

CEE-USV™ Called in for Baking Soda Effluent Lagoons

Solvay Chemicals operate a baking soda plant in Parachute, Colorado USA. The CEE-USV™ was used to generate an accurate bathymetry map in one day instead of several days of laborious point measurements lying flat on a boat under the bird netting to obtain far less accurate data!

Food grade Sodium Bicarbonate (Baking Soda) is manufactured by the Solvay Chemicals plant in Parachute, Colorado, USA using soda ash from the company's Green River, Wyoming site. The process produces effluent water that is extremely high in dissolved soda crystals and precipitation of the dissolved constituents in the effluent lagoons causes the buildup of solids on the bottom and around the edges of the lined ponds.

Instead of conducting a lengthy field survey of sludge height from a manned boat, Solvay decided to call on the CEE-USV™ to undertake a bathymetry survey of three ponds.



Each pond is covered by netting 2-6ft above the water surface to prevent bird deaths. The presence of the

netting required the GPS and data telemetry antennae to be installed directly on the hull giving the CEE-USV a super-low profile about 1ft in height.

The CEE-USV™ used at the plant was equipped with the CEESCOPE-LITE™ single beam system with a Hemisphere Crescent GPS receiver capable of meter-level performance using SBAS corrections; well adequate for this survey. A 200kHz transducer was installed and Hydromagic software was used for navigation, acquisition and editing. Data were telemetered directly to a laptop internal WiFi radio; the CEE LINK™ high power shore radio was not needed to achieve the required range.



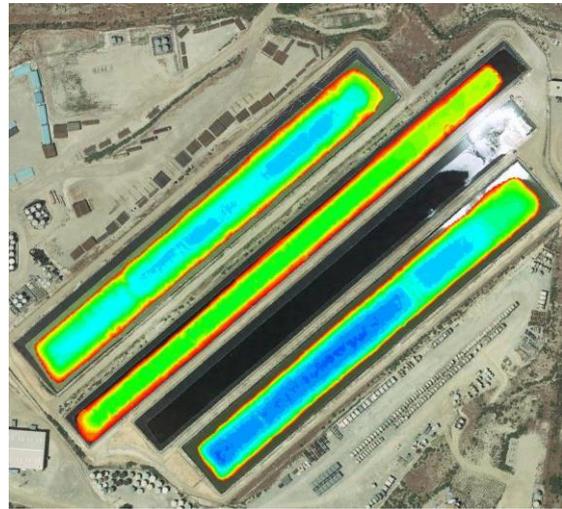
The boat was first driven around the perimeter of each pond, and then with the edge of the survey established it was driven in a standard line pattern from two, or in the case of the longest 500m (1600ft) pond, three control positions on the shore. With winds at 25-35mph, the low windage of the USV helped the vessel stay on track although frequent course correction was still required to keep on line.



Before acquiring soundings, the presence of clean echo sounder data was first verified. The echogram output was viewed as the USV made a pass along the length of each lagoon. The solids presented a uniform and straightforward interface with highly consistent sounding results obtained. Subsequent data editing was fast and easy. XYZ grids from TIN models at 1m x 1m spacing were used to calculate total water volumes. Solvay engineers were able to use the bathymetry with existing drawings to determine the total solids accumulation in each of the three lagoons. The fourth lagoon had insufficient water to survey at the time of this CEE-USV™ deployment.

While the CEE-USV™ was completely encrusted with wind-blown deposits after the survey, as the pond water

constituents have detergent properties, it looked like new after being hosed off!



3D views:

