Otterpool Park
Garden Town

ARCADIS Design & Consultancy for natural and built assets

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Propertyhousemarketing

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Stage 1 Feasibility and Capacity Study

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1 Executive Summary

1.1 Otterpool Park Garden Town's vision is *A great place for a great community*. The Stage One Feasibility and Capacity Study finds that there is the potential to create a thriving, healthy and vibrant settlement within the area of search in Shepway, Kent. Its excellent location adjacent to strategic transport links, proximity to beautiful countryside and coastline, and the relatively poor current condition of the site itself means that it is uniquely positioned to become a desirable place to live, work and relax.

1.2 Arcadis Consulting (UK) Limited was appointed in August 2016 to develop a masterplan and planning submission in respect of the proposed garden town. The Feasibility and Capacity Study is the first stage in the creation of the masterplan, comprising an assessment of the area of search and analysis of the constraints and opportunities.

1.3 The ambition is to create a garden settlement of up to 12,000 homes as set out in Shepway District Council's Expression of Interest submitted to the Government. The Otterpool Park site benefits from excellent existing strategic transport connections. The proximity of M20 Junction 11 is a major advantage and, unusually for development at this scale, relatively minor improvements are required to the motorway junction to enable delivery of circa 7,500 homes. Development beyond that size will, as is to be expected, require further improvements (such as works to widen the approach and exit routes to the junction).

1.4 Westenhanger Station is likely to be a key driver of development value. While on the High Speed 1 line, it is not currently served by those trains. Engagement with Network Rail has commenced and progressing the development of the initial stage of business case preparation for enhancements to the station and services provided from there is a priority for Stage Two.

1.5 Early engagement with utility suppliers suggests that supply for 12,000 homes can be provided and this needs testing through the pre-planning developer services when details of the proposed masterplan will be shared and evaluated formally.

1.6 Development density is a key consideration and influences the volume of homes achievable at Otterpool Park. A suburban-style garden town in the style of Letchworth Garden City would require the full area of search, whereas a more dense apartment led garden town would require significantly less space. Decisions will need to be made during the next stage of the masterplan development about desired building height, numbers of storeys and size of homes, all of which will be informed by the market advice to be provided by the agent to be appointed early in Stage Two.

1.7 While much of the site is of poor quality landscape, there are areas which contain features which can be used as the starting point for creating the character of the garden town. Examples include Westenhanger Castle, the East Stour River and Harringe Brooks Ancient Woodland.

1.8 Long-term stewardship and management of Otterpool Park is a key consideration in creating the masterplan. The resources available to maintain the landscape, community assets and infrastructure once it has been provided will influence the way in which they are designed. A whole-life costing approach will enable understanding of the implications associated with design decisions as the masterplan evolves.

1.9 Community engagement events held in December 2016 provided valuable feedback about a number of concerns and ideas in relation to development at Otterpool Park. An independent report prepared by Kevin Murray Associates sets out the findings. Many of the issues raised are being examined as part of the masterplan. However, two key areas have not yet been studied: health and education. Completion of an assessment of the requirements for Otterpool Park is necessary during the next stage of the masterplan project.

1.10 The Local Planning Authority, Shepway District Council is partially reviewing its Core Strategy with a clear timetable laid out to develop the evidence base, including areas of growth. Initial feedback suggests that the area of search for Otterpool Park is viewed favourably. The Local Planning Authority is engaging proactively with the Department for Communities and Local Government to ensure the process for the Core Strategy review is streamlined as far as possible. On the basis of the current timetable, the planning application for Otterpool Park would be determined in the third quarter of 2019. Development of a programme and phasing plan for the delivery of Otterpool Park will be undertaken during the next stage of the masterplan process. As one of the Government's flagship policies, there may be pressure to demonstrate evidence of progress on site within this Parliament and the programme will enable an understanding of the extent to which this is feasible.

1.11 The next stage of the masterplan process will result in the Framework Masterplan for Otterpool Park in autumn 2017. It is proposed that Stage Two will involve the technical assessment and financial modelling of a number of alternative masterplan concepts to be agreed during the first quarter 2017.

2 Introduction and methodology

2.1 The demand for housing across England is high following sustained population growth and changes in the way people live. Demand is particularly acute in the south east of England. Substantial development within, or as an extension to, existing settlements is challenging because of the impact (real or perceived) that it has on neighbouring residents and businesses. A key response to the housing crisis is, therefore, the creation of new settlements which are designed to provide the necessary infrastructure, services and facilities without placing a burden on existing neighbourhoods.

2.2 The provision of housing is one of the Government's major policy objectives. A Housing White Paper is due for publication in early 2017 which, it is understood, will target the acceleration of housing delivery. A number of initiatives have already been announced, including support for the development of new garden settlements.

2.3 Otterpool Park in Shepway, Kent received support from the Government to proceed as a proposed garden settlement following submission of an Expression of Interest in June 2016. The scale and relatively undeveloped nature of the site, coupled with its proximity to the high-speed rail link and motorway network and its location outside of any Area of Outstanding Natural Beauty (AONB) were all identified by Shepway District Council (SDC) as compelling reasons for pursuing a garden settlement in this location.

2.4 The Local Planning Authority is currently reviewing its Core Strategy with the Growth Options Study and Strategic Housing Market Assessment due to be completed early in 2017. The timetable for the Core Strategy review currently envisages that an Inspector's report into the revised policies (anticipated to include the Otterpool Park garden settlement) will be published in Autumn 2019. The local planning authority suggests that any application for Otterpool Park would only be determined after that date. Representations are being made to seek to speed that process up and the Housing White Paper referred to in paragraph 1.2 may also assist in encouraging the Council to accelerate the Core Strategy review process.

2.5 *A great place for a great community* is the vision for Otterpool Park with the five key aims being to deliver:

- Quality and innovative design;
- Cutting-edge technologies;
- Local employment opportunities;
- Accessible green space for all to enjoy; and
- High quality public realm.

2.6 The development principles for Otterpool Park focus on the three pillars of sustainability: economic, social and environmental.

Economic
Maximise opportunities for new strategic employment space
Provide an ultra-fast IT enabled community
Maximise investment in and the use of existing infrastructure assets
Create local neighbourhood centres within walkable distances
Create an attractive town centre as the heart of the settlement

Environmental
Landscape-led masterplanning retaining and enhancing existing green and blue assets
Embrace and enhance the natural landscape character, with a diverse range of green spaces
Make best use of technologies in energy generation and conservation
Prioritise walking, cycling and sustainable transport
Promote healthy and sustainable environments

Social
Provide much needed new homes through a phased approach
Maximise the visibility and enjoyment of local heritage assets
Deliver distinctive high quality townscapes with an appropriate mix of housing types and tenures
Take advantage of economies of scale and capturing land value
Provide opportunities for self-build and custom build
Provide spaces for local food growing
Establish a suitable legal entity for long term management

2.7 During the Feasibility and Capacity Study the vision, aims and objectives have been at the heart of the assessment of the extent to which the identified site can deliver the aspirations for Otterpool Park.

2.8 Arcadis Consulting (UK) Limited (Arcadis) was appointed in August 2016 to develop a masterplan and planning submission in respect of the proposed garden town called Otterpool Park. The Feasibility and Capacity Study is the first stage in the creation of the masterplan, comprising an assessment of the area of search and analysis of the constraints and opportunities.

2.9 The purpose of the study is to understand the extent to which a garden settlement that adheres to the defined development principles for Otterpool Park might be delivered on the site. The area of search for this study for is as drawn in Figure 1 below.

2.10 The Feasibility and Capacity Study has been undertaken by technical experts organised by themed workstreams overseen by the project leadership team comprising masterplanning, planning and development experts.

2.11 The methodology for the Feasibility and Capacity Study comprised the following activities:

Garden settlement principles review

2.11.1 A review of the publications and guidance relating to garden settlements in conjunction with the Otterpool Park Expression of Interest to Government, to establish a robust understanding of the principles for the masterplan development. Feedback from study tours completed by Shepway District Council Members and officers has been captured.

Site visits

2.11.2 A number of site visits were completed by the consultant team to develop a comprehensive understanding of the site including surveys to establish baseline data.

Document review and gap analysis

2.11.3 A review of available documentation about the site including current planning policies summarised in Appendix B. Identification of information gaps and recommended next steps.

Stakeholder engagement

2.11.4 Initial meetings with key stakeholders to identify information available and key risks to the development. Discussion about future engagement and associated arrangements.

Constraints and opportunities mapping

2.11.5 Production of a series of reports and figures to describe the workstream findings and inform the initial masterplan concepts. The technical reports are provided in Appendices B to L.

Risk assessment

2.11.6 Identification of risks associated with the development of Otterpool Park, captured in the risk register in Appendix M.

Design workshop

2.11.7 Presentation of the findings with discussion and debate about the relative importance of the constraints and opportunities identified across the workstreams, and early thinking about what Otterpool Park might look like to provoke exploration of the constraints and opportunities.

Community engagement

2.11.8 Events to capture initial feedback from the public about the proposed garden town.

Public relations and website

2.11.9 Reactive and proactive engagement with the media to develop positive early messages about Otterpool Park. Development of a website for the garden town www.otterpoolpark.org

Figure 1: Otterpool Park Study Area

3 Background to Otterpool Park Garden Town

Site description

3.1 The Otterpool Park site, subject to this Feasibility and Capacity Study, comprises circa 700 hectares of land located to the west of the Shepway district. The towns of Folkestone and Hythe are located to the south east with Ashford to the north west. The site is bounded by the M20 and high speed train line to the north, the A20/Stone Street to the east, Harringe Lane to the west and Aldington Road to the south.

3.2 Four settlements are within the area of search. Westenhanger to the north where, aside from the castle and station, existing buildings are primarily residential use. Lympne is a residential settlement which lies to the south east of the site and is partially included within the area of search. Barrow Hill and Newingreen are small residential settlements to the north west and east of the site respectively.

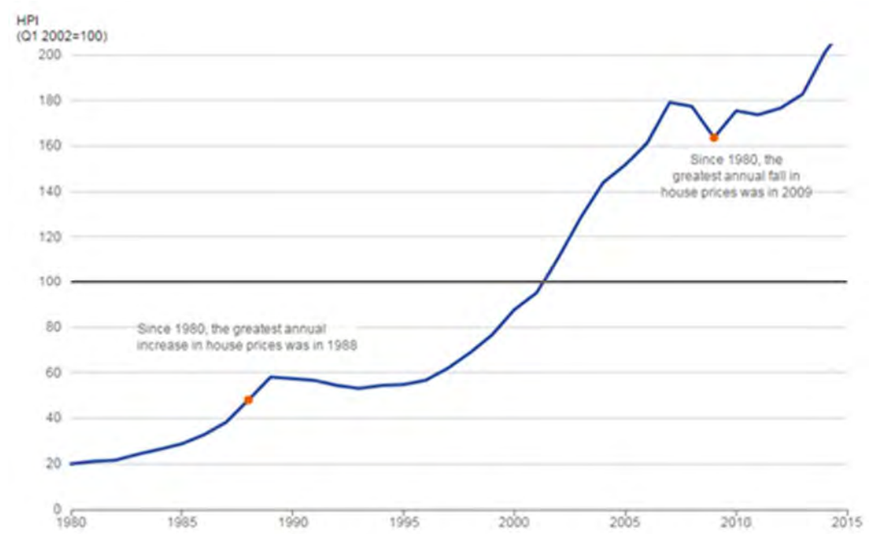
3.3 Lympne Distribution and Industrial Park lies to the south west. A large portion of the remainder of the site is used as agricultural land with small farmsteads.

3.4 Beyond the area of search lie a number of small settlements including Stanford to the north, Sellindge to the north west, Sandling to the north east, Pedlinge to the east and West Hythe to the south.

The housing crisis

3.5 The UK is not delivering sufficient housing to meet the country's needs. The availability and affordability of housing is a vital foundation of the country's dynamic and sustainable economy and has an impact on the United Kingdom's regional and international competitiveness. Housing completions are broadly half of the 240,000 homes per annum needed to keep up with household formation and demographic and migration challenges.

3.6 In addition to under-delivery of housing units, the predominance in market sale tenure of what is being delivered is unaffordable to many. Both of these factors have resulted in record house price growth whereby the average house price is roughly seven times the average income. This has further implications in that purchasers are required to 'over leverage' when obtaining mortgages to access the housing market. This is especially an issue for first time buyers.



Source: ONS House Price Index - February 2016 (Table 22)

Figure 2: Mix-adjusted House Price Index (HPI), UK, 1980 to 2015.

3.7 Key national statistics released by the Department for Communities and Local Government (DCLG) show that:

- Construction began on 141,740 homes in England in 2015/16 2016, the highest number of starts in a financial year this decade
- Private sector starts rose by four per cent to 116,880
- Housing Association starts were down three per cent to 23,370
- Council starts fell 22 per cent to 1,490
- Across all tenures, completions rose 10 per cent to 168,210 homes in the year to 31 March 2016

3.8 England's population is forecast to rise by a further four million over the next decade, with the South-East accounting for nearly one fifth of the growth. Only the population of London will rise more than the South East.

3.9 The Government will publish a Housing White Paper, expected in spring 2017, setting out a comprehensive package of reform to increase housing supply and halt the decline in housing affordability. To help deliver this, the Autumn Statement announced the Housing Infrastructure Fund of £2.3 billion allocated to local government on a competitive basis to provide infrastructure targeted at unlocking new private house building. This will deliver up to 100,000 new homes. The Government will also examine options to ensure that transport funding better supports housing growth. Additional funding of £1.4bn will deliver an additional 40,000 affordable housing starts by 2020-21. Understanding how Otterpool Park can benefit from such funding is an important activity for the second stage of the masterplanning process.

Kent residential development market

3.10 Prior to the European Union referendum, the United Kingdom housing market was facing a number of challenges. Changes to Stamp Duty Land Tax (SDLT) on second homes created a short-term distortion in the market, while both supply and demand was muted. This supported price growth, which peaked at the end of Q1 2016 at 5.7% year on year, the highest pace of growth since January 2015 (Nationwide). The 2016 Kent Property Market report by Kent County Councils' Economic Development Team states that, the position in Kent was more acute, with average prices rising over 13% in the 12 months to the end of June 2016, ahead of the London region. The average value of a home in the county at the end of Q2 was £266,870 (Office of National Statistics (ONS)).

3.11 The driving force behind this upturn was population and household growth. The county saw a 1% increase in population between mid-2014 -2015, following steady growth in previous years. The imbalance between supply and demand occurred despite a net addition of 5,087 homes in 2015/16, a significant increase on the previous 12 months.

3.12 Recent household forecasts for Kent project a greater housing need with a 6.6% increase in households forecast by 2020, while ONS forecasting the county's population growth at 22% over the next two decades.

3.13 To meet some of this projected household deficit, there are a number of large-scale schemes underway or in the pipeline, in town centre regeneration schemes, brownfield sites and major new settlements. All the major house builders are active in the county with the upturn in values also attracting developers from other areas.

3.14 There are a number of schemes underway in Ashford. Construction commenced on the Chilmington Green village extension that will include 5,750 new homes to be developed by Pentland Homes, Ward Homes, Barratt Homes and Hodson Developments. Permission was granted in June to developers U+I and Quinn Estates for 660 homes at Victoria Way, a former Powergen site, with GRE Investments forward purchasing 267 units for £45m as a private rented investment.

3.15 Maidstone district has the largest growth in population in the county. A number of schemes are coming forward, with most of the major housebuilders active on sites in the centre or to the edge of the town. There are a number of new plans in the pipeline including over 1,000 units off Sutton Road in three schemes that received permission in July.

3.16 At Detling Hill, Quinn Estates has submitted plans for a 63ha (155 acre) site next to the Kent Showground. The scheme includes 1,150 homes, 650,000ft^2 of commercial space, a hotel, highway improvements and community facilities. Meanwhile, at the developer's self-build development at Hammill Brickworks near Sandwich, the majority of the 19 plots on the 6ha (14 acre) site are sold or under development.

3.17 Ebbsfleet Garden City is now well underway with all the developers involved either on site or in possession of planning consent. These include Redrow, David Wilson Homes, Taylor Wimpey, Countryside, Charles Church, Persimmon and Circle Housing. Nearby, 80 new homes are proposed at the former Gravesend and North Kent Hospital in Gravesend following an application submitted by the NHS.

3.18 In March, Corinthian Land submitted an application for a new garden suburb for Canterbury, which would include around 4,000 new homes. The developer hopes to start on site in January 2017, with the first 100 homes completed by March 2018. Empiric Student Property purchased a 79-bed student accommodation building in the city for £9.2m. Meanwhile, at the Spirit of Sittingbourne development there are plans for 164 apartments in three new buildings.

3.19 At Kings Hill, consent was granted for the next phase of development to include 635 dwellings and community facilities. Developers are being selected for the scheme that has the benefit of services in place. Phase 2 is largely sold out with one apartment building comprising 14 units under construction.

3.20 Kent's coastal towns have seen a sharp increase in house prices with an upturn of in-movers to the towns, encouraged in part by improved accessibility. The EU referendum result has impacted market dynamics, although the county can ill afford delays to development given the challenging housing need targets. Caution has however presented opportunities for some in the market, including Registered Social Landlords (RSL) and institutional investors seeking to develop build to let portfolios in Kent.

3.21 It is expected that activity will resume as buyers and developers adjust to uncertainty. Longer term implications will depend on the form of Brexit agreements, but given post referendum business lettings activity across the county, strong demand in the housing market looks set to persist.

Location	Average new build sold value achieved (£/ft^2) houses and apartments 2016
Ashford	£250 - £350
Canterbury	£275 - £450
Dartford	£300 - £425
Dover	£200 - £300
Gravesham	£275 - £350
Maidstone	£275 - £350
Medway	£225 - £350
Sevenoaks	£380 - £625
Shepway	£225 - £325
Swale	£225 - £350
Thanet	£225 - £290
Tonbridge and Malling	£325 - £450
Tunbridge Wells	£400 - £575

Commercial

3.22 To ensure Otterpool Park flourishes as a positive place to live, an effective employment strategy will need to be developed. The balance of residential and commercial development, in conjunction with advice on values for each use class, needs careful evaluation in conjunction with the financial model during the second stage to ensure that Otterpool Park is viable. Engagement with SDC economic development officers will be important to understand scope for inward investment strategies to support in attracting employers to Otterpool Park and any financial incentives that can be applied.

3.23 The Bank of England's Agents' Scores indicate that occupier demand, particularly in London, is in decline. This presents an opportunity for Otterpool Park to attract employers to the area and boost the economically active population.

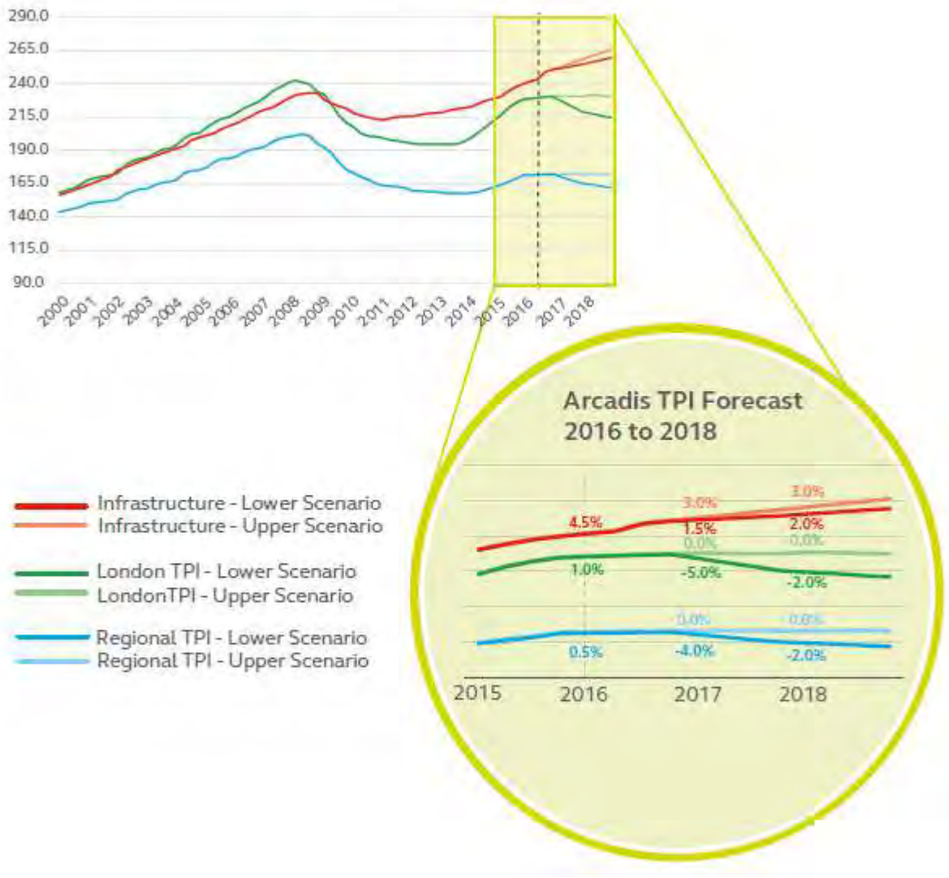
Infrastructure

3.24 The past quarter has seen infrastructure come under the spotlight with a number of high profile and key project decisions being made by government including Heathrow Third Runway, Hinkley Point C and reiterated backing for High Speed Two. Though the National Infrastructure Commission will not be enshrined under legislation as an independent body, its existence and purpose has been validated by the new government. Furthermore, the Autumn Statement reinforced the very positive outlook for infrastructure committing almost £20bn of additional funding to 2020 with spending on roads and the digital railway taking prominence. As with funding for housing, understanding the capacity for Otterpool Park to benefit from this funding source will be important as the masterplan progresses.

UK construction market

3.25 The ability of the construction market to deliver the volume of development anticipated for Otterpool Park presents a key risk to the delivery programme and viability. The construction industry in the UK faces significant challenges, not least because of the shortage of available skilled labour. However, Otterpool Park presents the opportunity of providing certainty to the Kent market and its supply chain with the long-term delivery programme a scheme of this scale will require.

3.26 The Arcadis Tender Price Index Forecast 2016-2018 predicts that infrastructure prices will rise at 2-3% while building construction prices will remain static or reduce by up to 2%. A return to growth is likely for 2019 and 2020.



Source: 2017 – Is Winter Coming? Arcadis, September 2016

Figure 3: Arcadis Tender Price Index Forecast 2016 to 2018.

3.27 The delivery strategy for Otterpool Park needs to be evaluated during the second stage of the masterplan development. Engagement with the market to analyse the capacity for delivery, in conjunction with advice on projected sales rates will ensure that the ability to commence construction at Otterpool Park is achievable once planning permission is secured. The appetite for commencing, for example, demolition in advance of the determination of the planning application, could be considered in order to create momentum for the development and prepare for construction.

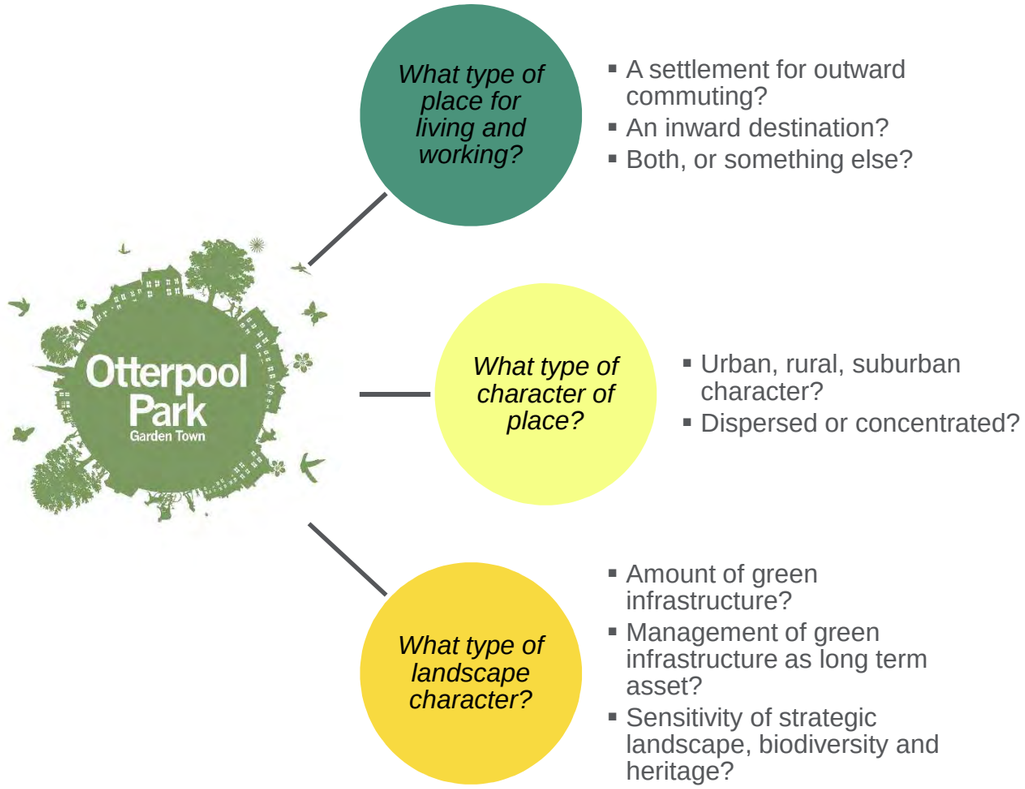
3.28 The employment strategy for Otterpool Park provides the opportunity for one area of focus to be on the ability to generate jobs through the development and construction process. The appetite for modern approaches to design and construction, making use of the advances in technology and manufacturing methods, has grown significantly and could combine well with the desire to attract technology companies specialising in the built environment to the area.

4 Key questions for the Otterpool Park masterplan

4.1 The creation of a garden settlement is a unique process which needs to be location specific. While taking inspiration from other places is important, Otterpool Park will develop its own identity. The Otterpool Park masterplan has the advantage of numerous opportunities which the site presents:

- Close proximity of Westenhanger Station and the High Speed 1 railway network provides opportunity for housing and employment uses with excellent accessibility to and from the wider region
- The ability to create a high street within walking distance of the railway station and proposed housing and employment uses
- The majority of the site is not of as high landscape value as its surroundings, therefore the proposed public open space can be linked to existing landscape assets in the surrounding areas to create increased value through a connected landscape strategy
- Existing heritage assets, whilst of interest, are not able to be fully appreciated in current land use and can be enhanced with improved landscape settings and an integrated part of the cultural strategy of the masterplan
- The site being controlled by limited number of owners enables masterplan, management structure and phasing to be established to support the long-term quality and delivery of infrastructure and public realm.
- The existing water courses in the site can be integrated into a sustainable urban drainage strategy within a new landscape green infrastructure.

4.2 There are a number of key questions to be debated throughout the masterplan evolution in order to create a clear and valuable identity for Otterpool Park. Initial responses to each question are provided in the paragraphs which follow:



What type of place for living and working?

4.3 The excellent rail access and road accessibility of Otterpool Park creates the opportunity to both provide homes meeting the needs of people who want to commute out from Otterpool Park, as well as the opportunity to attract businesses and provide local employment to people who want to live at Otterpool Park and work locally.

4.4 The characteristics and location of employment land within the masterplan needs careful evaluation including whether strategic employment land for a possible business park near to the M20 Junction 11 is the right approach.

4.5 Creating a place with social interconnectivity and walkable neighbourhoods also requires the masterplan to provide employment land distributed across the masterplan to create a mix of uses.

4.6 Poundbury in Dorset is an example of a new type of settlement which has set out and achieved a mix of employment and local services in each neighbourhood. Further studies of the success and challenges from the

Poundbury example will be carried out in the next stage of the masterplan development.

4.7 The ambition for Otterpool Park is to create one or more sustainable communities with the following criteria:

- Create walkable neighbourhoods with local services accessible in centres distributed within 10 minutes' walk from all housing
- Provide integrated public transport and frequent bus services with bus stops located within 5 minutes' walk of all homes, close to local centres and with good links to the railway station
- A mix of appropriate retail, business and community uses located within residential areas creating specific focal points of street fronting activity contributing to an inclusive community with varied daytime pattern of pedestrian footfall
- Local employment opportunities provided through affordable commercial space of a wide range of sizes to make it possible for local people to progress from home working through start-up businesses to create larger enterprises
- A variety of housing with a mixture of tenures in designs which enable integration of private, affordable and rented housing in groupings creating mixed communities
- Streets which encourage community outdoor activities including play and social gatherings within streets visible from homes encouraging interaction and providing natural surveillance
- A legible pattern of streets with local centres, pockets of open space and mixed uses located at key nodes which encourages footfall and communication between neighbourhood
- Areas of landscape integrated into housing to provide a sense of a green landscape throughout publicly accessible areas to provide enjoyment of the natural environment
- Wider areas of landscape to provide opportunities for active healthy lifestyles and recreation and whilst close to proposed housing are strongly landscaped to create openness and a green lung for both the residents of Otterpool and the surrounding villages

What type of character of place?

4.8 Ebenezer Howards' three magnets explain the vision for "Town and Country" yet, when written, did not necessarily expect nor anticipate the resulting low density uniform, singular housing suburb without facilities that became the norm for much of the 20th century. Howard's objective to create a new model settlement with the best of both of urban and rural character in close juxtaposition is still a desirable objective which can be achieved at Otterpool Park:

- An optimised combination of urban higher densities and mixed housing type and supporting uses in a lively settlement centre, radiating out with reducing density and a more rural character with local neighbourhood centres.
- Interconnecting tree lined streets, lanes and pathways and landscape, creating walking and cycling connectivity between the main centre, local neighbourhood centres and the surrounding landscape.
- The optimum result would be a mix and hierarchy of housing and supporting uses in a settlement with sufficient scale to provide social interconnectivity yet still creating walkable neighbourhoods, a layout defined enough to create a legible hierarchy and gradation of places, yet loose enough with sufficient landscape to have variety and quality of place.
- A settlement sized in distance from a centre to edge of up to approximate 1km radius is considerably more likely to achieve the optimum number of residents and mix of uses to create social interconnectivity and walkability.
- Public transport accessible within the approximate 2km diameter would encourage patterns of travel with less dependence on car and make the provision of alternative public transport and sustainable travel more viable.

4.9 A settlement of scale with self-sufficiency as outlined above could provide facilities that support and provide services for smaller outlying settlements, even allowing new smaller satellites to be created with a local centre.

4.10 This mixed and graduated urban and rural environment creating "town and country" is a sound principle and an achievable objective for Otterpool Park with the amount of land available in the search area.

4.11 In terms of high street and services for Otterpool Park, there are a variety of alternative approaches which would be delivered. Given the scale of the site, there is the opportunity to deliver more than one of the following:

- A principal centre as a defined heart that is within easy walking distance from most homes and with good public transport connectivity to all homes. The concept could comprise a strong urban enclosure such as a 'high street' or market square with retail at ground floor and flats or businesses above. Nearby to the central space could be public gardens with community facilities such as schools, community centre, sports centre etc. The urban design precedents would be based on local examples, such as Tenterden High Street.

- Smaller village centres could be created to provide local services and primary schools in a wider dispersed area also pockets if mixed use including retail and businesses at ground floor and flats with a green space such as village green to create a focal point.

- The streets which connect the principal and local centres could have the character of tree lined urban boulevards with homes and some businesses creating active frontages, with segregated cycle facilities and bus stops as well as vehicular traffic.

- Within residential areas a permeable network of access streets could create connected walkable neighbourhoods with a mix of residential flats, terraced and semi-detached homes. Some on plot and mews courts with flats over parking could limit parking on frontages with shared surface streets to prioritise pedestrians and cyclists. Home zones, informal green areas with edible planting could provide green spaces and natural play areas to encourage active streets.

- Towards the rural edges the housing access could be scaled down to lanes and paths with restricted traffic and a range of detached and small terraces of homes some grouped as loose courts and some fronting to the open landscape.

4.12 Garden settlement principles suggest a mixture of densities and character of neighbourhood should be provided. The layout should create a legible hierarchy and gradation of places:

- Highest density in the principal centre should have some key landmark buildings with mixed use commercial, community residential use, located as focal points, some with additional height to create character, with all ground floor frontages as commercial use

- An urban high street should generally be higher density and more homogenous in scale with predominantly mixed use ground floor frontages

- The medium density mid-town predominantly residential homes of a relatively consistent scale with some varied height as key markers, with a permeable network of streets and some mixed use at ground floor on key intersections

- The outer edges and some areas fronting most sensitive green spaces should be of a lower density of residential with more variegated scale

4.13 The character and mix of housing could reflect some of the following:

- The higher density on the high street with linear blocks of flats above ground floor commercial frontages fronting the high street and market square

- High street areas should have car parking in rear mews courtyards with flats above or have car parking in a lower ground level to create a predominantly pedestrian shared surface streetscape

- The urban boulevards fronted with terraced town houses with gardens and some flats with ground floor commercial frontages at key intersections. Urban boulevards should have a tertiary access lane to create frontages with parking predominantly to side and rear mews courts with flats above

- High to medium density mid-town houses, mainly short terraces and semi-detached with generous gardens on plot parking and some mews courts and flats above

- Medium to lower density village edge with mainly semi-detached and some short terraces and detached with very generous gardens on plot and frontage parking

- Lower density village edge mainly detached very generous gardens fronting the landscape with on plot parking, with some semi-detached and short terraces with gardens clustered in courts

What type of landscape character?

4.14 The Landscape Assessment of Kent (2004) identifies the character within the search area as being in 'poor' condition and of 'moderate' sensitivity, resulting in the opportunity to 'Restore and Create' through a new landscape framework, opportune within a garden settlement concept.

4.15 The continuous historic evolution of the area has been influenced by its strategic importance as a gateway to the European continent. The history of the site is summarised below:

- The geology and topography of the Kent downs creates a unique setting with a gently sloping land form with a ridge of chalk hills to the north and a steep escarpment to the south
- The Roman influence can be traced to the port of Lemanis at Lympne with connecting routes to Canterbury in the north and west along the ridge line towards Aldington
- Lympne has a Saxon and medieval history with traces in monuments, pathways and historic buildings which date from the strategic importance of the area in defence and trade from sea and rivers to the south, now Romney Marsh
- Westenhanger Castle was a medieval defended site and became a 17th century manor house controlling surrounding farmland along with Otterpool Manor
- Villages of Lympne, Sellindge, Newingreen, Stanford have grown along the strategic routes across the area
- During the 19th century the new railway from London to Dover cut through the lower valley farmlands. The station at Westenhanger created the opportunity for the area to be developed for leisure as a racecourse
- The defence role of the area was continued in 20th century with airfields created at the racecourse and the higher ground at Lympne airfield
- The recent proposals to provide a lorry holding area on the M20 will affect the search area and wider surroundings and impacts need to be included in the capacity studies

4.16 As a garden town, high quality landscape will an important consideration throughout the masterplan evolution, in particular:

- Provide quality over quantity: green infrastructure for the garden town will be multi-functional and high quality
- Optimise surrounding landscape assets to create a well-connected green infrastructure network that provides links through and beyond the study area
- Landscape as legacy: high quality open space provision and public realm with an emphasis on maintenance and long term stewardship of the green infrastructure in perpetuity.
- Integration of blue infrastructure and sustainable drainage systems, focussed around the river corridors and tributaries, including integration/location of water management features, for visual and recreational amenity, and the location and orientation of open space to assist with water management
- A rich mosaic of green infrastructure, including street trees, formal sports, formal play, natural play spaces, food production, waste water treatment, recreation corridors, transport corridors, green open space, hubs, sustainable drainage, architectural features, buffers and visual screening, streets and habitat links
- Ease of access and walking distances from homes to open space and play space
- Ease of access to and direct routes for pedestrians and cyclists, to encourage physical activity and reduced car use/dependence of fossil fuels
- Positioning and orientation of streets, street trees and architectural features to support climate change resilience, solar shading and provide screening of the development from the Area of Outstanding Natural Beauty (AONB)
- Location and orientation of 'wild' places, to best serve biodiversity
- Orientation and location of sports facilities to ensure optimal functionality regarding sun path and levels/falls
- Appropriate separation of the garden town from existing settlements through a shared green infrastructure asset

5 Town and Country Planning

Town planning background and strategy

5.1 There have been a number of key developments in relation to the planning background dealing with the provision of new garden settlements since commencement of the masterplan project in August 2016. The key elements of national and emerging SDC policy are set out in the following paragraphs.

National policy

5.2 Following the publication of the prospectus into new garden settlements and SDC's submission of its expression of interest, the Government confirmed it support for Otterpool Park as a new garden settlement for up to 12,000 dwellings in November 2016. This announcement was made prior to the more recent announcement (January 2017) of a further list of new garden settlements. This would tend to indicate the priority that Otterpool Park has been given at national level.

5.3 In making the announcements about Otterpool Park the Housing Minister, Gavin Barwell, emphasised that the provision of new garden settlements would "turbo charge" the provision of housing supply in the country generally. Similar sentiments were made in the announcement of the further list of new garden settlements in January 2017. Therefore, the intention of the Government to ensure that appropriate proposals for new garden settlements do indeed lead to the significant boost to housing supply relies upon the planning system dealing with applications as quickly as possible.

5.4 A new Housing Bill is expected shortly that may include proposals for how the system could be speeded up in this regard – dealing particularly with potential improvements to the Local Plan preparation process relating to how much time Local Planning Authorities need to take considering matters like objectively assessed housing need (OAN). These developments will be closely monitored and the Local Planning Authority (LPA) will be encouraged to move as quickly as they are allowed in preparation of the Local Plan and in determining a planning application for Otterpool Park. The LPA expects to receive the Planning Inspector's report into the Core Strategy Review during 2019.

5.5 Certain other authorities where new garden settlements are being proposed are taking the view they need not relate the size of new garden settlements to the OAN figures coming from their Core Strategy. These developments are being monitored and lessons shared with the LPA.

Local Planning Authority policy position

5.6 SDC is in the early stages of preparing its Core Strategy Review which, in the normal way, seeks to establish an OAN for the district in the review period. The Strategic Housing Market Assessment (SHMA) which has been commissioned to advise the LPA on the level of OAN is near completion and is likely to show a need for an increase in housing supply. SDC's Cabinet will receive a report on this matter in April 2017.

5.7 The LPA has commissioned consultants to advise on the growth strategy options, including identification of suitable locations for development in the district. The precise details of how much housing should be provided in the Core Strategy Review period is yet to be determined.

5.8 The next stages of the project will require significant involvement and participation in the Core Strategy Review policy process by the consultancy team. Examples of other policies elsewhere that have brought forward large areas for housing have been shared with SDC LPA officers. The intention is to assist officers in coming up with a range of policies that allow flexibility in terms of how the new settlement is provided and without being overly prescriptive in terms of functional requirements of the development. There is a useful example with the sustainable urban extensions at Lincoln which has recently been through an examination process in front of two Planning Inspectors.

5.9 It will be crucial to maintain positive engagement with the LPA during the second stage of the masterplan process and the Housing Bill, when published, may allow further opportunity for discussion on the timing of the determination of the Otterpool Park planning application.

Short term planning approach

5.10 Discussions have commenced with the LPA officers in relation to the drawing up of a Planning Performance Agreement which will deal with the process for the preparation of the application and the issues to be addressed. It will include the scoping of the Environmental Impact Assessment (EIA). The EIA scoping opinion will be a public document containing information about the proposed scale of development across the site and is therefore expected to be scrutinised closely. It is recommended that the EIA scoping request is submitted once there is greater clarity about the upper limit of development on the site. In the meantime, informal discussions can commence about the likely content so as not to delay the preparation of studies and content required for the EIA.

5.11 Analysis of the likely Section 106 contributions will be undertaken during Stage Two of the masterplan. It is understood that the Community Infrastructure Levy (CIL) is unlikely to apply for a site of this nature consistent with the SDC approach to large development elsewhere in the district.

5.12 New or existing planning applications within the area of search will continue to be monitored through the development programme. In this regard the draft SDC Places and Policies Plan (relating to the existing Core Strategy) proposes a site of 125 dwellings in the Lympne Airfield area to the south east of the site – a previous proposal for 250 dwellings was dismissed on appeal in 2013. There is an extant application for a green energy plant in the southern part of the area of search.

5.13 One potential strategy for the planning application is a hybrid application for the new settlement i.e. an outline covering the settlement as a whole with detail submitted for an early phase(s) and/or early infrastructure/landscape provision. The planning application strategy will be developed during Stage Two. The level of design work required to submit a detailed application needs to be understood.

6 Site assessment – summary of key technical constraints

6.1 The conclusion of the technical studies completed during stage one is that there are **no significant barriers** to development of a garden settlement identified at this stage which would preclude delivering the aspirations defined by the vision, aims and principles. Indeed, there are numerous opportunities to enhance the environment, infrastructure, services and facilities and deliver homes and a community in an exemplary manner.

6.2 A summary of key constraints and opportunities influencing the evolution of the garden settlement masterplan options is set out below with the detailed studies contained in Appendices B to L.

Access and travel (Appendix E)

6.3 While the proposed garden settlement is located close to the M20 and high speed railway, it is poorly connected to them. The A20 runs through the site and the local road network connections within the area are constrained by various factors including restrictions in places on height and width. There is therefore an opportunity to improve the existing road network and develop high quality connections within Otterpool Park.

6.4 Initial traffic capacity modelling of the M20 Junction 11 identifies that it could constrain, at some future point, the quantum of development and numbers of homes on the site. Unusually, with only minor capacity improvements, the junction could accommodate development of around 7,500 homes plus other land uses:

- The A20, Channel Ports access and M20 eastbound approaches and corresponding circulatory arms are signalised;
- Two lanes are provided on the M20 Westbound off slip; and
- The number of approach lanes are increased without widening of the carriageway.

6.5 With further improvements, such as those set out below, a higher number of homes could be accommodated:

- Westbound M20 on-slip widened to safely accommodate two lanes of traffic on the exit to the junction;
- Widen the M20 Eastbound approach to three lanes;
- Widen the Ashford Road Approach and Circulatory arm of the junction to accommodate 3 lanes of traffic.

6.6 All options are to be evaluated during Stage Two design development, including modelling of the financial implications.

6.7 Westenhanger Station provides a key opportunity for Otterpool Park and will be an important driver of value, in particular if high speed trains are able to serve the settlement. It is not yet understood if rail system upgrades are required in order to allow high speed trains to stop at the station. Improvements to the car park and platform access will be required and are to be explored with Network Rail as a priority. Bus, pedestrian and cycle routes to and from the station, as well as across the site, all need to be set out in the masterplan as existing routes are limited. Early discussions have taken place between SDC and Network Rail and the process for commencing the business case for proposed changes should be a priority for Stage Two.

Resource demand and supply (Appendices D and F)

6.8 Early engagement with utility companies suggests that water, gas and electricity supplies can be connected to the Otterpool Park site, subject to the necessary investment. Utility companies will remain key stakeholders throughout the masterplan evolution to ensure that the necessary infrastructure is developed in a viable manner and connections scheduled to meet construction and occupation needs.

6.9 The next step for engagement with the utilities will be production of calculations required to work out the required loading and demand for the scheme. A highest load and demand case will be identified based on conventional housing, rather than high energy efficiency homes. The overall loading will be based on the upper limit of housing (12,000). Assumptions about the phasing of site development will be prepared. A pre-planning developer service enquiry will then be undertaken on this option with each utility provider, which can be adjusted as the masterplan evolves. The submission of multiple scenarios to the utility providers is not recommended.

6.10 Openreach has not yet confirmed whether fibre broadband services can be installed and this remains a key area of enquiry which needs resolution as a priority.

6.11 There is significant opportunity to design Otterpool Park in a way which minimises demand for resources and meets that demand within its boundaries which will be explored as the masterplan evolves. Smart grids, district heating, renewable sources, roof orientation and other ideas will all be considered. Analysing the benefits for the landowner as well as the future occupiers will be tested in conjunction with the financial model.

Cultural heritage (Appendix K)

6.12 The proposed garden settlement site contains cultural heritage with the potential to bring benefits to the masterplan design. The key cultural heritage assets within the site are Westenhanger Castle, a Scheduled Ancient Monument, and its buildings, other medieval and post-medieval buildings within the Site and surrounding area, Lympne airfield and two barrows close to the East Stour River. Additionally, several non-designated buildings and some indicators of archaeological potential were documented which require further study and investigation during the second stage of the masterplan process. An initial meeting with Historic England took place during Stage One with further engagement to continue during future stages.

Habitats and biodiversity (Appendix B)

6.13 The garden settlement nature of development at Otterpool Park presents many opportunities to enhance habitats and biodiversity. Decisions will be required as the masterplan evolves about the extent to which existing habitats and biodiversity are to be retained in situ or mitigation measures are to be taken. The financial model will be used to consider the cost value and programme implications of the options.

6.14 There are three key areas on or adjacent to the site which are likely to require more consideration in terms of protection and enhancement within the masterplan because of the species which make use of them:

- East Stour River corridors
- Waterbody and its surrounds within the racecourse
- Harringe Brooks Ancient Woodland and its surrounds

6.15 These areas, together with the remaining parts of the site, will be surveyed in greater detail during the next stage of the masterplan process. Initial concepts have taken account of these areas with green infrastructure designed in these places.

6.16 Non-native invasive plants have been identified on the site, all of which will require mitigation. Species identified during this first stage are Japanese knotweed, Virginia creeper, New Zealand stonecrop and Parrot's Feather. The costs for mitigation need to be defined and captured within the financial model.

Views and setting (Appendix B)

6.17 The site is visible from the North Downs AONB and the masterplan will therefore need to respond in a sensitive way to its surroundings. The setting of the Registered Parks and Gardens of Historic Interest at Sandling Park and Port Lympne will need to be respected.

6.18 The retention of the identifiable character of neighbouring villages at Lympne (which contains a conservation area), Barrow Hill and Westenhanger needs careful consideration, including use of green buffers where appropriate.

Light (Appendix B)

6.19 The west of the site shows particularly low levels of manmade light. Ashford Borough Council is proposing protection of a dark skies area over land near to the west of the site. Minimising light pollution, in particular to the west, will be important.

Flood risk (Appendix C)

6.20 There are a number of areas of flood risk to be accounted for during the masterplan evolution to ensure the position within or downstream of the boundary is not worsened by development:

- The site has a network of small watercourses that have surface water flood extents
- There are areas of medium and high flood risk along the East Stour River
- Ashford and the area downstream from Otterpool Park has experienced flooding in the past. The proposed garden town must not increase the flood risk and there is the opportunity to help improve the position

6.21 The south east of England is a relatively water stressed area with demand already exceeding supply. Initial assessments suggest that large areas of the Otterpool Park site would be suitable for infiltration based sustainable drainage systems. Infiltration techniques should be used where feasible in order to recharge groundwater supplies, reduce downstream flood risk and reduce the requirement for attenuation storage.

6.22 The impact of the proposed freight lorry park to the north of the site has been modelled by Highways England and flood risk mitigation measures are being designed. The impact on the Otterpool Park site needs to be understood more fully as the masterplan evolves.

Ground conditions (Appendices F and J)

6.23 There are no substantial constraints associated with the ground conditions on the site. One significant pollution incident was recorded on the site in 1999 at

Lympne Industrial Estate involving the failure of an above ground tank and release of phosphoric acid. A number of contaminants, two military crash sites and small burning pits have been identified and the cost of remediation will be evaluated as the masterplan evolves.

6.24 Otterpool Quarry is designated as a Site of Special Scientific Interest (SSSI) for its geological interest. It is also a Geological Conservation Review (GCR) site. The site was notified as a SSSI in 1984 due to the significant exposures of the contact between the Hythe Formation and the overlying Sandgate Formation. The last condition review, in 2012, reported that the site was in favourable condition. It is regulated by Natural England who publish a list of operations likely to damage the special interest of the site. These include most types of construction and excavation activities. Any proposal that includes the operations on the list must be approved by Natural England, and this therefore imposes limits on the development in this location. The extent to which this limits development in this location needs to be examined during the next stage of the masterplan development.

6.25 Agricultural land quality requires more detailed analysis in Stage Two. However, initial assessment suggests that there are some areas of good quality agricultural land to the north and east of the site. Consideration will be given to how these areas can be utilised as part of the land uses on site and green infrastructure strategy.

7 Otterpool Park masterplan concepts

7.1 The masterplan concepts for Otterpool Park have been developed by assimilating a broad range of information and sources of inspiration. The strategic drivers and development principles; local history and context; lessons from garden settlements and large developments nationally and internationally; technical constraints and opportunities have all been evaluate to ensure the development is compelling and deliverable.

Vision, aims and development principles

7.2 The vision, aims and development principles are summarised in Section 2. The key masterplanning questions set out in Section 4 attempt to begin the debate about how the development principles will be brought to life and consider how they will be converted in to a deliverable masterplan. A further important consideration relates to the commercial imperative to ensure the development is viable and will generate appropriate returns to land owners.

Local history and context

7.3 The context of the site and its history are important factors in masterplan design. The figure below illustrates the topography of the area:

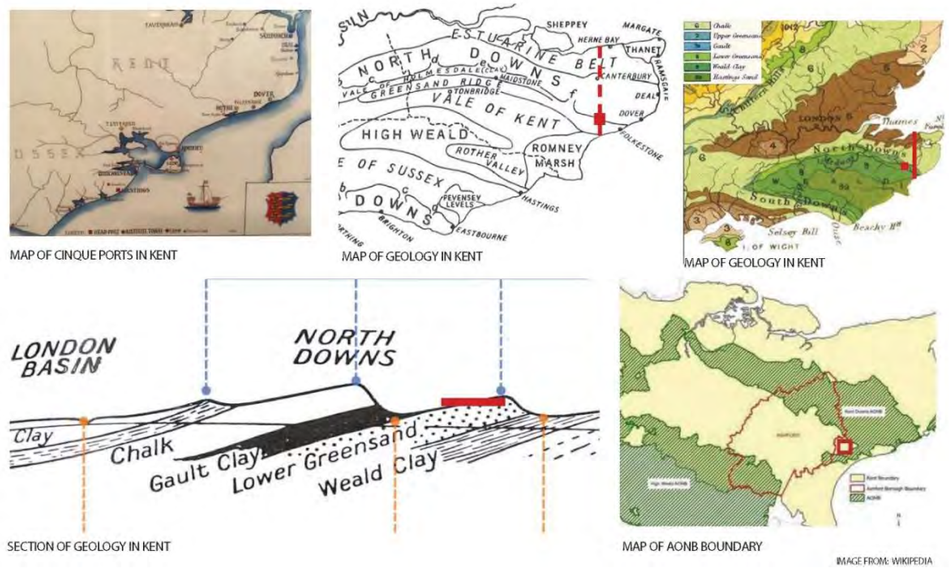


Figure 4: Topography of the Area

7.4 Similarly, historical maps provide a valuable reference point:

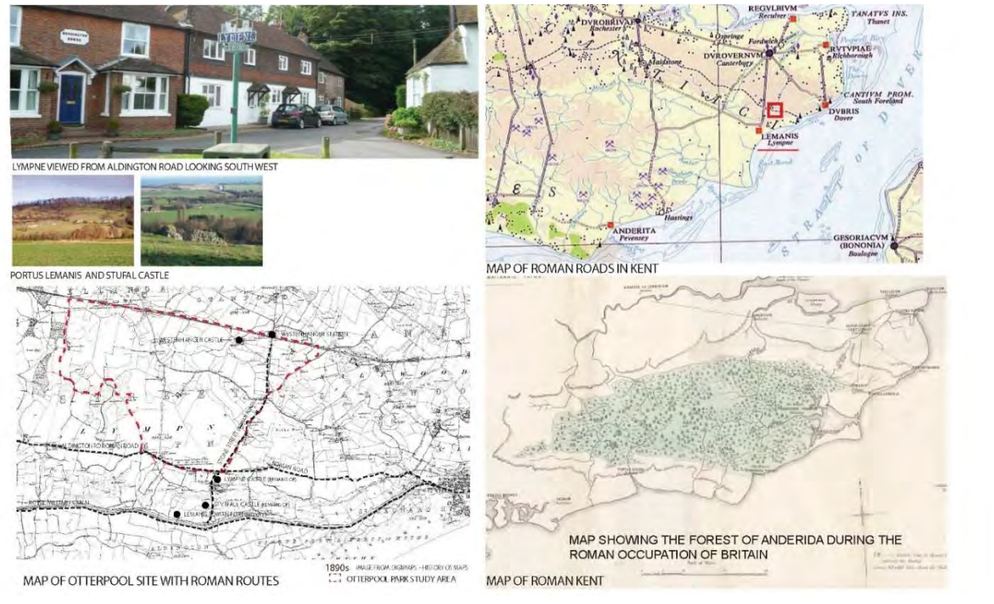


Figure 5: Historical Maps

7.5 The chronology of the site from Roman times to the 20th century is described below:

Figure 6: Site chronology

7.6 Existing development in Kent provides valuable insight in to the potential character of the masterplan for Otterpool Park:

1. Lympne Conservation area

2. Otterpool Manor

3. Westenhanger Castle curtailage

4. Westenhanger Castle

Figure 7: Heritage assets in the area

7.7 Tenterden High Street provides an example of the type of high street that could be desirable at the heart of Otterpool Park.

Figure 8: Tenterden High Street, Kent – example of character and place

7.8 Hythe and Folkestone are other examples of local character and place.

Figure 9: Hythe and Folkestone, Kent - examples of character and place

7.9 Ingress Park is a more recent example of what could be achieved at Otterpool park, optimising the use of existing heritage assets and creating new high quality development in Kent.

Figure 10: Ingress Park, Kent – example of character and placemaking

7.10 Farmsteads are a characteristic of the Kent landscape, such as the following typical examples:

Figure 11: Kent farmsteads – character and placemaking

7.11 Kent villages are also a source of inspiration for the masterplan process with three examples below:

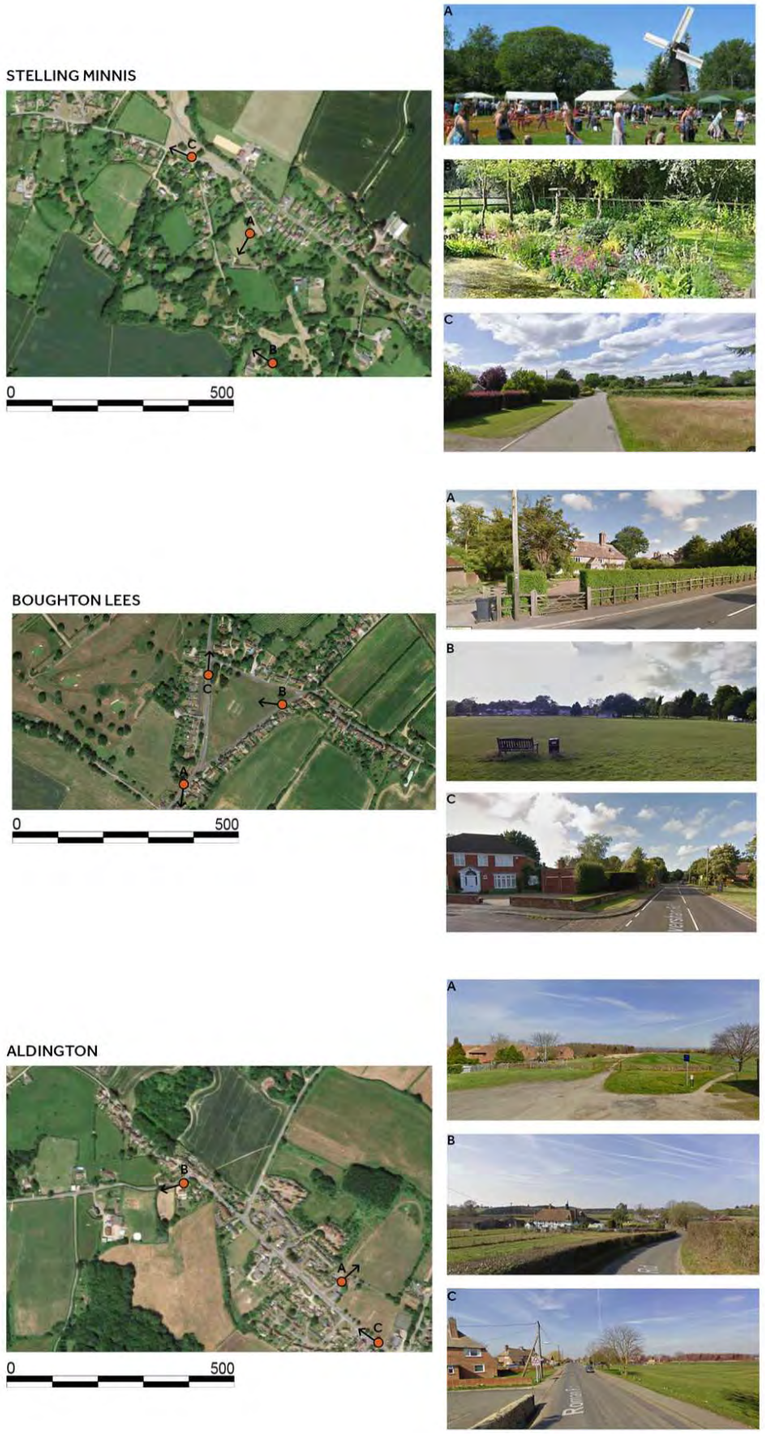


Figure 12: Kent villages

Best practice lessons nationally and globally

7.12 There are various examples within the UK and abroad which have been used to provide inspiration for the masterplan concepts for Otterpool Park, not least Letchworth Garden City, cited as the exemplar garden settlement which is a settlement of 14,000 homes. The image below shows the area of search boundary overlaid on to an aerial view of Letchworth Garden City:

Figure 13: Letchworth Garden City with Otterpool Park area of search overlay

7.13 As an alternative, Hammerby in Stockholm, Sweden is an exemplar garden settlement of similar scale to that proposed for Otterpool Park and fills less than half of the site area because of the higher density:

Figure 14: Hammerby, Stockholm with Otterpool Park area of search overlay

7.14 Figures 13 and 14 help assess the alternative density options for Otterpool Park. Advice from agents will be sought during the second stage of the masterplan. However, initial thinking suggests that a development of the type in Hammerby would not be appropriate for Otterpool Park. Higher density development is likely to be favoured in a principal centre location, with density reducing away from the main centre(s).

7.15 Poundbury in Dorset is often cited as an exemplar of integrating homes and employment. Poundbury consists of three main overlapping neighbourhoods around the town square with a completed link to the existing community. Each neighbourhood centre links to the other through direct radiating routes which contains the shops and facilities. Integrated uses including tenure blind affordable housing. Retail tends to sit along major routes at ground floor. Industrial and business units are typically along major routes but integrated into fabric.

Figure 15: Poundbury, Dorset

7.16 North West Bicester Ecotown is the largest true zero carbon housing development in the UK. Climate change adaptation and mitigation is built in to the masterplan. Key features include:

- All homes within 800m 10 mins walk of local centre with community services
- All homes within 400m 5 mins walk to bus stops with real time travel information in homes
- Creating communities with resilience and interdependency across all age groups
- Route networks giving priority to cycling and walking over cars
- Lifetime Homes silver with high speed broadband access to real time information and public transport
- Energy centres with CHP gas combined with PV solar to achieve true zero carbon code level 5
- Green infrastructure linked to the wider countryside
- Includes existing hedgerows and stream corridors, augmented with new habitat
- Streets are designed for people with extensive use of homezones
- Soil resources are reused
- Allotments and community farm created for local food production

Figure 16: North West Bicester Ecotown

7.17 Housing density is a key consideration and will affect the quantum of development, including numbers of homes achievable on the Otterpool Park site. The types of homes which would typically be considered within a traditional English garden town include the following:

Figure 17: Housing density options

7.18 At Otterpool Park, it is likely that the residential offering will go beyond houses to include apartments where appropriate, in particular in proximity to the principal centre and high street.

Technical and policy constraints and opportunities

7.19 Using the technical analysis completed and summarised in section 6 constraints maps have been used to assess the areas of the site suitable for development. There are a limited number of key areas of the site that will be essential to retain, many aspects which have the potential to be improved and new aspects which will need to be introduced to deliver the vision, aims and objectives for Otterpool Park.

7.20 The following figures illustrate the primary constraints to development:

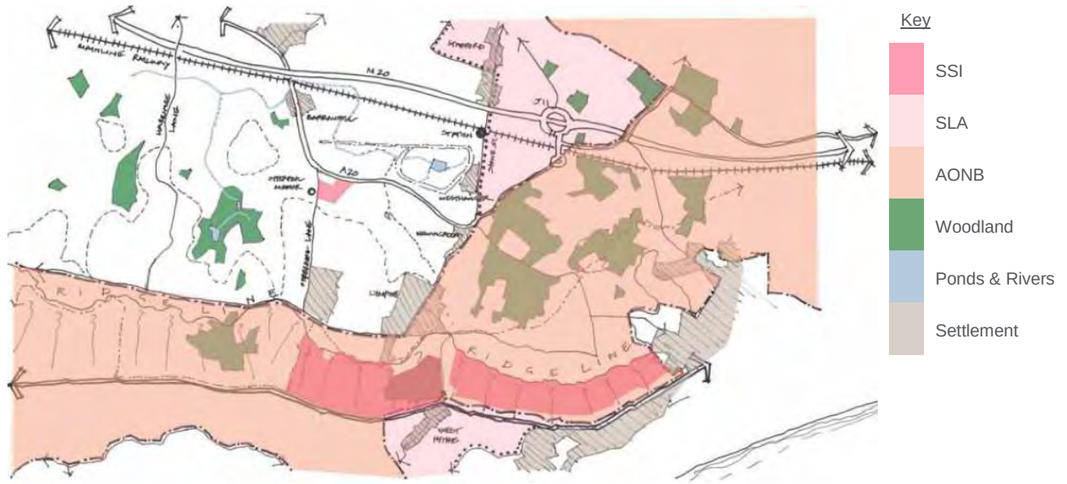


Figure 18: Landscape setting constraints

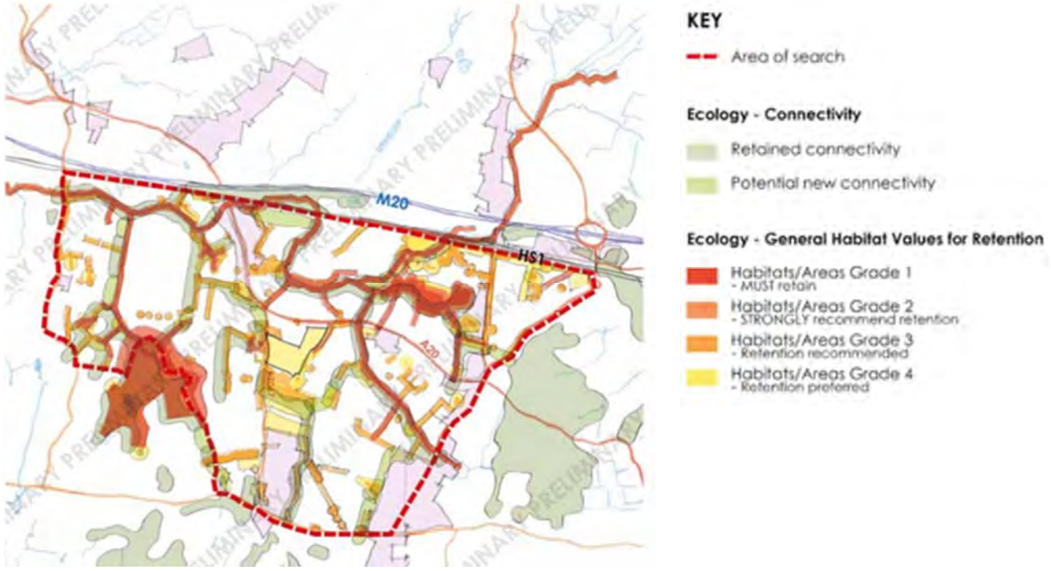


Figure 19: Green infrastructure and biodiversity constraints

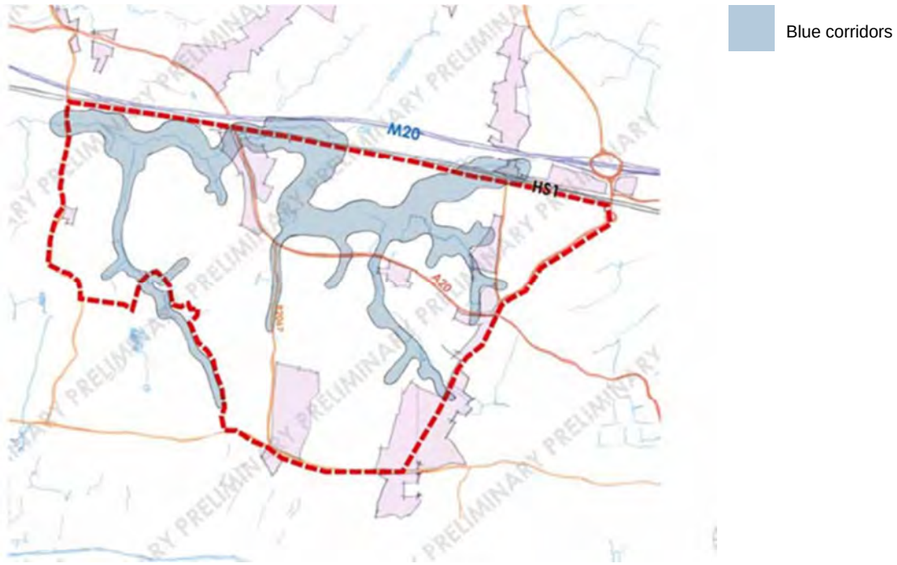


Figure 20: Water, flood risk and blue infrastructure constraints

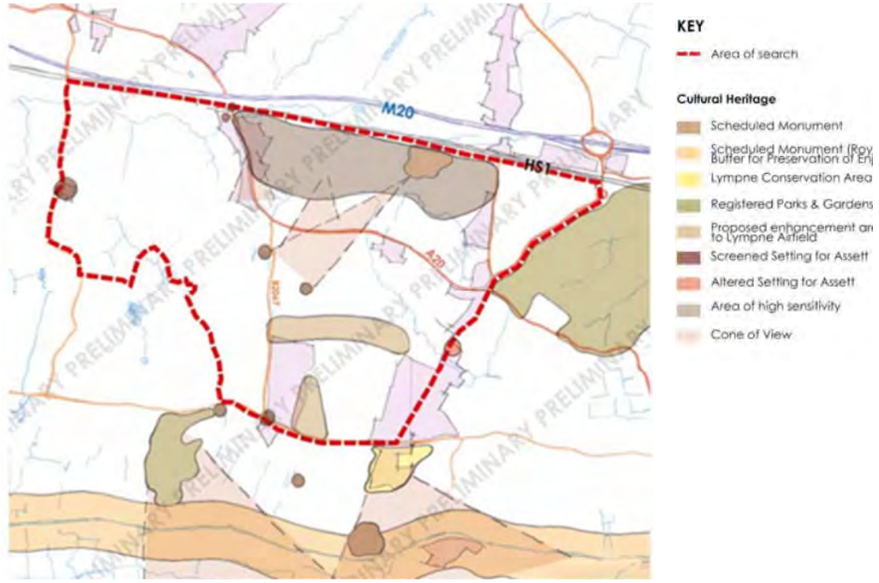


Figure 21: Heritage constraints

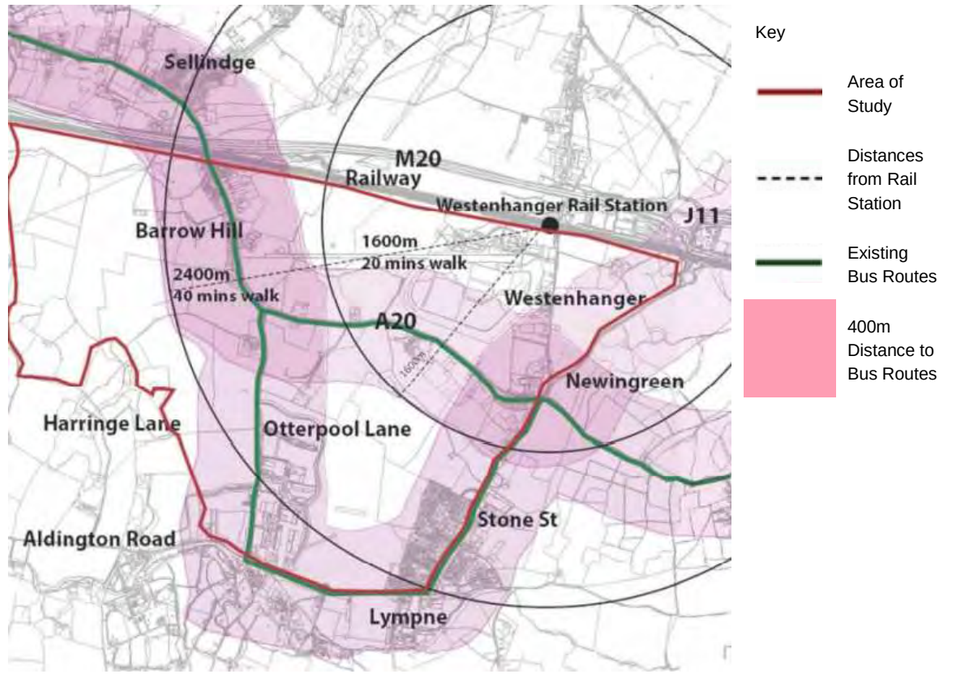


Figure 22 Access constraints

Masterplan concepts

7.21 A series of landscape-led masterplan concepts were created during Stage One which are described using the plans which follow.

L1: Landscape buffers

L2: Landscape ridges

L3: Landscape valleys

L4: Landscape connectivity

7.22 The concepts respond to the elements which are distinctive and special about the landscape on the Otterpool Park site:

- An area lying between the prominent North Downs escarpment and the old Saxon shore
- A pronounced orientation– singularly sloping to the Vale of Holmesdale, and a landform which is occasionally cut by north-south valleys
- Subtle topography belying its importance, where predominantly open landscape is intersected by river valleys
- Settlements, which surround old farmsteads, are linear, strung out along roads and lack a sense of focus
- Visible heritage, a strong historic time depth with large scale human intrusion (M20, high speed rail line, industrial park)

7.23 Landscape elements which are characteristics of the locality are:

- Local Greensand and Kentish Ragstone in the older buildings of Lympne, Aldington and Westenhanger
- Red brick in the farms and Victorian railway terraces of Barrow Hill and Sellindge
- Ash, hazel and field maple copses, with distinctive field and hedgerow oaks
- A few woodland blocks- at Harringe Brooks and Sandling Park
- Gappy, species poor, and tightly cut hedgerows
- Numerous small field corner ponds

7.24 Potential local sources of inspiration for the green infrastructure at Otterpool Park include:

Figure 23: Kent landscape resources

7.25 The Weald ancient woodland would provide an excellent starting point for the green infrastructure at Otterpool Park with potential to reintroduce forest within the landscape at Otterpool. During Stage Two, it is recommended that further work on the long-term management of Otterpool Park is undertaken to ensure that proposals for green infrastructure and other community facilities can be maintained long in to the future.

Figure 24: The Weald as inspiration for green infrastructure

CREATES LANDSCAPE BUFFERS BETWEEN EXISTING AND PROPOSED NEW SETTLEMENTS

PROS
- Separates existing homes from proposed development
- Some landscape in areas needed for habitat or flood mitigation

CONS
- More fragmented new development sharing of services is more challenging
- Separation increases distances travelled less walkable
- Some landscape not where needed for habitat or flood mitigation
- Some development in view from AONB and landscape is less effect for screening

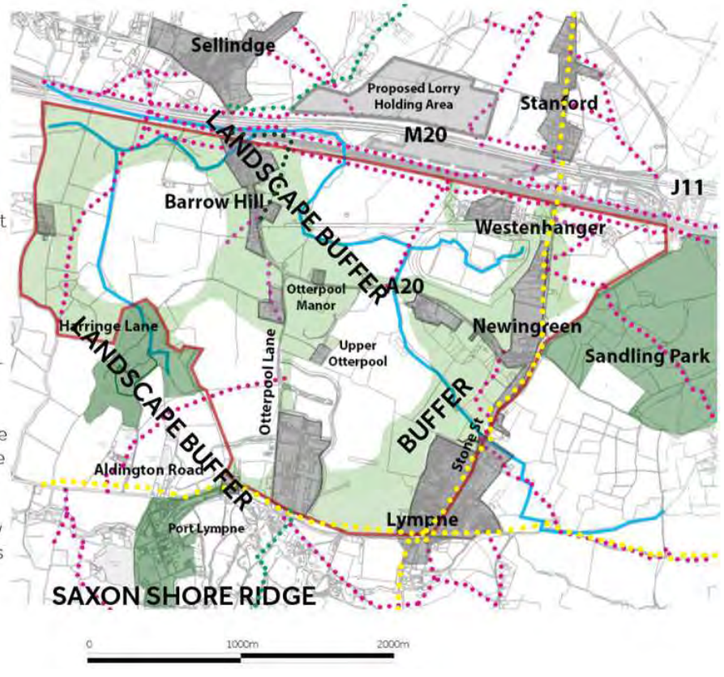


Figure 25: L1 Landscape buffers

CREATES LANDSCAPE ON HIGHER RIDGES AS SCREEN TO NEW SETTLEMENT SETTING FROM AONB TO NORTH.

PROS
- Screens some proposed development viewed from AONB
- Some landscape in areas needed for habitat mitigation
- Potential for large park in middle with Enhanced woodland landscape
- Less fragmented development
- Potential for varied character in settlements

CONS
- Development conflicts with areas needed for flood mitigation
- Less existing homes separated from proposed development

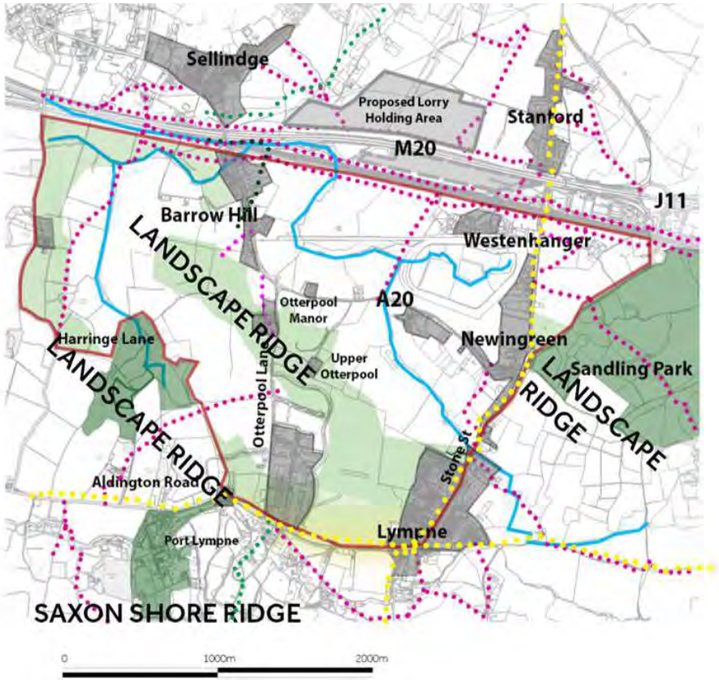


Figure 26: L2 Landscape ridges

CREATES NEW LANDSCAPE IN LOWER VALLEY AREAS WITH EXISTING STREAMS.

PROS
- Landscape in areas needed for flood mitigation.
- Potential for large park in middle of development

CONS
- More fragmented new development with sharing of services more challenging
- Separation increases travel distances discourages walkability
- Some landscape not where needed for habitat mitigation
- More development in view from AONB with landscape less effect for screening
- Less existing homes separated from proposed development

Figure 27: L3 Landscape valleys

CREATES LANDSCAPE CONNECTING LINKS BETWEEN NEW AND EXISTING URBAN AND RURAL PARKS, WOODS AND HERITAGE

PROS
- landscape in areas needed for flood and habitat mitigation.
- Potential for parks upper and lower development

CONS
- More fragmented new development with sharing of services more challenging
- Separation increases travel distances discourages walkability
- Some development in view from AONB with landscape less effect for screening
- Less existing homes separated from proposed development

Figure 28: L4 Landscape connectivity

7.26 The next step brought together two of the landscape-led masterplan concepts described above: L2 Landscape ridges and L4 Landscape connectivity to provide a large area of public green space across the ridge while providing connecting landscape for habitats, flood mitigation and heritage. This identifies potential additional landscape along higher ground, creating a new woodland on the ridge to screen development to the south west of the area of search.

7.27 The following figure shows, for the purpose of illustration only, an example of this combined landscape-led concept with walkable neighbourhoods with three centres: the main centre to the north east and two smaller local centres to the north west and south west.

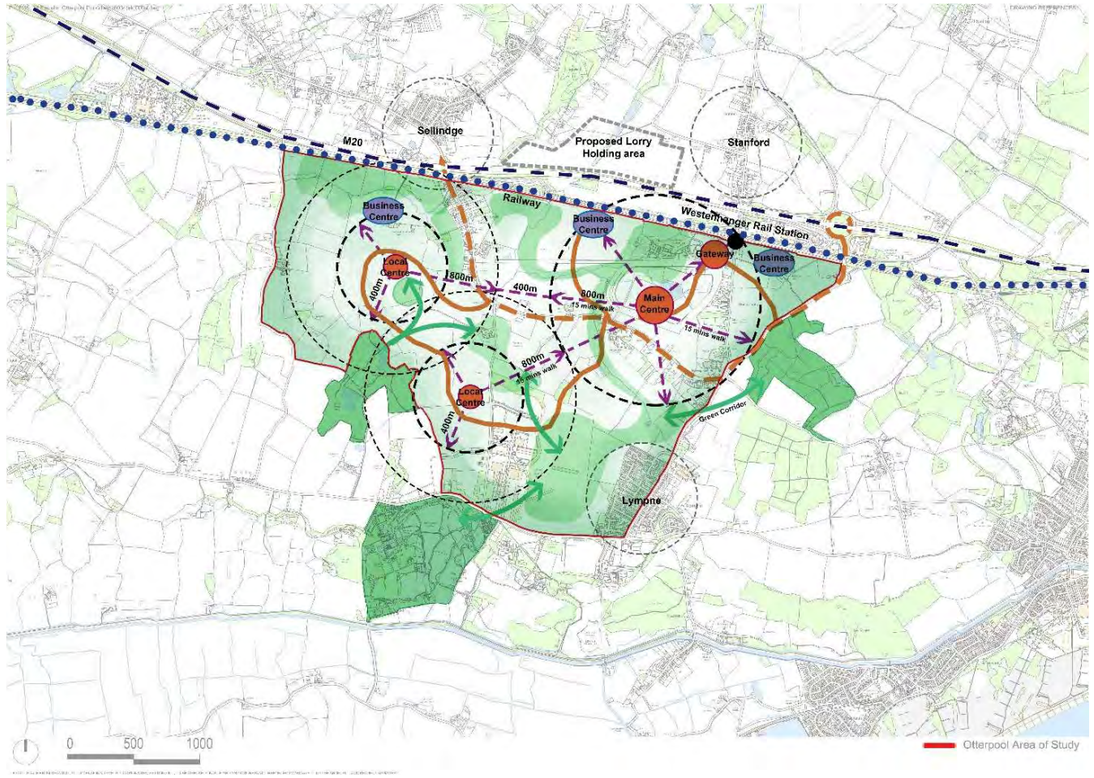


Figure 29: Most extended development combining landscape and walkable neighbourhoods

7.28 It is possible to remove one or both of the local centres as alternative scenarios. The advantages of developing the main centre with the local centre to the south west would be the greater separation with Sellindge and Barrow Hill from Otterpool Park with the commercial benefit of land under the control of SDC and Cozumel Estates.

7.29 The next step will be to agree a series of alternative masterplan concepts to be technically and financially evaluated during Stage Two.

8 Next steps for Otterpool Park Garden Town

8.1 The next stage of the Otterpool Park project will focus on the development of the framework masterplan. There are a number of key priorities for Stage Two:

- Commission market advice to inform the masterplan design and financial model
- Finalise the Planning Performance Agreement with the Local Planning Authority and commencement of formal pre-application meetings
- Assess education and health requirements for the development using analysis of existing provision, future plans and review of masterplan options
- Prepare development programme and phasing strategy based on assessment of the market capacity to deliver
- Continue testing the M20 Junction 11 capacity in consultation with the LPA, Kent County Council and Highways England.
- Engage in pre-planning developer services with utilities suppliers with the highest case for demand and load
- Scope and agree service required from Network Rail to commence business case process for enhancements at Westenhanger Station
- Commission report on title by legal advisors for all land within the masterplan options selected to ensure no restrictions on development
- Confirm technical survey requirements via formal change request process to Collaboration Board
- Prepare report on proposals for long-term stewardship and governance for Otterpool Park to ensure the masterplan is designed in a way which can be maintained in accordance with long-term plans

8.2 A Project Execution Plan will be submitted for approval by the Collaboration Board in advance of commencement of Stage Two.

APPENDIX A

Town & Country Planning Workstream Report

Planning Policies Relevant to Initial Feasibility Assessment of Otterpool Park New Settlement

Introduction

This note sets out the relevant planning policies that are currently applicable in Shepway District Council area and could be considered relevant to the emerging new garden settlement. At the outset a note of caution about the weight to be given to the policies set out below insofar as the new garden settlement is clearly a development that received no consideration (nor its implications) in the formulation of policies that currently constitute the Development Plan (and emerging Development Plan) in Shepway Council.

Having said that there are policies that relate to the constraints analysis that are relevant in that certain constraints have a degree of policy backing to them which is likely to be given weight by the planning authority during the masterplanning process for Otterpool Park.

The Development Plan

The Development Plan comprises the adopted 2013 Core Strategy and (with lesser weight being attached) certain saved policies of the approved 2006 District-Wide Local Plan. The Core Strategy provides strategic policies applying across the district as a whole. The Council is in the course of preparing the second element of the Development Plan – the Places and Policies Plan. The first draft of this Plan was consulted upon recently. Little weight can be attached to the policies in this emerging Plan because they have not progressed significantly along the consultation process nor been the subject of independent examination. Most relate to site specific allocations including one for eleven dwellings on the racecourse which Arena has commented on.

Currently (without reference to Otterpool Park) the Core Strategy housing policies can be generally regarded as 'up to date' although this could be qualified by the emergence of new housing requirements from 2014 to 2037 arising from the Council's SHMA process.

Current Relevant Development Plan Policies

For ease of reference the policies considered relevant are listed with their key topics mentioned. The detailed wording of the policies has been quoted in the various chapters of the initial feasibility assessment so are not reproduced here. They are on the Council's website in any event.

Core Strategy Policies

- DSD – delivering sustainable development
- SS1 – district spatial strategy
- SS3 – place shaping and sustainable settlement strategy
- SS5 – district infrastructure planning
- CSD4 – green infrastructure of natural networks, open spaces and recreation
- CSD5 – water and coastal environmental management in Shepway
- LR9 – open space protection and provision
- LR10 – provision of children's play space and development
- BE1 – standards expected for new development in terms of layout, design, materials etc
- BE2 – provision of new public art
- BE6 – safeguarding character of groups of historic buildings
- BE16 – requirement for comprehensive landscaping schemes
- BE17 – tree preservation orders and criteria for allowing protected trees to be removed
- U4 – protection of ground and surface water resources
- U10 – waste recycling and storage within development
- U10a – requirements for development on contaminated land
- U14 – criteria for assessment of development which encourage use of renewable sources of energy
- U15 – criteria to control outdoor light pollution
- TR2 – provision for buses in major developments
- TR5 – provision of facilities for cycling in new developments
- TR6 – provision of pedestrians in new developments
- TR13 – travel plans
- CO1 – countryside to be protected for its own sake
- CO4 – special landscape areas

2006 Local Plan Saved Policies (less weight)

- SD1 – sustainable development
- LR5 – Folkestone racecourse
- LR8 -rights of way
- LR9 – public open space
- LR10 – children's play space
- BE1 – built environment
- BE5 – listed buildings and their settings
- BE16 – existing landscape features
- BE17 – TPO trees
- E14 – renewable energy sources
- U15 – outdoor lighting
- TR2 – bus penetration in major developments
- TR5 – facilities for cyclists
- TR6 – provision for pedestrians
- TR11 – highway safety
- TR13 – travel plans
- CR4 – special landscape areas
- CO11 – impact on biodiversity
- CO13 – impact on fresh water environment

Where the above policies (particularly in the saved Local Plan) are not up to date or in accordance with the NPPF, more weight can be placed on NPPF policies as material considerations. Various sections of the NPPF are relevant (eg flood risk, heritage etc) and have been referred to in the first stage feasibility report.

Emerging Policies - 2016 (Places and Policies Plan (little or no weight)

- HB1 – quality places through development
- HB2 – Cohesive development
- C1 – creating a sense of place
- C3 – provision of open space
- C4 – formal play space provision
- C5 – local green space
- NE1 – enhancing the natural environment
- NE2 – biodiversity
- NE3 – protection of district landscapes and countryside
- CC1 – Reducing … on emissions
- CC2 – Sustainable construction
- CC3 – SUDS
- HE1 – heritage assets
- HE2 – archaeology
- ND9 – allocation of site for 11 dwellings at Folkestone Racecourse

APPENDIX B

Green Infrastructure & Biodiversity Workstream Report

The following figures and tables are found within this document

Figures

Biodiversity

Figure 1001 - Existing and proposed habitat connectivity V2.0;

Figure 1002 - General habitat values for retention - with labels V2.0;

Figure 1003 - General habitat values for retention - no labels V2.0;

Figure 1004 - Wider opportunities for connectivity enhancement V2.0.

Figure 1005 – Draft Japanese Knotweed found to date V1.0;

Figure 1007 – Draft Indicative Habitats and Photos v1.2

Figure 1008 – Draft areas for detailed habitat survey V1.1;

Figure 1009 – Draft Reptile habitat / survey areas v0.1;

Figure 1010 – Draft known Ponds and GCN Ponds and Buffers V0.1;

Figure 1011 – Draft Areas with dormouse potential / confirmed dormice presence – for Survey V0.1;

Figure 1012 – Draft Areas with water vole potential for survey v0.1.

Figure 1013 – Draft Indicative GI Baseline Plan v0.2

Figure 1016 - Designated sites within 10km of the Site v1.3;

Figure 1017 - Designated sites within 5km of the site v1.2;

Figure 1021 – Aerial Imagery of the Site v0.1

Figure 1022 – Location of the Otterpool site v0.1

Figure 1023 – Designated sites within 2km of the site V0.2

Landscape & Visual Impact

Figure 01 – Location & National Character Areas

Figure 02 – Landscape Character Areas – Kent County Council & Kent Downs AONB

Figure 03 – Landscape Related Planning Designations – within wider area (TBC)

Figure 04 – Landscape Related Planning Designations – within immediate area

Figures

Figure 05 – Preliminary Viewpoint Locations

Figure 06 – Landscape Character & Visual Amenity Constraints & Opportunities

Figure 07 – Location of Representative Viewpoints relating to schemes

Plate 2: Tranquillity Mapping for the Site and its surrounds,

Plate 3: Light Pollution Mapping for SDC

Plate 4: Light Pollution Mapping for the site and its surrounds

Green Infrastructure

Plate 5: Extract from SDC Core Strategy Local Plan 2013 – Green Infrastructure Network

UA008926-1502-02 Site Topography Sketch

UA008926-1503-03 Green and Blue Infrastructure Opportunities - Combined

UA008926-1504-01 Green and Blue Infrastructure Opportunities - Ecology

UA008926-1508-01 Local Context Plan

Tables

Green Infrastructure

Table 1: Assets and Functions, Habitats and Biodiversity

Table 2: Garden Settlements Design Principles, Original and Evolving

Otterpool Park Masterplan

Stage 1 Feasibility and Capacity Study

Workstream Name: Green Infrastructure & Biodiversity

Date: 30-11-2016

This workstream includes the following topics of:

- Biodiversity
- Landscape & Visual Impact Assessment
- Green Infrastructure

Whilst bringing these three topics together into the same workstream has led to the closer sharing of information and the preparation of more collaborative responses to the opportunities and constraints of the site, the Stage 1 findings of each are sufficiently complex now that separate sections are necessary.

As such this document sets out separately the *Methodology*, *Baseline Information*, *Policy Context*, *Stakeholder Engagement*, *Constraints*, *Opportunities*, *Impacts on Masterplan Design* and *Changes to the Risk Register* for each.

A concluding paragraph, and the setting out of the *Next Steps*, at the end of this report draws the three topics back together, and describes how they will collaboratively be taken forward into the next stage.

Throughout this study the current area of land that has been assessed for its feasibility and capacity for development of this nature and scale is referred to, for ease of writing, as the 'site'. Upon the majority of figures it is given the proper title of the 'Area of Search'.

Biodiversity

The Stage 1 Preliminary Findings are to be read alongside the following accompanying plans:

- Figure 1001 - Existing and proposed habitat connectivity V2.0;
- Figure 1002 - General habitat values for retention - with labels V2.0;
- Figure 1003 - General habitat values for retention - no labels V2.0;
- Figure 1004 - Wider opportunities for connectivity enhancement V2.0.
- Figure 1005 – Draft Japanese Knotweed found to date V1.0;
- Figure 1007 – Draft Indicative Habitats and Photos v1.2
- Figure 1008 – Draft areas for detailed habitat survey V1.1;
- Figure 1009 – Draft Reptile habitat / survey areas v0.1;
- Figure 1010 – Draft known Ponds and GCN Ponds and Buffers V0.1;
- Figure 1011 – Draft Areas with dormouse potential / confirmed dormice presence – for Survey V0.1;
- Figure 1012 – Draft Areas with water vole potential for survey v0.1.
- Figure 1013 – Draft Indicative GI Baseline Plan v0.2
- Figure 1016 - Designated sites within 10km of the Site v1.3;
- Figure 1017 - Designated sites within 5km of the site v1.2;
- Figure 1021 – Aerial Imagery of the Site v0.1
- Figure 1022 – Location of the Otterpool site v0.1
- Figure 1023 – Designated sites within 2km of the site V0.2

Please note that these are liable to be modified as survey data is obtained.

1. Stage 1 Methodology

Desk study / gap analysis

A desk study has been conducted to review existing ecological information relating to the Otterpool Park Search Area referred to as the "Site". This has included an assessment of existing data (listed below in section 2). As a component of this, a 'gap analysis' has been conducted to identify where further information is required.

The location of the Otterpool Site as assessed and Aerial imagery is presented in the following documents:

- Figure 1021 – Aerial Imagery of the Site v0.1
- Figure 1022 – Location of the Otterpool site v0.1

Walkover / constraint identification

An initial walkover survey was conducted on the 4th, 5th and 6th October 2016 by Arcadis Ecologists Brandon Murray and Guy Stone. This walkover identified key habitats on site and potential for protected species where appropriate. N.B. The walkover was an initial assessment and all findings should be considered provisional. A further visit was undertaken on the 25th of October by Arcadis ecologists Brandon Murray and Martina Girvan to access previously unassessed areas and to confirm the initial risk ratings with regards to Masterplan design.

An overview of the Habitat types and Green Infrastructure they support is presented in the following figures:

- Figure 1007 – Draft Indicative Habitats and Photos v1.2
- Figure 1013 – Draft Indicative GI Baseline Plan v0.2

It should be noted that these maps are a high level assessment only and do not constitute a full 'Phase 1' map. Some areas could not be accessed and were mapped from aerial imagery only.

Constraints and opportunities mapping

The combined data obtained from the desk study and walkover survey have been used to make assessments as to the constraints and opportunities to inform the Masterplan initial design. These were provided as .pdf maps by the biodiversity team and are shown as the following plans:

Key constraints and opportunities are presented on the following figures:

- Figure 1001 - Existing and proposed habitat connectivity V2.0;
- Figure 1002 - General habitat values for retention - with labels V2.0;
- Figure 1003 - General habitat values for retention - no labels V2.0;

- Figure 1004 - Wider opportunities for connectivity enhancement V2.1;

These have been rendered by the landscape team into a combined constraints drawing, along with other landscape and cultural heritage constraints. This drawing is referred to as drawing 1504-01 Green and Blue Infrastructure Opportunities.

2. Baseline Data

The existing data reviewed and additional data collected to date includes:

- Data collected during Arcadis walkover 4/5/6th and 25th October 2016;
- Shepway District Council, Folkestone Kent, Extended Phase 1 Habitat Survey Ecology Report (WYG) July 2016;
- Publically available data from "Magic" http://magic.defra.gov.uk/ the Natural England managed database and https://data.gov.uk/dataset/ the UK Government dataset
- Biological records centre data from Kent and Medway Biological Records Centre obtained for the WYG Report 24th May 2016;
- M20 Lorry Area Stanford West Interim Environmental Assessment Report (Highways England) August 2016;
- Planning reporting for the Harringe Brooks Wind Park (Ecotricity) April 2012;
- Planning reporting for Link Park Phase 2 (Peter Brett) August 2015;
- Ecology Report – Lympne, Former Lympne Airfield – Proposed Housing Development (CSa) January 2013; and
- Ecological Appraisal, Folkestone Racecourse, Kent, Waterman Energy, Environment & Design Limited, September 2010.

3. Policy Context

The following key policies have been identified with regards to the scheme. It is likely that additional relevant policy will be highlighted during consultee liaison.

Key policies relating to the masterplan design are:

- The National Planning Policy Framework (NPPF 2012) sets out how the planning system should protect and enhance nature conservation interests. Section 11 is concerned with conserving and enhancing the natural environment. The NPPF states that *'planning policies should promote the protection of priority species populations linked to national and local targets'*. The NPPF also states *'The planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes….and minimising impacts on biodiversity and providing net gains in biodiversity*'.
- ODPM Circular 06/2005 states that the presence of protected species is a material consideration in the planning process.
- The 'Locally-Led Garden Villages, Towns and Cities' policy document by the Department for Communities and Local Government (March 2016) has also been reviewed
- Shepway District Council's Local Plan / Core Strategy includes:
  - Policy CSD4 – 'Green Infrastructure of Natural Networks, Open Spaces and Recreation' which covers biodiversity as follows:
    - *Improvements in green infrastructure (GI) assets in the district will be actively encouraged as will an increase in the quantity of GI delivered by Shepway District Council working with partners and developers in and around the sub-region, including through pursuing opportunities to achieve net gains in biodiversity, and positive management of areas of high landscape quality or high coastal/recreational potential.*
    - *Green infrastructure will be protected and enhanced and the loss of GI uses will not be allowed, other than where demonstrated to be in full accordance with national policy, or a significant quantitative or qualitative net GI benefit is realised or it is clearly demonstrated that the aims of this strategy are furthered and outweigh its impact on GI. Moreover:*
      - *Development must avoid a net loss of biodiversity.*
      - *The highest level of protection in accordance with statutory requirements will be given to protecting the integrity of sites of international nature conservation importance.*
      - *A high level of protection will be given to nationally designated sites (SSSI and Ancient Woodland) where development will avoid any significant impact.*
      - *Appropriate and proportionate protection will be given to habitats that support higher-level designations, and sub-national and locally designated wildlife/geological sites (including Kent BAP habitats, and other sites of nature conservation interest).*
  - Policy CO1 The District Planning Authority will protect the countryside for its own sake. Subject to other Plan policies, development in the countryside will be permitted where proposals:
    - Maintain or enhance features of landscape, wildlife, historic, geological and agricultural importance, and the particular quality and character of the countryside;
    - Development proposals that would significantly conflict with…*the* criteria will only be permitted where it can be shown that:
      - i) there is an overriding social or economic need;
      - ii) negative impacts are minimised as far as possible and; i
      - ii) adequate measures will be taken to compensate for any the adverse environmental effect. Compensatory measures should, as a minimum, ensure that no net environmental loss occurs. Note: For the purposes of Policy CO1, the Countryside is defined as the area outside of the settlement boundaries identified on the proposals map. Where land in the countryside is allocated on the proposals map for a specific development purpose, the associated policy will take precedence over Policy CO1.
  - Policy CO11 The District Planning Authority will not give permission for development if it is likely to endanger plant or animal life (or its habitat) protected under law and/or identified as a UK Biodiversity Action Plan priority species or cause the loss of, or damage to, habitats and landscape features of importance for nature conservation, unless; there is a need for development which outweighs these nature conservation considerations and measures will be taken to minimise impacts and fully compensate for remaining adverse effects.
  - POLICY CO13 Development proposals likely to have a harmful effect on the freshwater environment, including water courses, natural ponds, canals and sewers and adjoining banks, will only be permitted where harmful impact will be minimal, and where benefit in the form of increased access and / or water based recreation outweigh the negative effects. In such cases, measures should be taken to minimise impacts and fully compensate for remaining adverse effects.
- The Natural Environment and Rural Communities (NERC) Act 2006 places a duty upon public bodies to consider Section 41 lists flora, fauna and habitats (previously UK BAP habitats and species) as a material consideration in planning and to consider enhancement of biodiversity.
- Biodiversity 2020: A strategy for England's Wildlife and Ecosystem Services (**Error! Reference source not found.**) includes a list of Habitats of Principal Importance in England (HPIEs) and Species of Principal Importance in England (SPIEs). These were previously included as Priority Habitats and Priority Species in the UK BAP.
- BS 42020:2013 - Biodiversity. Code of practice for planning and development states that all developments should follow the mitigation hierarchy.

4. Stakeholder Engagement and Feedback

The following actions have been taken to instigate engagement with Stakeholders:

- Kent County Council (KCC) was contacted via email to obtain the details of a Biodiversity Officer on 11/10/2016 with a follow up call on 19/10/2016 and 20/10/2016. Arcadis was informed on 20/10/2016 that Nathan Coughlan would be in contact to discuss the project and that that commission would necessarily also be on behalf of Shepway District Council who have a standing relation with KCC to provide biodiversity advice. Arrangements for Arcadis to contact KCC are currently being arranged by Julia Wallace.

- Deanne Morgan and Julia Wallace of Shepway District Council have contacted Marian Ashdown and Julia Coneybeer of Natural England (NE) to arrange a meeting. A DAS (Discretionary Advice Service) request form has been completed and submitted to NE. The meeting is scheduled to occur during W/C 28/11/2016.

- A meeting between Arcadis (biodiversity and water team representatives Brandon Murray, Principal Ecologist and Renuka Gunasekara, Technical Director of the Integrated Water Team) and the Environment Agency (EA) (Ghada Mitri, Planning Advisor) and Kent County Council (KCC) (Joseph Williamson, Flood Risk Project Officer) was held on 14/11/2016. Joseph Williamson's input was related to drainage only, no comment on biodiversity was made. The following key information relating to biodiversity was communicated:
    - All communications with the Environment Agency are to be handled by Ghada Mitri who will forward to the correct department / individual;
    - For all queries which are for data or data sets which the EA hold, this information is free;
    - The East Stour (and any buffers, inputs modifications etc.) are the responsibility of the EA and KCC are responsible for all other water courses (ditches etc.);
    - Main rivers must have a minimum (but likely to be much larger) 8m buffer from the bank top;
    - All other drainage features require a 4m buffer from the bank top, but again is likely to be much larger dependent upon the habitats and species present;
    - No culverting will be permitted, all river crossings of the main river must be via clear span bridges;
    - All impacts to riparian margin vegetation and habitat must be justified and mitigated.
    - Otter have been recorded in the Great Stour, to which the East Stour flows approximately 9km to the west of the Site and any scheme must allow for the potential for this species to be present in the area and/or use the East Stour in the future. Future proofing of the design will be expected;
    - All minimum buffer widths from water courses must be justified with survey data;
    - All non-native invasive species must be addressed (and replaced with natives where possible).
    - Use of non-native species within any planting schemes will be discouraged by KCC and the EA.

5. Constraints

Biodiversity is likely to pose constraints to the master planning of the development.

Character areas priority for retention are:

- Three critically important areas for biodiversity identified to date:
    - East Stour River corridors;
    - The pond/lake and its surrounds within the racecourse which link to the East Stour River Corridor; and
    - Harringe Brooks Ancient Woodland and its surrounds.

These areas are identified as 'Habitat Areas Grade 1' on the maps provided with this document. Other valuable or notable habitats and areas are also identified within these maps. Many areas have high biodiversity value and should be avoided or buffered within the masterplan design, including water features (ponds and streams), trees, hedgerows and woodlands.

Habitat categories priority for retention are, in summary:

- Habitats/Areas Grade 1 – MUST* retain – contain habitats of irreplaceable or high value or support multiple notable / protected species;
- Habitats/Areas Grade 2 – STRONGLY* recommend retention (contain habitats of high value or support notable / protected species);
- Habitats/Areas Grade 3 - Retention recommended* (contain or buffer habitats of high value or support notable / protected species); and
- Habitats/Areas Grade 4 - Retention preferred/known constraints* (contain or buffer habitats of value or are known to or likely to support notable / protected species)

*N.B. This is an initial assessment for masterplan design purposes. As further surveys are conducted and more information is gathered regarding the site, including stakeholder liaison; areas may be added to these categories or moved within the categorisations. Conversely, following liaison with the wider design team it may be possible to develop areas that are currently listed as Grade 1 and 2 with iterative mitigation through design. These categories are an initial approach to aid communication and minimise risk. These findings are summarised on the following maps provided as appendices to this document:

- Figure 1001 - Existing and proposed habitat connectivity V2.0;
- Figure 1002 - General habitat values for retention - with labels V2.0;
- Figure 1003 - General habitat values for retention - no labels V2.0;
- Figure 1004 - Wider opportunities for connectivity enhancement V2.1.

In terms of masterplan design, there are valuable or protected / notable habitats and species on site that although are not likely to prevent the iteration of the masterplan will require mitigation and that mitigation will either need to be incorporated into the masterplan or re-provisioned off site. This will also require consultee liaison. The following features, habitats and species which will need mitigation (if to be impacted) have been identified below, please note further dedicated surveys may produce additional constraint information:

Designated sites priority for retention or with the potential for indirect effects are:*

*NB although multiple additional sites are present within the Zone of Influence of the Site these are the most likely to affect masterplan design:

- A Site of Special Scientific Interest (SSSI) Otterpool Quarry is located in the centre of the site, however this is not designated for its ecological value (it is of geological interest) and constraints around this site will be pursued by NE and the geological work stream);
- A Local Wildlife Site and Ancient Woodland, Harringe Brooks Wood is located immediately to the west of the site to maintain functionality a buffer will be required;
- Dungeness, Romney Marsh and Rye Bay SAC, SPA, Ramsar and SSSI, located c.8km from the site. Some features of the site may be considered functionally linked to this designated area and that will be discussed with NE as to the constraints imposed around the pond/lake which may be supporting these features;
- Folks Wood Local Wildlife Site is located c.250m to the east of the site, and indirect effects will be considered;
- The North Kent Downs AONB is located immediately to the east and south of the site, this element of constraint will be managed by the landscape part of the team; and
- Lympne Escarpment SSSI is located c.250m from the southern boundary of the site but due to the topography of the area and lack of hydrological connection it is unlikely that this will present a constraint to the masterplan, but this will be confirmed through additional work.

Designated sites within the potential zone of influence of the Otterpool Site are presented on the following plans:

- Figure 1016 - Designated sites within 10km of the Site v1.3;
- Figure 1017 - Designated sites within 5km of the site v1.2.
- Figure 1023 – Designated sites within 2km of the site V0.2

Notable Habitats (essential for function of natural capital services and for the wider landscape and which may contain protected fauna and flora) and their indicative areas include*:

- Hedgerows of varying quality, some containing mature trees (approximately 10km of hedgerows identified on the accessed areas of the site);
- Ponds (approximately 30 ponds on site, with approximately a further 10 ponds adjacent to the site);
- Grasslands, including semi-improved (SI) grassland (approximately 220ha of improved grassland and 70ha of SI grassland identified to date);
- Woodlands, including one ancient woodland immediately adjacent to the site (approximately 20ha of woodland identified on site);
- Trees (a large number (many hundreds) of individual trees are present within the site, some of which may qualify as veteran trees);
- Arable land (approximately 270ha of arable land are present on the site);
- Scrub (some significant areas identified including areas associated with the East Stour); and
- Riparian habitat: rivers, ditches and streams (approximately 14km of rivers, streams and ditches identified on site).

*With the exception of trees and scrub, areas, lengths and numbers of these habitats have been approximated from aerial mapping and should not be considered as accurate measurements but are presented for illustrative purposes only.

Notable and Protected Species supported by the Site include:

- Bats (roosts present on site, identified during previous surveys, multiple habitats and roosting features on site, including trees and buildings);
- Water voles (present on site around the racecourse lake, found during walkover and during previous surveys for other schemes);
- Badgers (main setts present on site, other setts found across the site during the walkover and recorded in previous surveys);
- Great created newts (present on site in a minimum of four ponds, recorded during previous surveys and within data search);
- Hazel dormice (present adjacent to the site within Harringe Brooks Wood, with suitable habitat on site);
- Reptiles (recorded on site during walkover and recorded in areas across the site in previous surveys and in the data search);
- Wintering and Breeding Birds (qualifying species of the Romney Marsh & Rye Bay SPA confirmed to be using the site in the data search, other species including owls, Kingfishers and farmland birds likely to be on site)*;
- Otter (confirmed as present in Great Stour which is approximately 9km from the site), they are unlikely to be present within the search area but are important considerations for future potential re-colonisation);
- BAP (S41) species including hedgehogs and brown hares (suitable habitat on site and recorded on data search;
- Notable plants (no protected or notable plants have been recorded to date but species including orchids and Bluebells were recorded within the data search results); and
- Invertebrates (suitable habitats on site, but no records of protected or notable invertebrates have been returned to date).

* One wintering bird scoping survey has been completed to date, on 15th and 16th November 2016.

Areas of habitat identified as likely to be important for certain protected species have been mapped where possible.

Habitats maintaining or supporting protected species are presented on the following plans:

- Figure 1008 – Draft areas for detailed habitat survey V1.1 (i.e. could support notable plants);
- Figure 1009 – Draft Reptile habitat / survey areas v0.1;
- Figure 1010 – Draft known Ponds and GCN Ponds and Buffers V0.1;
- Figure 1011 – Draft Areas with dormouse potential / confirmed dormice presence – for Survey V0.1;
- Figure 1012 – Draft Areas with water vole potential for survey v0.1.

Non-native invasive plants (listed on Schedule 9 of the Wildlife and Countryside Act and cannot be cause to grow or spread) found during the walkover survey, are (although a dedicated non-native invasive species survey has not yet been completed):

- Japanese knotweed*;
- Virginia creeper;
- New Zealand stonecrop (*Crassula Helmsii*); and
- Parrots Feather.

**Japanese knotweed found to date has been mapped and is presented on the following plan:*

- Figure 1005 – Draft Japanese Knotweed found to date V1.0.

Mitigation areas for Species relocation and translocation will be required either within the masterplan area or as offsetting

Habitat areas will need to be identified within the masterplan for the maintenance and/or translocation of populations of species, including reptiles and Great crested newts (which have been used as an initial guide as to the area likely to be required to support or maintain these populations). The actual size of the area required will depend upon the population density of the species identified within the detailed surveys and the exact details of the development. However, high level calculations suggest that this retained or created mitigation area may need to be in the region of 70 – 100ha of wildlife habitat suitable for a range of species, including Great crested newts and reptiles (although this habitat will need to be designed to support other species, including birds, plants and invertebrates). Within these areas habitat quality could be maximised to increase the carrying capacity for target species to potentially reduce the area required, this can be calculated when the surveys are completed.

It will likely be necessary to prepare the receptor / mitigation area ahead of the construction phase in order to allow establishment of the target habitat types. This should be considered within the preparation / construction timetable of the development.

Habitats Regulations Assessment (HRA) requirements

The large pond/lake and its surrounds supports wintering birds that are qualifying species of the SPA located c.8km away (five species as confirmed by analysis of available data). An HRA will be required to demonstrate that the areas is not functionally linked land to that SPA, i.e. the qualifying features of the SPA do not require the pond/lake area and its surrounds to maintain their population. We have scheduled the necessary wintering bird surveys and meeting with NE to confirm their opinions and to support our assertions for the HRA, (i.e. that the land is not functionally linked). Survey results and mitigation would be incorporated into a project specific Habitats Regulations Assessment, mitigation may include certain areas of habitat retention and noise mitigation during construction and operation. Some collision risk assessments may also be required.

6. Opportunities

There are opportunities to safeguard and enhance the biodiversity value of the site within the masterplan design and to utilise the biodiversity on the site to maximise the value of the development.

Opportunities are summarised below to:

- Improve ecological connectivity within the site. Opportunities to increase connectivity through hedgerow improvement and connectivity across barriers to dispersal such as main roads;
- Improve the site by removing invasive plants;
- Improve functionality through design of what is now agricultural land and improved grassland with regards to natural capital and biodiversity. This could include:
    - improvement of defunct hedgerows and field / habitat margins;
    - improvement of the biodiversity value of the retained areas that are currently improved grassland and agricultural land within the site;
    - increase the variety of habitats present; and
    - improve wider connectivity to off-site areas. Potential to include green bridges, improved and new culverts and crossings to improve ecological connectivity through the site and between off site habitats.
- Utilise valuable tree stock. The trees on site should be retained where possible. The extensive tree stock on site is a valuable GI asset and if retained will improve the quality of the development. Maintenance of the tree stock will also reduce provisioning costs.
- Create a multi-use SANGS area (suitable accessible natural greenspace). This could provide a recreational facility for local communities (which would reduce recreational pressure on other areas) and also integrate a valuable wildlife habitat within the development.

There are also opportunities to further enhance the GI functionality of the features on site and create features with GI functionality as a component of the works. These are described in the GI table produced to date, referred to as: 'Green and Blue Infrastructure – Assets and Functions, Habitats and Biodiversity'

Green Infrastructure opportunities are summarised on the following maps disseminated with this document:

- Figure 1001 - Existing and proposed habitat connectivity V2.0.
- Figure 1004 - Wider opportunities for connectivity enhancement V2.0.

The potential functions and services provided by retained and created GI features are discussed more fully in the GI specific section of this assessment.

7. Impact on Masterplan Design

The mapping listed in sections 5 & 6 above shows the key impacts upon masterplan design from the information obtained to date. In summary, it is considered at this stage that the following design rules should be implemented to inform the masterplan design:

- The ancient woodland will require a minimum of 100m buffer to minimise impacts (this would be confirmed with statutory consultee liaison);
- Retained areas of the East River Stour and 'dark corridors' will require a minimum 25m buffer from development (this would be confirmed with statutory consultee liaison);
- The detailed development around the pond/ lake area will require liaison with statutory consultees to iterate, for present discussions a minimum of a 100m buffer should be considered;
- Retained hedgerows not identified as dark corridors are to have a minimum of a 5m buffer area (this may be extended around particular trees to be confirmed by subsequent Arboricultural Survey);
- A 25m buffer around woodlands is recommended (this may be extended around particular trees to be confirmed by subsequent Arboricultural Survey);
- Areas for provisioning land / mitigation planting and habitat will need to be identified, either on site or off site, of a suitable size and condition to mitigate for the habitats to be lost (this would be confirmed during survey and impact assessment and with statutory consultee liaison);
- No culverting of the East Stour will be permitted which may impact the masterplan design;
- Impacts to areas likely to support protected or notable habitats and species should be limited to minimise the need for mitigation and compensation.

8. Changes to Risk Register

Risk register remains largely as provided on 12/10/2016. Key risks are shown in the table below, new risks shown in the bottom two rows of the table.

Date Raised	Work Stream and Risk Owner	Risk Description	Programme Impact	Probability (1-5)	Impact (1-5)	Rating (IxP)	Risk Rating	Mitigation	Status
31/08/2016	GI+Biodiversity (BH)	Lack of early engagement with SDC planning officers, KCC planning officer, NE, EA, AONB unit, Ashford BC planning officers etc. to discuss landscape character and visual context	Risk to robustness of the Baseline Assessment in Stage 1	3	5	15	High	Client agrees to early engagement with such stakeholders. Client agrees to incur costs necessary to bring consultees on board early in program.	EA and NE approached and formal engagement has commenced. Approach to KCC yet to be approved.
12/10/2016	GI+Biodiversity (BM)	In combination impacts of the lorry park proposals	Risk to appropriateness of mitigation	3	3	9	Medium	Analyse in combination impacts of lorry park and Otterpool development	Lorry park application has been examined, Impact Assessment will need to include these in combination impacts
12/10/2016	GI+Biodiversity (BM)	NE opposing development due to perceived impacts to SPA (functionally linked habitats present – on site pond)	Waiting until next winter season to complete surveys and determine mitigation	2	3	6	Low	Surveys in winter 2016 - 2017 are ongoing.	Visits in November and December, program to extend until March 2017.
12/10/2016	GI+Biodiversity (BM)	Redesign costs if GI and biodiversity not considered early	Large environmental impact or increase in mitigation costs. Unnecessary environmental impacts.	3	4	12	Medium	Consultation and integration between GI team and Farrells.	Comments on masterplan have been provided by GI and biodiversity team.
12/10/2016	GI+Biodiversity (BM)	Species surveys not conducted in optimum period	Delay to submission of ES as extra information requested.	2	3	6	Low	Liaison with local authority and stakeholders. Robust surveys conducted	Initial scoping for surveys completed. Liaison with NE required to finalise scope.
12/10/2016	GI+Biodiversity (BM)	Presence of protected species impacting the viability of certain proposals. Key species listed below.	Delays, increase in costs etc.	5	3	15	High	Robust surveys and sensible mitigation. Joined up approach to mitigation	See each specific species and group below.
12/10/2016	GI+Biodiversity (BM)	Presence of Hazel Dormice confirmed in Harringe Brooks wood	Limits options in areas supporting dormice, requires mitigation, cost etc.	5	2	10	Medium	Full surveys across site in 2016 / 2017. Design masterplan to limit impacts	Surveys not yet commenced.
12/10/2016	GI+Biodiversity (BM)	Presence of water voles confirmed on site	Limits options in areas supporting water voles requires	5	3	15	High	Full surveys across site in 2016 / 2017. Design	Surveys not yet commenced.

Date Raised	Work Stream and Risk Owner	Risk Description	Programme Impact	Probability (1-5)	Impact (1-5)	Rating (IxP)	Risk Rating	Mitigation	Status
			mitigation, cost etc.					masterplan to limit impacts	
12/10/2016	GI+Biodiversity (BM)	Presence of reptiles confirmed on site	Requirements for mitigation, possibly translocation, cost etc.	5	2	10	Medium	Requires surveys and suitable mitigation. Suitable receptor area will be required which will need to be accommodated within the masterplan	Surveys not yet commenced.
12/10/2016	GI+Biodiversity (BM)	Bat roosts on site, site support valuable habitats	Survey costs, costs of mitigation, requirement for commuting routes to be retained	5	2	10	Medium	Full surveys in 2017 – mitigation to be determined once surveys are completed	Surveys not yet commenced.
12/10/2016	GI+Biodiversity (BM)	Great crested newt populations on site – confirmed	Requirements for mitigation, possibly translocation, NE licence, delays cost etc.	5	3	15	High	Requires surveys and suitable mitigation. Suitable receptor area will be required which will need to be accommodated within the masterplan	Surveys not yet commenced.
12/10/2016	GI+Biodiversity (BM)	Birds on site, breeding and wintering. Barn owls, kingfishers and water fowl key receptors.	Need to accommodate habitats and features within masterplan	4	2	8	Medium	Surveys in winter 2016 - 2017 are ongoing.	Wintering bird surveys are ongoing. Breeding bird surveys not yet commenced.
12/10/2016	GI+Biodiversity (BM)	Badgers on site. Three main setts found to date, records of setts across site in	Need to accommodate habitats and features within masterplan. Licence to close setts likely required.	5	2	10	Medium	Full survey winter 2016	Specific surveys not yet commenced.

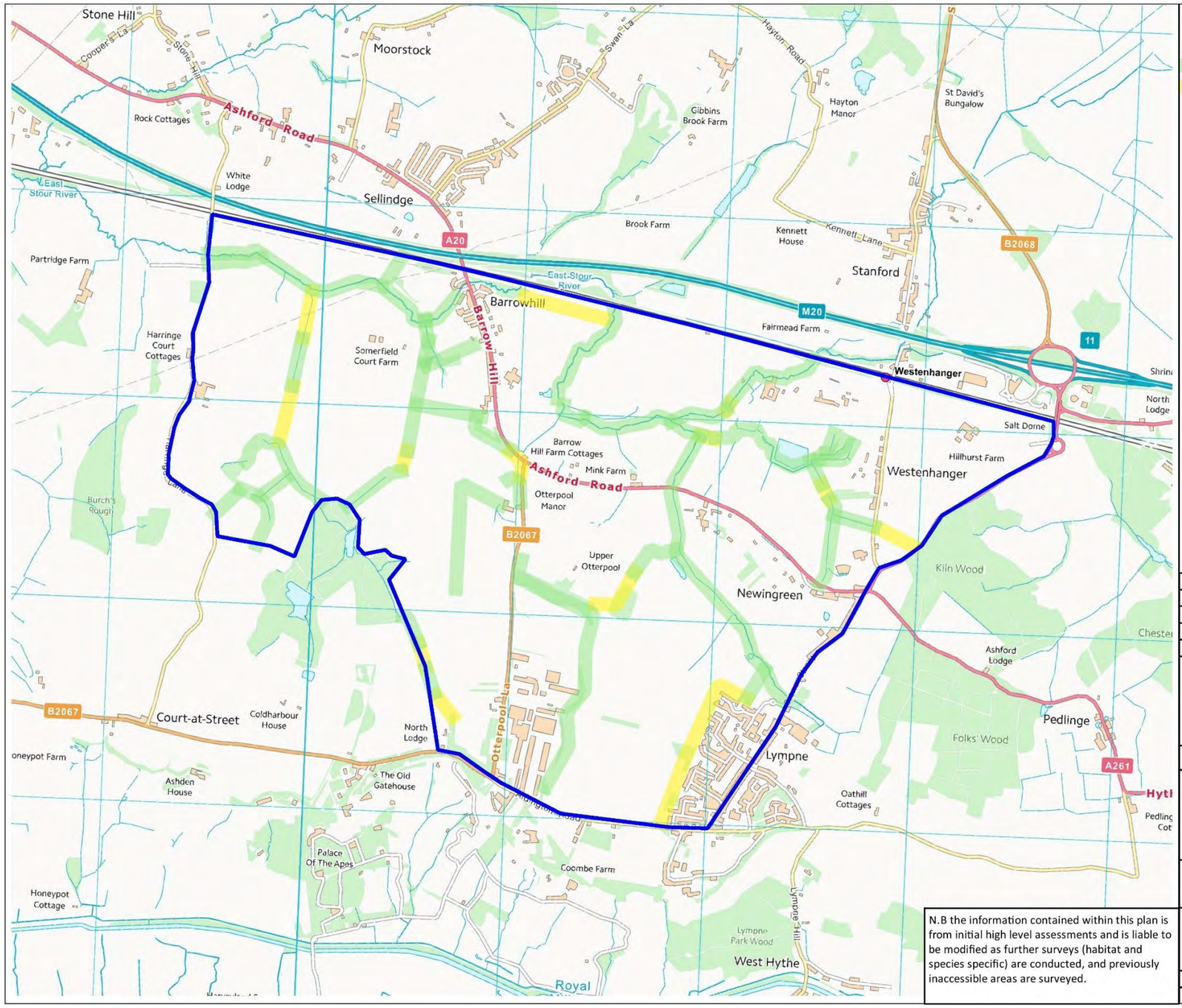
Date Raised	Work Stream and Risk Owner	Risk Description	Programme Impact	Probability (1-5)	Impact (1-5)	Rating (IxP)	Risk Rating	Mitigation	Status
		previous survey works.							
12/10/2016	GI+Biodiversity (BM)	Sensitive habitats to be avoided (riparian corridors, ancient woodlands)	Need to accommodate habitats and features within masterplan	5	2	10	Medium	Sensible masterplan design	Surveys not yet commenced.
21/10/2016	GI+Biodiversity (BM)	Invasive plants. Japanese knotweed and other Schedule 9 plants present on site.	Costs of remediation, delays for removal / treatment.	5	2	10	Medium	Recruitment of suitably qualified contractors to begin removal / treatment and documentation of affected areas by Arcadis	Full surveys not yet commenced.
30/11/2016	GI+Biodiversity (BM) / Water	EA have advised that no culverts will be permitted within the scheme	Potential delays and costs resulting from redesign of the scheme if it is rejected due to the presence of culverts.	3	3	9	Medium	Ensure that Masterplan does not have culverts or that culverts are approved by the EA.	EA comments forwarded to design team.
30/11/2016	GI+Biodiversity (BM)	Preparation of Receptor / Mitigation Areas	Delay to the commencement of works whilst receptor sites / mitigation areas are prepared or establishing.	2	3	6	Low	Once master plan layout is completed, the amount of mitigation area can be calculated. Consider bringing required mitigation areas online ahead of the development works.	Requirement for mitigation areas will need to be considered in the ongoing masterplanning.
30/11/2016	GI+Biodiversity (BM)	Otter known to be present in Great Stour (9km from site) – development will need to be future	Inclusion of permeability for Otter and the inclusion of Otter habitat within the	2	3	6	Low	Suitable buffers for the lake and river corridors. No new culverting and the removal of	Future proofing for Otters will need to be considered at the master planning stage.

Date Raised	Work Stream and Risk Owner	Risk Description	Programme Impact	Probability (1-5)	Impact (1-5)	Rating (IxP)	Risk Rating	Mitigation	Status
		proofed for this species.	masterplan will be required.					existing culverts if possible.	

Next steps:

- agree the preliminary photo-viewpoints with stakeholders such as the AONB Unit, Shepway DC Development Control officers; and Natural England;
- collect a set of further photographs from these points over the winter, when deciduous trees are not in leaf – i.e. the worst case scenario;
- carry out initial night time impact testing;
- carry out thorough review of landscape and visual assessment findings from related proposed developments surrounding the site;
- identify and examine the impact of similar developments within the 'setting' of an AONB and in particular along the North Downs
- undertake the landscape character assessment work for the site and immediate surrounds.
- Meeting with KCC and Ashford BC
- Cumulative impact study

Figure 1001



N.B the information contained within this plan is from initial high level assessments and is liable to be modified as further surveys (habitat and species specific) are conducted, and previously inaccessible areas are surveyed.

revision	date	status	author	checker	approver
2	02/11/16	DRAFT	BM	MG	

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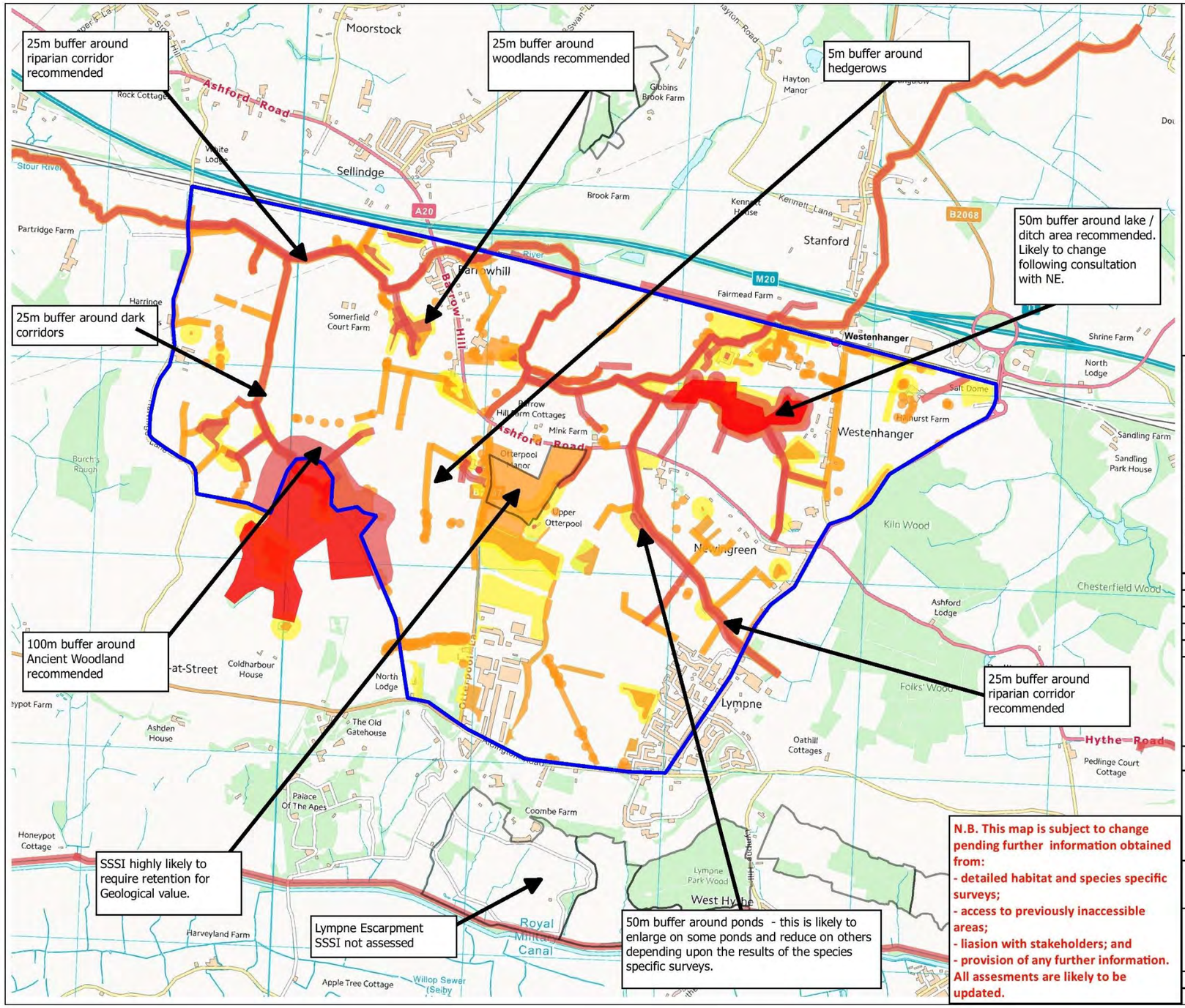
Figure 1001 -Stage 1 preliminary findings - key existing ecological connectivity and potential new / enhanced connectivity

scale	original size	datum	grid
NTS	A3	-	-

Figure 1002



- Habitats/Areas Grade 1 – MUST retain – contain habitats of irreplaceable or high value or support multiple notable / protected species;
- Habitats/Areas Grade 2 – STRONGLY recommend retention (contain or buffer habitats of high value or support notable / protected species);
- Habitats/Areas Grade 3 - Retention recommended (contain or buffer habitats of high value or support notable / protected species); and
- Habitats/Areas Grade 4 - Retention preferred/known constraints (contain or buffer habitats of value or known to or likely to support notable / protected species.

revision	date	status	author	checker	approver
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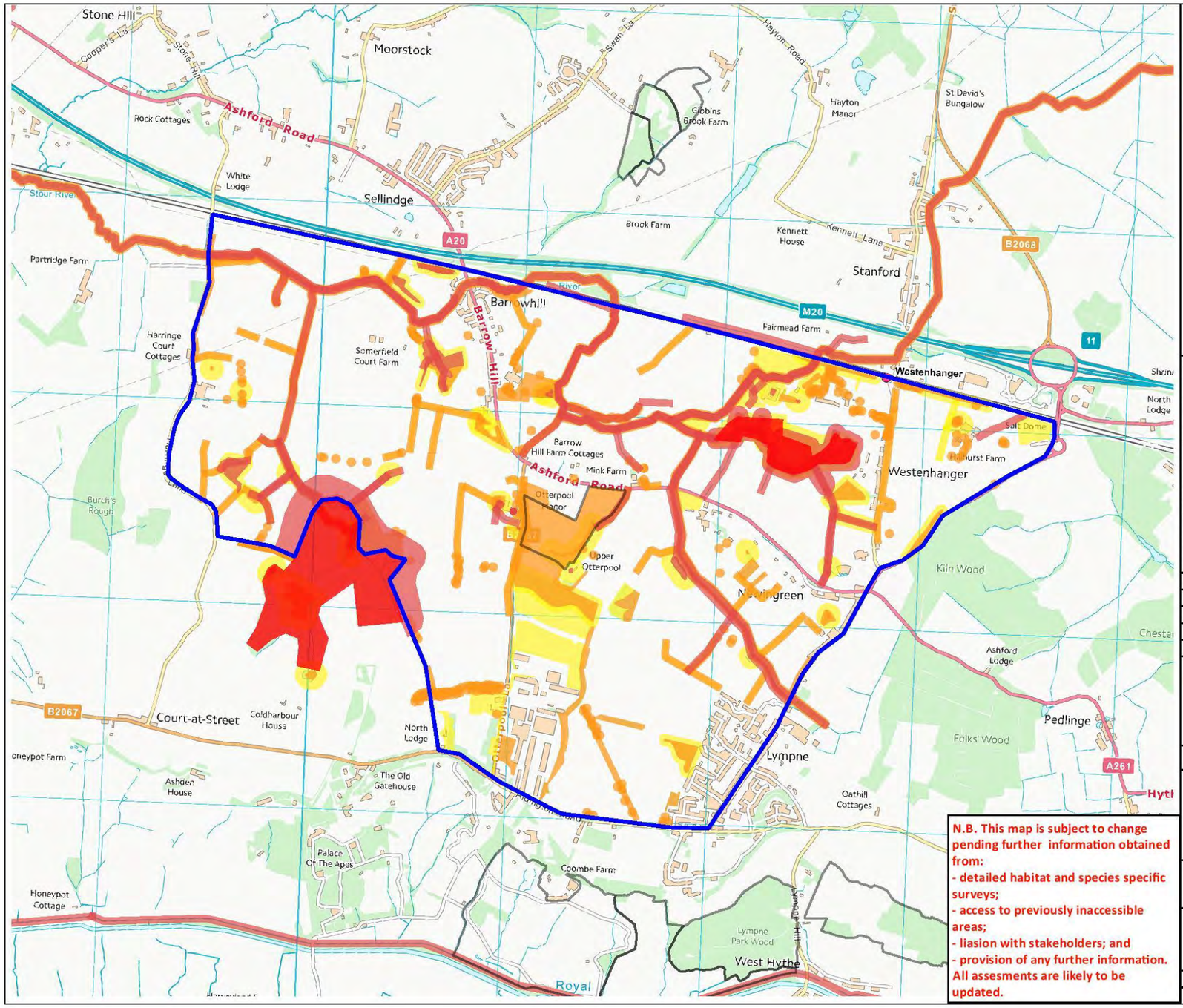
Figure 1002 - Stage 1 preliminary findings - general habitat values for retention (with labels)

scale	original size	datum	grid
NTS	A3	-	-

N.B. This map is subject to change pending further information obtained from:
- detailed habitat and species specific surveys;
- access to previously inaccessible areas;
- liasion with stakeholders; and
- provision of any further information.
All assesments are likely to be updated.

Figure 1003



legend

- Study Area
- Habitats / areas grade 1
- Habitats / areas grade 2
- Habitats / areas grade 3
- Habitats / areas grade 4

- Habitats/Areas Grade 1 – MUST retain – contain habitats of irreplaceable or high value or support multiple notable / protected species;
- Habitats/Areas Grade 2 – STRONGLY recommend retention (contain or buffer habitats of high value or support notable / protected species);
- Habitats/Areas Grade 3 - Retention recommended (contain or buffer habitats of high value or support notable / protected species); and
- Habitats/Areas Grade 4 - Retention preferred/known constraints (contain or buffer habitats of value or known to or likely to support notable / protected species.

N.B. This map is subject to change pending further information obtained from:
- detailed habitat and species specific surveys;
- access to previously inaccessible areas;
- liasion with stakeholders; and
- provision of any further information. All assesments are likely to be updated.

revision	date	status	author	checker	approver
02	02/11/16	DRAFT	BM	MG	

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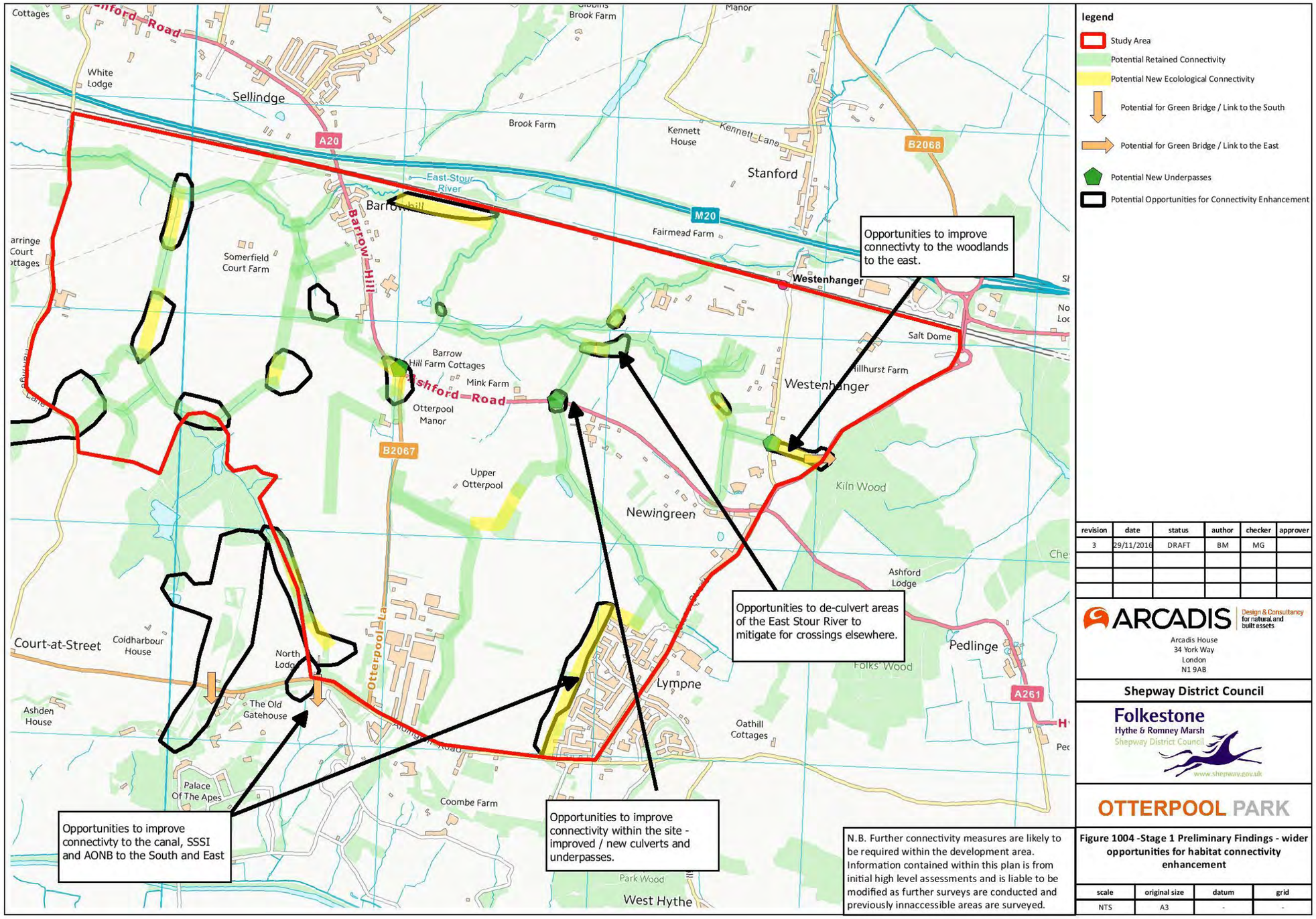
Figure 1003 - Stage 1 preliminary findings - General habitat values for retention (no labels)

scale	original size	datum	grid
NTS	A3	-	-

Figure 1004



N.B. Further connectivity measures are likely to be required within the development area. Information contained within this plan is from initial high level assessments and is liable to be modified as further surveys are conducted and previously innaccessible areas are surveyed.

revision	date	status	author	checker	approver
3	29/11/2016	DRAFT	BM	MG	

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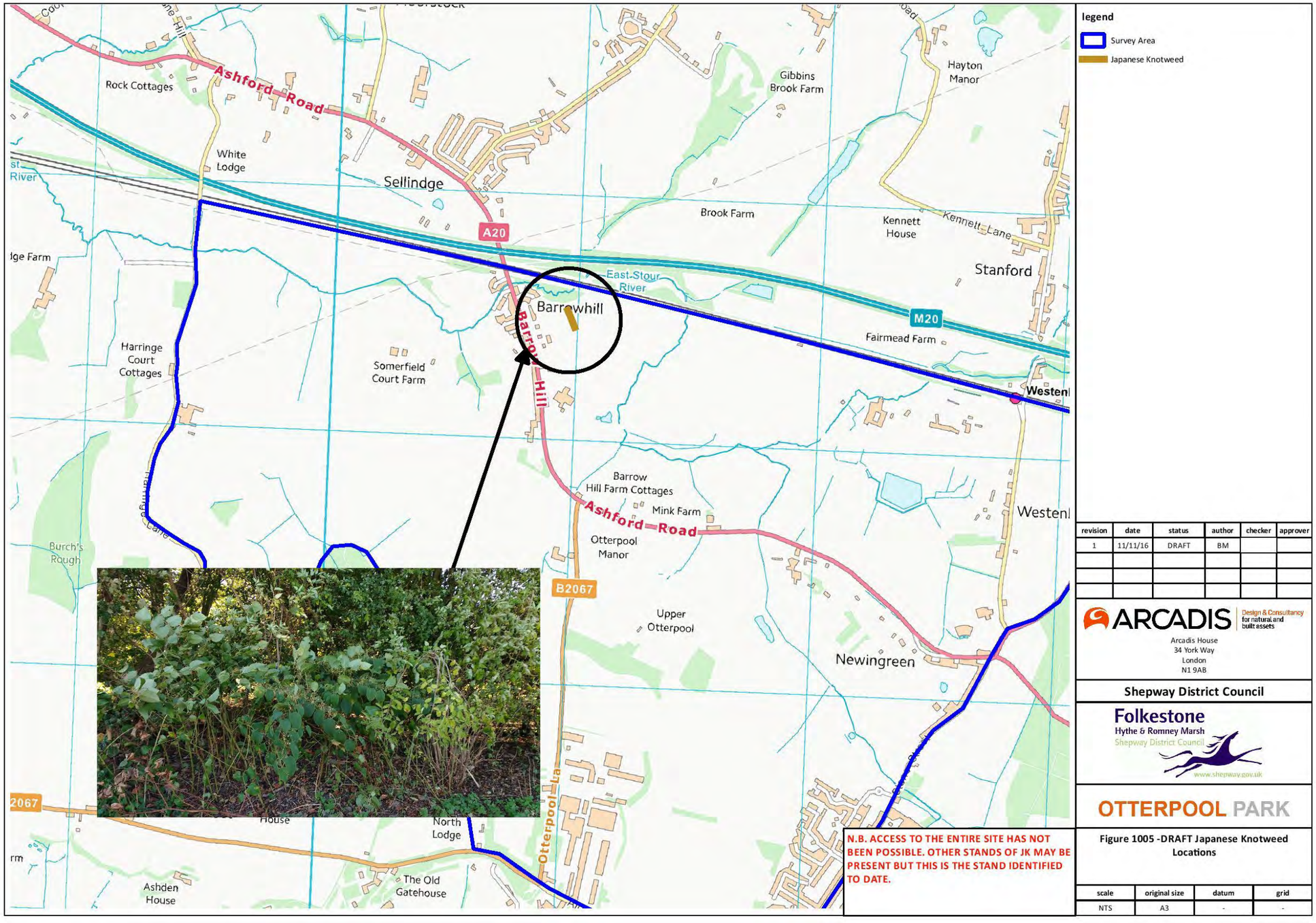
Figure 1004 -Stage 1 Preliminary Findings - wider opportunities for habitat connectivity enhancement

scale	original size	datum	grid
NTS	A3	-	-

Figure 1005



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1	11/11/16	DRAFT	BM		

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N.B. ACCESS TO THE ENTIRE SITE HAS NOT BEEN POSSIBLE. OTHER STANDS OF JK MAY BE PRESENT BUT THIS IS THE STAND IDENTIFIED TO DATE.

Figure 1005 -DRAFT Japanese Knotweed Locations

scale	original size	datum	grid
NTS	A3	-	-

Figure 1007

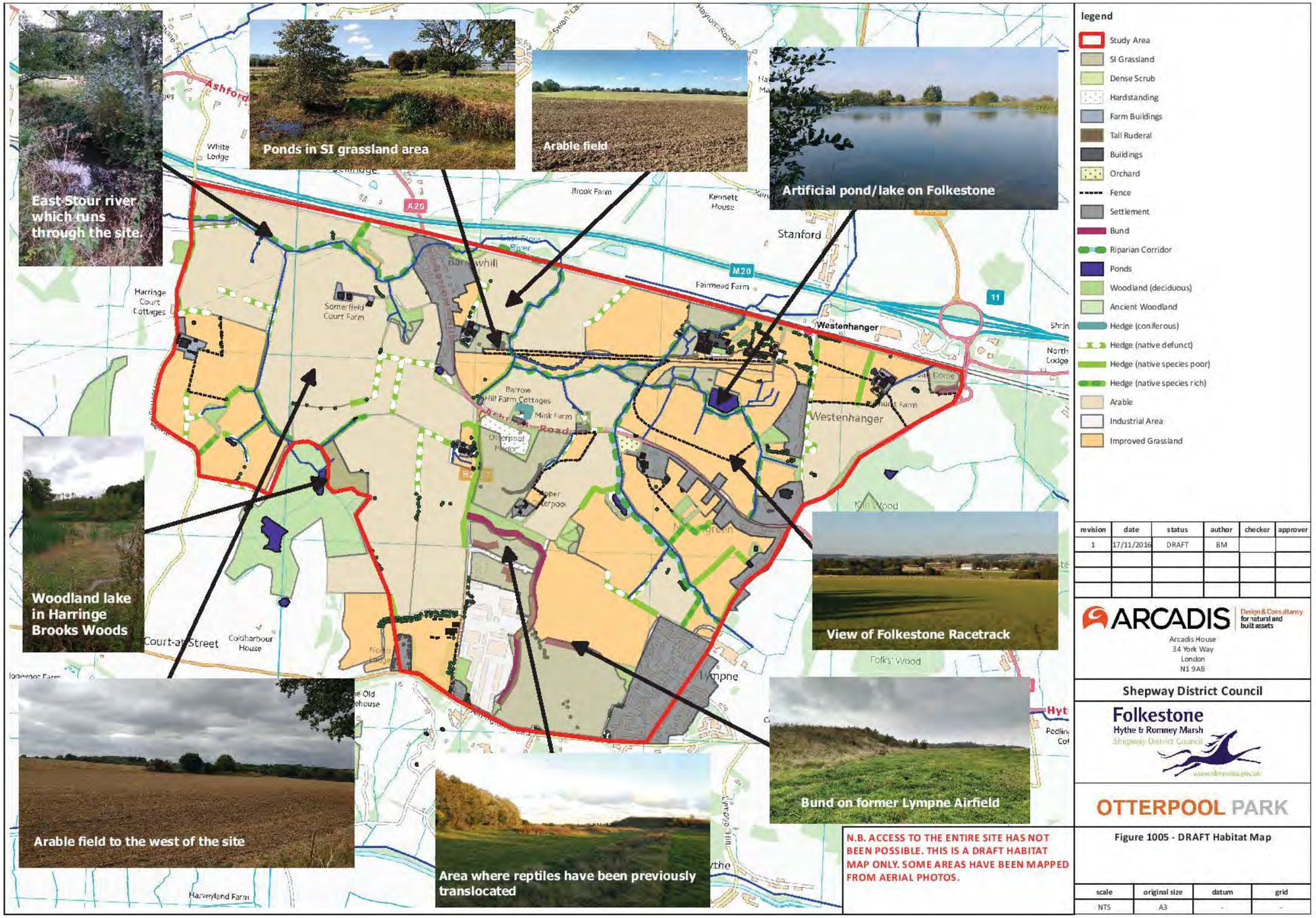
East Stour river which runs through the site.
Ponds in SI grassland area
Arable field
Artificial pond/lake on Folkestone
Woodland lake in Harringe Brooks Woods
View of Folkestone Racetrack
Arable field to the west of the site
Area where reptiles have been previously translocated
Bund on former Lympne Airfield
Ashford
White Lodge
A20
Brook Farm
Kennett House
Stanford
M20
Fairmead Farm
Harringe Court Cottages
Somerfield Court Farm
Barrowhill
Barrow Hill Farm Cottages
Mink Farm
Otterpool Manor
Westenhanger
Court-at-Street
Coldharbour House
Lympne
Folks' Wood
Kiln Wood
Harveyland Farm
legend
Study Area
SI Grassland
Dense Scrub
Hardstanding
Farm Buildings
Tall Ruderal
Buildings
Orchard
Fence
Settlement
Bund
Riparian Corridor
Ponds
Woodland (deciduous)
Ancient Woodland
Hedge (coniferous)
Hedge (native defunct)
Hedge (native species poor)
Hedge (native species rich)
Arable
Industrial Area
Improved Grassland
N.B. ACCESS TO THE ENTIRE SITE HAS NOT BEEN POSSIBLE. THIS IS A DRAFT HABITAT MAP ONLY. SOME AREAS HAVE BEEN MAPPED FROM AERIAL PHOTOS.
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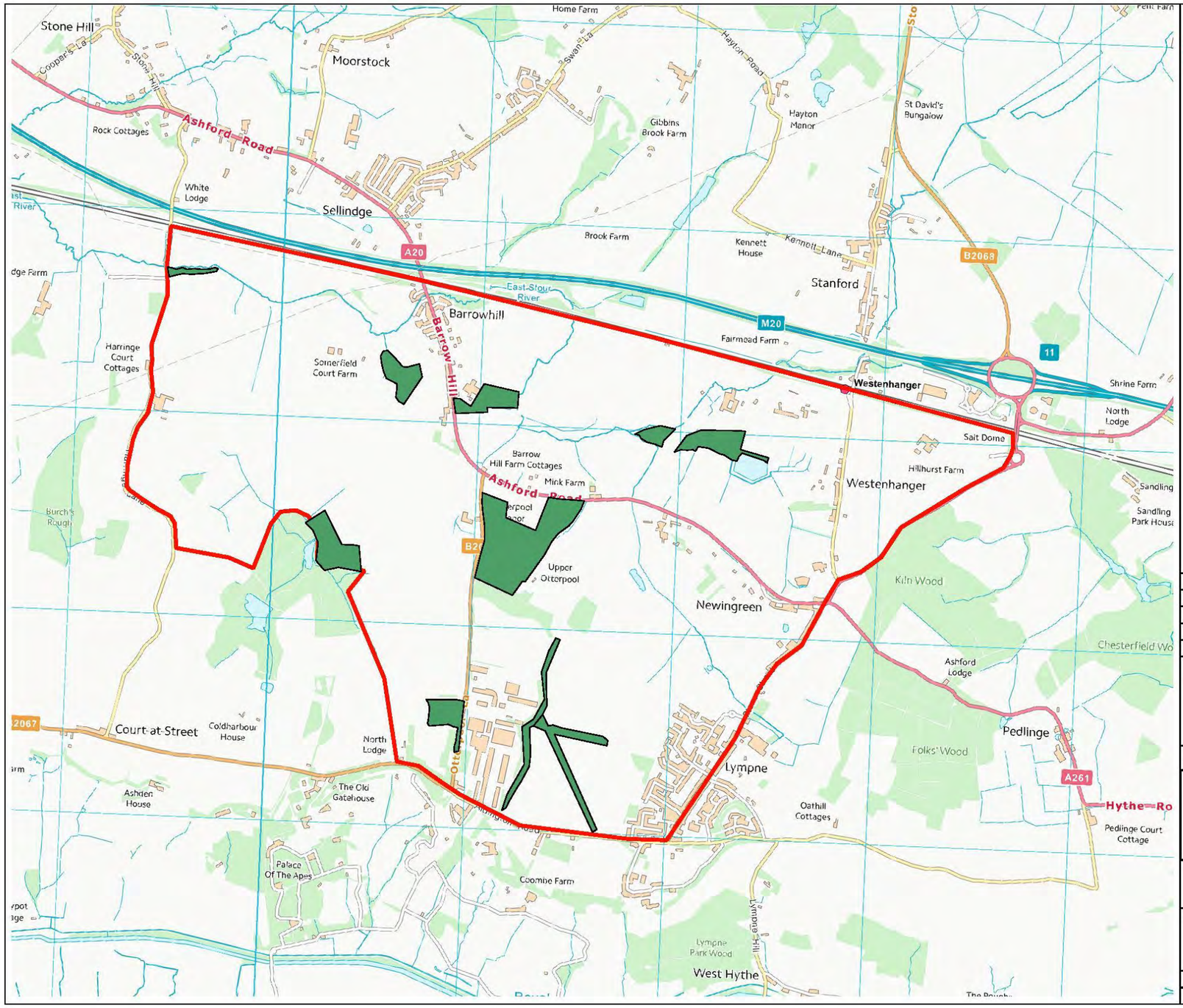
Figure 1005 - DRAFT Habitat Map
scale | original size | datum | grid
NTS | A3 | - | -

Figure 1008



revision	date	status	author	checker	approver
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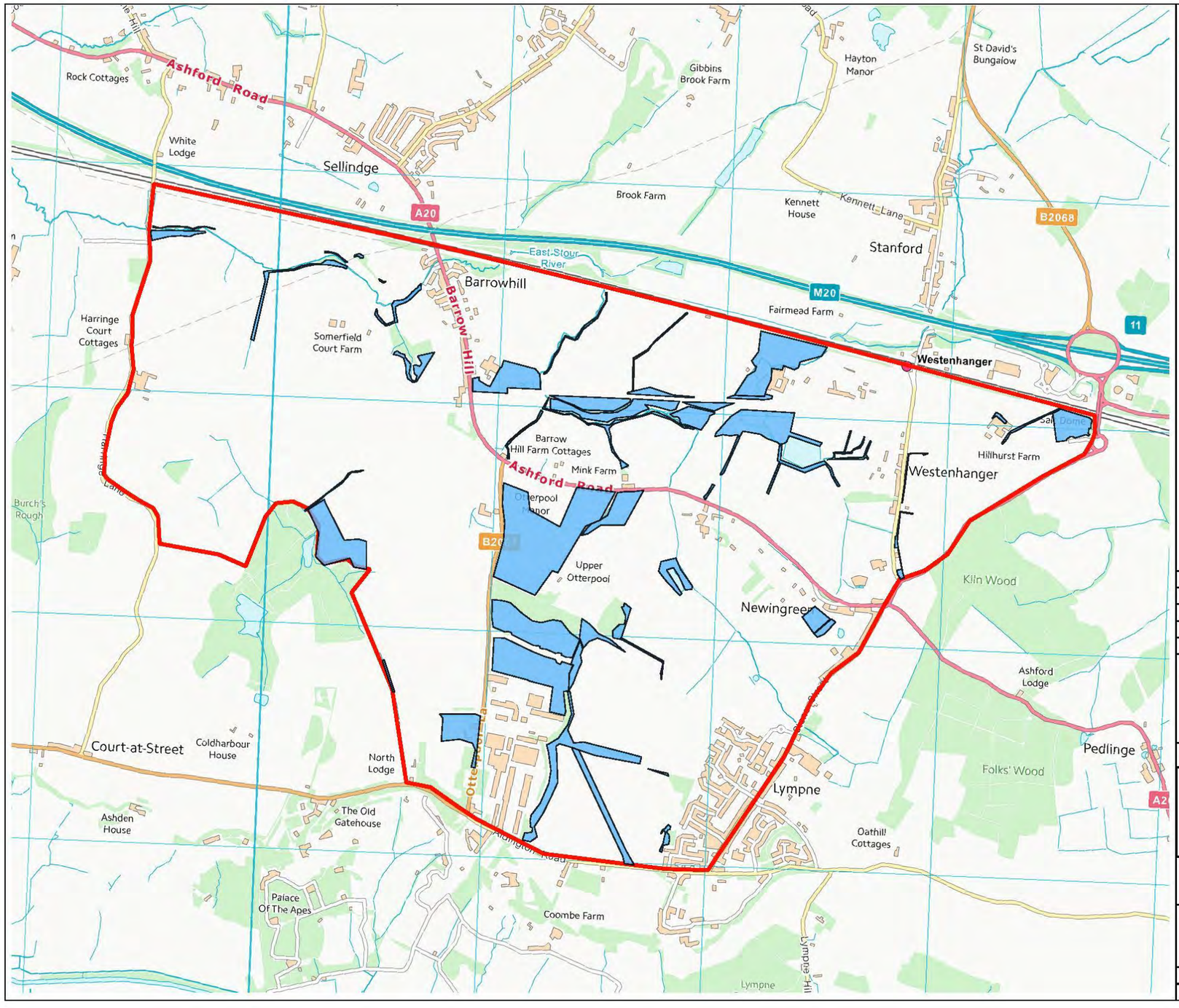
Figure 1008 - Key areas for Habitat Survey Spring / Summer 2017

scale	original size	datum	grid
NTS	A3	-	-

Figure 1009



legend

- Study Area
- Reptile Survey Areas

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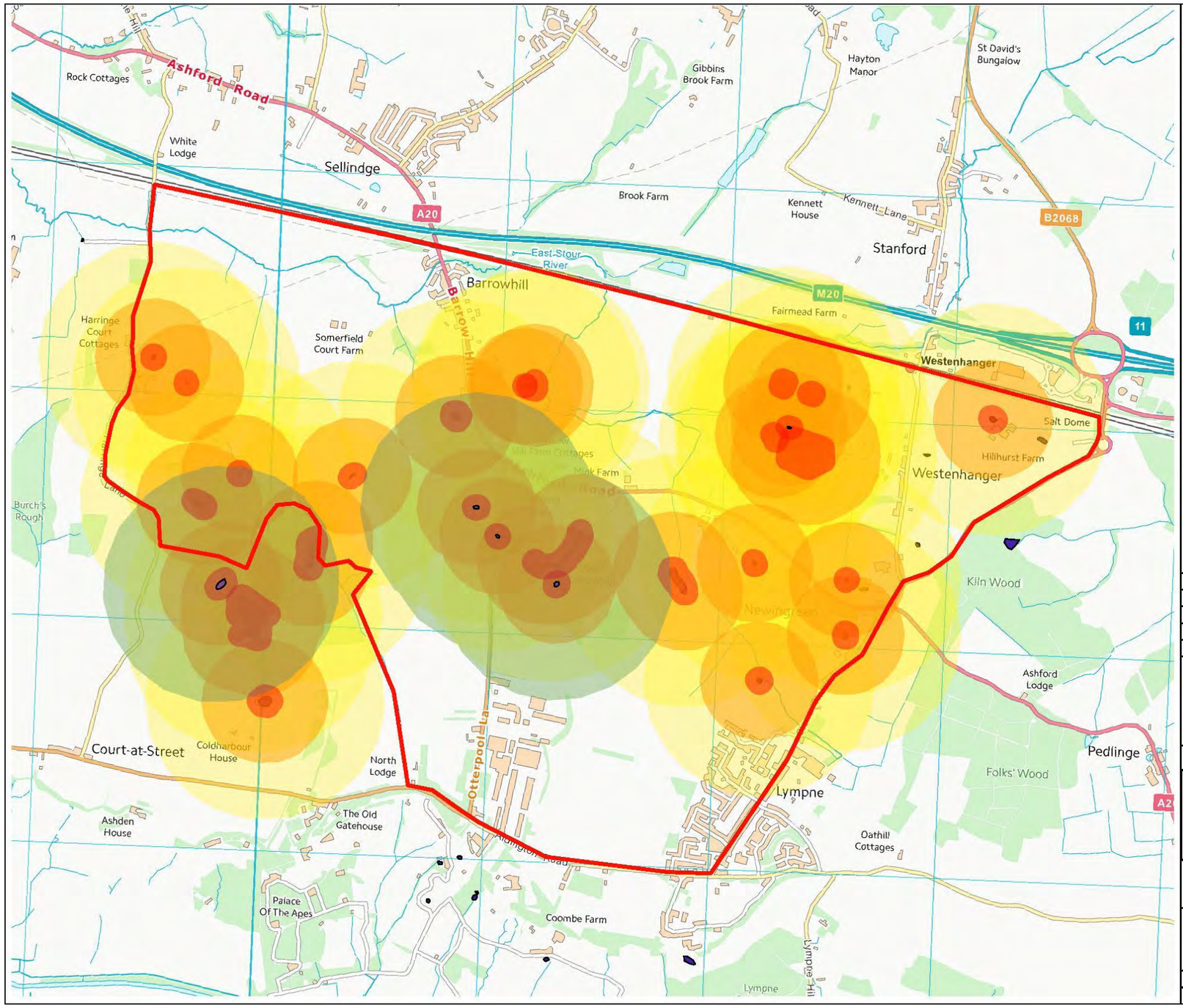
Figure 1009 - Key areas for Reptile Survey Spring / Summer 2017

scale	original size	datum	grid
NTS	A3	-	-

Figure 1010



legend

- Study Area
- Ponds with GCN 500m buffer
- Ponds General 50m buffer
- Ponds General 250m buffer
- Ponds General 500m buffer

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Figure 1010 - Ponds on site with buffers, including 500m buffer around ponds known to contain GCN (from previous surveys)

scale	original size	datum	grid
NTS	A3	-	-

Figure 1011

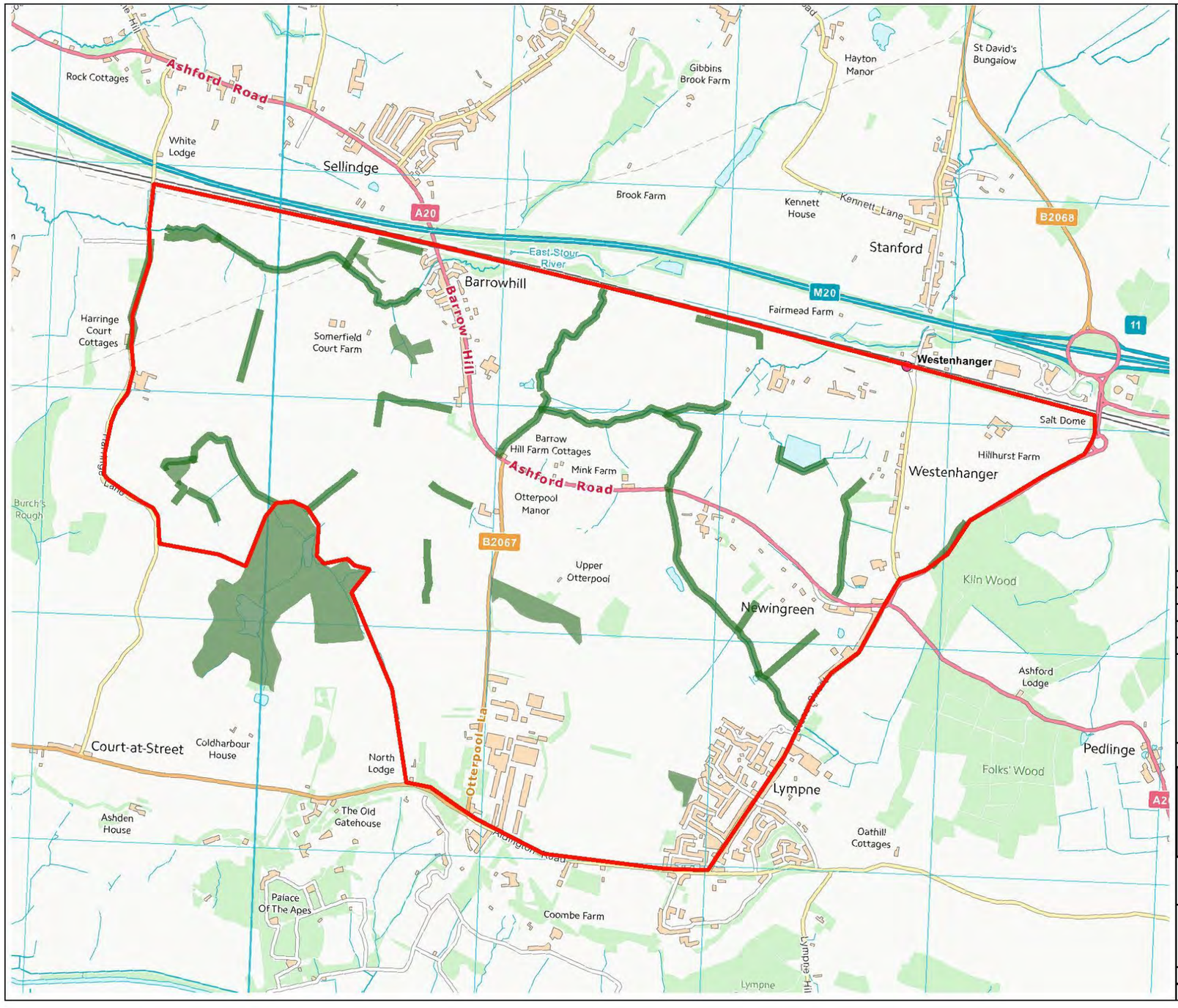

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Figure 1011 - Areas with suitability for dormice - potential for survey

scale	original size	datum	grid
NTS	A3	-	-

Figure 1012

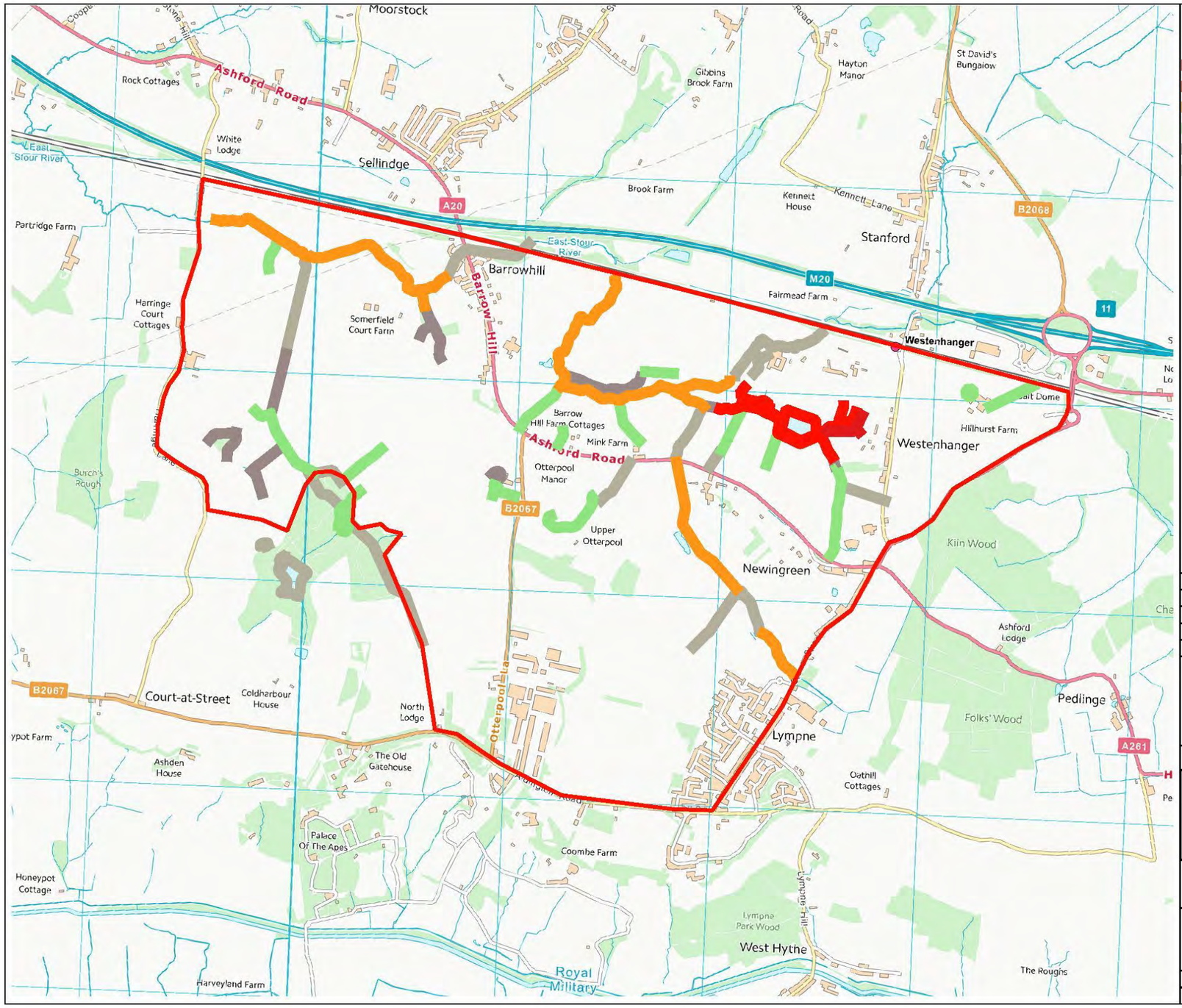

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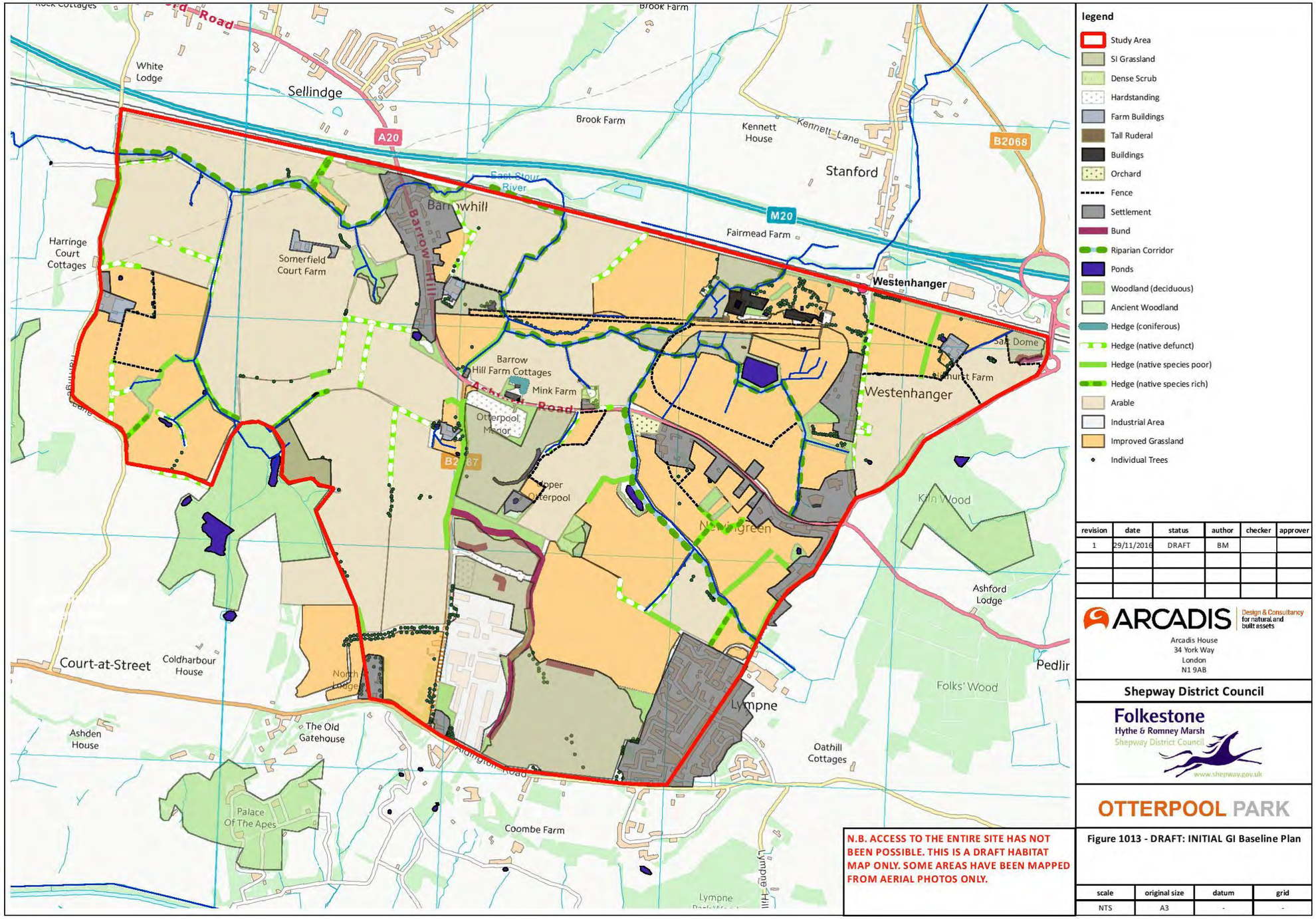
Figure 1012- Water vole suitability and areas for survey

scale	original size	datum	grid
NTS	A3	-	-

Figure 1013


Brook Farm
White Lodge
Sellindge
A20
Brook Farm
Kennett House
Kennett Lane
B2068
Stanford
East Stour River
M20
Fairmead Farm
Barrowhill
Barrow Hill
Harringe Court Cottages
Somerfield Court Farm
Westenhanger
Barrow Hill Farm Cottages
Mink Farm
Ashford Road
Otterpool Manor
Westenhanger
Kiln Wood
Ashford Lodge
Court-at-Street
Coldharbour House
Folks' Wood
Pedlir
Lympne
Ashden House
The Old Gatehouse
Oathill Cottages
Palace Of The Apes
Coombe Farm
Lympne Hill
legend
Study Area
SI Grassland
Dense Scrub
Hardstanding
Farm Buildings
Tall Ruderal
Buildings
Orchard
Fence
Settlement
Bund
Riparian Corridor
Ponds
Woodland (deciduous)
Ancient Woodland
Hedge (coniferous)
Hedge (native defunct)
Hedge (native species poor)
Hedge (native species rich)
Arable
Industrial Area
Improved Grassland
Individual Trees
N.B. ACCESS TO THE ENTIRE SITE HAS NOT BEEN POSSIBLE. THIS IS A DRAFT HABITAT MAP ONLY. SOME AREAS HAVE BEEN MAPPED FROM AERIAL PHOTOS ONLY.
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1 | 29/11/2016 | DRAFT | BM
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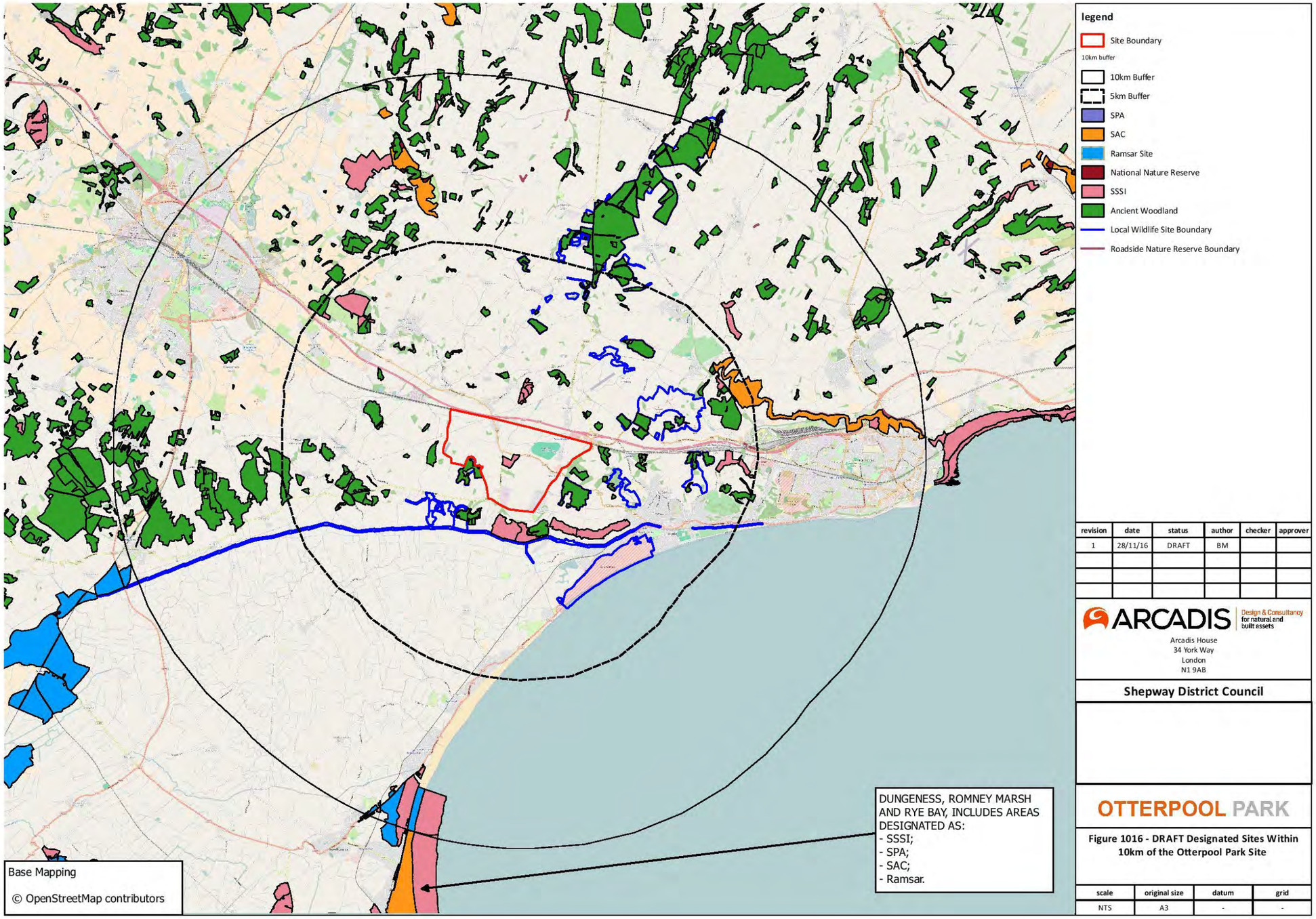
Figure 1013 - DRAFT: INITIAL GI Baseline Plan
scale | original size | datum | grid
NTS | A3 | - | -

Figure 1016



revision	date	status	author	checker	approver
1	28/11/16	DRAFT	BM		

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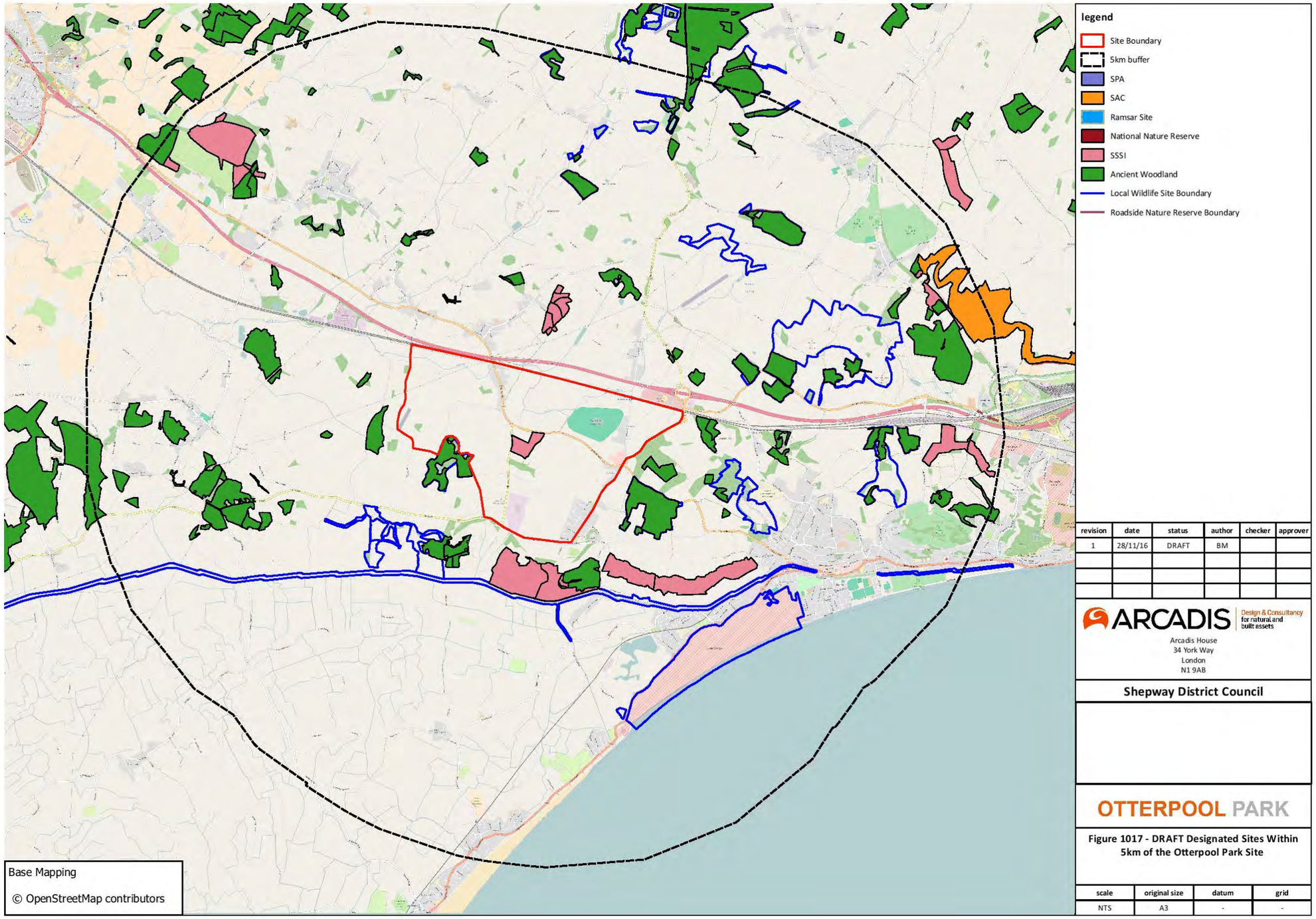
Figure 1016 - DRAFT Designated Sites Within 10km of the Otterpool Park Site

scale	original size	datum	grid
NTS	A3	-	-

Figure 1017



revision	date	status	author	checker	approver
1	28/11/16	DRAFT	BM		

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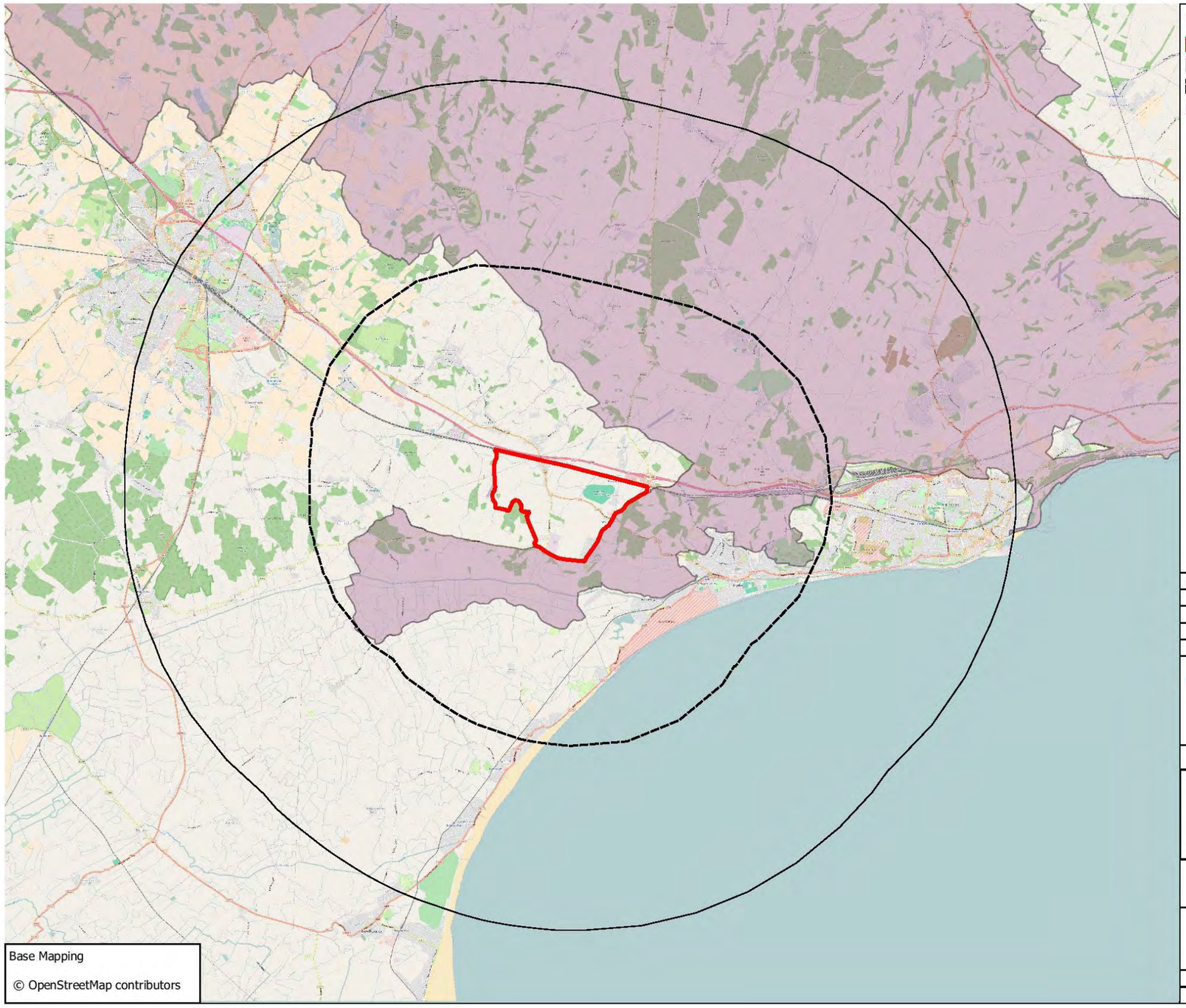
Figure 1017 - DRAFT Designated Sites Within 5km of the Otterpool Park Site

scale	original size	datum	grid
NTS	A3	-	-

Figure 1020



legend

- Site Boundary
- 10km Buffer
- 5km Buffer
- AONB

revision	date	status	author	checker	approver
1	29/11/16	DRAFT	BM		

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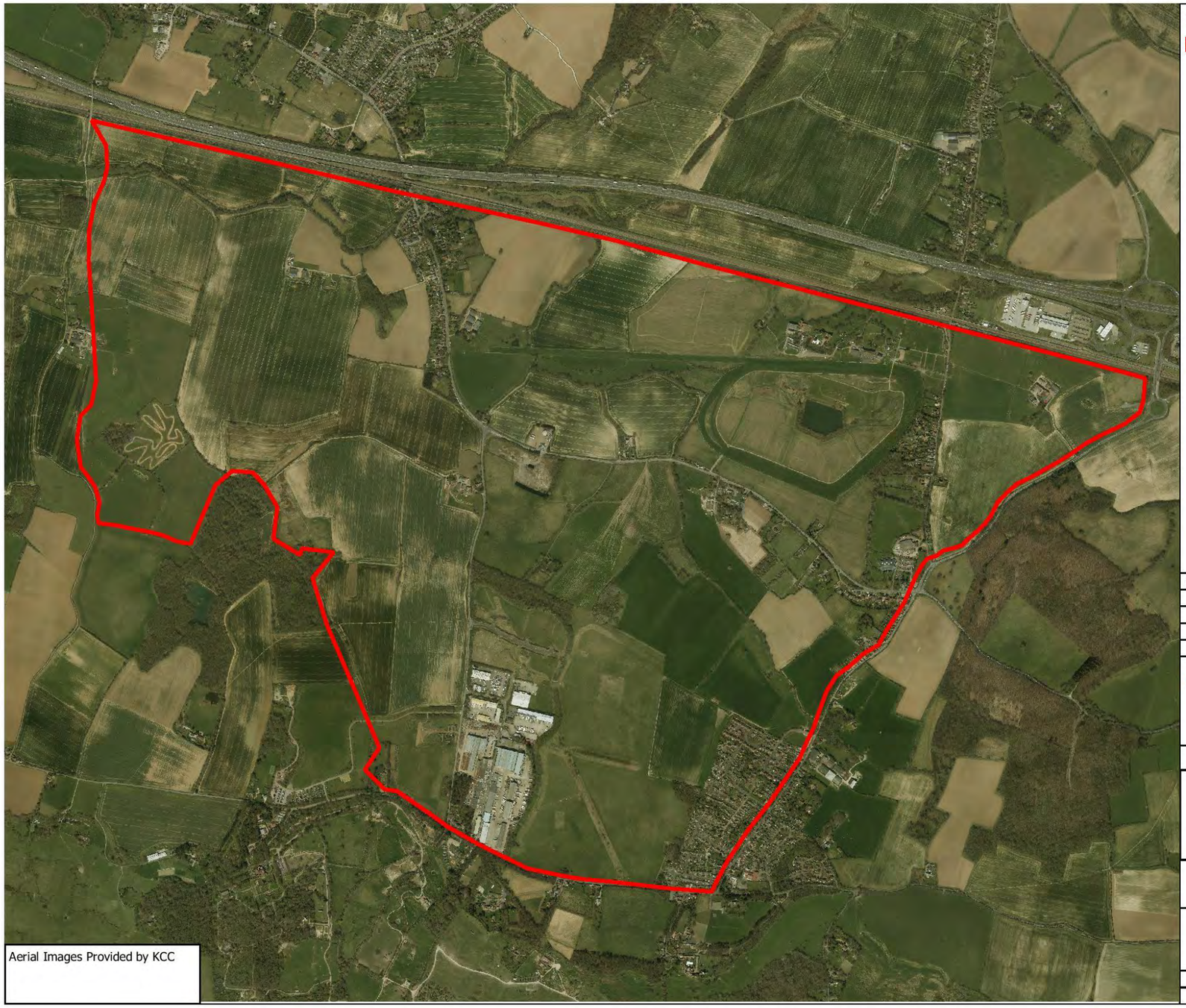
Figure 1020 - DRAFT - AONB around the Otterpool site

scale	original size	datum	grid
NTS	A3	-	-

Figure 1021



legend

Site Boundary

revision	date	status	author	checker	approver
1	29/11/16	DRAFT	BM		

ARCADIS Design & Consultancy for natural and built assets

Arcadis House
34 York Way
London
N1 9AB

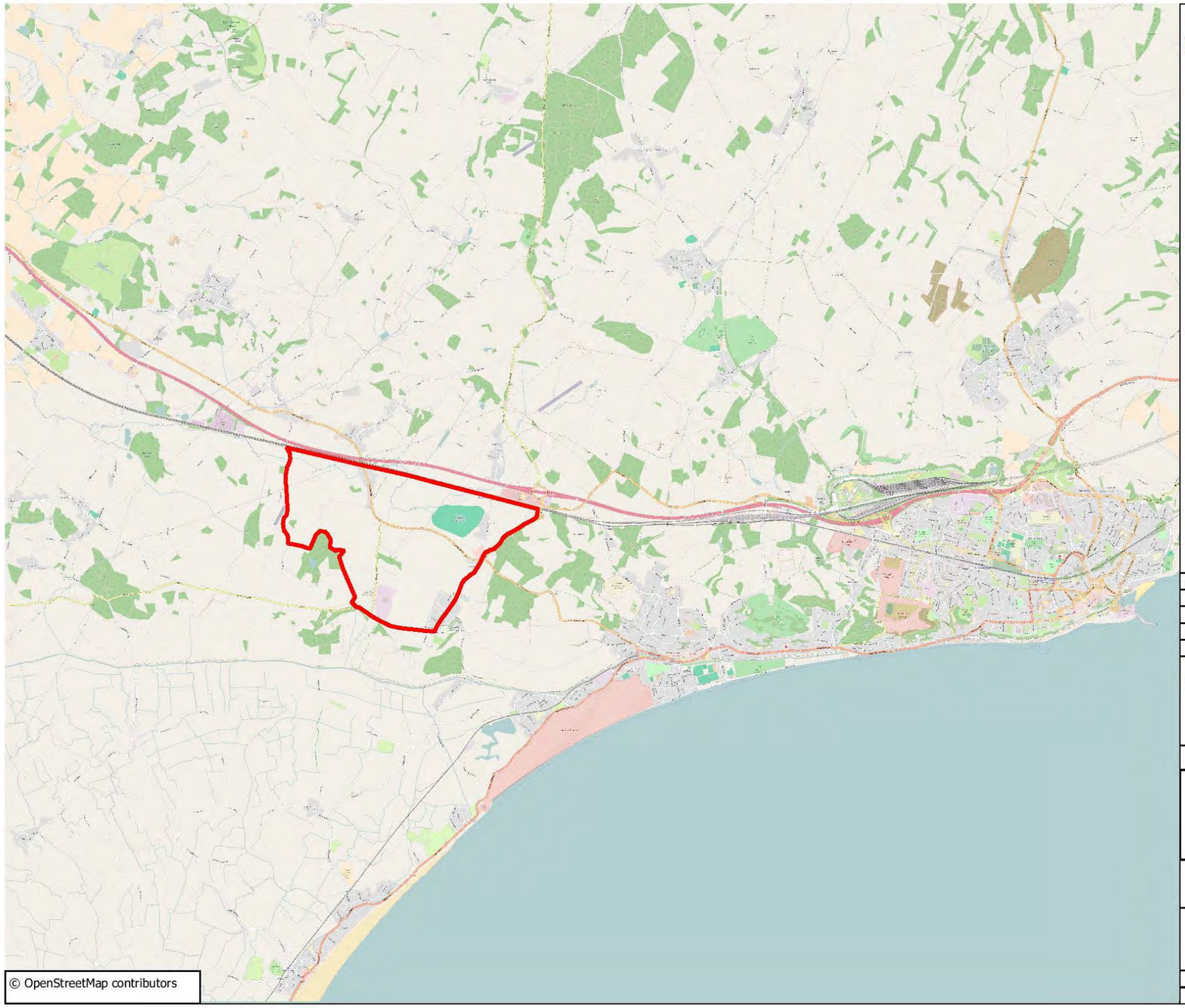
Shepway District Council

OTTERPOOL PARK

Figure 1021 - Aerial Imagery of the site

scale	original size	datum	grid
NTS	A3	-	-

Figure 1022



legend

Site Boundary

revision	date	status	author	checker	approver
1	29/11/16	DRAFT	BM		

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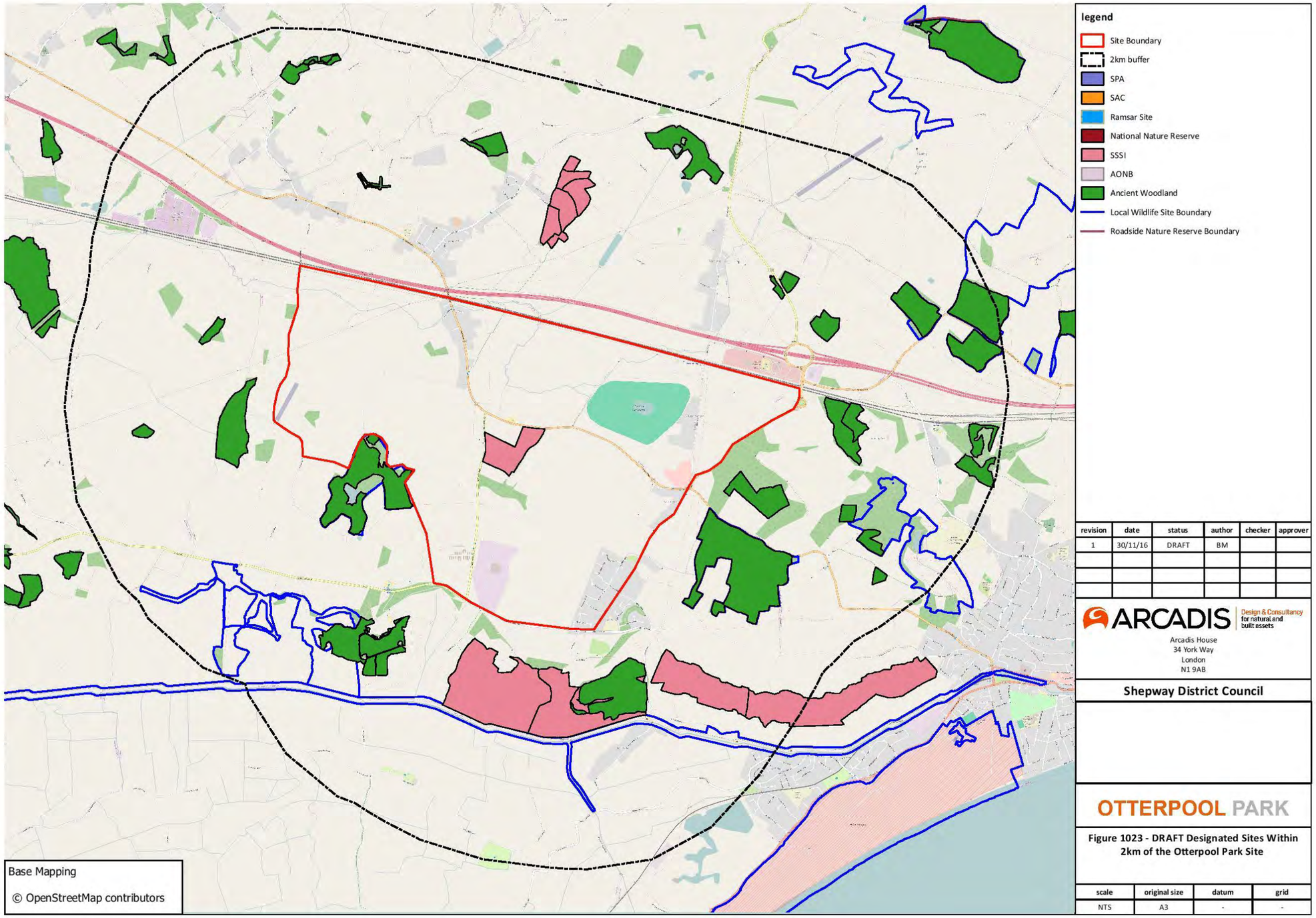
Shepway District Council

OTTERPOOL PARK

Figure 1022 - Location of the Otterpool Site

scale	original size	datum	grid
NTS	A3	-	-

Figure 1023



revision	date	status	author	checker	approver
1	30/11/16	DRAFT	BM		

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London
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Shepway District Council

OTTERPOOL PARK

Figure 1023 - DRAFT Designated Sites Within 2km of the Otterpool Park Site

scale	original size	datum	grid
NTS	A3	-	-

Landscape & Visual Impact

This section of the report considers the current landscape and visual implications of the emerging proposed development. Landscape is defined in the European Landscape Convention as '*...an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*' (Council of Europe, 2000). Visual amenity considerations relate specifically to the views of a landscape afforded to people. These separate but related issues form the basis for landscape and visual impact assessment (LVIA).

The LVIA will form part of the Environmental Impact Assessment that accompanies the assumed eventual planning submission. Current guidance on LVIA: the *Landscape Institute and Institute of Environmental Management and Assessment, Guidelines for Landscape and Visual Impact Assessment: Third Edition, 2013* (GLVIA3) promotes the preparation of an LVIA as an iterative process with the project design team. This way designs that avoid, reduce or offset likely significant adverse impacts can be prepared as part of the scheme's evolution, rather than addressed reactively upon the completion of proposals.

The findings from this initial stage of the project with regards to LVIA, as set out below, are to be read alongside the following accompanying plans:

- Figure 01 – Location & National Character Areas
- Figure 02 – Landscape Character Areas – Kent County Council & Kent Downs AONB
- Figure 03 – Landscape Related Planning Designations – within wider area (TBC)
- Figure 04 – Landscape Related Planning Designations – within immediate area
- Figure 05 – Preliminary Viewpoint Locations
- Figure 06 – Landscape Character & Visual Amenity Constraints & Opportunities
- Figure 07 – Location of Representative Viewpoints relating to schemes

1. Stage 1 Methodology

During the initial stage of the project we have undertaken the following:

- *Desk Study / Gap Analysis* - A desk study has been conducted to identify and gather existing landscape-related information concerning the development site, its environs and the nature of the planned settlement. This has included existing landscape character assessments at national, county and local levels; planning policy, guidance documents and information supporting related proposed developments surrounding the site. A review of the reliability and robustness of these has been undertaken and the key findings drawn out. A 'gap analysis' has been conducted to identify where further information is required.

- *Field Work*– An initial visit to establish the landscape context and visual setting of the site (i.e. the LVIA Study Area) was undertaken on 28.09.2016. A detailed walkover and preliminary analysis of the remaining areas of the site was carried out in 07.10.2016.

  Using information gained from these a further visit (13.10.2016) targeting particular areas of high landscape and visual sensitivity was undertaken. This has helped define possible representative viewpoints to the site, for example, from particular locations along the edge of the Kent Downs Area of Outstanding Natural Beauty (AONB). This has also helped more closely define the extent of publicly accessible areas of the North Downs escarpment that scheme is likely to be visible from.

  This visit also allowed us to confirm findings from the desk study, and establish the scope of further necessary landscape character and visual assessment work necessary, to inform the masterplanning, and to ensure the successful integration of the scheme into its setting.

- *Establishment of a Study Area:* In terms of LVIA it is important to define an area of study in which potential direct, and cumulative impacts upon landscape character and visual amenity may occur as a result of the emerging proposed development at Otterpool Park, and within which the assessment will take place.

  Figure 01 shows the current predicted extent of this study area - which has primarily been shaped by the development's potential '*zone of visual influence*'. The *Visual Context* section of this Feasibility and Capacity Study sets out in more detail the reasoning for this. It is important to note that this area may need to be extended, or possibly rationalised, as further baseline data collection and stakeholder engagement is undertaken.

- *Engagement with key stakeholders* - Meetings with both the Landscape Officer at Shepway District Council and the Kent Down Area of Outstanding Natural Beauty Unit have taken place in order to: agree on an appropriate level of engagement through the process of masterplanning and planning preparation, help define the scope of the LVIA, highlight key landscape character and visual sensitivities and discuss potential methods for mitigating any adverse effects arising from the development. The key findings are set out in section 4 of this part of the Stage 1 report. Our initial findings from this engagement have helped inform the current development of the masterplan.

- *Review of relevant nearby determined and 'in-planning' developments:* An assessment has begun of the relevance to the Otterpool Park project of the number of recent development proposals that have either been determined and are awaiting implementation, have been submitted but refused or withdrawn, or are 'in-planning' (i.e. during pre-application stages or waiting to be determined). The following are considered to be relevant to the planning of the LVIA for Otterpool Park:

  - The 2010-2012 proposals for residential development upon the Racecourse;
  - The proposals for the extension of the Link Park industrial estate;
  - The Harringe Brook Windfarm;
  - The Highways England lorry park to the north of the railway;
  - The proposed recycling facility and anaerobic digestion plant at Otterpool Quarry.

  Using the LVIA-related work prepared for each scheme, and in order to learn more about the landscape character, visual amenity and landscape-related planning policy context of the Otterpool Park proposals we are in the process of reviewing the of each scheme the:

  - landscape character and visual baseline findings - including interpretation of published landscape character assessments;
  - predicted 'zones of theoretical visibility';
  - range of representative viewpoints upon which the visual impact has been assessed;
  - consideration of the proposals by the determining authorities and key stakeholders (e.g. the Kent Downs AONB Unit, Natural England etc. Parish Councils).

  In order to help us decide the location of the representative viewpoints upon which the potential visual impact of the Otterpool Park scheme will be assessed we have plotted those selected for the schemes listed above. These are shown on Figure 07 of this study. This has been shared with Shepway District Council and with the Kent Downs AONB Unit.

  Our on-going awareness of the schemes listed above, and others within the study area will be an important factor in assessing the landscape and visual cumulative impact of the Otterpool Park development. The scale of the proposed development is such that there may be significant impacts associated with the potential presence of the Otterpool Park and other developments within the same view, or sequence of views. There may also be cumulative landscape character impacts upon the capacity of certain character areas to receive Otterpool Park and, in-combination, other similar schemes. Our initial findings on this work has helped inform the current development of the masterplan.

- *Review of developments of a similar scale within the setting of the AONB:* We have begun a study of other settlements, recently built development, and planned schemes that lie in a similar setting to the Kent Downs AONB (and other AONB's) to that of Otterpool Park. Sites looked at have included Cooper's Edge near Brockworth, Gloucestershire, within the setting of the Cotswold AONB escarpment, Leithfield – near the Surry Hills AONB, and Whitehill & Bordon, in Hampshire, which lies close to the boundary of the South Downs National Park. This has helped in understanding the capacity of the landscape surrounding Otterpool Park to accept development of this type and scale, and how any residual adverse impacts can be mitigated. Our initial findings on this have helped inform the current development of the masterplan.

- *A review of related planning policy*: An identification of landscape related planning designations at national, regional and local levels within the LVIA study area (see Figures 04 & 05), and a review of related planning policy has taken place. This is set out in Section 3 of this part of the report.

2. Baseline Data

Landscape Character Context

National Level

Natural England has produced a landscape character assessment of England[1]. The site lies within National Character Area (NCA) no.120 - Wealden Greensand – see Figure 01. This character area covers the majority of the Vale of Holmesdale which lies between the escarpment of the North Downs (approximately 2-3km to the north of the site: NCA 119 - North Downs) and the Greensand Ridge. This stretches between Farnham, on the Surrey/Hampshire border in the west, to the sea at Folkestone, some 8km to the east of the site. To the south of the site, beyond the south-facing escarpment of the Greensand Ridge lies the Romney Marsh (NCA 123-Romney Marshes).

Their key characteristics, sensitivities and guidance recommendations, and the relevance of these to the planning of Otterpool Park have been noted.

Regional Level

Kent Downs Area of Outstanding Natural Beauty

Landscape Character Assessment: A landscape character assessment of the Kent Downs AONB was carried out by the Countryside Commission. Entitled '*The Kent Downs Landscape*' (1995), The Countryside Commission, it splits the area into thirteen separate character areas. The site is adjoins the Postling Vale character area to east and north, and the Lympne character areas to the south. The North Downs escarpment lies within the East Kent Downs Character Area (see Figure 02).

The document further divides each of these in to sub-areas, upon which there is greater distinction.

The document forms the basis for the character descriptions included within the current Kent Downs AONB Management Plan (2014-2019), and Kent Downs AONB Landscape Design Handbook.

Romney Marsh

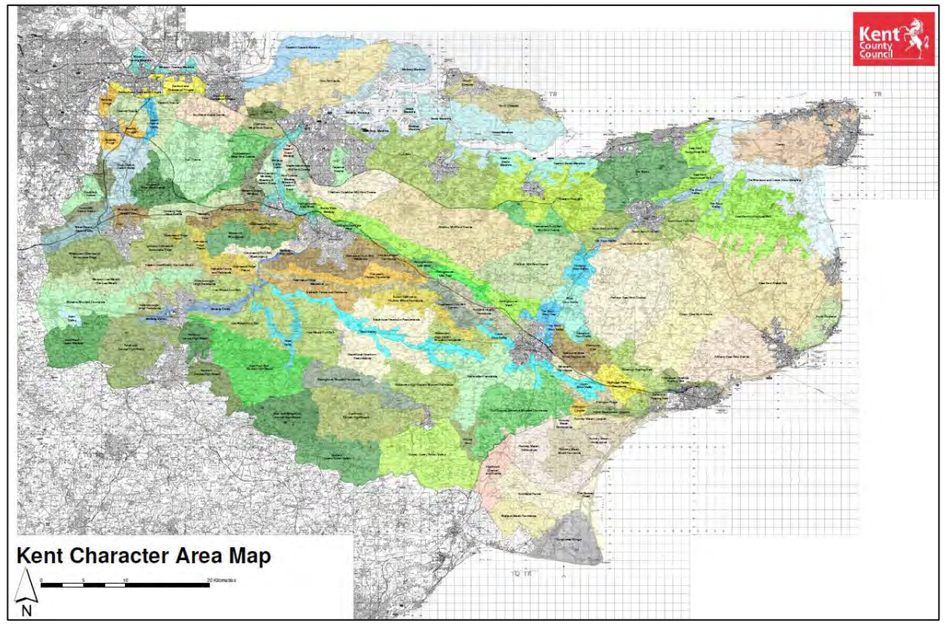
A landscape character assessment (LCA) of Romney Marsh has been carried out. We are in the process of obtaining this from SDC.

County Level

Kent County Council

Landscape Character Assessment: The Landscape Assessment of Kent, published by Kent County Council in 2004 divides the county into over 130 distinct character areas. The site spans three of these (see Figure 02): *Sellindge Plateau Farmlands*, *Aldington Ridge* and *Upper Stour Valley*.

Plate 1: Landscape Character Areas - The Landscape Assessment of Kent (2004, Kent County Council



Paragraph 1.1.4 of The Landscape Assessment of Kent, states that

'*countywide studies offer a broad-brush, strategic approach and are written with the intention that detailed local studies should be undertaken to assess site specific proposals. … Local landscape assessments undertaken at a district scale or for specific sites and areas can focus on a greater level of detail and therefore give more targeted information. Generally, for development proposals, the most detailed / local landscape assessment should be referred to in the first instance. For example, for a site specific proposal a district/unitary level assessment should be used'*

Historic Landscape Characterisation: Kent County Council published the 'Kent Historic Landscape Characterisation' report in 2001. The site lies within Character Area no. HLCA 31 - *Central Valley Area*. The descriptions of the precise Historic Landscape Types found in this Character Area within the site vary from 'Regular Assarts', 'Quarries', Pre 19th Century Coppice' and 'Prairie Fields'. A more detailed analysis of the relevance of the findings of this report is included in the Cultural Heritage Stage 1 Feasibility and Capacity Study. The Historic Characterisation Report and this analysis will be used during the preparation of the site specific landscape character assessment for Otterpool Park (see 'Site Specific' section below).

Local Level

Shepway District Council

Landscape Character Assessment: There is currently no local level landscape character assessment for Shepway at District level. The only reference to landscape character is contained within the Shepway Core Strategy Local Plan, 2013. This states that the site is located within the *North Downs* area of the District See Figure 03. This document states that the section of this area outside of the AONB is characterised by:

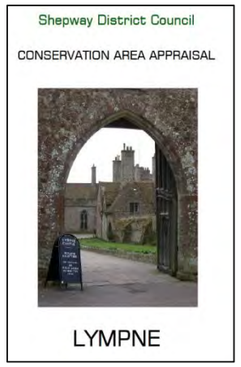
> *'1.53 The south west of this area is outside the AONB and is bisected by major transport infrastructure, severing many of its communities, such as Stanford. These new routes have partly superseded the former main coastal route from London, the Ashford Road (A20), but the historic coaching route's legacy is evident with ribbons of development, creating other linear or fragmented communities, most notably within Sellindge parish.*
>
> *1.54 The area is rich in history and places to visit, including castles at Westenhanger and Lympne, Folkestone Racecourse and the Port Lympne Wild Animal Park. Hythe provides the nearest town centre to this part of the North Downs, supplemented by Ashford's urban facilities 6km (approximately 4 miles) from the western edge of this area.*

[1] Natural England (continually updated) 'Natural England Joint Character Area Profiles

Strengths: Positive image and environment of Area of Outstanding Natural Beauty, and attractive villages; Active village communities; Reasonable rural transport links to range of urban centres, including within Shepway or at Canterbury, Ashford and Dover.

Weakness: Lack of affordable housing; Some localities impacted by the presence of nearby urban environment and infrastructure routes; Hawkinge in particular needs to develop a further sense of place and also improve integration into the surrounding rural fabric.'

AECOM have been commissioned by SDC to prepare landscape character information to assist the High Level Growth Study that they are also producing for the District. In accordance with LCA guidance ('An Approach to Landscape Character Assessment', Natural England 2014) which states that there is a need for those preparing LCAs to coordinate their work with other relevant existing and emerging LCAs, w e will be looking to align findings where possible through liaison with AECOM and SDC.as we prepare our own LCA for the site and its surrounds.



Conservation Areas: Shepway have designated the area immediately adjacent to the south east corner of the site the Lympne Conservation Area (see Figure 05).

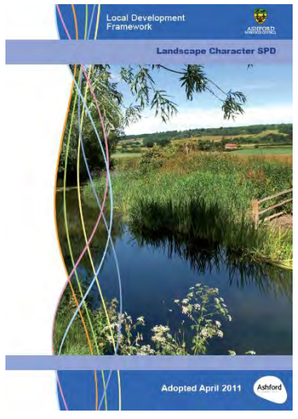
The *Registered Parks & Gardens of Historic Interest* in the environs of the site (Sandling Park, Port Lympne & Lympne Castle) are also shown on Figure 05. The key characteristics as gleaned from the Historic England citations for Sandling Park (Grade II), Port Lympne (Grade II*), and their relevance to the planning of Otterpool Park have been noted. Lympne Castle is at present only locally listed.

It is considered, from the desk-based and field-work we have carried out that all three *Parks & Gardens of Historic Interest* have, in general, a south/south east facing aspect – i.e. away from the site boundary.

Ashford Borough Council

Whilst the entirety of the site lies within the District of Shepway, its western edge of the lies only a few hundred metres from the boundary with the Borough of Ashford. The authority's 'Landscape Character Supplementary Planning Document' highlights the presence of two current LCAs covering the Borough. The first, from 2005 focused upon the undeveloped areas around the edge of the town of Ashford. The second, from 2009 characterised those remaining areas of the Borough, but excluded those parts included with the AONB designations.

The character areas that may be potentially affected by the Otterpool Park development are set out on Figure 03.



Site Specific Level

Our initial LVIA Field Work & Site analysis has concluded that sole reliance upon the existing Kent CC Landscape Character Assessment is too broad brush in nature across the site to provide sufficient information to inform the LVIA and shaping of the masterplan. For this reason, and on account of the size of the site and the relatively complexity of its landscape, a **site-specific LCA** is warranted.

Subsequently we are currently preparing a site specific LCA in line with current guidance: '*An Approach to Landscape Character Assessment*' (2014), Natural England. In accordance with this document the LCA will be carried out at Level 3- 'Local scale or site level, at 1:10,000 or larger'. This will involve a process of:

- setting of draft landscape character areas, and the production of outline descriptions for each;
- field work to confirm draft assessment and boundaries between areas,
- consultation with other disciplines within team, and with key stakeholders such as the AONB Unit, Shepway DC Landscape Officer, Natural England, and Kent CC;
- finalising the characterisation work, and issuing findings to the masterplanning team.

The work, carried out by Chartered Landscape Architect, will establish a more robust evidence base, that is specifically linked to site, and which identifies the key characteristics that together create sense of place and the unique character of the study area and is surrounds, to inform the masterplanning phases.

It would also allow for a more focused assessment of those areas of the site that display better capacity, in landscape terms, than others to accept the nature of development proposed. The assessment would combine '*Landscape Character Sensitivity*' with '*Visual Sensitivity'* and '*Landscape Value*' to provide an overall '*Landscape Capacity'* for each of the individual landscape character areas. '*Landscape Character Sensitivity*' would capture the aspects of: landuse, landform pattern, landscape complexity, landscape condition and rarity, and representativeness of wider landscape character. '*Visual Sensitivity*' would capture the aspects of degree of openness, tree/woodland cover, orientation, altitude, and the appropriateness of potential mitigation measures. '*Landscape Value*' would bring in the issue of designated areas, tranquillity, and other perceptual aspects.

Other Character Aspects

The scale of the Otterpool Park scheme may raise issues regarding potential increases in light pollution and the loss of tranquillity, particularly in relation to the sensitive landscapes of the Kent Downs AONB, Special Landscape Area, and Romney Marsh.

The Council for the Protection of Rural England have published freely available data on current levels:

Tranquility Mapping

The mapping below show areas of lowest 'tranquility' in red and highest in green. The site has been ringed in red. The findings are based upon both an understanding of the visual and auidible detractors within a landscape such as the existence of overhead electricity pylons and the noise of motorways. It is apparant that along the M20 and HS1 rail line corridor between Folkestone and Ashford there is three/four kilometre wide strip which is relatively lower in tranquility compared to the areas deeper within the Kent Down AONB (marked with the pink line) to the north, and to the south along the greensand escarpment, further south from this within Romney Marsh.

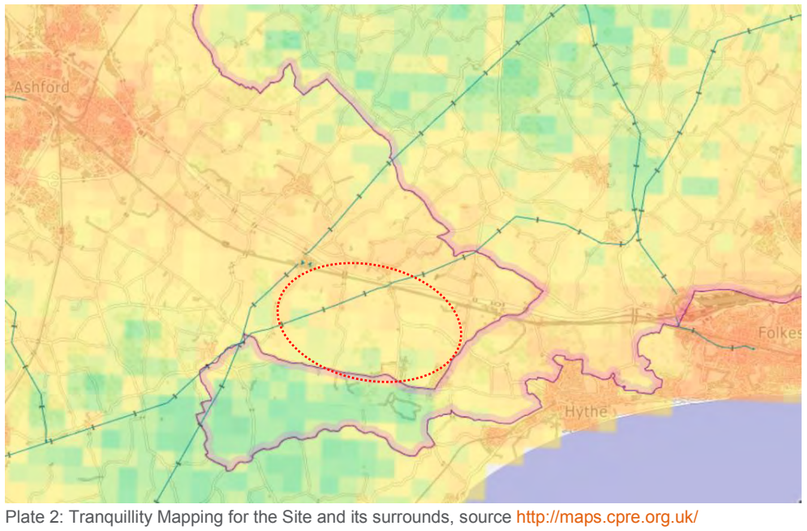


Plate 2: Tranquillity Mapping for the Site and its surrounds, source http://maps.cpre.org.uk/

Light Pollution:

The mapping below shows areas of relative light pollution in terms of radiance (night lights shining up into the night sky). The darker red/brown colours indicate greater radiance. The darker blue indicates least polluted areas. The map below shows, outlined in a thick black line the entirety of Shepway District. The site has been ringed in red.

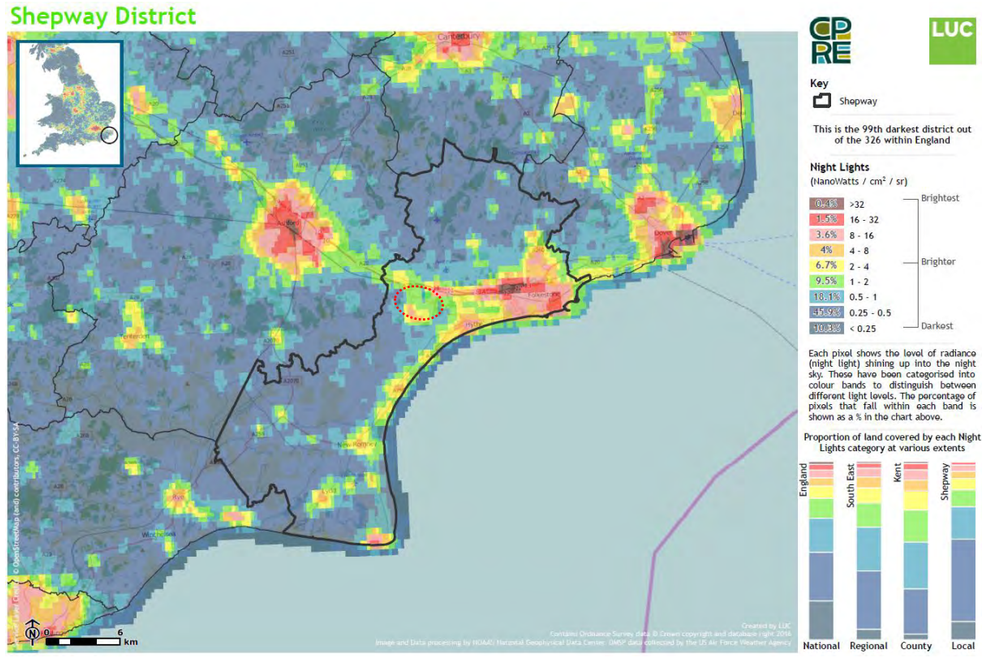


Plate 3: Light Pollution Mapping for SDC, source http://maps.cpre.org.uk/

The map below shows a more detailed analysis and the boundary of the Kent Down AONB (pink line). The site is ringed in red.

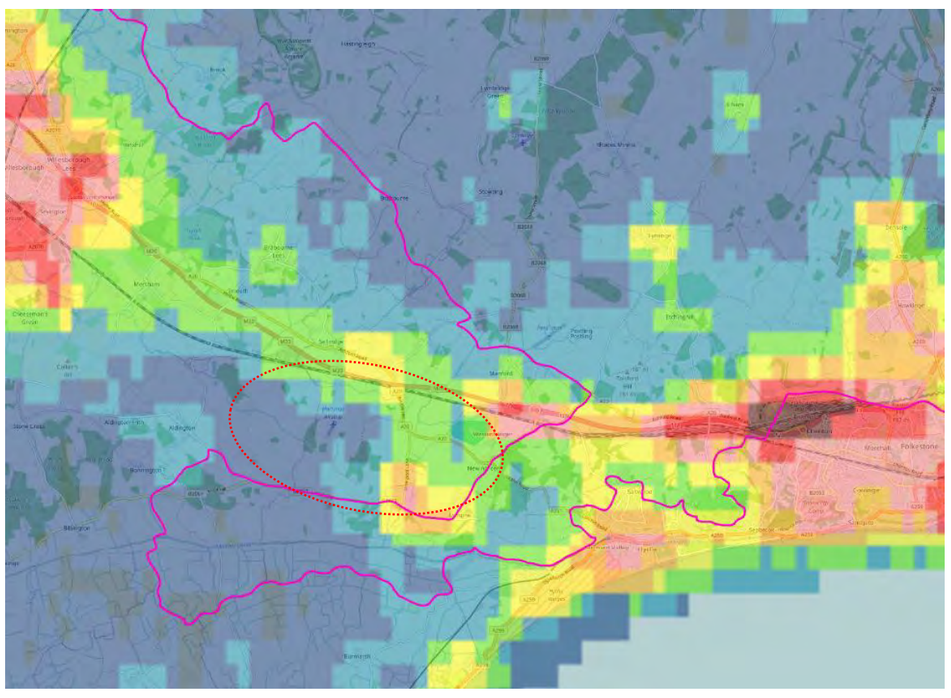


Plate 4: Light Pollution Mapping for the site and its surrounds, source http://maps.cpre.org. uk/

There is a clear band of relative greater light pollution along the M20/HS1 rail line corridor. There are also marked areas of intensity associated with the M20 service station, the channel tunnel terminal and the Link Park industrial estate. When these are combined with the light pollution emanating from the settlements of Sellindge, Lympne and Stanford much of the site displays the kind of light levels found at the edges of main conurbations. In contrast the area of the site to the north and west of Harringe Brooks Wood displays relative darkness.

Visual Context

The key aspects relating to visual amenity with regard to the planning of the Otterpool Park scheme are the:

- panoramic and focused views from the sensitive areas along the North Downs escarpment (from Dover Hill in the south-east to Broad Downs in the north-west – up to approximately 10km way) and along its foot-slopes (such as the North Downs Way National Trail, other public rights of way, areas of Open Access Land, particular public highways, and established viewpoints – all within the Kent Downs AONB) both into the site and to the greensand ridge, and over this to areas beyond such as the Dungeness Peninsular, and the coast at Hythe and Hastings;
- panoramic and focused views from the sensitive areas along the Greensand Ridge (such as at Court-at-Street, Postling Green, Ruffin's Hill, Clap Hill– some within the Kent Downs AONB) up to approximately 5km away both into the site and to the North Downs;
- panoramic and focused views from the sensitive areas within the SLA that are outside of the AONB (such as at Stone Hill and Stanford) both into the site and to the greensand ridge;
- general intervisibility of the North Downs escarpment and the Greensand Ridge, when viewed from either;
- views from other public rights of way (PRoW) that cross through the site to the North Downs Escarpment, the greensand ridge, to view areas of visual legibility (such as St Michael's church tower in Aldington, Westenhanger Castle and the Stanford windmill;
- residential visual amenity of people in the villages and settlements within the site, and around the immediate edge;
- night-time impact of the scheme, particularly upon the emerging protection
- cumulative visual impact with scheme such as the proposed Highways England Lorry Park to the north of the site, and other developments

Whilst it is not possible to prepare an accurate zone of theoretical visibility for the scheme until elements such the extent of built form and maximum building heights are set, we have been undertaking provisional studies to inform the scope of the LVIA and inform the masterplaning.

3. Policy Context

In the course of our data review we have also identified landscape related planning designations and reviewed the key planning policies at a national, regional and local level with regards to the scheme.

Landscape Related Planning Designations

Figures 03 and 04 show the relevant landscape related planning designations that exist within the expected LVIA study area

National Level:

- *Kent Downs AONB* – this designation is administered by the Kent Downs AONB Unit, but it is Natural England who are the statutory consultee on potential effects. Paragraph 7.4 of the Shepway District Council '*Places and Policies Local Plan, Preferred Options*' document (October 2016) confirms that the '*AONB Unit only responds to planning consultations when requested in accordance with an agreed protocol and the comments of the AONB relate only to the impact of the application … on the components of natural beauty as set out in the Management Plan, and not all planning issues.*'

  Despite the fact that the Otterpool site is not located within the AONB it directly adjoins it along two of its sides- the south and east, and lies within key views out from the designated area to the north. As such it is considered that the site lies within the 'setting' of the AONB.

  The impact of the development at Otterpool on this 'setting' is likely to be tested upon:

- the 'special qualities' of the Kent Downs AONB (as set out in the '*Management Plan-Second Revision 2014-2019*'), which include '*dramatic landform and views*'.
- the key characteristics of the particular area of the AONB which may be affected by the development (as set out in the Management Plan, the '*Kent Downs Landscape*' (1995); and th '*Kent Downs Area of Outstanding Natural Beauty Landscape Design Handbook*')
- the policies contained within the Management Plan.

- *Parks and Gardens of Historic Interest*: The register is compiled by Historic England, and they remain as the statutory consultees on development that my affect the integrity of the designated area, or its setting. The registered locations are graded in the same way as historic buildings are categorised i.e. graded I, II* and II (with grade I being the highest). Local authorities are also required by central government to provide for the protection of these assets, as part of the historic environment, in their policies. They must consult Historic England where an application affects a Grade I or II* registered site and the Garden History Society on all applications regardless of the grade. The Otterpool Park site does not encompass any registered site but directly adjoins Sandling Park (Grade II), Port Lympne (Grade II*) and Lympne Castle (locally listed). As such there will be a need to consider if there is likely to be potential impact upon the setting of these sites.

- *The North Downs Way, National Trail*: The North Downs National Trail is administered by the dedicated North Downs Way Officer and the 'Trail Partnership', which is made up of the local authorities along the path and other interested bodies such as the Ramblers Association. Given the distance from the nearest part of the site (between 3-4km) there is unlikely to be any direct impact upon the physical asset of the North Downs Way. Its presence within the site's zone of visual influence however means that the outlook from it would be affected, and the Trail's presences heightens the 'value' of the representative views in this area upon which the visual impact of the development at Otterpool will be assessed.

- *Open Access Land*: This designation is administered by Natural England, but afforded protection at a local level. Given the distance from the site to the nearest area of Open Access Land (approximately 1km) there is unlikely to be any direct physical impact upon the designated area. The presence, however, of the designation within the site's zone of visual influence heightens the 'value' of the representative views in this area upon which the visual impact of the development at Otterpool will be assessed.

Regional:

Special Landscape Area: Shepway District Council have retained the designation of parts of their administrative area as *Special Landscape Areas* (SLA) as they are considered have '*countywide landscape significance*' (policy NE3 of the Shepway District Council '*Places and Policies Local Plan, Preferred Options*' document (October 2016)). Paragraph 13.14 states that until a '*landscape assessment is carried out of the whole district it is proposed to carry forward the designations*' into the local development plan.

The area of this designation which encompasses the very eastern section of the site is termed the '*North Downs'* SLA (policy NE3), and as such there is the potential for the development at Otterpool to have a direct impact upon its integrity. There is, however, no published data upon the detailed reasoning for its designation, or a description its key character.

Our site specific LCA will: identify the key characteristics of this area; consider the condition and rarity of the landscape has: and assess the contribution it makes to the wider area – and hence the suitability for is continuance as a SLA.

Local:

- Conservation Areas: In common with other authorities SDC protect the character or appearance of particular built-up areas that are designated for their special architectural and historic interest. The only conservation area that is likely to be affected by the development is that of Lympne, that lies at the immediate edge of the south-east corner of the site.

Landscape Related Planning Policy

[2] Department of Communities and Local Government (2012); 'National Planning Policy Framework'.

National Policy

The National Planning Policy Framework (NPPF)[2] advises, as part of its 'Core Planning Principles' that planning decisions '*take account of the different roles and character of different areas,recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it*'. Paragraph 115 advises that '*great weight should be given to conserving landscape and scenic beauty in nationally designated landscapes, including AONBs, which have the highest status of protection in relation to landscape and scenic beauty*'.

Paragraph 52 It acknowledges that the '*supply of new homes can sometimes be best achieved through planning for larger scale development, such as new settlements or extensions to existing villages and towns that follow the principles of Garden Cities*'.

Paragraph 64, however states that '*permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions*'. in addition paragraph 128 states that '*In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets* [such as conservation areas] *affected, including any contribution made by their setting*'.

With regards to non-designated heritage assets paragraph 135 states that the effect of an application on their significance '*should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset*'.

Finally paragraph 170 states that '*where appropriate, landscape character assessments should also be prepared, integrated with assessment of historic landscape character, and for areas where there are major expansion options assessments of landscape sensitivity*'.

Local Policy

Shepway District Council's current adopted Core Strategy / Local Plan (2013) sets out a number of landscape-related planning policies for consideration during the development of proposals for Otterpool Park:

The *Strategic Need B* seeks the management of the '*sensitive landscapes shaping the character of the district, especially on the edge of settlements or within the Kent Downs AONB and its setting*'.

Policy SS1- District Spatial Strategy states that the '*future spatial priority for new development in the North Downs area is on accommodating development outside of the AONB and without material impact on its setting; …. and sensitively meeting the needs of communities within the AONB at better-served settlements*'. It amplifies this point by stating at paragraph 4.26 that the '*main area of future change in the North Downs Area is expected to be outside of the AONB. The protection of open countryside, recognising its intrinsic character and beauty, in policy SS1 (and policies such as CSD3 and CSD4) will be significant to sustainable development in this Shepway character area*'. Paragraph 4.68 continues: '*as part of this approach to encouraging positive change, the Strategy supports development which enhances a sense of place of communities and locations throughout Shepway. This place-shaping entails facilitating development where the quality of life and the physical environment is lower, and only encouraging development in locations of high townscape, strategic landscape, established historic or biodiversity value, where it reinforces or contributes to local character and sustainability*'.

Policy CSD4 - Green Infrastructure of Natural Networks, Open Spaces and Recreation states that '*planning decisions will have close regard to the need for conservation and enhancement of natural beauty in the AONB and its setting, which will take priority over other planning considerations. Elsewhere development must not jeopardise the protection and enhancement of the distinctive and diverse local landscapes in Shepway (especially where these support the setting of the AONB), and must reflect the need for attractive and high-quality open spaces throughout the district*'.

The '*Shepway District Local Plan Review (2006) Policies Applicable 2013 Onwards'* sets out those policies that have been 'saved' from the Shepway District Local Plan Review (2006) and that continue to apply after the adoption of the Core Strategy (18th September 2013). Policies from these two plans now make up the statutory Shepway development plan:

Countryside: **Policy CO1** seeks protection for the countryside (defined as the area outside of the settlement boundaries identified on the proposals map) for its own sake: '*Subject to other Plan policies, development in the countryside will be permitted where proposals: a) maintain or enhance features of landscape, wildlife, historic, geological and agricultural importance, and the particular quality and character of the countryside; b)*

demonstrate that they cannot be practicably located within an existing settlement and essentially require a countryside location; c) are of a high standard of design and, sympathetic in scale and appearance to their setting; e) preserve or enhance the amenity, character and functioning of rural towns and villages. Development proposals that would significantly conflict with one or more of criteria above will only be permitted where it can be shown that: ii) negative impacts are minimised as far as possible and; iii) adequate measures will be taken to compensate for any the adverse environmental effect. Compensatory measures should, as a minimum, ensure that no net environmental loss occurs.'

Kent Downs AONB: With regard to the Kent Downs AONB the Core Strategy / Local Plan states, at paragraph 12.8 that '*the national importance of the North Downs landscape is recognised by its inclusion in the Kent Downs Area of Outstanding Natural Beauty. The primary objective of the AONB is conservation of the natural beauty of the landscape and this should be reflected in Local Plan Policy and development control*'. There appears however to be no formal policy formalising this statement.

Special Landscape Areas: With regard to Special Landscape Areas the Core Strategy / Local Plan states, at paragraph 12.10, that '*the* [Kent County Council] *Structure Plan identifies areas of county-wide landscape importance as Special Landscape Areas (SLAs). Within Shepway, these incorporate the North Downs AONB, Old Romney Shoreline and Dungeness. SLAs have been identified through a process of landscape assessment and their detailed boundaries defined on the proposals map. The long-term protection of these areas and the conservation and enhancement of their natural beauty is given priority by Structure Plan Policy ENV4(1996 Adopted Plan). Development within the AONB and SLA should be kept to a minimum and where acceptable, should be designed and constructed so that the visual impact on the landscape is minimised and it makes a positive contribution to the attractiveness of the area*'.

Policy CO4 states that '*proposals should protect or enhance the natural beauty of the Special Landscape Area. The District Planning Authority will not permit development proposals that are inconsistent with this objective unless the need to secure economic and social wellbeing outweighs the need to protect the SLAs countywide landscape significance*'.

Paragraph 12.11 states that: 'outside of the Special Landscape Area, there are parts of the District which are of particular local landscape value and / or act as green buffers within or adjoining urban areas, contributing to local environmental quality and identity.

Conservation Areas: With regards to Conservation Areas **Policy BE4** states that SDC will '*require the height, scale, form and materials of new development, including alterations or extensions to existing buildings, to respect the character of Conservation Areas …. seek to retain the historic patterns, plot boundaries, building lines, open spaces, footways, footpaths and kerblines which are essential to the character or appearance of Conservation areas; …. protect trees, verges and hedgerows which enhance both the setting and character of Conservation Areas*.'

Parks and Gardens of Historic Interest: Paragraph 8.34 states that SDC recognises the importance of parks and gardens of historic interest. It sets out that '*while they have no statutory protection, the District Planning Authority wishes to protect them from harmful development. The "Historic Parks and Gardens of Kent" produced by Kent County Council in conjunction with the Kent Gardens Trust, identifies a number of gardens in Shepway with historic interest'*.

POLICY BE18 states that 'planning permission will be refused where development proposals would adversely affect the site or setting of the following parks and gardens of historic interest as shown on the Proposals Map: Lympne Castle, Port Lympne & Sandling Park.

The *Shepway - Places and Policies Local Plan, Preferred Options, October 2016* includes emerging policy which, given the potential length of the Otterpool Park masterplan development process, should be acknowledges at this stage.

Paragraph 13.14 states that '*the landscapes within the AONB are highly valued; they need to be protected and enhanced to ensure that their nationally important status can be maintained. It is also important to protect views into and out of the AONB. There are a number of high quality landscape areas outside of the AONB and it will be necessary to consider whether these areas should benefit from a local landscape designation particularly where they are important to the setting of the AONB. Until a new landscape assessment is carried out of the whole district it is proposed to carry forward the designations, Special Landscape Areas and Local Landscape Areas of the previous plan*'.

Paragraph 13.13 refers to the area surrounding Otterpool Park: '...In the east Kent Downs, the Lympne escarpment of calcareous Sandstone and Ragstone provides a spur of higher ground affording dramatic views across the near-level Romney Marsh and Hythe Bay.

Policy NE3 seeks to '*protect the District's landscapes and countryside. The impact of individual proposals and their cumulative effect on Kent Downs AONB and its setting will be carefully assessed. Planning permission will be granted where it can be demonstrated that all the following criteria have been met:*

1. *The natural beauty and locally distinctive features of the AONB are conserved and enhanced;*
2. *Proposals reinforce and respond to, rather than detract from, the distinctive character and special qualities of the AONB;*
3. *Either individually or cumulatively, development does not lead to actual or perceived coalescence of settlements or undermine the integrity or predominantly open and undeveloped, rural character of the AONB and its setting;*
4. *Is appropriate to the economic, social and environmental well-being of the area or is desirable for the understanding and enjoyment of the area (where this is consistent with the primary purpose of conserving and enhancing natural beauty);*
5. *The policy aims of the Kent Downs AONB Management Plan.*
6. *Special Landscape Areas: … Proposals should protect or enhance the natural beauty of the Special Landscape Area. The District Planning Authority will not permit development proposals that are inconsistent with this objective unless the need to secure economic and social wellbeing outweighs the need to protect the SLAs countywide landscape significance.*
7. *Outside of designated landscape areas, proposals should demonstrate that their siting and design are compatible with the pattern of natural and man-made features of the Landscape Character Areas, including cultural and historical associations,*
   Opportunities for remediation and improvement of damaged landscapes will be taken as they arise'.

With regards to potential Light Pollution Policy NE5 states that 'applications for major development, and development including significant external lighting, will be approved if: The proposal does not materially alter light levels outside the development site and/or has the potential to adversely affect the use or enjoyment of nearby buildings or open spaces

4. Stakeholder Engagement and Feedback

Separate consultations with Piran Cooper, Landscape & Urban Design officer Shepway District Council, and Nick Johannsen, Director of the Kent Downs AONB Unit have took place on 16th November 2016. The meetings we called to discuss the key landscape character and visual sensitivities of the site and its surrounds, and to agree on the scope of the LVIA. The key findings from these meetings are set out below:

The Landscape & Urban Design officer, Shepway District Council:

- described the degree of 'self-containment parts of the AONB have in this area;
- described the relative lack of a distinct character in the area encompassing the site;
- stressed the importance of landform and watercourses in the emerging masterplan proposals;
- shared examples of poor quality/integrated development – such as at Hawinge and north of Lympne;
- expressed a desire for the masterplan to explore new architectural vernaculars, as long a repetition in form is minimised;
- stressed the need for there to be an element of 'surprise', 'variety' and 'spontaneity' reflected in the emerging masterplan proposals, and for there to be an outwardly visible organically grown centre (with elements such as church spires, manor houses etc.)
- called for areas of 'semi-natural landscape' to punctuate the masterplan (such as found at Stelling Minnis),
- feels that as a basis for our site specific LCA the Kent County Council LCA (2004) 'stands-up well'.

The Kent Down AONB Unit:

At the meeting with Nick Johannsen the Director of the Kent Down AONB Unit we firstly reviewed their letter to Shepway Council Dated 16th August 2016 (which was received by Arcadis on 10th October 2016). The AONB Unit have opposition to the location of the scheme. During the meeting we discussed the theoretical development of Otterpool Park. The key findings from this are that:

- the AONB unit are preparing a draft 'setting' paper, which they are willing to share with us,
- they would like to be involved in the site specific LCA we are carrying out,
- they would like to review the ZTV of the development,
- they have concerns about the cumulative impact of the development in combination with other developments such as the Lorry Park,

- they would like to take part in the setting of design principles for the development (such a roofscape, building colour, form etc. density, scale)
- the sensitivity of the AONB areas to the east and south of the site is far less than that to the north- with regard to the Otterpool Park development,
- they would like to better understand the potential impact upon the recreational resources of the National Trail and Long Distance Paths through the AONB as a result of the development,
- they are coming up to the review period for their Management Plan,
- they would be interested to discuss the long term management implications of the development,
- they cite Hawkinge as a poor example of new development.

Natural England:

On 7th December we met with the Lead Planning Advisor from NE or the Otterpool Park Project.

NE are a statutory consultee with relation to the AONB, alongside the AONB unit. NE would appreciate being copied in to communication we have with the AONB unit. For NE the LVIA is key document to review. NE would like to be involved in the LVIA process including the determination of the assessed viewpoints, and the LCA work preceding this.

NE outlined how concerned NE are regarding the Lorry park to the north of the M20 and stated that Otterpool Park will need to take into consideration cumulative impacts to the 'setting' of the AONB from this. There are likely to be impacts upon the setting of the AONB from the Lorry Park. There will likely be an onus upon the Otterpool Park development to mitigate for cumulative visual impacts upon the AONB. Cumulative impact should also consider impacts from the proposed residential development at Sellindge (c.162 units). JC is to provide examples of recent planning applications which were declined due to impacts upon AONBs for reference, including Waterside Park (off J8 M20) and Farthingloe (Dover).

Further engagement with these stakeholders as well as landscape officers at Kent County Council and Ashford Borough Council (Mark Chapman and Matt Nouch) will take place over the coming weeks.

As well as seeking their views upon the key landscape character and visual sensitivities of their areas of interest in relation to the site and its surrounds, we will also be seeking awareness of other in-planning developments that may have an 'in-combination' **cumulative** impact with the emerging proposals at Otterpool Park.

With regards to landscape character our cultural heritage colleagues' consultation with KCC & Historic England identified their desire for the retention of individual farm settlements within the masterplanning proposals.

5. Constraints

With regards to landscape character and visual amenity there are the following constraints associated with the scheme (also see Figure 06):

- views from the North Downs escarpment, experienced by users the North Downs Way national trail and other publicly accessible areas along it;
- impact upon the character and qualities, and visual setting of the Kent Downs AONB, primarily in relation to views out from the North Downs escarpment;
- the setting of Sandling Park, and Port Lympne (Registered Parks & Gardens of Historic Interest) which adjoin the site area;
- night time impact of lighting from the potential development;
- the potential loss of the identifiable character and definition of the existing settlements of Lympne, Barrow Hill and Westenhanger;
- potential loss of relatively intimate landscape character along the course of the East Stour River by expansive development;
- the relatively high degree of exposure of the ridge tops within the site to panoramic long distance views;
- the potential loss of key shorter views to existing church towers, existing village edges and other notable local landmarks through the existing landscape
- the cumulative landscape and visual impact with the proposed lorry park to the immediate north of the site.
- the emerging protection of a 'dark skies area' in land near to the west of the site by Ashford BC.
- providing a suitable Setting of the Conservation area and the Registered parks and gardens.

6. Opportunities

With regards to landscape character and visual amenity there are clear opportunities associated with the scheme (many of which are endorsed by the Kent County Council Landscape Character Assessment). These are:

- the reinforcement of the existing landscape pattern of north-south undulating topography;
- the creation of a stronger landscape structure, using small woodlands, hedgerows and tree belts, in response to the 'Restore' and 'Create' actions proposed within the 2004 KCC LCA;
- the visual amelioration of existing detracting elements such as the HS1 rail line, Link Park industrial areas, the soon to be built M20 lorry park, and other commercial activity;
- the mitigation of noise from M20;
- the reinforcement of the historic landscape structure of the site through the development.
- Contribution to the wider aims of enhancing the AONB e.g. supporting the 'undergrounding' of some of the high-voltage pylons that cross the site and continue towards the AONB.

7. Impact on Masterplan Design

A number of principles necessary for the successful integration of the proposed development into its landscape and visual setting have emerged from the Stage 1 process. These are:

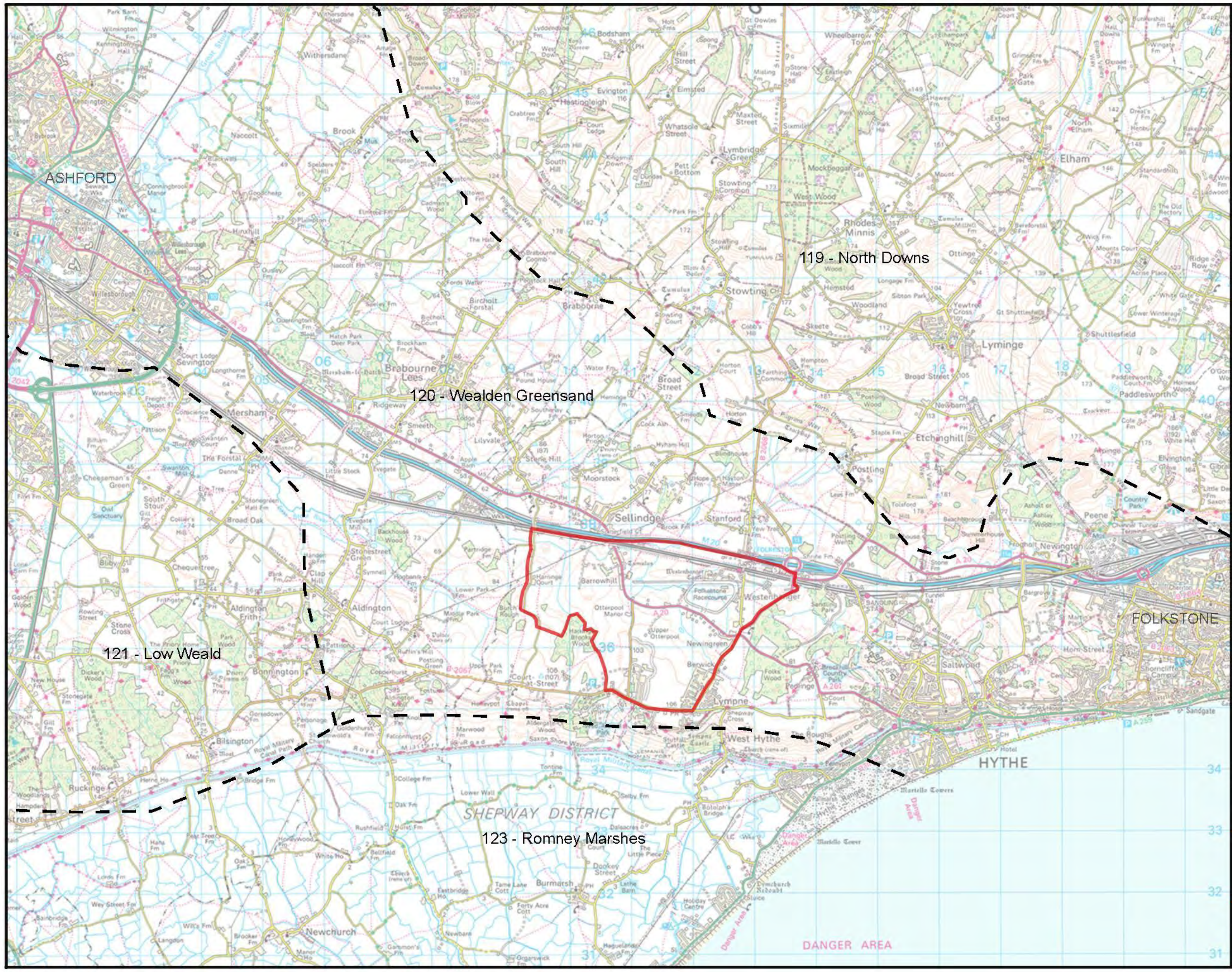
- the reflection of the pronounced topography, found predominately in the western part of the site (such in the area east and west of Somerfield Court Farm), in the layout of the streets, spaces and built form;
- the avoidance of built form in locations (see Figure 06) that are likely to break the skyline when viewed from areas of high sensitivity and relative low altitude, such as the footslopes of the North Downs escarpment within the AONB;
- the design of a settlement that appears to have organically evolved (i.e. with a clearly visible centre, areas of differing townscape character, and defined edges), when viewed from areas of high landscape and visual sensitivity such as the Kent Downs AONB;
- the choice of building form, orientation, materials etc. as these are important factors in minimising the visual impact upon key areas of high landscape and visual sensitivity;
- the inclusion of belts of trees, generally along an east-west orientation through the site, to assist in breaking up the perceived mass of built form resulting from a settlement of this scale that is likely to be visible from areas of high landscape and visual sensitivity such as the Kent Downs AONB;
- the retention and development of farms, farmland and semi-natural areas between sections of built form, to mirror that found at the edges of Lympne and Barrow Hill;
- the consideration of the visual experience of those using the existing PRoW that span across the site;
- the importance of a masterplan that minimises light spill, given the presence of the AONB to the north, south and east of the site, and a protected 'dark skies area to the west (between which width of corridor is to be agreed); and
- the conservation of the character of existing townscapes, landscapes, in and around the site-such as Lympne conservation area, and the East Stour river valley.

8. Changes to Risk Register

Risk register remains largely as provided in early November 2016, new risks shown in the bottom two rows of the table below.

Date Raised	Work Stream and Risk Owner	Risk Description	Programme Impact	Probability (1-5)	Impact (1-5)	Rating (IxP)	Risk Rating	Mitigation	Status
30/10/2016	GI+Biodiversity	Shepway District Wide LCA being produced in isolation from our site specific LCA	The to LCA conclude different results so that we cannot agree common ground with the local Planning authority	3	3	9	Medium	Continue to seek engagement with SDC and their advisors AECOM	Communication with SDC is underway
21/10/2016	GI+Biodiversity	The Stated objection to the scheme by the AONB Unit	Risk of continuing opposition by a key stakeholder Further engagement with the AONB Unit will be necessary	4	4	16	High	To mitigate this we will work in collaboration with the Unit to help reduce their concerns throughout the LVIA and masterplanning process.	We have dialogue with the AONB Unit and will continue to engage with them through stage 2

Figure 01



KEY

Area of Search

National Character Map of England: Character Area Boundary

version	date	status	author	checker	approver
01	29.11.16	DRAFT	N.S.	B.H	

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OTTERPOOL PARK

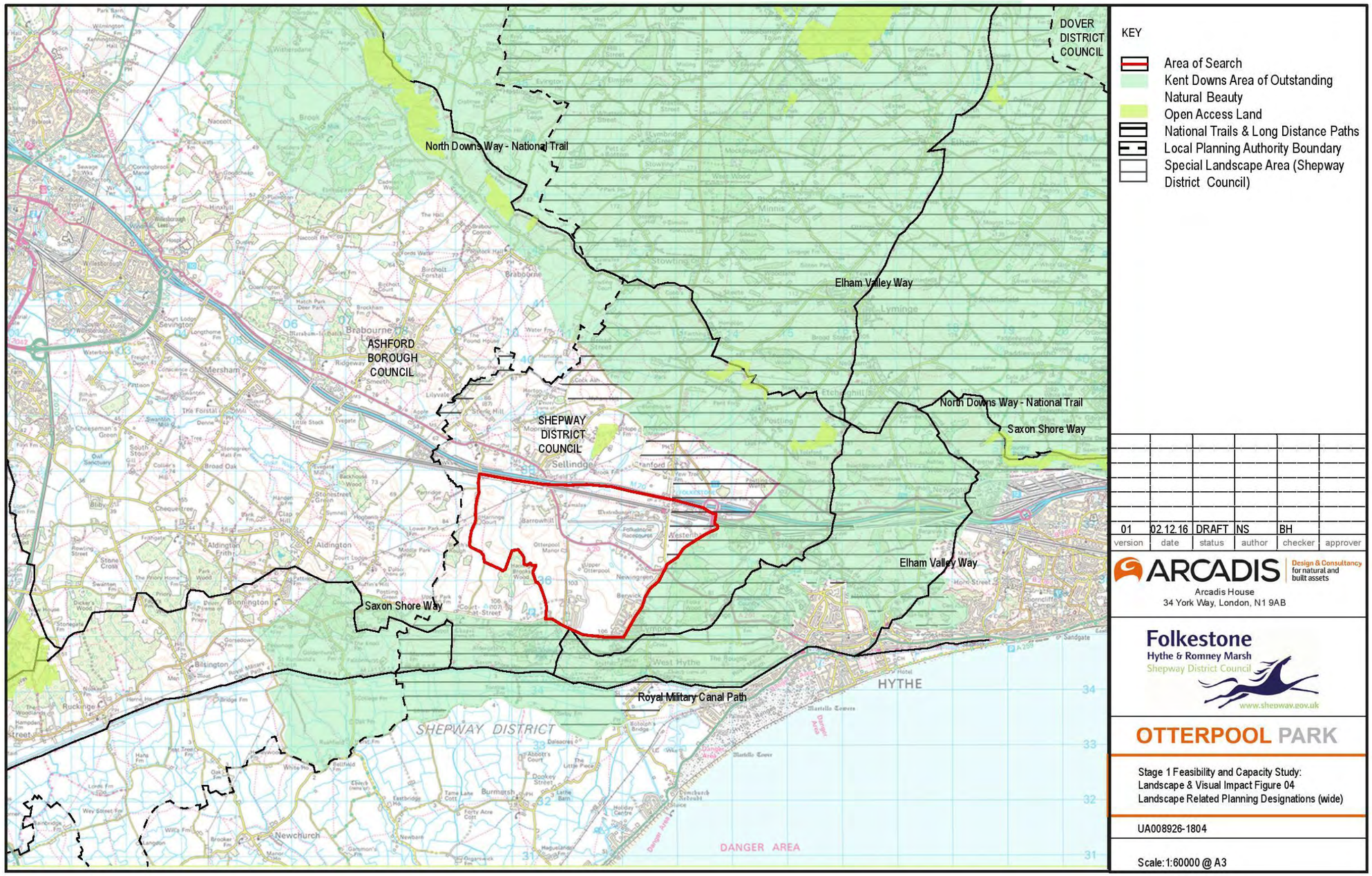
Stage 1 Feasibility and Capacity Study:
Landscape & Visual Impact - Figure 01
Location Plan & National Character Areas

UA008926-1801

SCALE 1:60000 @ A3

-

Figure 02


DOVER DISTRICT COUNCIL
North Downs Way - National Trail
Elham Valley Way
ASHFORD BOROUGH COUNCIL
SHEPWAY DISTRICT COUNCIL
North Downs Way - National Trail
Saxon Shore Way
Elham Valley Way
Saxon Shore Way
Royal Military Canal Path
SHEPWAY DISTRICT
HYTHE
DANGER AREA
KEY
Area of Search
Kent Downs Area of Outstanding Natural Beauty
Open Access Land
National Trails & Long Distance Paths
Local Planning Authority Boundary
Special Landscape Area (Shepway District Council)
01 02.12.16 DRAFT NS BH
version date status author checker approver
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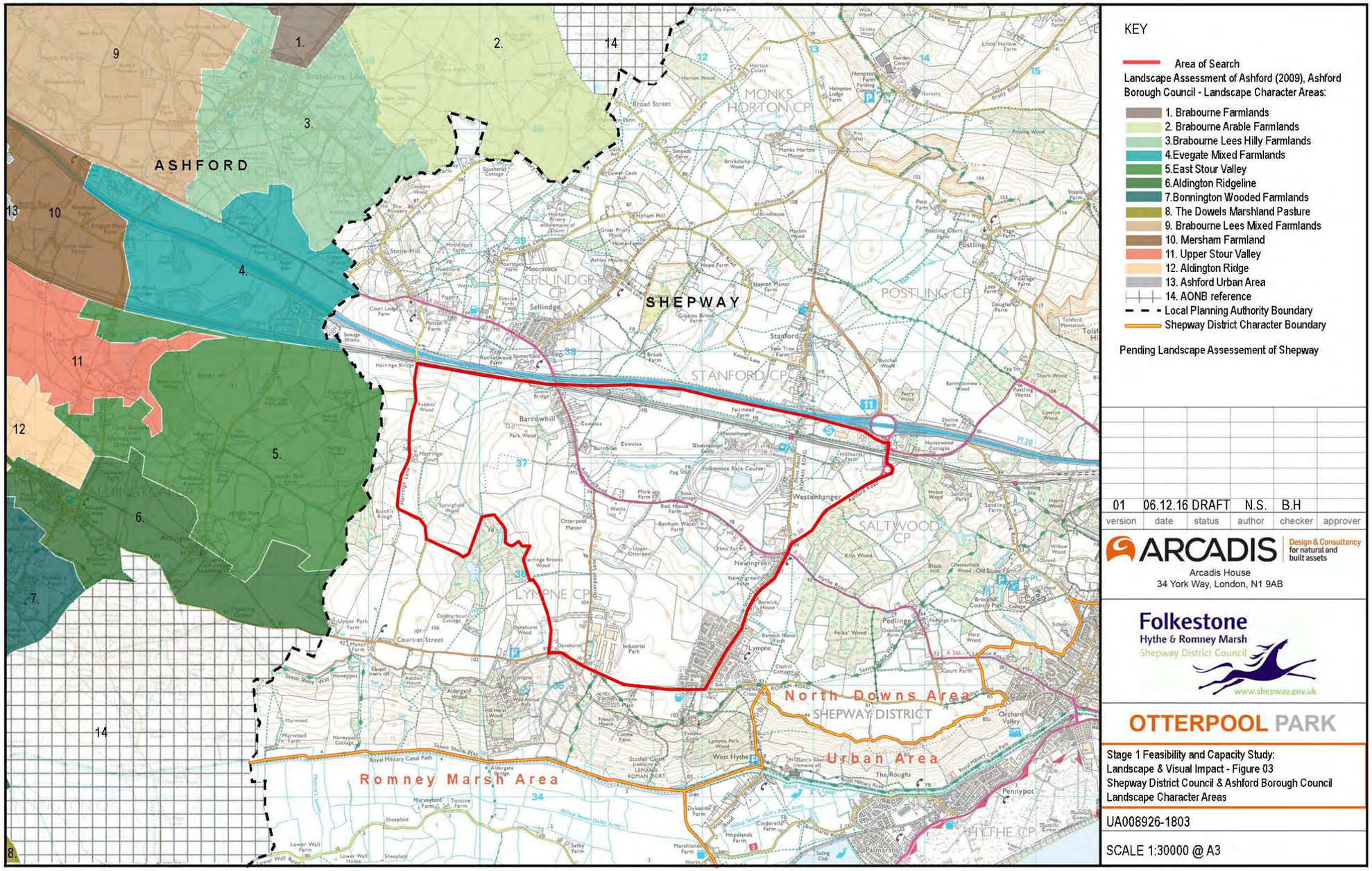
Stage 1 Feasibility and Capacity Study:
Landscape & Visual Impact Figure 04
Landscape Related Planning Designations (wide)
UA008926-1804
Scale: 1:60000 @ A3

Figure 1803



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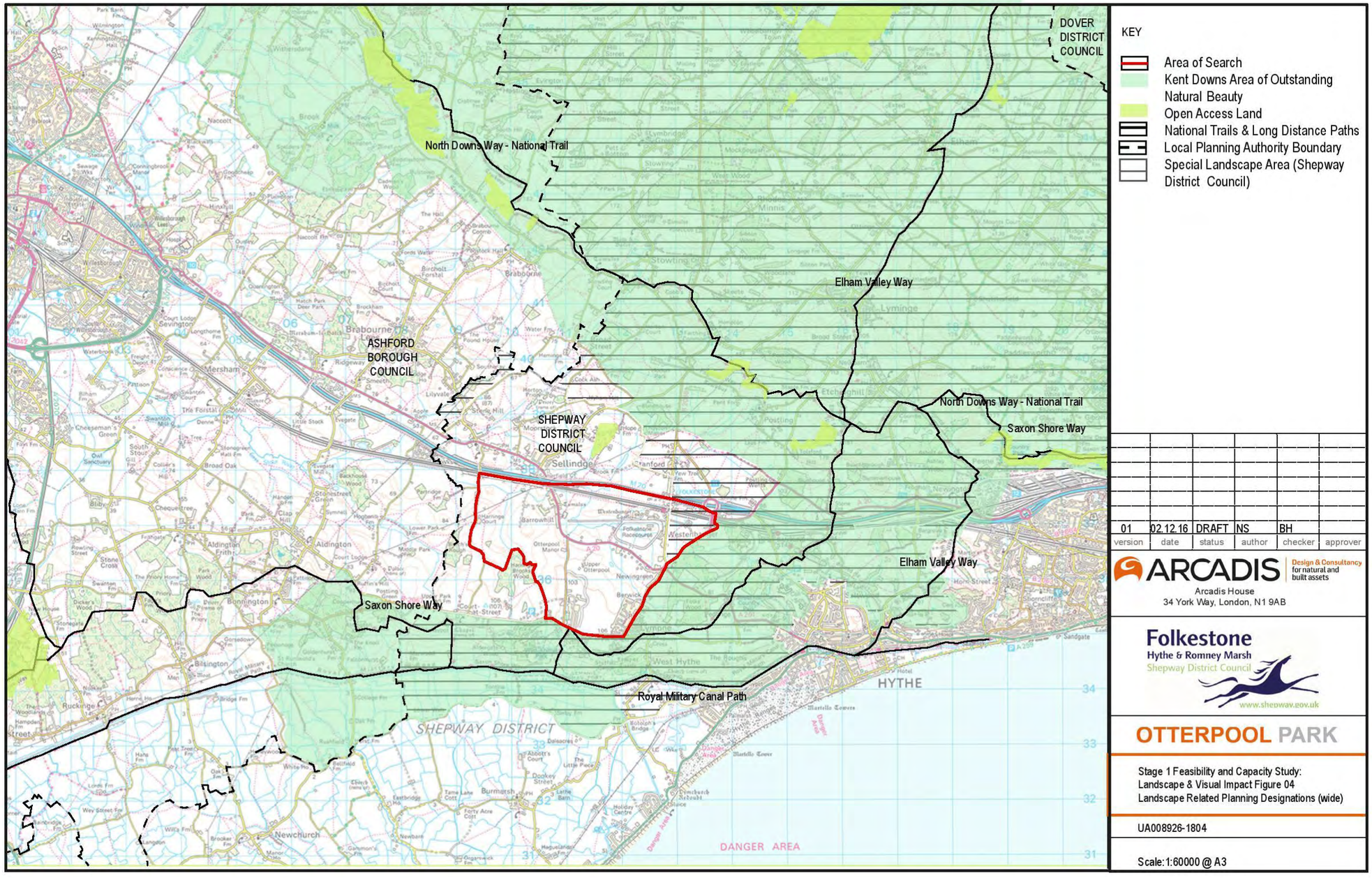
Stage 1 Feasibility and Capacity Study:
Landscape & Visual Impact - Figure 03
Shepway District Council & Ashford Borough Council
Landscape Character Areas

UA008926-1803

SCALE 1:30000 @ A3

Figure 04



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01	02.12.16	DRAFT	NS	BH	

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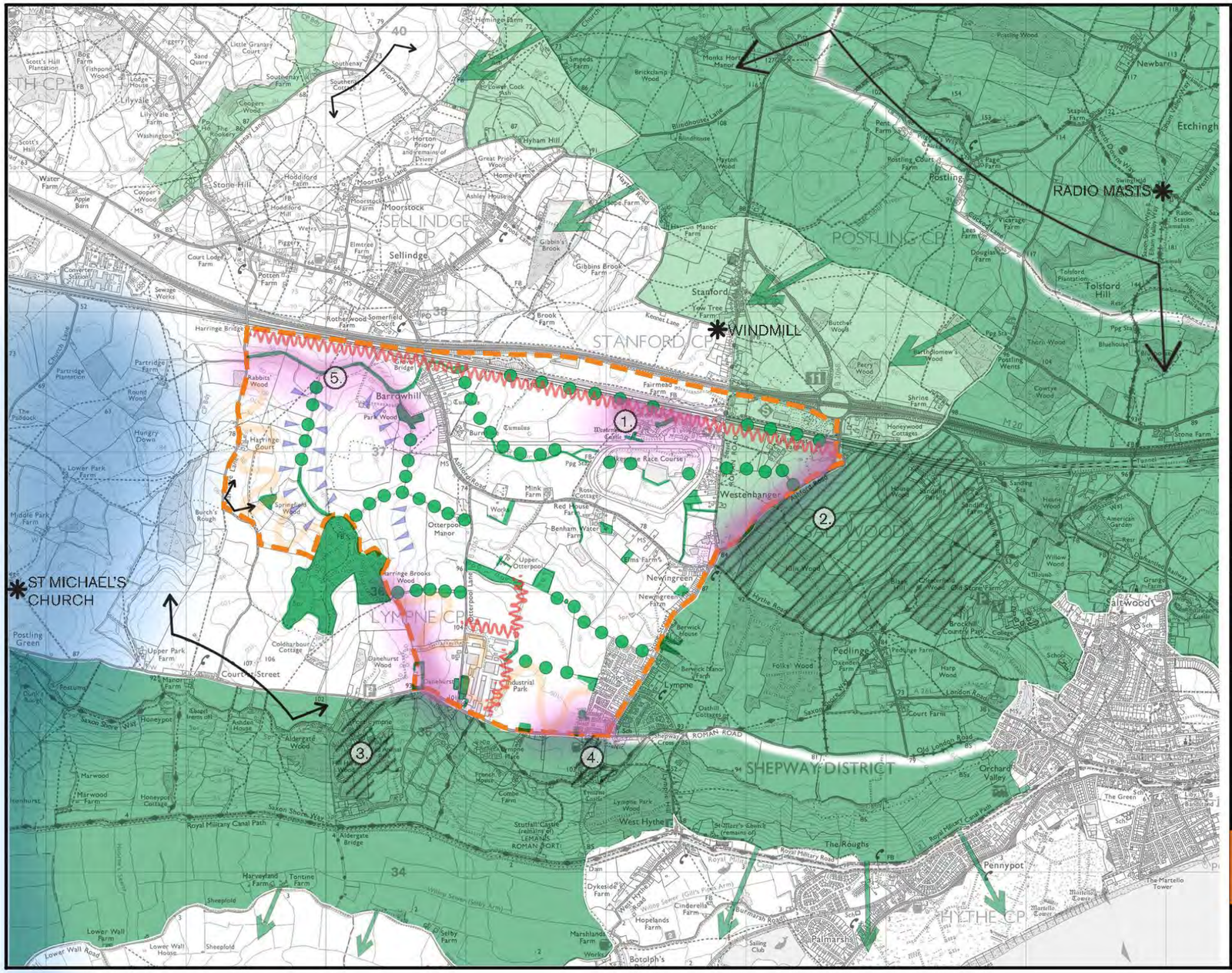
Stage 1 Feasibility and Capacity Study:
Landscape & Visual Impact Figure 04
Landscape Related Planning Designations (wide)

UA008926-1804

Scale: 1:60000 @ A3

Figure 05



Key:

- Area of Search
- Kent Downs AONB
- Percieved Setting of Kent Downs AONB
- Special Landscape Area (beyond AONB)
- Locally Designated Areas of Protected Dark Skies (Ashford B.C)
- Visual Landmarks
- Key Views into site
- Key Landform from the site
- Area at Risk of Proposed Built Form Breaking the Skyline
- Key Areas of Woodland/Tree Belts
- Proposed Tree Belts to Break up Mass of Buill Form when Viewed from Outside Site
- Areas of valued Landscape Character within site and their proposed buffer

1. Westenhanger Castle
2. Sandling Park (Registered Park of Historic Interest)
3. Port Lympne (Registered Park of Historic Interest)
4. Lympne Castle (Conservation Area).
5. East Stour Valley

- Proposed Amelioration of Existing Audible / Visual Detractors

version	date	status	author	checker	approver
01	30.11.16	DRAFT	R.B.S	B.H	B.H

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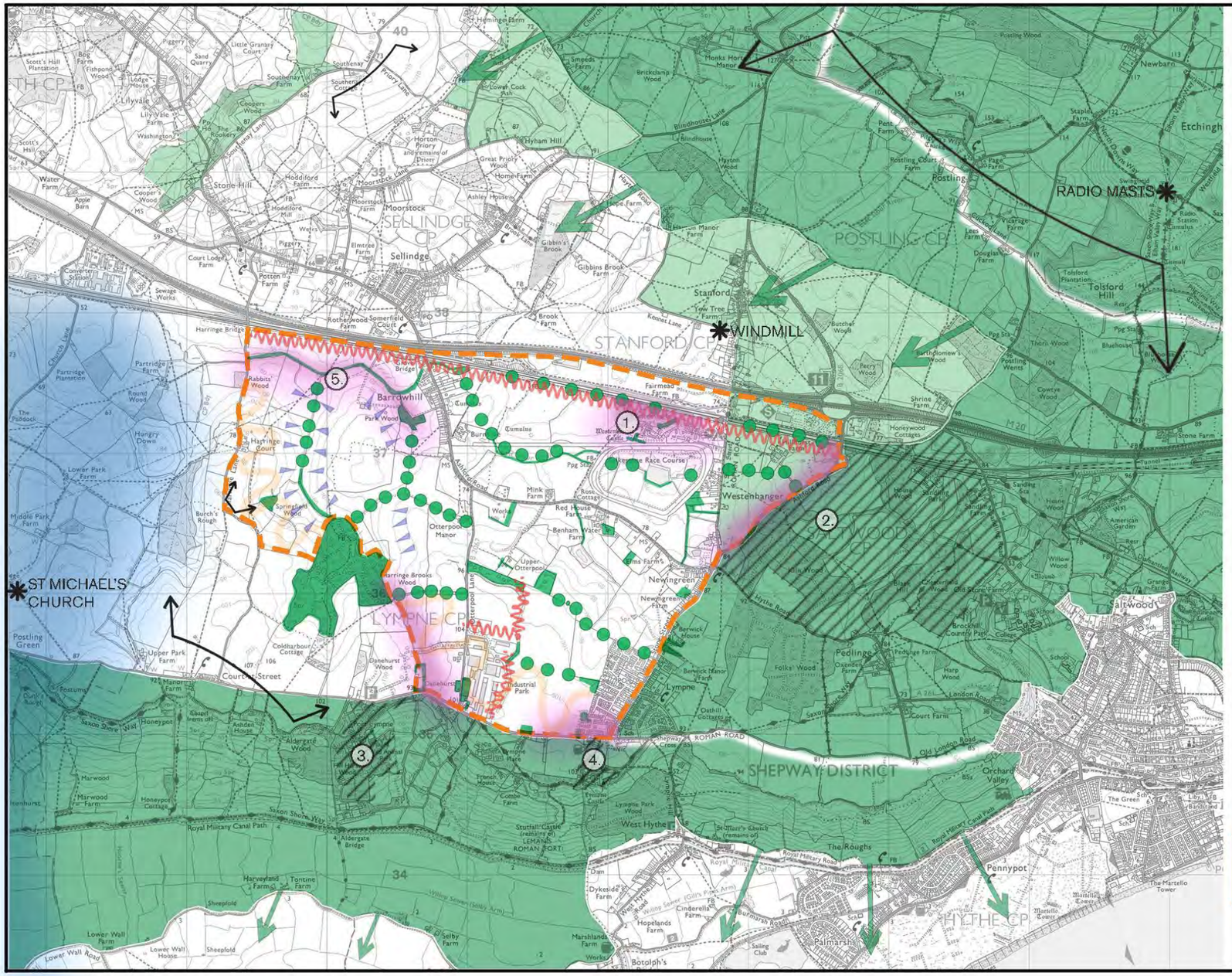
Stage 1 Feasability and Capacity Study;
Landscape & Visual Impact Figure 06
Opportunities + Constraints Plan

UA008926-1806

Scale: NTS Orginal Size: A3

Figure 06



Key:

- Area of Search
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- Proposed Amelioration of Existing Audible / Visual Detractors

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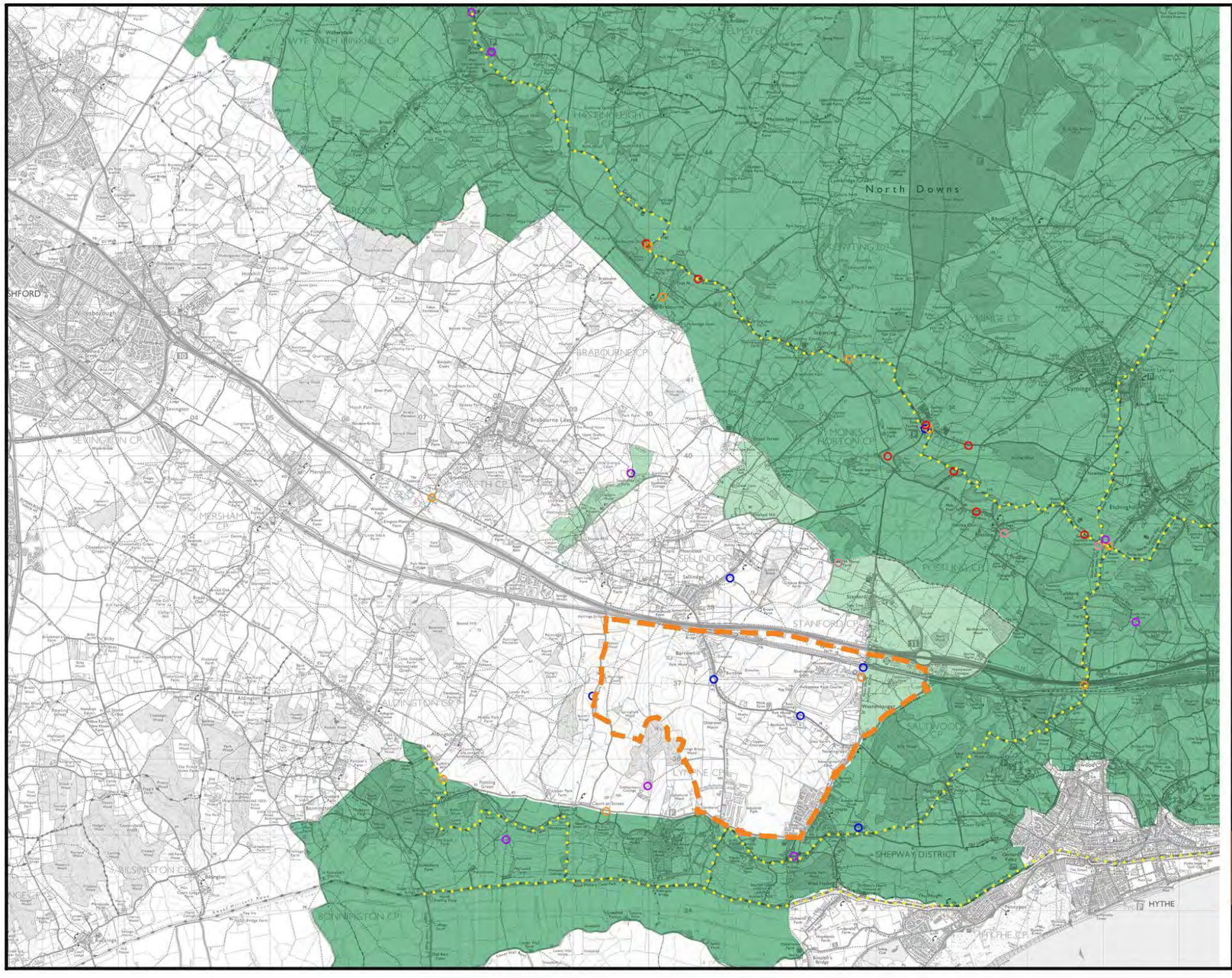
Stage 1 Feasability and Capacity Study;
Landscape & Visual Impact Figure 06
Opportunities + Constraints Plan

UA008926-1806

Scale: NTS Orginal Size: A3

Figure 07



Key:

- Area of Search
- Kent Downs AONB
- Special Landscape Area (beyond AONB)
- View Point - Lorry Park
- View Point - 2012 Racecourse Residential Scheme
- View Point - Harringe Windfarm
- View Point - Link Park Biomass Plant
- View Point - KCC Recreation
- National Trails / Long Distance Paths

version	date	status	author	checker	approver
01	02.12.16	DRAFT	R.B.S	B.H	B.H

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Stage 1 Feasability and Capacity Study;
Landscape & Visual Impact Figure 07
Potential Viewpoint Locations

UA008926-1807

Scale: NTS Orginal Size: A3

Green Infrastructure

1. Stage 1 Methodology

- *Baseline GI* - A schedule has been set up to track existing and proposed GI Typologies, their assets, and functions in relation to Green Infrastructure, Blue Infrastructure and Biodiversity. This will inform the masterplan and also underpins the importance of services provided to the scheme and wider area, by GI.

- *Design Principles* – A schedule has been set up to track design principles in relation to retained (and eventually, proposed) features of the site. Draft principles set out for example the extent of proposed buffers and dark corridors, and will assist in informing the masterplan/capacity study.

- *Quantification* – Alongside the masterplanners, we have been broadly estimating the quantum of existing GI and requirements for GI, going forward, against the typologies schedule. This has enabled us to broadly baseline existing GI, measure proposed loss to development and estimate new GI provision.

Collaborative Working

Whilst the Landscape, Biodiversity, Hydrology and Cultural Heritage teams produced separate work we have also been working on combined mapping; each discipline has provided drawings expressing initial opportunities and constraints identified via desk study and/or site walkover, which when combined illustrates the areas of potentially greatest constraints and opportunities on the site. This mapping informs and underpins the evolving masterplan strategy.

The combined mapping is referenced UA008926-1503-03 Green and Blue Infrastructure Opportunities-Combined and should be viewed with drawings UA008926-1504-02 and UA008926-1506-03.

2. Baseline Data

Local Green Infrastructure requirements have been reviewed against Shepway Council policies (see below) and a typologies schedule prepared. Research upon the principles of the Garden City movement from E. Howard's original Design Principles through to the Garden Cities for the 21st century has been undertaken and comparisons made against current guidance on garden settlements.

A list of relevant guidance documents relating to Green Infrastructure which have been reviewed to date, can be found under 'Guidance' in the Policy Context section, below.

3. Policy Context

In the course of our data review we have also identified and reviewed the below key policies with regards to the scheme. It is likely that additional relevant policy will be highlighted during consultee liaison.

National Policy

- The National Planning Policy Framework (NPPF 2012) sets out how the planning system should protect and enhance nature conservation interests. Section 11 is concerned with conserving and enhancing the natural environment. The NPPF states that *'planning policies should promote the protection of priority species populations linked to national and local targets'*. The NPPF also states *'The planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes….and minimising impacts on biodiversity and providing net gains in biodiversity* '.

- NPPF at para 115 confirms that great weight should be given to conserving scenic beauty in AONBs

- ODPM Circular 06/2005 states that the presence of protected species is a material consideration in the planning process.

- The 'Locally-Led Garden Villages, Towns and Cities' policy document by the Department for Communities and Local Government (March 2016) has also been reviewed

Local Policy

- Shepway District Council's Local Plan / Core Strategy includes:
- Policy CSD4 – 'Green Infrastructure of Natural Networks, Open Spaces and Recreation' which covers biodiversity as follows:
    - *Improvements in green infrastructure (GI) assets in the district will be actively encouraged as will an increase in the quantity of GI delivered by Shepway District Council working with partners and developers in and around the sub-region, including through pursuing opportunities to achieve net gains in biodiversity, and positive management of areas of high landscape quality or high coastal/recreational potential.*
    - *Green infrastructure will be protected and enhanced and the loss of GI uses will not be allowed, other than where demonstrated to be in full accordance with national policy, or a significant quantitative or qualitative net GI benefit is realised or it is clearly demonstrated that the aims of this strategy are furthered and outweigh its impact on GI. Moreover:*
        - *Development must avoid a net loss of biodiversity.*
        - *The highest level of protection in accordance with statutory requirements will be given to protecting the integrity of sites of international nature conservation importance.*
        - *A high level of protection will be given to nationally designated sites (SSSI and Ancient Woodland) where development will avoid any significant impact.*
        - *Appropriate and proportionate protection will be given to habitats that support higher-level designations, and sub-national and locally designated wildlife/geological sites (including Kent BAP habitats, and other sites of nature conservation interest).*

- Policy CO1 The District Planning Authority will protect the countryside for its own sake. Subject to other Plan policies, development in the countryside will be permitted where proposals:
    - Maintain or enhance features of landscape, wildlife, historic, geological and agricultural importance, and the particular quality and character of the countryside;
    - Development proposals that would significantly conflict with…*the* criteria will only be permitted where it can be shown that:
        - i) there is an overriding social or economic need;
        - ii) negative impacts are minimised as far as possible and; i
        - ii) adequate measures will be taken to compensate for any the adverse environmental effect. Compensatory measures should, as a minimum, ensure that no net environmental loss occurs. Note: For the purposes of Policy CO1, the Countryside is defined as the area outside of the settlement boundaries identified on the proposals map. Where land in the countryside is allocated on the proposals map for a specific development purpose, the associated policy will take precedence over Policy CO1.

- Policy CO11 The District Planning Authority will not give permission for development if it is likely to endanger plant or animal life (or its habitat) protected under law and/or identified as a UK Biodiversity Action Plan priority species or cause the loss of, or damage to, habitats and landscape features of importance for nature conservation, unless; there is a need for development which outweighs these nature conservation considerations and measures will be taken to minimise impacts and fully compensate for remaining adverse affects.

- POLICY CO13 Development proposals likely to have a harmful effect on the freshwater environment, including water courses, natural ponds, canals and sewers and adjoining banks, will only be permitted where harmful impact will be minimal, and where benefit in the form of increased access and / or water based recreation outweigh the negative effects. In such cases, measures should be taken to minimise impacts and fully compensate for remaining adverse effects.

- Shepway District Council's adopted Core Strategy and relevant Policy CSD4,

- Local Plan Review 2013 saved Policy CO1

Plate 5: Extract from SDC Core Strategy Local Plan 2013 – Green Infrastructure Network

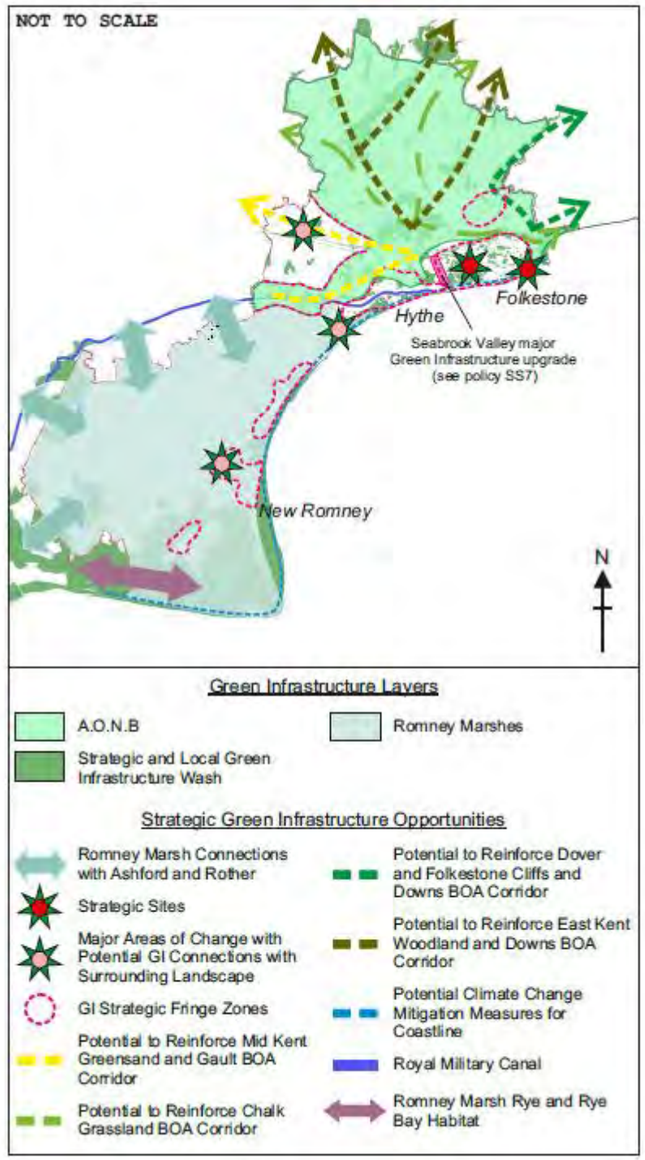


Figure 5.3 Green Infrastructure Network

Legislation

- The Natural Environment and Rural Communities (NERC) Act 2006 places a duty upon public bodies to consider Section 41 lists flora, fauna and habitats (previously UK BAP habitats and species) as a material consideration in planning and to consider enhancement of biodiversity.
- Biodiversity 2020: A strategy for England's Wildlife and Ecosystem Services (**Error! Reference source not found.**) includes a list of Habitats of Principal Importance in England (HPIEs) and Species of Principal Importance in England (SPIEs). These were previously included as Priority Habitats and Priority Species in the UK BAP.
- Public Rights of Way, including the North Downs Way, a National Trail, as well as areas of extensively used Open Access land. 'Duty of Regard' set out in the CRoW Act 2000.

Guidance

- BS 42020:2013 - Biodiversity. Code of practice for planning and development states that all developments should follow the mitigation hierarchy;
- Kent Design Guide;
- Kent County Council – Growth & Infrastructure Framework
- Good practice guidance for green infrastructure and biodiversity (TCPA)
- "Shepway Local Development Framework Green Infrastructure Report"
- Green Infrastructure Guidance (the Landscape Institute)
- Green Infrastructure An Integrated Approach to Land use (Natural England
- Active Design (Sport England)
- Connectivity and Ecological Networks (Landscape Institute)
- The essential role of green infrastructure: eco-towns green infrastructure worksheet (TCPA)
- Demystifying Green Infrastructure (Green Building Council)
- Green Infrastructure - Valuation Tools Assessment (Natural England)
- Ashford Borough Council Green Blue Grid Strategy
- Comparison of original, existing and new policy in relation to Garden City principles is being undertaken. Comparison includes policy/guidance from TCPA, DCLG, Shepway Vision.
- To inform the capacity study, we have begun the process of obtaining information on any LPA prescribed quantities in relation to GI e.g. sports pitches, allotments.

4. Stakeholder Engagement and Feedback

At the meeting with NE on 7th December NE expressed a keen interest to be involved at the design stage in relation to the GI design (and how it can be used to reduce visual impacts). NE see that GI is how the scheme can best demonstrate its credentials as the Garden Settlement. NE would like to get involved with the planning of the GI for the Otterpool site at a high level, in an advisory/ best practice way. NE feel a joint workshop to discuss GI alongside KCC, SDC and others would be the best use of their input.

Landscape team have made contact with contacts provided by SDC at:

- Kent CC – Liz Milne, Green Infrastructure officer. Initial contact made; Liz has confirmed that her team is correct to provide input in respect of green infrastructure and that she is happy to be first point of contact for this once arrangements have been agreed between Kent CC and Shepway DC.

5. Constraints

Constraints posed by GI:

Volume and distribution of existing notable features and sensitivities in relation to existing landscape, ecology, cultural heritage and blue infrastructure. See individual responses for Biodiversity, Water Management and LVIA.

Land take necessary to adequately protect existing features including three critically important areas for biodiversity identified to date:

- The pond/lake and its surrounds within the racecourse;
- Harringe Brooks Ancient Woodland and its surrounds;
- East Stour River corridors.

These areas are identified as 'Habitat Areas Grade 1' on the maps provided with this document. Other valuable or notable habitats and areas are also identified within these maps. Many areas have high biodiversity value and should be avoided or buffered within the masterplan design, including trees, hedgerows

and woodlands. Constraints in relation to GI are also posed by water management requirements and flood zones.

Evolving design principles have been set out for these areas/features. The design principles set out what measures are required to protect, enhance or mitigate and how these measures will also contribute to human experience – e.g. a riparian buffer to the River Stour could support water management, protect and enhance ecology associated with the river, and be utilised as a linear park for leisure, access to nature, natural play and movement (cycle and pedestrian).

Land take (presumed GI) necessary to protect existing cultural heritage features and their setting e.g. Westenhanger Castle, military pill boxes, tumulus.

The quality and complexity of the existing landscape, geology, ecology and heritage, offer an exciting opportunity to underpin, and enhance the proposed development. They will inform the layout and features of the proposals, with *careful consideration in order to positively integrate the existing qualities, whilst managing the space requirements and functionality of proposed development.*

6. Opportunities

Great range of valuable existing features identified on, adjacent and near to the site offer potential to provide an exceptional network of GI. Many of the features have potential to add positively to the development, through a range of functions, and provide opportunities to enhance. Opportunities in relation to GI include those from landscape, ecology, cultural heritage and blue infrastructure.

There are opportunities to safeguard and enhance the biodiversity value of the site within the masterplan design. These are summarised within the Opportunities section of the ecology chapter of this report.

With regards to landscape character and visual amenity, there are clear opportunities associated with the scheme (many of which are endorsed by the Kent County Council Landscape Character Assessment). These are:

- the reinforcement of the existing landscape pattern of north-south undulating topography;
- the creation of a stronger landscape structure, using small woodlands, hedgerows and tree belts,
- the visual mitigation of existing detracting elements such as the HS1 rail line, Link Park industrial areas, and other commercial activity;
- the mitigation of noise from M20;
- the reinforcement of the historic landscape structure of the site through the development.
- AONB enhancement
- Contribute to KCC GI Network
- Relieve pressure on existing areas of recreation such as the north downs way, Saxon Shore path etc. by creating SANGs on site
- Improved north-south link to break severance caused by rail/M20
- Conservation and enhancement of the AONB by building in dependence upon some of the industries it supports – e.g., timber products produced in the coppices of the Kent Downs being used in the construction of the development, or for fuelling Biomass energy plants.

7. Impact on Masterplan Design

Combined mapping identifies the complexity and quantity of constraints on site; conversely, it illustrates the level of opportunity for enhancements and for positive integration of existing features into the scheme.

The mapping listed in sections 5 & 6 above, shows the key impacts upon masterplan design from existing ecological, hydrological and cultural heritage features, using information obtained to date.

These existing typologies and proposed GI typologies, have been set out in document UA008926-1001-01. These include:

Street trees, formal sports, formal play, natural play spaces, food production, waste water treatment, recreation corridors, transport corridors, green open space. Hubs, SuDS, architectural features, buffers and visual screening, streets and habitat links.

Along with the existing GI, arrangement and integration of the proposed GI will be key to informing the tenets of the masterplan, for example:

- Ease of access and walking distances from homes to open space and play space
- Ease of access to and direct routes for pedestrians and cyclists, to encourage physical activity and reduced car use/dependence of fossil fuels
- Integration/location of water management features, for visual and recreational amenity
- Orientation and aspect of food production facilities
- Positioning/orientation of streets/street trees to maximise solar gain to buildings and provide screening of the development from the AONB
- Location and orientation of architectural features such as green roofs, green walls, and earth sheltering to maximise architectural gains and lessen the impact of views into the development from the AONB
- Location and orientation of open space to assist with water management
- Location and orientation of ‘wild’ places, to best serve biodiversity
- Orientation and location of sports facilities to ensure optimal functionality regarding sun path and levels/falls
- Layout/arrangement and extent of GI to create the desired look and ‘feel’ for the development

A key question will be how GI is distributed throughout the development. It could be, for example:

- Largely concentrated in few areas of large, open spaces, with limited GI in streets and hubs
- Distributed fairly evenly throughout the scheme, with small areas of open space/public gardens within streets and neighbourhoods and wide, green streets throughout
- A balance of the two

GI Allocation & Open Space Provision

Existing and Proposed GI Typologies, Assets and Functions have been set out in document UA008926-1001-01 (see above). One of their uses has their use as a basis for establishing a methodology to ascertain the required quantities of Green Infrastructure. This methodology shows the correlation between population, development land size, and green infrastructure. At this early stage of masterplan development, the quantities are fluid; the methodology forms a tool to aid discussion and decision making, and inform the capacity study in the following ways:

- Demonstrate the various options/scenarios for the site in relation to the balance of population, land take and GI
- Inform debate around the desired look and feel of the garden settlement development (that may be achieved through quantity, quality and distribution of GI)
- Initiate and inform debate around quantity of policy related GI provision e.g. provision of strategic open space, quantity of sports provision, acceptable distances from homes to play facilities
- Initiate and inform debate around what facilities can be shared and whether this is required to reduce the overall quantity of GI e.g. can school playing fields be accessed by the public outside school hours? Or could schools utilise public facilities?
- Demonstrate the importance of GI in facilitating successful development (in combination with UA008926-1001-01 GI Typologies, Assets and Functions)
- Initiate and inform debate regarding where it may be appropriate to reduce quantity of GI, by intensifying its quality attributes.

The methodology takes into account the following:

Policy based GI Allocation (Formal Sports, Formal Play, Food Production, Green, Open Space, Burial/cemeteries)

Essential GI Allocation at *assumed* quantities (school playing fields, waste water treatment, recreation corridors, buffers/visual screening)

Estimated GI Allocation (Habitat and water management, estimates based on initial desk based findings and will be adjusted as survey work is undertaken and the development proposals progress) For Habitat, it is assumed that 60% of allocation would be accommodated within the other typologies. For water management, it is assumed that 40% of allocation would be accommodated within other categories.

Typologies/Assets excluded. These items have been excluded from the calculations as it is assumed they would either be accommodated within the other categories, or within non-GI land allocation (Natural Play, Transport Corridors, Cultural Heritage, Hubs, Architectural Features, Streets (including street trees).

For policy based allocation, the following polices were used:

Shepway Local Plan Saved Policy LR9 and LR10 (both site Fields in Trust Guidance, which was then used to inform the calculations)

Ashford BC LDF – Public Green Spaces and Water Environment SPD (neighbouring authority used for guidance, where no Shepway policy evident)

Link to specific Shepway LP saved policy info: http://www.shepway.gov.uk/webapp/local-plan/contents_written.php

With Farrells, an illustrative scale has been set out, which used the GI Allocation tool to illustrate the effect of density on site capacity and land take.

Garden City Principles

Garden City Principles from the original Ebenezer Howard concept through to those of the TCPA, DCLG and Shepway EOI, have been set out in document UA008926-1405-01 Garden City Principles Overview. This document will inform debate around what the principles should be for Otterpool Park, many of which relate directly to GI provision, for example:

Ebenezer Howard – Large blocks with substantial enclosed areas of green space. Homes with gardens, generous green space, local food growing.

TCPA – Masterplans linking private green space with wider green and blue space for habitats

Shepway EOI – Accessible green space for all to enjoy and high quality public realm

Stewardship

The document described above, is also useful in considering the long-term management/custodianship of the landscape and green infrastructure elements of the scheme. Consideration of the long-term strategy will inform the masterplan/landscape strategy.

Two of the founding principles of the Garden City movement are community engagement and long term stewardship. The formation of a Community Trust, principally for the management of public open space and potentially for other community assets, may be appropriate for Otterpool, and could be a vehicle to engage the local community in the delivery of open space, from an early stage in the design process. The functions, responsibilities, governance and funding of a community trust are all areas for consideration.

Examples of established Trusts can be found at:

- Letchworth Garden City Heritage Foundation (http://www.letchworth.com/heritage-foundation)
- Milton Keynes Parks Trust (http://www.theparkstrust.com/)

Ashford Council are currently planning to establish a Community Trust for Chilmington Green (http://chilmington-green.co.uk/index.php/news_articles/)

Alternative solutions include external providers such as the Land Trust (www.landtrust.org.uk) a charity taking responsibility for long term sustainable management of open space, for community benefit.

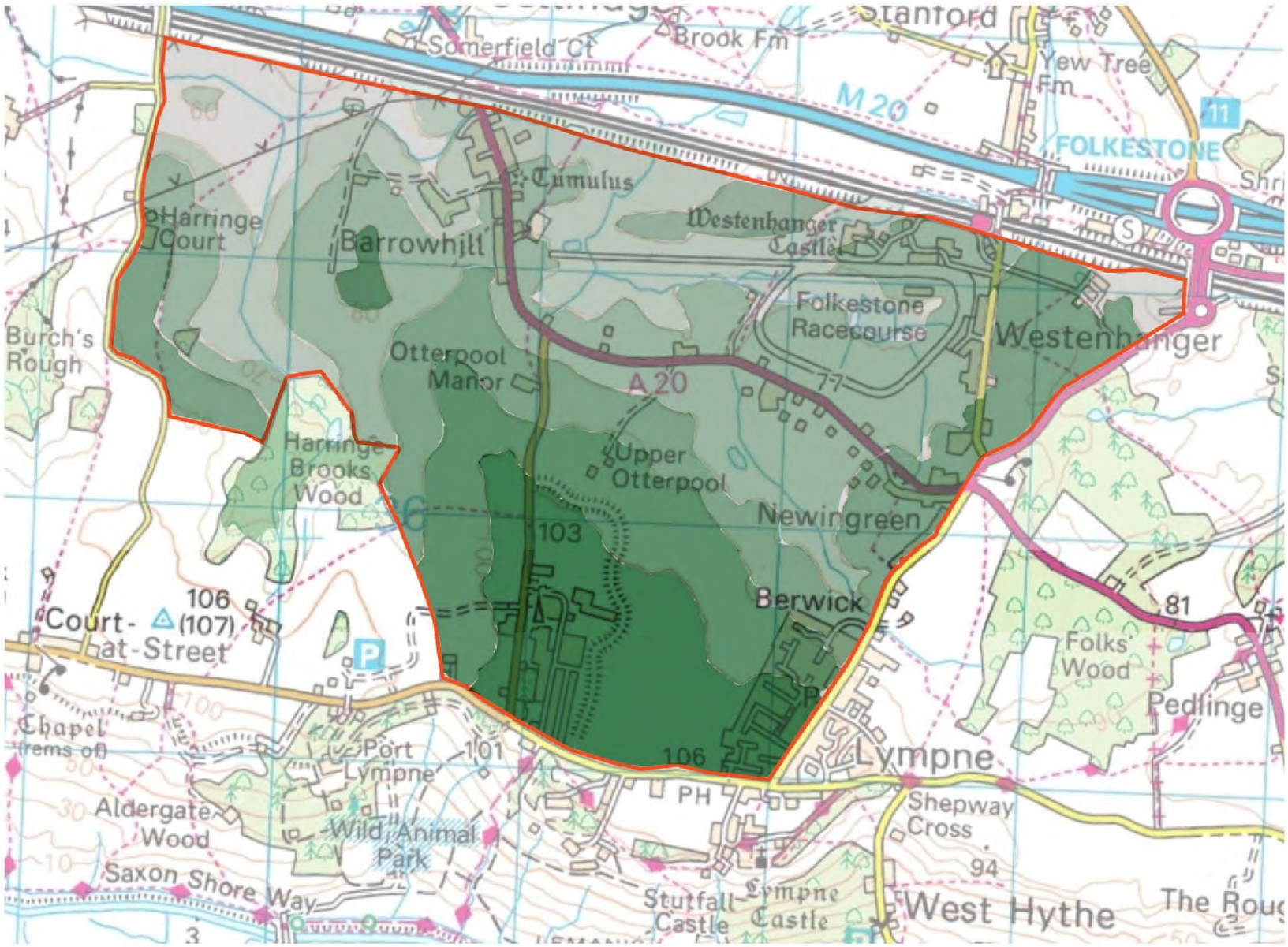
The website http://www.gardencitydevelopments.org/index.php/stewardship-of-a-garden-city sites the advantages of early establishment of a Community Trust as follows:

- Involvement of both existing and new residents in the initial identification, specification and design of facilities and potentially services, supervision of their delivery and their long-term management.
- Continuous feedback from residents to developers during the lengthy development period, enabling improved and cost effective delivery.
- Ring fencing of funding for management, allowing proper long term financial planning, so that short-term tasks such as grass cutting and long-term tasks such as footpath repair or bridge re- placement can all be accommodated.
- Identification of potential continuous /long term funding sources for the long-term maintenance of the community assets during the development process
- A clear responsibility and accountability for maintaining and raising standards, which can add value to both community cohesion and the value of property over time.
- Potential for increasing revenue streams over a period of time to support a wider range of local services, further reducing the burden on Council Tax payers.
- Provide confidence to developers and other investors

8. Changes to Risk Register

No change to risk Register in relation to GI at present

UA008926-1502-02 Site Topography Sketch



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02	29-11-16	DRAFT	AV	AV	AZ
01	02-11-16	DRAFT	AA	AV	AZ

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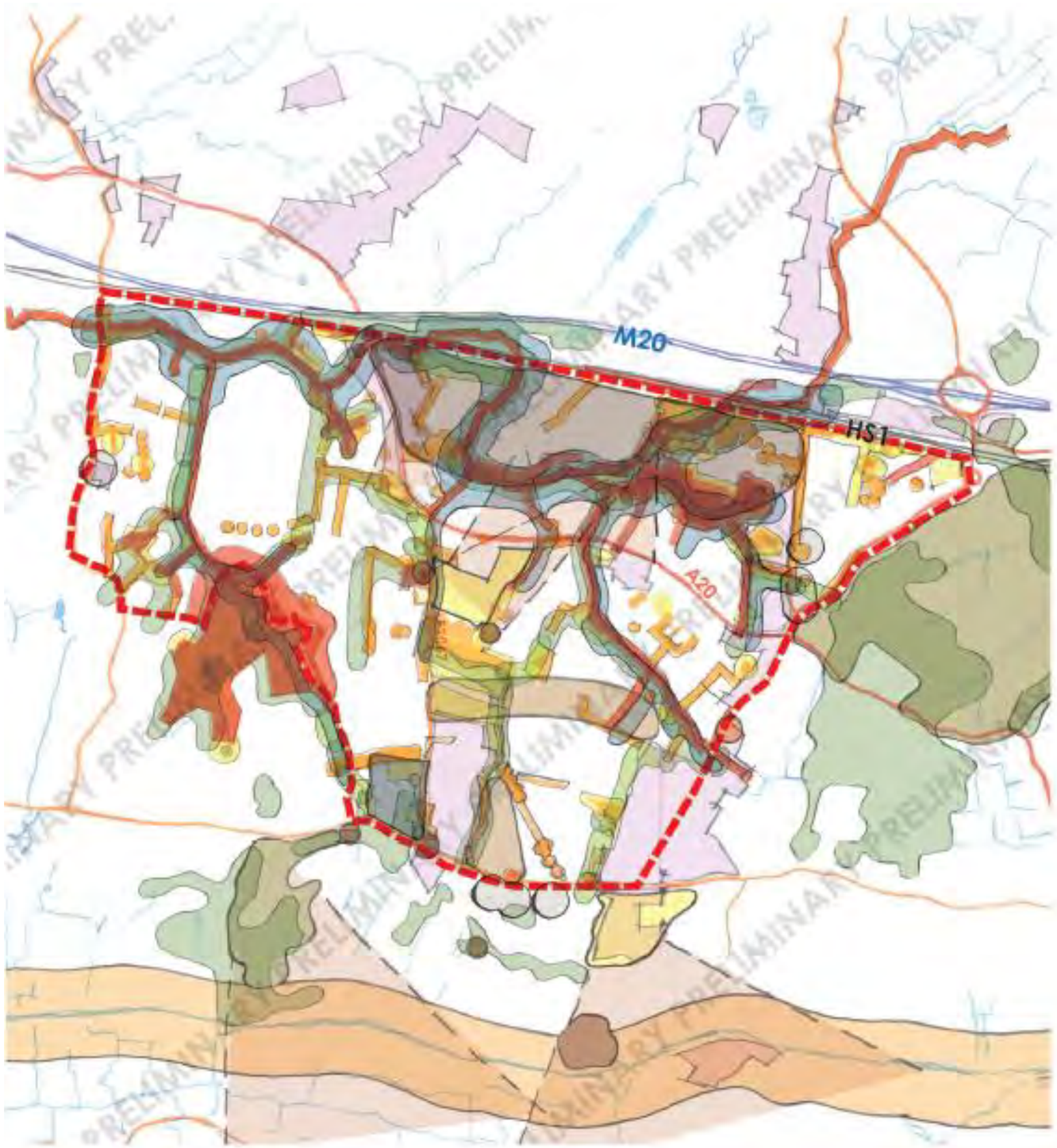
Shepway District Council
www.shepway.gov.uk

OTTERPOOL PARK

Stage 1 Initial Testing
Green and Blue Infrastructure
Site Topography Sketch

UA008926-1502-02

Scale: NTS Original Size: A3



KEY

Area of search

Cultural Heritage
- Scheduled Monument
- Scheduled Monument (Royal Military Canal) Buffer for Preservation of Environment
- Lympne Conservation Area
- Registered Parks & Gardens
- Proposed enhancement areas relating to Lympne Airfield
- Screened Setting for Asset
- Altered Setting for Asset
- Area of high sensitivity
- Cone of View
- Potential for re-use (military building)
- Potential for listed protection

Ecology - Connectivity
- Retained connectivity
- Potential new connectivity

Ecology - General Habitat Values for Retention
- Habitats/Areas Grade 1 - Must retain
- Habitats/Areas Grade 2 - STRONGLY recommend retention
- Habitats/Areas Grade 3 - Retention recommended
- Habitats/Areas Grade 4 - Retention preferred

Hydrology
- Blue corridors

version	date	status	author	checker	approver
03	08-11-16	DRAFT	AA	AV	AZ
02	08-11-16	DRAFT	AA	AV	AZ
01	02-11-16	DRAFT	AA	AV	AZ

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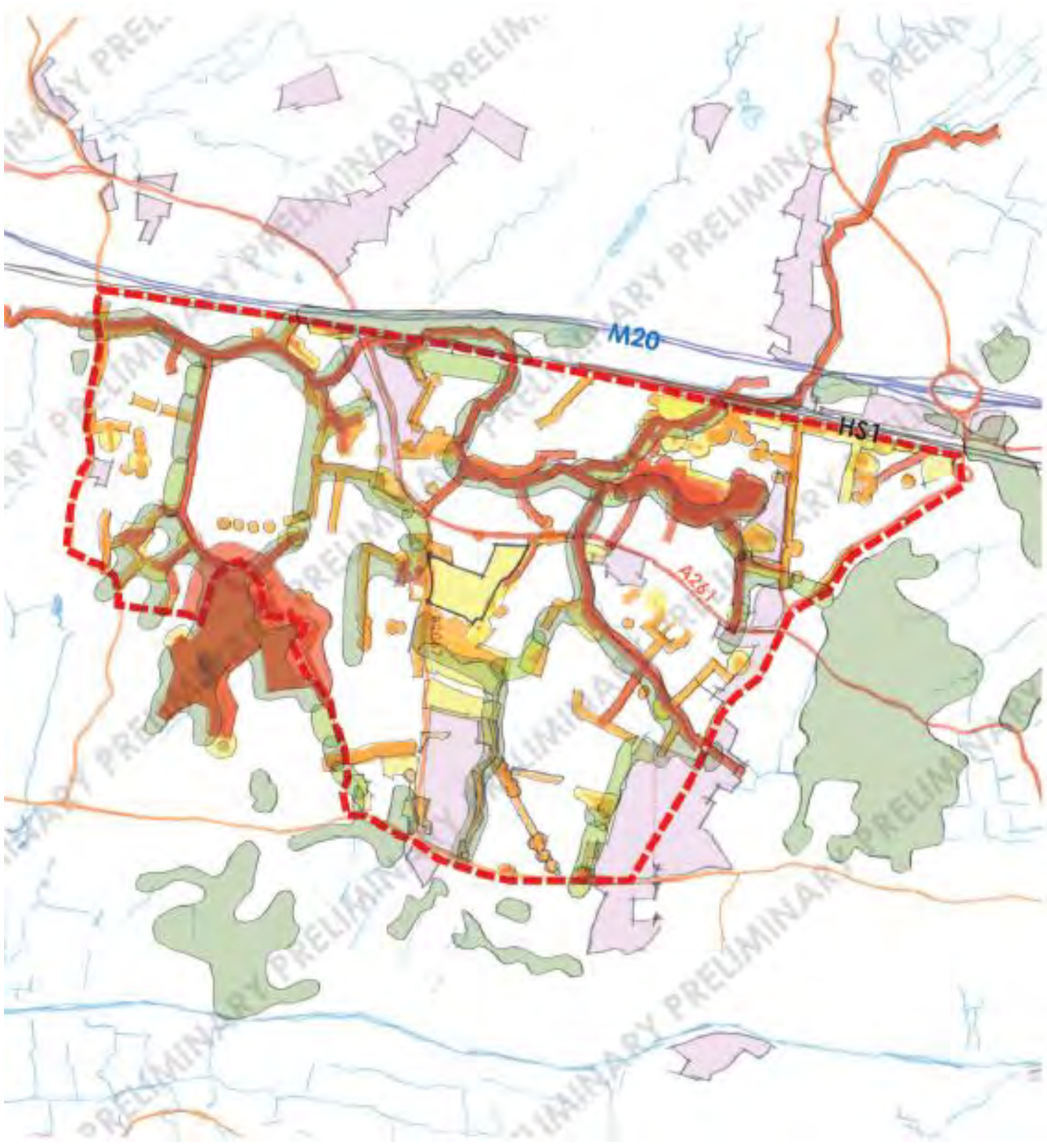
Stage 1 Initial Testing
Green and Blue Infrastructure
Opportunities - Combined

UA008926-1503-03

Scale: NTS Original Size: A3

UA008926-1504-01 Green and Blue Infrastructure Opportunities - Ecology



KEY

Area of search

Ecology - Connectivity

Retained connectivity

Potential new connectivity

Ecology - General Habitat Values for Retention

Habitats/Areas Grade 1 - MUST retain

Habitats/Areas Grade 2 - STRONGLY recommend re

Habitats/Areas Grade 3 - Retention recommended

Habitats/Areas Grade 4 - Retention preferred

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Stage 1 Initial Testing
Green and Blue Infrastructure
Opportunities - Ecology

UA008926-1504-01

Scale: NTS Original Size: A3

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Scale
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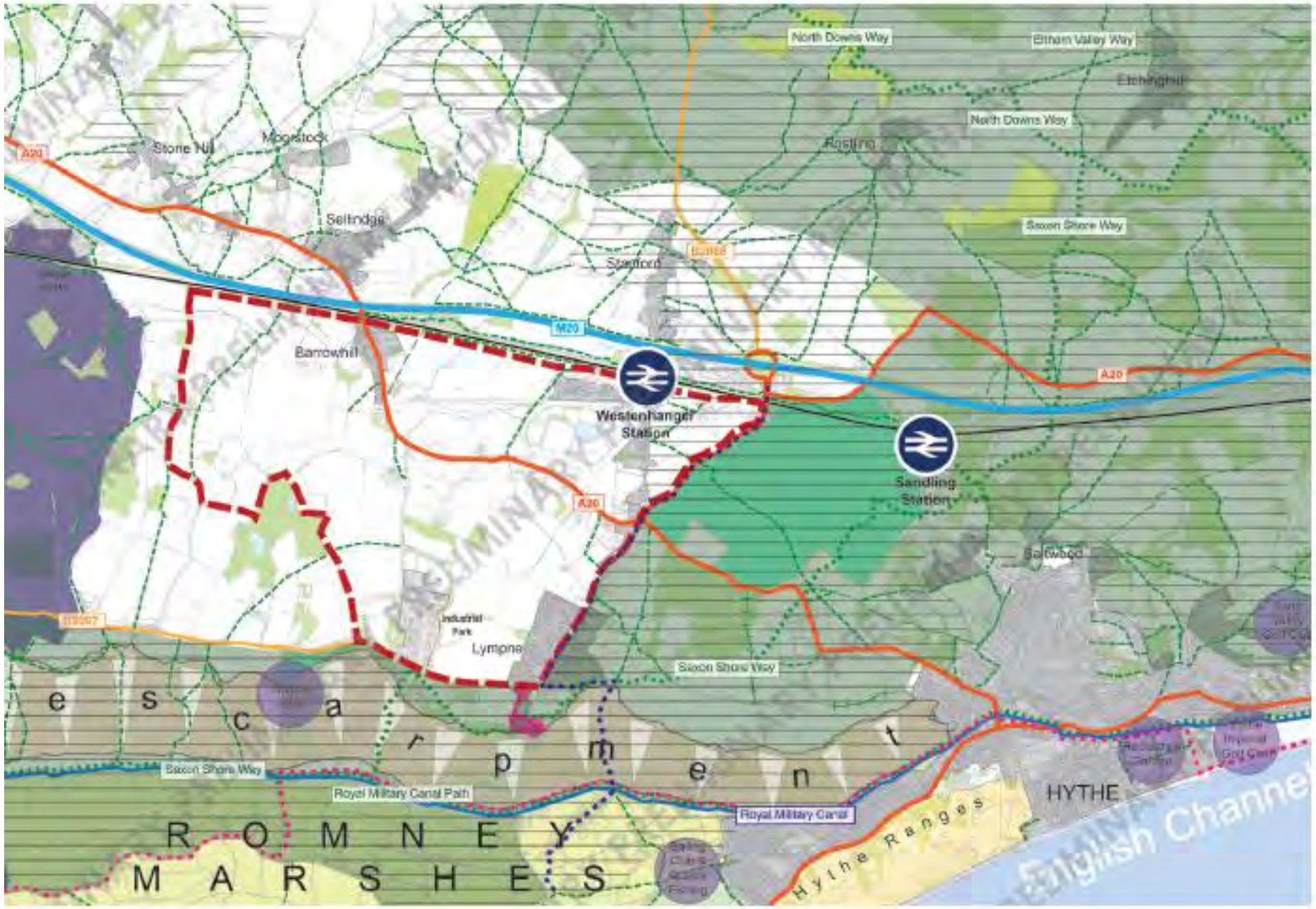

KEY

- Area of search
- National Cycle Route : Route 2 - Garden of England
- Local Cycle Route
- National Trail
- Footpath
- Byeway
- Bridleway
- Other public right of way
- Motorway
- Main Road/Dual Carriageway
- Secondary Road
- Railway
- Royal Military Canal
- Woodland
- Settlement
- Local leisure facility

Landscape Designations (local)

- Kent Downs Area of Outstanding Natural Beauty (AONB)
- Registered Parks and Gardens
- Open Access Land
- Special Landscape Area (Shepway District Council)
- Conservation Area
- Dark Skies Protection Area (Ashford District Council)

version	date	status	author	checker	approver
01	30-11-16	DRAFT	AA	AV	AZ

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Shepway District Council

OTTERPOOL PARK

Stage 1 Initial Testing
Site Context
Plan

UA008926-1508-01

Scale: NTS Original Size: A3

Table 1- Green and Blue Infrastructure – Assets and Functions, Habitats and Biodiversity

	Existing / proposed	Typology	Key Asset/s	Existing GI functions/benefits	Proposed GI functions*/benefits	Existing Blue Infra. functions/benefits	Proposed Blue Infrastructure functions/benefits	Existing habitats/ biodiversity benefits	Proposed habitats/ biodiversity benefits
1	Existing	Hedgerows	Field boundaries, property boundaries, highway boundaries	Biodiversity, wildlife corridors, visual screening, historic field pattern, landscape character, wind break, carbon store, reduce airborne pollution	Additional: Aesthetic, amenity and recreation value, access to nature, natural play, provide shade, reduce urban heat island effects, mitigate wind chill and turbulence. Assimilation of development into landscape Maintained/enhanced: Existing functions/benefits	Water treatment, infiltration, interception	Maintained/enhanced: Water treatment, infiltration, interception	Of value to nesting birds. Also provide shelter for fauna including invertebrates, dormice, badgers, hedgehogs, reptiles and amphibians. Provide movement routes for species including bats. Edge habitats are valuable for plant diversity (ground flora), and species including reptiles and invertebrates.	Additional: Linking habitat, as part of a network of retained, established habitat areas. Maintain/enhance: Existing benefits
2	Existing	Grassland	Cultivated agricultural, marsh, calcareous	Biodiversity, landscape character, water management, carbon store, food production	Additional: Aesthetic, amenity and recreation value, health & wellbeing, water management/quality, natural play, reduce urban heat island effect. Maintained/enhanced: Biodiversity, landscape character, water management, carbon store	Water treatment, infiltration, interception	Maintained/enhanced: Water treatment, infiltration, interception	Of value to nesting birds, farmland birds including skylark, reptiles and amphibians. Can support rare or notable grassland plants and plant communities. Supporting habitat to ancient woodland and other habitats.	Additional: Forms linking habitat, as part of a network of retained habitat areas. Maintain/enhance: Habitat for reptiles and birds, supporting habitat to ancient woodland and other habitats.
3	Existing	Margins	Field margins, riparian buffers, verges	Biodiversity, landscape character, wildlife corridors, carbon store, water management/quality, recreation	Additional: Buffers between development and valuable habitats, ecological awareness and education, amenity, health and wellbeing Maintained/enhanced: Existing functions/benefits	Water treatment, infiltration, interception	Maintained/enhanced: Water treatment, infiltration, interception	These edge habitats are of particular importance for reptiles, amphibians, small mammals and invertebrates, and can support rare and notable plant communities.	Additional: Buffer impacts of development on retained habitats, and link habitats, where appropriate Maintain/enhance: Habitat for notable species and groups
4	Existing	Trees	Individual and small groups, Veteran trees.	Biodiversity, amenity, carbon store, landscape character, shade, shelter, wind break, visual screening, reduce airborne pollution	Additional: Urban heat island mitigation, natural play Maintained/enhanced: Existing functions/benefits	Water treatment, infiltration, interception	Maintained/enhanced: Water treatment, infiltration, interception	Provide habitat for species including bats, birds (including barn owls) and invertebrates and synergistic relationships with soil VAMs (vesicular-arbuscular mycorrhizas).	Maintain/Enhance: Existing benefits
5	Existing	Woodland/copses	Small woodland blocks	Amenity, biodiversity, visual screening, landscape character, shelter, shade, wind break, carbon store, cultural heritage, recreation (walking and shooting), water management/quality, reduce airborne pollution	Additional: aesthetic, amenity and recreation value, access to nature, natural play, reduce airborne pollution, provide shade, reduce urban heat island effects, mitigate wind chill and turbulence. Assimilation of development into landscape. Health and wellbeing. Maintained/enhanced: Existing functions/benefits excluding recreation (shooting).	Water treatment, interception	Maintained/enhanced: Water treatment, interception	Provide habitat for species including bats, woodland birds, badgers, dormice, hedgehogs, reptiles and amphibians. Can support rare or notable plants and plant communities in the understorey. .	Additional: Form part of the proposed GI network's habitat corridors/nodes, setting for biodiversity areas Maintain/enhance: existing benefits

	Existing / proposed	Typology	Key Asset/s	Existing GI functions/benefits	Proposed GI functions*/benefits	Existing Blue Infra. functions/benefits	Proposed Blue Infrastructure functions/benefits	Existing habitats/ biodiversity benefits	Proposed habitats/ biodiversity benefits
6	Existing	Ancient woodland	Harringe Brooks Wood and off-site woodland blocks	Amenity, natural and cultural heritage, biodiversity, visual screening, landscape character, shelter, shade, wind break, carbon store, soil quality, recreation (walking and shooting), reduce airborne pollution	Additional: reduce airborne pollution, provide shade, reduce urban heat island effect, mitigate wind chill and turbulence. Assimilation of development into landscape. Health and wellbeing. Maintained/enhanced: Existing functions/benefits excluding recreation (walking and shooting).	Interception, water treatment, amenity, microclimate		Provide habitat for species including bats, woodland birds, barn owls, badgers, dormice, hedgehogs, reptiles and amphibians. Can support rare or notable woodland understorey plants and plant communities. Deadwood is a valuable ecological resource for invertebrates and other species groups.	Additional: Conservation. Form part of the proposed GI network's habitat corridors/nodes. Note: Recreation not promoted within the areas of ancient woodland Maintain/enhance: Existing benefits
7	Existing	Public rights of way	Footpaths, bridleways	Recreation, health and wellbeing, access to nature	Additional: green infrastructure network connections, reduce impacts on nearby statutory and non-statutory designated sites, by providing facilities for dog walking, encourage a transport modal shift. Maintained/enhanced: Existing functions/benefits			Linear routes – benefits vary dependant on surrounding landscape	Additional: Habitat corridors, reduction of impacts on nearby statutory and non-statutory designated sites by providing facilities for dog walking
8	Existing	Watercourses	East Stour River, tributaries	Biodiversity, micro-climate resilience, climate change resilience, amenity	Additional: Aesthetic and recreation value, access to nature, natural play, food production, encourage transport modal shift (pedestrian and cycle movement), health and wellbeing Maintained/enhanced: Existing functions/benefits	Amenity, conveyance, storage & character	Additional: Education, improvements to existing by incorporation of swales/wetlands within the buffer` Maintained/enhanced: Amenity, conveyance, storage & character	Vital habitats for birds, water voles, amphibians, fish and provides a foraging and commuting resource for bats. Supports aquatic plant communities. Forms habitat corridors through the landscape.	Additional: Form part of the proposed GI network's habitat corridors/nodes Maintain/enhance: Existing benefits
9	Existing	Waterbodies	Racecourse lake, Benham water farm lake, Burnbrae pond, Newingreen Spring	Biodiversity, Landscape character, recreation, water management/quality	Additional: Amenity, access to nature, natural play, food production. Maintained/enhanced: Existing functions/benefits	Attenuation, water treatment, education	Additional: Improvements to existing by connecting and extending to the wider SuDS network Maintained/enhanced: Attenuation, water treatment, education	Vital habitats for birds, water voles, amphibians, fish and provide a foraging resource for bats. Support aquatic plant communities. Form 'stepping stone' habitats for amphibians.	Additional: Receptor site for Great Crested Newts. Form part of the proposed GI network's habitat corridors/nodes Maintain/enhance: Existing benefits
10	Existing	Springs	Newingreen Spring	Biodiversity, natural heritage	Additional: Recreation, education Maintained/enhanced: Existing functions/benefits			Can support rare plant communities. This area could be valuable for a range of species, including birds and notable plants.	Additional: Form part of the proposed GI network's habitat corridors/nodes Maintain/enhance: Existing benefits
11	Existing	Cultural heritage features	Tumulus/Burial mounds	Amenity, sense of place, education, biodiversity, cultural heritage	Additional: Education, recreation Maintained/enhanced: Existing functions/benefits			Can support rare (calcareous) plant communities	Additional: Form part of the proposed GI network's habitat corridors/nodes Maintain/enhance: Existing benefits

	Existing / proposed	Typology	Key Asset/s	Existing GI functions/benefits	Proposed GI functions*/benefits	Existing Blue Infra. functions/benefits	Proposed Blue Infrastructure functions/benefits	Existing habitats/ biodiversity benefits	Proposed habitats/ biodiversity benefits
12	Existing	Natural heritage features	Quarry (SSSI)	Amenity, sense of place, education, biodiversity	Additional: Recreation, Maintained/enhanced: Existing functions/benefits		TBC Dependant on SSSI requirements but possibility for a shallow SuDS feature to increase attenuation, infiltration & treatment	Low value to biodiversity	Not yet known
a. 13									
14	Proposed	Formal sports	Playing fields, school playing fields	N/A	Health & wellbeing, sports & fitness, active recreation, community cohesion			N/A	Can provide low value foraging habitats for bats and badger. Form open areas through which some wildlife can traverse (badger etc.)
15	Proposed	Formal play	LEAPS, NEAPS, LAPs Skateparks and MUGAs	N/A	Health & wellbeing, fitness, active recreation, community cohesion, education, engagement			N/A	Form open areas through which some wildlife can traverse (badgers etc.)
16	Proposed	Natural play		N/A	Health & wellbeing, fitness, active recreation, community cohesion, education, engagement, creativity, environmental awareness and interactive learning			N/A	Form open areas through which some wildlife can traverse (badgers etc.). Depending upon design, deadwood can be a valuable habitat for invertebrates
17	Proposed	Food production	Allotments, community orchards, community gardens, apiaries	N/A	Food production, Biodiversity, Health & Wellbeing, Education, community cohesion, environmental awareness, local distinctiveness, urban heat island (UHI) mitigation,			N/A	Allotment habitats with appropriate margins and buffers between plots can provide resources for animals including reptiles, birds and invertebrates, which in turn become feeding resources for species including bats. Fruit trees provide feeding resources for a range of species.
18	Proposed	Waste water treatment	Biological WWTW	N/A	Biodiversity, education, environmental awareness, water management			N/A	WWTW can provide habitats such as reedbeds, which in turn provide resources for birds and other notable species.
19	Proposed	Recreation corridors		N/A	Movement, health & wellbeing, active and passive recreation, biodiversity, community cohesion, urban heat island (UHI) mitigation, amenity,			N/A	Will be part of or interlinked with the green grid to form wildlife corridors. SUDs areas can be valuable habitats for

	Existing / proposed	Typology	Key Asset/s	Existing GI functions/benefits	Proposed GI functions*/benefits	Existing Blue Infra. functions/benefits	Proposed Blue Infrastructure functions/benefits	Existing habitats/ biodiversity benefits	Proposed habitats/ biodiversity benefits
									amphibians, plants, reptiles, birds and foraging areas for bats.
20	Proposed	Transport corridors	Highways, cycleways, footpaths	N/A	Movement, amenity, urban heat island (UHI) mitigation, street trees, water management, local distinctiveness, health and wellbeing, urban heat island (UHI) mitigation,			N/A	Will be part of or interlinked with the green grid to form wildlife corridors where appropriate. See below for integration features.
21	Proposed	Green, open space	Parks, public gardens	N/A	Environmental awareness, enjoyment of nature, education, health and wellbeing, water management, biodiversity, active and passive recreation, amenity, microclimate resilience, landscape character, climate change resilience, community cohesion, local distinctiveness, urban heat island (UHI) mitigation, amenity, cleaner air			N/A	Permeable area for biodiversity to allow movement, edge habitats can be valuable for invertebrates and reptiles. Bats can forage in these areas. Targeted planting can support notable or valuable plant species.
22	Proposed	Hubs	Village greens, public squares	N/A	Amenity, urban heat island (UHI) mitigation, street trees, water management, local distinctiveness, community cohesion, cultural identity, health and wellbeing, urban heat island (UHI) mitigation, amenity,			N/A	Permeable area for biodiversity, edge habitats can be valuable for invertebrates and reptiles. Bats can forage in these areas (greens).
23	Proposed	SuDS	Swales, attenuation ponds	N/A	Water management, biodiversity, environmental awareness and education, local distinctiveness, landscape character, urban heat island (UHI) mitigation, amenity,			N/A	Can provide valuable habitats for foraging bats, birds, amphibians, invertebrates and reptiles. Can support valuable or notable plant communities.
24	Proposed	Architectural features	Green roofs, green walls	N/A	Environmental awareness, local distinctiveness, biodiversity, urban heat island (UHI) mitigation, amenity, cleaner air, carbon store			N/A	Foraging and habitat for notable invertebrates, bats and birds. Bat and bird boxes added will further enhance this benefit Green walls can also provide resources for invertebrates, bats and birds.

	Existing / proposed	Typology	Key Asset/s	Existing GI functions/benefits	Proposed GI functions*/benefits	Existing Blue Infra. functions/benefits	Proposed Blue Infrastructure functions/benefits	Existing habitats/ biodiversity benefits	Proposed habitats/ biodiversity benefits
23	Proposed	Buffers & visual screening	Hinterland planting, woodland belts, offsets from retained features	N/A	Food production, environmental awareness, local distinctiveness, biodiversity, local distinctiveness, urban heat island (UHI) mitigation, amenity, cleaner air, wind break, carbon store			N/A	Depending upon design, can provide habitat for birds, reptiles, amphibians, invertebrates, etc. Protect existing habitats from disturbance, light, domestic animals and recreational pressure
25	Proposed	Streets	Woonerfs, 'edible' streets	N/A	Food production, community cohesion, environmental awareness, health and wellbeing, biodiversity, urban heat island (UHI) mitigation,			N/A	Provide a food resource for birds and bats and notable invertebrates, a permeable area through which animals can move (hedgehogs etc.) if well designed.
26	Proposed	Burial	Green Burial Ground	N/A	Health & wellbeing, community cohesion, tranquillity, reflective space, spiritual awareness, environmental awareness, biodiversity, amenity, cleaner air, wind break, carbon store			N/A	
	Proposed	Habitats (Created or enhanced habitats that do not form part of any of the above typologies)	Habitat links and features, non-publicly accessible habitat, mitigation measures	N/A	Local distinctiveness, biodiversity, landscape character, tranquillity, urban heat island (UHI) mitigation, amenity, cleaner air, wind break, carbon store				Habitat for birds, reptiles, invertebrates, etc. Will link important areas for biodiversity within the site and to the wider communities which will increase population stability, support gene transfer and provide climate change mitigation for species

Table 2: UA008926-LS-005-01 Garden Settlements Design Principles, Original and Evolving - Overview

DRAFT WIP

'A town designed for healthy living and industry, of a size that makes possible a full measure of social life. Surrounded by a rural belt, the whole of the land being in public ownership or held in trust for the community.' Howard, E.(1898) Garden Cities of Tomorrow

Design Aspect	E.Howard Garden Cities Principles	Existing Garden Suburbs	TCPA (Mix of 2014 principles and 2012 Creating GC & Suburbs today doc)	Central Government (Dept for Communities and Local Government 2016)	SHEPWAY EOI 2016 & presentation to Parish 2016
Masterplan & Layout	Holistically planned with efficient definition of blocks & routes for movement		Holistically and comprehensively planned Masterplans linking private green space with wider green and blue space for habitats	Holistically planned with community engagement and LA backing, if large LEP support	Landscape-led masterplanning retaining and enhancing existing green and blue assets Well planned approach that embraces landscape features
	Large blocks with substantial enclosed areas of green space		Emphasis on homes with gardens, space for allotments		
	6 Concentric settlements to main city	On outskirts of city			
	Open space/parks, 6 radial green boulevards		Tree lined streets, open spaces/parks	Accessible green space	Accessible green space for all to enjoy &high quality public realm
	Industry, Amenity and Residential kept apart				
	Factories in the east to avoid smoke blowing over the town				
	communities surrounded by greenbelt	Sometimes	Surrounding belt of countryside to prevent urban sprawl		
Containment	Self-contained – discrete, separated by green belt	Not always		If small village must be discrete new settlement to get backing, if larger can be extension	Built out in discrete neighbourhoods
Landuse	Mixed use – % areas of residence/agriculture/industry – work	Not mixed use– mainly residential	Local employment opportunities – at least 1 per household Local food growing provision Strong local cultural, recreational and shopping facilities	Local employment opportunities and other infrastructure	Provide 85ha of employment land, New schools, shops and community facilities, Local employment Local food growing
Conservation	Preserve the countryside	Not always	Enhances natural environment		
Investment	Self-sustaining - work and live in same place, attract companies through cheaper land, good transport, quality area, happier workers	Commuter towns - not self-sustained	Self-sufficiency is impossible but the need to travel for work should be reduced as much as possible A wide range of jobs in the Garden City within easy commuting distance of homes	Self-sustaining, not dormitory suburbs, attract private investors	Opportunity to attract private investors
	Economically independent of city	Dependent on city		Economically independent of city	
	Combine U&C aspects for better city life	More rural			
Transport	Settlements well connected by public transport (rail/road)	Settlements well connected by public transport (rail/road)	Integrated and accessible transport systems, with walking, cycling and public transport	Settlements well connected by public transport (rail/road)	Be well connected

Design Aspect	E.Howard Garden Cities Principles	Existing Garden Suburbs	TCPA (Mix of 2014 principles and 2012 Creating GC & Suburbs today doc)	Central Government (Dept for Communities and Local Government 2016)	SHEPWAY EOI 2016 & presentation to Parish 2016
			designed to be the most attractive forms of local transport. A focus on rapid public transport links – rail mainly and shared transport – car clubs		
	Short commute times	Sometimes but congestion prevents this			
	Promote healthier lifestyles, walk to work – Welwyn Walk to the town centre & open country		walkable neighbourhoods, prioritise sustainable transport		Prioritise sustainable ways of transport - walking/cycling Local neighbourhood centres within walkable distance
Size	Mid size settlements – 32,000 people housed, around 10-15000 homes		Large and small scale developments including suburbs & villages	Any scale - villages of 1500-10,000 homes, or larger 10,000 plus	12,000 new homes
Egalitarianism /Diversity	For everyone – including blue collar workers		Social housing, diverse communities, mix of tenure and housing, genuinely affordable for all (60-70% minimum affordable) 50% of AH for social rent. opps to build own home design contributing to sociable neighbour-hoods – culturally and age inclusion	Mix of housing types and tenure to meet all needs – self build, custom build, starter homes etc	Mix of housing types and tenure to meet all needs – self build, custom build, starter homes etc
Land value capture for community	Distribution of profits to the community – reinvested into community services		Distribution of profits to the community – reinvested into community services	Distribution of profits to the community – reinvested into community services	Investment in community services such as sewerage, utilities, schools
Ownership	Land owned/held in trust for the community		Community ownership of assets		
Long term Management	Community stewardship		Community stewardship		
Quality	Quality affordable housing, most architect led, some self-build but supervised		High quality Beautifully and imaginatively designed homes with gardens, combining the best of town and country to create healthy communities, and including opportunities to grow food	High quality without additional public subsidy	High quality
Sustainability	Homes with gardens, generous green space, local food growing		Climate resilience – extensive blue and green infrastructure Development that enhances the natural environment, providing a comprehensive green infrastructure network and net biodiversity gains, and that uses zero-carbon and energy-positive technology to ensure climate resilience.		Sustainable development as per NPPF – climate change
Technology			Innovation in construction, and conservation and climate change	Cutting edge tech – innovative construction	Cutting tech – especially energy generation and conservation and climate change
					IT enabled community
					Innovative design

Design Aspect	E.Howard Garden Cities Principles	Existing Garden Suburbs	TCPA (Mix of 2014 principles and 2012 Creating GC & Suburbs today doc)	Central Government (Dept for Communities and Local Government 2016)	SHEPWAY EOI 2016 & presentation to Parish 2016
Site specific design	Architect led Arts & Crafts style. Letchworth - use of render to cover the vernacular brick (with aim of not reminding residents of low quality urban living conditions).		Sensitivity to local vernacular design and materials		Designed so as to embrace and enhance the natural landscape character with a diverse network of green open space of the highest quality.
					enhancing existing green and blue assets
					Maximise local heritage assets
Adaptability					Adaptable homes with adaptable working space Modern business space
Site selection				Promote use of brownfield land/public sector	
Community engagement			Community engagement	Community engagement	

APPENDIX D

Sustainability & Resources Workstream Report

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Table 1: Water Policy Summary

Table 2: ReFH2 greenfield rates

Table 3: Otterpool Park Strategic Water, Flood Risk and Blue Infrastructure Objectives

1 Stage 1 Methodology

Arcadis has been appointed by Shepway District Council (SDC) in order to support the masterplan design for a new garden settlement located in Kent, Otterpool Park. A number of workstreams have been established including Water, Flood Risk and Blue Infrastructure which aim to establish opportunities and constraints for the development and feed into the masterplan design.

The work has been broken down into three stage ultimately culminating in an outline planning application, this report contains the work undertaken as part of the Stage 1 work, feasibility and capacity. It provides an overview of the site's existing water environment and establish the strategic water management principles.

2 Baseline Data

The following GIS data has been assessed as part of the Stage 1 baseline review:

- EA Flood Map for Planning
- EA uFMfSW Mapping
- EA Recorded Flood Outlines
- EA Source Protection Zones
- Cranfield Soilscapes Mapping
- WFD Classification
- EA Catchment Abstraction Management Strategy
- CEH LandCover Map
- BGS 625k Hydrogeology aquifer classification
- BGS 50k Bedrock / Superficial mapping

3 Policy Context

A summary of the relevant international and national legislation, and national, regional and local plans and policies relating to the water environment in the context of the proposed scheme is contained in Table 1.

Table 1: Water Policy Summary

Policy / Guiding document	Relevant summary
Water Framework Directive (WFD). Council Directive 2000/60/EC	The Water Framework Directive (WFD) provides a framework for the protection of surface (fresh) water, estuaries, coastal water and groundwater. The objectives of the WFD are to enhance the status, and prevent further deterioration, of aquatic ecosystems, promote the sustainable use of water, reduce pollution of water and ensure progressive reduction of groundwater pollution.
Flood and Water Management Act 2010	The Flood and Water Management Act 2010 provides comprehensive flood risk management framework for people, homes and businesses. The Act encourages the use of sustainable drainage in new developments and re-developments.
National Planning Policy Framework (NPPF)	The NPPF and the accompanying Technical Guidance to the National Planning Policy Framework (TGNPPF) set out the Government's planning policies for England and how these are expected to be applied. As the proposed development scheme exceeds 1 hectare, a standalone Flood Risk Assessment (FRA) is required to be prepared and submitted as part of the planning application.
Shepway Core Strategy: Local Plan 2013	Shepway's Core Strategy Local plan directs how Shepway changes by forming the basis for deciding planning applications for development, and also through guiding public and private sector investment decisions. The following policies are relevant to water and flood risk: **Policy SS3**: Place-Shaping and Sustainable Settlements Strategy For development located within the zones identified by the Environment Agency as being at risk from flooding, or at risk of wave over-topping in immediate proximity to the coastline (within 30 metres of the crest of the sea wall or equivalent), site-specific evidence will be required in the form of a detailed flood risk assessment. This will need to demonstrate that the proposal is safe and meets with the sequential approach within the applicable character area of Shepway of the three identified, and (if required) exception tests set out in national policy. It will utilise the Shepway Strategic Flood Risk Assessment (SFRA) and provide further information. Development should also meet the following criteria as applicable: a. no residential development, other than replacement dwellings, should take place within areas identified at "extreme risk" as shown on the SFRA 2115 climate change hazard maps; or b. all applications for replacement dwellings, should, via detailed design and the incorporation of flood resilient construction measures, reduce the risk to life of occupants and seek provisions to improve flood risk management. c. Strategic scale development proposals should be sequentially justified against district-wide site alternatives.

Policy / Guiding document	Relevant summary
	Proposals should be designed to contribute to local place-shaping and sustainable development by: a. respecting and enhancing key historic features of conservation interest; and b. through appropriate sustainable construction measures, including water efficiency and a proportion of energy from renewable/low carbon sources on new-build development. **Policy CSD4**: Green Infrastructure of Natural network, Open Spaces and Recreation Shepway's GI network shown in Figure 5.3, and other strategic open space, will be managed with a focus on: a. Adapting to and managing climate change effects. **Policy CSD5**: Water and Coastal Environmental Management in Shepway Development should contribute to sustainable water resource management which maintains or improves the quality and quantity of surface and ground water bodies, and where applicable, the quality of the coastal environment and bathing waters. This will be achieved by protecting or enhancing natural water reserves through sustainable design and construction, managing development in relation to wastewater infrastructure, and promoting long-term resilience to climatic pressures on the coast and water systems. Proposals must be designed to contribute to the maintenance of a sustainable supply of water resources in the district; the achievement of water management plans for the district; and the maintenance of coastal ecological habitats (through seeking to avoid the inhibition of natural coastal processes. Development will be permitted where the following criteria are met: b. All developments should incorporate water efficiency measures appropriate to the scale and nature of the use proposed. Planning applications for the construction of new dwellings should include specific design features and demonstrate a maximum level of usage of 105 litres per person per day, or less. c. New buildings and dwellings must be delivered in line with wastewater capacity, and designed so as to ensure that peak rate and surface water runoff from the site is not increased above the existing surface water runoff rate, incorporating appropriate sustainable drainage and water management features. The quality of water passed on to watercourses and the sea must be maintained or improved, and flood risk must not be increased by developments within the district. Water reserves and the coastal environment will be maintained and enhanced through Shepway District Council working with partners to manage development and upgrade water infrastructure and quality, and through green infrastructure provisions (policy CSD4).
Shepway District Council Strategic Flood Risk Assessment (SFRA) 2015	SFRAs are intended to guide development decisions and allow Local Planning Authorities to apply the NPPF Sequential Test. The SFRA provides a number of policy recommendations for the district to enable the following objectives: • To ensure that new residential development does not take place in areas identified as 'extreme' flood hazard risk by the SFRA climate change hazard maps. • To ensure the replacement dwellings located within Flood Zone 2 and 3 reduce risk to life to residents through the adoption of appropriate design. • To ensure that flood risk is not increased within the District any development will need to be designed such that the peak rate and volume of surface water run-off from the site is not increased above existing rates. • To help reduce the rate and volume of surface water run-off and to improve the quality of the water passed on to watercourses, new development should incorporate the principles of SuDS in its drainage design where practically achievable. • To ensure that all development in Flood Zones 2 and 3 incorporates flood resilient construction techniques.

Policy / Guiding document	Relevant summary
	• To ensure that any new development does not have an adverse impact of drinking water resources.
CIRIA SuDS Manual C753	The SuDS Manual provides a framework for planning and designing Sustainable Drainage Systems (SuDS) in order to delivery multiple benefits. It provides a number of high level objectives for SuDS schemes: • Use surface water as a resource. • Manage rainwater close to where it falls (at source). • Manage runoff on the surface (above ground). • Allow rainwater to soak into the ground (infiltration). • Promote evapotranspiration. • Slow and store runoff through pollution prevention and by controlling the runoff at source. • Treat runoff to reduce the risk of urban contaminants causing environmental pollution. The SuDS Manual also provides a process for delivery of sustainable surface water management within strategic development sites along with the technical design requirements for various SuDS components.
DEFRA Non-statutory technical standards for sustainable drainage systems	This document sets out non-statutory technical standards for sustainable drainage systems. They should be used in conjunction with the National Planning Policy Framework and Planning Practice Guidance. It provides the specific requirements for Greenfield developments which include the following: **Peak flow control** For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event. **Volume control** Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event. **Flood risk within the development** The drainage system must be designed so that flooding does not occur on any part of the site for a 1 in 30 year rainfall event, and flooding does not occur during a 1 in 100 year rainfall event in any part of: a building or utility plant within the development. The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed in exceedance routes that minimise the risks to people and property. **Designing for maintenance considerations** Pumping should only be used to facilitate drainage for those parts of the site where it is not reasonably practicable to drain water by gravity.
Water. People. Places: A guide for master planning sustainable drainage into developments	Kent County Council in liaison with other Lead Local Flood Authorities (LLFAs) of the South East of England have developed guidance for integrating SuDS into the Masterplanning process. This document provides points to consider at various points within the Masterplanning process.
Drainage and Planning Policy Statement: Local flood management strategy guidance	Kent County Council as the LLFA has produced this policy statement to set out its policy requirements for sustainable drainage, including ten specific SuDS policies.

4 Site Description

4.1 Location

Otterpool Park is located approximately 10km west of Folkestone within the County of Kent. It lies with the District of Shepway between the towns of Lympne and Sellindge. The National Grid Reference for the centre of the site is TR 11023 36475.

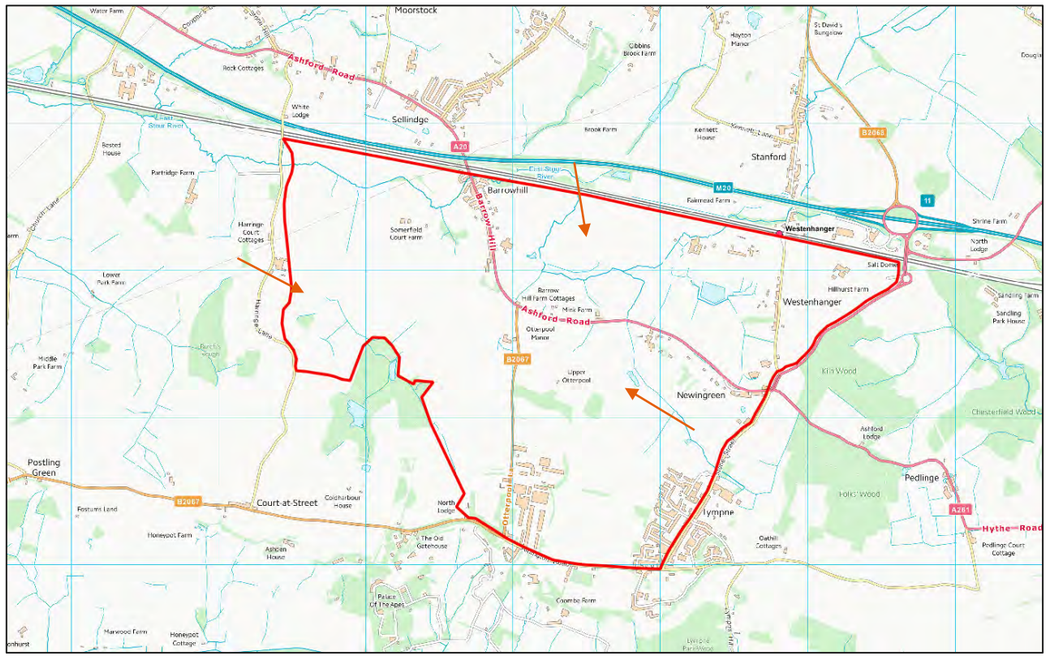

Figure 1: Site Location Map

The site, shown in Figure 1, is irregular in shape and occupies and area of approximately 700ha. Much of the site is greenfield having not been previously developed however there are pockets of localised urban areas including:

- an industrial estate located close to the inside of the south side boundary;
- the village of Lympne situated on the south-corner, and;
- the village of Barrow Hill and Sellindge to the north.

The proposed site also encloses Folkestone Racecourse, which is situated near the north-east corner of the site which may be classified as previously developed land but the majority of this land is of greenfield nature. The site is bounded by railway track and the M20 to the north, the A20 to the east, which then runs through the centre of the site. The west side of the site generally borders with unimproved grassland and woodland.

4.2 Topography

The site area can generally be described as gradually falling towards the north-west, shown in Figure 2, which displays the 2m LiDAR data upon the site area. The site has varying levels of elevation with a high point of approximately 107mAOD to the south and a low of approximately 57mAOD towards the north west.

The terrain can be split into two main zones, the southern is characterised by high elevations which gradually slope toward the north-west region and towards the north east also. A minor northern zone can be seen with higher elevations up to 70.7mAOD, creates a subtle valley that starts at the north east that travels through the top of the site towards the north-west border.

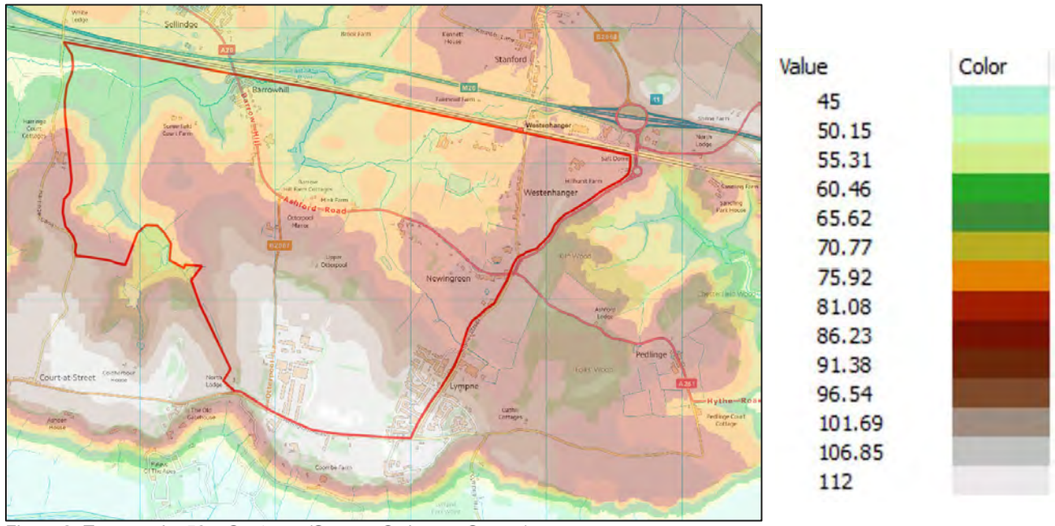

Figure 2: Topography 50m Contours (Source: Ordnance Survey)

Due to this topography, surface water mainly flows through two minor valleys towards the north west of the site, this is a natural area for water to accumulate and is represented in Figure 3. The below figure includes the site LiDAR data with the surface water data, to show how the terrain influences the path of the surface water.

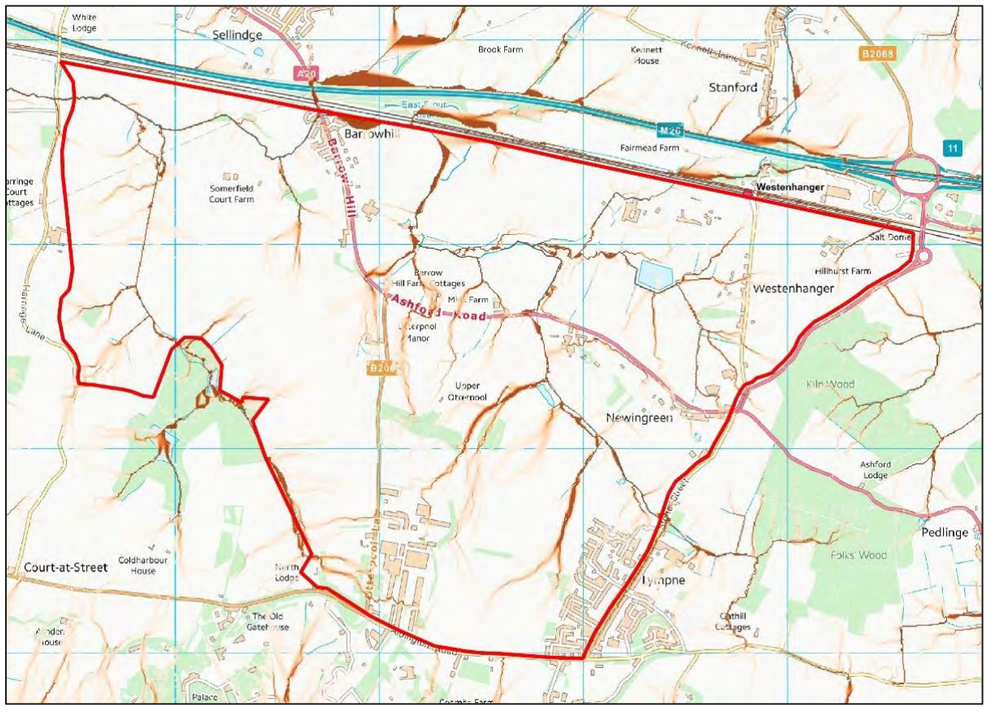

Figure 3: Flow accumulation from LiDAR/OS DTM (darker orange equates to more accumulation)

4.3 Land Use

4.3.1 Historic

Most of the existing greenfield is being currently used as farmland including Somerfield Court Farm, Mink Farm and Hillhurst Farm. The old Lympne Airport site is now being used as Lympne Business Park. Folkestone racecourse is still present however is no longer functioning as a race course.

Existing settlements on site include the village of Lympne as well as scattered residence along Ashford Road towards a grouped settlement at the norther point of Barrow Hill. Situated to the north west of the racecourse lies a castle and the respective grounds, which holds significant cultural heritage and is currently being used as a wedding venue and conference centre.

4.4 Ground Conditions

4.4.1 Soil

A review of the Soilscapes map has been undertaken which shows that the soil types for the proposed site location can be split into four main areas, shown in Figure 4.

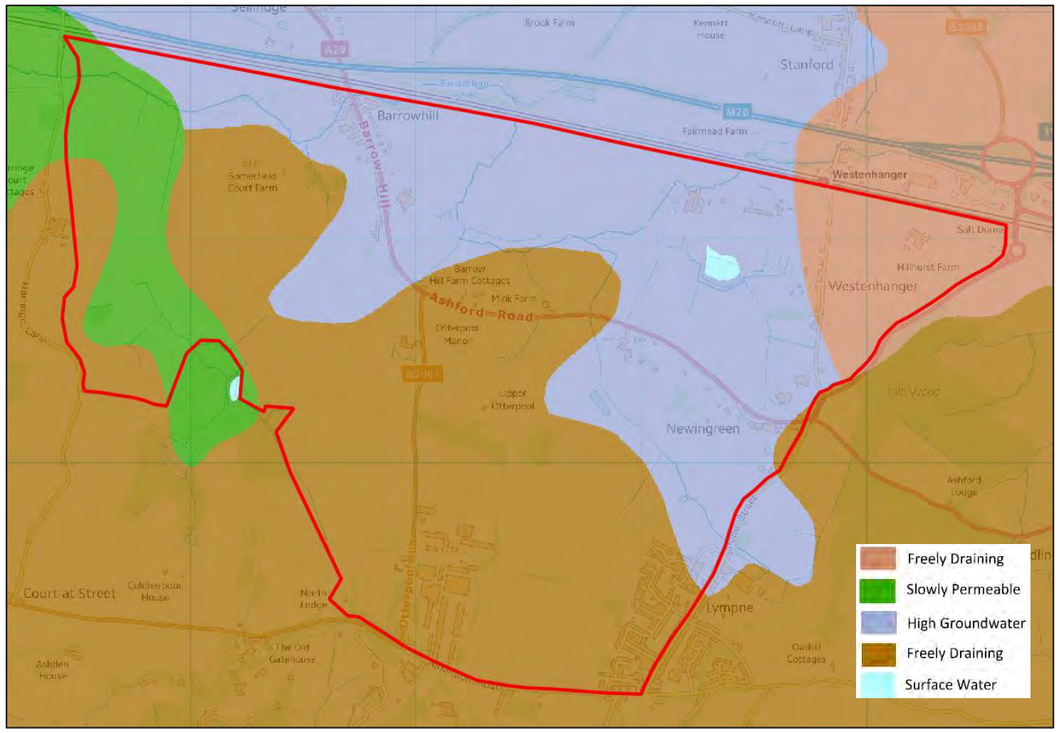

Figure 4: Soilscapes Profiles (Source: Cranfield University)

Most of the site is covered by freely draining, slightly acidic but base rich soils, which creates good conditions for sustainable water management due to its permeable nature. The second largest soil type in terms of plan area on site can be identified as loamy soils with naturally high groundwater likely influenced by the East Stour and underlying geology as discussed below. The loam properties of the soil create good conditions for the drainage of surface water and overly what is understood to be substantial aquifer.

Further analysis shows that the west of the site is partially covered by slowly permeable, seasonally wet, slightly acidic loamy which follows the profile of the Harringe Brook and the water outfall of the site. To the east, freely draining and slightly acidic loamy soils cover a small proportion of the site, which present good opportunities for water management strategies.

An intrusive site investigation would provide a better understanding of the soil properties and extents as discussed in Section 4.5.5.

4.4.2 Bedrock Geology

A desk study reviewing the BGS 1:50k Bedrock mapping data, as shown in Figure 5, shows that the bedrock formation of the proposed site location consists of five different formations of bedrock.

Most the underlying bedrock of the site consists of the Hythe Formation, which due to its limestone content presents as an efficient aquifer. A further and second largest formation on site is the Sandgate Formation which could act as a lateral aquifer to assist with the management of surface and ground water.

Other bedrock formations include the Weald Clay Formation and the Atherfield Clay Formation which are located within the area of the Harringe Brook and the final water outfall location for the site. These could be slowly permeable to ensure the surface and ground water are directed off site, this is to be confirmed through site investigation. The Folkestone Formation can also be seen to the north-east corner of the site.

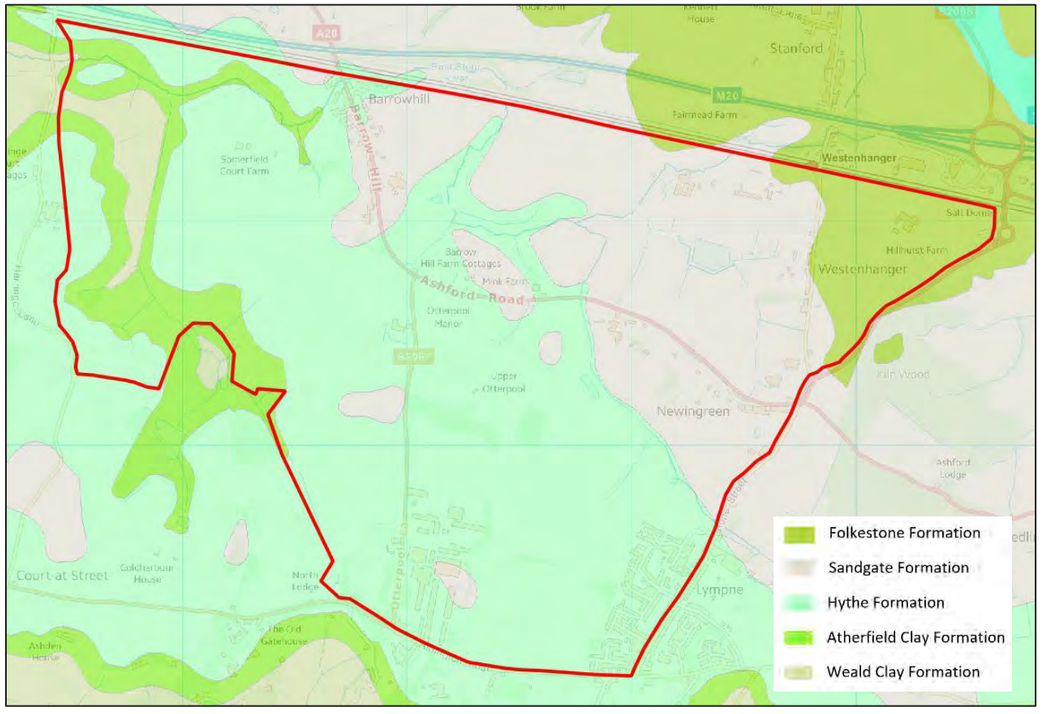

Figure 5: Bedrock Geology (Source: British Geological Society)

4.5 Infrastructure

Given the large scale of the site there are substantial existing elements of infrastructure including highways, surface and foul sewers, pumping stations and other utilities. During a site visit two pumping stations, owned by Southern Water were identified. The first pumping station, seen in Figure 6, is located towards the centre of the site to the north of A20 and to the west of Folkestone Racecourse. The second, is located towards the north west of the site boundary where Barrow Hill intersects the Eastern Stour. A river flow gauge is also located at the upstream face of A20 crossing at the same location of the second Pumping Station.

Figure 6: On-site Southern Water pumping station to the north of A20

Statutory utility data requests have also been sent to the relevant water companies but only the asset data from Affinity Water has been received to date. As part of the stage 2 work a detailed desk study of existing utilities will be required to inform the water management and flood risk strategy.

5 Baseline Water Environment

5.1 Hydrology

From analysis of the Flood Estimation Handbook (FEH) Catchment Descriptors the site area lies within a Catchment of 19.5km² with an annual Seasonal Average Annual Rainfall of 775mm. With further analysis of the catchment descriptors the greenfield runoff rates that have been calculated are discussed below.

The greenfield runoff rates were calculated using the Revitalised Flood Hydrograph (ReFH2) model, whereby the FEH Catchment Descriptors above were used estimate design flood hydrographs for the ruralised catchment runoff rates and volumes, which can be seen in Table 2 below. The drainage design during the Stage 2 work should ensure that the rates and volumes below are not to be increased due to the planned development.

Table 2: ReFH2 greenfield rates

Return Period	As Rural Peak Flow Rate (l/s/ha)	As Rural Direct Runoff Volume (m³)
1 in 1	0.92	13,174
1 in 30	2.21	34,394
1 in 100	3.04	48,066

The greenfield rates that were generated from the model have been used to produce 1 in 100 annual probability storm hydrograph, which can be seen in Figure 7 below.

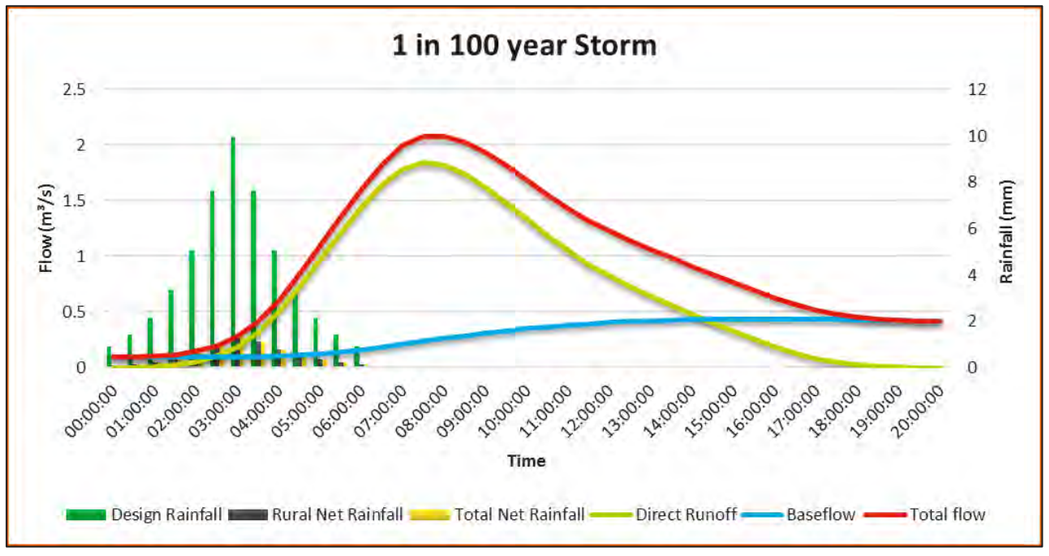

Figure 7: Design Hyetograph and Hydrograph for the natural catchment using FEH Catchment Descriptors

The above Hydrograph and Hyetograph show a peak flow of 2.08m³/s at 8hrs and a peak design rainfall of 9.96mm at 3hrs, respectively for the current baseline conditions.

5.2 Watercourses and Waterbodies

As discussed before, the main watercourse that runs through the site is the East Stour which flows from the north-east to the west site of the site boundary.

Substantial water bodies include a large pond within the centre of the former Folkestone Racecourse with an approximate surface area of 1.6 Ha. It is understood that the original function of this pond was to provide a water supply for the irrigation of racecourse grass. At present this may serve as a drainage point for the surrounding wetland swale network within the vicinity of the racecourse although no obvious direct pipe connections were noted during the site visit. This suggest that the water level in the pond may have a direct hydrogeological connection with the surrounding groundwater table Two larger watercourses between Westenhanger and Newingreen can also be seen to flow towards the retention pond from the roads and buildings further south.

The North Lympne Watercourse (see Figure 1), which is close to 2km long, can be seen to channel water from just north of the dwellings at Lympne to the Eastern Stour. A further smaller waterbody is also located along the North Lympne Watercourse, which has the potential to be utilised as a water management component within the proposed drainage strategy.

To the south west, within the site boundary, a small network of minor watercourses drain into two waterbodies which can be seen just outside of the western side boundary within the existing woodland. Other minor watercourses can be seen Barrow Hill Farm Cottages and Mink Farm, which flow into the East Stour to the west of racecourse. Also, there are watercourses either side of Somerfield Court Farm, which flow down into the Eastern Stour at the eastern side of the site.

5.3 Water Quality

5.3.1 Chemical

By assessing the data from the Environment Agency Catchment Planning a chemical assessment of the water quality was not required, therefore it can be concluded that in terms of chemical content the water quality is good.

When looking at water quality, high amounts of Copper and Zinc can be seen within the water, however this has not been assessed with the last two years.

5.3.2 Ecological

When looking at species within the water, fish and invertebrates can be seen to a good extent. However, there are lower amounts of aquatic and microscopic plants attached to rocks or within the watercourses. WFD targets have been set for the catchment to achieve 'good' ecological status by 2027.

5.4 Fluvial Water

The Environment Agency Flood map for Planning for Zones 2 and 3 is shown below in Figure 8. The analysis of this maps shows that Flood Zones 2 and 3 follow the route and profile of the Easter Stour valley which runs through the northern half of the proposed site. This shows a significant area of flood risk influence surrounding the Eastern Stour corridor. During the site masterplan and drainage design, these flood zones will need to be considered so that the flood zones are not extended after the site has been developed.

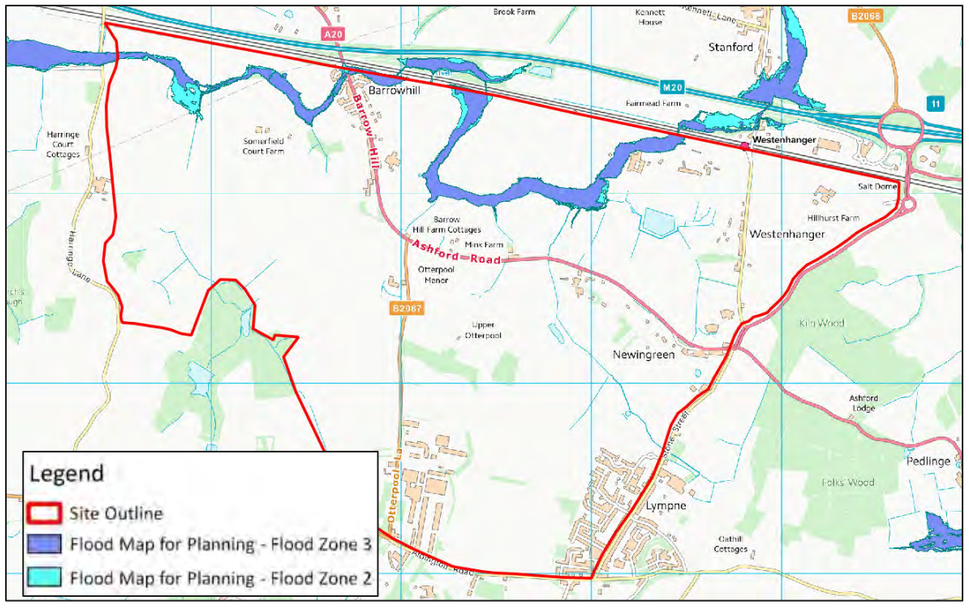

Figure 8: Flood Map for Planning (Source: EA)

5.5 Surface Water

The Environment Agency surface water flood maps, shown in Figure 9, indicate areas of localised flooding within the boundary of the proposed development site. Most of this surface water follows the profiles of the previously mentioned watercourse within the site area. Other areas in which surface water flooding occurs can be seen towards the western border of the site to the south of the Eastern Stour, which is the single water outfall location for this site.

Other areas of considerable surface water flooding can be seen towards the centre of the northern site boundary surrounding the local area to the Eastern Stour meander. Upstream of the Eastern Stour from this location surface water flooding can also be seen due to the topography and watercourse networks of the site.

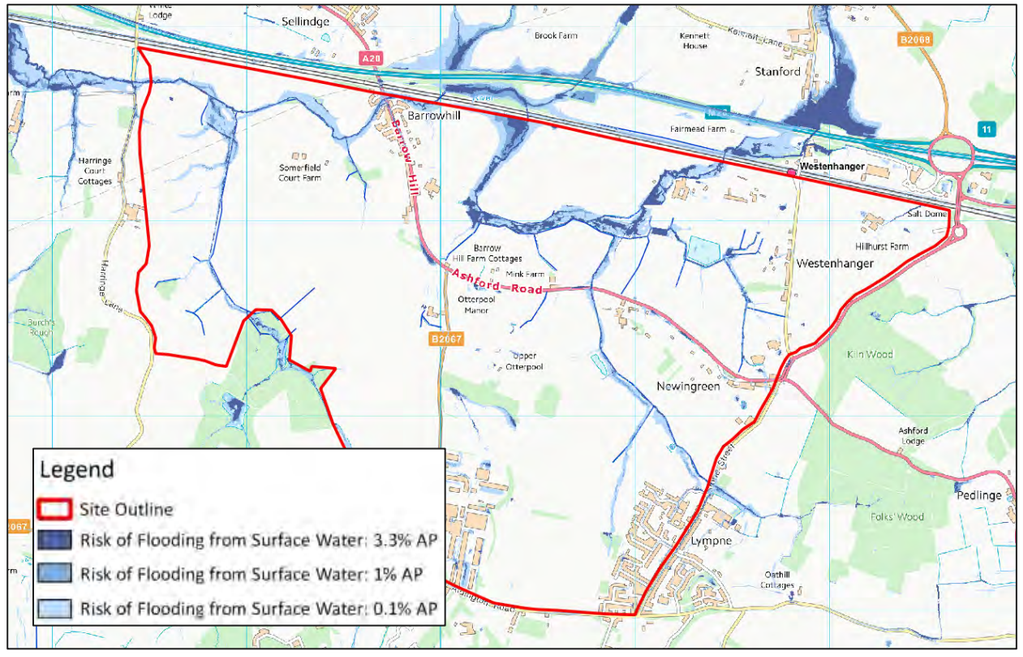

Figure 9: Updated Risk of Flooding from Surface Water Map (Source: EA)

5.6 Groundwater

5.6.1 Hydrogeology Aquifer

A desk study review of the hydrogeology aquifer classification 625k data from the Environment Agency reveals that most of the site lies upon a section of the Lower Greensand Group which is a highly productive aquifer and significant intergranular flow. This formation is generally sandstone and conveys water of a soft nature at a rate of up to 50 l/s.

A small proportion of the site is located upon a section of the Wealden Group, which consist of mainly rocks with very limited groundwater within the pours and voids.

5.6.2 Source Protection Zones

After a review of the Environment Agency Source Protection Zone data, it can be concluded that no source protection zones are located within the site boundary. The closest source protection zone in proximity to the site is 2.2km to the east. This means source protection zones do not cause a barrier for the use of infiltration based SuDS techniques.

5.6.3 Flood Risk

The 2015 Shepway District Council Strategic Flood Risk Assessment, Phase 2 has analysed the data compiled from the British Geological Survey. This inspection of the datasets and related mapping shows that the whole of the Shepway District is generally located within a low risk area in terms of ground water.

However, this analysis does not consider more localised causes of groundwater flooding such as low-lying land drained by man-made watercourses. These low-lying parts of the district area contain typically marine alluviums and beach sands which have the potential to convey groundwater. Chalk can be seen within the higher parts of the district, which provide considerable storage for groundwater.

This SFRA analysis has also shown that groundwater is also found within the interface of the Folkestone and Sandgate Beds, which has contributed to landslips that have occurred in the past.

5.6.4 Borehole Data

Analysis of the Borehole scans for the site area was undertaken using the British Geological Survey. A total of eight borehole records were assessed for their findings in relation to groundwater, these were; TR13NW83, TR13NW84, TR13SW9, TR13NW95, TR03NE231, TR13NW44, TR13NW195, TR13NW232.

For boreholes TR13NW83, TR13NW84, TR13SW9, TR13NW95, TR13NW44 and TR13NW195, the borehole remained dry during boring. This indicates that at these locations, no groundwater is present.

For borehole TR03NE231 groundwater was present at a level of 22.3m below the ground surface level of 64.7mAOD, this gives a ground water level of 42.4mAOD at the time of survey in April 1999. This then was observed to rise 5m in 20mins.

Groundwater was also present within borehole TR13NW232 at 7.6m below the ground surface level of 73.45mAOD, which gives a groundwater level of 65.85mAOD at this location in November 1996. The water level at this location did not rise during the time it was observed.

Borehole locations can be seen below in Figure 10.

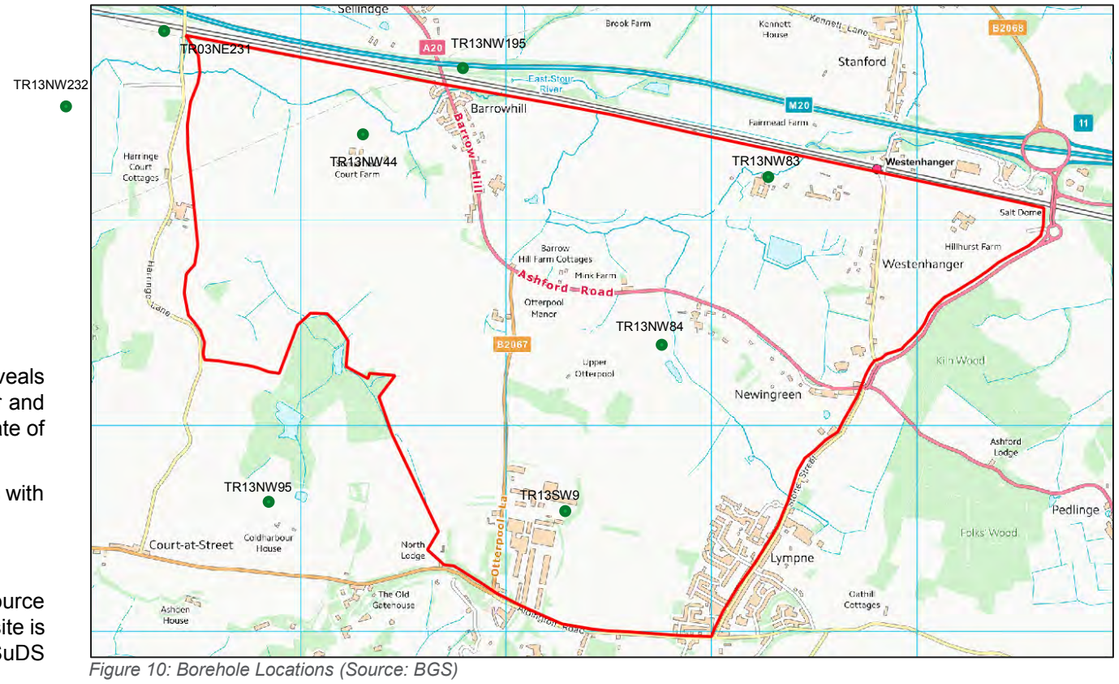

Figure 10: Borehole Locations (Source: BGS)

5.6.5 Potential for Infiltration

The initial scoping identifies that there may be potential for infiltration across a large portion of the site, as illustrated in Figure 11. In order to confirm this, it is recommended that trial pits and soakaways testing in

accordance with BRE365 are undertaken during the early part of Stage 2 work in order to confirm infiltration rates and areas suitable for ground infiltration as this has a notable impact on the required SuDS land take and design, impacting the wider masterplan proposals. Without sufficient ground infiltration it is not feasible to comply with the EA and LLFA requirement to make no increase to the greenfield runoff volumes.

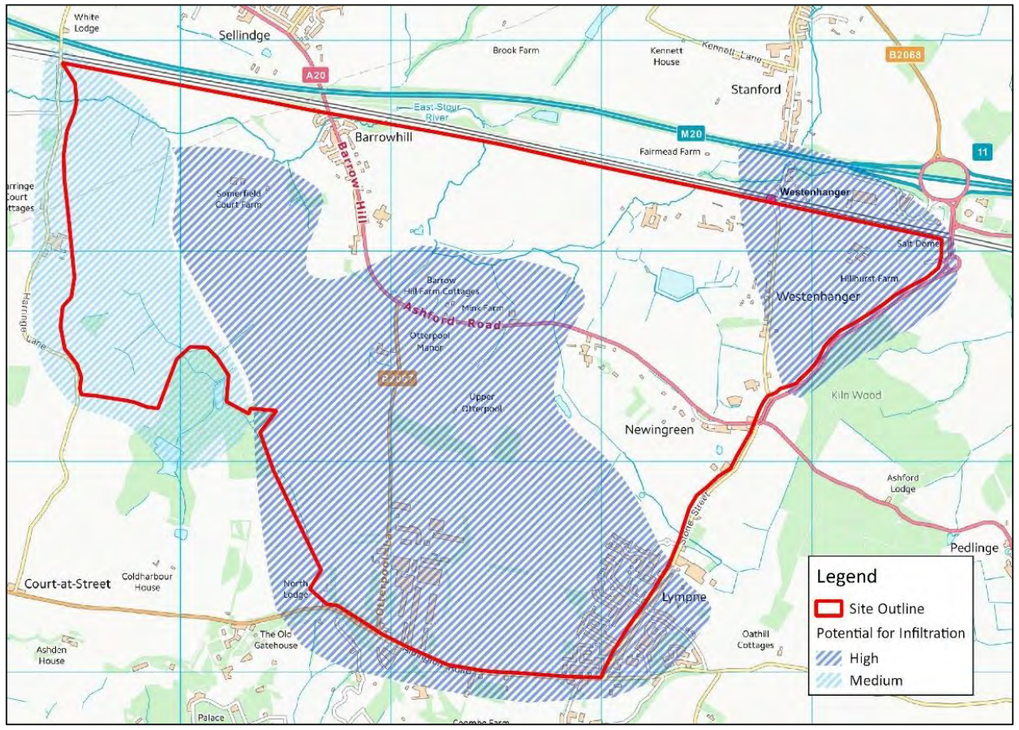

Figure 11: Potential for Infiltration Map (Source: Arcadis. Contained OS Opendata)

5.7 Artificial and Infrastructure Flood Risk

The site does not lie within an area at risk of flooding from reservoirs. The nearest extent of flooding shown on the EA's published maps is roughly 2.8km to the north-west of the site towards Ashford. The nearest reservoir is Aldington Flood Storage Area connected to the East Stour River and is located at grid reference TR0661138053 in Ashford, any increase to flow rates and volumes discharged to this from the development will need to be considered and managed.

5.8 Ecology

A desk study review was undertaken of the OS Master map data which highlights many woodland areas within the proposed site boundary. The largest of these is located adjacent to the B2067 (Otterpool Lane) and consist of dense woodland close to 3.9 Ha in plan area. A further woodland is located to the eastern border of the proposed site boundary which is approximately 0.9 Ha in plan area and looks to be a dense woodland.

A woodland is also located just offsite to the west with an area of around 29 ha, although not located on site, this has potential to be utilised as a wetland retention pond as a large amount of surface water can be seen to collate in this area at present.

6 Stakeholder Engagement and Feedback

As part of this Stage 1 work the following have been identified as stakeholder in relation to surface water and flood risk management:

- Kent Lead Local Flood Authority (LLFA)
- The Environment Agency (EA)
- Natural England (NE)
- Southern Water (SW)
- Affinity Water (AW)

These stakeholders have been engaged with to ensure that the proposed SuDS design aligns with all requirements and achieves multiple benefits wherever possible. The outputs of the early engagement have been used to inform the strategic water management objectives identified in Section 5.

7 Constraints and Opportunities

7.1 Constraints

- Ashford and the area downstream of the site has experienced flooding in the past, the proposed development must not increase this risk and ideally should reduce it;
- EA's Aldington Flood Storage Area is located downstream from Otterpool Park site on the East Stour, providing flood protection to Ashford and any increase in the rate or volume of discharge from this site (i.e. both surface water and foul water) will potentially have an adverse impact on this flood defence structure, which should be fully considered and mitigated from the outset of the site design;
- There are existing and upcoming urban areas (i.e. Lympne / Lympne Business Park and the new lorry park adjacent to M20) which currently lie within or close to the site and its catchment. Runoff from these areas will need careful consideration to ensure it does not adversely impact the site and downstream;
- The site has a network of small watercourses that have surface water flood extents associated with them. These will need to be considered, incorporated, and designed out to ensure surface water flooding is not worsened through the proposed drainage strategy;
- The East Stour River has medium risk and high risk flood zone 2 and 3 associated with it, any new development (including water management proposals) in these areas would need to satisfy the sequential test and exception test if needed (i.e. where new development is proposed in medium and high flood risk zones) which for this site is unlikely to be passed, considering the large areas of available greenfield land in low risk flood zone 1;
- Whilst the site does overall drain to one final outfall point in the north west, there are local variations in topography which need to be accounted for in the masterplan and drainage design. Areas where there are undulations, ridges or other topographical features will need design consideration;
- Given the site's extent there are existing infrastructure assets which are already present and used, understanding of their current function/extent and future use will need to be fully understood regarding the surface water and flood risk management strategy;
- The constraints to the water supply and wastewater treatment will be confirmed in the utility capacity report produced by the site infrastructure, utilities and ground conditions workstream. However, it is very unlikely that the existing Wastewater Treatment Works (WwTW) at Sellindge or nearby areas can accommodate the extra flows from the full Otterpool Park development and therefore highlighting the need for major upgrades or constructing a new WwTW (i.e. whether on-site or off-site). This will need further investigation in Stage 2.
- Given the large number of dwellings that the site is proposing to accommodate, any wastewater discharges from a newly constructed or upgraded existing WwTW will need to be fully understood to as to ensure no adverse impact to water quality or flood risk. The initial calculations suggest that the extra Dry Weather Flow (DWF) from 12,000 homes can approximately generate 45 l/s and 3,850 m^3/day whereas the baseflow on the East Stour at the final site outfall is approximately 90 l/s. This suggests that residential DWF alone can increase the river baseflow by 50%, highlighting the importance of effective water management to avoid detriment to downstream flood risk and water quality.

7.2 Opportunities

- The South East of England is a relatively water stressed area with forecasts showing that demand already outweighs supply with further worsening anticipated in the future. Initial reviews have shown that large portions of the site may be suitable for infiltration based SuDS techniques. Infiltration is a key aspiration where this is feasible because not only does it recharge groundwater supplies but it also reduces the

downstream flood risk and the extra space required for attenuation storage, thereby increasing developable land;

- The EA has identified that the East Stour River is targeting 'Good' overall status by 2027, the development could contribute to this through an effective SuDS treatment train;
- Collaboration with the ecology and environment team has highlighted that many species in the study area would benefit from created habitats. Through considered design, SuDS that are well integrated with Green Infrastructure could be multi-functional to provide these habitats as well as water quality / quantity / amenity function;
- By adhering to the required guidance and best practice the SuDS strategy could be designed with a view to being adopted by either: Natural England, Kent LLFA or local Wildlife Groups thereby minimising adoption risk, future maintenance costs and increasing community engagement;
- Given the potential to be a sustainability exemplar the site could provide an opportunity to liaise with local schools / education trusts as a chance to see SuDS in action, from planning through to construction and operation;
- Folkestone Racecourse in the north east of the site comprises a unique and exceptional water management area which large ditches/scrapes providing habitat and drainage. These by interlinking with the existing large lake in the centre of the site provides a large habitat and significant amenity value – hence there is a significant opportunity to develop this area and provide a showcase entrance to the site featuring garden town principles;
- Where existing watercourses are culverted of flow through man-made channels there is the opportunity to naturalise these. For example, there are several notable culvert sections within the racecourse area. This would provide amenity and downstream flood risk benefits, something which the EA is usually very supportive of;
- Given the above water stresses in the area along with the sustainability drivers for the site there is the option to look at water recycling options, either at a household level or for community buildings (schools / hospitals etc.) and community allotments.
- The need to construct a new WwTW to serve the proposed development also provides an opportunity to recycle the suitably treated wastewater effluent (i.e. either for potable or non-potable usage subject to risks, costs, feasibility, stakeholder acceptance etc.) to reduce the extra water demand. If an onsite WwTW is constructed for this purpose then an inset water company may be used to adopt such a facility and the SuDS system.

- As part of the Stage 1 engagement works Arcadis has developed a link with the University of Portsmouth in order to collaborate on industry leading research as part of the 'Providing Real-world Opportunities for Sustainable Drainage Systems (ProSuDS)' project. The aim of this project is to:
  - Establish a standardised toolkit of valuation and costing techniques and guidance that can be used to provide evaluation of SuDS particularly in housing developments.

  The project will provide the opportunity to apply the toolset to the Otterpool Park case study and real value quantification of the benefits that any proposed SuDS will provide. This can be useful for informing marketing value of any proposed development as well as showcasing how innovation is being used across the development process. It is recommended that SDC give consideration to take part in this ProSuDS project during Stage 2 and Stage 3 work.

8 Impact on Masterplan Design

Following consultation with key stakeholders, site walkover and Masterplanning team workshops, strategic surface water and flood risk management objectives have been developed, these are shown below in Table 3. These strategic objectives will allow the SuDS design to respond to local character and fully integrate into the wide masterplan and water management proposals.

Table 3: Otterpool Park Strategic Water, Flood Risk and Blue Infrastructure Objectives

Delivery area	Strategic objective
Water resources	The site is in an area of increasing water stress, with one of the key sources of water in the area being groundwater. The SuDS strategy will recharge the aquifers where ground infiltration rates are favourable. In addition, rainwater harvesting and water-reuse can be utilised for community buildings, employment areas, schools, allotments and public open spaces where appropriate.
Flood risk	Rates and volumes of surface water discharge from the site will be controlled to greenfield rates including an allowance for climate change. Impacts on the East Stour River baseflow from any extra wastewater treatment discharges will not increase flood risk downstream of the development. Development within medium risk and high risk flood zone 2 and 3 will be limited as per NPPF sequential requirements whilst allowing for blue corridor buffer zones to accommodate climate change impacts. De-culverting of the existing watercourse crossings will be maximised and new river crossings will be of clear span bridge structures.
Water quality	The SuDS strategy will provide treatment trains to surface runoff from the site, contributing to the water quality improvement targets identified in the WFD objectives for the catchment. Where water is proposed to recharge aquifers, this will undergo treatment to ensure no deterioration to groundwater sources.
Amenity	To deliver amenity benefits across the site water will be presented as an amenity feature wherever possible. SuDS will be integrated into community areas and green corridors, and the designs will consider form and function for both day to day and extreme events. SuDS components will be designed to be attractive, adding to the surrounding development. Links will be established with relevant community groups and schools to grow knowledge of the water environment and the importance of sustainability.
Habitat and biodiversity	The SuDS strategy will be developed in an integrated manner with the ecology and green infrastructure workstreams to support habitat creation for all identified wildlife including (but not limited to) birds, mammals, and amphibians. The SuDS scheme will reinforce and improve existing habitat corridors through the site as well as provide additional ones which link into the wider environmental strategy.
Climate resilience	On the assumption that the development is mainly a low density garden town, urban cooling is not identified as being a significant driver. All technical work is to be undertaken using the upper climate change sensitivity allowances identified by the EA for the catchment.
Approval, maintenance and adoption	Kent Lead Local Flood Authority is identified as being the approving body for the SuDS components within the site. The SuDS strategy will be undertaken in accordance with best practice from CIRIA, the LLFA and DEFRA to ensure approval, safe maintenance and adoption. Adoption and maintenance responsibilities will be discussed so that the approach can be agreed prior to finalising the SuDS outline design scheme.

9 Next Steps

As part of the next stage of the Masterplanning process the following actions will be undertaken by the water, flood risk and blue infrastructure workstream:

1. Existing site characterisation, taking the outputs from this stage of work and combining with further desk study including existing utilities and assets capacity review;
2. Comment on emerging masterplan options and layouts, these options can be used to inform the development characterisation;
3. Development of the site design criteria for the four sustainable drainage and flood risk principles: water quantity, water quality, amenity and biodiversity. These will be agreed with the relevant stakeholders: EA, LLFA, SW, River Stour (Kent) Internal Drainage Board, SDC and the Highways Authority;
4. Establishment of the SuDS management train including identification of SuDS components, treatment pathways, outfalls, adoption and maintenance requirements. This will feed into a conceptual water management design for the site;

5. Discuss and agree the potential scope for taking part in ProSuDS project in collaboration with University of Portsmouth and SDC.

The following actions are required to inform the next stage of work:

1. Ground condition testing to include an assessment of infiltration capacity and identification of groundwater levels across the site;
2. Liaison with the wider green and grey infrastructure teams to ensure alignment and understanding.

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APPENDIX D

Sustainability & Resources Workstream Report

The following figures and tables are found in this report.

Figures

Figure 1: Overarching Principles for Otterpool Park

Figure 2: The energy hierarchy as illustrated in the Kent Environment Strategy

Figure 3: Indicative Otterpool Park Heat Map – Commercial and Industrial Heat Density within 10km

Figure 4: Otterpool Park Resource Flow Vision

Tables

Table 1: Selected Indicators from the Kent Environmental Strategy

Table 2: Opportunities and constraints relating to the context of the site

Table 3: Opportunities and constraints to reduce energy demand

Table 4: Opportunities and constraints for energy efficiency

Table 5: Opportunities and constraints of District Heating

Table 6: Opportunities and Constraints for Energy Recovery Plant

Table 7: Opportunities and Constraints for Micro-renewables

Table 8: Opportunities and Constraints for Large Scale Renewable Electricity Generation

Table 9: Opportunities and constraints of individually serviced homes

Table 10: Opportunities and constraints relating to climate change adaptation

Table 11: Opportunities and constraints relating to water efficiency and treatment

Table 12: Opportunities and constraints relating to materials and waste

Table 13: Opportunities and constraints relating to low carbon transport and accessibility

Table 14: Opportunities and constraints relating to biodiversity

Table 15: Opportunities and constraints relating to the local economy

Table 16: Opportunities and constraints relating to health and wellbeing

Otterpool Park Masterplan
Stage 1 Report: Feasibility and Capacity Study

Workstream Name: Sustainability and Resources

Date: 23/11/16

1. Stage 1 Methodology

As part of Stage 1 the masterplan development for Otterpool Park, a desk based study has been completed to define the opportunities and constraints relevant to 'Sustainability and Resources'. This exercise is the first step towards establishing the sustainability and resources principles and objectives for the development of the masterplan. Stage 1 has included the following elements:

1. Consultation with the Arcadis masterplanning team to discuss the initial findings of each workstream and to ensure a joined up approach
2. Key stakeholder engagement with Kent County Council
3. Review of policy context to establish the policy framework and context
4. Defining baseline data
5. Identification of opportunities and constraints relating to sustainability and resources including renewable and low carbon energy.

2. Stakeholder Engagement and Feedback

- Communication established with Carolyn McKenzie, Head of Sustainable Business and Communities at Kent County Council. Two calls have been scheduled but were subsequently cancelled, a further call is to be rearranged.
- It has been confirmed that there is no Sustainability Officer at Shepway District Council.

3. Baseline Policy and Guidance

The following policy documents have been reviewed as part of the Stage 1 work in order to ensure that our work is following current best practice and meeting the latest sustainability requirements:

- National Planning Policy Framework (2012)
- The Kent Environment Strategy (2016)
- The Kent Environment Strategy: Implementation Plan 2017
- Shepway Core Strategy Local Plan (2013)
- Shepway District Local Plan Review (2006)
- Sustainability Appraisal (SA) of the Shepway Core Strategy (2012)
- The East Kent Local Strategic Partnership Sustainable Community Strategy (2009)

The following guidance has been reviewed as part of the Stage 1 feasibility and capacity study:

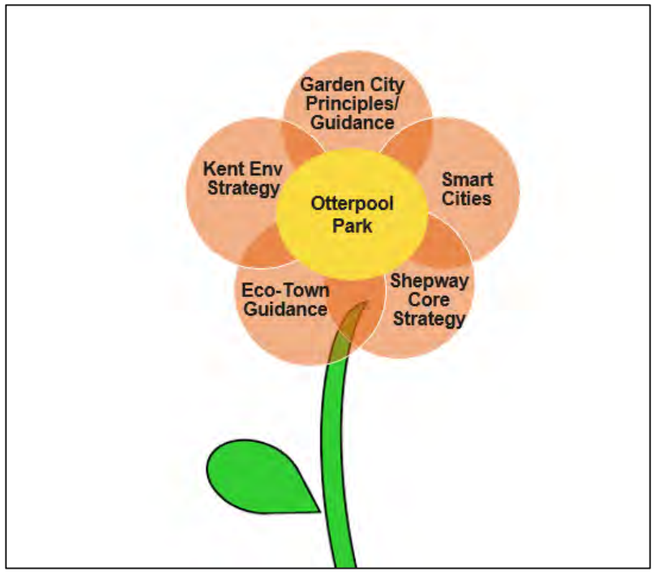
- Locally-Led Garden Villages, Towns and Cities (DCLG 2016)
- Practical Guides for Creating Successful New Communities - Planning for Energy and Climate Change (Town and Country Planning Association, 2016)
- 21st Century Garden Cities of To-Morrow (Philip Ross, 2013)

- Supplement to Planning Policy Statement 1 Eco-Towns (DCLG, 2009 – withdrawn)
- Smart Cities – Background Paper (Department for Business Innovation and Skills, 2013)
- The Kent State of the Environment Report (2015)
- Kent Joint Strategic Needs Assessment - Sustainability Chapter, Kent County Council (JSNA, 2014)
- Low Carbon Kent – Developing an evidence base for opportunities in the Low Carbon Economy (2012)
- Renewable Energy for Kent Part 1 – Overview and Action Plan (2012)
- Renewable Energy for Kent Part 2 – Underpinning the Vision (2012)

4. Baseline Context

Based on a review of the policy and guidance documents listed above a baseline context for the development of Otterpool Park has been outlined for 'Sustainability and Resources'. The context has been informed by the core documents identified in Figure 1 below. To deliver a Garden Settlement relevant to 21st Century in the context of sustainability and resources, the following key overarching principles and guidance should be brought together to inform the masterplan for Otterpool Park.

Figure 1: Overarching Principles for Otterpool Park



4.1 Garden City Principles - Ebenezer Howard, 1898

Garden Cities were founded on a series of principles developed by Ebenezer Howard in 1898, which remain relevant today and have a strong bearing on the design in relation to Sustainability and Resources:

- Strong vision, leadership and community engagement
- Land value capture for the benefit of the community
- Community ownership of land and long-term stewardship of assets
- Mixed-tenure homes and housing types that are affordable for ordinary people
- Beautifully and imaginatively designed homes with gardens in healthy communities
- A strong local jobs offer in the Garden City itself and within easy commuting distance
- Opportunities for residents to grow their own food, including allotments
- Generous green space, including: surrounding belt of countryside to prevent unplanned sprawl; well-connected and biodiversity-rich public parks; high quality gardens; tree-lined streets; and open spaces
- Strong cultural, recreational and shopping facilities in walkable neighbourhoods
- Integrated and accessible transport systems

4.2 21st Century Garden Cities of To-Morrow - Philip Ross, 2013

An updated set of principles have been developed for the 21st Century which also provide guidance to underpin the masterplan and have a strong bearing on community and overall sustainability:

- Residents are Citizens of the Garden City
- The Garden City owns itself
- Energy efficient and carbon neutral
- Provides access to land for living and working to all
- Fair Trade principles are practised
- No special privileges for anyone
- Fair Representation and direct democracy
- Participatory design and public spaces
- A City of Rights and the right to the City
- Wealth and harmony measured by happiness

4.3 Locally-Led Garden Villages, Towns and Cities, DCLG 2016

In terms of the Government's criteria for a Garden City the most relevant requirement is:

"Quality and design: Good design is essential if we are to create sustainable places where people want to live and be part of the local community. It will be important for expressions of interest to demonstrate how the garden town, or city, will be built to a high quality, well designed and attractive. Use of qualitative and quantitative research on local public opinion will be welcomed on issues around design and community".

4.4 Planning Policy Statement: eco-towns - A supplement to Planning Policy Statement 1

Supplementary Guidance to the withdrawn Planning Policy Statement 1, provided developers with policies and principles relative to the development of Eco-Towns. Although the statement is now withdrawn from the planning process, it provides useful context for the development of a new town and community. The following standards are identified:

- Zero carbon: Over a year the net carbon dioxide emissions from all energy use within the buildings on the development as a whole are zero or below
- Climate change adaptation: to minimise future vulnerability in a changing climate, and with both mitigation and adaptation in mind; as well incorporating wider best practice on tackling overheating
- Homes: Achieve Building Life Silver Standard, Code for Sustainable Homes Standard 4, affordable portion
- Employment: Genuine mixed-use communities and that unsustainable commuter trips are kept to a minimum
- Transport: Prioritise walking, cycling, public transport and other sustainable options; support people's desire for mobility whilst achieving the goal of low carbon living.
- Health Lifestyles: Promoting and supporting healthier and more active living and reduce health inequalities
- Local Services: Good level of services including leisure, health, and social care, education, retail, arts and culture, library services, sport and play facilities and community and voluntary sector facilities

- Green Infrastructure: Forty per cent of the eco-town's total area should be allocated to green space, of which at least half should be public and consist of a network of well managed, high quality green/open spaces which are linked to the wider countryside. The space should be multifunctional. Particular attention should be given to land to allow the local production of food from community, allotment and/or commercial gardens
- Landscape and Historic Environment: Consider the implications for the local landscape and historic environment
- Biodiversity: Demonstrate a net gain in local biodiversity
- Water: Develop a water cycle strategy that provides a plan for the necessary water services infrastructure improvements; incorporate sustainable drainage systems (SUDS); Eco-towns in areas of serious water stress should aspire to water neutrality, I.e. achieving development without increasing overall water use across a wider area
- Flood Risk: The location, layout and construction of eco-towns should reduce and avoid flood risk wherever practicable.
- Waste: Develop a sustainable waste and resources plan, covering both domestic and non-domestic waste that sets targets for residual waste levels, recycling levels and landfill diversion, establishes how all development will be designed so as to facilitate the achievement of these targets, provides evidence that consideration has been given to the use of locally generated waste as a fuel source for combined heat and power (CHP) generation, ensure that no construction, demolition and excavation waste is sent to landfill, except for those types of waste where landfill is the least environmentally damaging option
- Transition, Community and Governance: How developers will support the initial formation and growth of communities, through investment in community development and third-sector support; a governance transition plan from developer to community, appropriate governance structures are in place to ensure that standards are met, maintained and evolved to meet future needs; continued community involvement and engagement, sustainability metrics, including those on zero carbon, transport, water and waste are agreed and monitored

4.5 Smart Cities – Background Paper, Department for Business Innovation and Skills, 2013

In order for Otterpool Park to be successful in the 21st Century it is considered that it might also embrace the principles of a Smart City.

There are many definitions of a Smart City. The Government's Smart Cities background paper outlines that a Smart City is 'essentially enabling and encouraging the citizen to become a more active and participative member of the community. For example, providing feedback on the quality of services or the state of roads and the built environment, adopting a more sustainable and healthy lifestyle, volunteering for social activities or supporting minority groups. Furthermore, citizens need employment and "Smart Cities" are often attractive locations to live, work and visit. It brings together hard infrastructure, social capital including local skills and community institutions, and (digital) technologies to fuel sustainable economic development and provide an attractive environment for all'. There are five key aspects of a Smart City:

- A modern digital infrastructure, combined with a secure but open access approach to public re-useable data, which enables citizens to access the information they need, when they need it
- A recognition that service delivery is improved by being citizen centric
- An intelligent physical infrastructure ("smart" systems or the Internet of Things), to enable service providers to use the full range of data both to manage service delivery on a daily basis and to inform strategic investment in the city/community
- An openness to learn from others and experiment with new approaches and new business models
- Transparency of outcomes/performance, for example, city service dashboards to enable citizens to compare and challenge performance

4.6 Kent County Council Policy and Guidance

The fourth element of the Sustainability Context is ensuring that the sustainability and resources strategy for Otterpool Park addresses and supports Kent County Council's environmental plans.

The Kent State of the Environment report, provides an evidence base and baseline in terms of Kent's environment and related economic, social and health performance indicators.

The Kent Environmental Strategy has a vision to deliver a "competitive, innovative and resilient economy, with our natural and historic assets enhanced and protected for their unique value and positive impact on our society, economy, health and wellbeing". The Strategy is underpinned by three themes:

- Building the Foundations of Delivery
- Making best use of existing resources, avoiding or minimising negative impacts
- Towards a Sustainable Future

Kent has set out key issues and targets to achieve the plan.

Table 1: Selected Indicators from the Kent Environmental Strategy

Issue	Targets
Energy	• We will reduce our emissions across the county by 34% by 2020 from a 2012 baseline (2.6% per year) • More than 15% of energy generated in Kent will be from renewable sources by 2020 from a 2012 baseline
Water	• We will reduce water use from 160 to 140 litres per person per day • Reduce the number of properties at risk from flooding • 28 Kent and Medway water bodies will be at good status by 2021
Natural and Heritage Assets	• A minimum of 65% of local wildlife sites will be in positive management and 95% of SSSIs will be in favourable recovery by 2020 • 60% of local wildlife sites will be in positive management and 95% of SSSIs will be in favourable or recovering status by 2020 • Status of bird and butterfly specifies in Kent and Medway are quantified • We will have completed a natural capital assessment for Kent by 2017 • Heritage assets at risk quantified and identified
Sustainable Transport	• Targets are under review, they will initially focus on monitoring modal shift to sustainable and active travel options.
Resilience	• Public sector services will have reviewed climate risk assessments and have developed actions as appropriate by 2018 • Emergency plans reviewed and guidance developed for key animal and plant health risks e.g. Ash Dieback
Skills	• We will work to increase the number of jobs in the Low Carbon and Environmental Goods and Services sector by 10% by 2020 • We will support 500 businesses to increase resilience and build innovation in LCEGS by 2020
Health and Wellbeing	• Decrease the number of days of moderate or higher air pollution and the concentration of pollutants (align with the Kent and Medway Air Quality Partnership and national monitoring standards) • We will work to reduce the noise exposure from road, rail and other transport
Waste	• We will send no more than 5% waste to landfill by 2020 • We will reduce household waste by 10% by 2020

4.7 Otterpool Park Garden Settlement Visioning Summary

The Otterpool Park Garden Settlement Visioning Summary has been developed against the background of garden city guidance and complements much of the guidance outlined above. There are a number of high level guiding principles outlined in the Visioning Summary that are relevant to sustainability and resources:

- Create **local neighbourhood shopping centres** in accessible (walkable) distances responding to local people's cultural diversity and ranges of ages and life-stages.
- Prioritising **walking, cycling and sustainable transport** as the easiest and most attractive forms of transport in the garden settlement through the provision of a comprehensive, permeable and balanced network of streets and boulevards.
- Maximising the opportunities for **strategic new employment space** in close proximity to junction 11 of the M20, and to provide a range of modern employment types and spaces within the new settlement to support a mixed-use community.
- Taking advantage of significant **economies of scale and capturing land value** to deliver new technology and physical and social infrastructure such as for transport, education, energy and community facilities.
- Promoting **healthy and sustainable environments** through active design principles and healthy living choices, applying good practice.
- Incorporating infrastructure that makes **best use of technologies in energy generation and conservation** and climate change adaptation and mitigation.
- Providing spaces for **local food growing**

5. Opportunities and Constraints

Opportunities and constraints relevant to the site have been considered and are summarised below across a number of themes relevant to sustainability and resources. The sections below identify opportunities and constraints across the following key themes:

- Site Context
- Energy and Carbon Emissions
    - Reduce the Need for Energy
    - Use Energy More Efficiently
        - A Smart City
        - District Heating
        - Energy from Waste
    - Supply Energy from Renewable Sources
        - Micro renewables
        - Large Scale Ground Mounted Renewables
    - Individually Serviced Properties
    - Ensure that any continuing use of fossil fuels should use clean technology and be more efficient
- Climate Change Adaptation
- Water Efficiency and Treatment
- Materials and Waste
- Low Carbon Transport and Accessibility
- Biodiversity
- Local Economy
- Health and Wellbeing

5.1 Site Context

The development of a masterplan on a site of this scale presents an opportunity to incorporate design measures and infrastructure that will support the aspirations of a sustainable community.

A number of constraints and opportunities have been identified related to the site context.

Table 2: Opportunities and constraints relating to the context of the site

Opportunities	Constraints
The predominantly undeveloped nature of the site provides opportunities to embed sustainability and resource efficiency measures into Otterpool Park from the outset. Opportunity to improve range of sustainable services on the site and increase natural capital through the masterplan design.	The rural nature of the site currently provides functions such as farming, biodiversity habitat and flood attenuation. The development of Otterpool Park will impact on existing ecosystem services.
	Competing needs for land use with the site boundary are likely, including residential development, commercial development, landscaping, green infrastructure and blue infrastructure. Energy generation plant, energy distribution infrastructure and wastewater treatment facilities may also be required which will further compete for land use.
	Competing pressures such as cost may affect the delivery of a sustainability vision. Embedding sustainability from the outset will help to facilitate the successful delivery of competing agendas.
	There is currently a lack of existing utilities infrastructure capacity for gas, electricity, water and waste water management.

5.2 Energy and Carbon Emissions

One of the guiding principles identified in the Otterpool Park Garden Settlement Visioning Summary is to incorporate infrastructure that makes best use of technologies in energy generation and conservation.

Opportunities to minimise energy demand and provide energy generation will be influenced by the masterplan design. An overall Energy Strategy will be developed for Otterpool Park to inform Stage 2 of the Masterplan design. The Energy Strategy will ensure that all sources and forms of energy consumption, generation, distribution and ownership are reviewed as part of the Masterplan design. It will provide an evidence base for decisions and ensure that the Masterplan incorporates futureproofing, as Otterpool Park will be delivered within an evolving regulatory and technical energy market.

The Energy Strategy will follow the energy hierarchy set out in the Kent Environment Strategy. This highlights the need to first reduce the need for energy and to then implement resource efficiency measures:

- Reduce the Need for Energy
- Use Energy More Efficiently
- Supply Energy from Renewable Resources
- Ensure that any continuing use of fossil fuels should use clean technology and be more efficient

Figure 2: The energy hierarchy as illustrated in the Kent Environment Strategy

5.2.1 *Reduce the Need for Energy*

The masterplan should be developed so that buildings can best exploit the benefits of passive design and maximise the energy output from solar technology. Building designs and technologies are evolving due to more stringent regulatory standards and improving construction practices. The overall layout and orientation of the masterplan and future buildings should be designed to most efficiently exploit the natural resources available. The following table provides some constraints and opportunities to minimise energy demand in the design.

Table 3: Opportunities and constraints to reduce energy demand

Opportunities	Constraints
Masterplan layout should take account of passive design principles to most efficiently exploit the natural resources available to find a balance between minimising energy demand and addressing summer overheating.	Review the long term energy and carbon benefits of passive or mechanical ventilation with heat recovery – optimise the building orientation with results of this analysis.
Roof orientation should be east, south and west facing to maximise solar irradiation for solar technologies. Solar orientation modelling should take account of domestic energy use to ensure that output is maximised (i.e. for example east or west roof solar installations generate more in the morning and evening, which correlates more closely with residential demand).	
Roof slope tilt should be 30-45° to maximise solar gain. Solar energy modelling should be undertaken to determine the optimum roof orientation and tilt for Otterpool Park.	

5.2.2 *Use Energy More Efficiently*

A Smart City

Energy consuming equipment and generation technologies will be chosen on the basis of the highest efficiency standards such as the Energy Technologies List. Infrastructure may also be required to ensure that Otterpool Park is able to fully exploit the community benefits of a Smart City in the future. This may include an intelligent physical infrastructure (“smart” systems or the Internet of Things). It will enable

service providers to use the full range of data both to manage service delivery on a daily basis and to inform strategic investment in the city/community. This may also include storing or aggregating renewable electricity generation for the benefit of the community. These opportunities and constraints are outlined in Table 4 below.

Table 4: Opportunities and constraints for energy efficiency

Opportunities	Constraints
Energy efficient technologies – use standards such as the UK Government's Energy Technologies List.	
Energy efficiency benefits of access to smart grids.	Ensuring flexible, future proof smart grid infrastructure.
Financial benefit to community from energy aggregating.	Financial benefits not easily shared with community as infrastructure owned by third party.

District Heating

A key decision which will affect the Masterplan design is whether to include district heating in the masterplan or for properties to be independently serviced. One of the key benefits of district heating is that it broadens the opportunity to use low carbon generation plant, heat sources and fuels.

District heating systems provide multiple buildings including dwellings with space heating and hot water from a central boiler house, or one or more 'energy centre(s)'. The system provides heat transferred from the energy centre through an infrastructure network of highly insulated pipes carrying the water to each building. Every building has a heat exchange unit including a heat meter to monitor how much heat is used.

Depending on the size and density of the network, there are a number of different energy sources that can be used for district heating: including biomass, solar systems, heat pumps (including the possible use of underground aquifer water for ground source heating), cogeneration systems (Combined Heat and Power) as well as conventional gas boilers. Sources of heat could also be from local energy from waste facilities or waste heat from local industry.

The potential to generate energy from waste water and municipal waste from Otterpool Park will be explored alongside using heat (and possibly exporting heat and electricity) to local industry or commercial properties. An initial investigation using the DECC Heat Map[1] shows that there appears to be limited sources of heat in the area, but there are one or two options that will require further investigation as part of the Energy Strategy.

below shows heat density of heat with a 10km radius of the Otterpool Park site. Blue and yellow show areas of low heat density whist red areas highlights a potential area of high heat density. This initial investigation shows that the area around Otterpool Park does not appear particularly attractive to import or export heat.

[1] http://tools.decc.gov.uk/nationalheatmap/

Figure 3: Indicative Otterpool Park Heat Map – Commercial and Industrial Heat Density within 10km

The table below provides an overview of the possible opportunities and constraints to installing district heating at Otterpool Park.

Table 5: Opportunities and constraints of District Heating

Opportunities	Constraints
Allows broad range of generation technologies and fuels.	Masterplan design may not align most effectively with District Heating requirements. District heating is suited to high heat density urban areas. 55 new dwellings per hectare are necessary for financial viability of a residential only scheme or a heat density of at least 3,000kW per square kilometre.
Allows flexibility to use local sources of heat (e.g., from waste or water treatment, industrial waste heat).	Capital costs are about £6-10k per dwelling higher for energy centre and distribution.
Enables use of CHP (cogeneration of heat and power) which increases efficiency.	With improvements in thermal efficiency space heating demand reduces which will impact on the long term strategic planning for district heating.
Potential to exploit ground water aquifer for renewable heating and cooling – further analysis of ground water supply required.	Energy Centre and distribution infrastructure will impact on space / design of masterplan.
Central plant reduces labour and maintenance and Operational financial savings	Although relatively flexible on fuel district heating ties communities into this energy solution for the long-term.
Choice of fuels/ heat sources allow greater options for carbon savings	Projected speed and rate of the electricity grid decarbonisation may make on-site electricity only

	decentralised solution more competitive in the future against a district heating solution.
Improves security of energy supply	
Depending on the business model chosen, the local community may be able to benefit financially from the network	

Energy from Waste

One of the opportunities for using district heating is that it can exploit locally generated heat from an energy from waste plant or sewage treatment works. The benefit is that the energy generated would be recovered from the waste streams from Otterpool Park. It is too early in the design process to determine whether these sites are feasible based on resources, space constraints and economic viability.

There is currently one EfW facility in Allington Quarry near Maidstone and one new planned facility which will be located in Kemsley. Each facility has an annual capacity of approximately 500,000 tonnes of waste per year and an electrical generation output of approximately 40-50MW. Both are regional waste management facilities and are located in the north of Kent, and there may be a possibility for a regional site further south. The facility at Kemsley will occupy around 4.6 ha, which includes the plant and associated facilities. Energy from Waste facilities can be much smaller at around 2-5MWe operating on 20,000-50,000 tonnes of waste per year – which will also have a smaller footprint. On average a domestic property generates approximately 1 tonnes of municipal waste a year, which would generate around 12,000 tonnes which is unlikely to be sufficient on its own to support an energy from waste plant. Table 6 below outlines opportunities and constraints for recovering energy from waste streams.

Table 6: Opportunities and Constraints for Energy Recovery Plant

Opportunities	Constraints
Enables recovery of energy and reuse of site. A regional Energy from Waste facility can provide energy for approximately 35,000 homes.	Requires space of energy recovery infrastructure. An area of approximately 4.6ha for a regional energy from waste facility and would add additional HGV movements into Otterpool Park, further stressing the Highway infrastructure.
Will enable use of low carbon heat	Will require district heating to distribute waste heat
Likely to attract 3rd party investment	Likely to require additional investment and planning approval

5.2.3 Supply Energy from Renewable Sources

The Kent Environment Strategy has set a target for more than 15% of energy generated in Kent to be from renewable sources by 2020 from a 2012 baseline. In order to meet energy and carbon requirements under the current Building Regulations and potentially more stringent thresholds in the future, Otterpool Park will need to exploit opportunities for renewable energy generation.

Micro-renewables

Micro-renewables such as solar photovoltaics, solar thermal and ground source heat pumps could be incorporated into building designs from the outset.

Table 7: Opportunities and Constraints for Micro-renewables

Opportunities	Constraints
Renewable generation benefit for each property – financial, energy and carbon benefits to the owner.	Efficiency maybe impacted at small scale – in terms of financial, energy and carbon benefit.
Energy storage could help maximise the benefit of renewable generation for the building occupant.	Owner may not be able to utilise energy generated when property is not occupied.
Community could aggregate energy generation for improved financial return.	

Large Scale Ground Mounted Renewables

Ground mounted renewable technologies for large-scale electricity generation such as solar farms could also be an option for Otterpool Park. Table 10 provides and overview of the opportunities and constraints for the inclusion of large scale renewable technologies.

Table 8: Opportunities and Constraints for Large Scale Renewable Electricity Generation

Opportunities	Constraints
Potential for large scale renewable energy generation	Requires space to locate the renewable energy technologies. Likely to have adverse landscape and visual impacts
Likely to provide significant carbon reductions	Potential planning delays if local objections to renewable technologies.
Likely to attract 3rd party investment	Likely to require additional investment
Does not require district heating infrastructure	May require Private Wire electrical infrastructure to gain full economic and carbon benefits for the community

Individually Serviced Properties

The alternative option to district heating would be to heat and power homes individually. Due to the projected timescales for the electricity grid decarbonisation (DECC 2015)[2], it is likely that this option would specify electricity for heat and power and would not require connection to the gas grid. An overview of the opportunities and constraints of all electricity independent heating is outlined in Table 9 below.

Table 9: Opportunities and constraints of individually serviced homes

Opportunities	Constraints
Reduced capital cost on heat infrastructure and central energy centre(s).	Reduces future flexibility to exploit new technologies or fuels.
Medium/long term projected reduction in grid electricity carbon factor will incentivise electricity generating technologies.	May require larger quantities of renewable energy generation (solar panels) on each building to meet carbon targets.

[2] DECC/HM Treasury Green Book supplementary appraisal guidance on valuing energy use and greenhouse gas (GHG) emissions

Exploiting smart grids and use of communal batteries and aggregation, the community could benefit from renewable energy generation.	May be more challenging to meet energy and carbon targets in the short term.
	Insufficient scale for some low carbon generation technologies such as cogeneration plant or biomass technology and open loop ground source heating.
	Will not be able to benefit from locally generated heat (energy from waste, water or industrial).
	Will add to electricity demand – there may not be capacity in local grid.

Small-scale renewable technologies located on or near to individual dwellings and buildings could serve both heating and electricity demand. Technologies include:

- Solar photovoltaics
- Air or ground source heat pumps
- Solar thermal

Irrespective of whether the future Energy Strategy determines that district heating or individually serviced option is the most suitable for Otterpool Park, the masterplan should be designed so that building design and orientation is optimised to generate energy from solar panels as it is likely that these will be installed in either scenario.

5.2.4 Ensure that any continuing use of fossil fuels should use clean technology and be more efficient

Any residual heat demand after the use of low carbon heat which requires fossil fuels will use efficient generation and distribution infrastructure. This will include low temperature flow and return temperatures to ensure that gas fired boilers can operate most efficiently.

5.3 Climate Change Adaptation

Kent County Council recognise that due to Kent's geographical location, long coastline and population density it is likely to suffer from some of the severest impacts of climate change in the United Kingdom. The predicted impacts of climate change for Kent include warmer wetter winters, hotter drier summers and more extreme weather events. These predicted impacts will influence a number of issues relevant to Otterpool Park including thermal comfort, stormwater management, water conservation and durability of materials. The opportunity to address these issues through creating a development that is adaptable to the predicted impacts of climate change is greatest and most cost effective when addressed during masterplan design.

Table 10: Opportunities and constraints relating to climate change adaptation

Opportunities	Constraints
There is an opportunity to design Otterpool Park to be resilient to the predicted future impacts of climate change and therefore deliver a development that is exposed to a reduced level of climate related risk.	Landscape measures that deliver climate change adaptation such as green and blue infrastructure require land and therefore may be competing for space with other land uses.
Climate change adaptation is one of a host of multi-functional benefits that can be delivered through green and blue infrastructure. Green and blue infrastructure is already a key component of the vision for the Otterpool Park masterplan, therefore providing a significant opportunity for climate change adaptation.	If climate change adaptation is not considered sufficiently during the design process, the development may be exposed to climate related risks such as overheating and flooding. This in turn, would have an impact on the health and wellbeing of residents and the attractiveness and value of Otterpool Park.
A landscape led approach to Sustainable Drainage Systems (SuDS) can allow for attenuation and infiltration on site to reduce the risk of flooding, both on site and downstream. This provides an opportunity to design Otterpool Park to be resilient to the predicted increase in intensity of rainfall and associated stormwater flows.	
The emphasis on the provision of green space provides an opportunity to reduce the risk of overheating associated with climate change.	

5.4 Water Efficiency and Treatment

There are significant pressures on water resources which affect both the water environment and water supplies. In Kent there are many catchments where there is little or no water available for abstraction during dry periods. Pressures are particularly notable in Kent as it is one of the driest parts of England and Wales, coupled with high population density and household water use. Over the next few decades, there will be increasing pressures from the rising population and associated development. Looking further ahead, climate change could have a major impact on the water that will be available for consumption (Environment Agency, 2012).

Table 11: Opportunities and constraints relating to water efficiency and treatment

Opportunities	Constraints
Communal rainwater harvesting systems to supply multiple homes with rainwater from centralised storage tanks to reduce potable water demand and increase water efficiency.	Land area would be required for on-site wastewater treatment, this would potentially be competing for space with other land uses. The value of land may present a constraint. Reed-beds/constructed wetlands would require more land than wastewater treatment plant.
Sustainable on site wastewater treatment through the incorporation of reed-beds/constructed wetlands.	The site exists within an area of water stress and should respond to this through considering water efficiency in design decisions.
The potential to generate energy from sewage waste will be investigated. This would contribute towards a circular resource flow model at Otterpool Park.	

5.5 Materials and Waste

Moving towards a more sustainable model of resource use and waste management is fundamental to achieving sustainable development.

A development of this scale has a significant requirement for construction materials and also presents an opportunity for more sustainable procurement of materials through economies of scale and the opportunity to influence procurement and transportation of materials.

Waste should be considered both in terms of reducing the generation of waste associated with demolition, excavation and construction and also in terms of delivering a development that provides efficient systems for waste management during operation.

Table 12: Opportunities and constraints relating to materials and waste

Opportunities	Constraints
There is an opportunity to set targets for construction related materials and waste from an early stage. This could take the form of materials and waste design guidance to be developed in Stage 2.	A community led approach to procurement of goods and services may be required to ensure a fully integrated circular economy. This will need to be linked with smart city concepts of data access and management
Sourcing materials and aggregates from as close to the site as possible presents an opportunity to deliver a reduced environmental, social and financial impact.	Energy from waste plant will require a relatively large area that is currently not factored within the red line of the masterplan.
Balancing cut and fill volumes relating to earthworks on site. This would reduce the need for vehicle movements to and from the site resulting in a lower environmental, social and financial impact. Investigate opportunities to utilise any excess cut for landscaping and earth-sheltered buildings to achieve a balance.	The likelihood that Otterpool Park will be relatively low density compared to higher density urban developments, which may reduce the viability of waste infrastructure such as an Envac underground vacuum waste management.
Investigate opportunities for the local sourcing of materials.	
Allocating space for food growing during the development of the Masterplan would allow opportunities for local food production supporting a circular resource flow.	
Adopting a circular approach to resource flows. This presents an opportunity to move away from a linear model of resource consumption centred on consumption and disposal, and towards a more circular model where resources are reused and recycled within Otterpool Park. For example, on-site composting of organic waste to support efficient waste management and reduce greenhouse gas emissions whilst also producing compost to support local food production, therefore supporting a circular resource flow. See Figure 4 below for an illustration of indicative opportunities relating to sustainably managing resources within Otterpool Park.	
Review potential for an energy from waste plant on or near site; this could manage waste, reduce carbon emissions on site and divert waste from landfill.	
The opportunity to incorporate highly efficient waste infrastructure such as an Envac underground vacuum system for waste handling is greatest at the design stage. Hammarby Sjostad and Stockholm Royal Seaport provide examples of Envac being used in residential areas. Waste systems should be considered from a technical, spatial and user convenience perspective.	

5.6 Low Carbon Transport and Accessibility

Enabling and promoting low carbon transport within Otterpool Park and to and from the site can support wide reaching environmental and social gains.

Table 13: Opportunities and constraints relating to low carbon transport and accessibility

Opportunities	Constraints
Local neighbourhood shopping centres that are within convenient distances for walking/cycling to encourage active travel and reduce the need to travel longer distances by private car.	Due to the size of the site and Westenhanger Rail Station being located on the north eastern edge, not all development will be within an attractive and convenient walking distance of existing bus routes or Westenhanger Rail Station. This may result in a reliance on private car use unless alternative options are available and convenient.
A mixed use development that results in significant employment opportunities within Otterpool Park, for example through a business park or multiple employment hubs, could reduce the need for residents to travel longer distances for work.	There are capacity issues on existing roads and junctions in the local area.
Facilitating broadband infrastructure to potentially provide residents with the opportunity to work from home and purchase items online, therefore reducing the need to travel.	Due to the location of the site, there is potential for a significant number of residents to commute to London via Westenhanger Rail Station. At present the facilities at the railway station do not seem adequate for this.
A masterplan designed to encourage and facilitate walking and cycling within Otterpool Park through a network of high quality walking and cycling routes that provide convenient linkages.	If convenient, accessible alternatives to private car use are not available, residents may rely on private cars to travel within Otterpool Park and to reach Westenhanger Rail Station. This could result in traffic congestion / parking stress within the development and close to the station.
Direct cycle routes to Westenhanger Rail Station with a secure, convenient cycle storage facility close to the station to encourage low carbon intermodal transport and to reduce traffic congestion / parking stress close to the station.	Depending on the type of employment and commercial uses, there may be large numbers of car bound trips generated by the development.
Infrastructure that provides both active and passive provision for electric vehicle charging to enable simple installation and activation of a charging point at a future date if required.	

5.7 Biodiversity

The development of Otterpool Park will impact on local biodiversity, decisions made at the masterplanning stage will have a significant bearing on the extent to which this impact is positive or negative.

The ‘Green Infrastructure and Biodiversity’ workstream is developing a detailed review of opportunities and constraints relating to biodiversity in the context of Otterpool Park.

Table 14: Opportunities and constraints relating to biodiversity

Opportunities	Constraints
A strategy to deliver an overall net gain for biodiversity for the site addressing opportunities at both a landscape and building level.	The site is currently characterised by a rural landscape. Ensuring that natural capital is retained and improved could be challenging when other development pressures are considered.

5.8 Local economy

Otterpool Park presents an opportunity to support positive outcomes for the local economy and new opportunities for local businesses.

T*able 15: Opportunities and constraints relating to the local economy*

Opportunities	Constraints
Incorporating employment space into the masterplan provides the opportunity to deliver a mixed-use community in line with Garden City Principles.	Developing a new local economy through the provision of a business park or employment hubs could present a challenge and may require support, funding and/or incentives to be successful.
Potential opportunity to incorporate research/manufacturing/employment space and infrastructure to support the growth in the Low Carbon and Environmental Goods and Services (LCEGS) sector. This could establish Otterpool Park (business park or employment hubs) as a key location for the LCEGS sector in the region. This would be in line with the aims of Kent County Council to promote the county of Kent as the place for low carbon and environmental businesses. This would deliver direct benefits to the local economy and indirect environmental and social benefits.	

5.9 Health and wellbeing

The design of a masterplan can have a significant influence on the health and wellbeing of future residents.

Table 16: Opportunities and constraints relating to health and wellbeing

Opportunities	Constraints
Promoting healthy lifestyles through active design principles and the provision of amenities, recreation areas and play space to support a healthy, active community.	Due to the size of the site, without well designed infrastructure for walking and cycling, there is a risk that there will be a reduced incentive for active transport within the site e.g. to employment hubs, local amenities and transport nodes.
Informal opportunities for play incorporated into green space.	There may be noise and air quality issues for areas of the site located in close proximity to the M20 motorway on the northern edge of the site. This could have a negative impact on health and wellbeing in these areas.
A landscape led approach should provide much opportunity for design to connect residents, workers	

and visitors with nature to improve health and wellbeing.

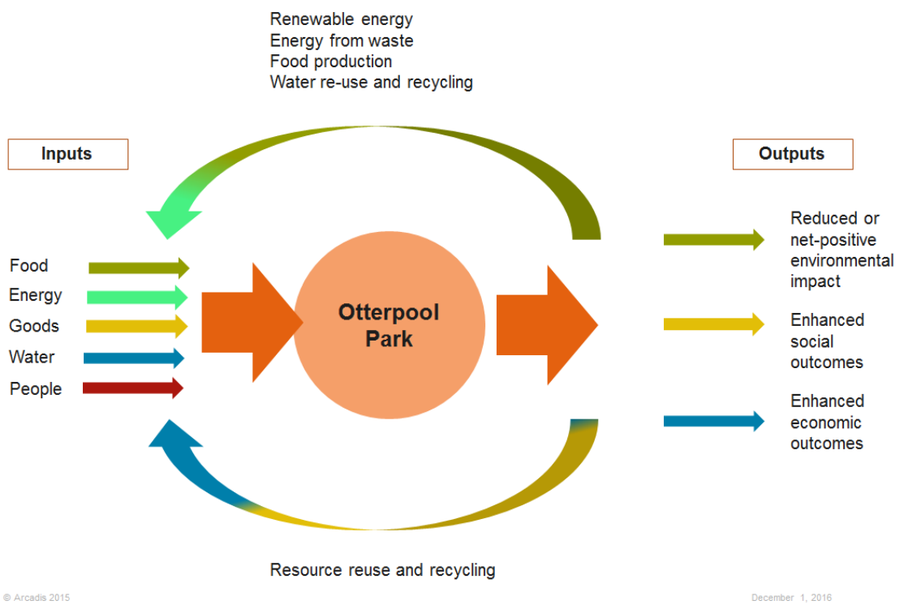
6. Strategic Vision

Based on this policy and guidance a sustainability and resources vision has been developed which highlights the key strategic concepts that should be embedded within the design of Otterpool Park. The masterplan provides an opportunity to demonstrate the benefits of sustainable design, low carbon infrastructure and the circular economy. The vision is not just to consider energy and resources as individual strands of demand and consumption, but within a holistic, integrated, resilient and efficient system.

Indicative opportunities relating to sustainably managing resources are illustrated through a resource flow diagram in enewable energy.

Figure 4 below. This highlights the opportunity to move away from a linear model of resource consumption centred on consumption and disposal, and towards a more circular model where resources are reused and recycled within Otterpool Park e.g. harvested rainwater, composted organic waste in addition to resources being produced within Otterpool Park e.g. food growing, renewable energy.

Figure 4: Otterpool Park Resource Flow Vision

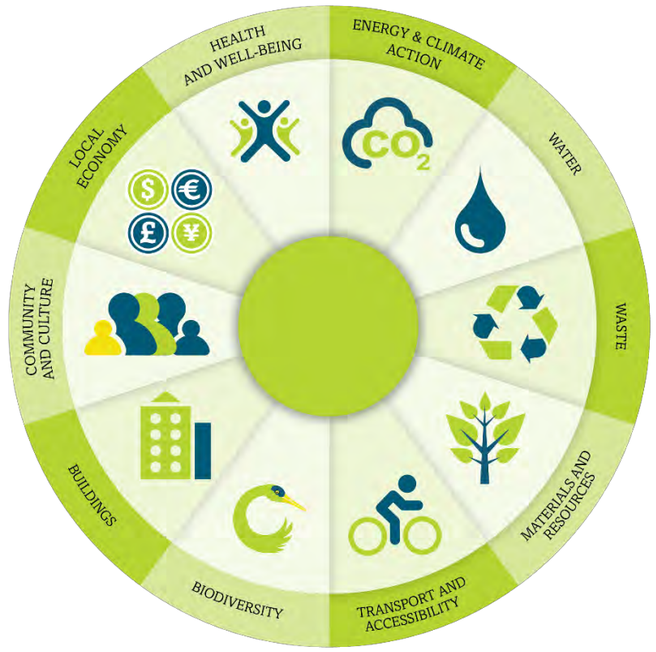


7. Next Steps

A robust Energy Strategy will be developed to inform the masterplanning design. The Energy Strategy will ensure that on all sources and forms of energy consumption, generation, distribution and ownership are reviewed as part of the Masterplan design.

The Arcadis STAR Framework should be used to define and articulate sustainability issues relevant to Otterpool Park and ensure that sustainability is integrated into the development of the Masterplan from an early stage. A set of Sustainability Principles would be tailored for the project under a number of categories to outline a high level approach to delivering more sustainable outcomes. This would complement the guiding principles set out in the Otterpool Park Garden Settlement Visioning Summary (see 5.7). Performance Indicators would then be defined to outline measures that enable the implementation of the Sustainability Principles. This approach would deliver a framework to inform the development of the masterplan and enable the approach to sustainability and resources to be clearly communicated to the design team and key stakeholders.

Figure 5: Indicative STAR Framework categories



APPENDIX E

Access & Travel Workstream Report

Otterpool Park Masterplan
Stage 1 Feasibility and Capacity Study

Workstream Name: **Access & Travel**

Date: **December 2016**

The following figures and tables are found in this report.

Figures

Figure 1.1 - Method of Travel to Work, 2011 Census

Figure 1.2 – Distance Travelled to Work, 2011 Census

Figure 1.2 – Distance Travelled to Work, 2011 Census)

Figure 2000 Highway Height and Width Restrictions Map

Figure 2001: Walking and Cycle Routes Map

Figure 2002: Walking and Cycle Isochrones

Figure 2003: Bus Stop Locations in the Otterpool Park area

Figure 2004: Bus Routes in the Otterpool Park area

Figure 2005: Node 1 - Public Transport Accessibility Map

Tables

Table 1 Development Scenarios from AECOM Report

Table 2 Summary of Rail Services form Westenhanger Railway Station (Source SoutheasternTrain)

Table 1.1 – Place of Work of People Residing in the Shepway SOAs E01024550, E01024536 and E01024546, 2011 Census

Table 1.2 – Place of Residence of People Working in the Shepway SOAs E01024550, E01024536 and E01024546, 2011 Census

1. Stage 1 Methodology

An audit of the baseline transport conditions has been carried out, using a combination of desktop analysis, a site visit and review of previous studies.

1. Stage 1 Methodology

A meeting took place with Kent County Council and Shepway District Council (SDC) on 25th October 2016 to identify sources of transport data, begin to scope the transport assessment and establish protocols for communication during this and subsequent stages.

Establish the scope and programme for other relevant studies and transport infrastructure works currently being planned/undertaken that would influence our work

During Stage 1 additional transport data has been gathered including traffic flow data for junctions in the Otterpool Park area. The traffic flow data received to date has the following gaps:

- The M20 Junction 11 traffic data does not include all arms of the junction;
- Queue length data, needed for validating the traffic modelling, has not yet been provided by AECOM.

A list of other transport data needed to inform the next stages of the project is being compiled. This includes Public Right of Way counts.

During Stage 1 an initial capacity assessment has been undertaken of the M20 J11 to ascertain if this junction is likely to constrain the scale of the development.

Based on the meeting of the 25th October 2016 with Kent County Council and SDC, discussions on the scope of the Stage 2 transport assessment would start once a Planning Performance Agreement is in place between Kent County Council and the Otterpool Park developer team (Arena Racing Company). In the meantime, a transport assessment scope is being worked up, which will broadly include the following sections:

- Existing site context
- Development proposals
- Baseline transport conditions
- Policy context
- Trip generation and distribution
- Transport effects on all modes
- Summary and conclusions.

2. Baseline Data

During Stage 1 additional transport data has been gathered including traffic flow data for junctions in the Otterpool Park area. The traffic flow data received to date has the following gaps:

- The M20 Junction 11 traffic data does not include all arms of the junction;
- Queue length data, needed for validating the traffic modelling, has not yet been provided by AECOM.

Recent baseline traffic flow data (October 2016) and a base year ARCADY traffic model for Junction 11 of the M20 have been obtained from AECOM. In addition, SDC has provided a schedule, put together by AECOM, of existing traffic surveys for links and junctions. The schedule identifies which surveys are to be retained in the Junction 11 model. It also identifies the new surveys that have recently been carried out. All link surveys were undertaken for one week. All junction surveys were undertaken for the peak periods (0700-1000 and 1600-1900) on a weekday.

SDC has indicated that it will need to conduct its own reviews of the traffic survey data and that subject to internal approval, SDC would be able to share a selection of the data soon.

Going forwards, the survey schedule will be used to help identify locations for which new surveys will need to be carried out in Stage 2. A list of other transport data needed to inform the next stages of the project is being compiled. This includes Public Right of Way counts and parking surveys.

Arcadis has obtained from SDC trip generation rates for different land uses and has used these to produce an initial estimate of the trips that would be generated by a development scenario consisting of 12,000 homes,

2. Baseline Data

employment uses and an hotel. The benefit of using these trip rates is that they have already been agreed by SDC and are consistent with work carried out by SDC.

AECOM has separately been commissioned to model several junctions in the Otterpool Park area, including the M20 Junction 11. However, AECOM's programme for completing the traffic models did not tie in with the timeline of the Stage 1 Feasibility and Capacity Study. To mitigate this, Arcadis has obtained traffic data and model files of Junction 11 to build a future year model and test the impacts of a development scenario.

AECOM issued in April 2016 a report, entitled 'Land at Junction 11, M20 Advice Note', which explores the potential for development, at different scales and with different mixes of land use, on land adjacent to Junction 11 of the M20. The key transport findings are summarised below:

- Some parts of the network are working well under capacity, while others are already at, or beyond capacity, in particular the junctions of the A20, especially those with Stone Street and the A261;
- Junction 11 of the M20 has spare capacity.

Three development scenarios were assessed: a limited development scenario, an intermediate development scenario and an enhanced development scenario. Table 1 below summarises the scenarios.

Table 1 Development Scenarios from AECOM Report

Scenario	Dwellings	B1 Floor Space	B8 Floor Space	Hotel (Rooms)	Lorry Park Spaces
Limited development scenario	150	23,540m2	39,079m2	80	360
Intermediate development scenario	872	31,087m2	39,079m2	80	1,360
Enhanced development scenario	3,273	31,087m2	39,079m2	160	1,360

Source: AECOM (2016), Land at Junction 11, M20 Advice Note

AECOM's findings for the intermediate development scenario are that Junction 11 would continue to function well within capacity, while the other junctions assessed are over capacity to varying degrees. For the enhanced development scenario, AECOM's findings are:

"Junction 11 would continue to function well within capacity, while the other junctions assessed are over capacity to varying degrees. As before, the junctions on the A20, to the south west corner of Parcel A (at the southern end of Stone Street and at the A26 Hythe Road), as well as the A20 'Left-in Left-out (LILO) junction, are significantly over capacity."

A review of existing information and baseline transport conditions in the Otterpool Park study area has been carried out including existing travel patterns, the local highway network and constraints, public transport (rail and bus services), walking and cycling routes as well as accessibility to public transport. The full findings of the review are appended in Appendix A, with the key findings summarised in the following paragraphs.

Walking and Cycling

Otterpool Park benefits from a number of well-established walking routes penetrating the area, which connect residential areas with the rural surrounding area as illustrated in Figure 2001 in Appendix B. Both within and near to the site, the key cycling routes are the National Cycle Network Route 2 and an on-road local route along Ashford Road, Stone Street, Aldington Road and Lympne Hill. A preliminary assessment of the accessibility of Otterpool Park has been undertaken by considering the distances from three nodes within the site; Node 1 representing the eastern part of Otterpool Park, Node 2 representing the southern part and Node 3 representing the western part. The assessment, illustrated in Figure 2002 in Appendix B, indicates that most of the Otterpool Park area is within a 1,200m buffer from each node. This assessment will be developed further to determine actual walk and cycle distances instead of straight-line distances.

Bus services

A total of eight bus routes currently run through or around Otterpool Park. Two of these only cater for school children. The frequency of the bus services is currently low, which is a constraint in terms of sustainable travel options (refer to Appendix A. There are in total 21 bus stops located within the Otterpool Park area, as illustrated in Figure 2003 in Appendix B. Not all bus stops have benches and/or shelters while some appear not to have any signage. It would be recommended that bus infrastructure is significantly upgraded to provide high-quality

facilities to encourage and enable a higher percentage of travel by bus. Figure 2003 also shows a 400m buffer around each bus stop as well as Westenhanger Station, which illustrates that less than half of Otterpool Park is currently within reasonable walking distance of a public transport node.

Public Transport Accessibility

Figure 2005 in Appendix B shows the travel time, in ten minute bands, by bus and train from different parts of Otterpool Park. These figures illustrate that a large part of Shepway and destinations in the M20/high-speed rail corridor are accessible from Otterpool Park within a 60-minute bus or train journey including the towns of Ashford, Folkestone and Hythe.

Existing Travel Patterns

2011 Census data has been used to ascertain existing travel behaviour of residents in the vicinity of the Otterpool Park area in relation to how they travel to work. This data will be refined for use within the capacity analysis and transport assessment. Some initial findings include:

a) The percentage of people who travel by car is high at between 69% and 76%;
b) Less than 10% of people travel by public transport;
c) Over 40% of commuters living in Shepway travel less than 10km to work;
d) Almost 50% of residents of Shepway also work in Shepway; and
e) Other main attractors for commuters are Ashford (around 20%), Canterbury (6-9%), Dover (4-8%) and Maidstone (4-6%).

3. Policy Context

A review of the following policy documents has been undertaken related to transport:

a) The National Planning Policy Framework (2012)
b) The Strategic Road Network and the Delivery of Sustainable Development - DfT Circular 02/13
c) Shepway Core Strategy, 2013
d) Shepway District Council Transport Strategy, 2011
e) Places and Policies Local Plan, Preferred Options, 2011
f) Supplementary Planning Guidance SPG4: Kent Vehicle Parking Standards.

The policies and guidance in place seek an emphasis on development in locations where sustainable travel modes can be encouraged and of facilitating access by all modes, together with good design where the car is not dominant. Otterpool Park is adjacent to a strategic rail line and major highway network corridor, with bus routes and strategic cycle connections within the area. There are significant opportunities for Otterpool Park to develop with excellent sustainable travel connectivity and places for people to fulfil the policy aims of both Kent County Council and SDC.

A review of the Kent County Council draft Local Transport Plan 4 (LTP) and the consultation response produced by Shepway District Council has been undertaken. The key findings are:

a) A number of transport infrastructure improvements are proposed that could provide increased capacity on local transport networks that development at Otterpool Park would benefit from. However, the programme for delivery of the schemes is not confirmed and extra funding is required
b) Otterpool Park is not currently identified within the LTP4 as it is not an allocated site. However, both Kent County Council and Shepway District Council are working on producing an evidence base to ensure inclusion within the Shepway DC Core Strategy and subsequently the LPT.

4. Stakeholder Engagement and Feedback

A meeting with Kent County Council and Shepway District Council officers was held on Tuesday 25th October. Officers from both sides were keen to engage and provided a good degree of useful information relating to

sources of data, project scope and future methods of engagement. Kent County Council indicated that the scope of work for the transport assessment is likely to require a VISSIM model to test development scenarios. The model is likely to need to include the A20 London Road corridor to Hythe as well as M20 J11 and new J10A

Based on the meeting of the 25th October 2016 with Kent County Council and SDC, discussions on the scope of the Stage 2 transport assessment would start once a Planning Performance Agreement is in place between Kent County Council and the developer (Shepway District Council/ Cozumel Estates). In the meantime, a transport assessment scope is being worked up, which will broadly include the following sections:

- Existing site context
- Development proposals
- Baseline transport conditions
- Policy context
- Trip generation and distribution
- Transport effects on all modes

Summary and conclusions.

A meeting with Kent County Council and Shepway District Council officers was held on Tuesday 25th October. Officers from both sides were keen to engage and provided a good degree of useful information relating to sources of data, project scope and future methods of engagement. Kent County Council indicated that the scope of work for the transport assessment is likely to require a VISSIM model to test development scenarios. The model is likely to need to include the A20 London Road corridor to Hythe as well as M20 J11 and new J10A

5. Constraints

Initial key constraints identified are as follows:

a) Otterpool Park is located close to the M20/high-speed rail corridor but junctions on the local road network are constrained;
b) Connections to the north-west are constrained by a single lane section on the A20 south of Sellindge;
c) The M20/high-speed rail corridor acts as a barrier to north-south movement;
d) The frequency of existing bus and rail services is low;
e) Westenhanger station is on the edge of Otterpool Park and can only be accessed from the south via Stone Street, which is a relatively narrow road. The station is not served by bus and has limited parking capacity. Access to the station for mobility impaired persons, pedestrians and cyclists is poor;
f) The capacity of the A261 London Road to Hythe is constrained by both alignment and on-street parking in Hythe town centre;
g) Height and width restrictions reduce capacity on the local highway network, including on the A20 and B2067;
h) It has been suggested that significant additional traffic passing through Sellindge could lead to political pressure to provide a bypass for Sellindge under the M20 and railway lines; and
i) The current high level of travel by car in the area presents significant challenges in terms of behaviour change to encourage a shift from travel by car to more sustainable modes.

In terms of the access and travel workstream, the following limitations are identified:

a) Initial modelling work on the capacity of the M20 J11 identifies that it is likely to present a constraint to the development of the site for the full 12,000 homes. Further work is required to examine the assumptions and identify the point at which the junction would reach capacity, without improvements;
b) The application for the new M20 lorry park is likely to be delayed by a judicial review. Construction was due to begin in 2017 but is likely to be delayed by at least 6 months;
c) There are concerns over the performance of the A20 junction at Rowntree tunnel. It is likely that the scope of modelling work will need to cover this junction;
d) New proposals are anticipated to be submitted for the Lympne old Airfield site; and
e) Kent County Council indicated that objections are likely from the local community on transport grounds.

6. Opportunities

Initial key opportunities identified are as follows:

a) Otterpool Park is close to the M20/high-speed rail corridor, providing connections to Ashford, London and Folkestone;
b) Most of Otterpool Park is relatively flat and within 2km of Westenhanger station, which provides a good potential for cycling. It is widely regarded that cycling has the potential to substitute for short car trips, particularly those less than 5km;
c) Providing a frequent bus service as well as a cycle route between Otterpool Park and Westenhanger station could help unlock the potential for sustainable travel and reduce impacts on the existing highway network;
d) The draft Local Transport Plan identifies bus and rail improvements as a key transport infrastructure objective. Specific proposals for Westenhanger station are yet to be discussed, however South Eastern Trains and Network Rail are understood to have had initial discussions about the possibility of using the station as a stop for high-speed trains;
e) Whilst there are likely to be capacity issues with the M20 junction 11 with the Otterpool Park development, there is the potential to signalise the roundabout and improve capacity;
f) The current capacity issues on the local roads within the site could be addressed through realignment and widening;
g) Traffic data being collected and modelling being produced by AECOM should provide valuable information for our Stage 2 work;
h) A number of the draft transport proposals in the Kent County Council Local Transport Plan could bring transport network capacity benefits to Otterpool Park;
i) Careful consideration of road layout and links to the existing network could influence traffic routing to reduce the impact on existing communities;
j) Creating a new highway link to Junction 11 of the M20 could help reduce the impact of development on the existing highway network; and
k) Opportunities for behaviour change can be identified; by increasing accessibility to Westenhanger station to encourage more long-distance travel by train and increasing accessibility to local bus services. Further car trip reductions will need to be sought by considering the location of new employment within the site boundary.

Opportunities for Improving the Local Highway Network

The arrangement of the junctions of the A261 and Stone Street (north and south) with the A20 could be significantly improved with a new junction. Options for the form that this junction could take need to be explored as part of the next stage of this project. These options could require additional land take outside of the current highway boundary. An issue that would need to be resolved as part of an improved junction in Newingreen is that of the westbound approach along the A20. Prior to the junction with Stone Street (north, towards Westenhanger) there is a significant crest that obscures visibility on approach. There are also opportunities to improve highway drainage at this location. Flooding, obscuring two thirds of the available width of carriageway on both sides of the road, was witnessed as part of site observations.

If increased traffic capacity is required along the A20, an option would be to remove the pinch point at Barrow Hill under the high-speed railway line.

A significant upgrade to Stone Street would be required in order to facilitate access to Westenhanger railway station for new residents to the area. Current on-street parking, both by existing residents of Stone Street and those using Westenhanger Railway Station, will need to be addressed within the masterplan. Westenhanger Railway Station has very limited parking facilities and poor accessibility. There is an opportunity as part of the Otterpool Park scheme to provide a more attractive station and improved facilities for the benefit of all residents in the wider area.

Opportunities for Improving Pedestrian and Cycle Facilities

There are opportunities along the A20, Otterpool Lane and Stone Street to improve/provide facilities for cyclists and pedestrians. At present, there are no formal cycle paths and the provision for pedestrians is very limited. A benefit for the wider population of the area would be created through providing suitable pedestrian and cycle facilities adjacent to existing carriageways in the Otterpool Park area where possible. This combined with adding to the existing network of off carriageway facilities would provide a permeable network for non-motorised users.

7. Impact on Masterplan Design

It has been acknowledged that much of the existing local highway network within and bordering the site offers insufficient capacity for significant development. In this sense, it is acknowledged that a masterplan solution is likely to involve road realignment and/or establishment of a new road network and possibly a link to Junction 11 of the M20 and a new link to bypass the single-lane section on the A20.

The feasibility of linking into the existing highway network to the north of Otterpool Park will influence capacity and design and impacts on the existing highway network.

The potential upgrade of Westenhanger station aligns with local policy plans and would appear to also be part of the future plans of South Eastern Trains and Network Rail. Additional land within the application site is likely to be required to expand facilities. Upgrades to capacity and accessibility would increase the development capacity of the site.

A key challenge will be to better link Otterpool Park to Westenhanger station. A transport hub at Westenhanger station, with good rail, bus and cycle connections as well as park and ride, would help maximise the potential for sustainable travel.

The production of a VISSIM model to test highway capacity, as implied by Kent County Council, would offer a flexible method of testing development options, subject to costs being acceptable.

8. Changes to Risk Register

Based on the Stage 1 findings, the capacity of the M20 Junction 11 should be elevated to a ‘red’ risk rating.

9. Next Steps

The key next steps are summarised below:

- Undertake scoping discussions with Kent County Council to complete the scoping of the Transport Assessment and any associated outputs;
- Carry out further liaison with AECOM regarding assumptions, sharing of transport information and the assessment of the M20 Junction 11;
- Identify the costs and benefits of producing a VISSIM model and outline any alternatives;
- Identify locations for which new surveys will need to be carried out, scope these and commission; and
- Explore potential highway improvements.

APPENDIX A

Baseline Transport Report

1. Policy Context

1.1 National Policy and Guidance

1.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) came into force in 2012. The NPPF replaces all the previous Planning Policy Statements (PPSs) and Planning Policy Guidance (PPGs) including PPG13 (Transport).

The NPPF introduces 12 core planning principles, which of relevance to transport suggest that planning should:

- Actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable.

Section 4 of the NPPF covers 'Promoting sustainable transport'. Relevant elements of this section are summarised below.

- Transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas.
- The NPPF states that all developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment.
- Planning decisions should take account of whether improvements can be undertaken within the transport network that cost effectively limits the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe (subject to certain provisos).
- Planning policies should aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities.

National Planning Policy Guidance was updated on Travel plans, transport assessments and statements in decision-taking in March 2014 and this gives detailed advice on when transport assessments are required and what they should contain.

1.1.2 The Strategic Road Network and the Delivery of Sustainable Development - DfT Circular 02/13 and Highways England guidance

The Department for Transport (DfT) Circular explains how the HA will participate in all stages of the planning process with Government Offices, regional and local planning authorities, local highway/transport authorities, public transport providers and developers to ensure national and regional aims and objectives can be aligned and met.

The Circular sets out that proposals should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

It is identified that a robust travel plan that promotes use of sustainable modes is an effective means of managing the impact of development on the road network and reducing the need for major transport infrastructure. The Highways Agency expects the promoters of development to put forward initiatives that manage down the traffic impact of proposals to support the promotion of sustainable transport and the development of accessible sites.

Further guidance on engagement with Highways England on planning matters is contained in the document 'The strategic road network: Planning for the future', published in September 2015.

1.2 Local Policy

1.2.1 Shepway Core Strategy, 2013

The Core Strategy is a long-term plan bringing together the aims and actions of the government, local councils, residents, businesses and voluntary groups, by managing land-use and developments. The Shepway Core Strategy Local Plan was adopted as part of the statutory development plan for the district on 18 September 2013. The general plan period for this document is from 2006 up to the end of 2031.

Policy SS2: Housing and the Economy Growth Strategy

The core long-term objective is to ensure the delivery of a minimum of 350 dwellings (Class C3) per annum on average until 2030/31 (inclusive from 2006/7). This trajectory is set out to provide impetus to the transformation of the district's economy sought in the district spatial strategy, and to promote a good rate of delivery of new employment land and infrastructure.

Policy CSD1: Balanced Neighbourhoods for Shepway

Development resulting in new housing (class C3) will be allowed in line with policy SS3 (optimising distinctiveness, appeal, sustainability and accessibility of places in Shepway) where it contributes to the creation of balanced and popular neighbourhoods through high-quality design proposals which address identified affordable housing needs. All housing development should, subject to viability, include a broad range of tenures (incorporating market housing for sale, shared equity and other forms of intermediate housing, and affordable rented) wherever practicable. This requirement includes the following:

Policy CSD2: District Residential Needs

Residential development and new accommodation should be designed and located in line with the Spatial Strategy's approach to managing demographic and labour market changes in Shepway and meeting the specific requirements of vulnerable or excluded groups existing with the district.
Housing supply will also be managed with an objective that at least half of new homes by 2026 will be three bedroom (or larger) dwellings. Development should maintain the vitality and mix of activity in the local economy and neighbourhoods, or alternatively accommodation should directly contribute to meeting the long-term flexible living or care requirements of residents.

1.2.2 Shepway District Council Transport Strategy, 2011

The Transport Strategy was adopted in January 2011 and aims to ensure that walking and cycling are promoted as a dominant mode of travel for short trips. The Transport Strategy sets out a number of measures / options for consideration in order to create and promote a high quality, safe environment for pedestrians and cyclists.

Walking

Four initial options have been suggested for walking:

- Improvements to road crossing points
- Improvements to signage and clutter reductions
- Completions of selected links
- Enhancements of the environment of the town centres

Cycling

Six initial options have been suggested for cycling:

- Creation of a comprehensive District wide cycle network
- Enhancement of road crossing facilities
- Enhancement of signage
- Promotion of parking facilities at destinations
- Consideration of cycle hire
- Promotion of safety awareness

Parking

Shepway District Council (SDC), working with Kent County Council (KCC) as the highway authority for the district, provide and manage parking across Shepway.

The key measures that are identified by the parking strategy are:

- Promotion of Workplace Travel Plans for existing sites
- Promotion of balanced parking provision at new developments
- Integration of management of on and off street parking
- Review of management of car parking at Westenhanger Rail station – including formalising parking at the station, reviewing parking management on Stone Street, and promoting access to station in connection with three local Core Strategy sites
- Promotion of 'visible' parking provision for use by tourists

1.2.3 Places and Policies Local Plan, Preferred Options, 2016

The Places and Policies Local Plan (2016) supports the delivery of the Core Strategy and sets out preferred options for consultation.

Policy ND7 – Former Lympne Airfield

The Former Lympne Airfield falls within the Otterpool Park area. The Places and Policies Local Plan, Preferred Options explains, under Policy ND7, the conditions under which development proposals will be supported. Conditions include that existing trees and hedgerows within/around perimeter of the site are retained and enhanced as part of a comprehensive landscaping scheme; and that primary vehicle access is provided on to Aldington Road.

Policy NP9 – Land at Folkestone Racecourse

The land at Folkestone Racecourse also falls within the Otterpool Park area. The Places and Policies Local Plan, Preferred Options explains, under Policy ND9, the conditions under which development proposals will be supported. Conditions include the proposal achieving the highest quality design of both buildings and surrounding space and reinforces local rural distinctiveness; and the development ensures that there is no adverse impact on water quality from wastewater overflow.

1.2.4 Supplementary Planning Guidance SPG4: Kent Vehicle Parking Standards

The SPG 4 Kent Vehicle Parking Standards (2006) is contained within Kent and Medway Structure Plan: Mapping out the future, and has been adopted by Kent County Council. The purpose of Supplementary Planning Guidance (SPG) is to supplement the policies and proposals of development plans and the Kent Vehicle Parking Standards provide a consistent approach to parking provision.

1.3 Summary

The policies and guidance in place seek an emphasis on development in locations where sustainable travel modes can be encouraged and of facilitating access by all modes, together with good design where the car is not dominant. Otterpool Park is adjacent to strategic rail line and major highway network corridor, with bus routes and strategic cycle connections within the area. There are significant opportunities for Otterpool Park to develop with excellent sustainable travel connectivity and places for people to enjoy safely and thus comply with policy.

2. Baseline Access and Travel

1.4 Introduction

This chapter focuses upon the existing travel patterns, transport conditions and accessibility within the vicinity of the proposed development site, for travel on foot, by bicycle, bus and train. This chapter has been informed by comprehensive desktop-based analysis and site visits.

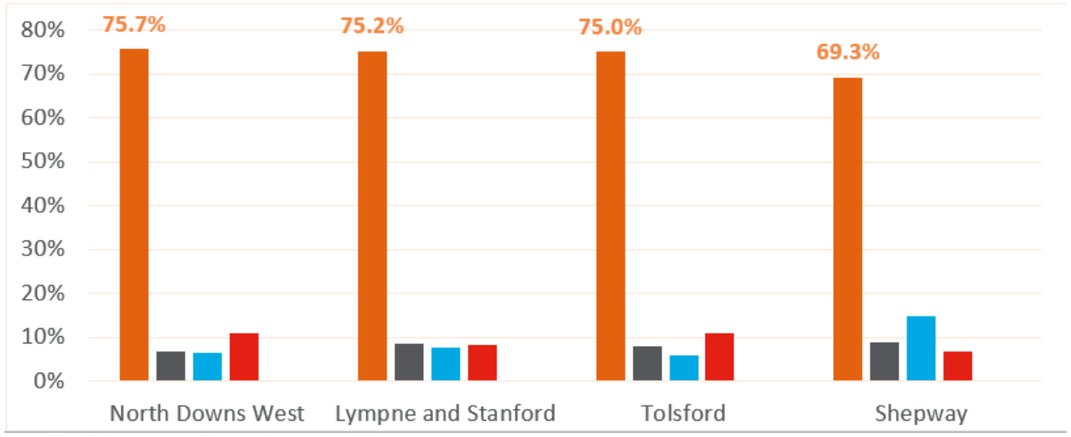
1.5 Existing Travel Patterns

The Census data from 2011 has been used to ascertain the distance travelled to work, working from home and the mode share of those trips for residents of the Otterpool Park area. The Otterpool Park area falls within the following three 2011 ward boundaries[1] North Downs West, Lympne and Stanford and Tolsford.

1.5.1 Method of Travel to Work

The *method of travel to work* census data (QS701EW) for residents' of the wards that make up the Otterpool Park area and the District of Shepway, are illustrated in Figure 1.1. The results show a similar split between each mode type compared across each ward. The results for Shepway District overall are slightly lower for car (car or van driver, car passenger or motorcyclist) 69.3% and higher for active travel (walking or cycling) 14.8%, whilst the proportion of residents travelling via public transport (bus or rail) is similar to that of the overall District 9%.

Figure 1.1 - Method of Travel to Work, 2011 Census

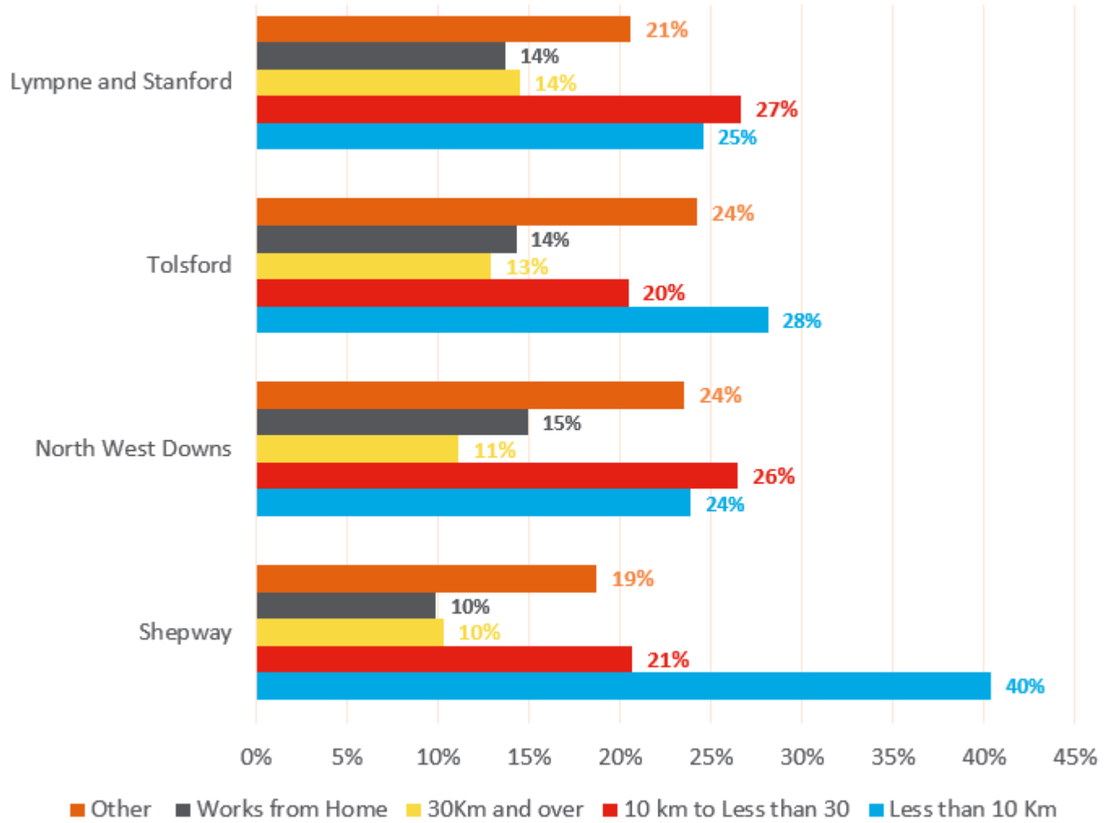


1.5.2 Distance Travelled to Work

Figure 1.2 shows the majority of residents in the District of Shepway travel less than 10 Km to work. The majority of residents living within the wards of Lympne and Stanford, Tolsford and North Downs West travel a maximum distance of less than 30km to work at a proportion ranging between 57 to 59%. The proportion of residents who work from home within the District of Shepway is 10%, whereas this is considerably higher in the wards that make up the Otterpool Park area (14-15%).

[1] As of 7th May 2015, new ward boundaries came in to effect in the District of Shepway, the analysis within this study area will remain based on 2011 wards.

Figure 1.2 – Distance Travelled to Work, 2011 Census



1.5.3 Location of Usual Residence and Place of Work

The *location of usual residence and place of work* census data (WF01BEW) for residents of the following 2011 Super Output Areas (SOA); W01024550, E01024536 and E01024546 of which Otterpool Park is located has been analysed. The SOAs are shown in Figure 1.3.

Figure 1.3 – Selected SOAs (E01024550, E01024536 and E01024546)

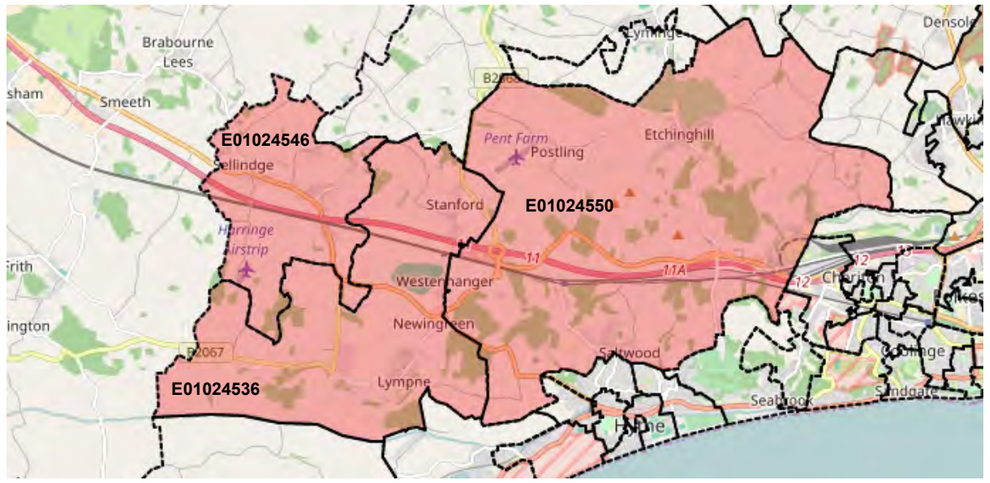


Table 1.1 shows the shows the percentage outward commuting of residents residing within the three SOAs. Shepway is shown to have the highest percentage illustrating that the majority of residents both reside and work within the district.

Table 1.1 – Place of Work of People Residing in the Shepway SOAs E01024550, E01024536 and E01024546, 2011 Census

Place of Work	Currently Residing in (%)		
	E01024550: Shepway 008D	E01024536: Shepway 009C	E01024546: Shepway 009D
Shepway	48.0	50.0	36.1
Ashford	14.0	18.8	34.2
Canterbury	8.8	5.7	5.2
Dover	8.0	4.0	3.8
Maidstone	3.9	3.2	6.1
Other	17.3	18.3	14.6

Table 1.2 shows the percentage of residents of the three named SOAs that commute to each area for work. Shepway is shown to have the largest share of residents travelling to each of the SOAs to work.

Table 1.2 – Place of Residence of People Working in the Shepway SOAs E01024550, E01024536 and E01024546, 2011 Census

Currently Residing in	Place of Work (%)		
	E01024550: Shepway 008D	E01024536: Shepway 009C	E01024546: Shepway 009D
Shepway	55.0	55.8	55.4
Ashford	7.0	21.8	38.3
Dover	26.9	9.5	0.0
Other	11.1	12.9	6.3

1.6 Highway Network and Junctions

1.6.1 Local Highway Network

M20 and Junction 11

The M20 is a motorway connecting Kent with the M25 and London. It terminates at junction 13, on the northern outskirts of Folkestone. The M20 within the vicinity of Otterpool Park comprises three lanes in either direction, subject to the national speed limit, and Junction 11.

Junction 11 of the M20 connects with the A20 (south), B2068 (north) and the STOP 24 Service Station via a five-arm roundabout. Junction 11 gives access to the M20 northbound (Ashford and London) and southbound (Folkestone, Dover and continental Europe via ferry or Eurotunnel).

Operation Stack

The number of HGV's crossing the English Channel has increased seven-fold in recent years. Nearly ninety percent of all UK freight goes through the Strait of Dover, which puts 11,000 HGV's per day on Kent's roads. Currently there is a procedure known as Operation Stack comprising the parking of HGV's on the M20 motorway in Kent, on occasions where services in Dover (across the English Channel) are disrupted. Operation Stack was implemented 48 times between 1997 and January 2015 with an average of five to six days per year and rarely for longer than a single day at a time.

As a result, local roads became impassable and many HGV's were forced to park in laybys. Travel times were increased and the delivery of goods to the local area affected, causing increased disruption to businesses across Kent and UK-wide. As such, Highways England is proposing to provide a lorry park near Stanford, to the west of M20 J11.

Lorry 'Fly parking'

An issue that is prevalent in Kent as a whole is that of 'fly parking'. Highways England defines fly parking as:

"For reasons of safety lorry drivers are subject to strict rules on how long they can drive between breaks, and how long these breaks must be, and if no formal parking is available drivers stop where they can. The shortage of spaces leads to inappropriate lorry parking, sometimes known as 'fly-parking', where lorries park in areas not intended for them, such as the motorway hard shoulder, rural verges, local streets and so on."

With the site being located within easy reach of cross channel routes (Eurotunnel and the Port of Dover) as well as having pockets of existing industry, the site is subject to fly parking. Additional capacity for formalised lorry parking maybe incorporated in to the Operation Stack Lorry Park, or as part of the planned expansion to service station Stop24. However, with the recent growth trend in freight crossing the channel this additional capacity may not be sufficient. Design considerations need to be made to reduce the attractiveness of locations for lorry drivers to park.

A20 Barrow Hill / Ashford Road

The A20 is major distributor road in Kent, carrying traffic between London and Dover. The A20 Barrow Hill/ Ashford Road crosses the Otterpool Park area from east to west and also forms the north-eastern boundary of the area. The A20 provides access to the M20, via junction 11. The road consists of a single carriageway subject to a 40mph speed limit. The A20 through the Otterpool Park area is constrained by a single lane section, controlled by traffic signals, where the road passes under the high-speed railway line south of Sellindge. Underneath the railway bridge there is a height restriction of 4.7m.

A number of residential premises are accessed from the A20, within the Otterpool Park area. The A20 Ashford Road, north of the M20 (Count Point ID: 16234) carried an annual average daily flow (AADF) in the region of 8,516 vehicles, during 2015[2]. South of Junction 11 of the M20, the A20 has an AADF in the region of 12,679[3] vehicles, during 2015.Observations taken from site suggest that there may be scope for significant route improvements on the A20, predominantly centred on the junction arrangement at Newingreen.

B2067 Otterpool Lane

The B2067 Otterpool Lane, within the vicinity of the Otterpool Park area, comprises a single carriageway road with a north - south alignment. The road is predominantly subject to the national speed limit, which reduces to 50mph at the northern extent within the vicinity of the signalised junction with the A20 Ashford Road. The road provides access to Lympne Industrial Park, Lympne Animal Park and Gardens, and a farm. Otterpool Lane is bounded by hedgerows and rural land. There are no footways present along the entirety of the road.

Stone Street

Stone Street forms the eastern boundary of the Otterpool Park area. It extends northwards to the M20 and southwards into Lympne, to the junction with Aldington Road, providing access to Westenhanger railway Station. The road is separated by a small section of the A20 Ashford Road and as such has been split into the following two section for this study; Stone Street South and Stone Street North. There is a bridge over the M20 between these two sections, comprising a one-way carriageway.

The southern section comprises a single lane carriageway allowing for two-way movements, with the exception of one-way priority systems in place north of Lympne built up area. At the Aldington Road junction, a sign says that Stone Street is 'Unsuitable for heavy goods vehicles'. The road is subject to a 40mph speed limit, which reduces further within the settlement boundary to 30mph. Footways are predominantly provided along at least one side of the carriageway.

The northern section, which provides access to Westenhanger Rail Station and a number of residential properties comprises, is a narrow single carriageway road, subject to a speed limit of 30mph. North of Westenhanger railway station, Stone Street narrows to a single-track road before coming to a dead end by the M20 motorway. There is also a section of Stone Street north of M20 motorway, beyond the study area.

Aldington Road

The B2067 Aldington Road forms the southern boundary of the Otterpool Park area. It has an approximate east-west alignment, extending between Lympne Hill and Otterpool Lane. It is a narrow single carriageway road. There is a 2m width restriction (except for access) east of the junction with Lympne Hill. These width restrictions are sign posted to the east of the Aldington Road/ Stone Street junction and on the east side of the Lympne Hill junction. Aldington Road becomes considerably narrow to the west of the Otterpool Lane junction, potentially allowing only one vehicle at a time to pass through. The road is subject to the national speed limit, which reduces to 30mph within Lympne. A footway is provided along the northern side of the carriageway between Lympne Distribution Park and Octavian Drive, within Lympne. In addition, the route has a hilly terrain sloping in a westerly direction.

Harringe Lane

Harringe Lane has an approximate north-south alignment extending between the A20 and B2067, located at the north-western boundary of the Otterpool Park area. The road provides access to a few residential properties and farmland. The narrow route is predominantly bounded with hedgerows and comprises a narrow country lane, which can only accommodate one-way traffic movements with regular passing points. Harringe Lane is subject to width restrictions with signage restricting vehicles of a width greater than 1.98m (except for access). There is no footway provision along the road.

A261 Hythe Road

The A261 Hythe Road connects the A20 at Newingreen with the A529 within Hythe, comprising a single carriageway road with no footway provision. The road is predominantly subject to the national speed limit, which reduces to 30mph on approach to the built-up area of Hythe. Nearby the junction with the A20, the A261 (Count Point ID: 36876) carries an AADF in the region of 7580[4] vehicles (2015 data).

1.7 Walking and Cycling

Otterpool Park benefits from a number of well-established walking routes penetrating the area, which connect residential areas with the rural surrounding area. Both within and near to the site, the key cycling routes are the

[2] http://www.dft.gov.uk/traffic-counts/cp.php?la=Kent# 16234
[3] http://www.dft.gov.uk/traffic-counts/cp.php?la=Kent#80737
[4] http://www.dft.gov.uk/traffic-counts/cp.php?la=Kent#36876

National Cycle Network Route 2 and an on-road local route along Ashford Road, Stone Street, Aldington Road and Lympne Hill.

1.7.1 Walking and Cycling Environment

Within Otterpool Park, the walking and cycling environment is a mix of on-road and off-road footways, footpaths and cycle routes. Between the A20 and the railway line, the land is fairly flat. South of the A20, the land rises gently towards the B2067 Aldington Road. Overall the site's rural position boasts a variety of routes for pedestrians and cyclists although footways are limited along some roads and on-road cycling lanes are not provided. Walking and cycle routes are shown in Figure 2001 in Appendix B.

There are various on-road and off-road walking routes within the site area. Otterpool Park is located in a rural area and so benefits from various footpaths. There are public rights of way alongside the railway and through fields and also connecting residential areas. There are footways provided on many of the roads including Ashford Road, Aldington Road and Barrow Hill. The footways on Ashford Road and Aldington Road are relatively narrow, whilst Barrow Hill benefits from wider footways. There is a formal pedestrian crossing on Otterpool Lane, at the Otterpool Lane/Ashford Road junction.

There is an on-road local cycling route along the A20 on the eastern side of the site. The route's northerly point is the Westenhanger roundabout and consists of the A20, Stone Street, Aldington Road, Lympne Hill and West Hythe Road. There are very limited cycle lane provisions with the exception of one on the eastern side of the A20 between the Westenhanger roundabout and the A20 roundabout.

National Cycle Network Route 2 runs along the canal towpath through West Hythe, Hythe and Folkestone, and is located within 1km south of the site. Royal Military Road is part of the route and can be located at the southern point of Lympne Hill. The route travels in westerly and easterly directions.

The route is a long-distance cycle route and when complete will link Dover in Kent with St Austell in Cornwall via the south coast of England.

1.7.2 Walking and Cycling Accessibility

The accessibility of Otterpool Park on foot has been calculated by considering the walking distances from three nodes (Node 1 representing the eastern part of Otterpool Park, Node 2 representing the southern part of Otterpool Park and Node 3 representing the western part of Otterpool Park) as illustrated in Figure 2002. It can be see that almost the whole of Otterpool Park area is within a 1,200m buffer from each node.

1.8 Public Transport Network and Services

1.8.1 Bus Infrastructure

Although Otterpool Park predominantly comprises rural land there are in total 21 bus stops located within the study area. Bus stops are located on the strategic and local routes within the area, namely along the A20, B2067, Aldington Road and Stone Street. Most bus stops comprise a flag and pole; many also with timetables. A few of the bus stops also have benches and/or have shelters. A few stops however appear not to have any signage at all. Bus stop locations in the Otterpool Park area are presented in Figure 2003.

1.8.2 Bus Services

Within the Otterpool Park area, bus services currently route along the A20 Barrow Hill / Ashford Road, B2067 Otterpool Lane, Stone Street and Aldington Road. Table 1 summarises the services which serve the bus stops along these routes. This route has the highest frequency (two buses an hour, Monday to Friday) of all the bus services in the Otterpool Park area.

The 10 / 10A / 10X bus service provides a regular bus service between Folkestone and Ashford. The 111 operates on a Thursday only, between Ashford and Folkestone via Aldington and Burmarsh. The 737 comprises the national Express service from Oxford to Stansted Airport. The 994 and 18A runs daily, once in the morning and returns in the afternoon, taking local children to and from schools in Liphook and Canterbury. This service only operates on school days.

Table 1 Summary of Local Bus Services from Waterside (One-way) (Source: Traveline)

Bus Number	Route	Frequency (One-way)		
		Monday - Friday	Saturday	Sunday
10 / 10A / 10X	Folkestone - Ashford	30 minutes	30 minutes	70 minutes
111	Folkestone - Ashford	Thursday only	-	-
737A / 737C	Lympne - London	4 buses per day	-	-
994	Stanford - Folkestone	School service	-	-
18A	Canterbury - Ashford	School service	-	-

1.8.3 Rail Services

Westenhanger Railway Station is located in the north-eastern corner of the Otterpool Park area. The station is strategically located on the South-Eastern Railway Line connecting Ashford and Dover. All trains serving Westenhanger are operated by Southeastern, and the station has limited free car parking. Table 1.2 presents a summary of key destinations and the frequency of services from the station, which includes hourly (two trains an hour at certain times) southbound services into Folkestone. Northbound, there is an hourly service to Ashford, where high speed Eurostar services depart from, or regular services to London.

Table 2 Summary of Rail Services form Westenhanger Railway Station (Source SoutheasternTrain)

Destination	Journey Time	Frequency (approx.)
Ashford International	9 minutes	Hourly
Folkestone Central	11 minutes	Hourly
Dover Priory	24 minutes	Hourly
London	51 minutes/ 1 hour 44 minutes	Hourly

1.8.4 Public Transport Accessibility

Accessibility analysis has been carried out for the Otterpool Park area. The analysis illustrates that a large part of Shepway and destinations in the M20/high-speed rail corridor are accessible from Otterpool Park within a 60-minute bus or train journey including the towns of Ashford, Folkestone and Hythe. The analysis is shown in Figure 2005.

1.9 Summary

The baseline transport report has considered the existing travel patterns of those currently residing in the Otterpool Park area by exploring existing methods and distances travelled to work, and current commuting trends.

The local highway network and walking and cycling environment has also been explored, describing the site's accessibility and environmental surroundings. The site benefits from a variety of rural footpaths and an on-road cycle route so that pedestrians and cyclists can travel safely. National Cycle Network Route 2 is also only less than 1km from the site, which can be reached via local on-road cycle routes.

The public transport network is relatively limited in terms of bus service; however, it does offer school services as well as a frequent service between Folkestone and Ashford. Hourly services by rail also run to Ashford International, Folkestone Central and Dover Priory.

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APPENDIX B

M20 Junction 11 Capacity Testing Summary Note

1 Introduction

Arcadis was commissioned by Shepway District Council to undertake an initial modelling assessment of the M20 J11 junction to inform the Stage 1 Feasibility and Capacity Study for Otterpool Park Garden Town. This junction is a grade-separated roundabout which connects the M20, the A20 and the B2068 and will form the principal access point to the development site from the wider area and is therefore key to the successful delivery of the scheme. The location of the M20 J11 roundabout is shown in Figure 1.1.

The purpose of this initial study is to determine the ability of the junction to accommodate traffic growth and to thereby understand the constraints to development on the adjacent Otterpool Park site. This study represents an initial high-level assessment of potential Otterpool Park development scenarios sufficient to provide a preliminary indication of the scale of development the site might accommodate, based on the motorway junction capacity only. More detailed assessment will be required to inform the development of options during the framework masterplan stage.

The Stage 1 Feasibility and Capacity Study considers a number of initial development options, as described further in section 3.2. For this study, five traffic flow scenarios have been tested; one existing scenario to determine the current operation of the junction, and four future-case scenarios. Within the five scenarios the weekday AM and PM peak periods were assessed as these are the periods in which any development would be expected to have the greatest impact on the capacity of the junction.

The five scenarios were tested under two junction layout conditions; the first based on the existing junction layout and the second using a revised layout that includes several potential capacity-enhancing mitigation measures, as described in section 3.4.

Figure 1 Location of M20 J11 Roundabout

2 Existing Situation

The junction is a large priority controlled grade separated roundabout, circular in shape. Given the rural location, there are no pedestrian crossings provided on any of the arms of the roundabout. The M20 is the main route to both the Channel Tunnel and the port of Dover, therefore most of the buildings and services in the local area consist of retail units and import-export facilities. These are mainly located off the southeastern arm of the roundabout.

The roundabout is located in Westenhanger. The northern arm of the roundabout (B2068) leads to a priority junction which is linked to Stone Street, which continues along the B2068. The arms on the east and west of the roundabout are off/on slips of the M20 providing a link to the Channel Tunnel and the ports of Dover to the east and to the M25 in the west and merges onto the A20 at Swanley. A southern arm of the roundabout is used as an access to motorway services including a petrol station and retail units. Ashford Road (A20) leads to a priority controlled junction with Stone Street in the south and Sandiford Road in the East. The existing layout is shown in Figure 2.

Figure 2 Existing Gyratory Layout

3 Model Design and Assumptions

3.1 Development Scenarios

Modelling was carried out using five traffic flow sets to establish the operation of the junction under a number of existing and future-case conditions. The flow sets are described as follows:

- **Scenario A**: this scenario tests the current operation of the junction using base traffic flows collected in October 2016. Traffic flow data was provided by Shepway District Council.
- **Scenario B**: this scenario examines the future operation of the junction based on predicted background growth between 2016 and 2031 (the end year for the Local Transport Plan4 rather than the Local Development Plan). This provides us with an understanding of how the junction is expected to operate in future with no development on the Otterpool site from which we can ascertain the likely impact of adding Otterpool Park development flows. The future year flows were derived from the 2016 flows using the TEMPro[5] growth factors for the area, which suggested traffic will increase 8.67% in the AM peak period and 11.41% in the PM peak between 2016 and 2031.
- **Scenario C**: this tests future junction operation taking into account the 2031 background growth and the Otterpool Park development option, which was calculated to generate the lowest level of external vehicle trips. This scenario is described in more detail in section 3.2.
- **Scenario D**: this scenario tests future junction operation including the 2031 background growth and the Otterpool Park development option which was calculated to generate the greatest level of external vehicle trips, as described in section 3.2.
- **Scenario E**: this scenario also tests future junction operation using the 2031 background growth forecast and an Otterpool Park development scenario similar to that tested by Shepway District Council in a previous feasibility study[6].

3.2 Development Options and Trip Forecasts

Six development scenarios were provided by Farrells as masterplanners to inform the testing in the Otterpool Park Stage 1 Feasibility and Capacity study consisting of varying scales of development across the range of land uses. A trip generation exercise was carried out to calculate the level of external vehicle trips each scenario could be expected to generate based on trip rates provided by Shepway District Council, which are being used to inform the work for the development of the Core Strategy of the Local Plan. Details of the six development scenarios as well as the trip rate assumptions used in the trip generation exercise are included in Appendix C. Appendix C also details the trip distribution assumptions used in this assessment.

The trip rates provided by Shepway District Council are the rates used in its assessment of local development options for the emerging Local Plan. The trip rates cover a variety of land uses with generic development characteristics akin to smaller, less self-contained developments than the Otterpool Park development is anticipated to be. It was therefore necessary to amend the trip rates to more accurately replicate the development characteristics of Otterpool Park, which is expected to give rise to more trip containment, i.e. travel between land uses within the boundary of the site rather than to off-site locations, which will lead to less vehicular traffic routing on the wider network and through the M20 junction 11. As explained in Appendix C, the trip containment assumptions were considered separately for each land use and resulted in an overall level of containment of between 60% and 70%. This represents a significant level of trip containment. For the purposes of this assessment, the elements described in Appendix C are considered sufficient to provide the high-level advice required for Stage 1 of this project. All these elements will need refinement prior to the modelling that will be undertaken for the options testing in Stage 2 of this project and will require consultation with Shepway District Council and Kent County Council.

For the purposes of the capacity testing, the development scenarios which generated the greatest and the lowest number of external vehicle trips were selected. Table 1 presents the development quanta which generated the lowest (Scenario C) and the greatest (Scenario D) level of external vehicle trips.

As described in section 3.1, our capacity testing also included a scenario (E) based on the level of Otterpool Park development that was assumed in a feasibility study conducted by Shepway District Council. The development quantum used in this scenario is also included in Table 1.

Table 3 Development Quanta by Scenario

Land Use	Scenario (number of units / Net Internal Floor Area)		
	C – Lowest level of development	D – Highest level of development	E – Shepway study
C3 Residential	7,181	11,213	3,275
C2 Extra Care Housing	318	795	0
C1 Hotel	11,200m^2	11,200m^2	7,680m^2
B1 Office	52,000m^2	66,000m^2	31,087m^2
B2 Industrial	9,000m^2	4,500m^2	0
B8 Warehousing	9,500m^2	4,750m^2	39,079m^2
D1 Nursery	2,800m^2	5,600m^2	0
D1 Primary School	5,400m^2	5,400m^2	0
D1 Secondary School	7,200m^2	7,200m^2	0
D1 Health	2,800m^2	8,400m^2	0
D1 Community	2,800m^2	5,600m^2	0
D2 Indoor Sports	7,200m^2	7,200m^2	0
A1 Retail	8,000m^2	12,000m^2	0
A2 Business, A3 Café / Restaurant, A4 Pub / Takeaway	6,000m^2	12,000m^2	0
Total	**7,499 / 123,900m^2**	**12,008 / 149,850m^2**	**3,275 / 77,846**

[5] Trip End Model Presentation Program. This forecasts trips based on changes in population, employment, car ownership, accessibility and travel cost.

[6] Land at Junction 11, M20 Advice Note (April 2016)

Table 2 presents the level of external vehicle trips calculated to be generated by the three scenarios in the AM and PM peak periods.

Table 4 External AM and PM Peak Trips Generated by Scenario

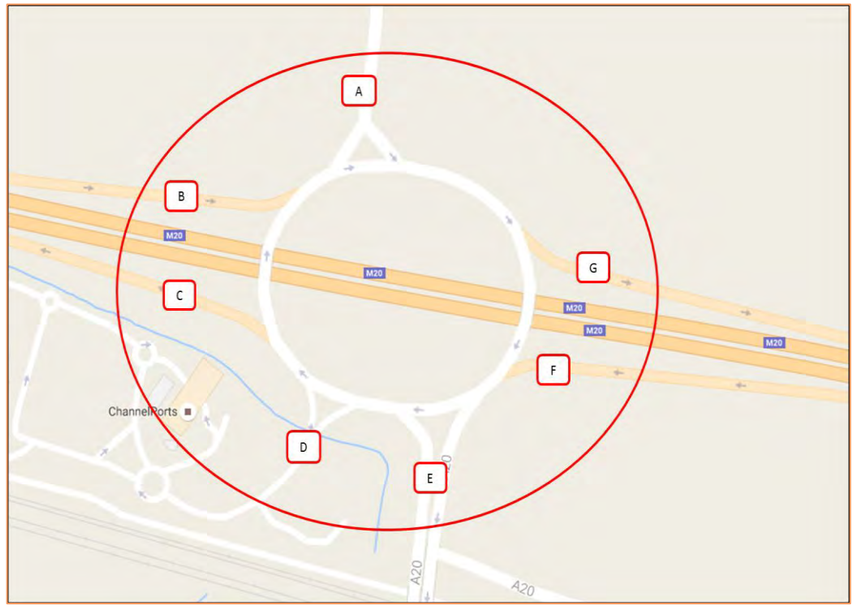
Scenario	AM Peak			PM Peak		
	Arrival	Departure	Combined	Arrival	Departure	Combined
Scenario C	1228	1416	**2644**	1188	1018	**2206**
Scenario D	1764	2077	**3841**	1868	1453	**3320**
Scenario E	602	514	**1116**	376	510	**886**

3.3 Model Assumptions

3.3.1 Existing Junction Layout

The Arcady modelling package was used to assess the scenarios for the peak hour periods. Modelling was carried out based on the existing highway layout, as shown in Figure 3. Arms C and G are exit only and as of such, they have been omitted from the assessment. The proposed modelling was undertaken for the AM peak period (08:00 - 09:00hrs) and PM peak period (17:00-18:00hrs) for each flow set.

Figure 3 Existing Layout of the M20 J11 Roundabout



3.3.2 Revised Roundabout Design

The five traffic flow scenarios were also tested on a revised roundabout design that included the following capacity-enhancing features:

1. The A20, Channel Ports access and M20 eastbound approaches and corresponding circulatory arms are signalised;
2. Two lanes are provided on the M20 Westbound off slip; and
3. The number of approach lanes are increased without widening of the carriageway.

This design was tested using the LinSig software package that assesses capacity of signal-controlled junctions.

4 Results of Capacity Testing

4.1 Existing Roundabout Design

Each of the scenarios described in section 4 were tested on the existing roundabout layout to determine how much of the total capacity of the roundabout is used to accommodate the flow of traffic generated by each scenario. For the purposes of this study, the Arcady modelling results are presented in terms of the percentage of the total capacity of the roundabout that is used in each scenario.

Table 3 presents the results of capacity testing for each scenario based on the existing junction layout.

Table 5 Results of Capacity Test based on Existing Junction Layout

Scenario	Percentage of Capacity Used	
	AM Peak	PM Peak
Scenario A: Existing 2016 Base	43%	42%
Scenario B: Future 2031 Base	47%	49%
Scenario C: Future with Minimum Flows	176%	172%
Scenario D: Future with Maximum Flows	226%	271%
Scenario E: Future with Shepway Flows	93%	94%

The results show that the junction currently operates well within capacity and would continue to do so in the 2031 future case with no Otterpool development. However, the scenarios C and D, which include Otterpool Park development involving 7,500 and 12,000 homes plus other land uses respectively, would not be able to be accommodated within the existing junction capacity, as indicated by the capacity values of greater than 100%. The Shepway District Council development scenario, which includes 3,275 homes and a much lower level of other land uses, could be accommodated although it would be slightly over the theoretical capacity of 85% used as an industry standard for priority controlled roundabouts. It should be noted that the results above for the Shepway scenario show less capacity than when tested by Aecom on behalf of Shepway and we would wish to explore the assumptions used with them.

4.2 Revised Roundabout Design

Table 4 presents the results of capacity testing for each scenario based on a revised junction design that includes some mitigation features to increase capacity.

Table 6 Results of Capacity Test based on Existing Junction Layout

Scenario	Percentage of Capacity Used	
	AM Peak	PM Peak
Scenario A: Existing 2016 Base	50%	58%
Scenario B: Future 2031 Base	51%	65%
Scenario C: Future with Minimum Flows	94%	94%
Scenario D: Future with Maximum Flows	116%	107%
Scenario E: Future with Shepway Flows	82%	83%

Table 4 predicts the junction operating well under capacity for the existing and future base case scenarios. While scenario D, the 12,000 homes scenario, does not function within the capacity of the revised junction, the 7,500-home scenario C is slightly over theoretical capacity for a signalised junction of 90%. When considering the results of any transport modelling it is important to understand the limitations of the model. The model calculates capacity based on a number of factors including the geometry of the junction, the speed of the vehicles and the behaviour of the drivers. The model calculates a theoretical capacity which could be achieved if all factors are optimised. In reality, conditions are such that all factors that influence capacity are rarely operating to maximum optimisation and are in fact operating at less than 100% efficiency, thus junctions can rarely be used at 100% of its theoretical capacity. For this reason, where a model predicts that a junction is operating over 90% theoretical capacity, it is often assumed that it is operating at operational capacity. Thus, the highway authority assessing the scheme may consider a junction operating at 94% capacity will cause unacceptable delays.

It is noted that the results indicate a greater percentage of capacity is used in the existing and future base cases in this revised roundabout option than in the existing design. This is a feature of the signalisation of the roundabout in the revised design, which has the effect of increasing capacity when traffic flows are high, but decreasing capacity for low traffic flows which experience delays under red-light conditions that they would not have otherwise experienced under free-flowing, non-signal-controlled traffic conditions.

4.3 Interpretation of Results

The results suggest that junction currently operates with spare capacity and can be expected to do so in future, but would not be able to accommodate the predicted level of background growth and the traffic flows that could be generated by 7,500 to 12,000 homes plus other land uses. However, with some capacity enhancements the results are more favourable for the development scenarios, with the 7,500-home option operating at around 94% capacity.

The results in this section should be considered as preliminary results to be used as a guide to the range of development that could potentially be accommodated on the site and offer the indication that a development with around 7,500 homes might be accommodated subject to improvements of the M20 junction 11.

The junction improvements included in the revised roundabout design were suggested as they involve minimal change from the existing layout and could be implemented with no carriageway widening, subject to detailed design and testing. Additional changes requiring a greater impact to the existing design could be considered to further enhance capacity. Such changes could include:

1. Westbound M20 on-slip widened to safety accommodate two lanes of traffic on the exit to the junction;
2. Widen the M20 Eastbound approach to three lanes;
3. Widen the Ashford Road Approach and Circulatory arm of the junction to accommodate 3 lanes of traffic.

5 CONCLUSION

The results from the testing of the existing junction design suggest that the Otterpool Park development scenarios considered at Stage 1 could not be accommodated within the existing junction capacity. However, with some capacity enhancements, a level of development of around 7,500 homes plus other land uses was accommodated.

Further capacity enhancement beyond the minimum-impact measures incorporated into this assessment could be considered subject to further design and testing, which will be an integral part to Stage 2 of the project. As mentioned in section 2, other elements of the calculations described in this note will also require further consideration and consultation, and as such the conclusions of this note must be considered preliminary. The factors influencing the capacity testing that require more detailed considered are as follows:

1. The vehicle trip generation rates. The rates provided by Shepway District Council were considered too high to be used to directly reflect travel behaviour at the Otterpool Park site and so were adjusted to reflect the high level of trip containment anticipated. These are vehicle trip rates and there are also mode share issues to consider. Further investigation will be required to provide a robust, evidence-based set of trip rates which would need to be agreed with Shepway District Council and Kent County Council;

2. The distribution of trips. The trip distribution assumptions in this study assume that the majority of external vehicle trips would pass through the M20 junction 11. Further consideration will be given to the likely distribution of trips including the influence of the proposed access strategy. This will require liaison with Shepway District Council and an investigation into the trip distribution assumptions inherent in the capacity study currently being undertaken for the Local Plan;

3. Capacity modelling validation requirements. The modelling undertaken in this study was done independently from the highway authority. Models produced for the eventual planning application must go through a checking process with the authority to ensure the base model is sufficiently validated against existing conditions, i.e. that the results of the existing-case model reflect actual measured results to the degree of accuracy required by the authority;

4. Design of junction options. The capacity enhancements used in the revised roundabout option reflect ideas that are within the range of design standards, but have not been tested for safety. Likewise, any other design changes that have greater impact on the existing design, for example that require additional land, would need to be tested for design and safety;

5. Testing of junction options. The design and testing of junction options will be an iterative process influenced by all of steps 1 to 4 above;

6. Scope of junction modelling. Along with the M20 junction 11, other local junctions will need to be considered. In addition, wider-area modelling is likely to be required using additional software that models many junctions together as one system to better understand the interaction between them rather than the impact on one junction in isolation. This scope of modelling would be agreed with Shepway District Council / Kent County Council as appropriate.

While there are a number of steps to complete in order to achieve the robust level of assessment required to most accurately inform the masterplan process, this initial study has provided confidence that a significant level of development could be accommodated on the Otterpool Park site.

7 Further Notes

7.1 Trip Generation and Distribution

7.1.1 Development Scenarios

Table 1 presents the development quanta for six development scenarios considered in this capacity assessment. The table includes all residential and non-residential land uses that are expected to generate vehicle trips external to the site. The proposed green infrastructure areas are assumed to generate internal trips only.

Table 7 Development Quantum by Scenario

Land Use	Scenario (number of units / Net Internal Floor Area)					
	A	B	C	D	E	F
C3 Residential	9,575	7,181	7,181	11,213	6,140	9,213
C2 Extra Care Housing	424	318	318	795	424	795
C1 Hotel	11,200m^2	11,200m^2	11,200m^2	11,200m^2	11,200m^2	11,200m^2
B1 Office	77,500m^2	77,500m^2	52,000m^2	66,000m^2	76,800m^2	69,280m^2
B2 Industrial	9,000m^2	9,000m^2	9,000m^2	4,500m^2	12,600m^2	4,500m^2
B8 Warehousing	9,500m^2	9,500m^2	9,500m^2	4,750m^2	13,300m^2	2,375m^2
D1 Nursery	2,800m^2	2,800m^2	2,800m^2	5,600m^2	5,600m^2	5,600m^2
D1 Primary School	5,400m^2	5,400m^2	5,400m^2	5,400m^2	4,500m^2	5,400m^2
D1 Secondary School	7,200m^2	7,200m^2	7,200m^2	7,200m^2	7,200m^2	7,200m^2
D1 Health	2,800m^2	2,800m^2	2,800m^2	8,400m^2	11,200m^2	8,400m^2
D1 Community	2,800m^2	2,800m^2	2,800m^2	5,600m^2	5,600m^2	5,600m^2
D2 Indoor Sports	7,200m^2	7,200m^2	7,200m^2	7,200m^2	7,200m^2	7,200m^2
A1 Retail	8,000m^2	8,000m^2	8,000m^2	12,000m^2	8,000m^2	12,000m^2
A2 Business, A3 Café / Restaurant, A4 Pub / Takeaway	6,000m^2	6,000m^2	6,000m^2	12,000m^2	6,000m^2	12,000m^2
Total	**9,999 / 149,400m^2**	**7,499 / 149,400m^2**	**7,499 / 123,900m^2**	**12,008 / 149,850m^2**	**6,564 / 169,200m^2**	**10,008 / 150,755m^2**

Scenario D provides the greatest number of C2/C3 residential development, while Scenario E provides the lowest but also provides the greatest non-residential floor area. Scenario C would provide the lowest amount of non-residential floor area.

10. Vehicle Trip Rates by Land Use

Vehicle trip rates used for the assessment of development forecasts within their Transport Strategy were provided by Shepway DC and Kent CC. Table 2presents the AM and PM peak trip rates by land use provided.

Table 8 Trip Rates by Land Use (Transport Strategy)

Land Use	AM Peak			PM Peak		
	Arrival	Departure	Combined	Arrival	Departure	Combined
C3 Residential	0.14	0.3	**0.44**	0.32	0.19	**0.51**
C1 Hotel	0.28	0.45	**0.73**	0.38	0.23	**0.61**
B1 Office	1.37	0.23	**1.6**	0.18	1.13	**1.31**
B2 Industrial	0.45	0.21	**0.66**	0.12	0.39	**0.51**
B8 Warehousing	0.08	0.05	**0.13**	0.03	0.09	**0.12**
D1 Primary School	4.92	3.49	**8.41**	0.28	0.55	**0.82**
D1 Secondary School	1.75	1.19	**2.94**	0.16	0.26	**0.42**
D1 Doctors	5.69	2.56	**8.25**	2.73	4.14	**6.87**
D1 Dentists	7.14	1.43	**8.57**	1.43	5.71	**7.14**
D2 Leisure	0.15	0.12	**0.26**	0.36	0.26	**0.63**
A1 Local Shops	4.52	4.33	**8.86**	5.18	5.25	**10.43**
A3 Restaurant	0	0	**0**	2.87	2.22	**5.08**
A3 Café	0.4	0	**0.4**	12	12.51	**24.51**

These trip rates were assigned to the proposed land uses as shown in Table 9.

Table 9 Trip Rate Type Used for Proposed Otterpool Land Uses

Proposed Otterpool Land Use Type	Trip Rate Land Use Type
C3 Residential	C3 Residential
C2 Extra Care Housing	Half the C3 Residential as expected to be lower than C3 land use
C1 Hotel	C1 Hotel
B1 Office	B1 Office
B2 Industrial	B2 Industrial
B8 Warehousing	B8 Warehousing

Proposed Otterpool Land Use Type	Trip Rate Land Use Type
D1 Nursery	D1 Primary School
D1 Primary School	D1 Primary School
D1 Secondary School	D1 Secondary School
D1 Health	Average of D1 Doctors and Dentists
D1 Community	Expected to be similar to D2 Leisure so set at 3 x D2 Leisure
D2 Indoor Sports	D2 Leisure
A1 Retail	A1 Local Shops
A2 Business, A3 Café / Restaurant, A4 Pub / Takeaway	Average of A3 Café and Restaurant

11. Vehicle Trip Generation by Scenario

The trip rates in Table 8 and trip assumptions in Table 9 were applied to the proposed development quantum in Table 7 to calculate the total number of trips that would be generated in the peak periods by each scenario. The results are presented in Table 10.

Table 10 AM and PM Peak Trips Generated by Scenario

Scenario	AM Peak			PM Peak		
	Arrival	Departure	Combined	Arrival	Departure	Combined
Scenario A	3617	3981	**7599**	4337	3909	**8246**
Scenario B	3282	3263	**6545**	3571	3455	**7025**
Scenario C	2932	3204	**6137**	3525	3166	**6691**
Scenario D	4366	4827	**9194**	5642	5034	**10674**
Scenario E	3790	3202	**6993**	3453	3713	**7164**
Scenario F	4129	4233	**8364**	5007	4689	**9694**

Key:
Lowest number of peak hour vehicle trips
Greatest number of peak hour vehicle trips

The results of the trip generation exercise suggest that Scenario D would generate the most vehicle trips in both peak periods. Scenario D has the greatest number of residential units. Scenario C, which has the lowest number of proposed residential units, would generate the lowest trips in each peak period.

12. Internal Vehicle Trips

The trips shown in Table 10 include trips between on-site land uses as well as trips to on-site land uses from off-site locations. Since vehicle trips between on-site land uses are not expected to route through Junction 11 of the M20, a capacity assessment of this junction should exclude these 'internal' trips.

The majority of trips between on-site land uses are expected to originate from the C2/C3 Residential land uses. There are also likely to be trips generated between non-residential land uses that are included in Table 10 that should also be discounted. These internal trips are likely to be lower in magnitude that the internal trips originating from the C2/C3 Residential land uses, therefore for the purposes of this study they have not been calculated. The issue of internal trips will need to be considered in more detail in the transport assessment.

In order to calculate the number of internal trips between residential and non-residential land uses we have determined the following:

a. The purpose of the trips generated by the residential land uses. Data relating to residential trip purpose is described in the National Travel Survey (NTS) and has been applied to this study. Table 11 presents the distribution of residential trips to purpose relating to each on-site non-residential land use in the AM and PM peaks;
b. The percentage of total trips generated for each trip purpose that would be attracted to on-site land uses. This perform this calculation accurately we would need to identify the alternative off-site destinations that offer similar services and consider how likely residents are to use the off-site destination rather than the on-site one. This would take into account the scale, quality and variety of service offered by the off-site destination compared to the on-site one as well as the distance required to travel to each and the ease of travel. This calculation method would be used for the transport assessment, but is beyond the scope of this feasibility study. We have therefore made high-level assumptions based on the information available at this stage. The percentage of total trips generated by residential land uses for each trip purpose that are likely to be destined to on- or off-site destinations used in this study are presented in Table 12.

Table 11 Trip Rates by Land Use (Transport Strategy)

Land Use	Percentage of Peak Hour Trips	
	AM Peak	PM Peak
C2 & C3 Residential	7%	11%
C1 Hotel	0%	0%
B1 Office	30%	35%
B2 Industrial	0%	0%
B8 Warehousing	0%	0%
D1 Primary School	31%	2%
D1 Secondary School	7%	1%
D1 Medical	10%	8%
D1 Community	>1%	1%
D2 Leisure	>1%	>1%
A1 Local Shops	15%	17%
A3 Café / Restaurant	>1%	25%

Total	**100%**	**100%**

Table 12 Shepway DC Transport Strategy Trip Rate Allocation to Otterpool Land Uses

Land Use	Percentage of Peak Hour Trips	
	Internal	External
C2 & C3 Residential	80%	20%
C1 Hotel	0%	100%
B1 Office	15%	86%
B2 Industrial	1%	99%
B8 Warehousing	1%	99%
D1 Primary School	50%	50%
D1 Secondary School	50%	50%
D1 Medical	95%	5%
D1 Community	95%	5%
D2 Leisure	90%	10%
A1 Local Shops	99%	1%
A3 Café / Restaurant	95%	5%

Applying the internal trip assumptions in Table 11 and Table 12 to the total peak hour trips in Table 10 enables us to calculate the number of external peak hour trips that would route on the highway network outside the site, including Junction 11 of the M20. The resulting external peak hour trips are presented in Table 13.

Table 13 External AM and PM Peak Trips Generated by Scenario

Scenario	AM Peak			PM Peak		
	Arrival	Departure	Combined	Arrival	Departure	Combined
Scenario A	1661	1756	**3417**	1434	1376	**2809**
Scenario B	1516	1447	**2963**	1190	1231	**2420**
Scenario C	1228	1416	**2644**	1188	1018	**2206**
Scenario D	1764	2077	**3841**	1868	1453	**3320**
Scenario E	1673	1357	**3030**	1098	1315	**2412**
Scenario F	1679	1821	**3501**	1663	1357	**3020**

Key:
Lowest number of peak hour vehicle trips
Greatest number of peak hour vehicle trips

The result is that between 54% and 60% of total AM peak vehicle trips and 64% to 71% of PM peak trips are internal trips. This represents a significant level of internal trips and a large reduction on external vehicle trip rates compared to the trip rates provided by Shepway DC. It should be noted that to use this level of external trip reduction in the transport assessment would require robust data evidence to support the assumptions in Table 11 and Table 12.

13. Vehicle Trip Distribution

This assessment aims to determine the potential impact of the development options on the M20 Junction 11. In order to calculate the number of external vehicle trips in Table 13 that would route through this junction we have analysed the travel behaviour of existing residents in the vicinity of the proposed site using Census 2011 data in order to determine the likely direction the external trips are likely to travel to/from Otterpool Park. Table 8 presents the percentage of existing local residents who travel to destinations within the District, other local residential/employment centres and further afield to their workplace.

Table 14 External AM and PM Peak Trips Generated by Scenario

Place of Work	Percentage of Local Residents
Shepway	49%
Ashford	16%
Canterbury	7%
Dover	6%
Maidstone	4%
Rest of the Country	18%

Considering the nature of the existing highway network it is considered likely that any trips to/from locations outside Shepway are likely to route on the M20 and therefore access the site through Junction 11. Trips to/from locations within Shepway north of the M20 are considered likely to route to/from the site via the northern arm of Junction 11. Trips to/from locations in the south of Shepway considered likely to route to/from the site via Ashford and therefore route through Junction 11. It is assumed that the only trips that would not route through Junction 11 of the M20 are trips between the site and Hythe, which is likely to be accessed via the A261. The number of trips to/from Hythe is estimated to be 15% of the total trips to/from destinations within Shepway. Table 15 summarises the assumptions of the percentage of external trips that would route through Junction 11 based on the workplace destination in Table 8. The direction of travel of these trips on departure from the site is also shown.

Table 15 External AM and PM Peak Trips Generated by Scenario

Destination	Percentage of External Trips Not Routing Through Junction 11	Percentage of External Trips Routing Through Junction 11	Direction of Departure on M20
Hythe	7%		-
Shepway north of Site		5%	North
Other Shepway		37%	50% East, 50% West
Ashford		16%	West
Canterbury		7%	West
Dover		6%	East
Maidstone		4%	East
Rest of the Country		18%	5% East, 95% West
Total	**7%**	**93%**	**29% East, 59% West, 5% North**

The result is that around 93% of all external trips routing to/from the site are expected to route through Junction 11.

APPENDIX C

Figures

Figure 2000 Highway Height and Width Restrictions Map

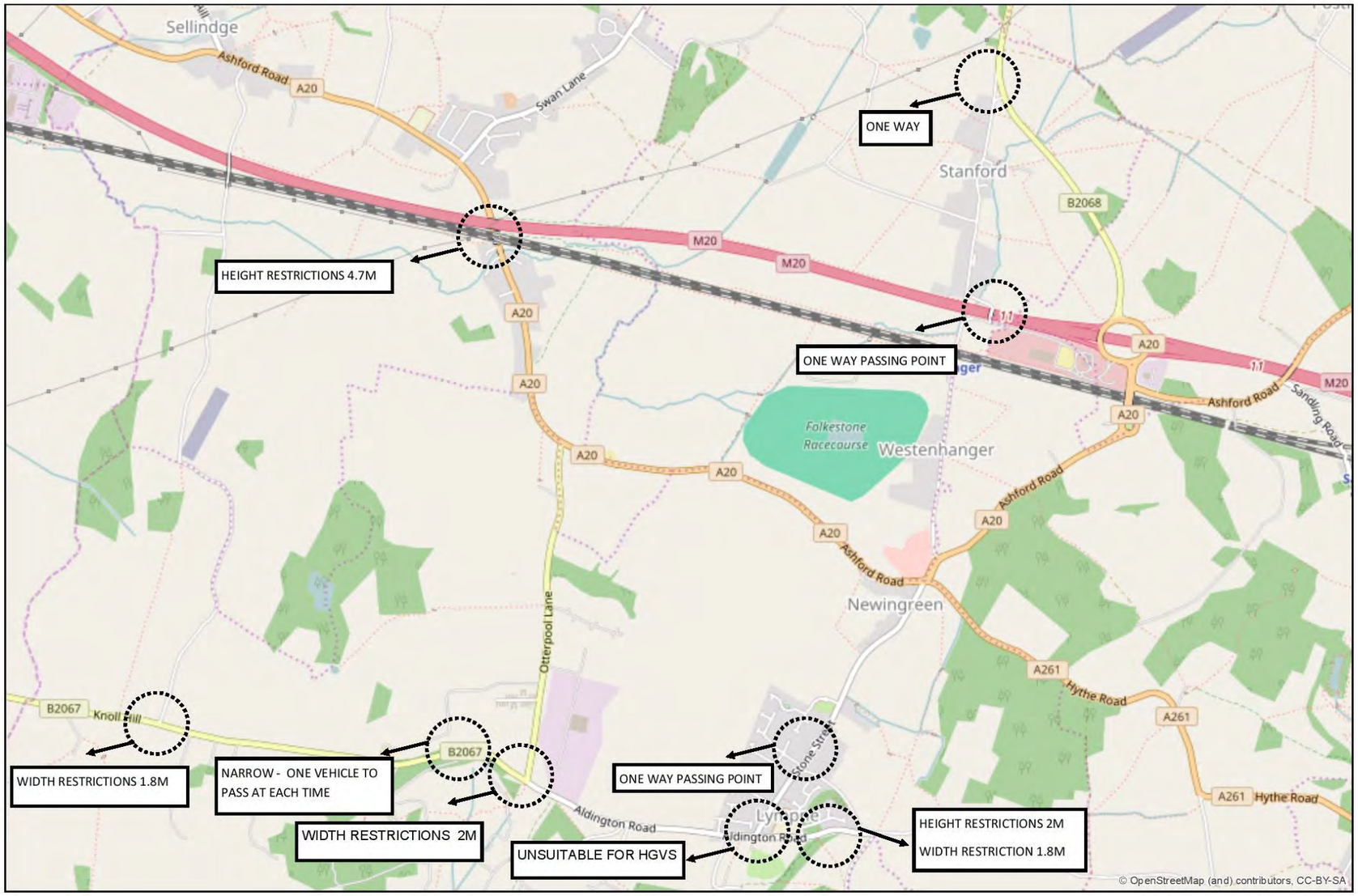


Figure 2001: Walking and Cycle Routes Map

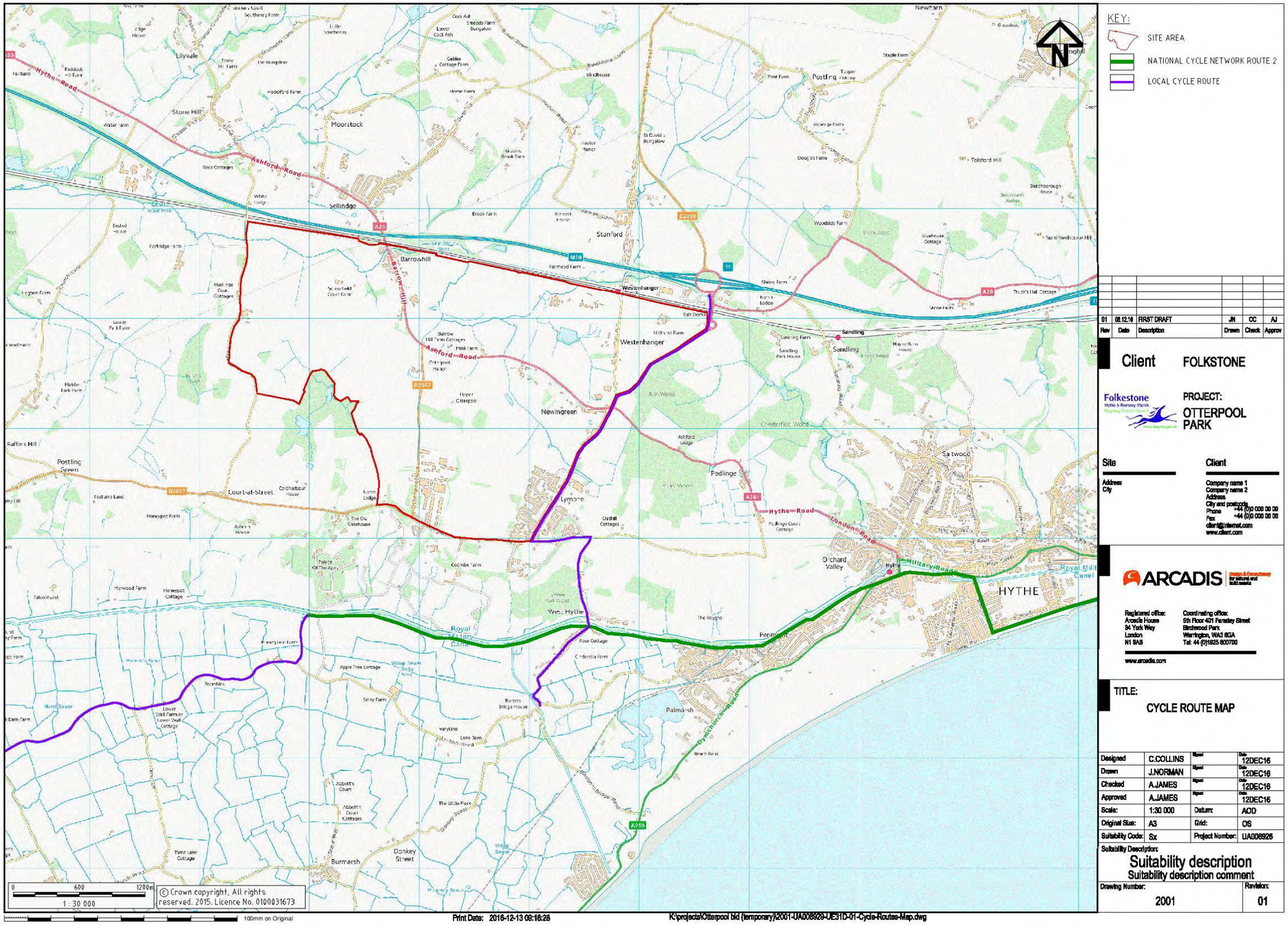


Figure 2002: Walking and Cycle Isochrones

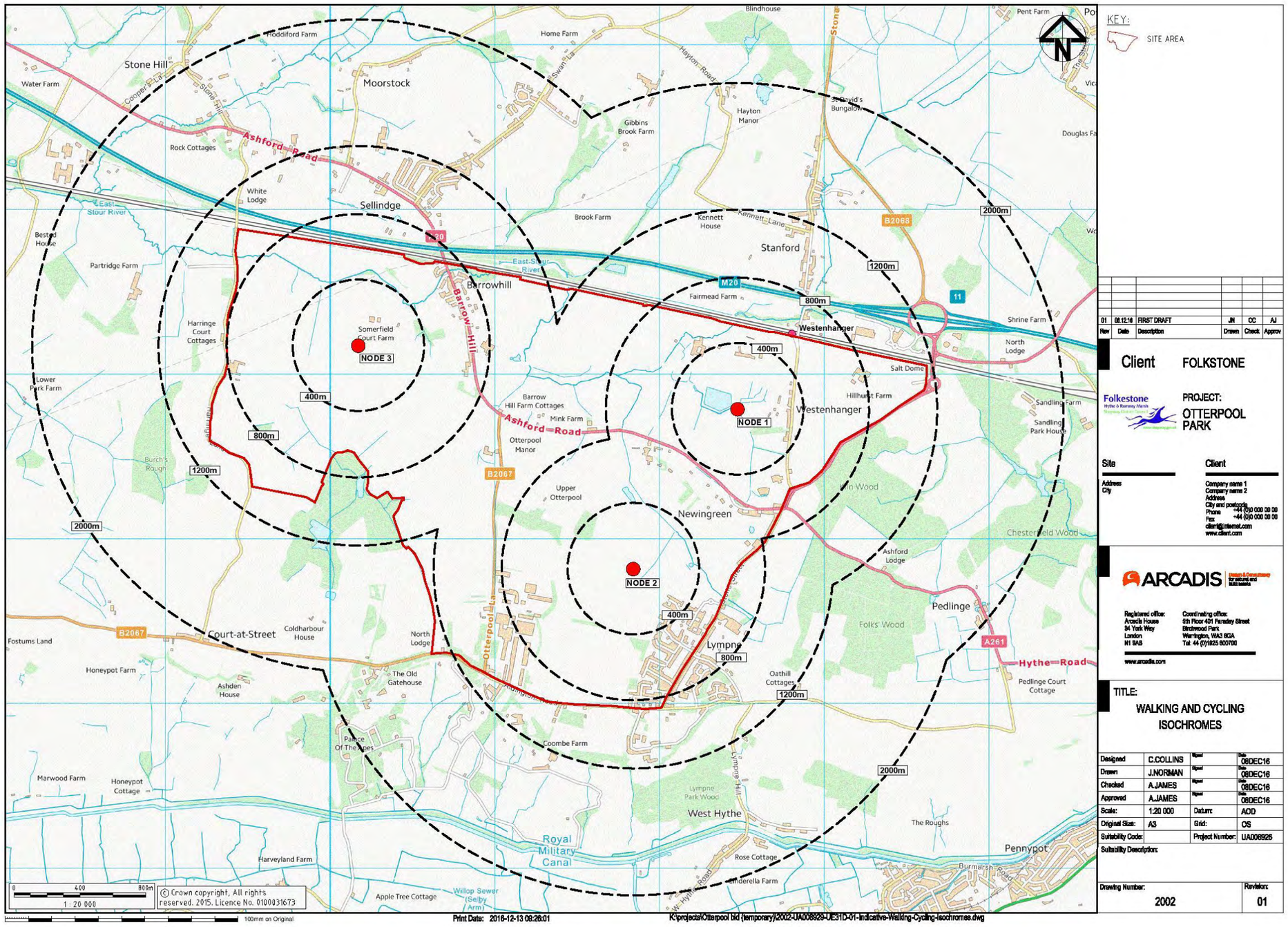


Figure 2003: Bus Stop Locations in the Otterpool Park area

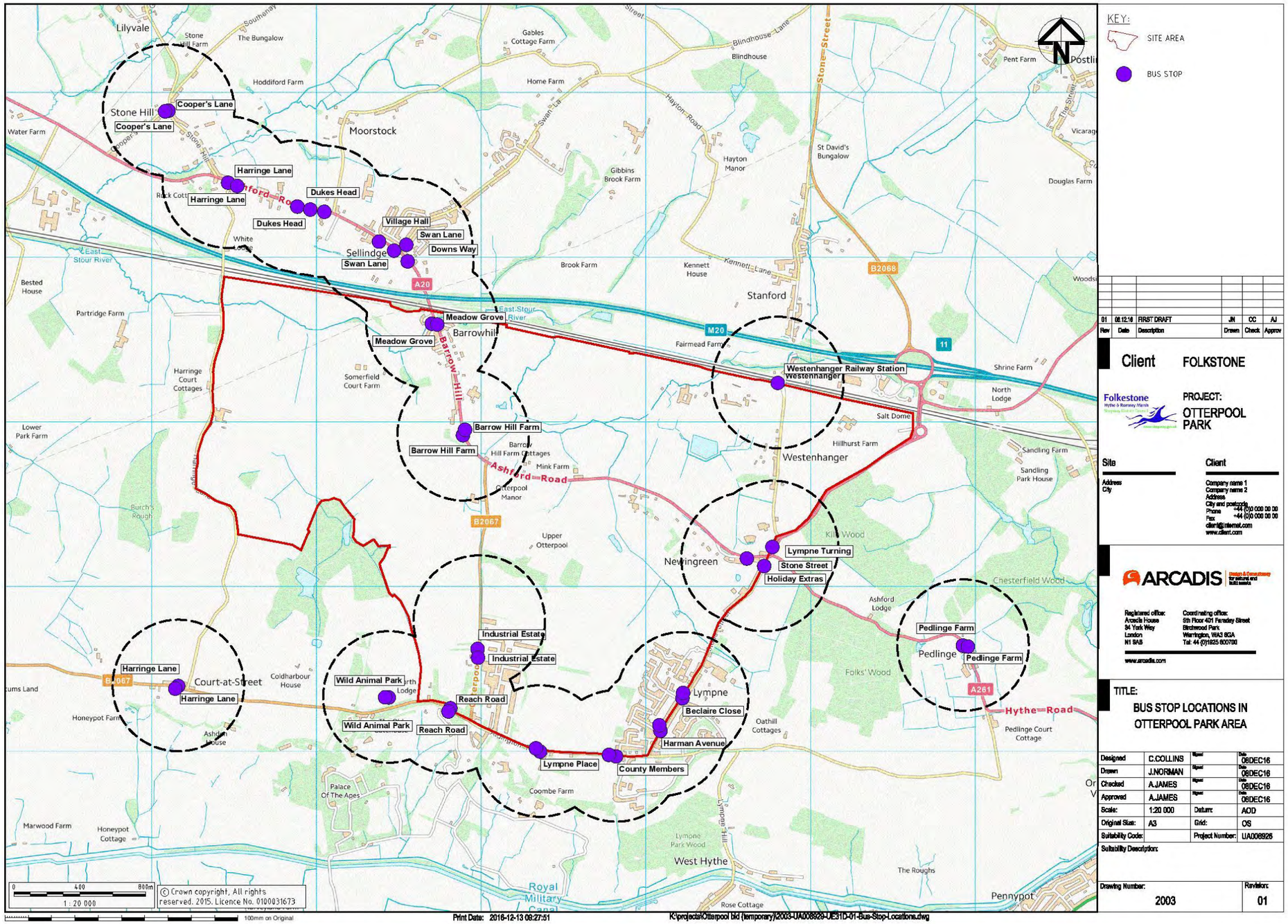


Figure 2004: Bus Routes in the Otterpool Park area

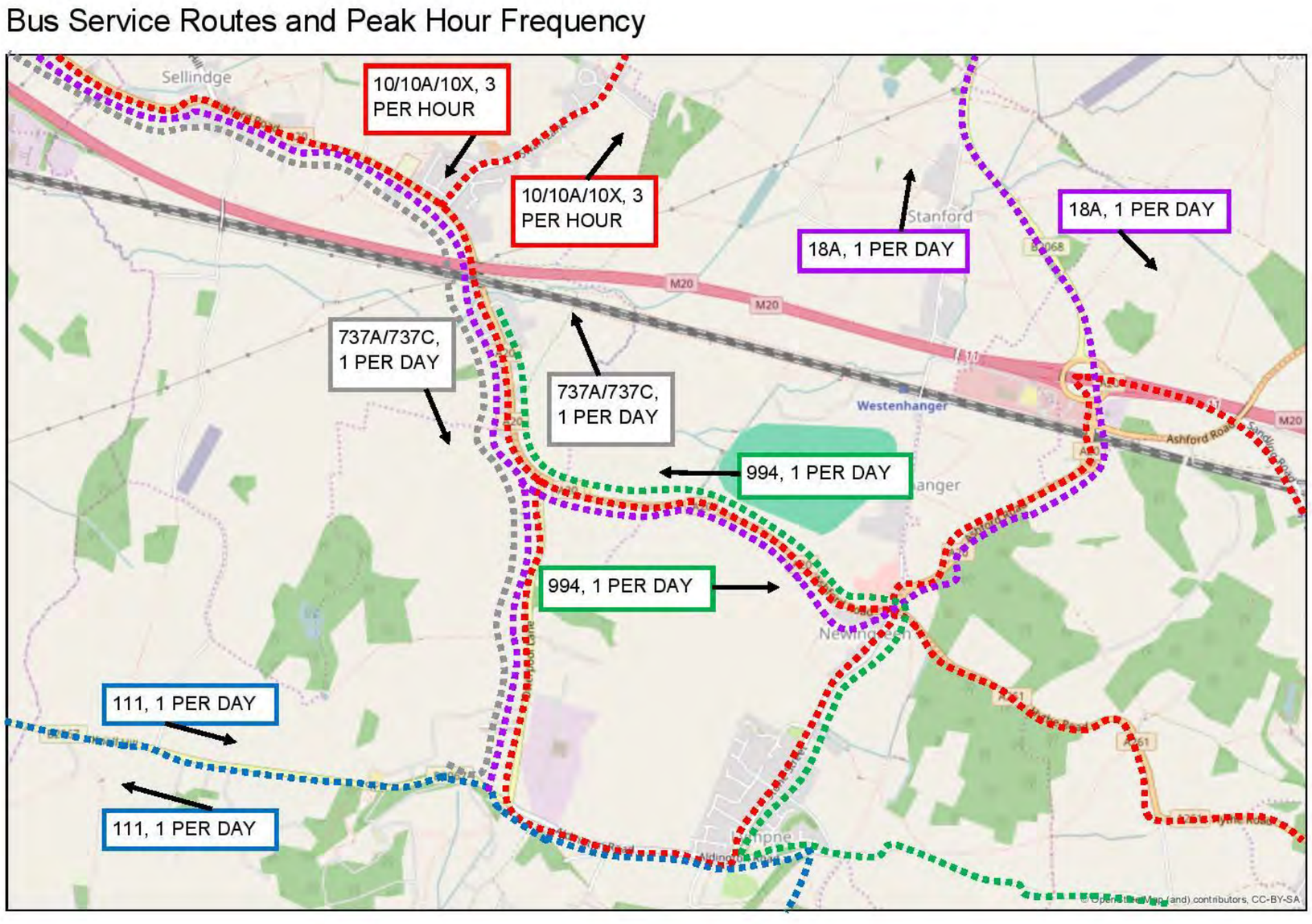
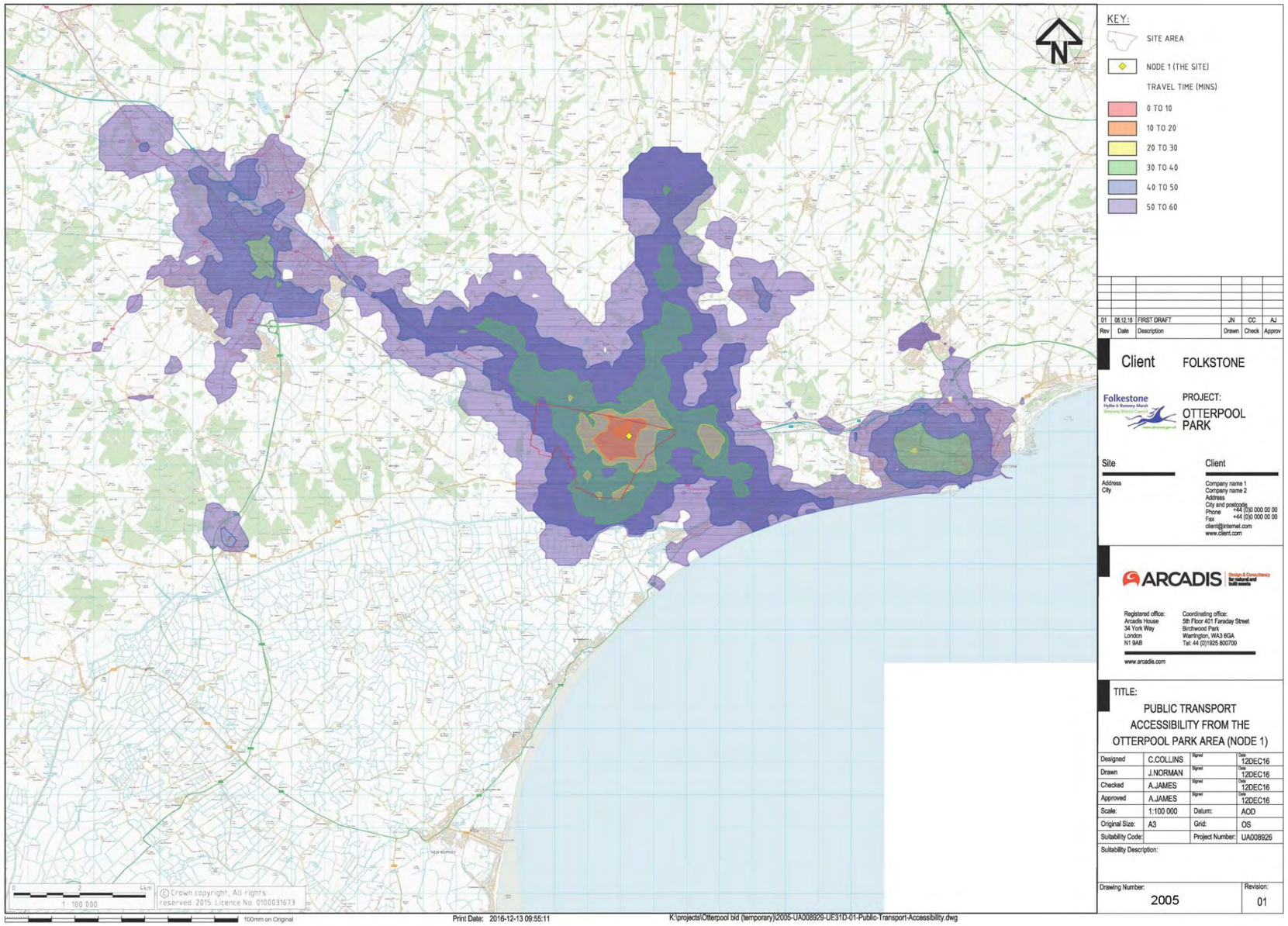


Figure 2005: Node 1 - Public Transport Accessibility Map



APPENDIX F

Site Infrastructure, Ground Conditions and Utilities Workstream Report

Otterpool Park Masterplan

Stage 1 Feasibility and Capacity Study

The following figures & tables are found in this report.

Figures

UA008926-5001-UP31-01 -Land Quality - Potential Development Constraints

Tables

Table 1: Statutory Undertakers assets that are affected or not affected by the development proposal.

Table 2: Potentially Contaminative Land Uses

1 Existing Utilities Assets

1.1 NRSWA C2 Information

1.1.1 Overview

Data collection has been undertaken through a process governed by regulations in the New Roads and Streetworks Act (NRSWA). Under the NRSWA C2 Inquiry process individual consultations with Statutory Undertakers (SU) request extracts from their records to demonstrate their utilities equipment locations and the nature of that equipment (such as sewer sizes, electrical cable capacities, telecom cable types etc.). The data initially arrives in scanned pdf format directly from the SU's plans; with statements whether or not their asset is affected or not affected by the proposed development. All of the data from the Statutory Undertakers is being collated into one Fusion Plan, which will show an overlay of all the utilities in the area of the development on top of one another. This fusion plan is being produced in a format that is easily imported in to GIS. There are number of Statutory Undertakers with asset within the development area, however the review below is centered around the five main Statutory Undertakers

1.2 Summary

Whilst there are existing utilities asset on the site these are predominantly confined to the route of existing highway, with exception to the overhead powerlines to the north western quadrant of the site and the Southern Water pumping station.

There are minor constraints to site development due to existing site assets. Overhead powerlines in the north western corner of the proposed development are a constraint on the site, as well as other localised features such as the presence of a small Southern Water pumping station and small electricity sub stations dotted around the site.

Please see below list for confirmation of Statutory Undertakers assets that are affected or not affected by the development proposal. Where an asset is identified as affected, this means that there are assets present on or immediately adjacent to the site proposal area

Table 1: Statutory Undertakers assets that are affected or not affected by the development proposal.

AFFECTED	NOT AFFECTED
Affinity Water	Energetics UK
BT	Engie
Colt	EU Networks
GTC	SSE
Instalcom	Verizon
Interoute	Vodafone
National Grid	
National Rail	
SGN	
Sky	
Telent	
UKPN	
Virgin	

2 Connection to Statutory Undertakers Networks

2.1 Introduction

Initial discussions have been undertaken to ascertain the viability of connections to Statutory Undertaker Networks, with questions raised to them to ascertain budgetary cost implications and whether or not their respective utility requires above ground land take.

2.2 Affinity Water

Affinity Water confirmed that they would be able to supply the site, however without detailed information there would be little value at this stage in undertaking a connection request. This connection request is their process for identifying whether there is sufficient capacity on their network, and what infrastructure upgrades are required to provide capacity if there is insufficient capacity available.

2.3 Openreach (BT)

Openreach currently do not have fibre broadband services in the area. However they state that they are working with the Government to bring super-fast broadband to as many people in the country as possible. We have opened discussions with Openreach to ascertain their plan for providing a connection to the development, we have yet to have a formal response to establish whether the site can be connected or not.

2.4 SGN

SGN have stated that they would connect the site to their network, however at present they do not serve the local area, although they are the supplier for the south-east region. We are in discussions with SGN over the provision of supply to this area, as this falls under SGN's 'Infill Projects' programme of works.

2.5 Southern Water Services (SWS)

Southern Water Services have confirmed that they will be considering an appropriate solution for the waste water drainage of the development and will be working with Shepway DC and others to ensure that they are not a constraint to development.

SWS have also recommended that once a more detailed masterplan is drawn up, with firm numbers for the quantity of new homes and facilities provided, that they can look at their system and identify where they maybe potential capacity and what infrastructure upgrades will be required.

2.6 UKPN

Discussions are still ongoing with UKPN, however they have stated that they will connect the development to their network. Unfortunately due to the stage at which we are at we don't have enough significant information for UKPN to provide budgetary costs at this stage.

2.7 Summary

Initial enquiries have been made to the main utility providers in this area of Kent to ascertain what is required to supply a potential development of up to 12,000 homes. These enquiries have focused on UKPN (electricity), Openreach (telecommunications) SGN (gas), Southern Water (waste water) and Affinity Water (water supply). All have indicated that they are able to supply the site however there will be significant infrastructure improvements to be made to accommodate a development of this size.

Openreach have stated that there isn't a fibre broadband connection within the development, nor a clear plan developed to provide connection. We have made contact with Openreach regarding this to ascertain what impact the proposed development would have on gaining connection to their fibre broadband network.

SGN have stated that at present this is an area that isn't supplied by themselves, however it is part of their 'Infill Projects' to supply this area.

None of the above mentioned Statutory Undertakers are a constraint to development. When a clear masterplan is formulated they have suggested that a connection application is submitted. After which they will assess their respective networks for capacity and identify the scale and budgetary costs for any required upgrades needed to serve the development. There is a cost implication for this application process that differs per Statutory Undertaker.

All of the aforementioned utilities suppliers request that formal applications for connection are made in order for them to assess available capacity, scale of upgrade required and provide budgetary cost estimates. These formal applications incur a cost as the individual utility companies have to undertake their own capacity assessments in relation to the request for connection of the new development.

3 Recommendations

Connection applications to ascertain the capacity available and required upgrades to the various Statutory Undertakers needs to be carried out when we have a confirmed approach for the masterplan. We recommend that these are undertaken following confirmation of the total number of homes to be built at a later stage. There are common caveats from the Statutory Undertakers on the information provided as part of formal applications for connection, these include but are not limited to:

- Responses to formal application for connection are only valid for 6 months
- Capacity statements are not guaranteed; other developments may come along that take the stated available capacity unless the development is connected within the 6 months.
- High level budgetary costs are an estimate only.

An appreciation of how and over what timescale the development would be constructed (parcels of land built by a number of house builders for example) would be good to know when the application is made, as this may affect how capacity is bought on line for utility connections.

An assessment of the likely loading required per home would be beneficial to assist any connection requests. Once the level of sustainable energy solutions is identified across the proposed development more detailed discussions can be undertaken to ascertain the likely impact on Statutory Undertakers networks.

In terms of the existing assets around the sites any enquiries relating to SU asset protection or diversion (if required as part of the site development) require increased detail of the Masterplan proposals. The process is subject to the C3 stage of the NRSWA procedures: this will not be achievable under the deliverables for the current stage of this project and is likely to be undertaken in a much more advanced design stage of the project.

4 Land Quality

1. Stage 1 Methodology

Preliminary Desk Study Assessment/Gap Analysis

A preliminary review of desk study information relating to land quality at the site has been undertaken in order to identify potential development constraints. This has included an initial assessment of existing data listed in Section 2 below. A gap analysis has been undertaken to identify where further information may be required.

This preliminary assessment has been prepared to inform initial discussions with the study team and assist in the development of the masterplan. It does not constitute a full Phase 1 Land Quality Baseline Study, which will be undertaken during Stage 2 to support the masterplan development.

Walkover / constraint identification

A walkover survey was conducted on the 6th October 2016 by Arcadis Consultant Jon Raven. This walkover identified potentially contaminative features on and near to the site which are detailed later in this report.

Constraints and opportunities mapping

The combined data obtained from the desk study sources in Section 2 and walkover report have been used to make initial assessments as to the constraints and opportunities to inform the Masterplan design. Potential constraints such as adverse ground conditions, contaminative land uses, pollution incidents, aquifer classifications and designated sites are identified in this report.

A constraints plan has been prepared and is appended to this report (Drawing number UA008926-5001-UP31-01). This should be reviewed whilst reading this report.

2. Baseline Data

Information reviewed to date includes:

- Data collected during Arcadis walkover 6th October 2016;
- Shepway District Council, Contaminated Land Strategy, July 2002
- Environment Agency Interactive mapping (maps.environment-agency.gov.uk/wiyby)
- British Geological Survey (BGS) Online GeoIndex (www.bgs.ac.uk/GeoIndex/)
- Planning information - Contamination Assessment report for Otterpool Quarry (SLR 2008)
- Zetica Pre Desk Study Assessment report
- Environmental Information from public and regulatory databases obtained from Landmark Information Group Ltd.
- Historical Ordnance Survey Mapping obtained from Landmark Information Group Ltd.

3. Policy Context

The key policies driving land quality issues at the site are summarised below.

- The **National Planning Policy Framework** (NPPF 2012) sets out current national policy for preventing unacceptable risks from pollution and land instability under the planning system. The NPPF requires the effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, to be taken into account. In particular:
  - The site should be suitable for its new use, taking into account the ground conditions and any pollution arising from previous land use, and any proposal for mitigation including land remediation,
  - After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and
  - Adequate site investigation information, prepared by a competent person, should be presented.

The policy aims to both prevent new contamination and to address the inherited legacy of contaminated land.

3. Policy Context

The primary legislation that covers historic land contamination is Part 2A of the Environmental Protection Act 1990, which was inserted by Section 57 of the Environment Act 1995. Part 2A provides a definition of contaminated land, focussing on risks in the context of the current use and circumstances of the land. It places specific duties on local authorities to inspect their areas to identify land falling within this definition and, where they do, to require its remediation in line with the 'suitable for use' approach.

Part 2A of the Environmental Protection Act 1990 defines contaminated land as 'Any land which appears to be in such a condition, by reason of substances in, on or under the land that: Significant Harm is being caused or there is a Significant Possibility of such harm being caused; or Pollution of Controlled Water is being, or is likely to be, caused.

The identification of contaminated land on the basis that there is a significant possibility of significant harm (SPOSH) being caused is set out in the Statutory Defra guidance on Contaminated Land (Defra (2012).

The identification of contaminated land, as defined in Part 2A of the Environmental Protection Act 1990, comprises a risk-based approach. For harm to the non-aquatic environment or pollution of controlled waters to occur, there must be a relevant 'pollutant linkage'. This linkage is based on the following being present:

- A source of contamination (hazard);
- A pathway for the contaminant to move from source to receptor; and
- A receptor (target), which is affected to an unacceptable degree by the contaminant. This includes humans, ecosystems, controlled waters, physical systems and built structures, which could be affected by the hazard.

The local authority is also required to maintain a register of contaminated sites. It is recommended that they be consulted for the purposes of determining whether any of the proposed development has been designated as contaminated (Section 4 below).

- **Shepway District Council Local Plan Policy U10a** (Shepway District Local Plan Review (2006) Policies Applicable 2013 Onwards) is relevant in this context and is reproduced below:

  When development is proposed on or near a site that, has been used for the purpose of waste disposal; is known to be contaminated; or there is good reason to believe that contamination may exist, the applicant will be required to carry out a site assessment and submit a report of the findings in order to establish the nature and extent of the contamination. Development will only be permitted if practicable and efficient measures are to be taken to treat, contain and/or control any contamination so as not to:

  1. *expose the occupiers of the development and neighbouring land users, including in the case of housing the users of gardens, to unacceptable risk.*
  2. *Threaten the structural integrity of any building built or to be built on or adjoining the site.*
  3. *Lead to the contamination of any watercourse, water body or aquifer.*
  4. *Cause the contamination of adjoining land or allow such contamination to continue.*

  Any permission for development will require that the remedial measures agreed with the Authority must be completed as the first step in the carrying out of the development.

4. Stakeholder Engagement and Feedback

The following stakeholders have been contacted and responses are awaited. This will inform the baseline assessment of the site and deliver early engagement with the relevant regulators for the site to reduce the risk of existing land quality issues being overlooked.

- Building Control Department (Shepway District Council)
- Contaminated Land Officer (CLO) (Shepway District Council)
- Petroleum Officer (Kent County Council)
- Local Environment Agency office

Natural England will be consulted regarding the geological SSSI (see Section 5) and a date for a meeting is currently being agreed.

5. Constraints / Baseline Information

A preliminary assessment was carried out as outlined in Section 1 in order to identify baseline features that may potentially impose constraints / need consideration for the masterplanning of the development.

Geology and Ground Conditions

The site is located on an area of gently undulating ground north of the Hythe escarpment. The bedrock beneath the site is the Lower Greensand Group. In order of increasing age, this Group comprises the Folkestone Formation (sandstone) in the northeast corner of the site, the Sandgate Formation (sandstone, siltstone and mudstone) in the north and east and in three small outliers, and the Hythe Formation (sandstone and limestone) in the south and west. Underlying the Hythe Formation are mudstones of the Atherfield Clay and Weald Clay Formations, which outcrop on the slopes to the south of the site.

Several small inferred faults are shown on and within 1km of the site, trending north-south.

Approximately 50% of the site is covered by Head (clay and silt) superficial deposits. The geological map indicates these deposits may be more gravel and sand dominated in the north and east of the site. Alluvium is shown associated with tributaries of the East Stour River, which drain most of the site towards the northeast.

The BGS records landslide deposits (Quaternary) on the south-facing scarp slope of the Hythe escarpment to the south of the site. As the slope is off site, (with the exception of the far southwest corner) it is not considered to represent a risk to development on the site.

Preliminary information from Landmark indicates that the site is at low or very low risk of ground stability hazards including collapsible ground, landslide, running sands and shrink-swell clays. There is unlikely to be a hazard present from dissolution features.

There is a moderate risk of compressible ground associated with the Alluvium deposits; these are generally confined to within 50m of the main surface watercourses.

The site is located in a low probability area for radon gas emissions from the ground. Less than 1% of homes are estimated to be at or above the Action Level. Remedial measures in new dwellings are therefore unlikely to be a statutory requirement

Potentially Contaminative Land Uses

Potentially contaminative land uses on the site and in the surrounding area have been identified and are summarised below.

Table 2: Potentially Contaminative Land Uses

Feature	Location	Description
On-site		
Former Folkestone race course	Westenhanger, south of the railway	The walkover survey identified fuel storage facilities and electrical substation. Race course was reportedly used as a decoy airfield during WW2 (possible fuel storage and diversionary fires). Former pumping station on site (related to surface water abstraction)
Former RAF Lympne airbase / Lympne Airport	In the area of the current Lympne Industrial Estate and the grassed areas to the east and west.	Military and civilian use as an airfield for approximately 70 years. Runway surfaces and some derelict structures are still evident. (possible fuel storage and spills, crash sites, burning pits, firefighting foams, ordnance)
Miniature rifle range facility	Immediately east of Lympne Airport and west of Lympne Village	Small-bore rifle range shown on historical OS maps from c.1939 to c.1970. Ordnance may be present.
Lympne Industrial Park Landfill	North of the current industrial estate	Limited information available. Understood to have accepted inert waste c.1992. Large stockpiles of Made Ground present on site.
Lympne Industrial estate	On site in the southwest, off the B2067 road	Current land uses include: - Vehicle repair and fuelling (underground fuel tanks) - Gas storage tanks - Warehousing - Electrical Substation Made Ground is present in large bunds to the east of the industrial park.
Farms including biodiesel manufacturer	Several on site around Barrowhill, Upper Otterpool and Westenhanger	Potential features include fuel storage, waste storage and burial. Biodiesel manufacture from vegetable oils at Barrowhill.

Former quarry / Lorry park / former cement manufacturer	Upper Otterpool	Originally in use for quarrying of building stone (Hythe Formation sandstone and limestone) between the 1930s and 1970s. Subsequently the site was used for cement and asphalt manufacturing/processing (Lafarge), as reported in SLR (2008). Current use for the southern half is grazing land. Northern half is used as HGV parking and is unpaved. This is designated as a geological SSSI (see below).
Vehicle repair yard	Upper Otterpool	A small auto repair yard (Arena Autos) is located north of the airport café in the southwest of Area 1. Ground surface is generally poor or no hardstanding. Believed to include fuel, oil and lubricant storage.
Former Crosskeys LPG Service Station	Newingreen	Believed to be obsolete, no further details available.
Electrical substations	Lympne village and Lympne Industrial Park	6No. electrical substation shown in dataset and observed on walkover, all are believed to be small final distribution facilities.
Pits / Ponds	Across the site	Small potentially infilled features across the site.
Within 500m of site		
Quarry Field Landfill	Approx. 5km southeast of site in Lympne	Limited information available. Understood to have accepted inert and household wastes c.1962
Fuel station, vehicle recovery operations	M20 Service area	Petrol filling station entry
Sellindge Service Station (inactive)	Sellindge	Former petrol filling station
Historical tanks	Identified on historical maps to the south (6No.) and north (1No.) of the site.	No further details are available on the stored material; however, it is possible that some were for water storage based on the presence of nearby hydraulic rams.

One significant pollution incident has been recorded on site. This was dated 1999 and located at Lympne Industrial Estate. It comprised the failure of an above ground tank and release of phosphoric acid. Other environmental features are detailed on the constraints plan but are not considered to pose a significant constraint to development. These will be discussed in more detail during the development of the Phase 1 desk study.

Potential contaminants that may be associated with the above tabulated land uses include (amongst others):

- Petroleum hydrocarbons (e.g. oils, fuels, lubricants)
- Polycyclic Aromatic Hydrocarbons (PAH)
- Polychlorinated Biphenyls (PCB)
- Heavy metals
- Asbestos – as free fibres and bound in building materials
- Ground gases – including methane and carbon dioxide from landfill site / significant areas of Made Ground
- Ordnance and possibly burning pits
- Radioactivity associated with instrumentation

UXO and military sites

The presence of former military sites (airfields) indicates that Unexploded Ordnance (UXO) may be present. The Zetica PDSA report indicates that the operational airfield was bombed in WWI and heavily in WWII. A detailed desk study is therefore recommended to assess and zone the UXO hazard level across the site.

Two crash sites have been identified on site; one in the south eastern corner and one in the western part of the site, and there are two further crash sites within 200m of the site boundary. These are discussed in more detail and mapped within the Cultural Heritage report.

Due to the presence of the RAF base on the site, there is the potential of small burning pits and crash sites (as detailed above), which were used to burn old aircraft / equipment. Luminous dials previously contained Radium 226 and therefore there is the possibility of low levels of radiological contamination in these areas. If present these would need to be removed during the development which could increase cost to the project. This may pose a risk to the development in the absence of investigation.

Geological SSSI

The former quarry (Otterpool Quarry) is designated as a Site of Special Scientific Interest (SSSI) due to its geological interest. It is also a Geological Conservation Review (GCR) site.

The site was notified as a SSSI in 1984 due to the significant exposures of the contact between the Hythe Formation and the overlying Sandgate Formation. The last condition review, in 2012, reported that the site was in favourable condition.

It is regulated by Natural England who publish a list of operations likely to damage the special interest of the site. These include most types of construction and excavation activities. Any proposal that includes the operations on the list must be approved by Natural England, and this therefore imposes limits on the development in this location.

Potential Receptors

Information on sensitive land uses and receptors on the site based on the information known to date has been collated and is summarised below:

Human Health

- Current residents (settlements of Lympne, Barrowhill, Westenhanger and various individual properties)
- Current site users (adjacent residents, farms, industrial estate, former racecourse facilities, Westenhanger Castle estate)

Controlled Waters

- The Folkestone Formation in the northeast and the Hythe Formation in the south and west of the site are classified by the Environment Agency as Principal Aquifers. These units have a high permeability and may support water supply or base flow to rivers on a strategic scale. The Sandgate Formation in the north and east of the site is classified as a Secondary A aquifer. These permeable layers capable of supporting water supplies or river base flow at a local rather than strategic scale.
- The Alluvium is classified as a Secondary A Aquifer.
- There are no groundwater Source Protection Zones (SPZ) or licenced groundwater abstractions on the site. The nearest groundwater abstraction is approximately 2km to the east of the site.
- Various surface water receptors are present including field drains, the pond in the centre of the racecourse, and tributaries of the East Stour River. Various springs are shown on historical and hydrogeological maps.
- A surface water abstraction is shown to the area of the racecourse. This is understood to be associated with irrigation and is no longer in use.

Selected features are shown on the constraints plan provided as an attachment to this document in order to inform the masterplanning of the site.

The presence of, or potential for,contamination does not necessarily present an unacceptable risk. Risk exists when a source (contamination) pathway, and receptor are present, forming a contaminant linkage.

This is an initial non-intrusive assessment for masterplanning. Further non-intrusive and intrusive investigation of the site will be required in line with CLR11 Model Procedures for Contaminated Land (2004).

A Phase 1 preliminary risk assessment in accordance with CLR11 is recommended in order to produce a Conceptual Site Model (CSM) for the site. The CSM will identify potential contaminant linkages associated with the potential contaminant sources and receptors listed in this report. The preliminary risk assessment should be prepared as part of Stage 2, once the masterplan has been developed further so that it can assess the different land uses proposed in relation to the features discussed above.

6. Opportunities

Opportunities for general improvement of land quality through the sustainable development of the site and minimisation of environmental and economic costs should be considered. These are outlined below:

- Beneficial regeneration of brownfield land, for example, former areas of landfill and worked ground;
- Mitigation of contamination. If areas of contaminated land are encountered during the development, an opportunity may exist to remediate soils and waters, reducing the long-term potential risk to receptors including Controlled Waters and natural ecosystems, and progressing improving brownfield land quality;

- Reduction of waste and maximisation of reuse of soils can be achieved by the appropriate planning and implementation of a Materials Management Plan(s) (MMP), under the Definition of Waste Code of Practice (DoWCoP) (CL:AIRE, 2011); and
- Part of the site is currently agricultural land (Grade 2). Topsoil is a finite resource that should be stored appropriately and reused where possible (e.g. gardens / soft landscaping) in accordance with an MMP and with regards to DEFRA guidance Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009).

7. Impact on Masterplan Design

The preliminary data review presented in this report has identified a number of potential constraints / considerations relating to potentially contaminated land and other relevant information on ground and groundwater conditions.

None of these features is considered to present a significant constraint to the feasibility of a garden settlement. Restrictions on land use are also considered unlikely to be required although the potentially contaminative land uses identified should be taken into consideration during masterplanning, in particular sensitive land uses (e.g. residential housing with gardens, schools, etc.). Locations of potential drainage via soakaways etc. will need to take into account the areas of potential contamination identified.

A baseline desk study report is recommended to produce a Conceptual Site Model (CSM) and identify potential contaminant linkages. This should include consultation with the organisations listed in Section 4.

A phased approach to ground investigation is recommended, focusing on areas of concern based on the CSM and the proposed development. The findings of the ground investigation should be used to refine the CSM and assess the potential risk to receptors and appropriate mitigation required.

Land quality and ground condition issues can generally be resolved through use of currently available technologies and techniques. However, these may have programme and cost implications to the development project and therefore should be considered early on in the programme of the development.

8. Changes to Risk Register

The risk register entries for land quality and ground conditions are presented in the attached Risk Register.

APPENDIX A

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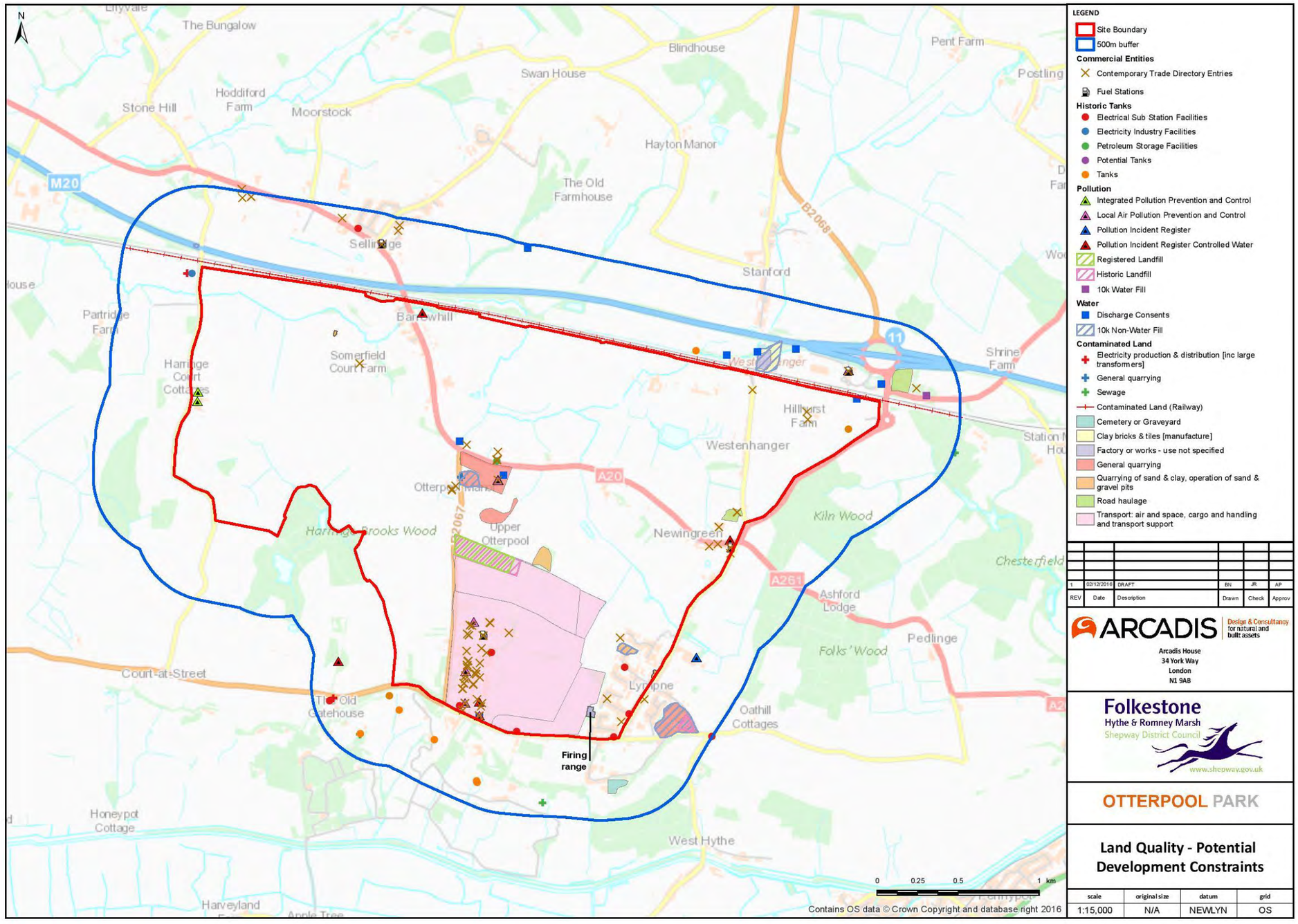


APPENDIX G

EIA Socioeconomics Workstream Report

Otterpool Park Masterplan

Stage 1 Feasibility and Capacity Study

Workstream Name: **Socio-Economics**

Date: **December 2016**

The following figures and tables are found in this report.

Figures

Figure 1: Index of Deprivation Map 2015 (Kent

Figure 2: Indices of Deprivation Map 2015 (Shepway District)

Tables

Table 1: Summary of Demographic Baseline Data

Table 2: Summary Demographic Baseline Data for Wards in Shepway District

Table 3: Housing Tenure Data

Table 4: Housing Tenure Data by Ward

Table 5: Shepway District and Kent County Economic Activity and Qualifications Data

Table 6: Comparison with Other New Settlements (2011 Census Data and 2015 ONS Mid-year estimates)

Table 7: Economic Activity Summary Data by Ward

1. Stage 1 Methodology

For the socio-economics topic, the purpose of Stage 1 has been to review baseline data relating to demographics, local economy and social and community infrastructure, in order to be able to describe the kind of place that Shepway District is at present and how it compares to the wider area of Kent. The Stage 1 methodology also includes a review of key data for other new settlements (examples have included Poundbury in Dorset, Cambourne in South Cambridgeshire and areas of significant new residential development in Ashford), in order to ascertain key demographic characteristics that might be reflective of Otterpool Park.

2. Baseline Data

See Annex A.

3. Policy Context

The policy context for the socio-economics topic includes the following:

- Shepway District Local Plan Review (2006)
- Shepway District Core Strategy Local Plan (2013)
- Places and Policies Local Plan (October 2016)
- Economic Development Strategy 2015-2020, Shepway District Council
- Shepway Open Spaces: Sports & Recreation Report, 2011
- Shepway Housing Strategy 2011-2016
- Affordable Housing Supplementary Planning Document (September 2008)
- Unlocking Kent's Potential: Regeneration Framework
- 21st Century Kent Vision Document
- Development and Infrastructure – Creating Quality Places (Kent County Council)

4. Stakeholder Engagement and Feedback

No stakeholder engagement has been undertaken to date as part of Stage 1 for socio-economics.

5. Constraints

See Annex A.

6. Opportunities

See Annex A.

7. Impact on Masterplan Design

See Annex A.

8. Changes to Risk Register

None identified.

ANNEX A

Baseline Data

Socio-economic Baseline Analysis

Shepway is a south-eastern coastal district in the County of Kent, sharing boundaries with Dover to the east and north, with Ashford to the north and west and Rother District in East Sussex to the south and west. The 2011 Census records a population of 107,969 residents in Shepway. Shepway district is a predominantly rural area, with a population density of three persons per hectare. Population is concentrated in the coastal towns of Folkestone and Hythe.

Table 1 sets out summary demographic baseline data for Shepway District, with Kent as a comparator. The table shows that the resident population of Shepway District increased by 14.3% compared to 10.1% for Kent as a whole between 2001 and 2015. Both Shepway and Kent have a slightly higher percentage of females, and the majority of the population fall within the White British category for ethnicity. Shepway District as a whole has a slightly older population profile, with 23.5% of its population aged over 65, compared to 17.9% for Kent. The number of young and working age people is consequently lower in Shepway as a proportion, given the larger proportion in the older age groups.

Table 1: Summary of Demographic Baseline Data

	Shepway District	Kent County
Total population (2015 mid-year estimates)	110,034	1,524,719
Population growth (2001-2015)	14.3%	14.7%
Age profile (%) (2015)		
0-15	17.1%	19.1%
16-64	59.4%	61.2%
65+	23.5%	19.7%
Gender (%) (2015)		
Male	49.4%	49.0%
Female	50.6%	51.0%
Ethnicity (%) (2014 mid-year estimates)		
White / White British	94.7%	93.7%
Asian / British Asian	3.4%	3.3%
Black/ Black British	0.4%	1.1%
Mixed White / Black /Asian	1.2%	1.5%
Other Minority	0.3%	0.5%

Summary Demographic Baseline Data for Wards in Shepway District

– *(Please see Table 2 to the end of this document)*

In May 2015, new ward boundaries were formed in the District of Shepway, with the number of wards reduced from 22 to 13. Table 2 shows summary demographic baseline data on a ward-by-ward basis, with highlighted columns showing those wards covering the Otterpool Park area of search.

Of the three wards that have part of the area within the Otterpool site, there are particularly high proportions of over 65 year olds and low children and working age, compared to Shepway district or Kent as a whole. In terms of ethnicity, the proportion of population classified as White British is higher than the district average, ranging from 96.5-98.1%.

1.1.1 Housing Data

The section provides summary data in relation to housing tenure by district and ward. Contributory factors to housing tenure include average earnings, property prices and housing supply. Table 3 sets out data for housing tenure taken from the 2011 census, and shows that over half of the population of both Shepway District and Kent County are property owners. Shepway has a higher proportion of private rented properties, and a lower proportion of social rented properties than is the case for the County as a whole. A new Strategic Housing Market Assessment (SMHA) will be published shortly with more up to date information at both County and District level.

Table 3: Housing Tenure Data

	Shepway District	Kent County
Housing Tenure (%)		
Owned	64.8	67.3
Shared ownership	0.5	1.0
Private rented	22.2	16.5
Social rented	11.2	13.9

Source: Nomis 2011

Table 4 in Annex A of this document shows housing tenure data for each of the 13 wards within Shepway District. Of the three wards in the Otterpool area of search, there is high home ownership in the more rural wards of Hythe Rural and North Downs West.

1.1.2 Local Economy

Table 5 sets out summary statistics for the local economy. Census data from 2011 indicates that Shepway District and the County of Kent have a high percentage of economically active residents, with over two-thirds of each area's population in employment. With regard to qualifications, a slightly higher proportion of residents in Shepway District have no qualifications than is the case for Kent as a whole (24.7% compared to 22.5%). Shepway District shows as having a higher proportion of benefit claimants than for Kent as a whole (this includes all the main out-of-work benefits, such as Jobseeker's Allowance, ESA Incapacity Allowance).

Industries with the highest proportions of employees in Shepway District include the wholesale and retail trade/motorvehicle repairs (16.7%), human health and social work activities (13.9%) and administrative and support services (11.1%). The District also has a higher proportion of employees in the public administration and defence category (6.2% compared to 3.3% for the South-East as a whole). Shepway has a lower proportion of employees in professional, scientific and technical activities than is the case for the South-East (4.2% compared to 9.1%).

Table 5: Shepway District and Kent County Economic Activity and Qualifications Data

	Shepway District	Kent County
Economic Activity		
Economic Activity (2011)	81.4%	79.3%
Unemployment[1] (%)	5.3%	5.4%
Benefit Claimants[2] (%)	14.5%	11%
Qualifications (2011)		
No qualifications	24.7%	22.5%
GCSE and A level equivalents	44.3%	43.9%
Further and higher education	21.8%	24.7%
Other qualifications	5.4%	5.1%

Source: Nomisweb

Economic Activity Summary Data by Ward

(Please see **Table 7** Appended to the end of this document)

Table 6 includes information on economic activity and qualifications by ward within Shepway District. The wards within the area of search have a lower percentage of economically active residents than is the case at District and County level, but also lower unemployment.

With respect to qualifications, Hythe Rural has a higher proportion of residents with no qualifications than the District as a whole. Hythe and North Downs West however have a higher proportion of residents with further and higher education qualifications. Hythe is home to a variety of education establishments, including adult education facilities and an arts college.

'Shepway in Context' describes the District as having three distinct economic sub-areas – Folkestone and Hythe, Romney Marsh and the North Downs area, each of which have their own distinct economies and spatial characteristics. A summary of these is given below:

- **Folkestone and Hythe** – home to the majority of economic activity in the District and where the majority of growth is likely to take place up to 2026. The sub-area has good transport connections (for example HS1, M20, Eurotunnel, Port of Dover). Folkestone is the largest retail centre in the District and both Folkestone and Hythe have several industrial estates. Folkestone is developing a role as a focus for cultural, creative and IT companies especially in the Old Town.
- **Romney Marsh** – predominantly agricultural area. Home to the nuclear power stations at Dungeness (one of which is currently being decommissioned and the other due to decline significantly) and also Lydd Airport (which has plans for expansion to accommodate larger planes).
- **North Downs** – again a predominantly agricultural area, with settlements including Hawkinge, Sellindge, Lyminge, Elham and Densole and including part of the Kent Downs Area of Outstanding Natural Beauty. The sub-area performs exceptionally well economically, with key development opportunities.

1.1.3 Deprivation

The English Index of Multiple Deprivation (IMD)2015 provide a relative measure of deprivation at small area levels (known as Lower Super Output Areas or LSOAs) across England, based on information relating to income, employment, health and disability, education, crime, barriers to housing and services and living environment, which can be combined into an overall. Shepway District has moved down in the rankings between 2010 and 2015, indicating that levels of deprivation have reduced relative to other local authorities in England. Shepway District's national IMD ranking is 113 of 326 with four LSOAs in the top 10% most deprived areas. These include the old ward boundaries of Folkestone Harbour, Folkestone Central, Folkestone East and Folkestone Ford. Deprivation levels are shown spatially on Figures 1 and 2 below, with the site of the proposed Otterpool Park development identified for information.

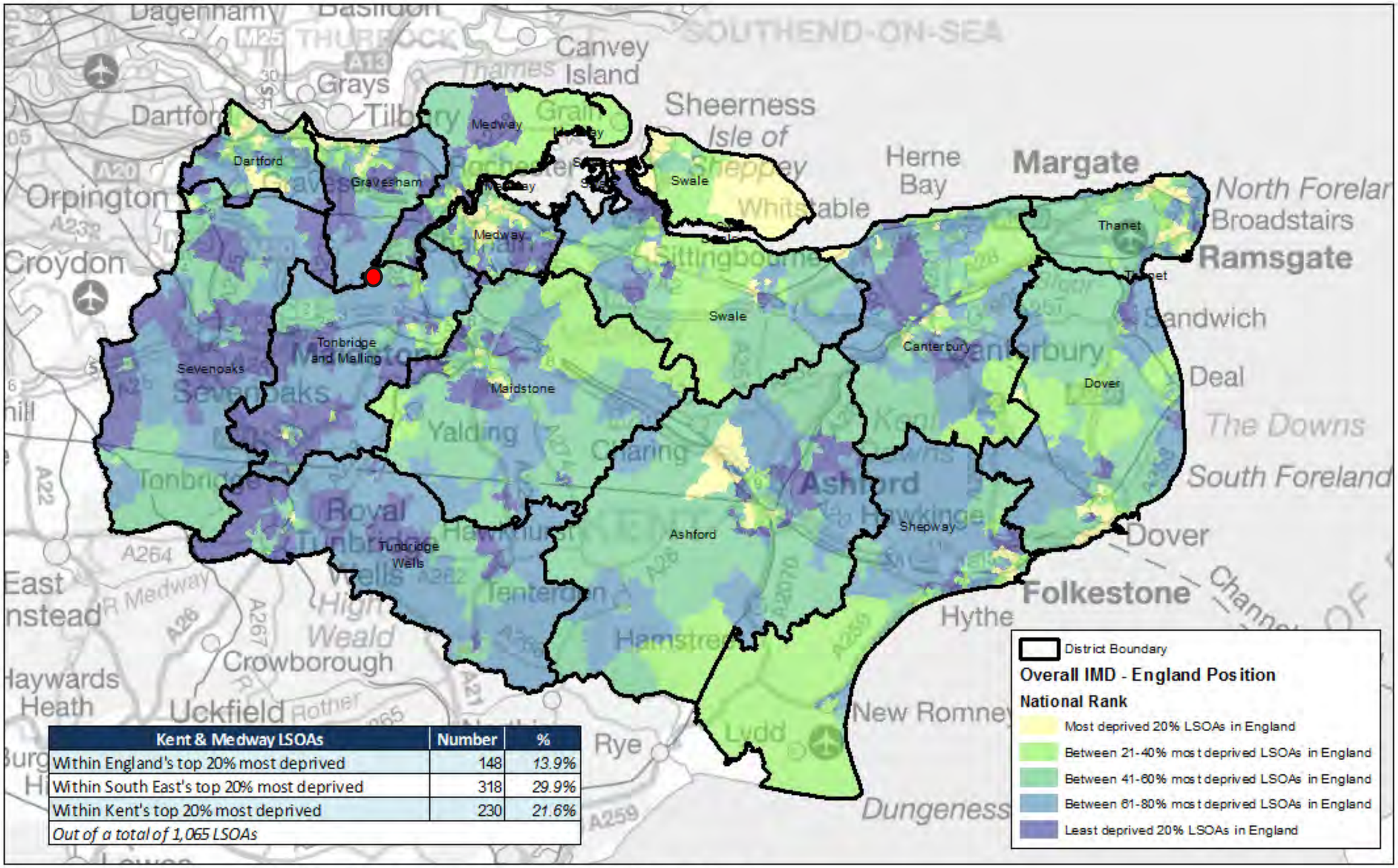
[1] July 2015-June 2016 data (Nomisweb)

[2] NB this relates to all out-of-work benefits by working age people

APPENDIX A

Tables and Figures

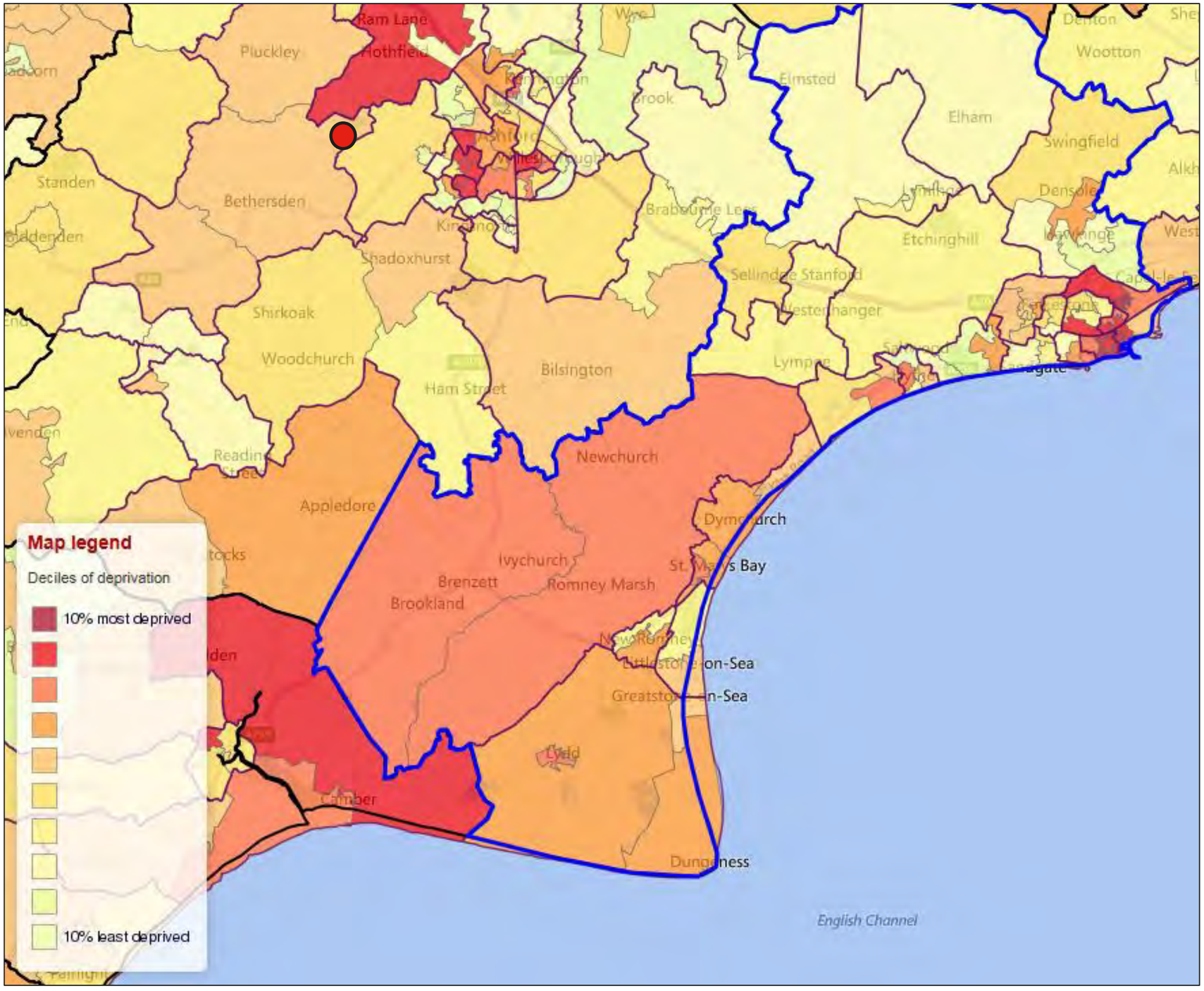
Figure 1: Index of Deprivation Map 2015 (Kent)



Kent & Medway LSOAs	Number	%
Within England's top 20% most deprived	148	*13.9%*
Within South East's top 20% most deprived	318	*29.9%*
Within Kent's top 20% most deprived	230	*21.6%*
Out of a total of 1,065 LSOAs		

This map produced by Strategic Business Development & Intelligence, Kent County Council

Figure 2: Indices of Deprivation Map 2015 (Shepway District)



Source: (http://dclgapps.communities.gov.uk/imd/idmap.html)

Table 2: Summary Demographic Baseline Data for Wards in Shepway District

	Broadmead	Cheriton	East Folkestone	Folkestone Central	Folkestone Harbour	Hythe Rural	Hythe	New Romney	North Downs East	North Downs West	Romney Marsh	Sandgate and West Folkestone	Walland and Denge Marsh
Total population[3]	3,854	12,432	11,938	11,460	6,914	5,855	11,219	7,169	11,791	6,367	7,186	5,656	,193
Age profile (%)													
0-15	14.5	21.4	23.1	14.0	21.6	14.5	12.6	14.4	20.3	15.0	10.7	14.7	17.9
16-64	58.9	61.6	62.6	65.5	63.8	57.1	52.4	54.8	60.7	57.4	53.5	61.0	58.2
65+	26.6	17.1	14.3	20.5	14.6	28.4	35.0	30.8	19.0	27.6	35.8	24.2	23.9
Gender (%)													
Male	49.2	47.7	48.9	53.0	50.9	48.3	47.2	48.7	49.4	48.7	48.2	51.3	50.7
Female	50.8	52.3	51.1	47.0	49.1	51.7	52.8	51.3	50.6	51.3	51.8	48.7	49.3
Ethnicity (%) (2014 Mid-year estimates)													
White / White British	90.1	84.7	95.9	93.0	95.8	98.1	96.5	97.7	95.5	98.0	98.6	90.0	98.3
Asian / British Asian	0.7	12.7	2.1	3.6	1.8	1.0	2.1	1.2	2.7	0.7	0.4	7.3	0.6
Black/ Black British	0.5	0.5	0.5	1.0	0.7	0.2	0.2	0.2	0.4	0.1	0.1	0.4	0.1
Mixed White / Black /Asian	1.2	1.2	1.2	1.7	1.3	0.6	1.0	0.8	1.2	1.1	0.8	1.9	0.9
Other Minority	0.1	0.8	0.2	0.7	0.3	0.1	0.1	0.1	0.3	0.1	0.1	0.4	0.1

[3] Total population, age and gender data is based on 2015 Mid-Year Population Estimates. Ethnicity statistics are based on 2014 Mid-Year Population Estimates. (ONS)

Table 4: Housing Tenure Data by Ward

	Broadmead	Cheriton	East Folkestone	Folkestone Central	Folkestone Harbour	Hythe Rural	Hythe	New Romney	North Downs East	North Downs West	Romney MArsh	Sandgate and West Folkestone	Walland and Denge Marsh
Housing Tenure (%)													
Owned	76.2	64.8	51.9	34.3	48.1	78.8	70.9	77.4	75.2	81.7	80.0	67.8	72.0
Shared ownership	0.2	0.4	0.2	0.7	0.3	0.2	0.4	0.4	0.9	0.7	0.2	0.9	0.2
Private rented	16.3	17.8	23.8	51.9	31.5	5.9	15.7	9.9	11.2	8.4	7.7	21.1	13.6
Social rented	4.9	12.2	21.6	10.0	17.7	11.8	9.4	9.0	9.1	6.0	8.3	7.4	10.5
Other rented	1.6	3.8	1.4	1.9	1.6	1.6	1.9	1.8	2.5	1.2	2.2	2.0	1.8
Living Rent Free	0.9	1.0	1.1	1.2	0.9	1.6	1.7	1.5	1.0	2.0	1.5	0.8	1.9

Table 7: Economic Activity Summary Data by Ward

	Broadmead	Cheriton	East Folkestone	Folkestone Central	Folkestone Harbour	Hythe Rural	Hythe	New Romney	North Downs East	North Downs West	Romney MArsh	Sandgate and West Folkestone	Walland and Denge Marsh
Economic Activity													
Economic Activity (%) (2011)	67.1	70.6	68.2	68.9	69.6	64.7	64.1	62.3	71.2	68.3	58.3	71.5	65.0
Unemployment (%)	4.0	4.3	6.3	8.4	8.0	2.8	3.0	3.5	3.6	2.1	3.7	2.9	4.7
Qualifications													
No qualifications	23.1	23.0	27.6	24.7	28.1	26.2	22.5	30.1	18.3	19.9	35.9	19.0	30.7
GCSE and A level equivalents	47.1	47.7	49.8	44.5	46.4	43.0	39.5	44.0	48.0	41.4	41.4	48.5	45.9
Further and higher education	25.3	17.3	14.5	25.3	17.7	21.5	32.8	19.2	25.6	32.1	14.9	31.0	15.4
Other qualifications	5.1	7.9	5.2	7.4	5.7	4.5	5.0	5.5	4.4	3.6	4.7	6.5	4.8

Comparison with Other Areas

This section provides a brief overview of baseline characteristics for other new settlements, including Cambourne in South Cambridgeshire and Poundbury in Dorset. The Park Farm area of Ashford has also been included as a relatively new residential extension in a neighbouring district. When comparing these areas to Shepway District, Shepway has a slightly smaller proportion of the population of working age (61.4%) than is the case for Cambourne, Poundbury or Park Farm. The economic activity rate for Shepway District is also lower than for Cambourne (81.4% for Shepway compared to 85.6% for the Bourn ward in which Cambourne is located); Shepway is however comparable to the Park Farm wards in Ashford district.

Table 6: Comparison with Other New Settlements (2011 Census Data and 2015 ONS Mid-year estimates)

	South Cambridgeshire (County)	Bourn (Ward)	Cambourne (Parish)*	West Dorset (County)	Dorchester (Combined Wards)	Poundbury (Parish)*	Kent (County)	Ashford (District)	Park Farm (Ward)	Shepway (District)	Otterpool Park (Combined Wards – Hythe, Hythe Rurak + North Downs West)
Resident Population	154,888	12,226	8,186*	100,747	19,634	2,266*	1,524,719	124,250	7,068	110,034	23,441
Population aged 16-64	61.5%	63.1%	-	56.4%	58.3%	62.0%*	61.2%	60.5%	64.9%	59.4%	54.9%
Economic activity	84.3%*	85.6%*	-	85.6%*	91%*	-	79.3%*	79.8%*	81.5%*	81.4%*	-
No qualifications (%)	15.3%*	5.7%*	6.3%*	20.1%*	19.5%*	-	22.5%*	21.2%*	12.3%*	7.5%*	-

*2011 Census Data

APPENDIX H

EIA Noise Workstream Report

Otterpool Park Masterplan

Stage 1 Feasibility and Capacity Study

Workstream Name: **Noise**

Date: **December 2016**

1. Stage 1 Methodology

The review of baseline noise information available for the site that would be suitable for the assessment and consideration of a mixed-use settlement such as that proposed at Otterpool has been undertaken. However, as would be expected with regard to noise there is very little existing detailed baseline information available for the site that can be used to inform the masterplan and EIA.

As such a detailed baseline and ambient noise survey will be commissioned in Stage 2 to accurately quantify the prevailing baseline noise climate of the development site, which will aim to be used to inform the masterplan as well as forming the basis of the noise assessment and ES Chapter.

The following review has been undertaken from desk-based sources.

2. Baseline Data

There is no specific publically available quantifiable information available with regard to the baseline and ambient noise climate at the site that can be used to inform the masterplanning process. Specific constraints would be confirmed through the baseline and ambient noise survey that is planned in due course.

3. Policy Context

There are a number of National and Local policy documents that would be relevant to the assessment and consideration of noise impacts associated with residential development and as such will therefore be referenced within the EIA process. However, these Policies are not specifically relevant to the baseline surveys necessary to inform the masterplan and EIA, but more related to the assessment and consideration of the gathered data.

Within the process of the EIA the baseline noise surveys would be undertaken in accordance with appropriate British Standards and Guidance specific to equipment and methodology.

For the EIA assessment the likely effects of the proposals presented in the Masterplan will be assessed against relevant national and local policy supported, as appropriate, by information in relevant British Standards and guidelines. These are likely to include:

- Noise Policy Statement for England (NPSE, 2010)
- National Planning Policy Framework (NPPF, 2012)
- Planning Practice Guidance Noise
- Any applicable local policies.
- BS5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites. Noise
- BS4142:2014, Methods for rating and assessing industrial and commercial sound
- BS8233:2014, Guidance on sound insulation and noise reduction for buildings

3. Policy Context

- Design Manual for Roads and Bridges (DMRB, 2011)

Consideration will be made of any noise mitigation measures and provide outline details for any measures that may be required to meet the relevant national and local policy objectives at both the existing noise sensitive dwellings and the proposed noise sensitive uses.

4. Stakeholder Engagement and Feedback

The acoustics team is in the process of liaising with SDC's Environmental Health Department to agree a baseline noise monitoring scope that will assist in the development of the masterplan and EIA.

5. Constraints

Whilst there is no specific baseline or ambient noise data available for the site at the present time that could be used to inform the potential constraints to residential development, reference to nearby land uses identified via map data allows subjective constraints to be identified as detailed below. These areas would require specific consideration within the master planning process to ensure that adverse noise impacts are avoided.

It is specifically noted that this is subjective opinion at this stage, based upon acoustic principles and confirmation of the exact magnitude of these constraints can only be confirmed following the detailed assessment.

Specific constraints would be confirmed through the baseline and ambient noise survey undertaken as part of the overall assessment process and including during the EIA. The baseline and ambient noise data amassed within the surveys would be used to map the propagation of noise across the development site allowing detailed consideration of residential suitability across the site and identification of key areas of constraints within the design.

Infrastructure noise is likely to be the main existing noise source of the development site, specifically in close proximity to the main routes. These are identified as:

- ***M20 Motorway and HS1 to the north of the development site***: These features are likely to be the predominant noise sources of the area, specifically with regard to the northern aspect of the development site. As such acoustic issues would need to be a key features of the design of this northern area of the site. There is a high risk that the mitigation measures would need to be considered within this area (the exact extent will be confirmed through detailed assessment):
- ***A20 Ashford Road to the north east and through the centre of the site***: The A20 is also likely to be a predominant noise source for aspects of the development, specifically in close context. As such acoustic issues would need to be a key features of the design within close proximity to the A20, with mitigation measures requiring to be specified within this area (the exact extent will be confirmed through detailed assessment):

Should the Lympne Industrial Estate be retained on site, an assessment of associated noise will be made of the effects upon noise sensitive elements of the proposals in the context of the new development.

6. Opportunities

Generally, the following measures should be considered, and where necessary implemented within the design of the development to ensure a commensurate level of noise protection is provided to ensure that appropriate amenity is achieved across the development site.

- Standoff zones between sensitive residential development (within the design) and the main noise sources of the area as identified:

  - M20 motorway;
  - HS1 high speed railway line;
  - A20 Ashford Road;
- Acoustic fencing/bunding adjacent to the key noise sources depending upon design, these are likely to require to be sizable features in certain cases, specifically with regard to the M20 and HS1;
- Sensitive external amenity space should be either excluded from the aspects of the development site within close proximity to the identified main noise sources (as listed above) or development designed such to position external amenity spaces away from these features, behind dwellings, apartment blocks etc. (dwellings fronting onto these elevations); and
- Potential use of commercial office/research uses within close proximity to the M20 motorway/HS1.
- Heavy industrial/ noise generating activities should be avoided as a result of the potential to create additional noise impacts into the scheme.

Furthermore, it is highly likely that in peripheral areas of the development site, adjacent to the identified noise sources enhanced façade designs would be necessary to control internal noise including acoustic glazing and ventilation provision. However, this is likely to reduce toward the central portions of the site as a result of increased distances and screening provision from the identified main noise sources.

7. Impact on Masterplan Design (or possible approaches to minimise impacts)

Approaches to minimise impacts are identified as per the above opportunities.

8. Changes to Risk Register

No new risks identified to date.

APPENDIX I

EIA Air Quality Workstream Report

Otterpool Park Masterplan

Stage 1 Feasibility and Capacity Study: Initial Findings

Workstream Name: **Air Quality**

Date: **December 2016**

The following figures and tables are found in this report.

Figure

Figure 1 – Air Quality Monitoring Sites (existing)

EIA - Air Quality

Table 1 NO2 Monitoring Results

Table 2 Background Pollutant Concentration Predictions

Table 3 Air Quality Objectives

1. Stage 1 Methodology

A review of currently available baseline data has been undertaken including review of Local Air Quality Management (LAQM) reports and local planning policy downloaded from the Shepway District Council (SDC) website, background concentrations downloaded from the Department for the Environment, Food and Rural Affairs (Defra) website and utilisation of google earth to assess potential site constraints.

2. Baseline Data

Local Air Quality Management

As required by the Environment Act (1995), SDC has undertaken a Review and Assessment of air quality within their area of jurisdiction. This process has indicated that concentrations of all pollutants considered within the Air Quality Strategy (AQS) are below the relevant AQS objectives and as such, no Air Quality Management Areas (AQMAs) have been declared to date.

Air Quality Monitoring

SDC undertake monitoring of nitrogen dioxide (NO_2) concentrations using passive diffusion tubes at 9 locations across their district. Review of the most recently available LAQM report[1] indicated that the Royal Oak Motel, Ashford Road diffusion tube is located within the site boundary and Cold Harbour diffusion tube is located to the south west of the site. The locations are shown in Figure 1 at the end of the report. Recent NO_2 results are shown in Table 1.

Table 1 NO_2 Monitoring Results

Monitoring Site	Site Classification	2012 Monitored Annual Mean NO_2 Concentration (µg/m^3)
Royal Oak Motel, Ashford Road	Roadside	23.9
Cold Harbour	Urban Background	16.5

As shown in Table 1, no exceedances of the annual mean AQS objective for NO_2 of 40 µg/m^3 were recorded at either monitoring site in 2012. Reference should be made to Table 3 within Section 3 for full details of the AQS objectives.

It should be noted that there are no monitoring sites next to the M20 motorway. As such, concentrations adjacent to the motorway are currently unknown and it is recommended that a diffusion tube survey is undertaken to determine concentrations across the site.

Background Pollutant Concentrations

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by Defra for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located across a number of grid squares. Data for these locations was downloaded from the Defra website[2] for the purposes of this assessment and is summarised in Table 2.

Table 2 Background Pollutant Concentration Predictions

Grid Square	Pollutant	2015 Predicted Background Concentration (µg/m^3)
611500, 137500	NO_2	11.7
612500, 137500	NO_2	11.9
611500, 136500	NO_2	9.3
612500, 136500	NO_2	9.7

As indicated in Table 2, background concentrations are predicted to be below the relevant AQS objectives at the site.

3. Policy Context

UK Legislation

Part IV of the Environment Act (1995) requires UK government to produce a national AQS which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was published in July 2007. The AQS sets out objectives that are maximum ambient pollutant concentrations not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale.

The regulations referred to in the AQS have been supplemented by the Air Quality Regulations (2010), which came into force on 11th June 2010 and transpose the European Union (EU) Air Quality Directive (2008/50/EC) into UK law. Air Quality Limit Values (AQLVs) were published in these regulations for seven pollutants, in addition to Target Values for an additional five pollutants. These are generally in line with the AQS objectives, although the requirements for the determination of compliance vary.

Table 3 presents the AQS objectives for pollutants considered within this assessment.

Table 3 Air Quality Objectives

Pollutant	Air Quality Strategy Objective	
	Concentration (µg/m^3)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM_{10}	40	Annual mean

1 Shepway District Council LAQM Progress Report, Bureau Veritas Air Quality, 2013.

2 http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html.

	50	24-hour mean; not to be exceeded more than 35 times a year

It is a requirement of the Environment Act (1995) that Local Authorities (LAs) review current and future air quality within their area of jurisdiction under the system of LAQM. Any areas of relevant exposure where the AQOs are not, or unlikely to be, achieved should be identified.

Where it is anticipated that an AQO will not be met, it is a requirement that an AQMA be declared. Where an AQMA is declared, the LA is obliged to produce an Action Plan in pursuit of the achievement of the AQOs.

National Planning Policy

National Planning Policy Framework

The National Planning Policy Framework (NPPF) (2012) sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to the proposed development:

"The planning system should contribute to and enhance the natural and local environment by:

…Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability"

"Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."

The implications of the NPPF will be considered throughout the Air Quality Assessment.

National Planning Practice Guidance

The National Planning Practice Guidance (NPPG) web-based resource was launched by the Department for Communities and Local Government in March 2014 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. Why should planning be concerned about air quality?
2. What is the role of Local Plans with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality be relevant to a planning decision?
6. Where to start if bringing forward a proposal where air quality could be a concern?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?
9. How do considerations about air quality fit into the development management process?

These will be reviewed and the relevant guidance considered as necessary throughout the undertaking of the Air Quality Assessment.

Local Planning Policy

The SDC Local Plan comprises two policy documents that explain the vision for Shepway and how that vision will be delivered. The Core Strategy is the overarching planning policy document for the district and sets out the vision for the district to 2026. The Core Strategy contains the following policy relevant to air quality:

“POLICY SD 1 All development proposals should take account of the broad aim of sustainable development – ensuring that development contributes towards ensuing a better quality of life for everyone, now and for generations to come. This involves meeting economic and social objectives and helping people meet their personal aspirations through accommodating the district’s need for commercial and industrial development, new homes and other land uses and improving quality of life for all members of society whilst respecting the following environmental criteria:

h) Maintain and enhance water, soil and air quality..

This policy will be considered throughout the Air Quality Assessment.“

4. Stakeholder Engagement and Feedback

Consultation via email with SDC’s Environmental Protection Officer has been undertaken to request their most up to date LAQM reports and to confirm the required duration of air quality monitoring. A period of six months of diffusion tube monitoring has been agreed with the Officer and will be used to provide a baseline of the air quality at the site. Prior to commencement of the monitoring, the proposed locations will be confirmed with SDC, along with an agreement of the proposed air quality assessment methodology.

5. Constraints

Background concentrations for 2015 across the site are below the AQS objective and monitoring data from 2012 at two locations, one at the site, are below the AQS objective. However, the currently available monitoring data is from 2012 and there are no monitoring locations adjacent to the M20 motorway or railway. Due to the proximity of the motorway and railway there is the potential for air quality effects from these sources. As such, sensitive receptors (residential properties and schools) would need to be set back from the motorway/ rail corridor to minimise exposure to poor air quality.

6. Opportunities

Air quality monitoring using diffusion tubes will be undertaken to determine baseline conditions at the site. There are no specific opportunities identified at the present stage.

Table 4 Additional Fees

Work Required	Fee (£)	Details
Air Quality Monitoring	4,250	Six months of monitoring comprising of seven site visits

7. Impact on Masterplan Design

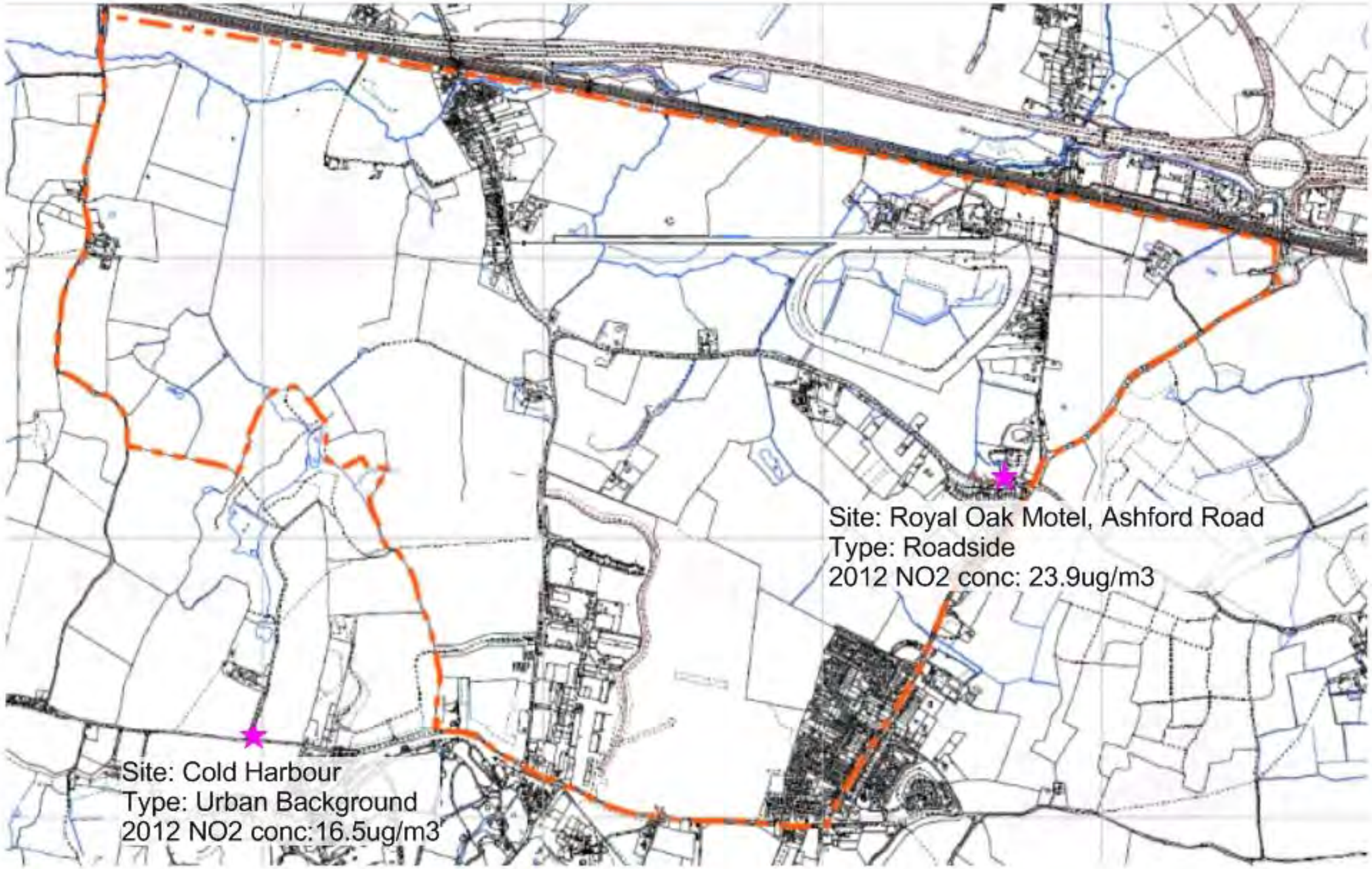
Sensitive receptors (houses and schools) should be set back from the motorway/ rail corridor to minimise the potential for air quality effects.

8. Changes to Risk Register

No changes.

ANNEX A

Figure 1 – Air Quality Monitoring Sites (existing)



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APPENDIX J

EIA Agriculture Workstream Report

Otterpool Park Masterplan
Stage 1 Feasibility and Capacity Study: Initial Findings

Workstream Name: **Agriculture**

Date: **December 2016**

The following figures and tables are found in this report.

EIA - Agriculture

Figure 1: Extent of detailed mapping currently available (see separate Figure 2 for greater detail)

Figure 2 - 001-UA008929-UE31D-01- Agriculture -POST-1988ALC

1. Stage 1 Methodology

The following baseline data sources have been reviewed:

1. Published geological (solid and drift) maps
2. Published soil maps
3. Published Agricultural Land Classification (ALC) maps
4. Aerial photographs

A landowner/land manager interview template has been developed. Interviews will be conducted as part of Stage 2 with each identified landowner or land manager in order to understand the nature of the individual farm businesses.

2. Baseline Data

Geology: The site is underlain by sandstone and mudstone, with some Head deposits across the northern part of the site and alluvium associated with watercourses.

Soils: The soils are mapped as belonging to two groups. The northern part of the site is covered by soils described as loamy soils with naturally high groundwater. In the eastern / southern parts the soils are described as freely draining slightly acid (in places base-rich) loamy soils.

ALC Grades (see below for explanation of grades): The Provisional ALC mapping (at a scale of 1:250 000) shows the land to be a mix of Grades 2 and 3, with some non-agricultural land also mapped (likely to relate to the racecourse). The provisional mapping suggests BMV (Grade 2) land stretches west from Ashford Road to the north and south of the A20, potentially as far in places as Harringe Lane. This comprises much of the rest of the developed area. This mapping does also suggest lower grade land (Grade 3; not sub-divided into 3a (BMV and 3b (not BMV)) may be present around Barrowhill.

This mapping does not, however, distinguish between Sub-grades 3a and 3b. Some detailed mapping is available (see map below). The eastern part of the site has been mapped as predominantly Grade 2, with small areas of Sub-grades 3a and 3b. A small area around Newingreen has also been mapped as Grade 2.

Kent has 20.5% cover of Grade 2 land, compared to an average for England of 14.2%. Grade 1 land cover in Kent is 9.0% compared to 2.7% for England. As cover of BMV land in Kent is higher than the National average its importance can be downgraded slightly and focus should be on utilising the lowest grade land (even if still BMV, e.g. Grade 3a), and in particular avoiding Grade 1 land.

The Provisional mapping is not considered sufficiently detailed to be used for site-specific assessments. As such, it is likely that detailed mapping, in accordance with the ALC Guidelines (MAFF (1988). Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land) will be required; the extent of survey work required will be confirmed through formal consultation with Natural England. This survey work would be undertaken as part of Stage 2.

Land Use: The agricultural land appears, from aerial photographs, to be predominantly arable land. There are small woodland blocks present with limited areas currently under pasture. The land lies between approx. 60 and 100m AOD with an undulating landform. From available mapping, it is unlikely that slope angle is a limiting factor in terms of agricultural production and thus ALC grade. A number of land parcels are under Stewardship agreements (both Entry and Higher Level); further details on this will be gained from the landowner/land manager interviews.

3. Policy Context

Legislation and Policy of relevance to this topic includes:

- EIA Regulations
- National Planning Policy Framework (NPPF)
- The Soil Strategy for England
- Defra Code of Practice for the sustainable re-use of soils on construction sites
- Natural England Technical Information Note 049 (2009)
- Good Practice Guide for Handling Soils (MAFF, 2000)
- British Standard Specification for Topsoil and Requirements for Use (BS3882:2007)

The NPPF (paragraph 112) states the following:

'*local planning authorities should take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality*.

Local planning authorities should also (paragraph 143) *'put in place policies to ensure … (safeguarding of the long term potential of best and most versatile agricultural land and conserving soil resources) …'*

Shepway District Local Plan Core Strategy makes reference to the extent of Grade 1 agricultural land. In addition, the following 'saved' policy is of relevance:

POLICY SD1 includes the requirement to '*Maintain and enhance water, soil and air quality*'. In the absence of specific policies regarding best and most versatile land the NPPF would apply.

4. Stakeholder Engagement and Feedback

None available yet. Landowners/land managers will be interviewed. Natural England will be consulted in relation to any additional ALC/soil survey work required.

5. Constraints

Main constraints will relate to

- ALC land grade – how much land likely to fall into the best and most versatile (BMV) grades (Grades 1, 2 and 3a) – it is not possible to mitigate for the loss of BMV land but see below for how the presence of this land can be used to promote allotment use, local food production etc.
- How the land is managed (access points, proportion of land within any single farm enterprise etc.) – a key aspect here will be how the development is phased to limit impacts relating to fragmentation.

6. Opportunities

The existing mapping shows there are areas of BMV land, including some Grade 2 land. This is productive land and there are no measures available to mitigate for its loss. However, maximising the use of this land for allotments and GI would be seen as beneficial and an appropriate use of the land. The quality of the soils

should also drive the promotion across the scheme and within the design of local food production within, for example, gardens (e.g. provision of guidance and advice to those who want to grow their own etc.)

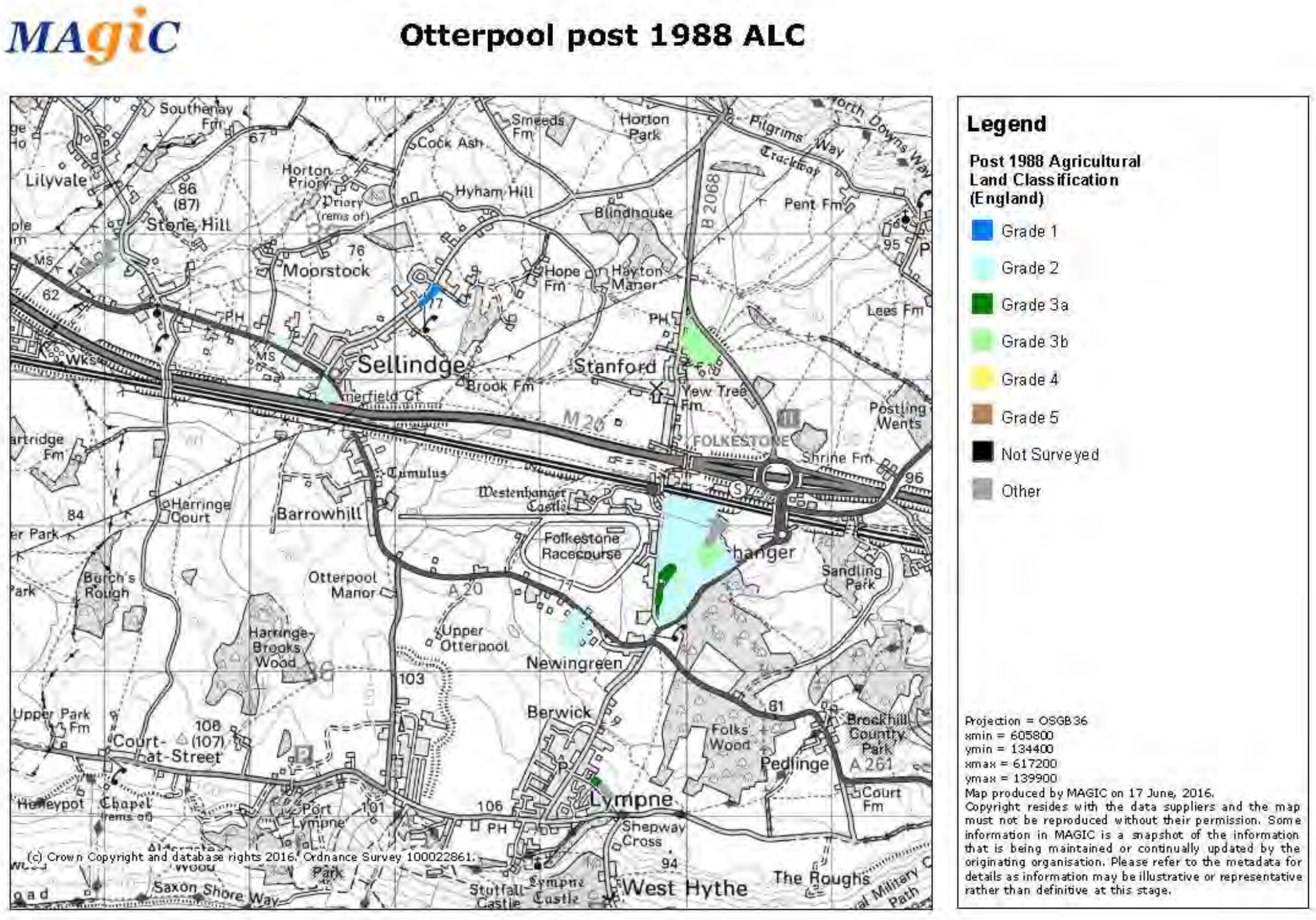
7. Impact on Masterplan Design

See above – locate allotments on the best quality land and maximise the overlap between GI and BMV land. It will be important to demonstrate that the presence of BMV land has been taken into account in the masterplan development. Should any Grade 1 land be identified, for example, every effort should be made to avoid these areas. Consideration should also be given to reducing the overall land take (i.e. maximising the area of land within the site boundary which is not developed plus the areas set aside for GI) to reduce the extent of loss of BMV land.

8. Changes to Risk Register

None

Figure 1: Extent of detailed mapping currently available (see separate Figure 2 for greater detail)



Agricultural Land Classification

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land).

ANNEX A

Figure 2 - 001-UA008929-UE31D-01- Agriculture -POST-1988ALC

APPENDIX K

EIA Cultural Heritage Workstream Report

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1 Summary

A Cultural Heritage Desk Based Assessment was carried out in October 2016 by Arcadis Consulting (UK) for Otterpool Park, Lympne. The site covers an area of 709ha and is centred on NGR 611239, 136507. The site comprises a large area of land between the M20 and the B2067 Aldington Road close to the village of Lympne, Kent and bisected by the A20 Ashford Road.

Cartographic analysis has shown that the site has had a long history as agricultural land with some diversification in the Modern period. This includes historic hedgerows, which would be protected under the Hedgerow Regulations, including coppiced wood and historic woodland copses. There are forty-one Listed Buildings, two Registered Parks and Gardens and seven Scheduled Monuments within 1km of the site; as well as four Military Crash sites, 47 non-designated Built Heritage assets and 121 non-designated archaeological assets within 500m of the site. As such archaeological potential within the site is considered to range from moderate to low with areas of specific archaeological interest identified.

The key assets for consideration within the site are Westenhanger Castle and its buildings, other medieval and post-medieval buildings within the Site and surrounding area, Lympne airfield, two barrows close to the East Stour River. Additionally, several non-designated buildings and some indicators of archaeological potential (not recorded by the Kent HER) were documented which require further study and investigation. These will be addressed, variously, by appraisal and fieldwork.

Retention of certain historic buildings and heritage assets, together with informed consideration of how they are incorporated into the scheme, will help to provide diverse built form in the new town and serve as a potential visitor and tourist attraction. Similarly, where not retained these assets have potential to inform about the identity and history of the area, and should be considered as resources in that sense. Recommendations are made concerning this throughout the report and will be further developed under the appraisals.

Consultation with Historic England and the heritage advisors at Kent County Council and Shepway District Council identified the following areas for consideration;

- Defining a roll for the Scheduled Monument of Westenhanger Castle and its two Grade I Listed buildings within the scheme;
- Consideration of the setting and historic views of Westenhanger and several designated and non-designated assets in and around the Site and how these relationships might inform master-planning and design;
- Restoring the historic southerly aspect of Westenhanger;
- Palaeo-environmental potential within the Site associated with records of Hythe Beds and Head Deposits;
- Historic Landscape Characterisation and input in master-planning;
- Two barrows with the north of the Site;
- Listed and non-designated buildings as identified by this report;
- The Lympne Conservation Area,
- The registered parks and Gardens of Sandling Park and Lympne, which lie close to the Site;
- The settings of other non-designated assets which lie within the wider study area.

Detailed assessment of these assets will both help to develop a fully informed understanding of the site and its potential, which will serve as master-planning input and ensure that robust arguments are made for retention, alteration, removal and removal of heritage assets as the scheme progresses.

Concerning historic buildings, it is recommended that the Historic England Listing Screening Service, which provides a review of specific built heritage assets, be commissioned where appropriate following the results of the appraisals. This will provide a basis for rapid resolution of the status of built heritage assets which are uncertain or likely to change.

It is recommended under the next stage that appraisals be carried out of the key heritage assets to help inform a better understanding for decision making and to inform master-planning. This will optimise the role that the site's diverse heritage resource can play in the outcome for the new town. The heritage Assets and themes proposed for further study under the appraisals are as follows;

- Westenhanger – Castle, Grade I Listed Manor and barns and scheduling;
- Otterpool Manor, Upper Otterpool, Bell Vue and other designated and non-designated assets;
- Arts and Crafts Cottages at Stone Street
- Historic buildings and assets at Barrow Hill
- Historic Landscape Character- including Roman and medieval landscapes;
- Military buildings relating to Lympne Airfield

The potential for archaeological remains is low to moderate for most periods within the site whilst no specific indicators of potential have been identified for the Post-Medieval period. Specific zones of archaeological potential identified within the site are located within the area of and around Westenhanger in the north-east, to the north of the East Stour River around the identified Barrow monuments, medieval potential associated with the site of Upper Otterpool, Otterpool Manor, Bell Vue, Harringe Court and other potential sites of medieval date and in the south of the site around the former Lympne airfield. These zones have high potential for their respective periods.

The advisors at Historic England, KCC and SDC have requested assessment of paleo-environmental potential associated with documented Hythe beds and Head Deposits from past investigations within the wider area. Further indicators of archaeological were identified during the site visit which provide further details and confirm the presence of assets recorded on the Historic Environment Record, where able. This includes features relating to water-management, a possible former road and a possible house-plot to the south of Harringe Court.

It is recommended that the understanding of archaeological potential be developed further in relation to specific areas of impact under master-planning to inform schemes of archaeological investigation and mitigation through a managed programme of works. This will focus efforts and reduce overall costs for evaluation. It is recommended that outreach and the potential to inform residents and users be integrated in this programme.

Stakeholder engagement should provide a key focus and input to progressing the scheme. This was highlighted during consultation. Engagement should seek to identify interests and inform values within the Site, focusing on Westenhanger and other key heritage assets. This will play an essential role in determining sustainable strategies for the management of Westenhanger and other heritage assets as well as overcoming local opposition to the scheme. An invitation for the project team to present to Hythe Society, received during site visits, might provide a key in road into this.

As stated above, a programme of further assessment will need to be undertaken over Stages 2 and 3 of the project. Archaeological fieldwork is recommended as part of this work to establish the full nature and extent of these remains and reveal any unknown archaeological remains which will add to the understanding of the overall archaeological resource of the area. Buildings recording may also need to be carried out on selected Built Heritage as part of this fieldwork based on further assessment of the resource within the site.

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2 Introduction

2.1 Background

This Desk-Based Assessment of cultural heritage assets has been conducted to provide the baseline data and analysis to inform the master planning stage of the proposed development. The assessment focuses on a 709ha area within the Shepway District of Kent centred on NGR 611239, 136507; hereafter referred to as 'the site'.

2.2 Proposed Development

The proposed development comprises an area south of the M20 and to the north of the B2067 Aldington Road in Shepway District, Kent. The development proposal is for a new town to provide housing and economic opportunity to the area.

2.3 Site Location, Geology, Topography and Land Use

The site lies within the Shepway District of Kent and is approximately 2.4km to the west of Hythe. The site lies to the south of the M20 and Channel Tunnel Rail Link (CTRL) line and is crossed by the A20 Ashford Road. The site covers agricultural, recreational, residential, industrial and commercial areas of usage.

The East Stour River passes through the site in its northern extent and the topography of the site reflects the river valley nature of this area. Around the River the land lies at around 55-60m AOD (Above Ordnance Datum) and rises to 75-80m AOD. The highest point within the site is at its south-east corner adjacent to the B2067, between Lympne industrial park and the Modern village of Lympne. This gives the landscape a gently undulating nature. There are two small unnamed watercourses which also run south-north through the site from areas of higher ground towards the East Stour River.

The underlying geology of the site is variable and covers: Sandstones and Limestones of the Hythe Formation; Sandstone, Siltstone and Mudstone of the Sandgate Formation; Sandstone of the Folkestone Formation; and Mudstones of the Atherfield Clay and Weald Clay Formations. Superficial deposits are also varied but are more limited across the site and comprise of head clay deposits and silts and clay, silt, sand and gravel alluvium along the course of the East Stour River (BGS 2016).

2.4 Aims and Objectives

The general aims of this assessment are to:

- establish the nature and extent of the non-designated heritage assets within a 500m radius (see 3.2);
- establish the nature of designated heritage assets within a 1km radius (See 3.2);
- assess the significance of the heritage assets within the site which might be affected by the proposed development; and
- assess any potential impact on designated heritage assets within a 1km radius of the site;
- Make recommendations concerning detailed appraisal of key assets to inform masterplanning and detailed heritage impact assessment (Stage 2 of the project) that would be required as part of the Environmental Impact Assessment (EIA) supporting the proposed outline planning application.

3 Methodology

3.1 Study Area

The study area comprises the site (Figure 1), all nationally designated assets within 1km of the site boundary and all non-designated assets listed on the Kent Historic Environment Record (HER) within 500m of the site.

These provisional study areas were set to establish the archaeological baseline for the site and its immediate vicinity.

3.2 Consultation

Consultation was carried out with the Kent County Council heritage advisors by telephone on the 4th of November 2016 and subsequently with Historic England, and the advisors to KCC and Shepway District Council (SDC) at a meeting in Folkestone on the 16th of November 2016.

The 500m and 1km study areas were discussed and agreed. In addition to this the wider context of barrows and sites on the North Kent Downs was agreed to be considered together with those within the study area. Similarly, it was agreed that a former pilgrim's way, historic and listed farms to the north of the M20 and CTRL and a farm to the north west of the study area called 'Shrine Farm' should be taken into consideration as well as evidence for paleo-environmental archaeology within the Site with key emphasis placed on consideration of the historic landscape character of the study area, which should inform masterplanning. KCC also stated it would identify any other sites that should be taken into consideration subsequently. It was also recommended that archaeological work for a proposed lorry park and the CTRL be reviewed in developing the approach to heritage at Otterpool further.

A view was expressed that detailed consideration should be undertaken of the roles of Westenhanger and other designated and non-designated assets and it was agreed that this would be undertaken through the detailed appraisal stage of the project. They advised that a heritage strategy should be implemented which might form part of this, which should focus on Westenhanger. Further details discussed concerning the setting and layout of Westenhanger are provided under the relevant section later in the report.

Additionally, it was considered by xxx that the historic landscape character might be informed by Kent Farmstead Guidance, guidance from the North Kent Downs AONB and early information from the upcoming Heritage Strategy for Shepway planned for early 2017 and the coming Research Framework for the South East. Drafts of the relevant planning guidance will be made available by xx. Historic England indicated that it will be working independently on a review of the designation status of assets affected by the proposals, which would be covered by Arcadis through the appraisal programme. To resolve matters raised under the appraisals, they offer a listing screening service, which will clarify the status of assets which could then help to develop matters further. Other discussions focussed on specific aspects of the heritage assets covered by this report and are covered in their respective sections (KCC *Pers comm*).

3.3 Assessment Criteria

Assessment of the significance of the site and its archaeological potential seeks to identify how particular parts of a place and different periods in its evolution contribute to, or detract from, identified heritage values associated with the site. This approach considers the present character of the site based on the chronological sequence of events that produced it, and allows management strategies to be developed that sustain and enhance the significance of heritage assets.

Significance (for heritage policy) is defined in NPPF Annex 2 as:

'the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.'

Current national guidance for the assessment of the significance of heritage assets is provided by (the then) English Heritage in the document Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (2008) in which significance is weighed by consideration of the potential for the asset to demonstrate the following value criteria:

- **Evidential value**. Deriving from the potential of a place to yield evidence about past human activity.

- **Historical value**. Deriving from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative.
- **Aesthetic value**. Deriving from the ways in which people draw sensory and intellectual stimulation from a place.
- **Communal value**. Deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values, but tend to have additional and specific aspects.

Table 1: Table of Significance

Significance	Factors Determining Significance
International	World Heritage Sites Assets of recognised international importance Assets that contribute to international research objectives
National	Scheduled Ancient Monuments Grade I and Grade II* Listed Buildings Grade I and Grade II* Registered Parks and Gardens Undesignated assets of the quality and importance to be designated Assets that contribute to national research agendas
Regional	Grade II Listed Buildings Grade II Registered Parks and Gardens Assets that contribute to regional research objectives
Local	Locally listed buildings Assets compromised by poor preservation and/or poor contextual associations Assets with importance to local interest groups Assets that contribute to local research objectives
Negligible	Assets with little or no archaeological/historical interest
Unknown	The importance of the asset has not been ascertained from available evidence

3.4 Site Walkover Survey

A site visit has not yet been undertaken as part of this baseline assessment.

3.5 Sources

A variety of sources were consulted during the preparation of this report.

- The Kent Historic Environment Record (HER), was consulted for details on non-designated archaeological assets and archaeological events;
- The National Heritage List for England (NHLE) was consulted for information on designated assets within the study area;
- The Pastscape website, provided by Historic England, was also consulted for additional information on assets within the study area and the wider area;
- The British Geological Survey website, for information on the prevailing geological conditions within the vicinity of the Site;
- The Shepway District Council website was consulted for updated information on planning policy; and

3.6 Presentation within the report

All identified assets have been numbered sequentially and are referenced in bold type within the text. All identified assets are presented in gazetteers within Annex A, and displayed on **Figures 3** and **4**. Designated assets – Scheduled Monuments and Listed Buildings – are prefixed by **SM** and **LB** respectively. Non-designated heritage assets are not prefixed except where they are listed as locally listed buildings in the Kent HER whereupon they are prefixed by **LLB**.

Information from the site visits carried out for this assessment is presented within the relevant section for specific heritage assets and themes. General information is then provided within a summary site visit section. Each section then concludes with consideration of relevant matters, such as setting and recommendations concerning further investigation.

4 Regulation and Policy

This assessment has been undertaken in accordance with current legislation, national and local plans and policies. Relevant legislation, policy and guidance are outlined below.

4.1 Legislation

The relevant parliamentary act which provides the legislation framework for development and archaeology is the Town and Country Planning Act 1990. This assessment has also taken into account the Planning (Listed Buildings and Conservation Areas) Act 1990 and the Ancient Monuments and Archaeological Areas Act 1979.

National policy relating to the archaeological resource is outlined in the National Planning Policy Framework (NPPF) which was enacted in 2012.

4.1.1 Planning (Listed Buildings and Conservation Areas) Act 1990

The Planning (Listed Buildings and Conservation Areas) Act 1990 applies special protection to buildings and areas of special architectural or historic interest.

Section 66 (1) of the act states that "In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses".

4.1.2 Ancient Monuments and Archaeological Areas Act 1979

The Ancient Monuments and Archaeological Areas Act 1979 gives statutory protection to any structure, building or work which is considered to be of particular historic or archaeological interest and regulates any activities which may affect such areas. Under the Act any work that is carried out on a Scheduled Ancient Monument must first obtain Scheduled Monument consent.

The NPPF identifies that Scheduled Ancient Monuments and their setting are a material consideration for a planning application.

4.2 Policy

4.2.1 National Planning Policy Framework (NPPF)

The NPPF sets out Government planning policies for England and how these are expected to be applied. The NPPF provides a framework within which local and neighbourhood plans can be produced. Planning law requires that applications for planning permission must be determined in accordance with the development plan. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions.

Section 12 of the NPPF 'Conserving and Enhancing the Historic Environment' contains the government's policies relating to the historic environment.

Paragraph 126 states that local planning authorities should set out in their Local Plan a positive strategy for the conservation and enjoyment of the historic environment. In doing so they should recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance.

Paragraph 128 states that in determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset's importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record

should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate Desk-Based Assessment and, where necessary, a field evaluation.

Paragraph 129 states that local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including development affecting the setting of a heritage asset). They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.

Paragraph 135 states that the effect of an application on the significance of an undesignated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly undesignated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

Paragraph 136 states that local planning authorities should not permit the loss of the whole or part of a heritage asset, without taking all reasonable steps to ensure that the new development will proceed after the loss has occurred.

Paragraph 139 states that undesignated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments are to be considered subject to the same policies as designated heritage assets.

Paragraph 141 states, in part, that local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost, whether wholly or in part in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible, in the relevant HER or local museum.

4.2.2 Local Planning Policy Framework

The Shepway District Council Core Strategy (2013) is currently emerging and has not yet fully replaced the Local Plan 2006. In addition, the Places and Policies Plan is also emerging and covers which policies will be lost and which will be saved moving forward. Below are the policies which are applicable to the proposed development. If an issue is not covered by a local policy or the local policy is not in line with current national policy, then national policy will take precedence.

POLICY HE1

HERITAGE ASSETS

THE DISTRICT COUNCIL WILL GRANT PERMISSION FOR PROPOSALS WHICH PROMOTE AN APPROPRIATE AND VIABLE USE OF HERITAGE ASSETS, CONSISTENT WITH THEIR PROTECTION AND CONSERVATION, PARTICULARLY WHERE THESE BRING REDUNDANT OR UNDER-USED BUILDINGS AND AREAS BACK INTO USE OR IMPROVE PUBLIC ACCESSIBILITY TO THE ASSET.

POLICY HE2

ARCHAEOLOGY

IMPORTANT ARCHAEOLOGICAL SITES, TOGETHER WITH THEIR SETTINGS, WILL BE PROTECTED AND, WHERE POSSIBLE, ENHANCED. DEVELOPMENT WHICH WOULD ADVERSELY AFFECT THEM WILL NOT BE PERMITTED. IN AREAS WHERE THERE IS KNOWN ARCHAEOLOGICAL INTEREST, THE DISTRICT COUNCIL WILL REQUIRE APPROPRIATE DESK BASED ASSESSMENT OF THE ASSET HAS BEEN PROVIDED AS PART OF THE PLANNING APPLICATION. IN ADDITION, WHERE IMPORTANT OR POTENTIALLY SIGNIFICANT ARCHAEOLOGICAL HERITAGE ASSETS MAY EXIST, DEVELOPERS WILL BE REQUIRED TO ARRANGE FOR FIELD EVALUATIONS TO BE CARRIED OUT IN ADVANCE OF THE DETERMINATION OF PLANNING APPLICATIONS.

WHERE THE CASE FOR DEVELOPMENT AFFECTING A HERITAGE ASSET OF ARCHAEOLOGICAL INTEREST IS ACCEPTED, THE ARCHAEOLOGICAL REMAINS SHOULD BE PRESERVED IN SITU AS THE PREFERRED APPROACH. WHERE THIS IS NOT POSSIBLE OR JUSTIFIED, APPROPRIATE PROVISION FOR PRESERVATION BY RECORD MAY BE AN ACCEPTABLE ALTERNATIVE. ANY ARCHAEOLOGICAL RECORDING SHOULD BE BY AN APPROVED ARCHAEOLOGICAL BODY AND TAKE PLACE IN ACCORDANCE WITH A SPECIFICATION AND PROGRAMME OF WORK TO BE SUBMITTED TO AND APPROVED BY THE DISTRICT COUNCIL IN ADVANCE OF DEVELOPMENT COMMENCING.

POLICY HE3

LOCAL LIST OF BUILDINGS AND SITES OF ARCHITECTURAL OR HISTORIC INTEREST

PROPOSALS FOR DEVELOPMENT AFFECTING BUILDINGS OR SITES IDENTIFIED ON THE LOCAL LIST OF BUILDINGS OF ARCHITECTURAL OR HISTORIC INTEREST, OR WOULD MEET THE CRITERIA, WILL BE PERMITTED WHERE THE PARTICULAR CHARACTERISTICS THAT ACCOUNT FOR THE DESIGNATION ARE PROTECTED AND CONSERVED.

POLICY CO4

SPECIAL LANDSCAPE AREAS ARE DEFINED AS FOLLOWS AND ILLUSTRATED ON THE PROPOSALS MAP: NORTH DOWNS (INCLUDING THE SCARP AND CREST) OLD ROMNEY SHORELINE DUNGENESS SHEPWAY DISTRICT LOCAL PLAN REVIEW (2006) POLICIES APPLICABLE 2013 ONWARDS 46 PROPOSALS SHOULD PROTECT OR ENHANCE THE NATURAL BEAUTY OF THE SPECIAL LANDSCAPE AREA. THE DISTRICT PLANNING AUTHORITY WILL NOT PERMIT DEVELOPMENT PROPOSALS THAT ARE INCONSISTENT WITH THIS OBJECTIVE UNLESS THE NEED TO SECURE ECONOMIC AND SOCIAL WELLBEING OUTWEIGHS THE NEED TO PROTECT THE SLAS COUNTYWIDE LANDSCAPE SIGNIFICANCE. WHERE AREAS ARE ALSO WITHIN THE KENT DOWNS AONB, POLICY CO3 [POLICY DELETED] WILL TAKE PRECEDENCE.

POLICY ND7

FORMER LYMPNE AIRFIELD

SITE 1 IS ALLOCATED FOR RESIDENTIAL DEVELOPMENT WITH AN ESTIMATED CAPACITY OF 125 DWELLINGS.

DEVELOPMENT PROPOSALS WILL BE SUPPORTED WHERE:

1. EXISTING TREES AND HEDGEROWS WITHIN/AROUND PERIMETER OF SITE ARE RETAINED AND ENHANCED AS PART OF A COMPREHENSIVE LANDSCAPING SCHEME

2. THE NORTHERN BUILDING EDGE IS FRAGMENTED AND SOFTENED WITH A STRONG LANDSCAPE BUFFER

3. OPEN SPACES AND PLANTING ARE USED TO PROVIDE A VISUAL LINK TO THE COUNTRYSIDE AND NORTH DOWNS SCARP AND AN ATTRACTIVE BACKDROP TO DEVELOPMENT

4. SITE 1 HAS ON SITE OPEN SPACE TO MEET THE RECREATIONAL NEEDS OF RESIDENTS

5. THE DEVELOPMENT HAS AT LEAST

6 SELF / CUSTOM BUILD PLOTS ON SITE 6. APPROPRIATE AND PROPORTIONATE CONTRIBUTIONS ARE MADE TO IMPROVEMENTS AT THE NEWINGREEN JUNCTION

7. SITE 2 REMAINS UNDEVELOPED

8. A NEW FOOTPATH ACROSS SITE 2 IS PROVIDED IN PARALLEL WITH THE DEVELOPMENT OF SITE 1

9. THE PROPOSAL ACKNOWLEDGES THE SURROUNDING URBAN GRAIN, FRONTING DWELLINGS ON TO EXISTING STREETS AND FOLLOWING THE EXISTING BUILT EDGE WHERE POSSIBLE

10. FOOTPATHS ARE PROVIDED TO LINK IN WITH THE EXISTING NETWORK

11. A PRIMARY VEHICLE ACCESS IS PROVIDED ON TO ALDINGTON ROAD

12. AN ASSESSMENT OF NON-DESIGNATED HERITAGE ASSETS AND AN ARCHAEOLOGICAL SURVEY IS CARRIED OUT AND APPROPRIATE MITIGATION MEASURES PUT IN PLACE IF REQUIRED

13. ADEQUATE WASTE WATER INFRASTRUCTURE HAS BEEN PROVIDED

14. CONTAMINATED LAND IS FULLY REMEDIATED PRIOR TO CONSTRUCTION WORKS.

POLICY ND9

LAND AT FOLKESTONE RACECOURSE

THE SITE IS ALLOCATED FOR RESIDENTIAL DEVELOPMENT WITH AN ESTIMATED CAPACITY OF 11 DWELLINGS.

DEVELOPMENT PROPOSALS WILL BE SUPPORTED WHERE:

1. THE PROPOSAL ACHIEVES THE HIGHEST QUALITY DESIGN OF BOTH BUILDINGS AND SURROUNDING SPACE AND REINFORCES LOCAL RURAL DISTINCTIVENESS

2. EXISTING TREES AND HEDGEROWS WITHIN/AROUND PERIMETER OF SITE ARE RETAINED AND ENHANCED

3. OPEN SPACES AND PLANTING ARE USED TO PROVIDE A VISUAL LINK TO THE COUNTRYSIDE AND AN ATTRACTIVE BACKDROP TO DEVELOPMENT

4. ADEQUATE OFF STREET PARKING MUST BE PROVIDED

5. AN ASSESSMENT OF THE IMPACT OF DEVELOPMENT ON THE SETTING OF NEARBY SCHEDULED AND GRADE I LISTED WESTENHANGER CASTLE HAS BEEN SORT AND ADHERED TO ENSURING THE LAYOUT OF DEVELOPMENT PROTECTS ITS SETTING

6. THE PROPOSAL ACKNOWLEDGES SURROUNDING STREET PATTERN AND URBAN GRAIN, FRONTING DWELLINGS ON TO STONE STREET AND FOLLOWING THE EXISTING BUILT EDGE

7. THE DEVELOPMENT INCLUDES OR SAFEGUARDS APPROPRIATE LAND FOR THE EXPANSION OF PARKING FACILITIES AT WESTENHANGER STATION AS PART OF A MASTERPLAN AND INCLUDES MEASURES TO REDUCE ON STREET PARKING CONGESTION ALONG STONE STREET

8. THE DEVELOPMENT ENSURES THAT THERE IS NO ADVERSE IMPACT ON WATER QUALITY FROM WASTEWATER OVERFLOW

9. THE ARCHAEOLOGICAL POTENTIAL OF THE LAND IS PROPERLY CONSIDERED AND MEASURES AGREED TO MONITOR AND RESPOND TO ANY FINDS OF INTEREST.

4.3 Guidance

This Desk-Based Assessment (DBA) was undertaken with regard to all relevant industry guidance, principally the 'Code of Conduct', 'Standards and Guidance for Archaeological Desk-Based Assessments' and 'Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment' (Chartered Institute for Archaeologists, 2014) and Historic England's 'Historic Environment Good Practice Advice in Planning 3: The Setting of Heritage Assets' (2015).

4.3.1 Guidance on Military Remains

All military aircraft crash sites in the United Kingdom, its territorial waters, or British aircraft in international waters, are controlled sites under the Protection of Military Remains Act 1986. A licence must be obtained from the Ministry of Defence (MOD) to authorise any disturbance of these sites and a licence to excavate must be issued from the Joint Casualty and Compassionate Centre (JCCC), part of the Defence Business Services (DBS).

Prior to a licence being issued the applicant is required to research and supply the JCCC with the location of the crash site, type of aircraft and the fate of the crew. Applications can take at least 3 months and should be processed before any works are commenced. This guidance is being provided in relation to records of two of four crash-sites within the study area that are located within the Site.

A licence will not be issued if human remains are likely to be found at the Site and also if there are significant amounts of unexploded ordnance at the site.

4.4 Designated Assets Within the Site

Within the Site there are seven Listed Buildings (**LB**) and one Scheduled Monument (**SM**). The Listed Buildings are discussed fully in the Built Heritage section below and marked on **Figure 2**.

4.4.1 Scheduled Monuments

Plate 1: Westenhanger (from north)

Westenhanger Castle (SM6)

Westenhanger Castle (**SM6**) lies at the northern edge of the Site 1.6km east of Barrow Hill and 250m to the south of the M20, at the edge of the floodplain of the River East Stour. The castle is bounded on its northern edge by the CTRL. The monument is described as a fortified house and associated structures and landscaping which remain both above and below ground. It comprises both the earthwork and structural remains of the moated inner court, a 16th century bar and stable, the buried remains of the outer court, the buried remains of the church, medieval hall, walled garden, and cemetery. The Site is also associated with more modern remains such as a deer park and water control system and was formerly the site of two Manors, Westenhanger and Ostenhanger (Easternhanger), which were reunited in the 16th century.

The moat encloses an area of around 60m square and is 10-14m wide, and is still water filled on the south and south-east sides. The Castle's water control system lies to the west and north of the outer court and used the floodplain of the East Stour to create an expanse of shallow water around the monument which formed a symbolic defensive feature in keeping with its high status. These are referred to in 1559 as the 'waters'. To the north are a series of banks and ditches which delineate platforms and enclosures which fell inside the area of the deer park laid out in 1542. The deer park had a symbolic value as viewed from the castle but the only remains of this now can be found to the north-east of the moat where an earthwork bank is located: this was part of the park pale (the ditch and boundary of the deer park).

Significance

Fortified houses of this type were important components in the Medieval and later landscape and the Manor at Westenhanger has had a long and rich history. The Manor has its origins before the 12th century, when the parish of Le Hangre was divided to form the two Manors of Westenhanger and Ostenhanger. In 1701 the property was sold and most of the buildings pulled down. The present house dates to the 18th century and was based around a surviving 16th century core. The Manor has also been associated with the parish of Stanford to the north which was merged with the Manor in the 16th century.

In more general terms fortified houses are found mostly in lowland England and are quite rare with fewer than 200 identified examples. The setting of this monument is based around reading the history of the manor through surviving elements such as the moat and earthwork remains such as the inner court or deer park pale. Due to modern development around the site, the railway to the north and racecourse to the south, much of the monument's connection to the wider landscape has been lost. However, the wider setting of the monument would have been contributed to by its connections to the East Stour River to the south-west, the settlements at Westenhanger and Stanford to the south-east and north-east, and the now lost Deer Park to the north.

Westenhanger Castle's designation as a Scheduled Monument recognises its national significance, within which it has clear high evidential and historical values, which demonstrate a high potential to inform the area and make a contribution to the identity of the proposed development. These values should be considered as a group together with the listed and non-designated buildings therein which comprise a Grade I listed Castle or Fortified House, of 14th Century origin, and two ragstone barns of 16th Century date, also Grade I Listed. This applies equally to the aesthetic value of the individual components and as a group. The SM has aesthetic value as a visual asset and focus within the landscape, whilst the buildings are constructed in vernacular style from local materials and provide aesthetic content to the site.

The communal value of Westenhanger has been discussed with stakeholders and the advisors at KCC and is relatively one-sided at present, providing a function venue for weddings and other activities. Westenhanger has received approximately £5 million funding from The Heritage Lottery Fund and Historic England (formerly English Heritage) and the advisors are keen to see a more integrated sustainable role for Westenhanger developed under the forthcoming Otterpool Park proposals. Currently it has a relatively low profile in terms of heritage tourism of other values for the local area, which the advisors at KCC are keen to see developed. Potential is seen for it to be integrated under the proposals as focal point to a local attraction and have recommended development of a heritage strategy for the site, which amongst other aims would secure this.

Similarly, it should have an increased profile in terms of wider heritage tourism and within this could easily continue to serve as a function venue. Ongoing discussions with the owners and other stakeholders should seek to address these points.

Setting and Historic Views

The historic setting of Westenhanger Castle would have been linked to the surrounding agricultural area which it administered and defended, as well as its own designed setting which included the deer park to the north and the water management features to the north and west. In addition to this, discussions with the KCC archaeological advisor for Shepway have indicated a possible garden of Tudor date to the south and a causewayed entrance approach from the south. It would also have had visual links to Upper Otterpool from the 1500's and an indirect relationship to other sites of medieval date as part of its setting.

The setting of Westenhanger has been curtailed to the north by modern infrastructure, in the form of the CTRL line and the M20, which have done much to remove its connections to the area of the former deer park and some of it symbolic views across the flood plain of the East Stour. Important historic views are still available from the west and add to the understanding and significance of this asset as a defensive feature in the landscape. Views to the south are impacted by the racecourse, whilst the Grade I Listed buildings are largely screened by intervening tree cover and structures. However, the SM itself retains views to the south beyond this and the adjacent land which forms its immediate setting. Additionally, links to other settlements (**C1**) and manors (**51, 59, LB38/BH12, LB3**) which are contemporary with Westenhanger (**SM6**) inform the understanding of this asset within the landscape and unsettled nature of the area during the Medieval period.

Further details from consultation with HE, KCC and SDC noted the original approach via the causeway from Ashford Road, to the south, the route of which passes the western side of today's racecourse. The southerly approach would have come into the Site to the west of the barns and the manor and presents an important aspect in terms of its setting. Other issues raised included that the original layout, which would have included additional structures and the potential Tudor period garden between the racecourse and manor, has been reduced in area. These aspects should form a consideration in addressing Westenhanger's setting and views under the proposals.

Recommendations

A new role should be determined for Westenhanger Castle and its buildings under the new development, which is more diverse and therefore sustainable than a function-venue, providing it with long-term viability. This could combine a focus within the current proposals making it a local attraction and visual asset to residents, visitors and other users, and help promote local and wider heritage tourism. Within this it has high potential to inform the area's history through outreach, making a strong contribution to developing the new town's identity. Together with the other heritage assets integrated within and/or informed about under the proposals this will provide people a reason to visit Otterpool, which would add to the diversity of the development and help to secure its role as a new town of value within south-east England. Detailed appraisal, to be included under Stages 2-3 of the project will play a key role in this. The findings will then inform design and impact assessment and a heritage strategy during the EIA process.

It has been recommended, during consultation, that the new role for Westenhanger should realign the site to its original southerly aspect, in doing so removing the current screening from adjoining outbuildings and vegetation along the racecourse and presenting it within the development. The earlier large footprint of Westenhanger should be considered together with the relationship between it and other medieval sites within the site and surrounding area, such as Otterpool Manor, Upper Otterpool and others. It was also agreed that whilst the setting of the medieval deer park should be a consideration in the cumulative value of these assets, the degree of change within the landscape means that this is no longer a physical consideration. A successful outcome would see Westenhanger integrated both physically and communally within the Site and playing a new vital role.

4.5 Designated Assets within 1km of the Site

Within a 1km radius from the Site boundary there are a further five Scheduled Monuments (**SM**), two Registered Parks and Gardens (**RPG**), one Conservation Area (**C**) and thirty-four Listed Buildings (**LB**). Built heritage including Listed Buildings, Conservation Areas and Registered Parks and Gardens are discussed below in the Built Heritage Section of this report.

4.5.1 Scheduled Monuments

Romano-British Building (SM1)

A monument located 580m to the south-west of the Site is listed as a Romano-British building or Villa site that survives as buried remains.

The villa has cemented rag-stone foundations and evidence of tessellated floors. Finds recovered during excavations in 1972 date the structure to the end of the 3rd century into the early 4th century AD. The Dover to Maidstone Roman Road runs 550m to the south of the Site which is located on a tributary of the East Stour River.

The villa is located in a rural area close to Upper Park Farm on a small rise in the landscape. Its setting at the time of its use would have been agricultural in nature and the landscape has mostly retained this character into the Modern period. Appreciation of this asset in the Modern landscape is informed by its relationship to the Roman Road (**8**) to the south. It has a general rural setting, with a probable focus to the south on the Roman road, which indicates no defined relationships in terms of setting or views with the Site beyond the rural context.

Its significance as a Scheduled Monument is of national value and should be considered in terms of the other evidence of Roman activity within the study area. As a resource this has potential to inform the history of Otterpool and the surrounding area within the Roman period.

Significance

The Romano-British Building (SM1) has a high significance as part of the Roman landscape and heritage of the study area. Particularly, it should be seen in conjunction with the Roman route at Ashford Road and Stutfall Castle to the south as well as entries of Roman date on the KHER. It lies some distance from and has little inter-visibility with the Site meaning that its consideration should essentially be as part of the Roman context.

Recommendations

The cumulative value of this Romano-British Building, together with other evidence of Roman activity in the study area, should be communicated in the proposed development through outreach in the form of information signs and displays. It is not anticipated that development within the Site would physically impact on its setting given its nature as a buried feature and remove and the potential cumulative impact to Roman remains would be addressed through representation in outreach.

Stutfall Castle (SM4)

The Saxon Shore fort, known as Stutfall Castle, (**SM4**) lies 620m to the south-east of the site. The monument is described as a Roman Fort of the Saxon Shore series which comprises both upstanding and below ground remains. The upstanding remains are 3.5m thick and were recorded as 5m high in the 20th century. The remains have been partially damaged by landslip but were thought to have been pentagonal in plan. The fort is built of flint with tile-bonding courses and has semi-circular bastions around the perimeter. The fort dates to around the late 3rd century AD and was abandoned around AD 350. Additionally, the monument has also been found to contain a bathhouse, principia and some reused altars.

Some of the altars were covered with salt water barnacles and other reused material was of the *Classis Britannica* suggesting a naval base existed nearby. The fort is situated towards the foot of a steep escarpment at the north-east edge of Romney Marsh. It is thought that due to the coastline in the Roman period the fort would have been well place to defend the natural harbour which is now part of Romney Marsh.

Earlier Ordnance Survey (OS) mapping shows Stone Street running north from Lympne as a Roman Road and this would have once connected to the fort to Canterbury, '*Durovernum*'. A second Roman Road connects Lympne to Dover to the east and Maidstone to the west. Additionally, the Archaeology Data Service (ADS) Roman rural settlement resource (http://archaeologydataservice.ac.uk/archives/view/romangl/map.html - accessed 10/10/2016) shows that there was settlement and other activity along the valley of the East Stour River during the Roman period. This demonstrates that the fort was part of a wider landscape to the north as well as looking southwards across the marsh. However, based on the location and function of this monument the main setting is based on its relationship to Romney Marsh to the south and the former coastline which it represents.

Stutfall Castle lies south of the Site below the escarpment leading down to Romney Marsh. As such it has no inter-visibility with the Site.

Significance

Its significance as a Scheduled Monument is of national value and should be considered in terms of the other evidence of Roman activity within the study area. As a resource this has potential to inform the history of Otterpool and the surrounding area within the Roman period. This could contribute to developing identity in the proposed development of Otterpool Park.

Recommendations

The cumulative value of Stutfall Castle, together with other evidence of Roman activity in the study area, should be communicated in the development through outreach in the form of information signs and displays. It is not anticipated that development within the Site would physically impact on its setting given the lack of inter-visibility and distance from the Site and the potential cumulative impact to Roman remains could also be addressed through representation in outreach.

Royal Military Canal (SM2, SM5, SM3)

The Royal Military Canal (**SM2, SM5, SM3**) passes through the south of the study area, 950m south of the Site at its closest point, in three sections which form part of the 28 mile long defensive structure. The structure comprises a water filled canal, parapets, a northern bank, the Royal Military Road which survives as a terrace, and the back drain which survives as a ditch. Additionally, the Honeypot Cottage to West Hythe Dam section contains two World War II Pillboxes within the listing.

The Royal Military Canal was constructed between 1804 and 1809 as a defence against the expected landing of Napoleon's troops on Romney Marsh and Walland Marsh. The route of the canal runs from Shorncilffe Camp via Hythe and joins the Rivers Rother and Brede before returning back to a canal from Winchelsea to Cliff End. The excavated earth was banked to the landward side of the canal and behind this was a supply route, the Royal Military Road, whilst on the opposite side were the tow path and wharves. The canal was not completed until after the defeat of Napoleon and was then opened to the public. The road was also opened for a toll.

The setting of this asset is based around its relationship to the marsh and the coastline which it was defending as well as any associated assets, most of which are included in the listing. The asset is appreciated in modern times from the Military Road which runs along some sections of the canal to the west and from two national footpaths, the Royal Military Canal Path and the Saxon Shore Way. The monument also has a relationship to other coastal defences along the former coastline or marsh edge, such as Stutfall Castle (**SM4**), which demonstrate the long and continual history of defence along this coastline and its importance as a military asset.

The Royal Military Canal lies south of the Site below the escarpment leading down to Romney Marsh. As such it has no inter-visibility with the Site.

Significance

This scheduled monument is unique in Britain and is an important part of the Napoleonic military defences of the south coast. The best persevered section of this monument can be found between West Hythe Bridge and Scanlon's Bridge to the east. Together with the other nationally significant assets it has potential to inform the local area which can contribute to an identity associated with the proposed development.

Recommendations

The Royal Military Canal lies below the escarpment to the south of the Site meaning that it would have no inter-visibility with the Site. It should instead remain a consideration in terms of the military history and potential of the study area and the cumulative effect of the Site's development through related assets. Its historical and evidential value as part of the area's military history should be communicated in the development through outreach. This could draw on the 19th Century development of Shorncliffe Barracks, Folkestone, Napoleonic defences in the form of Martello Towers at Hythe and Shorncliffe and the surrounding area, and the later military history associated with Lympne Airfield located within the Site.

4.6 Non-designated Assets

The Kent HER was consulted to acquire information regarding non-designated heritage assets present within 500m of the site, (the study area) as shown on **Figures 3 & 4**. The numbers presented within the following text are unique heritage identifiers allocated for the purposes of this report.

4.6.1 Prehistoric Period (30 000 BC – 600BC)

Within the study area seventeen monuments (**10, 11, 13, 21, 24, 26, 44, 46, 47, 50, 55, 68, 102, 103, 105, 119, 121**) are listed on the Kent HER as dating to the prehistoric period. Of these seven have been found within the Site (**26, 46, 44, 55, 68, 103, 121**) and ten within 500m of the site.

Most these assets are findspots (**10, 11, 24, 47, 50, 55, 102, 103, 105, 119**) which are listed as Flint and pottery finds (**10**), flint artefacts (**11**), buried soil horizon (**24**), two axes (**47, 50**), Bronze Age Pottery (**102**), two Neolithic arrowheads (**103, 119**) and Neolithic or Bronze Age Flints (**105**).

Of the remaining assets six (**13, 21, 44, 46, 121, 26**) indicate occupation activity within the Prehistoric period and the seventh is a Palaeochannel (**68**) close to Barrow Hill. It is likely that this is a former course of the East Stour River which lies 22m to the south-east of the current East Stour River channel as it passes through Barrow Hill. The occupation activity within the Site comprises a Bronze Age occupation site (**26**) and associated Prehistoric ditches (**121**) at Lympne Industrial Park. This area of occupation lies at a high point within the landscape where the valley of the East Stour River, to the north, meets the Aldington ridge, to the south, which marks the edge of Romney Marsh. Approximately 1.2 to 1.4km to the north of the occupation site, are two possible Bronze Age barrows (**44, 46**) which lie close to the East Stour River on slight rises in the ground, at least one (**44**) of which is marked on the first edition OS map. Beyond the Site the evidence of occupation is limited to some Bronze Age ditches (**21**) to the north of Westenhanger, 50m north of the site, which are associated with finds of Neolithic or Bronze Age worked flint (**105**) and a buried soil-horizon (**24**); and a possible ring ditch (**13**) which lies within Sandling Park (**RPG2**) 500m to the east of the site.

Site visit

The Barrows (**44 & 46**) were inspected during the Site visit. No. 46 remains extant within the garden of a house called 'Tumuli' at Barrow Hill, whilst No 44 has been impacted by ploughing meaning that survival of remains is likely to be reduced. The concentration of Bronze Age activity at and around Lympne Industrial Estate was also inspected. No extant features were noted.

These isolated finds and occupation activity demonstrate that the area was in use throughout the prehistoric period with the activity increasing in the Bronze Age as settlement activity becomes more common throughout the region as well as the area. There is considered to be **moderate** potential for unknown Prehistoric activity within the site.

Significance

The significance of buried remains within the Site will largely be defined by the nature of the find, its wider context and completeness or preservation. For example, within this the finds of flint-tools and axes provide indicators of activity, the potential Bronze Age date of which indicates a moderate to high level of significance relating to regional or higher value. The ditches and paleochannel have a more definite moderate to high significance on grounds of being better determined. This would also apply to the possible Bronze Age Barrows, which as extant features should also be considered aesthetically in terms of their contribution to the landscape. As such they have potential to be integrated into the proposals as features within the development or if not retained the results of their recording as mitigation should provide a useful source of information about the Site in the Bronze Age. Assets which lie outside of the Site might contribute in terms of landscape context and potentially provide useful information about the history of the area, for example in the case of the possible ring-ditch in Sandling Park to the east of the Site.

4.6.2 Iron Age (600BC-AD43)

With respect to the Iron Age there are three assets within the Site (**90, 81, 72**) listed on the Kent HER and nine assets within 500m of the Site (**94, 92, 1, 83, 93, 78, 74, 17, 104**).

The three assets listed as within the Site (**90, 81, 72**) are findspots which are recorded as Iron Age coins which most likely represent casual losses across the landscape but do indicate that the landscape was in use during this period.

Beyond the boundaries of the Site there are two occupation sites (**74, 78**) recorded on the Kent HER. These are described as an Iron Age rural landscape (**78**) and late Iron Age to Roman pits and ditches (**74**) both of which were discovered as part of the work carried out for the CTRL project. Both sites lie to the north of Westenhanger, with one (**74**) 790m to the east of the Manor (**SM6**). These indicate the continuation of occupation across the landscape but with particular focus on the slight rises of land around the East Stour River as the landscape is quite flat in this area varying from 55 to 80m AOD.

The remaining assets (**94, 92, 1, 83, 93, 17, 104**) are recorded as coins (**1, 92, 93. 94, 83**) and two pottery finds (**17, 104**).

Based on this evidence there is considered to be a low potential for Iron Age activity within the majority of the Site but a moderate potential in the north of the site, to the north of the East Stour River.

Significance

The significance of potential finds of Iron Age date within the Site, will be determined by their nature, but is likely to be determined as moderate to high reflecting regional value or higher. The finds recorded within Site may represent evidence of additional settlement or background context to the sites recorded under the CTRL works.

4.6.3 Roman Period (AD 43 – 410)

The Kent HER records thirteen (**5, 8, 9, 12, 14, 15, 16, 49, 67, 95, 118, 88, 89**) assets as dating from the Roman, or Roman to Early Medieval, period. Nine of these are findspots (**12, 14, 15, 16, 49, 95, 118, 88, 89**), two are Roman Roads (**5, 8**) and two are Roman occupation evidence (**67, 9**).

Stone Street (**5**), Roman Road, runs north-south from Canterbury to Lympne for 16miles (Margary 1955) and passes through the north-eastern corner of the Site through the village of Westenhanger. The route of the road then either follows the line of the Site boundary from Newingreen down to Lympne, and the Roman fort (**SM4**) beyond, or diverges to head for West Hythe and the Roman port of *Portus Lemanis*. The Kent HER maps both routes with one, Stone Street, still in use and the other having dropped out of use between Newingreen and the Aldington Road. The Aldington Road is itself a Roman Road (**8**) which runs east-west from Dover to Maidstone via Lympne and marks the southern boundary of the site. The road has been in use since this time to the present day and this stretch, which runs along the Aldington Ridge, is thought to have earlier origins (Margary 1955).

At Westenhanger, away from the Site to the east of Stone Street (**5**) evidence of Roman settlement (**9, 67**) has been found during excavations. This activity is described as pits (**9**) and field systems (**67**) and is recorded close to the M20, to the north of the site. This occupation activity contributes to our general understanding of the use of the landscape in the Roman period along with the fort at Lympne (**SM4**), the Villa to the south-west of the Site (**SM1**), the Roman Roads (**5, 8**) and the possible port at West Hythe. These provide an image of a broadly rural landscape close to the coast and with good access to the large towns of the region. It is likely this would have been an active area during the Roman period.

In addition, casual finds are scattered across the study area. A copper alloy weight (**118**) and a copper alloy bead (**88**) have been found within the Site while further copper alloy finds (**89, 95**) including a coin have been found beyond the site. Further, there have been several finds of pottery or tile (**12, 14, 15, 16, 49**) within 500m of the site.

Based on the evidence of use and occupation of the landscape during the Roman period provided by the Kent HER there is considered to be moderate potential for activity of a rural nature within the Site in the east and north close to the Roman road. The potential elsewhere on the Site is considered to be low.

Significance

Taken together the evidence for Roman activity from the HER and the scheduled monuments within the wider area would be considered of moderate to high significance reflecting regional or national value with regards to the SMs. As with other finds from other periods, this will be determined by the nature of the finds, context and condition.

4.6.4 Early Medieval Period (AD 410 – 1066)

Sixteen assets are listed on the Kent HER within the study area and of these, eight (**97, 98, 99, 100, 71, 41, 117, 52**) are listed as being within the site.

Within the Site there is one asset (**52**) which is recorded as occupation for the Early Medieval period. This is based on cropmark evidence and it thought to be an Anglo-Saxon Palace which sits within the current Folkestone Racecourse. The cropmarks are described as six or seven 'boat shaped' features which may represent the earliest site of Westenhanger Manor, 200m to the north-west. Discussion of this entry with HE,

KCC and SDC casts some doubt over its likelihood. It remains possible there is potential that it may instead relate to installations and activity during WWII. This area was inspected visually at a distance during the Site visit which observed that it is overgrown with trees and scrub. The ground was noted to be undulating but did not display any clear indicators of potential.

Within the study area Early Medieval occupation evidence is shown through features (**20**) recorded on the Kent HER to the north of Westenhanger Manor (**SM6**) and through two burial sites (**56, 19**), to the south and south-east of the site. The first of these (**19**) lies 465m south-east of the Site at the cross roads of Stone Street and Aldington Road and is a possible Anglo-Saxon cemetery. The second (**56**) lies 155m to the south of the site within the land around Port Lympne park (**RPG1**) and is recorded as a Flemish inhumation cemetery.

Other assets within the study area are isolated findspots which include Anglo-Saxon vases (**57**) close to the possible cemetery (**19**), brooches (**41, 80, 85**), coins (**97, 98, 99, 100**), a gaming piece (**117**), a copper alloy weight (**87**), a stirrup (**86**) and strap mount (**71**).

Place name evidence can also be used to evidence activity in this period. Lympne, Sellindge and Daneshurst are all thought to have origins based in the Early Medieval Period (http://kepn.nottingham.ac.uk/map/place/Kent/Lympne - accessed 12/10/16).

This evidence shows the continuation of occupation across the study area for the Early Medieval period particularly in the areas of Westenhanger and close to the Roman Roads. The potential for unknown archaeological remains from this period is therefore considered to be high in the north-east of the site, moderate along the southern and eastern edges close to the Roman Roads, and low in all other areas of the site.

The evidence relating to a potential 'palace' within the race course and the potential cemeteries require further clarification through research and investigation. The 'boat-shaped' description with relation to the 'palace' may equally indicate the presence of other feature types, given the possible Bronze Age Barrows, recorded on the HER to the northwest of the race course. Consultation with KCC indicated evidence for a potential 'causewayed' entrance to Westenhanger close to this location. Further investigation is recommended to clarify the nature of any remains present.

The significance of any extensive finds of early medieval-date would be considered moderate to high and equate to at least regional value. As with other periods, the outcome will be determined by the nature of any finds.

4.6.5 Medieval Period (AD 1066 – 1540)

Activity in the Medieval landscape is demonstrated on the Kent HER through six findspots (**82, 84, 96, 101, 106, 110**) and fourteen HER monuments (**42, 51, 53, 54, 66, 75, 76, 77, 120, 65, 45, 59, 79, 107**).

The findspots are described on the Kent HER as two coins (**82, 101**), one copper figurine (**84**), one brooch (**96**), a gold finger ring (**110**) and a scatter of pottery to the north of Westenhanger Manor (**106**).

Seven of the HER monuments are within the Site (**42, 45, 54, 53, 59, 66, 51**). Four of these (**42, 45, 54, 53**) are located within the Scheduled Monument at Westenhanger Manor (**SM6**). Two of these are described as the deserted Medieval sites of Westenhanger (**53**) and Easternhanger (**54**) however it is noted that Deserted Medieval Villages (DMV) are virtually unproven in Kent as the county was largely comprised of isolated Manors and Farmsteads at this time (Kent HER 2016). To the west of Westenhanger are cropmarks of a trackway and fields system (**42**) which may have been associated with the Manor. Close to the Manor house at Westenhanger is the site of St Mary's Church (**45**) which was demolished around AD 1701 (NHLE accessed October 2016). These areas where inspected during the Site visit which noted uneven topography and a possible water-management feature to the north of Westenhanger Manor. One large feature was identified to the west of the buildings at Westenhanger in the form of a ramp or embankment leading up to the railway. This is likely to relate to construction of the South Eastern Railway in the 1840s.

To the south of the site, at Belle Vue (**LB21**), is the site of a Medieval moated site (**51**) and an associated site of an aisled barn (**66**) which lies on the junction of Otterpool Lane and the Aldington Road. This may indicate an earlier establishment date for occupation in this location which is backed up by data from the Kent HER of earlier activity to the north beneath the current industrial park. Additionally, associated settlement activity from the Medieval period can be found to the south of the Aldington road (**107**).

Harringe Court (**59**) lies at the western edge of the site and is described as an L-shaped brick and stone house of probable 15th century date. This record is also a Built Heritage asset (**BH6**) and is discussed below.

Both of these buildings were inspected during the Site visit, during which features of possible late medieval date were confirmed in the structure of their buildings and other features (see **Section 7**).

Seven assets (**76, 77, 79, 57, 65, 120, 107**) are recorded within 500m of the site on the Kent HER. To the east of Westenhanger village Medieval ditches (**75**) are recorded and to the north of Westenhanger Manor (**SM6**) is further possible settlement activity (**76**) in the form of ditches (**79, 77**) and enclosures (**77**) which may have once been associated with the manor itself.

To the north of Barrow Hill, 35m from the site, is the location of Talbot House (**65**) which was a Medieval Hall House that was dismantled and relocated as part of the CTRL project. To the north-west of Talbot House (**65**) close to the southern end of Sellindge are ditches and surfaces which are of a possible Medieval date and indicate occupation activity in the area at this time.

Finally, 40m to the south of the site at Lympne campsite within the land held by Lympne Park (**6**) is the location of a Medieval hollow way with associated enclosures and buildings (**107**) which presents potential settlement activity associated with the moated site (**51**) to the north at Belle Vue.

The distribution and nature of these assets suggest that settlement activity was focused around a few isolated farms and manor sites within the Medieval period, as suggested by the Kent HER records (KCC 2016). As such the potential for unknown archaeological assets within the site is considered to be low except around the Manor of Westenhanger, Belle Vue and Harringe Court where the potential is considered to be moderate.

The significance of remains of Medieval date relating directly to Westenhanger Castle would be considered high given the scheduled status and therefore might also be of national value. Remains relating to the wider medieval rural context are likely to be of moderate to high significance depending on their nature and context. This would equate either to regional value or higher.

4.6.6 Post Medieval Period (AD 1540 – 1914)

Seven assets are recorded on the Kent HER (**70, 22, 25, 43, 91, 108, 73**) within the study area, of which one lies outside the site (**70**). This asset lies 50m to the south and is described on the Kent HER as the site of a windmill and smock mill (**70**).

Within the site there are two findspots (**91, 108**) which are described as gold jewellery on the Kent HER; these are most likely casual losses based on their location within the landscape and their isolated nature.

The majority of the other assets from the Post-Medieval period (**22, 25, 43, 73**) are located to the east of the site close to Stone Street, between Westenhanger village and Newingreen. At Newingreen two assets are described as the location of the former Royal Oak Motel (**73**) and features found during excavations at the Hotel. The Royal Oak Motel (**73**) was a Grade II listed building but was demolished in the early 21st century and was associated with the Royal Oak Public House (**LB15**). A ditch (**43**) runs parallel to Stone Street where it passes through the village of Westenhanger and features (**22**) were discovered on either side of Stone Street during the CTRL construction work, which were assessed to have been of Post-Medieval date. However, during the excavations a buried soil horizon was also discovered which could have origins in the Roman or Late Prehistoric period.

Assets from the Post-Medieval period within the study area are limited which may correlate with cartographic evidence that there has been little change in the area until the Modern period. As such there is considered to be little potential for unknown archaeological assets of this date within the site.

As with the earlier medieval potential any such remains are likely to be considered of moderate to high significance relating to probable regional value. Given the uncertain nature it is also possible that potential finds might be of lower significance equating to local value.

4.6.7 Modern Period (AD 1914 – Present)

All assets listed on the Kent HER within the study area are of a military nature and are probably associated with the former airfield at Lympne (**27**). There are twenty-three assets of this nature within the study area (**2, 4, 7, 18, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 60, 61, 62, 63, 69**) and only three of these are outside the boundary of the site (**63, 18, 33**).

Lympne airfield (**27**) was an emergency landing ground for home defence aircraft which was established in 1916. The development of the site began with canvas hangers and wooden huts; the officers' mess was at Lympne Castle (**LB3**). In 1917 more sheds, workshops and offices were built close to the Aldington Road. Between the two world wars the airfield was opened to civil aviation and was the host location for several competitions and cape to cape runs, by Amy Johnson, Jim Mollison and the Duchess of Bedford. In 1936 the base was reopened as an operational station and was over the course of the war a bomber base, HMS Buzzard under the Admiralty, a fighter command; but only became fully operational in 1941. Dispersed hard standings, a fighter pen and accommodation were built during this time to bring the station up to standard. The station was further upgraded

in 1942 to accommodate more fighters for Operation Jubilee. After the war the airfield was downgraded to care and maintenance only with civil aviation readmitted.

Lympne airfield (**27**) covered the area to the north of the Aldington road between Otterpool Lane and Stones Street with some activity to the west of Otterpool lane. Much of the airfield (**27**) has now been replaced by an industrial estate and to the east only a small portion of the runway (**39**) has survived. Additional assets which are listed at the site include an auxiliary operational unit base (**4**), a battle headquarters (**28**), two aircraft dispersal pens (**29, 40**), a gas decontamination building (**30**), air raid shelters (**31**), Picket Hamilton fort (**32, 60**), slit trenches (**34**), trenches (**34**), a former barracks hut (**35**), an overblister hanger and trackway (**36**), a machine gun testing range (**37**), a bulk fuel installation (**38**), a concrete base of unknown use (**61**) and a gun emplacement (**62**). Although much of the airfield has been lost to later development the setting of any surviving assets associated with this site should be considered as part of the proposed development as part of this larger asset (**27**). These assets are of local and regional significance due to their links with the cinque ports and coastal defence, whilst Lympne Airfield's role in the defence of Britain in WWII presents an aspect of national significance.

Plate 2: Military buildings to west of Otterpool Lane (view east)

Site Visit

The areas to the east and west of Lympne Industrial Estate were inspected during the Site visit to assess survival of structures relating to the airfield. To the east, the airstrip (**27**) remains as a visual feature within the field. Modern aerial coverage from online resources demonstrates this clearly with a perpendicular track or road leading south east to the Lympne Industrial Estate. No remains were noted of the aircraft dispersal pens, but a circular feature surrounded by rings in the south of the field to the east of the industrial estate may indicate the position of a former anti-aircraft battery or similar defence installation. North of the airstrip is a large bank, measuring around 5m in height and running east to west across the field immediately east of the industrial estate. Online resources indicate that this is the grassed over spoil heap from ongoing construction works to the north of the Lympne Industrial Estate.

To the west of Otterpool Lane surviving military buildings and associated structures comprise nine brick-built sheds with pitched roofs of corrugated sheeting, which are not recorded by the Kent HER, around ten outlying bunkers or air-raid shelters (**31**), two of which lie within trees, two concrete weighbridge structures, not recorded, on the approach drive to Lympne Park, and the picket Hamilton fort (**32**). The latter of these is an automated circular pillbox, which rises from the ground in use to allow shooting and then sinks back under cover. The brick-built sheds are one storey high and are divided by high rectangular windows into around seven bays. These high windows indicate that the buildings are likely to have served as workshops. One building at the south of the group stands out in having a flat roof and a projecting stair-head or similar. This is likely to be the gas decontamination building (**30**). The air-raid shelters are identifiable as extant grass-covered banks with concrete entrances. They are approximately 10m long.

Plate 3: Picket Hamilton Fort (view west)

To the north east of the Lympne Industrial Estate, the pillboxes recorded by the KHER were not inspected owing to lying within and beyond a construction site area, where access was not provided. This includes the location of the Picket Hamilton Fort (**60**) as shown on Plate 3. Inspection of these assets from online resources indicates that they are also circular structures. Given that Picket Hamilton Forts are documented more widely in the local area at Shorncliffe Barracks, Folkestone amongst other locations it seems likely that these may also be of the same type. Online resources were also used to check the condition of the auxiliary operational unit base (**4**)which was not accessible during the Site visit, and which appears to be extant at its recorded location on the KHER to the west of Otterpool Lane.

Other structures which may have WWII origins were identified at Benbridge Industrial Estate opposite the Airport Café on Ashford Road: the Airport Café refers to Lympne Airfield's post-WWII role as a small commercial airfield. These buildings include a Nissan hut, mid-20th century garages, a concrete weighbridge, wooden huts with chicken cages on the walls and a pair of concrete workshops which are currently in use as offices. At the centre of the group is a derelict redbrick structure which has a Critall window and no roof. The proximity of this group to the former Lympne Airfield and the inclusion of a Nissan hut present potential that they may have played a role in WWII. Whilst none of the buildings have significant architectural merit, any wartime role played has value in its

potential to inform the history of Lympne Airfield. The Nissan hut and the derelict redbrick structure, with commonalities form the primary indicators in this. None of these structures are recorded by the KHER.

Further north at the race course, one of the pavilion buildings has been identified by HE and the heritage advisors at KCC and SDC as having a possible WWII role. This should be considered together with evidence associated with Lympne Airfield. The advisors also provided details concerning a narrow-gauge railway which connected Lympne Airfield to the railway, which was removed after WWII and noted that the linear track to the west of the race course was reportedly used as a landing strip in WWII. Finally, a concrete building foundation immediately south of the farmhouse at Upper Otterpool (**BH20**) is according to the owners of Upper Otterpool a former military structure relating to the wartime use of Upper Otterpool by officers (owners of Otterpool *perscomm*).

Further to the west of the site is a single anti-tank pimple (**7**) which is located 265m to the south-east of Harringe Court (**59**).

Beyond the site boundary are further military assets including a WW2 auxiliary unit hide (**18**) and a nodal point (**63**) on Swan Lane in Sellindge.

Finally, the site is bounded by the line of the London and Dover Railway (**2**), now shared by CTRL, and which was opened in 1844. A redbrick railway bridge belonging to this lies close to the north-west corner of the Site has value historically and aesthetically and provides an important access through the railway, CTRL and the M20. The bridge bears traces of white paint indicating that it was previously whitewashed.

Assets from the Modern period are mostly military in nature and potential for unknown archaeology from this period within the site is considered to be low due to the potential for unrecorded military assets within the south of the site. The military assets at Lympne airfield (**27**) are considered to be of local and regional significance due to their links with the cinque ports and coastal defence.

4.6.8 Military crash site remains

Four military crash sites are recorded in the Kent HER within the study area, and of these, two are located within the site (**MR3, MR2**). The remaining two sites (**MR1, MR4**) lie 150m to the south of the site and 200m to the north of the site respectively.

Military aircraft sites are often classed as war graves and can comprise both surface and buried artefacts, human remains and unexploded ordnance. These sites are covered not only by the Ancient Monuments and Archaeological Areas Act 1979 but also the Protection of Military Remains Act 1986. HE has published guidance on the significance and treatment of military remains which should be followed at all times (HE 2002).

The significance of these remains can be both of a local, national and international level as they relate to the local communities and the families of the deceased, whichever county they may be from. In addition, crash sites have significance for remembrance, commemoration, their cultural value as historic artefacts and the information they contain about both the circumstances of the loss and of the aircraft itself.

Significance

The information reviewed concerning Lympne Airfield indicates that it played an important role in 20th Century conflicts which would be regarded as of moderate to high significance and therefore of regional to national value. Given the level of subsequent impact, much of the airfield's potential now equates to potential to inform rather than provide physical evidence.

Recommendations

The structures relating to Lympne Airfield represent a key historical resource concerning 20th Century defence and aviation, particularly with relevance to WWII. As such both standing and former structures have the potential to inform the development and contribute to outreach. Initial consultation with the HE and respective heritage advisors indicates that the Picket Hamilton Forts are considered to be significant and may need to be retained to some degree. The sheds or workshops have potential for reuse if integrated into the proposed development in some way. The most relevant resolution for this group would be to contribute in terms of historical context to the development through outreach and information, with possible retention of key elements, following determination of their status in terms of protection. Any structures not retained would need to be mitigated through a programme of documentation and research. The understanding of military structures relating to Lympne Airfield and 20th Century conflict should be developed as one of the appraisals during Stage 2 of the project.

4.6.9 Unknown Date

Thirteen assets (**3, 6, 23, 48, 58, 64, 109, 111, 112, 113, 114, 115, 116**) of unknown date lie within the study area. Two are findspots of metalwork, pottery and worked flints (**64, 109**), eight are cropmarks (**111, 112, 113, 114, 115, 116, 58, 48**), two are land parcels at Lympne Park and Westenhanger manor (**3, 6**) and one is a diversion of the East Stour River (**23**).

The cropmark data may add to our knowledge of settlement in the study area and although they are undated, most of these cropmarks can be found in the area of Barrow Hill (**113, 114, 115, 116, 58**) and may reflect occupation associated with the Prehistoric barrows also located there (**44, 46**). One cropmark (**48**) is associated with the group of monuments at Belle Vue discovered during the excavations at the industrial park. This was not accessible during the Site visit. A linear geophysical anomaly (**111**) was discovered near Harringe Court and may be related to a Neolithic arrowhead (**103**) found nearby. Finally, a cropmark to the west of Westenhanger (**112**) marks an enclosure of unknown date.

The first land parcel is a repeat of the Scheduled Monument (**SM3**) at Westenhanger manor and the second is land associated with the Registered Park (**RPG1**) at Port Lympne which is larger than the park itself and is mostly occupied by the wild animal park marked on the OS maps.

In addition to these entries, three areas of potential were identified during the Site visit.

Features south of Harringe Court (x)

The first of these relates to extant raised linear features, which are possibly wall foundations, and a possible buried track or road surface 40m to the east of Harringe Lane and 200m south of Harringe Court. The layout of extant features indicates a possible building plot.

Plate 4: Features to the south of Harringe Court

Features at Upper Otterpool (x)

The second area is larger and potentially more significant and relates to the settlement of Upper Otterpool (**BH20**). There are clear indicators of landscaping and agriculture across the promontory occupied by Upper Otterpool, which may indicate that it has provided cultivation for the house at some point and indicates likely potential for further structures and remains associated with earlier activity. It currently forms pasture which is used for sheep grazing, and the roadside ditch terminates close to the house at a possible collecting pond, which is now empty. A Neolithic Axe (**47**) is recorded at this location, but there is nothing else to confirm whether this is related. A steep bank marks the plateau boundary to the north-east which might indicate a defensive feature or an historic quarry edge. The modern quarry lies around 100m further to north-east.

Former track or route adjacent to Stone Street (x)

The final area of potential takes the form of an extant section of track, possibly a hollow-way located along the east side of Stone Street in the north of the Site. The section runs for around 60m from the industrial buildings at the junction with Ashford Road northwards where it converges with the current road.

Although these assets can shed some light on the archaeological potential of the study area they cannot offer any certainty and so offer little as to the significance of the archaeology within the study area.

4.6.10 Archaeological Events

There are 25 recorded archaeological events (**Figure 6**) within the site, of which three there were DBAs, eight evaluations, five watching briefs, four tree ring analysis events, two geophysical surveys, one geotechnical evaluation, one test pit survey, one earthwork survey, one surface collection event and three other survey events.

Of these only fourteen yielded archaeological results, these are listed and surmised below:

- EV1 – Evaluation of land at Cedars, Barrow Hill. A possible Prehistoric Paleochannel was discovered during and evaluation.
- EV8 – Surface collection of finds for CTRL yielded pottery of Roman, Iron Age and Medieval dates, Prehistoric worked flints, and other Prehistoric finds.
- EV 9 – A watching brief at Jesters, Westenhanger discovered a Post-Medieval ditch.
- EV10 – A geophysical survey at Harringe Court yielded results of a linear geophysical anomaly which remains undated.
- EV11 – An archaeological evaluation at Plot 20, Link Park, Lympne, revealed several Prehistoric post-holes, a gully and a ditch of similar date.
- EV 16 – A possible Bronze Age burial mound was recorded near Barrow Hill.
- EV17 – A geophysical survey of the A259 Dymchurch to A20 revealed possible ditches and an enclosure of an unknown date.
- EV18 – An evaluation east and west of Stone Street, Westenhanger revealed undated features to both sides of the road.
- EV19 – An evaluation close to Hillhurst Farm revealed Roman settlement activity.
- EV23 and EV24 - Evaluation trenching and a watching brief at Link Park, Lympne revealed a Bronze Age occupation site.
- EV26 – A survey of Lympne Airfield recorded the presence of the Airfield, a Gas Decontamination Building, Air Raid Shelters, a Picket Hamilton Fort and former Barracks Huts.
- EV 28 – An archaeological desk based assessment and walkover survey recorded the presence of a Pickett Hamilton Fort and a concrete base, likely to be of WWII origin.
- EV 29 – An archaeological evaluation revealed finds of uncertain date at Link Park, Lympne.

These events add to our general knowledge and understanding of the study area.

4.7 Discussion of Non-designated Archaeological remains

The Kent HER was consulted for information on the archaeology of the study area and the results are surmised below.

The Prehistoric archaeology within the study area is found mostly in the east of the site from the Barrows (**44, 46**) in the north to the Bronze Age settlement activity at Lympne industrial park (**26, 121**) in the south and settlement activity north of Westenhanger (**21**) towards the far east of the site. Based on this evidence there is considered to be a moderate potential for unknown archaeology from the Prehistoric period for the east of the site (to the east of Otterpool Lane and the A20).

Iron Age activity is limited and is mainly found in the area to the north of the site, north of the East Stour River, with settlement activity located to the north of Westenhanger (**78, 74**). Due to this there is considered to be a low potential for Iron Age activity across most of the site which rises to a moderate potential along the northern edge, to the north of the East Stour River.

Activity in the Roman period is more widely spread within the study area with a Roman Villa to the west (**SM1**), the Roman fort to the south (**SM4**) Roman Roads (**5, 8**) crossing the site in the east and bounding the site to the south, and settlement activity to the north-east of the site (**67, 9**). This activity suggests a landscape which was mostly rural in nature with some defensive aspects towards the coast. In this sort of landscape activity tends to be focused along the roads and close to the key settlements such as the Villa (**SM1**) and Fort (**SM4**). Therefore, there is considered to be low potential for unknown archaeology of this period across the majority of the site which rises to moderate in the area close to the Roman Roads (**5, 8**).

During the Early Medieval period the study area does show signs that it was in use through burials (**19, 56**) to the south and south-east, and a possible Palace site (**52**) in the north-east of the site close to Westenhanger Manor (**SM6**). There is therefore considered to be a low potential for unknown activity of an Early-Medieval period cross most of the site with moderate potential in the area around Westenhanger Manor (**SM6**).

The landscape of the area in the Medieval period was characterised by isolated farmsteads and manors (KCC 2016) which are shown within the study area through scheduled monuments (**SM6**) and HER assets (**5, 66, 59. LB38, LB20, LB1)** such as Westenhanger (**SM6**) and Harringe Court (**59**). This can still be read in the landscape although some farms have been encroached upon and some of the manors lost to later development. Given the comprehensive sample of data reviewed for identified periods, there is considered to be little or no potential for unknown archaeology of a significant nature across most of the site and a low potential in the area around Westenhanger (**SM6**).

In the Post-Medieval period there was little change across the landscape from the Medieval period and the evidence from the Kent HER reflects this with only a few assets recorded (**73, 25**) within the site. There is therefore considered to be of little or no potential for unknown archaeology of a significant nature from this period within the site.

Finally, in the modern period the study area saw a large amount of activity through the growth of settlements and infrastructure (**2**) in the area. The largest area of notable activity during this period is in the south of the site around the area of the former Lympne airfield (**27**) which was operational during the First and Second World Wars and is important to the heritage of both the local area and the region. There is considered to be a low potential for the discovery of unknown military remains across the site. In addition, there a two Military Aircraft Crash sites within the site which should be considered as of national importance and be approached as by Historic England (HE 2002).

The archaeological remains within the study area show activity ranging from the Prehistoric through to the Modern period and demonstrate a landscape which has been occupied throughout these periods. The nature of this activity has changed over time from Bronze Age settlement activity close to Belle Vue and north of Westenhanger, which is also evidence in the Barrows close to the East Stour River, to the dispersed farmsteads of the Post-Medieval period. The use of the landscape has also developed over time from a largely agricultural area across the earlier periods through to the Post-Medieval to a more varied landscape including agriculture, industrial sites, quarrying, airfields and racecourses in the Modern period. This is confirmed by the cartographic analysis, section x6.

The main areas of potential in the site are in the north-east of the site in the area around Westenhanger Manor (**SM6**) and in the south of the site around Lympne airfield (**27**). Other isolated assets are considered to be of significance to the area and are discussed in the further assessment and conclusion sections.

Recommendations

It is recommended that the understanding of archaeological potential be developed further in relation to specific areas of impact under masterplanning to inform schemes of archaeological investigation and mitigation through a managed programme of works. The schemes of investigation involved in this should be based upon a review of the identified potential from the KHER and the above event data. This will focus efforts and reduce overall costs for evaluation. It is recommended that outreach and the potential to inform residents and users be integrated in this programme.

4.7.1 Historic Landscape Characterisation Data

Historic Landscape Characterisation (HLC) data has been supplied by the Kent HER (**Figure 5**) and is analysed in the section below.

Across the site the landscape includes: Post 1810 settlement, small rectilinear enclosures late medieval to 17th or 18th century, 19th century enclosures with extensive boundary loss (prairie fields), small parliamentary enclosure, medium parliamentary enclosure, gravel works both active and disused, industrial complexes, racecourse, post 1800 scattered settlement, small rectilinear fields with wavy boundaries.

Much of the site is described as late Medieval to 17th or 18th century enclosures which are mainly rectilinear with curvilinear boundaries. These are generally considered to be separate from assarts (forest clearance), converted from woodland, as they lack the small areas of dispersed woodland and copses typical of this earlier form. However, during the site visit it was observed that some of the landscape, particularly in the west of the site, displays areas of fragmented woodland and still shows some of these, along with tree-lined streams and gullies today. This may indicate that the landscape in the west of the site is a mix of assarts and later Medieval fields. It is known that Westenhanger (**SM6**) was a Royal manor with attached forests for Elizabeth I and so some of this landscape may date from this time or shortly after.

This reflects the mixed agricultural use of the landscape as understood from cartographic sources and data from the Kent HER. The landscape has been in continual use from the earliest times through to the Modern period. This is reflected in the development of the fields systems in the area from smaller rectilinear and irregular enclosures which may date from the Medieval period, through the parliamentary enclosures and into modern larger scale fields and land use.

Recommendations

The grain of this rectilinear and irregular enclosure pattern should be used to inform layout in the masterplanning of the Site. Design under the proposals might use this framework to inform groupings and relationships between the different areas within the development. In addition to this the advisors at KCC have advised that the isolated farmstead typology which is characteristic to Kent should also be considered in the proposals. This typology predates the more recent development of nucleated settlement in Kent. This typology might be included in the proposals would be to integrate individual units, both existing and new within the different areas of development. Information is provided concerning this from the Kent Village Guide and guidance from the North Kent Downs AONB. HLC will be developed as one of the appraisal areas under Stage 2, which will include liaison with the design team to incorporate the patterns and characteristics present within the Site and wider area into masterplanning.

5 Cartographic Analysis

The cartographic analysis for this baseline study was carried out using online sources via the National Library of Scotland (NLS) (accessed 12/10/16) and the British Library's (BL) Ordnance Survey Drawings collection (accessed 12/10/16). There are several historic county maps which have been cited by Historic England and the Kent HER in their descriptions of heritage assets. These are referred to below but have not been consulted directly.

The earliest map available for this area is the 1769 Andrews and Drury map of Kent which shows detail of Sandling Park (**RPG2**) and Westenhanger wood, according to the National Heritage List for England (NHLE).

Second is the 1797 OS drawing (BL – accessed October 2016) which shows the area in some detail, field boundaries are defined and some detail can be seen on villages and estates. The map shows that the Villages of Sellindge and Stanford were both much smaller and focused further to the north than the current extent of settlement. This is particularly true of Sellindge which is shown on the map as having its focus close to where Stone Hill is now. Barrow Hill is not marked on this map but Otterpool and Harringe are marked and seem to have changed little from this time. Newingreen and Belle View are also marked on the map though Newingreen (New Inn Green) is much smaller than the current settlement, and comprises only a few houses. Lympne is limited to the south of the Aldington Road close to the Castle (**SM4**) and the settlement has not yet begun to spread northwards up Stone Street towards Berwick House (**LB29**).

Aside from the addition of the M20, the roads in the area appear to have changed very little from this time to the present and the railway is not yet developed in the area.

Some detail can also be seen of the Manor at Westenhanger where a possible garden can be seen to the south of the buildings and woodland or plantation can be seen both to the south and the north-east of the manor house. There is no evidence of the deer park to the north. To the east Sandling Park (**RPG2**) has not yet been established. Woodland can be seen in the area but it seems to be dominated by large scale enclosures at this time. Of Port Lympne (**RPG1**) there is no trace yet, the site is shown as within Romney Marsh and is partially wooded.

In broad terms the 1797 OS drawing shows an agricultural landscape of larger and small enclosures interspersed with isolated farmsteads and occasional woodland.

The 1801 Mudge map and the 1819-20 Greenwood map also show detail of the area but have not been consulted here.

The area is covered by four Tithe maps for the parishes of Lympne (1841), Sellindge (1840), Stanford (1838) and Saltwood (1842).

The Saltwood Tithe, 1842, shows the farms of Tin Chimney (**BH24**) and Hillhurst (**BH32**) and the house Little Sandling (**BH38**). The area is clearly in use as a mixture of arable and pasture fields with hedges forming the boundaries. The railway has not yet been built but the line has been marked on the map. The area within the site is bounded by Stone Street (**5**) to the west and the Ashford Road to the south-east.

The Stanford Tithe map of 1838, shows the area north of the Ashford Road and to the east of the East Stour where it turns to the north. This map mainly shows the Manor at Westenhanger (**SM6**) with ancillary buildings and causewayed access from the south. At the southern end of the causeway, adjacent to the Ashford Road, is a small building which is probably Rose Cottage. Within the village of Westenhanger there is one dwelling marked at this time, Pound cottage, which was lost to later development. The land is clearly shown as enclosed for agricultural use and the roads are in their current form.

The Lympne Tithe map of 1841, covers the area south of the A20 Ashford Road and extends as far west as Harringe Brook woods including parts of modern Barrow Hill. The map shows the house at Bellevue (**BH11**), the cottages to the south of the Aldington Road, west of Lympne, and those houses around the green at the northern end of the Lympne Conservation Area (**C1**). To the north of Lympne the houses at Berwick are shown (**BH27, BH28**), along with Berwick farm to the south, New Inn Green Farm (**BH25**) and the Royal Oak Public House (**LB15**). Along the Ashford Road, to the south, there are several buildings marked which are extant on later mapping. On this map, Upper Otterpool (**LB20**) is marked as 'Great Otterpool' and Otterpool Manor (**LB38**) as 'Little Otterpool' indicating there was a change of importance between these two buildings by this time. The barn at Otterpool manor (**LB38**) is clearly marked and the complex at Upper Otterpool (**LB20**) is quite extensive. More detail can be seen on the Sellindge Tithe. At the northern end of what is now Barrow Hill a dwelling known as Humble Bee Hall can be seen which is still extant today. The woodland at Harringe Brook woods is more extensive to the north-east than it is today and extends well into the site boundary. The land is enclosed for agricultural use and is comparable with the modern field systems.

The 1840 Sellindge Tithe map shows the area in the west of the site to the north and east of the Ashford Road. The extent of the complex of buildings at Upper Otterpool (**LB20**) can be seen on this map as much more extensive to the west of the house than it is today. Harringe Court (**BH6**) is shown as a large farmstead although the fields around the farm have not yet reached their modern form. In the area around Harringe there are two areas of woodland (App nos. 59 & 155) which are no longer present. The cottages at Barrow Hill (**LB11**) are clearly marked along with several ancillary buildings as is the now lost cottage to the north (**LB17**). The line of the railway is not yet marked on this map. Further south within Barrow hill there are two further dwellings and Barrow Hill Farm (**BH13**). The fields are enclosed for agricultural use and are of mixed sizes and shapes with dispersed woodland across the area.

The first edition OS map dates from 1877. By this time the Railway has arrived across the north of the site but the road system remains unchanged. The Roman Roads of Stone Street (**5**) and Aldington Road (**8**) can still be seen in use. Additionally, the possible alternative line or diversion of Stone Street to the port at West Hythe can be seen in field boundaries along the western edge of Folks Wood.

The settlement at Sellindge is beginning to spread south along the A20, probably due to the arrival of the railway and the settlement at Barrow Hill is much the same as on the Tithe map. Stanford is still focused more to the north than its present location and has not begun to spread south along Stone Street. All other settlements in the area remain much unchanged as well. To the south of the site a cottage has been built which is marked as Bellevue Cottage, now Danehurst. A possible access from the west can be seen from Otterpool Lane to Upper Otterpool (**LB20**).

Westenhanger Manor is still marked on the map but it appears to have lost some of its surrounding landscaping or gardens, which have been replaced with agricultural fields. To the east Sandling Park (**RPG2**) is beginning to develop and paths can be seen across the estate as well as woodland planting in both the north and south. Hillhurst is marked on the map in the location of the current Port Lympne House (**LB7**) though there is no sign of gardens around the house. The causeway to the south of the manor, from the current A20, is also visible on this map as a tree-lined avenue which begins at Rose Cottage, also marked on the map

The landscape is still broadly of an agricultural character and has changed little from that illustrated on the Tithe maps. Notably the fields immediately surround in the farm at Harringe (**BH6**) have reached their modern form and the woodland to the north-east of Harringe Court (**BH6**), Forestall Wood, has been lost.

The 1889-99 OS map Barrow Hill shows little change in the area again with only minor changes to the layouts of some fields. In addition, a small area of woodland has been lost to the south east of Harringe Court (**BH6**) and quarrying has begun to the north-east of Otterpool Manor (**LB38**), on the east side of Otterpool Lane. The largest change to the landscape is the line of the railway to the north of the site.

At Barrow Hill some cottages and 'The Gables' have been built and there are some additional dwellings at Westenhanger village. A house has been built at the junction of Otterpool Lane and the A20.

The Tumulus (**44**) is visible on the map as a small hachured hump and the landscape is crossed by many footpaths which are now no longer in use.

The 1908 OS map shows the construction of the racecourse has occurred between 1899 and 1908. In addition, the settlements of Sellindge and Barrow Hill have spread south and north, respectively, towards the railway line and more closely resemble their modern forms. There has been little change in Westenhanger village and New Inn Green. Danehurst, formerly Bellevue Cottage, has a small area of gardens around it.

Upper Otterpool (**LB20**) and Otterpool Manor (**LB38**) are now marked with their modern titles and Upper Otterpool has begun to reduce in size. To the east of Westenhanger Manor (**SM6**) there appears to be a small area of gardens which may be associated with the racecourse. It is unclear where the access to Westenhanger Manor is at this time. There have been some minor changes to the landscape through field boundary alterations but the boundaries are still much the same as on the Tithe maps.

The 1933 OS map shows the expansion of Stanford towards the south and the growth of occupation all along Stone Street as far as New Inn Green (Newingreen).

The 1938-40 OS map shows that Barrow Hill has continued to expand as has the settlement at Westenhanger, there are two cottages marked on the map close to the station which have since been lost. In addition, the section of Lympne which lies along Stone Street (**5**) is beginning to develop.

The grounds of Upper Otterpool (**LB20**) have further reduced and the quarrying to the north-west has expanded. There are now three hangers marked at Lympne airfield.

There are some minor changes to field boundaries but little overall change.

The 1943 OS map shows the beginning of expansion along Stone Street from New Inn Green to the cross roads of Stone Street and Aldington Road. Lympne has not yet developed beyond its Medieval core. At Belle View the first appearance of industrial activity can be seen with the erection of 3 large sheds. A quarry has also been dug to the north-east of Otterpool Manor.

The 1961 OS map shows the expansion of New Inn Green to the west and south as well as further expansion of settlement all along Stone Street (**5**). Upper Otterpool (**LB20**) has lost more of its surrounding structures and has also lost a stand of woodland to the north-east of the house. However, there has been little change at Barrow Hill or Harringe Court (**BH6**).

Lympne Airfield is now clearly marked with detail on buildings on the 1:2,500 scale mapping. The Barrow (**46**) within the village of Barrow Hill is also now marked on the OS.

There has been little overall change to the agricultural landscape within the study area.

The 1973-78 OS map shows the movement of quarrying activity to the location adjacent to Upper Otterpool (**LB20**) and the construction of the quarry buildings close to the A20. There has been further expansion of the airfield and Lympne has now reached its modern form.

There has been further expansion of Barrow Hill and Benham/Red House farms, to the south of the A20.

Little Sandling has now been lost and there has been a reduction at Harringe Brook woods so that this now lies outside the site boundary.

The 1990 OS map shows the expansion/construction of the Link Park industrial estate and the M20.

On the 2016 OS map the railway line has been widened to accommodate the modern CTRL route and the M20 has been built to the north of this. Evidence of quarrying activity can still be seen to the east of Otterpool Manor but the original quarry site has been replaced by 'works' and the industrial activity at Bell View has expanded north to Otterpool Farm. Lympne has expanded to the north of the Aldington Road and up Stone Street almost to Berwick House (**LB29**). Sellindge has likewise expanded but in this case only in its southern extent.

The parks at Sandling Park (**RPG2**) and Port Lympne (**RPG1**) are now fully established and in the case of Port Lympne has been repurposed as a wild animal park with associated infrastructure. An additional settlement has been established at Lympne Place between Lympne and Port Lympne Park.

Cartographic analysis shows that in general, the landscape of the area has retained its agricultural nature as described on the Tithe maps. However, some fields have now become much larger post-war enclosures and settlement has expanded along the transport routes in the 19th and 20th centuries.

5.1.1 Historic Hedgerows

Many of the hedgerows, tree-lined field boundaries and woodland copses on Site are shown by map regression to be historic and would therefore qualify for protection under the Hedgerow Regulations (HMSO 1997). Map regression, Historic Landscape Characterisation and the results of on-site survey indicate many of the woodland and copses within the Site, as well as the hedgerows, are result of gradual reduction of earlier woodland relating to deer park and earlier landscape through agricultural management of field systems. The character of this survival should inform the masterplanning process.

6 Built Heritage

6.1 Within the site

6.1.1 Westenhanger

Westenhanger Manor (LB5)

Westenhanger Manor (**LB5**) is a Grade I listed Castle or Fortified House which dates, in part, from the 14th century and is now partly ruined. Additions and alterations have been made in the 16th century, late 18th century, and 19th century, and the house was restored in the 1980's. The licence to crenelated was granted in 1343 to John de Kiriel and the house was largely demolished in 1701 for building materials.

Due to this the house varies in style and materials. The 14th century walls are coursed ragstone, the front elevation is red brick in Flemish bond, the left gable and rear are in red brick in header bond, and the roof is plain tile. The house has a rectangular plan with a courtyard covering 130 feet across, bastions are located on the corners which are both circular and rectangular in design.

The house is associated with the Scheduled Monument (**SM6**) of Westenhanger Castle and the Barns to the north-west of the Manor house are also Grade 1 listed (**LB1**). As such the buildings at Westenhanger and the Westenhanger Castle SM are of national significance and should be integrated in the proposals as an important focus and source of information about the identity of the area. This should include details and results on consultation set out earlier in this report and will be developed further through detailed appraisal and liaison with the design team. The potential significant environmental effects of the Otterpool Park proposals on the Westenhanger Manor and the group will then be determined through the EIA process.

Plate 5: Grade I Listed barns at Westenhanger (view east)

Barns at Westenhanger Manor (LB1)

Two Barns to the north-west of Westenhanger Manor (**LB5**) are grade I listed and date to the 16th century in two periods. The barns are constructed of galleted ragstone which is roughly coursed on the east-west range and evenly coursed in small blocks on the north-south range. The roofs are of plain tile. The two ranges form an L-shaped structure. They have a clear open aspect to the west, and to a lesser degree to the south, presenting historic views. They should be considered together with Westenhanger Manor, the scheduling and non-designated heritage, such as the potential Tudor garden, at Westenhanger to provide a comprehensive resolution of setting and views. A key focus in this would be the south-facing aspect of the earlier approach to Westenhanger.

Non-designated Built Heritage

Westhanger Manor (**BH34**) is also listed on the Kent HER as a regular multi-yarded farmstead which was recorded as part of the Kent Farmsteads and Landscape Project (KFLP). In addition, the Kent HER lists two outfarms (**BH22, BH23**) close to Westenhanger Manor (**LB5/BH34**); one being located 350m to the north (**BH22**) and the other located 400m to the south (**BH23**). Both are described as field barns with no associated yards and are thought to date from the 1800's.

Discussion

The setting of these assets are derived from their relationship to each other as a group and their immediate surroundings in the agricultural landscape, although the links to the outfarm to the north (**BH22**) have been lost due to the intervening development of the CTRL line. The significance of these assets is gained from the continuation of character within the wider landscape from the Medieval to Modern periods which is characterised by isolated farmsteads and manors (KCC 2016). These assets also share a setting with the scheduled monument (**SM6)** in which they sit, although they are not included in the scheduling and are of a later date, they should be considered together.

6.1.2 Other Listed Buildings

Otterpool Manor (LB38)

Otterpool Manor (**LB38/BH12**) is a Grade II listed Farmhouse located on the B2067 Otterpool Lane within the site. The farmhouse dates from the 17th century or earlier. The left gable end has been dated to 1633, and has a late 18th century façade and early 19th century additions. The construction is probably timber-framed with the front elevation of red brick in Flemish bond on the left section, and red and grey brick in Flemish bond on the right section. The roof is of plain tile and there is a glazed porch in the right front elevation.

Site visit

The farmhouse at Otterpool Manor is constructed of redbrick, with a tiled-roof, as has 'R1633C' set into its south wall. The date is presumably that of construction and the 'RC' refers to 'Regis Charles' or King Charles I, given that it is before the interregnum. The building has a large hipped-roof and a cat-slide at the southern end. The lower coursing of some areas of the walls is of ragstone, including the area of the date and the windows are multiple light sashes. Additionally, there is a thick red-brick perimeter wall on the north side of the house, which encloses the garden. The character of the wall is reminiscent of kitchen-garden walls of various 16th to 18th Century manor houses.

The adjacent barn, which now serves as Champney's fireplace salesroom is a low, redbrick structure with an L-plan and an arrangement of different pitched and cat-slide roofs. It has a demolished section along the south half of the main façade, indicated by a low stone and brick wall. This may have formed a pig-house or similar role given the low roof-height. Similarly, a low-perimeter wall to the rear and some wall stubs, indicate that it the plan has been altered at various points and is likely to have originally had a larger footprint. The low arrangement of pitched roofs and the materials used indicate a likely medieval date, which is supported by an aisled timber frame arrangement inside, which was not inspected during the site visit but was identified during earlier inspections (*Perscomm* Ben Found: KCC).

To the rear of this is a second taller barn constructed of ragstone with brick quoins and detailing around windows and roof line. There are vertical slit windows which are set at regular intervals around the upper wall, which are presumably original. A glazed window of nine lights, which also has a brick detailed surround is positioned in the west gable end and there are two open apertures (a window and a full height access) which are currently covered by corrugated sheeting.

Plate 6: Possible medieval barn at Otterpool Manor (view north west)

Setting and views

Otterpool Manor has its principle aspect facing south east to Otterpool Lane. As a group the farmhouse and the barns have setting comprising surrounding farmland, which is slightly impact by the presence of later 20th Century agricultural buildings. As a group they have inter-visibility with Westenhanger, which would still have been significant when they were constructed, but perhaps not a primary focus. The group at Otterpool Manor has views further to the west, particularly with Upper Otterpool.

Upper Otterpool (LB20)

Upper Otterpool is a Grade II listed farmhouse (**LB20**) which dates to the late 16th or early 17th century with later alterations. The building is located between the B2067 Otterpool Lane and the A20 Ashford Road. The construction is recorded as small blocks of roughly coursed stone with brick dressings on the front elevation with the wing being of un-coursed stone on the first floor and red brick in Flemish bond on the first floor, the rear elevation is red brick in English bond. Plain tile roof. Upper Otterpool (LB20) is also listed on the Kent HER under the KFLP as a Post-Medieval farmstead.

Plate 7: Farmhouse at Upper Otterpool (view east)

It is assumed that these two assets are historically linked. Manor (**LB38**) and manor farm (**LB20**), and their setting are of the same nature. This setting is mostly linked to the agricultural natures of their immediate surroundings as both assets are well screened from the wider landscape by their own environs. The significance of these two assets is based on the reading of the wider landscape in its historic context as a rural landscape with dispersed farmsteads and manors (KCC 2016).

Site visit

Upper Otterpool and its adjoining buildings occupy a high plateau, which is clearly visible to the south from Ashford Road (A20). It is screened to the south and east by trees around its perimeter, which also entirely screen the adjoining barns and a concrete and brick building foundation from a possible WWII military building. As mentioned earlier the plateau or occupied by the Upper Otterpool group, exhibits clear indications of having been landscaped at an earlier point and includes a roadside ditch along the approach which is via a long track from Ashford Road, which also passes an area of quarrying.

The buildings at Upper Otterpool comprise the house, two barns, a one-storey lodge or out-house structure and the foundations of the WWII building. The house in constructed of ragstone, with a similar hipped roof and redbrick detailing to Otterpool Manor. Following an invitation, internal inspection revealed detailed timber-frame structure which supports a late medieval date. The building appears to have originally formed two dwellings, indicated by an external wall-scar and internally a wide division containing an anteroom to the north-east third of the building. In addition to this it has been extended at the north-east end in redbrick. The internal timber framing is most ornate at the centre of the house, where the ceiling beams are chamfered. In addition to this there are areas of timber panelling of probable 16th century date both at ground floor and first floor levels.

The lodge or outhouse building, at the entrance to Upper Otterpool, is constructed of redbrick of a 19th or 20th century character and has a tiled hipped roof. The foundation of the military building (owners of Upper Otterpool *perscomm*) comprises a brick and concrete plinth accessed by steps. Of the two barns, according to the owners, one is of recent date and is constructed in a Kentish tradition with wind-braced wallposts. The other is likely to be

of later medieval or post-medieval date. It is timber-framed with wind-braced posts, redbrick and ragstone walls and a hipped roof. The ragstone walling survives across the lower section of one wall, the timber-framing includes some original elements and the building has clearly been much altered.

Setting and views

The group at Upper Otterpool is enclosed by a ragstone perimeter wall and by hedges and trees on three sides and has open aspects along its approach road to the north. The principle aspect of the group at Upper Otterpool faces north to Westenhanger presenting a clear relationship. This would have applied when the buildings were constructed in the 1500's and may have an earlier antecedent given the indicators of archaeological potential across the plateau at Upper Otterpool. Away from the north-facing aspect the group has a visual and historical relationship with Otterpool Manor.

Recommendations

The relationship between Westenhanger, Otterpool Manor, Upper Otterpool, Belle Vue, Harringe Court needs to be further studied through detailed appraisal at Stage 2. This will include detailed consideration of historic views and setting. Currently it is clear that there are relationships between these medieval to early post-medieval sites and Westenhanger and that the inter-visibility between them should be a consideration as masterplanning progresses.

The Royal Oak Public House (LB15)

The Grade II listed public house was built in the early to mid-19th century and was altered internally in the 1950's. The building is rendered with a slate roof. The door is located on the right gable end and is fronted by a half glazed porch. The Public House is located in the settlement of Newingreen on the eastern edge of the site which sits at the junction of the A20 Ashford Road and Stone Street, the Roman Road.

The setting and significance of this asset are mostly gained from the cross roads of the A20 Ashford road and Stone Street (8) which the public house serves as these have been major routes since at least the 18th century and probably before. This also means that it faces away from the Site which severely limits potential for secondary impact. Both as an amenity and a built heritage asset its retention would make a positive contribution.

Belle Vue House and Flats (LB21)

Belle Vue House (**LB21**) is a Grade II listed building which was formerly a county club and is now in use as a house and flats. Dating to the early 18th century with a possible earlier core the house is constructed of roughly course stone with brick window dressing on the front elevation with the right return elevation of coursed stone below and red brick in Flemish bond on the first floor. The roof is of Plain tile. There is a date stone over the door which reads '1706' which has possibly been reset, and a 19th century service wing has been added to the rear left.

Plate 8: Farmhouse at Belle Vue (View east)

The house lies at the junction of Otterpool Lane and the B2067 Aldington Road and is surrounded to the north and east by modern industrial development. The location is also listed on the Kent HER under the KFLP as a Post-Medieval farmstead (**BH11**).

The house sits on the site of a Medieval Moated Site (**51**) but does not date to this period. The house is enclosed within its grounds and screening by trees on all sides limiting its setting to its immediate surroundings.

Site visit

Belle Vue forms a group of buildings to the south-west of the Lympne Industrial Estate. The house at two single storey buildings at the entrance from Otterpool Lane were inspected. The house is two storeys high and has a hipped roof. It has been painted white and has sash windows at both levels. Those at ground floor have rounded heads. There are two tall redbrick chimney stacks, at either end of the roof. The house stands within a ragstone perimeter wall, which has a redbrick upper course and stands at around 1.8m high. Beyond Belle Vue, the rooftops of other buildings within the group were observed which were not accessible for inspection during the site visit.

The pair of buildings either side of the entrance to Belle Vue are single-storey structures of ragstone with few doors or windows. They also have hipped tiled roofs and brick chimney stacks. It is likely that these formed a pair of lodges. The group at Belle Vue is enclosed by ragstone perimeter wall along Otterpool Lane and Aldington Road which has a bowed profile and redbrick detailing of the top coursing.

Setting and views

The farmhouse and outbuildings face into Otterpool Lane, which presents their primary aspect. The group has been heavily impacted by the Lympne Industrial Estate, which effectively disconnects it from most of the Site. As a result of this, potential secondary impact is only posed by development of the field to the west of Otterpool Lane. The retention of this group, whole or in part, following detailed appraisal as part of the areas medieval to

early post-medieval heritage is advisable. Assessment of the buildings to the rear of these within the Belle Vue group was not possible during the site visit.

Stream Cottage and Grove Bridge Cottage (LB11)

Stream Cottage and Grove Bridge Cottage (**LB11**) were once a single house dating to the 17th century or earlier which was later divided and has a 19th century façade. The property is Grade II listed. The construction is timber framed clad with red brick in Flemish bond which has been painted on Stream Cottage.

The property lies within the northern edge of the site at the northern end of the settlement of Barrow Hill and is directly adjacent to the CTRL line. The East Stour River passes to the south.

The cottages main setting and significance is as part of the urban fabric of Barrow Hill, although this is curtailed to the north by the CTRL line. The architectural style is reflective of the area in general.

Setting and views

Built form and vegetation together with a rise in topography screen these buildings to the west whilst later 20th Century housing at Grove Bridge and Meadow Grove screen them to the east.

Recommendations
These buildings should be considered in the appraisals together with the non-designated buildings at Barrow Hill detailed below.

6.1.3 Non-designated Built heritage within the site

Military Assets

Within the site there are seven Pillboxes (**BH42, BH41, BH47, BH43, BH44, BH45, BH46**), which surround the area of the former Lympne airfield (**27**) and likely define its northern and southern extents (**Figure 3**). It is unclear from the listings if these are extant assets or sites noted from mapping. These

Farms and Outfarms

There are seven (**BH32, BH24, BH26, BH17, BH13, BH37, BH19**) non-designated farms or associatedassets listed on the Kent HER within the site.

Hillhurst Farm (**BH32**) lies in the north-east corner of the site and is described as a 19th century regular courtyard farmstead. Hillhurst Farm is screened from much of the Site by the rise which its name refers to.

Tin Chimney Farm (**BH24**) lies to the south of Westenhanger village close to Stone Street and is described as a19th century loose-courtyard farmstead with buildings on one side.

At Newingreen an outfarm (**BH26**) with a regular multi-yard plan is listed on the Kent HER as being of 19th century date. A second farm **BH25** lies adjacent and is described as 'farm southwest of Newingreen'.

Site visit

Newingreen Farm or alternately Stone Court (**BH26**) forms an enclosed complex of redbrick and tile buildings with hipped roofs, on an internalised courtyard plan. The roofs of the entrance buildings sport cupolas with weathervanes and the character of the complex and nucleated layout supports a 19th century design. The adjacent property (**BH25**) is a rendered single storey house with a tile-hipped roof. It is enclosed in a late 19th Century rendered brick perimeter wall with wrought iron detailing. The character of the building also indicates its construction originates from the 19th century.

A second outfarm (**BH19**) of a loose-courtyard design and 19th century date is located 560m to the south-west of Newingreen. This was not inspected during the site visit.

Plate 9: Newingreen Farm (view south)

Harringe Court

The farmhouse and outbuildings at Harringe Court were inspected as part of the Site visit. The farmhouse has a hipped roof, two identifiable chimneys from the roadside and a tiled-clad first floor. The ground floor has been rendered and painted white. The farmhouse has sufficient commonalities with Upper Otterpool, Otterpool Manor and Belle Vue to indicate an earlier post-medieval date. The outbuildings closest to the road include a large brick-built barn of likely 20th century date and those further from Harringe Lane are steel-framed with sheet walls and roofs.

Setting and views

The group faces Harringe Lane and is screened by later 20th century lightweight buildings to the east. To the west, the buildings are afforded some screening by the banks and hedgerows of Harringe Lane. North of Harringe Court lies Harringe Cottage, which comprises a semi-detached building with tiled first floor and hipped roof which is likely to be modelled on Harringe Court farmhouse, but of later date **(X)**.

Views north and east from Harringe Lane have a clear vista over the Site across to the North Kent Downs. Westenhanger is screened by hedgerows and tree cover that currently lie to the south of the manor. Only the Grade I Listed barns are visible to the east of this screening. Elsewhere trees and hedgerows along the various field boundaries and numerous wooded copses present intermittent screening. As with many areas of the Site, the hedgerow and trees that line the boundaries around Harringe Lane display clear signs of coppicing (a type of management and method for producing wood for charcoal burning) and a variety of species. This indicates a degree of historic survival which is also apparent in the woodland copses, which are likely to be the result of woodland management and reduction. As such both are historic and may have origins in the Roman or medieval landscape.

Recommendations

It is recommended that the farmhouse at Harringe Court be included under the appraisals in Stage 2 to assess its date and relationship to medieval and early-post-medieval heritage in the Site and surrounding area.

Twin Chimneys and Arts and Crafts Cottages at Stone Street

The houses which line Stone Street approaching Westenhanger Station comprise a variety of 19th and 20th Century buildings and an earlier cottage named 'Twin Chimneys' which lies to the east of the lane. Twin Chimneys is a single storey cottage with a tile hipped roof and high chimneys. Aspects of this character indicate a likely earlier post-medieval date. Twin chimneys does not face Stone Street indicating an earlier date and has a general rural setting, although its front façade faces north.

A group of Arts and Crafts cottages, which stands on the east side of the lane at the southern extent stands out. These buildings are constructed in redbrick with stock brick banding, contrasting with those at Barrow Hill, and display characteristic Arts and Crafts features including timbered dormers and porch hoods and arched brick detailing over their windows. The other houses at Stone Street display a range of relatively common 19th and 20th century details and do not distinguish themselves in the same manner of the Arts and Crafts cottages.

Plate 10 Arts and Crafts Cottages at Stone Street (view north west)

Recommendations

Twin chimneys should be included under the appraisals in Stage 2 together with the other buildings of late medieval to early post-medieval date.

The cottages face into Stone Street which forms their setting and demonstrate an unusual survival within the Site. As such they should be retained within the scheme to contribute to the diversity of the built form. Appraisal of these buildings should be carried out under Stage 2. This should seek to complete an understanding of their history and development and may resolve the matter of the apparent similarity with cottages at Barrow Hill.

Barrow Hill

Barrow Hill Farm (**BH13**) is located 260m to the south of Barrow Hill and is described as a 19th century dispersed multi-yard farmstead.

On the southern edge of Barrow Hill a dispersed farmstead (**BH17**) is listed as being of 19th century date. A further dispersed farmstead (**BH37**) of the same date is located to the south of the East Stour River where it passes through Barrow Hill.

Plate 11: Railway cottages at Barrow Hill (view north)

Site visit

A possible brick-built oast-house, adjoining singles-storey farm building and an 18th or 19th century barn were noted at Barrow Hill Farm which relate to **BH13** on the Kent HER which records a 'a 19th century dispersed multi-yard farmstead'. It is also likely that the farmhouse has 19th Century or earlier origins.

The houses at Barrow Hill south of CTRL and which form a strip either side of Barrow-Hill were inspected,. The majority are two storey structures, built in yellow London stock brick with hipped roofs. Many have tile shingled upper storeys which comprise alternating lines of rounded and square-tiles. Variations within this group include redbrick examples and others with redbrick courses, a terrace of paired houses with front-facing gables at either end of the row. A 'GR' or *George Regina* red post box inbuilt into a gatepost was observed within this terrace. The houses within this group share common dimensions and layout and appear to have been railway cottages (**Plate 11**) associated with the construction of the South East Mainline (SER) in the 1840s. At the end of the group is a slightly taller house, also of two storeys, constructed in yellow stock brick with redbrick banding, with projecting bay windows and a covered porch. It is possible that this building belongs to same group as the cottages but was of a higher status. The group is located on the west side of Barrow Hill.

Other houses along Barrow Hill include three-storey Victorian houses in stock and redbrick, which have more detailed facades and a pair of Grade II Listed Cottages, Stream Cottage and Grove Bridge Cottage, which lie on the west side of Barrow Hill immediately south of the CTRL. They have hipped roofs and shingled and brick facades and are screened to the east by topography, built form and vegetation. Together with other structures at the northern extent of the Barrow Hill group they are screened to the west by a rise in topography together with later 20th Century housing at Grove Bridge and Meadow Grove and to the east by hedges and trees. Noise reduction boarding along the CTRL screens the Barrow Hill group to the north breaking inter-visibility with Sellindge.

Amongst other houses at Barrow Hill, which are of later 20th Century date, two notable examples were identified at the southern extent. The first of these is a recently renovated redbrick farmhouse with a pitched roof with three dormer windows along the front and a date stone in the façade which reads *'1763'*. There are also small S-ties set either side of the front door. The second is a white-painted weather-board cottage which is located at the southern extent of the buildings at Barrow Hill on the east side of the road. The building has a hipped tile-roof and a brick-built chimney. Its alignment faces north east, diagonal to the line of Barrow Hill, suggesting that it does not relate to the road primarily. It has been re-clad which may hide other indicators of earlier date.

At the south of Barrow Hill is a milestone which is located on the road outside of the weatherboard cottage mentioned above. The stone is possibly made of Reigate stone and has two iron mounts which would have secured its plaque, which is no longer present.

Setting and views

To the west the houses at Barrow Hill are screened by hedges and trees along their perimeters. Those to the east side of Barrow Hill receive little screening from trees, hedges and fences around their gardens, but are otherwise open to views from and to the fields to the west. A copse is present to the rear of the houses which is likely to be a survival of more expansive woodland beyond which the topography drops down to Sellindge with open views over the CTRL and the M20 to the North Kent Downs. Further west the ground rises again to the eastern boundary of the Site presenting a vantage point with views in all directions. The only buildings in this area are at Somerfield Court Farm, which were not accessible for inspection but from a distance appear to be of later 20th Century date.

Recommendations

The houses at Barrow Hill form a distinct group characterised by the 19th Century railway cottages which includes earlier and later examples of different styles and types. These comprise later 19th Century townhouses, the listed Stream and Grove Bridge Cottages at the north of the group and the two probable earlier examples at the southern extent, that with the '1763' date and the weather-boarded example to the south. Barrow Hill should be incorporated into the development to add to the diversity of built form and culture. Appraisal of the buildings at Barrow Hill is recommended to inform how this can be best achieved.

Many of these assets are listed on the KFLP and form part of the landscape of dispersed, isolated farms described on the Kent HER which characterises this area.

Discussion

The farms and outfarms listed on the Kent HER form the part of the significance for the wider landscape of agricultural use and dispersed isolated settlement (KCC 2016) and contribute in this way to the setting of other assets within the study area. The setting of these assets is mostly limited to their immediate surroundings due to their nature, which should be a consideration in informing the masterplan.

The Pillboxes' significance is gained mostly from their relationship to and representation of the now lost Lympne airfield (**27**). They also inform the wider defensive history of the area and region and some of their significance is gained from this. The setting of these assets is less clear as it is not certain whether the assets are extant or only reported, based on information available from the Kent HER. However, these are defensive assets and were designed to have clear views across the landscape and to each other to be an effective defence barrier.

6.2 Within 1km of the site

6.2.1 Port Lympne

The park at Port Lympne is a Grade II* listed park and garden (**RPG1**) which contains five listed buildings (**LB7, LB22, LB23, LB24, LB36**). The park lies 15m to the south-west of the site and is separated from it by the Aldington Road.

Port Lympne Registered Park and Garden (RPG1)

The gardens at Port Lympne are described as a 20th century terraced garden which was laid out by Sir Philip Sassoon and the architect Philip Tilden. The garden was later also planted by Russel Page. The estate was bought by Sir Philip Sassoon and the present house built between 1911 and 1913 with the gardens laid out immediately after the First World War.

The site comprises 23ha in total of which 6ha of formal gardens is set within 17ha of woodland. The garden lies along the top of a 1km long south-facing slope which rises to 100m above Romney Marsh and is bounded to the north by the B2067, to the west by woodland and arable land, to the west by the paddocks and woodbelts of the animal park and to the south by the arable land of Romney Marsh and the Royal Military Canal.

The modern visitor approach to the gardens is via a footbridge across the B2067 Aldington Road to the north through woodland planted from the 1920's through to 1997 and mesh-caged animal enclosures to the northern end of the long avenue. The long avenue is lined with pine trees and hydrangea borders, and opens to a large hexagonal hedged enclosure at the southern end where there are expansive views of the surrounding landscape to the sea and where the terraced gardens can be accessed via the Trojan Staircase (**LB24**). The modern vehicular approach is via a small service road from the B2067 close to the footbridge and runs to the north of the house. The original 1km approach to the house was from the east and entered the estate from the B2067 opposite the junction with Otterpool Lane passing through the red-brick walls and gate piers of the lodges (**LB22, LB23**). The approach ran along the northern edge of the estate before turning south towards the house.

The gardens and pleasure grounds lie mostly to the south and west of the house (**LB7**) in a series of terraces down the cliff. Additionally, further from the house, to the west and south the gardens are enclosed by the mature woodland of Hill Hurst Wood which is cut by a series of allées leading to vista points some of which look south toward the sea.

Port Lympne House (LB7)

The listing for Port Lympne House, Grade II*, (**LB7**) comprises the house, a stable block, forecourt walls, the loggia, patio, terrace and a shell fountain. The assets are all contained by Port Lympne gardens (**RPG1**) and share its setting.

The house was built in 1912 by Sir Herbert Baker in the Cape Dutch style in red-brick with plain tile roof, the terrace and fountain are of ashlared stone. The house is of H-plan with a double piled central range running east-west, the entrance is to the east. The grounds and fittings are said to have been inspired by the Roman associations of the site (NHLE – accessed 10/10/2016).

The house and associated assets are set within the gardens and woodland of the estate and no key views are mentioned in the Historic England listing (NHLE – accessed 10/10/2016).

Lodges (LB22, LB23)

The park at Port Lympne (**RPG1**) was traditionally entered through the north-east corner of the estate and passed between two Grade II listed lodges (**LB22, LB23**). Both were built in 1912 by Sir Herbert Baker in the same style and fabrics and Port Lympne House (**LB7**).

The road which previously connected the estate to the B2067 Aldington Road has been lost to later redevelopment. Previously it connected opposite the junction with Otterpool Lane. Although the setting of these assets has been altered by the change in access to the estate it can still be appreciated that this is the entrance to a large and prestigious house within a landscaped setting. Of the listed structures at Port Lympne, the lodges lie closest to the site. Their relationship is primarily with Port Lympne and concerns itself with presenting the estate. As such they have no significant direct relationship with the site.

Trojan Staircase (LB24)

The Grade II listed Trojan Staircase (**LB24**) is a monumental flight of stairs built around 1920 in the classical style. There are 125 shallow steps forming the staircase flanked by low-swagged stone plinths and stone walls which represent removed gardens.

From the top of the staircase there are views across the landscape to the south and the terraced gardens. The staircase is part of the main pedestrian access to the house and gardens.

Claire Voyee (LB36)

Built around 1920 by Philip Tilden the Grade II listed "Claire-voyée" comprises a red brick in Flemish bond platform built into the hillside with a bay loggia below accessed via brick steps which lead down from the left and right flanks. The structure looks south across Romney Marsh and the Royal Military Canal.

Discussion

The House (**LB7**), gardens (**RPG1**) and associated features (**LB22, LB23, LB24, LB36**) at Port Lympne are all date to the Modern period and have little historical connection with the development of the area. The park (**RPG1**) Port Lympne House (**LB7**) are Grade II* listed.

The significance of these assets is primarily their group value as a designed landscape with contemporary gardens and house by the same designer. The setting of these assets is contained within the bounds of the Registered Park and Garden itself which surrounded on all sides by woodland. The setting of the designed gardens and the built aspects has also been partially altered by the installation of the wild animal park infrastructure across the park (**RPG1**) and to the east in additional land owned by the trust (**6**). Views from the park (**RPG1**) and house (**LB7**) are described as laying to the south, south-east, and south-west, across Romney Marsh and towards the sea.

Due to its enclosed nature and the nature of the designed views from the park and house (**RPG1, LB7**) it is considered that the proposed development would have negligible effect on the assets at Port Lympne. This was confirmed during the Site visit, which found Port Lympne to be heavily screened.

6.2.2 Sandling Park

The Grade II listed Sandling Park (**RPG2**) lies immediately to the east of the site and is separated from the site only by the A20 Ashford Road which runs along the parks western boundary. There are no Listed buildings (**LB**) within the Registered Park and Garden.

The park is bounded to the west by the A20 Ashford Road, to the north by the M20 and the CTRL which cuts through the northern tip of the park, to the east by the outskirts of Saltwood and to the south by the A261 Hythe Road and Brockhill County Park. The woodland within the south of the park continues across the A261 as Folks Wood. The park covers 177ha in total and comprises 13ha of formal and ornamental gardens and 164ha of farmland, parkland and woodland. The park lies on the undulating south-west facing slope of a greensand ridge and the land surrounding the stream valley which rises in the north of the park and runs towards the south.

The park was developed on the site of the ancient wood of Westenhanger and was named Sandling due to the adjacent property which is shown on the 1769 Andrews and Drury map. The park was laid out by Henry Milner in 1897 under the direction of the then new owner Hon Lawrence Hardy MP. The estate is accessed from the Ashford Road at the north-west of the park via a yellow brick gatehouse. The driveway then traversed along the north of the estate to Sandling House. A secondary entrance came from the Hythe Road to the south, curved along the valley and crossed the lake before entering the forecourt at the north-west side.

The formal gardens lie immediately south-east and south-west of the house with informal woodland gardens surrounding them and the house on all sides. The house looks out over the park to the south-east, across the formal terrace and shrubbery bank. Also to the south east are two parallel rose beds with an expanse of lawn beyond which offers views to the sea. To the south-west the gardens were laid out between 1801 and 1819-20 and take the form of a woodland garden laid with paths. The park extends to the south, west and south east of the gardens and in character was open to the west and south west with the area laid to grass or arable crops but mostly wooded in all other directions. There is also a kitchen garden 100m to the north-west of the house which is enclosed by red brick walls, and is thought to be contemporary to the stable and coach house.

The House is T-shaped in plan and built of red brick. It was constructed in 1949 by ED Jefferiss Mathews to replace the house built in 1796 which was destroyed by a WWII bomb in 1942.The house enjoys views to the south-east and south-west across the stream valley, and south and east towards the coast.

Non-designated Built Heritage

Little Sandling (**BH38**) is a regular courtyard farmstead with buildings on three sides, which is listed on the Kent HER as dating from the 1800's. The farm is marked on the early OS mapping and was probably the farm for Sandling House to the east.

Discussion

Sandling Park (**RPG2**) is a designed landscape of woodland and plantations which lies to the east of the site. The main significance of this park is derived from their partial representation and recreation of the ancient Westenhanger wood through designed woodland interspersed with arable land. The views from this park are mostly to the south and east towards Saltwood and the sea. Based on this assessment it is considered that the site would be well screened from the park and there would be minimal effect by the proposed development.

6.2.3 Lympne

Within the Lympne Conservation Area, which abuts the south-east corner of the site, area there are nine Listed Buildings (**LB30, LB41, LB19, LB3, LB37, LB4, LB25, LB26, LB31**) of which three are churchyard monuments (**LB25, LB26, LB31**).

Lympne Castle (LB3)

Lympne Castle is a Grade I listed fortified house (**LB3/BH5**) which probably dates from the 13th century with 14th and 15th century elements and underwent restoration in 1907 and 1911-12. The house is constructed of ragstone with ashlar dressings and a plain tile roof. The Castle comprises a square east tower, a central hall, a stair turret, a porch, a rectangular west tower of later date, a two-storey range and a service range.

Lympne was granted to the Archdeacons of Canterbury from the 11th century and the castle commands extensive views from Dover to Hastings.

The Church of St. Stephen (LB4) and Churchyard Monuments (LB25, LB26, LB31)

The Church of St Stephen (**LB4**) in Lympne is a Grade I listed Church which lies directly adjacent to Lympne Castle (**LB3**). The Church is thought to be of a late 11th century date and was restored in 1859 and 1878-80. The building is constructed of small block of un-coursed ragstone with Caen-stone, tufa and ragstone dressings and a plain tile roof. The church comprises a late 11th century tower with a 12th century nave to the west, a 13th century chancel, a 14th century aisle and a 14th century porch to the north.

The church sits with the walled churchyard at the southern edge of the village where the land begins to fall away to the south towards Romney Marsh and the Royal Military Canal (**SM5**). Within the churchyard are three listed Monuments (**LB25, LB26, LB31**) which are described as 18th and 19th century stone headstones and one table tomb. The setting of these monuments is limited to the church and churchyard by their nature.

The Sanctuary (LB41)

The Sanctuary (**LB41**) is a Grade II listed former farmhouse which is now in use as a house. The western part of the house dates from 1774 and the eastern part dates from the early 19th century. In the eastern part the house is constructed of rendered brick whilst in the west the house is tile hung with some painted brick on the ground floor. The roof is tile and the chimney stack is brick. The eastern elevation was the original frontage of the house and the north side is now the principal entrance.

The house was converted in the 1970's and can be seen on the first edition OS map where a smithy is marked. Parts of the smithy were incorporated into the 20th century garage.

The significance of this farmhouse is derived from its intact nature as a late 18th century farmhouse and its survival which allows the plan form to be easily legible as well as surviving internal features. The house also has group value with adjacent listed buildings including Lympne Castle (**LB3**).

Lympne Hall (LB30)

The Grade II listed Lympne Hall (**LB30**) dates from the 16th century with an 18th century façade and 20th century alterations. The house is timber framed with a red brick frontage, un-coursed galleted stone forms part of the ground floor and the roof is of plain tile.

Well Head (LB37)

Grade II listed circular Well-head adjacent and to the north of Lympne Castle (**LB3**) which dates to the early 20th century and is constructed of stone with moulded ashlar copings.

Pump House (LB19)

A Grade II listed disused pump house of a 20th century date which is constructed of un-coursed stone with vermiculated stone dressings and a concrete roof. The pump house once served Lympne Castle (**LB3**) 175m to the east.

Lympne Conservation Area (C1)

Lympne is described in the Conservation Area Appraisal (CAA) (SDC 2006) as located in south-east Kent and is situated in the Kent Downs Area of Outstanding Natural Beauty (AONB). The area of Lympne has been key to the defence of the southern English coast since the Roman period as demonstrated by the Saxon Shore Fort (**SM4**) to the south of the village and Lympne Castle (**LB3**), the fortified house at its southern edge. The original harbour at Hythe is thought to have been located at Lympne earning it the name '*Shipway*'. The form of the village has also changed little since Hastead's Survey of Kent in 1793 (CAA – SDC 2006).

Views from the village are most striking to the south across Romney Marsh from its position at the top of the escarpment, John Ruskin once admired the views as did H G Wells in his novel Kipp. From within the Conservation Area the key views are towards the church of St Stephen and the Castle from the Aldington Road, of Castle Close from both direction, From the Church looking over Romney Marsh and looking along the Aldington Road from within the Conservation Area. Finally, the Conservation Area is appreciated from the Marsh below the Castle taking in the Church (**LB4**), Castle (**LB3**) and Stutfall Castle (**SM4**).

The character of the Conservation Area is defined by its important location in the landscape both as a port and as a strategic defensive location. Its surrounding landscape is defined by agricultural activity which is mostly of a pastoral nature with some small industrial activity scattered around the landscape. The Conservation Area is also contributed to by the Listed Buildings (**LB30, LB41, LB19, LB3, LB37, LB4, LB25, LB26, LB31**) within it, of which the earliest (**LB30**) dates from the 16th century. Additionally, several non-designated buildings contribute to its character, although these are not listed in the CAA.

Non-designated Built Heritage

There are two assets (**BH30, BH4**) listed on the Kent HER as being within the Conservation Area (**C1**) at Lympne. The first (**BH30**) is described as a regular courtyard farmstead with buildings on three sides creating an L-shaped plan and dates from the 1800's. The second (**BH4**) is a Medieval house within Castle close to the north-west of Lympne Castle (**LB3**), the house dates from the 1400's.

Plate 12: Lympne Hall at centre of Lympne Conservation Area (view south east)

Discussion

Lympne Conservation Area (**C1**) represents the historic core of Lympne village and has an overall Medieval character through the Castle (**LB3**) and Church (**LB4**) as well as surrounding assets and buildings. The Conservation Area (**C1**) lies on the edge of the escarpment along the edge of Romney Marsh where the land drops steeply from 100m AOD to 10m AOD. The location of this historic settlement is significant to its setting and understanding of its significance within the landscape. This is due to the Castle's (**LB3**) original function as a fortified house and defensive feature along the former coastline, which is now marked by the Royal Military Canal (**SM2, SM5, SM3**) to the south.

Setting and views

The main views to and from the Castle (**LB3**) and the Conservation Area (**C1**) are from the south and south-east from the bottom of the escarpment and the sea. The Conservation Area (**C1**) is also well screened to the north and west by treelines and more recent development. Despite this screening, returning views from the south of the Lympne Conservation Area might be subject to very limited impact from the introduction of new built form into the background of the village. The removal of the body of the Conservation Area, from the site, would help to ameliorate this as will the intervening form of the later estate at Lympne to the north of the conservation area. In addition it might be advisable to gradate or otherwise limit massing and form close to the south-east boundary of the site, although this not considered essential.

Recommendation

The medieval built form within the Lympne Conservation Area relates cumulatively to the medieval heritage within the Site, but given the nucleated character the village of Lympne is in many ways removed, particularly in terms of secondary impact to its setting. It should instead, contribute to outreach and information programmes as part of the medieval character of the Site and surrounding area.

6.2.4 Sellindge

Within the Parish of Sellindge are ten Grade II Listed Buildings (**LB28, LB33, LB35, LB10, LB34, LB9, LB18, LB40, LB14, LB17**) which are described below.

Somerfield Court (LB28)

Somerfield Court (**LB28/BH15**) is a late 17th century house by Thomas Gomeldon which has been altered in the 19th and 20th centuries. The house is built in chequered red and grey bricks in Flemish bond with a plain tile roof, and towards the road there are also rusticated stone quoins.

Barn Complex (LB33)

A complex of Grade II listed barns date from 1834, with later alterations. The barns are constructed on coursed stone with brick dressings, with some red brick in header bond on the outer buildings, plain tile roofs. The complex is rectangular in plan and opens to the south with a central barn dividing the courtyard north-south.

This building is probably associated with Somerfield Court (**LB28**) 135m to the east.

Rhodes House (LB35)

A Grade II listed Farmhouse of a late-18th or early-19th century date, Rhodes House is also listed on the Kent HER (**LB35**). The house is constructed of painted brick with a plain tile roof. The Farmstead (**BH16**) is also listed on the Kent HER under the KFLP as a Post-Medieval farmstead.

Little Rhodes (LB10)

A Grade II listed House of a late-18th century date which is constructed of painted brick, with red brick in English bond on the gable ends. The roof is of plain tile.

Guinea Hall (LB34)

Guinea Hall (**LB34**) is a Grade II listed house of a late-18th or early-19th century date which lies 555m to the north of the site. The house is rendered with a slate roof.

Elm Tree Farmhouse (LB9)

Elm Tree Farmhouse (**LB9**) is a Grade II listed farmhouse of a late-18th or early-19th century date. The ground floor is pebble-dashed and the first floor is tile-hung with a plain tile roof.

Barn at Elm Tree Farmhouse (LB18)

Associated with the Farmhouse at Elm Farm (**LB9**), 17m to the south, this barn is Grade II listed and dates to the mid to late-16th century. The barn is timber framed and weather-boarded on a stone plinth, part of the right side is faced with red brick in English bond. The barn has a plain tile roof.

Lees Cottage (LB40)

Lees Cottage (**LB40**) is located on the northern edge of Sellindge 615m to the north of the site and is Grade II listed. The cottage dates to the early-16th century, or possibly earlier, with later 16th and 17th century alterations. The construction is timber framed coated with pebble-dashing; the cottage has a plain tile roof.

Holly Cottage (LB14)

Holly Cottage is a Grade II listed house of 17th century date with later alterations which is located at the north-eastern edge of the village of Sellindge, 930m to the north of the site. The front elevation of the property is rendered, the left end gable is of galleted stone to the ground floor and rendered above, and the roof is of plain tile.

Railway Cottages (LB17)

A row of Grade II listed houses which were formerly one house are thought to be of a 15th century date with restoration in the 1980's. The house was timber-framed with the ground floor clad in red brick in mixed bond. Additionally, there is exposed framing to the first floor which is infilled with render, and the roof is plain tile. The house is located directly to the north of the CTRL line which bounds the northern edge of the Site.

Site visit

The area of former railway cottages was inspected and were not present. It is likely that they were demolished in advance of the construction of CTRL.

Non-designated Built Heritage

Also within Sellindge are the farms of Grove House (**BH8**), located 420m to the north of the site, and Potten Farm (**BH7**), located 470m to the north of the site. Both are recorded as loose-courtyard farmsteads of a 19th century date on the Kent HER.

To the south and south-east of Grave House, Sellindge, are two farmsteads of 19th century date (**BH9, BH10**). The south-east of these (**BH10**) is described as a dispersed farmstead and the farm to the south (**BH9**) is of a loose-courtyard plan. The closest of these lies 220m to the north of the Site.

Discussion

Sellindge as a settlement mostly developed in the later 19th and 20th centuries along the A20 Ashford Road from its historic core close to Stone Hill, to the north. The settlement has subsumed some farms (**LB28, LB9**) and more rural settlement elements (**LB33, LB18, LB34**) as it has spread south and these form the main historic elements within the village. In addition, the village has been separated by any views it may have had into the landscape to the south by Modern development in the form of the CTLR line and the M20. As such the proposed development would be considered to have negligible impact on the setting and significance of assets within the Sellindge area. The buildings at Barrow Hill are considered separately to this.

6.2.5 Stone Hill

Church of St Mary (LB2)

The Church of St Mary (**LB2**) is a Grade I listed building which is located 570m to the north-west of the site. The Church dates to the late 11th century with 12th and 13th century elements and was restored in the 19th century. The construction is of ragstone with plain tile roofs and comprises a west tower, nave, chancel, north chapel, north aisle, north porch and north vestry to tower. The spire is pyramidal with weathervane.

Ashdown Cottages (LB12)

Formerly a house which is now a row of houses Ashdown Cottages (**LB12**) is a Grade II listed building which dates to the 17th century with 19th century alterations. The house is timber framed which is rendered on the ground floor and tile-hung above, with a plain tile roof. The house is built perpendicular to Stone Hill Road.

Glebe Farmhouse (LB13)

Glebe Farmhouse (**LB13**) is a 17th century timber framed farmhouse which is partially clad with stone and the rest with red brick. The house has a plain tile roof.

Discussion

These assets lie within what was the historic core of the settlement of Sellindge, based on cartographic sources, which has since extended to the south along the A20 Ashford Road. The main setting of these assets is the small village nature of the settlement which is crossed by the A20. Views into the landscape to the south have been partially removed by the M20 and CTRL Modern infrastructure projects and screened by later development at Sellindge. Given the very limited inter-visibility, the proposed development is considered to have no potential for significant impact to these assets.

6.2.6 Other Listed Buildings

Plate 13: View to the north from Ashford Road to the North Kent Downs at Stanford Windmill

Stanford Windmill (LB8)

The windmill at Stanford (**LB8**) was built in 1851 by John Hill of Ashford of yellow and pale red stock brick in English bond with a tarred finish. The windmill is circular and is topped by a boat-shaped cap.

John Hill's firm was one of the largest millwrights in the area and was responsible for many windmills and watermills across Kent and Sussex. The mill suffered minor damage in the First World War when a bomb fell close by. Most of the changes to the building have been limited to the workings and internal fittings. In the 1990s the area surrounding the mill was developed as housing.

The significance of this mill is based on the degree of survival of the mill machinery and fittings and its architectural interest for its unusual two stage design, buttressing and rare date inscription. Additionally, it is the best preserved of only eight tower mills in Kent. By its nature the windmill is situated on the higher ground around the edge of the East Stour Valley and its setting would have been informed, and still is to a lesser extent, by the agricultural, specifically arable, nature of the area surrounding it. Stone Street to the east may also inform the setting of this asset due to its long history and a key route across the area the links it would have provided to key markets at Canterbury as well as the Port at West Hythe.

Due to modern development such as the M20, CTRL and the Folkestone racecourse much of the wider setting has already been damaged but overall the landscape has still retained its historic agricultural character, particularly to the west and east of the windmill. However, development in the 1990s has removed all elements of the immediate setting of the Windmill (**LB8**). The proposed development would therefore be considered to have no significant direct effect on the building but would constitute change to areas visible from it. The nature of this change will be determined by the design of proposals, but given the existing impacts of surrounding built-form it is anticipated that any effect would be negligible.

French House (LB6)

This Grade II* listed building which thought to date to the 15th or early 16th century and was restored in 1930 by H. Charlton Bradshaw with further restoration in the 1950s and 1980s. French House (**LB6**) is timber framed with rendered infilling and a plain tile roof. The house is said to have slipped several feet during a landslide in the 1730s. The house is well screened to the north by a thick tree belt and it is considered that the proposed development would have no impact.

Berwick House (LB29) and Little Berwick (LB27)

Berwick house (**LB29**) is a house of unknown date with a 19th century façade of stucco. The left gable end shows red and grey bricks in Flemish bond and the house has a plain tile roof.

Little Berwick (**LB27**) lies to the north of Berwick House (**LB29**) and is thought to be of early 17th century date with a 19th century façade and 20th century alterations. The house is timber-framed with the front elevation presenting the ground floor in red brick in Flemish bond and the first-floor tile-hung with banded plain and fishscale pattern. The right gable end is of stone and the roof is plain tile. Little Berwick (**LB27**) is also listed on the Kent HER under the KFLP as a Post-Medieval farmstead (**BH27**), which is described as a loose courtyard plan with buildings on two sides.

At least one of these assets can be seen on the 1797 OS drawing and is shown at that time as being surrounded by fields. There is very little settlement close to 'Berwick'. Settlement has now encroached on both houses along Stone Street, onto which they front, but this did not happen until the mid-late 20th century. Both properties still retain some of their original setting through a small area of fields which still surrounds the properties, however, both assets have had their immediate surroundings altered within the Modern period which has altered their settings and contracted it to comprise only their immediate vicinity. Berwick House faces into the road and the neighbouring properties, whilst Little Berwick faces its neighbour (Berwick House). The proposed development would be considered to have a moderate impact on these two buildings, which is dependent on the removal and replacement of the adjacent properties within the Site.

Shepway Cross (LB32)

This is a Grade II listed war memorial (**LB32**) which was erected in 1923 to commemorate the fallen of the Cinque Ports. The cross is of a perpendicular style and is constructed of Ashlar. The foundation stone was laid by William 7th Earl of Beauchamp and Lord Warden of the Cinque Ports and Admiral. Lympne airfield (**27**), 940m to the west, also had links to the Cinque Ports during the First World War.

The monument is 480m to the east of the Site and the modern village of Lympne lies between the two. There is no potential inter-visibility with the Site and therefore there would be no significant impact upon the setting of this monument.

Forge Cottage and adjoining cottages (LB39)

Forge Cottage is a Grade II listed building which was originally one property that has subsequently been subdivided into a row of houses. The Cottage (**LB39**) dates to 1803 on its left side and slightly later on its right. The house is constructed on roughly course galleted stone to the left and small block of coursed galleted stone to the right with red brick dressings, the roof is plain tile.

The House fronts on the B2067 Aldington Road close to the junction with Harringe Lane and is 990m to the south-west of the site. The main setting of this building is its immediate surroundings on the B2067 and it faces south away from the Site. The building is distant to the site and is partially screened by intervening woodland named Harringe Brooks wood. The proposed development would therefore be considered to have no impact on this asset.

Gibbins Brook Farmhouse (LB16)

This is a farmhouse of an early to mid-17th century date with 18th century additions and restoration in the mid-20th century. The House (**LB16**) is timber-framed with painted brick and rendered infilling, and the roof is plain tile.

The farmhouse is fairly isolated within the landscape and is located on a low promontory between Gibbin's brook and an un-named watercourse which flow towards the East Stour River. To the south-west is Brook Farm (**BH21**) and to the north Hope Farm. This farmhouse (**LB16**) is characteristic of the historic landscape of the area as defined by the Kent HER (KCC 2002).

The farm has been separated from the landscape to the south by the M20 and CTRL line and its main setting is considered to be its relationship with its immediate agricultural landscape and its views with the farms to the north and south. Its rooftop is visible from some points within the centre of the Site to the north of Ashford Road. This inter-visibility is so marginal that the proposed development has only potential for a negligible effect on this asset.

6.2.7 Other non-designated Built Heritage within 1km

General

Approximately 470m to the north of the site a milestone (**BH2**) is listed on the Kent HER which is located on the A20 Ashford Road within the village of Sellindge.

Military Assets

Beyond the boundaries of the Site there is one further asset (**BH1**), 160m to the north, is described as a WWII munitions store located at Farmead Farm (**Figure 3**).

Farms and Outfarms

There are thirteen non-designated farms or associated assets listed on the Kent HER within the study area which are discussed below where they have not already been referred to in the preceding text.

Brook Farm (**BH21**) lies to the south of Gibbins Brook Farm(**LB16**) and is 450m to the north of the site. The farm is described as a 19th century loose-courtyard farmstead with building to three sides of the yard.

To the north of Barrow Hill, 75m to the north of the site, is a loose-courtyard plan farmstead (**BH35**) of 19th century date with building on two sides of the yard. To the south of this was an outfarm (**BH36**) which was demolished during the construction of the CTRL line and to the west a demolished sheepfold (**BH14**) which was also lost during the construction of the CTRL line.

There are three further outfarms within 500m of the site (**BH31, BH33, BH29**). These are described as an isolated field barn (**BH31**), located 375m to the north of the site, and two loose-courtyard farmsteads (**BH33, BH29**) which are located to the north-west of Ashford lodge and within Lympne village respectively. All assets are of 19th century date. The outfarm at Oathill (**BH29**), Lympne, has been subsumed and lost to modern development.

Combe Farm (**BH18**) lies 360m to the south of the site close to French House (**LB6**) and is recorded on the Kent HER as 19th century farmstead with an L-shaped plan and a regular courtyard form.

Finally, Berwick Manor Farm (**BH28**) lies to the south of Berwick House (**LB29**) and is possibly associated with this small hamlet (**LB29, LB27**). The farm dates from the 19th century and is a loose-courtyard farmstead with two sides.

These assets are listed on the KFLP and form part of the landscape of dispersed, isolated farms described on the Kent HER which characterises this area.

Non-designated buildings at Aldington Road

A group of non-designated buildings were identified along Aldington Road, between the village of Lympne and Otterpool Lane. The easternmost of these is a single storey cottage with a tiled covered end wall, high chimney stack and multiple changes in roof level. Its porch, which appears to be an addition, displays timber framing which may be of 18th or 19th century date. There are two oriel windows on the roadside wall, which are of uncertain date. The house is currently covered in pebble-dash render which may conceal further evidence of earlier date **(X)**.

The neighbouring house to the west has a large tiled roof, which on the roadside slopes down to ground floor level. Elsewhere the redbrick façade of the house is two storeys high. The changes in roof pitch. The eastern half of the building, which has an approximate L-plan has clearly been reconstructed in a darker brick during the 20th century, the north-south aligned west half displays various commonalities with the earlier buildings around the Site, namely the roofs, the high chimneys and tile-hung wall sections. It is likely therefore that this building is of earlier post-medieval date **(X)**.

The third non-designated structure within this section lies to the west of the others and is called 'The Lodge'. The buildings within the group at The Lodge were inspected from the road and include timber framed houses. There are indicators of both earlier examples and later copies being present in the group. One aspect that sets this group apart from the other identified or potentially earlier buildings at the Site is that is that the facades are timber-framed with white painted rendered panelling. The roofs however, include hipped examples and a range of levels and heights as seen in the other buildings **(X)**.

Plate 14: Example of potential medieval or early post-medieval buildings at Aldington Road

Transportation

Westenhanger Station (**BH3**) was built in 1843 to serve the London to Dover Railway (**2**), now the South Eastern Main Line. It serves Folkestone Racecourse and Stanford. Approximately 250m to the west of the station are the remains of the dedicated station for Folkestone Racecourse which closed in the 1960s. These remains are not listed on the Kent HER but inform the use of this asset.

6.3 Discussion of Built Heritage

Built heritage within the study area can be mainly characterised as dispersed farms and historic manors with some Post-Medieval to Modern settlement located along the major infrastructure routes.

Within the site an additional five Listed Buildings (**LB38, LB21, LB20, LB11, LB15**) have been considered and seventeen non-designated built heritage assets (**BH3, BH32, BH24, BH26, BH25, BH19, BH43-47, BH42, BH41, BH6, BH13, BH17, BH37**). In addition to which a number of non-designated built heritage assets have been identified which are not included on the Kent HER.

The key Built Heritage assets within the study area are the Westenhanger Manor (**LB1, LB5**) which should be considered together with other medieval and post-medieval assets. These include Otterpool Manor, Upper Otterpool, Belle Vue (**LB38, LB20, LB21**) and non-designated buildings and structures with potential medieval to early post-medieval dates. Lympne Conservation (**C1**) and associated assets (**LB3, LB4, LB19, LB26, LB25, LB30, LB37, LB41**) should be included in this.

Following this the Grade II* Port Lympne park (**RPG1**), the Grade II* Windmill at Stanford (**LB8**), the Grade II* French House (**LB6**), Sandling Park (**RPG2**) should all be considered in terms of the potential to contribute to the development in terms of outreach and information. A variety of non-designated buildings have been identified which require further study to determine their age and character, which will better determine the understanding of the built heritage resource of the Site and surrounding area.

The assets to the south of the site (**RPG1, LB6, C1, LB3, LB4, LB30, LB41**) are all well screened from the site by intervening development and vegetation. In each of these cases the key views from the site are towards the south looking out over Romney Marsh and the sea and views towards the sites are from the same direction. These assets are also appreciated from the national footpaths which run along the Royal Military Canal (**SM2, SM5, SM3**) at the edge of Romney Marsh. The link between Lympne Castle (**LB3**) and the defended shoreline are of particular importance to the area. These assets remain a consideration in terms of cumulative effect and their potential to inform.

At Westenhanger Manor the listed buildings (**LB1, LB5**) are no longer representative of the original defensive use of the site but are more linked to the manorial agricultural landscape of the post Medieval periods. Their setting is therefore informed by their immediate agricultural surroundings as well as the broader agricultural landscape of dispersed farmsteads. However, much of this wider setting has been reduced by modern infrastructure to the north and the Folkestone racecourse to the south. Re-establishment of identified aspects, such as the southerly approach, identified through study and consultation should be undertaken as part of the determining a new role for Westenhanger within the Site. Design considerations during masterplanning should aim to present and clearly define Westenhanger Manor, together with its listed and non-designated buildings, in a manner which optimises its role in contributing to the new development.

The windmill at Stanford (**LB8**) has been almost entirely removed from its historic setting by modern development around its base and has again suffered a reduction in wider setting from modern infrastructure to the south. Whilst there is potential for changes to areas visible from the windmill it is anticipated that these would be of negligible effect.

To summarise potential impacts to the assets which lie off-site or at its periphery, many of these have limited settings and are to varying degrees screened from the site. The assets to the south of the site detailed above have settings and historic views which lie away from the site and generally south to the coast. In addition the topography, which rises to the southern area of the site, provides additional screening. Heritage assets, such as the Lympne Conservation Area, which lie within close proximity of the site have potential for limited impact, which should be addressed through design through appropriate massing, form and distance.

Many of these buildings and assets have potential to form valid contributions to the scheme, whether through retention or their capacity to inform the area providing identity and historical perspective for the new town. The next stage in addressing potential impacts will be to carry out a detailed assessment to develop the current understanding of Westenhanger Manor and the other listed and designated buildings within the site and its immediate environs.

7 Further Assessment

This Desk Based Assessment comprises a baseline assessment of the Kent HER data and National Designations data, with the aim of achieving an understanding of the archaeological and built heritage potential of the site and surrounding area. Further assessment is required to qualify the scope and scale of the archaeological potential as well as consider the impacts of the proposed development on designated heritage assets.

It is recommended under the next stage (Stage 2) that appraisals be carried out of the key heritage assets to help inform a better understanding for decision making and to inform the masterplan. This will optimise the role that the site's diverse heritage resource can play in the outcome for the new town. The heritage assets and themes proposed for further study under the appraisals are as follows;

- Westenhanger – Castle, Grade I Listed Manor and barns and scheduling;
- The medieval and post-medieval buildings of Otterpool Manor, Upper Otterpool, Belle Vue and other designated and non-designated assets;
- Historic buildings and assets at Barrow Hill;
- Arts and Crafts Cottages at Stone Street;
- Historic Landscape Character- including Roman and medieval landscapes; and
- Military buildings relating to Lympne Airfield.

8 Conclusions and Recommendations

A Cultural Heritage Desk Based Assessment was carried out in October 2016 by Arcadis Consulting (UK) for Otterpool Park, Lympne. The site covers an area of 709ha and is centred on NGR 611239, 136507. The site comprises a large area of land between the M20 and the B2067 Aldington Road close to the village of Lympne, Kent and is bisected by the A20 Ashford Road.

Cartographic analysis has shown that the site has had a long history as agricultural land with some diversification in the Modern period. This includes historic hedgerows, which would be protected under the Hedgerow Regulations, including coppiced wood and historic woodland copses. There are 41 Listed Buildings, two Registered Parks and Gardens and seven Scheduled Monuments within 1km of the site; as well as four Military Crash sites, 47 non-designated Built Heritage assets and 121 non-designated archaeological assets within 500m of the site. As such archaeological potential within the site is considered to range from moderate to low with areas of specific archaeological interest identified.

The key assets for consideration within the site are Westenhanger Castle and its buildings, other medieval and post-medieval buildings within the Site and surrounding area, Lympne airfield, two barrows close to the East Stour River. Additionally, several non-designated buildings and some indicators of archaeological potential (not recorded by the Kent HER) were documented which require further study and investigation. These will be addressed, variously, by appraisal and fieldwork.

Retention of certain historic buildings and heritage assets, together with informed consideration of how they are incorporated into the proposed scheme, will help to provide diverse built form in the new town and serve as a potential visitor and tourist attraction. Similarly, where not retained these assets have potential to inform about the identity and history of the area, and should be considered as resources in that sense. Recommendations are made concerning this throughout the report and will be further developed under the appraisals.

Consultation with Historic England and the heritage advisors at Kent County Council and Shepway District Council identified the following areas for consideration;

- Defining a role for the Scheduled Monument of Westenhanger Castle and its two Grade I Listed buildings within the scheme;
- Consideration of the setting and historic views of Westenhanger and several designated and non-designated assets in and around the Site and how these relationships might inform master-planning and design;
- Restoring the historic southerly aspect of Westenhanger;
- Palaeo-environmental potential within the Site associated with records of Hythe Beds and Head Deposits;
- Historic Landscape Characterisation and its importance to masterplanning;
- Two barrows with the north of the Site;
- Listed and non-designated buildings as identified by this report;
- The Lympne Conservation Area,
- The Registered Parks and Gardens of Sandling Park and Lympne, which lie close to the Site;
- The settings of other non-designated assets which lie within the wider study area.

Detailed assessment of these assets will both help to develop a fully informed understanding of the site and its potential, which will serve to inform the masterplan and ensure that robust arguments are made for retention, alteration, removal and removal of heritage assets as the scheme progresses.

Concerning historic buildings, it is recommended that the Historic England Listing Screening Service, which provides a review of specific built heritage assets, be commissioned where appropriate following the results of the appraisals. This will provide a basis for rapid resolution of the status of built heritage assets which are uncertain or likely to change.

It is recommended under Stage 2 that appraisals be carried out of the key heritage assets to help inform a better understanding for decision making and to inform masterplanning. This will optimise the role that the site's diverse heritage resource can play in the outcome for the new town. The heritage assets and themes proposed for further study under the appraisals are as follows;

- Westenhanger – Castle, Grade I Listed Manor and barns and scheduling;

- Otterpool Manor, Upper Otterpool, Bell Vue and other designated and non-designated assets;
- Arts and Crafts Cottages at Stone Street;
- Historic buildings and assets at Barrow Hill;
- Historic Landscape Character- including Roman and medieval landscapes; and
- Military buildings relating to Lympne Airfield.

The potential for archaeological remains is low to moderate for most periods within the site whilst no specific indicators of potential have been identified for the Post-Medieval period. Specific zones of archaeological potential identified within the site are located within the area of and around Westenhanger in the north-east, to the north of the East Stour River around the identified Barrow monuments, medieval potential associated with the site of Upper Otterpool, Otterpool Manor, Bell Vue, Harringe Court and other potential sites of medieval date and in the south of the site around the former Lympne airfield. These zones have high potential for their respective periods.

The advisors at Historic England, KCC and SDC have requested assessment of paleo-environmental potential associated with documented Hythe beds and Head Deposits from past investigations within the wider area. Further indicators of archaeological potential were identified during the site visit which provide further details and confirm the presence of assets recorded on the Historic Environment Record, where able. This includes features relating to water management, a possible former road and a possible house plot to the south of Harringe Court.

It is recommended that the understanding of archaeological potential be developed further in relation to specific areas of impact during the masterplanning process to inform schemes of archaeological investigation and mitigation through a managed programme of works. This will focus efforts and reduce overall costs for evaluation. It is recommended that outreach and the potential to inform residents and users be integrated in this programme.

Stakeholder engagement should provide a key focus and input to progressing the scheme. This was highlighted during consultation. Engagement should seek to identify interests and inform values within the Site, focusing on Westenhanger and other key heritage assets. This will play an essential role in determining sustainable strategies for the management of Westenhanger and other heritage assets as well as overcoming local opposition to the scheme. An invitation for the project team to present to the Hythe Society, received during site visits, might provide a key in road into this.

As stated above, a programme of further assessment will need to be undertaken over Stages 2 and 3 of the project. Archaeological fieldwork is recommended as part of this work to establish the full nature and extent of these remains and reveal any unknown archaeological remains which will add to the understanding of the overall archaeological resource of the area. Building recording may also need to be carried out on selected built heritage as part of this fieldwork based on further assessment of the resource within the site.

9 References

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Pers Comm

Kent County Council (KCC) and Shepway District Council (SDC) Pers:comm (Lis Dyson & Ben Found) 3rd of November 2016 and 16th of November

Historic England Peter Kendall Pers Comm 16th of November 2016

ANNEX A

Gazetteer of Heritage Assets

Designated Assets

Table 2: Scheduled Monuments

Project ID	NHLE ID/ Unique ID	Easting	Northing	Name
SM1	1004216	608679.4	136118.4	Romano-British building S of Burch's Rough
SM2	1005113	610389.1	134271	Royal Military Canal, Honeypot Cottage to West Hythe Dam
SM3	1005114	613950	134232.7	Royal Military Canal, West Hythe Bridge to Scanlon's Bridge
SM4	1005179	611768.9	134233.3	Saxon Shore fort now called Stutfall Castle, 468m south-west of St Stephen's Church
SM5	1005492	612211.7	134181	Royal Military Canal, West Hythe Dam to West Hythe Bridge
SM6	1020761	612297.9	137236.5	Westenhanger Castle

Table 3: Registered Parks and Gardens

Project ID	NHLE ID/ Unique ID	Easting	Northing	Name	Grade
RPG1	1000939	610239.5088	134903.9074	PORT LYMPNE	II*
RPG2	1000262	613942.9285	136387.45	SANDLING PARK	II

Table 4: Listed Buildings

Project ID	NHLE ID/ Unique ID	Easting	Northing	Name	Grade
LB1	1045888	612248.6	137198.5	BARNS AT WESTENHANGER MANOR	I
LB2	1054042	609383.6	138452.1	CHURCH OF ST MARY	I
LB3	1101773	611926.2	134661.8	LYMPNE CASTLE	I
LB4	1101780	611974.8	134658.8	CHURCH OF ST STEPHEN	I
LB5	1344223	612364.9	137162.9	WESTENHANGER MANOR	I
LB6	1344206	611232	134709.4	FRENCH HOUSE	II*
LB7	1344207	610219.5	134985.3	PORT LYMPNE HOUSE, STABLE BLOCK, FORECOURT WALLS TO EAST, AND LOGGIA, PATIO, TERRACE AND SHELL FOUNTAIN TO SOUTH	II*
LB8	1370011	612798	137840.5	Stanford Windmill	II*
LB9	1054020	610289	138361.4	ELM TREE FARM HOUSE	II
LB10	1054031	610653	137968.4	LITTLE RHODES	II
LB11	1054727	610684	137622.4	STREAM COTTAGE AND GROVE BRIDGE COTTAGE	II
LB12	1061062	609210	138792.4	ASHDOWN COTTAGES	II
LB13	1061065	609306	138596.4	GLEBE FARM HOUSE	II
LB14	1061066	611102	138518.4	HOLLY COTTAGE	II
LB15	1061067	612715.8	136201.1	THE ROYAL OAK PUBLIC HOUSE	II
LB16	1061068	611788	138362.4	GIBBONS BROOK FARMHOUSE SHALOM	II
LB17	1061097	610728.2	137700	RAILWAY COTTAGES	II
LB18	1061099	610296.9	138377.1	BARN ABOUT 5 METRES NORTH OF ELM TREE FARM HOUSE	II
LB19	1061109	611760.6	134610.5	PUMP HOUSE AT TR 118 346	II
LB20	1061110	611307	136240.4	UPPER OTTERPOOL	II
LB21	1061111	610982	135196.4	BELLE VUE HOUSE BELLE VUE HOUSE AND FLATS	II
LB22	1061112	610610	135269.4	PORT LYMPNE NORTH LODGE, WALL AND GATE PIER	II
LB23	1061113	610616	135255.4	PORT LYMPNE SOUTH LODGE, WALL AND GATE PIER	II
LB24	1061114	610178.3	134996.8	TROJAN STAIRCASE ABOUT 26 METRES WEST NORTH WEST OF PORT LYMPNE	II
LB25	1061115	611972.7	134667.1	MONUMENT TO CATHIRN KNATCHBULL ABOUT 1 METRE NORTH OF NORTH AISLE OF CHURCH OF ST STEPHEN	II
LB26	1061116	611968.8	134676.2	MONUMENT TO ELIZABETH WOOLLY ABOUT 16 METRES NORTH OF NORTH AISLE OF CHURCH OF ST STEPHEN	II
LB27	1061118	612466	135773.4	LITTLE BERWICK	II
LB28	1068786	610449.1	137847.5	SOMERFIELD COURT	II
LB29	1083582	612446	135740.4	BERWICK HOUSE	II
LB30	1083593	611838	134770.5	LYMPNE HALL	II
LB31	1101767	611969.8	134667.4	MONUMENT TO JOHN KNATCHBULL ABOUT 2 METRES NORTH OF NORTH AISLE OF CHURCH OF ST STEPHEN	II
LB32	1251489	612539	134993.4	SHEPWAY CROSS	II
LB33	1344201	610370.8	137865.2	BARN COMPLEX ABOUT 66 METRES WEST OF SOMERFIELD COURT	II
LB34	1344202	610065	138350.6	GUINEA HALL	II
LB35	1344203	610669	137910.4	RHODES HOUSE	II

LB36	1344208	610254.1	134901.5	CLAIRE VOYEE ABOUT 76 METRES SOUTH OF PORT LYMPNE	II
LB37	1344209	611933	134650.8	WELL HEAD ABOUT 2 METRES NORTH OF HALL RANGE OF LYMPNE CASTLE	II
LB38	1344210	611006	136535.4	OTTERPOOL MANOR	II
LB39	1347810	609182	135389.4	FORGE COTTAGE AND TWO COTTAGES ADJOINING TO RIGHT	II
LB40	1367112	610478	138345.4	LEES COTTAGES	II
LB41	1392273	611851.9	134706.3	THE SANCTUARY	II

Non-designated Assets

Table 5: Military Remains

Project ID	DesigUID / Unique ID	Name
MR1	DKE22293	Crash site of Hawker Typhoon IB
MR2	DKE22290	Crash site of Supermarine Spitfire I
MR3	DKE22254	Crash site of Messerschmitt Bf109E-1
MR4	DKE22247	Crash site of Supermarine Spitfire I

Table 6: Built Heritage

Project ID	PrefRef / Unique ID	Name	Period Range
BH1	TR 13 NW 164	WWII munitions store, Farmead Farm	Modern
BH2	TR 13 NW 168	Milestone	Post Medieval to Modern
BH3	TR 13 NW 38	Westenhanger Station	Post Medieval to Modern
BH4	TR 13 SW 137	Medieval house north west of Lympne Castle, Castle Close	Medieval to Modern
BH5	TR 13 SW 162	Lympne Castle, Castle Close, Lympne	Modern
BH6	MKE88390	Harringe Court	Post Medieval
BH7	MKE88395	Potten Farm	Post Medieval
BH8	MKE88402	Grove House	Post Medieval
BH9	MKE88403	Farmstead south of Grove House	Post Medieval
BH10	MKE88404	Farmstead south east of Grove House	Post Medieval
BH11	MKE88406	Bellevue House	Post Medieval
BH12	MKE88407	Otterpool Manor (Little Otterpool)	Post Medieval
BH13	MKE88408	Barrow Hill Farm	Post Medieval
BH14	MKE88409	Sheepfold north west of Barrow Hill	Post Medieval
BH15	MKE88410	Somerfield Court	Post Medieval
BH16	MKE88411	Rhodes Farm	Post Medieval
BH17	MKE88412	Farmstead south east of Railway Cottage	Post Medieval
BH18	MKE88416	Combe Farm (Coomb Farm)	Post Medieval
BH19	MKE88417	Outfarm north west of Berwick House	Post Medieval
BH20	MKE88418	Upper Otterpool (Otterpool)	Post Medieval
BH21	MKE88419	Brook Farm	Post Medieval
BH22	MKE88427	Outfarm N of Westenhanger	Post Medieval
BH23	MKE88428	Outfarm south east of Westenhanger	Post Medieval
BH24	MKE88429	Tin Chimney Farm	Post Medieval
BH25	MKE88430	Farmstead south west of New Inn Green	Post Medieval
BH26	MKE88431	Outfarm south west of New Inn Green	Post Medieval
BH27	MKE88432	Little Berwick	Post Medieval
BH28	MKE88433	Berwick Manor Farm	Post Medieval
BH29	MKE88435	Outfarm north west of Oathill	Post Medieval
BH30	MKE88436	Farmstead in Lympne	Post Medieval
BH31	MKE88440	Outfarm south east of Hayward Farm	Post Medieval
BH32	MKE88441	Hillhurst Farm	Post Medieval
BH33	MKE88442	Outfarm north west of Ashford Lodge	Post Medieval
BH34	MKE88710	Westhanger Manor	Post Medieval
BH35	MKE88711	Farmstead north of Barrow Hill	Post Medieval
BH36	MKE88712	Outfarm north east of Stream Cottage	Post Medieval
BH37	MKE88713	Farmstead south east of Stream Cottage	Post Medieval
BH38	MKE88738	Little Sandling	Post Medieval

Project ID	PrefRef / Unique ID	Name	Period Range
BH39	TR 13 NW 33	Sandling park	Post Medieval to Modern
BH40	TR 13 SW 139	Port Lympne	Modern
BH41	TR 13 NW 136	PILLBOX	Modern
BH42	TR 13 NW 138	PILLBOX	Modern
BH43	TR 13 NW 139	PILLBOX	Modern
BH44	TR 13 NW 140	PILLBOX	Modern
BH45	TR 13 NW 141	PILLBOX	Modern
BH46	TR 13 NW 143	PILLBOX	Modern
BH47	TR 13 NW 145	PILLBOX	Modern

Table 7: Non-designated Archaeological Assets

Project ID	PrefRef / Unique ID	Name	Period Range
1	TR 13 NW 34	Iron Age coin	Iron Age
2	TQ 84 SW 1	LONDON AND DOVER RAILWAY	Early Modern to Modern
3	TR 13 NW 3	Westenhanger Castle	Unknown
4	TR 13 NW 134	AUXILIARY UNIT OPERATIONAL BASE	Modern
5	TR 14 NW 53	Stone Street (Roman Road)	Roman
6	TR 13 SW 145	Port Lympne, associated land	Unknown
7	TR 03 NE 84	PIMPLE	Modern
8	TR 04 SE 120	Roman road	Roman
9	TR 13 NW 45	Roman site nt Hillhurst Farm	Roman
10	TR 13 NW 46	Prehistoric flint and md pottery, Lympne	Prehistoric
11	TR 13 NW 47	Prehistoric flint artefacts, lympne	Prehistoric
12	TR 13 NW 48	Roman pottery and tile, Lympne	Roman
13	TR 13 NW 49	Possible ring ditch, Saltwood	Prehistoric
14	TR 13 NW 50	Roman pottery, tile, coins, lympne	Roman
15	TR 13 NW 51	Roman pottery, Stanford	Roman
16	TR 03 NE 55	Roman tile found near Burch's Rough,	Roman
17	TR 13 SW 36	Iron Age pottery found near stutfall castle	Iron Age
18	TR 03 NE 58	WW2 auxiliary unit hide	Modern
19	TR 13 NW 54	Anglo-Saxon Cemetery?	Early Medieval
20	TR 13 NW 61	Medieval Features North of Westenhanger	Early Medieval to Medieval
21	TR 13 NW 156	Bronze Age ditches, north of Westernhanger Castle, Stanford	Middle Bronze Age
22	TR 13 NW 63	Features East and West of Stone Street	Post Medieval
23	TR 13 NW 64	East Stour Diversion	Unknown
24	TR 13 NW 62	Prehistoric buried soil north of Westenhanger Castle, Stanford	Early Neolithic to Late Bronze Age
25	TR 13 NW 67	Post Med Features at Royal Oak Motel, Stanford	Post Medieval
26	TR 13 NW 68	Bronze Age Occupation Site, Lympne Industrial Estate	Bronze Age
27	TR 13 NW 70	Lympne Airfield	Modern
28	TR 13 NW 71	Battle Headquarters, Lympne Airfield	Modern
29	TR 13 NW 73	Aircraft Dispersal Pen (Site of), Lympne Airfield	Modern
30	TR 13 NW 74	Gas Decontamination Building, Lympne Airfield	Modern
31	TR 13 NW 75	Air Raid Shelters, Lympne Airfield	Modern
32	TR 13 NW 76	Picket Hamilton Fort , Lympne Airfield	Modern
33	TR 13 NW 77	Site of Slit Trenches Near, Lympne Airfield	Modern
34	TR 13 NW 78	Site of Trenches Near, Lympne Airfield	Modern
35	TR 13 NW 79	Former Barracks Huts , Lympne Airfield	Modern
36	TR 13 NW 80	Remains of Overblister Hanger and Trackway, Lympne Airfield	Modern
37	TR 13 NW 81	Remains of Machine Gun Testing Range, Lympne Airfield	Modern
38	TR 13 NW 83	Bulk Fuel Installation, Lympne Airfield	Modern
39	TR 13 NW 84	Runway, Lympne Airfield	Modern
40	TR 13 NW 72	Aircraft Dispersal Pen, Lympne Airfield	Modern
41	TR 13 NW 85	Early Medieval Brooch	Early Medieval
42	TR 13 NW 163	Cropmarks of a medieval trackway and field system, NW of Westernhanger	Medieval
43	TR 13 NW 174	Post medieval ditch, Stone Street, Westenhanger	Post Medieval
44	TR 13 NW 1	Probable Bronze Age Burial Mound, nr Barrow Hill	Bronze Age
45	TR 13 NW 2	Site of St. Mary's Church, Westenhanger	Medieval to Post Medieval
46	TR 13 NW 9	Probable Bronze Age burial mound, nr Barrow Hill	Bronze Age
47	TR 13 NW 12	Neolithic axe	Neolithic
48	TR 13 NW 13	Cropmark and ring ditch	Unknown
49	TR 13 NW 14	Romano-British pottery; Roman coins	Roman
50	TR 13 NW 17	Tranchet Axe	Prehistoric
51	TR 13 NW 18	Moat site, Bellevue House, Shepway	Medieval
52	TR 13 NW 20	Possible Anglo-Saxon Palace near Westenhanger	Early Medieval
53	TR 13 NW 21	Possible Deserted Medieval Site, Westenhanger	Medieval
54	TR 13 NW 22	Possible Deserted Medieval Site of Eastenhanger	Medieval
55	TR 13 NW 28	Mesolithic Blade Found Near, Westhanger	Mesolithic
56	TR 13 SW 2	C6th-C7th Frankish Interments found c.1828	Early Medieval
57	TR 13 SW 25	Anglo-Saxon vases	Early Medieval
58	TR 13 NW 186	Cropmark of a large ring ditch, to the southwest of Barrow Hill	Unknown
59	TR 03 NE 39	Harringe court	Medieval to Post Medieval
60	TR 13 NW 86	Pickett-Hamilton fort at Lympne Airfield	Modern
61	TR 13 NW 87	Concrete base likely to be of Second World War origin at Link Park, Lympne	Modern
62	TR 13 NW 144	GUN EMPLACEMENT	Modern
63	TR 13 NW 142	NODAL POINT	Modern
64	TR 13 NW 89	Finds at Link Park, Lympne, Kent	Unknown
65	TR 13 NW 147	Former site of Talbot House, a medieval hall house	Medieval to Modern
66	TR 13 NW 43	Belle Vue Aisled Barn	Medieval

Project ID	PrefRef / Unique ID	Name	Period Range
67	TR 13 NW 153	Roman field systems at Junction 11, M20	Roman
68	TR 13 NW 173	Possible prehistoric palaeochannel, on land at the Cedars, Barrow Hill, Sellindge	Prehistoric
69	TR 13 NW 82	Remains of Ammunition Store, Lympne Airfield	Modern
70	TR 13 SW 134	Site of a Windmill and smock mill, Mill house, Lympne	Post Medieval
71	TR 13 NW 148	Find spot of an 11th century bronze stirrup strap mount Lympne parish	Early Medieval to Medieval
72	TR 13 NW 196	Find spot of 3 Iron Age coins, Lympne parish	Iron Age
73	TR 13 NW 129	Former site of the Royal Oak Motel	Post Medieval to Modern
74	TR 13 NW 161	Late Iron Age - Roman pits and ditches, Stanford and Sandling	Late Iron Age to Roman
75	TR 13 NW 162	Medieval ditch, Stanford and Sandling	Medieval
76	TR 13 NW 158	11th-13th century (?) settlement, north of Westernhanger Castle, Stanford	Medieval
77	TR 13 NW 159	14th-15th century (?) ditches and enclosures, north of Westernhanger Castle, Stanford	Medieval
78	TR 13 NW 157	Late Iron Age rural landscape, north of Westenhanger Castle, Stanford	Late Iron Age
79	TR 13 NW 160	16th century (?) ditches, north of Westernhanger Castle, Stanford	Medieval to Post Medieval
80	MKE64292	Early Medieval garnet brooch	Early Medieval
81	MKE67583	Iron Age copper alloy coin	Late Iron Age
82	MKE67638	Medieval silver coin	Medieval
83	MKE67791	Iron Age gold coin	Late Iron Age to Roman
84	MKE67817	Medieval copper alloy figurine	Medieval
85	MKE67872	Early Medieval silver brooch	Early Medieval
86	MKE67822	Early Medieval copper alloy stirrup	Early Medieval to Medieval
87	MKE67915	Early Medieval copper alloy weight	Early Medieval
88	MKE67991	Roman copper alloy bead	Roman to Early Medieval or Anglo-Saxon
89	MKE69025	Roman copper alloy mount	Roman to Early Medieval or Anglo-Saxon
90	MKE68923	Iron Age copper alloy coin	Iron Age
91	MKE68844	Modern gold personal ornament	Post Medieval
92	MKE69390	Iron Age gold coin	Iron Age
93	MKE69407	Iron Age gold coin	Iron Age
94	MKE69420	Iron Age copper alloy coin	Iron Age
95	MKE69547	Roman copper alloy coin	Roman
96	MKE69434	copper alloy brooch	Medieval
97	TR 13 NW 149	Anglo-Saxon gold shilling ('thrymsa'), near Lympne	Early Medieval
98	TR 13 NW 177	Anglo-Saxon silver penny, near Lympne	Early Medieval
99	TR 13 NW 150	Anglo-Saxon silver penny, near Lympne	Early Medieval
100	TR 13 NW 151	Imitation? Ottonian silver penny, near Lympne	Early Medieval
101	TR 13 NW 152	Anglo-Norman silver penny, near Lympne	Medieval
102	TR 03 NE 217	Early Bronze Age/Iron Age pottery, east of Sellindge Sewage Works	Bronze Age
103	TR 03 NE 222	Neolithic arrowhead, Harringe Court	Early Neolithic
104	TR 03 NE 223	Iron Age/Roman pottery, Harringe Court	Middle Iron Age to Roman
105	TR 13 NW 171	Neolithic/Bronze Age worked flint, Westenhanger	Early Neolithic to Late Bronze Age
106	TR 13 NW 172	Scatter of Medieval pottery, Westenhanger	Medieval
107	TR 13 NW 175	Medieval hollow way, enclosure and buildings, Otterpool Campsite, Aldington Road	Medieval to Post Medieval
108	MKE80001	gold finger ring	Post Medieval
109	MKE80019	unidentified object	Unknown
110	MKE80045	gold finger ring	Medieval to Post Medieval
111	TR 03 NE 226	Linear geophysical anomaly, Harringe Court	Unknown
112	TR 13 NW 176	Cropmark of an enclosure to the west of Westenhanger	Unknown
113	TR 13 NW 187	Cropmark of a large ring ditch, to the southwest of Barrow Hill	Unknown
114	TR 13 NW 188	Cropmark of a large double ring ditch, to the southwest of Barrow Hill	Unknown
115	TR 13 NW 189	Cropmark of a ring ditch, to the southwest of Barrow Hill	Unknown
116	TR 13 NW 190	Cropmark of a possible ring ditch, to the south of Barrow Hill, Sellindge	Unknown
117	MKE96595	Early Medieval Lead Alloy gaming piece	Early Medieval
118	MKE96596	Roman Copper alloy steelyard weight	Roman
119	MKE96667	Neolithic Flint leaf arrowhead	Early Neolithic to Middle Bronze Age
120	TR 13 NW 198	Medieval Ditches, Undated Ditch and Undated Cobbled surface, Sellindge	Medieval
121	MKE97538	Prehistoric ditch and post-holes at Enterprise Way.	Prehistoric

Table 8: Archaeological Events

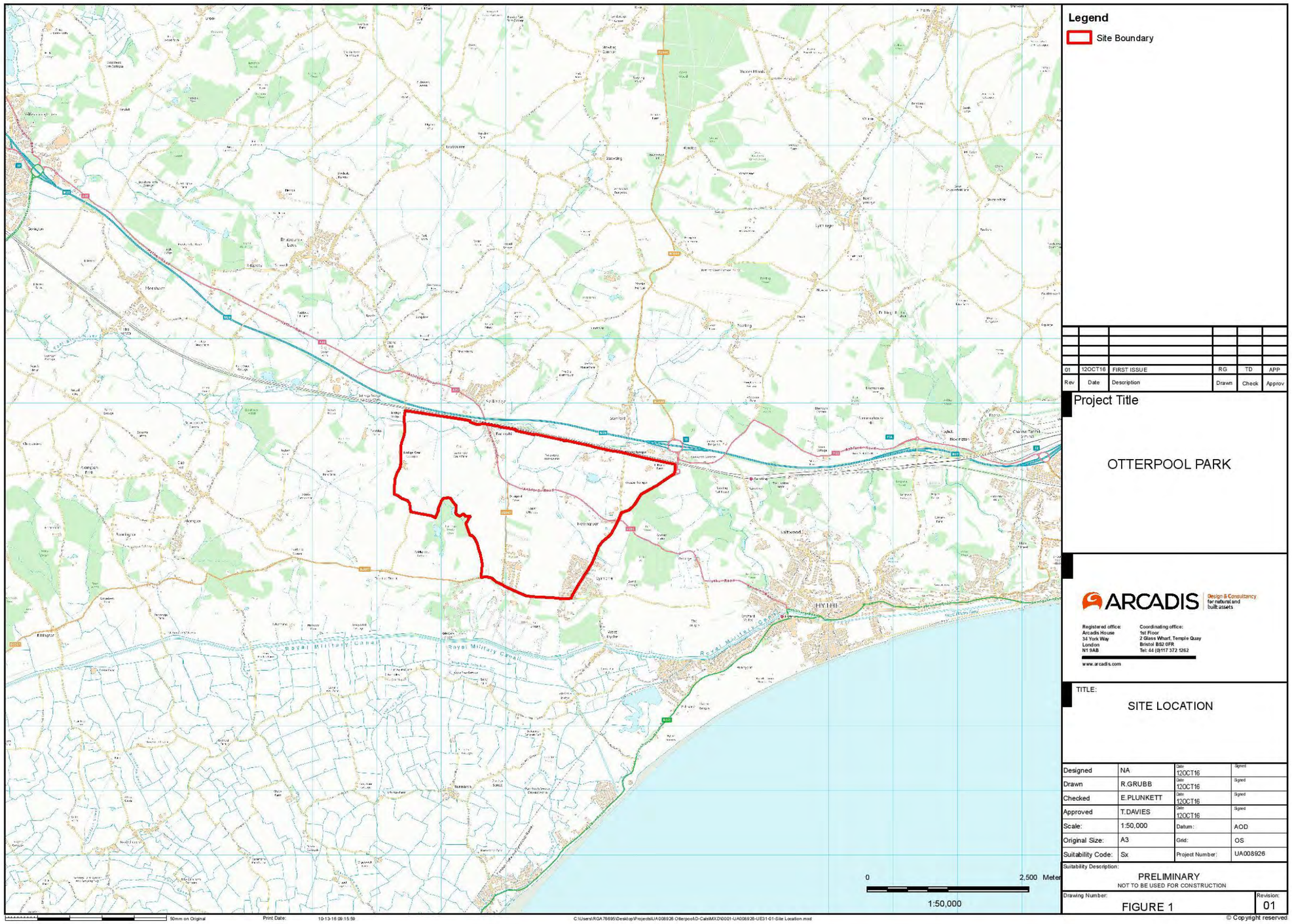
Project ID	EvUID /Unique ID	Name
EV12	EKE14724	A Geoarchaeological Evaluation of the Thames/Medway Alluvial Corridor of the Channel Tunnel Rail Link
EV28	EKE9232	Desk based assessment and walkover survey carried out at Link Park, Lympne
EV2	EKE10672	Desk-based assessment of the impact of the CTRL
EV19	EKE5115	Evaluation of Land adjacent to Hillhurst farm, Westenhanger, Hythe
EV23	EKE5876	Evaluation at Link Park, Lympne Industrial Estate

Project ID	EvUID /Unique ID	Name
EV21	EKE5730	Evaluation at Royal Oak Motel, Ashford Road, Stanford
EV6	EKE10807	Evaluation at the proposed Sico headquarters, Link Park Industrial Estate, Lympne
EV18	EKE5089	Evaluation East and West of Stone Street, Westenhanger
EV1	EKE10095	Evaluation of land at the Cedars, Barrow Hill, Sellindge.
EV29	EKE9658	Evaluation Report - Link Park, Lympne, Kent
EV10	EKE12247	Geophysical survey at Harringe Court
EV17	EKE5000	Geophysical survey of the A259 Dymchurch to M20 (Junction 11)
EV20	EKE5464	Outbuildings at Westhanger Castle, Stanford
EV13	EKE14828	Palaeolithic test-pits excavated at Otterpool Manor Farm, Lympne, 2013
EV11	EKE13952	Plot 20, Link Park, Enterprise Way, Lympne: Evaluation report
EV14	EKE14938	Proposed development of a biomass renewable electrical energy plant at Link Park, Lympne, Kent, Volume 2, Technical Appendix 5, desk-based assessment
EV22	EKE5766	Romney Marsh Earthworks Survey 1995
EV16	EKE3748	STANFORD
EV8	EKE11611	Surface collection survey for the Channel Tunnel Rail Link: Supplementary Fieldwork
EV26	EKE6050	Survey of Air Raid Shelters and Barracks, Lympne Airfield
EV25	EKE5967	Tree-Ring Analysis of timbers from a Barn at Westenhanger Manor, Stanford
EV27	EKE8493	Tree-Ring Analysis of Timbers From Westenhanger Castle
EV7	EKE11013	Tree-ring analysis of timbers from Westernhanger Manor barn and adjacent stable block
EV4	EKE10763	Watching brief at Farm Cottage, Stone Street, Stanford
EV9	EKE11965	Watching brief at 'Jesters', Stone Street, Westenhanger
EV5	EKE10806	Watching brief at Link Park Industrial Estate, Lympne
EV24	EKE5877	Watching brief at Link Park, Lympne
EV3	EKE10762	Watching brief at Westenhanger Castle, Folkestone
EV15	EKE15032	Westenhanger Manor Barn, Stone Street, Stanford, Near Folkestone, Kent: Tree-Ring Analysis of Timbers

ANNEX B

Figures

F0001-UA008926-UE31-01-Site Location



Rev	Date	Description	Drawn	Check	Approv
01	12OCT16	FIRST ISSUE	RG	TD	APP

Project Title

OTTERPOOL PARK

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
1st Floor
2 Glass Wharf, Temple Quay
Bristol BS2 0FR
Tel: 44 (0)117 372 1262

www.arcadis.com

TITLE:

SITE LOCATION

Designed	NA	Date: 12OCT16	Signed
Drawn	R.GRUBB	Date: 12OCT16	Signed
Checked	E.PLUNKETT	Date: 12OCT16	Signed
Approved	T.DAVIES	Date: 12OCT16	Signed
Scale:	1:50,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA008926

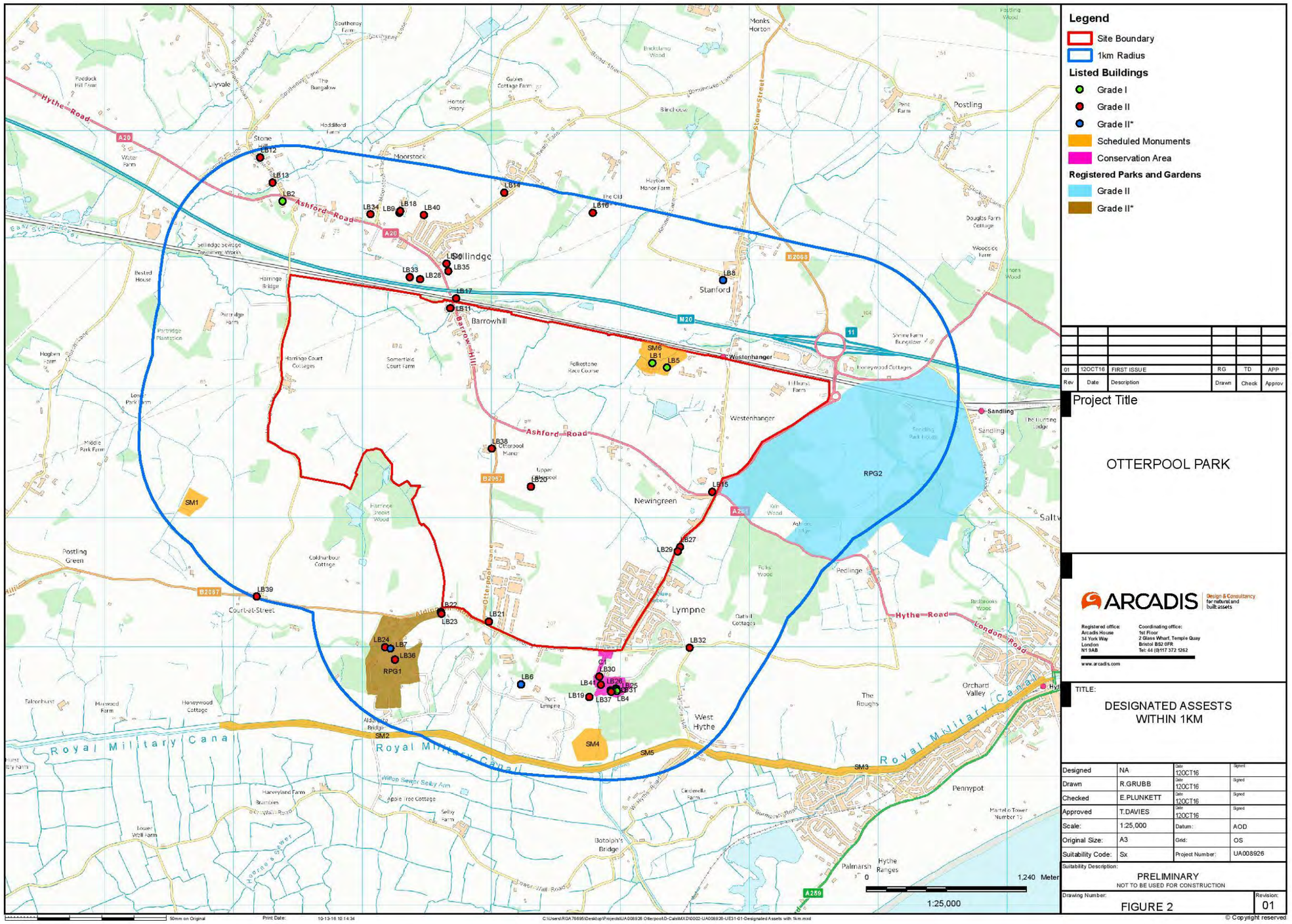
Suitability Description:

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

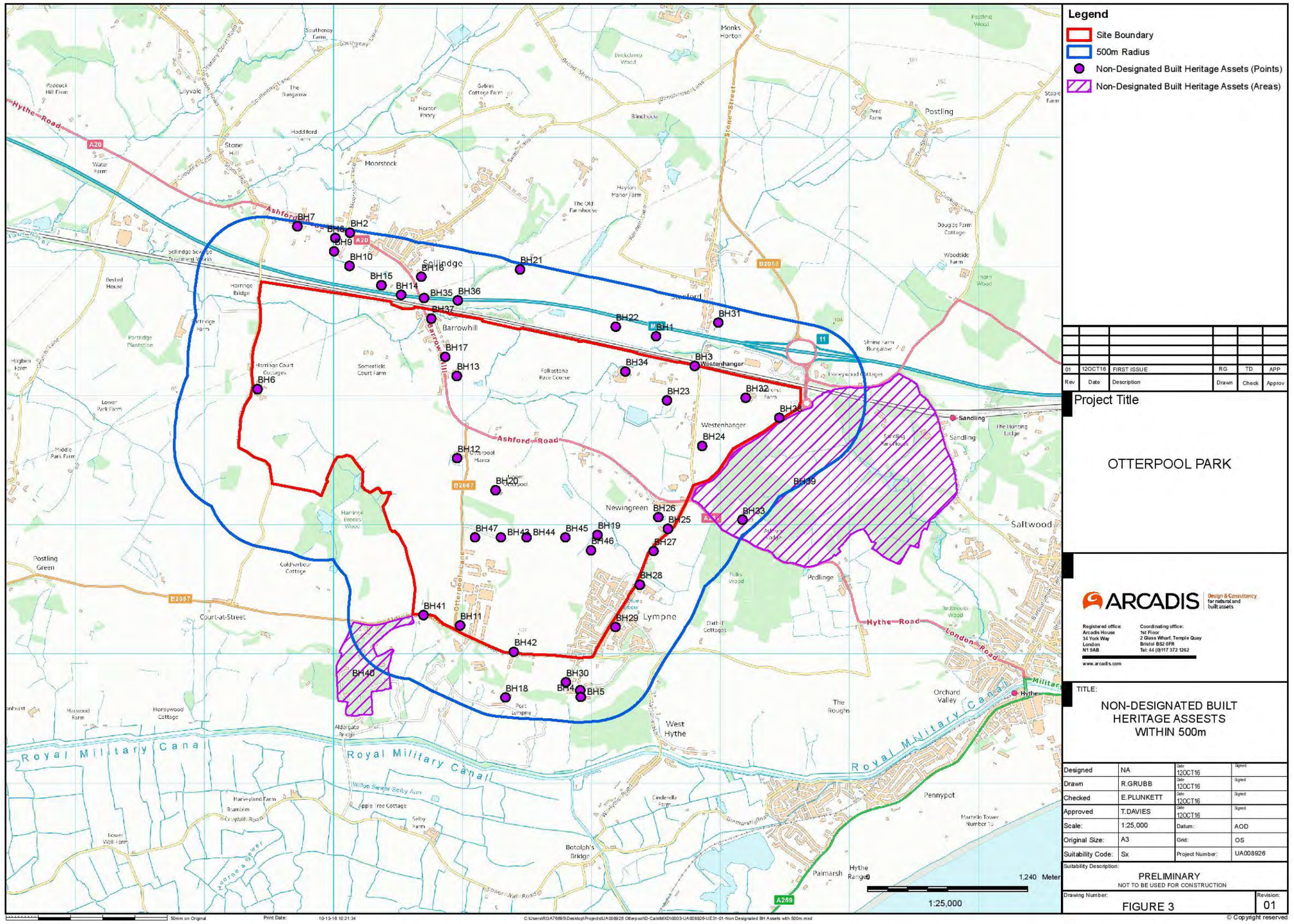
Drawing Number: FIGURE 1

Revision: 01

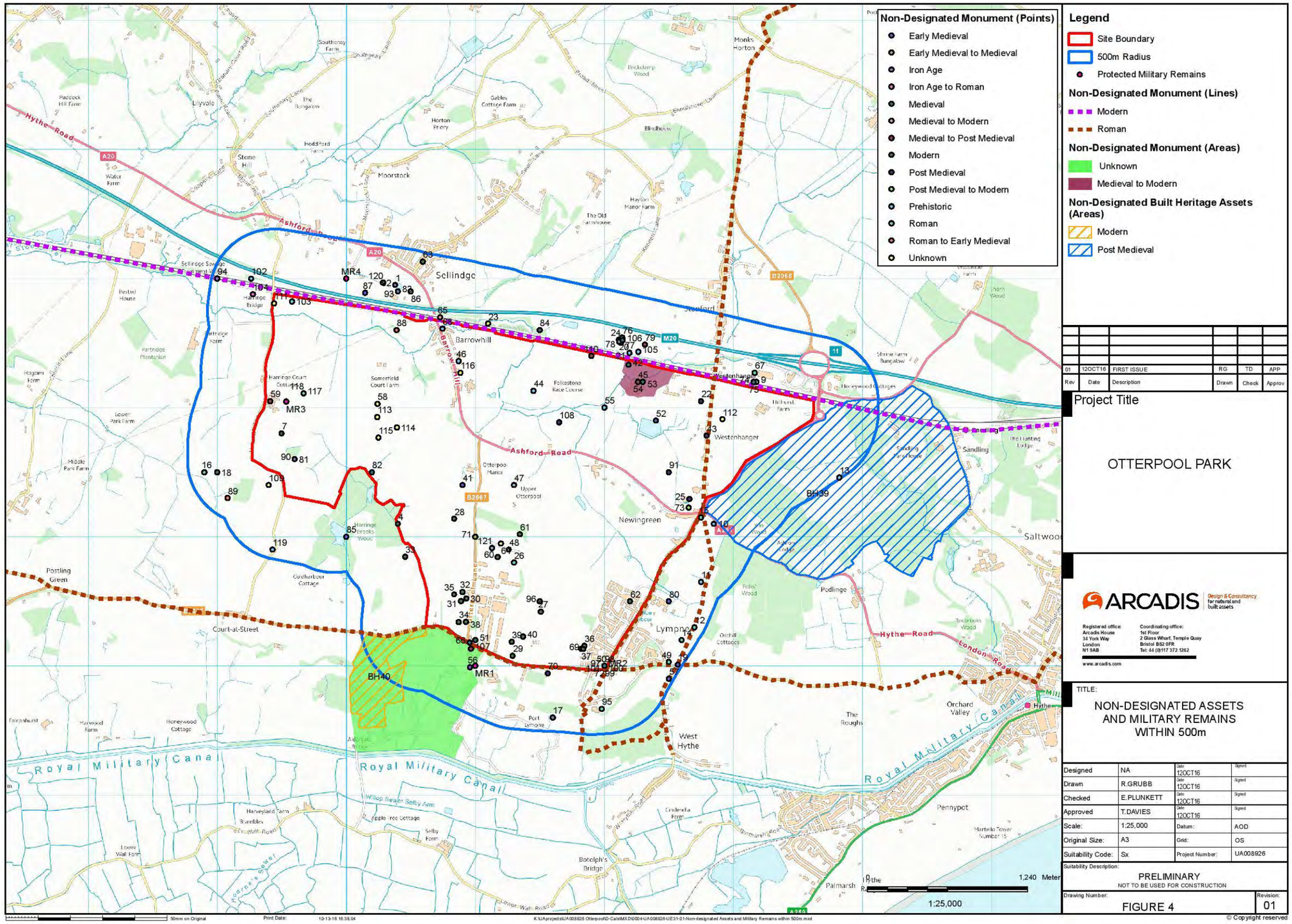
0002-UA008926-UE31-01-Designated Assets with 1km



0003-UA008926-UE31-01-Non Designated BH Assets with 500m



0004-UA008926-UE31-01-Non-designated Assets and Military Remains within .500km



01	12OCT16	FIRST ISSUE	RG	TD	APP
Rev	Date	Description	Drawn	Check	Approv

Project Title

OTTERPOOL PARK

ARCADIS Design & Consultancy for natural and built assets

Registered office: Arcadis House 34 York Way London N1 9AB

Coordinating office: 1st Floor 2 Glass Wharf, Temple Quay Bristol BS2 0FR Tel: 44 (0)117 372 1262

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TITLE:

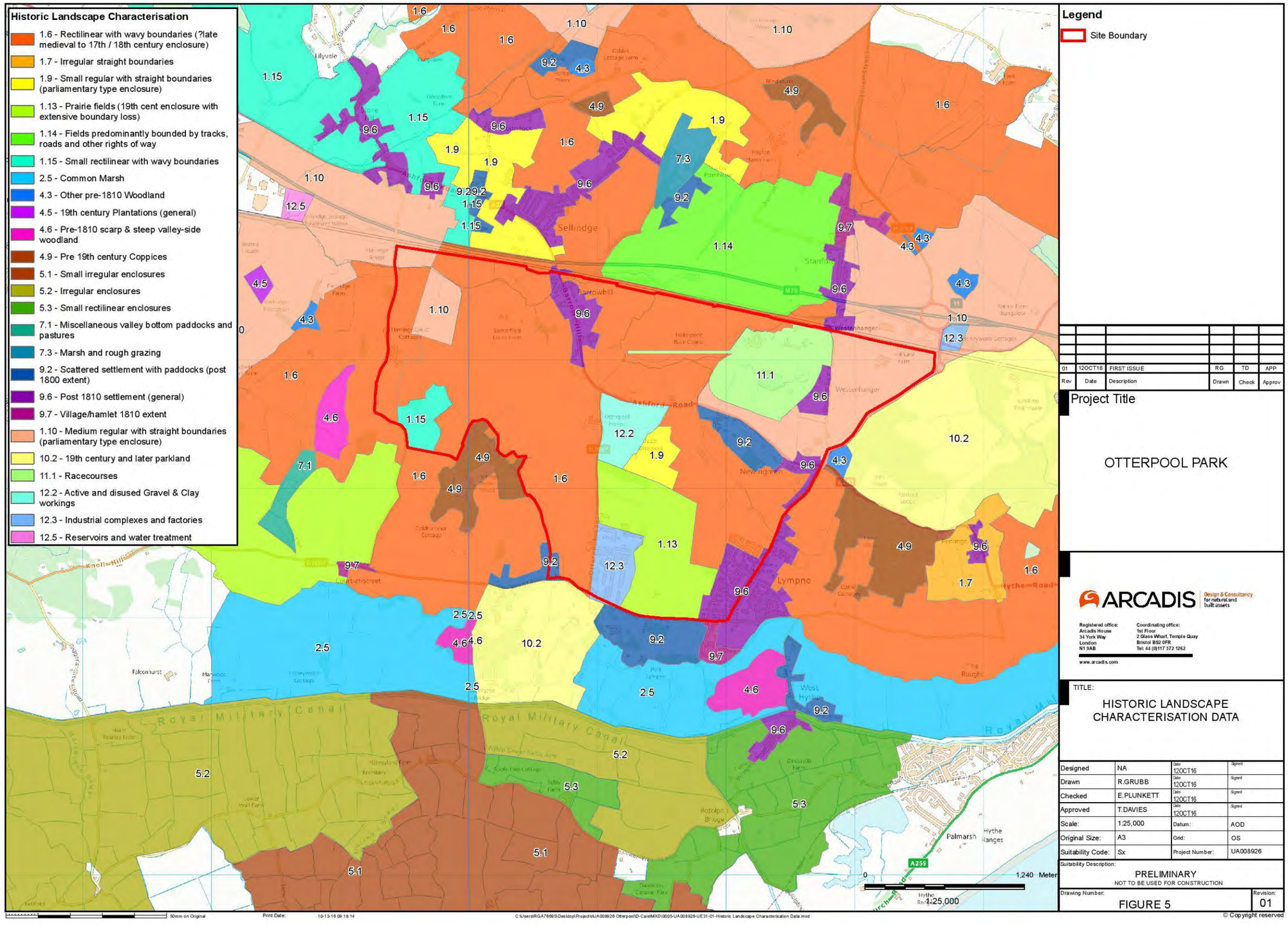
NON-DESIGNATED ASSETS AND MILITARY REMAINS WITHIN 500m

Designed	NA	Date: 12OCT16	Signed
Drawn	R.GRUBB	Date: 12OCT16	Signed
Checked	E.PLUNKETT	Date: 12OCT16	Signed
Approved	T.DAVIES	Date: 12OCT16	Signed
Scale:	1:25,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA008926

Suitability Description: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Drawing Number: FIGURE 4

Revision: 01


Historic Landscape Characterisation
1.6 - Rectilinear with wavy boundaries (?late medieval to 17th / 18th century enclosure)
1.7 - Irregular straight boundaries
1.9 - Small regular with straight boundaries (parliamentary type enclosure)
1.13 - Prairie fields (19th cent enclosure with extensive boundary loss)
1.14 - Fields predominantly bounded by tracks, roads and other rights of way
1.15 - Small rectilinear with wavy boundaries
2.5 - Common Marsh
4.3 - Other pre-1810 Woodland
4.5 - 19th century Plantations (general)
4.6 - Pre-1810 scarp & steep valley-side woodland
4.9 - Pre 19th century Coppices
5.1 - Small irregular enclosures
5.2 - Irregular enclosures
5.3 - Small rectilinear enclosures
7.1 - Miscellaneous valley bottom paddocks and pastures
7.3 - Marsh and rough grazing
9.2 - Scattered settlement with paddocks (post 1800 extent)
9.6 - Post 1810 settlement (general)
9.7 - Village/hamlet 1810 extent
1.10 - Medium regular with straight boundaries (parliamentary type enclosure)
10.2 - 19th century and later parkland
11.1 - Racecourses
12.2 - Active and disused Gravel & Clay workings
12.3 - Industrial complexes and factories
12.5 - Reservoirs and water treatment
Legend
Site Boundary
Project Title
OTTERPOOL PARK
ARCADIS Design & Consultancy for natural and built assets
Registered office: Arcadis House 34 York Way London N1 9AB
Coordinating office: 1st Floor 2 Glass Wharf, Temple Quay Bristol BS2 0FR Tel: 44 (0)117 372 1262
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TITLE:
HISTORIC LANDSCAPE CHARACTERISATION DATA
Designed NA 12OCT16
Drawn R.GRUBB 12OCT16
Checked E.PLUNKETT 12OCT16
Approved T.DAVIES 12OCT16
Scale: 1:25,000
Datum: AOD
Original Size: A3
Grid: OS
Suitability Code: Sx
Project Number: UA008926
Suitability Description: PRELIMINARY
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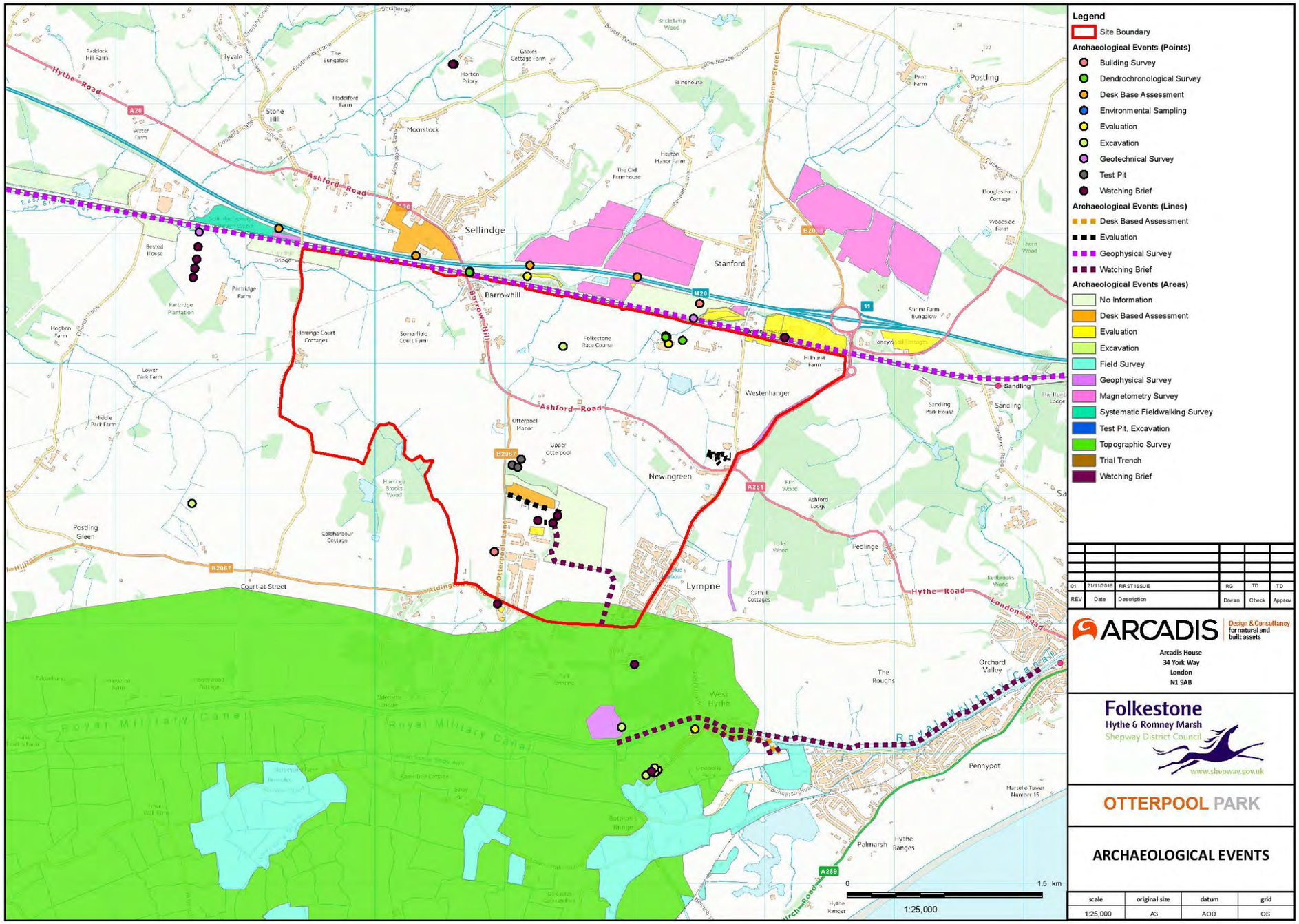


APPENDIX L

EIA Waste Workstream Report

Otterpool Park Masterplan

Stage 1 Feasibility and Capacity Study: Initial Findings

Workstream Name: **Waste**

Date: **18/11/2016**

The following figures are found in this report.

Figures

Figure 1: Large Landfill Sites

0009-UA008926-UE31-01-Waste Transfer Facilities

Tables

Table 1; ONS Total Waste Arisings

Table 2; Large Landfill Sites

Table 3: Policy Context

1. Stage 1 Methodology

In line with the current best practice for waste management the following tasks have been completed with the ultimate aim of establishing the strategic waste management principles and objectives for the Otterpool Park site masterplan development:

1. Key stakeholder engagement and consultation including Kent County Council and the Environment Agency. A meeting with the Environment Agency has taken place on 14th November 2016. Waste operational information has been received from the Kent County Council (KCC) Waste Officer (Hannah Allard) on 7th November 2016. Further information has been requested regarding construction waste.
2. Establishing the policy framework for waste management
3. Defining baseline waste environment, including receptors and existent waste facilities
4. Waste management facilities screening study
5. Workstream collaboration between contaminated land and waste in order to develop an informed approach
6. Opportunities and constraints reporting and location of waste facilities

2. Baseline Data

A desk study has been undertaken which has provided an opportunity to understand the existing site with its constraints and opportunities in greater detail. The following sources have been assessed as part of the Stage 1 baseline review:

- Environment Agency's public register.
- KCC Planning documents.

Construction Waste

The total construction, demolition and excavation (CD&E) waste arisings in Kent for 2005 was estimated to be 6,951,533 tonnes per year. Of this total:

- 52% was recycled to produce graded and ungraded aggregates and soil (excluding topsoil).
- 31% was deposited in licensed landfill sites, of which 35% were used for engineering and capping and 65% were waste.
- 17% was used on exempt sites (sites whereby a waste permit is not required, e.g. where wastes are used for land reclamation or improvement, composting, use of waste in the construction of educational installations etc.).

Data since 2005 has been reclassified into categories used under the Pollution Prevention and Control (PPC) permitting of landfills and because of the ban on the co-disposal of waste in landfills in July 2004.

Whilst figures for the study area arisings are reasonably robust for all years, for years prior to 2010, there were some significant methodological differences compared to later years. Therefore, data from 2005 should not be compared directly with the latest data from 2015.

Most recent data from Office for National Statistics (2015) shows that the total waste arisings (including municipal, commercial and CD&E waste) in Kent is estimated to be 1,532,673 tonnes per year as shown within the table overleaf.

Table 1; ONS Total Waste Arisings

Waste Type	Waste Arisings (tonnes)	% of Total
Hazardous Merchant	32,223	2.1%
Hazardous Restricted	31,080	2.0%
Non-hazardous with SNRHW cell	224,438	14.6%
Non-hazardous	114,422	7.5%
Hazardous*	0	0.0%
Inert	1,130,50	73.8%
TOTAL	**1,532,673**	**100.0%**

* Hazardous waste data has not been presented at this level of detail within the waste management 2015 data from National Statistics.

Of the 1,532,673 tonnes total, 95.9% is non-hazardous waste comprising:

- Some stable non-reactive hazardous wastes (SNRHW) being sent to a dedicated cell within a suitable landfill (14.6%).
- 73.8% inert waste
- 7.5% other non-hazardous waste.

The Annual Minerals and Waste Monitoring report for Kent indicates that overall landfill capacity decreased between 2012/13 and 2013/14 but the capacity of non-landfill waste management increased by 2,600,000 tonnes (recorded at approximately 15,000,000 tonnes for 2013/14).

Figure 1 below and Table 2 overleaf present a non-exhaustive list of large landfills (red dots) and waste management facilities (blue dots) that could potentially receive CD&E waste within 50 km of the proposed development .

Figure 1: Large Landfill Sites

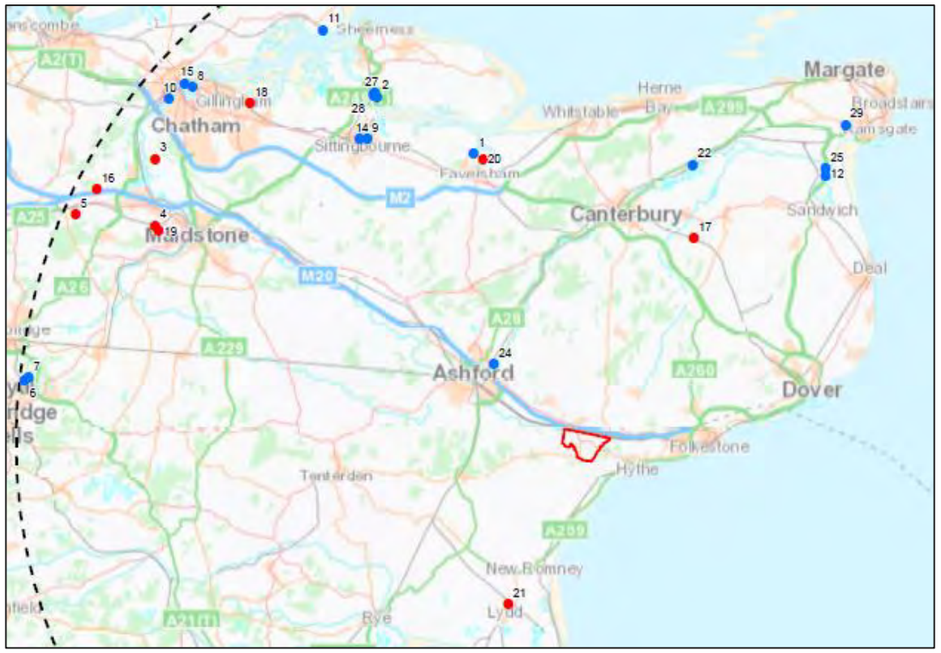


Table 2: Large Landfill Sites

Number	Waste Management Facilities and Landfill Sites	Permit Number	Annual Tonnes Permitted
1	The Recycling Centre	EA/EPR/AB3108XA/T001	74,999
2	E M R (Ridham)	EA/EPR/ZP3398HD/V004	312,960
3	Margetts Pit Landfill	EA/EPR/AP3698HB/V006	100,000,000
4	Hermitage Quarry	EA/EPR/RP3898HJ/A001	250,000
5	Offham Landfill	EA/EPR/AP3297SS/V011	446,400
6	North Farm Transfer Station	EA/EPR/BB3505HU/V002	135,000
7	Site 'b' North Farm Lane	EA/EPR/QP3998HQ/V004	50,000
8	Pelican Reach (Plot L)	EA/EPR/TP3495HH/V007	261,975
9	London & Kent Metals	EA/EPR/FP3495HD/V002	100,000
10	Countrystyle Recycling Ltd	EA/EPR/CP3095HT/V006	246,249
11	Isle Of Grain Sidings, Kent	EA/EPR/CP3795HQ/T002	160,110
12	Richborough Hall Waste Transfer & Recycling Centre	EA/EPR/MP3898HW/V003	380,000
13	Countrystyle Recycling	EA/EPR/XP3298HV/V008	200,000
14	Sittingbourne Weee Recycling Facility	EA/EPR/GP3498HL/V006	100,000
15	Medway M R F & W T S	EA/EPR/BP3396LD/A001	249,999
16	Workhouse Quarry Inert Landfill	EA/EPR/BX8505IG/	400,000
17	Bramling Quarry Landfill	EA/EPR/DP3198VK/V003	49,000
18	Lower Twydall Chalk Pit	EA/EPR/FP3630LC/V003	90,000
19	Hermitage Quarry Inert Landfill	EA/EPR/QP3135SX/	305,000
20	Ham Farm Landfill	EA/EPR/AB3309MZ/V002	150,000
21	Allens Bank	EA/EPR/BS6904IB/V002	150,000
22	Ling Metals Limited	EA/EPR/BP3490VD/V003	82,000
23	Ridham Waste Transfer & Treatment Facility	EA/EPR/SP3691ES/V003	200,000
24	Conningbrook Recycling Facility	EA/EPR/XP3394VP/V003	175,000
25	Richborough Park	EA/EPR/ZP3292EL/A001	450,000
27	Ridham Waste Transfer Station	EA/EPR/PB3931RK/A001	800,800
28	Waste Transfer Station At Ridham Dock	EA/EPR/CB3704FX/A001	250,000
29	The Chalk Pit	EA/EPR/DB3206UV/A001	200,000

These, and additional, facilities will be further reviewed as part of the future detailed assessments.

Operational Waste

During operation, municipal solid waste (MSW) would be generated by the residents of the proposed development. Commercial and industrial (C&I) waste would be generated by the occupants of the commercial units. Based upon the envisaged land uses of the proposed development, the waste generated during operational phase would include paper and cardboard, plastics, cans, glass, metals, organics, textiles, packaging, waste electrical and electronic equipment (WEEE), bulky waste and a residual waste stream.

As the Waste Disposal Authority for Kent, KCC arranges the recycling and disposal of waste collected from households by the local district council (in this case Shepway District Council). The household waste collected via kerbside collections is taken to one of KCC's Waste Transfer Stations (WTSs) for bulking where it is then taken to local processors contracted by KCC or Biffa (who operate the WTS in the East of the County). In Shepway, KCC also has two Household Waste Recycling Centres at Folkestone and New Romney for recycling and disposal of a range of materials delivered by Kent residents.

Kent currently achieves net self-sufficiency in waste management facilities for all waste streamsi.e. the annual capacity of the waste management facilities (excluding transfer) in Kent is sufficient to manage the waste arising in Kent. The continued achievement of the principle of net self-sufficiency and managing waste close to its source is a key Strategic Objective of the Kent Minerals and Waste Local Plan.

3. Policy Context

The following documents have been reviewed and summarised as part of the stage 1 work in order to ensure that our work is following the current best practice and meeting the latest requirements:

Table 3: Policy Context

Policy / Legislation	Summary of Requirements	Implementation
a. Waste Framework Directive (Directive 2008/98/EC on waste)	In December 2008, the Waste Framework Directive (WFD) (Directive 2008/98/EC) came into force and included: • The setting of recycling targets for non-hazardous construction and demolition waste (70% by weight by 2020: Article 10). • A provision which would enable the European Commission to adopt EU-wide end-of-waste criteria for specified wastes. A waste specified in this way would cease to be waste when it has undergone a recovery operation and complies with the criteria set by the Commission. • The obligation for Member States to set up waste prevention plans within five years from the adoption of the Directive.	The WFD will be implemented through the Environmental Protection Act 1990 (as amended), the Duty of Care and Carriers and Brokers regimes and regulations and the Environmental Permitting (England and Wales) Regulations 2010. Waste recovery targets will be integrated into the Waste Chapter of the EIA and the Waste Strategy.
b. EU Landfill Directive (Directive 1999/31/EC on the landfill of waste)	Establishes a framework for the management of waste across the European Community. It also defines certain terms, such as 'waste', 'recovery' and 'disposal', to ensure that a uniform approach is taken across the EU. Furthermore, it is an instrument for driving waste up the hierarchy through waste minimisation and increased levels of recycling and recovery. Sets out a number of procedures and criteria for construction, excavation and operational waste acceptance at landfills, including targets for the progressive reduction of biodegradable municipal waste (BMW) sent for disposal in landfill. The principles set up for the acceptance of hazardous and non-hazardous waste at relevant landfills includes ensuring that the waste will not endanger human health and the environment and satisfies the Waste Acceptance Criteria (WAC). They also set strict requirements for the acceptance of certain stable, non-reactive hazardous waste into non-hazardous waste landfills.	An assessment will be carried out against the context of the Schedule 10 of the Environmental Permitting (England and Wales) Regulations (EPR) 2010 (through which the Landfill Directive is implemented) and will assume that at a minimum, the targets in this Schedule will be met. Recommendations will be provided detailing the end destination of construction, demolition, excavation (CD&E) and operational waste. Wastes will be segregated based on their classification to ensure that they are managed appropriately.
c. The Clean Neighbourhoods and Environment Act 2005	A provision which would enable the European Commission to adopt EU-wide end-of-waste criteria for specified wastes. A waste specified in this way would cease to be waste when it has undergone a recovery operation and complies with the criteria set by the Commission.	The Waste Chapter of the Environmental Impact Assessment (EIA) will cover CD&E and operational waste that will be produced. This will be carried out against the context of the Clean Neighbourhoods and Environment Act 2005. Duty of Care checks will be undertaken as part of completing the Waste Chapter or the EIA.
d. Environmental Permitting (England & Wales) Regulations 2010	The Environmental Permitting Regulations (EPR) introduced a permitting and compliance regime, which deliver many of the requirements of the	A Waste Strategy covering CD&E and operational waste will be produced. This will be carried out against the context of the Environmental

Policy / Legislation	Summary of Requirements	Implementation
and The Environmental Permitting (England and Wales) (Amendment) Regulations 2015	European Environmental Directives and of national policy. The Schedules to the Regulations identify precise requirements, article by article, for each Directive which must be delivered through the permitting system. Each Directive covered by the Regime has a specific schedule. The most relevant for this project are: • Part A installations and Part A mobile plant (the Integrated Pollution Prevention and Control Directive) - Schedule 7. • Domestic Part B installations and Part B mobile plant - Schedule 8. • The Waste Framework Directive - Schedule 9: Waste Operations. • The Waste Framework Directive - Schedule 9.The Landfill Directive - Schedule 10.	Permitting (England and Wales) Regulations 2010. Any treatment, storage or reuse on site will be permitted (where required).
e. The Hazardous Waste (England and Wales) Regulations 2005, Statutory Instrument 2005 No. 894, 2009 amendment SI 507 and 2016 amendment SI 2016 No. 336	The Hazardous Waste (England and Wales) Regulations 2005 (HWR 2005) were amended on 6 April 2009 and further amended on 1st April 2016. The first change precludes the need as a producer of hazardous waste to notify their premises with the Environment Agency. The second aspect brings changes to the format of the unique consignment note code. The Hazardous Waste (England and Wales) Regulations 2005 require a Hazardous Waste Consignment Note (HWCN) to be produced for each consignment of hazardous waste removed from site. This may take the form of either a “Standard Procedure” (single movement) HWCN, where waste is moved from one premises to a Consignee in a single journey or a “Multiple Collection” HWCN, (as defined in Waste (England and Wales) Regulations 2011 Schedule 2).	The Waste Chapter of the EIA will include a classification of the estimated waste that will be produced on the site as inert, non-hazardous or hazardous. It will also include details (e.g. license number) of each waste carrier and each waste management facility the project intends to use. This will enable the project to ensure compliance with the regulations. Any hazardous waste will be segregated from non-hazardous waste and off site movement will be accompanied by a Hazardous Waste Consignment Note.
f. Waste (England and Wales) Regulations 2011, and 2012 amendment	The Waste (England and Wales) Regulations 2011 came into force on 29th March 2011 and update some aspects of waste controls. The need for waste permits and authorisations for certain activities therefore does not change. In summary, the regulations implement the WFD and require businesses to confirm that they have applied the waste management hierarchy when transferring waste and to include a declaration on their waste transfer note or consignment note. These regulations replace: • Environmental Protection (Duty of Care) Regulations, as amended. • Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations, as amended	The Waste Chapter of the EIA will cover CD&E and operational waste that will be produced. This will be carried out in accordance with the Waste (England and Wales) Regulations 2011 SI 988. The Waste Chapter of the EIA and the Waste Strategy will demonstrate how the waste will be managed with regards to the waste hierarchy and Duty of Care.

Policy / Legislation	Summary of Requirements	Implementation
	• Amends Hazardous Waste (England and Wales) Regulations 2005 (Schedule 2). DEFRA proceeded with the proposed amendments to the 2011 Regulations and, from April 2014, allows alternative documentation to be used to record the written description of waste.	
g. Waste Management Plan for England (DEFRA, Dec 2013)	The Waste Management Plan for England was published in 2013 and supersedes the Waste Management Strategy for England 2007. The 2013 plan did not introduce new waste management measures or policies, but instead collated the findings of the government's review of waste policy and the previous policies into one national plan. In addition, the plan helps meet the requirements of Schedule 1 of the Waste (England and Wales) Regulations 2011. The plan confirms the UK's commitment to meet its target under the Waste Framework Directive of recovering at least 70% by weight, of construction and demolition waste.	The waste assessment, included within the Waste Chapter of the EIA, will be carried out against all current relevant information and policies. As the plan is a compilation of existing information and policies the waste assessment will address the requirements of the plan. Waste recovery targets will be integrated into the Waste Chapter of the EIA and the Waste Strategy.
h. National Policy Statement for National Networks (NPSNN) (2014)	Section 5.42 of the NPSNN provides that: 'The applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome. The Secretary of State should consider the extent to which the applicant has proposed an effective process that will be followed to ensure effective management of hazardous and non-hazardous waste arising from the construction and operation of the proposed development. The Secretary of State should be satisfied that the process sets out: • Any such waste will be properly managed, both onsite and offsite; • The waste from the proposed facility can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area; and • Adequate steps have been taken to minimise the volume of waste arisings, and of the volume of waste arisings sent to disposal, except where an alternative is the most sustainable outcome overall.'	Waste will be forecast within the Waste Chapter of the EIA and the Waste Strategy, along with appropriate waste management options. All project options include maximising the reuse of waste onsite.

Policy / Legislation	Summary of Requirements	Implementation
i. National Planning Policy for Waste (Department for Communities and Local Government, 2014)	Sets out detailed waste planning policies. States that 'when determining planning applications for non-waste development, local planning authorities should ensure that: The likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities. The handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal.	Waste recovery targets will be integrated into the Waste Chapter of the EIA and the Waste Strategy.
j. The Definition of Waste: Development Industry Code of Practice v2, Contaminated Land: Applications in Real Environments (CL:AIRE), 2011	The Code of Practice (CoP) provides best practice for the construction industry to use when assessing if waste materials can be recovered and achieve "non-waste" status through managed use. The CoP permits reuse on and off site providing that the reuse scenario meets the four factors test: • Protection of Human Health & Environment • Suitable for use without treatment • Certainty of use • Quantity of material	It is not known which mechanism will be used to permit the reuse of material onsite at this early stage. The use of a CoP will be an option.
k. Shepway Core Strategy Local Plan (2013)	The Core Strategy is a long-term plan to manage land use and developments. The Shepway Core Strategy Local Plan was adopted as part of the statutory development plan for the district on 18 September 2013. Policy SS3 (Place-Shaping and Sustainable Settlements Strategy) states that during the build out stage there are opportunities for increased recycling of construction and demolition waste and procurement of low-impact materials. Policy SS5 (District Infrastructure Planning) states that the any new development should be designed to encourage minimisation of waste production and promote sustainable waste management.	The Waste Chapter of the EIA will cover CD&E and operational waste that will be produced. This will be carried out in accordance with the Waste (England and Wales) Regulations 2011 SI 988. The Waste Chapter of the EIA and the Waste Strategy will demonstrate how the waste will be managed with regards to the waste hierarchy and Duty of Care.
l. Shepway District Local Plan Review (2006)	Adopted by the council on 16 March 2006. These policies 'saved' in 2009 and not deleted by the Core Strategy remain part of the Development Plan and will remain saved until they are replaced by specific policies in a new adopted Local Plan document. Sustainable Development Policy SD1 and Utilities Policy U10 states the District Council will: • Encourage energy efficiency and conservation, re-use and recycling of materials and, the sensitive development of renewable energy resources.	The Waste Chapter of the EIA will cover CD&E and operational waste that will be produced. This will be carried out in accordance with the Waste (England and Wales) Regulations 2011 SI 988. The Waste Chapter of the EIA and the Waste Strategy will demonstrate how the waste will be managed with regards to the waste hierarchy and

Policy / Legislation	Summary of Requirements	Implementation
	• Grant planning permission for development required as part of the process of recycling materials.	Duty of Care. It will also assess the opportunity of energy from waste.
m. Kent Minerals and Waste Local Plan 2013-2030 (2016)	The Local Plan outlines the ambition for sustainable resource management for minerals and waste development in the plan area up to the end of 2030. The objectives are as follows: • Increase amounts of Kent's waste being re-used, recycled or recovered. Promote the movement of waste up the Waste Hierarchy by enabling the waste industry to provide facilities that help to deliver a major reduction in the amount of Kent's waste being disposed of in landfill. • Promote the management of waste close to the source of production in a sustainable manner using appropriate technology and, where applicable, innovative technology, such that net self-sufficiency is maintained throughout the plan period. • Use waste as a resource to provide opportunities for the generation of renewable energy for use within Kent through energy from waste and technologies such as gasification and aerobic/anaerobic digestion. • Provide suitable opportunities for additional waste management capacity to enable waste to be managed in a more sustainable manner. • Encourage the use of sustainable modes of transport for moving minerals and waste long distances and minimise road miles. • Promote and encourage the use of recycled and secondary aggregates in place of land-won minerals.	The Waste Chapter of the EIA will cover CD&E and operational waste that will be produced. This will be carried out in accordance with the Waste (England and Wales) Regulations 2011 SI 988. The Waste Chapter of the EIA and the Waste Strategy will demonstrate how the waste will be managed with regards to the waste hierarchy and Duty of Care. It will also assess the opportunity of energy from waste and sustainable modes of transport for moving material resources and waste (e.g. rail).
n. Kent Joint Municipal Waste Management Strategy (2007)	The Kent Waste Partnership is made up of the thirteen local authorities in Kent (and includes Shepway). This document provides the Strategy for the management of Kent's municipal solid waste for the next 20 years. The key elements of the strategy are: • To view waste as a resource. • To prioritise waste minimisation and re-use in order to break the link between waste production and economic growth. • Timely procurement of treatment capacity for residual waste to ensure that Kent meets government targets for diverting biodegradable wastes from landfill.	The Waste Chapter of the EIA will cover CD&E and operational waste that will be produced. This will be carried out in accordance with the Waste (England and Wales) Regulations 2011 SI 988. The Waste Chapter of the EIA and the Waste Strategy will demonstrate how the waste will be managed with regards to the waste hierarchy and Duty of Care.

4. Stakeholder Engagement and Feedback

The following stakeholders have been identified as being key to consideration of waste management for the development:

- KCC's Waste Officer - initial contact has been made with the Waste Officers (Hannah Allard and Nick Gill), both work directly within the Waste Management Team at KCC. As the Waste Disposal Authority for Kent, they arrange the recycling and disposal of waste collected from households by the local district council (in this case Shepway District Council).

  Operational waste information has been provided. However, it has been considered that it is too early a stage to discuss infrastructure capacity, as there are currently insufficient development details. It has been suggested that a meeting will be arranged as work progresses beyond Stage 1.

  Hannah Allard has referred us to Sarah Platts for information regarding CD&E waste. We are awaiting from Sarah the contact details of the individual within the planning waste department that will be dealing with the proposed development.

- KCC's Sustainability Officer - initial contact has been made with the Sustainability Officer and a meeting proposed for the w/c 14th November. Unfortunately, this was cancelled. A new date is awaited.

  Waste targets and KCC waste expectations will be discussed at this meeting.

- Environment Agency – a meeting has taken place on the 14th November. Following this meeting an email was sent to Ghada Mitri, requesting information relating to open landfills and waste management facilities within the vicinity of the proposed development, as well as future proposals for landfill and waste management facilities.

5. Constraints

The following initial waste management constraints to the proposed development have been identified at this time:

- Given the site's extent there are existing buildings and infrastructure assets which are already present and used. An understanding of their current function/extent and future use will be ascertained with regards to the waste management strategy. Demolition of existing buildings and infrastructure assets should be minimised and reuse of onsite materials maximised.
- To date, no Ground Investigation, or detailed surveys or monitoring programmes have been undertaken. Therefore, it has not been possible to provide conclusions with respect to the reuse of site materials due to contamination (e.g. soils and asbestos in made ground)

6. Opportunities

The South East England is an area with very low capacity for waste. The following are aspects to consider in planning for waste for the site:

- **Minimise movements of materials** (material resources and waste) by reducing imported fill to a minimum, and by obtaining aggregates and other fill from sources as close to the site as possible. Where this is not possible the import of aggregates via train to local railheads such as in Ashford should be considered, for their final journey to site by lorry using the M20.
- **Develop and implement Materials Management Plan and Site Waste Management Plan** from early stage; the prioritisation of the use of materials arising from demolition and secondary or recycled materials, with full consideration of appropriate Environment Agency / WRAP Quality Protocols and regulatory position statements should be considered.
- **Pre-demolition Audits** should be completed of any existing buildings to determine if, in the case of demolition, refurbishment is feasible and, if not, to maximise the recovery of material from demolition or refurbishment for subsequent high-grade/value applications. The audits should cover identification of the key refurbishment/demolition materials and potential applications and any related issues for the reuse and recycling of the key refurbishment and demolition materials.

- **Energy for Waste -** we are awaiting strategic engagement from the wider team with the Kent County Council Sustainability Officer.
- **Material Resources and Waste Targets** - given the potential to be a sustainability exemplar the site should set materials targets at very early stage, in line with other specialisms' constraints and opportunities (e.g. geology and soils).

7. Impact on Masterplan Design

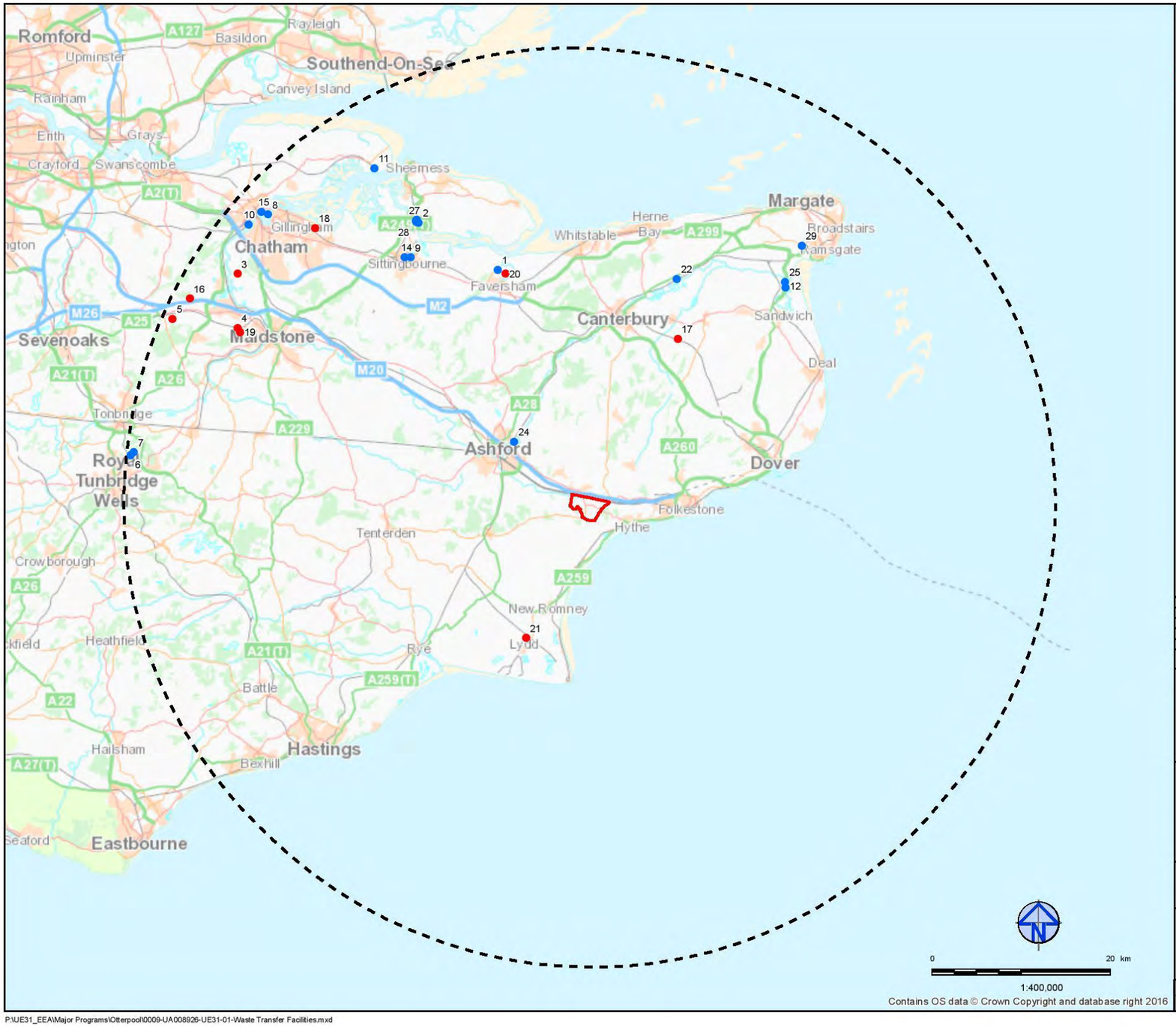
The current Stage 1 work has produced three major outcomes which should be considered as the masterplan design options develop these are:

- **Storage and waste segregation space** – whilst the specific volumes and storage locations cannot be known at this stage in development, the location of strategic storage space within the proximity of the rail line could be considered. Material resources and waste should be transported by train to avoid impact on road network when feasible and cost effective.
- **Existing buildings and structure assets** – where possible, existing buildings and structure assets should be integrated within the masterplan design. When demolition occurs, materials should be reused onsite.

8. Changes to Risk Register

No change is required to the risks identified this work.

0009-UA008926-UE31-01-Waste Transfer Facilities



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OTTERPOOL PARK

WASTE TRANSFER FACILITIES

scale	original size	datum	grid
1:400,000	A3	AOD	OS

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