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1.0 INTRODUCTION

1.01. This Hearing Statement is made for and on behalf of KCS Developments Ltd (KCS) and responds to selected questions set out within Matter 1: Legal and Procedural Requirements and Matter 14: Flood Risk of the Inspector’s Matters, Issues and Questions.

1.02. The following responses are pursuant to and should be read in conjunction with our comments on behalf of KCS upon the Publication Draft, dated September 2019 and Hearing Statements submitted as part of this and Matters 2, 3, 4 and 5. Carter Jonas is also scheduled to attend and participate in the Examination for the aforementioned matters on behalf of KCS.

1.03. Please note this statement has been prepared for the exclusive benefit of the respondents as set out herewith and no other parties may use or duplicate the report contents without the written permission of Carter Jonas.

1.04. KCS is actively promoting residential development on land off Ings Lane, Skellow (the site) and has progressed an Option Agreement with the owners of the land edged red below.

1.05. The 4.2ha site is proposed for removal from the Green Belt for the development of up to 75 dwellings, as detailed within the site-specific Promotional Document, submitted previously to the Council with covering representations in January 2019 and again in September 2019 as part of the Publication Draft Consultation. For completeness, a copy of the Promotional Document is attached at Appendix 1 of this Hearing Statement and the covering representations at Appendix 2.
1.06. This statement of case details our response to Matter 1 – MIQs 1.3, 1.5 and 1.12 and Matter 14 insofar as it is cross-related to Question 1.12. For ease of reference the Inspector’s questions are referenced in bold. Where a specific question is not covered KCS has no comment at this stage of the local plan process.
2.0 MATTER 1 – LEGAL AND PROCEDURAL REQUIREMENTS

Public Consultation and Engagement

Question 1.3

Was the Plan shaped by early, proportionate and effective engagement with communities, local organisations, businesses, infrastructure providers and operators, and statutory consultees?

2.01 We wish to acknowledge the submission of our client’s land interest during the later stages of the Plan’s preparation. We note however further to repeated requests to gain the LPA’s engagement and review of the proposed site. On receipt of additional information from the Environment Agency, confirming the site’s reduced susceptibility to Flood Risk, the Council remained unwilling to consider the updated assessment and deferred the site’s consideration to the examination process.

2.02 For completeness we include details of the timeline of our extensive engagement with local planning authority officers at Appendix 3.

2.03 We also enclose at Appendix 4 an email chain that confirms the local ward member support for Ings Lane as the preferred housing option for Skellow from Councillors Austen White and Cllr John Gilliver.

2.04 Despite having demonstrated that the site is at significantly less risk of flooding than was previously understood and despite clear support now from Doncaster Council Members, officers have throughout declined to engage and work with us toward a draft housing allocation. We therefore question the Plans proportionate and effective ongoing engagement with landowners due to our client’s own experience.

2.05 It is our view that the spatial strategy fails to meet the basic requirements for Skellow. It is welcomed that the Council recognises the need to review the Green Belt boundary around the town and allocated land. However, we consider that the main site off Crabgate Lane (Site Refs. 165 and 186) would not deliver the number of dwellings proposed across the plan period.

2.06 Also, the Council has identified a reserve site which is carried over from the UDP but has received no developer interest over the past 20 years, indicating that the site is not deliverable due to lack of market interest. As a result of choosing the two draft allocation sites over other more sustainable and deliverable options, the council has failed to proportionately engage with many small to medium site landowners and the views of local councillors and in doing so has failed to consider small to medium scale sites over the carried over and large scale allocations selected for Skellow.
**Sustainability Appraisal**

**Question 1.5**

Did the sustainability appraisal consider and compare reasonable alternatives as the Plan evolved, including for the broad spatial distribution of housing, economic and other development? Was the Plan informed by the findings of the sustainability appraisal?

2.07 With reference to the above we continue to draw attention to the Council’s reluctance to consider and compare reasonable alternatives as the Plan evolved. Whilst acknowledging the submission of our client’s site following the earlier, albeit incredibly concise Call for Sites exercise, on receipt of supporting information from the initial consultancy team (JPG and JBA) and finally the Environment Agency, the Council remained reluctant to consider alternative sites within Skellow including those benefitting from lower flood risk.

2.08 Repeated attempts to engage with the Council to present the work initially prepared by JPG questioning the accuracy of the Council’s flood maps, then by JBA Consulting providing detailed analysis of the flood risk across the local area and finally in the Environment Agency’s agreement to the revised modelling and that the proposed development was wholly contained within Flood Zone 1. For completeness, copies of the aforementioned report, technical appendices, correspondence with the EA and revised site plan are included in full at Appendices 5 - 9.

2.09 In summary, following extensive work by our flood risk consultants the Environment Agency has agreed that its online Flood Map for Planning is inaccurate in that FZ3 is shown to encroach onto the site whereas the work by JBA as appended more accurately shows a separation distance between the site and FZ3 with a strip of FZ2 between, as follows:

![Map Diagram](image-url)
2.10 In this, the brevity of the call for sites exercise and the lack of consideration of other sites outside that exercise leads us to the conclusion that reasonable alternatives were not properly considered under the Sustainability Appraisal. As such, the Sustainability Appraisal in respect of Skellow was in part based upon inaccurate flood risk information and, in combination with the insufficiency of the call for sites exercise, due consideration to the potential housing allocation of this site at Ings Road as a reasonable alternative was not given by the council.

_Flood Risk_

**Question 1.12**

Are the spatial strategy and allocations in the Plan, including those listed below, consistent with national planning policy relating to development and flood risk?

2.11 As outlined above and previously as part of representations submitted for Matter 5, we raise concerns in relation to the Council’s evidence base and supporting flood risk assessments required as statutory by national policy. Whilst acknowledging the submission of our client’s land during the later stages of the Plan’s preparation, on the receipt of additional information from the Environment Agency, the Council was unwilling to consider the updated assessment.

2.12 The Framework is clear that:

> “…inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risks…strategic policies should be informed by a strategic flood risk assessment…and take account of advice from the Environment Agency and other relevant flood risk management authorities” (paragraph 155).

2.13 Flood modelling carried out by JBA using 2018 Environment Agency data and a detailed topographical site survey confirmed the entirety of our client’s site is located within Flood Zone 1. This is evidenced in the supporting evidence we enclose at Appendices 5 – 9.

2.14 The Environment Agency’s flood mapping application was based on Ordnance Survey’s OS VectorMap, this data is to the nearest contour line, these are spread 10m apart and therefore EA mapping can only provide an indicative boundary, whereas JBA has modelled Environment Agency data with an up to date detailed site survey to deliver an accurate representation of flood risk on the site.

2.15 Following on from the extensive work by our flood risk consultants to demonstrate that the site is not at risk of flooding and the pursuant engagement with the Environment Agency to confirm this, we offered a thorough review of the entire flood catchment area to assist the site selection process for Skellow. However, as an
illustration of its unwillingness to engage in respect of a reasonable alternative, the council simply chose to defer these matters to the examination process, hence the need to append the extensive and compelling flood risk evidence in the form of the JBA fraFRA, modelling and reporting and the ultimate EA response leading to proposed amendments to their flood zone mapping.

2.16 We therefore highlight with particular reference to Skellow how elements of the proposed spatial strategy and allocations across the Service Town of Skellow are inconsistent with national planning policy. By disregarding updated information received in relation to sites across Skellow from our client’s ongoing engagement with the Environment Agency and favouring carrying over a previous UDP site (off Owston Road – Site 398) representing a significantly higher flood risk than our client’s land holding off Ings Lane the council has failed to consider an appropriate alternative housing site that performs better than the selected sites in terms of accessibility and connectivity as well as flood risk.

2.17 The following plan extracts showing the draft allocation of Site 398 as a housing reserve allocation despite the area being wholly washed over by FZ3. This and the failure to note the FZ1 status of the site at Ings Lane perfectly illustrate how the plan is wholly inconsistent with national planning policy relating to development and flood risk.
3.0 MATTER 14 – OTHER ENVIRONMENTAL ISSUES – FLOOD RISK

3.01 Our comments on the flawed way in which flood risk was taken into account in deciding the spatial strategy and selecting site allocations for Skellow are detailed under Matter 1.

3.02 Policies 57 and 58 set out development management requirements relating to drainage and flood risk. The sixth paragraph of policy 2 refers to development being accommodated in flood zones where sites are safe or can be made safe. The Council’s response to PQ13 suggests a change to this to make clear that development in flood zones will need to be in accordance with policy 58 and national policy. The Council’s response to PQ14 suggests removing this paragraph, along with 7 other paragraphs, from policy 2 and setting them out in a separate text box entitled “spatial strategy”.

3.03 The Council’s response to PQ12 explains why policy 58 part C confines the sequential test area of search for housing, business and industrial development on windfall sites to the settlement in question, rather than a wider area or the Borough as a whole. The response proposes a change to the policy so that it applies only to tiers 1 to 3 of the settlement hierarchy defined in policy 3.

Flood Risk – Approach to Development Management

Question 14.3

Is the Council’s suggested change to the sixth paragraph of policy 2 (or “spatial strategy” box) necessary and would it make this part of the Plan sound?

3.04 As outlined above and previously as part of representations submitted for Matter 1 and 5 we raise concerns in relation to the Council’s evidence base and supporting flood risk assessments required as statutory by national policy. Whilst acknowledging the submission of our client’s land during the later stages of the Plan’s preparation, on the receipt of additional information questioning the Council’s flood mapping, later also supported by the Environment Agency, the Council remained unwilling to consider the updated assessment. We therefore maintain that policy 2 remains unsound due to the flaws highlighted above within the supporting evidence base.

Question 14.4

Are policies 57 and 58 consistent with national policy and would they be effective in ensuring that development is safe from the risk of flooding and would not increase flood risk elsewhere? Is the approach to windfall sites in areas of flood risk set out in policy 58 part C consistent with national policy or otherwise justified? Is the Council’s suggested change necessary and would it make the policy sound?
3.05 For the reasons as set out in our responses to Questions 1.5 and 1.12, we maintain that the Council’s approach to flood risk assessment remains fundamentally flawed and therefore supporting development management policies to ensure future developments is safe from flooding are consequently also unsound.

3.06 The Framework at paragraph 150 remains clear that new development should be planned in ways that avoid increased vulnerability to the range of impacts arising from climate change. Paragraph 155 explains further how inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk.

3.07 The Council’s assessment however failed to consider alternative sites across Skellow or the updated flood risk information supporting areas at lower risk of flooding in preference of carried over / proposed large scale allocations. This is against the Frameworks overarching flood risk policy guiding development away from areas of increased vulnerability from climate change and areas at the highest risk from flooding.

3.08 To illustrate this point and as stated at paragraph 2.15 above, the failure of the council to take into account up-to-date and accurate flood risk evidence has led to lack of consideration of a reasonable alternative site, namely land at Ings Road, Skellow. However, the council also seeks to allocate Owston Road – Site 398 which lies centrally within a wider area covered by FZ3 and has failed the sequential flood risk assessment when considered as part of the site selection process.

3.09 We note also that Part D of Policy 58 states “The Council will ensure it keeps its evidence base on flood risk up-to-date...” Given the failure of the council to take into account up-to-date flood risk evidence in respect of Skellow when selecting housing sites, we challenge its willingness to meet this stated intention.
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1.0 INTRODUCTION

1.01 Carter Jonas LLP is instructed by KCS Development Ltd to prepare this submission for Land West of Ings Lane (the site), Skellow to support release from the current Green Belt classification and subsequent allocation for residential use through the emerging Doncaster Local Plan. This report should be read in conjunction with the technical and environmental reports and surveys commissioned to support this submission. If you have any queries regarding the site or this document, please contact Joel Gandhi (Joel.Gandhi@carterjonas.co.uk or 0113 203 1074) or Paul Leeming (Paul.Leeming@carterjonas.co.uk).

1.02 Doncaster Council is progressing with the preparation of a new Local Plan for the District through to 2032, setting out how it will meet the objectively assessed development needs of the community and how this will be distributed across the District. A revised Local Development Scheme (LDS) was published in March 2019 following the commissioning of further evidence. The updated LDS sets out the following schedule for the preparation of the next stages of the Local Plan:

- Consideration of Draft Plan by Council - Late Spring 2019
- Publication – Early Summer 2019
- Submission – Late Autumn 2019
- Examination in Public - Winter 2019
- Inspector’s Report – Spring 2020
- Adoption - Summer 2020

1.03 Consultation on initial draft sites and policies occurred in September /October 2018; the site was not submitted at that time as no promoter had been appointed. Until late 2018, Environment Agency mapping suggested part of the site to be within Flood Zone 3, however detailed investigation by JGP Engineers in 2018 underpinned by a site specific topographical survey confirms the majority of site within Flood Zone 1. Confirmation of this position by the Environment Agency is still pending. Therefore, it is considered an appropriate time to submit this site ahead of the finalisation of the plan document and its submission for Examination, with Environment Agency advice to follow.

1.04 Within the emerging Plan, the Council seeks to meet the objectively assessed development needs of the District including housing and to facilitate the delivery of at least 920 (net) new homes each year over the plan period (2015-2032). A settlement hierarchy is identified as the focus for accommodating this development, with the Council recognising that the Green Belt will need to be reviewed around some settlements to achieve a sustainable pattern of development. Carcroft and Skellow is provisionally identified as one of 10 Service Towns/Villages with a proposed minimum target of 250 new homes, based on the most recent evidence base. It is considered land west of Ings Lane can sustainably contribute to meeting part of that housing target.

1.05 This document sets out the suitability and appropriateness of the site in the context of the Council’s evidence base and assessment methodology in particular the Green Belt Review and Site Selection Methodology, as well as a comparison with the Sustainability Appraisal (objectives) which underpins the emerging Local Plan. This document should be read alongside other supporting information contained within the submission. These include:

- Heritage Impact Assessment (Prospect Archaeology);
- Transport Appraisal (Optima Highways);
- Coal Authority Search;
- Mineral Resource Assessment (E3P);
- Preliminary Utilities Services Map (MRB); and
• Revised Flood Mapping Boundary (JPG Group).

1.06 This remainder of this submission is structured as follows:

• Section 2 provides a context and description of the site;
• Section 3 reviews the emerging planning policy context and national plan-making considerations;
• Section 4 reviews the Green Belt using the Council’s Green Belt Review and Stage 3 assessments;
• Section 5 considers the sustainability of the site against the emerging Local Plan objectives; and
• Section 6 draws various conclusions.
2.0 SITE CONTEXT

Overview

2.01 Skellow (along with the adjacent settlement of Carcroft) is a community of 8,500 people (2011 Census) immediately to the east of the A1 Great North Road and to the north of J38 A1M. It sits within a rural landscape some seven miles north of Doncaster.

2.02 Parts of the settlement along the main Skellow Road (B1220) date from the mid-1600s and include remnants from the English Civil War; although a motte and bailey castle suggest earlier settlement. These historical elements of the settlement are recognised with the designated Conservation Area; these are discussed further in the accompanying Heritage Statement. Much of the current form of the settlement is of twentieth century origin associated with the coal mining industry, along with more general suburban housing estates of the late twentieth century. Coal mining in the area at Bullcroft Colliery ceased in 1968.

2.03 Skellow (and Carcroft) is well served with schools, community facilities, open space, parks, local shops and larger supermarkets and there are major employment areas locally on the Carcroft Enterprise Park.

Site Description

2.04 As seen from the figure 1 below, the site lies south of Skellow Road (B1220), adjacent to Ings Lane in the south of Skellow, and accessed via Ings Lane or a pedestrian footpath from South Farm Drive.

Figure 1: Aerial view of Skellow with A1 road to west, proposed housing allocation site outlined in red (for reference only).
2.05 The site is approximately 2.5 ha (6.5 acres) in size and rectangular in shape. It is arable farmland which is currently fallow to pasture. The entire site is gently sloping towards the Old Ea Back watercourse to the south. Boundaries comprise a mix of thick woodland to the west, and hedging with mature trees to the south, forming a well-defined border around the site, albeit more broken and open along the (east) Ings Lane frontage. To the north the boundary is a mix of field hedge and (rear) garden boundary walls.

2.06 There is modern residential development on two sides of the site, to the north (fronting Skellow Road) and to the east of Ings Lane, namely Humber Court and Humber Close. Immediately to the north east is the Skellow Social Club and the Skellow Local Centre which contains a range of small local shops, bakery, newsagents, a Post Office and services along with a small convenience store (one Stop Shop).

2.07 Vehicular and pedestrian access is available directly from the adopted public highway off - Ings Lane to the east and South Farm Drive to the north-west directly adjoining the property. A Local Authority search has confirmed the site is not crossed by any Public Rights of Way.

Accessibility

2.08 As described above there is potential to achieve a safe and appropriate access into the site from two locations with adopted highway along the entirety of the eastern site frontage, off Ings Lane. These matters have been appraised by Optima Highways (2019) including capacity issues on the local highway.

2.09 At Appendix 1 of this report a more detailed assessment has been given of accessibility to services and facilities by means other than the private car.

2.10 The report identifies that the site is immediately adjacent to the southern edge of Skellow Local Centre, and within an easy level walk to a range of existing essential services and facilities most within five or ten minutes.

The majority of Skellow is located within a 5 minute cycle journey of the site, however additional employment opportunities and facilities are located within a half hour bicycle ride such as Redhouse Interchange, Carcroft Enterprise Park and Wellsyke industrial Park.

2.11 Regular and frequent bus services are available along Skellow Road which provide up to 8 buses per hour (two way) Monday to Friday between Cantley, Doncaster and Askern (Instoneville). The nearest bus stops are on the Skellow Road in front of the Social Club; i.e. within 100m of the site.

2.12 Adwick Interchange (AWK) is located approximately 2.5km south east of the Site off Adwick Lane providing access to local and regional rail services. There are lit footways leading to the station and both cycle and car parking facilities are provided. Adwick Interchange provides regular services to Leeds, Doncaster, Wakefield and Sheffield.

Flooding

2.13 Evidence from the Environment Agency has identified parts of Carcroft and Skellow as well as surrounding land as low-lying and with some areas located in Flood Zones 2 & 3, at highest vulnerability to the risk of flooding.

2.14 Site specific flood modelling carried out by JGP Group using 2018 Environment Agency data and a detailed topographical site survey are submitted alongside this report. These confirm the entire proposed housing allocation is located in Flood Zone 1, at lowest risk of flooding on the Environment Agency Flood Map. Part of the site not proposed as a housing allocation, directly to the south, is designated flood zone 3, the most severe risk of flooding and is proposed as public open space.
Heritage

2.15 Six designated assets have been identified within close proximity to the site. These include two grade II Listed barns, a grade II Listed house, a Listed (grade II) and scheduled medieval cross base, earthworks of a scheduled motte and bailey castle, all within the Buttercross Conservation Area designated in November 1991. This identifies that the boundary of the designated area abuts the north western corner of the site (at South Farm Drive), but does not include any part of it. A heritage appraisal supplements this document.

Mineral Safeguarding

2.16 The site partially lies within a mineral safeguarding zone, the Council intend to protect Limestone Bedeck deposits from development in order to maintain strategic reserves. A mineral resource assessment has been procured to assess the site against Council mineral policies.

Agricultural Land Classification

2.17 Grades 1-3a are considered Best and Most Versatile Agricultural Land (BMVAL) across England and Local and National Policy seeks to maintain land of this grade. Assessment of the Agricultural Land Classification Yorkshire and the Humber (ALC003) published 24th August 2014 indicates the site is grade 3 agricultural land, in close proximity to non-agricultural, urbanised land (Skellow).

Landscape Character Assessment

2.18 The site is located in D2 – Hampole Limestone River Valley of the Doncaster Landscape Character and Capacity Study (2007).

Ecology

2.19 A MagicMap search indicates no environmental or ecological designations within the site or in the surrounding area that would prohibit development of the site.

Planning history

2.20 There is no recent planning history for the application site in respect of the current Local Plan. Nor has the site been promoted through the Local Plan process or submitted to the Strategic Housing & Employment Land Availability Assessment before this.

Indicative Sketch Layout
2.21 In considering the site and issues that have been identified, an indicative sketch layout of how the site might be developed, with 80 residential dwellings within the developable area of the site adjoining existing development; the residual area will provide public open space to the south extending to 1.35 ha (3.34 acres).

Figure 2: Indicative Sketch Layout showing up to 80 dwellings with public open space to the south (Ellis Healey, 2019).
3.0 PLANNING POLICY CONTEXT

3.01 This section sets out relevant the policy context where local authorities are preparing or revising their development plan. It also provides an overview of relevant draft policies and evidence in the emerging Local Plan.


3.02 An updated National Planning Policy Framework (the Framework) was published 19 February 2019. Annex 1: Implementation of the Framework sets out the relationship between the Framework (and PPG) to various local planning documents stating that it is a material consideration from the date of publication (para 212) for the process of plan making.

3.03 Throughout, the Framework makes clear the purpose of the planning system is to contribute to the achievement of sustainable development and promote economic growth, social inclusion and environmental sustainability. It indicates that the contents and policies of the Framework should be read as a whole and constitutes the Government's view of what sustainable development means in practice.

3.04 Paragraph 8 sets out the objectives of sustainable development emphasising support for a strong and competitive economy (Economic and Social Objectives) and contribution to protecting and enhancing the natural, built and historic environment; including making effective use of land (Environmental Objective). It states that the planning system must support sustainable economic growth.

3.05 Paragraphs 15 to 22 focus on the plan-making process and suggest that development plans should be prepared with the objective of contributing to the achievement of sustainable development and be positive, in a way that is aspirational but deliverable. Of particular note, paragraph 22 emphasises a need to plan for a minimum of 15 years, and longer where Green Belt reviews take place in order to accommodate longer term requirements and maintain the permanence of Green Belts.

3.06 Paragraphs 31 to 33 outline the approach to preparing and reviewing plans, stating spatial development strategies should be informed by a sustainability appraisal, demonstrating how the plan has addressed economic, social and environmental objectives. It goes further, indicating that significant adverse impacts should be avoided and alternative options that reduce or eliminate such impacts should be pursued.

3.07 Paragraphs 35 to 37 provide the context as well as the process of examination and the 4 critical requirements for assessing the soundness of a plan:

- **Positively prepared** – providing a plan that seeks to meet objectively assessed need’s (at a minimum);
- **Justified** – appropriateness, taking account of all reasonable alternatives based on proportionate evidence;
- **Effective** – deliverable over the plan-period; and
- **Consistent with national policy** – enabling the delivery of sustainable development in accordance with the Framework

3.08 Paragraphs 117 to 119 state planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. They also state plan-making authorities should take a proactive role in identifying and helping to bring forward land that may be suitable for meeting development needs.
3.09 Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in particular promoting the development of under-utilised land, especially where land supply is constrained and available sites could be used more effectively.

3.10 Paragraph 133 reiterates that the Government attaches great importance to Green Belt and their fundamental aim to prevent urban sprawl. Paragraph 134 outlines that Green Belt serves five purposes, preventing urban sprawl and the merging of towns; maintaining the openness around urban areas; maintaining the setting and character of historic cores and safeguarding the countryside.

3.11 Paragraph 136 indicates that once established, Green Belt boundaries should only be altered where exceptional circumstances are fully evidenced and justified, through the preparation or updating of plans.

3.12 Paragraphs 137 & 138 note that all other reasonable options for meeting identified (housing) need should be explored before Green Belt is released; for example through consideration of brownfield land opportunities. Further to this, it suggests that when ‘reviewing Green Belt boundaries, the need to promote sustainable patterns of development should be taken into account’ and ‘where it has been concluded that it is necessary to release Green Belt land for development, plans should give first consideration to land which has been previously-developed and/or is well-served by public transport’.

3.13 Paragraph 139 emphasises that when setting Green Belt boundaries, consistency with requirements for sustainable development are considered and the use of physical features that create new recognisable boundaries that are likely to be permanent is preferred.

Emerging Policy

3.14 The emerging Doncaster Local Plan is at an early stage of preparation. A document entitled ‘Informal Consultation: Draft Policies and Proposed Sites’ was consulted on until 26th October 2018.

3.15 Draft Policy 2: Spatial Strategy and Settlement Hierarchy (Strategic Policy): sets out the Council’s overall Strategy and confirms that new development (including homes, supporting services and associated jobs) will be focused in and around existing urban areas (primarily Doncaster’s ‘Main Urban Area’, its 7 ‘Main Towns’ and 10 ‘Service Towns and Larger Villages’). At least 50% of new homes will go to the ‘Main Urban Area’, about 40% to the ‘Main Towns’ and around 10% to the ‘Service Towns and Larger Villages’.

3.16 Skellow is identified as one of the ‘Service Towns and Larger Villages’ within the settlement hierarchy, these provide a good range of services meeting their own needs and the local area. The draft policy states ‘To maintain and enhance their role as service towns and larger villages which provide housing, employment, retail, and key services and facilities for the local area, these settlements will be a focus for accommodating an appropriate level of growth’.

3.17 An overarching approach to the Green Belt is set out in Part 5 of the policy suggesting that the overall extent will be maintained, and a supply of safeguarded land will be maintained equivalent to five year supply of development land.

3.18 Draft Policy 3: Level and Distribution of Growth (Strategic Policy): confirms that the Council’s strategic aim is to facilitate the delivery of at least 920 (net) new homes each year over the plan period 2015-2032 (15,640 homes in total) with sufficient land allocated to deliver at least 15 years’ supply (13,800). In particular, the policy text highlights that land for a minimum of 250 dwellings is to be identified in Carcroft and Skellow over the plan period (2015-2032).
3.19 Draft Policy 6: Housing Allocations: refers to the distributional elements of Policy 3 and states the housing (and other) allocations will be identified on a Proposals Map.

3.20 Draft Policy 8: Delivering the necessary range of housing: outlines how the Council will ensure the delivery of a wider range and mix of housing types, sizes and tenures will be supported, proscribing ‘new housing developments will be required to deliver a mix of house size, type, price and tenure to address as appropriate the needs and market demand identified in the latest Housing Need Assessment (or other robust evidence)’.

3.21 Draft Policy 14: Promoting sustainable transport within new developments: confirms that proposals are required to make appropriate provision for access by sustainable modes of transport to protect the highway network from residual vehicular impact.

Local Plan Evidence Base

3.22 Underpinning the emerging Local Plan are a series of evidentiary documents which inform the strategy and the proposed sites for allocation. Those considered to be of relevance include:

Economic Forecasts and Housing Needs Assessment

3.23 Published in June 2018 this report provides information on the Objectively Assessed Needs (OAN) for the District for the plan period to 2032, recognising that the report is prepared in a period of transition for the planning system. A range of projections and forecasts based upon a “business as usual” approach or a job-led housing need approach consistent with the Sheffield City Region job growth aspirations produce a range of housing projections of between 590 and 1060 dwellings per annum (DPA).

Settlement Background Paper

3.24 Prepared to inform the 2018 consultation the paper explains how the local plan’s housing strategy emerged and in particular supports the approach set out in Policy 2 (Settlement Hierarchy) and Policy 3 (Distribution and level of Growth). This Background Paper is informed by a Settlement Audit (updated February 2017) and Settlement Profile which describes Carcroft-Skellow as the largest of the Tier 3 Settlements (Service Towns and Villages) providing a large number of primary services and has a close relationship with Adwick-Woodland. It suggests that Carcroft Skellow is well placed to take a higher proportion of the housing allotted within that tier of the settlement hierarchy.

3.25 It also highlights that Carcroft Skellow is deficient in both formal (-0.89ha) and informal (-3.44ha) open space. Consequently the accompanying Greenspace Audit identifies a priority in Skellow to provide additional formal and informal open space.

Housing and Economic Land Availability Assessment (HELAA)

3.26 The Doncaster Housing and Economic Land Availability Assessment (HELAA) is part of the Council’s evidence to inform the selection of Housing and Employment Allocations in the new Local Plan and to provide the basis for demonstrating the on-going 5-year housing land supply position.

3.27 It is required by national guidance and includes sites that were submitted in the “call for sites” that took place at the end of 2014 and also includes sites with planning permission. The assessment is monitored and updated annually, the 2017 update was published in July 2017 and provides a revised summary of land availability for the borough as at 1 April 2017.

Identifying Development Limits Methodology Paper
3.28 Published as a draft for consultation in 2018 the Paper sets out a number of principles for how development limits (DL) will be determined. It suggests what will be included within the limits and what will be excluded. With regard Skellow the Paper suggests any changes to the DL review will be co-ordinated with the Green Belt Review Paper.

**Green Belt Review**

3.29 Consultants (Arup) were commissioned to undertake a review of Green Belt in the District as the Council concluded that there is insufficient brownfield land and the need to promote a sustainable pattern of development requires the removal of land from the Green Belt to deliver the Local Plan strategy. For example, Carcroft-Skellow is entirely surrounded by a tightly drawn Green Belt boundary, therefore in order to meet its minimum identified housing growth (250 homes) up to 2032, the Council has acknowledged land must be removed from the Green Belt.

3.30 A three stage process was undertaken for the Green Belt Review comprising a Stage 1: Definition Green Belt Purposes and assessment of General Areas, followed by Stages 2 and 3 comprising a Technical Site Constraints Analysis and Resultant Green Belt boundaries. The site is located in northern boundary of Green Belt parcel ‘Carcroft 1’ within the Review (2016) as seen from figure 3 below.

![Figure 3: Extract from ARUP Stage 1 Green Belt Review (2016) with Carcroft 1 parcel (site outlined in purple, for reference only).](image)

3.31 Within the Stage 2 Assessment, the appraisal of the Carcroft 1 parcel with the five purposes of the Green Belt suggests the following:

- **Purpose 1 - to check the unrestricted sprawl:** suggests that the Green Belt boundary in this location is angular and indented and does not perform a strong function in preventing urban sprawl.
• **Purpose 2 - Preventing towns from Merging:** suggests that the area serves as a largely essential gap, but whilst relatively narrow provides sufficient visual and perceptual gap and that some development may be appropriate as it would not result in the merging, coalescence or erosion of a valued gap.

• **Purpose 3 - Safeguarding the Countryside from Encroachment:** identifies the area to have a rural character but with a range of unnatural landforms and few features which are distinctive or rare indicating that the Green Belt in the area is of a low to moderate sensitivity to encroachment.

• **Purpose 4 - Historic Cores:** suggest that the area does not perform a strong role.

• **Purpose 5 - Regeneration:** suggests that the area performs a strong role in assisting with urban regeneration.

3.32 Within the Stage 3 Green Belt Review (2017) the report examines the implications of removing specific sites from the Green Belt to accommodate housing or employment allocations in terms of their contribution to Green Belt purposes, then secondly the effect of their removal from the Green Belt upon the robustness (permanence) of Green Belt boundaries. Six sites around Skellow and Carcroft are included in the Review. Of relevance are Site 042 Land to the rear of Skellow Hall which is directly adjacent to the site and contained in the same Stage 2 Parcel “Carcroft 1”, along with sites 165 & 186 which emerged as the Council’s preferred sites for housing allocations. These assessments have been used to provide comparative analysis in section 4.
4.0 GREEN BELT REVIEW

4.01 Some six sites were assessed around Skellow as part of the Stage 3 GB Review to deliver a minimum of 250 dwellings over the Plan period. Below is the ARUP Green Belt Review (2016) assessment of Carcroft 1, in relation to the parcels strength in serving the five purposes of the Green Belt. The assessment provides an overview of the entire parcel, as evidenced from figure 4, the proposed site lies adjacent to the development limit of Skellow, where development extends further south along the eastern side of Ings Lane.

Comment on Boundaries

4.02 Stage 3 analysis for Site 042 suggests the site boundaries are strong (in isolation) and well defined by dense tree belts. It suggests however that consequential changes to the GB boundary would be detrimental resulting in an indented, stepped and irregular boundary which would be weak and inconsistent, potentially undermining the permanence of the GB boundary to the south of Carcroft/Skellow.

4.03 Taken in context this would suggest that the eastern boundary to Site 042 is substantial and well defined. This would provide the western boundary to this site.

4.04 Elsewhere, analysis of site boundaries suggests that where proposed Green Belt boundaries consist of agricultural field boundaries that these are inherently weakly defined and not likely to be permanent features. Therefore use of field hedgerows needs to be considered in combination with other factors.

4.05 Considering the southern site boundary is a defined hedge line with mature trees, it is considered that in isolation the boundary would be moderate. However, it would be anchored by two “strong” features; to the east the hedge aligns with the edge of modern residential curtilages at Humber Court, and to the west, the tree belt within Site 042. Therefore, the proposed Green Belt boundaries are strong as a collective and would create a smoother boundary than site 042.

4.06 It is suggested the summary narrative would state

*Strong: The proposed Green Belt boundary would be defined by a moderately dense and well defined field boundary in the south and a strong tree belt to the west. The proposed Green Belt boundary would therefore be strong; and the resultant Green Belt boundary would create a rounding off to the built form of Carcroft and Skellow adjacent to existing development off Skellow Road and Ings Lane.*

Comment on Performance against Green Belt Purposes

Purpose 1: To check the unrestricted sprawl of large built-up areas

4.07 **Score 1:** The Green Belt parcel ranks lowest in checking the unrestricted sprawl of large built-up areas. Carcroft and Skellow is identified as a ‘Small Urban Area’ within the Doncaster Local Plan Issues and Options (2015) which means it is not identified as a ‘large built up area’ within the original designation of the Green Belt or following the analysis of primary tier settlements within neighbouring authorities.

4.08 The Green Belt at this location is therefore connected to the South Yorkshire Green Belt, but not in close proximity to any large built up area and does not serve to check the unrestricted sprawl of large built-up areas.

4.09 The site is in close proximity to the river Skell, as well as Old Ea Beck, designated as Flood Zone 3, these two water sources naturally restrict development from sprawling.
Purpose 2: To prevent Neighbouring Towns from merging into one another

4.10 (Purpose 2a) Score 2: The parcel serves ‘a largely essential gap between two or more settlements where the overall openness and scale of the gap is important to the restricting merging or protecting gaps involving other ‘inset’ Green Belt Settlements, but where limited development may be possible’. The parcel along with Adwick 1, 2 and 3 protects a land gap between the Small Urban Area of Carcroft and Skellow and Large Urban Area of Adwick Le Street.

4.11 The assessment notes that although it is a relatively narrow gap, there is sufficient visual and perceptual separation (alongside Adwick Le Street 1) that some development would not result in the merging, coalescence or significant erosion of a valued gap.

4.12 (Purpose 2b) Score 0: With respect to ribbon development, this means there are no instances or opportunities for ribbon development along Ings Lane as it does not provide direct access to any settlement.

4.13 As is the case with purpose 1, Flood Zone 3 to the south of the site and no further access along Ings Lane serve to prevent Adwick Le Street and Carcroft and Skellow from merging. Further to this, allocation of this site will not extend the built form of Skellow beyond existing development east of Ings Lane.

Purpose 3: To assist in Safeguarding the Countryside from Encroachment

4.14 (Purpose 3a) Score 2: In terms of sensitivity of the Green Belt, this area has moderate to low sensitivity to encroachment. The General Area therefore contains no distinctive components or features which are considered to be irreplaceable or rare. Land at this location was in a poor to fair condition: there was evidence of fly-tipping and open storage taking place along Ings Lane.

4.15 However, given that there is very limited built form within the General Area, development within the Green Belt could have a negative impact on the physical landform, and views (particularly if unscreened and located on the former spoil colliery).

4.16 (Purpose 3b) Score 3: In terms of the extent to which the land features have been impacted by encroachment, the area possesses moderately strong rural character. Whilst the land appears to have low levels of built form, it has evidence of urbanised uses that reduce the rural character of the general area.

4.17 The development limit of Skellow extends beyond the proposed allocation, therefore this site is not considered to encroach on the countryside as it is not extending the built form of Skellow beyond the present limit. The strong boundary features to the west and south of the site also serve to limit encroachment and screen the rural character of the area from urbanised uses. Positioning public open space to the south further limits encroachment into the Countryside by providing a gradual buffer from urban area to rural landscape.

Purpose 4: To preserve the setting and special character of historic towns

4.18 (Purpose 4a) Score 1: When assessing what role the general area has in supporting the character and views of historic towns, neither Adwick Le Street or Carcroft and Skellow are historic towns and therefore the parcel does not support this purpose.

4.19 (Purpose 4b) Score 1: There are no views of historic towns from the parcel and so the general area scores poorly when considering the role of supporting views into and out of historic towns.
4.20 Heritage assets in a town can be considered to have a positive contribution in providing setting and character to towns, to the point they become historic towns. The Heritage appraisal provided by Prospect Archaeology assesses historic considerations in relation to local heritage assets as well as archaeology and infers that development of the site, subject to design details will not affect the character or setting of heritage assets.

**Purpose 5: Assists in urban regeneration, by encouraging the recycling of derelict and other urban land**

4.21 **Score 3:** The parcel is considered to be contiguous with the Regeneration Area of Carcroft and Skellow and serves to direct development towards previously developed land inside the development limits. However, as established by the Council, although the site is in close proximity to the Carcroft and Skellow Regeneration Priority Area, large portions of urban land within Skellow are located in Flood Zones 2 and 3, making redevelopment of previously developed land unachievable.

4.22 As the Council has acknowledged the settlement lacks enough brownfield land to meet housing needs and Green Belt must be released for development, the site is considered to score equally with current housing allocation sites 165 & 186.

**View on Purposes**

4.23 Within the appraisal against Green Belt purposes it is considered that the site “performs poorly against the Local Interpretation of the Green Belt Purposes.”

4.24 In comparison Site 042 was assessed to have a moderate case for inclusion in further site selection work, with a mixed strength boundary and moderate scores for serving the purposes of the Green Belt. The site scores lower than site 042 in serving the purposes of the Green Belt and has moderately strong boundaries, therefore, it can be considered to have a moderately strong case for inclusion within further site selection work.

4.25 Also, the site is considered to score lower than current Skellow housing allocation sites 165 and 186, indicating they serve the purposes of the Green Belt more strongly.

**Conclusion**

4.26 Therefore a balance of national plan making policies and assessments from the Green Belt review should be measured when removing land from the Green Belt and allocating it for residential use. From the information provided through the ARUP Green Belt Review and Stage 3 site assessment Review, it can be considered the site should have the following grading:

“Strong Case for inclusion within further Site Selection work: Strong Boundary and Weakly Performing against Green Belt Purposes”.
5.0 **SUSTAINABILITY ASSESSMENT**

5.01 A further part of the Council’s evidence base supporting the emerging Local Plan is a Sustainability Assessment of the whole plan and also of the individual sites. Table 8.20 summarises the results of the SA process for housing sites for Carcroft and Skellow. Within the narrative at pages 182-183 it summarises the settlement strategy for Carcroft and Skellow with a comparative assessment of the sites, alongside their capacity, to inform the selection of Proposed Housing Sites.

5.02 The exercise below replicates the assessment of the site in the context of the SA Objectives, informed by the specialist studies as listed at paragraph 1.5 above. It concludes with a narrative similar to that set out at Pages 182 and 183 of the SA, Based upon evidence from sections 3 & 4, the following sets out the main considerations supporting the allocation of land West of Ings Lane for residential development. A number of technical reports have been procured to provide additional evidence and clarification in relation to adverse impacts identified in the SA, issues such as Heritage, Access, Flooding and Mineral Safeguarding.

5.03 Furthermore, the site has been assessed against national policy relating to reviewing Green Belt boundaries and the need for sustainable development in line with relevant plan-making provisions of the NPPF (the Framework). It is considered that the principal issues are as follows:

- Sustainability of the Site; and
- Impacts of Development.

5.04 Each of these points will be addressed in turn below.

**Objective 1A (i) Loss of existing employment use**

5.05 This is a housing proposal which is not on land in employment use

*Score = 0*

**Objective 3A (i) Distance to Train Station**

5.06 Site lies over 1200 m from a train station at Adwick Interchange.

*Score = -*

**Objective 3A (ii) Distance to Bus Stop**

5.07 There are bus stops to the front of the Skellow Social Club, within 400m of the site giving access to a high frequency services.

*Score = +*

**Objective 3A (iii) Access to Cycle Network**

5.08 The site is within 100m of the identified cycle network, along Skellow Road

*Score = +*

**Objective 3B (i) Access to Existing Centre**

5.09 The site lies within 100m of a town or local centre District Centre on Skellow Road, immediately north of the site.

*Score= ++*

**Objective 3B (ii) Access to Primary School**

5.10 The site lies more than 800m walking distance to the nearest primary school.

*Score = -*
**Objective 3B (iii) Access to Secondary School**

5.11 The site lies within a walking distance of 1km to 2km of the nearest secondary school.

Score = 0

**Objective 3B (iv) Access to GP**

5.12 The site lies within 800m – 1.2km of a GP surgery.

Score = 0

**Objective 5A (i) Affordability**

5.13 At 80 units, the site will trigger provision of affordable and other subsidised housing; a contribution will be provided consistent with the prevailing policy.

Score = +

**Objective 5D (i) Market Failure**

5.14 This site does not represent a cleared housing site and is located within an attractive settlement to the north of Doncaster with good access to services, community facilities, jobs and the strategic highway network.

Score = 0

**Objective 7B (i) Minimise Risk to Health and Safety**

5.15 The site is located outside of a Health and Safety Executive Consultation Zone.

Score = +

**Objective 8A (i) Encourage the Re-use of land and buildings**

5.16 This is a green field site on the edge of an existing settlement. It has not been previously developed.

Score = 0

**Objective 8A(ii) Contaminated Land**

5.17 This site is not known to be on an area of known contamination.

Score = 0

**Objective 8A (iii) Landfill Sites**

5.18 The site is located within an area identified as containing a closed land fill site.

Score = 0

**Objective 8A (iv) Unstable Land**

5.19 The site is not within a “Development High Risk Area”

Score = 0

**Objective 8B (i) Highways Capacity**

5.20 An access statement has been prepared which identifies that development of the site for 80 residential units will have no traffic impacts upon the strategic or local road network.

Score = +

**Objective 8B (ii) Fibre Broadband Capacity**

5.21 The site is in an area where fibre broadband and associated infrastructure will be in place by 2018.

Score = +

**Objective 8B (iii) Primary School Capacity**

5.22 Analysis of local primary school provision indicates that there is spare capacity in the region of more than 10% surplus of spaces.

Score = +
Objective 8B (iv) Secondary School Capacity
5.23 Analysis of local secondary school provision indicates that there is limited capacity with a surplus of less than 5% of spaces.
Score = -

Objective 9A (i) Access to public open space
5.24 Evidence supporting the Local Plan suggests there is a shortfall in formal and informal open space in Skellow and Carcroft. It is anticipated that the scheme will result in the provision of an additional 1.35 ha of open space which will address the shortfall in part.
Score = +

Objective 11A (i) Main River Flooding
5.25 Environment Agency mapping suggests that part of the site falls within FZ3a. However, a detailed topographical survey and analysis by JPG engineers suggests the developable area of the site is within FZ1. As a consequence, the proposal would result in development being located in FZ1, at the lowest level of risk of flooding.
Score = +

Objective 11A (ii) Surface Water Flooding
5.26 The site is not identified as being at risk from surface water flooding.
Score = +

Objective 11A (iii) Areas benefitting for Flood Defences
5.27 The proposal is in an area benefitting from flood defence works and is not at risk of main river flooding (FRZ1)
Score = +

Objective 11A (iv) EA Flood Warning or Alert Area
5.28 The site falls within an EA flood warning or alert area or is not at risk of flooding (FRZ1).
Score = +

Objective 12A (i) Biodiversity
5.29 The site is in arable agricultural use, albeit currently fallow. It is outside all designated sites and buffers.
Score = 0

Objective 12B (i) Landscape Capacity
5.30 The site is located in D2 – Hampole Limestone River Valley of the Doncaster Landscape Character and Capacity Study (2007). Whilst the report acknowledges that the valley should be conserved, it notes there is moderate potential for mitigation of housing development. In particular, any development should not encroach on the valley floor or the watercourse (Old Ea Beck) and developers should ensure there are limited visual impacts and separation of settlements is maintained.

5.31 From the Green Belt assessment, it is concluded that strong boundary features with adequate screening have the ability to limit the visual impact as well as maintain separation of the settlements. Additionally, situating public open space in the south of this site restricts encroachment on the Old Ea Beck.
Score = 0

Objective 13A (i) Heritage Impacts
5.32 The north western part of the site abuts the boundary of the Butter Cross Conservation Area. There are two Grade II Listed barns within the visual envelope, albeit they have lost their original context following conversion to residential use, and further residential development in their curtilage. These matters are covered in detail in the accompanying Heritage Statement which suggests negligible indirect effect on the Buttercross Conservation
Area and the two listed barns in South Farm Drive. Consideration could be given to planting and sensitive design and materials to maintain/enhance the setting of the Conservation Area.

Score = 0

**Objective 13B (i) Archaeology**

5.33 A heritage appraisal has been produced by Prospect Archaeology, it concludes that whilst site has moderate potential to contain archaeological remains, notably of the Iron Age and Roman periods, there are no known assets that would be a constraint to development and further investigation of the archaeological potential could be dealt with through the planning process.

5.34 Archaeological remains should not represent a constraint to development and can be dealt with through the planning process.

Score = 0

**Objective 14A (i) Minerals Sterilisation**

5.35 A mineral safeguarding report produced by E3P has analysed local mineral policy and provided an in depth review for the purposes of the sustainability appraisal. The report concludes there is a clear and identified need for the residential development in the Borough and:

- The site interrelationship with highly sensitive receptors including adjacent residential housing and surface water features would preclude mineral extraction given that the environmental and physical impact are likely to be unacceptable;
- Limestone bedrock, which is safeguarded in the wider area surrounding Skellow, is not present across the entire site, with geological mapping identifying the absence of Limestone in the south of the site. The volume of mineral that could be viably extracted is therefore considered to be low, particularly once boundary mitigation is taken into consideration; and
- It is not anticipated that development of the site will cause sterilisation of this mineral as Limestone bedrock deposits cover an extensive area.

5.36 Based on the above, there is no conflict with Policy M4 and M5 as there is an overriding need for the housing development, mineral extraction cannot be achieved in an environmentally acceptable or likely economic manner.

Score = 0

**Objective 14A (ii) Best and Most Versatile land**

5.37 Assessment of the 2014 ALC Natural England Mapping for Yorkshire and the Humber suggests that the site falls within a general area of Grade 3 and Grade 2 land. It is likely therefore that the land will fall within the BMVL category 3a, although further survey work will be required. However, given the site is 2.5 ha (6.5 acres), should the site be grade 3a (BMVAL), the loss of it to development is considered not substantial and protection of BMVL under the NPPF only applies to substantial losses of land.

Score = 0

**Objective 14B (i) Ground Water Source Protection**

5.38 The site is located within the total catchment (Source Protection Zone 3) or further form a source.

Score = 0

**Objective 14B (ii) Pollution to Surface Water Bodies**

5.39 The site is located 25m or more from an identified surface water body.

Score = 0

**Objective 14C ((i) Air Quality**


5.40 The site is located outside of any defined Air Quality Management Area or National Exceedance Area.
Score = 0

Sustainability of the Site

5.41 On the basis of the preceding analysis of the site against the relevant sustainability appraisal objectives, the site is considered to rank better than other sites in Skellow and therefore represents a more sustainable solution given its proximity to local services and the ability to provide open space to overcome a recognised shortfall in provision in the locality.

5.42 Given the appraisal work we would suggest that the summary appraisal for this site should be incorporated into Table 8.25 Reasons for Selecting and Rejecting Potential Housing Sites and should include the following entry under the Service Town Village: Carcroft Skellow Section (currently at Page 182 of the Volume 1 SA Report):

5.43 Land West of Ings Lane, Skellow; Potential Number of New Homes = 80

5.44 Proposed Housing Site – there are significant constraints in the settlement in respect of flood risk and Green Belt. As such many of the development options have failed the flood risk sequential test. This site has been demonstrated not to be at risk. The Phase 3 Green Belt Review (see Section 4.0 of this report) identifies the site as having a Strong Case for inclusion in further site selection work.

5.45 This site provides the opportunity to deliver a proportion of the local housing requirement on a site close to the village centre along with public open space to address the current deficiencies in the locality.
6.0 CONCLUSION

6.01 Doncaster Council is preparing a new Local Plan that is in the early stages of preparation, currently an adoption in late 2020 is anticipated. Through its Plan, the Council seeks to facilitate the delivery of at least 920 (net) new homes each year over the plan period 2015-2032. Consideration needs to be given to a framework compliant plan with end date at least 15 years from adoption.

6.02 In terms of the spatial strategy, Carcroft and Skellow is designated in the settlement hierarchy as one of the largest of ten service towns, capable of accommodating a minimum of 250 dwellings over the plan period. Given an indicative density of 32 dwellings per hectare, a possible capacity of 80 dwellings is achievable. The site is capable of delivering up to 1.35 ha of public open space, which will go a long way to addressing the identified local shortfall.

6.03 This site was not submitted to the most recent consultation on sites (October 2018) as a promoter had not been appointed. Topographical surveys and a detailed assessment demonstrate that the site is FRZ1, at no risk of flooding; confirmation is awaited from the EA on this point. As that position has been clarified and the emerging Plan is at an early stage, this site is submitted for further assessment as a draft housing allocation.

6.04 In delivering the spatial strategy, the Council has acknowledged Carcroft and Skellow lacks enough brownfield or greenfield sites within the development limit to meet identified needs over the plan period, therefore exceptional circumstances exist for releasing Green Belt. As part of the evidence base, the Council has commissioned a Green Belt Review to assess potential development sites.

6.05 Having considered the contents and methodology of that Green Belt Review, an assessment of the site (as evidenced in section 4) suggests it is appropriate for removal from the Green Belt as a housing site and that a permanent and recognisable Green Belt boundary can be established using the strong tree belt to the west and well-defined mature hedge line to the south, compliant with NPPF 139 (f), regarding clearly defined boundaries that are recognisable. Although development of the site has potential to affect views to and from the adjoining countryside, the site’s containment and strong boundary limit this relationship. Situating public open space south of the site further preserves the Green Belt by maintaining a gap between Skellow and Adwick-Le-Street.

6.06 The assessment against SA objectives in section 5, informed by additional technical reports provides a clear breakdown of the site compared to the nine Skellow sites assessed in Table 8.20, at pg 130 of the Sustainability appraisal. It is considered the site has scored better on numerous objectives, and where it has scored poorly, so have the alternative sites in Skellow; therefore the site is considered a better housing site in respect of the SA.

6.07 Sites 165 and 186 are a substantial distance from the local centre in Skellow, Land West of Ings Lane is considered to be in a more sustainable location, creating a logical and efficient rounding off of Skellow although sites 186 and 165 could complement the site in providing adequate housing growth. A need for sustainable development forms the core of the NPPF and sites within the Green Belt that are sustainable and deliverable within the plan period should be considered for removal first before sites that are not as sustainable.

6.08 To summarise, on the basis of limited harm to the Green Belt and taking account of identified housing needs with sustainable development being central to the plan-making process, exceptional circumstances exist to justify removal of the site from the Green Belt and inclusion as a housing allocation, compliant with the NPPF (2019).

6.09 Further to this, the site is immediately available and deliverable with a keen landowner and a draft promotion agreement agreed with a regional promoter. The NPPF (2019) places large emphasis on smaller sites that can deliver housing quickly and seek to diversify housing within residential market areas. Therefore, it should be included for further assessment as a preferred housing allocation within the emerging Doncaster Local Plan.

CARTER JONAS
APRIL 2019
Accessibility of the site has been appraised by Optima Highways (2019). Consideration has been given to walking/cycling and public transport accessibility, however the site is also accessible by private car within close proximity of the A1 motorway and Skellow Road (B1220).

It is immediately adjacent to the southern edge of Skellow, within walking distance of a range of existing essential services and facilities (minutes) as seen by figure 2 below:

5 minute walk from the site:

- Two local convenience stores;
- Newsagents;
- Post Office;
- Bakery;
- Barbers & hairdressers;
- Pharmacy;
- Dental practices; and
- Takeaways and cafes.

10-15 minute walk from site:

- Owston Park Primary is the closest primary school; and
- Larger food stores including Iceland and Asda.

15-20 minute walk from site:

- Carcroft Primary School; and
- The closest GP surgery.

- Within a 25 minute walk towards Adwick Le Street there are multiple employment opportunities at Carcroft Enterprise Park and Wellsyke Industrial Estate.

The majority of Skellow is located within a 5 minute cycle journey of the site, however additional employment opportunities and facilities are located within the area;

- Employment opportunities within Redhouse Interchange, Carcroft Enterprise Park and Wellsyke industrial Estate are within a 15 minute cycle journey;
- Adwick Interchange can be accessed within a 15-20 minute journey by bike;
- Outwood Academy, Adwick can be accessed within a 20-25 minute bike ride; and
- From the Site a 30 minute catchment area includes Skellow, Carcroft, Askern, Bentley and Adwick Le Street.
The services along Skellow Road provide up to 8 buses per hour (two way) Monday to Friday between Cantley, Doncaster and Askern (Instoneville).

Indicative bus journey times to nearby destinations are as follows:

- Adwick Interchange – 5 minutes via bus service 50;
- Adwick le Street – 9 minutes via bus service 51;
- Bentley – 14 minutes via bus service 51;
- Askern – 18 minutes via bus service 51a; and
- Doncaster – 28 minutes via bus services 51.

Adwick Interchange (AWK) is located approximately 2.5km south east of the Site off Adwick Lane. There are lit footways leading to the station and both cycle and car parking facilities are provided. Adwick Interchange provides regular services to Leeds, Doncaster, Wakefield and Sheffield.

Approximate journey times are as follows:

- Doncaster – 11 minutes;
- Wakefield (Westgate) – 21 minutes;
- Leeds – 38 minutes; and
- Sheffield – 50 minutes.

Each of these destinations (as well as others) provides accessibility to significant employment, leisure and retail opportunities beyond the immediate local area.
APPENDIX 2: PREVIOUS REPRESENTATIONS
Dear Jonathan,

DONCASTER MBC EMERGING LOCAL PLAN: CALL FOR SITES SUBMISSION IN SUPPORT OF DRAFT HOUSING ALLOCATION ON LAND WEST OF INGS LANE, SKELLOW, DN6 8JL.

Further to our email correspondence, Carter Jonas LLP instructed by our client, KCS Developments Ltd wish to submit a site for consideration in the emerging Local Plan to be removed from the Green Belt and included as a draft housing allocation.

Located in Carcroft-Skellow, which is identified as one of 10 Service Towns/Villages in the borough from the emerging Doncaster Local Plan. The Homes & Settlements consultation (March 2016) proposed a housing allocation to the town of 255 new homes over the plan period to 2032. The latest, and most up-to-date evidence base, now proposes a slightly lower target for Carcroft-Skellow of 250 new homes during this same timeframe. As seen from the site location plan below, the site is approximately 2.5 Ha (6.5 acres) in size, and lies south of Skellow Road (B1220), adjacent to Ings Lane on the eastern boundary.
Currently, the land is generic pasture, formed of overgrown grass with a mix of thick woodland and hedging that forms a protective border around the site. The entire site is gently sloping with no obvious technical hurdles, both Ings Lane to the east and South Farm Drive to the north-west directly adjoin the property and are adopted highways, a further Local Authority search has confirmed the site is not crossed by any Public Rights of Way.

Flood modelling carried out by JGP Group using 2018 Environment Agency data and a detailed topographical site survey has confirmed the entire site is located in Flood Zone 1, this is evidenced in a supporting map that highlights the difference in location between modelling from JGP and the Environment Agency when assessing the extent of Flood Zone 3. The Environment Agency’s flood mapping application is based on Ordnance Survey’s OS VectorMap, this data is to the nearest contour line, these are spread 10m apart and therefore EA mapping can only provide an indicative boundary, whereas JPG have modelled Environment Agency data with an up to date detailed site survey to deliver an accurate representation of flood risk on the site. Therefore we consider the Flood Zone 1 boundary using JGP Group’s analysis of 2018 EA data acceptable and further assessment of this data will be provided to assist the Council’s site selection methodology process for this site.

Of particular note is our client’s decision to instruct solicitors, and agree a promotion agreement with the landowners, emphasising intent to progress this site through the Local Plan. This agreement holds a time-specific clause, therefore the land is considered immediately available and inclusion of the site as a housing allocation will be acted upon by all interested parties.

It is our intention that the site be included for consideration within the emerging Local Plan as a draft housing allocation for Carcroft-Skellow, given an indicative dwellings per hectare density of 30 units, we calculate a possible capacity of 75 houses. Furthermore the site constitutes effective rounding off of Skellow, with the potential to deliver homes promptly in a sustainable location close to the centre. Previous experience in delivering sites of this nature and size suggests that, if removed from the Green Belt it would take perhaps 9 months to secure a planning consent which would allow development to commence. In terms of delivering the entire site this would be approximately 2 years from starting construction to the sale of the final house in one single phase.

The site has very few limitations that would restrict development other than being washed over with a Green Belt designation, although we consider that the site performs weakly in protecting the Green Belt as evidenced in the stage 3 Green Belt Review by site 42, a neighbouring site immediately to the west. Additionally, this site maintains the characteristics of the tightly drawn Green Belt surrounding Carcroft-Skellow far more so than the provisional housing allocations of sites 165 and 186 to the west of the settlement. These two sites (also in the Green Belt) are provisionally accepted because they are not at risk of flooding, the site we are proposing is neither at risk of flooding, nor within close proximity to the A1 motorway, which may negatively impact residential amenity. Therefore, we reflect that this site is as appropriate, if not more so for residential development than other sites under deliberation.

To summarise, the site is immediately available and suitable for development with few restrictions. The NPPF (2018) places a large emphasis on smaller sites that can deliver housing quickly and seeks to diversify the variety of housing within residential market areas. The removal of the Green Belt designation and inclusion of this site as a draft housing allocation conforms to the aspirations of the NPPF (2018) and creates a logical and efficient extension of the settlement.

Please do not hesitate to contact me should you have any queries.
Yours Sincerely,

Joel Gandhi  
Graduate Planner

E: Joel.gandhi@carterjonas.co.uk  
T: 0113 203 1074  
M: 07920 543382
From: Carter Jonas Consultants on behalf of KCS Developments Ltd  
Sent: 30 September 2019 16:28  
To: Local Plan  
Subject: Doncaster Publication Draft Local Plan - Representation on behalf of KCS Developments Ltd  
- Land to west of Ings Lane, Skellow  

One of two emails.

Please find attached representation on behalf of KCS Developments Ltd for the removal of land from the Green Belt and allocation for housing to the west of Ings Lane, Skellow. To support these proposals the following are included with this representation:

- Appendix 1 SK01A Site Layout Plan  
- Appendix 2 SK03 Site Plan  

A number of separate technical papers are also submitted for information:

- Site Promotion Document (Carter Jonas) (Second Email)  
- Heritage Impact Assessment (Prospect Archaeology) (Second Email)  
- Access Appraisal (Optima Highways)  
- Coal Authority Report  

A copy of the representation form is also included (Second Email).

We would be grateful for a formal acknowledgement of receipt and look forward to working with the Council to bring these proposals forward.

Paul Leeming MRTPI  
Associate, Partner

Carter Jonas

First Floor, 9 Bond Court, Leeds, LS1 2JZ
30th September 2019

Dear Jonathan,

DONCASTER PUBLICATION DRAFT LOCAL PLAN CONSULTATION, AUGUST AND SEPTEMBER 2019 - LAND WEST OF INGS LANE, SKELLOW, DN6 8JL

Further to email correspondence, Carter Jonas LLP is instructed by our client, KCS Developments Ltd, to submit representation to the Doncaster Publication Draft Local Plan (the DLP) regarding the development strategy for the settlement of Carcroft-Skellow, in particular the delivery of housing growth over the Plan period.

A Site Promotional Document was issued to the Council in April 2019 identifying the site specific matters, availability and suitability of the land in question to the West of Ings Lane, Skellow, in particular the ability to deliver up to 80 dwellings, in close proximity to the village centre. A copy of that document is attached to this representation along with other technical and environmental reports as listed in the text below.

Since the preparation of those documents further work has been undertaken with respect to flood risk and this representation sets out the consequences of that additional work and how it ties with the Local Plan strategy.

To inform this representation two plans are attached as Appendices

- Appendix 1 SK01A Site Layout Plan
- Appendix 2 SK03 Site Plan

A number of separate technical papers are also submitted for information:

- Site Promotion Document (Carter Jonas)
- Access Appraisal (Optima Highways)
- Heritage Impact Assessment (Prospect Archaeology)
- Coal Authority Report
Progress of the Local Plan

Doncaster Council published a revised Local Development Scheme (LDS) which suggests that a draft version of the Plan would be submitted in Late Autumn 2019 with the Inspector’s Report in Spring 2020 following an Examination in Public. On balance we consider that the timescale set out in that document is optimistic, and the Council should anticipate that the adoption may be delayed into 2021.

Soundness

Given the stage of progress of the DLP, Paragraph 35 of the Framework requires Plans submitted for examination to be prepared in accordance with legal and procedural requirements and meet the four tests of ‘soundness’ for Local Plans to be:

- Positively prepared;
- Justified;
- Effective; and
- Consistent with National Policy.

Plan Period

Consultation on the Local Plan during October 2018 suggested the plan period would comprise 2015 to 2032, a seventeen year plan period. The current draft plan suggests an extension of the plan period for the period 2015 to 2035, it is welcomed that the Council has moved the Plan period forward as this acknowledges the particular issue we raise. Nevertheless, such an approach is unsound as it is not consistent with policies in the Framework and is not planning positively.

To address this point, we consider that the Council should review the plan period bearing in mind the requirements of with paragraph 22 of the Framework which requires that “strategic policies should look ahead over a minimum period of 15 years from adoption”. This requirement is set out in the Framework specifically to identify and respond to long term development requirements and opportunities (in particular improvements to infrastructure). A similar consideration also applies where a review of the Green Belt is required, as is the case to deliver the Doncaster Local Plan. The Framework suggests at paragraph 139 that longer term requirements should be identified for beyond the plan period in the form of safeguarded land.

In light of our comments on the LDS above, we consider that the Council should extend the plan period to 2037 to take into account the Framework requirements and as a prudent approach should there be further slippage to the progress of the DLP.

Policy 1: Presumption in Favour of Sustainable Development (Strategic Policy)

We welcome and support Policy 1. It is considered to be integral to ensuring that the growth of the Borough is sustainable and improves the economic, social and environmental conditions of the area.

Policy 2: Spatial Strategy and Settlement Hierarchy (Strategic Policy)

Policy 2 is also welcomed and aligns with the settlement hierarchy for the Borough and the presumption in favour of sustainable development. The inclusion of Skellow as one of 10 Service Towns and Villages is welcomed with the expectation that this tier of the hierarchy will accommodate some 10% of the District’s housing needs. As an observation it would be appropriate for the Local Plan to maintain consistency, as in certain sections of the document it refers to this tier as “Larger” Villages.
Within the policy it suggests that new development (allocations) will be distributed on a pro-rata basis to the most sustainable locations taking a sequential approach to flood risk. Such an approach is supported where the flood zones are accurately recorded and up-to-date. We return to this issue in relation to Skellow later in this representation.

Policy 3: Level and Distribution of Growth (Strategic Policy)

As a strategic policy the wording is split into two parts - identifying the District wide development needs followed by an indication of the distribution of development across the each tier of the settlement hierarchy along with the identification of a quantum for each defined settlement.

Policy Preamble

For housing the policy seeks to deliver 18,400 dwellings for the period 2015 to 2035, based on a need of 920 dwellings per annum. In the first instance, we would suggest that the policy should be set out to be similar in vein to the employment policy to suggest a level of provision. As currently stated the requirement seems to suggest that this is a target (maximum) rather than a starting point. To address this, we would suggest the policy wording starts:

“at least **** new homes”.

Also in line with our comments above regarding the plan period we would suggest the plan period is phrased as:

“2015 – 2037”.

Furthermore it is not clear how the housing and allocation proposals take into consideration non-delivery, where sites do not come forward, or do not deliver the quantum of housing anticipated through the indicative yields set out in the individual allocations. Officers at the Council may wish to have regard to recent events in Kirklees where a number of allocated sites are not delivering the housing numbers indicated in the adopted Local Plan; particularly once detailed site investigations have been carried out in support of formal planning applications.

To reflect these matters the Local Plan Expert Group and the housebuilding industry (through the HBF et al) recommend, that when allocating sites, a buffer is built in amounting to an additional 20% over the identified housing requirement. It would be appropriate for this policy to reflect on this matter to set an appropriate policy hook for the draft housing allocations at Policy 6. Policy 3 could state that:

“Site allocations in Policy 6 will seek to identify a 20% buffer above the net housing requirement in order to achieve a level of flexibility over the plan period.”

Housing Requirement

Turning to the housing numbers we note the Council continues to identify a net housing requirement of 920 dwellings per annum (dpa) over the plan period 2015-2035. Paragraph 60 of the Framework states that ‘to determine the minimum number of homes needed, strategic policies should be informed by a local housing need assessment, conducted using the standard method in national planning guidance – unless exceptional circumstances justify an alternative approach which also reflects current and future demographic trends and market signals’.

It is considered that the housing requirement is not consistent with the level of local housing need (LHN) using the Standard Methodology as set out in PPG. There is also a disjoint between the economic growth aspirations and the housing provisions in the Local Plan requirement. In effect the employment
land requirement is expressed as a minimum whereas the housing requirement is a target; as a consequence limiting the housing numbers will act as a brake on the economic growth aspirations. Such an approach does not represent positive planning, so is unsound:

Reflecting on the Standard Method, it should be noted that it identifies a minimum annual housing need figure, it does not produce a housing requirement figure. This requires consideration of a range of adjustment factors including annual average household growth, affordability and economic growth factors. Noting the comment above on Local Plan housing figures acting as a brake on economic growth the Government is committed to ensuring that more homes are built and supports ambitious authorities who want to plan for growth. The Standard Method provides a minimum starting point, and there may be circumstances where it is appropriate to consider whether the actual housing need is higher than the Standard Method indicates. PPG (ID: 2a-010) goes on to state that these circumstances can include growth strategies for the area; strategic infrastructure improvements; previous levels of delivery; or where previous assessments of need are significantly greater than the outcome from the Standard Method.

Doncaster Council commissioned Peter Brett Associates to produce the Economic Forecasts and Housing Needs Assessment 2018 which identifies a demographic starting point from the 2014-based household projections of 562dpa. If adjusted to match a “business as usual” job forecast would equate to 579dpa. However, to match the jobs growth aspiration of the Sheffield City Region it identifies a jobs-led housing need of 1,073dpa. Therefore, it is clearly apparent that there are circumstances identified that would require a housing figure significantly greater than the outcome of the Standard Method.

From the above we do not consider that the local housing need produced from the Standard Method would provide an appropriate housing requirement, it is evident that the actual housing requirement should be higher. Also it would not be appropriate to limit the housing requirement at the top end of the range either. We do not consider that this would be consistent with the Framework’s requirement to support the Government’s objective to boost the supply of homes.

Taking these matters into consideration we would suggest that the Local Plan should provide for a minimum net requirement of 1,100 dwellings per annum. This translates to a minimum requirement to 2037 of 24,200 dwellings; around 6,000 units more than the Publication draft Policy. Furthermore in considering the allocation of housing and mixed use sites we suggest that the Plan seeks to identify sufficient land for 29,400 dwellings, minus any supply from the years 2015 to 2019/20.

Turning to the second part of the Policy which distributes development across the settlement hierarchy, for the Service Towns and (Larger) Villages, the policy suggests these accommodate “about 10% of the Borough’s requirement”. We have no comment upon this as an indicative approach, but would suggest that the requirement for each settlement is not prescriptive as set out in the current policy wording. It is important that a strategy is put in place which provides a sufficient range of sites to provide enough sales outlets to enable delivery to be maintained at the required levels.

Carcroft-Skellow

Within the DLP the evidence base for Carcroft-Skellow identifies the town as one of the most sustainable settlements within this tier of the settlement hierarchy. We agree with this analysis. It follows therefore that any increase in the housing requirement or the need to identify buffer sites that first consideration is given to Carcroft-Skellow.
Based on the analysis above we consider Service Towns and Villages should accommodate between 2,420 and 2,940 dwellings over the plan period. Accordingly the requirement for Carcroft-Skellow that the housing requirement is increased proportionately. When considered against the provisions of Policy 2 which allows for windfall development in and on the edge of the selected settlements this would provide a sound policy approach.

**Policy 6: Housing Allocations (Strategic Policy)**

It is important that the levels of development proposed for each settlement is informed by appropriate analysis of the deliverability and viability of the sites. It is no use continually promoting growth in locations if there is little or no prospect of them being brought forward.

Specific allocations for Carcroft and Skellow are referred to in a series of subsequent tables; Table H1(M) indicates housing allocations with planning permission (at 1st April 2018); Table H2(N) identifies Housing Allocations without planning permission (at 1st April 2018); and Table H3 (E) identifies reserve development sites. The tables themselves are contained in Chapter 16. Chapter 16 paragraphs 16.195 to 16.205 set out the settlement specific approach to Carcroft-Skellow.

Within the explanatory text (para 16.195) it suggests that Carcroft-Skellow is the largest settlement in the Service Towns and Villages tier of the settlement hierarchy, with a good level of services and access to services in Adwick Woodlands. Paragraph 16.197 acknowledges the settlement is tightly bound by Green Belt and extensive areas are also covered by flood zone.

Over the Plan period, paragraphs 16.198 and 199 explain the settlement function and role of Carcroft Skellow identifying the housing requirement (of 250 units) over the Plan period to meet its baseline (local needs) requirement of 16 units per year. Our comments on the housing requirement (Policy 3) are highlighted above suggesting an increase over the Plan period along with a settlement specific figure (in a range) for Carcroft-Skellow.

As justified at paragraph 16.198 the approach to Carcroft-Skellow would appear fundamentally unsound, as it does not represent “positive planning”. If one accepts the 16 dwellings per year as a minimum, this would suggest that over the 20 year period as set out in the Publication DLP a minimum requirement of 320 dwellings. If as we suggest the Plan period is extended by two years to accord with the Framework there would be a minimum requirement of 352 dwellings. Furthermore as we explain the housing requirement should increase along with the inclusion of a 20% buffer for non delivery. This would suggest a minimum requirement for Carcroft-Skellow of around 425 to 450 dwellings over the Plan period to be identified through site allocations.

Paragraphs 16.203 to 16.205 set out the approach to housing allocations in the settlement. Broadly we accept the approach outlined in the DLP that in the absence of opportunities within the defined urban area exceptional circumstances are demonstrated such that it is necessary to review the Green Belt around the settlement and for land to be removed from the Green Belt. We suggest that land at Ings Lane falls into this category.

Existing supply [Table H1(M) at 01/04/2019] relates to a single commitment for 7no. dwellings at Suite Express House (Site Reference 1076). That being the case, we agree with the approach of the Council to allocate land to provide housing during the Plan period along with a reserve site to be brought forward should the main allocation not deliver at the appropriate rate.
H2(N) Land at Crabgate Lane, Skellow

Paragraph 16.204 supplemented by Table H2(N) indicates the single site allocation (Sites 165 and 186) for land of Crabgate Lane. Totalling 15.1 hectares, the indicative capacity achieves 300 dwellings, assuming areas of lower density and/or buffer zones adjacent the A1(M) to mitigate concerns of noise generated by traffic. Being prudent, we would question the ability of the Crabgate Lane site to deliver the dwelling numbers as set out in Table H2(N). This states that the site will deliver 175 units over a five year period; i.e. 35 units per year. We would suggest that a delivery of 25 units per year is feasible, reflecting the yield for the following five year period. This would suggest that a number of the units will be delivered beyond the Plan period.

H3(E) Owston Road, Carcroft (Reserve Site)

A reserve development site is identified at Table H3(E) off Owston Road, Carcroft comprising 3.3has of land with an indicative capacity of 93 dwellings. Text at paragraph 16.205 indicates the suitability of this site is questionable given flood risk constraints. It states that the flood risk constraints have not been met through the planmaking stage, suggesting that these will be dealt with through any subsequent planning application. In our view it is an unsound consideration if it is not demonstrated that the site is suitable for a vulnerable use such as housing.

It is notable that the Owston Road site remains an allocation from the 2001 -16 Unitary Development Plan, marked on the Proposals Map and listed under saved Policy PH1 (Page114) as PH1 (3/15) Land at Owston Road, Carcroft extending to 3.4has to deliver 84 dwellings. It is clear from the Council’s Public Access that there has been little developer interest in the site. We would question therefore whether it is a suitable and deliverable site given that it has been identified as available for at least two decades.

In light of the above we have fundamental concerns with regard to the Settlement Strategy for Carcroft-Skellow, where the Council is seeking to not meet the demonstrable requirement set out in its own plan. In attempting to meet that suppressed requirement, it reasonable to state that one of the identified sites at Owston Road, Carcroft is not suitable or deliverable.

Land at Ings Lane, Skellow

To address this concern we recommend that the Council should identify more land including further releases from the Green Belt. We consider that land to the west of Ings Lane, Skellow is a suitable and deliverable site. The site proposed for removal from the Green Belt is identified at Appendix 1 with a gross site area of 4.2ha. The boundaries would follow well defined hedgerow features. At Appendix 2 is a drawing indicating how much land is proposed for housing at this stage, extending to 1.5has, with a yield of 51 dwellings. A further area of around 1.0ha is currently the subject of further discussion with the Environment Agency to agree that it is not at risk of flooding. In the present circumstances this additional area is submitted as potential reserve land (in effect, safeguarded) at this stage.

Details within the attached promotional document (which has been submitted to the Council previously) demonstrates how the larger site is available, suitable and achievable, capable of delivering around 75 dwellings (@30dph). This scale of development is considered proportionate to the village’s housing requirement. The site is in close proximity to the village centre and a level 100m walk to bus stops.

Currently, the land is laid to pasture, formed of overgrown grass with a mix of thick woodland and hedging that forms a protective border around the site. The entire site is gently sloping with no obvious
technical hurdles, both Ings Lane to the east and South Farm Drive to the north-west directly adjoin the property and are adopted highways, a further Local Authority search has confirmed the site is not crossed by any Public Rights of Way.

Flood modelling carried out by JGP Group using 2018 Environment Agency data and a detailed topographical site survey has confirmed the entire site is located in Flood Zone 1, this is evidenced in a supporting map that highlights the difference in location between modelling from JGP and the Environment Agency when assessing the extent of Flood Zone 3. The Environment Agency’s flood mapping application is based on Ordnance Survey’s OS VectorMap, this data is to the nearest contour line, these are spread 10m apart and therefore EA mapping can only provide an indicative boundary, whereas JGP have modelled Environment Agency data with an up to date detailed site survey to deliver an accurate representation of flood risk on the site. Therefore we consider the Flood Zone 1 boundary using JGP Group’s analysis of 2018 EA data acceptable and further assessment of this data will be provided to assist the Council’s site selection methodology process for this site.

The site has very few limitations that would restrict development other than being washed over with a Green Belt designation. The Council has already accepted that there are exceptional circumstances for removing land from the Green Belt. As set out in the attached promotional document we consider that the site performs weakly in protecting the Green Belt as evidenced in the Stage 3 Green Belt Review by site 42, a comparative neighbouring site immediately to the west. Additionally, this site maintains the characteristics of the tightly drawn Green Belt surrounding Carcroft-Skellow far more so than the provisional housing allocations of sites 165 and 186 at Crab Green Lane to the west of the settlement. These two sites (also in the Green Belt) are provisionally accepted because they are not at risk of flooding, the site we are proposing is neither at risk of flooding, nor within close proximity to the A1 motorway, which may negatively impact residential amenity. Therefore, we reflect that this site is as appropriate, if not more so for residential development than other sites under deliberation.

To summarise, the site is immediately available and suitable for development with few restrictions. The Framework places a large emphasis on smaller sites that can deliver housing quickly and seeks to diversify the variety of housing within residential market areas. The removal of the Green Belt designation and inclusion of this site as a draft housing allocation conforms to the aspirations of the NPPF (2018) and creates a logical and efficient extension of the settlement.

In order to assist the Council in its consideration of this site, in addition to the Promotion Document, the following reports are also included with this representation submission:

- Access Appraisal (Optima Highways)
- Heritage Impact Assessment (Prospect Archaeology)
- Coal Authority Report

Within reason, further reports will be commissioned should they be required to facilitate the Council’s consideration of this proposal.

**Policy 8: Delivering the necessary range of housing (Strategic Policy)**

We are of the view that this strategic policy as presently drafted is not considered to be sound as it is not justified or consistent with national policy for the following reasons:
Housing Mix

Whilst there is the need for a mix of house sizes, type, price and tenure and is generally supportive of providing a range and choice of homes to meet the needs and market demand in the local area. It is, however, important that any policy is workable and ensures that housing delivery will not be compromised or stalled due to overly prescriptive requirements or the need to provide significant amounts of additional evidence.

We recommend (along with others) that a flexible approach is taken regarding housing mix which recognises that needs and demand will vary from area to area and site to site; ensures that the scheme is viable; and provides an appropriate mix for the location.

It is also important to highlight the need for creating a housing market that will attract investors to Doncaster, and to provide an element of aspiration to ensure working people and families are retained within the area. To this end the Council should recognise that the latest Housing Need Assessment will only ever identify current deficits and reflects a snap-shot in time. Therefore, even the latest HNA may not reflect the position at the time of an application. It is important that there is greater flexibility within this policy to acknowledge that the mix can vary both geographically and over the plan period.

Affordable Housing

This policy requires housing sites of 15 or more homes in the Borough’s high value housing market areas to include 23% affordable homes and for 15% of affordable in other areas.

There is no dispute about the need for affordable housing within Doncaster and the need to address the affordable housing requirements of the borough. Provisions within the Framework are, however, clear that the derivation of affordable housing policies must not only take account of need but also viability. Paragraph 34 establishes the importance of viability to ensure that development identified in the Plan should not be subject to such scale of obligations and policy burden that their ability to be delivered might be threatened.

The Whole Plan Viability Testing (2019) report shows the issues of viability for a number of sites. It shows that schemes in the low value areas are not viable and will not be able to support the affordable housing requirement.

The Council should be mindful that it is unrealistic to negotiate every site on a one by one basis because the base-line aspiration of a policy or combination of policies is set too high as this will jeopardise future housing delivery. Therefore, site by site negotiations on these sites should occur occasionally rather than routinely.

Policy 29: Open Space Provision in New Developments

We consider this policy not to be sound as it is not justified or consistent with national policy.

This policy looks for residential developments to provide open space to address local green space needs and deficiencies. Overall, there is support for the drive towards incorporating additional green space within new communities on health and well-being grounds. However, developers should only be expected to provide for those facilities which are made necessary by the development proposed and not simply in order to make up for existing deficiencies in provision or provide benefits for the community at large. It should also be acknowledged that this may have a knock-on effect on housing density and the need for additional land to be allocated for new development.
Policy 67: Development Viability (Strategic Policy)

This policy is not considered to be sound as it is not consistent with national policy. There may be some circumstances where this policy and the use of trigger points can be utilised to bring forward the delivery of homes. However, we have significant concerns around the implementation of this policy and how frequently it will be used. Simply put, the use of trigger points could add further burdens to any developer who will need to reproduce viability assessments at a potentially regular basis, going against Government initiatives which are looking to reduce the need for viability assessments. This policy causes unnecessary uncertainty and additional risk for developers, and that could become an impediment to the development process.

Conclusions

Doncaster Council should be congratulated for progressing the Local Plan to this stage. We do raise concerns however, that the slippage in progress may have unintended consequences for the need to introduce further changes. For example this may result in an extension to the Plan period to ensure consistency with national policy; i.e., a minimum 15 year plan period from the date of adoption.

We have raised concerns regarding the housing requirement identified and the disjoint with the economic development policies. In blunt terms a failure to adequately address local housing needs will act as brake upon economic growth aspirations. We have suggested that the housing requirement be increase accordingly, and stated as a minimum.

With regards delivering growth it is welcomed that the Council recognise that exceptional circumstances have been demonstrated requiring the release of land from the Green Belt. In doing so however, we have concerns regarding the approach to the settlement of Carcroft-Skellow as set out in this version of the Local Plan.

It is our view that the spatial strategy fails to meet the basic requirement for the settlement. It is welcomed the Council recognise the need to review the Green Belt boundary around the town and allocate land. However, it is considered that the main site off Crabtree Lane, may not deliver the number of dwellings proposed across the Local Plan. Furthermore the Council has identified a reserve site which is carried forward from the UDP. That site off Owston, Road Carcroft is identified within a flood risk zone (a matter which has not been addressed through the plan making process). Furthermore given that that particular site has been allocated for some 20 years it is questioned whether it is deliverable.

In these circumstances we suggest that land to the west of Ings Lane, Skellow is removed from the Green Belt in its entirety and allocated for the delivery of up to 51 dwellings in the early part of the Plan period. Layouts attached as Appendices 1 and 2 to this representation indicates how the site may come forward. Additionally a Promotion Document has been prepared by Carter Jonas which has been submitted to the Council previously, but is contained as part of this representation along with a number of other technical and environmental studies to assist the Council in the consideration of this additional sustainable site.

Further Engagement

We trust that the Council will find these comments useful as it continues to progress its Local Plan. We would welcome the opportunity to discuss the plan wide issue as well as matters relating specifically to the site off Ings Lane, Skellow.
We would like to be kept informed of all forthcoming consultations upon the Local Plan and associated documents. Please use the contact details provided below for future correspondence.

Please do not hesitate to contact me should you have any queries.

Yours faithfully,

Paul Leeming
Town Planner

E: 
T: 
M:
APPENDIX 1

EXTENT OF LAND FOR REMOVAL FROM GREEN BELT
(ELLIS HEALEY DRAWING 1853 SK01A SITE LAYOUT)
Schedule of accommodation

- 2 bed dwelling: 20 no.
- 3 bed dwelling: 18 no.
- 4 bed dwelling: 13 no.

Total: 51 no.

Site area: 4.2 Ha
Nett Developable area: 1.5 Ha
APPENDIX 2

AREA OF LAND TO BE ALLOCATED

(ELLLIS HEALEY DRAWING SK03)
Area of land to be allocated

Existing Line of flood zone 1

Area of land to be brought forward as protected area of search depending on the outcome of discussions on the extent of flood zone
APPENDIX 3: TIMELINE OF LOCAL AUTHORITY ENGAGEMENT
<table>
<thead>
<tr>
<th>Date</th>
<th>Type of Engagement</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2018</td>
<td>Emails exchanged with Doncaster Local Plans Team - Call for Sites Pro Forma</td>
<td>Discussion over the availability of the Call for Sites forms</td>
</tr>
<tr>
<td>February 2019</td>
<td>Emails exchanged to Doncaster Planning Team</td>
<td>Discussion of a Pre-app meeting with a view to submitting a planning application on the site</td>
</tr>
<tr>
<td>February 2019</td>
<td>Emails exchanged with Doncaster Policy Team for Local Plan Site Representation</td>
<td>Submitted a request for clarification under the Freedom of Information Act 2000</td>
</tr>
<tr>
<td>April 2019</td>
<td>Submission of site following site representations in January and February 2019.</td>
<td>Submission included: a site promotional document (including an analysis of the Green Belt Review) with additional technical reports</td>
</tr>
<tr>
<td>May 2019</td>
<td>Email with Doncaster Policy Team</td>
<td>Discussion over site submission and Local Plan progression</td>
</tr>
<tr>
<td>November 2019</td>
<td>Emails covering Doncaster Flood Review</td>
<td>Discussion over the site in the context of flooding and progress of the Local Plan.</td>
</tr>
<tr>
<td>January 2020</td>
<td>Emails exchanged for Local Plan Site Representation</td>
<td>Submission included flood risk map and letter of submission</td>
</tr>
<tr>
<td>January 2020</td>
<td>Email response from Doncaster Council</td>
<td>Following response from the site submission. It notes they will keep your site on file and incorporate into the evidence base at the earliest opportunity.</td>
</tr>
<tr>
<td>January 2020</td>
<td>Doncaster Flood Review</td>
<td>Email exchanges discussing Doncaster Flood Review.</td>
</tr>
<tr>
<td>March 2020</td>
<td>Letter to Doncaster Civic Office</td>
<td>A letter sent to the council asking whether any of the sites which are currently passing through the Local Plan as preferred allocations were subject to inundation during the flooding events in of late 2019 and any amendments deemed necessary to the Local Plan process</td>
</tr>
<tr>
<td>March 2020</td>
<td>Local Councillors letter of support submitted to policy officers on the 30th of March 2020.</td>
<td>Letter sent to Jonathan Clarke regarding proposals on land at Ings Lane.</td>
</tr>
<tr>
<td>May 2020</td>
<td>Skellow Flood Zone Review</td>
<td>Progress report for Skellow Flood Zone Review. A confirmation letter from the Environment Agency for the Evidence Review Request for the Flood Map and a map showing the site and proposed flood zones. Supporting amendments to the flood zoning (from zone 3 to zone 1).</td>
</tr>
</tbody>
</table>
APPENDIX 4: SUPPORT FROM LOCAL COUNCILLORS
Dear Richard

I trust your well.

Please find below the letter sent to Jonathan Clarke today, our apologies that this has taken a while. As you can see the letter you drafted remains the same other than a date change. We shall let you know of any responses we receive.

Kindest Regards

John

J Gilliver
Clr Norton & Askern Ward
07711608140

Dear Jonathan

We are writing to you to confirm our continued support for the proposals on land at Ings Lane, the site to the immediate south of Skellow village centre. A scheme is being promoted by KCS Development Ltd and the landowner and was submitted to the Council earlier part of 2019 and through the recent Local Plan consultation.

Like many villages in the District, Skellow has areas affected by potential flooding, although it is well-known the flood mapping is not the most accurate. The developer at Ings Lane has put forward proposals suggesting that the site can accommodate around 80 family homes in easy reach of shops and public transport services. Much of the site is identified as Flood Zone 1 with no risk of flooding and it seems that every effort has been made to clarify the area that can be safely built on with the Environment Agency. An initial phase of development could take place on site in an area where all parties are agreed that there is no flood risk, with a potential second phase coming forward if the investigation currently underway, proves as expected, that the current EA flood zones have been too tightly drawn and need amending. The developer has given a commitment to only develop in areas where it is agreed there is no flood risk.

There are many areas of the Doncaster Green Belt which are sensitive to change and it is important for keeping villages separate and protecting the identity of individual settlements such as...
as Skellow. It is clear from the work prepared by the developer that that the land off Ings Lane can be taken out of the Green Belt without detriment to its purposes.

The Local Plan strategy identifies that Skellow along with Carcroft is a good location to accommodate new housing and this site at Ings Lane is the best site in the village. Two other sites have been put forward in the village by the Council. The land off Owston Lane (reference H3.E) has known problems of flooding whilst the proposal at Crabgate Lane (Reference H2.N) is a very large scheme which is not well related to the village centre and public transport services, there is significant local opposition to this site. You will be aware of our opposition to the site adjacent to the A1 which was recorded when the Full Council considered the issue earlier in the year. It is very likely that future residents will be dependent upon their private motor cars to get to jobs and shops, adding to congestion and pollution in the area which is the reason why the site at Ings Lane, due to its more sustainable location, would be a preferable site for new housing.

To conclude we remain of the view that Ings Lane is the best site and much better than the other options in the village which are being pushed through the Local Plan.

We look forward to hearing from you.

Sincerely

Cllr Austen White and Cllr John Gilliver

Best Regards

John

J Gilliver
Cllr Norton & Askern Ward
07711608140
APPENDIX 5: JBA FLOOD ESTIMATION REPORT
Flood estimation report: Skellow Flood Zone (The Skellow and Old Ea Beck)

Introduction
This report template is based on a supporting document to the Environment Agency’s flood estimation guidelines (Version 6, 2017). It provides a record of the hydrological context, the method statement, the calculations and decisions made during flood estimation and the results.

Contents
1 Method statement .................................................................................................................. 2
3 Locations where flood estimates required ................................................................. 6
4 Statistical method .................................................................................................................. 8
5 Revitalised flood hydrograph 2 (ReFH2) method ..................................................... 11
6 Discussion and summary of results ..................................................................................... 13

Approval

<table>
<thead>
<tr>
<th>Method statement prepared by:</th>
<th>Name and qualifications</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briony McIntosh MEarthSci</td>
<td>9 Dec 2019</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method statement reviewed by:</th>
<th>Name and qualifications</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Cameron BSc PhD MCIWEM CWEM CSci</td>
<td>11 Dec 2019</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculations prepared by:</th>
<th>Name and qualifications</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briony McIntosh MEarthSci</td>
<td>9 Dec 2019</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculations reviewed by:</th>
<th>Name and qualifications</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Cameron BSc PhD MCIWEM CWEM CSci</td>
<td>11 Dec 2019</td>
<td></td>
</tr>
</tbody>
</table>
Abbreviations

AM..........................Annual Maximum
AREA ..........................Catchment area (km²)
BFI .............................Base Flow Index
BFIHOST ......................Base Flow Index derived using the HOST soil classification
CFMP ..........................Catchment Flood Management Plan
CPRE ..........................Council for the Protection of Rural England
FARL ..........................FEH index of flood attenuation due to reservoirs and lakes
FEH .............................Flood Estimation Handbook
FSR .............................Flood Studies Report
HOST .........................Hydrology of Soil Types
NRFA ..........................National River Flow Archive
POT .............................Peaks Over a Threshold
QMED ..........................Median Annual Flood (with return period 2 years)
ReFH .........................Revitalised Flood Hydrograph method
SAAR ..........................Standard Average Annual Rainfall (mm)
SPR .............................Standard percentage runoff
SPRHOST ......................Standard percentage runoff derived using the HOST soil classification
Tp(0) ..........................Time to peak of the instantaneous unit hydrograph
URBAN .......................Flood Studies Report index of fractional urban extent
URBEXT1990 .................FEH index of fractional urban extent
URBEXT2000 .................Revised index of urban extent, measured differently from URBEXT1990
WINFAP-FEH .................Windows Frequency Analysis Package – used for FEH statistical method
1 Method statement

1.1 Requirements for flood estimates

| Overview | Peak flows and hydrographs for input to a hydraulic model for an FRA. Peak flows required for The Skell and Old Ea Beck to their confluence. Events required: 50%, 20%, 1%, 0.1% AEP. |

1.2 The catchment
The Old Ea Beck catchment to the A1 is ~52 km² and ranges from 100 mAOD to 24 mAOD. The headwaters of the catchment are topographically steep with a wide flat valley bottom through which the Ea Beck flows. The catchment bedrock is dominated by the Pennine Upper Coal Measure with Dolomitised Limestone and Dolomite in the lower portion of the catchment. The catchment is predominantly rural with a number of field drains feeding into the Ea Beck.

The Skell is a tributary of the Ea Beck with a catchment area of ~12 km². It discharges into the Ea Beck just east of the A1. The headwaters and valley sides are steep with a narrower valley bottom through which The Skell flows. Elevations range from ~70 mAOD to 10 mAOD. The catchment bedrock is dominated by Dolomitised Limestone and Dolomite, with small outcrops of mudstone and the Pennine Upper Coal Measure in the far northwest of the catchment. The catchment is therefore permeable, and predominantly rural.

### 1.3 Source of flood peak data

<table>
<thead>
<tr>
<th>Source</th>
<th>NRFA peak flows dataset, Version 8, released October 2019. This contains data up to water year 2017-18. Catchment descriptors from the FEH Webservice.</th>
</tr>
</thead>
</table>

### 1.4 Gauging stations (flow or level)

<table>
<thead>
<tr>
<th>Watercourse</th>
<th>Station name</th>
<th>Gauging authority number</th>
<th>NRFA number</th>
<th>Catchment area (km²)</th>
<th>Type (rated / ultrasonic / level...)</th>
<th>Start of record and end if station closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ea Beck</td>
<td>South Emsall</td>
<td>L0935</td>
<td>N/A</td>
<td>18.3</td>
<td>Level</td>
<td>Jun 2001 - present</td>
</tr>
<tr>
<td>Ea Beck</td>
<td>Adwick Le Street</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>Level</td>
<td>Jan 2001 - present</td>
</tr>
</tbody>
</table>

**Details:** South Elmsall is a level only gauge. The gauge was rated as part of a previous JBA study but there is uncertainty in the rating. Rating review not being undertaken as part of this study.

Adwick Le Street is a level only gauge. Rating review not being undertaken as part of this study.
### 1.5 Other data available and how it has been obtained

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Data relevant to this study?</th>
<th>Data available?</th>
<th>Source of data</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check flow gaugings (if planned to review ratings)</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>The two gauges on the Ea Beck are level only gauges and are not being used in flow estimation for this study.</td>
</tr>
<tr>
<td>Historic flood data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow or river level data for events</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Rainfall data for events</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Potential evaporation data</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Results from previous studies</td>
<td>No</td>
<td>No</td>
<td>EA supplied models</td>
<td></td>
</tr>
<tr>
<td>Other data or information (e.g. groundwater, tides, channel widths, low flow statistics)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Upper Ea Beck

<table>
<thead>
<tr>
<th>Yr</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Stat</td>
<td>6.9</td>
<td>18.8</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>6.2</td>
<td>15.9</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>5.8</td>
<td>16.7</td>
</tr>
</tbody>
</table>

#### The Skell

<table>
<thead>
<tr>
<th>Yr</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>FEH RR</td>
<td>-</td>
<td>2.50</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>0.30</td>
<td>0.74</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>0.38</td>
<td>1.25</td>
</tr>
</tbody>
</table>
1.6 Hydrological understanding of catchment

<table>
<thead>
<tr>
<th>Plots of data</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrological</td>
<td>The site of interest is on the left bank of The Skell and Old Ea Beck. The cause of flooding is from bank overtopping.</td>
</tr>
<tr>
<td>interpretation and</td>
<td></td>
</tr>
<tr>
<td>conceptual model</td>
<td></td>
</tr>
</tbody>
</table>

Any unusual catchment features to consider? The Ea Beck catchment is moderately permeable with an SPRHOST of 24.26. The Skell catchment is highly permeable with an SPRHOST of 7.76 and BFIHOST 0.913.

1.7 Initial choice of approach

<table>
<thead>
<tr>
<th>Is FEH appropriate?</th>
<th>Yes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial choice of</td>
<td>Statistical due to the size and permeability of the catchments. A comparison is to be made with ReFH2 with FEH13 for The Skell as this method has been calibrated to permeable catchments.</td>
</tr>
<tr>
<td>method(s) and reasons</td>
<td></td>
</tr>
<tr>
<td>Software to be used</td>
<td>FEH Web Service¹ / WINFAP-FEH v3.0.003² / JBA FEH Statistical spreadsheet v5.1 / JBA’s Flood Estimation Software (JFes) v.7</td>
</tr>
<tr>
<td>(with version numbers)</td>
<td></td>
</tr>
</tbody>
</table>

² WINFAP-FEH v3 © Wallingford HydroSolutions Limited and NERC (CEH) 2009.
3 Locations where flood estimates required

The table below lists the locations of subject sites. The site codes listed below are used in all subsequent tables to save space.

3.1 Summary of subject sites

<table>
<thead>
<tr>
<th>Lumped estimates</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site code</td>
<td>Type of estimate</td>
<td>Watercourse</td>
<td>Name or description of site</td>
<td>Easting</td>
<td>Northing</td>
</tr>
<tr>
<td>SK01</td>
<td>L</td>
<td>The Skell</td>
<td>The Skell @ B1220</td>
<td>452850</td>
<td>410450</td>
</tr>
<tr>
<td>UEB01</td>
<td>L</td>
<td>Old Ea Beck</td>
<td>Old Ea Beck @ A1</td>
<td>452300</td>
<td>409950</td>
</tr>
</tbody>
</table>

Sub catchment/Intervening areas

N/A

Note: Lumped catchments (L) are complete catchments draining to points at which design flows are required. Sub-catchments (S) are catchments or intervening areas (I) that are being used as inputs to a semi-distributed model of the river system. There is no need to report any design flows for sub-catchments, as they are not relevant: the relevant result is the hydrograph that the sub-catchment is expected to contribute to a design flood event at a point further downstream in the river system. This will be recorded within the hydraulic model output files. However, catchment descriptors and ReFH model parameters should be recorded for sub-catchments so that the results can be reproduced. The schematic diagram illustrates the distinction between lumped and sub-catchment estimates.

3.2 Important catchment descriptors at each subject site (incorporating any changes made)

Any changes made to the original catchment descriptors are shown in red.

<table>
<thead>
<tr>
<th>Lumped catchments</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site code</td>
<td>FARL</td>
<td>PROPWET</td>
<td>BFIHOST</td>
<td>DPLBAR (km)</td>
<td>DPSBAR (m/km)</td>
<td>SAAR (mm)</td>
<td>URBEXT 2000</td>
</tr>
<tr>
<td>SK01</td>
<td>0.954</td>
<td>0.32</td>
<td>0.913</td>
<td>4.07</td>
<td>31.9</td>
<td>603</td>
<td>0.0593</td>
</tr>
<tr>
<td>UEB01</td>
<td>0.978</td>
<td>0.32</td>
<td>0.563</td>
<td>8.91</td>
<td>42.5</td>
<td>616</td>
<td>0.0910</td>
</tr>
</tbody>
</table>

Sub catchment/Intervening areas

N/A

3.3 Checking catchment descriptors

Record how catchment boundary was checked and describe any changes

Checked against OS opensource background mapping, DTM and aerial photography. Minor amendments made to include tributaries/ field drains.
Record how other catchment descriptors were checked and any changes.

- BFIHOST high for The Skell catchment which is in-keeping with the geology of the catchment as per the British Geological Survey opensource mapping. ^3

Source of URBEXT
- URBEXT2000 for FEH statistical and ReFH2.

Method for updating of URBEXT
- CPRE formula from 2006 CEH report on URBEXT2000

^3 http://mapapps.bgs.ac.uk/geologyofbritain/home.html
4 Statistical method

This section will discuss the parameters used in the statistical method to determine flow estimation at various points within the study catchments. This was undertaken at lumped estimation points to allow comparison with ReFH2.

4.1 Overview of estimation of QMED at each subject site

<table>
<thead>
<tr>
<th>Site code</th>
<th>Initial QMED rural (m³/s) (from CDs)</th>
<th>Final method</th>
<th>Data transfer</th>
<th>Urban adjustment factor (UAF)</th>
<th>Final QMED estimate (m³/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>0.2</td>
<td>DT</td>
<td>26013</td>
<td>60.73</td>
<td>1.031</td>
</tr>
<tr>
<td>UEB01</td>
<td>4.1</td>
<td>DT</td>
<td>28058</td>
<td>64.86</td>
<td>0.966</td>
</tr>
</tbody>
</table>

Are the values of QMED spatially consistent? The catchment boundaries have been extended to the confluence between the Old Ea Beck and The Skellow. The sum of the estimates will be used for the downstream node.

Method used for urban adjustment for subject and donor sites

<table>
<thead>
<tr>
<th>Parameters used for WINFAP v4 urban adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious fraction for built-up areas, IF</td>
</tr>
<tr>
<td>0.3</td>
</tr>
</tbody>
</table>

Notes: DT – Data transfer (with urban adjustment); CD – Catchment descriptors alone (with urban adjustment). The QMED adjustment factor A/B for each donor site is given in Table 3.2. This is moderated using the power term, a, which is a function of the distance between the centroids of the subject catchment and the donor catchment. The final estimate of QMED is: (A/B)<sup>a</sup> x QMED<sub>initial</sub> x UAF

4.2 Search for donor sites for QMED (if applicable)

Old Ea Beck:
Donor sites suggested by WINFAP included Derwent@Chatsworth (28043), Crimple@Burn Bridge (27051), Winterbourne Stream@Bangor (39033) and Goyt@Marple Bridge (69017). These were discounted due to differences in FARL, SAAR and BFIHOST to the site. The Wye@Ashford (28023) and Henmore Brook@Ashbourne (28058) were also considered and Henmore Brook was selected as the catchment descriptors were more similar to the site.

The Skell:
Donor sites suggested by WINFAP included Derwent@Chatsworth (28043), Driffield Trout Stream @ Driffield (26013) and Winterbourne Stream @ Bangor (39033). Driffield was selected as the final donor.
4.3 Donor sites chosen and QMED adjustment factors

<table>
<thead>
<tr>
<th>NRFA no.</th>
<th>Reasons for choosing</th>
<th>Method (AM or POT)</th>
<th>Adjust-ment for climatic variation?</th>
<th>QMED from flow data (A)</th>
<th>QMED from catchment descriptors (B)</th>
<th>Adjust-ment ratio (A/B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26013 (for SK01)</td>
<td>Similarity of SAAR, BFIHOST and FARL.</td>
<td>AM</td>
<td>N</td>
<td>2.78</td>
<td>2.16</td>
<td>1.251</td>
</tr>
<tr>
<td>28058 (for UEB01)</td>
<td>Similarity of AREA, SAAR and FARL.</td>
<td>AM</td>
<td>N</td>
<td>8.84</td>
<td>11.39</td>
<td>0.756</td>
</tr>
</tbody>
</table>

4.4 Derivation of pooling groups

<table>
<thead>
<tr>
<th>Name of group</th>
<th>Site code from whose descriptors group was derived</th>
<th>Subject site treated as gauged</th>
<th>Changes made to default pooling group, with reasons</th>
<th>Weighted average L-moments,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Ea Beck</td>
<td>Ungauged site</td>
<td>N</td>
<td>Winterbourne Stream@Bangor (39033) removed – discordant and steep growth curve. Lod@HalfwayBridge (41022) added to increase record length.</td>
<td>L-CV 0.293 L-skew 0.106</td>
</tr>
<tr>
<td>The Skell</td>
<td>Ugauged site</td>
<td>N</td>
<td>Bolingeey Stream @ Bolingeey Cocks Bridge (49005) – discordant. Black Burn @ Pluscarden Abbey (7011) – short period of record, discordant, steep growth curve. Langdon Beck @ Langdon (25011) – low BFIHOST compared to site.</td>
<td>L-CV 0.295 L-skew 0.248</td>
</tr>
</tbody>
</table>

Note: Pooling groups were derived using the procedures from Science Report SC050050 (2008).

4.5 Derivation of flood growth curves at subject sites

<table>
<thead>
<tr>
<th>Site code</th>
<th>Method</th>
<th>If P, ESS or J, name of pooling group (Error! Reference source not found.)</th>
<th>Distribution used and reason for choice</th>
<th>Urban or permeable adjustment</th>
<th>Parameters of distribution (location, scale and shape after adjustments)</th>
<th>Growth factor for 100-year return period</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>P</td>
<td>The Skell</td>
<td>GEV. Z-value indicates best fit.</td>
<td>No. Adjustments to create a 'permeable' pooling group was explored but did not improve the heterogeneity of the group.</td>
<td>Location 0.846 Scale 0.409 Shape -0.134</td>
<td>3.45</td>
</tr>
<tr>
<td>UEB01</td>
<td>P</td>
<td>Upper Ea Beck</td>
<td>GEV. Z-value indicates best fit.</td>
<td>N</td>
<td>Location 0.834 Scale 0.457 Shape -0.079</td>
<td>2.60</td>
</tr>
</tbody>
</table>
4.6 Flood estimates from the statistical method

This table shows the flow estimates for all the lumped catchments.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Flood peak (m$^3$/s) for the following Annual Exceedance Probabilities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>SK01</td>
<td>0.34</td>
</tr>
<tr>
<td>UEB01</td>
<td>4.88</td>
</tr>
</tbody>
</table>
5  Revitalised flood hydrograph 2 (ReFH2) method

5.1  Catchment sub-divisions for ReFH2 model
N/A

<table>
<thead>
<tr>
<th>Site code</th>
<th>Rural or un-developed (km²)</th>
<th>Paved (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

5.2  Parameters for ReFH2 model
The FEH recommends that where possible the time to peak of the unit hydrograph should be determined from gauged data rather than catchment descriptors. The catchment is ungauged therefore the default time to peak from the catchment descriptors was used.

5.2.1  Time to peak gauge data

<table>
<thead>
<tr>
<th>Station</th>
<th>Type of gauge</th>
<th>Record period</th>
<th>Distance from river gauge (km)</th>
<th>Area (km²)</th>
<th>Elevation (mAOD)</th>
<th>Adjustment ratio for Tp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2.2  Time to peak adjustments
A default value of time to peak scaling factor equal to 0.5 has been applied to adjust the time to peak for heavily urbanised catchment (URBEXT2000>0.15).

| Site code | Method | T
|-----------|--------|---------|
|           |        | P
|           |        | C
|           |        | R
|           |        | I
|           |        | B
|           |        | L
|           |        | R

5.3 **Design events for ReFH2 method: All catchments**

The catchments are classified as ‘urban’ if the URBEXT2000 catchment descriptor exceeds 0.15. It is recommended that the winter storm defaults should be used in all but the most heavily urbanised catchments. For consistency, all storms have been run with the winter profile and same storm duration.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Season of design event</th>
<th>Storm duration (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>Winter</td>
<td>9</td>
</tr>
<tr>
<td>UEB01</td>
<td>Winter</td>
<td>13</td>
</tr>
</tbody>
</table>

5.4 **Flood estimates from the ReFH2 method**

A selection of results has been provided for the lumped catchments; provided to allow comparison with the FEH statistical results.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Flood peak (m$^3$/s) for the following Annual Exceedance Probabilities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Lumped</td>
<td>0.47</td>
</tr>
<tr>
<td>UEB01</td>
<td>6.22</td>
</tr>
</tbody>
</table>

Sub catchments / Intervening catchments

<table>
<thead>
<tr>
<th></th>
<th>N/A</th>
</tr>
</thead>
</table>

N/A
6 Discussion and summary of results

6.1 Comparison of results from different methods

This table compares peak flow estimates from the ReFH2 method with those from the FEH Statistical method, at example sites for two key return periods.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Ratio of peak flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50% AEP</td>
</tr>
<tr>
<td></td>
<td>ReFH2/Statistical</td>
</tr>
<tr>
<td>SK01</td>
<td>0.43 / 0.36 (1.19)</td>
</tr>
<tr>
<td>UEB01</td>
<td>6.22 / 4.88 (1.27)</td>
</tr>
</tbody>
</table>

6.2 Final choice of method

Choice of method and reasons

The Skell: Statistical pooling due to the permeable nature of the catchment.
Old Ea Beck: Statistical pooling due to the large rural nature of the catchment.

How will the flows be applied to a hydraulic model?

ReFH2 units scaled to the statistical peak flow estimates.

6.3 Assumptions, limitations and uncertainty

List the main assumptions made

No permeable adjustments were made for The Skell catchment.
The suitability of the donors.

Discuss any limitations

The Skell catchment is permeable and relatively small with no gauged data.

Give what information you can on uncertainty in the results

QMED estimates have been derived using data transfer and it is assumed these are suitable for application.
Without observed data for The Skell catchment and the heterogeneity of the pooling group as a result of it being a permeable catchment means uncertainty remains in these flow estimates.

Comment on the suitability of the results for future studies

These estimates would need to be revised for use in future studies.

Give any other comments on the study

-

6.4 Checks

Are the results for two separate watercourses that meet downstream of the
consistent, for example at confluences?
inflow points.

What is the range of 100-year growth factors? Is this realistic?
Growth factors are 2.60 to 2.65 for the Old Ea Beck estimates and 3.16 to 3.45 for The Skell. These are both realistic as defined within the EA Flood Estimation Guidelines which states the ratio varies from 2.1 to 4.0. The Skell growth factors are anticipated as a result of the catchment being permeable.

If 1000-year flows have been derived, what is the range of ratios for 1000-year flow over 100-year flow?
The 1000 year:100 year ratios are 1.60 for The Skell and 1.26 for the Old Ea Beck.

How do the results compare with those of other studies?
The estimates derived here are comparable with other studies.

### Upper Ea Beck

<table>
<thead>
<tr>
<th>Year</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Stat</td>
<td>6.9</td>
<td>18.8</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>6.2</td>
<td>15.9</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>5.8</td>
<td>16.7</td>
</tr>
<tr>
<td>This study</td>
<td>Stat</td>
<td>4.9</td>
<td>12.7</td>
</tr>
</tbody>
</table>

### The Skell

<table>
<thead>
<tr>
<th>Year</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>FEH RR</td>
<td>-</td>
<td>2.50</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>0.30</td>
<td>0.74</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>0.38</td>
<td>1.25</td>
</tr>
<tr>
<td>This study</td>
<td>Stat</td>
<td>0.34</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Are the results compatible with the longer-term flood history?

6.5 Final results

### Flood peak (m³/s) for the following Annual Exceedance Probabilities (%)

<table>
<thead>
<tr>
<th>Site code</th>
<th>50</th>
<th>20</th>
<th>10</th>
<th>5</th>
<th>4</th>
<th>3.3</th>
<th>2</th>
<th>1.3</th>
<th>1</th>
<th>0.5</th>
<th>0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumped</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SK01</td>
<td>0.34</td>
<td>0.52</td>
<td>0.66</td>
<td>0.83</td>
<td>0.88</td>
<td>0.92</td>
<td>1.05</td>
<td>1.15</td>
<td>1.23</td>
<td>1.45</td>
<td>2.25</td>
</tr>
<tr>
<td>UEB01</td>
<td>4.88</td>
<td>7.23</td>
<td>8.67</td>
<td>9.97</td>
<td>10.37</td>
<td>10.69</td>
<td>11.56</td>
<td>12.22</td>
<td>12.67</td>
<td>15.21</td>
<td>22.36</td>
</tr>
</tbody>
</table>

If flood hydrographs are needed for the next stage of the study, where are they provided? (e.g. give filename of spreadsheet, hydraulic model, or reference to table below)
Offices at
Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Leeds
Limerick
Newcastle upon Tyne
Newport
Peterborough
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
Warrington

Registered Office
1 Broughton Park
Old Lane North
Broughton
SKIPTON
North Yorkshire
BD23 3FD

t:+44(0)1756 799919
e:info@jbaconsulting.com

Jeremy Benn Associates Ltd
Registered in England
3246693

Visit our website
www.jbaconsulting.com
APPENDIX 6: JBA SKELLOW MODELLING AMENDMENTS
1 Document purpose

This document details the changes made in this work to the ENV0001797C Ea Beck FM TUFLOW model supplied by the Environment Agency. This was supplied with a model review document, with actions that were pending comment or amendment at the time of supply of the model. This document presents the actions against the review document recommendations first, then progresses to how the model geometry and boundary conditions were adjusted in this work and how uncertainty in the model was assessed.

2 Model review actions

The table below summarises the "must do" actions raised in the model review document supplied with the ENV0001797C Ea Beck FM TUFLOW model and how these were addressed in the modelling undertaken for the Skellow Flood Zone review.

<table>
<thead>
<tr>
<th>Must do review item</th>
<th>Skellow FZ action</th>
<th>Justification/explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update panel markers</td>
<td>None</td>
<td>Panel markers can improve conveyance curves. The panel markers are appropriate and conveyance curves are smooth</td>
</tr>
<tr>
<td>Document existing hydrology</td>
<td>N/A - relates to the past work</td>
<td>Hydrology is revised in this work and appropriately documented</td>
</tr>
<tr>
<td>Document source of roughness</td>
<td>N/A - relates to the past work</td>
<td>Roughness was reviewed and deemed appropriate in the reach of interest for this work</td>
</tr>
<tr>
<td>Test sensitivity to downstream boundary</td>
<td>This was undertaken.</td>
<td>Simulation undertaken with the 1% AEP event. No change in results at site.</td>
</tr>
<tr>
<td>Missing spill unit S1_00946</td>
<td>None</td>
<td>The soffit level at this structure is not reached so the deck does not need to be represented for the site of interest.</td>
</tr>
<tr>
<td>Document LIDAR age</td>
<td>N/A - relates to the past work</td>
<td>-</td>
</tr>
<tr>
<td>How were buildings modelled?</td>
<td>N/A - relates to the past work</td>
<td>Representation of buildings will have nominal impact at the site of interest as there are no buildings in the flow routes to the site of interest.</td>
</tr>
<tr>
<td>Avoid referencing 2d_bc_1d2d_links_03.mif in two locations</td>
<td>N/A - relates to the past work</td>
<td>In this instance, this does not impact the results at the site of interest.</td>
</tr>
<tr>
<td>Overlapping material layers</td>
<td>Addressed</td>
<td>Landform entries removed</td>
</tr>
<tr>
<td>Provide results files</td>
<td>N/A - relates to the past work</td>
<td>Results files can be provided for the Skellow Flood Zone Review work</td>
</tr>
<tr>
<td>Explain use of two models</td>
<td>N/A - relates to the past work</td>
<td>Only the FM-TUFLOW model was supplied and suitably covers the site of interest for the purpose of this work.</td>
</tr>
</tbody>
</table>
3 Model geometry changes

3.1 Flood Modeller
No changes to the Flood Modeller geometry were made.

3.2 TUFLOW
Three changes to the TUFLOW geometry were made.

3.2.1 2D roughness
The materials layer that applies roughness based on landcover was filtered to remove overlapping items by omitting those with the "landform" descriptive term.

3.2.2 2D model domain
For runs with higher flows, the flood extents reached the downstream 2D boundary of the model. The model code was extended slightly but it was clear the necessary extent to avoid flow reaching the edge was impractical. There is no file applied to define a formal boundary here. However, given the drop in landscape towards the model boundary, this was not required as predictions at the site of interest are independent of the predictions at the boundary. This is discussed in Section 7.

3.2.3 Undefended geometry
2D "Z shapes" were defined to filter out the embankments present within the model domain. This was done via three files which smooth the embankments to natural surrounding land levels:

- 2d_zsh_R_LB_undefended_005.MIF/ 2d_zsh_P_LB_undefended_005.MIF
  - This file filters out the embankments adjacent to the site of interest along the left bank Skell and left bank Ea Beck

- 2d_zsh_R_Up_undefended_001.MIF/ 2d_zsh_P_Up_undefended_001.MIF
  - This filters out the embankments along the right bank of the Skell and left bank of Ea Beck upstream of their confluence

- 2d_zsh_R_RB_undefended_001.MIF/ 2d_zsh_P_RB_undefended_001.MIF
  - This filters out the embankments along the right bank of Ea Beck

Two scenarios were tested during model development to determine a worst-case situation for the site of interest:

1. Collapsing all defences in the modelled reach including the right bank of the Ea Beck [This is the approach used in defining Flood Zones. Given the nature of the surrounding land, it is expected to make almost limitless floodplain storage available].

2. Collapsing only defences flanking the site of interest [This was expected to be a worst-case as flows would be contained to a greater level by the right bank defences].

In addition, in all scenarios, files in the TUFLOW model geometry that enforced defence crest levels were commented out to ensure they were not used.
4 Boundary conditions

4.1 Inflows
Revised hydrology was derived for this study. This is detailed in the accompanying hydrology calculation record. Peak flows are given in the table below.

The derived flows are lower than those applied in previous use of this model and the Environment Agency 2009 Lower Don model. Therefore, as well as the scoped flows, an additional "extreme" flow was run to demonstrate the sensitivity of the predicted extent of Flood Zone 2 to hydrological assessment.

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Peak flow (m³/s) for given AEP event (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Ea Beck</td>
<td>4.9</td>
</tr>
<tr>
<td>Skell</td>
<td>0.3</td>
</tr>
</tbody>
</table>

4.2 Downstream boundary
The approach to the downstream boundary in the 2D domain is discussed in Sections 3.2.2 and 7.

The 1D downstream boundary is a stage-discharge rating curve. This was unchanged from the supplied model in this work. However, sensitivity to a 1m increase in the level for a given flow was applied to assess sensitivity to the boundary choice. As discussed in Section 5.2, this had no impact at the site of interest.

1 This model was supplied by the Environment Agency but ultimately not used in this analysis.
5 Sensitivity tests

5.1 Flow

As the peak flows derived in this study are lower than past studies, a sensitivity run was undertaken with an extreme flow that would define a worst-case extent for Flood Zone 2 if a steeper growth curve were applied. The variation in peak flood level at the site of interest is approximately 0.6m with a lateral variation of up to 25m into the site of interest.

<table>
<thead>
<tr>
<th>Model scenario</th>
<th>Event applied (% AEP)</th>
<th>Peak water level (mAOD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skell LB defences removed</td>
<td>0.1%</td>
<td>9.1</td>
</tr>
<tr>
<td>Skell LB defences removed</td>
<td>0.1% (extreme)</td>
<td>9.7</td>
</tr>
</tbody>
</table>
5.2 Downstream boundary

Sensitivity to adjusting the downstream boundary rating curve was tested with the 1% AEP event. The predicted peak water level at the site of interest is unimpacted. This was also tested with the extreme flow described above and there remains no change in predicted water level near the site of interest - this is demonstrated in the long section below.
6 Model health

6.1 1D model

The 1D simulation remains within tolerance with no poor convergence.

![1D model convergence graph]

6.2 2D model

The mass balance for the model in both geometry scenarios has a small spike of poorer mass balance at the start of the simulation but this reverts immediately into be well within the ±1% acceptable range.

![2D model mass balance graph]
7 Limitations

- 2D model extent
  - The model extent is defined laterally to ensure flooding does not reach the boundary of the active model domain. Given the nature of the surrounding land, it was prohibitive to extent the model longitudinally to a point where flooding did not reach the boundary of the active domain. A downstream boundary has not been applied to the downstream extent of the 2D domain. However, this has no impact on results at the site of interest as the drop in ground levels from the site of interest to the boundary is such that no backwater is experienced. This can be seen in the figure below where the level to the right of the plots does not influence the levels to the left of the plots (near the site of interest).
  - This would need to be reviewed for future use of the model away from the site of interest.

- 1D model extent
  - This is suitable for the site of interest. As above, it would need to be reviewed for any use of the model away from the site of interest.

- Warnings and checks
  - Warnings and checks when the model initialises do not impact on results. There are five instances, two relate to use of high roughness for buildings, which is intentional, and three relate to projection, which has been checked and has no influence on the placing of the model files in space.
## Summary of supplied files

The table below provides the files used to define the scenarios run. First it details the base model received from the Environment Agency and then the files used in this analysis.

<table>
<thead>
<tr>
<th>File type/purpose</th>
<th>EA supplied version</th>
<th>Skellow FZ Review version</th>
<th>Downstream boundary sensitivity run</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flood Modeller Geometry</strong></td>
<td>SK01_BL_02.DAT</td>
<td>SK01_BL_02.DAT</td>
<td>SK01_BL_02.DAT</td>
</tr>
<tr>
<td><strong>TUFLOW Run file</strong></td>
<td>SK01_BL_<del>e</del>_01.tcf</td>
<td>SK01_BL_UNDEF_<del>s</del>_01.tcf</td>
<td>SK01_BL_UNDEF_<del>s</del>_01.tcf</td>
</tr>
<tr>
<td><strong>TUFLOW Geometry file</strong></td>
<td>SK01_2-5m_BL_01.tgc</td>
<td>SK01_2-5m_BL_UNDEF_SkelILBUpRB_01.tgc</td>
<td>SK01_2-5m_BL_UNDEF_SkelILB_01.tgc</td>
</tr>
<tr>
<td><strong>TUFLOW Boundary file</strong></td>
<td>SK01_BL_01.tbc</td>
<td>SK01_BL_01.tbc</td>
<td>SK01_BL_01.tbc</td>
</tr>
<tr>
<td><strong>TUFLOW materials file</strong></td>
<td>EaBeck_001.tmf</td>
<td>EaBeck_001.tmf</td>
<td>EaBeck_001.tmf</td>
</tr>
<tr>
<td><strong>Flood Modeller Inflow Boundary</strong></td>
<td>Various: QXX.IED, where XX is the return period in years</td>
<td>Q100_KCS.IED Q1000_KCS.IED Q1000CC_C_KCS.IED Q1000CC_HC_KCS.IED Q1000_Extreme.IED</td>
<td>Q100_KCS.IED Q1000_KCS.IED Q1000CC_C_KCS.IED Q1000CC_HC_KCS.IED Q1000_Extreme.IED</td>
</tr>
</tbody>
</table>
APPENDIX 7: JBA SKELLOW FLOOD ZONE LETTER TO KCS
Dear Mr Morton,

**Skellow Flood Zone Review**

I am pleased to provide the outcome of our hydraulic flood risk modelling to review the current Flood Zone extent at your site of interest in Skellow. The site is located in an area which is prevented from flooding from the Ea Beck and River Skell by formal defences (shown below). Flood Zones do not account for formal defences. Therefore, the current Flood Zone 2 covers your site of interest. Flood Zone 3 also covers the site of interest but in the existing zones this has the same extent as Flood Zone 2 in the area of interest.

To support any challenge to the Flood Zone extent, the Environment Agency advised that hydraulic modelling was required.

The work presented here provides this analysis to assess the extent of Flood Zone 2.
The outcome of our analysis is that the modelling indicates there is grounds to challenge the extent of the current Flood Zone 2 in your site of interest.

In the sections that follow, we summarise the process undertaken to reach this conclusion and provide an illustration of the proposed revised extent. Technical detail is provided in the accompanying modelling and hydrology technical appendices to support the analysis presented here.

**Methodology**

Environment Agency Flood Zones represent flood risk in a situation where formal defences are not present. To review the Flood Zones a hydraulic model without the presence of defences was therefore required.

An existing Environment Agency model covers the site of interest. This was supplied in draft format, together with comments for adjustments expected to make the model final. The model was updated to address relevant comments, revise hydrological inputs and remove defences (see accompanying modelling technical notes).

To replicate the methods used to derive the Flood Zones, all defence features within the modelled reach were removed. The flat nature of surrounding land means that in a fully undefended scenario, an almost limitless expanse of floodplain storage would become available. Therefore, in addition to the above scenario, to provide a conservative worst-case for the site of interest, a second scenario was derived where only the banks flanking the site of interest were removed (shown in pink in the figure above, referred to hereafter as the “Skell LB defences” scenario).

These versions of the model were run with the 1% and 0.1% AEP event and the 0.1% AEP event with allowances for climate change (namely, the Central [20%] and Higher Central [30%] allowances).

In order to assess sensitivity of the model to boundary conditions, the model was also run with a 1m increase to its downstream boundary rating relationship and an extreme flow. The former was recommended in the Environment Agency model review of the supplied model. The latter was undertaken as the current hydrology reduces flows compared to past analysis and so would add resilience to the analysis undertaken and provide a conservative maximum bound for a revised Flood Zone 2.

**Findings**

In all scenarios and events tested, peak flood extents are smaller than the current Flood Zone 2 in the site of interest. This is illustrated in the figure below with the results from the sensitivity test with an extreme flow used (i.e. the most conservative results).
Larger scale plans are presented at the end of the letter report for the 1% AEP event, 0.1% AEP event and 0.1% AEP event with climate change allowances.

The peak level across the site of interest for the models run are tabulated below.

<table>
<thead>
<tr>
<th>Model scenario</th>
<th>Event applied (% AEP)</th>
<th>Peak water level (mAOD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All defences removed</td>
<td>1%</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td>0.1%</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>0.1% (CC - Central)</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>0.1% (CC - Higher Central)</td>
<td>8.7</td>
</tr>
<tr>
<td>Skell LB defences removed</td>
<td>1%</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>0.1%</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>0.1% (CC - Central)</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>0.1% (CC - Higher Central)</td>
<td>9.3</td>
</tr>
<tr>
<td>Sensitivity runs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All defences removed</td>
<td>0.1% (extreme)</td>
<td>9.2</td>
</tr>
<tr>
<td>Skell LB defences removed</td>
<td>0.1% (extreme)</td>
<td>9.7</td>
</tr>
<tr>
<td>All defences removed - +1m d/s boundary</td>
<td>1%</td>
<td>8.2</td>
</tr>
<tr>
<td>Skell LB defences removed - +1m d/s boundary</td>
<td>1%</td>
<td>8.7</td>
</tr>
</tbody>
</table>

Of the scenarios simulated, predicted flood water levels are lowest at the site of interest when all defences are removed and so flood extents also cover the smallest area of the site of interest in this scenario.
Compared to the all defences removed scenario, the Skell LB defences scenario increases water levels by up to 0.7m, with flood extents moving approximately 45m further into the site of interest at the western side and 25m at the eastern side. They remain smaller than the current extent of Flood Zone 2.

Hydrology calculations carry the greatest uncertainty in any flood risk analysis. The calculations undertaken in this work follow industry standard methodology. However, it is acknowledged that the peak flows derived are lower than those from previous Environment Agency studies, with very steep growth curves previously justified for Ea Beck near the site of interest. Therefore, an extreme flow was also run that exceeds past 0.1% AEP flows in the area. The difference in peak water level at the site of interest compared to the 0.1% AEP is of the order of 0.6-0.8m and moves the flood extent into the site of interest by a further 25m. Results in the extreme flow sensitivity runs are broadly comparable to those in the Skell LB defences scenario when climate change is accounted for. Again, the maximum flood extent remains smaller than the current extent of Flood Zone 2.

Varying the downstream boundary has no impact at the site of interest.

Recommendations
The analysis above demonstrates that the current Flood Zone 2 extent could be reduced in the site of interest so that more was allocated in Flood Zone 1. The most conservative approach, and so least likely to be adjusted by future Environment Agency studies, is to define this with the 0.1% AEP (extreme) sensitivity runs or the worst-case defence scenario where climate change is accounted for, which are largely comparable. The analysis also indicates that Flood Zone 3 could also be reduced. The plan below shows the proposed extent of Flood Zone 2 and also a proposed extent for Flood Zone 3. As simulations accounting for climate change for the 1% AEP event are not currently available, this outline is based on the 0.1% AEP event, again as a conservative extent.
If you have any queries relating to the analysis in this letter report or its appendices, please do not hesitate to contact me.

Yours sincerely,

Eleanor Charles  
**Associate Director**  
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Encs:
- Modelling technical note,  
- hydrological calculation record,  
- GIS layer of 1% AEP extent with all defences removed,  
- GIS layer of 1% AEP extent with only adjacent defences removed,  
- GIS layer of 0.1% AEP extent with all defences removed,  
- GIS layer of 0.1% AEP extent with only adjacent defences removed (Proposed FZ3),  
- GIS layer of 0.1% AEP (extreme) extent with all defences removed,  
- GIS layer of 0.1% AEP (extreme) extent with only adjacent defences removed (Proposed FZ2).
Flood extent maps

1% AEP extent*

* Note currently there is no distinction between Flood Zone 2 or 3 in the area of interest.
0.1% AEP with central allowance for climate change to the 2080s
0.1% (extreme) AEP extent
Document purpose

This document details the changes made in this work to the ENV0001797C Ea Beck FM TUFLOW model supplied by the Environment Agency. This was supplied with a model review document, with actions that were pending comment or amendment at the time of supply of the model. This document presents the actions against the review document recommendations first, then progresses to how the model geometry and boundary conditions were adjusted in this work and how uncertainty in the model was assessed.

Model review actions

The table below summarises the "must do" actions raised in the model review document supplied with the ENV0001797C Ea Beck FM TUFLOW model and how these were addressed in the modelling undertaken for the Skellow Flood Zone review.

<table>
<thead>
<tr>
<th>Must do review item</th>
<th>Skellow FZ action</th>
<th>Justification/explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update panel markers</td>
<td>None</td>
<td>Panel markers can improve conveyance curves. The panel markers are appropriate and conveyance curves are smooth</td>
</tr>
<tr>
<td>Document existing hydrology</td>
<td>N/A - relates to the past work</td>
<td>Hydrology is revised in this work and appropriately documented</td>
</tr>
<tr>
<td>Document source of roughness</td>
<td>N/A - relates to the past work</td>
<td>Roughness was reviewed and deemed appropriate in the reach of interest for this work</td>
</tr>
<tr>
<td>Test sensitivity to downstream boundary</td>
<td>This was undertaken.</td>
<td>Simulation undertaken with the 1% AEP event. No change in results at site.</td>
</tr>
<tr>
<td>Missing spill unit S1_00946</td>
<td>None</td>
<td>The soffit level at this structure is not reached so the deck does not need to be represented for the site of interest.</td>
</tr>
<tr>
<td>Document LIDAR age</td>
<td>N/A - relates to the past work</td>
<td>-</td>
</tr>
<tr>
<td>How were buildings modelled?</td>
<td>N/A - relates to the past work</td>
<td>Representation of buildings will have nominal impact at the site of interest as there are no buildings in the flow routes to the site of interest.</td>
</tr>
<tr>
<td>Avoid referencing 2d_bc_1d2d_links_03.mif in two locations</td>
<td>N/A - relates to the past work</td>
<td>In this instance, this does not impact the results at the site of interest.</td>
</tr>
<tr>
<td>Overlapping material layers</td>
<td>Addressed</td>
<td>Landform entries removed</td>
</tr>
<tr>
<td>Provide results files</td>
<td>N/A - relates to the past work</td>
<td>Results files can be provided for the Skellow Flood Zone Review work</td>
</tr>
<tr>
<td>Explain use of two models</td>
<td>N/A - relates to the past work</td>
<td>Only the FM-TUFLOW model was supplied and suitably covers the site of interest for the purpose of this work.</td>
</tr>
</tbody>
</table>
3 Model geometry changes

3.1 Flood Modeller
No changes to the Flood Modeller geometry were made.

3.2 TUFLOW
Three changes to the TUFLOW geometry were made.

3.2.1 2D roughness
The materials layer that applies roughness based on landcover was filtered to remove overlapping items by omitting those with the "landform" descriptive term.

3.2.2 2D model domain
For runs with higher flows, the flood extents reached the downstream 2D boundary of the model. The model code was extended slightly but it was clear the necessary extent to avoid flow reaching the edge was impractical. There is no file applied to define a formal boundary here. However, given the drop in landslope towards the model boundary, this was not required as predictions at the site of interest are independent of the predictions at the boundary. This is discussed in Section 7.

3.2.3 Undefended geometry
2D "Z shapes" were defined to filter out the embankments present within the model domain. This was done via three files which smooth the embankments to natural surrounding land levels:

- 2d_zsh_R_LB undefended_005.MIF/ 2d_zsh_P_LB undefended_005.MIF
  - This file filters out the embankments adjacent to the site of interest along the left bank Skell and left bank Ea Beck
- 2d_zsh_R_Up undefended_001.MIF/ 2d_zsh_P_Up undefended_001.MIF
  - This filters out the embankments along the right bank of the Skell and left bank of Ea Beck upstream of their confluence
- 2d_zsh_R_RB undefended_001.MIF/ 2d_zsh_P_RB undefended_001.MIF
  - This filters out the embankments along the right bank of Ea Beck

Two scenarios were tested during model development to determine a worst-case situation for the site of interest:

1. Collapsing all defences in the modelled reach including the right bank of the Ea Beck [This is the approach used in defining Flood Zones. Given the nature of the surrounding land, it is expected to make almost limitless floodplain storage available].
2. Collapsing only defences flanking the site of interest [This was expected to be a worst-case as flows would be contained to a greater level by the right bank defences].

In addition, in all scenarios, files in the TUFLOW model geometry that enforced defence crest levels were commented out to ensure they were not used.
4 Boundary conditions

4.1 Inflows

Revised hydrology was derived for this study. This is detailed in the accompanying hydrology calculation record. Peak flows are given in the table below.

The derived flows are lower than those applied in previous use of this model and the Environment Agency 2009 Lower Don model\(^1\). Therefore, as well as the scoped flows, an additional "extreme" flow was run to demonstrate the sensitivity of the predicted extent of Flood Zone 2 to hydrological assessment.

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Peak flow (m(^3)/s) for given AEP event (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Ea Beck</td>
<td>4.9</td>
</tr>
<tr>
<td>Skell</td>
<td>0.3</td>
</tr>
</tbody>
</table>

4.2 Downstream boundary

The approach to the downstream boundary in the 2D domain is discussed in Sections 3.2.2 and 7.

The 1D downstream boundary is a stage-discharge rating curve. This was unchanged from the supplied model in this work. However, sensitivity to a 1m increase in the level for a given flow was applied to assess sensitivity to the boundary choice. As discussed in Section 5.2, this had no impact at the site of interest.

\(^1\) This model was supplied by the Environment Agency but ultimately not used in this analysis.
5 Sensitivity tests

5.1 Flow
As the peak flows derived in this study are lower than past studies, a sensitivity run was undertaken with an extreme flow that would define a worst-case extent for Flood Zone 2 if a steeper growth curve were applied. The variation in peak flood level at the site of interest is approximately 0.6m with a lateral variation of up to 25m into the site of interest.

<table>
<thead>
<tr>
<th>Model scenario</th>
<th>Event applied (% AEP)</th>
<th>Peak water level (mAOD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skell LB defences removed</td>
<td>0.1%</td>
<td>9.1</td>
</tr>
<tr>
<td>Skell LB defences removed</td>
<td>0.1% (extreme)</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Contains Ordnance Survey Data, 2020
5.2 **Downstream boundary**

Sensitivity to adjusting the downstream boundary rating curve was tested with the 1\% AEP event. The predicted peak water level at the site of interest is unimpacted. This was also tested with the extreme flow described above and there remains no change in predicted water level near the site of interest - this is demonstrated in the long section below.
6 Model health

6.1 1D model
The 1D simulation remains within tolerance with no poor convergence.

![1D simulation graph]

6.2 2D model
The mass balance for the model in both geometry scenarios has a small spike of poorer mass balance at the start of the simulation but this reverts immediately into be well within the ±1% acceptable range.

![2D model graph]
7 Limitations

- **2D model extent**
  - The model extent is defined laterally to ensure flooding does not reach the boundary of the active model domain. Given the nature of the surrounding land, it was prohibitive to extent the model longitudinally to a point where flooding did not reach the boundary of the active domain. A downstream boundary has not been applied to the downstream extent of the 2D domain. However, this has no impact on results at the site of interest as the drop in ground levels from the site of interest to the boundary is such that no backwater is experienced. This can be seen in the figure below where the level to the right of the plots does not influence the levels to the left of the plots (near the site of interest).
  - This would need to be reviewed for future use of the model away from the site of interest.

- **1D model extent**
  - This is suitable for the site of interest. As above, it would need to be reviewed for any use of the model away from the site of interest.

- **Warnings and checks**
  - Warnings and checks when the model initialises do not impact on results. There are five instances, two relate to use of high roughness for buildings, which is intentional, and three relate to projection, which has been checked and has no influence on the placing of the model files in space.
# 8 Summary of supplied files

The table below provides the files used to define the scenarios run. First it details the base model received from the Environment Agency and then the files used in this analysis.

<table>
<thead>
<tr>
<th>File type/purpose</th>
<th>EA supplied version</th>
<th>Skellow FZ Review version</th>
<th>Downstream boundary sensitivity run</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flood Modeller Geometry</strong></td>
<td>SK01_BL_02.DAT</td>
<td>SK01_BL_02.DAT</td>
<td>SK01_BL_02+1mDsBDy.DAT</td>
</tr>
<tr>
<td><strong>TUFLOW Run file</strong></td>
<td>SK01_BL<del>e</del>.01.tcf</td>
<td>SK01_BL_UNDEF<del>s</del>.01.tcf</td>
<td>SK01_BL_UNDEF<del>s</del>.01.tcf</td>
</tr>
<tr>
<td><strong>TUFLOW Geometry file</strong></td>
<td>SK01_.2-5m_BL_01.tgc</td>
<td>SK01_.2-5m_BL_UNDEF_SkelILBUpRB_01.tgc</td>
<td>SK01_.2-5m_BL_UNDEF_SkelILB_01.tgc AND SK01_.2-5m_BL_UNDEF_SkelILBUpRB_01.tgc</td>
</tr>
<tr>
<td><strong>TUFLOW Boundary file</strong></td>
<td>SK01_BL_01.tbc</td>
<td>SK01_BL_01.tbc</td>
<td>SK01_BL_01.tbc</td>
</tr>
<tr>
<td><strong>TUFLOW materials file</strong></td>
<td>EaBeck_001.tmf</td>
<td>EaBeck_001.tmf</td>
<td>EaBeck_001.tmf</td>
</tr>
<tr>
<td><strong>Flood Modeller Inflow Boundary</strong></td>
<td>Various: QXX.IED, where XX is the return period in years</td>
<td>Q100_KCS.IED Q1000_KCS.IED Q1000CC_C_KCS.IED Q1000CC_HC_KCS.IED Q1000_Extreme.IED</td>
<td>Q100_KCS.IED Q1000_KCS.IED Q1000CC_C_KCS.IED Q1000CC_HC_KCS.IED Q1000_Extreme.IED Q1000_Extreme.IED</td>
</tr>
</tbody>
</table>
Flood estimation report: Skellow Flood Zone (The Skellow and Old Ea Beck)

Introduction

This report template is based on a supporting document to the Environment Agency’s flood estimation guidelines (Version 6, 2017). It provides a record of the hydrological context, the method statement, the calculations and decisions made during flood estimation and the results.

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4 Statistical method.................................................................................................................................................. 8
5 Revitalised flood hydrograph 2 (ReFH2) method ......................................................................................... 11
6 Discussion and summary of results.................................................................................................................. 13

Approval

<table>
<thead>
<tr>
<th></th>
<th>Name and qualifications</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method statement prepared by:</td>
<td>Briony McIntosh MEarthSci</td>
<td>9 Dec 2019</td>
</tr>
<tr>
<td>Method statement reviewed by:</td>
<td>David Cameron BSc PhD MCIWEM CWEM CSci</td>
<td>11 Dec 2019</td>
</tr>
<tr>
<td>Calculations prepared by:</td>
<td>Briony McIntosh MEarthSci</td>
<td>9 Dec 2019</td>
</tr>
<tr>
<td>Calculations reviewed by:</td>
<td>David Cameron BSc PhD MCIWEM CWEM CSci</td>
<td>11 Dec 2019</td>
</tr>
</tbody>
</table>
# Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>Annual Maximum</td>
</tr>
<tr>
<td>AREA</td>
<td>Catchment area (km$^2$)</td>
</tr>
<tr>
<td>BFI</td>
<td>Base Flow Index</td>
</tr>
<tr>
<td>BFIHOST</td>
<td>Base Flow Index derived using the HOST soil classification</td>
</tr>
<tr>
<td>CFMP</td>
<td>Catchment Flood Management Plan</td>
</tr>
<tr>
<td>CPRE</td>
<td>Council for the Protection of Rural England</td>
</tr>
<tr>
<td>FARL</td>
<td>FEH index of flood attenuation due to reservoirs and lakes</td>
</tr>
<tr>
<td>FEH</td>
<td>Flood Estimation Handbook</td>
</tr>
<tr>
<td>FSR</td>
<td>Flood Studies Report</td>
</tr>
<tr>
<td>HOST</td>
<td>Hydrology of Soil Types</td>
</tr>
<tr>
<td>NRFA</td>
<td>National River Flow Archive</td>
</tr>
<tr>
<td>POT</td>
<td>Peaks Over a Threshold</td>
</tr>
<tr>
<td>QMED</td>
<td>Median Annual Flood (with return period 2 years)</td>
</tr>
<tr>
<td>ReFH</td>
<td>Revitalised Flood Hydrograph method</td>
</tr>
<tr>
<td>SAAR</td>
<td>Standard Average Annual Rainfall (mm)</td>
</tr>
<tr>
<td>SPR</td>
<td>Standard percentage runoff</td>
</tr>
<tr>
<td>SPRHOST</td>
<td>Standard percentage runoff derived using the HOST soil classification</td>
</tr>
<tr>
<td>Tp(0)</td>
<td>Time to peak of the instantaneous unit hydrograph</td>
</tr>
<tr>
<td>URBAN</td>
<td>Flood Studies Report index of fractional urban extent</td>
</tr>
<tr>
<td>URBEXT1990</td>
<td>FEH index of fractional urban extent</td>
</tr>
<tr>
<td>URBEXT2000</td>
<td>Revised index of urban extent, measured differently from URBEXT1990</td>
</tr>
<tr>
<td>WINFAP-FEH</td>
<td>Windows Frequency Analysis Package – used for FEH statistical method</td>
</tr>
</tbody>
</table>
1 Method statement

1.1 Requirements for flood estimates

| Overview | Peak flows and hydrographs for input to a hydraulic model for an FRA. Peak flows required for The Skell and Old Ea Beck to their confluence. Events required: 50%, 20%, 1%, 0.1% AEP. |

1.2 The catchment

Map
The Old Ea Beck catchment to the A1 is ~52 km² and ranges from 100 mAOD to 24 mAOD. The headwaters of the catchment are topographically steep with a wide flat valley bottom through which the Ea Beck flows. The catchment bedrock is dominated by the Pennine Upper Coal Measure with Dolomitised Limestone and Dolomite in the lower portion of the catchment. The catchment is predominantly rural with a number of field drains feeding into the Ea Beck.

The Skell is a tributary of the Ea Beck with a catchment area of ~12 km². It discharges into the Ea Beck just east of the A1. The headwaters and valley sides are steep with a narrower valley bottom through which The Skell flows. Elevations range from ~70 mAOD to 10 mAOD. The catchment bedrock is dominated by Dolomitised Limestone and Dolomite, with small outcrops of mudstone and the Pennine Upper Coal Measure in the far northwest of the catchment. The catchment is therefore permeable, and predominantly rural.

### 1.3 Source of flood peak data

 NRFA peak flows dataset, Version 8, released October 2019. This contains data up to water year 2017-18. Catchment descriptors from the FEH Webservice.

### 1.4 Gauging stations (flow or level)

<table>
<thead>
<tr>
<th>Watercourse</th>
<th>Station name</th>
<th>Gauging authority number</th>
<th>NRFA number</th>
<th>Catchment area (km²)</th>
<th>Type (rated / ultrasonic / level...)</th>
<th>Start of record and end if station closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ea Beck</td>
<td>South Emsall</td>
<td>L0935</td>
<td>N/A</td>
<td>18.3</td>
<td>Level</td>
<td>Jun 2001 - present</td>
</tr>
<tr>
<td>Ea Beck</td>
<td>Adwick Le Street</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>Level</td>
<td>Jan 2001 - present</td>
</tr>
</tbody>
</table>

**Details:** South Elmsall is a level only gauge. The gauge was rated as part of a previous JBA study but there is uncertainty in the rating. Rating review not being undertaken as part of this study.

Adwick Le Street is a level only gauge. Rating review not being undertaken as part of this study.
## 1.5 Other data available and how it has been obtained

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Data relevant to this study?</th>
<th>Data available?</th>
<th>Source of data</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check flow gaugings (if planned to review ratings)</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>The two gauges on the Ea Beck are level only gauges and are not being used in flow estimation for this study.</td>
</tr>
<tr>
<td>Historic flood data</td>
<td></td>
<td></td>
<td></td>
<td>Include chronology and interpretation of flood history in Annex or separate report.</td>
</tr>
<tr>
<td>Flow or river level data for events</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Rainfall data for events</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Potential evaporation data</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Results from previous studies</td>
<td>No</td>
<td>No</td>
<td>EA supplied models</td>
<td></td>
</tr>
</tbody>
</table>

### Upper Ea Beck

<table>
<thead>
<tr>
<th>Yr</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Stat</td>
<td>6.9</td>
<td>18.8</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>6.2</td>
<td>15.9</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>5.8</td>
<td>16.7</td>
</tr>
</tbody>
</table>

### The Skell

<table>
<thead>
<tr>
<th>Yr</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>FEH RR</td>
<td>-</td>
<td>2.50</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>0.30</td>
<td>0.74</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>0.38</td>
<td>1.25</td>
</tr>
</tbody>
</table>

### Other data or information (e.g. groundwater, tides, channel widths, low flow statistics)
### 1.6 Hydrological understanding of catchment

<table>
<thead>
<tr>
<th>Plots of data</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrological interpretation and conceptual model</td>
<td>The site of interest is on the left bank of The Skell and Old Ea Beck. The cause of flooding is from bank overtopping.</td>
</tr>
</tbody>
</table>

| Any unusual catchment features to consider? | The Ea Beck catchment is moderately permeable with an SPRHOST of 24.26. The Skell catchment is highly permeable with an SPRHOST of 7.76 and BFIHOST 0.913. |

### 1.7 Initial choice of approach

<table>
<thead>
<tr>
<th>Is FEH appropriate?</th>
<th>Yes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial choice of method(s) and reasons</td>
<td>Statistical due to the size and permeability of the catchments. A comparison is to be made with ReFH2 with FEH13 for The Skell as this method has been calibrated to permeable catchments.</td>
</tr>
<tr>
<td>Software to be used (with version numbers)</td>
<td>FEH Web Service⁴ / WINFAP-FEH v3.0.003² / JBA FEH Statistical spreadsheet v5.1 / JBA’s Flood Estimation Software (JFes) v.7</td>
</tr>
</tbody>
</table>

---

² WINFAP-FEH v3 © Wallingford HydroSolutions Limited and NERC (CEH) 2009.
³ CHX-JBAU-00-00-CA-HO-0003-Calculation_Record-S3-P01.docx
3 Locations where flood estimates required

The table below lists the locations of subject sites. The site codes listed below are used in all subsequent tables to save space.

3.1 Summary of subject sites

<table>
<thead>
<tr>
<th>Lumped estimates</th>
<th>Site code</th>
<th>Type of estimate</th>
<th>Watercourse</th>
<th>Name or description of site</th>
<th>Easting</th>
<th>Northing</th>
<th>AREA on FEH CD-ROM (km²)</th>
<th>Revised AREA if altered</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>L</td>
<td>The Skell</td>
<td>The Skell @ B1220</td>
<td>452850</td>
<td>410450</td>
<td>12.09</td>
<td>12.27</td>
<td></td>
</tr>
<tr>
<td>UEB01</td>
<td>L</td>
<td>Old Ea Beck</td>
<td>Old Ea Beck @ A1</td>
<td>452300</td>
<td>409950</td>
<td>51.26</td>
<td>51.60</td>
<td></td>
</tr>
</tbody>
</table>

Sub catchment/Intervening areas

N/A

Note: Lumped catchments (L) are complete catchments draining to points at which design flows are required. Sub-catchments (S) are catchments or intervening areas (I) that are being used as inputs to a semi-distributed model of the river system. There is no need to report any design flows for sub-catchments, as they are not relevant: the relevant result is the hydrograph that the sub-catchment is expected to contribute to a design flood event at a point further downstream in the river system. This will be recorded within the hydraulic model output files. However, catchment descriptors and ReFH model parameters should be recorded for sub-catchments so that the results can be reproduced. The schematic diagram illustrates the distinction between lumped and sub-catchment estimates.

3.2 Important catchment descriptors at each subject site (incorporating any changes made)

Any changes made to the original catchment descriptors are shown in red.

<table>
<thead>
<tr>
<th>Lumped catchments</th>
<th>Site code</th>
<th>FARL</th>
<th>PROPWET</th>
<th>BFIHOST</th>
<th>DPLBAR (km)</th>
<th>DPSBAR (m/km)</th>
<th>SAAR (mm)</th>
<th>URBEXT 2000</th>
<th>FPEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>0.954</td>
<td>0.32</td>
<td>0.913</td>
<td>4.07</td>
<td>31.9</td>
<td>603</td>
<td>0.0593</td>
<td>0.059</td>
<td></td>
</tr>
<tr>
<td>UEB01</td>
<td>0.978</td>
<td>0.32</td>
<td>0.563</td>
<td>8.91</td>
<td>42.5</td>
<td>616</td>
<td>0.0910</td>
<td>0.059</td>
<td></td>
</tr>
</tbody>
</table>

Sub catchment/Intervening areas

N/A

3.3 Checking catchment descriptors

Record how catchment boundary was checked and describe any changes

Checked against OS opensource background mapping, DTM and aerial photography. Minor amendments made to include tributaries/field drains.
Map of revised catchment boundary (if relevant)

Record how other catchment descriptors were checked and any changes.

<table>
<thead>
<tr>
<th>Source of URBEXT</th>
<th>URBEXT2000 for FEH statistical and ReFH2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method for updating of URBEXT</td>
<td>CPRE formula from 2006 CEH report on URBEXT2000</td>
</tr>
</tbody>
</table>

BFIHOST high for The Skell catchment which is in-keeping with the geology of the catchment as per the British Geological Survey opensource mapping[^3].

[^3]: [http://mapapps.bgs.ac.uk/geologyofbritain/home.html](http://mapapps.bgs.ac.uk/geologyofbritain/home.html)
### 4 Statistical method

This section will discuss the parameters used in the statistical method to determine flow estimation at various points within the study catchments. This was undertaken at lumped estimation points to allow comparison with ReFH2.

#### 4.1 Overview of estimation of QMED at each subject site

<table>
<thead>
<tr>
<th>Site code</th>
<th>Initial QMED rural (m$^3$/s) (from CDs)</th>
<th>Final method</th>
<th>Data transfer</th>
<th>Urban adjustment factor (UAF)</th>
<th>Final QMED estimate (m$^3$/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>0.2</td>
<td>DT</td>
<td>26013</td>
<td>60.73</td>
<td>1.031</td>
</tr>
<tr>
<td>UEB01</td>
<td>4.1</td>
<td>DT</td>
<td>28058</td>
<td>64.86</td>
<td>0.966</td>
</tr>
</tbody>
</table>

Are the values of QMED spatially consistent?

The catchment boundaries have been extended to the confluence between the Old Ea Beck and The Skellow. The sum of the estimates will be used for the downstream node.

<table>
<thead>
<tr>
<th>Method used for urban adjustment for subject and donor sites</th>
<th>Parameters used for WINFAP v4 urban adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kjeldsen (2010)</td>
<td></td>
</tr>
<tr>
<td>Impervious fraction for built-up areas, IF</td>
<td>Percentage runoff for impervious surfaces, PR$_{imp}$</td>
</tr>
<tr>
<td>0.3</td>
<td>70%</td>
</tr>
</tbody>
</table>

**Notes**

Methods: DT – Data transfer (with urban adjustment); CD – Catchment descriptors alone (with urban adjustment). The QMED adjustment factor A/B for each donor site is given in Table 3.2. This is moderated using the power term, a, which is a function of the distance between the centroids of the subject catchment and the donor catchment. The final estimate of QMED is: $(A/B)^a \times QMED_{initial} \times UAF$

#### 4.2 Search for donor sites for QMED (if applicable)

**Old Ea Beck:**

Donor sites suggested by WINFAP included Derwent@Chatsworth (28043), Crimple@Burn Bridge (27051), Winterbourne Stream@Bangor (39033) and Goyt@Marple Bridge (69017). These were discounted due to differences in FARL, SAAR and BFIHOST to the site. The Wye@Ashford (28023) and Henmore Brook@Ashbourne (28058) were also considered and Henmore Brook was selected as the catchment descriptors were more similar to the site.

**The Skell:**

Donor sites suggested by WINFAP included Derwent@Chatsworth (28043), Driffield Trout Stream @ Driffield (26013) and Winterbourne Stream @ Bangor (39033). Driffield was selected as the final donor.
4.3 Donor sites chosen and QMED adjustment factors

<table>
<thead>
<tr>
<th>NRFA no.</th>
<th>Reasons for choosing</th>
<th>Method (AM or POT)</th>
<th>Adjust-</th>
<th>QMED from</th>
<th>QMED from</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>26013 (for SK01)</td>
<td>Similarity of SAAR, BFIHOST and FARL.</td>
<td>AM</td>
<td>N</td>
<td>2.78</td>
<td>2.16</td>
<td>1.251</td>
</tr>
<tr>
<td>28058 (for UEB01)</td>
<td>Similarity of AREA, SAAR and FARL.</td>
<td>AM</td>
<td>N</td>
<td>8.84</td>
<td>11.39</td>
<td>0.756</td>
</tr>
</tbody>
</table>

4.4 Derivation of pooling groups

<table>
<thead>
<tr>
<th>Name of group</th>
<th>Site code from whose descriptors group was derived</th>
<th>Subject site treated as gauged?</th>
<th>Changes made to default pooling group, with reasons</th>
<th>Weighted average L-moments,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Ea Beck</td>
<td>Ungauged site</td>
<td>N</td>
<td>Winterbourne Stream@Bangor (39033) removed – discordant and steep growth curve. Lod@HalfwayBridge (41022) added to increase record length.</td>
<td>L-CV 0.293 L-skew 0.106</td>
</tr>
<tr>
<td>The Skell</td>
<td>Ugauged site</td>
<td>N</td>
<td>Bolingey Stream @ Bolingey Cocks Bridge (49005) – discordant. Black Burn @ Plascarden Abbey (7011) – short period of record, discordant, steep growth curve. Langdon Beck @ Langdon (25011) – low BFIHOST compared to site.</td>
<td>L-CV 0.295 L-skew 0.248</td>
</tr>
</tbody>
</table>

Note: Pooling groups were derived using the procedures from Science Report SC050050 (2008).

4.5 Derivation of flood growth curves at subject sites

<table>
<thead>
<tr>
<th>Site code</th>
<th>Method</th>
<th>If P, ESS or J, name of pooling group (Error! Reference source not found.)</th>
<th>Distribution used and reason for choice</th>
<th>Urban or permeable adjustment</th>
<th>Parameters of distribution (location, scale and shape after adjustments)</th>
<th>Growth factor for 100-year return period</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>P</td>
<td>The Skell</td>
<td>GEV. Z-value indicates best fit.</td>
<td>No. Adjustments to create a 'permeable' pooling group was explored but did not improve the heterogeneity of the group.</td>
<td>Location 0.846 Scale 0.409 Shape -0.134</td>
<td>3.45</td>
</tr>
<tr>
<td>UEB01</td>
<td>P</td>
<td>Upper Ea Beck</td>
<td>GEV. Z-value indicates best fit.</td>
<td>N</td>
<td>Location 0.834 Scale 0.457 Shape -0.079</td>
<td>2.60</td>
</tr>
</tbody>
</table>
4.6 Flood estimates from the statistical method

This table shows the flow estimates for all the lumped catchments.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Flood peak (m$^3$/s) for the following Annual Exceedance Probabilities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>SK01</td>
<td>0.34</td>
</tr>
<tr>
<td>UEB01</td>
<td>4.88</td>
</tr>
</tbody>
</table>
5  Revitalised flood hydrograph 2 (ReFH2) method

5.1  Catchment sub-divisions for ReFH2 model

N/A

<table>
<thead>
<tr>
<th>Site code</th>
<th>Rural or un-developed (km²)</th>
<th>Paved (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

5.2  Parameters for ReFH2 model

The FEH recommends that where possible the time to peak of the unit hydrograph should be determined from gauged data rather than catchment descriptors. The catchment is ungauged therefore the default time to peak from the catchment descriptors was used.

5.2.1  Time to peak gauge data

<table>
<thead>
<tr>
<th>Station</th>
<th>Type of gauge</th>
<th>Record period</th>
<th>Distance from river gauge (km)</th>
<th>Area (km²)</th>
<th>Elevation (mAOD)</th>
<th>Adjustment ratio for Tp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2.2  Time to peak adjustments

A default value of time to peak scaling factor equal to 0.5 has been applied to adjust the time to peak for heavily urbanised catchment (URBEXT2000>0.15).
5.3 Design events for ReFH2 method: All catchments

The catchments are classified as ‘urban’ if the URBEXT2000 catchment descriptor exceeds 0.15. It is recommended that the winter storm defaults should be used in all but the most heavily urbanised catchments. For consistency, all storms have been run with the winter profile and same storm duration.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Season of design event</th>
<th>Storm duration (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK01</td>
<td>Winter</td>
<td>9</td>
</tr>
<tr>
<td>UEB01</td>
<td>Winter</td>
<td>13</td>
</tr>
</tbody>
</table>

5.4 Flood estimates from the ReFH2 method

A selection of results has been provided for the lumped catchments; provided to allow comparison with the FEH statistical results.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Flood peak (m³/s) for the following Annual Exceedance Probabilities (%)</th>
<th>Lumped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>SK01</td>
<td>0.47</td>
<td>0.64</td>
</tr>
<tr>
<td>UEB01</td>
<td>6.22</td>
<td>8.02</td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sub catchments / Intervening catchments

N/A
6 Discussion and summary of results

6.1 Comparison of results from different methods

This table compares peak flow estimates from the ReFH2 method with those from the FEH Statistical method, at example sites for two key return periods.

<table>
<thead>
<tr>
<th>Site code</th>
<th>Ratio of peak flow</th>
<th>50% AEP</th>
<th>1% AEP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ReFH2/Statistical</td>
<td>ReFH2/Statistical</td>
<td></td>
</tr>
<tr>
<td>SK01</td>
<td>0.43 / 0.36 (1.19)</td>
<td>1.36 / 1.23 (0.90)</td>
<td></td>
</tr>
<tr>
<td>UEB01</td>
<td>6.22 / 4.88 (1.27)</td>
<td>16.48 / 12.67 (1.30)</td>
<td></td>
</tr>
</tbody>
</table>

6.2 Final choice of method

<table>
<thead>
<tr>
<th>Choice of method and reasons</th>
<th>The Skell: Statistical pooling due to the permeable nature of the catchment. Old Ea Beck: Statistical pooling due to the large rural nature of the catchment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>How will the flows be applied to a hydraulic model?</td>
<td>ReFH2 units scaled to the statistical peak flow estimates.</td>
</tr>
</tbody>
</table>

6.3 Assumptions, limitations and uncertainty

<table>
<thead>
<tr>
<th>List the main assumptions made</th>
<th>No permeable adjustments were made for The Skell catchment. The suitability of the donors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss any limitations</td>
<td>The Skell catchment is permeable and relatively small with no gauged data.</td>
</tr>
<tr>
<td>Give what information you can on uncertainty in the results</td>
<td>QMEX estimates have been derived using data transfer and it is assumed these are suitable for application. Without observed data for The Skell catchment and the heterogeneity of the pooling group as a result of it being a permeable catchment means uncertainty remains in these flow estimates.</td>
</tr>
<tr>
<td>Comment on the suitability of the results for future studies</td>
<td>These estimates would need to be revised for use in future studies.</td>
</tr>
<tr>
<td>Give any other comments on the study</td>
<td>-</td>
</tr>
</tbody>
</table>

6.4 Checks

<table>
<thead>
<tr>
<th>Are the results</th>
<th>The results are for two separate watercourses that meet downstream of the</th>
</tr>
</thead>
</table>
consistent, for example at confluences?

inflow points.

What is the range of 100-year growth factors? Is this realistic?

Growth factors are 2.60 to 2.65 for the Old Ea Beck estimates and 3.16 to 3.45 for The Skell. These are both realistic as defined within the EA Flood Estimation Guidelines which states the ratio varies from 2.1 to 4.0. The Skell growth factors are anticipated as a result of the catchment being permeable.

If 1000-year flows have been derived, what is the range of ratios for 1000-year flow over 100-year flow?

The 1000 year:100 year ratios are 1.60 for The Skell and 1.26 for the Old Ea Beck.

How do the results compare with those of other studies?

The estimates derived here are comparable with other studies.

### Upper Ea Beck

<table>
<thead>
<tr>
<th>Year</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Stat</td>
<td>6.9</td>
<td>18.8</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>6.2</td>
<td>15.9</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>5.8</td>
<td>16.7</td>
</tr>
<tr>
<td>This study</td>
<td>Stat</td>
<td>4.9</td>
<td>12.7</td>
</tr>
</tbody>
</table>

### The Skell

<table>
<thead>
<tr>
<th>Year</th>
<th>Method</th>
<th>2yr</th>
<th>100yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>FEH RR</td>
<td>-</td>
<td>2.50</td>
</tr>
<tr>
<td>2009</td>
<td>Stat</td>
<td>0.30</td>
<td>0.74</td>
</tr>
<tr>
<td>2018</td>
<td>[Not supplied]</td>
<td>0.38</td>
<td>1.25</td>
</tr>
<tr>
<td>This study</td>
<td>Stat</td>
<td>0.34</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Are the results compatible with the longer-term flood history?

6.5 Final results

<table>
<thead>
<tr>
<th>Site code</th>
<th>Flood peak (m$^3$/s) for the following Annual Exceedance Probabilities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Lumped</td>
<td></td>
</tr>
<tr>
<td>SK01</td>
<td>0.34</td>
</tr>
<tr>
<td>UEB01</td>
<td>4.88</td>
</tr>
</tbody>
</table>

If flood hydrographs are needed for the next stage of the study, where are they provided? (e.g. give filename of spreadsheet, hydraulic model, or reference to table below)
Offices at

Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Leeds
Limerick
Newcastle upon Tyne
Newport
Peterborough
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
Warrington

Registered Office
1 Broughton Park
Old Lane North
Broughton
SKIPTON
North Yorkshire
BD23 3FD

t:+44(0)1756 799919
e:info@jbaconsulting.com

Jeremy Benn Associates Ltd
Registered in England
3246693

Visit our website
www.jbaconsulting.com
Dear Ms Charles,

**RE: Evidence Review Request for the Flood Map for Planning at Skellow, Doncaster**

The Environment Agency (EA) would like to confirm that, after the submission of an updated hydraulic model for the The Skell/Ea Beck area, we will be amending our Flood Map for Planning (FMfP) with this updated understanding of the flood risk in the area. This includes the area to the west of Ings Lane, Skellow, as delineated by the red line boundary on the accompanying map. This draft map shows how the FMfP will be represented for this red line boundary location going forward from this date, 15/05/2020.

It can be confirmed that once the amendments have been made to the EA’s data, it is expected that these changes will be seen in the public domain in the next quarterly update. In the intervening period, the draft update mapping provided can be used to inform any planning, development and/or flood risk management decision making until the amendments have been published.

Yours sincerely,

Kate Wilcox

PSO Advisor, DATA & EVIDENCE – Yorkshire | Flood & Coastal Erosion Risk Management Environment Agency | Lateral, 8 City Walk, Leeds, LS11 9AT

Attachments:

GE10270_Skellow_Proposed_FZs - PDF
APPENDIX 9: EA PROPOSED AMENDED FLOOD ZONE MAP