STAFF REPORT

File No.: SS-RZ-2017.3

DATE OF MEETING:	July 12, 2022
TO:	Salt Spring Island Local Trust Committee
FROM:	Geordie Gordon, Acting Island Planner Salt Spring Island Team
COPY:	Louisa Garbo, Acting Regional Planning Manager Salt Spring Island Team
SUBJECT:	Rezoning for second dwelling unit. Applicant: Jamie Colligan Location: 2188 North End Rd.

RECOMMENDATION

1. **That the Salt Spring Island Local Trust Committee places application SS-RZ-2017.3 in abeyance until the conclusion of the Salt Spring Island Local Trust Committee Housing Action Program Bylaw 530.**

REPORT SUMMARY

This report brings forward a recommendation from staff to place the rezoning application SS-RZ-2017.3 in abeyance until the conclusion of the Housing Action Program. The applicant has indicated that they are unwilling to provide the deposit required to conduct the legal review for of the Housing Agreement (to ensure the second dwelling is rented at an affordable rate) and Section 219 Covenant (for energy efficiency requirements).

As the SS LTC is currently considering a proposed bylaw (Bylaw 530) that may affect the subject property and the lawfulness of the second dwelling, staff recommend that the proposed rezoning is put into abeyance pending the conclusion of the Housing Action Program Bylaw 530.

BACKGROUND

The applicant is seeking to make lawful a long-standing second dwelling that is not permitted on the subject property.

The SS LTC has considered this application on several occasions previously. The most recent consideration by the SS LTC was at their meeting of December 14, 2021, where a proposed bylaw was given first reading.

Previous staff reports can be accessed here:

December 14, 2021:

Staff report: https://islandstrust.bc.ca/document/salt-spring-ltc-regular-meeting-agenda-4/ (page 300)

Meeting Minutes: https://islandstrust.bc.ca/document/salt-spring-ltc-regular-meeting-minutes-7/ (page 11)

February 15, 2021:

Staff Report: https://islandstrust.bc.ca/document/salt-spring-island-ltc-regular-meeting-agenda-14/ (page 261)

Meeting Minutes: https://islandstrust.bc.ca/document/salt-spring-ltc-regular-meeting-minutes/ (page 10)

December 17, 2019:

Staff Report: https://islandstrust.bc.ca/document/ss-ltc-rm-agd-2019-12-17/ (page 380)

Meeting Minutes: https://islandstrust.bc.ca/document/ss-ltc-rm-min-2019-12-17/ (page 10)

January 29, 2019

Staff Report: https://islandstrust.bc.ca/document/ss-ltc-rm-agd-2019-01-29/ (page 609)

Meeting Minutes: https://islandstrust.bc.ca/document/ss-ltc-rm-min-2019-01-29/ (page 15)

ANALYSIS

Issues and Opportunities

Housing Agreement and Covenant

The rezoning application is proceeding on the basis of the applicant supplying an affordable dwelling unit with energy efficiency aspects (primarily related to appliances used in the dwelling). In order to secure these conditions of rezoning, legal review of the instruments are necessary – by Islands Trust lawyers, not the applicants'. In the absence of these instruments, it is inadvisable to move the application forward at this time.

Housing Action Program

The SS LTC is currently considering Salt Spring Island Local Trust Committee Bylaw No. 530 to allow accessory dwelling units (ADUs) on the island -- such as the second dwelling that is the subject of this rezoning. As Bylaw 530 could impact the land use permissions of the subject property, the proposed rezoning of the subject property may be rendered unnecessary. Should Bylaw 530 receive final adoption, the secondary dwelling in question will likely only be required to go through the building permit process.

Consultation

The proposed rezoning bylaw was referred to agencies, organizations, and Local Trust Committees listed in the staff report of December 14, 2021. A summary of responses is contained in appendix 1. An extensive reply was received from (at that time) the Ministry of Forests Lands Natural Resource Operations and Rural Development (FLNRORD) as a result of the referral of the potable water assessment report.

First Nations

The proposed bylaw was referred to First Nations listed in the staff report of December 14, 2021. No responses to the referral were received.

Rationale for Recommendation

The applicant has not provided the deposit necessary to move the application forward. Given the Housing Action Program work underway, staff recommend putting the subject application in abeyance until the conclusion of Bylaw 530.

ALTERNATIVES

The SS LTC may wish to consider the following alternatives to the staff recommendation:

1. **Deny the application**

   The SS LTC may deny the application. Staff advise that the implications of this alternative is file closure. If this alternative is selected, the SS LTC should state the reasons for denial. Recommended wording for the resolution is as follows:

   That the Salt Spring Island Local Trust Committee proceed no further with application SS-RZ-2017.3 for the following reasons: the applicant has not provided the deposit necessary to review legal agreements required for the rezoning.

NEXT STEPS

If the SS LTC accepts the recommended resolution, the rezoning application will be put into abeyance until the Housing Action program Bylaw 530 process is resolved.

Submitted By:	Geordie Gordon, Acting Island Planner	June 20, 2022
Concurrence:	Louisa Garbo, Acting Regional Planning Manager	June 21, 2022

Attachments:

1. Agency, organization, and LTC referral responses summary report.

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Appendix 1

Print Date: June 20, 2022

Referrals: Bylaw SS-521

Agency	Sent	Received
BC Ambulance Services *Room 103:*	04-Jan-2022	
BC Assessment Authority *Policy, Audit and Legal Services:* Cathie McIntyre	04-Jan-2022	
BC Transit *520 Gorge Road East:* Myrna Moore *Comment:* BC Transit is generally supportive of the rezoning. It is worth noting that the lot in question is not within an area currently served by transit nor does the recent Transit Future Service Plan (completed 2021) identify priorities to serve this area in the near future.	04-Jan-2022	05-Jan-2022
Capital Regional District - All Referrals Aggie Chan and Jessica Arnet *625 Fisgard Street:*	04-Jan-2022	
Capital Regional District - SSI Senior Manager *145 Vesuvius Bay Road: . .* *Comment:* Interests Unaffected.	04-Jan-2022	13-Jan-2022
Cowichan Valley Regional District *175 Ingram Street:* Mike Tippett	04-Jan-2022	
Front Counter BC *FrontCounterBC@gov.bc.ca:*	04-Jan-2022	
Galiano Island Local Trust Committee *200 - 1627 Fort Street: . .* *Comment:* Interests Unaffected.	04-Jan-2022	07-Feb-2022
Islands Trust, Bylaw Enforcement *200 - 1627 Fort Street:* Warren Dingman	04-Jan-2022	
Mayne Island Local Trust Committee *Islands Trust: . .* *Comment:* Interest Unaffected.	04-Jan-2022	28-Feb-2022
Ministry of Forests, Land, Natural Resource Operations & Rural Development - Water Authorization Sec *1520 Blanshard Street: . .*	04-Jan-2022	

Referrals: Bylaw SS-521

Agency	Sent	Received
Ministry of Forests, Lands and Natural Resource Operations - Water Protection *# 142 - 2080A Labieux Road:* Referrals Coordinator *Comment:* Please see substantive response.	13-Jan-2022	22-Feb-2022
Ministry of Municipal Affairs and Housing *Planning and Land Use Management:* Kris Nichols	04-Jan-2022	
Ministry of Transportation and Infrastructure *Vancouver Island District Office: . .* *Comment:* Approval Recommended for Reasons Outlined Below: The Ministry has no objections to this rezoning. It is suggested that the property owner apply for a secondary access permit if there is more than one access from the property to the road. A permit can be applied for through this link https://www2.gov.bc.ca/gov/content/transportation/funding-engagementpermits/permits	04-Jan-2022	04-Jan-2022
North Pender Island Local Trust Committee *Islands Trust: . .* *Comment:* Interests Unaffected.	04-Jan-2022	27-Jan-2022
North Salt Spring Waterworks District *761 Upper Ganges Road:* The Manager	04-Jan-2022	
R.C.M.P. *401 Lower Ganges Road:* *Comment:* The Salt Spring RCMP have no policing concerns with the proposed bylaw.	04-Jan-2022	06-Jan-2022
Salt Spring Island Fire Rescue - District *105 Lower Ganges Road:*	04-Jan-2022	
Thetis Island Local Trust Committee *Northern Office: . .*	04-Jan-2022	
Vancouver Island Health Authority *1952 Bay Street: . .*	04-Jan-2022	

BYLAW REFERRAL FORM
RESPONSE SUMMARY

[X] **Approval Recommended for Reasons Outlined Below**

[ ] **Approval Recommended Subject to Conditions Outlined Below**

[ ] **Interests Unaffected by Bylaw**

[ ] **Approval Not Recommended Due to Reason Outlined Below**

The Ministry has no objections to this rezoning. It is suggested that the property owner apply for a secondary access permit if there is more than one access from the property to the road.

A permit can be applied for through this link https://www2.gov.bc.ca/gov/content/transportation/funding-engagement-permits/permits

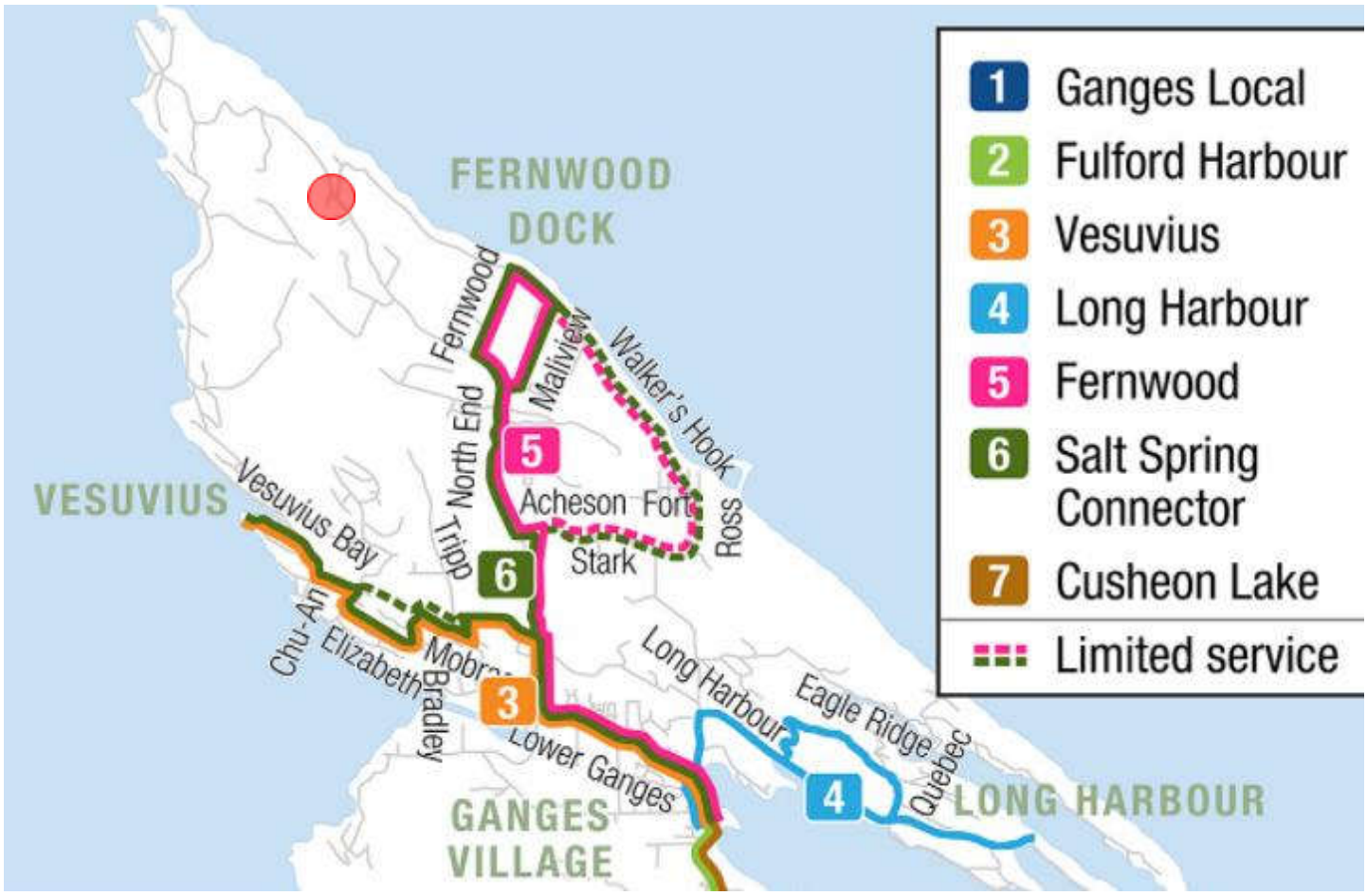
Salt Spring Island Trust Area	521
(Island)	(Bylaw Number)
Haley Leech	Development Services Officer
(Signature)	(Title)
January 4, 2022	Ministry of Transportation and Infrastructure
(Date)	(Agency)

From: Ford, Tristan <TFord@BCTransit.Com>
Sent: Wednesday, January 5, 2022 11:09 AM
To: SSIInfo
Subject: Salt Spring Island Proposed Bylaw No. 521 - 2188 North End Road, SSI - BC Transit Response

Hi Daniela,

Thank you for providing us the opportunity to review the proposed referral.

BC Transit is generally supportive of the rezoning. It is worth noting that the lot in question is not within an area currently served by transit nor does the recent Transit Future Service Plan (completed 2021) identify priorities to serve this area in the near future.



Please let me know of any questions or concerns!

Cheers and happy New Year,

Tristan Ford, *BASc, EIT, PMP (he / him)*
Transit Planner
BC Transit

520 Gorge Road East, PO Box 9861 Victoria, BC V8W 9T5
236-969-2611 | tford@bctransit.com | bctransit.com

We acknowledge with respect that BC Transit delivers our mission on the ancestral territories of Indigenous Peoples across British Columbia, and their historical relationships with the land continue to this day.

From: Seabrook, Clive <Clive.Seabrook@rcmp-grc.gc.ca>
Sent: Thursday, January 6, 2022 8:17 PM
To: Daniela Murphy <dmurphy@islandstrust.bc.ca>
Subject: FW: Salt Spring Island Proposed Bylaw No. 521 - 2188 North End Road, SSI

Good evening,

Thank you for checking in with us. The Salt Spring RCMP have no policing concenrs with the proposed bylaw.

Sgt. Clive Seabrook
Detachment Commander
Salt Spring RCMP
401 Lower Ganges Road
Salt Spring Island – V8K 2V4
Phone: 250-537-5555
Fax: 250-537-1631

BYLAW REFERRAL FORM
RESPONSE SUMMARY

☐ **Approval Recommended for Reasons Outlined Below**

☐ **Approval Recommended Subject to Conditions Outlined Below**

☒ **Interests Unaffected by Bylaw**

☐ **Approval Not Recommended Due to Reason Outlined Below**

Salt Spring Island Trust Area	521
(Island)	(Bylaw Number)
	Senior Manager SSI Electoral Area Administration
(Signature)	(Title)
January 13, 2022	Capital Regional District
(Date)	(Agency)

BYLAW REFERRAL FORM
RESPONSE SUMMARY

☐ **Approval Recommended for Reasons Outlined Below**

☐ **Approval Recommended Subject to Conditions Outlined Below**

☒ **Interests Unaffected by Bylaw**

X

☐ **Approval Not Recommended Due to Reason Outlined Below**

Salt Spring Island Trust Area	521
(Island)	(Bylaw Number)
J. Chonk	
(Signature)	Jas Chonk, Legislative Clerk (Title)
January 27, 2022 (Date)	North Pender Island Local Trust Committee (Agency)

BYLAW REFERRAL FORM
RESPONSE SUMMARY

☐ **Approval Recommended for Reasons Outlined Below**

☐ **Approval Recommended Subject to Conditions Outlined Below**

☒ **Interests Unaffected by Bylaw**

X

☐ **Approval Not Recommended Due to Reason Outlined Below**

Salt Spring Island Trust Area	521
(Island)	(Bylaw Number)
J. Chonk	
(Signature)	Jas Chonk, Legislative Clerk (Title)
February 7, 2022 (Date)	Galiano Island Local Trust Committee (Agency)

File: 58000-35/Salt Spring Island Bylaw 521

February 22, 2022

VIA EMAIL: ggordon@islandstrust.bc.ca

Dear Geordie Gordon,

Re: 2188 North End Rd (PID 000-276-901) on Salt Spring Island

Thank you for providing the opportunity to provide comment on the subject bylaw, pertaining to rezoning of the property at 2188 North End Rd (PID 000-276-901) on Salt Spring Island.

The property owner has submitted a hydrogeologic report, "Potable Water Assessment of Well #44431 at 2188 North End Road, SSI" prepared by Dave Gooding, P.Eng, September 2021. Islands Trust has requested that the regional hydrogeologist provide technical review of this report focussed on determination of the sustainable yield of the subject well and the likelihood of hydraulic connection between groundwater and surface water.

Sustainable Yield

The owners of the subject 10,040 m^2 (2.5 acre) parcel are seeking rezoning and amendment of the Salt Spring Island Land Use Bylaw 355 (Salt Spring Island Local Trust Committee, 1999) to allow legal occupation of an accessory dwelling. Bylaw 33 requires a minimum water quantity of 1,600 litres per day per residence, equivalent to 3,200 litres per day (Table 1).

A short-term test was undertaken to verify whether the well is capable of providing a water quantity sufficient for the bylaw requirements. A 12-hour test was completed on August 5, 2021, during the summer, therefore test results are likely to represent aquifer conditions during the driest time of year. The test was completed at an average discharge rate of 3 L/min (4,320 L/d). Groundwater levels were measured manually and using a transducer within the pumping well, WTN 44431, and within an observation well on an adjacent property, WTN 46504, sited approximately 65 m to the northwest.

Table 1: Water requirement compared to pumping rate during the well test

Annual demand (m^3/y)	1,168		
	m^3/d	L/min	USgpm
Minimum Daily Demand	3.20	2.2	0.6
Test pumping rate	4.32	3	0.8

Ministry of Forests, Lands, Natural Resource Operations and Rural Development
West Coast Natural Resource Region Water Protection
Mailing Address: 2080 Labieux Rd Nanaimo, BC V9T 6J9
Tel: 250 751-7220
Fax: 250 751-7224
Website: www.gov.bc.ca/env/water

I have independently calculated the long-term capacity using data from the first ~9 hours of the test (Table 2), with detailed calculations in Appendix A. My estimate of well capacity is lower than estimated by Gooding (2021). The methods and conclusions of my assessment are outlined below:

a) Data from the start of pumping until 540 minutes (9 hours) into the test were utilized for analysis. The data from later in the test were not available or not usable, due to a sudden increase in well pumping rate and drawing down of the water level to below the transducer installation depth (or range of accuracy).

b) Although not stated explicitly in the report, it is assumed that the domestic well pump remained in place in the well, and a second pump was installed, above the domestic pump, for the duration of the test which meant household use was continued during the test.

c) Available drawdown was estimated as the depth between the static water level and the depth of the primary water-bearing fracture reported in the well construction record, consistent with common practice for assessment of water supply wells (Province of B.C., 2020). Gooding (2021) estimated the available drawdown between the static water level and the top of the well pump. However, it is not recommended to drawdown groundwater levels below the depth of the main water-bearing fracture, as this can result in fracture dewatering, turbulent groundwater flow, water oxygenation and bacterial growth that can lead to clogging of fractures and reduced well yield over time.

d) The transducer data were not provided with the report, however the manual data for the pumping well, provided in the Appendix 3, were re-plotted for further analysis. A derivative plot (Figure 1) shows that the rate of drawdown in the well increased over time, particularly during the latter part of the test, which could be interpreted as a boundary condition such as fracture dewatering or a zone of lower permeability being encountered as the area of influence around the well expanded over the duration of pumping.

e) The plot of drawdown over time shows two distinct slopes, one of moderate slope, and one steeper, but harder to discern due to the limited number of manual data points. The slope of observed drawdown up until 540 minutes was projected to 100-days (144,000 minutes) and to 180-days for comparison. A longer period of 180 days is more consistent with the duration of dry season in coastal B.C. during which no recharge occurs, rather than 100-days standard within the utility approval guidelines (Province of B.C., 2020).

f) The well capacity is estimated as from 2,800 to 3,020 litres per day depending on whether the 180-day or 100-day projection of the drawdown curve is used. This would not meet the bylaw requirements of 3,200 litres per day. If the late-stage steeper part of the drawdown curve is utilized then the long-term well yield could be 1,570 litres per day, which is more consistent with water supply sufficient for zoning of one residence.

g) The interpretation of well yield was affected by the test methodology. For example, as shown in Figure 3 below, the static water level reported at the start of the test is lower than the true non-pumping water level in the well. When the test began the groundwater levels were still in recovery from pumping for domestic water use earlier in the day. The

estimated well capacity would likely be slightly higher if the static prior to well use was used to calculate the available drawdown. Sources of error encountered during the test emphasize the importance of ensuring that groundwater levels in a well have stabilized before beginning the test and providing a secondary water supply to homeowners so that domestic pumping of the well does not create additional challenges in test interpretation.

h) Field parameters (temperature, electrical conductivity, or total dissolved solids) were not monitored during the test, and water quality samples were not collected to verify if water is potable or requires treatment. Some forms of treatment increase water demand depending on water quality concerns and the type of treatment method used. Household water demand may be lower if water is only used for non-potable purposes, and alternate water sources are used for drinking and food preparation.

i) It was not possible to interpret potential interference between the pumping and observation well due to the domestic use of the observation well during the test. The observation well data show cycling periods of well drawdown and recovery, with a magnitude of 40 to 50 m suggesting this well has relatively low productivity. The static water level increased in the observation well following cessation of pumping recovery of the test well, which could indicate that groundwater levels were locally depressed during the test and rebounded following the test cessation or due to recharge (e.g., from water diverted from the pumping well). The construction record for the test well (WTN 44431) reports water-bearing fractures at a depth of ~62.48 m (205 ft) below ground (bg), and compared to reported fractures in the observation well (WTN 46504) at 27.43, 70.10, 74.68 m bg (90, 230, and 245 ft bg) respectively. The non-pumping groundwater levels near the start of the test in both the pumping and observation wells are within a similar range (data were not provided to calculate the actual difference in levels). The two wells could be intersecting a similar fracture network but are likely not strongly interconnected due to overall low permeability of the rock.

j) The subject well is constructed in Aquifer 721 (AQ721), within the Tricomali Channel groundwater management region, an area in which most properties are supplied by an individual well and septic system. Well yields in this sedimentary bedrock (sub-type 5a) aquifer are relatively low; wells in this groundwater region have a median estimated yield of 5.7 Litres/minute (1.5 USgpm), based on reported yields at the time of drilling. Groundwater levels in this area are monitored at Observation Well 438 Salt Spring Island (Ross Road), sited 5.6 km southeast of the subject well. Several neighbourhoods in the northern part of the island, especially closer to the coast, have diminished well quantity during summer months, and augment supplies with bulk water delivery (S. Cowan, personal communication, January 2022). The site is located approximately 560 m from the coast and in an area with moderately low risk of seawater intrusion (Province of B.C., 2015).

k) Data were not provided in the well assessment report to indicate average water use in the residence and accessory dwelling for comparison to the bylaw requirements. It was also not reported if there have been any issues with the well over time. It was noted that “The tested well #44431 has been supplying water to both the residences on the subject property for over 30 years.” This would suggest that the well is likely able to provide sufficient water for the residences provided onsite water use does not change significantly. The bylaw requirement for sufficient water for two residences (1,600 litres/day/residence, total 3,200 litres) is relatively high, in particular if the occupancy and facilities (e.g. number of bathrooms) in the secondary residence is less than within the primary dwelling. Average daily demand on Salt Spring Island is in the range of

240 to 630 litres per connection, based on previous studies (Gorski & Sacré, 2019; Cowan, 2021). Due to the low permeability of the fractured rock aquifer, the area of influence around the well is likely to be small. The water has already been in use for the identified purpose since 1992 according to Islands Trust correspondence (G. Gordon, personal communication, January 13, 2022). A change in water availability in this area is not anticipated from approval of the secondary residence if the volume of use is consistent with historic rates of diversion.

Table 2: Long-term well capacity estimates

	Specific Capacity				Reference
Scenarios	**m^3/d**	**L/day**	**L/min**	**USgpm**	
After 9 hours ($(Q/DD_{time\ t})$*Max SAD))	18.74	18,740	13.0	3.4	
Projected 100 days, drawdown to top of pump	4.22	4,200	2.9	0.8	Gooding (2021)
Projected 100 days, drawdown to Water Bearing fracture	3.02	3,020	2.1	0.6	
Projected 180 days - slope 1 (figure 2)	2.81	2,810	2.0	0.52	
Projected 180 days - slope 2 (figure 2)	1.56	1,560	1.1	0.29	

*All calculations are inclusive of a 30% safety factor; Q means pumping rate, SAD means Safe Available Drawdown

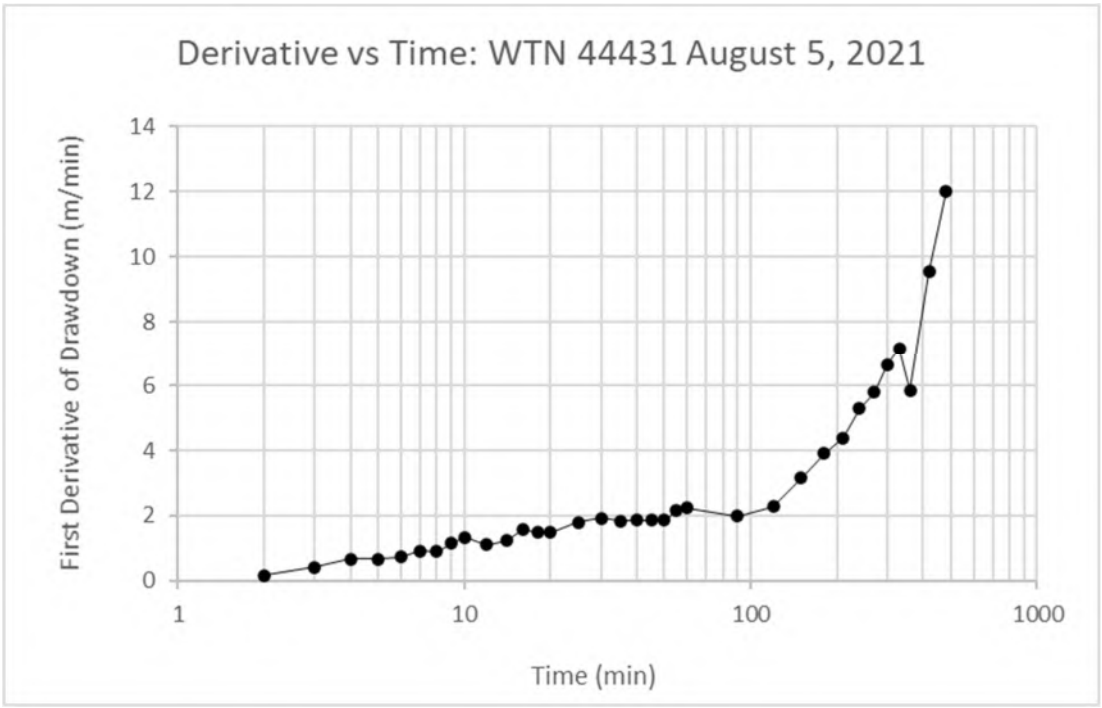


Figure 1: First Derivative of Drawdown vs time

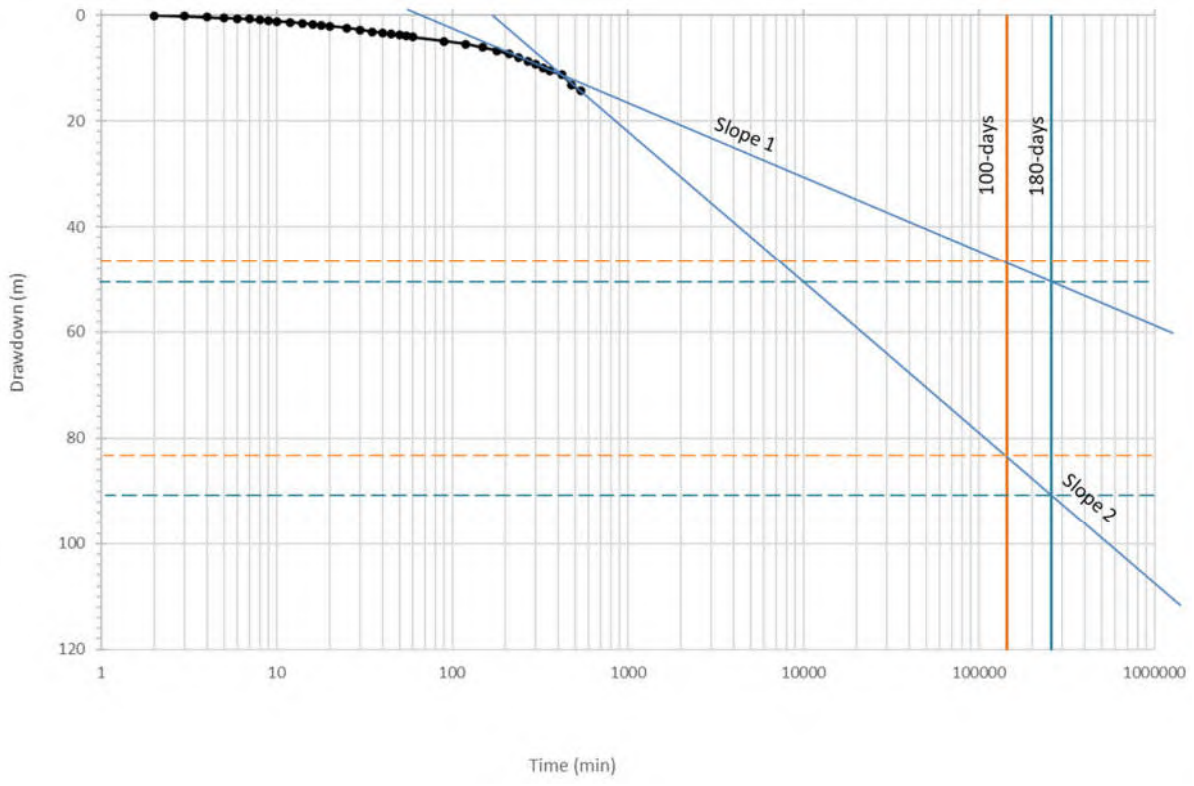
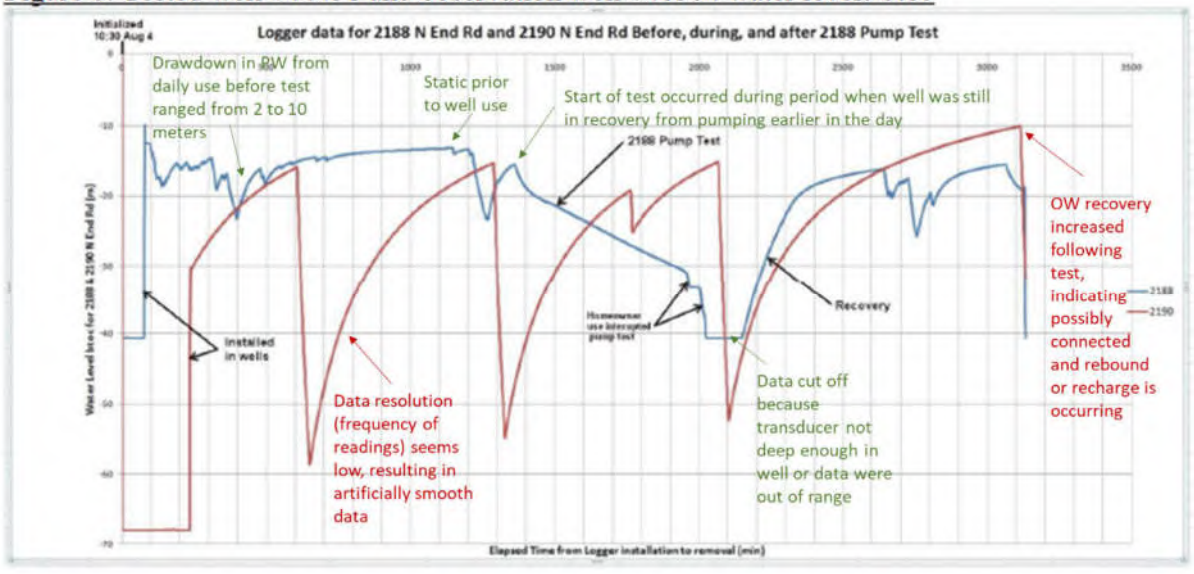


Figure 2: Drawdown vs time in WTN 44431 during pumping test

Figure 6: Tested well #44431 and observation well #46504 water levels btoc



Additional interpretation in GREEN for PW=Pumping well, additional interpretation in RED for OW=Observation Well

Figure 3: Additional interpretation of pumping well and observation well response from multi-day transducer data, excerpted from Gooding (2021), Figure 6

Additional comments on pumping test methods and summary report:

a) Field validation of pumping rate during the test was not reported. The test rate was given as an average (3 Litres/minute).

b) Casing stickup above ground not reported for the test well nor for the observation well.

c) The location of water discharge from pumping was not reported.

d) Continuous transducer data for pumping well were not usable for later phase of pumping test. The measuring device was not installed deep enough, or groundwater level variation was out of the transducer range, resulting in flattening of the data curve from 660 to 790 minutes following the start of household use.

e) The rate of household diversion for pumping well or for observation well during the test was not estimated nor reported, nor accounted for in the analysis.

f) It was not reported whether the pumping well or observation well transducer data were corrected to manual measurements or for variations in barometric pressure.

g) Water level calibration (static) and drawdown data were not reported nor provided in the report Appendix for the observation well.

h) Field parameters (temperature, electrical conductivity, or total dissolved solids) were not monitored during the test, and water quality samples were not collected. Although this was not required by the Islands Trust bylaw, it would have been a useful additional source of data for the well owners and to improve understanding of well characteristics and suitability for potable use.

i) The GWELLS database lists an additional well as sited on the subject parcel, WTN 81237. In the technical assessment, there was no mention of a second well on the property, therefore it is not known if it is present nor the status of its use. If a well is not in use and there is no intent to use it, to be compliant with the *Water Sustainability Act* (WSA) Section 56 and Groundwater Protection Regulation (GWPR) Part 9, the well must be decommissioned--filled throughout its depth with sealant and clean fill) by a registered qualified well driller. If there is no additional well onsite, it would be useful to know this to make a correction to the GWELLS database (Province of B.C., 2022).

j) Although the purpose of groundwater use is considered domestic, and does not require a license, for future assessments of this type, the consulting hydrologist (engineer) is recommended to review standards and data submission requirements in the Guidance for Technical Assessments in Support of an Application for Groundwater Use in British Columbia Version 2 (Todd, et al., 2020), including the associated Table of Concordance.

Hydraulic Connection to Surface Water

To assess potential impacts of the groundwater diversion on surface water rights and environmental flow needs for fisheries, the Islands Trust requested an evaluation of evidence for hydraulic connection between the subject well and adjacent surface water sources. Aspects related to hydraulic connection were not assessed by Gooding (2021) but were not specifically required by the Islands Trust bylaw.

The guidance document "Determining the Likelihood of Hydraulic Connection" (Province of B.C., 2016), defines hydraulic connection as being: "for the purpose of water allocation and use… the reasonable likelihood that pumping of groundwater from a well will eventually result in a change in the flow of a stream or spring or change in the level of a lake, pond, wetland that overlies or borders the aquifer, over a time period and to an extent that the decision maker must take into account in considering the environmental flow needs of the stream or whether the rights of other authorized users on the stream are likely to be detrimentally affected." Determination of the likelihood of hydraulic connection involves evaluation of subsurface geology; aquifer sub-type; presence, absence and spatial extent of low permeability confining layers (e.g., clay, till); and groundwater flow direction and elevation in comparison with stream elevation.

Surface water sources in proximity to the subject parcel and WTN 44431, include the brooks, creeks, and springs listed in Table 3 and shown in Figure 4.

Table 3: Assessment of hydraulic connection with WTN 44431 and surface streams

Stream name	**Distance from well (m)**	**Direction**	**Probability of hydraulic connection (HC) and rationale**
Weisner Brook	53	southwest	Unverified stream location on subject property. Not likely HC. Vertical separation between groundwater and surface (static >15 m bgs). Brook may be local source of groundwater recharge during wet season.
Weisner Brook at PD34038 (Active)	305	southeast	Not likely HC. Vertical separation between groundwater and stream elevation. Groundwater flow direction is toward northeast.
Weisner Brook at PD34037 (Inactive)	407	northwest	Not likely HC. Vertical separation between groundwater and stream elevation. Groundwater flow direction is toward northeast.
Wellington Spring	403	north	Not likely HC. Groundwater flow direction is toward northeast, stream and groundwater table are vertically and horizontally separated in low permeability bedrock.
Saunders Spring	501	east	
Peachey Spring	525	east	
Nettles Creek	608	southeast	
Frederick Spring	700	southeast	
Kathleen Spring	841	southeast	
McFadden Creek	450	northeast	Closest distance downslope, not likely HC. Groundwater flow direction is toward McFadden Creek closer to coast. Due to low permeability of fractured bedrock aquifer and low rate of groundwater use, area of influence around the well is likely to be small (capture zone not likely to intersect creek).

The closest stream, Weisner Brook is mapped as crossing the southwestern side of the subject parcel, but this location was not field verified. McFadden Creek drains an area to the east, and discharges to the coast north of the subject parcel. A series of licensed springs are also mapped southeast of the subject parcel.

Lithological records were examined for a subset of 32 wells within a 200 m buffer of Weisner Brook along its mapped extent in the non-TRIM hydrography layer (Figure 4). Depth to bedrock is shallow in this area, with an average 1.8 m (6.0 ft), ranging from no overburden (bedrock at the surface) up to a maximum overburden thickness of 6.1 m (20 ft) reported. For wells with lithological information, 74% of wells have confining materials with a median thickness of 1.7 m, described as loamy soil, red clay overlying broken sandstone or shale bedrock, while 25% of the wells in the area of the brook have limited to no overburden (lithologically unconfined conditions). Due to the limited degree of lithological confinement surface streams are a probable source of aquifer recharge. At the well there is a vertical separation between the land surface and groundwater table greater than 15 m. Groundwater elevation contours indicate that the direction of groundwater flow is generally toward the north, however hydraulic connection to McFadden Creek is not likely, due to the distance of McFadden from the well (>400 m) and relatively low permeability of the bedrock aquifer. In summary, hydraulic connection between the well and adjacent surface streams is unlikely, and adverse impacts of this domestic groundwater diversion on water availability for stream licensees and environmental flows are not anticipated.

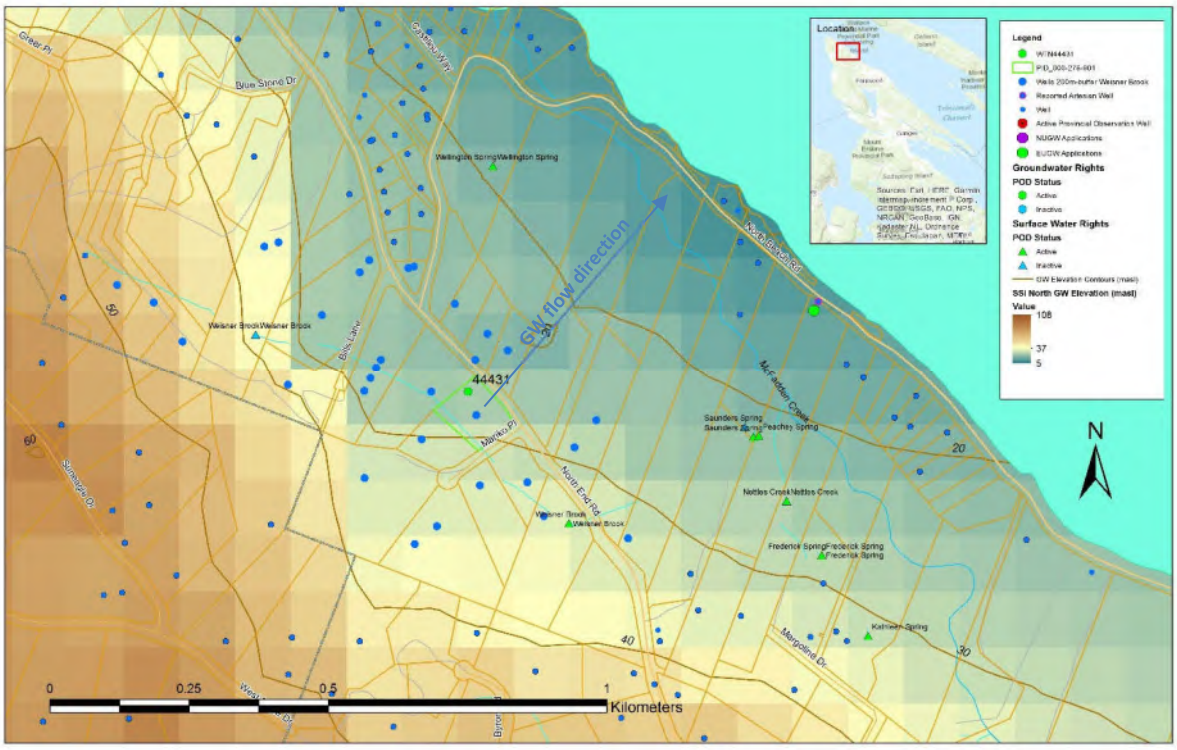


Figure 4: Surface water sources and wells in the area of the subject parcel

Closure

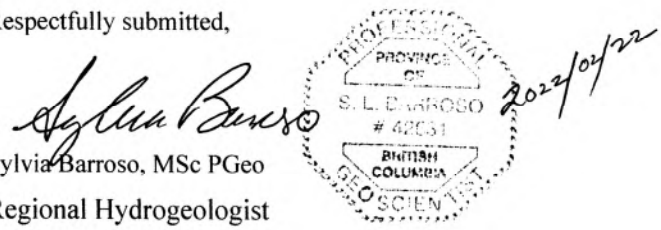
A short-term pumping test was completed to verify the ability of a domestic well to provide water for a residence and accessory dwelling on the subject property. The well has supplied water for the two residences since 1992, and a variance is being sought to bring the land use into regulatory compliance

with the Islands Trust bylaws. Based on analysis of the test results, the well capacity is estimated as from 2,800 to 3,020 litres per day, slightly lower than the bylaw requirements of 3,200 litres per day. However, considering the long-standing use, the well is likely able to provide sufficient water for the residences provided onsite water use remains in the range typical for island residences (up to 630 L/day/connection). Due to the low permeability of the fractured rock aquifer, the area of influence around the well is likely to be small, and a change in water availability for other groundwater users in this area is not anticipated from approval of the secondary residence provided the volume of use is consistent with historic rates of diversion. Hydraulic connection between the well and adjacent surface streams is unlikely, and adverse impacts of this domestic groundwater diversion on water availability for stream licensees and environmental flows are not anticipated.

An unused well on the property, if present and not intended for future use, should be decommissioned according to requirements of the *Water Sustainability Act*, Groundwater Protection Regulation.

Please let me know if you have additional questions or would like to discuss further.

Respectfully submitted,



Sylvia Barroso, MSc PGeo
Regional Hydrogeologist

Attachments: APPENDIX A – WELL CONSTRUCTION INFORMATION AND LONG-TERM CAPACITY ASSESSMENT

pc:

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APPENDIX A: WELL CONSTRUCTION INFORMATION AND LONG-TERM CAPACITY ASSESSMENT

LITHOLOGY

Pumping Well Lithology (WTN 44431, 2188 North End Road, Salt Spring Island)

Depth from (ft)	Depth to (ft)	Depth from (m)	Depth to (m)	Depth from (masl)	Depth to (masl)	Material
0	5	0.00	1.52	59.00	57.48	overburden
5	100	1.52	30.48	57.48	28.52	hard sandstone shale seams
100	131	30.48	39.93	28.52	19.07	brown shale some moisture
131	205	39.93	62.48	19.07	-3.48	brown shale some moisture
205	250	62.48	76.20	-3.48	-17.20	black shale sandstone seams
250	350	76.20	106.68	-17.20	-47.68	soft black shale
350	350	106.68	106.68	-47.68	-47.68	Total depth
205		62.48		-3.48	59.00	WB Fracture 0.75 gpm (total estimated yield)
341		104.00				Reported pump setting (2021 test)

SB comment - pump set below wb fracture, recommend not drawing down below fracture to avoid aeration/turbulent flow in well

Observation well lithology (WTN 46504, 2190 North End Road)

Distance from pumping well (m)	65 m (northwest)			
Elevation (masl)	60		(based on WALLY tool)	
	Level (m)	Date		
Static water level 1	nr	31-Oct-80		
Static water level 2	nr	05-Aug-21	Not reported	Approximately 16 m bgs, close in elevation so approximately same level as PW
Depth main water-bearing fracture (mbgs)	74.68			
Safety factor	0.30			
Safe Available Drawdown(30% safety) (est)	nc			

Depth from (ft)	Depth to (ft)	Depth from (m)	Depth to (m)	Depth from (masl)	Depth to (masl)	Material
0	1.5	0.00	0.46	60.00	59.54	black loam
1.5	5	0.46	1.52	59.54	58.48	sandy loam with gravel
5	10	1.52	3.05	58.48	56.95	brown shale
10	15	3.05	4.57	56.95	55.43	brown black shale
15	20	4.57	6.10	55.43	53.90	black shale
20	20	6.10	6.10	53.90	53.90	casing
20	90	6.10	27.43	53.90	32.57	black shale
90	230	27.43	70.10	32.57	-10.10	black shale
230	245	70.10	74.68	-10.10	-14.68	black shale
245	325	74.68	99.06	-14.68	-39.06	black shale
90		27.43		32.57		fracture
230		70.10		-10.10		fracture (water-bearing)
245		74.68		-14.68		fracture (water-bearing), total estimated yield (

ASSESSMENT OF LONG-TERM YIELD (WTN 44431)

Parameter	Units	Value			
Well information					
Well Tag Number		44431			
Well Identification Plate		na			
Owner well name/number		na			
Well diameter	m	0.152			
Well radius	m	0.076			
Depth water-bearing fracture (first)	m bgs	62.48			
Depth water-bearing fracture (second)	m bgs	na			
Depth to top of aquifer	m bgs				
Depth of pump (test or recommended set-up)	m bgs	104.00			
Finished well depth	m bgs	106.68			
Aquifer thickness (top of aquifer - well bottom)	m	106.68			
Elevation information					
Ground surface at well head	m asl	59	(based on WALLY tool)		
Well stickup above ground	m	nr			
Elevation water-bearing fracture (first)	m asl	-3.48			
Elevation water-bearing fracture (second)	m asl	nr	Single water-bearing fracture reported in well log		
Depth to top of aquifer	m bgs	15.55	Static water level (2021-08-05)		
Depth of pump	m asl	-45.00			
Bottom of well	m asl	-47.68			
Water level information (pumping well WTN 44431)			Date		
Static water level (Pre-test)	m bgs	15.55	08-Aug-21		
Static water level (Pre-test geodetic)	m asl	43.45	08-Aug-21		
Static water level (Max historic)	m bgs	nr			
Static water level (Max historic geodetic)	m asl	nr			
Static water level (Min historic)	m bgs	nr			
Range static water level	m	15.55 -15.55			
Est. seasonal fluctuation in water level	m	4 to 6	from OW438 Salt Spring (Ross Road) 4 - 6 m seasonal fluctuation, from 21 to 26 mbgs		
Est. interference from adjacent wells (max)	m	nr			
Water demand estimates				L/min	Usgpm
Annual demand	m3/y	1168			
Average Daily Demand	m3/d	3.200		2.2	0.6
Test pumping rate	m3/d	4.320		3	0.8

Pumping test information

2021 Pumping Test				**Test pumping rate, Q**			
Test period	**Time from**	**Time to**	**Duration (min)**	**m^3/d**	**L/min**	**Usgpm**	**% proposed rate**
Test date 2021-08-05	9:00	21:00	720	4.3	3	1	135%
Recovery			1047				
Total test duration*		hours	12				
Weighted average pumping rate		m3/d	nc				

*Data not usable after 540 minutes due to well usage (increase in pumping rate) - curtailed test duration 9 hours

Observation well during test			
Well Tag Number		46503	
Well ID		na	
Owner			
Distance from pumping well	m	65	Estimated from map (not field verified)
Est. max interference from PW	m	nc	
% SAD reduction in obs well		nc	

2021 Pumping Test				
DD after 9 hours	m	14.27		
DD projected 100 days	m	63.45	Gooding (2021)	
DD projected 100 days - slope 1	m	47	SB estimated from plot of manual data	
DD projected 180 days - slope 1	m	50.5	SB estimated from plot of manual data	
DD projected 100 days - slope 2	m	83	SB estimated from plot of manual data	
DD projected 180 days - slope 2	m	91	SB estimated from plot of manual data	
Min available drawdown	m	46.93	Drawdown to water-bearing fracture	
Max available drawdown	m	88.45	Drawdown to top of pump (not recommended)	
Safety factor (%)	(no units)	0.3		
Min safe available drawdown (SAD)	m	32.85	Drawdown to WB fracture	
Max safe available drawdown	m	61.92	Drawdown to top of well pump (not recommended)	

	m^3/d	L/min	Usgpm	
Specific capacity				
After 9 hours ($(Q/DD_{time\ t})$*Max SAD))	18.74	13.0	3.4	
Projected 100 days, dd to top of pump	4.22	2.9	0.8	Gooding (2021)
Projected 100 days, dd to WB fracture	3.02	2.1	0.6	
Projected 180 days - slope 1	2.81	2.0	0.52	
Projected 180 days - slope 2	1.56	1.1	0.29	

Report reference for pumping test: "Potable Water Assessment of Well #44431 at 2188 North End Road, SSI" prepared by Dave Gooding, P.Eng, September 2021.

BYLAW REFERRAL FORM
RESPONSE SUMMARY

☐ **Approval Recommended for Reasons Outlined Below**

☐ **Approval Recommended Subject to Conditions Outlined Below**

☒ **Interests Unaffected by Bylaw**

X

☐ **Approval Not Recommended Due to Reason Outlined Below**

Salt Spring Island Trust Area	521
(Island)	(Bylaw Number)
J. Chonk	
(Signature)	Jas Chonk, Legislative Clerk (Title)
February 28, 2022 (Date)	Mayne Island Local Trust Committee (Agency)