

Chignik Subregional Watershed Plan

Potential Water Quality Threats and Pollution Sources

DRAFT, September 21, 2023

Introduction

Understanding potential water quality threats and pollution sources are crucial for effective watershed management in the Chignik subregion. Identifying these factors is a critical first step towards developing a protection-based watershed plan that focuses on improving water quality and preventing future degradation of water sources and aquatic habitats.

Watershed Area Boundaries

The Chignik Watershed study area is located within the Shelikof Strait Hydrologic Unit Code-8 (HUC8) watershed and encompasses three HUC10 watersheds – Black Lake, Chignik Bay, and Chignik River (Chignik Lake area). See a map of the subregion below. The communities of Chignik Lagoon, Chignik, and Chignik Lake are within the study area. Communities within and nearby the study area, such as Ivanof Bay and Perryville, rely on these waters for subsistence and commercial fishing.



The U.S. Geological Survey (USGS) uses Hydrological Unit Codes (HUC) to classify watersheds into different levels, from the regional level down to much smaller subwatersheds.

In the Alaska region, (HUC2) there are:

- 8 subregions (identified by 4-digit codes, HUC4)
- 38 basins (6-digits, HUC6)
- 112 subbasins (8-digits, HUC8)
- 542 watersheds (10-digits, HUC10)
- Approx. 15,500 subwatersheds (12-digits, HUC12)

The number of subwatersheds in Alaska and their boundaries vary based on data updates and ongoing delineation processes.

The project includes 23 HUC12 subwatersheds. None of the waters within the study area are listed under Alaska’s 303(d) Category 5 Impaired Waters and therefore do not have an established Total Maximum Daily Load (TMDL).¹ Chignik Lagoon is prioritized as a medium value, medium stress watershed while Chignik Bay is categorized as a medium value, low -stress watershed in the Alaska Department of Environmental Conservation’s Watershed

¹ Alaska DEC [Integrated Water Quality Monitoring and Assessment Report](#) Factsheet, 2022.

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Prioritization Map.² Two creeks in the Chignik Bay Watershed have been designated as Category 3 Assessed Waters (Not enough information).³

Methodology and What Comes Next

The list of water quality threats in this document is incomplete and is based on data from narratives from local community groups and other plans related to the study area. Resources for the list include watershed characterizations and challenges presented during the 2023 Chignik Regional Climate Resiliency Symposium, historic reports documenting watershed impairment in the region, and federal and state resources, including the Alaska Department of Environmental Conservation Contaminated Sites Database. Over the winter months, we will work with stakeholders in the region to review, revise, and expand on the list, including identifying specific locations for known and suspected water quality threats and pollution sources, and to identify priority water bodies to be protected. With this information in hand, the planning team will work with communities and partners in the region to develop watershed goals, identify proposed projects, and craft an action plan that provides guidance on how to protect and promote water resources in the region.

Potential Water Quality Threats

- 1. Climate Change Impacts.** Like all watersheds in the world, the Chignik subregion watershed is susceptible to climate change-related impacts, including accelerated coastal and stream bank erosion and flooding from altered precipitation patterns, increasing water temperatures, rise in sea levels, and intense storm events. These changes can lead to alterations in discharge/flow patterns, water chemistry, sedimentation, and increased risk of water contamination nonpoint source pollution, all of which can impair the long-term health and resilience of the watershed.
- 2. Stormwater Runoff.** Stormwater is the flow of water from precipitation events over impervious surfaces, such as roads, parking lots, rooftops, instead of infiltrating into the ground. The runoff collects pollutants from various sources and carries them into nearby waterbodies or directly into the watershed as nonpoint source pollution.
- 3. Bacterial Contamination & Nutrient Discharges.** Failing or improperly maintained septic systems, unmonitored dump sites, and unregulated sewage discharges from communities can introduce harmful bacteria and excessive nutrients into the watershed via runoff. Contamination of bacteria poses significant risks to the health of humans, aquatic life, wildlife, and the overall integrity of the ecosystem. Nutrients, such as nitrogen or phosphorus, can propagate algal blooms and deplete oxygen levels in water systems, jeopardizing the health of residents and aquatic species.

Definitions of Point and Nonpoint Pollution Sources

Point source: A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution, such as a pipe, ditch, ship, ore pit, or factory smokestack.

Nonpoint source: Diffuse pollution source; a source without a single point of origin or not introduced into a receiving stream from a specific outlet. The pollutants are generally carried off the land by stormwater. Common nonpoint sources are agriculture, forestry, urban areas, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

Definitions from the U.S. Environmental Protection Agency, Handbook for Developing Watershed Plans to Restore and Protect Our Waters

² [Alaska's Watershed Prioritization Map](#), Chignik Region, 2023.

³ Alaska DEC Final Integrated Report Assessed Waters [Web Map](#), 2022.

4. **Chemical Contamination.** Improper disposal of hazardous substances can introduce chemicals, heavy metals, and petroleum products into the watershed as nonpoint source pollution. In the Chignik region, there are several abandoned buildings that may need to be condemned, which could be sources of chemical contamination. Additionally, the landfill at Rocky Point and other old dumpsites have not been monitored for potential runoff or contamination. These contaminants, if not adequately managed, can have severe impacts on water quality, aquatic organisms, and the ecological balance of the Chignik subregion.
5. **Oil and Fuel Spills.** Due to maritime activities in the region, the potential for oil and fuel spills exists within the watershed. Some spills have been reported on or near Chignik Lake as approximately 40,000 gallons of bulk fuel is hauled from Chignik Bay to the landing pad of the Chignik River then transported from by a fuel truck to a tank farm in the village.^{4,5} Other spills have been reported from vessel and facility fires, bilge accidents, and groundings.⁶ These include the following contaminated sites, identified in the Alaska Department of Environmental Conservation Contaminated Sites Search:

- i. **Chignik Bay (4):** Chignik Bay City Tank Farm, Chignik Bay School, Chignik Norquest Plant, Trident Seafoods
- ii. **Chignik Lagoon (3):** Chignik Lagoon PTI Communications Central Office, Columbia Ward Fisheries Facility, Wards Cove Packing Former Cannery
- iii. **Chignik Lake (4):** Chignik Lake PTI Communications Switch Gear Station; Chignik Lake Tribal Council Old Tank Farm, Chignik Lake Fuel Transfer Tank Farm, Chignik Lake ANTHC Water Line Upgrade

Spills like this present as nonpoint sources of pollution and can have detrimental effects on marine ecosystems, shoreline habitats, and numerous species that rely on the region's waters for survival.

6. **Erosion & Sedimentation.** Land disturbances from erosion and flooding lead to increased sediment runoff in the watershed, which exacerbates nonpoint source pollution from the above listed water quality threats. The community experiences flooding yearly, with the worst flooding often occurring during spring thaw. Additionally, the increase of sediment deposits can alter river flows, change water levels (reducing water depth important for spawning streams), disrupts the natural food chain by destroying habitat leading to declines in fish population, and can impact fish egg and larvae development.
7. **Mining Impacts.** The subregion is home to various mineral resources, with small mining exploration sites spread throughout the area, mostly on Bristol Bay Native Corporation lands. Mining exploration and mineral extraction/production activities could potentially impact the watershed via nonpoint source pollutants from mining operations, disturbances of water bodies, and other concerns.

⁴ Alaska DEC SPAR Online Services, PPR Spills Database (Chignik Lake CDP)

⁵ Chignik Lake IGAP Proposal, 2011.

⁶ Alaska DEC SPAR Online Services, PPR Spills Database