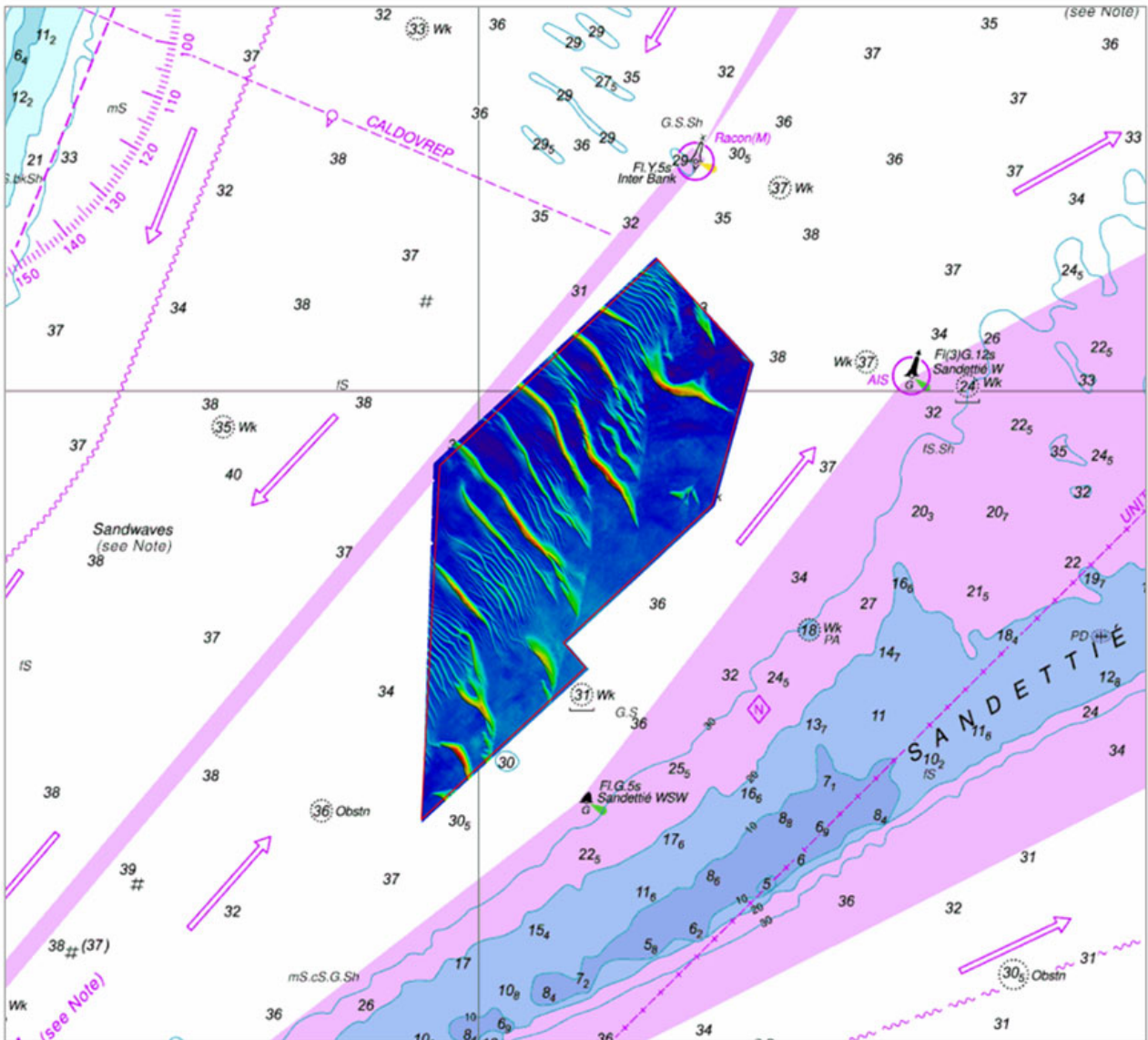




DOVER STRAIT

DEEP WATER ROUTE

ASSESSMENT ON THE ANALYSIS OF
ROUTINE RESURVEY AREA DWR T
FROM THE 2013 SURVEY



DOVER STRAIT

DEEP WATER ROUTE

Summary Assessment DWR T/2013

A summary assessment of the 2013 hydrographic survey of the area: to monitor recent seabed movement; to identify any implications for shipping; and to make recommendations for future surveys.

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DEEP WATER ROUTE, 2013

1 EXECUTIVE SUMMARY

The Area and Recent Changes

- 1.1 Area DWR T is currently surveyed on a 3-year cycle under the Civil Hydrography Programme, although postponement of the 2012 survey resulted in a 4 year period between the latest two surveys. It lies within the Sandettié Deep Water Route (DWR) and covers part of a recommended Deep Draught Route (DDR) for vessels of 20.7 to 22.6 metres draught. The route consists of a series of waypoints and a one nautical mile corridor.
- 1.2 The Department for Transport recommends an under-keel allowance for deep draught vessels using this part of the DDR of 6.4 metres. A Netherlands Deep Draught Planning Guide, which breaks down the different factors that affect dynamic draught, states that a lesser under-keel clearance at the point of the controlling depth within DWR T should be considered.
- 1.3 A sandwave field crosses the area. In the 2013 survey, the minimum depth in the DDR corridor is 28.5 metres.
- 1.4 Examination of surveys back to 1992 shows no clear overall trend in changes to sandwaves in the area.

Reasons for Continuing to Resurvey the Area

- 1.5 Depths over sandwaves in the area are relatively shallow and have the potential to provide the minimum depth along the recommended Deep Draught Route.

Recommendations

- 1.6 It is recommended that the 3-year survey interval is retained, but restricted to a focused area covering the critical sandwaves. The proposed focused area is shown at [Annex L](#). The area covers all areas where depths of less than 30 metres have been found in the last five surveys (2000 – 2013). The survey interval for the remainder of the area should be extended to 6 years.

2 INTRODUCTION

- 2.1 This Assessment is produced by the United Kingdom Hydrographic Office (UKHO) for the Maritime and Coastguard Agency (MCA).
- 2.2 Analysis of the Routine Resurvey Areas forms part of the Civil Hydrography Programme and the reports are made available to members of the Committee On Shipping Hydrography (COSH) through the UKHO website, before being presented to the Civil Hydrography Working Group. When approved, the recommendations are incorporated into the Routine Resurvey Programme. The report is governed by a Memorandum of Understanding between the DfT (including the MCA) and the MOD (including the UKHO).

3 HISTORY

- 3.1 Area DWR T was established in 1984, when an Understanding between the Hydrographers of the Netherlands, Belgium, France and the United Kingdom was reached on national responsibilities for hydrographic surveying in the southern North Sea and Dover Strait. In effect, the Understanding modified the surveying limits that would be delineated by official

territorial waters / continental shelf boundaries in order to ensure that efficient and coherent surveys are conducted. The area covers part of a Deep Draught Route (DDR) for vessels of 20.7 to 22.6 metres draught and was to be resurveyed annually.

- 3.2 Following assessment of the 1985 survey, the survey interval was extended to 3 years. However, in 1989 annual surveying of the area was reintroduced.
- 3.3 In 1993, the limits were extended to encompass the 1 Nautical Mile DDR corridor.
- 3.4 Following recommendations made in the 1997 Assessment, the survey interval was extended again to the current 3 year interval.
- 3.5 The assessment of the 2003 survey recommended a 3 year focus of shoal sandwaves, with the full survey extending to 12 years. However the area has continued to be fully surveyed every 3 years to allow survey lines to be run parallel to shipping rather than at right-angles.
- 3.6 Details of the area, including survey history, are at [Annex A](#).

4 DESCRIPTION OF THE AREA

- 4.1 DWR T lies within the Sandettié Deep Water Route (DWR), which forms part of the north-east bound lane of the Dover Strait Traffic Separation Scheme (TSS). Sandettié Bank lies to the southeast and South Falls to the west. DWR T comprises an area of 3.16 sq NM (10.76 sq km).
- 4.2 The section between waypoints G and H of the DDR recommended by the Netherlands authorities passes through DWR T. The Department for Transport recommends an Under Keel Allowance (UKA) for deep draught vessels using this part of the route of 6.4 metres. Assuming a maximum draught of 22.6 metres for Europoort, this gives a critical depth for DWR T of 29 metres. Paragraph 5.3 gives details of guidance provided in the Netherlands Deep Draught Planning Guide.
- 4.3 A sandwave field lies across the area. These sandwaves are widely spaced and generally orientated 145°/325°, ranging in height from 2 to 10 metres. Within the DDR route corridor, a minimum depth of 28.5 metres was observed in the 2013 survey. The sediment transport implied from sandwave asymmetry is to the south-west along the south-east side of the sandwave field and generally in equilibrium along the north-west side of the sandwave field. The area limits are shown at [Annex C](#) and sandwave migration is shown in [Annexes D](#) and [E](#).

5 SHIPPING IN THE AREA

- 5.1 Vessels drawing up to 22.6 metres are known to use the route. An indicative route adopted by deep draught vessels, based on sample data, is shown at [Annex B](#). This indicates that vessels generally adopt a track slightly to the north of the recommended route, in doing so reducing the degree of course change required at the next waypoint.
- 5.2 Due to the depth of water in the area, changes in depth would only be of concern to deep draught vessels.
- 5.3 The Netherlands Deep Draught Planning Guide (HP 8) contains details on passage from Greenwich Buoy to Europoort for vessels with a draught of between 20.7 metres and 22.6 metres. The guide tables the effect of shallow water on draught (squat) and effects on dynamic draught due to rolling and pitching. It states that “*the underkeel allowance values*

are such that a deep-draught vessel should be able to proceed along the route under (almost) all conditions of tide, swell or sea-state, except in the area between waypoints L and M [Noord Hinder Junction], where the depths may not be sufficient because of extreme vessel motions due to very heavy swell or high sea states". It also states, "mariners should note the existence of a "relatively shallow" bank of 26.5 metres [within area DWR T]. A lesser Underkeel Clearance at this position should be considered".

- 5.4 The British Authorities recommended Under Keel Allowances are based on a 22 metre draught vessel making passage in Southwest storm conditions at 12 knots. It takes into account movement due to storm waves and swell; uncertainties in charted depths and vessel's draught; risk of negative surges and squat of 1 metre at a speed of 12 knots. Within DWR T, the recommended Under Keel Allowance to be applied to stationary draught is 6.4 metres.
- 5.5 For a 22.6 metre draught vessel, this would require 0.5 metres tide to achieve the recommended UKA, given the charted depths of 28.5 metres. At Sandettié Bank, MLWS is 0.5 metres and MHWS 6.1 metres above Chart Datum, with MLWN 1.4 metres and MHWN 4.9 metres above Chart Datum.

6 2009 SURVEY DETAILS

- 6.1 The survey was conducted on 26 July over an 18 hour period. Weather conditions during the survey were good.
- 6.2 The survey achieved IHO S-44 (4th Edition) Order 1 standard and obtained 100% seafloor cover.
- 6.3 The survey was scheduled as a focussed survey covering critical sandwave crest-lines, but after discussion with the survey contractor at the 2008 Civil Hydrography Working Group, it was agreed to survey the full area. This has the benefit of running lines parallel to the main direction of shipping.

7 2013 SURVEY DETAILS

- 7.1 The survey was conducted between 29 November and 10 December, in conjunction with other areas and with standby periods due to variable weather conditions.
- 7.2 The survey achieved IHO S-44 (5th Edition) Order 1a standard and 100% seafloor cover.
- 7.3 Depths in both surveys were reduced to Chart Datum using GPS heights, with ellipsoidal height to Chart Datum taken from the Vertical Offshore Reference Framework (VORF).

8 DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 8.1 Colour banded depth plots of the 2009 and 2013 surveys, are at [Annexes F](#) and [G](#) with selected shoal depths identified in the Annexes.
- 8.2 A variability plot, at [Annex H](#), shows changes in depth between the 2009 and 2013 surveys.
- 8.3 The shallowest depth within the DDR corridor in DWR T is found over a different sandwave to that in the 2009 survey. The controlling sandwave in the 2009 survey has deepened from 28.6 metres to 29.4 metres, while depths over a sandwave 2,500 metres to the northeast of it have reduced from 29.4 metres to 28.5 metres to provide the new controlling depth.

8.4 Figure 8.1 shows the minimum depths over selected sandwaves, with their letters taken from the report on the 1997 survey. The location of the sandwaves is shown in [Annex G](#). There is no clear trend in changes to sandwave heights across the area, although sandwave 'A' shows a shoaling trend since the 2000 survey.

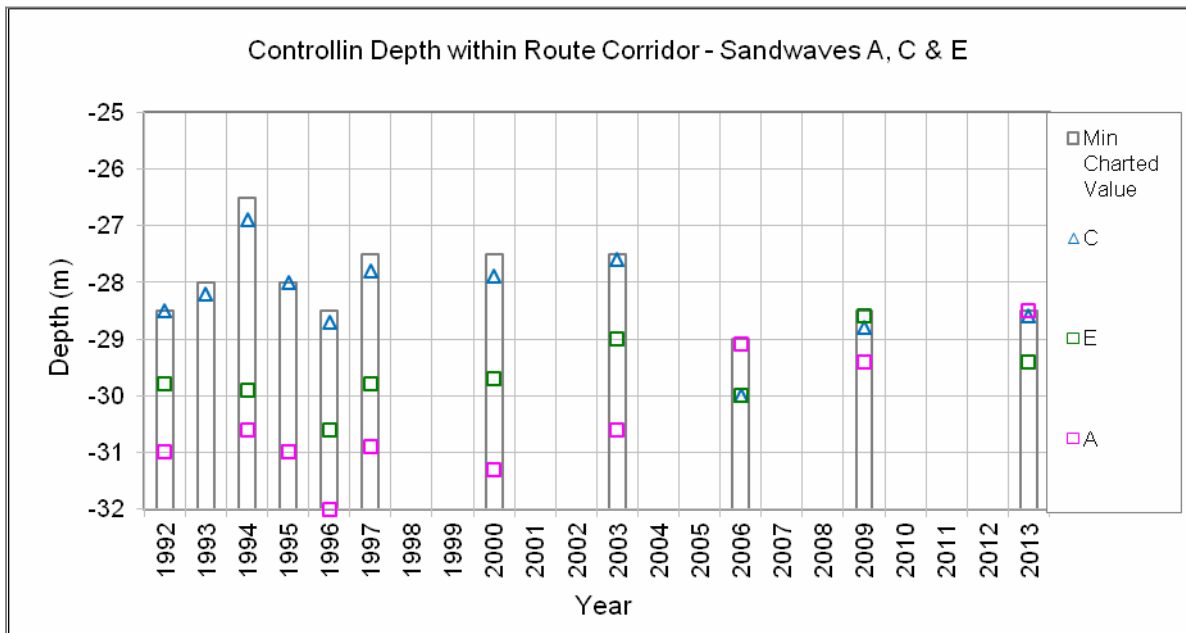


Figure 8.1: Minimum depths over sandwaves that have produced the controlling depth

8.5 When originally established, area DWR T covered a much smaller area. The report on the 1992 survey contains depth comparisons back to 1971 for this smaller area, with sandwave 'C' producing the controlling depth in those earlier surveys. Minimum depths over the sandwave for this extended period are shown in Figure 8.2.

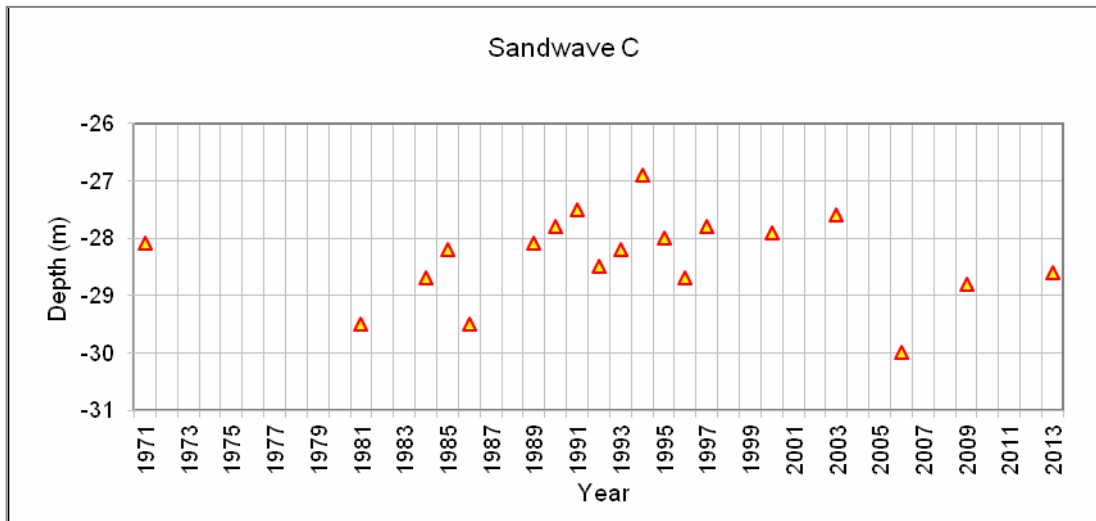


Figure 8.2: Minimum depths over sandwaves that have produced the controlling depth

8.6 In the south-eastern part of the area, where sandwave asymmetry is strongest, sandwaves have migrated in a south-westerly direction by up to 50 metres, an average of migration of 11m/yr.

8.7 It appears that most of the sandwaves are relatively stable in position, but with notable variation in minimum depths between surveys.

9 IMPLICATIONS FOR SHIPPING

9.1 Within the DDR corridor, the controlling depths of 28₅ metres is the same as that found in the 2009 survey, but in a different position. The minimum charted depth along the DDR is currently found 9 miles to the north-east in area DWR R, where there is a charted 26₅ metres; but with a depth of 29.8 metres found in that area in the 2013 survey, DWR T now provides the controlling depth along the route.

9.2 There is no significant movement in the position of the sandwave crests, with any change parallel to the main direction of shipping.

10 RECOMMENDATIONS FOR FUTURE SURVEYS

10.1 Area DWR T currently provides the minimum depth within the north-west bound DDR; as such it is important to continue resurveying the area.

10.2 It is recommended that the 3-year survey interval is retained, but restricted to a focused area covering the critical sandwaves. The proposed focused area is shown at [Annex L](#). The area covers all areas where depths of less than 30 metres have been found in the last five surveys (2000 – 2013).

10.3 The survey interval for the remainder of the area should be extended from 3 to 6 years.

AREA SPECIFICATIONS
(Including Survey History)

REGION: Deep Water Route **NAME:** Deep Water Route **AREA:** DWR T

LIMITS:

A	51.26400°N	1.86433°E
B	51.25283°N	1.88067°E
C	51.23767°N	1.87383°E
D	51.22283°N	1.84800°E
E	51.22017°N	1.85183°E
F	51.20383°N	1.82333°E
G	51.24183°N	1.82650°E

Area co-ordinates are referred to WGS84 Datum

AREA SIZE: 3.16 sq NM (10.76 sq km)

SURVEY INTERVAL: 3 yrs (focused) / 12 yrs full

SURVEYS: (conducted at 1:25,000 scale (not applicable to multibeam surveys))

Year	Survey	File Ref	Data	Year	Survey	File Ref	Data
1970	K6006			1994	M2296	HH090/635/01	s.d
1971	K6274			1995	M2470 ²	HH090/651/01	s.d
1981	K8495 ¹	H2820/71		1996	M2673	HH090/692/01	s.d
1984	K9390	H2898/83	s.t	1997	M2830	HH090/746/01	s.d
1985	K9713	H2346/84	s	2000	M3415	HH090/891/01	s.d
1986	K9867	H2348/85	s	2003	M3927	HH090/1025/01	s.t.d
1989	M1344	HH090/460/01	s.t.d	2006	HI1159	SDRA 20072068	m
1990	M1609	HH090/492/01	s.d	2009	HI1294	SDRA 200929529	m
1991	M1780	HH090/519/01	s	2013	HI1434	SDRA 2013269142	m
1992	M1914	HH090/555/01	s.t.d				
1993	M2151	HH090/578/01	s.d				

1) 1:12,500 2) 1:5,000

KEY: s = sonar sweep, t = seabed texture tracing, d = digital data, m = multibeam digital data

REPORTS: 1986 Latest Survey included K9713 (HH0423/86)
1993 Latest Survey included M1914 (HA145/002/003/02)

ASSESSMENTS: 1995 M2470 (HA145/02/03/05) (old style assessment)
1996 M2673 (HA145/010/007/01)
1997 M2830 (HA145/010/007/01)
2000 M3415 (HA145/010/007/01)

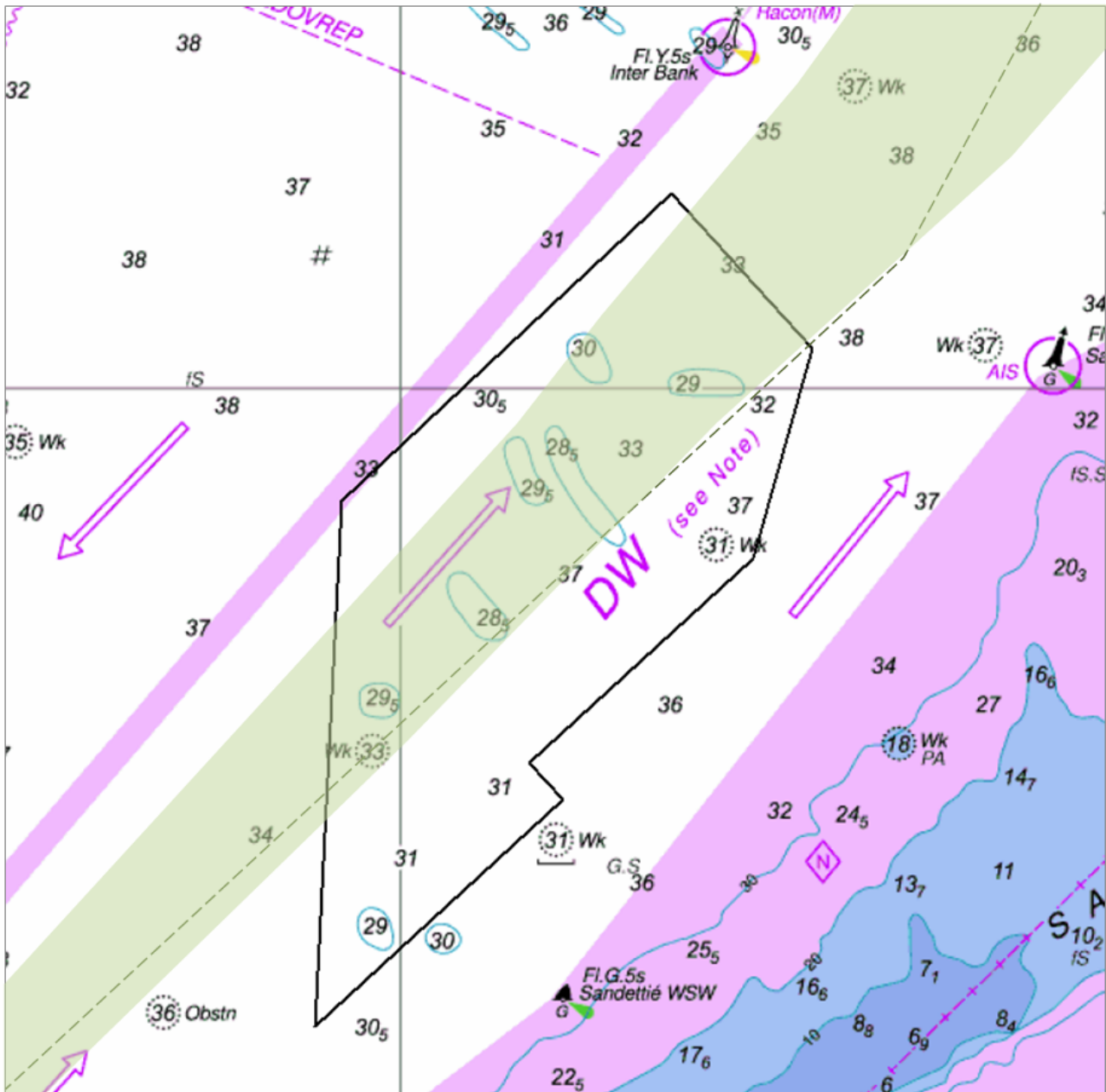
REMARKS 1984 Area T established (H6026/82-E53)
1993 Report recommended the limits of this area to be increased to cover the full width of the recommended track and moved 875m NE to encompass the

sandwave field in area S. They were further increased SW to cover the sandwaves in area U when it was removed from the resurvey programme in 1993. Dept of Transport accepted these recommendations on 15 Oct '93 (HA145/02/03/03-E9)

- 1995 Area T partially surveyed by Dutch M2470/3&4
- 1998 Area changed from one to three years (HA 145/002/003/07)
- 2003 3-year focused survey of sandwave crests and full 12-year survey recommended, but full 3-year survey continued to avoid running lines at right-angles to shipping.

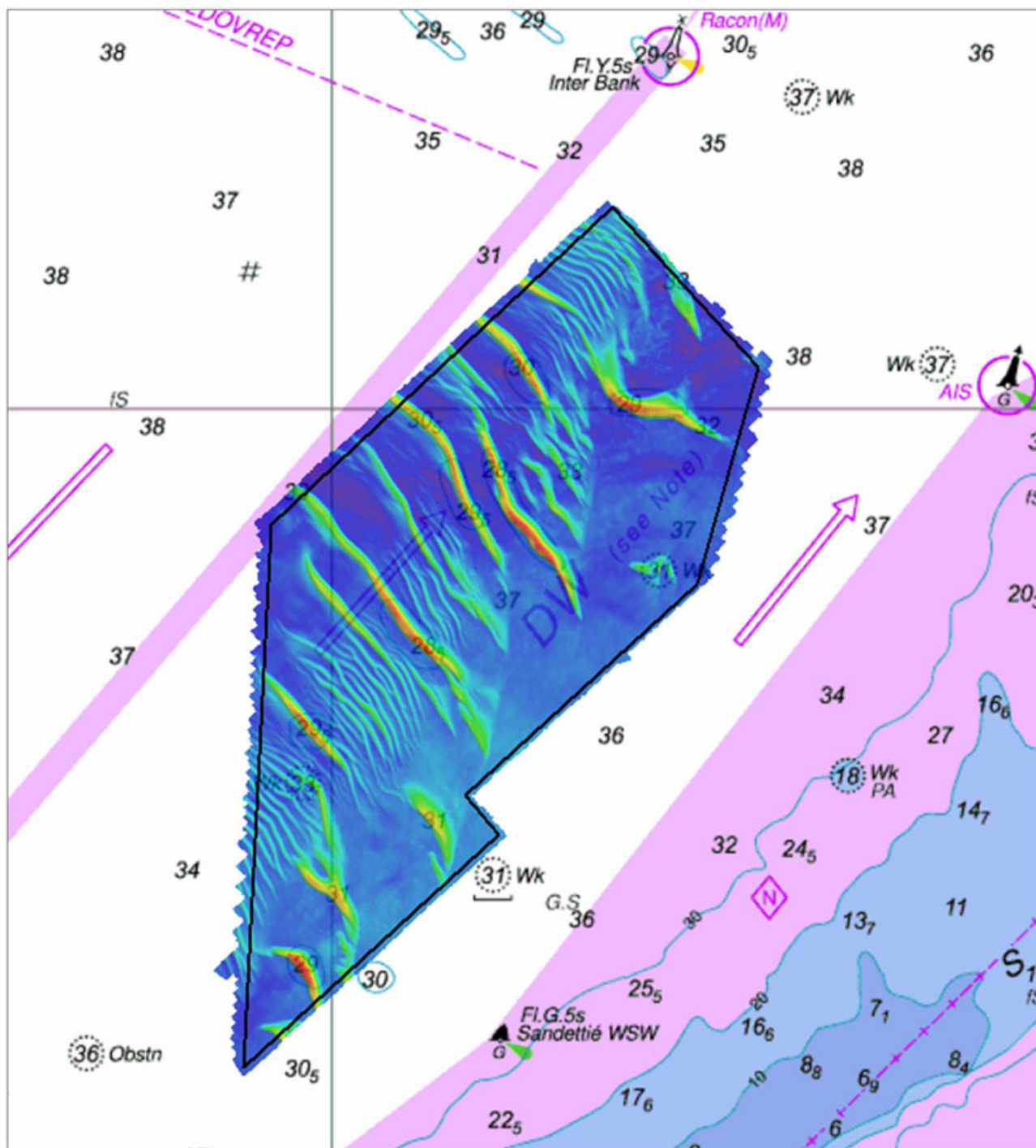
LARGEST SCALE CHART: BA 323 (1:75,000)

DEEP DRAUGHT SHIPPING ROUTE

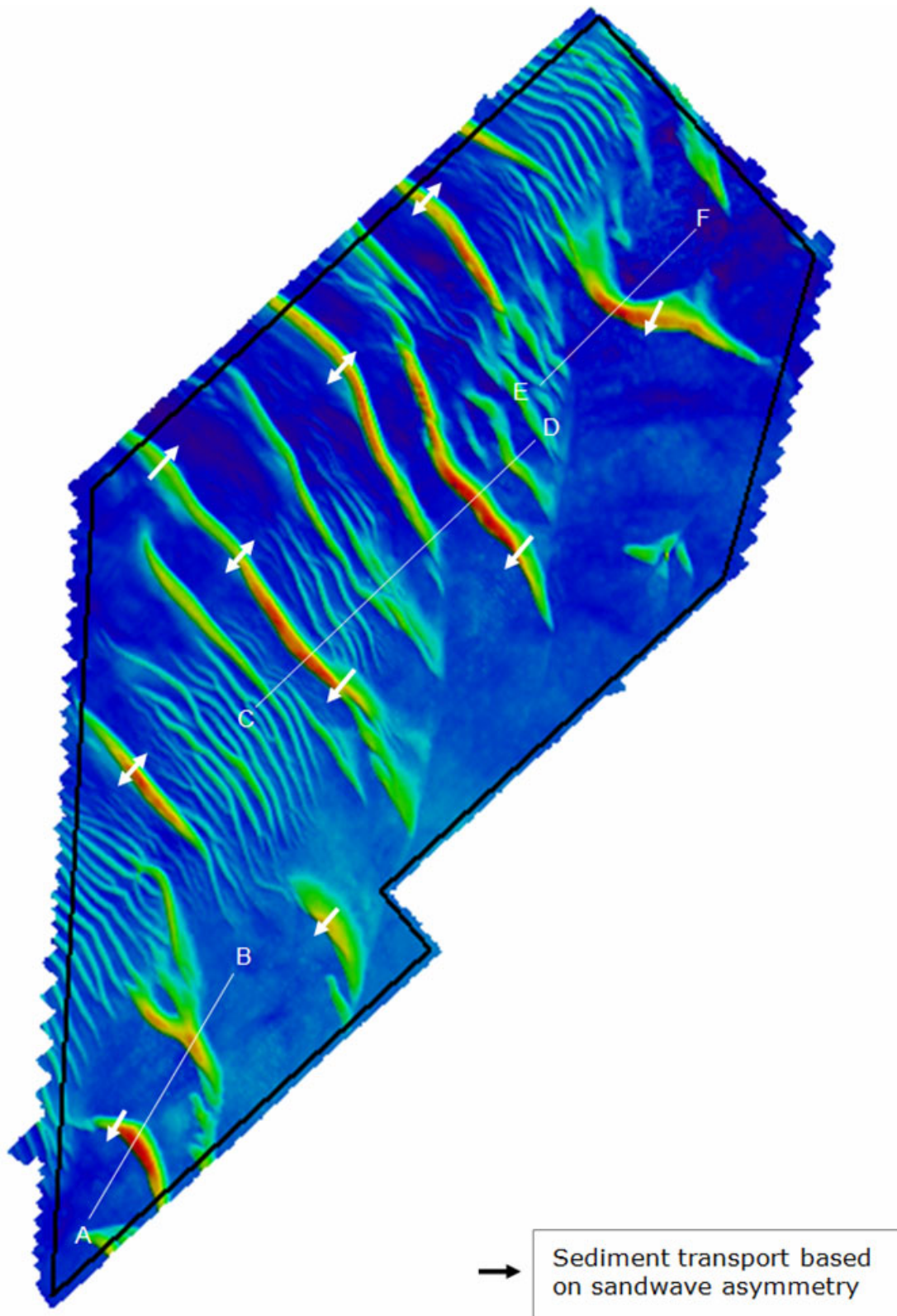


- Indicative route of deep draught shipping (>20.0m) based on sample AIS data
- Deep Draught Route Track

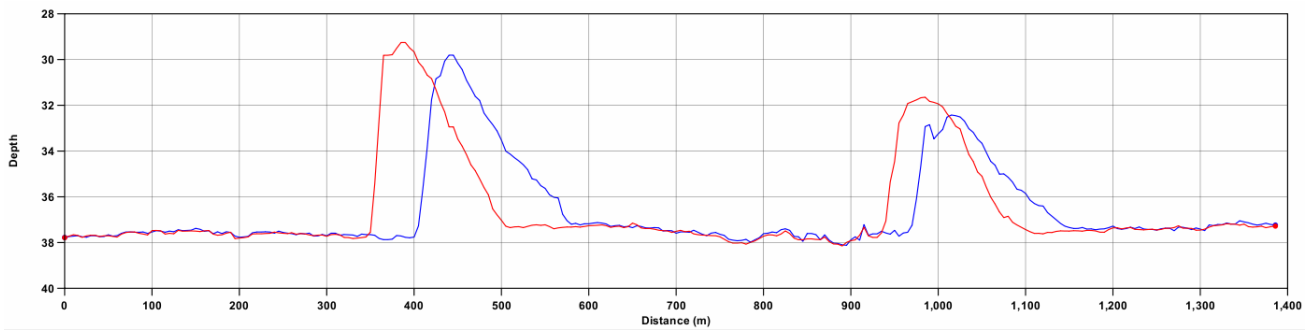
SUN ILLUMINATED VIEW OF THE 2013 SURVEY
OVERLAID ON CHART 323



SUN ILLUMINATED VIEW OF THE 2013 SURVEY
AND
LOCATON OF CROSS SECTIONS SHOWN AT ANNEX E



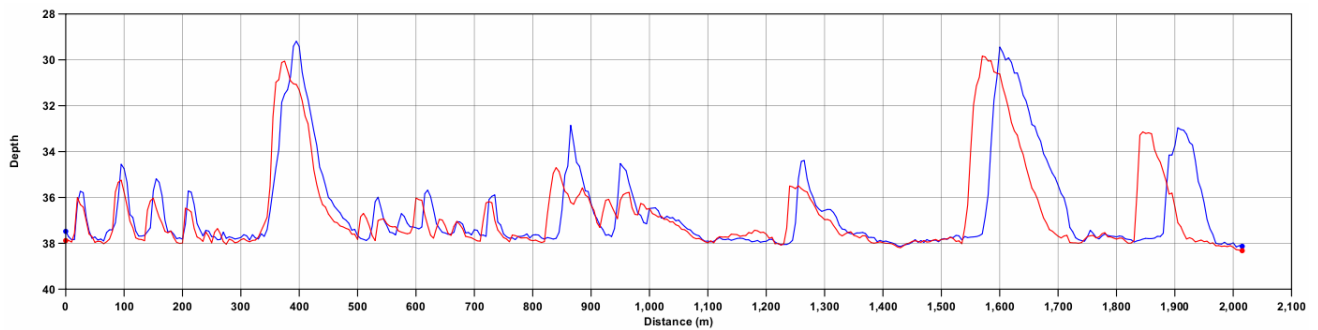
CROSS SECTION COMPARISONS BETWEEN THE
 2009 AND 2013 SURVEYS
 (See Annex D for locations)



A

Profile A-B

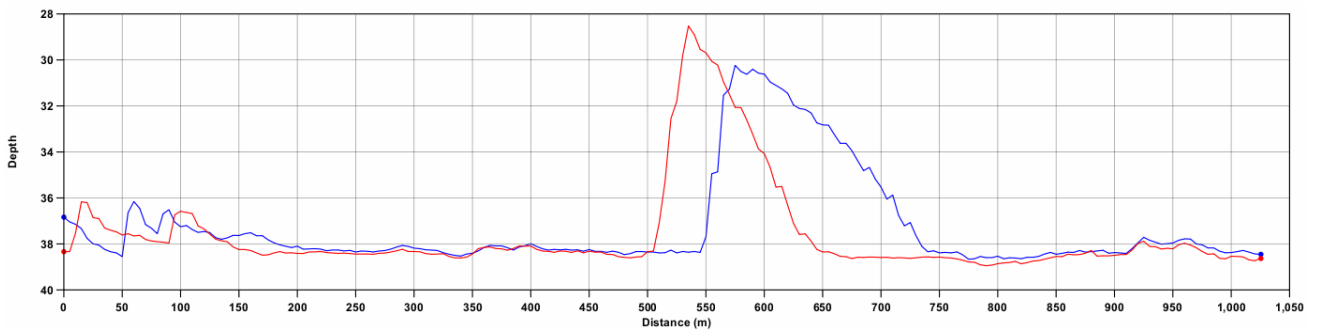
B



C

Profile C-D

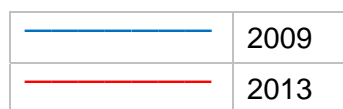
D





E

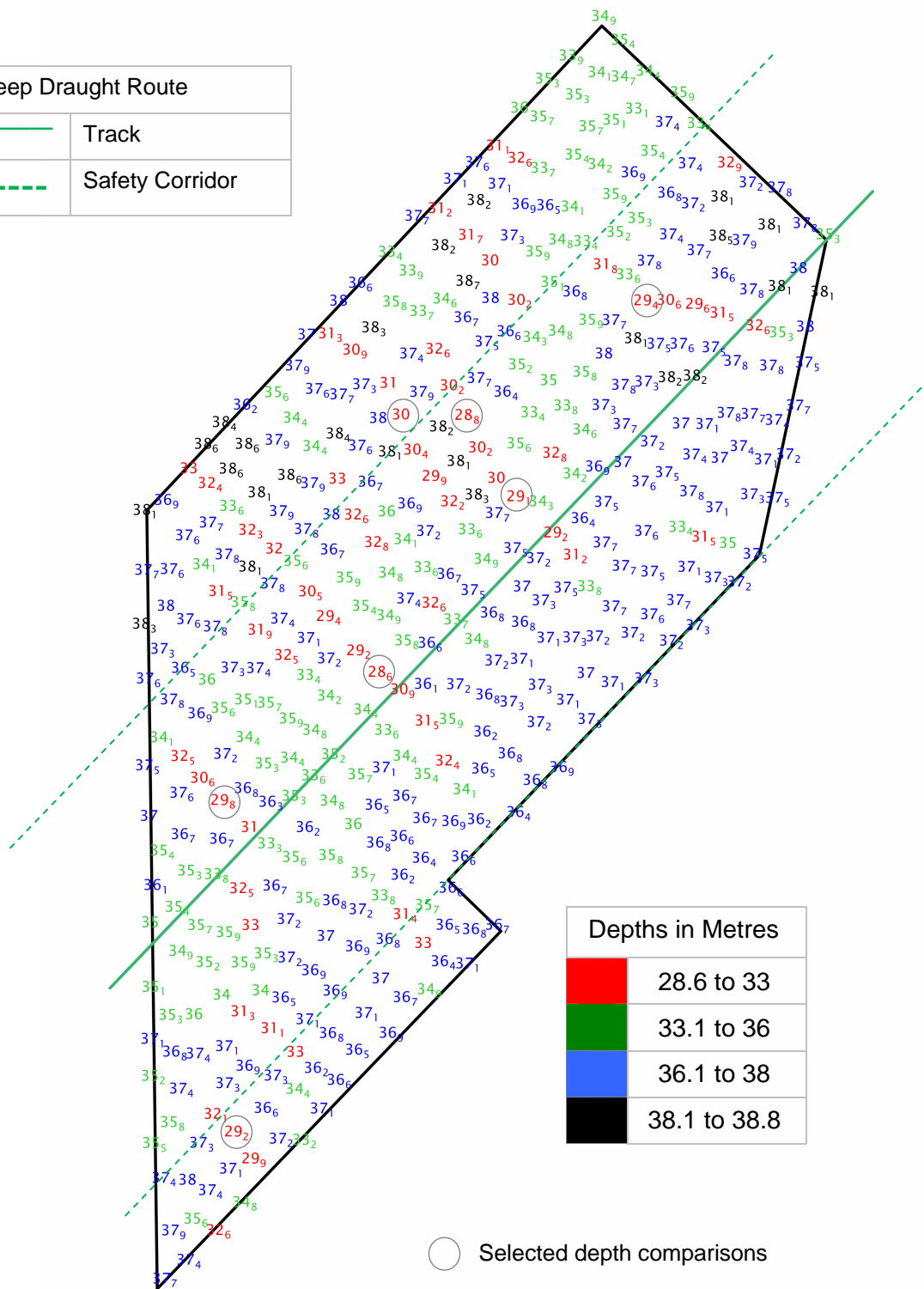
Profile E-F





F



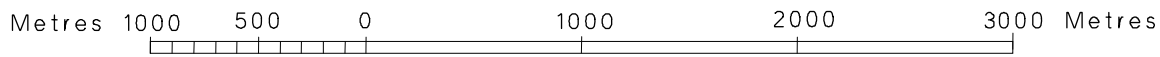
COLOUR BANDED DEPTH PLOT
 FROM TH 2009 SURVEY
 SHOWING SELECTED DEPTHS
 SCALE 1:35,000

Deep Draught Route	
	Track
	Safety Corridor





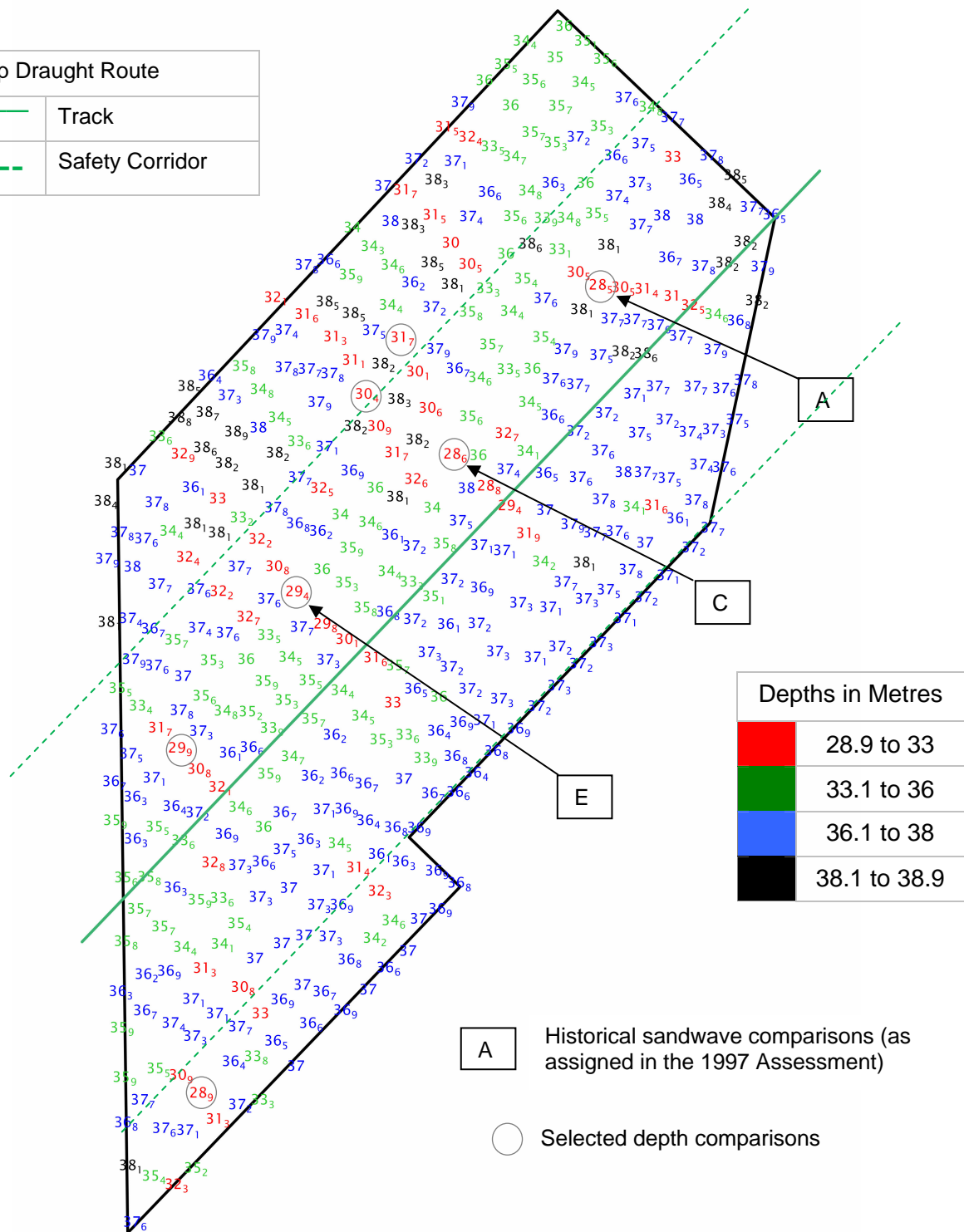
Depths in Metres	
	28.6 to 33
	33.1 to 36
	36.1 to 38
	38.1 to 38.8





 Selected depth comparisons



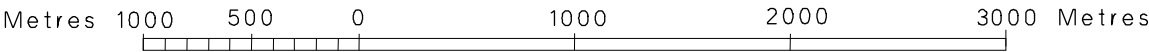
COLOUR BANDED DEPTH PLOT
 FROM THE 2013 SURVEY
 SHOWING SELECTED DEPTHS
 SCALE 1:35,000

Deep Draught Route	
	Track
	Safety Corridor

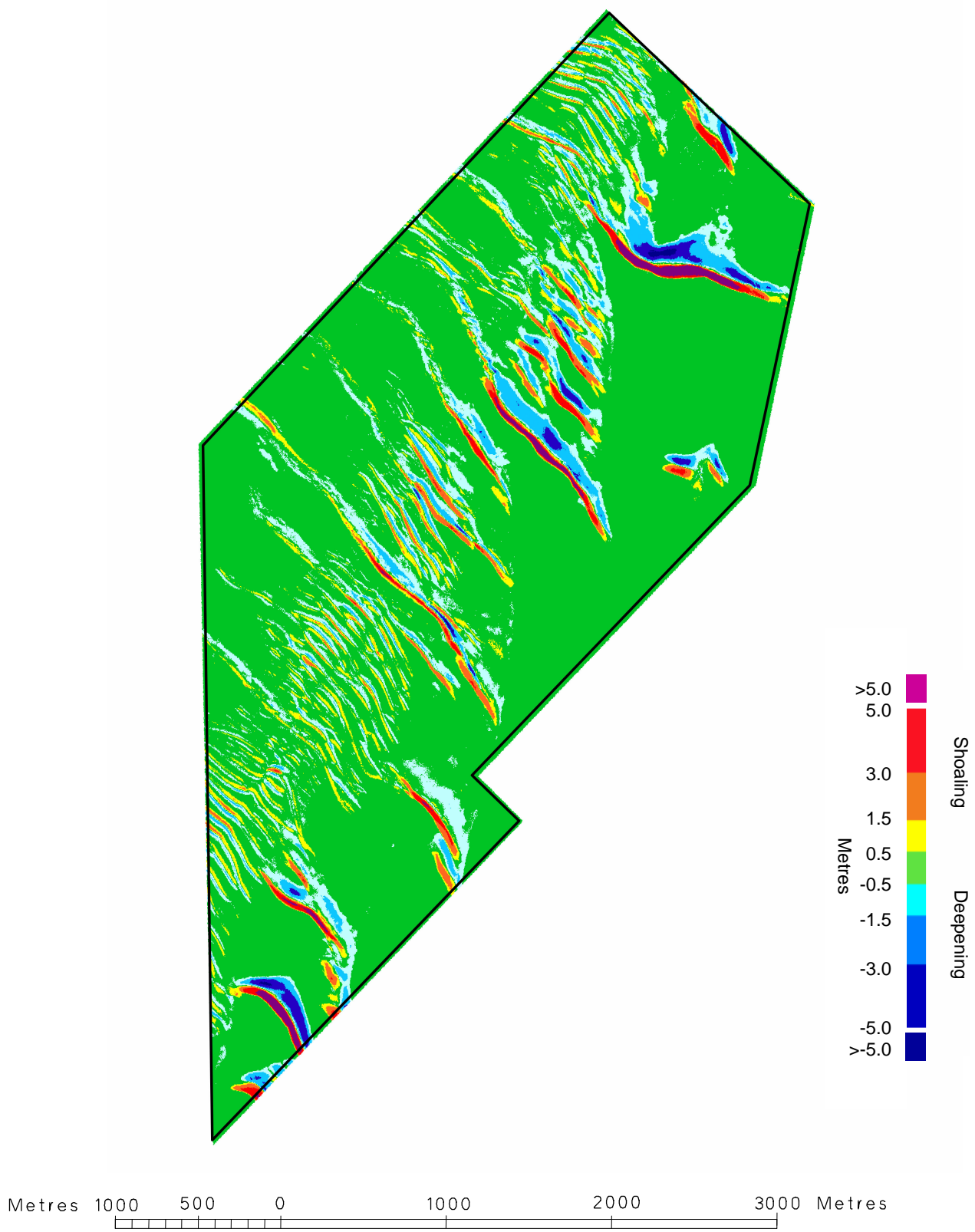


Depths in Metres	
	28.9 to 33
	33.1 to 36
	36.1 to 38
	38.1 to 38.9

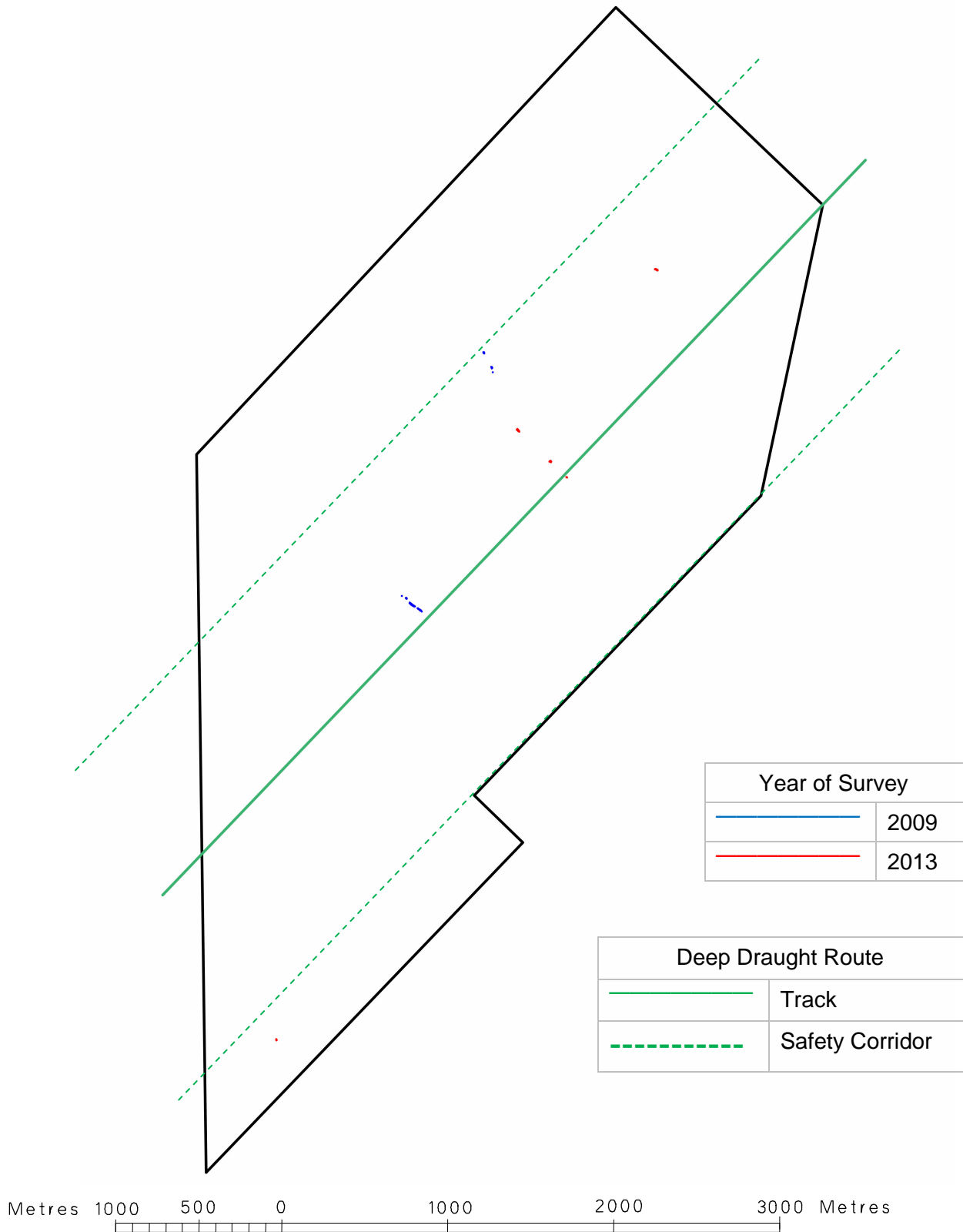
- A Historical sandwave comparisons (as assigned in the 1997 Assessment)
- Selected depth comparisons



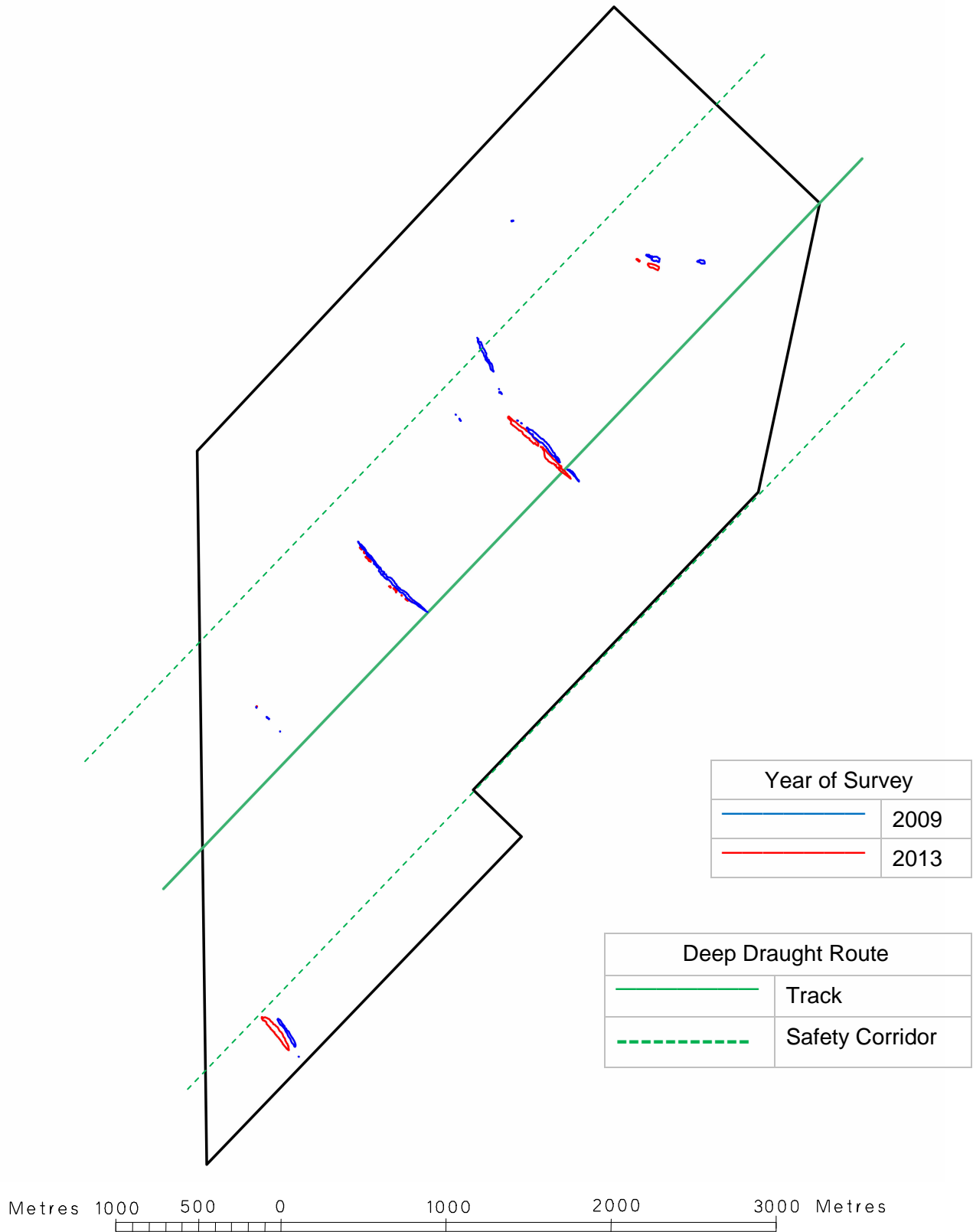
VARIABILITY PLOT SHOWING
BATHYMETRIC CHANGES BETWEEN THE 2009 AND 2013 SURVEYS
SCALE 1:35,000



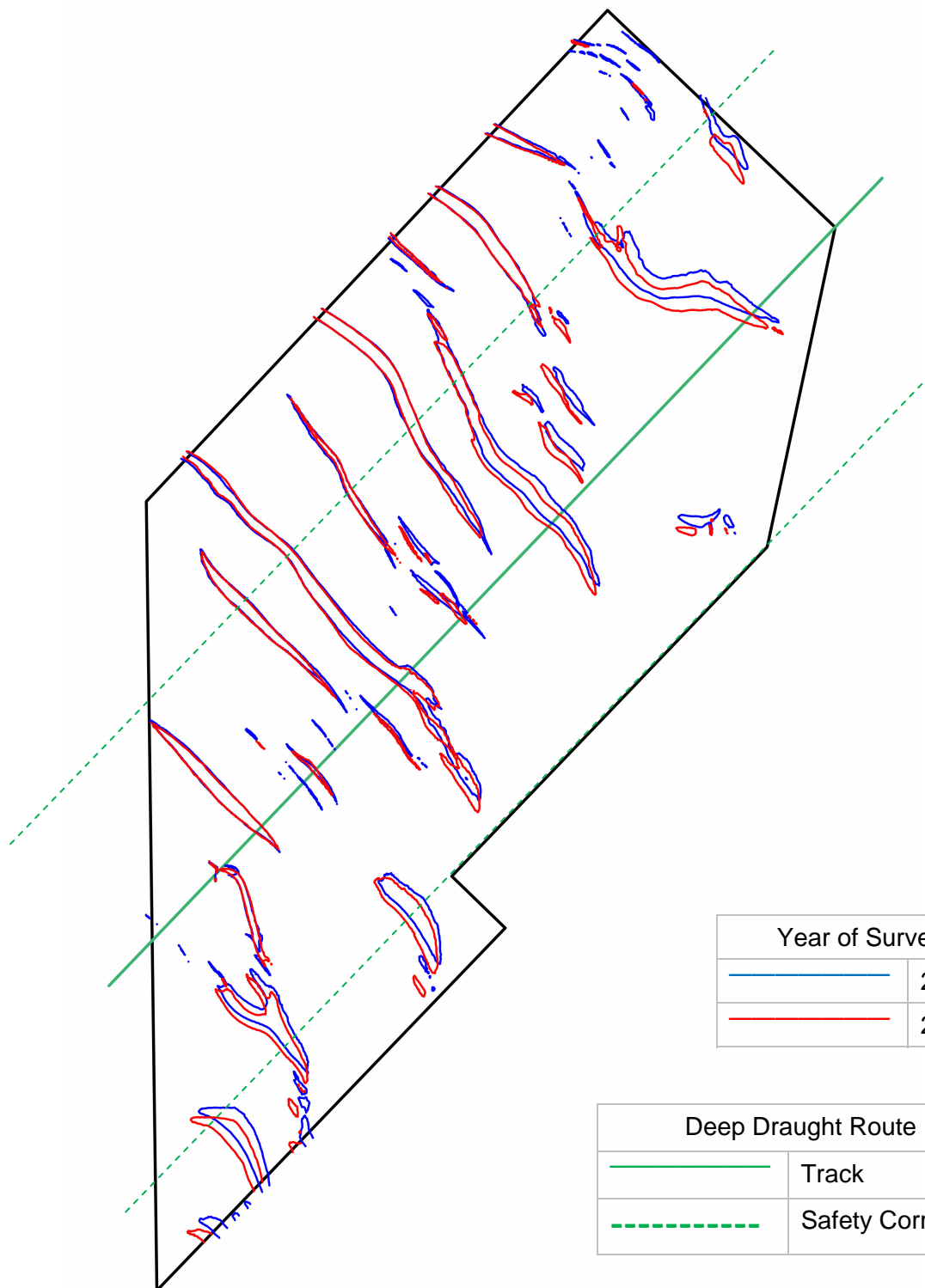
COMPOSITE DIAGRAM OF THE
29 METRE CONTOUR FROM THE 2009 AND 2013 SURVEYS
SCALE 1:35,000







COMPOSITE DIAGRAM OF THE
30 METRE CONTOUR FROM THE 2009 AND 2013 SURVEYS
SCALE 1:35,000

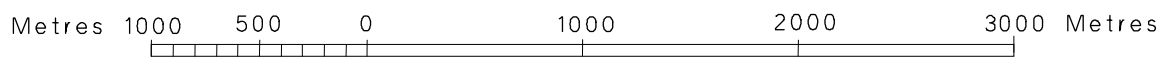


COMPOSITE DIAGRAM OF THE
35 METRE CONTOUR FROM THE 2009 AND 2013 SURVEYS
SCALE 1:35,000

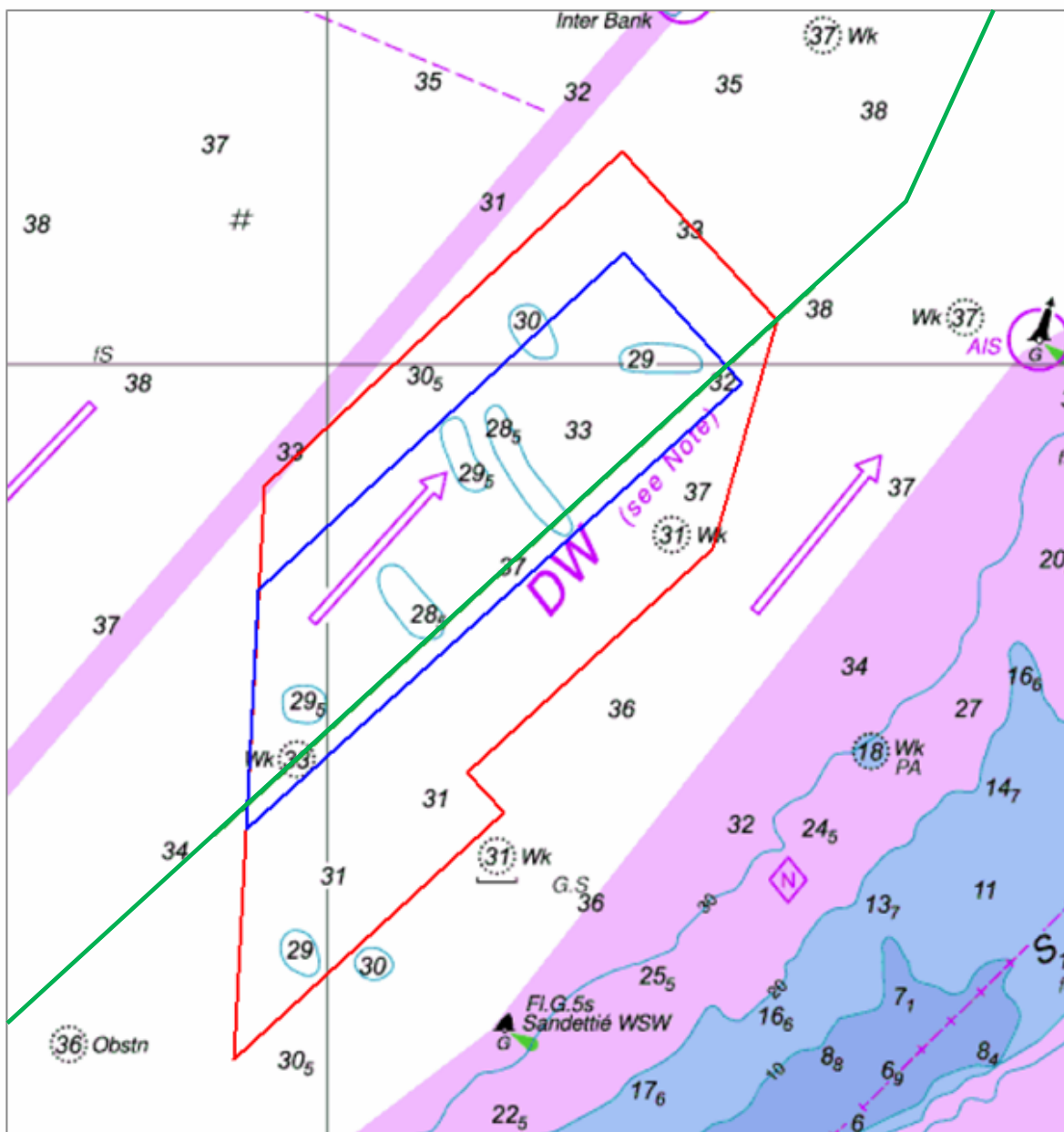




Year of Survey	
	2009
	2013

Deep Draught Route	
	Track
	Safety Corridor



PROPOSED FOCUSED AREA LIMITS



Existing Limits	
Proposed 3 Yr Focused Limits	
Deep Draught Route	