

Stockpile success at Hibbing Taconite

Maptek I-Site™ is ideal for scanning stockpiles in all conditions.

A world-class iron ore pellet producer, Hibbing Taconite began shipping pellets in 1977. Located in Minnesota's Mesabi Iron Range, the mine is managed by Cleveland Cliffs Mining Company.



I-Site handles the challenges of survey of multiple stockpiles around reclaimer and vehicle access roads

HIGHLIGHTS

- Fast turnaround - results available 2 days after scanning
- Ideal for stockpile volumes
- Monitor flow in tailings channel
- Pit surveys keep surfaces up to date for planning and design
- Truck studies to determine accurate volumes, and check bulk material densities

The I-Site team did its first consulting job for Cleveland Cliffs in 2006, measuring stockpiles at Hibbing Taconite's dock facility in Duluth, Minnesota. Using the I-Site 3D laser imaging system, a task which was previously done with aerial photography, taking about 6 weeks turnaround for results, was now completed in 2 days, with results available 2 days after scanning. That was the first of many consulting jobs for Cleveland Cliffs operations.

The Hibbing Taconite site had been using Maptek Vulcan™ since 2001 and then approached Maptek about using the I-Site system, initially for scanning of stockpiles. Successful results saw more projects eventuate as the engineers identified other areas in which they could use the I-Site 4400LR scanner.

For example, I-Site has been used to monitor flow in a tailings channel to make sure the tailings flowed smoothly while the dragline was down for repair. Close monitoring was crucial, as a backup of tailings would cause major delays in production.

I-Site has also been used for pit surveys, determining volumes from shovel advances, blast analysis, and keeping surfaces up to date for daily planning and design.

The bulk of scanning has been on stockpiles, with monthly surveys on site and annual surveys at their dock facility. Truck studies have also been conducted, scanning both empty and full trucks to determine accurate volumes, to check the bulk material densities.

Lidar data is normally collected once a year, providing Hibbing Taconite with surface files and contours.

Producing a photo-overlay onto lidar data is traditionally a complex procedure involving camera calibration, specialty software, and rubber-sheeting. I-Site Studio™ provides an option to convert the scan and image to a triangulated file with the image registered (photo-overlaid); this is then exported to a Vulcan-compatible file. With software and hardware both designed and engineered by Maptek, camera distortion and calibration are accounted for automatically.



Heather Kutchery, I-Site Technical Consultant and David Oberstar, Hibbing Taconite Surveyor measuring pit walls



All-weather scanning

TESTIMONIAL

Hibbing Taconite has used I-Site to its full potential - conducting truck studies, measuring stockpiles and pit volumes, monitoring tailings flow and making use of the 64-bit capabilities in processing aerial lidar data.

Purchase of I-Site Studio software in mid 2008 has improved the mine's ability to use all the information provided by aerial lidar data, with greater control over the process. One of the reasons that Studio was attractive was that it is capable of processing raw point files of aerial lidar data.

'Through I-Site Studio, they can easily take the 60 million points from their raw aerial lidar data and reduce them into a useable Vulcan format,' noted Scott Schiele, I-Site Senior Technical Consultant. 'They can then easily update the overall pit topography so the surfaces they are using for design and reporting are always the latest.'

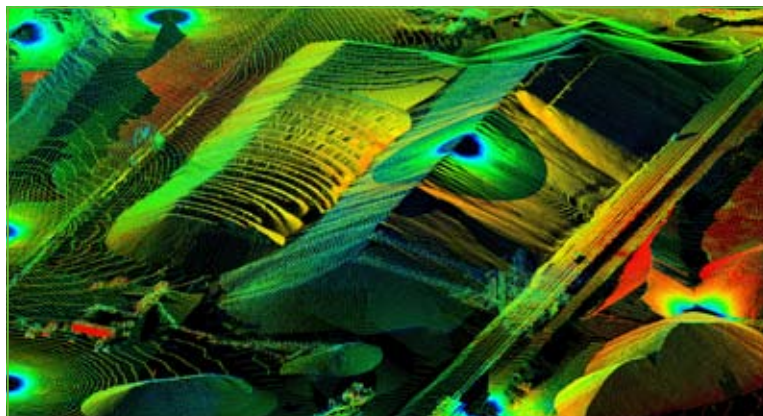
Hibbing Taconite then rented the I-Site 4400LR scanner to test its functionality, leading to a purchase in 2008. Mike Young, Mine Engineering Section Manager at Hibbing Taconite, has used I-Site since it was first introduced, and directs the usage of the hardware and software on site.

'Surveyors, engineers and geologists all use the scanner. After the success of the trials, we all saw new possibilities', said Mike.

Scott Schiele summarised, 'Hibbing Taconite has used I-Site to its full potential - conducting truck studies, measuring stockpiles and pit volumes, monitoring tailings flow and making use of the 64-bit capabilities in processing aerial lidar data.'

Thanks to
Hibbing Taconite

One of the biggest issues for surveyors is the massive (40 Mb) size of models exported by some survey processing software for import to mine planning systems. A 220 kb model in I-Site Studio allows for fast, flexible transfer, as well as storage on convenient portable media such as memory sticks. I-Site Studio was quick to take advantage of 64-bit computing on the Windows XP Professional x64 operating system. Projects consisting of hundreds of scans and hundreds of millions of points can be managed inside one software session. A maximum of about 20 million points in Windows 2000 or Windows XP Professional is extended by a factor of 10 on XP 64, about 200 million points.



Raw scan data coloured by scan intensity - the colouring indicates the reflectivity of the material scanned