Aquifer, groundwater and watershed evidence: 620 Laura Road cidery rezoning (RZ-2026-0014), with private wells and the Grafton Lake watershed considered, Bowen Island BC

This is a documentary record of the watershed, aquifer and groundwater evidence concerning three linked rezoning applications on Bowen Island: 620 Laura Road (RZ-2026-0014, a cidery), 1355 Westside Road (OCP/RZ-2025-0113) and Lot 7 Adams Road (RZ-2025-0015). It draws together, from the Province's, MetroVancouver's and the Municipality's own mapping and the public planning record, the material set out below: where the three properties sit within the Grafton Lake watershed and the Watershed, Aquifer and Stream Protection Development Permit Area; the sensitive ecosystems mapped across the area; the density of wells drawing on the shared groundwater; the documented artesian conditions; and the gaps in the groundwater record on which these applications turn. Prepared by Heather Miller. June 29, 2026.

Contents

1. A note on scope.

Water defines this ground, and water does not respect a single boundary. Wells follow the waterways, and the waterways are themselves watersheds: to concentrate on one named system is to risk losing the others it is part of. This record gives attention to the Grafton Lake watershed, the largest and most widely recognised of the systems here, but that focus is a matter of where the record could be built, not the limit of what is affected.

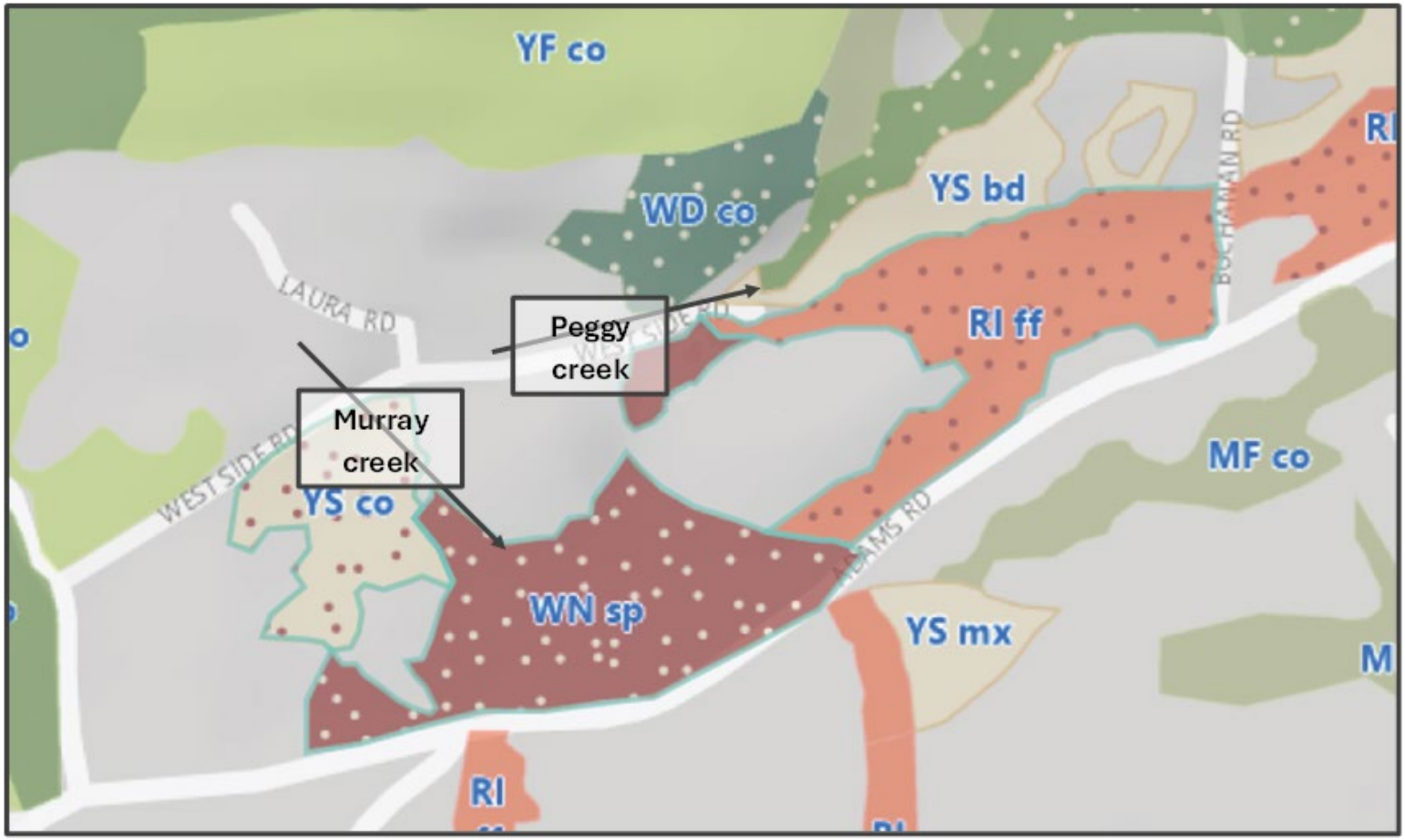
Murray Creek runs down to Lot 7 Adams Road, where it enters Bowen Brook; from there Bowen Brook runs toward Grafton Lake, while a second system runs the other way and is part of the Tunstall Bay and Explosives Creek watershed, ending at the ocean.

This is an area of unusually complex water intersections and interactions. It spans two watersheds, and the Province's mapping shows it falling across two aquifers: Aquifer 746, on the Grafton Lake side, which this record examines, and Aquifer 749. Alongside the private wells looked at in this report, there are also private domestic surface-water diversions along the waterway routes that this record does not examine.

The three properties sit in the centre of this water landscape, and their relationship to the water around them is correspondingly complex.

Aquifer 749, the second watershed, and the surface water diversions all lie beyond what this record sets out. They are named so that the focus on Grafton Lake, and on Aquifer 746, is not mistaken for the limit of what these applications may affect.

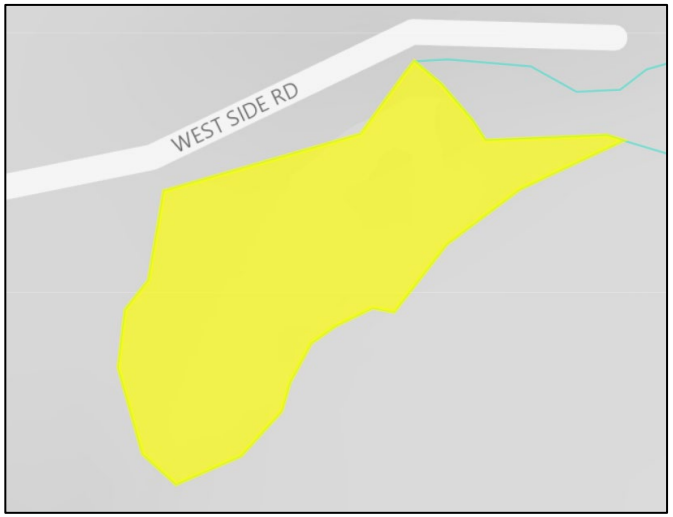
2. Sensitive ecosystems: the Metro Vancouver inventory



Sensitive Ecosystem Inventory (Metro Vancouver), which maps and classifies ecologically significant areas across the region, Bowen Island included, with the identified intent to inform official community plans (as with the one now in draft for Bowen Island), development permits and stream setbacks. Additional markers for creeks in immediate 620 Laura Road context added by submitter.

Figure 1

polygon 62735

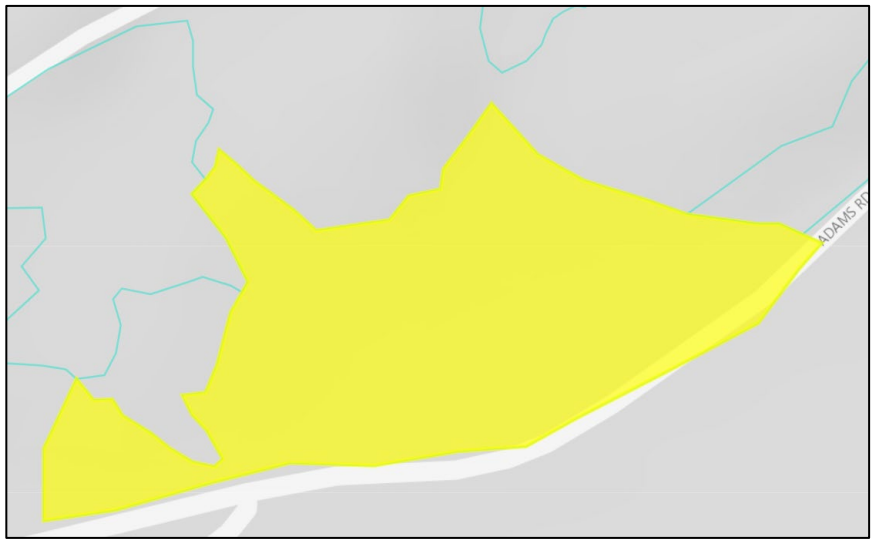


Primary Ecosystem Class: Wetland

SEI Polygon No.	62735
BGC Unit	CWHxm1
Ecosystem 1	100% Wetland, shallow water (SE)
Ecosystem 2	Null
Ecosystem 3	Null
Quality	C
Area, Ecosystem 1	5650.01
Area, Ecosystem 2	0
Area, Ecosystem 3	0
Total Area (sq. m)	5650.01
Change	Null

Figure 2

polygon 62124

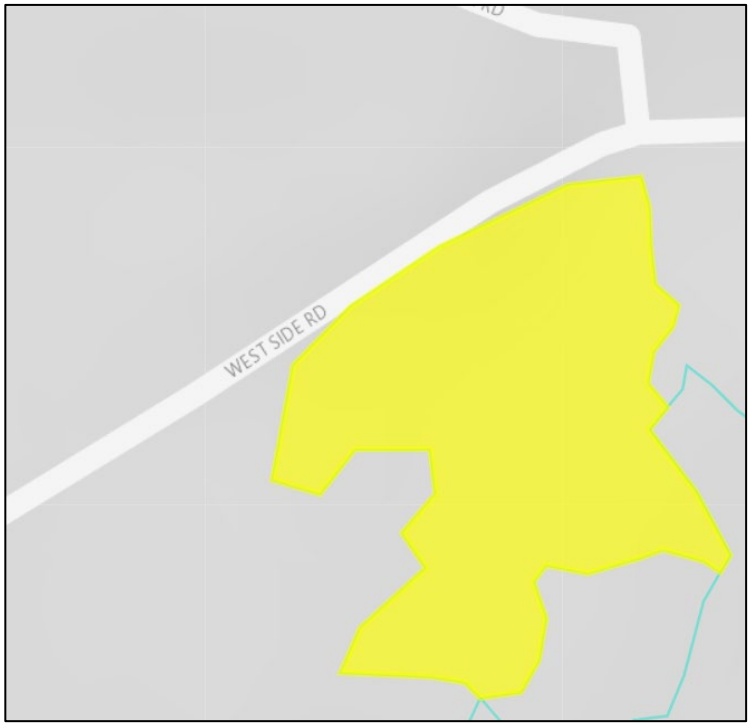


Primary Ecosystem Class: Wetland

SEI Polygon No.	62124
BGC Unit	CWHxm1
Ecosystem 1	80% Wetland, swamp (SE)
Ecosystem 2	20% Young Forest (small), mixed (non SE/ME)
Ecosystem 3	Null
Quality	C
Area, Ecosystem 1	55157.54
Area, Ecosystem 2	13789.38
Area, Ecosystem 3	0
Total Area (sq. m)	68946.92
Change	Null

Figure 3

polygon 62221



SEI Ecosystems (1)

Primary Ecosystem Class: Non SE/ME

SEI Polygon No.	62221
BGC Unit	CWHxm1
Ecosystem 1	70% Young Forest (small), coniferous (non SE/ME)
Ecosystem 2	30% Wetland, shallow water (SE)
Ecosystem 3	Null
Quality	D
Area, Ecosystem 1	20377.51
Area, Ecosystem 2	8733.22
Area, Ecosystem 3	0
Total Area (sq. m)	29110.73
Change	Null

Figure 4

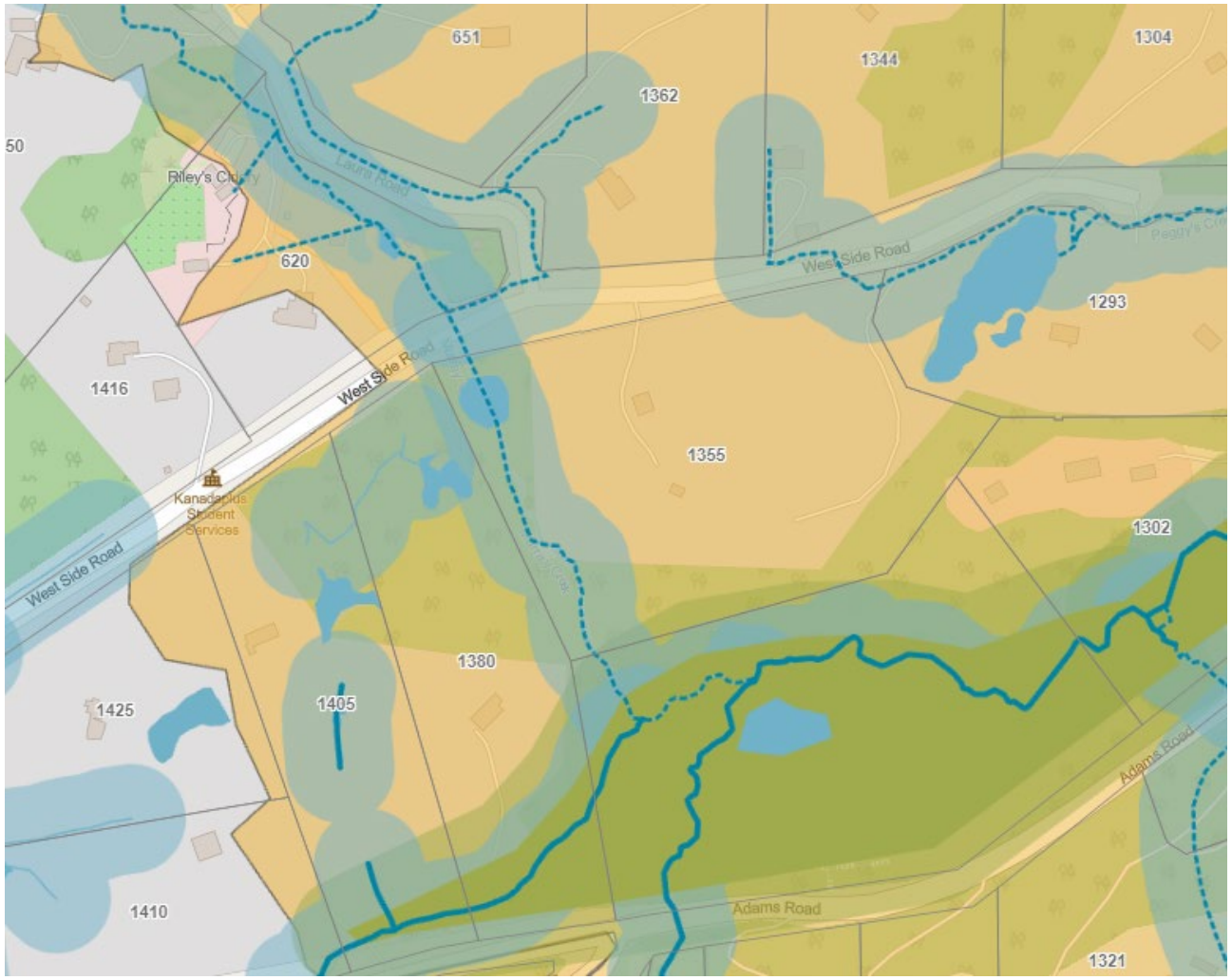
polygon 62288

Primary Ecosystem Class: Riparian

SEI Polygon No.	62288
BGC Unit	CWHxm1
Ecosystem 1	70% Riparian, fringe (SE)
Ecosystem 2	30% Wetland, swamp (SE)
Ecosystem 3	Null
Quality	C
Area, Ecosystem 1	44287.34
Area, Ecosystem 2	18980.29
Area, Ecosystem 3	0
Total Area (sq. m)	63267.63
Change	Null

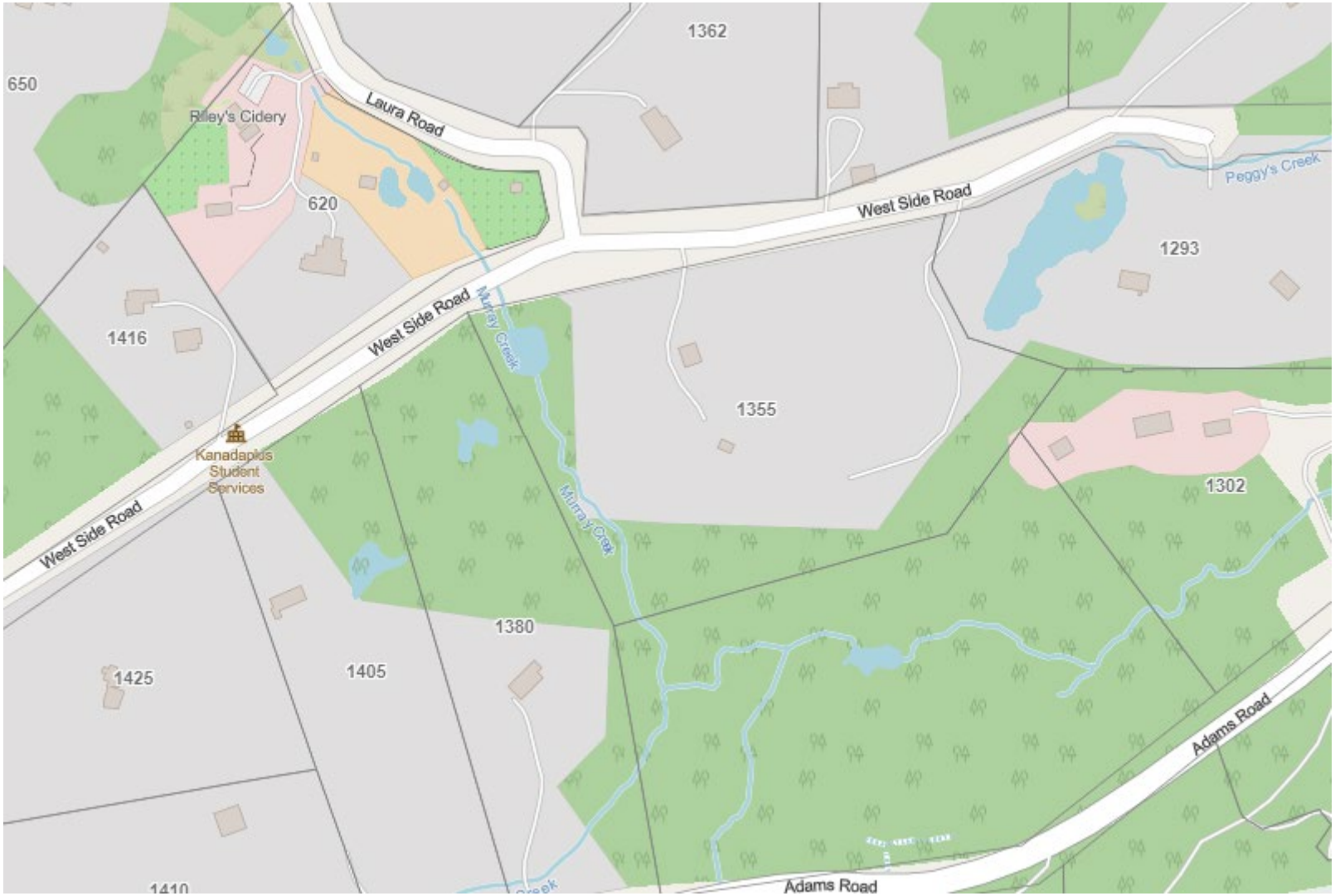
Figure 5

3. Bowen Island watershed, wetland and stream mapping



BowMap (Bowen Island Municipality), with the Watershed, Aquifer and Stream Protection (WASP) Development Permit Area overlay, designated under Official Community Plan Bylaw No. 282, 2010, with guidelines under Land Use Bylaw Amendment No. 301, 2011. The cidery (620 Laura Road), 1355 Westside Road and Lot 7 Adams Road all lie within this Development Permit Area, in the Grafton Lake watershed.

Figure 6



BowMap (Bowen Island Municipality), the same area showing watercourses, without the DPA overlay. Murray Creek runs from 620 Laura Road down to Lot 7 Adams Road, where it enters Bowen Brook. From that junction the systems divide: one toward Grafton Lake, the other toward Tunstall Bay. The area falls within two watersheds.

Figure 7

= *wetland, with buffer in transparent tint. BowMap (Bowen Island Municipality), showing the wetlands currently identified as protected under the Watershed, Aquifer and Stream Protection Development Permit Area. The sensitive-ecosystem features in the Metro Vancouver inventory above are not all reflected here.*

Figure 8

4. Watershed scrutiny: 620 Laura Road and its neighbours

All three linked applications lie within the same Grafton Lake watershed and within Bowen Island's Watershed, Aquifer and Stream Protection (WASP) Development Permit Area. The other watershed (Tunstall Bay/Explosives Creek) appears to have received no attention.

For the two neighbouring properties, the Island's own advisory committees and Council required or recommended hydrogeological, septic, water-supply and watershed assessment before the applications could proceed. For 620 Laura Road, upstream of both and generating effluent, none was required.

Property	Watershed and groundwater scrutiny on the record	Body and source
Lot 7 Adams Road (RZ-2025-0015)	APC: support reserved pending the outcome of hydrogeological testing; septic location and design effective to protect the Grafton Lake watershed; adequacy of water supply for domestic use and fire suppression; covenant protection of the watershed. PECAAC: support to await hydrogeological reporting and assurances that the groundwater recharge area, the wetlands and the Grafton Lake watershed would be protected.	APC, 9 Oct 2025 (adopted 13 Nov 2025). PECAAC, 4 Feb 2026.
1355 Westside Road (OCP/RZ-2025-0113)	PECAAC: riparian and stream protection by restrictive covenant or parkland dedication; larger SPEA buffer; measures to prevent waste disposal in the riparian area; environmental monitoring; 50% conservation under the Conservation Development Policy. APC: recommended deferral until the OCP is updated and the Grafton Lake Watershed Management Plan is complete. Council: deferred the application on that basis.	PECAAC, 4 Feb 2026. APC, 3 Feb 2026 (adopted). Council, 9 Mar 2026, motion 26-97.
620 Laura Road (RZ-2026-0014), the cidery	No hydrogeological, septic, water-supply or watershed assessment required, through either the temporary use permit or the rezoning.	No assessment on the record.

For the two neighbouring applications, two advisory committees and Council all treated groundwater, septic, water supply and the Grafton Lake watershed as matters requiring assessment before the application could advance. 620 Laura Road sits in the same watershed and the same Development Permit Area, immediately upstream, and has been asked for none of it.

The Advisory Planning Commission also stated the principle directly. In recommending deferral of the 1355 application, it asked that the Official Community Plan consider "whether there should be limits on the types or intensity of development allowed in watershed areas island-wide, not just on a case-by-case basis." That is that committee's position, that watershed development should not be judged property-by-property. That is the basis on which 620 Laura Road is nonetheless being assessed alone.

5. Well density and clustering patterns

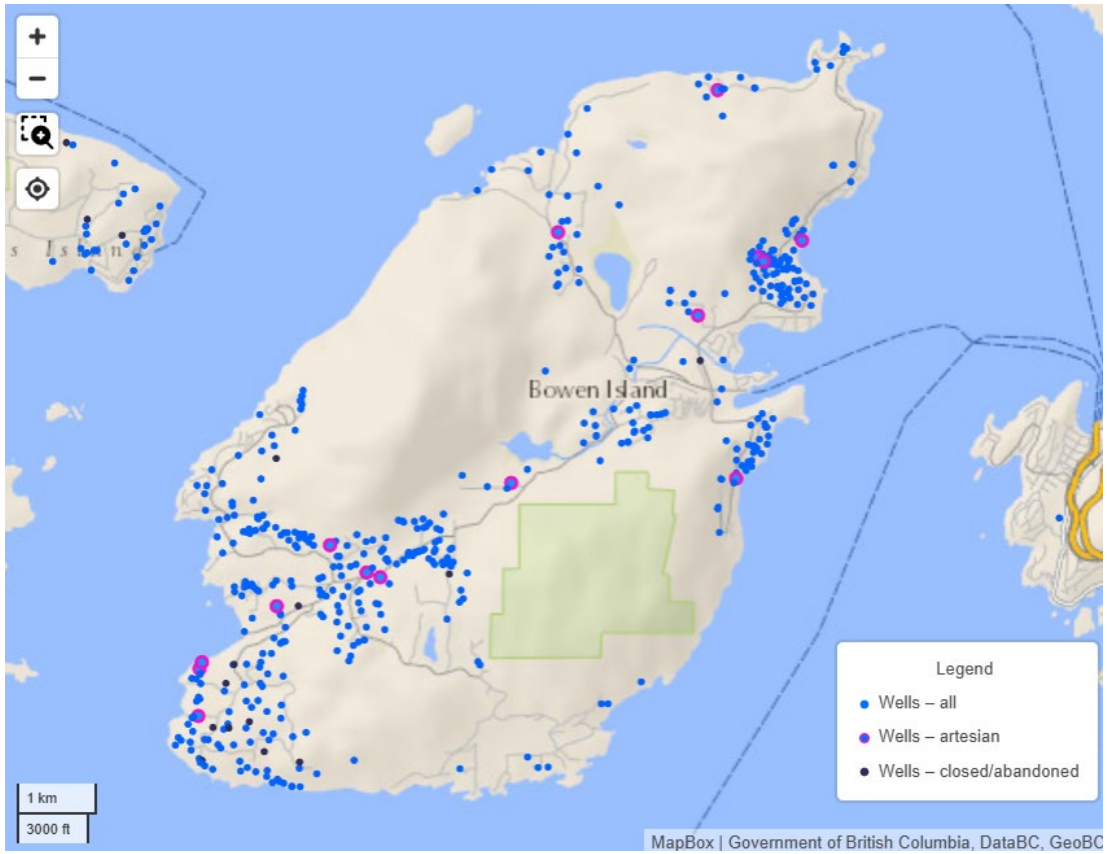
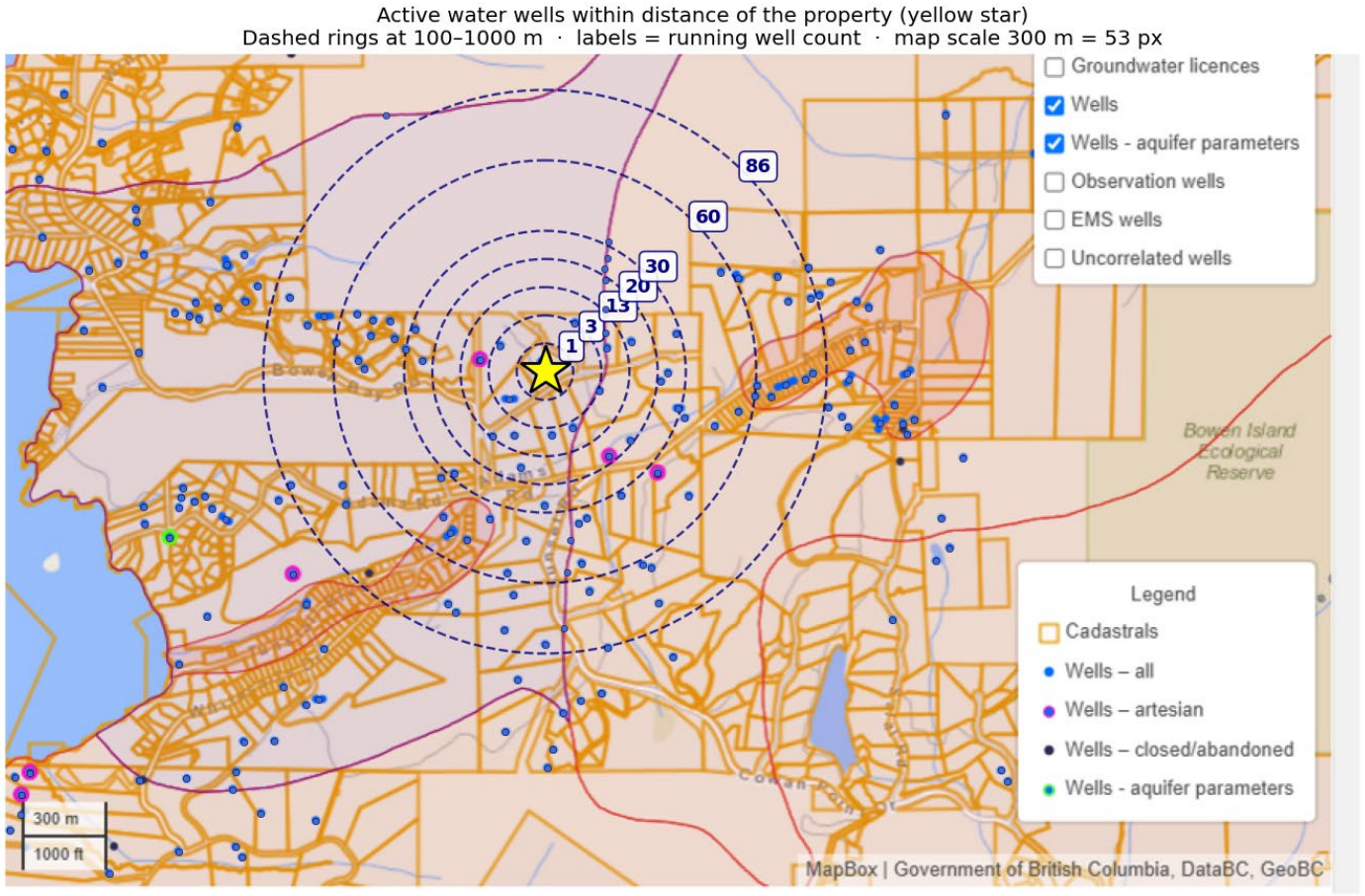


Figure 9

Every well on Bowen Island recorded in the Province's groundwater mapping (image is unedited GWELLS map).

Each blue dot is a well that draws on the island's groundwater; the magenta circled blue dots are documented artesian wells.

The pattern is not even. Wells cluster tightly wherever people live and the ground yields water, and the area around these three properties is one of the densest clusters on the island. The next pages zoom into that cluster: the same provincial well records, counted by distance from 620 Laura Road.



GWELLS basemap (Province of British Columbia); distance rings and well-count analysis by the submitter. Map scale: 300 metres = 53 pixels

Figure 10

6. The case for assessment, never met

A use that generates effluent is being carried from a temporary permit into permanent zoning, on ground that carries nearly every flag that normally prompts a professional review. As far as the record shows, no environmental assessment and no hydrogeological assessment has ever been done, and certainly has never been proffered to Council or to the public. Not at the temporary-permit stage, not for the rezoning. This note does not set out to prove harm. It sets out to show why the absence of any assessment is the problem.

Flags

The Province's own mapping rates this aquifer's vulnerability as Moderate, on fractured crystalline bedrock: ground where contamination can move quickly along fractures, with little of the natural filtering that thick soil or sand provides. And the municipality's own mapping designates this ground a Watershed, Aquifer and Stream Protection area, a Development Permit Area established under the Official Community Plan to protect the watershed, the aquifer, and the streams within it.

Below the property sits a documented flowing artesian well, P.Eng-confirmed, where groundwater stands above ground level under its own pressure. It is a point where groundwater surfaces, below the effluent source. A second well, recorded on the provincial registry for the same lot, could not be located on the staff site visit; an old well that cannot be found cannot be confirmed to have been properly sealed, and an unsealed or abandoned well is itself a recognised route for surface contamination to reach an aquifer directly.

Sensitive ecosystems are mapped right here: wetland, swamp, riparian fringe, and shallow open water, in the Sensitive Ecosystem Inventory's own classes, strung along the creeks that drain the area. These are the ecosystems most readily harmed by effluent, because they are low-lying, water-fed, and depend on clean water passing through them.

A dense cluster of domestic wells draws drinking water from the same ground. Within 300 m of the property there are 13 wells; within 500 m, 30; within 1 km, 86. That is several times the density the aquifer's single published average implies. The property sits in the middle of that cluster, not at its edge.

What the record undercounts

Every provincial figure here undercounts what is actually present, always in the same direction.

The wells correlated to the aquifer, the basis for its density rating, are a fraction of the wells present. On this, the Province speaks for itself. In correspondence, the provincial groundwater team explained that correlation is a recent initiative tied to licensing under the Water Sustainability Act; that reviewing the more than 100,000 historical well records is slow and ongoing; that domestic wells, exempt from licensing, are typically correlated only during a broader aquifer mapping or remapping; and that Bowen's most recent mapping was done in 2006, before correlation began, which, in their words, would explain why so many of the island's wells are uncorrelated compared with more recently mapped areas. So the sparse, correlated count is an artefact of when Bowen was mapped, not of what is in the ground.

Registration compounds it: well registration was voluntary until 2016, so older wells need not appear in the database at all.

And springs enter the provincial record only when someone applies to divert one under a water licence, so a spring no one has licensed is a spring the map does not show. I know this directly. I lived at 1355 Westside Road, between the cidery (620 Laura Road) and the Adams Road artesian well, and there were seasonal springs on the land. They are on no map.

What the Province has recorded is the product of three administrative processes (correlation, voluntary registration, and water-licence applications), not a survey of the wells, springs, and groundwater actually here. Each gap runs the same way: more water, more wells, more discharge than the published data shows, never less.

No assessment, at any stage

A temporary use permit is, by nature, provisional: it is time-limited, it must be renewed, and the use returns for review. That is its safeguard. A rezoning removes those guardrails. It fixes the use to the land permanently, with no requirement to come back, no renewal, no further check.

The permanent step now before you is therefore the one that most needs thorough assessment, not the least, because it is the one that cannot be revisited.

On this record there is no history or consideration of assessment from the initial TUP in 2021 to now, as rezoning is requested. These are not questions the permanent stage raises for the first time: they were live at the temporary stage too, and should have been addressed then. They were not. The assessment has been passed over at each stage: when the use was first permitted in 2021, when the permit was renewed in 2023, and now, as permanence is sought.

I do not need to prove that effluent will reach a particular well, spring, or wetland. Those are the very things informed hydrogeological assessments would examine, and the point of this note is that no such assessment has ever been done. Where I cannot be certain, it is because no one has checked.

So the question is simply this: before a permanent, effluent-generating use is locked into the zoning of ground the Province flags as vulnerable, with a documented artesian discharge below the property, mapped sensitive wetlands and riparian habitat, seasonal springs, and a dense cluster of drinking-water wells, why has no environmental or hydrogeological assessment ever been required, and should one not be required now?

7. Notes for consideration

These three properties, 620 Laura Road (RZ-2026-0014), 1355 Westside Road (OCP/RZ-2025-0113), and Lot 7 Adams Road (RZ-2025-0015), sit within a few hundred metres of one another on the same groundwater and watershed, and are the three linked applications.

Surface water from 620 Laura Road runs down Murray Creek into the wetland complex below 1355 Westside Road, a mapped sensitive ecosystem that recharges the aquifers supplying this part of the island. What is documented at one property bears on all three.
The Committee has been given a confident statement about this ground before. The Updated Environmental Report submitted with the 1355 Westside Road application cites the Province's records, 18 wells correlated to this aquifer and 98 uncorrelated wells within the mapped aquifer extent, and then states there are "no artesian wells." (Updated Environmental Report, 1355 Westside Road, application documents for OCP/RZ-2025-0113, Bowen Island Municipality, https://bowenisland.civicweb.net/document/331676/, accessed 28 June 2026; well figures therein attributed to Province of BC iMap, 2024.)

The same sentence shows the difficulty. It records that the great majority of wells in the aquifer, 98 of 116, are uncorrelated, meaning not yet reviewed; and then reads the correlated records as though they were a complete census, concluding there are no artesian wells. But a flowing artesian well is documented immediately next door, on Lot 7 Adams Road: confirmed by a Professional Engineer, with a static water level standing above ground surface, and uncorrelated to any aquifer, which is exactly why a count drawn from correlated records does not show it.

This is the correlation gap in practice: a confident negative was drawn from records the same sentence acknowledges are incomplete, and it passed into the information the Committee worked from. For Lot 7 Adams Road the Committee had itself sought assurance from

qualified professionals that the groundwater recharge area, the wetlands and the Grafton Lake watershed would be protected, the same watershed in which all three properties sit, yet the artesian conditions next door were not identified. I note this not as a comment on any individual, but because this shared groundwater has now been considered more than once on information the provincial record cannot support. That is precisely why the combined, independent assessment sought in the accompanying submission is needed before any of the three applications proceeds.

A note on groundwater complexity, the linked applications, and the committee's own unfinished work.

The groundwater context for 620 Laura Road is genuinely complex. The aquifer is fractured crystalline bedrock, ground in which flow directions are hard to determine, and whether a well finds water depends on hitting a fracture. The surface gives little away: fractures can run in directions that contradict the lay of the land, so the way water moves below cannot be reliably read from the slope above it. Yield and location cannot be predicted from desktop data or neighbouring wells. I have deliberately not taken this up in depth for the present submission, but it underlies this application and, as set out below, the two neighbouring applications it is linked to.

The 1355 Westside Road reports and Council submissions show the complexity: qualified professionals disagreed over how to read the same well data. A documented flowing artesian well next door, at Adams Road, has groundwater standing above ground under its own pressure, the kind of local variation this ground produces. Even a proposed test well can mislead here: a well sited where groundwater surfaces locally may not represent the deeper bedrock aquifer any developments or uses would rely on. The point is that this ground is hard to read and site-specific, and it reinforces what this submission has shown throughout: a complex, sensitive, and vulnerable area, where the burden must be on establishing the facts before permanent decisions are made.

What the record engaged, and what it did not.

The artesian well is documented in the applicant's own well report for the Adams Road rezoning application, and that report was read closely: by the applicant, by staff, and by the Islands Trust groundwater specialist who worked directly from it. But it was engaged almost entirely as one question, whether the well could supply the proposed lots. That a well on this ground is a flowing artesian well, that groundwater here stands above the surface under confined pressure, was noted as a fact about supply and not taken up for what it also signals: a pressurised, hydraulically connected groundwater system, and a standing point of connection between what is below ground and what is above it. The significance of the artesian condition, as distinct from its yield, passes through the record unremarked.

The same lot carries a further point of connection. A second well is recorded on the provincial well registry for Lot 7 Adams Road, and was noted in the Committee's own consideration; the site visit of 8 September 2025 looked for it and could not locate it. Its condition is

therefore unknown. I do not characterise it beyond what the record shows. I note it because it belongs with the other features this ground presents, the springs, the flowing artesian well, the creeks, as one more place where surface water and the subsurface meet, on a property where those connections are already dense and already, on this record, unexamined.

A note on the character of the wastewater, flagged here as work I am actively carrying out.

The complexity above concerns how this ground behaves; a separate question concerns what has been discharged into it. The effluent from a cidery is not domestic sewage. It is the process wastewater of a fermentation operation: a high-organic-load, low-pH stream, different in character from household wastewater. Yet for more than five years this operation has run with its wastewater handled through the framework for domestic sewage, the Sewerage System Regulation, and its actual character has never been examined. That character matters a great deal in a setting like this one, because organic loading acts on a receiving environment: it does not simply add to what is there, it can change the conditions under which other hazards behave.

This is a significant subject in its own right, and a larger one than this record can carry (see source notes below for some reference points). It reaches into how process effluent interacts with groundwater, with the wetland downstream, and with the other hazards already present in this catchment, and also into which regulatory regime, if any, is actually responsible for that interaction. I am developing it separately, and the records bearing on how the wastewater has been handled over the past five years are the subject of requests now in progress. I flag it here because a permanent decision is being asked on an operation whose most consequential environmental output has, in five years, never been assessed for what it is.

This is why the linked applications cannot be assessed in isolation. A supply opinion for one property that assumes domestic-only surroundings cannot account for a commercial, water-using operation among the three. Assessed separately, each leans on assumptions the others break.

The committee's own predecessor recognised the need. The 2019 ECAAC Work Plan set out to collect aquifer and groundwater data for sustainable water management. That work does not appear to have been completed, and the aquifer-data action is gone from the 2020 plan of that committee. The knowledge it would have produced is what these applications now turn on, and it is still missing.

8. Sources

All sources below are public records of the Province of British Columbia, Metro Vancouver, or Bowen Island Municipality. Throughout, this record also draws on the minutes, agendas and attached agenda items of Bowen Island Municipality Regular Council, Committee of the Whole, the Advisory Planning Commission, and the Parks, Environment and Climate Action Advisory Committee, from 2019 to the present; specific meetings are dated in the text where they are relied on.

• Metro Vancouver, Sensitive Ecosystem Inventory (SEI), gis.metrovancouver.org/mvmaps/SEI. Ecosystem-class composite map accessed 27 June 2026; individual SEI polygon panels (62221, 62124, 62288, 62735) accessed 28 June 2026.

• Province of British Columbia, Groundwater Wells and Aquifers (GWELLS) and iMapBC (DataBC, GeoBC). Aquifer 746 summary, well information, and the well-location and density maps, accessed 27 June 2026.

• Bowen Island Municipality, BowMap. Watershed, Aquifer and Stream Protection (WASP) Development Permit Area (Official Community Plan Bylaw No. 282, 2010; Land Use Bylaw Amendment No. 301, 2011), accessed 28 June 2026.

• Updated Environmental Report, 1355 Westside Road, application documents for OCP/RZ-2025-0113, Bowen Island Municipality, https://bowenisland.civicweb.net/document/331676/, accessed 28 June 2026 (well figures therein attributed to Province of BC iMap, 2024).

• 1355 Westside Road application page: Bowen Island Municipality, “Land Use Bylaw and Official Community Plan Amendment Application at 1355 West Side Road” (18 July 2025), https://bowenislandmunicipality.ca/2025/07/18/land-use-bylaw-and-official-community-plan-amendment-application-at-1355-west-side-road/, accessed 28 June 2026.

• Committee and Council records (Bowen Island Municipality): Advisory Planning Commission minutes, 9 October 2025 (adopted 13 November 2025) and 3 February 2026 (adopted); Parks, Environment and Climate Action Advisory Committee minutes, 4 February 2026; Regular Council minutes, 9 March 2026 (motion 26-97).

• Well report, Lot 7 Adams Road: EDS Pumps & Water Treatment Ltd., Pumping Test Evaluation for Well ID Plate No. 54701 (Well Tag No. 120532), Leo Montis Ventures (Marc Zubel, P.Eng., 25 April 2020), in the application documents for RZ-2025-0015.

Among the sources and real-world cases considered in forming my understanding of the character of cidery process wastewater:

• Sustainable Winegrowing British Columbia, Winery Process Wastewater Management Handbook: Best Practices and Technologies (February 2018).

• Greater Vancouver Sewerage and Drainage District (Metro Vancouver), Fermentation Operations Bylaw No. 294, 2015, and associated Fermentation Operations regulatory program, metrovancouver.org.

• BC Assessment, Light Industrial vs. Business and Other Property Classifications (fact sheet, last updated 15 February 2023), info.bcassessment.ca.

• New Hampshire Department of Environmental Services, Effects of Breweries, Distilleries and Wineries on a Publicly Owned Treatment Works (WEB-28, 2022).

• Urban Systems Ltd. (Mary Boulanger, P.Eng.), Snug Cove Wastewater Treatment Plant Capacity Review, prepared for Bowen Island Municipality, 16 October 2019.

• Proposed Brewery/Cidery Waste Management Practices (2001 County Road 3), with engineered three-tank on-site wastewater system.

• Marlborough, New Zealand (2016–2018): grape-marc leachate linked to contamination of neighbouring drinking-water bores (manganese, iron, arsenic) and a contaminated stream; RNZ and Stuff.co.nz (2018), NZ Geographic (2021).

• Washington State Department of Ecology, Winery General Permit (2019): introduced on the basis that the acidity and oxygen demand of winery wastewater are incompatible with on-site septic/drainfield function.

• California Central Valley Regional Water Quality Control Board: Cleanup and Abatement Order, Delicato Vineyards (2004); 2015 Waste Discharge Requirements order; California Winery General Permit (2021).

• Astoria, Oregon (2020–2022): fermentation operations straining municipal treatment, prompting an industrial pretreatment program; OPB (2022), Daily Astorian (2020).

• Burlington, Vermont (2018): partially-treated wastewater released into Lake Champlain, attributed in part to high-strength brewery and cidery waste; AP, Craft Brewing Business, Vermont Public.

9. List of figures