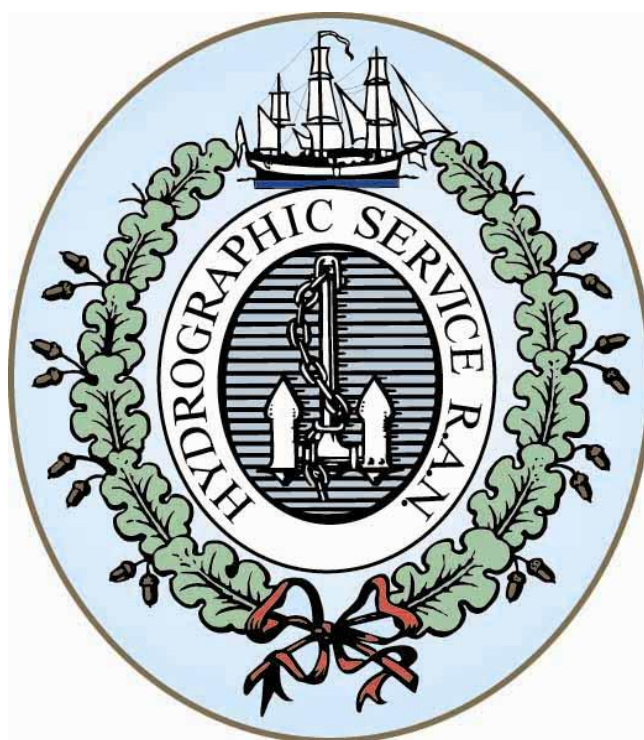


**IHO HYDROGRAPHIC COMMISSION ON ANTARCTICA (HCA)
10th Meeting - Cambridge, United Kingdom, 20-22 September 2010**

HCA10-07.4Ag



**National Report
AUSTRALIA**

**10th Hydrographic Commission on Antarctica (HCA) Meeting
British Antarctic Survey (BAS), Cambridge, United Kingdom, 20-22 September 2010**

NATIONAL REPORT - AUSTRALIA

1. GENERAL

The Australian Hydrographic Service (AHS)'s primary focus has been to complete the initial ENC coverage by end 2010.

2. SURVEYS

2.1 General

Hydrographic surveying in Antarctica is carried out by the Australian Hydrographic Service (AHS) on an opportunity basis when resupply ships chartered by the Australian Antarctic Division (AAD) are available to transport and support the AHS Deployable Geospatial Support Team (DGST) and the Antarctic Survey Vessel (ASV) WYATT EARP. The AHS therefore continues to remain fully reliant on the AAD for logistic support and transport to and from the Antarctic continent.

2.2 Hydrographic Surveys in 2009/10 – Davis Station Region

The Australian Hydrographic Service (AHS) in conjunction with Geoscience Australia (GA) and the Australian Antarctic Division (AAD) conducted a multibeam hydrographic survey in Davis anchorage and it approaches during summer season 2009/10. The survey was the first use by Australia of a multibeam echo sounder in the Antarctic and the results were exceptional. The survey was a component of a larger multidisciplinary Australian Antarctic Science Project 2201 (AAS 2201) - Natural variability and human induced change in the Antarctic nearshore marine benthic communities.

The surveyors completed 13 sqnm of sounding with the majority in less than 25m of water (**see Annex A**). Davis Station is located in an area with a significant coastal area of what would be deemed shallow water unlike the other permanent Australian Stations. The survey proved the viability of utilising a multibeam echo mounted on a small boat in the Antarctic. The survey also demonstrated the requirement to investigate a medium range and frequency sonar compared to a high frequency to cope with the deeper water in the unsurveyed areas in the nearshore of the majority of Antarctic stations.

The detail provided by multi-beam hydrographic surveying is now recognised by the AAD as the preferred method of conducting hydrographic surveys in the Antarctic. Multi-beam sounders provide both bathymetry and seabed texture information where traditional single beam surveys were primarily used for nautical charting. The bathymetry and seabed texture information is now in greater demand both within the AAD and the wider academic community for the significant value it adds to research.

In addition to dedicated hydrographic surveys, commencing in 2010, the AHS has assisted with the processing of passage sounding data by the AAD resupply vessel the MV Aurora Australis. DGST processed greater than 30,000nm of passage sounding data collected in the summer of 2009/10.

2.3 Hydrographic Surveys Planned for 2010/11 – Mawson Station

DGST is scheduled to conduct survey operation in the vicinity of Mawson Station in the summer of 2011/12 to investigate the feasibility of resupply ships going alongside the west arm of Horseshoe Harbour in the event the entrance to the harbour is blocked by an iceberg (see Annex B).

2.4 Hydrographic Survey of Approaches to Larsemann Hills

In the summer of 2006 a large hydrographic survey was undertaken by the R.V. Akademik Boris Petrov on behalf of the Indian National Centre for Antarctic and Ocean Research (NCAOR) (see Annex C). Australia has requested India for bathymetric data of their hydrographic survey of the approaches to Larsemann Hills which is required to update INT Chart 9030 (published in 1992). Copies of this data have been promised for Australian researchers but till now no data has been forthcoming. Despite requests to Indian representatives in the IHO, ATCM and NCAOR and promises of a copy of the data, no data has been received.

2.5 Integrated Bathymetric Data Set

Using bathymetric data supplied by Germany, Australia, USA and others, an integrated bathymetric data set will be derived for the region between Iles Kerguelen and Heard Island. This data set will not be useful for navigation in shallow waters.

3. NEW CHARTS & UPDATES

3.1 National Charting Scheme

Hydroscheme is the three year rolling hydrographic surveying and Nautical Chart Production Plan. The current version of Hydroscheme 2010-2012 is available to the public via the AHS website(www.hydro.gov.au). It provides details on our upcoming programme. The Antarctic area remains of low priority in the current Hydroscheme.

41 New Charts and New Editions of the national paper and raster chart series were produced from July 2009 to June 2010. None of these were charts covering the Antarctic. Production priorities remain low but charts flagged for action are:

Action	Chart	Title	Scale
New Chart	Aus 599 (INT 9037)	Gibney Island to Kista Strait	1:25,000
New Edition	Aus 600 (INT 9036)	Approaches to Mawson	1:25,000
New Edition	Aus 602 (INT 9032)	Approaches to Davis Anchorage	1:12,500
New Chart	Aus 448 (INT ?)	Kirby Island to Magnet Bay	1:500,000 at lat 68
New Chart	Aus 453 (INT ?)	Cape Filchner to Mill Island	1:500,000 at lat 68

It is intended that Aus 448 and Aus 453 will be made available as INT charts, to complement our existing coverage. Australia has approached Russia for access to their INT charts in the area to aid in the production of these charts. No response has been received.

Aus 448 will allow the withdrawal of Aus 402 an imperial chart. It has also been requested by Australian Antarctic Division, Shipping Operations Section. It fills in the gap of coverage between INT 9040 and INT 9035. Limits will be approx 64 deg 35 min to 67 deg 47 min south and 45 deg to 57 deg 25 min east.

Aus 453 has also been requested by Australian Antarctic Division, Shipping Operations Section. It will fill in the gap between INT 9025 and INT 9020. Limits will be approx 63 deg 45 min to 67 deg south and 90 deg to 102 deg 23 min east.

3.2 International (INT) Charting Scheme for Region ‘M’

The current status of the INT charts produced by Australia in Region ‘M’ is as follows:

INT No.	Producer <i>Producteur</i>	National No.	Date		Scale/ <i>Echelle</i>		Format	Printer <i>Reproducteur</i>
			Publication	N.Edition	1:	Latitude		
9030	AU	Aus 451	1992		500 000	68°	A0	
9031	AU	Aus 452	2002		500 000	68°	A0	
9032	AU	Aus 602	2003	Proj 10/11	12 500		A0	
9033	AU	Aus 450	1991		500 000	68°	A0	
9035	AU	Aus 449	1993		500 000	68°	A0	
9036	AU	Aus 600	1987	Proj 10/11	25 000		A0	
	Plan: A- Horseshoe Harbour 1:5 000							
9037	AU	Aus 599	Proj 10/11		25 000		A0	
9014	AU	Aus 603	2002		25 000		A0	
	Plan: A – Boat Harbour 1:5000							
9020	AU	Aus 454	1998		500 000	68°	A0	GB
9021	AU	Aus 601	1992		50 000		A0	
	Plan: A – Newcomb Bay 1:12 500							

3.3 Data required to update INT Chart 9030

In the summer of 2006 a large hydrographic survey was undertaken by the R.V. Akademik Boris Petrov on behalf of the Indian National Centre for Antarctic and Ocean Research (NCAOR). Australia has requested India for bathymetric data of their hydrographic survey of the approaches to Larsemann Hills which is required to update INT Chart 9030 (published in 1992). Copies of this data have also been promised for Australian researchers but till now no data has been forthcoming. In the interest of producing accurate charts and research in this region it would be of interest to know whether the bathymetric data will be shared with IHO members.

3.4 ENCs

Three ENC cells (usage codes 4 and 5) were published in March 2008 to provide equivalent paper chart coverage for Aus600 (INT 9036). These cells are: AU468062, AU468063 and AU5600P1.

329 New ENC cells and new editions were published by Australia last Financial Year (2009/10) focussing on Commercial ports, port approaches and major shipping lanes. This took our total number of ENC to 535. All Australian ENCs are being distributed via the IC-ENC network, with limited direct distribution to selected maritime agencies. The current aim is to achieve full ENC coverage of Australian mainland waters in 2010. It is expected AUS ENC of Antarctica will be completed in 2011, this includes AU1 and AU2 coverage. Australia will seek access to the adjoining Russian Cells to aid in edge matching of ENC data. It is expected that GB104074 will be withdrawn on publication of the AU coverage.

ENC Cell number	Containing	Comment
AU190060	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU190090	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU190120	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU190150	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU270050	Aus 449 (500000),	
AU270060	Aus 449 (500000), Aus 450 (500000)	
AU270070	Aus 450 (500000), Aus 451 (500000)	
AU270080	Aus 451 (500000), Aus 452 (500000)	
AU270090	Aus 452 (500000) clipped to avoid overlapping Russian INT 9025 coverage	
AU270100	Aus 454 (500000)	
AU270110	Aus 454 (500000)	
AU260060	Aus 597 (1500000)	
AU260070	Aus 597 (1500000)	
AU260080	Aus 597 (1500000)	
AU250060	Aus 597 (1500000)	
AU250070	Aus 597 (1500000)	
AU250080	Aus 597 (1500000)	
AU466110	601	
AU467110	601	
AU367142	603	
AU468077	602	
AU468142	603	
AU469077	602	
AU5601P1	601 NewComb Bay	
AU5603P1	603 Boat Harbour	

4 NEW PUBLICATIONS & UPDATES

4.1 Australian National Tide Tables (ANTT) and Seafarer Tides

The ANTT and Seafarer Tides provide data on eight sites within the Antarctica region. Four are in the Australian Antarctic Territory (AAT) - Casey, Davis, Mawson and Commonwealth Bay; and two on off-lying islands - Heard Island and Macquarie Island. The other two stations

listed in the ANTT are Ross Island (New Zealand) and Port Martin (France). All are listed as secondary ports in the ANTT. Casey, Davis, Mawson and Macquarie Island are treated as Standard ports in Seafarer Tides to ensure consistency with information provided to the Antarctica research community.

For details see:

<http://www.hydro.gov.au/prodserv/antt.htm>

<http://www.hydro.gov.au/seafarer/tides/tides.htm>

4.2 Australian Seafarers Handbook

The second edition of the handbook was published in December 2009. It contains information in respect of the Antarctic region and is maintained by notice to mariners.

For details of the publication see: <http://www.hydro.gov.au/prodserv/ash.htm>

4.3 Maritime Gazetteer of Australia

The AHO maintains the Maritime Gazetteer of Australia as a web product. The gazetteer is a listing of all names shown on Australian navigational chart products. The resulting search provides the lat and long of the place, its feature code and the Australian navigational charts on which the place is depicted.

For details see: <http://www.hydro.gov.au/tools/mga/mga.htm>

4.4 Australian Chart and Publication Maintenance Handbook

The AHO is currently compiling this NP to describe the process for the upkeep of Australian digital and paper navigational products. It is due for publication in 2010.

4.5 Australia Pilot

Under the United Kingdom Hydrographic Office / Australian Hydrographic Office Sailing Directions Cooperation Project, revision of the UKHO Admiralty Sailing Directions - Australia Pilot NP 13 (2008), NP 14 (2007) and NP 15 (2009) have been published as new editions under dual UKHO and AHO badging.

5. MSI

Both NAVAREA X and Australia's Search and Rescue Region (SRR) extend to the coast of part of Antarctica. The Australian Maritime Safety Authority (AMSA) covers the area with NAVAREA X messages and SAR broadcasts.

AMSA only uses Inmarsat SafetyNET for MSI. No new infrastructure is planned.

6. S-55

No additional information to report.

7. CAPACITY BUILDING

No activity related to Antarctica has taken place since the last meeting.

8. OCEANOGRAPHIC ACTIVITIES

8.1 Sea level determination

Measuring sea level in the Antarctic region is important for a number of reasons:

- Sea level rise
- Study of inter-annual variability of the circum-polar current and links with inter-annual climate variability, such as the El Niño-Southern Oscillation phenomenon.
- The study of tides - particularly cross-shelf transport of heat.
- Vertical datum for maps and charts
- Operational purposes – tidal predictions for shipping, diving and other field operations
- Macquarie Island - coastal access
- Tsunami warning systems

The tide gauge work is in support the Australian Climate & Ecosystems (ACE) Cooperative Research Centre (CRC) Programme which involves five main research programs focused on Antarctic Marine Ecosystems, Climate Variability & Change, Ocean Control of Carbon Dioxide, **Sea Level Rise**, and Antarctic and Southern Ocean Policy.

A peer reviewed paper ‘Twentieth century constraints on sea level change and earthquake deformation at Macquarie Island’, published by Watson et al using 9 months of 1912–1913 sea level data with intermediate observations in 1969–1971, 1982 and 1998–2007 yields an estimate of absolute sea level change of $+2.0 \pm 0.8$ mm yr⁻¹ over the twentieth century.

(<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-246X.2010.04640.x/abstract>)

8.2 Tide gauge programme and achievements summer of 2009/010

Casey tide gauge

The tide gauges in the Casey wharf have operated successfully for the past year. The bottom mounted pressure gauge will have stopped logging and will be retrieved when divers get to Casey station. Datum control of both tide gauges was undertaken in February 2009 using the floating GPS technique.

Mawson

The existing bottom mounted tide gauge was downloaded in June 2010 and the second bottom mounted tide gauge removed from Horseshoe Harbour. The bottom mounted tide gauge and the onshore tide gauge are operational.

Davis

The tide gauge has not been downloaded as yet this winter.

The work requires dedication and persistence and without this dedication volunteers are not successful.

Larsemann Hills / Nella Fjord tide gauge

The tide gauge batteries are now flat and the tide gauge will need to be removed at the next opportunity.

Macquarie Island tide gauge

Both the Aquatrak and Druck pressure gauges have functioned successfully for the past year. A successful calibration was carried out in March of 2009.

Boat Harbour / Cape Denison / Commonwealth Bay

The tide gauge in Boat Harbour operated successfully for two years and was retrieved in February 2010. Levelling between tide gauge bench marks will be done in the summer of 2010/11.

A second tide gauge by the French has operated successfully for three years.

Processing data – BoM National Tidal Centre

The Bureau of Meteorology (BoM) National Tidal Centre personnel in Adelaide process the tidal data and calculate tidal predictions which are available from the [BoM](#) and [Australian Antarctic Division](#) station website pages. Tidal data is available on request to the Australian Antarctic Division. (henk.brolsma@aad.gov.au)

8.3 Tide gauge program summer 2010/11

Mawson – continue to download the tide gauge in Horseshoe Harbour

East Arm – shore based tide gauge - continue to stream data to Australia.

Calibrate the tide gauges using a dual frequency GPS receiver.

Davis – download the tide gauges. Calibrate tide gauges using GPS on ice technique.

Casey – continue streaming of data to Kingston. No field activities anticipated.

Macquarie Island – continue streaming of data to Kingston. Calibrate tide gauge during Voyage 5 resupply in April 2011.

Boat Harbour – Level between tide gauge bench marks.

9. OTHER ACTIVITIES

The Australian Antarctic Division (AAD) has an air link from Hobart on mainland Australia to Casey station that will integrate with the AAD's existing shipping operations.

For details see <http://www.aad.gov.au/default.asp?casid=33742>

The AAD website (www.aad.gov.au) provides information on Environmental Impact Assessment of activities, Pollution, Quarantine, Navigating near Antarctica, Landing Ashore and the Australian Antarctic Stations.

Information on the Antarctic and Southern Ocean weather can be found on the Australian Bureau of Meteorology website (www.bom.gov.au).

10. CONCLUSION

The Australian Antarctic Division has sent a proposed hydrographic programme to the Australian Hydrographic Service for inclusion in the Hydroscheme. It is hoped that logistics will allow the AAD to support the AHS in conducting hydrographic surveys in Antarctic waters.

WGS84 positions CAN be plotted directly onto this chart

**HI 468 - PLANNING CHART
ANTARCTICA - APPROACHES TO DAVIS**

Printed 12 March 2010

PROVISIONAL

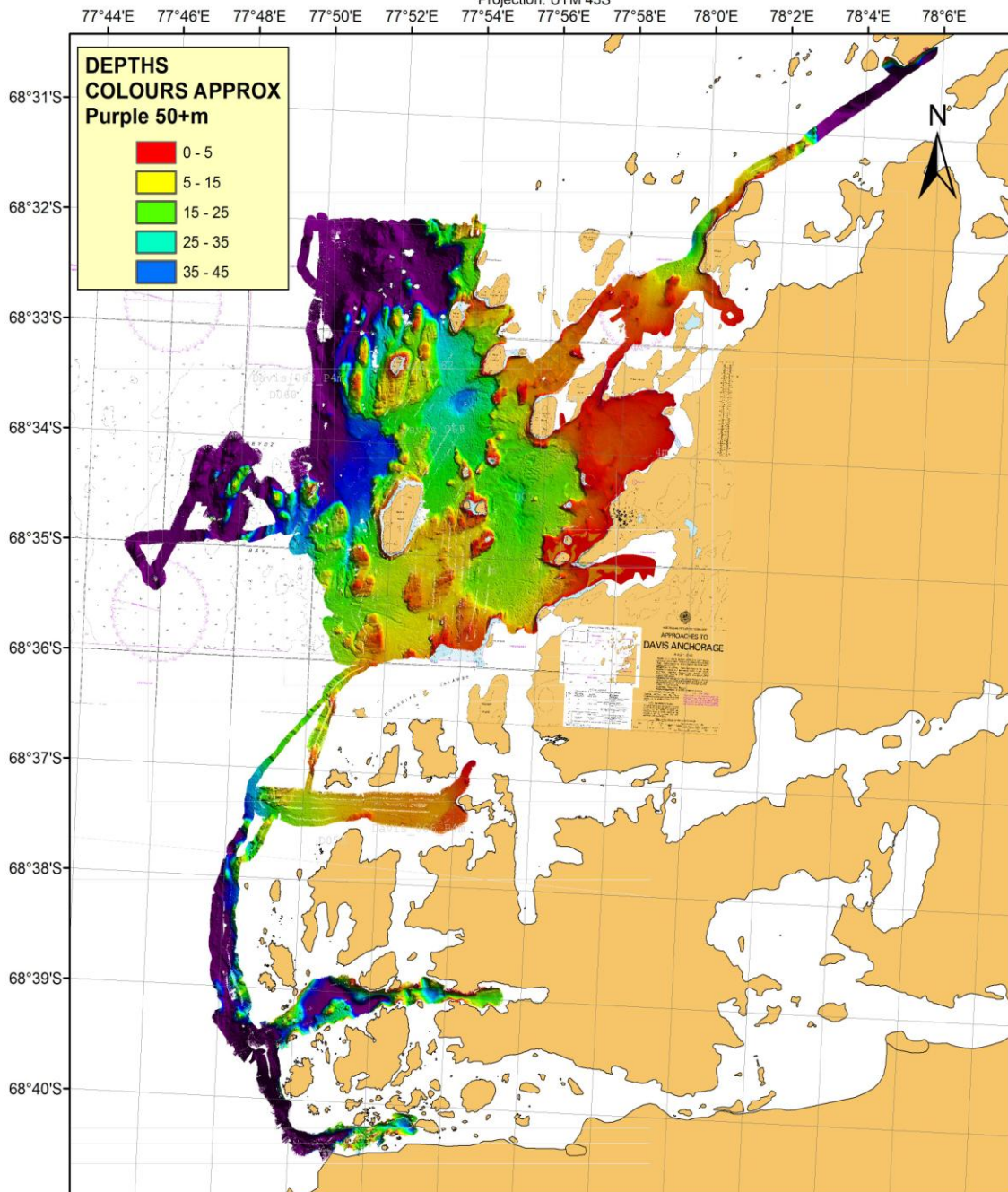
This is a Provisional chart and has not undergone the full Hydrographic Service quality assurance processes. There may be deficiencies in the quality or thoroughness of the data shown. It should be used as part of navigation with caution, and only when justified by the operational situation.



NOT TO BE USED FOR NAVIGATION

This chart is not intended for navigation. Uncharted dangers to navigation may exist in the depicted area. This MMGI product is not intended for navigation in normal circumstances. Any such use should be at the discretion of the operational and/or tactical commander, taking into account the circumstances at the time.

Datum: WGS84
Projection: UTM 43S



1:65,000 at 68°35'S for A3 prints.

DEPTHS IN METRES
NOT TO BE USED FOR NAVIGATION

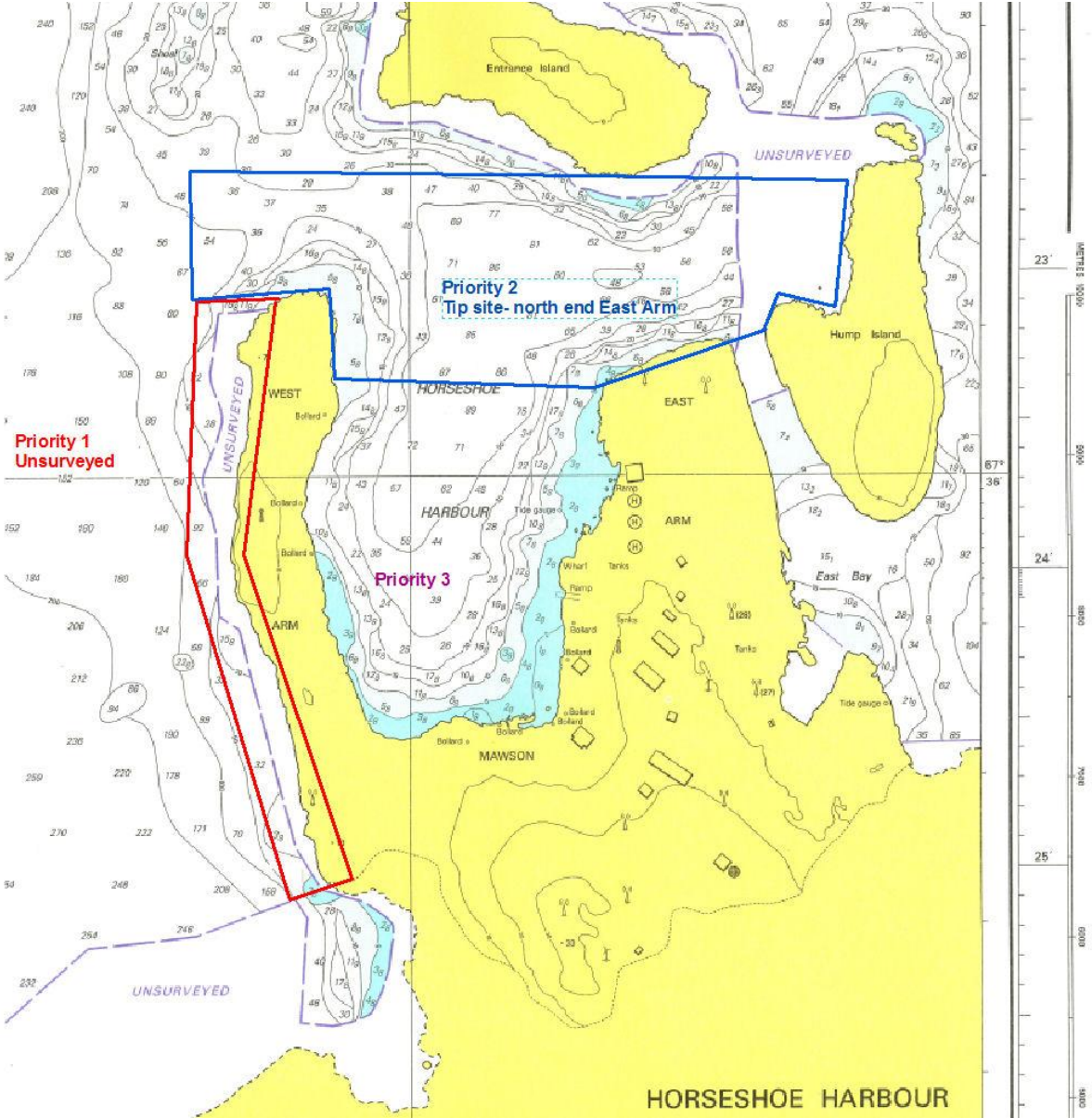
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NOT CORRECTED FOR NOTICES TO MARINERS

Produced by:
Deployable Geospatial Support Team
Australian Hydrographic Service

PROVISIONAL

Area to be surveyed at Mawson



Seabed Topography / Bathymetric Contour Map

