South Oxfordshire and Vale of White Horse
Joint Local Plan 2041
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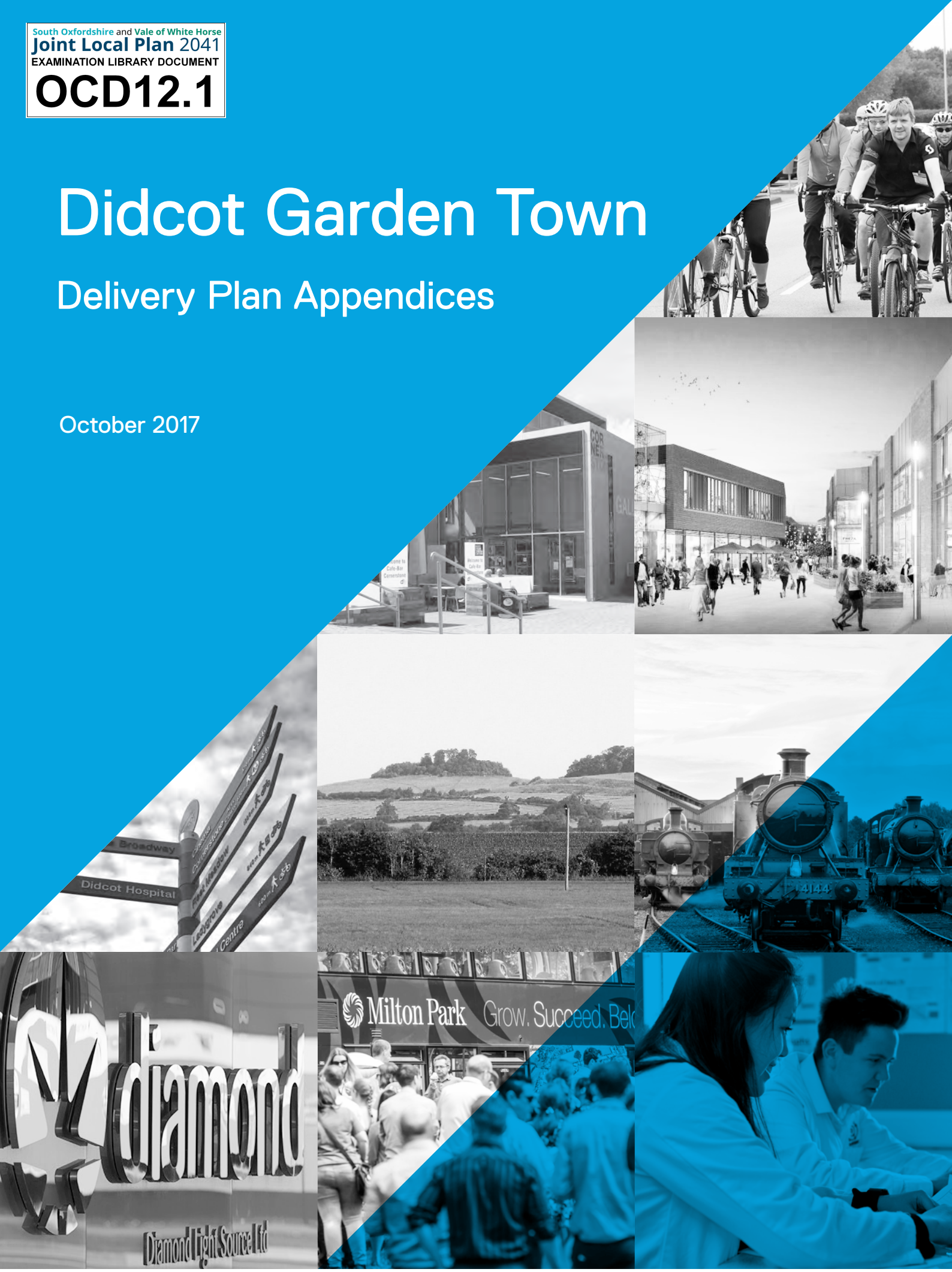
Didcot Garden Town

Delivery Plan Appendices

October 2017



South Oxfordshire District Council
Vale of White Horse District Council
OxLEP driving economic growth
OXFORDSHIRE COUNTY COUNCIL

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A.
Phase two community engagement summary report

Didcot Garden Town Engagement Summary – 18/12/2016

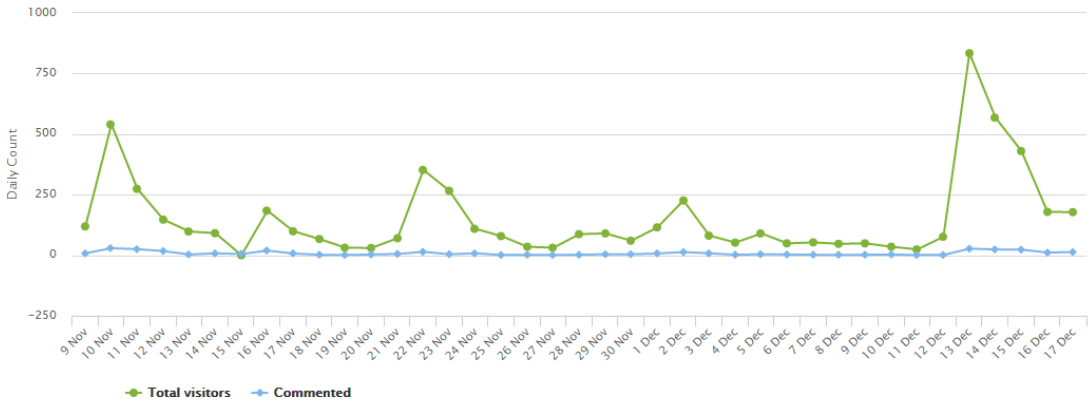
In the six week period between 9 November and 19 December 2016, the Garden Town website was visited a total of 4,804 times.

These visits can be categorised as follows:

1,260 Transient visitors	-	people that visited the website home page, but left before clicking through to any other pages.
922 Aware visitors	-	people that visited more than one page on the Garden Town website but did not spend a significant amount of time reading the content.
2,193 Informed visitors	-	people that read content in depth (i.e. visited more than one page and spent a significant amount of time reading the content).
429 Engaged visitors	-	people that read content in depth, registered their details and provided at least one comment.

It is worth noting that both peaks on 22 November and 13 December are directly related to advertising/engagement.

- Our stakeholder event and engagement event with Didcot Residents saw 400 people comment on the website the following day
- The Facebook advertisement saw an increase of referrals from Facebook overnight from 1500 people to 2580 people
- This Facebook referrals increase was mainly in the age bracket 25-54



Engagement Methods

Residents and stakeholders have been in engaged in a variety of ways:

- Interactive website
- Public drop in sessions at Cornerstone Arts Centre
- Pop-up shops in the Orchard Centre
- Facebook advertising
- Advertising in the Herald series newspapers
- Meetings with key stakeholders, parish councils and community groups
- Display stands – Orchard Centre, Cornerstone Arts Centre, Didcot Civic Hall, Didcot Wave and South Oxfordshire and Vale of White of White Horse District Council Offices.
- Leaflet delivery to all homes in Didcot
- Posters in Didcot and surrounding villages
- Community engagement at Didcot street fair
- Press releases leading to articles in local media

Facebook Engagement

We have carried out a low cost Facebook campaign in December.

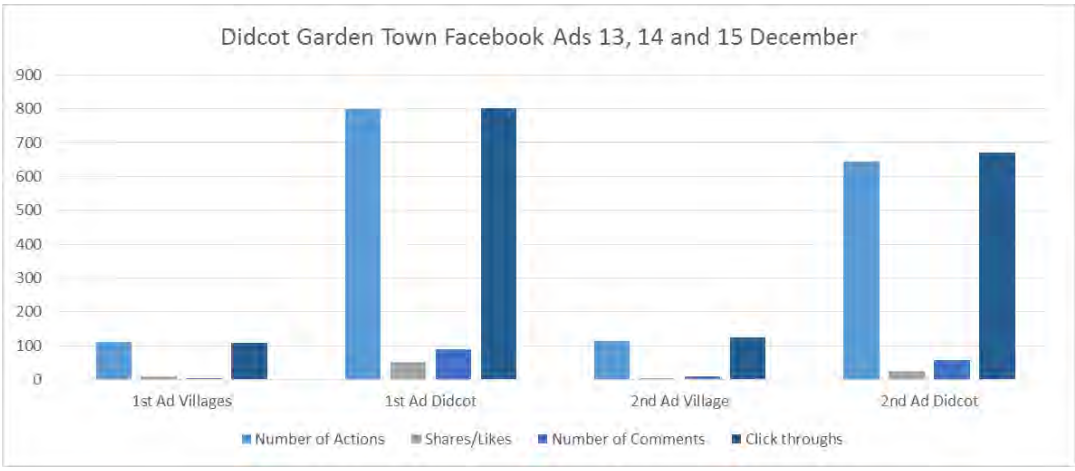
The objectives of the Facebook campaign were to:

- Raise awareness of Didcot Garden Town with local residents of Didcot and surrounding villages
- Drive them online to have their say about the future of Didcot Garden Town on the dedicated website

The audience (potentially 35,000 people) we wanted to reach were

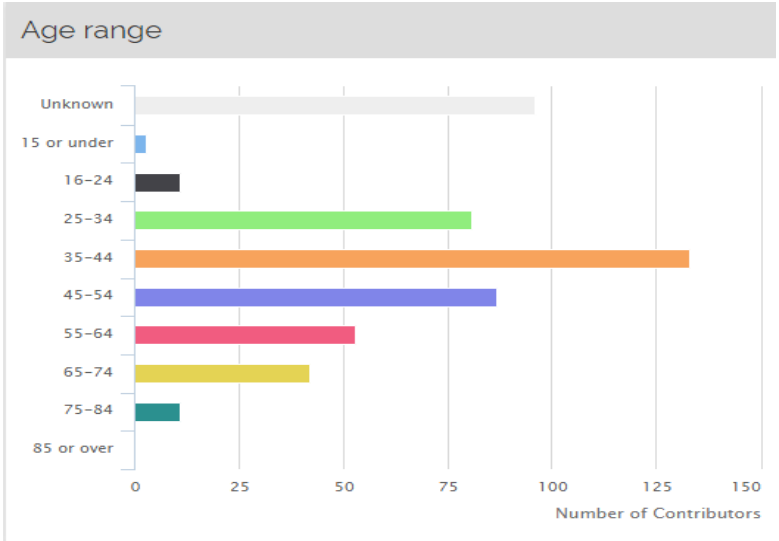
- Everyone on Facebook aged between 18 and 65+ in Didcot and Hagbourne
- Everyone on Facebook aged between 18 and 65+ in Blewbury, Appleford, Milton, Sutton Courtenay, Harwell

Slightly more people took action with the first advert on day one (912) than with the second advert which ran over the following two days (754).



Age Group

We have managed to engage with various age groups, reaching out to all age ranges. Predominately 55% of those who stated their age group are under 44 years of age.

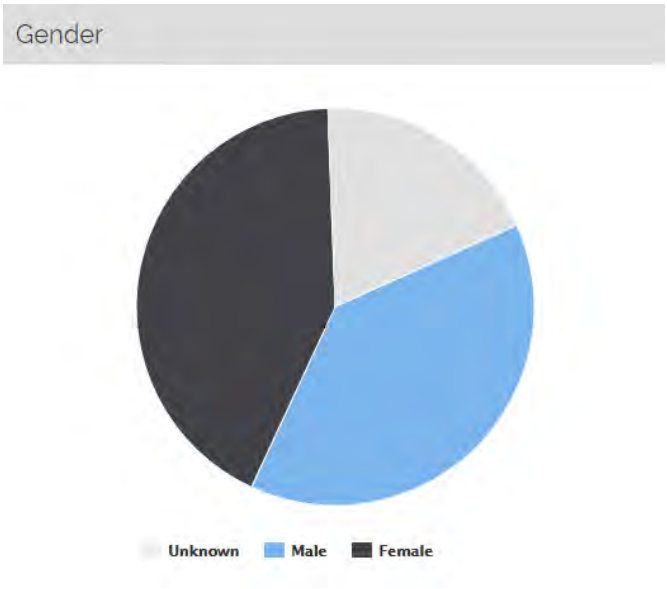


Age Range

Age 35-44	26%
Age 45-54	17%
Age 25-34	16%
Age 55-64	10%
Age 65-74	8%
Age 75-84	2%
Age 16-24	2%
Under 15	1%
No age given	18%

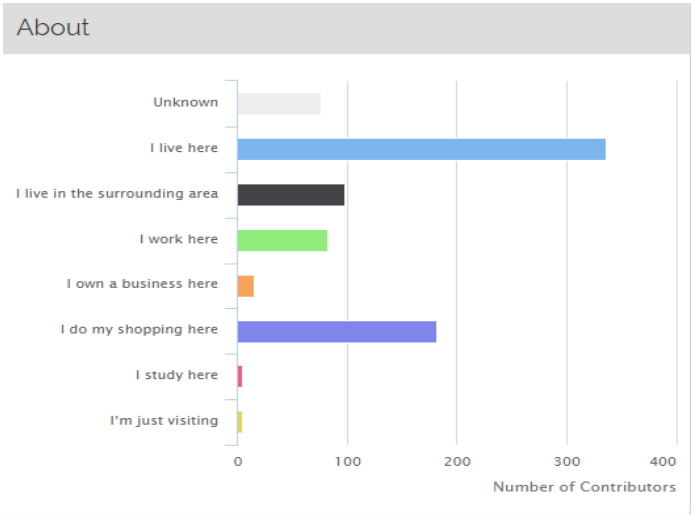
Gender

We have also reached out to both Genders with 39% of the comments being written by Men and 42% written by Women. 19% have not given their details.



Q. What is your connection with Didcot?

Predominantly people who have commented either live in Didcot or do their shopping in Didcot (71%).
14% of the people who commented are residents from the surrounding area.



Comments

The purpose of the engagement is to help the Garden Town team develop a robust masterplan for Didcot Garden Town and identify the best means to deliver this.

The masterplan sets out the physical distribution of physical features and we have therefore divided comments into three sections:

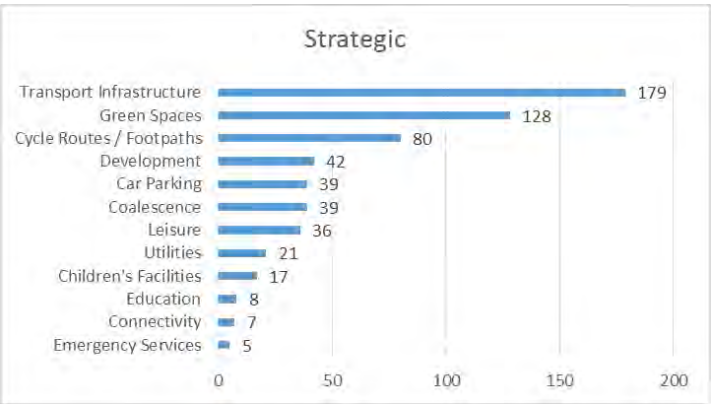
Masterplan related – Comments relating to physical features such as infrastructure, buildings and green spaces

Service and Maintenance – Comments relating to quality of service delivery and maintenance of public spaces

Governance – Comments on how the Garden Town is managed and how this is being funded

Of the 961 engagements made through the interactive website a total of 681 comments were made. Any comments received by email and by hard copy feedback forms / letters were input into the website and are included in these statistics. These comments broken down as above are as follows:

Masterplan Related Comments = 601

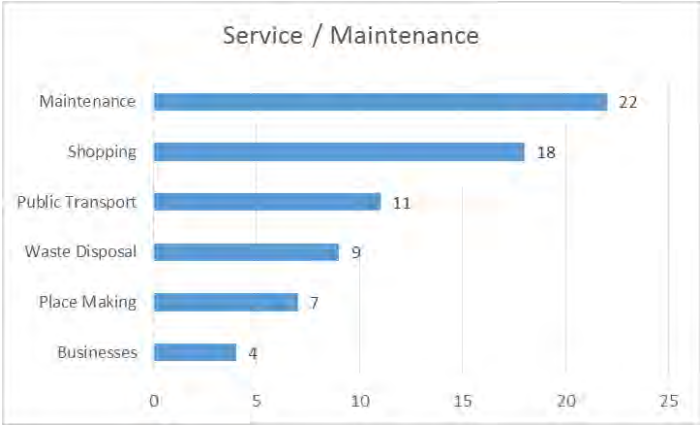


Category	Key Points
Transport Infrastructure	• Improvements to road infrastructure prior to additional developments is essential. This is also the case for all other amenities • Concern of the congestion of the A34 (57 of the 179 comments on transport infrastructure mentioned traffic on A34) • Need for additional Thames crossing • Better links between science facilities • Better / more train services • Delivery of northern perimeter road received conflicting comments. Some in favour on the basis of improving traffic flow, some against due to damage to the environment • Cow lane also received conflicting suggestions for its future (leave as one-way = 2, make two-way = 9, widen and make two-way = 8, pedestrianise = 1)

	• Existing road layouts to be reviewed to improve traffic flow and safety • More pedestrian crossings required • Culture shifts required to encourage use of other means of transport • Investigate opportunities for alternative transport such as tram network to key sites • Need to ensure that traffic improvement plans in Didcot does not negatively impact the surrounding villages
Green Spaces	• Retaining / creating green spaces is key to Garden Town credibility • Particular concern over the potential loss of green space and lakes in the proposed town centre red boundary (Ladygrove) – At the point of writing this report there is a petition with 600+ signatures campaigning to protect all Ladygrove green spaces, paths and amenities from loss, shrinkage or relocation through future development (including the recreation ground, lakes, mounds, primary school field, football club, leisure centre and health centre sites). • Care should be taken to avoid loss of green space / trees in new developments (housing and roads). • Ant trees lost due to development to be replaced • Suggestions for a tree to be planted for each resident / home in Didcot • Better / more landscaped communal spaces within developed areas • Existing allotments to be protected and new allotments to be created • Concerns over loss of woodland in the development of the northern perimeter road • Benefits to health and wellbeing identified by residents having easy access to green spaces • Benefits to preservation of wildlife recognised • Improvements and better access to water courses / water facilities • Suggestions of using woodland / trees to reduce traffic noise • Entrances to Didcot to be more attractive
Cycle Routes / Footpaths	• Safer cycle routes required both within Didcot and on routes to surrounding areas i.e. better lighting, cycle paths separate from traffic • More cycle routes required to surrounding areas, particularly to science facilities at Harwell and Culham • Improvements in cycle and footpaths will reduce reliance on cars • Better footpaths around town centre area
Development	• Disappointment at lack of progress on gateway site and Orchard Centre • Conflicting comments between suggestions for denser development to prevent urban sprawl and those requesting that more open spaces in new developments • Improvements required to Broadway / town centre

	• Inspirational developments for the community such as a science discovery centre / museum (to include explanations of some of the most exciting science projects based near Didcot (e.g. Nuclear fusion at JET, Skylon, Diamond, building satellites at Harwell (RAL Space, SA Catapult, ESA and others), and using the data from them (e.g. Copernicus for Earth observation and Galileo for navigation) and an improved railway centre • Must learn from mistakes made in existing developments • Roofs on new buildings to have solar panels / roof gardens
Coalescence	• Green boundaries are key to allow surrounding villages to retain their identities • These comments mainly relate to East Hagbourne and Sutton Courtenay but are relevant to all surrounding villages
Car Parking	• Town centre / Didcot Parkway • Street parking
Leisure	• More / better leisure centres • Better nightlife • More choice in leisure facilities (bowling, splash parks, pools) • More facilities for local sports teams to play / train • More variety in pubs / restaurants
Utilities	• Drainage • Sustainable energy sources • Moving overhead power and telephone cables underground
Children's Facilities	• More / better parks for children. A splash park / open air pool was a recurring theme
Education	• More education facilities required to meet the needs of increasing population
Connectivity	• Better connectivity across the town (currently divided by the railway • Better connectivity to surrounding villages and countryside • Pedestrian / cycle / alternative transport links required as well as for traffic
Emergency Services	• Better medical provisions required to cope with growing population • More policing required

Service and Maintenance = 71



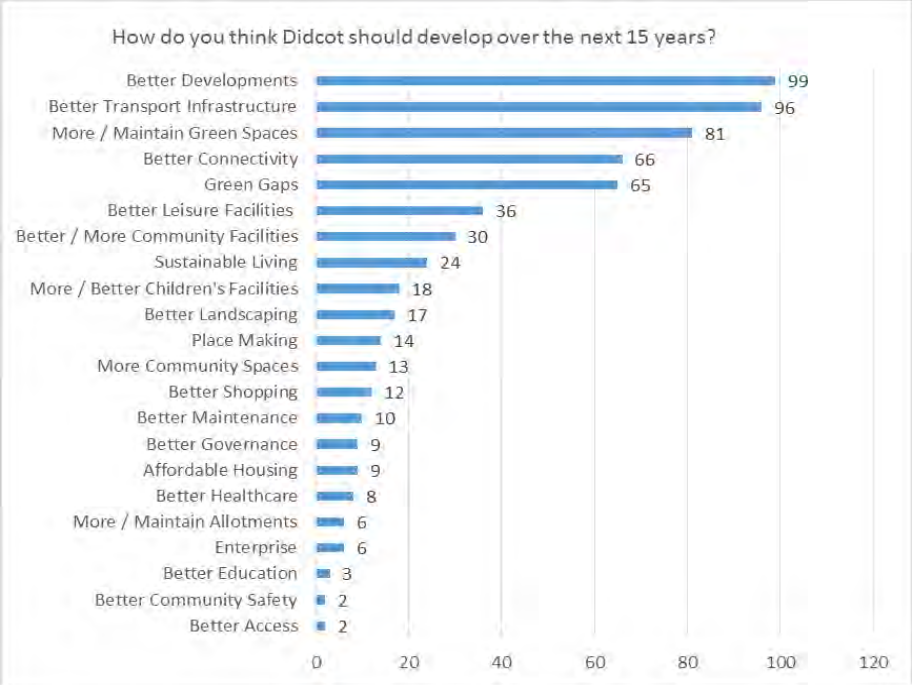
Category	Key Points
Maintenance	• Maintenance of footpaths, cycle paths and roads required throughout Didcot • Budget for maintenance will be needed for existing areas in Didcot as well as new areas / developments • Maintenance required for landscaped areas, especially those that can cause pavements to become overgrown
Shopping	• Better variety of shops to avoid people shopping in reading / oxford • Improve frontage of the Broadway • Cafes and restaurants situated amongst shops • Move supermarket out of town centre
Public Transport	• Better bus services both within Didcot and to the surrounding villages • Bus routes that serve educational facilities, leisure facilities and health centres • More evening / weekend bus services • Better train services and include more services to surrounding stations • If cycling / walking is to be promoted as part of the garden town, public transport will have to be improved for those who are less physically able
Waste Disposal	• More litter / dog bins which are emptied more regularly • More innovative methods of waste collection to make this more environmentally friendly • Educate people to reduce, reuse and recycle
Place Making	• Use Didcot's links to the Science community and it's railway heritage to put Didcot on the map • Improve / promote Didcot railway centre • Hands-on science discovery centre/museum to showcase the area's scientific pedigree • Heritage trails around Didcot • Fuse art, science and nature with Didcot's Heritage
Businesses	• Promote and support local businesses

Governance = 9

Key Points:

- Ensuring that local people (town / parish councils) have a say in planning decisions
- Encourage investment and enterprise in Didcot
- Ensure that the garden project is as deliverable as it is aspirational
- Put in place funding to maintain the built and landscaped areas of the garden town

Q. How do you think Didcot should develop over the next 15 years?



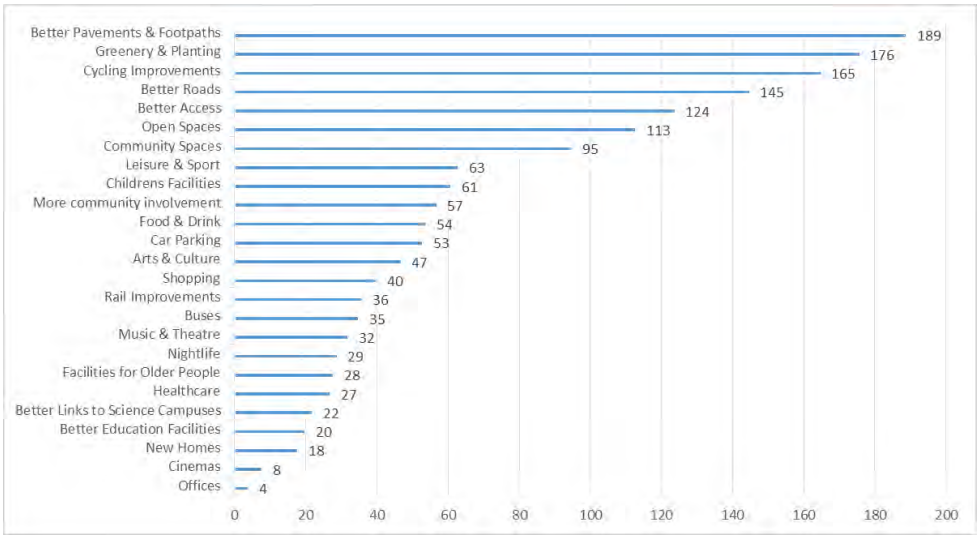
Q. What would you like to see here?

There were in excess of 1600 responses to the question "What would you like to see here?" (Multiple comments can be inputted).

The most frequent comments related to the need for better Pavements and Footpaths in various areas.

Cycling had a large amount of comments, mostly commenting that they were unconnected and unsafe. They were generally commenting on the whole town but particular mention should be made in relation to the poor cycle routes from Ladygrove and various stations around Didcot.

Better Pavements & Footpaths	189 comments received (9% of the total)
Greenery & Planting	176 comments received (8% of the total)
Cycling Improvements	165 comments received (8% of the total)



Inspirational comments

It is very clear from the engagement process that residents care very deeply about Didcot and the surrounding areas. These are a few of the inspirational comments made through the engagement process:

"Didcot needs to believe in itself. Identify and address negatives, find ways to deliver enhancements."

"Let's do something really inspirational."

"The transformation of Didcot will demonstrate excellence in its approach to low-carbon living and integrated urban design. Didcot will provide for the needs of all irrespective of wealth or age. Didcot will be the place of first choice for people to settle and its success will be an example used nationally."

"It is exciting to see Didcot growing. One of the things that makes it a great place to live and work is that there is a good mixture of facilities that are close to hand. We have a mixture of housing and work opportunities, together with leisure facilities, green spaces and cycle/pathways. As Didcot grows is would be good to preserve and enhance these facilities and indeed create more spaces where people walk, play and come together."

"I want to see my town as somewhere the whole community is proud of with plenty of green space and good transport links."

"Encourage a stronger sense of community and develop well maintained and sustainable community facilities for all age groups."

"I think the town is in desperate need of improvement and that DGT is a once in a lifetime opportunity to make some new positive changes. The planned growth of a DGT is to be welcomed, especially where it protects, enhances and respects the unique individuality of nearby historic settlements."

"Didcot is a great place to live, and I love that we have so many green areas."

"It's great to have so many shops nearby where we live and I'm excited about phase 2 of the Orchard Centre. I absolutely love Cornerstone, we are very lucky to have it."

"It would be great to make Didcot a more welcoming, vibrant town with the plans of the new getaway at the station."

"I'd like to see Didcot become a Capital for Sustainability through this project by providing a catalyst for innovation and demonstration of sustainable design and transport/mobility."

"The Garden Town status is an opportunity to get the infrastructure sorted for this housing and make Didcot a pleasant and aspirational place to live."

"I am proud to say I live in Didcot"

Key points from meetings with Stakeholders

At the point of compiling this report the Garden Town team have met with over 100 stakeholder groups, many of these on more than one occasion and attended the stakeholder events in October and November.

These stakeholders are made up of parish councils, Oxfordshire County Council, utility providers, community groups, environmental groups, sports clubs, residents associations, local businesses, government organisations, educational facilities, leisure providers, housing associations, science industries, emergency services and developers.

Some of the key points arising from these meetings are as follows:

Transport infrastructure	• Rail improvements – station (inc possible relocation), services, grade separation and access • Infrastructure improvement delivery • Smart transport solutions – autonomous vehicles, improved road layouts, smart city technology • Traffic modelling / surveys • Better public transport around Didcot and to surrounding villages
Place making	• Using science links to put Didcot on the map – science discovery centre / science festival

	to include explanations of some of the most exciting science projects based near Didcot (e.g. Nuclear fusion at JET, Skylon, Diamond, building satellites at Harwell (RAL Space, SA Catapult, ESA and others), and using the data from them (e.g. Copernicus for Earth observation and Galileo for navigation • Becoming a leader in adopting smart transport solutions, sustainability and eco friendly technology • Arts and culture • Making the most of Cornerstone Arts Centre • Use great architecture • Improve services and entertainment to encourage skilled workers to locate in Didcot
Health and wellbeing	• Encouraging green spaces • Cohesive working with medical facilities (CCG, NHS, GPs and OCC) to ensure the needs of the residents are met • Adopt a healthy town initiative • Encourage and support care charities to locate in Didcot to support the medical facilities • Better quality of life • New / improved and better variety in leisure facilities
Governance / delivery	• Encouraged to include local people (parish councils) in decision making process • Ensuring that plans are deliverable • Securing sufficient funding to deliver new projects and maintain existing areas.
Green spaces / coalescence	• Ensure surrounding villages retain their identity by preventing coalescence • Retaining / creating green spaces within Didcot (health and wellbeing benefits) • Wildlife habitats • Burial grounds and allotments
Utilities	• Upgrade drainage, electricity supply etc in advance of the upcoming extra demand
Enterprise / local businesses	• Improve transport infrastructure (local, national and international) to encourage successful multinational companies to locate in the area • Support for SMEs • Social improvements / increase vibrancy to encourage young skilled workers to locate in Didcot rather than commute in • Promote Enterprise Zones
Development	• Smart and sustainable development, encourage use of eco-friendly technology such as solar panels on roofs

	• Work with developers to produce higher quality homes and more diversity in developments • Ensure needs of housing associations are met
Connectivity	• Better cyclist and pedestrian connectivity around Didcot and to surrounding areas • More rail services • Better local, national and international links • New developments to be better connected • Autonomous vehicle loops between science centres and Didcot Parkway • Ensure access requirements are taken into place • Areas to stop and rest for less physical able people
Education	• More opportunities for young people • Make better use of science potential in education • Hotel in area to be ran by students (overseen by staff) and provide training opportunities in industries such as catering, beauty and hospitality.
Community Facilities	• Support for local sports clubs • Adequate community buildings for community groups / clubs and support / guidance in the running of these facilities • Maintenance of community spaces

B.
Phase two community engagement summary report

Didcot Garden Town Engagement Summary – Phase 2 - 28/02/2017

South Oxfordshire and Vale of White Horse councils encouraged people who live, work and visit Didcot and the surrounding villages to comment on the initial Garden Town proposals by Friday 28 February 2017. These proposals were broken down into three sections; Masterplan and Landscape, Town Centre, and Transport.

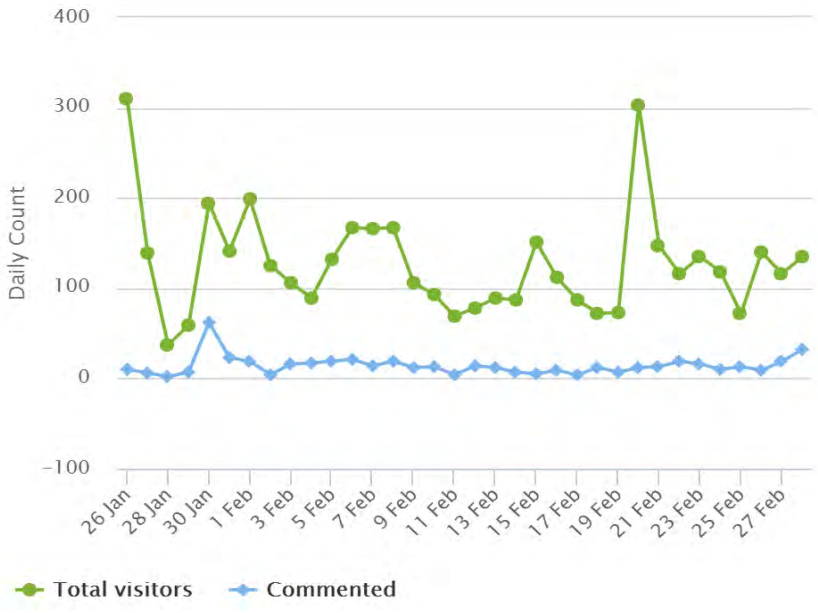
Feedback received through the interactive Garden Town website, along with direct correspondence and meetings with community representatives, has helped shape the final delivery plan document. This is a long term project that comprises of short, medium and long term aspirations and the views of the residents of Didcot and the surrounding areas are key in helping us to produce a garden town that we can all be proud of.

Website Engagement

In the period between 26 January and 28 February 2017, the Garden Town website was visited a total of 3,093 times.

These visits can be categorised as follows:

692 Transient visitors	-	people that visited the website home page, but left before clicking through to any other pages.
762 Aware visitors	-	people that visited more than one page on the Garden Town website but did not spend a significant amount of time reading the content.
1189 Informed visitors	-	people that read content in depth (i.e. visited more than one page and spent a significant amount of time reading the content).
450 Engaged visitors	-	people that read content in depth, registered their details and provided at least one comment or agreement.
732 Engagements	-	Total number of engagements made by visitors to the website. Some of these engagements commented on more than one aspect of the initial proposals



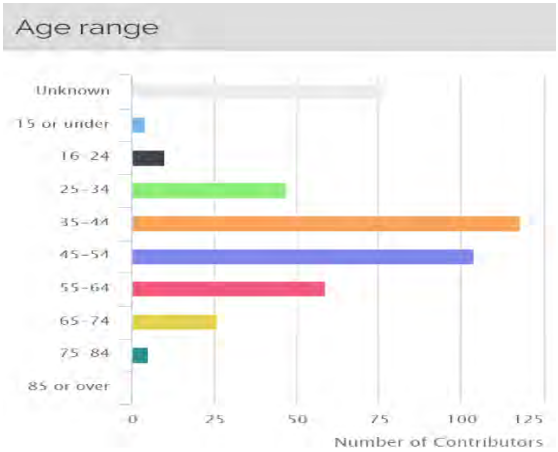
Engagement Methods

In continuation to the first stage of community engagement, the public and stakeholder groups have been in engaged in a variety of ways:

- Stakeholder representative group meeting on 19 January 2017
- Interactive website
- Article in Herald series newspapers at launch of initial proposals
- Meetings with key stakeholders, parish councils, community groups and residents
- Dedicated Garden Town phone number and email address

Age Group

We have managed to engage with various age groups. Predominately 60% of those who stated their age group are between 35 and 54 years of age.

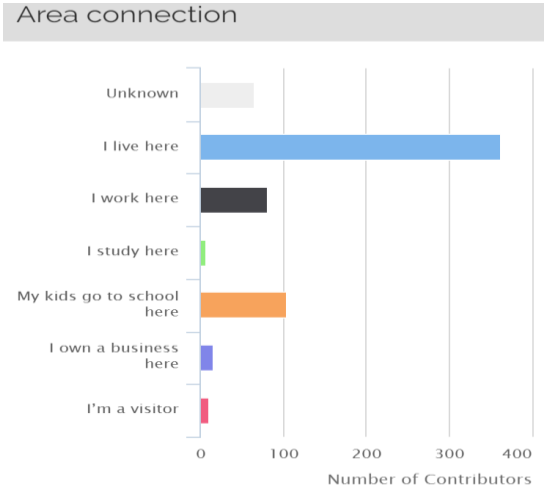


Age 35-44	26%
Age 45-54	23%
Age 55-64	13%
Age 25-34	10%
Age 65-74	6%
Age 16-24	2%
Age 75-84	1%
Under 15	1%
No age given	18%

Q. What is your connection with Didcot?*

The main connections to Didcot of the 450 people who have registered are:

81% reside in Didcot
23% have children who attend school in Didcot
18% work in Didcot



*more than one answer was able to be given to this question

Direct Engagement

In addition to feedback received through the interactive website, 157 engagements on the initial proposals where received by email, post and telephone. These have been added the engagements received through the website in the section below.

The councils also took receipt of a petition to 'Please promise to protect all of Didcot's green spaces, paths and amenities on Ladygrove from loss, shrinkage or relocation through future development' signed by 2,039 people on 28 February 2017. This petition is connected to website and social media campaigns that have driven a high response rate to this stage of the engagement process on the proposals for Gateway North (Ladygrove).

Proposals to close Cow Lane to vehicular traffic and the potential railway station relocation also attracted a particularly high number of comments.

Comments

The purpose of the second phase of community engagement was to help the Garden Town team understand the opinions of the residents of Didcot and the surrounding area on the initial proposals so that these could be shaped to reflect the views of the community.

The initial proposals were broken down into three projects; Masterplan and Landscape, Town Centre, and Transport.

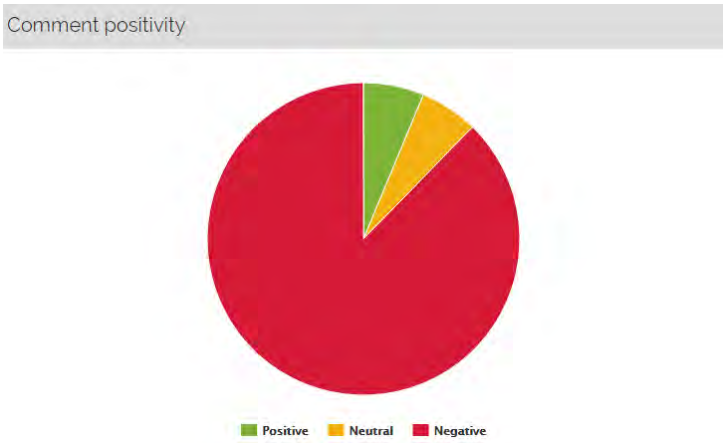
Masterplan and Landscape – Comments on proposals for the whole masterplan area including landscaping and our visions for protecting the surrounding settlements.

Town Centre – Comments relating to the proposals in the heart of Didcot such a Station Gateway South, Ladygrove Gateway North, Rich's Sidings, Potential new town / market square in front of the Baptist Union building and Orchard Centre Phase two.

Transport – Comments on short, medium and long term infrastructure plans, proposed cycle networks and improvements to the train station and surrounding area.

Comment positivity

The initial proposals have attracted a majority negative comments. The majority of comments received relate to the proposals at Didcot Gateway North (Ladygrove), Proposals to close Cow Lane to vehicular traffic and the proposed relocation of the railway station which have proved to be particularly controversial. Feedback on these three aspects of the initial proposals made up 69% of all of the comments received.



The key points from these three proposals are listed below:

Proposal	Feedback	Alternative Suggestions
Proposed Gateway North development (Ladygrove)	- Comments on this proposal made up 86% of the feedback received on the town centre projects - Petition received to 'Please promise to protect all of Didcot's green spaces, paths and amenities on Ladygrove from loss, shrinkage or relocation through future development' signed by 2,039 people - Concerns over loss of green space - the flat area south of Tyne Avenue (approx. 50% loss) used by children, football, runners and walkers - Impression that this is against the ethos of Garden Towns - Increase in traffic on estate from users of tech campus and accommodation / potential hazard to children at nearby schools - Scepticism that people would use public transport to access the facility and would drive instead	- Technology Campus a good idea for Didcot but not in proposed location. This could be on other site such as Gateway South, business parks, existing gasometer site, area marked for potential new railway station or brownfield site - The proposed site allows no room for future expansion of campus, This should be located on a site that would allow for this - Enhance existing green space (better planning and maintenance) but no built development on this area - Allow this area to remain as it is

	- Air quality impact of additional traffic due to proposed development - Lack of parking for development / likely impact on on-street parking - Potential loss of / shrinkage of play park, skate park, tennis courts and basketball court - Health and wellbeing impact of loss of green spaces - Alteration of Park Run route - Potential hazard of access road close to play areas - Perception that if tech campus does not go ahead the land would be used for housing development - Unsuitable for a residential area - Impact on wildlife in the area - Belief that this proposal is about money rather that benefitting residents	
Proposed closure of Cow Lane to vehicular traffic	- Comments on this proposal made up 35% of the feedback received on the transport projects - Concerns of loss of connection of rest of town - Knock on traffic impacts to other areas of Ladygrove (particularly Tamar Way and Avon Way due to schools) - Air quality impact of longer journeys - Impact of other roads in town centre (particularly Station Road, Jubilee Way Roundabout, Marsh Bridge) - Particular impact to those who are unable to walk / cycle	- Widen underpass and make two way - Change direction of traffic so that flow is from south to north - Leave in current configuration - Open Collett to connect to Basil Hill Road as an alternative route into town for new residential and business developments north of Ladygrove
Proposed relocation of railway station	- Comments on this proposal made up 26% of the feedback received on the transport projects - Seen as unnecessary (especially after recent / other proposed upgrades and planned new car park for existing station) - New location would take up green space on Ladygrove - Impact on houses close to proposed new site - loss of	- Use money to re-open Grove station or other stations west of Didcot to avoid people having to come into Didcot to get trains - If move is required, look at alternative sites west of Didcot such as power station site - Upgrade existing station - Access to existing station from North of the lines

	property value, increased noise levels, poorer view from properties - Location is further from A34 and villages west of Didcot that use the station. This would mean that traffic from the West would have to travel through Didcot to get to the station. - Proposed location further from town centre and proposed development at Gateway North and South - Doubts that this location could support a station due to track layout, space, location lack of car parking	

Feedback on other elements of the initial proposals are broken down by the three project areas below:

Masterplan and Landscape Feedback

Category	Key Points
Delivery Plan	• All Town and Country Planning Association (TCPA) principles should form the basis for the Garden Town delivery plan • Serious consideration to be given to methods to promote community involvement • Ensure that the community is at the heart of the Garden Town governance model
Development	• Future developments should be sustainable and be in keeping with the TCPA Garden Town Principles • Care should be taken when developing in the town centre to ensure that this does not have a negative impact on the surrounding residential areas • Ensure that the correct types of housing for the needs of Didcot are provided – these should include adequate parking and gardens • Use development that enhances the natural environment • Ensure that Garden Town proposals are incorporated within local plans • Beautifully and imaginatively designed homes with gardens, combining the best of town and country to create healthy communities, and including opportunities to grow food. • Funding for infrastructure should be secured before more housing is built • New homes should be carbon neutral

Green Spaces	• Are there proposals for enhancements of existing green spaces other than Ladygrove park i.e. Edmunds Park? • Ensure that green spaces meet the requirements for number of residents – include a sustainable baseline for green spaces • Concerns over loss of green space due to planned developments such as Didcot North East and Valley Park • Ensure that all residential areas and estates have access to public open space • Suitable locations to be identified for burial grounds • Support for city farm on North East Didcot site and community garden on Ladygrove
Local Services	• Sufficient local services such as schools, libraries, health care and emergency services required to support additional development
Surrounding Villages	• Enhanced public transport service for surrounding villages • How can the green buffers be protected in planning control
Collett	• Suggested that Collett could be linked up to Basil Hill Road to make an additional north / south link. • Potential sites on Collett for proposed Technology Campus
Leisure Centre	• Support for new leisure centre • Requirement for new pool in Didcot / refurbishment of Didcot Wave
Maintenance	• Better maintenance required of existing roads, paths and green spaces • Maintenance programme required to be in place for any additional development
Vauxhall Barracks	• Suggested that once closed Vauxhall Barracks could be at potential site for 55+ community development • Possible alternative location for technology campus

Town Centre Feedback

Category	Key Points
Gateway South	• Disappointment that work on this site is still to begin • This should include a community garden / significant area of green space as a statement that Didcot is a garden town • Strong support to retain the Prince of Wales pubs as one of Didcot's most popular establishments and historic buildings • Area must become an attractive welcome to Didcot • Consideration must be given to the residents of the surrounding area

	• Calls for the Prince of Wales Pub, SOHA offices and Lydalls Road nursery to be incorporated into the plans and not moved • Conflicting views as to if this area should be residential or commercial • Residential development on this site should be supported by adequate parking and gardens for the number of houses • Suggestion that this is a suitable site for a hotel due to central location and proximity to railway station • Could include shops / cafes that would be useful for when people are waiting for trains • Possible alternative location for proposed technology campus
Orchard Centre	• Opposition to re-opening of station road as a bus route due to safety concerns, air pollution and impact on business and houses on the revised route • Support for the development of stage two of the Orchard Centre – increase in shopping and dining options in the town
Rich's Sidings	• Concern over future of existing businesses on this site • Doubts over whether this would be a suitable location for a commercial hub given the proximity to more favourable enterprise zone sites • If commercial opportunities created in this area it should cater for both large and small businesses
Broadway	• Shopping and road enhancements required for Broadway • Needs to be revitalised with better variety of shops • Improved landscaping and street decoration • Concerns that Broadway is not suitable for nightlife as opposite side of street is residential • Support for local independent retailers • Support for potential town square at the Baptist House site • Concern over potential loss Baptist House building and employment impact of this • Lower Broadway is narrow and roads require maintenance. These should be addressed before development is done in this area.
Town Centre – Shopping	• Support for second phase of Orchard Centre and the new retail opportunities that come with this • Need for more independent retail outlets • Improved mobility solutions
Gasometer Site	• Suggested as possible alternative site for technology campus • Concerns of use of this area for car parking due to impact on road network
Town Centre – Leisure	• More effort should be made in exploring bring more leisure facilities to the centre of Didcot such as a bowlplex which could possibly be situated on the Rich's sidings site in the location earmarked for commercial opportunities • Concern over reduction of recreational grounds at Ladygrove and that the additional pitches proposed by the football club are not free to use.

Town Centre – Business	• Feasibility studies required on the potential commercial opportunity sites on Rich's Sidings to confirm if this would be the most viable use for this site. Many businesses may be more attracted to locating in the Enterprise Zone sites due to the benefits offered in these locations • Town centre units to encourage sustainable business practices and appropriate for local businesses
Didcot Railway Centre	• Didcot Railway Centre is a key part of Didcot's heritage and are keen to be involved in putting the Didcot on the map. A dedicated entrance and access improvements would be welcomed as part of the proposed enhancements to Didcot Parkway Station – An access ramp is key to this • Support to make a feature of Didcot Railway Centre along with Didcot's railway heritage and Prince of Wales public house

Transport Feedback

Category	Key Points
Whole Area – Transport	• Environmental assessments to be done on any proposed transport enhancements on impact on wildlife habitat and noise and air pollution • Cohesive transport plan to be put in place and delivered before development • Better connectivity to Culham Science Centre and Harwell Campus • Better local bus service around Didcot and to surrounding villages • Better local train services to neighbouring stations (particularly Culham) and research into opening additional stations to the west of Didcot such as Grove station • Concerns over no plans to improve / increase the capacity of the A34 • Better maintenance of roads • Residential / restricted parking schemes
Cycle / pedestrian Network	• Support for enhanced cycle and pedestrian network • Calls for existing and new cycle and footpaths to have robust maintenance plans in place • For safer cycling the network should be separated from traffic and well maintained • Connections to Culham Science Centre and Harwell Campus • Need for safe pedestrian / cycle route over manor bridge (A4130)
Northern Perimeter Road	• Conflicting views over NPR3 with some calling for this to be completed as soon as possible with others suggesting this is not need / an alternative route using existing roads would be a better option • Concerns over safety at point the proposed road connects at Hadden Hill • Pedestrian traffic lights should not be installed on Northern Perimeter road

Town Centre - Transport	• Concerns over knock on impact on town centre traffic if Cow Lane is closed to vehicles • Town centre road improvements must be robust enough to cope with planned development • Jubilee Way roundabout and Hitchcock Way are particular traffic pinch points that need addressing
Town Centre - Parking	• Sufficient parking required to served improved town centre facilities • Consideration to be given to location of car parks in terms of their impact on the road network • Parking still required on Broadway to support business in this area • Sufficient car parking in suitable locations for those with limited mobility

Key points from Community Stakeholders Feedback

The Garden Town team have continued to engage with stakeholder groups. These stakeholder groups are made up of parish councils, Oxfordshire County Council, utility providers, community groups, environmental groups, sports clubs, residents associations, local businesses, government organisations, educational facilities, leisure providers, housing associations, science industries, emergency services and developers.

Key points arising of the initial proposals as part of the ongoing engagement are as follows:

Gateway North (Ladygrove)	• By unanimous vote Didcot Town Council reaffirmed their original intention and decision as to the purposes and use of the land, that is the subject of the lease signed on August 6 1997 between Didcot Town Council and South Oxfordshire District Council. The original intention and decision being that the land be used as a sporting, recreation and nature park. • Look at alternative locations for technology campus
Gateway South	• Needs to be a sense of arrival at this site • Prince of Wales pub should be retained in the plans • Uncertainty over this site has been going on too long, residents of the surrounding area deserve clarity on the plans for this • Location for nursery to be confirmed
Rich's Sidings	• Development in this area is long overdue and should commence as soon as possible • Assistance should be given to businesses located in the area to relocate / occupy new commercial units
Proposed closure of Cow Lane to Vehicular Transport	• Opposition to closure of Cow Lane to Vehicular Traffic • Suggestions to make Cow Lane underpass two way to relieve traffic pressure on Station

	Road / Hitchcock Way / exit of Orchard Centre
Proposed Station Relocation	• Concerns over viability / suitability / need of potential re-location of station • Long term proposal that may detract from proposals that are able to be delivered in the short term
Development	• Look into how biodiversity can be incorporated into built developments to increase wildlife habitats in urban areas • Ensure that development does not increase flood risk
Cycle / Pedestrian Network	• Enthusiasm from local cycle groups that cycling forms a large part of the proposals and willingness to work with the councils to achieve these goals • Support from Sport England for connected cycling and walking routes – Signage required to allow public to make use of these opportunities • Consider how town centre improvements could encourage walking and cycling • Sufficient cycle parking required
Transport Network	• Robust traffic modelling required before any changes to road configurations are confirmed • There should be no delay in steps to improve traffic flow around Jubilee Way Roundabout and Hitchcock Way • Calls for improved public transport and parking – this should be prioritised • Priority should be given to NPR3 and Jubilee Way Roundabout / Hitchcock Way improvements • A southern extension to the northern perimeter road to reduce traffic through town centre • Look for alternative methods of transport such as light railway services as passenger shuttles • Steps to be taken to reduce air and noise pollution • Broadway improvements should not reduce / remove parking as this would negatively impact businesses in this area • Consider reduction in speed limits to increase safety and reduce noise
Landscape / Open Space Proposals	• Suitable sites for burial grounds to be identified • Opposition by Didcot Town Council to the use of Sutton Courtney Landfill site as landscaped recreational ground when it is closed in 2030 • Consult with Sport England to ensure that their guidance and Active Design Principles

	are followed for existing and new green spaces • More should be done to support wildlife and biodiversity by developing / enhancing natural environments and blue and green infrastructure
Governance	• Consideration to be given in installing a robust governance mechanism • Community must be an important factor in governance proposals • Strong vision, leadership and community engagement

C.
Hotel school research

note

Didcot Garden Town - Hotel Schools Research

Colleges with Hotel/Restaurant Facilities

Hotelschool, The Hague/Amsterdam, The Netherlands

Hotelschool The Hague is an international university of applied sciences specialising in hospitality management. It was founded in 1929 by HORECAF, the former employers' organisation in the hotel and catering sector. It has two campuses – one in The Hague and one in Amsterdam. It has a student population of c.2,300. Approximately 250 students graduate in each academic year.

The Hotelschool offers a four-year Bachelor's degree in Hotel and Hospitality Management. Both campuses provide in-house training facilities which enable practical education in areas such as hospitality, catering, business administration etc. There is a hotel (Skotel) and a variety of different bars/restaurants (Brasserie Zinq, Les Saveurs and Le Début) on both campuses. In addition, The Hague campus has a banqueting department, which provides lunches and dinners, hosts meetings, offers cookery workshops and hosts receptions for internal and external guests.

The school is also home to one of the leading hospitality Research Centres (with three Research Groups for applied research) and a Hospitality Consultancy division which advises and trains hospitality business professionals, either in company or at the annual summer schools.

Restaurants

All the restaurants are run by students and supervised by instructors. In the restaurants, students receive both practical and management training.

Skotel

Skotel is a hotel complex where first-year students both live and work. The students are accommodated in 'living units' and share a room with another student. The hotel rooms are also rented out to external guests. Skotel The Hague has 21 hotel rooms and Skotel Amsterdam 20 hotel rooms. These can be booked per night. All work is done by the students under the supervision of university staff. Revenue from Skotel Amsterdam was €308,842 in 2015, and Skotel The Hague revenue was €197,246.

Partnerships

The Hotelschool has a wide range of strategic partnerships including:

- Accor – Multinational hotel group (includes Novotel, Ibis, Mercure etc);
- Bonnewits – Supplier of hospitality interiors;
- Centre Parcs – Holiday Park group;
- City Living BV – International specialist in student accommodation;

- Darboven – Coffee supplier;
- Heineken – Premium beer brand;
- La Place – Restaurant chain;
- Miele Professional – Appliance manufacturer;
- Okura – Hotels and resorts;
- Ramada Apollo – High-rise hotel in Amsterdam;
- Rational – Appliance manufacturer;
- Rosval – Cooking range producer;
- Schoondergang – Kitchen supplier including design, consulting, manufacturing and maintenance;
- SkannaBasics – Hospitality recruitment and training;
- Starwood – Hotel company;
- Van de Wouw – Hotel interior designer;
- Vrumona – Soft drinks manufacturer;
- WestCord – Hotel company;
- Winterhalter – Warewashing system manufacturer for hospitality and catering industry; and
- WMF – Tableware manufacturer.

Edge Hotel School, Essex

The Edge Hotel School offers two-year accelerated bachelor degree courses (and foundation degrees) in Hotel Management, and Events Management with Hospitality. The school is based on the University of Essex Colchester Campus, in Wivenhoe Park, where university education is combined with real life experience, helping to run the 4* hotel (Wivenhoe House) located on campus.

The school has 110 registered students (as of December 2015). Students help to run all areas of the hotel including the brasserie, bar and forty bedrooms. A number of bedrooms in Wivenhoe House are sponsored by industry leaders such as Milsom Hotels & Restaurants, Portico, BaxterStorery, Exclusive Hotels, Hilton and Marriott. Each is designed and furnished as one of the sponsor's own rooms, giving students relevant experience to offer prospective employers.

The school was founded by the Edge Foundation, in partnership with the University of Essex and Kaplan Open Learning (KOL) in 2011. The Edge Foundation is an independent charity dedicated to raising the status of vocational learning. Academic programmes, validated by the University, were offered by KOL and delivered through the School. In 2013, following the conclusion of the agreement between KOL and the University, the school underwent a separate validation event with the University and established itself as Edge Hotel School Ltd, with charitable trust status.

Wivenhoe House, formerly a conference facility and office building, was converted into a hotel with a £11m investment provided jointly by the Edge Foundation and the University of Essex. The hotel has 40 professionals which work alongside the 100 students.

The first students to graduate from Wivenhoe House did so in July 2014. Of the first group of 16, two-thirds went straight into a hospitality job.

L20 Hotel School and Restaurant, Liverpool

The L20 Hotel School forms part of one of the UK's first Hospitality and Visitor Economy Career Colleges (a division of Hugh Baird College) for 14-19 year olds, in partnership with the Career College Trust. The School works by combining lectures with hand on experience in dedicated training facilities and its own restaurant on site – the L20 Restaurant.

The school launched in 2013 in a purpose-built, £8million building, set up by assistant principal of Hugh Baird College. It comprises a restaurant and bar (L20 Restaurant), a conference centre and event space, kitchens, dining areas, two new retail outlets and a simulated airline cabin for 20 passengers. There is also a café run by students, for students.

The core of the restaurant is run by the students alongside the managing staff. Students also have the opportunity to work alongside guest Michelin-star chefs. There are approximately 100 full-time hotel school students.

The school offers NVQ Level 1, 2 and 3 qualifications. L20 Hotel School also links with the Hugh Baird University Centre to offer a Foundation Degree in Hospitality and the Visitor Economy, validated by the University of Central Lancashire, allowing those already working in the industry the chance to gain a further qualification.

Partnerships include Liverpool hoteliers such as Malmaison and Crowne Plaza.

Colleges Partnered with Local Hotels/Restaurants

Bath Hotel School, Bath

The Bath Hotel and Restaurant School is a partnership between leading hotels and restaurants and Bath College. Sixteen hospitality businesses including Macdonald Bath Spa Hotel, the Bath Pub Company, the Abbey Hotel, Searcys and the Hilton Hotel are partnering with the college to provide work experience opportunities across the hospitality industry. The school is also welcoming Bath Spa University as their new Higher Education partner in 2016.

As part of Level 3 Hospitality and Catering courses, students have the opportunity to undertake work placements and masterclasses at one of the partnered hotels/restaurants. Many students are secure permanent work at one of the hospitality businesses following graduation.

Plymouth University Hotel School

Plymouth University partners with a range of high profile partners, including Millennium Copthorne Hotels, Hilton Hotels and Dartington Hall Trust to provide academic education combined with commercial experience. The school was launched in 2014 and offers a range of hospitality bachelor degree courses.

The Artist Porto Hotel

The Artist Porto Hotel is the only Hotel-School in Porto and provides real life, on the job training for students from the Hotel Industry and Tourism School of Porto. The students are included in the hotel team and are trained to become professional staff within the hotel.

Social Enterprise Hotels/Restaurants

The Magdas Hotel, Vienna

Opened in May 2015 to provide jobs and training to refugees, whilst also making a political statement about Austria's restrictions on asylum-seekers being able to work.

The former retirement home was turned into a boutique hotel with a €1.5m loan from the charity Caritas and €60,000 raised through crowdfunding. The hotel has 78 rooms and 28 staff. Of the 28 staff, 20 arrived in Austria as refugees. The projects purpose is to provide training and jobs to refugees and make a political statement that "whoever is in Austria legally should also be able to work legally", as asylum-seekers are rarely granted the right to work before their application is processed (which can take years).

Good Hotel - Royal Docks, London

A 148 room, floating hotel to provide local unemployed people with an opportunity to be trained and employed within the hospitality industry. The hotel (originally built in 2007 as a prison to house illegal immigrants) was built on a large floating platform and opened in Amsterdam in June 2015 as a pop-up social enterprise project, with the aim of providing local people, struggling to find employment direct experience. The hotel is being transported from its current base in Amsterdam to Newham's Royal Docks and is anticipated to open November 2016.

The hotel will also have a public garden created on the roof, and will provide meeting spaces, a restaurant, a spa salon and gym facilities.

Whilst operating in Amsterdam, one third of the staff were previously unemployed (18 people) and were taken on for a 10-month work placement that includes training and working in the hotel, and then helped to find long-term work through the hotel's partners. As one group graduates, a new intake in employed, a model will be repeated in London, although the trainees will be taken on for shorter, 3 month placements.

The Good Hospitality Group was founded in 2012 by Dutch entrepreneur Marten Dresen. It operates according to a no-dividend model, with all profits from the hotel reinvested back into the training programme.

D.
Social and economic baseline

Didcot Garden Town

Social and Economic Baseline

May 2016

Quod

Key Messages - Social

- Most social indicators are at or around average for South-East and England as a whole
- Growing population – higher than district averages between 2001-2011
- More households are of working age and families with children, fewer older people than the Oxon Districts as a whole
- Most households in Didcot live in houses – only 1 in 5 households live in flats
- The majority of people own their property rather than rent
- House prices in Didcot are low compared to elsewhere in the district
- Levels of deprivation generally fairly low across all domains – measured at a national level

Key Messages - Economic

- Low unemployment and high economic activity and relatively high incomes – compared to South-East and England as a whole
- Qualification attainment amongst residents is in line with South-East and England as a whole but below the district level
- Didcot is not operating well as an employment centre having seen a decline in jobs in recent years
- Didcot's residents have local but dispersed patterns of work. Didcot is a retail centre with some residual manufacturing and transport/ logistics functions. Growing sectors such as F&B and R&D largely concentrated in the business and science parks
- Lower than expected level of jobs in public services, health and education – the latter two being growing sectors

Key Messages – Summary

- The reality is more positive than might be expected
- Perception and branding of the town are key issues – it is seen as a ‘poor relation’ to other Oxfordshire districts
- Didcot needs to continue to appeal to families
- Didcot needs to attract more young professionals particularly those brought to the area by economic growth in the Science Vale
- There is a need to define a unique economic role for Didcot – as a hub at the centre of business/science park locations within the Science Vale

Overview

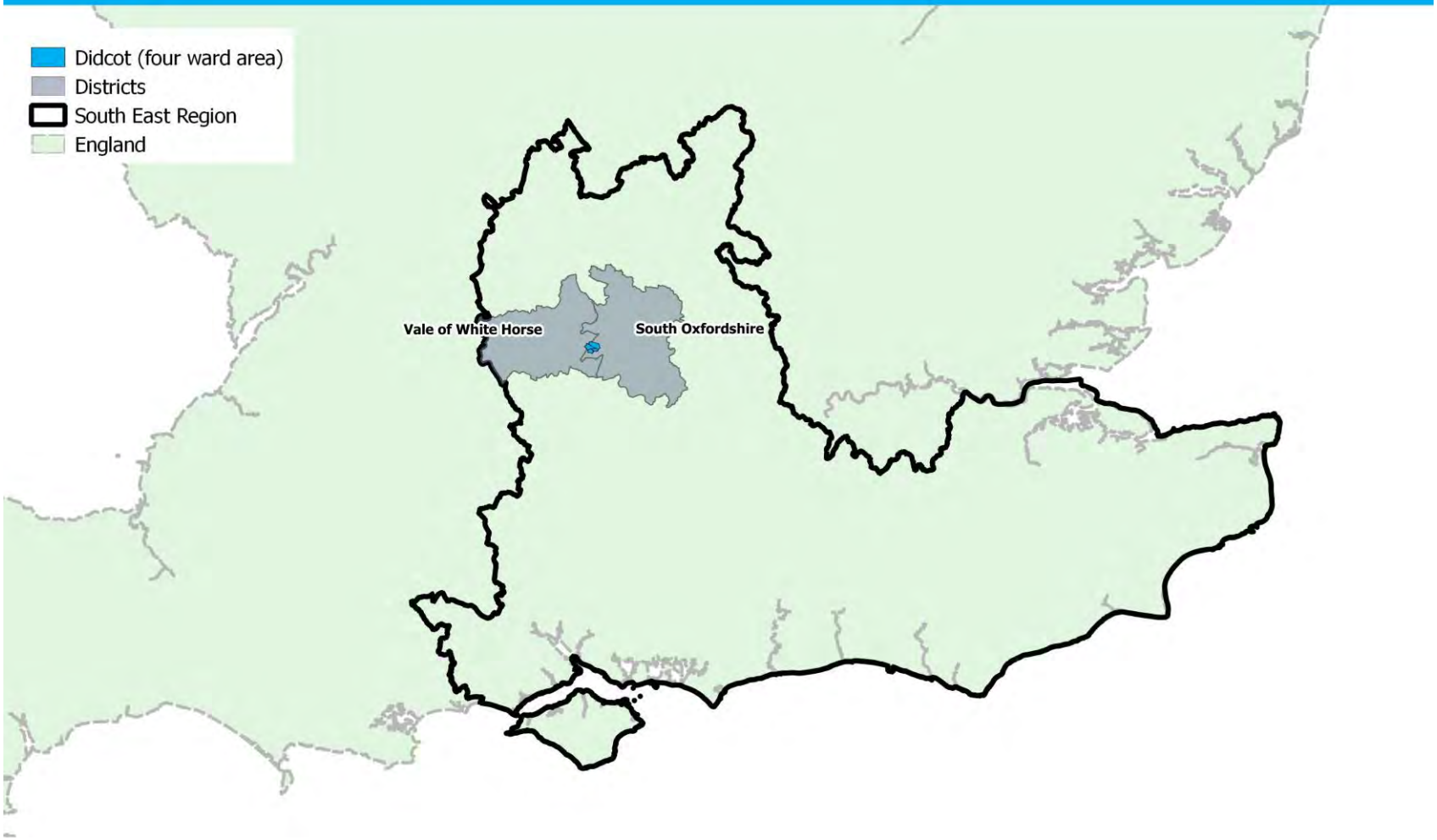
- Social Baseline
  - Population Change (2001-2011)
  - Age Profile (2011)
  - Ethnic Profile (2011)
  - Qualifications (2011)
  - Household Type (2011)
  - Household Tenure (2011)
  - Occupancy & Overcrowding (2011)
  - Household Composition (2011)
- Health and Well-being
  - General Health (2011)
  - Long-term health problem or disability (2011)
  - JSNA General highlights/issues (2016)
- Economic Baseline
  - Economic Activity (2011)
  - Jobseekers Allowance (2016)
  - Claimant Count (2016)
  - Resident Employment Sectors (2011)
  - Occupation (2011)
  - Household Income (2015)
  - Travel to Work (Didcot Residents) (2011)
  - Business Register & Employment Survey (2014)
  - Gross Value Added
- Indices of Multiple Deprivation (2015)
- Area Profile Comparators
  - ONS Output Area Classifications (2011)

Comparator Areas

- Didcot (four ward area)
- South Oxfordshire (District)
- Vale of White Horse (District)
- South East (Region)
- England (Country)

Comparator Areas

Baseline Context



Population Change

Didcot	
	Change
Under 16	1%
16-64	8%
65+	19%
Total	7%

South Oxfordshire	
	Change
Under 16	0%
16-64	1%
65+	25%
Total	5%

Vale of White Horse	
	Change
Under 16	-3%
16-64	3%
65+	22%
Total	5%

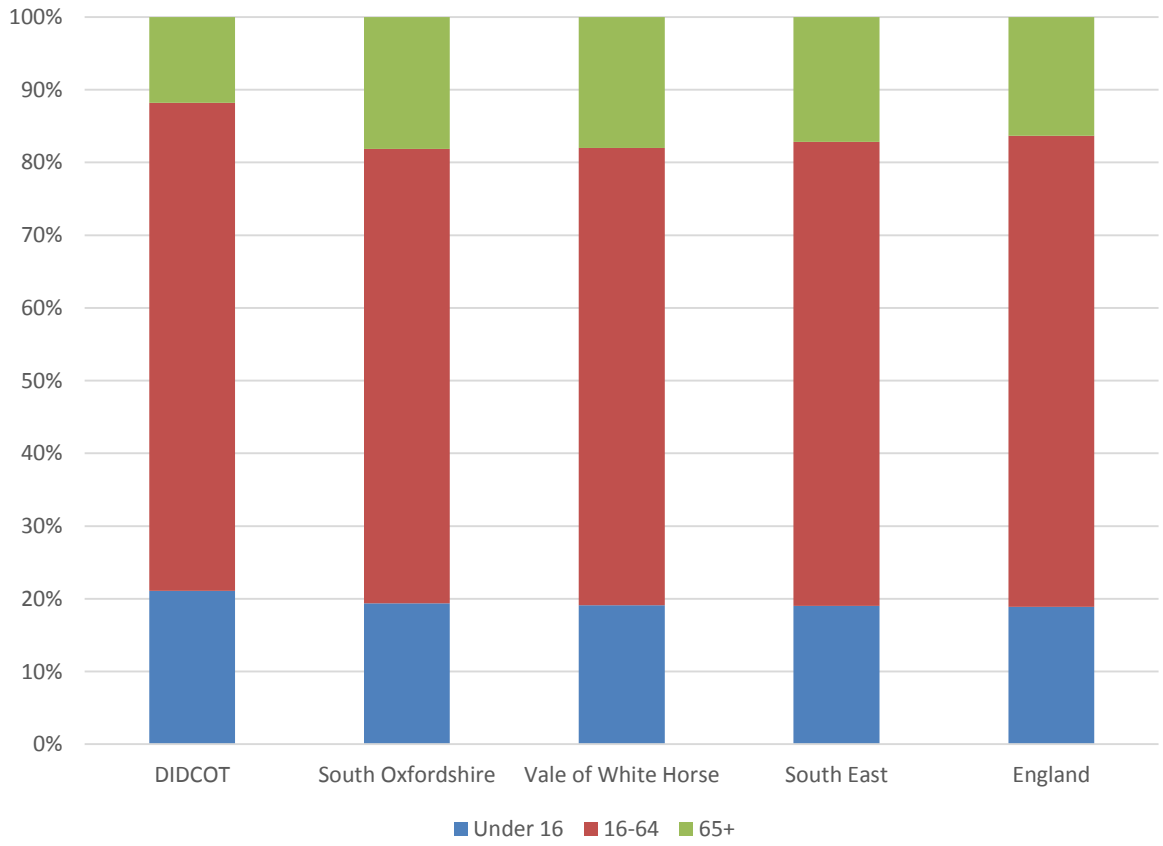
South East	
	Change
Under 16	3%
16-64	8%
65+	13%
Total	8%

England	
	Change
Under 16	1%
16-64	9%
65+	11%
Total	8%

- Resident population of Didcot = c.25,140 people (2011)
- Average size of Didcot household = 2.5 people (2011)
- The population of Didcot increased by 7% between 2001 and 2011 – in line with regional and national average but **higher** than the district averages
- The proportion of working age people has grown more than at the district levels
- Most significant increase has been amongst the 65+ age group
- Household sizes in Didcot are in line with SODC but slightly higher than VoWH, the region and nationally

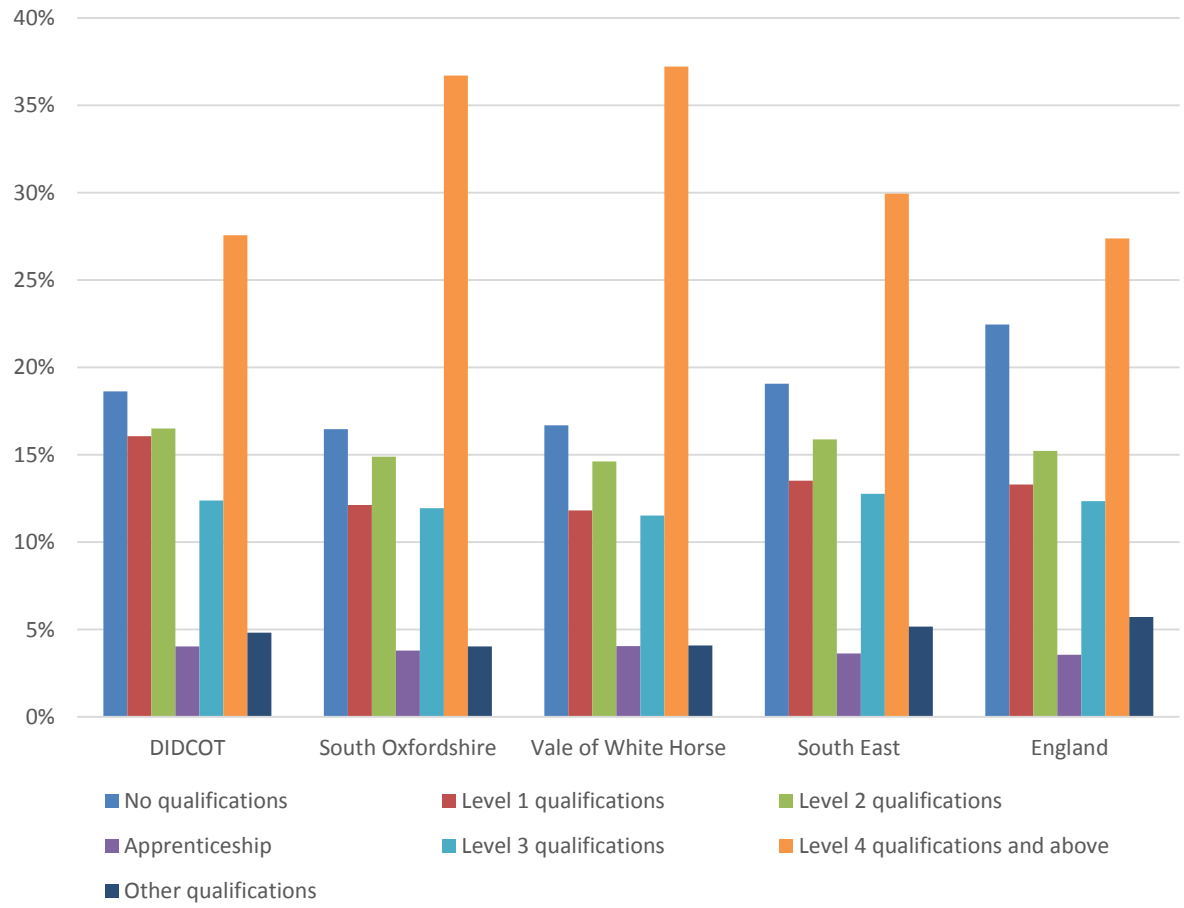
Age Profile

- Didcot has a younger population and more families
- 67% of Didcot residents are of working age
- Lower proportion of 65+ residents in Didcot (12%) compared to 18% for SODC and VoWH – although all areas saw a significant increase in this age group between 2001 and 2011



Qualifications

- Qualification attainment of Didcot residents is close to regional and national average
- 28% of Didcot residents have Level 4+ qualifications* – this is **lower** than district averages (both 37%) but **in line** with the national average (27%)
- Nearly a fifth of Didcot residents have no qualifications
- Qualification attainment is highest amongst 25-50 year old age groups



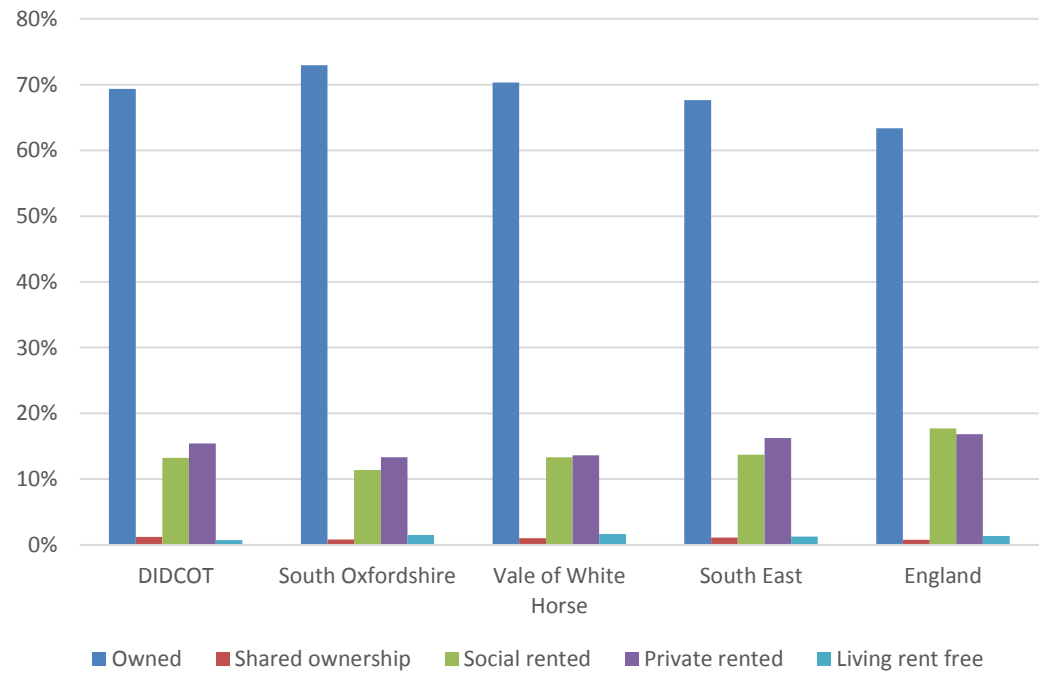
* Degree (e.g. BA, BSc); Higher Degree (e.g. MA, PhD, PCGE), NVQ Level 4-5, HNC, HND, RSA Higher Diploma, BTEC Higher level, Foundation Decree

Housing Profile

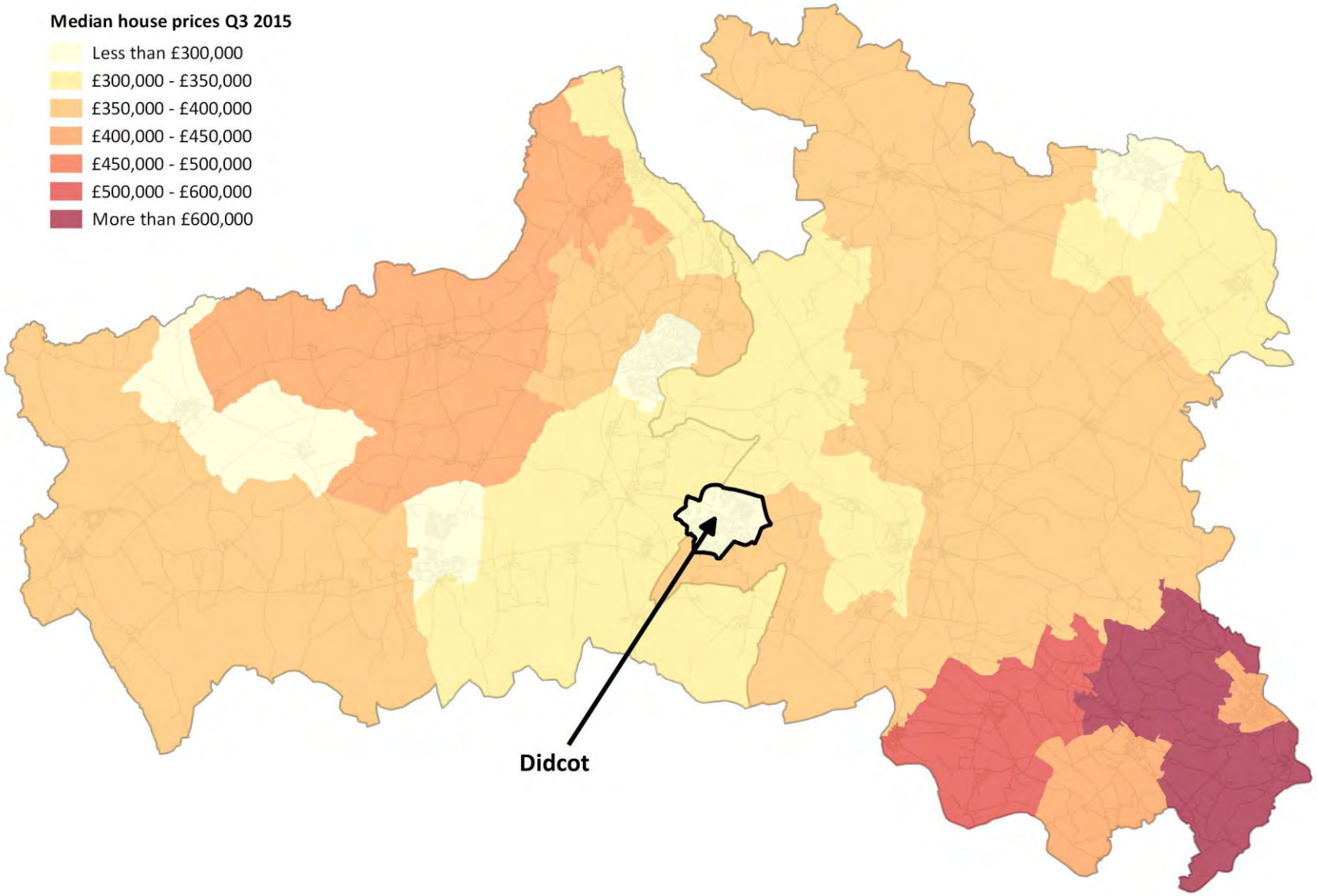
- Didcot is home to c.10,400 households (2011)
- The majority of Didcot residents live in houses rather than flats
- Flats make up less of the housing offer of Didcot (15%) than in Oxford City (where a third of homes are flats)
- 16% of homes in Didcot are 4+ bedrooms. This compares to South Oxfordshire and WoVH as a whole where c.30% of homes have 4+ bedrooms
- There are also fewer 1 bedroom properties in Didcot than might be expected
- Didcot has more families than other areas – nearly a third of households have a dependent child

Tenure

- Tenure profile of Didcot is similar to the regional average
- There are fewer privately-owned properties and more private-rented and social-rented homes in Didcot than at the district level.
- 15% of homes in Didcot are private rented and 13% are social rented

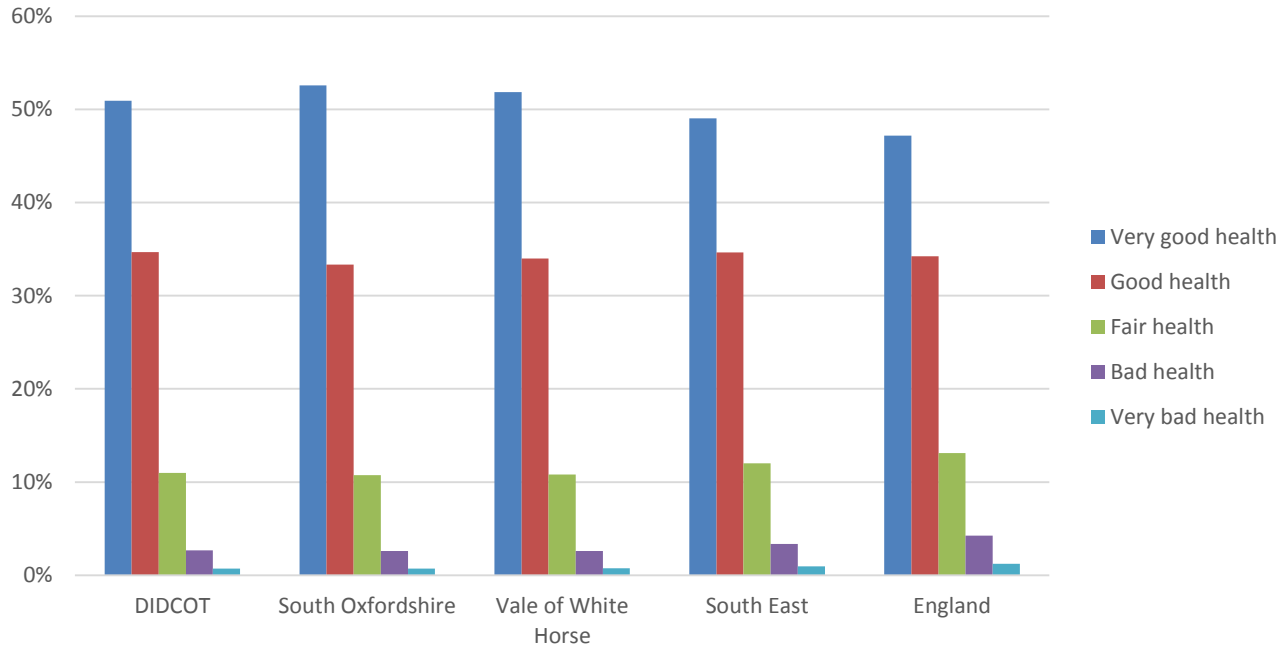


House Prices



Health

- Over half of the population of Didcot recorded themselves as in ‘very good health’ (2011). This is above the regional and national average



- Those most likely to be in ‘very good’ or ‘good health’ are aged 16 to 49 and those most likely to rate their health as ‘bad’ or ‘very bad’ are over 65 (with almost half this population ranking their health in this category). This is in line with comparator areas.

Long-term Health Problem or Disability

- Approximately 3,270 residents of Didcot reported that their day to day activities were limited from long term health problems (2011) – this equates to 13% of the population
- This is in line with the regional average but lower than the national average (17%)
- Of these people - 48% are aged 20 to 64 and 45% are over 65
  - This differs from the trend across comparator areas where those aged 65 and over are more likely to have limiting illnesses than 20 to 64 year olds
- This dataset is a self-assessment of whether a person has a health problem or disability which limits their daily activities and which has lasted, or expected to last, at least 12 months. This includes problems that are due to old age

Joint Strategic Needs Assessment

- Published by the Oxfordshire Clinical Commissioning Group (OCCG) in 2016.
  - The CCG covers five districts: West Oxfordshire, Cherwell, Vale of White Horse, South Oxfordshire and Oxford.
  - There are 77 GP surgeries with approximately 720,000 registered patients across the CCG.
- Life expectancy is higher in SODC compared to the other local authority areas in the CCG.
- Across the CCG, levels of disability are relatively low (compared to national average).
- The leading causes of death are dementia (for women) and heart disease (for men).
- Other common ailments are high blood pressure, asthma and common mental health disorders (e.g. depression and anxiety)
- Two GPs registered in Didcot report the highest rates of depression across the CCG area

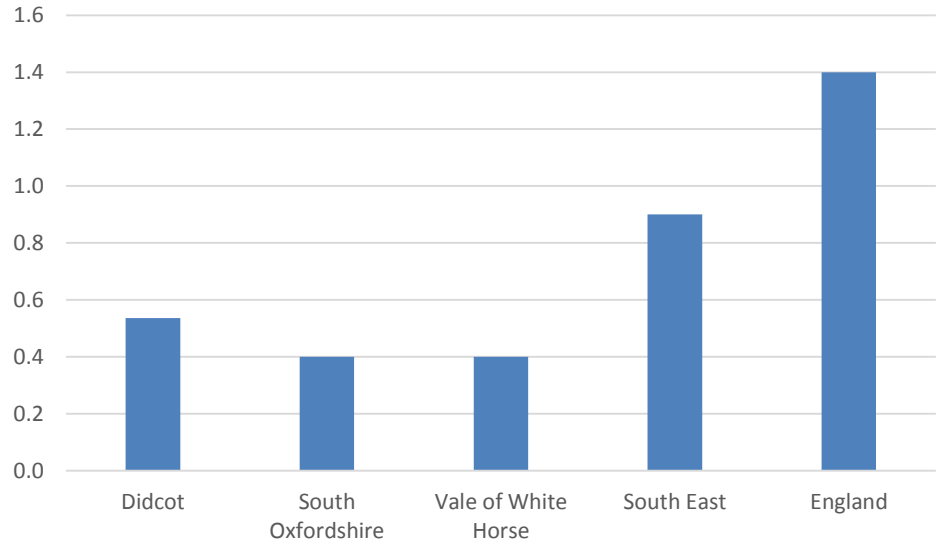
Economic Activity

- High proportion of working age people who are economically active
- 81% of Didcot residents are economically active - higher than all comparator areas
  - A smaller proportion of economically active Didcot residents are self employed (7%) compared to comparator areas

	Didcot	South Oxfordshire	Vale of White Horse	South East	England
Economically active	**81%**	**75%**	**75%**	**72%**	**70%**
Economically active: In employment	75%	70%	70%	65%	62%
Economically active: Self-employed	*7%*	*13%*	*11%*	*11%*	*10%*
Economically active: Unemployed	3%	3%	3%	3%	4%
Economically active: Full-time student	3%	2%	3%	3%	3%
Economically Inactive	**19%**	**25%**	**25%**	**28%**	**30%**
Economically inactive: Retired	9%	14%	14%	14%	14%
Economically inactive: Looking after home or family	4%	4%	4%	4%	4%
Economically inactive: Student (including full-time students)	3%	3%	4%	5%	6%
Economically inactive: Long-term sick or disabled	2%	2%	2%	3%	4%

Jobseekers Allowance (JSA)

- JSA is an unemployment benefit paid to individuals of working age (16 to 64) who are registered as unemployed and actively seeking work.
- In April 2016, the JSA rate in Didcot was 0.5%. This is higher than the district rates but lower than the regional rate (0.9%) and national rate (1.4%).
- Of those receiving JSA almost half are looking for work in sales and customer service occupations. This is true of all comparator areas.



Claimant Count (experimental)

- Experimental data from the ONS models the expected figure of those claiming JSA and Universal Credit (collectively known as ‘Claimant Count’).
- These figures are broadly in line with the JSA. The rate in Didcot is 0.7% which is higher than both districts (at 0.5%) but lower than the regional (1.1%) and national averages (1.8%)

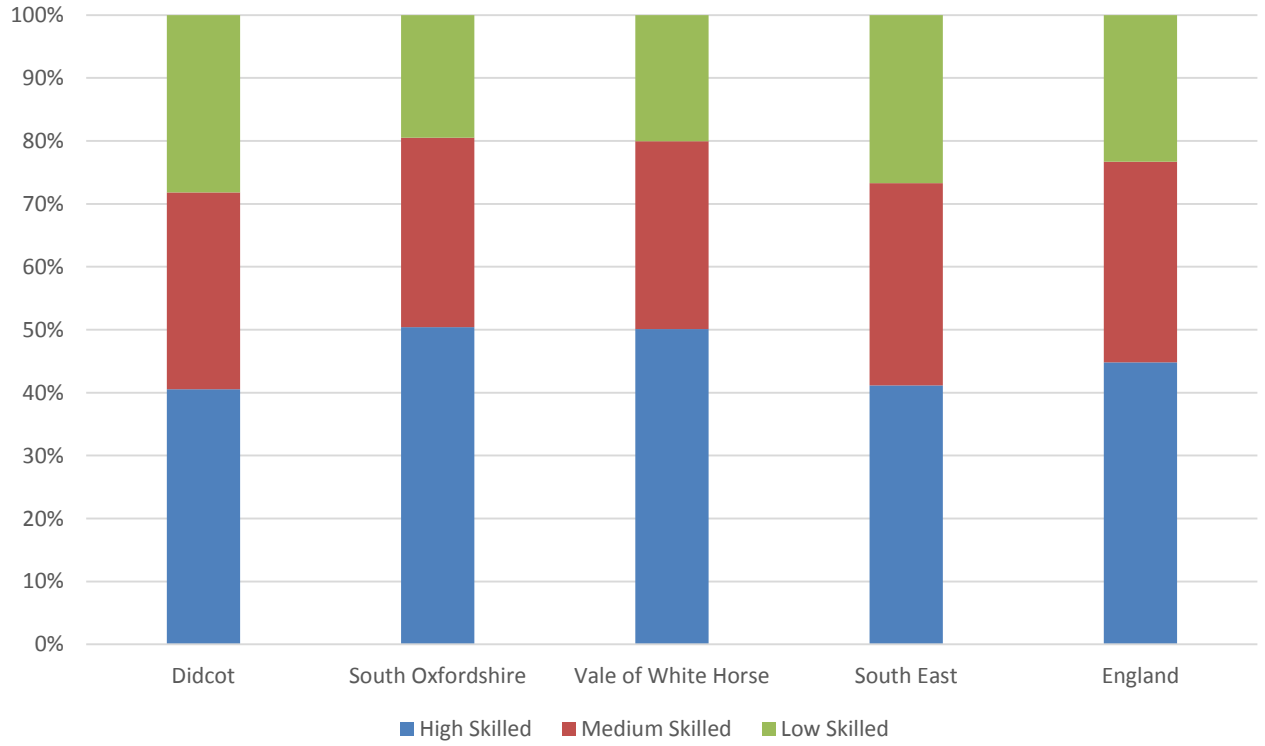
Resident Employment Sectors

- Top industries of employment for Didcot residents are:
  - Wholesale & retail trade (18%);
  - Professional, scientific & technical activities (11%).
- Across SODC there is a more even split between retail, professional activities, education and health industries.

Industry	Didcot	SODC	VoWH	South East	England
C Manufacturing	7.1%	7.2%	7.6%	8.8%	7.2%
D Electricity, gas, steam and air conditioning supply	1.6%	0.7%	0.7%	0.6%	0.6%
E Water supply; sewerage, waste management and remediation activities	1.3%	1.0%	0.8%	0.7%	0.7%
F Construction	7.5%	7.5%	7.8%	7.7%	8.0%
G Wholesale and retail trade; repair of motor vehicles and motor cycles	18.0%	14.5%	13.7%	15.9%	15.6%
H Transport and storage	5.9%	3.6%	3.1%	5.0%	5.2%
I Accommodation and food service activities	3.6%	4.4%	4.0%	5.6%	5.0%
J Information and communication	6.1%	7.2%	6.4%	4.1%	5.5%
K Financial and insurance activities	2.2%	2.8%	2.1%	4.4%	4.5%
L Real estate activities	1.0%	1.4%	1.4%	1.5%	1.4%
M Professional, scientific and technical activities	11.0%	11.3%	11.0%	6.7%	7.5%
N Administrative and support service activities	5.5%	4.7%	4.2%	4.9%	5.2%
O Public administration and defence; compulsory social security	6.7%	6.4%	7.7%	5.9%	6.0%
P Education	8.4%	10.8%	13.7%	9.9%	10.1%
Q Human health and social work activities	9.4%	10.1%	9.8%	12.4%	11.6%
R, S, T, U Other	4.3%	5.2%	5.0%	5.0%	5.1%

Occupation

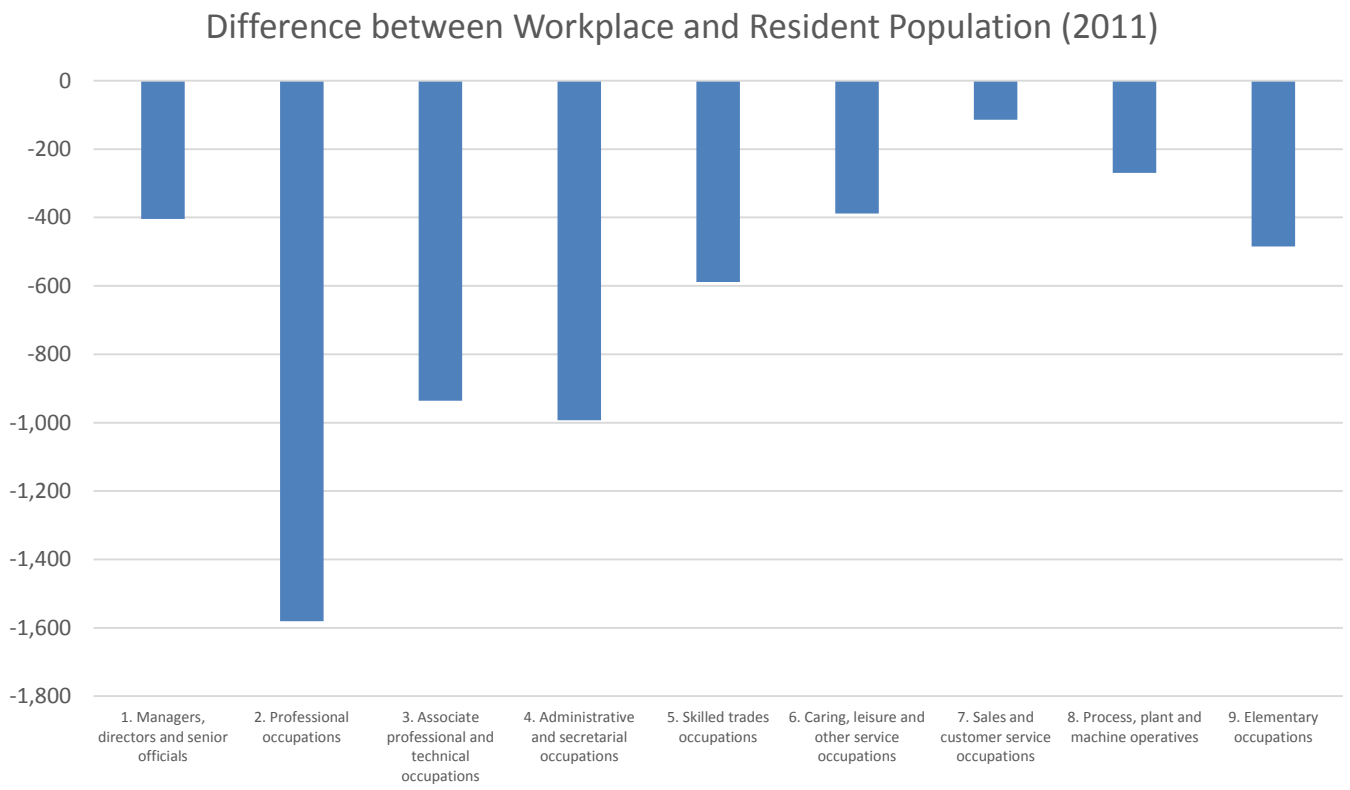
- 41% of Didcot residents are employed in ‘high skilled’* occupations. This is lower than at the district levels and the national average but is very similar to the regional average
- 18% of Didcot residents are employed in professional occupations of which half are made up of those employed in science research, engineering and technology professions



*managers, directors and senior officials; professional occupations; associate professional and technical occupations

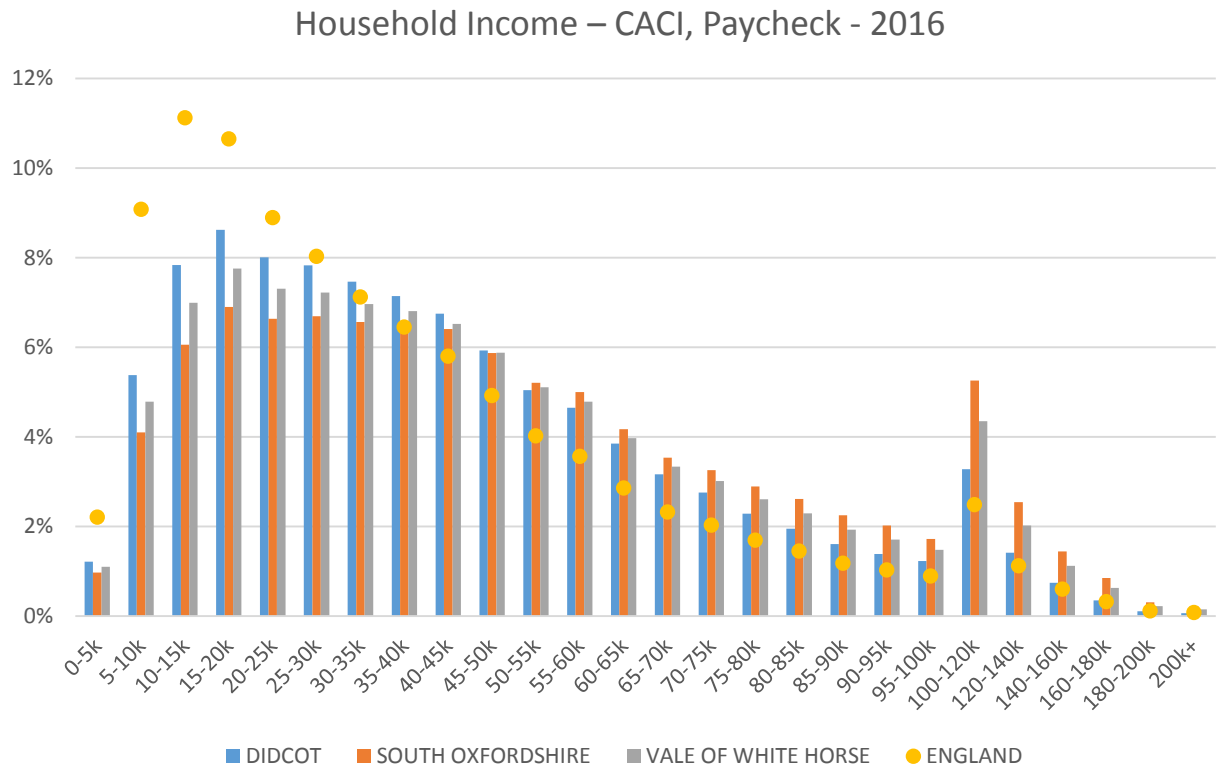
Didcot – Net Exporter of People

- Didcot is a **net exporter** of people
- The most significant loss is amongst Professional Occupations, reflecting the lower value sectors represented in Didcot at present
- Interestingly, for a service centre, Didcot also exports a lot of people who work in admin/elementary roles



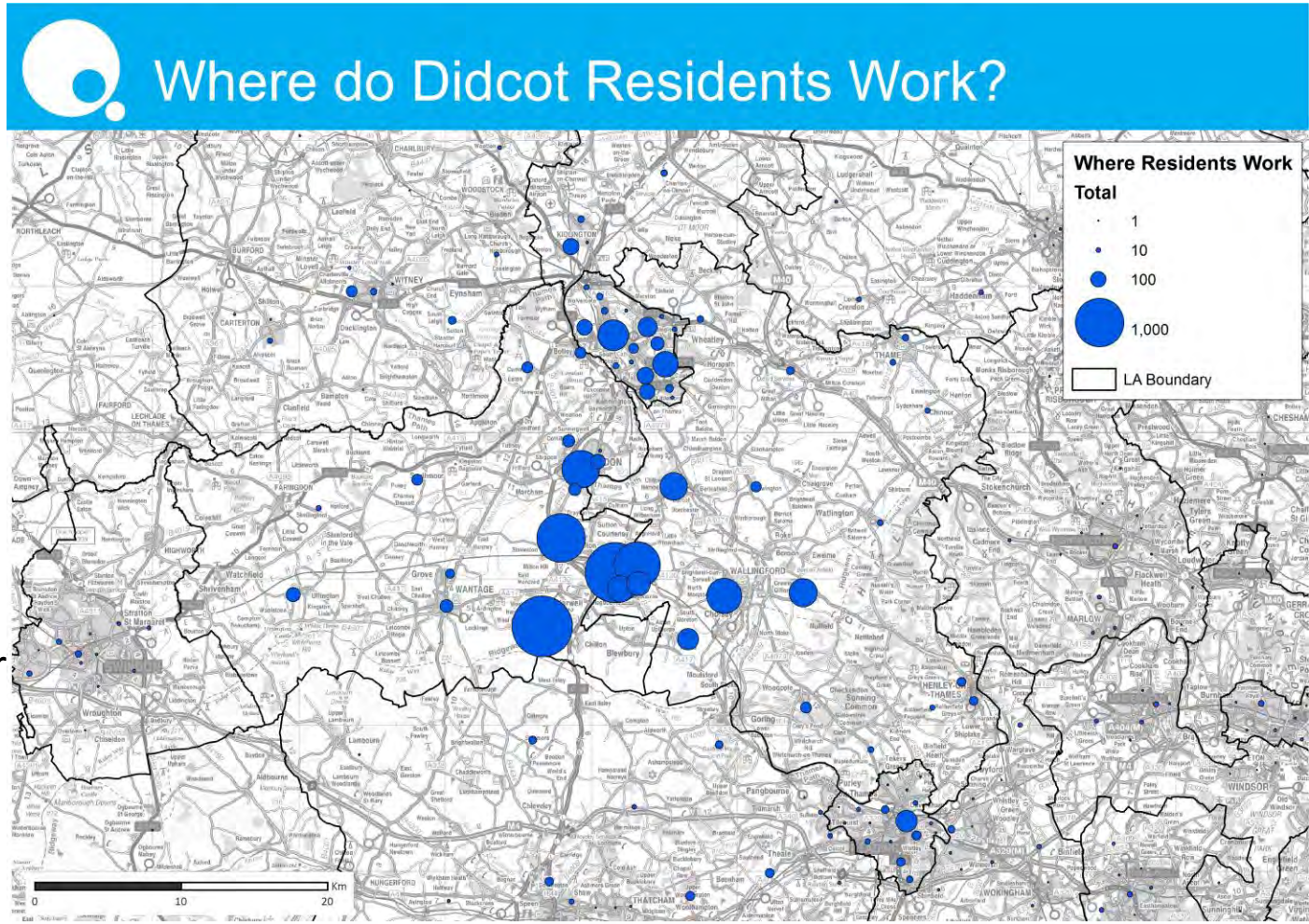
Household Income (CACI)

- Average household income across Didcot is approximately £43,350. This is lower than both VoWH (£49,780) and South Oxfordshire (£53,470)
- A larger proportion of households in Didcot earn between £10k and £25k than at the district levels
- Household income in Didcot is generally above the national average apart from at the lowest levels



Travel to Work

- Local clusters of employment
- Didcot, Abingdon, Oxford and Harwell are significant locations of employment for Didcot residents.
- 11% work from home
- 21% work in Didcot (excluding those working from home)
- 11% work at Harwell
- 61% of all workers who travel for work travel by driving a car or van



Business Register and Employment Survey

- Didcot is a service centre with a strategically significant transport hub
- c.8,300 people work in Didcot (2014)
- The top three industries for people who work in Didcot are:
  - Retail (22%)
  - Manufacturing (11%)
  - Transport & Storage (10%)
- This differs from the districts where the most common industry of employment is the Professional, Scientific & Technical sector (21% in South Oxfordshire and 17% in Vale of White Horse)
- There are fewer jobs in health, education, public administration than might be expected for a service town such as Didcot

BRES (2014)

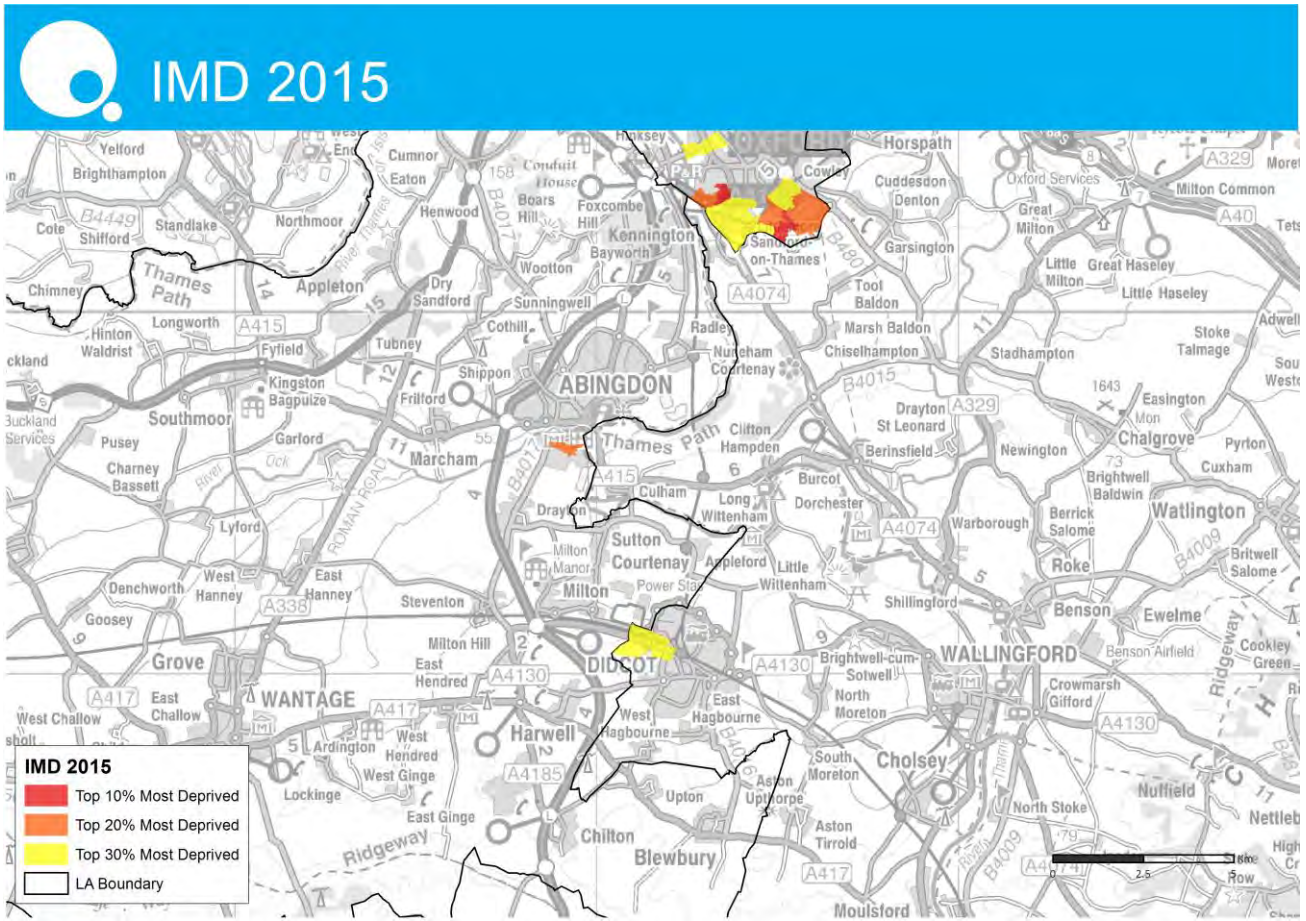
Industry	Didcot	South Oxfordshire	Vale of White Horse	South East	England
Manufacturing (C)	10.8%	5.9%	5.6%	6.2%	8.3%
Construction (F)	2.8%	5.0%	5.8%	4.8%	4.3%
Motor trades (Part G)	1.7%	1.7%	1.6%	1.9%	1.8%
Wholesale (Part G)	4.0%	4.7%	5.1%	4.9%	4.2%
Retail (Part G)	21.9%	9.6%	7.2%	10.0%	9.9%
Transport & storage (inc. postal) (H)	9.9%	3.5%	3.8%	4.6%	4.6%
Accommodation & food services (I)	4.4%	8.9%	6.5%	7.3%	7.0%
Information & communication (J)	3.1%	4.5%	6.8%	5.8%	4.3%
Financial & insurance (K)	1.7%	2.1%	1.5%	3.2%	3.8%
Property (L)	2.4%	1.7%	1.7%	1.6%	1.7%
Professional, scientific & technical (M)	4.0%	20.7%	17.4%	9.0%	8.4%
Business administration & support services (N)	9.3%	7.9%	8.7%	8.5%	8.9%
Public administration & defence (O)	2.2%	2.2%	2.0%	3.4%	4.3%
Education (P)	7.4%	8.6%	10.8%	10.1%	9.3%
Health (Q)	7.2%	7.4%	9.4%	11.9%	12.9%
Arts, entertainment, recreation & other services (R,S,T and U)	5.9%	4.7%	4.2%	4.7%	4.4%

ABI & BRES (2007-2014)

- The number of jobs in Didcot decreased between 2007 and 2014
- Total number of workers in Didcot dropped by 3% (approximately 260 workers). No other comparator area experienced an overall decrease in workers. Jobs growth was around 6% across all other areas
- The greatest decrease (-51%) was within the Business Administration and Support Services sector followed by Motor Trades (-22%)
- The Information and Communication sector in Didcot has increased by over 100%. The Transport and Storage sector also increased significantly (by 62%). The Retail sector decreased by 11%

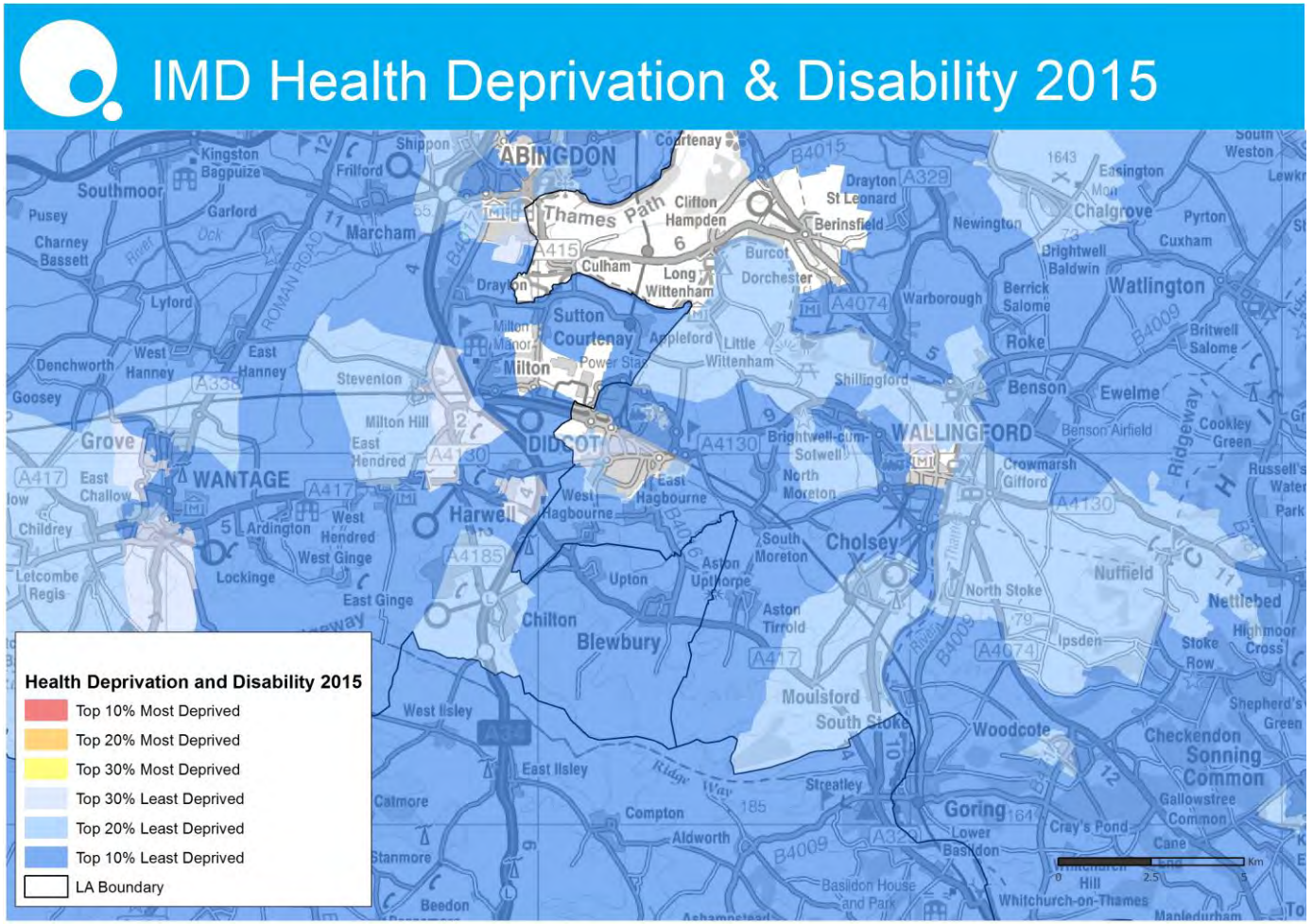
Indices of Multiple Deprivation (2015)

- The Government's Index of Multiple Deprivation (2015) measures deprivation by combining a number of indicators which include a range of social, economic and housing issues to give a single deprivation score for each 'Lower Super Output Area' (LSOA) across England.
- Each LSOA contains a population between 1,000 and 3,000 individuals and 400 and 1,200 households. These are then ranked relative to their level of deprivation.

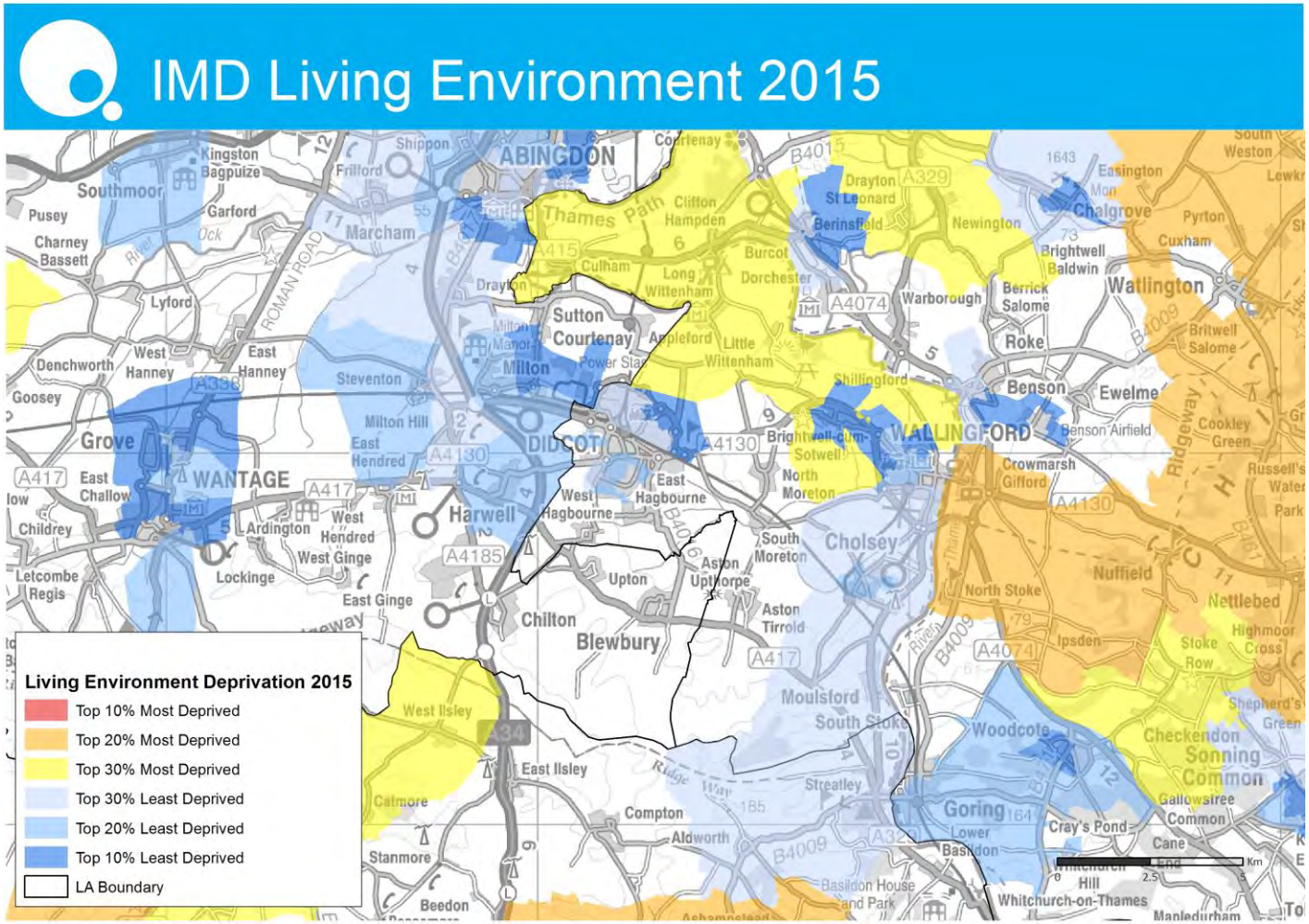


Health Deprivation & Disability

- Measures the risk of premature death and the impairment of quality of life through poor physical or mental health
- Indicators include:
  - Years of potential life lost
  - Comparative illness & disability ratio
  - Acute morbidity
  - Mood & anxiety disorders



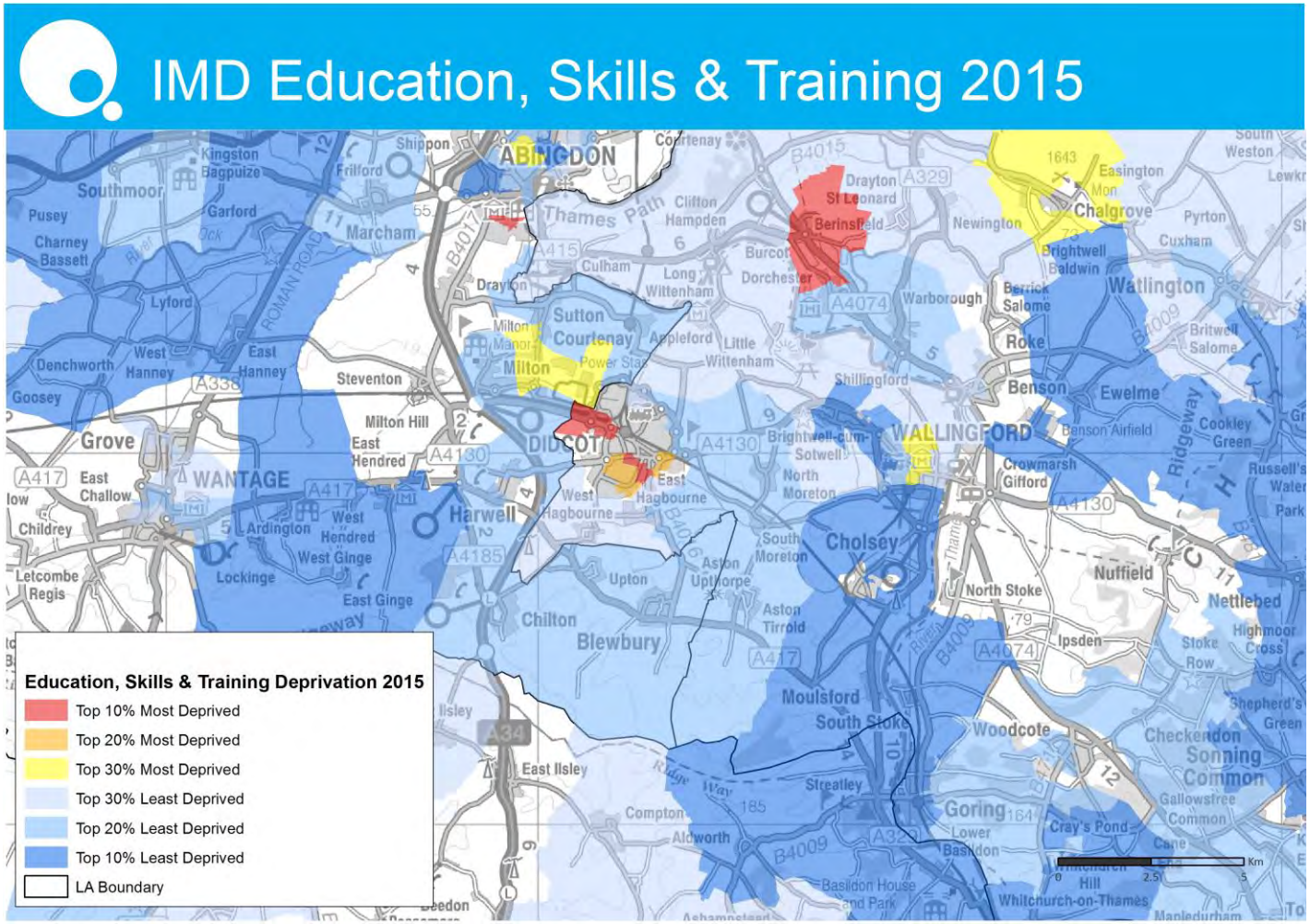
Living Environment



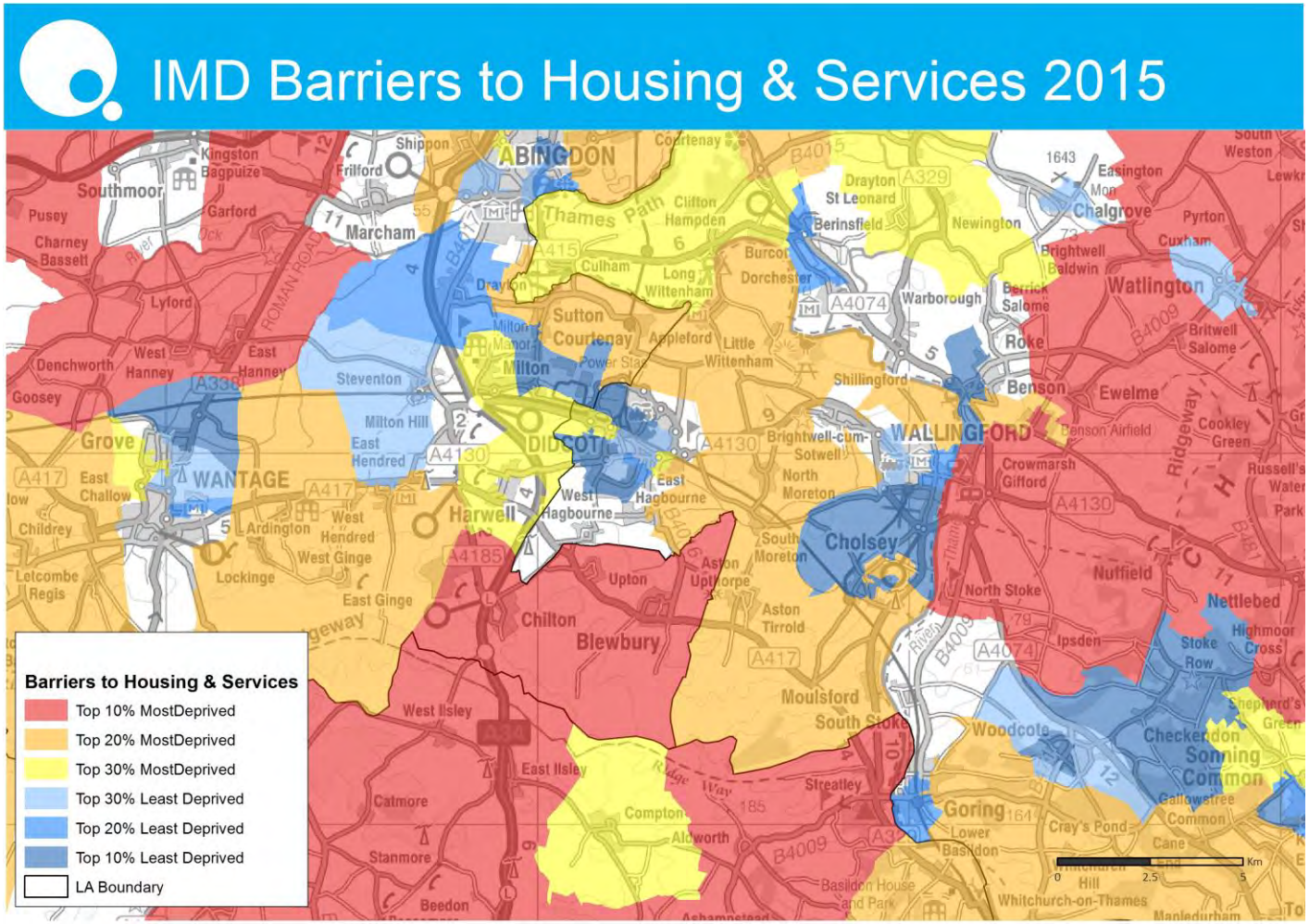
- Measures the quality of the local environment – both ‘indoors’ and ‘outdoors’
- Indicators include:
  - Housing in poor condition
  - Houses without central heating
  - Air quality
  - Road traffic accidents

Education, Skills & Training

- Measures the lack of attainment and skills in the local population.
- Indicators include:
  - Key stage 2 attainment
  - Key stage 4 attainment
  - Secondary school absence
  - Staying on in education post 16
  - Entry into higher education
  - Adults with no or low qualifications
  - English language proficiency



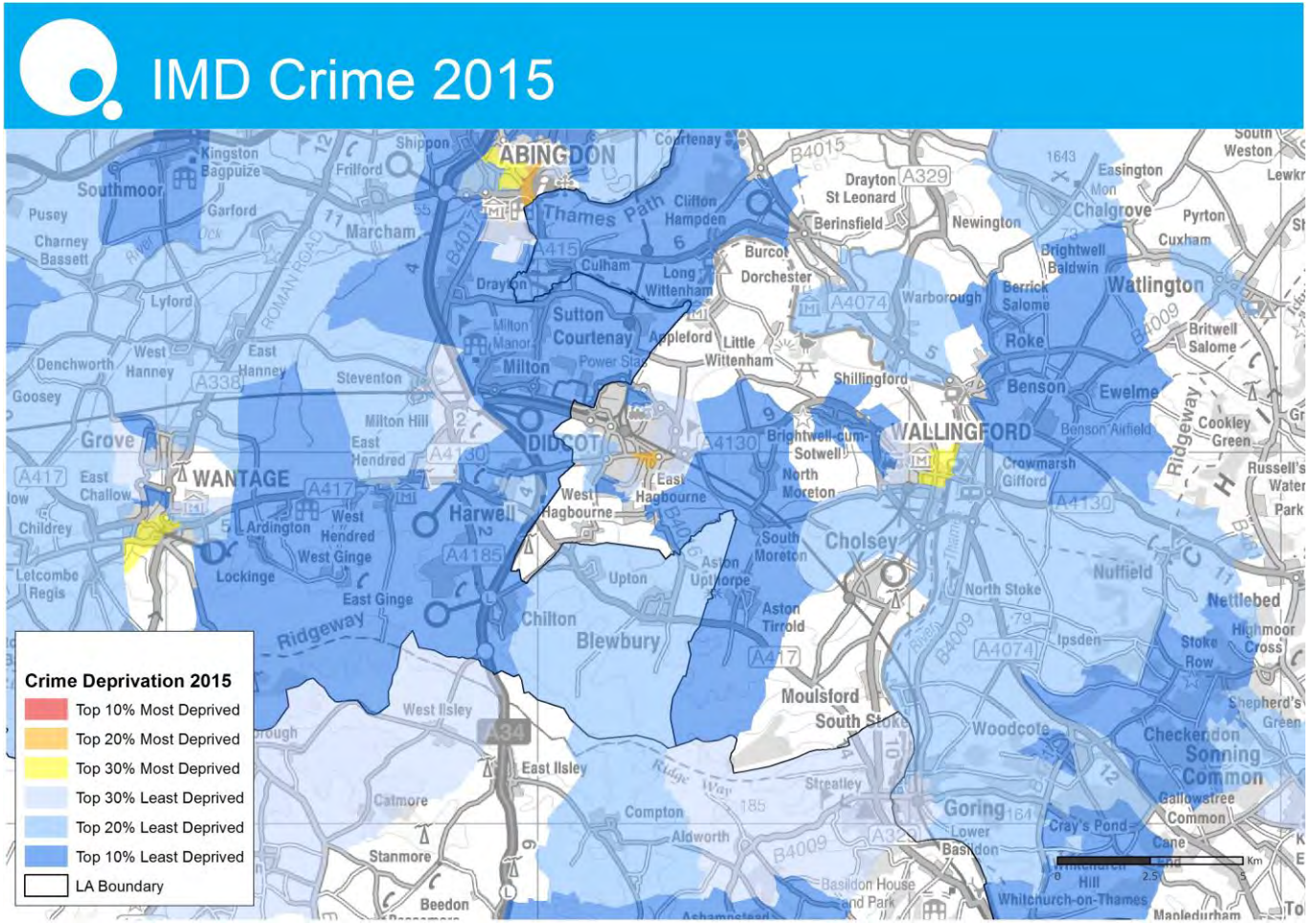
Barriers to Housing & Services



- Measures the physical and financial accessibility of housing and local services
- Indicators include:
  - Road distance to – primary school, supermarket, GP
  - Household overcrowding
  - Homelessness
  - Housing affordability

Crime

- Measures the risk of personal and material victimisation at a local level.
- Indicators include:
  - Recorded crime rates for – violence, burglary, theft and criminal damage



E.
Utilities assessment

South Oxfordshire and Vale of White Horse District Councils

Didcot Garden Town

Utilities Assessment, Constraints and Opportunities

February 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

Gerry Brough
Interim Head of Development, Regeneration and Housing
South Oxfordshire District Council and Vale of White Horse District Council
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Document revisions

No.	Details	Date
01	Draft Issue for Comment	December 2016
02	Final Issue	February 2017

Contents

1. Introduction

1.1 Background

A 21st Century Garden Town at Didcot is planned. This initiative is guided with spatial vision to develop both a connected town and super green town.

A Masterplan is now in place with ten key principles, which are to:

1. Support cycling, walking and better public transport.
2. Make Didcot a destination.
3. Build a better town centre.
4. Celebrate Didcot's history.
5. Create a better sense of arrival at key gateways.
6. Provide new outstanding landmark facilities.
7. Overcome major severance issues.
8. Establish a legible network of streets connecting key local centres.
9. Integrate smart technology into Didcot's future.
10. Offer more diversity in homes and jobs.

From this ten key masterplan moves are being proposed as shown in Figure 1.1.

In conjunction with these initiatives, it is planned to increase the housing stock from approximately 15,000 to 30,000 dwellings by 2031. Both South Oxfordshire District Council and the Vale of White Horse District Council are working together to identify key opportunity sites.

A number of these homes have already been allocated as part of the strategic sites both in and around Didcot and are identified as consented. Some of which cannot be influenced by the masterplan moves, however, for others some influence still exists and study is of benefit. Other sites are currently under the process of consenting, with these there are various opportunities to be investigated. These are classified as either, having critical importance, already coming forward or of strategic worth. In addition to this there are other opportunity sites, where individual study is not (yet) required.

The 14 sites with the proposed scope of study input for each are shown on 38421/LEA/CVD/015 within Appendix A.

Figure 1.1 - Key Master Plan Moves

1.2 Purpose of Report

As part of this study Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler) was appointed to prepare an Infrastructure Strategy Report. This includes an assessment of the public utilities. These furnish the everyday necessity for provision of surface and foul water drainage, potable water, electricity, gas mains and telecommunication services. Each of these utilities is investigated in the context of the development of the Didcot Garden Town.

This report identifies:

- Didcot's current utility requirements;
- the headline spatial constraints for the town;
- the capacity requirements for these; and
- the opportunities and constraints within the town layout for each respective utility.

A gap analysis of study limitations also highlights the key areas where further strategic definition of utilities is still required.

2. Existing Utilities

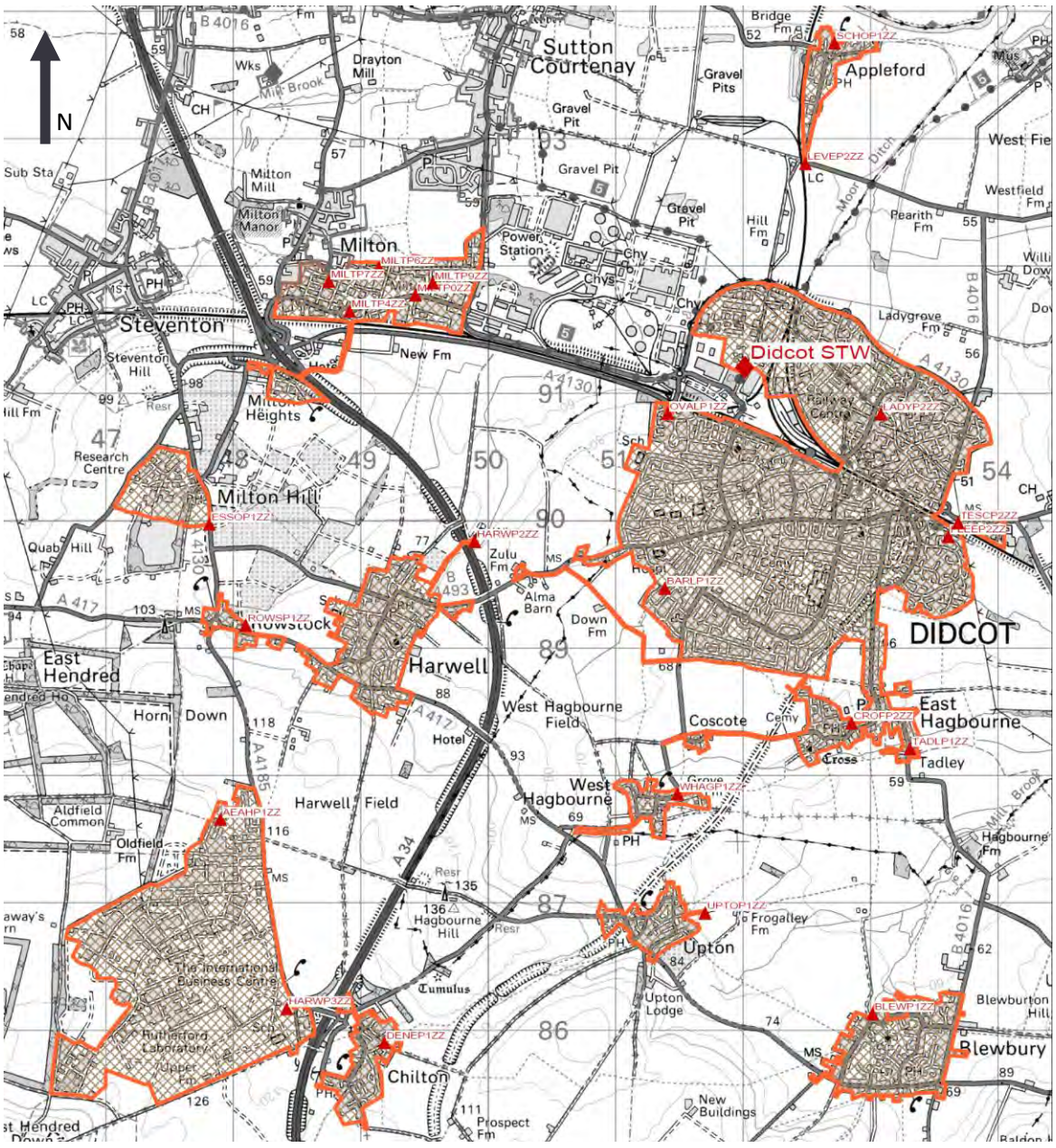
2.1 Sewerage Network

Didcot Sewerage Network

The majority of the sewerage infrastructure is the responsibility of Thames Water with the exception of the partially completed Great Western Park development which is currently serviced by **Scottish and Southern Energy** plc(SSEWater).

The Didcot drainage catchment is approximately 45 km^2 and is situated approximately 16 km south of Oxford. The catchment includes Didcot town centre, Blewbury, Chilton, Dene Hollow, Harwell, Milton Hill, Upton and both East and West Hagbourne. Figure 2.1 shows the Didcot drainage catchment highlighted in red with Thames Water priority sub-catchments which have known issues.

Figure 2.1 - Didcot Catchment Plan from Thames Water Didcot Drainage Strategy



The areas of Blewbury, Chilton, Dene Hollow, Harwell, Upton and East and West Hagbourne drain via a gravity network into pumping stations from where flows are transferred along rising mains to the south of Didcot town centre. The flows then drain under gravity along a 900mm by 600mm sewer before crossing underneath the west coast mainline railway along a 1200mm diameter pipe which extends to the sewage treatment works (STW).

The majority of Didcot town sewers drain under gravity via three crossings underneath the west coast mainline railway (375mm, 600mm and 1200mm diameter) before discharging at the STW.

Flows from Milton drain under gravity to a pumping station and are then transferred along a 200mm diameter rising main to the STW.

Flows from the Ladygrove Estate drain within a gravity sewer to a pumping station located on Cow Lane and are then transferred along a twin 300mm diameter rising main beneath the west coast mainline railway after which it drains under gravity to the STW.

A drainage strategy for Didcot was undertaken by Thames Water which identifies the catchment system to be foul only. However, over time this has suffered with ingress from groundwater and surface water connections.

Refer to drawing 38421/LEA/CVD/006 included within Appendix A for strategic sewerage assets.

Surface Water

The area of Ladygrove Estate is served by a separate surface water system discharging in multiple outfalls into the Ladygrove Brook. The rest of the Didcot Garden Town boundary is shown to have limited surface water sewers indicated on the Thames Water plans and is likely to drain to local drainage ditches and culverts throughout the catchment. It is anticipated that there are uncharted highway drains throughout the catchment.

A discussion with Oxfordshire County Council drainage engineer indicated that the majority of the gullies within the catchment are connected to the Thames Water foul water system.

Didcot Sewage Treatment Works

Didcot Sewage Treatment Works (STW) is a wastewater treatment facility in Didcot dealing with the domestic and industrial flows from Didcot as well as outlying villages. The STW currently serves a population equivalent of 37,000 and provides preliminary, primary and secondary treatment as well as biogas generation.

Refer to drawing 38421/LEA/CVD/006 included within Appendix A for location of the STW.

2.2 Potable Water

The majority of the potable water network is the responsibility of Thames Water with the exception of the partially completed Great Western Park which is the responsibility of SSE Water.

Didcot is supplied by several strategic water mains from the south-west and north-east ranging in size from 300mm to 400mm and are identified as ductile iron pipelines. These then feed into distribution networks throughout the town. There are currently three crossings of the west coast mainline railway through underpasses at Broadway, Cow Lane and Hitchcock Way. There is another crossing of the railway through a culverted watercourse. At this stage it is unknown how this is supported and any impacts this may have on the culvert capacity.

Refer to drawing 38421/LEA/CVD/005 included within Appendix A for strategic potable water assets.

2.3 Electricity

The regional electricity infrastructure is the responsibility of Scottish and Southern Energy (SSE) for the Didcot Garden Town area. The area is also crossed by National Grid (NG) assets responsible for electricity transmission across the country.

The area is served by a range of high voltage networks ranging from 11kV to 132kV upwards with step down transformers allowing distribution to properties within the area.

A feasibility study for the Planned Housing Growth in Oxfordshire 2015 to 2031: Impact on the Scottish & Southern Electricity Networks Distribution Network issued SSE in October 2016 stated that the Oxfordshire area is fed mainly from the 400/132 KV grid supply point at Cowley, which is operated by National Grid.

The feasibility study states that 132kV networks supply the Bulk Supply Point (BSP) at Drayton approximately 9km north of Didcot. At the BSP, the supply is then reduced from 132kV to 33kV and supplied to the Milton primary substation approximately 3km west of Didcot town centre. At Milton primary substation 33kV is reduced to 11kV and distributed through Didcot to local substations before being distributed to properties.

The current electrical vehicle charging points are located at Orchard Centre near station road. The charging points are equipped with three pin 3kW and type 2 7kW supply.

Refer to drawing 38421/LEA/CVD/007 included within Appendix A for strategic electrical assets.

2.4 Gas Mains

The regional gas infrastructure is the responsibility of Scotia Gas Networks (SGN) for the Didcot Garden Town boundary area. The area is also crossed by National Grid (NG) assets responsible for gas distribution across the nation.

There are currently several national high pressure gas mains (responsibility of National Grid) crossing the Didcot Garden Town boundary from NE connecting to Didcot B Power Station (Didcot B). Didcot B is a natural-gas power generation plant supplying national grid.

There is an intermediate pressure main (IP) crossing from the west to the north through the town with a range of medium and low pressure gas mains shown throughout the town. These are used for distribution of gas to properties and are therefore the reasonability of SGN.

The records show a gasworks site which lies adjacent to SW of Ladygrove East. Further to discussion with National Grid gas and SGN it is understood that this site has been decommissioned as a storage site. However, all pipes crossing the site are still live.

Refer to drawing 38421/LEA/CVD/004 included within Appendix A for strategic gas assets.

2.5 Telecommunications

The existing UK telecommunications network is built up using a range of copper and fibre-optic cables with radio signals used for mobile phones. Fibre-optic broadband is the most reliable solution currently available within the UK.

The existing town is served by both the Didcot and Rowstock telecommunications exchanges which are fibre enabled. Didcot exchange currently serves approximately 11,000 residential premises and 430 non-residential premises. The Rowstock exchange serves approximately 3,400 residential premises and 360 non-residential premises.

Refer to drawing 38421/LEA/CVD/008 included within Appendix A for strategic telecommunication assets.

Landline and Broadband

BT / Openreach

The existing catchment is served by the Didcot and Rowstock telecommunications exchanges located along Broadway and Wantage Road respectively. These are both fibre enabled. The system is owned by the BT Group and is comprised of a fibre to cabinet system with copper cables then running from the cabinet to each property (FTTC). The existing network delivers fibre broadband from a range of providers and broadband speeds can be as high as 100Mbps, depending upon location and provider.

In a briefing note issued by Openreach in November 2016, it concluded that they would deploy fibre to the premises (FTTP), free of charge, into all new housing developments of 30 or more homes. FTTP is a fibre-optic cable connection running from the telecommunications exchange directly to the user's home or business, providing a choice of broadband speeds up to 330mbps. It is understood that FTTP is available already in the Great Western Park New development.

Virgin

The majority of the existing Didcot Garden Town boundary is served by the Virgin Media fibre-optic network. Virgin Media owns and operates one network, which it exclusively uses to deliver FTTP (Fibre to the Property) broadband at speeds up to 100Mbps to large parts of Didcot, and up to 120Mbps in upgraded areas.

Vodafone

The majority of the Didcot Garden Town boundary is served by a Vodafone cable network. At the time of reporting no communication had been made with Vodafone to confirm capacity or use of the network.

Mobile Communications

The existing area of Didcot is served by the four major mobile phone providers with a range of signal quality being achieved. Table 2-1 shows the number of masts per provider within Didcot Area. Figures 2.2 to 2.9 show the signal quality available for phone calls and 4G data inside buildings from the Ofcom coverage checker.

Table 2-1 Number of Mobile Phone Masts per Provider in Didcot

Network Provider	Number of Masts within the Garden Town Boundary
Vodafone	10
EE (Orange and T-Mobile)	5
O2	3
Three	3

Figure 2.2 – Vodafone Coverage for Voice Calls inside Buildings

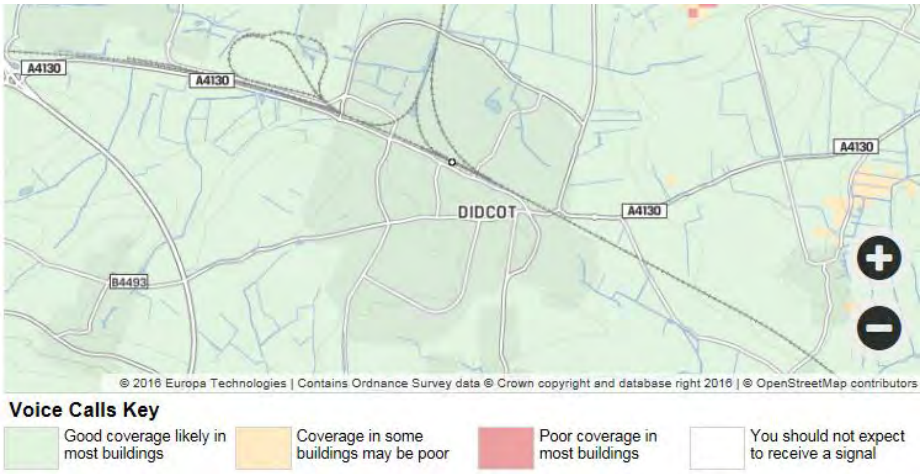


Figure 2.3 – Vodafone Coverage for 4G inside Buildings

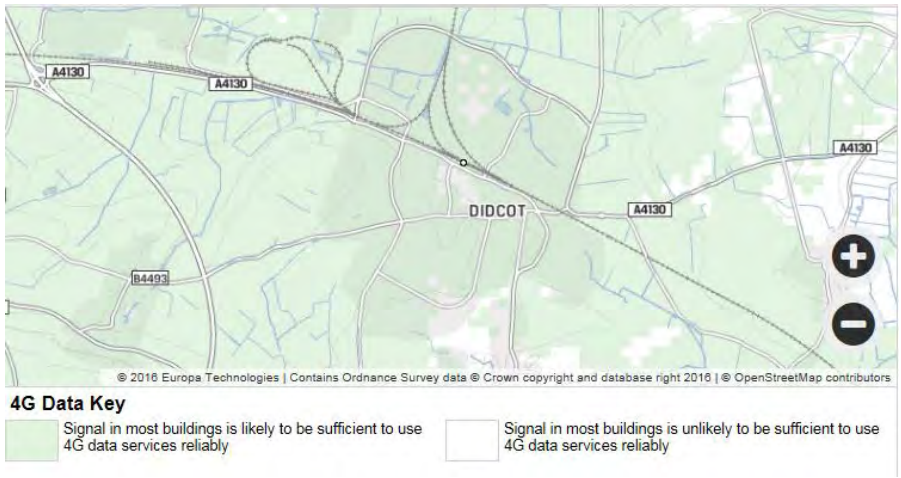


Figure 2.4 – 02 Coverage for Voice Calls inside Buildings

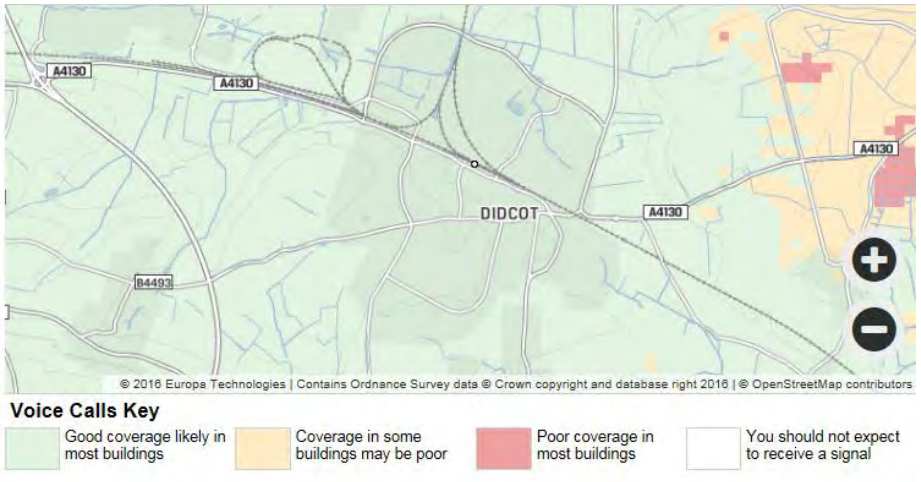


Figure 2.5 – 02 Coverage for 4G inside Buildings

Figure 2.6 – EE Coverage for Voice Calls inside Buildings

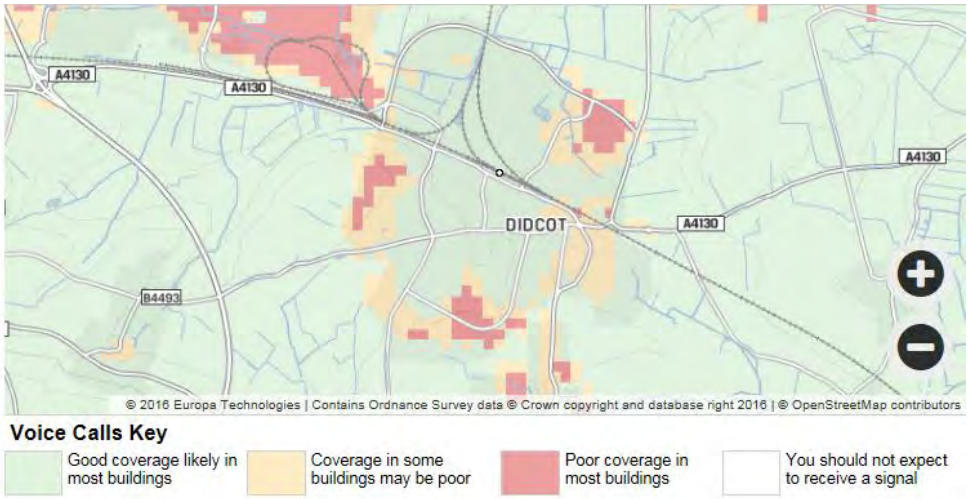


Figure 2.7 – EE Coverage for 4G inside Buildings

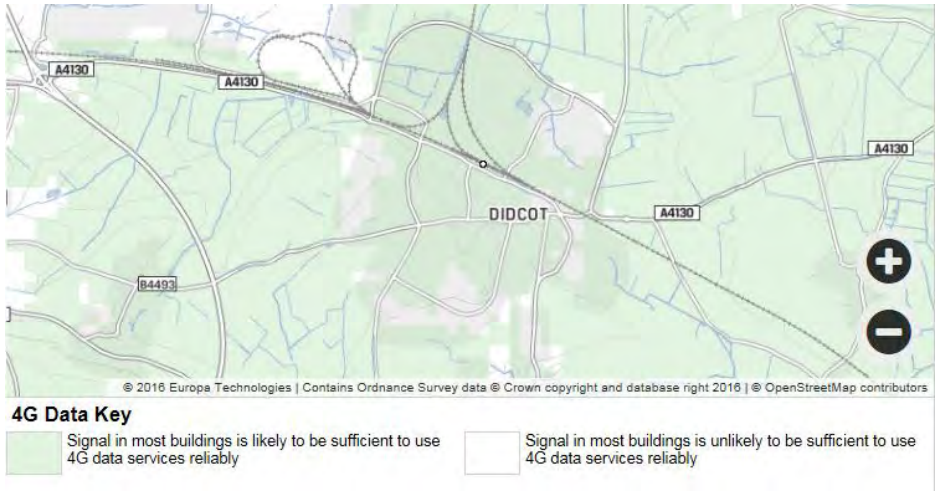


Figure 2.8 – Three Mobile Coverage for Voice Calls inside Buildings

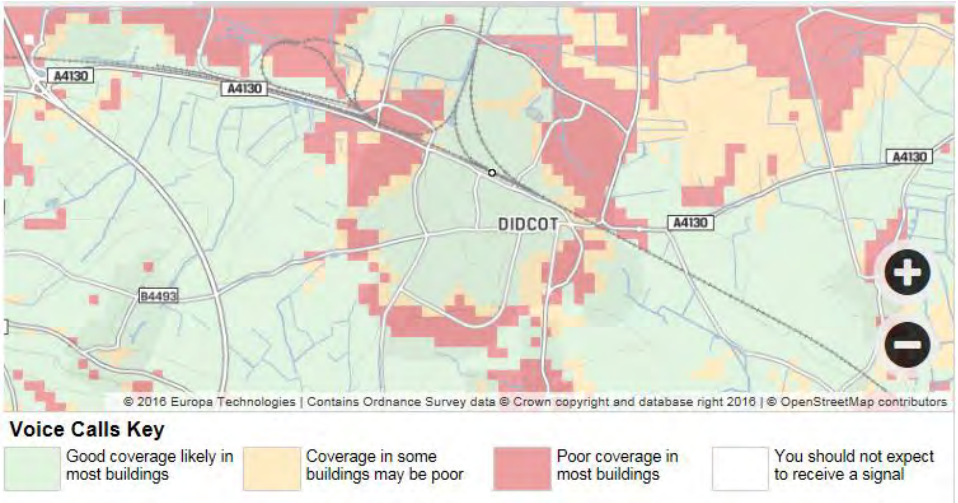
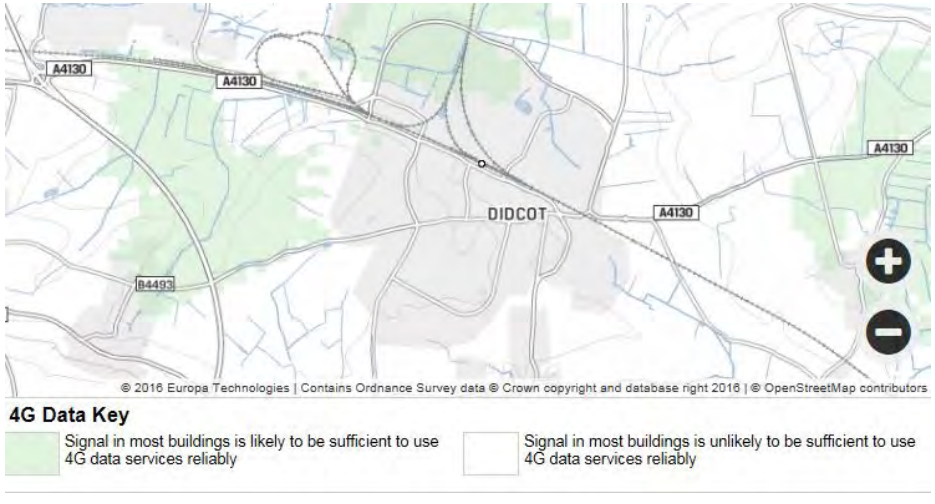


Figure 2.9 – Three Mobile Coverage for 4G inside Buildings



3. Headline Spatial Constraints for Didcot Garden Town

An assessment was made for each headline (high level) strategic utility within the Didcot town development to identify any spatial constraints. These primary (arterial) constraints to development include salient crossing points of the west coast mainline and branch line railways and also the A34 truck road. Other constraints may also potentially exist depending on routing of any new infrastructure corridors and the site layouts of specific developments.

This section of the report only covers the headline constraints that may potentially impact on the spatial layout of the town's development. However, when implementing the development of any specific sites, consideration will need to be given to all utilities that exist. It will be necessary to maintain functionality of each statutory service whilst carrying out the work safely, with minimal social impact to the community.

3.1 Sewerage Network

The sewerage network constraints have been identified as strategic assets, the locations of which are shown on drawing 38421/LEA/CVD/006 and listed below for information:

- The village to the south has pumped systems discharging to a gravity network to the south of Didcot town centre;
- A 375mm diameter sewer transfers flows from the west and south to the east of Didcot town centre;
- A 900 x 600mm sewer transfers flows from the south east corner of Didcot through the town centre, crossing the West Coast Main Line to Ladygrove Estate via an existing underpass to the railway;
- A 600mm diameter track crossing is present from the town centre to Ladygrove Estate via an existing underpass to the railway;
- A 375mm diameter track crossing is present from the town centre to Ladygrove Estate;
- All flows from the west of Didcot are currently pumped to the STW;
- Flows from the Ladygrove Estate are pumped to a 1000mm diameter gravity crossing of the West Coast Main Line to Didcot STW;
- Flows from the 900 x 600mm sewer are then transferred to the treatment works via a 1200mm diameter undertrack crossing.

3.2 Potable Water

The potable water network constraints have been identified as strategic assets, the locations of which are shown on drawing 38421/LEA/CVD/005 and listed below for information:

- The town is served from the west and east via strategic (trunk) water mains;
- A 450mm ductile iron main is shown in the highway verge along Hadden Hill prior to connecting to a 9'' main;
- The west of the town is served by a 12'' and 400mm diameter main. The 400mm main then turns north and is located to the east of the proposed Great Western Park Development;
- A 300mm diameter Fductile iron main is located within Station Road crossing the West Coast Main Line via an existing bridge and underpass;

- A 9'' main is located along the eastern side of the Didcot town centre crossing the West Coast Main Line via an underpass before continuing on along the west of Ladygrove Estate.

3.3 Electricity

The electricity network constraints have been identified as strategic assets, the locations of which are shown on drawing 38421/LEA/CVD/007 and listed below for information:

- The town is served from the Milton substation to the north west of Didcot;
- Overhead 132kV electric cables mounted on pylons are located to the east of Didcot crossing the West Mainline prior to crossing through the Ladygrove Estate to Didcot power station;
- Overhead 33kV electric cables mounted on poles are located to the north east of Didcot crossing to Didcot power station;
- Overhead 33kV electric cables mounted on poles are located to the north west of Didcot crossing to Didcot power station;
- Underground 132kV electric cables are located to the west of Didcot to Didcot power station;

3.4 Gas Mains

The gas network constraints have been identified as strategic assets, the locations of which are shown on drawing 38421/LEA/CVD/004 and listed below for information:

- National Grid national high pressure gas main is located to the north east of Didcot serving Didcot power station. As stated in National Grid Guidelines the easement for this pipe is between 6m to 25m depending on the pipe size and pressure;
- SGN 16" Steel intermediate pressure gas main is located to the north of Didcot;
- SGN 12" Cast Iron medium pressure gas main is located to the north of Didcot;
- SGN 12" Steel Medium pressure gas main is located to Ladygrove East;
- 2 No. low pressure gas main crossings of the West Coast Main Line are shown via existing bridges;
- A medium pressure gas main crossing of the West Coast Main Line are shown via an existing underpass;
- Multiple low pressure gas mains crossing the development areas that may require diversion (typical time frame of 6 months for a diversion) depending on site layout.

3.5 Telecommunications

The telecom network constraints have been identified as strategic assets, the locations of which are shown on drawing 38421/LEA/CVD/008 and listed below for information:

- Several crossings of the West Coast Main Line are shown via existing bridges and underpasses;
- 6 street cabinets on Didcot exchange are currently enabled for fibre broadband;
- 3 street cabinets on Rowstock exchange are currently enabled for fibre broadband;
- Any new lines from the Didcot telecom exchange to the north will require a crossing of the West Coast Main Line.

4. Capacity Requirements for Proposed Development

4.1 Sewerage Network and Potable Water

Existing Capacity

Sewerage Network

Amec Foster Wheeler requested information regarding capacity within the existing sewerage network from Thames Water on the 10th November 2016. Thames Water confirmed that the wastewater network in this area is unlikely to be able to support the demand anticipated from the Didcot Garden Town developments. Upgrades to the existing drainage infrastructure are likely to be required to ensure sufficient capacity is brought forward ahead of the development. Where there is a capacity constraint the Local Planning Authority should require the developer to provide a detailed drainage strategy informing what infrastructure is required.

At the time that planning permission is sought for development at a site, Thames Water are expected to request a planning condition to ensure the recommendations of the strategy are implemented ahead of the demand from the development.

The capacity of the STW is currently has a known population equivalent of 38,112, with expectations of serving 53,877 by 2021 & 63,392 by 2026.

Oxfordshire County Council drainage engineer indicated known capacity issues within the Ladygrove Estate due to the surface water system arising from ground water infiltration.

Potable Water Network

Amec Foster Wheeler requested information regarding capacity within the existing potable water network from Thames Water on the 10th November 2016. At the time of writing, there is no information available regarding the existing capacity within the Didcot Garden Boundary.

Thames Water have raised concerns about the capacity of the potable water system within recent planning applications.

Water Security

The Thames Water Final Water Resources Management Plan 2015 – 2040 issued in 2014 concluded that there is a predicted water deficit during dry years from 2020 onwards. Thames Water are looking to address this by various methods including metering, use of water saving devices and reducing leakage. There may be potential for investigating large resource schemes, but these will primarily be to serve the London area where significant deficit is predicted.

Planned Upgrades

Sewerage Network

Thames Water indicated that upgrade plans for Valley Park and Great Western Park has been divided in two separate projects for north and south of these areas.

Currently Thames Water is constructing a tunnel to provide a connection to the STW for north of the Great Western Park and Valley Park. This project involves the construction of an approximately 3.7km long gravity sewer between the A34 and the Didcot STW. After the completion of this tunnel Thames Water will construct a sewage system which runs around the existing Didcot Town and connects to a new pumping station in Ladygrove East. The location of the new pumping station needs to be confirmed with Thames Water.

Thames Water also currently plan to renovate sewers which have been damaged, either from aging or other street works activities. This includes localised sewer rehabilitation using lining, patch repair, pipe replacement and manhole repairs to prevent water ingress, where cost effective.

Thames Water are currently within the design phase of a water quality project at the STW with a change in ammonia consent from 9mg/l to 3mg/l. Thames Water are also looking at the capacity of the inlet works for the pumping station on-site that is due to be commissioned next year. As part of this project Thames Water will be undertaking a hydraulic assessment of the storm stream to understand if there are any constraints on their operations.

Potable Water Network

At the time of reporting there is no information available regarding planned upgrades within the Didcot Garden Town boundary. Any potential upgrades or capacity issues need to be confirmed by Thames Water and also recognised by South Oxfordshire and Vale of White Horse County Councils.

Water Security

Along with reducing current leakage and providing user information on reducing water usage, Thames Water are reviewing a proposal to construct a new approximately 4 square mile reservoir near Abingdon. The new reservoir is approximately 7km north-west of Didcot and is proposed to increase the water supply for London and the south east, reducing the predicted water deficit.

Additional Capacity Requirements

Sewerage Network / Potable Water

There will be an increase in capacity requirements within the existing network and also at Didcot STW as a result of the additional developments. Table 4-1 shows the additional (theoretical) capacity requirements calculated based on industry best practice of 4000 litres/day/household. The headroom (or capacity) requirements have been calculated using an average housing occupation of 2.4 people/house.

Table 4-1 Sewerage and Potable Water Capacity Requirements.

Development Name	Number of Properties	Additional Head Room Requirements	Theoretical Foul Dry Weather Flow (l/s)	Theoretical Water Consumption (l/s)
Vauxhall Barracks	400	960	2.80	2.80
North East Didcot	2100	5040	14.70	14.70
Ladygrove East	700	1680	4.90	4.90
Milton Heights	450	1080	3.15	3.15
West of Harwell	200	480	1.40	1.40
North of Harwell Campus	550	1320	3.85	3.85

East of Harwell Campus	850	2040	5.95	5.95
Valley Park and North West Valley Park	5100	12240	35.70	35.70
East of Sutton Courtenay	200	480	1.40	1.40
Great Western Park	3500	8400	24.50	24.50
Didcot A	400	960	2.80	2.80
Didcot Gateway	300	720	2.10	2.10
Didcot Orchard Centre Phase 2	300	720	2.10	2.10
Totals	**15050**	**36120**	**105.35**	**105.35**

Note: Refer to drawing 38421/LEA/CVD/015 (Appendix A) for Proposed development areas associated number.

Opportunities

There are several things that could be undertaken to maximise the opportunities available within the Didcot catchment. The possibilities that could be reviewed are shown below:

- Reduce the demand for both potable water supply and foul drainage capacity by use of water saving devices within new developments and existing homes.
- Reduce the demand for potable water supply by use of rainwater harvesting within new developments. This can be incorporated within SuDS schemes, if designed in appropriately.
- Reduce the demand for both potable water supply and foul drainage capacity by use of multi-residential greywater harvesting across the catchment where sink, shower, and bath water is collected, filtered, disinfected and stored for reuse. This can be then re-used within the properties for non-potable requirements such as for the flushing of toilets. Typical systems on the market in the UK have shown a decrease of water consumption (and therefore foul water discharge) within a block of flats of approximately 50%. This would be most applicable for new developments where it can be designed into the master plan rather than retro-fitting to the whole catchment.
- Reduce the demand for potable water through metering at all properties.
- Reduce the demand on the water for all the Didcot zones by undertaking a leak detection survey and repairing these leaks. This is likely to reduce water loss across the catchment, resulting in a reduced demand at water treatment plants. At this stage it is unknown how/if this could be funded across the catchment and may already be within the Thames Water programme of works.
- Reduce the demand on the foul sewer of all the Didcot zones by undertaking works to separate surface water from the foul system either through repair (ground water ingress)

or by disconnecting surface water cross connections, however this is likely to be expensive and not possible across the whole catchment.

- Use public open space to construct offline underground storage tanks to provide storage on the existing foul system. If constructed with high level overflows from the existing system it may further be possible to reduce the required storage by using existing storage within the network.
- Use existing track crossings/under paths by upsizing existing sewers instead of installing new ones. However pipe sizes at these locations are likely to be limited due to existing services within the area.
- Construct a dedicated service tunnel underneath the railway sized to suit a range of services including sewers, water mains, electric cables, gas mains and telecoms. This option would reduce the requirement of multiple crossings of the mainline and the number of chambers required for each of these crossings. This would however need to be reviewed/approved by Network Rail and may limit systems to be pumped only depending on site elevations.
- Early consultation with Thames Water at a catchment wide level will allow the organisation to plan for the proposed developments in a strategic manner. Whilst they are constrained by the AMP cycle with 5 year windows for Asset Management Plans, the requirements for upgrade and designs for increased capacity at facilities look to a horizon where committed development can be confirmed. Of particular importance to Thames Water is the phasing of the construction at individual sites, so that capacity thresholds can be better modelled and understood for the network and facilities.
- Opportunity to include smart water gully systems to remotely inform any maintenance issues. Refer to Flood Risk and Sustainable Drainage Strategic Initiatives report (Ref 38421R004)

4.2 Electricity

Existing Capacity

Scottish & Southern Electricity Networks completed a feasibility study reviewing the impact on their network in October 2016. The feasibility study indicated that the existing Milton transformers need improvements as currently there is not enough capacity in the existing network.

National Grid stated that there are no existing capacity issues with electricity transmission cables.

Planned Upgrades

Based on the feasibility study carried out by SSE, upgrades will be required to the Milton primary substation to increase capacity to 22.56 MVA, based on the growth for the Didcot Garden Town. The following upgrades are currently planned in Didcot:

- Within the Drayton BSP, the housing growth will trigger the replacement of the Milton primary transformers from three 15/30MVA 33/11 KV transformers to three 20/40 MVA 33/11KVA transformers by 2017;
- Upgrading Drayton/Milton 33 KV circuits by 2017.

Additional Capacity Requirements

With the additional developments, there will be an increase in capacity requirements within the existing network and at Milton sub-station. Table 4-2 shows the additional capacity requirements based on the SSE feasibility report.

The feasibility report produced by SSE stated that housing growth was predicted by local plans to calculate the rate of housing construction in each area. These plans were then converted into a loading growth of 1.5KVA average peak load per household.

Table 4-2 Electricity Capacity Requirements

Development Name	Number of Properties	Increased load KVA
Vauxhall Barracks	400	600
North East Didcot	2100	3150
Ladygrove East	700	1050
Milton Heights	450	675
West of Harwell	200	300
North of Harwell Campus	550	825
East of Harwell Campus	850	1275
Valley Park and North West Valley Park	5100	7650
East of Sutton Courtenay	200	300
Great Western Park	3500	5250
Didcot A	400	600
Didcot Gateway	300	450
Didcot Orchard Centre Phase 2	300	450
Totals	**15050**	**22557**

Note: Refer to drawing 38421/LEA/CVD/015 (Appendix A) for Proposed development areas associated number.

Opportunities

The key opportunities within the Didcot Garden Town area relate to renewable energy. This is covered in more detail in a separate report, but key points are brought out here:

- Provision for battery storage to complement roof mounted solar PV array;
- Provision of electric vehicle charging points at home with allocation of space for parking such vehicles, or community parking areas with access to charging points where density of development precludes space for vehicles at individual dwelling level;

- Public access charging areas within central areas (vehicles and e-bikes);
- Use of solar panels to power electric vehicle charging points;
- Use of the landfill site at Sutton Courtenay as a ground mounted solar PV array, following closure as a landfill site in 2036. This could have an energy generating capacity of 12-18 GWh per year;
- Solar innovation making use of new technology in building, e.g. solar tiles, solar floors, solar windows;
- Potential to integrate a fuel CHP system at Harwell or Culham sites.

4.3 Gas Mains

Existing Capacity

Amec Foster Wheeler requested information regarding capacity within the existing gas network from SGN on the 11th November 2016. At the time of reporting there is no information available regarding the existing capacity within the Didcot Garden boundary.

Planned Upgrades

Amec Foster Wheeler requested information regarding capacity within the existing gas network from SGN on the 11th November 2016. At the time of writing there is no information available regarding planned upgrades within the Didcot Garden Town project boundary.

Additional Capacity Requirements

With these additional developments, there will be an increase in capacity requirements within the existing network. Table 4-3 shows the additional capacity requirements.

Table 4-3 Gas Capacity Requirements

Development Name	Number of Properties	Theoretical Annual Average Loading kWh/yr	Theoretical Average Loading kVA
Vauxhall Barracks	400	8,240,000	941
North East Didcot	2100	43,260,000	4,938
Ladygrove East	700	14,420,000	1,646
Milton Heights	450	9,270,000	1,058
West of Harwell	200	4,120,000	470
North of Harwell Campus	550	11,330,000	1,293
East of Harwell Campus	850	17,510,000	1,999

Development Name	Number of Properties	Theoretical Annual Average Loading kWh/yr	Theoretical Average Loading kVA
Valley Park and North West Valley Park	5100	105,060,000	11,993
East of Sutton Courtenay	200	4,120,000	470
Great Western Park	3500	72,100,000	8,231
Didcot A	400	8,240,000	941
Didcot Gateway	300	6,180,000	705
Didcot Orchard Centre Phase 2	300	6,180,000	705
Totals	**15050**	**310,030,000**	**35,392**

Note: Refer to drawing 38421/LEA/CVD/015 (Appendix A) for Proposed development areas associated number.

Opportunities

There are several things that could be undertaken to maximise the opportunities available within the Didcot catchment. The items that could be reviewed are shown below:

- Use the new deck of the proposed Science Bridge to incorporate gas supplies to the North. This would provide a means of crossing the railway without the need for tunnelling.
- Use existing track crossings/under paths by construction of new gas mains. This however is likely to limit pipe sizes due to existing services within the area.
- Construct a dedicated service tunnel underneath the railway sized to suit a range of services including sewer(s), water mains, electric cables, gas mains and telecoms. This option would reduce the requirement of multiple crossings of the main and the number of chambers required for each of these crossings. This would however need to be reviewed/approved by network rail and may limit sewers to being pumped only depending on site elevations.

4.4 Telecommunications

Existing Capacity

Landline/ broadband

- **BT Network:** As of November 2016, Openreach confirmed that there are no issues with capacity within the existing catchment area. However ongoing capacity management and review is in place to support any new developments.

- **Virgin Media Network**: At the time of reporting there is no information available regarding capacity within the Didcot Garden Town boundary.

Mobile Network

Refer to plans shown in Figures 2.1 to 2.9, included in section 2.5, for further details in regard to mobile coverage in Didcot area.

A review of the data from the OFCOM signal checker highlights the following:

- Vodafone and O2 networks provide a good indoor coverage in the majority of the buildings within the area for voice calls and 4G data for the Didcot Gardens Boundary area.
- The EE network provides the majority of the Didcot Garden Town's Boundary area with a good courage for voice calls and 4G data. However in locations the coverage in some buildings may be poor.
- The Three Mobile network is shown to have fairly poor coverage inside most buildings for voice calls and 4G data for the Didcot Gardens boundary area.

Planned Upgrades

Landline/ broadband

- **BT Network:** Openreach confirmed that at this stage they haven't scheduled any upgrade works to the existing network, located within the proposed development area. However unscheduled upgrade works may be required to make fibre broadband available for both existing and new premises. Refer to drawing 38421/LEA/CVD/008 for further details. Upgrade works to provide fibre broadband in several locations are due for completion by December 2017;
- **Virgin Media:** Amec Foster Wheeler requested information regarding capacity within the existing Virgin Media network on the 1st December 2016. At the time of reporting there is no information available regarding the existing capacity within the Didcot Garden Town boundary.

Mobile Network

At the time of reporting there is no information available regarding planned upgrades within the Didcot Garden Town boundary.

Additional Capacity Requirements

BT Network

With the proposed development plan there will be an increase in capacity requirements within the existing network. Table 4-4 shows an indication of the number of cabinets required to connect new properties in the existing FTTC system.

Table 4-4 BT Capacity Requirements

Development Number and Name	Number of Properties	No. of lines outgoing form Cabinet	*No. of Cabinets required
Vauxhall Barracks	400	400	1.5

North East Didcot	2100	2100	7.3
Ladygrove East	700	700	2.5
Milton Heights	450	450	1.6
West of Harwell	200	200	0.7
North of Harwell Campus	550	550	2.0
East of Harwell Campus	850	850	3.0
Valley Park and North West Valley Park	5100	5100	17.70
East of Sutton Courtenay	200	200	0.7
Great Western Park	3500	3500	12.20
Didcot A	400	400	1.5
Didcot Gateway	300	300	1.1
Didcot Orchard Centre Phase 2	300	300	1.1
Totals	**15050**	**15050**	**53**

Note: Refer to drawing 38421/LEA/CVD/015 (Appendix A) for Proposed development areas associated number.

*Number of new cabinets are based on each cabinets supporting 288 lines. Data extracted from available published information found on http://www.ispreview.co.uk/index.php/2016/09/openreach-bt-handles-full-capacity-fttc-broadband-cabinets.html

It should be noted that Openreach were not able to provide information for any constraints within the network capacity due to the size of the proposed development. Openreach would need to plan appropriately for this (i.e. installing new cable where required, moving the current infrastructure where the proposed development creates new roads etc.). Once the plans are confirmed in more detail, Openreach will be able to provide further information in detail.

Virgin Media

Amec Foster Wheeler requested information regarding capacity within the existing Virgin Media network on the 1st December 2016. At the time of writing there is no information available regarding the existing capacity within the Didcot Garden boundary.

Opportunities

The items that could be reviewed are shown below:

- Make use of the FTTP technology for proposed properties as it is much faster than FTTC. In addition it eliminates the requirement for new premises to be adjacent to street cabinets, in order to get faster speeds. The availability of ultrafast speeds will have a positive impact on the proposed development as this would encourage home working. This would have a beneficial effect upon the traffic flows from the proposed development by reducing the need to commute.
- Removal of existing copper cabinets that are no longer required throughout the town.
- Construction of mobile masts within open spaces around the Didcot Garden Town using the same mobile mast where possible for multiply companies.
- If new duct work is required to be installed there would be an opportunity to lay multiple ducts to allow for future connections. This could be considered within a standard service corridor and included within the bridge deck of the new science bridge.

5. Opportunities and Constraints for Proposed Development Sites

5.1 Introduction

For the purposes of the opportunities and constraints Didcot has been categorised into five areas and include the proposed developments shown in Table 5-1 Didcot Zones as shown on drawing 38421/LEA/CVD/015 included within Appendix A.

It should be noted that any crossing of the West Coast Main Line will need the approval of Network Rail requiring temporary processions of the railway by the contractor. Therefore any reduction in the required crossings has been deemed an opportunity within this section.

Table 5-1 Didcot Zones

Area Title	Proposed Developments Covered	Drawing Reference
North East (NE) Zone 1	Development 6 – Didcot Parkway Station and North and South Gateways	38421/CVD/LEA/022
	Development 9 – Ladygrove East	38421/CVD/LEA/025
	Development 12 – Railway Centre	38421/CVD/LEA/028
North East (NE) Zone 2	Development 5 – North East Didcot	38421/CVD/LEA/021
	Development 14 – Land between NE Didcot and railway	38421/CVD/LEA/030
North West (NW)	Development 4 – Didcot A	38421/CVD/LEA/020
	Development 8 – D-Tech	38421/CVD/LEA/024
	Development 11 – Gravel Pit/Landfill (Park lane opportunity)	38421/CVD/LEA/027
West	Development 2 – Valley Park	38421/CVD/LEA/016 and 38421/CVD/LEA/017
	Development 3 – Great Western Park	38421/CVD/LEA/018 and 38421/CVD/LEA/019
	Development 10 – NW Valley Park	38421/CVD/LEA/026
South	Development 1 – Orchard Centre Phase 2*	Not Applicable
	Development 7 – Rich Sidlings	38421/CVD/LEA/023
	Development 13 – Vauxhall Barracks	38421/CVD/LEA/029

*Development not considered as part of this report.

5.2 Surface and Foul Water

NE Didcot Zone 1

Table 5-2 NE Didcot Zone 1 Surface and Foul Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 6	Potential to upgrade sewerage network in this area to suit further development areas including areas 9 and 12 when modifying the station. Opportunity to discharge surface water into the existing network if storage is provided and agreed with Thames Water.	The development is likely to require the diversion under Section 185 of the Water Industry Act 1991 for the 4 No. existing foul sewers, 2 No. existing foul rising mains and 1 No. surface water sewer that would be crossed by the new station. Depending on the length/complexity of the sewer to be diverted the time scale will vary between 18 months and 3 years.
Development 9	It may be possible to pump flows from any foul flows from the development to the existing gravity system at manhole 2101 which has an invert level of 52.01mAOD. This would remove the need to drain to the Ladygrove Estate pumping station. Potential to upgrade sewerage network within this area to suit further development areas.	The development site is likely to require a pumping station due to existing ground levels across the site. Downstream reinforcement of the existing system is likely to be required due to known incapacity issues.
Development 12	Existing gravity foul connection is possible due to the existing gravity sewer crossings within this location. Opportunity to provide a service tunnel beneath the West Coast Main Line allowing for maintenance to be completed beneath the railway. This would also allow for the existing network to be upgraded within this area increasing capacity into the STW.	The development is likely to require the diversion under Section 185 of the Water Industry Act 1991 for the 2 No. existing foul sewers that would be affected by the development. Depending on the length/complexity of the sewer to be diverted the time scale will vary between 18 months and 3 years. Any new sewer would need to cross the West Coast Mainline and other network rail assets. This would require written permission and supervision throughout by Network Rail.

NE Didcot Zone 2

Table 5-3 NE Didcot Zone 2 Surface and Foul Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 5*	The Foul Water Study undertaken by Thames Water suggested that online storage could be provided within the existing network to reduce the impact on the downstream system. If this was sized correctly it would also improve the capacity for further developments upstream of the storage. Another possible solution would be to provide offline storage which would reduce the volume however this would increase land take. An opportunity could be to improve the existing network by removing cross connections from the surface water network to the foul system and lining old sewers to prevent water increase.	A Foul Water Study undertaken by Thames Water identifies that there is currently inadequate capacity in the existing sewerage network to accept the development flows under storm conditions. The capacity of the Ladygrove Sewerage Pumping Station will likely need to be increased.
Development 14	Opportunity to drain via gravity to the existing network within Ladygrove Estate. If this development was incorporated into development 5 the improvements to the network could be completed at the same time.	The existing foul network within the Ladygrove Estate is known to be hydraulically under capacity. Further to this it is reported to be responsive to rainfall events, suggesting there is water ingress and/or cross connections with surface water networks.

*A detailed utility review has been undertaken by RPS Group issued in July 2015 as part of the planning process for this development site. This includes constraints and opportunities following discussion with Thames Water.

South Didcot

Table 5-4 South Didcot Surface and Foul Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 7	Opportunity to provide a dedicated service corridor under the West Coast Main Line allowing for a pumped or gravity sewer crossing.	The development is likely to require the diversion under Section 185 of the Water Industry Act 1991 for the 2 No. existing foul sewers that would be affected by the development. Depending on the length/complexity of the sewer to be diverted the time scale will vary between 18 months and 3 years.
Development 13	Opportunity to use the existing drainage network onsite with minor upgrades depending on layout and capacity.	Limited capacity within offsite sewers may require additional downstream upsizing and will require a crossing of the West Coast Main Line. Abandonment of existing site sewers if not required.

West Didcot

Table 5-5 West Didcot Surface and Foul Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 2	Thames Water are currently constructing the Didcot tunnel to provide a connection to the STW for the Great Western Park and Valley Park. This involves the construction of approximately 3.7km of gravity sewer between the A34 and the Didcot STW. There is an opportunity to connect the foul pumping station from the development to this new gravity sewer.	Thames Water has identified an inability of the existing waste water infrastructure which may lead to sewage flooding downstream of the development. Thames Water have recommended that a drainage strategy which outlines any on and/or off site drainage works.

Development Number	Opportunities	Constraints
	There is a chance to provide a dedicated service corridor under the West Coast Main Line.	
Development 3	There is an opportunity to disconnect the northern catchment from the Mendip Heights network on completion of the Didcot tunnel.	Connections to the existing foul system have already been undertaken for the three catchments described within the Great Western Park Didcot Foul Drainage Statement In Respect Of Phase SN02ABCD & DN02CD issued by JKL/MB in March 2015.
Development 10	A chance to drain this via the same network and method as Development 3 if designed together. This would reduce future costs.	This is likely to require the diversion of an existing 150mm diameter sewer under a Section 185 agreement of the Water Industry Act 1991 along the western edge. Depending on the length of the sewer to be diverted the time scale will vary between 18 months and 3 years.

NW Didcot

Table 5-6 NW Didcot Surface and Foul Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 4	Thames Water are reviewing an option to continue with the 87GG Project. This involves the construction approximately of a 3.7km long gravity sewer between the A34 and the Didcot STW. There is a chance to connect the foul flows from the development to this new gravity sewer reducing offsite sewer requirements.	Thames Water has identified an inability of the existing waste water infrastructure which may lead to sewage flooding downstream of the development. Thames Water have recommended that a drainage strategy detailing any on and/or off site drainage works is produced. Limited funding is available for the Thames Water 87GG Project and it is likely to require a Section 98 from the developers. This would result in the developers paying the costs with a discounted based on income from properties.

Development Number	Opportunities	Constraints
Development 8	There is opportunity to connect any flows from the development to a gravity sewer to the south of the site. This is likely to require pumped flows from the site.	Thames Water has identified an inability of the existing waste water infrastructure which may lead to sewage flooding downstream of the development. The development is likely to require the diversion under section 185 of the Water Industry Act 1991 of the 1 No. existing foul rising main that would be affected by the development. Depending of the length/complexity of the sewer to be diverted the time scale will vary between 18 months and 3 years.
Development 11	Opportunity to drain any facility to a septic tank system using constructed wetlands as secondary treatment. This would mean that no direct connection would be required to the existing STW reducing any sewer lengths to a minimum while contributing to the park with a wetland facility.	Due to the site being a former landfill ground conditions could limit the use of below ground sewers or result in settlement of sewers overtime. Gravel bed and surrounds are likely to require wrapping in a geotextile wrap increasing costs to prevent migration of fines.

5.3 Potable Water

NE Didcot Zone 1

Table 5-7 NE Didcot Zone 1 Potable Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 6	Opportunity to construct a water main within any new subway installed under the railway as part of the train station development.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development. Highway crossing of strategic main may require the main to be located diverted to prevent damage. An option would be to divert the water main under a Section 185 agreement of the Water Industry Act 1991. Depending of the length of the main to be diverted the time scale will vary between 18 months and 3 years.
Development 9	Opportunity to connect to existing strategic water main.	Existing strategic water main located along the southern and western edges located 7m from the highway kerb. Thames Water will not allow any building within 5 metres of this main and will require 24 hours access for maintenance purposes. An option would be to divert the water main under a Section 185 agreement of the Water Industry Act 1991. Depending of the length of the main to be diverted the time scale will vary between 18 months and 3 years.
Development 12	Opportunity to incorporate a potable water connection into a service tunnel beneath the West Coast Main Line. This could be installed as a ring main to prevent a dead-end on any lead.	No existing portable water connection across the West Coast Main Line.

NE Didcot Zone 2

Table 5-8 NE Didcot Zone 2 Potable Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 5*	Opportunity to extend the strategic main further west providing potable water to other future developments.	Given the proposed vehicular accesses onto Ladygrove Estate at the eastern frontage of the Site, the existing trunk main may require localised lowering. Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development. Thames Water recommend an impact study of the existing water supply infrastructure is undertaken.
Development 14	Opportunity to extend the strategic main further west providing potable water to other future developments. Opportunity to introduce rainwater and grey water harvesting.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development.

*A detailed utility review has been undertaken by RPS Group (reference: BA/sb/JNY4873-10D) issued in July 2015 as part of the planning process for this development site. This includes constraints and opportunities following discussion with Thames Water.

South Didcot

Table 5-9 South Didcot Potable Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 7	Opportunity to look at a connection from water mains adjacent to the site if agreed with Thames Water reducing excavation requirements.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development.
Development 13	Opportunity to use existing water supply if capacity proven.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development.

West Didcot

Table 5-10 West Didcot Potable Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 2	Opportunity for developers to work together extending water mains west through the new development footpaths. Opportunity to provide a water main within the road deck of science bridge providing a further crossing of the rail track.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development. Thames Water recommend an impact study of the existing water supply infrastructure is undertaken. There is a Thames Water main crossing the development site which may need to be diverted at the Developer's cost. There are large water mains adjacent to the proposed development. Thames Water will not allow any building within 5 metres of these and will require 24 hours wayleave access for maintenance purposes.

Development Number	Opportunities	Constraints
Development 3	Opportunity for developers to work together extending water mains west through the new development footpaths.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development.
Development 10	Opportunity for developers to work together extending water mains west through the new development footpaths.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development.

NW Didcot

Table 5-11 NW Didcot Potable Water Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 4	Opportunity to provide a water main within the road deck of science bridge providing a further crossing of the rail track and a crossing to the development site.	The existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development. Impact studies of the existing water supply infrastructure. Currently no water connection to the site and therefore would require a new connection.
Development 8	Opportunity if the water main to the north is upgraded to also provide a connection for the development from the north, if agreed with Thames Water.	Thames Water have identified that the existing water supply infrastructure has insufficient capacity to meet the additional demands for the proposed development. There is limited crossings of the east coast main line.

Development 11	Opportunity to look at a connection from the north of the site if agreed with Thames Water.	A water supply will still be required for any toilet sinks, cafes and other catering facilities.

5.4 Electricity

NE Didcot Zone 1

Table 5-12 NE Didcot Zone 1 Electricity Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 6	Existing 11kV cables are located to the south-east corner with an existing crossing of the railway. This may allow for a future connection point for the development. There is the potential for diversion of the overhead electrical cables either around the site or by means of buried solution.	132kV National Grid overhead electricity cables have an easement including the use of a minimum 6m restriction as per the health and safety guidance GS6. 11kV electricity cables run through the middle of the site from east to west.
Development 9	Existing 11kV cables are located to the west and south. This may allow for a future connection point for the development.	132kV National Grid overhead electricity cables have an easement including the use of a minimum 6m restriction as per the health and safety guidance GS6.
Development 12	Existing 11kV cables cross the site. This may allow for a future connection point for the development.	It is expected that the 11kV electric cables will need to be diverted.

NE Didcot Zone 2

Table 5-13 NE Didcot Zone 2 Electricity Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 5	There is the opportunity to divert the overhead electrical cables either around the site or by means of buried solution.	There are SSE extra high voltage overhead cables rated to a minimum of 33kV with associated easement and height restrictions. The 11kV cables adjacent to highway and roads may require diversion to allow for easement requirements and access roads.
Development 14	There is the opportunity to divert the overhead electrical cables either around the site or by means of buried solution.	There are SSE extra high voltage overhead cables rated to a minimum of 33kV with associated easement and height restrictions.

South Didcot

Table 5-14 South Didcot Electricity Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 7	Existing 11kV cables are located to the south of the site. This may allow for a future connection point for the development.	The 11kV cables adjacent to highway and roads may require diversion to allow for easement requirements and access roads.
Development 13	Existing 11kV cables are located to the crossing the site. This may allow for a future connection point for the development.	The 11kV cables adjacent to highway and roads may require diversion to allow for easement requirements and access roads.

West Didcot

Table 5-15 West Didcot Electricity Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 2	Existing 11kV cables are crossing the site. This may allow for a future connection point for the development.	There may be a requirement to divert the 11kV cables crossing the site.
Development 3	Opportunity for connection with development 2 if planned in advance.	Development being completed under construction so there is minimal influence on utility locations.
Development 10	Existing 11kV cables are crossing the site. This may allow for a future connection point for the development.	There may be a requirement to divert the 11kV cables crossing the site.

NW Didcot

Table 5-16 NW Didcot Electricity Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 4	Existing 11kV cables are crossing the site. This may allow for a future connection point for the development.	Requirement to divert the 11kV cables crossing the site.
Development 8	Opportunity to divert the overhead electrical cables either around the site or by routing underground.	There are SSE extra high voltage overhead cables rated to a minimum of 33kV with associated easement and height restrictions. There may be a requirement to divert the 11kV cables adjacent to highway and roads to allow for easement requirements and access roads.

Development Number	Opportunities	Constraints
		There is a 132kV National Grid overhead electricity cables easement including the use of a minimum 6m restriction as per the health and safety guidance GS6.
Development 11	There are existing 11kV cables to the east of the site. This may allow for a future connection point for the development.	There is 132kV National Grid overhead electricity cables easement including the use of a minimum 6m restriction as per the health and safety guidance GS6. There may be a requirement to divert the 11kV cables.

5.5 Gas Mains

NE Didcot Zone 1

Table 5-17 NE Didcot Zone 1 Gas Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 6	Opportunity to construct a new gas main within any new subway installed under the railway as part of the train station development.	No identified site specific constraints.
Development 9	There is a possible connection point to existing Medium pressure gas main.	No identified site specific constraints.

Development Number	Opportunities	Constraints
Development 12	Opportunity to incorporate a gas main connection into a service tunnel beneath the West Coast Main Line.	No existing track crossing to provide gas to the development. Therefore, a new tunnel would be required.

NE Didcot Zone 2

Table 5-18 NE Didcot Zone 2 Gas Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 5	Opportunity to provide a gas connection for development 14 if planned ahead.	There is a National Grid Gas high pressure gas pipe with an easement of 6m to 25m. A minimum notice of 14 days is required before any construction work takes place. There is a SGN 16” intermediate gas pipe with an easement of 3m. A minimum notice of 14 days is required before any construction work takes place.
Development 14	Opportunity to provide a gas connection for future developments with Development 5, if planned.	There is a National Grid Gas high pressure gas pipe with an easement of 6m to 25m. A minimum notice of 14 days is required before any construction work takes place. There is a SGN 16” intermediate gas pipe with an easement of 3m. A minimum notice of 14 days is required before any construction work takes place.

South Didcot

Table 5-19 South Didcot Gas Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 7	There is the opportunity to provide a gas connection for future developments from medium gas main crossing east of the proposed development.	No identified site specific constraints.
Development 13	There is the opportunity to utilise existing network depending on ages, condition and required capacity.	Existing mains are owned and operated by third party and would require permission to work or transfer ownership.

West Didcot

Table 5-20 West Didcot Gas Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 2	There is the opportunity for developers to work together extending gas mains west through the new development footpaths.	No identified site specific constraints.
Development 3	There is the opportunity for developers to work together extending gas mains west through the new development footpaths.	Development being completed (or under construction) so minimal influence on utility locations.

Development 10	There is the opportunity for developers to work together extending gas mains west through the new development footpaths.	No point of connection adjacent to the proposed development.

NW Didcot

Table 5-21 NW Didcot Gas Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 4	There is the opportunity for a connection from development 2 via the science bridge.	No existing gas mains are located within the vicinity of the site.
Development 8	No identified site specific opportunities.	A National Grid high pressure gas main crosses the site. This is likely to have an easement requirement of 6m to 25m depending on the size, condition and pressure of the main, as per the National Grid guidance for working near gas mains. Any working in the vicinity of the gas main will require a minimum notice of 14 days to national grid prior to works commencing. A 16” intermediate pressure gas main crosses the site. This is likely to have an easement requirement of 3m depending on the size, condition and pressure of the main. Any development in the vicinity of the gas main will require a minimum notice of 14 days to SGN prior to commencing works.
Development 11	Possible connection to Medium pressure gas main to the north of the site.	High and intermediate pressure gas mains to the south of the site.

5.6 Telecommunications

NE Didcot Zone 1

Table 5-22 NE Didcot Zone 1 Telecom Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 6	*Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located adjacent to the proposed development area. This would reduce excavations however this is dependent on duct capacity. While diverting the telecoms that cross the site it may be possible to increase the number of ducts increasing capacity for future network cables.	Diversion of the existing underground BT telecommunications cables, crossing the proposed development at several locations, are likely to be required. This would take approximately 3 months depending on the extent of diversion/removal works. Diversion of the existing BT Overhead cables, crossing the proposed development, are likely to be required to allow building work. This would take approximately 3 months depending on the extent of removal works. Diversion of the existing underground Virgin Media telecommunications cables, crossing the proposed development, are likely to be required. This would take approximately 3-6 months depending on the extent of diversion/removal works. Diversionary/Removal works to existing Vodafone telecommunications cables, running underground the proposed development along the shared path located west of Cow Lane on the south, will be required. This would take approximately 3-6 months depending on the extent of diversion/removal works. Three Mobile: Network coverage issues are noticed within the proposed development area on the south side. Refer to Note 4 for further details.
Development 9	*Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT	Vodafone: Network coverage issues are noticed within the proposed development area on SE corner. Refer to Note 3 for further details.

Development Number	Opportunities	Constraints
	exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located adjacent to the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Three Mobile: Network coverage issues are noticed within the proposed development area. Refer to Notes 1 and 4 for further details.
Development 12	Available connection locations: *Proposed development may be connected using the existing BT duct work network, with the existing crossing of the railway. This would reduce excavations and time constraints for crossing the railway.	Diversion of the existing underground BT telecommunications cables, crossing the proposed development at several locations, are likely to be required. This would take approximately 3 months depending on the extent of diversion/removal works. Three Mobile: Network coverage issues are noticed within the proposed development area. Refer to Note 4 for further details.

NE Didcot Zone 2

Table 5-23 NE Didcot Zone 2 Telecom Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 5	*Proposed development may be connected using the existing BT duct work network, located along the south, east and north sides of the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity.	Existing underground BT telecommunications cables cross the proposed development at several locations. Diversion of these is expected. This would take approximately 3 months depending on the extent of diversion/removal works. Existing underground Vodafone telecommunications cables cross existing service roads. Diversion of these is expected. Diversion of these is

Development Number	Opportunities	Constraints
	*Proposed premises can be connected to existing Virgin Media network, via existing cable located on SW corner of the prosed development area.	expected. This would take approximately 3-6 months depending on the extent of diversion/removal works. Network coverage issues are observed with Three Mobile within the proposed development area on west side. Refer to Notes 2 and 4 for further details.
Development 14	*Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located adjacent to the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Network coverage issues are observed with Three Mobile within the proposed development area on North side. Refer to Notes 1 and 3 for further details.

South Didcot

Table 5-24 South Didcot Telecom Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 7	*Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity.	Existing underground BT telecommunications cables cross the proposed development at several locations. Diversion of these is expected. This would take approximately 3 months depending on the extent of diversion/removal works.

Development Number	Opportunities	Constraints
	*Proposed development may be connected using the existing Virgin Media duct work network, located adjacent to the proposed development area. This would reduce excavations however this is dependent on duct capacity. While diverting the telecoms that cross the site it may be possible to increase the number of ducts increasing capacity for future network cables.	Diversion of the existing BT Overhead cables, crossing the proposed development, are likely to be required to allow building work. This would take approximately 3 months depending on the extent of removal works. Diversion of the existing underground Virgin Media telecommunications cables, crossing the proposed development, are likely to be required. This would take approximately 3-6 months depending on the extent of diversion/removal works. Network coverage issues are observed with EE Mobile within the proposed development area. Refer to Notes 1 and 4 for further details. Network coverage issues are observed with Three Mobile within the proposed development. Refer to Note 4 for further details.
Development 13	*Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located adjacent to the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Diversion of the existing underground Virgin Media telecommunications cables, crossing the proposed development, are likely to be required. This would take approximately 3-6 months depending on the extent of diversion/removal works. Network coverage issues are observed with Three Mobile within the proposed development area. Refer to Notes 2 and 4 for further details.

West Didcot

Table 5-25 West Didcot Telecom Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 2	*Proposed development may be connected using the existing BT duct work network, located along the north and south sides of the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located along the south side of the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Diversion of the existing underground Virgin Media telecommunications cables, crossing the proposed development, are likely to be required. This would take approximately 3-6 months depending on the extent of diversion/removal works.
Development 3	*Proposed development may be connected using the existing BT duct work network, located along the south side of the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located along the south side of the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Network coverage issues are observed with Three Mobile within the proposed development area on North side. Refer to Notes 2 and 4 for further details.
Development 10	*Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located adjacent to the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Diversion of the existing underground BT telecommunications cables, crossing the proposed development at several locations, are likely to be required. This would take approximately 3 months depending on the extent of diversion/removal works.

NW Didcot

Table 5-26 NW Didcot Telecom Opportunities and Constraints

Development Number	Opportunities	Constraints
Development 4	* Proposed development may be connected using the existing BT duct work network, located adjacent to the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located along the southeast corner side of the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Diversion of the existing underground BT telecommunications cables, crossing the proposed development at several locations, are likely to be required. This would take approximately 3 months depending on the extent of diversion/removal works. Network coverage issues are observes with EE Mobile within the proposed development area. Refer to Notes 2 and 4 for further details. Network coverage issues are noticed with Three Mobile within the proposed development area. Refer to Notes 2 and 4 for further details.
Development 8	*Proposed development may be connected using the existing BT duct work network, located along the south side of the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity. *Proposed development may be connected using the existing Virgin Media duct work network, located along the east side of the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Diversion of the existing underground BT telecommunications cables, crossing the proposed development at several locations, are likely to be required. This would take approximately 3 months depending on the extent of diversion/removal works. Diversion works to existing underground Vodafone telecommunications cables, crossing existing service roads across the proposed development, is likely to be required. This would take approximately 3-6 months depending on the extent of diversion/removal works.
Development 11	*Proposed development may be connected using the existing BT duct work network, located along the south side of the proposed development area. This would reduce excavations to the BT exchange within the town centre but is dependent on duct capacity.	Diversion of the existing underground Virgin Media telecommunications cables, crossing the proposed development, are likely to be required. This would take approximately 3-6 months depending on the extent of diversion/removal works.

Development Number	Opportunities	Constraints
	*Proposed development may be connected using the existing Virgin Media duct work network, located along the east side of the proposed development area. This would reduce excavations however this is dependent on duct capacity.	Network coverage issues are observed with EE Mobile within the proposed development area on SW corner. Refer to Notes 2 and 4 for further details. Network coverage issues are observed with Three Mobile within the proposed development area on west side. Refer to Notes 2 and 4 for further details.

* The full extent of fibre optics required will be determined with the relevant telecommunication companies during the detailed design stages of the Proposed Development

Note 1 Coverage in some buildings may be poor for voice calls

Note 2 Poor Coverage in most buildings for voice calls

Note 3 Signal in some buildings may be insufficient to use 4G data services reliably

Note 4 Signal in most buildings is unlikely to be sufficient to use 4G data services reliably

6. Gap Analysis and Conclusion

6.1 Gap Analysis

Information is based on the utility plans provided and these may not be accurate with onsite surveys required to confirm service locations. Limitations about planned developments. The table should be read in conjunction with the following notes:

1. Existing utility data has been provided by the supplier, reviewed and added to drawings by Cornerstone Projects Limited.
2. Information is based on the utility plans provided and these may not be accurate and onsite surveys are required to confirm service locations.
3. Mobile Networks have been assessed using the Ofcom courage checker maps at the time of reporting, the latest of these can be accessed here http://maps.ofcom.org.uk/check-coverage/.
4. Reviewed from existing utility plans provided by the Asset Owner.

Red: Further Information is a Must;

Amber: Further Information would inform decisions;

Green: Enough Information to make an engineering judgement, however further discussions could be productive.

Table 6-1 Gap Analysis for Didcot Garden Town Boundary

Utility and Asset Owner	Existing Utilities	Headline Spatial Constraints	Capacity Requirements			
			Existing Capacity	Planned Upgrades	Additional Capacity Requirements	Spatial Opportunities
Sewerage – Thames Water	See Note 1 and 2.	See Note 4. Refer to section 3.1 and drawing 38421/LEA/CVD/006 for further details.	Information has been reviewed from previous planning portal comments to dateand information received from Thames Water dated 12/12/2016 and 03/02/17. Thames Water need to be engaged with respect to the capacity of the local network. This is with respect to known flooding issue which exist and the capacity (head room) of the treatment works.	Information received from Thames Water dated 12/12/2016 and 03/02/17. Thames Water need to be engaged with respect to the capacity of the local network. This is with respect to known flooding issues which exist and the capacity (head room) of the treatment works.	Additional Capacity Requirements have been worked out based on industry best practice. Refer to section 4.1 and Appendix B for details.	The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Sewerage – SSE	SEE are the sewerage undertaker for the Great Western Park Development. See Note 1.	See Note 4. Refer to section 3.1 and drawing 38421/LEA/CVD/006 for further details.	Recently designed and constructed as part of the Great Western Park Development. Capacity has been designed for the development and no information is available to identify if any capacity is available for further development.	Not Applicable – As limited scope across the Didcot Garden Town Boundary.	Not Applicable – As limited scope across the Didcot Garden Town Boundary.	Not Applicable – As limited scope across the Didcot Garden Town Boundary.
Potable Water – Thames Water	See Note 1 and 2.	See Note 4.	Information has been reviewed from previous planning portal comments to date, no	Limited available information.	Additional Capacity Requirements have been worked out based on industry	The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.

Utility and Asset Owner	Existing Utilities	Headline Spatial Constraints	Capacity Requirements Existing Capacity	Planned Upgrades	Additional Capacity Requirements	Spatial Opportunities
		Refer to section 3.1 and drawing 38421/LEA/CVD/005 for further details.	information has been received from Thames Water. Thames Water need to be engaged with respect to the capacity of the local network.	Thames Water need to be engaged with respect to the capacity of the local network.	best practice. Refer to section 4.1 and Appendix B for details.	
Portable Water – SSE	SEE are the Potable Water undertaker for the Great Western Park Development. See Note 1.	See Note 4. Refer to section 3.2 and drawing 38421/LEA/CVD/005 for further details.	Recently designed and constructed as part of the Great Western Park Development. Capacity has been designed for the development and no information is available to identify if any capacity is available for further development.	Not Applicable – As limited scope across the Didcot Garden Town Boundary.	Not Applicable – As limited scope across the Didcot Garden Town Boundary.	Not Applicable – As limited scope across the Didcot Garden Town Boundary.
Electricity - SSE	See Note 1 and 2.	See Note 4. Refer to section 3.3 and drawing 38421/LEA/CVD/007 for further details.	SSE have provided current capacity and requirements refer to section 4.2 for details.	SSE have provided upgrade capacity and requirements refer to section 4.2 for details. Further discussions are needed to discuss timescales for upgrades and a strategic approach to the upgrade.	Additional Capacity Requirements have been worked out based on industry best practice. Refer to section 4.2 and Appendix B for details.	The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Gas Mains – SGN	See Note 1 and 2.	See Note 4. Refer to section 3.4 and drawing 38421/LEA/CVD/004 for further details.	Information has been reviewed from previous planning portal comments to date. No information has been received from SGN. SGN need to be engaged with respect to the capacity of the local network.	Limited available information. SGN need to be engaged with respect to the capacity of the local network.	Additional Capacity Requirements have been worked out based on industry best practice. Refer to section 4.3 and Appendix B for details.	The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Telecommunications – BT /Openreach	See Note 1 and 2.	See Note 4. Refer to section 3.5 and drawing 38421/LEA/CVD/008 for further details.	As of November 2016, Openreach confirmed that there are no issues with capacity within the existing catchment area. However continual capacity management take place to support any new development.	Openreach confirmed that at this stage they haven't scheduled any upgrade works to the existing network, located within the proposed development area. However unscheduled upgrade works may be required to make fibre broadband available for existing and new premises.	Additional Capacity Requirements have been worked out based on street cabinet's maximum capacity. Refer to section 4.4, table 4.1 for details.	Refer to section 4.4 for details. The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Telecommunications – Virgin Media	See Note 1 and 2.	See Note 4. Refer to section 3.5.	Virgin Media need to be engaged with respect to the capacity of the local network.	No information is available to date. Virgin Media need to be engaged with respect to the capacity of the local network.	Virgin Media need to be engaged with respect to the capacity requirements for future developments of the local network.	Refer to section 4.4 for details. The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.

Utility and Asset Owner	Existing Utilities	Headline Spatial Constraints	Capacity Requirements			
			Existing Capacity	Planned Upgrades	Additional Capacity Requirements	Spatial Opportunities
Telecommunications – Vodafone	See Note 1, 2 and 3.	See Note 4. Refer to section 3.5.	Existing Network courage has been reviewed See Note 3. Currently no information regarding capacity of the network.	No information available to date. Vodafone need to be engaged with respect to the capacity of the local network.	Vodafone need to be engaged with respect to any future upgrades to the local network.	Refer to section 4.4 for details. The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Telecommunications – O2	See Note 1, 2 and 3.	See Note 4. Refer to section 3.5.	Existing Network courage has been reviewed See Note 3. Currently no information regarding capacity of the network.	No information available to date. 02 need to be engaged with respect to the capacity of the local network.	02 need to be engaged with respect to any future upgrades to the local network.	Refer to section 4.4 for details. The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Telecommunications – EE	See Note 1, 2 and 3.	See Note 4. Refer to section 3.5.	Existing Network courage has been reviewed See Note 3. Currently no information regarding capacity of the network.	No information available to date. EE need to be engaged with respect to the capacity of the local network.	EE need to be engaged with respect to any future upgrades to the local network.	Refer to section 4.4 for details. The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.
Telecommunications – Three Mobile	See Note 1, 2 and 3.	See Note 4. Refer to section 3.5.	Existing Network courage has been reviewed See Note 3. Currently no information regarding capacity of the network.	No information available to date. Three Mobile need to be engaged with respect to the capacity of the local network.	Three Mobile need to be engaged with respect to any future upgrades to the local network.	Refer to section 4.4 for details. The ideas presented have not been discussed with the asset owner and therefore further discussions will be required.

Information is based on the utility plans provided and these may not be accurate with onsite surveys required to confirm service locations. The table should be read in conjunction with the following notes:

A. An opportunity is available however discussions with the network owner would be required to confirm strategic approach.

B. An opportunity is available however due to limited information available regarding proposals for the developments these would need to be reviewed.

C. The opportunity would allow for the development to have a more direct connection to the treatment works however funding and discussion with both Thames Water and SSE would need to be undertaken.

D. Not Applicable as no assets within the area.

E. A full survey should be undertaken within the catchment to identify flow paths from gullies.

Table 6-2 Gap Analysis for Didcot Garden Town Development Sites

Utility and Asset Owner	**Opportunities and Constraints for Proposed Development Sites**												
	NE Didcot Zone 1		**NE Didcot Zone 2**			**South Didcot**		**West Didcot**			**NW Didcot**		
	5	**14**	**6**	**9**	**12**	**7**	**13**	**2**	**3**	**10**	**4**	**8**	**11**
Sewerage – Thames Water	See Note A. See Note E.	See Note B. See Note E.	See Note B. See Note E.	See Note B.	See Note B.	See Note B. See Note E.	See Note B. See Note E.	The opportunity would allow for the development to have a more direct connection to the treatment works however funding and discussion with both Thames Water and SSE would need to be undertaken.			See Note B. See Note E.	See Note B. See Note E.	
Sewerage – SSE Water	See Note D.	See Note D.	See Note D.	See Note D.	See Note D.	See Note D.	See Note D.	The opportunity discussed exist however would need to be confirmed with SSE regarding capacity within the network.			See Note D.	See Note D.	See Note D.
Potable Water – Thames Water	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Portable Water – SSE	See Note D.	See Note D.	See Note D.	See Note D.	See Note D.	See Note D.	See Note D.	The opportunity discussed exist however would need to be confirmed with SSE regarding capacity within the network.			See Note D.	See Note D.	See Note D.
Electricity - SSE	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Gas Mains – SGN	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Telecommunications BT /Openreach	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Telecommunications Virgin Media	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Telecommunications Vodafone	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Telecommunications O2	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Telecommunications EE	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.
Telecommunications Three Mobile	See Note A.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note B.	See Note A.	See Note A.	See Note A.	See Note A.	See Note B.	See Note B.

6.2 Conclusion

Baseline and spatial constraints

A baseline study of the existing key utilities serving Didcot has been undertaken and is presented within this report. The utilities that have been reviewed are:

- Foul water drainage;
- Potable water;
- Electricity;
- Gas;
- Telecommunications.

Data for these utilities has been obtained from the following Statutory Undertakers:

- Thames Water;
- SSE Water;
- Scottish and Southern Energy (SSE);
- Scotia Gas Networks (SGN);
- National Grid Electric;
- National Grid Gas;
- BT/Openreach;
- Virgin Media;
- Three;
- EE;
- O2;
- Vodafone;

The spatial constraints from the existing strategic utilities have been identified where they may impact on the delivery of Didcot Garden Town masterplan.

Capacity constraints

Further to this assessments of capacity requirement for the increase in demand for each of these utilities is considered. The utilities that pose the greatest concern for the large increase in population are sewerage and electricity. Both of these require early engagement to ensure that the required upgrades to the networks and facilities can be delivered in time.

For electricity, the Feasibility Report produced by SSE indicates that significant upgrades are already planned to the substation serving Didcot and that they have planned for significant growth. There is a need to continue to liaise with SSE to ensure that the latest numbers for planned growth are included within their proposals.

For sewerage, Thames Water indicate that there will be a need to upgrade Didcot Sewage Treatment works to cope with the planned growth. The programming of this needs to be considered and Thames Water requires information about the phasing of development to ensure that they can plan their asset management appropriately.

Specific opportunities and constraints for each of the development sites are assessed. Owing to the limitations of the available information for this scope of study, a gap analysis is provided. This identifies requirements for information which if made available will help progress the study further.

Opportunities

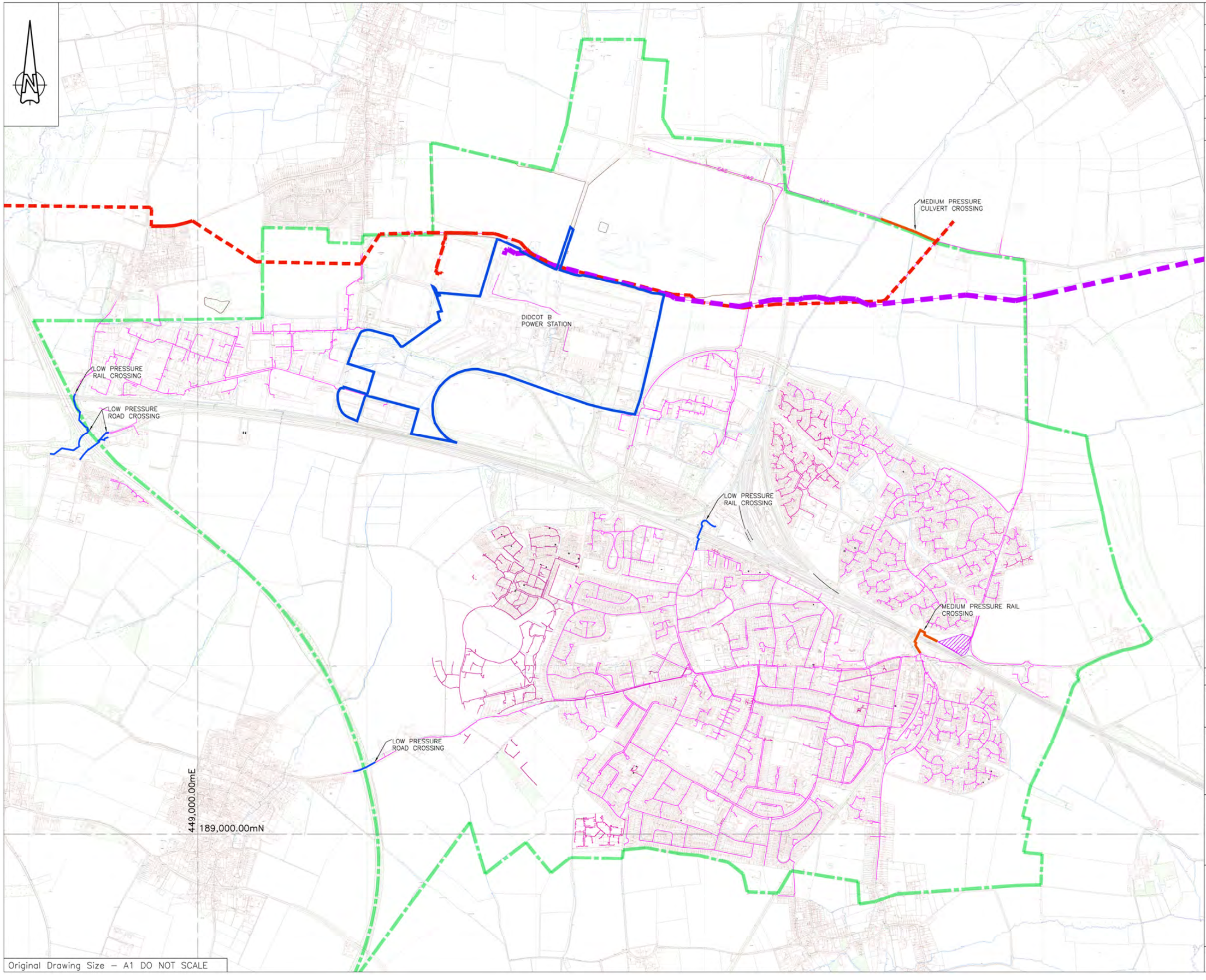
Opportunities have been identified relating to each utility. Those presented below are considered to be the ones that could be brought forward most effectively within the Garden Town Delivery Plan:

- Early consultation with all utilities providers at a strategic level to allow the organisations to plan for the proposed developments and increased demand in a strategic manner. This is already happening through the IDP process as part of the Local Plan and it is important to continue this once the Local Plan is adopted to ensure utilities providers are kept up-to-date with changes.
- Reduce the demand for both potable water supply and foul drainage capacity by use of water saving devices within new developments and existing homes.
- Use of rainwater and/or greywater harvesting within new developments.
- Provision of electric vehicle charging points at home with allocation of space for parking such vehicles, or community parking areas with access to charging points where density of development precludes space for vehicles at individual dwelling level.
- Public access charging areas within central areas (vehicles and e-bikes).
- Use of solar panels to power electric vehicle charging points and provision for battery storage to complement roof mounted solar PV array.
- Use of the new deck of the proposed Science Bridge to incorporate service ducts for future provision to the North. This would provide a means of crossing the railway without the need for tunnelling.
- Construction of new shared mobile masts to improve network coverage.

Appendix A
Drawings

Drawing Number	Revision	Title
38421/LEA/CVD/004	D	Strategic Gas Assets
38421/LEA/CVD/005	D	Strategic Potable Water Assets
38421/LEA/CVD/006	D	Strategic Foul Water Assets
38421/LEA/CVD/007	D	Strategic Electrical Assets
38421/LEA/CVD/008	D	Strategic Telecom Assets
38421/LEA/CVD/015	B	Didcot Proposed Developments and Area Breakdown
38421/LEA/CVD/016	B	Didcot Proposed Developments and Area Breakdown Development Area 2 - North
38421/LEA/CVD/017	B	Didcot Proposed Developments and Area Breakdown Development Area 2 - South
38421/LEA/CVD/018	B	Didcot Proposed Developments and Area Breakdown Development Area 3 - North
38421/LEA/CVD/019	B	Didcot Proposed Developments and Area Breakdown Development Area 3 - South
38421/LEA/CVD/020	B	Didcot Proposed Developments and Area Breakdown Development Area 4
38421/LEA/CVD/021	B	Didcot Proposed Developments and Area Breakdown Development Area 5
38421/LEA/CVD/022	B	Didcot Proposed Developments and Area Breakdown Development Area 6
38421/LEA/CVD/023	B	Didcot Proposed Developments and Area Breakdown Development Area 7
38421/LEA/CVD/024	B	Didcot Proposed Developments and Area Breakdown Development Area 8

38421/LEA/CVD/025	B	Didcot Proposed Developments and Area Breakdown Development Area 9
38421/LEA/CVD/026	B	Didcot Proposed Developments and Area Breakdown Development Area 10
38421/LEA/CVD/027	B	Didcot Proposed Developments and Area Breakdown Development Area 11
38421/LEA/CVD/028	B	Didcot Proposed Developments and Area Breakdown Development Area 12
38421/LEA/CVD/029	B	Didcot Proposed Developments and Area Breakdown Development Area 13
38421/LEA/CVD/030	B	Didcot Proposed Developments and Area Breakdown Development Area 14



DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	EDG	MM	KS

REVISIONS

REV	DATE		DWN	CHK	APP
B	22.11 2016	CHANGES TO PIPE WIDTH & FADING BACKGROUND	EDG	JF	PK
C	07.12 2016	ADDED UTILITIES SEARCH INFORMATION, ADJUSTED EXISTING ACCORDINGLY	EDG	JF	PK
D	27.02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DIDCOT GARDEN TOWN INFRASTRUCTURE STRATEGY REPORT UTILITIES ASSESSMENT, CONSTRAINTS AND OPPORTUNITIES.
2. SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT
3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- NATIONAL HIGH PRESSURE GAS PIPE (NHP) – 6m to 25m EASEMENT
- INTERMEDIATE PRESSURE GAS MAIN – 3m EASEMENT
- MEDIUM PRESSURE STRATEGIC GAS MAIN
- LOW PRESSURE STRATEGIC GAS MAIN
- DIDCOT B
- GAS WORKS
- LOW AND MEDIUM PRESSURE GAS MAIN
- DIDCOT GARDEN TOWN BOUNDARY

0m 200m 400m 600m 800m
SCALE 1:10,000

SCALES: 1:10,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

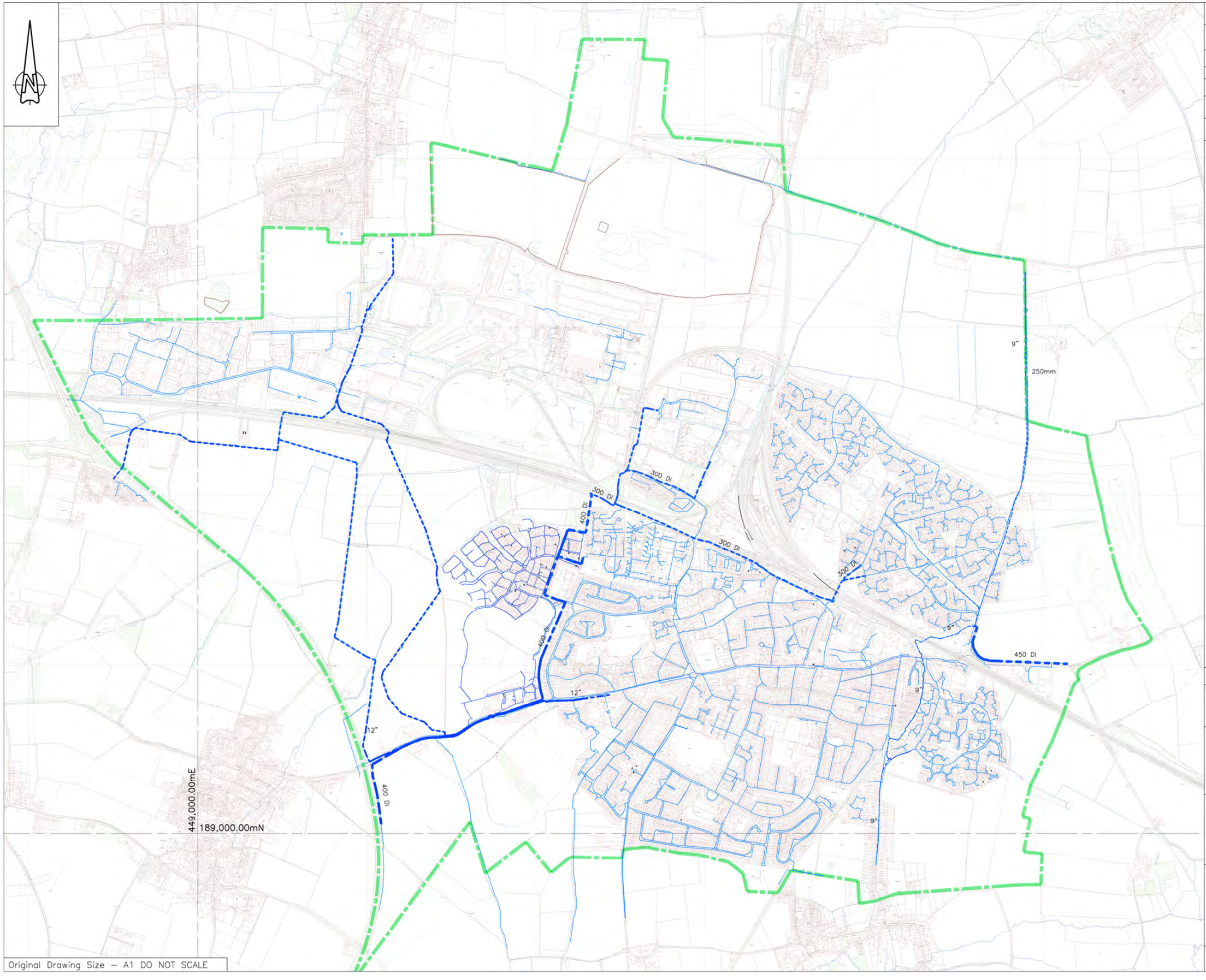
DRAWING TITLE:
STRATEGIC GAS ASSETS

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/004 REV. D

Original Drawing Size – A1 DO NOT SCALE



DESCRIPTION

REV	DATE		DWN	CHK	APP
A	Nov 2016	FIRST ISSUE	DJRH	MM	KS

REVISIONS

REV	DATE		DWN	CHK	APP
B	22.11 2016	ADDED ADDITIONAL PIPES, FADED OS MAP, CHANGED PIPE SIZES RELATIVE TO SIZE.	EDG	JF	PK
C	07.12 2016	ADDED UTILITIES SEARCH INFORMATION, ADJUSTED EXISTING ACCORDINGLY	EDG	JF	PK
D	27.02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DIDCOT GARDEN TOWN INFRASTRUCTURE STRATEGY REPORT UTILITIES ASSESSMENT, CONSTRAINTS AND OPPORTUNITIES.
2. SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT
3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID
5. ALL DIMENSIONS IN MILLIMETRES UNLESS STATED OTHERWISE.

KEY:

- POTABLE WATER STRATEGIC MAINS
- POTABLE WATER MAIN
- DIDCOT GARDEN TOWN BOUNDARY

0m 200m 400m 600m 800m
SCALE 1:10,000

SCALES: 1:10,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
STRATEGIC POTABLE WATER ASSETS

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

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DRAWING No. 38421/LEA/CVD/005 REV. D

Original Drawing Size – A1 DO NOT SCALE

DIDCOT STW

449,000.00mE

189,000.00mN

Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	EDG	MM	KS

REVISIONS

REV	DATE		DWN	CHK	APP
B	22.11 2016	CHANGES TO PIPE WIDTH & FADING BACKGROUND	EDG	JF	PK
C	08.12 2016	ADDED UTILITY SEARCH INFORMATION, ADJUSTED EXISTING ACCORDINGLY	EDG	JF	PK
D	27.02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DIDCOT GARDEN TOWN INFRASTRUCTURE STRATEGY REPORT UTILITIES ASSESSMENT, CONSTRAINTS AND OPPORTUNITIES.
2. SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT
3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- RISING MAIN
- 900x600mm GRAVITY SEWER
- 1000–1200mm GRAVITY PIPE CROSSING
- 825–900mm GRAVITY SEWER
- 375mm GRAVITY SEWER
- PUMPING STATION
- DIDCOT GARDEN TOWN BOUNDARY
- FOUL SEWER
- SURFACE SEWER
- COMBINED SEWER

0m 200m 400m 600m 800m

SCALE 1:10,000

SCALES: 1:10,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
STRATEGIC FOUL WATER ASSETS

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler

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DRAWING No. 38421/LEA/CVD/006

REV. D

MILTON SUBSTATION

DIDCOT B POWER STATION

PEARITH FARM SUBSTATION

OVERHEAD TRACK CROSSING

PILOT CABLE CONTINUES EAST

449,000.00mE

189,000.00mN

Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	EDG	MM	KS

REVISIONS

REV	DATE		DWN	CHK	APP
B	22.11 2016	CHANGES TO PIPE WIDTH & FADING BACKGROUND	EDG	JF	PK
C	08.12 2016	ADDED UTILITIES SEARCH INFORMATION, AMENDED EXISTING	EDG	JF	PK
D	27.02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DIDCOT GARDEN TOWN INFRASTRUCTURE STRATEGY REPORT UTILITIES ASSESSMENT, CONSTRAINTS AND OPPORTUNITIES.
2. SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT
3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- HIGH VOLTAGE ELECTRICITY CABLES, TRANSPORTED ON POLES. 33kV
- HIGH VOLTAGE ELECTRICITY CABLES, TRANSPORTED ON PYLONS. 33kV OR HIGHER
- EXTRA HIGH VOLTAGE ELECTRICITY CABLES, UNDERGROUND. 132kV OR HIGHER
- ASSUMED EXTRA HIGH VOLTAGE ELECTRICITY CABLES, UNDERGROUND. 132kV OR HIGHER
- EXTRA HIGH VOLTAGE ELECTRICITY CABLES OVERHEAD ON PYLONS 132kV OR HIGHER
- PILOT CABLE
- DIDCOT B
- ELECTRICAL SUBSTATION
- SCOTTISH & SOUTHERN ELECTRICITY SUBSTATION
- DIDCOT GARDEN TOWN BOUNDARY
- ELECTRIC CAR CHARGING STATION
- ELECTRICAL CABLE

0m 200m 400m 600m 800m

SCALE 1:10,000

SCALES: 1:10,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
STRATEGIC ELETRICAL ASSETS

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler

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DRAWING No. 38421/LEA/CVD/007

REV. D

ROWSTOCK BT STREET CABINET

ROWSTOCK BT STREET CABINET

RAILWAY CROSSING

DIDCOT BT STREET CABINETS

DIDCOT BT STREET CABINET

RAILWAY CROSSING

RAILWAY CROSSING

RAILWAY CROSSING

DIDCOT EXCHANGE

RAILWAY CROSSING

DIDICOT BT STREET CABINETS

ROWSTOCK EXCHANGE LOCATED FURTHER WEST ALONG WANTAGE ROAD

449,000.00mE

189,000.00mN

Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	OCT 2016	FIRST ISSUE	AT	MM	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	22.11 2016	CHANGES TO FADING BACKGROUND AND INCLUDE VIRGIN MEDIA ASSETS	EDG	JF	PK
C	29.11 2016	INCLUDE STREET CABINETS ALREADY ENABLED FOR FIBRE SERVICE – AMENDMENTS TO KEY AND NOTE	AT	JF	PK
D	27.02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. VIRGIN MEDIA SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT
2. THIS DRAWING IS PREPARED FOR INFORMATION PURPOSE ONLY
3. COVERAGE INFORMATION SHOWN ON THIS DRAWING HAS BEEN OBTAINED FROM "BETTER BROADBAND FOR OXFORDSHIRE 30/09/2016" AND SHOWS THE UPGRADED TELECOM/BROADBAND INFRASTRUCTURE PROVIDING MIN. 24MBS SUPERFAST BROADBAND SPEEDS AND UP TO 24MBS FIBRE BROADBAND SPEEDS BASED ON POSTCODE.
4. COVERAGE INFORMATION SHOWN ON THIS DRAWING IS INDICATIVE AND SHOULD NOT BE RELIED ON OR OTHERWISE TREATED AS A GUARANTEE OF CURRENT OR FUTURE PROVISION

KEY:

- SUPERFAST/FIBRE BROADBAND SERVICES TO BE AVAILABLE IN PC AREA BY DECEMBER 2017
- SUPERFAST/FIBRE BROADBAND SERVICES ARE CURRENTLY AVAILABLE IN PC AREA
- SUPERFAST/FIBRE BROADBAND SERVICES MAY BE CURRENTLY AVAILABLE IN PC AREA. ADDITIONAL WORKS ARE PLANNED TO EXPAND COVERAGE SPEEDS BY DECEMBER 2017
- SUPERFAST/FIBRE BROADBAND IN PC AREA IS ALREADY OR WILL BE, COMMERCIALLY AVAILABLE IN THE NEXT TWO YEARS
- SUPERFAST/FIBRE BROADBAND SERVICES TO BE AVAILABLE IN PC AREA BY DECEMBER 2016
- SUPERFAST/FIBRE BROADBAND SERVICES ARE NOT CURRENTLY AVAILABLE IN PC AREA. ADDITIONAL FUNDING IS REQUIRED
- WATERCOURSE
- DIDCOT EXCHANGE – ENABLED FOR F.B
- DIDCOT TEL. EXCHANGE COVERAGE AREA
- ROWSTOCK TEL. EXCHANGE COVERAGE AREA
- AREA IS COVERED BY BOTH DIDCOT AND ROWSTOCK TEL. EXCHANGES
- STREET CABINETS – ENABLED FOR FIBRE SERVICE
- BT UNDERGROUND CABLE
- BT OVERHEAD CABLE
- BT PLANNED CABLE
- VIRGIN MEDIA UNDERGROUND CABLE
- VODAFONE UNDERGROUND CABLE
- DIDCOT GARDEN TOWN BOUNDARY

0m 200m 400m 600m 800m

SCALE 1:10,000

SCALES: 1:10,000

PROJECT TITLE:

DIDCOT GARDEN TOWN

DRAWING TITLE:

STRATEGIC TELECOM ASSETS

CLIENT:

SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler

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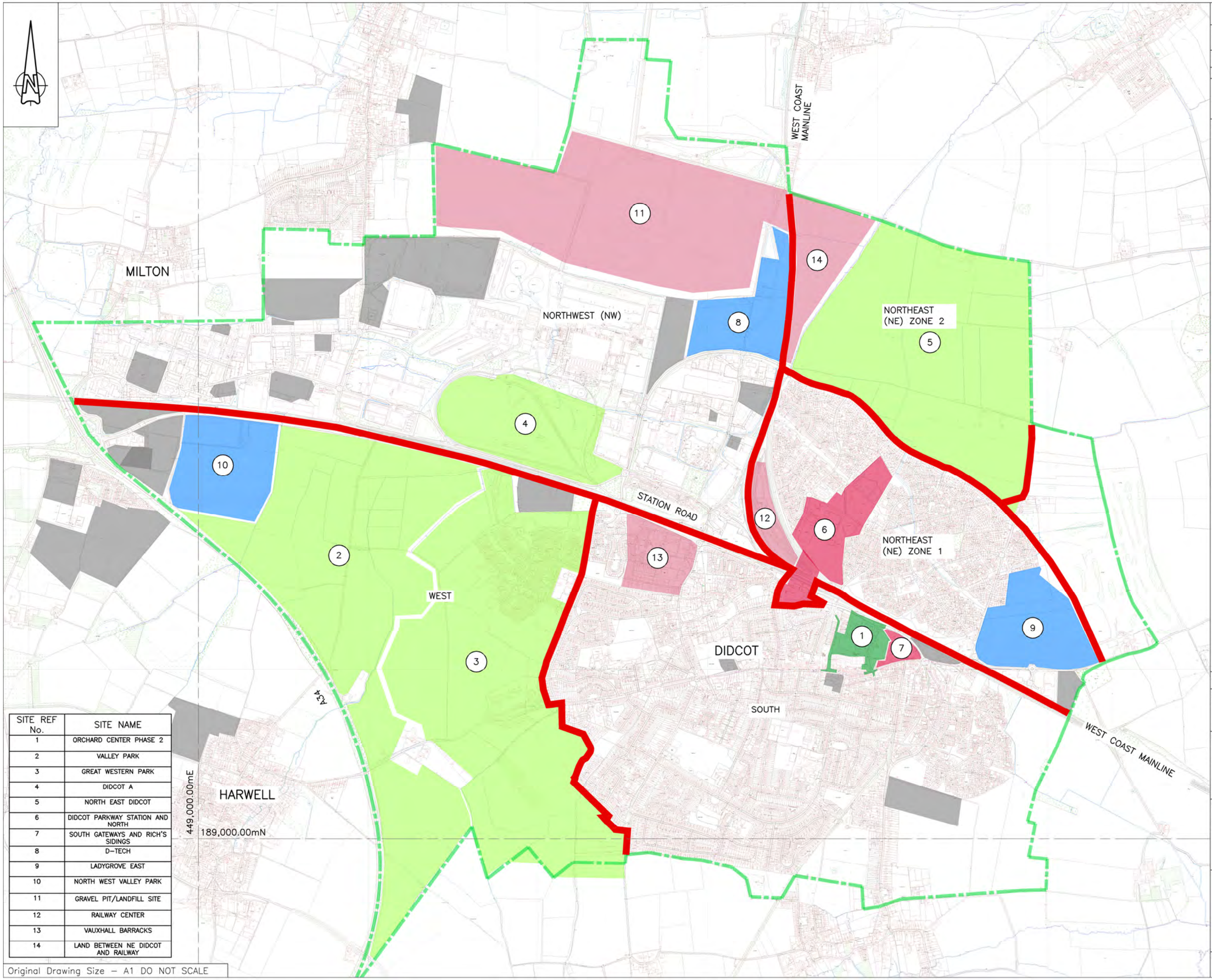
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/008

REV. D



SITE REF No.	SITE NAME
1	ORCHARD CENTER PHASE 2
2	VALLEY PARK
3	GREAT WESTERN PARK
4	DIDCOT A
5	NORTH EAST DIDCOT
6	DIDCOT PARKWAY STATION AND NORTH
7	SOUTH GATEWAYS AND RICH'S SIDINGS
8	D-TECH
9	LADYGROVE EAST
10	NORTH WEST VALLEY PARK
11	GRAVEL PIT/LANDFILL SITE
12	RAILWAY CENTER
13	VAUXHALL BARRACKS
14	LAND BETWEEN NE DIDCOT AND RAILWAY

Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	DJRH	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DIDCOT GARDEN TOWN INFRASTRUCTURE STRATEGY REPORT UTILITIES ASSESSMENT, CONSTRAINTS AND OPPORTUNITIES
2. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016
3. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- SITE BOUNDARY
- CONSENTED SITES – NO INFLUENCE POSSIBLE
- CONSENTED SITES – SOME INFLUENCE
- OPPORTUNITY SITES – CRITICAL IMPORTANCE
- OPPORTUNITY SITES – ALREADY COMING FORWARD
- OPPORTUNITY SITES – STRATEGIC WORTH
- OPPORTUNITY SITES – OTHER
- DIDCOT GARDEN TOWN BOUNDARY
- (No.) DEVELOPMENT REFERENCE NUMBER

0m 200m 400m 600m 800m
SCALE 1:10,000

SCALES: 1:10,000

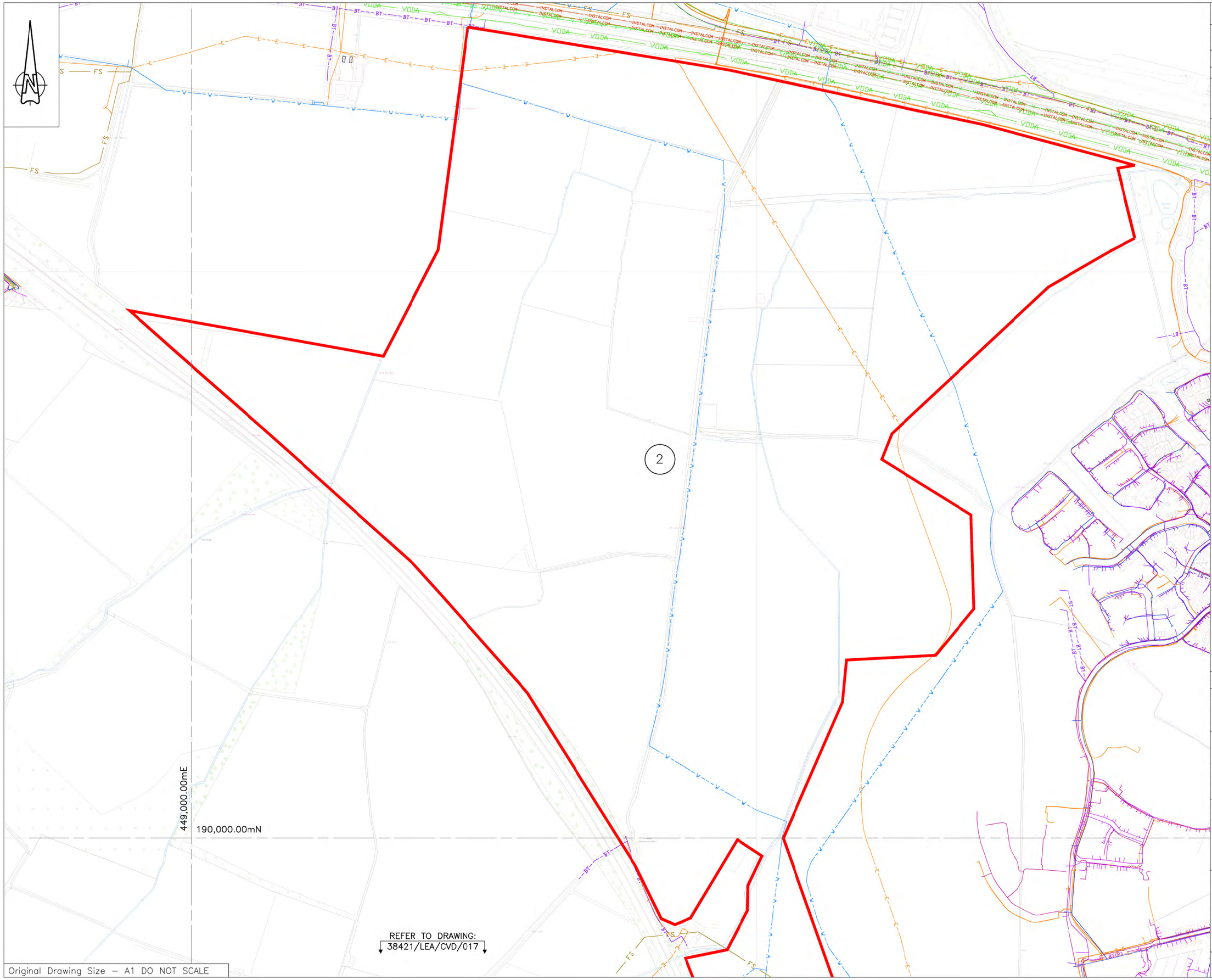
PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/015 REV. B



DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	DJRH	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

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3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016.
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- DEVELOPMENT BOUNDARY
- BT (UNDERGROUND)
- BT (OVERHEAD)
- BT (PLANNED)
- ELECTRICITY (NATIONAL GRID)
- ELECTRICITY NATIONAL GRID – (OVERHEAD)
- ELECTRICITY (GTC)
- ELECTRICITY (SSE)
- GAS (ES PIPELINES)
- GAS (GTC)
- GAS (NATIONAL GRID)
- GAS (SOUTHERN GAS NETWORK)
- GAS (SSE)
- INSTALCOM
- SEWER (COMBINED)
- SEWER (FOUL)
- SEWER (SURFACE)
- VIRGIN MEDIA
- VODAFONE
- WATER (THAMES)
- WATER (SSE)
- No. DEVELOPMENT REFERENCE NUMBER

0m 60m 120m 180m 240m
SCALE 1:3,000

SCALES: 1:3,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

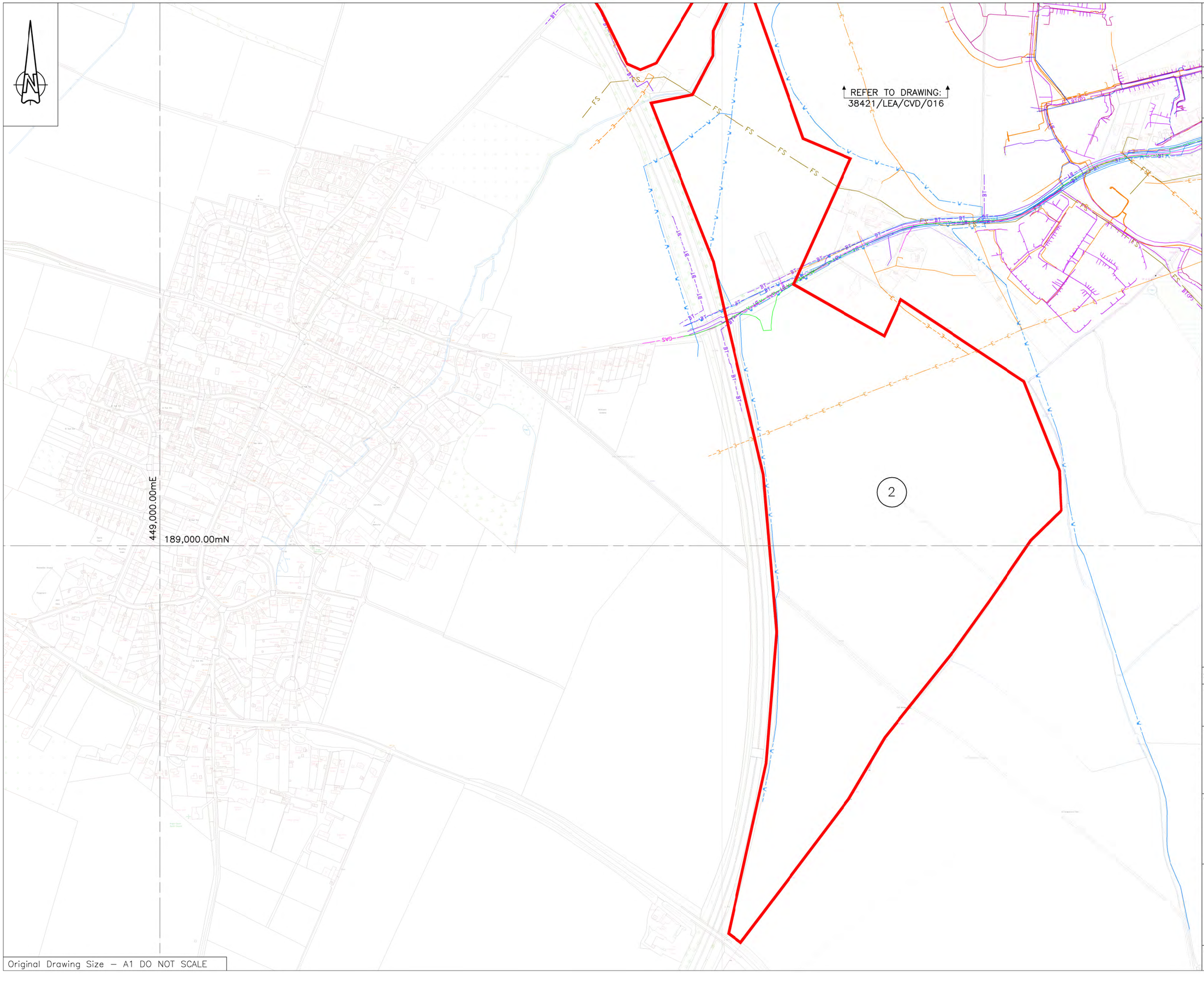
DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 2 – NORTH

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/016
REV. B

Original Drawing Size – A1 DO NOT SCALE



DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	DJRH	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE DIDCOT GARDEN TOWN INFRASTRUCTURE STRATEGY REPORT UTILITIES ASSESSMENT, CONSTRAINTS AND OPPORTUNITIES.
2. SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT.
3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016.
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- DEVELOPMENT BOUNDARY
- BT (UNDERGROUND)
- BT (OVERHEAD)
- BT (PLANNED)
- NG-E — ELECTRICITY (NATIONAL GRID)
- OHE — ELECTRICITY NATIONAL GRID – (OVERHEAD)
- GTC(E) — ELECTRICITY (GTC)
- E — ELECTRICITY (SSE)
- ESP-GAS — GAS (ES PIPELINES)
- GTC(G) — GAS (GTC)
- NG-GAS — GAS (NATIONAL GRID)
- GAS — GAS (SOUTHERN GAS NETWORK)
- SSE-GAS — GAS (SSE)
- INSTALCOM — INSTALCOM
- CS — SEWER (COMBINED)
- FS — SEWER (FOUL)
- SS — SEWER (SURFACE)
- V — VIRGIN MEDIA
- VODA — VODAFONE
- W — WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 60m 120m 180m 240m
SCALE 1:3,000

SCALES: 1:3,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

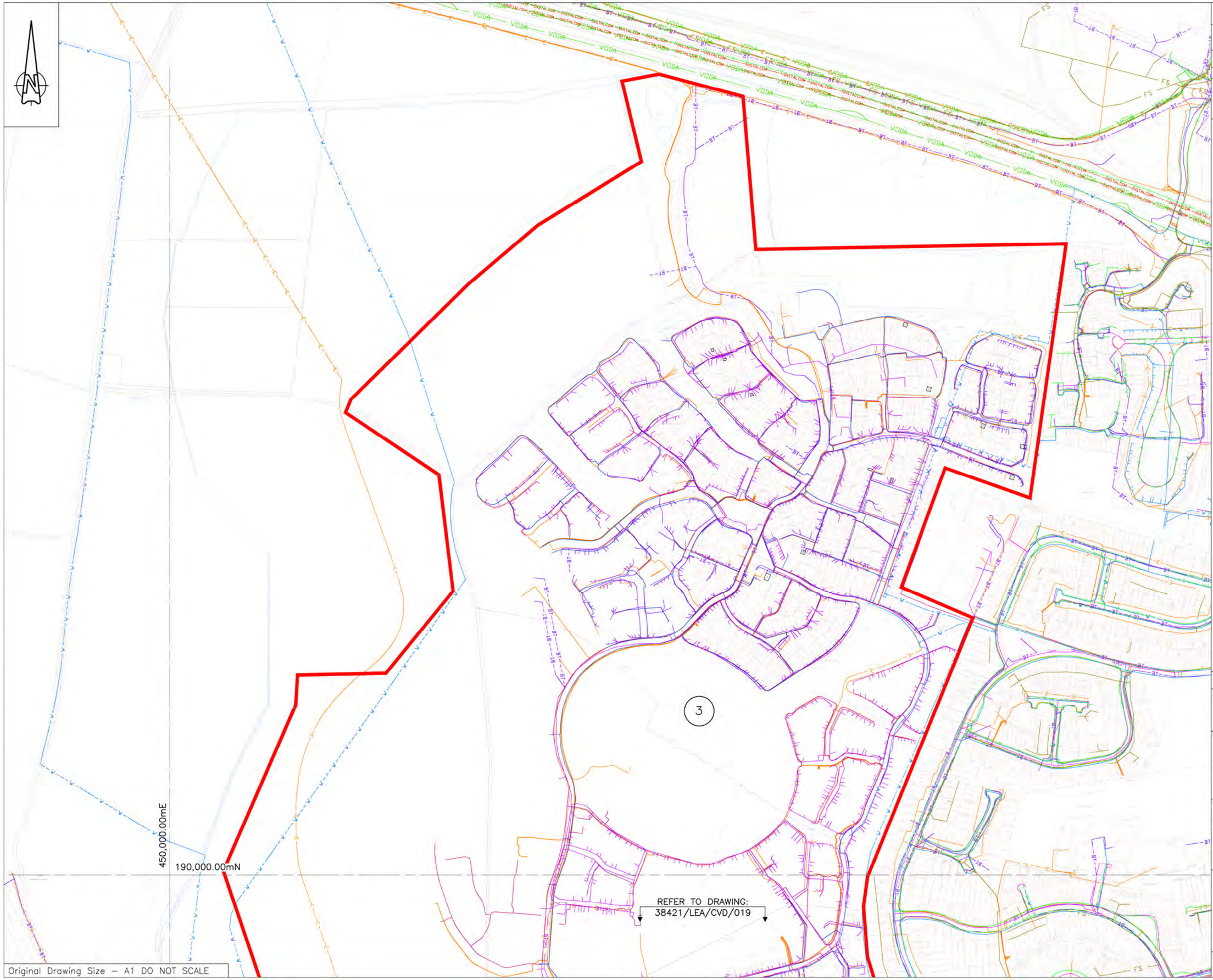
DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 2 – SOUTH

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/017 REV. B

Original Drawing Size – A1 DO NOT SCALE



DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	DJRH	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

NOTES:

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2. SERVICES INFORMATION HAS BEEN INTERPRETED FROM SERVICE UNDERTAKERS PLANS PROVIDED BY CORNERSTONE. COPIES OF THE ORIGINAL DRAWINGS ARE AVAILABLE FOR INSPECTION. NO GUARANTEE IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THERE IS A RISK OF UNCHARTED SERVICES BEING PRESENT.
3. PROPOSED DEVELOPMENT SITES SHOWN ARE BASED ON THE GRIMSHAW DRAWING 16093 RECEIVED ON 22nd NOVEMBER 2016.
4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- DEVELOPMENT BOUNDARY
- BT (UNDERGROUND)
- BT (OVERHEAD)
- BT (PLANNED)
- NG-E — ELECTRICITY (NATIONAL GRID)
- OHE — ELECTRICITY NATIONAL GRID – (OVERHEAD)
- GTC(E) — ELECTRICITY (GTC)
- E — ELECTRICITY (SSE)
- ESP-GAS — GAS (ES PIPELINES)
- GTC(G) — GAS (GTC)
- NG-GAS — GAS (NATIONAL GRID)
- GAS — GAS (SOUTHERN GAS NETWORK)
- SSE-GAS — GAS (SSE)
- INSTALCOM — INSTALCOM
- CS — SEWER (COMBINED)
- FS — SEWER (FOUL)
- SS — SEWER (SURFACE)
- V — VIRGIN MEDIA
- VODA — VODAFONE
- W — WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 50m 100m 150m 200m
SCALE 1:2,500

SCALES: 1:2,500

PROJECT TITLE:
DIDCOT GARDEN TOWN

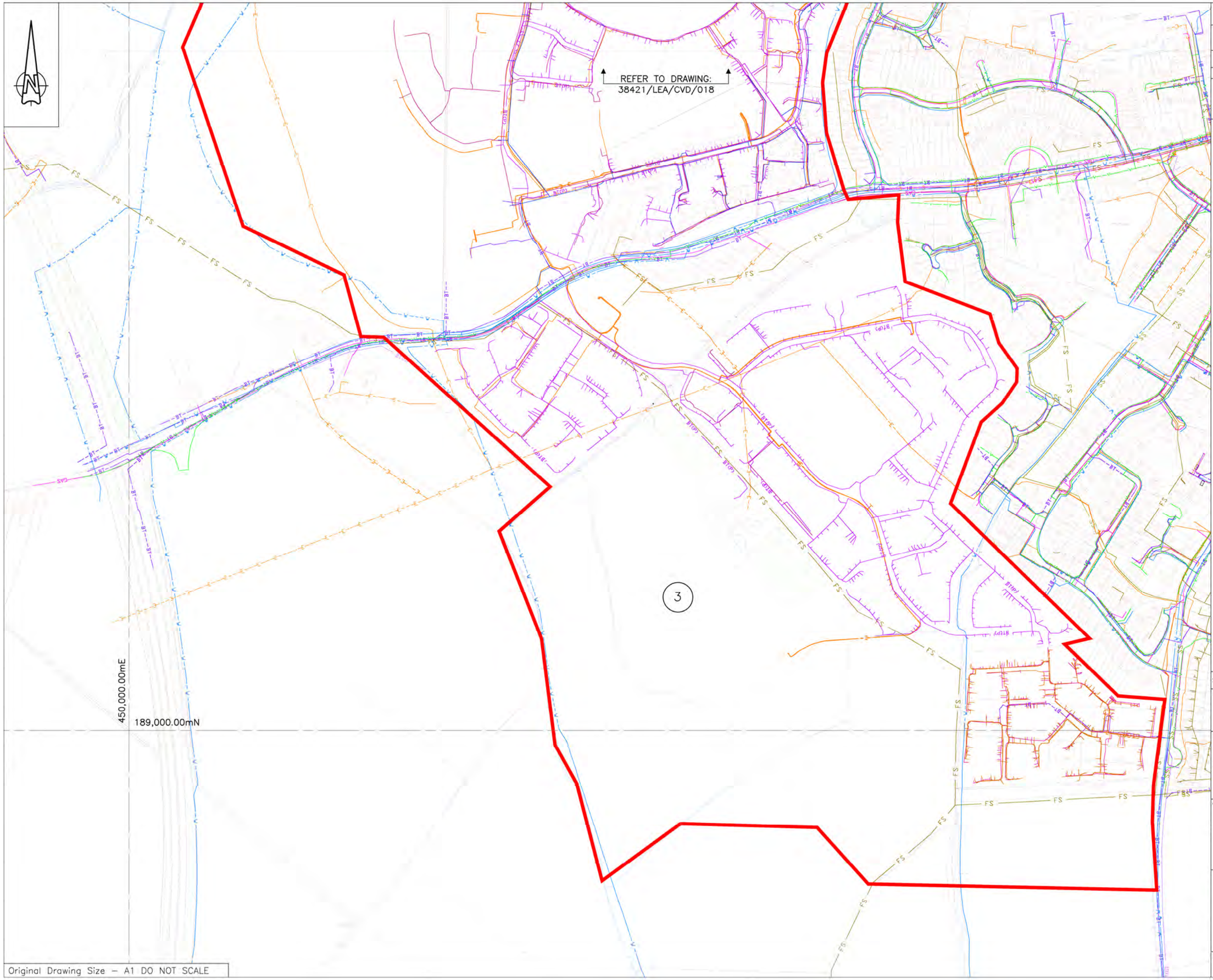
DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 3 – NORTH

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/018 REV. B

Original Drawing Size – A1 DO NOT SCALE



DESCRIPTION					
REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	DJRH	JF	PK

REVISIONS					
REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

- DEVELOPMENT BOUNDARY
- BT (UNDERGROUND)
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- FS — SEWER (FOUL)
- SS — SEWER (SURFACE)
- VIRGIN MEDIA
- VODA — VODAFONE
- WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 50m 100m 150m 200m
SCALE 1:2,500

SCALES: 1:2,500

PROJECT TITLE:
DIDCOT GARDEN TOWN

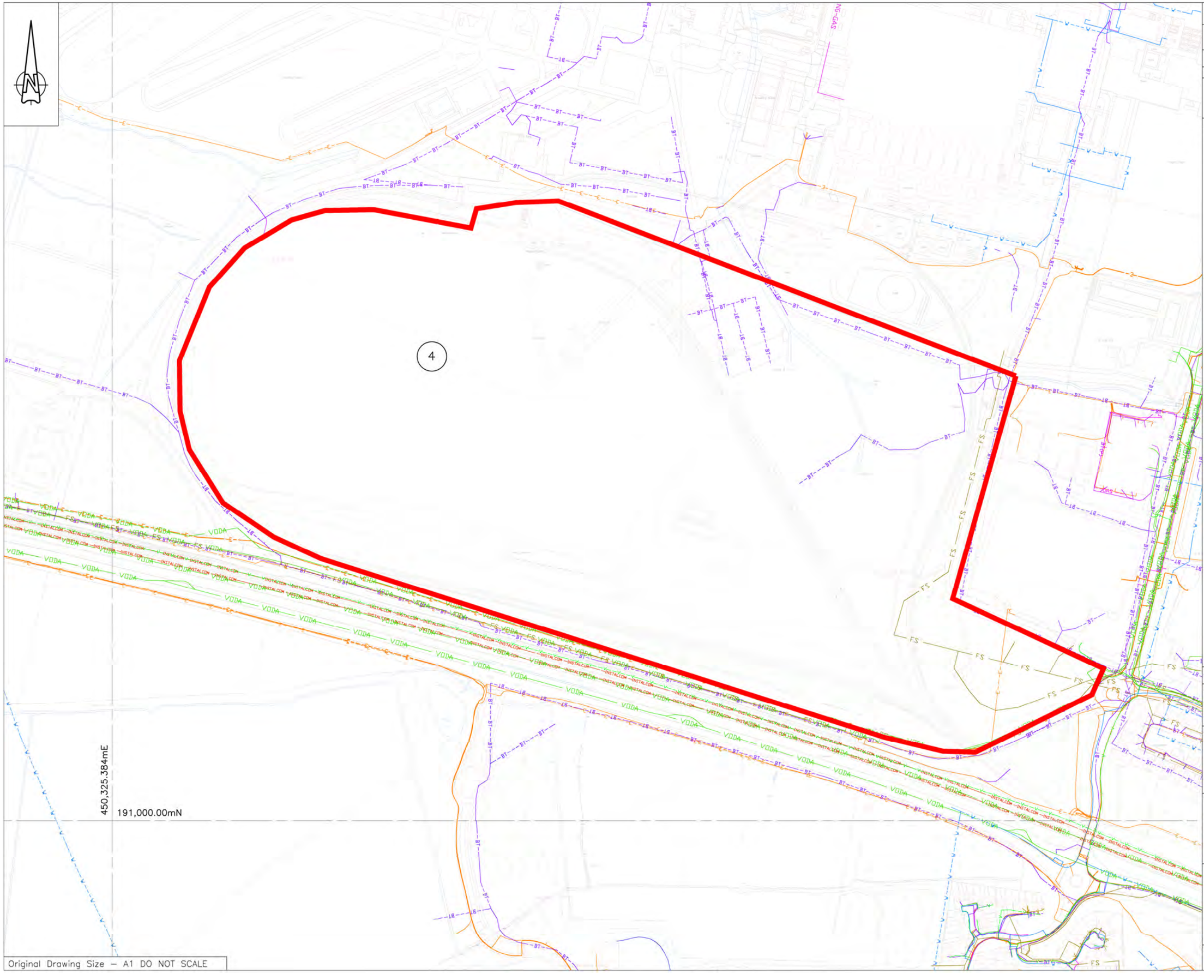
DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 3 – SOUTH

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/019 REV. B

Original Drawing Size – A1 DO NOT SCALE



Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	NOV 2016	FIRST ISSUE	DJRH	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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4. GRID CO-ORDINATES RELATE TO ORDNANCE SURVEY NATIONAL GRID.

KEY:

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- E — ELECTRICITY (SSE)
- ESP-GAS — GAS (ES PIPELINES)
- GTC(G) — GAS (GTC)
- NG-GAS — GAS (NATIONAL GRID)
- GAS — GAS (SOUTHERN GAS NETWORK)
- SSE-GAS — GAS (SSE)
- INSTALCOM — INSTALCOM
- CS — SEWER (COMBINED)
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- SS — SEWER (SURFACE)
- VIRGIN MEDIA
- VODA — VODAFONE
- WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 40m 80m 120m 160m
SCALE 1:2,000

SCALES: 1:2,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 4

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/020
REV. B

INTERMEDIATE PRESSURE GAS

NATIONAL HIGH PRESSURE GAS

HIGH VOLTAGE ELECTRICITY

5

450,000.00mE

190,000.00mN

Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	DEC 2016	FIRST ISSUE	EDG	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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- ELECTRICITY (NATIONAL GRID)
- ELECTRICITY NATIONAL GRID – (OVERHEAD)
- ELECTRICITY (GTC)
- ELECTRICITY (SSE)
- GAS (ES PIPELINES)
- GAS (GTC)
- GAS (NATIONAL GRID)
- GAS (SOUTHERN GAS NETWORK)
- GAS (SSE)
- INSTALCOM
- SEWER (COMBINED)
- SEWER (FOUL)
- SEWER (SURFACE)
- VIRGIN MEDIA
- VODAFONE
- WATER (THAMES)
- WATER (SSE)
- No. DEVELOPMENT REFERENCE NUMBER

0m 100m 200m 300m 400m

SCALE 1:5,000

SCALES: 1:5,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 5

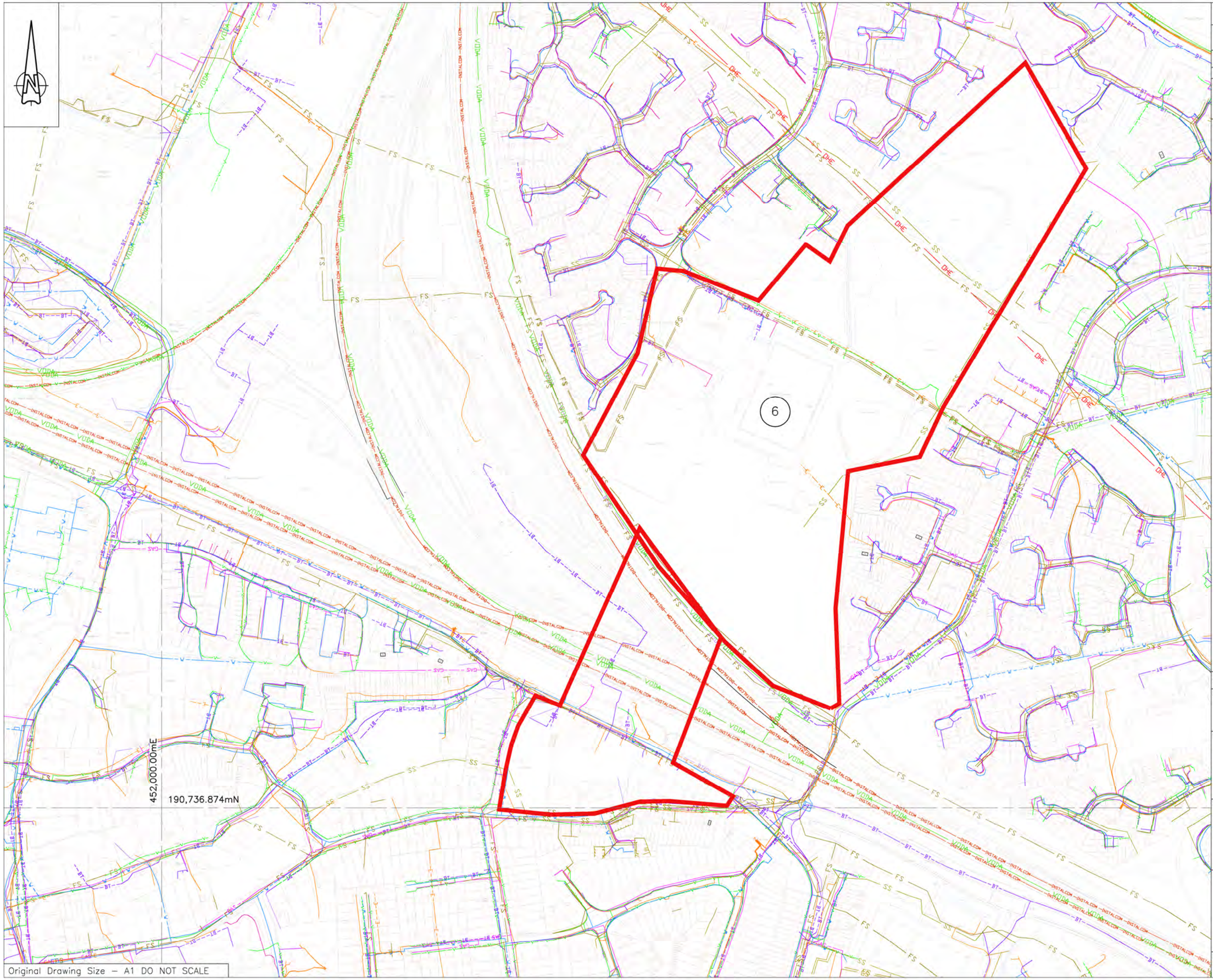
CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler

GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/021

REV. B



Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	DEC 2016	FIRST ISSUE	EDG	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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- VIRGIN MEDIA
- VODA — VODAFONE
- WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 40m 80m 120m 160m
SCALE 1:2,000

SCALES: 1:2000

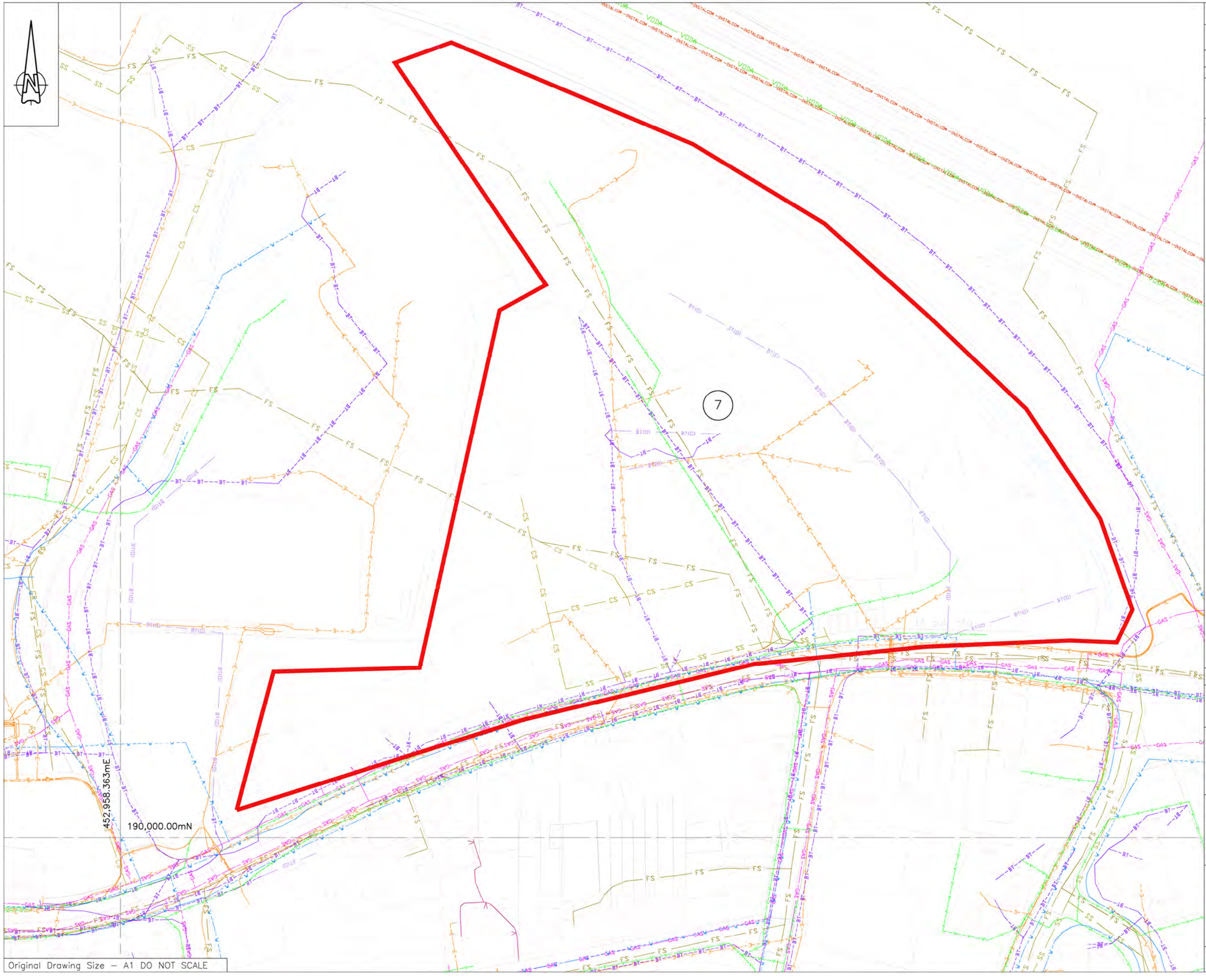
PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 6

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/022
REV. B



Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
A	DEC 2016	FIRST ISSUE	EDG	JF	PK

REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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- SSE-GAS — GAS (SSE)
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- CS — SEWER (COMBINED)
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- SS — SEWER (SURFACE)
- VIRGIN MEDIA
- VODA — VODAFONE
- WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 10m 20m 30m 40m
SCALE 1:500

SCALES: 1:500

PROJECT TITLE:
DIDCOT GARDEN TOWN

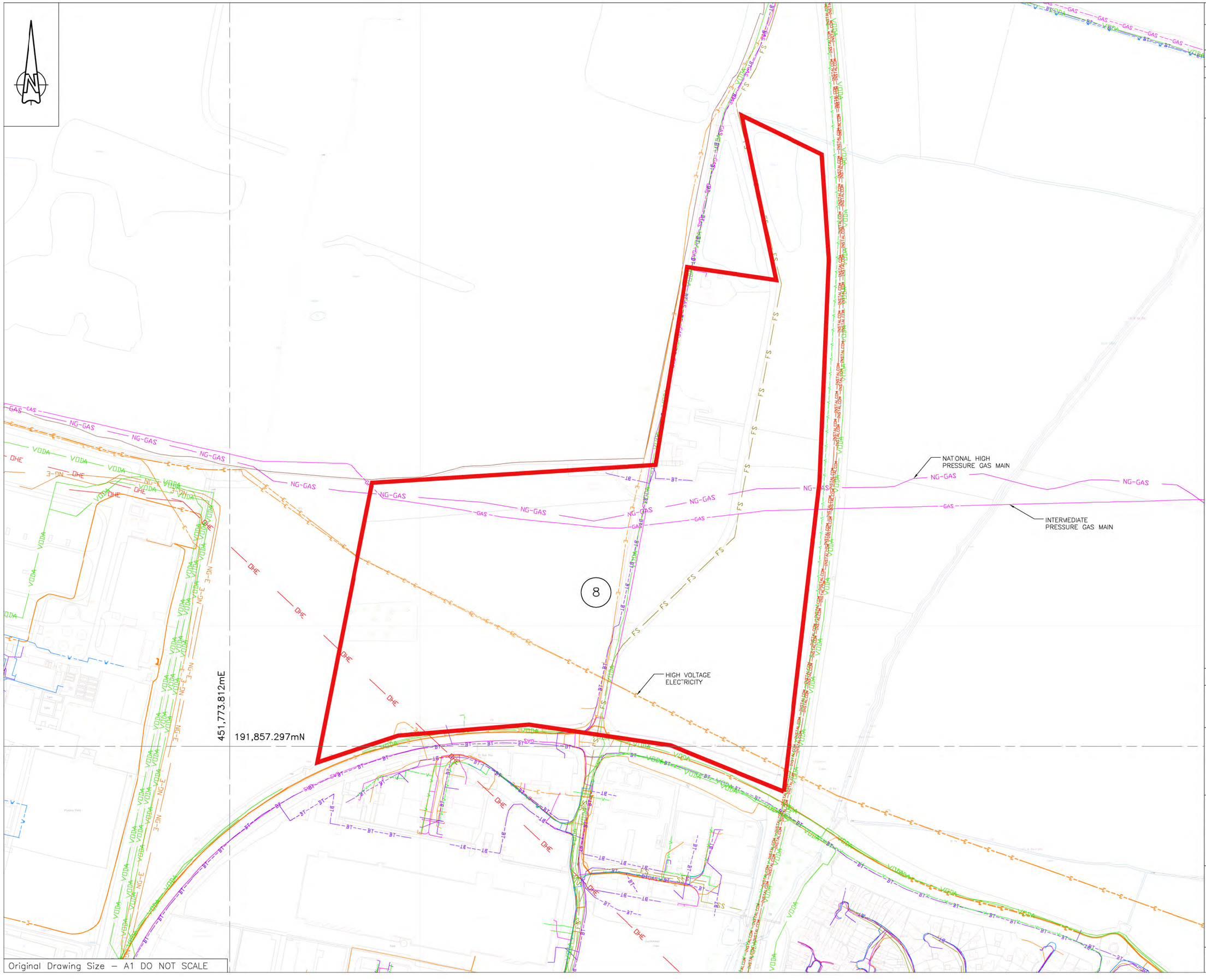
DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 7

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler

GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/023 REV. B



DESCRIPTION

REV	DATE		DWN	CHK	APP
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REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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- VODAFONE
- WATER (THAMES)
- WATER (SSE)
- No. DEVELOPMENT REFERENCE NUMBER

0m 40m 80m 120m 160m
SCALE 1:2,000

SCALES: 1:2,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 8

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/024
REV. B

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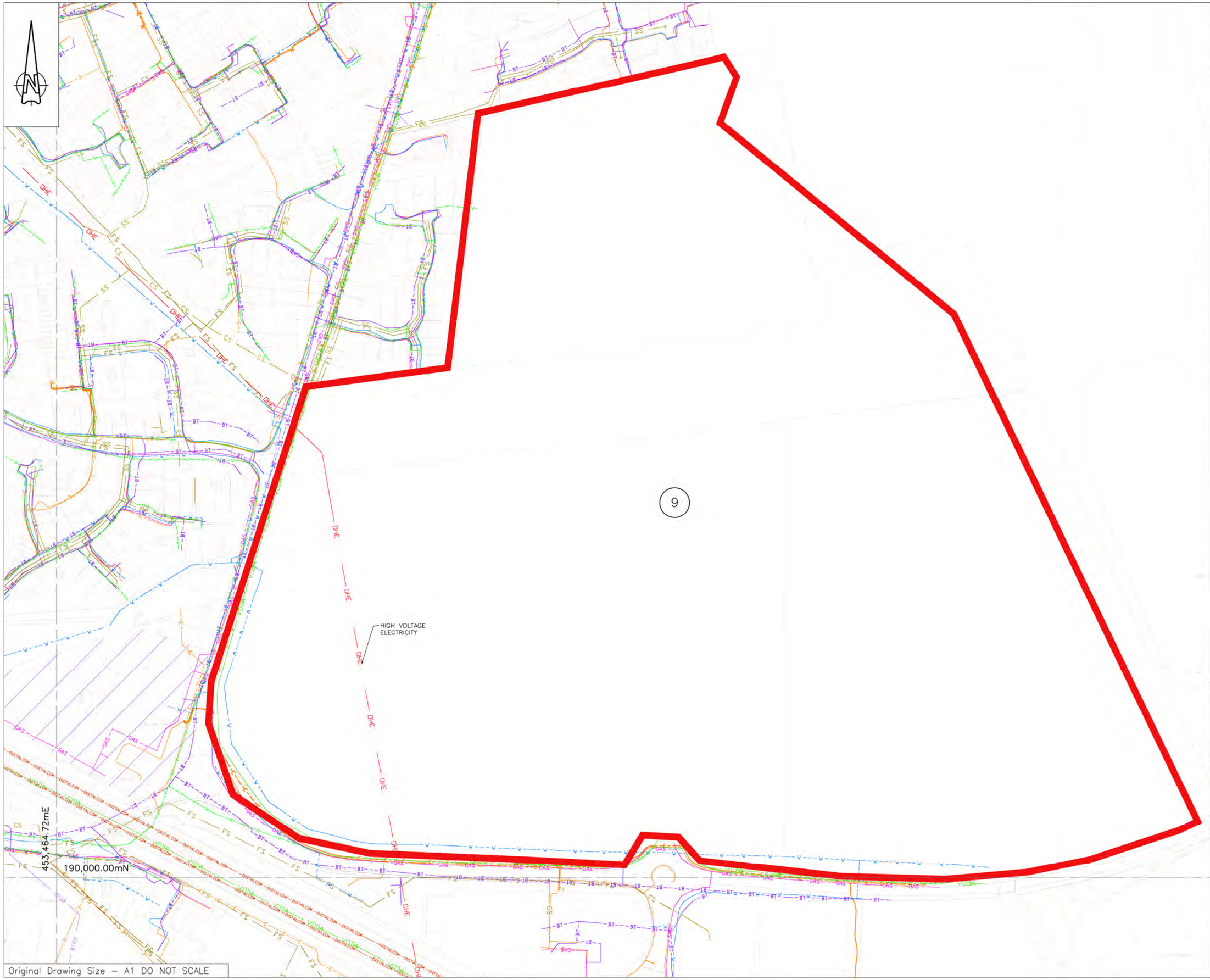

Original Drawing Size – A1 DO NOT SCALE

DESCRIPTION

REV	DATE		DWN	CHK	APP
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REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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- VODA — VODAFONE
- WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

0m 25m 50m 75m 100m
SCALE 1:1,250

SCALES: 1:1,250

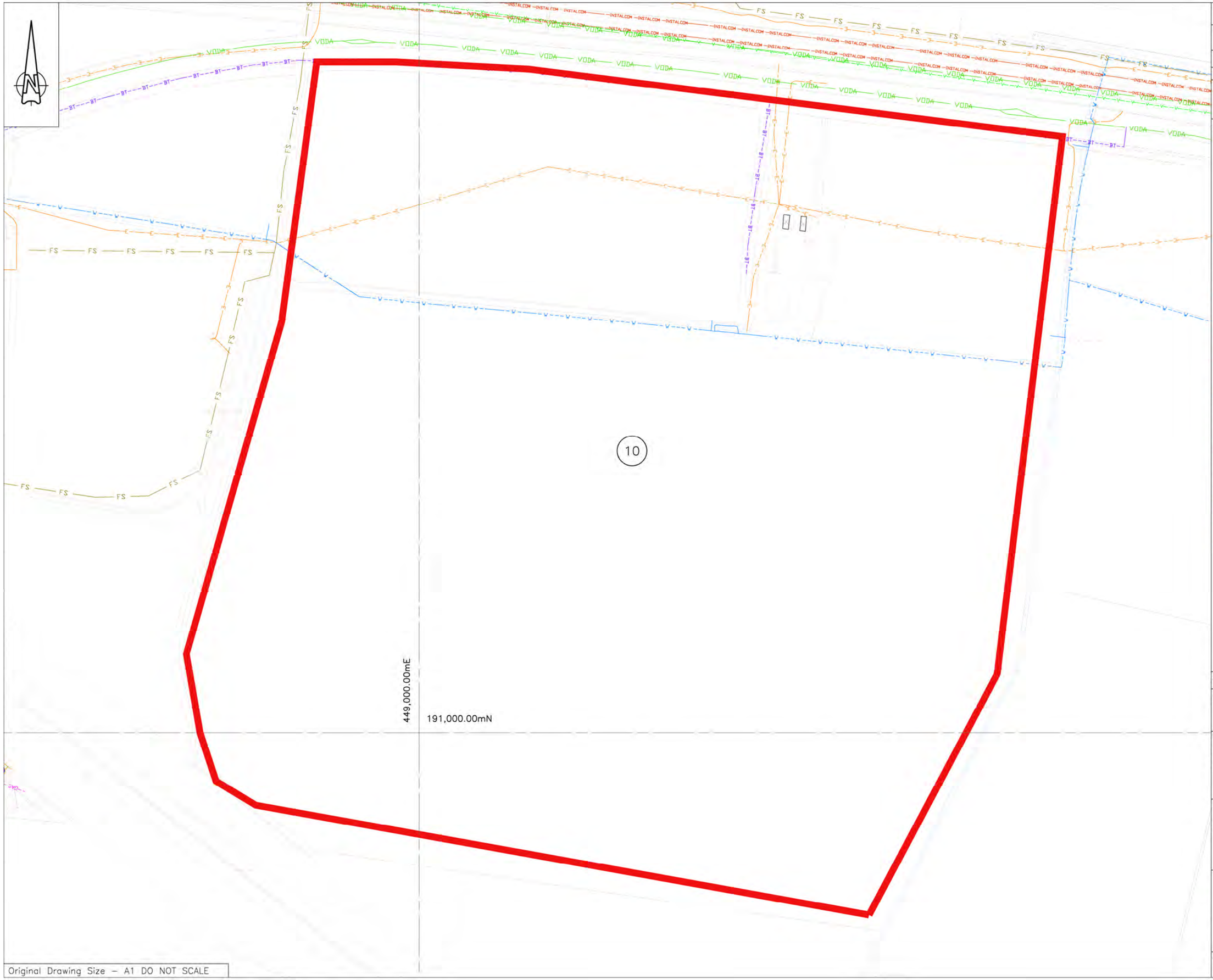
PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 9

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/025
REV. B



DESCRIPTION

REV	DATE		DWN	CHK	APP
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REVISIONS

REV	DATE		DWN	CHK	APP
B	27/02 2017	FINAL MARK UP	EDG	JLM	PK

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- WATER (THAMES)
- SSE-W — WATER (SSE)
- (No.) DEVELOPMENT REFERENCE NUMBER

0m 25m 50m 75m 100m
SCALE 1:1,250

SCALES: 1:1,250

PROJECT TITLE:
DIDCOT GARDEN TOWN

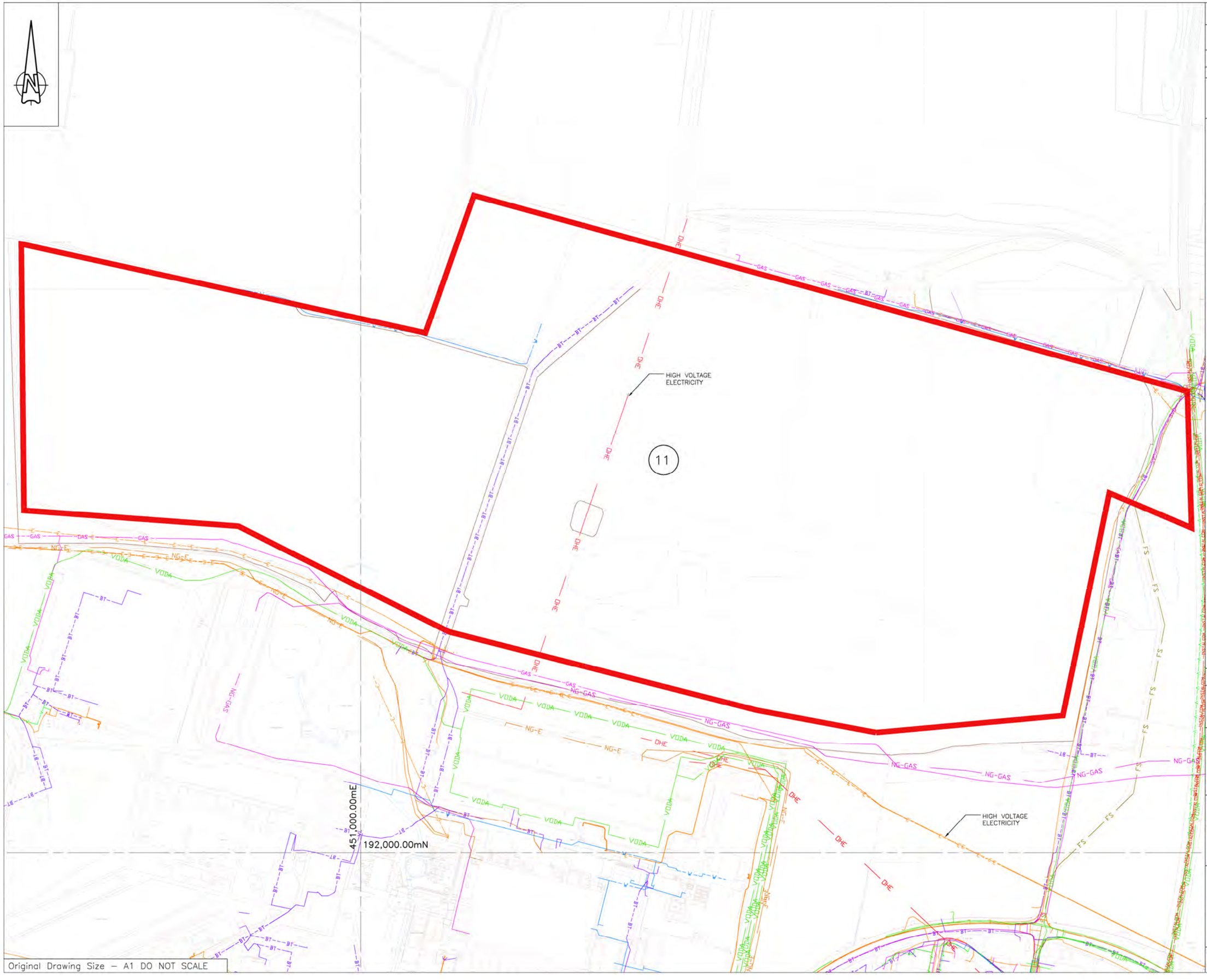
DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 10

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA, WARWICKSHIRE CV32 6JX
TEL: (01926) 439000

DRAWING No. 38421/LEA/CVD/026 REV. B

Original Drawing Size – A1 DO NOT SCALE



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A	DEC 2016	FIRST ISSUE	EDG	JF	PK

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- DHE — ELECTRICITY NATIONAL GRID – (OVERHEAD)
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- SSE-W — WATER (SSE)
- (No.) — DEVELOPMENT REFERENCE NUMBER

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SCALE 1:3,000

SCALES: 1:3,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 11

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

amec foster wheeler
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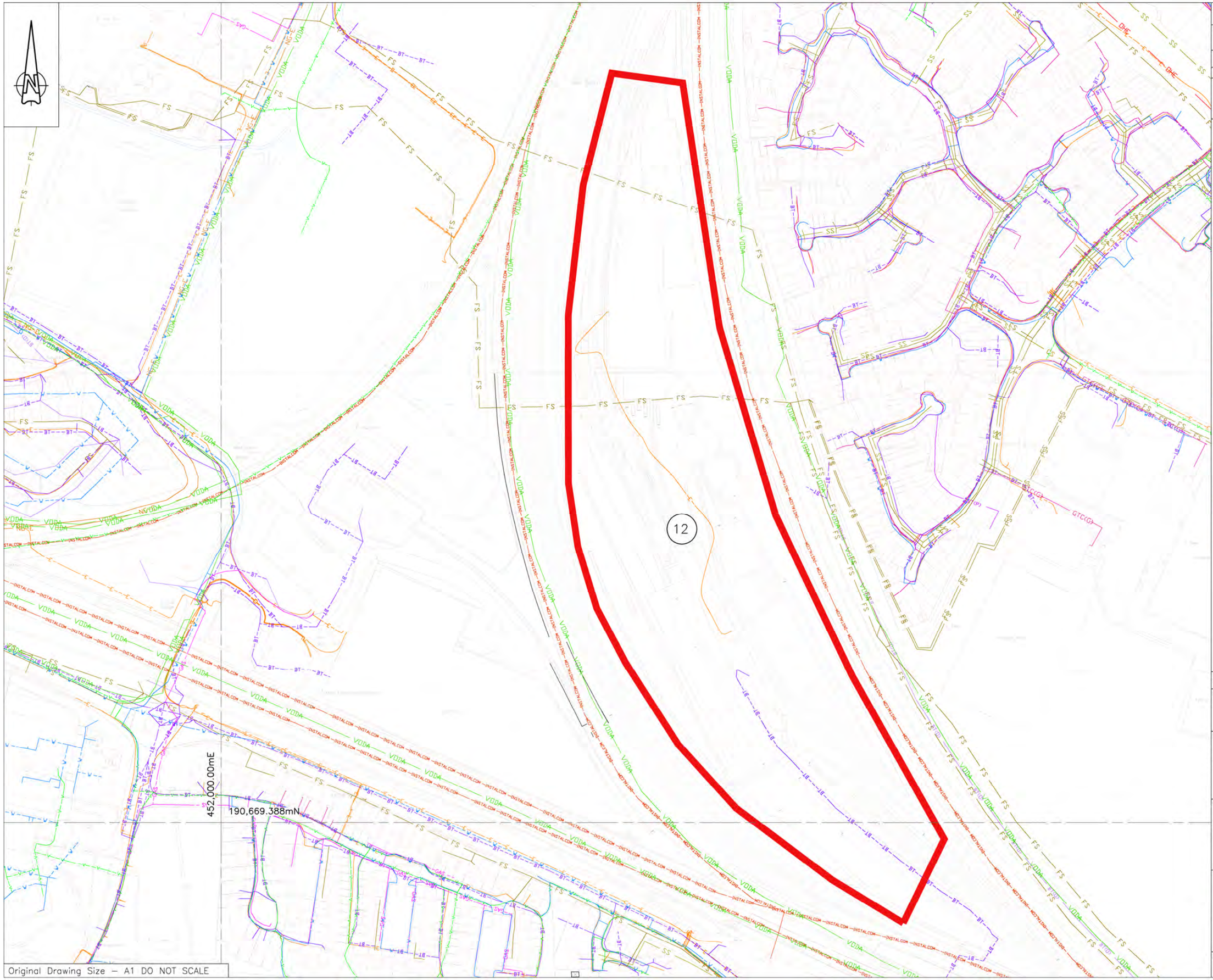

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SCALE 1:1,250

SCALES: 1:1,250

PROJECT TITLE:
DIDCOT GARDEN TOWN

DRAWING TITLE:
DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 12

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

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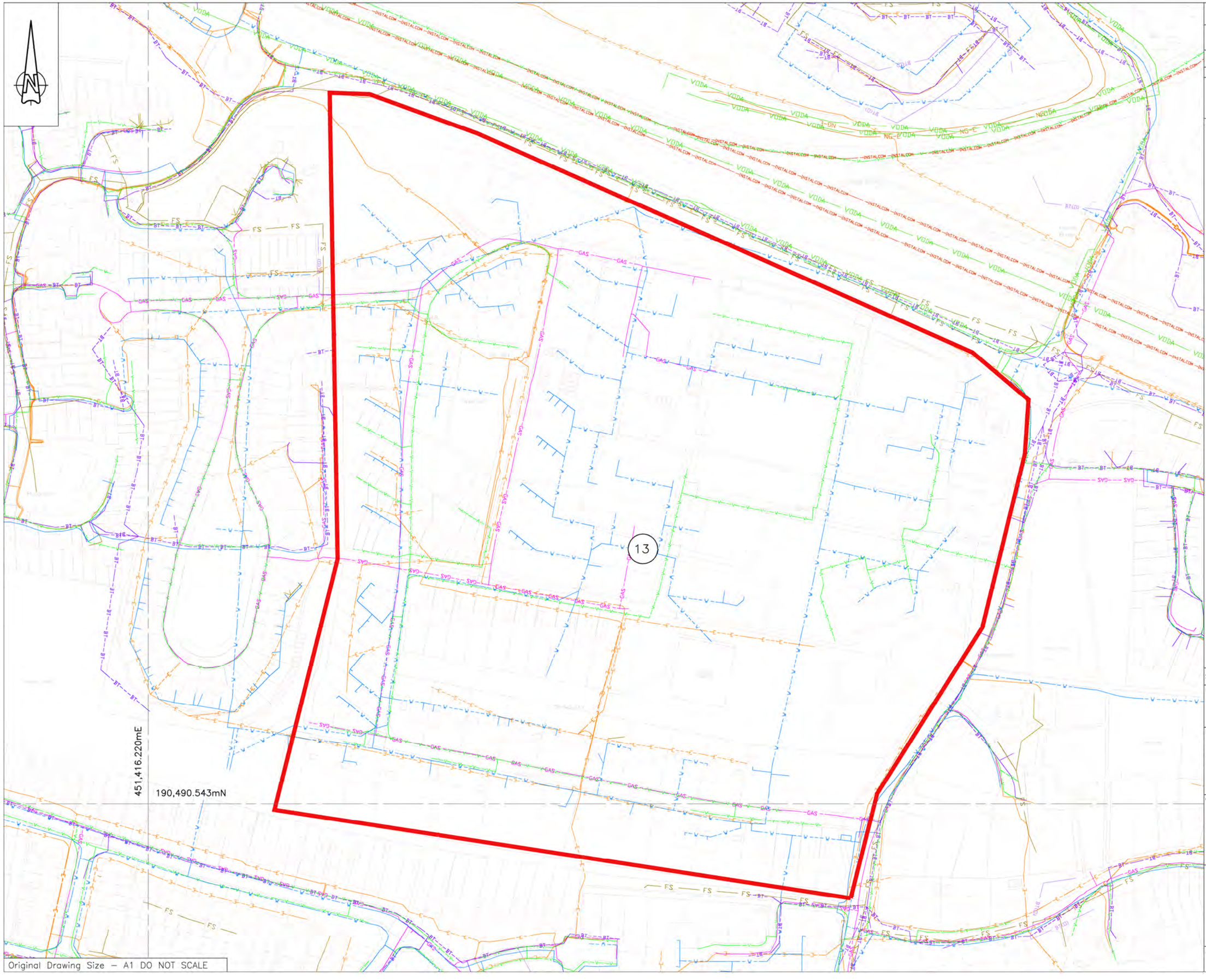

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SCALE 1:1,000

SCALES: 1:1,000

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DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 13

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

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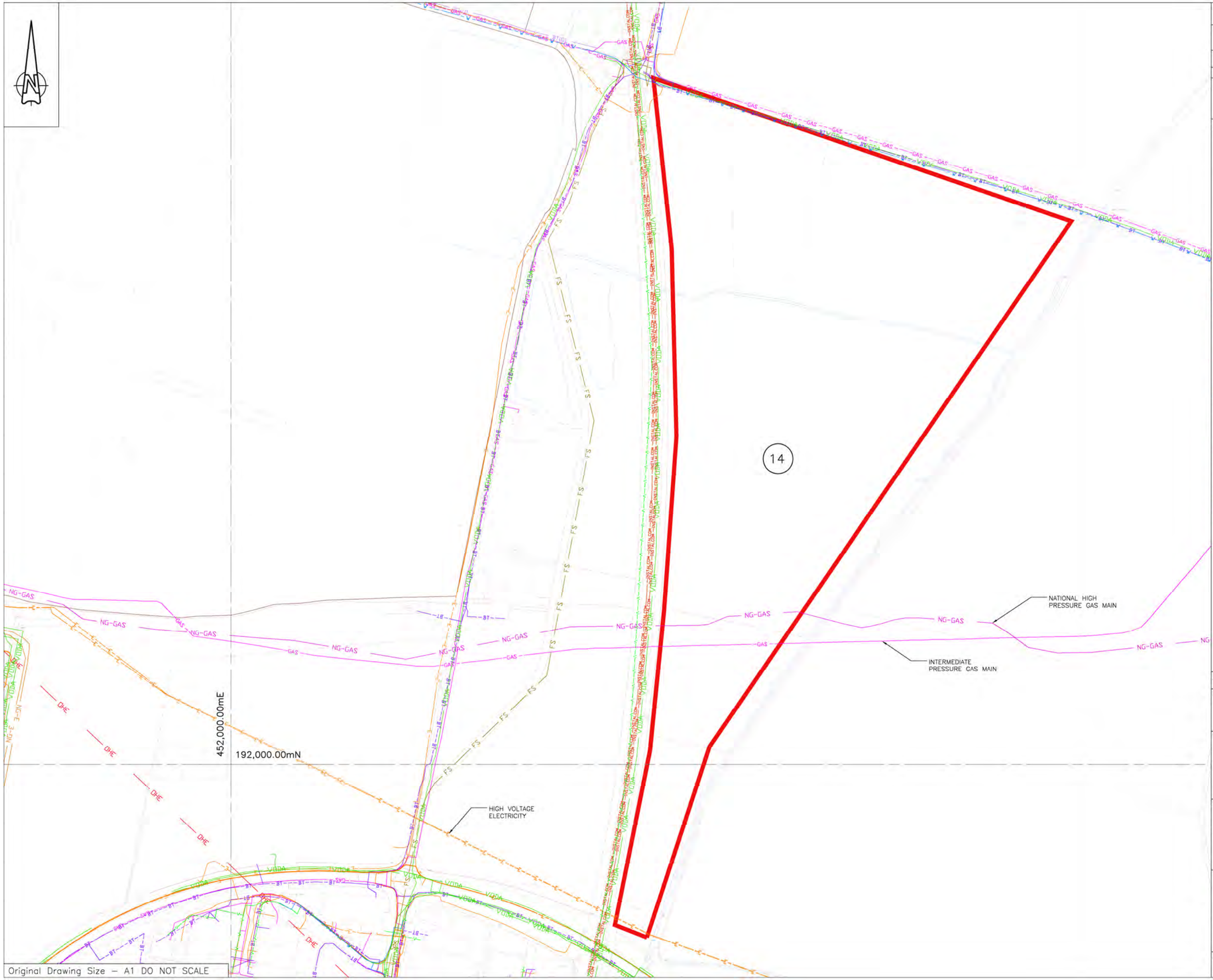

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- (No.) DEVELOPMENT REFERENCE NUMBER

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SCALE 1:2,000

SCALES: 1:2,000

PROJECT TITLE:
DIDCOT GARDEN TOWN

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DIDCOT PROPOSED DEVELOPMENTS AND AREA BREAKDOWN
DEVELOPMENT AREA 14

CLIENT:
SOUTH OXFORDSHIRE DISTRICT COUNCIL AND VALE OF WHITE HORSE DISTRICT COUNCIL

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F.
waste and environmental services

South Oxfordshire and Vale of White Horse District Councils

Didcot Garden Town

Review of Waste and Environmental Services

February 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

Gerry Brough
Interim Head of Development, Regeneration and Housing
South Oxfordshire District Council and Vale of White Horse District Council
135 Eastern Avenue
Milton Park
Milton
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Main contributors

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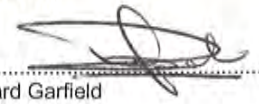
Issued by



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Document revisions

No.	Details	Date
1	Draft Report	January 2017
2	Final Issue	

Contents

1. Introduction

Amec Foster Wheeler has been engaged as part of the Didcot Garden Town (Phase 2) assignment to undertake a review of waste management considerations, specifically reviewing existing and required waste management infrastructure, existing and ongoing environmental services delivery and future utilisation of technology and innovation to support and enhance service delivery in a garden town environment.

In particular, the following tasks have been undertaken within this review:

- Evaluation of local and national policy in relation to waste collection, processing and disposal;
- A consideration of existing waste collection, processing and disposal operations relevant to the Didcot area;
- An evaluation of existing contracts for waste management relevant to the Didcot area, including a review of tonnage and contract length considerations;
- An evaluation of the impact of proposed development on projected waste arisings;
- A consideration of service requirements to cater for population and waste growth; and
- The identification of opportunities for the use of innovative and sustainable working practices to enhance service delivery.

In undertaking this review, relevant stakeholders have been engaged with directly, including South Oxfordshire and Vale of White Horse environmental services department and the Oxfordshire County Council environment and economy team.

2. Policy Background

As the waste collection authority (WCA) and principal litter authority (PLA) for the Didcot area, Vale of White Horse and South Oxfordshire District Council has a statutory duty to ensure the collection of controlled waste and to keep its relevant land clear of litter and refuse as far as is reasonably practicable (as defined in section 89(1) of the Environmental Protection Act 1990. Oxfordshire County Council, as waste disposal authority (WDA), has the responsibility for the treatment and disposal of material collected by the WCA.

In order to support and promote sustainable waste management practices within garden town developments, consideration should be given to both national and local waste management policies and strategies, specifically:

2.1 EU and National Waste Policy

- The waste hierarchy as defined in the EU Waste Framework Directive underpins the management of waste in the UK. As such, a target of 50% reuse and recycling for EU member states has been set for 2020;
- The European Commission's Circular Economy package furthers recycling aspirations by setting a recycling rate of 65% on EU members to be met by 2030, coupled with a 10% limit on waste being sent to landfill;
- The Environmental Protection Act (1990) sections 45 and 46 place the duty on waste collection authorities for the collection of controlled waste using receptacles and collection methodologies that the council considers most appropriate;
- Section 51 of the Environmental Protection Act (1990) places the duty on a waste disposal authority to dispose of controlled waste collected in its area by waste collection authorities. Exception is made to the recycling of collected material which, under section 48, may be arranged by the waste collection authority;
- The Waste (England and Wales) Regulations 2012 requires WCAs to collect paper, glass, plastics and metals separately where technically, environmentally and economically practicable (the TEEP test); and
- WRAP's waste collection consistency framework, introduced in September 2016, outlines three preferred options in order to promote greater harmonisation of public services across England. One of these options is a fully comingled service including plastics, metals, cartons, glass and card, as currently provided to residents of the Vale of White Horse and South Oxfordshire District Council area.

2.2 Local Waste Strategy

Oxfordshire's Joint Municipal Waste Management Strategy 2013 states that the planning authority (i.e. Oxfordshire County Council) should define where waste management facilities should be located. The strategy also has a clear focus on the following areas;

- Aligning local waste management with the waste hierarchy, promoting waste reduction and the treatment of waste before disposal;
- Joint working to save money, improve recycling opportunities and maximise material value; and
- Linking carbon measures to waste management delivery, improving access to services and the variety of services offered.

2.3 Planning Policy

The National Planning Policy for Waste (2014) covers the following considerations for planning bodies and authorities:

- Support for the waste hierarchy and the proximity principle;
- The consideration of waste management at planning stages;
- Promotion of good waste segregation and storage through effective development design so as to support high quality service delivery;
- Support for collaborative cross boundary working to maximise the use of capacity on a local level;
- Identification of the benefits of locally sited facilities and linking energy sources to developments at a local level; and
- How waste facilities should positively contribute to the local environment.

South Oxfordshire and Vale of White Horse District Council Policy DC7 (Guidance for Future Planning Proposals and their Impact on Waste Vehicles) details the provisions to be made within new developments for the sorting, storage and collection of waste, along with provisions to support sustainable waste management initiatives. Specifically:

- Details of waste containment to be provided to each property;
- Confirmation that all waste containers must be stored within property boundaries without the need to go up / down steps or through the property, and with suitable access points to allow for the presentation of waste for collection;
- Consideration of internal methods of waste separation to support collection services, such as a two-bin system in kitchen areas for waste and recyclable material;
- Accessibility to bin storage areas by all residents, including those who are less mobile;
- Provision of a suitably clear and wide path from any bin store to the collection point;
- Confirmation that waste should be presented no more than 25m away from the nearest accessible point for a collection vehicle; and
- Road design should address minimising the need for vehicle reversing, and construction should be suitable for a full sized refuse collection vehicle, both in terms of width and in terms of suitability to accept vehicles of 32 tonnes gross vehicle weight.

Figure 2.1 Typical Roadside Collection Vehicle

3. Existing Environmental Services Delivery – Waste Collection, Street Cleansing and Grounds Maintenance

As the waste collection authorities for the Didcot area, South Oxfordshire District Council and Vale of White Horse District Council has responsibility for the collection of waste from households. This responsibility is borne from the point of occupation. In addition, as principal litter authority, the District Councils have responsibility to keep relevant land clear of litter and refuse as far as is reasonably possible. This may involve the use of street cleansing schedules and the provision of suitable litter and dog waste bins, however the responsibility for providing these services is only borne from the point at which a footpath or road is adopted.

Environmental services provided by South Oxfordshire and Vale of White Horse District Council have been reviewed below in terms of contractual terms and service standards to allow an assessment of capacity for growth to be undertaken.

3.1 Waste and Recycling Collection Services

Oxfordshire is a high performing county in terms of waste recycling. For the 2015/16 annual period the waste collection authorities of South Oxfordshire and Vale of White Horse District Councils achieved preliminary recycling figures of 66.5% and 64.8% respectively, placing them in first and second place in the national recycling league table. This level of performance means that both councils are achieving the 2020 target of 50% set by the Waste Framework Directive, and together surpass the Circular Economy target for 2030 of 65% recycling.

South Oxfordshire and Vale of White Horse District Councils have jointly procured and managed waste collection services, currently provided by Biffa under a contract that has been extended to run up to 2024. No further extension will be permitted and therefore the contract will need to be tendered in advance of 2024. This contract also includes street cleansing services, dog and litter bin servicing, and fly tipping removal.

Waste collections services are based on an alternate weekly collection service, whereby over a two-week period residual waste is collected from a grey wheeled bin one week, and dry mixed recyclable materials are collected from a green wheeled bin the following week. In addition, food waste is collected from a kerbside caddy on a weekly basis, and an optional fortnightly garden waste scheme is available to residents at a cost of £37 per annum. Approximately 46,000 households (42%) subscribe to this additional service. The collection containers utilised are described in table 3.1.

Table 3.1 Core waste and recycling collection services

	Standard Containment	Collection Frequency
Residual Waste	180 litre wheeled bin	Fortnightly
Dry Mixed Recyclables	240 litre wheeled bin	Fortnightly
Garden Waste (opt in)	240 litre wheeled bin	Fortnightly
Food Waste	23 litre caddy	Weekly

Figure 3.1 Typical Household Waste Bins

Supporting high levels of performance, the collection methodology in place is in line with WRAPs consistency framework as described in section 1.1, through the provision of a comingled recyclable material stream accepting plastics, metals, cartons, glass and card.

In addition to the core services provided as detailed above, a chargeable bulky waste collection service is offered. Whilst the reuse of bulky waste is promoted and supported by the council, there is no current reuse scheme in place. Residents are directed to reuse options when they call to request a collection service, such as charity outlets, however this service is not provided by the council directly.

The council does not offer a commercial waste collection service, and traders are directed to the council's contractor, Biffa Commercial, if a service is requested.

Bring sites for the depositing of recyclable material in public spaces has been scaled back in recent years, with a small number of collection points remaining for waste electrical and electronic equipment (WEEE) along with some underground glass banks. Historical sites suffered from contamination and fly tipping, and the introduction of more comprehensive kerbside collection schemes has in effect made this service surplus to requirements. The recent introduction of kerbside collections of WEEE and textiles has meant that there will likely be a further drop in bring bank provision moving forward.

3.2 Street Cleansing and Grounds Maintenance Services

A good level of street cleanliness is being achieved in the South Oxfordshire and Vale of White Horse area, with BVPI 195 measurements sitting at 3% for litter and 11% for detritus, against targets of 4% and 7% respectively. Street cleansing is a contracted service, with this currently undertaken by Biffa. This service attends to the cleansing of inner and outer town centre areas and car parks, large and small villages, and is undertaken under schedule utilising both manual and mechanical sweeping methodologies.

Community litter picking is supported through the provision of tools and bags (refuse and recycling) by the council and collection of collected material by the street cleansing contractor. While the recycling of litter is limited due to contamination, some on street recycling litter bins and park recycling bins are provided and serviced regularly.

Grounds maintenance is also a contracted service, currently being provided by Sodexo. Waste arisings from grounds maintenance operations are the responsibility of the contractor to manage appropriately. Currently, Sodexo ensure that all grounds maintenance waste is composted off site.

Street cleansing and grounds maintenance operations are delivered in accordance with the contract held between contractor and council. There is little alignment of services where delivered by differing contractors,

other than the continuity of a single council officer overseeing the contracts. Park up areas, where refuse collection or street cleansing vehicles and equipment is held overnight, are provided by the relevant contractor and not by the council. Where vehicles are deployed, the council requires contractors to utilise the most up to date engine technology in terms of emission standards at the point of contract commencement or the replacement of fleet (Euro 6 at the time of writing). There is a contractual aspiration to deploy the use of biofuels, however concerns have been raised regarding engine manufacturer warranties which would need to be resolved before use of biofuels could become a reality. There is no contractual requirement for the deployment of further alternative fuel technology such as hydrogen fuel cell or electric / hybrid vehicles.

3.3 Infrastructure and Waste Disposal Arrangements

South Oxfordshire and Vale of White Horse District Council retain ownership of dry mixed recyclable material collected as part its services, and currently the responsibility for handling and the sale of dry mixed recyclable material after the point of collection is held by the collection contractor. Currently, Biffa deposit this material at a waste transfer station at the 'Culham No 1' site, approximately 3 miles north of Didcot. From this site material is bulk hauled to materials recovery facilities in North London and the West Midlands.

Oxfordshire County Council has procured and manages an extensive infrastructure network for the management and processing of residual and organic waste collected across the county, as detailed in table 3.2. This infrastructure supports the local waste policy by promoting the treatment of waste before disposal, and in accordance with the proximity principle.

Table 3.2 Residual and Organic Waste Management Facilities provided by Oxfordshire County Council

Waste Stream	Facility Type	Contractor	Location	Notional Design Capacity (tpa)	Contract End Date (extension)
Residual Waste	Energy from Waste	Viridor	Ardley	300,000	2040 (2050)
Organics	Anaerobic Digestion	Agrivert	Wallingford	50,000	2024 (2029)
Organics	Anaerobic Digestion	Agrivert	Cassington	50,000	2024 (2029)
Organics	In Vessel Composting	Agrivert	Ardley	35,000	2024 (2029)
Organics	Windrow Composting	Agrivert	Showell	25,000	2024 (2029)
Organics	Windrow Composting	Agrivert	Wallingford	25,000	2024 (2029)
Organics	Windrow Composting	Agrivert	Hinton	5,000	2024 (2029)
Bulky Waste	Landfill	FCC	Sutton Courtenay	n/a	2017

Oxfordshire County Council's contract with Viridor (let in 2011, with a 25-year service term commencing 2015) for the processing of residual waste has an exclusivity clause whereby all residual waste for which Oxfordshire County Council has responsibility for must be processed by Viridor through their Energy Recovery Facility (ERF) at Ardley. Similarly, there is agreement between the County Council and all waste collection authorities to ensure that all collected residual waste is to be managed by the County Council. Therefore, there is full exclusivity in the management of this material stream.

Figure 3.2 Viridor's Energy Recovery Facility at Ardley

The in-vessel composting and anaerobic digestion contract between Oxfordshire County Council and Agrivert has a minimum tonnage. The garden waste composting (windrow) agreement with Agrivert has no restriction either in terms of exclusivity or minimum tonnage.

In addition to the treatment and disposal infrastructure detailed above, Oxfordshire County Council provides a network of household waste recycling centres (HWRC) for the depositing of household waste without charge in line with the Environmental Protection Act section 51(1) and (2).

A total of 7 HWRC sites are managed and maintained under contract. Oxfordshire County Council intends to extend the contractual arrangements for up to 10 years from 2017. Many sites are reaching capacity and are in need of refurbishment.

Figure 3.3 Example HWRC site – Oakley Wood, Oxfordshire

The closest HWRC site to the Didcot area (Steventon Road, Drayton, Nr Abingdon, OX14 4LA) has an annual throughput of approximately 10,000 tonnes per annum and achieves a 47% recycling rate, however suffers as a result of limited space and high usage, resulting in regular queuing on site. This has had the knock on effect of residents depositing waste at alternative sites, putting additional pressure elsewhere. Oxfordshire County Council continues to review the provision of HWRCs which, subject to appropriate analysis and approvals, may result in a long term move to fewer, larger and more innovative sites.

Street sweeping material collected as part of the street cleansing contract provided by Biffa is processed by Grundon under contract with Oxfordshire County Council. The site, at Ewelme, processes approximately 5000 tonnes of street sweeping material per annum from across Oxfordshire to recover or recycle 100% of delivered material through separation into constituent parts (predominantly organics, metals, grit and sand).

4. Growth in Population and Waste Arisings

The level of development planned for Didcot will result in inevitable growth of waste arisings for that area which must be incorporated into existing or new waste management infrastructure. In order to assess the level of waste growth that can be expected from the Didcot Garden Town development, current waste arisings across the South Oxfordshire and Vale of White Horse area have been reviewed. Table 4.3 summarises the material collected over the 2015/16 annual period.

Table 4.3 Waste arisings (2015/16) across South Oxfordshire and Vale of White Horse District Council area.

	Tonnes per Annum	% of Material Collected
Dry Recyclable Material	27,076	31.30
Anaerobic Digestion / In-vessel Composted	7,945	9.19
Composted	19,533	22.58
Energy from Waste	30,529	35.30
Landfill	1,413	1.63
TOTAL	86,496	100

Mid-year 2014 ONS data indicates that South Oxfordshire[1] and Vale of White Horse[2] have a combined total population of 261,900. With a resident per household average of 2.4 across Oxfordshire, this equates to a household total of 109,125.

Using this data to calculate the waste arisings per household results in a figure of **0.79 tonnes per annum per household** of kerbside collected material across the South Oxfordshire and Vale of White Horse area (86,496/109,125).

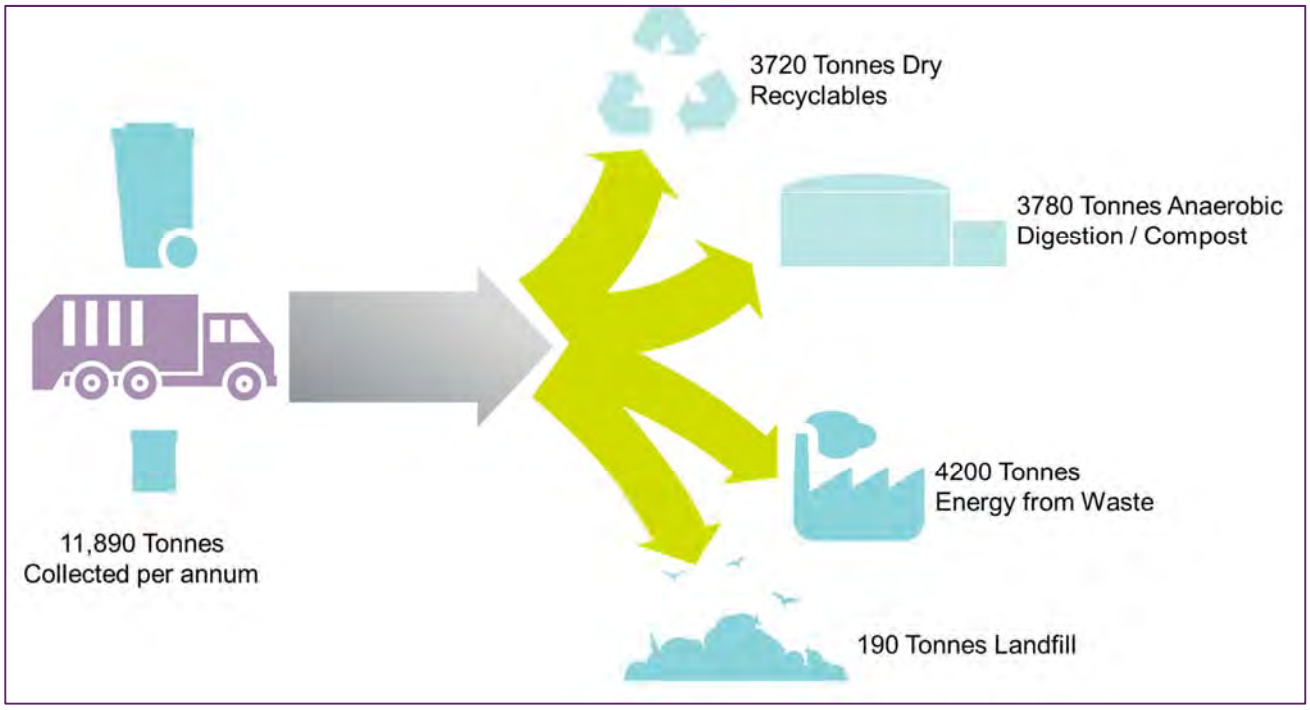
Based on the current proposals for Didcot Garden Town development anticipating 15,050 new households, the expected growth in kerbside waste arisings can be calculated as shown in table 4.4 (assuming the same mix of materials collected as at present).

Table 4.4 Expected Growth in Waste Arisings as a result of Didcot Garden Town Development.

	Calculation	Tonnes per Annum
Dry Recyclable Material (31.30%)	0.79 x 15050 x 0.313	3721
Anaerobic Digestion / In-vessel Composted (9.19%)	0.79 x 15050 x 0.0919	1093
Composted (22.58%)	0.79 x 15050 x 0.2258	2685
Energy from Waste (35.30%)	0.79 x 15050 x 0.3530	4197
Landfill (1.63%)	0.79 x 15050 x 0.0163	194
TOTAL		11,890

[1] https://www.oxford.gov.uk/districtdata/homepage/5/district_data_-_south_oxfordshire
[2] https://www.oxford.gov.uk/districtdata/homepage/6/district_data_-_vale_of_white_horse

Figure 4.1 Predicted Tonnages of Waste to Different Facilities



4.1 The Impact of Waste Growth on Waste and Recycling Collection Services

The calculation of anticipated waste growth as detailed in table 4.4 allows an assessment of service delivery impacts to be undertaken. By utilising assumed vehicle capacity for each material stream, an estimate of additional loads and therefore vehicles required can be made. These calculations are detailed in table 4.5.

Table 4.5 Estimated Increase in Vehicles Required per Material Stream.

Material Stream	Total pa (tonnes)	Vehicle Capacity	Additional Loads pa	Working Days pa	Additional Loads per day (every other week / each week)	Additional Vehicles per week Assuming 2 tips / day
Dry Recyclable Material	3721	5.5 tonnes	677	130	5.2 / 2.6	1.5
Residual Waste	4197	7.5 tonnes	560	130	4.3 / 2.15	1
Garden Waste	2685	10.5 tonnes	256	260	0.98 (every week)	0.5
Total						3

Table 4.5 predicts a requirement for a total of an estimated three additional vehicles to be deployed for the collection of all waste predicted to be created from the additional 15,050 properties as a result of the growth of Didcot Garden Town. These additional resources, within the current collection contract, would be managed as part of the 'extra works' contractual arrangement, whereby additional properties are added to the contractors 'extra works' invoice throughout the annual period. These are then added to the core invoice at the end of each annual period for payment in the following and future periods. It is then up to the contractor to provide the necessary resources to ensure that additional households are serviced appropriately.

It is anticipated that take up of the chargeable garden waste scheme would likely take a period of two to three years to reach the existing take up rates due to gardens needing to become established over that period of time.

These estimated additional vehicles will result in increased vehicle movements between collection area and tip site which should be considered from a traffic impacts perspective. The current deposition of dry recyclable material at the 'Culham No 1' site does require the movement of refuse collection vehicles through the village of Sutton Courtenay and Long Wittenham. With an estimated increase of three tips per day (rounded up from 2.6), this would equate to an estimated increase of 3 vehicle movements (to and from tip site) per day from servicing the expanded Didcot area.

This increase in traffic movements between Didcot and the Culham No 1 site will be helped by the proposed Thames River Crossing[3] which will add a direct route between the two areas, diverting traffic away from Sutton Courtenay and Long Wittenham.

The increase in residual waste collection vehicles will have no impact outside of the Didcot area. As planning permission is in place for the transfer of non-hazardous waste up until 2030, the current practice of domestic residual waste transfer at the FCC transfer station situated at the Sutton Courtenay landfill site will continue for the foreseeable future.

Organic waste (garden waste and food waste) is transported to the Wallingford anaerobic digestion and windrow composting site located approximately 1.2 miles north east of Wallingford. As food waste is collected within a vehicle pod alongside residual waste, it is likely that a single tip per day will be required per vehicle and that this will therefore result in a likely increase of 1 vehicle movements per day between Didcot and the Wallingford site. Similarly, it is likely that a maximum of 1 additional garden waste vehicle movement will be required along the same route.

It must be noted that the assumptions made with regard to vehicle movements are based on the existing service and infrastructure provision and cannot take account of unknown changes to contracts held by either the South Oxfordshire and Vale of White Horse District Council or the Oxfordshire County Council over the next 15 years. New or amended contracts, either for waste collection or waste handling, may result in the utilisation of alternative sites at the discretion of any new contractor and in agreement with the relevant local authority.

4.2 The Impact of Waste Growth on Material Treatment and Disposal

The calculation of anticipated waste growth as detailed in table 5.4 allows an assessment of the impact on waste management infrastructure to be undertaken.

Oxfordshire County Council have confirmed that the existing infrastructure does have capacity to accept the additional volumes of material predicted to arise from the growth of Didcot Garden Town. There is also a contractual obligation to direct all residual waste under exclusivity and food waste under a minimum tonnage agreement.

However, as detailed earlier within this report the existing HWRC infrastructure is currently struggling with demand, and will further struggle with additional material that may be deposited at these facilities from new developments.

Over the 2015 / 16 annual period, a total of 49,176 tonnes of household waste and recyclable material was deposited at HWRC sites across Oxfordshire. With the total number of households in Oxfordshire totalling 280,208, the average waste per household deposited at HWRC sites equates to 0.18 tonnes per annum. Therefore, with the planned growth of 15,050 households within Didcot, it can be estimated that an additional ~2,709 tonnes of material will require deposition at HWRC sites.

When put into context, the closest site to Didcot, located at Drayton, currently manages a throughput of 8,040 tonnes per annum. Assuming all waste growth is diverted through this site, this would result in an increase in waste of 33.7%. As previously stated, the Drayton site is currently under pressure and therefore it

[3] www.cpreoxon.org.uk/news/item/download/759

can be assumed that such an increase in waste throughput would not be sustainable for this site in its current state.

Even if the next closest site (Oakley Wood, near Wallingford) is taken into account, both of these sites currently accept an annual total of 18,050 tonnes per annum. An increase of 2,709 tonnes would add 15% to the total waste throughput.

It is therefore recommended that Oxfordshire County Council are further engaged on the subject of HWRC service provision. Discussions to date have confirmed that the County Council's service review is focussed more on the north of the County, however there would likely be considerable interest should a suitable site for a new and improved HWRC site be identified in or around the Didcot area. A failure to consider the impact on HWRC sites may have an impact on local street scene due to the potential for increased fly tipping where access to HWRC sites is constrained due to capacity limitations, and it is therefore in the interest of South Oxfordshire and Vale of White Horse District Council to engage with Oxfordshire County Council on this matter.

The development of innovative waste management solutions within development plans will not only ensure that facilities are fit for purpose and aligned with existing services, but will also promote the more sustainable management of waste on a local level and make solutions easy for the public to utilise effectively.

4.3 The Impact of Development on other Environmental Services

In addition to the impact on property development on waste arisings, the development of infrastructure and the associated urban environment will impact on the provision of environmental services in the form of street cleansing, provision for litter containment, and grounds maintenance.

In both cases, street cleansing and grounds maintenance, services are delivered by third party contractors under contract let by South Oxfordshire and Vale of White Horse District Council, and additional requirements through infrastructure development are managed through the issuing of variation orders. For example, the street sweeping requirements will increase in line with the length of new roadway created, with responsibility being borne by the council from the point at which the road becomes adopted. Until full development plans are available it is not possible to identify the scale of additional services required.

5. Best Practice / Innovation

As detailed earlier, the provision of environmental services across an enlarged Didcot Garden Town area can be managed within existing and future contracts procured for the delivery of services. In addition, waste treatment and disposal contracts can accommodate the predicted waste growth across existing infrastructure.

This therefore gives some comfort that, in general, the growth in demand for services will be subsumed within existing practices or any new contracts let over the next 15 years. The only exception to this is perhaps the provision of HWRC sites, and the pressure on the existing sites that will be seen from increased waste creation within Didcot.

There are, however, areas of best practice and innovation that must be considered to support the development of service delivery in a way that is in line with the ethos of a garden town, some of which can be built into future contracts. These have been split into three main themes; firstly, the delivery of best practice within current service delivery practices, secondly the development of solutions to take existing service delivery to the next level, and thirdly the review of new technology and innovation to transform service delivery now or in the future.

Core to the principles of Garden Town developments is community engagement and involvement, and the creation of an environment where residents want to feel part of the community. From a service provision perspective these principles are supported by ensuring that services are easily understood and convenient to participate in.

5.1 Best Practice in Design

Engagement and participation in waste and recycling collection schemes is best promoted at property level through direct communication with residents, however there is considerable benefit from promoting the separation of waste and recyclable material through the inclusion of waste segregation containment systems at the development stage of property design, a number of which are detailed within the South Oxfordshire and Vale of White Horse Council's Policy DC10.

In particular, the following principles[4] should be considered and implemented to support service delivery and provide best value solutions:

- The provision of in premise storage for each material stream collected as part of a kerbside collection scheme;
- Suitable and adequate storage (individual and communal) for waste and recyclable material;
- Adequate and convenient access to services for all residents;
- Adequate and accessible space for waste containment, allowing full access to the point of presentation for collection;
- Consideration of underground waste storage to minimise environmental impact;
- Provision of durable, low maintenance and clean facilities; and
- Ensuring that facilities take into account noise, odour and fire safety[5].

Balancing service provision methodologies with innovative building design means that new and smart waste solutions should be incorporated into design principles in order to meet residents' needs and ensure that solutions are forward facing and future oriented[6].

[4] http://resource.co/article/new-guidance-building-suitable-waste-storage-flats-9984
[5] NHBC Guidance (2015) 'Avoiding Rubbish Design: Providing for Bin Storage on New Housing Developments'
[6] http://www.ramboll.co.uk/~/media/files/rgr/documents/brochures/stu/solid%20waste_moderncities.pdf

The inclusion of embedded and well-designed waste management systems can bring benefit to the local community, service delivery companies and the environmental outlook of an area. The use of underground or semi-underground waste storage systems can both keep streets and garden areas free from wheeled bins and reduce vehicular movements around housing areas. While solutions have often been deployed for use by communal properties, consideration of solutions for non-communal domestic properties may have merit. As an example, the Molok system[7] is widely used across continental Europe and North America, and provides a high capacity and a relatively visually unobtrusive system for the collection of material from multiple properties. With up to 5000 litres of capacity, these systems can store residual waste from up to 27 households over a fortnightly collection period (assuming 180ltr residual waste wheeled bins as currently utilised for household waste collections in the Didcot area).

Figure 5.1 Examples of Underground Waste Storage

Due to 60% of the container being underground, the visual impact of these systems is considerably less than that of traditional communal wheeled bin style communal bins. In addition, building such collection systems into the design of housing areas can ensure ease of access to all residents. Underground storage systems bring further benefit in the form of a reduction in odour due to cooler conditions, reduced manual handling for collection staff, and collection of waste and recyclable material from a single location, rather than individual households. However, careful planning with regards the location of such containers is required to ensure that no underground utilities are impacted and to minimise the potential restrictions of use for residents with restricted mobility. Consideration would also need to be made regarding the bespoke nature of a collection vehicle required to service such waste containment areas, although it is noted that systems exist which can be serviced utilising standard rear end loader refuse collection vehicles, for example the Sotkon solution[8].

5.2 Best Practice in Service Provision

Recognising that the South Oxfordshire and Vale of White Horse District Council areas are the top performing areas in England, and that service delivery methodologies are limited by the contracts held by private contractors, best practice is, in essence, already being achieved. Any further step-change improvement in recycling performance will likely require a fundamental change to either the frequency of residual waste collection (from fortnightly to three-weekly) or a restriction in residual waste collected through provision of smaller waste bins. Neither options could be implemented for Didcot Garden Town alone due to the perceived imbalance of service levels being received within a single local authority area, and also due to the contractual and service complications that this would entail.

Participation in recycling schemes will support the sustainable principles of the Garden Town and as such the available services should be promoted to new residents within the Garden Town area, using direct communication to ensure that knowledge of services is in place as soon as a new resident is occupying their

[7] www.molokna.com/municipal
[8] www.sotkon.com

property. This will maximise participation in recycling schemes and minimise confusion that can lead to recyclable material becoming contaminated.

5.3 Progressive Sustainable Practice

Over and above the core services delivered to all residents, a number of initiatives could be considered for the integration of sustainable practices within the community of Didcot Garden Town. These have been split into five main themes; community engagement and service development, community development, incentives, connectivity, and streetscene enhancement.

Community Engagement and Service Development

The direct communication of local services available to residents is key to them gaining an understanding of and participating in those services. The incorporation of clear and comprehensive waste management information into any new resident communication packs would benefit all new residents by describing environmental services available to them and providing contact numbers in case of any queries or uncertainties. In addition to the promotion of services, such communications initiatives should promote the existing high performance that is being achieved within environmental services delivery in the South Oxfordshire and Vale of White Horse area. Such promotions could be targeted with the aim of supporting new residents to buy into such high levels of performance, maintaining or even surpassing them using the services available to them.

The provision of comprehensive, sustainable and accessible services is key to achieving high levels of participation and therefore performance. While South Oxfordshire Council and Vale of White Horse Council provides comprehensive and high performing environmental services to local residents there are small areas of improvement that could be developed an embedded within the Didcot Garden Town area. While recycling levels are high, reuse has not seen the same success, and currently all bulky waste collected by the council is disposed of in landfill.

Community groups and third sector organisations have long been engaged in reuse projects and provide a valuable service in many parts of the UK. For example, the Bicester Green Centre for Skills, Sustainability and Second-hand Stuff[9] based in Bicester has been providing supporting the local community since 2013 by diverting waste from landfill by focusing on the repair of electrical items, furniture and bicycles. In addition to the reuse of otherwise disposal destined items, this social enterprise works with volunteers to develop skills and bring together the local community. This has meant Bicester Green has become a sustainability hub for the Bicester area, a model that could be replicated to support sustainability within a Garden Town.

As well as acceptance of donated items for reuse on an individual basis, third sector organisations have often been engaged to provide direct collections of reusable items of furniture, either through direct instruction from a local authority under a collection agreement, or through direct contact from residents. These free services not only divert material away from disposal routes but also further promote community engagement and local volunteering, while providing income to third sector organisations and low cost furniture solutions to local residents. The support for such services through direct engagement with the third sector and the provision of suitable workshop areas could benefit the local community on a wider scale through the development of a local sustainability hub. Direct engagement between South Oxfordshire and Vale of White Horse Council and suitable local third sector organisations would be required to develop and support a long term sustainable solution.

Further supporting local reuse and sustainable waste practices, in addition to supporting retailer obligations under the Waste Electrical and Electronic Equipment (WEEE) Regulations 2013, the development of commercial premises should, where relevant take account of available storage for take back items deposited by residents upon purchase of a new replacement product. Communication to local residents should promote this service, thereby promoting not only waste reuse but also local businesses.

As detailed within section 1.4 of this report, consideration will need to be given to the capacity of existing household waste and recycling centres (HWRCs). As reported, the existing sites are under pressure and are therefore unlikely to be able to cope with predicted growth in waste arisings. As local authorities look to make

[9] www.bicestergreen.org.uk/

savings through the reduction of HWRC numbers, many are seeking to replace existing sites with fewer but larger facilities with a focus on recycling and reuse. The development of Didcot Garden Town may present an opportunity to develop a new HWRC 'super site', providing improved services in terms of accessibility, reduced waiting times, and promoting recycling and reuse as the primary focus of the site.

Oxfordshire County Council have confirmed that their Drayton HWRC site is under considerable pressure, with regular queuing resulting in residents seeking alternative sites for waste disposal. Should suitable land be identified within the Didcot area there may be benefit in the development of a new HWRC site to the West of the town, with a capacity of c. 12,000 tonnes per annum and an onsite reuse shop.

Community Development

Community involvement, cohesion and development are key themes within Garden Town developments. There are many opportunities to support this from a waste reuse and recycling perspective.

Further improving links with the third sector, community composting is a way in which both local residents and businesses can recycle their garden waste and support the local community. As an example, Brighton Community Compost Centre[10] has been running since 2005 and focuses on providing an affordable and local centred green waste recycling solution, not only utilising a local workforce and processing material on a local level, but also providing a service through the sale of high quality garden and horticultural products at a low price. Supporting such a start-up community business within a sustainability hub would provide many benefits to the local community and could support any new allotments created as part of the Garden Town development.

Support for community 'fix it' groups within a community further enhances community cohesion while promoting sustainability and repair / reuse initiatives. As previously detailed, the Bicester Green centre has been acting in this capacity and provides a model that could be replicated in a Garden Town area. In addition, charity organisations such as The Restart Project[11] have supported local activities to help residents and businesses alike to prevent the disposal of electronic waste, providing educational development as well as the promotion of sustainable practices.

A number of community sustainability focussed projects are supported within the Community Action Group Project (CAG) (www.cagoxfordshire.org.uk), an initiative across Oxfordshire which supports and funds over 60 network groups covering a wide scope of sustainable practices including waste minimisation and reuse. Through early and direct engagement with CAG, Didcot Garden Town could benefit from experience of setting up initiatives covering the following areas and more:

- Waste reuse;
- Community composting;
- Carbon reduction;
- Retailer engagement;
- Food redistribution; and
- Sustainability.

The promotion of local community responsibility and street scene initiatives could be supported through the implementation of delegated authority for community groups to maintain local areas.

Incentives

Incentive schemes have been introduced by some local authorities as a way of improving participation and reducing contamination within kerbside recycling schemes. While the benefits of such schemes have been reported to be variable, and potentially limited[12] there may be benefit in the introduction of such a scheme to support early communication campaigns and to maximise recycling as soon as possible. However, further

[10] www.brighton-compost.coop
[11] https://therestartproject.org/
[12] http://www.letsrecycle.com/news/latest-news/reward-schemes-saw-no-sea-change-recycling/

consideration must be made to any financial commitment required and support from South Oxfordshire and Vale of White Horse Council for the development and administration of any scheme. Oxford City's Blue Bin Recycling League initiative provides charitable donations in response to recycling improvements measured within 8 geographical areas and has thereby instilled an element of recycling awareness across the city.

Connectivity

With the use of technology on a day to day basis being common, developing web and application based systems to support local service delivery and awareness will be key to supporting a sustainable and waste aware community.

South Oxfordshire and Vale of White Horse have developed a web app ('Binzone') which provides access to collection day information for residual and recyclable waste. This could be enhanced to include information on street cleansing schedules, the ability to request and sign up to additional services, and the ability to report concerns or problems directly to the Council. QR codes could be deployed on litter bins to allow live reporting of full or damaged infrastructure, either by residents or by contractors. Such a system has been deployed on litter bins by Tower Hamlets Council and has saved £300,000 per annum, winning a Keep Britain Tidy Innovation award in 2016.

Widening the scope of such a service to improve local communication and promotion of services, an app for Didcot Garden Town could be developed to provide residents with information on all services, charitable and community resources available, including the realms of waste management and sustainability.

Streetscene Enhancement

A number of actions and initiatives can be implemented to support and enhance the local street scene alongside the core waste collection and street cleansing services provided by South Oxfordshire and Vale of White Horse Council and their contractors.

The council support community litter picking and promote the collection of material for recycling as well as disposal, and this should be promoted through sustainable community groups noted earlier in this report.

Mobile applications ('apps') are common used for the reporting of environmental issues by members of the public. These are provided either by local authorities themselves (for example Islington Council) or by third party app providers, for example 'fixmystreet' and 'lovecleanstreets', and allow residents to not only report any issues they encounter such as graffiti, fly tipping and full litter bins, but to also obtain information on service delivery such as the next recycling collection day or scheduled street sweeping. A Didcot garden town branded app, building on the 'Binzone' app currently available to Didcot residents could provide service related information as well as information on community groups and other sustainable initiatives in the area.

Service delivery can be supported through design of commercial and residential premises to provide suitable access to collection and cleansing vehicles. However, in addition to material presentation and access, storage of containers must be considered in order to reduce the visual impact when stored on site. The inclusion of well-designed and integrated internal or semi-underground storage solutions minimises visual impact however clearly need to be included at design stage.

In the case of commercial waste collections, restrictions on the allowable presentation times for waste prior to collection can reduce the unsightliness and opportunity for increased litter through refuse bags being damaged or opened by animals.

5.4 Technology and Innovation

In addition to best practice and the implementation of progressive service enhancements, the deployment of technology and innovation could be used to put Didcot garden town at the forefront of innovative sustainable practice. While such innovation may have been implemented and proven elsewhere, in many cases it may require significant investment and / or changes to current practices for benefits to be realised, either financial or sustainability focussed.

Underground waste storage systems as described earlier in this report can provide many environmental benefits in the form of reduced visual intrusion, reduced risk of odour and lower vehicle movements. However, such impacts can be further reduced through the use of automated vacuum waste collection systems, such as those provided by Envac[13]. These systems require a realignment in traditional thinking with regards waste collections, with a move towards waste being viewed more as a utility that flows in to and out of buildings. A connected network of underground pipes is linked to a central collection station from where material is collection for onward transportation to reprocessing and disposal facilities. Waste and recyclable material is placed by residents into inlets which can be located either within or outside premises. When full, inlets are automatically emptied by a central control system using vacuums created in the pipe network. In addition to inlets being provided for domestic waste and recyclable material, litter bins can also be included in a system network, further reducing the need for vehicles and manual labour. Such systems must be committed to and built into the design of an area early on, and it is noted that such systems will not be cheap. However, the costs should be weighed up against reduced waste collection costs, and long term sustainability benefits that a system may deliver.

Local authorities have the powers to install such underground systems, and indeed contribute to them as defined in the Environmental Protection Act (1990) s.45 (7), and including such systems into planning and design would not only save cost but also ensure that solutions are built for ease of use. Such collection systems would support low carbon strategies through a reduction in vehicle movements from household collections and would therefore support the adoption of low emission zone designations. However, such benefits would need to be weighed up against the long term cost profile, including maintenance, any issues that may be encountered due to the high water table, and the impact of bespoke collection systems on the wider waste collection contract.

Where individual kerbside collections are made (i.e. from containers presented by individual properties for waste and recycling collections), minimising the environmental impact in terms of emissions and noise pollution must be considered. While not yet in widespread use, alternative fuel use for collection vehicles could improve one or both impacts. Biofuel, hydrogen[14] and electric powered vehicles have been deployed but each have their limitations, largely due to access to fuel sources. While not proven for refuse collection vehicles, electric vehicles are being deployed for street cleansing, ground maintenance and smaller waste collection vehicles. The development of electric vehicle charging points within a new development would make the use of such vehicles a reality, as well as supporting the use of private electric vehicles. While vehicle choice is a decision left to contractors, providing the opportunity to utilise alternative vehicles would allow innovation in service delivery to be deployed.

Smart city infrastructure is becoming a reality, and provides a scalable solution to improve connectivity, promote community involvement and deliver a higher quality of life[15]. Smart cities are attractive locations to live, work and visit, and embedding smart city technology into service provision can make services streamlined and make more accessible. Services such as waste collection and street cleansing require regular, reliable operations which means that a refuse collection vehicle passes every property and travels down almost every road in the Country on a weekly basis. In addition, technology exists for live feeds to be provided on service demand such as the fill rate of litter bins. This provides the opportunity for information to be gathered by these waste vehicles from smart technology embedded into household utility meters, street furniture, lighting and roadways. This could allow for more resource efficient methodologies to be utilised for service delivery, for example through the deployment of staff to service a litter bin when it has hit a particular fill rate, or knowing that a street lamp is not working without the requirement for an inspection or report from a member of the public. 'Big Belly Bins'[16] not only utilise fill rate sensors to allow staff to empty them only when needed, but also employ solar power to compact litter, increasing the amount of material that can be held by up to 8 times when compared to a standard litter bin. Such technology would bring greatest benefit in areas of high footfall, for example outside a railway station or in a market square, and while expensive at the outset has been shown to deliver savings through reduced emptying frequencies. The provision of litter bins specifically for residual waste or recyclable waste would promote the recycling on the go agenda within the

[13] www.envacuk.co.uk
[14] http://www.letsrecycle.com/news/latest-news/fife-converts-two-rcv-to-use-hydrogen-fuel/
[15] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/246019/bis-13-1209-smart-cities-background-paper-digital.pdf
[16] http://bigbelly.com/

town, and the use of chewing gum bins[17] would support the maintenance of a cleaner environment and a reduced requirement for reactive cleansing regimes.

Large retailers have become more focused on sustainable practices with regard to householder level waste management, with a recent example being the investment by Sainsburys in Swadlincote as a Food Waste Town to support residents to reduce food waste by 50%[18]. Adopting the learnings from this and other schemes and designing a town to fully support their principles would give Didcot Garden Town residents the ability to lead more sustainable lifestyles. The Sainsburys scheme has delivered an app supporting residents to share surplus food, a community fridge for the donation of unwanted food by residents and retailers, waste awareness campaigns and support for waste reduction champions. Partnering up with retailers may allow Didcot garden town to benefit from experience, enthusiasm and, potentially, funding.

Further engagement with retailers on a local level could target waste reduction initiatives. While the charge on single use carrier bags in England has proven to be a great success, other initiatives have taken the concept of reducing retail waste further by implementing bulk good sales whereby goods (for example pasta, rice, spices, coffee, cooking oil and washing up liquid) are not pre-packaged but dispensed from bulk containers[19]. While this would require buy in from local retailers and a change in traditional retail methods, residents could be provided with containers to be used within such a scheme so as to promote its use.

[17] For example, http://gumdropltd.com/
[18] http://resource.co/article/swadlincote-chosen-sainsbury%E2%80%99s-food-waste-trial-town-10684
[19] http://ec.europa.eu/environment/waste/prevention/pdf/Ecopoint_crai_Factsheet.pdf

6. Conclusions

As detailed within this report, the provision of environmental services across an enlarged Didcot Garden Town area can be managed within existing and future contracts procured for the delivery of services such as waste and recycling collections and street cleansing. In addition, waste treatment and disposal contracts can accommodate the predicted waste growth within existing infrastructure.

This therefore gives some comfort that, in general, the growth in demand for services will be subsumed within existing practices or any new contracts let over the next 15 years. The only exception to this is perhaps the provision of HWRC sites, and the pressure on the existing sites that will be seen from increased waste creation within Didcot.

There are, however, areas of best practice and innovation that can be considered in order to support the development of service delivery in a way that is in line with the ethos of a garden town, and these could be included in future service delivery contracts to maximise the sustainability of the area and it's supporting service providers. These are summarised in the following recommendations:

- New developments should support recycling and reuse and embed the principles of sustainable service provision into the design phase, ensuring that access to services and sustainable practices as easy as possible for residents and visitors;
- The use of underground waste storage systems, whether automated utilising vacuum technology or individually emptied brings the benefits of improved neighbourhood aesthetics, reduced odour and a lower number of vehicle movements. However, these must be built into the design of an area to ensure maximum benefit and ease of access to all residents;
- Maximising the use of technology will bring much benefit to Didcot garden town and its residents. Provision of a comprehensive app will allow residents to be kept informed on service delivery schedules and delays, to allow them to report any issues in the local environment, and to be made aware of sustainable practices available to them. The wider use of web enabled technology will allow services to be reduced through, for example, a live feed of litter bin fill rates;
- The use of high capacity, below or above ground, web enabled litter bins in areas of high footfall, for example in a market square or outside a railway station, could bring reduced service delivery costs due to a lower frequency of emptying, and therefore fewer vehicle movements;
- Supporting the use of alternative fuel technology could reduce emissions from both service delivery and resident's vehicles. The provision of electric vehicle charging points within development design would support service providers in deploying innovative fleet solutions;
- Environmental services and sustainable practices available to residents of the garden town should be promoted from day one of residency, whether by electronic or non-electronic means;
- Full engagement with the third sector would support waste reduction and reuse initiatives. The development of a sustainability hub could be used to embed a community feel and involvement through setting up repair clubs and cafes, clothing swap shops and other initiatives; and
- Should a suitable area of land be identified for a new household waste recycling centre, with an emphasis on recycling and reuse, this could be developed alongside the community sector to maximise the recycling and reuse of material, including the development of an onsite reuse shop.

G.
Energy and renewables

South Oxfordshire and Vale of White Horse District Councils

Didcot Garden Town

Energy and Renewables

February 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

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01	Draft Issue for Comment	December 2016
02	Final issue	February 2017

Contents

1. Introduction

1.1 Background

A 21st Century Garden Town at Didcot is planned. This initiative is guided with spatial vision to develop both a connected town and super green town.

A Masterplan is now in place with ten key principles, which are to:

1. Support cycling, walking and better public transport
2. Make Didcot a destination
3. Build a better town centre
4. Celebrate Didcot's history
5. Create a better sense of arrival at key gateways
6. Provide new outstanding landmark facilities
7. Overcome major severance issues
8. Establish a legible network of streets connecting key local centres
9. Integrate smart technology into Didcot's future
10. Offer more diversity in homes and jibs

In conjunction with these initiatives, it is planned to increase the housing stock from approximately 15,000 to approximately 30,000 dwellings by 2031. Both South Oxfordshire District Council and the Vale of White Horse District Council are working together to identify key opportunity sites.

A number of these homes have already been allocated as part of the strategic sites both in and around Didcot and are identified as consented. Some of which cannot be influenced by the masterplan moves, however, for others some influence still exists and study is of benefit. Other sites are currently under the process of consenting, with these there are various opportunities to be investigated. These are classified as either, having critical importance, already coming forward or of strategic worth. In addition to this there are other opportunity sites, where individual study is not (yet) required.

1.2 Purpose of Report

As part of this study Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler) was appointed to prepare a study on the opportunities for renewable energy within the Garden Town Delivery Plan.

This report considers the baseline situation for energy use, the forecast for energy use and the opportunities for introducing additional and new renewable energy options:

2. Renewables Overview

2.1 Summary

The potential mix of local energy supply sources that can be used within the Didcot Garden Town Masterplan is summarised below.

Supporting Greenways and Sustainable Travel

The focus on greenways and sustainable travel routes is likely to constrain volumes of vehicles used within the Garden Town. This suggests a less significant impact on demand associated with an increase in electric vehicles. Nonetheless, provision for vehicle charging points and ebike requirements needs accounting for in masterplanning land allocation. Solar canopies in car parking areas offer potential to supply the charging points.

Decentralised Heat Network

In terms of district heating potential, a parallel study will provide further details regarding potential network options in the study area. Without prejudicing the outcomes of that study, in masterplanning terms the significant anchor loads are likely to be centred around:

- Didcot Gateway - existing Leisure Centre and buildings to South of Didcot Parkway.
- North East Didcot - using community facilities as anchors for new housing development
- Harwell Campus - office and accommodation buildings
- Culham Science Centre - office and administration buildings

There would need to be provision for primary energy centres in the masterplanning to account for the prime mover for any heating scheme (more than likely gas CHP engines in the first instance) and auxiliary equipment.

It is useful to also allow for some additional heat stations (smaller footprint than an energy centre) on the larger housing allocations to allow for future connection requirements around a heat network.

Sources of Heat

There is also potential to use water source heat pumps as a source for heat networks. This would require a small heat station close to the water source to house pumping and control systems. These would not be on the same scale as an energy centre for any district heating scheme.

Energy from waste

There's no immediate opportunity for EfW since the present waste contract involves removal of residual waste to a treatment facility outwith the Garden Town boundary. There is some potential opportunity around the use of local organic waste, though this is constrained by the relatively small volumes this would entail. It is unlikely that a large-scale anaerobic digestion plant would be viable; however, smaller-scale community composting arrangements or AD facilities might be possible. From a masterplanning perspective this would again add to communal land required for service provision. There are, however, also contractual obligations to consider as the existing waste streams are committed to the contract for waste disposal, currently operated by Viridor.

Microgrid

This would have more impact on individual building design than in terms of energy related footprints for operation. In essence, this looks at integrating energy storage within dwellings/buildings - in this instance

batteries. This then allows for storage of any surplus generation (typically from solar PV) which can then be discharged at a later period when output has dropped. This has dual benefits in maximising use of on-site generation and reducing draw on grid supplied electricity. The detailed solution for any area will depend on electrical engineering plans for any development. However, the main planning consideration is to build in some physical space within dwellings/buildings to house batteries or similar. If the proposed storage was on a broader scale (i.e. multi-buildings) then this would potentially require capacity for sub-station like buildings within the masterplan (80 - 100 sq m footprint) to house battery storage.

Other Options

Other technology options that have been reviewed, but are not considered to offer significant input to the overall Masterplan, are summarised here.

Wind

Given existing environmental designations and required buffers for noise considerations, medium scale wind capacity is not anticipated to form part of the energy supply mix for the Garden Town. The vision for extensive transport corridors to support cycling and sustainable transport acts as a secondary constraint to any potential wind development.

Hydro

Small scale hydro schemes are unlikely, though there may be one or two potential schemes using unconventional run of river solutions. These would require small footprint generating stations (of the order of 20 - 30 sq m) to support transmission of generated electricity.

Thermal Storage

At this stage there is no expectation of large scale thermal storage requirements; any storage facilities would be integrated with initial heat network clusters.

Geothermal

There is no immediate opportunity for deep geothermal energy systems, based on previous national feasibility work.

3. Energy Demand Projections

This section provides an overview of existing energy demand in the Didcot area and how this might be impacted by the proposed development of the Garden Town.

3.1 Existing Energy Demand

BEIS published statistics[1] provide a summary of existing energy demand within the South Oxfordshire and Value of White Horse local authority areas. These figures provide a guide as to the mix of supplies that presently exist to serve both residential and non-residential consumers within the Garden Town area.

Table 3.1 Regional energy statistics (South Oxfordshire and Vale of White Horse)

Energy	South Oxfordshire (GWh/yr)	Vale of White Horse (GWh/yr)
Coal, *of which:*	59.0	24.1
Industrial & Commercial	51,5	19.7
Domestic	7.4	4.4
Rail	0.1	-
Manufactured Fuels, *of which:*	3.5	1.6
Industrial	0	0
Domestic	3.5	1.6
Petroleum Products, *of which:*	1,658	1,558
Industrial & Commercial	99.7	108.3
Domestic	116.7	82.5
Road Transport	1.367.1	1,297.8
Rail	74.5	68.9
Gas, *of which:*	**869.5**	**862.2**
Industrial & Commercial	196.8	254.3
Domestic	672.7	607.8
Electricity, *of which:*	874.1	835.7
Industrial & Commercial	581.8	594.9
Domestic	292.3	240.8
Bioenergy & Wastes	39.2	24.9
TOTAL (All Fuels)	3,503	3,306

Source: BEIS Sub-national total final energy consumption in the UK (September 2016)

The breakdown of fuel use by industrial and domestic consumers is shown in Figure 3.1 and Figure 3.2.

[1] BEIS Sub-national total final energy consumption in the UK (September 2016)

Figure 3.1 Regional Energy Consumptions Statistics (Industrial Consumers)

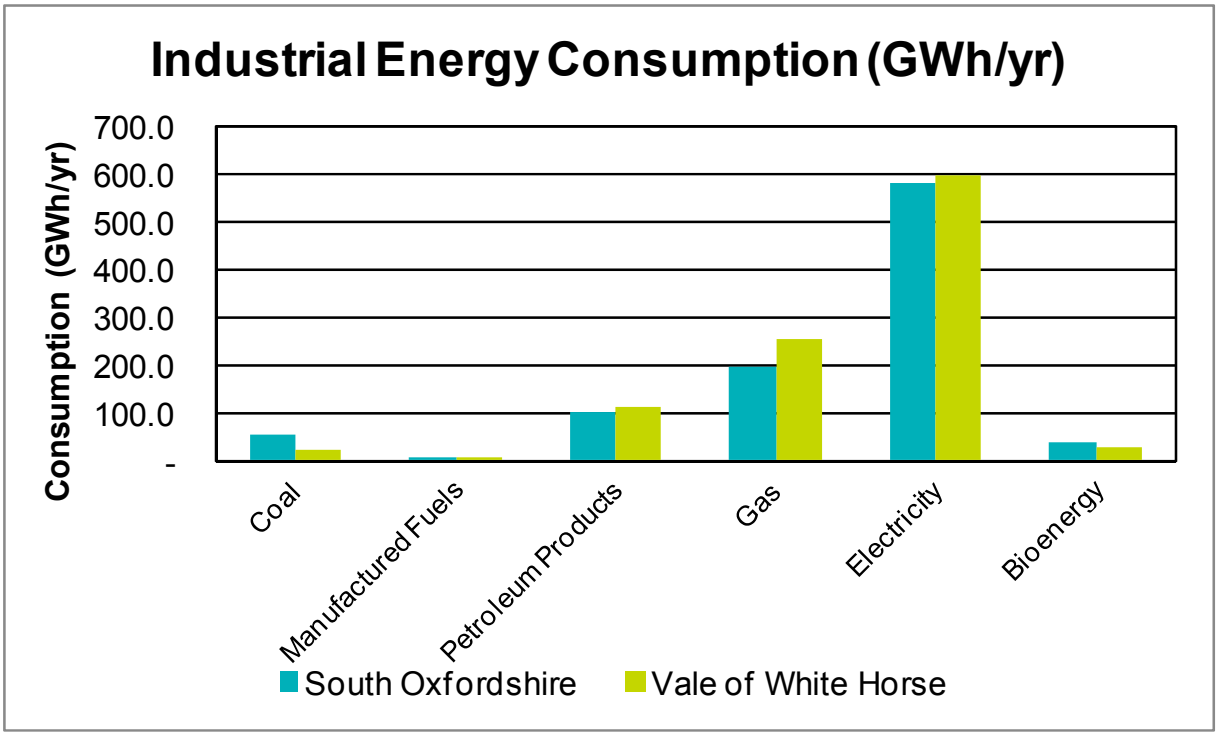
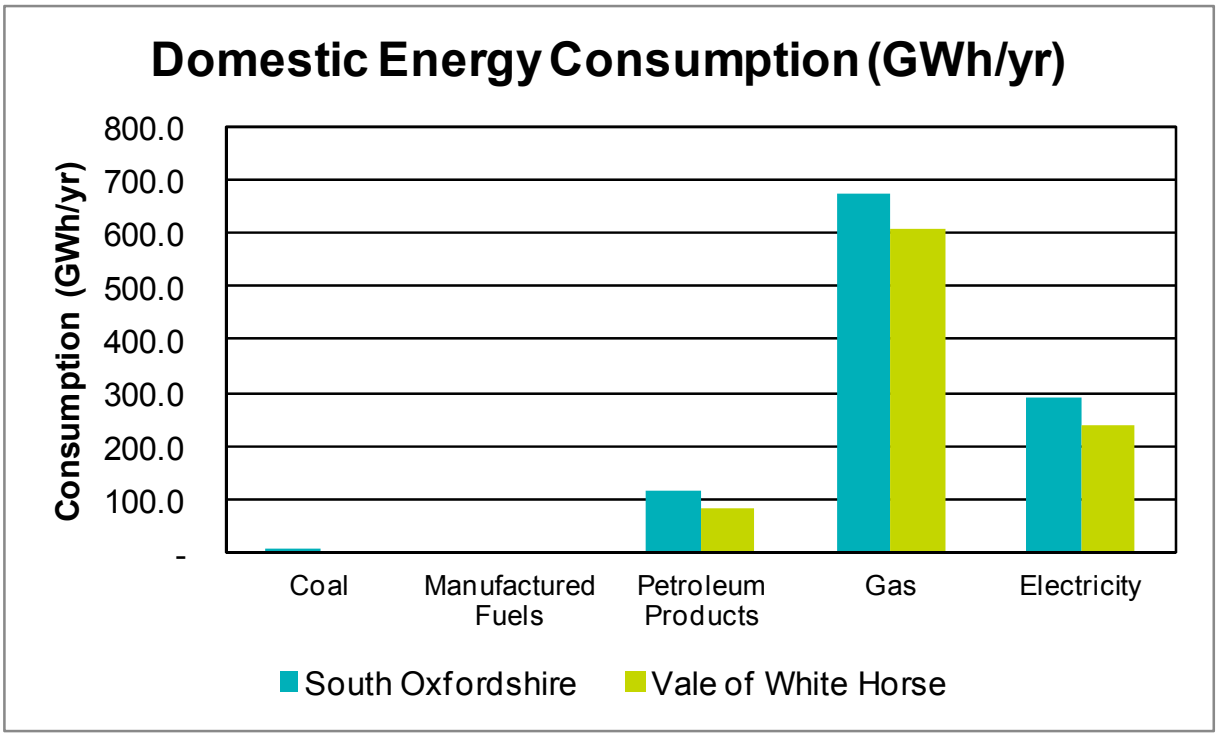


Figure 3.2 Regional Energy Consumption Statistics (Domestic Consumers)



It can be seen that the predominant demand sources are natural gas and electricity in the case of both subsets of consumers.

Any proposed low carbon energy generation mix therefore needs to take account of the prevalence of natural gas (space heating and hot water provision) and grid electricity in assessing what alternative options there are for localised or decentralised supply options.

Looking at the historic trend in terms of total consumption of these two primary energy sources provides a guide in accounting for projected future demand. These are shown in Figure 3.3 and Figure 3.4.

Figure 3.3 Regional Energy Consumption Statistics (Electricity)

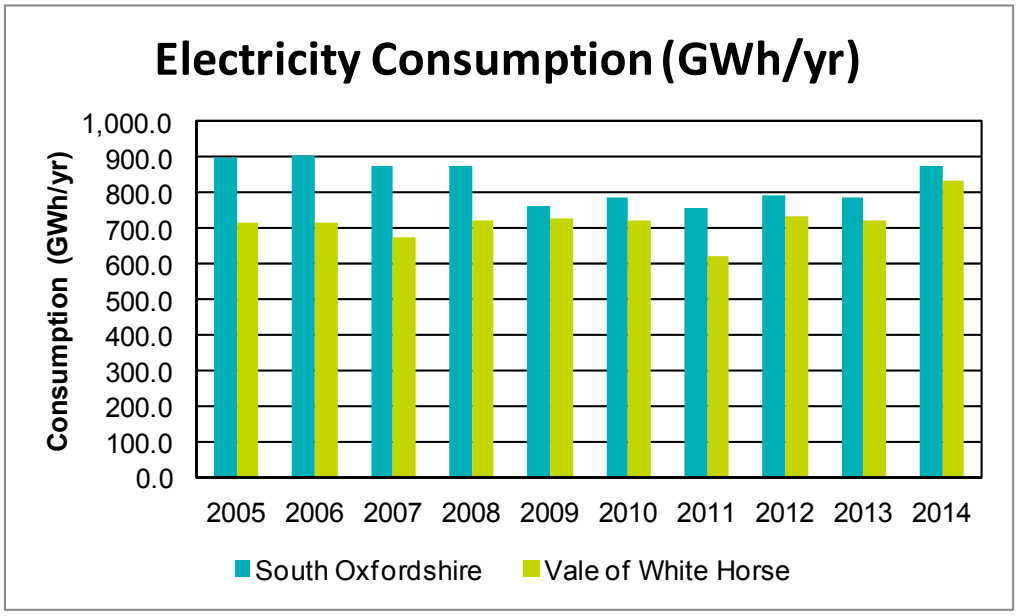
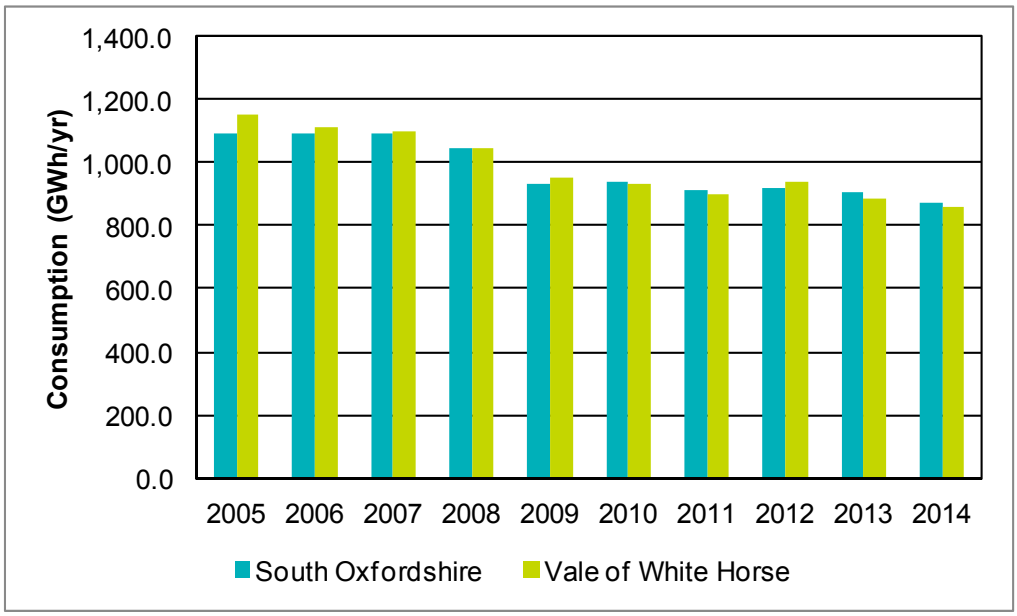


Figure 3.4 Regional Energy Consumption Statistics (Natural Gas)



In the case of electricity, demand has remained relatively constant across the period shown here. In the case of South Oxfordshire 2014 demand amounts to 97% of the 2005 total; for Vale of White Horse it is 116%.

In the case of natural gas demand this shows a sustained fall in demand over the period. In the case of South Oxfordshire 2014 demand amounts to 80% of the 2005 total; for Vale of White Horse it is 75%.

In summary, in the case of existing consumers (both domestic and non-domestic) the demand for electricity is persistent and static in scale (at best), while heating energy demand is falling. The challenge in meeting this demand going forward therefore is:

- Decarbonisation of electricity supply by diversification of supply sources
- Continued support for enhancing thermal energy efficiency (building fabric and boiler efficiency)
- Diversification of heat sources

3.2 Influences on Future Energy Demand

There is uncertainty around what future energy demand requirements might be, given the early stage of potential development and plans around the scale and nature of these.

However, it is clear that the major drivers of energy demand will come from a combination of:

- Energy use associated with new residential and non-domestic developments;
- Electric vehicles (cars, delivery vehicles and e-bikes)

Energy Use in Developments

Long term trends in energy consumption within residential and non-domestic buildings suggest that demand for heat is reducing over time. At the same time electricity consumption continues to rise, or is at best remaining constant.

Recent UK Government work in this space in the form of Zero Carbon Homes standards, and proposed zero carbon non-domestic buildings has been abandoned. At the same time efforts to enhance existing work on energy efficiency have also failed to ignite via use of the Green Deal.

As with the UK as a whole the extent of demand increase associated with new scale development will not remove the need to consider the impact of retrofit on existing building stock and associated changes in energy demand.

Current and future Building Standards requirements provide a driver for efficient thermal envelopes in all buildings, minimal reliance on mechanical ventilation systems (where feasible) and maximal use of solar gains and associated opportunities for on-site energy generation.

Demand Side Management

At present energy demand consumption is seen through the prism of passive end users, i.e. there is a persistent requirement for energy that is met solely by regulating supply (electricity, gas etc.) to meet that demand. Larger non-domestic consumers can participate in market mechanisms to encourage them to reduce overall electricity demand at peak demand periods (typically in winter months and early evening periods); there is no real scope for residential consumers to do so at present.

The proposed UK wide roll out of Smart meters offers a route to more effective demand side management. It enables two way communication of energy data, rather than the present situation where primary meters are read by consumers and meter readings fed back to suppliers.

As a larger volume of small scale renewable energy systems are integrated into the electrical distribution system in particular, then the ability of the local grid network to absorb the more varied power flows is enhanced by demand side management. This can take several forms. In terms of physical aspects of design this could include use of battery storage.

At an individual dwelling level there are emerging offerings within the market supplying battery storage to complement a roof mounted solar PV array. The battery will be topped up whenever there is power available

from the PV array that is not required to meet local demand (e.g. during working hours when nobody is at home); the battery will then discharge in evening periods when the array is not generating any electricity.

Typical storage offering would physically fit into a large storage cupboard, varying in size from something comparable to a desktop computer to something the size of a washing machine. It is also important to consider the weight of these systems; larger batteries will weigh anything between around 85 – 200 kg. Lithium-ion batteries are lighter and at the lower end of this scale; lead acid batteries are at the higher end of the scale.

Non-domestic users may also benefit from on-site battery storage systems. However, there is much more potential variation in solutions for individual premises. In the case of larger consumers, for example, using flexibility in demand reduction (i.e. reducing demand at peak periods to avoid higher grid supply charges) and generation options (selling into the supply market at given periods) are likely to be an option over and above electrical storage solutions.

While both sets of consumers need to be considered, it is particularly important that domestic scale energy storage is reviewed as part of the emerging Masterplan.

Electric Vehicles

The uptake of electric vehicles within the UK is, up to now, fairly slow. This is due to a mixture of both the number of vehicles available in the market (and associated range between charging) and awareness and roll out of vehicle charging points. Data for November 2016 is shown here.

Table 3.2 UK Sales of Electric Vehicles (EVs)

Vehicle Type	YTD 2016	YTD 2015	% Change
Plug-in (Pure Electric)	9,106	8,417	8.2
Plug-in (Other Electric)	24,837	17,164	44.7
Hybrid (Petrol-electric)	47,190	37,673	25.3
Hybrid (Diesel-electric)	1,507	3,709	-59.4
Total New Cars Registered	2,514,764	2,453,426	2.5
% of Total New Cars Registered that are EVs	3.3	2.7	

Source: The Society of Motor Manufacturers and Traders [SMMT] https://www.smmt.co.uk/2016/12/november-2016-ev-registrations/

Projected uptake is anticipated to rise, as part of wider transport emission reduction works. This, in turn, relies on a reduction in grid carbon intensity to justify the switch between electricity supply and existing fossil fuel supply. Another pathway to decarbonisation is to encourage greater use of low carbon on-site generation and decentralised micro grids.

The vision for the Garden Town focusses on greenways and sustainable travel routes as a crucial element in integrating the diverse areas of Didcot into a holistic living space. Enhanced access across and throughout the Didcot area is clearly an important aspect of the desired vibrancy and connected nature of the emerging development. This has a focus therefore on encouraging cycling and pedestrian access as well as use of public transport, to the detriment of overall volumes of vehicles.

The combination of appropriate greenways and urban design, as well as work with community to encourage the shift in mindset would, it is hoped, lead to a more limited impact in terms of the growth in electric vehicle use.

However, the provision of charging points for both electric vehicles and e-bikes then becomes an important element to overall urban design. This therefore needs to be accounted for in land allocations within the emerging masterplan. This is a combination of accounting for:

- Charging of electric vehicles at home and allocation of space for parking such vehicles
- Public access charging areas within central areas (vehicles and ebikes)
- Community parking areas with access to charging points where density of development precludes space for vehicles at individual dwelling level

From a renewable energy perspective, this can be supported in a number of ways:

- Small scale solar PV arrays (analogous to existing powering of backlit road signs and gantry signs)
- Dwelling scale renewable electricity generation (typical Solar PV)
- Solar canopies within car park areas. There are a number of designs available for use within ground level open access parking areas and multi-storey car parks.

Solar Canopies

There are a number of designs for solar canopies presently available. The most common designs are summarised here.

Design	Monopitch	Duopitch
T-frame		
V-frame		
Portal frame		

T-frame and V-frame designs are typically used at ground level. Examples are shown in Figure 3.5.

Figure 3.5 Ground level solar canopies

Portal frame designs are more appropriate for rooftop arrays due to the increased wind loadings.

Mary Arches and John Lewis car parks, an Exeter City Council owned scheme, is the first solar canopy to be installed on the top deck of a multi-storey car park in the UK. The portal-frame canopy spans 144 parking bays and has a rated capacity of 200 kWp. It was completed in September 2015. Energy generation is estimated at around 285,000 kWh per annum and is used to feed electric vehicle charging points. The design was tailored to the needs of the car park due to structural issues related to its age and construction.

Figure 3.6 Multi-storey car park canopies example (Exeter)

A recently published BRE guide[2] offers information and design considerations regarding solar canopies. Relevant details are summarised here.

- **Planning Fee Clarification** - Solar carports are classified as Erection/Alterations/Replacement of plant and machinery incurring a fee calculated on a per hectare of installation basis.
- **PV system standards** - Recommended good practice is to design, install and operate solar installations to meet the requirements of the IET Solar PV CoP[3].
- **Structure regulations** - Carports are classified as buildings and must fulfil Building Regulation Part A: Structure.
- **Wind loadings** - BS EN 1991-1 Eurocode 1: Actions on structures states the wind loadings specific to the UK.
- **Impact from vehicles –** As described by BS EN 1991-1-7 General Actions. Accidental Actions, the mounting structure for any canopy should be designed to withstand vehicle impacts at up to 20 mph.
- **Overhead glazing regulations** - Building Regulation K: Protection from falling, collision and impact apply. Voluntary code of practice BS 5516-2:2004 Patent glazing and sloping glazing for buildings provides details for mechanical design and wind loading of PV glazing solutions.

[2] 'Solar Car parks: A guide for owners and developers', BRE, March 2016
[3] http://www.theiet.org/policy/media/press-releases/20150916.cfm (Accessed March 2016)

Mounting solutions that enable access to panels from underneath the canopy ar preferable since they avoid contractors working on the roof of the frame itself.

- **Lighting regulations** - Car park lighting levels are specified in BS 5489-1:2013 Lighting of roads and public amenity areas at a minimum of 10 lux for medium traffic sites such as department stores. The British Parking Associations (BPA) Park Mark requires a minimum of 20 lux. Undercanopy lighting may therefore need to be part of the design to ensure lighting levels are maintained at required levels.
- **Drainage regulation** - Car parking drainage is specified in Building Regulation Part H: Drainage and waste disposal. The drainage requirements of the car park are not impacted by solar carports since there is no change in the total rainfall incident on the car park surface. However, a guttering system on the solar canopy is needed to ensure run off of peak rainfall and no build up of weight on the canopy itself.

E-bike charging points

The requirements for e-bikes are likely to be less significant than for electric vehicles. Charging points can be integrated into bike storage areas relatively simply. Example designs are shown here.

Figure 3.7 Examples of e-bike storage areas

Street furniture designs in the emerging masterplan therefore need to account for bike storage and associated charging points.

4. Local Renewable Energy

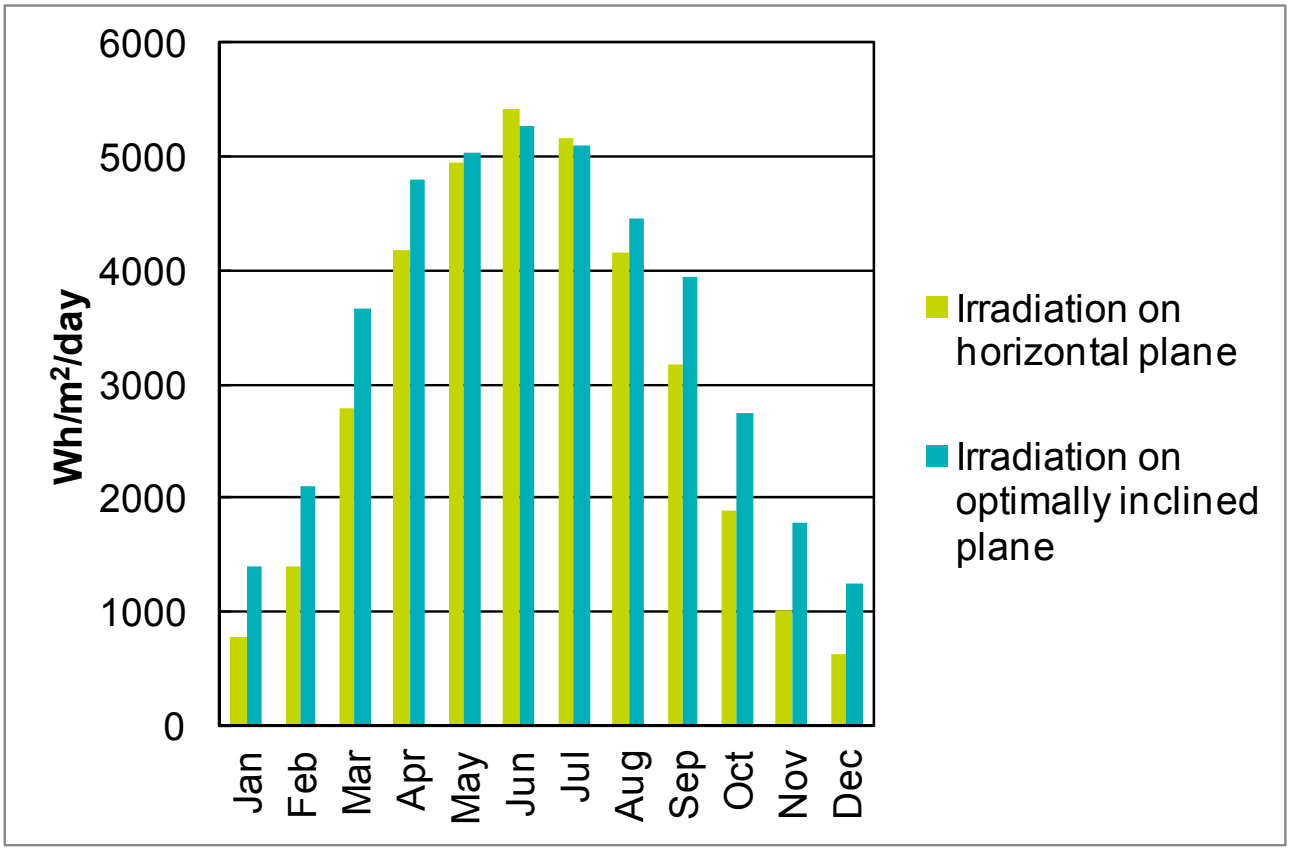
Ongoing work at UK level seeks to deliver an increasingly decarbonised energy mix, in terms of both electricity and heat. While large scale assets, particularly in the context of traditional 'top down' supply models, remain a part of the future energy supply mix, there is increasing recognition of the need to seek low carbon energy supplies at a localised level, closer to end users, in order to achieve overall carbon emission reduction targets.

There is no single prescription that will serve the needs of all the consumers within the expanded Garden Town. However, it is useful to consider, in broad terms, how significant contributions to local energy supply mixes could be achieved. The following sections look at where these contributions may come from, linking to local resources.

4.1 Solar Resource Availability

The average incident solar radiation in Didcot is estimated to be 2,970 Wh/m^2 /day for a horizontal plane (Hh) and 3,460 Wh/m^2/day on an optimally inclined plane (Ho), corresponding to an average annual solar radiation of 1,084 kWh/m2 and 1,263 kWh/m^2 respectively[4]. The optimum inclination angle for solar panel installed in Didcot is 38^o. Figure 4.1 shows the local average monthly radiation based on long term averages.

Figure 4.1 Solar Resource Availability (Didcot)



[4] http://re.jrc.ec.europa.eu/pvgis/apps4/pvest.php PVGIS © European Communities, 2001-2012

Existing Solar Development

Ofgem published statistics provide a summary of the number of solar PV installations undertaken across the UK that are eligible for feed-in tariffs (i.e. are of a scale less than 5 MW in capacity). While not granular enough to provide specific details for the Didcot Garden Town masterplan area, the details are available for individual local authority areas. This therefore provides an indication of the scale of present uptake and typical capacity sizes that are being installed in the area.

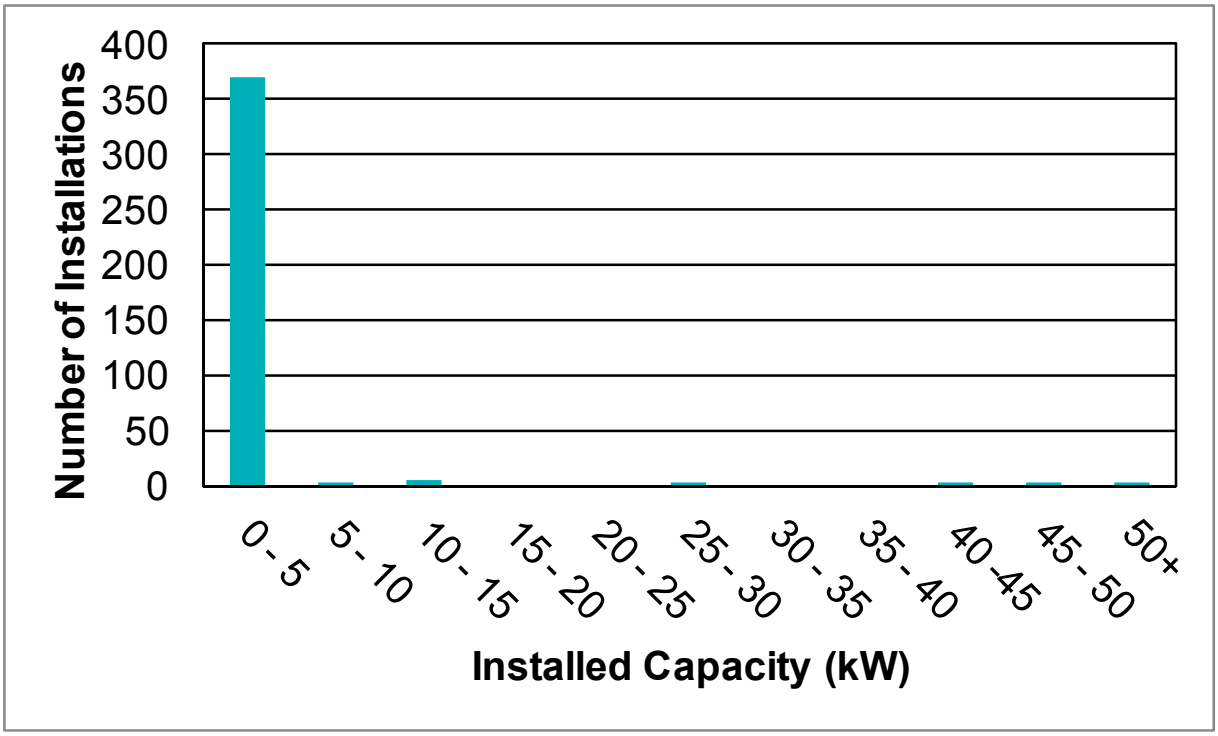
A summary of these details is provided in Table 4.1 and Figure 4.2.

Table 4.1 Existing Solar PV Installations (OX11 Postcode area)

Capacity / kW	Number of Installations (Installed Capacity)	Number of Installations (Declared Net Capacity)
0 – 5	369	369
5 – 10	3	4
10 – 156	4	3
15 – 20	0	0
20 -25	0	1
25 – 30	3	2
30 -35	0	0
35 – 40	0	0
40 -45	1	2
45 – 50	3	2
Greater than 50	2	2
Total Capacity (kW)	1,635	1,593

Source: Ofgem FiT Statistics (September 2016)

Figure 4.2 Existing Solar PV Installations (Count by Installed Capacity)



It can be seen that the vast majority of installation are in the low capacity range (less than 5 kW). This corresponds to retrofit and new build installations predominantly on residential properties.

Moving forward, this scale of retrofit installation is likely to be similar in the domestic sector.

Non-domestic users are larger consumers of electricity (mean energy consumption per meter is approximately 5-6 times that of domestic consumers for businesses not on half-hourly meters[5]) and therefore likely to consider larger scale PV installations (50 kW and above). Clearly with any given site this will depend upon the availability of suitably orientated roof area and scale of any overshading.

Given the mix of proposed development for the Garden Town there is likely to be a continuation in this trend, as Solar PV is integrated into the design of new developments. Due account of roof orientation (ideally South or South West / South East facing) and potential overshading issues should be made when considering planning applications for the proposed future developments. This will enable full benefit of solar potential in the area to be realised.

Ground Mounted Solar

Oxfordshire County Council have an existing position paper setting out guidance in relation to large-scale ground mounted solar arrays[6]. While broadly supportive of solar PV development in principle, it sets out several factors that are considered important in ensuring that ground mounted solar PV developments are:

- Appropriately sited
- Respect local landscape, heritage and visual amenity
- Mitigate transport impacts; and

[5] Based on MSOA Non-domestic electricity data for 2014 (BEIS – formerly DECC) excluding half-hourly metered premises
[6] Oxfordshire County Council, Position Statement: Major Development Proposals for Ground-mounted Solar PV Arrays

- Account for opportunities to enhance bio-diversity

In the first instance, such developments should look to brownfield or industrial sites, accounting for any issues associated with groundwater or surface water quality (and legacy contamination if relevant). While greenfield sites can be considered, these should avoid high grade agricultural land where at all possible and seek to encourage agricultural and other environmental management activities where viable.

Given the green and blue infrastructure themes underlying the present Masterplan, and the extent of local environmental and cultural heritage designations, it is not envisaged that large numbers of ground-mounted solar PV arrays will be proposed.

The existing landfill site at Sutton Courtenay, presently operated by FCC, is scheduled for closure around about 2030, with restoration work scheduled to be completed by 2036. At present the commitment from FCC is to restore it to agricultural grade use. An alternative option, used in several other cases with capped landfill sites, is to develop a ground-mounted array. The scale of array could be in the range 2 – 3 MW, with an associated output of around 12 – 18 GWh per year.

Solar Innovation

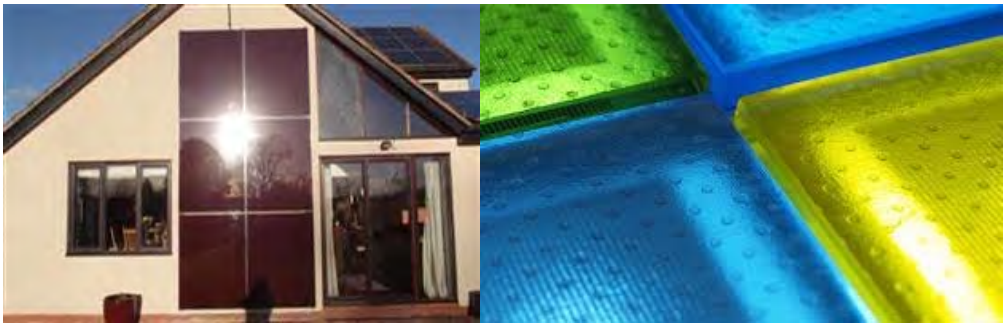
In the present market, installations are predominantly traditional monocrystalline modules which sit slightly above the roofline. These can be either on pitched roofs, where they are attached to the underlying roof at a fixed orientation, or on flat roofs where a ballast-based system is used to ensure that the array remains in place.

Emerging market products include:

- Solar tiles – These products come in a number of different forms but are fully integrated in the roof and therefore have no visible flashings or weather-proofing. At present applications are typically limited to Grade I buildings or areas of outstanding natural beauty.
- Building integrated solutions – Thermally insulated façade solutions offer the opportunity to overclad external walls of buildings. This therefore offers a combination of on-site electricity generation, with additional improvement to the overall thermal efficiency of the building
- Solar floors – glass floor tiles, including integrated PV modules, can be included in the design of buildings. Such tiles can be selected in different colours, sizes and shapes to suit the aesthetics of the particular building
- Solar windows – thin film solar PV can also be integrated into glazing, either for use in particular windows or skylights
- Photovoltaic road surfaces

These products offer on-site generation solutions that provide for aesthetic qualities and can therefore be used in a variety of settings to enhance on-site energy generation for both retrofit and new developments. Examples of these products are shown in Figure 4.3.

Figure 4.3 Examples of innovative solar PV products



Note: Solar roof tiles (top left); curtain wall (top right); domestic vertical façade (bottom left); solar floor (bottom right)

4.2 Fuel Cell CHP

The vast majority of combined heat and power plants presently operating in the UK typically use natural gas as the primary fuel source to feed either reciprocating engines or gas turbines. Penetration of alternative fuel source systems, such as biomass or fuel cell technologies remains low.

Fuel cell CHP systems offer potential for low emission heat and power generation, and significant flexibility in the source of input fuel that is used.

The DIMES (Distributed Integrated Multi Use Energy System for urban developments) feasibility project is an ongoing piece of work looking at supporting low carbon ambitions within the Bicester area. The proposed 10 MWe fuel cell CHP will use local municipal waste as the source for input fuel gas. Output electricity will be supplied via a private wire network to local consumers. Heat available from the CHP will be supplied to a planned district heating network. Given the scale of input waste gas, there is also opportunity to use the hydrogen (reformed from processing the waste gas [methane]) as a fuel supply for transport.

This multiple energy supply solution therefore has potential value for the proposed Didcot Garden Town, in offering a means of generating low carbon electricity, alongside high grade heat for use in heat networks and (potentially) a source of hydrogen as transport fuel.

While there are consumables associated with the operation of any proposed fuel cell system, there is no significant direct combustion processes. This is a considerable advantage in an urban development setting, in comparison to natural gas fuelled CHP systems, since it means no local emissions of NOx, SOx or particulates.

Fuel cell CHP are larger than equivalent gas CHP reciprocating engines and therefore need a larger footprint in terms of any proposed energy centre. It is likely that any energy centre would incorporate gas feed and reforming modules along with whatever fuel cell CHP energy generating system was proposed. An initial estimate of the footprint of any such energy centre would be in the range 250 – 350 square metres.

In terms of potential locations, it may be possible to integrate a fuel CHP system into development at the Harwell or Culham development sites.

4.3 Anaerobic Digestion

More specific details regarding wider proposals around waste management requirements for the Garden Town are dealt with elsewhere.

This section considers the resource opportunities there are in the context of energy generation.

Importing waste streams into the area to support any energy generation facility would be counter-intuitive in terms of both the Garden Town masterplan and in the context of effective use of the waste management hierarchy. For this reason the focus is on what resources may be available in the study area.

Residual waste collection in the Didcot area is presently tied into a services contract with Viridor. All waste is therefore collected and taken from the area to the Ardley Energy Recovery Facility (ERF) for processing. There is no current opportunity to use this resource in a local energy generation scheme.

Organic waste, by contrast, is not presently subject to any contractual obligations in terms of either exclusivity or minimum tonnages of green waste. Estimated arisings are around 4,000 tonnes per annum at maximum extent from kerbside collections.

If this were all available for anaerobic digestion then it is estimated to offer the potential to generate around 725 MWh of electricity per year[7]. An average electricity consumption figure for households in South Oxfordshire and Vale of White Horse, based on BEIS published statistics, is of the order of 4,700 kWh. The scale of generation feasible from this level of waste arisings would therefore be capable of meeting the needs of around 150 households per year.

It is more difficult to quantify the scale of additional waste arisings from parks, gardens and allotments. However, there may be opportunity to pursue community composting arrangements where these resource streams are utilised. This would target the value of small scale gas production that could be cleaned up and used to generate small quantities of electricity. This might be a viable supply source for small power to signs or electric vehicle charging points for example.

4.4 Biomethane

Didcot was the first UK site to carry out biomethane injection to the national grid network[8]. Anaerobic digestion at the local waste water treatment works (WwTW) results in a biogas, predominantly consisting of methane and carbon dioxide, with additional impurity levels of siloxanes, hydrogen sulphide and nitrates. Cleaning this gas mixture results in a biogas that can be injected into the national gas grid. The process is presently subject to support via the Renewable Heat Incentive (RHI).

Biomethane injection can be carried out either into the national high pressure gas transmission grid or a local low pressure gas distribution network. The advantage of using by-products from processes on the WwTW is that is provides a constant supply of input fuel.

4.5 Decentralised Heat Networks

Space heating and domestic hot water needs are, at present, predominantly met in the Didcot area through the use of natural gas as the primary fuel source. This is shown in the regional energy statistics for South Oxfordshire and Vale of White Horse summarised in Section 3.1.

There are no decentralised heat networks operating within Didcot at present. However, a parallel study commissioned in December 2016 will carry out a heat mapping study for the Garden Town area to identify potential small scale networks for heat that could be given suitable priority in the overall Masterplan.

The extent of present heat demand has been assessed at a high level via the BEIS (formerly DECC) national heat map. An extract from the national heat map is shown in Figure 4.4.

[7] This assumes a single facility operating for 8,000 hrs/yr with a 90 kWe gas reciprocating engine and a moisture content of waste of 70%

[8] http://www.cngservices.co.uk/index.php/services/biomethane/the-didcot-project/ (Accessed October 2016)

Figure 4.4 National Heat Map (Didcot Overview)

Source: http://tools.decc.gov.uk/nationalheatmap/default.aspx

Without prejudicing the outcomes of the ongoing feasibility study, in masterplanning terms the significant anchor loads are likely to be centred around:

- Didcot Gateway - existing Leisure Centre and buildings to South of Didcot Parkway.
- North East Didcot - using community facilities as anchors for new housing development
- Harwell Campus - office and accommodation buildings
- Culham Science Centre - office and administration buildings

There are a number of practical design considerations that have implications for ongoing Masterplanning and are considered in brief here. Further details around these considerations are anticipated to emerge from the heat mapping and feasibility study.

Sizing of Plant and Network

At this early stage in feasibility, there needs to be a consideration of how proposed development will be phased. Phasing impacts directly on the scale of heat demand that comes on line and may be incorporated into any supply network. It is a crucial element in determining the financial viability of primary supply assets (typically CHP) and how this supply can be provided economically. Given a knowledge of existing boiler plant in the network area, for example, a supply solution can be developed that uses these for a period up until sufficient phases of development have been completed and where a CHP solution may become viable.

Equally if retrofit works are to be carried out, then if these buildings are scheduled to be connected in a later phase of development then it may be possible to refurbish the buildings, reduce heat demand and adjust the supply requirements to suit a lower flow temperature.

The scale of projected heat demand to be met by any network should be defined, so as to build in sufficient secondary supply systems or peaking boiler plant to meet any shortfall.

In selecting the location of the primary energy centre a number of factors are relevant, including:

- Distance from anchor heat loads;
- Sufficient space for primary plant (and future expansion);
- Accessibility for plant installation/removal and fuel deliveries;
- Visual impact;
- Local air quality impacts and flue requirements

Network routing

Optimal heat network routes ultimately minimise the length of the network. This means minimisation of both network losses and install capital costs. In practice this means:

- Using existing service area routes to connected buildings (minimising buried network costs);
- Avoiding major barriers such as major roads, railways, rivers and canals wherever possible;
- Avoiding known existing utility services or areas where congestion of services is recognised; and
- Liaising with relevant bodies to identify constraints and opportunities to co-ordinate the heat network installation with other works (e.g. re-surfacing of roads, other utility works etc)

Low Network Losses

Heat losses on any network have a direct impact both economically and environmentally. One of the key areas that can incur relatively high losses is the distribution systems within non-domestic and multi-occupancy buildings (so called secondary side losses). This needs to be reviewed in initial feasibility work, though maintenance of supply systems in buildings is typically the responsibility on the building owner (rather than the heating network operator).

In the case of new build developments there should be high thermal envelope efficiencies and therefore relatively low heating requirements. This in turn makes network losses more significant (as a proportion of overall heat supply).

Low return temperatures and flow temperatures

For a given flow temperature, a low design return temperature will reduce peak flow rates leading to smaller pipes and lower costs. Maintaining low return temperatures under part-load conditions is important to keep heat losses and pumping energy low. New build developments can look to design heat supply systems with a low flow temperature (e.g. 45 °C for underfloor heating in a domestic dwelling, or 60 °C for fan coil units in an office building). Where retrofit is being proposed, in connecting existing buildings, these will typically need to deliver a higher flow temperature. Conventional radiator systems, for example, are typically designed for a higher flow temperature of 82 °C, with a return temperature of 70 °C. These can be reduced through building fabric improvements and rebalancing of the radiator system, but need to be accounted for in respect of interfacing requirements.

Use of variable flow control

Using variable flow control will result in lower flow rates and lower return temperatures at part-load. Variable speed pumps should be used to maintain a minimum pressure difference at the extremities of the network. This will reduce heat losses and pumping energy.

Low Carbon Heat Sources

The control systems and any thermal storage should be designed to maximise the contribution of low carbon heat and to ensure the efficient and cost-effective operation of these heat sources. Where different types of heat sources are used, a large number of energy centres on the network should be avoided so as not to compromise the value of the low carbon heat sources through over complex hydraulics.

Operational carbon emissions for the proposed system should account, not only for efficiencies of central plant, but also heat losses from the network and electricity used for pumping and other purposes. Where relevant there should also be an estimate of NOx and particulate emissions shall be estimated; in the case of biofuels or other low carbon fuels wider environmental impacts (e.g. credentials of production) need to be considered.

Treating Customers Fairly

For a natural monopoly such as a Heat Network it is important that fair and equitable contracts are put in place for all customers.

These contracts should therefore specify a target level of availability of heat supply, as well as agreed positions on planned and unplanned shut-down periods. There should also be a stated compensation payment process, where supply is interrupted and targets not achieved. Maximum response times for attendance of a heat supply fault need to be outlined, as well as proposed means of supporting all customers, but particularly any vulnerable customers in the event of a prolonged fault.

The arrangements for recording relevant details of supply (flow/return temperatures, pressures, flow rates and annual consumption) to customers should also be clear, as well as the periodic checks and calibration requirements for the system.

Sources of Heat

Potential sources of heat for any proposed networks will be explored in the separate heat mapping and energy masterplanning study. Some initial possibilities are listed here.

Gas CHP

Commonly initial phase networks will use gas CHP reciprocating engines as the prime mover technology. This provides a relatively low cost fuel source and outputs of both heat and electricity. The overall economics of the scheme can often be improved by sales of electricity, either via private wire to consumers, or exported to the national grid.

Fuel Cell CHP

The example consider earlier is an alternative to the gas fuelled reciprocating engine. It would require a larger footprint for the energy centre (relative to the gas CHP) and a suitable fuel source. One option would be to use biomethane generated at the WwTW to provide the hydrogen source required for the fuel cell. If any larger scale anaerobic digestion were developed (see earlier section) then that too could provide a source of biogas that could be cleaned up and used a fuel source for this technology.

Biomass CHP

This technology would also require a large energy centre, since it needs fuel storage facilities alongside the physical space for the CHP plant. Good access would also be required to enable delivery of fuel on a regular basis. Sourcing fuel, and the costs of transport involved in bringing it to site would be a significant factor in the operating model.

Water Source Heat Pumps

Water source heat pumps use the same working principles as air and ground source heat pumps. However, in this case it is the heat contained within a body of water that is utilised, rather than that in the air or ground.

Pipework is submerged in a water body (e.g. lake or river). Working fluid is then pushed through this pipe network absorbing heat from the water. Compression of this fluid raises the temperature and a heat exchanger id then used to extract the heat and supply it as hot water to the property. This can then be used in radiators/underfloor heating for space heating or as a pre-feed for domestic hot water.

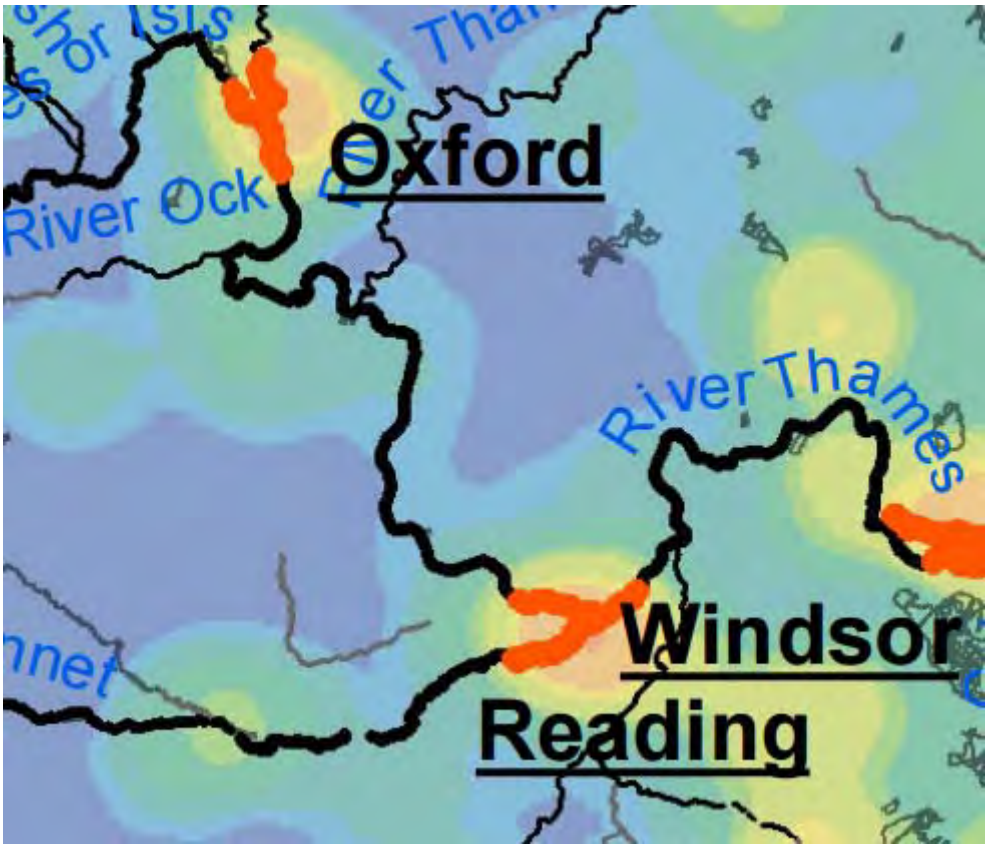
There are some benefits of water source heat pumps relative to air or ground equivalent systems, which can be summarised as:

- Heat transfer rates are higher from water than from the ground
- The coefficient of performance (COP), i.e. how much energy can be extracted for each unit of energy consumed, can be up to 4.5, which is higher than typical air and ground performance
- Pipework installation is simpler than the boreholes or trenches required for ground source heat pumps and there is less uncertainty regarding ground conditions that can be encountered
- Visual impact on the properties supplied is low

If the water source is completely frozen than this will prevent heat transfer; otherwise a constant supply of hot water can be provided for year round.

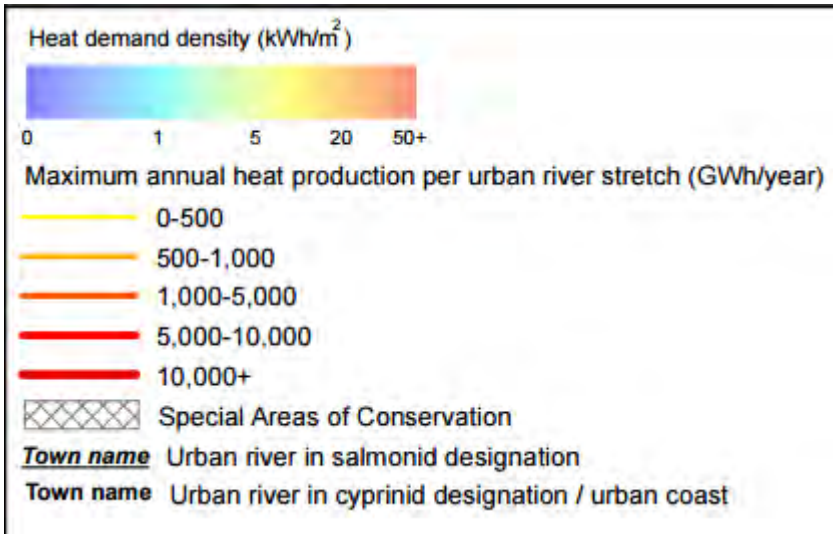
BEIS (formerly DECC) developed a national heat map looking at areas where water sources offer best potential for development of heat pumps[9]. A snapshot for the Didcot area is shown here.

Figure 4.5 Water Source Potential



Key

9 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/353979/decc_water_source_heat_map.pdf (Accessed November 2016)



Waste Heat Sources

Exhaust heat from non-domestic users can potentially be used to pre-heat feedwater for the heat network. In the case of process heat this would need to provide for a heat recovery system that could then be linked to the heat network via a heat exchanger. Where heat is exhausted from other thermal plant, such as Didcot Power Station, then it can be utilised only if it is at a sufficiently high temperature and pressure to meet the needs of the network. If, for example, it is low temperature and pressure steam then it will be at a much lower temperature than the supply flow of the network. This makes it uneconomic to use, since additional energy would be used in heating the steam to achieve a suitable hot water supply to the heat network.

4.6 Other Technologies

A number of other technologies have been reviewed to consider the balance of contribution that they might make to the overall mix of energy supply to the Garden Town. None of them are considered to have a significant role to play in the overall energy mix.

Hydro

The potential for use of water in the production of energy can be investigated both in terms of electricity generation and heat.

In the case of electricity small scale hydro schemes rely on the potential energy for a given body of water at a height (head) to be converted into electricity by passing it through a turbine and doing mechanical work. There are a number of different turbine configurations depending upon the volumetric flow of water available and suitable environmental considerations (e.g. presence of salmonid or other protected species in the water course).

There are recent examples of so called ‘in river’ turbines, where turbines are operated in rivers and use the kinetic energy of the river, rather than the potential energy in the form of net head, to generate electricity. These turbines are designed to operate as modular units and can be operated in tandem with solar PV panels[10].

More commonly, diversion of a proportion of the flow in a water course could provide sufficient flow to run through a turbine, with the flow returned to the main flow further downstream.

A number of potential turbine designs that could be considered:

[10] http://www.smart-hydro.de/renewable-energy-systems/hydrokinetic-turbines-river-canal/ (Accessed October 2016)

- Archimedes screw turbines – these turbines have a helical screw design that uses a helical surface around a central cylindrical shaft mounted in a hollow tube. Water fed into the top of the screw causes the shaft rotation that drives a generator.
- Pit turbines – this design of axial turbine would see the bulb (enclosing the generator and runner) installed in the outflow pipe. The use of a gearbox means that the size of the bulb can be reduced to suit the diameter of the outflow.
- Open flume turbines – these turbine designs use a vertical shaft with the turbine at the base of the shaft within the flow of water. This therefore requires civil works at ground level to accommodate the generator and connection of output electricity.
- Watermills (Francis) – this would use an impulse turbine design where the water flow would be directed at a waterwheel angled so as to turn the wheel and therefore the horizontal drive shaft.
- Tube turbines – This axial design would use a bulb design, similar to the pit turbine. However, in this instance a larger diameter turbine would be installed without a gearbox.
- Siphonic turbines – a vacuum pump is used to draw water into the guide vane and the turbine and generator sit above the level of the inlet water. Discharged water is then returned to the main flow.

Given the proposed scale of development it is not considered practical to seek large scale use of hydro schemes. Use of water source heat pumps as a secondary source of heating for a network, or as a primary supply to some waterside developments is a more appropriate solution.

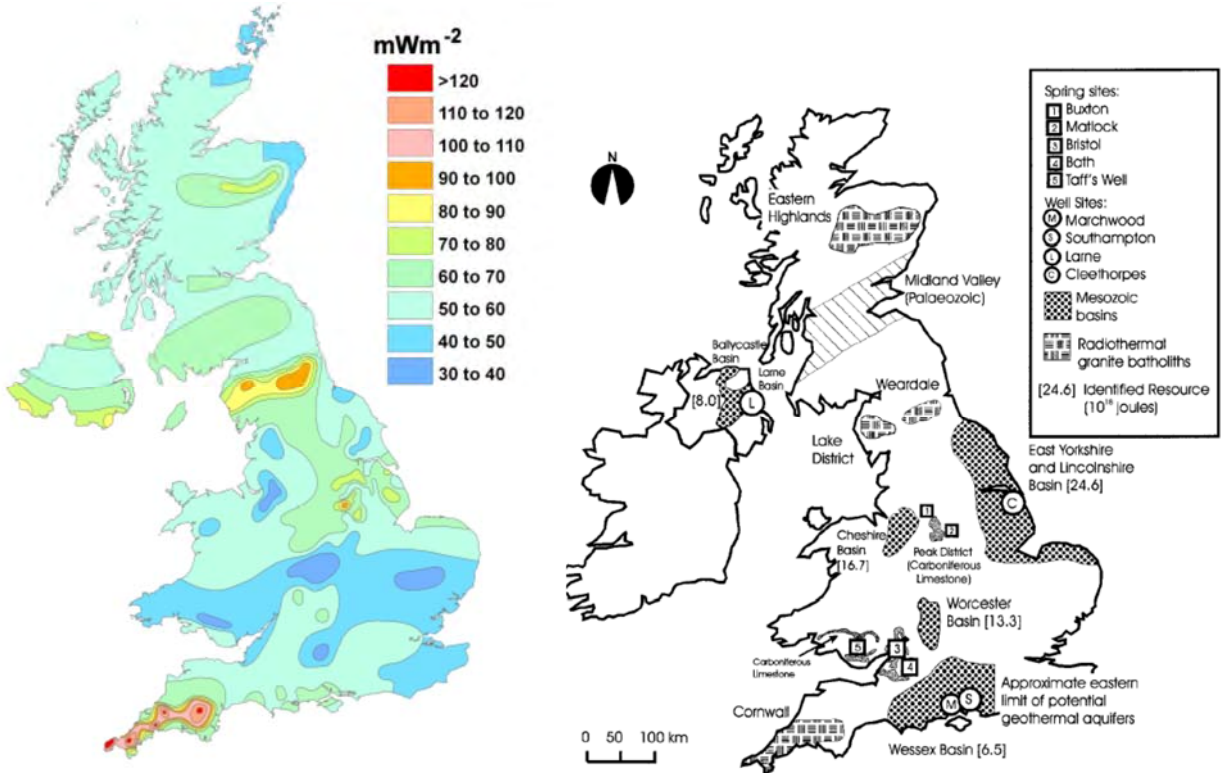
Geothermal

The potential for geothermal energy generation in the UK has been analysed as part of the Deep Geothermal Review study undertaken by DECC and summarised in a report released in October 2013[11]. The report used evidence from a number of previous studies examining the potential for geothermal energy generation in different areas of the UK.

The report identifies the key areas for UK geothermal resource which include granite outcrops in South West and northern England, and hot sedimentary aquifers in the Wessex and Cheshire basins (Figure 4.6).

[11] Deep Geothermal Review Study Final Report Department of Energy & Climate Change (DECC) October 2013

Figure 4.6 Heat Flow Map of UK (left); Location of Sedimentary Basins and Major Radiothermal Granites (Right)



Source: DECC

The report identifies key criteria for the viability of any geothermal power generation systems in terms of being able to access a thermal store of greater than 100 deg C at a depth of no greater than 5 km. On this basis, the report does not identify any significant potential for geothermal power production within the Didcot region.

Biomass

Present planning guidance for developers in South Oxfordshire is broadly supportive of the use of biomass boilers. In each case where they are proposed for use, however, there needs to be a clear demonstration that air quality standards will be maintained and NOx emissions minimised below the stated performance threshold of 180 mgNOx/Nm^3 and 15 mg PM/Nm^3. Vale of White Horse does not prescribe similar emission performance limits, though any impacts on local air quality would have to be suitably mitigated.

For the scale of development proposed it is unlikely that biomass fuel would be used as a primary fuel source. The practicalities of fuel supply and scale of consumption would make it an expensive option to pursue. There could also be potential issues with air quality if used at significant scale for residential developments given technical complexity in ensuring local air dispersion.

Wind Development

Development of any wind turbine needs to take account of a number of factors or constraints as summarised in Table 4.2.

Table 4.2 Wind development constraints summary

Constraint	Description	Impact on siting of wind turbine

Wind resource	Review published mean annual wind speed for local area	Wind turbines best sited where mean average wind speeds are highest
Land Availability / Ecology	Green belt, green infrastructure, designated environmental sites, built heritage sites	Development should avoid green belt, designated environmental sites or other sensitive natural heritage sites
Infrastructure	Roads, railways, power lines, airfields, airports	Turbines need to be sited away from major infrastructure
Noise	Separation distances to buildings and development areas	Wind turbines must be sited at sufficient distance from existing buildings to ensure noise levels meet national requirements.
Flood Risk	Proximity to water courses	Siting turbines in areas of flood risk would require expensive foundations and make access for maintenance more costly
Ministry of Defence	MOD owned sites and related radar operation issues	Turbines need to be at a distance from MOD sites that avoids any compromising of MOD activities.
Grid Connection	Proximity to a feasible grid connection point	This will indicate whether substantial cabling and support infrastructure may be required.
Grid Capacity	availability of the distribution network to incorporate the additional power output	Lower network capacity may require upgrades to grid infrastructure such as substations and safety systems (at a cost to the wind developer).
Safeguarded CAA sites, NERL and other radar systems (aviation issues)	potential issues of interference with radar systems	Careful siting will minimise impacts on radar systems and reduce any potential mitigation costs1213
Radio / Communications Links / fixed microwave links	Identify location and scale of these links	Careful siting will minimise impacts on the links and reduce any potential mitigation costs.
Construction	Avoiding complex development areas (e.g. wetland areas)	Minimising the need for more complex wind turbine infrastructure.
Access	Ease of access to site for construction / maintenance	Due to the size of medium to large scale wind turbine components access can determine if a site will be physically and economically feasible

An initial constraints map has been developed that summarises a number of these considerations.

Given existing environmental designations and required buffers for noise considerations, medium scale wind capacity is not anticipated to form part of the energy supply mix for the Garden Town. The vision for extensive transport corridors to support cycling and sustainable transport acts as a secondary constraint to any potential wind development.

[12] To aid developers with radar impact assessment, a number of maps have been produced corresponding to turbines with tip heights from 20 to 200m describing the areas where turbines of the relevant height would be within line-of-sight of at least one of the primary surveillance radars operated or used by NATS En-Route.
[13] http://www.nats.aero/services/information/wind-farms/self-assessment-maps/ (accessed July 2014)

5. Conclusion

The study shows that the current energy usage within Didcot is dominated by gas and electricity and with the growth of the Garden Town the demand is set to increase significantly.

There are many new and innovative technologies coming to the market and significant improvements are being made to the efficiencies of the many of these technologies.

The key opportunities are considered to be in these areas:

- Provision for battery storage to complement roof mounted solar PV array
- Provision of electric vehicle charging points at home with allocation of space for parking such vehicles, or community parking areas with access to charging points where density of development precludes space for vehicles at individual dwelling level
- Public access charging areas within central areas (vehicles and e-bikes)
- Use of solar panels to power electric vehicle charging points
- Use of the landfill site at Sutton Courtenay as a ground mounted solar PV array, following closure as a landfill site in 2036. This could have an energy generating capacity of 12-18 GWh per year.
- Solar innovation making use of new technology in building, eg. solar tiles, solar floors, solar windows.
- Potential to integrate a fuel CHP system at Harwell or Culham sites.

Appendix A
Wind Constraints Map

February 2017
Doc Ref. 38421R005i2

H.
Social infrastructure comparators

Didcot Garden Town

Community Facilities Analysis

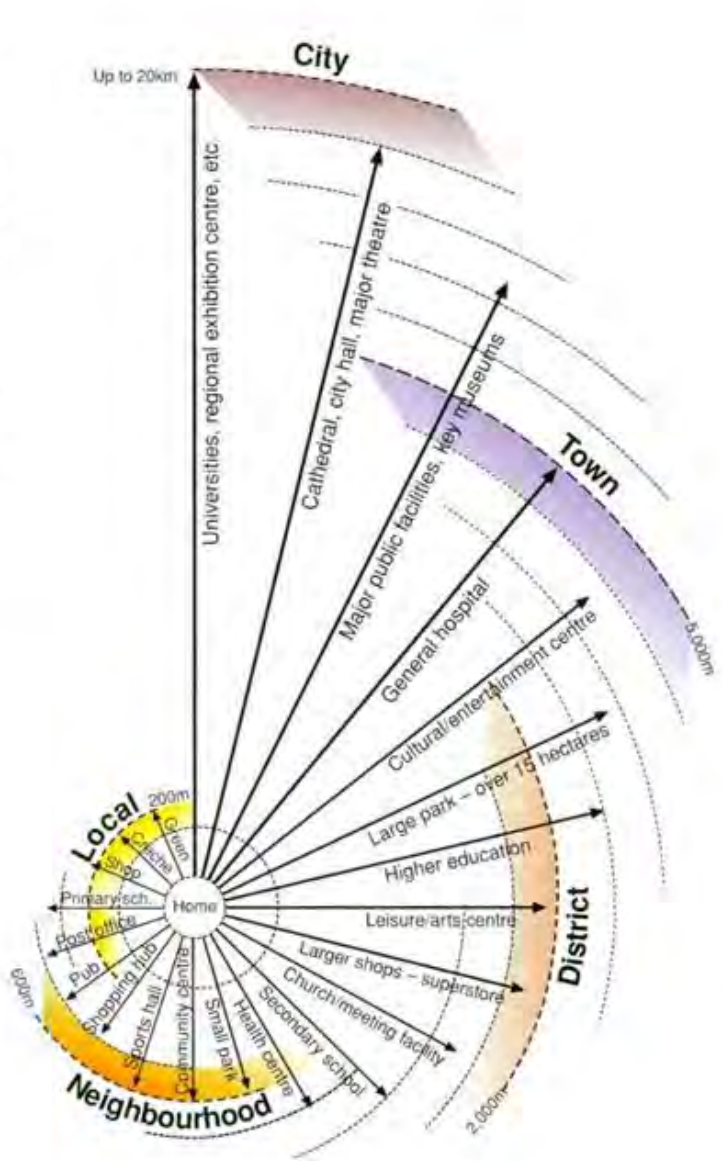
October 2016

Quod

Settlements and Infrastructure

Possible facility		Catchment population
City facilities	Stadium	City
	Cathedral	City
	City hall	City
	Theatre	City
District or Town	Sports centre	25,000 – 40,000
	District centre	25,000 – 40,000
	Library	12,000 – 30,000
	Health centre	9,000 – 12,000
Neighbourhood	Community offices	7,500
	Community centre	7,000 – 15,000
	Pub	5,000 – 7,000
	Post office	5,000 – 10,000
Local hubs	Primary school	2,500 – 4,000
	Doctor	2,500 – 3,000
	Corner shop	2,000 – 5,000

This chart is indicative and is based upon city-scale urban areas. Catchments will vary in specific areas.



Didcot – today and future baseline

- Current population of the ‘built-up area’ of Didcot = c.29,400
- New homes proposed through strategic sites = c.15,000
- Average size of new households = 2.5 (based on average of PopCal10 yields)
- Potential new population = c.37,500
- Current + new population = c.67,000

Methodology

- The purpose of this study has been to identify the types of facilities that Didcot might be able to support given the growth expected to be delivered by the town over the coming decades
- Conclusions and recommendations have been drawn from analysis of:
  - The existing/emerging policy context
  - SODC/VoWH's evidence base
  - Comparator towns
- There has been a focus in this assessment on community facilities and cultural/leisure attractions. Further work is being undertaken looking specifically at employment/commercial floorspace

Policy/Evidence Base

- Didcot is one of four ‘towns’ identified in South Oxfordshire’s ‘settlement hierarchy’. SODC’s Local Plan Preferred Options (2016) identifies Didcot and Henley as the district’s only two ‘major towns’
- As a Garden Town, Didcot is expected to deliver c.15,000 new homes and 20,000 new jobs (SODC LP Preferred Options, 2016)
- IDP identifies the infrastructure required to meet anticipated population growth
- Evidence base documents: SODC & VoWH Hotel Needs Assessment (2014); SODC Retail and Leisure Needs Assessment (2016); SODC Green Infrastructure Strategy (2011); SODC Draft Leisure Facilities Strategy (2016); SODC Recreational Space, Local Leisure Facilities and Playing Pitch Strategy (to be completed by SODC)

Infrastructure Delivery Plans

- The SODC IDP (February 2015) identifies the following requirements for Didcot:
  - Enhanced library provision
  - Additional community space for adult learning
  - Health and well-being centre for older people
  - Two new community centres plus contributions towards existing facilities e.g. public art, allotments, community halls
  - Facilities for emergency services (police and fire service)
- VoWH's IDP (October 2014) focuses mainly on transport infrastructure needed to support growth in and around Didcot.

Hotel Needs Assessment

- Opportunity to increase hotel supply in the Science Vale – development will increase corporate demand including contractor accommodation and MICE products (meetings, incentives, conferencing and exhibitions)
- Consultees (hotel operators) were unaware of Science Vale opportunity and concerned about weekend demand in these areas
- Projections show need for 761 to 1,000 new hotel rooms by 2031
- Recommendations:
  - Expand the hotel offer in areas such as Milton Park, Harwell and Didcot
  - Create a 'hotel investment market strategy' for the Science Vale to promote the area to operators

Retail & Leisure Needs Assessment

- Didcot's current retail offer is mid/lower-end. There is an absence of higher quality retail outlets
- Potential improvements could include: better parking, increased shop choice, more pubs and restaurants
- 'Leakage' expenditure tends to be in Reading, Oxford, High Wycombe and out-of-town retail parks
- Policy aspiration for Didcot to expand its role to that of a secondary regional centre with a greater offer of non-food i.e. comparison stores
- Recommendations include: broader retail mix; increase in bars, restaurants and cafes – this will support entertainment market through increasing dwell time and spend
- Orchard Centre Phase II is seen as an opportunity to meet some of Didcot's current deficiencies (including provision of an M&S, restaurant and health/fitness unit)

Draft Leisure Facilities Strategy

- Current provision in Didcot considered to be sufficient
- GWP and NE Didcot expected to meet the majority of anticipated needs including: sports halls, fitness stations, outdoor courts
- Measure walking and running routes needed in Didcot
- Recommends protecting and enhancing existing provision (or securing suitable replacement) and supporting new provision at strategic sites

Green Infrastructure Strategy

- Provides an update to the 2009 version
- Reiterates the conclusions of The Didcot Greenspace Network Feasibility Study (2008) which concluded:

  "…there is limited support for the formal designation of a 'Country Park' for Didcot... The revised recommendations… promote the concept of developing a network of greenspaces for Didcot linking existing and significant new accessible natural green space" (Extract from report preface)
- The Didcot Greenspace Network would meet the indicative requirement for provision of at least 100ha of accessible natural greenspace by 2026 (within 2km of Didcot).

Comparator towns (based on settlement hierarchy)

- Henley-on-Thames (11,500)
- Thame (11,330)
- Wallingford (10,350)

Comparator towns (based on existing population size)

- Deal (30,560)
- Sevenoaks (29,500)
- Witney (29,100)

Comparator towns (based on future population size)

- Maidenhead (64,800)
- Newbury/Thatcham (68,230)
- Tunbridge Wells (68,910)


Other Comparators

- Canterbury
- Winchester
- Redhill

Facilities Matrix

Town	Allotments	Cinema	Country Park	Department Store	Further Education	Higher Education	Galleries (≤3)	Galleries >3)	Museums	Theatre	Leisure Centre	Stadium	Hospital	Library	Market	Hotels	Cemetery	Nature Reserve	Heritage Attractions	Skate Park	Multi-Use Community / Arts Centre
Didcot	✓	✓	X	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	X	X	✓
Henley-on-Thames	✓	✓	X	X	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	X	✓	X
Thame	✓	X	X	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X
Wallingford	✓	X	X	X	✓	X	✓	X	✓	✓	X	X	✓	✓	✓	X	X	X	✓	X	X
Deal	✓	X	✓	X	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	✓	X	X
Sevenoaks	✓	✓	✓	X	✓	X	✓	X	✓	✓	✓	X	✓	✓	✓	X	X	✓	X	X	✓
Witney	✓	✓	✓	✓	✓	X	✓	X	✓	X	✓	X	✓	✓	✓	✓	✓	X	X	X	X
Maidenhead	✓	✓	X	X	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓
Newbury / Thatcham	✓	✓	✓	✓	✓	X	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	X	X	✓
Tunbridge Wells	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
Canterbury	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
Winchester	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X	✓
Redhill	✓	✓	✓	X	✓	X	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X

Conclusions

- Generally, Didcot has the range of facilities you would expect for a town of its size
- The population of Didcot is expected to over double in size. Therefore, more of the same/enhancements to existing provision plus additional types of infrastructure will be able to be supported
- There are examples of recent investment in facilities e.g. Cornerstone Arts Centre, Willowbrook Leisure Centre, Orchard Centre Phase 1
- Orchard Centre Phase 2, GWP and NE Didcot are expected to meet many of the retail and leisure needs identified in the evidence base documents
- However, there are opportunities in relation to: higher education; historic and cultural attractions; hotels (and associated facilities); choice and quality of shops, bars and restaurants; green infrastructure (particularly measured running/walking routes)

Recommendations

- Make the most of what is already there:
  - Signposting/legibility/accessibility of existing facilities
- Opportunities to introduce uses that are currently absent e.g. hotels, specialist/boutique retail, higher education
- Opportunities to enhance facilities that are currently under-represented e.g. cultural/historic attractions and green infrastructure
- Draw inspiration from Didcot's past/future that could be used as features within the town
- Consider role of new landmark buildings, greening of public realm, and meanwhile/interim uses
- Further work is being undertaken on primary/secondary education and healthcare provision and employment/commercial uses

I.
Supported community village

note

Support Community Village Research

Overview

Site and location	Site size	No. of residents	Layout	Facilities	Build cost	Cost per resident	Staffing level
Operational Facilities							
Hogewaye - Netherlands	4 acres - 23 houses	152	Life style differentiated houses	Supermarket, Park, restaurant, bar, theatre, hairdresser, clinic and 25 clubs.	£15.1 million	£4,500 per month	Total of 240 staff
Planned Facilities							
Dementia Village – Rome, Italy		100					
Dementiaville - Switzerland	23 houses	150			£17 million		
Miami Jewish Health Systems – Florida, US		66-99		Store, spa, wellness centre, café and art centre.	£41 million		

Operational Facilities

Hogewaye – Weesp (20 miles south of Amsterdam), Netherlands (2009)

A specially designed, gated village with 23 houses for 152 dementia-suffering seniors. The elderly all need nursing home facilities and live in houses differentiated by lifestyle so that residents can share a space with people with the same backgrounds, ideas and values – making the house feel more familiar. Each home houses six to eight people with the same lifestyle.

There are 7 different lifestyles:

- Goois (upper class);
- Homey;
- Christian;
- Artisan;
- Indonesian; and
- Cultural.

The lifestyle is displayed in the layout of the house, the interaction in the group and with members of staff, day-to-day activities and the way the activities are carries out.

The residents manage their own households (incl. washing, cooking etc.) together with a constant team of staff members. There is a village supermarket, gardens, squares, park, hairdresser, café, restaurant, a bar and theatre which are for use by both the residents and residents of the surrounding neighbourhoods. In

addition to clinics for a doctor and a physiotherapist. There are 25 clubs covering different interests e.g. baking, painting, cycling, literature, bingo etc.

Around-the-clock care is provided by 240 “villagers” – trained geriatric nurses and caregivers dressed in street clothes. The staff takes care of everything from cooking meals and planning activities to assisting with bathing, personal care and administering medications. Individuals staffing the various village “businesses” are also trained in dementia care. There are also cameras which monitor the residents around the clock.

Construction of the village cost €19.3 million and was funded primarily by the Dutch government (€17.8 million) plus funding and sponsorship from local organisations (€1.5 million). The facility covers 4 acres of land.

The village is government-funded and relatively affordable. Henley[1] (2012) from the Guardian UK reports that the cost for the residents in the village is not much higher than regular care homes in Britain. A payment of €5,000 a month, is paid directly to Hogewey by the Dutch public health insurance scheme, to which every Dutch taxpayer contributes through their social security deductions. Some residents also pay a means-tested sum to their insurer.

Renting out the theatre for conferences, training sessions and performances, and fees for formal visits, help balance the budget. The budget is also kept low by a limited managerial team and staff who multi-task (Kremer 2013).

Benefits

- Reduced anxiety, confusion and anger of the dementia residents by providing a safe, familiar and human (not hospital) environment.
- Increased engagement in the community, reducing the chance of suffers becoming withdrawn (isolation reduces the production of myelin (a fibre that maintains our nerve cells) which can accelerate the condition, making deterioration a product of our current method of treatment).
- Increased physical activity promoting and improving general health of residents. Although residents living in the villages cannot leave the site, they are free to move around in the outside areas and through the village. This combined with planned activities, promotes increased well-being.
- The above resulting in an increased quality of life and reduced overuse of drugs e.g. anti-psychotics.
- Reduced staff turnover rate (resulting from calmer, happier patients), saving organisations money as well as decreased stress of formal and informal carers.

[1] Henley, Jon (27 August 2012). "The village where people have dementia – and fun". The Guardian

Planned Facilities

Dementia Village – Rome, Italy (2016)

Village for 100 residents is currently being developed in Italy according to DVA (http://www.dementiavillage.com/). Due to open in 2016. No further information accessible online.

Dementiaville– Wiedlisbach, Switzerland (2017)

Approved £17m project, to be built next to the Swiss village of Wiedlisbach near Bern to provide accommodation and care to 150 elderly dementia patients in 23 purpose-built 1950s-style houses.

Miami Jewish Health Systems – Florida

Miami Jewish Health Systems is planning an extension on its 28-acre campus to provide dementia patients more freedom by creating a safe space where they're not confined to their rooms – called 'EmpathiCare'.

The facility is planned to house between 66 and 99 patients and include a store, spa, wellness centre, café and art centre. Each living space will include kitchens and common areas designed to be as home like as possible.

The estimated cost of the expansion facility is set at $50 million. The living costs of the residents have not yet been determined.

Community/Engagement Focused Care Units

Abbey Place Nursing Home – Yorkshire, UK

A 1950s-style village has been created at Abbey Place Nursing Home to help residents remember their pasts within familiar surroundings. Scene's set within the homes gardens, including a 1950s café, post office, grocery store, hairdressers, florist, shop, library and car garage. The residents are allowed to wander through the village on a regular basis and the set gives them the change to recognise familiar objects and feel more secure. Inspiration came from Hogewey in the Netherlands, however as it is just a set within the care homes original facility, its benefits are more limited. Costs remain the same as a standard care home.

Dr. Sandra Black Centre for Memory Care – Penetanguishene, Canada (2014)

Located at the Georgian Bay Retirement home. Designed to look like it is in the 1950s or 60s, to make patients feel comfortable in their surroundings. Described as a variation of "reminiscence therapy", the centre helps patients recall memories form years ago, which can have a therapeutic effect.

It is a 52 bed, 2,323sqm facility. There is a five-to-one ratio of staff to patients.

J.
Flood risk and sustainable drainage initiatives

South Oxfordshire and Vale of White Horse District Councils

Didcot Garden Town

Flood Risk and Sustainable Drainage Strategic Initiatives

February 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

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Document revisions

No.	Details	Date
1	Draft	16 December 2016
2	Final	21 February 2017

Executive summary

Purpose of this report

As part of this study Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler) was appointed to prepare a Flood Risk and Sustainable Strategy Report. This report summarises the main flood risk issues encountered in Didcot and the flood risks posed to new developments in the Garden Town. The main scope of the report is to analyse strategic initiatives to improve flood risk and implement sustainable drainage in the Garden Town as a whole.

This report identifies relevant planning and technical guideline documents for Didcot; summarises the baseline information of the area, including geology, hydrology and topography; describes the new development proposals and how they address flood risk and drainage; and finally includes opportunities and constraints within the town layout to improve the flood risk and sustainable drainage in Didcot.

Five main areas for improvement have been identified. The first is the area to the west of Didcot along the south side of the A4130. There are opportunities to improve the weirs, valves and culverts along the drainage ditch adjacent to the southbound carriageway of the A4130, and also to improve the connectivity between culverts beneath the A4130 and beneath the railway line.

The second area for improvement is re-naturalising Moor Ditch in the vicinity of Site 4. There are several culverted and channelized watercourses that drain into Moor Ditch. Historical mapping suggests that the natural route of Moor Ditch was altered due to the power station on site. Moor Ditch in this location is culverted for part of its route, de-culverting will restore natural riverbank habitats and may reduce flood risk if there are locations where the culvert doesn't have sufficient capacity for watercourse flow. Re-naturalising rivers may also slow the passage of water, and ameliorate flood risk further downstream.

The third area identified for possible improvements is the forecourt of Didcot Parkway Railway Station. The station has flooded as recently as September 2016, believed to occur as the station is at a lower elevation than surrounding land so water flows downhill from the higher ground to the south of the station, as well as due to a lack of capacity in the drainage system. The main causes of flooding at this location have been identified as pluvial and sewer flooding.

The fourth area identified for possible improvements is to the north of Didcot. A triangular area bordered by Moor Ditch on the east and the railway line on the west has been identified as a possible location for a Flood Alleviation Scheme. This would improve flooding issues in the west of Ladygrove Estate which are caused by Moor Ditch.

The fifth area for improvement is the Ladygrove Estate area to the north east of Didcot. This area has flooding problems, believed to be caused by surface water resulting from poor maintenance of watercourses and from surface water sewers.

For this study, it was advised that the Flood Zone Mapping provided by the EA was used, rather than that contained within the 2007 or 2013 SFRA. Hydraulic modelling is beyond the scope of this report. However, as part of site specific Flood Risk Assessments for some of the consented developments, some hydraulic modelling had been carried out in the past. Where modelling has been undertaken, the results have highlighted discrepancies when compared to the Environment Agency flood extents. The models have been completed prior to the most recent climate change allowances updated by the government in April 2016, as such they may not accurately reflect future climate conditions or future flood extents. Further hydraulic modelling could be undertaken in order to apply the most recent climate change allowances and to form a detailed and coherent model of flood risk to the whole of Didcot, rather than focusing on specific sites in isolation.

There are opportunities for implementation of Sustainable Drainage Systems (SuDS) in all sites across the Didcot Garden Town development.

SuDS features such as swales, rain gardens, green roofs and tree pits provide a visual amenity benefit, provide environmental benefits such as improved wildlife habitats, and can positively affect water quality by

providing an early treatment step. Besides, SuDS features might improve flooding issues as the surface runoff is attenuated at source reducing flows further downstream.

The geology and the hydrogeology of the north of Didcot is not suitable for infiltration, therefore, ponds and swales would be more suitable SuDS features at this area of Didcot. However, the geology of the south of Didcot has certain degree of permeability and options such as pervious pavements could be considered.

The current land uses would need to be considered for the selection of SuDS features, greenfield sites are deemed more suitable for ponds and swales whereas in highly urbanised areas preferred SuDS features would be pervious pavements, green roofs and brown roofs and tree pits.

The topography of Didcot is relatively flat, therefore suitable SuDS options are limited to those which are shallow in construction, such as swales and retention basins. Maximum and minimum discharge rates from runoff from new developments would need to be agreed with Oxfordshire County Council (OCC) and South Oxfordshire (SODC) and Vale of White Horse District Councils (VoWHDC).

Future communications with the Local Authorities, the Environment Agency (EA) and Thames Water (TW) will be crucial for the success of the proposed strategic initiatives described throughout this report.

Contents

Appendix B Site Visit Conclusions 1

1.Introduction

1.1 Background

A 21st Century Garden Town at Didcot is planned. This initiative is guided with spatial vision to develop both a connected town and super green town.

A Masterplan is now in place with ten key principles, which are to:

1. Support cycling, walking and better public transport;
2. Make Didcot a destination;
3. Build a better town centre;
4. Celebrate Didcot's history;
5. Create a better sense of arrival at key gateways;
6. Provide new outstanding landmark facilities;
7. Overcome major severance issues;
8. Establish a legible network of streets connecting key local centres;
9. Integrate smart technology into Didcot's future;
10. Offer more diversity in homes and jobs.

From this ten key masterplan moves are being proposed as shown in Figure 1.1.

In conjunction with these initiatives, it is planned to increase the housing stock from approximately 15,000 to approximately 30,000 dwellings by 2031. Both South Oxfordshire District Council and the Vale of White Horse District Council are working together to identify key opportunity sites.

A number of these homes have already been allocated as part of the strategic sites both in and around Didcot and are identified as consented. Some of which cannot be influenced by the masterplan moves, however, for others some influence still exists and study is of benefit. Other sites are currently under the process of consenting, with these there are various opportunities to be investigated. These are classified as either, having critical importance, already coming forward or of strategic worth. In addition to this there are other opportunity sites, where individual study is not (yet) required.

Figure 1.1 Key Master Plan Moves

1.2 Purpose of Report

As part of this study Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler) was appointed to prepare a Flood Risk and Sustainable Strategy Report. This summarises the main flood risk issues encountered in Didcot and the new developments in the Garden Town. The main scope of the report is to analyse strategic initiatives to improve flood risk and sustainable drainage in the Garden Town as a whole.

This report identifies:

- Planning and technical guidelines documents for Didcot;
- A summary of the baseline information of the area, geology, hydrology, topography;
- A summary of the new development proposals and how they address flood risk and drainage;
- The opportunities and constraints within the town layout to improve the flood risk and sustainable drainage in Didcot as a whole

1.3 References

- National Planning Policy Framework, produced by UK Government in March 2012;
- Planning Practice Guidance, Flood Risk and Coastal Change, produced by UKL government in April 2015;
- Environment Agency Flood Map for Planning, accessed online in December 2016(http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=floodmap&layerGroups=default&lang=_e&ep=map&scale=7&x=531500&y=181500);
- UK Government "Long term flood risk assessment for locations in England", accessed online in December 2016 (https://flood-warning-information.service.gov.uk/long-term-flood-risk/);
- British Geological Survey (BGS) "Geology of Britain Viewer", accessed online in December 2016 (http://mapapps.bgs.ac.uk/geologyofbritain/home.html);
- Ordnance Survey "Ordnance Survey Maps - 25 inch England and Wales, 1841-1952", accessed online in December 2016 (http://maps.nls.uk/os/25inch-england-and-wales/);
- Ordnance Survey Maps, accessed online in December 2016 (https://osmaps.ordnancesurvey.co.uk/osmaps/);
- Google Maps, accessed online in December 2016 (https://www.google.co.uk/maps);
- Strategic Flood Risk Assessment (SFRA) prepared by HR Wallingford in 2007 on behalf of South Oxfordshire District Council and Vale of White Horse District Council;
- Strategic Flood Risk Assessment (SFRA) prepared by JBA Consulting on behalf of South Oxfordshire District Council and Vale of White Horse District Council in July 2013;
- Addendum to 2013 SFRA prepared by JBA Consulting on behalf of South Oxfordshire District Council and Vale of White Horse District Council in October 2014;
- Didcot Drainage Strategy, prepared by Thames Water;
- Vale of White Horse District Council Planning Portal, accessed online in December 2016 (http://www.whitehorsedc.gov.uk/services-and-advice/planning-and-building/find-application);
- South Oxfordshire District Council Planning Portal, accessed online in December 2016 (http://www.southoxon.gov.uk/services-and-advice/planning-and-building/find-application);
- Drainage Proposals Surface Water for Great Western Park, prepared by RSKENSR in May 2006;
- Chapter 8: Hydrology and Flood Risk for Site 2, prepared by Brookbanks Consulting in March 2016;
- Surface Water Drainage Strategy Addendum Report 6 for Site 3, prepared by Barnard & Associates in November 2014;
- Environmental Statement North East Didcot prepared by CSA Environmental Planning in July 2015;
- Flood Risk Assessment (FRA) for Didcot A Power Station (Site 4), prepared by BWB Consulting in March 2015;
- Flood Risk Assessment (FRA) for Site 5, prepared by Glanville Consultants in August 2015 on behalf of Croudacre Homes Ltd and the University of Reading;
- Didcot Gateway Site Surface Water Drainage Strategy and Flood Risk Assessment prepared by Alan Baxter & Associates in March 2015 on behalf of GL Hearn;

- Flood Risk Assessment (FRA) for Orchard Centre Phase 2, Didcot prepared by Waterman in February 2015;
- Surface Water Drainage and Flooding Environment Statement prepared by Hammerson UK Properties Plc in February 2015;
- Didcot Town Centre Supplementary Planning Document and Design Guide (2016) – Part 2 prepared by South Oxfordshire District Council;
- Vale of White Horse District Council Design Guide, Local Plan 2031 – Part 6, Strikethrough Plan Appendix 6 Design and Environment and Appendix A prepared by the Vale of White Horse District Council;

2. Planning and guidelines

This section of the report will summarise previously undertaken Strategic Flood Risk Assessments (SFRA) for Didcot and the surrounding areas. This section also collects the Sustainable Drainage Systems (SuDS) guidelines for planning in Didcot from various sources, and summarises the guidelines.

In Didcot, Oxfordshire County Council is designated as the Lead Local Flood Authority (LLFA), under the Flood and Water Management Act (2010). As the LLFA, Oxfordshire County Council is responsible for co-ordinating the management of local flood risk from surface water, groundwater and ordinary watercourses. The Environment Agency has responsibility for flooding from main rivers, reservoirs and from the sea.

2.1 Flood risk

National Planning Policy Framework, 2012 and Planning Practice Guidance, 2014

The National Planning Policy Framework (NPPF) issued in March 2012 requires that flood risk must be taken into consideration during the planning process. The NPPF states that development in areas at risk of flooding should be prevented, and development should be undertaken on sites at lower risk of flooding. If development is necessary in flood risk areas, then care should be taken to ensure the development is both safe and does not increase the risk of flooding elsewhere.

The NPPF indicates that Local Plans should be supported by a SFRA and should develop policies to manage risk from all sources, taking advice from flood risk management bodies, in particular the Environment Agency. The NPPF states that planning authorities should apply the precautionary principle when considering flood risk to locations of proposed development, using a risk based approach to avoid flood risk wherever possible and managing it elsewhere, applying the Sequential Test, and applying the Exception Test where necessary. Land that is required for current flood management should be safeguarded from development, and opportunities offered by new development which have potential to reduce causes and impacts of flooding should be pursued.

The PPG defines Flood Zones as follows;

- Flood Zone 1 - Low Probability. Land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).
- Flood Zone 2 – Medium Probability. Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.
- Flood Zone 3a – High Probability. Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Flood Zone 3b – The Functional Floodplain. This zone compromises land where water has to flow or be stored during times of flood. It should be noted that Flood Zone 3b is not separately distinguished from Flood Zone 3a in the Environment Agency Flood Maps for Planning.

These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences.

The Sequential Test is a method of steering new development into areas with the lowest probability of flooding. The aim is to develop in Flood Zone 1. Where appropriate sites are not available, then taking the vulnerability of the development into consideration, reasonably available areas in Flood Zone 2 are considered applying the Exception Test if required. If there are no reasonably available and suitable sites within Flood Zone 1 and Flood Zone 2 then the suitability of sites in Flood Zone 3 are considered, taking into consideration the vulnerability of proposed development and applying the Exception Test where necessary. When applying the sequential approach to location new development, the probability of other sources of flooding (e.g. surface water flooding) must be taken into consideration.

The Exception Test ensures that necessary development located in areas considered to be at risk of flooding only takes place in Flood Zone 2, or in Flood Zone 3 where the flood risk to development is compensated by other sustainability factors and the development will be safe for the entire lifespan, including allowances made for the effects of climate change.

The Planning Practice Guidance (PPG) to the NPPF released in March 2014 provides additional guidance to local planning authorities to ensure effective implementation of planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding. Under this guidance, the vulnerability of new development to flooding is considered, ranging from "essential infrastructure" to "water compatible development". Once the vulnerability of the development is known, then the compatibility of the type of development with the location of the development can be assessed.

An excerpt from the PPG is shown below, giving an indication of some of the vulnerabilities of different forms of development in the Didcot Garden Town proposal.

Table 2.1 Flood Risk Vulnerability Classification (PPG, Table 2)

Vulnerability	Development Type
Essential Infrastructure	Grid and primary substations, Water treatment works needing to remain operational in time of flood
Highly Vulnerable	Basement dwellings, Police, ambulance and fire stations required to be operational during flooding
More Vulnerable	Dwelling houses, schools and nurseries, hospitals, residential care homes
Less Vulnerable	Shops, restaurants and cafes, offices
Water-Compatible Development	Flood control infrastructure, amenity open space

http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/

The following table, Table 2.2, displays the suitability of the different vulnerabilities of development within different Flood Zone areas.

Table 2.2 Flood Risk Vulnerability and Flood Zone Compatibility (PPG, Table 3)

	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception Test Required	✓	✓	✓
Flood Zone 3a	Exception Test Required	✗	Exception Test Required	✓	✓
Flood Zone 3b	Exception Test Required	✗	✗	✗	✓

✓ Development is appropriate

✗ Development should not be permitted
http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-3-flood-risk-vulnerability-and-flood-zone-compatibility/

SFRA 2007

A Strategic Flood Risk Assessment (SFRA) for Didcot was completed by HR Wallingford, and released in 2007. This SFRA included hydraulic and hydrological modelling of the Moor Ditch and Hakkas Brook systems. The objective of the study was to produce improved flood mapping for the Moor Ditch and Hakkas Brook catchments, displaying flood zones caused by fluvial flooding. Only results pertaining to the Moor Ditch and Ladygrove Brook catchments will be described here.

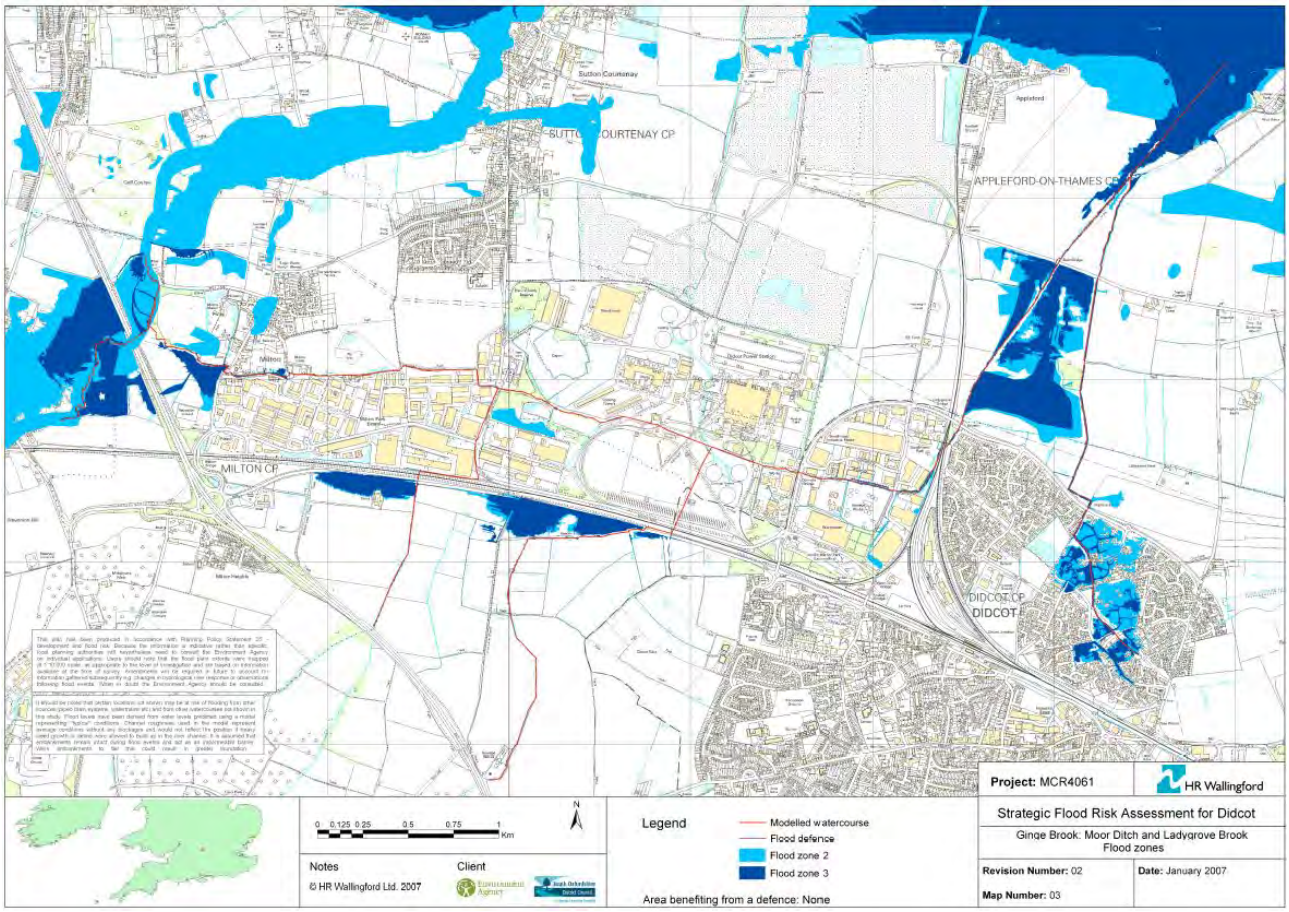
Given the lack of historical modelling carried out on the Moor Ditch catchment, there was insufficient survey data or models that could be used in the study. Therefore, it was necessary to collect channel survey data to support the new hydraulic model. Main structures, which may have an impact on flood flows, such as road/rail bridges and culverts were surveyed and included in the model. An issue with the SFRA study was the absence of flow or level data with which to calibrate the model. There are no continuous flow monitoring stations in the Moor Ditch catchment, as such it was necessary to use local knowledge and limited flood mapping from 2003 in order to 'calibrate' the Moor Ditch model.

At the time of the publication of the SFRA, flood mapping for the Didcot area displayed extensive areas of Flood Zone 2 and 3 in the middle reaches of Moor Ditch, in the vicinity of Milton Park, the Didcot power station, and agricultural land on what is now Site 5. It is explained in the SFRA that the flood mapping at the time of production of the SFRA was very broad and undertaken on a national level, and underestimated the capacity of the Moor Ditch channel. The JFLOW (2-D hydrodynamic modelling software) model assumes the channel capacity is equivalent to the median annual flood, Qmed. The updated study in 2007/2008 found that the Moor Ditch channel has excess capacity, generally sufficient to contain the 1 in 100 year event, hence was able to convey more water in times of flood and thus the flood zones were reduced in size.

The model results displayed flooding in these areas, and can be seen below:

- Ponding at the north of Site 2 and to the north of Site 10, where the watercourses are culverted beneath the A4130 and railway embankment.
- Flooding in the eastern part of the Ladygrove Estate. This study displayed areas of the Ladygrove Estate as being in Flood Zone 2 and 3 for the first time.
- Flooding in the area between Moor Ditch and Ladygrove Brook, to the north of Site 14.
- Around the outfall of Moor Ditch into the River Thames, due to flooding in the River Thames.

Figure 2.1 Flood Zone Map for Didcot (From 2007 SFRA)



The SFRA concludes that the updated, more accurate, modelling displays smaller areas of Flood Zone 2 and 3 in the western part of the Moor Ditch catchment, but predicts flooding in the Ladygrove Estate to the north east of Didcot, where the previous Environment Agency flood maps had not predicted flooding.

The flood maps generated for the SFRA were then used to form the basis of site specific guidance, in order to assist developers. Since the SFRA was completed in 2007, the proposed development zones have changed and therefore only 2 of the development sites proposed in 2007 correspond to current development sites.

Development Area 5 corresponds to Site 2 (Valley Park) and Site 10 today, these sites being bordered by the A3140 on the north boundary, by the A34 on the south west boundary, and by Site 3 – the Great Western Park development on the east boundary. The key points to take from the site specific guidance are:

- The culverts beneath the A4130 and railway embankment are the main constrictions to flow, and flooding in the vicinity of the culvert entrance is due to insufficient capacity.
- The Environment Agency considered the area in the vicinity of the culverts to be functional flood plain, and as such these areas would be expected to be retained as flood storage areas.
- Consideration should be given to opportunities to retain runoff up the slope to the south of the site, which will reduce flood risk to the lower reaches.

Development Area 8 corresponds to Site 5 (North East Didcot) and Site 14 today, these sites being situated to the north east of Didcot. Site 5 is bordered by the A4130 on the south boundary, the B4016 on the east and north boundaries, and Moor Ditch on the west boundary. Site 14 is directly adjacent to Site 5 on the east boundary, bordered by Moor Ditch on the east boundary, the B4016 on the north boundary and the railway line towards Oxford on the west boundary. The key points taken from the site specific guidance are:

- Flooding on the site would be expected to come from fluvial flooding from Moor Ditch or Ladygrove Brook, or from surface runoff from slopes to the east of the site.
- The area is underlain by Clay Gault formation, therefore this would suggest that infiltration methods are unsuitable.
- Culverts under the B4016 should be investigated, as lack of sufficient capacity can cause water to accumulate upstream.

SFRA 2013

Since the completion of the Didcot SFRA in 2007 and the completion of a combined SFRA for South Oxfordshire District Council (SODC) and Vale of the White Horse District Council (VoWHDC) in 2009, there have been changes to legislation and flood risk policy, updates to local plans for both of the District Councils, and some updates to flood risk mapping. Therefore, it was deemed necessary for an updated SFRA to be produced, and this task was completed in 2013. The study area of the 2013 SFRA covers the entirety of SODC, and VoWHDC, whereas the 2007 Didcot SFRA was specifically concerned with Didcot and the immediate surrounding area. The 2013 SFRA did not undertake any modelling work, instead collating available data from the 2007 Didcot SFRA, the 2009 SODC and VoWHDC SFRA, and information available from the Environment Agency.

The 2013 SFRA provides information to developers regarding potential development areas. The document identified approximately 40 potential development areas, and produced flood risk summary sheets for those areas. There are two flood risk summary sheets that relate to Didcot; one for Valley Park development to the east of Didcot (known as Site 2) and one for Didcot as a whole.

The Valley Park flood risk summary sheet uses the Moor Ditch model produced by HR Wallingford in 2007 and therefore displays the same flood extents as in the 2007 SFRA for Didcot. The 2013 SFRA includes surface water flood risk, and states that due to the presence of smaller watercourses, the Site 2 - Valley Park development has some areas at risk of surface water flooding. These areas are associated with the smaller watercourses flowing from south to north across the site. The flood risk summary sheet states that the Areas Susceptible to Groundwater Flooding (AStGWF) map suggests that the site is at medium to high risk of groundwater emergence, with the risk increasing towards the northern part of the site, but that there is no historical records of groundwater flooding. The implications for development on Site 2 – Valley Park are summarised as:

- The Environment Agency concluded it was preferable to include the area at risk of fluvial flooding within the site boundaries, in order to enhance the amenity value of the development.
- The site specific FRA should demonstrate that development will not be at risk from small watercourses crossing the site, and that potential blockage of culverts should be taken into account, through detailed modelling where necessary. The FRA should also include a detailed assessment of groundwater flood risk.
- The route of smaller watercourses across the site and of drains on site should be preserved.

The Didcot flood risk summary sheet also uses the Moor Ditch model produced by HR Wallingford in 2007. The flood extents include areas to the south of the A4130 on Site 2, flooding on Site 5, Site 14 and to the Ladygrove Estate, all to the north east of Didcot. The 2013 SFRA states that much of Didcot was marshy and poorly drained, including the Ladygrove area to the north east. In the present day, the main risk of flooding to existing development is to housing in the Ladygrove Estate, from Ladygrove Brook. This is supported by events in 2007, where high water levels in Ladygrove Brook led to the surface water drainage system backing up and becoming overwhelmed. The flooding only affected two properties but investigation of the event showed that had water levels been slightly higher, many more houses would have been affected. The majority of Didcot is at lower risk of groundwater emergence, with industrial estates to the north west at higher risk. The implications for development across Didcot as a whole are summarised in the 2013 SFRA as:

- Development should be sequentially located away from Flood Zone 2 and 3, and located in Flood Zone 1 where possible.

- Development should be located away from small watercourses, but if development is necessary then a site specific FRA should be undertaken to understand the potential level of flood risk.
- Development should not interfere with existing surface water flood risk or flow paths.

2.2 Sustainable Drainage Systems (SuDS)

Policy

Information referred on this documents has been extracted from the relevant policy documentation available and produced by the local planning authorities responsible for the application of sustainable drainage strategies on new developments. For the Didcot local area, South Oxfordshire District Council (SODC) and Vale of White Horse District Council (VoWHDC) have the duty to ensure that fit for purpose SuDS schemes are delivered. Also, the Lead Local Flood Authority Oxfordshire County Council (OCC) has taken on the role of statutory consultee.

Below there is a brief summary that have been consulted highlighting the relevant point about sustainable drainage.

South Oxfordshire District Council

Summary of the policy extracted from the SODC Website (Planning Policy section).

Didcot Town Centre Supplementary Planning Document (May 2009)

The Supplementary Planning Document and the Sustainability Appraisal Report emphasise in the implementation of SuDS to reduce the risk of flooding from the increase of water run off resulting from the new impermeable surfaces added on new developments or re-developments.

This should comply with the interim Code of Practice for SuDS, for at least the 1 year in 100 year return period events. SuDS contribute to storm water and flood management through:

- Prevention: Prevent run-off and pollution.
- Source Control: Control of run-off at or very near the source.
- Site control: Management of water from several sub-catchments (including routing water from roofs and car parks to one large soak away or infiltration basin for the whole site).
- Regional control: Management of runoff from several sites, typically in detention ponds, wetlands or basins.

Local Plan 2032 Sustainability Appraisal Report (June 2016)

The Local Plan 2032 proposed that any development taking place has to be on flood zone 1 land and permeable surfaces and SuDS will be incorporated into them according the climate change regulation and meeting prescribed standards of good design. A Strategic Flood Risk Assessment produced by the SODC should be used to determine the best approach depending on the requirement of each area.

Vale of White Horse District Council

Local Plan 2031 Part 6 (November 2014)

The Local Plan 2031 Part 6 establishes on this chapter policies where national guidance alone is not sufficient to deliver the council's vision. Referred to protection the environment and responding to climate change, Core Policy 42: Flood Risk is mentioned.

All development will be required to provide a drainage strategy. Developments will be expected to incorporate sustainable drainage systems and ensure that run-off rates attenuated to greenfield run-off rates.

Higher rates would need to be justified and the risk quantified. Developers should strive to reduce run-off rates for existing developed sites. Sustainable drainage systems should seek to enhance water quality and biodiversity in line with the Water Framework Directive (WFD).

Vale of White Horse District Council Design Guide (March 2015)

Principle DG14: Water features and SuDS establishes;

Where practically possible surface water features should be retained, enhanced and/or re-established as positive features contributing to the character, ecological value and biodiversity of new development. Development proposals should incorporate the use of sustainable urban drainage as an integral part of the landscape structure.

SUDs should be designed into the development from the outset as features such as ponds, retention planters/basins, green back lanes and wetlands, and combined with good biodiversity and landscape features to make a positive contribution to the biodiversity, character and appearance of a development. Infiltration methods should be used wherever soil conditions permit. Maximise the amount of porous hard surfacing to enable infiltration. Consideration should also be given to the future management and maintenance of the SUDs.

Other documents

Strategic Flood Risk Assessment Final Report (July 2013)

Section 6.4.2 establishes;

The effectiveness of a flow management scheme within a single site is heavily limited by site constraints including (but not limited to) topography, geology (soil permeability), and available area. The design, construction and ongoing maintenance regime of such a scheme must be carefully defined, and a clear and comprehensive understanding of the catchment hydrological processes is essential. Additionally, for infiltration SuDS it is imperative that the water table is low enough and a site specific infiltration test is undertaken. Where sites lie within or close to source protection zones further restrictions may be applicable, and guidance should be sought from the Environment Agency. Flood Risk Assessments should consider the long-term maintenance and ownership of SuDS.

Connection of surface water drainage to an existing surface water sewer should only be considered as a last resort. Thames Water should be consulted at an early stage to ensure that sufficient capacity is available in the existing drainage system.

All new development which has surface water drainage implications will potentially require SuDS Approval Body (SAB) consent and need to conform to National and Local Standards. Further guidance on SuDS can be consulted on the Susdrain, CIRIA and Environment Agency websites.

3. Communications

3.1 Meetings and Consultations with Local Authorities

A few consultations were made by Amec Foster Wheeler to the Environment Agency (EA), Oxfordshire County Council (OCC), South Oxfordshire District Oxfordshire District Council (SODC), Vale of White Horse District Council (VoWHDC) and a drainage consultant for the local area Monson.

A meeting was arranged on the 7th December 2016 to better understand the flood issues at Didcot. Representatives from the following; Oxfordshire County Council, South Oxfordshire District Oxfordshire District Council (SODC), Vale of White Horse District Council (VoWHDC) and a drainage consultant for the local area Monson including AFW where present.

The main conclusions obtained after the meeting are summarised below:

- A maintenance management plan undertaken by the owners of the drainage assets may improve considerably flooding issues at various locations of Didcot;
- During the meeting it was advised that the more up to date data to use for the flood maps are the EA flood maps rather than the SFRA 2013. It was also mentioned, an addendum of the SFRA is currently being undertaken.
- With regards to SuDS, OCC recommends the application of pervious pavements wherever possible. Besides, the discharge rates from proposed developments will not be increase existing runoff rates.
- OCC recommends the application of the Ciria Manual for the design of SuDS, even if it has adopted its own less extensive guidelines for developers for the design and implementation of SUDs to new developments.

Amec Foster Wheeler has exchanged communications with the EA regarding their preferred approach on the latest climate change allowances to consider and how it might impact the proposed developments for Didcot Garden Town.

Recommendations made by EA officers indicated that Natural England should be involved in the deculverting and re-meandering proposals, they also indicated that the proposals should not cause anu flooding downstream. EA officers have also indicated that funding of the works might be available through the Water Framework Dircetive funding, and that further advise from the EA catchment coordinators should be sought.

4. Baseline Information

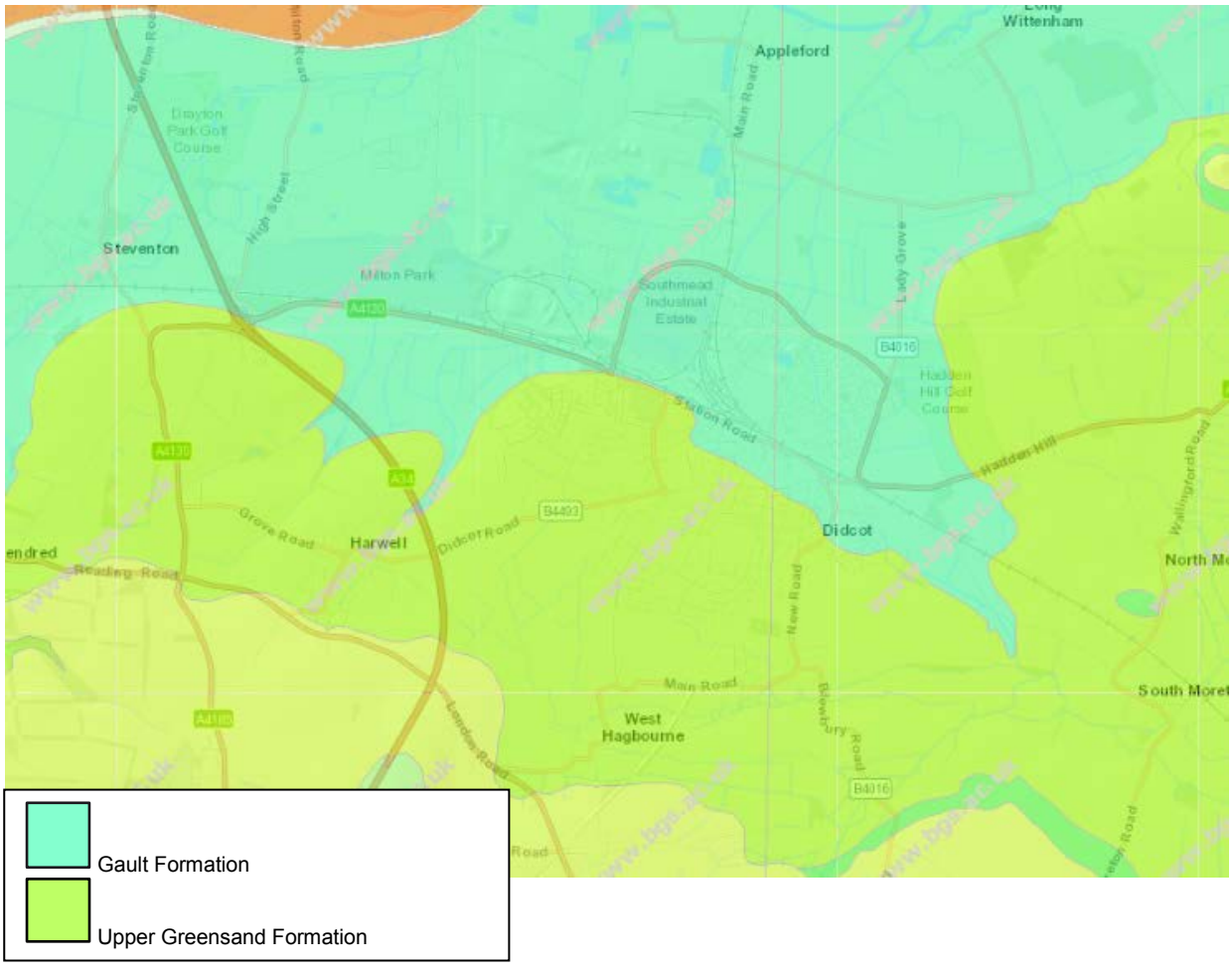
4.1 Topography

In the north eastern quarter, Didcot is relatively flat at approximate elevation of 55 metres Above Ordnance Datum (mAOD). South of the railway line in the south east quarter, the elevation slopes upwards from a height of approximately 55mAOD in the vicinity of the railway line, to an elevation of 72mAOD before levelling out and forming a plateau at approximate elevation of 72mAOD. The north western quarter has a gradual slope from an elevation of approximately 55mAOD at the northwards railway line, to an elevation of approximately 60mAOD at the western extent, in the vicinity of Milton. The south western quarter is at approximate elevation of 58mAOD along the A4130, before rising to an approximate elevation of 80mAOD in the vicinity of the B4493. This means that generally, elevations increase from north to south and from east to west, with the north eastern quarter having the lowest elevation, and the south western quarter having the highest elevation. A contour map showing the topography of Didcot can be found in Appendix A, Figure 2.

4.2 Geology & Hydrogeology

British Geological Survey (BGS) mapping indicates that there are two main types of bedrock geology in Didcot. These are Upper Greensand Formation – calcareous sandstone and siltstone to the south and Gault Formation - musdstone to the north.

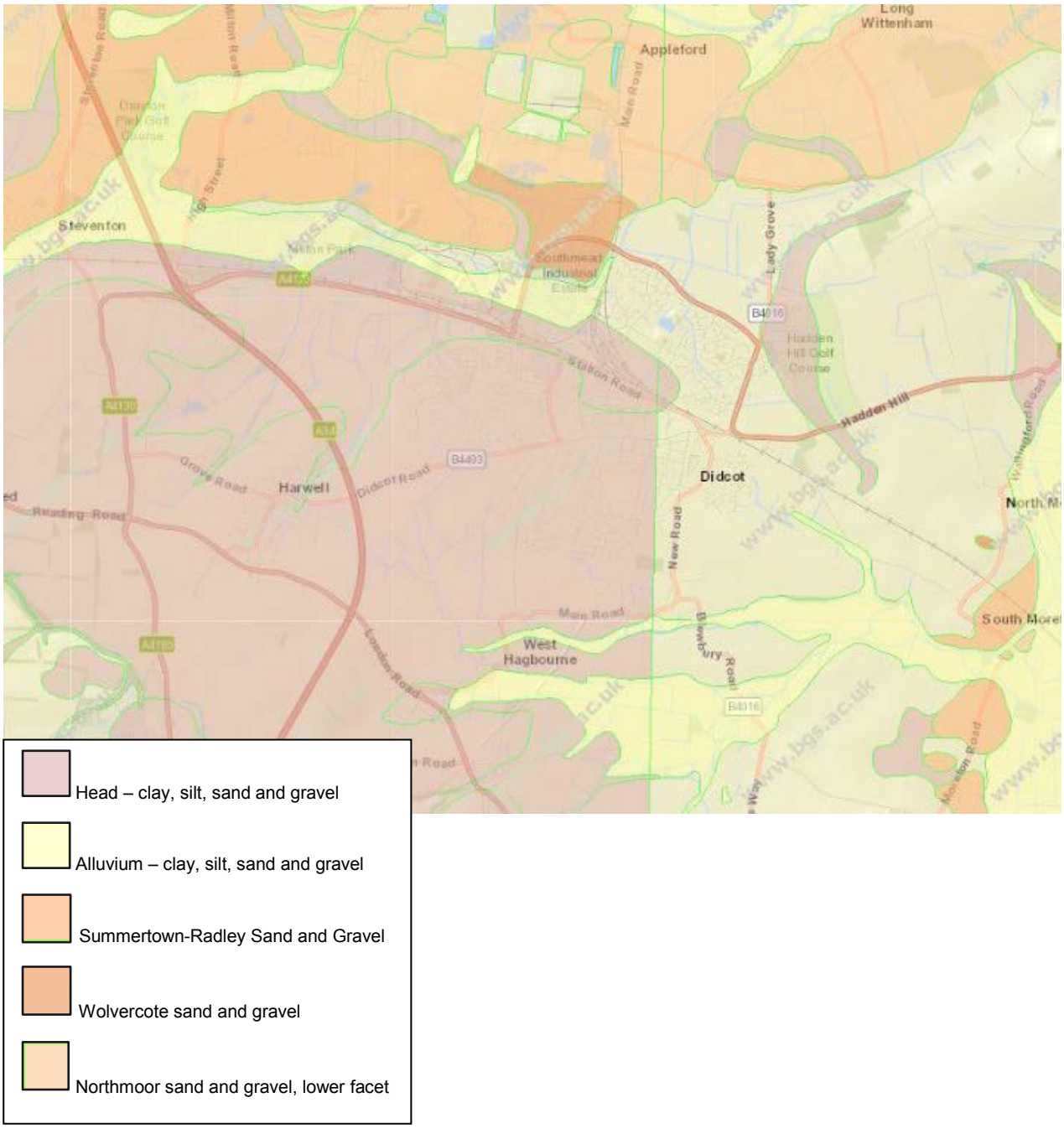
Figure 4.1 Bedrock in Didcot Area (from BGS mapping, accessed December 2016)



Upper Greensand Formation is comprised of poorly consolidated and cemented sands, and is separated from Lower Greensand Formation by Gault Formation. Gault Formation is clay, and is considered to be unsuitable for infiltration methods. As described in the Site Specific FRA for Site 5, intrusive ground investigations were undertaken by RPS. The investigations indicate that the ground conditions underlying the site are primarily Gault Clay Formation. Soakage testing by RPS has confirmed the Gault Clay Formation underlying this site to be practically impervious.

Superficial deposits vary across Didcot and the surrounding areas, with Head – clay, silt, sand and gravel in the south west, Alluvium – clay, silt, sand and gravel, Summertown-Radley Sand and Gravel, Wolvercote sand and gravel, Head – clay, silt, sand and gravel in the north west, no records for most of the north east but with small areas of Northmoor sand and gravel, lower facet and Head – clay, silt, sand and gravel, and finally no records for most of the south east of Didcot, but with small areas of Alluvium – clay, silt, sand and gravel.

Figure 4.2 Superficial Deposits in Didcot Area (from BGS mapping, accessed December 2016)



4.3 Hydrology

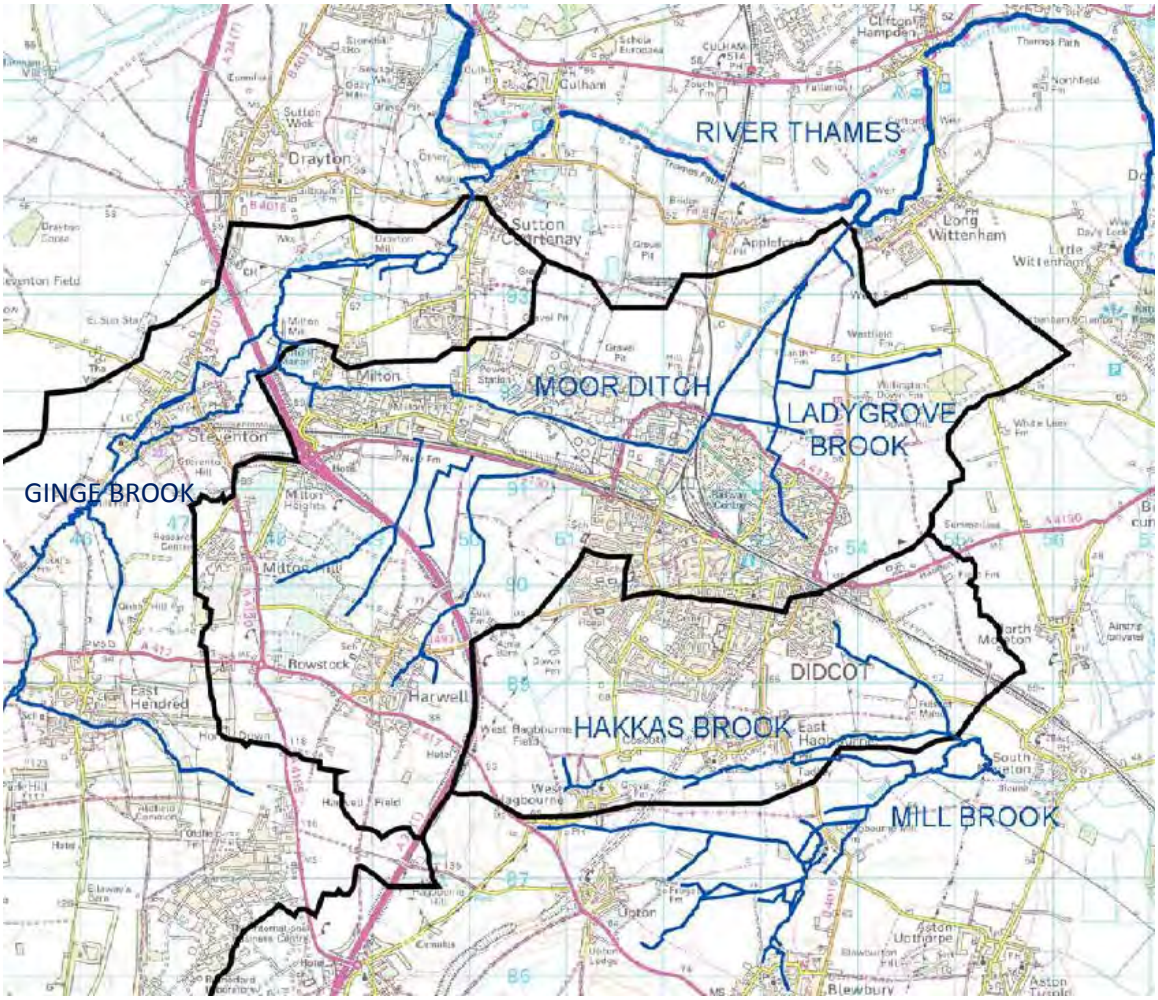
There are three main watercourse systems in Didcot; the Moor Ditch system which covers much of the west and north west of Didcot, the Ladygrove Brook system which covers the north east, and Hakkas Brook which covers the south. Moor Ditch and Ladygrove Brook can be considered to be part of the same system. All three watercourses are designated as 'main rivers' by the Environment Agency.

The Moor Ditch system originates from Ginge Brook to the west of Didcot. Moor Ditch flows on Gault Formation, which is fairly impervious. Moor Ditch flows from west to east past the north boundary of Milton Park, then crosses the Didcot power station site, culverted in two stretches across this location. The catchment of Moor Ditch covers greenfield areas on the edge of Didcot, surface water drains from agricultural land to the south of the A4130 drains and is transferred through culverts under the road and railway embankment and finally discharges into Moor Ditch. The sewerage treatment works to the west of Didcot discharges treated water into the watercourse. Moor Ditch then turns to the north and flows across farmland, before meeting Ladygrove Brook. Approximately 900 metres downstream from the confluence of Moor Ditch and Ladygrove Brook, the watercourse discharges into the River Thames.

Ladygrove Brook originates in the north east of Didcot. Similarly to Moor Ditch, Ladygrove Brook flows over Gault Formation. A tributary of Ladygrove Brook is culverted under Station Road in a north-south direction, before meeting another watercourse and being culverted northwards beneath Station Road and railway embankment. Ladygrove Brook flows through Ladygrove Estate, before passing under the A4130 and flowing across farmland to meet Moor Ditch.

Hakkas Brook is to the south of Didcot. The catchment mainly drains farmland to the south of Didcot, and also surface water from urban areas in the south of Didcot. Development proposals are to the north and west of Didcot, as such this report will not be concerned with Hakkas Brook.

Figure 4.3 River Catchments in Didcot and Surrounding Areas (from 2007 SFRA)



4.4 Summary of Flood Risk in Didcot

Historical Flooding

A map displaying Didcot in 1955 (prior to the Ladygrove Estate extension) with the proposed development sites overlain can be found in Appendix A, Figure 5. The 2007 Didcot SFRA gathered evidence from local residents, newspaper reports, sandbag records and drew on information from previous FRAs. It should be noted that newspaper reports are likely to be solely concerned with flooding affecting property or infrastructure, and therefore flooding in remote areas is unlikely to be reported. This means that the map does not represent a wholly complete overview of flooding in the Didcot area, and detailed information on flood risk for remote areas can only be obtained from detailed hydraulic modelling or from eyewitness experience of the flooded area. A map summarising historical flooding in the Didcot area can be found in Appendix A, Figure 7. The 2007 Didcot SFRA historical flooding map also includes histograms which give an overview of how the incidents of flooding have changed in the past. From this, it can be seen that much of the historical flooding to the south of the railway line only occurred in the years 1970-1990 and that as the flooding stopped after 1990, it suggests that the underlying causes behind the flooding were remedied. After 1990, the main areas that have experienced flooding are the industrial estate to the north west of Didcot town centre, and to the south of Didcot in the vicinity of West Hagbourne. The industrial estate to the north west of Didcot town centre is associated with the Moor Ditch floodplain, and flooding is believed to be related to new development both in this area and further upstream. As hydraulic modelling does not suggest flood risk, the flooding at this location may be as a result of culverts being blocked by debris. It is unclear why the area of West Hagbourne floods, although it is theorised that flooding is as a result of changing farming practices, leading to less infiltration of water into the ground, and hence more runoff.

Historically, Didcot has had problems with flooding, although modern drainage has alleviated the some of the problems. The location of Didcot, lying at the southern edge of the Thames floodplain with hills and slopes to the east and south makes the town prone to flooding.

The area to the north of the railway line, on what is now Ladygrove Estate, was historically part of a marsh associated with the Thames floodplain. The Romans did much to aid drainage in the northern area of Didcot, canalising what is now known as Moor Ditch in order to drain the marshy area. The underlying bedrock of the northern part of Didcot is Gault Clay Formation which is impermeable, with only a thin layer of topsoil. In the past when there was precipitation, the fields to the north of Didcot would be covered in water as infiltration into the ground was not possible. Ditches have been dug across the fields to assist drainage, these drain into Moor Ditch or into Ladygrove Brook.

Ladygrove Estate in north east Didcot experienced flooding in July 2007, believed to be caused by backing up of the culverted Ladygrove Brook and sewer outfalls, worsened by poor maintenance and blockages from build-up of silt. The surface water system became overwhelmed and subsequently overflowed. Only two properties were affected by internal flooding as high floor levels protected many properties, although only a slight rise in water levels would have caused many more properties to be affected.

The area of Didcot to the south of the railway line has also experienced historic issues with flooding. Near to Didcot Parkway railway station in the vicinity of Lydalls Road, the area would sometimes flood with water mixed with sewage. The issues causing this type of flooding have since been removed. Further to the south of Didcot town centre, an area which is now housing but was previously farmland would often be saturated in winter. Mowbray Fields nature reserve was built approximately 25 years ago, in order to intercept water from the south of Didcot and alleviate flooding to West Hagbourne to the south east. The tendency of this area of Didcot to flood is shown by road names in the area; for example Lake Road in West Hagbourne. Flooding in these areas is associated with Hakkas Brook.

In more recent times, in September 2016, Didcot Parkway railway station flooded. Heavy rain starting on the evening of the 15 September 2016 and continuing overnight until early morning on the 16 September 2016 led to flash flooding in Didcot and inundation of the station underpass, causing the north platform to become inaccessible to passengers. This occurred despite recent improvements to the station forecourt. The cause of the flooding is still under investigation, though the station and station subway is at a lower elevation than the land to the south, so water flows downhill and can inundate the station.

Sea or Tidal Flooding

Didcot is situated sufficient distance inland so as to not be at any risk of flooding from the sea. The nearest large river to Didcot is the River Thames, approximately 3.5 kilometres to the north. The River Thames is not tidally influenced in the vicinity of Didcot due to the presence of Teddington Lock in West London, approximately 100km downstream of Didcot.

Flooding from Rivers and the Sea

The Environment Agency (EA) defines Flood Zones as follows;

- Flood Zone 1 - Low Probability. Land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).
- Flood Zone 2 – Medium Probability. Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.
- Flood Zone 3a – High Probability. Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Flood Zone 3b – The Functional Floodplain. This zone compromises land where water has to flow or be stored during times of flood. It should be noted that Flood Zone 3b is not separately distinguished from Flood Zone 3a in the Environment Agency Flood Maps for Planning.

These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences.

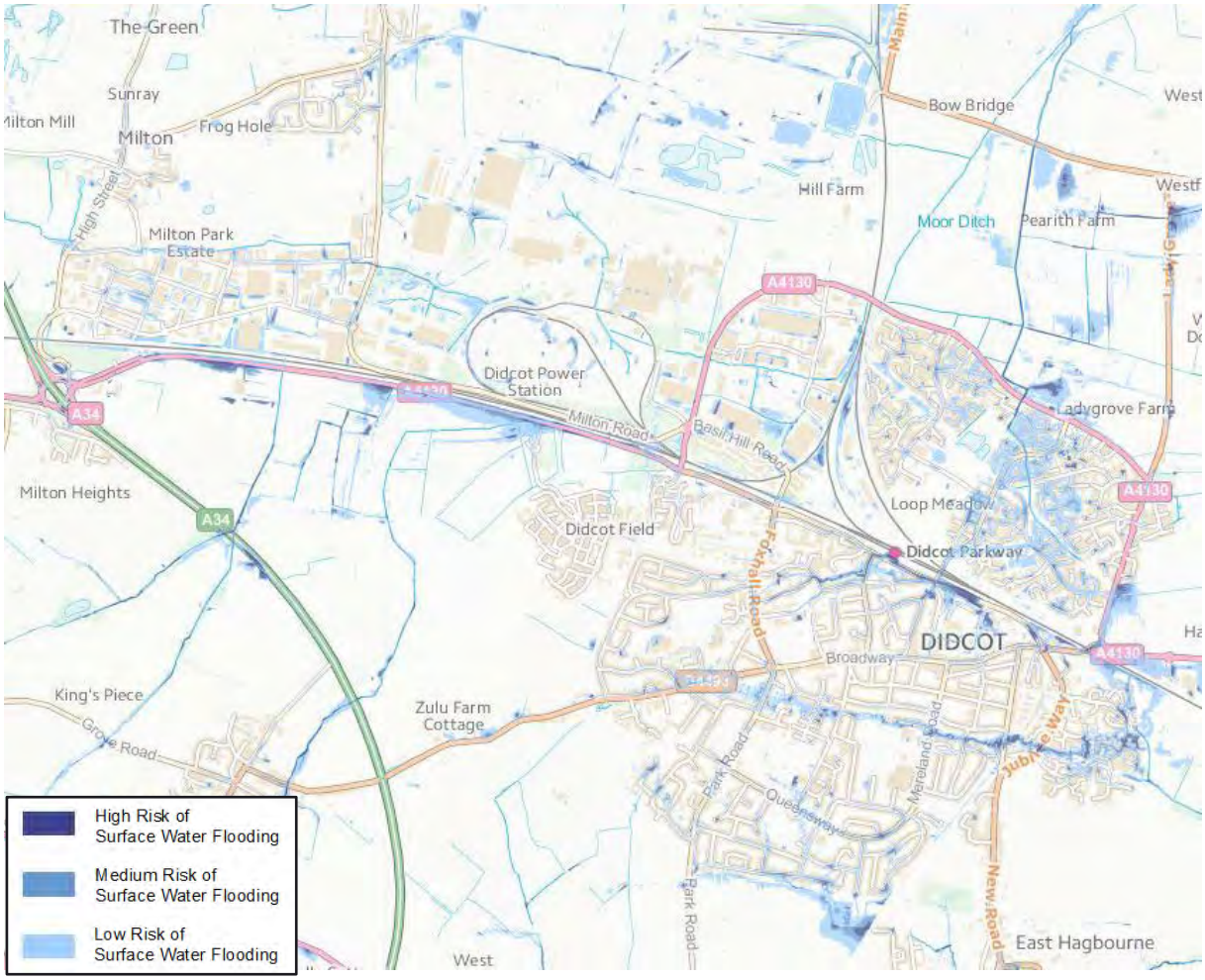
Figure 4.4 Flood Zones in Didcot (from EA Flood Map for Planning, accessed December 2016)

The majority of Didcot is located within Flood Zone 1. However, there are some areas which are designated as Flood Zone 2 or Flood Zone 3. Adjacent to the A4130 to the west of Didcot, there are areas of Flood Zone 2 and 3 to the south of the road. On the Ladygrove Estate housing estate, to the north east of Didcot, there are areas of Flood Zone 2 and Flood Zone 3 adjacent to Ladygrove Brook as it flows through the estate. To the north of Ladygrove Estate, there is an area of Flood Zone 3 immediately adjacent to the location where the Ladygrove Brook passes under the A4130. Ladygrove Estate is the only location within Didcot where residential properties are in Flood Zone 2 or 3. Heading further north, between the Ladygrove Brook and Moor Ditch watercourses, there is a large area of Flood Zone 2, and a smaller area of Flood Zone 3. To the west of Moor Ditch there are areas of Flood Zone 2. To the south east of Didcot, there are areas of Flood Zone 2 and 3 which are associated with Hakkas Brook. A map showing the flood zones with proposed development sites can be found in Appendix A, Figure 3.

Surface Water Flooding

This mapping finds natural drainage channels, low areas in floodplains, rivers and flow paths between buildings. It only indicates flooding that takes place as a result of surface runoff generated by rainwater, including snow and other forms of precipitation, which is on the surface of the ground (in motion or otherwise) and has not entered a watercourse, drainage system or public sewer. This mapping does not indicate flooding that has occurred as a result of watercourses, drainage systems or public sewer systems being over capacity.

Figure 4.5 Surface Water Flooding in Didcot (from .gov.uk, accessed December 2016)

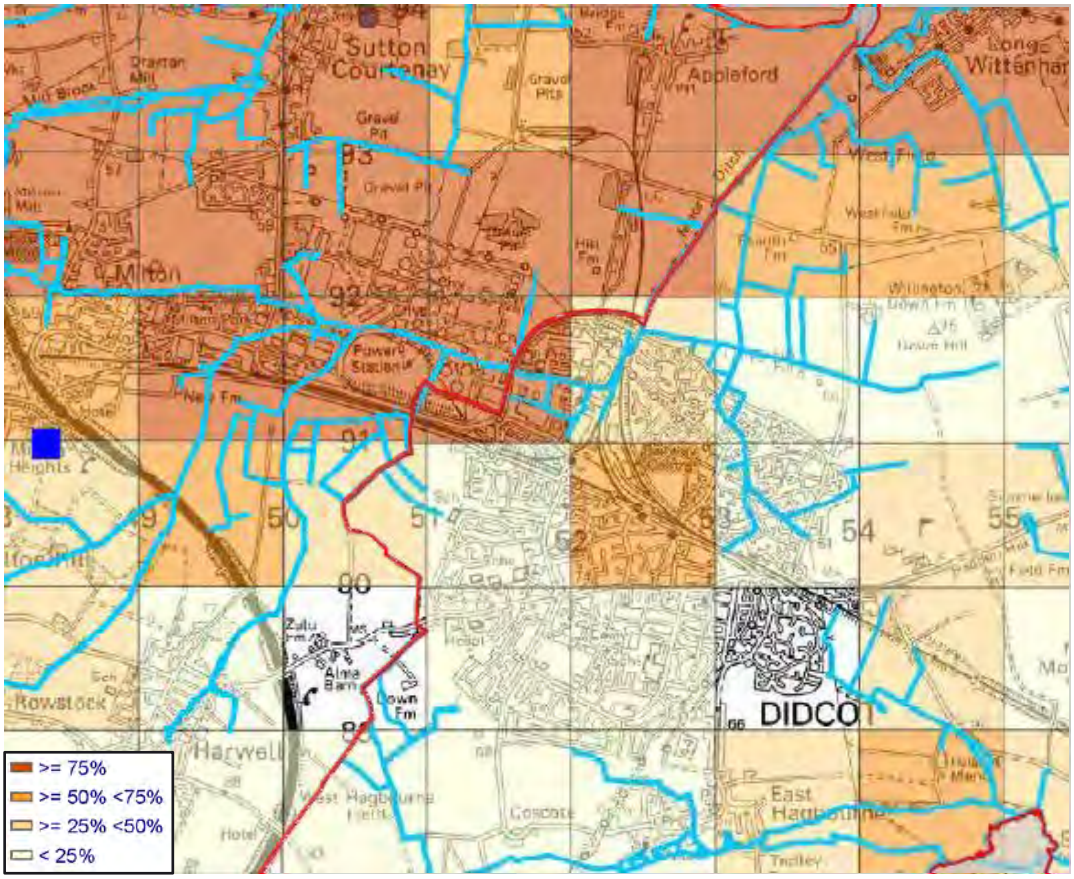


It can be seen that Didcot is at some risk from surface water flooding. The areas at 'high' risk are on the south side of the A4130 to the west of Didcot, the area to the south and south east of Didcot Parkway railway station along Station Road, areas of Ladygrove Estate to the north east of Didcot including the location where Ladygrove Brook passes under the A4130, and some areas of the south and south east of Didcot. A map showing the surface water flood risk with proposed development sites can be found in Appendix A, Figure 4.

Groundwater

The Areas Susceptible to Groundwater Flooding (AStGWF) map displays the susceptibility of 1 kilometre square grids to groundwater flooding. This map is found in the 2013 SFRA. It displays the proportion of each 1 kilometre square where hydrogeological and geological conditions indicate that groundwater may emerge. For example, if a grid square is the darkest shade of orange, it indicates that 75% or greater of the area is at risk of groundwater emergence. It should be noted that this map is not site specific, and as such does not accurately represent groundwater flood risk on a local level.

Figure 4.6 Areas Susceptible to Groundwater Flooding (AStGWF) map (From 2013 SFRA)



As can be seen from the map, areas to the north west of Didcot are shown as having a higher susceptibility of groundwater emergence, particularly in Milton Park, the industrial estate to the north-west. The grid square surrounding Didcot Parkway railway station is also at higher risk that the surrounding grid squares.

Thames Water Sewer Flooding

Thames Water maintain a DG5 flood risk register recording flooding caused by hydraulic incapacity within the foul or surface water networks. Table 4.1 provides a breakdown of the DG5 register for the Didcot catchment. The property numbers shown have been provided by Thames Water in December 2016 and are subject to change.

Table 4.1 Thames Water DG5 Register for Didcot

	Internal Register			External Register		
Storm Event Return Period	2 in 10	1 in 10	1 in 20	2 in 10	1 in 10	1 in 20
Number of Properties	6	7	60	14	65	91

Although property numbers are shown within Table 4.1 it is possible that these properties have flooded on a number occasions in the past. Data received is only for the past 10 years of flooding therefore there may be properties at risk of sewer flooding which haven't yet experienced the rainfall sufficient to cause flooding or reported flooding to Thames Water. There may also be flooding events that have not been reported.

The condition of existing sewers is unknown across the Didcot catchment, however some sewers are anticipated to be over 100 years old. All new development sewers will have been designed in accordance with sewers for adoption and based on a 1 in 30 year design storm return period. Refer to Didcot Garden Town, Infrastructure Strategy Report Utilities Assessment, Constraints and Opportunities issued by Amec Foster Wheeler in December 2016 (reference: 38421-LEA-002) for further details about the sewerage system serving the Didcot catchment. Thames Water have produced a Drainage Strategy for Didcot. This document states that sewers in Didcot and surrounding areas have surcharged as a result of groundwater infiltration into both the public and private sewerage systems, groundwater runoff from saturated fields, surface water inundation from highways and public spaces, and from surface water misconnections.

Highway Drainage

The extend of highway drainage within the catchment is unknown at the time of writing however it is anticipated that the majority of highway gullies drain either to the Thames Water system or local culverts.

The catchment has a history of highway flooding from culverts which are inundated during storm conditions. It is unknown what the capacity of the culverts are across the catchment at this time.

Risk of Flooding from Canals, Reservoirs and Artificial Sources

Didcot is not at risk of flooding from reservoirs. The nearest reservoir is Farmoor Reservoir, approximately 17km north-west of Didcot town centre. Reservoir flooding maps show that if the reservoir were to fail, floodwaters would flow into the River Thames and water level would rise along the river, to a location just to the north of Sutton Courtenay, approximately 5km north-west of Didcot.

Figure 4.7 Flood Risk from Reservoirs (from .gov.uk, accessed December 2016)

5. Analysis of Proposed Developments

5.1 Overall Scheme & Development

Description of the Garden Town

Didcot was awarded Garden Town status by the government in late 2015, as a result of the two District Councils, SODC and VoWHDC, preparing a successful bid. Didcot is expected to grow in the next 15 years, with population more than doubling from 25,000 to 65,000 by 2031. There will be 15,000 new homes built, along with infrastructure to complement, such as primary and secondary schools, healthcare facilities, shopping and commercial areas, and 20,000 new jobs for Didcot and Science Vale.

Getting around Didcot will become easier, with improvements to transport links across the railway line, and new cycle paths and walking routes planned. Didcot is surrounded by countryside, and part of the Garden Town plan is to increase green space within the town centre itself, by providing green infrastructure routes and natural environments that enhance the surroundings.

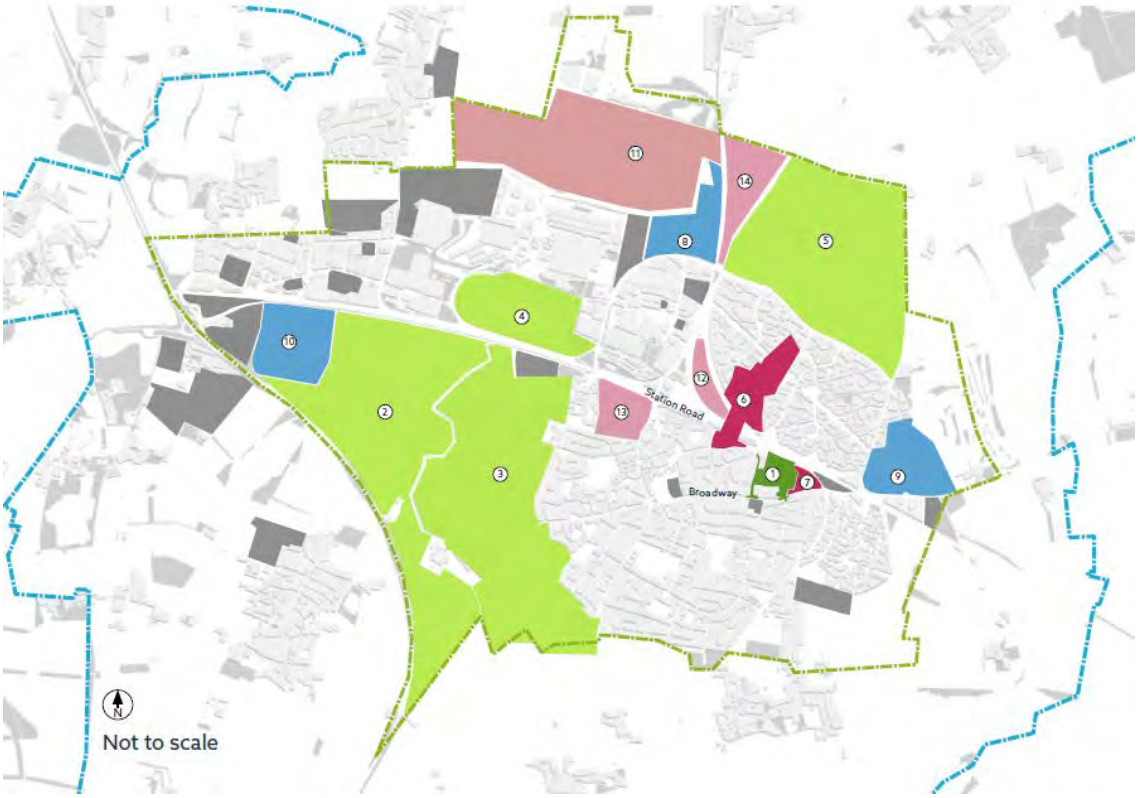
The Garden Town proposals have promoted the opportunity to use Sustainable Drainage Systems (SuDS) as a means of reducing the flood risk to Didcot. SuDS features such as swales, green roofs, tree pits and rain gardens can increase the amount of green space in an area, provide visual and environmental benefits, and can also positively affect water quality by providing an early treatment step. SuDS features also reduce flood risk by attenuation of surface water or rainwater, and can result in less water going into surface water sewers, which reduces the overall volume of water going to water treatment stations.

5.2 Focus Sites

Location

The following Figure 5.1 is a map obtained from the Didcot Garden Town Master Plan, produced by South Oxfordshire District Council, which shows the opportunity sites that currently have planning permission, and areas which potentially could be developed. Following sections describe further each of the areas, those need to be used with reference to the map below.

Figure 5.1 Key Opportunity Sites (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)



Consented sites - no influence possible
- No input required

Consented Sites - some influence
- Assess against Garden Town criteria
- Propose amendments for engagement with developers

Opportunity sites - critical importance
- Apply garden town master plan principles
- Indicative massing and capacity
- Preferred mix and typologies
- Landscape opportunities

Opportunity sites - already coming forward
- Consult on garden town principles
- Collaborate and feed into proposals were appropriate

Opportunity sites - strategic worth
- Gather information
- Highlight key opportunities

Opportunity sites - other
- Individual study not required (as of yet)

1 Orchard Centre Phase 2
2 Valley Park
3 Great Western Park
4 Didcot A
5 North East Didcot
6 Didcot Parkway Station and North and South Gateways
7 Rich's Sidings
8 D-Tech
9 Ladygrove East
10 NW Valley Park (Allocated LPP1 site)
11 Gravel Pit / Landfill Site (park land opportunity)
12 Railway Centre
13 Vauxhall Barracks
14 Land between NE Didcot and railway

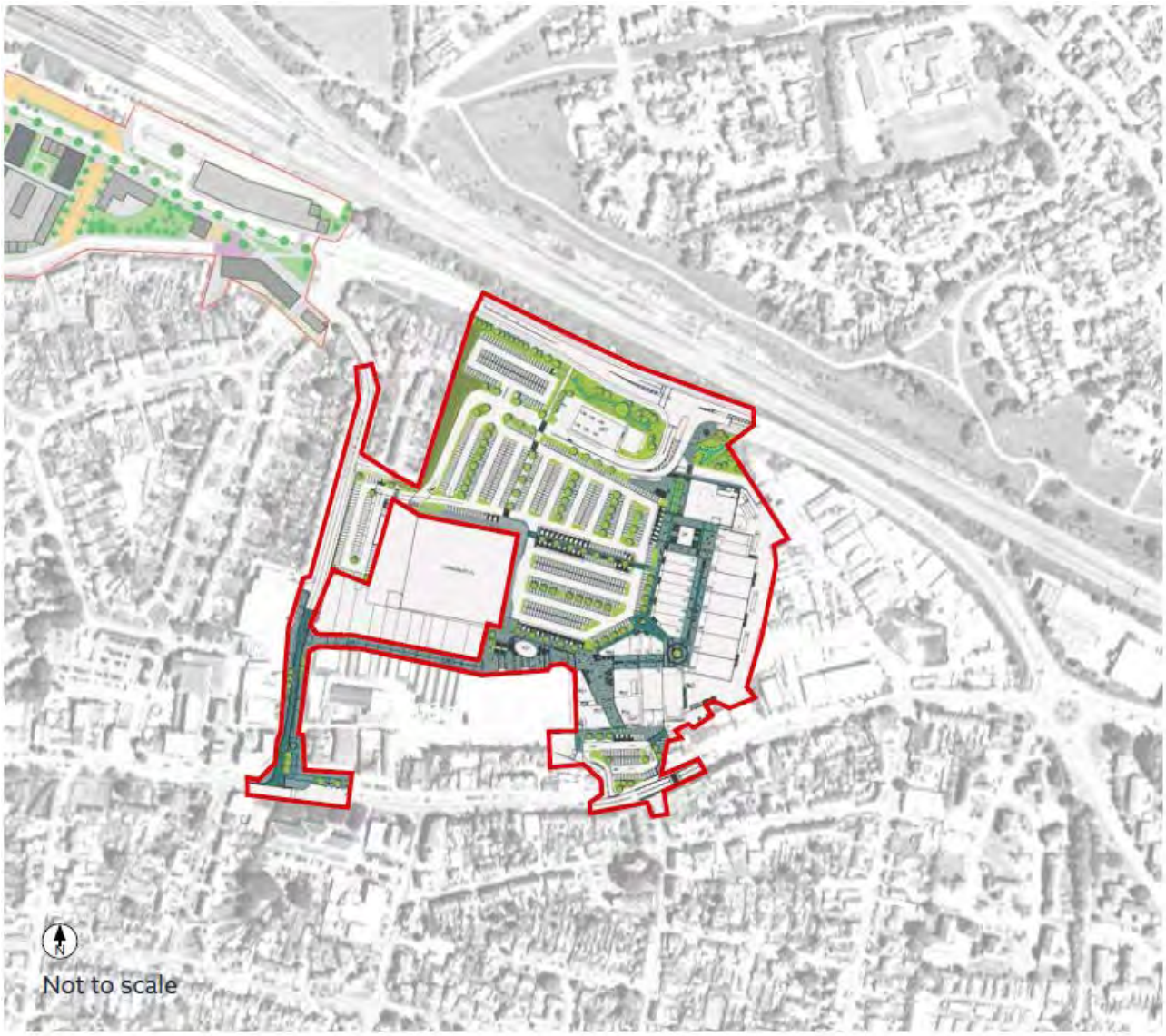
5.3 Site 1 – Orchard Centre Phase 2

Consented Site - no influence possible

Location

Site 1 is located to the east of Didcot, approximately 400 metres east of Didcot Parkway railway station. It is bordered by Station Road/Hitchcock Way on the north side, by Site 7 (Rich's Sidings) on the east side, Broadway and the pedestrianised shopping area to the south side, and a residential street, also called Station Road, on the west side.

Figure 5.2 Orchard Centre Phase 2 (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)



Site Description and Current Usage

Site 1 is currently a large shopping centre called "The Orchard Centre". The site is currently occupied by a large supermarket in the centre of the site, a pedestrianised shopping arcade to the south of the site, with the remainder of the site taken up by car parking.

Topography

The maximum height of Site 1 is approximately 66mAOD. There is a gradual slope downwards to the north boundary of the site, reaching a minimum elevation of approximately 53mAOD, before rising up at the junction of Station Road (Hitchcock Way) and the entrance road to the site, at elevation of 55mAOD.

Hydrology & Drainage

There are two watercourses in the vicinity of Site 1. The first watercourse runs from west to east parallel to the north carriageway of Station Road which forms the north boundary of the site. This watercourse enters a culvert which passes beneath Station Road and emerges on the south side of the road. The watercourse flows above ground for approximately 70m before entering another culvert and passing beneath the north entrance road to The Orchard Centre. It was unclear from the site visit where this culvert emerges, but it is understood, with reference to historical Ordnance Survey mapping from 1955 (accessed online), that the watercourse would travel north, again pass under Station Road and the railway line, and then join the Ladygrove Brook system. Communications with representatives of SoDC and VoWHDC confirm this. When the watercourse emerges at the north side of the railway embankment, the EA classification changes from ‘ordinary watercourse’ to ‘main river’.

A second watercourse flows from south to north at the east boundary of the site, adjacent to Site 7. This watercourse is culverted in the vicinity of the junction of the entrance road and Station Road. It was difficult to ascertain the route of the watercourse whilst on the site visit, but from inspection of historical mapping it is thought that the second watercourse will join with the first watercourse, and join the Ladygrove Brook system to the north of Station Road and the railway line.

Geology & Hydrogeology

BGS mapping indicates that the bedrock under the majority of the site is Gault Formation. It is understood that this type of bedrock is not conducive to infiltration methods. The south west corner of the site is underlain by Upper Greensand Formation. There are no records of superficial deposits for the majority of the site, but the north-west corner is underlain by Head – clay, silt, sand and gravel.

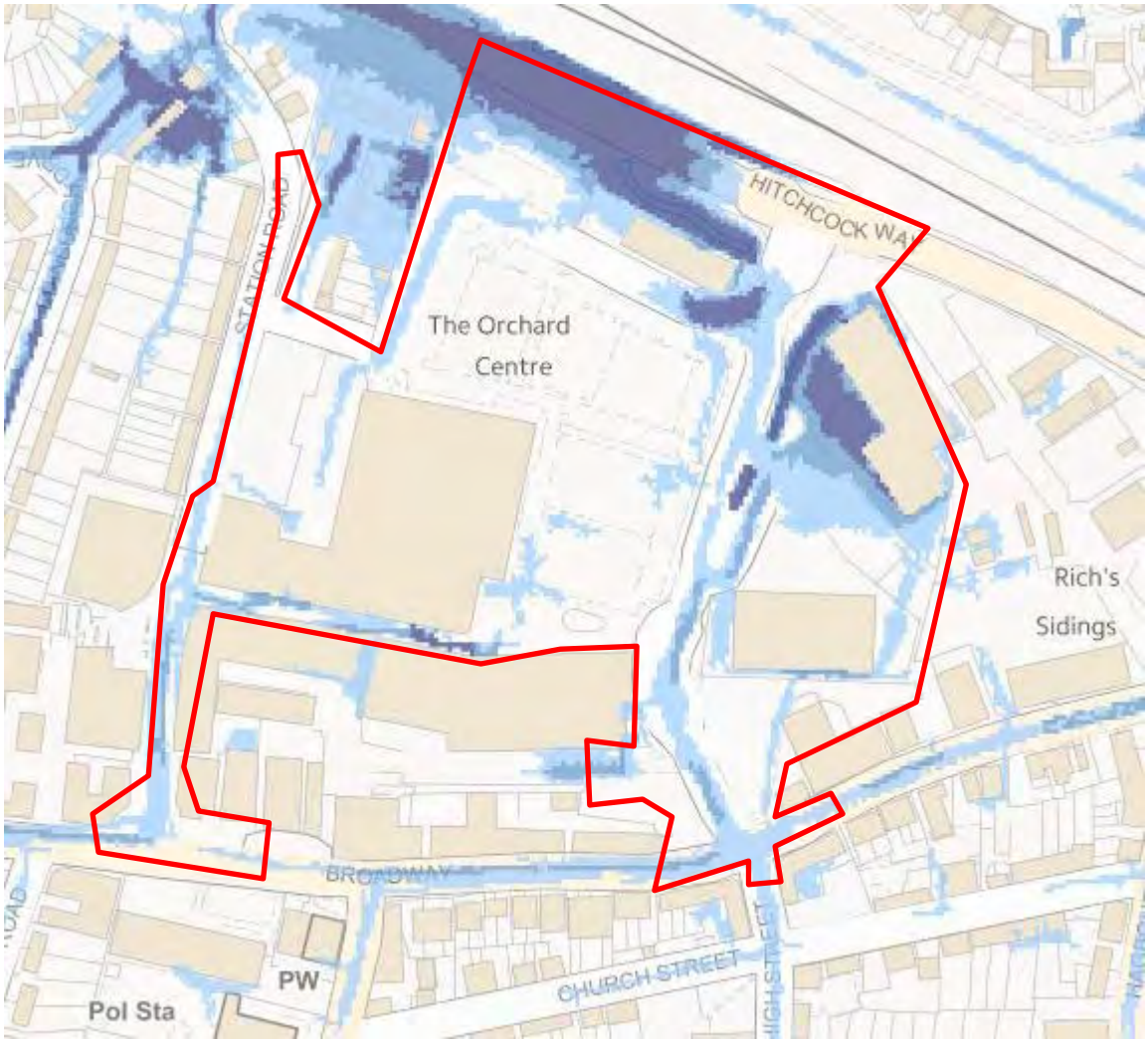
Development Proposals

This area has been granted planning permission for expanding Orchard Centre. It is understood that the development type will be commercial, which, with reference to the Planning Practice Guidance document issued by the Government, is classified as ‘less vulnerable’. The site is entirely Flood Zone 1, therefore all forms of development will be appropriate.

Flood Risk

This site is entirely within Flood Zone 1. There are areas at ‘high’ risk of surface water flooding, these are associated with the watercourse which is culverted under Station Road/Hitchcock Way.

Figure 5.3 Risk of Flooding from Surface Water to Site 1 (from .gov.uk, accessed December 2016)



The SODC SFRA 2013 indicates that the site is in a grid square considered to have between 50% and 75% of the area susceptible to groundwater emergence. This study is not site specific, and it is noted that there are no historical records of groundwater flooding on site. Therefore the site is deemed to be at low risk of groundwater flooding.

SuDS

The FRA presents a hierarchical structure to the preference of surface water management at source, with SuDS being the most preferred option.

A ditch (most upstream stretch of the Ladygrove Brook) runs through the existing Site in a northerly direction, which in turn discharges into the Ladygrove Brook downstream of the railway line. As the existing Site discharges to the ditch, it is proposed surface water runoff from the post developed Site will discharge to the ditch to mimic existing conditions.

No objections were raised on surface water and foul sewers by the South Oxfordshire District Council. It is noted that Thames Water have identified issues to accommodate the requirements within the existing waste water treatment plant.

The surface water drainage strategy for the Development would achieve a reduction in the existing surface water from the Site by at least 20% for the 1 in 100 year plus climate change event, allowing for the effects of climate change over the lifetime of the Development. All surface water would be attenuated on the Site. The surface water drainage strategy would therefore be in accordance with the SODC SFRA.

In order to sufficiently restrict the rate of surface runoff derived from the completed and operational Site, the following SuDS would be incorporated into the inherent development design:

- Geocellular storage units would be located beneath the pedestrian areas;
- Living roofs would be provided on two of the proposed buildings, providing biodiversity and water quality benefits; and
- The potential for permeable paving (lined if infiltration is not possible) would be considered at the detailed design stage.

In view of the above, the Development is likely to have a minor beneficial effect upon the capacity of the surface water drainage infrastructure.

Prior to the commencement of the development, a fully detailed foul water drainage strategy of the development, based on SuDS principles and hydrological context, shall be submitted to, and approved in writing by the Local Planning Authority in consultation with the water authority.

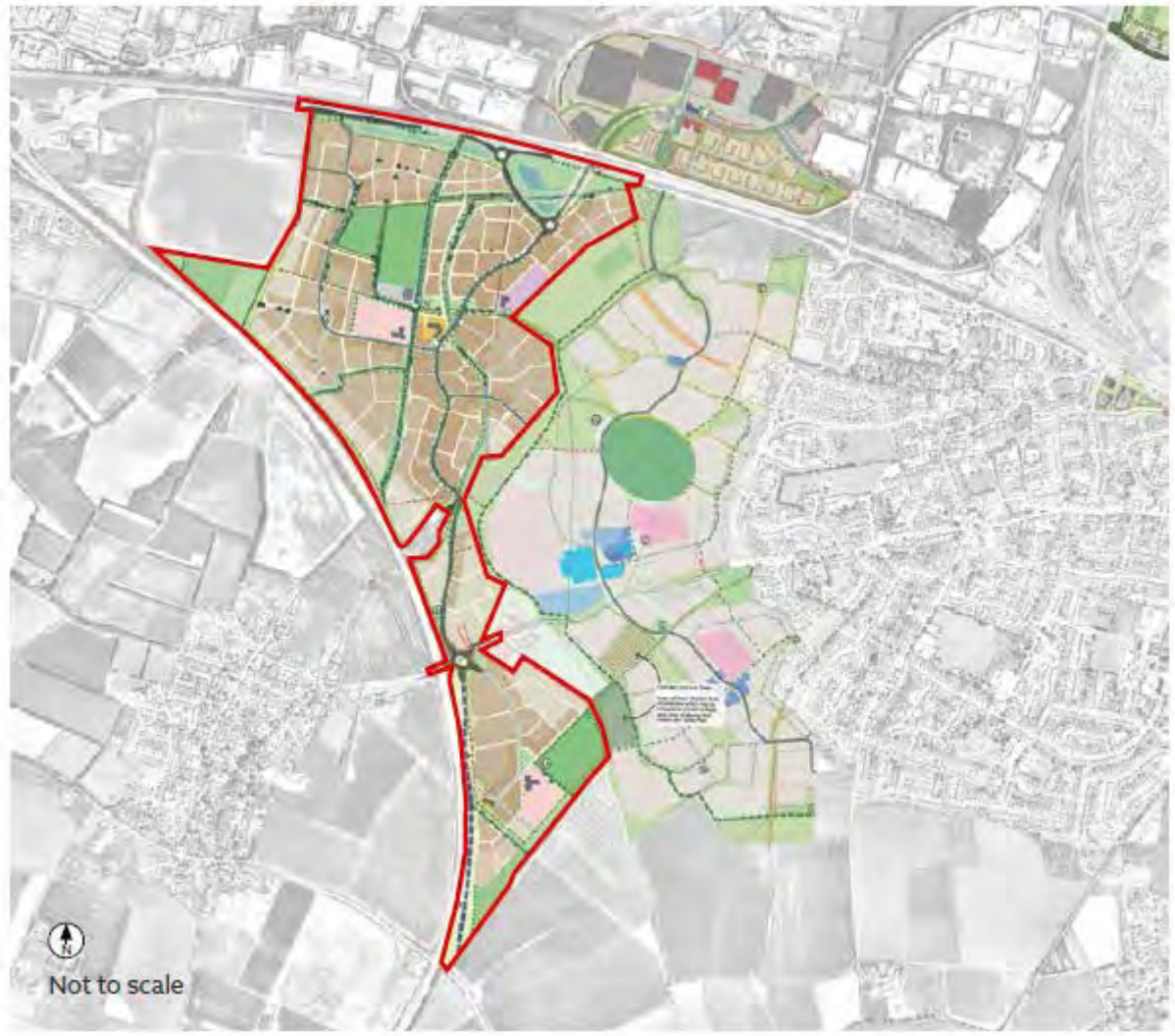
5.4 Site 2 – Valley Park

Consented site - some influence

Location

Site 2 is located to the west of Didcot, approximately 2.5 kilometres west of Didcot Parkway railway station. It is bordered by the A4130 on the north side, by the A34 and a watercourse on the west side, and by Site 3 - Great Western Park on the east side.

Figure 5.4 Valley Park (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)



Site Description and Current Usage

The site is currently greenfield land, mainly consisting of land used for agriculture. There is a farm near the northern boundary of the site. The site is crossed by public rights of way, and has established hedgerows and trees.

Topography

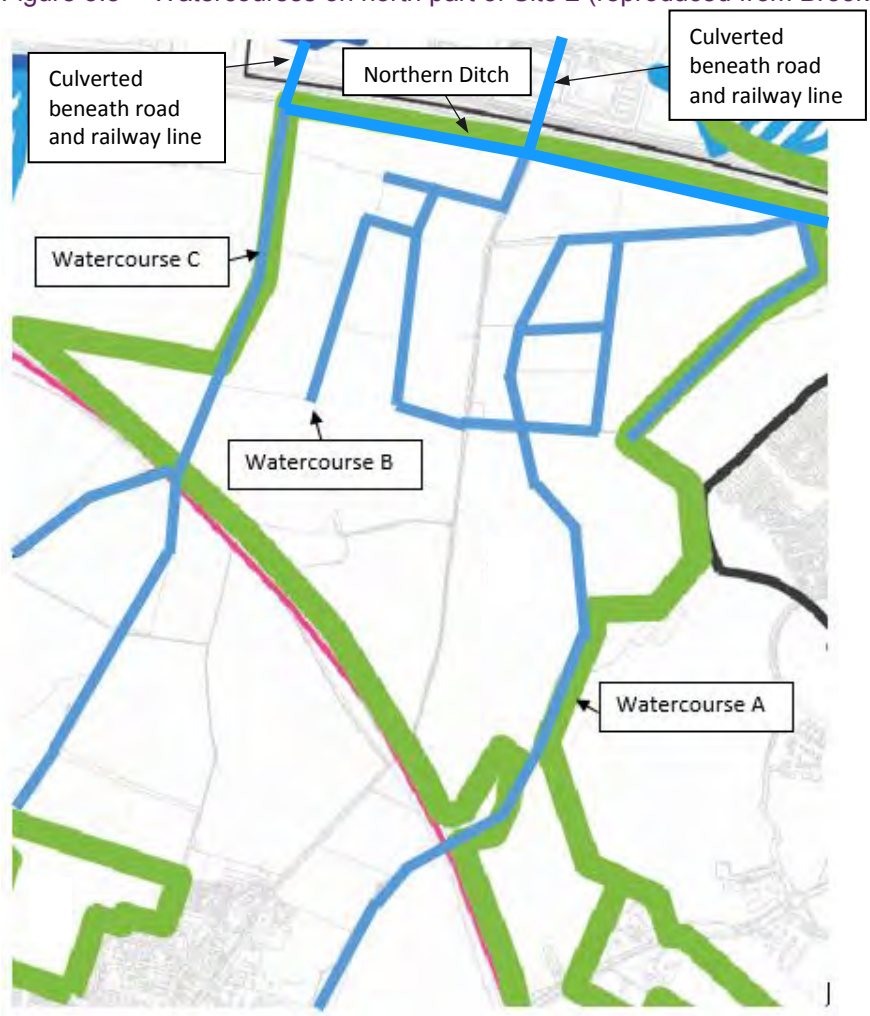
The northernmost part of the site remains broadly flat at an elevation of 58mAOD at the north boundary with the A4130, before rising to 77mAOD as distance from the A4130 increases. From the elevation of 77mAOD,

levels drop to 65mAOD before rising steadily to 79mAOD in the vicinity of the B4493. Going south from the B4493, levels drop to 74mAOD at the south eastern boundary of the site.

Hydrology & Drainage

There are numerous drainage ditches on the site, they mainly are situated along the edges of fields on site, and drain these fields. There are three watercourses on site, the first runs down the west boundary of the site, the second forms part of the east boundary of the site, and the third originates towards the south western boundary of the site, and runs parallel to the first watercourse.

Figure 5.5 Watercourses on north part of Site 2 (reproduced from Brookbanks Consulting FRA)



Northern Ditch runs parallel to the A4130, and runs along the north boundary of the site. It receives highway drainage from the A4130, and is hydraulically linked to watercourses on the site. Water is able to flow from the Northern Ditch into culverts beneath the A4130 and railway embankment, but is limited by concrete weirs and no-return valves

Figure 5.6 Northern Ditch and culvert beneath A4130 (taken on 22 November 2016)

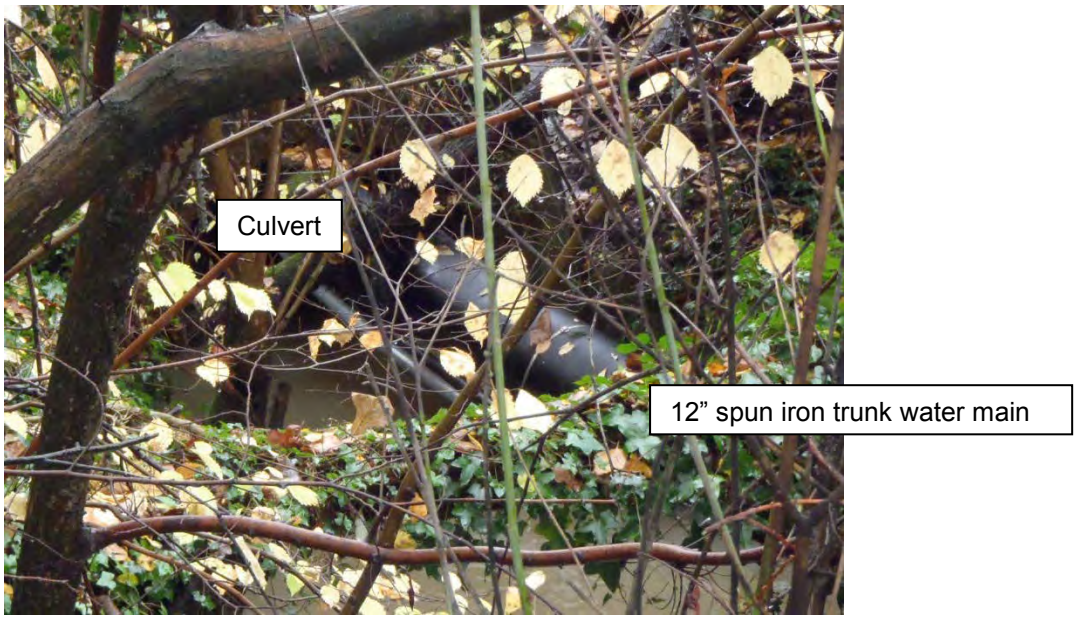
The left image shows the concrete weir structure, with the no-return valve submerged beneath the water level. The right image shows the culvert beneath the A4130.

Watercourse A originates in Harwell, a village to the south of the site. It is culverted beneath the A34 and flows from south to north across the site, before turning to the east and heading towards Site 3 – Great Western Park.

Watercourse B originates near the south western boundary of the site in the vicinity of the A34. The watercourse then flows from south to north before being culverted beneath the A4130 and railway embankment, and discharging into Moor Ditch.

Watercourse C originates from the confluence of two smaller watercourses beyond the south western boundary of the site. It flows from south to north along the west boundary of the site, before being culverted beneath the A4130 via a concrete culvert box of approximately 1.2 metres. The watercourse is then culverted beneath the railway embankment, and then discharges into Moor Ditch. The culvert beneath the railway line is partially obscured by a 12” spun iron trunk water main. At high water levels, the presence of this pipe will reduce the capacity of the culvert beneath the railway embankment.

Figure 5.7 Culvert beneath railway embankment with pipe (taken on 22 November 2016)



Geology & Hydrogeology

The site is mainly underlain by Gault Formation, which is unsuitable for infiltration methods. There are smaller areas of Upper Greensand Formation towards the south east of the site, and portions of the south west boundary. The bedrock is overlain with superficial deposits of Head - clay, silt, sand and gravel.

Development Proposals

According to the VoWHDC planning portal, current development plans on this site are for a new neighbourhood comprising of up to 4,254 residential dwellings. There are also new facilities planned, including primary schools, a special educational needs school, community and leisure facilities, a local centre, as well as open spaces.

With reference to the Planning Practice Guidance document issued by the Government, residential developments and schools are classified as ‘more vulnerable’. Buildings such as leisure facilities or community centres are classified as ‘less vulnerable’. Public open space is classified as ‘water compatible development’.

Flood Risk

As discussed there are areas of Flood Zone 2 and 3 to the north of the site, adjacent to the A4130. However, the site specific FRA undertaken by Brookbanks Consulting in March 2016 stated that site inspections of the affected area suggest that areas of Flood Zone 2 and 3 are as a result of a surface water mechanism, rather than a fluvial mechanism. This is due to storm water being unable to enter the culverts beneath the A4130 on the northern site boundary.

Therefore, as part of the site specific FRA, a computational 2D hydraulic model for the watercourses on site was developed, in order to understand the flood risk associated with watercourses on site. The hydraulic model showed that for both the 1 in 100 year and 1 in 1000 year event, the water level in the watercourse did exceed the level of the river banks adjacent to the A4013, but that the extent of the flooding was much less than that predicted by the model completed by HR Wallingford as part of the 2007 Didcot SFRA. Therefore, it was considered that the majority of the site be recognised as Flood Zone 1, apart from a small area of Flood Zone 2 and 3 towards the north of the site. Proposed development does not impact on the areas of Flood Zone 2, or Flood Zone 3. The Environment Agency approved the new model as fit for purpose, and confirmed that the flood extents are less than those shown on the Environment Agency flood maps. However, the climate change allowance included in the model is a +20% increase to predicted flows for the 1 in 100 year event. Updates to government guidance regarding climate change allowances in April 2016 may mean that the model has to be run again, to take into account the increases to climate change allowance.

Figure 5.8 Updated Flood Extents (from Brookbanks Consulting FRA)

The Areas Susceptible to Groundwater Flooding (AStGWF) map suggests that the north of the site is at medium to high risk of groundwater emergence, with risk decreasing towards the southern part of the site. There are no known issues with sewer flooding. The Brookbank Consulting site specific FRA states that the site is in an area at low risk of flooding from groundwater, sewer and artificial bodies.

SuDS

As per the Emerging Local Plan (2014), developments will be expected to incorporate SuDS and ensure that run-off rates are attenuated to greenfield run-off rates. The attenuation will be subject to 1% annual probability (1 in 100 year) event with a proposed 15% reduction on existing discharges rates, plus climate change.

SuDS will be provided in accordance with current guidance and discharge to surrounding watercourses at a rate below the present day conditions, thereby reducing flood risk in the area. With respect to protection of on-site receptors, the proposed site drainage strategy would incorporate a range of SuDS measures, including: permeable paving; filter trenches; ponds; ditches; swales; and attenuation drainage systems.

Figure 5.9 Illustrative surface water Drainage strategy previously suggested Valley Park - North (from Illustrative surface water Drainage Strategy produced by RPS/EDP/Brookbanks)

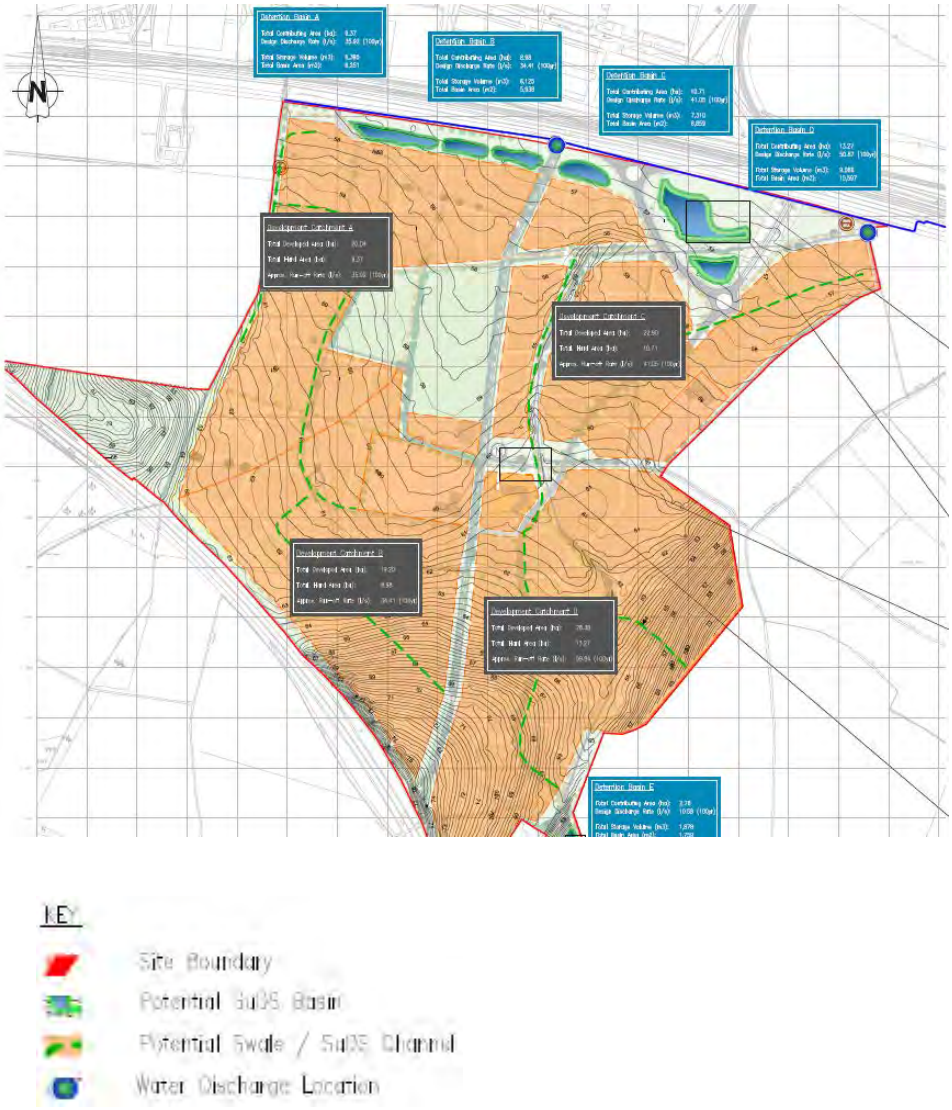
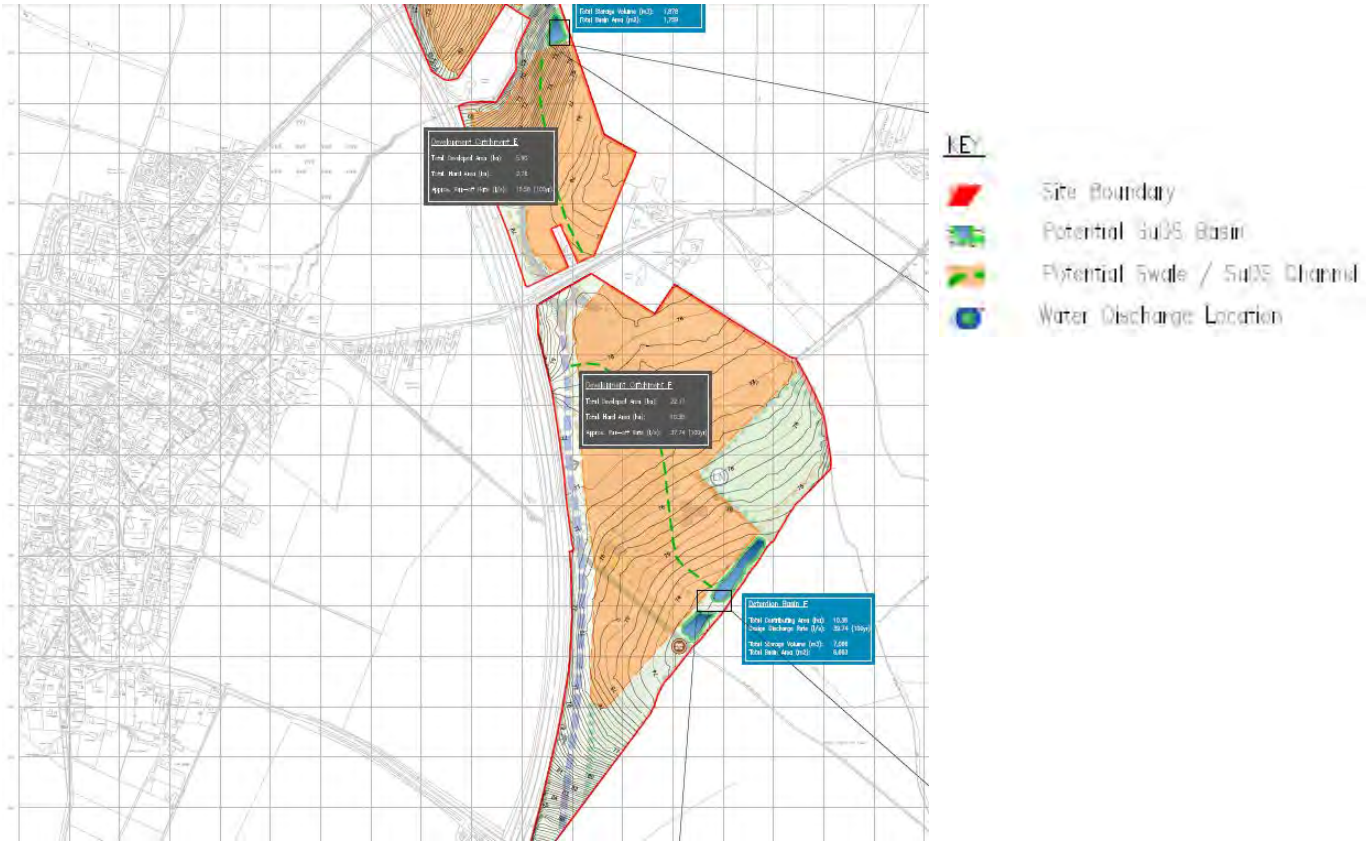


Figure 5.10 Illustrative surface water drainage strategy previously suggested Valley Park – South (from Illustrative surface water Drainage Strategy produced by RPS/EDP/Brookbanks)



Additional Information

Communications with the Environment Agency dated 24/02/16 state that:

- There shall be no built development in areas of Flood Zone 2 or 3.
- Watercourses on the site have been subject to channel manipulation and realignment resulting in limited channel diversity. Re-meandering the watercourses would provide an opportunity for providing ecological enhancement, in line with local and national planning policies.
- The number of river crossings should be minimised in order to avoid fragmenting riverbanks habitats along the watercourse. Plans to culvert watercourses will be considered inappropriate as they result in the destruction of riverbank habitats.
- A minimum buffer of 8m should be provided on both sides of watercourses on the site. The buffer zone should be free of all built development, including foot and cycle paths, lighting, and formal landscaping. The buffer zone could be a component of green infrastructure in the development. The drainage ditch at the west boundary of the site which discharges into Moor Ditch shall have a 20m wide buffer on either side of the watercourse.
- No infiltration drainage systems are permitted except with written consent of local planning authority. Discharges of runoff from the roads and car park areas are not allowed into the ground to avoid potential contamination of the groundwater. All infiltration SuDS which will accept potentially contaminated drainage (for example from roads or car parking spaces) must provide a clear unsaturated zone (usually 1 metre) between the base of the SuDS feature and any groundwater. Oxfordshire County Council has notified that the installation of interceptors will be required prior any discharge is released into the water environment.

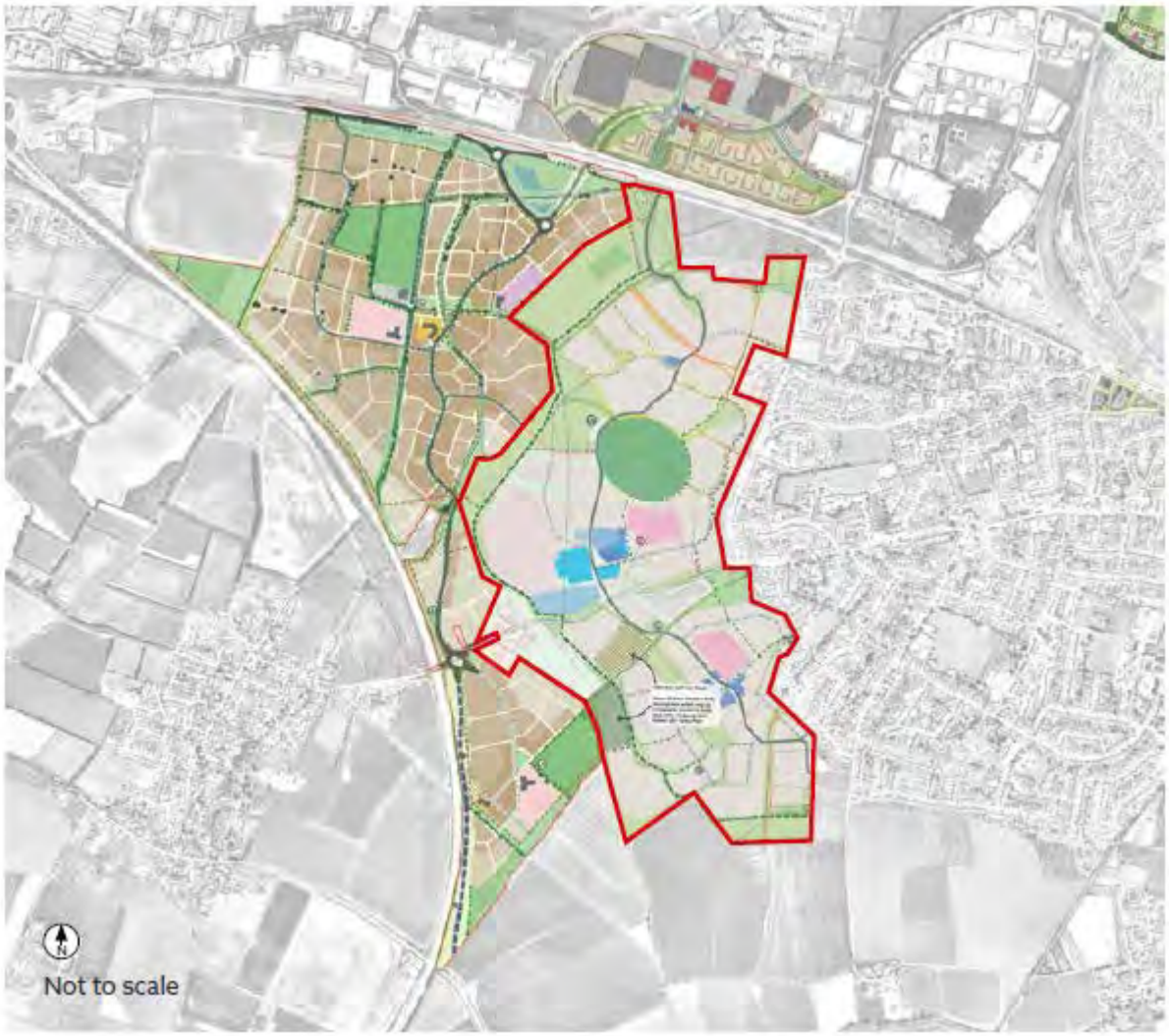
5.5 Site 3 – Great Western Park

Consented site - some influence

Location

Great Western Park is located to the west of Didcot, approximately 2km west of Didcot Parkway railway station. It bordered by the A4130 on the north side, by Site 2 – Valley Park on the west side, and a residential area of Didcot on the east boundary.

Figure 5.11 Great Western Park (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)



Site Description and Current Usage

The site is currently under development, with approximately half of the homes across the site complete and occupied, mainly to the north of the site. Development to the south of the B4493 Wantage Road is currently underway. The site was previously greenfield land, used for agriculture.

Topography

The elevation increases from a level of 58mAOD at the north boundary of the site adjacent to the A4130, to a maximum of 83mAOD midway between the A4130 and the B4493. To the south of the B4493, the elevation decreases from 80mAOD to 73mAOD at the southern boundary of the site.

There is a hill with a crest which runs in a northeast to southwest direction across the northern part of the site. The ground falls on either side of this hill.

Hydrology & Drainage

There are a number of surface watercourses and drainage ditches on the site. Land drainage constructed in the 1960s directs surface water from the north of the B4493 into the watercourse along the west boundary of the site. This watercourse is eventually culverted under the A4130 and railway embankment and subsequently discharges into Moor Ditch. Watercourses to the south of the hill crest will drain to the south, towards West Hagbourne, and will consequently become Hakkas Brook.

Geology & Hydrogeology

The majority of the site is underlain with bedrock of Upper Greensand Formation. There is a small area to the north west which is underlain by Gault Formation. Superficial deposits of Head – clay, silt, sand and gravel are present across all of the site.

Detailed intrusive geotechnical investigations undertaken as part of the Surface Water Drainage Strategy Addendum Report 6 for Site 3, prepared by Barnard & Associates in November 2014 indicate that infiltration into soils underlying the development was not technically feasible.

Development Proposals

When work is completed, as described in the SODC planning portal, the development will include approximately 3,300 homes, three primary schools, a secondary school, a nursery, a health centre, a residential assisted living facility, a number of shops, community centres, public open space including play areas, allotments and numerous sports pitches.

With reference to the Planning Practice Guidance document issued by the Government, residential developments such as dwellings or assisted living facilities and schools or nurseries are classified as ‘more vulnerable’. Buildings such as shops or community centres are classified as ‘less vulnerable’. Public open space, sports pitches and allotments are classified as ‘water compatible development’.

Flood Risk

The majority of the site is Flood Zone 1, with a small area of Flood Zone 2 and 3 at the northern extent of the site. All built development to date has been in Flood Zone 1, according to the current EA flood mapping.

The majority of the site is not at risk of surface water flooding, however there is a small area deemed to be at medium to high risk at north of the site, adjacent to the A4130 in the vicinity of the access road into the site. In addition to this, along the north side of the B4493 road which bisects the site, there are small areas deemed to be at medium to high risk. Along the east boundary of the site, there is a small area at high risk of surface water flooding. Historically, flooding has been experienced on the fields to the south east of the site, and along the north side of the B4493 road.

The north of the site is in a grid square considered to have greater than 75% of the area at risk of groundwater emergence. The proportion of land at risk of groundwater emergence reduces as distance from the A4130 increases.

SuDS

The Flood Risk Assessment (FRA) undertaken by RSK establishes the principles for the surface water drainage strategy.

The FRA defines that limiting discharges are based on a runoff rate of 2l/sec/hectare and suitable controls and balancing are to be included.

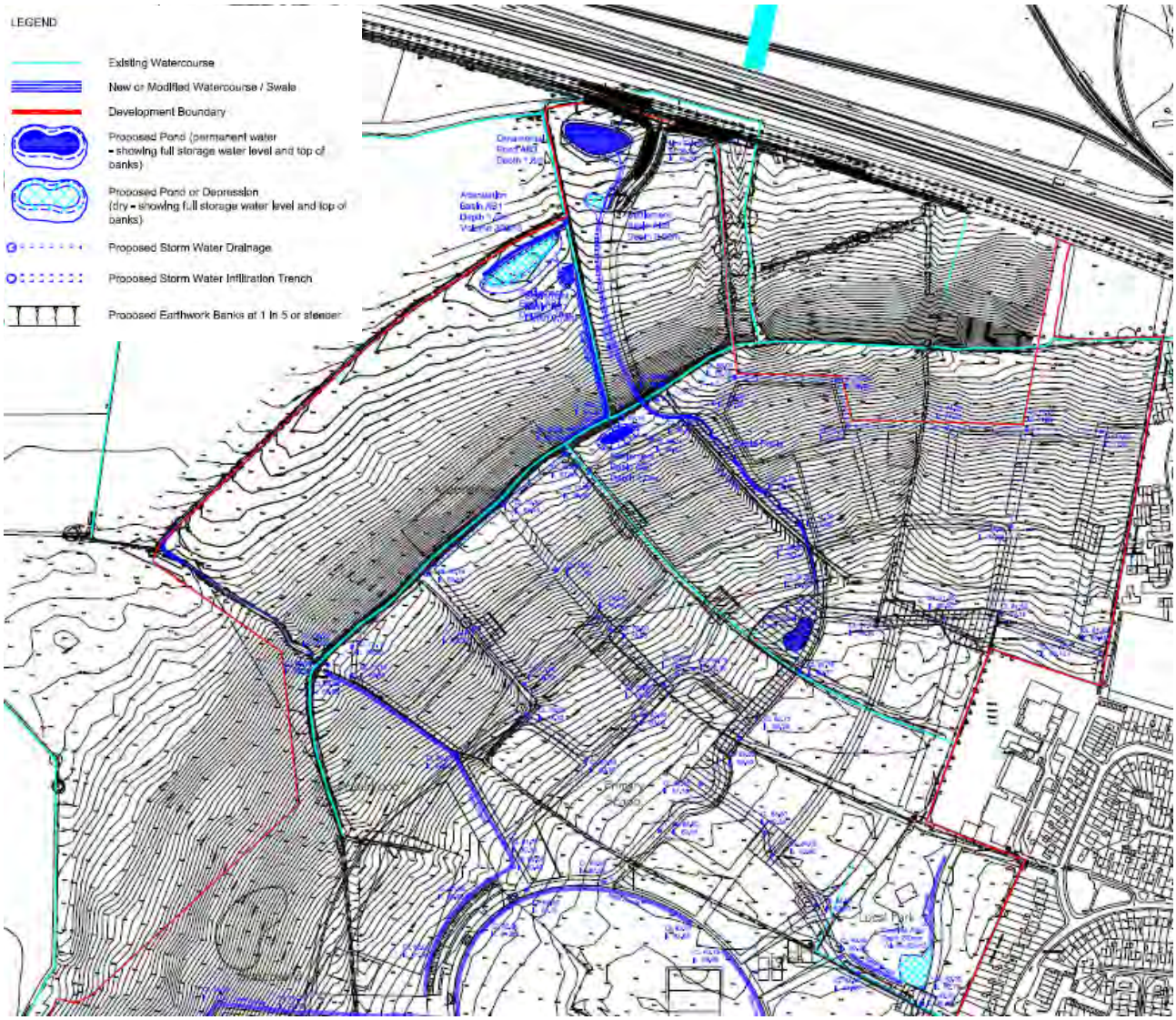
The attenuation volume will be subject to 1% annual probability event (1 in 100 year) plus 30% increase in intensity for climate change.

Detailed intrusive geotechnical investigations undertaken on each parcel of land, including percolation testing, confirmed that infiltration within the soils underlying the development parcels was not technically feasible.

Given the relatively flat lie of the land, it is proposed to construct large shallow attenuation basins to receive storm water flows from adjacent residential parcels and infrastructure roads.

Infrastructure roads will drain to enhanced swales and ditches (layout permitting). At attenuation basins, stormwater flow will discharge into channels and then into wet ponds prior to discharge into the stormwater drainage ditch network. Existing ditch networks will be retained where layouts allow and will continue to discharge run-off from areas of open space.

Figure 5.12 Illustrative surface water drainage strategy previously suggested Great Western Park (from Preliminary Surface Water Drainage drawings prepared by RSKENSR)



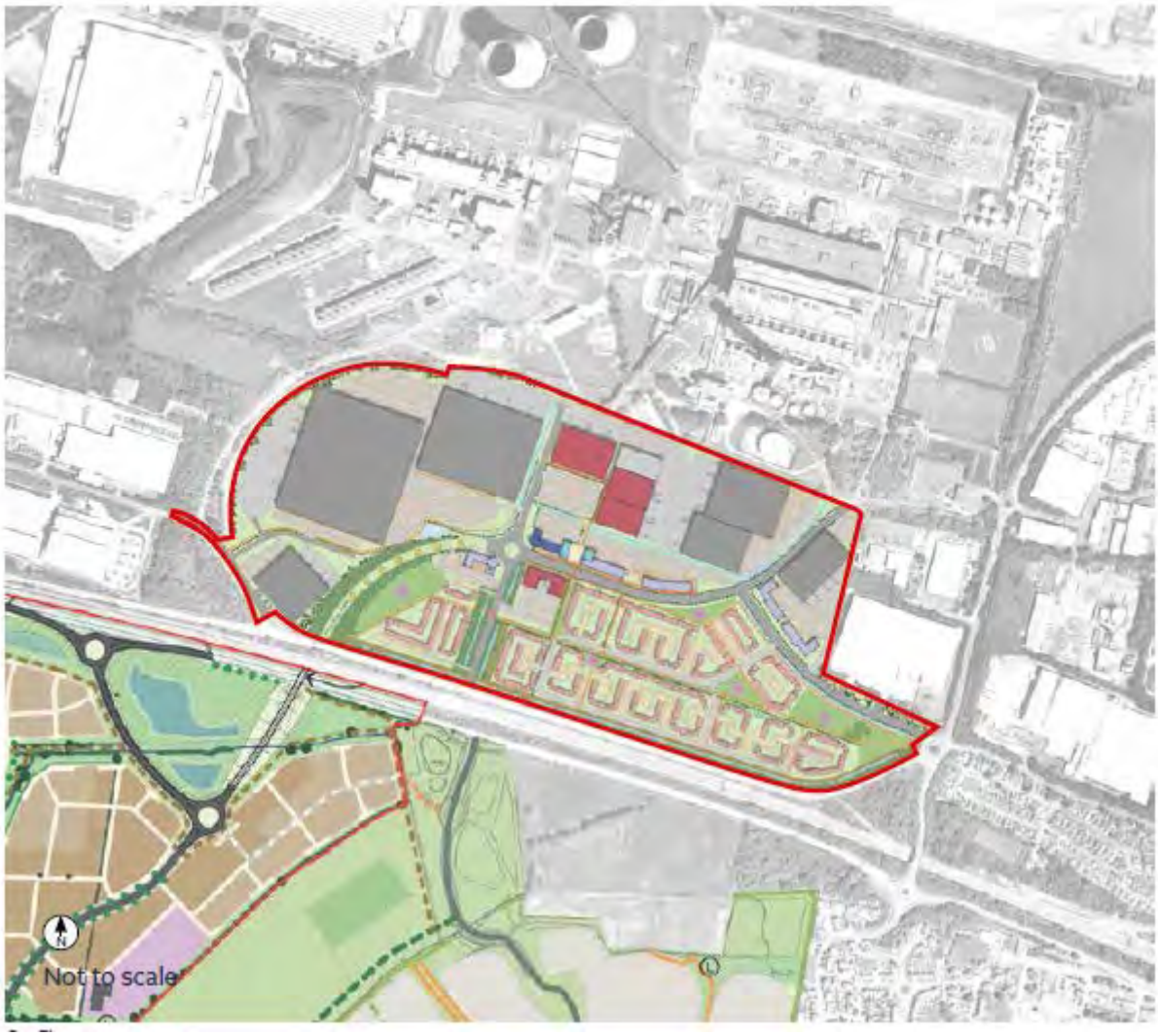
5.6 Site 4 – Didcot A

Consented site - some influence

Location

Site 4 is located north west of Didcot, approximately 2km north-west from Didcot Parkway railway station. It is bordered by Milton Road (running parallel to the railway line) on the south side, by the railway loop on the west side, and by Moor Ditch on the northern boundary.

Figure 5.13 Didcot A (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)



Site Description and Current Usage

The site covers brownfield land previously used by the now decommissioned Didcot A coal and oil power plant.

Topography

The site is relatively flat, at approximate elevation of 56mAOD, however there is a gradual fall towards Moor Ditch to the north of the site.

Hydrology & Drainage

Moor Ditch flows from west to east along the north boundary of the site. This watercourse is culverted along two stretches, where it passes beneath the tracks of the railway loop. When not in a culvert, as indicated in the Flood Risk Assessment (FRA) for Didcot A Power Station (Site 4) prepared by BWB Consulting, Moor Ditch is within a channel, with a height difference of approximately 3 metres from the water level to the top of the bank.

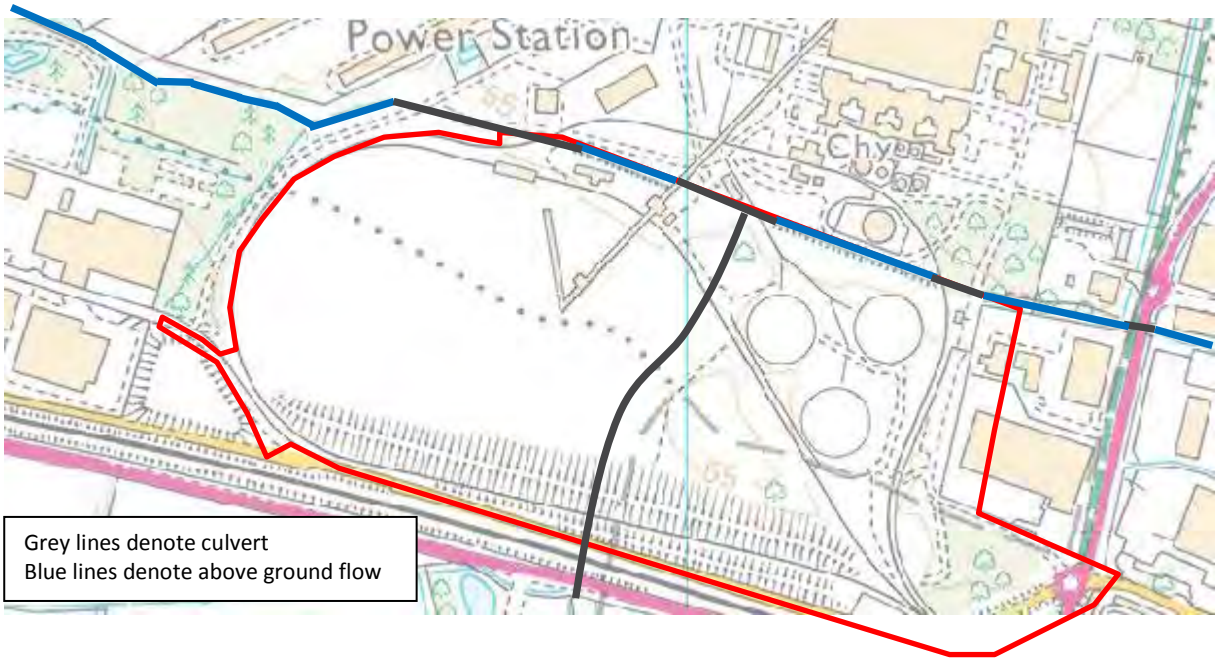
A culverted watercourse runs from south to north through the eastern part of the site, this then discharges into a culverted section of Moor Ditch. A CCTV survey undertaken as part of the site specific FRA has identified that the culvert consists of a 320 metre section of 1000 millimetre diameter concrete pipe, joined to a 94 metre section of 900 millimetre diameter concrete pipe. From inspection of Ordnance Survey historical mapping from 1955-1961, it is thought that this watercourse is a continuation of the watercourse which is culverted under the A4130 and the railway line in the vicinity of Site 3 – Great Western Park.

Surface runoff from the site is directed into Moor Ditch to the north, or the culverted watercourse to the east of the site.

There is development underway on Site 3, immediately to the south of Site 4. As Site 3 was previously greenfield, new development will increase the amount of impermeable surface, and may increase the amount of run-off entering the culverted watercourse beneath Site 4. However, as part of the development, there are attenuation ponds which will be designed to control the discharge into the culverted watercourse resulting in a more consistent flow rate, and therefore should not increase flood risk to the proposed development of Site 4.

There is an artificial watercourse towards the north east of the site, this was designed to take water from the cooling towers to the treatment station, where it was then discharged into Moor Ditch. As the southern set of cooling towers has been demolished, with the northern set of towers to follow, the artificial watercourse will no longer be necessary and will be removed when the site is developed.

Figure 5.14 Moor Ditch in vicinity of Site 4 (reproduced from BWB FRA)



Geology & Hydrogeology

The bedrock in this area is Gault Formation. It is understood that this type of bedrock is not conducive to infiltration methods. Superficial deposits in the southernmost third of the site are Head - clay, silt, sand and gravel, in the middle third Alluvium – clay, silt, sand and gravel, and there are no records for the northernmost third. Previous investigations have discovered reinforced concrete across a large proportion of the site, with made ground also present.

Development Proposals

As described in the SODC planning portal, the current proposals on Site 4 are for mixed use redevelopment, comprising up to 400 dwellings, 110,000 square metres of general industrial/storage or distribution units (Class B2/B8), 25,000 square metres of business units (Class B1), 13,000 square metres of shop units (Class A1), a 150 bed hotel (Class C1), and a 500 square metre pub/restaurant (Class A3/A4). The redevelopment will include open green space, appropriate drainage infrastructure, and land reserved for a new link road and a future road bridge named Science Bridge that will cross the railway line to the south of the site.

With reference to the Planning Practice Guidance document issued by the Government, residential, hotel and drinking establishments are classified as 'more vulnerable'. Buildings used as shops, cafes/restaurants, general industry and distribution/storage are classified as 'less vulnerable'. Public open space is classified as 'water compatible development'. According to the Environment Agency Flood Maps for Planning, the entirety of the site is in Flood Zone 1, and hence all forms of development are appropriate.

Flood Risk

The site is entirely in Flood Zone 1, and therefore at no risk of flooding from rivers on site. There are small areas of 'high' risk of surface water flooding across the site, these are considered to be related to existing low areas on the site.

The Areas Susceptible to Groundwater Flooding (AStGWF) map found in the 2013 SFRA shows that the 1 kilometre grid square which contains Site 4 is considered to have 75% of the land within the grid square at risk of groundwater emergence.

SuDS

A FRA for the site was produced by BWB Consulting in March 2015. To mitigate the development's impact on the current runoff regime it is proposed to incorporate surface water attenuation and storage as part of the development proposals. The volume of surface water to be discharged from the development site will be managed to ensure that the risk to the downstream catchment is no greater than the existing conditions and will provide a degree of betterment.

In order to ensure the on-going effectiveness of the onsite strategic drainage infrastructure it is proposed that the piped drainage network will be adopted by Thames Water Utilities (TWU) as the local statutory undertaker. To complement this adopted surface water network a series of linear open water features (swales) are proposed to deliver surface water attenuation, which will also provide both visual amenity value and important bio-diversity and habitat creation opportunities.

Surface water run-off from the proposed development site will be managed through the use of a network of green corridors incorporating a linear channel network. These green infrastructure corridors provide a sustainable means of collecting and storing surface water run-off, whilst also creating valuable habitat and improving water quality.

The SuDS features proposed, swales and permeable paving, provide a remarkable train treatment of the runoff generated by the development.

Figure 5.15 Illustrative surface water drainage strategy previously suggested Didcot A (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)

Additional Information

Environment agency communications dated 11/08/15:

- No development shall take place until a scheme to de-culvert the watercourses on site, based on appropriate dimensions to ensure flood risk is not increased on site or elsewhere, has been approved in writing by the local planning authority.
- The Environment Agency identifies Moor Ditch, a main river which flows along the northern boundary of the site, as a potential receptor of environmental impacts. As Moor Ditch discharges into the River Thames, consideration should be given to any water quality issues that arise, for example any spillage of oil during construction.
- The development shall not commence until a scheme to dispose of surface water has been approved by the local planning authority.
- Surface water runoff from the development must be controlled to prevent sediments and contamination discharged into watercourses or groundwater.

5.7 Site 5 – North East Didcot

Consented site - some influence

Location

Site 5 is situated to the north east of Didcot, approximately 1.2 kilometres north east of Didcot Parkway railway station. It is bordered by the A4130 to the south, the B4016 to the north and east, and Moor Ditch on the west. Ladygrove residential area is located to the south of the site, with agricultural land on the north, east and west.

Figure 5.16 North East Didcot – development proposal (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)

Site Description and Current Usage

The site is currently used as farmland. There is a farm to the north of the site, and another towards the south east of the site. The site is part of the historical marsh associated with the River Thames floodplain.

Topography

The site is relatively flat. Levels rise from 50mAOD at Moor Ditch towards the west side of the site, to 54mAOD at the east boundary of the site.

Hydrology & Drainage

Moor Ditch flows along the west boundary of the site. It enters through a culvert under the A4130 in the south west corner of the site, and flows northwards under the B4016 as it leaves the site.

Ladygrove Brook, a tributary of Moor Ditch, flows through the site. It enters the site under the A4130 at Hopkins Bridge to the south of the site, then flows across the site in a northerly direction. It leaves the site through a brick arch under the B4016, called Bow Bridge. There are pipes situated perpendicular to the watercourse flow direction at either side of the crossing of the B4016, which may impede the flow of water. The pipe is carrying medium pressure gas supply.

Figure 5.17 North side of bridge, showing pipe (taken on 22 November)

Hydraulic modelling of Site 5 to the north east of Didcot was undertaken by Glanville in August 2015 as part of the site specific flood risk assessment for Site 5. The modelling found that high water levels in the River Thames had no effect on flooding in the Ladygrove Brook/Moor Ditch system. There are numerous drainage ditches on the site, these are used to aid drainage as the site is relatively flat. The ditches on the east side of the site discharge into Ladygrove Brook.

Ladygrove Brook and Moor Ditch meet approximately 600 metres downstream (to the north) of the northern boundary of the site. Moor Ditch then flows into the River Thames, approximately 850 metres downstream of the confluence of Ladygrove Brook and Moor Ditch.

Geology & Hydrogeology

The bedrock in this area is Gault Formation. It is understood that this type of bedrock is not conducive to infiltration drainage methods. There are no records of superficial deposits for the majority of the site, although the north-west corner is Northmoor - sand and gravel. Intrusive ground investigations undertaken by RPS indicate that the ground conditions are primarily Gault Clay. Soakage testing by RPS have confirmed the Gault Clay Formation in this site to be practically impervious, and therefore infiltration methods for disposal of surface water may not be suitable.

Development Proposals

As described in the SODC planning portal, the development proposal is for a new neighbourhood comprising of 1880 homes. The proposal includes plans for new facilities including two primary schools, a secondary school, a leisure facility, sports pitches and pavilion, a neighbourhood shopping centre consisting of a 1500 square metre shop (class A1), up to five 200 square metre units of Class A1, A2, A3, A4 or A5, a mixed use pub/restaurant (Class A3/A4), a hotel (Class C1), a non-residential crèche or children's day nursery (Class

D1), a community hall, a residential extra care housing facility (Class C3), new areas of green space including allotments and play areas, and appropriate infrastructure to support the neighbourhood development.

With reference to the Planning Practice Guidance document issued by the Government, residential dwellings, nurseries or crèches, schools, hotels and pubs are classified as 'more vulnerable'. Buildings such as shops, cafes, restaurants and leisure and assembly buildings such as a community halls are classified as 'less vulnerable'. Public open space, sports pitches, playing fields and essential facilities for sport such as changing rooms are classified as 'water compatible development'.

Table 3 of the Planning Practice Guidance indicates that 'more vulnerable' development is appropriate in Flood Zone 1 and 2. The Exception Test is required if 'more vulnerable' development is to be sited in Flood Zone 3. Development classified as 'less vulnerable' is appropriate in Flood Zone 1, 2 and 3. Development classified as 'water compatible' can be situated in any Flood Zone, even if the area is designated as flood plain.

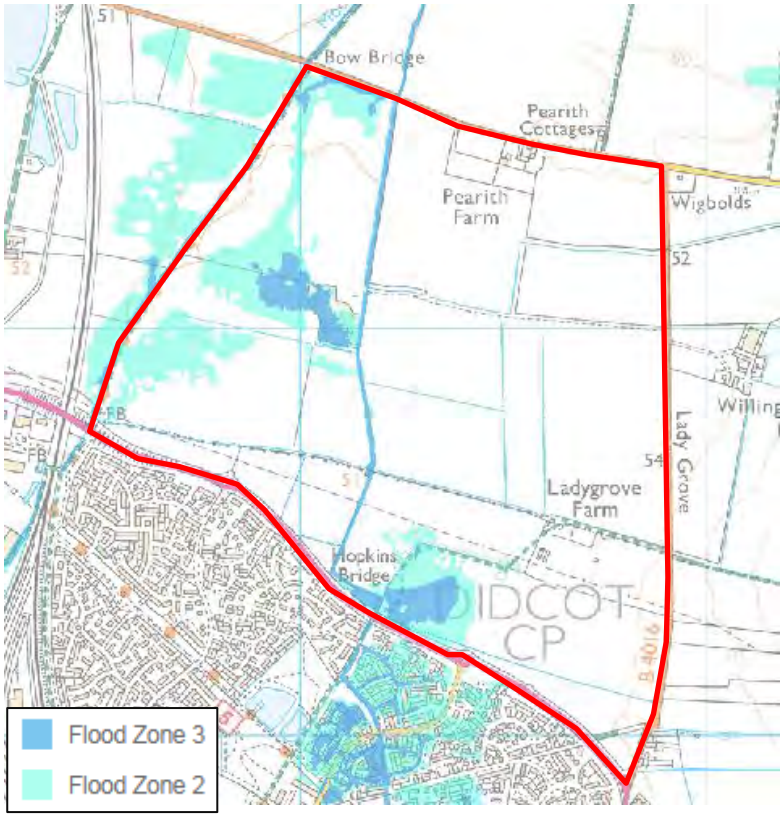
Flood Risk

Site 5 is bisected by Ladygrove Brook, with the western half (bordered by Moor Ditch to the west and Ladygrove Brook to the east) having areas of Flood Zone 2 mainly on the west side, with smaller areas of Flood Zone 3 to the north, adjacent to B4016, and also a small area to the east of the western half. The government surface water flooding information indicates that there is small areas of 'low' risk of surface water flooding, manly in the northern half of the site.

The eastern half of Site 5 has a small area of Flood Zone 2 and 3 in the south western corner, adjacent to the A4130. This flood zone corresponds to where Ladygrove Ditch passes under the A4130. There are areas at risk of surface water flooding, these are 'high' risk in the north west corner and in the south west corner, and 'medium' or 'low' risk across the site, with small areas at 'high' risk in locations associated with drainage ditches on the site.

The area around the confluence of the two watercourses is Flood Zone 3, with areas of 'low' risk of surface water flooding also associated with it.

Figure 5.18 Flood Zones in North East Didcot (from EA Flood Map for Planning, accessed December 2016)



The Flood Risk Assessment (FRA) for Site 5 prepared by Glanville Consultants included two dimensional hydrodynamic modelling of the floodplain using TUFLOW software. The modelling was approved by the Environment Agency. The model was sensitivity tested against high flood levels in the River Thames, to determine the influence of high flood levels in the River Thames upon the Moor Ditch/Ladygrove Brook system. The model showed that high flood levels in the River Thames had a negligible effect on water levels within the watercourse on the site.

The Areas Susceptible to Groundwater Flooding (AStGWF) map contained in the 2013 SFRA shows that Site 5 is split between four 1 kilometre grid squares. The north west is in a grid square considered to have greater than 75% of the area at risk groundwater emergence, the north east of the site is in a grid square considered to have between 50% and 75% of the area at risk of groundwater emergence, the south east of the site is in a grid square considered to have less than 25% of the area at risk of groundwater emergence, and the south west is in a grid square considered to have less than 25% of the area at risk of groundwater emergence.

However, the site specific FRA undertaken by Glanville in August 2015 states that the site is predominantly underlain by Gault Clay Formation which is an aquiclude. Therefore, the risk of flooding from groundwater sources is considered to be low. In addition to this, there is no known evidence of flooding from groundwater sources affecting the site.

SuDS

All surface water drainage systems will be designed to restrict discharge rates to greenfield values and store the balance of water for all events up to and including the 1 in 100 year event including allowance for a 30% increase in rainfall intensities as a result of climate change.

Intrusive ground investigations indicate that infiltration techniques for the disposal of surface water runoff may not be feasible. Therefore, surface water runoff from the proposed development will be discharged to the local watercourses at rates restricted to existing greenfield rates to ensure that flood risk is not increased downstream as a result of the proposed development.

It is recommended that consideration is given to further soakage testing at detailed design to assess any potential benefits that could potentially be provided by partial infiltration within individual development parcels on the small area of the site along the northern boundary understood to be located on superficial deposits of gravel. Whilst groundwater at shallow depths is generally anticipated in this material, there may be locations where shallow SuDS features for individual plots may be practical which could help reduce the total volume of attenuation storage required elsewhere in the sub-catchment.

Modelled water levels in the receiving watercourse are shown to be high during the rainfall events considered in the design of the surface water drainage system meaning that outfalls may become submerged. In order to prevent water from the watercourses backing up into the development SuDS system, flap valves will be installed at all outfalls to the watercourse or ditch system.

Any attenuation volume provided below the design flood level could quickly fill when the flap valves are closed meaning that surface water storage available must be assessed against modelled flood levels in the receiving watercourse or ditch.

Given the very flat nature of the majority of the site and potential high water levels the most appropriate SuDS options are those which are shallow in construction. Pervious paving will be used widely to provide source control, and an extensive network of offline dry swales is proposed to provide attenuation for more extreme events. Other SuDS features that will be considered include green roofs, bioretention areas, and water butts.

Figure 5.19 Illustrative surface water drainage strategy previously suggested North East Didcot (from Development Areas drawing produced by CSA environment planning)

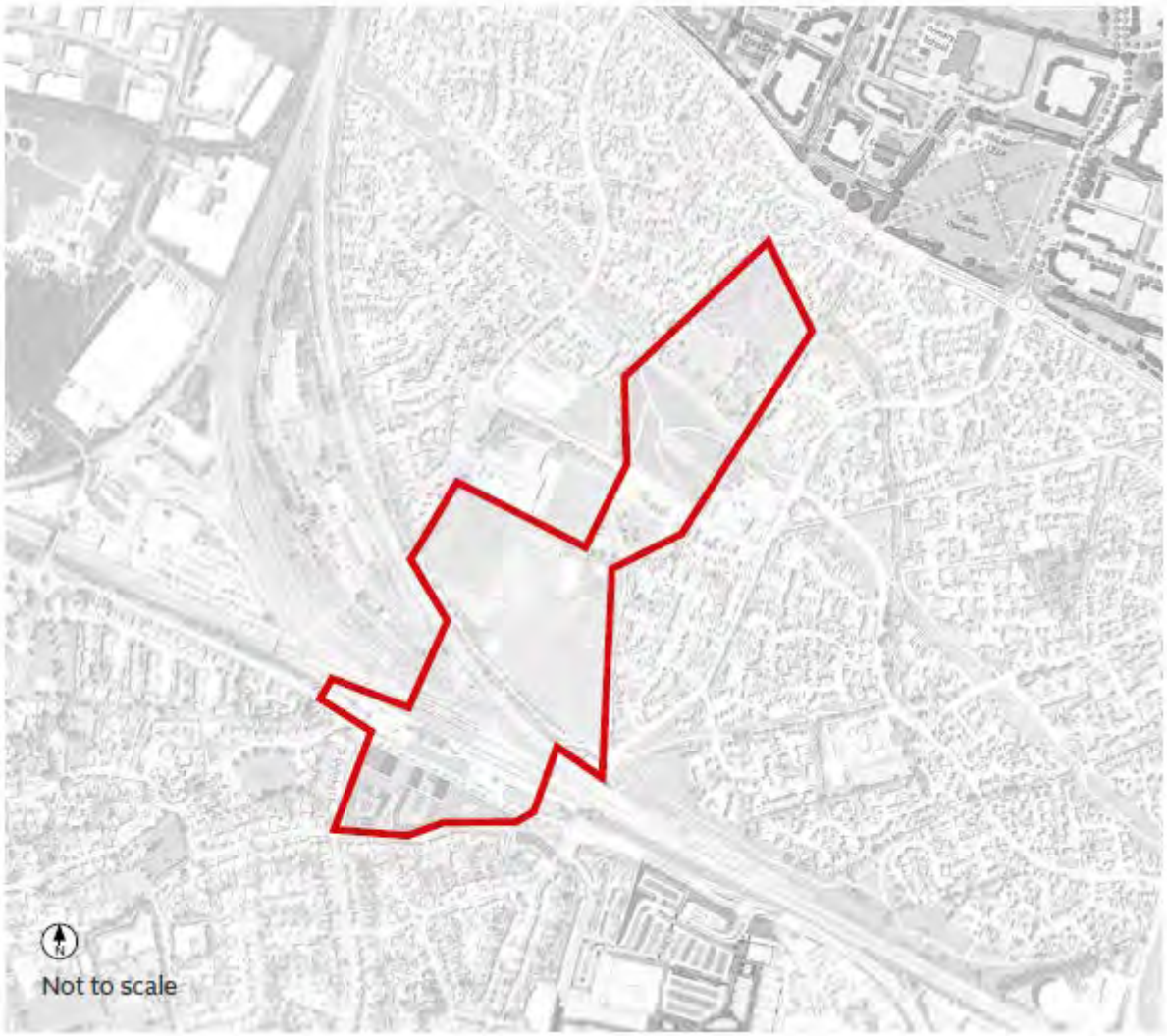
5.8 Site 6 – Didcot Parkway Station and North/South Gateways

Opportunity sites - critical importance

Location

Site 6 is located in the vicinity of Didcot Parkway railway station, with the majority of the site to the north of the station, and the remainder to the south.

Figure 5.20 Didcot Parkway Station + N/S Gateways (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)



Site Description and Current Usage

The south part of Site 6 is brownfield land and comprises Didcot Parkway railway station and forecourt along with a small triangular shaped piece of land on the south side of the A4130, which comprises car parking, a pub, a nursery school and an office building. The triangular part of the site is bordered by Haydon Road on the west boundary, and by Lydall's Road on the south east boundary.

The north part of Site 6 is an area of public green space to the north of Didcot Parkway railway station which includes Didcot FC football ground, tennis courts, and a playground. There are two small lakes to the north of the public space, and two low hills.

Topography

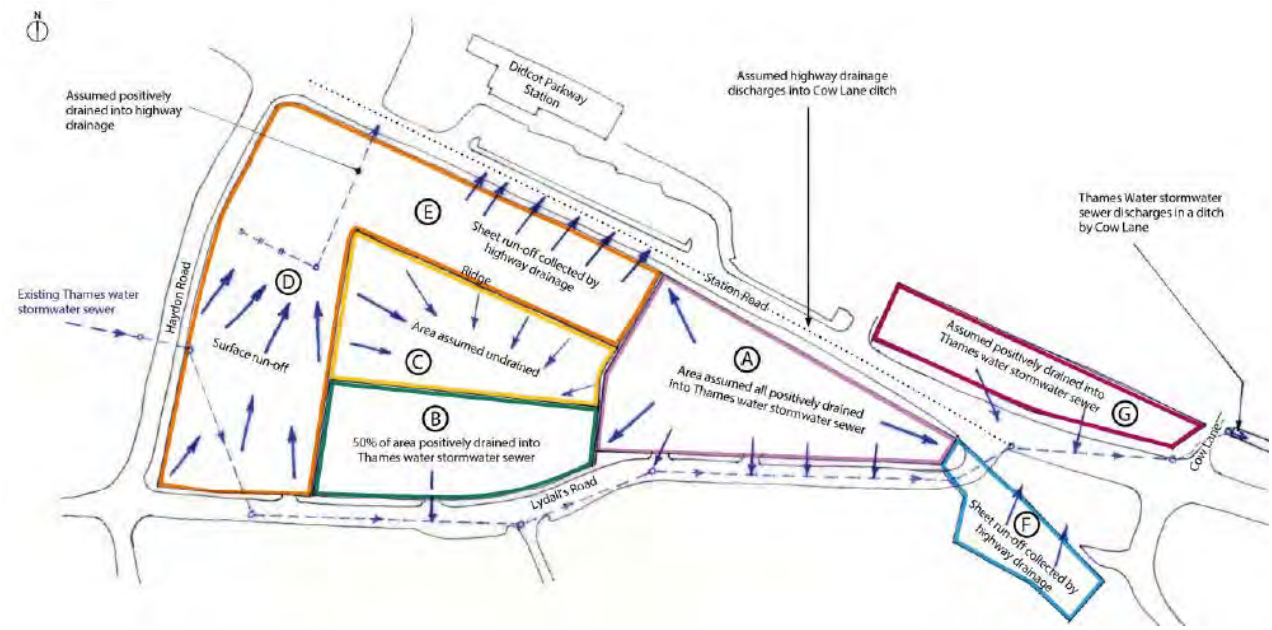
The parking area to the south of Site 6 is relatively flat at elevation of 57mAOD, with a rise towards the southwest corner at elevation of 59mAOD. The station forecourt with the main entrance to the railway station is at an elevation of 56mAOD, which is lower when compared to the surrounding area. The railway lines that cross the site are on a raised embankment. Information from Margaret Davies (leader of Didcot Town Council in 2007) contained in the 2007 SFRA indicates that the railway subway was built in the 1930s and is a low point which subsequently floods as water runs down from higher ground to the south of the railway site.

The north part of Site 6 is at an approximate elevation of 54mAOD, with the two low hills at a higher elevation of 60mAOD.

Hydrology & Drainage

There are no watercourses in the south part of Site 6, to the south of the railway line. As mentioned in the Didcot Gateway Site Surface Water Drainage Strategy and Flood Risk Assessment prepared by Alan Baxter & Associates, it is assumed that surface water falling onto the south part of the site drains to the south into a Thames Water stormwater sewer that runs along Lydall's Road, or drains to the north onto highway drainage running along Station Road. The surface water then discharges into a ditch to the east of Cow Lane, this ditch subsequently flows eastwards along the north boundary of Site 1, before eventually discharging into Ladygrove Brook.

Figure 5.21 Plan of southern part of Site 6, showing drainage features (from Surface Water Drainage Strategy and Flood Risk Assessment for Didcot Gateway Site prepared by Alan Baxter & Associates)



There are two small lakes to the north of Site 6. With reference to historical Ordnance Survey mapping from 1955-61, it can be seen that these lakes are artificial. Information from Margaret Davies (leader of Didcot Town Council in 2007) contained in the 2007 SFRA indicates that the two lakes were old sewage ponds. Ladygrove Brook approaches the north east corner and splits, with the west part being culverted and running underground along the north boundary of Site 6. There is a drainage ditch running along the west boundary of the site, it is assumed that this discharges into Ladygrove Brook.

Geology & Hydrogeology

All of Site 6 is underlain with Gault Formation. It is understood that this type of bedrock is not conducive to infiltration drainage methods. The south half of the site is underlain with superficial deposits of Head – clay, silt, sand and gravel. There are no records of superficial deposits for the northern half of the site.

Development Proposals

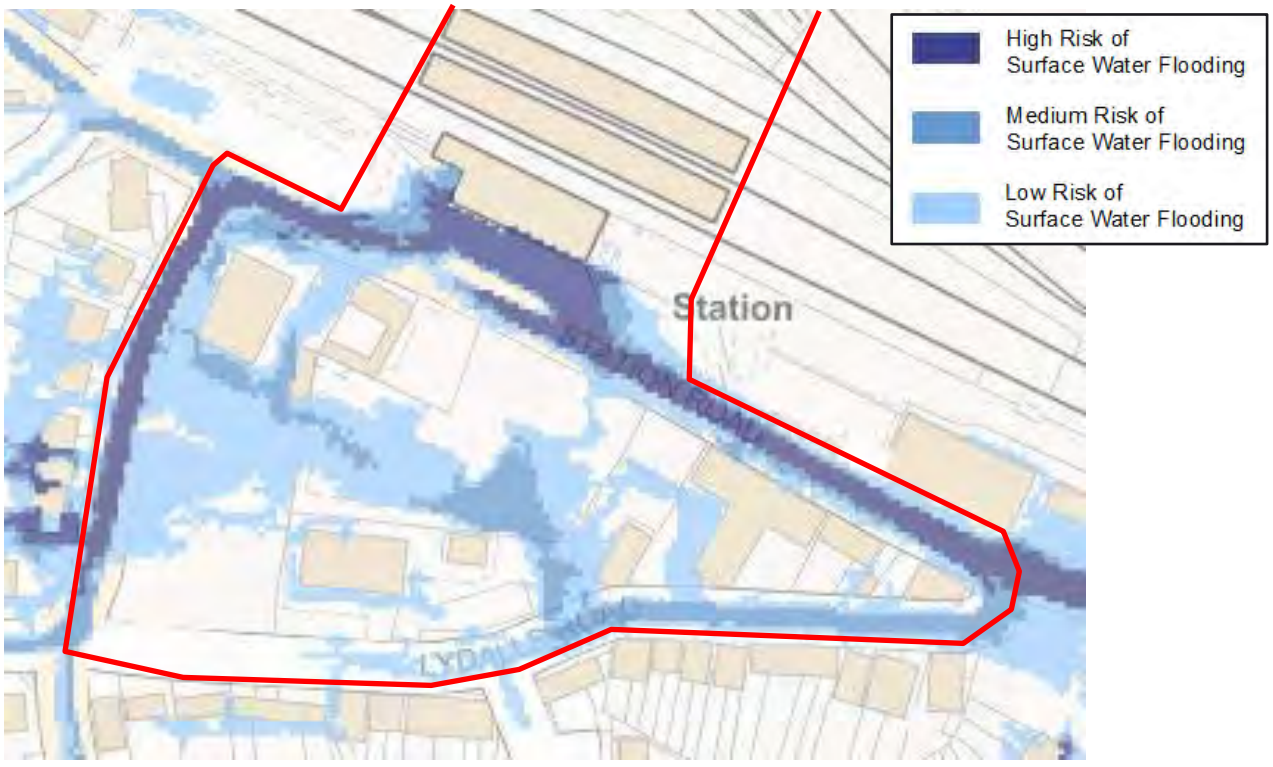
As described in the SODC planning portal , proposals for the area to the south of the railway line are for a mixed-use development of up to 300 residential units (Class C3), a 70 bed hotel (Class C1), a gym (Class D2) of up to 800 square metres, up to 2,400 square metres of retail space (Class A1, A2, A3, A4, A5), up to 1,800 square metres of commercial office space (Class B1), a replacement nursery school (class D1) and a multi-story car park of up to 3 levels. Table 3 of the Planning Practice Guidance indicates that all forms of development will be appropriate Flood Zone 1.

There are no available development plans for the remainder of the site, north of the railway line.

Flood Risk

All of Site 6 is situated within Flood Zone 1. On the southern part of the site, in the vicinity of Didcot Parkway railway station, all of Station Road, Haydon Road and the railway station forecourt are high risk of surface water flooding. On the car parking area on the south side of Station Road, there are areas of low and medium risk of surface water flooding.

Figure 5.22 Risk of Flooding from Surface Water to south part of Site 6 (from .gov.uk, accessed December 2016)



It is understood that as part of the Didcot Station Forecourt Improvements, new drainage was installed to alleviate flooding issues. Despite improvements to the forecourt, Didcot Parkway railway station flooded recently. Heavy rain starting on the evening of the 15 September 2016 and continuing overnight until early morning on the 16 September 2016 led to flash flooding in Didcot and inundation of the station underpass, causing the north platform to become inaccessible to passengers.

On the northern part of the site, north of the railway line, there are isolated spots at high risk of surface water flooding. The playing field belonging to Ladygrove Park Primary School is at low risk of surface water flooding.

The south part of Site 6 is contained within the grid square considered to have between 50% and 75% of the area at risk of groundwater emergence, with the north part of the site within the grid square considered to have between 25% and 50% of the area at risk of groundwater flooding.

SuDS

The strategy is to limit the runoff rates for the proposed development so that they do not exceed the existing runoff rates (with an allowance for climate change). Surface water runoff is to be attenuated on line and discharged via a hydro brake at a similar discharge rate to the pre-development site in order to maintain existing conditions for the various rainfall events.

It is proposed to limit the 1 in 100 year (1% AEP) peak discharge rate with an allowance for 30% climate change to that of the existing for the 1 in 100 year event. Where discharge rates for the individual catchment areas of the site have been estimated to be below 5l/s, in line with current guidance by the Environment Agency to reduce the risk of blockages to pipes, the peak surface water discharge rate will only be attenuated to a practicable minimum limit of 5l/s prior to discharging into a new stormwater sewer.

The proposed surface water drainage strategy for the proposed site is to provide for infiltration where possible within the landscaped areas and attenuate peak flows to not exceed existing run-off rates with an allowance for climate change. As part of the detailed design once the proposed ground levels and SuDS features are fully defined, flow routes would be modelled and reviewed so that key flow routes are fully intercepted /or directed to the proposed systems without increasing flood risk to the proposed development and immediate areas surrounding the site to deal with exceedance flows for extreme events.

The Flood and Water Management Act 2010 (FWMA) introduces the concept of a SuDS Approving Body (SAB), to be managed by unitary authorities or county councils Lead Local Flood Authority (LLFAs). For the proposed Didcot Gateway site this is likely to be SODC, when the SAB role is officially launched by DEFRA. Further consultation and liaison with SODC will be necessary prior to carrying out detailed design to agree the strategy for SuDS maintenance and adoption.

5.9 Site 7 – Rich's Sidings

Opportunity sites - critical importance

Location

Site 7 is located to the east of Didcot, directly east of Site 1 – Orchard Centre. It is situated approximately 600m south east of Didcot Parkway railway station.

Figure 5.23 Rich's Sidings (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)

Site Description and Current Usage

The site is roughly triangular in shape, bordered by Hitchcock Way (the continuation of Station Road) on the north boundary, by Broadway on the south east boundary, and by Site 1 – Orchard Centre on the west boundary.

The site is predominantly an industrial estate comprising commercial buildings, along with car parking and other areas of hardstanding, and some areas of undeveloped land. There is a small terrace of retail and professionals services buildings along the south east boundary of the site.

Topography

The site is highest in the south west corner, at elevation of 62mAOD. Levels fall along the west boundary to 52mAOD, and along the south boundary to 55mAOD. The central area of the site is relatively flat, at an approximate elevation of 55mAOD.

Hydrology & Drainage

There is a drainage ditch to the north west of the site, this watercourse flows from south to north along the west boundary of the site, adjacent to Site 1. This watercourse is culverted in the vicinity of Station Road and

the entrance road to Site 1. It was difficult to ascertain the route of this watercourse whilst on the site visit, but from inspection of historical mapping it is thought that this watercourse will join with a watercourse flowing from west to east, and will be culverted beneath Station Road and the railway embankment, and then eventually join the Ladygrove Brook system.

Geology & Hydrogeology

The bedrock beneath the site is Gault Formation. There are no records of superficial deposits on the site, however it is anticipated that made ground will be present, relating to previous developments on site.

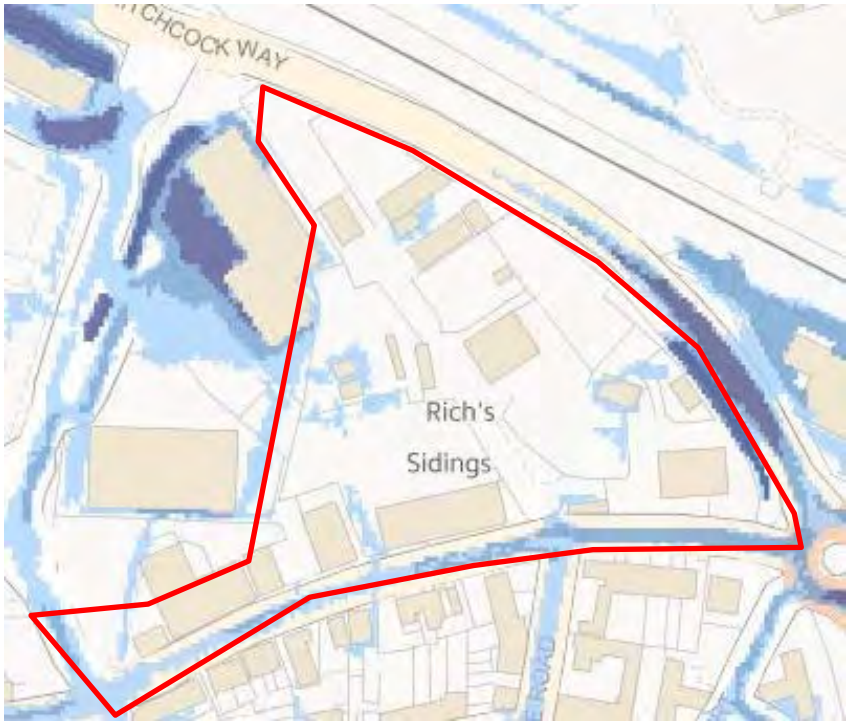
Development Proposals

As described in the SODC planning portal, the proposal is for a mixed-use development, which will be an extension to Site 1 – Orchard Centre. The development will include up to 25,294 square metres of commercial space (Class A1 and A3), between 100 and 200 residential units, and potentially a community facility (Class D1). The development will include additional car parking and space for bicycles.

Flood Risk

The site is entirely in Flood Zone 1. The site is generally at very low risk of surface water flooding, however an offsite area adjacent to the north west corner is at high risk of surface water flooding, this may be due to the drainage ditch and culvert on the west boundary. The north east corner of the site is at high risk of surface water flooding.

Figure 5.24 Risk of Flooding from Surface Water to Site 7 (from .gov.uk, accessed December 2016)



The Areas Susceptible to Groundwater Flooding (AStGWF) map found in the 2013 SFRA indicates that the site is within a grid square considered to have between 50% and 75% of the area at risk of groundwater emergence. However, the AStGWF map is not site specific, and it is noted that there are no records of groundwater flooding on site. Therefore, as with Site 1, the site is deemed to be at low risk of groundwater flooding.

SuDS

A Drainage Appraisal should be undertaken. The use of a Sustainable Urban Drainage System (SUDS) will be considered, and a site-wide drainage strategy will be formulated and will incorporate best practice sustainable drainage techniques.

In order to sufficiently restrict the rate of surface runoff derived from the completed and operational Site, infiltration features (i.e. tree pits, pervious pavement) should be considered as first options if ground investigations show it is feasible. Living roofs should be considered as attenuation features, and over ground systems as swales to storage the volume to be discharge into the existing drainage system with an appropriate runoff rate.

5.10 Site 10 – NW Valley Park

Opportunity sites – already coming forward

Location

Site 10 is located to the east of Didcot, approximately 3.5 kilometres west of Didcot Parkway railway station. It is bordered by the A4130 on the north boundary, by Site 2 – Valley Park on the east and south boundaries, by the A34 to the south west, and by a retail area on the west boundary.

Figure 5.25 NW Valley Park (Didcot Garden Town – Opportunity Sites Draft Report, November 2016)

Site Description and Current Usage

The site is currently greenfield land, used for agriculture. There is a farm called New Farm towards the north boundary of the site.

Topography

The site has a maximum elevation of approximately 80mAOD in the south west corner, this falls in an easterly direction to an elevation of 70mAOD, and falls to the north to an elevation of 60mAOD. The north boundary of the site is flat, at an elevation of 60mAOD.

Hydrology & Drainage

There is watercourse flowing along the eastern boundary of the site. This watercourse forms the boundary between Site 10 and Site 2. It originates in the south east corner of the site, forming as a result of the confluence of two watercourses. This watercourse runs from south to north along the east boundary of the site before being culverted beneath the A4130 in a concrete culvert of approximately 1.2 metres. This watercourse is then culverted beneath the railway embankment, and discharges into Moor Ditch. As with Site 2, the culvert beneath the railway line is partially obscured by a 12” spun iron trunk water main. The presence of this pipe will reduce the capacity of the culvert beneath the railway embankment.

Geology & Hydrogeology

The north east half of the site is underlain with bedrock of Gault Formation, whereas the south west half of the site is underlain with Upper Greensand Formation. The site has superficial deposits of Head – clay, silt, sand and gravel.

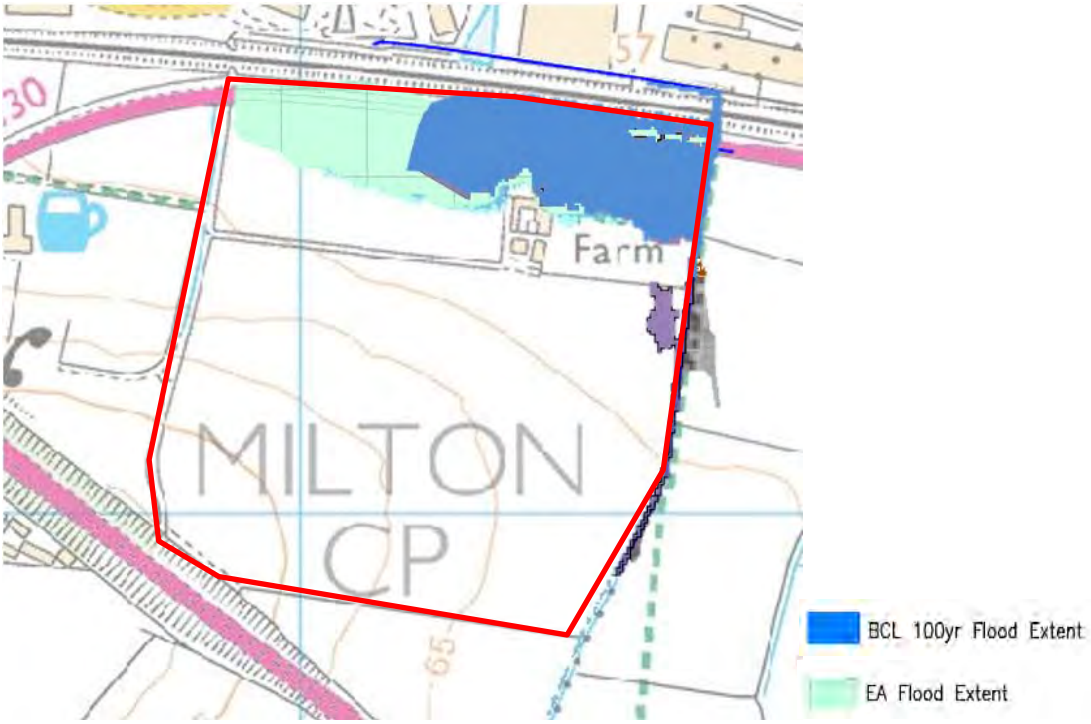
Development Proposals

Current proposals for development are unknown at this time.

Flood Risk

The majority of the site is in Flood Zone 1, with an area of Flood Zone 2 and 3 adjacent to the A4130 at the north of the site. However, as part of the flood modelling undertaken by Brookbanks Consulting for the site specific FRA for Site 2, it was found that the extent of flooding was much less than that which was predicted by the HR Wallingford model as part of the 2007 SFRA.

Figure 5.26 Updated flood extents – Site 10 (from Brookbanks Consulting FRA, accessed December 2016)



SuDS

All infiltration devices must demonstrate are technically feasible undertaking infiltration investigations and must count with the express written consent of the local planning authority, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to controlled waters. Under no circumstance should any SUDS discharge direct to groundwater.

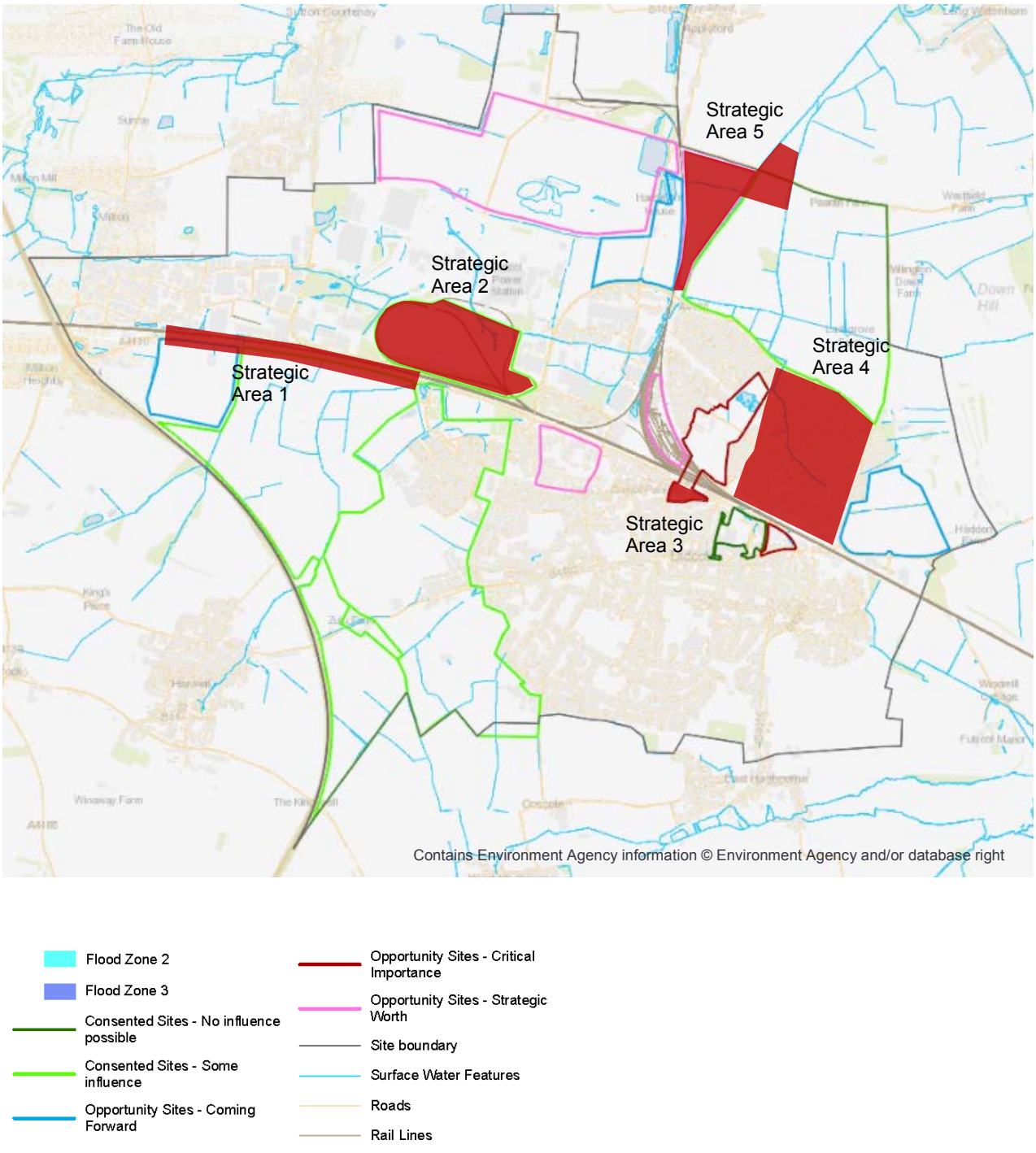
Flat areas could suggest the implementation of depth storage features for the attenuation of the runoff similar or less to the current greenfield runoff. Attenuation volume devices as swales and basins should be located out of flood zones 2 and 3 for being effective, and discharging with rates agreed with the LLFA into close watercourse if possible, or into the existing surface water drainage system.

6. Strategic Proposals

6.1 Flood Risk

Improvements to drainage and flow of water in Didcot have been identified, and separated into 5 main strategic areas for improvement. This section will define each strategic area of improvements, discuss opportunities and constraints, and then make conclusions.

Figure 6.1 Location of Strategic Areas in Didcot



Strategic Area 1

Location

Strategic Area 1 is located to the south of the railway line, approximately 3 kilometres west of Didcot Parkway railway station. The development sites affected are Site 2, Site 3 and Site 10.Opportunities

Opportunities to reduce the flood risk areas to the south of the A4130 have been identified. This could be achieved by maintaining the continuity of flows coming from the south, towards Moor Ditch. During the site visit blocked and obstructed culverts were identified, as well as discontinuity in the watercourses feeding Moor Ditch.

The 2013 SFRA identifies watercourses flowing from the south of the development site to the north. These preferential streams will help enhance sustainability of residential developments. Existing watercourses will be used as discharge points for proposed SuDS systems, at allowable discharge rates.

Watercourses on Site 2 have been subjected to channel manipulation and diversion, resulting in limited channel diversity. There is the opportunity to bolster channel diversity by restoring watercourses to a more natural state, by re-meandering the watercourses.

Constraints

The EA and VoWHDC would need to confirm the preferred approach with regards to improving culverts in the vicinity of the site, as well as the preferred application of the updated climate change allowances. A hydraulic model of watercourses on Site 2 was prepared by Brookbanks Consulting and accepted by the EA in February 2016. This model displayed reduced flood extents when compared to the EA flood extents. However, this model was run prior to the updated climate change allowances in April 2016. Therefore, were the model to be run again, updates to climate change allowances may lead to increased flood extents, and subsequently floodplain compensation may be required as some areas are designated as functional floodplain.

The watercourses flowing across the site are likely to be disrupted by development and certain distances will need to be provided as public right of way. No restriction of preferential flows will be allowed as this may increase flood risk, especially from surface water.

Conclusions

The proposed development allows for green corridors to the north of the site, parallel to the A4130 on the south side. Proposed built development in the north of the site has been located away from areas of Flood Zone 2 and 3. However, the flooding extents are subject to change following updates to climate change allowances. The proposed development has taken into account the presence of existing watercourses on the sites, and green corridors have been maintained along these watercourses.

A hydraulic model could be run to reflect updates to climate change allowances, this would provide more information regarding the location of built development to the north of the site.

There are potential opportunities to improve the weirs, valves and culverts along the southbound drainage ditch and improve the connectivity between the culverts beneath the A4130 and the railway line.

Strategic Area 2

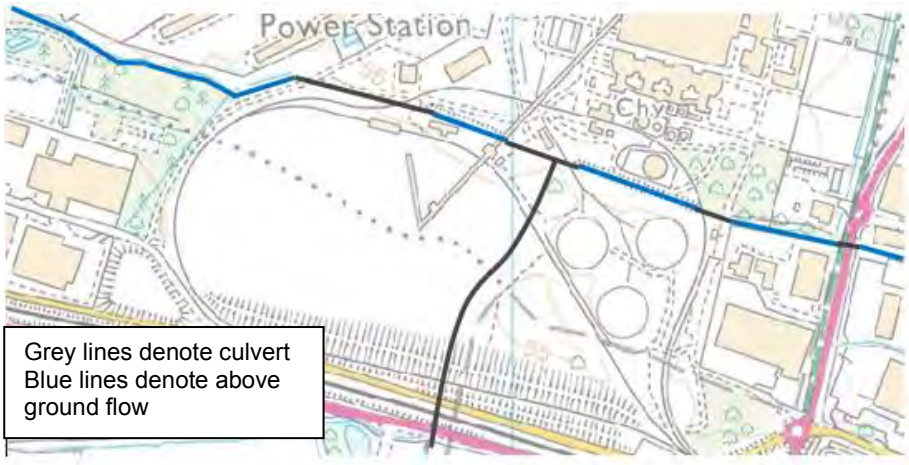
Location

Strategic Area 2 is located to the north of the railway line, approximately 2 kilometres north west of Didcot Parkway railway station. The development site affected is Site 4.

Opportunities

Improvements to Moor Ditch have been identified as possible opportunities, especially the stretches that are culverted beneath the power station. There are opportunities to restore the watercourse both within Site 4 and in the surrounding areas, with the potential of enhancing sustainability in the site.

Figure 6.2 Locations of culverted sections of Moor Ditch



Constraints

Communications and liaison with the EA are vital to understand the preferred approach and to investigate funding necessary to undertake the works.

Conclusions

There are areas designated as green infrastructure corridors that will eventually discharge into the River Thames. Restoring the rivers to their natural state will provide an important link to the River Thames.

Strategic Area 3

Location

Strategic Area 3 is located to the south of the railway line, at Didcot Parkway railway station. The development site affected is the south area of Site 6.

Opportunities

The area in front of Didcot Parkway railway station has experienced flooding in September 2016. It is believed that flooding occurs because the station subway is in a low spot when compared to the surrounding area, and water flows from higher ground to the south into the station. There is a potential opportunity for permeable paving and tree pits in the car parking area of the station, as a method of attenuating water and preventing flooding, but also for enhancing biodiversity in the area. There is the potential for sewer flooding at this location, and collaboration with Thames Water would be possible in order to improve this. There is the potential for installation of a highway drainage swale along Station Road, this would improve fluvial flooding.

Constraints

There may be space constraints which will impede the incorporation of SuDS. The current surface water flooding issues of the station forecourt and the south of the station may be worsened by proposed development, as a result of increased run-off due to increase in impermeable areas although clear knowledge of the effects on drainage of proposed plans will reduce any risks.

Conclusions

Didcot Parkway railway station is of crucial importance for commuters living in Didcot and travelling to London on a daily basis, and disruption to travel caused by flooding of the station is not acceptable. Initial layouts of the south development show open green spaces were SuDS could potentially be accommodated, though lack of available space may remain a constraint.

Strategic Area 4

Location

Strategic Area 5 is located on Ladygrove Estate, to the north east of Didcot. No development sites will be directly affected.

Opportunities

The Ladygrove area suffers from surface water flooding. This is historical flooding, and occurred prior to the Ladygrove Estate development. It is thought that much of the flooding in Didcot is due to lack of maintenance of watercourses and culverts, and from the site visit it could be seen that the water level in Ladygrove Brook is close to the top of the banks, and that the watercourse has vegetation encroaching on the flow of water. There are opportunities to implement a rigorous maintenance scheme in order to clear some of the vegetation from the watercourse and to improve capacity. Thames Water are working on a plan of improvement in the area that would alleviate some of the flooding issues.

Constraints

Improving the capacity of Ladygrove Brook and reducing the amount of vegetation impeding the flow may increase flood risk downstream. After leaving Ladygrove Estate and passing through Hopkins Bridge under the A4130, Ladygrove Brook flows through Site 5 before joining with Moor Ditch and flowing into the Thames. Care will have to be taken to not increase the flood risk to new development on Site 5, or further downstream.

Conclusions

While there are options for improving flood risk in the Ladygrove Estate area, consideration of downstream effects must be taken in order to not exacerbate flooding issues downstream.

Strategic Area 5

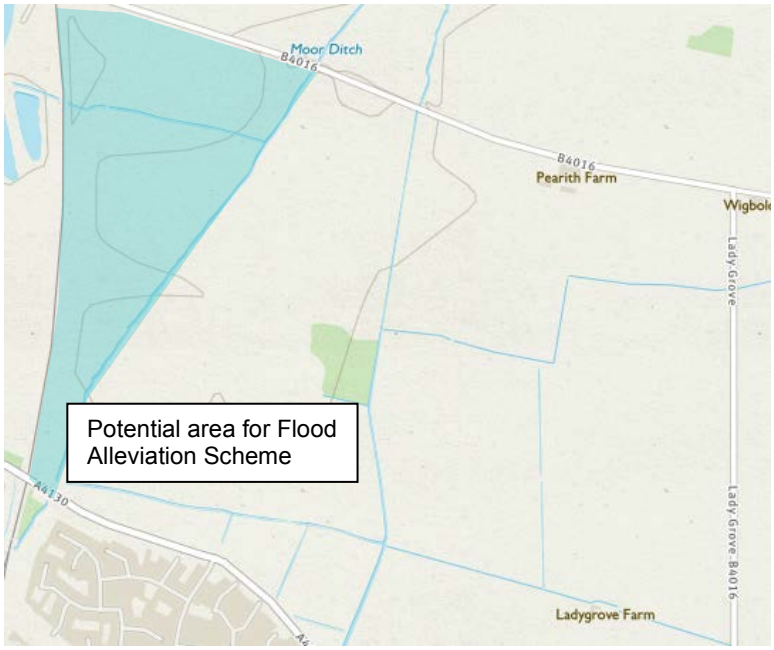
Location

Strategic Area 4 is located to the north of Didcot, approximately 2km north of Didcot Parkway railway station. The development sites affected are Site 5 and Site 14.

Opportunities

A potential opportunity has been identified for a Flood Alleviation Scheme (FAS) to the east of the railway line, and north of the A4130 outside Didcot. This FAS would be positioned on Site 14, immediately to the west of Site 5. Currently, Site 14 is used for agriculture, and the majority of the site is designated as Flood Zone 2 and 3. The opportunity to improve current flooding issues with Moor Ditch has been recognised.

Figure 6.3 Potential Flood Alleviation Scheme



The 2013 SFRA Appendix Part 1 mentions that flooding of the west of Ladygrove Estate, on the east side of the railway line, occurs as a result of poor drainage of the ditch along the railway embankment, and also because the drainage ditch becomes backed up from Moor Ditch when Moor Ditch floods. While this area is not part of Site 5, there may be the opportunity to make improvements to reduce flood risk in the west area of Site 5, perhaps by utilising the benefits of the proposed FAS on Site 14 immediately to the north.

A lack of capacity and partial blockage of culverts by utilities are potential reasons for flooding issues. There is the opportunity to realign the utilities and increase the capacity of culverts beneath the B4016, this will improve the discharge capacity and may alleviate flooding issues.

Preferential flow streams within Site 5 were identified in the 2013 SFRA. These preferential streams will enhance sustainability of the residential development. The watercourses will be utilised as potential discharge points for the limited discharge generated within the site after attenuation with SuDS.

Constraints

There are discrepancies between the flood extents shown on the EA maps and those included in the 2013 SFRA. Included in the planning application for Site 5 was a hydraulic model prepared by Glanville which showed similar extent of flooding to that of the EA maps. This hydraulic model indicated that the River Thames was not backing up into Moor Ditch and Ladygrove Brook, and that flood levels in the River Thames did not impact on the Moor Ditch/Ladygrove Brook system.

The watercourses will be maintained in their natural state, and certain distances will be provided for public right of way. No obstacles to preferential flows will be allowed as they may increase flood risk, especially from surface water.

As described in the site specific FRA undertaken by Glanville, ground investigation work undertaken by RPS as part of the planning process for the site has indicated that infiltration methods for disposal of surface water are likely to be impractical across the majority of the site, due to the site being underlain by Gault Clay Formation.

Communications with the EA dated 10 February 2016 stated that there should be no built development in Flood Zones 2 or 3. The communications also state that there should be no drainage systems for infiltration of surface water to the ground except where permitted by the local planning authority, where it has been demonstrated that there is no unacceptable risk to controlled waters. All infiltration SuDS accepting drainage from roads/car parks should be installed with sufficient unsaturated zone between the base of the SuDS and any groundwater. Under no circumstance may SuDS drain into groundwater.

Conclusions

There are currently no plans for proposed development on Site 14.

The route of Moor Ditch and Ladygrove Brook through Site 5 has been identified as a green infrastructure corridor, and it could potentially connect to the River Thames. Further description of what is proposed to the centre of the site in the vicinity of Ladygrove Brook will be required to assess vulnerability of the development. This would need to be assessed along with the potential FAS to the west of Site 5.

The proposed development on Site 5 has taken into account the presence of watercourses on site, and does not disrupt their route. During detailed design this will need to be granted. The proposed development has taken into account areas of Flood Zone 2 and 3 and has located built development away from these zones. A small area of leisure centre sports pitch is in Flood Zone 3, however national planning policy permits 'less vulnerable' development to be located in Flood Zone 3.

6.2 SuDS

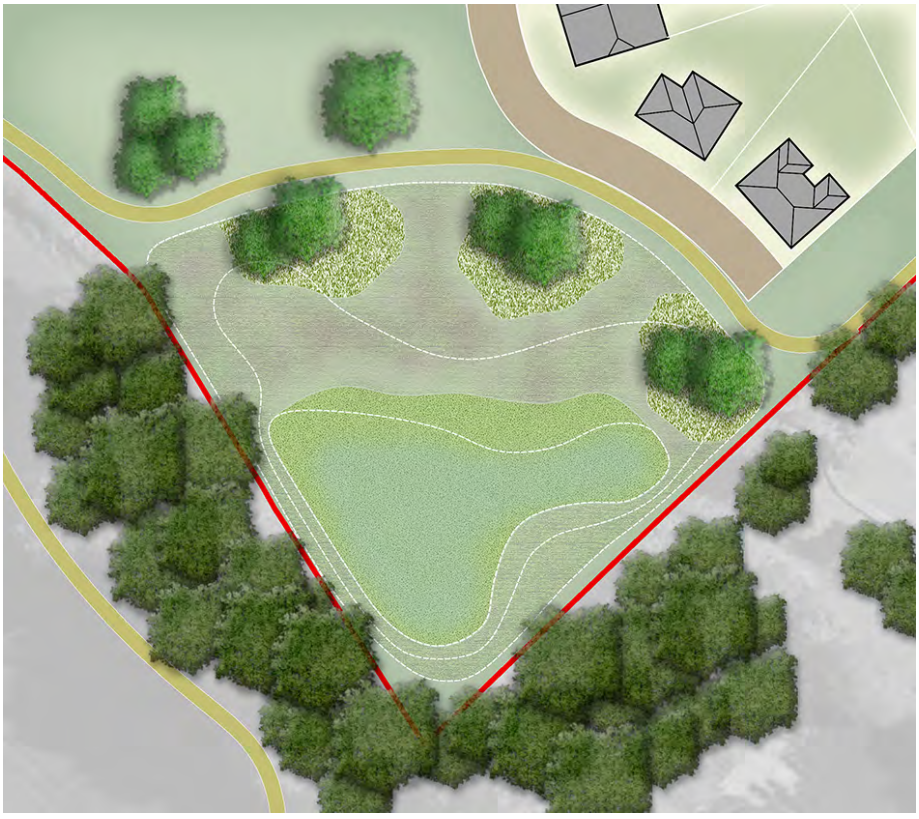
This section of the report outlines constraints and opportunities present in the Didcot for the implementation of sustainable drainage systems (SuDS). The main elements that will drive the selection of different features will depend on the level of urbanisation and ground conditions in different areas of Didcot.

As discussed in previous sections of this report, the geology and hydrogeology of Didcot is not appropriate for infiltration options such as soakaways, especially to the north of Didcot where due to the vicinity to the River Thames the water levels are remarkably high.

Strategic Opportunities and Constraints

- Ponds, swales and bio retention basins will be particularly suitable for areas to the north of Didcot that currently are greenfield sites.

Figure 6.4 Typical plan view and profile for the design of a detention basin



- Permeable paving, green roofs and tree pits will be recommended in highly urbanised areas of the town centre of Didcot. Below will be presented examples of the approaches to undertake.

Figure 6.5 Typical pervious pavements and tree pits solutions

Figure 6.6 Green roof

- Swales might be a preferred option along Station Road as they might improve some the surface water issues. Constraints on this option will be space of the main road and the possibility of amendment the horizontal alignments. It will have to take into account where the existing utilities are located and the way that could affect the inclusion of sustainable drainage features on the vicinity. Also the ownership of area will be an important point to be consider for using SuDS and communications should be undertaken prior any development.

Figure 6.7 Swale SuDS feature proposed within a residential development

- Where it is feasible, SuDS should be proposed within or in the vicinity of open spaces and leisure areas to produce green infrastructure corridor for collecting and storing surface water runoff, whilst also creating a valuable habitat and recreational opportunities.
- It is envisaged diversion and modification of exiting culverts along the areas subject to this report, for amending the current scenario and recovering as much as possible the original water flow paths. Studies about how that modification would affect the surrounding areas, as well as at the upstream and downstream areas should be undertaken for evaluating the best solution.
- Floodplains could be considered to provide extra flooding areas before unusual eventual extreme rainfall events. Specifically could be a good option on sites 2 (Valley Park), 3 (Great Western Park) and 5 (North East Didcot).

Figure 6.8 Wetland areas as green infrastructure

- Discharge rate will be limited to the greenfield runoff rate and it is preferable the discharge in any of the watercourses within and in the vicinity of the studied area that should be considered at rates restricted to ensure that flood risk is not increased as a result of the development.

Opportunities and Constraints of the consented developments

- Some of the swales and basins included on the current drainage strategy are located into flood zones 2 and 3. SuDS system should not be located on existing flooding areas, because attenuation capacity is considerably decreased, even making the sustainable drainage useless.
- Existing swales and basins currently located within the areas considered should be evaluated for being included within the new sustainable drainage strategy as storage points. Re-design or modifications will be undertaken if necessary for meeting the requirements of latest SuDS regulations.
- Previous intrusive geotechnical investigations undertaken of some of the areas considered, indicate that infiltration techniques for the disposal of water runoff may not be feasible, due to the type of ground and high groundwater levels. Relevant percolation tests and infiltration investigations should be undertaken on new opportunities sites to confirm the best sustainable drainage approach.

Previous proposed developments was based on conditions for the 1 in 100 year event with 15-20% of reduction of current runoff plus climate change. A fix reduction percentage should be agree with the LLFA to be consistent on further developments. Different approaches have been considering different areas previously but however every development should use the same criteria.

7. Conclusions

- There is potential to improve the flooding issues in several areas of Didcot. A maintenance management plan and regular cleaning of culverts, gullies (drainage assets of the County Council, District Councils, and Network rail) would remarkably improve some of the pluvial and fluvial issues in Didcot.
- Improvements in the surface and foul sewer Thames Water networks might also improve some of the flooding issues in Didcot.
- Didcot is split in north and south by Station road and the railway line. These infrastructures act as an obstacle to some of the watercourses and pluvial runoff that runs into the Moor Ditch from the south of its catchment. This, leads to flooding issues at some locations along Station Road A4130.
- An assessment of the main sources of flooding in Didcot has being undertaken in this report. Therefore, the main flooding issues have been identified as well as potential opportunities to improve them:
  - South west Didcot, southbound of Station Road: flooding issues have been identified, they affect some of the proposed developments within the Didcot Town (Site 10, potential opportunity site and Site 2, consented site). The sources of flooding at those locations are pluvial and fluvial flooding. There are potential opportunities to improve the weirs, valves and culverts along the southbound drainage ditch and improve the connectivity between the culverts beneath Station Road and the railway line.
  - South west Didcot, northbound of Station Road: there are several culverts and channelized watercourses that feed into the Moor Ditch. Besides, historical maps evidence that the natural pathway of the Moor Ditch was denaturalised due to the imprint of the power station (currently being decommissioned). There may be the opportunity to re-wild the watercourses, to de-culvert and re-meander where appropriate. This would have the benefits of restoring natural habitats and removing fragmentation of riverbank habitats, and also reducing flood risk where a river flows through a culvert which doesn't have sufficient capacity. Re-naturalising rivers will also slow down the passage of water, and may ameliorate flood risk further downstream.
  - South East Didcot, Didcot train station: flooding in this area has been recorded recently. Further investigation on the causes of flooding at this location is still being undertaken by the stakeholders. Nevertheless, the topographic situation of the station (low point of the Station Road), the lack of highway drains along the road and the conditions of the surface water network lead to flooding of the station by several sources (surface water and sewers). There are potential opportunities to improve Thames Water assets as well incorporate swales along the Station Road. This solution would also be a potential opportunity for SuDS, as it would help to attenuate the surface water runoff of the road and adjacent sites.
  - North East Didcot, Ladygrove estate: fluvial and surface water flooding is identified in this area of Didcot. Potential improvements would consist on cleaning and maintaining the drainage assets and increase the discharge capacity of the culverts where needed. Besides, it is highlighted that communications with OCC, SODC and VoWHDC indicated that the current surface water sewer network is inundated, therefore, Thames Water is working on a plan of improvement in this area that would help to alleviate some of the flooding issues.
  - North East Didcot, at the vicinity of the confluence between the Ladygrove Brook and Moor Ditch: there is fluvial and pluvial flooding in the greenfield sites upstream the B4016. A lack of capacity and partial blockage by utilities of the culverts beneath this road are potential reasons for the flooding issues. Potential opportunities to improve the flooding issues might be to increase the capacity of the culverts and realign the utilities as well as design a flood

storage area along the stretches of the Moor Ditch. Those potential solutions might also improve the connectivity with the River Thames.

- For a better understanding of the potential opportunities to address flooding issues, hydraulic models of the full catchments should be prepared. They will be fundamental to better understand how modifications in the upstream parts of the catchments would affect the locations downstream. These are deemed remarkably important for the potential opportunities of improvement along the Lady Grove watercourse.
- It is highlighted that there are discrepancies between the flood maps prepared by the Environment Agency and the flood maps included in the SFRA 2013 prepared by the SODC and VOWDH. Given that the EA maps are more recent, it has been assumed that those are more relevant for the preparation of this report.
- Hydraulic models have been built as part of the planning process for Site 2 and for Site 5. These models have shown discrepancies between the Environment Agency flood extents and the model outputs. It would therefore suggest that flood zone extent data held by the Environment Agency is not up to date, or might not accurately reflect flood conditions. Hydraulic modelling of Site was undertaken by Glanville in August 2015 as part of the site specific flood risk assessment for Site 5. The modelling found that high water levels in the River Thames had no effect on flooding in the Ladygrove Brook/Moor Ditch system.
- Communications with the SODC and VOWDC indicated that it is currently being undertaken an addendum of the SFRA. However, no information on the date of completion neither fundamental modifications on the document have been described.
- Future communications with the EA would define the most suitable approach for the latest climate change allowances released in April 2016, as it is envisaged that they will have an effect not only on the revised SFRA but also on the flood extents to consider for future developments.
- According to the National Planning Policy Framework (NPPF), areas defined as functional floodplain are not suitable for most of developments and areas defined as flood zone 3 are not usually suitable for more vulnerable developments. It is also highlighted that any proposed development within floodplain would need to be compensated and properly mitigated.
- Potential opportunities for SuDS have been identified for Didcot Garden. The adequacy on the selection of the different features will depend on the geology and existing land use conditions. The use of SuDS attempts to mimic the existing flow regime of the undeveloped thus reducing the impact of the new developments on the hydrology of the undeveloped catchment.
- As described throughout this report there is a remarkable difference in the type of geology between the north and the south of Didcot. The northern part of the town is underlain by Gault Formation and there does not have potential for infiltration as the soil is mainly heavy clay and the water levels are very high due to the proximity to the River Thames. The southern part of Didcot has a low potential of infiltration but the geology is Upper Greensand Formation. Therefore, potential opportunities for features with certain degree of infiltration could be further investigated through relevant percolation and infiltrations tests in the south of Didcot.
- With regards to land uses, it is deemed appropriate that ponds and swales (features that require a bigger land take) are proposed in greenfield sites whereas permeable paving, tree pits green roofs and brown roofs would be considered more appropriate in more urbanised areas of the town.
- Given the very flat nature of some parts of Didcot suitable SuDS options are those which are shallow in construction such as swales and retention basins.
- It is highlighted that a consistent approach should be provided to developers in the future in terms of design criteria for the climate change allowances to consider for rainfall, as well as the discharge limitations when designing SuDS.

- According to the planning policy and guidelines consulted all surface water drainage systems would be designed to restrict discharge rates to greenfield values and store the balances of water for all events up to and including the 1 in 100 year event including allowances for rainfall intensities as result of the climate change setting out by the latest authority regulation. In small urban catchment areas the allowance applied for potential change anticipated for 2070 to 2115 is 40% (Upper end) and 20% (central).
- Communications with OCC and SODC and VOWDC have indicated that new proposed developments will not increase the existing runoff discharge into the watercourses as the increase of runoff generated by the development will need to be appropriately attenuated with SuDS at source.
- Thames Water has identified that could have issues for the existing surface water infrastructure to accommodate the discharge flow produced by runoff on the new developments. They shall be consulted at an early stage to ensure that sufficient capacity is available in the existing drainage system, and agreeing the discharge rates.

Appendix A
Water Environment and Flood Maps

Figure 1 – Watercourses

448000 449000 450000 451000 452000 453000 454000

194000 193000 192000 191000 190000 189000 188000

N

Drayton
The Old Farm House
Sutton Courtenay
Appleford
Long Wittenham
Sunray
Milton Mill
Milton
Didcot Power Station
Harwell House
Pearith Farm
Westfield Farm
Willington Down Farm
Down Hill
Ladygrove Farm
A4130
Milton Heights
A34
Steventon Hill
Milton Hill
Didcot Parkway
Didcot
Hadden Farm
King's Piece
Zulu Farm
Newstock
Harwell
Windmill Cottage
Fulscot Manor
East Hagbourne
Winaway Farm
A4185
The Kingswell
Coscote
West Hagbourne
The Comstore

11
14
8
5
4
10
2
12
6
13
3
1
7
9
0

Key

- Consented Sites - No influence possible
- Consented Sites - Some influence
- Opportunity Sites - Coming Forward
- Opportunity Sites - Critical Importance
- Opportunity Sites - Strategic Worth
- Site boundary
- Surface Water Features
- Roads
- Rail Lines

0 0.2 0.4 0.6 0.8 1 km

Scale at A3: 1:25,000

38421 - Didcot Garden Town

Focus Sites

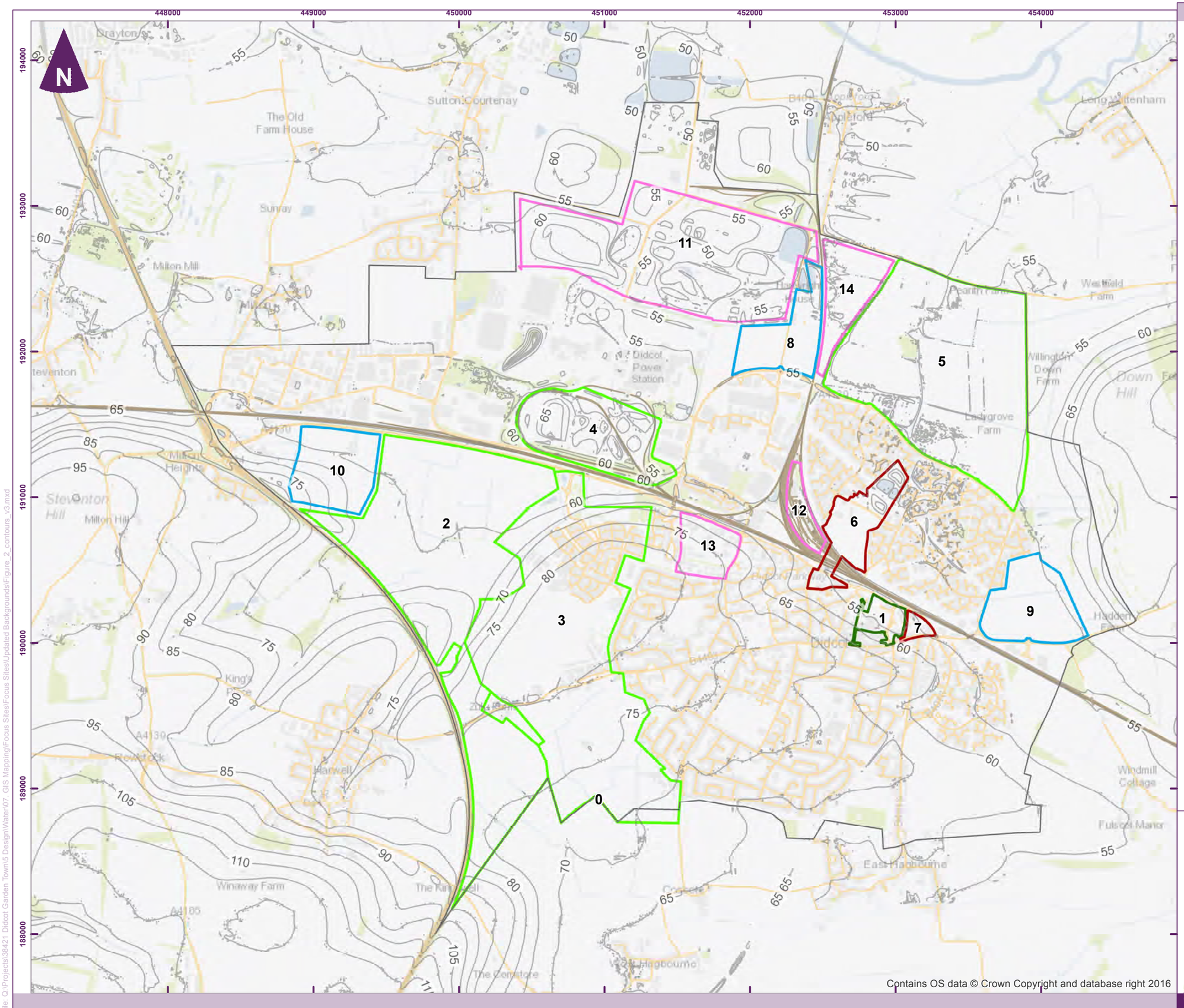
amec foster wheeler

Figure 1 - Watercourses
38421/LEA/CVD/100

February 2017 Ted Vickers

file: Q:\Projects\38421 Didcot Garden Town\5 Design\Water\07. GIS Mapping\Focus Sites\Focus Sites Updated Backgrounds\Figure_1_Watercourses_v3.mxd

Figure 2 - Contours



Key

38421 - Didcot Garden Town

Focus Sites

amec foster wheeler

Figure 2 - Contours
38421/LEA/CVD/101

December 2016 Ted Vickers

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Figure 3 – Flood Zone 2 and 3 maps (Environment Agency Flood Maps)

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194000 193000 192000 191000 190000 189000 188000

N

Drayton
The Old Farm House
Sutton Courtenay
B4017
Sunray
Milton Mill
Milton
Steventon
A4130
Milton Heights
A34
Steventon Hill
Milton Hill
King's Piece
A4139
Newstock
Harwell
B4493
Zulu Farm
Winaway Farm
A4185
The Kingwell
The Comstore
West Hagbourne
Coscote
East Hagbourne
Didcot Power Station
B4493
Didcot Parkway
Didcot
B4016
Appleford
B4016
Appleford
Long Wittenham
Hampton House
Pearith Farm
Westfield Farm
Willington Down Farm
Down Hill
Ladygrove Farm
Hadden Farm
Windmill Cottage
Fulscot Manor

10
2
4
3
0
11
14
8
5
13
12
6
1
7
9

Key

- Flood Zone 2
- Flood Zone 3
- Consented Sites - No influence possible
- Consented Sites - Some influence
- Opportunity Sites - Coming Forward
- Opportunity Sites - Critical Importance
- Opportunity Sites - Strategic Worth
- Site boundary
- Surface Water Features
- Roads
- Rail Lines

0 0.2 0.4 0.6 0.8 1 km

Scale at A3: 1:25,000

38421 - Didcot Garden Town

Focus Sites

amec foster wheeler

Figure 3 - Flood Zone 2 and 3 (Environment Agency Data) 38421/LEA/CVD/102

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Figure 4 – Surface Water Flood Maps (Long Term Flood Information)

448000 449000 450000 451000 452000 453000 454000

194000 193000 192000 191000 190000 189000 188000

N

Drayton
The Old Farm House
Sutton Courtenay
B4016
Appleford
Long Wittenham
B4017
Sunray
Milton Mill
Milton
Steventon
A4130
Didcot Power Station
Westfield Farm
Ladygrove Farm
Willington Down Farm
Down Hill
A4130
A4130
Milton Heights
Steventon Hill
Milton Hill
A4130
Didcot Parkway
Didcot
Hadden Farm
B4493
King's Piece
Zulu Farm
A4130
Rowstock
Harwell
B4493
Windmill
B4016
Fulscot Manor
East Hagbourne
Winaway Farm
A4185
The Kingswell
Coscote
The Comstore
West Hagbourne

11 14 8 5 4 10 2 13 12 6 3 1 7 9 0

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Contains Environment Agency information © Environment Agency and/or database right

Key

- High Risk of Surface Water Flooding
- Medium Risk of Surface Water Flooding
- Low Risk of Surface Water Flooding
- Consented Sites - No influence possible
- Consented Sites - Some influence
- Opportunity Sites - Coming Forward
- Opportunity Sites - Critical Importance
- Opportunity Sites - Strategic Worth
- Site boundary
- Roads
- Rail Lines

0 0.2 0.4 0.6 0.8 1 km

Scale at A3: 1:25,000

38421 - Didcot Garden Town

Focus Sites

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Figure 4 - Risk of Flooding From Surface Water
38421/LEA/CVD/103

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file: Q:\Projects\38421 Didcot Garden Town\5 Design\Water\07. GIS Mapping\Focus Sites\Focus Sites\Updated Backgrounds\Figure_4_Surface_Water_Flood_Extents_v3.mxd

Figure 5 – Development Sites (Grimshaw Masterplan)

448000 449000 450000 451000 452000 453000 454000

194000 193000 192000 191000 190000 189000 188000

N

Drayton
Sutton Courtenay
The Old Farm House
B4016
Appleford
Long Wittenham
B4017
Sunray
Milton Mill
Milton
Harwell House
Pearith Farm
Westfield Farm
Didcot Power Station
A4130
Willington Down Farm
Down Hill
Ladygrove Farm
Steventon
Milton Heights
A34
Steventon Hill
Milton Hill
Didcot Parkway
B4493
Hadden Farm
King's Piece
Zouch Farm
Rowstock
Harwell
Windmill Cottage
Fulscot Manor
East Hagbourne
Winaway Farm
A4185
The Kingswell
Coscote
West Hagbourne
The Comstore

11 14 8 5 4 10 2 13 12 6 3 1 7 9 0

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Key

- Consented Sites - No influence possible
- Consented Sites - Some influence
- Opportunity Sites - Coming Forward
- Opportunity Sites - Critical Importance
- Opportunity Sites - Strategic Worth
- Site boundary

0 0.2 0.4 0.6 0.8 1 km

Scale at A3: 1:25,000

38421 - Didcot Garden Town

Focus Sites

amec foster wheeler

Figure 6 - Development Sites
38421/LEA/CVD/105

December 2016 Ted Vickers

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Figure 6 – Historical Flooding Maps (SFRA 2013)

DIDCOT CP

DIDCOT

WEST HAGBOURNE CP

EAST HAGBOURNE CP

SOUTH MORETON CP

RWELL CP

N CP

Steventon

MILTON

Golf Course

Marsh - Pre-roman time

Lydalls Road, outside the station

Hagbourne Marsh

Marsh bridge

Junction of Norreys Close and Park Road

Farmland south of Didcot, below Kynaston Road

Below Mowbray field, Mowbray Road and Loyd Road

East Hagbourne

West Hagbourne

North Moreton

South Moreton

Steventon Hill

Milton Heights

The historical flood envelopes shown are based on a combination of Environment Agency data from validated third party data and anecdotal evidence. There may be records of relatively minor flood events and the area at risk may be more extensive. They should not be considered exhaustive and are known, in part, to be incomplete. An area without a Flood Outline does not necessarily imply no flood risk. The Environment Agency should be consulted with queries in any case.

Legend

- Sandbag Record Points

Information provided by Brian Lingham

- Below Mowbray field, Mowbray and Loyd Road
- Farmland south of Didcot, below Kynaston Road
- Hagbourne Marsh
- Junction of Norreys Close and Park Road
- Lydalls Road, outside the station
- Marsh - Pre-roman time
- Marsh bridge

Newspaper Flood Points

- 2005_1990
- 1990_1970
- 1970_1950
- 1950_1930

- River
- Worst historical flood (1947-2003)
- Comment points

N

0 0.5 1 2 3

Kilometres

Map 8b: Historical Flooding (Didcot)

Historical flooding in Didcot area

HR Wallingford

Newspaper, sandbag records and historical sources
Environment Agency historical flood outlines (1947-2003)

Date: January 2007

Job number: MCR4061

Clients: South Oxfordshire District Council, Environment Agency

Appendix B
Site Visit Conclusions

Site 2 – South side of A4130

Site 2 was visited first, stopping at locations where the drainage ditches were culverted under the road (A4130).

Figure 9 - Culvert at first stop location

It was noted that water was flowing freely in a south-north direction, but that there were impediments to flow in a west-east direction such as no-return valves and weirs. The culverts on the south side of the road were wide (approximately 1150mm), which left sufficient room for water to flow.

Figure 10 - Impediment to flow in west-east direction at location of first stop

Weir across the channel, with no-return valve. Water colour differences indicates there is some flow through the pipe.

Figure 11 - Pipe blocking drainage through culvert at location of second stop

Further to the west, where the watercourse was culverted beneath the railway line, there was a 12" diameter spun iron trunk water main pipe which would have reduced the capacity of the culvert. The drainage ditches will eventually flow northwards into Moor Ditch.

Figure 12 - Impediment to flow on north side of road at location of second stop

On the north side of the road, there is a weir which partially blocked the passage of water flowing west to east. Water was able to pass through this, as evidenced by the turbulence on the right side of the barrier, compared to the left side. The water would then flow through the culvert indicated above in Figure 3.

The north portion of Site 2 which is adjacent to the A4130 is in Flood Zone 2/3. The government surface water flood information available online indicates that the portion of the site adjacent to the A4130 is at 'low' risk of surface water flooding, with some areas at 'medium' or 'high' risk.

Site 10 - South side of A4130

This site is directly west of Site 4, bordered by the A4130 on the north boundary, the A34 on the south west and a watercourse flowing into Moor Ditch on the east. The site is currently farmland. Similarly to Site 4, there is an area of Flood Zone 2/3 on the south side of the A4130, and an area at 'high' risk of surface water flooding in the same location.

Figure 13 - Site 10

Site 4 – Along the former power station

Access to Site 4 was not possible to do use as a power station. However, it was possible to observe some areas where Moor Ditch was flowing. It is understood that Moor Ditch is culverted for some stretches in the vicinity of Site 4, and that Moor Ditch is de-naturalised.

Figure 14 - Moor Ditch

There may be an opportunity to re-naturalise the watercourse. In locations where it was possible to see Moor Ditch flowing above ground, the water level was high, although it had been raining in the days previous to the site visit.

Figure 15 - Moor Ditch flowing above ground

The sewage treatment works discharges into Moor Ditch. Moor Ditch turns northwards and then is culverted beneath the north-south railway line.

Figure 16 - Moor Ditch culverted under north-south railway line

There is a small area of Flood Zone 2 associated with the flow of Moor Ditch near Site 4, this is to the south east of the roundabout indicated on the map below. The area is currently green space. The government surface water flooding information available online indicates that there are areas at risk of surface water flooding, these are associated with Moor Ditch and are more prominent towards the east of Site 4, alongside the railway line.

Site 5 and Site 14 – North Didcot

Both Site 5 and 14 are flat, currently used as farmland. There was standing surface water on both sites, possibly due to the recent rainfall. Ladygrove Brook flows from south to north and passes under the road (B4016), which forms the northern boundary of both sites, as shown in the pictures below.

Figure 17 - Ladygrove Brook under B4016 (south side), Ladygrove Brook (north side)

There are pipes which may block the flow of water under the bridge, there could be the opportunity to move the pipes so they are not able to block flow of water.

Figure 18 - Ladygrove Brook, downstream of bridge

Figure 19 - Moor Ditch, downstream of bridge

Moor Ditch flows through a wider channel, as shown below. Downstream of the bridge crossing, the ditch itself has vegetation on both sides

Figure 20 – Bridge crossing over Moor Ditch

The majority of Site 14 is Flood Zone 2, concentrated on the east side of the site, adjacent to Moor Ditch. There is a small area of Flood Zone 3 also on the east side of the site. The government surface water flooding information available online doesn't indicate that Site 14 is at risk from surface water flooding.

Site 5 is bisected by Ladygrove Brook, with the western half (bordered by Moor Ditch to the west and Ladygrove Brook to the east) having areas of Flood Zone 2 mainly on the west side, with smaller areas of Flood Zone 3 to the north, adjacent to B4016, and also an area to the east of the western half. The government surface water flooding information indicates that there is small areas of 'low' risk of surface water flooding, manly in the northern half of the site.

The eastern half of Site 5 has a small area of Flood Zone 2/3 in the south western corner, adjacent to the A4130. This flood zone corresponds to where Ladygrove Ditch passes under the A4130. There are areas at risk of surface water flooding, these are 'high' risk in the north west corner and in the south west corner, and 'medium' or 'low' risk across the site, with small areas at 'high' risk in locations associated with drainage ditches on the site.

Confluence of Moor Ditch and Ladygrove Brook

Approximately 600m further downstream from the bridges, towards the River Thames to the north, Moor Ditch (left) and Ladygrove Brook (right) join.

Figure 21 - Confluence of Moor Ditch (L) and Ladygrove Ditch (R)

The area around the confluence of the two watercourses is Flood Zone 3, with areas of 'low' risk of surface water flooding also associated with it. It is understood from hydraulic modelling that flood levels in the River Thames do not affect Moor Ditch or Ladygrove Brook.

Figure 22- Ladygrove Brook culverted at location of confluence with Moor Ditch

Ladygrove Estate in North East Didcot

Ladygrove Brook originates to the south east corner of the housing estate, and flows through from south east to north west before passing under the A4130 and eventually joining Moor Ditch.

The watercourse is generally vegetated on both sides, with an area of grassland on one side.

Figure 23 - Ladygrove Brook

Bridges over the watercourse have sufficient capacity for water to pass beneath.

Figure 24 - Bridge over Ladygrove Brook

Figure 25 - Location where watercourse splits

The watercourse splits into two, with the westwards split being culverted and flowing underground. The westward split does re-join with Ladygrove Brook, north of the A4130.

Areas on both sides of Ladygrove Brook are Flood Zone 2/3, with Flood Zone 3 prominent between the two branches of Ladygrove Brook, and to the south of the location of where the watercourse splits and is culverted.

The majority of the site on both sides of Ladygrove Brook is at ‘low’ risk of surface water flooding, with areas at ‘medium’ risk of surface water flooding, and some areas at ‘high’ risk of surface water flooding.

Outlet of Ladygrove Brook under A4130

Figure 26 - Ladygrove Ditch passing under A4130

Ladygrove Brook passes under the A4130 by means of a wide bridge, there is sufficient room for the watercourse to pass under without reaching capacity. The bridge is known as Hopkins Bridge.

Figure 27 - Ditch joining Ladygrove Brook

Across the A4130, on the north side, runoff from the fields of Site 5 enters a ditch running parallel to the roadway. This can be seen in the above picture, the water on the right side of the picture is carrying mud or silt from the field.

The area of Site 5 in the vicinity of Hopkins Bridge is Flood Zone 2/3.

Site 6 (north)

The north of Site 6 comprises an area of green space, with a small football ground, and some sports pitches. To the north of Site 6, between two low hills, there are two lakes. It is believed, from observation of historical

OS mapping from 1955-61, that these lakes are artificial.

Figure 28 - Two lakes

There are no regions of Flood Zone 2 or 3 in the north of Site 6. An area to the west of the site is at 'low' risk of surface water flooding, this is currently a school playing field. There are small areas at 'high' risk of surface water flooding, these are to the south of the playing fields, and towards the east of the site.

Site 1 and Site 7 – South East Didcot – Southbound A4130

Site 1 is currently a large shopping complex, with a supermarket and car park area. There is a watercourse culverted under Station Road/Hitchcock Way, this watercourse was observed to be flowing north to south, contrary to expectations. It was expected that the watercourse would flow from south to north, under the railway line and then flow towards Ladygrove Brook.

The watercourse enters another culvert and passes under the entrance road to the shopping complex, from the site visit it was difficult to understand the route of the watercourse, but from historical mapping it can be seen that the watercourse does pass under the railway line and then subsequently flows into Ladygrove Brook.

Figure 29 - Culvert under Station Road (north entrance)

Figure 30 - Culvert under Station Road (south exit)

An area of concrete hardstanding to the east of the site was observed to have standing water on it, this may be due to the recent rainfall. This is part of Site 7.

Figure 31 - Standing water on Site 7

There are no areas of Flood Zone 2 or 3 on Site 1. There are areas at 'high' risk of surface water flooding, these are associated with the watercourse which is culverted under Station Road/Hitchcock Way. The road slopes upwards from west to east where it meets the entrance road into the shopping complex. There is an area to the north west of Site 7 which is at 'high' risk of surface water flooding.

Site 6 – South- East Didcot, Southbound A4130

The south portion of Site 6 comprises Didcot Parkway railway station forecourt, and a parking area. The entrance to the railway station is in a low area, this may be why the station forecourt is deemed to be at 'high' risk of surface water flooding. Following heavy rain in September 2016, the subway to enable access to other platforms was flooded.

Figure 32 - station forecourt

Opposite the road from the station are two large car parking areas. They are deemed to be at 'low' risk of surface water flooding over about half of the total area, with small areas of 'medium' risk of surface water flooding.

Figure 33 - Car park, taken from south west corner

February 2017
Doc Ref. 38421R004i2

K.
Green infrastructure strategy

See space differently

Appendix I

Didcot Garden Town

Green Infrastructure Strategy

(DRAFT)

January 2017

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CONTENTS

References

APPENDICES

List of Figures

1.0 Introduction

1.1.1. Didcot Garden Town: the opportunity

1.1.2. The green, leafy landscape with a generous network of parks, gardens and tree-lined streets is a defining characteristic of the original garden cities and a key reason for their lasting appeal. Green spaces also offer a wide range of benefits to people in creating healthy, sustainable and resilient places. Recent studies into the economic value of high quality green infrastructure (GI) have shown it is fantastic value for money, adding value from increased land and property values to improved health and well-being[1].

1.1.3. Although Didcot Garden Town (DGT) will not be a completely new settlement, the scale of new development planned and aspiration to become a garden town provides an opportunity to re-imagine and redesign the town of Didcot.

1.1.4. The Town & Country Planning Association (TCPA) in their guidance document, 'The Art of Building a Garden City – Garden City Standards for the 21st Century' (2014), set out how GI is integral to many of the nine Garden City principles – the following outlines some of the key points for consideration in developing DGT:

Garden City Principle: Beautifully and imaginatively designed homes with gardens, combining the best of town and country to create healthy, vibrant communities.

- The 21st century Garden City will be characterised by a landscape structure of multi-functional green infrastructure, including the private or shared gardens associated with homes and a surrounding belt of well managed agricultural land.
- As a minimum (and including private gardens), 50% of a new Garden City's total area should be allocated to green space (of which at least half should be public), consisting of a network of multi-functional, well managed, high-quality open spaces linked to the wider countryside. Homes should have access to private or shared gardens, and space

[1] Microeconomic Evidence for the Benefits of Investment in the Environment 2 Natural England, 2014

must be allocated to allow local food production from community, allotment and/or commercial gardens.

- A fundamental aspect of the Garden City model is the provision of an agricultural belt to prevent sprawl and provide a local source of food and resources for the emerging market of the new Garden City. The Green Belt around a new Garden City must be properly managed, with urban and rural land management decision-making systems linked to ensure that it also provides for access for recreation, energy generation, agricultural production, and habitat creation.
- Set targets for walking and cycling, including reviewing proposed schemes to see how they could be enhanced to provide a safer, more appealing environment for pedestrians and cyclists in all sections of the community.
- Meet 'Active Design' guidelines to improve opportunities for access to sport and physical activity.
- Identify opportunities to create innovative spaces for growing food – for example allotments, derelict public open spaces, and green roofs.
- Require landscape or green infrastructure plans to demonstrate the potential use of any open space for community food-growing.

Garden City Principle: Development that enhances the natural environment, providing net biodiversity gains and using zero-carbon and energy-positive technology to ensure climate resilience.

- Garden Cities are places in which human development positively enhances the natural environment.
- New Garden Cities should yield a net gain in local biodiversity and should adopt plans to achieve the objectives of the Biodiversity 2020 strategy.
- A Garden City's multi-functional green infrastructure network should provide a wide range of benefits for people and the natural environment, including: **moderating temperature** – green space plays an important role in cooling surface and air temperatures and in mitigating the urban heat island effect: trees in particular provide important cooling, both through shading and through the process of evapotranspiration; **mitigating flooding and surface water run-off** – a higher proportion of unbuilt permeable space allows more rainfall to infiltrate naturally to recharge groundwater resources, while trees and shrubs intercept rainfall in their canopies and slow down surface run-off; **supporting biodiversity** – green spaces, and

gardens in particular, are widely recognised as providing important habitats for plants and wildlife, as well as the opportunity for human contact with nature; and **promoting human health and wellbeing** – green space and gardens support a wide range of physical and wellbeing objectives.

- A Garden City's green infrastructure network should also offer a range of benefits in terms of adaptation to and mitigation of climate change.

Garden City Principle: Strong cultural, recreational and shopping facilities in walkable, vibrant, sociable neighbourhoods.

- The pioneers of the Garden City movement put great emphasis on the role of the arts and culture in improving wellbeing as part of a co-operative approach to society.
- Garden Cities are places of cultural diversity and vibrancy, with design contributing to sociable neighbourhoods. This means, for example, shaping design with the needs of children's play, teenage interests and the aspirations of the elderly in mind, and creating shared spaces for social interaction and space for both formal and informal artistic activities, as well as for sport and leisure activities.
- The creative arts cannot be perfectly planned, but they can be brilliantly enabled. Garden Cities should provide formal frameworks for cultural expression, but also leave open space for artistic dissent and chaos.

Garden City Principle: Integrated and accessible transport systems, with walking, cycling and public transport designed to be the most attractive forms of local transport.

- New Garden Cities should be designed to encourage positive behavioural change in terms of low-carbon transport: walking, cycling and low-carbon public transport should be the most convenient and affordable modes of transport.
- Foster healthy and active communities by encouraging walking and cycling and providing a comfortable, stimulating and therapeutic environment, bringing together the best of the urban and natural environments.

1.2. Defining green infrastructure

1.2.1. This GI Strategy embraces the definition of GI set out by the European Commission:

'Green Infrastructure can be broadly defined as a strategically planned network of high quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings' (European Commission, 2013).

1.2.2. The Strategy adopts the typology of green spaces set out in Natural England's Green Infrastructure Guidance[2], which comprises:

1.2.3.

- Parks and Gardens – urban parks, Country and Regional Parks, formal gardens;
- Amenity Greenspace – informal recreation spaces, housing green spaces, domestic gardens, village greens, urban commons, other incidental space, green roofs;
- Natural and semi-natural urban greenspaces - woodland and scrub, grassland (e.g. downland and meadow), heath or moor, wetlands, open and running water, wastelands and disturbed ground), bare rock habitats (e.g. cliffs and quarries);
- Green corridors – rivers and canals including their banks, road and rail corridors, cycling routes, pedestrian paths, and rights of way; and
- Other - allotments, community gardens, city farms, cemeteries and churchyards.

1.2.4. GI assets can be specific features such as street trees, specific sites at the local level or broader environmental features at the landscape scale within and between rural and urban areas such as wetlands or woodlands. GI includes both publicly accessible green spaces and private or non-publicly accessible spaces.

1.2.5. A fundamental principle of GI is that a single site or asset can provide a range of social, economic or environmental functions and benefits. This multi-functionality highlights the advantage that GI has over traditional engineered solutions to environmental problems such as:

- Access, recreation, movement and leisure
- Habitat provision and access to nature
- Landscape setting and context for development
- Energy production and conservation
- Food production and productive landscapes
- Flood attenuation and water resource management

2 Green Infrastructure Guidance, Natural England, 2009

- Cooling effect

1.3. Role and purpose of the GI strategy

1.3.1. This document sets out a GI Strategy for Didcot Garden Town, (DGT) drawing on the findings of the South and Vale GI Strategy[3] and providing a framework and focused guidance across district boundaries, to serve the specific needs of the developing Garden Town.

1.3.2. The South and Vale GI Strategy presents the Councils' vision for the future provision and management of GI in South Oxfordshire and the Vale of White Horse districts up to 2031. It provides a framework for the wider Science Vale strategic area (which includes Didcot), including strategic corridors and links and broad recommendations for the Didcot area. It also sets out a framework for the delivery and management of GI within South and Vale which includes Didcot.

1.3.3. As a settlement scale GI Strategy, this document bridges the gap between the South and Vale GI Strategy and the emerging masterplan for DGT, translating district-wide standards and priorities into a garden town specific GI framework and covers the same timescale up to 2031. This Strategy also considers the delivery and management of GI within a garden town context.

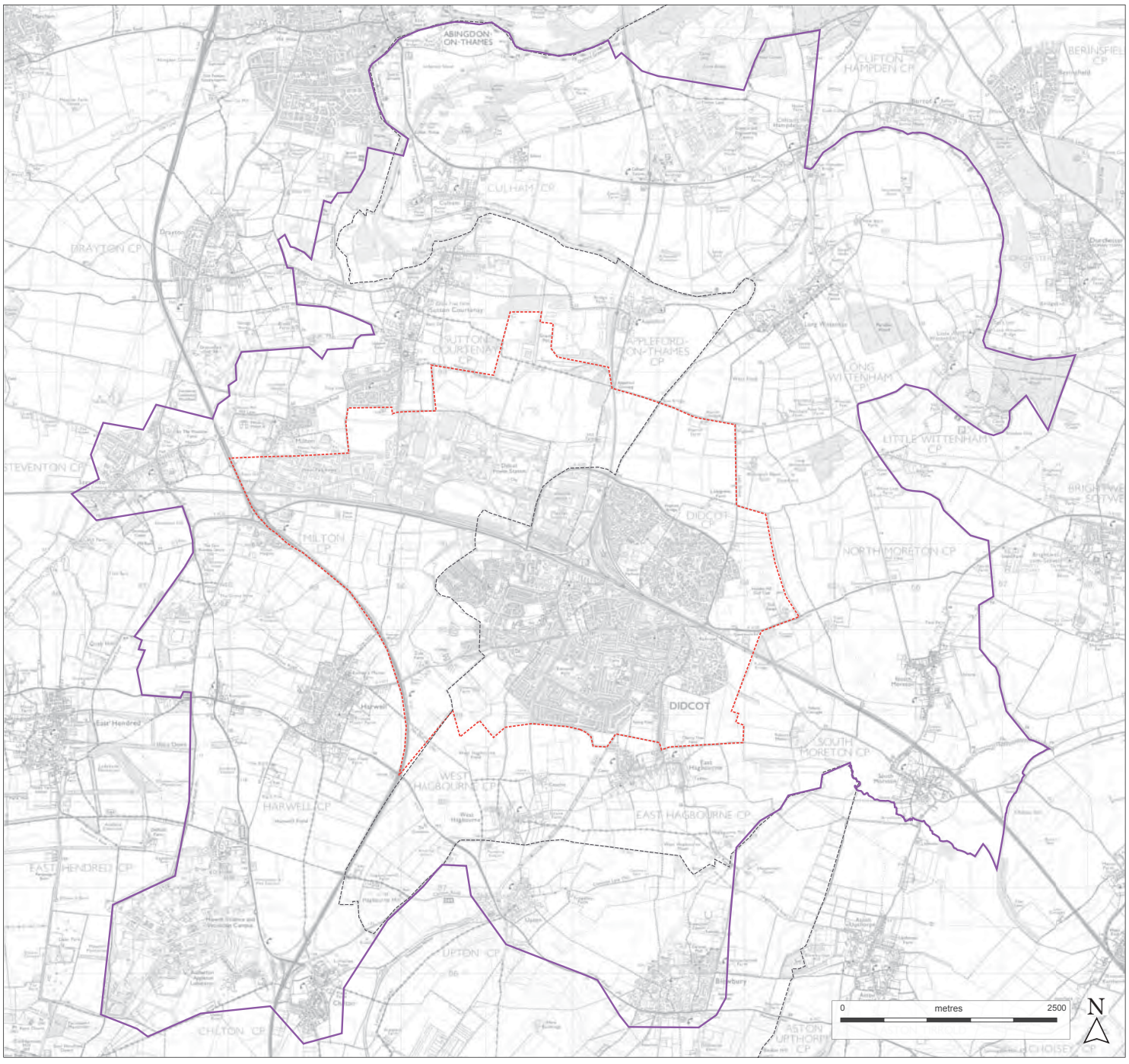
1.3.4. The geographic scope of this Strategy focuses on the area within the DGT boundary with consideration of GI links to the wider DGT area of influence. See Figure 1 Boundaries. Specifically, the purpose of this strategy is to:

- Provide a GI framework to inform masterplanning work
- Provide an evidence base for local plan policy development, in particular the Didcot Garden Town DPD
- Provide guidance to developers on the provision of GI on new developments
- Set out options for future funding and stewardship of the GI network

1.3.5. The Strategy identifies existing GI assets across the town and assesses which require protection and which would benefit from enhancements to quality or actions to improve

3 South & Vale Green Infrastructure Strategy, Chris Blandford Associates, 2017

fig 1 - Boundaries



KEY

- Didcot Garden Town boundary
- Local authority boundary
- Didcot Garden Town Area of Influence

their function. Using the proposed district open space standards as a starting point, the Strategy considers the need for additional GI to meet the needs of the existing and future increased population of the town and proposes a spatial GI network to ensure GI assets are linked to create sustainable movement corridors for people and wildlife.

1.3.6. GI assets are owned and managed by a range of organisations and delivering an effective GI network, which maximises the benefits for local people will require coordination and working in partnership. New development in the town brings opportunities to significantly invest in an improved GI network, but this will require ongoing funding and management. The Strategy considers the issues of GI governance, including potential alternative models of future funding and management. The delivery section of the Strategy will form the basis for future discussions on creating a sustainable and viable GI network in partnership with key stakeholders.

1.4. How the green infrastructure strategy has been developed

1.4.1. The Didcot Garden Town GI Strategy was prepared by Novell Tullett on behalf of South Oxfordshire and Vale of White Horse District Councils using the existing evidence base of district- and county-wide open space assessment and GI strategy work as well as local and national planning policy and strategy.

1.4.2. To realise the aspiration for Didcot to become a Garden Town, the Strategy also draws on the latest national best practice guidance on creating the next generation of garden towns and cities, primarily from the TCPA, as well as national best practice guidance from Natural England on planning positively for networks of biodiversity and GI4. See references at the end of this document for a full list of source documents.

1.4.3. The methodology used for developing the Strategy is outlined in the steps below:

- Analysis of current planning policy and district-wide GI strategy influencing GI protection, enhancement and creation within the Garden Town area, including a review of local standards for GI to ensure their applicability within the garden town setting.

4 Green Infrastructure Guidance, Natural England, 2009

- Identification of relevant socio-economic issues and priorities to inform GI needs, issues and opportunities.

- Analysis of the landscape context to the town, including landscape character, biodiversity, blue infrastructure, agriculture and heritage.

- Identification and mapping of the network of publicly accessible and private or non-publicly accessible GI assets, by typology and the routes and linkages connecting them.

- Assessment of the current quantity, quality and accessibility of existing publicly accessible GI assets in Didcot, using existing information from district-led assessments.

- Identification of any deficiencies in publicly accessible GI based on the current proposed open space standards in relation to current and future populations.

- Assessment of functionality of existing GI assets based on the ecosystem services they provide, identifying opportunities to increase functionality and therefore benefits for local people.

- Identification of key stakeholder issues, aspirations and needs through one to one meetings and feedback from wider masterplan and district GI strategy workshops.

- Identification of GI vision, objectives and key principles based on the findings from the above.

- Development of a spatial GI framework, including existing and proposed GI assets and linkages, based on the assessment of deficiencies and the aspirations and needs identified.

- Development of options for GI governance, funding and management.

- Identification of priority actions and next steps

2.0 Strategic context

2.1. Overview

2.1.1. Didcot is located in South Oxfordshire adjacent to the border with the Vale of White Horse district within Oxfordshire and is the focus for housing growth in the district. It forms a key part of the Science Vale strategic area of southern Oxfordshire, an area with the highest concentration of science research facilities and development activity in Western Europe[5]. The research and development activity is primarily located in three centres to the immediate west and north of Didcot; Harwell Campus, Culham Science Centre and Milton Park. Didcot is the main service centre and gateway entrance for the wider Science Vale area particularly by rail. The development plans for Didcot aim to improve the quality of the place to attract investment, and provide attractive places to live and work without compromising its natural beauty, historic and rural character. A Science Vale Area Action Plan is currently being developed[6] which includes protecting the distinctive character and heritage of Science Vale's market towns, villages and countryside and encouraging a 'step change' away from car travel towards public transport, cycling and walking.

2.1.2. Didcot's original expansion from village to town started with the arrival of the Great Western railway in 1839 when a station was built about half a mile from the original medieval village. This was followed by the building of the railway village of Northbourne at the end of the nineteenth century and commercial development and hotels around the station. In the 1920s several housing estates were built in the centre and the south side of Broadway developed as the shopping area. Housing development increased after the Second World War with new estates to the south, west and east of the town. In the 1980s work started on the Ladygrove Estate and Southmead Business Park to the north of the main line railway. In 2004 the Orchard Centre opened, moving the retail focus of the town to the north and east.

2.1.3. The power station is a key feature in Didcot located just across the district boundary in the Vale of White Horse. It has been a strong feature on the area's landscape for over forty years. Didcot A Power Station, which was a combined coal and oil power plant closed in 2013 and Didcot B Power Station is an active natural-gas power plant that supplies the

5 Oxfordshire Local Enterprise Partnership Strategic Economic Plan

6 Science Vale Area Action Plan Issues and Scope Document February 2015

National Grid. The power stations feature a chimney, which is one of the tallest structures in the UK, and three hyperbolic cooling towers (three others were demolished in 2014), which can be seen from much of the surrounding landscape.

2.1.4. To the north of Didcot and just south of the Thames is the Sutton Courtenay landfill site and an area with a long history of sand and gravel extraction and associated activities, currently managed by Hanson UK. With only a few years worth of permitted reserves, the Hanson site has potential to be restored for recreational use with ecological improvements. The landfill site is permitted to be filled until 20307, but is a potential long-term site for recreational use.

2.1.5. Today, Didcot has strong transport links with a railway station on the main London Paddington to Bristol line, and a branch line to Oxford and beyond and access to the A34 and M4 road links.

2.1.6. The piecemeal development of the town and lack of an historic core has resulted in a series of neighbourhoods which lack the connectivity and focus of a more traditional market town. A key challenge is to create an improved town centre including enhanced green links between the centre and surrounding areas, in particularly across the barrier of the railway[8].

2.2. Socio-economic context

2.2.1. Didcot is a key growth area in Oxfordshire and was awarded Garden Town status by the Government in December 2015 following a successful bid by South Oxfordshire and Vale of White Horse District Councils in partnership with Oxfordshire County Council and the Oxfordshire Local Enterprise Partnership. Didcot's Garden Town status emphasises the importance of maximising the potential of the area's green spaces and the town's easy access to the countryside.

2.2.2. By 2031, Didcot's population is projected to have grown from 25,140, (Census 2011) to around 62,500. It is therefore essential that the needs of the number of people living in the town by the end of the Local Plan period are planned for and that new development provides the necessary GI to meet the needs of new residents.

7 Oxfordshire Minerals and Waste Local Plan. Part 1 – Core Strategy. Proposed submission document, 2015

8 South Oxfordshire Core Strategy 2012

2.2.3. The town is anticipated to see a large increase in the number of people over the age of 65 over the plan period. In addition, whilst the town is relatively affluent, there are some communities that experience deprivation, and Didcot has one area, Didcot All Saints ward, within the top 30 per cent in the English Index of Multiple Deprivation[9], (see Figure 2 Socio-economic context). Areas to the south of the railway have relatively low incomes and high proportions of social housing compared to north of the railway line. These factors are important considerations when planning future GI provision to ensure that inclusive, healthy and equitable communities are created. Older people are likely to be less mobile with more limits on the distance they can travel to green spaces. Deprived communities typically have less access to high quality green spaces for healthy recreation, despite being the most likely to benefit from them[10].

2.2.4. Promoting healthy lifestyles and increasing physical activity in people of all ages is highlighted as a priority in the Oxfordshire Health and Wellbeing Strategy[11]. There is growing evidence of the link between physical inactivity and preventable disease and early death and a network of high quality green spaces and routes can encourage people to be physically active.

2.2.5. Climate change is a risk to the future success of the town's economy with milder and wetter winters and associated heavy rainfall causing severe flooding in recent years, affecting homes and businesses and causing travel disruption. A likelihood of hotter summers and more frequent heatwaves, brings associated risks to health particularly in the elderly and vulnerable people[12].

2.2.6. Didcot is already undergoing considerable change and much of the infrastructure including GI has already been consented through the planning process – development sites such as Great Western Park are being built out with new parks and green space. Other large development sites with planning consent are in the pipeline such as North East Didcot (in SODC), Valley Park (in VoWH) and the site of Didcot A (cross-boundary). Other sites, such as Ladygrove East, have been identified as opportunity sites for potential future development.

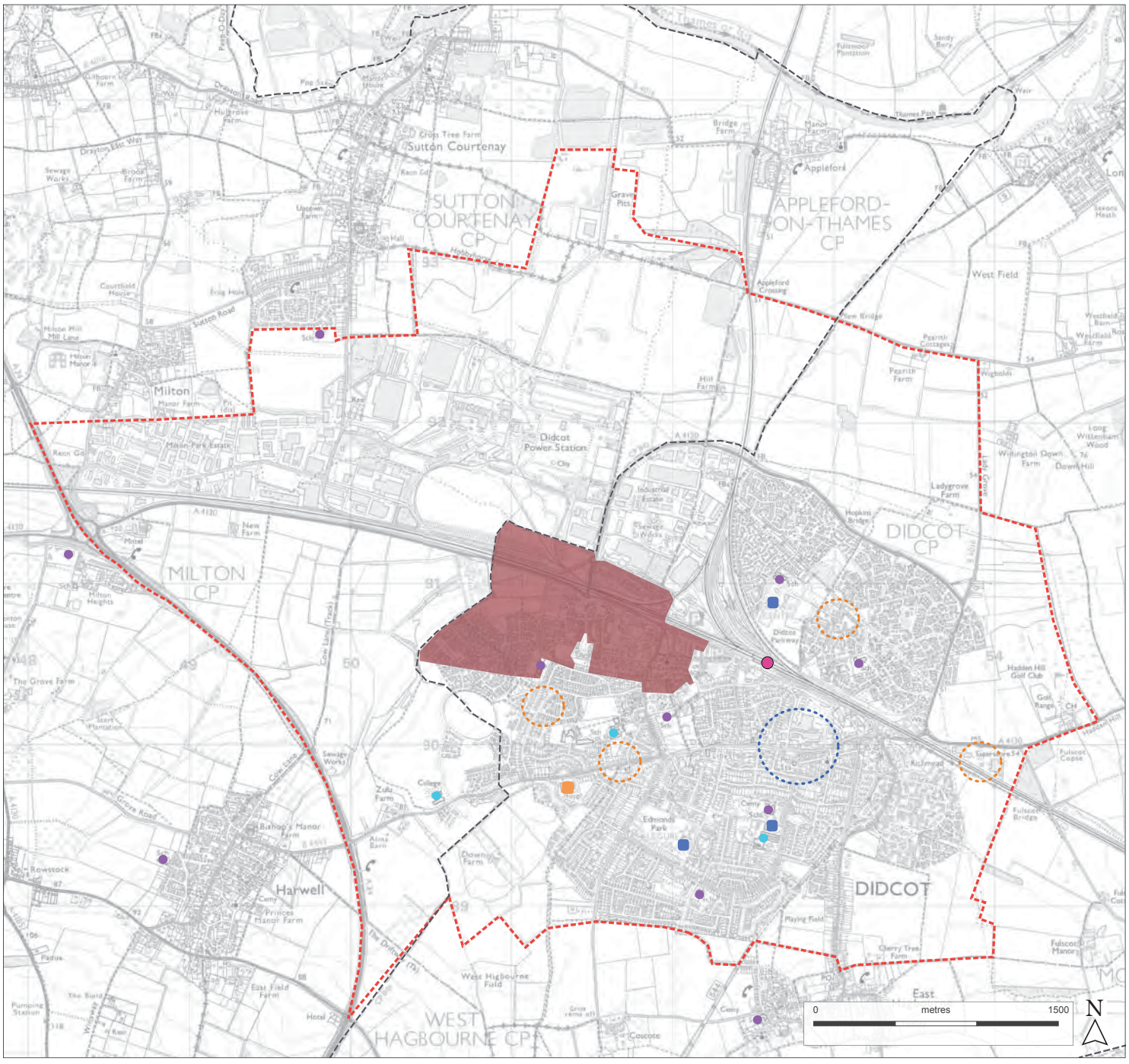
9 https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

10 Urban green nation: building the evidence base CABE, 2010

11 Oxfordshire's Joint Health & Wellbeing Strategy 2015 - 2019

12 http://ukclimateprojections.defra.gov.uk/

fig 2 - Socio-economic context



KEY

- Town centre
- Secondary centre
- Primary school
- Secondary school
- Leisure
- Hospital
- Railway station
- Area of Multiple Deprivation within the 30% most deprived in England
- Didcot Garden Town boundary
- Local authority boundary

2.2.7. Transport improvements to accommodate sustainable economic and housing growth in Didcot and the Science Vale area are being delivered by Oxfordshire County Council and the Highways Agency including road junction improvements and cycle network improvements. Improvements to Didcot Parkway Station Interchange and A4130 capacity improvements including a Didcot Science Bridge across the railway are at feasibility stage. Figure 3 Development Context shows the key development sites and proposed transport improvements.

2.3. Planning policy context

2.3.1. National Planning Policy13 requires local planning authorities to plan positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. It also requires the planning system to contribute to and enhance the natural and local environment by various means including recognising the wider benefits of ecosystem services. National Planning Practice Guidance14 highlights how GI is important to the delivery of high quality sustainable development, alongside other forms of infrastructure such as transport, energy, waste and water providing multiple benefits, notably ecosystem services, at a range of scales. The Guidance also recommends that 'arrangements for managing green infrastructure, and for funding its management over the long-term, should be identified as early as possible when planning green infrastructure and factored into the way that it is designed and implemented'.

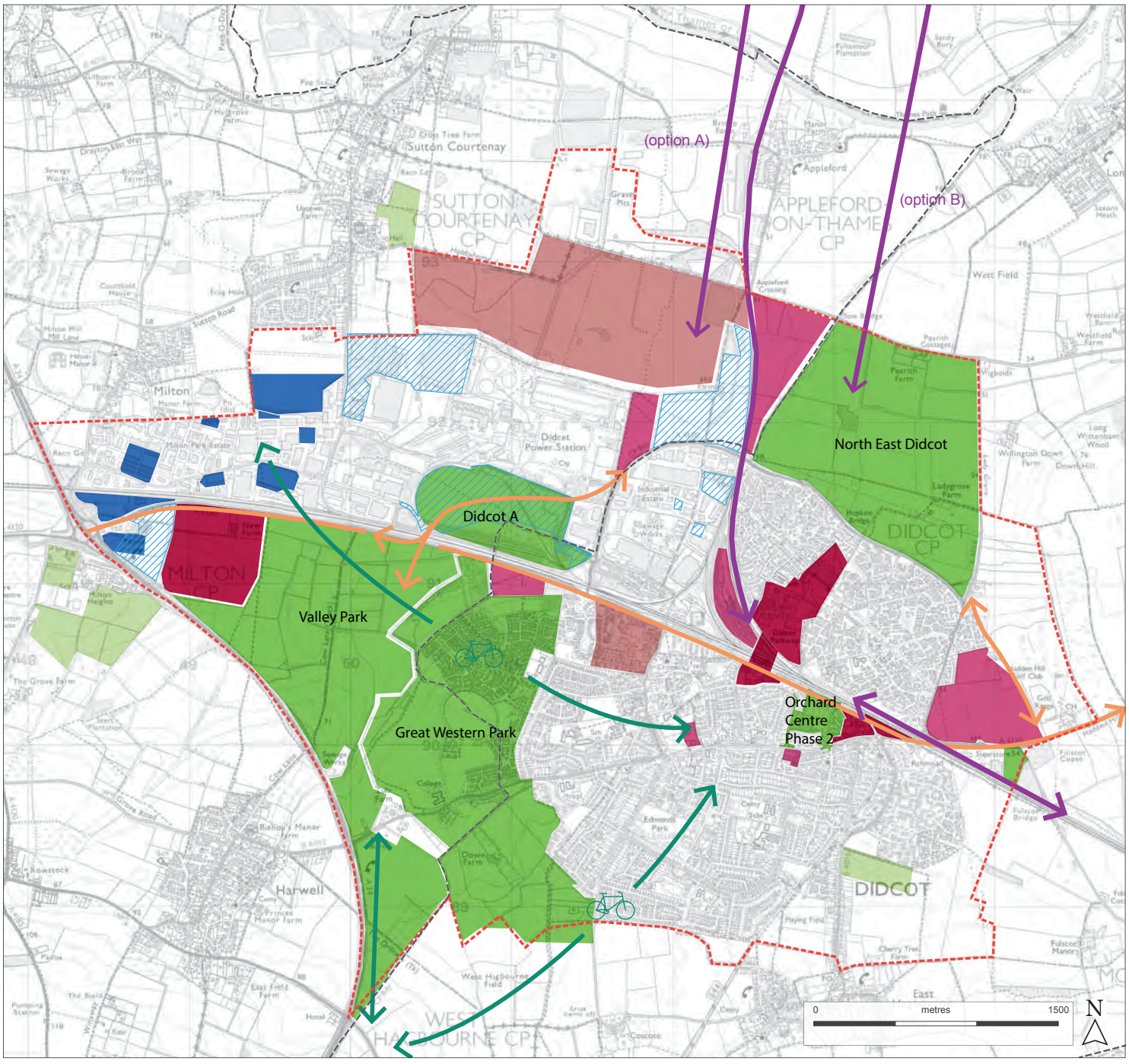
2.3.2. Oxfordshire County Council plays an important role in the provision and management of GI in the DGT area as the authority responsible for highways, public rights of way, minerals and waste. The Oxfordshire Rights of Way Management Plan 2015, emerging Local Transport Plan, Connecting Oxfordshire: Local Transport Plan 2015-2031 and Minerals and Waste Local Plan 2031 identify potential GI opportunities. The County also has developed a draft Green Infrastructure Framework for Oxfordshire with nine principles for GI in Oxfordshire – see Appendix A for details.

2.3.3. Although the existing town of Didcot is located largely within South Oxfordshire district, many of the proposed development sites are located within the Vale of White Horse district and the wider Didcot Garden Town area extends across both local authority areas. Both

13 National Planning Policy Framework, 2012

14 http://planningguidance.communities.gov.uk/blog/guidance/natural-environment/green-infrastructure/

fig 3 - Development context



KEY

- Consented development sites
- Planning application pending
- Science Vale Entreprise zone
- Didcot growth accelerator
- Opportunity site - Next 10 years
- Opportunity site - Next 20 years
- Opportunity site - Next 30 years
- Transport improvements recently completed Near Term (2016 - 2026)
- Transport improvements Medium Term (2016-2031)
- Transport improvements Long Term (2026-2031 and beyond)
- Didcot Garden Town boundary
- Local authority boundary

districts are developing updated Local Plans, which will cover the period up to 2031 and 2032 respectively and are due to be adopted by 2018.

2.3.4. Both the South Oxfordshire Core Strategy and the Vale of White Horse Local Plan, recognise the importance of green infrastructure including the character and quality of the landscape. A summary of key policies related to GI can be found in Appendix A.

2.3.5. South Oxfordshire's adopted Core Strategy 2012 has a strong focus on the growth of Didcot. A total of 6,300 homes have been allocated to Didcot up to 2027. These will be based at the strategic sites of Didcot North East, Great Western Park, Ladygrove East, Vauxhall Barracks and the Orchard Centre Phase 2.

2.3.6. The Core Strategy 2012 recognises the need for additional housing must be balanced against protecting and enhancing the natural environment and providing a 'linked Green Infrastructure framework,' which facilitates access to open spaces and the countryside. Core Strategy Objective 3: Environment and Design requires all new development to provide GI as well as enhance and manage the natural environment. Policy CSG1 Green infrastructure requires a net gain in green infrastructure including biodiversity to be sought through developer works, developer contributions and the targeted use of other funding sources. Proposals for new development must demonstrate that they have taken into account the relationship of the proposed development to existing green infrastructure. Where appropriate, proposals will be required to contribute to the delivery of green infrastructure and/or the improvement of existing assets. Policy CSB1 Conservation and improvement of biodiversity states that a net loss of biodiversity will be avoided, and opportunities to achieve a net gain across the district will be actively sought, including the connection of sites, large-scale habitat restoration, enhancement and habitat re-creation.

2.3.7. Didcot Garden Town lies within the South-East Vale Sub-Area of the Vale of White Horse Local Plan 2031 and houses significant employment sites, including Milton Park and the site of Didcot A Power Station. The Plan includes strategic housing allocations of 3350 dwellings by 2031 on two sites within the DGT area – Valley Park and North West Valley Park.

2.3.8. Protecting the environment forms a key part of Vale's Local Plan. Chapter 6d Environment includes policies on the historic environment, landscape, green infrastructure and conservation and improvement of biodiversity as well as design and local distinctiveness

and sustainable design and construction. *Core Policy 45: Green Infrastructure* requires a net gain in GI including biodiversity, either through on-site provision or off-site contributions and the targeted use of other funding sources. Proposals for new development must provide adequate GI in line with the GI Strategy. *Core Policy 46: Conservation and* Improvement of Biodiversity states that a net loss of biodiversity will be avoided and development that will conserve, restore and enhance biodiversity in the district will be permitted.

2.3.9. The evidence base for South and Vale GI related policies can be found across a number of studies. The South and Vale Green Infrastructure Strategy 2017 covers natural and semi-natural green spaces as well as other types of green infrastructure. South Oxfordshire District Council Open Spaces, (Nortoft, 2016) and draft Vale of White Horse District Council Joint Recreational Space, Local Leisure Facilities and Playing Pitch Study, (Nortoft, 2016) include proposed quantity, quality and accessibility standards for parks and gardens, amenity green space, allotments and children's play space and youth provision. An assessment of the applicability and implications of proposed open space standards within the DGT area is discussed in section 5.

3.0 Overview of existing green infrastructure

3.1. Landscape character and heritage

3.1.1. With evidence of settlement from the Iron Age and later Romano-British, the future parish of Didcot was sited on a well-watered wooded ridge that arose from the marsh which covered the low-lying land to the north of the current railway, stretching from Sutton Courtenay in the west to Fulscott and the Moretons in the east[15]. It remained a village largely medieval in character until the 19th Century when in 1839 the Great Western Railway was laid down through Didcot. Once the Branch Junction to Oxford was sited there in 1844, Brunel's covered station was built and the conditions for the town's growth were set.

3.1.2. Today the area around Didcot is predominantly rural dominated by agriculture with a diverse pattern of landscapes, including rolling downland, extensively wooded hills, historic parkland, low-lying farmland and riverside meadows, with a scattering of rural villages. The National Character Area Map identifies two Character Areas within the Didcot Garden Town area of influence; Upper Thames Clay Vales and Berkshire and Marlborough Downs. The National Character Areas provide a broad context for defining three local character areas, which fall within the Garden Town area; River Thames Corridor - the flat, low-lying alluvial land which forms the corridor along the River Thames, Vale & Downs Edge - a tract of mixed landscape lying between the River Thames and the Downs, comprising an area of low-lying land, partly encircled by the chalk hills of the Wessex Downs and the outlying Sinodun Hills and Nuneham Courtney Ridge - comprising the southerly part of a ridge of low limestone hills, that appear as a spur above the River Thames[16]. See Figure 4 Landscape Character Areas

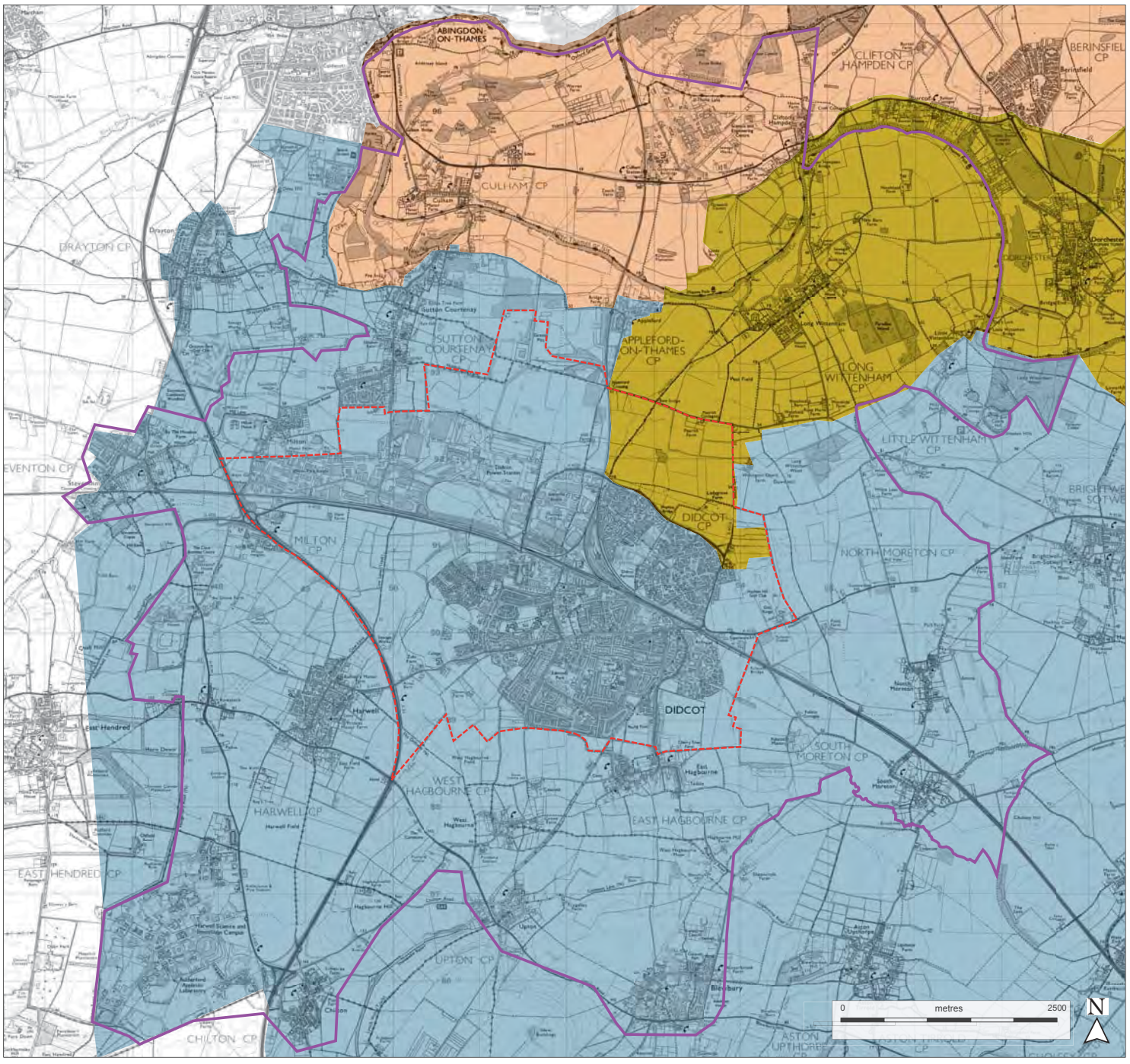
3.1.3. The DGT Landscape Character Assessment[17] considers the landscape character in more detail within the planned garden town area and its area of influence. The majority of the Didcot Garden Town area beyond the existing town is currently undulating lowland farmland on predominantly Jurassic and Cretaceous clays. Much of the area is underlain by Upper Greensand providing pronounced, rolling landform and lighter, calcareous and fertile

15 http://www.didcot.gov.uk/Didcot-History.aspx

16 South Oxfordshire Landscape Assessment 1998

17 Didcot Garden Town Landscape Character Assessment, Novell Tullet, 2016

fig 4 - Landscape character



KEY

Local landscape character areas

- Nuneham Courtney Ridge
- River Thames Corridor
- Vale & Downs Edge

- Didcot Garden Town boundary
- Didcot Garden Town Area of Influence

soils. The major feature to the north and west is the River Thames, its flood plains and tributaries, which are fed from higher ground. The alluvium and gravel terraces spread over this area, give rise to gently undulating topography. The alluvial flats are resistant to drainage creating the wet 'valley bottom' pasture areas, while the raised, better drained gravel ground is better suited to settlement and cultivation. To the south-west of the Didcot Garden Town area, part of the chalk uplands that form the North Wessex Downs, rise to form an elevated plateau of smoothly rolling or undulating topography, incised by dry valleys or combes, with scrub woodland on some of the steeper slopes. Soils are predominantly light, free-draining and thin except where clay-with- flints cap the chalk, creating localised areas of damp, heavier soils.

3.1.4. The main land use beyond the urban areas is arable farming with some grazing and a few orchards to the south-east. Agricultural land quality is generally high (grade 2 to 3b) around the town with relatively rich loamy and clayey soils, freely draining to the south and west of the town and seasonally wet to the north and east[18].

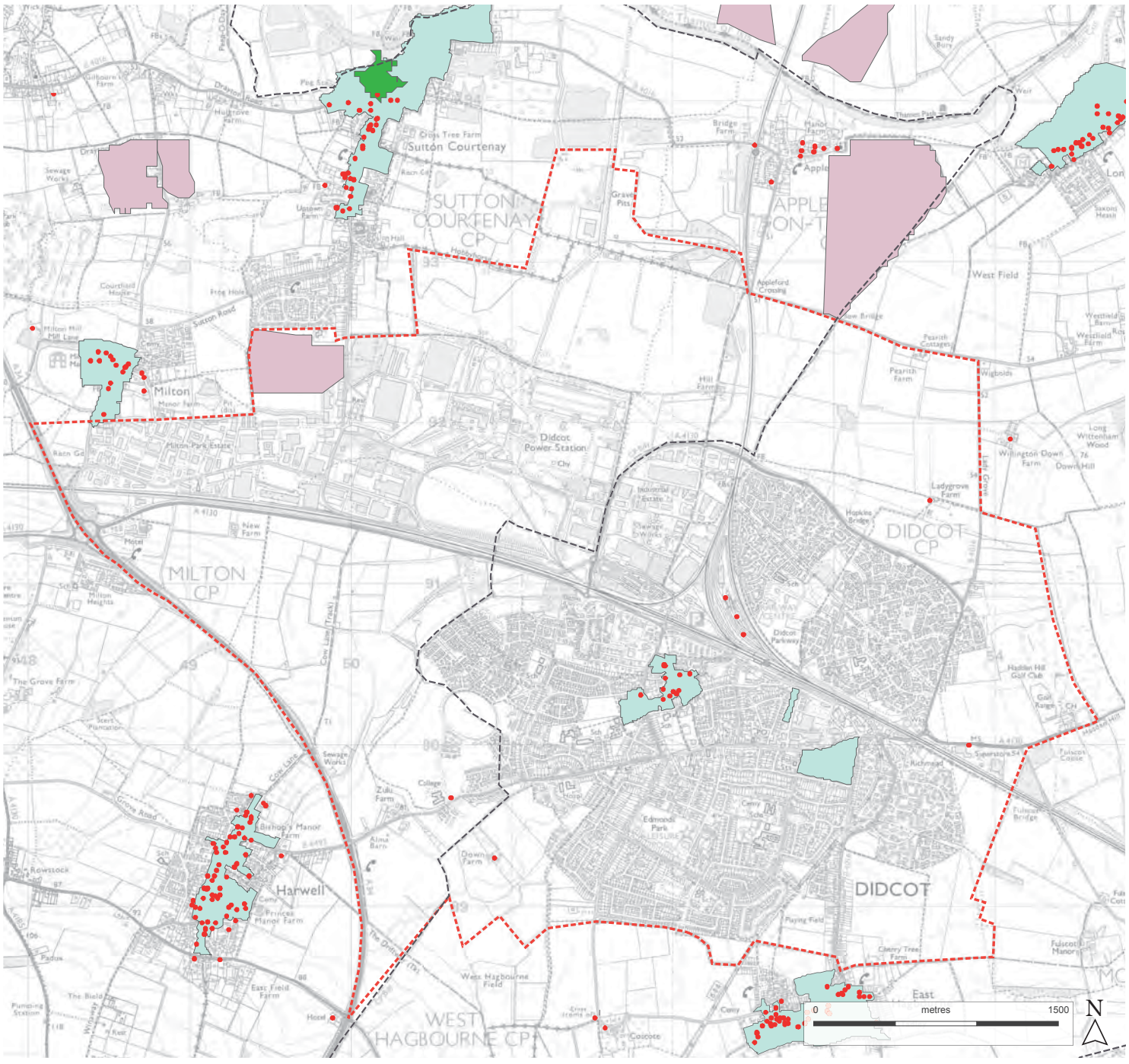
3.1.5. The land to the north of the town has been subject to substantial change from the effects of ongoing mineral extraction, landfill and industrial development. The power station, railway and major roads are also major built features in the landscape.

3.1.6. There are few heritage designations within the DGT area and no Registered Historic Parks and Gardens. However just to the north west of the power station site is a Scheduled Monument, one of a number of settlement sites concentrated along the River Thames between Abingdon and Didcot. There are also seven listed buildings within and around the town and and three conservation areas: Didcot Old Area, Didcot Northbourne Area and Didcot Station Road. Heritage designations are shown on Figure 5 Heritage Designations.

3.1.7. Two Areas of Outstanding Natural Beauty (AONB), the Chilterns and the North Wessex Downs, are beyond the Garden Town boundary but are important due their visual prominence within its context, and the nearby recreation they offer. The Oxford Greenbelt lies just to the north of the Thames as shown on Figure 6 Protected landscapes and Green Be*lt*.

18 http://www.natureonthemap.naturalengland.org.uk/magicmap.aspx

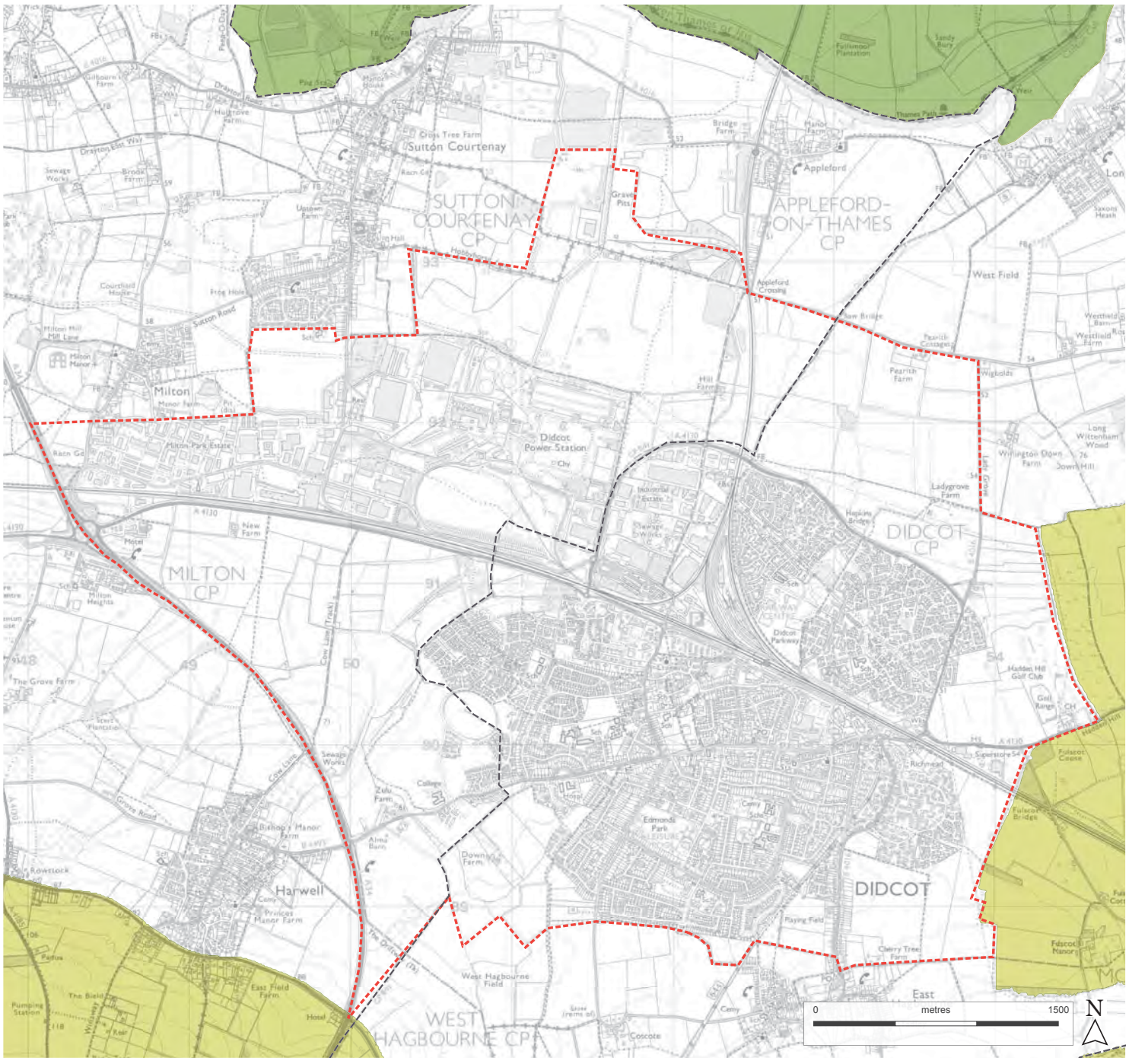
fig 5 - Heritage designations



KEY

- Scheduled Monuments
- Listed buildings
- Conservation areas
- Registered Parks and Gardens
- Didcot Garden Town boundary
- Local authority boundary

fig 6 - Protected Landscapes and Green Belt



KEY

- North Wessex Downs AONB
- Oxford Green Belt
- Didcot Garden Town boundary
- Local authority boundary

3.2. Habitats and biodiversity

3.2.1. The existing town of Didcot has limited biodiversity with most green spaces being managed primarily for amenity use. The UK Biodiversity Action Plan (UK BAP) identifies a range of semi-natural habitat types, which are most at threat and requiring conservation action. Natural England identifies small areas of Priority Habitat within and around the town, mainly Deciduous Woodland and Lowland Meadow with a few Traditional Orchards to the south-west.

3.2.2. There is one designated Local Nature Reserve (LNR) in the town, Mowbray Fields which is situated immediately south of Didcot and northwest of East Hagbourne. The LNR designation was primarily to secure the management of the area for its existing wildlife value, and in particular for its special nature conservation interest in the fill pond. The fill pond was constructed as a flood overflow for the adjacent brook to prevent the flooding of East Hagbourne during heavy rains. In the years since its construction the fill pond has developed a varied and interesting ecosystem that includes a healthy population of common spotted and southern marsh orchids. The site is managed by the Earth Trust on behalf of the Council.

3.2.3. Just south of the DGT boundary, the disused Didcot to Upton Railway line is a designated Local Wildlife Site for the chalkland habitat it provides.

3.2.4. Little Wittenham to the north-east of Didcot is a 68.65 hectare Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). One of the best-studied great crested newt sites in the UK, Little Wittenham comprises two main ponds set in a predominantly woodland context (broad-leaved and conifer woodland). There are also areas of grassland, with sheep grazing and arable bordering the woodland to the south and west. The River Thames is just to the north of the site, and a hill fort to the south. The site also supports large breeding populations of smooth newts, common frogs and common toads. The north and east of the existing town area fall within the SSSI Impact Risk Zone of this site.

3.2.5. The Didcot power station site falls within the SSSI Impact Risk Zone of a SSSI just north of Culham, Culham Brake, a 1.48 hectare area of willow carr naturally subjected to flooding by the adjacent water course. Impact Risk Zones are a tool developed by Natural England to

make a rapid initial assessment of the potential risks posed by development proposals to Sites of Special Scientific Interest, Special Areas of Conservation, Special Protection Areas and Ramsar sites. They define zones around each site reflecting the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

3.2.6. The Thames Valley Environmental Records Centre (TVERC) has defined and mapped key target areas for nature conservation action in Oxfordshire known as 'Conservation Target Areas'. Only a small area to the north of the DGT area of influence falls within a CTA, the Thames Clifton to Shillingford CTA which includes the woodland at Little Wittenham. See *Figure 7 Habitats and Biodiversity.*

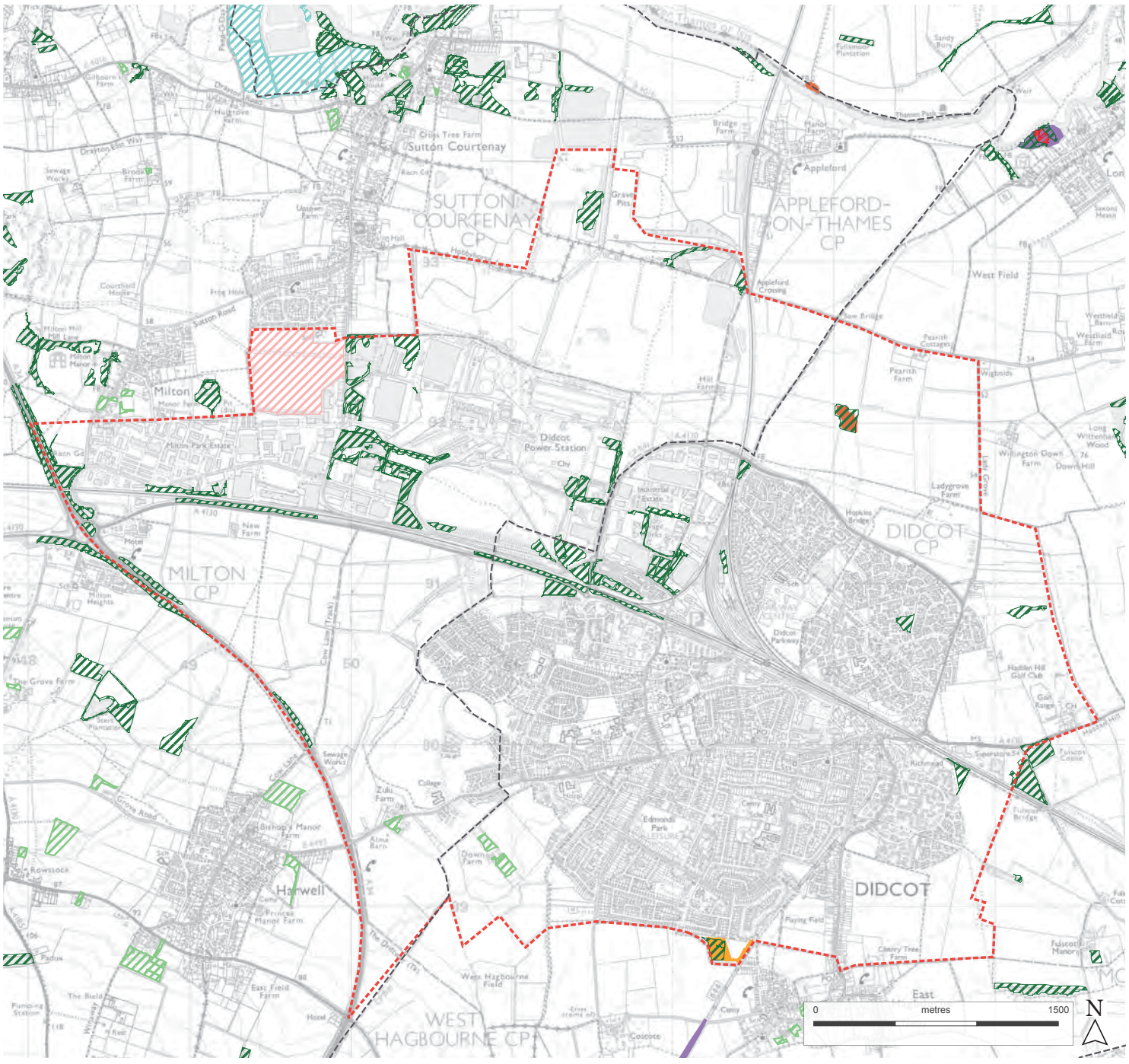
3.3. Blue infrastructure

3.3.1. Watercourses provide part of the diversity, character and interest of landscapes and create a functional blue infrastructure network which when well managed, contribute to the biodiversity and water quality in an area and can provide accessible recreation space. Where space for waterways to overtop their immediate channel has been properly provided flooding is less of an issue to surrounding development.

3.3.2. Two tributaries of the River Thames, the Moor Ditch and Ladygrove Brook run through the north of the town and Hakkas Brook flows just south of the town through East Hagbourne. Historically much of the current area of Didcot was poorly drained and marshy, particularly north of the railway line and parts of this area is designated by the Environment Agency as Flood Zone 2 and 3. Today, the main area of fluvial flood risk to existing development is to the Ladygrove Estate from the Ladygrove Brook. The floodplains of Hakkas Brook and Moor Ditch cover greenfield areas beyond the town. A flood relief scheme in Mowbray Field includes a retention pond to intercept water from south east Didcot to stop flooding of East Hagbourne, and which now forms the Mowbray Park Local Nature Reserve.

3.3.3. Many of the watercourses in Didcot have been artificially straightened, throttled by culverts, especially under the railway and their amenity and wildlife value is much diminished as a result. See Figure 8 Blue Infrastructure.

fig 7 - Habitats and biodiversity



KEY

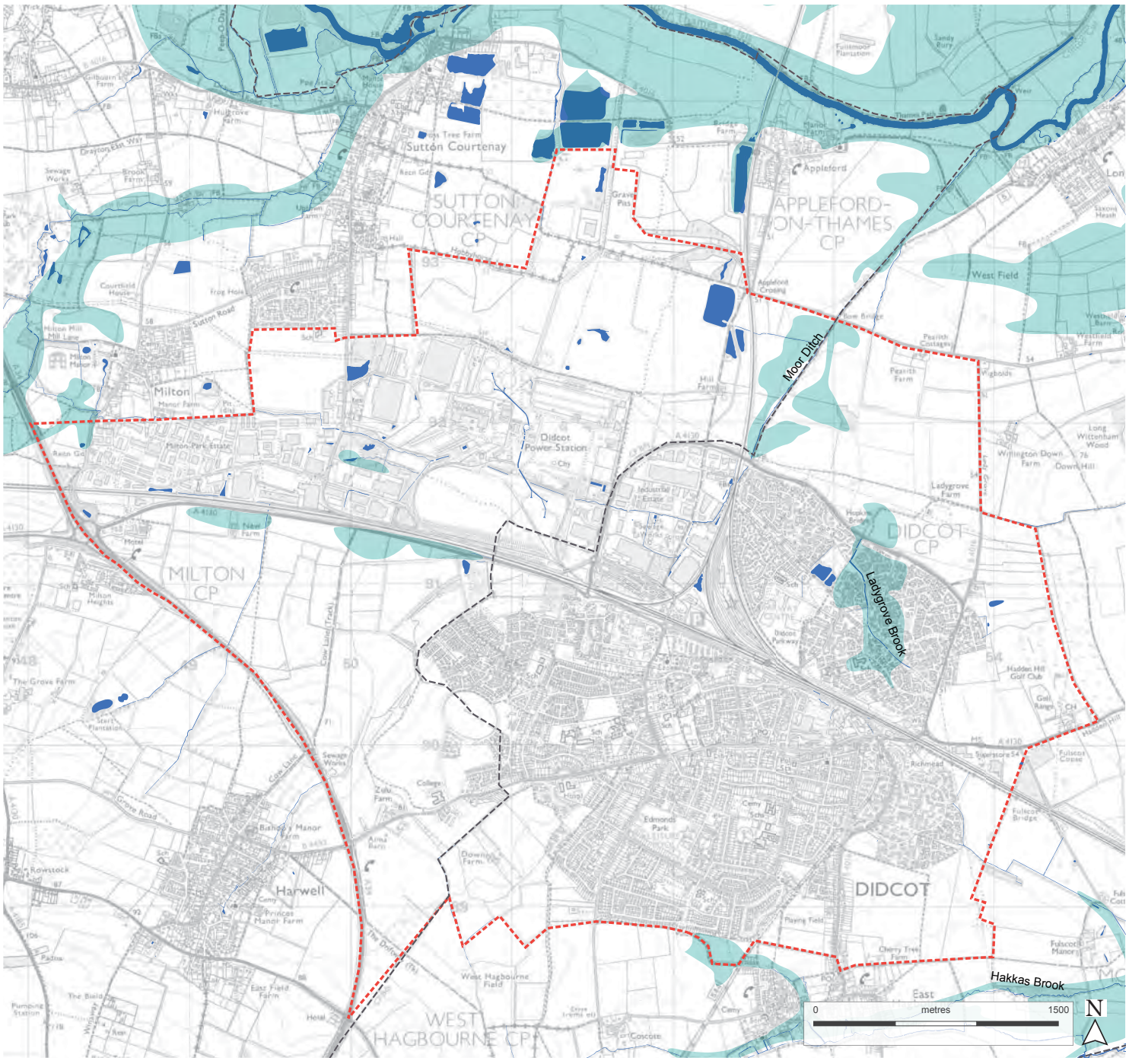
Priority habitats

- Deciduous woodland
- Reedbeds
- Lowland meadows
- Traditional orchard
- Coastal and floodplain grazing march

- Ancient woodland
- Local Nature Reserve
- Local Wildlife Site

- Didcot Garden Town boundary
- Local authority boundary

fig 8 - Blue infrastructure



KEY

- Water courses
- Flood zones
- Didcot Garden Town boundary
- Local authority boundary

3.4. Publicly accessible green space

3.4.1. Publicly accessible green space provides access to healthy recreation, important social space and encourages more sustainable forms of movement. The review of publicly accessible green space in Didcot is based on open space assessments carried out by Nortoft for both South and Vale districts[19] as well as the draft South and Vale Green Infrastructure Strategy. It updates the accessible natural greenspace assessment in the 2008 Didcot Greenspace Network feasibility study.

3.4.2. In general, Didcot is reasonably well provided with accessible green space, in particular small amenity spaces, which provide important doorstep spaces for local residents. The north of Didcot includes the 'Ladygrove Loop', which opened in 2011 and comprises a green, circular walking, cycling and fitness route with wildflower meadows.

3.4.3. Most of the public parks, gardens and amenity green spaces in Didcot are currently managed by Didcot Town Council under a grounds maintenance contract with the exception of green spaces created on new development sites which have not been adopted by the Council. In addition, some wildlife sites are managed by local Trusts with the help of local community volunteers. See Figure 9 Publicly accessible green space. Section 4 provides an assessment of existing publicly accessible green space quantity, quality and accessibility by typology. A full list of sites can be found in Appendix B.

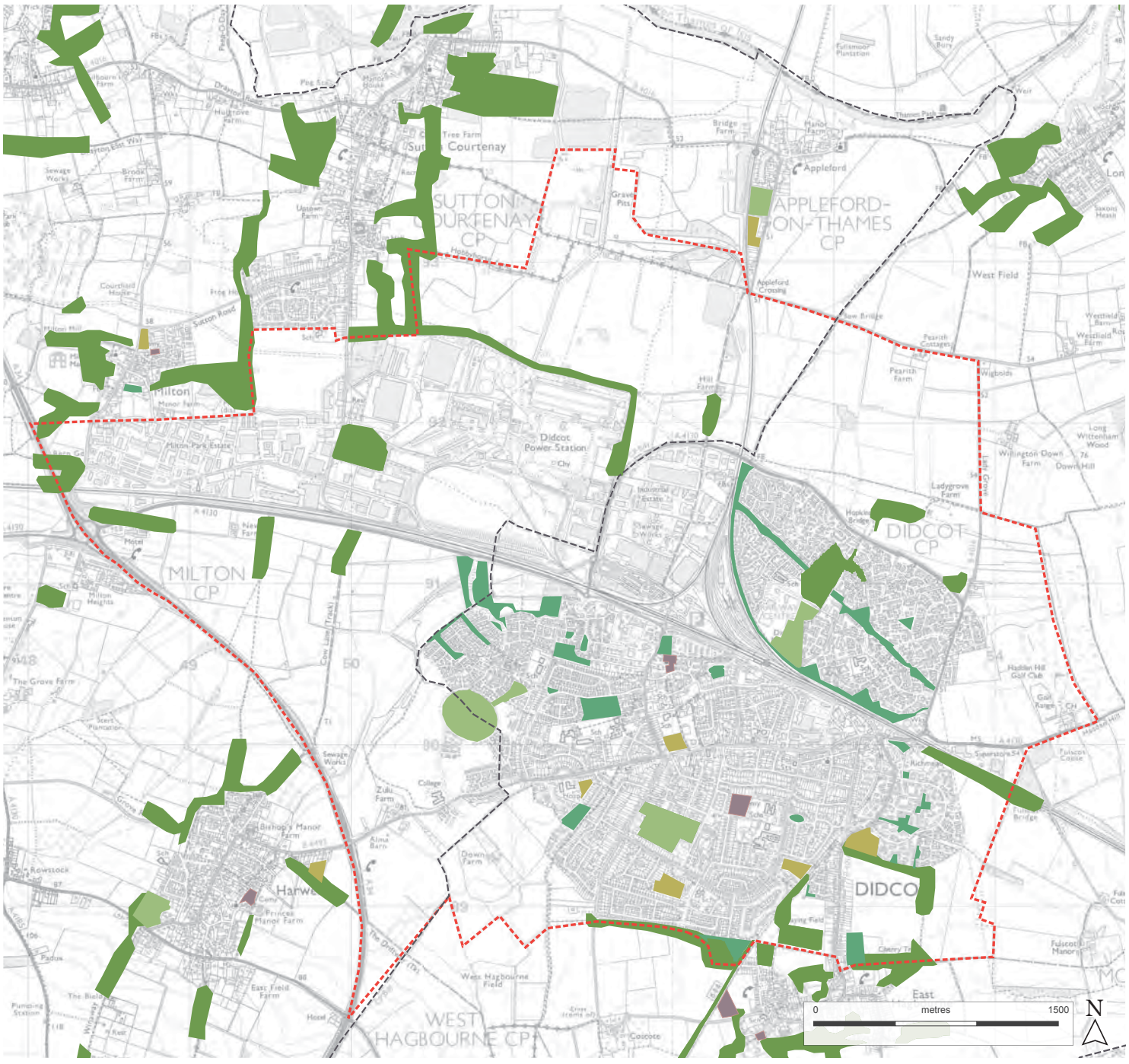
Parks and Gardens

3.4.4. Parks and gardens provide accessible, high quality multi-functional green space defined by the Fields in Trust's (FiT) Guidance for Outdoor Sport and Play: Beyond the Six Acre Standard, England (2015) as, 'formal green spaces including urban parks, country parks, forest parks, and formal gardens'.

3.4.5. The review identified three parks and gardens in Didcot - Edmonds Park, Ladygrove Park and the recently created Boundary Park located in new development to the west of Didcot, (Great Western Park).

19 Open Spaces, South Oxfordshire District Council, Nortoft, 2016, Joint Recreational Space, Local Leisure Facilities and Playing Pitch Study, Draft report Open Spaces, Nortoft, November 2016

fig 9 - Publicly accessible green space



KEY

- Existing natural and semi-natural green space (including countryside accessible from public rights of way within 300m of the urban area)
- Existing park and garden
- Existing amenity green space
- Existing allotment
- Existing cemetery and churchyard
- Didcot Garden Town boundary
- Local authority boundary

3.4.6. Edmonds Park at 7.82 hectares is the main park serving south Didcot and comprises a large, flat grass space surrounded by mature trees with two children's play areas, senior and junior football pitches, sports courts and pavilion and a recently installed adult exercise equipment area. The younger children's playground is located to the south of the park near the adjacent Didcot Wave Leisure Pool, which provides convenient toilet and cafe facilities as well as free car parking.

3.4.7. Ladygrove Park, located immediately to the north of the train station and railway line, and south of Tyne Avenue provides mostly formal green space with football pitches, play area, multi-use games area (MUGA), skatepark and three tennis courts. Together with Ladygrove Lakes immediately to the north, this park covers an area of 12.75 hectares and forms the central focus of the circular green route, the 'Ladygrove Loop'.

3.4.8. Boundary Park is a new multi-sports facility situated within the Great Western Park development with 7.08 hectares of green space including two cricket pitches, two rugby pitches, one full size football pitch and five junior pitches of assorted sizes. All of the pitches have been built to Sport England specifications along with modern drainage systems to ensure that playing surfaces are provided all year round. The pitches are serviced by a two storey pavilion with changing rooms and a social space which includes a bar, kitchen and function room. Boundary Park is leased from South Oxfordshire and Vale of White Horse District Councils by Boundary Park Sports Association, a new Charitable Incorporated Organisation set up with the specific aim of managing these facilities. Boundary Park is home to Didcot Cricket Club, Didcot Rugby Union Football Club and Harwell & Hendred Youth Football Club. The pitches are available to other local clubs for hire when not in use by these clubs and the public can use the grass areas for general recreation when not in use by the sports clubs.

Amenity green space

3.4.9. Amenity green space, defined by the Fields in Trust's Guidance for Outdoor Sport and Play: Beyond the Six Acre Standard, England (2015) constitutes 'informal recreation spaces, communal green spaces in and around housing, and village greens'. They often provide important informal space for children to play close to home and contribute to the quality and 'greenness' of a neighbourhood.

3.4.10. The review identified 20 amenity green spaces in Didcot including the linear green spaces of

the Ladygrove Loop, Smallbone Recreation Ground, located just north of the Town Council offices and home to the Didcot Bowls Club and newly created housing green spaces in Great Western Park. Spaces of less than 0.2 ha in size and without obvious recreational use were not included in the assessment.

Allotments

3.4.11. Allotments are available for local people to rent from the town council and provide opportunities for growing produce whilst providing landscaped open space for the local area that can promote improved physical and mental health. Allotments can contribute to the quality of life of communities by providing a cheap source of good food, healthy outdoor exercise and social interaction and if managed well can enhance the biodiversity in an area.

3.4.12. There are five Statutory allotment sites in Didcot at New Road, Broadway, Wantage Road, Cockcroft Road and Mereland Road. Statutory allotment sites are protected by the Allotments Acts. There is currently a waiting list for allotment plots in the town.

Natural and semi-natural green space

3.4.13. The definition of natural space within Natural England's Accessible Natural Greenspace Standard (ANGSt) is, 'places where human control and activities are not intensive so that a feeling of naturalness is allowed to predominate' (Natural England, 2010). In line with Natural England's recommendations, sites included within this definition include designated nature conservation areas (eg local nature reserves), woodland, remnant countryside within urban/urban fringe areas, formal/informal open space and unimproved grassland and open access land. Due to the proximity and accessibility of the countryside at the urban fringes, the assessment included Public Rights of Way, (PRoW) buffered by 50m either side within 300m of the settlement boundary.

3.4.14. The review identified three natural and semi-natural green spaces within the existing town of Didcot – Mowbray Fields Local Nature Reserve, (LNR), Didcot Millenium Wood and Ladygrove Lakes.

3.4.15. Mowbray Fields LNR, managed by the Earth Trust, covers an area of 1.88 hectares out of a total site area of 3.68 hectares. The reserve includes a small section of stream, a wildflower meadow, part of a railway embankment and the fill pond. The area not designated as LNR is

an area of amenity grassland with scattered trees that is managed as a recreational area by Didcot Town Council.

3.4.16. Didcot Millenium Wood at the Hagbourne Triangle to the south of the town is a 3.6 hectare mixed deciduous wood with native species shrubs and ephemeral pond. Ladygrove Lakes is a wildlife area with two fishing lakes created as part of the Ladygrove Loop. Both are managed by Didcot Town Council.

Cemeteries and churchyards

3.4.17. Cemeteries and churchyards are publicly accessible, and although many may not view them as places for recreation, they can deliver many of the amenity and ecological benefits as parks and form an important part of the GI network. They are often highly valued by communities for their spiritual and historical qualities. Many are havens for wildlife as maintenance can be low key, and there are often fine tree specimens in the older churchyards. There are two cemeteries in Didcot.

3.4.18. Kynaston Road Cemetery is a site of 1.6 Hectares with cherry-lined driveways and seasonal flower-beds providing areas for burials and cremated remains. The site is largely well hidden behind surrounding houses but together with adjacent school playing fields, provides a relatively large green open space in the south of the town. It has not been formally assessed for quality.

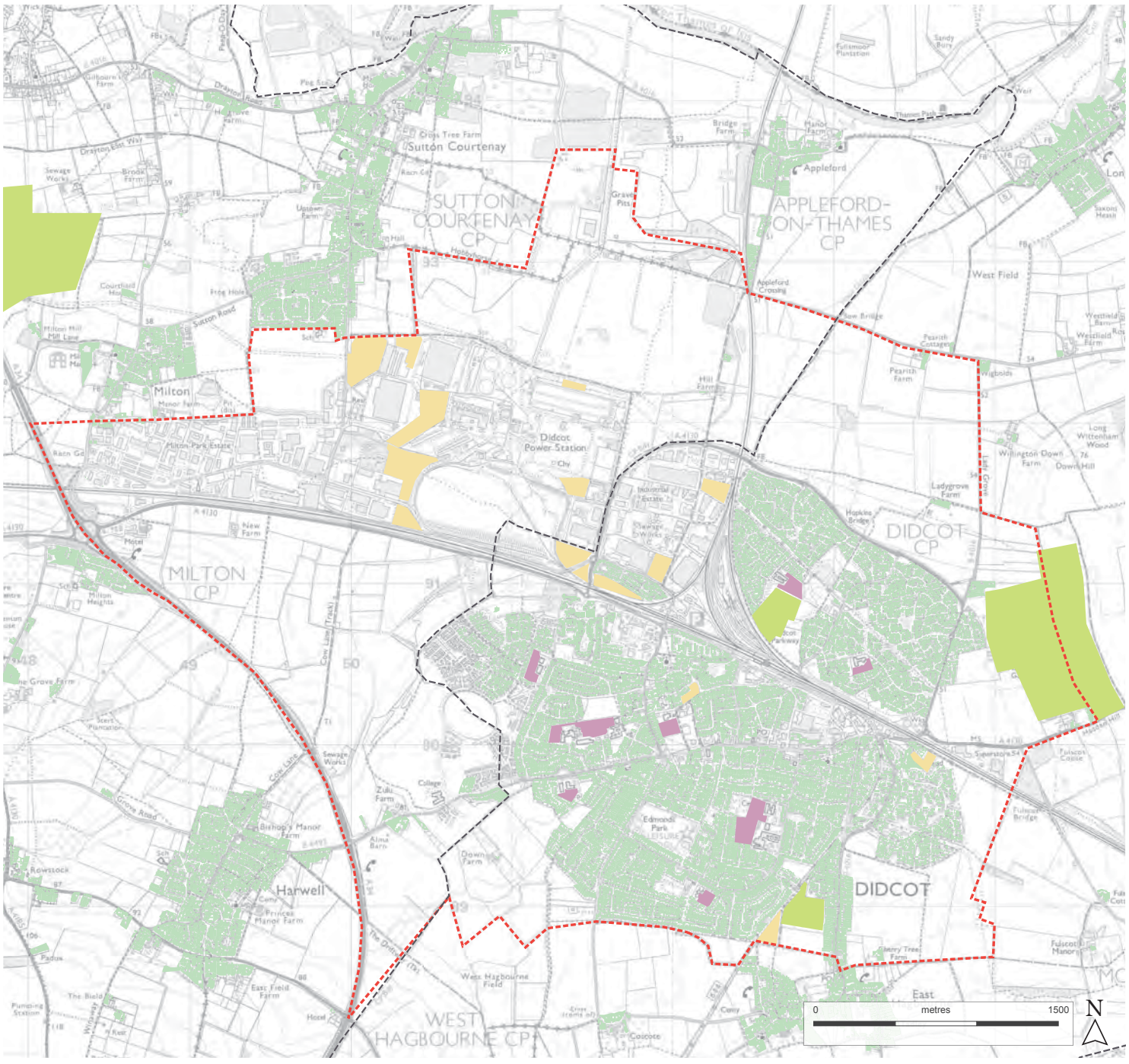
3.4.19. All Saints Church Cemetery located off Lydall's Road is the churchyard of the 12th Century All Saints Church. The church was built at the heart of a Saxon settlement, on a site of religious significance, at the highest point on the ridge and includes an ancient yew tree.

3.5. Non-publicly accessible green space

3.5.1. Private green spaces or sites which are not freely accessible to the public form a significant part of the GI network. Non-publicly accessible green space in Didcot accounts for much of the town's green character. See Figure 10 Non-publicly accessible green space.

3.5.2. School playing fields provide large areas of green space within the Didcot urban area. In addition to providing important recreational space for school children, these sites provide ecosystem services such as urban cooling and flood protection. In south Didcot, the

fig 10 - Non-publicly accessible green space



KEY

- Domestic gardens
- School grounds
- Private sports pitches (inc. golf courses)
- Other private spaces
- Didcot Garden Town boundary
- Local authority boundary

adjacent playing fields of Saint Birinus School and Willowcroft Community School adjoin the cemetery to provide a large green gap in the built up area. Likewise, the playing fields of Didcot Girls School in the south-west of the town abut Loyd Recreation park to form a large green area. A number of primary schools provide smaller green spaces to the north of the town.

3.5.3. Private sports facilities also contribute to the GI network. Didcot Town Football Club grounds provide additional open green space adjacent to Ladygrove Park and Hadden Hill Golf Course is a pay and play facility on the eastern fringes of Didcot.

3.5.4. Domestic gardens collectively provide an important resource in urban areas for wildlife and help to mitigate the effects of climate change. Ensuring domestic gardens are maintained as permeable green spaces can help reduce the risk of flooding, and encouraging wildlife friendly gardening will help improve the biodiversity across the town.

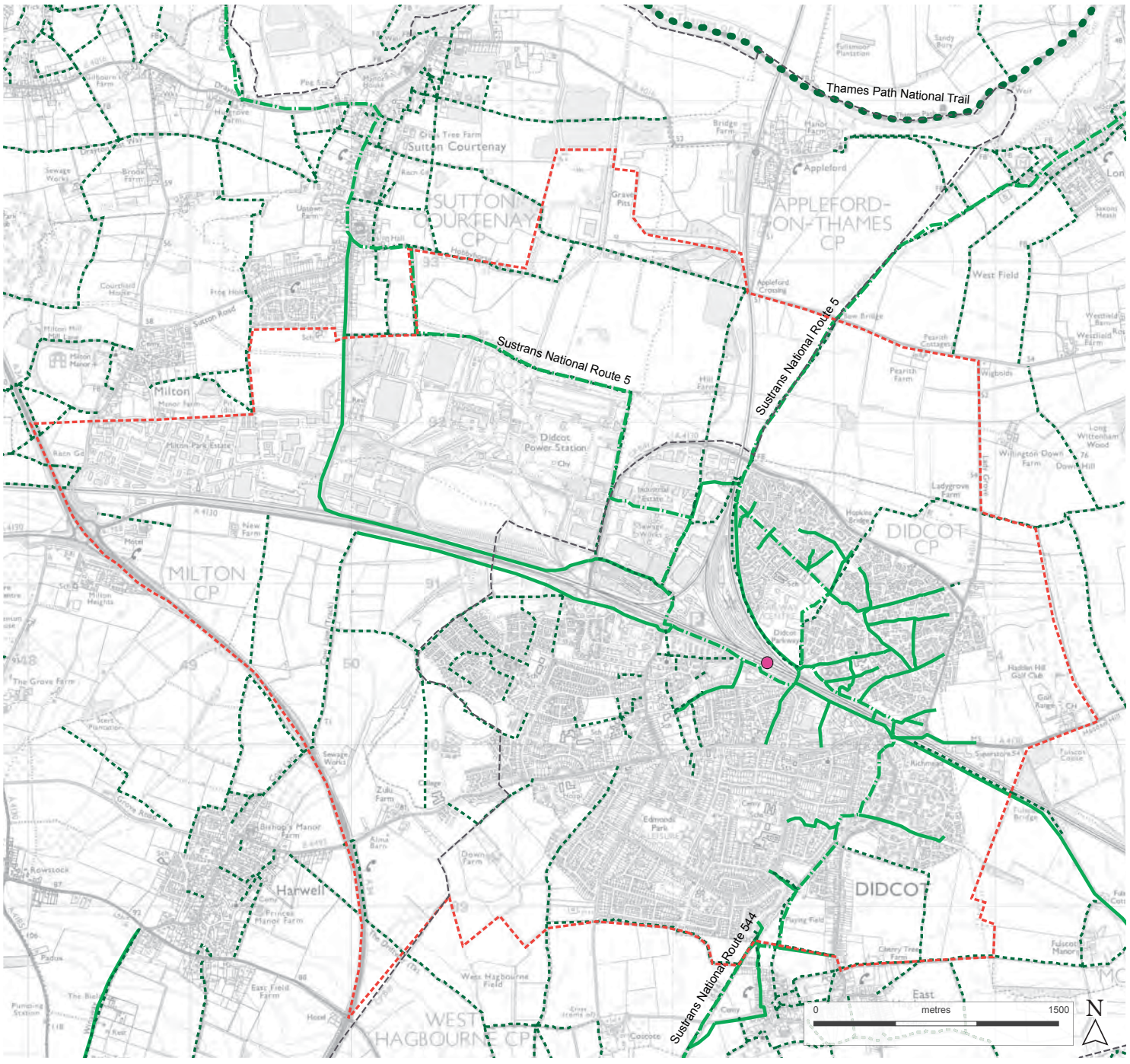
3.6. Green routes and corridors

3.6.1. Green routes and corridors, comprising footpaths, bridleways and byways provide important connections for people between settlements and the surrounding countryside. They can also connect wildlife between otherwise fragmented and isolated habitats. Footpaths and bridleways are the main public rights of way for those on foot and horseback. Cyclists are also able to use bridleways but as they are generally unsurfaced they are often only suitable for mountain bikes.

3.6.2. Oxfordshire County Council is responsible for maintaining rights of way to an appropriate standard, though maintenance of stiles and gates are the responsibility of the landowner. The Draft Oxfordshire Countryside Access Management Plan 2014-2024 is the statutory Rights of Way Improvement Plan for the County and sets out what the authority aims to do to secure better management and improvement of the countryside access network in Oxfordshire. There are a smaller number of ‘permissive’ paths within the area which are not maintained by the highway authority and which the public are permitted to use. See Figure 11 Green routes and corridors.

3.6.3. Didcot benefits from a location close to some outstanding accessible countryside being situated less than 1km to the east and 2km to the south from the North Wessex Downs Area of Outstanding Natural Beauty (AONB), which provides many opportunities for

fig 11 - Green routes and corridors



KEY

- National Trails
- Public Rights of Way
- Sustrans National Cycle Routes
- Other cycle routes
- Railway station
- Didcot Garden Town boundary
- Local authority boundary

informal outdoor recreation. Approximately 6km to the south of the town within the AONB is The Ridgeway National Trail, one of Europe's oldest long distance routes. In addition, the Thames Path National Trail runs along the bank of the River Thames to the north and east of the town.

3.6.4. There is a strong network of historic rights of way linking the town with the countryside and surrounding villages, particularly to the south and east of the town and less so the north and west. The following describes some key routes from the town to surrounding countryside and villages.

3.6.5. The Didcot to Upton Railway Path, part of the Sustrans National Route Network between Didcot and Wantage (NRN 544), heads south along a raised embankment starting at the end of Broadway, close to the Orchard Centre and out to the edge of the urban area linking Mowbray Fields and Millennium Wood and offering views across the countryside immediately south of Didcot and towards the Downs escarpment. It is a very popular walk and cycle ride for Didcot residents, and is well integrated into the local path network serving villages such as East and West Hagbourne and Upton with direct footpath links, and with easy footpath access to Chilton and Blewbury.

3.6.6. There is a footpath to Wittenham Clumps from central Didcot via Ladygrove but there is no safe crossing of the Northern Perimeter Road and the route is not direct or entirely off road. Currently the route does not allow for use by cyclists.

3.6.7. To the north of Didcot, a multi-purpose route, part of the Sustrans National Network Route 5, runs from the Cow Lane underpass alongside the railway line heading north then parallel to Moor Ditch between Didcot and Long Wittenham with branches to Long Wittenham and Appleford.

3.6.8. To the north-west, National Network Route 5 (the Hanson Way) skirts the Didcot Power Station site to the north then joins the road at Sutton Courtney to head north to Abingdon and Oxford.

3.6.9. To the west of the town there is a lack of east-west paths even to the nearby village of Harwell, which is only served by the very busy B4493 Harwell Road. New development brings opportunities to improve east west footpath and cycle links.

3.6.10. Major roads and railway lines create barriers to access across the town. In particular, the railway line bisects the town east-west and north-south, with limited crossing points for walkers and cyclists. The Cow Lane underpass provides a key pedestrian route under the railway but requires improvement. The A34 dual carriageway to the west of the town restricts journeys on foot and by cycle westwards and the A4130 east-west route and perimeter road restricts north south movement.

3.6.11. Much of the industrial and earlier housing development in Didcot (such as the Ladygrove Estate) has been designed to focus on access by car and has to a certain extent cut off the town from its rural hinterland. This also deters people from considering nearby countryside as a place for recreation, preferring to get in the car to reach 'honeypot' sites further afield.

4.0 Green infrastructure needs and opportunities

4.1. Overview

4.1.1. This section considers the opportunities to maximise the benefits of the GI network in Didcot, addressing the issues and needs identified through the assessment of existing GI and the stakeholder engagement to date. It also considers how much publicly accessible green space is needed to meet the needs of the current and future population of the town assessing the applicability of district-wide standards to the garden town context.

4.2. Public and stakeholder feedback

4.2.1. Feedback from public and stakeholder consultation on the DGT masterplan and the South and Vale GI Strategy carried out in 2016 has informed this Strategy (see Appendix D for details). Residents and stakeholders were invited to express their views in a variety of ways from drop-in sessions, exhibition display stands, interactive website and one to one meetings. Didcot's green spaces were a common theme in the feedback, in fact the second most common topic after transport, highlighting the importance of GI to local people.

4.3. Assessment of green infrastructure needs and opportunities by function

4.3.1. The value of GI to Didcot lies in the benefits it provides to people and wildlife. The key to maximising the benefits is to identify ways in which the functionality of GI assets can be increased, for example through new features or a change in management practices.

4.3.2. There is a growing body of evidence that identifies strong links between investment in GI and the economic, social and health benefits that can result including:

- Inward investment - increasing the attractiveness of the environment increases inward investment and property values in proximity
- Visitor spending – the quality of the environment impacts on the number of visitors it attracts and how much money they spend in the area
- Environmental cost-saving - GI provides important regulatory services which can reduce damage costs and allow greater investment in productive activities
- Health improvement – access to quality green space has a positive impact on ill-health

issues and productivity

- Market sales – urban food growing can increase economic output locally
- Employment generation - developing and maintaining GI provides jobs

4.3.3. Using an adaptation of the Natural Capital Committee's 10 categories of the ecosystem services provided by the natural environment[20], the extent to which Didcot's existing GI is providing each of these services is reviewed below.

Recreation, movement and health

4.3.4. There is significant evidence on the physical and mental health benefits of green spaces. Research shows that access to good quality green space is associated with a range of positive health outcomes including better self-rated health; lower body mass index scores, overweight and obesity levels; improved mental health and wellbeing and increased longevity in older people. High quality, safe green spaces encourage people to go outdoors and be more active. Increasing the use of good quality green space for all social groups, and particularly children, is likely to improve health outcomes and reduce health inequalities.

4.3.5. Recreation and health benefits will accrue if green spaces are easy to access, are well-designed and managed, providing a range of experiences. Sport England's Active Design guidance[21] promotes environments that offer communities the greatest potential to lead active and healthy lifestyles. Their 10 principles include creating a network of multifunctional open space and walkable communities with connected walking and cycling routes.

4.3.6. Linking green spaces with walking and cycling routes will encourage physical activity and more sustainable ways of getting around. At present about 70% of journeys in Didcot are made by car, a higher proportion than many other towns. As the town grows in size, the number of journeys will double and alternative more sustainable and healthy forms of transport need to be encouraged through the design of the environment.

4.3.7. Although the town is relatively green and surrounded by attractive countryside, there are areas of the town with little accessible green space within an easily walkable distance. Barriers to access across the town, in particular north-south across the railway, limit access

20 Report of the Natural Capital Committee 2014

21 Active Design. Planning for health and well-being through sport and physical activity, Sport England, 2015

to green spaces for some of the local population. A lack of footpaths west towards Harwell limit sustainable movement in this direction. The footpath east towards Wittenham Clumps is indirect and could be improved to allow cyclists and reduce the impact of car use on this important site. The quality of existing green routes and urban green spaces could also deter people from using them. Some footpaths are poorly surfaced and not well signposted making them difficult to use. Parks and amenity green spaces are generally well maintained but many lack variety in character and facilities on offer are limited.

Wildlife and access to nature

4.3.8. Wild species diversity and abundance has aesthetic, cultural and recreational value as well as making a vital contribution to the quality of the environment. Accessible natural greenspaces are valued by the community, provide important refuges for wildlife particularly in urban areas and are beneficial to public health and wellbeing. Provision of accessible natural green space close to where people live ensures people in urban areas have the opportunity to experience nature as part of everyday life.

4.3.9. GI should contribute to biodiversity gain by safeguarding, enhancing, restoring, and creating wildlife habitat and by integrating biodiversity into the built environment. Parks and amenity green spaces should include appropriate areas of habitat, alongside more formal green areas, even where nature conservation may not be the primary objective. The built environment should aim to be permeable to wildlife, incorporating design features aimed at sustaining and increasing the population of particular species through physical and functional connectivity between sites at strategic and local levels. Where a physically joined-up network is not possible, simple proximity can be enough to functionally integrate green spaces into a wider network, enabling species to move between sites. Landscape-scale connections are also necessary to reduce fragmentation, improve connectivity, and secure functioning ecosystems.

4.3.10. Didcot's residents can access high quality, beautiful countryside within a few kilometres but many parts of town lack nearby nature which particularly disadvantages those who are less mobile, as well as children and young people who may not be allowed to roam far from home. Existing parks and amenity spaces are not generally managed for biodiversity. Urban watercourses can provide excellent places for people to experience nature in towns but in Didcot these have been culverted or diverted away from where people live limiting access and biodiversity.

Aesthetics – providing an attractive place to live and work

4.3.11. The importance of GI to the attractiveness of neighbourhoods to people and investors is well proven. A review of GI's contribution to economic growth for Defra and Natural England identifies six ways in which local economic growth is boosted by high quality GI[22] including increased inward investment and property values, increased visitor spending in the local area and employment generation. Good quality landscape design on new developments is also highly cost effective as it is relatively low cost but pays dividends in increased sales values and positive perceptions.

4.3.12. The character and quality of the countryside surrounding Didcot is a key attractor for people. The expansion of the town is a potential threat to this character and quality in particular to the special qualities of the surrounding historic villages. Protecting and enhancing a green gap between the town and surrounding settlements will be key to preserving the local character.

4.3.13. In Didcot's residential areas, the numerous small amenity green spaces, grass verges and private gardens generally provide an overall impression of a green town. The town centre however is less green and could benefit from additional street tree planting and other greening initiatives including green walls and roofs.

4.3.14. Ensuring the quality of landscape design on new developments will be key to creating a garden town character as the town expands. Quality standards for GI should be enshrined in planning policy and guidance.

Clean air

4.3.15. Poor air quality can pose significant risks to human and plant health and is a particular problem in urban areas. Vehicle emissions are the main cause of poor air quality and although the town has not been designated an air quality management area, the growth of Didcot could raise pollution levels if car travel continues to increase.

4.3.16. There is strong evidence that vegetation, particularly trees, but also green walls and roofs, can contribute to air quality improvements. Focusing street tree planting and other

22 Eftec, Sheffield Hallam University (2013) Green Infrastructure's contribution to economic growth: a review A Final Report for Defra and Natural England

greening initiatives on the town centre and main routes through town will help mitigate any increase in pollution.

Clean water

4.3.17. Clean water is critical to human health and the health of the natural environment. Water pollution can lead to communicable disease, infections, recreational impacts and environmental impacts such as algal blooms. In urban areas, polluted run-off is a major cause of diffuse pollution (pollution from multiple sources, which is collectively significant). There is good evidence that the natural environment contributes to improved water quality particularly woodlands and wetlands which act as a barrier trapping and intercepting pollutants before they reach water courses. Green roofs are also effective at reducing pollutant carrying runoff in urban areas.

4.3.18. Water quality data from the Environment Agency suggests that water quality across Didcot's streams and brooks is generally 'Moderate' or 'Poor'. Rural and urban diffuse pollution, wastewater discharges, road run-off, loss of habitat and biodiversity and invasive non-native species are all likely to impact on water quality.

4.3.19. Urban greening such as swales, rain gardens and green roofs can be retrofitted to create sustainable drainage measures to reduce the chances of surface water inundation into foul sewers and hence less risk of sewer flooding, pollution incidents and storm tank overflows at the sewage treatment works. Better routine maintenance of watercourses and ditches is also needed to ensure free drainage of water.

Energy production and conservation

4.3.20. The UK Government is committed to reducing carbon emissions and has set in place legally binding carbon budgets to achieve reductions by 2027. Investment in energy infrastructure, with diversification away from limited natural resources such as coal and increased energy efficiency is critical to reducing carbon emissions, saving money and insulating the economy against fossil fuel price rises.

4.3.21. Urban green spaces can reduce carbon emissions in a number of ways. Green spaces particularly around towns can be used to supply biomass or biofuels to directly replace fossil fuels. Urban agriculture and allotments can provide local food to reduce food miles. GI can also reduce the need for heating and cooling of buildings through shading which

reduces the amount of heat absorbed by buildings and evapo-transpiration, which cools the air by using solar energy that would otherwise heat the air and the buildings. The shelterbelt effect of trees and other green infrastructure can also slow winds, reducing the amount of heat lost from buildings. Green roofs have been found to significantly reduce energy use in poorly insulated buildings, making retrofitting a realistic option for many older buildings.

4.3.22. Although many streets in Didcot are planted with trees these are mostly small ornamental varieties and there are few large trees, which would provide the cooling, and sheltering needed to impact on energy use. There is also no evidence of green roofs. The town's allotments provide the opportunity for people to grow their own food close to home, reducing the food miles involved. However, beyond this small-scale activity, there are few links between the town's agricultural hinterland and the local market for food.

Equable climate

4.3.23. UK climate predictions for Oxfordshire show that average temperatures are likely to increase by between 2.5 and 8.0 C by the 2080s and heat waves will be likely at least once in every three years by 2050s. Managing high temperatures is a key concern, particularly for the elderly and other at-risk groups. Respiratory and cardiovascular diseases are made worse at higher temperatures, partly due to interactions with air pollution, which also becomes worse at high temperatures. Higher temperatures affect not only human health, but plant and animal health as well. River water temperatures, for instance, are expected to rise by 2 to 4°C by 2050, and this can impact on the health of freshwater wildlife such as trout and salmon[23].

4.3.24. GI can make an important contribution to regulating local temperatures as the cooling nature of green spaces counters the 'urban heat island effect'.

4.3.25. Increasing the amount of green cover in Didcot, particularly as the town expands will be key to ensuring resilience against climate change impacts such as high temperatures. Where there are practical constraints on increasing green cover in urban areas, green roofs can provide environmental benefits. They have been demonstrated to make buildings more thermally efficient, prolong the life of the roof, ameliorate extremes of temperature and

23 Rolls, S. & Sunderland, T. 2014. Microeconomic Evidence for the Benefits of Investment in the Environment 2 (MEBIE2). Natural England Research Reports, Number 057.

humidity, moderate surface water run-off and help to reduce air and noise pollution[24].

Food production

4.3.26. Historically, towns and cities were built around the supply and distribution of food. Today, our food is sourced worldwide and communities have become divorced from the process of food production, with resulting impact on healthy eating and negative effects on the environment. However with increased interest in recent years in locally sourced food and in 'growing your own', there is an opportunity to reconnect people with food in urban areas by diversifying the use of urban and urban fringe green spaces to include food production.

4.3.27. There is a need for more allotments in Didcot, particularly in the north of the town. There is also the potential to develop community growing projects on under-used land in existing public parks and amenity green space creating productive green spaces in the heart of neighbourhoods.

4.3.28. Maintaining a profitable and sustainable local agricultural sector in DGT's rural hinterland is also important for the local economy. The Earth Trust[25] provides a good local exemplar encouraging and supporting the production, distribution and eating of good quality, local, healthy food. In addition to managing approximately 500ha of arable, grassland and woodland near to Didcot in Little Wittenham, the Trust runs 'Farm Step' which offers land, favourable tenancy agreement terms and support to people who are currently locked out of farming by land price and availability, or lack of skills. The arable crops are sold to generate funds for the Earth Trust and farm and they also grow miscanthus providing fuel for heating the office and other buildings. All of the Earth Trust's arable and grassland areas are part of a Higher Level Stewardship (HLS) agreement with Natural England who provide funding to manage particular environmental features to support nature and wildlife.

Fibre production (timber)

4.3.29. The provision of plant and animal materials used for building, clothing and other objects, including timber is a key ecosystem service provided by the natural environment. If managed sustainably, forests in particular can support local economies and supply sustainable wood products as well as adding value in terms of alleviating floods, storing

24 https://www.asla.org/ContentDetail.aspx?id=43536

25 http://www.earthtrust.org.uk/About-us.aspx

carbon, providing habitats for nature, and contributing to the quality of the landscape.

4.3.30. Over the last 200 years, the extent of broadleaved woodland and the hardwood timber it produces has fallen dramatically and today most of the hardwood timber used in the UK is imported. With increasing pressure on consumers not to purchase tropical hardwoods, and strict control on their importation, the UK needs to able to provide an inexpensive, home-grown alternative. With climate change and the increase in new pests and diseases, developing trees of good genetic stock and exemplary silviculture (woodland management) is needed to maximise a forest's full potential.

4.3.31. At Long Wittenham, the Sylva Foundation[26] and nearby, the Earth Trust are championing sustainable models of woodland management, balancing amenity and wildlife value with economic, sustainable timber production as well as carrying out research into the improvement of hardwood tree species for increased timber productivity. Sylva are planting a community orchard and an educational 'Future Forest' with tree species that can thrive in the UK despite threats from climate change, pests and diseases with a dedicated forest education area with space for children to learn about and enjoy woodland. Such forest plantations could provide a sustainable model for the land around key developments in Didcot Garden Town, providing sustainable, productive woodland shelterbelts and landscape buffers.

Flood protection and water management

4.3.32. Climate change will increase the extent, severity and frequency of both fluvial and surface water flooding. In Didcot, the main area of fluvial flood risk to existing development is to the Ladygrove Estate from the Ladygrove Brook. However with increased development on greenfield sites around the town, it will be important to ensure the floodplains of watercourses in particular the Moor Ditch are retained. Surface water flooding is also a problem in the Ladygrove area as well as south of the railway line, in part due to insufficient sizing of culverts or clearing of trash screens upstream of the culverts under the railway. Currently groundwater flooding is not a significant risk in Didcot but wetter winters will result in more groundwater flooding problems. Flood risk has also increased due to an increasing amount of impermeable surfaces such as driveways.

4.3.33. Well-planned, designed and managed Sustainable Urban Drainage Schemes (SuDS) can help

26 https://sylva.org.uk/home

to reduce this risk. However, new developments in Didcot are not maximising the value of these facilities. Great Western Park in particular has created shallow grassed ditches, which have little biodiversity benefit and will not sufficiently slow flood flows. SuDS need to be designed to maximise their benefits. CIRIA's 'SuDS Manual'[27] provides comprehensive guidance on the cost-effective planning, design, construction, operation and maintenance of SuDS. Creating new SuDS in areas where the risk of surface water flooding is highest such as along the south side of the railway line should be a priority in the DGT plans.

4.3.34. Flood storage can be improved by designing space for existing watercourses to overtop their banks within a widened shallow channel. Where there is the space, a braided channel can restore both visual amenity to the waterway and allows opportunities for wildlife and with increased biodiversity, can improve water quality.

4.4. Applicability of local standards for green space quantity, quality and accessibility

4.4.1. Draft planning standards for the quantity, accessibility and quality of different types of green space inform developers of the requirements for provision within new developments and provide the basis for S106 and CIL contributions. Adherence to standards will ensure a certain amount of green space is created to serve the needs of a new population, and the level at which they are set in DGT will have a big impact of the quality and character of the expanded town.

4.4.2. South and Vale districts have set draft standards for Parks and Gardens, Amenity green space, Allotments and Natural and semi-natural green space. Although important for sport, recreation and health, standards for outdoor sports pitches and children's play facilities have not been included in this analysis as they are not necessarily green or they form part of a larger park or amenity green space which is already included.

4.4.3. Standards are based on a district-wide assessment of supply and demand for different types of spaces. Standards for Vale and South are the same with the exception of the Parks and Gardens and Amenity green space quantity standard and the Parks and Gardens accessibility standard. Vale's Parks and gardens and Amenity green space quantity standard is based on a percentage of the total area of a new development, rather than a quantity per head of population and accessibility to Parks and gardens is based on a drive time, which

27 http://www.susdrain.org/resources/SuDS_Manual.html

creates a much larger catchment than in South. These varying standards will provide different requirements for provision of Parks and Gardens and Amenity green space on new developments in DGT depending on which side of the boundary the site falls. See Table 1 below.

	Vale	**South**
Parks and Gardens and Amenity green space	Quantity: 15% of residential area Accessibility: 5625m for parks 480m for amenity green space Quality: Green Flag standard	Quantity: 2.13 ha/1000 pop Accessibility: 710m for parks 480m for amenity green space Quality: Green Flag standard
Allotments	Quantity: 0.4ha/1000 pop Accessibility: 1000m Quality: Allotments should be secure with gates and fencing providing suitable and accessible areas for growing, and where applicable an adequate water supply and car parking.	Quantity: 0.4ha/1000 pop Accessibility: 1000m Quality: Allotments should be secure with gates and fencing providing suitable and accessible areas for growing, and where applicable an adequate water supply and car parking.
Natural/semi-natural	Angst	Angst

Table 1: Draft standards for provision of green space in new developments 2016

4.4.4. The following section considers the applicability of the draft green space standards to DGT. The South standards have been used in the analysis as they use a common approach of hectares per head of population and apply to the existing town area. The analysis of quantities by head of population is based on the 2011 census total population figure of 25,140 and the projected future population of 62,500 by 2031, creating an additional 37,360 people. The overall quantities of green space are based on the 2016 Open Spaces report for South Oxfordshire District Council. Figures do not include green spaces under 0.2 hectares, (which have not been audited), or green corridors such as road verges.

Parks and Gardens and Amenity green space

4.4.5. The draft district quantity standards for Parks and Gardens and Amenity green space are combined. The total quantity of Parks and Gardens in Didcot is 29.59 hectares and the total quantity of amenity green spaces in Didcot is 38.51 hectares making a total of 68.1 hectares. Applying the draft South and Vale quantity standard of 2.13 hectares per 1000

population to the existing town, 53.55 hectares of Parks and Gardens and Amenity green space would be required to meet the standard. To meet the needs of an additional 37,360 people, 79.58 hectares of Parks and Gardens and Amenity green space should be provided to meet the district standard.

4.4.6. Green Flag is the well-established national quality standard and award scheme for park management and the eight Green Flag Award assessment criteria were used to assess the quality of parks and gardens and amenity green space in Didcot using a 1-5 scale.

4.4.7. All the parks were scored reasonably highly with Ladygrove Park the highest quality with a score of 4.3 out of 5. Boundary Park has not been scored as it has only recently been constructed. The lowest scoring criteria for parks was sustainability, marketing and for the more formal parks, nature conservation.

4.4.8. Amenity green space scores were generally lower than for Parks and Gardens, with particularly poor scores for sustainability, community involvement, marketing and overall management.

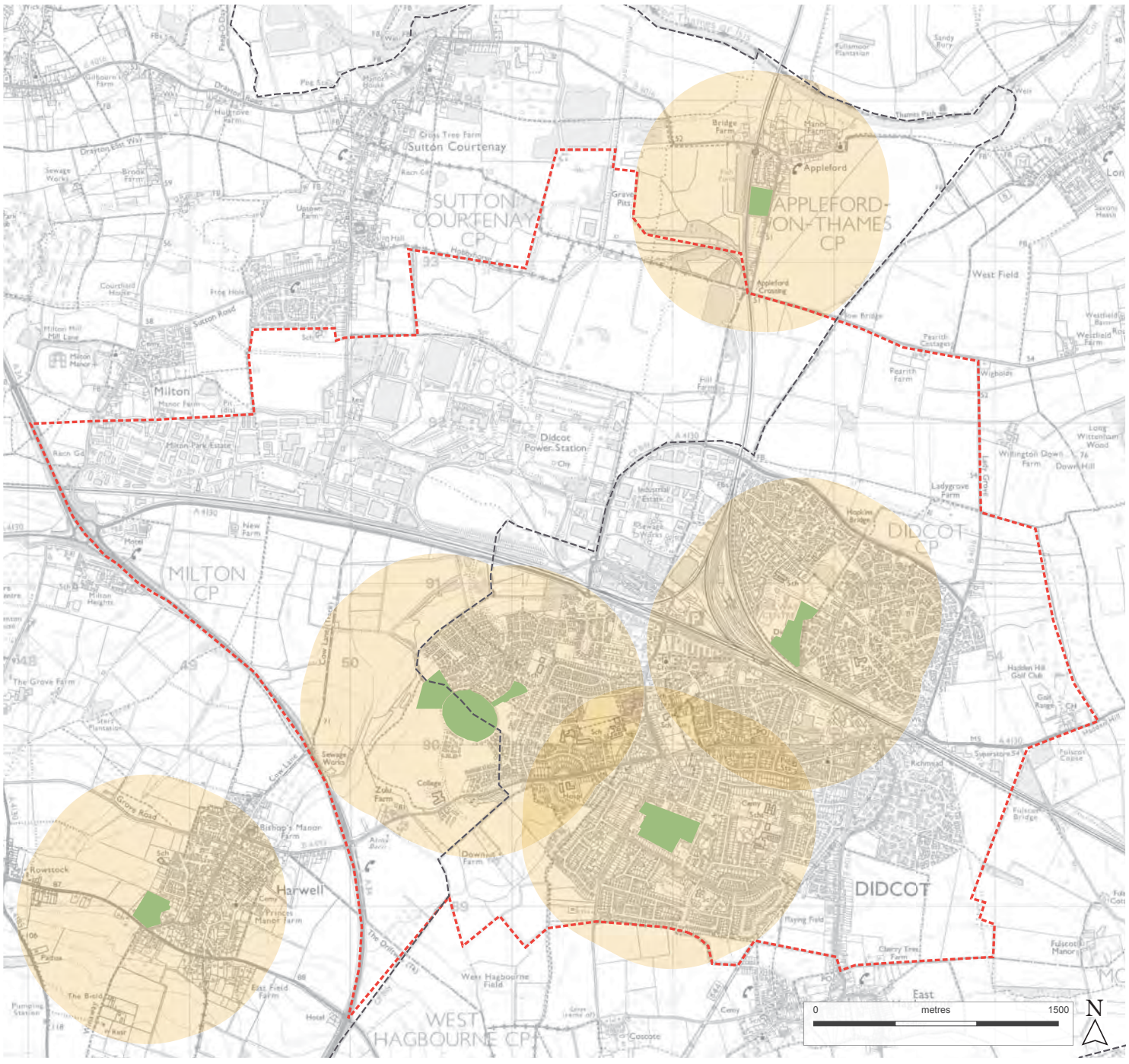
4.4.9. There are areas to the east of the town without access to Parks and Gardens within the proposed 710m accessibility standard. These areas however have sufficient amenity green space and access to nearby countryside. The railway also forms a barrier to access to Ladygrove Park, creating an additional area in the town centre deficient in access to Parks. See Figure 12 Parks and Gardens accessibility.

4.4.10. Most of Didcot has access to Amenity green space within the proposed 480m accessibility standard apart from a small area to the south, although this area has access to Edmonds Park. See Figure 13 Amenity green space accessibility.

Allotments

4.4.11. There are five allotment sites in Didcot covering an area of 4.1 hectares in total with around 439 individual plots. Applying the draft quantity standard for allotments of 0.4 hectares per 1000 population to the existing town, 10.06 hectares of allotments would be required to meet the standard, constituting a shortfall of 5.96 hectares. To meet the needs of an additional 37,360 people, 14.94 hectares of allotments should be provided to meet the district standard.

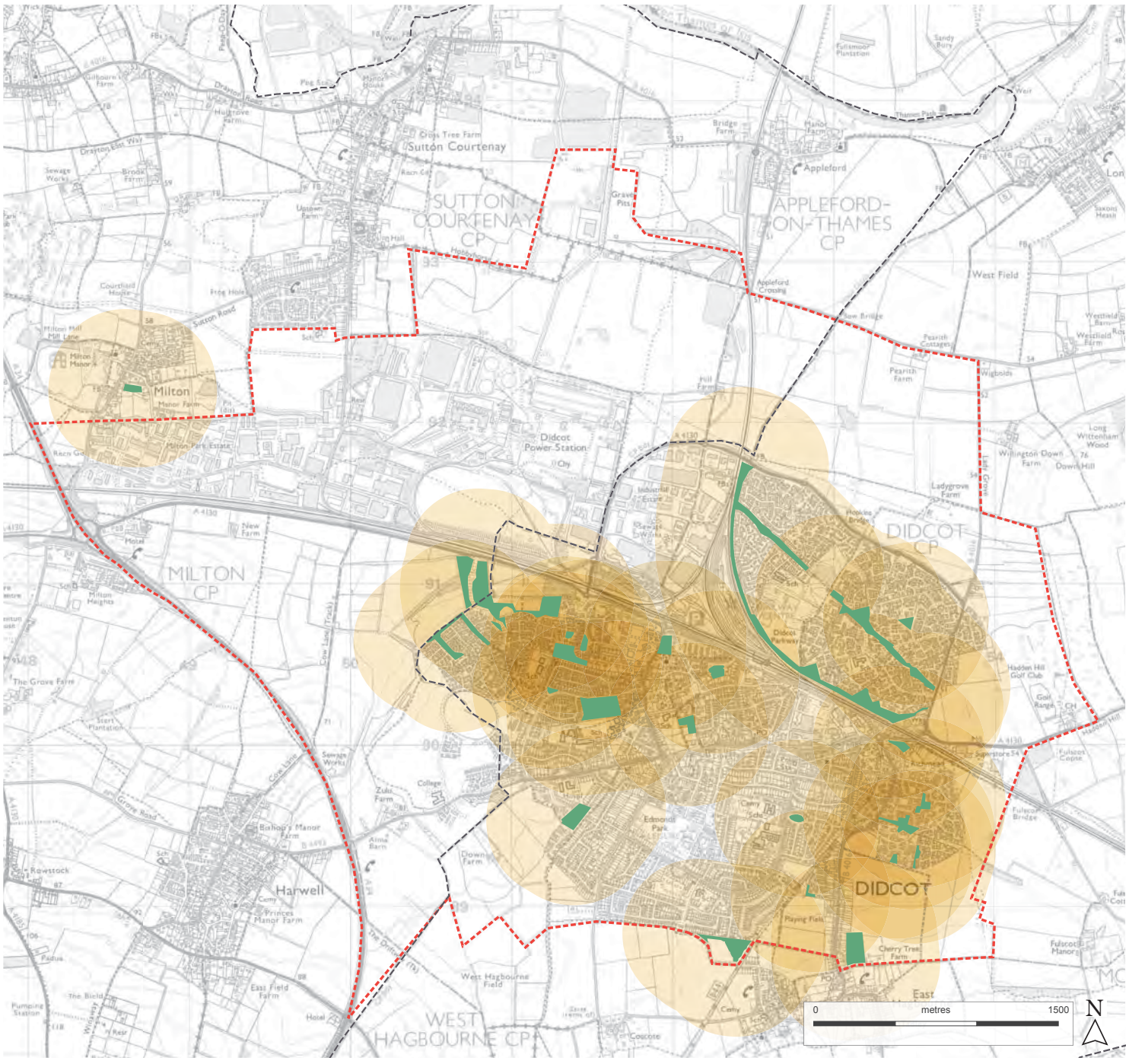
fig 12 - Parks and gardens accessibility



KEY

- Park and garden
- 710m catchment (SODC draft accessibility standard)
- Didcot Garden Town boundary
- Local authority boundary

fig 13 - Amenity green space



KEY

- Amenity green space
- 480m catchment (SODC draft accessibility standard)
- Didcot Garden Town boundary
- Local authority boundary

4.4.12. The quality assessment was scored from 1-5 based upon the presence/absence of fenced site boundaries, water supply to all plots, secure sheds, toilets on site and dedicated car parking. The sites all scored an average 3 apart from one site (Mereland Road), which scored 2.5.

4.4.13. Most of the area north of the railway line is without access to allotments within the proposed 1000m accessibility standard. See Figure 14 Allotments accessibility.

Natural and semi-natural green space

4.4.14. As the districts have adopted Natural England's Accessible Natural Greenspace Standard (ANGSt) for Natural and semi-natural green spaces which is an accessibility standard based on distance to different categories of site rather than a quantity standard per head of population. Some of the sites defined as Natural and semi-natural green spaces within this assessment are Parks which creates an overlap in categories, making it difficult to use this standard as part of an overall assessment of the quantity of green space in the town. However, the ANGSt assessment which follows helps identify where new green spaces should ideally be located, and their recommended size.

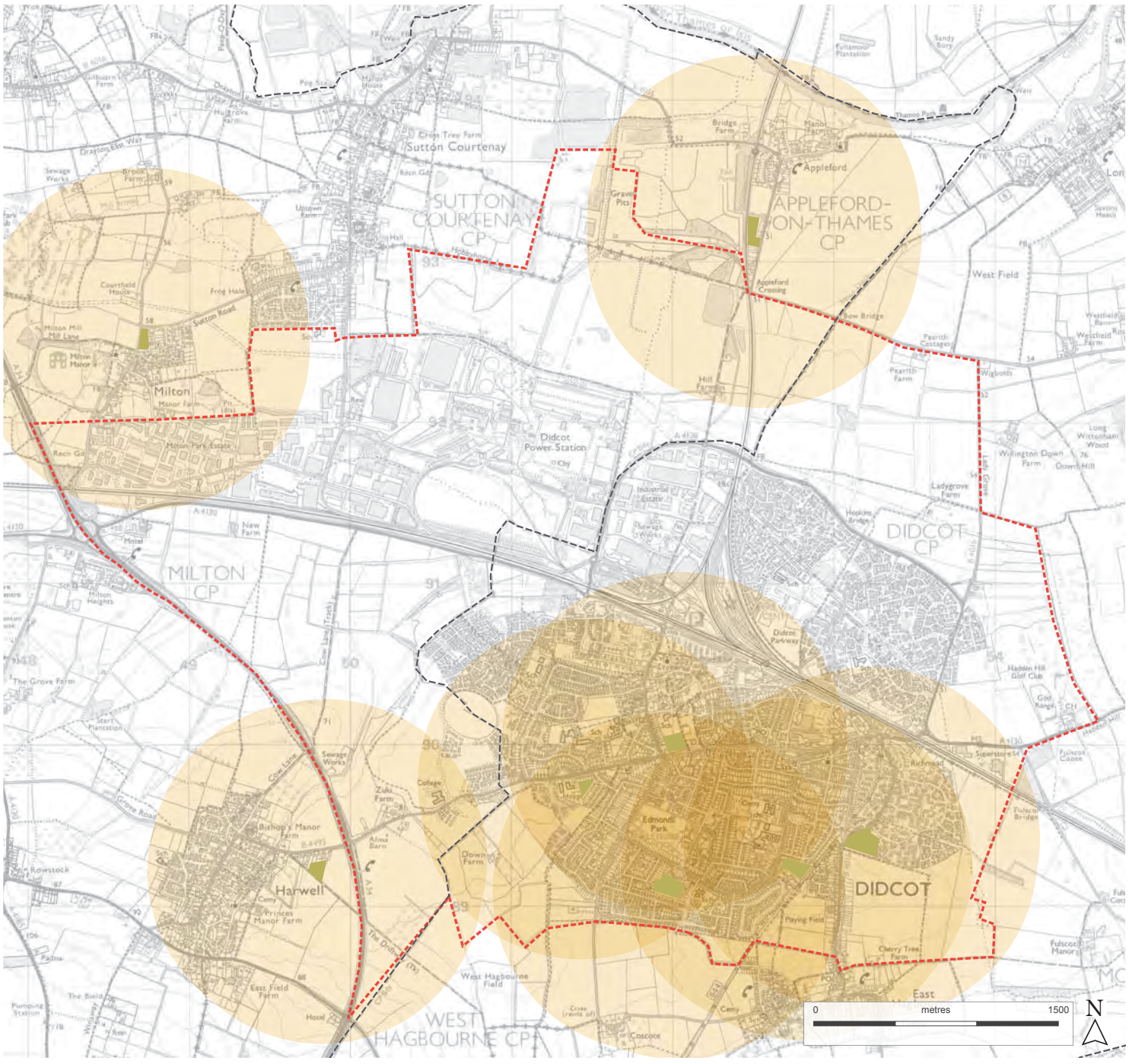
4.4.15. Natural and semi-natural green space quality was assessed on a scale of 1-5 based on two criteria; access and nature conservation value. Access was assessed on the presence of signposting to the site, information boards/interpretation panels, marked paths, clear entrance and dedicated car parking. Nature conservation value was assessed on the level of designation relating to the site from none, to Biodiversity Action Plan Priority Habitat, Local Nature Reserve, SSSI to National Nature Reserve. All three sites scored an average 3 for access and 1 for nature conservation. However as Mowbray Fields is designated as a Local Nature Reserve this should be amended to a 3.

4.4.16. The accessibility of Natural and semi-natural greenspace has been assessed using Natural England's ANGSt analysis, which states:

- No person should live more than 300 metres from their nearest area of natural green space of at least 2 hectares in size.

- There should be at least one accessible 20 hectare green space site within 2

fig 14 - Allotments accessibility



KEY

- Allotment
- 1000m catchment (SODC draft accessibility standard)
- Didcot Garden Town boundary
- Local authority boundary

kilometres from home.

- There should be one accessible 100 hectare green space site within 5 kilometres.

There should be one accessible 500 hectare green space site within 10 kilometres.

4.4.17. The assessment found:

4.4.18. There is a partial deficit of Accessible Natural Greenspace sites 2 hectares and above within 300m from home in Didcot. The central area between the Broadway and the railway line in particular is lacking access to Accessible Natural Greenspace. This is also the area with the highest social deprivation. North of the railway line, Ladygrove Park and Lakes provide an important area of Accessible Natural Greenspace. Residential areas further than 300m from this site tend to be well greened with access to the Ladygrove Loop and generous private gardens. See Figure 15 Natural and semi-natural green space accessibility – Sites at least 2 hectares.

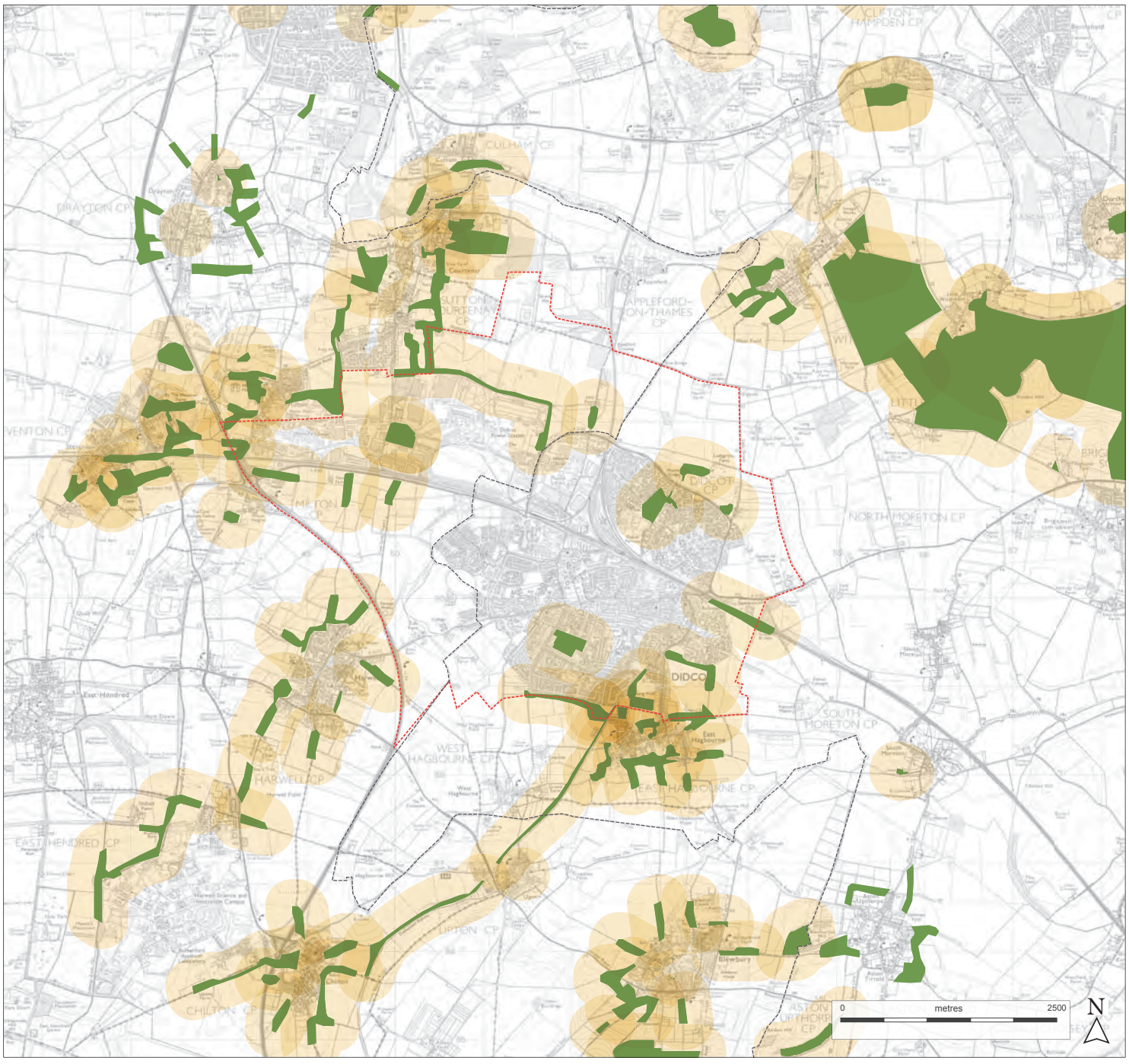
4.4.19. There is a complete deficit of Accessible Natural Greenspace sites 20 hectares and above within 2km from home in Didcot. The Earth Trust land at Wittenham Clumps is the only nearby site above 20 hectares but is over 2km away. See Figure 16 Natural and semi-natural green space accessibility – Sites at least 20 hectares.

4.4.20. There is a partial deficit of Accessible Natural Greenspace sites Greater than 100 hectares within 5km from home in Didcot. The Earth Trust land at Wittenham Clumps is the only site above 100 hectares and much of the south west of the town is further away from this site than 5km. See Figure 17 Natural and semi-natural green space accessibility – Sites at least 100 hectares

4.4.21. As it is unlikely that land would be available for a 100 hectare or larger site within 5km of the town, this has not been included in the recommendations for new Accessible Natural Greenspace. However it will be important to improve access to the countryside, in particular to key sites such as Wittenham Clumps and the AONB landscapes to maximize people's access to large areas of natural greenspace.

4.4.22. Given the space constraints in the existing urban area, green space in new developments needs to be planned to meet ANGSt standards and will help mitigate any lack of Accessible

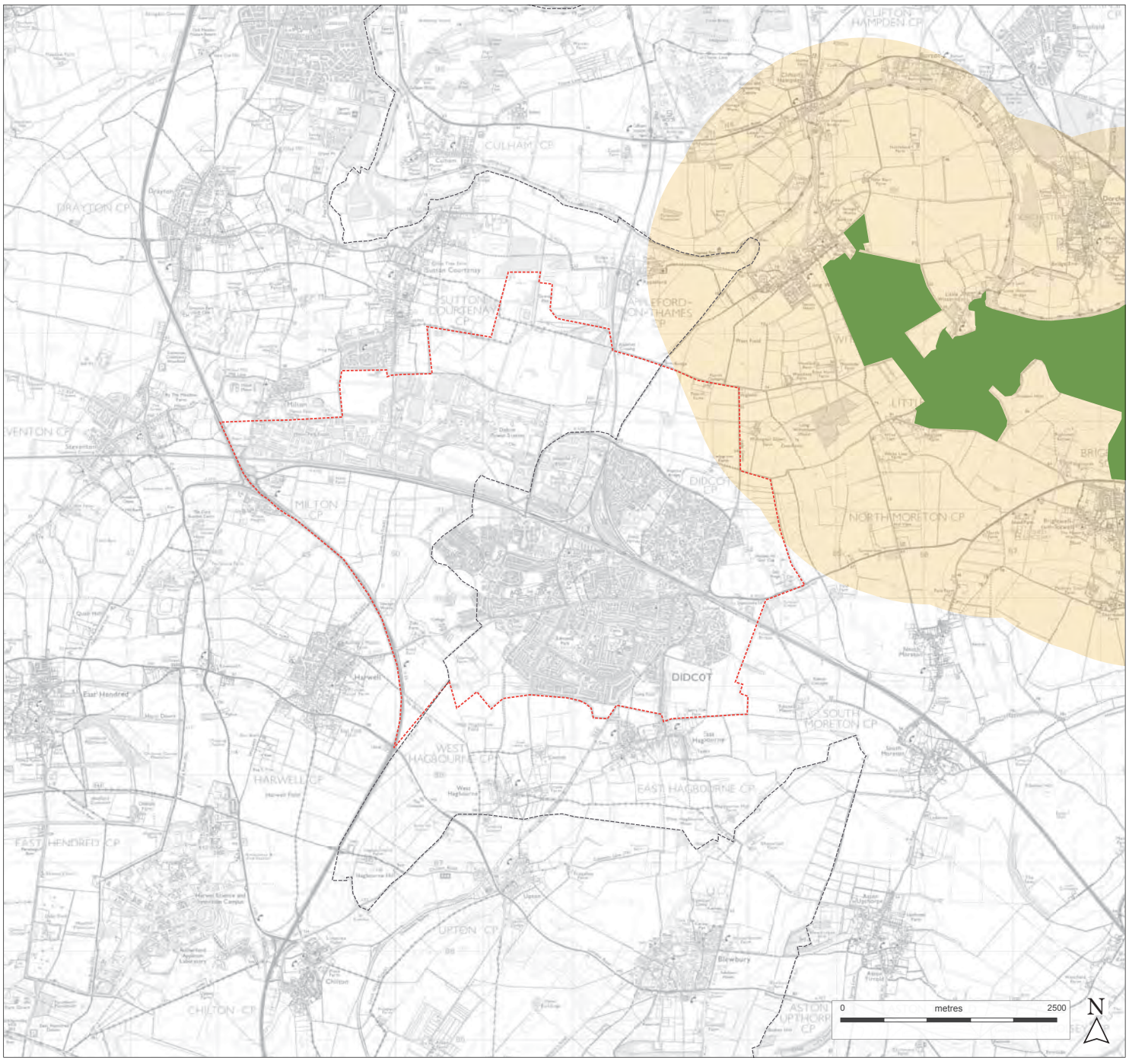
fig 15 - Natural and semi-natural green space accessibility - Sites at least 2 hectares



KEY

- Accessible Natural Greenspace sites (>2 hectares)
- 300m catchment (Accessible Natural Greenspace Standard)
- Didcot Garden Town boundary
- Local authority boundary

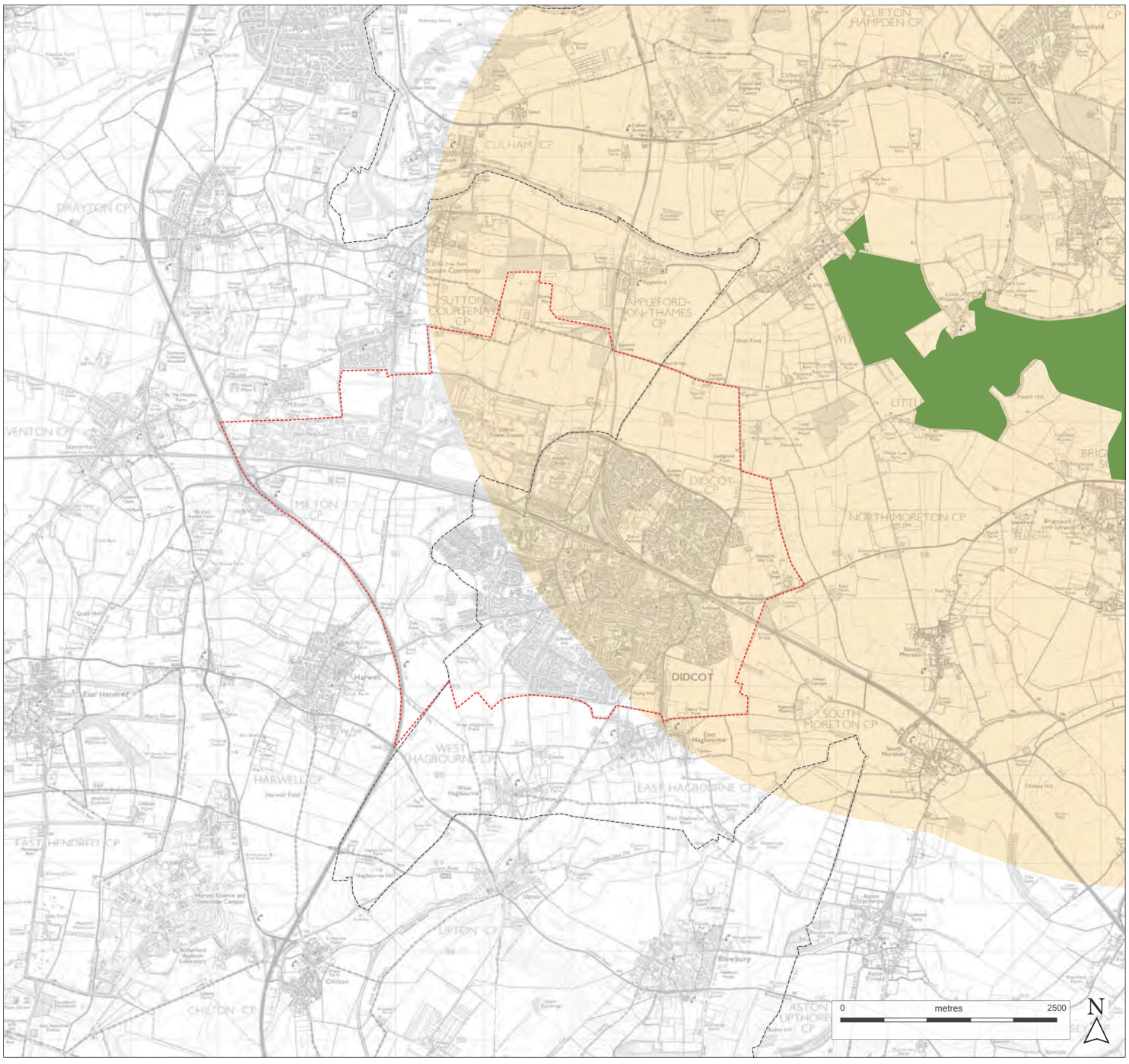
fig 16 - Natural and semi-natural green space accessibility - Sites at least 20 hectares



KEY

- Accessible Natural Greenspace sites (>20 hectares)
- 2km catchment (Accessible Natural Greenspace Standard)
- Didcot Garden Town boundary
- Local authority boundary

fig 17 - Natural and semi-natural green space accessibility - Sites at least 100 hectares



KEY

- Accessible Natural Greenspace sites (>100 hectares)
- 5km catchment (Accessible Natural Greenspace Standard)
- Didcot Garden Town boundary
- Local authority boundary

Natural Greenspace in adjoining existing areas of town, providing footpath linkages between areas are created. As a guide, and based on a spatial assessment of potential new development site areas, it is recommended that the following additional Accessible Natural Greenspaces should be provided as a minimum:

- At least seven Accessible Natural Greenspace sites of 2-20 hectares – four to the north and east of the existing town and three to the west of the existing town amounting to a minimum of 14 hectares in total. Locations will depend on the final layout of development and the proximity of the larger 20 hectare plus sites.

- At least two Accessible Natural Greenspace sites of 20 hectares or above – one to the north and one to the south of the existing town amounting to a minimum of 40 hectares in total. Identifying suitable land and resources to create these large sites is challenging but early identification and planning is vital. Potential locations are shown on *Figure 17 Didcot Garden Town green infrastructure network plan*.

4.4.23. In summary, using the draft South district standards as a guide, it appears that the existing town has sufficient Parks and Gardens and Amenity green space, a shortage of Allotments (also supported by the fact there is a waiting list for allotment plots at present) and a complete deficit of Accessible Natural Greenspace of over 20 hectares in size within 2km of home as well as parts of the town with no Accessible Natural Greenspace sites 2 hectares and above within 300m from home or greater than 100 hectares within 5km from home. Quality standards are average to good but nature conservation value needs improvement on most sites.

4.4.24. Whilst new development can bring opportunities for improving the GI network, developers cannot be expected to pay for an existing shortfall in public amenities. The existing urban area is also constrained in terms of the space available for new facilities. However, clever masterplanning can ensure that new green spaces are well linked into existing areas and provide the kind of facilities that are needed in the town as a whole, (eg more allotments).

4.4.25. With the aspiration to create a ‘super green’ garden town, the suitability of existing standards for provision of green space, which are based on a district wide assessment of needs, should be examined. Current TCPA guidance on masterplanning new garden towns and cities recommends at least 50% of a new Garden City’s total area should be allocated to

green infrastructure, of which at least half, or 25% should be public, consisting of a network of multi-functional, well managed, high-quality open spaces linked to the wider countryside. This figure includes 'non green space' GI elements such as green roofs and green walls.

4.4.26. Currently Didcot's publicly accessible green space amounts to approximately 83 hectares which represents approximately nearly 10% of the total land area of the existing town, (based on an estimated total area of 848 hectares[28])

4.4.27. The proposed DGT land area is 2070 hectares, which would require a total 517 hectares of publicly accessible green space to meet the TCPA standard of 25%, an increase of 434 hectares over existing levels.

4.4.28. The draft South Oxfordshire open space standards for new developments require 2.13 hectares of Parks and Gardens and Amenity green space and 0.4 hectares of Allotments per 1000 population, (2.53 hectares in total), plus additional Accessible Natural Greenspace required by the ANGSt assessment. Based on a projected increase in population of 37,360 by 2031, this would amount to an additional 79.58 hectares of Parks and Gardens and Amenity green space and 14.94 hectares of Allotments – 94.52 hectares in total. The ANGSt assessment identified a need for at least an additional 54 hectares of Accessible Natural Greenspace making a total of approximately 148 hectares.

4.4.29. There are four consented development sites, (Great Western Park, North East Didcot, Valley Park and Didcot A), which include green spaces amounting to approximately 151 hectares in total. This figure includes all green space including structural landscaping and SuDs for example, as not all proposals quantify publicly accessible green space by typology. It would appear that the consented developments will provide the amount of green space needed to meet the needs of the future population according to the draft district standards.

4.4.30. However, when combined with the existing quantities of green space, at just over 11% of the land area of DGT, these figures fall far short of the TCPA recommendation of 25% of the land area. As this is not a garden town created from scratch - over 40% of the future garden town's infrastructure is already in existence - opportunities for the creation of new GI is

28 https://en.wikipedia.org/wiki/Didcot

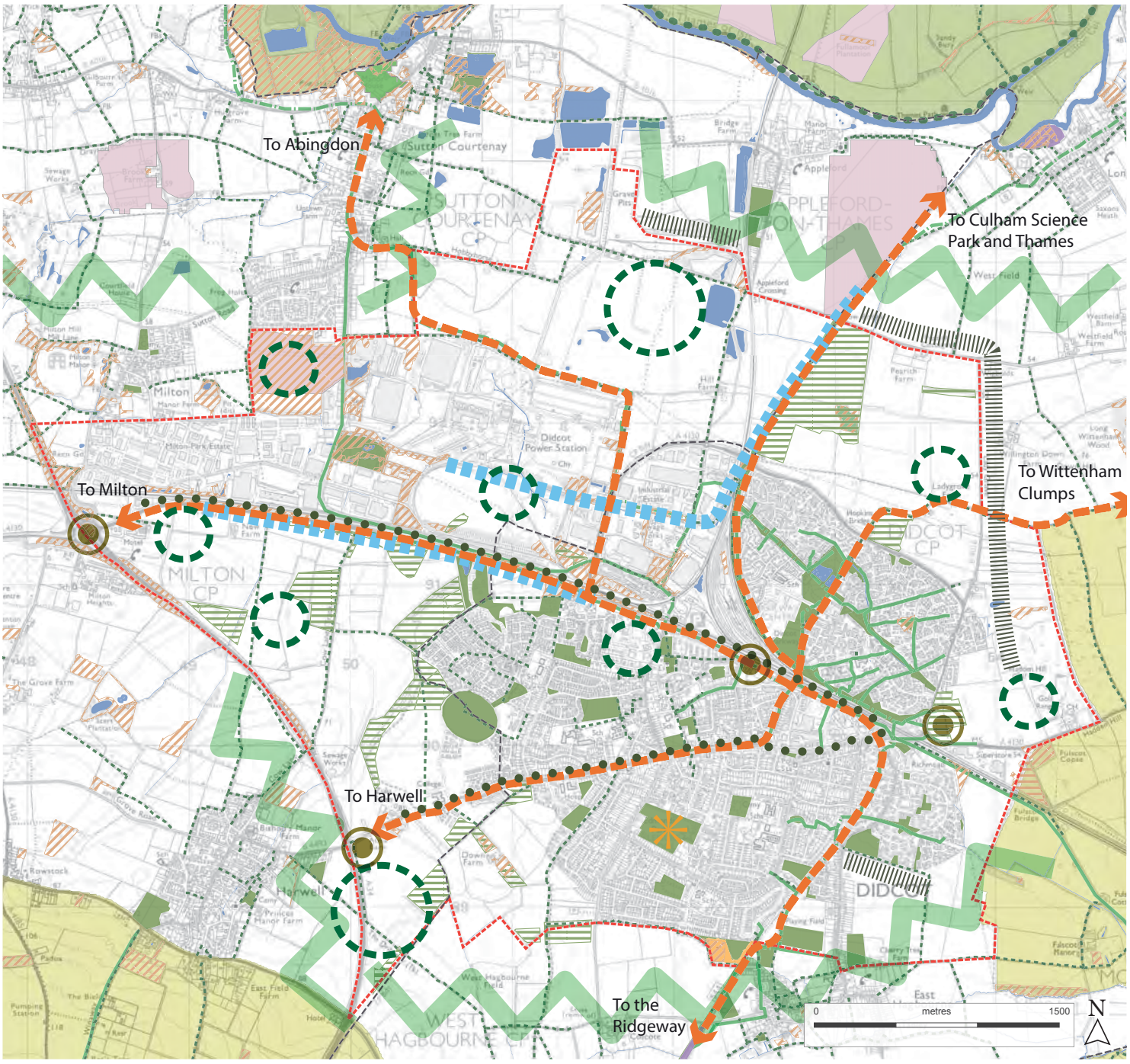
very limited. However, the additional 151 hectares only represents around 12% of the additional land area within the DGT boundary. The TCPA recommendation is based on garden towns and developments such as Hampstead Garden Suburb where the abundance of green space is a key part of the development's success. If Didcot is to meet the aspirations as a garden town, there is a need for the quantity of garden town green space to be higher than required by the district wide standards.

4.4.31. Table 2 below sets out a comparison of recommended and currently proposed green space quantities. As shown in the table, the application of the draft standard for quantity of green space on new developments using the additional projected population figure for DGT would result in publicly accessible green space covering just over 12% of the land area. Vale's draft standard requires a higher 15% of land to be parks and amenity green space.

4.4.32. In order to increase the overall proportion of publicly accessible green space to attain closer to the TCPA recommended 25% of total land area, it is recommended that the amount of Accessible Natural Greenspace provided within and adjacent to development sites includes at least 54 hectares above the current quantity on consented sites. When added to the 151 hectares of publicly accessible greenspace planned on consented sites, this would create a total of 205 hectares, which constitutes around 16% of the additional garden town area. To meet ANGSt requirements as set out in para. 4.4.22 above, this should consist of at least seven Accessible Natural Greenspace sites of 2-20 hectares (amounting to a minimum of 14 hectares in total) and at least two Accessible Natural Greenspace sites of 20 hectares or above (amounting to a minimum of 40 hectares in total). This approach would not necessitate altering the proposed district planning standards as both have adopted Natural England's ANGSt recommendations. As these are based on minimum site sizes, there is also potential to increase site sizes within the standard and deliver an overall green space quantity even closer to the 25% TCPA recommendation. Potential additional Accessible Natural Greenspace sites are shown on Figure 18 Didcot Garden Town green infrastructure network plan. These would need to be delivered as part of developer agreements as strategic GI and potentially funded via the Community Infrastructure Levy.

4.4.33. Regardless of overall quantities of greenspace provided, the most important factor is the arrangement of spaces within a multifunctional network and the quality of the spaces in terms of design and management. Ensuring developers adhere to appropriate GI quality and design standards will be key to creating a successful garden town. This is discussed

fig 18 - Didcot Garden Town green infrastructure network plan



KEY

- Potential location for accessible natural greenspace 2-20 ha
- Potential location for accessible natural greenspace 20 ha +
- Proposed green gap
- Key green routes / corridors to be improved
- Priority green space for improvement
- Proposed green gateway
- Priority site for GI flood mitigation measures
- Priority streets for greening / tree planting
- Potential location for woodland buffer
- National Trails
- Public Rights of Way
- Cycle Routes
- Existing publicly accessible green spaces
- Proposed green spaces on consented developments
- Ancient woodland
- Local Nature Reserve
- BAP priority habitats to be conserved
- Scheduled Monuments
- Registered Parks and Gardens
- AONB
- Green belt
- Existing watercourses
- Didcot Garden Town boundary
- Local authority boundary

further in section 6.

	Whole DGT area: 2070 ha (Figures include 83 ha of existing green space)	**Additional DGT area beyond the existing town: 1222 ha** (Population figures based on additional 37,360 people by 2031)
TCPA recommended quantity of public green space in garden town (25% of total land area)	517 ha (25% of total land area)	305.5 ha (25% of total land area)
Draft standard for quantity of green space on new developments (SODC: 2.53 ha per 1000 pop. plus ANGSt)	231 ha (= 11.1% of total land area)	148 ha (12.1% of total land area)
Quantity of GI on currently consented development sites in DGT area	234 ha (= 11.3% of total land area)	151 ha (12.3% of total land area*)

* Note that this figure does not represent the total land area of consented developments, which would be considerably less than 1222 ha, and the percentage of green space considerably higher.

Table 2: Comparison of recommended and proposed green space quantities

Proposed DGT green infrastructure network

4.5. Overview

4.5.1. This section presents the vision and objectives for the future provision and management of GI in Didcot Garden Town up to 2031. The Strategy aims to address deficiencies in quantity, accessibility, quality and functionality of the existing GI network and set out principles and guidance to assist in the planning, design and delivery of new GI, building on the recommendations of the draft South and Vale Green Infrastructure Strategy.

4.5.2. The Strategy includes a spatial framework, the Didcot Garden Town green infrastructure network plan, which identifies strategic GI links and corridors, locations for new GI sites and facilities and priorities for GI investment and improvement. See Figure *18 Didcot Garden Town green infrastructure network plan.*

4.6. Vision and objectives

4.6.1. The overall spatial vision for DGT is to create a connected and super green town. GI is a key component in achieving this vision and building on the green infrastructure vision for South and Vale, the proposed DGT GI vision is as follows:

4.6.2. Didcot Garden Town's multifunctional Green Infrastructure network of green and blue spaces and corridors, supports our communities and high class economy, creating a connected and super green town. The network is valued for its natural and recreational benefits and its contribution to attracting inward investment and supporting sustainable growth. It also helps to support healthy and thriving communities, and a resilient environment capable of enhancing biodiversity and managing the impacts of climate change.

4.6.3. In line with the draft South and Vale Green Infrastructure Strategy, the Strategy will aim to deliver the following five objectives, which will all contribute to creating a connected and supergreen garden town:

- Support sustainable economic growth
- Improve health and wellbeing
- Increase biodiversity and access to nature

- Adapt to and mitigate the effects of climate change
- Reinforce and/ or enhance local character

4.7. Guiding principles and recommendations

4.7.1. The following sets out guiding principles and recommendations for meeting each of the GI objectives:

Support sustainable economic growth

- Integrate high quality, abundant GI to capitalise on Didcot's garden town status, creating a new, greener character for the town and making it an attractive destination in its own right as well as a gateway to the Science Vale.

- Create green gateways to the town with new planting and landscaping to improve the identity of the town and announce the garden town at key entry points.

- Enhance the quality and attractiveness of the town centre through street greening initiatives with new street trees, more diverse planting of grass verges and greening the grey infrastructure with features such as green walls to encourage people and businesses to move to the area.

- Ensure new development provides high quality GI by applying and enforcing appropriate quality and quantity standards through the planning process. This will not only ensure developments create excellent places to live and work but will also add value to residential and commercial property.

- Maximise sustainable modes of transport by creating safe and pleasant walking and cycling routes in tandem with road improvement works. In particular, large scale transport infrastructure such as the proposed 'Science Bridge' should be designed to be cycle and pedestrian-friendly.

- Seek opportunities to strengthen and enhance multi-functional 'greenway' links between the existing town and new development in particular to the west of Didcot and to Harwell where links are currently poor.

- Improve the quality and functionality of existing cycle routes through the town such as the National Cycle Network Routes 5 and 544.

- Capitalise on the ability of GI assets to alleviate economic issues including flood control, water quality and pollution removal and dilution by incorporating SUDS into all infrastructure schemes, and tackling the problem of culverted and constrained watercourses.

- Explore opportunities to create and manage GI assets to generate income such as woodfuel production and timber products.

- Promote tourism associated with GI to attract inward investment such as recreational routes from the train station to key sites such as Wittenham Clumps.

- Encourage local food producers to market produce locally reducing food miles, and promoting healthy eating.

Improve health and wellbeing

- Ensure green space standards require developers to provide a range of quality green spaces of different sizes close to people's homes to encourage easy, no/low cost physical exercise, and mental health benefits.

- Ensure green spaces are designed and managed to be welcoming and accessible to all users particularly children and young people, the elderly, people with disabilities and from different ethnic backgrounds and provide a safe, stimulating environment for play, social interaction and informal recreation.

- Co-locate new leisure and community facilities with green spaces to increase useability and encourage greater community use of outdoor green space.

- Maximise health benefits through reduced air pollution by planting large species street trees close to main roads where pollutants are at the highest level.

- Explore opportunities through and around the town for enhanced recreational routes between existing and new green space and the countryside. Priority routes are: North-

south from the Thames to the Ridgeway via the Moor Ditch and the disused railway; from the town centre to the Earth Trust and Wittenham Clumps and from the town centre west to Harwell.

- Improve the quality of existing footpaths including better surfacing, lighting (where appropriate) and signposting and promote walking and cycling routes to encourage greater use.

- Address the shortage of allotments particularly in the north of the town, by allocating space for new allotments in adjacent developments to encourage healthy food growing and eating.

- Consider the feasibility of creating small community allotment sites within existing amenity green spaces where there is demand in the local neighbourhood. Often people don't want to manage a full sized allotment and smaller community-managed allotment sites can be popular.

- Integrate fruit trees and community orchards into existing and new green spaces to benefit both people and wildlife.

- Promote the use of green spaces and the countryside by the local community for healthy activities including for environmental education and as an 'outdoor classroom' for schools.

Increase biodiversity and access to nature

- Conserve and enhance designated wildlife sites and areas of priority habitat identified in the Oxfordshire Biodiversity Action Plan.

- Optimise the ecological value of the GI network by conserving and enhancing natural features and habitats and planning new GI strategically to create bigger, more diverse, joined-up and resilient ecological networks that connect, enlarge and enhance existing habitats and that create and support healthy ecosystems.

- Improve the condition and water quality of watercourses in the town by improving the design and management of waterside landscapes.

- Create and maintain at least seven new accessible natural greenspace sites from 2-20 ha within the DGT area to address deficits in provision and meet the needs of the future population.

- Create and maintain at least two new accessible natural greenspace sites of 20-100ha within 2km of the town to address deficits in provision and meet the needs of the future population.

- Improve footpath and cycle access to the countryside and honeypot sites such as Wittenham Clumps ensuring routes are designed to provide access for all.

- Explore potential for transforming former gravel pits and working landfill areas into a substantial nature park to the north of Didcot.

- Improve the biodiversity value of existing parks and amenity green spaces with more diverse planting and new management regimes, developing management plans for key green spaces in consultation with the local community.

- Encourage schools to increase biodiversity within school grounds, and develop local 'Forest Schools' to increase the connection between children and the natural environment.

Adapt to and mitigate the effects of climate change

- Improve the town's resilience by integrating GI into the existing urban area to help mitigate flooding, heat island effects and create more wildlife habitat, including encouraging the retrofitting of green roofs where feasible.

- Maximise the potential of GI to reduce flood risk through the incorporation of sustainable drainage systems (SuDS) or rain gardens as part of development proposals.

- Create new natural drainage systems along the line of Station Road and the station forecourt to reduce risk of surface water flooding.

- Remodel the Moor Ditch flood plain with a series of water channels to allow expansion and contraction of the watercourse as flows change.

- Encourage local residents to keep their front gardens green and resist paving over, through local campaigns or incentives.

- Encourage and support local renewable energy generation through provision of well-managed woodlands to supply woodfuel working with existing organisations such as the Earth Trust and the Sylva Foundation to identify sites and projects.

- Use the GI network as a 'laboratory' for demonstrating good practice in sustainable development, management and stewardship of land and incorporate learning and interpretation facilities.

Reinforce and/ or enhance local character

- Retain, enhance and manage the existing green infrastructure assets in and around the town in particular improving the quality and functionality of existing parks and green spaces.

- Reinforce a sense of place and local identity by incorporating existing natural/semi-natural features and characteristics such as distinctive field boundaries, local landmarks, valued trees into new GI networks and emphasise key views.

- Identify and protect green gaps to prevent coalescence between DGT and surrounding villages in order to protect the identity and character of the settlements.

- Restore characteristic landscape features such as native broadleaved woodlands particularly to the east and north of the town. New woodland could form multifunctional, green buffers to the new urban edge providing a wildlife and recreational resource as well as potentially income generation from timber.

- Produce, adopt and implement a collaborative tree strategy for protecting, developing and managing a thriving, benefit-generating urban forest in tune with local needs and aspirations following the 12 Trees in the Townscape principles.[29]

- Reflect and enhance local character and distinctiveness through the creation of bold new landscape features in and around Didcot such as man-made mounds or hillocks to create new viewpoints, which could use the spoil from nearby construction sites.

- Restore degraded landscapes such as the landfill site and gravel pits to create new publicly accessible landscapes.

4.7.2. Key recommendations are set out spatially in Figure 18 Didcot Garden Town green infrastructure network plan including potential locations for additional Accessible Natural Greenspace sites to meet ANGSt standards and ensure sufficient quantity of green space across the future garden town area. The plan also indicates sites to be conserved, broad locations for green gaps and woodland buffers, priority sites and green routes for improvement and gateway sites and streets for greening initiatives.

29 Trees in the Townscape. A guide for decision makers, Trees and Design Action Group, 2012

5.0 Delivering the green infrastructure network

5.1. Overview

5.1.1. Delivering the vision for an inter-connected, multi-functional and high quality network of GI will require significant resources and a step change in current management practice. Land and funding will need to be secured for new green spaces and funding for improvements to quality and function of existing green spaces. Securing long-term revenue for on-going management and maintenance of green space will be key to the success of the town and a real challenge given the current economic climate that the public, private and community sectors need to tackle head on.

5.1.2. Community ownership of land and long-term stewardship of assets is a key Garden City principle. A critical success factor in Letchworth, the first Garden City, is that it still benefits from a charitable organisation, the Letchworth Garden City Heritage Foundation, which uses income from its land and property in the town to provide benefits for residents including maintaining areas of open space and a greenway around the town.

5.1.3. This section of the Strategy outlines potential options for future delivery, funding and governance of the GI network. It provides the basis for further action planning and feasibility work into models of funding and management.

5.2. GI Delivery

5.2.1. Sustainable and effective GI networks will only be implemented, valued and protected if there is close collaboration between landowners, developers, planners, those responsible for maintenance and the local community. Existing GI and GI in new developments need to be coordinated to create a seamless network, avoiding the problems of a two-tier system with different management standards. Existing spaces must not become a poor relation and opportunities to improve the quality of green spaces across the DGT area must be taken.

5.2.2. Given the fragmented GI ownership and management responsibilities, it will be necessary to set up a GI Strategy Steering Group to ensure the network is planned, designed and managed as a whole. The GI Steering Group should include representatives from land

owning and managing organisations: the South and Vale District Councils, Oxfordshire County Council, Didcot Town Council and relevant Parish Councils, the Environment Agency, the Earth Trust and Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust. Other organisations active in the area such as Wild Oxfordshire, Sustrans and the Sylva Foundation will have skills and expertise to help deliver the Strategy and should be invited to contribute to the work of the Steering Group.

5.2.3. The Steering Group should provide strategic governance and leadership for delivery of the strategy. Coordination of key stakeholders implementing GI projects will be a key task, ensuring projects are joined up and benefits are maximised. Feasibility work to consider a town-wide management trust or delivery body for GI should be progressed as a priority.

5.2.4. The role of the Steering Group should include:

- Championing the importance, benefits and principles of GI to a wide audience across the Garden Town – including the public, private and voluntary sectors
- Ensuring the integration of the GI Strategy into DGT plans, policies and programmes related to planning, environmental management, recreation and health provision.
- Developing a detailed GI Strategy delivery plan, working with wider stakeholders to identify and promote GI initiatives/projects for funding, and agree priorities for delivery.
- Developing detailed recommendations on GI governance, working with stakeholders to consider the feasibility of alternative stewardship models.
- Sourcing funding for implementation of the GI Strategy, and advising on budgets for capital and revenue expenditure on GI.
- Establishing partnerships for the delivery, management and ownership of specific GI initiatives/projects.
- Liaising with GI partnerships in neighbouring areas to co- ordinate cross-boundary delivery of GI initiatives/projects.
- Monitoring the implementation of GI, promoting good practice and reporting progress on delivery of actions that help to deliver the GI Network.

5.3. GI funding

5.3.1. The scale of the DGT plans will afford considerable potential to deliver GI through new

development. New GI assets can be funded from the developers 'land value uplift' and included as part of development agreements. Section 106 agreements, the Community Infrastructure Levy (CIL) and other developer contributions can provide for GI asset creation and support their long-term maintenance. Funding for strategic open space, allotments and habitat creation, enhancement and restoration as well as public rights of way is included in South's CIL Regulation 123 List which contains generic types of infrastructure that may be funded using CIL receipts. Vale's list includes strategic open space and flood mitigation measures. If Section 106 agreements or the CIL are to secure the most appropriate GI, then local authority green space managers should be consulted, along with other relevant stakeholders such as non-government organisations, landowners, residents, and voluntary groups representing broad interests.

5.3.2. All new development should be designed around the principles identified in this Strategy to ensure that growth within the town is in line with the vision for GI. Developers should fully consider opportunities for adding value to the developments by incorporating high quality, sustainable and multi-functional GI at an early stage in the place-making process, including how it will contribute to, and connect with, the wider GI network beyond the development site. Green space management plans setting out the role and function and quality standards should be produced for each site. The South and Vale GI Strategy provides a GI design checklist, (see Appendix C), which should be used to appraise the quality and appropriateness of proposed development in DGT.

5.3.3. Green space creation or enhancement can be included as part of funded grey infrastructure projects such as transport, energy production or water management services. In some cases, utilising GI solutions instead of hard engineered ones can provide a more cost effective approach as in the case of SUDS. It's important that opportunities such as new and improved green routes and improved biodiversity and amenity through appropriate planting are not missed when implementing new transport or drainage schemes across Didcot. Implementing new GI is relatively low cost compared to other built infrastructure, but as with any other public service, it is vital to secure long-term funding for the ongoing management of GI so that it continues to meet its multi-functional goals.

5.3.4. Long term funding for management and maintenance of GI assets has traditionally been the responsibility of local authorities but in recent years, with economic austerity, budgets have been severely constrained and many councils are looking to new models of resourcing.

Identifying a sustainable funding stream for the long-term management of the GI network in DGT is a priority. CABE Space's report Paying for Parks[30] set out eight potential income streams for funding the management and maintenance of parks drawn from models in the UK and overseas:

- Traditional local authority funding
- Multi–agency public sector funding
- Taxation initiatives
- Planning and development opportunities
- Bonds and commercial finance
- Income–generating opportunities
- Endowments
- Voluntary sector involvement

5.3.5. How the management and maintenance of new GI will be funded must be considered at the outset of the development process. Costs must be accurately quantified to ensure the terms of any planning agreement provide sufficient funds to maintain GI to a high standard into the future. Obliging property occupiers to contribute as part of a service charge can ensure funding for maintenance is secure and sustainable. Other forms of local 'taxation' such as Business Improvement Districts (BIDs) can provide additional funding for green space management.

5.3.6. The maintenance of existing green spaces is currently mostly funded by the district and town councils. Additional funding to support greater levels of maintenance could be sourced from other public agencies, such as for example local health providers who could benefit from the increased physical activity in the local population. Greater third sector and community involvement in green space management could bring benefits in kind, saving public money and adding expertise and enthusiasm.

5.3.7. Some GI assets can provide income to support management costs – for example woodlands managed for fuel, renewable energy resources, and sustainable local food production. However, this will require specialist expertise to manage and may not always be compatible with recreational uses.

30 Paying for Parks. Eight Models for funding urban green spaces. Cabe, 2006

5.3.8. Endowment funds can provide a mechanism for providing a secure and steady funding source for green space management. Successful examples tend to be charitable trusts with sole responsibility for a network of spaces, with a sufficiently large initial endowment of funding or property/land at the outset and the right financial expertise such as the Milton Keynes Parks Trust. The Land Trust is a national charity who take over responsibility (and often liability) for the management of green spaces securing and investing long-term funding via an endowment (often in perpetuity). They currently have ownership or long term management responsibility for over 2,000 ha of land across England.

6 GI management

6.1 The DGT vision and the level of investment planned across the town offers an opportunity to consider a new governance model for green infrastructure.

6.2 Across the country, local authorities facing continued cuts to their budgets are considering new models for funding and management of public green spaces, which have been particularly vulnerable given their non-statutory status in local government. Currently, GI management in Didcot is the responsibility of a range of organisations. Didcot Town Council manages most of the existing parks and green spaces in Didcot with public funding. New green spaces such as those on Great Western Park have not been adopted by the council and are managed by new Trusts set up for the purpose, or private management companies. Management standards and approaches vary and there is little strategic planning across the network to ensure benefits to the community are maximised.

6.3 Ideally, the garden town's GI network including existing and new green spaces should be managed by a single organisation spanning the two local authority districts. Given the constraints on local authority funding, an independent organisation dedicated to the management of the towns green spaces would be the best approach. Nesta's Rethinking Parks[31] programme suggests a range of governance models as alternatives to traditional local authority management including:

- Establishing alternative structures that have greater flexibility to meet the needs of local communities.
- Delivering shared services with more integrated management systems across council departments.
- Developing community–based trusts and cooperative business structures.
- Creating new management partnerships between public and private organisations.
- Encouraging the development of community enterprises and interested companies.
- Forming public park foundations and conservancies.
- Exploring the creation of Park Improvement Districts as an adjunct to BIDs.

31 Rethinking Parks, Peter Neal, Nesta, 2013

6.4 A number of established and successful Parks Trusts, such as the Milton Keynes Parks Trust and Nene Park Trust, offer potentially feasible models. Nene Park Trust, a registered charity with a 999 year lease on the Park, was endowed by Peterborough Development Corporation, with commercial properties and other assets which now generate income to maintain the Park. The park covering an area of nearly 700 hectares is entirely self-funded through rental income from commercial and Park properties, concessions and investments at no cost to the taxpayer.

6.5 Whilst transferring local authority parks services to trusts is not a simple process, there are some clear advantages. Recent work to explore the parks trust model by the National Trust found it to be a long term solution which protects parks from further service cuts and enables a more strategic focus on improving quality. Providing a financial endowment is recommended to create a mechanism for those who benefit from parks to invest in them and ensures long-term financial stability. A parks trust structure fosters innovation in parks management, allowing greater focus and flexibility on how parks deliver for people. Public accountability is hardwired in through governance structures and with the public as key 'client' there are increased opportunities for public involvement.

6.5 For organisations considering transferring park ownership and/or management, the Rethinking Parks project highlighted three key learning points:

Secure buy in from key stakeholders

6.6 It's essential to bring in key infuencers and decision-makers early, get a resource commitment as soon as possible, and keep them in the loop over the long haul. The local authority needs to have a strong champion and drive the process navigating political processes and providing access to relevant staff and information.

Measure current costs and conditions and project future needs

6.7 This is essential for any organisations considering taking on parks management, fully or in part.

Build capacity to ensure a smooth transition

6.8 Organisations considering transferring management should ensure that whoever is taking on more responsibility has the relevant skills, knowledge and resources. This is likely to mean investing time and expertise in assuring or even building the capacity of the new manager.

6.9 A parks trust type model for DGT would need adequate start up funding and an endowment to fund on-going management. Contributions could be sought from developers as an essential strategic project via the CIL. The National Trust's Future Parks Toolkit (http://www.futureparks.org), primarily aimed at local authorities considering a parks trust model, is a useful resource in developing a sustainable, alternative model for the financing and management of public parks. Below is an example of how a Parks Trust might work from the Future Parks website.

Monitoring and review of the strategy

6.10 This Strategy has been produced at a time of great change in Didcot and will need regular monitoring and review to ensure it continues to remain relevant and develops to reflect changing priorities. In the context of the changing economic and political context, it is also important that the Strategy remains flexible so that changes in the structure or funding of either Council can be accommodated. An active management approach that can develop and monitor specific outputs is therefore essential, with buy-in at all levels and across authorities. This would be a key task for the Strategy Steering Group.

6.11 The South and Vale GI Strategy recommends monitoring the success of the GI Strategy using the following indicators which are also relevant to Didcot:

- GI principles incorporated into strategic approaches to the environment, economy, health and wellbeing (measured by reference to GI principles being included in Council and stakeholders strategic documents – including the Didcot Garden Town masterplan).
- GI policies included in Local Plans based on the GI Strategy (measured by reference to the inclusion of GI policies in the adopted Local Plans).
- GI design approach for new developments (measured by reference to the area, type and function of GI assets integrated into new development proposals).

Next steps and priorities for action

6.12 Whilst many of the principles and recommendations set out in this Strategy will be taken forward in the DGT masterplan, further work will be required to create a deliverable GI Strategy Action Plan which sets out detailed priorities for action identifying costs, budgets, timescales and delivery partners. This needs to be developed with the active participation of key stakeholders who will play a part in delivering the actions – and could form the workplan for a Steering Group as set out above.

6.13 Further community engagement will also be essential to ensure the Strategy fully reflects local needs and aspirations. Participation of the local community in delivering GI projects and in green space management should also be encouraged through the process.

6.14 An early action will be to develop detailed recommendations on GI governance structures, funding/resource requirements and delivery mechanisms, considering the viability and suitability of a dedicated parks trust or similar type of organisation.

6.15 Identification of project development funding is also a priority so that further feasibility work can be taken forward. Feasibility studies will be needed to examine the viability of specific proposals in more detail, identify and resolve detailed design, implementation and on-going land management and revenue funding issues. This should be informed by targeted consultation with relevant stakeholders, landowners and developers, local community representatives and special interest groups to identify site-specific opportunities and delivery constraints.

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APPENDICES

Appendix A: Planning policy context

European policy context

EU policy on landscape, biodiversity and GI applies to the UK. In 2007, the UK signed up to the European Landscape Convention (ELC)[32] which concerns the protection, management and planning of all landscapes in Europe. The ELC covers land and water and natural, rural, urban and peri-urban areas including everyday or degraded landscapes, as well as those that might be considered outstanding. It recognises that the quality of those landscapes affects everyone's lives and promotes the active participation of citizens in decision-making processes. The ELC also promotes sustainable development seeing landscape as essential in the preservation of natural and cultural heritage as an economic resource.

The EU's Biodiversity Strategy (2011)[33], aims to halt biodiversity loss in Europe by 2020 and includes a target to ensure that, '*by 2020, ecosystems and their services are maintained and enhanced by establishing Green Infrastructure and restoring at least 15% of degraded ecosystems*'.

In 2013, the European Commission adopted an EU-wide strategy[34] promoting investments in green infrastructure, to restore the health of ecosystems, ensure that natural areas remain connected together, and allow species to thrive across their entire natural habitat. The strategy promotes the deployment of green infrastructure across Europe as well as the development of a Trans-European Network for Green Infrastructure recognizing the role of GI in helping enhance the health and wellbeing of EU citizens, providing jobs, and boosting the economy.

National policy context

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and defines GI as, '*a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities*'. Its policies, which are a material consideration in planning decisions, include the following references to GI:

32 http://www.coe.int/en/web/landscape/home

33 http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm

34 http://ec.europa.eu/environment/nature/ecosystems/strategy/index_en.htm

- Policy 73 requires local planning authorities to develop policies based on, '*robust and up-to-date assessments of the needs for open space, sports and recreation facilities and opportunities for new provision. The assessments should identify specific needs and quantitative or qualitative deficits or surpluses of open space, sports and recreational facilities in the local area. Information gained from the assessments should be used to determine what open space, sports and recreational provision is required*'.
- Policy 74 protects existing open space, sports and recreational buildings and land from being built on subject to various provisions.
- Policy 75 requires local planning authorities to develop policies to, '*protect and enhance public rights of way and access*' and '*seek opportunities to provide better facilities for users*'.
- Policy 76 and 77 allows local communities to designate green areas of particular importance to them as Local Green Space for special protection.
- Policy 99 states that when new development is brought forward in areas which are vulnerable to the range of impacts arising from climate change, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.
- Policy 109 requires the planning system to contribute to and enhance the natural and local environment by various means including recognising the wider benefits of ecosystem services.
- Policy 114 requires local planning authorities to set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.

The Planning Practice Guidance (2016)[35] goes further in highlighting how GI is important to the delivery of high quality sustainable development, alongside other forms of infrastructure such as transport, energy, waste and water providing multiple benefits, notably ecosystem services, at a range of scales. It highlights that to ensure these benefits are delivered, green infrastructure must be well planned, designed and maintained. Crucially, the Guidance states the requirement for sustainable management and maintenance arrangements if GI is to provide benefits and services in the long term. It recommends that '*arrangements for managing green infrastructure, and for funding its management over the long-term, should be identified as early as possible when planning green infrastructure and factored into the way that it is designed and implemented*'.

Sub-regional policy context

35 http://planningguidance.communities.gov.uk/blog/guidance/natural-environment/green-infrastructure/

As two-tier local authority districts, County policy and guidance is relevant, particularly in respect of countryside access and public rights of way, biodiversity and the natural environment, flooding, sustainable transport and school grounds.

The vision of the Green Infrastructure Framework for Oxfordshire, Draft 2013 is '*to provide an increasingly interconnected, strong network of green spaces and corridors, which supports Oxford's communities and high class economy. The network will deliver fundamental ecosystem services, including climate change adaptation, a healthy and thriving community and a resilient environment*'.

The framework establishes nine principles to GI in Oxfordshire:

- Recognise the added value that GI can introduce to the local economy;
- Prepare for the predicted events of Climate Change in Oxfordshire, which include storm events, flooding and drought. Pursue increased tree cover to contribute to CO2 sequestration;
- Enable local communities to have access to attractive and connected green spaces with a range of GI features that promote healthy lifestyles and increase physical activity;
- Ensure that land allocation and design processes for new development and regeneration locations are future-proofed with robust and well-connected GI networks;
- Plan for better provision of safe, attractive and well-connected cycling and walking routes for commuters and families;
- Maintain, protect, promote and strengthen distinctive landscape character, including rural landscape and townscapes. Plan appropriate access to cultural heritage sites in order to avoid adverse effects of recreational pressure;
- Increase overall levels of traditionally managed broad-leaved woodland, hedgerows and street trees in villages, towns, Oxford and the wider county;
- Plan GI networks to protect and enhance biodiversity levels across and beyond the county, ensuring that development and farming affects wildlife positively, by means of restoration and creation of sustainable semi-natural habitats; and
- Maximise the benefit that historic and cultural sites can bring to the County by ensuring their location and setting is recognised and protected

Local planning policy context

A summary of key policies related to GI are outlined for each district below.

South Oxfordshire

The South Oxfordshire Local Plan 2011 was adopted in 2006. Saved policies from the Local Plan 2011 and the Core Strategy 2012 form the current development plan documents for South Oxfordshire. A Didcot Garden Town Development Plan Document (DPD) is also being developed and will be adopted in 2018. Additional guidance is provided in the South Oxfordshire Design Guide Supplementary Planning Document 2015.

South Oxfordshire's Core Strategy 2012 has a strong focus on the growth of Didcot. A total of 6,300 homes have been allocated to Didcot up to 2027. These will be based at the strategic sites of Didcot North East, Great Western Park, Ladygrove East, Vauxhall Barracks and the Orchard Centre Phase 2.

The adopted Core Strategy 2012 supports proposals which contribute positively to the health and recreation opportunities and include measures for adapting to and mitigating against climate change. It recognises the need for additional housing must be balanced against protecting and enhancing the natural environment and providing a '*linked Green Infrastructure framework,*' which facilitates access to open spaces and the countryside.

Core Strategy Objective 3: Environment and Design requires all new development to provide GI as well as enhance and manage the natural environment. Policies relating to GI can be found in Section 9 Didcot, Section 14 The Environment, Section 15 Quality development and Section 16 Green infrastructure and biodiversity.

Policy CSDID4 Other proposals for Didcot states that the council will work with others to secure necessary infrastructure to support development including green infrastructure.

Policy CSEN1 Landscape states that the district's distinct landscape character and key features will be protected against inappropriate development and where possible enhanced.

Policy CSG1 Green infrastructure requires a net gain in green infrastructure including biodiversity to be sought through developer works, developer contributions and the targeted use of other funding sources. Proposals for new development must demonstrate that they have taken into account the relationship of the proposed development to existing green infrastructure. Where appropriate, proposals will be required to contribute to the delivery of green infrastructure and/or the improvement of existing assets.

Policy CSB1 Conservation and improvement of biodiversity states that a net loss of biodiversity will be avoided, and opportunities to achieve a net gain across the district will be actively sought. Opportunities for biodiversity gain, including the connection of sites, large-scale habitat restoration, enhancement and habitat re-creation will be sought for all types of habitats, with a primary focus on delivery in the Conservation Target Areas. The highest level of protection is given to sites and species of international nature conservation importance (Special Areas of Conservation and European Protected Species).
Damage to nationally important sites of special scientific interest, local wildlife sites, local nature reserves, priority habitats, protected or priority species and locally important geological sites will be avoided unless the importance of the development outweighs the harm and the loss can be mitigated to achieve a net gain in biodiversity.

Policy CSQ3 Design requires new development that is of a high quality and inclusive design including provision of and/or links into green infrastructure.

Vale of White Horse
The new Vale of White Horse Local Plan 2031 Part 1: Strategic Sites and Policies was adopted in December 2016. Local Plan 2031: Part 2, which will set out policies and locations for strategic housing for the agreed quantum of Oxford's unmet housing need to be addressed within the Vale of White Horse District, is currently being developed. This document will contain detailed development management policies and allocation of smaller development sites for housing and other uses policies including for the part of Didcot Garden Town that lies within the Vale of White Horse District. Didcot Garden Town lies within the South-East Vale Sub-Area and houses a number of significant employment sites, including Milton Park and the site of Didcot A Power Station.

Protecting the environment and responding to climate change form a key part of Vale's Local Plan 2031 Part 1: Strategic Sites and Policies. Chapter 6d Environment includes policies on the historic environment, landscape, green infrastructure and conservation and improvement of biodiversity as well as design and local distinctiveness and sustainable design and construction. Policies of particular importance to planning GI in Didcot are:

Core Policy 44: Landscape sets out the key landscape features to be protected from harmful development and where possible enhanced, including trees, hedgerows, woodland, field boundaries and water bodies, important landscape settings of settlements, areas or features of cultural and historic value, important views and visually sensitive skylines, as well as tranquillity and

the need to protect against intrusion from light pollution and noise. Where development is acceptable in principle, measures will be sought to integrate it into the landscape character and/or the townscape of the area. Proposals will be expected to incorporate landscape proposals that reflect the character of the area through appropriate design and management, preserve and promote local distinctiveness and diversity and, where practical, enhance damaged landscape areas.

Core Policy 45: Green Infrastructure ensures the appropriate provision of GI through new development and requires a net gain in GI, including biodiversity, either through on-site provision or off-site contributions and the targeted use of other funding sources. Proposals for new development must provide adequate GI in line with the GI Strategy. All major applications must be accompanied by a statement demonstrating that they have taken into account the relationship of the proposed development to existing GI and how this will be retained and enhanced. Proposals will be required to contribute to the delivery of new GI and/or the improvement of existing assets including Conservation Target Areas in accordance with the standards in the GI Strategy and the Habitats Regulations Assessment.

Core Policy 46: Conservation and Improvement of Biodiversity states that development that will conserve, restore and enhance biodiversity in the district will be permitted. Opportunities for biodiversity gain, including the connection of sites, large-scale habitat restoration, enhancement and habitat re-creation will be actively sought, with a primary focus on delivery in the Conservation Target Areas. A net loss of biodiversity will be avoided. The highest level of protection will be given to sites and species of international nature conservation importance (Special Areas of Conservation and European Protected Species). Development likely to result in the loss, deterioration or harm to habitats or species of importance to biodiversity will generally not be permitted. The habitats and species of importance to biodiversity include:

Sites of Special Scientific Interest (SSSI)
Local Wildlife Sites
Local Nature Reserves
Priority Habitats and species listed in the national and local Biodiversity
Action Plan
Ancient Woodland and veteran trees
Legally Protected Species
Locally Important Geological Sites

It is recognised that habitats/areas not listed above can still have a significant biodiversity value within their local context, particularly where they are situated within a Conservation Target Area and/or they have good potential to be restored to priority habitat status or form/have good potential to form links between priority habitats or act as corridors for priority species. These habitats will be given due weight in the consideration of planning applications.

Chapter 6d Environment also includes policy on leisure provision including open space, sport and recreation and walking and walking routes. Development is expected to make appropriate provision for open space and recreational facilities as outlined in the council's Leisure and Sports Facilities Strategy and the Open Space, Sport and Recreation Future Provision SPD and in accordance with *Core Policy 7: Providing Supporting Infrastructure and Services* and the council's Infrastructure Delivery Plan.

Appendix B: List of existing publicly accessible green spaces

Existing publicly accessible green spaces		
Name/type	**Size (ha)**	**Average quality score 1-5 (low to high quality)***
Parks and gardens		
Edmonds Park	7.82	3.7
Boundary Park/Local Park (GWP)	9	N/A
Ladygrove park	12.75	4.3
Total area parks and gardens:	**29.57**	
Natural/semi-natural green space		
Ladygrove Lakes	2.82	2
Millenium Woods	3.6	2
Mowbray Fields Local Nature Reserve	2.1	3
Total area natural/semi-natural:	**8.52**	
Amenity green space:		
Bishops Orchard, East Hagbourne	0.23	2.7
Brasenose Road greenspace	0.2	1.6
Cromwell Drive greenspace	0.45	1.7
East Hagbourne Recreation Ground	1.6	4.1
Fleet Meadow	1.81	3.1
Smallbones Rec	0.75	3.2
Freeman Road greenspace	1.71	2.5
Great Western Drive Recreation Ground	0.8	3.8
Lloyd Recreation Park	1.5	3.2
Marsh Recreation Ground	1	3.8
Mendip Heights greenspaces (x4)	0.87	2.1
Parkway greenspace	0.61	1.6
St Hilda's Close greenspace	0.26	1.7
Stubbings Land	1.78	1.8
The Croft greenspace	0.33	1.8
Westwater Way greenspace	0.74	1.7
Worcester Drive greenspace	0.49	1.8
Mowbray Fields greenspace	1.7	N/A
Great Western Park greenspaces (to date)	8.4	N/A
Ladygrove Loop green spaces	13.3	N/A
Total area amenity green space:	**38.53**	

Allotments		
Broadway Allotments	0.8	3
Cockcroft Allotments	1.3	3
Mereland Road Allotments	1	2.5
New Road Allotments	0.8	3
Wantage Road Allotments	0.2	3
Total area allotments:	**4.1**	
Cemeteries		
Kynaston Road Cemetery	1.6	N/A
All Saints Church Cemetery	0.5	N/A
Total area cemeteries:	**2.1**	
TOTAL AREA PUBLICLY ACCESSIBLE GREEN SPACE:	**82.82**	

***** Source: South Oxfordshire District Council's Audit of Facilities, 2008

Appendix C: GI Design Checklist for Development Proposals

(Source: Draft South and Vale Green Infrastructure Strategy, CBA, 2017)

The following checklist is for use by developers to help raise the quality of design and development, and also to help local authority planners evaluate planning applications to ensure high standards in GI design are achieved.

Have opportunities for incorporating biodiversity enhancement measures into the development been considered, such as:

- Retaining and enhancing existing habitat corridors and providing ecological buffers through grassland, scrub, trees and woodland habitat creation?
- Creating a network of habitat links throughout a development, for example using an existing hedgerow network, and enhancing and extending links through habitat creation, including grassland, scrub and trees in adjoining areas?
- Retaining and enhancing existing watercourse corridors through incorporation into a site's open space network, and considering opportunities for naturalisation/diversification of habitats, such as wetland, grassland, scrub and trees?
- Conserving, strengthening and enhancing veteran trees and the existing native hedgerow network within and around a site, and enhancing and extending existing woodland, to safeguard biodiversity assets and maintain the landscape structure of a site?
- Encouraging use of ecological building design measures that enhance biodiversity – e.g. green roofs, green walls, and tree planting/habitat creation within green spaces, and nesting and roosting spaces for birds/bats?

Have opportunities for incorporating access to natural greenspace into the development been considered, such as:

- Conserving and enhancing existing tracks and field boundaries as green links to provide new footpath and cycle links to connect a development site with its different zones/neighbourhoods, and to link into the wider rights of way and green space network?
- Considering opportunities to create new crossings over/under major transport corridors to provide enhanced pedestrian and ecological connectivity between a site and its wider countryside?

- Providing opportunities to use green spaces and other GI assets as an outdoor classroom by providing access to and interpretation of natural and cultural assets?
- Designing community parks to provide a balance between formal and passive recreation and access to nature, and offer varied opportunities for natural play?
- Connecting housing and employment areas to wider greenways network to contribute to healthy communities and green travel objectives?
- Providing a hierarchy of access routes, segregated as necessary, for pedestrians, horse riders and cyclists?
- Engaging local communities at all stages of the planning and design process to foster a sense of ownership and responsibility for the long-term care of green spaces – e.g. design workshops and involvement in implementation through community planting/open days?
- Designing recreational and play spaces to have a distinct sense of place, which provides an enjoyable and visually rewarding environment for all users and responds to and reflects its landscape context?
- Designing green spaces and links to be accessible and inclusive to all ages and community groups, and to accommodate a wide variety of specific requirements including users with mobility impairments?

Have opportunities for incorporating landscape and historic environment enhancement measures into the development been considered, such as:

- Incorporating a structural network of linked natural green spaces into development to contribute to and enhance the site's landscape setting, and help integrate townscape and landscape elements?
- Planning for and implementing new structural landscape planting of native tree species appropriate to local character at the earliest possible stage, to ensure that development is visually well integrated into its landscape context and is appropriate to the local sense of place?
- Design of structural landscaping elements around residential development areas to create a soft edge linking landscape and townscape elements, with use of continuous bands of thicker screen planting to integrate new development areas into the landscape as experienced from within the site and from the surrounding townscape/countryside?
- Encouraging use of natural forms of architectural building design and materials to provide landscape and visual mitigation benefits and contribute to sense of place – e.g. green roofs, green walls, timber construction for walls and claddings?

- Using existing landscape structural features to enhance local landscape character and provide mitigation for environmental impacts – e.g. retain and extend woodlands as landscape buffers to visually screen roads, mitigate traffic noise and improve air quality, and integrate flood attenuation areas into the design of the structural landscape buffers?
- Conserving and enhancing existing structural features such as woodland blocks and hedgerows within the site to contribute to a strong landscape edge and setting for developed areas, retaining and managing these for recreational and biodiversity value as part of new accessible greenspaces?
- Extending structural landscape screening using shelterbelts with appropriate native species in more open parts of a site, to filter views of development from elevated areas?
- Designing lighting schemes to minimise sky glow as far as possible and to conserve dark night skies in the AONBs in particular?
- Creating positive approaches to new and existing development areas around settlements through avenue planting of native street trees on key gateway routes, and ensuring that existing street trees are managed and enhanced to ensure that they are sustained as enduring features of the landscape and townscape?
- Planning and designing new development to respect sensitive horizons/skylines and views that provide key elements of a site's visual context and setting, and tying the development visually to the historic centre of settlements by safeguarding key views of and from local landmarks?
- Have opportunities for incorporating water resources conservation measures into the development been considered, such as:
- Incorporating green building design measures that help reduce water consumption and provide natural shading/cooling to counter the heat island effect of urban areas (such as green roofs, green walls, timber construction for walls and claddings, water saving devices/rainwater recycling and retaining/planting trees within landscaping schemes)?
- Safeguarding water quality from potential risks of negative impacts associated with drainage from development?
- Incorporating Sustainable Drainage Systems (SuDS) into a site's layout to assist in delivering flood storage and water balancing functions?

Have opportunities for incorporating energy and food production into the development been considered, such as:

- Incorporating measures for local renewable energy production into management of green spaces – e.g. energy crops, Combined Heat & Power plant based on local woodland coppice management, micro hydro-electric schemes and wind turbines/solar panels?
- Specifying locally sourced and sustainably manufactured/ produced materials and finishes wherever possible in the design, implementation and future management of green space to assist in reducing the carbon footprint of delivering GI?
- Encouraging local food production by using green spaces for allotments and community gardens/orchards?
- Encouraging local food production by creating links with adjacent farms providing small-scale local food production, local produce sales and educational opportunities for children? Encouraging local food production by using green spaces to provide location for open air market selling local produce?

Appendix D: Stakeholder and public consultation results

Residents and stakeholders have been invited to express their views in a variety of ways from drop-in sessions, exhibition display stands, interactive website and one to one meetings. Key points relating to GI were:

- Retaining / creating green spaces is key to Garden Town credibility
- Particular concern over the potential loss of green space and lakes in the proposed town centre red boundary (Ladygrove) – At the point of writing this report there is a petition with 600+ signatures campaigning to protect all Ladygrove green spaces, paths and amenities from loss, shrinkage or relocation through future development (including the recreation ground, lakes, mounds, primary school field, football club, leisure centre and health centre sites).
- Care should be taken to avoid loss of green space / trees in new developments (housing and roads).
- Any trees lost due to development to be replaced
- Suggestions for a tree to be planted for each resident / home in Didcot
- Better / more landscaped communal spaces within developed areas
- Existing allotments to be protected and new allotments to be created
- Concerns over loss of woodland in the development of the northern perimeter road
- Benefits to health and wellbeing identified by residents having easy access to green spaces
- Benefits to preservation of wildlife recognised
- Improvements and better access to water courses / water facilities
- Suggestions of using woodland / trees to reduce traffic noise
- Entrances to Didcot to be more attractive
- Green boundaries are key to allow surrounding villages to retain their identities
- Roofs on new buildings to have solar panels / roof gardens
- Conflicting comments between suggestions for denser development to prevent urban sprawl and those requesting that more open spaces in new developments
- Safer cycle routes required both within Didcot and on routes to surrounding areas i.e. better lighting, cycle paths separate from traffic
- More cycle routes required to surrounding areas, particularly to science facilities at Harwell and Culham
- Improvements in cycle and footpaths will reduce reliance on cars

- Better footpaths around town centre area
- More / better parks for children. A splash park / open air pool was a recurring theme
- Better connectivity across the town (currently divided by the railway
- Better connectivity to surrounding villages and countryside
- Pedestrian / cycle / alternative transport links required as well as for traffic
- Maintenance of footpaths, cycle paths and roads required throughout Didcot
- Budget for maintenance will be needed for existing areas in Didcot as well as new areas / developments
- Maintenance required for landscaped areas, especially those that can cause pavements to become overgrown
- Heritage trails around Didcot
- Put in place funding to maintain the built and landscaped areas of the garden town

L.
Landscape character assessment

see space differently

→ DIDCOT GARDEN TOWN 'AREA OF INFLUENCE'

LANDSCAPE CHARACTER ASSESSMENT

in Association with QUOD

on behalf of SOUTH OXFORDSHIRE &
VALE OF WHITE HORSE DISTRICT COUNCILS

JANUARY 2017

WAITING FOR HDA INFO

NOVELL TULLETT THE STUDIO HOME FARM BARROW GURNEY BS48 3RW

→ CONTENTS

1. INTRODUCTION

This Landscape Character Assessment (LCA) was commissioned as part of the supporting information to the Didcot Garden Town (DGT) masterplan for South Oxfordshire and Vale of White Horse District Councils.

Didcot was awarded garden town status in 2016 as part of a national strategy to promote housebuilding. It is planned that the existing town of Didcot will expand by 15,050 new homes, 20,000 new jobs and associated infrastructure by the year 2032. The new DGT will continue to fall within the administrative boundaries of both councils.

DGT will have a new larger urban boundary, beyond which is an encircling area of influence extending into the countryside of South Oxfordshire and Vale of White Horse, these 2 boundaries are shown on Figure 1. This report deals with the area of influence which means areas of countryside which may be impacted by the growth of Didcot and landscape beyond this which has an important function as the setting of the town.

The report is required because the current baseline information is incomplete and inconsistent across both councils. South Oxfordshire is reliant on the South Oxfordshire Landscape Assessment produced by Atlantic Consultants in 1998 and updated in 2003, now out of date following a change in guidelines. Vale of White Horse, which until recently, had no landscape character assessment, commissioned Hankinson Duckett Associates (HDA) to produce such a report now in draft form (January 2017). HDA is using the new guidelines set out by Natural England in 2014 'An Approach to Landscape Character Assessment,' which incorporates the processes set out in the 2002 guidance note 'Landscape Character Assessment Guidance for England and Scotland.'

This guidance is now considered best practice and this document will use the same guidance and terminology to help provide a coherent baseline picture of the local landscape across the districts in the future.

For ease of use and a consistent approach this report will expand the HDA assessment across the DGT area.

Background

Landscape is described by the European Landscape Convention as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and human factors' (Purpose 1.5). The term 'landscape' applies equally to natural, rural, urban and peri-urban areas.

Landscape character assessment is concerned with identifying and describing character, rather than with what makes one landscape better than another. It should involve an understanding of how the landscape is perceived and experienced by people.

Landscape character assessment provides a clear statement of the landscape resource within a Local Plan area. This fulfils one of the core principals in national planning policy to recognise the intrinsic character and beauty of the countryside and the requirement for Local Plans to include policies for the conservation and enhancement of the natural environment, including landscape.

It is a process by which the key characteristics of an area of landscape which combine to make it distinctive, can be identified. It is a tool by which one can achieve an understanding of the landscape today and how it has changed over time. It can also be used to monitor changes in the landscape, and help make decisions about the future management of the landscape, including how it may be affected by development.

An LCA can be used to inform policy at all levels, place-making, green infrastructure plans and strategies, masterplanning, landscape impact and visual impact assessments and sensitivity and capacity studies, among others.

The benefits of LCA include:

- Establishing a robust evidence base linked to place
- Providing baseline evidence at the appropriate scale to inform decision
- Presenting a holistic approach to the whole geographic area, rather than focusing on special or protected sites and features
- Forming an agreed spatial framework of landscape character areas, or types, to which different policy options / applications and decisions can be applied
- Integrating socio-cultural and natural considerations (for example landscape and ecosystem services) and providing an understanding of how a place is experienced, perceived and valued by people
- Identifying the key characteristics that together create sense of place - the unique character of an area.

The assessment presented in this study sits within the framework provided by the national Landscape Character Types and Landscape Areas.

The assessment also draws on existing baseline information contained in South Oxfordshire District Council Local Plan (2011), South Oxfordshire Design Guide (2008) which is currently being updated, Oxfordshire Wildlife and Landscape Study (OWLS), Vale of White Horse Local Plan (2011), Vale of White Horse Design Guide Supplementary Planning Documents which contains an overview of the District, and the North Wessex Downs AONB Landscape Character Assessment and Management Plan.

Purpose and Scope

The purpose of this report is to provide a baseline landscape character assessment for the Didcot Garden Town 'Area of Influence'. It will be used by the local planning authorities in decision-making about the future development and management of the landscape around Didcot at a time of rapid expansion.

It will inform about key geological, physical and cultural characteristics which help foster a sense of place, in order to understand the particular sensitivities of a landscape and the pressures it may face.

It will also collate information which can assist in future planning and management within the landscape character area.

The scope of the report is very specific, but does not fit any recognised administrative area. It concentrates on the setting of Didcot, and on those landscape areas which have a direct relationship with the town (See Figure 1) which are described as the 'Area of Influence'. More distant landscapes which can no longer be said to have any influence on Didcot and vice versa have been excluded.

Scale

The landscape has been assessed at a scale of 1:25,000 which is considered a suitable scale for a district assessment of landscape areas.

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http://www.didcot.com/info/history.html

http://harwellcampus.com/about/amenities/

2. METHOD STATEMENT

The approach to this study followed best practice promoted by Natural England, as set out in the Landscape Character Assessment Guidance for England and Scotland (2002) and reaffirmed by Natural England's 2014 'An Approach to Landscape Character Assessment'.

This guidance recognises that landscape character is not purely a scenic experience and rarely the product of one influence but instead a combination and interaction to varying degrees of physiography, history and land management.

Hence factors as diverse as geology, ecology and culture impact on how a landscape is experienced and valued, and should be regarded within the assessment process.

Stage 1: Desk Study

The desk study helped to determine the scope, purpose and level of detail of the study to ensure it was tailored to satisfy the desired outcomes of the assessment.

The national framework provided by the National Character of England Map (Joint Character Areas) and the National Landscape Typology (landscape character types) set out the overall context for the study. This was followed by a review of the existing landscape character assessments, policy documents, including designations as set out in the references given.

The desk study also reviewed the physical and human influences that have shaped the landscape of the county. Physical influences (natural factors) including geology, landform, climate, hydrology, soils, land cover, flora and fauna.

A review of cultural and social influences included land use, patterns of settlement, occupation and activity, enclosure, socio-economic and cultural traditions, land ownership, and looked at current changes in the landscape and the effect of pressures for change acting on the landscape. Cultural associations with the landscape were also explored as expressed by writers, artists and musicians, and notable events, myths, legend and folklore.

Analysis of this range of data was used in the development of draft areas of common character, the mapping of draft landscape character areas and types and the preparation of associated draft descriptions prior to field testing. The draft characterisation stage mapped landscape types and landscape character area boundaries and established a detailed methodology for assessment across the survey area in advance of the fieldwork.

This approach maintains a distinction between landscape types and character areas, and developed a hierarchical approach as follows:

Landscape Types: generic, sometimes extensive areas of landscape that share common combinations of geology, topography, vegetation and human influences, such as Downs Open Farmland and River Floodplain.

Landscape Character Areas: which are unique, discrete geographical areas within the landscape type which exhibit all, or the majority of, the recognisable characteristics of the type, depending on the location of the character area, eg. West Hagbourne Downs Footslopes. They have a coherent and recognisable sense of place.

Stage 2: Field Study

Field work is an essential part of the landscape character process to capture aesthetic, perceptual and experiential qualities of landscape. For this report, the field survey was used to test and verify draft landscape type classifications, to identify landscape character area subdivisions and define more accurate boundaries.

The survey was rigorous and methodical, using written observations, map annotations and photographs. Survey checklists designed for this location were used to ensure that landscape features and characteristics were used in a consistent and objective way. Photographs were used to record general landscape character, key characteristics and specific attributes.

The field survey assessed and recorded each area in terms of the extent and combination of its key characteristics and features as well as the perceptual characteristics of each area.

It noted a description of landscape character, a list of landscape elements and characteristics, such as settlement form, landmarks and building style and assessed the aesthetic and perceptual factors, such as pattern, scale, unity, remoteness and tranquillity of the landscape.

The field assessment also recorded the current condition and management of the landscape.

Stage 3: Classification and Description

Landscape classification was informed by the previous steps and it divided landscapes into areas of distinct, recognisable and consistent character and grouped areas of similar character together. It was the framework on which landscape character descriptions and follow on judgements about future policy development, design strategies or land management could be based.

A final review of the draft area boundaries was undertaken having regard to the desk research findings, field maps and field record sheets and the guidance on current best practice. Summary descriptions of each landscape type and landscape character area were compiled in accordance with the guidelines.

The landscape character assessment was mapped at the scale of 1:25,000 and the boundaries to specific areas defined using the level of detail available at this scale. The landscape character areas were also named to create unique identities which are geographically specific. They may be based on a place name or specific locality but may also refer to the landscape type.

The boundaries selected for landscape types and landscape character areas are firm and recognisable features on the ground and represent a 'best fit' to the change in landscape type or character within an area. Boundaries to landscape character areas are defined but field observation often identifies a gradual transition in landscape character.

Stage 4: Evaluation and Guidance

Information from the desk study, fieldwork and consultation with the local authority was used to determine the existing situation and the forces for change bearing in mind the development impending.

An outline landscape strategy was prepared for each Landscape Type which identified broad objectives and principles to protect the highest quality and most sensitive landscapes from adverse change and to encourage positive change in weak or degraded landscapes. This information was used to make suggestions for landscape management planning and development issues.

If a Landscape Character Area required more specific actions, these were described.

3. LANDSCAPE OVERVIEW

Introduction

Didcot's landscape setting is largely rural land in agricultural use. It comprises a diverse pattern of landscapes, including rolling downland, extensively wooded hills, historic parkland, low-lying farmland and riverside meadows, with scattered rural villages.

Geology

The majority of the Didcot Garden Town area is undulating lowland farmland on predominantly Jurassic and cretaceous clays. Much of the area is underlain by upper greensand and is marked by pronounced, rolling landform and lighter, calcareous and fertile soils.

Physical features

The most important landscape feature to the north and west of the town is the River Thames, along with its floodplains and tributaries. The land is flat and lies almost entirely below 60m AOD. Along the course of the river and its immediate corridor heavy impermeable clay soil is liable to flooding and usually under permanent pasture. The raised, better drained, gravel ground is better suited to settlement and cultivation.

The differences and shifts from the floodplain to the surrounding landscape types and character areas is subtle. There are no obvious valley slopes but instead the ground starts gently undulating and rising.

To the south and east of the DGT lies part of the chalk uplands that form the North Wessex Downs. Here the open, rounded chalk downs rise to form an elevated plateau of smoothly rolling or undulating topography, dissected by dry valleys or combes, with scrub woodland on some of the steeper slopes. Soils are predominantly light, free-draining and thin.

Around Didcot, a band of calcareous siltstones and sandy limestones of the upper greensand forms the transition between the higher land of the downs and the lower-lying vale. These areas share characteristics of the chalk downland with smoothly rounded landform and well-drained chalky and sometimes flinty soils.

Isolated outcrops of greensand and chalk form prominent rounded hills at Wittenham Clumps and Cholsey Hill which are distinctive features within the flat vale landscape.

Intensive arable farming is the predominant land use, with a sparse covering of trees and woodland, except on the steeper valley and hillsides of the downs and at Wittenham.

To the north of the Thames, on the higher ground of the Abingdon loop, the bedrock geology is lower greensand, and forms a rolling plateau which drops steeply towards the Thames from Nuneham Courteney to Abingdon. Much of the ridge or slopes survives as woodland. The heavy clay soil of the floodplain remains under permanent pasture while the free-draining sandy soils are largely arable farmland.

The natural landscape was transformed in the 18th century by the creation of Nuneham Courtney Park which was designed by 'Capability' Brown. Extensive woods and a formal parkland remain as a legacy of this picturesque landscape.

Water

In addition to the River Thames, there are numerous waterbodies resulting from mineral extraction. Sand and gravel has been sourced from the floodplain since Roman times but was only exploited on a commercial scale during the 20th century. There is also an extensive ditch system remnants of former drained marshes.

The area is classified as having 'no water available' for additional abstraction, with several areas that are over-licensed. Demands placed on the water supply are likely to increase further with the significant identified growth of urban areas.

Vegetation

Woodland cover is low in the area but hedgerow and field trees are frequent. Watercourses are often lined by willows, with some black poplar. There were once many elms which have been lost to Dutch Elm disease. Shelter belts for agriculture are also evident in parts of the wider landscape.

Agriculture

Much of the area is farmed. It was formerly a dairy farming area but is now mostly in cereals and other arable crops with some horticulture including orchard fruit. Orchards around Harwell thrive on light, fertile, sandy soils at the foot of the chalk escarpment. There are also many relict orchards.

History

With the exception of Didcot town itself the area continues to show a strong link between the physical features that underpin it and human activity and occupation.

At Didcot the original settlement was Iron Age, which became Romano-British after the conquest and although evidence for its size or longevity is scant, remains including pottery, coins and a coffin found in the field immediately east of the village's church would suggest an existence up until the second or third century CE (Didcot Info).

The Romans brought an influx of people and as elsewhere in northern Europe their arrival heralded landscape change, with an integrated pattern of new settlements and planned roads, farm estates and pottery kilns. This development precipitated greater woodland clearance as the need for timber and open land increased.

A Saxon settlement followed in the 7th or 8th century and despite the enclosures of the 16th and 19th centuries and break-up and sell-off of the manor land in the latter 17th century, Didcot village retained a largely medieval character.

Didcot grew from a village to a town with the arrival of the Great Western Railway in 1839. Five years later, Isambard Kingdom Brunel's covered station was built there and conditions for the town's growth were set. The line now links to Oxford and there is a smaller station at Appleford which escaped Beeching's cuts of the 1960s.

Didcot Power Station was completed in 1968. Didcot A was decommissioned in 2013, and finally demolished in 2016. Didcot B, a gas-fuelled station on the same site, will continue until approximately 2030. Three of the cooling towers have been demolished and three remain as landmarks visible from almost everywhere within the DGT area and beyond. The power station and a nearby industrial estate have resulted in the conjoining of Didcot with the village of Milton.

Local industry has now switched to science and high tech firms which have been attracted by the proximity to London and the transport links.

Settlement and Buildings

The building materials of the traditional vernacular resonate with the local geology and materials. In the vale brick, tile and thatch are present while as the land climbs up to the Downs, more flint and timber are introduced.

Settlement locations are influenced by slope, elevation and water supply, while land use, predominantly agriculture, has been located as a consequence of the quality, permeability and workability of the soil.

The wider area evidence for prehistoric settlement, while scarce, signifies a preference for settling on the higher ground, where the potential of the soils was greatest (given the technology available at the time), was less likely to flood and a water supply was readily available at the springlines. People from these prehistoric settlements cleared large areas of forest on the higher ground for agriculture.

Within the DGT area, there are relatively few settlements in the

river corridor, but historically settlements have favoured the gravel terraces along the Thames, such as Long Wittenham and Sutton Courtenay. These are better drained and slightly elevated above the alluvium surrounding the river and hence less prone to flooding. Alongside the geophysical advantages, the river also provided a ready defence and a transport and trade route.

Both of these villages have Conservation Areas and listed buildings. Due to the lack of building stone, most of the older houses are timber-framed with thatched roofs and there are occasional examples of walls in cob. Brick was also widely used from an early date because of the easy availability of clay and appears as 'nogging' for timber-framed houses, in alternating bands of brick and flint in some 18th century cottages.

Around the vale and the Downs edge, there is a long history of settlement made evident by various prehistoric earthworks and hillforts (eg at Aston Upthorpe) which are scattered along the edge of the downs.

Many of the current settlements have Saxon origins, which took advantage of the water supply arising from springs at the junction of the chalk and clay. Some are located on isolated pockets of higher ground within the vale, such as North and South Morton, while others are of medieval origins along the trade routes that traverse the area. Steventon, for example, is on the old main road between Oxford, Abingdon and Newbury.

The springline villages tend to have a nucleated form, while those along major routes are typically linear. Thatch, red brick and weatherboard are characteristic of the older buildings, sometimes with knapped flint and weathered chalk or clunch in their walls. Traditional barns have a similar character.

South through the AONB the Ridgeway runs along the top of the downs, an ancient track described as Britain's oldest road.

North of the Thames, the Saxon settlements of Culham and Clifton Hampden are positioned just above the floodplain taking advantage of the higher land while retaining proximity to the fertile river meadows.

The building materials of the two villages are similar to those of the wider area, including brick, thatch, timber and stone.

The area has for several hundred years been traversed by an important historic route connecting the crucial Thames crossings at Abingdon and Clifton Hampden, which is now the A415 road. Most of the other roads connecting the villages retain a minor, rural character.

Tranquillity

Although there remain some tranquil rural spaces, the overwhelming impression is of an area criss-crossed by transport routes, including railways and roads and dominated by Didcot Power Station.

Sense of Place

Among the writers and artists attracted by the area are artist Eric Ravilious who painted numerous views of the Downs; Paul Nash, who chose the distinctive Wittenham Clumps as a subject, and David Inshaw who drew on the mystical qualities of the prehistoric landscape.

Landscape Character

The National Character Area Map identifies two Regional Character Areas within the boundary of DGT(see Figure 2):

- Upper Thames Clay Vales
- Berkshire and Marlborough Downs

The study area is also close to two Areas of Outstanding Natural Beauty (AONB) which are outside the DGT 'Area of Influence' but still important due their visual prominence within its setting (see Figure 2). They are:

- Chilterns AONB
- North Wessex Downs AONB

Upper Thames Clay Vales

This national character area (NCA) is a broad belt of open, gently undulating lowland farmland on predominantly Jurassic and Cretaceous clays. The unifying feature of this NCA is the River Thames with its floodplains and tributaries.

The Vale slopes down from the Berkshire and Marlborough Downs forming a clay plain, occasionally broken by minor hills of Greensand or Portland Limestone, and dissected by alluvial flats and low river gravel terraces around the Thames and its tributaries. The area supports mainly arable farming with some pasture, producing a field pattern of large, regular fields with few hedgerows or trees.

Berkshire and Marlborough Downs

Almost the entire NCA falls within the North Wessex Downs AONB in recognition of the scenic qualities and national significance of features across this landscape.

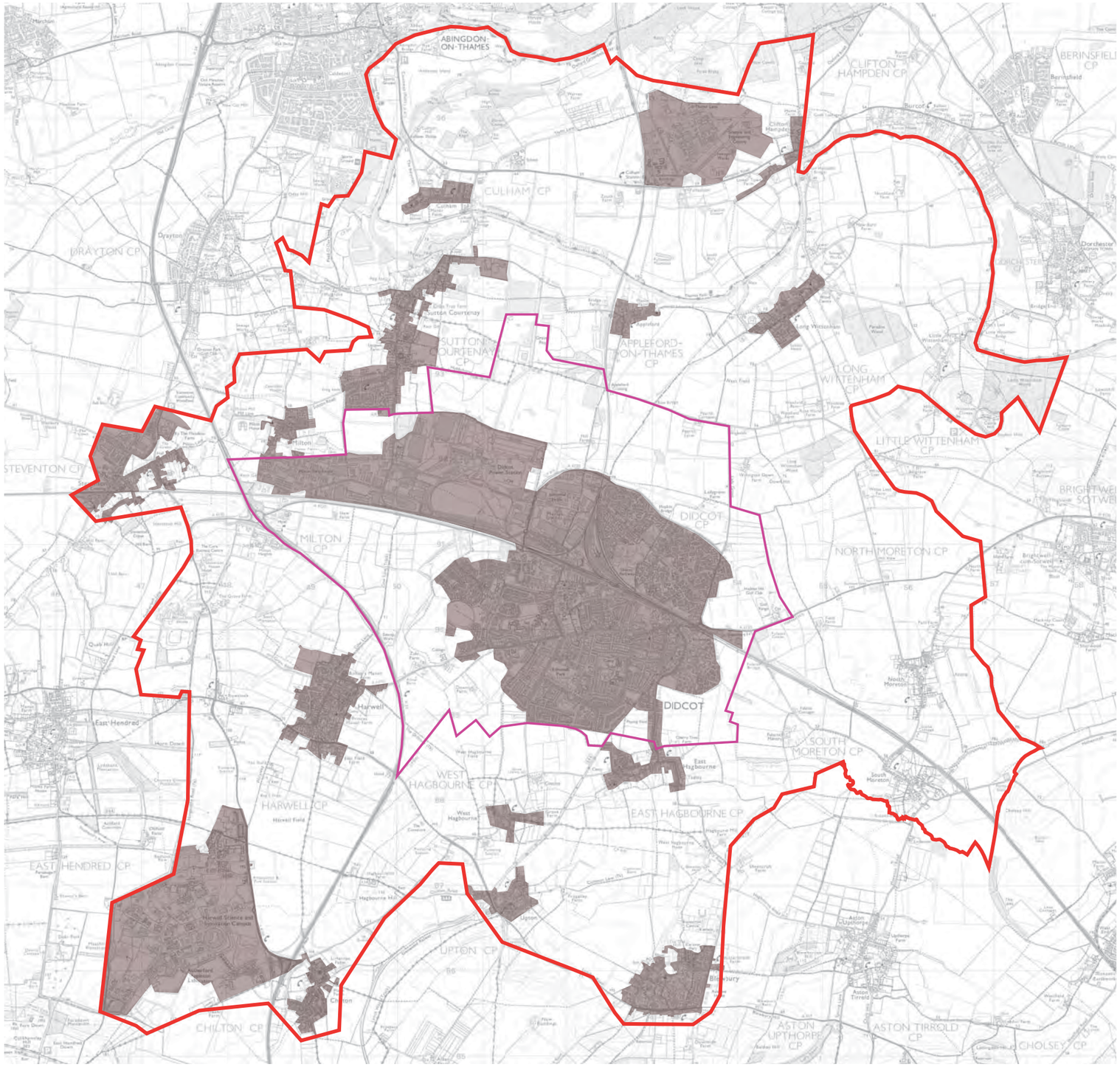
The Berkshire and Marlborough Downs comprise a mass of uplifted chalk which reaches as high as 295m AOD and falls gently south-east into the London basin.

The chalk hills are prominent and stretch north east to meet the Chilterns at Goring Gap. The lower escarpment and plain grades into low hills.

The higher escarpment is almost bare of woodland, exposing a slope convoluted by combes. Steep slopes support the majority of the chalk grassland which can be vibrant with diverse flowering plants and butterflies. Traditional downland makes up the majority of the open access land.

Across the sparsely settled uplands, huge arable fields offer vast skies and high levels of tranquillity. Post and wire fencing and grass strips bound fields, with views interrupted occasionally by small woodlands and historic routeways bordered by scrub. Gallops, racecourses and stables are particularly concentrated around the Lambourn Valley. Dew ponds, droveway verges and fallow plots create a mosaic of farmland habitat. Brown hare, harvest mouse, farmland birds including stone curlew and arable plants such as Legousia

→ FIGURE 1 - DIDCOT GARDEN TOWN AREA



Key

- Didcot Garden Town boundary
- Didcot Garden Town area of influence

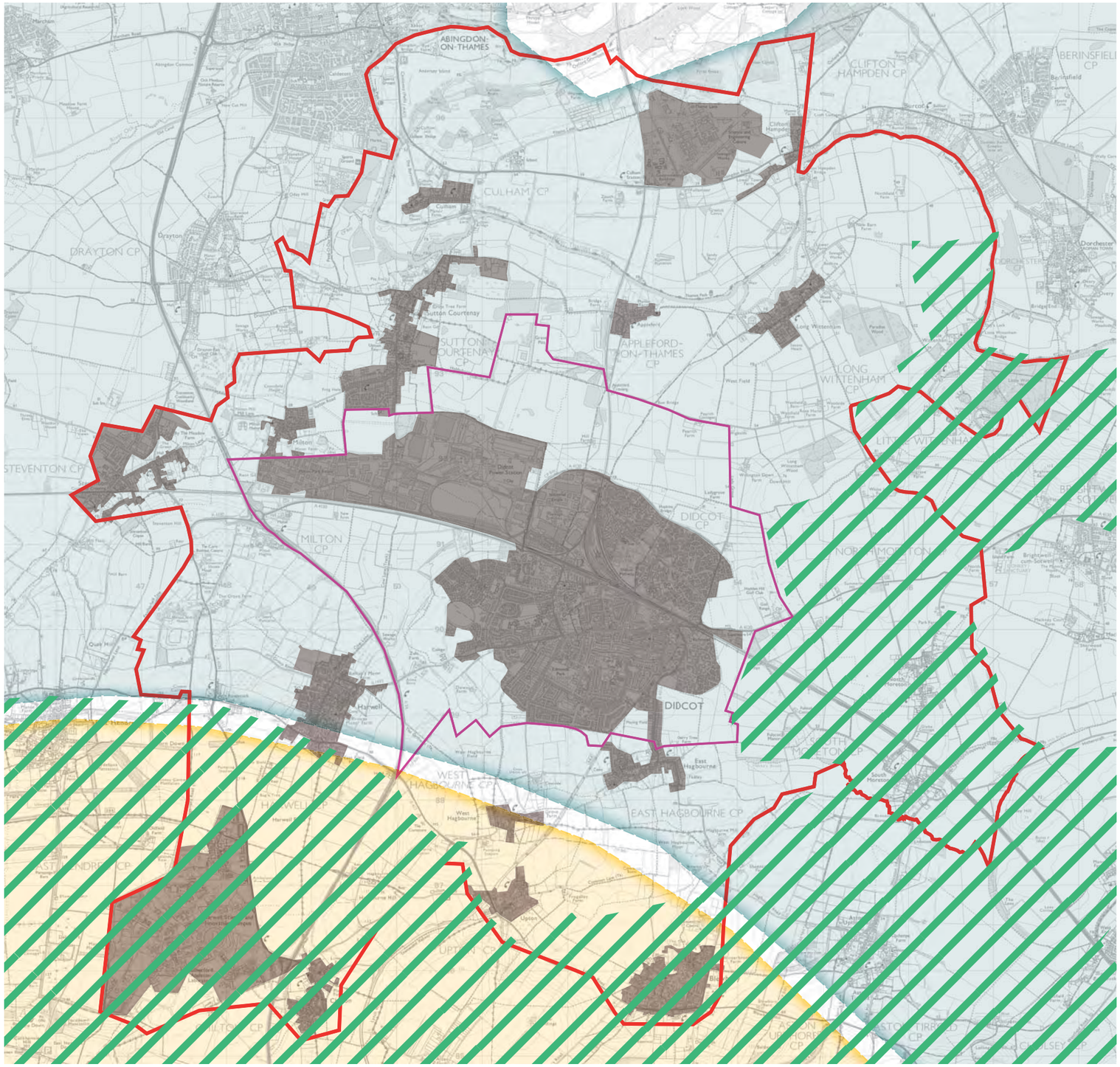
N

hybrida (Venus' looking glass) thrive where there has been a history of consistent cultivation.

The Open Downland forms the backbone of the North Wessex Downs as an elevated plateau of the hard Middle and Upper Chalks. The landscape is of open, smoothly rounded downland dissected by dry valleys and long sinuous steep scarps, and is devoid of surface water. Tree cover is limited to distinctive beech clumps crowning summits and occasional linear shelter belts.

This is a remote, tranquil landscape of panoramic views where the sky forms a key part of the landscape, including the effect of cloud shadows on the ground and the wind creating swells through the crops. The dominant landform is of vast sweeping arable fields with small remnant patches of chalk grassland on steeper slopes. Settlement is extremely sparse and limited to scattered farmsteads and racing stables.

→ FIGURE 2 - NATIONAL CHARACTER AREAS & AONB



Key

- Didcot Garden Town boundary
- Didcot Garden Town area of influence
- AONB
- Upper Thames Clay Vales
- Berkshire and Marlborough Downs

0 metres 2500

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4. LANDSCAPE CLASSIFICATION

The Landscape Types set out in this report are distinct types that are comparatively alike in character, are generic in nature and may occur several times across different parts of the study area.

All instances of a Landscape Type will typically share similar combinations of geology, topography, drainage patterns, vegetation, historic land use and settlement patterns. This means that there is a common discernible pattern, and not that the character across the Landscape Type will be uniformly identical.

The Landscape Types will then be sub-divided into Landscape Character Areas and depicted in more detail.

The Landscape Types of the Didcot Garden Town 'Area of Influence' study area are:-

DF Downs Open Farmland
DS Downs Scarp
DW Downs Woodland
FS Downs Footslopes
RF River Floodplain
RV River Valley Floor
VL Lower Vale Farmland
VW Upper Vale with Woodland

The Landscape Types often encompass or border but do not include settlements. The areas laid out do not necessarily constitute settlement boundaries or policy areas.

The Landscape Types are based on those developed by Hankinson Duckett Associates for their 2017 Landscape Character Assessment of the Vale of the White Horse District. (HCA 2017).

LANDSCAPE TYPE DF - DOWNS OPEN FARMLAND

Location And Boundaries

The Downs Open Farmland Landscape Type comprises some limited areas in the southern and eastern parts of the Garden Town Area. They are the elevated downland above the Downs Scarp (Type DS). Areas of Downs Open Farmland are defined by changes in topography, scale of landscape and land cover, with boundaries following recognisable features such as roads, woodland edges and field boundaries. This type is primarily within the North Wessex Downs AONB.

Key Characteristics

- Founded on chalk, the elevated downland of complex rolling topography is located above the steep scarp feature to the north;
- Predominantly open exposed arable farmland, of large scale fields, with occasional small blocks of dispersed woodland, but limited hedgerow structure;
- The Type includes Hagbourne Hill;
- The Downs Open Farmland is sparsely populated, with settlement limited to isolated farmsteads;
- There are wide panoramic views, north across the Garden Town landscapes to the ridges further north;
- The Downs Open Farmland provides a rural unsettled horizon above the ridge scarp in views from the north.

LANDSCAPE TYPE DW - DOWNS WOODLAND

Location And Boundaries

The Downs with Woodlands Type is located in the extreme east of the district, consisting of only a single area. The area is bounded on three sides by the boundary of the study area and to the remaining side, the north-west, by much lower flatter farmland. The Type is defined by topography, the scale and extent of woodland cover and land use. Boundaries follow easily recognisable features including roads, woodland edges and field boundaries. The Type is entirely within the North Wessex Downs AONB.

Key Characteristics

- Rolling downland, with occasional steep slopes. Landform reaches up to 120m at the highest point, Round Hill;
- The Type is characterised by a variety of woodland, including ancient deciduous, mixed and yew woodland, copses on hilltops. Mature tree species frequently include Beech, Oak and Ash as well as Yew;
- Historic features include the Iron Age hill fort atop Castle Hill;
- There is a no settlement in the area;
- There are wide panoramic views all around from the sides of the two hills. Woodland frames or obscures views in places elsewhere.
- The Downs with Woodland Landscape Type provides a landmark of two copsed hills, on the horizon above the generally lower land around much of the Garden Town area.

LANDSCAPE TYPE DS - DOWNS SCARP

Location And Boundaries

The Downs Scarp runs east-west in the southern portion of the district as a narrow band of steeply sloping land above the Downs Footslopes to the north, and below the elevated Downs to the south. Complex topography which continues outside the study area results in a disconnected eastern section of scarp to the south of Blewbury. The extent of the Landscape Type is predominantly defined by its steep, north-facing topography, with its boundaries mainly following the edges of fields. The landscape type is entirely within the North Wessex Downs AONB.

Key Characteristics

- Steeply rising slopes of the North Wessex Downs forming a prominent north-facing escarpment;
- The scarp has a complex twisting landform with localised ridges and spurs;
- Land cover on the scarp predominately consists of pasture;
- The scarp provides a rural, distinctive backdrop to views

from the north.

LANDSCAPE TYPE FS - DOWNS FOOTSLOPES

Location And Boundaries

The Downs Footslopes type is located across much of the southern half of the Garden Town area. The type is defined predominantly by its topography, located between the foot of the Downs Scarp (Type DS) to the south, and the Lower Vale landscapes to the north. Boundaries follow easily recognisable features including roads, woodland edges and field boundaries. Significant parts of the Downs Footslopes are within the North Wessex Downs AONB.

Key Characteristics

- The footslopes are largely underlain with chalk;
- They are formed by a shelf of rolling landscape and hills, descending gently north from the foot of the downs scarp;
- The type consists of a medium to large scale landscape, of mainly arable farmland with some significant areas of population. There are smaller parcels of land such as paddocks and large gardens associated with settlement and farmsteads;
- Tree cover varies, and includes small scattered woodland blocks, substantial tree belts and riparian woodland;
- A number of watercourses flow north from chalk springs towards the River Ock and Thames, and form a focus for rural settlement, including villages known as 'springline' villages;
- The Downs Footslopes are peppered with numerous nucleated settlements, including small villages and hamlets at the foot of the scarp. Villages include Harwell and Blewbury. The type also surrounds the large Harwell Science Campus;
- A network of main roads and rural lanes connect areas of settlement and access farmland;
- There are views across the farmland of the prominent Downs Scarp to the south, the town of Didcot as well as more distant glimpses of the often wooded ridge on the horizon to the north.

LANDSCAPE TYPE RF - RIVER FLOODPLAIN

Location And Boundaries

The River Floodplain consists of low-lying river terraces and valley bottoms following the courses of a number of rivers and streams that flow through the Garden Town area. In particular, the landscape type includes the River Thames as it winds along the northern and north-eastern areas of the district, and the River Ock, which flows west to east at the western boundary of the Garden Town area towards the River Thames. Boundaries are generally determined by the edge of the floodplain.

Key Characteristics

- Low-lying level areas of floodplain situated on alluvial deposits;
- The presence of open water in the form of rivers, with channels, streams and brooks;
- Land use is generally pastoral, often with wet meadows, including those used for grazing, with tree species including willow and alder;
- In areas along the Thames the river is enlivened by the movement and colour of boats navigating the waterways;
- In some instances there are surrounding urban influences, including housing, roads and utilities associated with settlements such as Abingdon;
- Elsewhere, such as along the majority of the River Ock, the route of watercourses are peaceful, semi-enclosed and sparsely settled other than at river crossings.

LANDSCAPE TYPE RV - RIVER VALLEY FLOOR

Location And Boundaries

The River Valley Floor Landscape Type comprises a number of separate areas of river terrace fringing the floodplain along the River Thames. The extent of the Type is based on the underlying sand and gravel terrace, topography and land use. Boundaries follow recognisable features on the ground where possible, including roads, field boundaries and the edge of settlement.

Key Characteristics

- Level or gently shelving landscape underlain by river terrace sand and gravel, elevated just above the alluvium of the floodplain;
- The valley floors consist of a mixture of large arable fields with limited boundary vegetation, smaller scale more enclosed areas of pasture, and small parcels of land including paddocks and large gardens associated with dwellings;
- Woodland includes some small blocks or copses incorporated into the geometric field pattern. There are mature trees along boundaries in less intensively farmed areas;
- Streams and ditches cross the area and feed into the River Thames and River Ock;
- Settlement is limited to farmsteads, large houses and occasional small groups of dwellings;
- Open areas allow views across the gravel terrace and adjacent floodplain, up to the wooded ridge on the northern horizon and the downs scarp on the southern horizon;
- The valley floor is rural and peaceful with limited urban influence.

LANDSCAPE TYPE VL - LOWER VALE FARMLAND

Location And Boundaries

The Lower Vale Farmland Type, together with the Upper Vale Farmland (Type VU) form a band of low-lying farmland across the northern part of the Garden Town area. The Lower Vale Farmland is defined by underlying geology, topography,

land use and the degree of openness and field pattern scale. Boundaries follow easily recognisable features including roads, woodland edges, watercourses and field boundaries.

Key Characteristics

- The type is predominately underlain by a superficial geology of sand and gravel, and has heavy clay soil;
- The area is low lying and relatively flat;
- The Lower Vale consists of large-scale, intensively managed arable farmland and pasture resulting in a relatively open landscape;
- There are individual mature trees along field boundaries, but woodland is generally limited;
- A network of ditches criss-crosses the Lower Vale, draining the farmland towards the River Thames;
- The type is disturbed by quarrying and settlement around Didcot, towards the River Thames floodplain;
- The Lower Vale Farmland wraps around the northern edge of Didcot Town but the main body of the type has very limited settlement other than the occasional farmstead;
- Roads cross through the Lower Vale Farmland, but there is a limited internal network of routes;
- The relatively open nature of the low-lying landscape allows views of high ground on the horizon to both the north, south and east.

LANDSCAPE TYPE VU - UPPER VALE FARMLAND

Location And Boundaries

The Upper Vale Farmland Type, forms a band of farmland north of the River Thames. The Upper Vale Farmland is defined by underlying geology, topography, land use and the degree of openness and field pattern scale. Boundaries follow easily recognisable features including roads, woodland edges, watercourses and field boundaries.

Key Characteristics

- The area has heavy clay soils;
- The area is low lying and relatively flat, albeit slightly more elevated and more gently undulating than the Lower Vale Farmland to the south;
- There is a patchwork of small to medium scale arable fields, interspersed with occasional areas of pasture, including minor watercourses;
- The intactness of the hedgerow pattern varies, particularly along arable field boundaries. There are also small blocks of woodland dispersed through the upper vale landscape.

LANDSCAPE TYPE VW - UPPER VALE WITH WOODLAND

Location And Boundaries

The Upper Vale with Woodland Type, is located in the north of the study area, between the lower Thames floodplain to the north and river valley floor farmland to the south. Defined mainly by its geology, topography and land cover. The Landscape Type boundaries follow easily recognisable features including roads, woodland edges and field boundaries.

Key Characteristics

- The landscape is generally steeper and higher than its surrounds especially the Thames floodplain to the north;
- The Upper Vale with Woodland includes significant blocks of woodland, along with more open, arable farmland;
- The intactness of the hedgerow network varies, with a limited network along some arable field boundaries, and more substantial mature hedgerows elsewhere. Large individual mature trees are a feature along field boundaries and roads;
- Settlement is limited to scattered farmsteads;
- The Upper Vale with Woodland Type contains no main roads, but lanes and tracks linking to farms;
- Vegetation often obscures or frames distant views, but at the edges of the woodlands long views over the lower surrounding lands are possible .

→ PHOTOGRAPHS

↑ Satellite image showing the River Thames northeast of Didcot

← Flat open farmland within the River Valley Floor, with view of the power station chimneys and cooling towers which are a major landmark

← Flat semi-enclosed farmland within the River Valley Floor near Long Wittenham

← River Floodplain near Long Wittenham, with willows to river edge and floodplain pasture behind

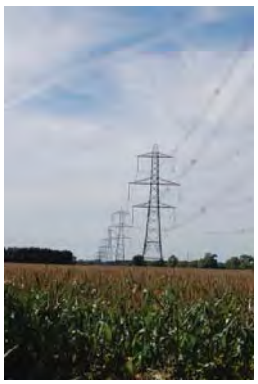
→ PHOTOGRAPHS

↑ Satellite image showing the farmland and rolling chalk landscape southwest of Didcot

↑ Open farmland northeast of Didcot

↑ Open farmland near Fulscot

← Brick nogging, a feature on many properties in the Hagbournes



← High-voltage electricity pylons, a feature of much of the landscape around Didcot

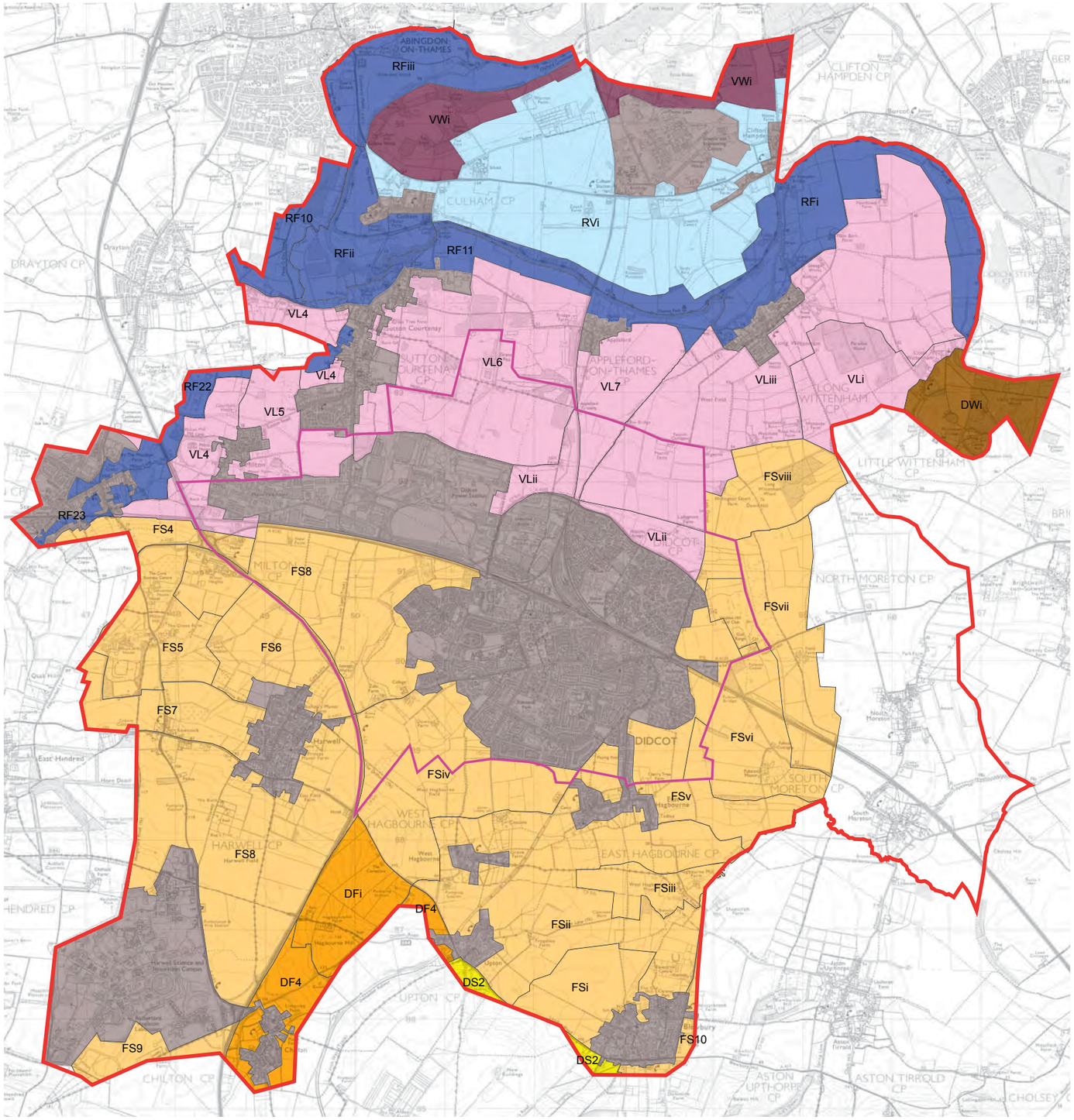
→ PHOTOGRAPHS

↑ Satellite image showing the Ridge north of Didicot

↑ Farmed land south of Culham village

↑ View from footbridge over the Thames looking towards the Sutton Pools vegetation

→ FIGURE 3 - LANDSCAPE TYPES



Key

- Didcot Garden Town boundary
- Didcot Garden Town area of influence
- DF — Downs Open Farmland
- DS — Downs Scarp
- FS — Downs Footslopes
- RF — River Floodplain
- RV — River Valley Floor
- VL — Lower Vale Farmland
- DW — Downs with Woodland
- VW — Upper Vale with Woodland
- Urban

N

5. LANDSCAPE CHARACTER AREAS

The Landscape Character Areas are the individual unique geographical areas in which landscape types occur. Although they share genetic traits and characteristics with other areas of the same type, they have their own particular identity.

Landscape Character Areas are often more prevalent than Landscape Types, as types are more generic and can occur in several areas. This means the Character Areas are usually more easily identified by non-specialist, local people and visitors, because at this level the sense of place is more important.

The Landscape Character Areas often encompass or border but do not include settlements. The areas laid out do not necessarily constitute settlement boundaries or policy areas.

The following Landscape Character Areas have been identified for Didcot Garden Town 'Area of Influence'.

DFi - Hagbourne Hill Downs Open Farmland
DWi - Sinodun Hills Downs Woodland
FSi - Blewbury Downs Footslopes
FSii - West Hagbourne Downs Footslopes
FSiii - West Hagbourne Moor Downs Footslopes
FSiv - South Didcot Downs Footslopes
FSv - East Didcot Downs Footslopes
FSvi - Fulscot Downs Footslopes
FSvii - Hadden Hill Footslopes
FSviii - Down Hill Footslopes
RFi - Clifton Cut River Floodplain
RFii - Andesey Island River Floodplain
RFiii - Culham River Floodplain
RVi - Culham River Valley Floor
VLi - Little Witttenham Lower Valley Farmland
VLii - North Didcot Lower Valley Farmland
VLiii - Long Wittenham Lower Valley Farmland
VWi - Culham Brake Upper Vale with Woodland

DFi - HAGBOURNE HILL DOWNS OPEN FARMLAND

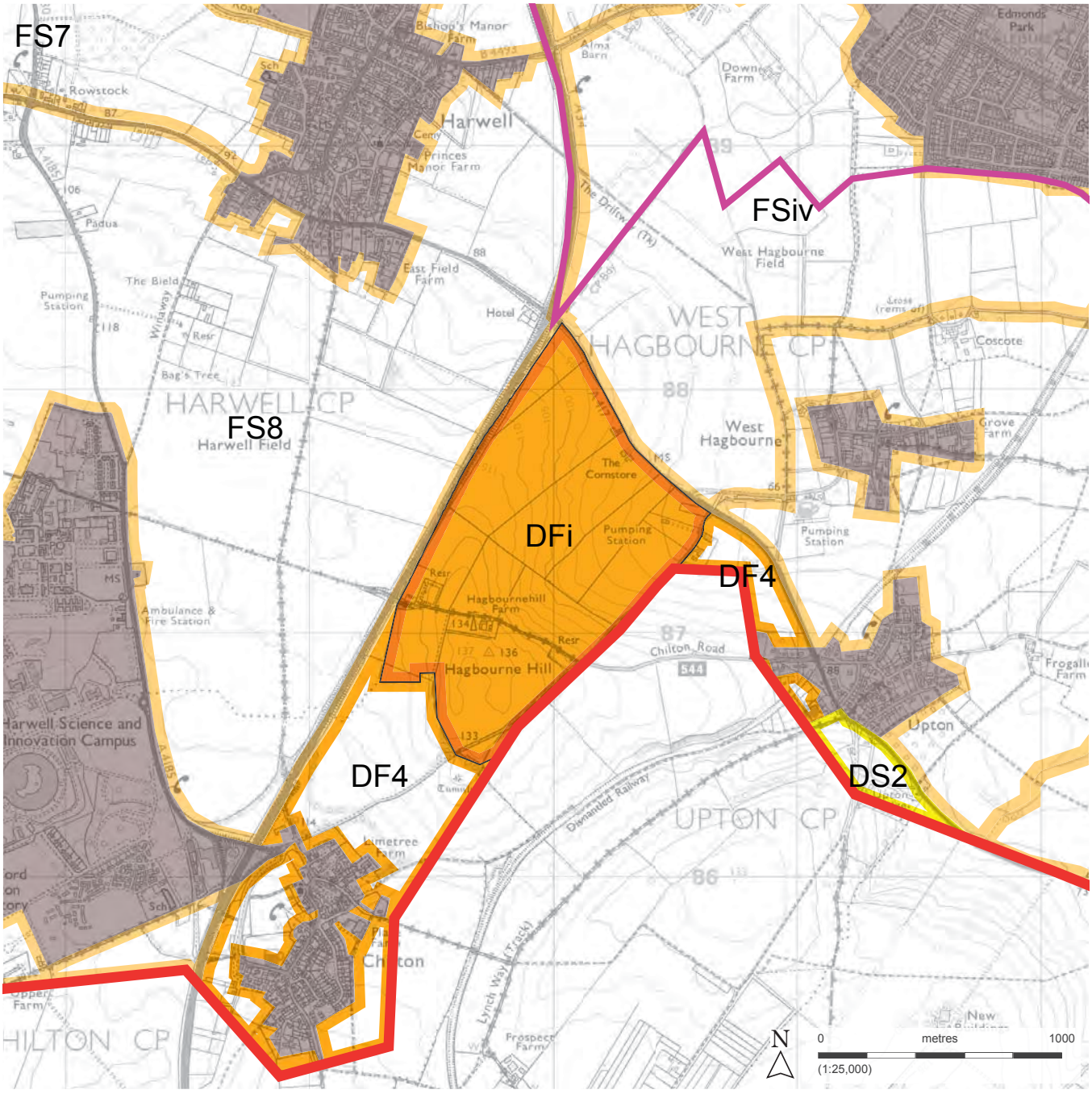
Location And Boundaries

The Hagbourne Hill Downs Open Farmland Character Area is an area of open chalk farmland below the chalk ridge, south of the Ridgeway. The area is defined by footslopes to the north and west. The extent to the south and east is defined by the boundary of study. The Area is within the North Wessex AONB.

Key Characteristics

- Downs, underlain by the West Melbury Marly, Zig Zag and Holywell Nodular Chalk Formations;
- The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from head deposits, material accumulated by down slope movements;
- Rolling landscape with a distinct hill, from a low 75m in the north-eastern corner of the Area, rising to the south to Hagbourne Hill at 137m AOD, running to the north-east is a subtle valley;
- The area consists entirely of large, open, rectilinear arable fields;
- Very little tree cover, limited to a shelter belt south of Hagbournehill Farm and small individual trees to road edges and field boundaries;
- Hedgerows are largely fading or absent to field edges and those to the road appear ill maintained;
- There are two open water reservoirs for the farmland; these are at either side of the Area just off the road;
- Extensive long panoramic views across the north, east and west are a feature of the area, including the town of Didcot, the power station and the Sinodun Hills. Where the topography to the south allows the ridge of the North Wessex Downs is visible;
- Electricity transmission lines run aross the area to the farm and large contemporary agri-sheds are visible at the base of the slope;
- The area is unsettled apart from Hagbournehill Farm a small collection of red brick and clay roof tile buildings;
- Formal vehicle access through the Area limited to Icknield Way which bridges the A34 and runs east west across the south of the area, the A417 is the northern boundary of the area and Hagbourne Hill road is the eastern boundary;
- The only public right of way in the Area, a byway open to all traffic (BOAT), is also along the only road;
- This is a rural character area with no nearby urban influences. The large scale landscape feels open and exposed. Panoramic views are continually available from the public right of way and there is a sense of remoteness to the Area.

DFi - HAGBOURNE HILL DOWNS OPEN FARMLAND



DWi - Sinodun Hills downs woodland

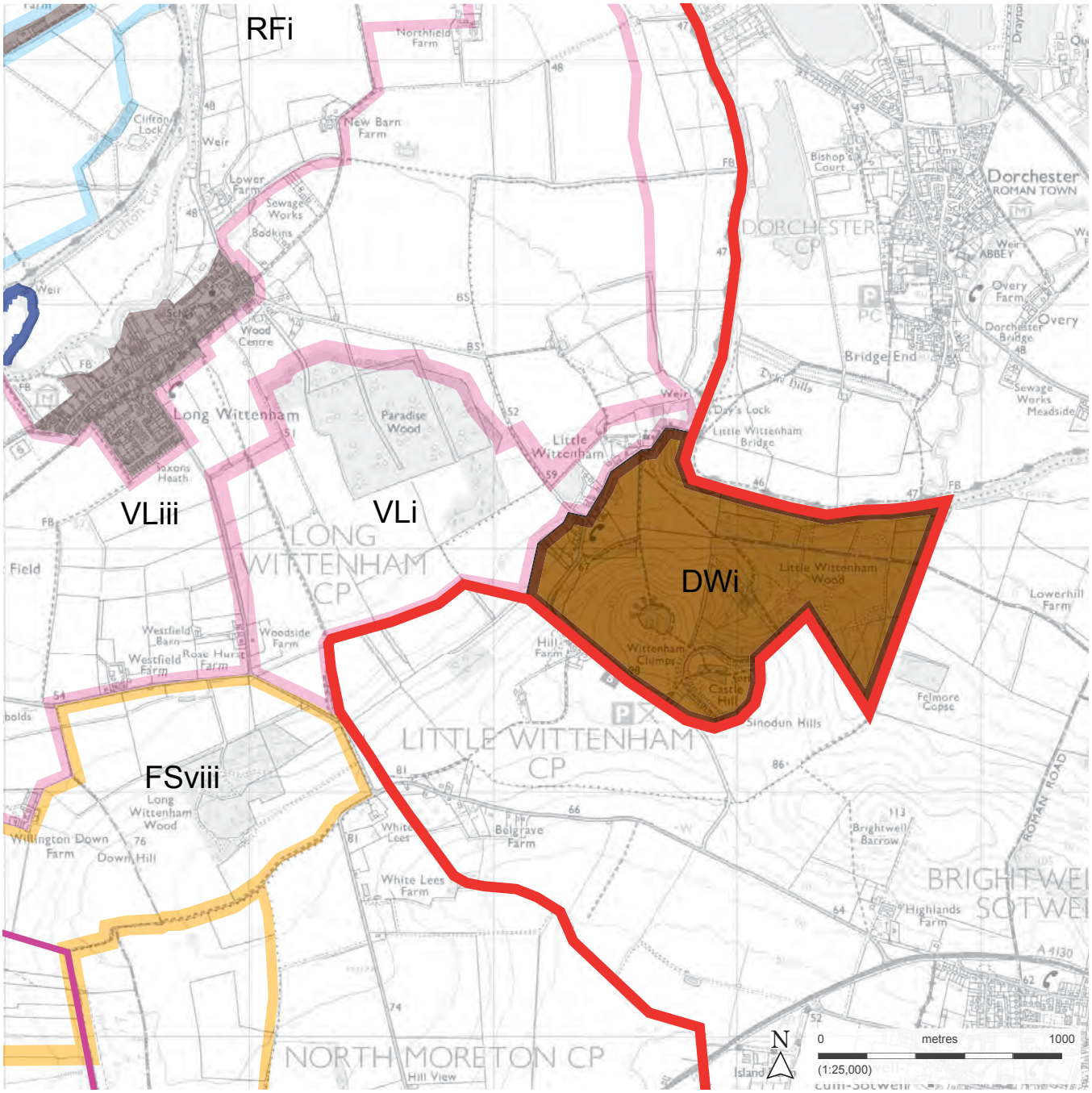
Location And Boundaries

The Sinodun Hills Downs Woodland Character Area is an area of open chalk footslope below the chalk ridge and scarp, south of the Ridgeway. The area is defined by more enclosed land to the north and west and by the area of scarp to the south. The character is contiguous with the landscape to the east but the extent is defined by the boundary of study. Known locally as the Wittenham Clumps, or just Clumps, strictly speaking, that name refers to the wooded summits of these hills. The Area is within the North Wessex AONB.

Key Characteristics

- Chalk hills at outer edge of downs, islands of the West Melbury Marly Chalk Formation surrounded by the Upper Greensand Formation of calcareous sandstone and siltstone;
- Rolling landscape with two distinct hills, from a low 50m by the River Thames along the northern boundary of the Area to north rising to Round Hill at 120m and Castle Hill at 110m AOD, between and to the north-east is a subtle valley, while to the north of Round Hill the land drops steeply towards the village of Little Wittenham;
- The area consists entirely of woodland, tree cover and the grasslands surrounding the hills;
- Little Wittenham wood covers roughly a third of the area. From the north-east corner to the centre is an Ancient Woodland with a beech copse atop each hill and much tree cover within the village itself;
- The woodland includes a number of ponds, streams, flushes and damp hollows fed by springs. Although parts of the woodland are known to be 400 years old, it has been extensively felled and replanted. The canopy is dominated by ash, field maple, hazel and oak. Parts are dominated by blocks of conifers. The ground flora includes many characteristic species of damp woodland including dog's mercury, ground ivy, goldilocks buttercup, sanicle and greater butterfly orchid. A wide range of woodland invertebrates is present including the white letter hairstreak butterfly and the hoverfly. The woodland ponds and streams support a wide diversity of dragonflies and damselflies;
- Little Wittenham is also designated both a Site of Special Scientific Interest (SSSI) and a Special Areas of Conservation (SAC). The site selection was because the village is one of the best-studied great crested newt sites in the UK. Large numbers of great crested newts have been recorded in the two main ponds, and research has revealed that they range several hundred metres into the woodland blocks;
- There is a limited network of hedgerows along tracks and to field edges but they are showing signs of a lack of management, gappy in places overgrown in others;
- There are two main ponds in the woodland with the main stream issuing from them flowing north to the Thames;
- Comprehensive panoramic views are available from the two hills with the only impediment being the two hills themselves and their near neighbour Brightwell Barrow to the south-east;
- The Area is largely unsettled bar a few dwellings to the south of Little Wittenham village;
- There is no formal vehicle access to the area. An unnamed road on the south-west side gives access to a car park for visitors to the Hills;
- A network of public rights of way criss-cross the area giving passage to the hills and woodland and connecting the village with Shillingford and Dorchester nearby;
- Castle Hill is the site of an Iron Age hill fort, with its earliest earthworks dating to the late Bronze Age. Investigations in 2004 by the Channel 4 archaeological television programme Time Team found the remains of a Romano-British house with tesserae (mosaic) floors and painted wall plaster on the southern slope of Round Hill;
- The 'Clumps' cultural associations include being repeatedly painted by the 20th-century British artist Paul Nash; being the filming location for the Radiohead webcast video of the band's song "Faust Arp"; and the woodland setting for the climax of the third episode of the third season of the Netflix series Black Mirror;
- This is a rural Character Area with only very small urban influences from the small village of Long Wittenham felt on the north-west edge. Outside the woodland it is a large-scale, open and exposed landscape with extensive panoramic views. Within the woodland the sense is of enclosure and shelter and, although well-managed, a natural environment. There is a feeling of remoteness to the majority of the Character Area, heightened by the magnificent views.

DWi - Sinodun Hills downs woodland



FSi - BLEWBURY DOWNS FOOTSLOPES

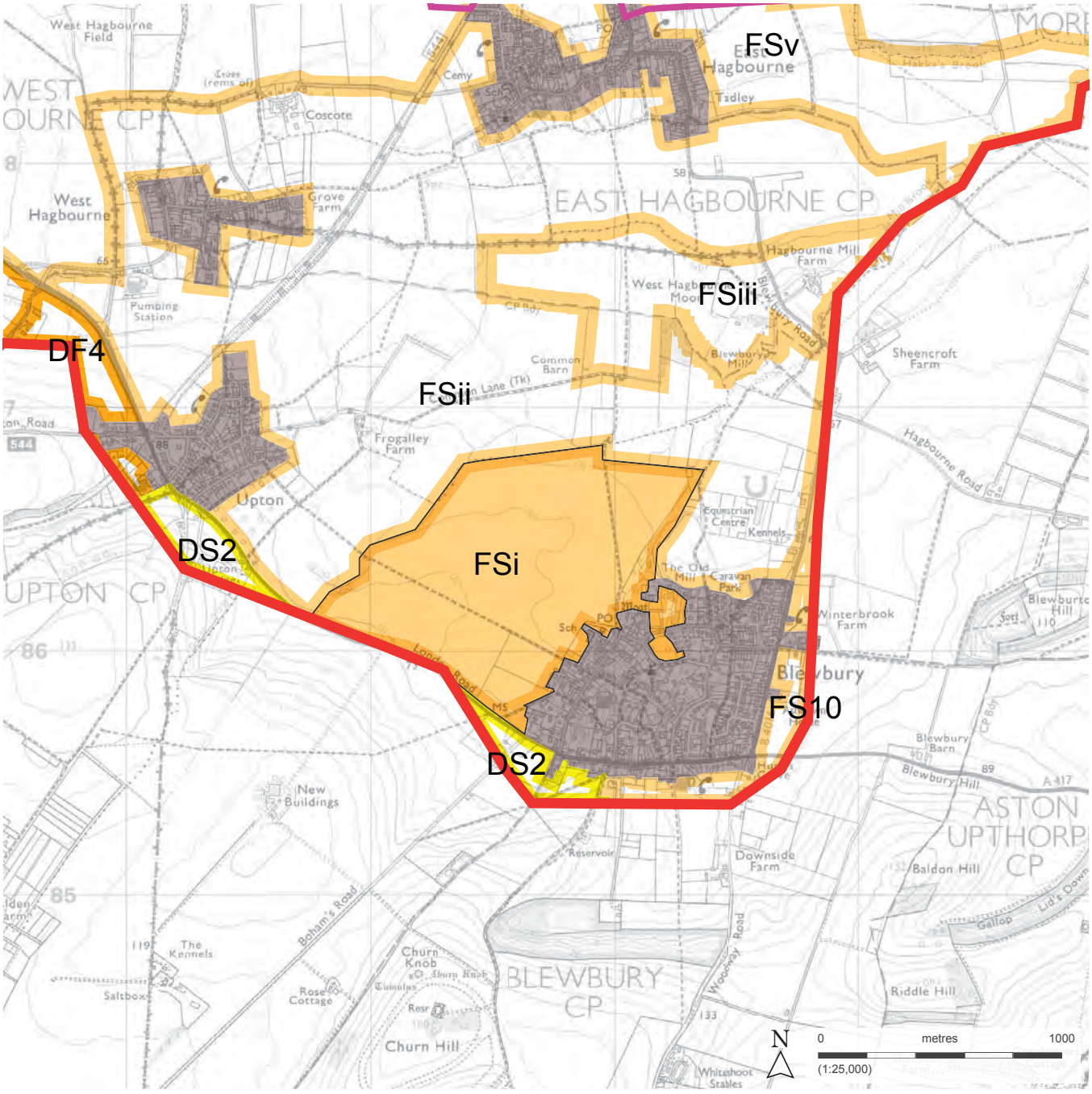
Location And Boundaries

The Blewbury Downs Footslopes Character Area is an area of open chalk footslope below the chalk ridge and scarp, south of the Ridgeway. The area is defined by more enclosed land to the north and west and by the area of scarp to the south. The character is contiguous with the landscape to the east but the extent is defined by the boundary of study.

Key Characteristics

- Chalk footslopes, underlain by the West Melbury Marly Chalk Formation;
- Gently undulating landform, rising slightly to the south to approximately 75m AOD, where it meets the downs scarp;
- Consists almost entirely of large-scale, mainly rectilinear, open arable fields;
- The only trees are along the boundaries of the more enclosed fields to the north and northeast, and along the edge of Blewbury;
- There are no hedgerows within the area except to the boundaries north and northeast;
- Extensive panoramic long-distance views are possible across the character area, including from the A417 looking north across Didcot, and from other public rights of way in the area looking south and east to the scarp and downs of the North Wessex Downs AONB. Views east are restricted by the settlement of Blewbury;
- The character area abuts Blewbury but other than that is without settlement;
- The A417 runs east west across the south of the area, and footpaths run from Blewbury west and north to nearby settlements;
- The area is largely rural but development along the edge of Blewbury is encroaching upon it;
- There is no enclosure within the area and it consequently feels open with panoramic views from the public rights of way.

FSi - BLEWBURY DOWNS FOOTSLOPES



FSii - WEST HAGBOURNE DOWNS FOOTSLOPES

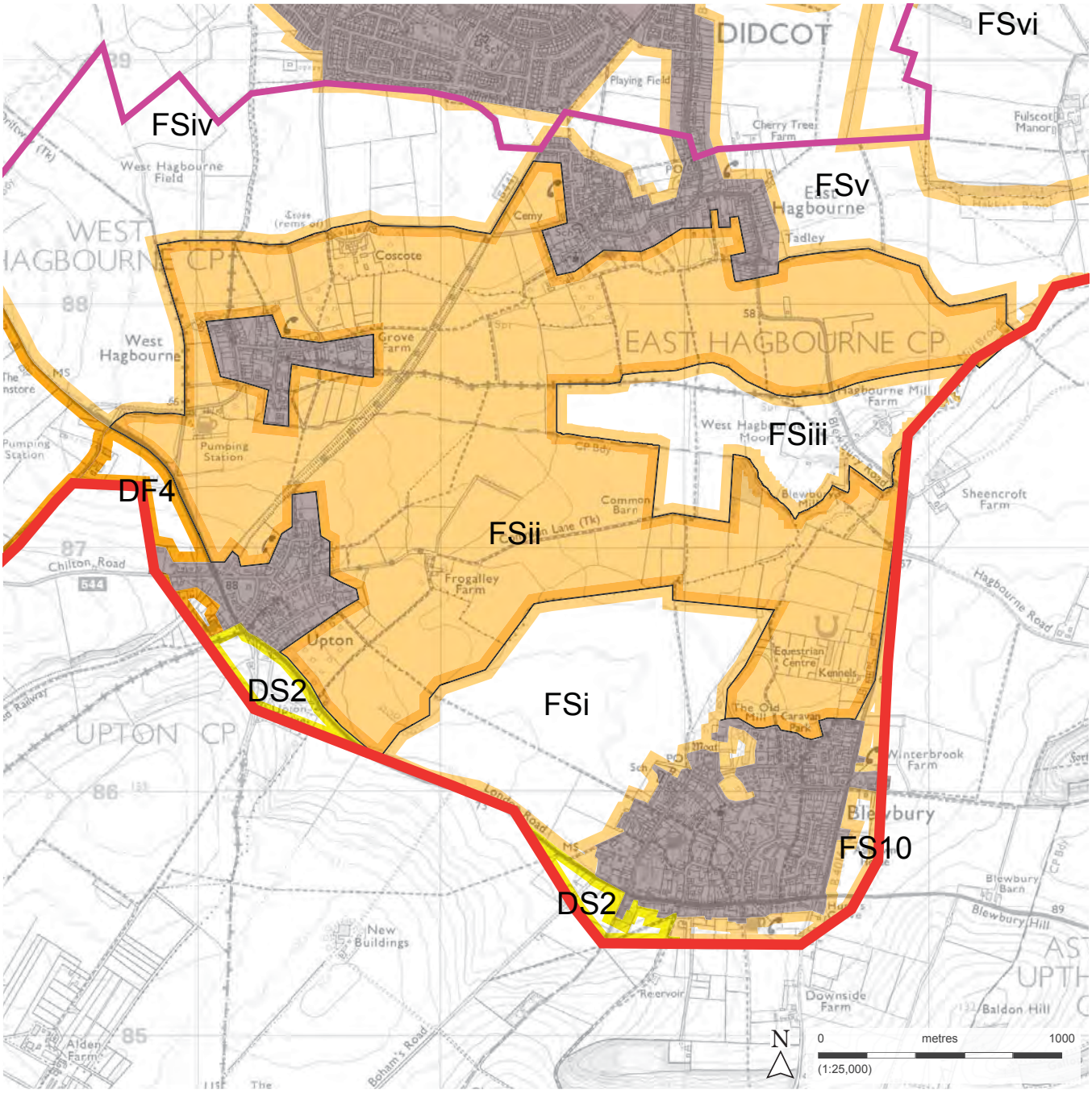
Location And Boundaries

The West Hagbourne Downs Footslopes Character Area is an area of semi-enclosed chalk footslope below the chalk ridge and scarp south of the Ridgeway. The areas is defined by more open land to the south, east and north. The boundary to the east is defined by the boundary of study.

Key Characteristics

- Footslopes, underlain by the West Melbury Marly Chalk Formation and Upper Greensand Formation of calcareous sandstone and siltstone;
- The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial and head deposits;
- Gently undulating landform rising to the east to approximately 75m AOD near Upton, where it meets the downs scarp;
- Consists almost entirely of medium to small scale arable fields irregular and asymmetrical in shape;
- There are substantial tree numbers to almost all field boundaries and to the edges of the settlements of Upton, West Hagbourne, East Hagbourne and Blewbury;
- There are two small blocks of deciduous woodland near Blewbury Mill in the eastern half of the Area;
- Historic orchards have been lost along the southern boundary of East Hagbourne and around West Hagbourne, but one adjacent to Upton survives;
- There is a reasonable hedgerow network, mainly to the boundaries of the fields but also to tracks;
- Hedgerows to some fields appear unmanaged and failing, and there has been a definite loss of hedgerows in recent years;
- Extensive panoramic long distance views are possible across the Character Area from the elevated cycle route (National Cycle Network No. 544) along a dismantled railway which cuts through the north-western corner of the area. Other views within the area are more restricted due to the field enclosure vegetation, although when they open up, views of Wittenham Clumps and North Wessex Downs AONB are possible;
- The Area is overlooked by the scarps and downs of the North Wessex Downs;
- Outside the villages habitation consists of isolated farmsteads usually in red brick and roof-tile;
- Vehicle access through the Area is limited to the few roads connecting the villages, however there is an extensive network of public rights of way, with those of a larger scale running east west, connected north south by small footpaths;
- There is an extensive network of streams, sometimes fed by springs, and drainage ditches generally all flowing east as the topography gently drops;
- This is a rural Character Area with the influence of the villages only felt as one gets very close to them. The small scale landscape generally feels intimate and enclosed.

FSii - WEST HAGBOURNE DOWNS FOOTSLOPES



FSiii - WEST HAGBOURNE MOOR DOWNS FOOTSLOPES

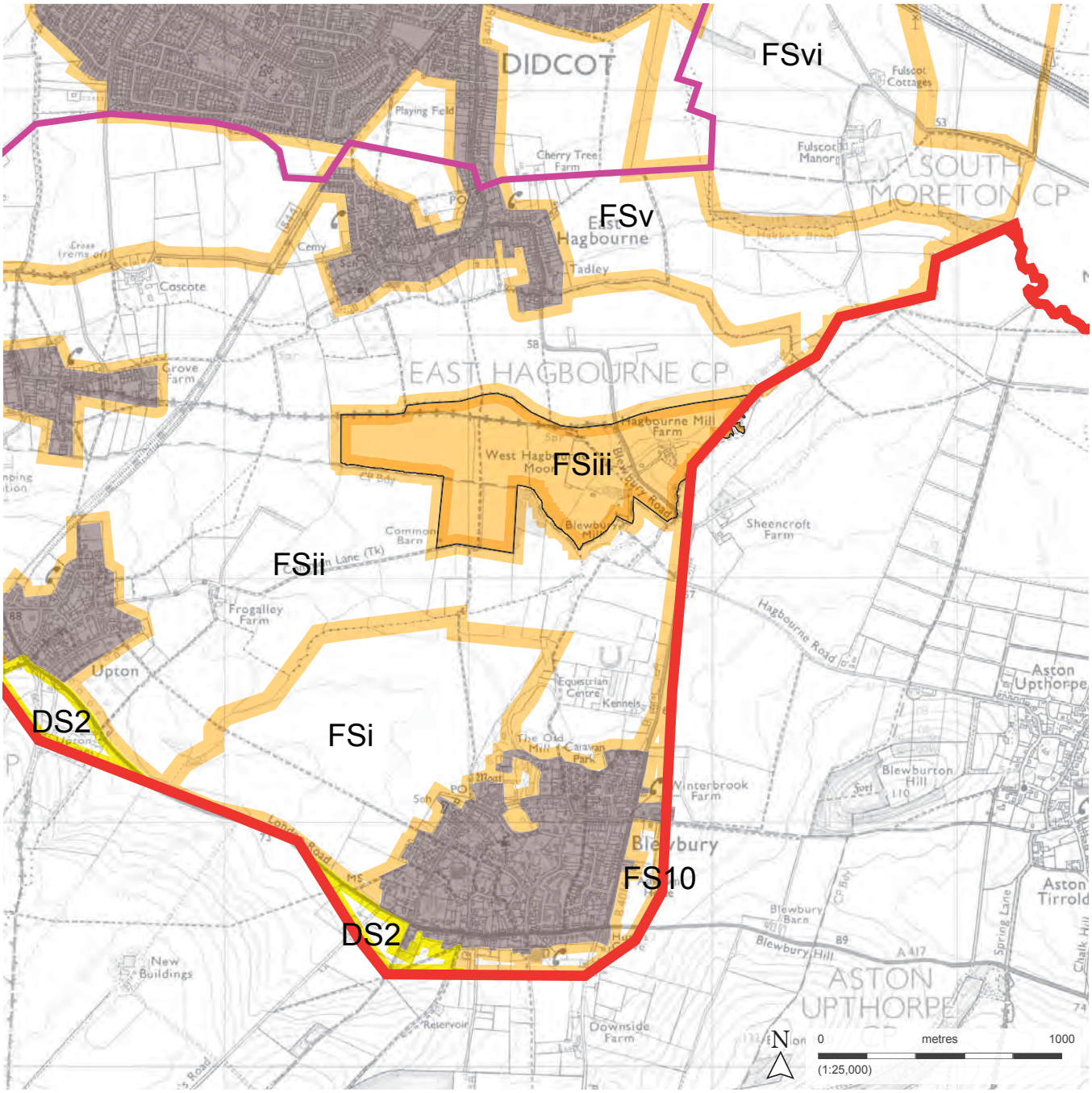
Location And Boundaries

The West Hagbourne Moor Downs Footslopes Character Area is an area of enclosed chalk footslope used for pasture below the chalk ridge and scarp south of the Ridgeway. The areas is defined by more open arable land all around.

Key Characteristics

- Chalk footslopes, underlain by the West Melbury Marly Chalk Formation;
- Generally flat landscape with slight fall to the northeast as shown by the flow of the brooks, streams and ditches of the area
- Consists of small irregular fields given over to pasture;
- There are substantial tree numbers to almost all field boundaries, although the Area is open to the north. Two small areas of woodland stand to the west of the B4016 (Blewbury Road / Bessel's Way). The one nearest the road and Hagbourne Mill Farm is recognised as Ancient Woodland;
- The majority of the field boundaries do have hedgerows although they are often gappy and overgrown;
- Views across the Area an limited with vegetation screening in all directions;
- The Area contains one farm and the former Blewbury Mill;
- The area is traversed by the road which connects Blewbury and East Hagbourne, but no others;
- There are a number of public rights of way in the Area either following field boundaries or the Mill Brook;
- This is a rural Character Area with no urban influences, small in scale it feels intimate, quiet and enclosed.

FSiii - WEST HAGBOURNE MOOR DOWNS FOOTSLOPES



FSiv - SOUTH DIDCOT DOWNS FOOTSLOPES

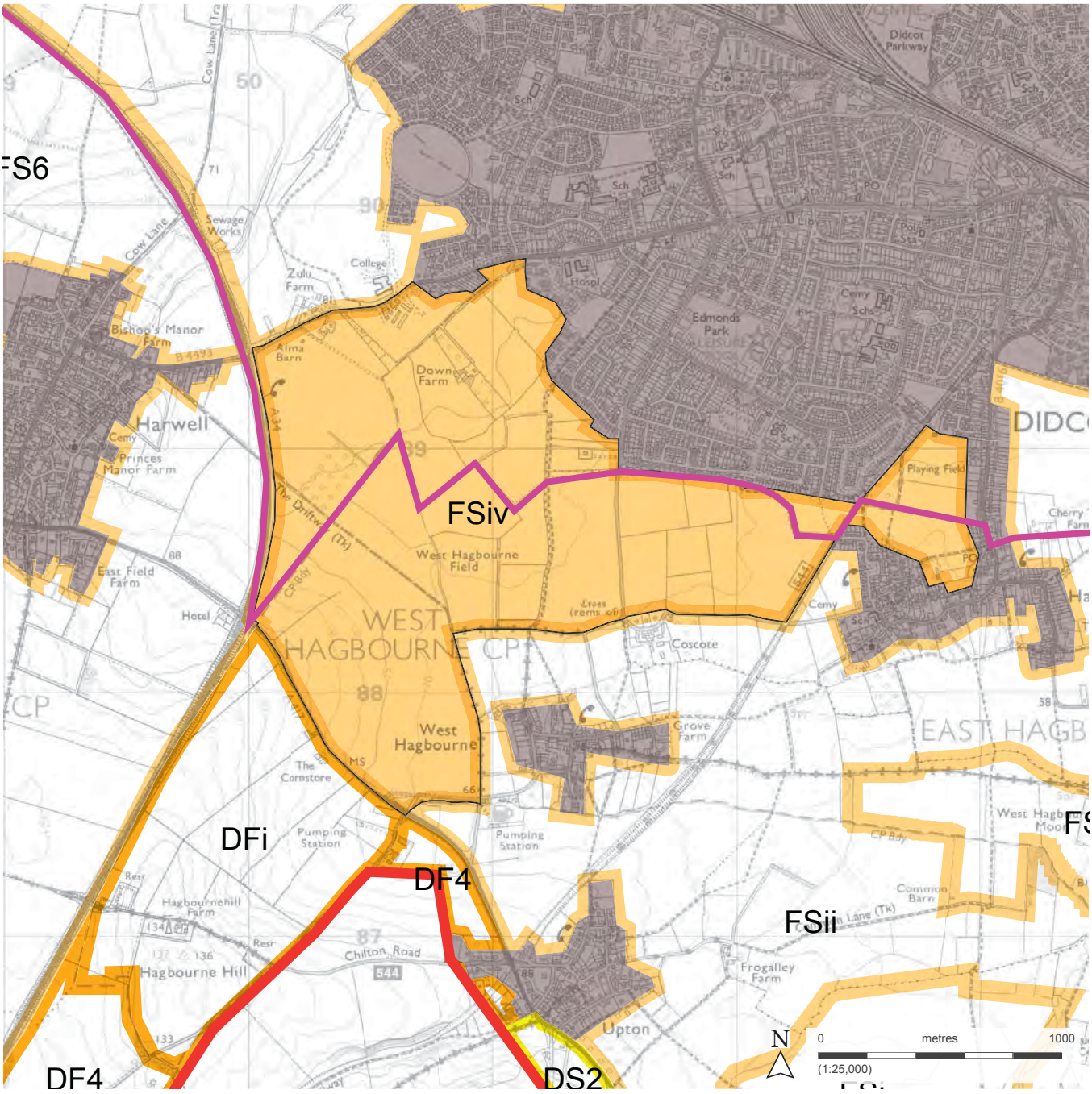
Location And Boundaries

The South Didcot Downs Footslopes Character Area is an area of open chalk footslope south of Didcot Town. The Area is defined by more enclosed land and Downs Open Farmland to the south, to the west by the A34, and the urban edge of Didcot to the north and east.

Key Characteristics

- Footslopes, underlain by the Upper Greensand Formation of calcareous sandstone and siltstone;
- The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from both alluvial and head deposits;
- A largely flat landform with some gentle undulation to the eastern boundary where the land rises to the scarp and Hagbourne Hill to approximately 90m AOD;
- The Area is mainly composed of irregular open arable fields, larger to the west and smaller to the east;
- There is a small block of deciduous woodland between Didcot and East Hagbourne that forms part of Mowbray Fields local nature reserve. Trees to field boundaries and the urban edge are very limited;
- At least one Orchard has been lost from the Area as field amalgamation has occurred;
- There are few hedgerows as field boundaries and they are largely gappy and have grown out.
- The Area feels open and view out and across are possible from within. The cooling towers of the power station, Didcot Town, the downs to the south and east and even the higher ground south of Harwell is visible beyond the A34;
- The area contains the hamlet of Coscote, an isolated farm, and abuts the settlements of Didcot and East Hagbourne, so although the area is largely rural there are many urban influences along its edges;
- Vehicle access within the Area is limited but it is bounded by the A34 to the west, the A4174 to the south, and the B4493 to the north. Park Road running north from West Hagbourne to Didcot is a busy commuter route;
- There are two important public rights of way across the Area connecting West Hagbourne with Didcot and via The Driftway, an historic route, Harwell;
- This is a rural Character Area, which, though largely surrounded by settlements, feels an open and large scale landscape with panoramic views.

FSiv - SOUTH DIDCOT DOWNS FOOTSLOPES



FSv - EAST DIDCOT DOWNS FOOTSLOPES

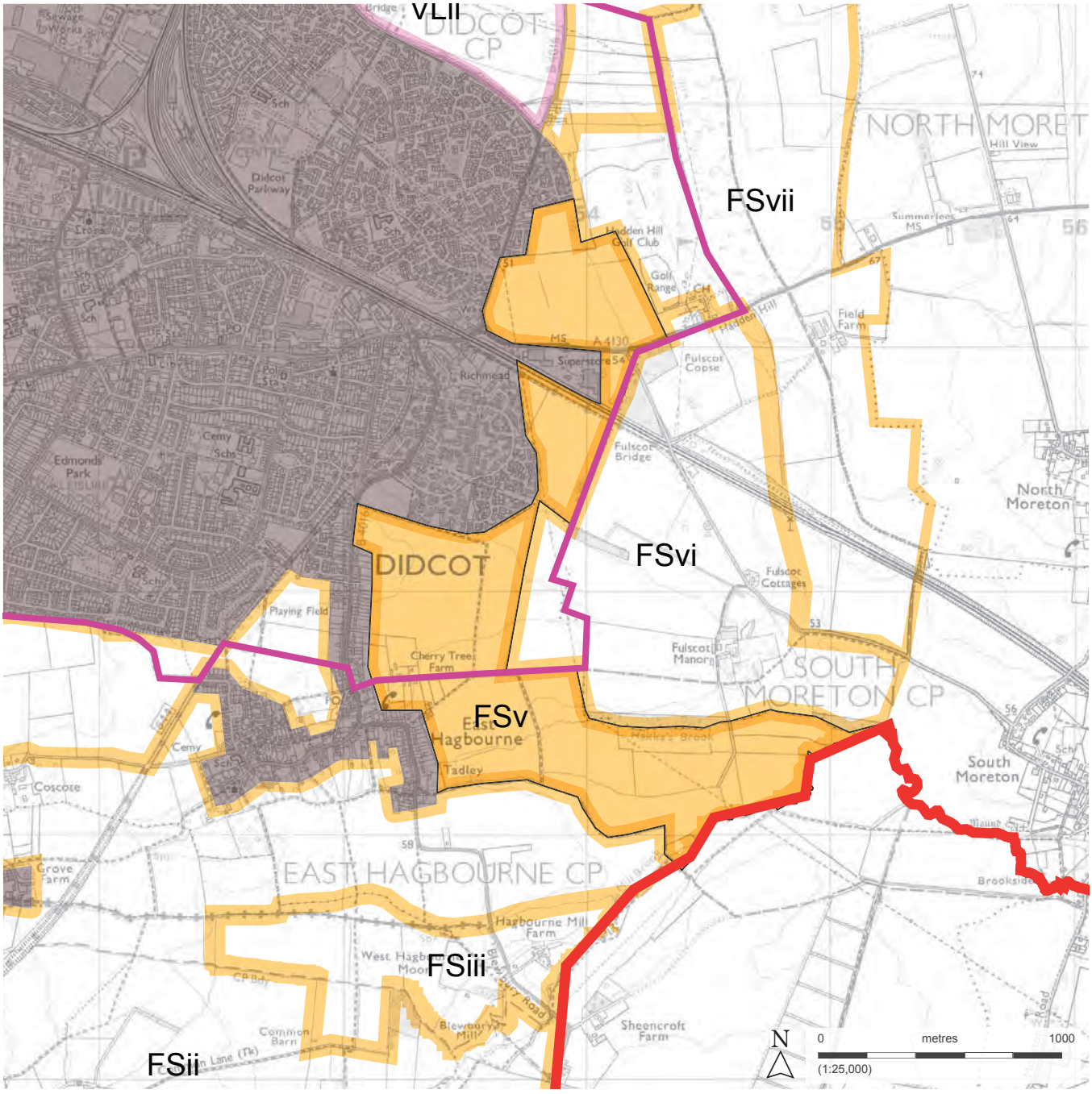
Location And Boundaries

The East Didcot Downs Footslopes Character Area is an area of open footslope east of Didcot Town. The Area is defined by more enclosed land to the north, east and south, while Didcot Town provides the western boundary.

Key Characteristics

- Footslopes, underlain by the Gault Formation of mudstone and Upper Greensand formation of calcareous sandstone and siltstone;
- Predominantly flat landscape at approximately 55m AOD, with some very gentle undulation;
- Composed of medium scale fields for arable crops;
- There are trees to the field boundaries in the south and to the western edge of the Area where it adjoins a more enclosed area;
- Hedgerows in this Area are alongside some of the tracks and along some of the field boundaries although many are showing signs of decline;
- Long views from within and across the Area are possible, and the cooling towers of the power station are visible over the town;
- The Character Area is largely unsettled however several domestic dwellings line Great Mead before this made track gives way to unmade track. The buildings of Cherry Tree Farm have their access off it;
- A railway bisects the Area, this is the busy mainline route to London creating frequent intrusive noise;
- Apart from the A4130, Great Mead, a byway open to all traffic, and several farm tracks provide the only vehicle routes to the Area;
- There are several public rights of way in the southern half on the Area but none either crossing or north of the railway line;
- This is a rural Character Area on the edge of Didcot with an open large scale landscape.

FSv - EAST DIDCOT DOWNS FOOTSLOPES



FSvi - FULSCOT DOWNS FOOTSLOPES

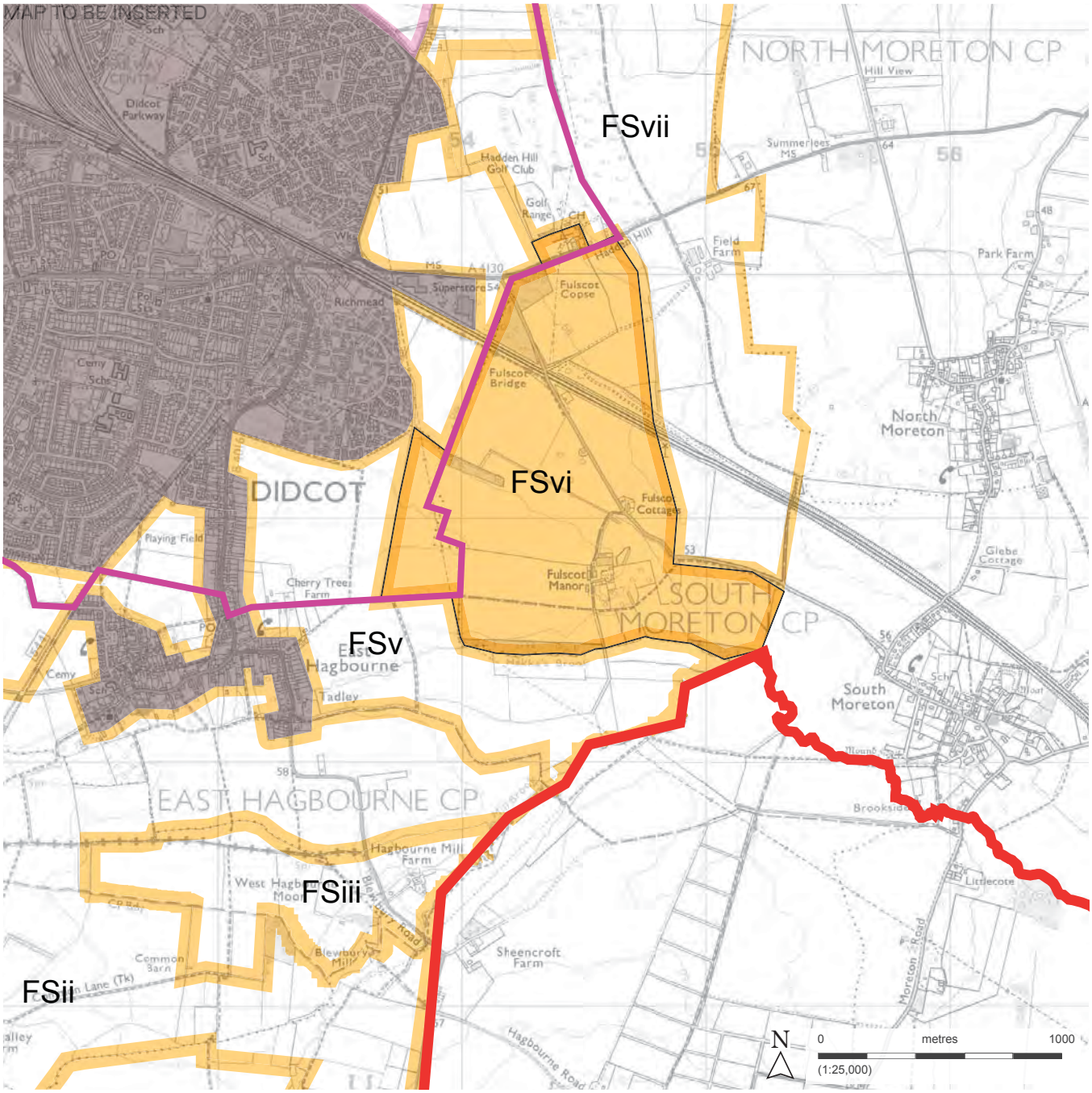
Location And Boundaries

The Fulscot Downs Footslopes Character Area is an area of semi-enclosed footslope east of Didcot Town. The Area is defined by more open land to the west and south and a more rolling landscape to the north and west. A small section of the south east boundary is the boundary of the study area itself.

Key Characteristics

- Footslopes, underlain by the Gault Formation of mudstone and Upper Greensand formation of calcareous sandstone and siltstone;
- Flat landform at approximately 55m AOD
- Composed of large irregularly shaped arable fields. Some of the irregularity is due to the railway line cutting through and disrupting pre-existing field patterns, but not the majority;
- There are several small blocks of woodland including Fulscot Copse in the north-west corner of the area, and two east west running stands to the boundaries of fields south of Fulscot. There are also many trees lining the routes of the water course which traverse the Area;
- There is a limited hedgerow network, mainly to field boundaries although by no means all;
- There are several small streams and ditches, including Hakka's Brook, combining at Fulscot and flowing towards South Moreton;
- Long views of the North Wessex downs to the east and south and the edge of Didcot to the west are possible where the lines of trees open up. Both high-voltage pylons and transition lines are visible in most of the Area;
- A railway line travels through the Area, the busy mainline route to London creating frequent intrusive noise;
- The Area is largely unsettled but there are occasional cottages and farmsteads, usually in red brick with clay roof tiles;
- The only road bisects the Area from north-west to south-east corner. It is unnamed but connects Didcot to South Moreton with a bridge over the railway line;
- Public rights of way in the south of the Area connect Fulscot Cottages and Fulscot manor with South Moreton and East Hagbourne;
- This is a relatively rural character area, on which the nearby town of Didcot makes only a limited impact, while semi-enclosed it is a large scale landscape with framed views out and a degree of variety for farmland.

FSvi - FULSCOT DOWNS FOOTSLOPES



FSvii - HADDEN HILL DOWNS FOOTSLOPES

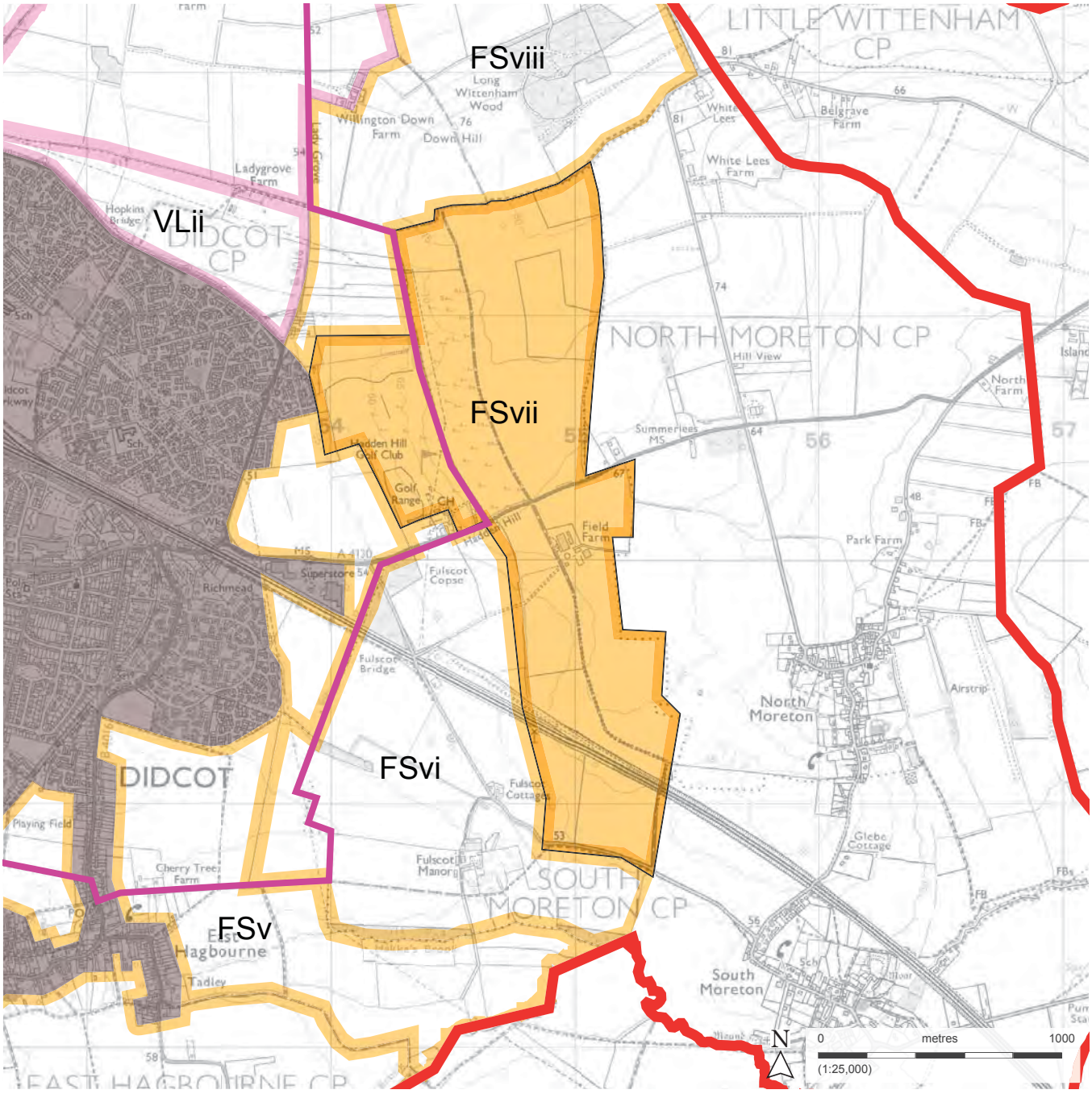
Location And Boundaries

The Hadden Hill Downs Footslopes Character Area is an area of open rolling footslope east of Didcot Town. The Area is defined by more enclosed land to the north, and a flatter landscape to the south and west. A eastern boundary is that of the study area itself.

Key Characteristics

- Footslopes, underlain by the Gault Formation of mudstone and Upper Greensand formation of calcareous sandstone and siltstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial and head deposits;
- Rolling landform, from a low of 55m AOD to a high of 80m in the north-east, the steepest part runs north-south along the western part of the golf course;
- Consisting open irregular arable fields;
- Tree cover is limited to individuals and lines along the field boundaries at the edges of the Area to the boundary of the golf-course and the more recent low-rise planting within;
- Long panoramic views are available from the higher parts of the area with the North Wessex Downs visible, while from the western slopes long views over Didcot are seen where both high-voltage pylons and transition lines are visible;
- The Area is largely unsettled with businesses, dwellings and farmsteads clustered along the A4130, including the golf course, a vehicle garage, a children's nursery and Hedges Farm;
- The A4130 is the only formal vehicle route although there are farm tracks. It connects Didcot to Wallingford;
- The landscape character area is largely rural in feel; the large scale open farmland is only intruded upon by Didcot in the north-western fringes. The golf course does add a tamed and slightly unnatural element of well-managed grasses and trees to the western boundary.

FSvii - HADDEN HILL DOWNS FOOTSLOPES



FSviii - DOWN HILL DOWNS FOOTSLOPES

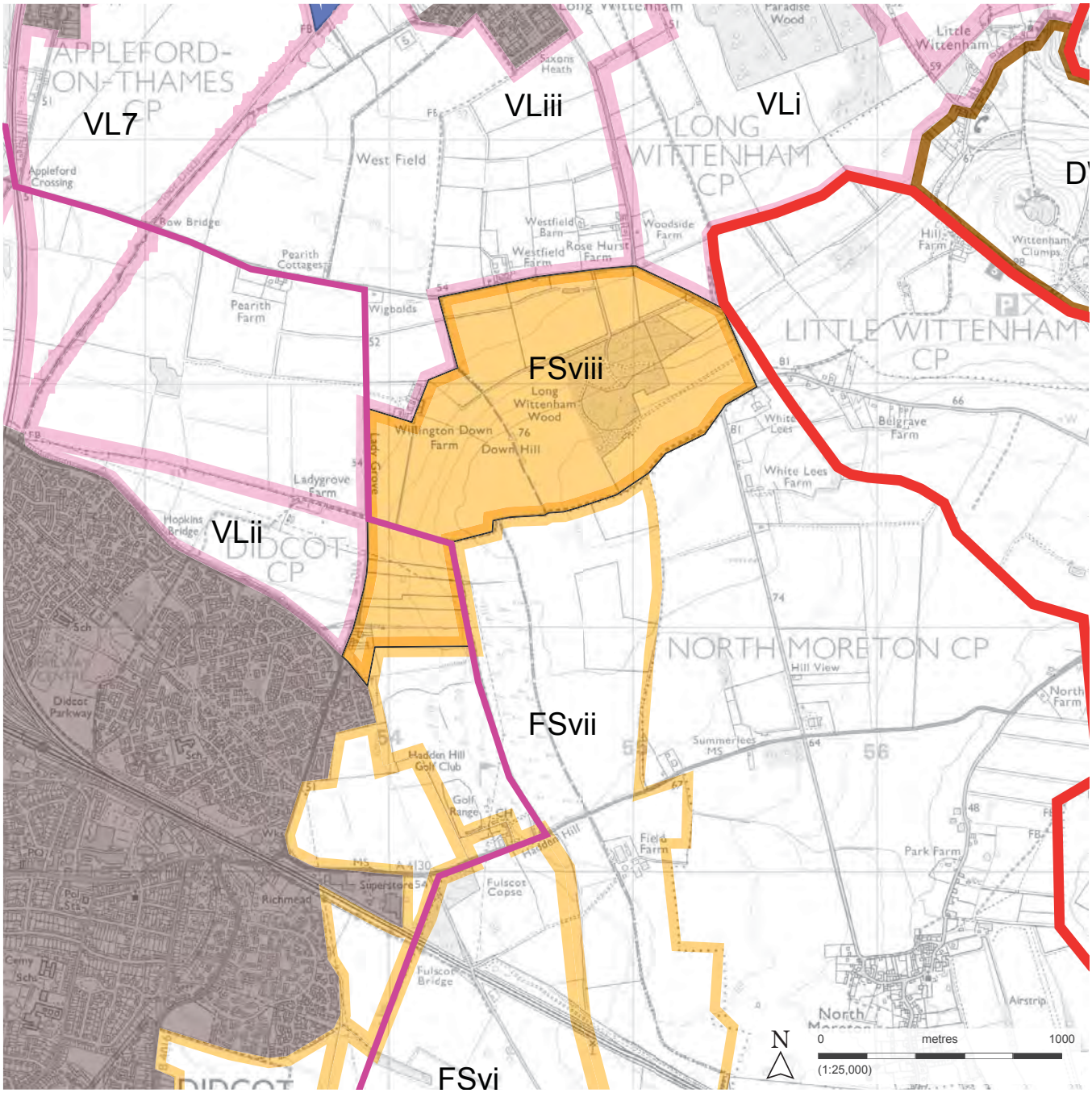
Location And Boundaries

The Down Hill Downs Footslopes Character Area is an area of semi-enclosed rolling footslope east of Didcot Town. The Area is defined by more open land to the north, west and south. An eastern boundary is that of the study area itself.

Key Characteristics

- Footslopes, underlain by the Gault Formation of mudstone and Upper Greensand formation of calcareous sandstone and siltstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from both alluvial and head deposits;
- Rolling landform, dropping from a high of 80m AOD in the east to 60m in the west of the Area. A gentle but conspicuous slope starts in the south-west corner and traverses north for approximately 400m before turning and running north-east;
- Composed of large semi-enclosed arable fields of irregular shapes and Long Wittenham Wood;
- A mixed deciduous woodland of approximately 16 hectares in size, Long Wittenham Wood is visible from much of the surrounding lower land to the north and west. There are also tress both individuals and lines along the field boundaries;
- Those field edges without lines of trees generally have hedgerow boundaries, hawthorn dominated and full;
- One stream runs down the slope from Downs Hill while the drainage ditches run along the contours at the bottom of the slope;
- Long views out of the area are possible in all directions where the trees allow, but views across the Area are generally interrupted by the woodland;
- The Area is inhabited by only two farmsteads; one in the north-west corner, Willingtons Down Farm, and one in the centre south of the woodland, Folly Farm;
- Vehicle access within the Area is provided by farm tracks only, however the east and west boundaries are roads, Sires Hill and Lady Grove respectively;
- There is one public right of way along the southern boundary and another running roughly north south over Downs Hill in the western quarter of the Area;
- A triangulation pillar lies on the northern slope of Downs Hill, accessible along a Bridleway. While this point is not the highest point locally, it does afford excellent views north and west;
- This is a rural Character Area, dominated by the large-scale arable fields and the woodland. There is some enclosure but panoramic views north and east are available from the public right of way.

FSviii - DOWN HILL DOWNS FOOTSLOPES



RFi - CLIFTON CUT RIVER FLOODPLAIN

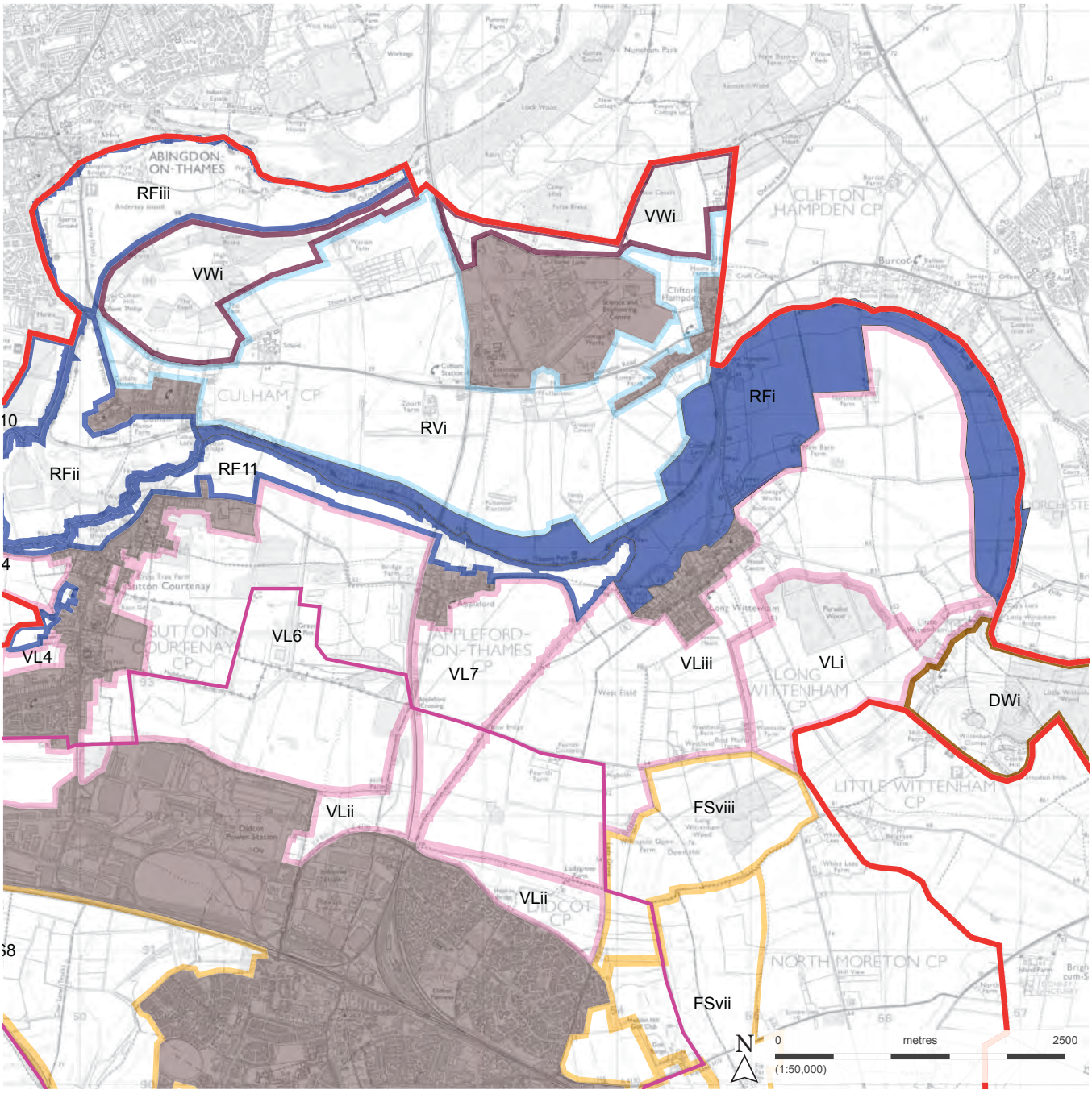
Location And Boundaries

The Clifton Cut River Floodplain Character Area is an area of low lying floodplain in the north-east of the study area. It is bordered both to the north, south and west by slightly higher arable farm land and to the east by the River Thames which forms the boundary of the study area.

Key Characteristics

- Floodplain underlain by the Gault Formation of mudstone and Lower Greensand formation of sedimentary sandstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Flat landform at just below 50m AOD;
- Consists primarily of small irregular fields usually pastures;
- Tree cover is heaviest around the village of Long Wittenham but there is also plenty along the course of the river itself including alder and willow;
- Limited hedgerows to field boundaries and what remains is fading, with field amalgamation an issue;
- There are many streams and ditches discharging into the Thames but the most dominant feature, not to mention water feature of the area, is the Thames itself. North of Long Wittenham the river is divided into two; the existing meandering course which forms the edge of the village and the Clifton Cut which removes about a mile of the natural course of the river. The Cut, its weirs and Clifton Lock were constructed piecemeal in the first half of the 19th century but finally completed in 1835;
- When the trees break, some longer framed views across the area are possible but these are not extensive as the area is lower than its surroundings. Views along the river are possible but limited by trees and bends to the river. Both high-voltage pylons and transmission lines are visible as they cross the area;
- Formal vehicle access is limited to the High Street leading north from Long Wittenham to the road bridge at Clifton Hampden;
- The Thames Path, a national trail, hugs the river across the area. It crosses the river from north bank to south bank and back again at Day's Lock, in the south-west corner, and the Clifton Hampden bridge in the centre;
- Historic features in the area include the Culham Bridge, a mediaeval bridge built of stone between 1416 and 1422, which crosses the Back Water. It was of considerable strategic importance during the English Civil War;
- This is a rural character area with minimal intrusion from vehicles and the villages, both well screened by tree cover. It is a generally peaceful, semi-enclosed natural environment with much high scenic quality landscape.

RFi - CLIFTON CUT RIVER FLOODPLAIN



RFii - CULHAM RIVER FLOODPLAIN

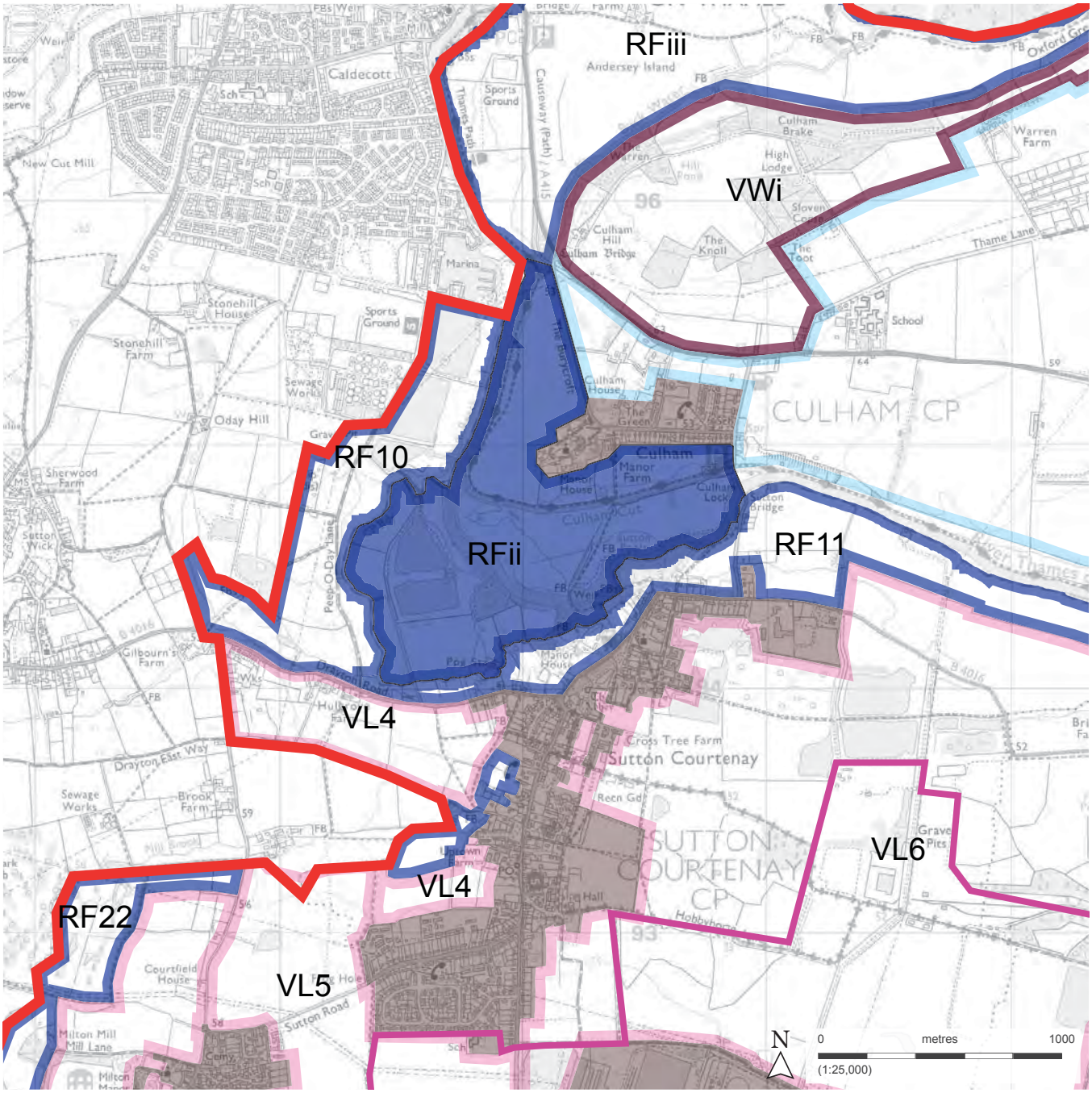
Location And Boundaries

The Culham River Floodplain Character Area is an area of low lying floodplain in the north-west of the study area. It is bordered to the north by higher land, by the village of Sutton Courtney to the south and west.

Key Characteristics

- Floodplain underlain by the Ampthill Clay Formation And Kimmeridge Clay Formation, sedimentary mudstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Flat landform at just above 50m AOD;
- Composed of small to medium irregularly shaped semi-enclosed arable fields, woodland and the River Thames;
- There is a lot of tree cover beside the river and around the pools and north of Sutton Courtney and a more limited amount to some of the field boundaries;
- Very limited amount of hedgerows to field edges, and those are poorly maintained gappy and growing out to trees;
- The river is the major component of the area, as it meanders along the northern edge of Sutton Courtney, an area now known as Sutton Pools. It is an attractive backwater formed by a number of weirs, islands, footbridges and barriers. The higher level of the river is separated from the lower pools by a causeway which dates from Saxon times. This river stretch ceased to be the main navigable route after Culham Cut was constructed in the early 19th century, which also created an island to the north of the Pools. In addition there are three smaller islands, linked by footbridges over the weirs, part of a footpath between Sutton Courtenay and the village of Culham;
- South of the river is a pit formed by gravel extraction and now filled with water;
- From within the character area longer views are framed and limited by the changes in levels and the vegetation;
- The only formal vehicle access is to the village of Culham in the north of the area and is called The Burycroft;
- The Thames Path, a national trail, follows the river across the area and there is a footpath between Sutton Courtney and Culham;
- Historic features in the area include the parish church to Saint Peter in Culham with a tower dating to 1710, and Culham House a mid-18th-century brick Georgian house, built to replace an earlier rectory;
- This is a rural Character Area with much high quality scenic landscape. The village of Sutton Courtney is well screened by not only the river but plenty of vegetation, and Culham has its active frontage facing away from the area. The area feels enclosed, sheltered and remote with any noises quiet and distant.

RFii - CULHAM RIVER FLOODPLAIN



RFiii - ANDESEY ISLAND RIVER FLOODPLAIN

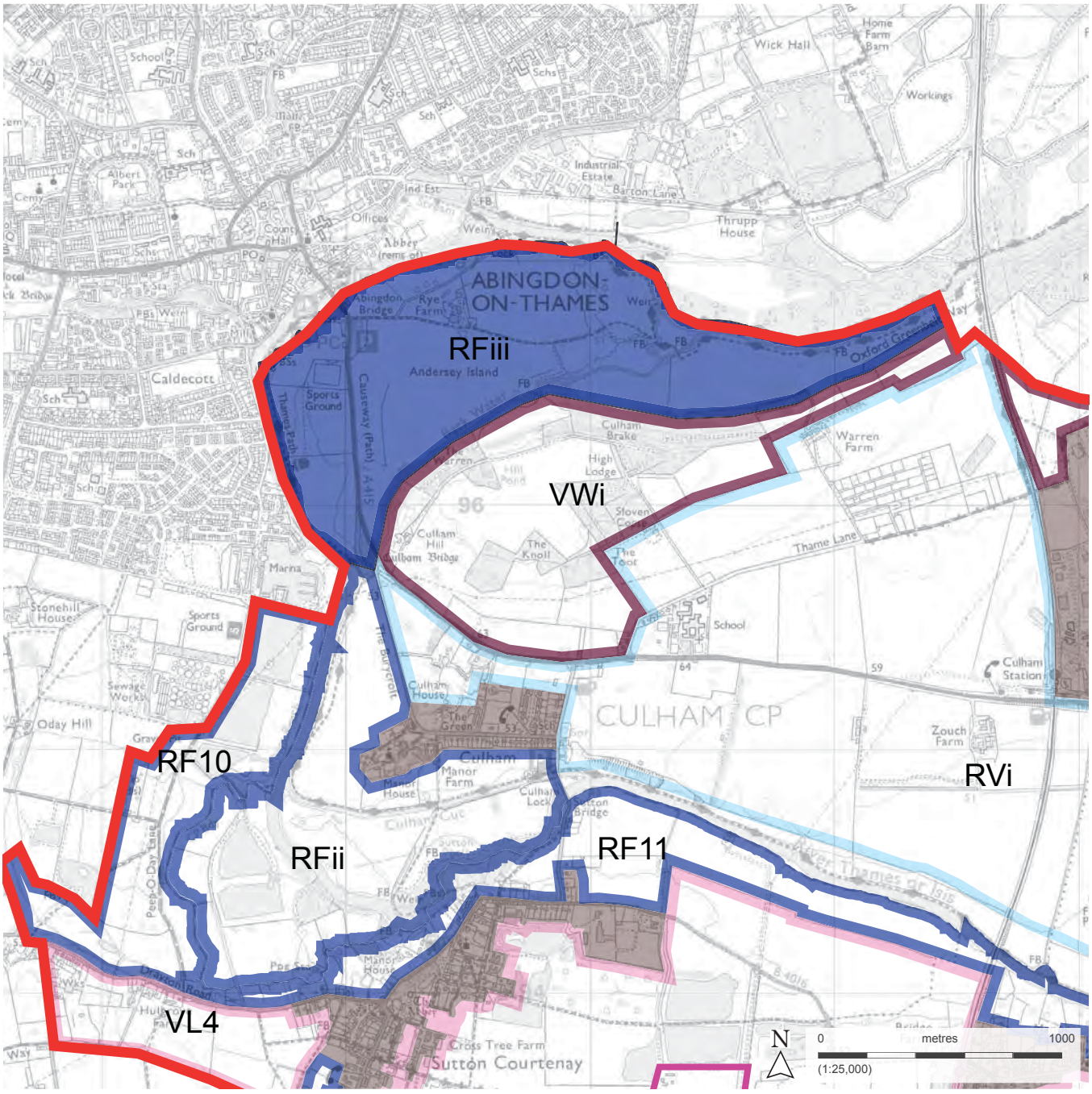
Location And Boundaries

The Andesey Island River Floodplain Character Area is an area of low-lying floodplain in the north-west of the study area. It is bordered both to the south and east by land and to the north and west by the River Thames which forms the boundary of the study area.

Key Characteristics

- Floodplain underlain by the Ampthill Clay Formation And Kimmeridge Clay Formation, sedimentary mudstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Flat landform at just above 50m AOD;
- The land is a mixture of large arable fields and small pasture fields closer to the river, all of irregular shapes. There is a cricket pitch on the western side, the Abingdon Vale Cricket Club;
- There is a reasonable amount of tree cover to the field boundaries, alongside the tracks and roads and also beside the Thames;
- Some hedgerows to roadways, but much of the field boundaries have grown out to trees;
- Views across the area are possible from the public rights of way, but not from the roads as they are enclosed by trees;
- The character area is largely unsettled, bar Rye Farm, a nearby dwelling and the holiday cottages of Kingfisher Barn;
- The A415 traverses the area across the western side and there is an unnamed road giving access to the Rye Farm complex;
- The Thames Path, a national trail, nestles beside the river along the western boundary of the area;
- This is predominantly a rural character area but the busy road and Abingdon on the western and northern boundaries do intrude. There is a sense of enclosure to most of the area as even though views do open up, they are cut short by the higher ground and trees to the east and south and the town to the north and west.

RFiii - ANDESEY ISLAND RIVER FLOODPLAIN



RVi - CULHAM RIVER VALLEY FLOOR

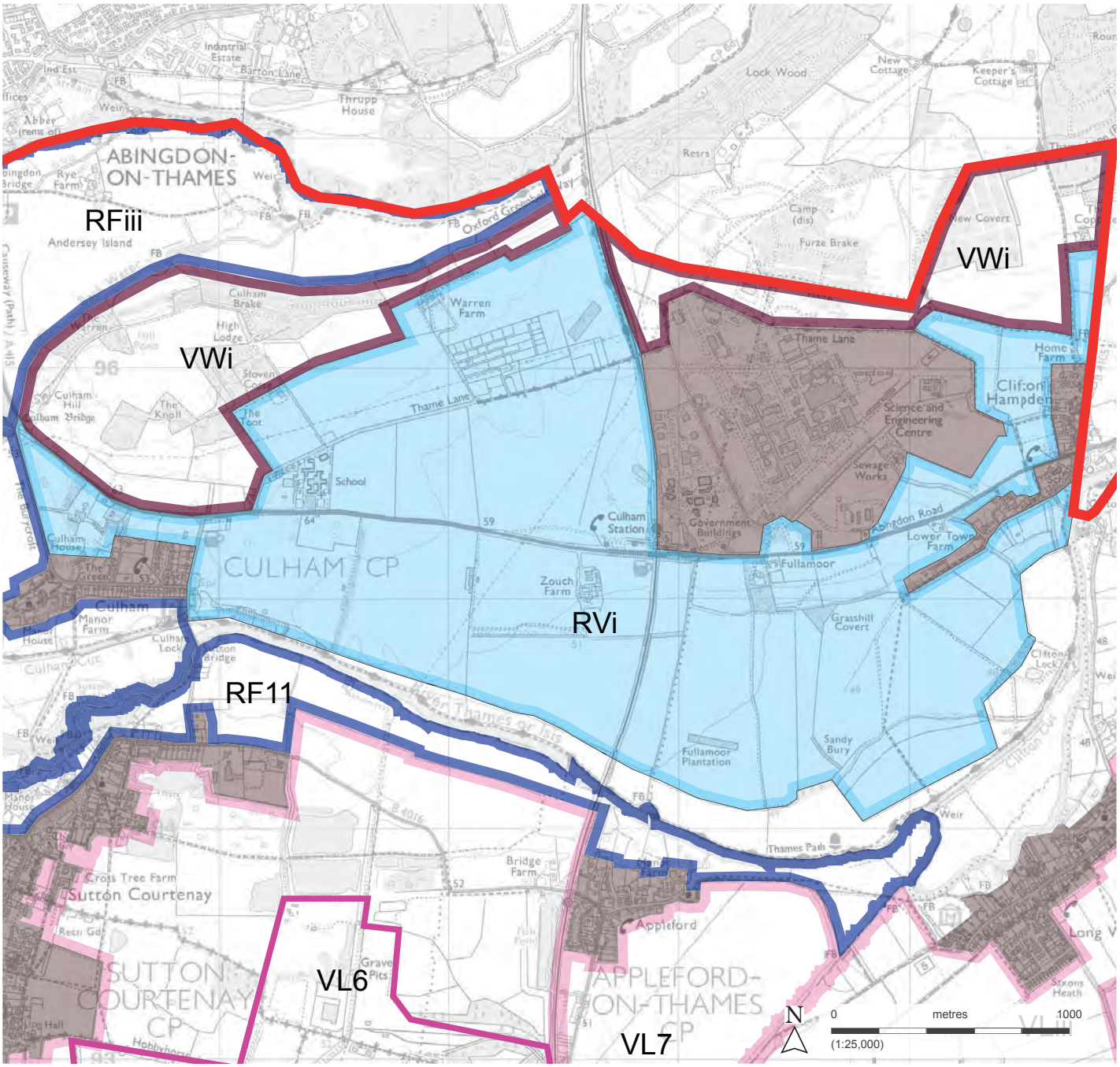
Location And Boundaries

The Culham River Valley Floor Character Area is an area of low-lying farmland to the north the study area. It is bordered both to the south and east by the River Thames and to the north and west by high more wooded land.

Key Characteristics

- Valley floor underlain by the Gault Formation of mudstone and Lower Greensand formation of calcareous sandstone and siltstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Flat and gently undulating landform from 50m by the river to 65m AOD in the north of the area;
- The land is predominantly large arable fields with smaller more enclosed pastures closer to the river and village of Clifton Hampden;
- There area number of small areas of tree cover including a shelter belt south of Zouch Farm, Fullamoor Plantation, Sandy Bury and Grasshill Covert all incorporated into the field pattern, plus a good number to some of the field boundaries;
- There is a network of hedgerows to some of the field boundaries but by no means all;
- Long panoramic views are possible from the public right of way to the higher north of the area, with the Sinodun Hills, Didcot power station and the downs of the North Wessex AONB all visible along with the less positive high-voltage pylons and transmission lines. To the north the views are blocked by the rising wooded landform;
- Although the area is sparsely populated with farmsteads and bordered by two small villages, Culham and Clifton Hampden, it also borders the Culham Science Centre which is substantially larger than the villages. The 800,000 square metre site is now dedicated to research with contemporary offices, laboratories and industrial buildings and is serviced by Culham railway station. Also within the area is the European School on the grounds of a former teacher training college whose buildings were described by Sherwood and Pevsner as “institutional Victorian Gothic at its grimmest”. It now has around 800 nursery, primary and secondary pupils;
- The area is bisected east west by the busy A415;
- There is a limited network of public rights of way, one in the northern section from Thame Lane to the science centre and the other in the south connecting Clifton Hampden to the Thames Path;
- The character area is predominantly rural, and even the two institutions have limited impact. It is a large-scale open landscape.

RVi - CULHAM RIVER VALLEY FLOOR



VLi - LITTLE WITTTENHAM LOWER VALLEY FARMLAND

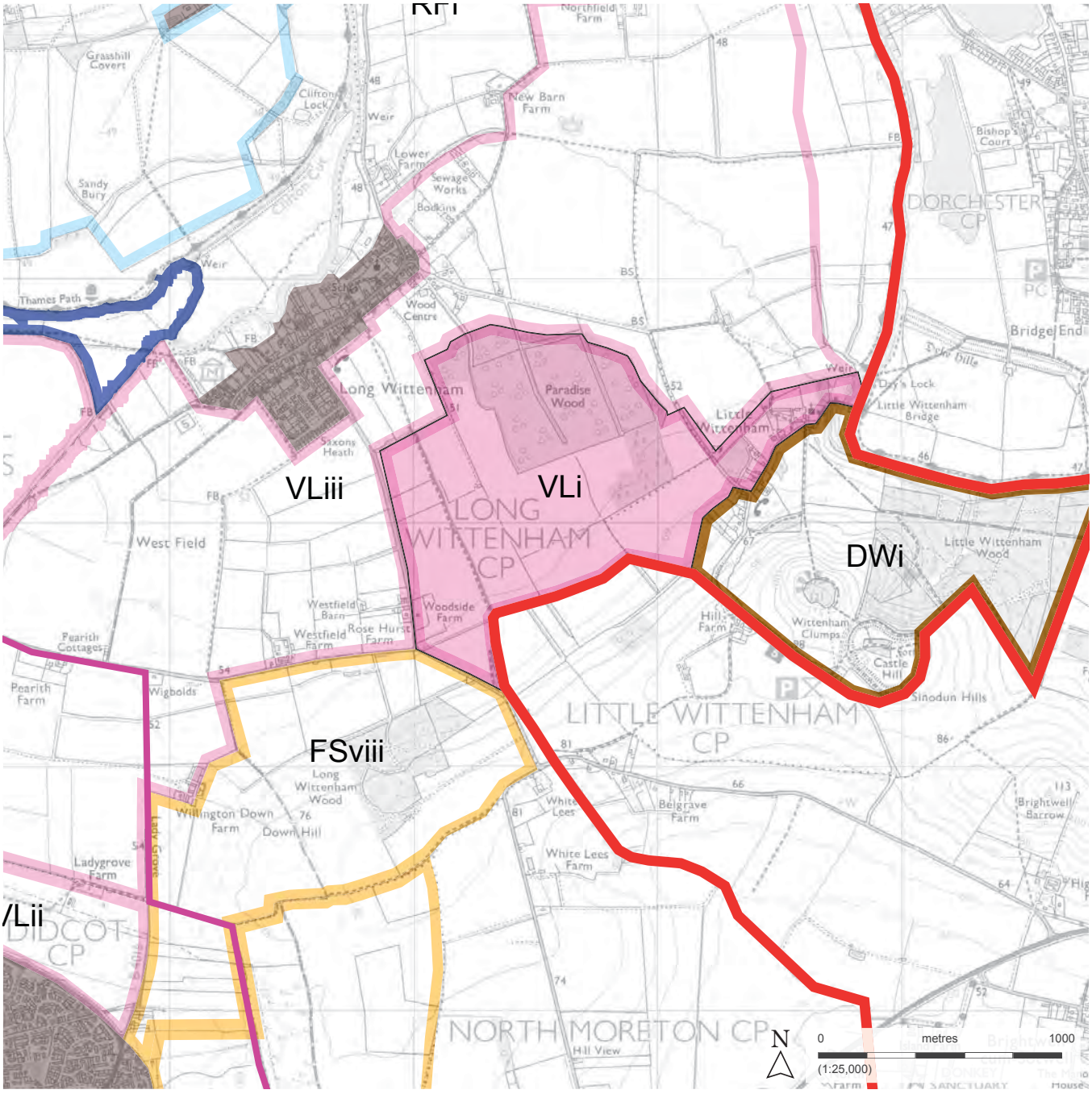
Location And Boundaries

The Little Wittenham Lower Valley Farmland Character Area is an area of semi-enclosed flat farmland west of Little Wittenham. The Area is defined by more open land to the north,east and west, while the southern boundary is dived between wooded downs and the study area boundary.

Key Characteristics

- Farmland, underlain by the Gault Formation of mudstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Generally flat landform at approximately 55m AOD;
- Comprised of large scale, irregular, open arable fields and recently planted, forestry research woodlands;
- There is a considerable amount of tree cover along the field boundaries around the village of Little Wittenham and two forestry research woodlands;
- The two woodlands are Neptune Wood, a 4.5 ha combination of French, Spanish and British oak planted to commemorate the 200th anniversary of the Battle of Trafalgar, and Paradise Wood, the largest collection of hardwood forestry trials in Britain, where five species ash, beech, cherry, oak and walnut are bred and monitored to improve the tree species for timber productivity. Both sites were previously arable land;
- There is a good hedgerow network across the site, along field boundaries and farm tracks. This is mainly mixed native hawthorn dominated and well managed;
- There are a number of regular drainage ditches, mainly orientated south-east to north-west;
- When not screened by tall field boundaries to the roads there are long panoramic views across the Area to the nearby Sinodun Hills to the south-east, Long Wittenham Wood to the south-west and Didcot to the west;
- Road access is generally north south with Didcot Road to the west and Little Wittenham Road to the east. A number a smaller roads / lanes provide access to Little Wittenham;
- The Character Area is largely devoid of public rights of way. Those present exist on the eastern and western fringes, providing connections to the villages of Little and Long Wittenham respectively;
- The Area is unsettled bar one dwelling on the western boundary and the village of Little Wittenham on the eastern side. The village is small, generally linear in morphology and displays a mixture of the local vernacular building materials red brick and roof tile, timber frames, thatched roofs and timber barns;
- The church of Saint Peter at the eastern end of the village has a 14th century west bell tower;
- This Character Area is predominantly rural with almost no influence from the well-screened village of Little Wittenham. The large scale arable fields have limited enclosure by hedgerows and the woodlands to the north and long panoramic views are often possible from the public rights of way.

VLi - LITTLE WITTTENHAM LOWER VALLEY FARMLAND



VLii - NORTH DIDCOT LOWER VALLEY FARMLAND

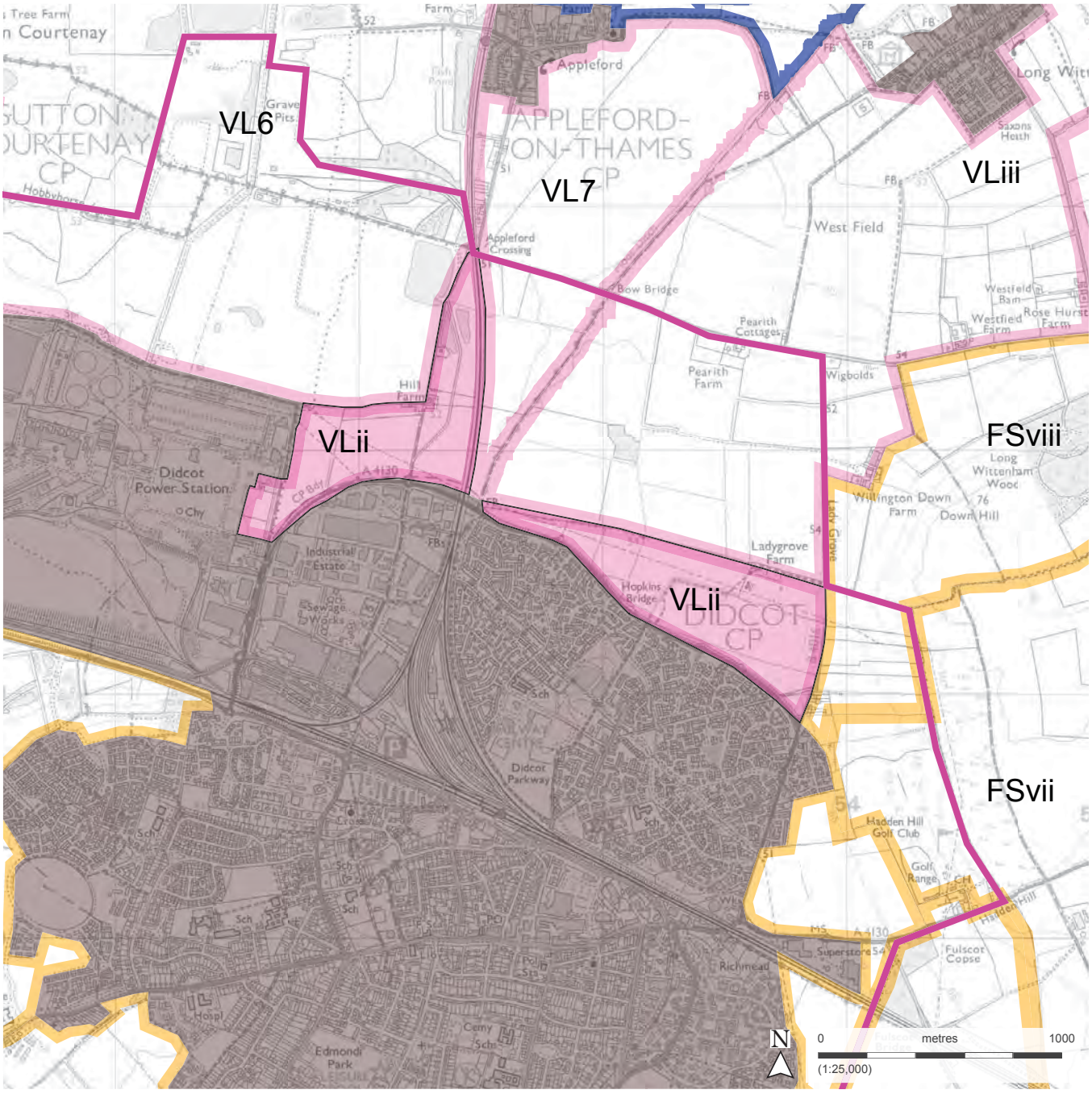
Location And Boundaries

The North Didcot Lower Valley Farmland Character Area is an area of semi-enclosed flat farmland upon the northern fringes of Didcot Town. The Area is defined by more open land to the north, rolling land to the east and the town to the south and west.

Key Characteristics

- Farmland, underlain by the Gault Formation of mudstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Flat landform at approximately 50m AOD;
- Comprised mainly of medium scale, irregular, semi-enclosed arable fields;
- Individual and lines of trees to field boundaries and farm tracks;
- Hedgerow network to field edges, generally well maintained to road boundaries but growing out into trees on the internal field boundaries;
- Frequent and straight drainage ditches span the Area and there are two balancing ponds in the north-west corner;
- Away from the tree lines of the field boundaries, extensive long-distance views are possible across the character area. The Sinodun Hills, the North Wessex Downs, Didcot power station and Culham Science Centre are all visible as are both high voltage pylons and transmission lines;
- The Area is largely unsettled with just two farmsteads, Hill Farm on the western edge and Ladygrove Farm towards the north-east corner, and a wood and pallet recycling business also on the western edge;
- The character area is bounded by roads, an unnamed road, the A4130 and Lady Grove to the west, south and east respectively;
- There is only one public right of way in the area which enters from the north-east corner and turns south by Ladygrove Farm and then follows the line of a small water course under Hopkins Bridge on the A4130 from where it leads to the centre of Didcot;
- This is a rural character area but the influences of the busy noisy A4130 and the neighbouring areas of industry and residential housing are felt within the area. The arable fields can feel open, especially the bigger ones, but there is much enclosure in the form of hedgerows and hedgerow trees at the field edges.

VLii - NORTH DIDCOT LOWER VALLEY FARMLAND



VLiii - LONG WITTTENHAM LOWER VALLEY FARMLAND

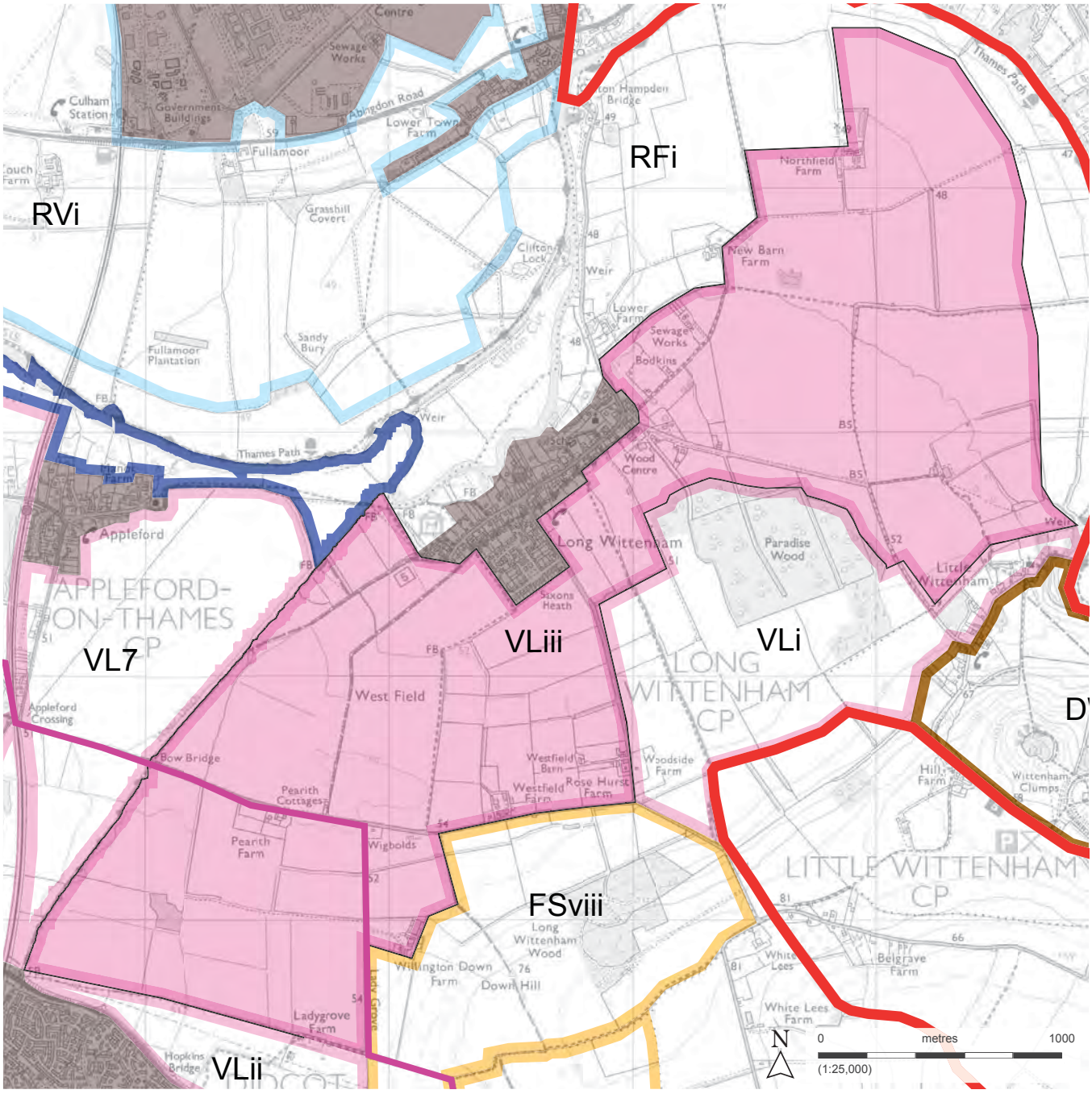
Location And Boundaries

The Long Wittenham Lower Valley Farmland Character Area is an area of open flat farmland north and north-west of Didcot Town. The Area is defined by more enclosed and rolling land to the south and west, whilst to the north is the River Thames.

Key Characteristics

- Farmland, underlain by the Gault Formation of mudstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel all from alluvial deposits;
- Generally flat landform at approximately 50m AOD;
- Composed of large-scale, irregular, open arable fields;
- There is a small piece of ancient woodland in the south-west corner of the Area. Other tree cover is limited to some of the field boundaries, usually oak, ash, maple and hawthorn, around the dwellings and village and poplars alongside some water courses;
- There is a limited network of hedgerows along the field edges usually hawthorn dominated but even these are often gappy and in decline;
- There are frequent straight drainage ditches which run parallel to the river to collect water off the fields and perpendicular to the Thames to drain into it. Moor Ditch, a canalised stream, crosses the entire western portion of the area from Didcot to the Thames at Long Wittenham;
- Extensive panoramic views are visible across and out of the area, from the majority of the public rights of way the Sinodun Hills, the North Wessex Downs, Didcot power station and Culham Science Centre are all visible as are both high-voltage pylons and transmission lines;
- There are numerous farms across the area in a variety of sizes and displaying both the materials and styles of the historic vernacular red brick and roof tile and timber barns, and also the bland metal and concrete of contemporary agri-sheds;
- Infill development and small-scale agricultural uses along the southern edge of Long Wittenham are intruding on the open farmland;
- This is a predominantly rural area, dominated by large open arable fields. Didcot town and infrastructure does intrude to the southern edge but within the area a sense of exposure and remoteness is appreciable.

VLiii - LONG WITTTENHAM LOWER VALLEY FARMLAND



VWi - CULHAM BRAKE UPPER VALE WITH WOODLAND

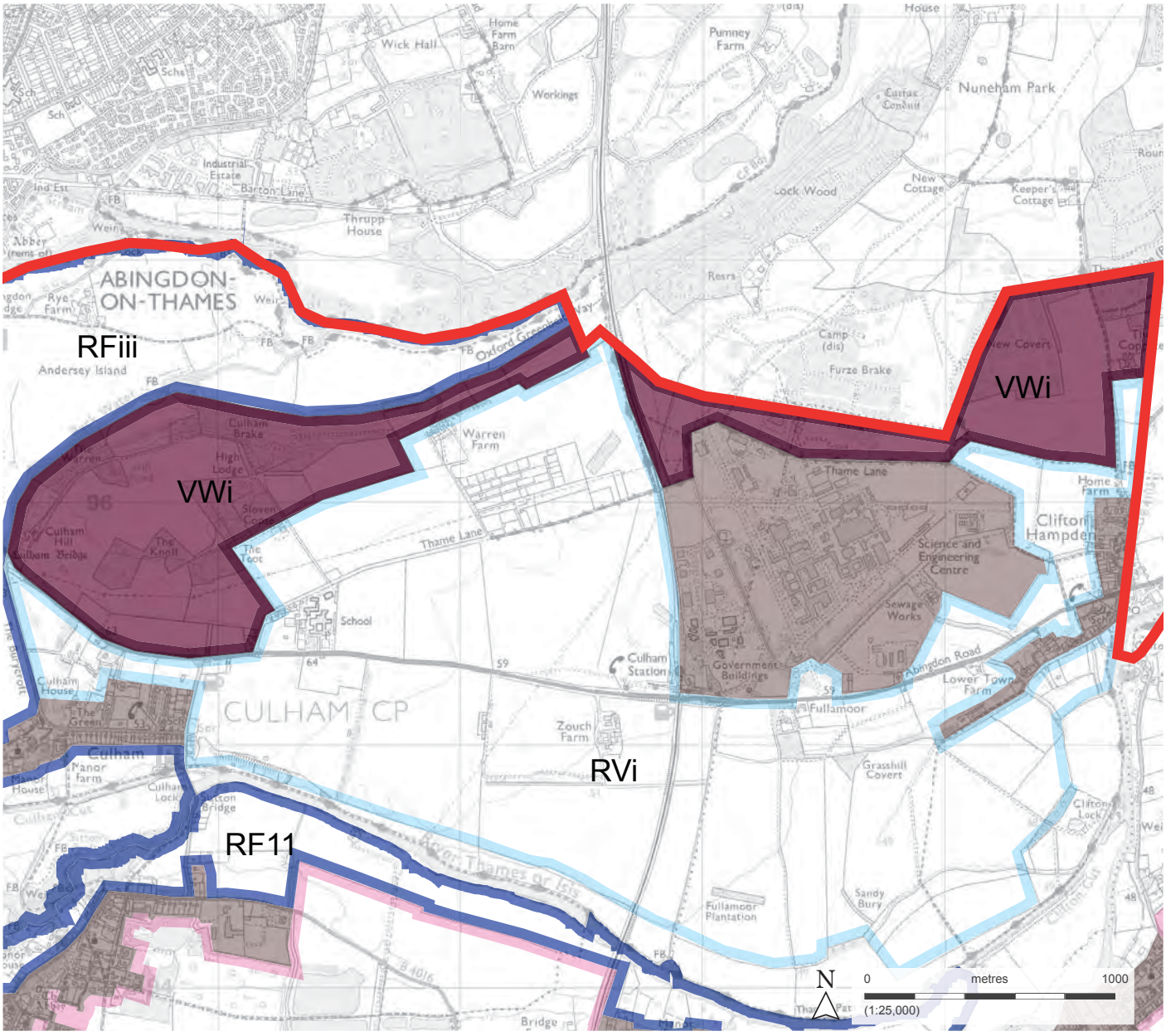
Location And Boundaries

The Culham Brake Upper Vale with Woodland Character Area is an area of undulating woodland and arable fields east of Abingdon. The Area is defined by flatter land to the south and east, while to the north is the River Thames and the west is the study area boundary.

Key Characteristics

- Woodland and farmland, Gault Formation of mudstone and Lower Greensand formation of calcareous sandstone and siltstone. The bedrocks are overlain with superficial deposits of clay, silt, sand and gravel from alluvial deposits;
- Generally rolling landform, a steep slope curls along the northern boundary of the area. Running north at Culham Hill, it turns east through Culham Brake and then north-east. From a low of 55m it rises to a high of approximately 80m AOD at Hill Pond;
- Composed of woodland and large scale, irregular, open arable fields;
- Woodland covers much of the Area especially on the slopes, including The Warren, Culham Brake, The Knoll, Sloven Copse to the west and Furze Brake and New Covert to the east;
- Within Culham Brake is an area designated as a SSSI. It is a small area of willow carr by the Thames and contains one of the largest British populations of a threatened species, the summer snowflake. This site is dominated by well-grown crack willow growing in a seasonally flooded backwater of the Thames. The wet clay soils and humid conditions within the willow thicket or withy bed support a lush fen carr flora in which well over a thousand clumps of summer snowflake occur;
- Hedgerows line many of the field boundaries although are often gappy evidencing a lack of maintenance;
- There are two small ponds at Hill Pond and a couple of balancing ponds north of Warren Farm;
- The Area is largely unsettled with just a couple of farmsteads and a large dwelling which is partially constructed in stone - a rarity for the area - in the west, and the Culham Science Centre bordering the eastern portion;
- To the north of the area, west of the railway line, lies the site of Culham Park MX track. This is a motocross, off-road motorcycle circuit with a wide dirt track graded into the slope. When in use it can be very noisy but use is sporadic;
- The Oxford Greenbelt Way (path) enters the area in the north-east corner, crosses New Covers, cuts across the science centre before turning north along the railway line to meet the Thames;
- This is a rural character area with no urban influences. The tree cover means it feels sheltered and enclosed.

VWi - CULHAM BRAKE UPPER VALE WITH WOODLAND



6. MANAGEMENT PLANNING AND DEVELOPMENT

Introduction

Around Didcot the landscape possesses a generally rural character with many unspoilt, attractive and scenic areas. Examples of these are found among the pastoral floodplain pastures, some of the more enclosed and structured farmland, the Sinodun Hills and nearby woodlands.

However with all landscape there are ongoing management issues, some more general and some specific to a Landscape Type. These are outlined below along with some conclusions to assist with planning and development.

Any development associated with the future expansion of Didcot would require careful integration to minimise its impact on surrounding areas.

The ability of the landscape to accommodate development will depend upon:

- The potential impacts on distinctive landscape and settlement character;
- The potential impacts on intrinsic landscape quality and valued features and the overall sensitivity of the landscape to change;
- The visual sensitivity of the receiving landscape.

LANDSCAPE TYPE DF - DOWNS OPEN FARMLAND

Landscape management issues

The Downs Farmland south of Didcot affords excellent views across the town and vale, and is redolent of the chalk downs landscape. The farmed landscape, while still rural and attractive, is showing some signs of decline in condition and quality. Principally this is the result of weakening in the landscape structure through intensive arable farming which has created an open and denuded character. This exacerbates the intrusion of built development, roads and the network of overhead power lines which cut across the open farmland.

Key landscape enhancement priorities should be to:

- Retain important open views from the chalk downland but encourage some replacement of hedgerows and woodland planting within the downs landscapes (to replicate the semi-wooded patchwork character of other downland areas);
- Encourage better management of field boundaries and discourage further hedgerow removal and replacement by fencing;
- Improve landscape structure and land management on the fringes of built areas and along main roads to mitigate adverse impacts on the surrounding countryside.

Planning and development issues

Large-scale development of any kind will be inappropriate within the open downs farmland

- The unspoilt, rural landscapes of the Wessex Downs, are particularly sensitive to change and therefore less able to accommodate new development;
- Development within visually exposed landscapes such as the denuded arable downs will be highly prominent;
- Any new development on the fringes of Didcot should avoid visually exposed areas and prominent skylines. They should be well-integrated within new landscape frameworks, which provide a strong edge to the built area, to minimise its wider impact on the landscape.

LANDSCAPE TYPE DW - DOWNS WOODLAND

Landscape management issues

The Downs woodland of the Sinodun hills is a highly scenic and nationally important landscape. It affords long panoramic views across the study area of the North Wessex AONB and the Vale of White Horse and contains a highly protected habitat, home to Great Crested Newts.

Key landscape enhancement priorities should be to:

- Retain important open views from the chalk downland
- Manage the woodland as wildlife habitat:
- Manage the grasslands as wildflower meadows.

Planning and development issues

- The unspoilt, rural landscapes of the Sinodun Hills are particularly sensitive to change and therefore less able to accommodate new development;
- Any new development on the fringes of Didcot should avoid visually exposed areas and prominent skylines, and be well-integrated within new landscape frameworks, which provide a strong edge to the built area, to minimise its wider impact on the landscape.

LANDSCAPE TYPE FS - DOWNS FOOTSLOPES

Landscape management issues

Around the town of Didcot, the area possesses a generally rural character with some particularly unspoilt and attractive areas of landscape. In places these landscapes have retained a strong structure of trees, hedgerows, footpaths and drainage ditches, and are generally of high scenic quality with a rich, and well-managed character.

Key landscape enhancement priorities should be to:

- Retain important open views from the chalk footslopes but encourage some replacement of hedgerows and woodland planting within the open landscapes;
- Encourage planting and pollarding of willows and poplars along ditches and watercourses and less intensive management of ditch systems to promote semi-natural aquatic and riparian vegetation;
- Improve landscape structure and strengthen landscape edge of amenity land use to reduce impact on surrounding landscape;
- Improve landscape structure and land management on the fringes of built areas and along main roads to mitigate adverse impacts on the surrounding landscape.

Planning and development issues

- Development within visually exposed landscapes such as the denuded arable downs and the open flat farmland of the floodplain, will be highly prominent;
- Landscapes with strong landform and a mature structure of woods and hedgerows may be more able to absorb small-scale development, as long as it is in character with the locality, carefully sited and well-integrated;
- Landscapes on the fringes of settlements are particularly vulnerable to change and special attention should be paid to creating strong landscape 'edges' to reduce the urbanising influences of development on adjacent countryside and to prevent the coalescence of settlements;
- Any new development on the fringes of Didcot should avoid visually exposed areas and prominent skylines, and be well-integrated within new landscape frameworks, which provide a strong edge to the built area, to minimise its wider impact on the landscape.

LANDSCAPE TYPE RF - RIVER FLOODPLAIN

Landscape management issues

This area retains a predominantly rural character with some particularly unspoilt and attractive areas of landscape. The pastoral floodplain pasture landscapes in particular has retained a strong structure of hedgerows and trees, has a particularly rich, diverse and well managed character and are of high scenic quality.
Outside these areas the arable farmland and the landscape shows signs of deterioration in terms of both condition and quality. Another land management issues include the impact of 'horsiculture' and somewhat ad hoc or intrusive land uses on the fringes of settlements.

Key landscape enhancement priorities should be to:
- Maintain permanent pasture and riverside trees to reinforce the tranquil, pastoral character of the river corridors;
- Encourage better management of field boundaries and discourage further hedgerow removal and replacement by fencing;

Planning and development issues

- Development would generally be inappropriate within the unspoilt floodplain pastures landscapes;

LANDSCAPE TYPE RV - RIVER VALLEY FLOOR

Landscape management issues

This area possesses a rural character and the arable farmland shows signs of deterioration. This weakening of the landscape structure is produced by the intensification of cereal farming and the loss of hedgerows, resulting in an open and exposed character.

Key landscape enhancement priorities should be to:
- Maintain permanent pasture and riverside trees to reinforce the tranquil, pastoral character of the river floodplains;
- Encourage planting and pollarding of willows along ditches and watercourses and less intensive management of ditch systems to promote semi-natural aquatic and riparian vegetation;
- Encourage better management of field boundaries and discourage further hedgerow removal and replacement by fencing;
- Strengthen landscape structure with special consideration given to the edges of the institutions;
- Encourage further woodland, hedge and tree planting on farmland to reinforce a distinctive patchwork of open fields, nearby woods and strong hedgerows of the farmed valley landscape;

Planning and development issues

- This open landscape is visually exposed and unsuitable for prominent development unless closely integrated with existing built form or well-integrated within new landscape frameworks;

LANDSCAPE TYPE VL - LOWER VALE FARMLAND

Landscape management issues

This predominantly arable farmland enjoys a rural quality. Some areas have retained a strong structure of hedgerows and trees while other areas have allowed the structure to fade as farming has increased its efficiency , resulting in a more open exposed landscape.
This Area also experiences the problem of intrusive land uses on the fringes of settlements.

Key landscape enhancement priorities should be to:
- Encourage planting and pollarding of willows and poplars along ditches and watercourses and less intensive management of ditch systems to promote semi-natural aquatic and riparian vegetation;
- Encourage better management of field boundaries and discourage further hedgerow removal and replacement by fencing;
- Improve landscape structure and land management on the fringes of built areas and along main roads to mitigate adverse impacts on the surrounding landscape.

Planning and development issues
- Development within the visually exposed landscapes of the open flat farmland, will be highly prominent unless closely associated with existing built form or well-integrated within new landscape structure;
- Landscapes on the fringes of settlements are particularly vulnerable to change and special attention should be paid to creating strong landscape 'edges' to reduce the urbanising influences of development on adjacent landscapes and to prevent the coalescence of settlements.

LANDSCAPE TYPE VW - UPPER VALE WITH WOODLAND

Landscape management issues

The majority of this area has a rural and unspoilt character, meaning that in general it has an appealing and delightful appearance. The landscape has retained a strong structure of woods, hedgerows and trees, and has a particularly rich, diverse and well-managed character and is of high scenic quality.

Key landscape enhancement priorities should be to:

- Manage existing woodlands to maximise their landscape and nature conservation value;
- Encourage better management of field boundaries and discourage further hedgerow removal and replacement by fencing;

Planning and development issues

- Landscapes with strong landform and a mature structure of woods and hedgerows are of a high landscape quality and therefore sensitive to development;

M.
Extract from South Oxfordshire District Council Local Plan - June 2016

9 DIDCOT AND SCIENCE VALE

Introduction

9.1 Science Vale is an international location for science and technology. From this strong starting point we need to capitalise on Science Vale's opportunity to provide an even better environment for business to flourish.

9.2 Our vision for Science Vale and Didcot in 2032 is grounded in continuing this story of economic success and channelling this prosperity into improved social and environmental wellbeing: the area will consist of thriving communities that have benefited from sustainable growth and the successful delivery of major infrastructure.

9.3 One of the priorities for Science Vale is to provide an environment in which science-led business can flourish. Part of this is ensuring that we have an attractive and diverse housing offer, set in an area with good transport and communications networks, links to university research, 'big science', the space sector and cutting edge technology. Clustering development in one area gives a critical mass of economic, social and cultural activity to support the delivery of infrastructure and sustain vibrant town centres. It also has well established road and rail networks, that are already the subject of investment and improvement.

9.4 Didcot is the gateway to Science Vale, connecting with the rest of the UK through direct train services to Oxford, London, and Bristol. An important part of our strategy for Science Vale is to improve and strengthen its relationship with Didcot, and realise Didcot's full potential as a thriving and attractive location to live, work and visit. We will do this by planning for the homes, jobs, skills, and infrastructure that are needed.

The Strategy for Didcot and Science Vale

9.5 Our strategic approach for Didcot and Science Vale:

- Excellent design throughout Didcot and Science Vale
- A coordinated approach to new development through an urban design framework
- Protection for the distinctive character and heritage of Science Vale's market towns, villages and countryside
- A range of new homes, to balance the new jobs
- Opportunities for people to build their own homes in appropriate locations

In December 2015, Government announced that Didcot will become a Garden Town, delivering 15,050 new homes and 20,000 high-tech jobs

- Didcot transformed into a well-serviced and well-connected high quality urban hub, including new social infrastructure (such as schools and medical facilities and a new leisure centre) to support the growing population
- A 'step change' in travel choices away from car travel with Didcot at the heart of a fully connected Science Vale
- Didcot's role as a major rail interchange strengthened and aspirations for rail services direct from Wantage and Grove
- A cycle strategy for Science Vale that enables people to reliably travel between their homes and their jobs by means other than the private car
- Improved access onto the A34 and to the M40
- Aspirations for superfast broadband across all of Science Vale by 2032

Didcot Garden Town

9.6 In December 2015, Government announced that Didcot will become a Garden Town, delivering 15,050 new homes and 20,000 high-tech jobs in the greater Didcot area. With strategic partners, we have been awarded funding to facilitate the delivery of the Didcot Garden Town concept.

9.7 We are now establishing a vision for Didcot Garden Town, and developing a delivery strategy that sets out how that vision will be realised. It is likely these will be outlined in a Didcot Garden Town Development Plan Document (DPD), that will form part of South Oxfordshire's development plan, complementing and supporting the Local Plan.

9.8 Didcot Garden town straddles the boundary of South Oxfordshire and Vale of White Horse district councils. The two councils are working closely together to ensure the delivery of new homes and employment opportunities and also to support what is already flourishing in the area.

9.9 The majority of sites for the 15,050 homes are allocated. Most of these are within Vale of White Horse District, and many already have planning consent. Of the sites within this district, the majority were allocated in the Core Strategy.

9.10 The potential Garden Town DPD will also explore opportunities to accelerate development and plan further development where it would contribute to the achievement of the Didcot Garden Town vision. Further development will be supported, but only where its principal purpose and effect is to contribute to achieving the vision.

New Housing

Proposed Policy – New Housing in Didcot

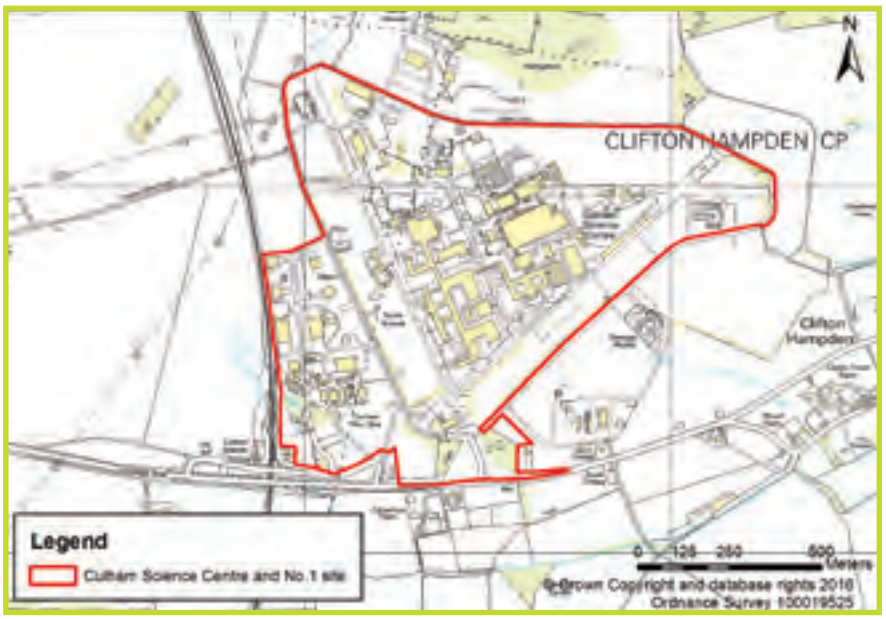
In Didcot planning permission will be granted for at least 6,500 homes between 2011 and 2032. Some dwellings have already been developed since 2011 and some will be on sites that have consent (including at outline or with a resolution to grant).

9.11 The supply of sites to deliver about 6,500 homes are outlined in table 9.1 below. The allocated sites also have site specific policies. At this time we are awaiting the outcome of the garden town development plan and will not allocate any further housing in isolation of an overall strategy and plan that will achieve the garden town strategy and aims.

Completed 2011- 2016			**1,304**
Committed	Great Western Park	1,494	
	Didcot NE	2,030	
	Didcot A	280	
	Gateway	300	
	Hadden Hill	74	
	Park Road	66	
	Total		**4,244**
Allocated	Ladygrove east	500	
	Orchard Centre Phase 2b	300	
	Total		**800**
Grand Total			**6,348**

9.12 Elsewhere in Science Vale, at least 800 new homes will be delivered through a proposed allocation adjacent to the Culham Science Centre and also through Neighbourhood Plans and windfall sites. There will also be a specific project in Berinsfield that may lead to new homes being built but this is dependent upon the realisation of specific regeneration aspirations. Further detail on the project is provided later in this chapter.

Culham Science Centre (& No. 1 Site)



9.13 We intend to continue to support the redevelopment and intensification of Culham Science Centre for research and science based businesses. The adjacent 'No.1 site' provides a redevelopment opportunity for new homes in a sustainable location next to a railway station. It is likely that the redevelopment will coincide with, and be complimented by, the delivery of the Clifton Hampden by-pass. Our preferred approach is to allocate the 'No.1 site' for new homes and relocate the businesses there to another appropriate location. We are in the process of identifying such a site and will consult on this at the next stage of the local plan.

9.14 The Culham Science Centre and No.1 site were previously identified as 'major development sites in the Green Belt.' Given the amount of development on the two sites and the suburban nature of the area we propose to inset the land identified on the plan from the Green Belt.

Proposed Policy – Culham Science Centre and No.1 site

Proposals for the redevelopment and intensification of the Culham Science Centre with the creation of about 1,000 new jobs will be supported, together with the re-development of the No.1 site for a mixed use scheme including about 500 new homes.

In order to deliver any potential proposal, we will work proactively with the UK Atomic Energy Authority and development partners to create an agreed masterplan that facilitates this growth.

Berinsfield

9.15 There are exceptional circumstances justifying a review of the Green Belt at Berinsfield:

- The 'washed over' status of Berinsfield inhibits its ability to achieve necessary regeneration;
- more land may be needed around Berinsfield to improve the mix of housing and to provide further opportunities for employment and service provision; and
- Berinsfield is a local service centre and some further development would be consistent with the overall strategy.

9.16 These issues have been considered in part in the Local Green Belt Study for South Oxfordshire District Council (September 2015) and through the drafting of the Berinsfield Neighbourhood Plan. However, more comprehensive and detailed work is necessary to consider the future of Berinsfield.

9.17 In light of this, we have decided to commission work to explore potential options for the regeneration of Berinsfield. The work will explore whether there is a sufficient case for the release of land at Berinsfield and whether such a release would enable the regeneration of Berinsfield to be delivered. In the meantime, the whole village remains washed over by the Green Belt and subject to the strongest planning policy protection.

9.18 The principal purpose of the recent Green Belt study was to assess the whole district and the extent to which the land within the Green Belt meets the five

purposes of the Green Belt set out in paragraph 80 of the NPPF, in the context of the current need to identify additional land for housing in the district to meet local and Oxford based demand.

9.19 The study itself clearly notes that the findings of the Study should: "not be considered in isolation. As a technical piece of work it will be used in conjunction with other evidence to inform future planning policy in South Oxfordshire." That evidence will include the work we recently commissioned, and all other necessary work that will be undertaken in preparation of the Local Plan. The housing policies of the Local Plan do not rely upon the release of land at Berinsfield, where the release of land will only be contemplated in the circumstances described below.

Proposed Policy – Regeneration of Berinsfield

The Council is commencing work on a feasibility study and masterplan to investigate the practicality of and the most appropriate approach to achieving the full scale regeneration of Berinsfield. This work will be developed in close collaboration with the local community. Pending the outcome of that work it is the Council's policy that:

i. The need for housing, alone, at Berinsfield is not considered by the Council to meet the test of exceptional circumstances necessary to justify the release of land from the Green Belt and neither would a residential planning application meet the test of very special circumstances;

ii. Apart from small scale development within the village, development at Berinsfield could only be accepted if it was satisfactory to the Council in all respects and if the development met at least the following criteria;

- **the development formed part of an agreed, comprehensive masterplan for the regeneration of Berinsfield; and**
- **the development funded the entire cost of the necessary regeneration of Berinsfield's physical, social, sporting, housing and public services infrastructure in accordance with an agreed masterplan for the village; and**
- **the development of land is no greater than is necessary to deliver the necessary regeneration.**

YOUR VIEW

Q14 Do you agree that no further housing should be allocated to Didcot, given the amount of housing land that is already committed?

Q15 Do you agree with our proposed approach to redevelopment at Culham Science Centre and the No.1 site? If not, what changes would you suggest?

Q16 Do you agree with our proposed approach towards the regeneration of Berinsfield? If not, what changes would you suggest?

N.
Text for Vale of White Horse District Council Local Plan Part 2

Didcot Garden Town

2.101. The Government announced that Didcot would become a Garden Town in December 2015. Garden Towns are locally-led and ambitious proposals for new communities that work as self-sustaining places and should have high quality and good design embedded from the outset[37].

2.102. The designation of Didcot and the neighbouring parishes in the Vale of White Horse as a Garden Town is an exciting opportunity. Both district councils are working closely together and in partnership with Oxfordshire County Council and other key stakeholders to develop a joined up vision and delivery strategy for the area.

2.103. It is important that the area realises its potential as a thriving and attractive location to live, work and visit and in particular to provide a high quality service centre at the heart of 'Science Vale'. This will allow Science Vale's international reputation for science and technology to support continued and accelerated growth of businesses in these sectors.

2.104. The Garden Town initiative will help to shape growth already identi ed through the Local Plan 2031: Part 1 within the Vale and that being identi ed within the emerging Local Plan 2033 for South Oxfordshire for housing, employment and infrastructure. The emerging South Oxfordshire Local Plan will focus on shaping the town centre of Didcot and helping the area to function more successfully in a joined up way, whilst embracing the key principles of Garden Towns.

2.105. To support the successful implementation of the Garden Town initiative, six high level principles have been developed **(Figure 2.7)** to help shape how development proposals come forward. Proposals for development with the Garden Town Masterplan Area will be expected to demonstrate how they comply with these principles in accordance with **Core Policy 16b: Didcot Garden Town.**

2.106. To assist the delivery of the Garden Town, further detail, for example in respect of design, will be set out either in a future Development Planning Document (DPD) or Supplementary Planning Document (SPD). Local Development Orders (LDOs) will also be developed to support the delivery of individual sites. The Garden Town Masterplan Area does not form a development boundary for Didcot and will include substantial areas of formal and informal open space and landscaping. The important separation between the surrounding villages, including for example Sutton Courtenay, will continue to be protected from development.

37. CLG (2016) Locally-led Garden Villages, Towns and Cities; available at: https://www.gov.uk/government/publications/locally-led-garden-villages-towns-and-cities

Core Policy 16b: Didcot Garden Town

Proposals for development within the Didcot Garden Town Masterplan Area, as de ned on the Adopted Policies Map and shown by **Figure 2.8**, will be expected to demonstrate how they positively contribute to the achievement of the Didcot Garden Town Masterplan Principles (**Figure 2.7**).

Figure 2.7: Didcot Garden Town Masterplan principles

Didcot Garden Town Masterplan Principles

1. **Design** – The Garden Town will be characterised by design that adds value to Didcot and endures over time; it will encourage pioneering architecture of buildings and careful urban design of the spaces in between, prioritising green spaces over roads and car parks. All new proposals should show the application of the Council's adopted Design Guide SPD and demonstrate best practice design standards.

2. **Local Character** – The Garden T , becoming a destination in itself that is distinctive from surrounding towns and villages whilst respecting and protecting their rural character and setting. Didcot's identity will champion science, natural beauty, and green living, in part delivered through strengthened physical connections and active public and private sector collaboration with the Science Vale.

3. **Density and tenure** – The Garden Town will incorporate a variety of densities, housing types and tenures to meet the needs of a diverse community. This will include high density development in suitable locations, such as in central Didcot and near sustainable transport hubs; higher density development will be balanced by good levels of public realm and accessible green space.

4. **Transport and movement** – The Garden Town will reduce reliance on motorised vehicles and will promote a step-change towards active and public transport through the creation of a highly legible, attractive and accessible movement network and the appropriate location of housing, employment and leisure facilities. Cycling and pedestrian links between the Garden Town, its surrounding villages, and natural assets and the strategic employment sites will be enhanced.

5. **Landscape and green infrastructure** – New development in the Garden Town will enhance the natural environment, increase biodiversity and support climate resilience through the use of traditional measures and new technology. Innovative habitat planting and food growing zones will characterise the Garden Town and, in turn, these measures will support quality of life and public health.

6. – The planning of the Garden Town will be community-focused, creating accessible and vibrant neighbourhoods around a strong town centre offer of cultural, recreational and commercial amenities that support well-being, social cohesion and vibrant communities. The Garden Town will embrace community participation throughout its evolution. It will promote community ownership of land and long-term stewardship of assets where desirable.

Figure 2.8: Didcot Garden Town Masterplan area

The Garden Town Masterplan Area does not form a development boundary for Didcot and will include substantial areas of formal and informal open space and landscaping. The important separation between the surrounding villages, including for example Sutton Courtenay, will continue to be protected from development.

O.
Governance note

note

Didcot Garden Town Governance Recommendations

a) Introduction

1. One of the key messages that emerged during our early work on Didcot Garden Town is that Didcot could be better served by a single, joined-up, strategic approach to its growth and development. Making sure that the Garden Town masterplan is deliverable is fundamental to the project. Some of the work previously done to identify how Didcot should evolve has not been realised, such as the Savills masterplan in 2013. In order to realise the Garden Town proposals, it will be important to establish a single body whose primary aim is to deliver the Garden Town Vision.

2. We are exploring options for a distinct governance mechanism for Didcot which would provide the necessary focus and impetus to drive forward the Garden Town proposals. This note sets out three governance options which could be applied to Didcot: a DIY/bespoke structure, an Urban Development Corporation (UDC) and an Urban Regeneration Company (URC). It goes on to set out our recommended governance mechanism for the Garden Town – a bespoke structure – in further detail.

b) Desired Powers

3. A new governance structure for the Garden Town should focus on the creation of a single body whose primary aim is to deliver the Garden Town Vision. The powers that we think the Didcot governance mechanism should control are:

    - Development management (determination of planning applications);
    - Plan making;
    - Compulsory purchase powers (CPO); and
    - Access to funding.

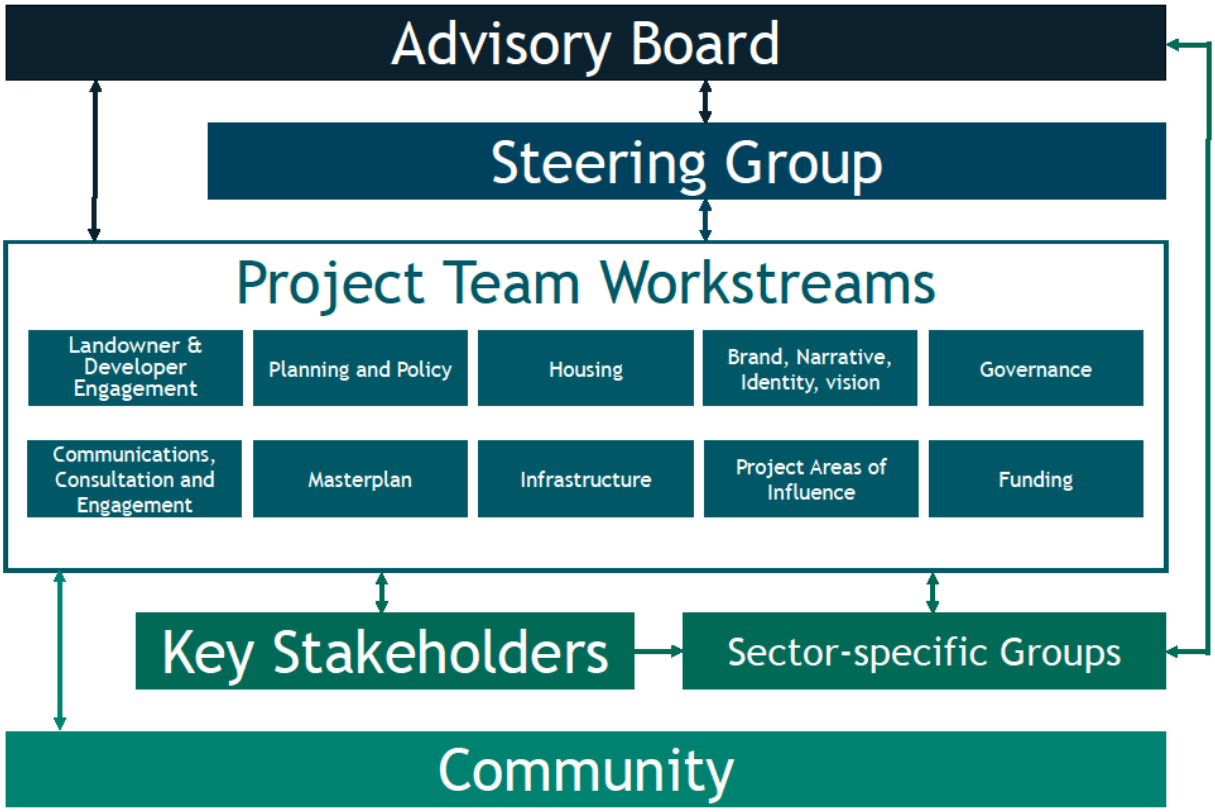
4. Each of the Councils already holds all of these powers for their own Local Authority area, including the part of Didcot which falls within their boundary. But it will be important to unify these powers across the boundary for the Garden Town area in order to provide focus and impetus to drive forward the Garden Town Vision.

5. As you might expect, various governance mechanisms offer a trade-off between how easy and quick they are to set up, and how powerful they are (in terms of the range and strength of their powers). It is important to strike the right balance between putting a new governance mechanism in place quickly enough to capture the momentum of the work being done now and ensuring that it is sufficiently powerful to be meaningful. This consideration has influenced our recommendation.

6. Formalised options such as UDCs and URCs would take longer to establish than a DIY option, so these would require an interim governance structure. An interim structure would be either a do-nothing option where the two Councils continue to hold all powers for their area of Didcot separately, or a DIY option where the Councils voluntarily restructure to take a more joined-up approach to the Didcot area. It should be asked, however, why a more formalised option is needed if an interim structure is effective.

c) Current organisational structure for the Didcot Garden Town Project

7. The below diagram sets out the organisational structure for the Didcot Garden Town project at present. This structure has emerged with regard to the potential longer term governance options outlined in this note.



8. The roles of each key group are as follows:

Advisory Board – The Advisory Board consists of a number of steering group members and a number of Councillors and, potentially in the future, key external community / business leaders. They are responsible for monitoring the project and supporting the delivery of the key projects.

Steering Group – The steering group is responsible for overseeing the work of the project workstreams, making strategic decisions and ensuring the project as a whole is on track.

Workstreams – The workstreams split the overall programme into discreet elements structured around the key outputs. Consultants are involved in one or more workstreams as appropriate. A suitable member is allocated as the leader of each workstream and is responsible for reporting progress back to the Steering Group and ensuring the necessary outputs are achieved.

Key Stakeholders – Key stakeholders are being contacted directly by the consultant team to ensure their knowledge is captured and their influence and networks are used to best effect. Consultants from the relevant workstream will be responsible for engaging with the key stakeholders on an initial and ongoing basis.

Sector-specific Groups – These are specialist stakeholder groups with knowledge of particular areas of interest that relate to the garden town such as property development, rail, health and wellbeing, science and innovation, education and skills etc. Representatives from these bodies may be invited to join the Advisory Board in future. Further detail on some early sector-specific groups is set out at the end of this note.

Community – The community will be consulted on and involved in developing the project, with the Communications, Consultation and Engagement Workstream taking the lead on this.

d) Option 1: DIY / bespoke governance option

9. A range of informal governance arrangements have been set up by local authorities within their existing powers in order to deliver specific visions for targeted areas. These sometimes involve only informal mechanisms, such as the formation of informal partnerships or strategic boards. In other cases, Local Authorities use more formal mechanisms which require approval by the Secretary of State (SoS), such as the formation of Unitary Authorities or the establishment of a joint planning committee (JPC) and/or joint planning unit (JPU). Because these changes require approval from the SoS, they extend beyond the remit of a true 'DIY' mechanism – we have called these *DIY plus* mechanisms 'bespoke' in this note.

10. The informal elements of bespoke models are expedient to set up, whilst more formal mechanisms take longer, but may reap greater rewards in that they consolidate the tools required for effective delivery into one body.

DIY / Bespoke Governance Model
Possible features
No single model, but may include: • A unitary authority • A Joint Planning Unit (JPU) and/or Joint Planning Committee (JPC) • An advisory group (i.e. a steering group) • A delivery group • Entering into a Joint Venture with a private sector partner • Legal agreements, e.g. a Memorandum of Understanding between neighbouring authorities, or between local authorities and their partners
Establishment procedure
• Where two or more local authorities are involved, resolution to establish each element should be made by the committees of each local authority • A JPU and a JPC must be signed off by SoS • Entering into a Joint Venture is subject to EU procurement rules

• Legal advice needs to be sought for any formalised agreements	
Powers	
• Planning powers (plan making, development management) may be delegated only with the approval of the SoS to a JPC and JPU • All or some elements of planning powers may be retained by the local authority/authorities • Decisions will continue to be made in line with constitutional arrangements of participating authorities • CPO powers remain with the local authorities	
Funding	
• Partnerships with private sector may generate funding; both through legal agreements and through the legitimacy that a partnership may lend by attracting developers to an area • Funding from developers may be secured through S106 and CIL • Local authorities may allocate existing funding specifically to the project • Elements of the structure, such as delivery boards, may be tasked with attracting external funding, for example from the HCA or government bids • Organisations clearly designed to achieve grant agreements may be more likely to receive funding	
Precedent	
• Vauxhall Nine Elms Partnership (See Appendix 1a) • Croydon • London Southend Airport and Environs	
Pros	**Cons**
• Easy and expedient to set up • Forum for establishing and maintaining vision, focus and direction for DGT, across authority boundaries • Minimises issues of 'democratic deficit': elected members retain decision-making powers, with opportunities to engage communities in the long-term and include existing community groups • Access to all powers needed (with approval of SoS) • Much faster than bidding for a UDC	• Ultimate decision making powers remain unchanged (rests with each local authority) • Lack of designated or automatic funding means time is spent changing funds

e) Option 2: Urban Development Corporation

11. Urban Development Corporations (UDCs) are set up by Order of the SoS to lead the regeneration of an area. UDCs are governed by boards on which include representatives from both the public and private sectors. The Chief Executive of the Development Corporation is appointed by the SoS after national competition, and must have a proven knowledge and interest in the UDC area in order to be appointed. UDCs usually attract considerable funding from central government, have their own dedicated planning teams and have access to a full range of powers – including CPO powers – so long as these will support the UDC to fulfil its mandate.

Urban Development Corporation	
Summary of approach	
• Established under Local Government, Planning and Land Act (1980) • Limited life bodies tasked to regenerate their designated areas • First wave wound up by mid-1990s; New wave with lesser powers designated since 2003 (Thurock DC and London Thames Gateway, dissolved in 2012 and 2013 respectively) • Reversion to affirmative resolution under Housing and Planning Bill 2016	
Establishment procedure	
• Proposal to government, approval subject to creation of an Order by the SoS • An Order to create an UDC is an affirmative resolution statutory instrument, i.e. it is not debated by Parliament and will become law unless there is an objection from either House within 40 days of being laid before the House of Commons • Nevertheless, establishing an UDC is generally a lengthy process; Ebbsfleet Development Corporation was established in July 2015, 16 months after central government's announcement of its intention to do this in the March 2014 Budget and after 20 years of attempts to build at Ebbsfleet	
Powers	
• Acquire, hold, manage, reclaim and dispose of land and other property • Development management	
Funding	
• No guaranteed funding but recent development corporations have attracted significant funding from government	
Precedent	
• LLDC, OPDC, Ebbsfleet DC (see appendix 1c)	
Pros	**Cons**
• Transferral of all development management powers to one body to direct and deliver the area	• Lengthy process • Concerns have been raised by central government and by local governments about democratic deficit created by UDCs - less likely that government will want to establish UDCs for every Garden Town • Plan-making powers remain with LPAs (however supplementary planning guidance may be written for Didcot Garden Town and adopted by the local authorities)

f) **Option 3: Urban Regeneration Company**

12. Originally set up by the Urban Task Force, Urban Regeneration Companies (URCs) are no longer particular models for delivering regeneration but are companies set up by one or more local authority (sometimes in partnership with the private sector) to focus efforts, generally on the regeneration of a particular area. These may be similar to the types of DIY options discussed in this note, and crucially they involve the establishment of a company and do not include any transferral of powers.

Urban Regeneration Company	
Summary of approach	
• Initially proposed by the Urban Task Force in 1999 • Independent companies established by the local authority (and previously the Regional Development agency) • Often work alongside the HCA (previously English Partnerships) and other stakeholders	
Establishment procedure	
• Formation of a private limited company • Appointment of Company Board and directors (Boards include local authority members URCs are often directed by local councillors)	
Powers	
• All powers (including planning and CPO powers) remain with local authority • The URC board makes decisions over allocation of funding by the Company	
Funding	
• No guaranteed funding, but partnerships with private sector may generate funding; both through legal agreements and through the legitimacy that a partnership may lend by attracting developers to an area	
Precedent	
• First three in Liverpool, East Manchester and Sheffield • Currently in existence in: o Birmingham (Curzon) o Solilhull (see case study in Appendix 1c) • Recently announced for Barking and Dagenham	
Pros	**Cons**
• Can be set up relatively quickly • Can be given a set life-span • Non-Council business members on Board • Forum for setting and agreeing vision and agenda	• No statutory basis; would require Councillors to approve – and Council to carry out – actions agreed by the URC. • Varying degrees of success • Not a standalone option; requires prior agreements and delivery mechanisms • Lack of ring-fenced funding; time spent changing funds • Time spent on building/maintaining consensus between public and private sector to stimulate investment • Has no real power to deliver

g) Recommendation

13. A summary and comparison table of the options described above can be found in Appendix 2.

14. On balance, the least favoured option is the Urban Regeneration Company. URCs, or any other company set up by a local authority, can be useful for limiting risk and demonstrating to the private sector that concerted efforts are being made to deliver a specific vision. Whilst creating a company (which a Council could do at any time) offers an opportunity to establish a new governance structure

by creating a board of directors, it is not a requirement for such a restructure. The benefits of creating a new company for the purposes of delivering the Garden Town are not clear, and at this stage we do not think that a URC is the most appropriate governance option.

15. UDCs are a powerful tool which would attract significant government funding, involve public and private sector interests and offer the opportunity to transfer all of the desired powers into one body with a single focus. However, establishing a UDC for the Garden Town would require significant time and continued political will. We are also aware of Government's reservations about UDCs because they can to lead to a democratic deficit. We have been advised by CLG officials that it is unlikely that the government will wish to set precedent by using UDCs as a common or standard delivery mechanism for Garden Towns.

16. At the present time, the preferred governance structure for Didcot Garden Town is a bespoke governance option that allows South Oxfordshire and Vale of White Horse District Councils to retain their respective powers, but bring together co-ordinated decision making powers for the Garden Town area. This is the most expedient and independent option available.

17. Figure 1 below sets out the proposed structure of the bespoke Garden Town governance option recommended here. Each element is described in Figure 2. (Enlarged versions of these figures can be found at Appendix 3).

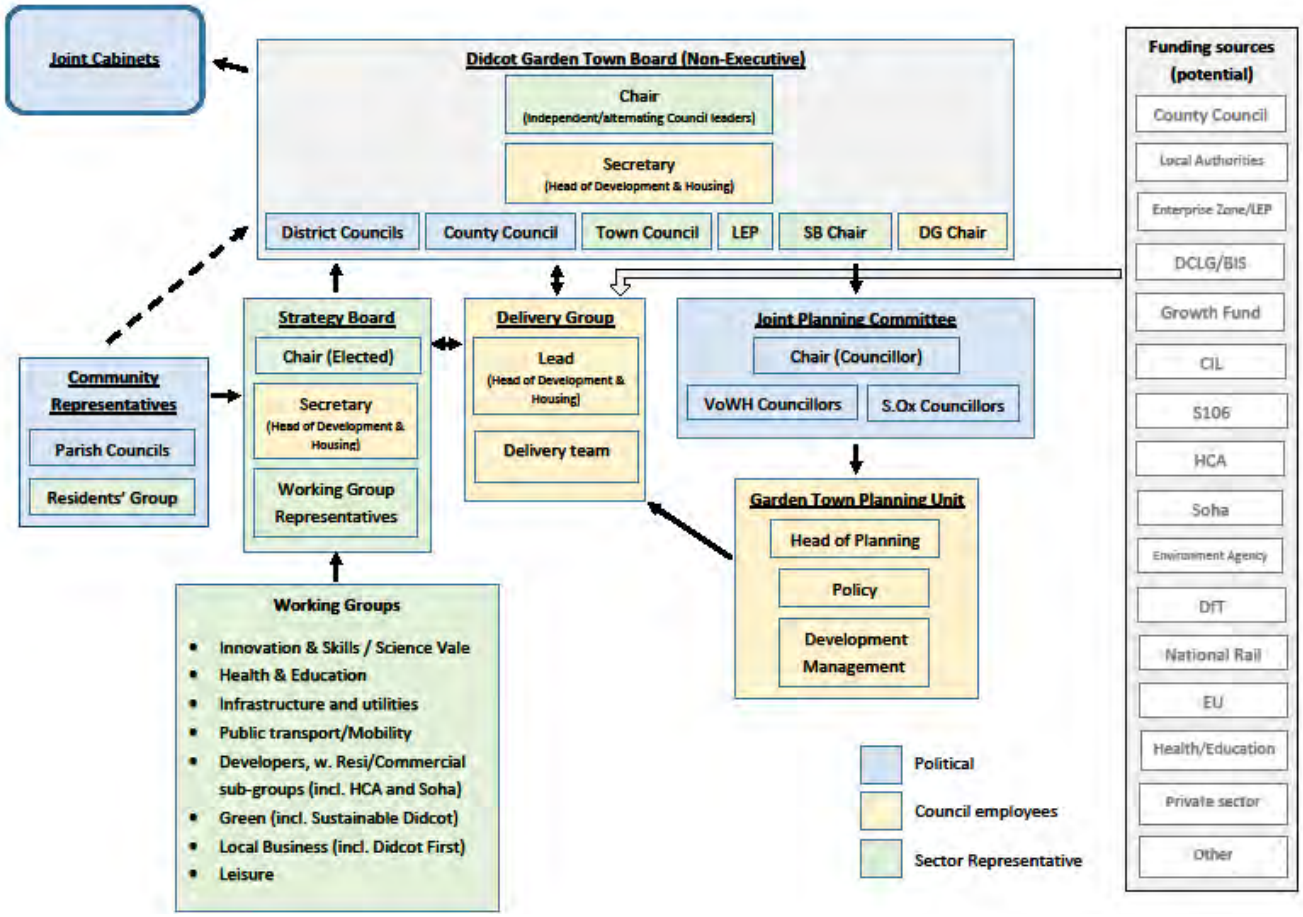


Figure 1. Proposed Bespoke Didcot Garden Town Governance Structure

Didcot Garden Town Board	Hears recommendations from the Strategy Board, Delivery Group and the community. Makes decisions on all matters relating to Didcot Garden Town. These decisions inform VoWH and S.Ox elected representatives (via Cabinets) who agree to take seriously all recommendations. Relays decisions to the Delivery Group and Joint Planning Committee. The Chair could be a well-respected independent individual, or the Board could be chaired alternately by the Leaders of the Councils.
Strategy Board	Advises on all visionary and strategic matters in relation to Didcot Garden Town and represents sectors (see working
Working Groups	Sector specific groups formed of voluntary participants who represent the interests of their organisations. A representative of each working group sits on the Strategy Board. May have sub-groups. Those listed in the diagram are initial options and may be re-worked or expanded as required.
Community Representatives	Community group comprised of residents' groups or representatives and the Parish Councils. This group will open channels of discussion between Board and the community. May have direct links to the Garden Town Board (TBC).
Delivery Group	Sources funding, applies for bids, recommends funding allocations to Garden Town Board, and distributes funding (with approval of DGT Board and sign-off from Joint Cabinet where required).
Joint Planning Committee	Comprised of members from VoWH and S.Ox Planning Committees, the joint planning committee determines planning applications for proposals of a certain scale.
Garden Town Planning Unit	Performs day-to-day functions of planning teams for Didcot Garden Town and lends strategic oversight. Has the ability to prepare planning policy documents (SPDs) and consider planning applications across Didcot Garden Town. Makes recommendations to the Delivery Group as to the spatial implications and deliverability of strategies and interventions.

Figure 2. Description of each element of the governance structure

18. Broadly, the structure represents a re-working and expansion of the current Didcot Garden Town organisational structure as described in Section 'c' of this note. This is intended to build upon the existing strengths and work that has brought Didcot Garden Town to its present position, whilst adding elements to support long-term delivery of the vision, and formalised mechanisms to facilitate ongoing input from stakeholder groups.

19. This governance structure would be expedient to set-up, with the exception of the JPU and JPC, which would require approval by the SoS. All other elements could be brought about immediately within the existing powers for the two District Councils. This option provides a framework for providing strategic direction and delivery mechanisms for the Garden Town vision in the long-term. It is also intended to provide routes to facilitate conversations between the County Council, Vale of White Horse and South Oxfordshire District Councils, the Town Council and the Parish Councils, and stakeholder groups, including the private sector and the community. It should be effective in focusing the efforts of all of those parties on achieving and delivering a more co-ordinated vision for Didcot.

20. The structure proposed is a draft suggestion and there are options with it which should be discussed and agreed.

21. Important characteristics of the proposed structure include:-

    i. a **Didcot Garden Town Board** which would be responsible for achieving coordination across principal stakeholders and driving a joined up vision for Didcot.

       The Board could be independently chaired if a sufficiently authoritative leader could be identified. Alternatively there could be alternating chairs drawn from the two local authorities. Including principal stakeholders on the Board is intended to assist in focusing

their efforts on achieving a coordinated division and concentrating the funding within the garden town.

The Board would not have actual decision making powers. Rather, it would recommend decisions to the joint cabinets of the two councils. It is intended, however, that the Board would carry considerable authority and that the two councils would agree as far as practical to abide by the recommendations and decision of the Board. A good example of this structure is the Vauxhall Nine Elms Battersea Board, which has been highly successful in achieving regeneration.

The Board would, for instance, make decisions about recommendations on funding put forward by the Delivery Group and on strategy put forward by the Strategy Board – these roles would give it considerable authority;

ii. the **Delivery Group** would be a small executive team that would be responsible for gathering together all funding opportunities, making recommendations for the expenditure of funds and receiving instructions from the Board to ensure delivery from that expenditure;

iii. a **Joint Planning Committee** would be established drawn from councillors of the two local authorities. The authorities would delegate all significant planning decisions within Didcot to the JPC, which would be served by a small delegated team of planning officers led by the Head of Planning. The planning unit would draw upon other resources available within the joint planning teams of the two councils;

iv. a **Strategy Board** would be responsible for generation of the overall strategy and the coordination of input from all key stakeholders. It would effectively "*do the work*", leaving the overall Garden Town Board to receive recommendations and make decisions.

The Strategy Board would be run by the Council's Head of Development & Housing, to ensure coordination with the Delivery Group. Members of the Strategy Board would include representatives from each of the principal Working Groups, which would be formed from key stakeholders in a series of topic areas. Their incentive to meet and work would include the ability to place a representative each on the Strategy Board;

v. **Community Representatives** can either be seen as a separate form of Working Group, with a representative member on the Strategy Board or could meet as a separate group consulted by the other groups. The Town Council, however, would have a seat on the Garden Town Board.

22. Once the principles of this structure are agreed, it would be necessary to prepare scopes for each element of the structure and for legal advice to be taken about the delegation of authority etc.

Appendix 1 – Case Studies

Appendix 1a. Nine Elms Vauxhall Partnership Case Study

Summary

In 2009 the Greater London Authority consulted on an Opportunity Area Planning Framework (OAPF) for Vauxhall, Nine Elms, setting out an ambition to deliver 16,000 new homes and 20,000-25,000 new jobs. Since the OAPF was adopted in 2012 an informal partnership between the local authorities, developers and other relevant organisations has formed. The project is shaped by a Strategy Board, set up for the OA to provide strategic leadership for the implementation of the framework. The Board is alternately chaired by the Leaders of Lambeth and Wandsworth Councils and is attended by officers of the public authorities and major landowners. The governance structure (see figure 1.4) comprises the Strategy Board and a series of subject-specific working groups and subgroups.

Establishment, governance and functions

Members of the strategy board comprise representatives of the Nine Elms London Partnership, including: the Leaders of Lambeth and Wandsworth Councils, the GLA, St James' Group, Ballymore Group, Sainsbury's, St. Modwens, Covent Garden Market Authority, Citygrove, Barratt, Belway, Wanda Group, Royal Mail, National Grid, St George, and CLS Holdings.

Officers and observers also attend meetings, including from the GLA, the Councils, Nine Elms Delivery Team, the Joint Coordination Unit, TfL, Network Rail, Battersea Power Station Development Company, Thames Tideway Tunnel and GVA. (Observers to the board provide counsel and advice and generally are held to the same confidentiality agreements as voting members, but do not vote and do not owe fiduciary duties to the board – this may be because they do not put in enough equity (or commitment) to justify a board seat, or where there are too many members on the board, or where they're from the industry to serve – i.e., their advice may be welcome/useful, they may have alternative motives or need to be kept at arms' length).

Powers

Powers remain with Lambeth Council and Wandsworth, who have demonstrated strong commitment to collaborative working. The Board does not have executive decision making powers, cannot own assets, employ staff, give grants or place contracts. Additionally, each of the partners needs to seek formal approval of decisions and recommendations in these areas via their own decision making structures. Despite this, the Nine Elms Vauxhall Partnership Business Plan 2012/13 states that *'the strength of the Partnership and the seniority of its membership have enabled delivery to proceed very effectively to date. The strength of the Partnership is recognised in the GLA's proposal for an Enterprise Zone which clearly identifies the primacy of the Board's role in the strategic leadership of the programme'*.

Funding

Developer contributions, set aside for funding the running of the partnership. The budget for Administration was agreed by the Strategy Board as £2.5M over five years, commencing in 2011/12. This includes £100,000 for communications / marketing / PR.

Developers' tariffs anticipated to generate £1.2bn for infrastructure investment (most of which is going into the Northern Line Extension).

The OA and the partnership is benefitted by the establishment of the opportunity area and the Northern Line Extension – this government loan has catalysed regeneration in the area.

Impacts

Land use: The GLA and the Partnership has played a role in taking a strategic view of land use (such as managing demand for hotel space, for example). It has encouraged developers to propose high quality schemes. For example, it has been specified that developers create public access onto the river front. This specification has been fulfilled as part of a development bringing forwards 802 apartments at the St James' Riverlight complex.

Employment and community benefits: 22,000 construction jobs and 25,000 permanent jobs. St James committed to 45 apprenticeships over the project, including non-construction jobs such as a café for training baristas. A supply chain initiative is also worked on by the Boroughs to support local businesses to win contracts with the new developments. New primary schools and health facilities.

Appendix 1b. Ebbsfleet Development Corporation Case Study

Summary

Earmarked for redevelopment since the 1990s, a UDC was set up for Ebbsfleet in 2014.

Establishment, governance and functions

Ebbsfleet DC was established by Government in 2014 after its consultation to determine whether a UDC was an appropriate option to oversee the delivery of the Garden City. Ebbsfleet DC is now the local planning authority for Ebbsfleet Garden City.

Governed by a Board whose members were selected after open competition. The Secretary of State has a statutory duty, when appointing members to have regard to the desirability of securing the services of people who have special knowledge of the locality in which the UDC will be situated.

Board Members had to prove they had a local understanding of the area.

Also comprised of:

1. *Development Corporation Planning Committee*: responsible for making decisions on applications of planning permission and listed building consent.

2. *Masterplan Steering Group:* to provide strategic direction on technical and performance matters working closely with the Strategy, Land & Regeneration and Planning teams for Ebbsfleet Development Corporation. It guides delivery of a focused, progressive Ebbsfleet Masterplan which is economically robust and deliverable.

3. *Planning Liaison Group:* established to assist with the engagement on strategic planning and infrastructure matters and ensure effective working between the EDC and the local authorities, in accordance with agreed Terms of Reference. It is formed by appropriate representatives from the EDC and the Borough Councils and the County Council and meets every six weeks.

Powers

Ebbsfleet DC has development management and CPO powers. Local authorities retain plan making powers and an agreement of a Memorandum of Understanding (MoU) was signed between the DC and the LPAs governing the way in which planning matters are handled to ensure effective processes are put in place for the bodies to work together on planning matters of common interest.

Funding

Significant Government funding: £310 million Government investment announced in November 2015 (in yearly instalments to 2018/20) to fund EDC activities to deliver the garden city vision. The programme of investment is organised around give sub-programmes (Housing, Commerical, Utilities,

Transport, Green Corridors) that focus on specific projects, can be delivered at page and demonstrate value for money.

Significant DCLG funding: The operational budget for 2015/16 was £3,430,000 and has been approved for 2016/17 at £3,744,000. This covers £182,644 of employee salary costs. EDC has 23 FTE permanent appointments in post and has made five further appointments that take EDC to its approved headcount of 28 FTE staff.

Income of £108,000 from planning fees as of 19 October 2016. Surplus income is largely funding contracted support, e.g. VAT and Accounting advice, and the Strategic Transport Planning Board.

Impacts

The aim is to deliver 15,000 homes. Still in its early stages, the impacts are yet to be determined. The establishment of the UDC, however, is a response to a long period of underperformance in the area..

Appendix 1c. North Solilhull Case Study

Summary

In 2004, Solilhull Metropolitan Borough Council invited tenders to set up a strategic partnership to tackle some of the area's problems and close the gap between the two parts of the borough. After a 12 month, 3-stage process of tendering and procurement which included the involvement of the local community and diverse stakeholders, the North Solihull Partnership (LLP) was formed. The partnership is made up of the council, investment company Inpartnership, housing association Whitefriars Group and housing developer Bellway Homes.

In 2005, the Partnership began working on an ambitious 15-20 years programme to make a noticeable improvement to the lives of local people. The Partnership now seems to have been brought under the umbrella of UK Central, which is marketed as a key investment location and for which there is a masterplan published by Solilhull Council, GBSLEP and Arup.

Establishment and composition

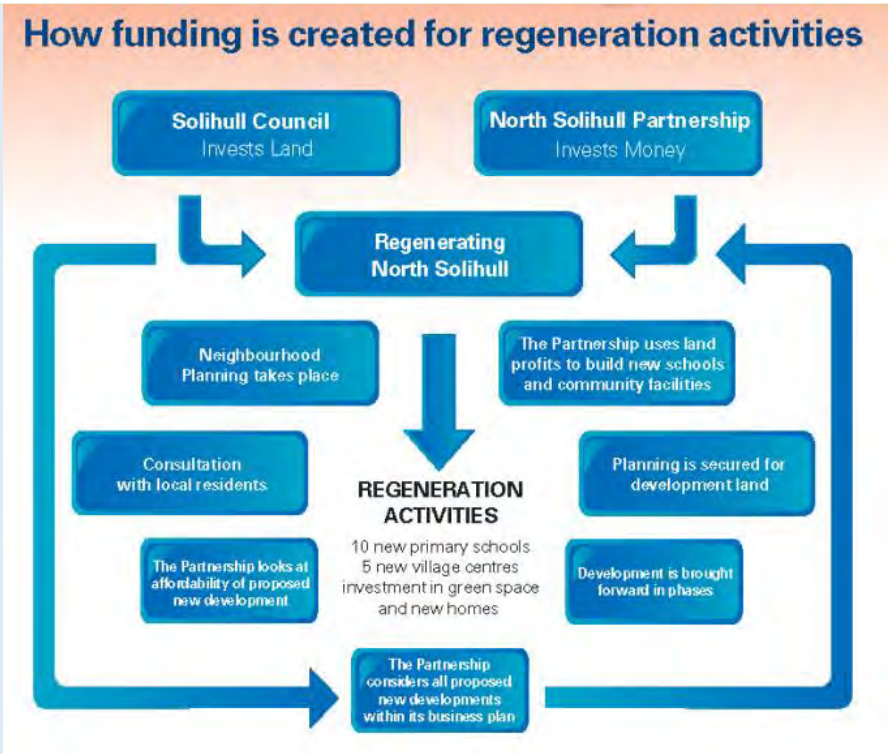
In May 2005 SMBC signed a 15 year Regeneration Agreement, creating North Solihull Partnership (with InPartnership Ltd, Bellway Homes, Whitefriars Housing Group) and covering three wards (Chelmsley Wood, Smith's Wood and Kingsthurst & Fordbridge)

Powers

URCs do not have the same funding, powers and land ownership as UDCs. They do not have planning and CPO powers, however can rely on their public sector partners to intervene on their behalf.

Funding

Funding was generated through Solilhull MBC selling land to the North Solihull Partnership. Once planning permission is granted, this land is sold to Bellway Homes by the Partnership. The money from the sales was put back into the project, funding new primary schools, Village Centres and improvements to infrastructure and green space. Funding sources included financial commitments from partners, the European Regional Development Fund (ERDF), the HCA and GBSLEP. In 2011 the partnership received a £2.6m funding boost, including £1.3m from the ERDF.



Impacts

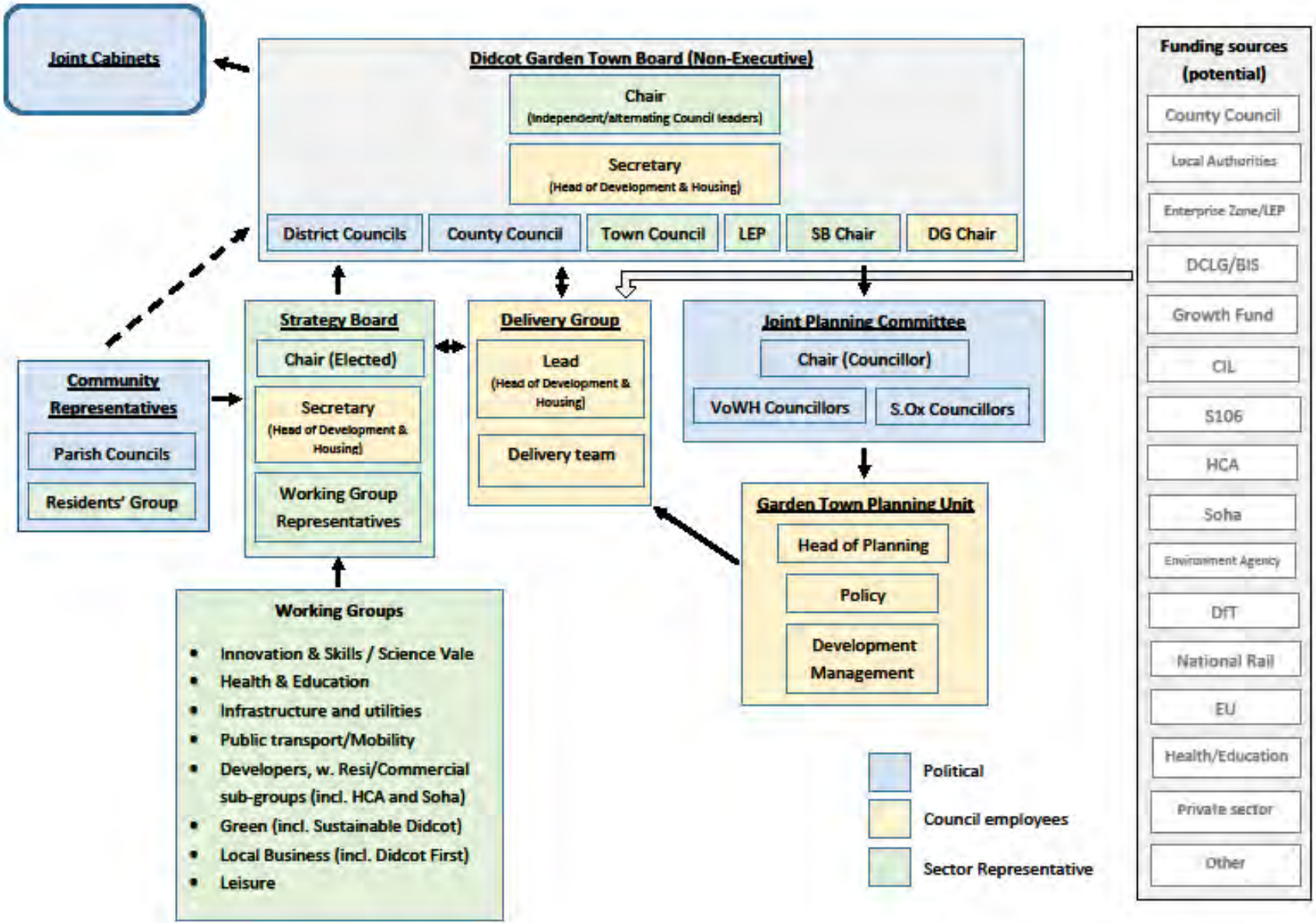
Won regeneration awards for successfully completing at least four new schools and nearly 800 homes, including homes for social rent by 2012. The body now continues under UK Central.

Appendix 2 – Summary and Comparison of Governance Options

	Bespoke Governance Option	Urban Development Corporation	Urban Regeneration Company
Summary	*Board supported by steering group, working groups and community groups, delivered through a delivery board, joint planning unit (JPU) and joint planning committee (JPC). Opportunity to include private sector.*	*Statutory body established by SoS to regenerate an area. Can access all powers necessary for its ends. Focused and effective but can be lengthy and accusable of democratic deficit.*	*Independent companies established by the local authority (and previously the Regional Development Agency). Formerly partnered with English Partnerships on regeneration projects. Still provide opportunities to include private sector and can signal intentions of the public sector to the private sector and offer focus.*
Establishment procedure	• Resolution by local authority committees (e.g. including memorandum of understanding) • JPU/JPC approved by SoS	• Call on SoS • Negative resolution procedure • Nationwide application process for leader	• Formation of a private limited company • Appointment of directors (include local authority members) • Appointment of Company Board
Powers	• Board makes strategic, non-executive decisions, approved by local authorities • All planning powers delegated to JPC	• All powers deemed necessary for the achievement of its purpose, development management and CPO	• Those held by the local authority (plan making, development management, CPO)
Funding	• No automatic additional funding • Bids made by delivery team for allocations from existing and new sources	• None guaranteed • Generally accompanied by significant government funding	• No automatic additional funding • Bids made by delivery team for allocations from existing and new sources • Access to funding from partners if set up in the form of a joint venture
Pros	• Expedient • Democratic • Coordination and focus • Accountable • Opportunities for community involvement • Private sector input (business knowledge and expertise)	• Access to all powers needed for regeneration, contained within one body whose sole focus is the area • Attention and funding from government	• Expedient • Optional fixed lifespan • Coordination and focus • Sends message to private sector of intentions • Potential to create partnerships with the private sector

Cons	• Reliant on relevant local authorities to approve and implement decisions • Lack of ring-fenced funding; time spent changing funds	• Lengthy to set up • Can be disbanded at any time • Often criticised as undemocratic	• Reliant on separate local authorities to approve decisions • Varying degrees of success • Requires delivery mechanisms • Lack of ring-fenced funding; time spent changing funds • Time spent on building/maintaining consensus between public and private sector to stimulate investment • Many were dependent on funding from Regional Development Agencies, which no longer exist

Appendix 3 – Bespoke Governance Option Structure



Appendix 3 – Bespoke Governance Option Structure

Didcot Garden Town Board	Hears recommendations from the Strategy Board, Delivery Group and the community. Makes decisions on all matters relating to Didcot Garden Town. These decisions inform VoWH and S.Ox elected representatives (via Cabinets) who agree to take seriously all recommendations. Relays decisions to the Delivery Group and Joint Planning Committee. The Chair could be a well-respected independent individual, or the Board could be chaired alternately by the Leaders of the Councils.
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Community Representatives	Community group comprised of residents' groups or representatives and the Parish Councils. This group will open channels of discussion between Board and the community. May have direct links to the Garden Town Board (TBC).
Delivery Group	Sources funding, applies for bids, recommends funding allocations to Garden Town Board, and distributes funding (with approval of DGT Board and sign-off from Joint Cabinet where required).
Joint Planning Committee	Comprised of members from VoWH and S.Ox Planning Committees, the joint planning committee determines planning applications for proposals of a certain scale.
Garden Town Planning Unit	Performs day-to-day functions of planning teams for Didcot Garden Town and lends strategic oversight. Has the ability to prepare planning policy documents (SPDs) and consider planning applications across Didcot Garden Town. Makes recommendations to the Delivery Group as to the spatial implications and deliverability of strategies and interventions.

P.
Community engagement strategy

Didcot Garden Town – Creating a strategy for ongoing Community Engagement

Context The Garden Town will be a transformative project for the whole of Didcot to 2031 and beyond. There will be few if any aspects of local life and activity that will not be affected and there is enormous potential to enrich and contribute to the success of the project from and by the third sector, voluntary organisations, together with local community and representative groups. If local groups feel they have a stake in the Garden Town and have the opportunity to help shape and deliver aspects of it, they will provide constructive and creative input - even where there are a wide range of views on a particular project or issue. Linking effectively with the wide range of organisations involved will need dedicated resource, since this will be a vital requirement for "doing with" not "doing to", for harnessing the energy and local character that will contribute to the success of the project and creating pride and identity which will make people choose to come and live, work and spend their time in the Garden Town. The challenge is to move from "we" and "you" to "us".

The following set of actions will be developed to form the basis of **a community engagement strategy**. The proposed elements are:

- Creating **an accessible, updatable Garden Town Outline for continuing local engagement.** The community engagement process, carried out over the past four months, has achieved a good level of response and engagement and the outcomes from this process have directly fed into the Delivery Plan. The challenge is to move from this big picture to something which is readily understood by local communities in terms of what might happen, when and where, what is essential and what is desirable, but which also makes clear that this is a developing process and that much depends on other partners, investment funds and so on. While the overall vision and plan is extensive (running to 2031 and beyond, covering the whole town) this, more basic, **Outline** would provide goals, area priorities, key projects and indicative phasing, all subject to further development. Most important of all, it needs to be **explicit about benefits** – most growth projects will have some downsides. How will a resident benefit from the Garden Town initiative eg jobs, opportunities, investment that might otherwise go elsewhere. This Outline document will be prepared once the Delivery Plan is finalised. There may also be scope to provide a web based model or similar to enable wider reach, easier engagement and which will allow for easier updating;

- **Mapping and building relationships across the voluntary sector**. While at first sight it is the democratic bodies (Local Government) that have the clearest interest in the Garden Town, it is through activity groups that the greatest potential exists for creating a shared agenda. There are a wide range of organisations in Didcot and the surrounding area whose activities are relevant. The Resident's Handbook for the town includes 310 organisations with 87 thematic activity headings and while many of these may only have a passing interest at this stage they are all potentially affected and worth contacting. Issues are likely to range from the basic - meeting spaces, ways of advertising activities, impact of new development, growth of the town etc to those where there is a direct link to Garden Town objectives eg sustainable transport, green infrastructure, energy and environmental initiatives and there will be a large group of the potentially interested – schools, training organisations and business groups. Groups need to see that their interests have been logged and will be responded to. A **dedicated voluntary sector co-ordinator** would undertake a themed series of meetings with groups of organisations (or meet one to one) to identify level of interest, potential for joint projects etc and so build up a community resourcebank for the Garden Town to underpin future engagement. This should be started quickly to capitalise on the awareness created by the consultation on vision and the

Delivery Plan and to maintain a positive engagement in the Garden Town project;

- **Identifying and commissioning possible joint projects.** Some of the priority proposals included in the Garden Town argue for rapid partnering with the voluntary sector as part of the delivery strategy. For example additional **transport investment** is likely to bring requirements for lower car use and modal shift to walking/cycling and as part of this a promotional and awareness raising campaign in which local cycling and green travel groups will be natural allies. Similar considerations apply on other **environmental and education projects, energy, design and town centre** issues. Even where the intended capital project (eg the new cyclelink to Culham and Harwell) is some years away there will be smaller cycling etc projects which can help prepare the way. Building capacity in these key areas can start quickly and small scale "demonstrator" projects can help maintain interest and momentum even though major works will take time to complete planning and funding stages. A successful technique used elsewhere has been to hold a "Pledge Day" in which voluntary groups respond with small scale project proposals to key priority goals (in this case set by the Garden Town Board) eg on transport, greenspace, energy etc. The Garden Town might then offer funding to a selection of those coming forward;

- **Building "Third Sector" capacity – short and long term** Just as the Garden Town vision envisages major growth in terms of new development – commercial and housing, inward investment and better infrastructure - so investing in the growth and development of the voluntary and community sector is highly desirable. As a stronger local partner it will be in a better position to take on a greater role, including acquisition and management of community assets which is likely to be a critical issue as major new developments are completed. There are several ways in which growth in this capacity could be stimulated including, as a start, offering voluntary groups help in having **a shared town centre presence**, possibly as part of the "Garden Town" central building. Groups could be asked to bid for a role in providing visitor tours as "Garden Town Guides" with a fee going to their funds (a similar model is used in other "showpiece" new communities). Another possibility is to provide **enabling help** from organisations such as Locality who could be engaged to help existing groups take on new projects.

- **Governance structure and relationship between community/voluntary organisations and the Garden Town Board.** The community and voluntary sector will be only one of several key stakeholder groups involved in the Garden Town, although they will benefit from direct representation on the main board. It also is to be expected that periodically issues will arise where the community and voluntary sector may have quite different views to those of eg business investors or transport providers. Critical for success will be: (a) **A voluntary sector objective for the Garden Town Board -** One of the Board tasks should be to approve an ongoing programme of work covering projects and partnerships, proposed by the Garden Town Delivery Team, which will sustain the objective of giving a wide cross section of the community a real stake in realising the overall vision; (b) **An integrated approach to community/voluntary sector as a whole** - Bringing together in the governance structure representatives of the voluntary sector and the parish councils/residents groups (they will overlap and the practical experience of the voluntary sector can help the debate) so as to grow capacity overall; (c) **Members of the Garden Town Board adoption of high level shared objectives on openness, commitment and compromise** - openness to discussion of difficult issues, a willingness to compromise, and an overall commitment to growing Didcot to make it a better and more sustainable place. Prospective members should be asked to accept these –

drafting and agreeing them would be a good way of building ownership.

It will be important to make early progress on community consultation after the Delivery Plan is adopted. The above approach would require the following **programme of early action:**

(I) Creating an accessible, updatable Garden Town Outline for continuing local engagement (by June/July 2017);

(ii) Appointing a dedicated voluntary sector co-ordinator and establishing a programme of engagement with the voluntary sector and parish councils/residents groups (by June/July 2017);

(iii) Developing a set of projects suitable for voluntary sector delivery which would contribute to delivery of major goals such as the cycle link;

(iv) Investing in growing the voluntary sector eg through space in the Garden Town HQ or by engaging enabling help to take on new roles;

(iv) The Garden Town Board to adopt an objective for the voluntary sector and broad principles for membership balancing openness, commitment and compromise.

Q.
Garden city developments note

GARDEN CITY DEVELOPMENTS
COMMUNITY INTEREST COMPANY

A Local Delivery Vehicle for South Oxfordshire?

Background

Following discussions on the 16th December with David Hill and Gerry Brough (attended by Charlotte Mitchell of Quod), I was asked “To prepare a short stand-alone report outlining how we can integrate a Local Delivery Vehicle into Quod's recommended governance model in such a way that we have the ability to intervene, on a commercial basis, to stimulate development and provide long-term stewardship over public assets within Didcot Garden Town”.

This short report is produced on behalf of Garden City Developments Community Interest Company, (gardencitydevelopments.org) established some three years ago by Trustees of the Town & Country Planning Association (TCPA). GCD’s purpose is to work with partners to apply Garden City Principles to create sustainable new communities. It does not wish to replace or compete with mainstream professional advice but seeks to bring parties together to form productive relationships using the in depth experience of its team. The report is necessarily brief.

Introduction

Delivery arrangements and their governance should be key components for anyone who needs to consider the economic, social and environmental impact that large scale development will have on existing and new communities. The impact of delivering one small housing or employment site will be relatively minor. The quality, pace and mix of large scale development, and its associated infrastructure and facilities has the potential to bring lasting improvement or damage to the lives of those who live or work in the area. Place making is widely recognised as an essential ingredient of development, but just how can we be sure that it will be delivered in a satisfactory manner on large sites?

The need for and nature of local ‘Delivery Arrangements’ depends firstly on the ambition of the Local Authorities, secondly their sense of satisfaction with what has been and is being delivered, and thirdly their confidence in the quality of future delivery. Housebuilders and commercial developers are skilled at delivering housing, offices and retail developments, but do they have the vision, the skills and the long term commitment needed to deliver whole new communities in a sustainable way? How best can a Local Authority work with them to improve the outcome?

South Oxfordshire: recommendations from Quod

We have seen the note from Quod, entitled “Didcot Garden Town Governance Recommendations”.

The option recommended for further study by Quod is a bespoke agency. We agree that this is better than either a URC or UDC model. URCs were used with varying success in several major urban areas, starting in Manchester to deal with the aftermath of the IRA bombing in the mid 1990s after which their working arrangements were codified by the Urban Task Force and used elsewhere to kick start regeneration in run down urban areas. URCs are a good model for areas that need renewal which market forces alone have not and arguably will not deliver.

Quod rightly, in our view, dismiss the stronger version of an Urban Development Corporation -(UDC), arguably the ‘big brother’ of the URCs. UDCs have statutory powers granted by parliament over such activities as planning and land assembly. They also have an established track record, though as with URCs it is variable. Successes include London Docklands during the 1980s and 90s, and more recently delivery of the developments which housed the 2012 Olympic Games. Their disadvantage from a local authority point of view is that they are controlled by and accountable to Central Government, thus lacking local democratic accountability. Their disadvantage to Government is that they were expensive, and we agree that it is unlikely that they will be seen as a suitable model for Garden Communities.

GCD Supplementary Options

General comments

URCs and UDCS were typically used in areas of low market confidence, to ‘light the fire’ and stimulate private investment. In South Oxfordshire we believe market conditions are already quite strong, but infrastructure is often overstretched and in need of major investment which most private developers are unable or unwilling to afford. There is also concern about the quality and pace of development, which lies entirely in the hands of a few developers/landowners.

We agree with Quod that what is needed is an organisation with an overall vision and brief - to be set by the Local Authorities - to secure development of successful communities alongside improvements to existing areas. With market forces already strong, the need to create confidence is less important than to show leadership, give direction about quality and mix of development and create a process whereby infrastructure is delivered at the right time, proving the conditions in which existing and new communities can thrive. This organisation could be called a Garden City Development Company (GCDC), the name of which spells out its purpose very clearly.

In order to intervene effectively and commercially the GCDC should be established with the agreement and participation of the major landowners and/or developers who own or control the areas to be developed. The GCDC should seek to gain effective control of the land by reaching contractual agreements with the developers/landowners and should be willing to invest directly in the infrastructure, getting its returns from a share of land values when sites are developed. The GCDC must appear and behave as a commercial operation, fulfilling its overall brief in a way which maximises long term value. It should aim to leave long term community facilities such as parks and community halls in the ownership of a suitably structured 'Community Trust" which should be funded in part from land value uplift. Ideally the arrangement with landowners/developers should have been negotiated in the early stages of planning, before the land is allocated in the local plan and when there is still some choice available to the Local Planning Authority. This would have increased the leverage of the Local Authority and allow the existence of an agreement (or not) to be taken into account when selecting preferred sites in the Local Plan, This is a legitimate process since confidence about delivery is a prime factor consider by the planning Inspectorate. This may be possible for some large future developments in South Oxfordshire and we would be happy to work with the Local Authorities to develop an approach is a manner that it attractive to landowner and developers, as we are already doing elsewhere.

Immediate Focus

However, the immediate question posed to us is whether better delivery of sites already allocated and in some cases already underway can be achieved through a Local Delivery Vehicle. In these circumstances the key question is what, if any, leverage does the Local Authority still have? We believe there is some leverage, using the king of bespoke GCDC structure discussed above, if the Local Authority is willing to take an active role in investment. Although this structure would look similar to that proposed by Quod, it would need to pass the test of simplicity and clarity of executive control if landowners and developers are to put their land under its effective control. Without control over the land the opportunity to play a proactive role in platemaking will be more limited.

The normal way in which infrastructure is secured is through planning conditions such as S106 agreements. These can be complex and take a long time to agree. In large developments over several years they are vulnerable to challenge and erosion, in which case vital infrastructure is often delayed or even abandoned, leaving both the new community and existing residents to cope with overcrowded roads, schools and facilities. In this 'normal' process the achievement of 'quality' in terms of house design and platemaking is reliant on the Local Planning Authority's ability to persuade or to resist non compliant developer proposals. This can be problematic and is essentially a reactive rather than proactive role..

We suggest that a structured and considered approach is made to developers/ landowners of existing sites where key infrastructure or quality issues exist. The reference to both landowners and developers is deliberate as we are not aware of the arrangements that exist on these sites- whether they are owned outright or under some form of option or promotion agreement.

The ‘offer’ from the Local Authority should be to relieve the developers of their S106 obligations. In exchange the LA would secure funding for and deliver (through the GCDC) all infrastructure (most of which would have been included in a S106), to an agreed programme which supports the community’s needs. All the costs of this infrastructure would be repaid from land values (plus some overage) as development proceeds. The GCDC would also acquire an effective controlling interest in the pace and nature of development, by taking on the role of ‘master developer’ bringing sites to the market with specific development briefs that reflect the aspirations and vision of the Local Authority as embedded in planning policies. GCDC would also make arrangements for some kind of ‘Community Trust’ to be put in place and properly funded to take responsibility for the long term stewardship of public amenities created during the development, such as open spaces and community halls.

This idea may seem fanciful, and indeed there is no guarantee that it will work. The developers land is already allocated and they can continue with confidence at their own pace if they prefer to do so. However, the advantages of this arrangement for them are real, as long as they have confidence in the Local Authority’s determination and capacity. Their cash flow would be improved enormously by having the infrastructure installed for them. Their confidence in seeing continued support from a partnership with the LA would be increased by knowing that there is a shared interest in the commercial success of the development. Finally, the effect of such a co-ordinated approach to high quality development would almost certainly raise values as it proceeded.

Giving confidence to the landowners and developers that GCDC could be an acceptable vehicle for delivery on their land will not be easy. Whilst GCDC should be owned by the Local Authority it would have to be visibly ‘arms length’ and be seen to operate independently of the normal political process. It should have a Board that includes ‘independent’ members, one of which should chair the Board. These should be selected for their expertise, plus nominees of the existing developers/landowners as well as nominees of the Council(s). The independence of the Board to get on with its job (as defined by the Local Authorities) and the capability of its senior executives would be of paramount importance.The brief of the GCDC would be along the lines of “to secure the laying out and development of the area in accordance with garden city principles and planning policies adopted by the Local planning Authority(ies)” The GCDC would need an agreement with developers/landowners, giving it the right to call on land for the development of infrastructure and to put development land on the market in accordance with business and marketing strategies previously agreed by the GCDC board.

How the GCDC would conduct its business would need further consideration, together with landowners/developers. This might include the appointment of a strategic private sector partner.

One further option, to keep in mind.

Earlier in this note we acknowledged that a Statutory UDC was not desirable, particularly because of the loss of local accountability that would be required. Before UDCs were invented the standard delivery vehicle for the New Towns programme, from 1946 to

1992, was the New Town Development Corporation (NTDC), set up under Act of Parliament in 1946 with various amendments up to 1982. NTDCs were extremely successful and effective instruments of delivery for large scale joined up development. Unlike the later UDCs they had a responsibility to deliver an overall vision that included economic, social and environmental objectives. The form of developments which resulted reflected the era in which they operated, and if used now the guiding vision would differ in many ways, but would include the responsibility to create balanced communities, with homes, jobs, facilities and infrastructure. Another strength, which is as relevant today as ever, was their ability to use land value uplift to pay for infrastructure, funded in advance by loans and delivered early so as to avoid stress on new or nearby existing communities.

Although NTDCs are intrinsically better suited to overall development of new communities than their cousins the UDCs, they suffer from the same democratic deficit. They also relied on government loans. Once fully repaid, the 'surplus' or profit also went back to the Treasury. However, the present government, prompted particularly by the TCPA, has shown that it understands both the power of the NTDC vehicle and the problem of local democratic deficit. It has indicated a willingness to amend the existing NTDC legislation to allow Local Authorities to call for the creation of locally accountable NTDCs. These would have their own powers of land assembly, planning and investment, but would be accountable to and work to a brief set by the Local Authority(ies).

The locally accountable NTDC option is not currently available, so we cannot put it forward as a recommendation. However we believe that South Oxfordshire should take an active interest in the option of a NTDC and if such becomes available should give it serious consideration for use in future areas of large scale development, or for existing allocations if progress is unsatisfactory.

Conclusions and Recommendations

1. We believe that intervention by Local Authorities in the process of delivering large scale developments on Garden City principles can reduce the scale of risk faced by local communities and bring the prospect of real long term financial, economic, social and environmental benefits.

2. In the short term, for sites already allocated, we agree with Quod's conclusion that a bespoke agency is needed. However we think it is worth trying to be more ambitious by developing propositions that can be discussed with developers and landowners which would relieve them of some of their current onerous responsibilities whilst giving the Local Authorities greater comfort about pace and quality together with real long term financial benefits. This could result in the formation of a Garden City Development Company (GCDC) with direct role in delivering infrastructure and selecting developers for specific sites. There is no guarantee that this approach will work at such a late stage in the process, but we believe it is worth investigating.

3. Looking ahead, we would suggest that a similar approach is put in place at the earliest opportunity for any new areas of large development on sites not yet allocated, so that agreements with landowners can be secured prior to allocation.

4. Finally, we would recommend that the Local Authority takes an active interest in the Government's amendment of the New towns Act, with a view to considering a locally accountable New Town Development Corporation should such a agency be made available.

We would be happy to expand on and discuss all of the above in greater detail should you wish us to do so.

John Walker on behalf of Garden City Developments

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R.
Didcot Garden Town consultation feedback report

Didcot Garden Town

Consultation which asked for views on the proposed delivery plan for Didcot Garden Town.

AUGUST 2017

CONTENTS

SUMMARY

This report summarises a consultation undertaken by South Oxfordshire and Vale of White Horse District Councils which asked for views on the proposed delivery plan for Didcot Garden Town. The consultation was designed to get local residents' and businesses as well as wider stakeholder and other interested parties views on the proposed plans.

In total, 458 people (residents, businesses and other interested parties) and 36 wider stakeholders (see appendix A) responded to the consultation.

Below is a summary table of the results. The consultation found that:

Overall, respondents broadly supported chapters and sub-chapters 6, 7 and 8 with proportionally more respondents agreeing than disagreeing, while views on chapters 3 and 5 were mixed. Proportionally more respondents disagreed with chapters 4, 9, 10 and 11.

Overall, slightly more respondents disagreed (40 per cent) that the document presents a realistic plan for Didcot than agreed (38 per cent).

Chapter/question	Agree	Disagree	Neither / don't know	*Base*
3.1 The vision for Didcot	48%	41%	12%	*94*
3.2 Bringing the vision to life	33%	50%	17%	*93*
4.1 Making Didcot a place for business	38%	45%	17%	*64*
5.1 Transport infrastructure (traffic flows, public transport and cycling)	36%	53%	11%	*157*
5.2 Grey infrastructure (utilities, waste, energy and renewables)	36%	24%	40%	*136*
5.3 Blue infrastructure (flood risks and sustainable drainage)	36%	29%	36%	*135*
5.4 Social infrastructure (education, healthcare, cultural and leisure facilities)	37%	38%	25%	*136*
6.1 Delivering a wider choice of homes	46%	39%	15%	*80*
7.1 Technology	43%	31%	25%	*67*
7.2 Sustainability projects	47%	30%	23%	*64*
8.1 Summary of super green town	47%	37%	16%	*100*
8.2 Didcot's relationship with its landscape setting	45%	40%	16%	*101*
8.3 Landscape principles, green infrastructure and open space strategy	47%	38%	15%	*102*
9.1 Introduction to masterplan	42%	34%	24%	*82*
9.2 Analysis	36%	40%	25%	*81*
9.3 Spatial vision and masterplan strategy	36%	45%	20%	*87*
9.4 The masterplan	36%	45%	19%	*86*
9.5 Guidance for key sites	32%	43%	25%	*84*
9.6 Phasing	32%	41%	27%	*81*
9.7 A design review panel for Didcot	37%	31%	33%	*82*

9.8 Progressing the masterplan	30%	36%	35%	*78*
10.1 An overview of planning and governance	27%	42%	31%	*71*
10.2 Planning	23%	54%	23%	*74*
10.3 Suggested approach to governance	22%	51%	27%	*73*
10.4 Garden town areas	25%	48%	27%	*73*
11.1 Funding and implementing the proposals	24%	52%	24%	*67*
To what extent agree/disagree that the document presents a realistic plan for Didcot?	38%	40%	23%	*300*

BACKGROUND TO THE CONSULTATION

Didcot was awarded Garden Town status by government in 2015. With this status, South Oxfordshire and Vale of White Horse District Councils are able to provide a mix of new affordable homes, schools and jobs whilst preserving the villages and countryside around the town.

It is one of only 10 UK Garden Towns and has significant investment planned in the town which will help to support delivery of the 15,000 new homes already planned for Didcot for people wanting to live, and create a future for their family, close to the 20,000 new jobs that will be created in the Science Vale area.

The proposed masterplan has recommendations for new schools, health and leisure centres and other services and proposes to work with the county council, NHS, highways and the emergency services to ensure the services they deliver in Didcot and the surrounding areas are capable of supporting the planned growth of the town.

As the garden town status suggests, the strategy will be to incorporate new open spaces, encourage and expand the biodiversity throughout the area and upgrade existing public green spaces to maximise all forms of leisure both energetic and relaxed.

The plan for the town and surrounding areas include the infrastructure that will be required for an increase in population. New roads and cycle paths are planned to improve access around the town and to the surrounding villages and science business parks.

The results of the consultation reported in this document follows two previous stages of community engagement by the councils which were promoted using a wide variety of methods, including:

- Interactive websites
- Public drop in sessions at Cornerstone Arts Centre
- Pop-up shops in the Orchard Centre
- Facebook advertising

- Advertising in the Herald series newspapers
- Display stands – Orchard Centre, Cornerstone Arts Centre, Didcot Civic Hall, Didcot Wave and South Oxfordshire and Vale of White of White Horse District Council Offices
- Leaflet delivery to all homes in Didcot
- Posters in Didcot and surrounding villages
- Community engagement at Didcot street fair
- Press releases leading to articles in local media

The first stage of engagement ran from 9 November 2016 to 18 December 2016 and saw 429 people express their views of present day Didcot and on what they would like to see in the future.
The second stage of engagement ran from 26 January 2017 to 28 February 2017 and followed the publication of some of the initial garden town ideas. 607 people commented on town centre, masterplan and transport proposals.

In addition to the people engaging directly with the councils a petition requesting to 'Please promise to protect all of Didcot's green spaces, paths and amenities on Ladygrove from loss, shrinkage or relocation through future development' signed by 2,039 was received. The comments saw the controversial proposals of a technology campus on Ladygrove Park removed from the proposed delivery plan.

Throughout both stages of engagement the councils conducted meetings with stakeholders, parish councils and community groups to incorporate their views into to proposed delivery plan.

To further refine the plan the councils undertook a third stage public consultation exercise during June and July 2017.

The Didcot Garden Town Delivery Plan will be finalised and published later this year. Everyone will have another opportunity to comment when each individual planning application is brought forward in the future.

CONSULTATION METHODOLOGY

This third stage of consultation was designed to capture people's views and suggestions on the proposed delivery plan for Didcot Garden Town.

The councils put together a survey asking for peoples' feedback on the proposed objectives and an online survey was designed that mirrored the chapters within the Didcot Garden Town Proposed Delivery Plan. Appendix C shows the presentation of the survey and questions used.

The introduction to the survey provided a weblink to download a full copy of the proposed delivery plan and respondents were given the option at the beginning of the survey to choose which sections and chapters they wished to complete.

At the start of each section/chapter the survey provided a weblink to the relevant chapter. This opened in a pop-up window, allowing respondents to review and consider the detail of the chapter prior to answering. At the end of each section, respondents were given the opportunity to provide comments on the chapter.

M·E·L Research published the survey online on Monday 19th June 2017 for a period of just over six weeks, with the survey deadline set as Friday 31st July 2017.

To draw attention to the consultation, people who had previously expressed an interest in council consultations were emailed with a link inviting them to complete the survey online.

The councils ran a social media campaign throughout the duration of the consultation to encourage people to participate. This was accompanied by a leaflet sent to each property within Didcot and surrounding villages and email notifications were sent to stakeholder groups and residents that had previously requested to be kept informed of garden town updates.

The launch of the proposed delivery plan was also comprehensively covered by the local media.

Paper copies of the Didcot Garden Town Proposed Delivery Plan were available to view at:

- South Oxfordshire and Vale of White Horse District Council, 135 Eastern Avenue, Milton Park, OX14 4SB
- Vale of White Horse District Council, Abbey House, Abbey Close, Abingdon, OX14 3JE
- Didcot Civic Hall, Britwell Road, Didcot, OX11 7HN
- Didcot Library, 197 Broadway, Didcot, OX11 8RU
- Cornerstone Arts Centre, 25 Station Road, Didcot, OX11 7NE
- Didcot Wave, Newlands Avenue, Didcot OX11 8NX.

CONSULTATION RESPONSES

In total, 458 people (residents, businesses, stakeholders and other interested parties) provided a response to the survey; 24 were postal returns, 105 via email and 329 online. In addition, 36 businesses and other stakeholders provided a written response to the consultation (see list at appendix A).

For chapters three to eleven, an analysis of the levels of agreement with each sub-chapter of the proposed delivery plan has been included. Where the term agree ‘overall’ or disagree ‘overall’ is mentioned, this refers to the combined proportion of respondents that either ‘strongly agreed’ and ‘agreed’ or ‘strongly disagreed’ and ‘disagreed’.

Respondent comments to each chapter have been broadly collated into key themes, with the top themes discussed within the report. It should be noted that a wide range of residents and community representatives have commented on the proposed delivery plan and that some of the comments received to various chapters follow a similar pattern or ‘template’ style response. This has been identified in the commentary.

VIEWS ON CHAPTER 1

The Garden Town Delivery Plan is an exciting opportunity to make the town an even better place to be. This chapter provided an introduction to the plan and an overview of the chapters within it (foreword, delivery plan process, overview of the delivery plan and project timeline).

Respondents were asked whether they had any comments on this chapter and 103 people chose to respond. The most frequently mentioned comments fall into the themes of home building and population increases, participating in the consultation, how the proposals would be funded, general objections to the delivery plan, concerns about development of green belt and green space and suggestions for other facilities for consideration.

Comment theme	All comments
Home building, population/job increases	32
Concerns regarding the consultation	20
Cost / How will it be paid for	19
Object to proposed delivery plan	18
Green belt / green space concerns	18
Other facilities / considerations (e.g. health)	17
Road and transport network/infrastructure	16
Didcot Garden Town footprint and impact on villages	14
Support the proposed delivery plan	12
Suggestions that Plan does not follow TCPA/Garden Town principles	11
Public transport / cycling / walking	11
Didcot Gateway South and train station	11
Including younger people in plans / consultation	11
Other comments	11

The following sections provide examples of the type of comments received and includes details of other aspects that respondents feel should be considered.

Home building, population/job increases

The highest proportion of comments (31 per cent) focused on the potential impact of home building brought about by population and/or job increases. A number of these comments related to concerns that the majority of houses identified within the plan already have planning permission, which could lead to developers/land owners increasing their costs to the council(s). Others raised concerns about the mix of housing, including affordable housing, while others did not wish to see poorly designed, high energy properties. Example comments are shown below.

> *This plan ought to help encourage developers to action their extant permissions. However some cynical developers will take exactly the OPPOSITE view. They will consider that land-banking their site whilst others shoulder the effort of delivering this*

vision will enable them to cream more profit from their site - when they bring it forward 10 or more years hence… I do not believe that our LPAs and Planning dept. will be taken seriously until or unless they enforce the extant planning permissions - using CPOs as necessary. Even one CPO package launched at a particular Developer/land-rights holder would immediately energise all the other calculating developers! (ID.5)

A lot of thought has gone into the plan, and I like a lot of the detail provided (e.g. connecting the elderly and student populations). There has to be a commitment that 'affordable housing' is actually affordable - the definition currently used is, for many, absurd. Long term public ownership of a significant portion of new housing should be guaranteed. These homes should also be where people would like to live - past building under the power lines and along the A34 highlights a very blinkered approach to housing provision. (ID.258)

I agree with the concept and vision of the Garden Town but there is a danger of speculative unplanned development applications being approved thereby negating the benefits of the plan and vision. (ID.322)

Concerns regarding the consultation

Almost one-fifth (19 per cent) of comments received to this chapter related to a perceived lack of engagement with or listening to the local community, with suggestions that previously discussed matters were not in the delivery plan or had been watered down, while others felt the complexity and length of the consultation document and annexes hindered full and considered participation.

This plan, I object to the overall document. The fundamental flaws are 1. The majority of houses already have planning permission, so they cannot positively contribute to a Garden Town and are likely to be just "bog standard". 2. SODC does not have the money secured to deliver the plan, especially not for the elements that would justify the name "Garden" Town. 3. Your approach to community engagement is atrocious. You are not engaging in proper dialogue and you are clearly not willing to let the community actually participate in decision making. 4. The document has not fully nor genuinely applied the TCPA Garden Town principles. The document is not consistent about principles neither within itself nor with the SODC Local Plan. Key aspects are missing altogether or are totally underrepresented, such as mental health & wellbeing, the obesity crisis and inactive lifestyles, air pollution, noise, organic food and sustainable agriculture, climate change, especially climate change adaptation. (ID.41)

Asking people to comment on a 446 page document and 576 pages of appendices is not effective consultation. As an example that even the writers seem to have struggled with putting together a coherent document this size, page 49 contains the words "Delete the remainder of the paragraph." The consultation period for a plan of this size is unreasonably short, and the actual practical outcomes of the plan have not been effectively communicated. (ID.215)

I object to the overview. The document lacks specifics (e.g. on funding), fails properly to apply Garden Town principles, and demonstrates a failure to engage with the community from the previous phases of consultation or in this stage. (It was also clearly rushed out, as shown by e.g. inadequate proof-reading (e.g. p 50, end of penultimate paragraph).) The document needs to be withdrawn with a view to restarting the consultation, this time with a willingness to listen to the community and genuinely have local people participate in decision-making. (ID.218)

It is good to see that a great amount of thought and work has gone in to how Didcot should be developed. However, there is a great deal of information within the 446 pages and appendices so it is difficult to be comprehensive in any comments... (ID.369)

Cost / How will it be paid for

The third most frequent theme related to how the proposals will be funded and how costs will be managed. Respondents therefore felt more detailed funding information was required.

Didcot will be ruined by this plan. Drawn up for the convenience of business and no thought for those who already live here. No forward planning on infrastructure to support it or how to pay for it. Madness. (ID.25)

SODC does not have the money secured to deliver the plan, especially not for the elements that would justify the name "Garden" Town. (ID.57)

I think this plan is really commendable and applaud the ambition. My main concern though is that sufficient funding is made available, over the long term, for the management and maintenance of the large new areas of green infrastructure. (ID.212)

I approve of the Masterplan and Didcot designated areas but think that the funding for some of the transport infrastructure is not certain at the moment and may become challenging. (ID.222)

Green belt / green space concerns

Another key theme, mentioned by 17 per cent of respondents, related to concerns over the proposed green buffers and the proposals to build on green belt land. Respondents suggested that brownfield sites and other options should be fully considered.

Designating 'green buffer zones' is utterly meaningless!! Either make them formal Green Belt (not that that makes much difference) and don't pretend they will not be swallowed up. Honesty please!! (ID.28)

The plan envisages building over a large piece of Green Belt land including an SSSI. I am not fundamentally opposed to such an action, but it should be an option of last resort after all other possibilities have been examined and excluded. Indeed

government policy appears to require this. As I understand it, the Housing White Paper requires that 'authorities should amend Green Belt boundaries only when they can demonstrate that they have examined fully all other reasonable options…'. 'Other reasonable options' include development of brownfield sites, efficient use of current underused sites, optimising densities and through exploring whether other authorities can help to meet housing need. This does not appear to have been done. I have not read every word of the plan but I have examined it in sufficient detail to convince myself that there is no evidence of any proper evaluation of alternatives. In those circumstances the proposal appears to contravene government policy and to run counter to common sense. (ID.69)

I agree with the development of Didcot town centre. However, since when has Culham been part of Didcot? Please explain! Culham's postal address is Abingdon. As for 'garden town' all I see is urban sprawl over pristine countryside and more importantly green belt land, which was specifically created to prevent such acts. Houses are starting to be built and planned without the required infrastructure in place which will lead to huge traffic congestion, increased pollution and pressure on already stretched services. This aligned with multiple quarry development is simply ruining 'England's green and pleasant land'. Surely there are better brownfield sites to be considered? (ID.221)

It appears to be very comprehensive on the extent of proposed Garden Town infrastructure but roads still seem inadequate! And existing green spaces must be retained! (ID.462)

Other facilities / considerations (e.g. health)

A number of respondents (17 per cent) commented on other facilities and services that they felt were missing or lacked sufficient detail that should be considered in the proposed delivery plan. These included health provision and services for younger people, for example.

I have noticed that you do not propose to provide any new health facilities. The current doctor provision is not going to cope with the proposed increase in population after building all these extra properties. The current roads are not sufficient to be able to cope with the additional traffic that will be generated. (ID.34)

There isn't much provision for young people (teenagers/school leavers) in Didcot. This plan was an excellent opportunity to put young people at the heart of the plans, yet there doesn't appear to be much, if any consideration for how the town can better support the future generations with more facilities (apart from the abstract concept that more job opportunities will be available and there may be a trickle-down effect). Young people are mentioned 15 times in the plan, of which, most is in reference to young professionals who may want to buy housing in the area. Moreover, "mental health" is only mentioned once, yet there is a significant need for more support within Didcot. Young people need more services immediately to help with mental health and allow

them to use their time productively. It's disappointing that there is no planned infrastructure/services for them, to support their growth as individuals which would in turn be of huge benefit to the town and the surrounding area. (ID.190)

On the current plans, there does not yet seem to be any health care provision for the North East Didcot development, the nearest shown being the Oak Tree Health Centre on the Ladygrove Estate. 3. Social Infrastructure mentions 'assessing needs for education, health, cultural and leisure facilities': does this mean that there will be a new health centre to avoid placing a great strain on the service provided by Oak Tree health Centre?? (ID.213)

A chapter on providing for public services and Public Buildings for additional Nurseries, Doctor Surgeries, Schools, Dentists Community Halls, Sports Facilities, etc. (ID.234)

Other comments

Below are a selection of comments relating to other themes, including road and transport network/infrastructure, the impact of the Didcot Garden Town footprint on surrounding villages, public transport, cycling and walking provision, Didcot Gateway South and train station and including younger people in the consultation.

Consequences for settlements more widely - impact of traffic congestion in Abingdon, Wallingford. (ID.275)

More attention needed to impact on surrounding villages. (ID.111)

Didcot will be the urban centre of surrounding villages which are set to become suburbs of Didcot. This is therefore not about a garden town at all - this is urbanisation of countryside, for the reasons of massive growth - 'close to the 20,000 new jobs that will be created in the Science Vale area' - how is this connected to 'garden town' status? This is not explained at all... Also it is stated that 'New roads and cycle paths are planned to improve access around the town and to the surrounding villages and science business parks' - but in the past 10 years there has been nothing but shrinkage in terms of infrastructure and public transport for this area - so what is the commitment of both OCC and SODC to these things? (ID.171)

I really like the overarching plan. The increased jobs and funding for the area and general improvements. I feel very strongly towards the position of the train station. Where it is currently is central and will be next to the new multi-story car park plans. If it is moved more eastwards it will take up the green space on the Ladygrove loop, which I know several young children enjoy kicking a football around and getting exercise. I for one also use the loops for running myself. I would prefer upgrades to the current station. (ID.63)

Young people should be mentioned more in the plan; I think they should be consulted to find out what they need in Didcot. (ID.450)

Support for the proposed delivery plan

While the above comments provide examples of respondents views to a range of themes, highlighting their concerns and alternative suggestions, 12 per cent of comments broadly supported the plan; half were businesses or community based groups.

Oxfordshire Cycling Network (OCN) brings together members from 29 cycling and supporting organisations in the county. OCN represents the 170,000 cyclists in the county and the 460,000 who would cycle if it were safe, convenient and pleasant. I, the Chair of the OCN, live in Steventon within the Area of Influence of Didcot, and I frequently cycle or drive to Didcot so benefit from local knowledge. OCN applauds this forward-looking vision for the town. We like the way that it integrates greener and cleaner infrastructure of many types to make the town operate more effectively and be a more attractive place to live. In particular we support the network of cycling and walking routes within Didcot and reaching out to important nearby locations for work, study, living and leisure. (ID.151)

I think that the garden town is a fantastic opportunity for Didcot to become a better place for everyone who lives and works there. (ID.176)

I think the overview is excellent and captures the important issues in the master plan for the Didcot Garden Town. (ID.185)

Looks very good - as long as you listen and more importantly ACT on consultation and feedback. (ID.272)

The 19th century branch line to Oxford changed Didcot from a village to an important regional hub. Didcot Railway Centre is ready to help make the vision happen by working with others in the town and local community, thus contributing to Didcot being a Fantastic Green Space. We support the Master Plan priorities and an upgraded or expanded railway station. We welcome your comment "The opportunity to enhance and expand the railway centre and bring its work to life in the station square area as this fits with our own vision of making Didcot a destination town for heritage as well as science. (ID.290)

OxLEP is supportive of the overall vision for the Garden Town and the opportunity it provides to: Diversify housing types and delivery methods, Accelerate the delivery of homes and the social and physical infrastructure required to support new residential development, Support economic growth generated by Harwell, Culham and Milton Park, Explore ways to capture value from new development, Establish strong local governance for the garden town. The content of the Delivery Plan aligns with the People, Place, Enterprise, Connectivity programmes of Oxfordshire's Strategic

Economic Plan. OxLEP is in agreement with the acknowledged need to consider how the Delivery Plan can influence planning decisions whilst a DPD is reviewed for examination and adoption. (ID.300)

The RSPB welcomes the Delivery Plan for Didcot Garden Town (DGT). There is much to support in the Delivery Plan, including the focus on high quality public spaces, green infrastructure, climate change mitigation and adaptation, and delivering a net gain in biodiversity through this development. The area proposed for development is generally of low value for biodiversity, with almost no existing statutory or non-statutory sites for nature within the DGT delivery area. Given reasonable ambition and commitment to delivery it will be entirely possible to secure a higher quality environment and net gain for nature through this development, which will also give the existing and new communities of Didcot a high quality of life and connections with nature. (ID.312)

CPRE welcomes the Didcot Garden Town initiative. We welcome the desire to create in Didcot a sustainable and vibrant town. We also welcome the thesis that the potential attraction of Didcot is its surrounding countryside and it is excellent to see the recognition of the importance of the rural landscape setting of Didcot. Indeed, we agree that Didcot needs 'a high quality and green environment that encourages healthy lifestyles' to encourage business' (page 90, section 4.1.8). We would, however, suggest that the importance of connection with the countryside is included in the Vision (pages 12 and 13). (ID.418)

VIEWS ON CHAPTER 2

As the garden town plan was developed the team sought input from as many people as possible. This chapter outlined the community engagement that had taken place prior to the final proposal.

This chapter contained: Listening to the Community (approach to community involvement, masterplan response to feedback, conclusions)

Respondents were asked whether they had any comments on this chapter and 105 people chose to respond. Comments fell into similar themes identified for chapter 1, with the addition of keeping existing facilities and car parking.

Comment theme	All comments
Concerns regarding the consultation	65
Other facilities / considerations (e.g. health)	15
Green belt / green space concerns	13
Object to proposals (e.g. Cow Lane)	11
Road and transport network/infrastructure	11
Support the vision	11
Including younger people in plans/ consultation	9
Public transport / cycling / walking	8
Didcot Garden Town footprint and impact on villages	7
Parking	7
Home building, population/job increases	6
Keep existing facilities and services	6
Against moving train station	2
Cost / How will it be paid for	1
Other comments	11

Consultation does not reflect previous input/ideas document too long

There is a much higher proportion (62 per cent) of comments relating to the extent to which local residents views from previous rounds of consultation have been considered and included in the proposed delivery plan. Other comments again include concerns that the complexity and length of the consultation document and annexes hindered full and considered participation and on the timing and duration of this round of engagement.

> *Hah. You haven't listened or consulted at all, except to the people who already agree with your 'vision'. We were certainly not consulted. You don't care or listen to the average person living in Didcot, just to your green PC focus groups. (ID.23)*

> *Your representatives assured us at previous meetings that there would be further meetings and presentations. Why are there none? (ID.45)*

Whilst I personally wasn't involved in any consultations, I know a number of people who were and they have been pretty stunned that not a single part of their input has been included in the very long document. Young people (teenagers), and those who represent them, seem to have been totally passed over. They are the people who will grow up in the garden town and be responsible for making it successful or not - making them disengaged in the process is disastrous ("I turned up to a meeting but nothing I said has been listened to, so I'm not going to bother again. There's no point.") LISTEN! ENGAGE THEM! They have some great ideas. (ID.106)

I object to the team's approach to consultation. In particular, I take objection to: - the unreasonably short consultation period: six weeks, in a period when many people are likely to be taking their summer holiday, is plainly unreasonably inadequate for a dense, poorly-written document with hundreds of pages, supplemented by appendices running to hundreds of pages more. (ID.218)

It is disappointing that the period of time to respond has been very tight and it has taken place during the lead up to and the start of school summer holidays . Issuing the proposal for consultation during the Summer Holiday period will no doubt have denied many residents the opportunity to give the consultation the due consideration that it requires as I have found. The size of the document has meant that appreciating it in detail has been challenging. I am concerned that the pressure engendered by the combined length, timing and nature of the documentation supplied is designed to obscure the proposals and therefore believe that the responses obtained cannot be taken as being a genuine response to a legal consultation. (ID.425)

Other facilities / considerations (e.g. health)

The next most frequent theme (14 per cent of comments) was on additional service and/or facilities that respondents felt should be considered or those that should be avoided.

The Churches within Didcot have a huge impact on the community life of Didcot with projects and services for the very young to the very old and they therefore are suitably placed to respond to some of these needs as well as have a voice for 1000's of people within Didcot. It therefore would be important to continue to involve the churches in the vision for Didcot Garden Town and how they can help support some of the needs and desire for community. One aspect could be to plan for a brand new Church (Taken over by an existing church in Didcot) to be in the town centre development of Orchard Centre Phase 3, combining a community focus right in the town centre, a worship place/space for those of all faiths and none and lastly almost a cathedral for the new identity of Didcot Garden Town. (ID.4)

It would be beneficial to many leisure and sporting groups if a 400m running track was constructed at the proposed world class leisure centre. The only track in south Oxfordshire and the vale is Tilsley Park in Abingdon which is well used by Abingdon

sports and leisure groups with no real space in the timetable for groups outside the area schedule weekly time slots. Another track would allow more people to access better facilities. (ID.115)

Didcot has many overweight and obese people and yet the plans include more fast food outlets. Why put so many food stores in one place rather than out where all the thousands of houses are being built? (ID.162)

The community have repeatedly asked that their quality of life should not be compromised this is evident in every category… Open spaces footpaths, woodland, wildlife cycle access to surrounding areas allotments and biodiversity a clean and healthy lifestyle. The community want Art Nature and Heritage. Their requirements are sound and deliverable. These qualities need to be considered at every level to fulfil the community's needs. The Community should be asked again about their requirements with regard to Public Facilities and Amenities as the increased population will put a strain on the present services. (ID.234)

Really encouraged to read so many positive comments, hopefully the community will have its voice heard. I believe NHS facility's should be included in the form of more doctors surgery's, a hospital to support the JR servicing the south of the county , with more facilities dedicated to supporting the elderly. (ID.285)

Green belt / green space concerns

The third most frequent (12 per cent of comments) theme relates to green space and the protection of green belt land.

This section and the pre-ceding maps make reference to protecting the green buffers around the town. There needs to be clear documentation in place to protect key areas from speculative housing development. This especially concerns areas to the south and east of the existing town. (ID.10)

Villages around Didcot are under threat. Appleford is being swamped by traffic and the encroachment of Didcot. Vale of White Horse DC and South Oxfordshire DC need to LISTEN to residents from the villages and provide a protective green space around these villages as per national policy. I note Appleford has a green space only to one side. Fine you want to develop, expand and promote Didcot BUT don't do this at the expense of the surrounding villages and please do leave some of the lovely countryside to the river untouched. Let's hope this is not yet another tick box exercise. (ID.11)

I hope that we're really going to be listened to and that this consultation isn't just because the decision has already been made and we're being steam-rolled. Please don't proceed with this plan. Didcot will be unrecognisable and we'll lose so much green space. We'd rather have the existing setup than all the new conveniences described, any day. (ID.214)

The importance of maintaining the green gap between Didcot and the surrounding villages cannot be stressed too highly. I note there are references in subsequent chapters, e.g. Ch.3 - the need to protect the rural character of the surrounding environment including the built environment of the individual villages. Ch. 8 reiterates the importance of formalising the green gap between villages and preserving and maintaining the distinctive character of each. (ID.318)

Other comments

Below are a selection of comments relating to other themes, including objections to specific proposals, road and transport network/infrastructure, public transport, cycling and walking provision, car parking and retaining existing facilities and services.

We appreciate the efforts to get input from the community. However, we are concerned on the specific topic of Cow Lane that inputs have not been reported correctly. Your appendices state "Cow lane also received conflicting suggestions for its future (leave as one-way = 2, make two-way = 9, widen and make two-way = 8, pedestrianise = 1)". We know that both OCN and HarBUG submitted responses saying that Cow Lane should be opened to two-way cycling and walking traffic. This concerns us for two reasons: Because 'pedestrianise' does not communicate the benefits of the conversion as part of a wider cycling and walking network, and because at least one point of view has not been counted, and there may be others. We support your plan to conduct feasibility studies before changes to Cow Lane, but these should be accompanied by communication of the benefits, as well as the impacts on motor vehicle users. (ID.151)

The community has repeatedly expressed reasoned objections to the proposals to close Cow Lane to cars and to relocate the Train Station. This section should state how many objections were raised, what these objections were, why they were raised and why they have been disregarded in the Delivery Plan. (ID.240)

As a resident of Sutton Courtenay, the largest village close to Didcot I am very concerned that the green gap between the two is retained and enhanced. With development on Milton Park and Didcot A, it is unclear how this can be achieved. It is vital that our village is clearly separated from Didcot and retains its village character. The plan refers to improved infrastructure but it is noted that none of these improvements will help the rat run through our village. In fact with the increase jobs this will get worse as the roads through our village are the quickest way to Abingdon. Similarly there is no improvement to the cycle path linking Abingdon with Didcot. This is already very busy and will become more so. This follows the B4016 and then south through the village along very busy roads. Furthermore the cycle path proposed to Culham will do nothing to aid our village. Instead the far smaller settlement of Long Whittenham will benefit. I would say that the masterplan completely ignores our fast growing village which will clearly suffer as a result. (ID.83)

Please, please, please make safe, off-road cycling routes to Milton Park and Harwell! (ID.29)

I was not listened to Roads and cycle routes improvements are restricted and do not benefit existing residents. Local bus connections were also mentioned and need to be improved for all not just Harwell Campus and GW Park. (ID.324)

Yes, well too many houses being built… not enough car parks… also too many cafes in Didcot. (What) we want is Sports World… we've not got one… we have too many restaurants. (ID.268)

I own a Crossfit box with my partner on Rich Sidings in Didcot. We have had this business for a number of years and have a huge customer base, as well as employing a lot of staff who have had to take professional qualifications to coach this sport. Crossfit is not the same as a normal gym, it is completely different and our customer base clearly shows the people in Didcot and visiting Didcot want this in their town. Please can you let me know what help will be given to make sure small businesses like ours are helped/protected or moved within Didcot Town? (ID.87)

Leisure facilities should be maintained unless they are to be improved. (ID.222)

VIEWS ON CHAPTER 3

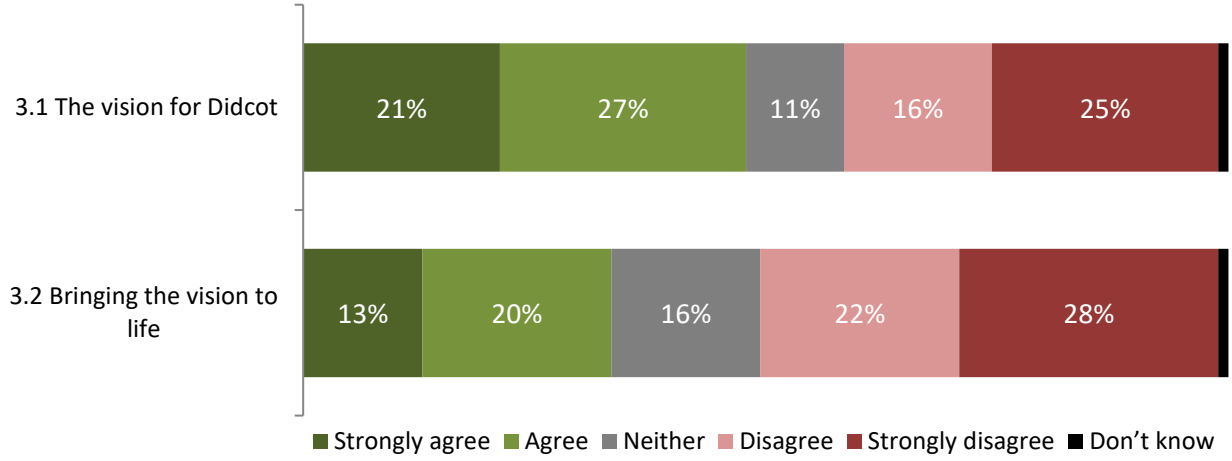
This chapter set out both the vision for the garden town plan and a range of principles that will guide the development for the next 20 years.

This chapter contained: 3.1 The vision for Didcot and 3.2 Bringing the vision to life.

As figure 1 below shows, just under one half (48 per cent) of respondents agree overall (either strongly agree or agree) with the Vision for Didcot, while one third (33 per cent) agree with the plans for bringing the vision to life.

However, 41 per cent disagree overall (either disagree or strongly disagree) with the Vision rising to 50 per cent that disagree with the plans for bringing it to life.

Figure 1: Levels of agreement with Chapter 3 (n=93 to 94)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 83 people chose to respond. Of these, 23 people were in agreement with the two sub-chapters, 36 disagreed and the remainder had mixed views or simply chose to comment on this chapter (i.e. did not answer the agree/disagree questions). The key themes are shown in the table below and again broadly follow those seen in chapters 1 and 2.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Plans over ambitious / not realistic/specific or contradictory	19	1	13	5
Support the proposals	18	13	1	4
Concerns regarding the consultation	14	0	13	1

Other facilities / considerations (e.g. health)	13	5	3	5
Home building, population/job increases	10	1	8	1
Green belt / green space concerns	10	1	5	4
Public transport / cycling / walking	10	7	0	3
Road and transport network	8	1	6	1
Include local community groups	5	1	2	2
Cost / How will it be paid for	6	0	5	1
Object to proposals	6	0	3	3
Keep existing facilities and services	3	0	1	2
Arts/culture/heritage ideas	4	2	2	0
Didcot Gateway and train station	2	0	2	0
Including younger people in plans/ consultation	3	0	0	3
Car parking	3	0	2	1
Other comments	14	4	3	7
Number commenting:	*83*	*23*	*36*	*24*

Plans are over ambitious / not realistic / not specific enough / contradictory

The most frequently made comments (23 per cent) related to the proposed delivery plan being unrealistic or overly ambitious, with limited specific detail on how proposals would be achieved.

> *Short sighted, does not address current problems and only seeks to provide extra facilities to support growth, without rectifying problems, in all likelihood making them worse. (ID.12)*
>
> *My impression is of a well delivered university project, which is not as grounded in reality as it will need to be if the project is to be a success. I do however wish it every success. (ID.198)*
>
> *The vision does not appear to be reflected in the detail. For example, 'local character' is a principle and yet the Prince of Wales is to be swamped with new buildings. You also talk of 'prioritising green spaces' and yet there are no new green spaces. ((ID.225)*
>
> *The vision for Didcot is an aspirational document aimed at persuading central government to give more funding. It is by definition therefore an incomprehensible report that is meaningless to the average resident. Bringing the vision to life lacks practicality and again is a high level over-view of what in reality might happen. Totally incomprehensible. (ID.456)*
>
> *Over ambitious. (ID.459)*

Support the proposals

The next most common theme was general support for the vision with 18 of the 83 comments (22 per cent) broadly supporting the proposals within chapter 3.

> *I think the vision sounds good and the model for the vision with the pillars is a good structure. The Connectivity Hub is a place that could be multi-use and provide an amazing space for people to be in however it depends on the stakeholder and who that actually is and what their priority actually is. I believe that the Church is well placed to be facilitators or to be involved the connectivity hub, maintaining the community focus allowing space for all to be welcomed and providing a commitment to the town beyond this generation and the next e.g. the worshipping community of All Saints have been in the town for over a 1000 years! (ID.4)*
>
> *The vision for Didcot looks great and I would encourage the development of the town to provide opportunities and services for local people. (ID.17)*
>
> *Yes, I think its brilliant all the things that are being planned and hope that it all happens. (ID.116)*
>
> *I really like the strong, bold themes. I am not sure if the Pillars are simply a literal way to present the ideas, or if these Pillars are going to be the UBS for Didcot - i.e. actual structures somewhere that represent us. I love the idea of the mass public art, and think that these would deliver the brand of Didcot far better than Pillars - we have the apple peel at the orchard centre, and this seems as if it could be used to generate a theme, blending in sculptures of molecules that also Swirl to combine the strong science centre that we already have? (ID. 139)*
>
> *I think that the three pillars on which this is based are an excellent concept. Combining the strength of the science base with culture/community and green space/recreation will create a town worth living in. (ID.185)*
>
> *The vision is good, needs political will to push it through. (ID.245)*
>
> *The proposals all look plausible on paper it remains to be seen as to what is eventually achieved? (ID.462)*

Concerns regarding the consultation

The third most frequently expressed theme again related to views that the consultation did not reflect comments and suggestions from previous rounds of engagement and that the process was too difficult to engage with.

> *I object to this vision, because neither the vision nor the principles were developed in genuine dialogue and engagement with the community. The vision is not fit for the 21st century. It will lead to an unsustainable situation in terms of traffic congestion, noise and pollution and quality of life. The vision is a lot of waffle and meaningless. (ID.57)*

This isn't a vision; it's just a branding exercise. You appear to be trying to manage expectations by saying "the New Urbanist reading of the Garden City Movement was as much an economic concept as an aesthetic and environmental one." This is a cop-out and not what people want. You also talk about the local community being "active at all stages of decision-making". This clearly is not the case here. I don't understand the bit about Didcot being cultural diverse. It's not exactly Cowley Road! 3.1.6 We don't want "pioneering architecture" and we do not want high-density building. (ID.61)

I object to this vision, because neither the vision nor the principles were developed in genuine dialogue and engagement with the community. (ID.227)

Consideration of other facilities

The fourth key theme related to the consideration of other facilities in the proposed delivery plan, including existing facilities and those that could be introduced.

What is going to happen to the athlete Centre in Didcot? This is not a leisure centre or gym. It is a crossfit facility. Will this be moved somewhere else in Didcot? There is a lot of people who go here and it is great for the community. (ID.15)

The vision again relies on ideals, some taken from areas in the country which have each had a very specific focus. The vision for Didcot seems again to ignore the younger people as being a key to success - they have to take ownership (to use awful modern jargon) of the vision. They need to care about the neighbourhood where they live and go to school. Clean up litter, not create litter, clear paths and streets outside their homes, start growing food, flowers, creating and looking after public spaces, not tolerating vandalism etc. Not waiting for 'them' to do the grotty work. Schools used to have manual subjects on the curriculum. These could set a kid up for life. Secondary modern and grammar schools used to have garden plots for pupils to grow things, used in Biology, maths, cookery, science, all aspects of curriculum. Garden city schools need to embrace a 'new' (but 'old') way of learning and all school governors need to be targeted by you to make sure that they understand their responsibility too to make the vision a success. (ID.72)

We feel strongly that the green buffer zone must be provided and safeguarded for future generations. Existing bridle paths and footpaths must be maintained. Local food growing must be encouraged with allotments provided and farmland preserved. Didcot must not be allowed to grow ad infinitum. There should be a plan as to where the expansion will end. (ID.147)

Though I agree with the sentiment I do believe that commissioned art works etc is a poor replacement for saving one of the cooling towers as a landmark art work linked to Didcot's past and heritage. Germany have done this why can't we and at least have some vision to keep at least one. (ID.256)

Other themes

Other comments included the themes of home building linked to population/job increases, concern for green belt and green space, public transport, cycling and walking provision, the road and transport network and the inclusion of local community groups and community support.

> *From what I've seen so far – it's… let's put thousands of houses over here and all the jobs over there then bitch and moan at the horrible motorists for clogging up the roads with their cars when house builders have been given free rein to build VAST housing abortions all over the county that have no 'organic economic development and jobs', forcing the over use of cars. (ID.92)*

> *One of the key things to make the good words a reality will be to ensure that the Town Centre is properly linked for pedestrians and cycles to the suburbs and beyond and that non car living is actively encouraged. As a cyclist myself I know that this will only be achieved this will only be achieved if cyclists feel safe which means proper cycle lanes being provided wherever possible. As much new housing as possible at high density perhaps 5/6 storey flats should be built in /adjoining the town centre. This to include affordable rent/ private rent/low cost for sale. The protection of the setting to Didcot including its ring of adjoining ancient villages is vital. Please do not allow further lateral spread of Didcot to ever distant suburbs where car dependency is inevitable. (ID.50)*

> *Only that from the outset, due regard must be taken to the future developments of transport, both public and private, in particular with the recent and accelerating trend for developing hybrid/all-electric vehicles and the increasing use of cycles. (ID.93)*

> *Didcot is thriving and it's important it is improved. However, traffic is a nightmare already and adding more houses, encouraging visitors and additional business needs to have easier access. There is currently only one route into Didcot via the a34. A town this size needs at least two to prevent all traffic being forced into the middle of town. Parking is also an issue in town. Ladygrove is already used as a "drop off" during school pickups and I'd hate for this to get worse. (ID.165)*

> *Involving volunteers is key to ensuring that people living, working or making visits in Didcot feel ownership of a shared vision for DGT. The plan should include greater provision for involving existing volunteering networks and a funded post to coordinate and engage with volunteers from across the town's social profiles. (ID.443)*

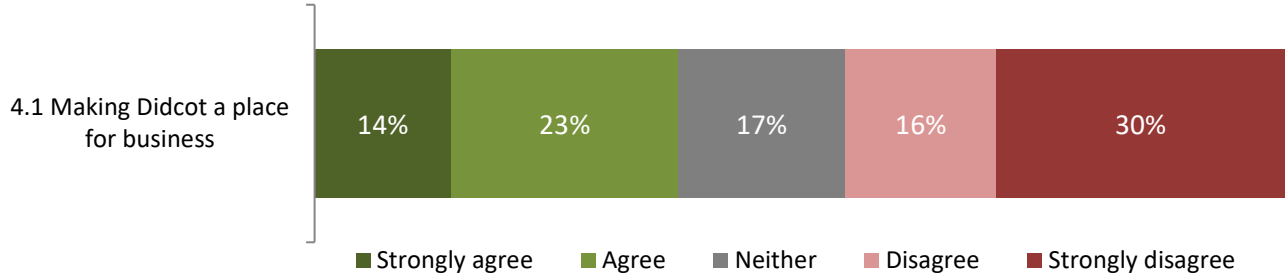
VIEWS ON CHAPTER 4

There are a wide range of successful businesses in Didcot, from local shops to international technology companies. This chapter detailed the proposals that will strengthen those already in the area and attract further investment.

This chapter contained: 4.1 Making Didcot a place for business

Overall, a greater proportion of respondents disagree (46 percent either disagree or strongly disagree) than agree (37 per cent) with making Didcot a place for businesses.

Figure 2: Levels of agreement with Chapter 4 (n=64)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 53 people chose to respond. Of these, 14 people were in agreement with the chapter, 27 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

The key themes relate to the impact on businesses and the ease of access to high quality jobs for local people, issues relating to traffic congestion and the road and transport network and the inclusion of public transport.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Business impact / High quality jobs / Local skills	25	4	14	7
Road and transport network	14	0	13	1
Public transport / cycling / walking	12	0	11	1
Plans over ambitious / not realistic/specific or contradictory	9	0	8	1
Support the proposals	8	6	0	2
Home building, population/job increases	6	1	4	1
Include local community groups	4	1	1	2

Parking	2	0	0	2
Green belt / green space concerns	2	0	2	0
Other	12	2	6	4
Number commenting:	*53*	*14*	*27*	*12*

Business impact / High quality jobs / Local skills

Of the 53 comments received, 25 (47 per cent) related to the impact on businesses, particularly SME's and independent retailers and/or the need for any job creation to be high quality and high skilled jobs for the local population of Didcot.

> *We would like to see a much greater emphasis on the place of social enterprise in the town and a much clearer idea of how the plan is going to deliver the skills needed for the employment opportunities created. (ID.132)*

> *Realistically, Didcot is a residential Town for people who work elsewhere. The document alarmingly seems to imply that skilled people live in Didcot and then look round for where to work - the reverse is true, skilled professionals move to where their work is and then look for somewhere suitable to live. The reason so many people commute out of Didcot (and no mention is made to London - why not? Didcot is an increasingly attractive place to live to commute to west London) is that they got a job at one of the many scientific / technological parks and then looked for housing. Encouraging retail businesses makes sense; I hope that any commercial business plans in central Didcot are carefully thought through - especially with the plans to cut travel through the centre. (ID.215)*

> *I think you should support local businesses and encourage independent shops and cafes. I think this requires some support from the council to help independent providers win franchises for the new shops/cafes and be able to compete with the chains. (ID.216)*

> *We welcome the statements about support for local independent retailers. Locally owned businesses are vital in a sustainable town centre to ensure that the profits from retail in the town remain in the local area. We would like to see more concrete statements of support for locally owned retailers in the text, and a larger commitment in the funding table. We recommend that concrete funding is allocated for the support of local retailers and not just to "test the recommendation of providing support". This should be achieved by working with the Didcot Chamber of Commerce. (ID.416)*

Five of the comments were broadly identical (template based and relate to ID's.41, 54, 57, 62, 227, and all residents of Didcot) and object to the plans based on job creation attracting people from outside the area.

I object to this chapter, because the strategy is not coherent. Didcot has high levels of employment. We all know that people do not live where they work and when you create new jobs people come from elsewhere. Creating more jobs will just lead to more traffic. Building more businesses will be good for South Oxfordshire's GDP, but not as much for the people of Didcot. The emphasis is on the wrong kind of jobs. Current poor examples include extension of Orchard Centre: low paid jobs and lots of traffic attracted from outside Didcot. Most proposed new businesses (fig 4.3) are close to A34 and/or too far away from the station to attract people commuting to work by train and too far away for people from Didcot to cycle to work. What we need is high-skilled jobs close to the station and/or a very substantial improvement to public transport network (light trains/ trams/ bus lanes – much higher frequency & lower fare prices). (ID's.41, 54, 57, 62, 227)

Road and transport network/infrastructure

Just over one-quarter of comments (14) relate to concerns over congestion and the need for improved or additional road and transport capacity. As noted in the section above, five of the comments were identical (template driven) and suggest increases in traffic related to more jobs. Below are other comments:

Didcot doesn't have the transport system or infrastructure. This is needed BEFORE you start up with your 'visions'. It won't be. (ID.23)

So much potential. Roads need to be adjusted an improved. Having long delays and tail backs in and out of town will put people from neighbouring areas. (ID.165)

In order to encourage business growth in Didcot the problem of the A34 needs to be addressed. There is no point in having new businesses if they can't get to the area due to traffic! We have already lost major logistic companies due to this problem. Also there is one road linking Didcot to the A34! Why should businesses come to Didcot compared with other towns? (ID.444)

Will bring lots of cars to a town that is already swamped. (ID.459)

Public transport / cycling / walking

Just over one-fifth of comments (12) relate to improvements needed to public transport, the practicalities of cycling to work, the promotion of walking and cycling for health and wellbeing. Again, as in the two previous sections, five of the comments were identical and have not been repeated here. Below are other comments:

Most proposed new businesses (fig 4.3) are close to A34 and/or too far away from the station to attract people commuting to work by train and too far away for people from Didcot to cycle to work… A lot of people will move to Didcot thinking they can commute

the 'easy' 45 mins to London - little realising that no extra trains will be laid on and the reality is not so nearly as 'easy' as they thought. (ID.60)

It would have been useful to include a commitment to active travel in this section. Research has shown that people who cycle or walk to work take fewer sick days, and that cycle paths result in increased turnover for retail premises. https://www.citylab.com/solutions/2015/03/the-complete-business-case-for-converting-street-parking-into-bike-lanes/387595/ (ID.158)

I object to this chapter. Didcot has high levels of employment already and although increasing business is a good thing it will not solve outstanding issues. People will always travel to work; the more houses there are the more cars will take to the road causing even more congestion in, around and out of Didcot. SODC is naïve to think that the implementation of cycle routes will counteract this, it will not as people will have other factors to consider such as distance, weather. Substantial improvements to public transport networks would be needed including higher frequency and lower fares. (ID.314)

Plans over ambitious / not realistic/specific or contradictory

The next most commonly mentioned theme (17 per cent of comments) was that the delivery plan was felt to be over ambitious or unrealistic, with a lack of specific details in some areas or contradictory information in others. Most of those commenting have used a template style response which has previously been noted. Other comments included:

The Delivery Plan lacks a transport assessment of the implications of 20,000 new jobs and a workforce of 30-50,000 employees. It is not included as an Appendix. Given the reported need for £9 billion of infrastructure, there is a lack of justification for new infrastructure to meet business needs to accommodate the proposed growth. (ID.182)

The plan details are confusing to say the least. We know there are already approved plans for housing, so what are the plans we are supposed to be consulting on? (ID.200)

The forward looking proposals (beyond Orchard Phase 2, which is actually being built at present) are very weak. I would have expected there to be some deep, well thought out and tangible proposals to rejuvenate the Broadway retail offering, which at present is dominated by charity shops. The minor changes proposed (street furniture and landscaping) are shallow and largely irrelevant. The removal of on-street parking that is proposed would be inconvenient for shoppers and further degrade use of the shops, perhaps hastening the demise of the better quality retail offerings. The reason why the one-sided street is "unique" is that it doesn't work very well, so making it double-sided would be of most benefit but is not even discussed. I thorough re-write is suggested. (ID.240)

Other themes

Other key comments included general support for the proposals, home building and population/job increases.

> *We support the recommendations, notably the introduction of a Town Centre Manager role and support for SMEs. (ID.290)*
>
> *The more jobs the better obviously but as well as science/technology jobs, commercial space in the town centre- bars, restaurants, a theatre, a bowling alley, a nightclub is needed too. (ID.1)*
>
> *I like that that strategy points out that jobs need to be for all skill sets and that jobs need to be accessible by all through all means of transport (including walking) and that the jobs/businesses need to complement each other rather than being random. (ID.163)*
>
> *A greater diversity of jobs in the town will make Didcot more sustainable - people will have to travel less for their jobs. (ID.176)*
>
> *Access is key here and the plans reflect that. I suppose housing is also key and making Didcot a place to live is demonstrated here. (ID.256)*

VIEWS ON CHAPTER 5

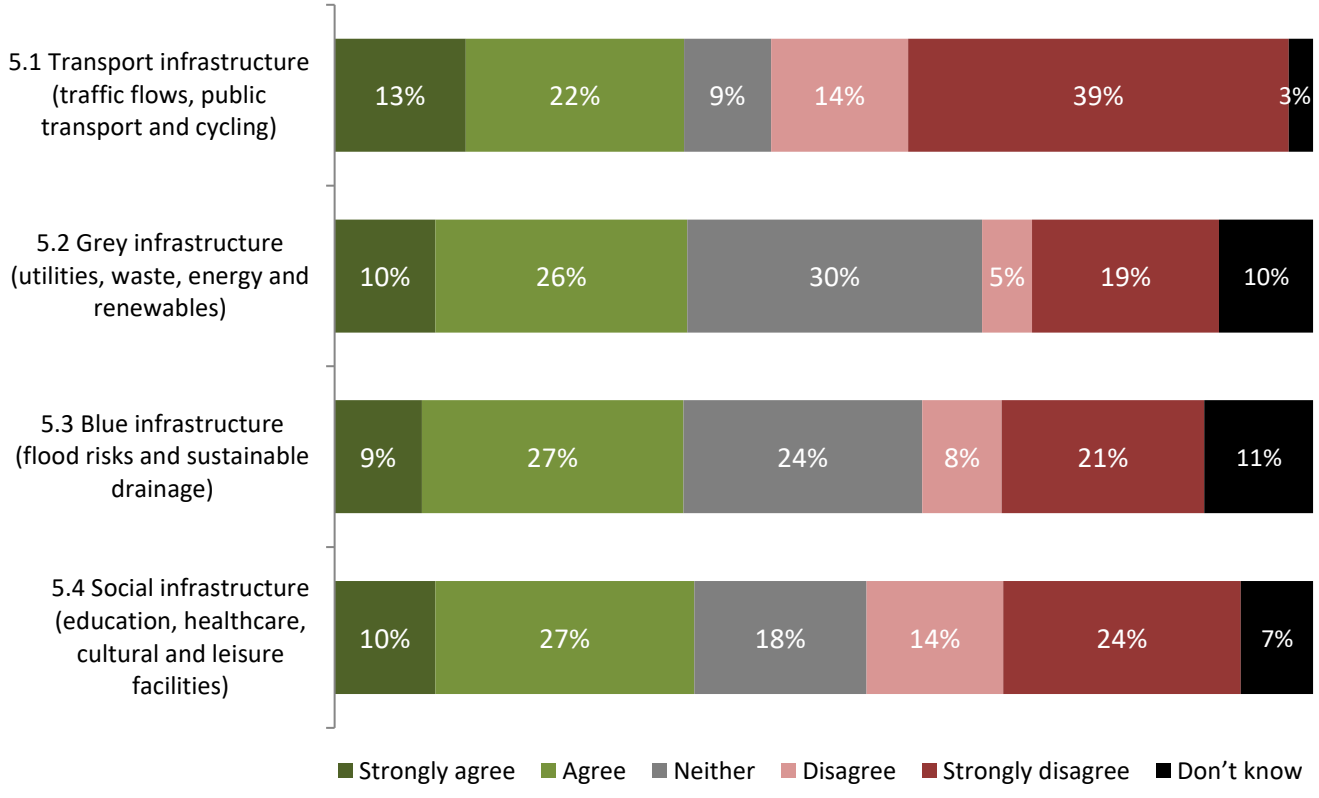
Traditional infrastructure, roads and sewers, and social infrastructure, schools and community halls are needed to ensure that a town works well for its residents. This chapter considered where infrastructure can be improved by recommending projects to meet future demand.

This chapter contained: 5.1 Transport infrastructure (traffic flows, public transport and cycling), 5.2 Grey infrastructure (utilities, waste, energy and renewables), 5.3 Blue infrastructure (flood risks and sustainable drainage), 5.4 Social infrastructure (education, healthcare, cultural and leisure facilities).

A greater proportion of respondents disagree or strongly disagree (53 per cent) with the plan for the transport infrastructure than those that overall agree (35 per cent). More closely matched is the proportion that overall disagree (38 per cent) compared to overall agree (37 per cent) with the plan for social infrastructure.

Of the two remaining sub-chapters on grey infrastructure and blue infrastructure, both have proportionally more respondents that agree overall (36 per cent) compared to those that overall disagree (24 per cent and 29 per cent, respectively).

Figure 3: Levels of agreement with Chapter 5 (n=135 to 157)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 174 people chose to respond. Of these, 37 people were in agreement with the sub-chapters, 57 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

The key themes related to the road and transport network, public transport (including cycling and walking provision), concerns over flooding, concerns that this chapter of the plan is unrealistic, general objections to the proposals, views on green space and green belt land and the potential impact on surrounding villages.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Road and transport network	79	14	29	36
Cow Bridge Lane closure to motor vehicles	*26*	*6*	*10*	*10*
Public transport / cycling / walking	65	21	21	23
Concern over flood risk	29	3	16	10
Unrealistic plan / proposal	27	4	12	11
Generally against proposal	26	0	21	5
Green belt / green space concerns	22	3	11	8
Didcot Garden Town footprint and impact on villages	17	4	2	11
Against pods /autonomous vehicles in pedestrian areas	9	0	8	1
Energy efficiency and environmentally friendly policies	8	2	2	4
Parking needs to improve	8	2	2	4
Other	12	3	2	7
Number commenting:	*174*	*37*	*57*	*80*

Road and transport network/infrastructure

Of the 174 responses, 79 (45 per cent) related to road and transport infrastructure, with suggestions that infrastructure needed to be in place prior to any additional home building/increases in population. Of these comments, 26 respondents specifically objected to the proposed closure of the railway bridge underpass to motor vehicles on Cow Lane. This included 6 respondents that broadly agreed with the sub-chapters and 2 that had mixed views. However, others welcome the proposal, such as ID.78 below.

> *Infrastructure work necessary (and) MUST be undertaken before other works. (ID.20)*

> *Having Cow Lane Bridge closed to motor vehicles will make many Ladygrove residents feel shut off from the main part of Didcot. After reading about the alternative new road I do not believe the closure to motor traffic is in the interests of many residents who live near to the tunnel. The alternative trip required by car is unacceptable and I see no*

reason why cyclists and pedestrians cannot use the Cow Lane tunnel and the current underpass. Could they also use the Basil Hill Road proposed too? The proposed closure of the bridge is unacceptable requiring a long round trip for a simple journey as the crow flies. It will handicap those least able to walk or cycle and will make Didcot grind to a halt especially in inclement weather. (ID.26)

The Council are unable to maintain the current infrastructure so any proposed plans are unlikely to be realised. The roads around Didcot are poorly maintained with large pot holes and patch after patch; heavy lorries cannot easily manoeuvre around the small roundabouts on the Ladygrove perimeter road and the main exit from Didcot to the A34 is a continuous bottleneck during morning and evening rush hour. (ID.44)

Closing Cow Lane bridge to vehicles is something I strongly object to. This will effectively cut off Ladygrove residents from Didcot. Also making the alternative routes of Marsh Bridge, Jubilee Way roundabout and the perimeter road increasingly busy. Peak times are already excessively busy, how does this make any sense whatsoever? (ID.55)

I strongly welcome the pedestrianisation of Cow Lane. This is extremely unpleasant for pedestrians at the moment. This should be done as soon as possible. In the longer term, a two-way vehicle tunnel could be added alongside. There is currently room for this, and the land should be safeguarded. (ID.78)

It is vital that routes that link the outlying villages to the railway station do not become part of a constant bottleneck with insufficient parking space at the end of it. Despite the new Milton Park roundabout design (which cause 1½ year's chaos and seems to have had precious little effect) the approach to Didcot involves long delays even outside the normal peak commuting times. Hours are wasted every day sitting in cars in queues. If you live in rural areas, cycling is not necessarily an option. (ID.94)

More needs to be done to improve the access from the A34 Milton Park junction to Didcot itself. The road is too narrow for the kind of expansion that is planned. (ID.243)

Too often, with planned expansion, the infrastructure is neglected. It is important to get the infrastructure in place early enough. (ID.329)

Public transport / cycling / walking

The second most frequent theme for this chapter was public transport, cycling and walking provision; 65 (37 per cent) of comments related to this theme. Some respondents suggested alternative routes to allow greater access via bicycle.

Science Bridge great idea; I hope it gets funding and is actually built. Desperate need to take through-traffic out of centre. Great ideas to link town with Harwell/Milton Park (rename this as being in Didcot not Abingdon as it is in Didcot)/Culham especially for

cycles. This should be a priority. Like the idea for autonomous public transport links too but appears to take out the Sustrans route on the old railway line to Newbury… If you are serious about increasing cycling then you must invest a lot on cycle lanes not just within the town but on the radial routes in too. Country lanes are frankly terrifying for cyclists (like me). (ID.50)

Whilst the promised provision of extra cycling infrastructure is encouraging, no mention is made anywhere of increased resources given to maintenance of the network. Much of the cycle infrastructure currently in the town, described in section 5.1.6 as "good", is desperately in need of maintenance. For example, Cycle Route 5 from the tunnel under the A4130 up to the B4016 is completely overgrown, the road surface is extremely bumpy to the point that it's broken my rear wheel, and even without the overgrown vegetation the path isn't actually wide enough for two cyclists to pass one another. (ID.82)

Our focus is on the Transport aspects and cycling in particular. We strongly support the intent to move Didcot away from dependence on motor vehicles, and to reduce the way that the railways and roads divide the town. We support cycling, walking and public transport as alternatives. We believe this shift to be an essential part of the vision for Didcot. We support all 11 of the proposed improvements to the cycling network in section 5.1.6. (ID.151)

There is so little on energy efficient new transport - this looks such an unimaginative, polluting plan. Where are the trams? All over the world these are proving to be the best form of urban and commuting transport. A line to Didcot, Abingdon, Chalgrove and the JR would be perfect. No new train lines proposed? Why not? We all know that this is the most efficient and green form of commuting transport. (ID.171)

Concern over flood risk

The third most frequently mentioned theme (29 comments) relates to concerns around flooding.

I am concerned about flood risk in the area. I note that Hakka's Brook is identified as one of the three key drainage systems for Didcot and yet no investment is planned to improve how it drains. Although most of the development proposed is away from the South of the town that relies on Hakka's Brook, there are a whole string of speculative developments on the table at the moment and if any of these are approved then an upgrade to Hakka's Brook will be needed (in the same way that you propose upgrading Moor Ditch). (ID.9)

A lot if the Didcot Garden City is being built on land which, as someone who has either lived just outside or still uses dentist, butcher, hairdresser, machinery firms over the past 35 years, has frequently flooded and been deemed unsuitable for development in the past. Memories of the past problems seem to be quite short. (ID.72)

The plan continues the pattern of building on flood prone areas. (ID.225)

A considerable amount of the proposed development is to be on land currently designated as Flood Plain, and I have no confidence that the measures to manage the reduction in flood plan will have the effect of reducing flooding risk, in an area immediately adjacent to the River Thames and already prone to flooding. When combined with the proposals for the Oxford Flood Alleviation Scheme there will be a considerable amount of extra water which will be displaced, and which will increase the risk of flooding along the Thames and, in particular, the parish of Culham and the neighbouring parishes of Appleford, Clifton Hampden and Long Wittenham. (ID.424)

Other themes

Other key themes not already covered under previous chapters included comments regarding pods /autonomous vehicles in pedestrian areas, suggested improvements to energy efficiency and environmentally friendly policies and parking.

Cars in a pod are still not a shareable space with children and people walking. A pod is still a vehicle and it still does not need to be on the same space as pedestrians. The energy plans are not in the least going to solve the problems that a more connected world brings because the energy needs will go up as will the supportive infrastructure needs to make that happen. (ID.53)

Not convinced about "shared spaces" – very unpopular and unsafe around Oxford station. Parking: there is no information about parking for residents. This needs to be addressed urgently. (ID61)

I haven't seen anything in relation to tackling the resultant air pollution all this development and infrastructure will create. The government's own evidence show that charging for urban driving is the quickest way to meet legally binding pollution thresholds.(ID.143)

Whilst in the planning stages I believe Didcot planners now have the unique opportunity of incorporating the governments new laws regarding the ban the sale of petrol and diesel cars from 2040. My 3 suggestions are as follows; 1) Start planning for 'electric supply stations' for the new generation of cars for stations to be built throughout Didcot and including the proposed employment and enterprise zones. 2) Proposal for a maximum speed limit of 20 mph in the Didcot area. This will have a double effect; firstly by reducing accidents and excessive speeding / driving and secondly making the experience if driving around Didcot a more pleasant and relaxed experience. Many London boroughs have adopted the 20mph speed limit and it works. I have worked in London and lived in Didcot for over 25 years. 3) Being a 'Garden Town' there should be more encouragement for alternative self-transport such as 'cycling' with road signs to the effect of 'cycling friendly roads' for the main roads of Didcot. This will encourage more cycling (for enjoyment and exercise) and encourage families to take up cycling.

Whilst I know that some of the above suggestions may seem a bit far advanced time moves at a quick pace and I believe the planners have the idea chance to make Didcot Garden Town an even greater place to live and the be the innovative leader for the future. (ID.398)

Didcot currently has problems with its existing infrastructure, transport and educational provisions. Increasing business and houses are not always the answer; look to what is already there first, lots of empty buildings due to closure of children's centres. The provision for car parking is not keeping up with the increase of cars. (ID.204)

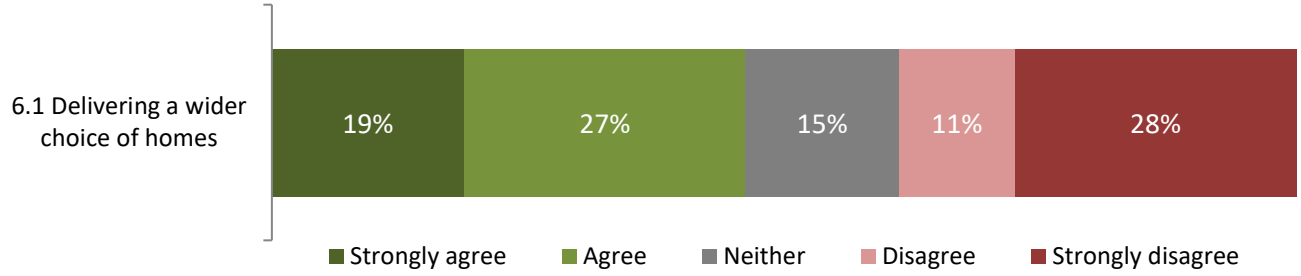
VIEWS ON CHAPTER 6

Housing is an important issue for new and existing residents of the town and this chapter looked at ways to provide a better range of homes to rent and buy.

This chapter contained: 6.1 Delivering a wider choice of homes

A greater proportion of respondents agree overall (46 per cent) with the plans for delivering a wider choice of homes, than overall disagree (39 per cent).

Figure 4: Levels of agreement with Chapter 6 (n=80)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 67 people chose to respond. Of these, 21 people were in agreement with the chapter, 26 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

The top three themes related to views on the type and mix of housing that should be considered, objections to the quantity of homes being proposed and the need for affordable housing.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Mix of housing	20	8	6	6
Too much housing proposed	17	0	13	4
Affordable housing needed	13	7	2	4
Lack of transparency	9	0	9	0
Green belt /green space concerns	7	1	4	2
Including Culham in plans	6	6	0	0
Developers will do what they want anyway	4	0	2	2
Need more parking	4	2	2	0

New housing caused increased traffic	2	0	2	0
Other	8	2	1	5
Number commenting:	*67*	*21*	*26*	*20*

Mix of housing

The most frequently mentioned theme was the mix of housing that should be considered. Respondents suggested a wide range of different types of homes should be provided in the delivery plan, including the provision of smaller (1 and 2 bedroom) properties as well as flats and larger homes.

> *Didcot without doubt needs more up to 5/6 storey flats particularly in /close to the town centre offering more opportunities for affordable/PRS/low cost for sale in sustainable locations limiting the continual outward spread of car dependant suburbs. It does not need huge numbers of identical suburban estate housing offering in the main 3/4 bed houses spreading further away from the town centre/station. It also needs top end housing e.g. 4-6 bed detached housing to accommodate top end workers/business owners who are forced to locate in the surrounding villages for lack of anything suitable in Didcot itself hence adding to car journeys. If Didcot is to become an aspirational destination it needs top housing too. (ID.50)*
>
> *So far, all we have seen in Didcot is a lot of very high density, identi-kit housing estates, fast built by the large builders. Nothing individual. The density of them is staggering and it's uncomfortable to drive through, let alone live in some locations. While some parts of the plan go some way to helping this, it again feels too little too late. 10's of thousands of houses have already either been built or already have full permission to build. The plan should have been tougher on how, where and what is being built. (ID.180)*
>
> *Consider small one bedroom flats above suitable industrial developments. I.e. such as the science park or Milton park. These could be really inexpensive. (ID.295)*
>
> *I agree that more forms of housing are needed, particularly for the elderly, young couples & single people. However most builders in this area go for larger 3 or 4 bedroomed houses which do not serve the needs of all. (ID.444)*
>
> *With an estimated 16,000 + new homes one hopes a wider choice of homes would be available. (ID.462)*

Too much housing proposed

The second most common theme related to the quantity of homes being proposed. As seen in comments to previous chapters, a number of responses followed a similar format indicating a template was used by multiple respondents, as shown in the first comment below.

I object to this chapter and the infrastructure proposals. There is no statement why this level of growth is needed. No justification is given. The level of housing proposed for Didcot alone is greater than that previously considered necessary for the whole of South Oxfordshire. SODC has been secretive about what deal exactly was done with central government. Has it received or been promised any funding in return for the Garden Town status and the increased housing delivery? (ID's.41, 54, 57, 62, 227)

There is little detail on the types of homes that will be available. I encourage the building of flats or apartments (maximum of 4 stories high) to allow more homes to be built. Not everyone wants a private garden. (ID.71)

*I object to these proposals. I don't understand how you've reached the number of houses you think are needed in Didcot. Extrapolating from the figures given at the start of the chapter, the 15,000 new homes in Didcot appear to be an attempt to account for all the new homes needed over the next 20 years *in South Oxfordshire*. Why are they all being built in Didcot, not spread out over South Oxfordshire? I have significant concerns about whether social and transport infrastructure proposals are robust enough to cope with this huge increase in residential housing in a single town. SODC must make improvements here a priority when securing funding. (ID.218)*

The density of housing in existing garden towns is low, with wide streets, many open spaces and lots of public parks. This does not seem to be what is proposed for Didcot. It should be. A lower density of housing would help overcome the biggest problem for the town i.e. extremely fast and excessive growth. This will create enormous problems for services of all types, including social, health and educational problems. It will decrease the cohesion of Didcot as a community and increase risk in several spheres. The Plan should deliver Didcot Garden Town at a much slower rate. It should recognise that there is a future for Didcot in the remainder of the Century and beyond, well after the termination of the current plan. The houses to be built should be constructed by SODC employing direct labour and not by Wimpey or similar companies. This will ensure that they reach BREAM standards and include a good proportion of affordable dwellings, rented and for sale at prices not inflated by the greed of developers. Is there provision for self-build in the plan? (ID.423)

Affordable housing needed

The third most frequently identified theme relates to the provision of, or concerns about, affordable housing, with 12 of the 67 respondents identifying this theme.

The use of the term 'affordable housing' is dishonest and used by developers to justify milking the plan for their own ends. Truly affordable housing needs to be 50% of current market rate. More council housing required to avoid developer/landlord exploitation. (ID.28)

We MUST re-orientate attitudes towards house ownership, which should be an aspiration, NOT what remains an (increasingly unrealistic and unattainable) expectation, particularly with the younger generation. To this end greater emphasis should be placed on providing rented accommodating, which (1) provides security of tenure (also with statutory safeguards for landlord) , (2) a good quality of accommodation, (3) an affordable market rent, allowing tenants to save towards an own home. Build to rent (both private and institutions) and authorities (Council housing) should be (fiscally) encouraged. This is the best way of achieving reasonable, competitive rental market. I realise that this is more of a central government issue, but all the more reason for arguing the case and developing that market. (ID.234)

We also support 'Promoting higher densities at appropriate sites in the centre of town and close to transport links and smart, eco-friendly homes' (page 39). However this needs to be a wider policy, not just at transport nodes, but maximising density throughout the development. Higher densities mean better use of the increasingly scarce resource of land, as well as more integrated communities, walking instead of driving to shops and work, as well as visiting neighbours. They also enable the lower cost two-bedroom housing that is needed for local people. (ID.418)

Concerns over a perceived lack of transparency

A lack of transparency on why the level of growth and number of homes was needed was expressed by 9 of the 67 respondents (13 percent) that commented on this chapter. Again, 5 of these comments relate to a template style response from Didcot residents, as seen earlier in this comment section. Other comments included:

Why are more houses needed? What is the justification for building on every blade of grass in the area? What exactly is the Garden Town deal with central government to get funding – build more houses if you want the cash? What is meant by high density housing? Houses with no garden to speak of? High rise flats? See the hideous Accordia, Great Kneighton and Trumpton Meadows developments in Cambridge as examples' of how NOT to do housing - Accordia has flat roofed houses, with tiny 'courtyard garden' (a few paving slabs) and a Juliet balcony, retailing at £1m. Will we get housing of poor quality, as has happened in the social housing and affordable housing sections of Accordia? (ID.175)

I object to the proposals. My main reasons are: 1) There is no evidence and justification of why the huge provision of new housing is necessary in Didcot. There is little detail about the source and level of funding required to provide supporting infrastructure for the housing and residents. 2) High density development based on residential units will be detrimental to the town centre. There is a distinct lack of leisure facilities at present especially for families. Greater provision of leisure facilities such as a bowling alley, skating rink, laser game range or similar is needed. Concerns have been expressed about town centre residential units becoming expensive flats for commuters to London

with a lack of affordable property. There is a strong possibility of town centre flats being bought mainly by buy to let landlords resulting in a transient commuting population occupying the flats mostly for sleeping accommodation. This would not regenerate the town centre and bring little extra trade to local retail units. Nothing could be found in the strategy to address the above issues. (id.306)

Including Culham in plans

Six respondents (that agreed with the sub-chapters of chapter 6) felt that it was a good idea to include Culham within the delivery plan. This included 4 residents of Didcot, 1 resident and 1 business from Culham. It should be noted that similarities in the responses also suggest that a broad template has been used by some of the residents.

I very much support the inclusion of Culham and other neighbouring areas in the Garden Town Area and Area of Influence. Culham is very well placed to meet some of the additional housing need in our area. It already has good infrastructure including a direct rail link to central Didcot and good rail links to other major local business centres such as Oxford, Reading and Swindon. Culham Science Centre is already a major employer and are planning for strong employment growth. Housing development here at Culham would accommodate many of the new employees and being so close to employment, journey times for employees would be minimal and environmental impact very low. Culham also has excellent cycle routes and from a sustainability point of view it is a perfect location for new housing. Transport links will be further improved by the new Thames Crossing and provide easy access to Didcot and Milton Park, the 2 other major centres of employment and growth in our area. (ID.74)

I strongly support the inclusion of neighbouring parishes within the Garden Town Area and Area of Influence. In particular Culham is well placed to meet the additional demand for housing in our area. Culham is already well connected to local and national transport infrastructure including a direct rail service providing excellent access to Didcot and to other major business centres including Oxford, Reading, Didcot, Swindon and Birmingham. Culham is also home to one of the region's largest employers who are forecasting significant growth. Coupled with this commercial development, residential development here would accommodate many of the new employees and being so close to such a major centre of employment journey times and consequently environmental impact would be minimal. Culham also benefits from excellent cycle routes and for these reasons it is an ideal location for new housing as the environmental and sustainability impact would be minimal compared to other locations. The proposed Thames Crossing would further improve transport links providing relief for congestion that occurs at the current bridges and provide easy access to Didcot and Milton Park, which are two other major centres of employment in the area and both of which are forecast to benefit from strong growth. (ID.79)

The inclusion of neighbouring areas within the Garden Town Area and Area of Influence and in particular Culham is very welcome. The Culham Science Centre is a major employer and will benefit from significant growth in the coming years including the creation of many new jobs. Culham is already boasts excellent infrastructure including direct rail links to the centre of Didcot and to other major economic centres locally at Oxford, Reading and Swindon and nationally in London and Birmingham. The proposal for a new Thames Crossing would further improve infrastructure, providing easy access to Didcot and Milton Park and would additionally provide relief for traffic congestion that occurs at the current bridges. To accommodate the economic growth, it is vital that new homes are built in Culham as being so close to such a major centre of employment journey times and the impact on our environment would be much lower than residential development at sites further away and without the excellent rail and cycle infrastructure that Culham enjoys. (ID.80)

Great to see areas bordering Didcot have been included and that much new homes are planned for these areas - especially Culham. Culham has great transport links and with the expansion plans for Culham Science Centre the Culham area will really need these new homes here. The proposed new bridge/Thames Crossing would alleviate the traffic issues. (ID.188)

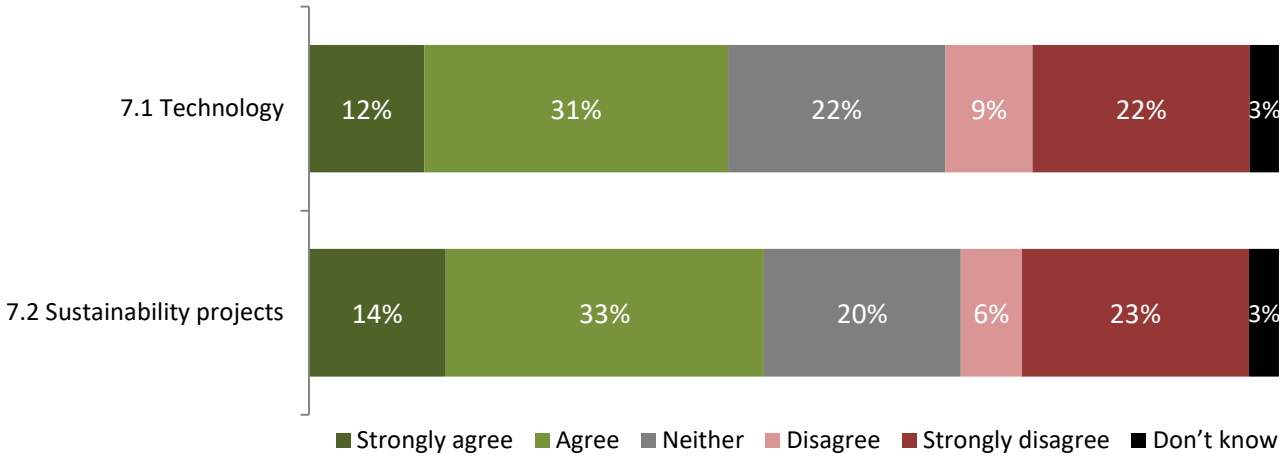
VIEWS ON CHAPTER 7

Technology is recognised as an important part of making Didcot a better and more sustainable place to live and this chapter set out plans for those taken place and those proposed.

This chapter contained: 7.1 Technology and 7.2 Sustainability projects.

A greater proportion of respondents agree overall with the plans for technology (43 per cent) and sustainability projects (47 per cent), than overall disagree (31 per cent and 30 per cent, respectively).

Figure 5: Levels of agreement with Chapter 7 (n=64 to 67)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 47 people chose to respond. Of these, 10 people were in agreement with the two sub-chapters, 24 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

Most did not feel the proposals were likely to come to fruition.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Proposals not realistic / won't happen in practice	21	3	17	1
Great if it happens / good proposals	9	3	2	4
Alternative options	8	2	2	4
Technology becomes outdated/don't waste money on new technologies	7	3	3	1
Encourage eco-measures, e.g. solar panels/water recovery	4	2	0	2

Other	8	1	4	3
Number commenting:	*47*	*10*	*24*	*13*

Proposals not realistic / won't happen in practice

Of the 21 people who fell within the theme of the proposals not being realistic, 5 Didcot residents (as seen in previous Chapters) used a template response and objected to the proposals on the grounds that their original views in earlier consultations had not been taken into account.

> *I object to the proposals in this chapter. There are actually no statements, if, how, when and to which degree these will be applied in Didcot Garden Town. A lot of waffle! This was the complaint that we made at the original consultation again we are not being listened to. (ID's.41, 54, 57, 62, 227)*

Others raised concerns about the feasibility of the proposed delivery plan and/or sought further clarification of what is being considered.

> *I have a feeling we will not notice much, if any, of this happening. It will either not happen, be too small scale, of negligible benefit or taken up by the whole country and so not specifically beneficial to Didcot. The plan just seems to be a collection of innovative projects from across the country and the implication that we might try them at Didcot. Again this is not really a plan with firm commitments, just a collection of ideas from other places. (ID.60)*

> *Kindly produce a set of proposals which are actually specific about what you realistically plan, and have the funding, to implement in Didcot. (ID.218)*

> *The sustainability projects may cost too much for very little benefit whilst compromising on design. Oxford Smart City, I do not find Oxford very welcoming for visitors especially if you have to visit by car so do not think this is a good advert. (ID.256)*

> *Smart Community Chapter 7 deals with A Connected Smart Community but there is little given by what is meant by the term other than a short list of examples on page 193. The rest is largely generalisation about the benefits of technology. Some further thoughts on what is sought would help. (ID.369)*

Support for the proposals and alternative suggestions

Others were more positive with 9 comments generally in support of all or some of the proposals and 8 respondents suggesting other alternatives.

> *It would be great to see these projects become reality in Didcot and really put the town on the map. (ID.176)*

> *Smart cards are actually a good idea. If you can make the ticketing work directly from tap to pay debit cards as TFL do that would actually be really neat. This is something*

that can actually plausibly be implemented. Good luck with community heating now you've signed off all the housing developments. (ID.179)

With the local quality of science innovation the smart technology solutions should be ground breaking. (ID.222)

We welcome the attempt in this document to provide a comprehensive assessment of the infrastructure needed to create a sustainable and attractive town and, in particular, to look forward to create a green infrastructure which can take advantage of our fast moving technological age. (ID.418)

Have more cycle hire points… need one at Milton Park, Harwell and shopping centre. (ID.22)

Section 7.2.1 Biofuels are discussed as a sustainable transport fuel. If, for whatever reason, this option is not considered viable it may also be worth considering LNG (liquefied natural gas) as an alternative. Whilst it is not as 'green', it provides for more efficient fleet transport fuelling and could be incorporated into a number of businesses already based at Didcot. (ID.30)

Electric car recharging points. (ID.234)

Seems to overlook smart payment systems for public transport, bike hire or other services. The transport chapter was talking about Oyster cards? Why? When everyone will either have a smartphone capable of making payments, or a contactless payment card. (ID.266)

Lifespan of technology and eco-measures

While the comments above highlight the support for the proposals, some respondents were concerned that opportunities for using technology were being missed or that some technology had yet to be 'tried and tested'. Others wanted to see greater emphasis on ecologically and environmentally friendly measures.

Some of the options are quite good, but very limited in their application. The technology on offer will be out of date in less than a few years. (ID.53)

Technology is wonderful but be cautious of using technology for technology's sake.The latest whizzy thing can all too soon become outdated, obsolete and expensive to maintain. Things like smart bus tickets, live bus signage, etc are proven technology which works well. Another good example would be a web page (mobile friendly, no fiddly log-in screens) which gives integrated info such as current road congestion & accident spots, real-time bus & rail info. Any smart technology, particularly if storing personal details, needs to be properly designed and security audited. InfoSec (information security) is a very, very, big deal. I broadly agree with sustainability in areas such as recycling, reuse of rainwater, waste-to-energy etc. However this must be

delivered with a carrot rather than a stick approach, if you make it easy people will do it. If you bear down on people with rules, regulations, fines, and other such "bin nazi" nonsense you will alienate people and create a "us & them" chasm between people and the local government supposedly representing them. If you can get this right the first time there are many opportunities to set an example to other towns and create an even nicer place to live for everyone. (ID.67)

Principles are sound. I hope you will insist that all new large buildings and public buildings have solar panels and not allow the market to dictate. It was a sad day when the ruling that said all new build had to have solar power after 2016 was scrapped. What a wasted opportunity - please do not make that mistake. Find a way to incentivise the house builders to do it and insist that all new big projects do. These words are all very well but phase 2 of the Orchard Centre is going up without any solar panels and that is a lot of wasted roof space. (ID.91)

Technology is desirable, but not at the expense of the existing town and community. Develop this in Milton Park, the existing science centres or in Oxford itself and not across the town of Didcot and surrounding villages where it would just be bewildering. Initiatives like water harvesting again sound like something that should be driven at a national level and not bound up in Garden Town proposals. Proposals for repair shops sound like no one has thought of these before - we want to improve the ambience of Didcot, not have it sink into a bed of second-hand repair shops. (ID.214)

Is this a City or a Town? I ask again. Technology aspirations are all very fine, but we are talking about Didcot here! Sustainability projects are also very laudable. I am totally and utterly disappointed that planning permission granted for vast swathes of houses at Great Western Park, and going further back in time Ladygrove, did not encompass these aspirations. It is too little too late to include these in this current plan. (ID.303)

VIEWS ON CHAPTER 8

This chapter set out how Didcot's landscape will be enhanced with new and improved green infrastructure and open spaces.

This chapter contained: 8.1 Summary of super green town, 8.2 Didcot's relationship with its landscape setting and 8.3 Landscape principles, green infrastructure and open space strategy.

Proportionally more respondents indicate overall agreement with the three sub-chapters in chapter 8 than overall disagreement. 47 per cent agree overall with the summary of the super green town, while 45 per cent do so for Didcot's relationship with its landscape setting and 47 per cent with the landscape principles, green infrastructure and open space strategy.

With that said, up to two-fifths (between 37 percent and 40 per cent) disagree overall.

Figure 6: Levels of agreement with Chapter 8 (n=100 to 102)

COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 113 people chose to respond. Of these, 27 people were in agreement with the three sub-chapters, 41 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

The key themes from these comments relate to concerns for green belt land and green space, that the proposed plans are not felt to be achievable, realistic or suitably specific, general support for the

proposed plans, concerns that the plans do not follow Garden Town principles, the impact of home building and comments on wildlife and biodiversity issues.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Green belt /green space concerns	63	11	26	26
Not achievable/realistic/specific enough/contradictory	22	4	15	3
Good plans/support plans	15	10	1	4
Home building, population/job increases	15	3	6	6
Plans not in line with Garden Town principles	13	0	11	2
Protect wildlife / biodiversity	11	2	4	5
Public transport / cycling / walking	10	4	4	2
Other facilities/ considerations (e.g. health)	8	3	2	3
Problem with how consultation has been carried out	6	1	1	4
Other	16	1	6	9
Number commenting:	*113*	*27*	*41*	*45*

Green belt /green space concerns

The greatest proportion of comments (48 per cent) related to the proposed green buffers, issues or concerns over building on green belt land and the importance of green space.

> *As suggested before there needs to be a clear identification of areas to be protected from speculative housing development to maintain the green buffer around the town. Of particular current concern is the current application by Catesby Estates to develop one of the fields to the south of Lloyd Road, thereby eroding the rural green gap between Didcot, Coscote and the Hagbournes. Please do not allow this to happen. (ID.10)*

> *There is a real danger that 'green' and 'sustainable' are being mixed up. What is 'green infrastructure'? Without clear definitions, easy for things to be diluted and have classic case of politicians double meaning. Hopefully the principles are at Didcot will be green in every sense: plenty of natural green spaces with grass and trees, with sustainability built in to every element. If that's the case then I strongly agree. (ID.106)*

> *Although the intentions are good, already building consent(s) are applied for on a number of Green spaces on the Garden Town boundary. In particular West Hagbourne and Harwell. Although it is claimed that a green zone is maintained by the planning applications, only a few metres are allowed between the Didcot and village boundaries. Since the Didcot Plan is a County issue, I strongly suggest that Clear boundaries be added to the Didcot plan, to protect green spaces between the Town and Villages, i.e. no build zones. If this no build zone is not defined the visual effect to the approach to the Town will be adversely effected. (ID.114)*

> *All sounds good - please don't fall short on this. Lots of trees and protected waterways to encourage birds and other wild life and generally benefit the feel of the place. I really*

hope that any new roads will incorporate some fencing, with periodic 'walkways / waterways' etc. underneath, to allow animals to cross from one side to the other while avoiding the road and reduce roadkill/dangers to drivers. (ID.297)

You have not convinced me that you will mitigate the negative effect of urban sprawl. The green areas of Ladygrove are not all protected, and we are still very concerned about what you intend to do with them, e.g. the relocation of the station will have a devastating environmental impact on our immediate area and be hugely wasteful when the existing station could be upgraded. And what about the £15m new multi-storey car park you are building on the existing site? What a waste! (ID.456)

Not achievable / realistic / not specific enough / contradictory

The second most frequently mentioned comments related to achievability, realism and lack of specific detail of the proposals, with 20 comments (18 per cent) falling into this theme. As in previous sections, five of those commenting have used a template style response, as shown in the first example below:

I object to the proposals in this chapter. It does not refer to nor apply 5 of the 9 TCPA Garden Town principles. The language used to describe Garden City principles is vague, generic & non-committal. What I want is specific firm commitments like: We will make solar panels on 40% of roof area of new housing development mandatory. We will make green roofs or solar panels on 90% of roof area of commercial development mandatory. We will make triple glazing/ water butts/ bat boxes/ bird boxes mandatory for all new housing developments. We will make off-road cycle paths along roads mandatory for all new housing developments. We will treble the provision of secure bike locks at the station. We will plant trees along all routes to primary schools to adapt to climate change. We will plant at least one tree for every resident in Didcot. We will subsidise residents for green wall retrofitting with £10/ m2. We will subsidise residents for solar panel retrofitting with £1000/ Kwh capacity installed. We will ensure every resident in Didcot will have a natural accessible greenspace (2ha+) within 300m and an accessible woodland within 500m of where they live. We will upgrade all green spaces so they can achieve Green Flag standard. We will extend the orchard and fruit tree provision, so that every person in Didcot can have 5 free portions of local fruit per year. (ID's.41, 54, 57, 62, 227)

8.3.1 mentions a higher proportion of un-built permeable space – please can we have some unbuilt space opposite the station, to make Didcot look like a garden town? You say further on that there is a deficit of Accessible Natural Green space particular in the area between the Broadway and the railway. You also talk about a "proposed green gateway" near the station but it's not possible to fit in anything meaningfully "green"

when you want to build high-density housing and all the other things you are talking about for the Gateway site. I like the sound of "Beautifully and imaginatively designed homes with gardens" but elsewhere you are talking up high-density building which does not fall into this category. Will ALL homes "have access to private or shared gardens"? "Should" is not the same as "will". Masterplan… this feels like increasing urbanism (plus a few trees). (ID.61)

Some bits were completely verbose and difficult to understand: 'Art can be as relevant to urban or rural water environment and enhances intelligibility and legibility of place.' please use plain English in future!! (ID.93)

Again, this is full of a lot of paragraphs that sound productive and useful but actually don't really detail any actual projects/plans/designs. (ID.228)

Broadly support plans

The third most frequently mentioned theme concerns broad support for all or some of the proposals in this chapter; 14 respondents indicated this.

Looking forward to seeing the plans come to fruition. (ID.116)

We note you intend to develop a design brief for the Rich's Sidings site to ensure any development adheres to the established priorities. We consider this a suitable approach and would appreciate engagement at an early stage in the process to understand your plans for the site. (ID.125, 126)

As a resident of Radley I know what it is like not to have local Accessible Natural Green Spaces, so I am strongly in favour of proposals to create them in Didcot. These spaces, and the improved network of cycle routes, would make Didcot my destination of choice for leisure. (ID.149)

These look like good and realistic landscape principles for Didcot and it would be great to see them become reality. I like the focus on growing food and the proposal to bring back orchards to south of the town. (ID.176)

I think this is one of the most visionary parts of the plan.... of course completely appropriate given the name of the project "Garden Town". This emphasis on Green Space will not only make Didcot a far better place to live but will also a much healthier place with resulting savings on health costs, hospitals etc. ... the costing of this must take into account the savings elsewhere. This is really quite visionary and I strongly support it. (ID.185)

This is by far and away the best chapter in the entire plan. Methinks I detect the hand of the brilliant (Name). I'm not in support of these proposals because I am against development. Rather, because they are human, empathetic and considerate. I also love

the way the ideas scale from the very local to the very broad. Holistic. Aspirational. Logical. Now you have to find an SODC Officer who will sign up to support this. (ID.305)

Protect wildlife / biodiversity

One in ten comments related to the protection of wildlife and ensuring biodiversity is provided in the delivery plan, including being more specific about how this will be achieved.

The plan talks about biodiversity in very general terms, there are no specifics, no studies of what is here, and no schemes that specify exactly which wildlife will be helped. For example the Oxford Swift Project 'hopes to improve the outlook for swifts in Oxford by raising local awareness of the many ways we can help these vulnerable birds', but there is no mention in the Garden Plan of the several colonies of swifts in Didcot or what will be done to maintain them. Skylarks are still hanging on at the edge of GWP (they were numerous before the building); they are also at the edge of Mowbury fields. But much of the small & medium bird populations, including rarer visitors, will have been lost at GWP, along with the larger grey partridge and tuneful yellowhammer. Replace by the more common garden birds. Water voles, the UK's fastest declining mammal, is also present on GWP and most likely other places, there could be conservation measures to enhance their chances of survival, along with fox, badger, deer and hedgehogs whose sharp decline in Didcot is evident. Perhaps the most rapidly declining species in Didcot are the butterflies, once numerous, with caterpillars swarming over nettles and Peacocks and Tortoiseshells covering buddleia in people's gardens, they are noticeable by their absence. Further massive declines of fritillary butterflies and others have been seen recently in Didcot due to housebuilding. Many of these are on watch lists and of concern, but as well as having a place in the world they enhance people's mood and their understanding of the world. A more proactive and targeted approach is required, the general 'like to' statements will achieve little. (ID.73)

It would be good to see emphasis put on bringing back biodiversity that has been lost to the area, where possible. Reference to 'Beautifully and imaginatively designed homes with gardens' - my concern is that this ambition will give way to the building of more of the same that we currently have - creating a sea of uniformity. (ID.258)

Ensure a strong emphasis on use of native tree species in new plantings / re-greening plans. Link re-greening to better habitat provision for wildlife, particularly birds. Discourage use of front gardens as parking areas. (ID.266)

We are concerned that despite claiming otherwise, the garden city will not yield a net gain in biodiversity. Although there are aspirations for sustainable movement corridors for people and wildlife, we have concerns how these will work in practice. There is mention of large scale habitat restoration and habitat re-creation. This implies that substantial habitat and green space will be lost in delivering this scheme. Bicester

claims to be an eco-town but continues to build on its green spaces thus creating a sterile environment for wildlife. To suggest that green corridors could exist towards Sutton Courtney which has lost many of its green fields and wildlife, because of intense development is not reassuring. A wider view needs to be taken of what is happening in surrounding villages. The population of Didcot will double with this scheme and the impact on the natural environment and countryside has not been adequately assessed. (ID.317)

The remaining comments broadly relate to themes already discussed in earlier sections and so we have not repeated these here.

VIEWS ON CHAPTER 9

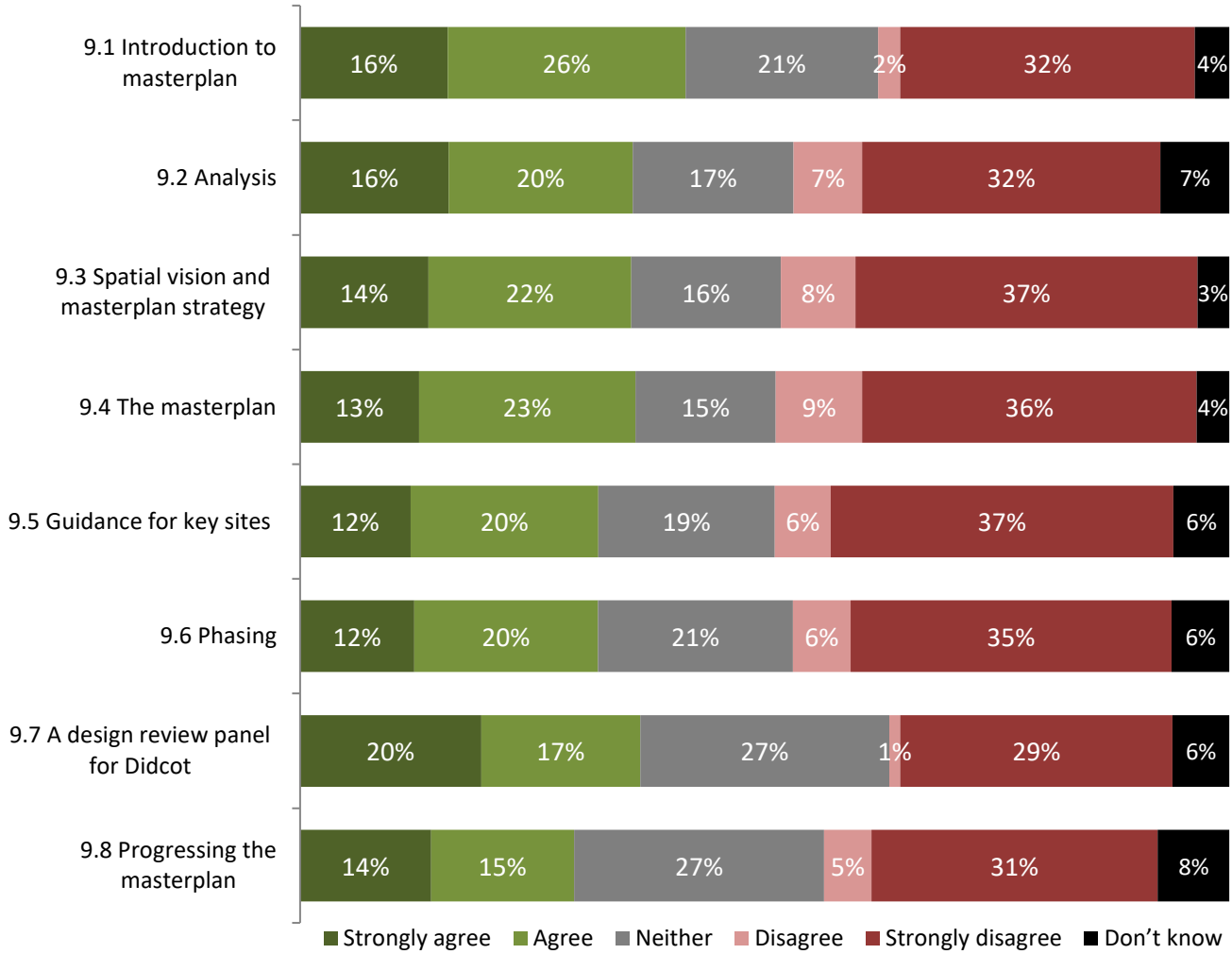
The Didcot Garden Town masterplan chapter includes the blueprint and sets out plans for the different parts of Didcot, all of which will work together for the town to reach its full potential.

This chapter contained: 9.1 Introduction to masterplan, 9.2 Analysis, 9.3 Spatial vision and masterplan strategy, 9.4 The masterplan, 9.5 Guidance for key sites, 9.6 Phasing, 9.7 A design review panel for Didcot and 9.8 Progressing the masterplan.

Views on chapter 9 are mixed with just two of the sub-chapters achieving overall agreement results and six overall disagreement.

Respondents agree overall with the introduction of the masterplan (42 per cent) and a design review panel for Didcot (37 per cent). However, the remainder have proportionally more respondents that overall disagree than agree.

Figure 7: Levels of agreement with Chapter 9 (n=78 to 87)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 97 people chose to respond. Of these, 18 people were broadly in agreement with the eight sub-chapters, 42 broadly disagreed and the remainder had mixed views or simply chose to comment on this chapter.

The key themes from these comments relate to views previously highlighted in previous sections. These include whether the consultation reflects previous input and ideas from earlier engagement activity, views on the proposals for the relocation of the train station, views on the road and transport network, general support for the proposals in this chapter, consideration for other facilities and concerns over loss of green belt and other green space, for example.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Concerns regarding the consultation	35	0	21	14
Didcot Gateway South and train station	27	1	15	11
Road and transport network	27	3	18	6
Support the proposals	16	9	0	7
Other facilities/ considerations (e.g. health)	16	3	1	12
Green belt /green space concerns	16	1	8	7
Object to proposed delivery plan	15	1	7	7
Home building, population/job increases	12	0	8	4
Public transport / cycling / walking	10	2	3	5
Cost / How will it be paid for	9	0	8	1
Didcot Garden Town footprint and impact on villages	8	1	6	1
Car parking	7	0	4	3
Other comments	11	3	4	4
Number commenting:	*97*	*18*	*42*	*37*

Concerns regarding the consultation

As seen in other chapters, a relatively high proportion of comments (37 per cent) related to respondents concerns that previous engagement and feedback has not been included in the proposed delivery plan and/or that the consultation process was difficult to engage with. Please refer to previous chapters for indicative comments.

Proposals for relocation of the train station

The second most frequently mentioned aspect relates to the proposals to relocate the train station; 27 respondents (28 per cent) indicated this. As in previous chapters, 5 of the 27 respondents have used a template to lodge their concerns. Other comments include:

> *The relocation of the train station is mentioned here again, with no reasons or justification for such a major project. Land appears to being kept aside for train station re-location. Again, no reasons or justification are provided. This is at odds with the rest of the plan where the strategy, aims and details are explained. Finally the plan is over 400 pages long. I'm not sure how many people have looked at it given the length of the document. (ID.71)*

> *I strongly disagree with the idea of the relocation of the railway station. It has nothing going for it…, there is a lot of green land where this ludicrous proposal is meant to be going. What is the purpose of a green town when the proposed development means getting rid of mature trees and play areas for children? We already have a perfectly good station with room for expansion. Even network rail have said it's not a good idea. Whose idea is it? The residents to the rear of the proposed new station site will be in limbo, not knowing if in the next twenty years, a monstrosity will be built in front of their living room windows. The constant announcements, the parking of commuters in front of their houses. The loss of their beloved green land they will be held prisoners in their own homes . All because somebody somewhere had a notion to move the station half a mile down the road, away from the multi storey car park that is being built next to the existing station. With as suggested maybe a bus link between the two? Am I the only one that thinks that this idea is ridiculous and should be dropped immediately? Or am I going to be completely ignored? (ID.148)*

> *I have read reports of moving the railway station: anyone who commutes knows how ridiculous this suggestion is with the track layout, as well as moving the station away from the new parking provision being built. (ID.415)*

Other themes

The remaining themes have already appeared earlier in this report and for brevity we have therefore not included comments relating to them here.

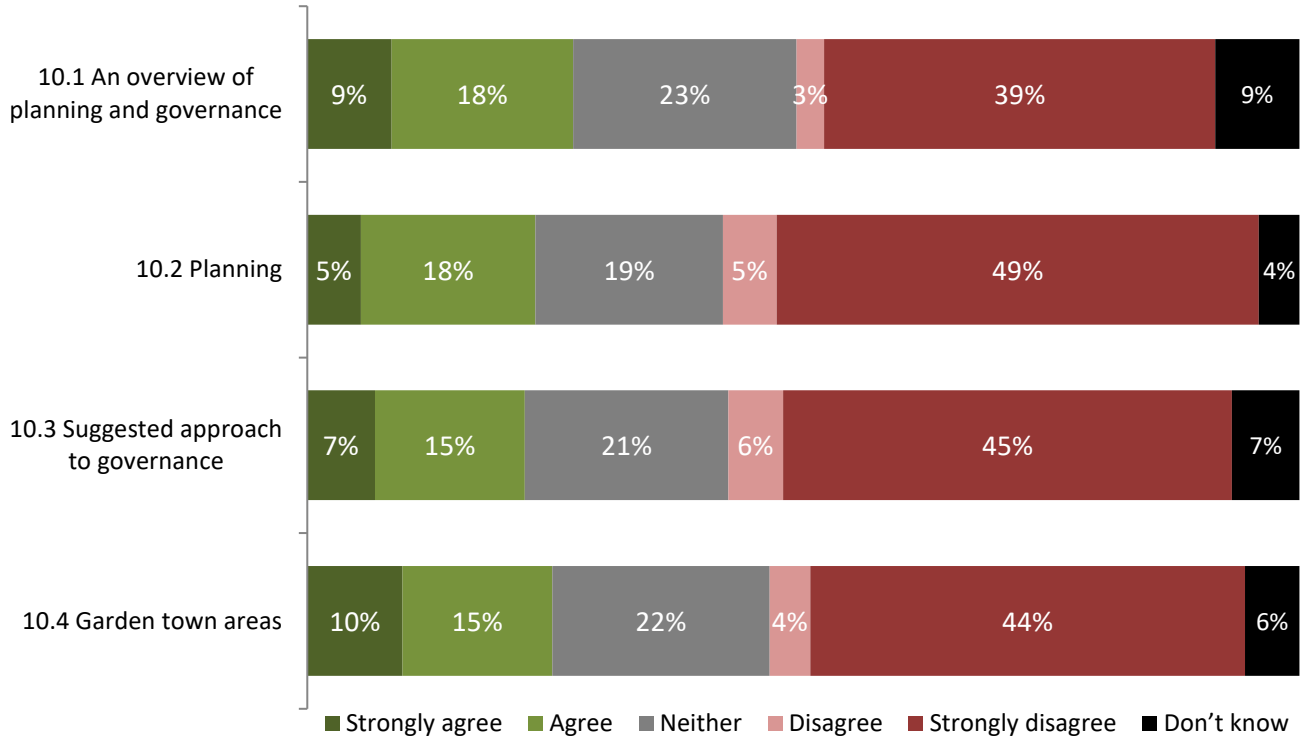
VIEWS ON CHAPTER 10

The councils need to put in place an effective governing body to champion the vision now and into the future. This chapter set out the planning strategy and governance structure for the Didcot Garden Town vision.

This chapter contained: 10.1 An overview of planning and governance, 10.2 Planning, 10.3 Suggested approach to governance and 10.4 Garden town areas.

This chapter appears to have been the most controversial. None of the four sub-chapter areas are supported by respondents, with proportionally more people disagreeing with the sections than agreeing.

Figure 8: Levels of agreement with Chapter 10 (n=71 to 74)



COMMENTS ABOUT THIS CHAPTER

Of the 132 comments received to this chapter, 78 (59 per cent) objected to the proposed house building on Green Belt land at Culham; 44 of these were from residents who specifically indicated they lived in Culham. It should be noted that comments to this section were often emailed directly to the

Didcot project team, rather than as a direct result of completing this section of the survey, and not all indicated whether they were residents of Culham or not.

This means that those that did complete chapter 10 of the survey (between 71 and 74 respondents) yet chose to indicate a level of disagreement are likely to be under-represented, given the wider 132 comments received. The table below provides details on the areas commented upon.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Concerns about / object to building homes at Culham	78	0	12	66
Governance / democratic oversight	21	5	7	9
Concern over house building / control of development	15	1	6	8
Concerns regarding the consultation	9	0	7	2
Support house building	3	0	0	3
Not achievable/realistic/specific enough / contradictory	2	0	1	1
Other	11	5	3	3
Number commenting:	*133*	*10*	*33*	*90*

Concerns about / object to building homes at Culham

As seen in previous sections, a number of Didcot residents' comments under this theme follow a similar pattern or template, although responses have clearly been personalised as shown below. For example, all 5 respondents included the non-bold text, 4 the following text shown in bold and 1 the text shown in bold and red. It should also be noted that not all of these respondents are against the other proposed measures.

> *I object to this plan, because the housing numbers are basically a done deal. Over two thirds already with planning permission. I consider your proposals to influence delivery of already consented housing development unrealistic.* ***I object to the lack of specific detail, timetable and strong commitment to producing a statutory binding document (DPD) ASAP. The Garden Town principles you propose for the SODC Local Plan are vague, generic and not demanding enough****.* ***You have no track record, not on positive community engagement, not on skills, not on attitude, not on sustainable housing development fit for 22nd century, not on leadership for genuine sustainability. Where is this change of heart and mind going to come from? You are just putting lots of consultants "clever ideas" in a document. It would be better if you applied all TCPA Garden City principles and asked the community how to apply them in the Didcot context.*** *(ID's 227,* ***41****,* ***54****,* ***57****,* ***62****)*
>
> *I strongly disagree with any building over the green belt at Culham. The homes required by Didcot could be much better served by developments on brownfield sites. The flyer*

about Didcot sent to all Culham residents neglected to mention that the Didcot plan included QUADRUPLING the size of Culham village by building on green belt, so I imagine the true number of people that object to this development is far higher! Apart from the developments outside Didcot itself, the plan looks good though. (ID.89)

Many of the comments received from Culham residents also used a template style response, where again some personalisation of responses have been included (as seen in bold text below).

I support sustainable development on brownfield sites in and around Didcot ***but I OJBECT IN THE STRONGEST POSSIBLE TERMS to the mention in CHAPTER 10 to building on Green Belt land at Culham. I also object to the attempt at concealing a major development in Culham in a document entitled 'Didcot Garden Town delivery plan'****. (ID.****344, 345****, 353, 354, 361, 362, 363, 364, 377, 378, 381, 382, 383, 386, 391, 392, 403, 406, 408, 409, 420, 438) See other personalised example below:*

As a Culham resident, living in a property located in the middle of the Culham Green belt, I strongly oppose any plans to build on the Green Belt land at Culham. I support sustainable development on any brownfield sites in and around Didcot, however, do not support any building on Green Belt land at Culham. (ID.383)

While there is clearly a group opposed to development in Culham, from both those resident in Didcot, Culham and elsewhere, it should be recognised that there is also support for this proposal, as seen in the comments received for chapter 6. Here, 4 Didcot respondents and 1 resident and 1 business from Culham felt that it was a good idea to include development within Culham within the delivery plan.

Governance / democratic oversight

The next most frequently mentioned theme related to opposition to the proposed governance model and a need for democratic oversight.

Not convinced about proposals for governance. Feels like consultants making more work for themselves. Not happy about proposals for local development orders. Where did the figure of 400 homes on Gateway South come from? There isn't even room for 300. Not happy about the LEP deciding who will chair the Board. Who decides who the "well-respected individual" is? Will they even be from Didcot? Not happy that Town Council is at the bottom of the hierarchy – should be a partner with the District councils. Not happy that the "community" is at the bottom either. I would like to see more detail about community involvement. It feels as if we are being thrown scraps (delivering peripheral projects) rather than influencing the big picture. (ID.61)

Sutton Courtenay Parish Council wishes to have clear direct routes for representation on the delivery of the Plan as a considerable amount of its parish is within the Didcot Garden Town Plan area. (ID.129 – Parish Council)

Delivery of the plan is the real challenge especially with the current political framework of parish, town, district and county councils - each with different agendas and political persuasion. I think it would make sense for Didcot Garden Town to have its own development corporation status in order to make things happen. (ID.176)

The Town Council should be more involved in the governance of the garden town. The town councillors actually live in Didcot and are elected by the residents of Didcot. We need more elected Didcot representatives making the decisions. (ID.216)

I would like to see a Didcot Development Council, independent of developer pressure, as for example occurred in Milton Keynes. An example of this pressure in Didcot was the introduction of the environmentally undesirable bus route through the previously pedestrianised area at Cornerstone. It seems to me that the DPD has no real teeth. It is the councillors who have to vote for the plan and they are subject to lobbying and to their party prejudices. In light of this I believe our planning system is not fit for purpose with this scale of development. (ID.322)

Concern over house building / control of development

Just over one in ten comments (11 per cent) related to how the control of house building and development would be effectively achieved or concerns over the number of proposed homes.

It is agreed that a DPD for Didcot is preferable to an SPD as it carries greater weight, but it is unclear what planning policies will be available to control development prior to and after adoption of a DPD. (ID.182)

Any developments in the town should be for the benefit of the residents of the town, existing and future, and NOT for the self-gratification of Councillors (County, Regional or Town) and profits of consultants and developers. Consultants and developers schemes should be properly monitored and managed, with appropriate penalty clauses imposed and inflicted, for failure to achieve agreed specifications and timings. The project should be accountable to democratically elected local bodies, not "Management Boards." (ID.412)

The remaining themes have already appeared earlier in this report and for brevity we have therefore not included comments relating to them here.

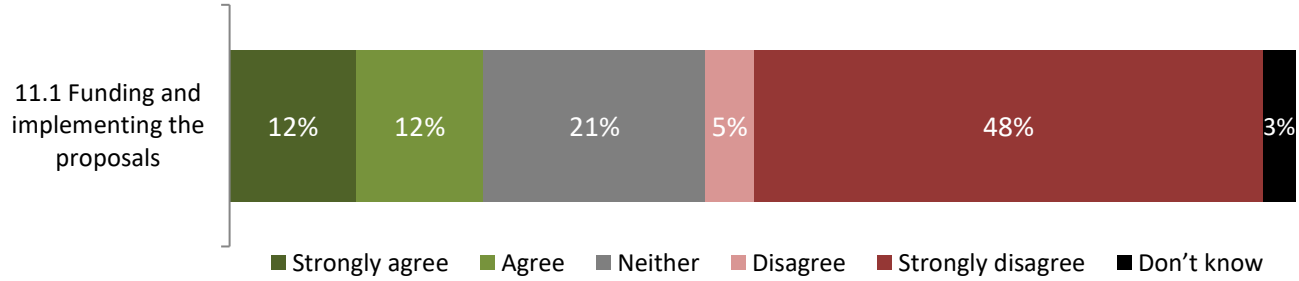
VIEWS ON CHAPTER 11

Securing funding to ensure the proposal is a fundamental step in making Didcot Garden Town a reality. This chapter identified the funds and key projects required to realise the town's proposals.

This chapter contained: 11.1 Funding and implementing the proposals.

Overall, a greater proportion of respondents disagree (53 per cent) with the details provided for funding and implementing the proposals compared to those who overall agree (24 per cent). Almost one half (48 per cent) strongly disagree.

Figure 9: Levels of agreement with Chapter 11 (n=67)



COMMENTS ABOUT THIS CHAPTER

Respondents were asked whether they had any comments on this chapter and 46 people chose to respond. Of these, 7 people were in agreement with the chapter, 26 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Cost / How will it be paid for	25	1	16	8
Burden on taxpayers	10	0	7	3
Plans are over ambitious/not realistic	6	1	4	1
Plans not in line with Garden Town principles	5	0	5	0
Complete infrastructure first	4	2	2	0
Other	7	3	2	2
Number commenting:	*46*	*7*	*26*	*13*

Cost / How will it be paid for

The table above shows the key themes with most (54 per cent) questioning how the proposals will be paid for without burdening the tax payer. Again, 5 respondents have used a similar template to provide customised comments.

I object to the funding proposals. The plan does not propose to let the community genuinely benefit from the uplift in land value. (TCPA Garden Town principle 1) I object to how little money you have allocated to communication and community "consultation" (6 pennies in 100 pounds is not enough!) ***I object to over 80% of funding being proposed for roads, concrete, tarmac and development. Not a "Garden" Town! With 59% of the total cost not identified, I consider the funding proposals unrealistic. I object to the fact that you are going to let over two thirds of "green" schemes get stuck at the strategy/ feasibility stage with money for delivery not even budgeted in plan! It would be better if you had a realistic business case for investment in genuine sustainable development.*** *(ID's. 54,* ***41****,* ***57****,* ***62****,* ***227****)*

How long is it going to take you to ensure that you have all funding in place? Will you start before you do have it? How can you ensure that public and private sectors will want to invest in this project? (ID.90)

Very little funding is allocated to communication and community consultation. Over 80% is allocated to infrastructure, which could squeeze out many of the greening elements. The major flaw is that potential sources have been identified for only 41% of the required funding – where is the remaining 59% to come from? The likely scenario is that developers will step into the breach, and the greening elements will be pushed out, and many projects could well be abandoned or left half completed. The Brexit factor is not acknowledged - this could have a substantial effect on economic growth and GDP, which could undermine identified sources of funding. (ID.175)

I object to the proposals: 1. This section confirms the suspicions of Didcot residents that the DGT schemes are underfunded by at least £318M. A matter of concern is the vast associated costs including SODC staff (£15M) and consultants fees (£5.5M?). SODC is invited to provide justification of how such expenditure will be VFM and be spent correctly. 2. The research/feasibility phases appear to be vastly expensive. Can SODC indicate how VFM will be demonstrated for the public purse? 3. Highway improvements (para.17 page 434) are a key piece of infrastructure but receive scant attention. "Prioritised in LGF3" – explanation of this is requested: when will the infrastructure be built; is it funded? 4. There appears to be no attempt at risk management in the estimated costs, programme or schemes. It appears the consultants are failing to plan and planning to fail. Clarification about risk management plans is urgently requested. 5. The cost estimates as presented: do not give a date for the estimated costs (cost base for future updating); the costs are not allocated to financial years; there is no risk estimating; there are no references for the source of the costs. If the estimated costs were presented as part of a Gateway review it is likely they would lead to a "high risk of project failure" assessment. Considering the very high fees involved in producing the estimated cost data can SODC advise how the work demonstrates VFM? (ID.306)

Burden on taxpayers

A further 22 per cent of comments related to a potential burden being placed on the tax payer with questions on how the delivery plan would avoid this.

> *So it's going to be horrendously expensive. And as usual, business will not pay for it, instead you will pick our pockets for your 'glorious vision'. And then, when it doesn't work, we get to pay AGAIN to try and fix it. (ID.23)*

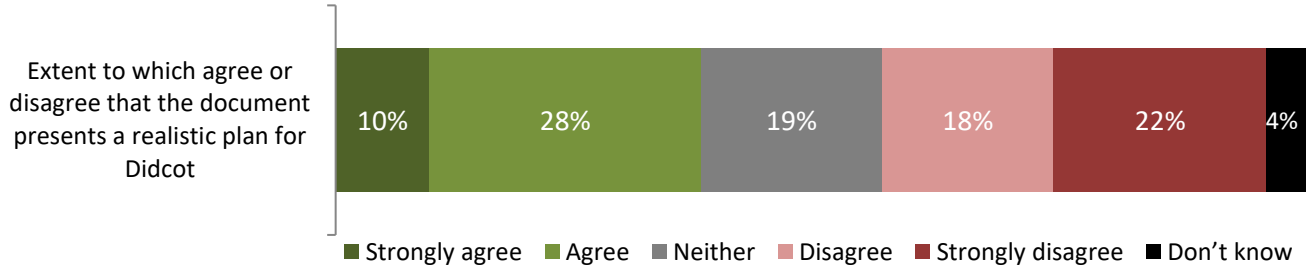
> *Needs a statement adding that no funding will be required from local population to implement this and that national government will underwrite any cost overruns. (ID.215)*

> *How long will funding last? Who is going to pay when the funding runs out? (ID.459)*

VIEWS ON WHETHER DOCUMENT REPRESENTS A REALISTIC PLAN

Finally, respondents were asked the extent to which they agreed or disagreed that the document presents a realistic plan for Didcot. Overall, a greater proportion of respondents disagreed (40%) than overall agreed (38%).

Figure 10: Levels of agreement (n=300)



COMMENTS ON WHAT WAS MISSING FROM THE PLAN

Respondents were then asked whether they felt anything was missing from the plan; 203 respondents included comments. Of these, 34 people were in agreement that the document presented a realistic plan for Didcot, 69 disagreed and the remainder had mixed views or simply chose to comment on this chapter.

Comment theme	All	Agreed	Disagreed	Mixed/no response
Details of what 'will' be included	47	6	18	23
Road and transport network	43	5	16	22
Don't feel they are being listened to / problems with consultation	35	3	14	18
Green belt / green space concerns	24	3	9	12
Incorporate religious, cultural and sporting facilities	22	4	4	14
Public transport / cycling / walking	19	2	5	12
Didcot Garden Town footprint and impact on villages/environment	16	2	4	10
Home building, population/job increases	13	3	3	7
Social infrastructure concerns	13	4	4	5
Cost / How will it be paid for	11	3	4	4
Including younger people in plans/ consultation	9	2	0	7
Other	18	4	9	5
Number commenting:	*203*	*34*	*69*	*100*

Details of what 'will' be included

The majority of comments fell into a category requesting details of the improvements that would actually be made, rather than potential or aspirational plans that might not be delivered, including the timescales for delivery; 23 per cent of comments were in this theme.

> *A feasible alternative to closing Cow Lane Bridge to motor traffic. The document is too lengthy and should have had a summary of the major changes. (ID.26)*
>
> *The plans show us all the wonderful new cycle routes and open planting areas, but do not advise how these will be maintained. I have lived on Ladygrove for almost 30 years and in that time the maintenance of Council owned land has been disgraceful. There are parts of the cycle path where the brickwork is uneven to say the least and represents a significant tripping hazard. The foliage around the pavements is unmaintained making several areas impassable (pavement at the top of Mersey Way on the left hand side, cycle path along the back of Synderford Close beside the woods, etc. etc. etc.). I wonder whether the Council intend fixing the existing problems before creating more? (ID.66)*
>
> *More actual specific detail would have been helpful. (Although I only read the Proposal document, not the Appendix document as it was too large and I didn't have enough time). (ID.203)*
>
> *A link between the principles (which are fine in themselves) and the delivery plan (which seems to have no relation to the principles). (ID.225)*
>
> *It is missing proposals of sufficient depth and substance that would maximise the chances of gaining public support and gaining funding from central government. The excessive length of the document (nearly 450 pages) and large amount of repetition makes the lack of depth apparent and impedes effective review and comment. This internet review process does not seem designed to capture and implement meaningful comments, but rather to solicit a response that can then be presented to third parties as evidence of stakeholder engagement. There is a lack of recognition of feedback from the community on Cow Lane and the Train Station relocation, which undeservedly live on and distract from some of the better ideas in the plan. There is a lack of local knowledge, as evidenced by the proposal to knock down Aldi, which highly unlikely to happen since it has only just been built. (ID.240)*
>
> *Not enough is said about the Science bridge. This must be a major feature in any plan without it the roads will clog up. At the moment it seems that the location is not even fixed. It must be in place before any development starts. (ID.302)*

Social infrastructure concerns

A number of comments were related to other features and facilities that appeared to be missing from the proposed delivery plan and on the potential additional burden on existing facilities. Many of these comments related to disability, health and social care provision.

The plans do not specifically mention any public toilets or amenities for disabled visitors or residents - at least not as far as I could find, they are VERY long. The council are fully aware of the importance of 'changing places' toilets (with an adult sized changing bench and hoist). Families with disabled loved ones would expect to see multiple changing places facilities around the Didcot area after the plans are implemented. There is no reason why at, this early stage, disabled visitors cannot be made to feel welcome by providing this basic level of dignity. No one should have to lie on a toilet floor!!! We all deserve dignity. We all deserve to be included and valued. (ID.18)

Reality - the Council cannot maintain the Didcot infrastructure as it is and this plan will only add to the burden on resources. (ID.44)

Greater provision for disabled access. (ID.75)

Not enough on healthcare, especially mental health, and the links with green living, Although healthcare funding is outside the scope of the Garden Town proposals, there needs to be an integrated approach between Local Authorities, Oxford University Hospitals Trust, Oxford Health, OCCG and NHS England. More detail and coherence needed on public transport issues and solutions. (ID.175)

Didcot desperately needs investment if it is to cope with the basic needs our current population. The new homes already approved will only serve to increase this deficiency. Our transportation, educational, healthcare, community facilities and green spaces are barely coping with demand as it is. A carefully considered, fully funded and inclusive plan of substantial investment, governed by a body representing and answering overwhelmingly to those directly impacted by the program of change would be welcome. Sadly this delivery plan falls far short of this ambition. (ID.232)

Provision for the elderly. (ID.261)

The plan looks good but it does not clearly highlight the overwhelming number of actual people who will end up here and the planned retail, roads, schools, etc may well struggle to cope. Without a local hospital, it's hard to see how the JR can realistically cope - even if patients make it there in time! (ID.280)

It may not be missing, but I'm not clear on how much health/social care facilities provision there will be: all absolutely - and increasingly – vital. (ID.297)

I may have missed it - ease of wheelchair and mobility scooter use. (ID.313)

Comments that fall within the remaining themes have already been broadly covered in previous sections of this report.

STAKEHOLDER RESPONSES

While a number of stakeholders completed the survey, these and others also provided separate and more detailed correspondence directly to the councils.

Below is a summary of the types of wider stakeholders that have provided more detailed comments. Please refer to Appendix A for a list of the 36 wider stakeholders who directly provided comments.

Respondent type	Frequency
Local Authority / Parish / Town Council response	14
Land / Property Developer or Agent response	7
Wider stakeholder response	7
Statutory Body response	5
VCS Organisation response	3

The extent and depth of response from these stakeholders are typically two to three pages long, however they vary from a single paragraph to 22 pages, plus additional appendices and maps that run to up to109 pages. Some responses are extremely detailed and include the use of technical planning terms. The councils will need to review the specific details in order to respond to the comments made.

The table below, nevertheless, identifies the broad themes contained within the stakeholder correspondence.

Comment theme	All comments
Public transport / cycling / walking	21
Road and transport network	18
Comment on development / home building	14
Green buffer / green space	14
Build infrastructure first	10
Other facilities/ considerations (e.g. health, education)	10
Didcot Garden Town footprint and impact on villages	8
Energy efficiency / environmentally friendly technology	8
Flooding / climate change	5
Funding	4
Biodiversity and wildlife	4
Didcot Gateway South and train stations	4
Poor consultation / timing / document too long	3
Governance	2
TCPA Garden Town principles	2

Most frequently mentioned was the need to include good public transport, cycling and walking provision to alleviate car usage by the increase in population, and stakeholders provided suggestions for additional cycling and walking routes. The need to ensure that the road and transport network was sufficient for an increase in vehicles was also highlighted with transport corridors provided for the inter-connectivity routes outlined in the delivery plan.

Home building and wider development was broadly welcomed by property developers or their agent's, although they did highlight some concerns around conflicting information in the delivery plan compared to pre-existing planning applications and wider development masterplans, particularly linked to proposed 'green buffers'.

Below are a number of key comments, corrections or considerations indicated by stakeholders that the council may wish to review to refine the proposed delivery plan.

> *Both figures 8.6 (Existing accessible open space) and 8.8 (Proposed landscape plan) show our Sutton Courtney Environmental Education Centre (SCEEC) as publicly accessible natural green space, which is incorrect. We use the centre for education purposes but it is for pre-booked groups and organised events only and not open for general use by the public. Nobody has contacted us about this but we are not interested in changing the access arrangement of the site and request that all information and maps are updated accordingly. (Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust)*
>
> *No mention of outstanding planning application for a Gravel Extraction Quarry and associated Concrete Works in Clifton Hampden. (Clifton Hampden Parish Council)*
>
> *It is recommended that, in the wording of the Didcot Garden Town Delivery plan, any mention of assistance from 'community' groups be amended to assistance from 'community and religious' groups; and that the list of stakeholders include 'religious groups'. (Church of England)*
>
> *Whilst the inclusion of some mapped information within the Delivery Plan is accepted, we have concerns that this 'Masterplan' could give rise to misunderstanding due to its similarity in appearance to a Local Plan proposals map, which it expressly is not. It should therefore be made clearer that the 'Masterplan' map is not an expression of planning policy, particularly where it annotates features such as 'Proposed green buffer around necklace of villages'. Not only are these not existing plan policy designations, but the Garden Town Delivery Plan is not able to implement them as such…. It is inappropriate to imply land use designations such as this within the Garden Town document. (Grainger Plc)*
>
> *The Didcot Garden Town Proposed Delivery Plan identifies Greenlight Developments' land interest as woodland. Clearly, we object to any such proposals that treat our land interest as woodland. It is currently an agricultural field and is not available for woodland. (Greenlight Developments)*

Scheduled monuments are identified in the National Planning Policy Framework as heritage assets of the highest significance, any harm to or loss of which (including through development within its setting) should require clear and convincing justification (in the form of overriding public benefits) and any substantial harm to which should be wholly exceptional. We are disappointed therefore not to see any reference to the scheduled monuments or the wider historic environment (including non-designated assets such as non-scheduled archaeological remains or historic landscapes) in the Vision for the Garden Town. (Historic England)

MEPC believe that Milton Park is a highly regarded and valued science park, and that its importance should be more strongly referenced within the delivery plan. It is located within the garden town masterplan boundary and is the largest employer of the three science park referred to above. MEPC therefore respectfully suggests that the value and importance of Milton Park is fully reflected within the delivery plan, and the wording of paragraph 4.1.2 be amended so that Milton Park is not seen as secondary to the Harwell Campus and Culham Science Centre. NB: Also includes requests for other corrections to factual errors (e.g. P337). Milton Park (MEPC Milton GP Ltd)

We note that the consultation document includes proposals to relocate Didcot Parkway Station. As per our discussions on the subject it is important to note that Network Rail has no plans to relocate the station so it is important that the document reflects this. To this end the label on P341 of a potential new site for the station as "Network Rail Opportunity Site" could convey the wrong message about the drivers for relocation. (Network Rail)

We support the aspiration for Science Vale set out in the South Oxfordshire Local Plan which outlines the need for Didcot to transform into "a well serviced and well connected high quality urban hub", including...a "step change" in travel choices away from car travel towards public transport, cycling and walking with Didcot at the heart of a fully connected science vale. The policy however gives no detail as to how this can be achieved and how the well-connected public transport network will evolve considering the quantum of development over the plan period. The plan also pays little attention to the focus of Didcot moving to the Orchard Centre and Didcot Parkway with an emerging "zone of disregard" around the Broadway – this needs to be dealt with as part of this delivery plan. This lack of information is replicated in the Delivery Plan Document, which despite stretching to over 400 pages merely states that "An improved bus service around Didcot and to the surrounding villages embracing new technology to track timetables and pay for journeys". (Oxford Bus Company)

We would like to suggest greater integration of the Councils' local plan evidence base. The Appendices refer to some of the technical evidence that the Council has already collected and produced, but the Delivery Document would benefit from an explanation of the links between the strategic local plan evidence and the greater detail provided for the Garden Town. (SODC Planning Policy Team)

The UKAEA broadly supports the vision for Didcot Garden Town and, in particular, it welcomes the idea that the Plan will "support economic growth" at CSC and the Harwell Campus and that it will promote Didcot as a "gateway" to those sites. Didcot's potential is in large predicated on the strengths of Harwell Campus, Milton Park and CSC, as well as its location adjacent to a key (rail/road) transport node. Against this background, the UKAEA has some concerns about the references to Didcot becoming the "home for future science, [and] applied technology". This is on the basis that any attempt to position Didcot as a primary location for science and technology development has the potential to generate competition between Didcot and the established science centres at Culham and Harwell, which could undermine their future growth. (UK Atomic Energy Authority)

The UoR support the preparation of the Didcot Garden Town PDP however it is clear that the council's focus is to the direct development to areas within the Didcot Garden Town Masterplan Boundary. The UoR's land to the north and east of Didcot falls outside of the Didcot Garden Town Masterplan Boundary but within the proposed Area of Influence. We therefore wish to draw the council's attention to the development potential of land to the north and east of Didcot and the benefits which it could bring, which includes facilitating the Thames Crossing, and we would urge a review of the Didcot Garden Town Masterplan Boundary to include our client's land. (University of Reading)

Section 9.1.2 discusses the Masterplan Process and provides a flow diagram which includes the key elements which have fed into this. However, this appears to have omitted the consideration of the masterplan at Valley Park, which has a resolution to grant planning permission as already discussed in Section 2 of this report. The established parameters, which include the Valley Park Combined Parameters Plan and Land Use Budget Plan, must be factored into the Garden Town Masterplan, as must other strategic development sites which are well advanced. (Valley Park Development Consortium)

HOW WE HAVE USED RESULTS OF THE CONSULTATION

The comments highlighted in this report have been reviewed by council officers and a paper will be produced and submitted to the South Oxfordshire and Vale of White Horse District Councils' joint scrutiny committee on 12 September 2017.

Following the joint scrutiny meeting any additional comments raised during the meeting will be considered and a final Didcot Garden Town Delivery Plan will be produced to take account of all comments received.

The final delivery plan will be submitted for approval to the cabinets of both South Oxfordshire and Vale of White Horse District Councils on 5 and 6 October respectively.

FURTHER INFORMATION

For information about the consultation or the results presented in this report, please contact:

Phillip Vincent

Corporate Consultation Officer

South Oxfordshire District Council

01235 422154

phillip.vincent@southandvale.gov.uk

APPENDIX A – LIST OF WIDER STAKEHOLDERS

1	Appleford, Clifton Hampden, Culham and Long Wittenham Parish Councils (joint response)
2	Appleford Parish Council (separate response to above)
3	Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT)
4	Blewbury Parish Council
5	Catesby Estates Ltd (plus appendices)
6	Clifton Hampden Parish Council (separate response to above)
7	Church of England (CofE)
8	Culham Parish Council (separate response to above)
9	Didcot Access Group
10	Didcot First
11	Didcot Town Council
12	East Hagbourne Parish Council
13	FCC Environment (plus appendices)
14	Grainger Plc
15	Great Haseley Parish Council
16	Greenlight Developments (Bromsgrove)
17	Harwell Bicycle Users Group (Harbug)
18	Highways England
19	Historic England
20	Long Wittenham Parish Council (separate response to above)
21	Milton Park (MEPC Milton GP Ltd)
22	Natural England
23	Network Rail
24	Oxford Brookes University
25	Oxford Bus Company
26	Oxfordshire County Council
27	SODC Environmental Protection Team - Air Quality and Noise Aspirations
28	SODC Equality Team
29	SODC Planning Policy Team
30	Sonning Common Parish Council
31	Sport England

32	Taylor Wimpey UK Ltd
33	Thames Water
34	UK Atomic Energy Authority
35	University of Reading
36	Valley Park Development Consortium

APPENDIX B – PROFILE OF RESPONDENTS

Respondent type	**Qty**	**%**
Resident	301	66%
Business	18	4%
Community or voluntary organisation	30	7%
Other	49	11%
Not specified	61	13%
Total	**459**	**100%**

Location in Garden Town area	**Qty**	**%**
Appleford	4	1%
Blewbury	11	3%
Chilton	2	0.5%
Clifton Hampden	8	2%
Culham	55	14%
Didcot	175	46%
East Hagbourne	12	3%
East Hendred	5	1%
Harwell	9	2%
Little Wittenham	2	0.5%
Long Wittenham	5	1%
Milton	5	1%
North Moreton	-	-
South Moreton	-	-
Steventon	2	0.5%
Sutton Courtenay	11	3%

Upton	4	1%
West Hagbourne	2	0.5%
None of the above	72	19%
Total	**384**	**100%**

APPENDIX C – CONSULTATION QUESTIONNAIRE

Didcot Garden Town
Proposed Delivery Plan Consultation

South Oxfordshire and Vale of White Horse District Councils are working with partners to create a vision for the future of Didcot as a 'garden town'.

We are consulting on a proposed delivery plan for Didcot Garden Town and would like your views on this. Feedback will be used by officers to finalise the plan, including amendments where appropriate. To find out why a delivery plan is needed for Didcot Garden Town, use this link http://bit.ly/2tqjhh7.

You can download a copy of the full proposed delivery plan here http://bit.ly/2tqadJn (large file 84mb). We have also summarised each section of the plan on the following pages of this consultation. Paper copies of the Didcot Garden Town Proposed Delivery Plan are available to view at:

- South Oxfordshire and Vale of White Horse District Council, 135 Eastern Avenue, Milton Park, OX14 4SB
- Vale of White Horse District Council, Abbey House, Abbey Close, Abingdon, OX14 3JE
- Didcot Civic Hall, Britwell Road, Didcot, OX11 7HN
- Didcot Library, 197 Broadway, Didcot, OX11 8RU
- Cornerstone Arts Centre, 25 Station Road, Didcot, OX11 7NE
- Didcot Wave, Newlands Avenue, Didcot OX11 8NX.

We strongly advise you read this information before making comments.

Responses to this consultation can be submitted until midnight 31 July 2017.

All comments will be handled anonymously unless submitted on behalf of groups or organisations

To find out more about the Didcot Garden Town Proposed Delivery Plan, click the 'next' button below.
For more information, to obtain paper response forms and for help with completing this consultation, please contact:

Didcot Garden Town Team
135 Eastern Avenue
Milton Park
Milton
OX14 4SB
didcotgardentown@southandvale.gov.uk
01235 422473

About Didcot Garden Town

Didcot was awarded Garden Town status by government in 2015. With this status, South Oxfordshire and Vale of White Horse District Councils are able to provide a mix of new affordable homes, schools and jobs whilst preserving the villages and countryside around the town.

It is one of only 10 UK Garden Towns and has significant investment planned in the town which will help to support delivery of the 15,000 new homes already planned for Didcot for people wanting to live, and create a future for their family, close to the 20,000 new jobs that will be created in the Science Vale area.

The proposed masterplan has recommendations for new schools, health and leisure centres and other services and proposes to work the county council, NHS, highways and the emergency services to ensure the services they deliver in Didcot and the surrounding area are capable of supporting the planned growth of the town.

As the garden town status suggests, the strategy will be to incorporate new open spaces, encourage and expand the biodiversity throughout the area and upgrade existing public green spaces to maximise all forms of leisure both energetic and relaxed.

The plan for the town and surrounding areas include the infrastructure that will be required for an increase in population. New roads and cycle paths are planned to improve access around the town and to the surrounding villages and science business parks.

The Didcot Garden Town Delivery Plan will be finalised and published later this year. Everyone will have another opportunity to comment when each individual planning application is brought forward in the future.

Contents

We have structured the consultation to mirror the content of the proposed delivery plan

Which sections of the proposed delivery plan would you like to comment on? Please tick all that apply

- [ ] 1. Overview
- [ ] 2. Listening to the Community
- [ ] 3. The Vision for Didcot
- [ ] 4. Making Didcot a Place for Business
- [ ] 5. The Infrastructure Needed to Support the Garden Town
- [ ] 6. Delivering a Wider Choice of Homes
- [ ] 7. A Connected Smart Community
- [ ] 8. A Super Green Town
- [ ] 9. A Masterplan for Didcot Garden Town
- [ ] 10. Managing Delivery of the Masterplan
- [ ] 11. Funding and Implementing the Proposals

Didcot Garden Town Proposed Delivery Plan Overview

The Garden Town Delivery Plan is an exciting opportunity to make the town an even better place to be. This Chapter provides an introduction to the plan and an overview of the chapters within it.

This chapter contains:

1.1 Overview (Foreword, delivery plan process, overview of the delivery plan, project timeline)

To view the chapter in a separate window, please use this link http://bit.ly/2rzmPfy

Do you have any comments or suggestions on this chapter of the proposed delivery plan?

Listening to the community

As the garden town plan was developed the team sought input from as many people as possible. This chapter outlines the community engagement that has taken place prior to the final proposal.

This chapter contains:

2.1 Listening to the Community (approach to community involvement, masterplan response to feedback, conclusions)

To view the chapter in a separate window, please use this link http://bit.ly/2tqixZn

Do you have any comments or suggestions on this chapter of the proposed delivery plan?

The Vision for Didcot

This chapter sets out both the vision for the garden town plan and a range of principles that will guide the development for the next 20 years.

This chapter contains:

3.1 The vision for Didcot
3.2 Bringing the vision to life

To view the chapter in a separate window, please use this link http://bit.ly/2s4GRCd

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
3.1 The vision for Didcot	○	○	○	○	○	○
3.2 Bringing the vision to life	○	○	○	○	○	○

Do you have any comments or suggestions on this chapter of the proposed delivery plan?

Making Didcot a place for business

There are a wide range of successful businesses in Didcot, from local shops to international technology companies. This chapter details the proposals that will strengthen those already in the area and attract further investment.

This chapter contains:

4.1 Making Didcot a place for business

To view the chapter in a separate window, please use this link http://bit.ly/2rzCIml

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
4.1 Making Didcot a place for business	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

The Infrastructure needed to support the Garden Town

Traditional infrastructure, roads and sewers, and social infrastructure, schools and community halls are needed to ensure that a town works well for its residents. This chapter considers where infrastructure can be improved by recommending projects to meet future demand.

This chapter contains:

5.1 Transport infrastructure (traffic flows, public transport and cycling)
5.2 Grey infrastructure (utilities, waste, energy and renewables)
5.3 Blue infrastructure (flood risks and sustainable drainage)
5.4 Social infrastructure (education, healthcare, cultural and leisure facilities)

To view the chapter in a separate window, please use this link http://bit.ly/2svLITR

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
5.1 Transport infrastructure (traffic flows, public transport and cycling)	○	○	○	○	○	○
5.2 Grey infrastructure (utilities, waste, energy and renewables)	○	○	○	○	○	○
5.3 Blue infrastructure (flood risks and sustainable drainage)	○	○	○	○	○	○
5.4 Social infrastructure (education, healthcare, cultural and leisure facilities)	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

Delivering a wider choice of homes

Housing is an important issue for new and existing residents of the town and this chapter looks at ways to provide a better range of homes to rent and buy.

This chapter contains:

6.1 Delivering a wider choice of homes

To view the chapter in a separate window, please use this link http://bit.ly/2rjOd2c

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
6.1 Delivering a wider choice of homes	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

A connected smart city

Technology is recognised as an important part of making Didcot a better and more sustainable place to live and this chapter sets out plans for those taken place and those proposed.

This chapter contains:

7.1 Technology
7.2 Sustainability projects

To view the chapter in a separate window, please use this link http://bit.ly/2se6n6M

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
7.1 Technology	○	○	○	○	○	○
7.2 Sustainability projects	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

A Super Green Town

This chapter sets out how Didcot's landscape will be enhanced with new and improved green infrastructure and open spaces.

This chapter contains:

8.1 Summary of super green town
8.2 Didcot's relationship with its landscape setting
8.3 Landscape principles, green infrastructure and open space strategy

To view the chapter in a separate window, please use this link http://bit.ly/2ruuNLP

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
8.1 Summary of super green town	○	○	○	○	○	○
8.2 Didcot's relationship with its landscape setting	○	○	○	○	○	○
8.3 Landscape principles, green infrastructure and open space strategy	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

A Masterplan for Didcot Garden Town

The Didcot Garden Town masterplan chapter includes the blueprint and set out plans for the different parts of Didcot, all of which will work together for the town to reach its full potential.

This chapter contains:

9.1 Introduction to masterplan
9.2 Analysis
9.3 Spatial vision and masterplan strategy
9.4 The masterplan
9.5 Guidance for key sites
9.6 Phasing
9.7 A design review panel for Didcot
9.8 Progressing the masterplan

To view the chapter in a separate window, please use this link http://bit.ly/2t5Ls5V

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
9.1 Introduction to masterplan	○	○	○	○	○	○
9.2 Analysis	○	○	○	○	○	○

9.3 Spatial vision and masterplan strategy	○	○	○	○	○	○
9.4 The masterplan	○	○	○	○	○	○
9.5 Guidance for key sites	○	○	○	○	○	○
9.6 Phasing	○	○	○	○	○	○
9.7 A design review panel for Didcot	○	○	○	○	○	○
9.8 Progressing the masterplan	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

Managing the delivery of the masterplan

The councils need to put in place an effective governing body to champion the vision now and into the future. This chapter sets out the planning strategy and governance structure for the Didcot Garden Town vision.

This chapter contains:

10.1 An overview of planning and governance
10.2 Planning
10.3 Suggested approach to governance
10.4 Garden town areas

To view the chapter in a separate window, please use this link http://bit.ly/2t5vFDT

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
10.1 An overview of planning and governance	○	○	○	○	○	○
10.2 Planning	○	○	○	○	○	○
10.3 Suggested approach to governance	○	○	○	○	○	○
10.4 Garden town areas	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

Funding and implementing the proposals

Securing funding to ensure the proposal is a fundamental step in making Didcot Garden Town a reality. This chapter identifies the funds and key projects required to realise the town's proposals.

This chapter contains:
11.1 Funding and implementing the proposals

To view the chapter in a separate window, please use this link http://bit.ly/2svlKcJ

To what extent do you agree or disagree with the proposals set out in this chapter of the delivery plan?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
11.1 Funding and implementing the proposals	○	○	○	○	○	○

Do you have any comments or suggestions on the proposals set out in this chapter of the delivery plan?

Additional Questions

To what extent do you agree or disagree that the document presents a realistic plan for Didcot?

- ◯ Strongly agree
- ◯ Agree
- ◯ Neither agree nor disagree
- ◯ Disagree
- ◯ Strongly disagree
- ◯ Don't know

Is there anything missing from the document?

◯ Yes ◯ No

If 'yes', please tell us what you think is missing.

Does the document make it clear that any proposed developments are subject to the planning process and will be subject to further public consultation?

◯ Yes ◯ No

About you

Which one of the following best describes how you are responding?

- ◯ Resident
- ◯ Business
- ◯ Community or voluntary organisation
- ◯ Other

If other, please provide details

If you are making a response on behalf of a business or community or voluntary organisation, please provide a name of the body you are representing. Please note, these responses will not be anonymised in our summary report.

Please indicate your location in the garden town area:

- ◯ Appleford
- ◯ Blewbury
- ◯ Chilton
- ◯ Clifton Hampden
- ◯ Culham
- ◯ Didcot
- ◯ East Hagbourne
- ◯ East Hendred
- ◯ Harwell
- ◯ Little Wittenham
- ◯ Long Wittenham
- ◯ Milton
- ◯ North Moreton
- ◯ South Moreton
- ◯ Steventon
- ◯ Sutton Courtenay
- ◯ Upton
- ◯ West Hagbourne
- ◯ None of the above (please specify below)

If none of the above, please provide information on your connection with the area and interest in the proposed delivery plan:

Further Contact

Are you happy for the councils to contact you in relation to the comments you have provided?

- ◯ Yes
- ◯ No

Would you like to be kept informed about Didcot Garden Town?

- ◯ Yes
- ◯ No

Would you like to be kept informed about other South Oxfordshire and Vale of White Horse District Council consultations?

- ◯ Yes
- ◯ No

Your Details

To help us stay in touch, please can you provide us with some contact details.

All personal information supplied to the councils will be will be handled in accordance with the Data Protection Act 1998. Your information will only be used for the purposes of contacting you in relation to council consultations.

Your name

Email

Phone number

Thank you for submitting your views on the Didcot Garden Town Plan

A summary of the consultation's outcomes will be published in autumn 2017

Please click on the "Submit" button below to complete the survey

S.
Didcot Garden Town Project Advisory Board governance proposals

DGT Project Advisory Board Governance proposals

Purpose

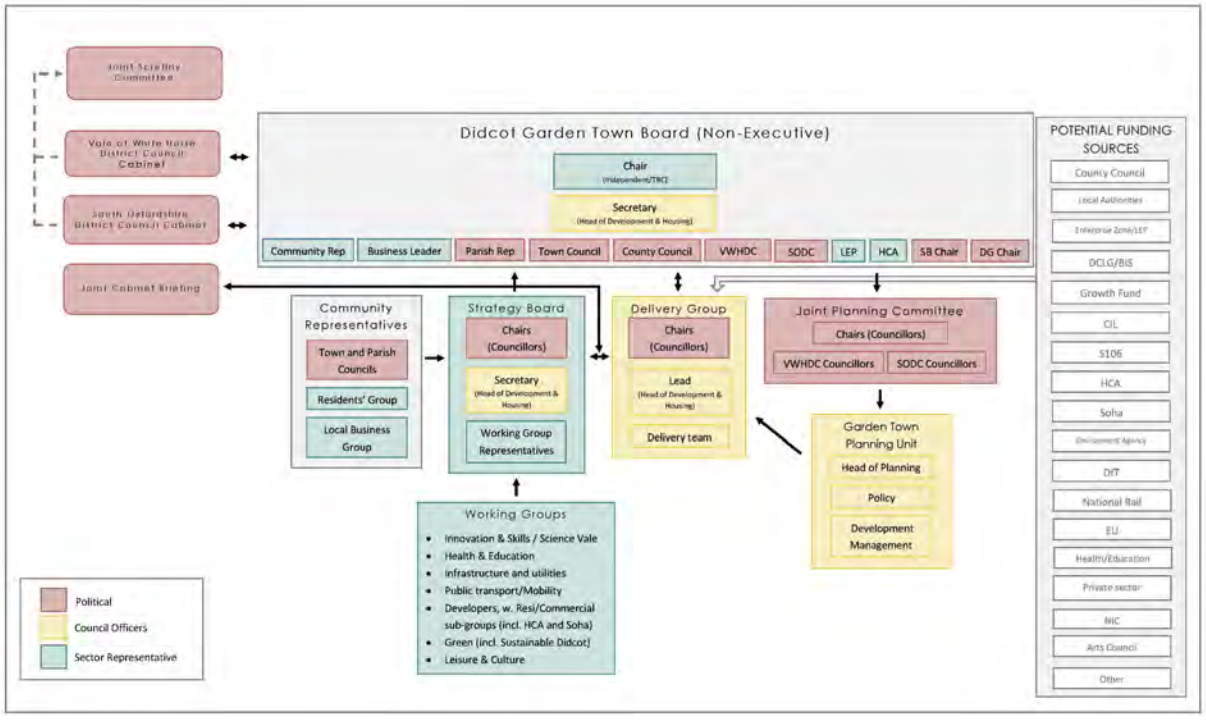
This paper seeks to outline the means by which the Governance structure, set out in the DGT Delivery Plan, will be realised by putting in place:

1. An appropriate scheme of delegation that will enable Council Officers, seconded to work in key DGT delivery teams, to authorise actions and expenditure relating to the implementation of the DGT Delivery Plan.
2. Appropriate Terms of Reference for the various DGT sub-groups that it is proposed to establish as a means of involving members of the local community and key stakeholder in the activities of DGT

Following discussion, the DGT Project Advisory Board will be asked to agree that Chapter 10 of the DGT Delivery Plan be amended to refer to the fact that a draft Scheme of Delegation and Sub-group Operational procedures will be produced, discussed and, hopefully agreed, at the first meeting of the DGT Board.

Didcot Garden Town (DGT) Delivery Plan proposals

Chapter 10 of the DGT Delivery Plan sets out the following proposed governance structure:



1. A scheme of delegation that;
    a. Gives delegated powers to Senior District Council Employees seconded to work in the Delivery Team and the Garden Town Planning Unit. The nature and level of delegated authority will be the same as the delegation given to these Senior Officers under the current (and future) constitutions of South Oxfordshire District Council and Vale of White Horse District Council.

b. Requires Senior Council Officers working in the DGT Delivery Group and the DGT Planning Unit, under the terms of their secondment, to notify the DGT Board of any decisions taken using delegated authority powers that relate to the implementation of the DGT Delivery Plan.

2. A clear set of operational procedures for the DGT Board and the various sub-groups established below the DGT Board.

3. A communications plan that takes account of the need to keep local residents fully informed of the actions of the DGT Board and its' sub-groups and makes provision for direct engagement with local residents via the various subgroups.

Proposed Scheme of Delegation

South and Vale legal team is currently engaging external solicitors to provide legal advice on the project and that they will also be advising on the governance proposals before they are finalised.
These governance proposals will ensure that Council delegated authority can, safely and legally, be granted to Senior Council Employees that are seconded to work in the DGT Delivery Team or Joint Planning Unit. The level of delegated authority will be commensurate with the level they possess prior to being seconded to work in the DGT Delivery Group or DGT Planning Unit.
As part of this scheme of delegation, the Senior Officers concerned will be required to notify the DGT Board of all decisions that they take using delegated authority powers.

Board Operational Guidelines

The initial DGT Board meeting will need to agree a set of future operating guidelines that takes account of the needs of Board members and all key stakeholders.

Sub-group Operational Guidelines

The Scheme of Delegation will require the DGT Board to agree operational guidelines for the Board and its' various sub-groups. The DGT Board Operational Guidelines will be agreed at the same time as the Scheme of Delegation. An initial draft of the sub- group guidelines is attached as Appendix 2(a). However these will need to be the subject of further discussion, before being agreed by the DGT Board.

Next Steps

Once a draft Scheme of Delegation and the Board and Sub-Group Operational Guidelines have been produced, these will need to be discussed and agreed with the DGT Board.
In the meantime, this paper has been added to the appendices of the Delivery Plan to reflect the fact that a draft Scheme of Delegation and Board and Sub-group Operational procedures will need to be produced, discussed and, hopefully agreed by the DGT Board, at the earliest opportunity.

DIDCOT GARDEN TOWN BOARD

SUB-GROUPS

Draft Terms of Reference

Purpose

The various sub-groups that site beneath the Didcot Garden Town Board (DGTB) are the main means of ensuring community involvement in the activities of Didcot Garden Town (DGT). They will provide an opportunity for members of the community, and interested community groups, to participate in the DGT governance and determine the nature of future DGT activities.

Therefore, if someone or some organisation based in DGT's wider area wishes to influence the activities of DGT, the best way to do this is to participate in one or other of the various groups that will be established as part of the DGT governance arrangements
These groups will provide advice and make recommendations to the DGTB, concerning the implementation of the Didcot Garden Town Delivery Plan (DGTDP), and subsequent variations to this plan.

The Management Board will give full consideration to recommendations and advice provided by these groups, whilst balancing recommendations received from other DGT stakeholders and the technical, financial, statutory and operational constraints that influence implementation of the Garden Town Delivery Plan.

Formal decisions beyond the scheme of delegation will need to be taken by the councils, but with full involvement of/recommendations from the Garden Town Management Board, since the Didcot Garden Town Management Board will not initially be a legal entity and cannot, therefore, assume legal or contractual responsibility for the Didcot Garden Town project and information and actions associated with it.

Objectives

The key objectives of DGTB sub-groups are to:

1. Provide advice and guidance to the DGTB relating to the sub-groups' area of expertise, through representation on the DGTB and/or Strategy Group
2. Identify and prepare new project ideas for submission to the DGTB, to consider whether they are worthy of further support
3. Help the DGT Delivery Group deliver projects approved by DGTB, and achieve expected outcomes, where possible
4. Assess whether projects are achieving expected outcomes and provide feedback on this (relative to the sub-groups area of expertise) to DGTMB

Proposed Sub-Groups

Based on the DGT governance structure outlined in the DGDP, and following comments received during the public consultation process, it is initially proposed to create the following DGTB sub-groups:

1. Strategy Group
2. Delivery Group
3. Joint Planning Committee
4. Community Representatives Group
    a. Town and Parish Councils
    b. Residents
    c. Local Business
5. Technical Working Groups
    a. Technology and Innovation
    b. Infrastructure and Utilities
    c. Developers
    d. Landscape and ecology
    e. Culture, Leisure and Sports
    f. Public transport, mobility and access
    g. Skills development and social enterprise
    h. Health and wellbeing

The Strategy Group, Delivery Group, Joint Planning Committee and Community Representatives Group are key components of the governance structure, due to the role they play in proposing, planning and delivering ideas and projects set out within the DGTDP.

The technical working groups are the principle mechanism for submitting new ideas to DGTB (via the Strategy Group) and monitoring progress in relation to the subsequent delivery of DGT projects. Initial suggestions concerning the type of technical working groups are not fixed. New or different groups can be established if there is sufficient demand for these from within the greater Didcot community. Likewise, once created, the members of the group will determine how long they will be active. Initially is suggested that technical working groups would be established for a period of one year and their remit would be extended beyond this period, subject to approval of DGTB.

It is proposed to establish the various DGT management and advisory groups in the following order.

1. Didcot Garden Town Management Board
2. Strategy Group, Delivery Group, Joint Planning Committee
3. Community Representative Group
4. Technical working groups

This order in which the above groups will be formed reflects the governance hierarchy proposed within the Garden Town delivery Plan, whereby all groups will be required to submit their ideas, proposals and recommendations to the DGTB via one of three key management groups – the Strategy Group, Delivery Group or Joint Planning Committee.

The Community Representatives Group will also submit ideas, proposals and recommendations to the DGTB via the same key management groups. However,

they will also have direct representation on DGTB, so will have a greater influence on DGT activities.

This proposal means that the DGTB will not have a full complement of members until after the Community Representative Groups are established. Waiting until the Community representatives Group to be formed, before establishing the DGTB is not practical, however, since early decisions will need to be taken concerning the establishment of technical working groups and early communication with possible various key stakeholders.

Operating Principles and Guidelines

A set of operating guidelines will be produced to help the various sub-groups fully understand their purpose and objectives, and the procedures they need to comply with, so the DGTB can properly consider their ideas and proposals.

This paper broadly describes what is required of the various groups. The operating guidelines will describe how they will meet these requirements and how they will contribute to the governance of DGT.

Group Membership

Strategy Group
The Community Representatives Group will nominate 3 representatives (one each from their Town and Parish Council, Resident and Local Business representatives) to become members of the Strategy Group. Each technical working groups will nominate one of their members to be their representative on the **Strategy Group**. One Councillor from each District Council (nominated by their respective Cabinets) and the County Council will sit on the Strategy Group. Meetings shall be chaired alternatively by one or other of the District Council members. The secretariat for this group will be provided by members of the DGT officer team.

Delivery Group
One Councillor from each District Council (nominated by their respective Cabinets) and the County Council will sit on the Delivery Group. Meetings shall be chaired alternatively by one or other of the District Council members and the co-chairs will, at their discretion, be able to invite some of DGT's other key funders/stakeholders to nominate a representative on the Delivery Group. The secretariat for this group will be provided by members of the DGT officer team.

Joint Planning Committee
The Joint Planning Committee will be comprised of an equal number of VoWH and SODC members. The committee will be chaired alternatively by Councillors from the two District Councils. Setting up the Joint Planning Committee may require the approval of the Secretary of State. Since this will be a formal decision-making body, it would be serviced by SODC's Democratic Services and Planning teams.

Community Representatives Group
The Community Representatives Group is one of the main mechanisms for ensuring local community support for, and involvement in, the activities of DGT. The Group will comprise three main sub-groups – a Town and Parish Councils Group, a Residents Group and a Local Business Group. It will be up to the Community Representatives Group to determine whether the group meets as one group or as three sub-groups

that perhaps only come together twice per year. The community Representatives Group will be able to nominate four representatives to sit on the DGTB. Two of these will be representatives of the Town and Parish Councils (one of which must be a representative from Didcot Town Council), one will represent Resident Groups and one will represent Local Businesses. The Community Representatives Group will nominate its own Chair, Vice Chair and Secretary.

Technical Working Groups
The Technical Working Groups are the second main mechanisms for ensuring local community support for, and involvement in, the activities of DGT. Members will be local residents or company employees within the DGT wider area of influence, or employees of DGT key stakeholders.
Membership of the technical working groups groups will be determined using a standard application process. On their application, all prospective members will be asked to explain;

1. Why they wish to become a member of the group
2. What experience and/or qualifications they have relative to the groups purpose
3. What organisation they will be representing on the group (members can apply to join the group on an "unattached basis". However, if representing a group or company, the applicant must be able to provide written confirmation that they have, in fact, been nominated as the group or company's representative).
4. What they expect to be able to contribute to the group and to the wider aims of Didcot Garden Town.

Opportunities to be a member of the sub-groups will be advertised in local media and applications for sub-group membership will be submitted to the DGTB, for consideration. The DGTB will be the sole arbiter in determining which applications are acceptable and will nominate up to six members of each technical working group. The remaining members of each group will be chosen from the acceptable applicants by the initial six group members. The Groups will normally be expected to have a minimum membership of 6 people and a maximum membership of 12 people.

When advertising for group members and selecting successful applicants, the DGTB will make every effort to ensure that each group is as representative as possible of all businesses, interest groups and individuals within the wider Didcot community (including those within DGT's wider area of influence).

The Chair of each Technical Working Group shall be elected by their fellow group members. This election will take place at the first meeting of the group, where group members will be proposed for the role of Chair by one other members of the group and seconded by another member of the group. Where only one member is proposed and seconded, the proposed individual will become Chair. Where more than one member of the group is proposed and seconded, all members of the group will vote for one or other of the proposed members. Votes will be counted by a show of hands in support of each respective candidate. The individual receiving the most votes will be elected Chair. In the event of a tied vote, lots will be drawn between the tied members to decide the issue.
Following the election of a Chair, the Group will also use the same election process to elect a Vice-Chair and a Group Secretary.

Meeting Frequency, Timings and Format:

The Strategy group and Delivery Group will meet once per month. The Joint Planning Committee will meet bi-monthly. The Community Representatives Group and

Technical Working Groups will meet bi-monthly (unless the groups agree to meet more frequently).
All groups shall meet at a date and time agreed by the group members. Meetings shall be held at a time and location that is convenient to all group members.

Agendas and agreed notes of previous meetings will normally be prepared and circulated one week in advance of each meeting. The Chair will be responsible for circulating further supporting information in a form acceptable to all group members. Meeting notes, including agreed actions will be circulated within one week of each meeting, for agreement by group members.

Agreed actions will be listed and the anticipated completion date and person responsible for completing each action will also be provided.

Agreed meeting notes will be copied to the Chair of the Garden Town Management Board, for subsequent circulation to Garden Town Management Board members, at the Chair's discretion.

Each group may consider the formation of task teams in order to achieve its objectives by implementing key tasks within the specified timeframe, and/or to gain some specific input from community interests that are not already represented on the Group.

The group will produce a brief six monthly summary report, for presentation to the Garden Town Management Board summarising the activities of the Group and achievements over the previous six monthly period.

Where the group require the Garden Town Management Board to make a decision, based on the recommendations of the group, a Board Decision Paper will need to be submitted to the appropriate Garden Town Management Board meeting. The Board Decision Paper will be written using a standard template, to be provided by the DGTB.
DGTB will operate according to the same level of transparency as public bodies. Therefore, all papers submitted to, or emanating from, DGTB will be published on the DGT website. DGTB and DGTB sub-group meeting minutes will also be published on the website, as will all formal DGTB decisions.

Financial Responsibilities

Generally the various DGTB sub-groups will have no financial responsibility. However, if any sub-group requires a budget for a particular purpose, this request will be made in the form of a Board Decision Paper and will need to be approved by the DGTB. The basis for managing this budget will be determined by the DGTB and subject to the scheme of delegation agreed between the DGTB and South and Vale District Councils.

Communications

Whilst DGTB will operate in a transparent manner, with papers and decisions etc. being published on the DGT website, DGTB will also need to communicate with members of the local community on a regular basis, to keep them informed of DGT activities and to seek their involvement in shaping and delivering these activities.

This will likely require the publication of a quarterly newsletter that can be distributed to all residents and businesses within Didcot Garden Town masterplan area (and possibly within the wider DGT area of influence).

Regular news releases, the issuing of periodic publications and the organisation of periodic community events will also be essential mechanisms for keeping people informed of DGT activities.

The Garden Town will have a significant positive impact on local residents and local businesses and it is therefore critical that these audiences are kept informed of DGT activities and, whenever possible, given the opportunity to participate in ideas generation, project formulation and project implementation.

Securing widespread community involvement in the activities of DGT will be critical to the future success of DGT.

Available information

Website: www.didcotgardentown.co.uk