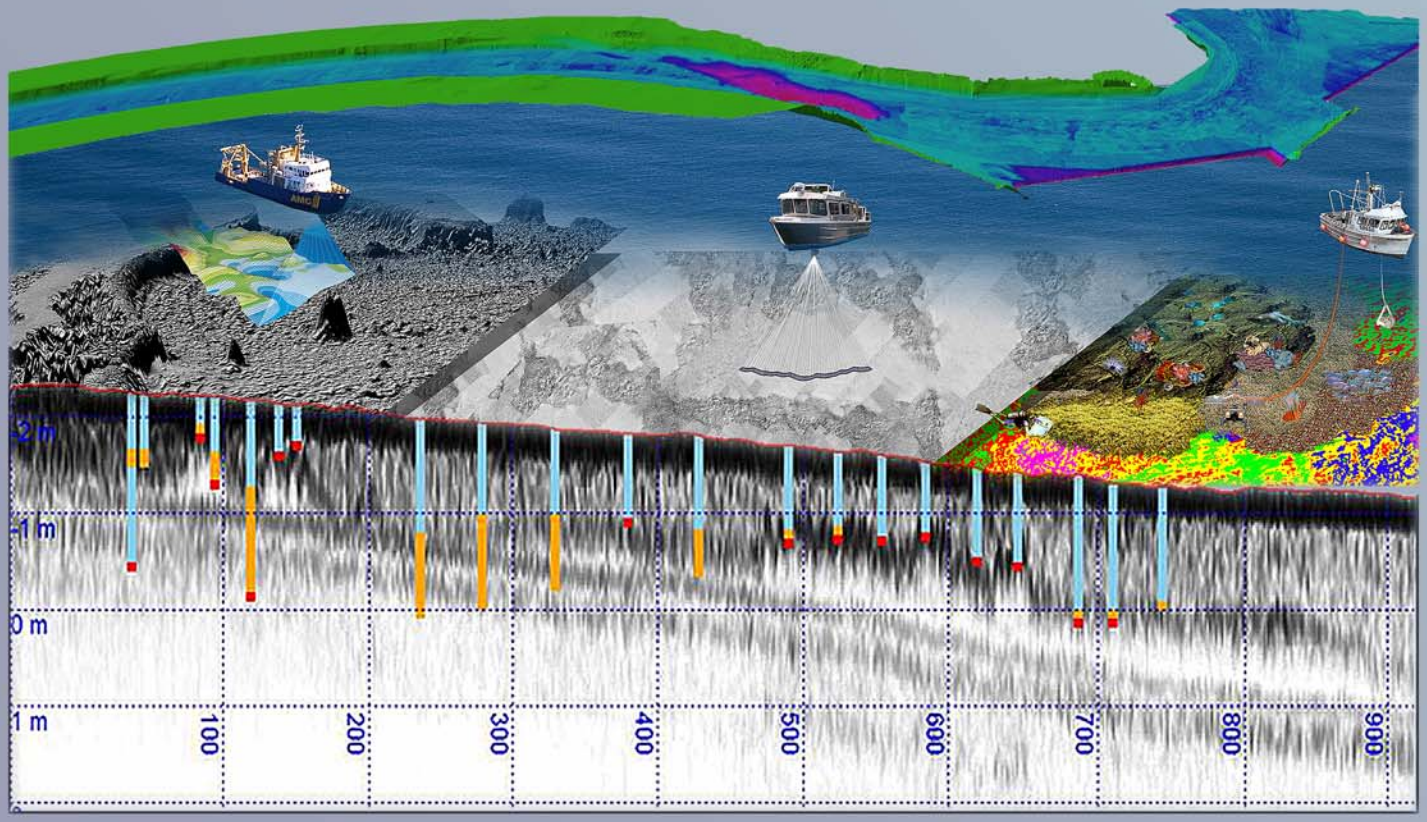
surrich
HYDROGRAPHICS

Capability Statement



2018

Capability Statement

Company Profile

Surrich Hydrographics provides Level 1 Certified Hydrographic and Geophysical Services for projects including navigational safety, dredging, construction, maintenance, monitoring, coastal zone management and habitat mapping.

Experience

Up-keep of technology

Provide solutions

Reduce risk

Add value to your project!

Key Services

- Hydrographic and geophysical survey
- Multi-beam bathymetry
- 3D survey and inspection – Sonar and LiDAR
- Dredging and construction survey and support
- Seismic reflection / sub bottom profiling
- Seismic refraction
- Electrical resistivity imaging
- Marine magnetics
- Side scan sonar
- Tide analysis
- Seabed classification / habitat mapping

Additional Services

- Photogrammetry
    - We acquire shallow bathymetry and/or shoreline LiDAR and/or above-water ground control points, which are used to tie-in photogrammetry digital terrain models and generate mosaiced high-res photo imagery of project areas which provide benefits throughout the life of the project and beyond.
    - We have a track record of sub-contracting these services to the cost-benefit of our client.
- Client representative.
    - The company principals, as well as their network of sub-contractors, have the intellect to serve the interests of our client.
- Installation of monitoring equipment.
- Data processing, imaging and programming services.
- Land geophysical surveys.
    - Principal Surrich geophysicist Justin Anning, owned and directed a high end geophysical consultancy employing up to 30 persons, performing land, marine, airborne and underground acquisition, processing and reporting.

Project Experience

Surrich principals, Andrew Richardson and Justin Anning, have worked on numerous marine projects in Australia including, but not limited to:

- Browse Basin development, Western Australia.
- Ichthys Project, Western Australia.
- Wheatstone LNG project, Western Australia.
- Gorgon Project, Western Australia.
- Cape Lambert export facilities.
- Sino Iron Cape Preston export facilities, Western Australia.
- Pilbara Port Authority, Western Australia (Port Hedland and Dampier Ports)
- Australian Marine Complex, Jervoise Bay, Western Australia.
- Gladstone Harbour, Queensland
- Bunbury, Albany, Fremantle and Anketell, Onslow, Western Australia.
- Darwin Port, Northern Territory.
- HMAS Stirling, Western Australia, HMAS Coonawarra, Northern Territory.
- Kimberly Port Authority (Broome Port).

Equipment

Surrich owns the following equipment:

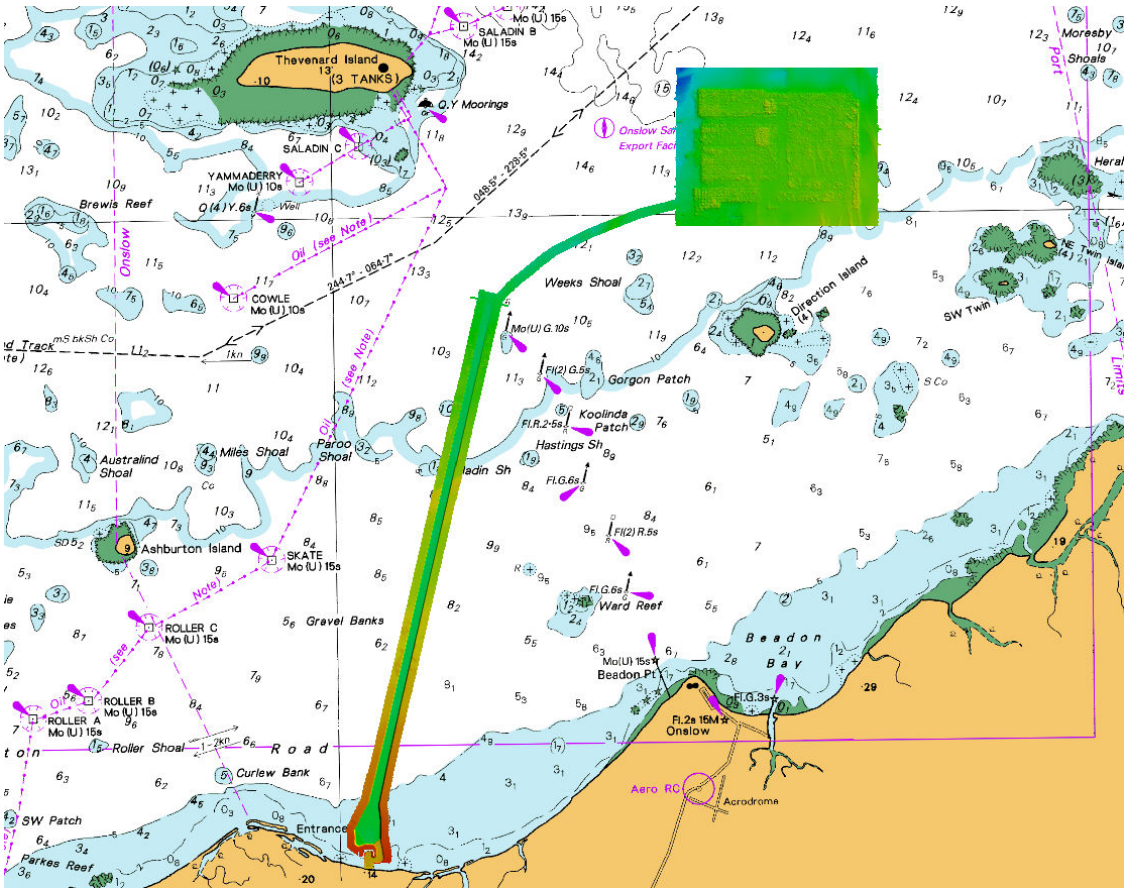
- Teledyne T-50P 200/400kHz Multibeam Bathymetry System
- Reson 7125 SV2 200/400kHz Multibeam Bathymetry System
- Odom Echotrac single beam echo sounder (200khz narrow beam transducer)
- Ceeducer single beam echo sounder (30/200kHz dual frequency transducer)
- Applanix PosMV 320 positioning system (IMU +GNSS)
- Applanix Wavemaster PosMV positioning system (IMU + GNSS)
- Septentrio Altus NR3 RTK Base/Rover GNSS systems
- Trimble and Novatel RTK Base/Rover GNSS systems
- Valeport Sound Velocity Probes
- Radar/Pressure tide gauges
- Continuous marine seismic refraction system
- Seamap and Bolt Airguns (including slimline borehole models)
- Air compressors (various electric and petrol models from 100 to 320L/minute)
- Geoeel Marine Seismic streamer and acquisition system
- Various side scan sonar systems
- 7m trailer mounted survey catamaran (can be mobilized to anywhere in Australia)
- Numerous acquisition and processing software applications

Certified SSSI Level 1 MBES Bathymetry Surveys

Surrich routinely performs SSSI Level 1 certified bathymetry surveys to IHO special order accuracies. Total propagated uncertainties exceed the HIPP precise classification set by the RAN.

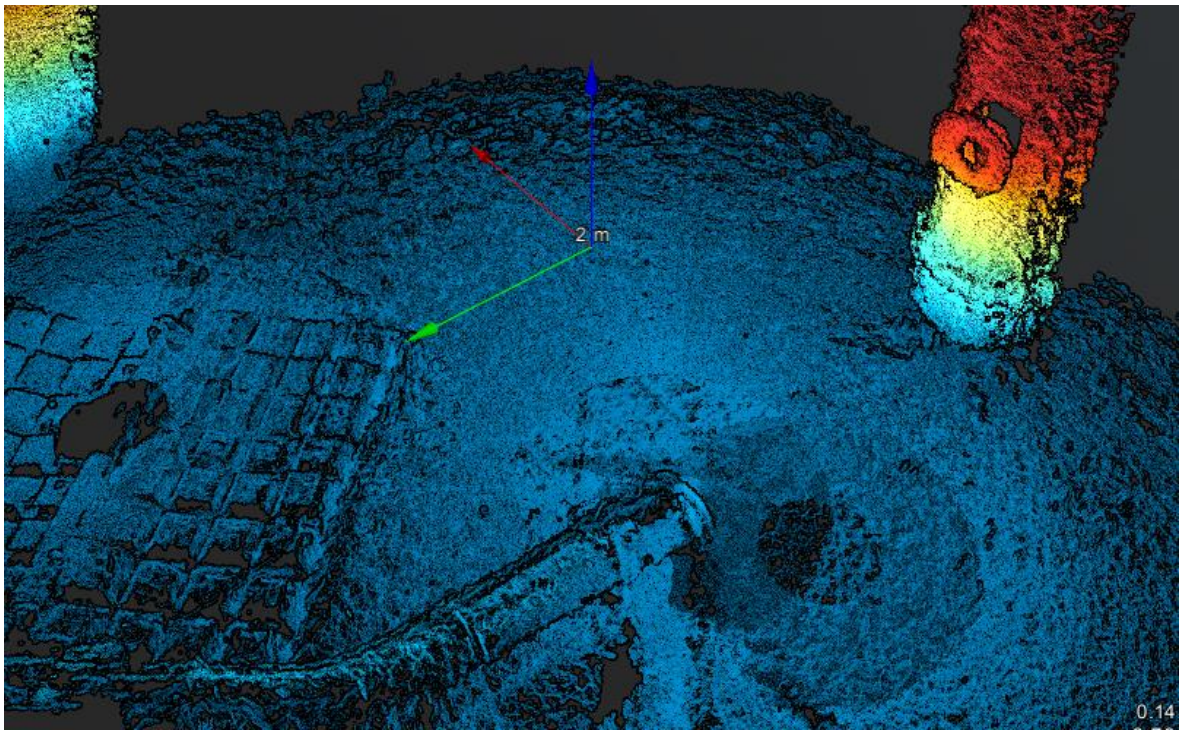
Bathymetry surveys are overseen by Andrew Richardson (*CPHS Level 1)*.

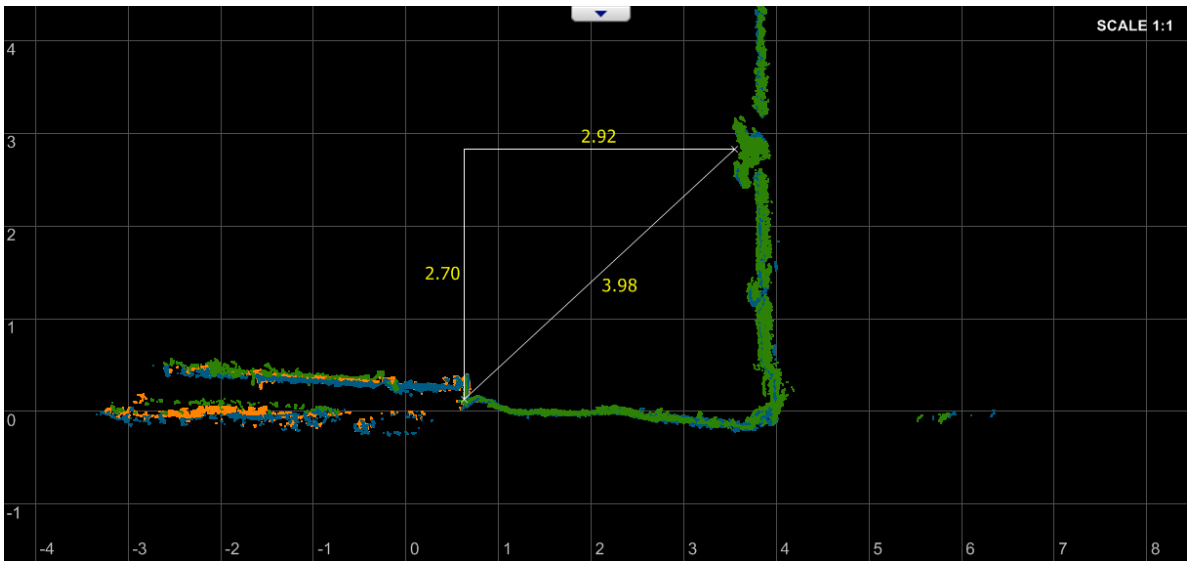
CHPS = Certified Professional Hydrographic Surveyor
IHO = International Hydrographic Organization
RAN = Royal Australian Navy
SSSI = Surveying and Spatial Science Institute



Example – 3D Sonar Scanning and Spool Piece Metrology

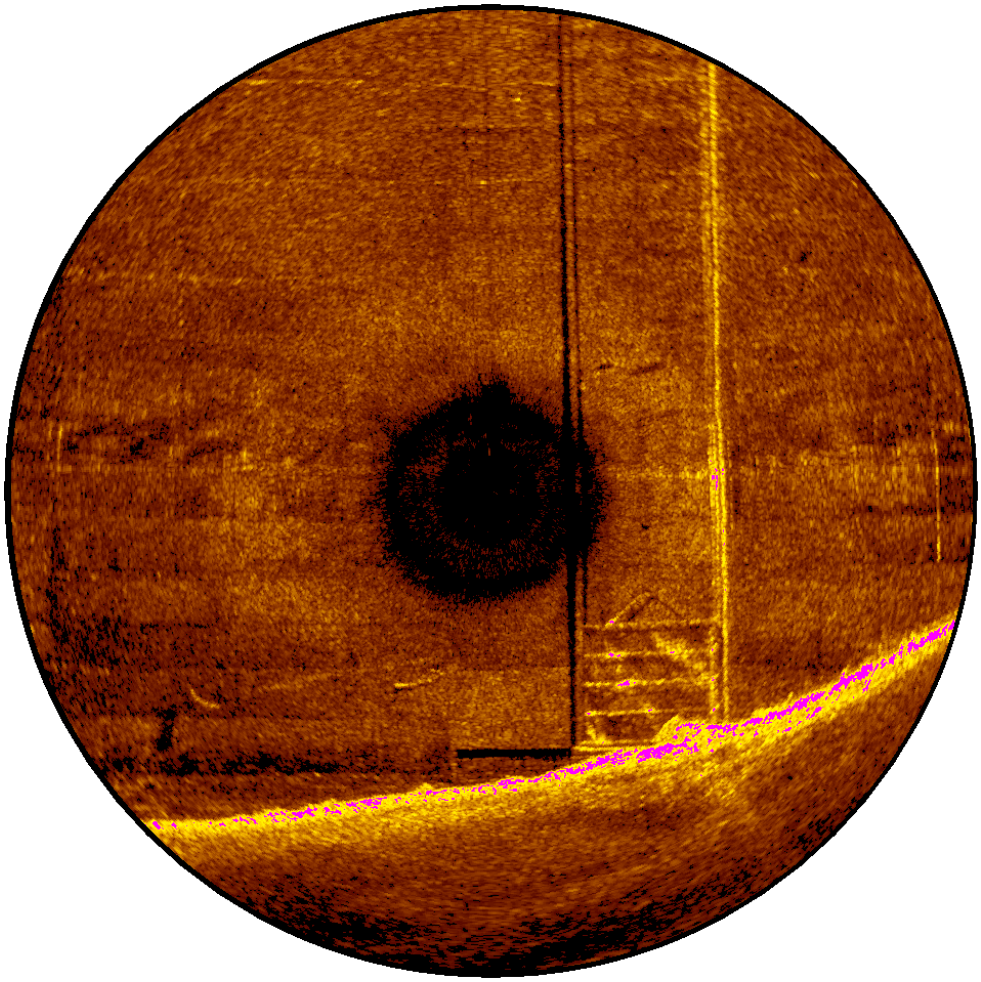
Surrich utilizes the Blueview micro sonar system where high-resolution 3D imaging and ranging is required during construction and inspection. The following example shows data used to calculate the final spool-piece dimensions for the successful completion of a pipeline construction project.





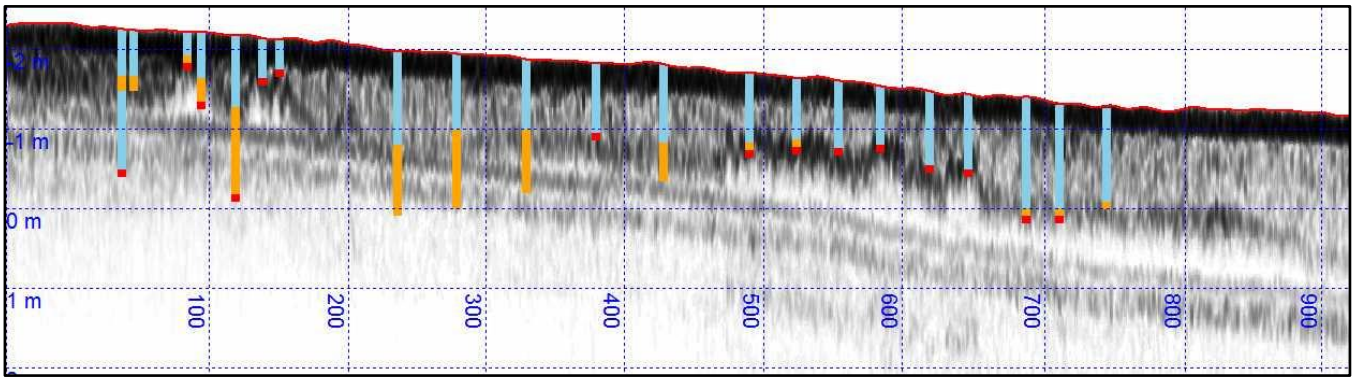
Example - High Resolution 2D Imaging of Structures

Surrich is experienced in rapid 2D imaging of concrete structures. The image of a vertical concrete reservoir wall shows a retractable water inlet grate. Sediment covers the grate preventing its removal for servicing. Minor deviations in the concrete from the construction formwork are also visible, as would be damage to the concrete. The blank spot at the centre of the image is the location of the sonar when the scan was performed. The bright sub-horizontal line along the bottom is the seabed which partly covers the grate. The scan range is 7.5m or 15m total image diameter.

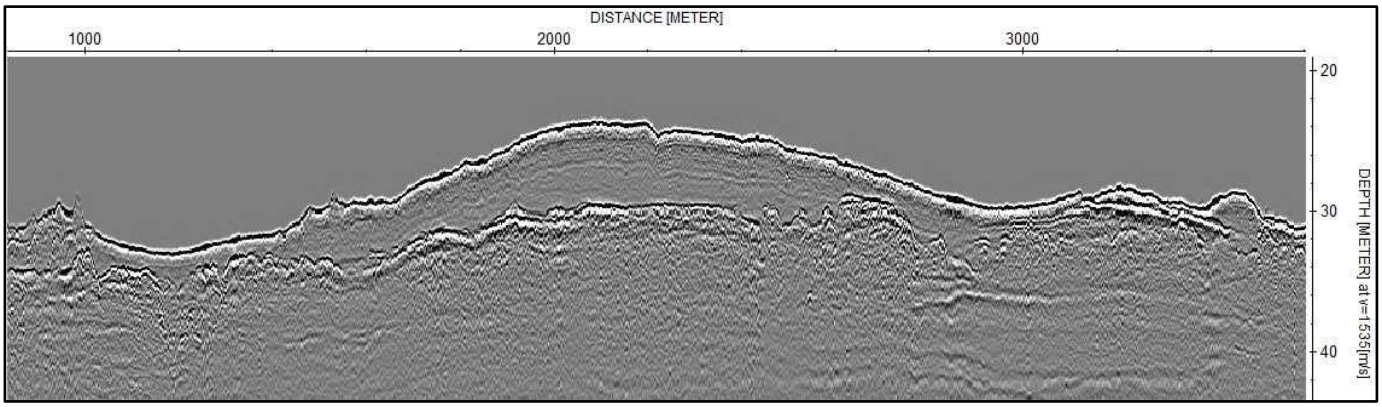


Example - Sub Bottom Profiling (SBP)

Detailed pinger/chirp SBP techniques are applied when the target zone is the top few metres of the seabed. Acquiring heave corrected pinger SBP, as opposed to basic swell filtering, allows attributes such as roughness and amplitude of the reflectors to assist interpretation. The cores in the ultra-shallow profile below were collected using a pushrod arrangement by the operator during low tide.

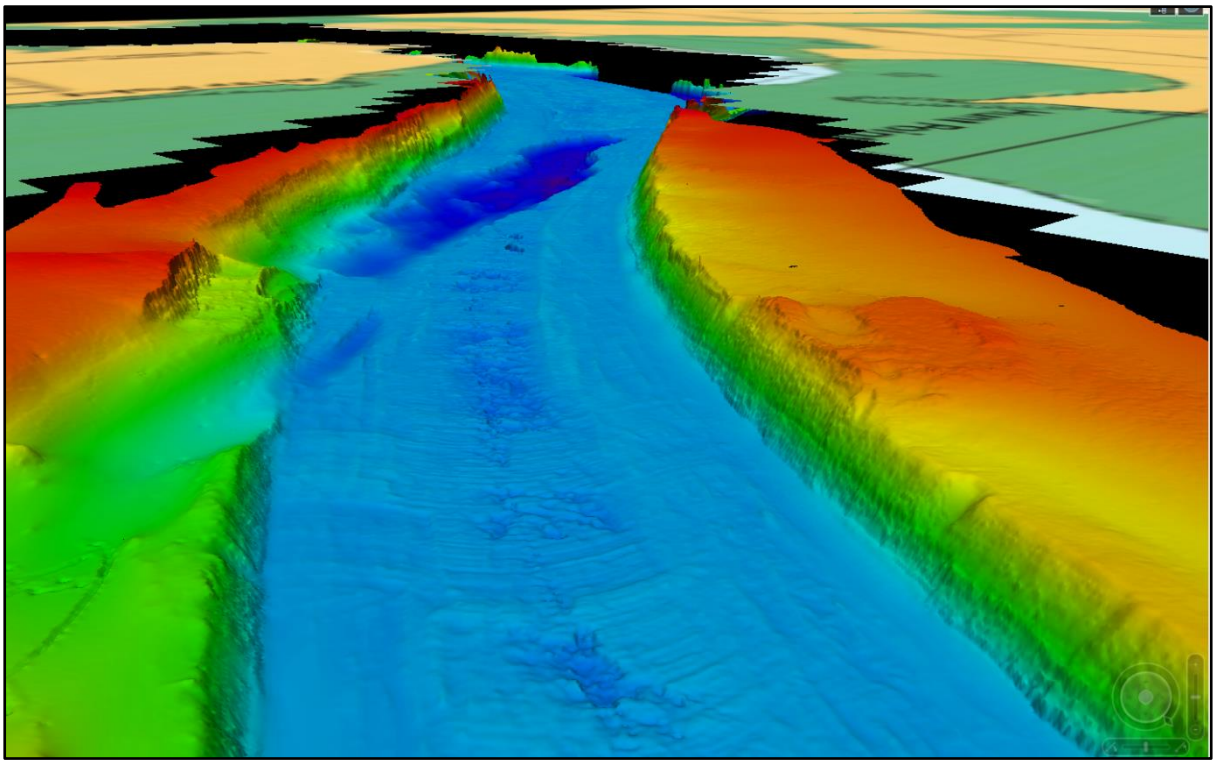


Boomer source SBP is also acquired on a routine basis. We have the experience and high end processing capabilities to ensure data quality.

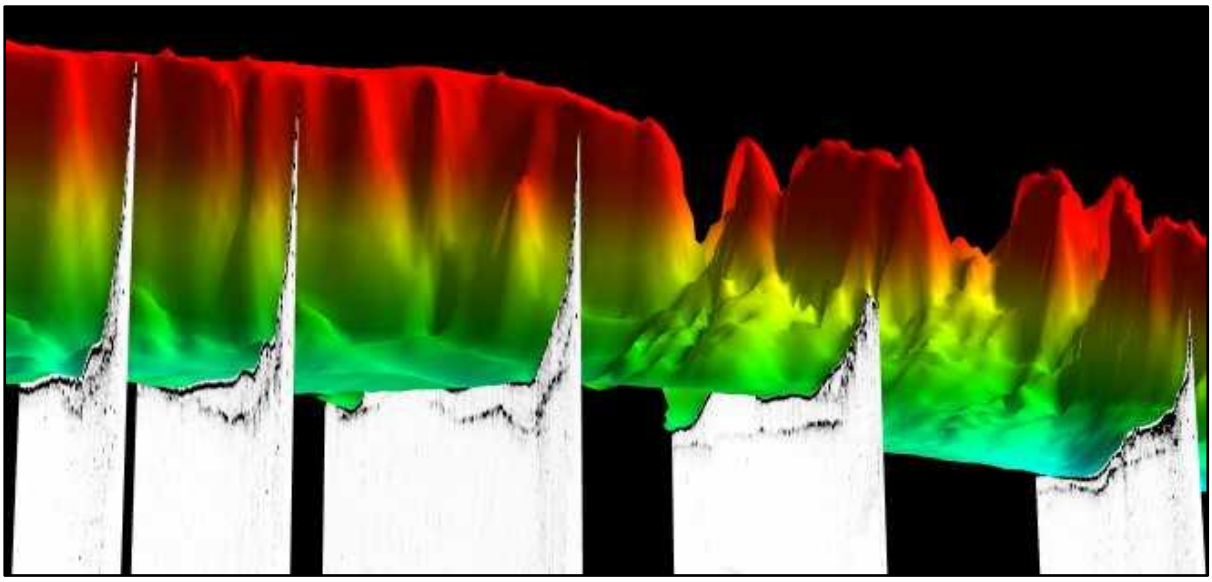


Example - 3D Visualization

Bathymetry of channel approach into Port Hedland.



Comparing multiple datasets in 3D is a useful QC step ensuring correct positioning has been applied, in addition to interpretation visualization.

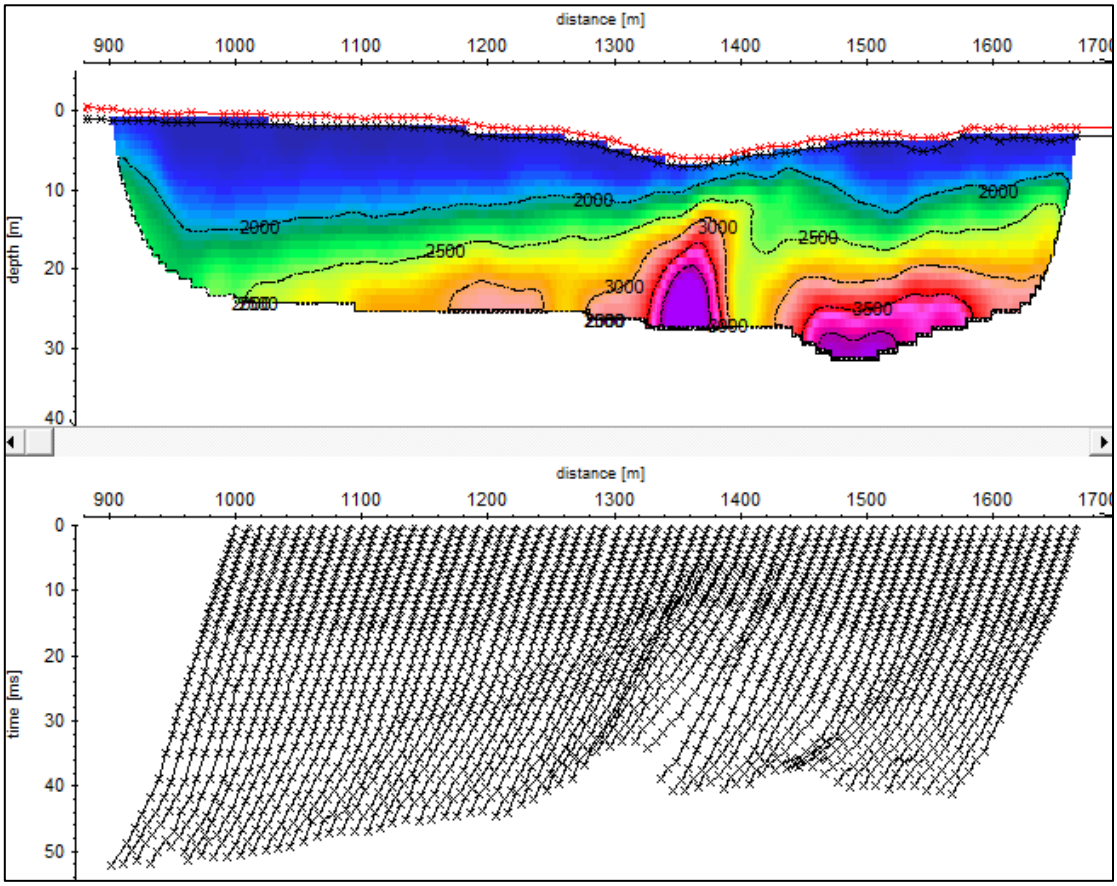


Example - Seismic Refraction for Geotechnical Investigations

The seismic refraction technique produces vertical sections of compressional seismic velocities (Vp). Data may also be displayed as horizontal depth slices and 3D point clouds.

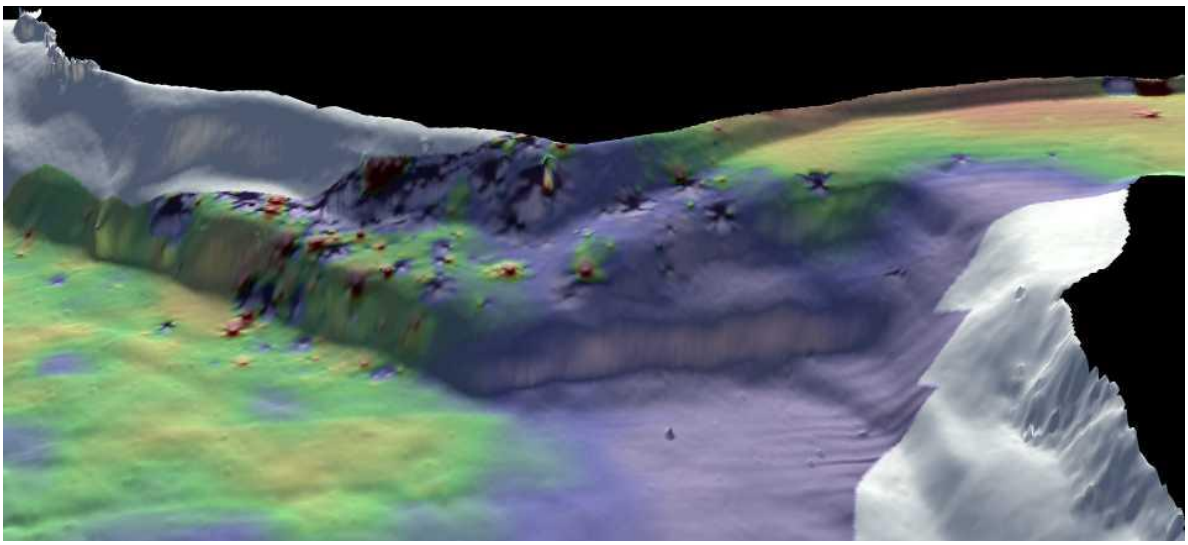
Our system is towed just above the seabed for optimum data quality. Where the seabed depth varies slowly, the airgun and trailing streamer is towed a constant altitude off the seabed. Where the seabed is variable, the system depth may be held relatively constant. Bathymetry, airgun depth and altitude are logged, and the variable water column thickness and topography are accurately modelled during the interpretation. The water column is removed from the final interpretation.

We believe our system to be one of the most environmentally friendly available, with impacts minimized by its high reliability, low streamer noise, low airgun size and shot pressure, non-contact with seabed, and deployment from a small vessel by a single operator + skipper. It's depth of investigation is one of the best in its class, with streamer lengths of 100m routinely acquired.



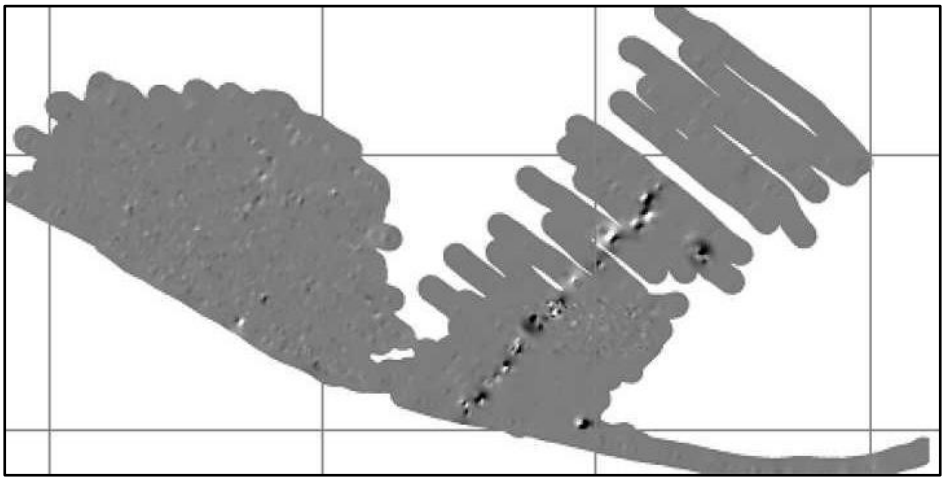
Example - Marine Magnetics for ferrous debris

The following 3D image shows colourized magnetic data draped over a 3D bathymetry in grey-scale. The pre-dredge survey was performed to map industrial debris (represented by the small coloured 'blips' in the magnetic image) accumulated over 100 years of industrial activity adjacent to the site. Lack of features in high resolution side scan sonar data indicate the targets are mostly buried. The data was carefully acquired to maintain the sensor close to the seabed and minimize parallax errors in time and towed layback position.



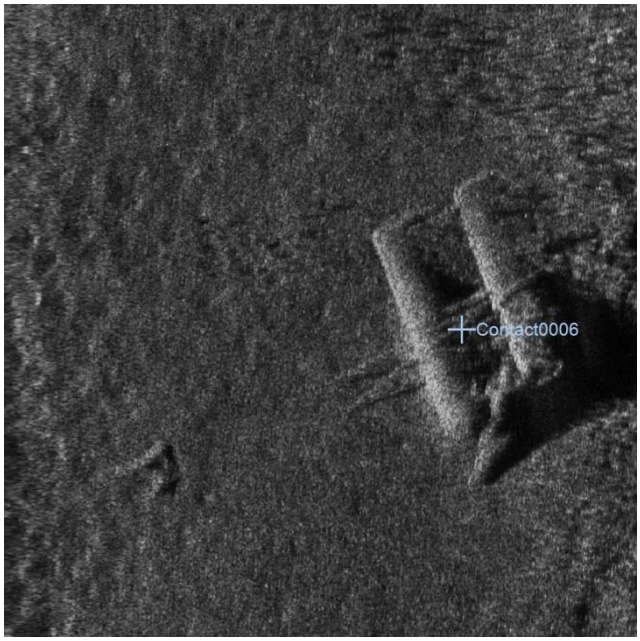
Example - Marine Magnetics for Archaeology

The following image shows a narrow linear magnetic feature extending 600m out from shore, discovered during an archaeological survey. It lies outside the contracted survey areas and was only detected as a result of the Surrich operator's diligence during transit. The square grid marks under-lying the image are 500m across, and all targets are buried below the seabed.



Example - Side Scan Sonar

Reports on SSS contacts are rapidly generated in various formats.

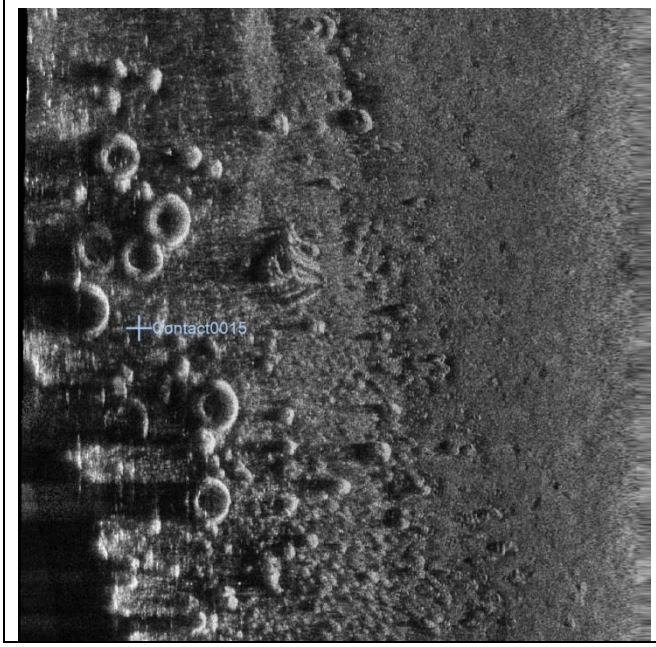


Contact0021

- Click Position
  (X) 370393 (Y) 6318536.60
- Map Projection: MGA50
- Acoustic Source File: C:\SH1022\SSS16.jsf
- Ping Number: 82040
- Range to target: 10.39 Meters
- Fish Height: 4.71 Meters
- Heading: 223.690 Degrees
- Water Depth: 2.23 Meters

Dimensions and attributes

- Target Width: 3.37 Meters
- Target Height: 0.65 Meters
- Target Length: 5.10 Meters
- Target Shadow: 3.80 Meters
- Description: Sunken pontoon



Contact0044

- Click Position
  (X) 382321.01 (Y) 6318528.58
- Map Projection: MGA50
- Acoustic Source File: C:\SH1022\SSS56.jsf
- Ping Number: 225325
- Range to target: 12.27 Meters
- Fish Height: 1.91 Meters
- Heading: 83.800 Degrees
- Water Depth: 2.27 Meters

Dimensions and attributes

- Target Width: 0.6 Meters (Fender tyre)
- Description: Fender tyres and debris

Marine Sediment Sampling

Surrich principals have experience collecting geotechnical samples using various techniques.

Contacts

Andrew Richardson – Certified Hydrographer

Andrew is a certified SSSI level 1 professional hydrographer with +14 years' experience in marine surveys, specialising in Level 1 certified multi-beam bathymetry surveys, habitat mapping, towed sensors and acoustic positioning.

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Mob: 0409 886 513

Justin Anning – Geophysicist

Justin has +21 years' experience as a geophysicist using a diverse range of geophysical techniques including land, underground and airborne applications, but with a strong focus and preference for challenging marine projects.

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