CLAIMS

1. A system for maintaining water quality in a large water body comprising water contained in a container having a bottom, the system comprising:

a container that contains a water body;

a chemical application system for dosing a flocculant into the water, wherein the chemical application system applies a flocculant to the water in the water body to maintain turbidity of the water below 2 NTU;

a mobile suctioning device capable of moving along the bottom of the container and suctioning a portion of water from the bottom containing settled solids at the bottom of the container, wherein the mobile suctioning device is configured to be activated before an increase in color black component of the bottom of the container exceeds 30% on a CMYK scale and wherein the mobile suctioning device comprises suction points distributed along a bottom of the suctioning device constructed to concentrate suctioning power at the suction points and not resuspend more than 30% of the settled solids in an area of the bottom of the container where the mobile suctioning device moves along;

a control system configured and arranged to activate the operation of the suctioning device based on a determination of the color of the bottom of the container;

a filtration system comprising a filtration unit in fluid communication with the mobile suctioning device, wherein the filtration unit receives the portion of water suctioned by the mobile suctioning device; and

a degreasing system, separate from the filtration system, comprising:

(a) a separation unit, including a degreaser and a screen or coarse filter, and

(b) skimmers in fluid communication with the body of water and the separation unit, the skimmers arranged and configured to provide a surface water flow from the water body to the separation unit, and

wherein the degreaser is an overflow apparatus for separating oils and greases from the water, the screen or coarse filter is arranged and configured for retaining large debris, and the degreasing system is capable of maintaining a top-most 1 cm surface water layer as having less than about 20 mg/L greases; and

one or more return lines for returning filtered water from the filtration unit and the degreasing system to the water body,

wherein the system is a closed system capable of maintaining water quality suitable for recreational uses.

2. The system of claim 1, wherein the water body has a surface area of at least 7,000 m^3.

3. The system of claim 1, wherein the container comprises an excavated structure having walls to contain the water and a non-permeable flexible membrane covering the bottom

of the excavated structure, the bottom having a slope that is about 20% or less and the walls having a slope that is greater than about 45%.

4. The system of claim 3, wherein soil forming the bottom of the excavated structure is compacted soil, the soil compacted to at least 80% of its relative density (RD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is less than 12%.

5. The system of claim 3, wherein soil forming the bottom of the excavated structure is compacted soil, the soil compacted to at least 85 % of its maximum dry density (MDD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is greater than 12%.

6. The system of claim 3, wherein the excavated structure has a top layer of soil removed, and wherein the removed top layer of soil is at least 5 cm.

7. The system of claim 1, wherein the control system is configured to activate the chemical application system and the degreasing system.

8. The system of claim 7, wherein the control system is arranged and configured to receive information regarding water quality parameters, process the information, and activate the chemical application system and/or degreasing system to adjust the water quality parameters within predetermined limits.

9. The system of claim 7, wherein the control system is an automated system that processes information.

10. The system of claim 7, wherein the control system may be operated on site.

11. The system of claim 7, wherein the control system may be operated remotely through an internet connection or other information-exchange system.

12. The system of claim 7, wherein the control system is arranged and configured to receive information regarding the turbidity of the water and activates the flocculant application to adjust the turbidity within a set limit.

13. The system of claim 1, wherein the bottom of the water body has a color that provides a specific coloration to water in the water body.

14. The system of claim 1, wherein the bottom of the container has a white, yellow, or light blue color.

15. The system of claim 3, wherein the non-permeable flexible material comprises rubber, plastic, Teflon, low density polyethylene, high density polyethylene, polypropylene, nylon, polystyrene, polycarbonate, polyethylene terephthalate, polyamides, PVC, acrylics, or a combination thereof.

16. The system of claim 3, wherein the non-permeable flexible material has a thickness between about 0.1 mm and about 5 mm.

17. The system of claim 3, wherein the walls are covered with the non-permeable flexible material.

18. The system of claim 1, wherein the suctioning device is supported over brushes to avoid damaging the bottom of the container.

19. The system of claim 1, wherein the suctioning device is a self-propelled device.