2017 Bottom Barrier Monitoring Report

Prepared Pursuant to

California Regional Water Quality Control Board
Lahontan Region Board Order No. R6T-2014-0059

Tahoe Keys
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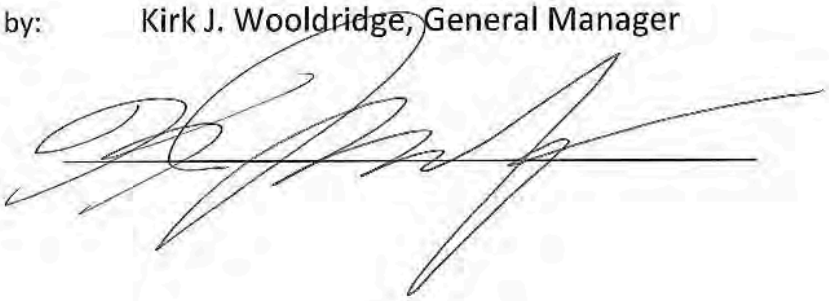
2017 Bottom Barrier Monitoring Report

Prepared for the Tahoe Keys Property Owners Association

Submitted by: Kirk J. Wooldridge, General Manager

Signature: 

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A. Waste Discharge Requirements

The Tahoe Keys 2017 Bottom Barrier Monitoring Report is being submitted in compliance with the Waste Discharge Requirements as adopted by the Lahontan Regional Water Quality Control Board Order No. R6T-2014-0059 on July 17th, 2014. Report format follows the outline described in Monitoring and Reporting Program No. 2014-0059 Section D, Bottom Barrier Monitoring Report.

B. 2016 Recommendation for 2017 Season

The TKPOA will offer the same Bottom Barrier Program for the homeowners to participate in, as in previous years. The homeowners will be required to fill out the permit / application through the Architectural Control Department and will be responsible for the installation, removal, cleaning, monitoring and documentation of the barriers. Upon completion of the installation, the Water Quality Department will be responsible for monitoring, ensuring the upkeep of the barriers by the homeowners and the end of season reporting for the program.

C. 2017 Implementation Plan

In 2016, the TKPOA received an increased number of bottom barriers from the Tahoe Resource Conservation District (TRCD) to equip twenty (20) homeowners with barriers. The intent was to use more barriers at different locations among the waterways to see the different results due to location. The location of the barriers was the key to the success or failure due to water currents, temperatures, boat traffic, plant density and wind patterns. The Water Quality Department monitored each bottom barrier site weekly throughout the 2017 season.

D. Summary of Findings

In 2017, the Tahoe Keys Property Owners Association (TKPOA) conducted another season of its bottom barrier program for homeowners. Barriers were supplied by the Tahoe Resource Conservation District (TRCD) free of charge for three (3) homeowners at the locations shown on Figure 1. Prior to the summer season, the WQD and ACD Staff held a town hall forum which focused on the TKPOA's Barrier Program. The topics covered were the AIS Program, bottom barriers, the process to get them, installation and removal along with the required monitoring and paperwork. Local diving companies were invited, and several attended, in order to discuss cost estimates for installation, extraction and maintenance.

For those that participated, the process for the homeowners required them to fill out an application and permit for use of the barriers. Barriers were installed by the homeowners by June 2017 and removed no later than 1 October 2017. The barriers were monitored throughout the season by the Water Quality (WQ) Staff.

Figure 1. Location of 2017 Bottom Barriers

After all the bottom barriers were removed, the treated areas were inspected by the homeowner for plant growth. The barriers were effective in preventing the growth of aquatic weeds directly underneath them but it was noted that plants were growing near the edges of the barriers and on top of the barriers in the sediment that had accumulated there. It was also noted that, while the bottom barriers were effective, they only covered between 100 and 400 square feet (depending on the amount and size that each property received) and the rest of the cove was densely infested with aquatic plants.

Each homeowner that participated in the program was given an end of the season report sheet that consisted of the following questions

1. Name / address / phone number
2. Density of plants during installation
3. Date installed / duration of installation / date removed
4. Effectiveness of the installation of barriers for the season
    a. Are any live weeds observed after removal?
    b. Was there any accumulation of dead/ decaying plant material observed?
    c. Were any odors of decaying plant material detected during the deployment?
    d. Was the water clouded (turbid) upon removal?
    e. Where and how was the barrier cleaned upon removal and where is it stored?
    f. Were the barriers cost effective to the homeowner?
5. Were there any incidents reported during the deployment, such as: Loose barriers, watercraft or swimmer entanglements, chemical spills, etc?
6. Additional comments or concerns

See Appendix A for each of the homeowner's End of the Season Report. Note: only one homeowner filled out the required paperwork. Architectural Control Department (ACD) Staff contacted and requested this information but was not complied with.

E. Decline in Participation

The 2017 Bottom Barrier program was down eighty three percent (83.3%) from the 2016 season. The biggest challenge with the 2017 season was the water depth at the beginning and throughout the season. Most homeowners that were initially interested in the program changed their decision due to the water's depth. Many believed that the plant growth would not be as prolific and not as dense due to the temperature and depth, while others were not ready to pay for the diving company's fees for the installation, removal and season maintenance. The pricing increased this season due to the depth and temperature of the water.

F. Summary of Bottom Barrier Performance

Several obstacles hindered the success of the 2017 Bottom Barrier Program. Issues included difficulties with installing the barriers, inability to harvest aquatic weeds near the barriers requiring cooperation with nearby homeowners, fragments from harvesting operations, and siltation on top of the barriers.

I. Harvesting Near Bottom Barriers

Harvesting is the primary aquatic plant control method used in the Tahoe Keys. Large harvesters travel around the lagoons and cut the plants to a height that allows boat access. Areas around the bottom barriers could not be harvested due to the risk of dislodging or damaging the barriers. Due to this, aquatic plant growth around the barriers was substantial and unchecked which can limit boat access. Docks belonging to other homeowners that were next to the bottom barriers could not be serviced which meant that cooperation with the adjacent homeowners was needed

II. Siltation on Top of Bottom Barriers

Over the four-month period that the barriers were in place, a layer of silt accumulated on top of them. This silt most likely came from boat traffic disturbing the layer of fine sediment on the bottom of the lagoons. The layer of silt allowed new aquatic weeds to root and grow on top of the barriers. The added weight of the silt and plant growth on the top of the barriers made removal more difficult.

III. Fragments from Harvesting

While harvesting near the bottom barriers was avoided, there was still harvesting taking place in the same cove where barriers were installed. The harvesting created fragments that settled on top of the barriers and began to root in the sediment which had accumulated on the surface of the barriers.

IV. Identification and Markings

There were two visual markers that the homeowners were required to display to identify the Bottom Barrier area. There were two (2) laminated sheets of white paper signs that that were posted on opposite ends of the docks to identify that there were bottom barriers in the vicinity. To identify the exact location of the outline a yellow buoy was placed at the edges. Most of the signs were taped to

the dock, which allowed a many of them to be blown away due to wind. Also, many of the buoys were improperly weighted down and had the same results of the signs.

G. Monitoring Data

The barriers were monitored throughout the season by the Water Quality (WQ) and ACD Staffs. This monitoring was to ensure that the signage / buoys were in place, that the barriers were properly in place and not bubbling due to escaping gases, and to see the overall progress of the area. However, the homeowners were responsible for documenting their experience with the bottom barrier program. Attachment A includes documentation from the one participant in the 2017 program.

H. 2018 Implementation and Recommendations

The TKPOA will offer the same Bottom Barrier Program for the homeowners to participate in. Prior to the summer season, the WQD and ACD staffs will hold another information forum for the homeowners to promote the program. The homeowners will be required to fill out the permit / application through the Architectural Control Department and will be responsible for the installation, removal, cleaning, monitoring and documentation of the barriers. Upon completion of the installation, the Water Quality Department will be responsible for monitoring, ensuring the upkeep of the barriers by the homeowners and the end of season reporting for the program.

I. List of Preparers

The following individual prepared the text presented in this report.

Name	Education	Role
Gregory J Hoover TKPOA	A.A. Natural Science A.A. Environmental Technology and Sustainability: Biological Resources Lake Tahoe Community College	Primary Author Data Collection
Kevin Schoonmaker TKPOA	B.A. Criminal Justice /Minor Forensic Science A.A.S. Natural Resource Conservation: Law Enforcement	Contributing Author Data Collection

Attachment A

Homeowner Program Evaluation Statements

LAGOON BOTTOM BARRIER: End of Season Report (Due Nov. 1)

Project Address: 1969 Marconi Way
Property Code: _____ /_____
Owner Name: George Yu Phone: 415 470 6576
Representative: _____Phone: _____

CHECKLIST:

1) Describe the density of the plants during initial installation, including average height of plants being covered by barriers.
No plants visible due to high water level in May.

2) Date barriers were installed, and removed for the season. Installed: 5/28/17 Removed: 9/15/17

3) Duration of installation (# of days) 1

4) Effectiveness of the installation:
A. Are any live weeds observed after removal? No

B. Are any accumulations of dead/decaying plant material observed? No, water level still high

C. Were any odors of decaying plant material detected during the deployment?
No

D. Was the water clouded (turbid) upon removal? Not more than other areas without barriers

E. Where and how was the barrier cleaned upon removal and where is it stored?
Backyard with water hose. Stored in backyard.

F. Were the barriers cost effective in the owner's opinion, etc.?
Yes, bought my own barriers for $200

5) Were any incidents reported during deployment, such as: loose barriers, watercraft or swimmer entanglements, chemical spills, etc.? No

Provide details:

6) Additional comments and/or concerns:

Owner Signature: _____ Date: 9/26/2017