



## Nature's Bounty

Aug 1, 2006 12:00 PM, By Adam Madison



**More than 10,000 years ago a melting glacier brought quality sand and gravel to the edge Madison, Wis. Miners started tapping this deposit as early as the 1920s. It evolved slowly as temporary operations moved in and out looking for fast material. But the deposit wasn't truly embraced until Capitol Sand & Gravel moved in permanently.**

**Now the family-owned company is embracing it further with a multi-million-dollar upgrade that includes a clamshell dredge, primary crusher, and screening and wash plant. This overhaul led to discovery of unknown reserves and improved efficiency.**

But Capitol Sand & Gravel didn't always have the wallet to absorb such a cost; it had to start from the ground up. In 1924, a 16-year-old J. A. "Brother" Gallagher bought a couple trucks. Gallagher hauled material for construction projects and batch plants. Two years later he sold the trucks to start a portable-crushing business to meet demand for material in Madison. He opened several pits along the city boundaries, taking fast material for various construction projects.

In 1947, he opened his first permanent location on the city's east side. By 1956 it was mined out, and Gallagher returned to one of his temporary sites in Cross Plains, which is now home

to Capitol Sand & Gravel. He also brought his sons Mike and Rod into the company's fold. Mike now serves as president and Rod as vice president and treasurer. The Cross Plains site was a dry operation, relying on loaders and a small dragline. As business picked up the portable crusher was upgraded to a stationary crusher, but the dragline was expensive to operate and suffered significant wear.



In 1970, that dragline was replaced with a luffing-type dredge. But this too had its flaws, which became apparent the day that it sunk. Mike says the crusher float was about 18 inches lower than the outside floats, which were all interconnected. Each had hatch covers for inspecting the lines running to them. And during an inspection, a hatch cover was left off. So each time the bucket was lifted, the dredge dropped and allowed the crusher float to fill with water. Eventually it capsized and sunk. It took more than a month to put it back into operation. Mike says it was later sold to a Canadian operation that sunk it two more times.

In 1987 they decided that this dredge, with a 3.5-cubic-yard clamshell, was too small and returned to dry operation. At that time the company contracted its crushing. Contract crushing, however, quickly grew cumbersome. "It became a question of when they could come in and do it, not a question of when we needed material," Mike says.

In the fall of 1991, they purchased a 2400 Lima dragline; another 2400 was added in 1994. Then the company regained its independence by buying portable crushing equipment in 1997 and eliminated the contractors. At that time, Capitol was using draglines to dig out the perimeter of the lake and pile material on shore for haul trucks to carry it to the wash plant. But that arrangement also was cumbersome. So Capitol installed a mile of conveyors, which knocked transportation costs down from 27 cents per ton to 5 cents per ton.

J.A. died in 1968. "I think he would be very surprised at the equipment and some of the other things in here," Mike says. And even greater change was still on the horizon.

They used the draglines until 2004. But Madison's population grew and that set off a construction boom and increased demand for Capitol. The dragline configuration could not keep up, Rod says. They had to upgrade.



**This dragline was recently replaced with a Rohr clamshell dredge.**

To replace the dragline, they added a Rohr 10.5-cubic-yard clamshell dredge equipped with an 8- × 20-foot Metso Minerals screen and 2248 Lippmann-Milwaukee jaw crusher. This arrangement cost the company \$2.2 million and produces an average of 3,000 tons per hour for 11.5 hours per day. But the 50-year-old plant just wasn't a good fit for it.

“We were at the limits of what the structure could hold,” Mike says. “In order to get any really significant increase in capacity, we just had to change completely rather than do a lot of modification to it.” First they introduced the JCI 1400LS cone crusher and followed up with the washplant. In hindsight, however, Mike says this was backwards. He would have rather started with the washplant because they now have more wash capacity than the crusher can accommodate. Despite this, the plant is running smoother than ever. Mike says there is a more balanced, constant stream of material. It is cleaner and simpler.

Today, Rod and Mike dredge an average of 450,000 tons per year from a 75-acre lake. Mike says past drilling indicated material as deep as 115 feet. Based on that, they estimated 15 to 20 years of reserves when they were digging at 55 feet.

The dredge is powered by a 12,000-volt feeder line attached to a 480-volt transformer. It yields more material per hour and digs deeper than their draglines. But this dredge, which reaches 200 feet deep, provided more than golfing time for Mike and Rod, it discovered twice the material that they anticipated.

“To our pleasant surprise, when we started digging with that dredge, we went down through the 115-foot level with absolutely no problem,” Mike says. “When we shut down last fall, the operators were digging at 167 feet.” Reserves have been re-estimated to last 25 to 30 years; leaving a safe angle of repose. But, they actually have no idea how deep the material may be.

The added life to the site is important to the Gallagher family. They then began upgrading the entire plant to secure the operation for their sons now working under them. Mike is father to Jim and John Gallagher, and Rod is father to Geoff Gallagher. All play an intricate part in the operation.



**At the wash plant material is screened at minus #4 mesh on an 8- x 20-foot screen. It flows down and into the 44- x 32-foot Kolberg-Pioneer sand screw.**

The Gallaghers also have been blessed with high-quality, hassle-free material. Rod says it consists of 12-inch stone to sand that is well graded. It is scooped out by the bucket, which is hoisted by cable up to a gantry and propelled over the hopper. It is then dumped onto a grizzly. Anything over 5 inches is raked off into the jaw crusher; less than 5 inches goes through the dewatering screen. Any boulders recovered are raked off to a 20- x 40-foot barge and pushed to shore by an ex-Navy 14- x 50-foot work boat. The crusher can handle stones up to 20 inches.

All material is carried to shore via 800 feet of floating conveyor. It is supported by a series of 40- x 10- x 5-foot Poseidon barges. Material is then distributed by a 60-foot transfer conveyor to a 42-inch x 125-foot radial stacker. The stacker creates a surge pile, which dries for 24 hours. It is then loaded into a feeder with a Komatsu WA500-3L wheel loader. The material then proceeds by conveyor toward the secondary crusher, a JCI 1400LS cone crusher.

Material is screened by 6- x 20-foot JCI screen. The top is screened at 1 $\frac{3}{4}$  inches and the bottom is  $\frac{7}{8}$  inches. After the material is crushed and sized, it is screened and washed on a three-deck 8- x 20-foot JCI screen. The top is  $\frac{7}{8}$ , inches the middle is  $\frac{5}{16}$  inches and the bottom is #4 mesh. The undersize goes to a twin 44- x 32-foot Kolberg-Pioneer sand screw. Silt and clay are carried to a waste pond that drains back into the lake as material settles. The wash pump is a 60-horsepower 6-inch submersible Grindex pump. The waste pump is a 6- x 8-inch Galigher.

Finished products are stacked by radial conveyors. A 42-inch x 125-foot Pond River stacks sand. A Superior Industries telestacker stacks #1 stone ( $\frac{3}{4}$  inch). Two 30-inch x 100-foot Pond River stackers pile up #2 stone (1 $\frac{3}{4}$  inch) and  $\frac{5}{16}$ -inch pea gravel. All of the material meets Wisconsin Department of Transportation specifications.

Trucks enter the yard in a one-way traffic pattern and wait by the piles to be loaded by another Komatsu WA500-3L. As they exit, loads are weighed on a concrete-deck, 10- x 60-foot Rice Lake Weighing System with a 100-ton capacity. Tickets are handwritten, and the driver comes to the window for a copy.



**Jim (left) and his father Mike Gallagher, Rod and his son Geoff Gallagher believe there may be as much as 30 years of reserves left at their site.**

For the next generation of Gallaghers, Jim, John and Geoff, the site's value will not expire with the deposit in 30 years. Once all equipment is dismantled and moved away, a 75-acre lake of the clearest blue water will remain. This, of course, will be prime for real estate development. Mike says they plan on excavating and landscaping the land with trees before their sons or grandsons sell it off bit by bit.

But in the meantime, Rod and Mike are focused on preserving their operation for as long as the deposit allows. With the permitting requirements, this could be the last site for the area, so it's important to use every bit wisely. "This stuff is running out and the government agencies don't understand that," Rod says. "So they make it extremely hard to open new locations."

**To learn more about this operation's clamshell dredge [Click Here.](#)**

## **Equipment List**

### **Marine:**

10.5-cubic-yard Rohr clamshell dredge with 8- × 20-foot Metso screen and 2248 Lippmann-Milwaukee jaw crusher

42-inch × 800-foot Midwest Equipment conveyors on 800 feet of Poseidon Barges (40 × 10 × 5 foot)

42-inch × 125-foot Pond River radial stacker

23-foot Monark work boat

50-foot ex-Navy work boat

### **Land:**

Syntron feeder

1400LS JCI cone crusher

8- × 20-foot JCI wash screen

6-foot × 20-foot JCI screen

(2) 36-inch × 60-foot shop-made conveyor

44-inch × 32-inch Kolberg-Pioneer twin sand screw

42-inch × 125-foot Pond River radial stacker

36-inch × 150-foot Superior Industries Telestacker

(2) 30-inch × 100-foot Pond River stacker

(3) Komatsu WA500 wheel loaders

36-inch × 65-foot shop-made conveyor

Komatsu WA450 wheel loader

24-inch × 40-foot shop-made return conveyor

36-inch × 93-foot shop-made conveyor

6-inch submersible Grindex pump (wash)

6- × 8-inch Galigher pump (waste)