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Shap Beck's InsightHQ REVOLUTION

Hanson's Shap Beck quarry near Penrith, in the county of Cumbria, North West England is reaping the benefits of increased use of Trimble Loadrite's state-of-the-art InsightHQ quarry management portal for web browsers and mobile devices. *ABE* editor **Guy Woodford** visited the quarry to learn more about how InsightHQ's sensor, cable and software-based measuring of extraction, processing and load-out is enabling the quarry to maximise its efficiency and performance.



Having claimed to save £152 (€169) a day and £38,000 (€42,170) a year since 2012 by using Trimble Loadrite's InsightHQ to optimise onsite excavator to hauler material loading, Shap Beck manager, Robin Gillespie, was very open to increasing InsightHQ's use at his 1 million tonnes/year limestone quarry.

"It showed our excavator was under-loading the haulers before by 10–15%, something that was not obvious to the human eye," explains Gillespie. "It led to us adding some side extensions onto our dump trucks, allowing us to maximise the carrying potential of each truck."

Gillespie says he and his Shap Beck colleagues were first introduced to InsightHQ in 2011 by visiting members of Hanson's parent company HeidelbergCement's Competence Centre Management (CCM) team, who asked Gillespie if he'd like to trial it.

"Now we also use it to measure daily production output through average tonnes an hour readings at ten minute intervals. These readings are taken from material on our three most important conveyor belts situated around the quarry. With InsightHQ, I can see how much material is being put into the primary crusher, how much saleable product I've got left after the scalping and waste removal process, and I can also learn how much of this saleable product is kiln feed limestone, that we can supply to Tata Steel, our biggest single customer, who operate the Shap Fell processing plant nearby. Around 650,000tonnes of our annual production is kiln feed limestone for Tata Steel, with one of our three key conveyor belts dedicated to handling the product."

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ROBIN GILLESPIE

The detailed material-processing performance reports emailed to Gillespie and management colleagues at the start of each day enable them to take swift action to tackle any problems and to obtain vital current product inventory data. InsightHQ can also offer "Snapshot" reporting on performance. Updated every minute, this covers individual product processing data, product processing by customer, individual excavator efficiency, individual conveyor throughput, email or text alerts to deviations in average individual conveyor material throughput, and details of material processing costs for that day and previous days. You can also view changes over time by adjusting reports to take in specific shift, day, week, month or year.

Gillespie says that since May 2016, and following regular discussions with Julian Athawes, director of Halomec, Trimble Loadrite's UK distributor, he and his management team have used InsightHQ to access Shap Beck's primary crusher kilowatt usage per hour data, conveyor running time figures, and conveyor black belt time data (how long the conveyor is not carrying any material).

"Having this tool and other things we do at Shap Beck is light years ahead of any other quarry I've worked in," adds Gillespie. "Having the ability to analyse kilowatt usage of the primary crusher means we can link it back to the fragmentation of the blasted material. The better the fragmentation from the blast, the less energy is used by the primary crusher to process material."

Gillespie, who also manages Hanson's Low Gelt quarry, a ►

TOP: Shap Beck quarry manager Robin Gillespie analyses an InsightHQ production and energy usage report **ABOVE:** Shap Beck has a near 1km field conveyor used to transport limestone during the crushing and screening process **LEFT:** Shap Beck is a 1million tonnes/year limestone quarry benefiting from the extensive use of InsightHQ

► 100,000tonnes/year sand quarry near Carlisle, is looking to embrace other quarry management technology companies to improve the Shap Beck operation. "I'm looking to work with WipFrag, a Canadian company that specialises in photo analysis of blast fragmentation, so we can learn how to obtain better blast consistency. And I'm interested in what technology we can use for stockpile value management."

Shap Beck quarry is keen to meet growing demand from Tata Steel's Shap Fell site for kiln feed limestone which is burnt at Shap Fell and used in large-scale lime production for steelmaking at a number of UK steelworks, including Tata Steel's Port Talbot site in South Wales. As a result, the quarry is looking to extend its current 218 acre site by 40 acres. A planning application will be submitted to the Lake District National Park Authority in Q4 2016. Shap Beck has a Review of Mineral Permission (ROMP) application to 2042.

Gillespie says that single-sized -31.5mm limestone products will start being transported by rail from Shap Beck quarry to Wigan in Lancashire later this year. "It will be redistributed by road from there to central Manchester and supplied to concrete plant customers. We used to use the rail line until 2014, when SSI UK went bankrupt and closed the Redcar steelworks."

At Shap Beck quarry, limestone is extracted by blasting, collected by a varying number of wheeled loaders and excavators – with Shap Beck using a Caterpillar 966M XE, Volvo L150, Volvo L220, Volvo L250 (L220 and L250 fitted with InsightHQ), and a Hitachi ZX870 excavator – and loaded onto two Caterpillar 775D and one Caterpillar 771D rigid dump truck. The material is then hauled an average of 500 metres and put through a roll grizzly feeder, followed by a Baxter ST5042 primary jaw crusher, capable of processing up to 375tonnes/hour of material, a scalping screen and two Wileman washing barrels. After this, the material goes to a near 1km field conveyor that takes the crushed material to a three-deck Hewitt Robins screen, from which the -125mm +31.5mm kiln feed limestone for Tata Steel's Shap Fell plant is produced. Oversized material goes to a secondary crushing and screening phase, resulting in concrete aggregates for Hanson's concrete plants near Carlisle. Shap Beck

EQUIPMENT LIST



CRUSHING & SCREENING

1 x Baxter ST5042 jaw crusher
1 x Hewitt Robins VL14 2.5m x 6m double deck screen



HAULING

2 x Cat 775D RDT
1 x Cat 771D RDT



LOADING

1 x Hitachi ZX 870 excavator
1 x Volvo L250 wheeled loader
1 x Volvo L220 wheeled loader
1 x Volvo L200 wheeled loader
1 x Caterpillar 966M XE wheeled loader



WASHING

2 x 2M4 Wileman washing barrels

also produces agricultural limestone products. Further emphasising the quarry's product diversity, Shap Beck has a 25,000tonnes/year industrial powders plant producing a cement-type product for Francis Flower, who supply filler for asphalt to major names including Cemex UK.

Of the Caterpillar 966M XE wheeled loader's performance, Ben Strickland, assistant manager at Shap Beck quarry, says: "We've got VisionLink on the 966M XE and our two Cat 775D haul trucks, and we've found that the 966M XE uses 25% less fuel than the Cat 966H we had before. Having VisionLink enables us to do weekly analysis of the 966M XE and 775D RDTs fuel usage and idling times.

"I'd like telematics data from all our machines to be available via InsightHQ – whether it be originally captured by VisionLink or Volvo's CareTrack solution," adds Gillespie, who works at Shap Beck alongside 21 full-time colleagues and up to five full-time contractors.

Hanson has also introduced InsightHQ into some of its other UK quarries where it's analysing excavator and hauler load-out. These include Craig-yr-Hesg near Pontypridd, South Wales; and Criggion in Shrewsbury, Shropshire.

Clearly converted to the benefits of cutting-edge quarry management software solutions, it will be interesting to return to Shap Beck quarry in a few years time to see just how much Gillespie and his team have further embraced all it has to offer. ●



FAR LEFT: InsightHQ is fitted on Shap Beck's Volvo L220 and L250 wheeled loaders **LEFT:** Limestone products come off the conveyor onto a stockpile at Shap Beck quarry **BELOW:** Updated every minute, InsightHQ's Snapshot tool can offer instant quarry site performance data

