HYDROGRAPHIC SURVEY STANDARDS AND DELIVERABLES

Prepared for Flinders Port Holdings by Peter Hanson
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Contents

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Document Amendment Table

Version	Prepared by	Date	Amendments
0	Peter Hanson	22 April 2022	

1. Introduction

Flinders Port Holdings (FPH) operate seven ports. Under their obligations in the Port Operating Agreements and in accordance with the recommendations of the Australian Hydrographer, they carry out hydrographic surveys of those seven ports every year.

2. Hydrographic Survey Reference Standards

These FPH Standards are in part derived from the guidelines contained in:

- International Hydrographic Organization Standards for Hydrographic Surveys (S-44 Edition 6.0.0 September 2020) and
- Principles for Gathering and Processing Hydrographic Information in Australian Ports (Version 1.5 – November 2012 Edition)

3. Hydrographic Survey Criteria

All surveys shall be conducted applying the hydrographic survey industry best practice and will meet the requirements of a Ports Australia Class A hydrographic survey.

Data emanating from a Class A survey is to meet the requirements for 'Special Order' surveys in accordance with IHO Publication S-44. While it is acknowledged that the latest version of S-44 introduces a superior classification to 'Special Order', namely 'Excusive Order', it is not recommended for FPH to adopt this standard in its annual hydrographic survey program.

Note: The definition of a Class A survey should not be confused with the 'Zone of Confidence' (ZOC) classification, which refers to the quality of the data used in the production of AHO paper charts and ENCs.

All surveys conducted over FPH ports shall be approved by a Level 1 Certified Professional in Hydrographic Surveying (CPHS 1), as certified by the Australian Hydrographic Surveyors Certification Panel (AHSCP) of the Surveying and Spatial Sciences Institute (SSSI). In addition, the CPHS 1 must have demonstrated experience in conducting surveys within a port environment and application for navigational safety.

In addition to the requirements of a Ports Australia Class A hydrographic survey, FPH shall, as a minimum requirement, conduct its hydrographic surveys to achieve the following criteria in its final processed survey data:

- Specify the horizontal datum used and control points to connect to the horizontal datum (eg GDA 2020 via the Continuously Operating Reference Station network)
- Achieve a Total Horizontal Uncertainty (THU) of +/- 0.5m at a 95% confidence level
- The survey should be connected to the port's standard port bench mark
- Soundings should be reduced to Port Datum
- The relationship to the ellipsoid height of the standard port bench mark should also be ascertained
- Achieve a Total Vertical Uncertainty (TVU) of +/- 0.15m at a 95% confidence level
  Note: This is better than Special Order
- 1.0m Object detection (ie a minimum of 3 hits along the track direction)
- Obtain 200% coverage over the survey area
  Note: This is better than Special Order
- Measure the attitude (roll, pitch, heave and squat) of the vessel
- Real Time Tides are to be recorded for the duration of the survey
- The speed of sound through the water column shall be recorded during the survey using a Sound Velocity Profiler
- Coverage shall be extended to a minimum of 50 metres outwards from the channel toe data lines where applicable and practicable and
- Final processed data shall be derived from the mean sounding in a 0.5 metre bin derived from the full density survey data

4. Hydrographic Survey Deliverables

The following Hydrographic Survey Deliverables shall be provided for all hydrographic surveys conducted for FPH:

4.1 Charts and Survey Data

- One copy of the survey charts in AutoCAD (*.dwg) format
- One digital copy of the survey charts in Adobe (*.pdf) format
- One digital copy of all raw survey data, calibration reports and logs
- One digital copy of the final processed hydrographic survey data of the mean depths in a 0.5 metre bin with the horizontal position of the mean depth preserved from the statistically derived surface in Excel (*.csv) format
- Three (3) paper copies of the survey charts duly signed by the supervising CPHS 1 surveyor as being representative of the final processed hydrographic survey data (ie one for the vertiplan cabinet of current charts, one for the Pilots' Room movable chart index and one for the affected Regional port, where applicable)
- Survey charts shall be plotted on A1 size sheets
- Charts are to be plotted at a scale of 1:1250 for River Sheets and 1:500 for Berth Plans
  Note: There are approximately 80 River Sheets and 30 Berth Plans
- Contain soundings rounded to the nearest decimetre
- Contain contours at appropriate intervals
  Note: Contours are imported by merging the .dwg file supplied by the surveyor
- Contain 'Volume to Clear' calculations to return each River Sheet or Berth Box to its Declared Depth – see an example of a Cut / Fill Report in Appendix D
- Address all of the requirements outlined in the Ports Australia requirements to achieve a Class A survey
- All charts shall include the depiction of any infrastructure within or near the survey area, including but not limited to wharf structures, fenders, aids to navigation etc.
- All charts shall be in metres geo-referenced to GDA 2020 and projected onto MGA Zone 53 or 54 (ie Zone 53 for Wallaroo, Thevenard, Port Lincoln, Port Giles and Klein Point and Zone 54 for Port Adelaide and Port Pirie)

4.2 Metadata

Metadata must be provided for all digital data detailing as a minimum:

- Approval from a Level 1 Certified Professional in Hydrographic Surveying (CPHS 1)
- Author, date, accuracy, horizontal and vertical datum
- A file naming convention to comply with FPH registered drawings nomenclature
- Metadata details may be shown in the title block of the CAD files, if appropriate

4.3 Survey Reports

Survey Reports shall address and contain as a minimum:

- The Report shall include a diagram to an appropriate scale indicating the bounds of the survey in relation to its surrounds including the relevant 200% coverage
- An Uncertainty Statement for both the Horizontal and Vertical Uncertainty achieved – for examples see Appendices A and B
- The results of the survey are to be sent to the Australian Hydrographic Office to ensure the official navigational charts reflect the port's Declared Depth – for example of Form AH 68 (A) see Appendix C
- Record of Hydrographic Survey including all personnel, software and equipment used – for example see Appendix E

All field notes / logs

- Photographic evidence of permanent and temporary installations of equipment employed during the survey
- Check measurements against official bench marks including results and subsequent adjustments and calibrations

Survey data processing methodology

- Survey data quality control including a traceable connection between real time checks and calibrations
- An 'a priori' assessment of accuracy
- Proof that requirements and accuracy has been achieved through checks, calibrations and on-going QC
- A signed statement by the CPHS 1 surveyor that the hydrographic survey and its processes were conducted under his or her direct supervision
- A signed statement by the CPHS 1 surveyor that the Hydrographic Deliverables comply with these FPH Hydrographic Survey Standards

5. Process Owner

The Chief Hydrographic Surveyor has overall responsibility for this procedure.

6. *Glossary of Terms used in Hydrographic Surveying*

AHO – Australian Hydrographic Office

AHSCP – Australian Hydrographic Surveyors Certification Panel

CD – Chart Datum

CORS – Continuously Operating Reference Station

CPHS – Certified Professional in Hydrographic Surveying

ENC – Electronic Navigation Chart

GDA – Geocentric Datum of Australia

IHO – International Hydrographic Organisation

LAT – Lowest Astronomical Tide

MBES – Multi Beam Echo Sounder

MGA – Map Grid of Australia

PA HSWG – Ports Australia Hydrographic Surveyors Working Group

PA TSLWG – Ports Australia Tides and Sea Level Working Group (formerly the PCTMSL (Permanent Committee on Tides and Mean Sea Level))

POA – Port Operating Agreement

POSMV – Position Orientation System for Marine Vessels

SVP – Sound Velocity Profiler

THU – Total Horizontal Uncertainty

TVU – Total Vertical Uncertainty

ZOC – Zone of Confidence

Appendix A – Example of Uncertainty Statement for the Felix

D. Uncertainty Statement

Horizontal and vertical uncertainty have been calculated using recommendations in the International Hydrographic Organisation (IHO) publication "Standards for Hydrographic Surveys (S-44)" 5th Edition. In the "IHO Standards for Hydrographic Surveys (S-44) 5th Edition" confidence level is described as "the probability that the true value of a measurement will lie within the specified uncertainty from the measured value". Confidence levels depend on the assumed statistical distribution of the data and are calculated differently for 1 dimensional (eg depth) and 2 dimensional (eg position), respectively 1.96 x standard deviation and 2.45 x standard deviation.

D.1 Horizontal Uncertainty

Factors to consider in assessing the Total Horizontal Uncertainty (THU) of the sounding data are listed below:

- It has been determined that the positioning system on the survey vessel *Felix* when using the Fugro Marinestar HP corrections has a horizontal uncertainty of approximately 20cm at 68% confidence.
- The POS MV Wavemaster V5 has a quoted standard deviation (68% confidence) for pitch/roll of 0.03° and for heading of 0.03°. This equates to a positional uncertainty at 30m range of approximately 3cm for pitch/roll and heading.

Therefore an estimation of the THU at 30m swath width can be calculated as:

THU = $2.45 \times \sqrt{(0.20^2 + 0.03^2 + 0.03^2)}$ = **±0.5m** at 95% Confidence.

Although a full seafloor search has been achieved for this survey, 100% overlap has not been achieved. Therefore the hydrographic surveyor has determined the order of this survey to be 1a.

D.2 Vertical Uncertainty

The maximum allowable Total Vertical Uncertainty (TVU) as determined by the IHO for a specific depth is calculated using the formula : TVU = $\pm \sqrt{(a^2+(b*d)^2)}$ where :

a : *represents that portion of the uncertainty that does not vary with depth*
b : *is a coefficient which represents that portion of the uncertainty that varies with depth*
d : *is the depth and*
b x d : *represents that portion of the uncertainty that varies with depth*

For order 1a surveys it has been determined by the IHO that a=0.5 and b=0.013. Therefore in 5m of water the TVU (order 1a) as determined by the IHO should not exceed ±0.50m.
To calculate the TVU for this survey 8 sources of error have been identified (Table 3). An estimation of the maximum TVU for this survey in 5m of water with up to 20m swath width either side of vessel can be calculated as follows:

TVU (5m depth) = $1.96 \times \sqrt{(.0.01^2+0.02^2+0.02^2+0.02^2+0.02^2+0.03^2+0.02^2+0.05^2)}$
= ± **0.15m** at 95% confidence

Error Source	Depth 5m
Sound Velocity (±1m/s)	0.01
System	0.02
Draft	0.02
Bottom Composition	0.02
Squat	0.02
Attitude (roll and pitch)	0.03
Water Level	0.02
Heave	0.05
TVU (this survey)	0.15
TVU (Order 1a)	0.50

Table 3 – Uncertainty assessment for this survey

These estimates refer to the multibeam portion of this survey and reflect a worst-case scenario based upon sea conditions at the time of the survey, maximum line spacing and overlap. The bulk of the survey would fall well within these limits.

Appendix B – Example of Uncertainty Statement for the Pathfinder

D. Uncertainty Statement

Horizontal and vertical uncertainty have been calculated using recommendations in the International Hydrographic Organisation (IHO) publication "Standards for Hydrographic Surveys (S-44)" 5th Edition. In the "IHO Standards for Hydrographic Surveys (S-44) 5th Edition" confidence level is described as "the probability that the true value of a measurement will lie within the specified uncertainty from the measured value". Confidence levels depend on the assumed statistical distribution of the data and are calculated differently for 1 dimensional (eg depth) and 2 dimensional (eg position), respectively 1.96 x standard deviation and 2.45 x standard deviation.

D.1 Horizontal Uncertainty

Factors to consider in assessing the Total Horizontal Uncertainty (THU) of the sounding data are listed below:

- It has been determined that the positioning system on the survey vessel *Pathfinder* has a horizontal uncertainty of approximately 20cm at 68% confidence.
- The POSMV Wavemaster V5 has a quoted standard deviation (68% confidence) for pitch/roll of 0.03° and for heading of 0.03°. This equates to a positional uncertainty at 30m range of approximately 3cm for pitch/roll and heading.

Therefore an estimation of the THU at 30m swath width can be calculated as:

THU = $2.45 \times \sqrt{(0.20^2 + 0.03^2 + 0.03^2)} = \pm 0.50$m at 95% Confidence.

This estimation is well within the IHO specifications for Special Order surveys which specify a THU of ±2m.

D.2 Vertical Uncertainty

The maximum allowable Total Vertical Uncertainty (TVU) as determined by the IHO for a specific depth is calculated using the formula : TVU = $\pm \sqrt{(a^2+(b*d)^2)}$ where :

a : *represents that portion of the uncertainty that does not vary with depth*
b : *is a coefficient which represents that portion of the uncertainty that varies with depth*
d : *is the depth and*
b x d : *represents that portion of the uncertainty that varies with depth*

For special order surveys it has been determined by the IHO that a=0.25 and b=0.0075. Therefore in 10m of water the TVU (special order) as determined by the IHO should not exceed ±0.26m. To calculate the TVU for this survey 8 sources of error have been identified (Table 5). An estimation of the TVU for this survey in 10m of water can be calculated as follows:

TVU (10m depth) = $1.96 \times \sqrt{(.0.02^2+0..03^2+0.02^2+0.03^2+0.02^2+0.02^2+0.07^2+0.05^2)}$
= ± **0.20m** at 95% confidence

Error Source	Depth		
	10m	20m	30m
Sound Velocity (±1m/s)	0.02	0.03	0.04
System	0.03	0.03	0.03
Draft	0.02	0.02	0.02
Bottom Composition	0.03	0.03	0.03
Squat	0.02	0.02	0.02
Attitude (roll and pitch)	0.02	0.03	0.04
Tide	0.07	0.07	0.07
Heave	0.05	0.05	0.05
TVU (this survey)	**0.20**	0.21	0.23
TVU (IHO Special Order)	0.26	0.29	0.34

Table 5 – Uncertainty assessment for this survey

These estimates reflect a worst case scenario based upon sea conditions at the time of the survey and maximum line spacing used. The bulk of the survey would fall within these limits.

Appendix C – Example of Form AH 68 (A)

AUSTRALIAN HYDROGRAPHIC SERVICE

SURVEY SUMMARY

INSTRUCTIONS FOR RENDERING

This Survey Summary form should be completed for all data rendered to the Australian Hydrographic Office which is not accompanied by a full written report, Method Statement, Plans or other reports which would normally include details such as those in this form.

This will provide the minimum information required to manage data within Australia's area of charting interest.

The preferred format of bathymetric data is:

- **Processed,**
- **Ungridded for singlebeam and multibeam, shoal biased, true position,**
- **Provided as either GSF, ascii .xyz, .dxf, .dgn, or Hydrographic Transfer Format (.htf, available from the AHS website http://www.hydro.gov.au). If these formats are not available, full source data will be accepted.**

Any ancillary data such as tides, benchmarks, linework and final levelling heights etc. is also of assistance. If supplying such data, please include positional data of deployed equipment.

Please forward survey data with the completed Survey Summary to:

Hydrographer of Australia
C/- Manager Digital Information
Australian Hydrographic Office
Locked Bag 8801
Wollongong NSW 2500

Guidance on Confidence Levels and Error Ellipse scaling is contained in ICSM Publication Number 1 (SP-1), uncertainties from IHO publication S-44 or by contacting the Validation and Assessment Section at the Australian Hydrographic Office on 02 4223 6500.

SURVEY SUMMARY

General

Survey Title and ID		**Locality**	
Port Giles Berth and Approach Soundings		West Gulf St Vincent, South Australia	
Survey Authority		**Survey Sponsor/Custodian**	
HydroSurvey Australia		Flinders Ports Pty Ltd	
Surveyor in Charge and Qualification		**Date this Survey Summary was completed**	
Peter Woolfall (SSSI Level 1)		22nd July 2019	
Start Date of Survey		**End Date of Survey**	
16th July 2019		16th July 2019	
Survey Platform/Vessel Name		**Scale** (if applicable)	
S.V. Pathfinder		Berths 1:500 / Approach 1:1000	
Purpose of the Survey			
Special Order survey along shipping approach and berth			
List of Data Provided			
3 x csv files			
Do you require the media returned and to which address?	No	If Yes, address details	

Horizontal Control

Soundings are on the following datum (WGS 84 preferred by not essential).			
Datum	GDA 94	**Spheroid**	GRS 80
Projection	MGA 94	**Zone**	53 South
Was the positioning system validated?	Yes	**Were laybacks applied?**	No
Estimated horizontal accuracy of soundings at 2σ (95%) confidence level (Calculations can be included as an attachment)		+/- 0.5 metres	

Vertical Control

Tides applied	Soundings corrected using Observed Tides	**Sounding Datum**	Lowest Astronomical Tide
Tide Station Details	Port Giles Wharf (Port No. 61685) (35°02'S 137°46'E)		
Benchmark (BM) used and height difference between BM and Datum	Chart Datum is 5.207m below NMV/E/58, brass rod in concrete foundation block for overhead conveyor at start of jetty. NMV/E/58 = E.L.3.662m AHD (17/3/83)		
Geoid details if using GPS tides	N/A		
Were soundings corrected for draught?			Yes
Estimated vertical accuracy of soundings at 1.96σ (95%) confidence level (Calculations can be included as an attachment)			0.15 metres

Please forward completed forms, along with the survey data (digital data or fairsheets [if applicable]) to:
Hydrographer of Australia, C/- Manager Digital Information, RAN Hydrographic Office, Locked Bag 8801, Wollongong, NSW 2500

Details of Survey Execution

The following positioning systems were used		
Positioning System 1	POSMV Wavemaster V5	
Positioning System 2		
Base Station	Fugro Marinestar G2 (ITRF to GDA94 corrections (2019.25 epoch))	
The following sounding systems were used		
	Model / System Details	**Frequency**
Echosounder 1	R2Sonic SONIC 2022 MBES	400 kHz
Echosounder 2	N/A	
Motion Reference Unit	POS MV Wavemaster V5 IMU 39	
Towed Side Scan Sonar	N/A	kHz
Hull Mounted Side Scan Sonar	N/A	kHz
	Model / System Details	**Spot density**
LIDAR	N/A	X by X metres
Sweep System	N/A	

Logging and Processing Systems used		**Version**
Logging	QINSy	8.18.3
Processing	Qimera / Terramodel	1.7.5 / 10.61m
Was the survey systematically controlled with planned survey lines or methods?		Yes
Were soundings corrected for sound velocity?		Yes
Was full feature detection achieved as defined in IHO publication S-44?		Yes
Were all shoal depths systematically investigated and their least depths determined?		Yes
Has the data been thinned from that collected?		Yes
If thinned, what thinning method and bin size was used?	Approach : 50cm bin thinned (shoal bias) to 9m circle of influence (1 to 1000) Berth : 50cm bin thinned to 4m circle of influence (1 to 500)	
If thinned, have least depths and their positions been retained?		Yes

Remarks (If applicable):
Enter additional remarks or amplifications here

Shoals and Dangers

This section seeks comment on any features that may be dangerous to surface navigation.

Please forward completed forms, along with the survey data (digital data or fairsheets [if applicable]) to:
Hydrographer of Australia, C/- Manager Digital Information, RAN Hydrographic Office, Locked Bag 8801, Wollongong, NSW 2500

Appendix D – Example of Cut / Fill Report

Cut/Fill Report

Generated: 2022-02-11 11:52:07
By user: altsl
Drawing: T:\13 Survey\Port Lincoln\Drawings\T:\13 Survey\Port Lincoln\Drawings\Lincoln_Berths_All2021.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (sq.m)	Cut (Cu. M.)	Fill (Cu. M.)	Net (Cu. M.)
Berth 8 Vol	full	1.000	1.000	1932.17	0.00	2657.22	2657.22<Fill>
Berth 5 Vol	full	1.000	1.000	28260.37	78.30	19819.29	19740.99<Fill>
Berth 4 Vol	full	1.000	1.000	25524.87	97.43	12622.29	12524.86<Fill>
Berth 9 Vol	full	1.000	1.000	2673.32	46.89	4951.82	4904.93<Fill>
Berth 2 Vol	full	1.000	1.000	4741.06	567.77	2813.43	2245.66<Fill>
Kirton Vol	full	1.000	1.000	11193.00	0.03	22876.05	22876.02<Fill>
Berth 6 Vol	full	1.000	1.000	11492.78	98.79	7301.00	7202.20<Fill>
Berth 7 Vol	full	1.000	1.000	4557.55	401.51	3497.69	3096.19<Fill>

Totals

	2d Area (sq.m)	Cut (Cu. M.)	Fill (Cu. M.)	Net (Cu. M.)
Total	90375.13	1290.71	76538.79	75248.09<Fill>

* Value adjusted by cut or fill factor other than 1.0

CutFillReport.xml[11/02/2022 11:52:51]

Flinders Ports

SURVEY BRANCH
RECORD OF HYDROGRAPHIC SURVEY

Hydro Survey

SURVEY OPERATIONS									
SURVEY NUMBER	*22_004*								
PROJECT	*ANI Osborne Soundings (including shiplift)*								
CLIENT	*Flinders Ports*								
SURVEYOR	*Peter Woolfall*	COXSWAIN	*John Bird*	JOB NUMBER	*HA2007*	PACKET	*Port Adelaide*	*Port River*	*10/02/22*
PROJECT COMMENTS									
SURVEY DATE	START :	*10FEB22*		FINISH :	*23 MAR 22*				
ADVANCE NOTICE OF SURVEY FORWARDED :	YES	NO ✓				NOTED			
PROJECT FILES	*22_004_ANI Osborne*			ARCHIVE	*Drive A*				
RELIABILITY CODE	4Z ✓	Other:		GRID	AMG84	MGA94	MGA2020 ✓	PCSA	
POSITION ACCURACY	+/-0.5m	Other:		ZONE			*54*		
SOUNDING ACCURACY	+/-0.15m	Other:		DATUM			GDA2020	WGS84	
SURVEY VESSEL	FELIX	PATHFINDER ✓		PROCESSING	Qimera 2.4.4		Terramodel 10.61N		
SURVEY VESSEL SPEED	0 - 2.5 m/sec			ACQUISITION	Qinsy Ver: 9.4.3				
SOUNDER	TYPE	R2Sonic SONIC 2022 Ver 5.0							
	FREQ	400Khz ✓		125 Khz					
AVE LINE SEPARATION	15m	SOUNDING SPACING		N/A	SPEED OF SOUND		N/A		
FIXING TYPE	TRIMBLE DGPS	RTK ✓		GPS – AUTON			POSMV V5 ✓		
TIDE OBSERVATION PT	PORT RIVER : Inner and Outer Harbor (checks only)			TIDE LOGGER: MAIN GAUGES					
REFERENCE STATION	POSMV NTrip Client / VRSNow Sensor / OHBase SA_Port Adelaide (POAD) 20_TVN_NEAREST_CMR_PLUS) / Ausgeoid2020 (-1.45 to PD) Transmitting GDA2020								
TIDE DATUM	AHD		LAT ✓	CD			OTHER		
HEAVE ADJUST	YES ✓	NO	SQUAT ADJUST	YES ✓	NO				
SURVEY BOOKS	SKETCH BK		FIELD BK		LEVEL BK				
SOUNDINGS	DEPTH ACCURACY +/- 0.15	Qimera GRID 50cm	CIRCLE OF INFLUENCE 2m (1:200) / 4m (1:500) / 8m (1:1000)						

REMARKS

Hoizontal Datum:
Map Grid of Australia 2020 (MGA2020) Zone 54

Notes:

VRSNow GDA2020
Station : SA Port Adelaide
Station Code : POAD
Lat: S 34° 46' 40.08142"
Lon: E 138° 28' 57.10140"

Height: 20.907 (Ellipsoid)
AHD: 21.025
Sensor type: TRIMBLE NETR9

D.O.S.
ANI Osborne : 23 March 22

Lauren:
Updates to detail:
Port River Sh9-11_ANI Piles_MGA2020.dwg
Port River Sh9-11_Submerged Sheet Pile Wall_MGA2020.dwg
And replace previous yellow buoys with
Port River Sh9-11_ANI Yellow Buoys_MGA2020.dwg

Filenames:	T:\13 Survey\Port Adelaide\2022\Data\ANI Osborne ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_50cmbin.csv ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_50cmbin_neg snds.csv ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to200_2mCOI.csv ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to500_4mCOI.csv ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to1000_8mCOI.csv ANI Osborne AWD Shiplift_MGA2020Z54_PD_23Mar22_1to500_4mCOI.csv	DXF/DWG Filename:	T:\13 Survey\Port Adelaide\2022\Data\ANI Osborne ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to200 contours.dwg ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to500 contours.dwg ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to1000 contours.dwg ANI Osborne AWD Shiplift_MGA2020Z54_PD_23Mar22_1to500 contours.dwg

T:\13 Survey\Port Adelaide\2022\Reports\ANI Osborne_10feb-23Mar22_Record of Hydrographic Survey.docx

Hydro Survey

DATA MANAGEMENT

FILES					
PURPOSE	**INTERIM**	**DRG NO / DRAWER**	**SCALE**	**PLAN TITLE**	**SUPERSEDES DRG**
Highest density file	T:\13 Survey\Port Adelaide\2022\Data\ANI Osborne ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_50cmbin.csv				
Thinned File 1 : 200	T:\13 Survey\Port Adelaide\2022\Data\ANI Osborne ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to200_2mCOI.csv				
Thinned File 1 : 500	T:\13 Survey\Port Adelaide\2022\Data\ANI Osborne ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to500_4mCOI.csv ANI Osborne AWD Shiplift_MGA2020Z54_PD_23Mar22_1to500_4mCOI.csv				
Thinned File 1 : 1000	T:\13 Survey\Port Adelaide\2022\Data\ANI Osborne ANI Osborne_MGA2020Z54_PD_10feb-23Mar22_1to1000_8mCOI.csv				

GIS					
SOUNDING DATABASE					
SOUNDING POLY REF <6>		STD AREA REF <7>			
DISPLAY FILENAME <45>					
ENTERED TO GIS		BY WHOM			
TRANSFERRED TO ARCHIVE		TRANSFERRED TO DISPLAY		DATE	