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TO: Thurston County Planning Commission

FROM: Claire Swearingen, Associate Planner

DATE: January 21, 2026

SUBJECT: Critical Aquifer Recharge Areas BAS and Concepts

Introduction

Critical aquifer recharge areas (CARAs) are parts of the environment where soil conditions and other factors help surface waters to infiltrate into groundwater. In the current Critical Areas Ordinance (CAO), CARAs are regulated under TCC Chapter 24.10. The WAC defines CARAs as follows:

"'Critical aquifer recharge areas' are areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge." (Washington Administrative Code 365-190-030)

Because water can infiltrate into the ground easily in these areas, they are important for replenishing groundwater resources, but are also susceptible to contamination. The most sensitive CARAs include areas with very coarse soil types, which allow for quick infiltration with little filtering of contaminants, and areas near wellheads, called wellhead protection areas.

Geologic formations under the soil can also impact the sensitivity of a CARA. Aquifers, and the groundwater they contain, are a critical part of the hydrologic cycle. There are two main types of aquifer; contained aquifers and water-table aquifers. Contained aquifers are surrounded by materials that don't allow water to pass though easily, putting them under pressure. Water often springs up out of these aquifers, creating artesian wells such as those in Downtown Olympia. Water-table aquifers are not contained under pressure, so they can rise and fall with rainfall and drought, and are more susceptible to contamination.

Protecting groundwater involves understanding the locations and characteristics of aquifers and water quality threats, planning for implementation of protective rules, and monitoring for contamination and other risks. Protecting CARAs ensures that Thurston County has clean water for drinking, and helps support other important habitat like streams, rivers, and lakes.

Functions and Values

Groundwater is a primary source of drinking water in Thurston County, and protecting it from contamination or depletion is important for maintaining human health and safety. If aquifers cannot recharge due to changes on the surface (like increased impervious areas), drinking water wells run dry. If water is contaminated by chemicals from spills or sewage from septic systems, people may become sick. Other factors, like climate change, sea level rise,

and water overconsumption can impact the quality and quantity of available groundwater. The Critical Areas Ordinance (CAO) can help when a specific development might impact a CARA, but other programmatic approaches, such as streamflow restoration, can help mitigate impacts at a larger scale.

Aquifers also help provide a consistent source of cold water to streams, lakes, and rivers, especially in the hot, dry season in the late summer and early fall. Many species of fish, especially salmonids, rely on clean, cold water for spawning habitat. Groundwater can discharge through springs or streambanks year-round, and aquifers keep water cold inside the earth. Human impacts and climate change mean that stream temperatures are rising, and water quantity is low in the dry season. Cold, full streams are important for habitat quality and fish survival, and if aquifers cannot recharge, many aquatic species may not have a healthy habitat. If aquifers are contaminated, those contaminants can make their way to surface waters, and harm the environment and human health.

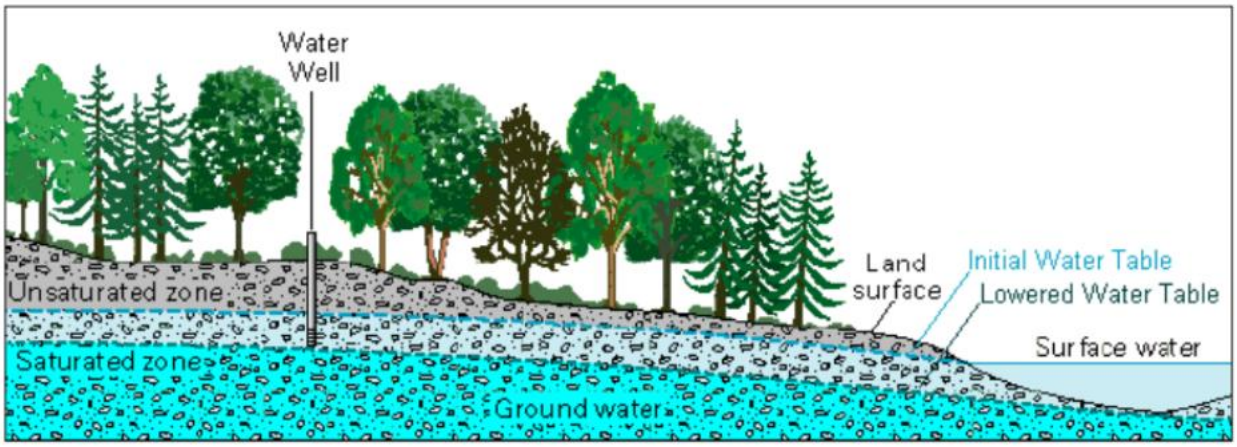

Figure 1. Image from *Critical Aquifer Recharge Areas Guidance,* WA Dept. Of Ecology, 2021. If the groundwater level drops too low, both the stream and the well could dry up. The water table drops when discharge (water flowing out) is greater than recharge (water flowing in).

Contamination Risk

The vulnerability (or risk of contamination) of a CARA is determined by two major factors. The first is the CARA's susceptibility to contamination, which is determined by the geologic setting of the aquifer. The depth of the aquifer, the soil types and geologic formations above it, and the speed at which the groundwater moves all affect susceptibility. The second is the possibility of contamination. Threats of contamination can come from many kinds of human development, and include things like contaminated runoff, chemical spills, and failing septic tanks. Part of the strategy for protecting CARAs is to ensure that high-risk activities are kept away from susceptible areas, and that proper mitigation efforts are used to reduce risk.

Climate Change and Human Impacts

CARAs can be impacted by a variety of factors related to climate change and human development on the landscape. Climate change affects the timing and intensity of precipitation, often resulting in hotter, dryer summers, and more intense rainfall events in the rainy seasons. Intense dry seasons can require people to draw more out of groundwater, especially for watering crops, and disrupt surface water features, like wetlands, which can have a recharging effect on aquifers. Intense rainfall in the wet seasons, combined with increased impervious area from human development, can lead to high peak surface flows and flooding. In this case, more water moves across the surface, and through rivers and streams to the sea, rather than infiltrating into groundwater to be stored. When flooding occurs, floodwaters can become exposed to contaminants and then carry those contaminants to both surface water and groundwater. Sea level rise can also cause saltwater infiltration into aquifers, making the water inside unsuitable for drinking or watering crops. Wildfires can release airborne contaminates that settle into ground and surface waters, and the loss of forest to wildfires increases fast-moving runoff after rain, decreasing the amount of water available to infiltrate into aquifers.

Key Protection Strategies

In its *Critical Aquifer Recharge Areas Guidance,* the WA Dept. Of Ecology recommends the following steps to regulate development and protect CARAs:

1. Identify where groundwater resources are located.
2. Analyze the susceptibility of the natural setting where groundwater occurs.
3. Inventory existing potential sources of groundwater contamination.
4. Classify the relative vulnerability of groundwater to contamination events.
5. Designate areas that are most at risk to contamination events.
6. Protect by minimizing activities and conditions that pose contamination risks.
7. Ensure that contamination prevention plans and best management practices are implemented and followed.
8. Manage groundwater withdrawals and recharge impacts to:

- Maintain availability for drinking water sources.
- Maintain stream base flow from groundwater to support in-stream flows, especially for salmon-bearing streams.

Thurston County GeoData maintains publicly available maps that identify CARAs, and indicates their sensitivity based on susceptibility characteristics. The Critical Areas Ordinance plays an important role in minimizing potentially harmful activities in CARAs by restricting land uses and outlining development requirements for potentially contaminating uses. Outside of the CAO, Thurston County's Environmental Health department regulates septic systems through the Thurston County Sanitary Code, helping to prevent contamination from

septic waste. Development projects must also comply with stormwater requirements. Thurston County also approaches groundwater conservation programmatically through streamflow restoration efforts, acquiring water rights to offset permit exempt wells, monitoring and modeling hydrologic and environmental factors, and other programs aimed at protecting water quality and quantity. The CAO protects CARAs by regulating new development as it occurs.

Primary Discussion Points for Planning Commission

- CARA designation and delineation
    - In the current county code, CARAs are designated with three levels of sensitivity, and the most sensitive category also includes wellhead protection areas. Language defining and designating CARAs must comply with the definition put forth in WAC 365-190-030 and all requirements of the Growth Management Act.
- Allowed uses
    - Currents allowed and prohibited uses are listed in TCC Table 24.10-1. The Planning Commission may recommend changes to allowed, restricted, and prohibited uses.
- Permitting process
    - Many uses in CARAs require a Critical Area Review Permit, but no specialized reports are required up-front to submit a permit. Staff may make a determination that reports are needed after initial review. Permitting staff have not recommended any major changes to CARA permitting, besides requests for clarity and consistency with other programs.

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Pierce County Critical Areas Ordinance Gap Analysis

Skagit County Best Available Science Review

Kitsap County Best Available Science Summary Report

City of Langley Best Available Science and Gap Analysis