Kingsbridge Berthing Improvements

Archaeological Desk-Based Assessment

SOUTH VIEW OF KINGSBRIDGE, FROM THE ESTUARY.

Prepared by Tom Cousins, Mike Allen and Dave Parham

Dave Parham

Four Dells Bungalow, Otterbourne, Winchester, Hants, SO21 2DY (Tel: 07733 206272)

AEA: Allen Environmental Archaeology

Redroof, Green Road, Codford St. Peter, WARMINSTER, Wiltshire, BA12 0NW (Tel: 07828 103454)

Title:	Kings
Author(s):	Tom Cousins, tcousins@gmail.com Mike Allen, *AEA Environmental*
Derivation:	
Origination Date:	26/06/13
Reviser(s):	Dave Parham
Date of last revision:	16/08/2013
Version:	1.0
Status:	Final
Summary of Changes:	
Circulation:	Internal, Client, English Heritage
File Name/Location:	…/Kingsbridge/dba_Kings.docx
Approval:	

Non-Technical Summary

Dave Parham was commissioned by Salcombe Harbour Masters to undertake an archaeological desk based assessment of the area around Square's Quay in Kingsbridge, Devon.

The archaeological assessment has shown the development of the area from prehistory to the present day; however the development area is confined and is unlikely to impact on any archaeology in the area.

The area has traditionally been used for navigation and trade, therefore any obstruction is likely to have a negative impact on its use and the area would have been kept clear making it highly unlikely that any remains of vessels or other archaeological features would be present in the development area.

Borehole records examined in the area have shown the geoarchaeological or palaeo-environmental potential of Kingsbridge to be low.

Acknowledgements

Thanks to Hugh Beamish and Vanessa Straker from English heritage for their useful comments.

Contents

1 Introduction

1.1 Site Background

1.1.1 This document forms an archaeological desk-based assessment (DBA) prepared by Dave Parham and Tom Cousins for the development area in Kingsbridge, Devon.

1.1.2 The purpose of this DBA is to assess if the proposals have the potential to impact on recorded and previously unrecorded heritage assets and assess the significance of these assets and suggest any mitigation.

1.1.3 The DBA has been written to comply with the archaeological conditions of the MMO license (Licence Number MLA/2013/00110). This document has been written in accordance with the I*f*A Standard and Guidance for historic environmental desk-based assessment (IfA, 2011).

1.1.4 The MMO Licence requites that *The License Holder must ensure that a Historic Environmental Impact Assessment is undertaken by a suitable heritage professional, and submitted to the MMO for approval by English Heritage four weeks before commencing the work. To clarify the potential of this location to include significant heritage assets.*

1.2 Site Location

1.2.1 The site is located at the far north of the Kingsbridge Estuary at Squares Quay in Kingsbridge with in the district of the South Hams.

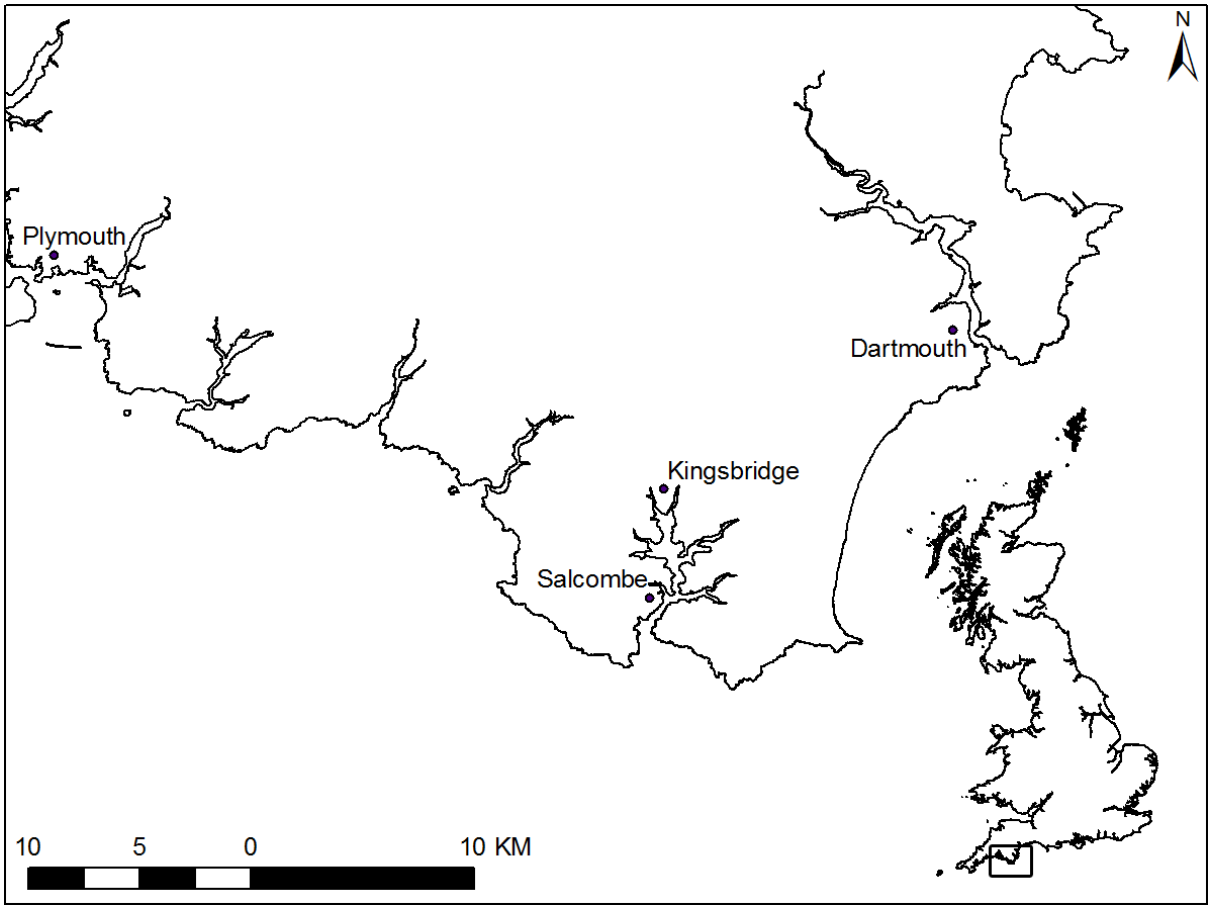


Figure 1. Location of Kingsbridge (Contains Ordnance Survey data © Crown copyright and database right 2013)

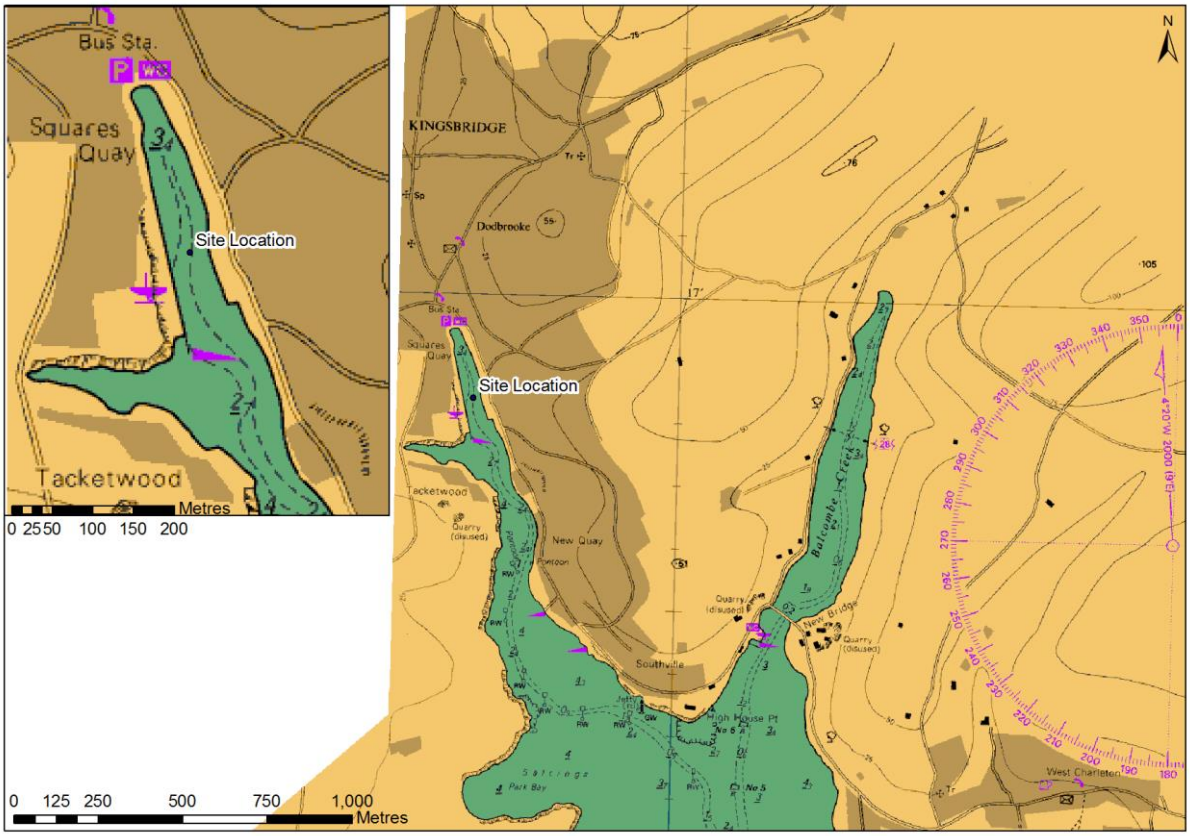


Figure 2. Site Location on Chart 0028 (© Crown Copyright All Rights Reserved. Licence No. 114455. Not to be Used for Navigation)

1.2.2 The site is within the South Devon Area of Natural Beauty, as well as being a Site of Special Scientific Interest, Local Nature Reserve and part of the South Devon Heritage Coast (Salcombe-Kingsbridge Estuary Conservation Forum, 2005).

1.3 Geology & Environment

1.3.1 Kingsbridge estuary is an 8.3 km long dendritic Ria (drowned River Valley) situated on the coast of South Devon between the towns of Salcombe and Kingsbridge. It consists of an area of land and water totalling 674 ha, 446ha of which is intertidal, with a coastline measuring 48.6 Km at high water . The estuary forms a natural well sheltered shallow harbour, less than 12.5m deep and is subject to a tidal range of between 6.0m (Astronomical) and 1.1m (neap) (Parham, 2006).

1.3.2 The underlying geology of the survey area (Plate 2) is Lower Devonian Rocks, made up of a complex of Mudstone, Siltstone and Sandstone. Inside the estuary there are superficial deposits of Alluvium made up of Clay, Silt and Sand (Hesketh, 2006). The geology of the area is expanded in section 5.2.

2 Aims and Objectives

2.1.1 The aims and objectives of this document are to:

- Asses Data from existing boreholes, if any

- Assess the extent and depth of any previous dredging, using logs where available
- Assess assets that might be recorded on heritage databases, for example the County HER
- Assess any other data that might be available and which would clarify the potential presence of, for example, peat, old land surfaces, undisturbed sediments
- Produce a basic map regression
- Produce an impact assessment comparing the proposals against the known and potential
  resource
- Produce an outline of potential mitigation options

3 Methodology

3.1.1 This methodology will follow the I*f*A Standard and Guidance for historic environmental desk-based assessment (IfA, 2011).

3.2 Coordinate Systems

3.2.1 The Coordinate systems used throughout this report will the Ordinance Survey British Nation Grid, (BNG).

3.3 Sources

3.3.1 The following sources were consulted for this DBA:

- Devon Historic Environmental Record
- National Monuments Record
- Historic Charts and Maps.
- Local Museum Records
- Secondary sources relating to historic activity in the study area

4 Summary of Results

4.1 Historical Background

4.1.1 See Plate 3 for a map of the sites mentioned in the text.

Prehistory (500,000BC-43AD)

4.1.2 Evidence for prehistoric occupation of the Kingsbridge area is lacking, with the majority of early prehistoric find spots revealing a "pattern of human activity along the coast and inland." (Born, 1986, p. 8) By the Bronze Age a "a ribbon of relatively rich survival running along the coastal strip between Bolt Head and Prawle Point" (Needham, et al., 2013, p. 19) but nothing of significance inland where the evidence for occupation tend to occur along the rivers reaching out into Dartmoor rather than the Kingsbridge Ria with its small catchment area. An Iron Age Hill Fort exist to the south of Kingsbridge at Burleigh Dolts, South Huish, (**DeHER: MDV7224**) with recent geophysics suggesting that there could be further prehistoric features in the area (Wilkes, 2006).

Roman (43-410AD)

4.1.3 It is thought that the roman presence in Britain "had less influence on the far south west than elsewhere" (Born, 1986, p. 11). Exeter was the principle Romano-British town in the South West but evidence does exist for Roman Influence in the region, such as a roman coin found in Kingsbridge (**DeHER: MDV58851**) and Roman Pottery in Salcombe (Born, 1986). Within the South Hams there is possible evidence of a possible Roman fort at Oldaport (**NMR: 441015**) on the Erme Estuary and at Bantham on the Avon **(NMR: SX64SE21)**. More conclusive evidence for Roman occupation in the region comes from the enclosures at Mount Folly, near Bigbury on the River Avon **(DeHER: MDV40102)** opposite Bantham. On-going investigations suggest that the area had "strong Roman trading links in southwest England" (Griffith & Wilkes, 2006)

Early Medieval (410-1066AD)

4.1.4 Kingsbridge first appears as 'Cinges bricge' in a 962 Anglo-Saxon charter for land at Sorely in Churchstow (Baker & Brookes, 2013). Haslam (1984) suggests that Kingsbridge was setup as a new burh of Edward the Elder, set up in the first decade of the 10th Century **(NMR: SX74SW91).** Haslam Suggests that the Church of St. Edmund's Church was built outside the walls of the burh after the construction of the burgh, although archaeological evidence point to the church being built in the 11th -12th century **(DeHER: MDV7241).** It should be noted that so far no archaeological evidence has been uncovered to support this theory.

Medieval (1066-1540)

4.1.5 The Domesday Book of 1086 does not mention Kingsbridge although Dodbrooke appears as 'Dodesbroch' (Kingsbridge History Society, 2011).

4.1.6 By the 12th century Kingsbridge and Dodbrooke became the collection point for the agricultural products produced in the surrounding area (Oswald, 1985). The town was owned by the Abbots of Buckfast who developed the town into an outlet for the corn and wool produced in the estate. A market was obtained in 1219 and borough status in 1238. Dodbrooke followed suite gaining a market 1257 and reckoned to be a borough by 1319 **(NMR: SX74SW64).** Kingsbridge also gained the right to hold an annual fair in 1461.

4.1.7 Shipbuilders in the Kingsbridge Estuary were providing ships for the crown as early as 1310 for Edward II war against Scotland where they were directed to aid Dartmouth to maintain a ship and crew. These were principally built in Portlemouth who provided ships throughout the 14th century (Born, 1986).

Post-Medieval (1540-1901)

4.1.8 Following the Dissolution of the Monasteries in 1538, Buckfast Abby was forced to give up its lands and the town passed into private hands (Kingsbridge History Society, 2011). With the superior port of Plymouth and Dartmouth in combination with poor roads Kingsbridge stagnated concentrating on exporting its agricultural products locally rather than looking further afield (Oswald, 1985). By 1572 century Kingsbridge only had one ship over 100 tons, but a 1586 town plan showed the town to be well developed (Oswald, 1985). This is reflected in the ships built for the Newfoundland cod trade where "virtually no mention

occurs of Kingsbridge-Salcombe ships" taking part in the trade whereas the other ports in region are heavily involved (Born, 1986, p. 74).

4.1.9 The Napoleonic wars increased demand for local products and ships which Kingsbridge capitalised on with the quays trading in wood for shipbuilding (Oswald, 1985). By the end of the wars Britain had become the dominant sea power and Kingsbridge and Salcombe played a notable part in the import of fruit (Born, 1986). Between 1800 and 1880 250 ships were built in the estuary 50 of which were built in Kingsbridge (Oswald, 1985).

4.1.10 The primary type of ship built in the estuary was the top-sail schooner, a fast ship designed for the fruit trade between the Azores and London. The trade reached its peak in 1860 but began to decline throughout the 1870s before virtually vanishing by the 1880s when the fruit crop was hit by disease and sail gave way to steam (Oswald, 1985).

4.1.11 Dodbrooke and Kingsbridge amalgamated into one settlement in 1893.

Modern (1901-Onwards)

4.1.12 The Railway reached Kingsbridge in 1893 which allowed for a reliable overland communication link for the town and its surrounding areas with a direct line to London (Burner, 1979). The traffic on the line reduced in 1935 to mainly summertime visitors but freight traffic remained substantial until total closure of the line on 16th September 1963 **(NMR: 444712).**

4.1.13 The timber trade continued in the early part of the 20th century at Squares Quay but the majority of Kingsbridge's trade moved down stream to New Quay (Fairweather, 2008). Dates shipyard south of New Quay continued to operate until 1912 ending shipbuilding in Kingsbridge.

4.1.14 The South Hams provided training grounds to allied troops in WW2 with Slapton Sands being particularly important, American troops were stationed in Salcombe and Slapton but on various occasions the military would gather in Kingsbridge as part of the preparation for D-day (Linton, 2003).

4.1.15 With increased communication links the tourism trade increased in Kingsbridge moving the main focus of the town's quays from commercial to leisure industries.

4.2 Cartographical Background

4.2.1 The 1859 admiralty chart show the creek to extend further into the main town of Kingsbridge, with what appears to be a quay side. The western side of the creek (Squares Quay) looks largely undeveloped with only a few small buildings with what could possibly be a squared off quay. The eastern side of the creek (Dodbrook Quay) is also largely undeveloped but a roadway runs along the edge of the creek and around the large hills to the east. A small the road passes a small quay opposite the proposed developments with a road leading to Windsor Cottage.

4.2.2 The 1886 Ordnance Survey County Series 1st Edition (1:2500) show the main quay still further into the town that present but has the western edge of the creek straightened with a promenade of possible quay. The Eastern edge is shown as a tree lined promenade with the quay seen on the 1859 chart clearly marked as "Saltmill Quay" and the presence of a lime kiln on it.

4.2.3 The 1906 County Series 1st Revision (1:2500) shows little change in the quays but the lime kiln previously marked in the 1886 OS map is no longer marked.

4.2.4 The 1929 Admiralty chart shows that the main quay that previously stretched into the town has been squared off, a small collection of building can be seen on the western side of the creek but these appear to be copied off the 1859 chart, the eastern side of the creek is shown to be squared off and further from the road than on the 1959 chart.

4.2.5 The 1936 County Series 3rd Revision (1:2500) OS map contradicts the earlier chart still showing the quay stretching further into the town; It also shows the development of the quay on the eastern side where the area has been squared off and marked as a Quay with a slipway. Saltmill Quay is no longer marked on the map and the promenade has been lengthened an extra 50 metres further south.

4.2.6 The 1938 3rd revision County Series (1:10560) still shows the quay stretching into the town but does not show any of the developments seen the 1936 OS map. It is not until the 1956 OS National Grid, National Survey (1:2500) that the quay is shown squared off at the top with the area of the old quay marked as a car park.

4.2.7 The 1st revision National Grid (1:2500) published in 1970 shows further development in the ear straightening and extending the eastern side of the creek to create a car park running the length of the creek. The 2nd Revision published in 1987 shows a miniature railway running along this promenade with a slipway at the south.

4.2.8 A map of the historic high water lines showing the evolution of the Quays is attached as Plate 4.

4.3 Known Archaeological Sites

4.3.1 Within a 250m radius of the development area there are 30 sites on the HER, 9 of which are listed buildings in the area and 2 sites on the NMR. These are included in Appendix 1 Summary of Archaeological Sites.

4.4 Potential Sites

4.4.1 The NMR list 4 potential wrecks lost off or near Kingsbridge, it is however unlikely that these wrecks are in the area as it is above drying height and therefore any vessel would be easily salvageable. Further research into the vessels seems to suggest that they wrecked in Bigbury Bay rather than in the Ria.

4.4.2 The creek is likely to have been a navigable channel leading to Kingsbridge since the earliest days of the settlement. During the nineteen century the creek was improved and quays were

built against the side of the channel reclaiming the immediate intertidal zone from the shore outwards.

4.4.3 As a navigable channel any wreck or debris within it who have been removed at or close to the time of deposition and if redeposit nearby would have been against the shore, which is now covered by reclaimed land. It is considered therefore that there is little potential for the survival within the creek of any in situ maritime archaeological remains.

4.4.4 An Intertidal Survey of the Kingsbridge Estuary by the Authors and Bournemouth University which took place between 2005 and 2009 found no evidence of any archaeology within the development area.

4.5 Extent of Previous Dredging

4.5.1 Early Charts of the area (1859) put the depth of the region to be -7ft[1] (-2.1m) by 1967 the charts state the depth as -12ft (-3.6m), the differences should not be taken at face value as the chart datum differs between the 1859 and 1967. Modern charts show the depth to be -3.4m suggesting that sediments in the creek are stable and largely unchanged since 1859.

4.5.2 A pre-dredge survey taken in 2010 showed the water depths to be between -2 and -2.6, the post dredge survey shows little change in the bathymetry.

5 Geoarchaeological and palaeo-environmental potential

5.1 Existing Borehole Data

5.1.1 Two sets of boreholes were reviewed to assess the geoarchaeological and palaeo-environmental potential. The sets of boreholes were a:

- Set of 4 boreholes by BGS near the Site at the Shipbuilding Yard, Kingsbridge
- Set of 11 boreholes by CJ Associated in 2002 towards the mouth of Salcombe estuary.

These can be seen on Plate 5. Together they provide an assessment of the deposits near the Site (Table 1), and these can be related to both deposits further south (

5.1.2 Table 2), and the geoarchaeological and palaeo-environmental desk-based assessment from the Salcombe and Moor Sand designated wreck site (Allen, 2010).

5.2 Summary benchmark statement: Geology and seabed topography

5.2.1 The geology of Salcombe environs comprises Precambrian gneiss and schist, north of which are Devonian sedimentary and meta-sedimentary rocks (Charman & Newnham, 1996) (Edmunds, et al., 1985). The Precambrian gneiss and schist extent offshore forming the seabed where they are mapped are low greenschist and more specifically form the Start Complex comprising as a series of Permo-Triassic mica/quartz schists and highly metamorphic chlorite schists (Charman & Newnham, 1996); (Pantin, 1991)), which are known to be friable and to fragment. The gneiss bedform is strongly jointed giving rise to an uneven rocky reef of crevices and holes, with numerous parallel and crossing gullies. The

[1] The depth show on the chart are above chart datum and there for are given a –depths

gullies are steep-sided and flat-bottomed and 3m – 6m deep filled with semi-mobile silty sand and boulder matrix. Offshore this survives area an area of broken bedrock and sand plain with some fine-grained marine sediment. The seabed descends in a series of steeply defined steps (formed by former erosion benches) which cut across some of the gneiss joint-gullies

5.3 Assessment of Borehole Data

The geotechnical borehole logs were examined and are summarised in Table 1 and

5.3.1 Table 2. These logs provide a basic record of the main sedimentological facies. The records, however, are described for geotechnical and not palaeo-environmental or geoarchaeological purposes so lack some of the detail normally required.

5.3.2 The deposits of potential interest were a) peats, b) below immediate sub-bottom organic silts, c) silts and clays and d) records of wood inclusions etc., above the natural shales and slates etc.

5.4 Presence and thickness of Holocene fine-grained deposits and peat

5.4.1 A set of cores were taken as part of the development at "The Moorings" a previously Date's shipyard (**DeHER: MDV51272**) to the south of New Quay, now luxury flats, and logged with the BGS. Between 1.00m and 4.10m of Made Ground were penetrated before thickness of between) and 1.90m of fine-grained deposits were encountered over shale Table 1. Many of the boreholes penetrate many metres into the natural shale. No peat, humic or organic deposits were encountered.

5.4.2 In contrast, further south at Batson Creek, although only 2 of the 11 boreholes were deeper than 3m and reached the shale, deposits of between 0.90 and >3.00m of the fine-grained deposits were present.

Table 1 Summary of borehole records from "The Moorings"

BGS ID	***610993***	***610994***	***610995***	***610996***	***610997***
BGS reference	***SX74SW7***	***SX74SW8***	***SX74SW9***	***SX74SW10***	***SX74SW11***
Made Ground	1.00	3.80	4.10	3.90	3.30
Organic silt	-	-	-	-	-
Silts and clays	-	5.30	6.00	4.80	3.90
Thickness silt/clay	0.00	1.50	1.90	0.90	0.60
Peat or organic deposits	-	-	-	-	-
Gravels (and sands)	-	-	-	-	-
Top of Shale	1.00	5.30	6.00	4.80	3.90
Total borehole depth	8.20	12.10	11.20	8.35	11.80

Table 2 Summary of borehole records from Batson Creek

MO669-	***BH 1***	***BH 2***	***BH 3***	***BH 4***	***BH 5***	***BH 6***	***BH 7***	***BH 8***	***BH 9***	***BH 10***	***BH11***
Made Ground	-	-	-	-	-	-	-	-	-	-	-
Organic silt	0.90	-	3.00	3.00	-	-	3.00	0.80	-	-	-

Silts and clays	-	3.00	-	-	3.00	3.00	-	3.00	2.50	2.50	2.50
Thickness silt/clay	0.90	3.00	3.00+	3.00+	3.00+	3.00+	3.00+	3.00+	2.50	2.50	2.50
Peat or organic deposits	-	-	-	-	-	-	-	-	-	-	-
Gravels (+ sand)	-	-	-	-	-	-	-	-	0.50	0.50	0.50
Top of Shale	0.90	3.00	-	-	-	-	-	-	-	-	-
Total bore depth	22.00	12.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

5.5 Character of Holocene fine-grained deposits and peat

5.5.1 The Moorings boreholes (Table 1) are characterised by minerogenic dark grey to brown sandy silts, to silty sandy clays. No peat was recorded but organic deposits were noted immediately below the made ground (610994) only 0.2m thick, and organic inclusions were or sediments that was 'organic in parts' were recorded 0.6m thick in 610995 (Table 3). All other records were wholly inorganic fine grained deposits.

Table 3 The presence of organic matter and marine shells in the fine-grained deposits

BGS ID	610993	610994	610995	610996	610997
BGS reference	***SX74SW7***	***SX74SW8***	***SX74SW9***	***SX74SW10***	***SX74SW11***
Silts and clays	-	5.30	6.00	4.80	3.90
Thickness silt/clay	0.00	1.50	1.90	0.90	0.60
Organic presence	-	✓	✓	-	-
Shells present	-	+	+	-	+

5.5.2 Shell fragments (presumably marine) were recorded as occasionally represent in three boreholes. No other palaeo-environmental inclusions were noted.

5.5.3 The second set of boreholes also did not record any peat, though the upper 3m was recorded as dark grey to black 'organic silt', grading to a very fine sand and some were recorded as containing some shells fragments.

5.6 Potential

The regional background

5.6.1 The value of palaeo-environmental and geoarchaeological data from the Salcombe environs is high as there are few studies in this area ((Webster, 2007); Straker pers. comm.) and they could play an important role in determining the changing environment and nature of the estuary. Work by Tinsley (2000) examined the pollen in the upper 2.3m of a 9m deep peat deposit in a coastal valley at North Sands, Salcombe. The mire vegetation in the Middle Bronze Age (1530–1250 cal BC, Wk-8103; 3130±60 BP) was alder carr and fen which was replaced by an open and wetter plant community and, by cal AD 50–350 (Wk-8102; 1860±60 BP), the carr woodland disappeared. The site appeared to have dried out during or after the Roman period. Tinsley attributed the phase of increased wetness to local hydrological

change, possibly associated with human activity. This was indicated by herbs characteristic of disturbance throughout the profile, but particularly in the Bronze Age level (Straker, et al., 2007).

Geoarchaeological and Palaeo-environmental Potential

5.6.2 The Holocene deposits at Kingsbridge are thin (1.90m max), and minerogenic. No peat or strongly organic deposits were present. The deposits are typically marine and estuarine.

5.6.3 No peat or richly organic deposits were encountered, as are present elsewhere in the Salcombe environs.

5.6.4 The upper profiles in the cored area had obviously been severely truncated by building (made ground).

5.6.5 Although there is a possibility that microfossils such as pollen and diatoms may be preserved, the lack of peat, stratified organic deposits or waterlogged wood etc., would render the sequence essentially undateable. The lack of dating evidence severely diminishes the low palaeo-environmental and geoarchaeological potential of these deposits.

5.6.6 Shell fragments are recorded as being present (Table 3), but these are probably marine, and provide little palaeo-environmental information.

5.6.7 Some further geoarchaeological information about the deposits, sedimentary structures and more detailed palaeo-environmental potential could have been obtained had the cores been available for examination.

5.6.8 If the cores were available for examination, re-description and subsampling then there may be clear further geoarchaeological and palaeo-environmental potential. However, the core were taken for engineering purposes and BGS advise that these have not been retained.

6 Impacts

6.1.1 The small scale of this development, 22 wooden piles all measuring less than 300m^2 and its confines within small channel with a low archaeological potential means that the impacts on the cultural heritage in the area will be at most minimal.

6.1.2 The design of the bridge landing has been changed so that the structure will not impact on the quay or the land in any way.

7 Conclusions

7.1 Recommendation for mitigation

7.1.1 As the impact is low, it is recommended that no mitigation needs to be in place during this development.

7.2 Geoarchaeological

7.2.1 The value of the geoarchaeological and palaeo-environmental data from this area is made more significant because of the Moor Sand Protected Wreck and any information to help understand the contemporaneous environments and post-wreck estuarine deposition would assist in the study of that site as well as the Salcombe environs in general.

7.2.2 However, the geoarchaeological or palaeo-environmental potential are recorded from the Kingsbridge Berthing Improvements site is deemed to be low

8 Summary of Sources Used

8.1.1 A request for data was granted for a 1km radius around the site from Devon HER, this was augmented through Heritage Gateway. The NMR and The National Heritage List for England was also consulted

8.1.2 The Main source for the historic background of this DBA has been the History of Kingsbridge and Salcombe by Ann Born (1986). This details the earlier history of the area and gives a starting point for further research in combination with other local sources and the local and national archives.

8.1.3 The Ordnance Survey maps and UKHO charts were used as part of a map/chart regression.

9 Archive Location

9.1.1 The archive will be held by Dave Parham, a copy will be offered to the client and the relevant heritage agencies.

10 Bibliography

Allen, M., 2010. *Salcombe and Moor Sands designated Wrecksite, South Devon; desk-based assessment of the geoarchaeological and palaeo-environmental potential; the buried environment.,* s.l.: Unpublished.

Baker, J. & Brookes, S., 2013. *Beyond the Burghal Hidage: Anglo-Saxon Civil Defence in the Viking Age.* Boston: Brill.

Born, A., 1986. *A History of Kingsbridge and Salcombe.* Chichester: Phillmore & Co. Ltd..

Burner, B., 1979. *Blue Skies.* Kingsbridge: Cookworthy Museum.

Charman, D. & Newnham, R., 1996. Introduction. In: D. Charman, R. M. Newnham & D. G. Groot, eds. *Devon and East Cornwall Field Guide.* London: Quaternary Research Association, pp. 1-13.

Edmunds, E. A., McKeown, M. C. & Williams, M., 1985. *South West England.* 2nd ed. London: British Geological Survey.

Fairweather, A., 2008. *A Salcombe Photographer.* Newton Abbot: Orchard Publications.

Griffith, F. & Wilkes, E., 2006. The Land Named from the Sea? Coastal Archaeology and Place-names of Bigbury Bay, Devon. *The Archaeological Journal,* 163(1), pp. 67-91.

Haslam, J., 1984. The Towns of Devon. In: J. Haslam, ed. *Anglo-Saxon Towns of England.* Dursley: Phillimore, pp. 249-283.

Hesketh, R., 2006. *Devon's Geology an Introduction.* Launceston: Bossiney Book.

IfA, 2011. *Standard and Guidance for historic enviroment desk-based assessment,* Reading: IfA.

Kingsbridge History Society, 2011. *A Brief History of the Kingsbridge Area.* [Online]
Available at: http://www.kingsbridge-history.co.uk/html/kinsbridge_history.html
[Accessed 01 August 2013].

Linton, S., 2003. *A Pictoral History of Kingsbridge and the Surrounding Area.* Newton Abbot: Orchard Publications.

Needham, S., Parham, D. & Frieman, C., 2013. *Claimed by the Sea: Salcombe, Langdon Bay, and Other Marine Finds of the Bronze Age.* York: Council for British Archaeology Research Reports.

Oswald, N., 1985. *Shipping in the Kingsbridge Estuary (Cookworthy papers series no.7).* Kingsbridge: Cooksbury Museum.

Pantin, H. M., 1991. *The sea-bed sediments around the United Kingdom; their bathymetric and physical environment, grain size, mineral composition and associated bedforms, Offshore Geology Series,* Keyworth: British Geological Survey.

Parham, D., 2006. *The Kingsbridge Estuary Archaeological Survey,* Poole: Bournemouth Univeristy.

Salcombe-Kingsbridge Estuary Conservation Forum, 2005. *Salcombe-Kingsbridge Estuary. Environmental Management Plan,* Totnes: South Hams District Council.

Straker, V. et al., 2007. Later Bronze Age and Iron Age Environmental Background. In: C. J. Webster, ed. *The Archaeology of South West England South West Archaeological Research Framework Resource Assessment and Research Agenda.* Taunton: Somerset County Council, pp. 103-117.

Tinsley, H. M., 2000. *Pollen Analysis of Samples from the upper 2 metres of a Peat Deposit at North Sands, Salcombe, Devon.,* Totnes: South Hams District Council.

Webster, C. J., 2007. *The Archaeology of South West England South West Archaeological Research Framework Resource Assessment and Research Agenda,* Taunton: Somerset County Council.

Wilkes, E., 2006. *Report on Geophysical Survey at Burleigh Dolts, South Devon,* s.l.: Unpublished.

11 Illustrations

Plate 1 Geological Key

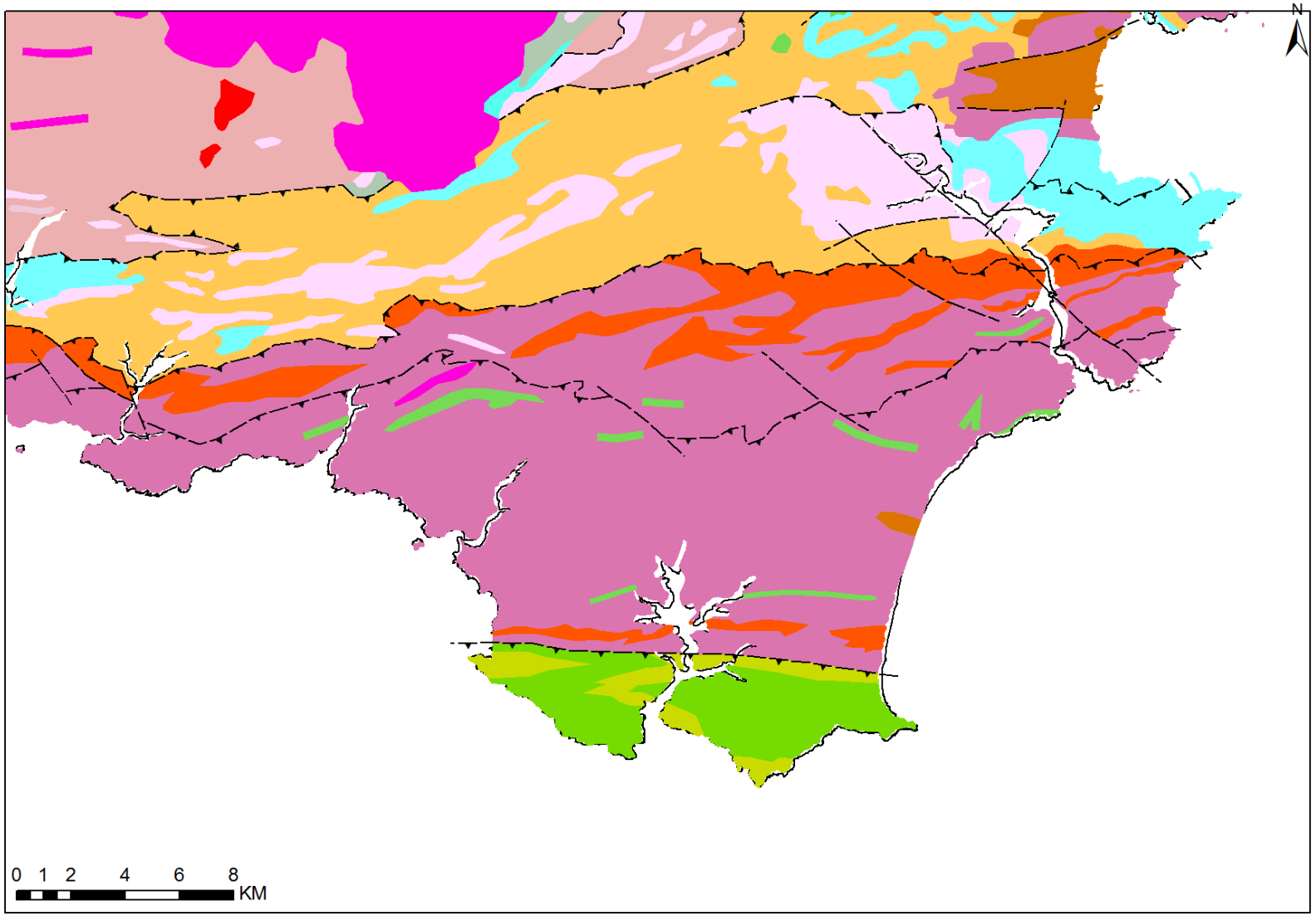


Plate 2 Geology of South Devon Contains British Geological Survey materials ©NERC 2013 (see Error! Reference source not found. **for Key)**

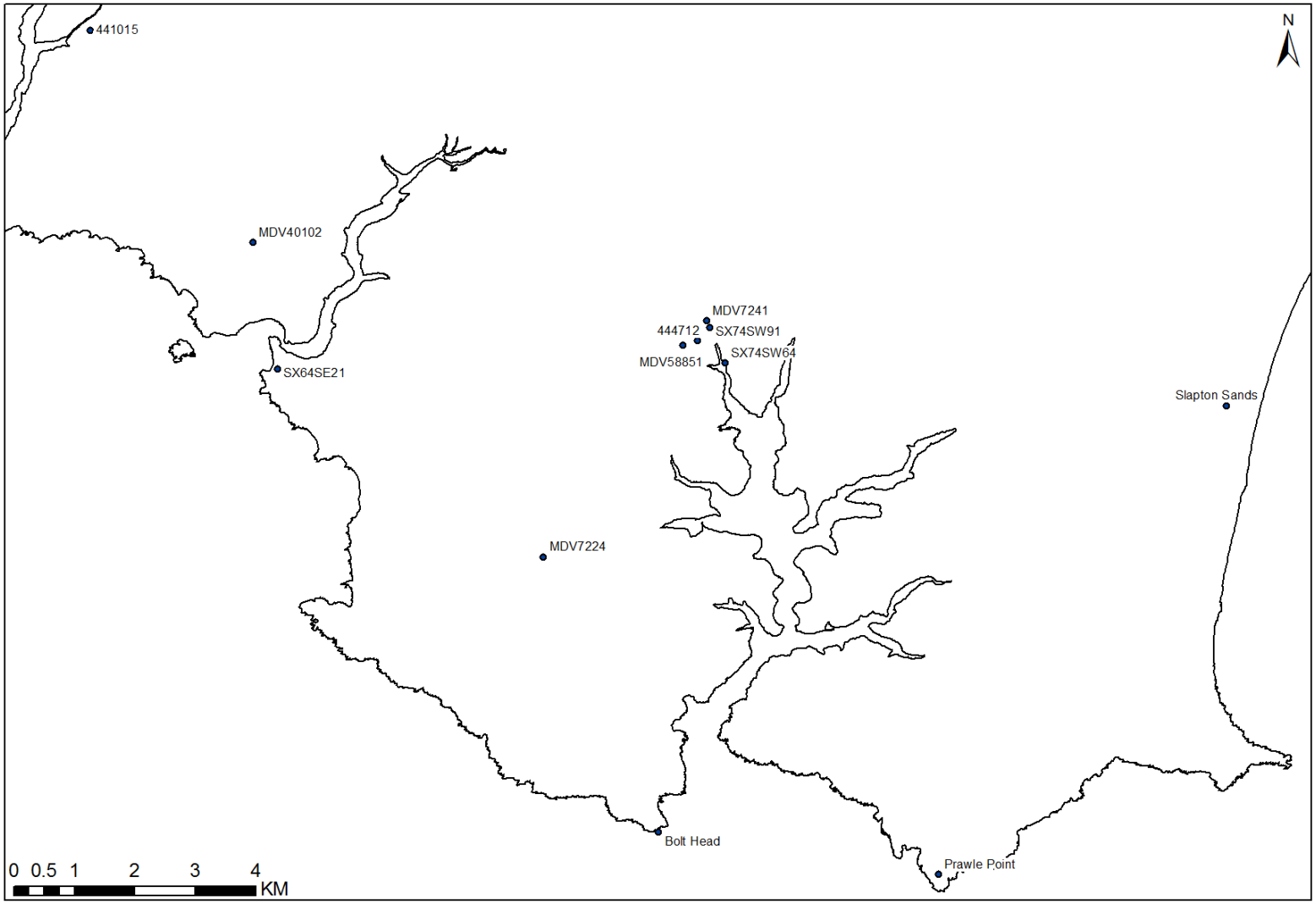


Plate 3 Sites mentioned in the text

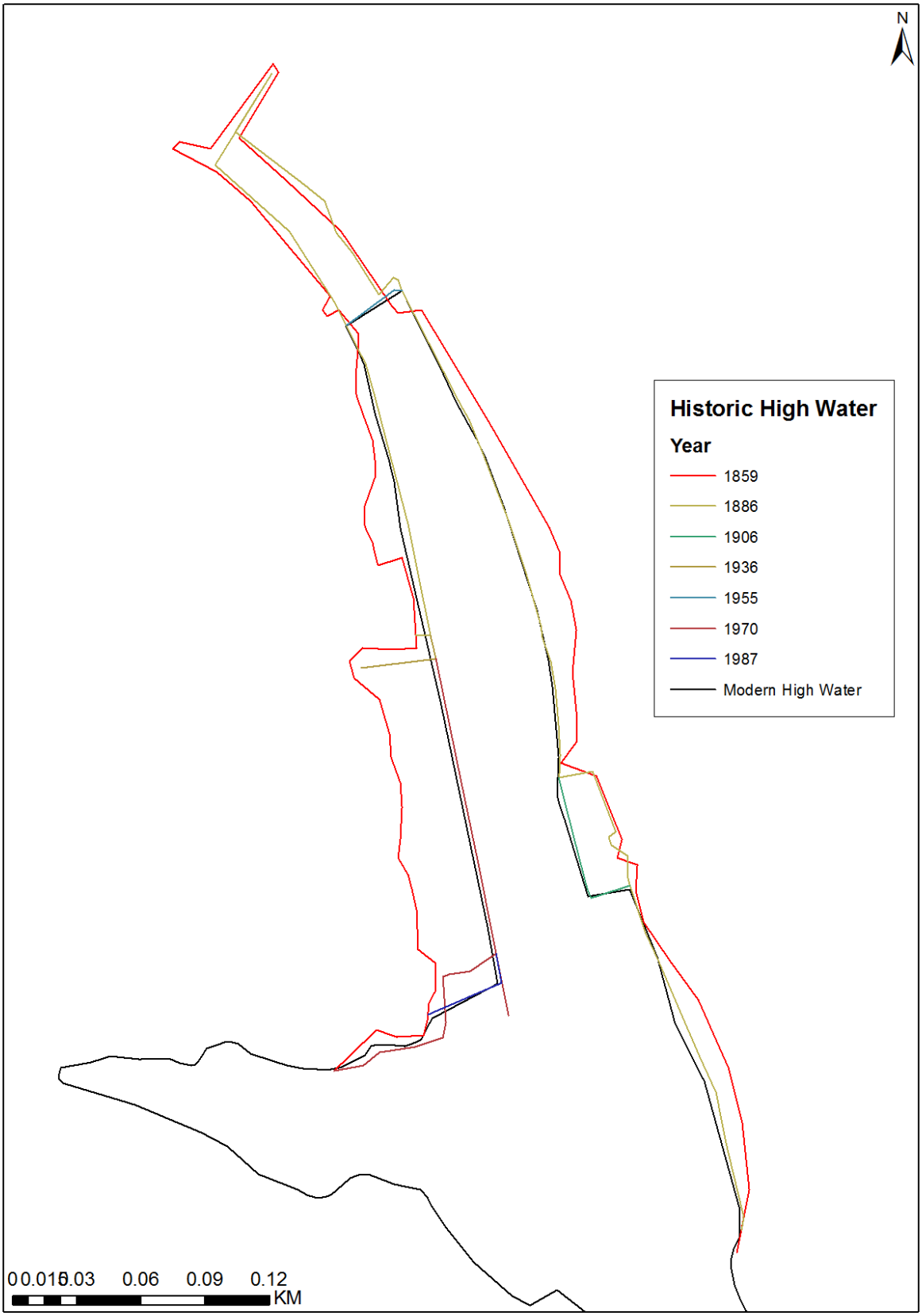


Plate 4 Historic High Water Lines

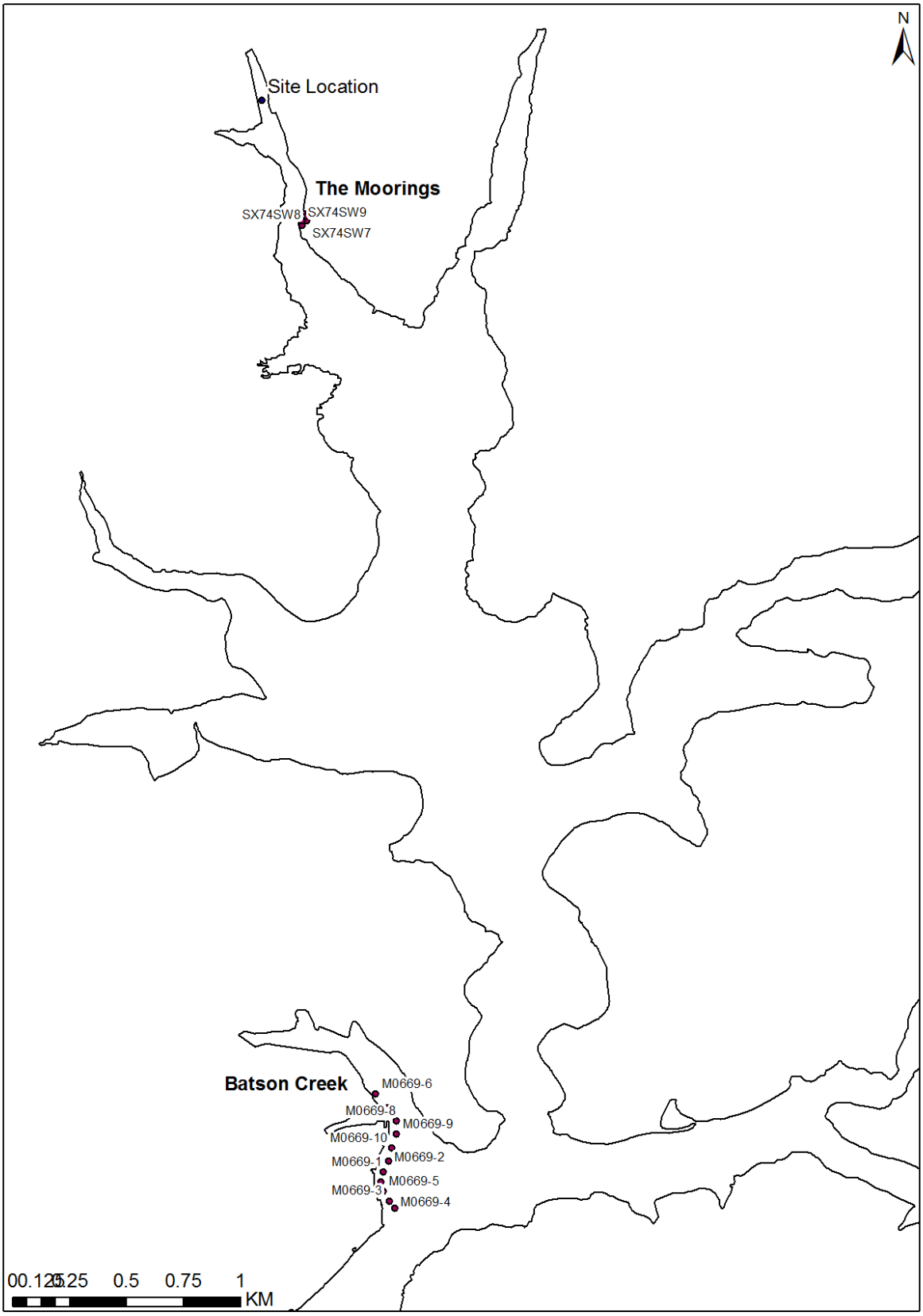
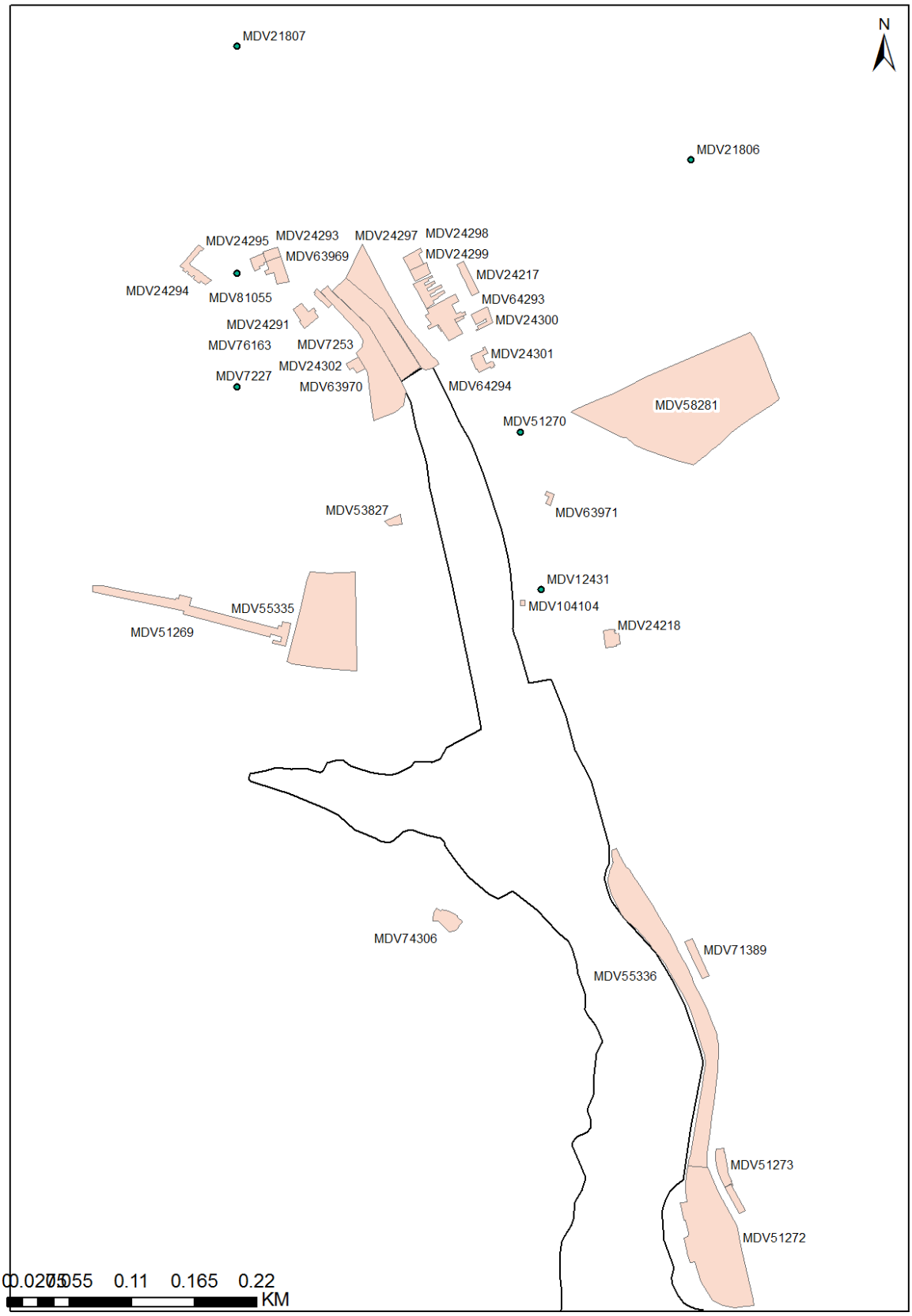


Plate 5 Borehole Locations

12 Appendix 1 Summary of Archaeological Sites

Monument ID	Listed Building	NMR ID	Record Type	Name	Monument Type	Heritage Gateway
MDV24299	1263739		BLD	1-4 South Place, The Promenade, Kingsbridge. Grade II	TERRACE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24299&resourceID=104
MDV24294	1249616		BLD	1-9 Devon Square, Kingsbridge, Grade II	TERRACE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24294&resourceID=104
MDV24293			BLD	9 and 11 Mill Street and Warehouse to Rear, Kingsbridge	SHOP	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24293&resourceID=104
MDV64294			MON	Building to Rear of Pindar Lodge, Dodbrooke	BUILDING	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV64294&resourceID=104
MDV63969			MON	Dodbrook Quay, Kingsbridge	QUAY	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV63969&resourceID=104
MDV51270			MON	Dodbrooke Workhouse	WORKHOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV51270&resourceID=104
MDV76163			MON	Former Building near Quay House	BUILDING	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV76163&resourceID=104
MDV24302			BLD	Former Cottage, Square's Quay	DWELLING	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24302&resourceID=104
MDV7253			MON	Former Harbour, Kingsbridge	HARBOUR	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV7253&resourceID=104
MDV24298	1249448		BLD	Harbour House, Former Conservative Club, Grade II	BUILDING	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24298&resourceID=104
MDV24217	1317303		BLD	Hingston's Malthouse, 38 Ebrington Street, Okehampton, Grade II	MALT HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24217&resourceID=104
MDV55335			MON	Kingsbridge Cattle Market	LIVESTOCK MARKET	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV55335&resourceID=104
MDV104104			MAR	Kingsbridge War Memorial		http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV104104&resourceID=104
MDV24297			BLD	Leighton House, The Promenade, Kingsbridge	HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24297&resourceID=104
MDV63971			MON	Lime Kiln South of Boxhill	LIME KILN	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV63971&resourceID=104
MDV53827			MON	Limekiln, Tumbly Hill, Kingsbridge	LIME KILN	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV53827&resourceID=104
MDV24300	1249461		BLD	Pindar Lodge, The Promenade, Kingsbridge, Grade II	HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24300&resourceID=104
MDV24291	1249367		BLD	Quay House, Ilbert Road, Kingsbridge, Grade II	HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24291&resourceID=104
MDV58281		SX74SW77	MON	Rackpark	TENTER GROUND	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV58281&resourceID=104
MDV51269			MON	Rope Walk in Kingsbridge	ROPEWALK	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV51269&resourceID=104
MDV63970			MON	Squares Quay, Kingsbridge	QUAY	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV63970&resourceID=104
MDV26793			MON	The Bishop Blaise Inn	INN	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV26793&resourceID=104
MDV42863			MON	The Kings Bridge	BRIDGE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV42863&resourceID=104
MDV24295	1249420		BLD	The Seven Stars Inn, Mill Street, Kingsbridge, Grade II	INN	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24295&resourceID=104
MDV12431		SX74SW29	MON	Tide Mill at Saltmill Quay	TIDE MILL	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV12431&resourceID=104
MDV7227			MON	Toll House, Kingsbridge	TOLL HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV7227&resourceID=104
MDV24301	1249488		BLD	Victoria Place, The Promenade, Kingsbridge, Grade II	HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24301&resourceID=104
MDV81055			BLD	Warehouse to Rear of 11 and 9 Mill Street, Kingsbridge	WAREHOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV81055&resourceID=104
MDV64293			MON	Warehouse, Dodbrooke Quay	WAREHOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV64293&resourceID=104
MDV24218	1325384		BLD	Windsor Lodge, Embankment Road, Kingsbridge, Grade II	HOUSE	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV24218&resourceID=104
MDV2180			MON	Kingsbridge	BURGH	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV21807&resourceID=104
MDV21806			MON	Dodbrooke	BURGH	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV21806&resourceID=104
MDV51272			MON	Date's Yard, Dodbrooke	SHIPYARD	http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MDV51272&resourceID=104


N
MDV21807
MDV21806
MDV24295
MDV24293
MDV24297
MDV24298
MDV63969
MDV24299
MDV24294
MDV81055
MDV24217
MDV64293
MDV24291
MDV24300
MDV76163
MDV7253
MDV24301
MDV24302
MDV7227
MDV63970
MDV64294
MDV58281
MDV51270
MDV53827
MDV63971
MDV12431
MDV55335
MDV104104
MDV51269
MDV24218
MDV74306
MDV71389
MDV55336
MDV51273
MDV51272
0.055
0.11
0.165
0.22
KM