The Great Grid Upgrade

Sea Link

Sea Link

Volume 9: Examination Submissions

Document 9.76.5.1: Change Request: Appendix A Saltmarsh Technical Note

Planning Inspectorate Reference: EN20026

Version: A
November 2025

nationalgrid

Page intentionally blank

Saltmarsh Development in Pegwell Bay, Kent

With particular reference to the area around the former Hoverport

KPAL Technical Note No: 021125

V2.0

12 November 2025

Kenneth Pye Associates Ltd.

Scientific Research, Consultancy and Investigations

Saltmarsh Development in Pegwell Bay, Kent

With particular reference to the area around the former Hoverport

KPAL Technical Note No: 021125

Prepared on behalf of AECOM and National Grid

[redacted]

Document history

Version	Issue	Date
V1.0	Draft for Client Review	06 November 2025
V2.0	Revision	12 November 2025

Disclaimer:
Kenneth Pye Associates Ltd (KPAL) has prepared this report in accordance with the instructions of our client for the client's specific use. KPAL has used reasonable skill, care and diligence in the assessment of data provided to them or obtained from Third Party sources referenced in the report but provides no warranty as to the accuracy or reliability of such information.

Cover photograph: View southwest across Pegwell Bay from the former Hoverport, taken March 2020 (KPAL)

Kenneth Pye Associates Ltd
Unit 8E
Millars Brook Office Park
Molly Millars Lane
WOKINGHAM
RG41 2AD
United Kingdom

Telephone: 0118 304 8416
E-mail: info@kpal.co.uk
Website: www.kpal.co.uk

Contents

1.0 Report scope and purpose

As part of plans to upgrade the UK National Grid network, National Grid Electricity (NG) is developing plans to construct a High Voltage Direct Current sub-sea cable link between the Suffolk coast north of Aldeburgh and Pegwell Bay in Kent (the Sea Link Project).

NG has proposed changes to the original development consent order (DCO) application reference EN20026 which include changes to the Order limits in the vicinity of the former hoverport in the northern part of Pegwell Bay from which it is proposed to access and exit the intertidal area. The purpose of the proposed change (shown on Figures 1 and 2) is to provide flexibility which will ensure the intertidal area can be accessed safely while at the same time supporting NG's commitment not to impact saltmarsh (a Priority Habitat). The inclusion of a wider area does not indicate that the Applicant will utilise a wider area than proposed previously, but does provide the flexibility for the location of the access to move to the location where it will have the lowest environmental impact by ensuring the avoidance of saltmarsh. It is recognised by NG that saltmarsh is a dynamic habitats and can change as a result of natural coastal events, such that the existing saltmarsh may be subject to change across the period of construction and operation.

The Examining Authority has requested justification for the increase in the extent of the Order limits around the former hoverport, in particular the proposal not to exclude the area of existing saltmarsh close to the southwestern access ramp of the former hoverport.

Against this background Kenneth Pye Associates Ltd (KPAL) was commissioned to undertake a desk study of saltmarsh habitat in Pegwell Bay in order provide a better understanding of the past, present and potential future extent / condition of saltmarsh. This Technical Note provides a summary of the findings, including:

- the current condition of the saltmarsh in Pegwell Bay including a brief summary of the key factors that typically dictate the advance and retreat of saltmarsh habitats
- historical trends in the extent and condition of the saltmarsh, with particular reference to the southwestern edge of the hoverport ramp
- The likely rate of seaward encroachment of saltmarsh from its current position
- The potential for saltmarsh to colonise along the southern and eastern edges of the former hoverport
- The suitability of a 50 m (or other distance) buffer zone to seaward of the saltmarsh edge, including how would the presence of pioneer species might affect the ability to implement a buffer.

2.0 Environmental background

2.1 Physical processes and controls on saltmarsh distribution

Pegwell Bay is a macrotidal embayment with a mean spring tidal range of approximately 2.75 m. There are small variations in the level of mean high water spring tides within the Bay with an estimated elevation of 2.70 m ODN along the high-water mark in the north-central part of the Bay (Table 1; Figure 3). High water levels during extreme surge tides can exceed 3.5 m ODN.

Wave action within the inner Bay is limited by the shelter provided by the bedrock foreland to the north and by the sand and shingle spit complex which has extended to the north and east of Sandwich. There are localised variations in wave energy along the shoreline which are related to relative exposure to waves from the northeast and southeast and also to the position of the River Stour low

water channel, and tributary feeder channels which flow into it on the ebb tide. The positions of these have varied over time on multi-annual to decadal timescales.

The saltmarsh 'window' within the Bay extends between approximately 1 .5 m ODN (close to the level of mean high water neap tides) and 3.3 m. Pioneer SM6 vegetation comminates composed of *Spartina* spp. occupy the lowest areas of the saltmarsh window. Above this are SM7 'low marsh communities dominated by *Salicornia* spp. and *Puccinellia maritima,* SM14c mid-marsh communities dominated by *Atriplex portulacoides,* and high marsh SM24 communities dominated by grass species such as *Elymus pycanthus* (Table 2). At lower levels in the intertidal zone species of macroalgae are found in areas with relatively low levels of sediment mobility. At the landward limit of the high marsh communities there is extensive development of brackish-tolerant reed beds, often dominated by *Phragmites australis*. The margins and sub-tidal areas of the brackish lagoon located to the north of Pegwell Bay Country Park possess their own local pattern of vegetation zonation.

Saltmarsh species can establish on a range of substrate types but a key limitation is that the sediment surface should be relatively stable – i.e. sediment is not frequently moved by strong tidal currents and/ or wave action. Once pioneer species have become established a positive feedback relationship comes into play whereby the presence of vegetation increases the surfaces roughness and acts as a drag of water motion. Plant stems and leaves also increase the surface area available to trap suspended sediment. Decaying vegetation also provides a source of organic sediment which contributed to a general increase in ground surface level.

The surface intertidal flat sediments within Pegwell Bay are mostly fine sands with a varying but generally low (<10%) content of mud. Live and dead shells (largely the Common cockle, *Cerastoderma edule*) are present in considerable numbers with the sediments. Within the saltmarsh areas the sediments generally contain more mud and have a higher organic carbon content. In areas where the marsh edge is subject to periodic over-washing by waves there is often a significant proportion of sand and fine gravel (mainly shell) incorporated within the sediment.

In general, periods of time with few or no major storms tend to favour the vertical accretion of sandflats and mudflats to a point where pioneer saltmarsh vegetation can become established. This may be preceded by colonization by non-saltmarsh species such as seagrasses or macroalgae. Conversely, severe storms can destroy pioneer saltmarsh relatively easily. Period of years with relatively frequent storms often remove pioneer and low marsh altogether and form erosional cliffs in older and higher marshes behind. In such circumstances the marsh edge may also be eroded by wave action into 'spur and groove' forms. Wave reworking of shells from the upper intertidal flats may lead to the formation of low shell ridges (cheniers) just behind the eroding marsh edge. This has occurred in the southern part of Pegwell Bay over the past 20 - 30 years (see below).

The marine waters in the western part of Pegwell Bay generally show lowered salinity by comparison with the open sea due to the large freshwater input from the River Stour catchment, springs and surface run-off piped into the western Bay via a number of outfalls. Typical salinities range from 19,000 to 26,000 ppm compared with c.33,000 in the open waters of the English Channel. In this respect the marshes are similar to estuarine marshes. However, during the summer months when there are fewer high spring tides and storm surges, rainfall is relatively low and temperatures / evaporation are relatively high, many pans, pools and the main saline lagoon dry out and/ or become hyper-saline, resulting in death of aquatic and marginal saltmarsh vegetation. Following periods of high rainfall and/or high surge tides water can become ponded in low-lying areas. If these conditions persist for more than a few weeks the surface sediments can become anoxic, leading to plant death.

The marshes and strandline suffer from high levels of marine litter accumulation. Despite the efforts of volunteer litter pickers. Water and sediment pollution also arises from the poor water quality in the Stour catchment and inputs of surface runoff and wastewater via the outfalls on the landward margin (one of which receives surface water drainage from Manston Airport). Algal blooms periodically occur resulting in local smothering of the saltmarsh vegetation. There is also some disturbance /

damage from trampling by bait diggers and cockle pickers although most of these activities take place on the intertidal tidal flats.

The Pegwell Bay saltmarshes have been heavily influenced by human activities and are of limited intrinsic geomorphological interest. The marshes have moderate flood and coastal erosion risk management (FCERM) significance as they act to reduce wave energy impacting on the Sandwich Road embankment which would otherwise require a higher standard of man-made defence (e.g. a rock armour revetment|. The presence of the Sandwich Road embankment prevents natural landward movement of the inland saltmarsh boundary (i.e. the saltmarshes will be subject to coastal squeeze in the face of sea level rise).

2.2. Location of the proposed works in relation to designated areas

The area of proposed works lies within the Thanet Coast and Sandwich Bay Special Protection Area (SPA; Figure 4), the Thanet Coast and Sandwich Bay Ramsar Site (Figure 5), the Sandwich Bay Special Area of Conservation (SAC; Figure 6), the Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest (SSSI; Figure 7), The Sandwich and Pegwell Bay National Nature Reserve (NNR; Figure 8), the Sandwich and Pegwell Bay Local Nature Reserve (LNR) managed by the Kent Wildlife Trust (KWT, Figure 9). The southern part of the area is owned by the National Trust (Figure 10). The SPA forms a part of the North East Kent European Marine Site (EMS).

The saltmarsh area and lagoon adjoining the proposed cable landfall occur with SSSI Condition Assessment Unit 5 which is classified simply as "Littoral Sediment" (Table 3). The last condition assessment, in February 2023, concluded the condition of this unit to be "Favourable", even though it was noted (Table 4) that there are local negative influence around the surface water outfall northeast of the Pegwell Bay Petrol Station and most of this frontage has an inverted vegetation zonation and is fronted by a ridge of shell and sand (chenier ridge). No specific mention is made of the brackish lagoon.

The Conservation Objectives for the Thanet Coast and Sandwich Bay SPA identified by Natural England (NE) state: *"Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:*

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The population of each of the qualifying features, and*
- *The distribution of the qualifying features within the site*

The Qualifying Features within the SPA are:

A140 *Pluvialis apricaria*, European Golden Plover (non-breeding)
A169 *Arenaria interpres*, Ruddy Turnstone (Non-breeding)
A195 *Sterna albifrons*, Litle Tern (breeding)

The habitat preference of migratory Golden Plover is farmland and coastal flats during winter, the diet principally consisting of worms, beetles and insects. The habitat preference of migratory Ruddy Turnstone is rocky, muddy and sandy shorelines, the diet consisting of insects, crustaceans and molluscs. The habitat preference for Little Tern is sand and shingle beaches, ridges, spits and inshore islets, with a diet consisting mainly of fish, crustaceans and invertebrates. All three species may be seen in Pegwell Bay and Sandwich Bay feeding on the upper tidal flats and beaches on the rising tide, notably but not exclusively at the northern end Pegwell Bay and near Shellness on the east side of the Stour estuary. None show a close affinity with well-vegetated saltmarsh or brackish lagoons but may be found close to the marsh edge, on associated sand, shingle and shell ridges, and on the fronting

tidal flats. In recent years there has been a decline in counts of all three species within the Thanet Coast and Sandwich Bay SPA, a trend which has been attributed to several factors including human disturbance and environmental pollution.

NE has not published specific guidance on the definition of favourable conservation status for Saltmarsh or Saline Lagoons, both of which are Biodiversity Action Plan Priority Habitats (BRIG 2011). However, 'favourable condition' has been defined generically as the situation where a habitat or species is thriving throughout its natural range and expected to continue to do so in the future.

General Conservation Objectives for Saltmarsh are included within Common Standards Monitoring Guidance for Saltmarsh (JNCC, 2004) which suggests that the following attributes can be used to monitor condition with respect to the conservation objectives:

- Extent of habitat - target: no decrease in extent from established baseline, subject to natural change
- Physical structure of creeks and pans – target: no further anthropogenic alteration of creek patterns or loss of pans compares to an established baseline
- Vegetation structure: zonation – target: maintain the range of variation of zonation typical of the site
- Vegetation structure: sward height – target: maintain site-specific structural variation in the sward
- Vegetation composition: characteristic species – target: maintain frequency of characteristic species of saltmarsh zones (pioneer zone, low-mid marsh, mid-upper marsh, terrestrial transition
- Negative indicators - targets: artificial drainage channels adversely affecting hydrology absent or rare; no obvious signs of pollution; turf cutting absent or rare; no increase in bare substrate as a result of anthropogenic activities such as vehicle use or trampling; poaching damage from livestock rare
- Indicators of local distinctiveness – target: maintain distinctive elements at current extent / levels and/ or in current locations

Procedures for measuring the Biological Status of Saltmarsh for Water Framework Directive purposes have also been published (UKTAG, 2014): *"These include a mix of aerial and field surveys carried out in the summer (June to September) when saltmarsh vegetation is most developed. Aerial imagery should be required at low tide to reveal the full extent of the saltmarsh and creek system. Recommended field survey procedures involve walking transects between the landward and seaward edges of the saltmarsh. Along each transect taxa are recorded to measure species diversity and for ground truthing of aerial imagery interpretation".* The following quantitative measures should be obtained:

- Saltmarsh extent expressed as a proportion of "historic saltmarsh"
- Saltmarsh extent expressed as a proportion of the intertidal area
- Change in saltmarsh extent over two or more time periods
- Proportions of saltmarsh zones present (up to five can be identified)
- Proportion of saltmarsh area covered by a dominant zone
- Taxa as a proportion of a historical reference value or as a proportion of 15 taxa

Using these values and reference to values considered representative of 'undisturbed waters' an Ecological Quality Ratio can be calculated and expressed in terms of value range of 0 to 1 (0 to 0.2 being 'Bad' and 0.80 to 1.00 being 'High').

3.0 Development and present features of saltmarsh in Pegwell Bay

Saltmarsh has been present around the edges of Pegwell Bay at least since medieval times. Prior to embankment and land reclamation back-barrier saltmarsh occurred in much of the area now occupied by St Augustine's Golf Course and the Stonelees Golf Centre, sandwiched between the north-south trending Ebbsfleet ridge, an erosional remnant of the Paleocene Thanet Formation, and a sand and gravel spit feature formed longshore drift of sediment southwest from Cliffsend. At an early date a track was constructed along the spit to provide a direct route (now known as Sandwich Road) between Ramsgate and Sandwich. Historical Ordnance Survey (OS) maps and aerial photographs (see Figures 11 to 53) show that over the past 180 years saltmarsh has come and gone along the seaward side of the barrier. In the 1870s a relatively wide belt of mature marsh fringed the southern part of Pegwell Bay, but this was eroded away between the late 1890s and the 1920s. In the late 1920s imported fill was deposited on a remnant of marsh where the Pegwell Bay petrol station now stands. During the 1930s and 1940s a sand and gravel beach fringed the road embankment in this area and much of the shoreline to the northeast was sandy.

During World War II the area was identified as a possible German invasion point and a series of beach defences was constructed. An observation post was built on the site of the present petrol station in association with gun batteries to the northeast and southwest. Underground oil storage tanks were constructed next to the observation post and connected via a pipeline to a line of anti-landing scaffolding poles on the foreshore, with the aim of creating a flame barrier in the event of seaborne invasion.

During the 1950s and 1960s an extensive area of *Spartina*-dominated marsh progressively expanded from the mouth of the River Stour towards northern Pegwell Bay. Seaward growth of this marsh was not continuous, with periods of marsh edge erosion and mud-mound development alternating with periods of new marsh progradation. The OS Six Inch map surveyed in 1957 and published in 1960 shows the marsh edge occupying a similar line to the present high marsh ridge, following a line which curves between what is now the sea wall surrounding Pegwell Bay Country Park and the Pegwell Bay petrol station.

In December 1961 tipping of municipal and inert waste began on the saltmarsh at what is now the southern end of the Country Park, then known as Cliffsend landfill site. Tipping progressively extended northwards until 1972 when the site was closed. The OS Six-inch map surveyed in 1963 and published in 1968 shows a continuous, wide zone of saltmarsh extending between the landfill site and the Pegwell Bay hoverport, then under construction. No saline lagoon is shown on this map, or on an aerial photograph taken in the mid 1960s. By the late 1970s a stone revetment had been constructed around the landfill site which was capped and opened as a picnic site by Kent County Council in 1983.

Late 1970s aerial photographs show a small lagoon in the northwest corner of the remaining active saltmarsh, bounded by the rock revetment, Sandwich Road and the early 1950s 'high marsh' ridge. These photographs also show a large triangular-shaped area of degraded marsh and bare mud seaward or the Pegwell Bay petrol station which had recently been constructed following demolition of two older buildings. The cause of the reduction in vegetation cover in this area between the mid-1960s and 1979 is unclear but might be related to discharges / leakage rom the old fuel storage tanks.

It remains uncertain whether the initial development of the brackish lagoon was linked to hydrological or physical changes associated with the landfill site, but raising of the ground level and construction of the bounding revetment has impeded free movement of tidal waters in the adjoining area. Impeded drainage would have led to death of vegetation and initiation of a large pan which has evolved into the present lagoon. Since 1979 the size of the lagoon has increased, although with fluctuations in its extent and coverage vegetation, while the triangular bare area seaward of the petrol station showed

increasing vegetation cover between 1979 and late 2017 when installation of the NEMO Link cable landfall began.

LiDAR imagery (Figure 1) shows that there is a slightly lower but still relatively high marsh ridge behind the outer 'high marsh ridge'. The inner ridge feature forms the seaward margin of the lagoon at the Country Park end of the system. Aerial photograph evidence suggests this ridge must have formed between c.1945 and the early 1950s; part of it coincides with the line of World War II scaffolding poles which may have encouraged preferential sediment accretion. Towards the northeast the two 'high marsh ridges' merge, forming a wider high marsh platform on the southern side of the NEMO Link cable corridor.

GIS comparison of aerial photographs has shown that although the position and character of the saltmarsh edge along this central part of the frontage has fluctuated since the early 1980s but there has been less than 20 m of net retreat. The most significant changes affecting the marsh edge occurred after 2020 due to a succession of severe storms and high tides, and to a lowering of the kevel of the upper tidal flatd due to northward development of a shallow intertidal creek system. Wave action has reworked large quantities of cockle shells from the fronting tidal flats and washed them onto the marsh edge where they now form a prominent chenier ridge, seaward of which lies a zone of mud mounds and localised low marsh vegetation.

North of the Pegwell Bay petrol station the saltmarshes are subject to greater freshwater influence derived both from man-made outfalls and natural springs which emerge from the interface between the Chalk and the Thanet Formation. Until the 1960s this area had a sandy hight tide beach but the construction of the hoverport in the late 1960s encouraged mud accumulation on both sides. Approximately 300,000 tons of coal waste was imported to provide the base on which the concrete surface layer of the hoverport was built. The hoverport remained operation until 1982 and maintenance operations continued until 1987. The buildings were demolished in 1995, since which time the site has been largely abandoned and has become overgrown.

At the time the hoverport was constructed *Spartina* marsh had already spread along the entire Bay frontage, almost reaching Cliffsend. The hoverport was built on the developing marsh but areas to the north of the site remained untouched. Since 1970 the areas to north and south of the hoverport have continued to trap sediment and the more landwards parts are now dominated by reed beds (*Phragmites australis)*. In the past 20 years the *Phragmites* zone has grown wider and extended southwards; patches of reed are now present along the high-water mark near the Pegwell Bay petrol station.

The presence of a higher saltmarsh ridge running through the southern and central parts of the marsh provides evidence of a former shoreline formed at a time when the marsh edge was eroding of stable for many years, after which there was a further period of seaward saltmarsh progradation. Over the last two decades the saltmarsh edge along the southern part of the Bay has again experienced erosion, resulting in the formation of spur and groove mud mound topography, low marsh cliffs, and cheniers (low mobile ridges composed mainly of shells). Erosion in this area has accelerated in the last 10 years due to lowering and channel development on the fronting intertidal flat. There is a dividing line between eroding marsh in the south and stable / prograding marsh in the northern Bay located close to the Nemo Link cable route.

Tables 6 and 7 provide a summary of changes in the width of saltmarsh since 1947 at a number of selected points around Pegwell Bay, based on analysis of the historical map and air photograph evidence. Table 8 summarises the rate of change in position of the saltmarsh edge at these point, and over different time periods, since 1960. At positions A and B in the southern part of the bay an erosional trend has been evident since the 1980s, spreading northwards over time. A 'null' point of little / no net change occurs close to the Thanet Windfarm cable corridor while at position C, to the southwest of the hoverport platform, the seaward limit of Spartina marsh has advanced at an average rate of 3.2 m/yr in the period 2016-24. In the short term the marsh edge in the southern half can be

expected to continue to erode while the marsh edge in the northern part is likely to remain stable or grow seaward slowly.

Comparison of several airborne LIDAR surveys undertaken in the period 2007 – 2024 provides evidence of how the changes in position of the saltmarsh edge are linked to changes in the elevation of the fronting intertidal flats (Figures 54 – 61). Over this 17 year period there has been a significant net loss of intertidal sediment volume in the southern part of the Bay and a corresponding gain in the northern part of the Bay around and the east of the hoverport. A major redistribution of sediment occurred during the stormy winter of 2013-14 and the trend continued in the periods 2016-18, 2018-20, 2020-22 and 2022-24. The elevation of the upper tidal flats around the hoverport has increased by 10 – 20 cm since 2007 (with the exception of a scour pit along the base of the concrete ramp), and even greater increases in elevation have occurred in areas where saltmarsh *(Spartina)* cover has increased to the southwest and northeast of the hoverport platform (cf. profiles whose locations are shown on Figure 62 and which are compared in Figures 63 & 64). While significant areas of bare sediment remain immediately adjacent to the SW corner of the hoverport, the number and size of *Spartina* clumps has shown a consistent increase in this area over the past 10 years. Visual observations made during the AECOM ground survey in mid-August 2025 suggest that this trend is continuing.

4.0 Conclusions and recommendations

It is evident from the 2024 aerial photography and LiDAR imagery that there is a relatively wide zone of high tidal flat to seaward of the hoverport. Much of this area is characterized by low-amplitude sand waves whose asymmetry suggest net movement towards the northeast. The 1.5 m ODN contour lies at a distance of 90 - 120 m seaward of the toe of the hoverport ramp, but in the central and southern parts of the bay it lies much closer to the marsh edge (Figure 65). As the lower tidal immersion limit for *Spartina* in this area lies at approximately 1.5 m ODN, it is theoretically possible that, during a period of low wave energy, *Spartina* could spread further and colonise parts of the tidal flat to south and east of the hoverport platform. This is considered unlikely in the short term (next 10 years) owing to the present instability of the sediment surface immediately seaward of the hoverport ramp which is maintained by wave action and migration of the low amplitude sand waves. However, if a low elevation sand bank or bar was to develop further seaward the resulting decrease in wave and current action could lead to a significant reduction in sediment mobility immediately seaward of the SE-facing hoverport ramp, allowing pioneer saltmarsh to establish. There is evidence from some of the historical maps that the development of such bars / low banks has occurred in the past. It is equally possible that changes in the topography of the upper intertidal flats could induce changes in local wave energy conditions and saltmarsh extent along the southwest side of the former hoverport. For these reasons it would be advantageous to retain flexibility in terms of the exact location of the access / exit point from the hoverport to and from the intertidal flats.

Consideration of the present elevation of the intertidal flats (based on contours interpolated from the 2024 airborne LiDAR survey) indicates that it would be feasible to define and maintain a 50 m wide buffer zone in front of the existing saltmarsh edge, as shown in Figures 66 & 67. However, the exact position of the saltmarsh edge, and of the buffer zone, should be determined by immediate pre-construction topographic and vegetation surveys.

5.0 References

BRIG (2011) *UK Biodiversity Action Plan Priority Habitat Descriptions* (ed. Ant Maddock) 2008, Updated 2011, Joint Nature Conservation Committee, Peterborough.

Environment Agency A (2019) *Coastal Boundary Study Update*. The Environment Agency, Bristol. Available at: Coastal flood boundary conditions for the UK: 2018 update - GOV.UK (www.gov.uk)

JNCC (2004) *Common Standards Monitoring Guidance for Saltmarsh. V.4.0 August 2004*. Joint Nature Conservation Committee, Peterborough.

Maddock, A. (2008) *UK Biodiversity Action Plan; Priority Habitat Descriptions – Saline Lagoons*. JNCC, Peterborough.

Natural England (2014) *European Site Conservation Objectives for Thanet Coast and Sandwich Bay Special Protection Area Site Code: UK9012071*. Available at: European Site Conservation Objectives for Thanet Coast & Sandwich Bay SPA - UK9012071 (naturalengland.org.uk)

UKHO (2024) *Admiralty Tide Tables 2025. NP201A Volume 1A – English Channel to River Humber*. UK Hydrographic Office, Taunton.

UKTAG (2014) *Transitional and Coastal Water Assessment Method Angiosperms – Saltmarsh Tool*. Water Framework Directive UK Technical Advisory Group, Stirling.

Tables

Table 1. Mean tidal levels near Pegwell Bay, in metres above Ordnance Datum Newlyn, taken from 2022 Admiralty Tide Tables (ATT) and the three closest offshore points to Pegwell Bay from the Environment Agency Coastal Boundary Study 2018 Update (CBS, Environment Agency, 2019). Point X in an interpolated estimate of elevations at the coastline in the centre of Pegwell Bay

	Ramsgate (ATT)	Richborough (ATT)	Point 4382 (CBS)	Point 4384 (CBS)	Point 4386 (CBS)	Point X (estimated)
HAT	3.12	nd	2.75	2.84	2.93	3.22
MHWS	2.62	2.07	2.35	2.42	2.50	2.70
MHWN	1.42	1.37	nd	nd	nd	1.46
MSL	0.15	0.09	nd	nd	nd	0.15
MLWN	-1.18	-0.93	nd	nd	nd	-1.22
MLWS	-1.98	-1.23	nd	nd	nd	-2.05
LAT	-2.88	nd	nd	nd	nd	nd
CD	-2.58	-1.33	nd	nd	nd	nd

Table 2. Typical elevations of saltmarsh to the south-west of the hoverport in Pegwell Bay, determined from aerial photography and LiDAR DTM flown 18/10/2024

Saltmarsh zone/species	Typical elevation (m ODN)
SM24 vegetation type (dominated by *Elymus pycanthus*)	3.0 to 3.3
SM14c vegetation type (dominated by *Atriplex portulacoides*)	2.8 to 3.0
SM7 vegetation type (dominated by *salicornia perennis* and *arthrocnemum perenne* with patches of *puccinellia maritima*)	1.9 to 2.9
SM6 vegetation type (dominated by *spartina anglica*)	1.5 to 2.3

Table 3. Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest Condition Assessment Units, with most recent condition status

Feature name	Habitat name	Area (ha)	Assessment date	Assessment description
1	SUPRALITTORAL ROCK	19.07	21/10/2010	Favourable
2	EARTH HERITAGE	1.08	10/02/2023	Favourable
3	LITTORAL SEDIMENT	252.04	07/12/2012	Unfavourable - Recovering
4	LITTORAL SEDIMENT	6.11	10/02/2023	Favourable
5	LITTORAL SEDIMENT	41.61	10/02/2023	Favourable
6	NEUTRAL GRASSLAND - Lowland	7.98	12/02/2021	Favourable
7	LITTORAL SEDIMENT	44.47	03/12/2012	Favourable
8	LITTORAL SEDIMENT	22.76	28/07/2009	Favourable
9	LITTORAL SEDIMENT	16.15	28/07/2009	Favourable
10	LITTORAL SEDIMENT	8.67	04/11/2012	Favourable
11	NEUTRAL GRASSLAND - Lowland	28.25	27/09/2012	Unfavourable - Recovering
12	LITTORAL SEDIMENT	259.65	07/12/2012	Favourable
13	LITTORAL SEDIMENT	45.15	07/12/2012	Favourable
14	LITTORAL SEDIMENT	12.45	12/02/2021	Favourable
15	SUPRALITTORAL SEDIMENT	52.41	12/02/2021	Favourable
16	NEUTRAL GRASSLAND - Lowland	71.13	27/09/2012	Favourable
17	SUPRALITTORAL SEDIMENT	129.52	12/02/2021	Favourable
18	SUPRALITTORAL SEDIMENT	120.89	02/07/2021	Favourable
19	SUPRALITTORAL SEDIMENT	11.38	27/07/2009	Favourable
20	SUPRALITTORAL SEDIMENT	2.21	22/10/2010	Favourable
21	SUPRALITTORAL SEDIMENT	10.54	14/07/2009	Favourable
22	SUPRALITTORAL SEDIMENT	104.30	12/02/2021	Favourable
23	SUPRALITTORAL SEDIMENT	1.59	03/12/2012	Favourable
25	SUPRALITTORAL SEDIMENT	7.88	18/01/2024	Unfavourable - Recovering
26	SUPRALITTORAL SEDIMENT	29.51	21/10/2010	Favourable
27	SUPRALITTORAL SEDIMENT	9.02	22/10/2010	Favourable
28	RIVERS AND STREAMS	4.05	04/11/2012	Favourable
29	RIVERS AND STREAMS	1.78	04/11/2012	Favourable
30	NEUTRAL GRASSLAND - Lowland	17.49	12/02/2021	Unfavourable - Recovering
31	ARABLE AND HORTICULTURE	82.16	12/02/2021	Favourable
32	NEUTRAL GRASSLAND - Lowland	5.67	30/07/2008	Unfavourable - No change
33	NEUTRAL GRASSLAND - Lowland	11.57	30/07/2008	Unfavourable - No change
34	RIVERS AND STREAMS	7.41	19/12/2008	Unfavourable - Recovering
35	NEUTRAL GRASSLAND - Lowland	65.20	18/10/2012	Unfavourable - Recovering
36	NEUTRAL GRASSLAND - Lowland	57.82	27/09/2012	Unfavourable - Recovering
37	NEUTRAL GRASSLAND - Lowland	22.37	21/11/2012	Unfavourable - No change
38	NEUTRAL GRASSLAND - Lowland	8.69	01/11/2012	Unfavourable - No change
39	NEUTRAL GRASSLAND - Lowland	2.33	05/06/2009	Unfavourable - Recovering
40	NEUTRAL GRASSLAND - Lowland	22.55	11/02/2010	Unfavourable - Recovering
41	NEUTRAL GRASSLAND - Lowland	3.59	19/12/2008	Unfavourable - Recovering
42	NEUTRAL GRASSLAND - Lowland	5.98	16/02/2021	Favourable
43	NEUTRAL GRASSLAND - Lowland	3.65	12/02/2021	Favourable
44	NEUTRAL GRASSLAND - Lowland	5.34	16/02/2021	Unfavourable - No change
45	NEUTRAL GRASSLAND - Lowland	4.98	12/02/2021	Unfavourable - Recovering
46	NEUTRAL GRASSLAND - Lowland	13.54	04/12/2009	Favourable
47	NEUTRAL GRASSLAND - Lowland	3.76	25/11/2019	Unfavourable - Declining
48	BROADLEAVED, MIXED AND YEW WOODLAND	6.53	08/11/2012	Favourable
49	RIVERS AND STREAMS	4.04	22/10/2010	Favourable
50	NEUTRAL GRASSLAND - Lowland	2.32	25/05/2010	Unfavourable - Recovering
51	NEUTRAL GRASSLAND - Lowland	7.11	08/11/2012	Favourable
52	FEN, MARSH AND SWAMP - Lowland	4.65	06/08/2008	Favourable
53	FEN, MARSH AND SWAMP - Lowland	23.82	01/11/2012	Favourable
54	BROADLEAVED, MIXED AND YEW WOODLAND	1.21	08/11/2012	Favourable
55	NEUTRAL GRASSLAND - Lowland	6.58	12/02/2010	Favourable
56	NEUTRAL GRASSLAND - Lowland	8.73	20/09/2012	Unfavourable - No change
57	NEUTRAL GRASSLAND - Lowland	12.28	14/07/2009	Unfavourable - Recovering
58	NEUTRAL GRASSLAND - Lowland	4.65	20/08/2008	Favourable
59	NEUTRAL GRASSLAND - Lowland	6.48	20/08/2008	Favourable
60	STANDING OPEN WATER AND CANALS	2.80	22/10/2010	Favourable
61	FEN, MARSH AND SWAMP - Lowland	8.52	20/07/2009	Unfavourable - Recovering
62	FEN, MARSH AND SWAMP - Lowland	9.13	20/07/2009	Unfavourable - Recovering
63	NEUTRAL GRASSLAND - Lowland	15.52	18/10/2012	Unfavourable - Recovering

Table 4. Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest Units descriptions in the northern part of the SSSI

Feature name	Comment
1	Littoral habitats undisturbed and in good condition. The geological feature on the cliffs is well exposed and in good condition.
2	Vegetation is partially obscuring the feature but part of the face is still exposed, vegetation is not damaging the features of interest. The features of interest can practically be re-exposed if required. There is no unconsented tree planting obscuring or damaging the features of interest and there are no engineering works obscuring or damaging the features of interest. The coverage of sea buckthorn and buddleia on the cliff face should be monitored to avoid roots damaging the feature. Native species also present; Hawthorn, bramble and Irish ivy.
3	Bird Disturbance Study 2010-11 published by Kent Wildlife Trust Oct 2012 provides strong evidence indicating that recreational and commercial activities including dog walking, walking without dogs, bait digging and kite surfing are having a detrimental impact on bird populations in Pegwell Bay. The most disturbing activity, particularly in the north section of the bay, is dog walkers with dogs off leads. This is being addressed through a dog management strategy which aims to provide alternative open space for dogs off leads. The voluntary agreement over kite surfing also needs to be reviewed given disturbance levels associated with this recreational activity. Continued monitoring is required particularly with regard housing development within Dover and Thanet Districts. Mitigation measures are being sought with regard these development plans including monitoring and possible wardening if monitoring indicates increased disturbance activity.
4	his unit is in favourable condition. The spartina is protecting the seaward edge of the mid saltmarsh. If it extended further into the bay it would become a threat. Currently monitoring it, no action needed at present. Spartina accepted as providing an ecosystem service by protection the saltmarsh behind. Zonation: Low to mid saltmarsh species mostly sea purslane, annual sea blight, sea aster. Transitional zone species included rocket, fennel, red dead nettle, sea beet, lucerne, saltmarsh orach, spear-leaved orach. Patch of native sea holly noted on site as well. Threat: Plastic waste, litter too prevalent. Extend of invasive species needs to be monitored to avoid damaging the feature of interest; buddleia, sea buckthorn, lesser periwinkle, which is currently at less than 5%.
5	This unit is in favourable condition as it meets all assessment criteria. The area directly surrounding the outfall pipe (less than 5%) is eutrophied leading to high coverage of plants that prefer fertile ground; nettles, bindweed, creeping thistles, willow species, dock species, elder. This created a fertile, ruderal habitat, which has reduced the extent of the saltmarsh. Extensive common reed to the north of the unit between the outfall and the hovercraft landing. This could be due to inflow of fresh water creating a brackish environment rather than a pure saline. The salt marsh feature is still in favourable condition, there is no loss of extent. Spartina has extended beyond the unit boundary from unit 5 to unit 3. Spartina is prevalent in unit 5.Black tailed godwit in unit 5 and 3, Redshank, oystercatcher, unit 3, lapwings in unit 5. The majority of the coastline of unit 5 has an inverted zonation fronted by a ridge of sand/shell. Documented species list includes typical species found within the saltmarsh zones; annual sea blight, common saltmarsh grass, sea aster, sea plantain, sea purslane. Transitional zone was dominated by sea couch.
6	This unit is being actively managed, there has been cutting and burning of scrub and trees and there are horses grazing the unit. There is good range of structure and habitat across this unit offering suitable breeding bird habitat. It meets the targets for favourable condition.
7	Extent of feature unchanged. Saltmarsh fenced off from grazing and supporting good range of species characteristic of mid to upper saltmarsh.
12	This unit is less disturbed than Pegwell Bay although vehicular tracks were seen along the top of the beach. Visited at high tide when large roosts of oystercatcher and knot were present.
14	Unit contains seamless transition from saltmarsh to dune grassland there is some grazing in unit and also rabbit grazing in places, scrub is within limits. This salt marsh within this unit meeting all the assessment criteria. Fencing has been removed in places but animals do not appear to be grazing the saltmarsh, the remaining fencing could possibly be removed site.
15	Unit is still in favourable condition, the grazed dune pasture is being appropriately managed and meets the assessment criteria for fixed dune grassland

Table 5. Comparison of 914 elevation measurement on a flat tarmac surface of the former hoverport (edged blue on Figure 1) from LiDAR DTMs. Source: DEFRA Data Services Platform and NNRCMP

LiDAR flight data	Median elevation (m ODN)	Difference in elevation from 18/10/2024 (m)	Adjustment applied to the survey data (cm)
26/11/2007	4.540	-0.064	+6.4
15/10/2009	4.522	-0.082	+8.2
05/10/2013	4.520	-0.084	+8.4
04/12/2015	4.700	0.096	-9.6
05/11/2018	4.630	0.026	-2.6
20/09/2020	4.660	0.056	-5.6
11/10/2022	4.674	0.070	-7.0
18/10/2024	4.604	0.000	0.0

Table 6. Distance of the limit of saltmarsh measured from the centreline of Sandwich Road along six calculation lines A-F. Distances are in metres.

	A	B	C	D	E	F
1957	132	63	none	none	none	none
1960	257	188	172	187	190	none
1963	229	202	172	187	250	none
1979	290	225	154	190	none	247
1984	290	238	171	187	none	247
1989	290	235	156	187	none	248
1995	290	237	141	184	none	253
2001	290	237	148	185	none	252
2005	290	239	186	198	none	253
2008	290	241	252	268	276	253
2013	290	240	252	266	280	258
2016	290	278	253	269	286	269
2020	289	259	250	285	287	271
2022	266	265	251	294	282	275
2024	265	234	252	294	282	275

Table 7. Distance of the limit of saltmarsh measured from the highest astronomical tide position in 1947 along six calculation lines A-F. Distances are in metres.

	A	B	C	D	E	F
1957	111	9	none	none	none	none
1960	235	134	119	152	51	none
1963	208	149	119	153	111	none
1979	269	172	101	155	none	65
1984	269	184	118	153	none	65
1989	269	181	103	153	none	65
1995	269	184	88	150	none	71
2001	269	184	95	151	none	70
2005	269	186	133	164	none	71
2008	269	188	198	233	136	71
2013	268	187	199	231	140	76
2016	269	225	199	235	147	87
2020	268	206	197	250	147	88
2022	244	212	198	260	143	92
2024	244	180	198	260	143	92

Table 8. Average rate of change (m / yr) of the saltmarsh seaward limit measured along six calculation lines A-F. Positive values indicate seaward movement, negative values indicate landward movement.

	A	B	C	D	E	F
1960-2024	0.1	0.7	1.2	1.7	1.4	no data
1984-2024	-0.6	-0.1	2.0	2.7	no data	0.7
2008-2024	-1.6	-0.4	0.0	1.7	0.4	1.3
2016-2024	-3.1	-5.5	-0.1	3.2	-0.5	0.7

Figures

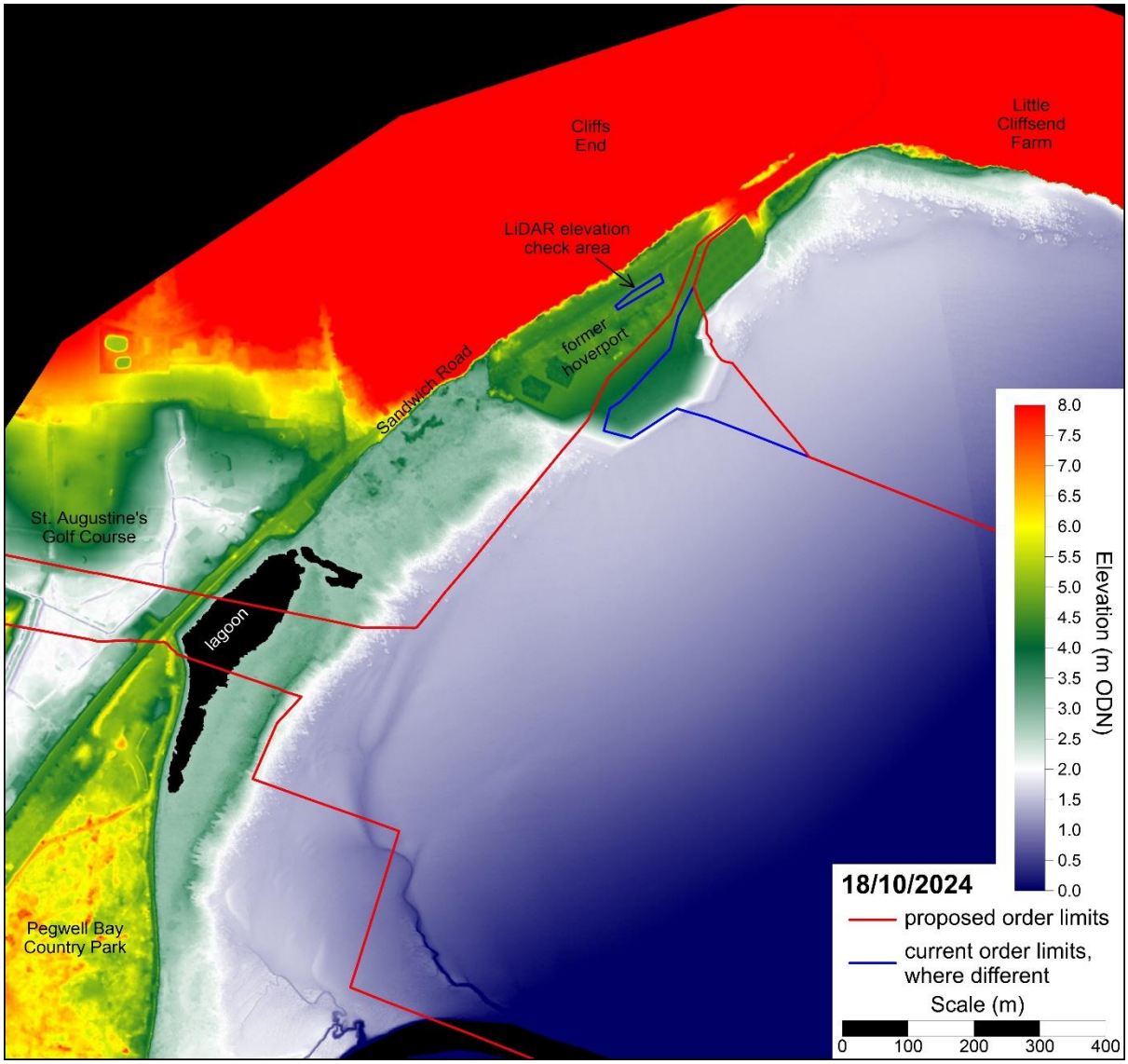

Figure 1. LiDAR DTM of Pegwell Bay flown 18/10/2024 showing current and proposed Sea Link Order Limits. LiDAR data source: NNRCMP

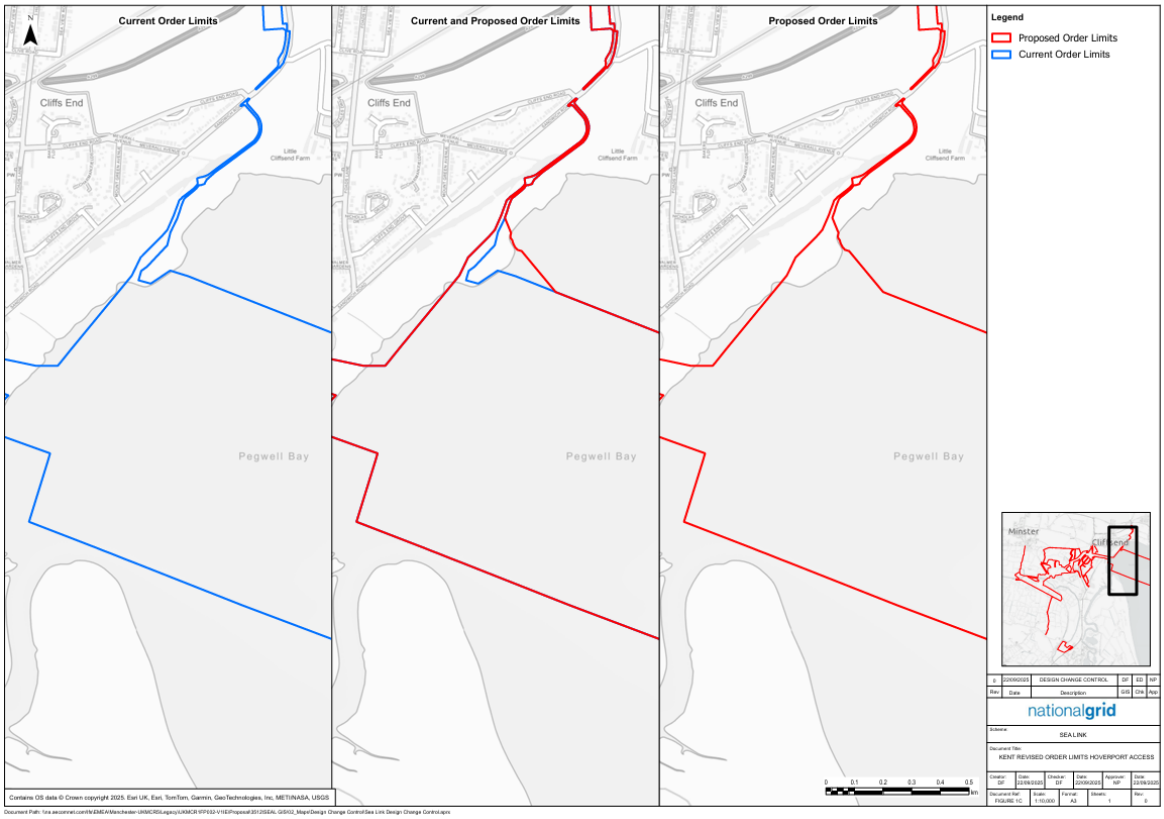

Figure 2. Current and proposed changes to Order Limits in the former hoverport area

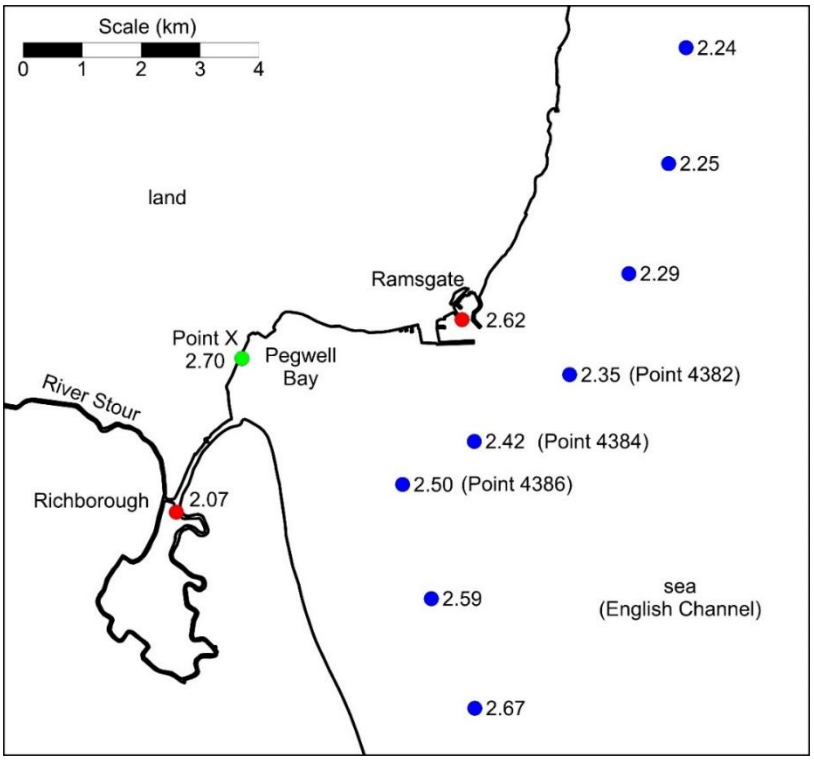

Figure 3. Levels of MHWS near Pegwell Bay, in metres above Ordnance Datum Newlyn, taken from 2022 Admiralty Tide Tables (red dots at the Standard Port of Ramsgate and the Secondary Port of Richborough), and from the Environment Agency Coastal Boundary Study 2018 Update (blue dots, Environment Agency, 2019). Point X (green dot) is inferred from mean levels at Ramsgate and elevations of vegetation types at the site

Figure 4. Thanet Coast and Sandwich Bay Special Protection Area. Base satellite imagery flown 30/03/2021

Figure 5. Thanet Coast & Sandwich Bay Ramsar site. Base satellite imagery flown 30/03/2021

Figure 6. Sandwich Bay Special Area of Conservation and part of the Thanet Coast Special Area of Conservation. Base satellite imagery flown 30/03/2021

Figure 7. Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest Condition Assessment Units. Base satellite imagery flown 30/03/2021

Figure 8. Sandwich & Pegwell Bay National Nature Reserve. Base satellite imagery flown 30/03/2021

Figure 9. Sandwich & Pegwell Bay Reserve (including the Prince's Beachlands Local Nature Reserve) managed by the Kent Wildlife Trust. Base satellite imagery flown 30/03/2021

Figure 10. National Trust Ownership (Sandwich and Pegwell Bays). Base satellite imagery flown 30/03/2021

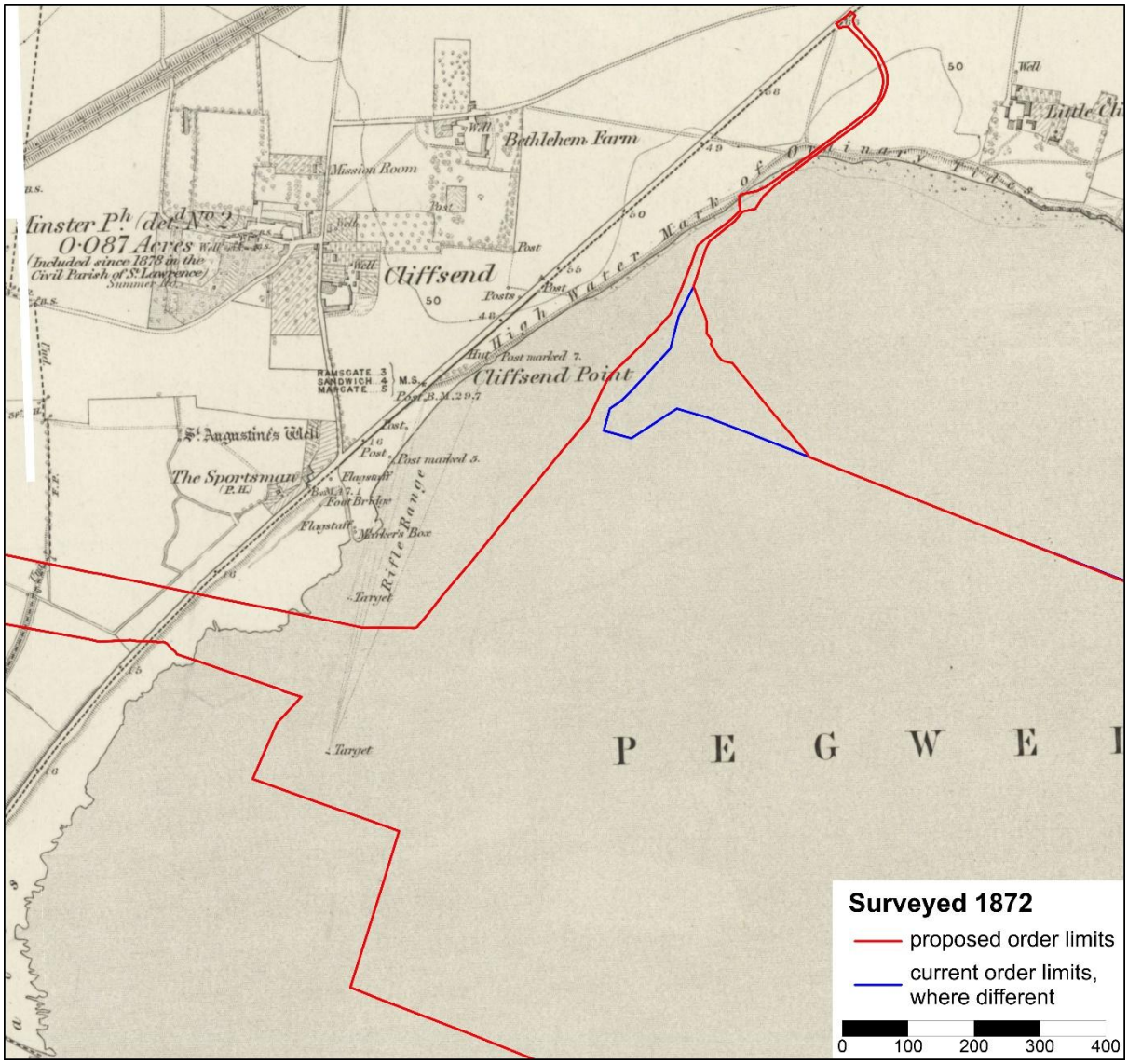

Figure 11. Six-inch Ordnance Survey map surveyed 1872 and published in 1877

.

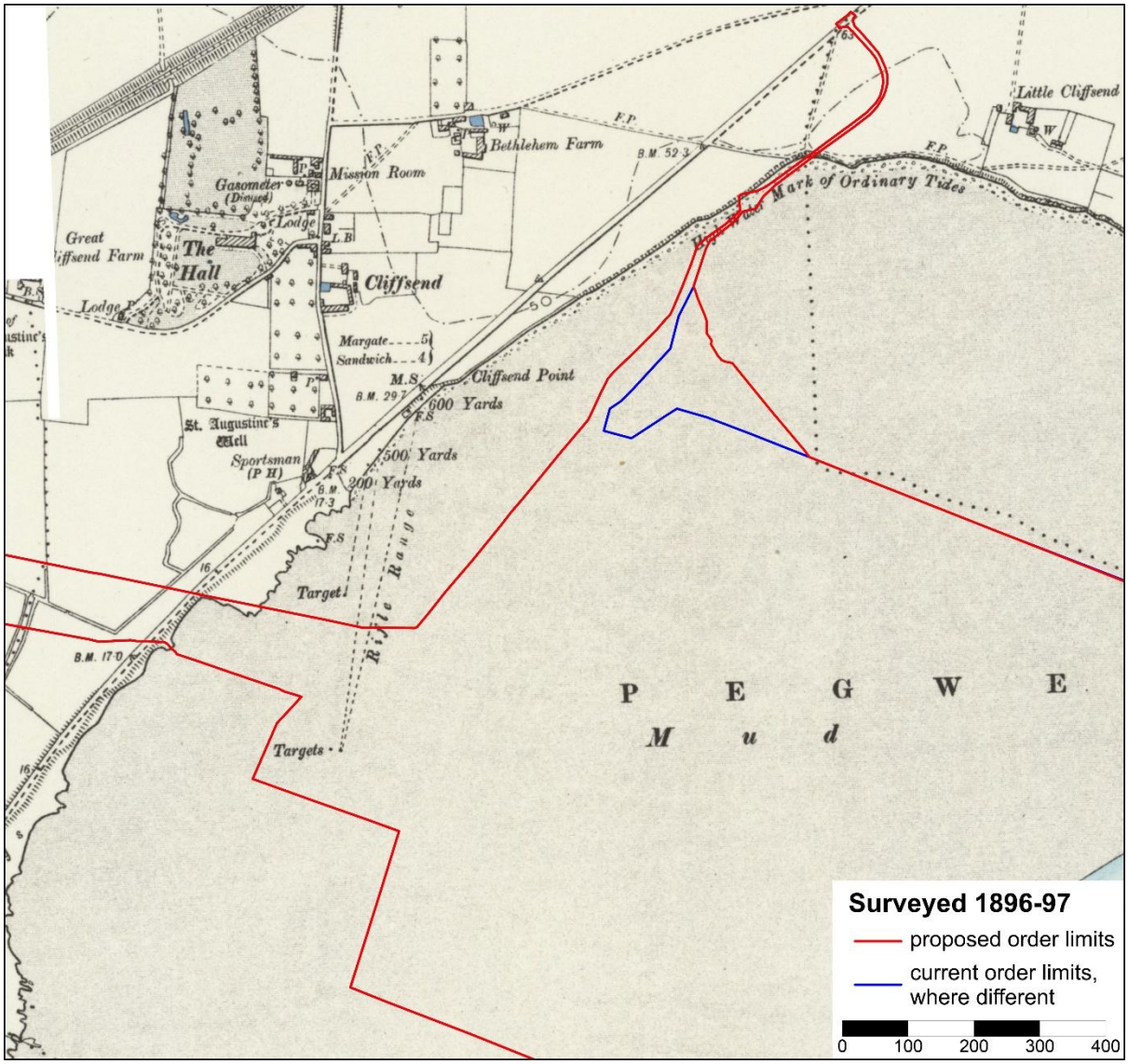

Figure 12. Six-inch Ordnance Survey map surveyed 1896-97 and published in 1899

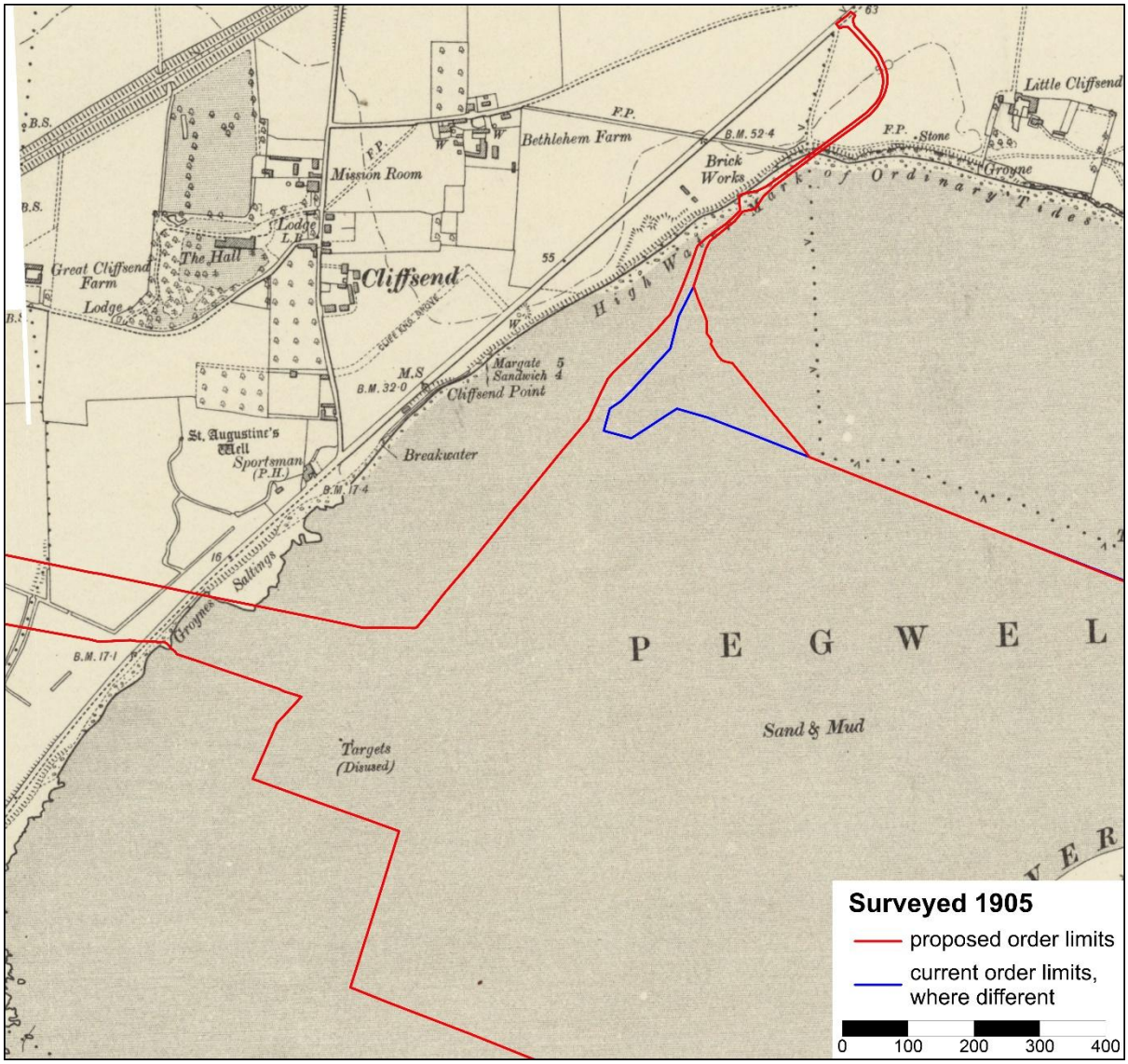

Figure 13. Six-inch Ordnance Survey map surveyed 1905 and published in 1908

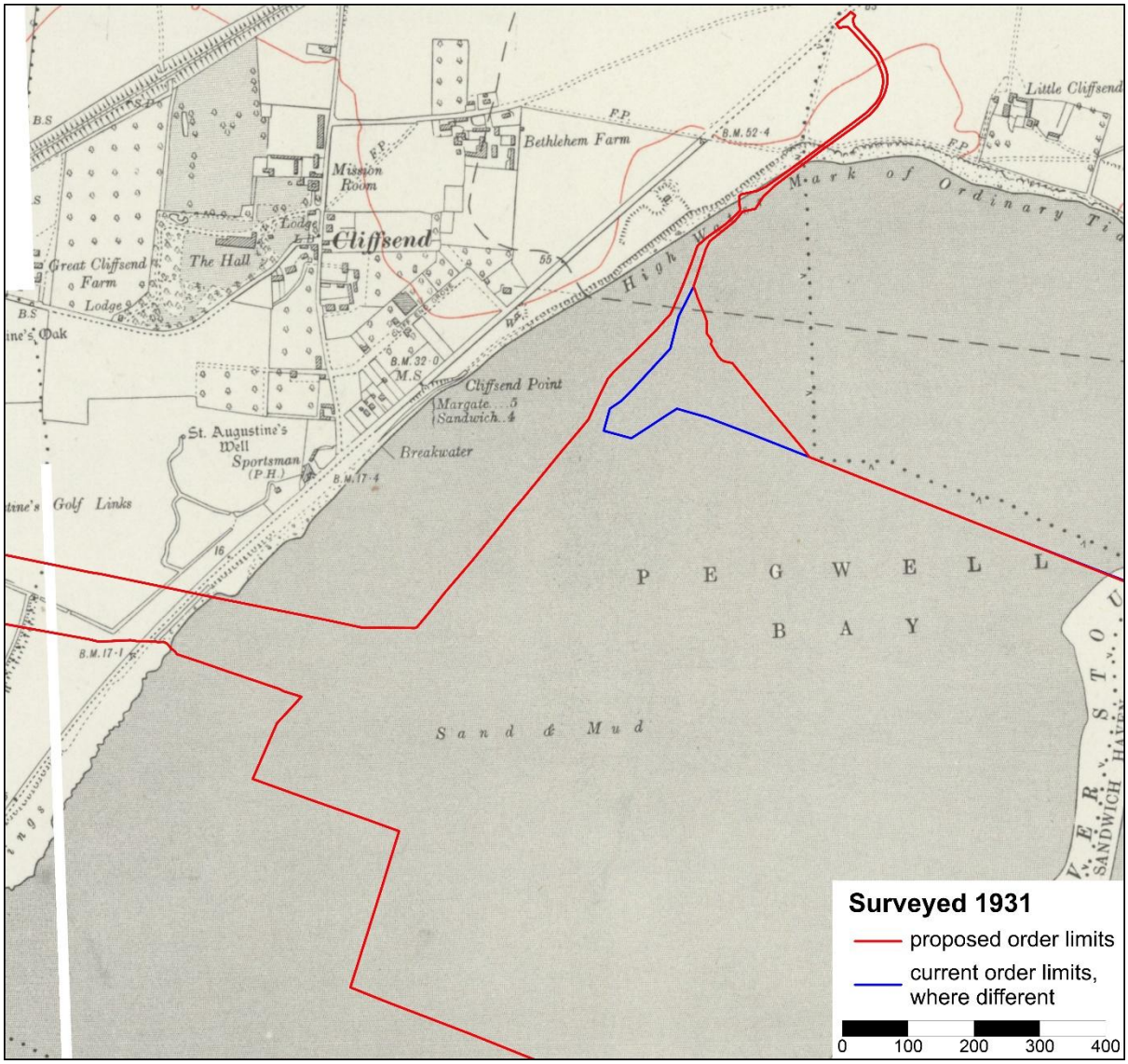

Figure 14. Six-inch Ordnance Survey map surveyed 1931 and published in 1934

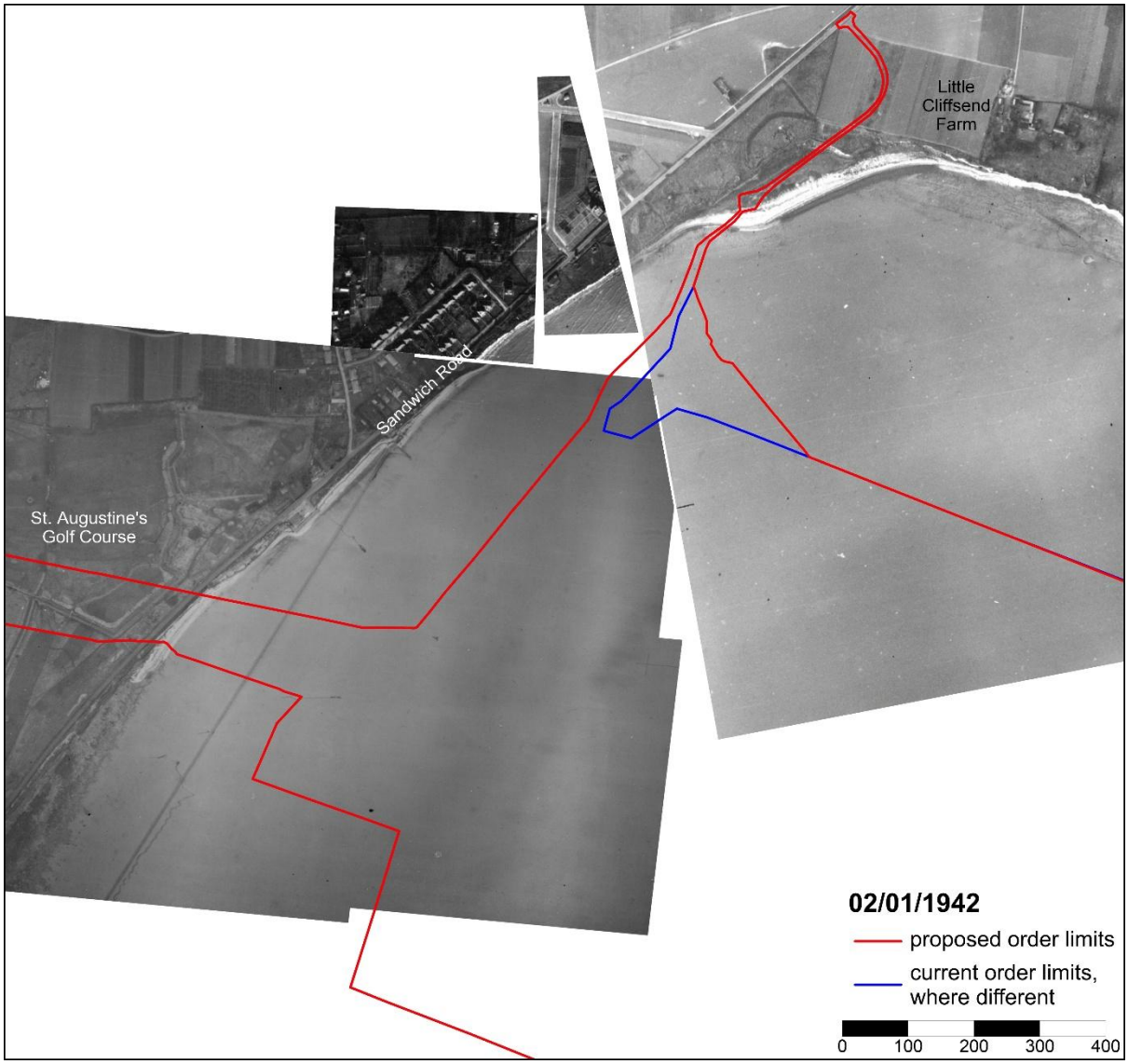

Figure 15. Aerial photography flown 02/01/1942. Source: Kent County Council (via Google Earth)

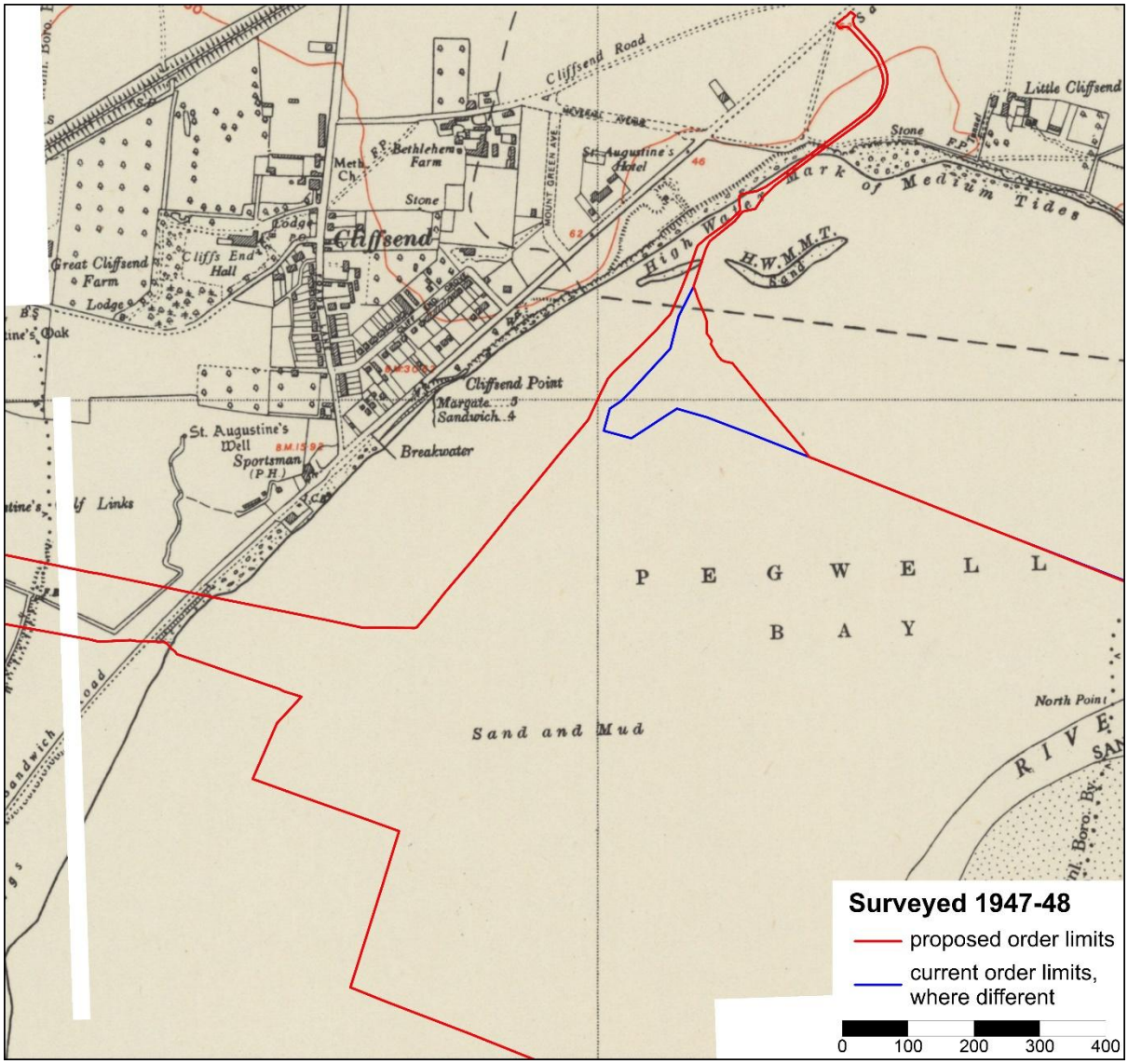

Figure 16. Six-inch Ordnance Survey map surveyed 1947-48 and published in 1951

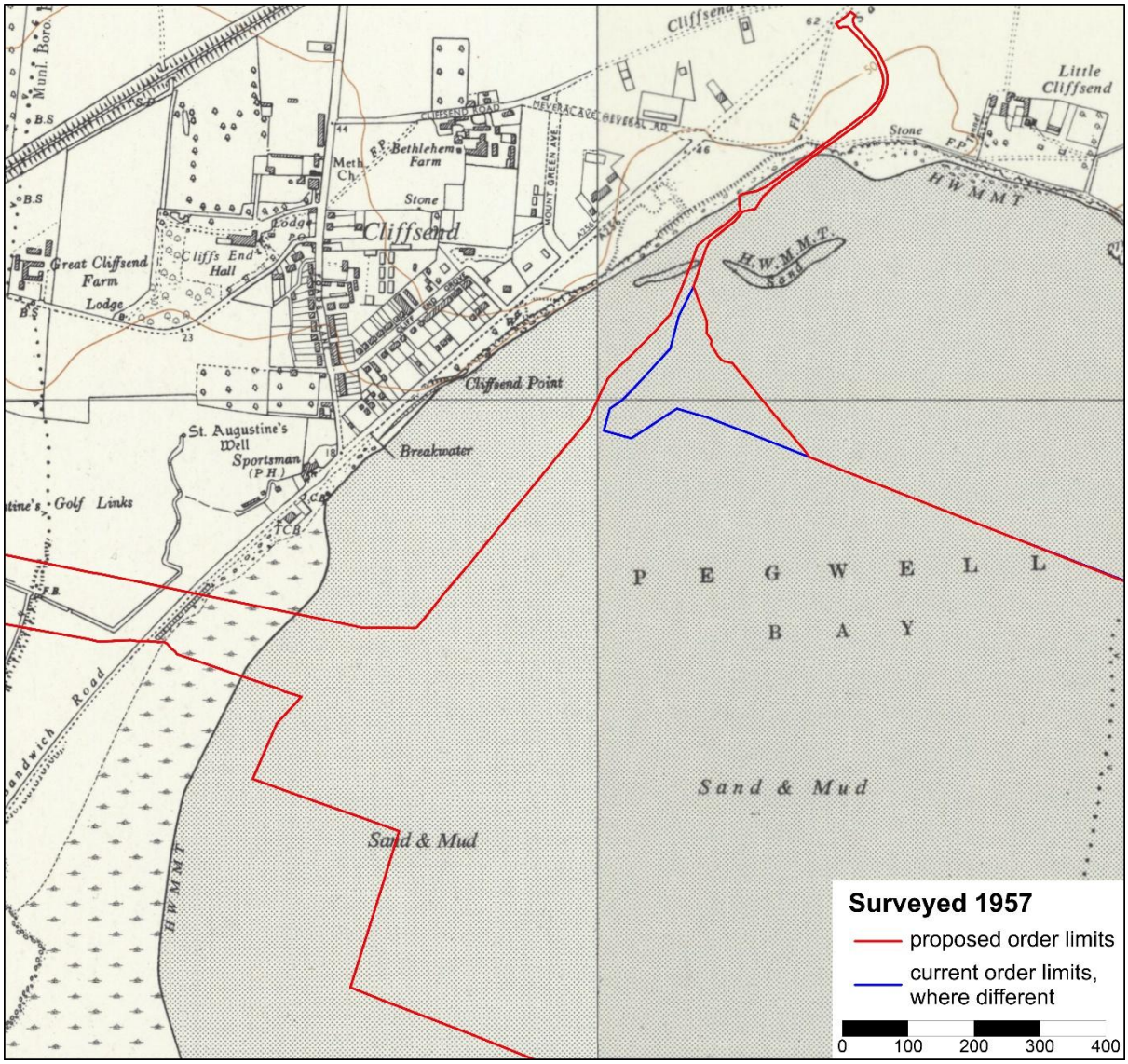

Figure 17. Six-inch Ordnance Survey map surveyed 1957 and published in 1960

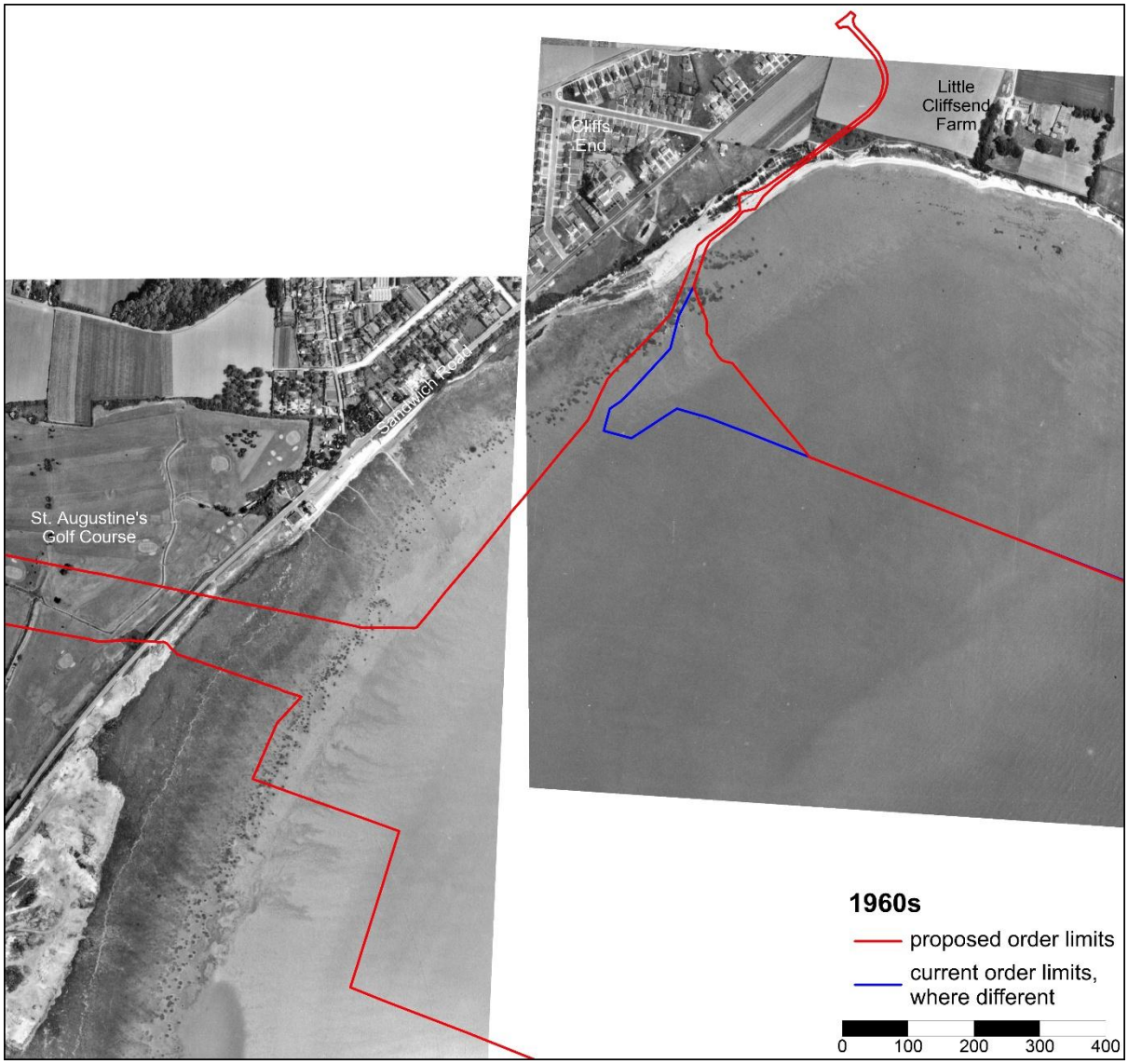

Figure 18. Aerial photography flown early to mid 1960s. Source: Kent County Council (via Google Earth)

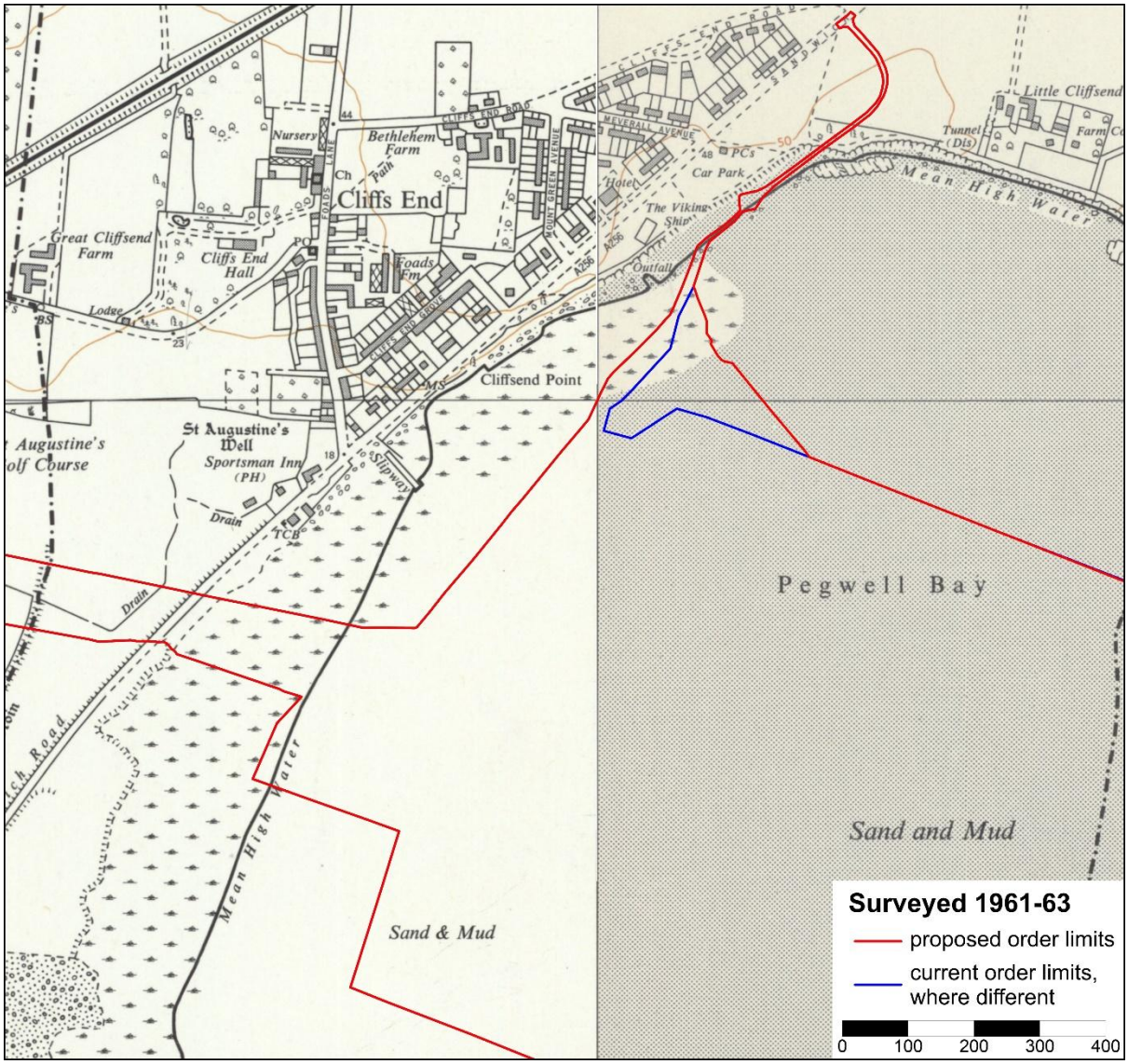

Figure 19. Six-inch Ordnance Survey map surveyed 1961-63 and published in 1968

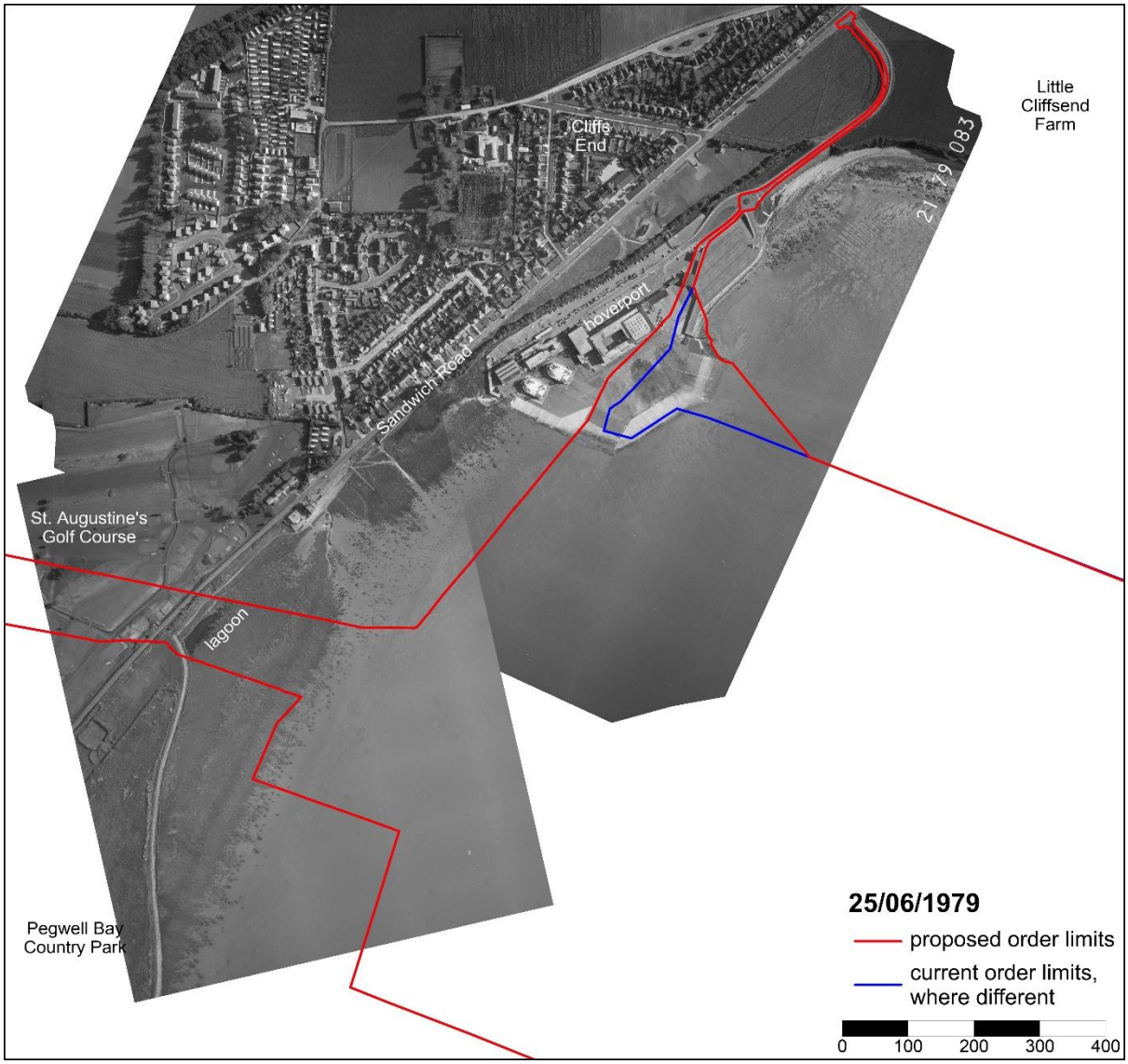

Figure 20. Aerial photography flown 25/06/1979 Source: NCAP

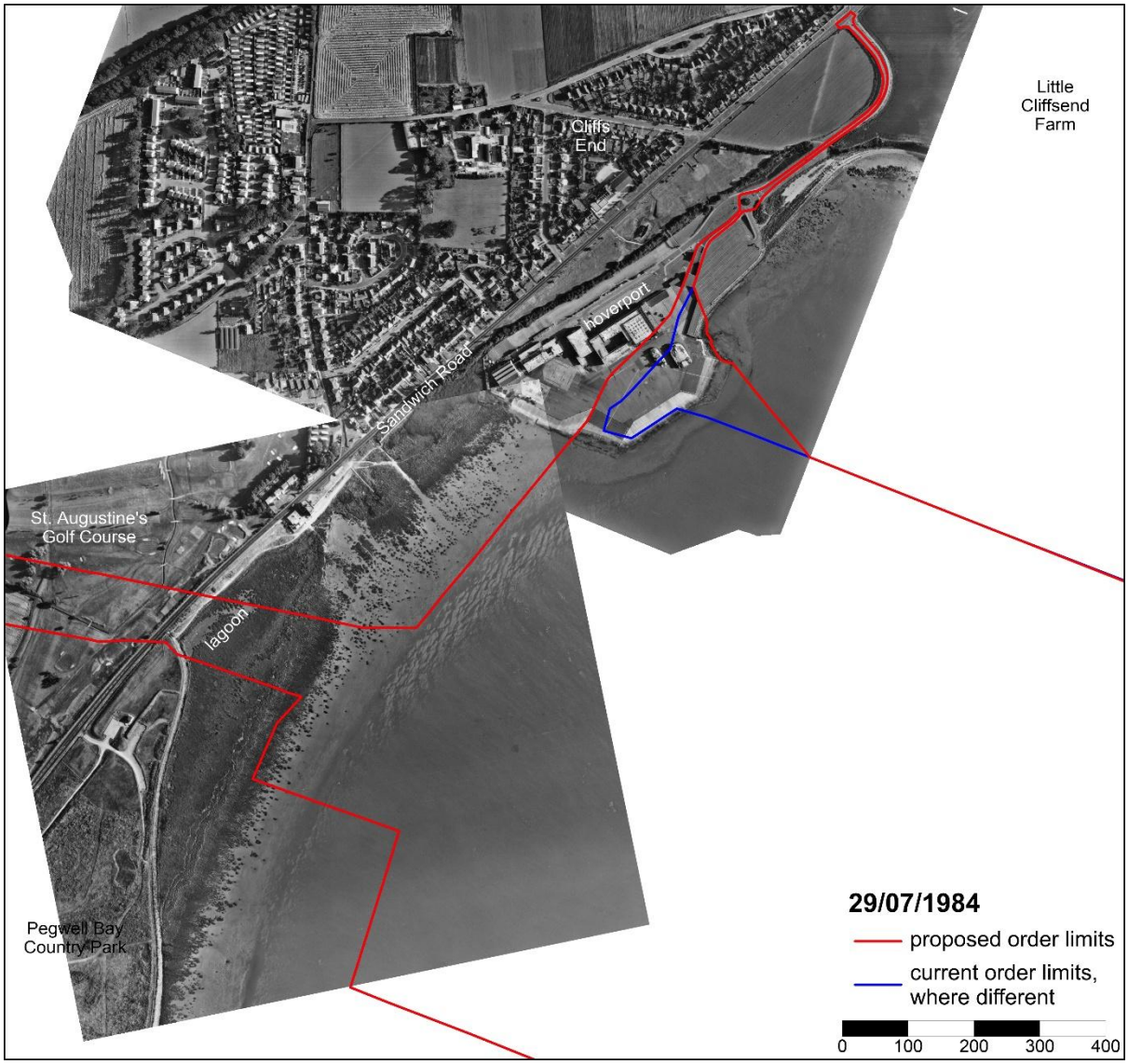

Figure 21. Aerial photography flown 29/07/1984 Source: NCAP

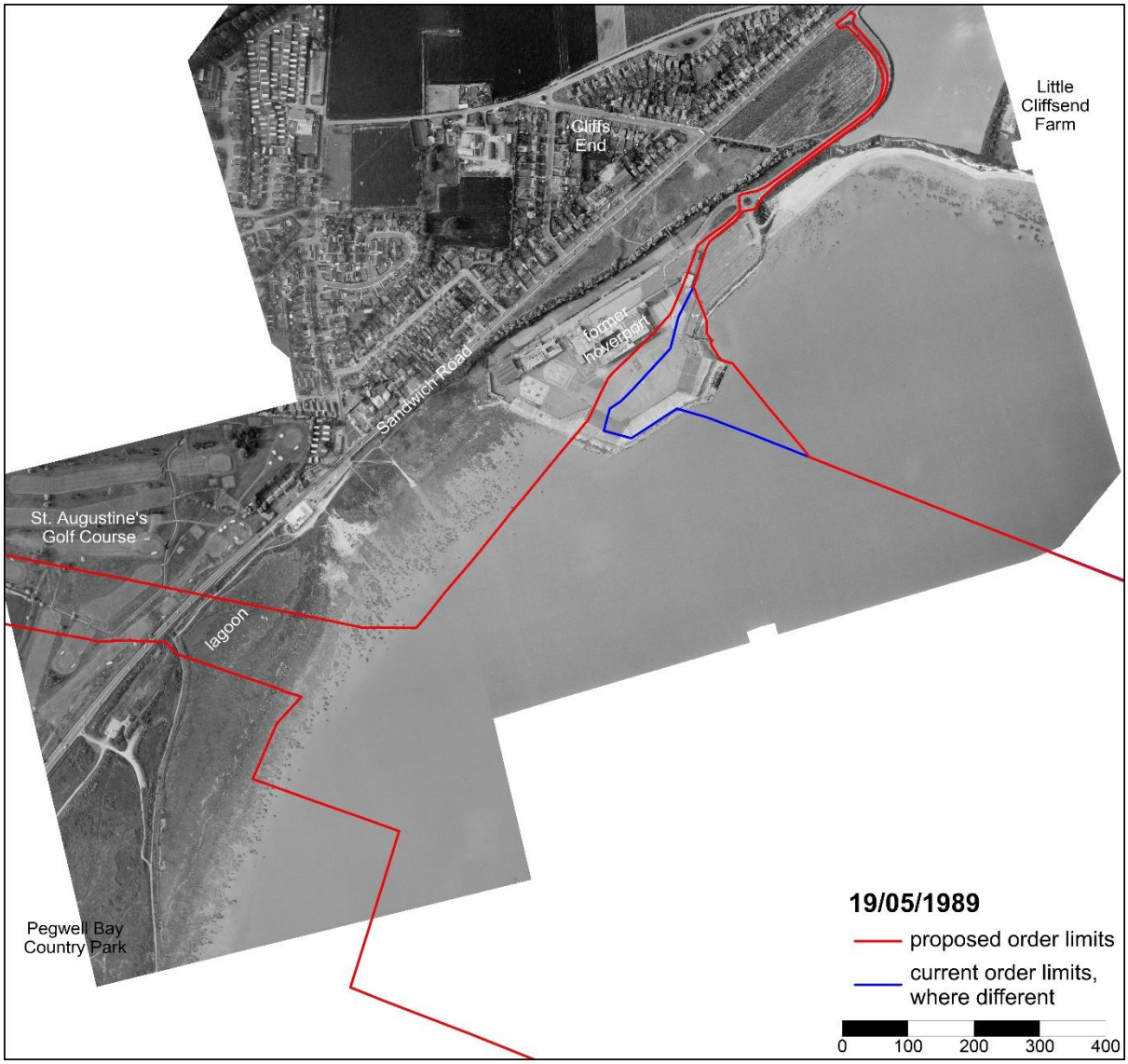

Figure 22. Aerial photography flown 16/05/1989 Source: NCAP

Figure 23. Aerial photography flown 04/04/1995 Source: NCAP

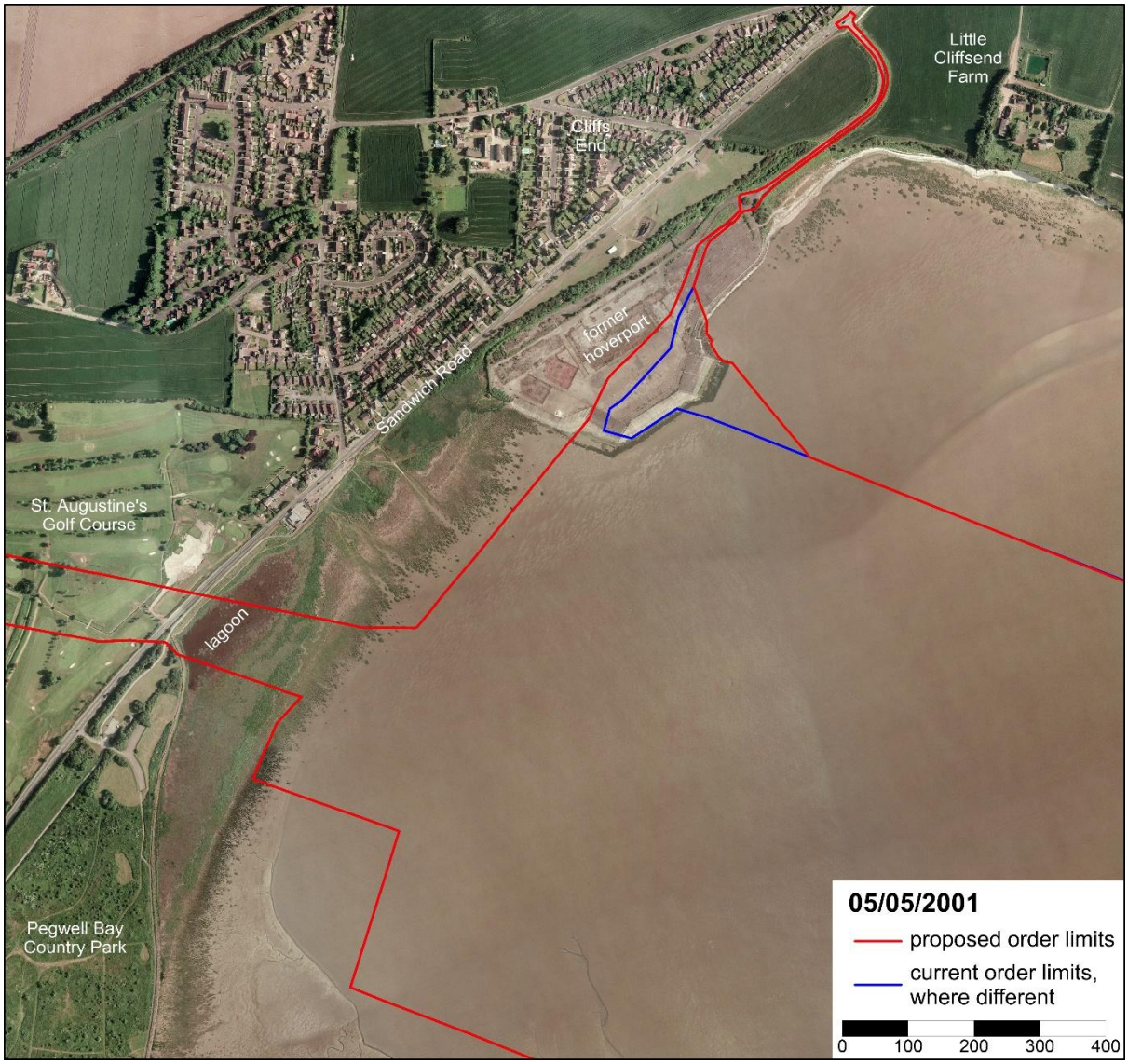

Figure 24. Aerial photography flown 05/05/2001. Source: NNRCMP

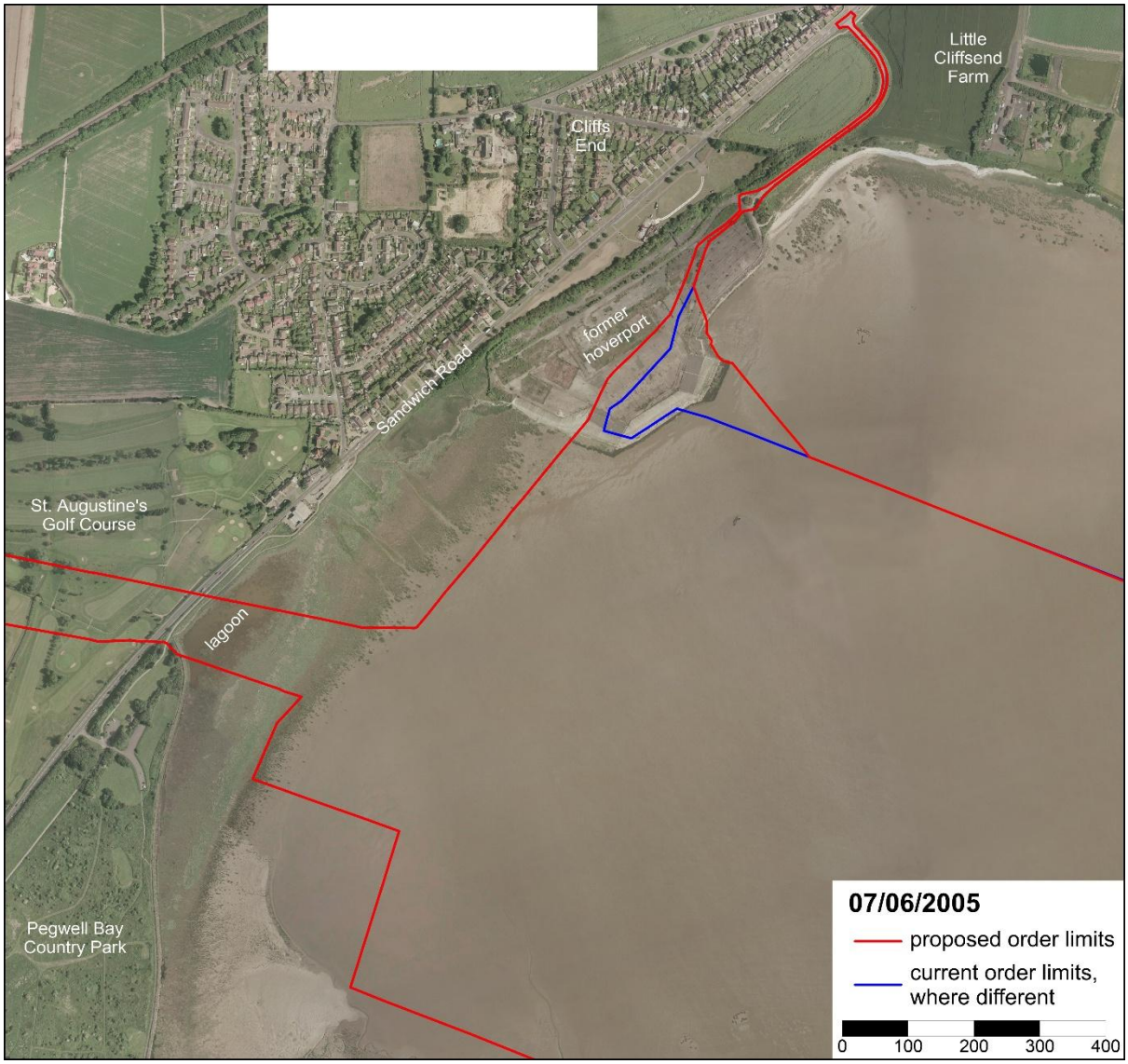

Figure 25. Aerial photography flown 07/06/2005. Source: NNRCMP

Figure 26. Aerial photography flown 18/05/2008. Source: NNRCMP

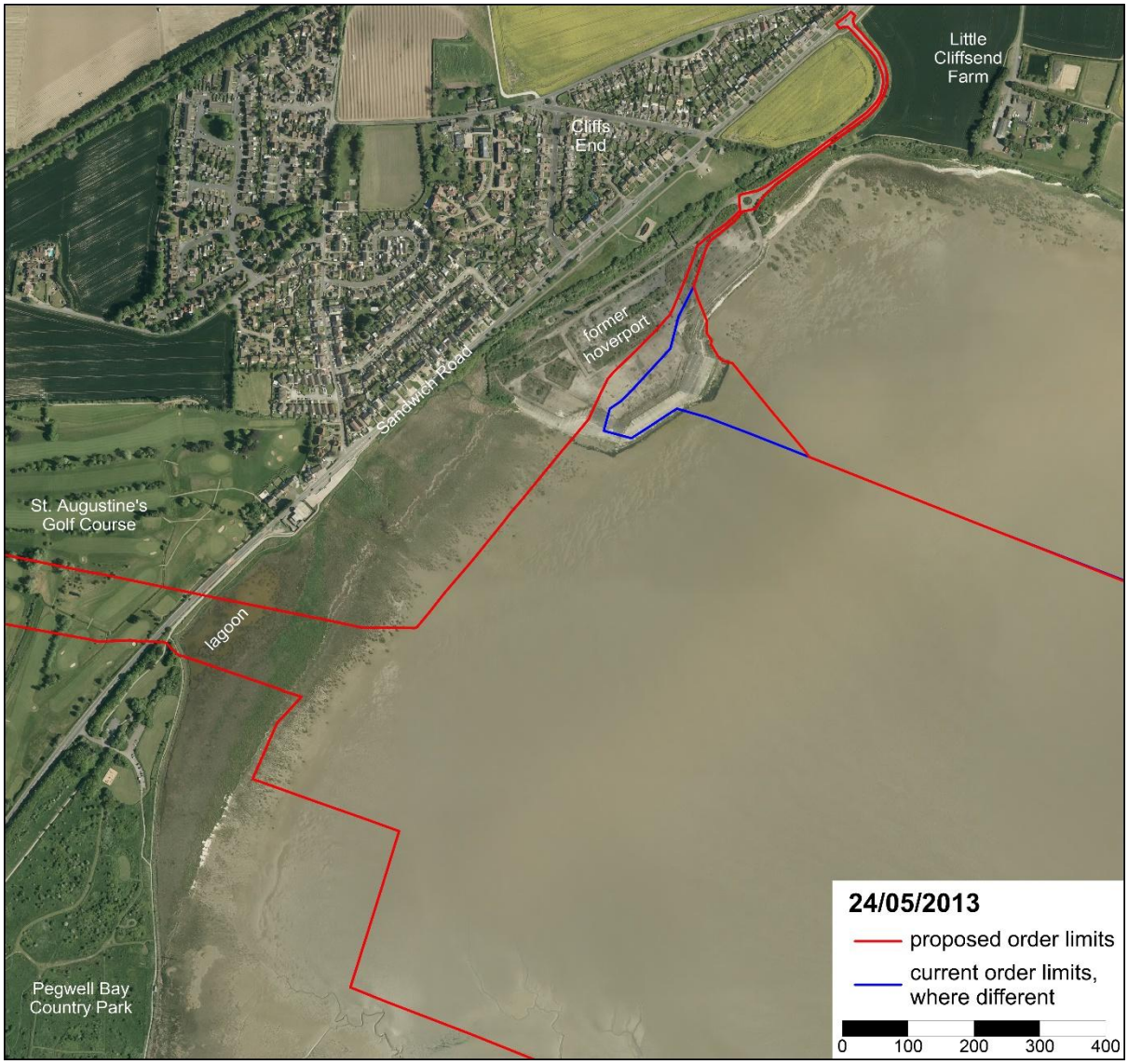

Figure 27. Aerial photography flown 24/05/2013. Source: NNRCMP

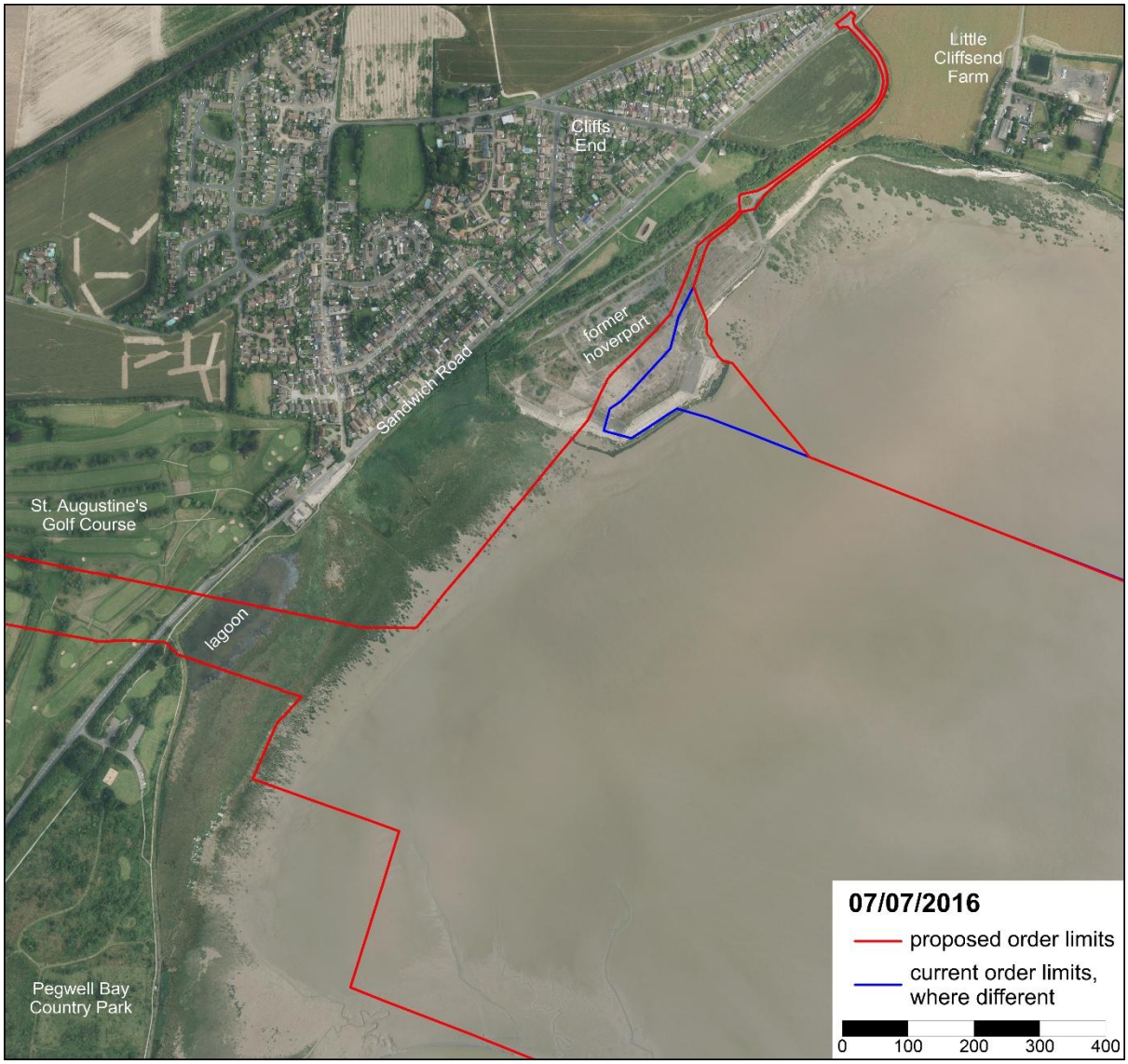

Figure 28. Aerial photography flown 07/07/2016. Source: NNRCMP

Figure 29. Aerial photography flown 19/09/2020. Source: NNRCMP

Figure 30. Aerial photography flown 13/08/2022. Source: NNRCMP

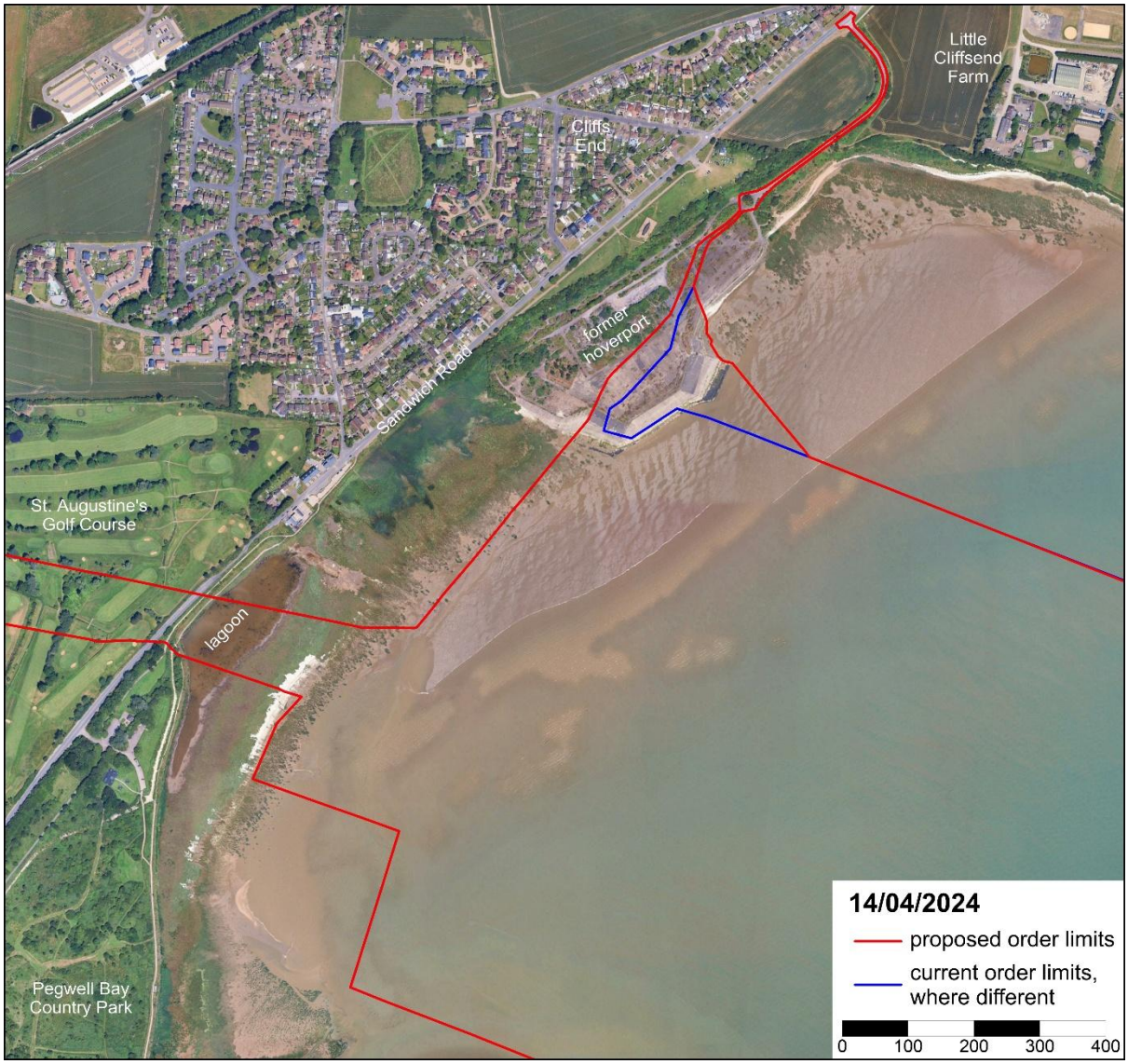

Figure 31. Aerial photography flown 14/04/2024. Source: Bluesky (via Google Earth)

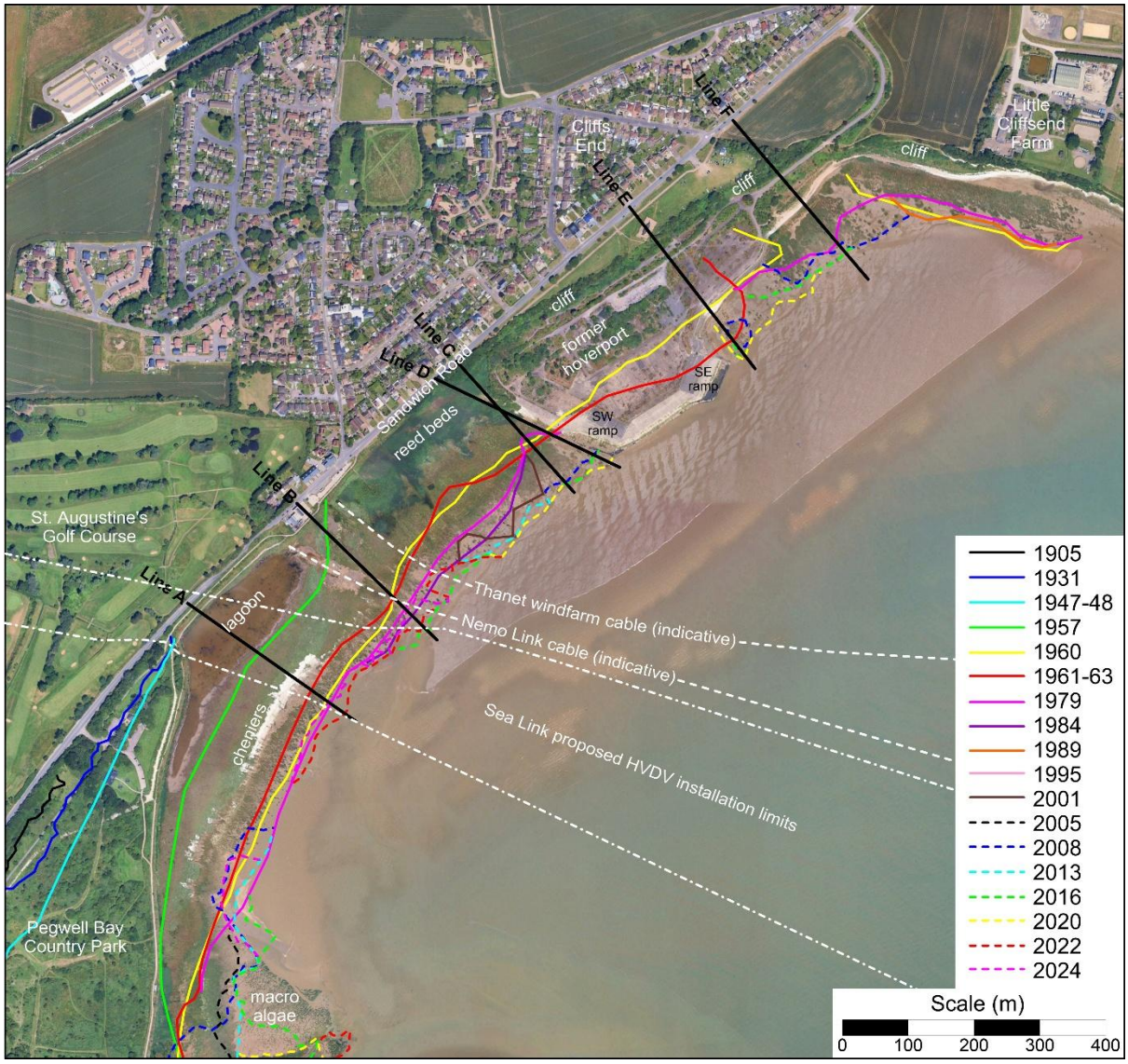

Figure 32. Aerial photography flown 14/04/2024 showing the progressive movement of the seaward edge of saltmarsh from historical Ordnance Survey maps and aerial photographs: a line is shown where it is different from the preceding position. Also shown are calculation lines A to F where the limit of saltmarsh has been calculated. The Sea Link proposed HVDV installation limits are taken from Drawing No. DCO/K/WK/PS/0410 in Application Document 2.5.2 of PINS Application Number EN020026. Aerial photography source: Bluesky (via Google Earth)

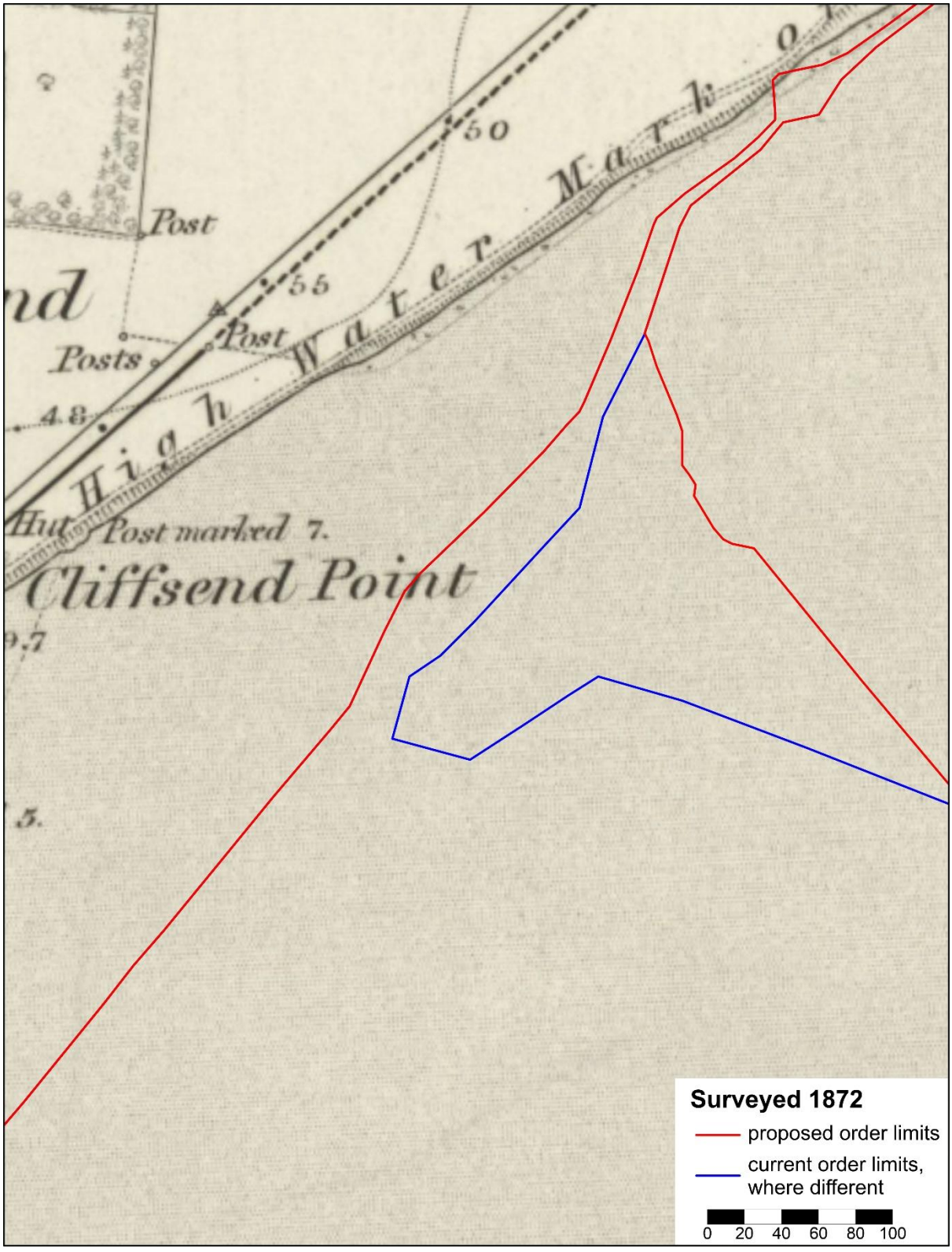

Figure 33. Six-inch Ordnance Survey map surveyed 1872 and published in 1877

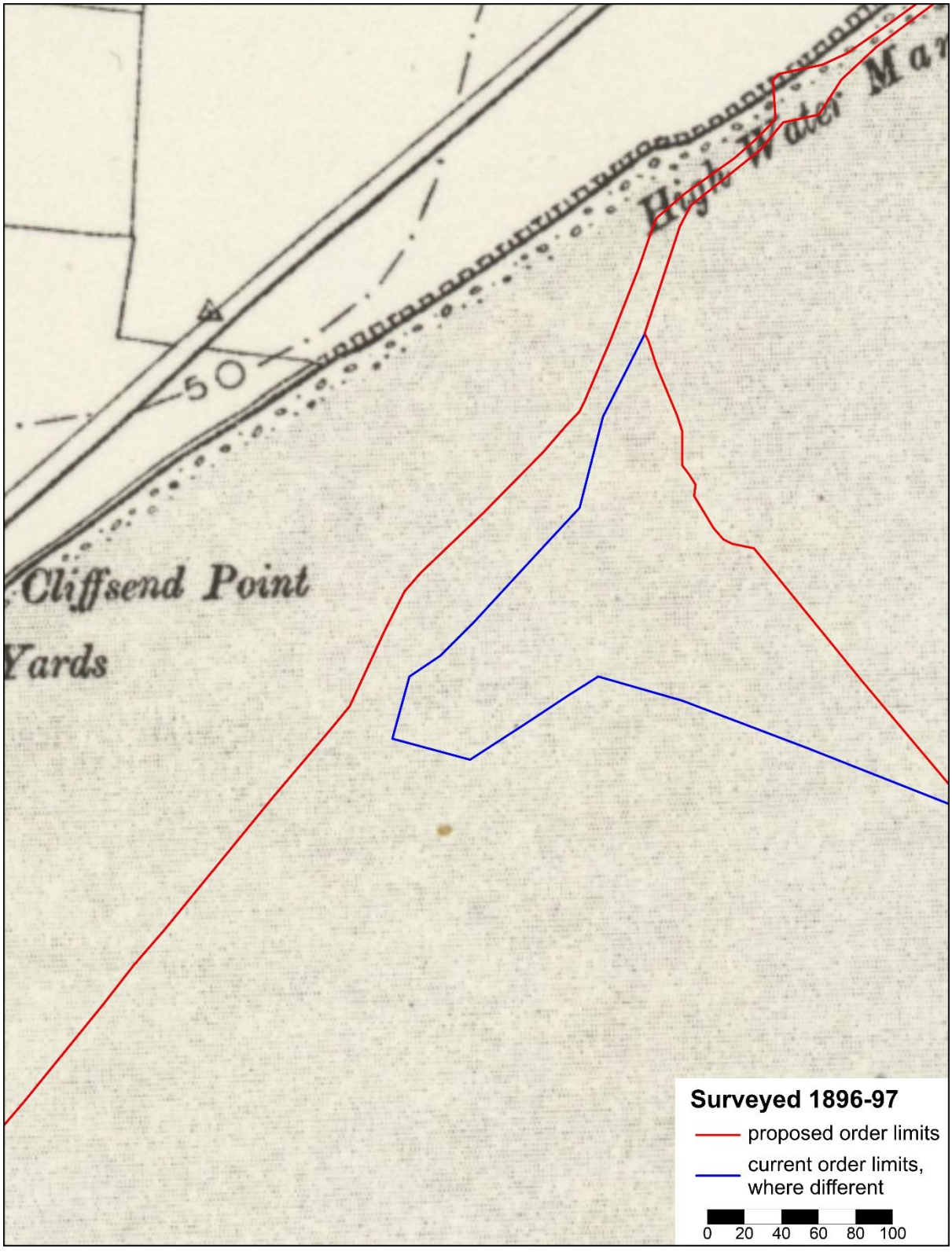

Figure 34. Six-inch Ordnance Survey map surveyed 1896-97 and published in 1899

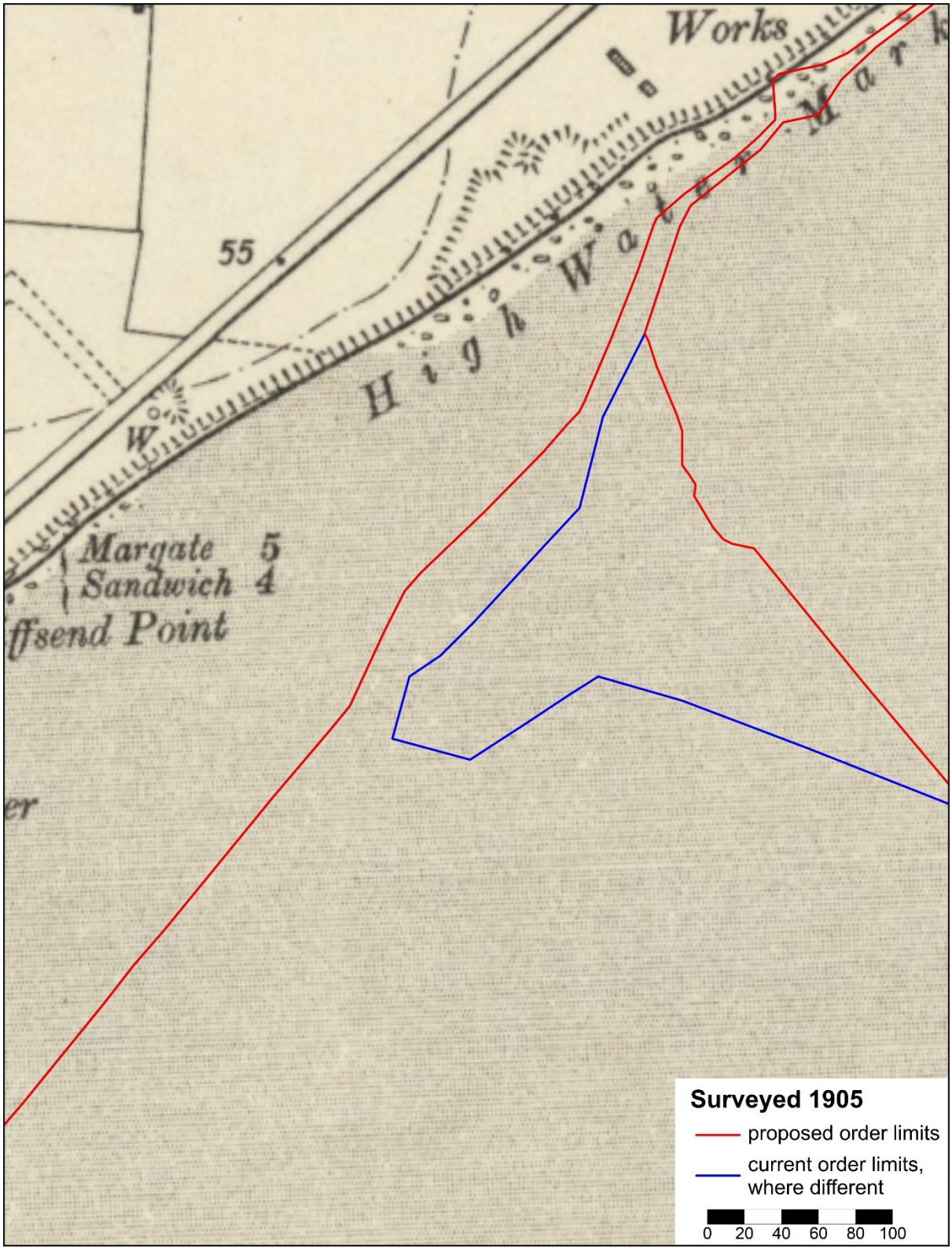

Figure 35. Six-inch Ordnance Survey map surveyed 1905 and published in 1908

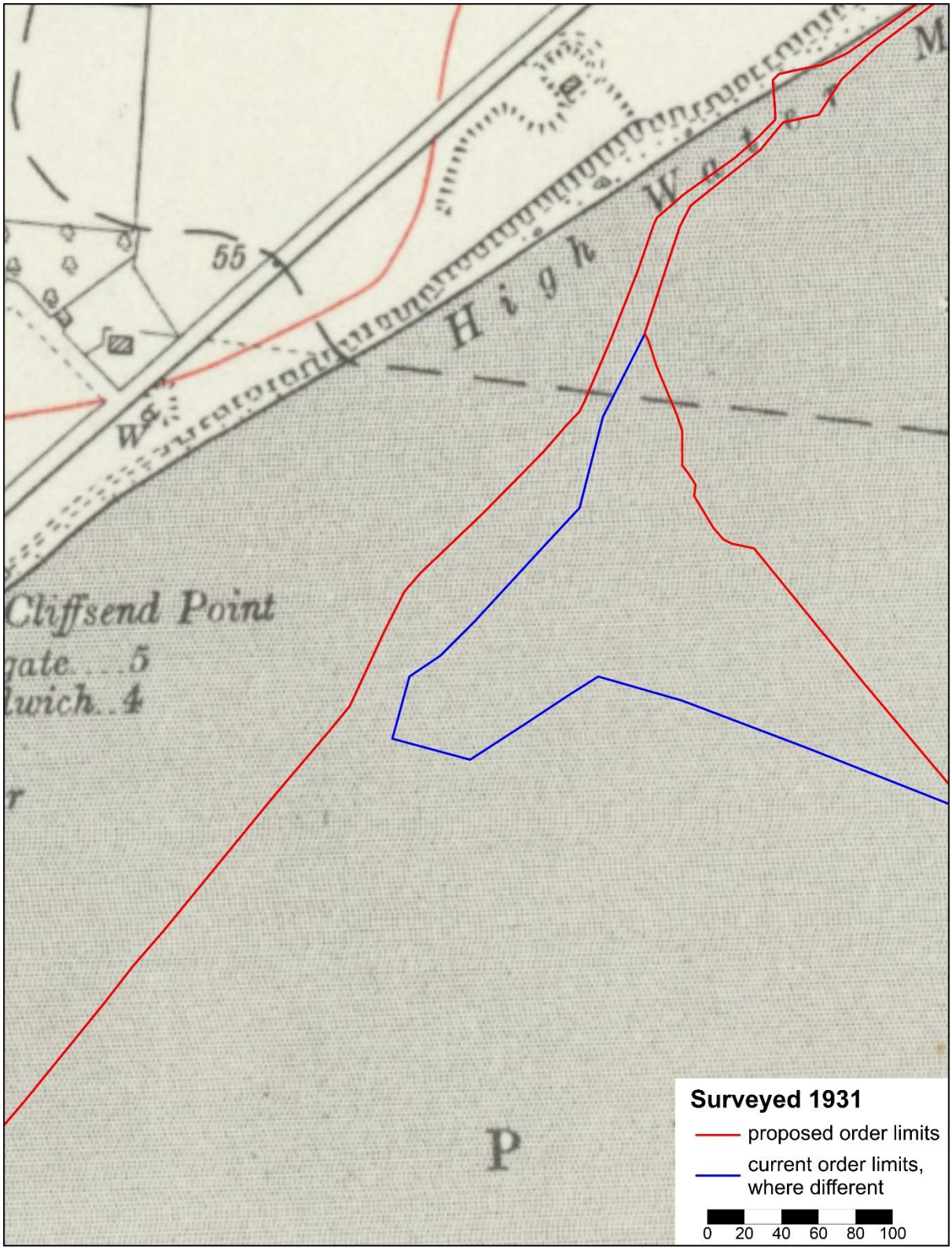

Figure 36. Six-inch Ordnance Survey map surveyed 1931 and published in 1934

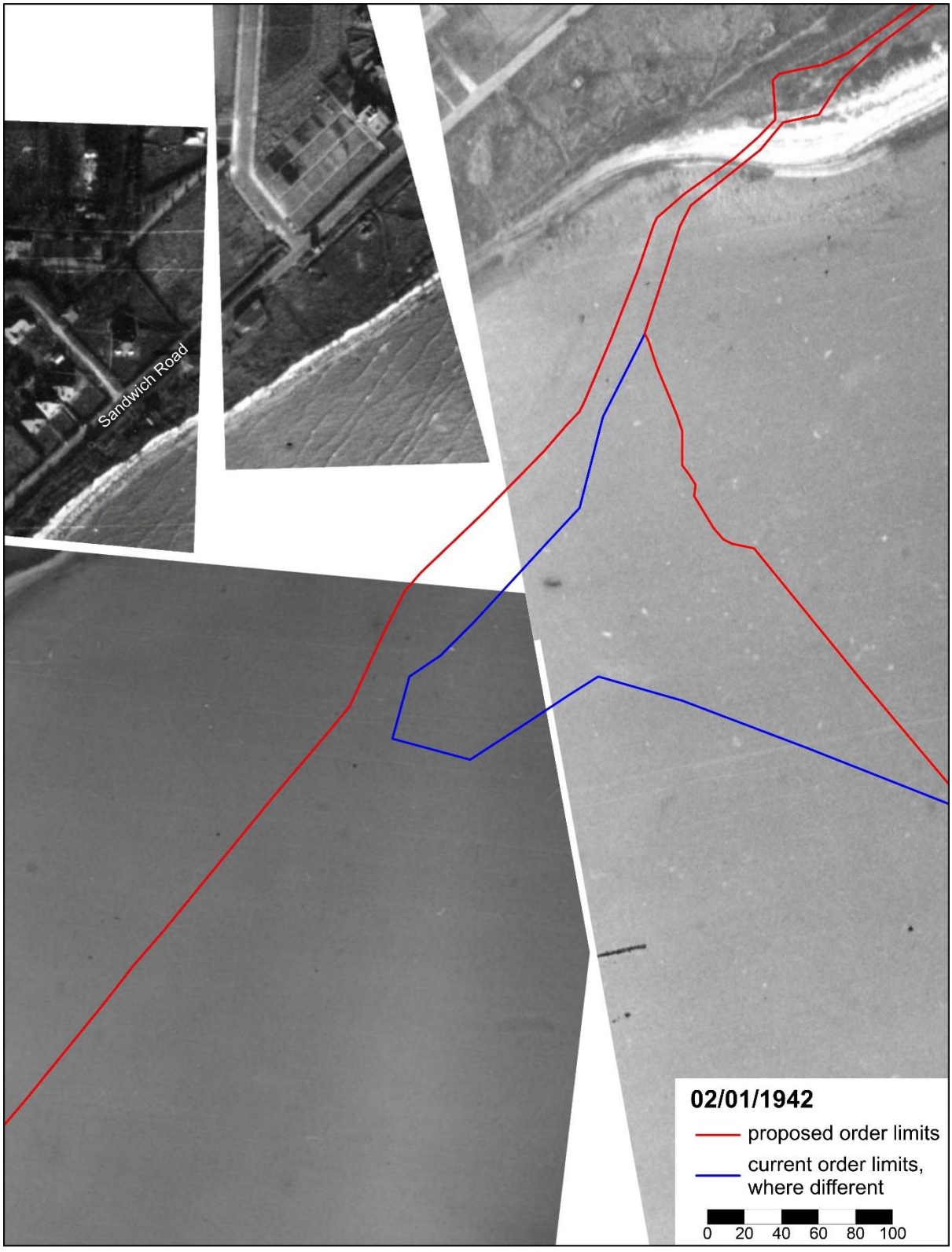

Figure 37. Aerial photography flown 02/01/1942. Source: Kent County Council (via Google Earth)

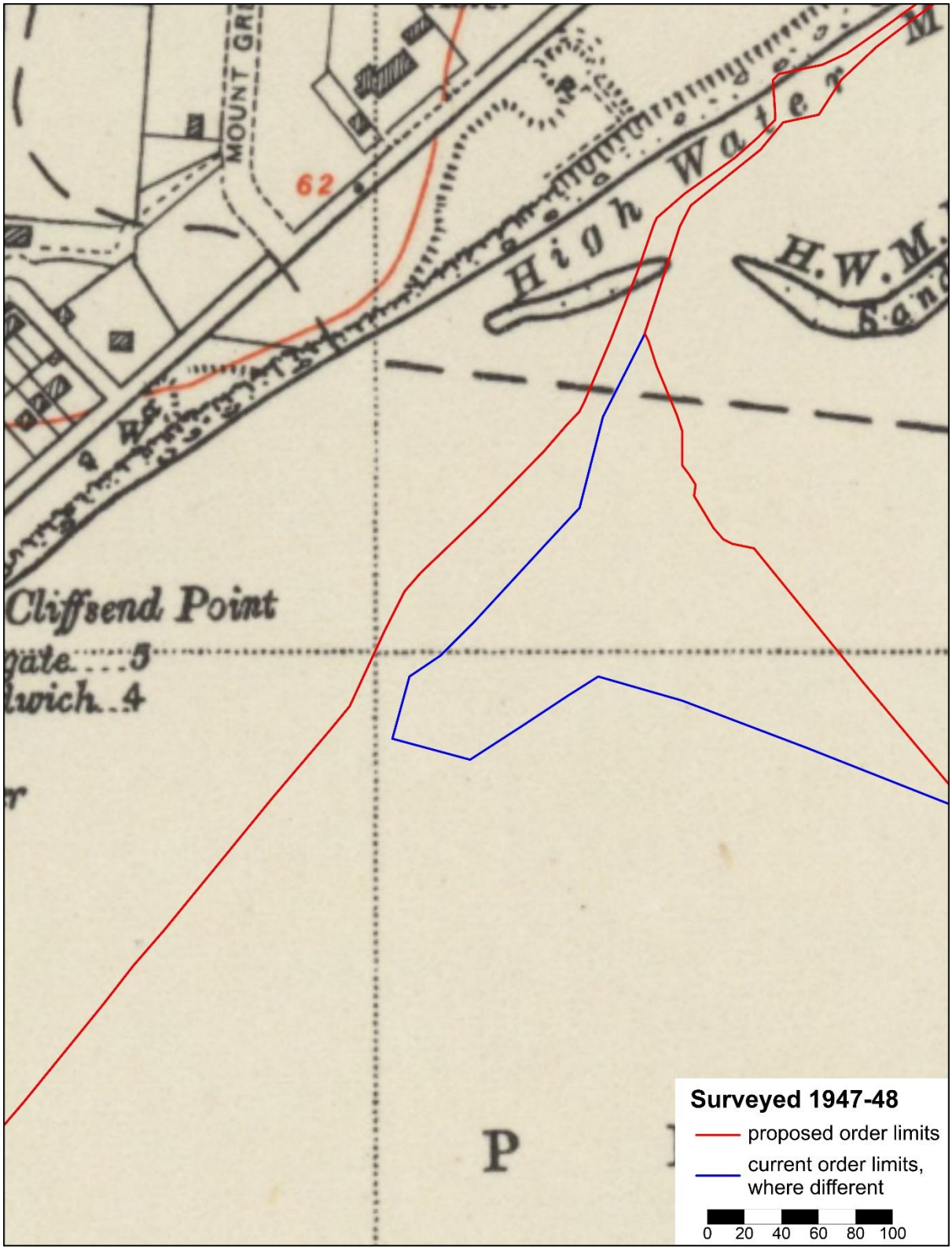

Figure 38. Six-inch Ordnance Survey map surveyed 1947-48 and published in 1951

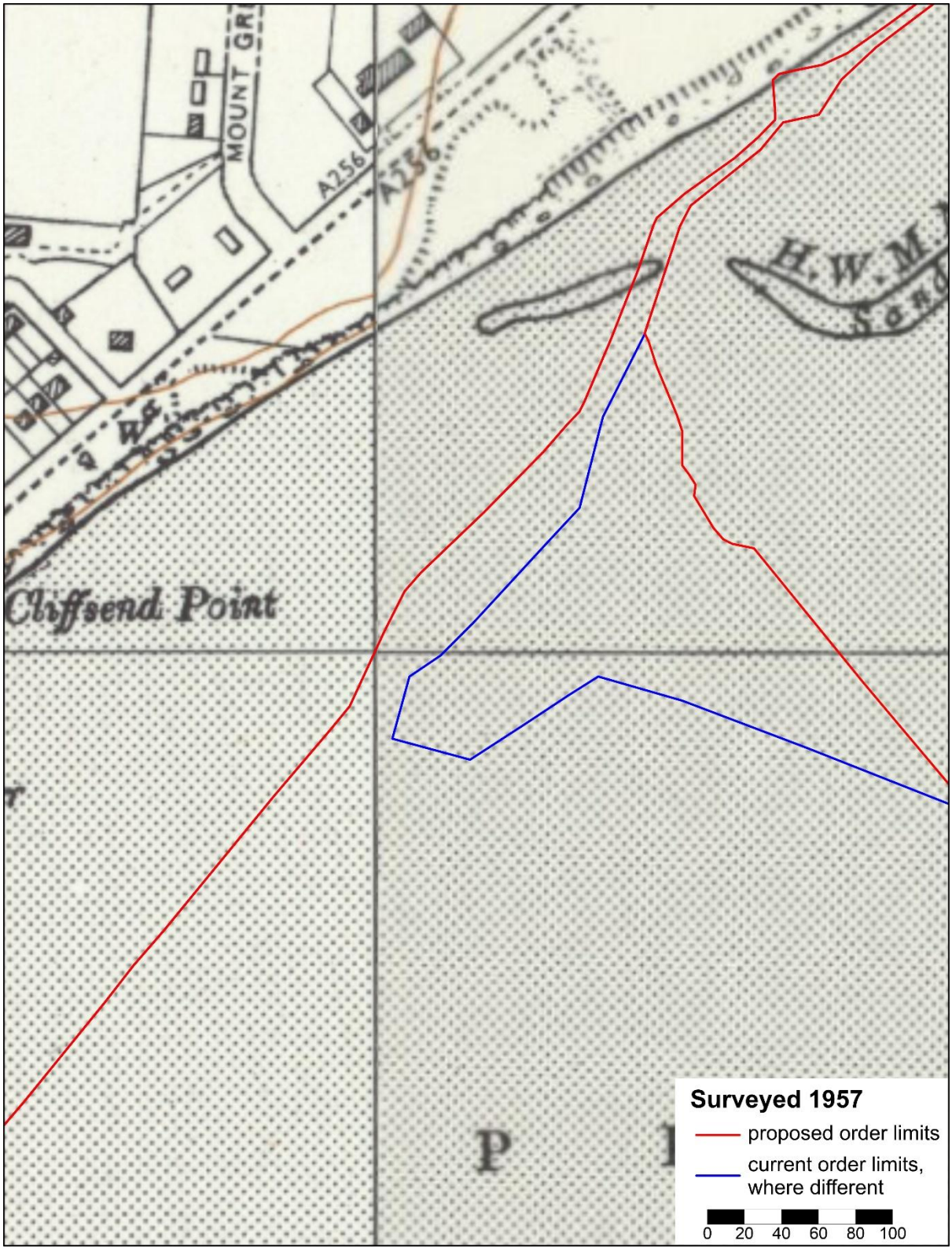

Figure 39. Six-inch Ordnance Survey map surveyed 1957 and published in 1960

Figure 40. Aerial photography flown early 1960s. Source: Kent County Council (via Google Earth)

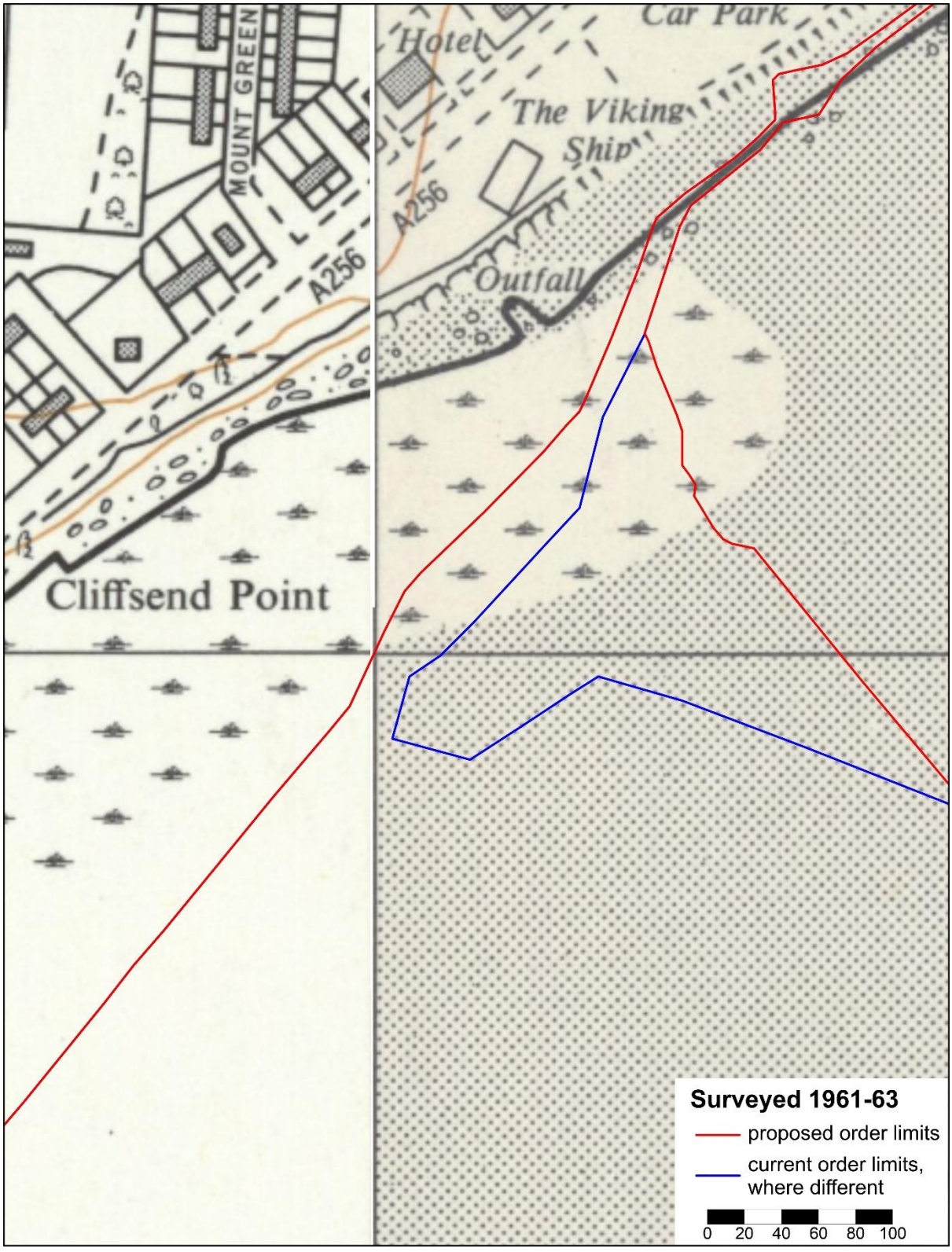

Figure 41. Six-inch Ordnance Survey map surveyed 1961-63 and published in 1968

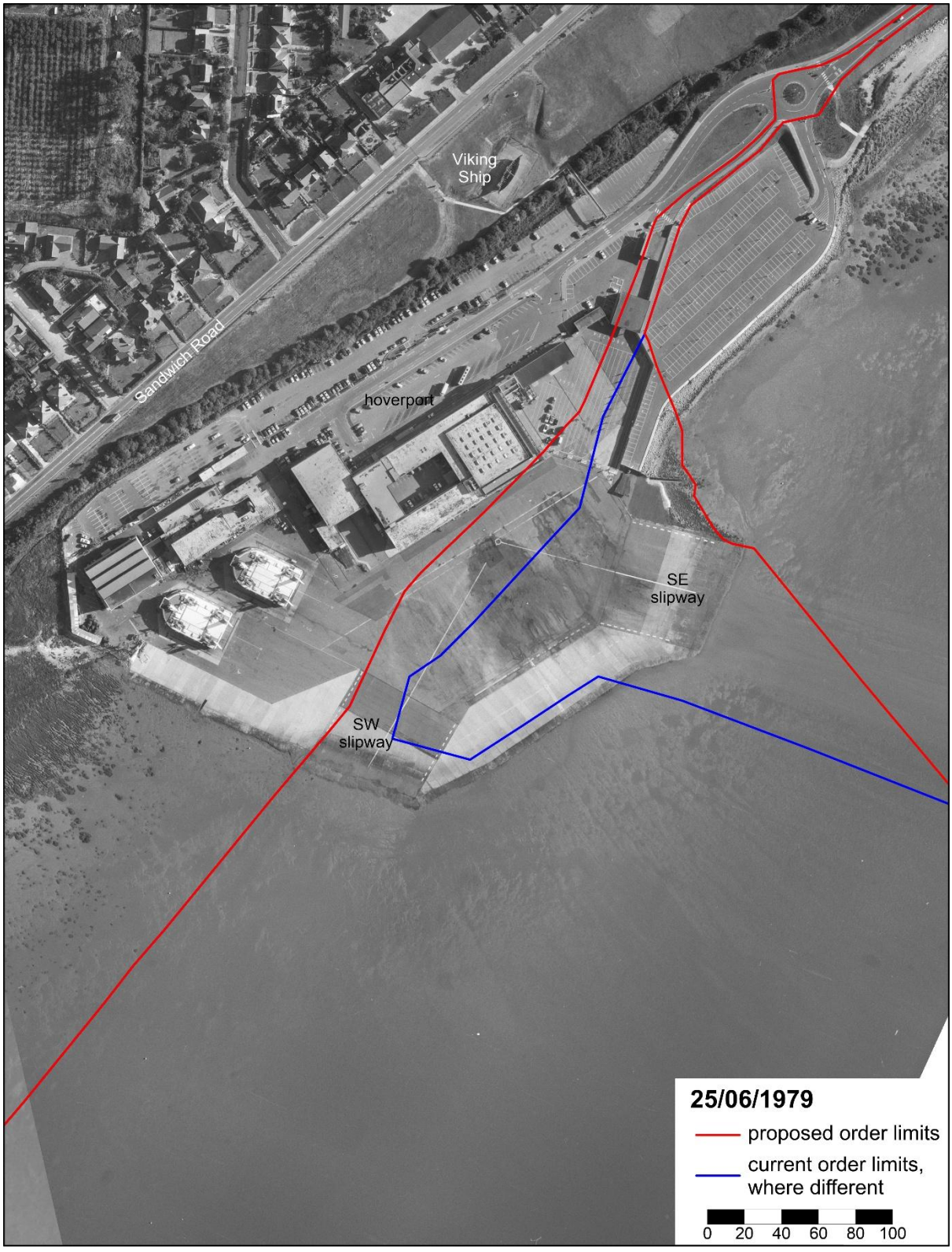

Figure 42. Aerial photography flown 25/06/1979 Source: NCAP

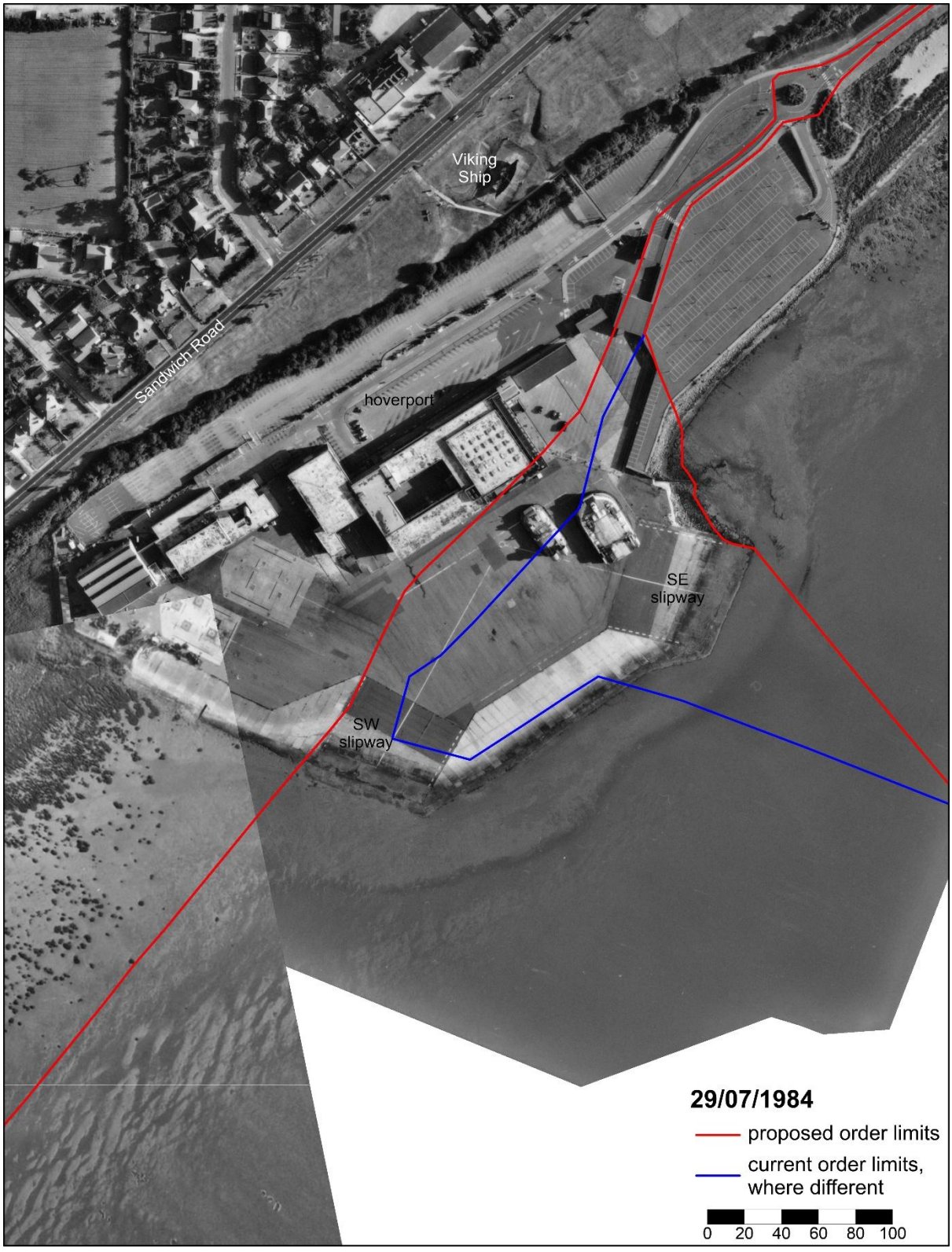

Figure 43. Aerial photography flown 29/07/1984 Source: NCAP

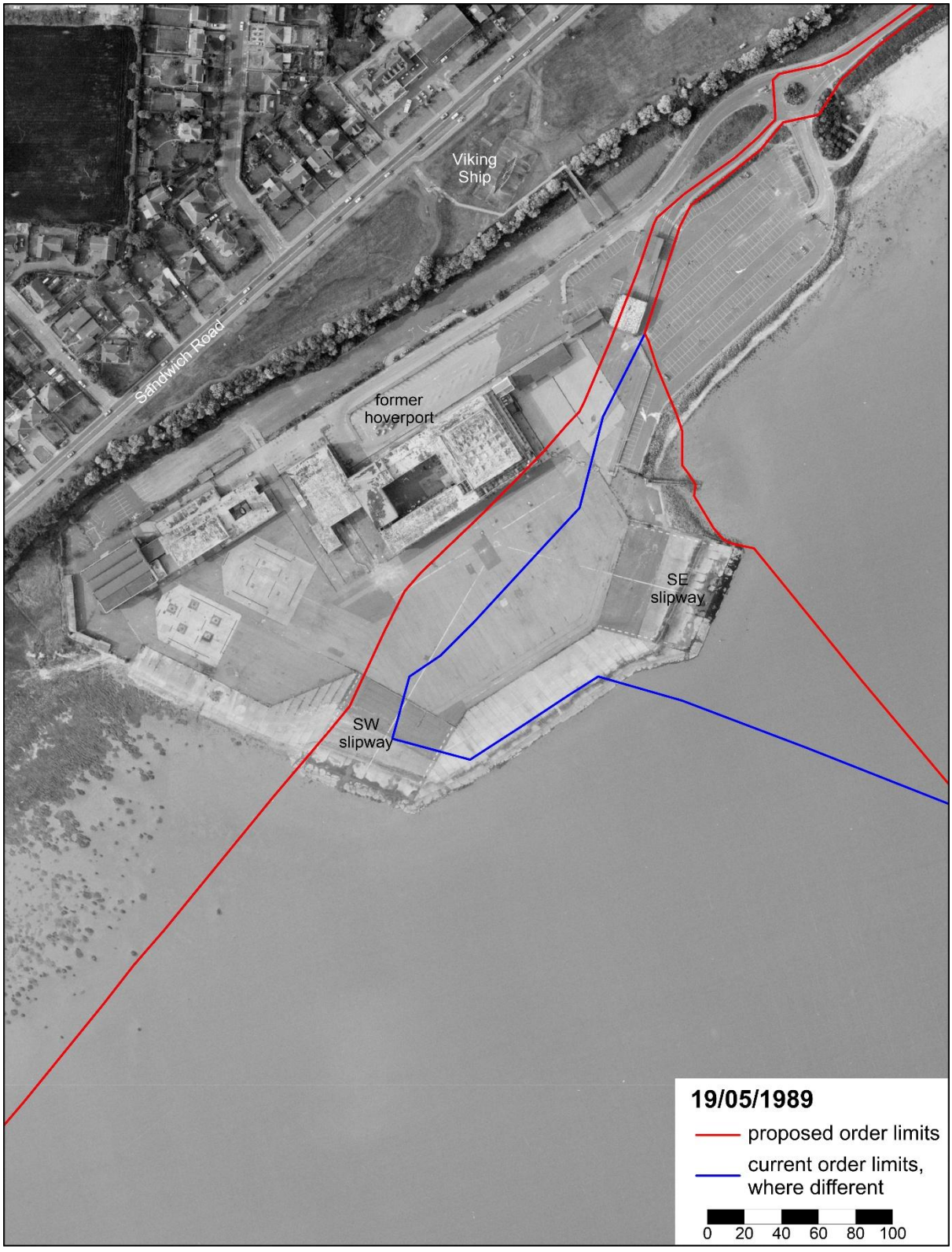

Figure 44. Aerial photography flown 16/05/1989 Source: NCAP

Figure 45. Aerial photography flown 04/04/1995 Source: NCAP

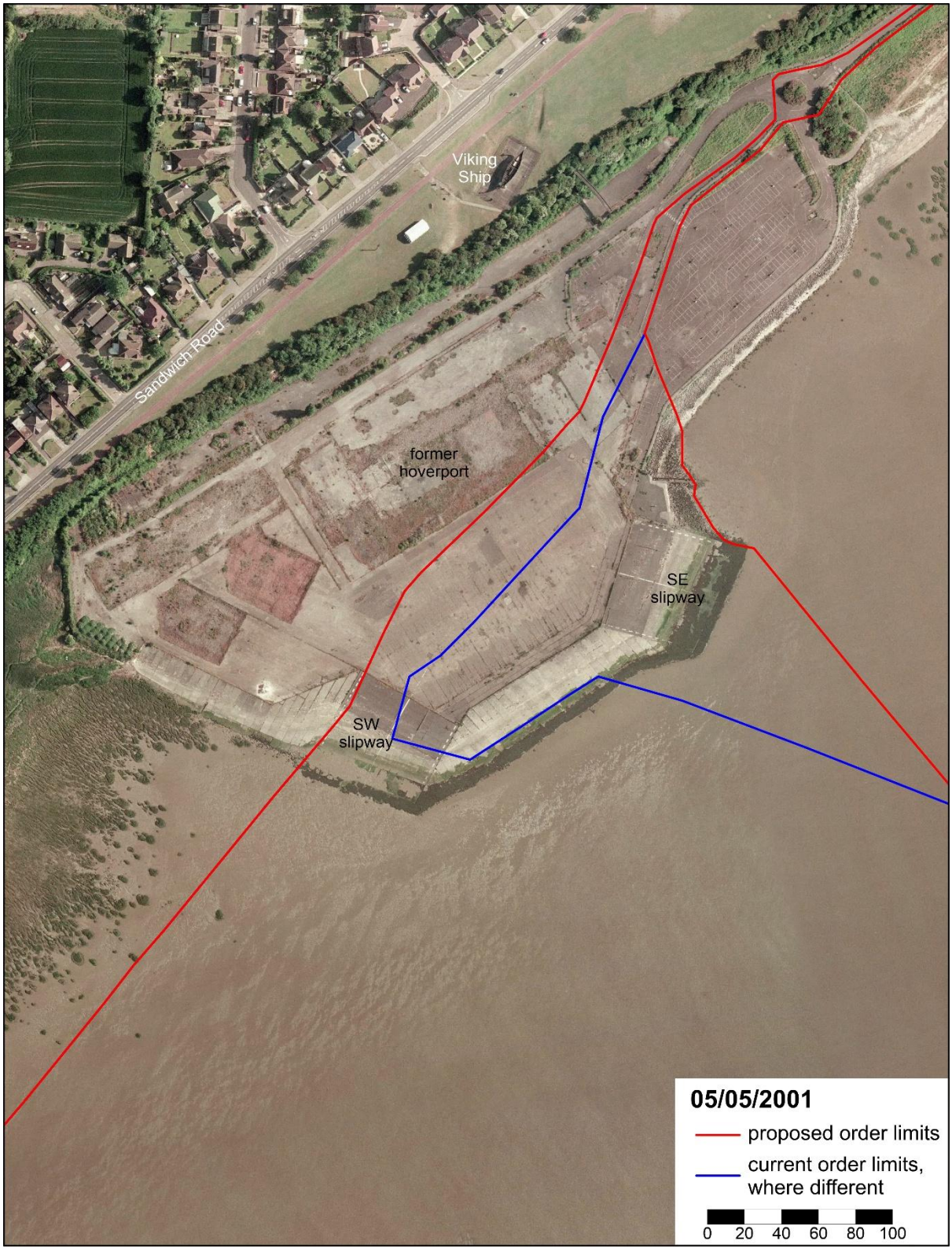

Figure 46. Aerial photography flown 05/05/2001. Source: NNRCMP

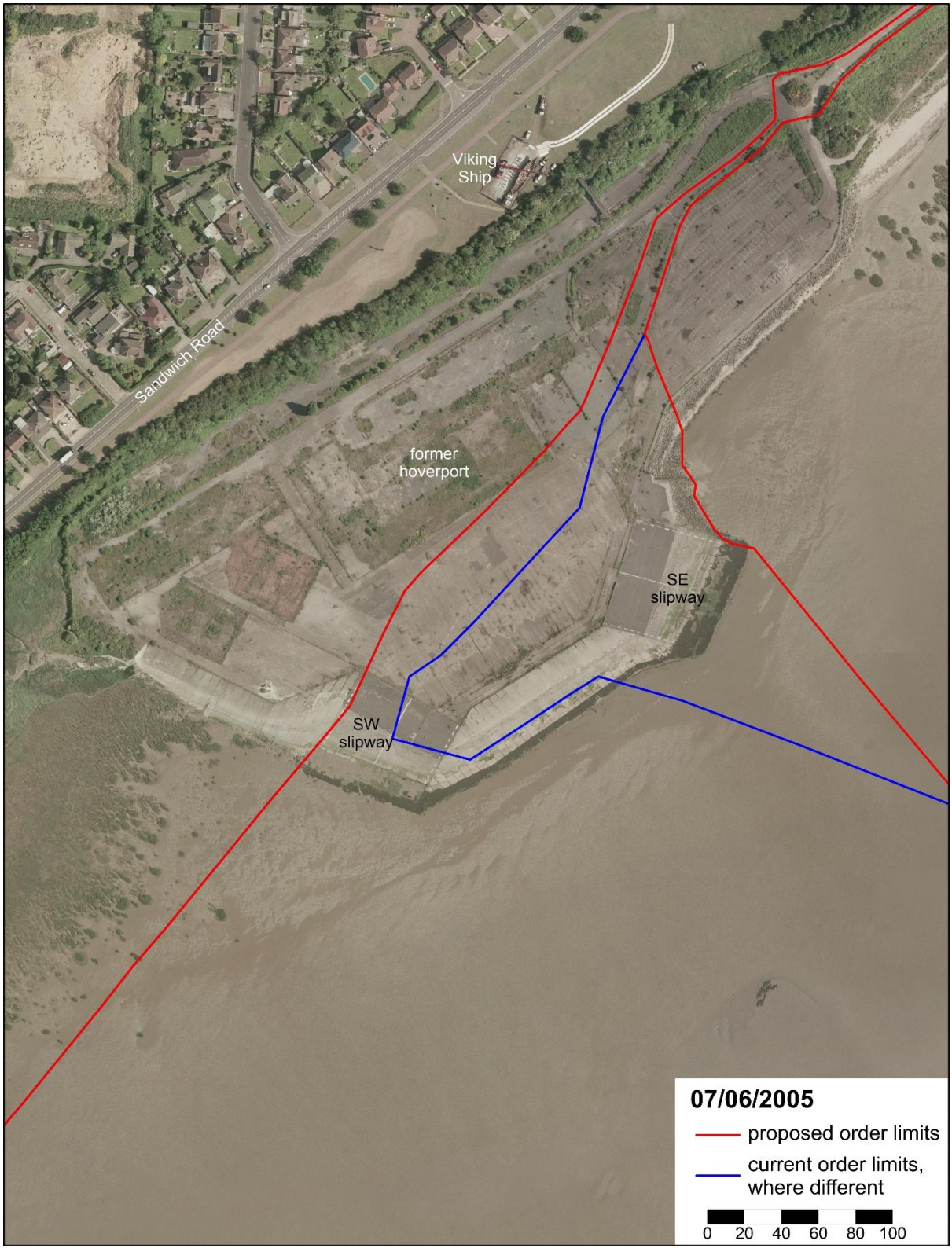

Figure 47. Aerial photography flown 07/06/2005. Source: NNRCMP

Figure 48. Aerial photography flown 18/05/2008. Source: NNRCMP

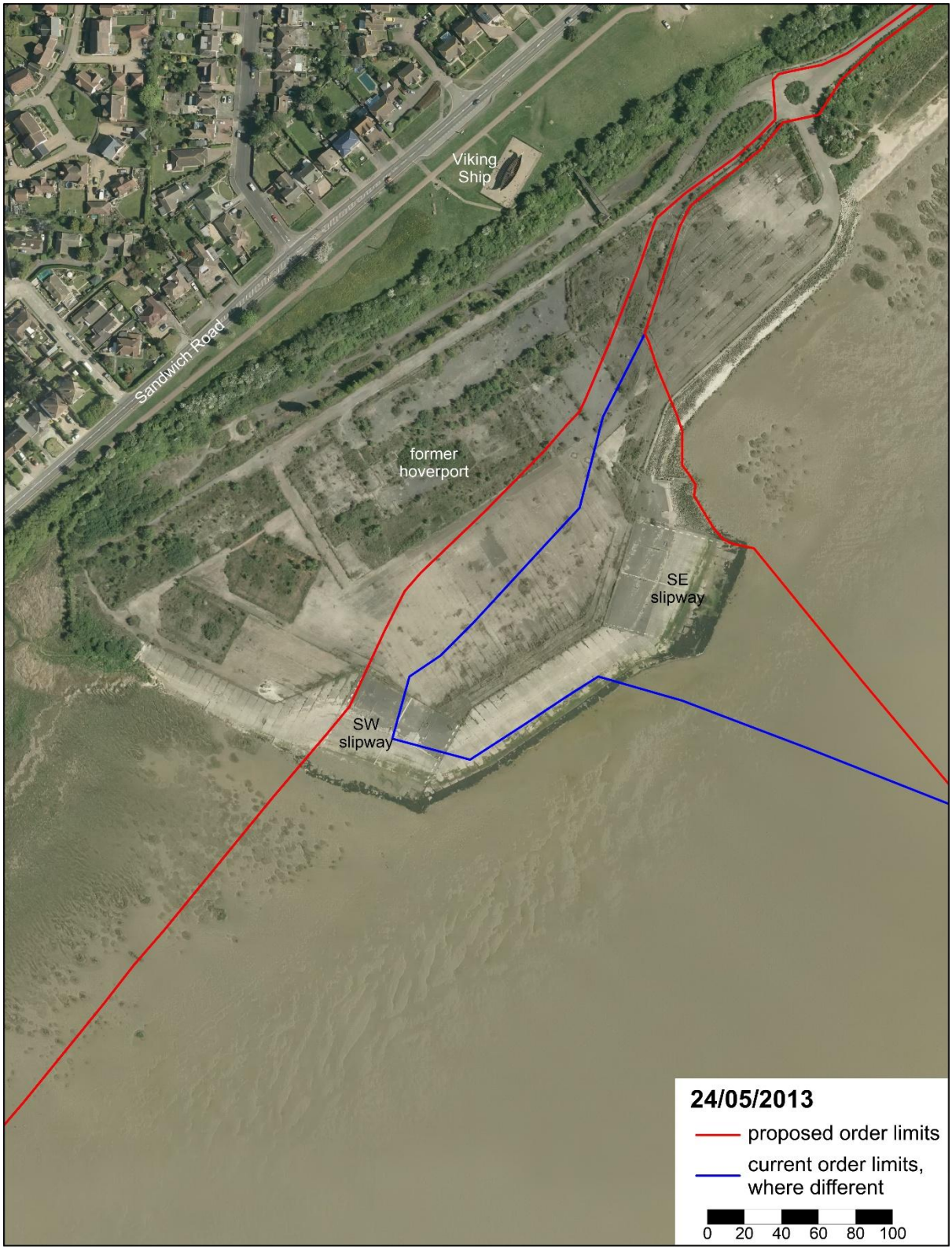

Figure 49. Aerial photography flown 24/05/2013. Source: NNRCMP

Figure 50. Aerial photography flown 07/07/2016. Source: NNRCMP

Figure 51. Aerial photography flown 19/09/2020. Source: NNRCMP

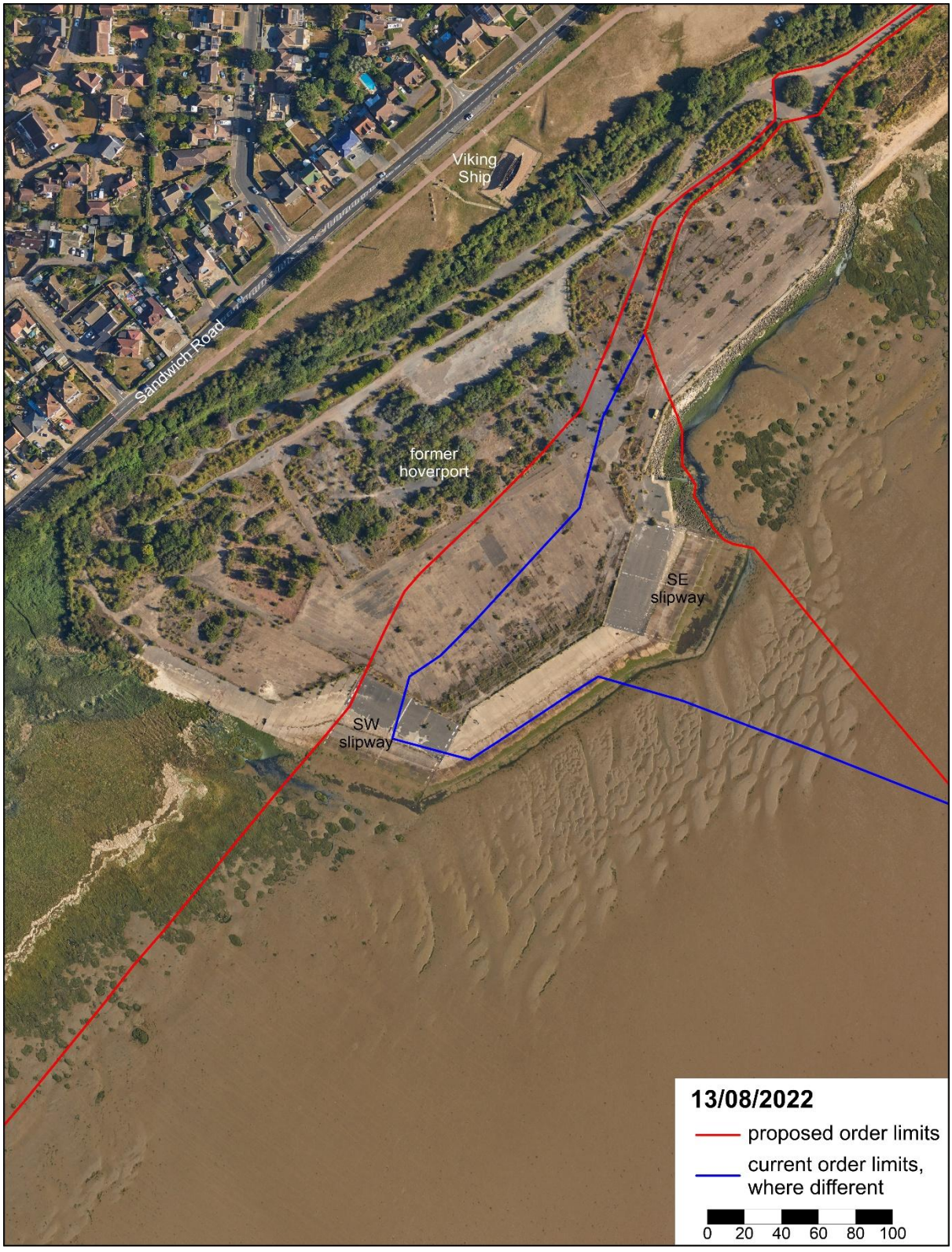

Figure 52. Aerial photography flown 13/08/2022. Source: NNRCMP

Figure 53. Aerial photography flown 14/04/2024. Source: Bluesky (via Google Earth)

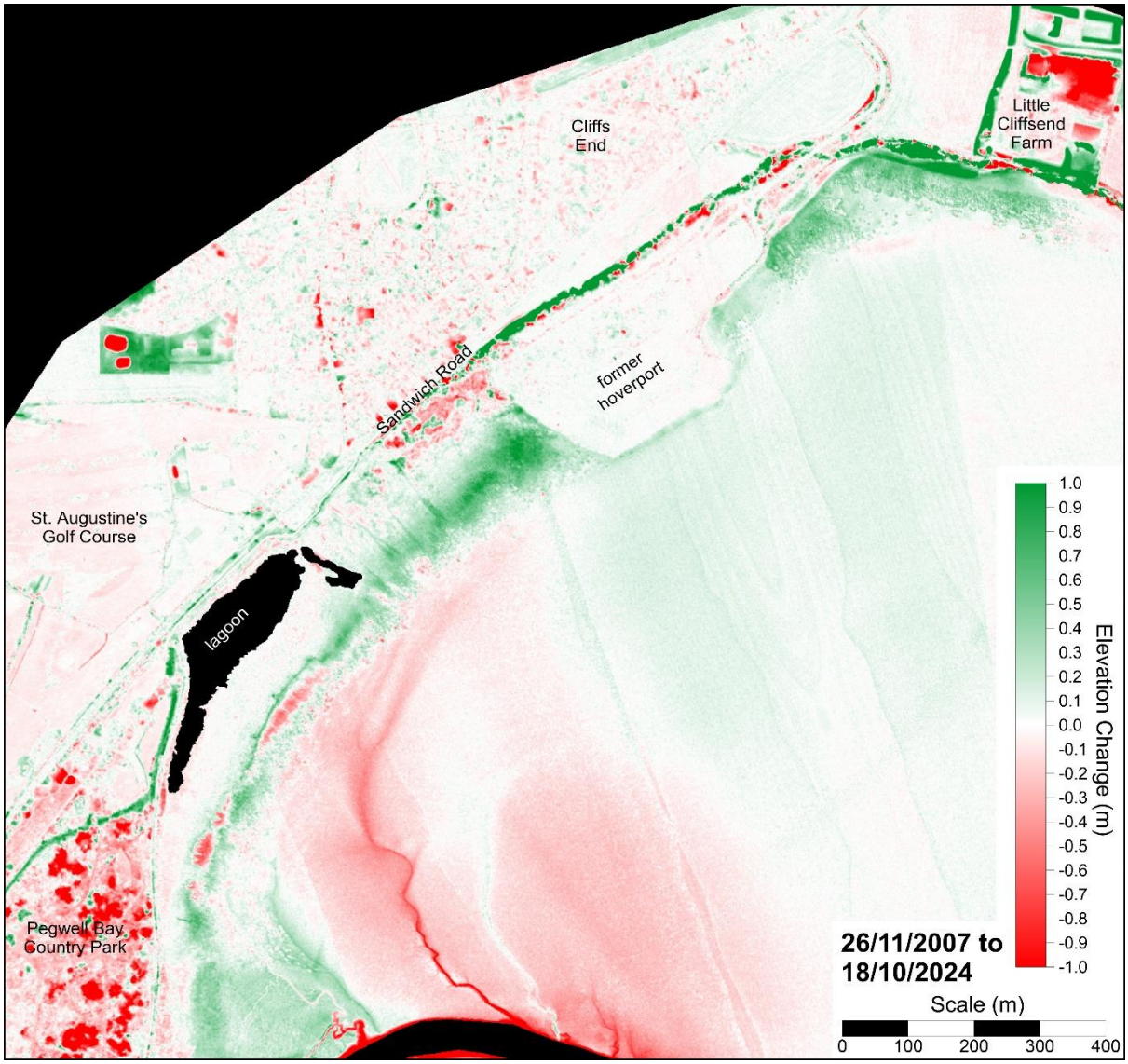

Figure 54. Elevation change between LiDAR DTMs flown 26/11/2007 and 18/10/2024 in Pegwell Bay. Source: DEFRA Data Services Platform and NNRCMP. Note: LiDAR elevations have been adjusted on the basis of comparison with RTK-GNSS ground survey of 'hard' surfaces, summarised in Table 5

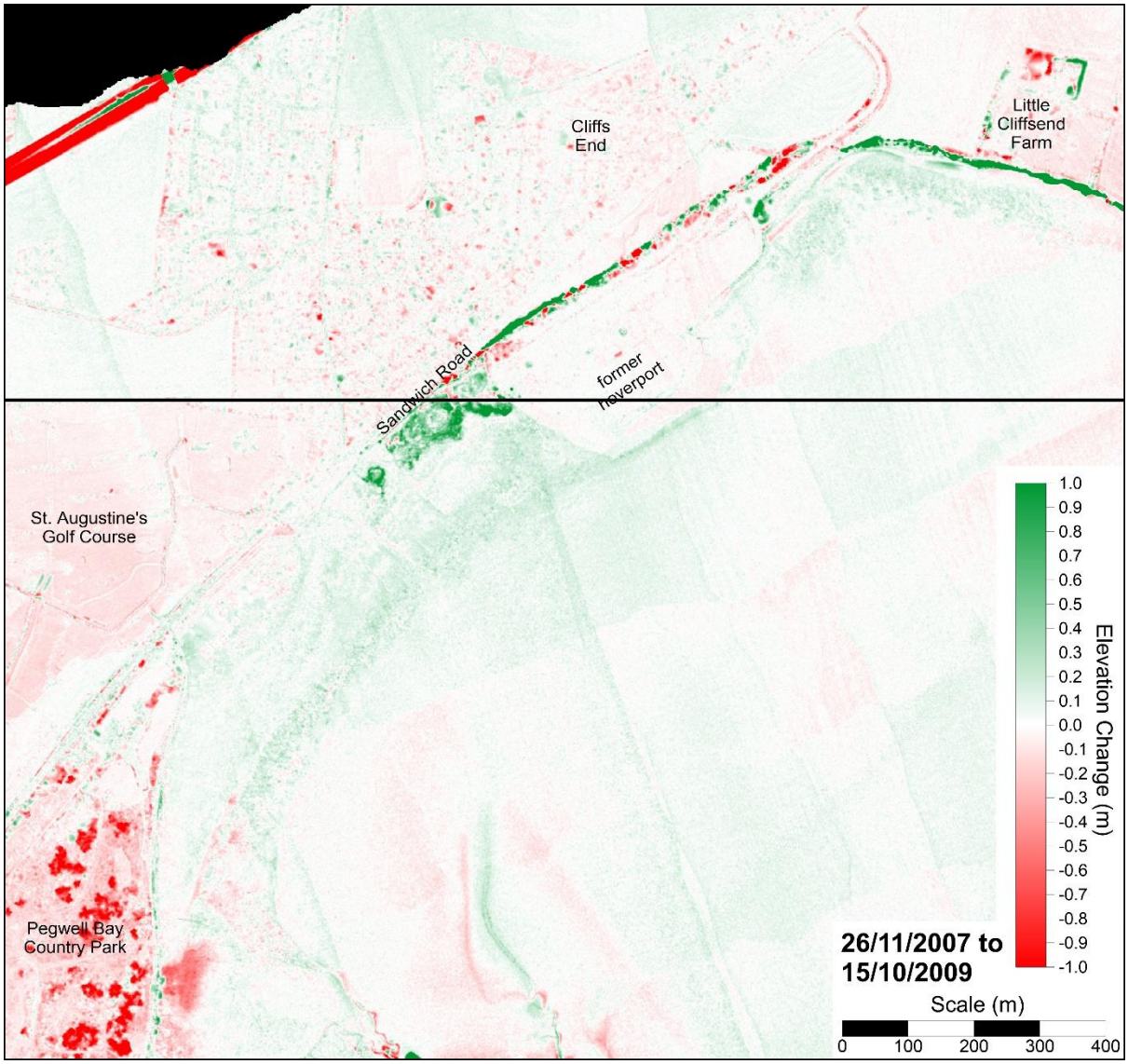

Figure 55. Elevation change between LiDAR DTMs flown 26/11/2007 and 15/10/2009 in Pegwell Bay. Source: DEFRA Data Services Platform

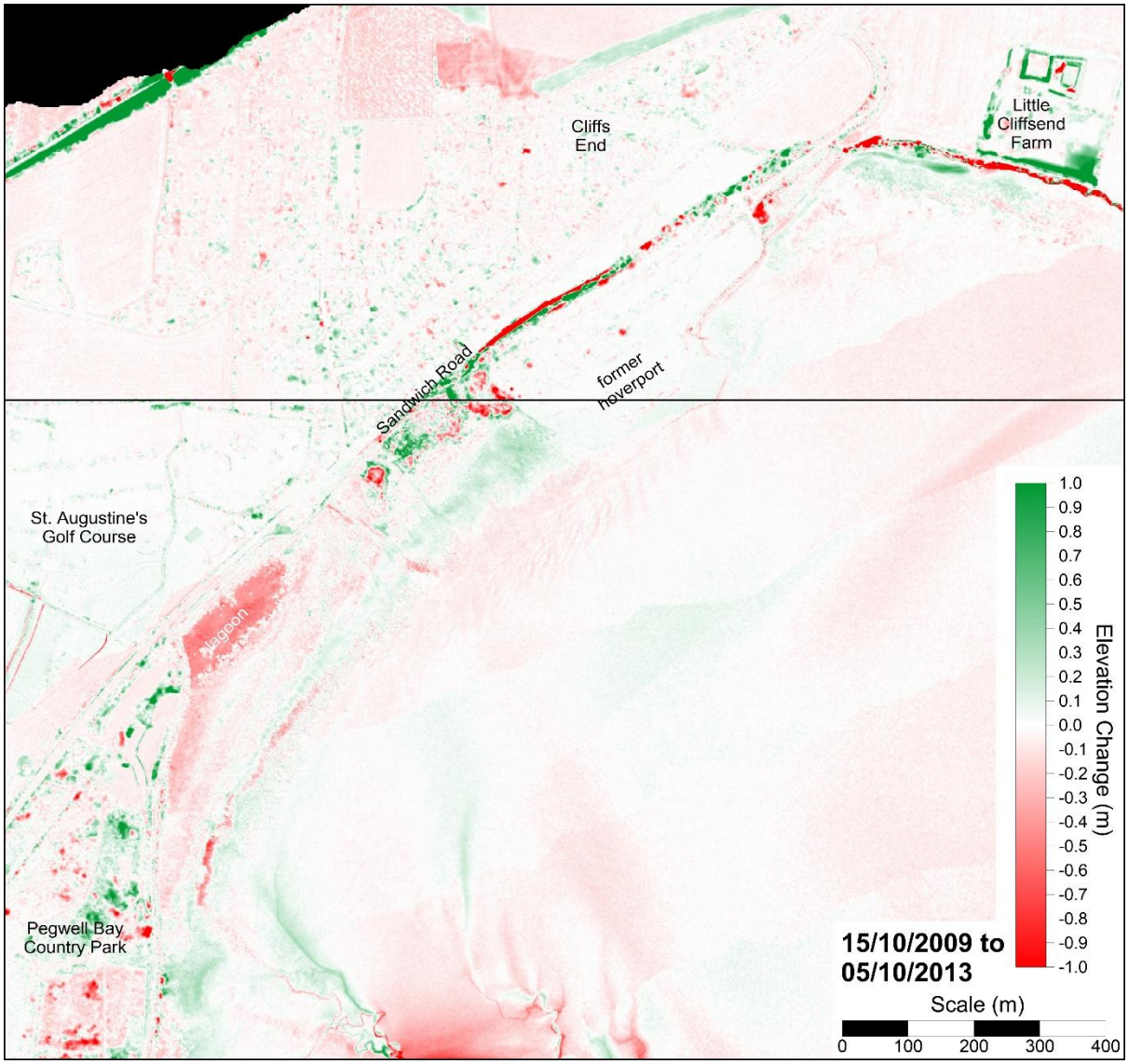

Figure 56. Elevation change between LiDAR DTMs flown 15/10/2009 and 05/10/2013 in Pegwell Bay. Source: DEFRA Data Services Platform

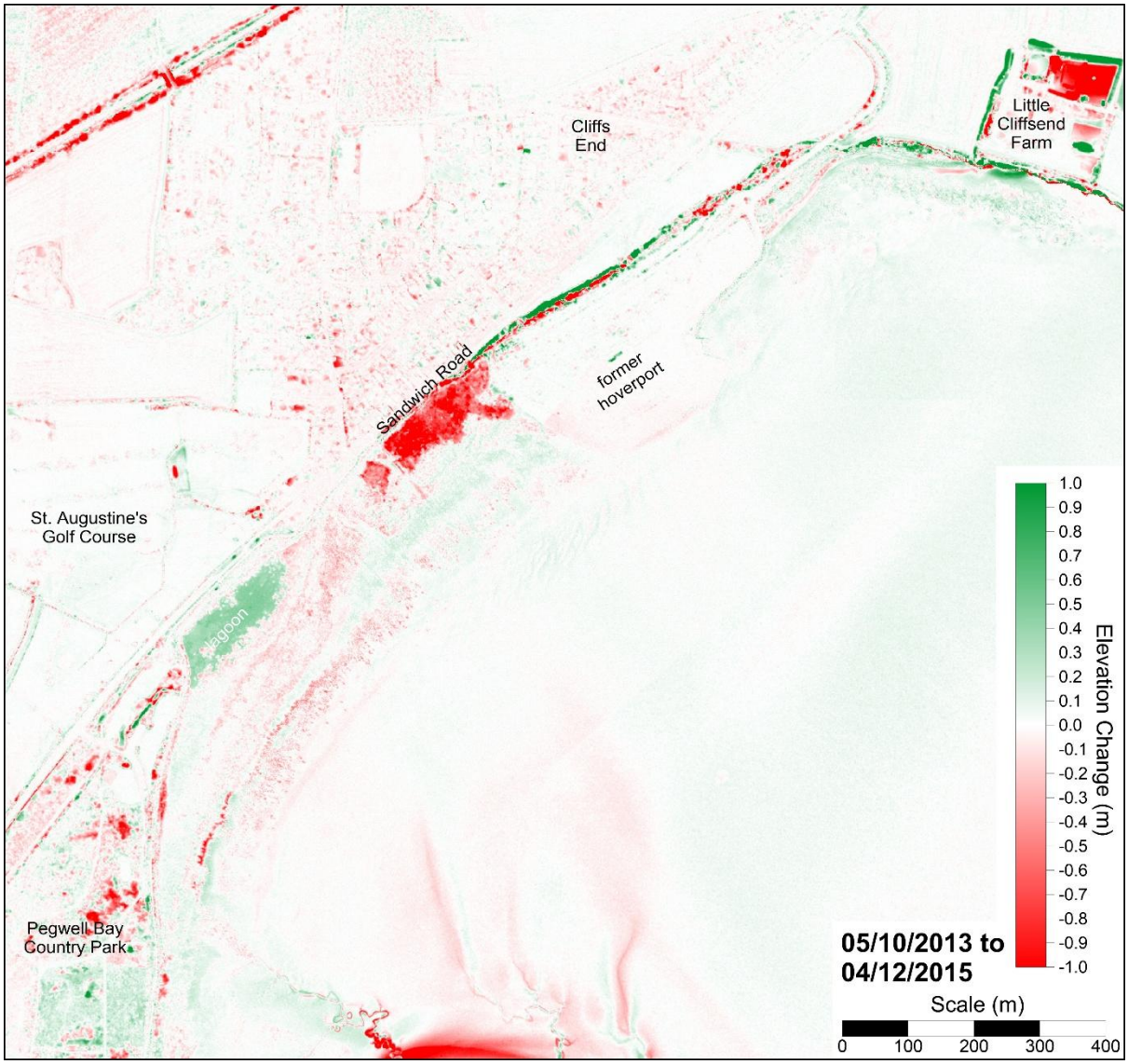

Figure 57. Elevation change between LiDAR DTMs flown 05/10/2013 and 04/12/2015 in Pegwell Bay. Source: DEFRA Data Services Platform

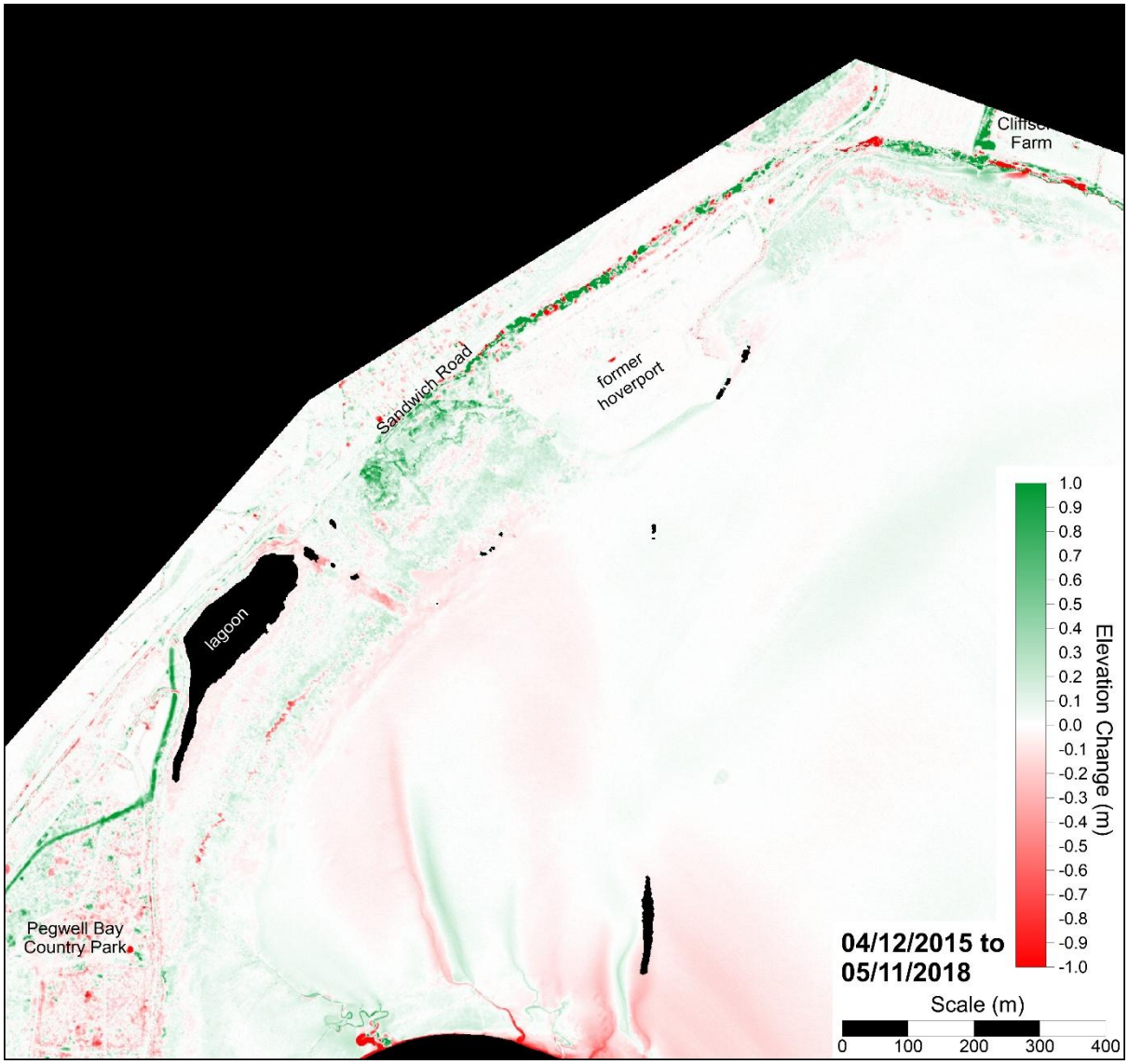

Figure 58. Elevation change between LiDAR DTMs flown 04/12/2015 and 05/11/2018 in Pegwell Bay. Source: DEFRA Data Services Platform

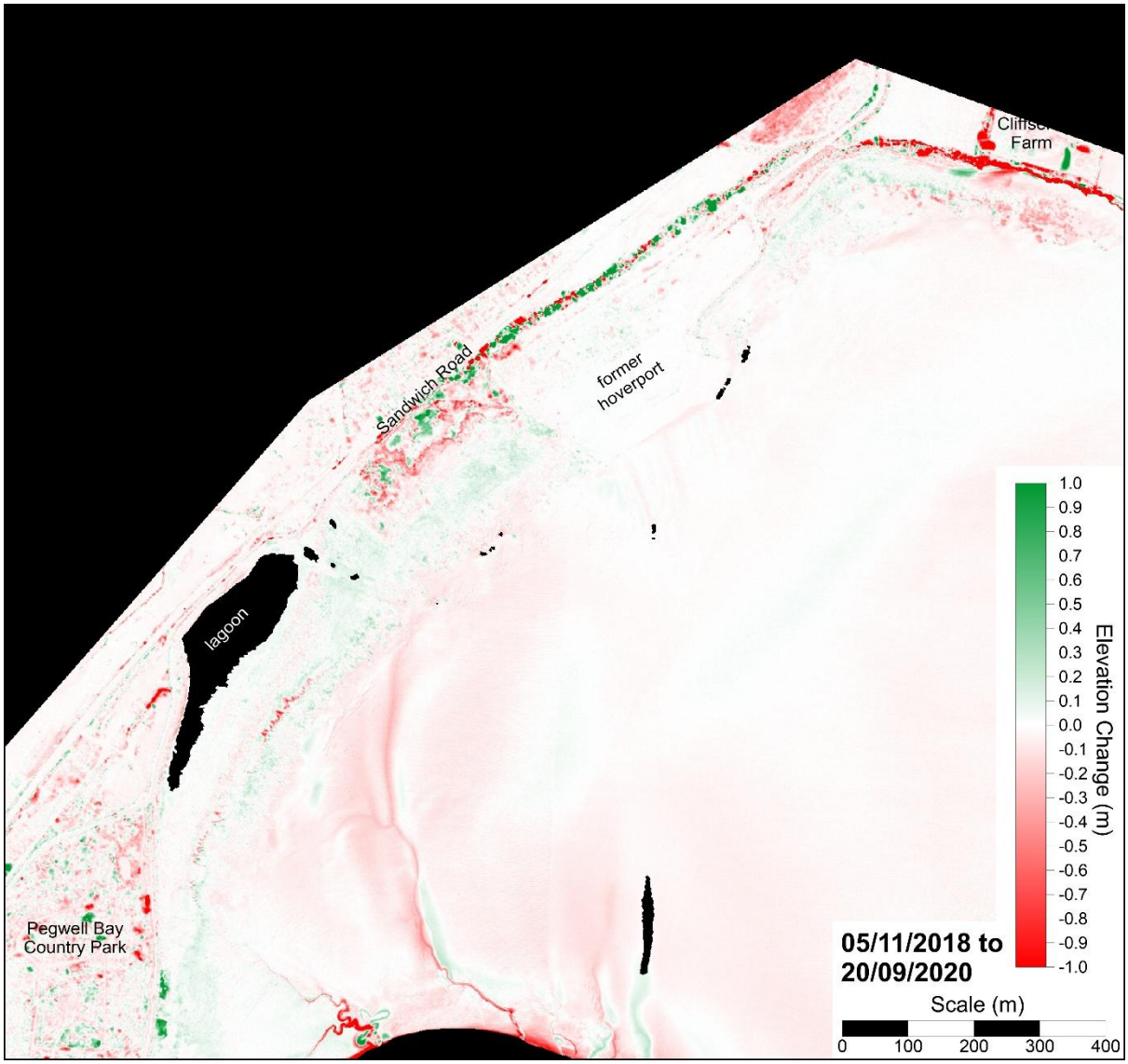

Figure 59. Elevation change between LiDAR DTMs flown 05/11/2018 and 20/09/2020 in Pegwell Bay. Source: DEFRA Data Services Platform

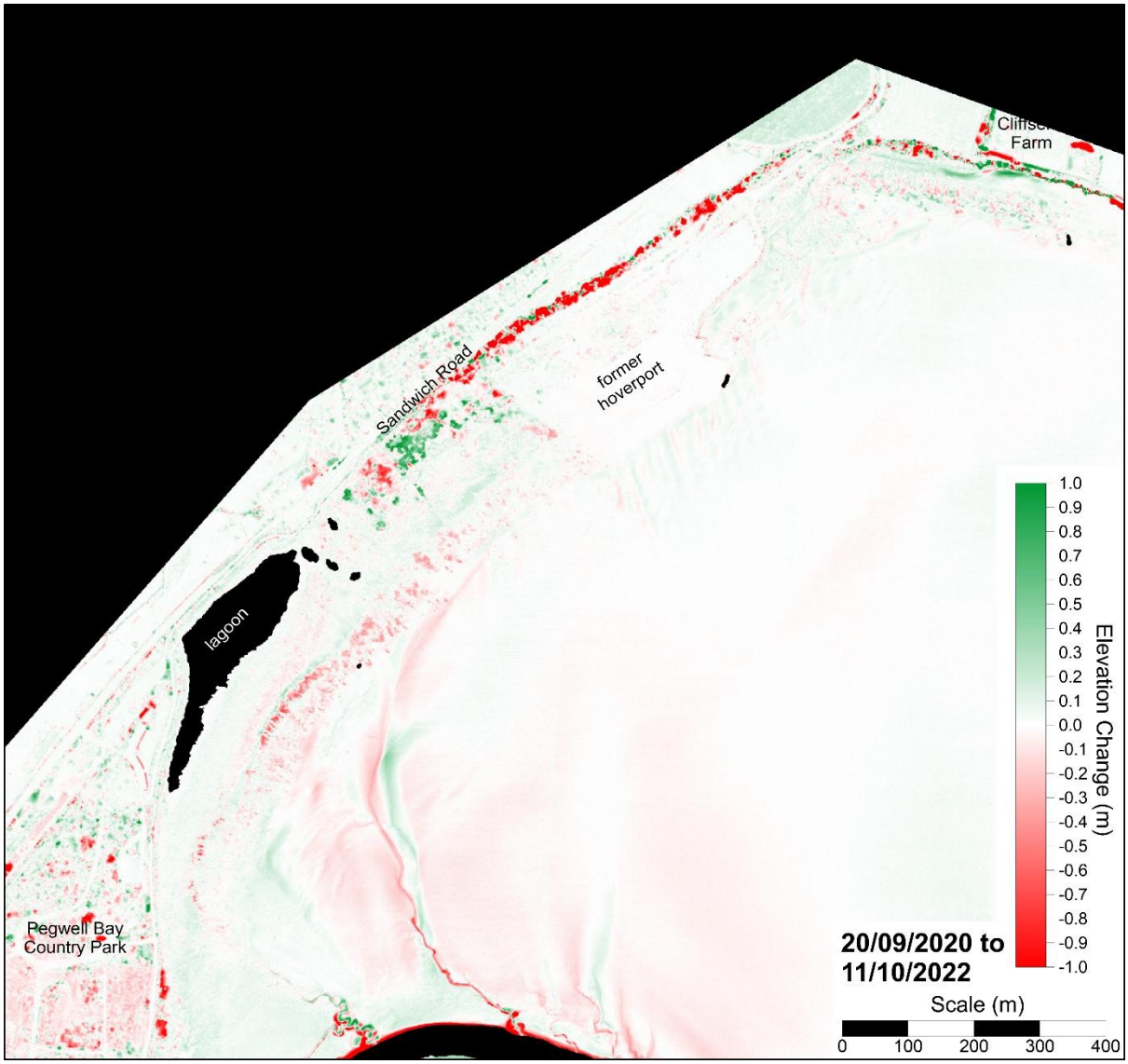

Figure 60. Elevation change between LiDAR DTMs flown 20/09/2020 and 11/10/2022 in Pegwell Bay. Source: DEFRA Data Services Platform

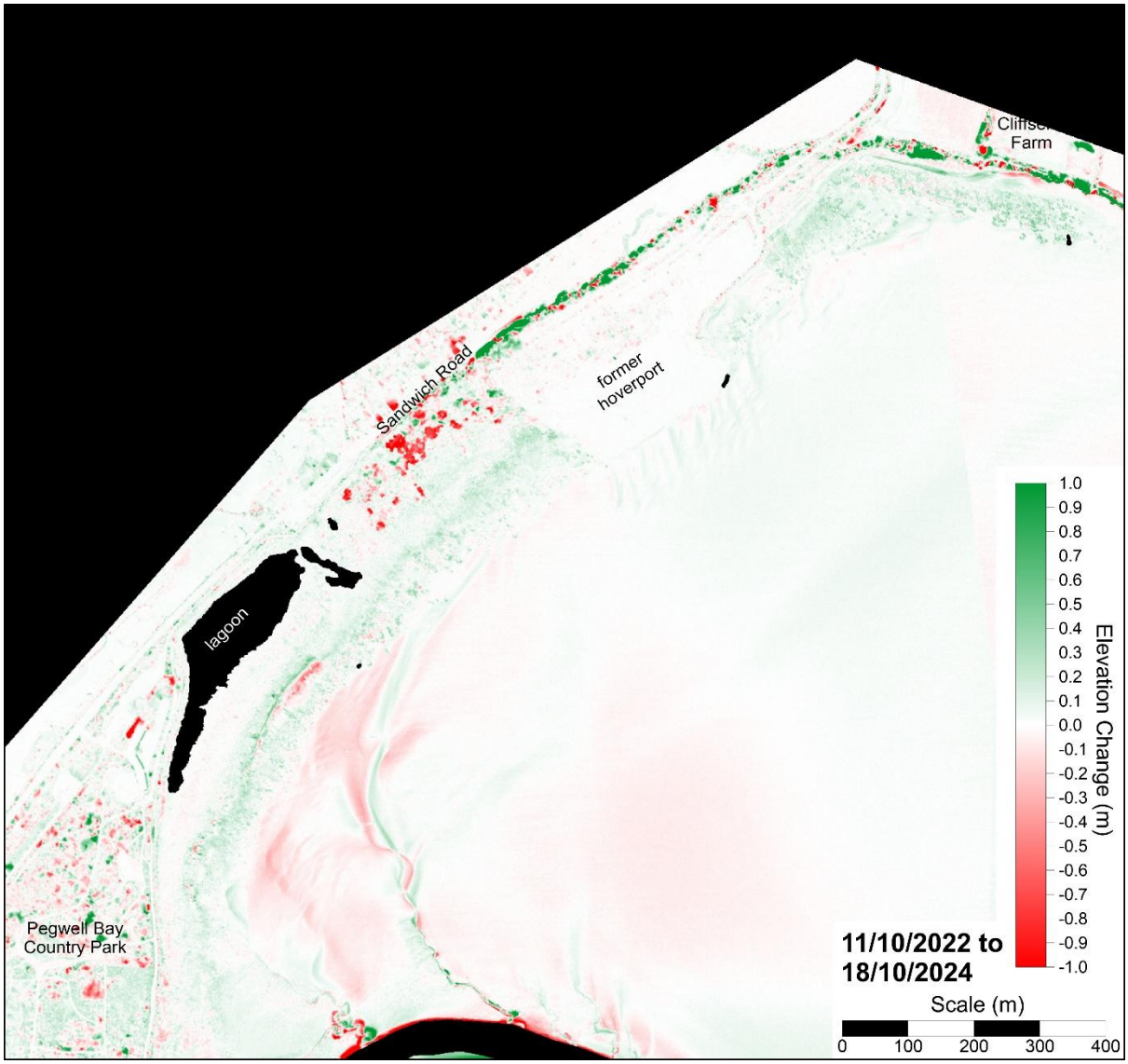

Figure 61. Elevation change between LiDAR DTMs flown 20/09/2022 and 11/10/2024 in Pegwell Bay. Source: DEFRA Data Services Platform

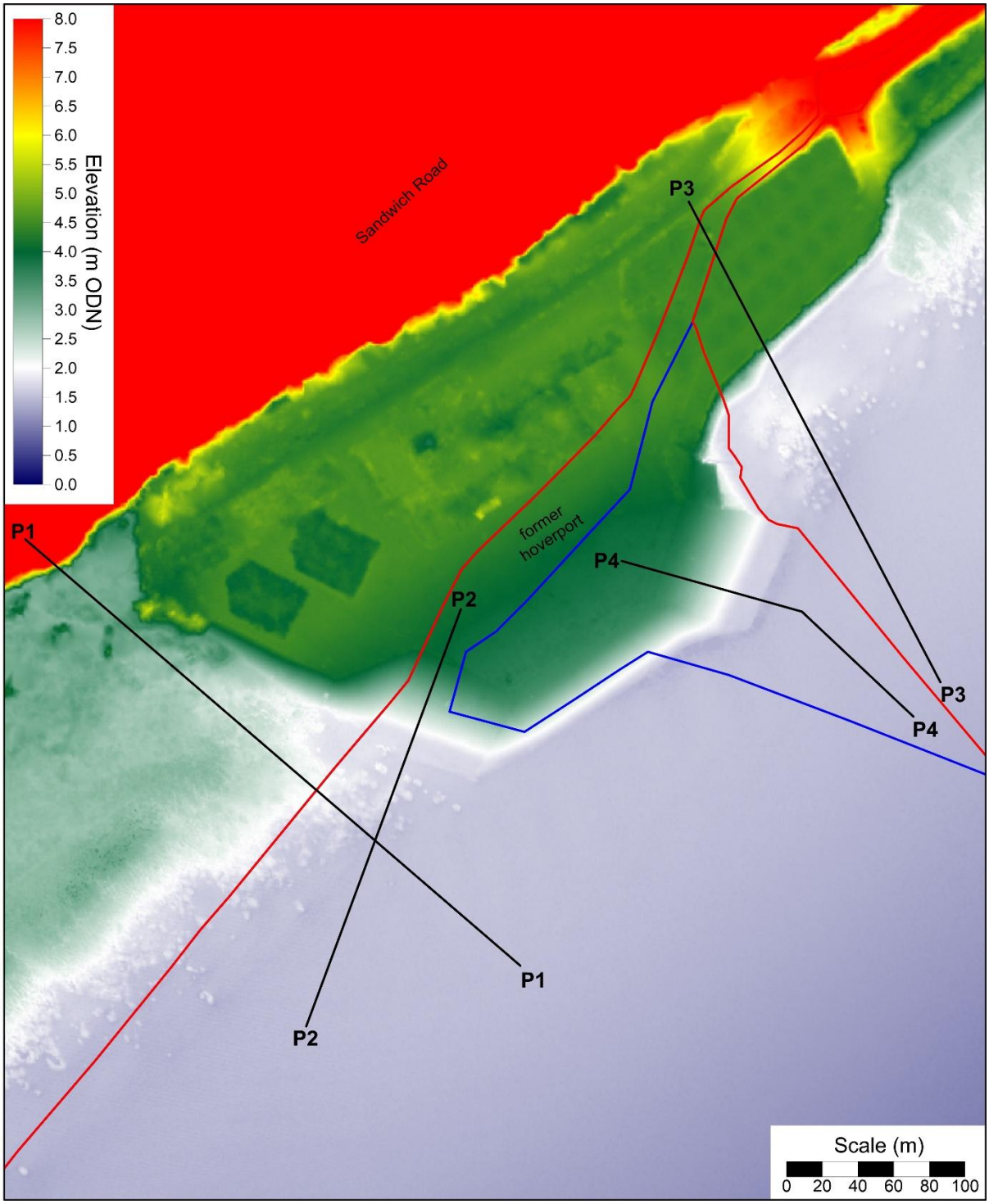

Figure 62. Enlarged LiDAR DTM of the hoverport area flown 18/10/2024 showing the locations of topographic profiles P1 to P4. Source: NNRCMP

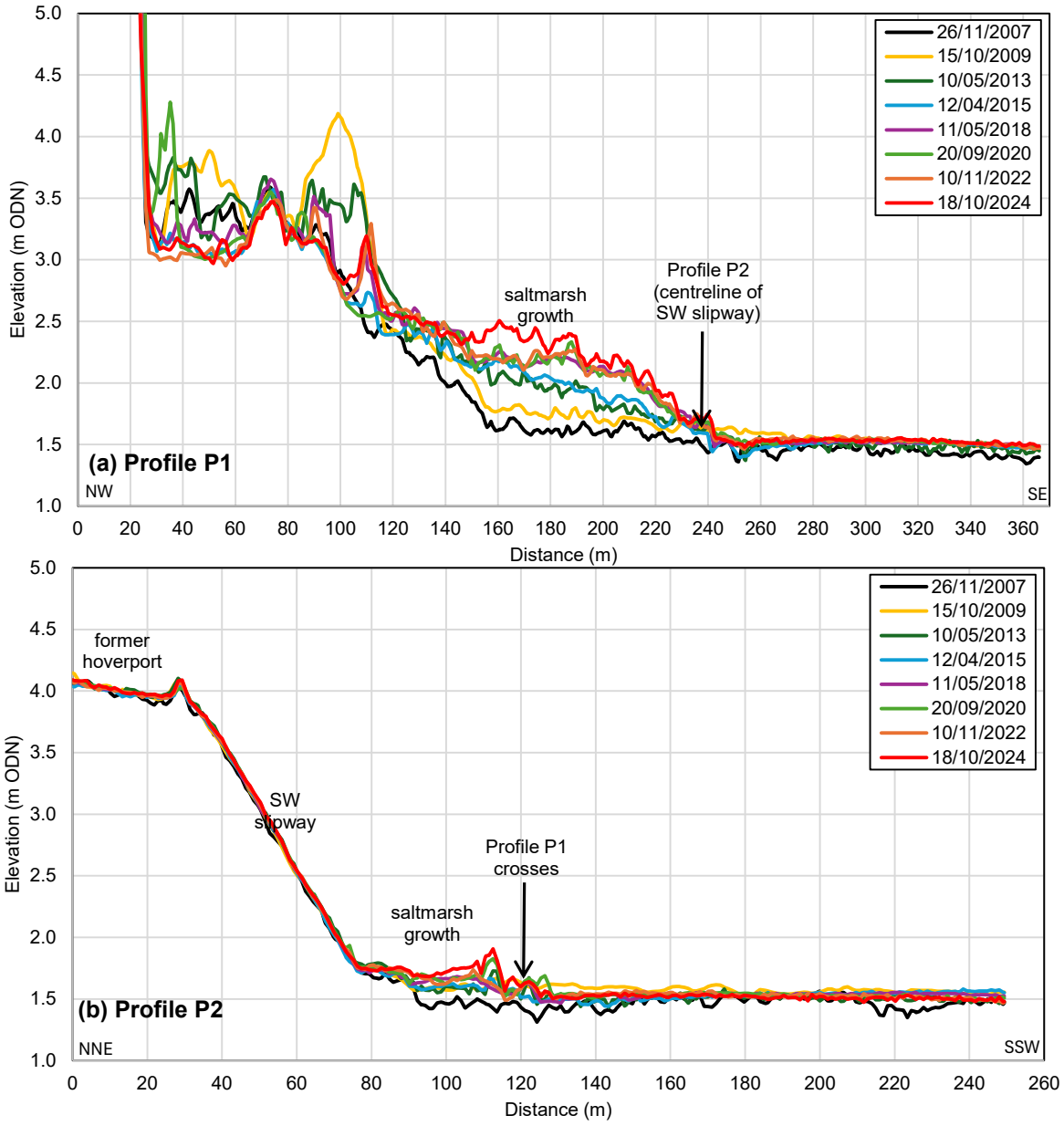

Figure 63. Topographic profiles P1 to P2 on the SW side of the hoverport, taken from eight LiDAR DTMs flown between 2007 and 2024. Source: NNRCMP

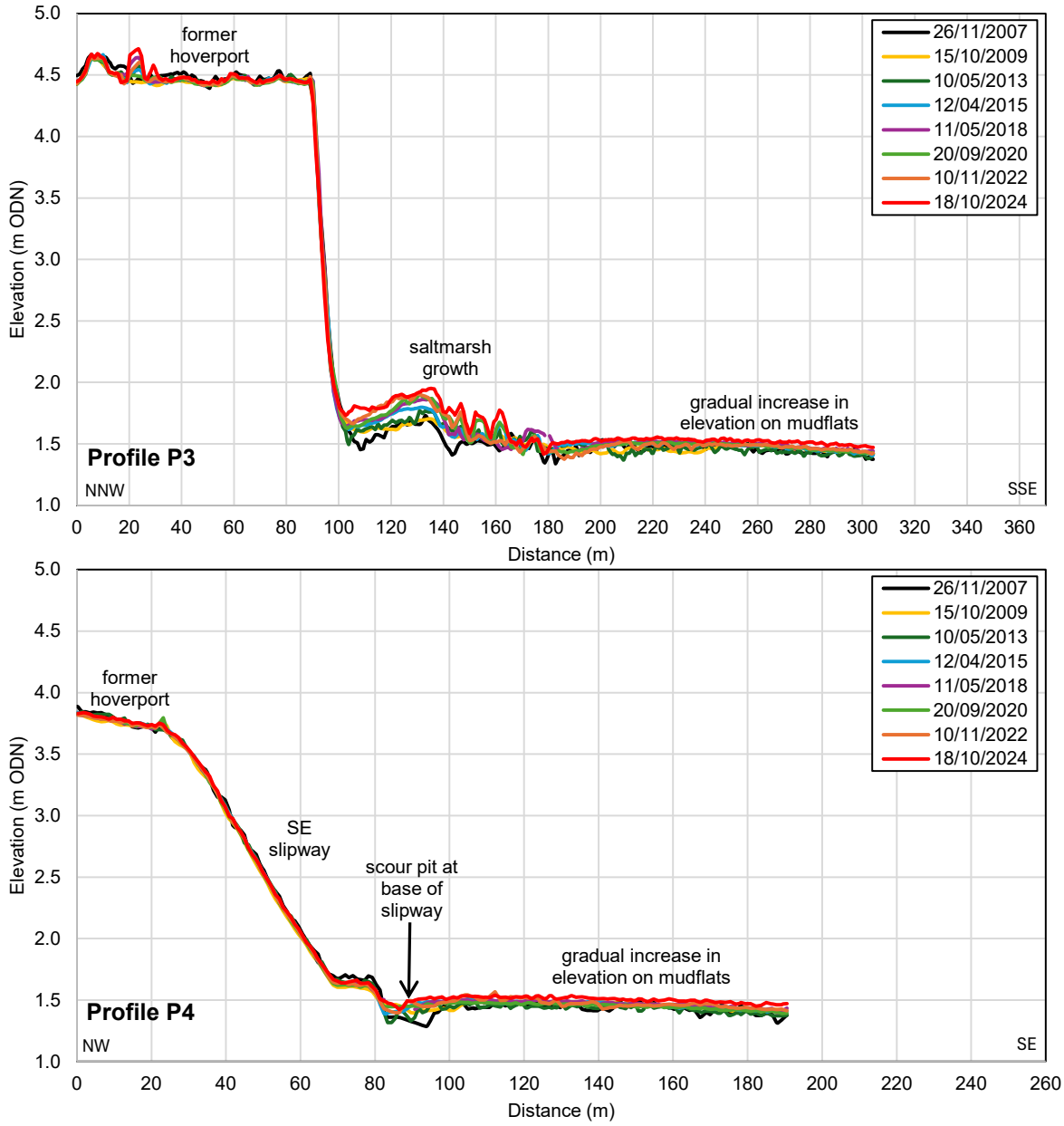

Figure 64. Topographic profiles P3 to P4 on the SE side of the hoverport, taken from eight LiDAR DTMs flown between 2007 and 2024. Source: NNRCMP

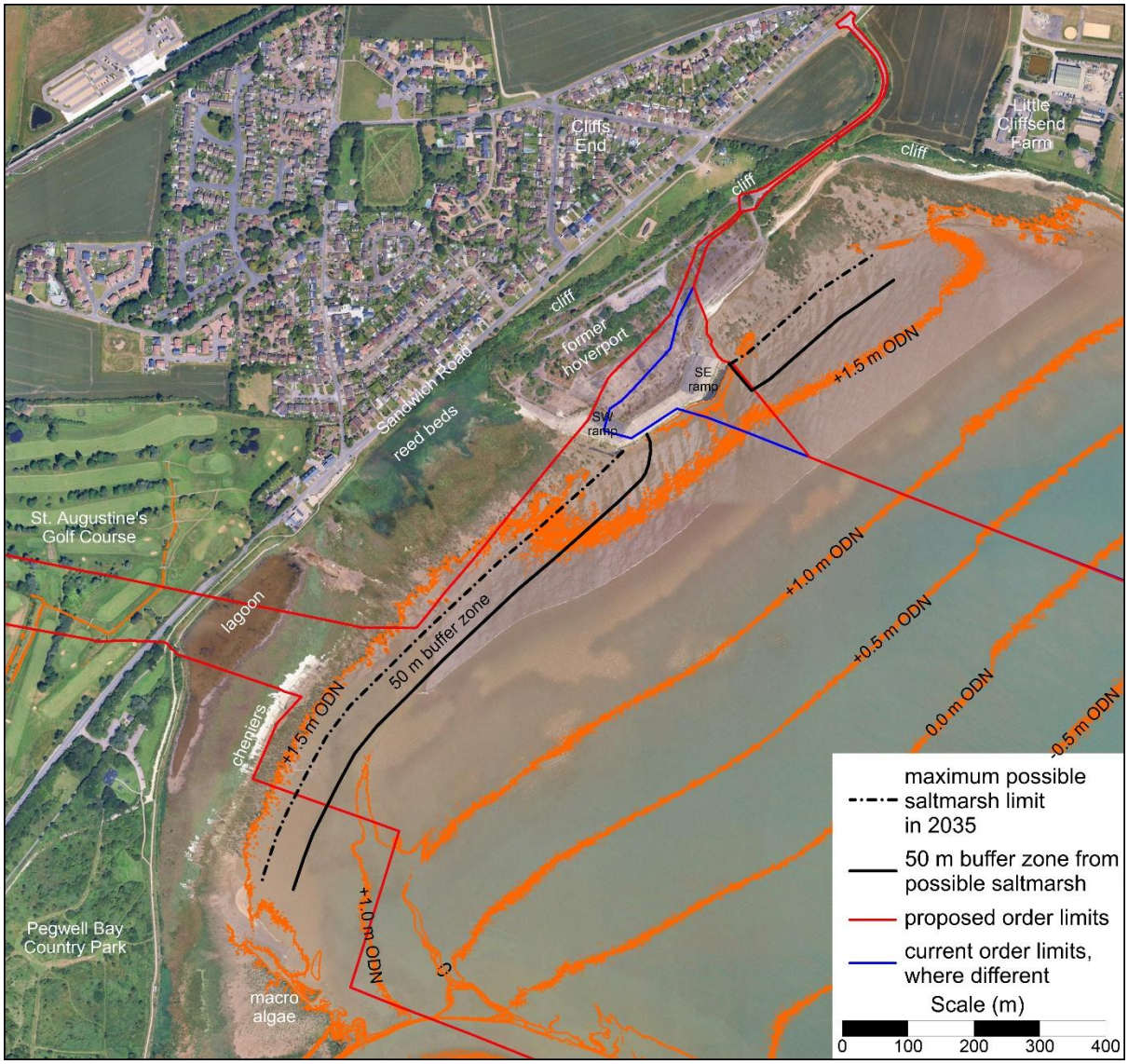

Figure 65. Aerial photography flown 14/04/2024 showing the maximum possible saltmarsh limit by the year 2035, and a 50 metre buffer zone to seaward of this line. Also indicated are tidal flat contours taken from the LiDAR DTM flown on 18/10/2024 at 0.5 metre intervals (orange lines). Source: Bluesky (via Google Earth)

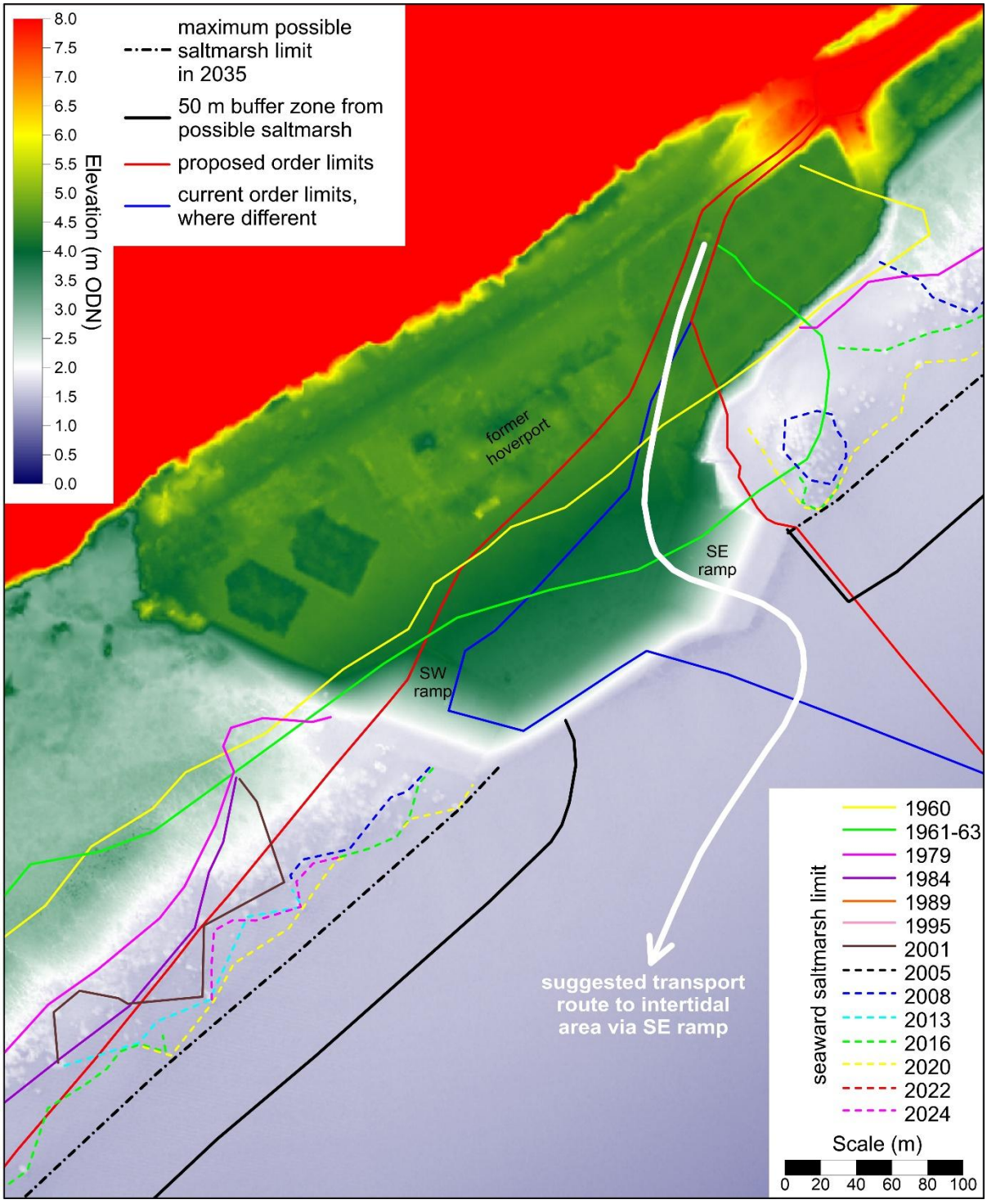

Figure 66. Enlarged LiDAR DTM of the hoverport area (flown 18/10/2024) with coloured lines showing the progressive movement of the seaward edge of saltmarsh from historical Ordnance Survey maps and aerial photographs: a line is shown where it is different from the preceding position. Also shown is the projected maximum saltmarsh limit by the year 2035, and a 50 m buffer zone to seaward of this line. Source: NNRCMP

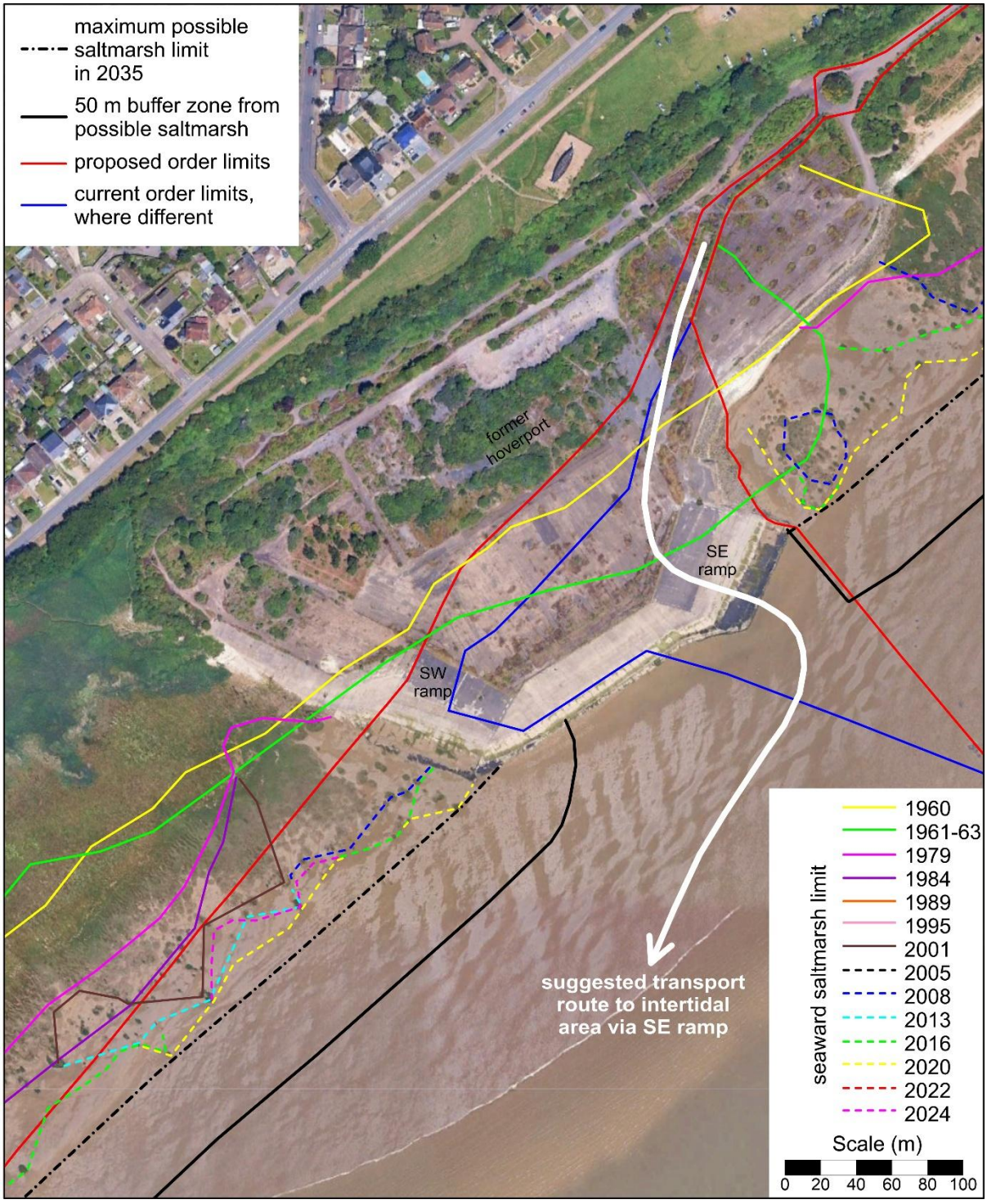

Figure 67. Enlarged aerial photograph of the hoverport area (flown 14/04/2024) with coloured lines showing the progressive movement of the seaward edge of saltmarsh from historical Ordnance Survey maps and aerial photographs: a line is shown where it is different from the preceding position. Also shown are the projected maximum saltmarsh limit by the year 2035, and a 50 m buffer zone to seaward of this line. Source: Bluesky (via Google Earth

Kenneth Pye Associates Ltd.

Scientific Research, Consultancy and Investigations

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com