

# LAKE LOMA ALGAE CONTROL PLAN EXECUTIVE SUMMARY

JANUARY 2020

## THE PROBLEM

Lake Loma is a 23-acre lake located in the Seven Lakes area of Snohomish County. The lake provides opportunities for swimming, fishing, boating and aesthetic enjoyment. It also supports a diverse array of aquatic life. Unfortunately, the lake suffers from excessive phosphorus pollution which causes:

- Low water clarity
- Low dissolved oxygen levels that stress fish
- Chronic excessive algae growth including frequent blooms of toxin-producing blue-green algae



ALGAE BLOOM ON LAKE LOMA SHORELINE

## THE EFFECT

Toxic algae blooms make the lake unsafe for residents, anglers, swimmers. The lake has been frequently posted with recreational advisories. The liver toxin, microcystin, is the most prevalent toxins with detections of over 12 times the state’s recreational guidelines. Even when not toxic, excessive algae leads to lower water clarity and depressed dissolved oxygen. The high phosphorus pollution has led the WA State Department of Ecology (Ecology) to list the lake as “impaired”. Collectively, these factors have the potential to reduce property values.



RECREATIONAL ADVISORY FOR TOXIC ALGAE  
POSTED AT LAKE LOMA BOAT LAUNCH

## IDENTIFYING SOLUTIONS

In 2018, Snohomish County Surface Water Management (SWM), together with the Lake Loma community, began the algae control plan project. The project goal is to determine 1) the major sources of phosphorus pollution 2) the best alternatives to reduce pollution and 3) the Lake Loma community’s preferred alternative. The project is funded by SWM and a grant from Ecology.



## PHOSPHORUS SOURCES

An estimation of the main phosphorus sources were developed based on an analysis of historic data, year-round monitoring of the lake, and sediment cores of the lake bottom. The key sources include:

- **Stormwater Runoff** – Residential pollution from pet/animal wastes, fertilizer, and dirt is carried into the lake by runoff when it rains. Runoff accounts for 25-38% of the annual pollution.
- **Groundwater** – The lake is largely fed by groundwater which contributes from 14-42% of the total phosphorus pollution each year. The pollution coming from groundwater largely depends on the level of contamination from septic systems which is difficult to accurately measure.
- **Lake sediments** – Pollution builds up from runoff and groundwater in the lake sediments and is recycled back into the lake each year, comprising 29-43% of the annual pollution to the lake. The levels in Loma’s sediments are very high and likely stem from a 1950s fish fertilization program.

## RECOMMENDED ALGAE CONTROL PLAN

The recommended plan includes three elements described in the table below. These three elements will meet the project goal of preventing toxic algae by addressing the main phosphorus pollution sources. The three elements were identified as the most effective and affordable methods to meet the plan goals.

Plan Element	Source Addressed	Description
<b>Element 1:</b> LakeWise Program	Stormwater Runoff	LakeWise, County’s outreach program to help lake area residents prevent phosphorus pollution from lawns, yards and septic systems. Residents can complete a voluntary checklist of actions to have their property LakeWise certified. LakeWise supports residents through educational workshops, site visits, and technical resources.
<b>Element 2:</b> Septic Savings Program	Groundwater	A septic savings program is designed to help residents regularly maintain septic systems which can otherwise pollute groundwater. Lake Roesiger has a successful program with the PUD where residents pay for septic care as part of their water bill. The plan calls for exploring this program as an option for Loma or the larger 7-lakes area.
<b>Element 3:</b> Alum Treatment	Lake Sediments	Alum is a chemical that permanently binds phosphorus in the lake water and sediments so it is no longer available to fuel algae growth. Commonly used in drinking water treatment, alum is safe for lake users and wildlife when applied properly. Options for alum timing include: <ul style="list-style-type: none"> <li>• <b>Option 1</b> - Large Initial Dose: Apply the full dose in one initial treatment followed by a smaller treatment every 5-10 years depending on new pollution levels.</li> <li>• <b>Option 2</b> – Multi-Year Dose: Apply half of the full dose in year one and spread the remaining over 10 years to neutralize new pollution and extend treatment longevity (recommended by County).</li> </ul> Both options will need year-round lake monitoring to assess effectiveness and adaptively manage for the next year’s treatment.

## EXPECTED OUTCOMES

Fully implementing the plan over the long-term will benefit the health of Lake Loma. The alum treatments will significantly reduce phosphorus resulting in less frequent and intense algae blooms. Lake recreation will benefit from the reduced risk of exposure to toxic blooms. Dissolved oxygen levels will increase benefitting aquatic life. Water clarity will also improve which is typically associated with higher property values. Higher clarity may also lead to increased aquatic plant growth in deeper areas of the lake. Pollution prevention by implementing Elements 1 & 2 will increase the longevity of alum treatment and reduce the frequency and scale of any future treatments.

## COSTS AND FUNDING

The estimated costs of each control plan element are outlined in the table below and is provided in a 10-year timeframe. The funding required to implement the recommended Algae Control Plan will require a long-term financial investment by the Lake Loma community. Funding assistance from grants can help alleviate this financial burden. The most promising grant is the Department of Ecology Freshwater Algae Control Program grant which provides \$50,000 maximum awards with a 25% local match. Options for raising local funds include:

- Creation of a lake association with voluntary local fund collection
- Formation of a Lake Management District (RCW 36.61)
- Authorization of a lake property assessment through an extra Surface Water Service Charge designated for phosphorus reduction activities at Lake Loma

## **ESTIMATED COSTS OF LAKE LOMA RESTORATION IN 2019 DOLLARS**

<b>Elements</b>	<b>Year 1</b>	<b>Years 2 - 9</b>	<b>Year 10</b>	<b>10-Year Total</b>
Element 1: LakeWise	<i>currently funded by Snohomish County SWM</i>			
Element 2: Septic Savings Program	<i>unknown administrative costs</i>			
Element 3: Alum Treatment <sup>a, b</sup>				
Option 1: Large Dose <sup>c</sup>	\$244,000	\$9,500	\$151,000	\$471,000
<i>Cost per parcel<sup>d</sup></i>	<i>\$2,773</i>	<i>\$108</i>	<i>\$1,716</i>	<i>\$5,352</i>
Option 2: Multi-Year Dose	\$141,000	\$35,000	\$45,000	\$466,000
<i>Cost per parcel<sup>d</sup></i>	<i>\$1,602</i>	<i>\$398</i>	<i>\$511</i>	<i>\$5,295</i>

a. Year-round lake monitoring has an estimated annual cost of \$9,500. A portion of monitoring costs may be covered by County's volunteer lake monitoring program pending annual budget approval.

b. A \$10,000 sediment core analysis is included for both options in year 10 (used to assess future treatment doses).

c. A repeat alum treatment will likely be required in 5 to 10 years. The costs is included in year 10 and is based on applying half of the original dose. The actual dose will depend upon on the sediment core analysis.

d. Estimated cost based on 88 lake shoreline parcels.

## NEXT STEPS

The goal of this plan is to provide the community with a road map for reducing toxic algae. The lake community will now need to collectively decide if the benefits of the implementation plan are worth the required financial and time investment. The recommended next steps are for volunteers from the Lake Loma community to form a lake restoration committee. The committee could review the plan and propose a path forward to the broader community for their approval. Essential decision points to decide would include: 1) plan elements to implement 2) preferred funding alternatives 3) timeline and 4) implementation roles. While this may seem like significant effort, other local lake communities have successfully navigated this process to achieve improvements in the health of their local lake.