



Grant All-Detail Report Projects and Practices 2018

Grant Title - Moody Lake Alum Treatment

Grant ID - C18-1912

Organization - Comfort Lake-Forest Lake WD

Original Awarded Amount	\$135,000.00	Grant Execution Date	3/26/2018
Required Match Amount	\$33,750.00	Original Grant End Date	12/31/2020
Required Match %	25%	Grant Day To Day Contact	
Current Awarded Amount	\$135,000.00	Current End Date	12/31/2020

Budget Summary

	Budgeted	Spent	Balance Remaining*
Total Grant Amount	\$135,000.00	\$135,000.00	\$0.00
Total Match Amount	\$100,000.00	\$88,864.04	\$11,135.96
Total Other Funds	\$0.00	\$0.00	\$0.00
Total	\$235,000.00	\$223,864.04	\$11,135.96

**Grant balance remaining is the difference between the Awarded Amount and the Spent Amount. Other values compare budgeted and spent amounts.*

Budget Details

Activity Name	Activity Category	Source Type	Source Description	Budgeted	Spent	Last Transaction Date	Matching Fund
Administration	Administration /Coordination	Local Fund	CLFLWD	\$5,000.00	\$9,900.99	12/31/2020	Y
Alum Treatment	Non-Structural Management Practices	Current State Grant	Moody Lake Alum Treatment	\$135,000.00	\$135,000.00	12/31/2019	N

Activity Name	Activity Category	Source Type	Source Description	Budgeted	Spent	Last Transaction Date	Matching Fund
Alum Treatment	Non-Structural Management Practices	Local Fund	CLFLWD	\$75,000.00	\$50,730.00	12/31/2019	Y
Engineering	Technical/Engineering Assistance	Local Fund	CLFLWD	\$20,000.00	\$28,233.05	12/31/2019	Y

Activity Details Summary

Activity Details	Total Action Count	Total Activity Mapped	Proposed Size / Unit	Actual Size / Unit
563M - Alum addition - In Lake	1		45 AC	AC

Proposed Activity Indicators

Activity Name	Indicator Name	Value & Units	Waterbody	Calculation Tool	Comments
Alum Treatment	PHOSPHORUS (EST. REDUCTION)	386 LBS/YR	Moody Lake	Other	BATHTUB/Sediment Core

Final Indicators Summary

Indicator Name	Total Value	Unit
PHOSPHORUS (EST. REDUCTION)	324.00	LBS/YR

Grant Activity

Grant Activity - Administration			
Description	<p>This Activity is primarily carried out by the CLFLWD Administrator and Watershed Technician. Tasks include budgeting, grant reporting, and general project management. Project management support will be provided by the District Engineer. District legal counsel time needed to review contracts is also included in this grant activity. Chisago Lake Township owns property riparian to Moody Lake which is ideal for access and staging for the alum treatment. In February 2018, CLFLWD executed an access and staging agreement with Chisago Lake Township for the project. CLFLWD staff would work closely with the BWSR grant administrator to revise the work plan, if needed.</p>		
Category	ADMINISTRATION/COORDINATION		
Start Date	11-Apr-18	End Date	
Has Rates and Hours?	Yes		
Actual Results	<p>2/1/19 Update: Sent out informational mailers. Neighborhood open house at Moody Round Barn on 8/21 from 5-7pm. Coordinated contracting with HAB Aquatic Solutions. Alum treatment public demonstration day held on Wednesday, October 3rd Time: 1:00 p.m. Location: Moody Lake Parking Lot, 24401 Lofton Ave, Chisago City.</p> <p>2/1/20 Update: A public demonstration was held on Monday, October 21st at Moody Lake Park from 3:00p.m. – 5:30p.m. Staff and EOR were on site during the alum application. Public turnout for the field demo was low, likely due to the fact that this is the second (and final) treatment. Informative signs were placed at the public access points notifying of the alum treatment and temporary water use restrictions. Mailers were sent out beforehand along with website and social media postings.</p>		

Grant Activity - Alum Treatment

Description	<p>Contractor costs for alum treatment application.</p> <p>This task will include application of alum treatment according to dosing determined during the engineering phase of this project. This activity will be carried out by a contractor awarded the construction project through a public bidding process. Completion of the whole-lake alum treatment is estimated to result in a reduction of roughly 324 pounds per year in the phosphorus load to Moody Lake. This treatment, in conjunction with the District's ongoing watershed load reduction projects, should result in Moody Lake achieving the in-lake water quality goal of 40 ug/L.</p> <p>The grant application for this project contained an error concerning the estimated internal load reduction. The application indicated an estimated reduction of 386 lb/yr, which was a typo of the original TMDL internal load estimate of 368 lb/yr; the District intended to report 368 lb/yr. This represents complete reduction of excess internal load in Moody Lake. The District contracted to obtain deep sediment paleolimnological core data on Moody Lake in order to inform the alum dosing. Given the rigorous sediment phosphorus fraction data available, determining an alum dose for a near complete reduction of excess internal load is achievable. However, as the District has been reporting reduction numbers for Moody Lake, the decision was made that it was more consistent to report the required reduction from the TMDL, or 324 lb/yr, which is based on an 88% reduction of the existing internal load estimate of 368 lb/yr. Either way, the in-lake alum treatment, in conjunction with the watershed load reductions, should result in Moody Lake achieving the in-lake water quality goal of 40 ug/L.</p>		
Category	NON-STRUCTURAL MANAGEMENT PRACTICES		
Start Date	1-Oct-18	End Date	
Has Rates and Hours?	No		
Actual Results	<p>2/1/19 Update: Round 1 of split treatment alum application occurred October 2-3, 2018.</p> <p>2/1/20 Update: Round 2 of split treatment alum application occurred October 21-24, 2019.</p> <p>12/17/20 Update: With the alum treatment complete, the District performed in-lake monitoring of Moody Lake over the 2020 open water season, including bottom water phosphorus measurements. All values are well under 20 ppb indicating excellent effectiveness of the alum treatment. Bottom P measurements greater than 100 ppb late in the summer would indicate a need for further investigation to determine when another alum application might be warranted. A spreadsheet containing the measurements is attached in eLINK.</p>		

Activity Action - Alum Treatment			
Practice	563M - Alum addition - In Lake	Count of Activities	1
Description	Whole-lake alum application to Moody Lake		
Proposed Size / Units	45.00 AC	Lifespan	10 Years
Actual Size/Units	AC	Installed Date	
Mapped Activities	No	Technical Assistance Provider	

Final Indicator for Alum Treatment			
Indicator Name	PHOSPHORUS (EST. REDUCTION)	Value	324
Indicator Subcategory/Units	WATER POLLUTION (REDUCTION ESTIMATES) LBS/YR	Calculation Tool	Other
Waterbody	Moody Lake		

Grant Activity - Engineering

Description	<p>Engineering costs for permitting, final dosing, contractor coordination, & application oversight.</p> <p>Paleolimnological sediment core data will be reviewed & analyzed to develop an appropriate dosing plan. Additional sediment cores may be collected to determine a more specific dosing plan. Plans & specs will be completed for all components of the alum dosing. This task will include preparing bidding documents, advertising for bids, conducting a pre-bid meeting, answering bidding questions, and providing bid packages for alum application. This task will include observation & documentation of the alum application and management of the alum application contract. Contract management will include the processing of pay requests and project close out documentation. This activity will be primarily carried out by EOR. Tasks include permitting, dosing design, contract documents, bidding, application oversight, and development of the alum treatment OM&M plan. EOR staff dedicated to this activity:</p> <ul style="list-style-type: none"> • Project Manager & District Engineer – Greg Graske, PE • Principal Oversight – Cecilio Olivier, PE • Water Quality Scientist & Limnologist – Meghan Funke, Ph.D. • Dosing Support – Joe Pallardy • Sediment Core Collection – Mike Majeski <p>Regarding design standards, the alum dose will be based on the best available science and methods, developed and published from several decades of alum treatment experience, presented at the North American Lake Management Society Lake & Pond Phosphorus Inactivation & Interception Workshop Training, and attended by EOR’s Meghan Funke on November 6, 2012. In addition, the alum dose will be calculated to account for other compounds that affect the binding efficiency of alum to phosphorus in the sediments (recently published in James and Bischoff, 2015. Relationships between redoxsensitive phosphorus concentrations in sediment and the aluminum:phosphorus binding ratio. Lake and Reservoir Management 31: 339-346), and in-depth sediment core sampling.</p>	
Category	TECHNICAL/ENGINEERING ASSISTANCE	
Start Date	11-Apr-18	End Date
Has Rates and Hours?	Yes	
Actual Results	<p>2/1/19 Update: Pre-bid meeting at Moody Round Barn on 8/22 at 1pm. Bid opening on 8/29 at 2pm. Notice of Award to HAB Aquatic Solutions on 9/14. Coordination with contractor re: alum treatment schedule</p> <p>2/1/20 Update: Treatment coordination and scheduling, water quality/temp review, observation and field demonstration, water quality field measurements during alum dosing, review alum treatment logs/payment app</p>	

Grant Attachments

Document Name	Document Type	Description
2018 Competitive Grant	Grant Agreement	2018 Competitive Grant - Comfort Lake-Forest Lake WD
2018 Competitive Grant executed	Grant Agreement	2018 Competitive Grant - Comfort Lake-Forest Lake WD
2020 Moody Bottom Water P Measurements	Grant	Moody Lake Alum Treatment
Access & Staging Agreement	Grant	Moody Lake Alum Treatment
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 12/17/2020
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 03/23/2020
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/01/2019
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 05/23/2019
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/03/2020
Application	Workflow Generated	Workflow Generated - Application - 08/09/2017
Application Image_Moody Alum	Grant	Moody Lake Alum Treatment
C18-1912 Interim Financial Report	Journal	Journal Dated - 04/27/2020
C18-1912 Reconciliation Checklist	Journal	Journal Dated - 04/27/2020
Final Financial Report	Grant	Moody Lake Alum Treatment
Internal Load Feasibility Study	Grant	Moody Lake Alum Treatment
Resolution Delegating Signing Authority to Administrator	Grant	Moody Lake Alum Treatment
Revised Work Plan Text	Grant	Moody Lake Alum Treatment
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 03/13/2018
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 12/20/2017
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 03/13/2018
Work Plan Budget	Grant	Moody Lake Alum Treatment
Work Plan Text	Grant	Moody Lake Alum Treatment
grantmap_19139_2017-08-08_07-19-59-PM.jpg	Grant	Moody Lake Alum Treatment