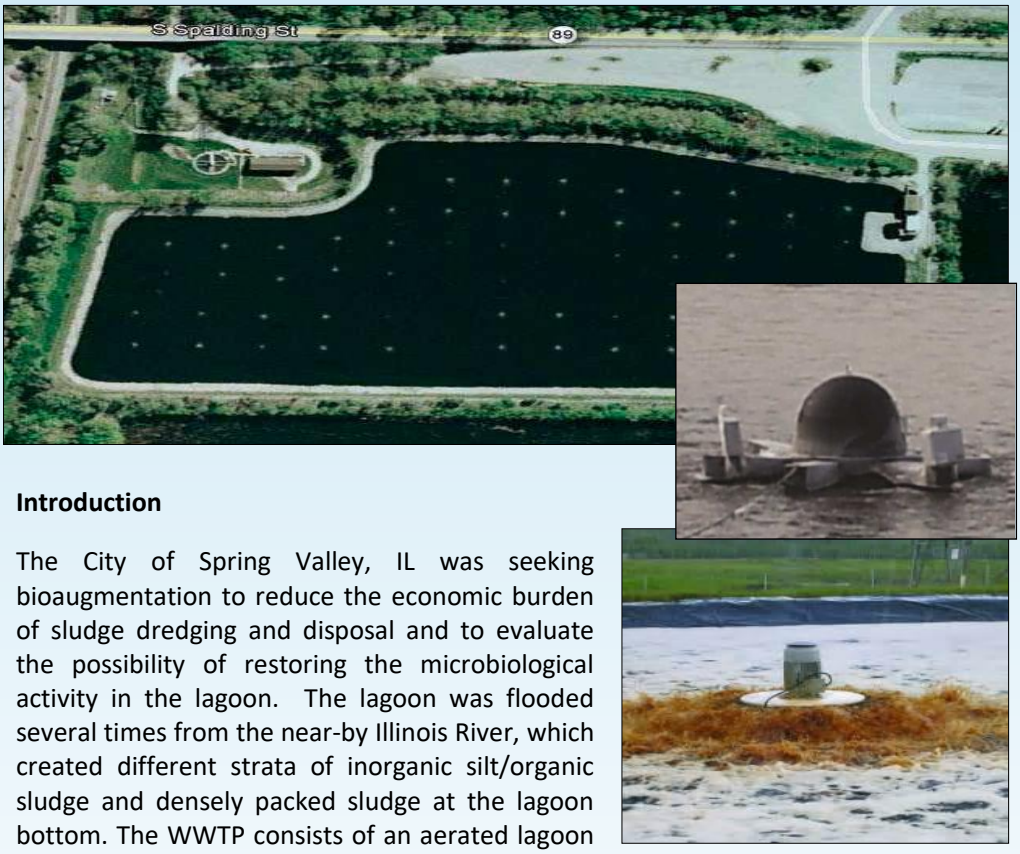
WWTP Sludge Reduction
Spring Valley, IL



Introduction

The City of Spring Valley, IL was seeking bioaugmentation to reduce the economic burden of sludge dredging and disposal and to evaluate the possibility of restoring the microbiological activity in the lagoon. The lagoon was flooded several times from the near-by Illinois River, which created different strata of inorganic silt/organic sludge and densely packed sludge at the lagoon bottom. The WWTP consists of an aerated lagoon that receives primary clarifier effluent. The lagoon sludge depth was 4 R within a 10 R lagoon depth that contained 16,208 cubic yards (CY) of Volatile Solids (VS) at 17.8%.

Goals & Objectives

The City and McClure Engineering (city consultant) issued a specification and request for proposal to reduce lagoon sludge, which required a reduction goal submitted with the bid. Bioaugmentation treatment proposed to reduce volatile suspended solids mass by a minimum of 25% in 180 days. At the end of the contract period, per the RFP, a penalty could be assessed if the actual sludge reduction percentage was less than the goal specified in the bid.

Biological Dosing Strategy

Biological dredging by continuously adding naturally occurring microbes combined with a low energy (1.6 HP) floating mixer to break the strata, to mix the densely packed sludge, to promote oxygen transfer, and to promote contact between food and microbes. Three automatic microbial dosing panels on the top of the floating mixer were installed. Additionally, there were six panels at the entrance of the lagoon wastewater treatment system to inoculate the lagoon influent with a high concentration formulation of robust and sustainable facultative bacteria.

Results

Performance evaluation at the end of 180 days of biological dredging reduced the volatile solids content 25% from 16,208 CY to 12,208 CY. This will save $175,000 in sludge disposal costs in one year ($22/CY disposal fee).

Project Profile
Summary at a Glance

Project: 180 days (Jun-Nov 2012)

Lagoon Size: 14.1 acres

Service Objectives:
- Biological Treatment to reduce the volume of sludge

Project Scope:
- Continuous addition of microbes (24/7) combined with low energy mixer in the lagoon
- Mixing diameter is 10 times the available depth
- Majority of movement is laterally due to the design of the impellor

Performance Summary:
- 25% Reduction of Volatile Solids
- Sludge Reduction Rate = 23 cu yds/day (19.4 tons/day)
- 9% Ammonia Nitrogen Reduction from 1,691 mg/kg to 1,540 mg/kg

Reference:

Jack Kusek
Engineer
McClure Engineering Assoc., Inc.

"After 40 years in operation, the lagoon capacity is maximized. Sludge accumulation caused effluent violations and we needed an efficient and cost effective alternative to reduce the total sludge volume. In only 3 months, biological dosing was already near their performance goal."

-Rob Baracani, WWTP Operator

AFFORDABLE EFFICENCY

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