



DATE OF MEETING: April 12, 2021

TO: Galiano Island Local Trust Committee

FROM: Narissa Chadwick, Island Planner  
Southern Team

COPY: Brad Smith, Island Planner  
William Shulba, Freshwater Specialist  
Robert Kojima, Regional Planning Manager

SUBJECT: Report subject Groundwater Sustainability Project: Phase 3 Implementation and Planning Preliminary Options

## REPORT SUMMARY

This report provides an update on progress related to the Groundwater Sustainability Project Phase 3 Implementation and Planning. It identifies a preliminary list of options for Official Community Plan (OCP) and Land Use Bylaw (LUB) amendments based on data collected through the mapping of groundwater recharge potential and regional groundwater availability (water budgets).

## BACKGROUND

At the February 1, 2021 Galiano LTC meeting the LTC approved the project charter for “Phase 3: Implementation Planning” of the Groundwater Sustainability Project (see Attachment 1).

The project was initiated in 2019 as an initiative of five Southern Local Trust Committees. The phases of the project are as follows:

Phase 0: Data and Information

Phase 1: Groundwater Recharge Potential Mapping

Phase 2: Regional Groundwater Availability Assessment (Water Budgets)

### Phase 3: Implementation and Planning

A [summary report](#) providing details on project was provided at the November 26, 2020 LTC meeting. As indicated in the February 1, 2021 staff report the use of the data and mapping will be integrated into the development review procedures for all local trust areas as final mapping data becomes available.

Staff are integrating the mapping into the Islands Trust TAPIS mapping system. The options for OCP and LUB amendments identified in this report are informed by draft outcomes from the project.

## ANALYSIS

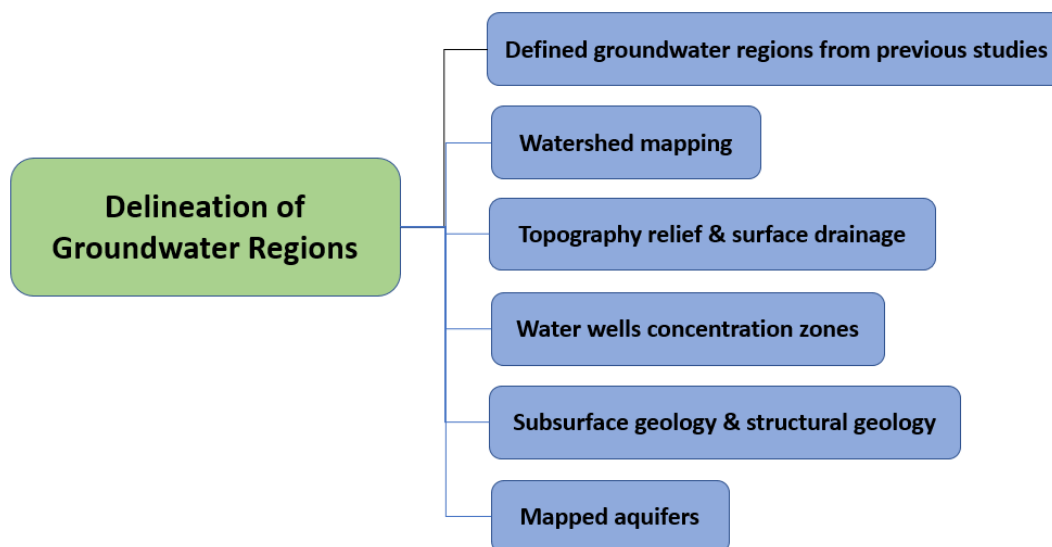
### What will the maps tell us?

**Groundwater recharge potential and groundwater protection zones-** Groundwater recharge potential refers to potential of the island to replenish water within its aquifers. This potential is dependent on factors such as the capacity of soils to retain water, interaction of the watershed ecosystems, changes in topography, geology, biogeography, land use and precipitation distribution. Understanding groundwater recharge potential helps estimate the amount of groundwater available for use by island communities and the environment. .

Understanding significant groundwater recharge potential areas can be represented as groundwater protection zones. Groundwater protection zones are physical landscape areas on the islands that are determined by natural, ecosystem, geological, topographic elements to protect groundwater recharge potential and other sensitive groundwater dependant ecosystems.

**The availability of groundwater in each Groundwater Region (water budget) -** Groundwater regions are loosely based on natural elements but can be considered boundaries or management unit areas consistent with the existing water management areas on Galiano Island (see Figure 1 and Figure 2). To quantify the amount of groundwater available within groundwater regions, the data collected considers climate variables, groundwater recharge potential, estimated water demand/usage, and three dimensional island hydrogeological models. A groundwater budget is determined by the rate of domestic water well use, ecosystems use, and discharge to the ocean from surface water runoff balanced by the amount of available recharge. Each groundwater region for Galiano has a water balance calculation (Figure 3). .

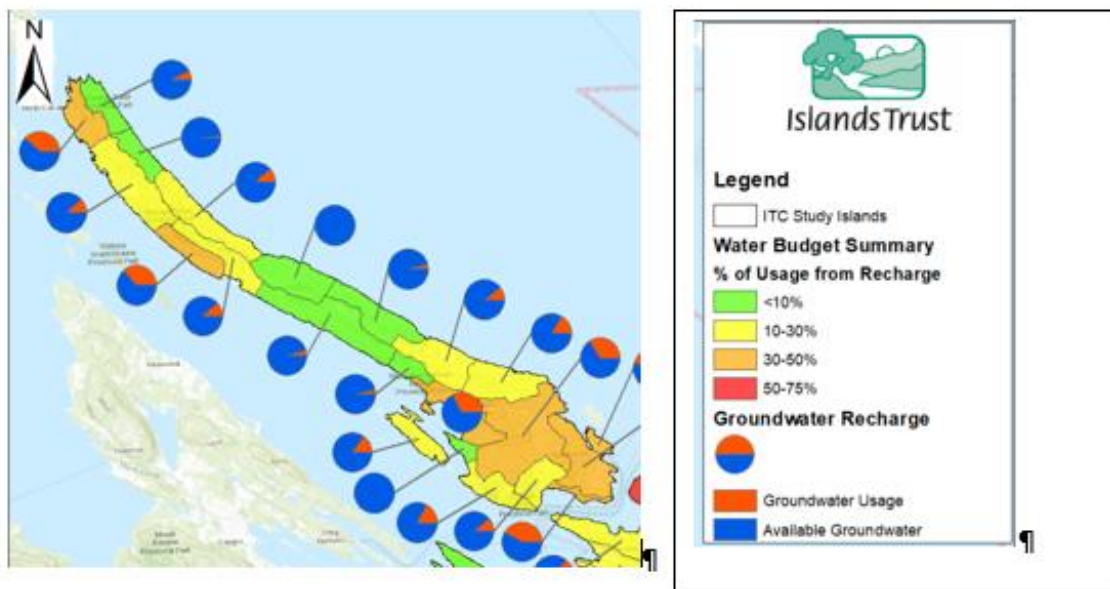
**Figure 1: Delineation of Groundwater Regions**



**Figure 2: Groundwater Regions of Galiano Island**



**Figure 3: Draft Water Budget Summary for Groundwater Regions of Galiano Island**



## **How can groundwater recharge potential mapping and regional water budgets inform changes land-use policy and regulation?**

Spatially determining groundwater recharge potential and regional groundwater availability can help refine the Local Trust Area's policies and regulations currently supporting groundwater sustainability.

The groundwater mapping of Galiano Island provides an opportunity for a tiered approach to OCP and LUB amendments supporting groundwater sustainability. The mapping and data factors include:

1. Spatial concentration of significant groundwater recharge potential identifies certain areas of the island that may be vulnerable to development and land use changes.
2. Water usage informs the water budgets in the different Groundwater Regions across the island.
3. Data gaps and the need for further analysis of water use, such as agricultural water demand, and differences between estimated water use, actual use and deemed water rights. Regional groundwater budgets are based on a conservative assumption of average usage per lot related to land use designation.
4. Build out potential and the existence of undeveloped land that has the potential to be developed over time. This includes private managed forest lands.
5. Influences of climate change on groundwater systems and the direct connection of groundwater to surface water bodies, streams, and watershed ecosystems.

A tiered approach to protecting groundwater recharge and regional groundwater sustainability focusses on four (4) classifications in two (2) subgroups: 1) groundwater protection areas 2) groundwater region sustainability (water budgets).

**Class 1-** Areas that are in critical need of attention where there is high confidence in existing data.

**Class 2** – Areas where there is a potential for critical attention but some data uncertainty.

**Class 3** – The level of attention needed is moderate based on existing use but could become critical if buildout or licensed potential (typically agriculture) is maximized.

**Class 4** – The level of attention needed is not critical. This includes protected areas and forest lots, or areas with limited development potential. In these areas there is high confidence in existing data.

## **What policies and regulations does Galiano already have in place to support groundwater sustainability?**

The Galiano OCP recognizes the need for and encourages groundwater sustainability in a number of ways.

These include:

- Recognition of the importance of using the precautionary approach to water use and policies related to water supply that address the interests in using the precautionary principle.
- Policies that encourage the protection of groundwater quality.
- Recognition of the “deteriorating water quality” on the island and the pressure of increasing demands
- Policy supporting designating sensitive watershed areas, water recharge areas and wetlands and streams and protecting them with development permit areas and other mechanisms “when accurate data is available”
- Identification of climate change as a fundamental factor in land use decision making

- The designation of a development permit areas (DPA) for Elevated Groundwater Catchment and related guidelines.
- The identification water regions and water management regions.
- Support of rainwater management and rainwater capture
- Advocacy policies related to the sustainability of water supply.

The Land Use Bylaw includes a number of regulations which support groundwater sustainability. These include:

- Rainwater capture (storage of minimum 16,000 litres) as a requirement for building permits for new construction in water management areas.
- Exempting cisterns located in a building from the calculation of floor area of the building and the lot coverage of the lot on which it is located.
- Requiring rainwater capture and storage system of at least 16,000 litres as a condition of building permit if the building is to contain a secondary suite.
- Standards for potable water supply with respect to subdivision

### **What are the OCP and LUB amendment options?**

Based on a preliminary review of existing policies and regulations and considering the information provided in the draft groundwater mapping data staff have identified a number of OCP and LUB amendment options ranging from simple updates to the addition of new DPA and the creation of a Water Protection Zone.

#### **Options for OCP Amendments:**

- Refining the language and update objectives related to water supply to include reference to groundwater regions, groundwater sustainability, water balance and the existence of groundwater mapping data (there are currently many references to “when accurate data is available”). This will include additional definitions.
- Recognition of groundwater sustainability and the cultural heritage value of water in OCP key principles.
- Addition of policies related to preservation of groundwater sustainability for each land use designation.
- Connecting groundwater sustainability to the health of ecosystems (current focus is more on water as groundwater as a providing a service to the community).
- Consideration of the climate change on water sustainability.
- Consideration of groundwater sustainability needs in TUP guidelines.
- Update existing groundwater regions to align boundaries with in the groundwater mapping work.
- Identify in mapping, areas that cannot support additional density (e.g Class 1 as first focus)
- Clarifying requirements for rezoning applications to consider impacts on groundwater sustainability.
- Update policies related to water licensing requirements.
- Replace the DPA policies and guidelines for Elevated Groundwater Catchment Areas with DPAs that consider: recharge protection areas, water conservation measures in small lot subdivisions, groundwater protection guidelines, ecosystem protection, and well capture for water systems.
- Advocacy policies amended to be informed by the Islands Trust Freshwater Sustainability Strategy.
- Develop water sustainability analysis criteria for rezoning .

#### **Options for LUB Amendments**

Updates to existing zoning regulations updates could include:

- The creation of groundwater protection zones for critical areas (Class 1, some areas in Class 2 and 3).
- Changes to zoning in some critical areas that reduce current density or development potential.
- Zoning regulations that provide the opportunity for density bonus if certain conditions are met.

- Zoning regulations that limit existing uses, place restrictions on size and siting (e.g. setbacks for wells, setbacks from community water system wells).
- Consideration of potable water as a condition of certain uses (It is currently a condition of subdivision).
- Review of water management area regulations and boundaries.
- Update of reference to potable water supply standards to include multi-unit residential.
- Limiting impermeable surfaces.
- Review and update rainwater capture and cistern regulations.
- Updating subdivision servicing regulations related to potable water requirements, cistern requirements, drainage requirements.

**Other Considerations**

- Development of guidelines for the rezoning of land in Forest (F1) Zone to consider cumulative impact on water region.
- Updates to bylaw enforcement policies
- Development Approval Information (DAI) bylaw amendments
- Development of a terms of reference for hydrogeologists
- Consideration of administrative requirements related to development permits, TUP, covenants and monitoring.
- Consider monitoring programs

**Next Steps**

- Staff will work to finalize mapping, including build-out analysis and integrate it into the Islands Trust TAPIS mapping system.
- Mapping will be done in phases: Phase 1 Recharge Potential Mapping, Phase 2 Regional Groundwater Availability Mapping
- Groundwater regions will be reviewed by provincial staff.
- Staff will classify groundwater protection areas and groundwater regions by incorporating build-out mapping.
- Staff will focus first on policy development for Class 1 and use build out overlays to identify what areas in Class 3 could become critical if not addressed through policy amendments.
- Methodology to address areas in Class 2 will be developed.
- Staff will schedule community meeting to share mapping results and implications.

Submitted By:	Narissa Chadwick, Island Planner	March 31, 2021
Concurrence:	Robert Kojima, Regional Planning Manager	March 31, 2021

**ATTACHMENTS**

1. Project Charter

# GROUNDWATER SUSTAINABILITY - IMPLEMENTATION – Project Charter v1

Galiano Island Local Trust Committee

Date: January 2021

**Purpose:** To implement results of Phases one and two of the Southern Gulf Islands Groundwater Sustainability Project through community engagement and education, policy, and changes to regulations.

**Background:** The Southern Gulf Islands Groundwater Sustainability project was initiated in early 2019 and consisted of data collection, mapping and analysis of groundwater regions in the southern gulf islands. The results of the first phases of the project will be incorporated into Islands Trust development review processes. The Local Trust Committee has identified further implementation of the results through public engagement and potential bylaw amendments as a Top Priority project.

## Objectives

- Identify implementation options
- Analyze and assess options
- To update bylaws to provide to greater protection of groundwater resources

## In Scope

- Analysis of options for bylaw amendments to implement groundwater protection measures based on earlier phases of the project
- Community engagement on phases I and II
- Community, First Nations, and agency consultation
- Recommendations on potential amendments
- Legislative process to amend bylaws

## Out of Scope

- Unrelated regulatory amendments
- Unrelated amendments to the OCP

## Workplan Overview

Deliverable/Milestone	Date
Preliminary report and review of Project Charter by LTC	January 2021
Staff report on implementation options, LTC direction	April 2021
Community Groundwater Workshop to present findings of Phases 1 and 2	June 2021
Early First Nations Consultation and Targeted Agency referrals	April – Sept 2021
LTC review of issues and options	September 2021
Community consultation	October – Dec 2021
LTC direction to prepare draft bylaws	January 2022
LTC review of draft bylaws, First Nations referrals, agency referrals and First Reading	Feb – April 2022
Public Hearing	May 2022
Post-hearing legislative process	May – Sept 2022
Implementation: educational materials, DAI Bylaw amendments, BVN Bylaw amendments, procedure bylaw amendments, application processing procedures revised	June – Dec 2022

## Project Team

Project Team		Est. Hours/annum
Robert Kojima	<i>Project sponsor</i>	50
Narissa Chadwick	<i>Project planner</i>	200
William Shulba	<i>Professional advisor</i>	200
Maple Hung	<i>Admin support</i>	30
Jas Chonk	<i>Legislative Clerk</i>	10
Jackie O'Neill	<i>IS support</i>	10
		500
<b>RPM Approval:</b> <i>Robert Kojima</i> <b>Date:</b> January 25, 2021	<b>LTC Endorsement:</b> Resolution #: <b>Date:</b> February 1, 2021	

## Budget

Budget Sources:		
Fiscal	Item	Cost
21-22	Community consultation	\$1000
21-22	Legal review contingency	\$2000
21-22	First Nations consultation	\$2000
22-23	Public Hearing	\$2000
22-23	Contingency	\$1000
	<b>Total</b>	<b>\$8000</b>