

CONSULTANT: SOLitude Lake Management, LLC  
CONTACT PERSON: John Holz  
ADDRESS: 735 S. 56<sup>th</sup> Street, Suite 2  
Lincoln, NE 68510  
FEDERAL TAX ID NUMBER/U.B.I. NUMBER: 54-1940110/604890922  
TELEPHONE/FAX NUMBER: 402-430-0352  
COUNTY DEPT: Conservation and Natural Resources  
DEPT. CONTACT PERSON: Marisa Burghdoff  
TELEPHONE/FAX NUMBER: (425) 388-3204  
PROJECT: Lake Ketchum Alum Treatment Services  
AMOUNT: \$ 182,049.00  
FUND SOURCE: SWM Funds  
CONTRACT DURATION: Execution through December 31, 2024

AGREEMENT FOR PROFESSIONAL SERVICES – AMENDMENT NO.3  
AGREEMENT NO. CC02-21

THIS AMENDMENT NO.3 to that certain Agreement for Professional Services (the “Agreement”) dated April 1, 2021, is made by and between Snohomish County, a political subdivision of the State of Washington (the “County”) and SOLitude Lake Management, LLC, a Virginia Limited Liability Corporation (the “Consultant”).

WHEREAS, Amendment No. 1 executed on March 18, 2022, increased the contract maximum to \$112,049.00;

WHEREAS, Amendment No. 2 executed on May 26, 2022, substituted the name of the Consultant from HAB Aquatic Solutions, LLC to SOLitude Lake Management, LLC; and

WHEREAS, the County and the Consultant wish to extend the Agreement for an additional year for the Consultant to provide alum treatment at Lake Ketchum in 2024

NOW, THEREFORE, for and in consideration of the benefits conferred on both parties and the mutual promises set forth below, the parties agree that the Agreement be amended as follows:

AMENDMENT NO.3 TO AGREEMENT FOR PROFESSIONAL SERVICES  
AGREEMENT NO. CC02-21

1. Section 3, f. Contract Maximum has been amended to increase the total charges under this Agreement. All fees and expenses included, shall not exceed **\$182,049.00** for the initial term of this Agreement (excluding extensions or renewals, if any).
2. Schedule A-2, Scope of Services, attached hereto and by this reference made part of the Agreement, has been amended and hereby replaces Schedule A.
3. Schedule B-3, attached hereto and by this reference made part of the Agreement, has been amended and hereby replaces the amended Schedule B-2.
4. Section 2, Term of Agreement; Time of Performance will be amended to read as:

This Agreement shall be effective upon Execution (the “Effective Date”) and shall terminate on December 31, 2024, PROVIDED, HOWEVER, that the term of this Agreement may be extended or renewed for up to one (1) additional one (1) year terms, at the sole discretion of the County, by written notice from the County to the Contractor. The Contractor shall commence work upon the Effective Date and shall complete the work required by this Agreement no later than December 31, 2024, PROVIDED, HOWEVER, that the County’s obligations after December 31, 2023 are contingent upon local legislative appropriation of necessary funds for this specific purpose in accordance with the County Charter and applicable law.

IN WITNESS WHEREOF the parties execute this Amendment No.3 upon the signature date of the last party to sign.

**SNOHOMISH COUNTY:**

**Harper, Lacey** Digitally signed by Harper, Lacey  
Date: 2023.12.13 10:55:54 -08'00'

County Executive Director

**SOLitude Lake Management, LLC:**

**Marc Bellaud** Digitally signed by Marc Bellaud  
DN: cn=Marc Bellaud, o=SOLitude Lake Management, ou,  
email=mbellaud@solitudelake.com, c=US  
Date: 2023.12.01 12:42:59 -05'00'  
Adobe Acrobat version: 11.0.23

Title:

Approved as to form only:

**Christina Richmond** Digitally signed by Christina Richmond  
Date: 2023.11.29 16:35:54 -08'00'

Deputy Prosecuting Attorney

Schedule A-2  
Scope of Services

The Contractor shall conduct a whole-lake, surface application of aluminum sulfate (alum) and sodium aluminate to Lake Ketchum for the purpose of phosphorus control at Lake Ketchum according to the following specifications and requirements.

**A. Schedule**

The Contractor shall conduct lake treatments between mid-March and Mid-April of years 2021, 2022, 2023, and 2024 and treatments shall occur on a Tuesday, Wednesday or a Thursday. Deviations to this schedule must be approved, in writing, by both parties.

The Contractor shall provide the County with the planned treatment dates at least three weeks in advance of the treatment to ensure that the County has adequate time to send notifications.

**B. Permitting**

1. Washington State Aquatic Plant and Algae Management General Permit (a combined National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit)

The Contractor shall be responsible for adhering to all permit conditions in the Washington State Aquatic Plant and Algae General Management Permit (APAM permit) effective April 21, 2021, and future revisions of the APAM permit, except for those obligations identified and described in the table below. The County shall provide to the Contractor a copy of the current APAM permit, the County’s letter of coverage under the permit, and the associated Discharge Management Plan for Lake Ketchum. In the event of a permit update, the parties may revisit allocation of responsibility in the table below and will document any mutually agreed upon changes as specified in Section 6 of this Agreement (“Changes”).

Table 1

Permit Section	Description of County Responsibilities
S5.A	Ecology Notification Requirements: 1) Pre- and post-treatment notification requirements and 2) Adverse incidents or spills
S5.B	Ecology Inspection Coordination Requirements
S5.C	Residential and Business Notification
S5.D	Shoreline Recreational Facilities Notification Requirements
S5.E	Shoreline Posting Requirements
S6.B.1.	Application of Phosphorus Inactivation Product – The County will be responsible for the pre- and post-treatment monitoring and continuous PH monitoring ONLY – all other requirements in this section are the responsibility of the Contractor.
S7	Reporting and Recordkeeping Requirements of the Aquatic Plant Management General Permit

## 2. Washington Department of Fish and Wildlife Use Permit

The County shall be responsible for obtaining a Temporary Use Permit from the Washington Department of Fish and Wildlife. The permit provides for authorization to use the Lake Ketchum boat launch for the duration of the alum treatment. The County will provide a copy of the permit to the Contractor. The County and the Contractor will be responsible for adhering to all requirements in the permit.

### C. Chemical Specifications:

#### a. Chemical Quantities

The initial application is anticipated to be 3,200 gallons of alum and 1,600 gallons of sodium aluminate as specified below. However, the amount of chemicals may vary each year. The County shall send a final written quantity of chemicals by February 15<sup>th</sup> each year except in 2021. In 2021, the County shall send a written quantity within one week of the contract execution date. The Contractor shall not order chemicals prior to receiving the final quantity of chemicals requested by the County for that year's treatment.

#### b. Alum (Aluminum Sulfate) Specifications

Upon approval by the County each year, the Contractor shall provide the specified gallons of liquid aluminum sulfate ( $Al_2(SO_4)_3 \cdot 14H_2O$ ) the annual treatment. Alum shall meet the following specifications:

Grade = Drinking Water Treatment Grade;

pH = 2.0 to 2.4;

Specific Gravity at 70°F = 1.333 to 1.337;

Freezing Point = -16°C;

Boiling Point = 101°C (214°F);

Total Water-Soluble Aluminum of 4.2 – 4.4% or as  $Al_2O_3$ , 8.0 to 8.4%

The total water-soluble iron (expressed as  $Fe_2O_3$ ) content of aluminum sulfate shall be no more than 0.02 percent, on a basis of 8.1 percent  $Al_2O_3$  in liquid alum. In liquid alum, the water-insoluble matter shall not exceed 0.02 percent. At a minimum, aluminum sulfate shall conform with the “American National Standards Institute/National Sanitation Foundation” (ANSI/NSF) Standard 60 Drinking Water Treatment Chemicals – Health Effects (2005 and previous), or Standard 61 Drinking Water System Components – Health Effects (2005 and previous) for use in drinking water.

The aluminum sulfate supplied shall contain no soluble mineral or organic substances in quantities that are capable of producing deleterious or injurious effects on public health or water quality, and shall be drinking water treatment grade.

The Contractor shall provide Snohomish County with the manufacturer's material quality assurance certification with each truck delivery to show that procurement meets specifications. The alum in each delivery shall be approved by Snohomish County on-site prior to applying the alum in Lake Ketchum.

c. Sodium Aluminate Specifications

Upon approval by the County each year, the Contractor shall provide for each treatment the specified gallons of sodium aluminate. Sodium aluminate ( $\text{NaAlO}_2$ ) is produced from the reaction of alumina trihydrate with caustic soda. The sodium aluminate shall meet the following specifications:

Liquid sodium aluminate shall contain a minimum of 32% available soluble sodium aluminate to a maximum of 38%. It shall contain no more than 0.5 percent insoluble matter. Liquid sodium aluminate shall have excess sodium oxide of at least 4 percent to ensure complete combination with the aluminum oxide.

The sodium aluminate supplied in accordance with this standard shall contain no substances in quantities capable of producing deleterious or injurious effects on public health or water quality, and shall be water treatment grade and be NSF certified.

The Contractor shall provide Snohomish County with the manufacturer's material quality assurance certification with each truck delivery to show that procurement meets specifications. The sodium aluminate in each delivery shall be approved by Snohomish County on site prior to applying the material in Lake Ketchum.

d. Alum and Sodium Aluminate Storage Tanks Specifications

The use of temporary on-shore storage tanks for staging the chemicals is not required. However, if on-shore storage tanks are used, separate tanks shall be provided for each chemical. All on-shore storage tanks shall be fabricated out of HDPE or other suitable material, i.e. stainless steel.

The Contractor shall check and confirm the volume of alum/sodium aluminate required for the specified dose prior to procurement of any storage tanks.

The Contractor shall provide secondary containment to help prevent spills or uncontrolled leakage of materials from on-shore storage facilities. Spill containment must provide the following features and be equal to or better than "Spill Guards":

- i. Puncture resistant;
- ii. One piece, no assembly required;
- iii. Wind resistant;
- iv. Approved for a temperature range of -40 to 160 degrees Fahrenheit.

#### **D. Equipment Specifications:**

The Contractor shall provide all equipment, labor, and materials necessary to perform the work, including application, mobilization and demobilization. This shall include:

- a. The specified amounts and qualities of aluminum sulfate and sodium aluminate.
- b. A treatment barge (or boat) with on-board chemical storage tanks and other equipment for uniform chemical distribution. The system of chemical distribution shall have a minimum application rate of at least 7,000 gallons per day of combined alum and sodium aluminate.
- c. A GPS-linked computer system for barge (boat) guidance together with real-time bathymetric measurements to provide chemical dosing control for both aluminum sulfate and sodium aluminate pumping rates and allow the Contractor to map the treated areas.
- d. Alum and sodium aluminate distribution lines, pumps, injector units, and all other pertinent equipment necessary. All piping shall be heavy duty HDPE tubing or appropriate material to avoid dissimilar metals corrosion and to provide safety relative to temperature and potential tubing leaks. Type 316 stainless-steel fittings shall be used in areas where contact with liquid alum and/or sodium aluminate is anticipated. All couplings and connectors used for alum and sodium aluminate distribution lines, storage tank, pumps, and injector units must meet corrosion resistance standards for alum, i.e. type 316 stainless-steel fittings at minimum.
- e. A boom system for chemical distribution shall be substantially similar to the illustration in Exhibit C to control and evenly distribute chemical dosing for both liquid aluminum sulfate and sodium aluminate simultaneously so that the chemicals mix immediately upon entering the water but not before. Both chemicals are to be delivered to the lake water with a preferable depth of 6 to 8 inches and a minimum depth of 1 to 2 inches below the water surface from a minimum of 12 pairs, up to a maximum of 25 pairs, of alum and sodium aluminate injection tubes (nozzles or small hoses) spaced 8 to 12 inches between pairs and with the alum and sodium aluminate injection tubes within each pair spaced 2 to 4 inches apart. The injection tubes shall be alternating so that the closest tubes in each direction are always tubes of the other chemical. Treatment shall not begin until the boom system is approved on-site by Snohomish County.
- f. Trained staff to safely and effectively implement the alum treatment, including but not limited to reading and following the safety data sheets.

#### **E. Application Specifications**

The contractor shall meet all of the following specifications for the application of alum and sodium aluminate to the lake in addition to the specifications provided in the Washington State Department of Ecology Aquatic Plant and Algae Management General Permit:

- a. The full chemical allotment, as defined above, shall be applied in a ratio of 2 gallons alum to 1-gallon sodium aluminate (assuming 38% concentration) with an accuracy of  $\pm 3$  percent. Prior to beginning each treatment (0.5 to 24 hours before), the Contractor will conduct the permit-required jar test using the delivered alum and sodium aluminate at a

concentration of 4.1 mg Al/L and at a ratio of 2:1 (alum to sodium aluminate) to verify that treated water remains above pH 6.0 after addition and mixing (0.25 to 0.5 hours after being dosed). If the tests indicate that the 2:1 ratio results in unacceptable pH changes, the County may require the Contractor to adjust the chemical ratio for the application. The Contractor may not begin work until the jar test is complete, the County has reviewed the results, and the equipment has been calibrated for the appropriate ratio of chemicals. The County may opt to perform the jar test instead of the Contractor and will notify the Contractor of this change.

- b. The chemicals must be simultaneously distributed so that the entire treatment area is uniformly covered and so the two chemicals mix immediately after entering the water but not before. GPS, depth measurements, barge/boat speed, and pumping rates shall be adjusted to ensure that the chemicals are distributed simultaneously and in the correct ratio. Treatment should be immediately stopped in the event of equipment failure to ensure chemicals are not being independently released.
- c. The Contractor shall apply the full chemical allotment of alum and sodium aluminate as defined above. If there is a remaining supply of chemical after the Contractor has applied the specified dose due to minor deviations in dosage, lake bathymetry, or chemical ratio, the Contractor shall apply the remaining amount of chemicals to the lake uniformly in areas exceeding 2 meters (6.5 feet) in depth at the specified ratio, if directed to do so by the County. No individual chemical (alum or sodium aluminate) should be applied in the absence of the other chemical to the lake at any time.
- d. Per permit requirements, the Contractor will monitor the lake pH the morning before application begins, and one hour following application each day and as needed during the treatment application. Work may not begin each morning until pH measurements are taken. The County will be responsible for the post-treatment pH monitoring in the 24 hours following treatment completion.
- e. Environmental conditions may exist at Lake Ketchum that may require delay or temporary interruption of work on the project. The Contractor will immediately alert the County if they observe any of the conditions listed below. The Snohomish County project manager will make a final determination on whether to initiate, suspend, or re-start treatment, based on having acceptable environmental conditions for treatment. Delays or postponements may be measured in hours or days, depending on the length of time necessary for conditions to improve. These conditions shall include but are not limited to:
  - i. the water temperature is less than 42° F throughout the water column
  - ii. the wind speed is greater than 15 mph at the lake surface.
  - iii. the pH of lake water is consistently less than 6.0 ( $\pm$  0.05) or greater than 8.5 ( $\pm$  0.05) based on the lake average. The threshold for re-starting treatment shall be a pH between 6.2 and 8.4 ( $\pm$  0.05).
  - iv. Fish appear to be in distress or dead fish are observed during the treatment. If this occurs, the Contractor must immediately notify the County.

- v. Other environmental factors including dissolved oxygen, and phytoplankton blooms.
- f. Barring delays from environmental conditions, the treatment from start to finish shall be completed within one full day. One additional day for mobilization and another additional for demobilization may also be used as needed.
- g. The County will notify the Contractor in the event of an inspection by the Washington State Department of Ecology. If an inspection occurs, the Contractor may not apply chemicals until Ecology staff is present, unless they do not arrive within 30 minutes of the scheduled start time and the County indicates they may proceed.

#### **F. Preparation**

The Contractor shall protect structures, utilities, sidewalks, roadways, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, or other hazards created by work associated with the application of liquid alum and sodium aluminate, including but not limited to, the transport and delivery of chemicals, chemical storage tanks, and chemical spills. During and at the completion of the application of liquid alum and sodium aluminate, the Contractor shall conduct all operations in such a way as to:

- i. Comply with any and all permit conditions for this project;
- ii. Prevent damage to the lake, equipment, and surrounding properties;
- iii. Prevent damage to the aquatic environment by using a biodegradable hydraulic fluid;
- iv. Prevent damage to the lake by ensuring that no aquatic invasive species are introduced into the lake. This shall include decontaminating all equipment and gear that will come into contact with lake water prior to bringing such equipment to the staging area.
- v. Maintain orderly appearance at the work site while the treatment is occurring;
- vi. Prevent damage to the aquatic environment by implementing temporary erosion and sediment control measures, if directed by Snohomish County; and
- vii. Prevent damage to the aquatic environment if temporary on-shore storage tanks are used.

#### **G. Staging Area**

The Contractor shall be responsible for all staging area setup, security, cleanup, and restoration to its original condition following completion of the application. The staging area will be left in the same condition as before the operation began, photo-documented and verified by Snohomish County prior to the acceptance of work.

The staging area is located at the Washington State Department of Fish and Wildlife public access boat ramp (see Exhibit B). The staging area is located within a residential area. The Contractor shall take steps to minimize impacts to residents and lake users in noise, parking, safety, equipment and supply storage, smells, and general condition of the site. The Contractor shall ensure that security fencing is in place around all equipment and storage tanks remaining on-site during non-working hours. Work on-site shall generally occur



between 7 AM and 7 PM, Monday thru Friday. Work on weekend days and holidays shall not be allowed.

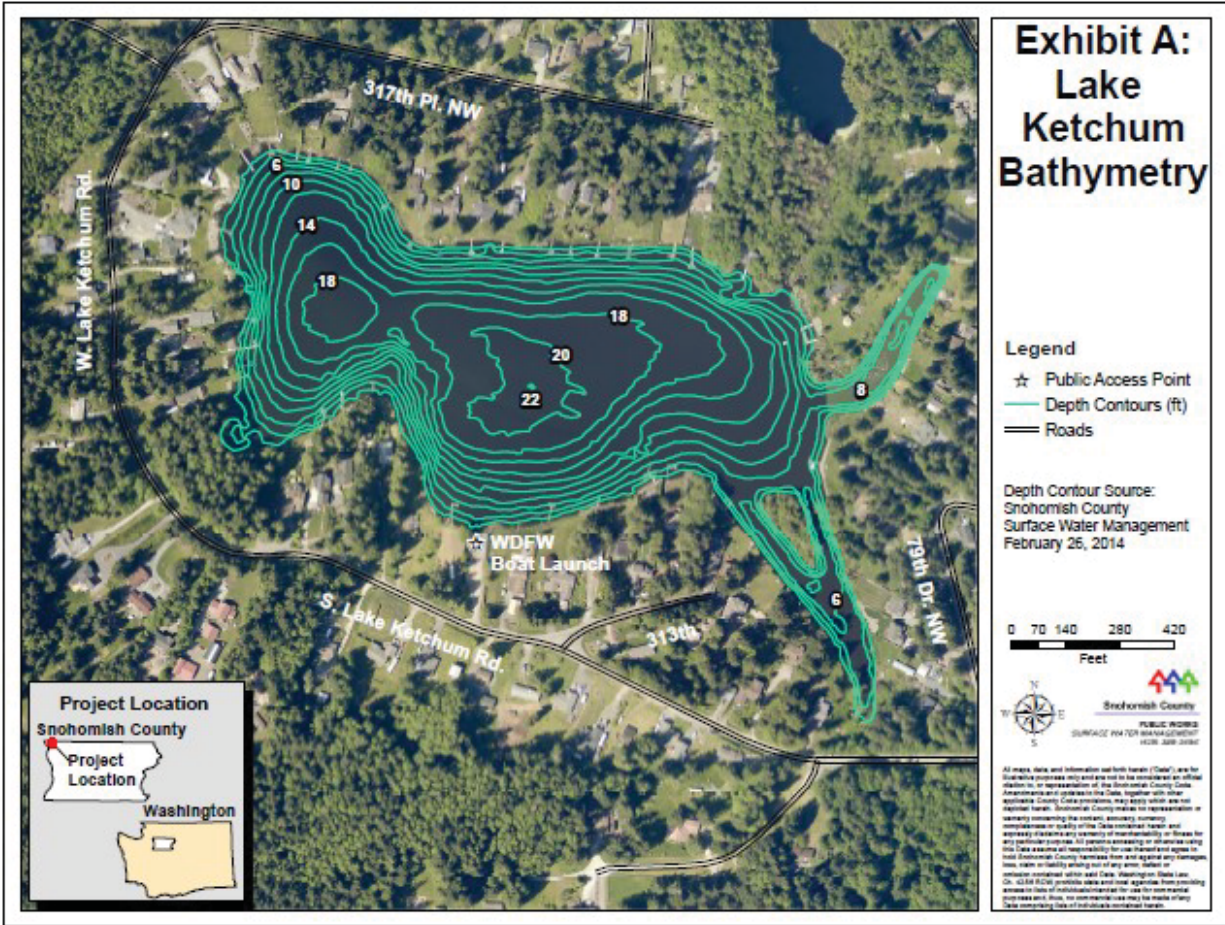
## **H. Deliverables**

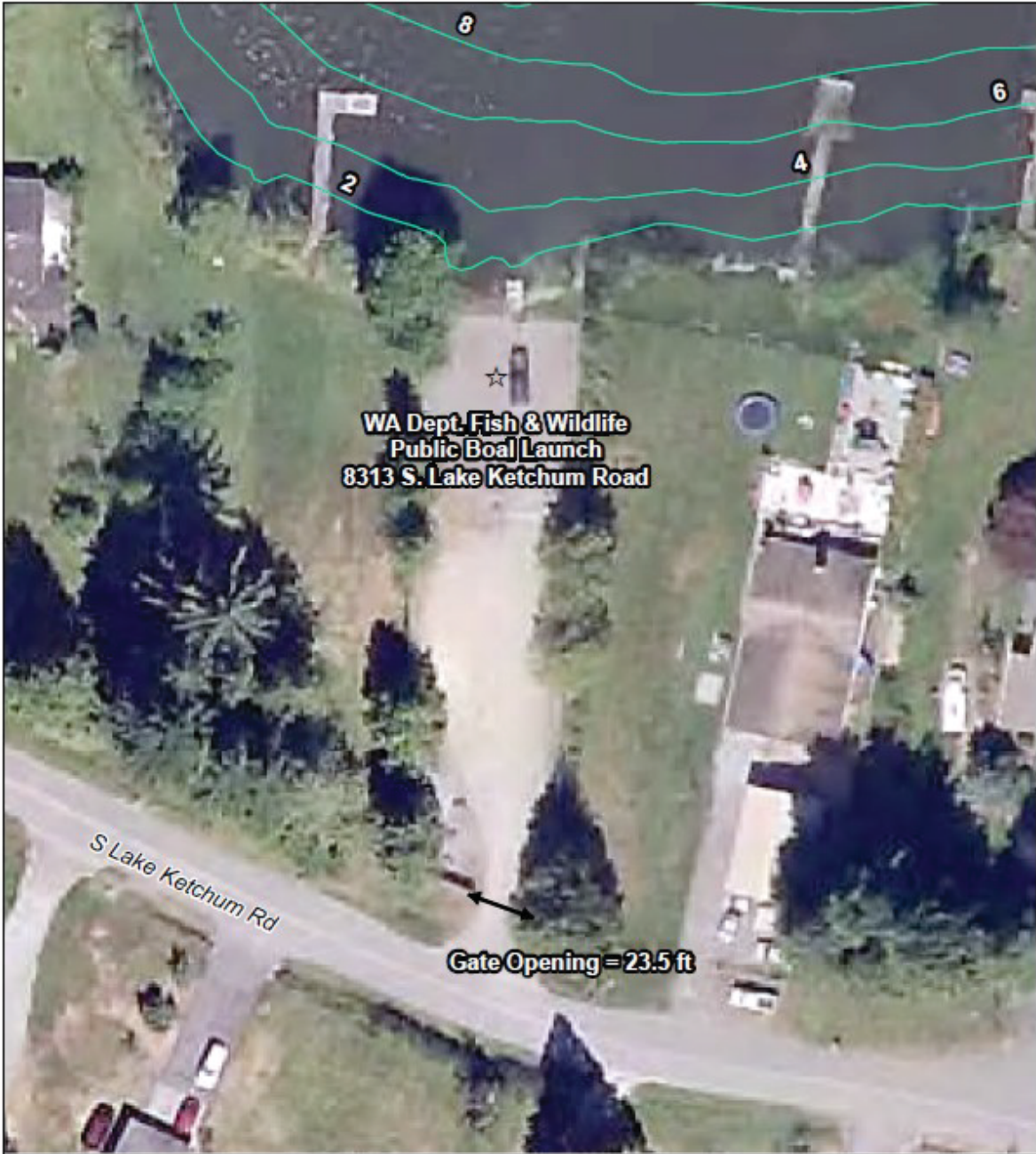
The Contractor shall submit the following for review and approval by Snohomish County following the treatment:

- a. Application Log – Shall include, at a minimum, the following items:
  - i. Date of work;
  - ii. Daily starting time and ending time;
  - iii. Copies of bill of lading with chemical specifications;
  - iv. Quantity of material applied in gallons;
- b. Map of completed treatment – a GIS map and/or associated files showing the GPS tracks of the application boat or barge.

## **I. Hazards**

Because the chemicals used in this treatment (aluminum sulfate and sodium aluminate) are considered hazardous and the application will take place in a lake, several potential hazards exist. These hazards may include but are not limited to exposure to chemicals, physical hazards like docks and boats, and underwater hazards such as sunken logs, debris, boats, or utilities. Therefore, the Contractor should use caution and good judgment during the application. The Contractor should provide the proper personal protective equipment and have a plan to address any hazardous conditions or other unforeseen site conditions that may be encountered. The Contractor is responsible and holds sole liability for safe execution of the alum treatment.





**Legend**

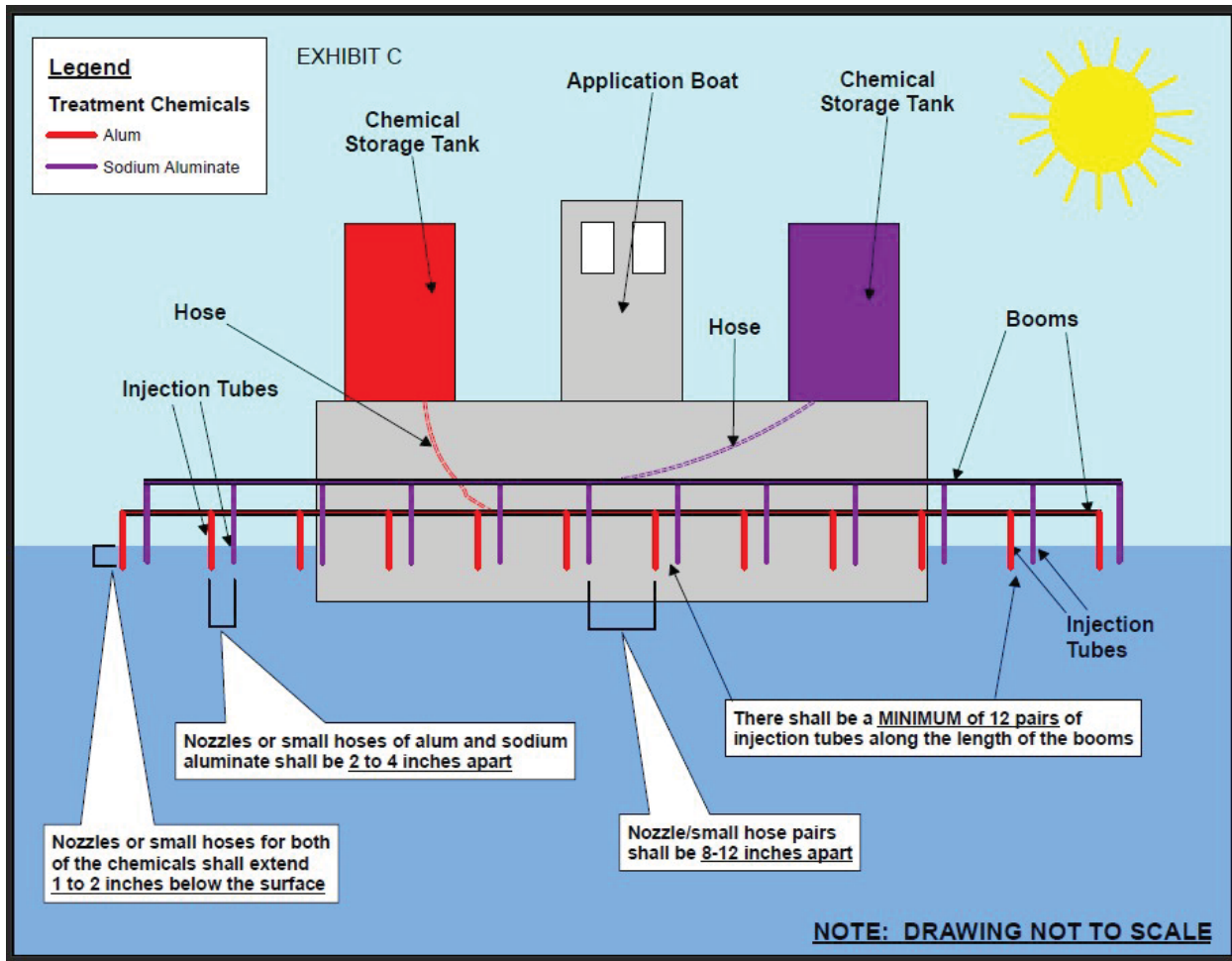
- ☆ Public Access Point
- Depth Contours (ft)

0 20 40 60  
Feet

**Lake Ketchum:Exhibit B**

**Snohomish County**  
PUBLIC WORKS  
SURFACE WATER MANAGEMENT  
(425) 388-3454

All maps, data, and information set forth herein ("Data"), are for illustrative purposes only and are not to be considered an official citation to, or representation of, the Snohomish County Code. Amendments and updates to the Data, together with other applicable County Code provisions, may apply which are not depicted herein. Snohomish County makes no representation or warranty concerning the content, accuracy, currency, completeness or quality of the Data contained herein and expressly disclaims any warranty of merchantability or fitness for any particular purpose. All persons accessing or otherwise using this Data assume all responsibility for use thereof and agree to hold Snohomish County harmless from and against any damages, loss, claim or liability arising out of any error, defect or omission contained within said Data. Washington State Law, Ch. 42.56 RCW, prohibits state and local agencies from providing access to lists of individuals intended for use for commercial purposes and, thus, no commercial use may be made of any Data comprising lists of individuals contained herein.



Schedule B-3  
Compensation

The County will compensate the Contractor for its services through an annual lump sum payment in the amounts listed below. The lump sum amounts include Contractor's expenses, except as described in Schedule C.

Item #	Items	Qty.	
1	2021 Treatment of Lake Ketchum	Lump Sum	\$ 30,269.00
2	2022 Treatment of Lake Ketchum	Lump Sum	\$ 41,772.00
3	2023 Treatment of Lake Ketchum	Lump Sum	\$ 40,008.00
4	2024 Treatment of Lake Ketchum	Lump Sum	\$ 70,000.00
	Four Year Total		\$182,049.00