

ENHANCING EFFICIENCY



Bathymetric mapping in mining operations



THE EDGE

EDGE 2-in-1 topo-bathymetric lidar system at a mine site in the USA. The system is for shallow water mapping of hazardous environments.



Collecting data on mining retention ponds and dams presents several challenges that underscore the need for a new and specialized tool. Traditional data collection methods often rely on manual surveys, which can be time-consuming, labor-intensive, and pose safety risks to field personnel, especially in hazardous mining environments. Other technologies (e.g., sonar) stop working in shallow water and require contact with the liquid substrate to acquire data.

The dynamic nature of retention ponds, subject to sedimentation, fluctuating water levels, and the presence of suspended particles, further complicates accurate data acquisition. Additionally, the sheer size and remoteness of some mining sites make it challenging to conduct comprehensive and frequent surveys

SOLUTION

The EDGE™ topographic and bathymetric LiDAR system plays a pivotal role in revolutionizing the mining industry by providing precise and detailed terrain and underwater topography data. These two LiDAR technologies, combined with the flexibility and rapid revisit capability of a UAV mounted sensor offers unparalleled accuracy in mapping and monitoring the complex landscapes associated with mining operations.

The system extends the applications of lidar technology to underwater environments, making them identify inadequately dredged zones, and plan extraction activities with precision. The ability to map underwater features enhances the efficiency of mining operations while reducing environmental disturbance. This

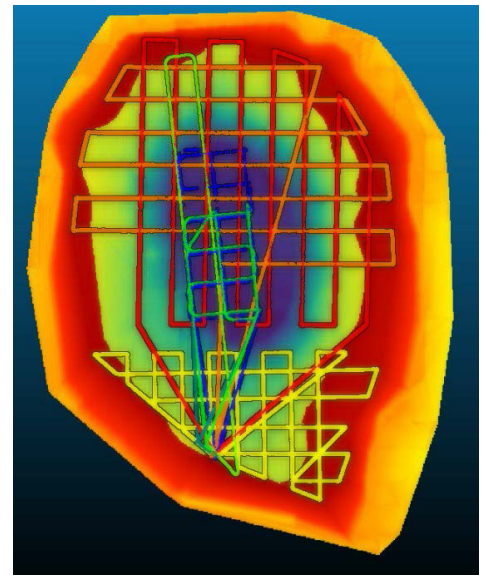
underwater lidar technology proves crucial in dredging to optimizing production yields, ensuring sustainable resource extraction, and adhering to strict environmental regulations.

The specialized sensor excels in volumetric calculations, providing invaluable insights into the pond's sedimentation and water volume dynamics. EDGE utilizes LiDAR technology to precisely measure the water surface elevation and the pond's bottom topography, allowing for accurate calculations of volume variations over time. By capturing high-resolution elevation data, the sensor enables the identification of sediment deposition and erosion patterns within the retention pond. This volumetric information is crucial for mining companies in assessing the efficiency of sedimentation control measures, optimizing pond maintenance, and ensuring compliance with environmental regulations. The sensor's ability to streamline volumetric calculations not only enhances the accuracy of monitoring but also contributes to sustainable mining practices by facilitating proactive management of retention pond resources.

HIGH RESOLUTION DATA

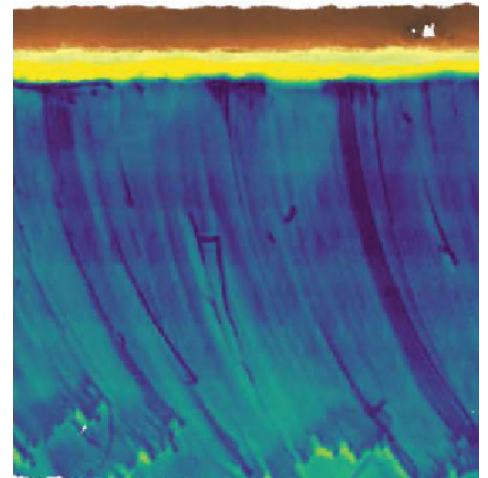
By utilizing advanced laser scanning technology, the system can penetrate water to capture intricate bathymetric features such as submerged ridges, channels, and contours with remarkable accuracy. This capability is particularly

beneficial for mining operations where precise knowledge of underwater topography is crucial for effective planning and resource extraction. Moreover, system's ability to map dredge lines provides invaluable insights into the morphology and spatial distribution of sediment deposits, aiding in the optimization of dredging processes and the management of sedimentation within mining sites. **EDGE LIDAR empowers mining companies to make informed decisions and streamline operations while minimizing environmental impact.**



SYSTEM CONOPs

The image above shows the typical CONOPs for EDGE with a 30-meter flight altitude and a flight speed of 5 meters/second.



DREDGE MAPPING

EDGE LIDAR provides users with high resolution mapping capabilities at centimeter level precision, providing detailed visualization of dredge lines (pictured above) in the 3D point clouds. This detail provides mining operations crucial information to better plan extraction and increase production yields.

PAINTING THE SCENE

The image below shows an evaporation pond with a 10x condensed view. Mine staff can dramatically enhance the full picture of their operations through improved monitoring and better understanding of the hydrography of their sites. This includes volumetric calculations of difficult-to-measure shallow water tailings ponds ensuring more accurate reservoir water levels than other methods (wading/staking or sonar) for improved compliance reporting, reduced risk to personnel, and increased efficiency of operations.

