Case Studies & Technical Review

INTRODUCTION

Cloudy, odorous, discolored water is typically the result of a disruption or imbalance in the natural ecology of a water body. Organic material such as leaves, branches, and aquatic vegetation tend to accumulate in water bodies. The decomposition of such materials can lead to odors, discoloration, and organic sludge accumulation.

Disinfectant products and chemicals commonly used in water treatment may destroy microbial activity; and as a result often perpetuate the pre-existing ecological imbalance. Repeated use of chemical treatments can cause water to become hazardous for use or consumption.

SHAC Ponder™ reduces odors, turbidity, and organic solids accumulations in water, and creates an environment that stimulates beneficial microbial communities. Ponder is designed for surface water conditions found in farms dugouts, stormwater reservoirs, golf course ponds, municipal reservoirs and lakes, and ornamental ponds.

CERTIFICATION AND SAFETY

Ponder™ is NSF/ANSI certified to standard 61 for use in the pre-treatment of potable water.

Ponder™ has been tested non-toxic and is routinely analyzed by NSF International for conformance.

CASE STUDIES

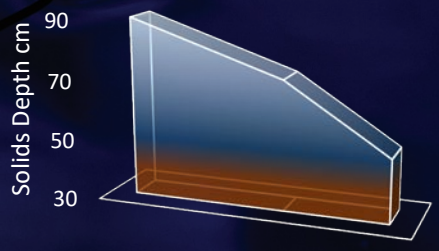
Ponder™ has been proven to improve water quality in a variety of surface water settings. The following studies illustrate the effects of Ponder on several key water quality parameters.

WATER QUALITY IMPROVEMENT STUDY 1

In a trial conducted at a water storage reservoir in Lakeland, Florida, Ponder™ was applied at recommended rates to determine product efficacy. The following results were reported by the Madrid Engineering Group:

- Organic solids reduction of 26% (Fig. 1)
- Clarity improvement of 81% (Fig. 2)

Figure 1: Organic solids (sludge) reduction reported during Ponder™ treatment.



	28-Mar	05-Jun	09-Aug
Solids Readings (cm)	90	73	51

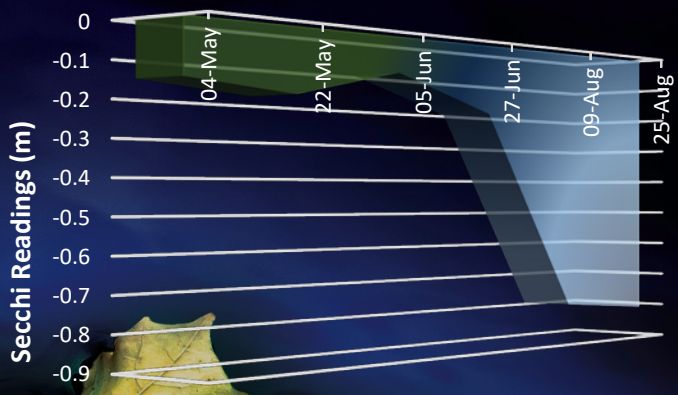


Figure 2: Clarity improvements reported during Ponder™ treatment.
*Water levels dropped during the early-June drought conditions.

As water levels returned to pre-drought levels, water clarity improved dramatically; and organic sediment reduction continued. Sediment reductions due to drought consolidation were taken into account during this study. Only organic sediment reductions attributable to Ponder™ treatment have been represented in figure 2.

WATER QUALITY IMPROVEMENT STUDY 2

Ponder™ was used to treat a lake in Calgary, Alberta. Water quality was monitored over a period of 12 months; sludge depth was monitored over a period of 9 months. The following results were observed:

- 82% reduction in turbidity (Fig. 3)
- 16% reduction in organic sediment (Fig. 4)

The majority of the reduction in organic sediments occurred in the first 4 months of treatment, only slowing under cold winter conditions.

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Figure 3: Turbidity reductions reported during Ponder™ treatment.

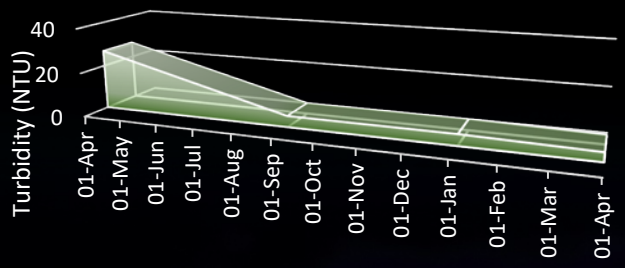
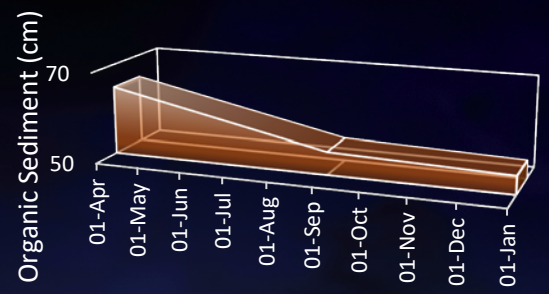


Figure 4: Organic solids (sludge) reduction reported during Ponder™ treatment.



Improvements to water quality and general aesthetics were noted by operators. The digestion of an estimated 8600m^3 of organic sediment within the 20 acre basin was achieved over nine months of treatment and observation. (That is 860 dump trucks.)

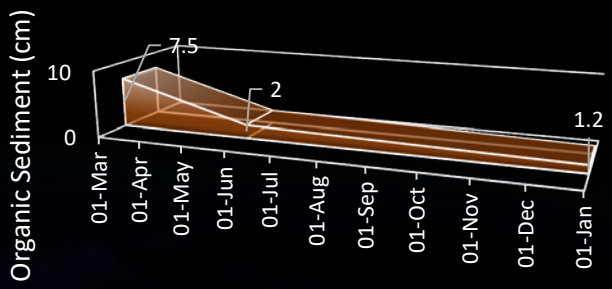
DISINFECTION BY-PRODUCT STUDY

Due to water sanitation practices used within water and wastewater treatment facilities, the potential for disinfection by-product formation during Ponder™ use was examined. Trihalomethane (THM) formation is of particular concern in such settings. THM's form through the addition of chlorine to water containing dissolved organic material. Although it is recommended that Ponder™ be applied only to non-chlorinated water, it is recognized that storage reservoirs and effluent ponds may require chlorination prior to use or discharge. As such, the following disinfection by-product studies were conducted.

In a study conducted at a water storage and treatment facility in Alberta, trihalomethane precursors were monitored over several months following Ponder™ treatment. The following results were observed:

- Organic Solids reduction of 83% (see Fig. 5)
- No elevation in other THM precursors such as Chl. A, TSS, or TOC

Figure 5: Organic solids reduction reported during Ponder™ treatment.



In a follow up study, Ponder™ was applied to chlorinated tap water at a rate equaling 25X the recommended rate for reservoirs, and 50X the recommended rate for runoff collection ponds/dugouts. Even at this elevated treatment rate, the formation of trihalomethanes remained well below established EPA and CCME guidelines.

HOW PONDER™ WORKS

SHAC Ponder™ is composed of liquefied oxidized lignite, and contains a high quality source of humic acids. The benefits of humic acid treatments, being numerous, include the stimulation of microbial communities. Ponder™ encourages the decomposition of organic matter by stimulating beneficial resident microbial communities present in water bodies. Stimulation of these microbial communities results in digestion of organic solids at optimum rates, and reduces offensive odors and discoloration of water.

Humic substances also play a role in the detoxification of heavy metals. Heavy metals complexed by humic substances are generally considered less 'bio-available' within an environment and thus, less inhibitory to the microbial populations. This mechanism encourages the growth of beneficial microbial communities responsible for remediation and decomposition.

PONDER™ BENEFITS

- Safe and easy to use.
- Creates an environment that stimulates microbial activity and encourages the decomposition of organic material.
- Does not inhibit immediate water use for livestock or domestic purposes.

For additional information, please contact SHAC Solutions Inc. at 1-888-533-4446 or visit us at www.shac.ca

SHAC® Solutions Inc.

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