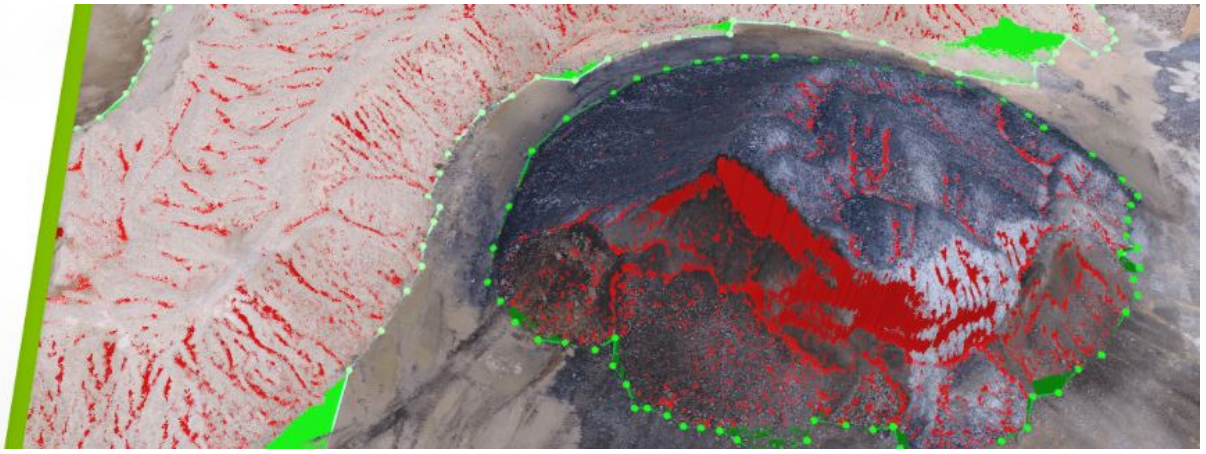


The PIX4D logo features the brand name in a bold, sans-serif font with a stylized green and yellow line graphic above the 'D'.The PIX4D MAPPER logo consists of the brand name in a smaller font above the word 'MAPPER' in a larger, bold font, all contained within a green square.

case study

“We use Pix4Dmapper software for the photogrammetric processing and point cloud generation. It is an ideal solution with robust features and functions that enable our team consistently create high-quality, accurate outputs, something our clients have come to expect.”

Jeff Lawrence, UAV Business Development, GEO Jobe UAV

Note: This case study was originally featured by Pix4D as a featured Pix4DMapper user case, April, 2018.

Improve mineral production forecasts up to 3.2%

Using drones, drone imagery, and image data to support mining, quarry, or mineral production operations (such as volume calculations and grading compliance measurements) is increasingly touted as the safer, faster and more accurate data gathering approach. Mineral production operations managers can then use such data to digitally map existing conditions and measure stockpile volumes for inventory management, production forecasts, and auditing. GEO Jobe UAV was featured by industry leader, Pix4D, for work in this area and shared results where UAV data collection has resulted in improved mineral production forecasts by up to 3.2%.

The Challenge

A few years ago, the client's survey team shifted to laser scanning technology to speed up the data capture process. With the scanner, a reality capture specialist would capture a dense 3D point cloud comprising millions of observations, and with post-processing software, calculate the cut, fill, and total pile volume. This method was certainly less hazardous than manual on-site measurements, took considerably less time, and was less disruptive than traditional approaches. However, because the scanner is on the ground and must interpolate the pile's top surface from the pile side faces, measurements of tall piles produce misleading results because of potential cratering. GEO Jobe was charged with providing a transition to drone-based surveying in order to obtain more accurate measurements.

GEO Jobe

GEO Jobe, a Nashville, Tenn.-based geospatial data provider, helped an engineering and survey company charged with supporting the mineral production processes at a mining site in the U.S transition to drone-based surveying.

The Solution

In 2017, as part of a side-by-side comparison with laser scanning methods noted above, GEO Jobe was contracted to fly the stockpiles with a UAV equipped with a 20-megapixel camera. Flight time for the UAV was about 20 minutes. In terms of accuracy, the client needed a ground sampling distance of .5-.75 inches horizontally and 1-1.5 inches vertically. The final product would be a table of volume calculations and a measurable 3D model. For photogrammetric post-processing and point cloud generation, the GEO Jobe team relied on Pix4Dmapper. The team's data gathering and processing practices would prove valuable in the side-by-side comparison.

Volumes Comparison			
Product	Cut Volume (ft ³)	Fill Volume (ft ³)	Total volume (ft ³)
White Pile UAV	96.9	68187.36	68090.46
White Pile C10	38.46	70344.06	70305.6
Black Pile UAV	2.1	43437.47	43435.37
Black Pile C10	0	44099.88	44099.88

Product	UAV vs. C10 (ft ³) Δ	UAV vs. C10 (%) Δ	UAV vs. C10 (ft ³ per ft ²) Δ
White Pile	-2215.14	3.20%	-0.161
Black Pile	-664.51	1.51%	-0.117

The Results

As part of the side-by-side comparison, the engineering firm's reality capture specialist calculated volumes using the laser scanner technique while GEO Jobe flew the aerial mission for two large material piles of rock. The GEO Jobe team delivered highly accurate surface reproduction that could be used to calculate volumes, stockpile valuations and support tax liability requirements.

As predicted, the photogrammetry calculations from Pix4Dmapper indicated smaller volumes for both piles due to the "cratered" top surfaces that the laser scans overestimated. In addition, the drone capture mission took less time than the ground scanner technique and captures a more realistic overall surface.

Today, GEO Jobe is contracted to regularly gather stockpile volume calculations and grading data on the site used for the comparative study and three other sites in other states.



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Case Study from Pix4D

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