

Goose Lake



SHARP Report — Part 1 of 2

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SHARP incomplete. SHARP it.		v2024.04.29	Ecology Info	
• SHARP rating	High		ERTS	SHARP it
• SHARP date	07/22/2025		CSID	2537
• EJFlagged?	⊘ - No Override		FSID	1185
• LD confidence level	low		VCP	SHARP it
• Cleanup milestone	feasibility study		UST ID	SHARP it
• SHARPster	Steve Teel		LUST ID	SHARP it

This section is blank if this is the first SHARP

SHARP Media	Scores	Confidence	Additional Factors	
Indoor air	D4	high	multiple chemical types	✓
Groundwater	C2	medium	risk to off-site people	⊘
Surface water	C2	medium	climate change impacts	✓
Sediment	A2	medium	plant/animal tissue data	✓
Soil	A1	medium		

Location and land use info

NW of SR 101, Shelton, Mason County, 98584

Primary parcel 420123300000

Land use SHARP it

Responsible unit SHARP it

Sources reviewed

Landau Associates, 2020, Public Review Draft-Revision 1, Feasibility Study, Oct. 29.

Landau Associates, 2018, Public Review Draft, Remedial Investigation Report, January 12.

Agreed Order DE 99TC-S260, issued April 25, 2001.

Primary census tract	Associated census tracts
420123300000	SHARP it

Local demographics comments

no comments

Source/source area description

The Goose Lake Site received spent calcium sulfite liquor generated at Rayonier's former pulp mill in Shelton, Washington, from about 1931 to 1943. The spent sulfite liquor was discharged to Goose Lake from May 1931 until September 1934 via a wood stave pipeline between the mill and Goose Lake. In 1934, the discharge point was moved to the disposal lagoons west of the lake. The spent liquor discharge was discontinued in August 1943. There is no information indicating that wood ash or wood char from the former mill operations was discharged to the lake.

Soil comments

no comments

Groundwater comments

Copper, lead, mercury, antimony, zinc, dioxins, and/or PCBs have been detected in four groundwater monitoring wells at concentrations exceeding screening levels protective of surface water in Goose Lake. One of these wells (MW-15) is immediately upgradient of Goose Lake, and three are along the lake's eastern shoreline (MW-03, MW-16, and MW-17).

Selected a medium confidence levels for soil, groundwater, surface water, and sediments because PFAS analyses have not yet been performed at the Site.

Surface water comments

Arsenic and lead were detected in Goose Lake surface water samples at concentrations exceeding the RI surface water screening levels. Total lead slightly exceeding the screening level in one of the six primary surface water samples. Dissolved arsenic slightly exceeded the screening level in all six primary surface water samples. Dioxins and furans were not analyzed.

Sediment comments

COPCs detected above screening levels in Goose Lake sediment include cadmium, chromium, copper, lead, nickel, mercury, zinc, dioxins, PCBs, ammonia, and sulfide. With the exception of the conventional parameters ammonia and sulfide, and PCBs in the 1.7 to 4.1 feet sample at SED-01 and chromium in the 5.1 to 5.6 feet sample at SED-05, the COPC exceedances in lake-bottom sediments occurred entirely in the thin surficial black silt layer on the bottom of Goose Lake.

Indoor air comments

no comments

Additional factors comments

The primary intent of the fish sampling and analysis was to document the concentrations of COPCs in the tissue of the Goose Lake fish species most likely to be consumed by humans or wildlife. Several metals, PCBs, and dioxins were detected in the fish tissue samples analyzed during the RI. The detected concentrations of mercury, PCBs, and dioxins in the Goose Lake fish tissue samples are less than, or within the range of, mean concentrations of these constituents detected in fish tissue

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The inactive landfill located at the east end of Goose Lake received solid waste from Rayonier's mill and research laboratory, ash and char from the burning of sulfite liquor in the liquor incinerator that began operating at the mill in 1945, and demolition debris from the decommissioning of the former pulp mill. Unauthorized domestic refuse also was placed in the landfill. The landfill received waste from about 1936 to 1974.

The previous investigations identified the presence of two visually distinct sediment strata in Goose Lake. The shallowest stratum was characterized as a relatively thin (less than 8 inches thick) layer of black, fine-grained, organic-rich sediment. This thin sediment layer on the bottom of Goose Lake is referred to in this RI report as "surficial black silt." A brown, silty, organic-rich sediment unit (characterized by SAIC as peat) was reported to be present beneath the surficial black silt. Samples of this brown organic sediment were not submitted for chemical analysis during the previous studies.

COPC concentrations in the underlying brown organic (native) sediment/peat were generally much lower or non-detectable, including the slight PCB exceedance at SED-01. The highest COPC concentrations detected in the surficial black silt layer generally occurred at the sampling station closest to the inactive landfill (station SED-05). COPCs detected above screening levels in one or more drainage ravine soil/sediment samples include chromium, copper, nickel, mercury, PCBs, and dioxins. The highest concentrations were detected at location SED-09, which is immediately upgradient of Dam #1 (the dam closest to Goose Lake). In general, the COPC exceedances in drainage ravine soil/sediment samples below Dam #1 (sample locations SED-10, SED-11, and SED-12) are only slightly greater than screening levels. Samples of the surficial black silt were submitted for chemical analysis. The surficial black silt samples were found to contain sulfide, mercury, and the polychlorinated biphenyl (PCB) Aroclor-1260 at concentrations above background levels. The previous investigations compared the sediment analytical results to the Washington State Sediment Management Standards (SMS) and Puget Sound Dredged Disposal Analysis (PSDDA) criteria that were in effect at the time. Those SMS and PSDDA criteria were applicable to marine sediments, not freshwater sediments; the SMS have since been updated to include freshwater criteria. In addition to the chemical testing, limited bioassay testing was performed on samples of the surficial black silt. The bioassay results indicated high mortality rates or limited growth of some freshwater organisms.

Overflow - Site contamination and cleanup history

It was originally intended that the analytical results for fish tissue samples would be compared to tissue residue-based lowest observable effect concentrations. However, the fish tissue data were not compared to numerical screening criteria due to uncertainty associated with the small number of fish (four) captured for tissue analysis, and also because Washington State draft freshwater sediment quality values and SMS freshwater sediment criteria became available after the RI sampling was completed. These freshwater sediment criteria comprise conservative screening levels that can be used to directly identify potential risks to aquatic life from COPCs present in sediment. Direct comparison of sediment data to these conservative screening levels provides a more robust means of identifying potential risks associated with Goose Lake sediment than inferences drawn from a limited

screening evaluation of tissue samples from only four fish. Accordingly, the fish tissue analytical results are presented in this RI for information only, without comparison to numerical screening criteria. Potential risks to fish in Goose Lake, as well as associated risks to wildlife and humans from fish consumption, were assessed by comparing the sediment and surface water analytical results to the screening levels developed for these media. The draft FS states that remediation of all soil, sediment, and groundwater contamination sources to surface water or elimination of all pathways from the sources to surface water is expected to address and eliminate COPC concentrations in surface water above preliminary cleanup levels. This expectation will be verified by surface water compliance sampling, which is included in both the Goose Lake and landfill area remediation alternatives.

Goose Lake

2537 Goose Lake 20250722

first SHARP/reSHARP = SHARP it

SHARP rating — High

SHARP Report — Part 2 of 2

Conceptual site model

07/22/2025



Assessment scores by environmental medium

