Table 25 Bathymetry

	DATA OPTION 1: Airborne Laser Scanning	**DATA OPTION 2: Quickbird 2 (or other satellite multi-spectral)**
Spatial Dimensions		
Area to cover	Can be up to 1000 km ^{2}	12 km x 12 km per scene
Mapping unit	0.5m to 10m – depends on sample intensity	068m panchromatic 4.0 m multi-spectral
Positional accuracy	10 cm or more depending on geo-referencing process	Dependent on geo-referencing process
Temporal Dimensions		
When	User controlled	Approx 10.45 am
How often	User controlled	Minimum every 4 days
Variable to map	Sea surface and seafloor height	Sea surface and seafloor height
Environmental / Sensor Restrictions	Not possible for turbid water Clouds, strong winds and breaking waves.	Not possible for turbid water Clouds, strong winds and breaking waves
Processing technique **(Output)**	Ocean surface and seafloor return extraction, interpolation and ground mapping. Raster or image surface with each pixel containing an absolute elevation.	Inversion of radiative transfer model to estimate depth. Or Empirical estimate of depth using Beer's Law
Resources – Hardware and Software	PC Image processing software GIS with image analysis capabilities.	PC Image processing software GIS with image classification module (e.g. ARCGIS Image Analyst)
Resource – Personnel	Trained and with experience in ALS mapping. Knowledge of area to be mapped	Trained in image classification Experience with high spatial resolution data Knowledge of area to be mapped
References: Note these are some example references	Gao (2009)	Lyzenga (1978) Stumpf et al (2003)

Gao, J. (2009). “Bathymetric mapping by means of remote sensing: methods, accuracy and limitations.” Progress in Physical Geography 33, 103.

Lyzenga, D. (1978). “Passive remote sensing techniques for mapping water depth and bottom features.” Applied Optics 17, 379-383.

Stumpf, R., K. Holderied, and M. Sinclair (2003). “Determination of water depth with high-resolution satellite imagery over variable bottom types.” Limnology and Oceanography, 48, 547-556.