

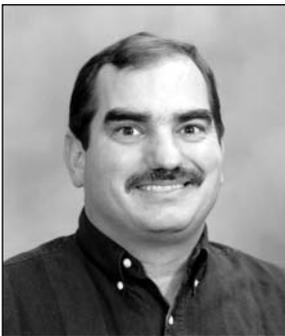
# Timely repairs save wastewater stabilization ponds

**I**want to showcase several projects in this article to illustrate the costs associated with lagoon maintenance. One project is at the City of Waterville, located in southern Marshall County in northeast Kansas. Waterville recently repaired an erosion problem on two cells originally constructed in 1960. The other similar project was at the City of Agra in northwestern Kansas.

C. Schwindamann  
Wastewater Tech

## Waterville's first of three phases

Waterville's project began by draining the cells and then reshaping the dike walls. There was adequate detention time in the two cells so that the city did not exceed their discharge permit limits.



Normally, the wastewater system only discharges about once a year. Riprap was added 10 feet wide on the berms for erosion prevention control. The total cost for the two cells, with total of 2.84 acres, was \$11,152. The project required 980 tons of rock at \$7,350. The rock was close by and only required 75 loads, a total of 3 miles at \$2.50 per mile or \$562.50. Placement and reshaping costs were \$2,940. The city is seeding and replacing some of the fence at a cost of approximately \$300. It took almost 2 weeks to complete the project.

Waterville's project is part of a 3-year project; the restoration of the dike berms was the first of the 3 phases. The next 2 phases will be to repair 2 other cells at an estimated cost of \$8,549 for a 3.38-acre cell and \$9,208 for a 4.32-acre cell. The city plans to repair one cell in each of the next two years.

## Agra repairs one cell per year

Another small Kansas town that has moved forward with lagoon maintenance is the City



Mick Swearingen, Superintendent at Waterville, and Jeff Lamfers, of KDHE's NE District office, Lawrence, review improvements for Waterville's lagoon system.

In 2001, Agra removed sludge and then cleared and reshaped one of the cell's dike

## The prices for projects will vary due to the size of the system and distance and availability of material.

of Agra in northwest Kansas. Agra has a 3-cell wastewater stabilization pond system; they planned for repair of one cell per year. I think Agra should be commended for their approach to the project. By splitting the project into phases, they created an excellent way to budget for repairs.

walls. They added riprap and a sludge test at a cost of \$28,235.71 to be exact. That price however included most of the riprap for all three cells. In 2002 the price of \$10,196.50 included sludge removal and clearing and shaping of the dike walls of the second cell. The final last cell was worked on in

2003. The cost of this was \$15,948 that also included additional cost for the final soil and sludge sampling and extra rock for riprap. The 3 cells are approximately 6 acres each. The total cost for the entire project was \$54,380.21.

**Prices vary by project**

The prices of these projects will vary due to the size of the system and distance and availability of material. This will give a general idea of these types of projects and cost. I hope this helps other systems that are planning for the future. Again both communities did what needed to be done and took logical approaches to accomplishing the tasks. I appreciate the information provided by Mick Swearingen, Supervisor for the City of Waterville and Lyndi Bell, City Clerk for the City of Agra.

**Get advice on lagoon rehab**

These types of repairs should be considered only upon the advice and direction of the Kansas Dept. of Health and Environment (KDHE) and their district offices. KDHE may require your system to take more effluent samples of any discharge to a receiving stream. That could be as many as one per week as the criteria varies from system to system. A few of these could include, but not be limited to, the environmental sensitivity of the receiving stream, the amount of effluent and the total detention time that your community would have if you were to have a cell out of operation to make the repairs.

**Time to update standards?**

KDHE's minimum standards for design for water pollution control facilities states in part as follows: Erosion protection via the use of concrete or asphaltic aprons, baffles, stone rip-rap or artificial membranes shall be

utilized on pond cells of 3.0 acres or larger such that the windward embankment slopes affected by prevailing wind(s) will be protected. The regs read as follows: "...3.0 acres or larger... WILL be protected" (from erosion). It does not say that smaller systems don't need to have similar treatment. In fact I see smaller cells with worse erosion problems than larger cells. This is because the larger systems have erosion control. Some smaller systems do have protection but certainly not all.

I would support KDHE revising these standards to

include all waste stabilization ponds being required to have erosion protection. I believe it should also include all sides of the interior dike walls, not just on the windward slopes. Most



*These photos at Waterville show a rebuilt dike and complete riprap in place to control erosion.*

**SolarBee Solutions  
for Water Problems**

**in Wastewater**

- Reduce Aerator Run-time and Energy Costs
- Reduce Odor Events
- Improve Effluent Water Quality

**in Fresh Water**

- Reduce Algae Blooms
- Reduce Taste and Odor in Drinking Water
- Reduce Fish Kills and Other Eutrophication Problems



**Solar Powered Circulators**



**"Cleaner Water at Less Cost"**

Manufactured by Pump Systems, Inc.  
PO Box 1940, Dickinson, ND 58602  
800-437-8076 • Fax 701-225-0320  
www.solarbee.com



*Dean Hermes, Operator at City of Olpe, shows dike erosion on one of the city's lagoons. The most severe erosion is generally on the windward slopes of the dikes. Most systems are unaware of the extent of erosion until the lagoon level is lowered.*

systems that do add erosion control have it placed on all sides. Were KDHE's standards to require this, it would be clear to everyone. Even though these are MINIMUM STANDARDS of

design, I believe some of these are candidates for revision as they were adopted in 1978, 25 years ago!

The size of riprap used is also important. If it's too small,

it will wash into the cells. If it's too large, erosion can occur behind the riprap. I have seen cities use pieces of sidewalk or other large types concrete for an attempt at erosion control. Generally, such efforts were not successful.

### City wins with riprap

One system used crushed concrete from a road construction project that was a win-win situation for the city as well as the road construction company. The city got the proper size riprap and the construction company had a place to go with the waste concrete. The construction company just had to crush it to right size for the city's needs. KDHE's regulations state, in part, that stone riprap should not be smaller than two inches in diameter or larger than five inches in diameter. The regs also say that placement of riprap or other erosion protection devices should be such that quiescent areas, conducive to mosquito breeding, are not formed.

DESIGNED TO HANDLE THE PRESSURE.  
SO YOU DON'T HAVE TO.

AFC is one of the world's largest manufacturers of fire hydrants, gate valves, check valves, and tapping sleeves. So, no matter what your project's parameters are, we have the products, knowledge and experience to handle it. Call 800.326.8051 or go to [www.acipco.com/afc](http://www.acipco.com/afc).

**AMERICAN FLOW CONTROL**  
IT'S WHAT WE KNOW.®



The old concrete may have been cheap but it's too large to prevent dike erosion.

I encourage you to attend the KRWA conference to learn much more about lagoons and lagoon maintenance. These are "Waste Stabilization Ponds: Nature's Way Accelerated" beginning at 10 a.m. in Hyatt Ballroom E on Tuesday, March 23. Another session is entitled "Extending Lagoon Performance Through Nutrient Reduction" on Wednesday, March 24 at 2:45 p.m. in Room

209A. And for plant operators, watch for the session on March 24 at 4 p.m. by Randy Johnson entitled "Advances In Oxidation Ditch Technology."

These and many other sessions help make the KRWA conference a "must-attend" event. You'll also find 268 exhibitors, more than at any national water/wastewater conference, including many companies targeting the wastewater industry.

**PARKER AG SERVICES, LLC**



**Biosolids Management Services**  
Lagoon & Digester Cleaning  
Transportation & Land Application

53036 Hwy 71  
Limon, CO 80828  
email: kipp@parkerag.com  
(Toll Free) 888-BIO-SOLIDS

**PUMP & POWER EQUIPMENT**

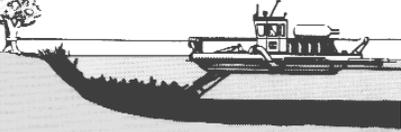
**Fairbanks Morse Pumps  
Dakota Pump Stations  
Pump Repair**

KANSAS CITY - WICHITA - OMAHA  
**1-800-544-9010**



5800 S. Hwy 57 • Junction City, KS 66441  
**CRAIG DIBBEN**

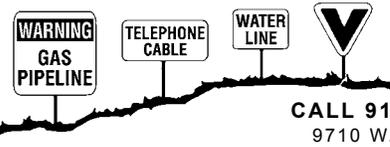
- Dredging
- Land application programs wet/dry
- Biosolids analysis
- Biosolids transportation
- Digester cleaning
- High Pressure Water Blasting



TOLL FREE 800-798-4205

**Rural Water Specialty Co.**

Signs and Markers  
for the Utility & Pipeline Industry



**CALL 918-446-1916**  
9710 W. 65th St. So.  
Sapulpa, OK 74066-8852  
Fax: 918-446-2770

WHOSALERS OF PIPE • VALVES • FITTINGS  
WATERWORKS • SANITARY SEWER • STORM SEWER



15347S. 169 Hwy • Olathe, KS 66062  
**(913) 829-3300**

**WAYNE RUNNELS**  
Sales  
E-mail: olathewwa@earthlink.net

Fax: (913) 829-3993  
Res: (913) 856-6540  
Mobile: (913) 837-0562  
1-800-829-7180

**Call Associates  
First!**

**KRWA Associate Members are supporting  
your Association.**

When shopping for products and services, call Associates first! Give KRWA a call if you don't see their ad in this issue.