

Memorandum

To:Nine Mile Creek Watershed District Board of ManagersFrom:Barr Engineering Co.Subject:Lake Cornelia Aluminum Treatment– Post Treatment Report and InvoiceDate:June 8, 2020Project:23271725.00c:Randy Anhorn – NMCWD Administrator

The NMCWD contracted with HAB Aquatic Solutions to apply alum and sodium aluminate to North and South Cornelia to control internal phosphorus loading in accordance with the recommendations provided in the *Lake Cornelia and Lake Edina Water Quality Study* (study completed in July 2019).

HAB mobilized on May 20, 2020 and set up holding tanks for alum and sodium aluminate in the parking lot near the Edina Aquatic Center (Rosland Park). Treatment at North Lake Cornelia was completed on May 21, 2020. For the treatment of South Cornelia, HAB staged their equipment on City of Edina property at an access point on Laguna Drive. Treatment of South Cornelia was completed on May 22, 2020. Barr staff provided oversite and pH monitoring on both days.

HAB submitted an invoice for the amount of \$81,844.97 (attached). Based on review of required documentation submitted, HAB completed the application in accordance with the contract documents and the desired aerial aluminum application. We are recommending payment of the invoice.

Table 1 provides a synopsis of the mass of alum and sodium aluminate delivered for the treatment at North and South Cornelia. These values are based upon information provided by the chemical supplier and trucking company and they serve as a check to determine if HAB applied the mass of alum and sodium aluminate in accordance with the contract. Barr calculated the aluminum mass from the information provided by the trucking company and the chemical supplier.

Deliveries	Truckload 1	Truckload 2	Truckload 3	Truckload 4	Truckload 5	Truckload 6
Location	North	North	North	South	South	South
	Cornelia	Cornelia	Cornelia	Cornelia	Cornelia	Cornelia
Mass (lbs) Delivered	48680	27520	42540	46980	6720	29900
Chemical	Alum	Alum	Sodium Aluminate	Alum	Alum	Sodium Aluminate
Formula Weight (% by weight)-Al2O3	8.32	8.34	20.2	8.3	8.32	20.2
Aluminum Mass (kg)	972	551	2063	936	134	1450

Table 1. Summary of alum and sodium aluminate deliveries.

Alum treatments are typically prescribed as an aerial application-- the mass of aluminum applied per square meter of lake bottom area. HAB used a smaller treatment boat with an air-cooled motor to enable the boat to apply alum to shallow areas in Lake Cornelia—this was conducted in accordance with the prescribed treatment area identified in the contract documents. Table 2 provides treatment summary statistics and the attached map provided by HAB shows the area where alum and sodium aluminate were applied. HAB applied the mass of alum to Lake Cornelia in accordance with the contract (it is estimated that they applied slightly more than required and this difference is largely due to the slight variations that occur in the chemical composition of each individual truck load of alum or sodium aluminate). HAB completed the application in accordance with the contract documents and the desired aerial aluminum application.

Location	Alum (gallons)	Sodium Aluminate (gallons)	Mass of Aluminum Applied (kg)	Contracted Mass of Aluminum Applied (kg)	Estimated Area Applied (ac) ¹	Planned Treatment Area (ac)	Aerial Application Rate (g Al m-2) ²	Planned Aerial Application Rate (g Al m-2)
North Cornelia	6,865	3,459	3586	3472	15.15	15.6	58	55
South Cornelia	4,838	2,431	2520	2441	26.0	27.7	24	22
¹ Considered to be an estimate. Based upon image overlay provided by HAB. ² Considered to be an estimate as the application area is an estimate.								

Table 2. Summary of alum and sodium aluminate applications.



HAB Aquatic Solutions

735 S. 56th Street, Suite 2 Lincoln, NE 68510 Phone: 402.430.0352 jholz@habaquatics.com

INVOICE FOR SERVICES

Nine Mile Creek Watershed District	DATE:	25 May 2020
Randy Anhorn	PROJECT NO.:	20-504
12800 Gerard Drive	INVOICE NO.:	20-506
Eden Prairie, MN 55346		

Project Name:	Aluminium Treatment for Lake Cornelia
Project No:	20-504
Contract Amount:	\$81,844.97

Task 01: Lake Cornelia Buffered Alum Application

Description	Amount	Current Due
Complete buffered alum application services for North & South		
lakes; including alum, sodium aluminate, labor, and equipment	\$ 81,844.97	\$ 81,844.97
mobilization and demobilization.		
	Task 01: Lake Cornelia Buffered Alum Application	\$ 81,844.97

	TOTAL DUE CURRENT INVOICE:	\$	81,844.97
CONTRACT AMOUNT:	\$	81.844.97	
PREVIOUS BILLING:	\$	-	
CURRENT INVOICE:		81,844.97	
TOTAL INV'D. TO DATE:	\$	81,844.97	
CONTRACT REMAINING:	\$	-	

Make checks payable to:

HAB Aquatic Solutions 735 S. 56th Street, Suite 2 Lincoln, NE 68510 Payment Term: 35 days



Soogle Earth



Cornelia South

Cornelia Lakes North/South Application Coverage Map

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North - Aluminum Sulfate (6,850 gallons) Sodium Aluminate (3,425 gallons)

South - Aluminum Sulfate (4,817 gallons) Sodium Aluminate (2,409 gallons)

May 21 -22, 2020