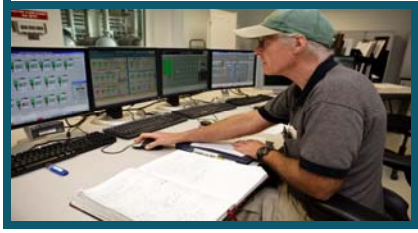
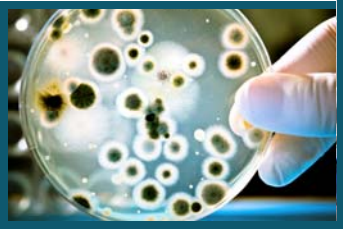
IN-PIPE TECHNOLOGY

Performance Focus

Bulletin #0209121





Sludge Reduction
Performance Focus: Lagoon Sludge

In-Pipe Technology® Company, Inc., is an effective, environmentally-friendly, and fiscally responsible method to reduce accumulated lagoon solids. By reducing accumulated sludge volumes by 40% to 85%, In-Pipe Technology has helped their clients significant savings every year by extending the intervals between dredging events. Additional benefits are seen in improved BNR, a significant reduction of odors and collection system degradation.

Summary at a Glance

Project Location: Iowa #1

Plant Type:

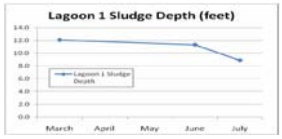
Project Installed: March, 2011

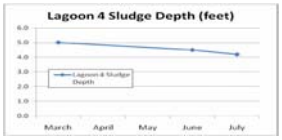
Plant Size: 4.0 MGD

Performance Summary:

- 10% Decrease in Total Sludge Produced
- 22% Decrease in Lagoon Digested Sludge

This Iowa city has dredged the sludge lagoons at the WWTP every three years. 2011 was slated be a 'dredging year' for their two wastewater lagoons. In March of 2011 In-Pipe was selected to reduce the accumulated solids enough to forestall the scheduled dredging and save the city a substantial amount of money. In September 2011 following six months of In-Pipe Technology service the treatment plant's operator and city engineer determined that dredging the lagoons would not be required. The result was a net savings to the City of $170,000. It is significant to note that both lagoons were receiving solids from the wastewater plant throughout the treatment regimen.





Summary at a Glance

Project Location: Iowa #2

Plant Type: Activated Sludge

Project Installed: May, 2007

Plant Size: 15.0 MGD

Performance Summary:

- An Almost 2 Foot Change in Lagoon Sludge Blanket in 3 Months
- 170,000 lbs Solids Converted in Lagoon

58% Reduction in Pounds of Total Solids

In 2006, with the planned dredging of their four wastewater lagoons, this Iowa city was facing a staggering cost. The contract operator, who operated the wastewater facility at the time of treatment, reported approximately 180,000 gallons of digested sludge at 2%-3% solids pumped into the lagoons daily. Based on those conditions, IPT completed their treatment program in less than 8 weeks achieving greater than a 50% reduction in pounds of lagoon total solids.

Mass Balance—Total Solids
Lagoon #4

Starting Sludge Depth (ft)	Starting Total Solids (M–lbs)	Solids Added (M–lbs)	Change in Sludge Depth (ft)	Change in Total Solids (M–lbs)	Reduction in Pounds of Total Solids
7.8	0.87	0.81	1.60	0.17	-58%

Lagoon #4 area = 180' x180'

The estimated starting total solids in lagoon 4 were

870,000lbs. At project inception, no definable water or rag layer could be determined. Strong odors and heavy bottom solids were present. Limited biological activity was observed.

In-Pipe has additional lagoon success stories in Alaska, Florida, Mississippi, Pennsylvania and Utah for more information please contact us.

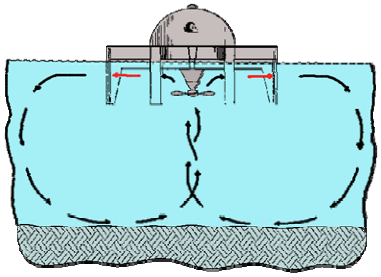
In-Pipe Technology Low Energy Mixer

Lagoons have been used as a part of wastewater treatment processes for decades. The efficacy of treatment depends upon the microbiology of the wastewater and the aerobic and/or the anaerobic conditions in the lagoon. The wastewater treatment is rapid and more effective under aerobic conditions than anaerobic conditions. However, lagoon aeration is a very energy intensive process and represents one of the barriers for rapid treatment of wastewater in a lagoon.

Low energy mixer

In-Pipe Technology's patented services greatly enhance the wastewater treatment process within lagoons through the continuous addition of a highly concentrated formulation of facultative bacteria, which are more robust and sustainable than indigenous wastewater bacteria. In-Pipe microbes can accelerate the treatment process under aerobic or anaerobic conditions. Some microbial reactions are highly efficient under aerobic conditions, and some reactions benefit from the anaerobic conditions in the lagoon.

As a part of In-Pipe's engineered strategy to further enhance the treatment process, a low energy mixer is added to the lagoon to circulate the stagnant water. The mixer will promote oxygen transfer to create aerobic conditions, and as important, promotes contact between food and microbes. The mixer operation can be controlled to optimize aerobic conditions favorable to aerobic microbial metabolism, or to create anaerobic conditions by turning the mixer down or stopping it to favor anaerobic metabolisms. Furthermore, the combination of the mixer and In-Pipe bacteria suppresses sulfate reducing activity and thereby eliminates the sulfide odor generated from the lagoon. An additional benefit is that the combination of bacteria and mixing allows operation of the lagoon for longer periods of time without the need to dredge.



Low energy mixer circulation pattern

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Service Offering

In-Pipe provides engineered wastewater treatment services to municipalities and industries worldwide. In-Pipe engineers a solution for each customer based on a full system review and includes turnkey installation, service and maintenance.

Proven Improvements

- Reduce Influent Loading
  - TSS 30%
  - BOD 30%
  - Total Nitrogen 50%
- Reduce Sludge Disposal 50%
- Reduce Energy Consumption (kWh) 30% to 60%
- Control H_2S Odor & Corrosion
- Control Fats, Oils, & Grease (FOG)
- Increase Plant Capacity

Unmatched Expertise

- Process Engineering
- Wastewater Treatment Plant Design Optimization
- Microbiology Laboratory
- Project Management
- Control Systems (SCADA) Programming and Remote Monitoring
- Microbial Production

Please contact us for additional information including full project profiles, references, or technical information.

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