



FLOOD RISK ASSESSMENT

ON LAND OFF
MOULTON CHAPEL ROAD, COWBIT

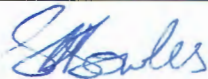
ON BEHALF OF
SURFACE PLANNING

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Flood Risk Assessment on Moulton Chapel Road, Cowbit**1834/02r1**

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1.0 INTRODUCTION

- 1.1 Surface Planning is proposing to develop a parcel of land located adjacent to Moulton Chapel Road, Cowbit for 32No. residential dwellings. As this is greater than 10No. dwellings, this is classified as a Major Development by Lincolnshire County Council and a Flood Risk Assessment is, therefore, required.
- 1.2 It is within the general development strategy of the country for development in areas where there is a risk of flooding to be assessed to avoid unnecessary increase in the requirement for flood defence. Under the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG), consultation is required with the Environment Agency, Land Drainage Authority and Water Authority and a Flood Risk Assessment Report should be prepared considering the development proposals and make recommendations for any flood mitigation measures.
- 1.3 ARP Associates have been appointed to carry out a Flood Risk Assessment of the site, implement appropriate consultations and prepare a report, in accordance with NPPF, to satisfy the requirements of the Planning Authority.
- 1.4 The consultations and site appraisal have been carried out during August and September 2018.
- 1.5 The report has been initially prepared for the use and reliance of the Client only. The report shall not be relied upon or transferred to any other parties without the written agreement of ARP Associates. For the avoidance of any doubt, where ARP Associates enters into a letter of reliance for the benefit of a third party, that third party will be permitted to rely on the report. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party without ARP Associates consent.

2.0 SITE DESCRIPTION

General

- 2.1 The site is undeveloped greenfield open space and is rectangular in shape, with an approximate area of 0.88ha. The site is centred on Ordnance Survey Grid Reference TF 26730 18007.
- 2.2 A site location plan is presented in Appendix A.

Current Use

- 2.3 The site is presently an overgrown grassed field. There is no formal access to the site; however, access could be gained from Moulton Chapel Road to the north of the site.

Boundaries

- 2.4 The northern boundary of the site is a landscaped soft margin onto Moulton Chapel Road, also known as B1357 Stonegate. The western boundary is formed by large trees and the property extents of private dwellings served from the roads named Stonegate and Backgate. The east of the site is predominantly bound by hedgerows, which deteriorate into scrubland close to the northeast corner of the site. There is a patch of relatively flat grass and scrubland between the east of the site and the A16 Cowbit Road and Stonegate roundabout, located some 30m to the east. An approximately six metre high hedgerow bounds the full length of the southern boundary of the site, with a land drainage ditch on the southern side. The majority of the urban area of Cowbit is to the west of the site, with predominantly arable farming land use to the north, east and south of the site.

Topography and Vegetation

- 2.5 The site is situated within a relatively flat part of the country, and the site follows the same trend. The land within the site is broadly flat with minor variations in height. The highest point on site is located in the southwest of the site, at a recorded level of 2.84m AOD. Whilst there are some undulations causing slight depressions across the site, the general trend is a

fall in level to the northeast of the site. The lowest level recorded is 2.46m AOD in the north east, giving negligible gradient across the site. A higher level of 2.97m AOD is present on the Stonegate, with the road generally at a slightly higher level than the site. The road is cambered adjacent to the site.

- 2.6 A topographical survey is included within Appendix B for reference purposes.
- 2.7 The Site is covered by grass, shrub and scrub. A well-established thick hedgerow runs along the site's southern and south-eastern boundaries. An area of mature woodland is located on the western boundary of the site, providing visual screening between the site and the adjacent private property boundaries.

Drainage

- 2.8 A Ground Penetrating Radar Survey and intrusive investigation of the site was undertaken during August 2018. The survey confirmed the presence of 4No. 150mm diameter rising foul public sewers running within the northern extent of the site. They run in an east to west direction and are located between depths of 1.2-1.4m below ground level and between 6 to 8m from the kerb along Moulton Chapel Road. The results of this survey are presented in Appendix C for reference purposes.
- 2.9 The site is located within a region known as The Fens. This is a low lying coastal plain drained by a large purpose built land drainage network of watercourses. They ultimately outfall into The Wash, a bay and estuary at the north-west corner of East Anglia. The land drainage network within proximity of the site is maintained by the South Holland Internal Drainage Board.
- 2.10 The adjacent highway, Stonegate, is drained by a combined kerb and drainage system as highway drainage. Records of the outfall have not been sought at the time of writing the report.
- 2.11 The nearest watercourse to the site is Mill Dyke located just outside the southern boundary of the site. It conveys flow towards the east and is assumed to carry surface water from Cowbit.

Mill Dyke outfalls into Wheat Mere Dyke, 100m to the east of the site, which eventually discharges into the River Nene, a Main River, located approximately 20km downstream.

- 2.12 The nearest Main River as classified by the Environment Agency is the River Welland, which is located approximately 1.6km to the west of the site. The site is located approximately 600m to the east of Barrier Bank, which is a raised flood defence for the River Welland. The area between the River Welland and the Barrier Bank is functional flood plain known as Cowbit Washlands.

3.0 ENVIRONMENT AGENCY CONSULTATION

- 3.1 A consultation was requested from the Environment Agency and a copy of their response, reference CCN/2018/96794 dated 28th August 2018, is presented in Appendix D for reference purposes.
- 3.2 The Environment Agency flood map for planning confirms that the majority of the site is in Flood Zone 1. A small area within the far north-eastern extent of the site is located within Flood Zone 2. The flood map shows areas of land that may flood from rivers or the sea and would be shaded blue. These areas do not take into account defences, as water can overtop them or the defences can fail in extreme conditions. The Zone classifications are:-
- 3.2.1 Flood Zone 1 - "Low Probability" is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (less than 0.1%).
- 3.2.2 Flood Zone 2 - "Medium Probability" is assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding in any year (1% - 0.1%) and between a 1 in 200 and 1 in 1,000 annual probability of flooding from the sea (0.5% - 0.1%).
- 3.2.3 Flood Zone 3 - "High Probability" is assessed as having a 1 in 100 or greater annual probability of river flooding in any year (greater than 1%) and a 1 in 200 chance or greater annual probability of flooding from the sea (less than 0.5%).
- 3.3 The latest flood map for surface water, which shows areas where surface water only would be expected to flow or pond in England & Wales has also been revised. All land in England and Wales will be within 'one' of a possible 'four' categories. The four categories shown on the map are:-
- 3.3.1 High - This area has a chance of flooding greater than 1 in 30 in any given year (annual probability of flooding 3.3%).

- 3.3.2 Medium - This area has a chance of flooding between 1 in 100 (1%) and 1 in 30 (3.3%) in any given year.
- 3.3.3 Low - This area has a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%) in any given year.
- 3.3.4 Very low - This area has a chance of flooding of less than 1 in 1000 (0.1%) in any given year.
- 3.4 The Environment Agency website provides a risk of surface water flooding map which demonstrates that the site is not within the mapped extent of surface water flooding and is at 'very low' risk of surface water flooding.
- 3.5 The site is protected by earth embankment flood defences, and upstream flood storage reservoirs, which protect the site from up to a 1 in 100 year fluvial flood event in any one year. The defences are in 'fair' condition and are inspected by the Environment Agency once a year.
- 3.6 Modelled flood levels from the River Welland have also been provided. Levels taken from the nearest node location point, reference Welland 20224 gives a 1 in 100 year plus a 20% allowance for climate change in-channel maximum water level of 4.67m AOD. The Welland Hydraulic Modelling Report appendices include a range of mapping for different storm scenarios. The site is shown to be outside the extent of all storm events, including the 1 in 100 plus climate change event.
- 3.7 The Environment Agency has also provided a map showing a record of historic flooding occurrences in the vicinity of the site. The map demonstrates there is no record of flooding within the site or to its immediate vicinity. A flood event in 1947 inundated Cowbit Wash, a flood storage reservoir designed for out of bank flows from the River Welland at times of flood.
- 3.8 The Environment Agency also provide a map showing the extent of flooding expected to occur should a reservoir fail, and the extent of flood risk associated with rivers and the sea. Reservoir failure is associated with the Cowbit Wash, a reservoir designed for the storage of floodwater.

4.0 WATER AUTHORITY CONSULTATION

- 4.1 A consultation was requested from Anglian Water, who is the Water Authority for this area, and a copy of their response, reference 972/903899111/1/0000579 dated 22nd August 2018, is presented in Appendix E for reference purposes.
- 4.2 Anglian Water asset mapping shows there are 4No. rising foul sewers running east to west within the centre of the site.
- 4.3 The foul drainage from this development is in the catchment of Cowbit Water Recycling Centre, which currently does not have capacity to treat the flows from the development site. Anglian Water are obligated to accept the foul flows from your development with the benefit of planning consent and would therefore take the necessary steps to ensure that there is sufficient treatment capacity should the planning authority grant planning permission.
- 4.4 The Anglian Water assessment has been based on development flows connecting to the nearest foul water sewer of the same size or greater pipe diameter to that required to drain the site. On this basis, a 150mm internal diameter pipe is required to drain the development site. Anglian Water has assessed the impact of gravity flows from the planned development to the public foul sewerage network. Anglian Water confirmed that the foul sewerage system, at present, has available capacity for the site. The connection point will be to the nearest 150mm diameter sewer at manhole 7002, at National Grid Reference TF2677018040, located in Stonegate.
- 4.5 The development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.
- 4.6 There are no public surface water sewers within the vicinity of the proposed development. Therefore Anglian Water will be unable to provide the site with a feasible solution of surface water disposal within the current assets. Alternative methods of surface water disposal will need to be investigated such as infiltration techniques or a discharge to a watercourse in accordance with the surface water management hierarchy as outlined in Building Regulations Part H.

- 4.6 The alternative is that a new surface water sewer is constructed which is used to convey surface water from the site to a watercourse or as part of a SuDs scheme, where appropriate. Subject to the sewer being designed in accordance with the current version of Sewers For Adoption, the sewer can be put forward for adoption by Anglian Water under Section 104 of the Water Industry Act 1991.
- 4.7 If the outfall is to a watercourse, the applicant will be required to obtain consent to discharge via the appropriate body. If the site has no means of drainage due to third party land then the developer may be able to requisition Anglian Water, under Section 98, to provide a connection to the public sewer for domestic drainage purposes. As part of this option, the developer may wish to enter into a works agreement in accordance with Section 30 of the Anglian Water Authority Act 1977. This will allow the developer to design and construct the public sewer using Anglian Waters' statutory powers in accordance with Section 159/168 of the Water Industry Act 1991.
- 4.8 Anglian Water will consider the adoption of SuDs provided that they meet the criteria outline in their SuDs adoption manual. This can be found on our website at <http://www.anglianwater.co.uk/developers/suds.aspx>. They will adopt features located in public open space that are designed and constructed, in conjunction with the Local Authority and Lead Local Flood Authority (LLFA), to the criteria within our SuDs adoption manual. Specifically, developers must be able to demonstrate:
- Effective upstream source control,
 - Effective exceedance design, and
 - Effective maintenance schedule demonstrating that the assets can be maintained both now and in the future with adequate access.

5.0 LAND DRAINAGE AUTHORITY CONSULTATION

- 5.1 A consultation was requested from Lincolnshire County Council (LCC) who is the Land Drainage Authority for this area and a copy of their response dated 15th August 2018 is presented in Appendix F for reference purposes.
- 5.3 The Land Drainage Authority confirmed that the discharge to the watercourse will be at a greenfield runoff rate.
- 5.3 LCC commented they hold no records of any flooding for the site.
- 5.4 LCC were unable to comment upon the suitability of a watercourse for accepting discharge, and advised a drainage strategy will need to be determined as part of the drainage strategy. LCC also advised contacting the South Holland Internal Drainage Board, Environment Agency and Anglian water to enquire about any information they may hold.

6.0 INTERNAL DRAINAGE BOARD CONSULTATION

- 6.1 A consultation was requested from South Holland Drainage Board (SHIDB) who is the Internal Drainage Board for this area and own and maintain the local areas land drainage network. A copy of their response, dated 13th September 2018, is presented in Appendix G for reference purposes.
- 6.2 SHIDB did not request a specific surface water discharge rate.
- 6.3 SHIDB agreed that infiltration across most of their drainage district is difficult to achieve given the nature of the soils and the shallow depth of groundwater.
- 6.4 A map was provided which demonstrates Mill Dyke is the Board's adopted watercourses, reference B21, shown in blue (with the culverted lengths in maroon). Works to the watercourse require consent under Section 23 of the Land Drainage Act. SHIDB confirmed the requirement to retain a 9m maintenance strip adjacent to this watercourse.
- 6.5 It was confirmed that the site is within the Internal Drainage District (IDD) of SHIDB and that the Board's byelaws apply. These Byelaws are available on the website https://www.wlma.org.uk/uploads/SHIDB_Byelaws.pdf. The site is located in catchment B - CMT193P - Wisemans (South) of the Board's Drainage District, as shown on Board's website https://www.wlma.org.uk/uploads/210-SHIDB_Index.pdf.
- 6.6 Land drainage consent is required for surface water (or treated foul water) discharge to a watercourse (either directly or indirectly). Consents granted may be conditional.
- 6.7 SHIDB confirmed recommend that where works are associated with a planning permission that any required consents are sought prior to the determination of the planning application.

7.0 MATERIAL CONSIDERATION IN RESPECT OF NPPF AND PPG

Flood Classification

- 7.1 The consultation with the Environment Agency confirms that the site falls within Flood Zones 1 and 2.. Therefore, in accordance with Table 1 of the PPG this part of the site falls within Flood Zone 1 'Low Probability' and Flood Zone 2 'Medium Probability'.

End Use

- 7.2 The development proposal is for the construction of 32 No. residential dwellings on the site. A proposed development masterplan is presented in Appendix H for reference purposes.
- 7.3 When applying Table 2 of the PPG, the flood risk vulnerability classification shows that the proposed end use will fall into a 'More Vulnerable' classification under the general classification 'dwellings'. With reference to NPPF, the siting of More Vulnerable development within Flood Zone 1 and 2 is deemed appropriate and assessment of other sites (the Sequential Test) is not deemed necessary.

Flood Sources

- 7.4 Flooding from Rivers - The nearest Main River is the River Welland, located approximately 1.6km to the west of the site. The Environment Agency Flood Mapping from Rivers and Sea shows the majority of the site is within Flood Zone 1, land at 'low' risk of flooding from this source. A small extent of the north-east of the site is located within Flood Zone 2, which is land at 'medium' risk of flooding.
- 7.5 Any potential flooding from the River Welland would emanate from the west. Modelled flood levels have been assessed from the River Welland nearest node location point, reference Welland 20224. This gives a 1 in 100 year plus a 20% allowance for climate change in-channel maximum water level of 4.67mAOD, which is the highest water level referenced within data model results provided by the Environment Agency. Utilising the mapping data available from the Environment Agency, it can be seen that a 5m AOD contour level is present along the full length of Barrier Bank. Levels on site range between 2.46mAOD and 2.84m AOD. Given

the Barrier Bank lies between the flood source, and is at a higher level than the worst case modelled flood water depth, the site is considered to be at a low risk of flooding from rivers.

- 7.6 Flooding from Local Watercourses - The nearest watercourse is Mill Dyke which flows along the southern boundary of the site. This conveys flow eastwards into Wheat Mere Drain, 100m to the east of the site. Both watercourses are at a lower level than the site. Analysis of the LIDAR Composite Digital Terrain Model data shows a 1m AOD contour level along Mill Dyke. As the lowest level on site is 2.46m AOD, it is anticipated that the watercourse is at least 1.5m lower than the site. . Furthermore, historically SHIDB has stated that the 2085, 1 in 100 year plus climate change flood level in Mill Dyke is modelled to be 1.18m AOD. This level is over 1.3m lower than the anticipated bank level of approximately 2.5m AOD within the site. In the unlikely event that the dyke was to flood, because the local topography is an extensive area of low lying land, the flood level would not be anticipated to rise significantly due to the large coverage area anticipated. Consequently, the site is considered to be at low risk of flooding from this source.
- 7.7 Flooding from the Sea – The Environment Agency Flood Mapping from Rivers and Sea shows the majority of the site is within Flood Zone 1, land at ‘low’ risk of flooding from this source. A small extent of the north-east of the site is located within Flood Zone 2, land at ‘medium’ risk of flooding. It is anticipated that external levels and plot levels can be designed to mitigate for any residual risk of flooding from this source, if deemed necessary during detailed design. Therefore, the site is therefore at ‘low – medium’ risk of flooding from the sea.
- 7.8 Flooding from Land - Impermeable surfaces have positive drainage systems in place including adjacent adoptable roads which have footways draining away from the site into these drainage systems. Providing that the design of the external levels for the proposed development takes account of overland flow during any exceedance event, it is considered that flooding from this source is ‘low’ risk.
- 7.9 Flooding from Groundwater - Whilst there is no intrusive ground investigation, the BGS geology online viewer advises that the bedrock comprises Oxford Clay Formation (mudstone) and superficial deposits comprise Tidal Flat Deposits (clay and silt). The geology is likely to be impermeable, which is emphasised by the presence of a nearby land drainage network,

preventing issues of groundwater. Therefore, flooding from this source is considered to be 'very low' risk.

- 7.10 Flooding from Sewer - There are four rising foul sewers located within the site, and positive drainage systems are present on the adjacent impermeable surfaces. There may be land drainage present and a new drainage network will be introduced for the development. It is possible that a blockage may result in flooding from manholes or gullies with the lowest cover levels and this will need to be considered as part of any proposed development.
- 7.11 Flooding from Reservoirs, Canals or Artificial Sources - The Environment Agency mapping shows the site is within an area at risk from reservoir flooding, from the Cowbit Wash which is a flood storage reservoir for the River Welland in times of flood. The Cowbit Washlands right hand bank is understood to have a crest in excess of 15.0m and the risk of breaching is considered negligible. The Environment Agency have not produced a Flood Hazard Maps a breach of the Barrier Bank, indicating that they agree with this view. It should be noted that reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. Therefore the risk from this source is deemed to be 'low'.

Climate Change

- 7.12 The NPPF and PPG have indicated that the Global sea level will continue to rise, depending on greenhouse gas emissions, and the sensitivity of the climate system and there will be an increase in rainfall across the country.
- 7.13 United Kingdom climate change guidance was revised in February 2016 for peak river flows and peak rainfall intensities. With regards to peak river flows, a regionalised approach has now been adopted to climate change impacts based upon the river basin district of the proposed development site, the flood risk vulnerability of the proposed development and the present day Flood Zone classification.
- 7.14 The proposed development site is situated within the Anglian river basin district, which, based on an "upper end" climate change scenario, could see peak river flows increase by 65% by 2115. As the majority of the site is situated within Flood Zone 1, with the far north-eastern

extent located within Flood Zone 2, an increase of 65% flows is deemed unlikely to affect the proposed development site.

- 7.15 In accordance with the revised climate change data, the published figures show that for an expected development life of greater than 50 years, the anticipated increase in rainfall could be up to 40%, subject to the location within the country. However, the worst case modelled flood levels from the River Welland data received from the Environment Agency allowed for a 20% uplift to account for climate change. The surface water drainage system should, therefore, be designed in accordance with this requirement.
- 7.16 Due to the land drainage network within the local area, surface water run-off from adjoining land is unlikely to be an issue. However, the existing levels on Stonegate road are generally at a higher level than the site, and the road is cambered. IT is possible that surface water run-off may reach the northern parts of the site. However, the development proposals include for a footway along this boundary, which is expected to be a full height kerb, which would act as a barrier to overland flow from the highway. However, the site access will tie-in to existing highway levels. Gullies or linear drainage should be installed along the access to the site, preferably along the channel line, to minimise the risk of water ingress to the site. Furthermore, it is anticipated that any run-off which does reach the site could be dealt with adequately, if necessary, elsewhere along the site boundary by a cut-off drain. Therefore, any run-off from outside the site will be insignificant and, on this basis, any rainfall falling within the site boundaries will need to be considered in respect of climate change.

Flood Mitigation

- 7.17 The majority of the site is in Flood Zone 1. A small area within the far north-eastern extent of the site is located within Flood Zone 2. It will be necessary to take account of potential sources of flooding through the layout and form of the development and implement the use of Sustainable Drainage techniques, where possible.
- 7.18 Flood mitigation measures are only required in the event of a catastrophic storm, overtopping or failure of the river defences or blockage of the existing or proposed sewers.. The following precautionary mitigation measures are, therefore, recommended:-

- 7.18.1 The finished floor levels to the properties shall be raised above general external levels by a minimum of 150mm. However, within the area of the development within Flood Zone 2, properties in the area shown to currently be at medium of fluvial flooding/flooding from the sea should be either 300mm above general external levels or 300mm above the level of the watercourse, whichever is higher.
- 7.18.2 The proposed dwellings will be designed without any basements and ground floors shall comprise solid concrete slabs or beam and block floors with screed construction.
- 7.18.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper level.
- 7.18.4 In the unlikely event of flooding of the site, it would be appropriate to design external levels with falls to non-critical areas, such as landscape, where the water can pond without causing danger for people or damage to buildings.

Sustainable Drainage

- 7.19 In order to comply with the requirements of NPPF, it will be necessary to consider aspects of sustainable drainage techniques for the new development. Whilst there is no intrusive ground investigation, the BGS geology online viewer advises that the bedrock comprises Oxford Clay Formation (mudstone) and superficial deposits comprise Tidal Flat Deposits (clay and silt). The geology is likely to be impermeable, which is emphasised by the presence of the nearby land drainage network. Therefore, the ground strata are likely to be considered as unsuitable for the disposal of surface water using infiltration techniques. However, it may be necessary to carry out appropriate infiltration tests in accordance with BRE Digest 365 "Soakaway Design" prior to construction on site with the results presented in a report for the approval of the Planning Authority. However, for the purposes of this report, a positive system to the watercourse will be required for surface water drainage.

Drainage

- 7.20 It is a requirement of the NPPF to ensure that surface water run-off from any proposed development has negligible consequence on downstream areas either in sewer capacity or discharge to watercourse.

Existing Surface Water Run-off

- 7.21 Lincolnshire County Council as Land Drainage Authority and South Holland Drainage Board as the Internal Drainage Board for this area require that the site is assessed as greenfield.
- 7.22 Therefore, the greenfield area has been assessed using the IH124 method of calculating greenfield run-off rates. This shows the maximum greenfield run-off rate of 1.208/s/ha is considered appropriate for this area. The site area has been assessed as being 0.88ha and, therefore, a greenfield run-off rate of 0.53l/s would be appropriate for this site. The indicative greenfield run-off calculations are presented in Appendix J for reference purposes.

Foul Drainage

- 7.23 Anglian Water has advised that the connection point should be to the nearest 150mm diameter sewer at manhole 7002, at National Grid Reference TF2677018040, located in Stonegate. From records provided, it is anticipated that the invert level of this manhole is 0.883m AOD, giving an anticipated depth to invert of 2.07m.
- 7.24 To assess the plausibility of this requirement, an indicative drainage strategy has been undertaken based on the proposed site plan. To enable a gravity connection into manhole 7002, proposed levels on the western part of the site may need to be raised. Assuming a minimum cover of 900mm is required between the invert level and cover level, the proposed level at the head of the foul run may need to be raised to approximately 3.15m AOD. Currently, levels in this area are around 2.61m AOD, suggesting a raise of 0.5m may be required. To minimise the volume of earthworks required, a stepped-plateau approach may be appropriate, such that proposed plot and external levels are progressively lowered towards existing levels towards the east.

- 7.25 As an alternative, it may be possible to reach agreement with the Regulatory Authorities to provide two separate foul water outfalls into the existing sewer within Stonegate. This would shorten the proposed drainage runs, which would likely enable two gravity outfalls without the need to substantially raise plot levels.
- 7.26 The above proposals will need to be agreed with the Regulatory Authorities. Notwithstanding this, it is still plausible that an adoptable pumping station may be required. In this instance, sewerage pumping must not exceed the agreed discharge rate required by the Regulatory Authorities.

Proposed Surface Water Drainage

- 7.27 Due to the low greenfield run-off rate calculated, any flow control device restricted to 0.53l/s will have a small orifice that will be prone to blockage. This would increase the risk of flooding upstream. Therefore, it is considered that a restricted discharge rate of 5l/s is appropriate.
- 7.28 The proposed site layout has been assessed as having a proposed impermeable area of 0.44ha, based on approximately 50% of the total developable area. Indicative calculations have been carried out using the WinDES Source Control Computer Program. The proposed surface water system should be designed to accommodate a 1 in 30 year storm event without flooding and the 1 in 100 year storm plus climate change event should be retained within the site in an area which will not affect the new buildings or third party land from flooding.
- 7.29 Restricting the discharge rate to no greater than 5l/s, requires 104.4m³ of on-site storage to be provided for a 1 in 30 year storm. This can be achieved by several methods including oversize pipes or above or below ground attenuation. One such option would be to provide 11m by 12m of 0.8m deep underground attenuation or equivalent to achieve the necessary volume. The drainage system will need to accommodate the 1 in 100 year plus 20% climate change event without causing flooding of property or third party land. In the event that levels dictate that the 1 in 100 year plus climate change flood water will flow off-site, an additional or larger storage facility will be required. Therefore, on-site storage would increase to 189.4m³. Indicative surface water calculations are presented in Appendix K. However, detailed calculations and proposals will need to be prepared and submitted to the Planning Authority for approval prior to construction.
- 7.30 As discussed in 6.19, soakaways are not considered to be a viable proposal for discharge of surface water for this site. However, this will be confirmed by infiltration testing. Assuming soakaways are determined to not be feasible, in accordance with the Sustainable Drainage Management train hierarchy, discharge to watercourse is considered to be the next most appropriate option.

- 7.31 The watercourse located on the southern boundary of the site is considered to be below the existing level on site, and appears to have a downstream confluence with Wheat Mere Drain. Therefore, a piped system to this watercourse is considered to be an appropriate proposal for surface water discharge. The route is not expected to cross third-party land, although any connection will be subject to the prior agreement of the Regulatory Authorities. Subject to a drainage strategy and detailed design, the most appropriate location for surface water attenuation may prove to be a mixture of oversized pipes within the adoptable highway, with an underground storage facility within the public open space area. The Proposed Site Layout indicates that the public open space is to be located on the eastern side of the development site. The site is very flat and, consequently, it is plausible that the system may need to be pumped to a higher level to enable a gravity outfall into the watercourse. In this instance, a surface water pumping station would be required to facilitate the connection. As part of the development proposals, agreement will need to be reached with Anglian Water regarding build-over or diversion of existing assets on site.
- 7.32 The options above are subject to agreement with the Regulatory Authorities.

Watercourse Conditions

- 7.33 Any surface water connection to watercourse and/or the construction of a headwall or works to the watercourse will require the approval of the Regulatory Authorities.
- 7.34 A 9m maintenance strip adjacent to the watercourse is required.

Emergency Egress During Times of Flood

- 7.35 It is a requirement under the PPG that occupants should be able to egress any building during times of flood, without being trapped by flood conditions.
- 7.36 As the site falls within Flood Zones 1 and 2, and there is no flooding from the local watercourse, no special mitigation measures are required for emergency egress during times of flood.

8.0 COMMENTS

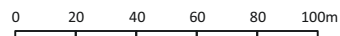
- 8.1 Flood mitigation measures are only required in the event of a catastrophic storm, overtopping or failure of the river defences or blockage of the existing or proposed sewers. The following precautionary mitigation measures are, therefore, recommended:-
- 8.1.1 The finished floor levels to the properties shall be raised above general external levels by a minimum of 150mm. However, within the area of the development within Flood Zone 2, properties in the area shown to currently be at medium of fluvial flooding/flooding from the sea should be either 300mm above general external levels or 300mm above the level of the watercourse, whichever is higher.
- 8.1.2 The proposed dwellings will be designed without any basements and ground floors shall comprise solid concrete slabs or beam and block floors with screed construction.
- 8.1.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper level.
- 8.1.4 In the unlikely event of flooding of the site, it would be appropriate to design external levels with falls to non-critical areas, such as landscape, where the water can pond without causing danger for people or damage to buildings.
- 8.2 A 20% increase in rainfall shall be incorporated into any new positive drainage system to satisfy the requirements of climate change.
- 8.3 In terms of foul water, the proposed connection point is to the nearest 150mm diameter sewer at manhole 7002, at National Grid Reference TF2677018040, located in Stonegate. This may result in the requirement to raise existing levels. A pump station may be required. However, it may be possible to reach agreement with the Regulatory Authorities to having two outfalls.
- 8.4 Sustainable Drainage Systems of infiltration techniques are considered to be unsuitable on this particular site and for the purpose of this report a positive drainage system will be

required. However, infiltration testing will need to be carried out in accordance with BRE Digest 365 "Soakaway Design" prior to construction on site and the results will be reported to the Planning Authority for approval.

- 8.5 Assuming soakaways are determined to not be feasible, in accordance with the Sustainable Drainage Management train hierarchy, discharge to watercourse is considered to be the next most appropriate option.
- 8.6 The proposed surface water drainage system shall be designed for an allowance of 20% for climate change and restricted to the agreed discharge rate for the appropriate attenuation incorporated into the design. A detailed design and supporting calculations shall be submitted to the Planning Authority for approval prior to construction on site. The most appropriate location for surface water attenuation may prove to be a mixture of oversized pipes within the adoptable highway, with an underground storage facility within the public open space area. The site is very flat and, consequently, it is plausible that the system may need to be pumped to a higher level to enable a gravity outfall into the watercourse. In this instance, a surface water pumping station would be required to facilitate the connection.
- 8.7 As part of the development proposals, agreement will need to be reached with Anglian Water regarding build-over or diversion of existing assets on site.
- 8.8 No special mitigation measures are required for emergency egress during times of flood.
- 8.9 Subject to compliance with the above, the proposed development can satisfy the requirements of the National Planning Policy Framework and the Planning Practice Guidance in relation to flood risk.

APPENDIX A

SITE LOCATION PLAN



Notes

Ordnance Survey Map

Ordnance Survey Map reproduced with the permission of
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CDM 2015

This drawing is for illustrative purposes and/or obtaining the relevant planning permission only. It should not be used for construction and accordingly, risk identification under the Construction (Design & Management) Regulations 2015 has not been undertaken.

Rev.	By	Notes	Date
 Robert Doughty Consultancy		32 High Street, Helpringham ☉ Sleaford, Lincolnshire NG34 0RA Tel: 01529 421646 Fax: 01529 421358 Email: admin@rdc-landplan.co.uk Web: www.rdc-landplan.co.uk	
Client:			
Mr P Smith			
Project:			
Land South of Moulton Chapel Rd, Cowbit			
Drawing title:			
Location Plan			
Drawing No.		Rev.	Drawn
1207-02_PA_LP01		-	WW
Scale		Date	Checked
1:2500@A4		13.01.17	LMS



LAND OFF CHAPEL ROAD, COWBIT
LOCATION PLAN
SCALE 1:500 @A3
DATE - SEPT 18
REF-CWB-2018-002

A P P E N D I X B

T O P O G R A P H I C A L S U R V E Y



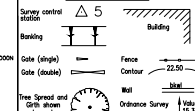
Co-ordinate Table			
Station	Eastings	Northings	Level
1	520764.526	518044.281	3.524
2	520765.217	518045.431	2.979

GPS Note:
This survey is related to OSGB36(13) coordinate system by
GPS typical static methods. No scale factor has been
applied to the survey information. All horizontal distances
taken from this drawing are ground distances.

Every effort has been made to confirm tree species on
site, yet it is advised to confirm these details with an
arborist before proceeding with any design.

Revision: 1
Description: Mound in the centre of site identified, client name amended.
Date: 05.08.18

LEGEND



Abbreviations	
Relative Beacon	BB
Barbed	BD
Boundary	BL
British Telecom Box	BTB
BT Inspection Cover	BTI
Concrete Potting Slab	CPS
Cable Manhole Cover	CMT
Electricity Cable Pit	ECP
Electricity Pole	EP
Earth Rod	ER
Fire Hydrant	FH
Flag Staff	FS
Gas Valve	GV
Gate Post	GP
Gully	GU
Inspection Cover	IC
Mark Outlet	KO
Lamp Post	LP
Manhole	MH
Marker Post	MP
Parking Meter	PM
Post	P
Retaining Wall	RW
Roofed Wire Fence	RWF
Close Barbed Fence	CBF
Chainlink Fence	CLF
Chainlink Paving Fence	CPF
Post and Rail Fence	PRF
Post and Wire Fence	PWF
Wooden Panel Fence	WPF
Plan	PE
Road Sign	RS
Roading Lip	RL
Service Marker	SM
Slip Post	SP
Sluice Valve	SV
Stop Sign	ST
Stop Cock	SC
Telephone Pole	TP
Telephone Call Box	TCB
Traffic Light	TL
Unroaded	UL
Vert Pipe	VP
Water Meter	WM
Edge Level	EL
Ridge Level	RL
Roof Level	RFL
Soft Level	SL
Threshold Level	THL
Finished Floor Level	FLL
Cover Level	CL
Invert Level	IL
No. Public Connection	NPC
Crucial to Life	CTL
Surface Marker	SM
Full Marker	FM
Flower Bed	FB
Shrub Bed	SB



Client: MINSTER PROPERTY GROUP

Project: LAND AT MOULTON CHAPEL ROAD, COWBIT SPALDING, PE12 6XA

Site: TOPOGRAPHICAL SURVEY

Drawn by: PG Checked by: PG

Scale: 1:100@A0 Date: AUG 2018

Drawing Number: TS18-345D\1 Revision: A

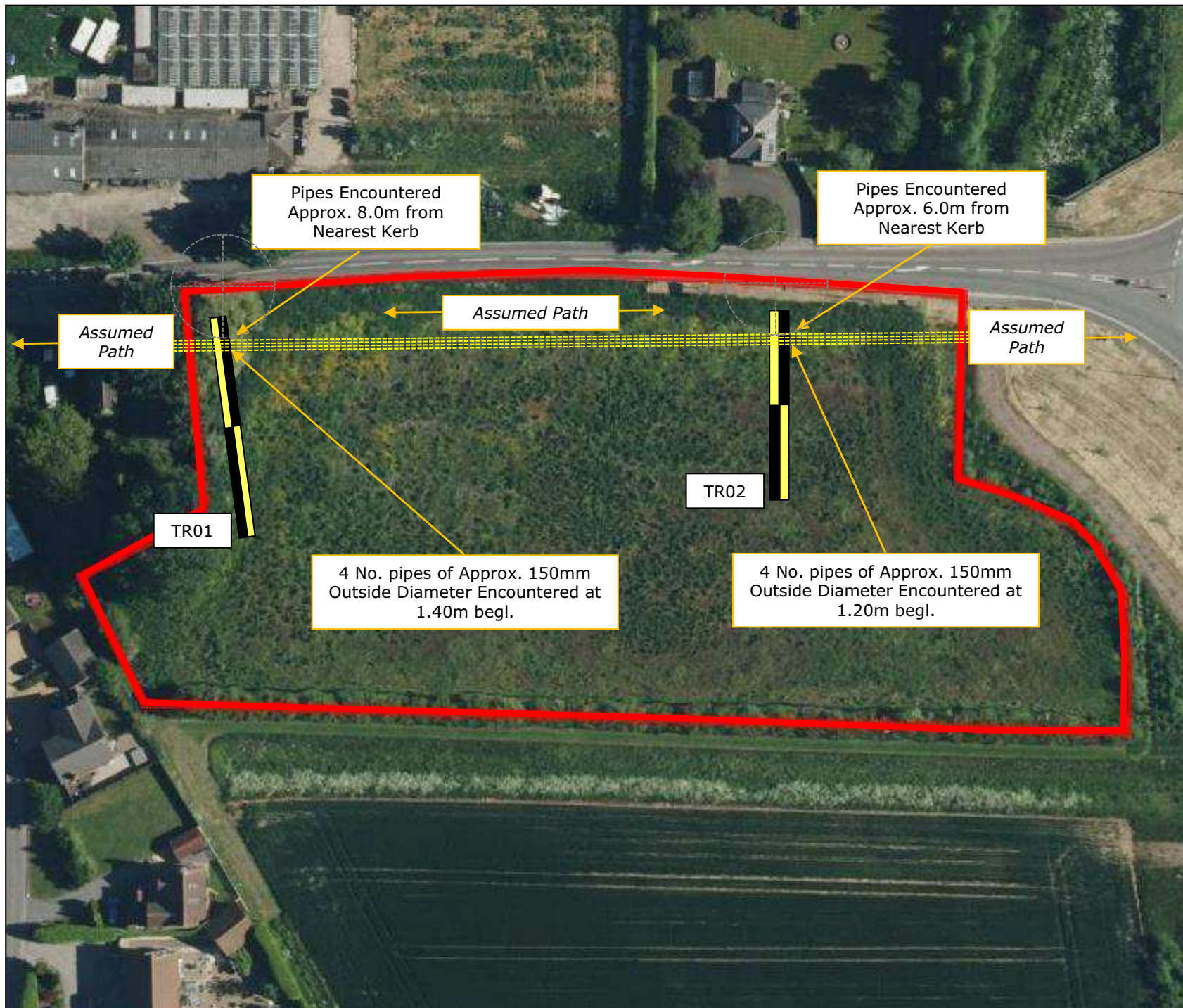
Sheet: 1 of 1

All levels related to Ordnance Survey active GPS network, of survey station 13.

Notes: 2.87m

A P P E N D I X C

G R O U N D P E N E T R A T I N G R A D A R S U R V E Y



- DO NOT SCALE
- NOTES:
-  Approx. Site Boundary
-  Approx. Location of Trial Trenches



www.geo-matters.com
info@geo-matters.com

CLIENT:
Minster Property Group Ltd

PROJECT:
Land off Moulton Chapel Road,
Cowbit

TITLE:
Plan of Observed Pipe
Positions

SCALE@SIZE : NTS	ISSUE: FINAL
DESIGN/DRAWN : AT	DATE: Sep. 2018
PROJECT No: GML18201	DRAWING No: 005P1

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Plate 1: 4 No. pipes exposed at c. 1.40m depth in trench TR02. Please note gravel backfill which was not present in trench TR01. Marker tape was not noted in either pit.



Plate 2: 4 No. pipes excavated by hand every 0.20m depth before being excavated by machine. Gravel backfill encountered and area carefully dug-out with hand tools.



Plate 3: 4 No. pipes were set close to one another, covering a total width of c. 0.60m. Observed to be constructed in black plastic of diameter c. 0.15m.

DO NOT SCALE
NOTES:



www.geo-matters.com
info@geo-matters.com

CLIENT:

Minster Property Group Ltd

PROJECT:

Land off Moulton Chapel Road,
Cowbit

TITLE:

Photographic Record of
Observed Pipes

SCALE@SIZE :

NTS

ISSUE:

FINAL

DESIGN/DRAWN :

AT

DATE:

Sep. 2018

PROJECT No:

GML18201

DRAWING No:

005P2

© Geo-Matters Ltd

Order Reference: G2332960-1
Produced on: 23 May 2018

COMMERCIALDW Drainage and Water Enquiry

The information in this document refers to:

Land Lying to the East of Back Gate
Cowbit
Spalding

This document was ordered by:

Tm Property Searches
Tm Property Searches
1200 Delta Business Park
Swindon
SN5 7XD

Customer reference: 17992095

This document was produced by: Geodesys, Osprey House, 1 Percy Road, Huntingdon, Cambs, PE29 6SZ. For any queries relating to this report please contact our customer services team on 0800 085 8050, quoting order reference: G2332960-1.

Interpretation of Drainage and Water Search

Appendix 1 of this report contains definitions of terms and expressions.

Enquiries and Responses

The records were searched by Daniel Raymond Berrill (Anglian Water Services Limited trading as Geodesys) who has no, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

The report was completed by Daniel Raymond Berrill (Anglian Water Services Limited trading as Geodesys) who has no, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

This was requested on 21 May 2018 and completed on 23 May 2018

Geodesys, has a robust and uniformly efficient complaints process. Formal complaints and queries can be made, by telephone on 0800 085 8050, in writing to Geodesys, Osprey House, 1 Percy Road, Huntingdon, Cambs, PE29 6SZ or by e-mail to customer.services@geodesys.com

Our standard terms and conditions for Commercial Drainage and Water Enquiries apply to this report. They are included in this search and are available on our website.

On 1 October 2011 ownership of private sewers and lateral drains changed in accordance with The Water Industry (schemes for Adoption of Private Sewers) Regulations 2011. The contents of this search may not reflect these changes. Please visit www.anglianwater.co.uk/sewerswitchover for more details.

Summary of Responses

Question	Answer
1 Where relevant, please include a copy of an extract from the public sewer map	Map Included
2 Where relevant, please include a copy of an extract from the map of waterworks	Map Included
3 Does foul water from the property drain to a public sewer?	Land/Plot
4 Does surface water from the property drain to a public sewer?	Land/Plot
5 Is a surface water drainage charge payable?	See Details
6 Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	Yes
6.1 Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?	No
7 Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	No
7.1 Does the public sewer map indicate any pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?	No
8 Are any sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?	Land/Plot
9 Has a Sewerage Undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	No
10 Is any building within the property at risk of internal flooding due to overloaded public sewers?	No
11 Please state the distance from the property to the nearest boundary of the nearest sewage treatment works	See Details
12 Is the property connected to mains water supply?	Land/Plot
13 Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	Yes
14 Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
15 Is the property at risk of receiving low water pressure or flow?	No
16 What is the classification of the water supply for the property?	See Details
17 Please include details of the location of any water meter serving the property	See Details
18.1 Who is responsible for providing the sewerage services for the property?	Anglian Water Services Limited
18.2 Who is responsible for providing the water services for the property?	Anglian Water Services Limited
19 Who bills the property for sewerage services?	See Details
20 Who bills the property for water services?	See Details
21 Is there a meter installed at the property?	Land/Plot
22 Is there any easement giving Anglian Water the right of access to defined assets located within the boundary of the property?	No
23 Are there any trade effluent consents relating to this site/property	No

Did you know?

Geodesys is a trusted brand providing a full range of conveyancing searches for residential and commercial properties throughout England and Wales.

Geodesys, a trading name of Anglian Water Services Limited, is responsible in respect of the following:

- (i) any negligent or incorrect entry in the records searched.
- (ii) any negligent or incorrect interpretation of the records searched.
- (iii) any negligent or incorrect recording of that interpretation in the search report.
- (iv) compensation payments.

Professional Standards



Geodesys is an executive member of CoPSO (Council of Property Search Organisations), the trade association working towards a more efficient and effective market for searches.



We also comply with the rules set out in the PCCB (Property Codes Compliance Board) Search Code, a code of practice that ensures the delivery of high quality products across the property search industry. See Appendix 4 for more information.



Geodesys have a robust complaints procedure in place. If we cannot resolve your complaint or have failed to comply with our process, you may refer your complaint under The Property Ombudsman scheme (TPOs). Further information can be found in Appendix 4.



Geodesys is certified to ISO 9001 (Quality) and ISO 22301 (Business Continuity) management systems by LRQA. This helps ensure that we minimise any systems downtime by having plans in place for dealing with the unexpected and managing risk.

Private Sewer Transfer

On 1 October 2011 ownership of private sewers and lateral drains changed in accordance with The Water Industry (schemes for Adoption of Private Sewers) Regulations 2011. As part of this change of ownership, from 1 October 2016, many private pumping stations will also become the responsibility of Anglian Water. The contents of this search may not reflect these changes. Please visit www.anglianwater.co.uk/sewerswitchover for more details. Further information is also supplied in Appendix 3.

Mapping Services

Through our sister brand, digdat, we also offer an online mapping service providing:

1. Ordnance Survey maps (ideal for unregistered land);
2. Location plans of underground assets for various utilities including Anglian Water and Hartlepool Water.

Find out more at www.digdat.co.uk



Question 1 Where relevant, please include a copy of an extract from the public sewer map

Answer A copy of an extract of the public sewer map is included, showing the public sewers, disposal mains and lateral drains in the vicinity of the property.

Informative Public Sewers are defined as those for which the Sewerage Undertaker holds statutory responsibility under the Water Industry Act 1991. Anglian Water Services Limited is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system. Assets other than public sewers may be shown on the copy extract for information.

Question 2 Where relevant, please include a copy of an extract from the map of waterworks

Answer A copy of an extract of the map of waterworks is included, showing water mains, resource mains or discharge pipes in the vicinity of the property.

Informative The map of the waterworks has been supplied by:
Anglian Water Services Limited
Lancaster House
Lancaster Way
Huntingdon
Cambs
PE29 6XU
Tel: 03457 145 145
www.anglianwater.co.uk
The 'water mains' in this context are those which are vested in and maintainable by the water company under statute. Assets other than public water mains may be shown on the plan, for information only.
Water companies are not responsible for private supply pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal, please refer to Question 23.
The enclosed extract of the public water main record shows known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Question 3 Does foul water from the property drain to a public sewer?

Answer This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer.

Informative Anglian Water Services Limited is not responsible for any private drains and sewers that connect the property to the public sewerage system, and does not hold details of these. The property owner will normally have sole responsibility for private drains serving the property. If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.
An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 4 Does surface water from the property drain to a public sewer?

Answer This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer.
If the property was constructed after 6th April 2015 the Surface Water drainage may be served by a Sustainable Drainage System. Further information may be available from the Developer or Question 3.3 of the CON29 from the local authority.

Question 5 Is a surface water drainage charge payable?

Answer Records indicate that a surface water drainage charge is not payable for the property. If the property was constructed after 6th April 2015 the Surface Water drainage may be served by a Sustainable Drainage System. Further information may be available from the Developer or Question 3.3 of the CON29 from the local authority.

Informative Where surface water from a property does not drain to the public sewerage system no surface water drainage charges are payable. Where surface water charges are payable but upon inspection the property owners believe that surface water does not drain to the public sewerage system, an application can be made your retailer to end future surface water charges by contacting them directly. Further information can be found on retailers by visiting the Open Water website:
<http://www.open-water.org.uk/for-customers/find-a-supplier/suppliers/water-and-wastewater-retailers/>

Question 6 Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

Answer The public sewer map included indicates that there is a public sewer, disposal main or lateral drain within the boundaries of the property. On 1 October 2011, private sewers that serve a single property and lie outside the boundary of that property, were transferred into public ownership. Therefore there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may prevent or restrict development of the property.

Informative The boundary of the property has been determined by reference to the Ordnance Survey record. The presence of a public sewer running within the boundary may restrict further development. Anglian Water has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the company or its contractors needing to enter the property to carry out work. Sewers indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer, if any.

Question 6.1 Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?

Answer The public sewer map included indicates that there is no public pumping station within the boundaries of the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Informative Only private pumping stations installed before 1 July 2011 and servicing 2 or more properties will be transferred into the ownership of Anglian Water Services. Pumping stations installed after 1 July 2011 will remain the responsibility of the homeowners unless they are the subject of an adoption agreement. Anglian Water Services will have rights of access to maintain their assets which is anticipated to be completed on a 12 monthly basis which will be reviewed dependent on monitoring and performance. Further information can be found on the pumping station adoption in the appendices of the COMMERCIALDW.

Question 7 Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

Answer The public sewer map indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the property. However, it has not always been a requirement for such public sewers to be recorded on the public sewer map. It is therefore possible for unidentified sewers or public sewers to exist within the boundaries of the property. However, on 1 October 2011 private sewers were transferred into public ownership, therefore there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.

Informative The measure is estimated from the Ordnance Survey record, between any building within the boundary of the property and the nearest public sewer. Sewers indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer.

Question 7.1 Does the public sewer map indicate any pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

Answer The public sewer map included indicates that there is no public pumping station within 50 metres of any buildings within the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Informative Only private pumping stations installed before 1 July 2011 and servicing 2 or more properties will be transferred into the ownership of Anglian Water Services.
Pumping stations installed after 1 July 2011 will remain the responsibility of the homeowners unless they are the subject of an adoption agreement.
Anglian Water Services will have rights of access to maintain their assets which is anticipated to be completed on a 12 monthly basis which will be reviewed dependent on monitoring and performance.
Further information can be found on the pumping station adoption in the appendices of the COMMERCIALDW.

Question 8 Are any sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?

Answer Records confirm that sewers serving the development, of which the property forms part, are not the subject of an existing adoption agreement or an application for such an agreement.

Informative This enquiry is of interest to purchasers of new properties who will want to know whether or not the property will be linked to a public sewer. Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of public drains and sewers for which they will hold maintenance and renewal liabilities.

Question 9 Has a Sewerage Undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

Answer The company's records confirm that there is not a statutory agreement or consent in respect of building over/near a public sewer at this property. For historical reasons the company may not be aware of some agreements or consents which have been entered into by the local authority. Whilst an 'agreement' may not exist, current Building Regulation guidance permits building over/near sewers in certain circumstances. Consent without an agreement may have been issued by Anglian Water or independently by the Building Control Body. As long as the extension has a valid building regulations certificate then this should prove adequate assurance to the purchaser.

Informative Anglian Water Services Limited is obliged to maintain its sewers. If any problem were to arise, Anglian Water Services Limited would investigate the problem and has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the company or its contractors needing to enter the property. In advance of any problem it is difficult to predict the effect the works would have on the property. Similarly, the position as to liability of both the property owner and Anglian Water Services Limited would need to be ascertained.
On 1 October 2011 private sewers were transferred into public ownership, therefore there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may further prevent or restrict development of the property.

Question 10 Is any building within the property at risk of internal flooding due to overloaded public sewers?

Answer The property is not recorded as being at risk of internal flooding due to overloaded public sewers. On 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership. It is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which Anglian Water may not be aware of. For further information it is recommended that enquiries are made of the vendor as to any previous flooding occurrences.

Informative A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (eg. Flat gradient, small diameter). Flooding as a result of temporary problems such as blockage, siltation, collapses, and equipment or operational failures are excluded.
"Internal flooding" from public sewers is defined as flooding which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes. "At Risk" properties are those that the water company has included in its Register of properties at risk of sewer flooding. These are defined as properties that have suffered flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure. Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the Flood Risk register.
Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the company. Public sewers are defined as those for which the company holds statutory responsibility under the Water Industry Act 1991. It should be noted that flooding can occur from private sewers and drains which are not the responsibility of Anglian Water Services Limited. This report excluded flooding from private sewers and drains and Anglian Water Services Limited makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

Question 11 Please state the distance from the property to the nearest boundary of the nearest sewage treatment works

Answer The nearest sewage treatment works is 2.00 kilometres to the North East of the property. The name of the sewage treatment works is COWBIT STW (Anglian Water Services Ltd).

Informative The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.
The Sewerage Undertaker's records were inspected to determine the nearest sewage treatment works. It should be noted, therefore, that there may be a private sewage treatment works closer than the one detailed above that has not been identified.

Question 12 Is the property connected to mains water supply?

Answer This enquiry appears to relate to a plot of land or a recently built property. It is recommended that the water supply proposals are checked with the developer.

Question 13 Are there any water mains, resource mains or discharge pipes within the boundaries of the property?

Answer The map of waterworks indicates that there are water mains, resource mains or discharge pipes within the boundaries of the property.

Informative The boundary of the property has been determined by reference to the Ordnance Survey record.
The presence of a public water main within the boundary of the property may restrict further development within it. Water companies have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the company or its contractors needing to enter the property to carry out work.

Question 14 Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

Answer Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Informative This enquiry is of interest to purchasers of properties who will want to know whether or not the property will be linked to the mains water supply.
Please note this could relate to a piece of land and is not subject to an adoption agreement.

Question 15 Is the property at risk of receiving low water pressure or flow?

Answer Records confirm that the property is not recorded on a register kept by the water undertaker as being at risk of receiving low water pressure or flow.

Informative "Low water pressure" means water pressure below the reference level which is the minimum pressure when demand on the system is not abnormal. We maintain a Low Pressure Register of properties that are at risk of persistently receiving pressure below the reference level, provided that allowable exclusions do not apply. (i.e. events which can cause pressure to temporarily fall below the reference level). Water Companies are required to include in the Regulatory Register that is reported annually to the Director General of Water Services properties receiving pressure below the reference level, provided that allowable exclusions do not apply. (i.e. events which can cause pressure to temporarily fall below the reference level).
The reference level of service is a flow of 9 litres/minute at a pressure of 10 metres head on the customer's side of the main stop tap (mst). The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap.
The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served. For two properties, a flow of 18 litres/minute at a pressure of 10 metres head on the customers' side of the mst is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS6700 or Institute of Plumbing handbook.
Allowable exclusions: The Company includes in the Low Pressure Register properties receiving pressure below the reference level, provided that allowable exclusions listed below do not apply.
Abnormal demand: This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand which are normally expected. We exclude properties which are affected by low pressure only on those days with the highest peak demands. During the report year we may exclude, for each property, up to five days of low pressure caused by peak demand.
Planned maintenance: We do not report low pressures caused by planned maintenance.
One-off incidents: This exclusion covers low pressure incidents caused by one-off events: mains bursts; failures of company equipment (such as PRVs or booster pumps); firefighting; and action by a third part.
Low pressure incident of a short duration: Properties affected by low pressure which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year.

Question 16 What is the classification of the water supply for the property?

Answer The water supplied to the property has an average water hardness of 145.300000mg/l which is defined as Very Hard by Anglian Water Services Limited.

Informative Water hardness can be expressed in various indices for example the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer as there are also other units. The following table shows the normal ranges of hardness.

Classification	Calcium (mg/l or ppm)	Calcium Carbonate (mg/l or ppm)	Degrees Clark	Degrees French	Degrees German	mmol/l (Millimoles of ca/l)
Very Hard	145.300000	363.300000	25.400000	36.300000	20.300000	3.600000

Question 17 Please include details of the location of any water meter serving the property

Answer Records indicate that this enquiry relates to a plot of land or recently built property. It is recommended that the charging proposals are checked with the developer.

Question 18.1 **Who is responsible for providing the sewerage services for the property?**

Answer Anglian Water Services Limited
Lancaster House
Lancaster Way
Huntingdon
Cambs
PE29 6XU
Tel: 03457 145 145
www.anglianwater.co.uk

Question 18.2 **Who is responsible for providing the water services for the property?**

Answer Anglian Water Services Limited
Lancaster House
Lancaster Way
Huntingdon
Cambs
PE29 6XU
Tel: 03457 145 145
www.anglianwater.co.uk

Question 19 **Who bills the property for sewerage services?**

Answer If you wish to know who bills for sewerage services at the property, then please make enquiries with the Developer, Vendor or Land Agent.

For a list of all potential Retailers for sewerage services, please visit: <http://www.open-water.org.uk>

Question 20 **Who bills the property for water services?**

Answer If you wish to know who bills for water services at the property, then please make the relevant enquiries with the Developer, Vendor or Land Agent.

For a list of all potential Retailers for water services, please visit: <http://www.open-water.org.uk>

Question 21 **Is there a meter installed at the property?**

Answer Records indicate that this enquiry relates to a plot of land or a recently built property.

Informative Water and sewerage charges are determined by agreement between the current owner/occupier of the site/property and the incumbent Retailer. Further relevant enquiries should be sought from the Vendor. Fees may be applicable for the installation of a water meter at the property. Enquiries in relation to future charging of services on occupancy of the premise should be made with the existing Retailer. For further information in relation to potential retailers for water and sewerage services, please visit: <http://www.open-water.org.uk/>

Question 22 Is there any easement giving Anglian Water the right of access to defined assets located within the boundary of the property?

Answer Records indicate that the property is not subject to such an agreement.

Informative This question relates to private agreements between Anglian Water acting in a private capacity and a landowner. Such contracts may often be part of a conveyance or land transfer, or a deed of grant of easement. If there is no formal easement, then a sewer or water main may have been constructed following the service of notice under the provisions of the Public Health Act 1936, Water Act 1945, Water Act 1989 or Water Industry Act 1991 as applicable. The company does not hold copies of these notices. However, in the absence of evidence to the contrary there is a legal presumption that all matters were properly dealt with. All rights and obligations relating to sewers and water mains are now covered by the Water Industry Act 1991. Where rights exist at the boundary of the property, but we are not sure of the exact correlation, we will answer 'yes' to this question. A documentary right can exist even if the physical asset itself has not yet been laid, or has been moved, or removed. Likewise the position of the right and of the asset may differ. You may also find that an asset is protected both with contractual rights and statutory rights. Please consult your solicitor as to why this may happen, and its effects. We refer to 'defined' assets for the following reasons: Often a contract may give Anglian Water an expressed right to install and maintain assets within an area but without stating the exact position or route of such assets. Also, the law may imply rights where none have been mentioned specifically in a related contract, such as a conveyance. Finally, rights may come into being through long use. In any of these cases the rights are undefined, and although Anglian Water may need to rely on them from time to time, as we cannot map the rights accurately, we will answer 'no' to this question. Information obtainable from physical inspection (including Trial Bore Holes) overrides information contained in the report. Any error in answering this question is not to be regarded as a waiver of Anglian Water's rights or title, or an agreement or representation that Anglian Water is prepared to vary or discharge any of its rights or title.

As a general rule, easement widths are as follows:

Pipe Diameter	Width or Strip
Up to 149mm	4.5m
150 - 449mm	6.0m
450 - 749mm	9.0m
750 and above	12.0m

If you require a copy of an agreement please contact Savills, Trinity Court, Trinity Street, Peterborough, PE1 1DA. A fee may be charged for this service. Please quote the date of the Report plus the Report Reference. You may also make contact either by telephone on 01733 209932 or by email to AWSEstates@savills.com

Question 23 Are there any trade effluent consents relating to this site/property

Answer Records indicate that there are no trade effluent consents relating to this site/property.

Informative The Trade effluent consent applies to premises in the vicinity of the premises the subject of this search, but it is for the applicant to satisfy itself as to the suitability of the consent for its client's requirements. If, in the case of any trade premises, any trade effluent is discharged without such consent or other authorisation, the occupier of the premises shall be guilty of an offence. The occupier of any trade premises in the area of Anglian Water Services Limited may only discharge any trade effluent proceeding from those premises into Anglian Water Services Limited's sewers if he does so with Anglian Water Services Limited's consent. Please note any existing consent is dependant on the business being carried out at the property and will not transfer automatically upon change of ownership. To view trade effluent consents and/or our database for free please contact the following: Environmental Standards Team, Environmental Regulation, Lancaster House, Ermine Business Park, Huntingdon, Cambridgeshire, PE29 6XU or email: Trade_Effluent_Regulation@anglianwater.co.uk. Alternatively, you may request in writing document copies and/or extracts from our database for a fee. The charges for the provision of this service are as follows: 10 pence per sheet for photocopying, and/or 25 pounds per hour, or a fraction thereof, for dealing with the enquiry. Note: VAT does not apply for this service.

APPENDIX 3: Some things you should know...

Private Sewer Transfer

In October 2011, Anglian Water became responsible for looking after many sewers and pipes that take used water from your toilets and sinks. This was due to a change in the law.

If your client's property is connected to the public sewer system, Anglian Water are now responsible for the pipes that are outside the boundary of the property and, depending on the property type, they may be responsible for pipes inside the boundary.

Simply put, Anglian Water became responsible for an estimated 23,500km of additional sewers and drains which were previously looked after and maintained by our customers. To put that in context, it is an increase of 60 percent on what Anglian Water already owned.

Previously if there was a blockage in a sewer outside the boundary of the homeowners property, but connecting to the main sewer, the homeowner was probably responsible for sorting it out

Now, the homeowner is only responsible for pipes that are inside the property boundary that take the used water for recycling. To find out more visit www.anglianwater.co.uk/sewerswitchover, or call 0845 026 5232.

Who should unblock or report a drain or sewer?

If there is a blockage or a repair is needed to a pipe, that is not connected to the sewers, or is within the boundary and only serves that property, then the homeowner is responsible for it.

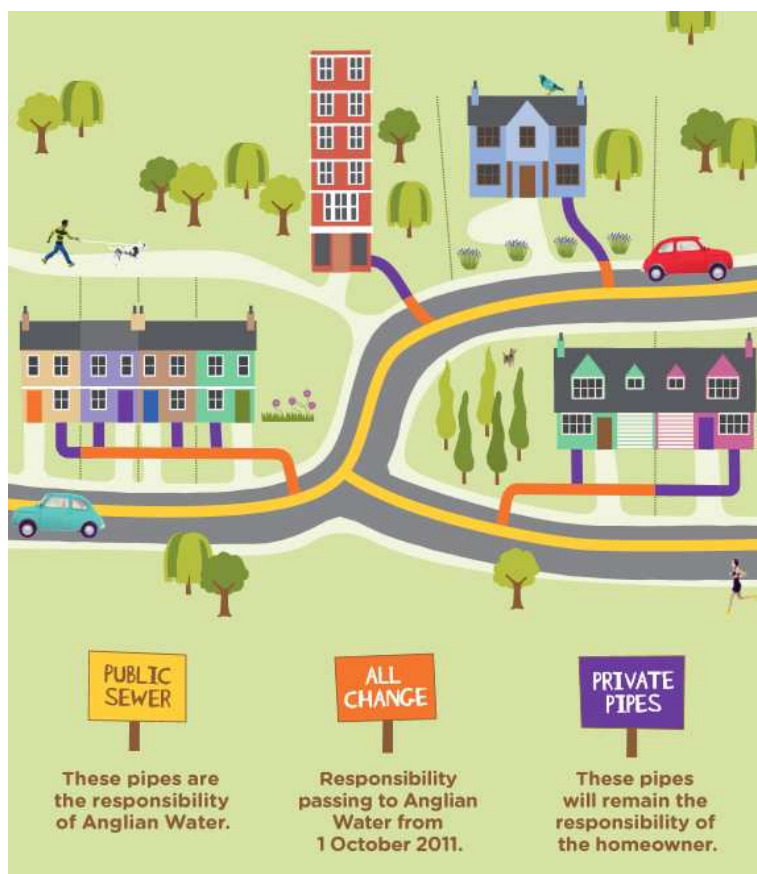
If the problem is with a section of pipe that takes water from more than one property and connected to the public sewer system, it is the responsibility of Anglian Water. Please contact the team on 03457 145 145.

Sewers owned by Anglian Water

For sewers that have been adopted as a public sewer, or were built before 1 October 1937, then Anglian Water is responsible for sorting it out. Please call to report it on 03457 145 145.

More information about sewers and drains is available on the Anglian Water website.

The picture below shows examples of responsibility for different property types.



Terraced properties

It is common for terraced properties to have a public sewer passing within the property boundary. The only section of the sewer which would remain private is the end of the terrace where the run of the sewer would begin. Where the sewer is shared, the water company would be responsible for the maintenance. The property owner would only be responsible for the lateral drain leading to the public sewer.

Semi-detached

The majority of semi-detached properties will share a connection. The section of the sewer which serves both properties will have been transferred into the ownership of the water company.

Detached

These property types are most likely to connect directly to the public sewer. It is very unlikely that assets within the boundary of the property would be transferred into the ownership of the water company. The homeowner would be responsible for the connection up to the property boundary.

Apartment/Flats

Shared drainage systems within a property curtilage will remain private. Any drains and sewers outside the boundary will have been transferred.

Pumping Stations

After 1 October 2016, many private pumping stations became the responsibility of Anglian Water Services.

Anglian Water Services are currently assessing each of these eligible pumping stations and carrying out detailed surveys and any necessary repairs. Details of power supply for the station will also be required to transfer the billing across to Anglian Water Services.

If the station serves two or more properties, then it is eligible to transfer. A pumping station which serves a single property is exempt from the transfer and will generally remain private unless it is situated on third-party land.

Once Anglian Water Services identify a station to adopt, they will write to the homeowner(s) to inform them of their intention to adopt which will include waivers of consent.

Many industrial or commercial pumping stations will remain privately owned too on the basis that they are situated on a single site in what is deemed to be a single curtilage.

Maintenance of pumping stations is anticipated to be completed on a 12 monthly basis which will be reviewed dependent on monitoring and performance.

For further information on the private sewer transfer and pumping station adoption, please visit:

<https://anglianwater.co.uk/household/water-recycling-services/private-sewers-and-lateral-drains.aspx>

SuDS (Sustainable Drainage Systems)

SuDS are an alternative way to manage surface water by reducing or delaying rainwater run-off.

SuDS manage rainfall by replicating what happens in nature. They prevent many of the problems caused by surface water run-off from development by reducing the impact of excessive quantities of water flow. They aim to mimic the way rainfall drains naturally rather than conventional piped methods, which cause problems such as flooding, pollution or damage to the environment.

Since April 2015, SuDS should be considered as part of the planning process on all major developments consisting of 10 or more properties. SuDS can be provided in a number of ways including swales, retention ponds and underground storage.

Ponds and detention basins provide areas for surface water to run off into, while permeable paving on driveways can absorb it, limiting the flow into nearby drains and easing the pressure on the sewer network. Swales are shallow, broad, vegetated channels designed to store surface water run-off and remove pollutants.

Further information in relation to the charging and maintenance of SuDS can be found in question 3.3 in the Local Authority search or the developer of your property.

Anglian Water Services promote the use of SuDS as a sustainable and natural way of controlling surface water run-off.

A guide on who looks after what...

Although it is often interconnected, our regions network of drains and sewers is managed and maintained by a number of different organisations and agencies.

Some useful contacts:

For supply queries

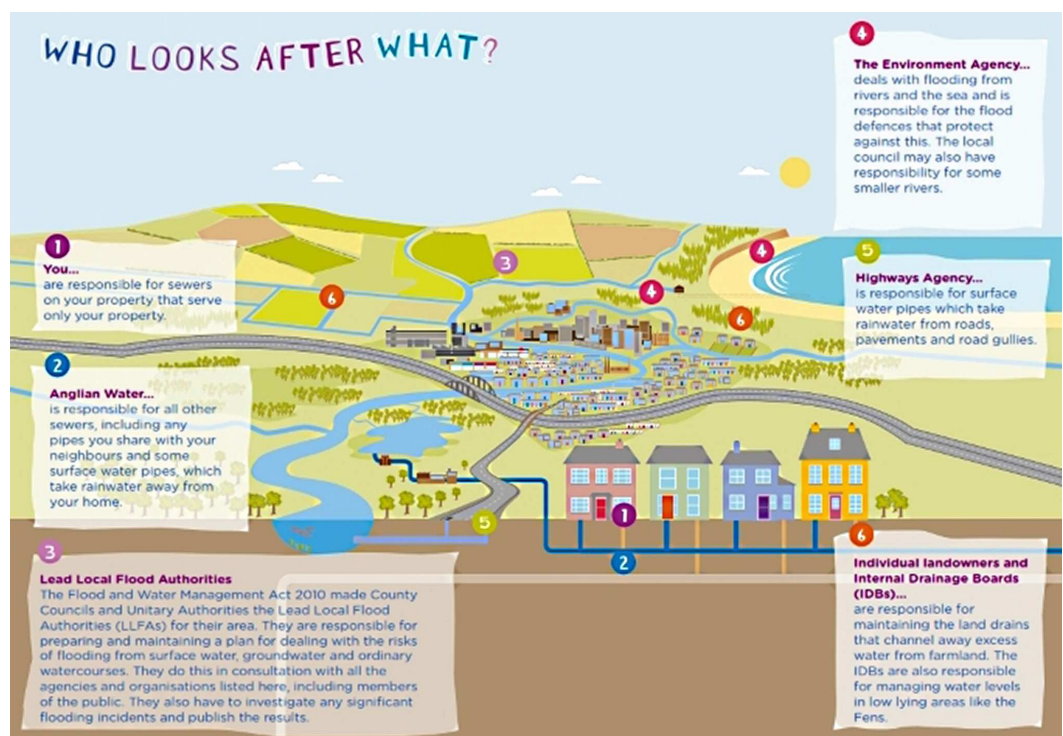
Water and sewerage queries, interruption to services and emergencies

03457 145 145

24/7 service

In Your Area

Select the [link](#) to get the latest updates on repairs, incidents or planned work in your area.



APPENDIX 4: Important Consumer Protection Information

This search has been produced by Geodesys, a trading name of Anglian Water Services Ltd. Our address is - Osprey House, 1 Percy Road, Huntingdon, Cambridgeshire, PE29 6SZ. To contact us - Tel 0800 085 8050 or email customer.services@geodesys.com. Geodesys is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

You can get more information about the PCCB from www.propertycodes.org.uk

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential property and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice and quality standards with the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the Code, their products and services

By giving you this information, Geodesys is confirming that they keep to the principles of the Code. This provides important protection to you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that all search services comply with the law, registration rules and standards
- monitor their compliance with the Code

Please email customer.services@geodesys.com if you would like a copy of the Search Code

Complaints

Whilst we make every effort to ensure that all our searches are accurate and dispatched in a timely way, we understand that occasionally things may not go as planned. If you have a query or complaint about your search, you should raise it directly with us, and if appropriate ask for any complaint to be considered under our formal internal complaints procedure. We will always try to resolve a query or complaint immediately. If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman Scheme (TPOS). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of Geodesys failing to keep to the Code.

If it is not possible to resolve your complaint immediately, we will:

- take all of the details and investigate your complaint under our formal complaints procedure. If we do not contact you within 5 working days of you raising the complaint, you will be entitled to £50 compensation
- always aim to resolve a complaint fully and in writing within 5 working days, but no later than 20 working days of receipt
- keep you informed by letter, telephone or email as you prefer should we need more time to resolve the matter
- provide a final response, in writing, at the latest within 40 working days of receipt
- liaise, at your request, with anyone acting formally on your behalf

If we consider your complaint to be justified we will:

- refund your search fee
- provide you with a revised search
- take all action within our control to put things right

Complaints should be sent to: Customer Services, Geodesys, Osprey House, 1 Percy Road, Huntingdon, Cambridgeshire PE29 6SZ, Tel: 0800 085 8050, Email: customer.services@geodesys.com

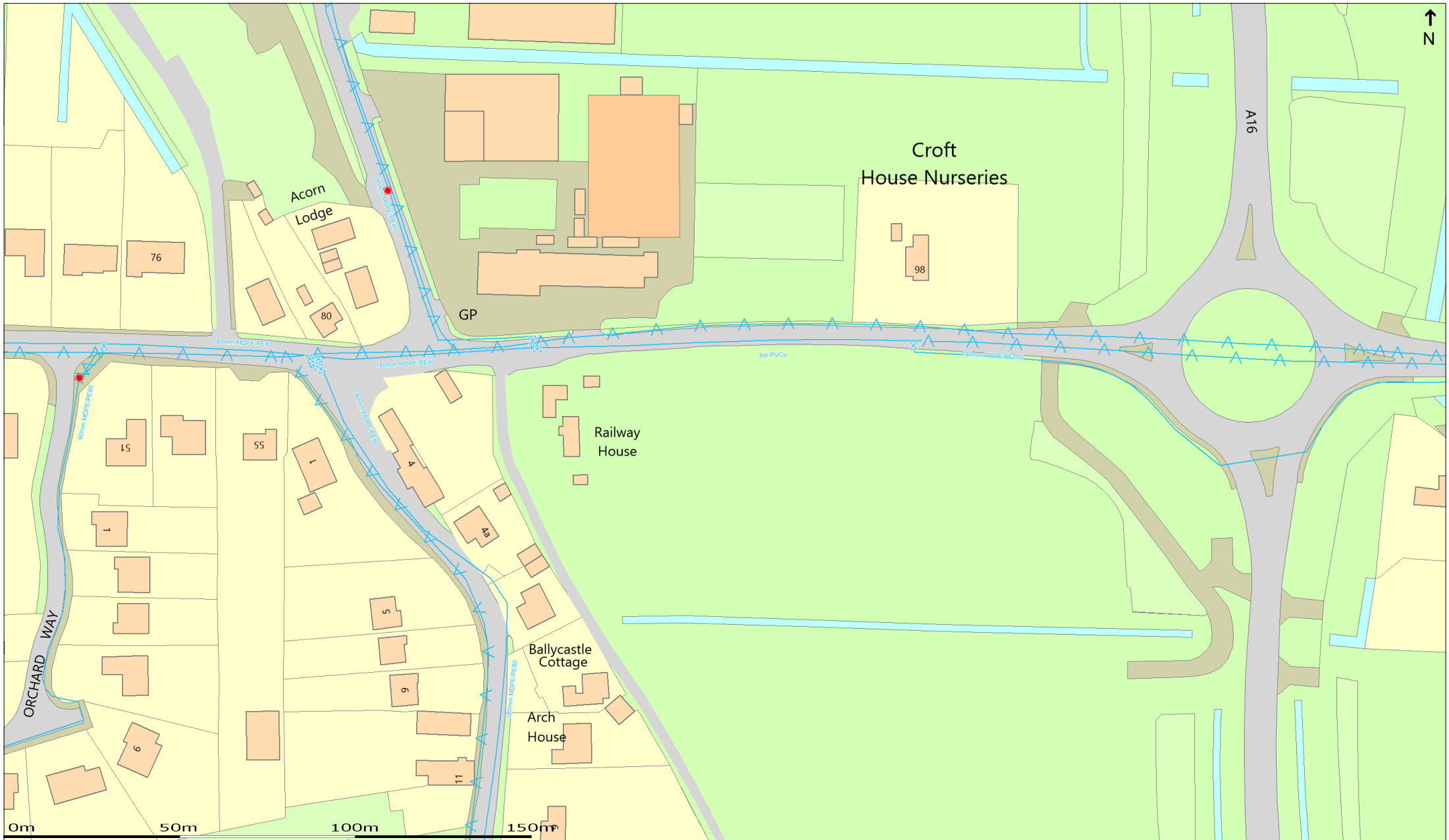
If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman Scheme (TPOS).

TPOs Contact Details:

The Property Ombudsman scheme
Milford House
43-55
Milford Street
Salisbury
SP1 2BP

Telephone: 01722 333306
Fax: 01722 332296
Website: www.tpos.co.uk
Email: admin@tpos.co.uk

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision.



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Date: 22/05/18 Scale: 1:1000 Map Centre: 526707,318018 Title: G2332960-1

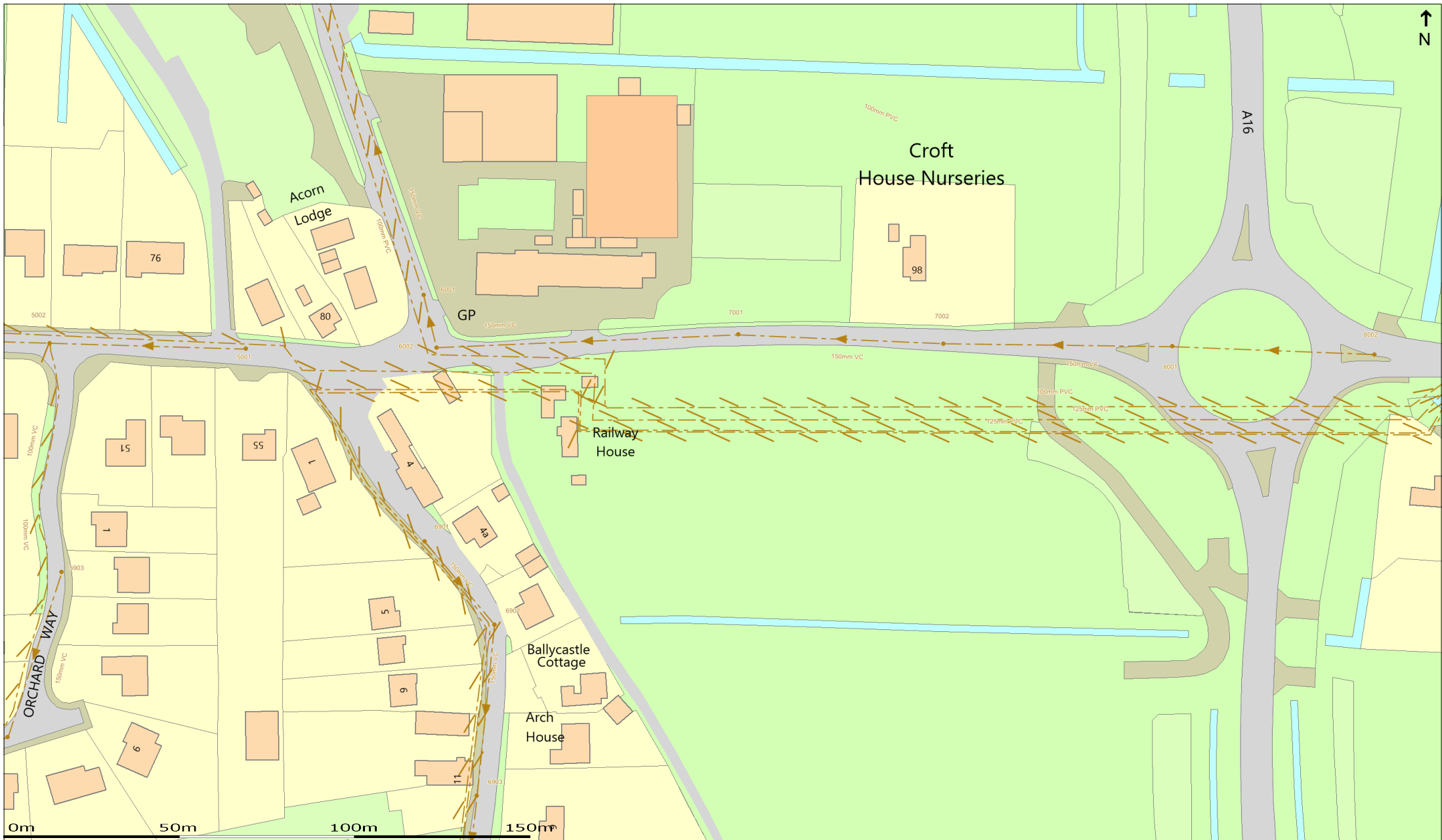
COMMERCIALDW

DRAINAGE AND WATER ENQUIRY

- | | | |
|----------------------|--|---------|
| Water Main (Potable) | | Hydrant |
| Decommissioned Water | | |
| Water Main (Raw) | | Fitting |



This plan is provided by Anglian Water pursuant to its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2018 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.



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Date: 22/05/18 Scale: 1:1000 Map Centre: 526707,318018 Title: G2332960-1

COMMERCIALDW
DRAINAGE AND WATER ENQUIRY

- Foul Sewer
- Surface Sewer
- Combined Sewer
- Final Effluent

- Decommissioned Sewer
(colour denotes effluent type)
- Private Sewer
(colour denotes effluent type)
- Rising Main
(colour denotes effluent type)

- Manhole
(colour denotes effluent type)
- Public Pumping Station
- Private Pumping Station
- Decommissioned Pumping Station

- Public Sewage Treatment Works
- Private Sewage Treatment Works
- Outfall
- Inlet



This plan is provided by Anglian Water pursuant to its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2018 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.



Drinking Water Quality Report for the Holbeach Public Water Supply Zone (KN64)

Report period: January 2017 to December 2017

Your drinking water supply

Anglian Water's region is divided into around 160 water supply areas called Public Water Supply Zones, each providing our customers with an excellent drinking water supply. We carry out around 140,000 tests each year on drinking water samples taken from customer taps. The number of drinking water samples we take, and the tests we carry out, are specified in the current Water Supply (Water Quality) Regulations and our regulator, the Drinking Water Inspectorate, carry out regular audits to make sure we comply with these regulations.

During the period of this report, all samples taken in this Public Water Supply Zone fully met the legal limits specified in the current Water Supply (Water Quality) Regulations.

Source:

Your drinking water supply comes from both surface (either river or reservoir) and groundwater (borehole) sources.

Hardness:

Your drinking water supply is classified as very hard. The hardness has been shown in different units below to help you set your domestic appliances:

Total hardness as Calcium (mg/l)	Total hardness as Calcium carbonate (mg/l)	Total hardness as Degrees Clark (°Clark or °e)	Total hardness as Degrees French (°f)	Total hardness as Degrees German (°dH)	Total hardness as millimoles (mmol/l of Ca)
149.6	374	26.03	37.4	21.243	3.74

(mg/l = milligrammes per litre is the same as parts per million)

Fluoride:

We don't add fluoride to your drinking water supply, but there is naturally occurring fluoride present in all drinking water supplies.

Chlorine:

Disinfection is important to ensure there are no harmful organisms in the water. We use chlorine to disinfect drinking water supplies. No ammonia is added in this process which means your water supply is not chloraminated.

Lead:

If you live in a house built before 1970, you may have lead pipework. If you think you may have lead pipework, call our Lead Advice Line on 0345 070 3445 to arrange for a free lead test.

Work in your area:

To make sure the quality of the drinking water we supply remains excellent, we sometimes need to carry out work to ensure we continue to meet the legal limits specified in the Water Supply (Water Quality) Regulations 2016 (as amended). This work is known as a Programme of Work. Our Regulator, the Drinking Water Inspectorate, closely monitors the progress of this work and will formally sign it off when it is completed. The table below shows what we are doing in the Holbeach PWSZ:

Parameter	Programme of Work
Metalddehyde and total pesticides	Catchment management

Drinking water sample results:

The results of tests carried out on drinking water samples taken from customer taps in this Public Water Supply Zone for the period are shown in the following table:

Parameter	Legal Limit	Units	Number of samples taken	Sample Results			Number of samples not meeting legal limit
				Minimum	Average	Maximum	
MICROBIOLOGICAL PARAMETERS							
Clostridium perfringens	0	No. per 100 ml	124	0	0	0	0
Coliform bacteria	0	No. per 100 ml	114	0	0	0	0
Colony counts (3 day at 22°C)	No abnormal change	No. per 1 ml	19	0	1	6	0
E. coli	0	No. per 100 ml	114	0	0	0	0
Enterococci	0	No. per 100 ml	8	0	0	0	0
CHEMICAL PARAMETERS							
1,2-dichloroethane	3	µg/l	16	<0.127	<0.155	<0.164	0
Aluminium	200	µg/l	19	<14	<14	<14	0
Ammonium	0.5	mg/l	19	<0.042	<0.042	<0.042	0
Antimony	5	µg/l	8	<0.13	<0.14	0.17	0
Arsenic	10	µg/l	8	<0.112	<0.139	0.22	0
Benzene	1	µg/l	16	<0.037	<0.068	<0.078	0
Benzo(a)pyrene	0.01	µg/l	8	<0.001	<0.001	<0.001	0
Boron	1	mg/l	16	<0.068	<0.085	0.13	0
Bromate	10	µg/l	16	<0.35	<0.61	1.44	0
Cadmium	5	µg/l	8	<0.007	<0.007	<0.007	0
Calcium	No legal Limit	mg/l	2	132	134	136	0
Chloride	250	mg/l	16	28.1	43	74.6	0
Chlorine (free)	No legal Limit	mg/l	114	0.05	0.31	0.52	0
Chlorine (total)	No legal Limit	mg/l	114	0.06	0.45	0.62	0
Chromium	50	µg/l	8	<0.673	<0.673	<0.673	0
Colour	20	mg/l	19	<0.34	<0.48	1.1	0
Conductivity	2500	µS/cm @ 20 °C	124	635	710	728	0
Copper	2	mg/l	8	0.004	0.121	0.333	0
Cyanide	50	µg/l	16	<1	<1.01	1.17	0
Fluoride	1.5	mg/l	18	0.138	0.253	0.431	0
Hardness (total) as calcium	No legal Limit	mg/l	2	148	149.6	151.2	0
Iron	200	µg/l	36	<7	<14	33	0
Lead	10	µg/l	8	<0.16	<0.206	0.336	0
Magnesium	No legal Limit	mg/l	2	9.61	9.81	10	0
Manganese	50	µg/l	19	<1	<1	<1	0
Mercury	1	µg/l	16	<0.029	<0.029	<0.029	0
Nickel	20	µg/l	8	0.49	1.3	2.74	0
Nitrate	50	mg/l	8	5.64	8.75	12.3	0
Nitrite	0.5	mg/l	8	<0.009	<0.009	<0.009	0
Nitrite/Nitrate	1		8	0.112	0.175	0.246	0
Odour	Acceptable to consumers and no abnormal change	Dilution No.	19	0	0	0	0
PAHs (sum of 4)	0.1	µg/l	8	0	0	0	0
pH (Hydrogen ion)	6.5 - 9.5	pH value	19	7.29	7.38	7.49	0
Phosphorus	No legal Limit	µg/l	32	575	910	1120	0
Selenium	10	µg/l	8	<0.35	<0.38	0.45	0
Sodium	200	mg/l	8	18.3	25.6	30.4	0
Solvents (tetrachloroethane and trichloroethene)	10	µg/l	16	0	0	0	0
Sulphate	250	mg/l	16	110	118	129	0
Taste	Acceptable to consumers and no abnormal change	Dilution No.	19	0	0	0	0
Temperature	No legal Limit	°C	58	6.7	11.3	19	0
Tetrachloromethane	3	µg/l	16	<0.094	<0.099	<0.1	0
Total organic carbon (TOC)	No abnormal change	mg/l	16	1.09	1.74	3.21	0
Trihalomethanes (THMs) (total)	100	µg/l	8	17.8	29.8	52.3	0
Turbidity	4	NTU	19	<0.013	<0.06	0.14	0
PESTICIDES							
2,4-D	0.1	µg/l	8	<0.005	<0.005	<0.005	0
Bentazone	0.1	µg/l	8	<0.004	<0.004	<0.004	0
Bromacil	0.1	µg/l	8	<0.003	<0.003	<0.003	0
Carbetamide	0.1	µg/l	8	<0.002	<0.005	0.01	0
Clopyralid	0.1	µg/l	8	0.004	0.017	0.035	0
Cyanazine	0.1	µg/l	8	<0.002	<0.003	<0.006	0

Dichloroprop	0.1	µg/l	8	<0.002	<0.002	<0.002	0
Diuron	0.1	µg/l	8	<0.004	<0.004	<0.005	0
Isoproturon	0.1	µg/l	8	<0.003	<0.003	<0.003	0
Linuron	0.1	µg/l	8	<0.005	<0.007	<0.007	0
MCPA	0.1	µg/l	8	<0.004	<0.004	<0.004	0
MCPP (Mecoprop)	0.1	µg/l	8	<0.003	<0.003	<0.003	0
Metaldehyde	0.1	µg/l	8	0.026	0.047	0.081	0
Monuron	0.1	µg/l	8	<0.003	<0.006	<0.006	0
Pesticides - Total	0.5	µg/l	8	0.031	0.075	0.144	0
Propyzamide	0.1	µg/l	8	<0.002	<0.009	0.021	0
Trietazine	0.1	µg/l	8	<0.003	<0.007	<0.008	0

Units	
<	Below the limit of detection of our analysis
mg/l	Milligrammes per litre or parts per million
µg/l	Microgrammes per litre or parts per billion
Pt/Co	Platinum/Cobalt
µS/cm	Micro Siemens per centimetre
Bq/l	Becquerel per litre
mSv/year	Micro Sieverts per year
NTU	Nephelometric Turbidity Units
No legal limit	There is no legal limit set in the Regulations

GLOSSARY		
Parameter	What it means	Legal limit
1,2-dichloroethane	Used in industrial processes. Trace amounts may be found in some water sources. Removed by water treatment.	3 µg/l
Acrylamide	A monomer not found naturally in water but found in polyacrylamide which can be used for water treatment. Use of polyacrylamide is tightly controlled.	0.1 µg/l
Alkalinity	Alkalinity is the amount of calcium and magnesium salts dissolved in the water. Known as temporary hardness and removed by boiling.	No legal limit
Aluminium	Naturally present in some water sources. Can be used in water treatment processes but is then removed. Anglian Water do not use aluminium in any water treatment process.	200 µg/l
Ammonium (ammonia and ammonium ions)	Naturally present in most water sources. Can be added as part of the disinfection process to maintain chlorine in the distribution system (known as chloramination).	0.5 mg/l
Antimony	Not found naturally in drinking water. Traces found in water are likely to be due to contact with brass fittings or lead solder.	5 µg/l
Arsenic	Low levels can occur naturally in some groundwater sources. Arsenic is removed by water treatment.	10 µg/l
Benzene	Used in the petrochemical and plastics industry. May be present in water sources due to industrial pollution but is removed by treatment.	1 µg/l
Benzo(a)pyrene	One of several compounds known as poly aromatic hydrocarbons (PAHs). Coal tar was historically used to line water mains to prevent corrosion; trace levels can be found in drinking water where coal tar linings are still present.	0.01 µg/l
Boron	Low levels may occur naturally in some water sources. Industrial discharges or detergents in treated sewage effluents can increase levels in surface waters.	1 mg/l
Bromate	May occasionally be detected in groundwater sources caused by industrial pollution. Can also be formed by the reaction of naturally occurring bromide with oxidants (such as ozone) used in the disinfection of drinking water.	10 µg/l
Cadmium	Low levels may occur naturally in some groundwater sources. Cadmium is removed by water treatment.	5 µg/l
Calcium	Occurs naturally in water as it passes through mineral deposits and rock strata.	No legal limit
Chloride	A common component of salt and found naturally in most water sources.	250 mg/l
Chlorine (free) Chlorine (total)	Anglian Water disinfects all water supplies using chlorine. The concentration of chlorine used is carefully controlled to ensure disinfection of the water is maintained whilst minimising any taste or odour issues for customers.	No legal limit
Chromium	Rarely found in drinking water. Traces may be found if water has passed through rock strata containing naturally occurring chromium.	50 µg/l
<i>Clostridium perfringens</i>	Organisms found in the gut of warm blooded animals. Their presence in treated water indicates possible contamination and requires investigation.	0 per 100 ml
Coliform bacteria	Organisms found in the environment (soil, water and vegetation). Their presence in treated water indicates possible contamination and requires investigation.	0 per 100 ml
Colony counts - 2 day at 37°C - 3 day at 22°C	Are a measure of naturally occurring harmless bacteria found in drinking water.	No. per 1ml - No abnormal change
Colour	Slight tingeing of the water can occur naturally in some water sources. It is removed by water treatment.	20 mg/l Pt/Co scale
Conductivity	A measure of the amount of naturally occurring dissolved inorganic substances in water.	2500 µS/cm at 20°C
Copper	Rarely found in water sources. Can occur in drinking water which has been in contact with copper pipes and fittings in households. May cause blue/green staining.	2.0 mg/l
<i>Cryptosporidium</i>	A parasite that can cause severe gastroenteritis. Continuous monitoring is carried out at	No legal limit

	any water treatment works classified as being at significant risk.	
Cyanide	Rarely found in drinking water. Traces may be found if water has passed through rock strata containing naturally occurring cyanide.	50 µg/l
<i>E. coli</i> and Enterococci	Organisms found in the gut of warm blooded animals. Their presence in treated water indicates possible contamination and requires investigation.	0 per 100 ml
Epichlorohydrin	Not found naturally in water but found in polyamine which can be used for water treatment. Use of polyamines is tightly controlled.	0.1 µg/l
Fluoride	Occurs naturally in many water sources at varying concentrations. Fluoride is added to some drinking water supplies at the request of the local Health Authority.	1.5 mg/l
Gross alpha activity Gross beta activity	Both of these are measured as part of the calculation of the Total Indicative Dose (TID) for radiation (see below).	0.1 Bq/l 1 Bq/l
Hardness (total)	Hardness is due to the calcium and magnesium salts dissolved in the water. The geology of the Anglian Water area means all our water is hard.	No legal limit
Iron	Naturally occurring in many water sources. Can be present in drinking water due to the corrosion of iron water mains. Can also be used in water treatment processes but is then removed.	200 µg/l
Lead	Lead is very occasionally found in water sources. It is more usually found in drinking water due to contact with lead pipes in properties built before 1970. Anglian Water dose phosphate to water supplies in areas where lead could leach from pipework, but the only permanent solution for householders is replacement of any lead pipework.	10 µg/l
Magnesium	Occurs naturally in water as it passes through mineral deposits and rock strata.	No legal limit
Manganese	Occurs naturally in many water sources and is removed by water treatment.	50 µg/l
Mercury	Rarely found in drinking water. Traces may be found if water has passed through rock strata containing naturally occurring mercury.	1 µg/l
Nickel	Occurs naturally in some groundwater sources. It can be found in drinking water due to contact with modern nickel coatings on domestic taps and fittings.	20 µg/l
Nitrate	Occurs naturally in most water sources. Increased levels in water sources can occur as a result of fertiliser use. Dilution with low nitrate water sources and water treatment reduces nitrate levels.	50 mg/l
Nitrite	Occurs naturally at low levels in some water sources but is removed by treatment. It is sometimes produced as a by-product when ammonia and chlorine are used together to disinfect the water.	0.5 mg/l (at customer taps), 0.1 mg/l (at water treatment works)
Nitrite/Nitrate	Measure of the combined concentrations of these two compounds in drinking water. Concentration of nitrate divided by 50 + concentration of nitrite divided by 3 should be less than or equal to 1.	1
Odour	A measure of the aesthetic quality of drinking water. Unusual odours or tastes may indicate a problem which needs investigating.	Acceptable to consumers and no abnormal change
Pesticides – organochlorine compounds (aldrin, dieldrin, heptachlor, heptachlor epoxide)	Persistent in the environment but no longer used in the UK. Treatment processes are used to remove any pesticide residues where present.	0.03 µg/l
Pesticides – other than organo chlorine compounds	Traces of pesticides can occasionally be found in water sources as a result of agricultural and non agricultural use of pesticides in the environment. Treatment processes are used to remove any pesticide residues where present. Monitoring is carried out for the most widely used pesticides in the area of supply.	0.1 µg/l
Pesticides - total	This is the sum of the concentrations of the individual pesticides detected.	0.5 µg/l
pH (hydrogen ion)	A measure of the acidity or alkalinity of water; pH values below 7 are acidic, 7 is neutral and above 7 are alkaline. A low pH can result in pipe corrosion.	6.5 (min) - 9.5
PAHs (sum of 4)	Polycyclic aromatic hydrocarbons (PAHs) may be found in drinking water where coal tar was historically used to line water mains to prevent corrosion. Those measured are benzo (b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene.	0.1 µg/l (sum of 4)
Phosphorus	Occurs naturally in water but can be added during water treatment in the form of phosphate to minimise the amount of lead which can be dissolved in water.	No legal limit
Potassium	Occurs naturally in water as it passes through mineral deposits and rock strata.	No legal limit
Selenium	Rarely found in drinking water. Traces may be found if water has passed through rock strata containing naturally occurring selenium.	10 µg/l
Sodium	Low levels occur naturally in many water sources. Domestic water softeners can increase the sodium concentration. Softened water should not be used for drinking, cooking and preparing babies' feeds.	200 mg/l
Solvents (tetrachloroethane and trichloroethene)	This standard is the sum of both solvents. Traces may be found in water sources due to industrial pollution. Solvents are removed using specialist treatment.	10 µg/l for the sum of both
Sulphate	Occurs naturally in many water sources after contact with mineral deposits and rock strata.	250 mg/l
Taste	A measure of the aesthetic quality of drinking water. Unusual odours or tastes may indicate a problem which needs investigating.	Acceptable to consumers and no abnormal change
Temperature	This is a measure of the water temperature when samples are taken.	No legal limit
Tetrachloromethane	A solvent sometimes found in water sources due to industrial pollution. Solvents are removed using specialist treatment.	3 µg/l
Total Indicative Dose (TID)	TID is the effective dose of radiation exposure the body may receive through drinking water. It is required to be measured if the gross alpha or gross beta activities (see above) exceed the screening values.	0.1 mSv/year
Total Organic Carbon (TOC)	A measure of the total amount of organic matter in the water.	No abnormal change
Trihalomethanes (THMs) (total)	Can be formed during the disinfection of water supplies if chlorine reacts with naturally occurring organic substances.	100 µg/l
Tritium	Tritium is a radioactive isotope of hydrogen which is found naturally in water at very low levels.	100 Bq/l
Turbidity	This is a measure of the cloudiness of the water.	4 NTU at customer taps 1 NTU at water treatment

		works
Vinyl chloride	Not found naturally in water. May be found in water pipes containing polyvinyl chloride (PVC). Concentrations are strictly controlled by product specification.	0.5 µg/l
Further information can be found on the Anglian Water and Drinking Water inspectorate websites: www.anglianwater.co.uk www.dwi.gov.uk		

A P P E N D I X D

E N V I R O N M E N T A G E N C Y C O N S U L T A T I O N

Anna-Lisa Morse

Our ref: CCN\2018\96794

anna-lisamorse@arpassociates.co.uk

Date: 28 August 2018

Dear Anna-Lisa

Provision of Flood Risk Information for Cowbit, Spalding.

Thank you for your request to use our flood risk information in the development of the Flood Risk Assessment (FRA) for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

Flood Map

The attached map includes the current Flood Map for your area. The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains there are many kilometres of raised flood defences. To meet the requirements of the National Planning Policy Framework, these defences are removed in their entirety to produce the Flood Map for Planning (Rivers and Sea). The map therefore shows the full extent of areas that would be at risk of flooding if no defences existed and water could spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of flooding particularly in the event of defence failure.

The Flood Map also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

Historic Flood Extent Map

A copy of the Historic Flood Extent Map showing the extent of previous recorded flooding in your area is attached. This only covers information we hold and it is possible other flooding may have occurred which other organisations, such as the Local Authority or Internal Drainage Boards, may have records.

Fluvial Flood Risk Information

Fluvial Defence Information

The fluvial defences reducing the risk of flooding to this site consist of earth embankments and upstream flood storage reservoirs. They are in fair condition and reduce the risk of flooding to a 1 in 100 chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

Modelled Levels and Flows

Available modelled fluvial flood levels and flows for the model nodes shown on the attached map are set out in the data table attached. This data is taken from the model named on the data table, which is the most up-to-date model currently available.

Please note these levels are in-channel levels and therefore may not represent the flood level on the floodplain, particularly where the channel is embanked or has raised defences.

Modelled Hazard Mapping

Please refer to South Holland District Council's hazard mapping undertaken for their Strategic Flood Risk Assessment (SFRA). Hazard mapping can be found for the district using the following link: <http://www.southeastlincslocalplan.org/2016-update-of-south-holland-strategic-flood-riskassessment-spalding-maps>

Development Planning

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of our information for Flood Risk Assessments. We recommend that you undertake a formal pre-application enquiry using the form available from the website.

<https://www.gov.uk/planning-applications-assessing-flood-risk>

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Climate change will increase flood risk due to overtopping of defences. Please note the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - Flood risk assessments: climate change allowances was published on GOV.UK in February 2016. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

Supporting Information

Please see the Standard Notice or licence for details of permitted use. The Standard Notice can be found at the link below.

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

Further information on flood risk can be found on the GOV.UK website at:
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. Additional information may be available from your Lead Local Flood Authority or the county council or unitary authority or, where they exist, the Internal Drainage Board.

Further Contact

We hope we have correctly interpreted your request. If you are not satisfied with our response to your request for information, you can contact us within two calendar months to ask for our decision to be reviewed.

If you have any queries or would like to discuss the content of this letter further please contact Sarah Curl using the details below.

Yours sincerely,



FOR Alastair Windler
Partnerships and Strategic Overview Team Leader - Welland and Nene

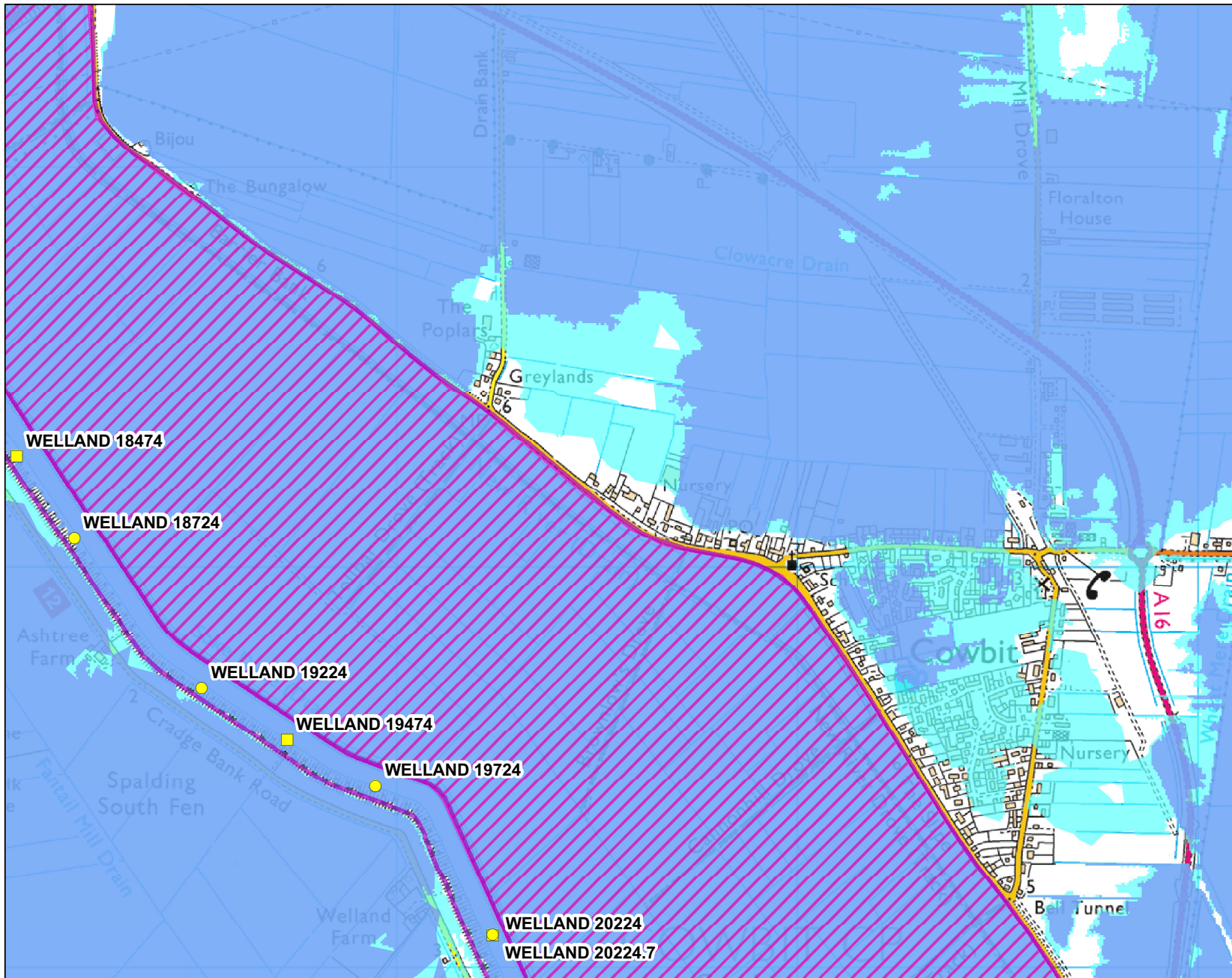
Direct dial 020 302 53535
Direct e-mail PSOWN@environment-agency.gov.uk

Enc.
Flood Map
Historic Flood Extent Map
Modelled Fluvial and Flows Data Sheet



Awarded to Lincolnshire & Northamptonshire Area

Flood Map centred on TF 25664 18191 - created August 2018 [Ref: CCN-2018-96794]



Scale 1:10,000



- Modelled Node - Levels
- Modelled Node - Flows
- Raised Defences
- ▨ Flood Storage Areas
- Area at Risk of Flooding from Rivers or The Sea
- Extreme Flood Outline

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.

- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering