). https://nickdoe.ca/pdfs/Webp649.pdf

[4] "*Gabriola's Shape – Including Some Surmises*". Doe N. (2009). https://nickdoe.ca/pdfs/Webp220c.pdf

[5] "*Geochemistry of Gabriola's Groundwater*". Earle et al (2004). https://web.viu.ca/earle/geol304/earle-krogh.pdf

[6] "*Groundwater Recharge Model for Gabriola Island*" (Burgess et al. (2016). https://www.rdn.bc.ca/dms/documents/dwwp-reports/gabriola-water-region/gabriola_groundwater_recharge_modelling_report_-_2016.pdf

[7] "*BC Water Resources Atlas Website"*. http://maps.gov.bc.ca/ess/hm/wrbc/

[8] "*Canadian Drinking Water Quality Guidelines*" (2018). Health Canada https://www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html

Conclusions

Based on the findings of this preliminary assessment, it may be possible to develop a bedrock-hosted water well on the site with a sustainable yield in the range 0.06 to 0.32 L/s. It is unlikely that a new groundwater supply source with a sustainable yield of > 0.32 L/s can be developed within the site.

The well should be installed as far from the marine shoreline and in a topographically-elevated setting, and pumped intermittently and at as low a rate as possible to avoid the introduction of salt water into the well (i.e. trickle-feed from the well into a large storage reservoir may be preferable to pumping directly from the well into a pressure tank for on-demand distribution. Horizontal setbacks for the well from property boundaries and potential contamination sources (including on-site sewerage systems) and treatment / monitoring requirements as mandated by the Vancouver Island Health Authority (Island Health) for new water systems should be observed.

A new on-site well used by BCF will require licensing with the BC Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD) under the BC Water Sustainability Act, since it would be classified as a "non-domestic well"[9]. The licensing application should include a well interference study to assess potential impacts on nearby existing groundwater users.

[9] FLNRORD defines "domestic use" as "water for household use by the occupants of a private dwelling, fire prevention, domestic animals, and watering a private lawn up to 1,000 m^2 in size".

TECHNICAL MEMO

To Halyna Tataryn, P.Eng. British Columbia Ferry Services Inc.	**From** Dragan Rokic, P.Eng.
Company McElhanney Ltd.	**Branch** 2233 - Duncan
Re BC Ferries Gabriola Island Terminal: Wastewater Management Options - Feasibility Assessment	**Date** November 22nd, 2019 **File Number** 2231-37011-01

McElhanney Ltd. was requested by British Columbia Ferry Services Inc. (BCF) to provide an opinion on the feasibility of wastewater management options for the BCF Gabriola Island terminal site in Descanso Bay.

Background Reports

Two background reports were provided for review:

- Wastewater Consideration, Descanso Bay, Gabriola Island Ferry Terminal (Stantec, 2019); and
- Gabriola Island Ferry Terminal Water and Sanitary Assessment (McElhanney, 2019).

Context

BCF has developed conceptual plans for the Gabriola Island Terminal and applied to Islands Trust to amend the Official Community Plan and Land Use Bylaw to permit the redevelopment. The redevelopment plan includes the construction of a new berth, improvements to parking areas, queuing lanes, traffic operations and passenger amenities such as a waiting room with washroom facilities.

Existing Sanitary System

The existing sanitary system at the BC Ferries Gabriola terminal consists of a 1,000 US gallon (3,785 liter) holding tank that receives sanitary effluent from the terminal's washroom facility. The holding tank is generally pumped out two to three times a week.

Estimated Sanitary Flows

Although the TDP contemplates the terminal expansion, future sanitary flows are not expected to increase

substantially. The sanitary flows, estimated at 10 m^3/day by Stantec in the 2019 report, were reviewed by McElhanney and assessed as reasonable.

Effluent Disposal Options

Three effluent discharge options were evaluated in the Stantec report:

1. in-ground disposal;
2. marine discharge; and
3. pumping for off-site disposal.

The first two options would have different regulatory approval routes. While the major part of the Stantec report discusses the requirements of the provincial BC Municipal Wastewater Regulation (MWR) and federal Wastewater Systems Effluent Regulation (WSER), neither regulation would apply to in-ground disposal given the anticipated design flow, as indicated in the previous section. Flows up to 5,000 lgpd (22.7 m^3/day) and ground discharges are regulated by the Ministry of Health.

The MWR would be applicable only to a marine discharge option while such a discharge would not require compliance with the WSER. The WSER regulation would apply to marine discharges and average flows exceeding 100 m^3/day.

Potential Treatment Technologies

Eight package wastewater treatment options were evaluated for the Site by Stantec. However, implementation of any of these options is not considered practical given the scale of the operation and anticipated annual operation and maintenance (O&M) costs. In addition to the up-front capital costs, the annual O&M costs would include:

- labour (operator salaries and benefits);
- operation and maintenance:
  - spare parts and equipment maintenance allowance;
  - electrical power;
  - chemicals (depending on treatment requirements); and
  - phone/internet service;
- allocations (e.g., legal, administration, etc.); and
- miscellaneous/reporting.

The annual O&M costs required to run a small package wastewater treatment plant are estimated in the $50,000 to $100,000 range assuming a part-time operator. This cost is expected to be higher than the annual holding tank pump-out cost.

Conclusions

Considering the operation scale and regulatory approval processes involved, the following option appears feasible for the Site:

- continue to operate a storage, pump and haul system for wastewater with an on-site, underground holding tank; and

As BCF is also considering the development of an onsite groundwater well to provide water to the BC Ferries terminal, development of a well, if assessed as a priority, would exclude the development of an onsite ground

disposal field, considering the Site's constraints. Assuming a design flow of 10 m^3/day, the minimum length of the ground disposal field would be approximately 110 m which equates to an area of 250 – 300 m^2. The size of field is largely dependent on the local ground conditions an in potentially could require a second stand-by field of equal size. The field design would also have to meet all regulatory setback requirements including a minimum setback of 30m from a well.

04-NA-R17

PLAN OF RIGHT OF WAY THROUGH LOT 5, PLAN 32840, SECTION 20, GABRIOLA ISLAND, NANAIMO DISTRICT

PLAN 3741 RW

Scale : 1 : 1250

0 50 100 150 METRES

All distances are in metres.

Deposited in the Land Registry Office at Victoria, B.C. this 9th day of November, 1979
asst.
Deputy Registrar

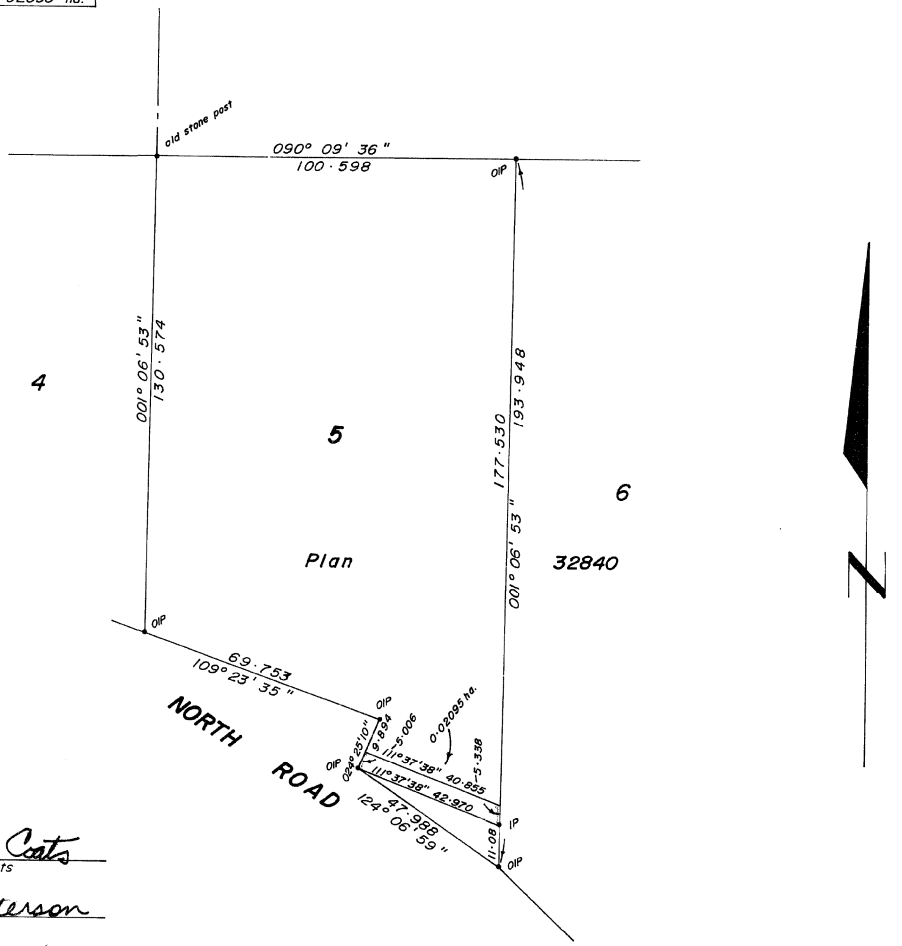
This plan lies within the Nanaimo Regional District

Legend

- OIP Denotes iron post found
- IP " iron post set

Bearings are derived from Plan 32840.

Book of Reference		
Lot	Plan	Area
5	32840	0·02095 ha.



Catherine E. Coats
Catherine Elmina Coats

Helen Patterson
Witness

375 Selby St
Address of Witness

Secretary
Occupation of Witness

I, George C. Smythies of the City of Nanaimo, British Columbia Land Surveyor, make oath and say that I was present at and did personally superintend the survey represented by this plan and that the survey and plan are correct.

The said survey was completed on the 18th day of October, 1979.

Sworn before me this 24th day of October, 1979 George C. Smythies B.C.L.S.

A Commissioner for taking affidavits within British Columbia

File: GB-20-4

Charles O. Smythies & Associates
B.C. Land Surveyors & Consulting Engineers
Nanaimo & Parksville, B. C.