5 THINGS TO KNOW
About How Drones are Being Used for Mining & Aggregates in North America
Drones have augmented the abilities of professionals in various industries, but nowhere have those impacts been seen or felt like they have for mining and aggregate supplier companies. Using a drone means that someone now doesn’t have to literally climb a stockpile to get a measurement of it. It means those same people no longer have to expose themselves to unstable terrain and share the operating area with heavy machinery. Keeping operators out of potentially dangerous situations means critical information can be gathered much faster, but these benefits go beyond the impact on safety considerations.

Traditional measurement practices are often performed on a quarterly or even annual basis, but drones allow users to easily take measurements monthly, weekly or even daily. Companies can use UAVs to perform visual inspections and answer questions on volumetrics and topography in order to help keep tabs on stockpiles. These efforts allow operators to produce a scaled dataset that can be trusted when making calculations.

Changes to regulation have eliminated one of the biggest challenges that many organizational stakeholders in North America cited as the reason they hadn’t pursued adoption to enable all of these benefits. New regulations have allowed large and small mining and aggregate supplier companies to integrate the technology into established processes. Doing so has proven to create differences that can be measured while also providing safety benefits that are incalculable.

**Drones are Improving Inventory Processes**

Founded in 1923, Luck Stone is a construction aggregate supplier that prides itself on being a customer-focused business. Simply put, they’re always looking at how to innovate and better serve their customers. With this in mind, the company created their own drone program to gather volumetric data, produce 3D site models, capture ortho-photographs, perform inspections, and examine parts of the plant that they couldn’t easily reach. Doing so has proven to create tremendous value, but drones have also drastically changed the company’s inventory process.

“Just like the grocery store has to inventory their cereal boxes, we have to inventory our stone product piles on our yards,” said John Blackmore, a surveying & mapping supervisor for Luck Stone. “We have to do that annually for tax purposes and accounting purposes, but it’s also important information for us to have operationally. How much product do we have? How many sales can we commit to?”

By using drones, Luck Stone can now perform inventory-checking four times a year, whereas before this was a task that was performed twice a year by someone with a GPS stick who walked all over the area where dirt had been moved. It might not seem much, but the efficiencies of doing so can be seen in the numbers Luck Stone is using internally and externally. This new process allows them to be that much more specific, extracting more complete value from a
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particular task or project in a way they were unable to previously. Thanks to this usage of the technology, Luck Stone no longer has to rely on contractor’s dirt counts. They now have a much more efficient process that provides them with a more accurate picture of what has or has not happened on a site.

Luck Stone no longer does significant stripping projects without flying drones. The tools have been integrated into their workflow so that they fly before, during and after a project because of the efficiency that doing so has created for the company.

The Technology is Being Used to Reduce Opportunity Costs

One issue various companies in the Mining & Aggregates industry might suffer from is over-purchasing materials without knowing exactly how much is there, which can lead to inventory and fulfillment problems. Irving Materials, Inc. (imi), a building materials supplier operating throughout the Midwest and the southern U.S., knows at first-hand what the implications are since the company fell into the mentality of keeping as much material on hand as possible. It got to the point where the back of certain stockpiles on imi sites wouldn’t get touched for years, and they literally had trees growing out of them.

“We stuffed our bins as full as we could every day,” said Tyler Stanley, Production Manager at imi. “We’d have haulers bring in rock and stone and they stayed full. That was the game, because we didn’t know how much we’d need and when. But then we started to realize that our stockpiles were getting out of control.”

Now, by using commercially available drones with the Stockpile Reports full-service subscription, imi created a real-time inventory solution that helped them keep track of the number of materials scattered around the site. No longer does the company order more than what they need or risk reaching the end of a material’s stock. This new process has greatly reduced the opportunity cost that was associated with their old approach.
“I can’t overstate how valuable it is to give our team the data they need to know what materials they have on the ground,” Stanley said. “We have a schedule built out based on how much material we think we’re going to order, and now we can be exact when it comes to how much tonnage we have and how much we need of a certain material. Now that we know how many tons are on the ground, we know what we need to order to replenish that on the ground. We have a real-time inventory number to make those decisions, and that’s lightened the load for the entire team.”

**Better Invoicing and Less Downtime Have Become a Reality**

An experienced team of mining industry professionals, Turner Mining Group found a way to reduce costly and time-consuming disputes with clients over how much material was moved on a given site or project, by using drones to collect data. By doing so, they also reduced downtime in a critical way.

The company works from coast to coast and supplies some of the largest cement, aggregate, and specialty minerals companies. A common problem for contractors like Turner Mining Group is associated with tracking the volumes of material moved, as clients are invoiced based on these volumes. Traditionally, the company would hire a surveying company to go on site with GPS rovers to collect the data, but Turner says those methods would involve “shutting down operating areas so that the surveyors can climb on the pile, which is dangerous, and includes a couple weeks of turnaround time to get the results back.”

Frustrated by the inefficiencies created by these old methods and the costs of the disputes with clients, the company decided to use drones as a viable solution for inventory measurements and mapping, as soon as the technology became available and reliable. The team felt it was the right decision, as the new system is efficient and safe. Turner chose Firmatek’s Drone Solutions because Firmatek processes the data. Turner Mining Group employees fly the drone on site the days they need to use it, and the data collected is delivered to Firmatek for processing. In the end, as the numbers presented to clients are coming from an independent third party, they trust the results, so disputes are less likely to happen.

Turner does not currently invoice using the numbers collected, but the company sees it as the next step, as they believe a drone flying frequently would allow them to keep the data updated, ready for invoicing. Their use of drone technology has already proven to be a huge win as there is no production time lost.
It’s Impossible to Overstage the Safety Element

For a surveyor, walking around a mining site to climb, survey and measure stockpiles can be a dangerous task, not to mention how physically tiring it can get. It’s a risky environment, as there’s a lot of machinery running around while the chance of sliding off a stockpile or falling off a high wall is not insignificant. As Whitaker Contracting Corporation’s UAS Pilot John Davenport says, “you don’t just get hurt in this environment, you get dead”.

Fortunately, drones are significantly safer than traditional surveying methods, as they take away most, if not all, of these dangers. A surveyor can safely stand out of the way and fly the drone over the job site, never getting near an active area.

“People have no idea how dangerous this world is, and not too long ago all of that had me seriously considering how much longer I could work in it,” Davenport said. “Honestly, before we got the drone I had thought about finding something else to do. I had to physically walk the sites. I had to travel across them. And if there were 500 pieces of equipment that day, I’d have to work my way through them the best I could. Physically, it was getting to a point where I just didn’t know if I could keep going.”

Drones have proven that they can protect human workers and keep them from numerous hazardous situations, creating incalculable benefits when it comes to avoiding costly or deadly accidents that otherwise might occur.

Drones Mean Less Time, More Precision

Drones have not only increased safety in mining and aggregates, but they have also drastically reduced the time needed to survey sites, while providing more efficient and reliable data than using traditional methods. That means less time surveying and less time waiting for results. It means more time to dedicate to other aspects of the business.

Surveying sites through traditional methods means not only shutting down operating areas but also having to wait to get the results back. Those results are also less accurate than those provided...
by drones, simply because a surveyor will only take a few hundred points while drones can collect a couple hundred thousand points in much less time.

One good example of how drones work to reduce time while providing more reliable data comes from Turner Mining Group, a company that introduced drones in their workflow. The company would hire a surveyor to collect data, a time consuming and dangerous operation that included a couple of weeks of turnaround time to get the results back. The drone solution changed everything, as it takes a Turner employee about 45 minutes from start to finish to capture the data on the site. The data is then processed by Firmatek and returned to Turner, creating a solution that is much more cost effective than using a traditional surveyor.

Less time often means less precision, but that is not the case with drone technology. John Davenport’s experience is a good example. A UAS Pilot at Whitaker Contracting Corporation, he moved from a “it was too much sugar for a nickel” position to that of a true believer in the advantages of using drones. The company saw a 22% reduction in cost while being able to inspect stockpiles twice as frequently in far less overall time.

Davenport’s ability to quantify the difference the technology made proved to compel adoption for the company. He measured 4,449 cubic yards after a 35 minutes survey. The drone took two minutes and came up with a quantity of 4,469 cubic yards.

These are the kinds of specific differences drones are making for mining and aggregate supplier companies today, all of which are set to get more powerful and more pronounced as the technology becomes easier to adopt.