

Modernizing mine planning and inventory management

By [Joe McCarthy](#) | October 17, 2018



The Southeast Missouri Quarry in Cape Girardeau, Missouri, is 400 ft. deep and features 10 different benches that produce a variety of materials. Photo courtesy of Delta Companies

Excellence in efficiency, accuracy and safety are three goals aggregate producers strive to achieve every day.

These areas are all of high-priority at [Delta Companies](#), a construction materials producer that operates sites in Missouri, Illinois and Arkansas. The use of a drone now helps the company achieve all three goals in the area of inventory management.

Delta Companies operates five stone quarries and a sand and gravel pit, and the company teamed with the [Colas Group](#), its parent company, to explore inventory management solutions with [Kespry](#). Several years ago, the companies discussed how drones could enhance operations at their six sites, and Delta Companies has been operating a Kespry drone to enhance inventory management efficiency, accuracy and safety since 2015.

The start of a successful relationship

Don Rosenbarger, business development manager at Delta Companies, attended a meeting with other company managers and Kespry back in 2013.

“By the end of the two-hour presentation and demonstration, we were sold,” Rosenbarger says. “It was going to be the right thing for us to do.”

Previously, Delta Companies used an “old-fashioned” method to manage inventory. According to Rosenbarger, a survey company used a rod and level to measure stockpiles before a GPS system was integrated to calculate inventory. Rosenbarger estimates this method cost about \$25,000, so the company only employed the vendor’s services once a year.

To Rosenbarger, this method just didn’t cut it – both for operational and accounting purposes.

“We would do it just once a year, and that was really all we could muster up the appetite for,” Rosenbarger says. “Each of our quarries may have up to 20 piles. Some are quite large piles, so it takes a lot of time to do that.”

According to Rosenbarger, the Colas Group encouraged Delta Companies to have an accurate and closed accounting book every month. To be more accurate in its accounting, Delta Companies needed to know how much material was in stockpiles once a month, not just once a year.

“We wanted it monthly and, obviously, with the price tag I mentioned, we sure don’t want to do that times 12,” Rosenbarger says.

The Kespry platform could, however, fulfill the monthly inventory management need while keeping Delta Companies on budget.

The drone, the books & the stockpiles

Initially, Delta Companies didn’t fully utilize the drone for the accounting part of its business. The company was quick to use it on the operational side, though.

Convincing the accounting team that the drone was accurate and beneficial to the books was a hurdle, Rosenbarger says, but the drone quickly proved its worth.

“For a period of time, we would run the drone and we would also do the hand measurement until we got very comfortable with the accuracy,” he says. “We also had to convince our auditing firm that this was the right thing to do, and they came on board pretty quickly.”



Drew Hoover, project engineer at Delta Companies, uses the Kespry drone for inventory management and mine planning purposes. Photo courtesy of Delta Companies

A major sticking point for the drone was the “bang for the buck” component Delta Companies saw related to inventory management.

“I wouldn’t say the cost has necessarily gone down, at least not in terms of the whole year,” says Drew Hoover, project engineer at Delta Companies. “But for the same cost, per say, you can now get your inventories every single month for essentially the same cost.”

Hoover was a college student when Delta Companies began using drones. Now, he plays a critical role at the company as his duties include operating the drone.

“This is just a part of Drew’s activities,” Rosenbarger says. “It is not the only thing he does, but it is one of the things he does. If there is an issue, he can go out and run the drone this afternoon.”

Delta Companies’ drone can be ready to fly at a moment’s notice to measure stockpiles or assist with mine planning. If the company were still using its old method, Rosenbarger argues that Delta Companies would face scheduling and budgetary issues. Fortunately, the drone provides both convenience and savings.

“Since Drew is an employee, when the need arises, he’s there,” Rosenbarger says. “He can go and take care of the problem just then. I think it is probably a matter of the [cost of the] drone itself and not so much the labor.”

Hoover appreciates how regular use of the drone can enhance the accuracy and efficiency of mining operations. According to him, when the old method of measuring stockpiles was conducted annually in October or November, the quarry manager would go nine or 10 months without having a good pulse on the material sitting in stockpiles. With a lapse like that, a quarry is open to not realizing mistakes and missing an opportunity for corrections.

“We use both belt scales and trucks to move stockpiles, but that is not 100 percent accurate,” Hoover says. “The drone allows us to find what is there versus what we reported every single month. It is not going to get rid of inaccuracies, as far as understanding what the plant has produced, but it allows me to make adjustments monthly.”

A pleasant surprise



A longer battery life and the ability to handle tougher weather conditions are benefits of the latest drone model Delta Companies operates.

In addition to inventory management, Delta Companies' drone plays a key role in mine planning. This was an unexpected yet welcomed benefit.

"Now Drew can fly the drone, look at our mining area and look at the benches we have opened up," Rosenbarger says. "He can use that to compute volumes or identify overburden material to be removed."

The company's Southeast Missouri Quarry located in Cape Girardeau, Missouri, has 10 different ledges that each produce a different product quality material. Some benches provide material that can be used in asphalt production, while others are useful for concrete pavement production or construction aggregate.

"Because the quarry is 400 ft. deep, it is not something you just go out tomorrow and [say], 'Well, I think I am going to start here today,'" Rosenbarger says. "You have to plan months and sometimes even years to make sure we will have the proper ledges opened up. The drone allows us to do that so much quicker.

"If we have a question or an issue, Drew can do the magic with the drone and tell us where we should be and what we need to be doing," he adds.

Prior to drone technology, an aerial photography company flew over a Delta Companies mine site to provide an aerial view. This was done maybe once or twice a year, and issues with schedules, weather and the budget could hinder the effectiveness of the process. With the drone, Hoover can get a view of the site whenever he needs one.

"It helps us see what we have done, what we can do or how much longer we have to go," Hoover says. "I can run a flight once, twice, three or four times a month over a pit to see what's happening."

Working with the drone

Working with the drone is pretty easy, Hoover says, but he still needed some training to get acclimated. Hoover first trained with Kespry, which covered safety and how to operate the drone. In addition, Hoover completed Part 107 training from the Federal Aviation Administration (FAA), which grants licenses to commercially fly a drone.

"I went to some night classes and studied for the FAA test," Hoover says. "I passed that and now I am a licensed commercial drone pilot."

Working with the drone has given Hoover a chance to see how drone equipment has evolved. An older drone model – the Kespry 1 – Delta Companies utilized had a battery that did not last as long as the current model – the Kespry 2 – deployed. Also, the older model did not handle windy conditions very well.

"The new one handles much higher wind and the battery lasts much longer," he says. "Every once in a while a sensor can be off or it has a hard time getting a GPS signal, but for the most part there are not many issues."

Bird's eye view on safety

Delta Companies embarked on a new safety initiative in 2015 and the relationship has proven to be a reliable resource in that journey.

"We have certainly become very aware of the safety aspect [the drone] provides," says Don Rosenbarger, business development manager at Delta Companies.

Consider the scenario where an employee or a third party walks around a stockpile – or even climbs the pile – to get a reading. With the danger of having someone tumble down the pile or get in the way of equipment moving around the site, manually inspecting these stockpiles presents safety concerns.

With the use of a drone, these safety concerns can be limited. As Rosenbarger points out, Drew Hoover, project engineer at Delta Companies who flies the company's drone, can work from a safe distance while getting more accurate readings on stockpiles.

This article is tagged with [Colas Group](#), [Delta Companies](#), [Don Rosenbarger](#), [Drew Hoover](#), [drones](#), [FAA](#), [inventory management](#), [Kespry](#), [mine planning](#), [Part 107](#), [SEMO Quarry](#), [Southeast Missouri Quarry](#) and posted in [featured](#), [Features](#)