

# 2023 SEDIMENT REMOVAL AND MARINA RESTORATION PLAN

## GRAND LAKE ESTATES HOMEOWNERS ASSOCIATION

Prepared for the Town of Grand Lake

March 27, 2023

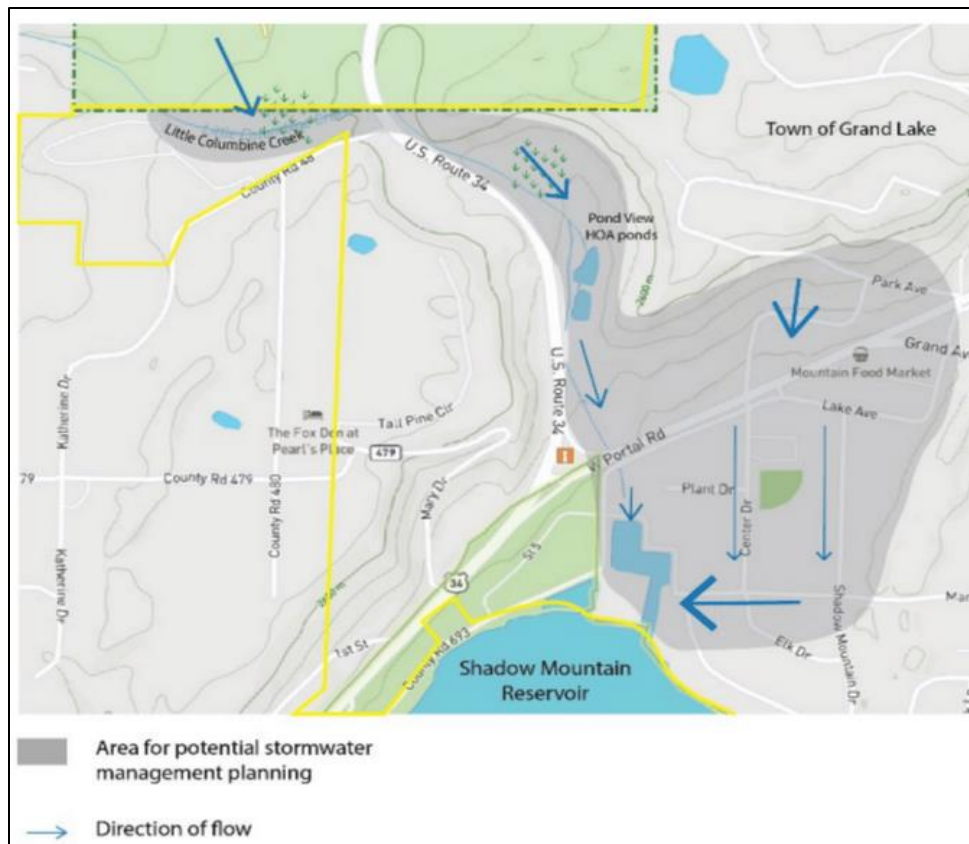


## 1.0 Purpose and Need

The Grand Lake Estates Homeowners Association (GLEHOA) owns, operates and maintains a private marina for its residents located immediately south of the Grand Lake Fire Station. The marina operates pursuant to a Special Use Permit with the U.S. Forest Service as a facility to be used solely by HOA resident members. Approximately 45-50 slips are currently occupied in the marina.

Significant volumes of storm water and snowmelt runoff from areas above the marina and within Town of Grand Lake, are discharged into the marina basin as an on-going occurrence (Figure 1). Several illustrations of the storm water runoff from the Town into the marina are shown in Attachment 1. The uncontrolled storm water drainage into the marina has resulted in significant sediment buildup within the marina basin. The sediment deposition has resulted in seriously compromised water depths and areas of the marina becoming unusable due to very shallow water adversely impacting the safe operation of the facility. Docks and areas around the perimeter and along the shore of the marina basin are most affected by the sedimentation. Slips in the northern portion of the marina are not currently accessible and many other slips in the marina are also adversely affected by the sediment deposition.

Figure 1. Storm Water Flow Into Marina Basin



The marina was last dredged in about 2006. The GLEHOA plans to again remove accumulated sediment from the marina in the summer of 2023, in order to enhance the safe operation of the facility. We understand that the Town of Grand Lake is currently developing a storm water management plan for areas that discharge into the marina (Figure 1). In conjunction with this plan, we believe it is critical that the Town direct its efforts to those areas that produce excessive storm water inflow to the GLEHOA marina. The construction of drainage improvements which permanently mitigate the sediment inflow to the marina are important, and will allow the GLEHOA to minimize ongoing dredging and sediment removal.

## 2.0 Alternatives for Sediment Removal

Three alternatives for marina basin restoration have been evaluated and have been determined to be technically feasible:

Alternative 1 (Proposed) – Suction Sediment from Marina Basin. This “vacuum” method would remove material with a gasoline powered suction pump. A suction line would be hand operated by a work crew (wearing wetsuits) stationed in the water. No heavy equipment would be used below the water line and existing docks would remain in place. The suction line would pump sediment and organic material to enclosed filter bags. *The GLEHOA property adjacent to the marina is not of sufficient size to accommodate the sediment containers.* Accordingly, the sediment containers would be temporarily situated on Town of Grand Lake property that is exclusively deeded for the future development of a park (Winter’s Park site). The filter bags would retain all sediment and organic material. Water from the filter bags would drain by gravity back to the marina. Once the filter bags have drained the material in the bags would be available for on-site landscaping to facilitate future development of the park site, or would be removed from Town property. It is estimated that up to 400 cubic yards of material will remain after the filter containers have drained.

Alternative 2 – Dredge Marina Basin and Immediately Haul Material Off-Site. Under this alternative, a long-reach backhoe would operate from Sailboat Lane and Lakefront Road to excavate the marina bed. Existing docks would be temporarily removed. Dredged material would be discharged into haul trucks and removed from the site. The volume of the material to be hauled from the site will be substantial (approximately 2,500 cubic yards) given the initial high water content of the dredged material. Haul truck traffic will be significant. The cost of this alternative would likely exceed the currently available funds of the HOA and dredging would be postponed until a future date when adequate funds are available.

Alternative 3 – Dredge Shoreline Areas Only With a Boat-Based Backhoe and Temporarily Store Material on HOA Property along the Shoreline. In this option, a smaller area of the marina basin would be physically dredged by a small backhoe that is situated on a modified pontoon boat. The dredged material would be placed in piles on the HOA Property which lies between the water line and the perimeter roads (Sailboat Lane and Lakefront Road). Once the dredged material has adequately drained, the shoreline areas of the marina would be regraded and excess sediment would be hauled off-site. Existing docks would be temporarily removed prior to excavation and would not be replaced until after the sediment has drained and the shorelines are re-graded. The marina will not be operable for a significant portion of the boating season.

The GLEHOA has previously secured approval from the U.S. Forest Service and the U.S. Army Corps of Engineers that will accommodate our proceeding with any of the above three

alternatives (Attachment 2). Additionally, we have discussed our dredging and marina cleanup plan with Three Lakes Watershed Association and Northern Water and both have indicated their support to dredge the marina via the suction method outlined above. We will continue to communicate and coordinate with these two groups during the remediation project to ensure ongoing adequate water quality control measures are employed.

Following discussions with various professionals and contractors, GLEHOA has concluded that the suction method (Alternative 1) is the most viable and effective for the following reasons:

- **Water Quality.** No sediment or organic material would be stored or handled along the shore of the marina. This minimizes the possibility of inadvertent discharges back to the water. All sediment and organic material would be stored in filter bags until disposal occurs. No dock removal would be required.
  - **Reduced Transport Impacts.** Once material in the filter bags have dried it can be removed from the site. This would substantially reduce the volume of material that must be hauled, and will significantly reduce local truck traffic.
  - **Creates Local Source of Landscaping Material.** If desired, the suctioned material can be used for landscape purposes in near-by areas.
  - **Reduced Impact to Marina.** The marina would remain open during the suction activities as the divers can suction around boats and docks. Docks will not need to be removed.
- Reduced Impact to Sailboat Lane.** All portions of Sailboat Lane will remain accessible throughout the project. Through-traffic would be curtailed for about a two to three week period during the suction work when drainage from the filter bags is being routed across Sailboat Lane via an above grade drainage pipe, or via a temporary 8' foot wide swale across the road. The Fire Department boat, the nearby storage units, and the future site of Winter's Park will be accessible at all times from either the East or West entrance to Sailboat Lane.

### **3.0 Detailed Description of Proposed Action**

#### **Suction Method**

A shore-based gas powered suction pump will be used to remove sediment and organic material. The suction line from the pump will extend from the marina to the future site of Winter's Park. The suction line will be manually operated by a crew in wetsuits working from the marina basin bed. Pumping will only occur during daylight hours.

The crews will work the suction line around boats and under existing docks in segments of multiple boats at a time. Sediment curtains will surround each segment while the suction work occurs. Once a section of the marina has been treated, the sediment curtains will be relocated and vacuuming of a different section will occur.

#### **Water Quality Controls / Silt Curtains**

The goal of GLEHOA is to minimize any temporary degradation in water clarity that may occur during restoration / maintenance activities. The temporary installation of silt "curtain" and sedimentation control devices between construction activities in the marina and Shadow Mountain Lake will be in place at all times.

As previously noted, we have discussed our dredging and marina cleanup plan with Three Lakes Watershed Association and Northern Water and both have indicated their support to dredge the marina via the suction method outlined above. We will continue to communicate and coordinate with these two groups during the remediation project to ensure ongoing adequate water quality control measures are employed.

#### **Temporary Storage of Sediment and Organic Material**

The suction line will discharge the vacuumed material to a temporary storage location on Town of Grand Lake Property (the future site of Winter's Park). The conceptual area impacted by the temporary use of the Town property is shown on Figure 2.

Two 45' by 110' sediment container bags will be used to temporarily store the sediment and organic material. The site for the filter bags will be 92' x 110' size. A berm approximately 16" in height will be placed around the perimeter of the containers. The berm will keep the containers in place as they are filled with water and sediment. A preliminary location for the silt containers is shown in Figure 2. A cross-section layout, and a depiction of the container bags and required berm is in Attachment 3. The actual location of the containers can vary in





It is estimated that the suction activities will take two to three weeks to complete. While the container bags are being filled, clean water drainage will occur from the bags back to the marina. This drainage will be routed across Sailboat Lane via an above ground pipe temporarily placed across the road. In the alternative, a 6 to 8 foot wide swale could be constructed across Sailboat Lane to rout the drainage into the marina. After 3 to 4 weeks the amount of drainage will significantly decrease, the road can be opened to through traffic, and Sailboat Lane will be restored to its prior condition.

The sediment containers will continue to drain at a slow rate. The contractor estimates that the material in the bags will be ready for re-grading or removal in late Fall. If weather conditions do not allow, the material could be moved in early spring of 2024. It is estimated that about 400 cubic yards of material will remain in the container bags after they have drained. This material can be used for local landscaping purposes or hauled off-site. This volume of material would cover a ½ acre site with approximately 6" of material.

In conjunction with the initial approval and development of the Grand Lake Estates subdivision, the "Winter's Park" property was deeded to the Town of Grand Lake. Deed restrictions for the property require that this area be solely used as a park. Currently, this Town property is largely devoid of topsoil and vegetation. The sediment and organic material temporarily stored on the site could possibly be spread at the "Winter's Park" site to facilitate future parkland development.

### Schedule and Timing

The GLEHOA contractor proposes to start the vacuuming process on July 31, 2023. A conceptual timeline of potential activities is outlined below:

#### Prior to July 31:

- Level site prior to placement of container bags
- Place above ground drainage pipe across Sailboat Lane, or construct a swale across Sailboat Lane
- Place temporary access barriers / signage at edges of the drainage across Sailboat Lane
- Allow continual access to Sailboat Lane from either East or West entrances

#### July 31 to August 31:

- Place plastic sheeting over site of container bags
- Vacuum marina and fill container bags



Early September:

- Regrade Sailboat Lane to specifications directed by Town Late Fall (prior to snow cover):
- Cut top off container bags
- Move material from bags to offsite location or spread material over Winter's Park site, as directed by Town
- Remove bags and plastic sheeting as needed
- Reclaim Town property as needed and as allowed by weather conditions (revegetation, tree mitigation if needed, etc.)

Early Spring 2024:

- Complete any site reclamation that was not possible in the Fall of 2023 (grading, revegetation, etc.)

Concurrent Use of the Town Property

Access will be continually available to allow entrance to the future site of Winter's Park. The area temporarily occupied by the container bags will not be available for public use, however, it does not appear that any improvements or public uses occur at this location at this time.

One infrequently used picnic table is located in the southwest corner of the Town property adjacent to Sailboat Lane. This area of the site should not be materially affected during this project and should be accessible throughout the marina basin restoration program.

#### **4.0 Areas of Coordination, Understanding and Agreement with the Town of Grand Lake and GLEHOA**

1. Generally work with and coordinate with the Town of Grand Lake to develop a mutually workable and financially feasible plan to dredge the GLEHOA marina during the summer of 2023. The plan will be aimed at addressing the significant sediment buildup that has occurred from unmanaged storm water drainage from Town property
2. Coordinate with the Town's Public Works Department Manager to specifically locate and define the preferred footprint for the temporary placement of the sediment containers
3. Following adequate drainage from container bags, regrade Town Property or remove accumulated sediment as agreed with the Public Works Department
4. Provide for temporary drainage across Sailboat Lane (above ground pipe or swale) consistent with agreed specifications with the Town
5. If necessary, at the appropriate time reseed any vegetated areas that may be disturbed
6. Obtain all required permits from the Town of Grand Lake

## Attachment 1 – Examples of Storm Water Runoff Into Marina Basin









## Attachment 2 - USFS Approval of Basin Restoration Plan

Appendix B  
Grand Lake Estates HOA  
Operating and Maintenance Plan  
Private Marina Basin Restoration and Dock Reconfiguration  
for  
Special Use Permit SUL450

*August 12, 2022*

1. This operating plan is prepared in compliance with ***Clause II. Improvements B. Plans C. Construction & Clause III. Operations C. Operating Plan*** of Special Use Permit #SUL450 issued to Grand Lake Estates HOA (GLEHOA).
2. The goal of GLEHOA is to minimize or preclude any temporary degradation in water clarity that may occur during maintenance activities. GLEHOA will consider the Grand Lake Clarity Program and the recent Stakeholders Memorandum of Understanding for this program. GLEHOA will coordinate with the Clarity Program Adaptive Management Committee in advance of any activities that may disturb the lake bed during the Clarity Operations Season of July 1 through September 11.
3. All work shall be in accordance with the description of work provided to the US Forest Service on May 9, 2022 (Basin Restoration Summary and Conceptual Slip Configuration).
4. Scope of work: Temporary installation of silt “curtain” and sedimentation control devices between construction activities in the marina and Shadow Mountain Lake. The following two alternative basin restoration methods, or a combination of these methods, may be used in the areas described in the SF-299 application. (A) Suction / vacuum devices will be used to remove accumulated silt and organic material. The suction/vacuum devices may be operated from either a floating boat that delivers the dredged material to the adjacent shoreline, or from a land-based location adjacent the boat basin. (B) Use of a “long-reach” backhoe for basin restoration working 50’ – 60’ from the shoreline. Placement of removed materials into appropriate haul truck and proper offsite disposal will occur with either restoration method. Dock removal, replacement, and reconfiguration is not to exceed (96) slips. Docks will meet Arapahoe National Recreation Area (ANRA) standards. It is recognized that dock improvements and maintenance may be completed over several construction seasons. If any substantial additions and/or changes to the project on National Forest Lands are contemplated, they will be presented in writing to the U.S. Forest Service as a proposed amendment to the operation and maintenance plan.

5. Construction access shall be limited to Grand Lake Estates HOA property boundary or authorized public right-of-ways.
6. During construction, trash and construction debris will be removed from NFS lands on a daily basis.
7. No equipment maintenance or refueling shall occur on NFS lands.
8. Hazardous Material Spill Plan shall be provided to the US Forest Service, and shall include the following stipulations: install silt fence in location approved by the US Forest Service; provide absorbent pads on site to be used if a spill occurs; dig-up and remove any hazardous material spilled on NFS lands.
9. All construction material and equipment will be removed from NFS lands upon project completion.
10. All work shall be in accordance with US Army Corps of Engineers, application no.33CFR325, ENG Form 4325 (if applicable).
11. All other applicable Local/State/Federal authorizations or permits must be obtained prior to construction activities.

Plan reviewed by: \_\_\_\_\_  
Permittee

Date: \_\_\_\_\_

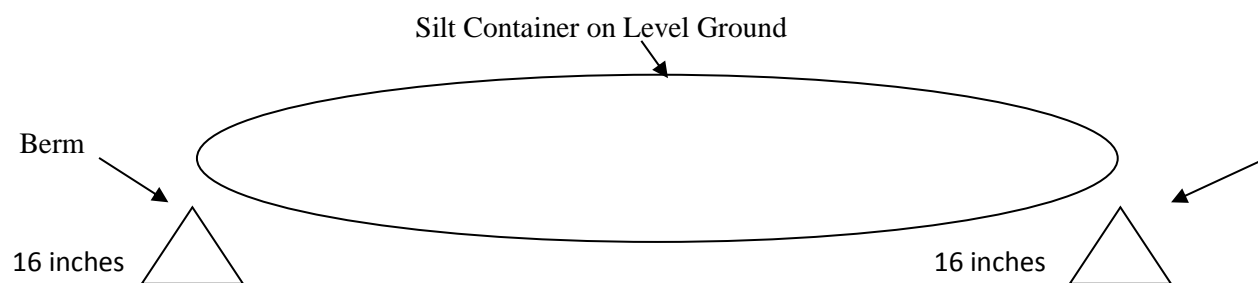
Plan approved by: \_\_\_\_\_  
District Ranger

Date: \_\_\_\_\_

### Attachment 3 – Cross Section and Illustration of Sediment Container Bags

## Silt Container Grades and Pictures by Organic Sediment Removal Systems © 2002

Silt containers are liquid filled so they are very susceptible to rolling down hill or lower areas of the property. To prevent this, they must be placed in very level areas and a berm constructed along the sides to hold the container in place. All you are doing is creating a cradel to support the sides of the container from rolling.



Depiction of Sediment Containers Prior to Fill





## Sediment Containers After Fill, and Before Drainage



This is what the sediments should look like after the top of the container is cut off. It is real easy now that the material is hard dried, to spread out the material and seed over or haul off site.

