



## **Cell 1 Regional Coastal Monitoring Programme Walkover Inspection Surveys 2020**

**Redcar & Cleveland  
Borough Council**



**October 2020**

# Redcar & Cleveland Borough Council

## Walkover Inspection Surveys 2018

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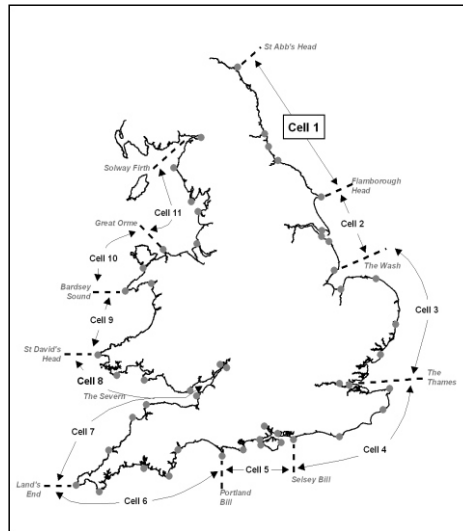
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<sup>1</sup> Scarborough Borough Council is acting as client on behalf of all Local Authorities within 'Coastal Cell 1'.

## Preamble

The Cell 1 Regional Coastal Monitoring Programme covers approximately 300km of the north-east coastline, from the Scottish Border (just south of St. Abb's Head) to Flamborough Head in East Yorkshire. This coastline is often referred to as 'Coastal Sediment Cell 1' in England and Wales (Figure 0-1). Within this frontage the coastal landforms vary considerably, comprising low-lying tidal flats with fringing salt marshes, hard rock cliffs that are mantled with glacial till to varying thicknesses, softer rock cliffs, and extensive landslide complexes.



**Figure 0-1 - Sediment Cells in England and Wales**

The work commenced with a three-year monitoring programme in 2008 that was managed by Scarborough Borough Council on behalf of the North East Coastal Group. This initial phase was followed by a five-year programme which started in 2011 and the current five-year programme which started in 2016. The programme funded by the Environment Agency, working in partnership with the following organisations.



The main elements of the Cell 1 Regional Coastal Monitoring Programme involve:

- beach profile surveys
- topographic surveys
- cliff top recession surveys
- real-time wave data collection
- bathymetric and seabed characterisation surveys
- aerial photography
- walkover inspection surveys

Royal HaskoningDHV has been appointed to provide Analytical Services in relation to the Cell 1 Regional Coastal Monitoring Programme 2016 - 2021.

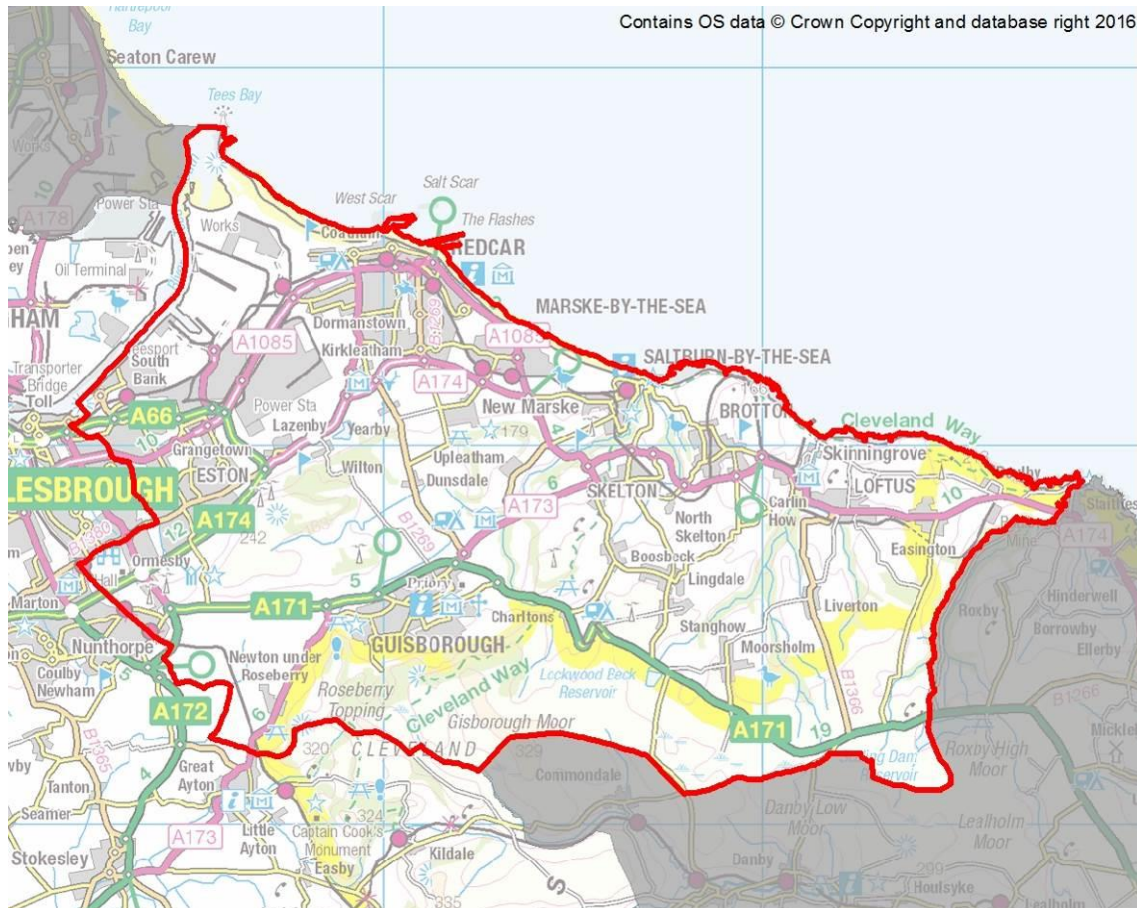
The present report is **Walkover Inspection Surveys 2020** and provides a summary of the main findings from the walkover inspections of Redcar & Cleveland Borough Council's frontage that are undertaken once every 2 years.

In addition, separate reports are produced for other elements of the programme as and when specific components are undertaken, such as beach profile, topographic and cliff top surveys, wave data collection, bathymetric and seabed sediment data collection, and aerial photography.

# 1. Introduction

## 1.1 Study Area

Redcar & Cleveland Borough Council's coastal frontage extends from South Gare at the mouth of the River Tees in the north, to Cowbar Nab in the south, and is shown in **Figure 1-1**. Detailed maps showing the location of each of the coastal defence assets considered in this report are presented in **Appendix A**. In addition, the cliffs within the frontage have been classified according to their characteristic behaviour condition and a series of Cliff Behaviour Units (CBUs) have been defined and mapped. The location of the CBUs is presented in **Appendix B**.



**Figure 1-1: Redcar & Cleveland Borough Council study area**

## 1.2 Methodology

This section presents the approach taken by the asset inspectors for the Redcar & Cleveland Borough Council coastal frontage.

The walkover inspection surveys for the Redcar & Cleveland Borough Council frontage were undertaken on 21<sup>st</sup> June and 20<sup>th</sup> August and 9<sup>th</sup> September 2020. The weather experienced during the inspections was clear and dry with no access or visibility problems caused by adverse weather.

Due to the Covid19 pandemic the walkover inspection of the Redcar and Saltburn frontages was timed to coincide with the end of the school holidays in September. This enabled the inspection of this busy section of coastline to be undertaken safely and within social distancing guidelines. The section from Saltburn to Staithes was considered lower risk due to the nature of the coastline and more remote nature of the inspection route.

The frontage has been split into a number of 'asset lengths' (Appendix A), as defined in the National Flood and Coastal Defence Database (NFCDD) that was established by the Environment Agency.

The walkover inspections cover both built defence assets and natural defence assets such as cliffs, slopes and dunes. All assets were visually inspected, photographed and graded based on their condition and an estimate made of their residual life.

For built assets the grading classification was undertaken in accordance with the Condition Assessment Manual (EA, 2012), with estimates made of the urgency of any necessary repairs. An extract of the grading classification for built assets is presented in **Table 1-1**. For ease of reference the built asset photographs presented in this report have also been bordered with the colours key indicated below.

Grade	Rating	Description
1	Very Good	'As built' condition or cosmetic defects that have no effect on performance.
2	Good	Minor defects that will not reduce overall performance of the asset.
3	Fair	Defects that could reduce overall performance of the asset.
4	Poor	Defects that would significantly reduce overall performance of the asset.
5	Very Poor	Severe defects resulting in overall performance failure of the asset.

*Table 1-1: Condition assessment grading for man-made assets.*

In addition to the above grading classification, for natural assets such as cliffs and slopes the same five point activity scale used in previous walkover inspections within Cell 1 was used. This grading classification is presented in **Table 1-2**. For ease of reference the natural asset photographs presented in this report have also been bordered with the colours key indicated below.

Grade	Class	Description
1	Dormant	Features with no interaction with marine processes.
2	Inactive	Features with no visible evidence of erosion or landsliding activity.
3	Locally active	Features with localised evidence of small erosion or landsliding activity.
4	Partly active	Features with widespread evidence of small erosion or landsliding activity or areas of intense erosion or landsliding.
5	Totally active	Features with large-scale or intense erosion or landsliding.



*Table 1-2: Condition assessment grading used for natural assets (cliffs/ slopes).*

This report provides an overview of the findings from the walkover inspections, summarising each locality in general but also specifically identifying individual assets in 'poor' or 'very poor' condition. It is anticipated that this summary will help identify areas for maintenance or capital investment. Full details of the inspection of each asset are provided in **Appendix B**.

In addition to this report, full details of the inspection and a selection of appropriate photographs have been entered into the SANDS (Shoreline And Nearshore Database System) database and provided along with this report with SANDS viewer software.

## 2. Overview

The following significant findings were observed during the 2020 walkover inspection surveys:

- **South Gare Breakwater** – The breakwater remains in poor condition and is comprised of numerous ad hoc repairs particularly along its northern flank. A large number of defects were noted including extensive cracking and spalling, exposure of reinforcing steel, missing mortar, open joints, damaged render and missing masonry blocks. At the root of the structure the slag embankments are being undercut and in places void formation is evident. The historic western pier arm structure remains in a failed / decrepit state. Damaged concrete Accropode and rock armour units show signs of displacement with a poor interlock. Some recent repairs to the deck slab were noted. In particular, a cracked and lifted deck slab on the south facing root of the structure which was reported in the 2018 report had been repaired.
- **Coatham Sands** – The dunes remain stable and well vegetated particularly in the north, however there is extensive ongoing erosion of the dune crest fronting the caravan site at the southern end of the asset.
- **Redcar** – The improved sea defences, completed in 2013, generally remain in good to very good condition. Several minor defects were noted along the frontage. These included minor cracking in larger *in situ* concrete panels at access ramps, staining of the concrete beneath drainage outfalls and localised vegetation growth on the stepped revetment. Generally, there was little change of the defence assets from the 2018 survey. The seawall fronting the Redcar Beacon remained an area of concern and still appeared to be missing flexible sealant in many of the joints, with filler board visible indicating that sealant was never present. Higher beach levels than recorded in the 2018 survey obscured previously reported undercutting of the north-east corner of the massive seawall to the rear of the derelict cinema.
- **The Stray** – The groynes appear to be in fair condition and performing satisfactorily. Beach levels are being maintained and there is a reasonable accumulation of pebble and cobble size material to the rear of the beach. Several timber elements are missing from the groynes, particularly towards their seaward ends. Recent repairs to the landward end of several groynes were found to be in good condition.
- **Saltburn-by-the-Sea** - Missing coping stones and local damage (cracking and spalling) to the concrete wall, access ramp surface and slipways were noted, as in previous inspections. At the eastern end of the frontage, the masonry and concrete seawalls and concrete aprons protecting the public house and land to the east of the slipway are in poor condition. Low beach levels have exposed voids and undercutting beneath the concrete apron/revetment poured to east of the defence. A series of masonry walls higher up the slope were also noted as being undercut.
- **Skinningrove** – A recent coastal defence scheme (completed in 2015) has repaired and improved the previously poor condition of the Skinningrove Jetty. As noted in 2018 a number of small defects remain, including heavily corroded steel sheet piling, cracked and abraded concrete and some of the new works have poorly inserted sealant in construction joints and exposed reinforcement bars, which could lead to future maintenance problems. Notably, in 2020 a lighting conduit was noted as having become detached from the crest wall and was severed in one location. The rock armour revetment and path leading from the jetty to the village remain in good condition.
- **Cowbar** - An area of particular and long standing concern is adjacent to Cowbar Lane. Here an upper till unit is undergoing severe erosion and there is evidence of recent rockfall from the lower part of the cliff. This is resulting in the loss of the now abandoned parts of Cowbar Lane. Following rockfall in 2016 the National Trust access to the Nab was closed due to further slippage of the till cliffs. Ongoing minor slippage and activity was visible by approaching the base of the cliffs from the foreshore. It was noted in 2020 that the Heras fencing and warning signs had been removed

at the access to the Nab meaning access was possible. Due to dense vegetation on Cowbar Nab it was not possible to follow the footpath route to inspect the upper reaches of the cliff.

### 3. Condition Assessment

#### 3.1 Coatham Sands

##### *Coastal Slope Condition Assessment*

As reported in previous inspections from 2008 onwards, the sand dunes along Coatham Sands were generally stable with a good coverage of established vegetation. Erosion, loss of vegetation and lowering of dune crest was evident locally at more frequently used beach access points (the northern and southern extents of the dunes). This was particularly significant alongside the caravan park to the south where the continuing roll-back of the dunes is now encroaching significantly into the caravan park and former site compound areas. This is evidenced by the loss of pitches along the seaward facing row of caravans in recent years. A healthy beach level was maintained throughout Coatham Sands.



*Looking south east from South Gare breakwater across the dunes and Coatham Sands (/C0507C01)*



*Outfall on Coatham Sands in poor condition (/C0507C01)*



*View looking south west from caravan site (/C0507C01)*



*View looking north west from caravan site (/C0507C01)*

##### *Coastal Protection Asset Condition Assessment*

The northern extent of Redcar & Cleveland Borough Council's coastal frontage is marked by the South Gare Breakwater. The structure has been graded in poor condition from the 2008 survey and this remains the case in 2020. Despite the poor condition of the asset, it still continues to provide protection to the navigation channel to the west and control of Coatham Sands to the east.

The structure is privately owned by PD Teesport and signage was present to instruct members of public not to progress onto the structure beyond the boundary fencing for the existing navigation

infrastructure. No physical barriers prevented access and it is understood that members of the public, in particular anglers, frequently venture onto the structure. During summer 2020 a man sadly died after being swept from the sea at the South Gare breakwater.



*Large void in western face (/C0506C01)*



*Western face (/C0506C01)*



*Historic repairs to deck slab along eastern face (/C0506C01)*



*Recent repair to deck slab along eastern face (/C0506C01)*



*Repairs to wall on breakwater crest (/C0506C01)*



*Northern extent of upper structure (/C0506C01)*

Numerous significant defects were observed along the structure. These included extensive cracking and spalling, exposure of reinforcing steel, missing mortar and masonry, open joints and damaged render. Additionally, it was noted that voiding and undercutting of the slag embankments at the root of the structure continue to worsen and the historic western pier structure is now totally collapsed. Along the seaward face of the structure, damaged rock armour and Accropode units were noted, with

generally poor profile, coverage and interlock. In several locations, the concrete deck slab beneath the wave return wall was lifted above the coping stones and in one location was missing entirely.

Multiple patchwork and ad-hoc repairs to both the deck slab, and face of the pier walls were evident throughout. The effectiveness of repairs differed greatly, with the more recent concrete encasements appearing in fair condition. One area of concern, noted in the 2018 report, comprised of a lifted and cracked deck slab on the southern lower deck, near the root of the structure at has been repaired. The condition of the repair was fair. Further historic repairs such as the grouted rubble revetment continued signs of voiding and collapse. As noted in previous surveys, a detailed survey of the structure is beyond the scope of the present inspections and a full structural survey of the breakwater is recommended in order to establish the full extent of the damage and identify any remedial works.

To the west of Redcar, defences comprise a concrete crest wall with grouted stone revetment fronting the promenade and car park. These remained in fair condition at the time of the inspections. Beach levels were significantly higher than in 2018 and as such, exposure/undermining of the north-eastern extent of the wall and promenade noted in the previous report was not recorded. Other localised damage included missing blocks from the grouted stone revetment. The concrete wall remains in fair condition, with the approximately two metre gaps towards the north-eastern extent still present. The beach remains in good condition, and is actively managed using a tractor and rotavator. There was no evidence of overtopping of the defence, however it was noted that surface water on the promenade continues to pool on the landward side of the path and as such did not drain through the crest wall surface water outlets as intended.



*View looking east, note high beach levels (/C0601C01)*



*High beach levels have covered previously recorded undercutting of western corner of the asset (/C0601C01)*



*Grouted stone revetment, partially covered due to high beach levels (/C0601C01)*



*Gap in concrete visible (/C0601C01)*

### 3.2 Redcar

#### *Coastal Slope Condition Assessment*

CBU **E52/11** which runs along the rear of the promenade along The Stray retains a Dormant grading as it has done since 2012. The vegetated slopes along this frontage are afforded ample protection from the upgraded blockwork revetment and the beach material retained by the refurbishment of the groynes.

#### *Coastal Protection Asset Condition Assessment*

The Environment Agency funded extensive capital works to upgrade the 2.7km of coastal defence assets from Coatham to the eastern extent of The Stray. These works were completed in 2013 and as such were inspected 'as built' during the 2014 walkover survey. The new defences follow similar alignments to the previous assets and, for the purposes of this report, the original NFCDD references have been retained, as they were in 2018. The GIS linework was amended as part of the 2016 survey.

The assets generally remained in very good to good condition, although several minor defects were noted. Minor cracking was observed in larger *in situ* concrete panels particularly at access ramps and staining of the concrete was evident beneath drainage outfalls. Particularly concerning was the lack of flexible sealant between numerous joints in the seawall fronting the Redcar Beacon. It was noted in the 2016 and 2018 reports that filler board was visible in certain joints indicating that joint sealant was never present. There was no discernible change to the condition of the assets in 2020, however the higher beach levels did mean that inspection of the toe of the structures was not always possible.

One area of developing concern is the presence of vegetation growth on the defence at various points. This concern was reported in 2018, however no remedial action has been undertaken. Although the issue is very localised it requires urgent attention. The vegetation should be removed and condition of joints in these locations inspected thoroughly.



*Mass concrete transition in fair condition. Note; horizontal and vertical cracks and damaged drain outfall (/C0602C06)*



*Vegetation growth on stepped revetment. (/C0602C06)*



*Slipway in good condition (/C0602C06).*



*Accumulation of beach material at transition with cinema wall (/C0602C06) & (/C0602C05)*



*Cinema seawall in poor condition high beach levels cover undercutting (/C0602C05)*



*Cinema seawall note accumulation of beach material (/C0602C05)*



*Undercut toe of Cinema seawall visible in 2018 (/C0602C05)*



*Undercut toe of Cinema seawall buried in 2020 (/C0602C05)*





*Slipway on in very good condition (/C0602C04)*



*Stepped concrete revetment with recurve wall in very good condition (/C0602C03)*



*Concrete sea wall at Redcar Beacon in 2018 (/C0602C03)*



*Concrete sea wall at Redcar Beacon note beach levels obscure concrete apron (/C0602C03)*



*Concrete sea wall at Redcar Beacon in 2018 (/C0602C03)*



*Concrete sea wall at Redcar Beacon note beach levels obscure concrete apron (/C0602C03)*



*Stepped concrete revetment and recurve wall in very good condition (/C0602C03)*



*Stepped concrete revetment and recurve wall in very good condition (/C0602C03)*



*Slipway in good very condition (/C0602C03)*

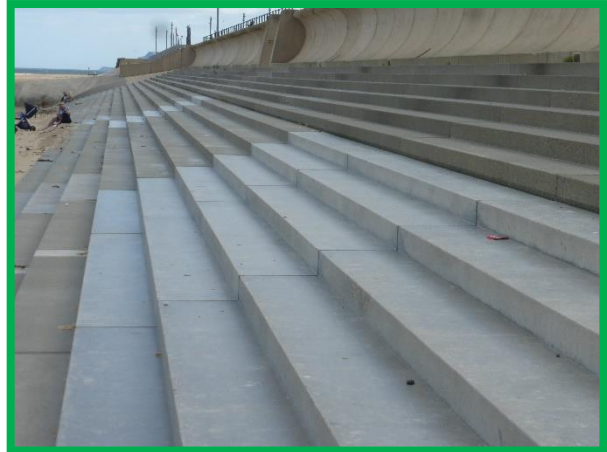


*Joint sealant on slipway remains in good condition (/C0602C03)*

The seawall at the cinema was not upgraded as part of the Redcar scheme. Beach levels were significantly higher than in 2018, this meant that the previously exposed undermining of the toe at the north-west corner noted in previous reports was not visible. The wall has been downgraded to poor condition following the 2018 survey due to the extensive undercutting visible along the toe of the wall and further localised cracking to its face. Although it was not possible to inspect the undercutting due to the high beach levels in 2020 there was no evidence that any recent repairs have been undertaken. There is evidence of historic repairs which generally remain in fair condition. The interfaces with the more recently constructed defences adjacent on both sides remained in good condition. The overall condition rating remains as poor following the 2020 inspection.



*Open joints in stepped concrete revetment. Overall condition remains as very good (/C0602C02)*



*Evidence of recent repairs to the stepped concrete revetment in very good condition (/C0602C02)*



*Slipway in fair condition (/C0602C02)*



*Slipway in fair condition some minor spalling around joints (/C0602C02)*



*South eastern access ramp. Loss of concrete render exposing grouted stone fill beneath concrete deck slab (/C0602C01).*



*Cracking to mass concrete slabs adjacent to slipway (/C0602C01).*



Concrete apron of slipway in good condition, despite being exposed. (/C0602C01).



Localized cracking and damage to stepped revetment (/C0602C01).



Sand accumulated in 2016 had been lost during the 2018 survey seen above (/C0602C01)



Accretion of sand along southern end of defence in 2020 (/C0602C01)



Vegetation growth indicating long term accretion at the slipway (/C0602C01)



Accumulated sand covers previously noted defects in concrete slipway (/C0602C01)

### 3.3 East Redcar to Saltburn-by-the-Sea

#### *Coastal Slope Condition Assessment*

The CBUs between Redcar and Saltburn show evidence of recent instability.

Unit **E52/10** remains classified as Partly Active during the 2020 inspection as it has been since 2013. The whole unit was showing signs of erosion, particularly around the subtle headland approximately mid-length of the unit. This continues to be the case and the status of Partly Active has been retained. A concrete outfall structure is present within this unit and there is evidence of scour around the structure. The gabion baskets and concrete blockwork scour protection which front the outfall have failed. The baskets themselves are split and fill material has begun to wash out. The scour protection shows signs of settlement and many blocks are displaced or missing entirely. An informal access ramp, formed of loose gravelly rock was present at the interface with the hard defences at the south eastern extent of The Stray. The condition of the access ramp continues to deteriorate however it continues to form as an informal access on to the beach in this location.



*View looking south east (/C0701C01) CBU E52/10*



*Concrete outfall structure, note failed gabions and scour protection (/C0701C01) CBU E52/10*



*CBU E52/10 (left) and informal access ramp (right)*



*Looking south east along CBU E52/10 Partly Active in 2020.*

The cliffs in Units **E52/9** and **E52/8** are afforded some protection by the wide beach at the toe, particularly at **E52/9** where there is a substantial coarse (cobble-size) fraction in the beach material, despite this the unit showed evidence of dune degradation and as such both units are now classed as Locally Active. The cliff units are prone to localised periodic slips, particularly around several field drain outlets. Furthermore, pedestrian access is causing further degradation and erosion adjacent the carpark. As with elsewhere along the frontage it is recommended that signage and fencing is installed to deter the public from further damaged this section of lower lying dune.



*View looking south east (CBU E52/8)*



*View looking south east CBU E52/9*

Immediately to the north of Marske, **E52/7** remains classified as Dormant as it has done since 2008. The asset is defended at its toe by low level sand dunes and a series of masonry and concrete walls, is well vegetated and shows no evidence of recent activity.



*Vegetated slope above masonry wall CBU E52/7*



*Vegetated slope above masonry wall CBU E52/7*

At the headland at Marske, **E52/6** the low dunes appear to have remained stable since 2018. The unit remains classified as Locally Active in 2020. At the access shown in the images below, the beach level continues to further expose the timber piles at the foot of the concrete path.



*Exposure of timber piles at foot of concrete footpath (CBU E52/6)*



*Further exposure of timber piles at foot of concrete footpath (CBU E52/6)*

From Marske to Saltburn the height of the coastal slopes increases, and the slopes become increasingly active. **E52/5** and **E52/4** show ongoing evidence of toe erosion and localised activity on their upper slopes and remain classified as Locally Active. Generally the toe of both units is stable, with erosion seemingly reduced by aided by the impact of higher beach levels in 2020.



*North western extent of CBU E52/5, some activity to inner dune face.*



*View looking south east, note stable dune toe (CBU E52/5)*



*View looking south east (CBU E52/4) seaward face of dune generally stable.*



*Southern extent of CBU (CBU E52/4)*

#### *Coastal Protection Asset Condition Assessment*

The frontage to the east of Redcar along The Stray to Mill Howle consists of concrete block revetment and concrete promenade constructed as part of the Redcar Coastal Defence Scheme which remained in very good condition.

As has been observed in previous surveys, several timber elements were missing from the groyne, particularly towards the seaward ends. Beach levels were higher than in 2018 meaning that the extent of damage was less pronounced. At the landward end of several groyne recent repairs had been undertaken comprising of concrete tie-ins to the existing sloped revetment, new horizontal timber elements supported from metal columns. The condition of the repairs was very good, and they were partially buried beneath a healthy accumulation of beach material.



*View on The Stray frontage looking south east (/C0603C01)*



*Recently repaired step at The Stray (/C0603C01)*



*Recently repaired groyne along The Stray (/C0603C01)*



*Slipway in very good condition at The Stray (/C0603C01).*



*Outfall at south eastern end of (/C0603C01)*



*Transition of revetment into natural defence (/C0603C01)*

The coastal defences at Marske are protected by a wide beach and so only exposed to marine action during storm events. The low masonry wall and revetment around the headland to the north west of the beach access at Marske was largely covered by beach levels. Where exposed, the wall and revetment remained in fair condition. As identified in previous inspections there were some missing coping blocks and there was evidence of lateral movement / settlement of the wall which remained stable.



The concrete wall at the toe of the vegetated slope was reported as cracked through its full height in all inspections from 2008 onwards, however the defect appeared to be of the same width and extent in the present inspections. The slope above showed no evidence of recent movement or any placement of excessive loading on the structure. An area of potential concern was the lower section of masonry wall towards the west of the asset, where there appears to have been some lateral movement. This was noted in the 2018 inspection report however there does not appear to have been any further movement in this location. It is recommended that this is monitored as failure of the wall would have a significant impact on the slope to its rear.



*Crack in wall – no apparent change (/C0702C03)*



*Masonry wall showing signs of lateral movement (/C0702C03)*



*Wall in fair condition some missing mortar and open joints (/C0702C03)*



*Wall in fair condition some missing mortar and open joints (/C0702C03)*



*High beach levels obscure masonry wall and north west of beach entrance (/C0702C01)*



*High beach levels and vegetation revetment north west of beach entrance (/C0702C01)*

Little change was noted to the masonry wall to the southeast of the beach access at Marske. Settlement cracks were evident throughout the full height and missing bricks at the seaward end, with scour evident to the rear of the structure. The landward, concrete wall was generally in fair condition, although as reported in previous surveys, displayed vertical cracks locally.



Masonry wall south east of beach entrance (/C0702C01)



Masonry wall south east of beach entrance (/C0702C01)

### 3.4 Saltburn-by-the-Sea

#### *Coastal Slope Condition Assessment*

The CBUs in and directly around Saltburn-by-the-Sea do not show much evidence of recent instability.

Units **E52/3b and E52/3a** above Saltburn Sands are again classified as Inactive in 2020, these units are defended at the toe by a sea wall and are well vegetated. Several unvegetated areas where shallow failures had exposed underlying material were noted in December 2013, but these do not appear to have developed since and vegetation appears to be re-establishing.

**E52/2** remains graded as Dormant unchanged since the 2016 survey due to a lack of evidence for failures in this section of cliff.

CBU **E52/1** shows a little more activity, with loose materials and localised erosion at the head of the large mound situated just east of Saltburn Gill. However, the activity is minimal, and this unit was downgraded from Locally Active to Inactive in 2014 and retained this status to 2016. In 2018 the unit was further downgraded to dormant. In 2020 there was no evidence of failures or erosion and as such the unit remains classified as dormant.

CBU **E53/5** was classified as Locally Active in 2012 due to shallow slumping which occurred on the cliff face and the unit was reclassified as Locally Active. The slumping has occurred despite the presence of toe protection and probably occurred in response to the wet weather experienced in the latter half of 2012. Evidence of activity still remains, so a status of Locally Active has been retained for this unit in 2018.



View looking east (E52/3b)



View east towards pier (E52/3a)



(E52/1)



(E53/5)

### *Coast Protection Asset Condition Assessment*

Hazel Grove Foot marks the north western extent of the hard defences which run along the Saltburn frontage. Missing coping stones and local damage (cracking and spalling) to the concrete wall and access ramp surface were present, as noted since 2014, and do not appear to have worsened resulting in retention of a fair condition grading.

During the 2016 survey it was noted that the security grille was open, presenting a health and safety risk. In 2018 this had been remedied and the grille was found to be sufficiently secured in place, however some of the bars were obviously damaged and the resulting opening was noted as being of a sufficient size to allow access to small children and animals. The grille appeared unchanged from 2018 and is still showing signs of damage. Due to the nature of this beach and the high footfall it receives it is recommended that the security grille be replaced to ensure access is restricted. It was notable in 2020 that there was an accumulation of pebbly beach material below the outlet whereas in 2018 the beach below the mouth of the outfall was eroding.



*Missing coping stone exposing fill beneath promenade surface (/C0703C02)*



*Security grille damaged (/C0703C02). Note accumulation of beach sediment around base of outfall.*

South of Hazel Grove Foot, the frontage is defended by a masonry seawall. The shingle/cobble beach levels were higher than observed in 2018 meaning that some defects previously reported along the masonry wall were not visible. The masonry and historic repointing works remained in good condition. Most mortar joints were in good condition as in 2018 with the exception of some localised areas of missing mortar and coping stones particularly around the slipway at the lifeguard station and seawall beneath the historic pier. Further localised damage was present along the low concrete wall to the rear of the promenade, comprising local cracking and abrasion. In 2020 it was noted that several of the cracks to this low concrete wall are full height and there was some evidence of localised instability of the slopes in these areas. Additionally, one section of damaged handrailing was noted in the 2020 inspection.



*View looking northwest. Lower beach higher than in 2018. (/C0702C04)*



*Slipway (/C0702C04)*



*Damage to slipway coping (/C0702C04)*



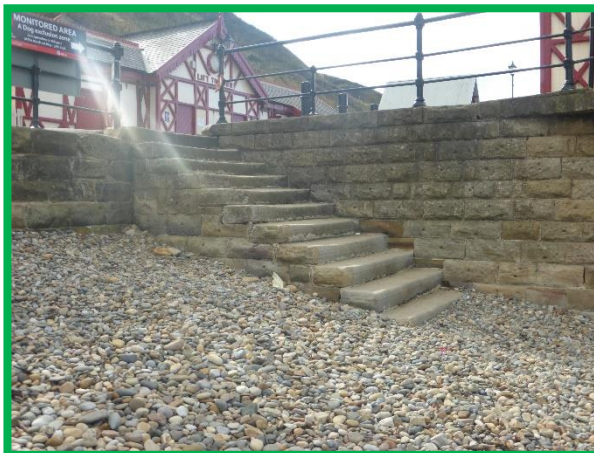
*Damage to handrailing along promenade (/C0702C04)*



*Defects to shallow retaining wall at rear of promenade (/C0702C04)*



*Further damage to shallow retaining wall evidence of material lost from slope to rear (/C0702C04)*



*Beach access steps adjacent Saltburn Pier (/C0702C04)*



*Looking south east along masonry wall south of pier (/C0702C04).*

To the south east of the pier, the defences comprise a masonry blockwork revetment which is generally in good condition with some missing mortar observed locally. Cobble beach levels were similar to 2018. The accumulation of material noted at the 'apex' of the curve of the structure had returned after it was reported as having been eroded in 2018.

The concrete blockwork wall to the west of Skelton Beck remains in fair condition although a section was missing coping stones, leaving the footway fill material exposed. Grouted masonry apron and masonry abutments to pedestrian bridge appeared to be in fair condition as reported in 2018.



*Slipway south east of Saltburn Pier (/C0704C01)*



*Missing / damaged blocks at apex of structure (/C0704C01)*



*Damage to coping stones along low blockwork wall (/C0704C06)*



*Repairs to steps in fair condition (/C0704C06)*



*Grouted rock revetment in fair condition (/C0704C06)*



*Grouted rock revetment in fair condition (/C0704C06)*



*Exposed crest of grouted rock revetment (/C0704C06)*



*Undercutting of rock revetment apron (/C0704C06)*



*Works ongoing at Skelton Beck, looking upstream from the Saltburn Road bridge.*



*Silt curtain installed at Skelton Beck.*

To the east of Skelton Beck, the frontage is undefended past the boat/car park. Further erosion/lowering of the cobble beach was evident at the eastern extent. Vegetation had begun to establish toward the crest of the shingle although local erosion was apparent, potentially as a result of members of public accessing the beach from the car park. Possibly a general lowering of beach levels on the east bank of Skelton Beck indicated by the exposure of the crest of the grouted rock revetment (although no significant change from 2014).



*Vegetation establishment fronting car park (/C0704C02)*



*Exposure of corner of car park (/C0704C02)*

To the south of the boat park is a set back wall protected by a high cobble beach. The wall remains in a good condition, and shows signs of recent repairs and paintwork. There remain some local defects such as minor cracking and loss of render as noted in 2018. The recently refurbished concrete slipway remains in good condition, however flexible joint sealant was observed to be loose and missing locally, particularly at the seaward end between deck slab and eastern facing side slope. The vertical face of the slipway was visible on the western side of the structure and minor abrasion was evident (the southern face of the structure remains obscured by the high cobble beach).



*View looking west (/C0704C03)*



*Western face of concrete slipway (/C0704C03)*

The most southerly section of coastal defences at Saltburn comprises the masonry and concrete seawalls and concrete aprons protecting the public house and land to the east of the slipway. The condition of the assets remains in poor condition as has done since 2016. The masonry and concrete seawalls show extensive signs of cracking and abrasion, particularly towards the eastern end. It was noted during the 2018 survey that the boundary wall fronting the public house car park has collapsed. This had not been fully repaired in 2020.

The concrete apron/revetment poured to east of the defence is severely undercut with numerous voids forming, and in parts has shown signs of collapse. The masonry walls higher up the slope were also undercut, as noted in 2018.





*Low beach levels exposing undercutting of toe (/C0704C05)*



*Damage to boundary wall fronting Public House (/C0704C05)*



*Undercutting of concrete apron (/C0704C05)*



*Ad hoc repairs to seawall in poor condition (/C0704C05)*



*Undercutting of mass concrete apron (/C0704C05)*



*Undercutting and voiding in mass concrete apron (/C0704C05)*

### 3.5 Cliffs northeast of Saltburn

#### *Coastal Slope Condition Assessment*

Northeast of Saltburn the cliffs have a slope-over-wall form, with a weak till overlying a steep hard rock cliff. The till is subject to periodic mudslides, which result in material falling over and staining the cliffs and deposition of a debris apron along the cliff toe. The debris apron is partly-vegetated, indicating periodic activity in the form of wave erosion and debris falls.

During July and August 2018 several high-profile incidents of cliff activity occurred along the coastline between Saltburn and Scarborough, including the collapse of a section of cliff to the east of Staithes on 8<sup>th</sup> August, where tragically a young child was killed. Since 2018 there have been further incidents of rockfall reported in local media, most recently on the 20<sup>th</sup> July and 8<sup>th</sup> August 2020. The Teesside Gazette reported that on the 20<sup>th</sup> July a large landslide occurred to the east of Saltburn, the incident was initially reported by The Ship Inn with photographs posted to social media. Fortunately, no one was injured. It is suspected that this rockfall occurred in E53/2. A similar rockfall was reported by the Teesside Gazette in August 2018 within this cliff behavioural unit. This unit which has been classified as Partly Active since 2008 and the headscarf can be seen in images below. On the 8<sup>th</sup> August 2020 a smaller rockfall occurred further to the east at Hunt Cliff. It is not known exactly where this rockfall occurred.

Following the 2014 inspection, cliff units E53/5 to E53/1 were classed as Locally Active except E53/2 which remained as Partly Active. The condition in 2020 was similar to as observed in 2018. The more westerly slopes (E53/5 – E53/3) are Locally Active and remain vegetated with some minor slips evident along the head scarp. In several locations, the Cleveland Way path is significantly exposed and at risk of being undercut particularly in the E53/2 locality and as such is observed as remaining Partly Active. Towards Hunt Cliff (E53/1) the cliff becomes steeper and less vegetated and appears to be only Locally Active.



**E53/3 to E53/5** Generally small-scale slumping in the till layer of the cliff northeast of Saltburn (Locally Active in August 2020).



**E53/2** Ongoing headscarf recession with some slumping of the till layer of the cliff northeast of Saltburn (Partly Active)



**E53/5** Outflanking of the concrete wall at the east end of Saltburn (Locally Active).



**E53/5** ongoing erosion of the toe directly east of Saltburn (Locally Active).



Image of rockfall at E53/2 occurring on 20/07/20 taken from Teesside Gazette website.



Image of rockfall at Huntcliff occurring on 08/08/20 taken from Teesside Gazette website.



**E53/2** (right) Partly Active in 2020 due to ongoing frequent headscarp recession and erosion of material at tow. **E53/1** (left) Locally Active in 2020 due to a more stable headscarp and upper slope.



**E53/3** (foreground) Locally Active in 2020 **E53/2** is obscured by minor headland and **E53/1** (visible in background) Locally Active in 2020.

### *Coast Protection Asset Condition Assessment*

There are no coastal assets within this area.

### **3.6 Hunt Cliff and Warsett Hill**

#### *Coastal Slope Condition Assessment*

The cliffs are characterised a slope-over-wall form, comprising vertical rock cliffs capped by weaker till. There is evidence of localised and recent rock fall activity in the cliff and mud sliding. These high, steep cliffs were all classed as Partly Active during the 2020 walkover survey, apart from E54/4 and E54/1 which were observed to be Locally Active.

During the 2020 inspection it was noted that the Cleveland Way path continues to be at significant risk of being undercut, particularly at the apex of the corner on the railway line. There are recent rockfalls and the fencing in parts is at risk of collapse due to the retreat of the escarpment.



**E54/4** looking northwest along Hunt Cliff showing active cliff face and debris apron (Partly Active)



**E54/3a** proximity of footpath and railway line to actively eroding cliff top (Partly Active)

### *Coast Protection Asset Condition Assessment*

There are no coastal assets within this area.

### 3.7 Cattersty Cliff and Skinningrove

#### *Coastal Slope Condition Assessment*

The cliffs in this area reduce in height towards Skinningrove and are generally less active than those around Warsett Hill. They have a characteristic slope-over-wall form, comprising a thin layer of till overlying the hard rock cliff.

**E54/1** is characterised by a vegetated layer of till, which sits above the Lower Jurassic bedrock. Lower down the cliff, the cliff face is largely obscured by periodically active debris lobes that are undergoing marine erosion at the toe. This unit was observed to remain as Locally Active in 2020.

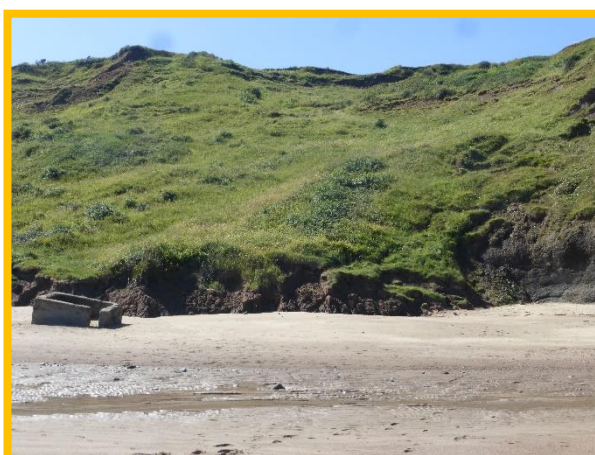
Units **E55/3**, **E55/2** and **E55/1** have a small, steep debris apron that is sparsely vegetated. The debris apron shows evidence of recent activity and is subject to ongoing toe erosion. The till in the upper cliff is subject to localised mudslide development and headscarp recession. These units were classed as Partly Active in 2018 and retain that status in 2020, despite showing some general signs of increased stability



**E55/2** Vegetated layer of till, which sits above the Lower Jurassic bedrock. Partly Active. ]



**E55/3** (left) Partly Active in 2020 and **E54/1** (right) Locally Active in 2020.



Evidence of past mudslides along the toe of **E55/1**.



**E56/2a and 56/2b** Cliffs above Cattersty Sands, looking towards Skinningrove (Locally Active)

Unit **E56/2a and 56/2b** are above Cattersty Sands (immediately west of the jetty). The cliffs here have a shallower gradient with extensive vegetation cover. They are also provided protection at their base by a set of embryo dunes. The development of these dunes and lack of erosional activity within this unit is due to the protection afforded by the adjacent jetty. The overall unit remains classed as

Locally Active, it could be argued that the more southerly of the two sections (**E56/2a**) be downgraded to Inactive, due to the low level of activity observed. However, the locally active status is retained due to the low possibility of activity along the headscarp.

Unit **E56/1** is located to the east of the jetty and adjacent to the mouth of the beck. The slopes within this unit are well-vegetated. There is no evidence of recent sliding activity and since modification of the rock revetment, the unit has been downgraded to inactive at the present time.

#### *Coast Protection Asset Condition Assessment*

Although Skinninggrove Jetty (Asset Ref No. 1221D901D0201C02) is redundant for its original purpose, the export of pig iron, and until recently has been in a failing state, the massive structure provides some coastal stabilisation, fixing the orientation of the adjacent bay to the east and giving some protection to Skinninggrove village to the south east. It also helps hold the beach in front of the undefended cliffs to the west.

Refurbishments works were undertaken in 2015 to repair a failed section of crest wall and damaged jetty decking, whilst placing additional rock armour protection on the collapsing seaward side. These works improved the condition of the jetty from poor to good. A number of small defects remain however, including corroded steel sheet piling, cracked and abraded concrete and some of the new works have poorly inserted sealant in construction joints and exposed reinforcement bars, which could lead to future maintenance problems.

The condition of the asset has not changed since 2016, other than staining of the seaward face of the repaired wall due to corrosion of reinforcement as highlighted in the 2016 and 2018 reports.



View of crest from access gate showing missing section of crest wall and damaged deck in 2014 (Asset Ref No. 1221D901D0201C02)



Voiding and collapse of west side of jetty structure in 2014 (Asset Ref No. 1221D901D0201C02)



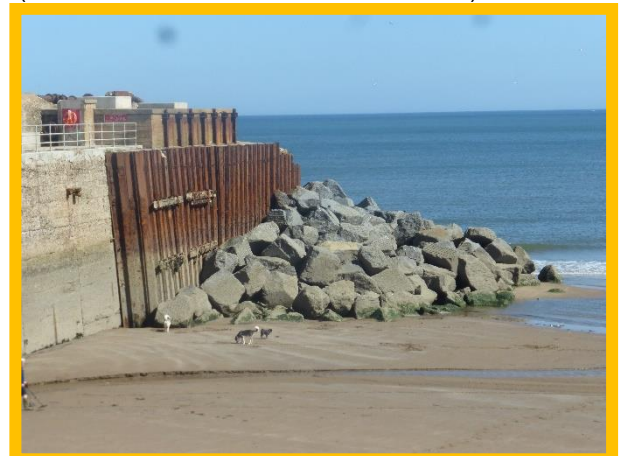
Repaired and improved structure in 2018  
(Asset Ref No. 1221D901D0201C02)



Repaired and improved rock armour  
(Asset Ref No. 1221D901D0201C02)



Seaward face of repair.  
(Asset Ref No. 1221D901D0201C02)



Heavily corroded sheet piles and rock armour  
around nose of original jetty structure.



Void visible halfway along inner face of  
breakwater.  
(Asset Ref No. 1221D901D0201C02)



Void visible at root of breakwater.  
(Asset Ref No. 1221D901D0201C02)

The nose of the original structure remains in poor condition with heavily corroded sheet piles visible on the landward face, and some rock armour placed around the seaward face. The poor condition does not seem to affect the structures performance however and it only recommended that ongoing monitoring of this is undertaken.

The inner face of the breakwater is in poor condition with two voids visible, one approximately halfway along the breakwater and the other at the landward root of the breakwater. Although the voids did not appear to be particularly deep, they are potentially causing for concern and should be monitored over the coming winter.

During the 2018 walkover survey it was noted that lighting had been provided along the jetty and revetment leading to the village of Skinningrove which provided an obvious health and safety benefit. During the 2020 inspection the conduits which house the power cables for these lights was found to be detached from the wall in 2 places and completely severed in another place. It is assumed that the lighting is no longer functional and as such presents a health and safety risk.



Damaged lighting conduit at head of breakwater. Severed conduit on breakwater.

The rock armour defence between Cattersty Jetty and Skinningrove village, (Asset Ref No 1221D901D0202C01) was re-profiled as part of the recent Skinningrove coastal defence works, with an extension of the armour around the inner face of the jetty. This appears to offer good protection against overtopping as there was no evidence of slippage in the backing slopes. The crest of the berm has also been surfaced as part of those works.

There is an ongoing loss of surface material from the path, particularly at the southern end of the revetment. This is likely caused by surface water runoff from the slope behind the path. It is recommended that footpath levels are monitored, particularly following heavy rainfall as they may present a health and safety risk if they increase significantly in size and depth.





General view of modified revetment and surfaced path looking from Jetty towards village in 2020  
(Asset Ref No. 1221D901D0202C01)



Evidence of washout of surfaced path.  
(Asset Ref No. 1221D901D0202C01)



Modified rock revetment protecting inner face of jetty (Asset Ref No. 1221D901D0202C01)

The masonry wall behind the rock revetment (asset ID 1221D901D0202C02) remains unchanged from 2018. The masonry wall was severely overtopped prior to the works at the breakwater and along the Beck.



Rock armour revetment fronting properties .  
(Asset Ref No. 1221D901D0202C02)



Blockwork wall at rear of revetment (Asset Ref  
No. 1221D901D0202C02)



Rock armour protection along eastern edge of  
Kilton Beck.  
(Asset Ref No. 1221D901D0202C05)



Rock armour groyne and concrete slipway  
(Asset Ref No. 1221D901D0202C05)

Defences to the east of Kilton Beck were also modified during the 2015 works, with the fishtail groyne being reduced in size and a small detached breakwater being constructed. Future monitoring and inspections should be used to determine the location and scale of beach changes that may result as a consequence of these modifications.



2014

Original defences to the east of Kilton Beck, 2014



2020

Modified defences to the east of Kilton Beck, 2020. **Note:** detached breakwater and repaired navigation light visible on right hand side of image.

### 3.8 Skinningrove to Boulby

#### Coastal Slope Condition Assessment

Many of the cliffs in this area have been subject to alum quarrying of their uppermost sections, resulting in a characteristic excavated upper part and a natural lower part. In some parts, the whole cliff face has been subject to quarrying and the coastline is formed in quarry waste.

Directly to the east of Skinningrove the Cleveland Way path rises sharply towards Hummersea Cliff. The path appears to have been recently repaired and in parts the head scarp of the cliff is encroaching upon the path. Three distinct large rockfalls were observed on the beach at the toe of E57/7. Other sections of the lower cliff face appeared loose and crumbling with some large cracks visible. The headscarp of the unit was found to be encroaching further upon the Cleveland Way in several locations. As such **E57/7** has been downgraded to Totally Active in 2020 due to the extent of activity across the unit **E57/6** is a high rock cliff with a thin cap of till above which is deemed to be Locally Active in 2020.



**E57/7** Slumping and recession along headscarp (Totally Active)



**E57/6** High rock cliff with till cap (Locally Active)



**E57/7** evidence of multiple significant rockfalls (Totally Active)



**E57/7** evidence of multiple significant rockfalls (Totally Active)

To the east of Hummersea Point the cliffs generally become less steep and area known as Hummersea Bank is heavily vegetated. The cliff units **E57/5** through **E57/3** remain locally active. During the 2018 inspection the footpath onto Hummersea Scar was closed, however in 2020 the footpath was noted as being open to the public, albeit overgrown with vegetation indicating only occasional use.



**E57/3** Hummersea Bank



**E57/1 to E57/5** looking across Hummersea Bank.

To the east of Hummersea Bank the cliffs are characterised by an upper till layer with some vegetation cover and localised mud sliding and consequent recession at the headscarp. The lower rocky cliff is free of vegetation and has evidence for on-going erosion. **E57/2** and **E57/1** remain classed as Locally Active, however due to access restrictions and the footpath leading down into The Warren being heavily overgrown it was not possible to observe any potential activity on the lower slopes.

Unit **E58/6** cover a section of cliff known as 'The Warren' and represents a change in behaviour between the naturally formed cliffs to the west and the cliffs formed, at least in part, by quarrying and tipping of waste. This unit is classified as Locally Active in 2020, unchanged since 2012.

To the east of The Warren, the cliffs rise to become some of the highest in Britain. Here the cliff form owes its character to the large abandoned alum quarries which were operational in this area during the 19<sup>th</sup> Century. Units **E58/5 to E58/2** each has an upper and lower unit. The upper parts of the quarry units are backed by steep sandstone cliffs and feature heavily vegetated, undulating terrain,

possibly the product of past rockfalls as a result it is classified as Locally Active in 2020, unchanged since 2012. The lower part of the cliff is exposed to marine attack, is steep and comprises exposed shales that are heavily weathered and prone to ongoing and intense erosion. Consequently, these lower units all remain classified as Partly Active in 2020, unchanged since 2012. Below Rockhole Hill there is a unit (**E58/1c**) classified as Partly Active, **E58/1a** and **E58/1b** remain classified as Partly Active.

It is worth noting that observations of activity along **E58** were generally made from afar due to the limited access and exposure within the abandoned quarries along Rock Cliff.



**E58/5** Upper looking towards Rock Cliff. Locally Active upper sections and Partly Active lower sections.



**E58/3 – E58/4** Upper looking across Rock Cliff and the Loftus Alum Quarries. Locally Active upper sections and Partly Active lower sections.



**E58/2** Upper showing signs of ongoing headscarp recession.



**E58/5** Upper further signs of headscarp recession presenting an imminent risk to footpath stability.

*Coast Protection Asset Condition Assessment*

There are no coastal protection assets within this area.

### 3.9 Boulby to Cowbar Nab

#### *Coastal Slope Condition Assessment*

In the coastal section between Boulby and Cowbar Nab the cliffs are much lower than those adjacent to the west. The majority of CBUs within this area are classified as Partly Active. They are characterised by a soft upper till unit which supports a variable vegetation cover and is subject to landsliding and consequent headscarp recession. Lower down the cliff the harder rock unit is largely bare except where covered by debris cones, reflecting localised rockfall activity.



**E58/1 to E59/8** Soft, slumping, upper till resting upon harder rock (Partly Active). E59/9 (Locally Active) fronts the properties.



**E59/5 to E59/4** Soft upper till resting upon harder rock subject to rock fall (Partly Active)



**E58/1a** headscarp recession encroaching on footpath.



**E58/1a** headscarp recession encroaching on footpath.

An area of particular and long-standing concern along this stretch is adjacent to Cowbar Lane. Here units **E59/5** to **E59/1** are all classified as Partly Active in 2020, unchanged from 2012. They are characterised by an upper till unit which is undergoing severe erosion and there is evidence of recent rockfall from the lower part of the cliff. This is resulting in the loss of the now abandoned parts of Cowbar Lane. Rock armour is also locally present along the toe of unit **E60/1b**, which is acting to locally protect the base of the cliffs, but is not able to prevent failures in the till materials above. However, a fresh rockfall occurred in 2016 immediately adjacent to the rock armour, leading to further slippage in the till cliffs above and closure by The National Trust of public access to Cowbar Nab. In 2020, it was noted that the nearly the abandoned section of Cowbar Lane is now affected along almost its entire seaward facing side.



**E59/3 and E59/4** Loss of road due to ongoing erosion at Cowbar Lane



**E59/3 and E59/4** Loss of road due to ongoing erosion at Cowbar Lane



**E59/4** Ongoing erosion of soft till layer leading to collapse of road (Totally Active).



**E59/3** Ongoing erosion of soft till layer leading to collapse of road (Totally Active).

In 2016 and 2018 access onto Cowbar Nab was suspended via means of Heras fencing and temporary barriers. During the 2020 walkover survey it was noted that access onto Cowbar Nab was possible, as the temporary access restrictions now having been removed. The stile and gateway were in poor condition and the footpath on Cowbar Nab was overgrown and difficult to follow. It is not known if the closure of Cowbar Nab has been lifted formally. If this is the case, then footpath maintenance is required to ensure that members of the public are able to follow a safe path around the Nab. If a safe route around Cowbar Nab cannot be maintained it is recommended that access is once again restricted in a more formal manner. Although the level of activity appears to have stalled in recent years Cowbar Nab (**E60/1b**) is still a highly active cliff complex and presents a significant risk to members of the public who may access the cliff top, and also those accessing the rocky foreshore below around the low tide.



**E60/1** Closure of access to Cowbar Nab in 2016, in 2018 the access appeared in very similar state with the same Heras fencing and plastic barriers still in use.



**E60/1** In 2020 the access is now no longer marked as closed although the path onto the Nab is overgrown.

*Coast Protection Asset Condition Assessment*

Although the NFCDD records show no specific coastal defence assets within this area there are two sections of rock armour that give some protection to the cliff toe adjacent to local 'pinch points' next to the cottages on Cowbar Lane, constructed as part of the 2002 scheme at Staithes harbour. The rock armour was in fair condition, similar to that observed in 2012, and appears to comprise a mixture of imported granite and smaller locally sourced rock. The crest level is relatively low, and the length of cliff protected short, so appears to be designed as an adaptive measure to slow the rate of erosion locally. In addition, netting has been used to help stabilise the till slopes in local sections along Cowbar Lane.



**E59/1** Rock armour located at toe of cliff to the west of Cowbar Cottages



**E60/1b** Rock armour located at toe of cliff to the north of Cowbar Cottages



## 4. Comparison with Previous Assessment

The previous formal assessment across the whole study frontage was undertaken in summer 2018.

Between 2014 and 2016, Skinningrove in particular benefited from a capital investment in repairs and improved defences. The repairs and improved defences appear to be in good condition to the present date and are having a positive impact on beach conditions and use of the shoreline features such as the surfaced path between Cattersty Jetty and Skinningrove itself.

Elsewhere, the two years since the previous inspection have seen little change to the defended and undefended assets. High beach levels along much of the Redcar and Saltburn frontage meant that previously reported defects were not visible in places. Of the remaining areas, the most major changes since 2018 exist along undefended cliffs, especially along Cowbar Lane where the rapid erosion of the upper cliff continues. Generally, however, the cliff behaviour categories remain largely unaltered from the 2018 inspections, except for a few areas where the classification has been downgraded.

There are several built assets which retain a poor condition grading, most notably the South Gare Breakwater the condition of which has continued to deteriorate.

## 5. Problems Encountered and Uncertainty in Analysis

During the 2020 inspections very few issues were encountered across the frontage. Access issues posed the largest risk; however, most assets are located within public spaces and therefore were freely accessible.

All assets were inspected at an appropriate stage in the tidal cycle and due care was taken when accessing the more remote assets. Beach levels were generally higher throughout the 2020 inspections meaning that undercutting and voiding visible in the 2018 inspection was generally not visible.

The South Gare Breakwater was not accessible to members of the public and therefore inspection of this structure was limited.

Views of the lower part of the cliffs were sometimes limited, especially between units **E58/5** to **E58/1c** due to the steep, complex terrain of the former quarries. At locations where observations were difficult, judgements about cliff behaviour activity status were made based on the visible cliff sections and informed by previous assessments and additional data derived from aerial survey data collected as part of Cell 1 Regional Coastal Monitoring programme.

## 6. Conclusions and Recommended Actions

Further to the visual inspection of all assets, specific conclusions and recommendations for individual assets are given in **Appendix C**. The main urgent recommendations are:

- South Gare Breakwater – Survey required to ascertain nature and extent of defects. Repairs are required to maintain the integrity of the structure. Potential health and safety issues due to the ease of access to the seaward elements of the structure.
- Potential health and safety issues were presented by the damaged security grille at the culvert outfall to the north-western extent of the promenade at Saltburn. Despite having been reattached following the 2016 inspection the damage may allow public access into the confined space.

- The collapsed masonry wall fronting The Ship Inn should be repaired to prevent damage to the premises and vehicles using the car park.
- The damaged lighting conduit on Skinningrove Pier should be repaired to prevent damage to the structure and restore an effective lighting system to the pier reducing health and safety risk to the public.

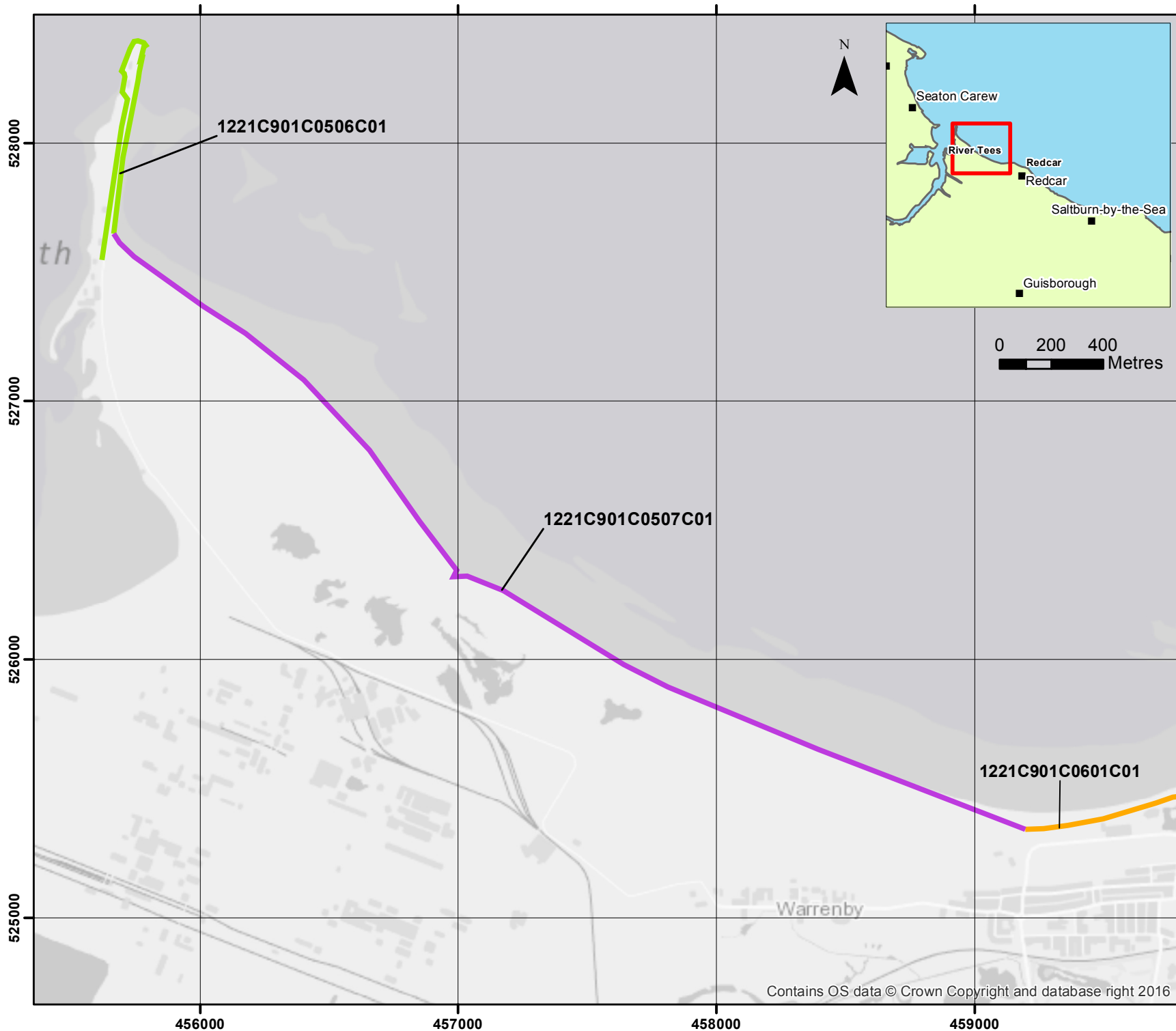
In addition, the cliffs have been characterised according to their present activity status and details are given in **Appendix D**.

All condition assessment data and selected photographs have been uploaded to SANDS (Shoreline And Nearshore Database System).

# Appendices

# **Appendix A**

## **Asset Location Maps**



**Legend**

- Asset location
- NFCDD Asset Number

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 1**  
**Redcar & Cleveland Borough Council Frontage**  
 Asset Inspection Report

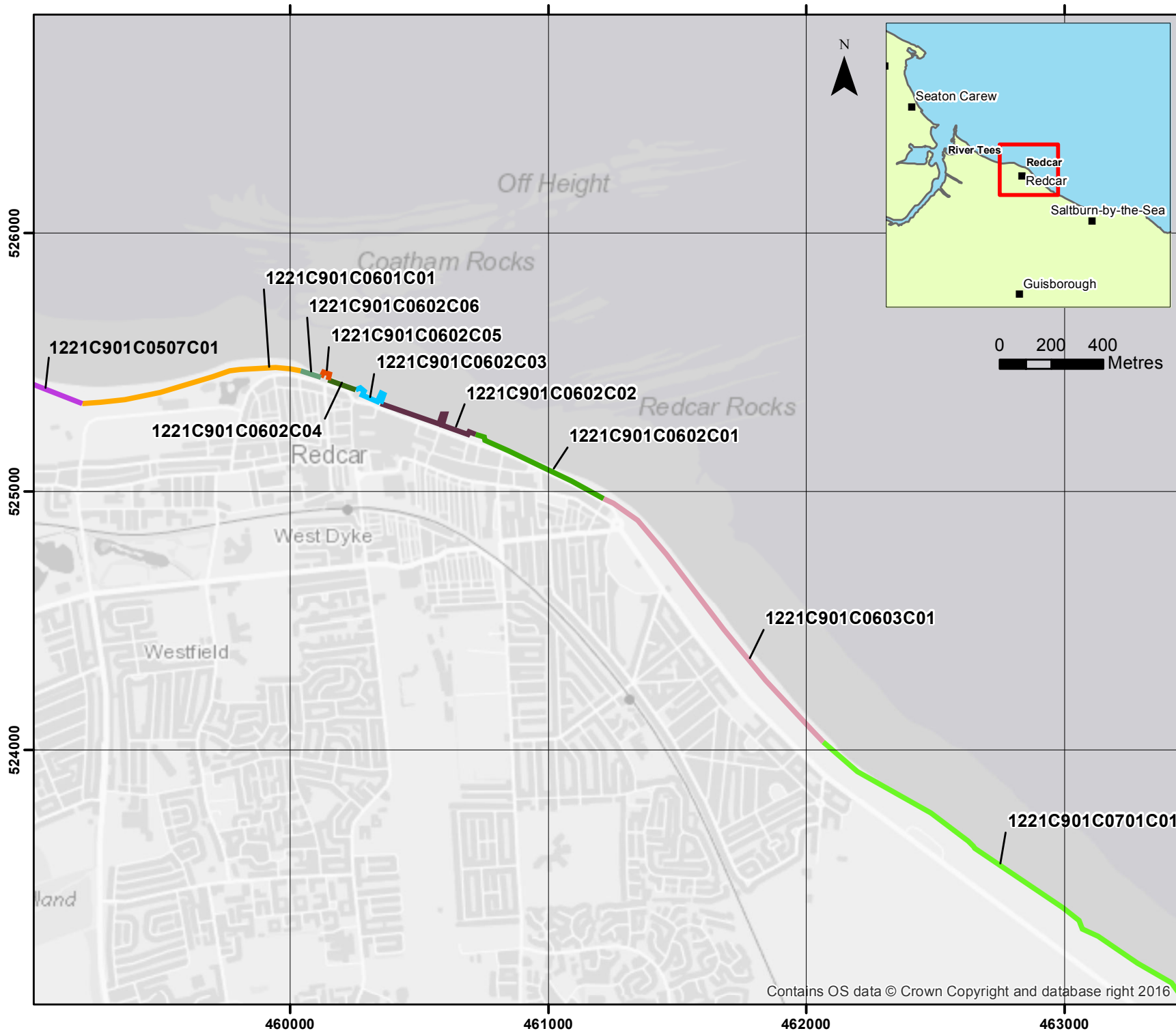
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**WATER**  
 Royal HaskoningDHV  
 Marlborough House  
 Marlborough Crescent  
 Newcastle upon Tyne  
 NE1 4EE

Tel: +44 (0)191 211 1300  
 Fax: +44 (0)191 211 1313  
 www.royalhaskoning.com



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**Legend**

- Asset location
- NFCDD Asset Number

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 2**

**Redcar & Cleveland Borough Council Frontage**  
 Asset Inspection Report

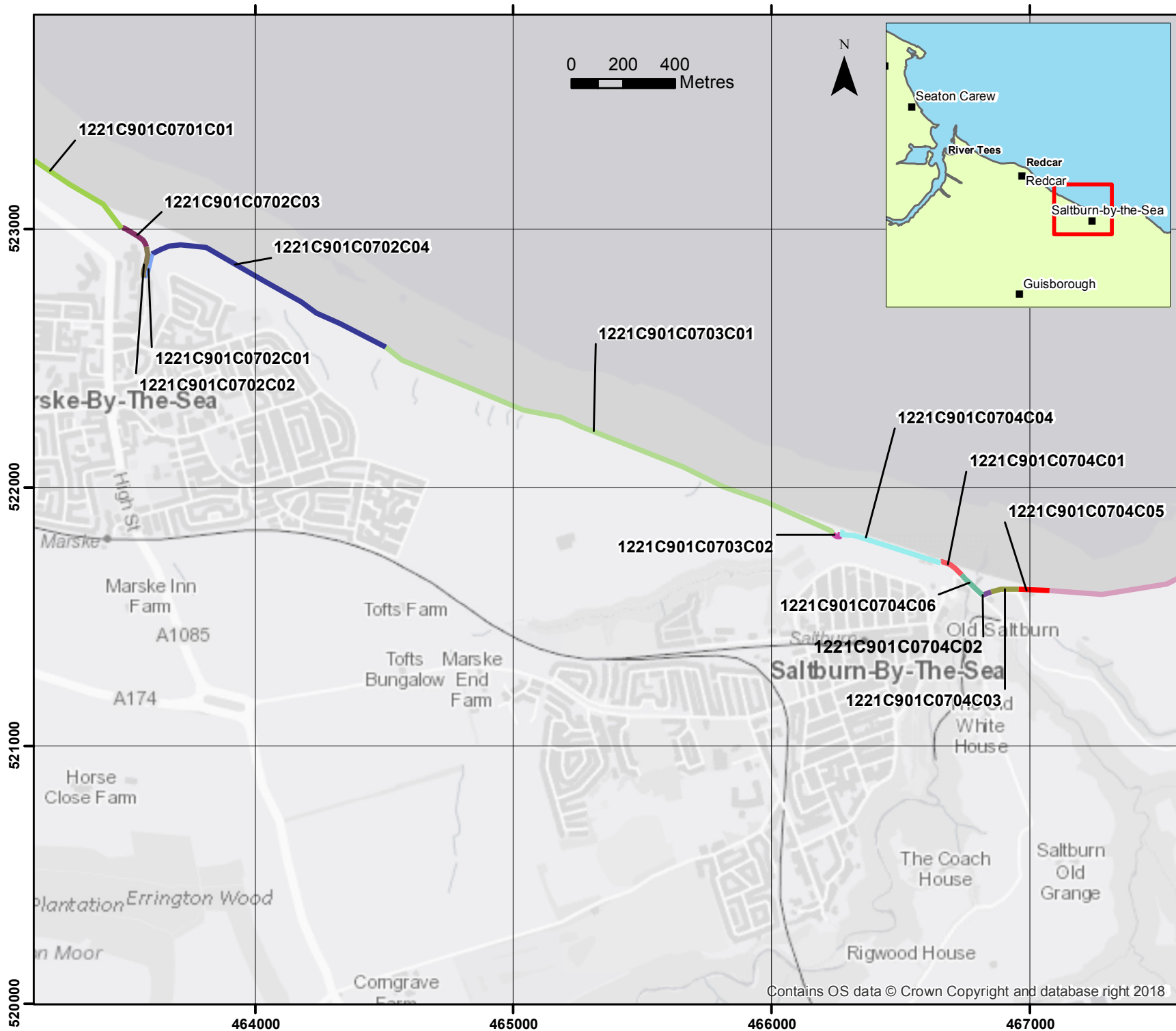
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**Legend**

- Asset location
- NFCDD Asset Number

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 3**  
**Redcar & Cleveland Borough Council Frontage**  
 Asset Inspection Report

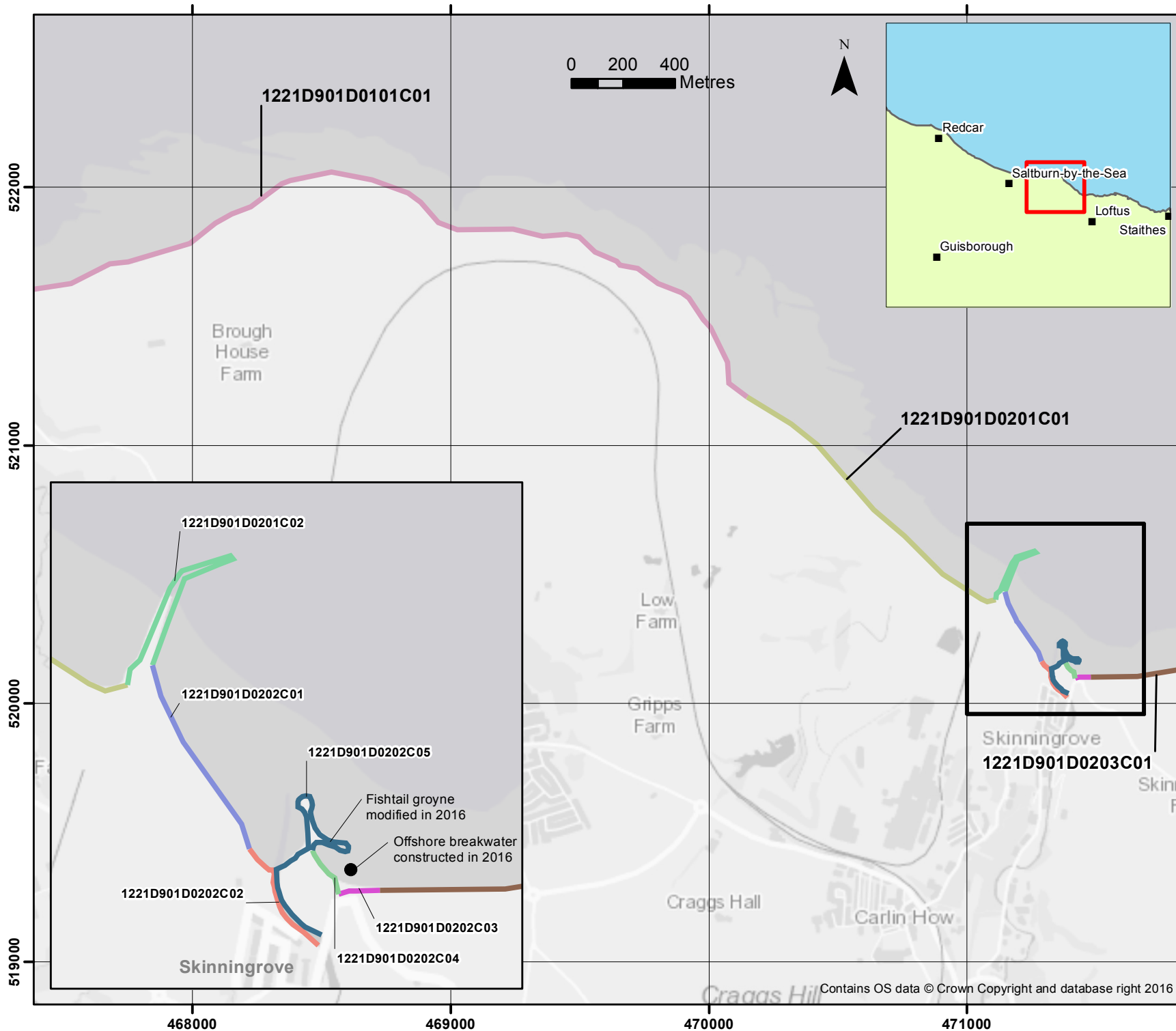
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**WATER**  
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**Legend**

- Asset location
- NFCDD Asset Number

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 4**  
**Redcar & Cleveland Borough Council Frontage**  
 Asset Inspection Report

Drawing Scale at A4 1:20,000

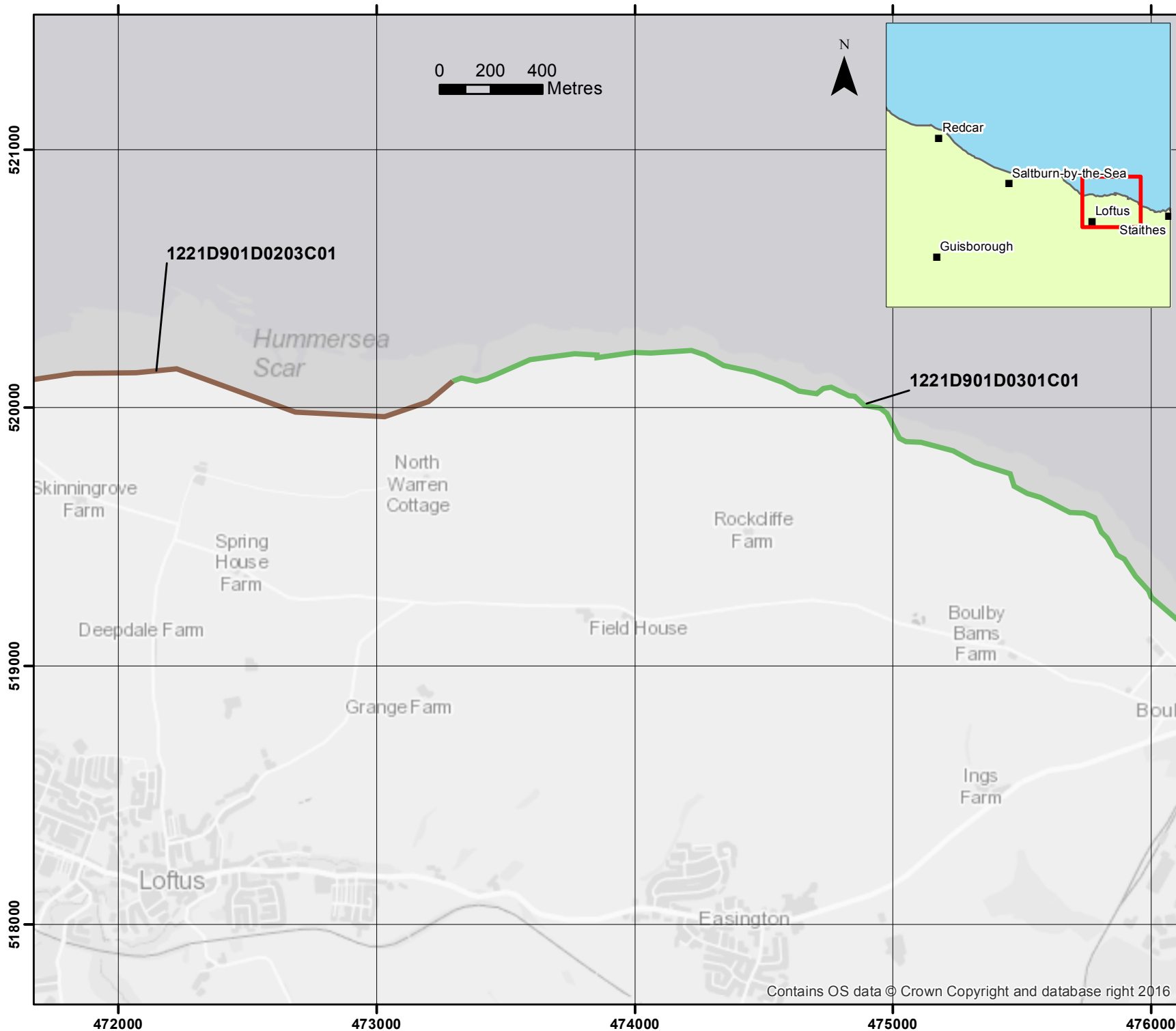
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**Legend**  
 — Asset location  
 — NFCDD Asset Number

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

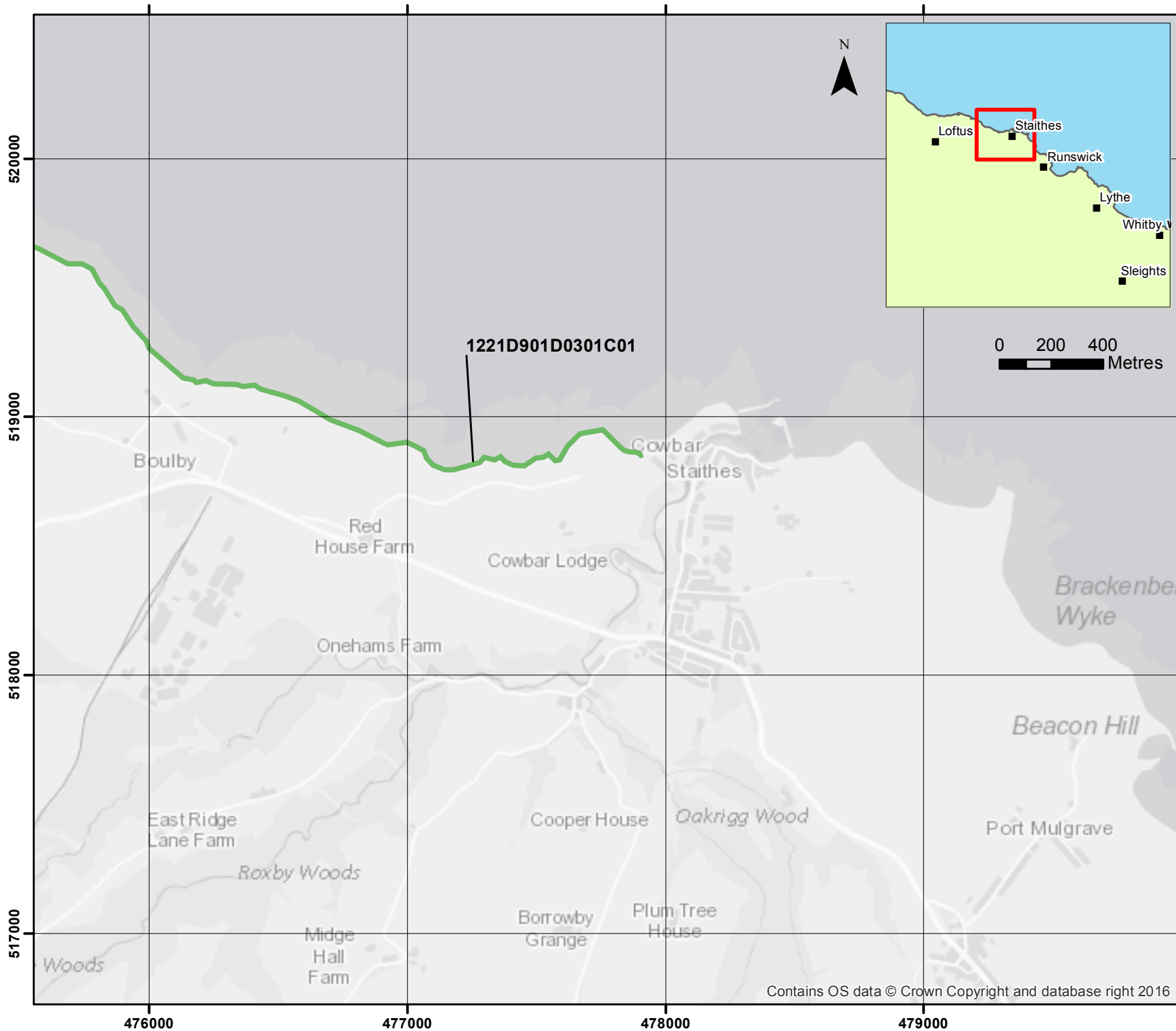
**Figure 1 - Map 5**  
**Redcar & Cleveland Borough Council Frontage**  
 Asset Inspection Report

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**Legend**

 Asset location

 NFCDD Asset Number

Note: The area of Cowbar is covered by Cliff Behaviour Units

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 6**

**Redcar & Cleveland Borough Council Frontage**

Asset Inspection Report

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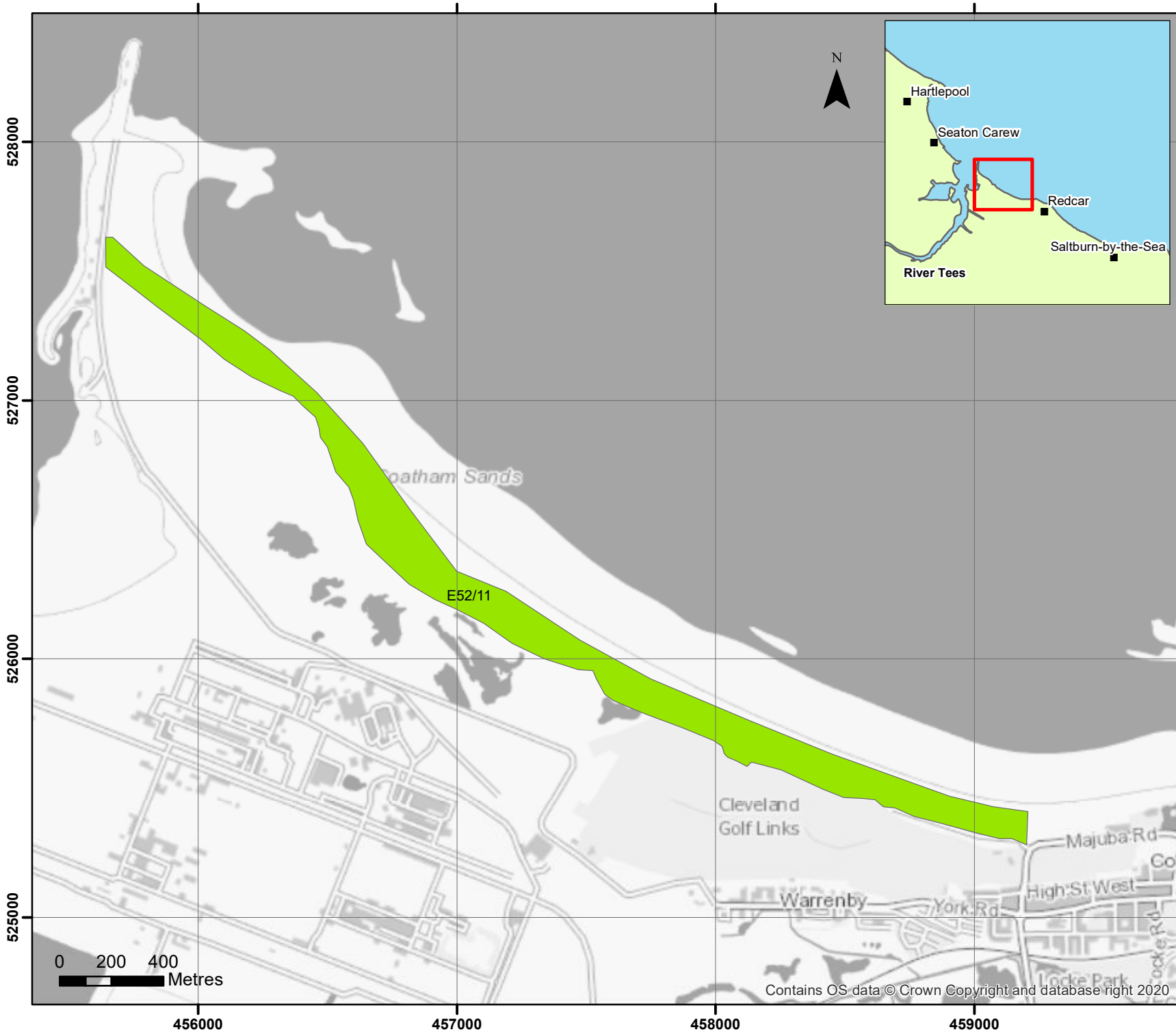
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# **Appendix B**

## **Cliff Behaviour Units**



**Legend**

**Cliff Activity Status 2020**

- Dormant
- Inactive
- Locally Active
- Partly Active
- Totally Active

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2- Map 1**

**Redcar & Cleveland Borough Council Frontage**

**Coastal Slope Condition 2020**

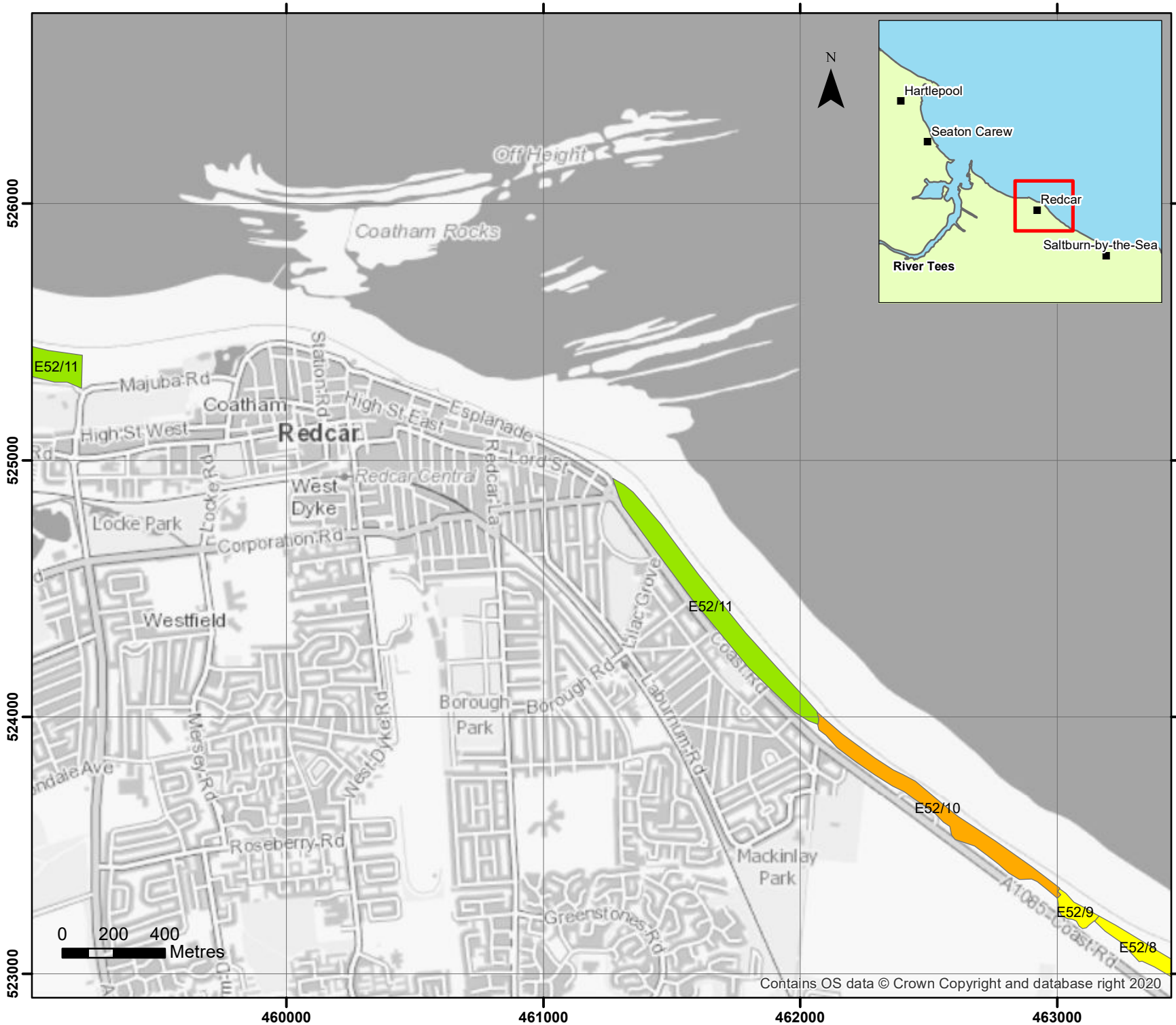
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**Legend**

**Cliff Activity Status 2020**

- Dormant
- Inactive
- Locally Active
- Partly Active
- Totally Active

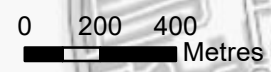
Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2- Map 2**  
**Redcar & Cleveland Borough Council Frontage**  
 Coastal Slope Condition 2020

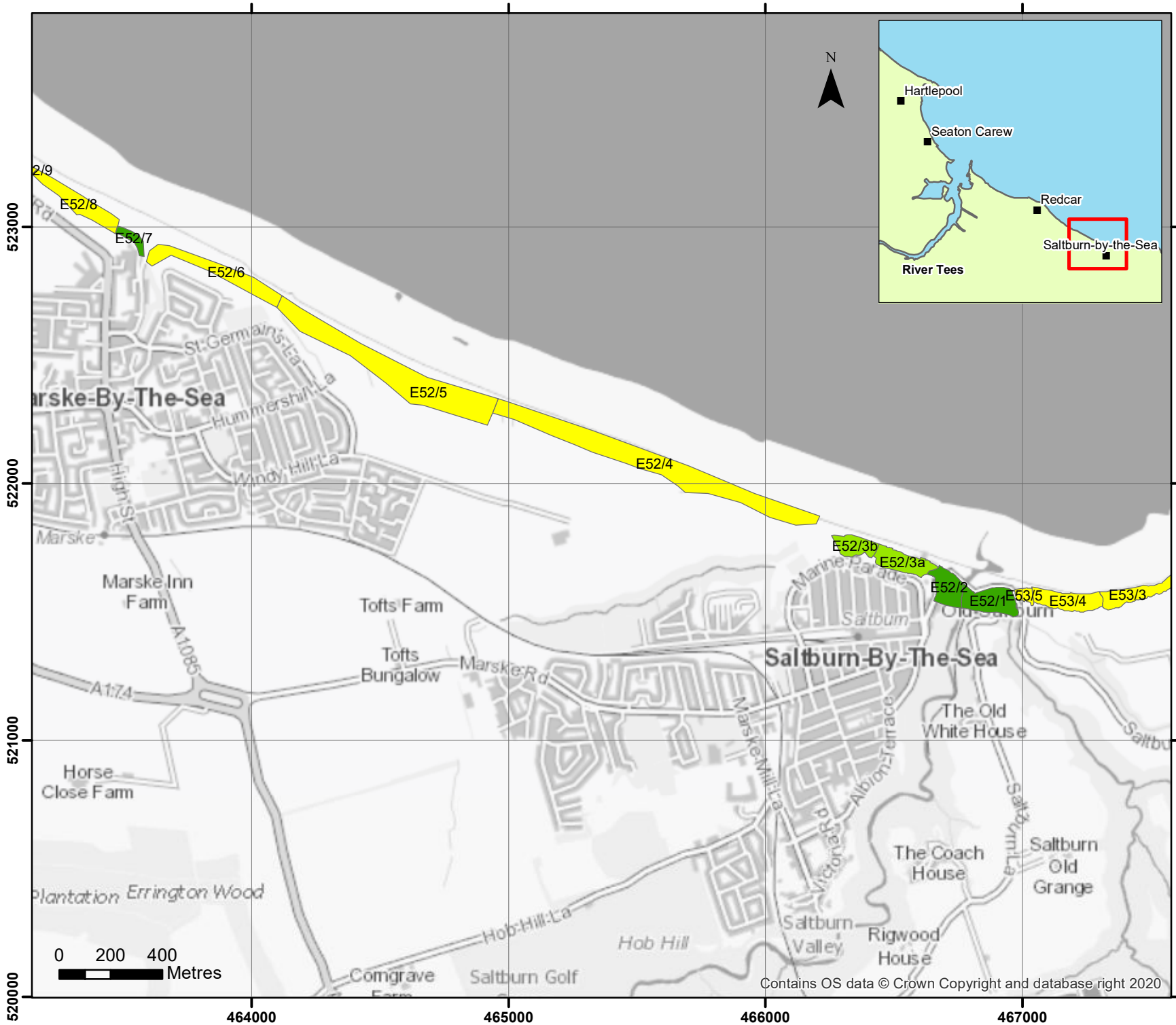
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**Legend**

**Cliff Activity Status 2020**

- Dormant
- Inactive
- Locally Active
- Partly Active
- Totally Active

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2- Map 3**

**Redcar & Cleveland Borough Council Frontage**

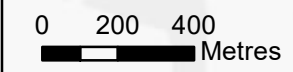
Coastal Slope Condition 2020

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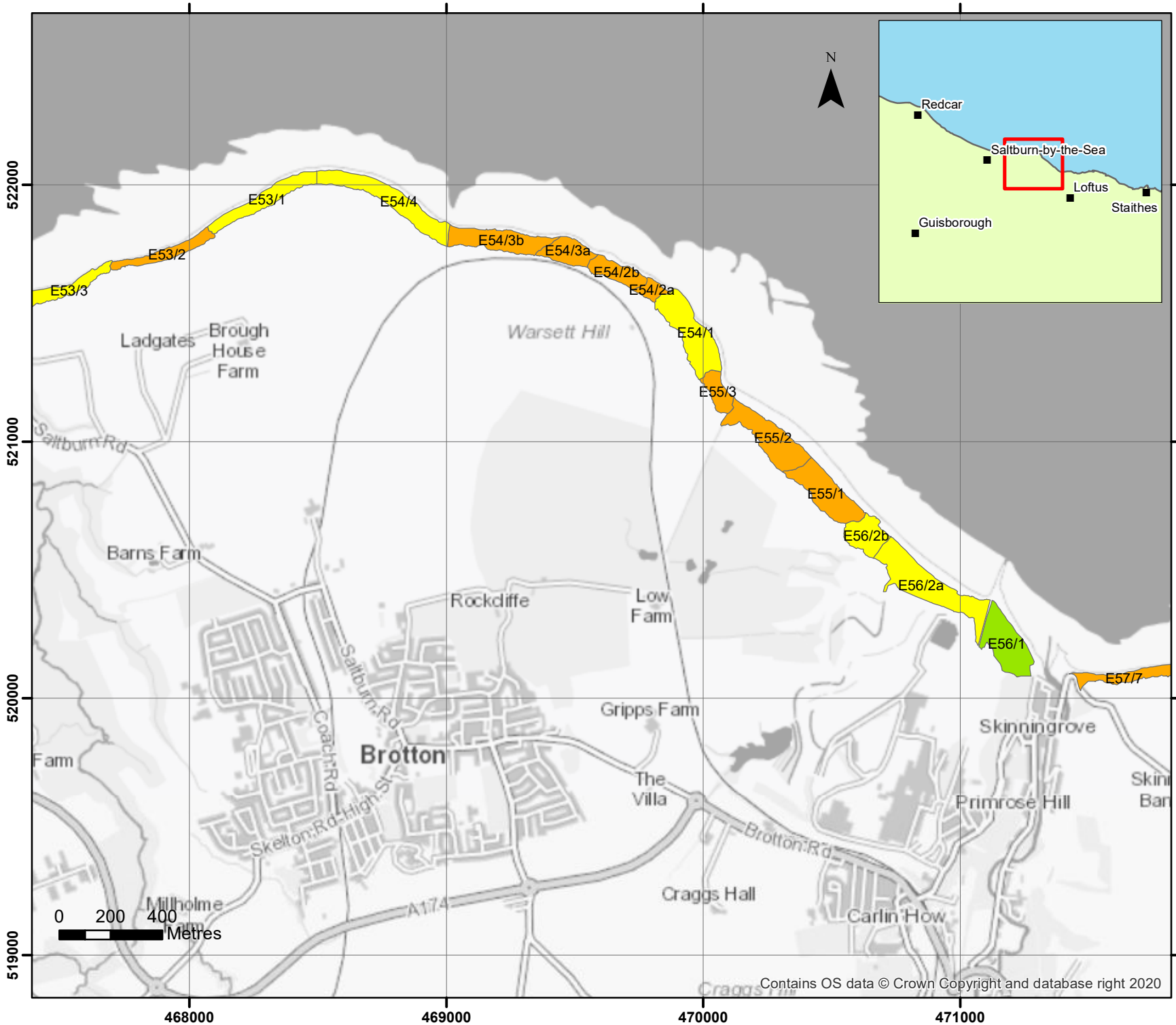
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**Legend**

**Cliff Activity Status 2020**

- Dormant
- Inactive
- Locally Active
- Partly Active
- Totally Active

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2- Map 4**

**Redcar & Cleveland Borough Council Frontage**

Coastal Slope Condition 2020

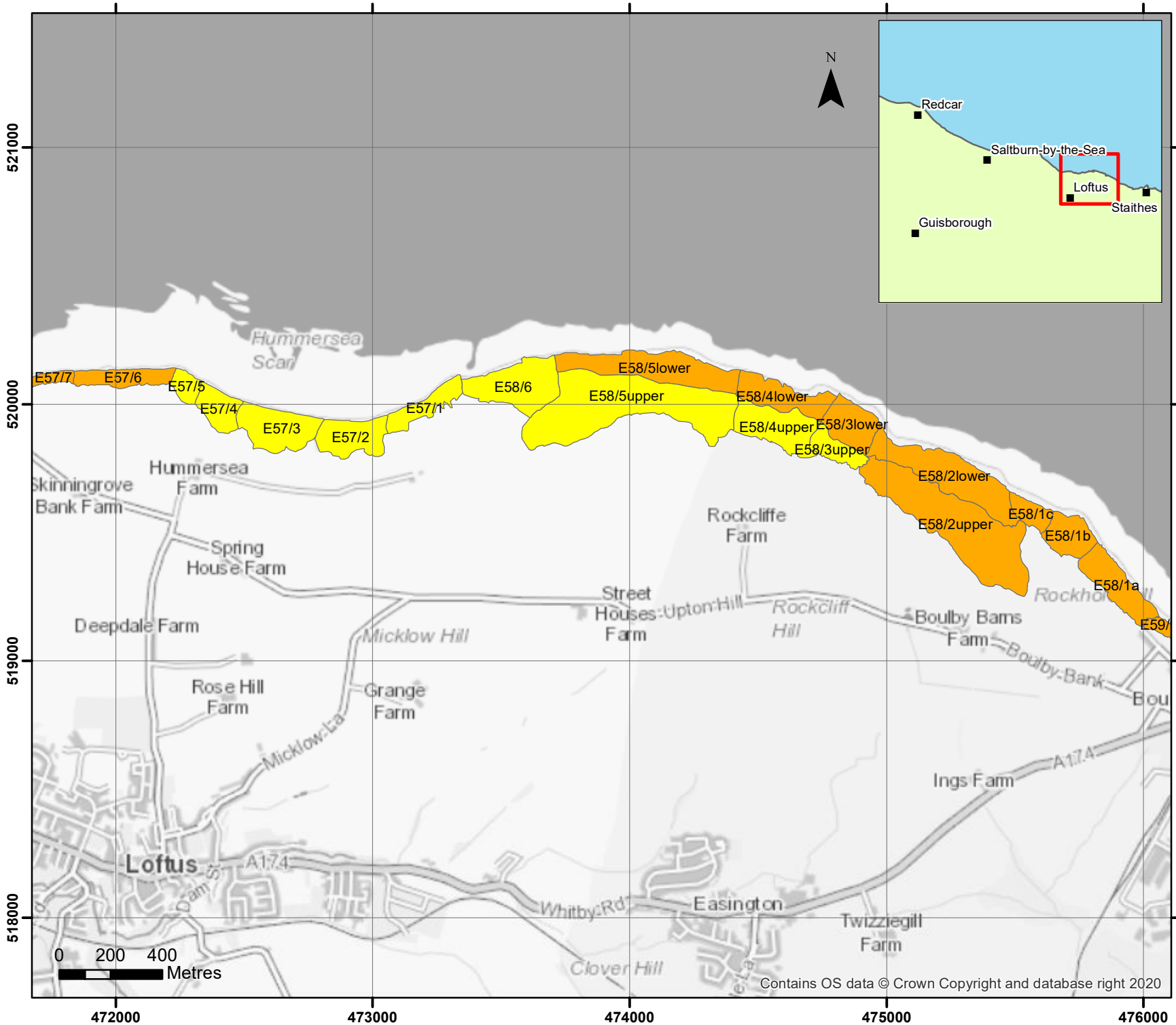
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**Legend**

**Cliff Activity Status 2020**

- Dormant
- Inactive
- Locally Active
- Partly Active
- Totally Active

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2- Map 5**  
**Redcar & Cleveland Borough Council Frontage**  
 Coastal Slope Condition 2020

Drawing Scale at A4 1:20,000

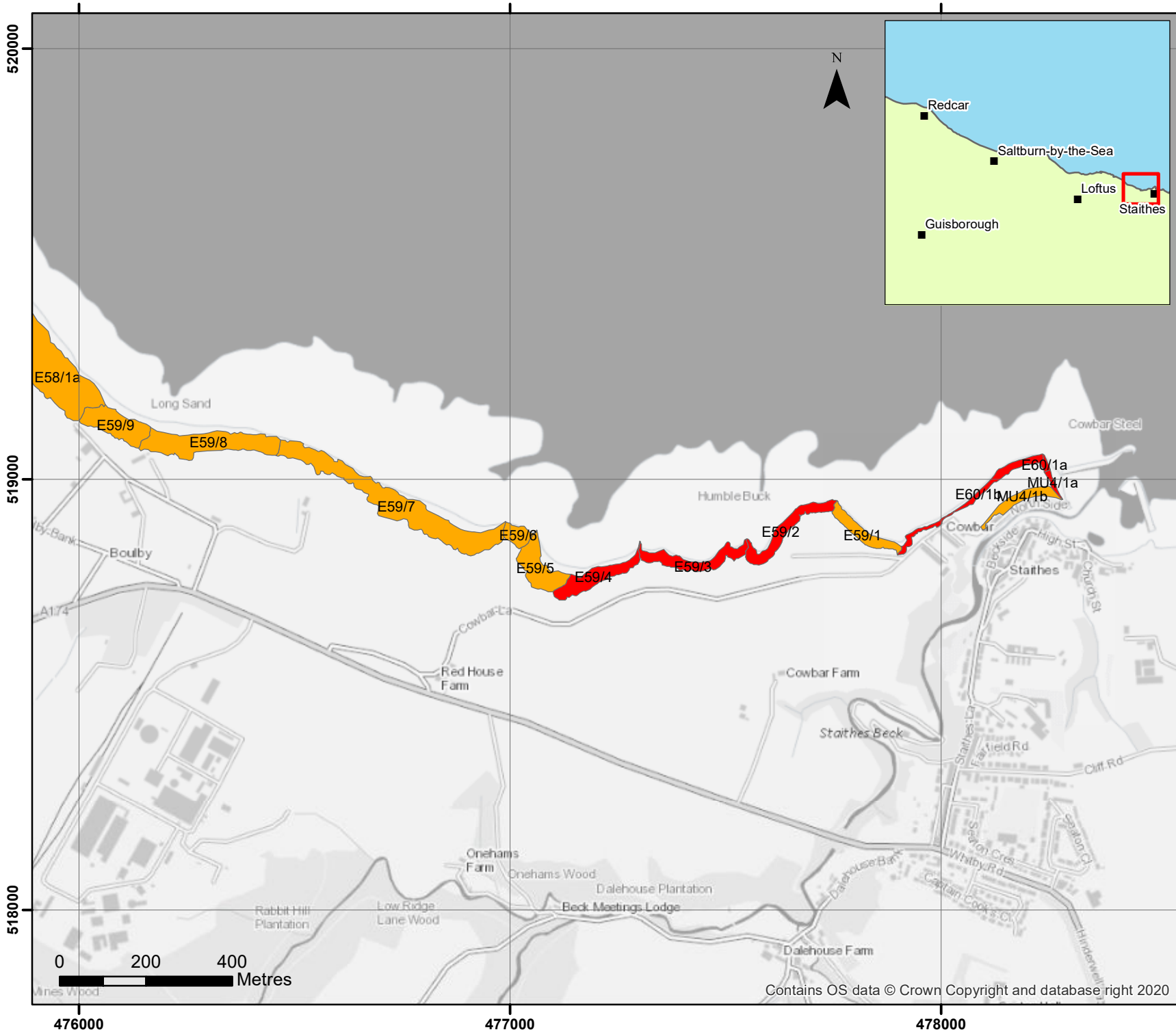
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**Legend**

**Cliff Activity Status 2020**

- Dormant
- Inactive
- Locally Active
- Partly Active
- Totally Active

Client: North East Coastal Group  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2- Map 6**  
**Redcar & Cleveland Borough Council Frontage**  
 Coastal Slope Condition 2020

Drawing Scale at A4 1:12,000

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# **Appendix C**

## **Asset Condition & Recommendations**

Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221C901C0506C01	South Gare Breakwater. Protects Coatham Sands to south and Tees entrance to north.	Breakwater	1672.5	09/10/2020	Royal HaskoningDHV	Generally the structure remains in poor condition with further degradation noted from the 2018 survey. A large recent repair to the deckslab on the south facing wave return platform appeared in good condition however a number of significant defects remain. These include missing, cracked and lifted deckslabs, missing coping stones, extensive cracking and spalling around the structure. Missing blockwork from the wall faces. Exposure of reinforcement steel, missing mortar, open joints, damaged render and void formation particularly on the northern face of the structure. The ongoing failure of the western pier arm structure, damaged and displaced rock armour and Accropode units with a poor interlock were also noted. Several sections of wall on the crest of the breakwater have been repaired and some access points blocked up, likely to attempt to prohibit access.	4	11 - 20	Structural inspection incl, boat/dive survey. Continue to monitor.	routine
1221C901C0507C01	Undefended	Undefended	4330.2	09/10/2020	Royal HaskoningDHV	Good coverage of established vegetation and dunes. Localised erosion due to public access was particularly apparent directly adjacent the South Gare breakwater and fisherman's huts. Continued degradation of the dune crest adjacent to the caravan park. Seaward facing row of caravans now has only 4 occupied pitches. The beach remains wide and healthy.	3	>20	Continue to monitor. Routine inspection & maintenance	routine
1221C901C0601C01	Concrete crest wall above part length of grouted stone revetment.	Revetment	861.5	09/10/2020	Royal HaskoningDHV	Gap in crest wall appears in similar state to 2016 (in 2018 it was not visible due to the presence of a funfair). Wall and grouted stone slope remain in fair condition. Localised areas of missing render visible along full asset length. Previously reported damage to blocks along toe not visible due to high beach levels. Ongoing undercutting and damage to the north end of the asset as previously reported.	3	11 - 20	Local repairs. Infill gap in crest wall.	routine
1221C901C0602C06	Rough concrete revetment over old 1890's slag revetment.	Revetment	82.1	09/10/2020	Royal HaskoningDHV	Stepped precast concrete revetment and precast concrete recurve wave return wall remain in as new condition. Occasional vegetation growth through open joints.	1	>20	Remove any vegetation from open construction joints. Routine inspection and maintenance.	routine

Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221C901C0602C05	Massive concrete wall to rear of cinema. Crest level reduces towards shore.	Wall	68.7	09/10/2020	Royal HaskoningDHV	Cinema building. Fair to poor condition, multiple cracks Cinema building and massive seaward facing rear wall in poor condition. Low beach levels exposed a void under the north eastern corner of the building in 2018. High beach levels in 2020 have partially obscured view of this void. It is suspected that the concrete toe remains significantly undercut as has been noted since 2014.	4	6-10	Continue to monitor. Place rock armour around toe of structure to prevent further undercutting.	no repairs
1221C901C0602C04	Former concrete promenade shelter, now has voids infilled with brick work (internal structure unknown).	Wall	113.9	09/10/2020	Royal HaskoningDHV	Stepped precast concrete revetment and precast concrete recurve wave return wall remain in as new condition. Occasional vegetation growth through open joints.	1	>20	Remove any vegetation from open construction joints. Routine inspection and maintenance.	routine
1221C901C0602C03	Stepped seawall to main sea frontage.	Wall	206.4	09/10/2020	Royal HaskoningDHV	Concrete seawall around Beacon. Missing flexible sealant in places, loose in others. In 2018 horizontal joints and joints in apron had no sealant and filler-board could be seen suggesting never sealant present. In 2020 high beach levels prevented inspection of the concrete apron.	1	>20	Replace/install flexible joint sealant. Routine inspection & maintenance.	routine
1221C901C0602C02	Concrete revetment below concrete seawall.	Revetment	480.7	09/10/2020	Royal HaskoningDHV	Stepped seawall and recurve wave wall, generally in as new condition. Some damage to the in-situ concrete slope around slipway fronting King Street / The Esplanade. Cracking, spalling and staining of the slope was noted, in addition to a 'cluster' of grouted boreholes through the slab. The other slipways, in particular the RNLI slipway, showed signs of localised damage to the deckslabs and low beach levels exposed minor undercutting. No change since 2018.	1	>20	Local repairs to slipway. Routine inspection & maintenance	routine
1221C901C0602C01	Concrete toe to revetment.	Apron	559.2	09/10/2020	Royal HaskoningDHV	Stepped seawall and recurve wave wall - as new condition. Further accretion of material and formation of embryo dunes/ vegetation toward SE end of asset.	1	>20	Routine inspection & maintenance.	routine
1221C901C0603C01	Grouted masonry revetment in front of promenade & The Stray. Concrete splash wall landward of promenade. Accretion of sand & dunes behind.	Splash Wall	1273	09/10/2020	Royal HaskoningDHV	Concrete block revetment tied into concrete promenade. As new condition. Some vegetation growth where sand has accumulated in joints. Timber groynes in good condition – repairs to groynes at landward end in good (as built) condition.	1	11 - 20	Continue to monitor. Routine inspection & maintenance. Local repairs to groynes.	routine

Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221C901C0701C01	Undefended Frontage	Undefended Frontage	1765.3	09/10/2020	Royal HaskoningDHV	Informal access ramp at interface with hard defence and the embankment crest shows ongoing signs of erosion and lowering - caused by public access. Headwall structure in fair condition, flexible tied concrete block mattress in very poor condition, several blocks missing with many misplaced and lifted. Localised scour to embankment across entire frontage. Generally more active in the NW and at 'headland', with more stable slopes in SE.	3	11 - 20	Continue to monitor. Replace or repair flexible tied concrete block mattress to ensure headwall and surrounding bank remain effectively defended.	routine
1221C901C0702C03	Lower masonry wall to path. Upper wall varies (concrete/masonry), coastal slope to rear.	Wall	125.9	09/10/2020	Royal HaskoningDHV	High beach levels. Accretion in front of wall with formation of dunes. Local defects to masonry wall - missing coping stones. Full height vertical cracks in rear concrete wall appear to be stable (noted since 2008).	3	11 - 20	Infill cracks. Replace missing blocks. Continue to monitor wall for movement.	routine
1221C901C0702C02	Masonry revetment to path and coastal slope above masonry wall. Coastal slope with access to properties above.	Revetment	122.2	09/10/2020	Royal HaskoningDHV	Extensive vegetation growth and high beach level largely obscuring blockwork revetment and wall. Visible sections in fair condition.	3	11 - 20	Repoint masonry, clear vegetation. Replace missing blocks.	routine
1221C901C0702C01	Brick wall enclosure of boat park and access. Short length of concrete wall with lower crest level.	Wall	97.2	09/10/2020	Royal HaskoningDHV	Damage to seaward end of masonry wall does not appear to have worsened significantly. Further scour and outflanking to rear. Landward concrete wall in fair condition with vertical cracks locally.	3	11 - 20	Repoint masonry, replace missing masonry/tidy seaward end of wall. Fill cracks.	routine
1221C901C0702C04	Undefended Frontage	Undefended Frontage	1011.6	09/10/2020	Royal HaskoningDHV	Low, accreting dunes fronting mostly vegetated slopes. Local erosion through pedestrian access. At SE extent, timber piles at toe of concrete ramp remain exposed and present a health and safety risk. Ramp is now significantly undercut and as such presents a health and safety hazard to the public and may be at risk of collapse in the near future.	3	11-20	Continue to monitor. Urgent repair to toe of concrete ramp to reduce risk to public. Extend ramp to prevent further undercutting in this location.	Urgent
1221C901C0703C01	Undefended Frontage	Undefended Frontage	1883.2	09/10/2020	Royal HaskoningDHV	Partly active. Erosion of the toe and land sliding is more widespread. NW extent and SE extent are most active (least vegetation). Good vegetation cover elsewhere.	4	>20	Continue to monitor.	routine
1221C901C0703C02	Concrete wall including outfall and two concrete slipways to coastal slope.	Wall	46.8	09/10/2020	Royal HaskoningDHV	Generally fair condition. Minor cracking and spalling remains but appears not to have worsened. Missing coping at top of south access ramp. Security grille open. Security grille securely closed. However, damage to the grille bars reported in 2018 remain.	3	>20	Routine: Infill cracks. Replace missing copes. Urgent: repair security grille to prevent child / animal gaining access.	urgent

Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221C901C0704C04	Masonry wall in good condition, generally high sand with shingle to east end. Concrete splash wall to rear of promenade below coastal slope.	Sea Wall	415	09/10/2020	Royal HaskoningDHV	High cobble beach covering much of wall. Masonry in good condition along with previous repointing/repairs where visible. Slipways at Lifeguard station generally in fair condition. Some damage at lower end of southernmost of the two slipways. Minor mortar loss locally underneath pier structure and no mortar in lower visible section of masonry slipway. Local defects to concrete wall at rear of promenade (cracking and abrasion). Improve/soften interface with undefended	2	>20	Local repairs masonry/concrete walls. consider new rock revetment to east. Repair damage to southern slipway toe.	routine
1221C901C0704C01	661501 Large masonry block revetment protecting carpark, road and coastal slope. Masonry slipway is also present.	Revetment	65.8	09/10/2020	Royal HaskoningDHV	Minor mortar loss locally. High cobble beach levels. Minor local damage to concrete wall at foot of slope. Masonry access ramp at RNLI station open-jointed in lower section (assume covered in beach material when re-pointing undertaken).	2	>20	Local repairs to concrete wall. Local repairs to pedestrian guardrail. Monitor.	routine
1221C901C0704C06	Concrete blockwork seawall protecting pavement, handrail and tarmac road. This section also includes bridging point over river, continuation of sea wall on the southern side.	Sea Wall	147.1	09/10/2020	Royal HaskoningDHV	Towards the north western end of the asset high beach levels protect the toe of wall. Beach levels lower around apex of bend and at south eastern end, particularly to the south east of Skelton Beck. Undercutting of wall visible adjacent crest of rock armour. Generally the wall remains in good to fair condition with minor local abrasion, cracking and vegetation growth throughout. Additionally a localised area of missing coping blocks has exposed the backing footway material, though there does not appear to have been any significant change here since 2016.	3	>20	Replace missing coping blocks. Repoint locally. Monitor beach levels at Skelton. Consider grouting voids beneath wall to the south east of Skelton Beck.	routine
1221C901C0704C02		Carpark.	35.7	09/10/2020	Royal HaskoningDHV	Erosion/ lowering of the beach on the SE flank of watercourse. Further exposure and undercutting of the rear of the rock armour revetment. Low beach levels expose undercutting at the tie in with wall to left of revetment. Local erosion around corners of car park. Vegetation established in front of car park, however accumulated material was 'cliffing' indicating recent erosion.	3	11 - 20	Continue to monitor. Consider reprofiling shingle.	routine

Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221C901C0704C03	661701 White rendered sea wall set back from the beach, cobbles have collected on the seaward side protecting the toe. Boat handling area, carpark and PH located behind. Slipway is also present giving access to the beach.	Wall	106.8	09/10/2020	Royal HaskoningDHV	Wall appears in fair condition and has recently been repainted. Some cracking and loss of render remains. Paving/ promenade remains in good condition. Concrete slipway in good condition, vertical concrete face remains visible on western side. Joint sealant missing towards seaward end of ramp.	2	11 - 20	Replace flexible joint sealant to access ramp. Local repairs to wall.	routine
1221C901C0704C05	661801 Various concrete and masonry walls to private property with various degrees of concrete apron with typical level of 4.7 mODN.	Wall	118.7	09/10/2020	Royal HaskoningDHV	Beach levels fronting the Ship Inn appeared lower than in 2016 and the undercutting / voiding along the toe of the wall was partly visible, as noted in previous reports. The poured concrete apron / revetment at E end is further undercut and extensive voids are visible. There is localised cracking to concrete elements. Concrete blockwork is abraded, and several full height vertical cracks were visible. Masonry wall has in poor condition and partially collapsed. The section of wall still standing has numerous open joints and extensive areas of missing mortar.	4	1 - 5	Repointing ramp, repair masonry wall fronting Ship Inn car park. Monitor undercutting of toe and voiding beneath grout revetment at eastern end.	urgent
1221D901D0101C01	High cliffs are locally active above beach east of Saltburn. Cliffs much more active (partly active) along Hunt Cliff above shore platform, specifically where railway nears cliff edge. Further east, cliffs are less high and locally active.	Un defended high cliffs.	3551.2	20/08/2020	Royal HaskoningDHV	Generally, similar to 2018. High cliffs are locally active, around Hunt Cliff the activity increases, particularly where railway nears cliff edge. The footpath on the seaward side of the railway is now at significant risk of collapse.	3	>20	Continue to monitor. Localised stabilisation works recommended in areas where erosion threatens footpath and railway.	
1221D901D0201C01	Cliffs to NW partly active, slumping of soft upper slopes, erosion of harder lower cliff, some veg. Cliffs to SE support more veg, small dune system at toe, less active (locally active/inactive).	Un defended high cliffs.	1262.3	20/08/2020	Royal HaskoningDHV	Generally similar to 2018. Some evidence of recent mudslips and activity at the toe of cliffs. Mud lomes protruding onto foreshore are being eroded and undercut. Embryo dunes remain visible.	4	>20	Continue to monitor.	

Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221D901D0201C02	Skinningrove Jetty	Breakwater	477	20/08/2020	Royal HaskoningDHV	Repairs to crest wall, jetty deck and rock armour placed along seaward face appear to be working effectively. Some defects visible on original structure (deck slab lifted, poor joint sealant, longitudinal cracks visible in landward face of structure, heavily corroded sheet pile at snout). The new structure is in generally good condition however small defects remain (exposed reinforcement on seaward face). Lighting conduit is severed and severely damaged. Rock armour appears in good condition with generally a good size and interlock. Noted that at the jetty root the rock armour appeared to be of a smaller size and perhaps more vulnerable to movement.	2	>20	Repair remaining defects and continue to monitor the effectiveness of existing repairs particularly rock armour. Urgent repair to lighting conduit on breakwater.	Urgebt
1221D901D0202C01	Rock armour defence from jetty to village protects coastal slope and footpath	Armour	305.1	20/08/2020	Royal HaskoningDHV	Re-profiled rock armour is in good condition. Backing slopes remain stable. Footpath along crest continues to erode. There is evidence of washout from the path surface between the rock armour. Geotextile mattress is visible in parts. This may be due to wave overtopping or more likely, surface water runoff from slope to rear of path (E56/1).	3	>20	Monitor effectiveness of re-profiled rock armour and stability of slope. Consider filling holes in revetment with concrete.	routine
1221D901D0202C02	662103 Masonry wall behind rock revetment, severely overtopped prior to breakwater and beck control works.	Wall	182.4	20/08/2020	Royal HaskoningDHV	Similar to 2018, rock armour in fair to good condition. Relatively good interlock, some gaps in coverage.	3	>20	Continue active monitoring.	routine
1221D901D0202C05	662201 Offshore fishtail breakwater protecting frontage and stabilizing beach levels. Concrete slipway also included in defence providing access for fishermen. Highground is natural main land.	Breakwater	450.4	20/08/2020	Royal HaskoningDHV	Repairs and reprofiling of fishtail breakwater appear in good condition. Beach levels appear similar to 2018.	3	>20	Continue to monitor rock armour and beach levels.	routine
1221D901D0202C04	Beach frontage with shingle, cobbles and boulders giving protection to soil embankment and fishing area. Small detached rock berm constructed in 2016 (using rock armour from former fishtail groyne 1221D901D0202C05)	Beach frontage.	77.2	20/08/2020	Royal HaskoningDHV	Beach level and composition appear similar to 2018. Evidence of accumulation of beach material around recently constructed berm.	2	>20	Continue to monitor.	routine



Asset Name	Description	Type	Length	Inspection Date	Inspector	Comments	Overall Condition	Residual Life	Recommendations	Urgency
1221D901D0202C03	662301 Concrete wall in moderate condition to end of protection offered by breakwater. Protects road.	Wall	60.5	20/08/2020	Royal HaskoningDHV	Fair condition, evidence of undercutting to the southern seaward face of structure.	3	>20	Continue to monitor. Consider placing rock armour around southern face of structure.	routine

# **Appendix D**

## **Cliff Condition Assessments**

UNIT	2008	2010	2012	2013 (post-surge)	2014	2016	2018	2020
E52/1	Locally active	Locally Active	Locally Active	Inactive	Inactive	Inactive	Dormant	Dormant
E52/2	Inactive	Inactive	Inactive	Inactive	Dormant	Dormant	Dormant	Dormant
E52/3a	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
E52/3b	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
E52/4	Not Inspected	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active	Locally Active	Locally Active
E52/5	Not Inspected	Not Inspected	Inactive	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active
E52/6	Not Inspected	Not Inspected	Inactive	Inactive	Inactive	Inactive	Locally Active	Locally Active
E52/7	Not Inspected	Not Inspected	Dormant	Dormant	Dormant	Dormant	Dormant	Dormant
E52/8	Not Inspected	Not Inspected	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active
E52/9	Not Inspected	Not Inspected	Locally Active	Inactive	Inactive	Inactive	Locally Active	Locally Active
E52/10	Not Inspected	Not Inspected	Locally Active	Partly Active	Partly Active	Partly Active	Partly Active	Partly Active
E52/11	Not Inspected	Not Inspected	Inactive	Dormant	Dormant	Dormant	Inactive	Inactive
E53/1	Locally active	Locally Active	Locally Active	Not Inspected	Locally Active	Locally Active	Locally Active	Locally Active
E53/2	Partly Active	Partly Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E53/3	Locally active	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active
E53/4	Locally active	Locally Active	Locally Active	Partly Active	Partly Active	Locally Active	Locally Active	Locally Active
E53/5	Dormant	Dormant	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active	Locally Active
E54/1	Locally active	Locally Active	Locally Active	Not Inspected	Locally Active	Locally Active	Locally Active	Locally Active
E54/2a	Partly Active	Partly Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E54/2b	Totally Active	Totally Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E54/3a	Partly Active	Partly Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E54/3b	Totally Active	Totally Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E54/4	Totally Active	Totally Active	Partly Active	Not Inspected	Partly Active	Partly Active	Locally Active	Locally Active
E55/1	Partly Active	Partly Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E55/2	Partly Active	Partly Active	Partly Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active
E55/3	Locally active	Locally Active	Locally Active	Not Inspected	Partly Active	Partly Active	Partly Active	Partly Active



