Grand Union Canal Transfer

Appendix 22-PD-3: Preliminary Flood Risk Assessment

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1. Introduction

1.1 Introduction

1.1.1 This Preliminary Flood Risk Assessment (FRA) has been produced to supplement the Preliminary Environmental Information (PEI) Report **Chapter 22: Water Environment and Flood Risk** in PEI Report **Volume 2** for the Grand Union Canal Transfer (GUCT) (the 'Proposed Development) at Phase Two consultation. A full FRA will be produced to support the Development Consent Order (DCO) Application.

1.1.2 The Proposed Development is a central component of both the Revised Draft Regional Plan of Water Resources South East (Ref. 1) and Affinity Water's (AfW) Water Resources Management Plan 2024 (WRMP24) (Ref. 2). These plans establish the need for an increase in water resilience and identify an inter-regional water transfer scheme using the Grand Union Canal to transfer water from the Midlands to the Southeast as one of the solutions. It is also part of the Regulators' Alliance for Progressing Infrastructure Development's (RAPID) programme of Strategic Resource Options (SRO) to meet the water needs set out in the Environment Agency's National Framework (Ref. 3).

1.1.3 The aim of the Proposed Development is to transfer surplus water from Severn Trent Waters (ST) supply area to areas of forecast water deficit in Affinity Waters (AfW) supply area.

1.2 Aims and Objectives

1.2.1 The overall aim of this Preliminary FRA is to provide a high-level assessment of flood risk to and from the Proposed Development based on Design Freeze 2 (DF2), in order to identify early the need for mitigation and/or design measures.

1.2.2 The Preliminary FRA, provided as an appendix to the PEI Report, underpins **Chapter 3: The Proposed Development** in PEI Report **Volume 2,** by providing evidence from available information of the flood risk to and from the Proposed Development. At this stage the Preliminary FRA provides the baseline flood risk to and from the Proposed Development. This is used as to inform the preliminary assessment of likely significance.

1.2.3 To achieve the overall aim of the Preliminary FRA, the following tasks have been undertaken:

a. Assessed the existing sources of flood risk to the Proposed Development;

b. Assessed the impact on flood risk as a result of the Proposed Development;

c. Provide a high-level assessment of flood risk to and from construction activities;

d. Identified how these flood risks are to be managed or mitigated; and

e. Identified any residual risks and any potential further mitigation measures that could be incorporated.

1.2.4 This Preliminary FRA is based on the flood risk information available at the time of writing, including:

a. Data sourced from the Environment Agency and other publicly available external sources;

b. Topographic data such as light detecting and ranging (LiDAR) data;

c. Hydraulic modelling of the Coventry, Oxford and Grand Union Canals at RAPID Gate 2 and Gate 3 of the Proposed Development; and

d. National and local planning policy and guidance.

1.3 Limitations and Assumptions

1.3.1 This Preliminary FRA has been largely based on available online mapping and data provided by the Environment Agency at the time of writing. A hydraulic model of the River Tame to support further development of Part 1a of the Proposed Development is currently underway and will be subject to refinement, as well as final review and approval by the Environment Agency, acting as the Statutory Consultee within the planning process. The hydraulic modelling exercise will provide further detail on the baseline risk, impact of the Proposed Development on flood risk and the effectiveness of mitigation if required. As such, conclusions in this Preliminary FRA regarding the fluvial flood risk for Part 1a and proposed mitigation should be considered indicative and subject to revision pending the results of that additional analysis. The hydraulic model and the FRA will be finalised prior to submission of the DCO.

1.3.2 Identification of mitigation options, including compensatory storage calculations will not be possible until completion of the hydraulic modelling. Therefore, a high-level assessment of possible measures has been undertaken to inform this Preliminary FRA.

1.3.3 Environment Agency product data for Parts 2, 3, 4a and 4b was not available at the time of writing. As a result, the current assessment of fluvial flood risk is preliminary and based on the best available information. This assessment will be updated using Environment Agency model data and additional modelled data being developed as part of the project, where relevant, to refine and confirm findings prior to submission of the DCO.

1.3.4 Hydraulic modelling of the canal network is also being finalised. The outputs of this modelling will define the anticipated water levels, which in turn will establish the bank raising and weir design parameters required for the Part 2 of the Proposed Development to mitigate and manage the potential flood risk impacts as a result of overtopping. The final model and both bank raising and weir design will subsequently be incorporated into the final FRA prior to DCO submission.

1.3.5 Due to the Proposed Development being scheduled for completion by 2032, it is unlikely the effects of climate change on increased intensity and frequency of peak rainfall events and thus flooding will materialise during construction, as outlined in **Chapter 10: Climate** in PEI Report **Volume 2**, therefore the impact of climate change is focussed on the permanent works only.

1.3.6 For the purposes of making an assessment of surface water flood risk from the Proposed Development it has been assumed that all temporary compounds and access roads will be constructed at grade and will be 100% impermeable; this is a worse case assumption. All surface water from permanent works will be attenuated and discharged at greenfield runoff rates. Sustainable Drainage Systems (SuDS) will be incorporated with above ground SuDS included, where possible. A Surface Drainage Strategy will be developed prior to the completion of the final FRA for the DCO submission.

1.3.7 Detailed ground investigation (GI) data was not available at the time of writing, therefore for the purpose of this assessment, groundwater levels have been assumed to be close to surface level where online data is not available, ensuring a precautionary assessment methodology has been adopted. The assessment of groundwater flood risk in the full FRA will be updated upon receipt of a detailed GI.

1.3.8 The PEI Report has adopted a pipeline corridor of approximately 200 m in width for Parts 1b and 4b. However, a conservative 50 m pipeline corridor through the centre of the Preliminary Order Limits boundary was used to allow an assessment across Parts 1b and 4b to take place, assuming all watercourses intersected would be crossed. The pipeline route has not been chosen at this point and will be determined through further design development prior to DCO submission. Additionally, temporary construction areas, compounds and associated access tracks have been assumed to be located outside of any Flood Zone for Part 4b.

1.3.9 Tidal flood risk has been scoped out of the assessment due to there being no potential flooding mechanism to or from the Proposed Development from this source.

2. Description of the Proposed Development

2.1.1 The Preliminary FRA has been structured to reflect the six main Parts of the Proposed Development. These parts are summarised below:

a. Part 1a – Minworth Advanced Water Treatment Plant (AWTP);
b. Part 1b – Minworth to Atherstone Pipeline;
c. Part 2 – Outfall and works to the Coventry, Oxford and Grand Union canals;
d. Part 3 – Daventry and Drayton Reservoirs;
e. Part 4a – Abstraction, Storage and Treatment; and
f. Part 4b - Pipeline to an underground reservoir near Luton.

2.2 Development Area

2.2.1 The Proposed Development (area which falls within the Preliminary Order Limits) covers a large geographical area from which the water transfer begins at Minworth AWTP before making its way south-east through 120 km of canal before discharging into an underground reservoir near Luton. The Preliminary Order Limits for each Project Part of the Proposed Development are shown on **Figure 1-PD-1** in PEI Report **Volume 3**.

2.2.2 The Proposed Development is located across several administrative areas: Birmingham City Council, North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Coventry City Council, Rugby Borough Council, Warwickshire County Council, West Northamptonshire Council, Milton Keynes City Council, Buckinghamshire Council and Central Bedfordshire Council. Table 3-1 in **Chapter 3: The Proposed Development** in PEI Report **Volume 2,** provides detail on the Parts of the Proposed Development that fall within each local authority.

2.3 Site Description and Existing Land Use

2.3.1 A description of existing Site and land use types per Project Part is provided in **Chapter 2: Existing Site and Surroundings** in PEI Report **Volume 2.**

2.4 Description of the Proposed Development

A description of the Proposed Development for each Project Part can be found within **Chapter 3: The Proposed Development** in PEI Report **Volume 2**.

2.5 Topography

2.5.1 A review of Environment Agency Light Detecting and Ranging (LiDAR) 2 m resolution Digital Terrain Model (DTM) data (**Figures 22-A3-16** to **18 Annex 3-1**) highlights that ground levels across the Proposed Development range from approximately 67 m Above Ordnance Datum (AOD) to approximately 241 m AOD. The highest elevations are present within Part 4b of the Proposed Development specifically around the B4541. The lowest elevations are found within Part 1b specifically around the village of Lea Marston where ground levels reach approximately 67 m AOD. There are some natural high and low points along the underground pipeline routes which generally align with where the pipeline elements cross watercourses.

2.6 Key Water Features

2.6.1 A substantial number of watercourses are present within and adjacent to the Preliminary Order Limits. These watercourses both influence and may be impacted by the Proposed Development. All identified watercourses fall within the following Water Framework Directive (WFD) surface water operational boundaries:

a. Part 1a – Tame Lower Rivers and Lakes;
b. Part 1b – Tame Lower Rivers and Lakes, Sence Anker and Bourne Rivers and Lakes;
c. Part 2 – Sence Anker and Bourne Rivers and Lakes, Avon Urban Rivers and Lakes, Avon Rural Rivers and Lakes, Nene Upper, Great Ouse Upper and River Ouzel and Milton Keynes;
d. Part 3 – Nene Upper;
e. Part 4a – River Ouzel and Milton Keynes; and
f. Part 4b – River Ouzel and Milton Keynes and River Colne.

3. Evaluation of Flood Policy, Supporting Strategies and Guidance

3.1.1 This section of the report introduces the main aspects the main aspects of the local and national planning policies that are relevant to the Proposed Development in terms of the assessment of flood risk.

3.2 National Policy Statement

3.2.1 The National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 4) provides a framework for decision making on development consent applications for the construction of new, or expansion of existing, water

resources infrastructure in England or in waters adjacent to England. Section 4.7 of the NPS: 'Flood Risk' indicates the guidelines for flood risk assessments to be followed by Proposed Developments. These guidelines shown in **Table 3-1**, set out considerations which should be made to gain development consent.

Table 3-1: National Policy Statement Flood Risk Assessment Guidelines

National Policy Statement Requirement
Applicant's Assessment - (NPSWRI Paragraph 4.7.4 to 4.7.7)
Applications for infrastructure projects in the following locations should be accompanied by a flood risk assessment: • Flood Zones 2 and 3 (medium and high probability of river and sea flooding) • Flood Zone 1 (low probability of river and sea flooding) for projects of 1 hectare or greater (or where strategic flood risk assessments identify land as being at increased flood risk in future), or projects that may be subject to other sources of flooding (local watercourses, surface water, groundwater, canals or reservoirs), or where the Environment Agency has notified the local planning authority that there are critical drainage problems
Surface water flood issues need to be understood, and these issues taken into account; for example, flow routes should be clearly identified and managed.
The applicant should identify and assess the risks of all forms of flooding to and from the development, and demonstrate how these flood risks will be managed, taking climate change into account.
Consider the risk of all forms of flooding arising from the development, in addition to the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime
Take into account the impacts of climate change, clearly stating the development lifetime over which the assessment has been made, and the range of climate scenarios considered
Explore opportunities for enhancing local flood risk management (for example, through increased water storage or adapting operational aspects of the infrastructure during critical flood risk periods)
Consider the need for safe access and exit arrangements
Include the assessment of residual risk after risk reduction measures have been taken into account, and demonstrate that this is acceptable for the development
Consider if there is a need to remain operational during a worst-case flood event over the development's lifetime
Provide evidence for the Secretary of State to apply the Sequential Test and Exception Test

National Policy Statement Requirement
Mitigation - (NPSWRI paragraph 4.7.9 to 4.7.15)
The applicant should ensure that the development's design takes into account flood risk and should put forward measures to mitigate the impact of flooding. Mitigation measures will need to be developed as part of the applicant's application for development consent to ensure that it is safe from flooding and will not increase flood risk elsewhere for the proposed development's lifetime, taking into account climate change
To manage flood risk satisfactorily and the impact of the natural water cycle on people, property and ecosystems, good design and infrastructure mitigation measures may need to be secured using requirements and/or planning obligations. This may include the use of sustainable drainage systems but could also include vegetation to help to slow runoff, hold back peak flows, and make landscapes more able to absorb the impact of severe weather events. Offsite mitigation may also be required, for example securing land for flood storage/conveyance purposes or providing contributions towards other flood risk management activities provided by other organisations.
Site layout and surface water drainage systems should be able to cope with events that exceed the design capacity of the system, so that excess water can be safely stored on, or conveyed from, the site without adverse impacts
The surface water drainage arrangements for any project should be such that the volumes and peak flow rates of surface water leaving the site are no greater than the rates prior to the proposed project, taking into account climate change, unless specific off-site arrangements are made and result in the same net effect.
The sequential approach should be applied to the layout and design of the project. Vulnerable uses should be located on parts of the site at lower probability and residual risk of flooding. The applicant should seek opportunities, where appropriate, to use open space for multiple purposes such as amenity, wildlife habitat, and flood storage uses. Opportunities can be taken to lower flood risk by improving flow routes, flood storage capacity and using sustainable drainage systems.
Decision Making – (NPSWRI paragraph 4.7.16 to 4.7.19)
Where flood risk is a factor in determining an application for development consent, the Secretary of State will need to be satisfied that, where relevant: • the application is supported by an appropriate flood risk assessment; and • the Sequential Test has been applied as part of site selection and, if required, the Exception Test.
When determining an application, the Secretary of State will need to be satisfied that flood risk will not be increased elsewhere,

National Policy Statement Requirement
and will only consider development appropriate in areas at risk of flooding where, informed by a flood risk assessment, following the Sequential Test and, if required, the Exception Test, it can be demonstrated that: • within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location; • the development is appropriately flood resistant and resilient; • it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate; • any residual risk can be safely managed; and • safe access and escape routes are included where appropriate, as part of an agreed emergency plan.
The applicant should take into account the potential impacts of climate change using the latest UK Climate Change Risk Assessment, the latest set of UK Climate Projections, and other relevant sources of climate change evidence.
The applicant should also ensure any Environment Statement and Flood Risk Assessment identifies appropriate mitigation or adaptation measures and how these will be secured. This should cover the estimated lifetime of the new infrastructure.
When determining an application, the Secretary of State will need to be satisfied that the potential effects of climate change on flood risk on the development have been considered as part of the design.

3.3 Consultation

Paragraph 4.7.8 of the NPSWRI states that early discussions with the Environment Agency and other regulators, as necessary, should be undertaken to identify the likelihood, extent, and nature of flood risk, help scope the FRA, and determine the information required by the Secretary of State to reach a decision on the application. In alignment with this requirement, a formal scoping opinion was sought, and both the Planning Inspectorate and the Environment Agency provided comments to inform the scope of the PEI Report and FRA. Further details of these responses are provided in **Appendix 5-PD-2** in PEI Report **Volume 4**. Additional consultation will take place and documented within the final FRA prior to DCO submission.

3.4 National Planning Policy

3.4.1 This Preliminary FRA has been prepared in accordance with NPSWRI (Ref. 4), which is the primary policy framework driving the approach to flood risk for Nationally Strategically Important Project's (NSIP). The NPSWRI explicitly references National Planning Policy Framework (NPPF) (Ref. 5), particularly in relation to the application of the Sequential Test and Exception Test (NPSWRI), ensuring that development is directed to areas of lowest flood risk wherever possible. In addition, the NPSWRI states the FRA should take account of the policy on climate change adaptation as set out in the NPPF and supporting guidance (NPSWRI paragraph 4.7.18) published by the Environment Agency. Applying appropriate allowances for future flood risk scenarios over the lifetime of the development ensures compliance with national policy objectives and demonstrates that flood risk will be managed and mitigated effectively.

<u>The Assessment of Flood Risk</u>

3.4.2 Section 4.7 of the NPSWRI (Ref. 4), section 14 of the NPPF (Ref. 5) and the 2025 Flood Risk and Coastal Change PPG (Ref. 6), advise how the planning process can consider the risks associated with flooding. NPSWRI paragraph 4.7.6 and the NPPF guidance states that flooding from all sources must be avoided where at all possible by applying a sequential approach to site selection, taking account of climate change and the vulnerability of future uses to flood risk. Therefore, as well as assessing fluvial and coastal flooding, either through hydraulic modelling or the Flood Map for Planning (FMfP) (Ref. 7), it is also necessary to consider flood risk from all sources, including ordinary watercourses, surface water, groundwater, sewers, drainage infrastructure failure, reservoirs and canals. The primary source of flooding to the Proposed Development is fluvial flooding, for which the PPG defines the four Flood Zones as:

a. **Flood Zone 1 'low probability of flooding'** – This zone comprises land assessed as having less than a 1 in 1,000 chance of river or sea flooding in any year (<0.1% annual exceedance probability (AEP));

b. **Flood Zone 2 'medium probability of flooding'** – This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 chance of river flooding (1% - 0.1% AEP) in any year, or between a 1 in 200 and 1 in 1,000 chance of sea flooding in any year (0.5% - 0.1% AEP);

c. **Flood Zone 3a 'high probability of flooding'** – This zone comprises land assessed as having a 1 in 100 year or greater chance of river flooding in any year (>1% AEP), or a 1 in 200 year or greater chance of flooding from the sea in any year (0.5% AEP) and

d. **Flood Zone 3b 'functional floodplain'** – A sub-part of Zone 3, this zone comprises land where water has to flow or be stored in times of a flood. Flood Zone 3b is defined land having a 1 in 20 year (5% AEP) or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively.

The Sequential Test

3.4.3 A primary aim of the NPSWRI (para 4.7.2) is that:

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, whether existing or future. But where development is necessary, it should be made safe without increasing flood risk elsewhere. Supporting guidance (Ref. 6) *explains that essential infrastructure (which can include nationally significant infrastructure projects covered by the National Policy Statement) is permissible in areas of high flood risk, subject to the sequential and exception tests. In addition, as set out in the National Planning Policy Framework new development should be planned to avoid increased vulnerability to the range of impacts arising from climate change."*

3.4.4 The NSPWRI applies a risk-based sequential approach at the site level which should be applied at all stages of the planning process, with the aim of steering more vulnerable parts of the development to areas within the site that have a lower risk of flooding as highlighted in **Table 3-1**.

3.4.5 Various layout iterations have been considered across the life of the project to date which have been influenced by numerous criteria including environmental constraints - see **Chapter 4: Consideration of Alternatives** in PEI Report **Volume 2** and supporting information for further details on the design selection process. Full account of the reasonable alternative routes studied which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option will be given within the ES. This will include any alternatives that might emerge through Phase Two Public Consultation feedback. Further design development is ongoing and will be refined to ensure impacts on

flood risk are minimised and compliance with the sequential test achieved. Evidence of compliance will be provided within the final FRA at DCO submission

Vulnerability Classification and the Exception Test

3.4.6 Following application of the Sequential Test, where it is not possible to locate the Proposed Development within areas of lower flood risk the Exception Test may be required. The necessity for the Exception Test will be determined by the vulnerability classification of the site and the nature of the Proposed Development.

3.4.7 The NPPF considers the vulnerability of different types of development to flooding. **Table 3-2** outlines various design elements of the Proposed Development and their vulnerability classification aligning with Annex 3 of the NPPF:

Table 3-2: Vulnerability Classification per design element

Project Part	Design element	Vulnerability classification	Justification
1a	Minworth AWTP	Essential Infrastructure	Water treatment works that need to remain operational in times of flood
1b	Pipeline	Water Compatible	Water transmission infrastructure and pumping stations
	Break Pressure Tank	Essential Infrastructure	Critical component of the water transmission infrastructure designed to manage pressure ensuring safe operation
2	Atherstone Outfall Structure	Essential Infrastructure	Critical component of the water transmission infrastructure that needs to remain operational to ensure the AWTP achieves water quality standards
	Pumping Stations and bypass pipes, bank raising	Water Compatible	Water transmission infrastructure and pumping stations, flood management
3	Pumping station and associated pipeline, outlet channel upgrades, discharge structure upgrades	Water Compatible	Water transmission infrastructure and pumping stations

Project Part	Design element	Vulnerability classification	Justification
4a	Galley WTW inc. water storage site	Essential Infrastructure	Water treatment works that need to remain operational in times of flood
	Abstraction point and pipeline	Water Compatible	Water transmission infrastructure and pumping stations
4b	Pipeline	Water Compatible	Water transmission infrastructure and pumping stations

3.4.8 Table 2 of the PPG (Ref. 6) identifies which vulnerability classifications are appropriate within each Flood Zone, shown in **Table 3-3**.

Table 3-3: Flood Risk Vulnerability and Flood Zone Incompatibility

Flood Risk Vulnerability Classification	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Required	✓	✓	✓
Zone 3a †	Exception Test Required †	✗	Exception Test Required	✓	✓
Zone 3b*	Exception Test Required*	✗	✗	✗	✓*

✓ Exception Test not required

✗ Development should not be permitted

† In Flood Zone 3a, Essential Infrastructure should be designed and constructed to remain operational and safe in times of flood.

*In Flood Zone 3b (functional floodplain) Essential Infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to remain operational and safe for users in times of flood resulting in no net loss of floodplain storage and not impede water flows and not increase flood risk elsewhere.

3.4.9 As described in section 2, the Proposed Development is largely located in Flood Zone 1 and partially located in Flood Zones 2 and 3.

3.4.10 Paragraph 7178 of the NPPF states "*For the Exception Test to be passed, the following points must be considered and satisfied:*

a. it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk; and

b. the development will be safe for its lifetime, taking account of the vulnerability of its users, without increasing flood risk elsewhere, and where possible will reduce flood risk overall."

3.4.11 Both elements of the test must be passed for development to be allocated.

3.5 Sequential Test and Exception Test Compliance

3.5.1 Evidence of the Sequential Test and the Exception Test will be provided within the full FRA once further hydraulic modelling and detailed design development have been completed.

3.6 Relevant Flood Risk Strategies

3.6.1 The relevant strategies for flood risk are summarised in **Table 3-4** These documents have informed the assessment methodology and approach to mitigation ensuring compliance is achieved.

Table 3-4: Summary of Relevant Flood Risk Strategies

Assessment Strategy	Strategy level	Description
Strategic Flood Risk Assessments	Birmingham City Council Level 1 Strategic Flood Risk Assessment; Birmingham City Council Strategic Flood Risk Management Strategy; Coventry City Council Level 1 Strategic Flood Risk Assessment; West Northamptonshire Council Level 1 Strategic Flood Risk Assessment; Milton Keynes City Council Level 1 Strategic Flood Risk Assessment; North Warwickshire Borough Council Level 1 Strategic Flood Risk Assessment; and Nuneaton and Bedworth Borough Council Level 1 Strategic Flood Risk Assessment. Central Bedfordshire Level 1 Strategic Flood Risk Assessment	A Strategic Flood Risk Assessment (SFRA) provides information on flood risk from all sources, the cumulative impact of a development on flood risk and the effects of climate change on flood risk.
Local Flood Risk Management Strategies	Birmingham City Council Strategic Flood Risk Management Strategy West Northamptonshire Local Flood Risk Management Strategy; Coventry Council Local Flood Risk Management Strategy;	Local Flood Risk Management Studies provide a wider base of knowledge and experience of the locality, e.g. sources and experiences of flooding, knowledge of existing activities that may increase the risk of flooding, the specific issues of the area, what is feasible and what is needed.

Assessment Strategy	Strategy level	Description
	Milton Keynes City Council Local Flood Risk Management Strategy; and Warwickshire County Council, Local Flood Risk Management Strategy and Surface Water Management Plan. Buckinghamshire Local Flood Risk Management Strategy Central Bedfordshire Local Flood Risk Management Strategy	

3.7 Climate Change

3.7.1 The UK Climate Change Risk Assessment (Ref. 29) identifies flooding as one of the most significant and costly climate hazards facing the UK affecting people, infrastructure, the economy and the natural environment.

3.7.2 In line with The NPSWRI (paragraph 4.7.18) site specific FRAs accompanying planning applications should take into account the impacts of climate change for the lifetime of the proposed development.

3.7.3 The EA's climate change allowance guidance (Ref. 8) is based on UKCP18 climate change projections and additional analysis on how these projections translate into hydrological responses. This indicates that climate change is likely to increase peak river flows, sea levels, rainfall intensity, wave height and wind speed in the future. Therefore, allowances need to be considered when developing the Proposed Development and associated mitigation, such as: drainage strategies, flood alleviation measures, and flood storage and compensation areas to account for the enhanced severity and magnitude associated with future flood events.

3.7.4 Construction of the Proposed Development is estimated to be completed by 2032. The proposed temporary works and construction methods (e.g. working areas, trenchless installations) will be required in the short term only to facilitate construction of the Proposed Development. They are therefore very unlikely to be impacted by climate change, as shown in **Chapter 10: Climate** in PEI Report **Volume 2**) and as such only permanent elements of the Proposed Development have taken into account climate change, where required.

Peak River Flow Allowances by River Management Catchment

3.7.5 The peak river flow allowance shows the anticipated changes to the peak flow by each Management Catchment within a River Basin District. The range of climate change allowances are based on percentiles. A percentile is a measure used in statistics to describe the proportion of possible scenarios that fall below an allowance level. The 50th percentile is the point at which half of the possible scenarios for peak flows fall below it and half fall above it.

a. Central allowance is based on the 50th percentile;
b. Higher central is based on the 70th percentile; and
c. Upper end is based on the 95th percentile.

3.7.6 The Proposed Development falls within a number of different River Basin Districts and Management Catchments. **Table 3-5** shows the relevant River Basin Districts, Management Catchments and their associated climate change allowances.

3.7.7 For developments located in Flood Zone 3b, the Environment Agency guidance for climate change allowance states that for Essential Infrastructure, the higher central allowance should be used and for Water Compatible Infrastructure, the central allowance should be used.

3.7.8 In accordance with the NPPF and Planning Practice Guidance (PPG) (Ref. 6) on Flood Risk and Coastal Change, a design life of 100 years has been applied to the Proposed Development, which is considered appropriate for the works mentioned above which are considered both Water Compatible and Essential Infrastructure. The 100-year assumption ensures that long-term flood risk, including the impacts of climate change, is accounted for in line with national guidance for non-residential developments.

3.7.9 To align the assessment with national planning policy and guidance , a design flood event will be adopted for any designs that fall within the 1% AEP plus climate change flood extent. The climate change allowance varies between management catchments (see **Table 3-5**) and will be adopted where necessary to inform design and mitigation.

3.7.10 For the purposes of Nationally Strategically Important Project's (NSIP) the NPSWRI para 3.7.6 states:

> *"The use of credible maximum allowances (H++) emissions scenarios (typically extreme climate change scenarios) should also be applied where there is potential for extremely negative consequences under high impact scenarios (such as elements of infrastructure which are critical to the safety of its operation). Although these are the very worst-case scenarios and the likelihood thought to be very low (at least this century) it is appropriate for the applicant to take a risk-averse approach in these cases. The most recent Climate change projections should always be used and references in the National Policy Statement should be read as references to the latest climate change projections"*

3.7.11 The Environment Agency's climate change allowance guidance states that the credible maximum scenario (CMS) may need to be assessed. The CMS represents the most realistic worst case conditions during operation. In relation to the River Tame, this includes the 1% AEP fluvial flood event plus the upper end climate change allowance which is recommended by the Environment Agency. This however should be treated as a sensitivity test which will help assess how sensitive the Proposed Development is to changes for different future scenarios. This will help to ensure the Proposed Development can be adapted to large scale climate change over its lifetime.

Table 3-5: Management Catchment Peak River Flow Allowances

River Basin District	Management Catchment	Project Part	Climate Change Epoch	Allowance		
				Central	Higher	Upper
Humber	Tame Anker and Mease	Part 1a Part 1b Part 2	2020s	10%	15%	24%
			2050s	11%	17%	30%
			2080s	22%	30%	51%
Severn	Avon Warwickshire	Part 2	2020s	7%	12%	22%
			2050s	8%	14%	31%
			2080s	21%	32%	59%
Anglian	Nene	Part 2 Part 3	2020s	-2%	4%	18%
			2050s	-7%	0%	17%
			2080s	4%	13%	36%
	Upper and Beford Ouse	Part 2 Part 3	2020s	5%	10%	24%
			2050s	4%	11%	30%
			2080s	19%	30%	58%
Thames	Colne	Part 4	2020s	10%	16%	30%
			2050s	8%	16%	38%
			2080s	21%	35%	72%

Peak Rainfall Intensity Allowances for the Proposed Development

3.7.12 The predicted increase in the frequency and intensity of storm events as a result of climate change could increase the volumes and rates of water entering the surface water and foul drainage network. **Table 3-6** shows the allowance which needs to be made for increases in peak rainfall intensity for the 3.33% AEP and 1% AEP rainfall events across the management catchments highlighted above.

Table 3-6: Rainfall intensity Allowances

Management Catchment	Climate Change Epoch	Annual Exceedance Probability	Allowance	
			Central	Upper End
Tame Anker and Mease	2050s	3.3%	20%	35%
		1%	20%	40%

Management Catchment	Climate Change Epoch	Annual Exceedance Probability	Allowance	
			Central	Upper End
	2070s	3.3%	25%	35%
		1%	25%	40%
Avon Warwickshire	2050s	3.3%	20%	35%
		1%	20%	40%
	2070s	3.3%	25%	35%
		1%	25%	40%
Nene	2050s	3.3%	20%	35%
	2070s	1%	20%	40%
	2050s	3.3%	25%	35%
	2070s	1%	25%	40%
Upper and Beford Ouse	2050s	3.3%	20%	35%
	2070s	1%	20%	40%
	2050s	3.3%	25%	35%
	2070s	1%	25%	40%
Colne	2050s	3.3%	20%	35%
	2070s	1%	20%	40%
	2050s	3.3%	25%	35%
	2070s	1%	25%	40%

3.7.13 A Surface Water Drainage Strategy is currently in development and will be submitted as part of the supporting documentation for the DCO submission ensuring compliance with NPSWRI para 4.7.20. The drainage strategy will set out how allowances for increases in rainfall intensity (across the Proposed Development) have been taken into account in the design approach for drainage to ensure that runoff rates from the Proposed Development do not increase beyond runoff rates for the existing land use. The strategy will set out the approach to managing drainage via the use of SuDS where possible and used to develop the drainage design for the Proposed Development.

4. Assessment of Flood Risk

Table 4-1: Summary of Flood Risk

Risk to and from the Development		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part4b
Fluvial	Risk to	High	Low	Low	Low	Low	Low
	Risk from	High	Low	Medium	Negligible	Low	Low
Surface Water	Risk to	Low	Low	Low	High	Low	Low
	Risk from	Low*	Low*	Low*	Low*	Low*	Low
Groundwater	Risk to	Medium	Medium **	Medium **	Medium	Medium	Low
	Risk from	Low	Low	Low	Low	Low	Low
Sewer and Water Supply	Risk to	Low	Low	Low	Low	Low	Low
	Risk from	Negligible	Low	Negligible	Negligible	Low	Low
Artificial Sources***	Risk to	Low	Low	Medium	Medium	Low	Low
	Risk from	Low	Low	Low	Low	Low	Low
Mitigation Required (✓/X)		✓	X	X	X	X	X

*Assumes appropriate drainage strategy will be designed and implemented.

**Limited groundwater data available. Assumes groundwater to be at surface.

***Shows the worst-case risk rating between reservoir flooding and canal flooding.

4.1 Part 1a: Minworth AWTP

Historic Flood Events

4.1.1 The Environment Agency historic flood map (Ref. 9) dataset which is managed and maintained by the Environment Agency has been reviewed to understand past flood extents within and around the Proposed Development.

This data represents historic fluvial and groundwater flooding events that meets set criteria.

4.1.2 In June 2025, the latest publication of the historic flood extent map was approved by the Environment Agency, using data that been collected since records began in 1946.

4.1.3 The historic flood map indicates that a flood event in July 2007 impacted Water Orton Lane, south of Minworth WwRC which is where a proposed access point is to be located. The event is stated to have occurred as a result of the capacity of the River Tame being exceeded.

4.1.4 According to the Birmingham City Council 2023 SFRA (Ref. 10), 37 flood incidents have occurred across the years 2003, 2004, 2012 and 2016 in a neighbouring postcode close to the Minworth WwRC. No further evidence of flooding was found within the SFRA or other strategic reports and section 19 inspections.

Fluvial Flood Risk

4.1.5 Fluvial flooding in the context of Part 1a occurs when the capacity of a river is exceeded due to high water volumes from the catchment draining into the river which causes the river to overflow or overtop its banks and consequently, flood water inundates the areas adjacent to the riverbanks.

Fluvial Flood Risk to the Proposed Development

4.1.6 When consulting the Environment Agency FMfP (Ref. 7), which excludes the presence of flood defences, it highlights that the majority of the works associated with Minworth AWTP are located within Flood Zone 1 and therefore have a low probability of flooding.

4.1.7 As shown in **Figure 22-A3-1-P1** in **Annex 3-2, Sheet A**, the proposed access route leading to Water Orton Lane (which will use an existing access track) to the southwest of Part 1a, intersects Flood Zones 2 and 3 (0.1% AEP and 1% AEP events) associated with the River Tame which flows eastwards approximately 710 m south of existing Site. The access route bell mouth adjoining Water Orton Lane, and area directly north, intersect Flood Zone 3 and therefore have a high probability of flooding. A length of the access track north of T-RB10 and an area towards the eastern limit of Part 1a, south and east of the proposed GUC filters building is shown to be located within Flood Zone 2 therefore has a medium probability of flooding. Aligning with the Jacobs FRA (Ref. 17) it is assumed that the two existing final effluent channels located approximately 50 -100 m south of the proposed AWTP are included within the Environment Agency hydraulic model flood extents. The updated hydraulic modelling will confirm the impact of these within the full FRA prior to DCO submission.

4.1.8 When comparing flood extents for the 1% AEP event against national LiDAR 1 m DTM) data, flood depths at the bell mouth on Water Orton Lane could reach up to approximately 1.2 m which is significant however the use of this access track is likely to be infrequent and restricted to construction related vehicle movements only.

4.1.9 When considering undefended future fluvial flooding, downloaded Environment Agency flood extents (Ref. 11) were consulted. The downloaded data (last updated 24th October 2025) indicates the 1% AEP plus CC extents encroach across the access track northwards and at the start of the pipeline around watercourse T-RB11, increasing the probability of flooding to the access track (as shown in **Annex 3-3 Figure 22-A3-4-P1, Sheet A**). No other aspect of Part 1a is shown to be impacted by fluvial flood risk when considering climate change.

4.1.10 The Environment Agency Spatial Flood Defence dataset (Ref. 11 and Ref. 12) indicates that flood defences are located along the left bank of the River Tame along the length of the existing Minworth WwRC and the proposed AWTP site. Defences, as shown in **Annex 3-2 Figure 22-A3-1-P1 Sheet A** include natural high ground, engineered high ground and embankments. The general Standard of Protection (SoP) provided by the defences is for the 2% AEP event however the engineered high ground leading up to the M42/M6 Toll bridge over the River Tame provides a 1% AEP SoP. The Environment Agency maintains these assets, all of which range in condition from 2, 3 and 4 described as Good, Fair and Poor respectively. These are defined as:

a. Good – Minor defects; no significant reduction in performance;
b. Fair – Defects that could reduce the performance of the asset; and
c. Poor – Defects that would significantly reduce performance.

4.1.11 The 1% AEP defended flood extent as shown in **Annex 3-2 Figure 22-A3-1, Sheet A**, highlights that flood defences provide some benefit and reduces the extent of flooding when comparing against the undefended flood extents. During the present day defended 1% AEP scenario, the majority of Part 1a has a low probability of flooding with only the access road over T-RB10 to the southwest shown to have a high probability of flooding. The Environment Agency provided two sets of hydraulic models to aid with understanding fluvial flood risk within the area. The Bromford 2024 Baseline Model, which adapted an existing Environment Agency model to include a more accurate representation of the Bromford Vale Flood Risk Management Scheme and surrounding topography. The data indicates that the majority of the proposed AWTP works are not at risk of fluvial flooding in both the 1% AEP and 1% AEP plus 23% climate change events (see **Annex 3-4 Figure 22-A3-19**). The access road to the southeast is at risk of in both events and could experience depths of up to approximately 1.17 m and 1.27 m, respectively.

4.1.12 It is worth noting that the flood flow estimates used within the model, were derived in 2014 and therefore outdated. The modelling technical note accompanying the model outputs indicates that a catchment wide River Tame model update will be complete in summer 2025 which would include updates to the flood flow estimates. This model is currently being used to inform flood risk to feed into the DCO application. As such the outcome of the baseline assessment is subject to change and will be updated prior to the DCO and full FRA submission to include for updated climate change.

4.1.13 The River Tame 2013 model was also provided however the outputs indicate that in the 1% AEP plus climate change event (**Annex 3-4 Figure 22-A3-19**, the southeastern extent of the Site including the indicative location of the Filters Building and the access road from the main WwRC fall within the flood extent. Flood depths extracted from the model would range from approximately 0.1 m and 0.4 m around the proposed Filters Building and approximately 1 m along the proposed access route connecting the AWTP to the Filters Building.

4.1.14 It is not clear within the information provided by the Environment Agency what climate change allowance was applied to the model (no model report was provided). A note within the data indicates that flood defences along the River Tame between the A5 and Vitoria Terrace were raised more than necessary to ensure they are not overtopped. This could have an impact on downstream levels and artificially exacerbate flood risk on site.

4.1.15 Considering the modelled data provided is relatively old and portrays flood risk differently across the Proposed Development, a conservative approach has been taken and the risk is considered **High** until the ongoing specific modelling for the Proposed development at Part 1a is complete.

4.1.16 The River Tame hydraulic model is currently in development and will be used to inform this assessment and any subsequent design and/or mitigation updates prior to the final ES submission.

Development Impact on Fluvial Flood Risk

4.1.17 Given the majority of works, both temporary and permanent fall within Flood Zone 1, and proposed access is via an existing track, the majority of the Proposed Development will have a **Low** risk of impacting flooding elsewhere. By adopting a conservative approach in the absence of detailed hydraulic modelling, the Filters Building is shown to be located in the floodplain and will likely reduce floodplain storage when considering climate change. As such Part 1a is considered to have a **High** risk of impacting fluvial flooding elsewhere and mitigation such as compensatory floodplain storage will be required.

4.1.18 Detailed hydraulic modelling is currently being developed for the River Tame. Outputs from this model will be used to verify the Proposed Development

impacts on fluvial flood risk elsewhere prior to the full FRA as part of the DCO submission.

Surface Water Flood Risk

4.1.19 As defined by the Environment Agency via the Long Term Flood Risk Mapping (LTFRM)(**Ref. 13**), surface water flood risk can be classified as the following:

a. **High Chance** – the area has a chance of flooding of greater than 1 in 30 year (>3.33% AEP);

b. **Medium Chance** – the area has a chance of flooding of between 1 in 100 year (1% AEP) and 1 in 30 year (3.33% AEP);

c. **Low Chance** – the area has a chance of flooding of between 1 in 1000 year (0.1% AEP) and 1 in 100 year (1% AEP); and

d. **Very Low Chance** – the area has a chance of flooding less than 1 in 1000 year (<0.1% AEP).

Existing Surface Water Flood Risk

4.1.20 **Figure 22-A3-1 Sheet A** in **Annex 3-2,** shows that the majority of Part 1a falls within areas that have a very low chance (<0.1% AEP) of surface water flooding in the present-day scenario including the main site and the area surrounding the proposed indicative Filters Building to the east. The access road to the southwest is partially located within an area deemed to have a high chance (>3.33% AEP) of experiencing surface water flooding north of ordinary watercourse T-RB10 but south of the main WwRC. Two small areas have a high chance (>3.33% AEP) of reaching depths up to 20cm with the remaining area having a low chance (0.1% AEP – 1% AEP) of reaching depths up to 20cm.

4.1.21 A large area east of the existing WwRC and the indicative Filters Building is shown to have a high (>3.33% AEP) and medium (1% AEP - 3.33% AEP) chance of surface water flooding. **Figure 22-A3-1** in **Annex 3-2** highlights that the pipeline route and temporary access road will be located within an area which has a high chance (>3.33% AEP) of surface water flooding. The majority of the surrounding area beyond these elements has a low chance of flooding. The pipeline route, site returns, and access road all intersect an area which has a high chance (>3.33% AEP) of reaching depths of up to 30 cm however there is a medium chance (1% AEP - 3.33% AEP) of depths reaching 30 cm between the existing WwRC and the indicative Filters Building. Land generally falls south in this area with overland flow coming in from the north towards the River Tame to the south. Flows are then constrained by a number of raised access tracks where ground levels increase by approximately 70 cm to 80 cm. This is likely the reason for the significant surface water flooding in this location.

4.1.22 Additional small areas of surface water flooding are shown across the wider area. These are likely to be associated with topographical depressions which naturally collect water in a rainfall event or existing infrastructure that is buried on Site.

4.1.23 When considering climate change, the LTFRM (Ref. 13), which accounts for climate change up to and including the year 2080, indicates the extent of surface water flooding largely remains unchanged with only the low-risk extent increasing slightly across Part 1a. However, a greater area to the east is shown to have a high (>3.33% AEP) and medium (1% AEP - 3.33% AEP) chance of reaching depths of up to 30cm with a small area south of the indicative location of the Floc-Sed Units having a medium chance (1% AEP - 3.33% AEP) of reaching 60cm.

4.1.24 Overall, the risk of surface water flooding to Part 1a is considered **Low**.

Development impact on Surface Water Flood Risk

4.1.25 The development across Part 1a will likely result in an increase in hardstanding area through the construction of access roads, Filters Building, pumping stations and tanks. As a result, the rate of surface water runoff generated would increase without mitigation.

4.1.26 A Surface Water Drainage Strategy will be developed for the Part 1a submission with the DCO. Surface water runoff from areas of hardstanding will be adequately attenuated and discharged following the drainage hierarchy at agreeable rates utilising above ground SuDS where feasible. This will be evidenced in a Surface Water Drainage Strategy which will be used to update this FRA for the DCO submission.

4.1.27 The pipeline to the east will be located underground and as such will not have any interaction with surface water flooding at the surface.

4.1.28 Provided that the drainage strategy is sufficiently designed and implemented to manage post-development surface water runoff, the development across Part 1a will not result in a material change surface water flood risk. The risk to surface water flooding from the development across Part 1a is therefore considered **Low**.

Groundwater Flood Risk

4.1.29 Groundwater flooding occurs when the level of water within the ground rises above local ground level. This can result in deep and long-lasting flooding of low lying or below ground areas such as underpasses and basements. It tends to occur after long periods of sustained rainfall, and the areas at most risk are often low-lying above permeable geological strata. Groundwater flooding is most likely to occur in areas underlain by principal aquifers,

although it is also associated with more localised superficial deposits such as floodplain sands and gravels.

Existing Groundwater Flood Risk

4.1.30 Hydrogeological information has been obtained from Defra's online Magic Map (Ref. 14), British Geological Society (BGS) mapping (Ref. 15) and Soilscapes mapping (Ref. 16). The majority of the Part 1a development is underlain by superficial deposits classified as Secondary A aquifers. This includes the permanent works at the main site, the Filter Building and associated works to the east and the pipeline route connecting both areas. Secondary A aquifers comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

4.1.31 No underlying aquifer designation is shown within the BGS mapping (Ref. 15) for the northern most MBBR and associated pumping station. A small area of the northern access point onto Kingsbury Road is underlain by a Secondary Undifferentiated aquifer which are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type.

4.1.32 The bedrock classification underlying the whole Part 1a development is Secondary B which are mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.

4.1.33 BGS online mapping (Ref. 15) indicates that the superficial deposits underlying the Part 1a development comprise of sand, gravel, clay and silt as shown on **Figure 14-PD-2** in PEI Report **Volume 3**). This correlates with online Soilscapes mapping (Ref. 16) which highlights underlying soil types across Part 1a as 'loamey with naturally high groundwater' and 'Slowly permeable seasonally wet slightly loamy and clayey soils. The drainage characteristics of both is classified as naturally wet and having impeded drainage, respectively. Part 1a is also underlain by the Sidmouth Mudstone Formation which consists of mudstone, and is known to be relatively impermeable, especially if it has a high clay content. Made ground is also present across the area of the proposed MBBR infrastructure

4.1.34 BGS mapping highlights that many boreholes have been undertaken across the existing WwRC including land to the southeast, however the majority of borehole data is classified and not available for use. A sample of borehole and trial pits across Part 1a has been analysed and range in depth from 1.7 m below ground level (bgl) to 7.7 m bgl. **Table 4-2** summarises outputs from a number of boreholes and trial pits across Part 1a. The makeup of ground within this area would indicate that it may be possible for perched water tables to form after periods of rainfall.

Table 4-2: Summary of BGS borehole Records (Part 1a)

Borehole ID	Depth (mbgl)	Coordinates	Groundwater strike
SP19SE144	3	418431, 292152	No
SP19SE332	1.7	417010, 292050	No
SP19SE203	7.7	417070, 292200	Yes – 5.3 mbgl
SP19SE210	3.4	417110, 292230	No
SP19SE336	2.5	417650, 291930	No

4.1.35 The Birmingham City Council SFRA (Ref. 10) states that Sutton Coldfield, the area of which Minworth WwRC is located, has experienced groundwater flooding, however specific locations are not provided. The SFRA also states that areas around the River Tame are likely to experience groundwater emergence. It was not possible to access the groundwater risk maps within the SFRA therefore it is not possible to comment on the hazard classification given to Part 1a.

4.1.36 BGS groundwater susceptibility to groundwater flooding mapping as highlighted in **Figure 22-A3-10 Sheet A** in **Annex 3-5** shows that the majority of the Proposed Development will be located on land which has the potential for groundwater flooding to occur at the surface. This correlates with the Secondary A Aquifer classification whereby groundwater movement within the superficial deposits is possible.

4.1.37 The proposed infrastructure within Part 1a will likely comprise of some below ground elements, some of which may interact with the groundwater within the area assuming a shallow groundwater level. Groundwater levels and potential impacts will be confirmed in the final FRA at DCO submission.

4.1.38 Due to the potential for groundwater levels to be elevated at times, as a precautionary measure the risk to Proposed Development from groundwater flooding is considered to be **Medium**.

Development impact on Groundwater Flood Risk

4.1.39 The works which fall directly south of the existing WwRC will largely be constructed above ground with some elements proposed to be below ground. The majority of these works will be constructed on Made Ground which largely consists of clay, silt and gravel therefore it is possible that artificially raised perched groundwater levels could be present, especially after a rainfall event. Although, groundwater level information is limited for works surrounding the filters buildings it is likely groundwater levels will be

similar given they fall within the same superficial deposits as the works south of the existing WwRC.

4.1.40 Considering the above, groundwater interaction is likely; however, given the lateral extent of the Secondary A aquifer, they will have limited effect on local groundwater flow and levels. The proposed works within Part 1a are therefore likely to have a negligible impact on groundwater storage or levels relative to other land users and property and hence changes in groundwater flood risk as a result of Part 1a of the of the Proposed Development is considered to be **Low**. This will be verified within the full FRA upon receipt of detailed Ground Investigation (GI) data and at the next design freeze.

Flood Risk from Sewers and Water Supply Infrastructure

4.1.41 Sewer flooding generally occurs when the available discharge capacity of the system is exceeded by the inflow, the system becomes blocked by debris or sediment, or it cannot be released at the outfall due to a high water level within the receiving waterbody. In all three cases, water could back up through the sewerage system and may surcharge through manholes, flooding highways and properties. Although modern sewers built since 1980 are designed for a 1-in-30-year storm, older systems and incremental urban development (urban creep) increase vulnerability, and even new systems can be overwhelmed by larger events.

Existing Sewer and Water Supply Flood Risk to the Development

4.1.42 As detailed within the Birmingham City Council SFRA (Ref. 10), the sewers relative to Part 1a are managed by Severn Trent Water. The SFRA indicates there is no historical sewer flooding across Part 1a.

4.1.43 The Gate 3 Minworth SRO AWTP and Pipeline Flood Risk Assessment (Ref. 17) indicates that a Severn Trent combined lateral drain runs along the northeast boundary north of the proposed Filters Building. Location, depth and extent of this pipe is not known however it is assumed to be a closed system.

4.1.44 As the Part 1a Proposed Development forms part of the existing WwRC which is at the end of the sewer system serving the wastewater catchment, there is a limited risk of flooding from sewers. Additionally, the existing WwRC is designed to receive and treat large amounts of wastewater and therefore will have sufficient capacity and is unlikely to experience sewer flooding.

4.1.45 Based on available online information and the Gate 3 FRA (Ref. 17) the risk of sewer flooding is considered **Low**, however the identification and verification of buried services will be undertaken prior to construction to identify any water supply and sewer infrastructure.

Development impact on Sewer Flood Risk and Water Supply Infrastructure

Part 1a of the Proposed Development will not alter water supply infrastructure and will not result in any increase in flow to the sewer system. Therefore, the potential of the Proposed Development to increase the risk of flooding from sewer and water supply infrastructure elsewhere is considered to be **Negligible**.

Flood Risk from Artificial Sources

4.1.46 Artificial flood sources include raised channels such as canals, or storage features such as ponds and reservoirs.

4.1.47 Reservoir dam failure can be a particularly dangerous form of flooding as it results in the sudden release of large volumes of water that can travel at high velocity over large distances. This can result in deep and widespread flooding, potentially resulting in significant damage.

4.1.48 Canal flooding occurs when water escapes from a canal due to excessive inflow or rainfall exceeding its capacity, structural failures such as damaged lock gates or embankments, overtopping during extreme weather that lead to uncontrolled water release.

Existing Risk from Artificial Sources to the Development

4.1.49 As shown in **Figure 22-A3-7 Sheet A** in **Annex 3-6**, the Environment Agency's Flood Risk from Reservoirs Map (Ref. 13) shows that approximately half of the Proposed Development across Part 1a which includes the Filters Building and associated works and associated permanent access roads are located within a reservoir flood extent in a 'dry-day' scenario, and therefore are at risk from reservoir flooding when the rivers are at normal levels. Only a small section of the proposed access road to the southeast is within the dry-day reservoir flood extent.

4.1.50 The wet day scenario assumes reservoir failure when rivers are also in flood. In this scenario reservoir flooding would inundate all works to the east (Filters Building and associated works and the Site Return pipework to the existing WwRC site). Flooding would also extend into the main WwRC where the access road to the southwest, areas to the north and the works and MBBR Chemical Compound would be at risk of flooding.

4.1.51 The Filters Building is proposed to have a basement which will include wet wells and pipe galleries that will be designed to be watertight and as such would not be impacted by water. The Filters Building will likely house mechanical and electrical equipment, which could become damaged in a flood event and could possibly disrupt operation of the wider site. Final floor levels and flood depth data was not available at the time of writing but will be

considered in the final FRA to determine the level of risk for the DCO submission.

4.1.52 Reservoirs which are shown to influence the reservoir flood extents across Part 1a are summarised in **Table 4-3.**

Table 4-3 Summary of Reservoirs Impacting Part 1a

Reservoir Name	Reservoir Owner	Scenario impacting the Proposed Development
Bartley	Severn Trent Water	wet-day
Blackroot Pool	Birmingham City Council	wet-day
Bracebridge Pool	Birmingham City Council	wet-day
Frankley Raw Water	Severn Trent Water	wet-day
Longmoor Pool	Birmingham City Council	wet-day
Minworth Cow Lane	Severn Trent Water	wet-day
Minworth Curdworth	Severn Trent Water	dry-day & wet-day
Penns Hall Lake	Sutton Coldfield Hotel Limited	wet-day
Powells Pool	Birmingham City Council	wet-day
Rotton Park	Canal & River Trust	wet-day
Wyndley Pool	Birmingham City Council	wet-day

4.1.53 The consequence of reservoir failure is significant however the likelihood of reservoir flooding occurring is generally extremely low given that all large raised reservoirs are managed in accordance with the Reservoirs Act 1975. Under the Reservoirs Act 1975, a large raised reservoir is defined as one that "*holds over 25,000 cubic metres of water above the level of the surrounding land"*. In the unlikely event of a breach, fluvial flood defences within the area or mitigation measures such as "off-site flood plans" that are developed for large raised reservoirs to manage the consequence of reservoir failure through a coordinated approach with multiple category 1 and 2 responders would provide some benefit. Although the consequence of a failure is high, it is very unlikely that a reservoir would fail due to the strict maintenance regime therefore the risk of reservoir flooding is considered **Low.**

4.1.54 The nearest canal to Part 1a is the Birmingham and Fazely canal which is located approximately 20 m north of the WwRC at its closest point. Although the canal appears to sit close to ground level it is situated higher than the WwRC. However, Kignsbury Road sits slightly higher than the surrounding

land and would restrict flows entering the WwRC. The water levels within the canal are actively managed and maintained by the Canal and River Trust so they remain navigable and as such is very unlikely to overtop. Considering the canal is actively managed the risk of flooding from this source is considered **Low**.

Development impact on Flood Risk from Artificial Sources

4.1.55 The Proposed Development is located at a substantial distance from all regulated reservoirs in the surrounding area. As a result, the works will not interface with, place loading upon, or otherwise affect any reservoir embankments, spillways, outfalls, or associated safety infrastructure. Consequently, the Proposed Development has no potential to influence the structural integrity, operation, or safety of any reservoirs, and therefore cannot alter the residual reservoir flood risk as modelled by the Environment Agency. It is therefore considered that the impact of the Proposed Development on reservoir flood risk is **Low**.

4.1.56 The Proposed Development will not have an impact on canal flood risk therefore risk from the development is considered **Negligible**.

4.2 Part 1b: Minworth to Atherstone Pipeline

Historic Flood Events

4.2.1 The Environment Agency historic flood map (Ref. 9) indicates that a flood event in December 1992 impacted areas directly east of Lea Marston specifically where the proposed pipeline will run. The cause of the event is not documented however it is likely a result of the capacity of the River Tame being exceeded.

4.2.2 According to the Stratford-on-Avon DC, Warwickshire CC, North Warwickshire BC & Rugby BC Level 1 SFRA (Ref. 18), North Warwickshire has experienced past flood events which have impacted the region as a whole. The SFRA however, does not identify any additional historic events that have previously occurred across Part 1b. Similarly, the Warwickshire 2011 Preliminary Flood Risk Assessment (Ref. 19) does not identify any historic flood incidents. No further evidence of flooding was found within the SFRA or other strategic reports.

Fluvial Flood Risk

Fluvial Flood Risk to the Development

4.2.3 The River Tame runs north through the centre of Part 1b directly east of Lea Marston. When consulting the FMfP (Ref. 7) and as shown in **Figure 22-A3-1 Sheets B to D** in **Annex 3-2,** it highlights that Flood Zone 2 and 3 associated with the River Tame and tributaries are largely located between

Lea Marston and Halloughton Grange (SP 22037 93572). A large proportion of the pipeline route, Break Pressure Tank (BPT), and associated temporary works will be located within Flood Zone 1 and therefore have a low probability of flooding. The area within which the BPT is likely to be located is near an ordinary watercourse which has not been captured within fluvial flood mapping. Using the surface water flood map as a proxy for fluvial risk indicates that flooding within the 0.1% AEP event is largely contained within channels and is situated around the periphery of the Preliminary Order Limits.

4.2.4 Consulting the Environment Agency Spatial Flood Defence dataset (Ref. 12) indicates that flood defences are located along the left bank of the River Tame directly east of Lea Marston and within the floodplain east of the River Tame. Defences include natural high ground along the left bank and an embankment which ties into Birmingham Road to the east. The SoP and condition rating of the natural high ground is not known however the embankment provides a SoP of 1% AEP and has a condition rating of 3 (Fair). The Environment Agency maintains both these assets. The embankment was constructed in 2012 and appears to have been located along the perimeter of the 1992 historic flood extents. No other known defences are located within the vicinity of Part 1b.

4.2.5 The proposed pipeline will be buried during operation and as such will not be at risk of flooding. However, where it intersects the 1% AEP flood extent between Lea Marston and Halloughton Grange and between Coventry Road (SP 22284 93854) and Meadow Farms (SP 24397 94504) there will be a high probability of flooding during construction where open trench methods are used. Generally, where trenchless techniques methods are proposed, the entry and reception pits are located outside of any flood zone and given the pipe is driven below ground, the risk of fluvial flood interaction of both development elements is low. However, the drive and reception pits which facilitate the crossing of DLB35 and the Kingsbury Junction to Whiteacre Junction Chord railway line are located within 1% AEP and 0.1% AEP flood extents, respectively. As such they are at risk of fluvial water ingress during construction.

4.2.6 The Pipeline will likely cross 13 watercourses, four of which will likely use trenchless techniques and the remaining nine via open trench methods. Where open trench methods are proposed, works within the channel have a higher probability of fluvial flooding. Additionally, as a result of temporary access requirements, culverting of watercourses T-RB26 and T-BA10 will likely be required.

4.2.7 When consulting the FMfP (Ref. 7), compounds CMP-PL-08, its associated access AR-PL-12, compound CMP-PL-09 and construction access routes CR-RL-08 and CR-RL-08 are partially located within Flood Zone 3 and

therefore have a high probability of fluvial flooding. Additionally, compounds CMP-PL-01 and CMP-PL10 and its associated access road AR-PL-13 are located within Flood Zone 2 and have a medium probability of flooding. **Figure 3-P1B-1** in PEI Report **Volume 3** highlights the location of compounds across Part 1b.

4.2.8 As shown in **Figure 22-A3-4-P1, Sheets A and B,** in **Annex 3-3**, the defended 1% AEP scenario flood extents associated with the River Tame are considerably reduced as a result of the existing defences. As such all compounds, access roads and the trenchless techniques drive and reception pits which are shown to be at risk in the undefended scenario are shown to be protected and are therefore located in what is considered defended Flood Zone 3.

4.2.9 When considering the future defended and undefended extents, they highlight that flood extents will increase slightly within the defended scenario and significantly in the undefended scenario, increasing the probability of flooding to the area which the pipeline will be installed especially within the River Tame floodplain. When considering the surface water flood mapping, the area in which the BPT may be located remains at low risk. The pipeline however will be located underground and therefore is not considered to be at risk of flooding when considering climate change.

4.2.10 When consulting the 2013 River Tame hydraulic model, the 1% AEP climate change outputs indicate that compound CMP-PL-08 and access road AR-PL-12 could experience depths of up to 1 m.

4.2.11 Overall, the risk of fluvial flooding to the Proposed Development is considered **Low** given the pipeline and BPT will be buried and located within Flood Zone 1 or when intersecting 1% AEP extent, this will be buried. There is an increased probability of flooding during construction however the risk would be managed through flood warnings and undertaking trenchless crossings during summer months.

Development Impact on Fluvial Flood Risk

4.2.12 Considering the pipeline will be located below ground and the BPT within Flood Zone 1, the impact of the Part 1b Proposed Development on fluvial flood risk is considered **Low**.

Surface Water Flood Risk

Existing Surface Water Flood Risk

4.2.13 The LTFRM (Ref. 13) and **Figure 22-A3-1 Sheets B to D** in **Annex 3-2** highlight that the majority of Part 1b has a very low chance (<0.1% AEP) of surface water flooding, including much of the proposed pipeline, BPT and associated temporary compounds and access roads.

4.2.14 Compound CMP-PL-10 will be located within an area deemed to have a high chance (>3.33% AEP) of surface water flooding with a medium chance (1% AEP - 3.33% AEP) of reaching depths of up to 30 cm. This is largely due to the compound being located in an area where ground levels fall towards the southwest. Levels at the proposed compound location range from approximately 68 mAOD to 60.2 mAOD. The immediate area is bounded by the Kingbury junction to Whitacre junction chord railway line and Hallbhoughton Grange highway which have approximate ground levels of 68.3 mAOD and 71.8 m ADO respectively.

4.2.15 The proposed pipeline is shown to intersect a number of localised areas which have a high chance (>3.33% AEP) of surface water flooding east of watercourse DLB2. It is also shown to intersect areas which have a high chance (>3.33% AEP) of flooding at the crossing of watercourses DLB4 and A-ST1, however the flood extents shown are a better representation of fluvial flooding where Environment Agency fluvial extents are not available. Flood extents present at the crossing of A-ST1 are likely a result of the misrepresentation of the culvert underneath Coleshill Road which would convey flows underneath the road. The pipeline itself will be buried and will therefore not be at risk of flooding during operation. However, the risk to site workers in these locations during construction is considered high.

4.2.16 When considering climate change within the LFRM (Ref. 13), surface water flood extents and depths increase across Part 1b, highlighted in **Figure 22-A3-4 Sheets B to D** in **Annex 3-3**. No new permanent elements of the Proposed Development are shown to be at risk.

4.2.17 Considering the above, the risk of flooding to the Proposed Development is considered **Low**.

Development Impact on Surface Water Flood Risk

4.2.18 The pipeline throughout Part 1b will be located underground and as such will not have an impact on surface water flooding. However, the works associated with the BPT will likely result in an increase in hardstanding area. As a result, the rate of surface water runoff generated from the site would increase without mitigation.

A Surface Water Drainage Strategy will be developed for Part 1b for the DCO submission. Surface water runoff from areas of hardstanding will be adequately attenuated and discharged following the drainage hierarchy at agreeable rates utilising above ground SuDS where feasible. This will be evidenced in the Surface Water Drainage Strategy which will be used to update the full FRA for the DCO submission.

4.2.19 Provided that the drainage strategy is sufficiently designed and implemented to manage post-development surface water runoff, the development across Part 1b will not result in a material change to surface water flood risk. The

risk to surface water flooding from the development across Part 1b is therefore considered **Low**.

4.2.20 It should be noted that any above ground SuDS features proposed will likely provide a dual function and will provide some surface water quality benefits alongside providing an increase in habitat availability.

Groundwater Flood Risk

Existing Groundwater Flood Risk

4.2.21 When consulting Defra's Magic Map (Ref. 14) it highlights that the superficial deposits of which the proposed pipeline and BPT facilities will be constructed upon are largely unclassified, however large stretches of the pipeline are situated on top of a Secondary A aquifer. Smaller stretches are also underlain by superficial deposits which are classified as Secondary (undifferentiated).

4.2.22 The bedrock classification underlying Part 1b, comprises of Principal, Secondary A and Secondary B aquifers. Most of the west and east are underlain by Secondary B and Principal aquifers respectively with a very small part of the pipeline route being underlain by a Secondary B aquifer. Principal aquifers provide significant quantities of drinking water and water for business needs. They may also support rivers, lakes and wetlands.

4.2.23 BGS online mapping indicates that the superficial deposits underlying Part 1b comprise of sand, gravel, clay and silt as shown in **Figure 14-PD-2** in PEI Report **Volume 3.** This correlates with online Soilscapes mapping (Ref. 16) which highlights the drainage of underlying soil types across Part 1b to be naturally wet and having impeded drainage.

4.2.24 The combined Stratford-on-Avon DC, Warwickshire CC, North Warwickshire BC & Rugby BC Level 1 SFRA (Ref. 18) provides information on the area of the Proposed Development. This indicates that there is generally low susceptibility to groundwater flooding across the proposed pipeline corridor except for areas of land directly adjacent to main rivers, where the groundwater levels may be hydraulically connected. This is largely because the underlying bedrock is comprised of mudstone, which is low permeability. There are no Section 19 reports within the district council area which cite groundwater as a mechanism for flooding.

4.2.25 BGS groundwater susceptibility mapping classifies the westernmost extent of the proposed pipeline corridor, east of the M6 Toll, as having the potential for groundwater flooding to occur at the surface, as highlighted in **Figure 22-A3-10 Sheet B** in **Annex 3-5**. Additionally, the River Tame floodplain which includes the network of ordinary watercourses, also has potential for groundwater flooding at the surface. This aligns with the findings of the SFRA (Ref. 18). The remainder of the proposed pipeline route and the area

in which the BPT may be located is shown as having limited potential for groundwater flooding to occur at the surface or no potential.

4.2.26 BSG borehole data (Ref. 15) has been analysed to ascertain possible groundwater depths. Borehole data was limited east of Lea Marston and the available data west of Lea Marston was not comprehensive and largely did not mention groundwater levels. Two boreholes (SP19SE13 A/B and SP29SW6) with lengths of 14 m and 45.7 m, located close to the proposed pipeline route highlighted that groundwater was not struck.

4.2.27 Although there is limited groundwater level information, it's anticipated that groundwater will be close to surface along the pipeline route. As such groundwater interaction during construction is likely especially within the vicinity of a watercourse and its floodplain. A conservative approach to groundwater flood risk has therefore been taken with the risk considered to be **High.** It is recommended that a GI is undertaken to ascertain groundwater levels which will be used to update this FRA for the DCO submission.

Development Impact on Groundwater Flood Risk

4.2.28 Construction activities such as the excavation of trenches in which to bury the pipeline could alter groundwater flow locally. The scale of works with respect to the lateral extent of aquifers is very small and is unlikely to have any impact on local groundwater regimes. Therefore, any local increases in groundwater are unlikely to increase groundwater risk to any nearby receptors. Based on this, the groundwater flood risk from the proposed Development is considered to be **Low**.

Flood Risk from Sewer and Water Supply Infrastructure

Existing Sewer and Water Supply Flood Risk

4.2.29 Following a review of the available desktop data, no sewer or water supply infrastructure has been identified which highlights a risk to the proposed pipeline. It is likely that sewer infrastructure within urban highways would be present especially if located within urbanised/residential areas.

4.2.30 The risk of sewer infrastructure and water supply flooding to the underground pipeline and the BPT is considered to be **Low**. Further consultation with relevant water utility providers and a buried services search will be undertaken at detailed design and prior to construction to identify any water supply and sewer infrastructure.

Development impact on Sewer and Water Supply Infrastructure

4.2.31 The Proposed Development will not alter water supply infrastructure and will not result in any increase in flow to the sewer system.

4.2.32 The construction of the pipeline has the potential to cause severance, disturbance, or blockage to any underground field drainage infrastructure that may be present. Although it is not currently clear if any infrastructure is present along the route, it is likely that sub surface drainage is present across some agricultural land. This may increase the risk of flooding locally, specifically to the surrounding land itself, and it is not expected that there will be an increase in surface water flood risk to any vulnerable receptors. Preconstruction investigations will be undertaken, where reasonably practicable, to identify the location and condition of sub surface drainage infrastructure within the working areas. Where such infrastructure is encountered during construction, mitigation measures as outlined in the CEMP will be implemented, where required and proportionate, to maintain or reinstate functionality. Reinstatement will aim to achieve a condition broadly comparable to that prior to construction, as far as is reasonably practicable.

4.2.33 Considering the above, the impact on sewer and water supply infrastructure is considered to be **Low**.

Flood Risk from Artificial Sources

Existing Risk from Artificial Sources to the Development

4.2.34 As shown in **Figure 22-A3-7 Sheets B** to **D** in **Annex 3-6**, the Environment Agency's Flood Risk from Reservoirs Map (Ref. 13) extents shows that the majority of the Proposed Development across Part 1b is not located within both the dry-day and wet-day reservoir flood extents and is therefore not at risk of reservoir flooding with the exception of the land east of Lea Marston which is at risk from both dry day and wet day scenarios.

4.2.35 Where reservoir flood risk is highlighted, it largely aligns with fluvial Flood Zones 2 and 3 extents for both the dry-day and wet-day scenarios, respectively. The pipeline, compound CMP-PL-08 and associated access AR-PL-12 fall within both reservoir flood scenarios and are therefore at risk in the event of reservoir failure or breach.

4.2.36 A number of reservoirs are shown to impact the Proposed Development within the River Tame floodplain; these are highlighted in **Table 4-4.**

Table 4-4: Summary of Reservoirs Impacting Part 1b

Reservoir Name	Reservoir Owner	Scenario impacting the Proposed Development
Bartley	Severn Trent Water	dry-day & wet-day
Earlswood Lakes – Engine Pool	Canal & River Trust	dry-day & wet-day

Reservoir Name	Reservoir Owner	Scenario impacting the Proposed Development
Earlswood Lakes – Terry's Pool	Canal & River Trust	wet-day
Earlswood lakes – Windmill Pool	Canal & River Trust	dry-day & wet-day
Frankley Raw Water	Severn Trent Water	wet-day
Gearys – Packington	Packington Estate Enterprises Ltd	wet-day
Great Pool – Packington	Packington Estate Enterprises Ltd	dry-day & wet-day
Hall Pool – Packington	Packington Estate Enterprises Ltd	wet-day
Minworth Cow Lane	Severn Trent Water	dry-day & wet-day
Minworth Curdworth	Severn Trent Water	dry-day & wet-day
Olton	Canal & River Trust	wet-day
Pandigo Lake	The National Exhibition Centre Ltd	wet-day
Rotton Park	Canal & River Trust	wet-day
Shustoke upper and Lower	Severn Trent Water	dry-day & wet-day
Whitacre	Severn Trent Water	dry-day

4.2.37 The likelihood of reservoir failure is extremely low and as such the risk of flooding form Reservoirs is considered to be **Low**.

4.2.38 Coventry Canal is at the easternmost point of Part 1b and is where the pipeline discharges. Although there are no modelled flood extents associated with Coventry Canal, the canal sits at ground level and the water levels are actively managed and maintained by the Canal and River Trust to allow it to remain navigable at all times and as such is very unlikely to overtop and impact development within Part 1b. As such the risk of flooding from canals is considered to be **Low**.

Development impact on Flood Risk from Artificial Sources

4.2.39 Given the proposed works are not located within close proximity to the reservoirs listed in **Table 4-4,** and there are no permanent above ground works within the flood extents, the Proposed Development impact on reservoir flooding is considered **Negligible**.

4.2.40 The Proposed Development will not increase the risk of canal flooding due to the pipeline being buried and located a sufficient distance away from Coventry Canal. The BPT will be designed such that in the very unlikely event Coventry Canal cannot receive flow and the BPT pumps do not stop, storage will be provided to allow time for the pumps to be manually turned off. The overflow would direct the flow to two retention ponds before been discharged at a controlled rate into a nearby watercourse.

4.2.41 Details of these ponds will be developed at the next stage and will be suitably sized to attenuate overflow and will be located close to the BPT. The design including the discharge rates will be agreed with the LLFA ensuring that no increase in flood risk elsewhere will occur.

4.2.42 Considering the above, impact on canal risk from the Proposed Development is considered to be **Low**.

4.3 Part 2: Canal Works

Historic Flood Events

4.3.1 The Environment Agency historic flood map (Ref. 9) indicates that a number of historic flood events occurred within proximity to both the Oxford Canal and the Grand Union Canal. No historic flood events are shown to have been within proximity to the Coventry Canal. **Table 4-5** highlights historic flood events.

Table 4-5: Environment Agency Historic Flood Records

Watercourse	Date	Reason	Canal/area of works impacted
River Avon	Jan 1985, Sept 1992	Channel capacity exceeded	No
Clifton Brook	Sept 1992	Channel capacity exceeded	No
River Nene	Apr 1998	Channel capacity exceeded	No
River Tove	Mar 1947	Channel capacity exceeded	No
River Great Ouse	Jan 1947, Jan 1998	Channel capacity exceeded	No
LB1	Sept 1968	Channel capacity exceeded	No

4.3.2 According to the Stratford-on-Avon DC, Warwickshire CC, North Warwickshire BC & Rugby BC Level 1 SFRA (Ref. 18) additional flood events along Clifton Brook occurred in 1985 although it is not clear if it impacted any of the area associated with the Proposed Development.

4.3.3 The West Northamptonshire Level 1 SFRA (Ref. 20) highlights West Northamptonshire has a long history of flooding, with major events recorded in 1947, 1998, 2007, 2012, and 2016. The most severe occurred in Easter 1998, when extreme rainfall caused river channel exceedance and surface water flooding, affecting 4,200 properties, Other notable events include widespread flooding from the River Nene in 1947, intense rainfall-driven surface water flooding in 2007, and heavy rain in November 2012 and 2016. Since 2010, 1,515 flooding incidents have been recorded: 410 in Northampton Borough, 889 in South Northamptonshire, and 587 in Daventry District. Flooding sources include fluvial (main rivers and ordinary watercourses), surface water, groundwater, sewer surcharging, and residual risks from canals and reservoirs. It is not evident if these events directly impacted the Proposed Development area.

4.3.4 Both the Nuneaton and Bedworth Borough Council SFRA (Ref. 21) and Coventry City Council SFRA (Ref. 22) highlight that no additional historic flood events occurred within proximity to the Proposed Development.

4.3.5 According to the Milton Keynes SFRA (Ref. 24) the Milton Keynes administrative has a history of flooding with the most significant events occurring in 1947, 1998, 2007, 2018 and 2020. Flooding has repeatedly affected communities along the River Great Ouse, River Ouzel, and their tributaries, including Newport Pagnell, Stony Stratford, Bletchley, Olney, Newton Blossomville, Lower Weald, New Bradwell and others, with the 1998 and 2020 events illustrating the combination of river, surface water and groundwater sources. Surface water flooding has been especially problematic, most notably during the May 2018 event, which resulted in 686 flood incidents, more than 315 properties flooded internally, and widespread disruption across multiple neighbourhoods including Beanhill, Coffee Hall and Lakes Estate. Sewer flooding is also a persistent issue particularly concentrated in southern urban areas such as MK6, MK3 and MK2. Localised groundwater emergence has been recorded in places like Newport Pagnell and Olney, while the Grand Union Canal has experienced historical breaches (1808, 1971) and overtopping (2007, 2013), adding to localised risk. Together, these events demonstrate a long-standing pattern of multi-source flooding driven by local topography, geology, drainage interactions and severe weather.

Fluvial Flood Risk

Existing Fluvial Flood Risk

4.3.6 Potential sources of fluvial flooding affecting the canal network include overtopping or breaching of banks along Main Rivers and/or Ordinary Watercourses. When flows exceed the capacity of these watercourses, floodwaters may escape their channels and enter the adjacent low-lying

canal network. Such inflows can raise canal water levels, increase flood risk to nearby assets, and affect the operational performance of the system.

4.3.7 When consulting the FMfP (Ref. 7) it shows that the majority of the temporary and permanent works fall within Flood Zone 1 and are therefore not at risk of fluvial flooding in the present-day scenario. While canals are not explicitly modelled by the Environment Agency- as they are not main rivers, a number of ordinary watercourses along the canal network have Flood Zones 2 and 3 defined. The FMfP however does not account for the hydraulic function of the canal network and their structures when maintaining levels, therefore where flood extents are shown within the canal network these are likely to be exaggerated.

4.3.8 When comparing the indicative location of the proposed temporary and permanent work areas (as shown **Figure 3-P2&3-1** in PEI Report **Volume 3)** against the present day flood risk maps (**Annex 3-2 Figure 22-A3-2)** several elements of the Proposed Development, both indicative temporary work areas and permanent work areas, are located within the undefended 1% AEP and 0.1% AEP flood extents along the Coventry Canal, Oxford Canal and Grand Union Canal. These include:

Coventry Canal

a. Bank repair works across watercourse A-WS4 and the associated proposed access from Manor Road (PEI Report **Volume 3 Figure 3-P2&3-1**, **Sheet A**) fall within the 1% AEP flood extent (**Annex 3-2 Figure 22-A5-2**, **Sheet A**). Fluvial flows may enter Coventry Canal at this location;

b. The compound and construction areas at Quarry Lane Weirs (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet B**) and areas where bank raising is proposed are located within the 0.1% AEP flood extent associated with A-WS12 (**Annex 3-2 Figure 22-A3-2, Sheet B**). Culverting of A-WS12 will also be required to facilitate access to and from the compound and the proposed bank raising works;

c. Construction areas associated with bank raising and pumping station works (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet D**) will require culverting of watercourses A-WS27 and A-WS28. While these works are located in Flood Zone 1, works within the channel will be needed to facilitate the construction of a crossing and these will have a higher probability of flooding;

d. Bank raising works and associated construction area, compound and access tracks adjacent to Judkins Quarry (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet E**) are located within the 0.1% AEP flood extent associated with the River Anker and A-WS47 (**Annex 3-2 Figure 22-A3-2, Sheet B**);

e. Bank repair works are proposed across Bar Pool Brook which is an open watercourse and watercourse A-WS70 which is culverted under the canal. These works fall within the 1% AEP flood extent (**Annex 3-2 Figure 22-A3-2, Sheet C**);

f. Bank raising works adjacent to Tomkinson Road Park (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet F**) are located in the 1% AEP flood extent which also impacts residential properties within Nuneaton (**Annex 3-2 Figure 22-A3-2, Sheet B**);

g. A section of the canal east of St Michael's Church of England Academy I shown to fall within the 1% AEP flood extent associated with Wem Brook. No works are proposed in this location however there is a high probability the canal will receive additional flows when Wem Brook is in flood;

h. The construction area at Hawkesbury Junction is shown to traverse the Coventry Canal connecting a construction area which will facilitate the pumping station works (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet G**). This is a result of the proposed cable connection to the proposed pumping station and as such will be buried below the canal; and

i. Watercourses that are shown to potentially introduce flows into the canal during the 1% AEP event include: A-WS12, A-WS14, Bar Pool Brook and W-SA35.

Oxford Canal

a. Access to bank raising works from Aldermans Green Road (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet H**) intersects the 1% AEP flood extent associated with Wyken Pool and watercourses S-BW11 and S-BW12 (**Annex 3-2 Figure 22-A3-2, Sheet D**);

b. The Harborough Magna Compound (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet R**) falls within the 0.1% AEP flood extent associated with watercourse A-CS23 (**Annex 3-2 Figure 22-A3-2, Sheet G**);

c. The River Swift weir access road within the north of Rugby (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet S**) intersects the 1% AEP flood extent associated with the River Swift (**Annex 3-2 Figure 22-A3-2, Sheet H**). The canal is raised and conveyed over the Rugby Aqueduct and therefore not at risk of flooding;

d. The Hillmorton Locks Compound (PEI Report V**olume 3 Figure 3-P2&3-1**, **Sheet T**) is partially located within 0.1% AEP flood extent associated with Clifton Brook (**Annex 3-2 Figure 22-A3-2, Sheet I**). The compound will require culverting of C-SA21; and

e. Rains Brook may introduce flows into the canal network within the 0.1% AEP event.

Grand Union Canal

a. Bank raising works and the associated compound at Lock 9, adjacent to Whilton Marina (PEI Report **Volume 3 Figure 3-P2&3-1**, Sheet AA), fall within the 1% AEP and 0.1% AEP flood extents associated with the Old Mill Race and watercourse WB-L9 (**Annex 3-2 Figure 22-A3-2, Sheet L**);

b. Bypass works associated with Stoke Bruene Locks including a compound, construction area and bypass pipes (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet AH**) fall within the 1% AEP flood extents associated with the River Tove and watercourse T-GN21 (**Annex 3-2 Figure 22-A3-2, Sheet O**). Two permanent piped crossings are required under T-GN21; and

c. Construction area adjacent to the Iron Trunk Aqueduct (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet AI**) borders 1% AEP flood extent associated the River Great Ouse (**Annex 3-2 Figure 22-A3-2, Sheet P**), though the canal is conveyed over the floodplain via the Iron Trunk Aqueduct and not at risk of flooding.

4.3.9 A total of 21 new watercourse crossings (some outlined above) are proposed with two required as a result of pumping station bypass pipes across watercourse T-GN21. These two piped crossings are likely to be constructed using open trenched methods. Nineteen of the crossings required are to facilitate construction and compound areas and access arrangements. As such new temporary culverts and bridges at these crossings are likely to be required to facilitate material and plant storage, construction works and construction traffic movements. Works within a channel will have a higher probability of experiencing fluvial flooding.

4.3.10 Areas where there is no defined flood zone within the FMfP but works are proposed to take place within an ordinary watercourse channel (e.g. open trench crossings, new culvert/bridge crossings) will have a high probability of flooding. Where bank modification/raising works are proposed, it is unlikely fluvial flooding, which is shown within the canal network would have an impact on these works due to water levels within the canal being controlled to ensure a consistent level is maintained.

4.3.11 There are no known flood defences along bordering Ordinary Watercourses and as such the risk remains unchanged in the defended scenario. Where flood defences are present, they appear to run along the larger watercourses (typically Main Rivers) within close proximity to the canals systems and include the River Anker, Wem Brook, River Avon, River Swift, Clifton Brook, Old Mill Race, River Nene, River Tove and the River Great Ouse. All are classified as Main Rivers which are managed and maintained by the EA.

4.3.12 Flood defences along these rivers range from natural high ground within more rural settings to walls, embankments and engineered high ground within more urbanised settings. Conditions of assets vary and are maintained by both the Environment Agency and riparian landowners. Generally, where defences are located within a more urbanised setting, they provide a greater standard of protection (2% AEP to 1% AEP) to that of defences located in rural settings which provide a lower SoP.

4.3.13 Consulting the defended 1% AEP scenario (**Annex 3-2 Figure 22-A3-2**) it highlights that flood extents in some locations are reduced, however the overall probability of flooding to the majority of the Proposed Development remains unchanged. Only bank raising works adjacent to watercourse WB-L9 fully benefit from flood defences located along Old Mill Race and this area is no longer shown to be at risk of flooding.

4.3.14 When considering the 1% AEP defended scenario with an allowance for climate change **Annex 3-3 Figure 22-A3-5** the probability of flooding to the Coventry Canal, Oxford Canal and Grand Union Canal for most of the Proposed Development remains the same with only an increase in probability of flooding shown along Coventry Canal adjacent to Judkins Quarry associated with watercourse A-WS47 (**Annex 3-3 Figure 22-A3-5 Sheet B**). Where flooding from ordinary watercourses is shown to enter the canal within the FMfP, it is likely the frequency and volume entering the canal will increase as a result of climate change however it is expected that levels will continue to be managed.

4.3.15 Based on the above the permanent Proposed Development is considered to be at **Low** risk of flooding from fluvial sources. It is recommended that detailed Environment Agency model data is obtained and analysed for all major rivers within close proximity to the Proposed Development for the final FRA prior to the DCO submission.

Development Impact on Fluvial Flood Risk

4.3.16 Where bank raising works are taking place and fluvial flows are shown to be conveyed into the canal, bank raising works may alter flood conveyance routes and/or reduce floodplain storage volumes within the defended 1% AEP plus climate change event. The risk of flooding would need to be quantified through further analysis in these locations. Bank modification works near Bar Pool Brook could have an impact on conveyance mechanisms and possibly increase water levels upstream. It is recommended that further analysis of the River Anker Environment Agency flood model (if available) is undertaken within the full FRA to ascertain probability of flooding and potential impact on raising of banks in these locations. Any increases in flood risk will be mitigated as part of the proposed development.

4.3.17 Where bypass pipes, both pumped and gravity fed and the Atherstone Outfall Structure, are proposed, the impact of them on fluvial flood risk is considered negligible due to them been buried below ground and outside the 0.1% AEP extent when considering climate change. The location of the pumping station control buildings is not currently known, however where possible these will be located outside of the 1% and 0.1% AEP flood extents as to not impact on floodplain storage. If there is a need to locate them in the 1% plus climate change extent then adequate floodplain compensation will need to be provided to mitigate any potential impacts.

4.3.18 Considering the above, the risk of flooding as a result of the Proposed Development is considered **Low** except for where bank raising works have the potential to impact flood levels where floodplain storage / conveyance is lost which would be considered **Medium.** It must be noted that the scale of bank modification and raising required has not yet been determined and will be finalised once hydraulic modelling of the canal network has been finalised. This modelling will also identify the impact of any increased water levels as a result of the Proposed Development. The assessment will be refined within the final FRA for DCO submission.

4.3.19 Further assessment will be required in the final FRA with respect to the Proposed Development, including the location of the pumping station control buildings against any Environment Agency flood extent or model data that has not been obtained as part of this assessment. The FRA will be updated in line with final modelled canal results and any design amendments that may take place prior to the DCO submission.

Surface Water Flood Risk

Existing Surface Water Flood Risk

4.3.20 The Environment Agency LTFRM (Ref. 13) and as shown on **Annex 3-2 Figure 22-A3-2** indicate that the majority of the permanent works (**PEI Report Volume 3 Figure 3-P2&3-1)** along the canal are at low or very low risk of surface water flooding. It also shows that the canal is at risk of surface water flooding in numerous locations however, it does not fully account for the canal operational controls (sluices, pumps, overflow weirs), maintenance practices or misrepresentation of structures such as culverts, spillways and bypass channels in the modelling. As such the mapping can overestimate flood extent and depth within areas.

4.3.21 National scale modelling such as the surface water mapping required the adoption of a number of high-level assumptions and therefore may not be representative of flood risk at a local scale. Where surface water flood extents largely align with the fluvial flood extents In these instances, and the surface water flood maps show flooding along and within a defined channel, fluvial flooding is likely the dominant mechanism at these locations.

4.3.22 Several elements of the Proposed Development, both temporary and permanent are shown to be at risk of surface water flooding, these include:

Coventry Canal

a. Bank modification works across A-WS4 and the access from Manor Road (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet A**) is located in areas deemed to have a high (>3.33% AEP) and low (0.1% AEP - 1% AEP) chance of surface water flooding (**Annex 3-2 Figure 22-A3-2, Sheet A**). Due to similar modelling techniques these extents are very similar to the defined Flood Zones on the FMfP as such these are likely more representative of fluvial extents and have been assessed as fluvial;

b. Construction areas and the compound at Quarry Lane Weirs (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet B**) are shown to fall within areas deemed to have a high chance (>3.33% AEP) of surface water flooding. As shown in **Annex 3-2 Figure 22-A3-2, Sheet A**, flooding north of the canal is largely constrained to watercourse A-WS12 and therefore more representative of fluvial flooding. Surface water flooding south of the canal largely aligns with Flood Zone mapping and therefore has been assessed as fluvial risk; and

c. Access from the B4114 as shown in **Figure 3-P2&3-1** in PEI Report **Volume 3**, intersects areas deemed to have a low chance (0.1% AEP – 1% AEP) of surface water flooding (as shown in **Figure 22-A3-2** in **Annex 3-2, Sheet B**).

Oxford Canal

a. Coventry substation compound & access (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet G**): Located in an area shown to have a high chance (>3.33% AEP) of surface water flooding; same for the access road from Parrotts Grove to Hawkesbury Junction (as shown in **Annex 3-2 Figure 22-A3-2, Sheet D**). There is a medium chance (1% AEP - 3.33% AEP) of depths reaching up to 0.9 m and 0.6 m on the access road and compound respectively;

b. Bank raising works near Coventry Cruising Club (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet H**): High chance (>3.33% AEP) of surface water flooding affecting the bank, temporary parking and access. Likely a combination of surface water risk and fluvial risk from S-BW14 (as shown in **Annex 3-2 Figure 22-A3-2, Sheet D**). There is a high chance (>3.33% AEP) for depths to reach up to 0.3 m within a small central area of the temporary parking area;

c. Noonhill Farm area (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet J**): bank modification works have a high chance (>3.33% AEP) of surface water flooding west of the M69; likely linked to W-SS19 and W-SS18 (as

shown in **Annex 3-2 Figure 22-A3-2, Sheet E**). This is likely a combination of both fluvial and surface water flooding. Flood depths are shown to have a low chance (0.1% AEP – 1% AEP) of reaching 0.2 m;

d. Flooding at Brinklaw Marina (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet Q**): The canal and bank raising works are shown to have a high chance (>3.33% AEP) of flooding with flows shown to pass over the canal (**Annex 3-2 Figure 22-A3-2, Sheet G**). LiDAR indicates the canal is raised at this location which may in fact limit surface water impacts. Watercourse A-CS9 is also culverted under the canal, and it is possible this is misrepresented in the national surface water modelling which could suggest flood extents are exaggerated;

e. Harborough Magna STW compound (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet R**): High chance (>3.33% AEP) of surface water flooding (**Annex 3-2 Figure 22-A3-2, Sheet H**). Depths have a medium chance (1% AEP - 3.33% AEP) of reaching up to 0.3 m adjacent to watercourse A-CS23;

f. Weir 3 and Brownsover and Cosford Flood Paddle Wier Works compound and access as shown in **Figure 3-P2&3-1, in PEI Report Volume 3, Sheet S**. The compound and access road has a High (>3.33% AEP) and medium (1% AEP - 3.33% AEP) chance of surface water flooding (**Figure 22-A3-2 Sheet H** in **Annex 3-2,**). There is a and medium chance (1% AEP - 3.33% AEP) of depths within the compound reaching 0.6 m along the bank of the canal and a low chance (0.1% AEP – 1% AEP) of depth searching up to 0.2 m along the access road;

g. Watercourses R-SL32 and R-SL33: Large surface water flow path has a high chance (>3.33% AEP) of impacting the canal (**Annex 3-2 Figure 22-A3-2, Sheet I**). R-SL32 Culvert underneath canal likely to be misrepresented in national modelling which could suggest flood extents are exaggerated;

h. Dunchurch Pools Marina: Significant amount of flooding shown south of the marina to enter the canal. Likely more representative of fluvial flooding associated with the convergence of watercourses R-SL7 and R-SL21. Culverted under the canal which is unlikely to be represented which could exaggerate extents shown;

i. Watercourse L-SR56: Large surface water flow path has a high chance (>3.33% AEP) of impacting the canal;

j. Watercourse L-SR2: Large surface water flow path has a high chance (>3.33% AEP) of impacting the canal. Culvert underneath canal likely to be misrepresented in national modelling which could suggest flood extents are exaggerated; and

k. Watercourse L-SR11: Major surface water flow path has a high chance (>3.33% AEP) of impacting the canal. Potential to introduce large flows given canal is not raised. Extent likely a combination of surface water and fluvial flooding.

Grand Union Canal

a. Broughton Marina (PEI Report **Volume 3 Figure 3-P2&3-1, Sheet U**): Significant surface water flooding shown to have a high chance (>3.33% AEP) of impacting the canal (**Annex 3-2 Figure 22-A3-2, Sheet J**) with LiDAR indicating a fall in gradient toward canal; overtopping is the likely mechanism. However, water levels in the marina are likely to be controlled by canal level;

b. Long Buckby Lock 7 gravity bypass pipeline and associated access (**Figure 3-P2&3-1** in PEI Report **Volume 3, Sheet Z**): The pipeline and access road from the A5 (Watling Street) intersect an area deemed to have a high chance (>3.33% AEP) of surface water flooding (**Figure 22-A3-2** in **Annex 3-2 Sheet L**). Depths across the proposed pipeline have a high chance (>3.33% AEP) of reaching 0.6 m in depth whereas there is a medium chance (1% AEP - 3.33% AEP) of depths reaching 0.3 m across a small area if the access road;

c. Weier 3 Compound and construction area adjacent to Heyford Lane (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet AF**): Located on a flow path which has a high chance (>3.33% AEP) of materialising and connecting to River Nene floodplain (**Annex 3-2 Figure 22-A3-2, Sheet M**). Land falls towards the River Nene with LiDAR highlighting a low point in the canal embankment aligning with the location of the flow path. Whilst there is a high chance (>3.33% AEP) of the flow path materialising there is only a low chance (0.1% AEP – 1% AEP) of depths reaching 0.2 m;

d. Stoke Bruerne Locks bypass pipe, compound and access (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet AH**): Shown to intersect areas deemed to have a high chance (>3.33% AEP) of surface water flooding, in particular compounds and pipeline locations. The intake structure construction area is shown to have a medium chance (1% AEP - 3.33% AEP) of flooding. Access from Shutlanger Road intersects an area that has a Low chance (0.1% AEP – 1% AEP) of flooding (**Annex 3-2 Figure 22-A3-2, Sheet O**). Depths generally have a low chance (0.1% AEP – 1% AEP) of reaching 0.2 m except for the compound bordering Northampton Road which has a high chance (>3.33% AEP) of reaching depth of 0.3 m to the south adjacent to Northampton Road;

e. Construction area adjacent to St Andrews Church, Great Linford (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet AM**): Localised high chance

(>3.33% AEP) of surface water flooding (**Annex 3-2 Figure 22-A3-2, Sheet Q**). There is a low chance (0.1% AEP – 1% AEP) of depths reaching up to 0.2 m;

f. Fenny Stratford construction area, access and pipeline (**PEI Report Volume 3 Figure 3-P2&3-1, Sheet AO**): Construction areas and access road intersect an area deemed to have a High chance (>3.33% AEP) of surface water flooding (**Annex 3-2 Figure 22-A3-2, Sheet S**). There is a high chance (>3.33% AEP) that depths can reach up to 0.3 m; and

g. The canal is shown to overtop in a 1% AEP event, impacting residential properties within Blisworth. Although the national modelling does not consider they hydraulic functions of canals and therefore the risk may be exaggerated it does highlight a possible low point in the canal bank.

4.3.23 When considering climate change, the LTFRM (Ref. 13) highlights that surface water flood extents and depths increase slightly across Part 2 as shown in **Annex 3-3 Figure 22-A3-5**. No new permanent elements of the Proposed Development are shown to be at risk in a future scenario.

4.3.24 Considering the above, the risk of flooding to the majority of the Proposed Development is considered **Low**. However, where bypass pipes and construction areas are proposed to intersect areas that have a high chance of flooding and the canal is shown to receive flow from nearby watercourses, the risk is considered **High**.

Development Impact on Surface Water Flood Risk

4.3.25 The Proposed Development will lead to an increase in hardstanding areas through the construction of the Atherstone outfall structure and pumped and gravity fed bypasses. This will include pump station control buildings and associated car parking as part of the development. As result, the rate of surface water runoff generated would increase without mitigation. To manage this, a drainage strategy will be developed as part of the DCO submission, and surface water will be adequately attenuated and discharged following the drainage hierarchy at agreeable rates using above ground SuDS where feasible.

4.3.26 Provided that the drainage strategy is sufficiently designed and implemented to manage post-development surface water runoff, the development across Part 2 will not result in a material change to surface water flood risk. The risk to surface water flooding from the development across Part 2 is therefore considered **Low**.

4.3.27 It should be noted that any above ground SuDS features proposed will likely provide a dual function and will provide some surface water quality benefits alongside providing an increase in habitat availability.

Groundwater Flood Risk

Existing Groundwater Flood Risk

4.3.28 Defra's Magic Map (Ref. 14) highlights the complex nature of the geological stratum across Part 2, also shown in **Figure 14-PD-2** in PEI Report **Volume 3**. **Appendix 14-PD-3** in PEI Report **Volume 4** provides further detail of the superficial deposit and bedrock types which underlay part 2 and their associated aquifer designation.

4.3.29 For parts of the Proposed Development that are to be fully or partially situated below ground (bypass pipes, pumping stations, Atherstone outfall structure) it is not possible to accurately ascertain groundwater levels in the absence of site-specific GI data. Additionally, borehole data within BGS is limited in these locations, however as shown in **Table 4-5**, some groundwater information was available in areas within close proximity to the Proposed Development, specifically at Hawkesbury Junction, Fenny Stratford Transfer lock and Dodford Road Transfer Lock. Groundwater data at Atherstone Outfall Structure and the remaining bypasses and transfer locks is not available. As such a conservative approach has been undertaken and groundwater levels are assumed to be close to the surface within Part 2.

Table 4-5: BGS Borehole Records (Part 2)

Name	Borehole ID	Borehole Depth (mbgl)	Coordinates	Groundwater strike (mbgl)
Hawkesbury Junction	SP38SE966	36.5	436290, 284630	9.5
Fenny Stratford Transfer Lock	SP83SE429	5.25	488402, 234376	3
Dodford Road Transfer Lock	SP66SW48	9.2	462550, 260710	7.6

4.3.30 The SFRA's (Ref. 18, Ref. 20, Ref. 21, Ref. 22, Ref. 24) for the relevant councils indicate that the susceptibility of groundwater flooding across the Proposed Development is generally low. Elevated risk is noted near main rivers where groundwater may be hydraulically connected. Coventry City mostly falls within low-susceptibility categories (<25% and 25–50%), though data for the Proposed Development is unclear. In Nuneaton, groundwater levels near the Coventry Canal range from 0.5 mbgl to 0.025 mbgl, while Bedworth shows no risk. West Northamptonshire identifies negligible risk for the Oxford Canal and Grand Union Canal , except near watercourses at Stoke Bruerne. Similarly, Milton Keynes reports low risk for most of the

Grand Union Canal, with some areas having shallow groundwater between 5 mbgl and 0.025 mbgl.

4.3.31 A groundwater study (Ref. 23) was undertaken across Northamptonshire in 2016 which highlights a number of flood incidents were reported to have occurred across the region. However, none were shown to be within the vicinity of the Proposed Development.

4.3.32 BGS's Susceptibility to Groundwater flooding map (see **Annex 3-5 Figure 22-A3-11**) shows that the majority of the proposed working areas have a limited potential of groundwater flooding to occur. Only areas at Braunston, the Stoke Bruerne Lock flight, Leighton and the Whilton Marina area have potential for groundwater flooding to occur at surface level.

4.3.33 The Atherstone Outfall Structure will have a basement depth of approximately 5 mbgl. Similarly, pumping station wet wells will have a maximum depth of approximately 5 mbgl. Both pumped and gravity bypass pipelines will largely be located within open space adjacent to the canal. Information of pipe diameters and depths will be confirmed within the final FRA for DCO submission.

4.3.34 The majority of works associated with the Proposed Development occur above ground however by assuming groundwater could be close to the surface in the absence of detailed GI, flooding at the surface could occur and as such a conservative risk rating of **Medium** should be given. Where below ground works are proposed such as the proposed pipeline bypasses, Atherstone Outfall Structure and pumping stations, groundwater interaction is likely. A conservative approach to groundwater flood risk has therefore been taken with the risk considered to be **Medium.**

Development Impact on Groundwater Flood Risk

The scale of below ground works with respect to the lateral extent of aquifers is very small and is unlikely to have any impact on local groundwater regimes. Therefore, any local increases in groundwater are unlikely to affect vulnerable receptors.

Permanently increasing the level of water throughout the canal could increase the risk of groundwater flooding to receptors localised to the canal corridor through additional leakage. Identification of leakages within the canal network should be undertaken with data be used within the final FRA at DCO submission

Based on this, the groundwater flood risk from the proposed Development is considered to be **Low**.

Flood Risk from Sewer and Water Supply Infrastructure

Existing Sewer and Water Supply Flood Risk

4.3.35 Sewer flooding is identified as a significant local flood risk across multiple areas, primarily linked to surface water sewer capacity issues. In West Northamptonshire, Anglian Water's DG5 data records 419 incidents, with most in Northampton, followed by South Northamptonshire and Daventry (Ref. 20). In Nuneaton and Bedworth (Ref. 21), Severn Trent Water reported 101 incidents, concentrated in CV10 and CV12 postcodes covering northern Nuneaton and Bedworth. Coventry (Ref. 22) experienced sewer flooding at 61 properties up to the year 2015, with hotspots in Canley, Wyken Green, Coundon, and Holbrooks, none of which are near the Coventry Canal. Milton Keynes (Ref. 24) shows the highest occurrence, with Anglian Water recording 2,342 incidents, mainly in the southern urban area and smaller clusters in Castlethorpe, Hanslope, and Olney. While the Grand Union Canal runs west of Castlethorpe, there is no evidence that sewer flooding has directly impacted the canal.

4.3.36 No specific sewer data has been obtained to inform locations of nearby sewers however it is very likely that given some of the urban setting of Part 2, sewers will be located within close proximity to elements of the Proposed Development. Overall, the risk of sewer flooding is considered **Low**, however prior to any excavation works a buried services search will be undertaken prior to construction to identify any water supply and sewer infrastructure.

Development impact on Sewer and Water Supply Infrastructure

4.3.37 The Proposed Development will not alter water supply infrastructure and will not result in any increase in flow to the sewer system. Therefore, the potential of the Proposed Development to increase the risk of flooding from sewer and water supply infrastructure elsewhere is considered to be **Negligible**.

Flood Risk from Artificial Sources

Existing Risk from Artificial Sources to the Development

4.3.38 The Proposed Development largely falls outside both dry-day and wet-day reservoir breach scenarios, but several localised risks remain. The Coventry Canal is at risk in a dry-day event from Oldbury No.1 and No.2 reservoirs, affecting bank raising works and associated compounds near Atherstone Road, while adjacent bank modification works at Bar Pool Brook also fall within this extent. Sesswood Pool poses both dry-day and wet-day risk, though no proposed works are impacted.

4.3.39 Neasby, Stanford, Sulby, Wellford and Drift III Lilibourne Meadows Main reservoirs, during both the dry-day and wet-day breach scenarios, are

conveyed via the River Avon and River Swift, the extents border the Oxford Canal near Rugby, but the canal is raised in the location and is conveyed by the Rugby Aqueduct and is not at risk.

4.3.40 Hillmorton pumping station and a number of temporary works fall within the wet-day extent of Stanford Reservoir, while bypass pipes at Whilton Marina are at risk in both scenarios from Daventry Reservoir. Although Daventry Reservoir's extents border the Grand Union Canal at Weedon Bec, the canal is elevated and not at risk of flooding. Towcester flood storage reservoir affects River Tove Gravity Bypass works in a wet-day scenario. Additional wet-day risks include the Iron Trunk Aqueduct compound from Foxcote Reservoir and Brick Kiln Lake, and bank raising works near Grafton Street from Bradwell Lake.

4.3.41 These reservoirs are well maintained therefore the risk of breach is low, and the risk of reservoir flooding to the Proposed Development is considered **Low**.

4.3.42 There is no evidence of historic canal flooding across Part 2 however five temporary crossings are proposed over the canals (two over Coventry Canal, two over Oxford Canal and one over Grand Union Canal). The levels within the Coventry Canal, Oxford Canal and the Grand Union Canal are all actively maintained, therefore it is very unlikely that a flood event would occur that would impact the Proposed Development. Works that are taking place along the canal banks (bank raising works and intake and discharge areas) are at an increased risk of breach during construction as such the risk of canal flooding to the Proposed Development is considered to be **Medium**.

Development Impact on Flood Risk from Artificial Sources

4.3.43 The proposed works are not located within close proximity to nearby reservoirs and the permanent works within the reservoir flood extents are either buried or small in comparison to the flood extent, therefore the Proposed Development impact on reservoir flooding is considered to be **Low**.

4.3.44 Construction activities undertaken along the canal banks, including the operation or positioning of heavy machinery, have the potential to increase the risk of breach or structural failure of the canal. Canals rely on stable embankments, weirs and control structures to maintain safe water levels. Overtopping or failure can occur where embankments are weakened, loads increase, or obstructions affect water management. Any additional pressure, vibration, or disturbance to the canal bank can therefore increase the likelihood overtopping or failure, particularly in locations where the bank forms the lowest containment point for the canal pound. Although construction works along the canal bank have the potential to increase the risk of canal overtopping or breach, these construction phase risks will be

managed through the CEMP and therefore the probability of occurrence is considered low.

4.3.45 The proposed AWTP works will be able discharge up to 115 ML/d into the Coventry Canal at Atherstone. This could put additional strain on the canal network increasing the risk of breaches and failure. This risk will be managed by the following:

a. Water levels within the canal will be actively managed to ensure the watercourse remains navigable. The Canal and River Trust manage levels in ways that can increase and decrease the water level depending on the need. The flow requirement (i.e. total amount of water transferred) will vary over the year with it tending to run at lower rates during the October to April period, then ramping up to higher flows over the summer. As such the additional flows into the canal, are unlikely to have an adverse impact on flood risk;

b. Where existing locks would not be able to pass the maximum transfer flows, gravity and pumped bypasses (Hawkesbury, Hillmorton, Hawkesbury and Fenny Stratford and Braunston) will be constructed;

c. Raising sections of canal bank levels to maintain a minimum freeboard (vertical distance from the top of the canal bank to the water surface) required to accommodate the increase in water level within the canals. The scale of bank raising will be determined through additional canal modelling which is not currently available at the time of writing. The final outputs of the modelling and specific location of any raising will be available for the DCO submission and will be used to inform the final FRA; and

d. Construction of up to three transfer locks to limit the extent of bank raising required and one to mitigate the impact on the Iron Trunk aqueduct which is a scheduled monument. A transfer lock is designed to provide a small change in water levels from the upstream to the downstream side. This effectively breaks up the hydraulic gradient across a long pound (A pound refers to the length of water in between two locks) during high flows and significantly reduces bank raising requirements in the upstream end of the pound.

4.3.46 When the Proposed Development is in operation, the canal water levels will rise, and adjustments will be needed to existing bypass weirs and waste weirs to avoid an increase in discharge from the canal network which could potentially increase the risk to nearby receptors. Measures to bypass weirs and waste weirs to ensure there is no impact as a result of water level increases are being refined and will be reflected in the final FRA for DCO submission. Modelling at Gate 3, as specified within the Detailed Feasibility and Concept Design (Ref. 25), identified 19 weirs where more substantial

works are required. These largely fall within Coventry Canal and Oxford Canal. Substantial works in these cases are considered whereby height increases of 100 mm or greater are required. Where a weir has heritage value and alterations to the weir itself is not possible alternative design options are being considered and will be reflected in the final FRA prior to DCO submission.

4.3.47 The magnitude of water level change and invert levels of existing outfalls are not yet known. However, increased water levels could reduce outfall efficiency and increase submergence and backflow risk to third-party drainage. To manage this risk and try to mitigate increases in flood risk, the following design principles should be adopted:

a. Provide backflow protection (e.g., non-return valves) to any affected outfalls;

b. Provide local raising of outfall headwalls/inverts or pumped discharge where gravity performance cannot be maintained; and

c. Implement monitoring and adaptive management during commissioning and early operation.

4.3.48 Additional detail regarding the waste weir and bypass measures stated above can be found in **Volume 2 Chapter 3 - The Proposed Development.** Considering the above design considerations, if constructed as per above the risk of the Proposed Development impacting canal flooding is considered **Low**.

4.4 Part 3: Daventry and Drayton Reservoirs

Historic Flood Events

4.4.1 The Environment Agency historic flood map (Ref. 9) indicates that no historic flood events have previously impacted the Proposed Development area.

4.4.2 The West Northamptonshire SFRA (Ref. 26) highlights that the Daventry District has experienced significant flooding over the years, primarily from fluvial and surface water sources. Major events include the widespread River Nene flooding in March 1947, severe rainfall and river channel exceedance during Easter 1998, and intense rainfall causing surface water flooding in June 2007. More recent incidents occurred in November 2012, when up to 40 mm of rain caused widespread flooding, and in March 2016, when surface water flooding led to over 200 reported incidents countywide. These events highlight the district’s vulnerability to both river and drainage-related flooding, particularly in areas with ordinary watercourses and limited drainage capacity.

4.4.3 Northamptonshire SFRA indicates sewer flooding in Daventry is primarily linked to surface water sewer capacity issues. Anglian Water’s DG5 records

show 68 incidents in the district, comprising 10 internal and 58 external property floods. It is not clear within the SFRA where these events took place.

Fluvial Flood Risk

Fluvial Flood Risk to the Development

4.4.4 When consulting the FMfP (Ref. 7) and as shown in **Annex 3-2 Figure 22-A3-2, Sheet K** it highlights that the majority of the Proposed development is situated with Flood Zone 1 and is not at risk of flooding. Only two construction areas which are accessed from Welton Road fall slightly within Flood Zone 2 associated with Welton Arm. Flood Zones 2 and 3 associated with the Welton Arm cover areas of the Daventry Reservoir and the canal.

4.4.5 The Environment Agency Spatial Flood Defence dataset (Ref. 12) indicates that no flood defences are located along Welton Arm or any watercourses across the area.

4.4.6 Part 3 of the Proposed Development will require 18 new watercourse crossings, nine of which are associated with pumping station pipes from Braunston Lock and will likely be constructed via trenchless techniques crossing, L-SR20, L-SR33, L-SR36 (two times), WVT4 (three times), WVT33 and WVT34. A further nine will be culverted to facilitate construction areas and compounds specifically impacting the Welton Arm, L-SR20, L-SR36, WVT2, WVT33, WVT41, WVT40, WVT45, WVT44. Where open trench methods are proposed, works within the channel will have a high risk of fluvial flooding.

4.4.7 When considering the future 1% AEP undefended extents with an allowance for climate change, the risk largely remains the same with a greater extent of agricultural land around Welton Arm shown to be at risk.

4.4.8 Overall, the risk of fluvial flooding to the Proposed Development is considered **Low.**

Development Impact on Fluvial Flood Risk

4.4.9 The Proposed Development falls within Flood Zone 1, therefore it will not impact fluvial flood risk. The impact of the Proposed Development on fluvial flooding is considered **Negligible**.

Surface Water Flood Risk

Existing Surface Water Flood Risk

4.4.10 The LTFRM (Ref. 13) and as shown in **Annex 3-2 Figure 22-A3-2, Sheet K** highlights that the majority of the Proposed Development has a very low chance (<0.1% AEP) of surface water flooding.

4.4.11 The Grand Union Canal Braunston Pumping Station intake and discharge, bypass pipework and associated construction area, and access adjacent to Braunston Marina, is located in an area deemed to have a high chance (>3.33% AEP) of surface water flooding and a medium chance (1% AEP - 3.33% AEP) of experiencing depths of up to 60cm. National scale modelling such as the surface water mapping required the adoption of a number of high-level assumptions and therefore may not be representative of flood risk at a local scale.

4.4.12 The remaining bypass pipework to both Drayton and Daventry Reservoirs intersects small areas deemed to have a high (>3.33% AEP) and medium (1% AEP - 3.33% AEP) chance of surface water flooding.

4.4.13 Temporary compound and construction areas located southwest and west of Drayton Reservoir and north of Daventry Reservoir along the Welton Arm watercourse are shown to have high chance (>3.33% AEP) of surface water flooding

4.4.14 When considering climate change the LTFRM (Ref. 13), surface water flood extents and depths increase (as shown in **Annex 3-3 Figure 22-A3-5, Sheet K**). No new permanent elements of the Proposed Development are shown to be at risk.

4.4.15 Considering the above, the risk of surface water flooding to the Proposed Development is considered **High**.

Development Impact on Surface Water Flood Risk

4.4.16 The bypass pipeline associated with Braunston Pumping Station works will be located underground and as such will not have an impact on surface water flooding. However, the works associated with the pumping station will likely result in an increase in hardstanding area. As a result, the rate of surface water runoff generated would increase without mitigation.

4.4.17 To manage this, a Surface Water Drainage Strategy will be developed, and will identify measures that will adequately attenuate and discharge surface water following the drainage hierarchy at agreeable rates utilising above ground SuDS where feasible. This will be evidenced in a Surface Water Drainage Strategy which will be used to inform the full FRA as part of the DCO submission.

4.4.18 Provided that the drainage strategy is sufficiently designed and implemented to manage post-development surface water runoff, Proposed Development will not result in a material change in surface water flood risk. The development impact on surface water flooding is therefore considered **Low**.

4.4.19 It should be noted that any above ground SuDS features proposed will likely provide a dual function and will provide some surface water quality benefits alongside providing an increase in habitat availability.

Groundwater Flood Risk

Existing Groundwater Flood Risk

4.4.20 Hydrogeological information has been obtained from Defra's online Magic Map (Ref. 14), British Geological Society (BGS) mapping (Ref. 15) and Soilscapes mapping (Ref. 16). Drayton Reservoir and its immediate surroundings are underlain superficial deposits classified as a Secondary Undifferentiated Aquifer whereas Daventry Reservoir is partially underlain by a Secondary A aquifer which extends northwards along Welton Arm. Braunston pumping station intake is underlain by a Secondary A aquifer with the associated pipe network underlain by a mixture of Secondary A, Secondary B, Secondary (undifferentiated) and areas where there is no aquifer designation. The bedrock classification underlying the Proposed Development is largely Secondary(undifferentiated), with a small area, where the proposed pipework leading to the discharge works will be located being underlain by a Secondary A aquifer.

4.4.21 BGS online mapping (Ref. 15) as shown in **Figure 14-PD-2** in **PEI Report Volume 3** indicates that large swathes of the Proposed Development are underlain by unclassified superficial deposits whereas Drayton Reservoir and areas surrounding Daventry Reservoir and Welton Arm are underlain by deposits which comprise of sand, gravel, clay and silt. This correlates with online Soilscapes mapping which highlights underlying soil types across the Proposed Development as loamey and clayey. The drainage characteristics of the soil types are shown to impede drainage. The Proposed Development is also underlain by the Charmout Mudstone Formation which includes the area west of Drayton Reservoir, Welton Arm and an area along the canal specifically where the proposed pipework will be located. This bedrock type consists of mudstone, and is known to be relatively impermeable, especially if it has a high clay content. Additionally, the central areas are underlain by the Dyrham Formation which consist of siltstone and mudstone.

4.4.22 BGS mapping highlights that boreholes have been undertaken across the area, many of which do not provide indications of groundwater levels. Three boreholes (as shown in **Table 4-6**) are located close to where proposed below ground works are to take place along the proposed pipeline routes, indicate that no groundwater was encountered up to depths of 8 m towards the pumping station intake, 2.8 m along the pipeline route towards the discharge point and 4.2 m along the pipeline route towards Daventry Reservoir.

Table 4-6: BGS Borehole Records (Part 3)

Borehole ID	Depth (mbgl)	Coordinates	Groundwater strike
SP56NW8	8	454280, 265840	No
SP56NE10	2.8	456810, 265310	`No
SP56SE584	4.2	455939, 264789	No

4.4.23 A groundwater study (Ref. 23) was undertaken across Northamptonshire in 2016 which highlights a number of flood incidents were reported to have occurred across Daventry however none were shown to be within the vicinity of the Proposed Development.

4.4.24 BGS groundwater susceptibility mapping as highlighted in **Figure 22-A3-11** in **Annex 3-5, Sheet K** shows that the majority of the Proposed Development will be located on land which has limited potential for groundwater flooding to occur at the surface. Areas along Welton Arm are shown to have potential for groundwater flooding at the surface. This correlates with the Secondary A classification whereby groundwater movement within the superficial deposits is possible.

4.4.25 The design of the pumped bypass pipelines will largely align with that of Part 1b and Part 2 with the pipes to be located a minimum depth of 1.9 m bgl. (assuming a 700 mm diameter and a 1.2 m depth to the top of the pipe). The existing inlet structure at Daventry Reservoir will be replaced with a new structure and connecting it to an existing large culvert using pre-cast culvert sections.

4.4.26 Due to the potential for groundwater levels to be elevated at times it is likely that groundwater will be struck, as a precautionary measure the risk from groundwater flooding is considered to be **Medium**. It is recommended that a GI is undertaken to ascertain groundwater levels at locations where below ground works are proposed.

Development Impact on Groundwater Flood Risk

4.4.27 Considering the above information, groundwater interaction is possible however, given the majority of the proposed works fall on unproductive aquifers where groundwater movement is restricted, the permanent works are negligible in scale compared to the lateral extent of the Secondary A aquifer and they will have a limited effect on local groundwater flow and levels. The Proposed Development is therefore likely to have a negligible impact on groundwater storage or levels relative to other land users and property and hence changes in groundwater flood risk as a result of the of the Development is considered **Low**.

Flood Risk from Sewer and Water Supply Infrastructure

Existing Sewer and Water Supply Flood Risk

4.4.28 No specific sewer data has been obtained to inform locations of nearby sewers however it is very likely that given some of the urban setting, sewers will be located within close proximity to elements of the Proposed Development especially when crossing highways. Overall, the risk of sewer flooding is considered **Low**, however prior to any excavation works a buried services search will be undertaken prior to construction to identify any water supply and sewer infrastructure.

Development impact on Sewer and Water Supply Infrastructure

The Proposed Development will not alter water supply infrastructure and will not result in any increase in flow to the sewer system. Therefore, the potential of the Proposed Development to increase the risk of flooding from sewer and water supply infrastructure elsewhere is considered to be **Negligible.**

Flood Risk from Artificial Sources

Existing Risk from Artificial Sources to the Development

4.4.29 The Proposed Development includes Daventry and Drayton Reservoirs, for which breach models have been developed by the Environment Agency as part of national scale mapping. Downstream of both Daventry and Drayton reservoirs, the mapping indicates that elements of the Proposed Development, including bypass pipelines, intake and discharge structures and associated temporary working areas (**Figure 3-P2&3-1, Sheets V to Y** in the PEI Report **Volume 3)** would all fall within both the dry-day and wet-day scenarios (as shown in **Annex 3-5 Figure 22-A3-8, Sheet K**). This is shown to slightly impact the Grand Union Canal however the flows are shown to then channel down Welton Arm into Old Mill Race.

4.4.30 The reservoirs which are owned by the Canal and River Trust and are subject to a strict maintenance regime ensuring alignment with the Reservoirs Act 1975 therefore the probability of risk or failure is low. However. given works are taking place around the periphery of the reservoirs the risk of reservoir flooding is therefore considered **Medium**.

4.4.31 Although elements of the Proposed Development will be located along the Grand Union Canal, there is no evidence of historic canal flood risk and given the levels within the Grand Union Canal are actively maintained, it is very unlikely that a flood event would occur impacting the Proposed Development. As such risk from canal flooding is considered **Medium**.

Development Impact on Flood Risk from Artificial Sources

4.4.32 Daventry and Drayton reservoir are currently used to supply water to the canal network ensuring navigation is possible. However, the Proposed Development will also allow utilisation of the reservoirs to ensure water supply within Affinity Waters catchment is maintained during periods when there may be additional water stress. Water resource modelling indicates potential risks to continuous supply from Minworth WwRC during prolonged droughts due to “hands-off flow” requirements in the River Trent, which may halt out-of-catchment transfers to protect river ecology. To mitigate this, Daventry and Drayton Reservoirs will serve as storage, allowing drawdown to support Grand Union Canal transfers during high demand or hands-off flow events, while maintaining navigation supply. A semi-continuous transfer from the canal to the reservoirs will keep them full, enabled by a new pumping station west of Braunston tunnel, feeding two pipelines, one (450 mm) to the reservoirs and one (700 mm) as a bypass. Upgrades will include discharge structures, outlet channels, and monitoring systems for flow, levels, water quality, and invasive species at key intake and outlet points.

4.4.33 The proposed works at Daventry Reservoir include replacing the existing highway drainage inlet structure with a new structure at the same location. Improvements will focus on waste retention and water quality enhancement through SuDS features. The outlet arrangements will remain largely unchanged, but a new discharge will be added to allow for future enhancement reservoir safety and allow controlled drawdown. Conveyance upgrades include raising the existing weir and upstream channel banks using grassed earth embankments to maintain freeboard, and replacing the 800 mm pipe to the canal with a larger culvert to reduce discharge velocity below 0.3 m/s.

4.4.34 The inlet to Drayton Reservoir will be provided via a 450 mm branch from the delivery pipeline, discharging through an existing headwall into a shallow intermediate ponded area before entering the main reservoir. The existing overflow structure will be modified to manage flows from both the Proposed Development and the reservoir; while it normally has sufficient capacity, an additional 350 mm siphon will be installed over the embankment, parallel to the existing 900 mm overflow pipe, to increase outlet flows when required. A new siphon discharge chamber will control flow into the existing culvert, which leads to an open channel and ultimately the Grand Union Canal. Existing pipes and channels from the reservoir to the canal have adequate capacity and will remain in place.

4.4.35 Considering the proposed works outlined above, it is highly unlikely there will be an increase in reservoir and canal flood risk as a result of the Proposed Development, even more so given the required active management of the reservoirs in line with the Reservoirs Act 1975. The risk from the Proposed Development on canal and reservoir flood risk is considered **Low**.

4.5 Part 4a: Abstraction, Treatment and Storage

Historic Flood Events

4.5.1 The Environment Agency historic flood map (Ref. 9) indicates that a flood event in March 1947 impacted areas where proposed temporary works will be located east of the proposed Water Treatment Works and storage site. The cause of the event is not documented however it was probably as a result of the capacity of the River Ouzel being exceeded. No other historic flood events have been recorded.

4.5.2 The Buckinghamshire Council SFRA (Ref. 27) indicates that Buckinghamshire has experienced significant flooding from rivers, groundwater, and surface water, often in combination. Major rivers involved include the Thames, Great Ouse, Thame, Colne, Misbourne, and Wye, with notable events in 1947, 1974, 1990, 2000, 2003, and 2013–2014. Severe multi-source floods occurred during the winters of 2000–2001 and 2013–2014, while July 2007 saw widespread surface water flooding following intense rainfall. More recent incidents in 2020 affected Aylesbury and northern areas after prolonged wet conditions. Historic patterns show vulnerability during saturated ground conditions and high groundwater levels, particularly in chalk aquifer areas.

4.5.3 The Buckinghamshire SFRA highlights that Thames Water and Anglian Water records do not show there to have been historic sewer flooding across the Proposed Development. Groundwater infiltration remains a major issue in Chesham, Hambleden, Little Marlow, Marsh Gibbon, and Princes Risborough. No spatial flood zone mapping exists for sewer flooding, so it is not certain where the risk is greatest.

Fluvial Flood Risk

Fluvial Flood Risk to the Development

4.5.4 When consulting the FMfP (Ref. 7) and as shown in **Annex 3-2 Figure 22-A3-3** it highlights that the majority of the Proposed Development is situated with Flood Zone 1 and is not at risk of flooding. The proposed pump station pipeline feeding into the proposed treatment works will intersect Flood Zone 3 associated with the River Ouzel.

4.5.5 Consulting the Environment Agency Spatial Flood Defence dataset (Ref. 12) indicates that natural high ground runs along the left bank of the River Ouzel however it is shown to only provide a 20% AEP SoP. This aligns with the defended 1% AEP scenario where flood risk extents show very little change from the undefended scenario. No further defences are located across the Proposed Development.

4.5.6 Parts 4a of the Proposed Development will cross one watercourse related to the pumping station pipeline which will be likely to cross the River Ouzel via trenchless techniques.

4.5.7 Watercourse O-uCM119 will be permanently diverted to facilitate both the construction and permanent works associated with Part 4a. The majority of the construction will take place offline and be brought online when needed. Measures outlined in the CEMP will ensure good practice measures are adopted mitigating any risk that arises through construction.

4.5.8 When considering climate change (**Annex 3-3 Figure 22-A3-6**), the future 1% AEP defended extents indicate the risk largely remains the same with a slighter greater flood extent impacting land near the proposed construction areas and compounds adjacent to watercourse O-uCM119.

4.5.9 Overall, the risk of fluvial flooding to the majority of the Proposed Development is considered **Low.**

Development Impact on Fluvial Flood Risk

4.5.10 The Proposed Development largely falls within outside of the 0.1% AEP flood extent when considering climate change however, as a result of the water storage site, watercourse O-uCM119 will need to be diverted. The proposed watercourse diversion will be developed in a manner that aims, as far as reasonably practicable, to ensure that flood risk is not increased. , This will be assessed in the final FRA prior to DCO submission.

4.5.11 Considering the above it is considered that the Proposed Development will have a **Low** impact on flood risk. Further assessment of the impacts of the watercourse diversion and wetland creation will be undertaken to inform the full FRA prior to DCO consent.

Surface Water Flood Risk

4.5.12 The LTFRM (Ref. 13) and **Annex 3-2 Figure 22-A3-3, Sheet A** highlights that within the construction area of Part 4a where the proposed water treatment works and open-air storage is proposed, a large flow path flows west across the construction area towards the River Ouzel before ponding directly south of the A4146. Flood depths across the construction area have a High chance (>3.33% AEP) of reaching up to 20 cm but a Low chance (0.1% AEP – 1% AEP) of reaching 30 cm adjacent to the A4146. This would impact the water treatment works, water storage site, pipeline and associated access arrangements.

4.5.13 When considering climate change the LTFRM, surface water flood extents and depths increase across Part 4b (as shown in **Annex 3-3 Figure 22-A3-6**) however no new elements of the Proposed Development are shown to be at risk.

4.5.14 Considering the above, the risk of flooding to the permanent works is considered **Low**.

Development Impact on Surface Water Flood Risk

4.5.15 The proposed pipeline associated with the pumping station will be located underground and as such will not have an impact on surface water flooding. However, the works associated with the pumping station, water treatment works, open air storage reservoir and access roads will likely result in an increase in hardstanding area.

4.5.16 As a result of the Proposed Development at Part 4a the rate of surface water runoff generated would increase without mitigation. To manage this a drainage strategy will be developed, and surface water will be adequately attenuated and discharged following the drainage hierarchy at greenfield rates utilising above ground SuDS where feasible. This will be evidenced in a detailed drainage strategy which will be used to inform the full FRA and DCO submission.

4.5.17 Provided that the drainage strategy is sufficiently designed and implemented to manage post-development surface water runoff, the development across Part 4a and 4b will not result in a material change surface water flood risk. The risk to surface water flooding from the Proposed Development across Part 4a and 4b is therefore considered **Low**.

4.5.18 It should be noted that any above ground SuDS features proposed will likely provide a dual function and will provide some surface water quality benefits alongside providing an increase in habitat availability.

Groundwater Flood Risk

Existing Groundwater Flood Risk

4.5.19 Defra's Magic Map (Ref. 14) indicates that the superficial deposits underlying Part 4a, near the pumping station works, are classified as Secondary A aquifers. The construction area for the water treatment works spans Secondary A, Secondary B, and unclassified aquifers. The bedrock classification underlying the Part 4a, comprises of an unproductive aquifer.

4.5.20 BGS online mapping indicates that the superficial deposits underlying Part 4a comprises of alluvium and sand, gravel, clay and silt. This correlates with online Soilscapes mapping (Ref. 16) which highlights the drainage of underlying soil types across as being impeded.

4.5.21 The Buckinghamshire Council SFRA (Ref. 27) indicates that high-risk zones align with river valleys where groundwater levels rise close to the surface with mapping shows susceptibility across the Thames Valley, Aylesbury Vale, and Great Ouse valley.

4.5.22 BGS groundwater susceptibility mapping as highlighted in **Annex 3-5 Figure 22-A3-12** shows that the majority of the Proposed Development across Part 4a will be located on land which has "... *potential for groundwater flooding to occur at the surface*". There is potential of groundwater flooding to occur at the surface however these are generally constrained to watercourse channels/corridors.

4.5.23 In the absence of any GI data and BGS borehole data, t has been assumed that due to the close proximity to the Grand Union Canal and River Ouzel, groundwater is assumed to be close to the surface. Given there will be significant below ground works associated with the openair storage and based on the shallow groundwater assumption, groundwater interaction is likely.

4.5.24 Considering the above, the risk of groundwater flooding to Part 4a is considered **Medium**. It is recommended that GI is undertaken to ascertain groundwater levels of which will then be used to update this FRA.

Development Impact on Groundwater Flood Risk

4.5.25 The water storage site will require large amounts of excavation and as such, given the possible interaction with groundwater, will be lined to prevent seepage. This will create an impermeable barrier that could impede subsurface flow regimes and raise groundwater levels locally. Vulnerable receptors within the area are scarce however include minor highways and the Grand Union Canal. The aquifers in this area are largely unproductive therefore the Proposed Development is unlikely to have an impact on groundwater levels. The impact of the water storage site on groundwater flood risk is therefore considered **Low** .

Flood Risk from Sewer and Water Supply Infrastructure

Existing Sewer and Water Supply Flood Risk

4.5.26 Following a review of the available desktop data, no sewer or water supply infrastructure has been identified which highlights a risk to the proposed pipeline. It is likely that sewer infrastructure within urban highways would be present especially if located within urbanised/residential areas.

4.5.27 The risk of sewer infrastructure and water supply flooding to the underground pipeline is considered to be **Low**. Further consultation with relevant water utility providers and a buried services search will be undertaken at detailed design and prior to construction to identify any water supply and sewer infrastructure.

Development impact on Sewer and Water Supply Infrastructure

4.5.28 The Proposed Development at Part 4a may require a foul water connection associated with the office buildings. In the absence of a drainage strategy, it

is assumed that the connection, if required, will be agreed with the relevant utility owner ensuring the receiving system has capacity to receive the flows. this. This will be evidenced in a Surface Water Drainage Strategy which will be used to update this FRA and DCO submission.

4.5.29 The construction of the pipelines across Part 4a and 4b has the potential to cause severance, disturbance, or blockage to any underground field drainage infrastructure that may be present. Although it is not currently clear if any infrastructure is present along the route, it is likely that sub surface drainage is present within most agricultural land. This may increase the risk of flooding to the land itself, and it is not expected that there will be an increase in surface water flood risk to any vulnerable receptors. Preconstruction investigations will be undertaken, where reasonably practicable, to identify the location and condition of sub surface drainage infrastructure within the working areas. Where such infrastructure is encountered during construction, mitigation measures as outlined in the CEMP will be implemented, where required and proportionate, to maintain or reinstate functionality. Reinstatement will aim to achieve a condition broadly comparable to that prior to construction, as far as is reasonably practicable.

4.5.30 Considering the above, the impact on sewer and water supply infrastructure is considered to be **Low**.

Flood Risk from Artificial Sources

Existing Flood Risk from Artificial Sources

4.5.31 Part 4a is not located within areas shown to be at risk from reservoir flooding in both the dry-day or wet-day scenarios therefore the risk of reservoir flooding is considered **Negligible**.

4.5.32 The Grand Union Canal is located to the west of Part 4a and is where the abstraction into the proposed water treatment works will take place. There are no modelled flood extents associated with the Grand Union Canal however its levels are actively managed and maintained by the Canal and Rivers Trust to ensure it remains navigable at all times and as such is very unlikely to overtop and impact Part 4a of the Proposed Development.

4.5.33 Part 4a of the Proposed Development will not be impacted by either reservoirs or canal and therefore risk from these sources is considered Low.

Development Impact on Flood Risk from Artificial Sources

4.5.34 The water storage area will comprise of excavation works to create a raised embankment perimeter which requires embankments up to 8 m in height to ensure a storage capacity of 575,000 m^3 is achieved. Current preliminary designs indicate that some water storage will take place above existing ground level therefore it is currently assumed the water storage area will be considered a large raised reservoir under the Reservoirs Act 1975 Current

preliminary designs indicate that some water storage will take place above existing ground level. ’. This would introduce reservoir flood risk (which is considered residual) to an area and receptors which were not previously at risk.

4.5.35 A proposed overflow weir will discharge excess water into the River Ouzel when levels exceed the crest height. While this will introduce additional flows to the river, it is not expected to significantly affect normal water levels or flood extents. However, during periods when the River Ouzel is already in flood typically, following heavy rainfall, the extra discharge could increase local flood depths however the impact of this is not considered significant. This would need to be confirmed within the full FRA.

4.5.36 Considering the above, the risk from the Proposed Development is considered **Low**. A detailed analysis of the final water storage area design will be undertaken to assess the potential impacts of the proposed water storage area. As the water storage area will likely be classified as a reservoir under relevant legislation (Reservoirs Act 1975), additional design considerations and a comprehensive risk assessment will be carried out. These findings will inform the full FRA and be incorporated into the final ES prior to Development Consent Order submission.

4.5.37 The Proposed Development has limited interaction with the Grand Union Canal other than abstraction works which removes water from the canal. As such the risk from the Proposed Development on canal flood risk is **Low**.

4.6 Part 4b: Pipeline to an Underground Reservoir Near Luton

Historic Flood Events

4.6.1 The Environment Agency historic flood map (Ref. 9) does not highlight that any historic flood event has occurred which has taken place within the Preliminary Order Limits across Part 4b of the Proposed Development.

4.6.2 Part of the pipeline falls within the administrative areas of Milton Keynes Council and Buckinghamshire Council. See sections 4.3 and 4.4 (respectively) for a summary of historic flood risk across these areas.

4.6.3 Central Bedfordshire SFRA (Ref. 28) states the region also has a long history of flooding from rivers, surface water, groundwater, sewers, canals, and reservoirs. Major fluvial events occurred in 1947, 1978, 1987, 1992, 1998, and 2003, mainly along the River Ivel, River Flit, River Ouzel, and Clipstone Brook, affecting towns like Sandy, Biggleswade, Shefford, and Leighton Buzzard. Surface water flooding has been frequent, with severe incidents in 2016, 2023, and record rainfall in September 2024 causing widespread disruption. Sewer flooding has repeatedly impacted urban areas,

while groundwater flooding has been recorded in chalk aquifer zones. Canal overtopping incidents have occurred in Leighton Buzzard.

4.6.4 Limited information is available within the Central Bedfordshire SFRA regarding historic sewer flooding however it does state that occurrences have been concentrated in urban areas like Leighton Buzzard, Ampthill, Flitwick, and Sandy.

Fluvial Flood Risk

Existing Fluvial Flood Risk

4.6.5 The pipeline design was in development at the time of writing therefore as outlined within section 2, a 50 m pipeline corridor through the centre of the Preliminary Order Limits was used as a conservative approach to assessing potential risk to and from the Proposed Development. When consulting the FMfP (Ref. 7) the pipeline will likely intersect Flood Zone 3 associated with Clipstone Brook (**Figure 22-A3-3** in **Annex 3-2, Sheet C**) and Ouzel Brook (**Figure 22-A3-3** in **Annex 3-2, Sheet D**). It has been assumed that temporary works associated with the pipeline such as construction areas, compounds and associated access tracks will be located in Flood Zone 1 and therefore not at risk of flooding.

4.6.6 Consulting the Environment Agency Spatial Flood Defence dataset (Ref. 12) indicates that Part 4b of the Proposed Development does not benefit from formal flood defences located along watercourses.

4.6.7 Part 4b of the Proposed Development will likely cross 18 ordinary watercourses via open trench methods and therefore will have a high probability of experiencing fluvial flooding associated with in channel works.

4.6.8 When considering climate change (**Annex 3-3 Figure 22-A3-6**), the future 1% AEP extents indicate the risk largely remains the same with a slighter greater flood extent impacting surrounding land.

4.6.9 Overall, the risk of fluvial flooding to the majority of the Proposed Development is considered **Low.** There is an increase probability of flooding during construction where open trench methods are proposed however the risk could be managed through utilising flood warnings and by undertaking trenchless crossings and working during summer months where possible.

Development Impact on Fluvial Flood Risk

The Proposed Development largely falls in areas outside the 0.1% AEP plus climate change flood extents and will be buried therefore will not interact with fluvial flood waters. Considering the above it is considered that the Proposed Development will have a **Low** impact on flood risk.

Surface Water Flood Risk

Existing Surface Water Flood Risk

4.6.10 The LTFRM (Ref. 13) and **Annex 3-2 Figure 22-A3-3, Sheets A to G** highlights that the majority of Part 4b has a very low chance (<0.1% AEP) of surface water flooding.

4.6.11 The proposed pipeline across Part 4b will likely intersect a number of localised areas which have a high chance (>3.33% AEP) of surface water flooding, in particular areas adjacent to watercourses CBT4, CBT3 and Ouzel Brook. It is possible that flooding is exaggerated at CBT4 due to a misrepresentation of the culvert underneath the A5, this is a known limitation of the LTFRM national modelling. Land surrounding CBT4 area generally sits at approximately 121 mAOD whereas the A5 has a crest level of approximately 125 mAOD. This may result in the build-up of surface water in this location. Surface water flooding depths around CBT3 are shown to have a low chance (0.1% AEP – 1% AEP) of reaching 20 cm. Whilst depths adjacent to Clipstone Brook have a medium chance (1% AEP - 3.33% AEP) of reaching 30 cm

4.6.12 When considering climate change the LTFRM surface water flood extents and depths increase slightly across Part 4b (as shown in **Annex 3-3 Figure 22-A3-6, Sheets A – G**) however no new elements of the Proposed Development are shown to be at risk.

4.6.13 Considering the above, the risk of flooding to the Proposed Development is considered **Low.**

Development Impact on Surface Water Flood Risk

4.6.14 The pipeline throughout Part 1b will be located underground and as such will not have an impact on surface water flooding. The risk to surface water flooding from the Proposed Development across Part 4b is therefore considered **Low**.

Groundwater Flood Risk

Existing Groundwater Flood Risk

4.6.15 Defra's Magic Map (Ref. 14) indicates that the superficial deposits underlying the pipeline route are predominantly classified as a Secondary (undifferentiated) aquifer from Little Brickhill to Stanbridge. From Stanbridge to just north of Whipsnade, the aquifer type is unclassified, while the remainder of the route is underlain by an unproductive aquifer.

4.6.16 The bedrock classification underlying the Part 4b from Battlesden Park to Honeywick comprises of an unproductive aquifer with the remainder of the

route spanning a principal A aquifer, comprises of an unproductive aquifer. The pipeline route.

4.6.17 BGS online mapping indicates that the superficial deposits underlying Part 4b comprises of alluvium and sand, gravel, clay and silt. This correlates with online Soilscapes mapping (Ref. 16) which highlights the drainage of underlying soil types across as being impeded.

4.6.18 The Buckinghamshire Council SFRA (Ref. 27) indicates that high-risk zones align with river valleys where groundwater levels rise close to the surface with mapping shows susceptibility across the Thames Valley, Aylesbury Vale, and Great Ouse valley.

4.6.19 The Milton Keynes SFRA (Ref. 24) indicates that groundwater levels south of Little Brickhill range from 0.025 m to 5 m bgl therefore indicating the potential for shallow groundwater.

4.6.20 The Central Bedfordshire SFRA (Ref. 28) indicates that groundwater susceptibility is generally low across the area, but pockets of high risk (>50%) occur near Leighton Buzzard, Marston Moretaine, and along Clipstone Brook at Hockliffe. Groundwater is close to the surface around Woburn, parts of Leighton Buzzard, Eaton Bray, and northern Houghton Regis. Any emerging groundwater is likely to follow existing watercourses such as Clipstone Brook, the River Ouzel, and Broughton Brook.

4.6.21 BGS groundwater susceptibility mapping as highlighted in **Annex 3-5 Figure 22-A3-12** shows that the majority of the Proposed Development 4b will largely be located on land which has "*...limited potential for groundwater flooding to occur at the surface"*. There is potential of groundwater flooding to occur at the surface however these are generally constrained to watercourse channels/corridors.

4.6.22 In the absence of any site-specific GI data, BSG borehole data (Ref. 15) has been analysed to ascertain possible groundwater depths across Part 4b of the Proposed Development. Given there will be significant below ground works associated with the openair storage and based on the shallow groundwater assumption, groundwater interaction is likely.

4.6.23 **Table 4-7** data from boreholes selected along the indicative Part 4b pipeline corridor. The data shows that groundwater, where encountered, is deep underground and will not pose a risk to the Proposed Development. This largely aligns with the unproductive nature of the superficial deposit aquifers.

Table 4-7: BGS Borehole Records (Part 4b)

Borehole ID	Depth (mbgl)	Coordinates	Groundwater strike
SP93SW214	3.5	491493, 232070	No
SP93SW284	3	493527, 230202	No
SP92NE8	91	496100, 227908	Yes – 24 mbgl
SP92SE28	10	496220, 223070	No
TL02SW57/B	114.3	500924, 219835	Yes – 36.9 mbgl
TL02SW208	20	504134, 220123	No

4.6.24 Considering the above, the risk of groundwater flooding to the Part 4b is considered **Low**.

Development Impact on Groundwater Flood Risk

4.6.25 Based on the groundwater information provide in **Table 4-7**, the probability of groundwater interaction with the proposed Luton pipeline is low therefore the impacts from this are considered **Low**.

Flood Risk from Sewer and Water Supply Infrastructure

Existing Sewer and Water Supply Flood Risk

4.6.26 Following a review of the available desktop data, no sewer or water supply infrastructure has been identified which highlights a risk to the proposed pipeline. It is likely that sewer infrastructure within urban highways would be present especially if located within urbanised/residential areas.

4.6.27 The risk of sewer infrastructure and water supply flooding to the underground pipeline is considered to be **Low**. Further consultation with relevant water utility providers and a buried services search will be undertaken at detailed design and prior to construction to identify any water supply and sewer infrastructure.

Development impact on Sewer and Water Supply Infrastructure

4.6.28 The Proposed Development will not alter water supply infrastructure and will not result in any increase in flow to the sewer system.

4.6.29 The construction of the pipeline has the potential to cause severance, disturbance, or blockage to any underground field drainage infrastructure that may be present. Although it is not currently clear if any infrastructure is present along the route, it is likely that sub surface drainage is present across some agricultural land. This may increase the risk of flooding locally, specifically to the surrounding land itself, and it is not expected that there will be an increase in surface water flood risk to any vulnerable receptors.

Preconstruction investigations will be undertaken, where reasonably practicable, to identify the location and condition of sub surface drainage infrastructure within the working areas. Where such infrastructure is encountered during construction, mitigation measures as outlined in the CEMP will be implemented, where required and proportionate, to maintain or reinstate functionality. Reinstatement will aim to achieve a condition broadly comparable to that prior to construction, as far as is reasonably practicable.

4.6.30 Considering the above, the impact on sewer and water supply infrastructure is considered to be **Low**.

Flood Risk from Artificial Sources

Existing Flood Risk from Artificial Sources

4.6.31 Part 4b is not at risk of either reservoir or canal flooding. As such the risk of flooding from either reservoirs or canals is considered to be **Low**.

Development Impact on Flood Risk from Artificial Sources

4.6.32 The Proposed Development will not have an impact on reservoir or canal flood risk. Therefore, the risk from the Proposed Development is considered **Low.**

4.7 Construction Effects on Flood Risk

4.7.1 The construction phase of works has the potential to be impacted by and have an effect on flood risk from all sources. The risks discussed in this section are general risks which may be encountered at this site.

4.7.2 The following potential flood risks could be encountered as a result of construction associated with the Proposed Development if good practice and mitigation is not implemented.

a. Works are taking place within Flood Zone 3 (inc. defended) and therefore are potentially at risk of fluvial flooding;

b. Fluvial flooding from ordinary watercourses due to restriction of in channel flow by mud/silt/debris entering the land drainage systems or temporary crossings; and

c. Increase flood risk due to temporary increases in impermeable areas.

4.7.3 Increased risk of canal flood risk due to bank failure / breach through construction works taking place along the banks.

4.7.4 Where flood risk associated with the construction phase is possible, mitigation measures may be required. These are discussed in Section 5.

5. Mitigation and Residual Risk

5.1 Additional Mitigation Measures

Construction Phase

5.1.1 Works are taking place within Environment Agency defined Flood Zones and, in some cases, defended Flood Zone 3, which is shown as an area of high flood risk on the Environment Agency's FMfP mapping service. As such the Construction Environmental Management Plan (CEMP) or similar will set out the emergency procedures related to the potential for extreme rainfall and flooding that will be in place during construction. This will detail the use of flood warning and rainfall event warnings to allow compound areas to be evacuated and material in flood risk areas to be moved where possible.

5.1.2 As defined under the Environmental Permitting (England and Wales) Regulations 2016, a Flood Risk Activity Permit will also be required for construction works that take place within Flood Zone 3. These will need to be acquired prior to construction. Similarly, as defined within Section 23 of the Land Drainage Act 1991 where works are taking place within, over, under or near an ordinary watercourse, relevant ordinary watercourse land Drainage consents will be required from the relevant regulator (i.e. Internal Drainage Board or LLFA). Where permits and/or consents are required these may be incorporated into the DCO where appropriate.

5.1.3 In order to control silt laden runoff from the pipeline routes, works will comply with CIRIA C649 guidance on "Control of water pollution from linear construction projects" (Ref. 30). For the remaining infrastructure, works will comply with CIRIA C532 "Control of Water Pollution from Construction Sites" (Ref. 31). Following these will ensure that the potential washout from the construction works is managed and treated.

5.1.4 The CEMP or similar shall include consideration of site drainage including surface water runoff within a pollution prevention and incident control plan from which it will seek the necessary consents and approvals for disposal of effluents to any watercourse/controlled water.

5.1.5 The measures included within the CEMP will ensure any adverse temporary flood risk impacts will be effectively mitigated.

Operation Phase

5.1.6 Based on the worst-case assumption that the Filters Building (Part 1a) will be located within the River Tame floodplain, the Proposed Development will result in a loss of floodplain storage volume in the design flood event (1% AEP plus climate change event). The total volume lost has not yet been calculated however this will be completed and included in the final FRA. Any storage loss will be compensated for as close to the area of loss as possible

on a level for level and volume for volume basis. Calculations and design will be refined and updated against the River Tame modelling outputs when these are available.

5.1.7 Additional assessments will be required once the locations of the proposed pumping stations are known, if they are located within Flood Zone 3 they could require additional floodplain compensation storage. When this information becomes available it will bel and used to inform the final FRA prior to DCO submission.

5.2 Residual Risks

Break pressure tank outlet blockage and manual shutdown delay

5.2.1 There remains a residual risk that the outlet of the ponds could become partially or fully blocked by debris, sediment, or vegetation during extreme rainfall events or if the length of time before the pumps manually shut down exceeds 30 minutes. Such scenarios could lead to localised flooding upstream and downstream potentially overtopping of adjacent infrastructure. Further assessment of overland flow routes will be undertaken to determine this residual risk and included in the FRA prior to the submission of the DCO.

Canal breach

5.2.2 Despite engineering design and routine inspection, there remains a residual risk that the canal embankment could fail due to unforeseen factors such as extreme rainfall, rapid drawdown, internal erosion, or structural defects. A breach could result in uncontrolled water release, causing severe flooding of adjacent land, damage to infrastructure, and potential safety hazards. Consequences may include threat to life, disruption to operations, environmental harm, and significant remediation costs. While mitigation measures such as regular monitoring, emergency response planning, and maintenance reduce the likelihood, the unpredictable nature of extreme weather and hidden defects means the risk cannot be fully eliminated. **Chapter 17: Major Accidents and Disasters** in PEI Report **Volume 2**, currently scopes out the residual risks outlined above for both the construction and operation phases due to an expected insignificant effect. As such the residual risk of canal breach is considered low. Whilst the construction risk has been scoped out, given the recent major canal collapses that occurred on Llangollen Canal, Whitchurch, Shropshire in December 2025, the risk and impact of collapse will be kept under review whilst considering the impacts of climate change. This will be refined within the final FRA at DCO submission.

Reservoir Breach –Filters Building

5.2.3 There remains a low residual risk that the Filters Building could be impacted in the event of failure or breach of Minworth Curdworth or Bartley reservoir.

Both water bodies are operated by Severn Trent Water and information on the risk, possible depths and maintenance should be obtained and used to inform the final FRA. This data should be used to inform resilience measures and flood warning and evacuation procedures in order to manage the residual risk of reservoir failure.

Drainage Design Event Exceedance

5.2.4 There will be a low residual risk associated with an exceedance of the rainfall design event (i.e. an event greater than the 1% AEP plus climate change), which will inform the drainage strategy design. Therefore, there will be a risk that attenuation features may be overtopped resulting in additional flow routes for surface water. As part of the drainage strategies, exceedance routes will be assessed with any conclusions feeding into the final FRA for the DCO submission.

Water storage site breach

It is currently assumed that some above ground storage of water within Part 4a is required and as such could be classified as a reservoir if it attenuates more than 25,000 m^3 above existing ground levels. Creating a reservoir introduces a residual risk of structural failure or uncontrolled water release due to unforeseen factors such as extreme rainfall or operational errors. A breach could result in catastrophic flooding downstream, endangering lives, damaging critical infrastructure, and causing significant environmental harm. Additional risks include long-term settlement of embankments, seepage through foundations, and overtopping during unprecedented storm events. While mitigation measures such as robust design, monitoring systems, emergency drawdown facilities, and regular inspections reduce the likelihood, these risks cannot be completely eliminated due to natural variability and climate uncertainty.

5.3 Summary and Next Steps

5.3.1 This preliminary FRA has appraised the risk of flooding to and from the Proposed Development, of which has been assigned the flood risk vulnerability category of ‘Essential Infrastructure’ and ‘Water Compatible’ in line with Annex 3 of the NPPF, as it will contain new water treatment infrastructure and use existing water infrastructure to convey clean water. The majority of the Proposed Development is deemed to be at low risk of flooding from all sources, with limited parts of the Proposed Development at high risk of fluvial and surface water flooding. In the absence of detailed GI groundwater has been assumed to be shallow and therefore for below ground elements a conservative risk rating of medium has been applied. Where impacts are likely mitigation measures will be designed and implemented to mitigate impact. The following potential sources of flooding

which could affect the Proposed Development (based on the current Preliminary Order Limits) have been considered and assessed as follows

Part 1a: Minworth AWTP

a. Fluvial: Majority of Proposed Development located within Flood Zone 1 (Low risk), but the access road to the south west intersects the 1% AEP flood extent with depths up to 1.2 m; climate change increases depth to ~1.27 m. Filters Building may reduce floodplain storage (High risk) and require flood mitigation measures. Risk to and from the Proposed Development is considered **High**;

b. Surface Water: localised areas which have a 3.3% AEP of flooding at the south western access road and laydown areas with depths up to 30 cm n places. Risk remains unchanged when considering climate change. Risk to and from the Proposed Development is considered **Low**;

c. Groundwater: Medium risk due to Secondary A aquifer; below-ground works may interact with perched water tables. Risk to and from the Proposed Development is considered **Medium** and **Low** respectively;

d. Sewer: no historic sewer flooding reported. Risk to and from the Proposed Development is considered **Low** and **Negligible** respectively; and

e. Artificial Sources: Low risk; Reservoir breach risk considered to be residual only; canal overtopping unlikely due to active management. Risk to and from the Proposed Development is considered **Low**.

Part 1b: Minworth to Atherstone Pipeline

a. Fluvial: Pipeline mostly in Flood Zone 1; compounds and crossings intersect the 1% and 0.1% AEP flood extents therefore pose High construction risk; depths up to 1 m at CMP-PL-08. Risk to and from the Proposed Development is considered **Low**;

b. Surface Water: Mostly very low risk; compound CMP-PL-10 located within 3.3% AEP flood extent (depths up to 30 cm). Risk to and from the Proposed Development is considered **High**;

c. Groundwater: assumed shallow groundwater poses a Medium risk during construction; pipeline intersects Secondary A aquifer however impact on Groundwater will be Low; GI recommended to determine groundwater levels and conditions. Risk to and from the Proposed Development is considered **Medium** and **Low** respectively;

d. Sewer: limited interaction expected. Risk to and from the Proposed Development is considered **Low**; and

e. Artificial Sources: Reservoir breach extremely unlikely; Coventry Canal actively managed so unlikely to overtop and impact the Proposed Development. Risk to and from the Proposed Development is considered **Low**.

Part 2: Canal Works

a. Fluvial: bank raising may pose Medium risk due to conveyance route impedance and possible floodplain storage loss; several compounds located in the 1% and 0.1% AEP flood extents. Risk to and from the Proposed Development is considered **Low** and **Medium** respectively;

b. Surface Water: Localised high risk at bypass pipes and compounds; climate change slightly increases extents. Risk to and from the Proposed Development is considered **Low**;

c. Groundwater: groundwater interaction possible for deep works near locks; conservative approach assumes groundwater close to surface. Risk to and from the Proposed Development is considered **Medium** and **Low** respectively;

d. Sewer: urban areas may have localised sewer flooding but negligible impact expected. Proposed Development is considered **Low** and **Negligible** respectively; and

e. Artificial Sources: Low risk; canal overtopping unlikely; reservoir breach residual risk only. Risk to and from the Proposed Development is considered **Medium** and **Low** respectively.

Part 3: Daventry & Drayton Reservoirs

a. Fluvial: Low risk as most works fall within Flood Zone 1; minor intersections the 1% and 0.1% AEP flood extents near the ordinary watercourse Welton Arm. Risk to and from the Proposed Development is considered **Low** and **Negligible** respectively;

b. Surface Water: High risk at Braunston Pumping Station (depths up to 60 cm); other areas Low to Medium risk. Risk to and from the Proposed Development is considered **High** and **Low** respectively;

c. Groundwater: Secondary A aquifer present; GI recommended for below ground works. Risk to and from the Proposed Development is considered **Medium** and **Low** respectively;

d. Sewer: Low risk; historic sewer flooding in district but not near site. Risk to and from the Proposed Development is considered **Low** and **Negligible** respectively; and

e. Artificial Sources: Daventry and Drayton reservoirs actively managed in accordance with the Reservoirs Act 1975. Construction works close to the reservoirs. Risk to and from the Proposed Development is considered **Medium** and **Low** respectively.

Part 4a: Abstraction, Treatment and Storage

a. Fluvial: Mostly Flood Zone 1 with only the pipeline intersecting the 1% AEP flood extent associated with the River Ouzel; minor climate-change effects; diversion of one watercourse but no increased risk expected. Risk to and from the Proposed Development is considered **Low**;

b. Surface Water: A shallow flow path affects Part 4a; climate change increases depths slightly; SuDS will control runoff. Risk to and from the Proposed Development is considered **Low**;

c. Groundwater: Some susceptibility due to shallow groundwater near watercourses; excavation may interact but lining limits impacts. Risk to and from the Proposed Development is considered **Low**;

d. Sewer: No significant existing risks; possible disturbance to field drains but mitigated. Risk to and from the Proposed Development is considered **Low**; and

e. Artificial Sources: No current reservoir/canal risk; new storage area introduces minor residual reservoir risk but considered low. Risk to and from the Proposed Development is considered **Low**.

Part 4b: Pipeline to an Underground Reservoir Near Luton

a. Fluvial: Low risk as most of the pipeline in Flood Zone 1. Pipeline crosses intersect the 1% AEP flood extent associated with Ouzel Brook and Clipstone Brook; ~18 watercourse crossings give higher construction stage risk. Climate change adds minor extent;

b. Surface Water: Most of route has very low risk; some localised areas which have a 3.3% AEP if flooding near brooks. Climate change increases depths slightly but adds no new risk. Risk to and from the Proposed development considered **Low**;

c. Groundwater: Aquifers mostly unproductive; shallow groundwater likely near watercourses but borehole data shows groundwater generally deep. Risk to and from the Proposed development considered **Low**;

d. Sewer: No identified infrastructure risk; possible disturbance to field drains but mitigable. Risk to and from the Proposed development considered **Low**; and

e. Artificial Sources: No existing or introduced risk from reservoirs or canals.

Next Steps for the Full FRA

5.3.2 The following actions are required to complete and finalise the flood risk assessment associated with the Proposed Development. These steps will ensure that all relevant hydraulic, surface water, groundwater and residual risks are robustly evaluated in accordance with best practice and regulatory expectations.

Fluvial Flood Risk

5.3.3 Updates to the fluvial flood risk assessment will be made upon receipt of the detailed River Tame hydraulic modelling (Part 1a), EA product data (Part 2), the bank raising and pumping station design information (Part 2) and design information (part 4b). Particular attention will be given to the influence on conveyance, and flood storage capacity including revising flood extents, depths, velocities across Part 1a, 2 and 4a to ensure consistency with the most up to date datasets.

a. **Flood Resilient Design** - The vulnerable equipment of the Proposed Development will either be located outside an area at risk of flooding or where this is not possible raised above the modelled design flood level (1% AEP plus an allowance for climate change) where relevant. For Part 1a this will be determined once hydraulic modelling has been finalised; and

b. **Compensatory storage** - for the requirement for compensatory storage for Part 1a will be determined by updated hydraulic modelling. Additional modelling will evidence that the mitigation measure ensures there is no increase in flood risk elsewhere. If additional infrastructure such as proposed pumping stations are to be located within a Flood Zone, compensatory storage will be provided to ensure there is no increase in flood risk elsewhere. Bank raising works and potential impact of this on floodplain connectivity will be assessed in further detail within the final FRA when designs and canal modelling has been developed further.

Surface Water Flood Risk

5.3.4 The assessment of surface water flood risk will be refined once the Surface Water Drainage Strategy becomes available. This will involve determining runoff rates, attenuation requirements, exceedance routing and the performance of proposed SuDS features**.**

5.3.5 Sustainable Drainage – Where an increase in hardstanding is proposed this will be designed in accordance with both national and local policies for the relevant region. This will accommodate the 1% AEP event plus an allowance for climate change (varies by management catchment) and discharge at

greenfield rates using SuDS and where feasible, above ground SuDS will be used.

Risk from Artificial Sources

5.3.6 Finalise the assessment of the impact of water level increases within the canal network on surface water outfalls and connecting watercourses. This will include quantifying downstream hydraulic effects and determining whether additional attenuation or operational controls are required.

5.3.7 Assess the potential impact of elevated canal water levels on existing surface water outfalls, including the risk of backflow, reduced discharge efficiency or the need for non-return arrangements.

5.3.8 A detailed residual risk assessment for the water storage site, including breach, overtopping, operational failure and emergency response considerations, will be undertaken to understand worst case impacts.

a. **Reservoir Breach Preparedness** - Although the risk of reservoir flooding is extremely low, it may be prudent to account for the residual risk by contacting the reservoir owner for key information (e.g., characteristics, discharge rates, maintenance regime), consulting relevant authorities on emergency planning, and applying the sequential approach to Site layout particularly for Part 1a. For developments within breach extent areas, flood depths and velocities, should be considered; and

b. **Flood Warning and Evacuation Plan** - It is recommended that flood warnings are signed up to, a safe access/egress route should be identified, and a Flood Evacuation Plan would also likely be required, identifying an area of safe refuge to allow for the safety of workers who may be present on the Site in the event of flood defence failure. This should be discussed with the Local Authority emergency planners.

Additional recommendations

5.3.9 Prior to the commencement of any construction works, all necessary Land Drainage Consents and Flood Risk Activity Permits will be obtained from the relevant regulatory authorities, including the Environment Agency and LLFAs. Where appropriate they will be incorporated into the DCO for the Proposed Development. These consents will cover activities such as:

a. Works within or adjacent to main rivers and ordinary watercourses;

b. Temporary or permanent culverting and watercourse crossings;

c. Floodplain compensation and excavation works; and

d. Discharge of surface water to watercourses.

5.3.10 The project team will engage early with regulators to ensure compliance with statutory requirements and to incorporate any conditions into the Construction Environmental Management Plan (CEMP). No works affecting watercourses or flood risk management assets will proceed without the appropriate permits in place.

5.4 References

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Ref. 14 Department of Food and Rural Affairs, Multi Agency Geographic Information for the Countryside (MAGIC). Available at: https://magic.defra.gov.uk/MagicMap.html [Accessed 01/12/2025].

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Ref. 16 Cranfield Soilscapes Mapping. Available at: https://www.landis.org.uk/soilscapes/ [Accessed 01/12/2025].

Ref. 17 Jacobs (2025), Minworth SRO AWTP and Pipeline Flood Risk Assessment Mar 2025 (Document number: A7W13155-DV-REP-10034 FRA).

Ref. 18 URS (2013) Stratford-on-Avon DC, Warwickshire CC, North Warwickshire BC & Rugby BC Level 1 SFRA Report Final Report.

Ref. 19 Royal Haskoning (2011) Warwickshire Preliminary Flood Risk Assessment.

Ref. 20 Northamptonshire County Council (2017) West Northamptonshire Level 1 Strategic Flood Risk Assessment.

Ref. 21 JBA (2023) Nuneaton and Bedworth Borough Level 1 Strategic Flood Risk Assessment.

Ref. 22 JBA (2022) Coventry City Council Level 1 Strategic Flood Risk Assessment.

Ref. 23 ESI (2016) Northamptonshire Groundwater Flood Risk Study.

Ref. 24 JBA (2024) Milton Keynes City Council – Level 1 Strategic Flood Risk Assessment

Ref. 25 WSP (2025), Grand Union Canal Strategic Resource Option: Detailed Feasibility and Concept Design, Annex A1 – Engineering

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Annex 3-1: Project Wide Topography

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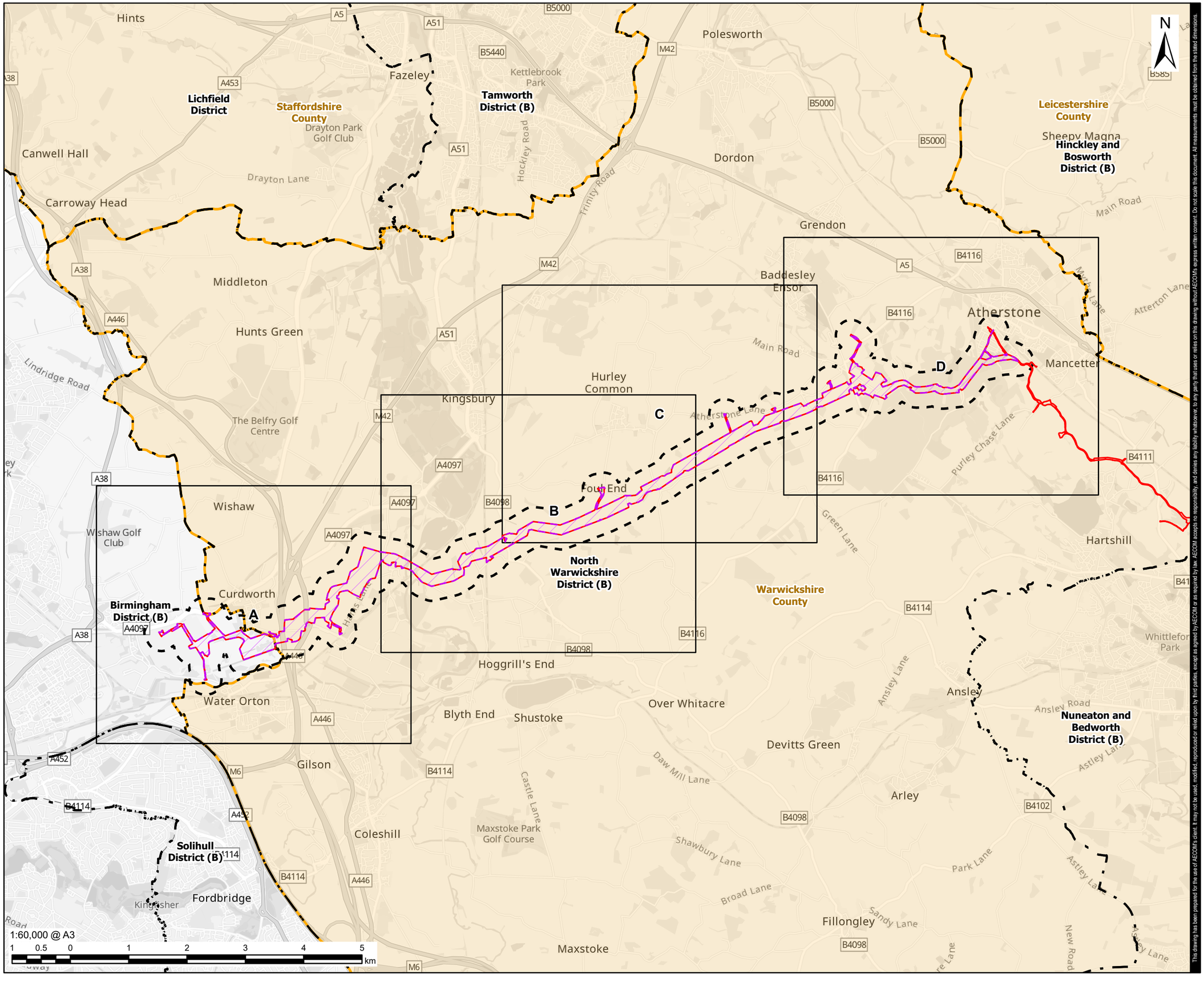

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www.aecom.com

LEGEND

- Part 1
- 250m Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 LiDAR Plan Overview

FIGURE NUMBER

Figure 22-A3-16

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2025-11-25

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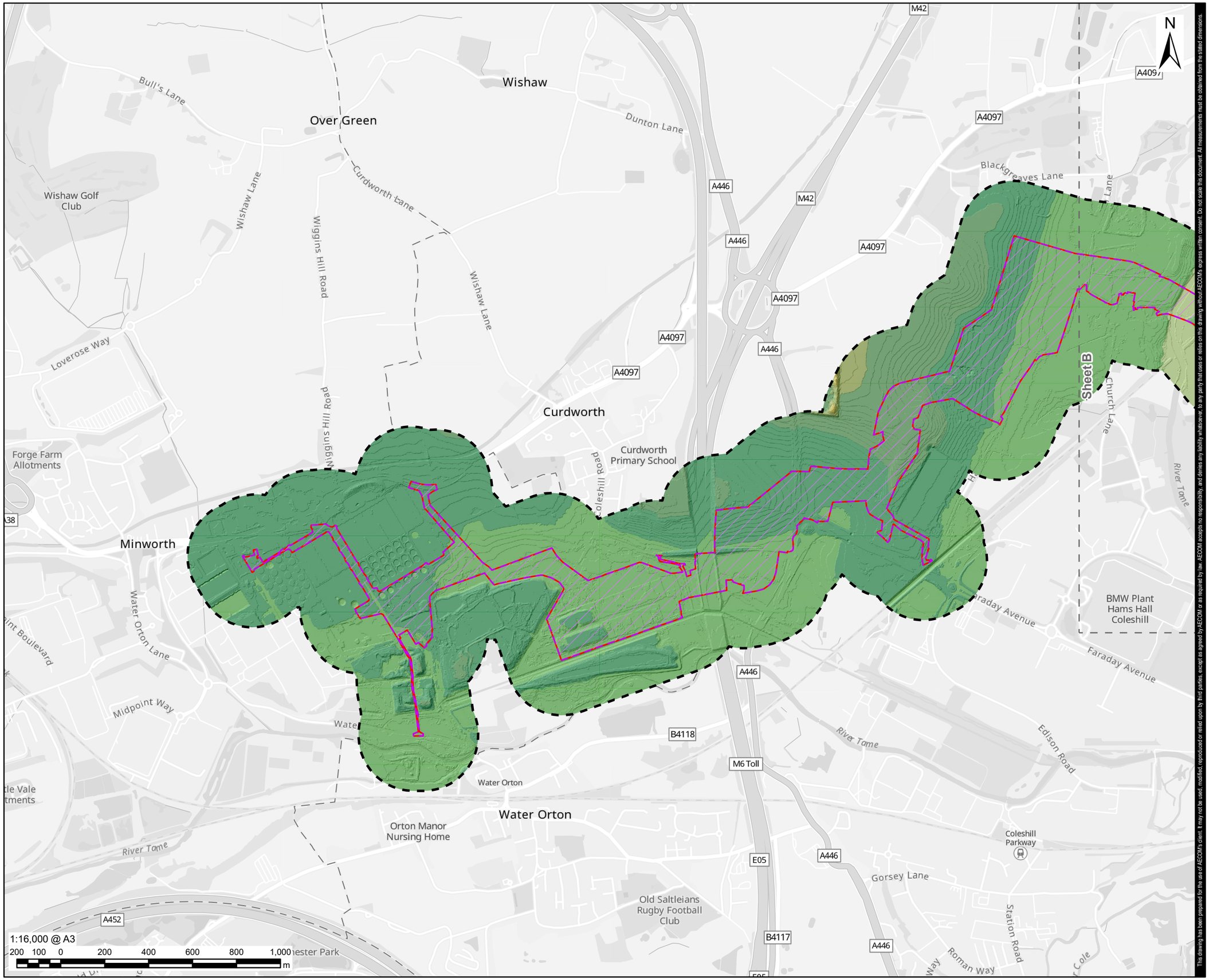

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LEGEND

- Part 1
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120

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PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 LiDAR Plan
Sheet A

FIGURE NUMBER

Figure 22-A3-16

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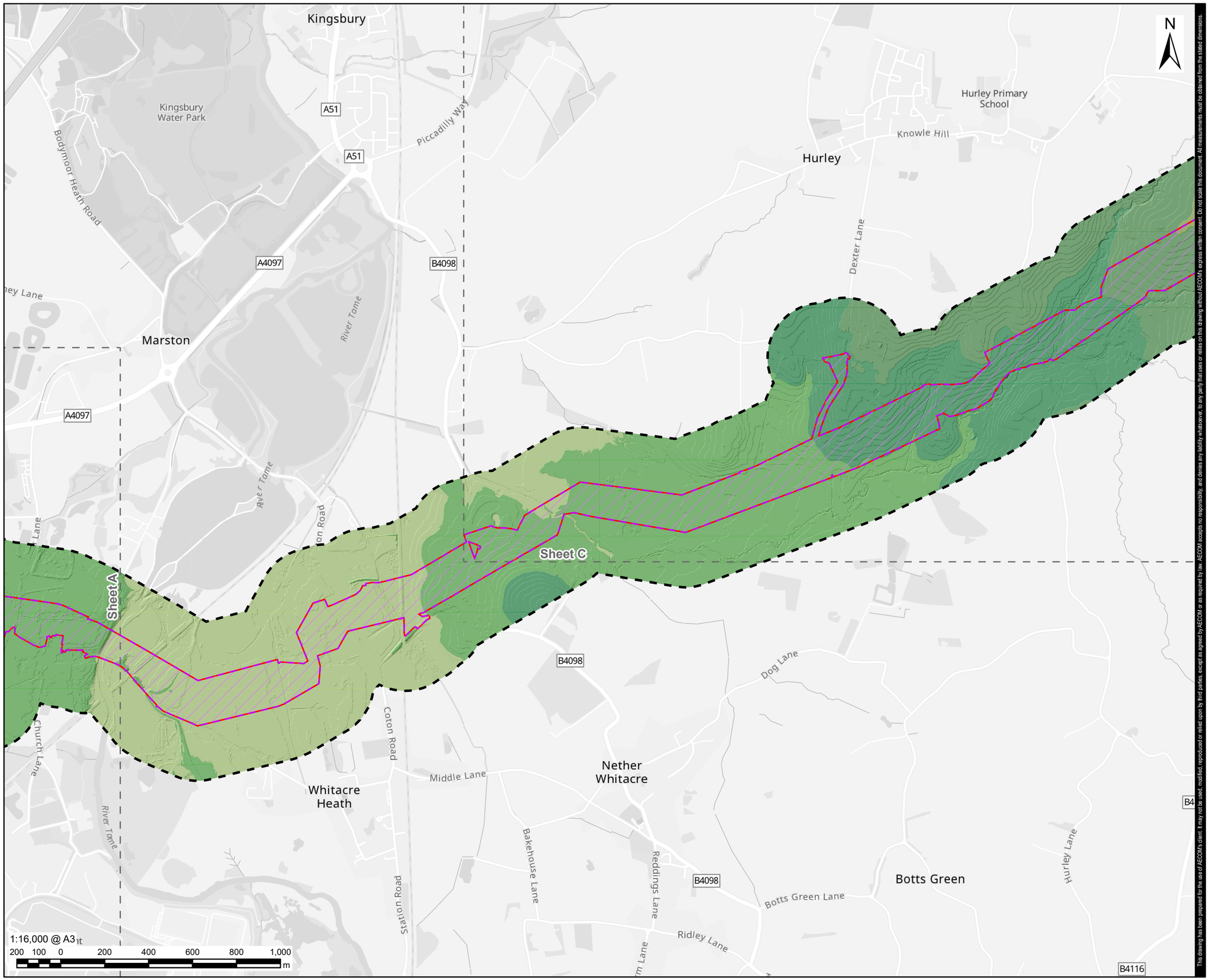

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LEGEND

- Part 1
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140

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FIGURE TITLE

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Sheet B

FIGURE NUMBER

Figure 22-A3-16

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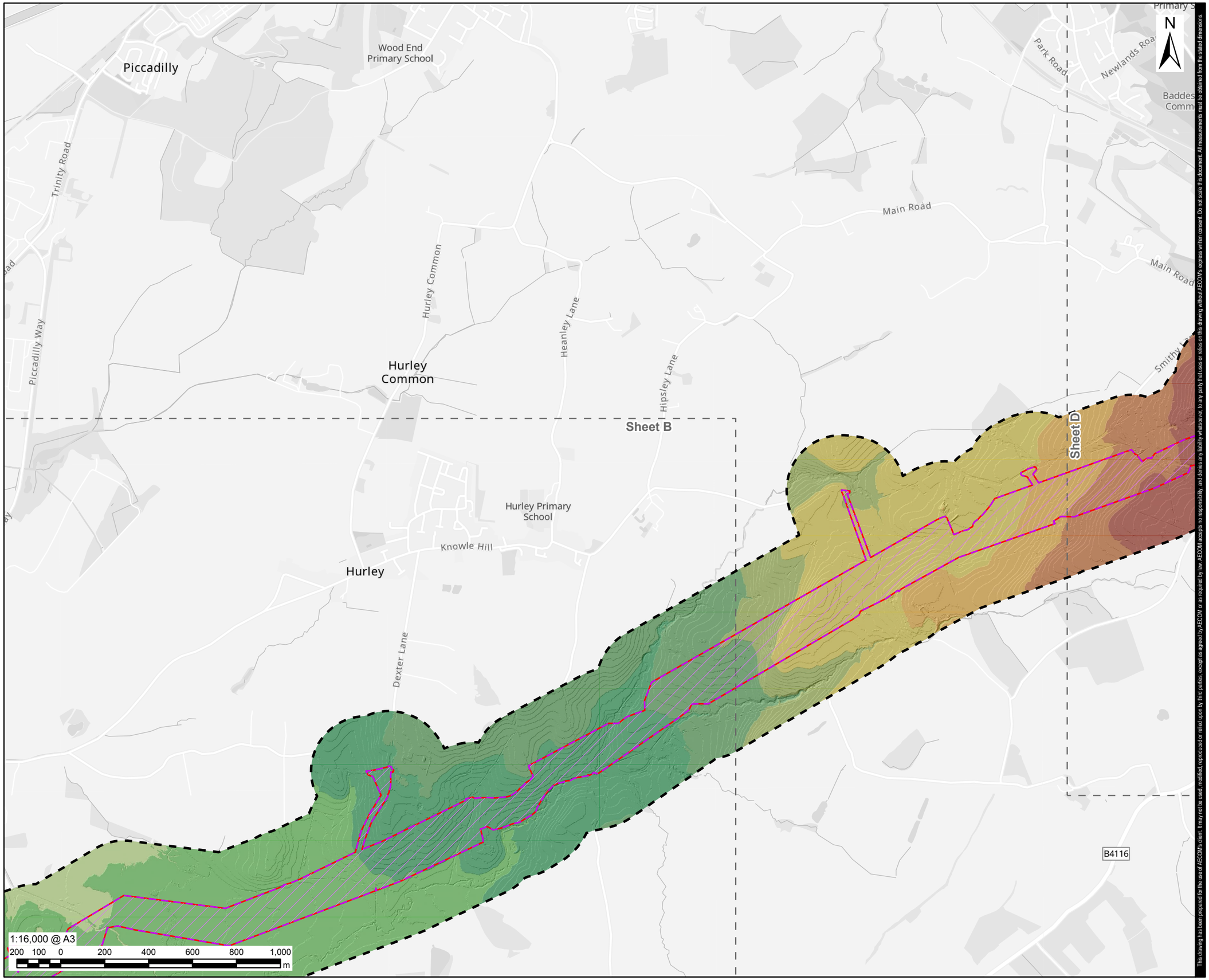

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LEGEND

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- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170

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FIGURE TITLE

Part 1 LiDAR Plan
Sheet C

FIGURE NUMBER

Figure 22-A3-16

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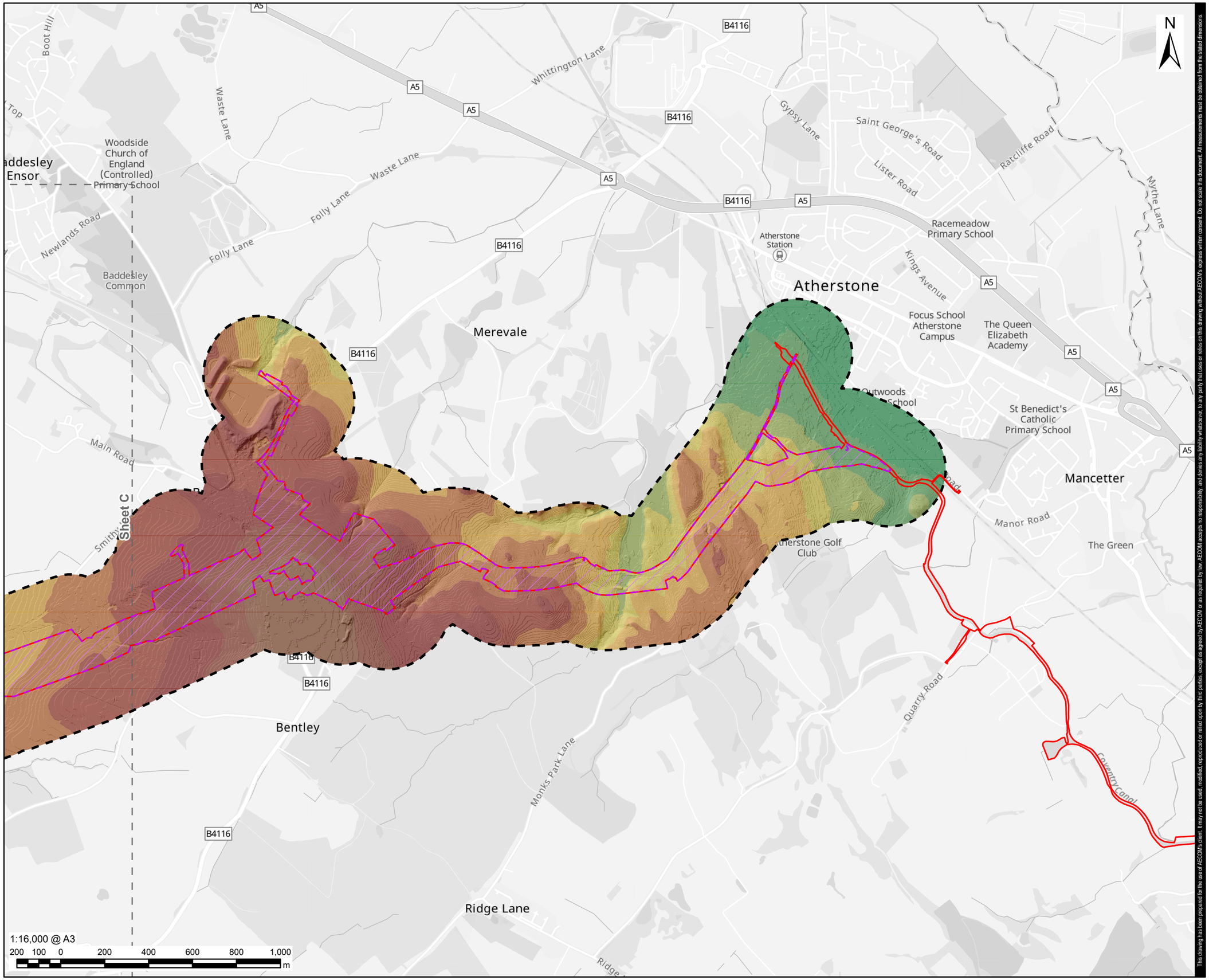

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LEGEND

- Part 1
- 250m Study Area
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- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180

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PROJECT NUMBER

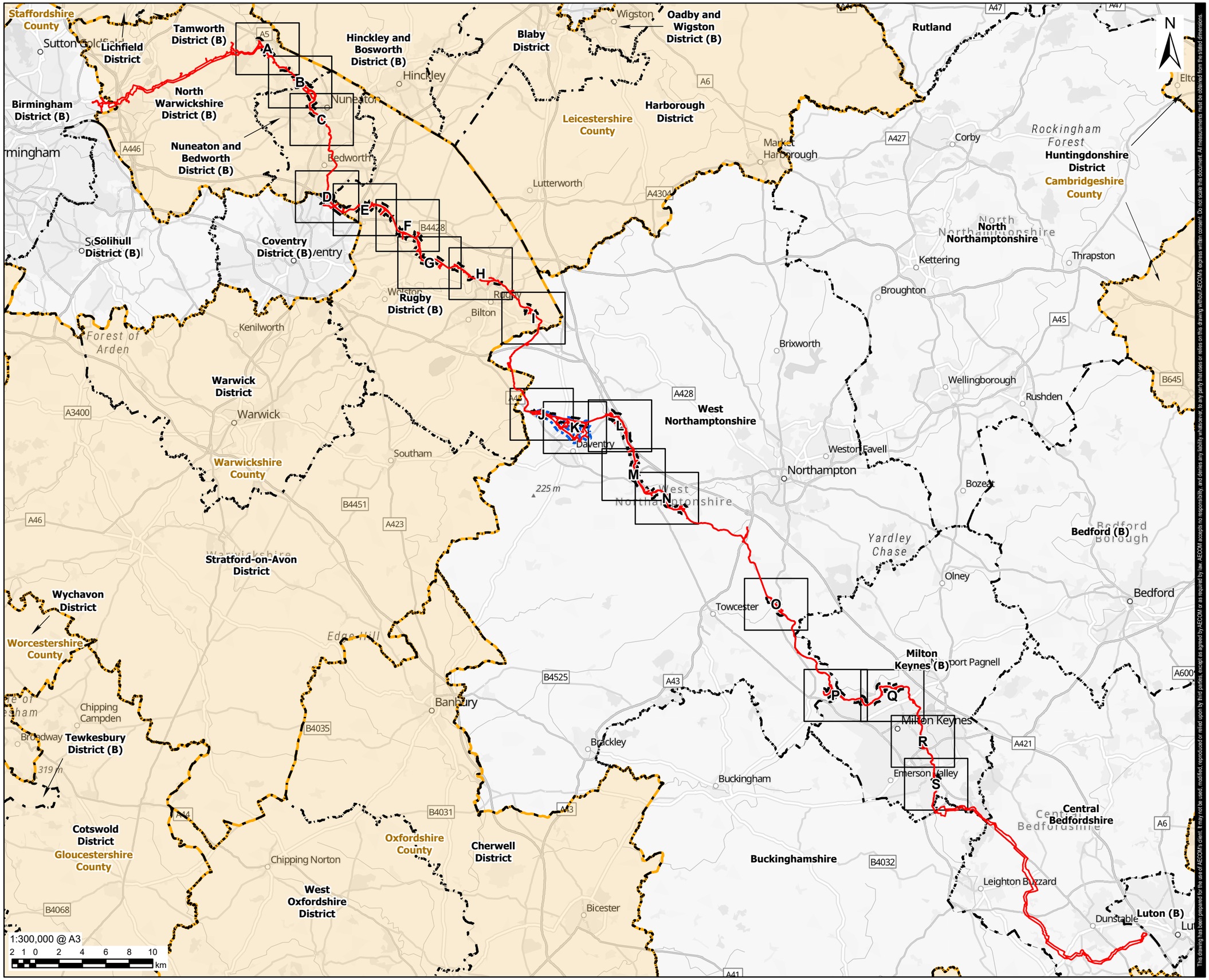
60720432

FIGURE TITLE

Part 1 LiDAR Plan
Sheet D

FIGURE NUMBER

Figure 22-A3-16



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LEGEND

- Part 2 - 250m Study Area
- Part 3 - 250m Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan Overview

FIGURE NUMBER

Figure 22-A3-17

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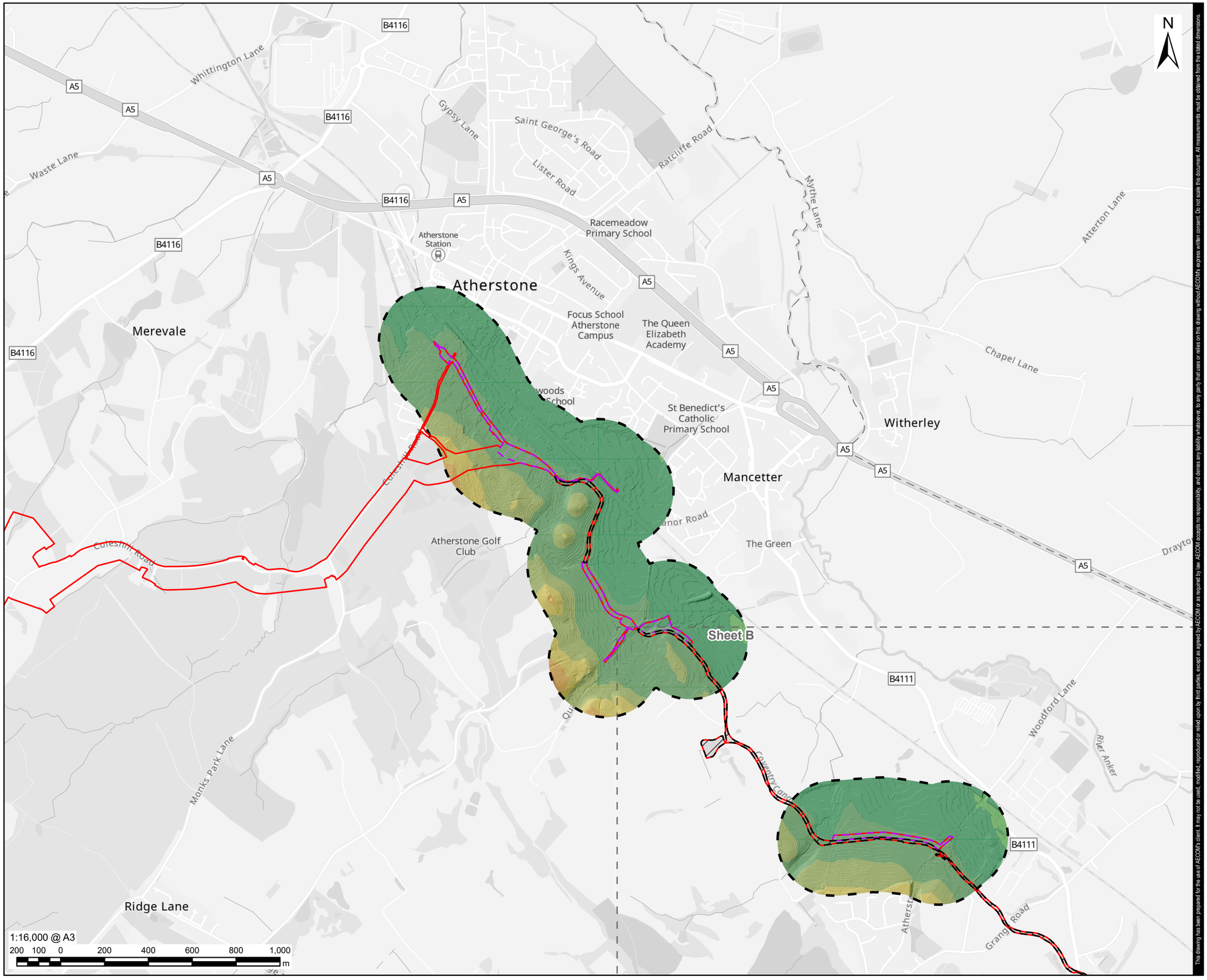

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180
- > 180 to 190

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FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet A

FIGURE NUMBER

Figure 22-A3-17

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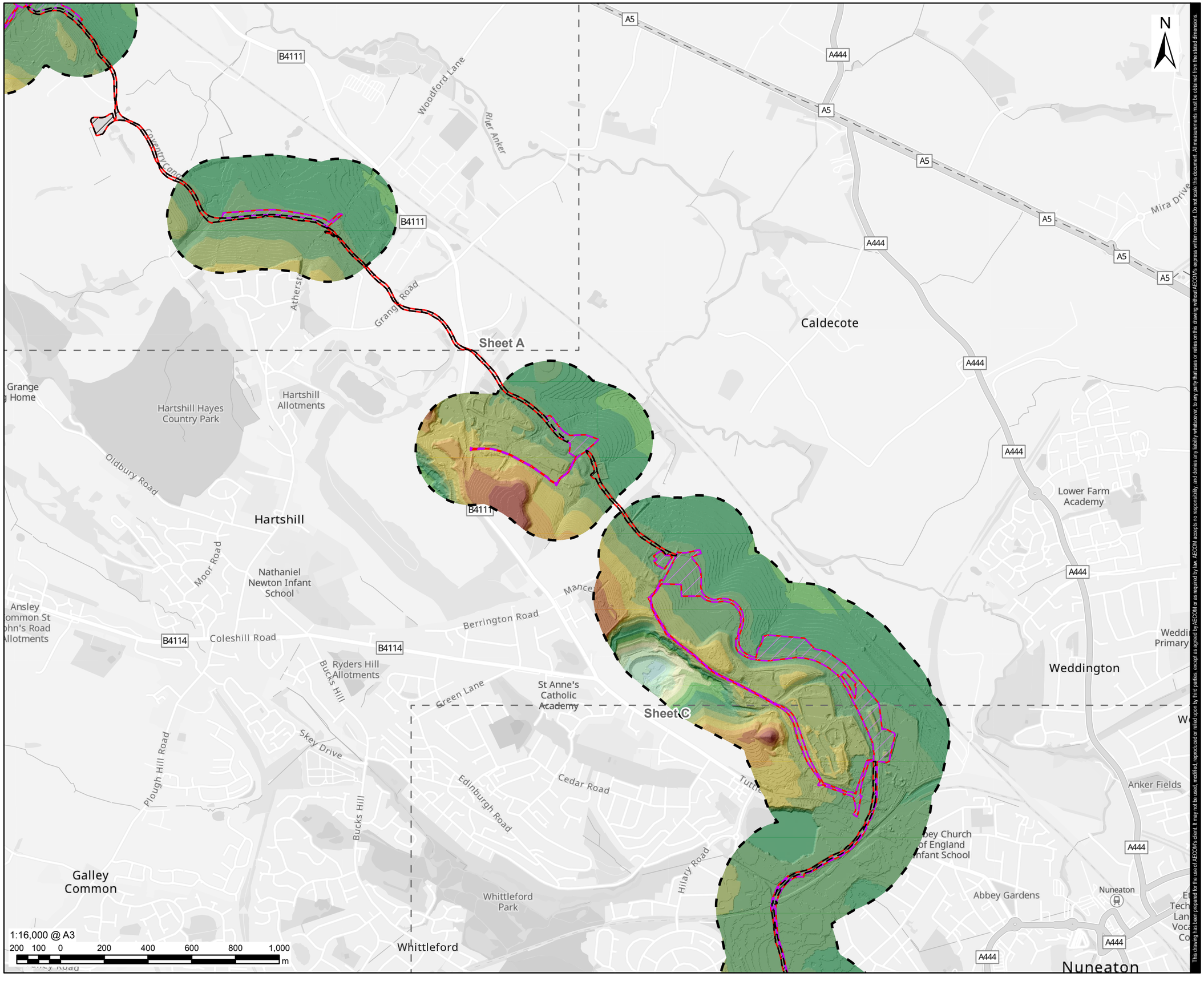

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- <= 30
- > 30 to 40
- > 40 to 50
- > 50 to 60
- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180

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FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet B

FIGURE NUMBER

Figure 22-A3-17

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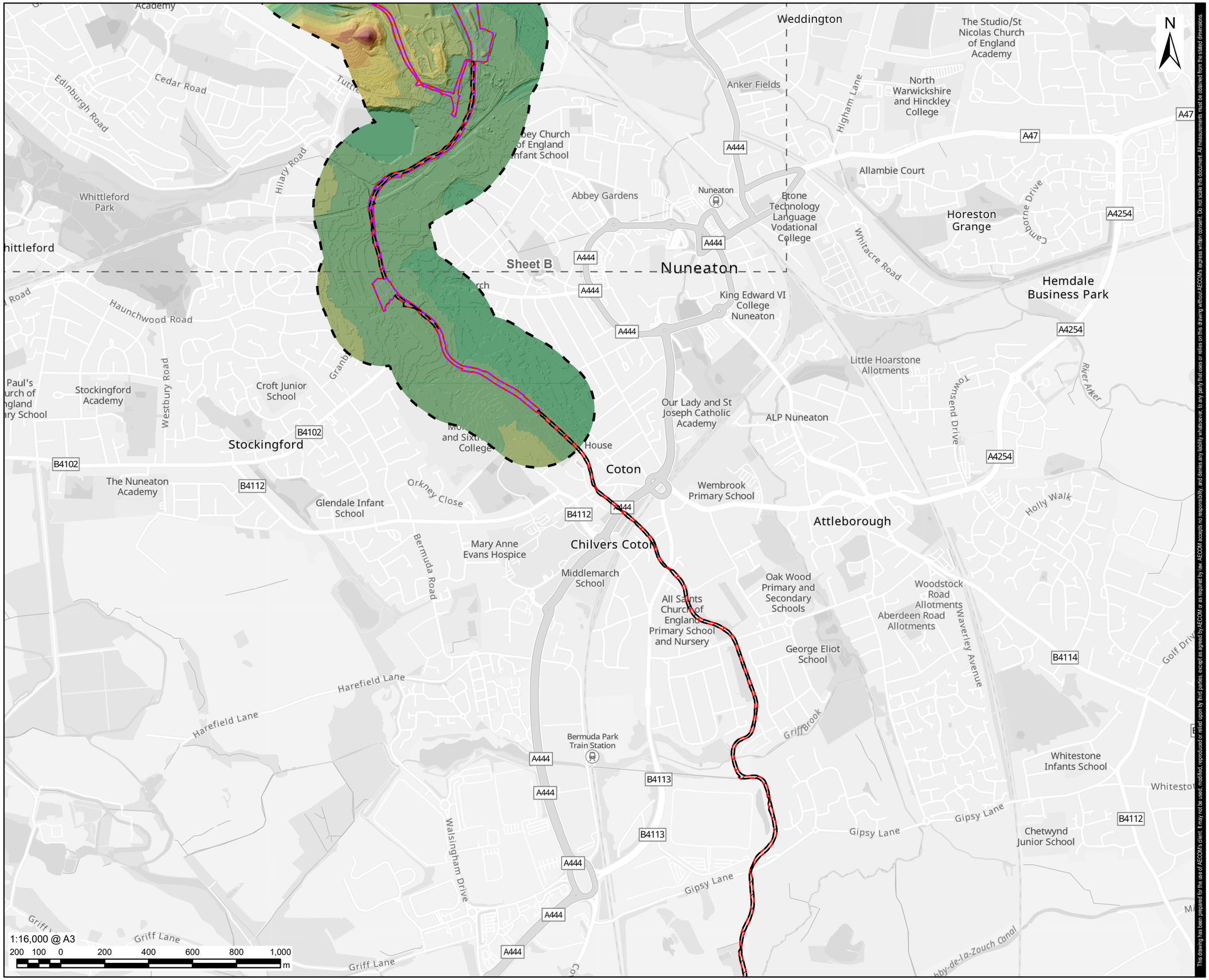

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160

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FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet C

FIGURE NUMBER

Figure 22-A3-17

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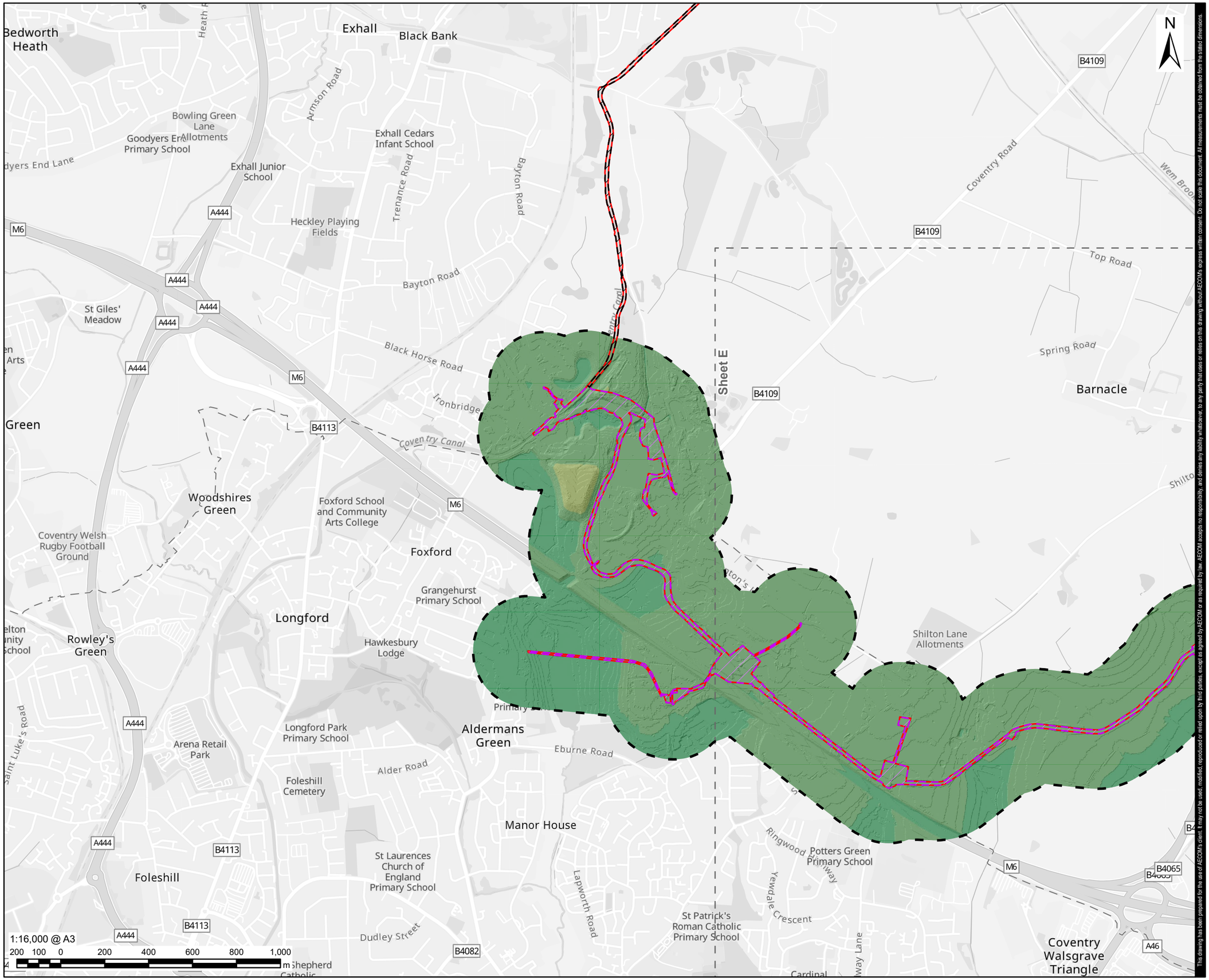

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet D

FIGURE NUMBER

Figure 22-A3-17

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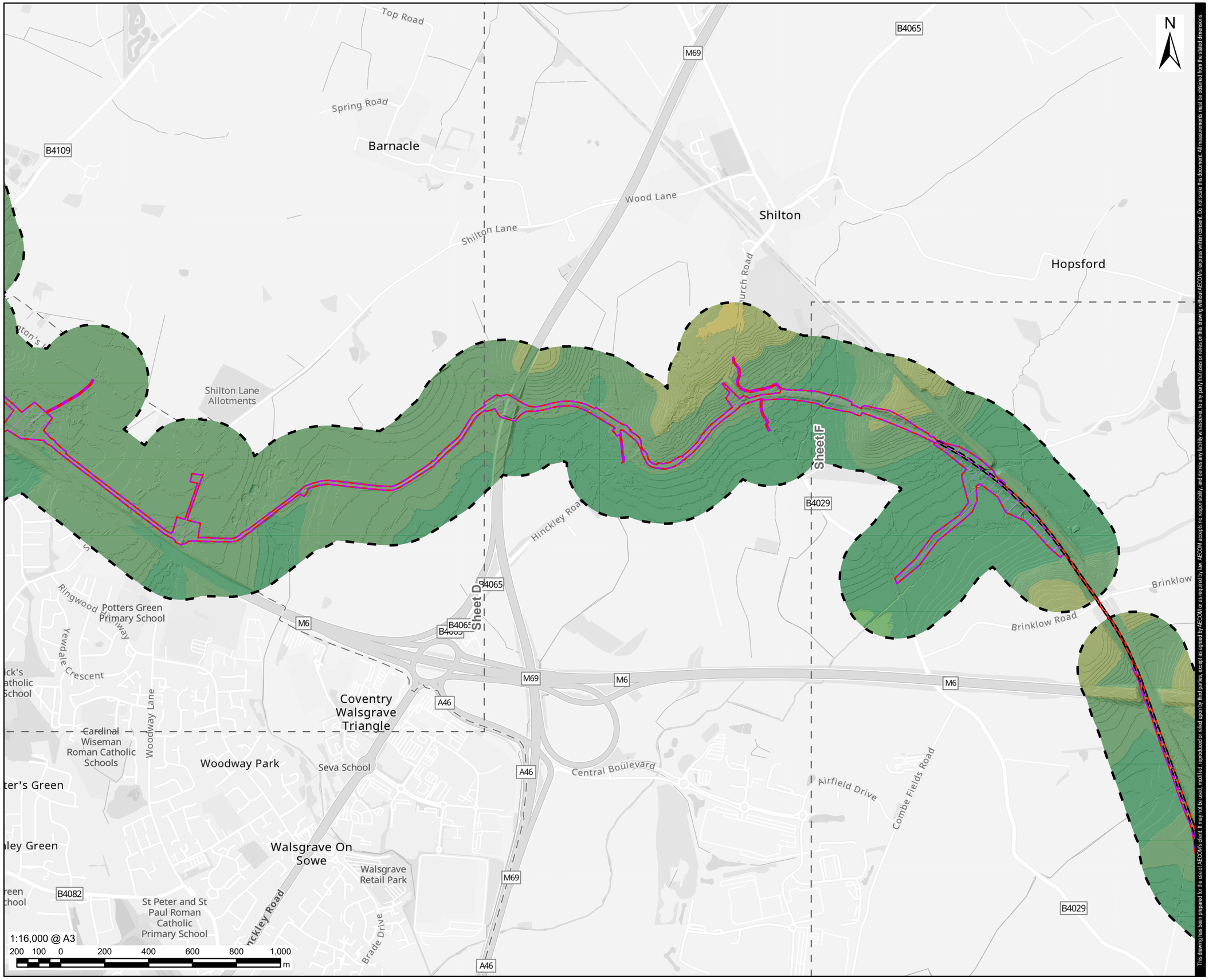

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet E

FIGURE NUMBER

Figure 22-A3-17

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet F

FIGURE NUMBER

Figure 22-A3-17

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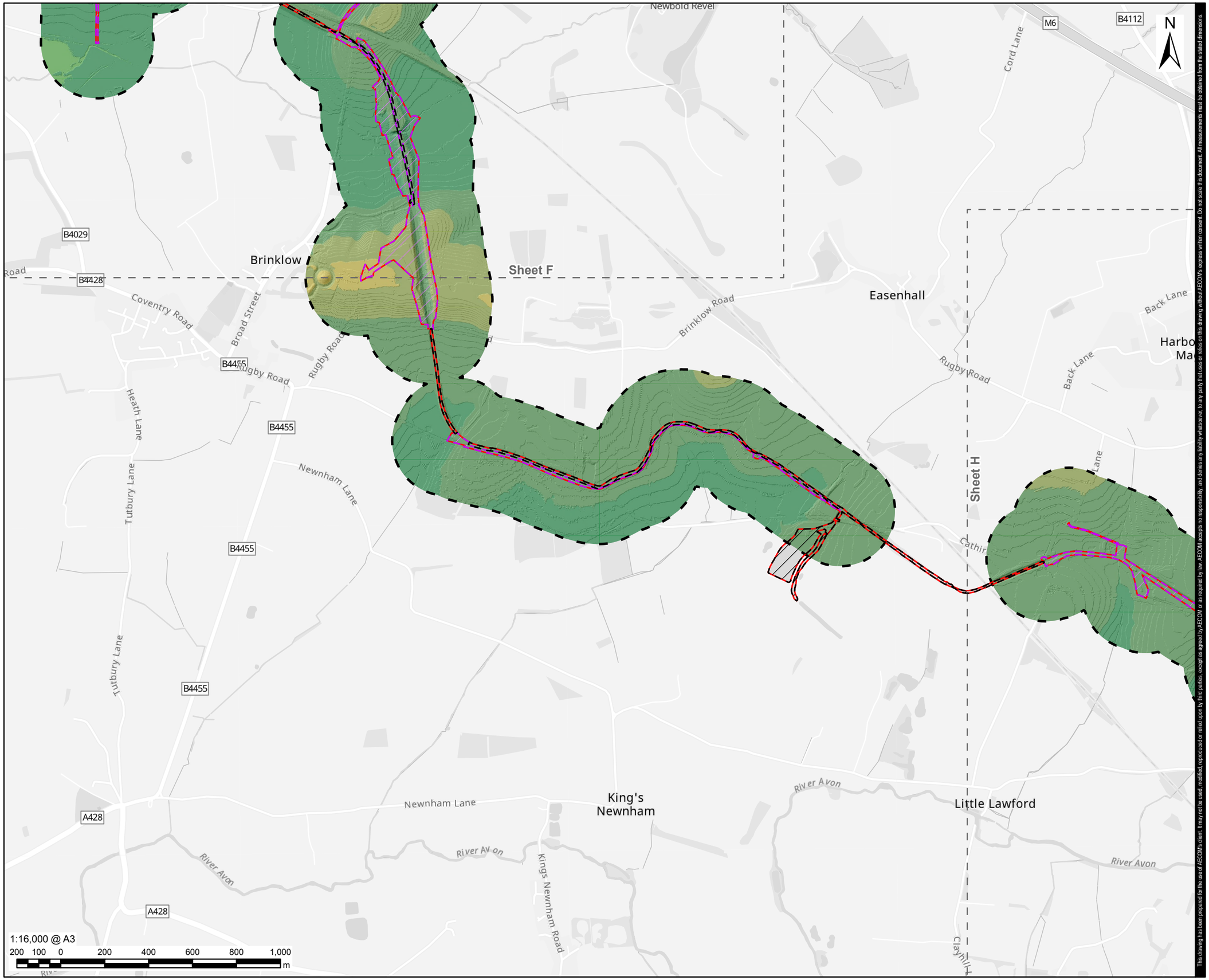

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet G

FIGURE NUMBER

Figure 22-A3-17

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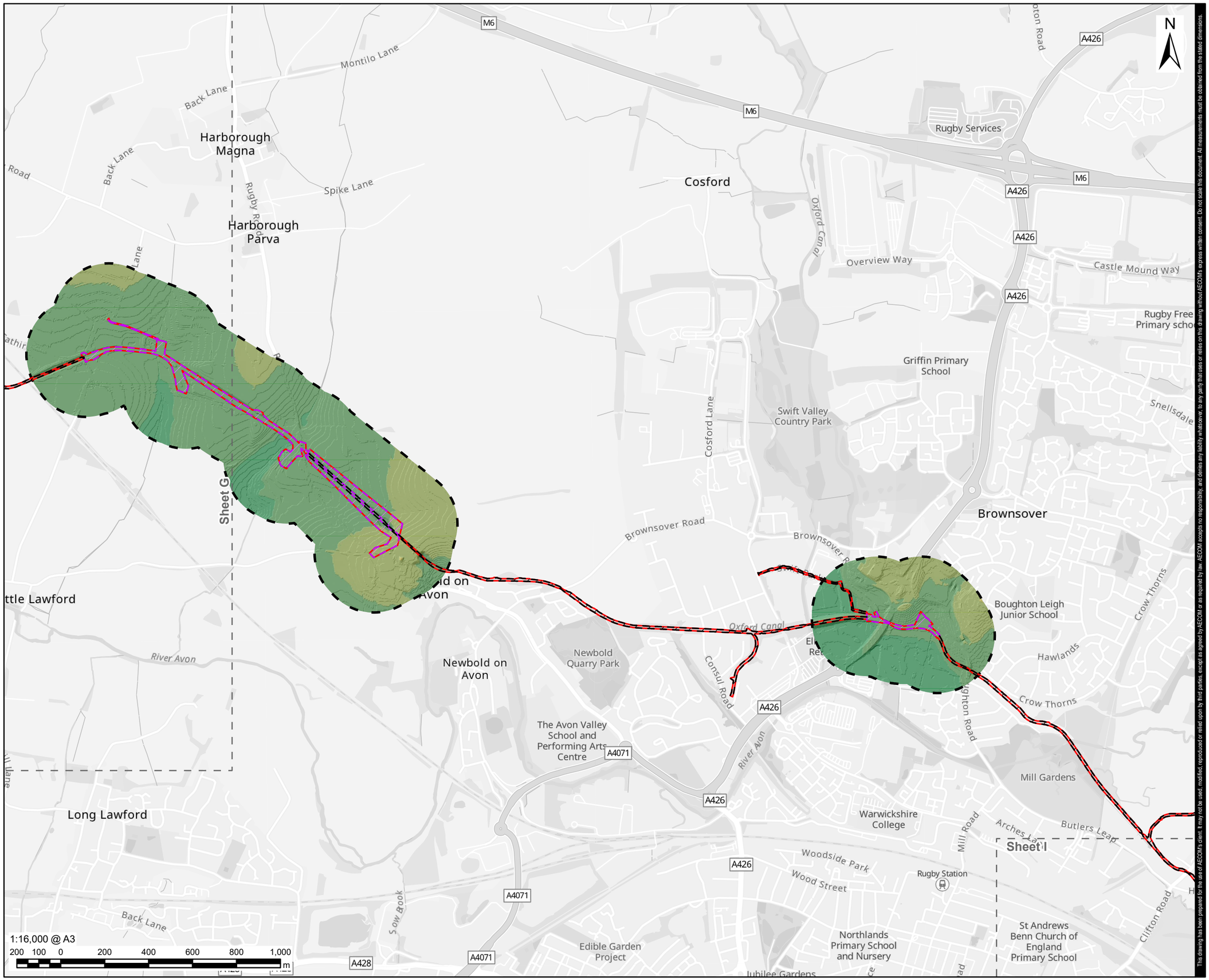

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet H

FIGURE NUMBER

Figure 22-A3-17

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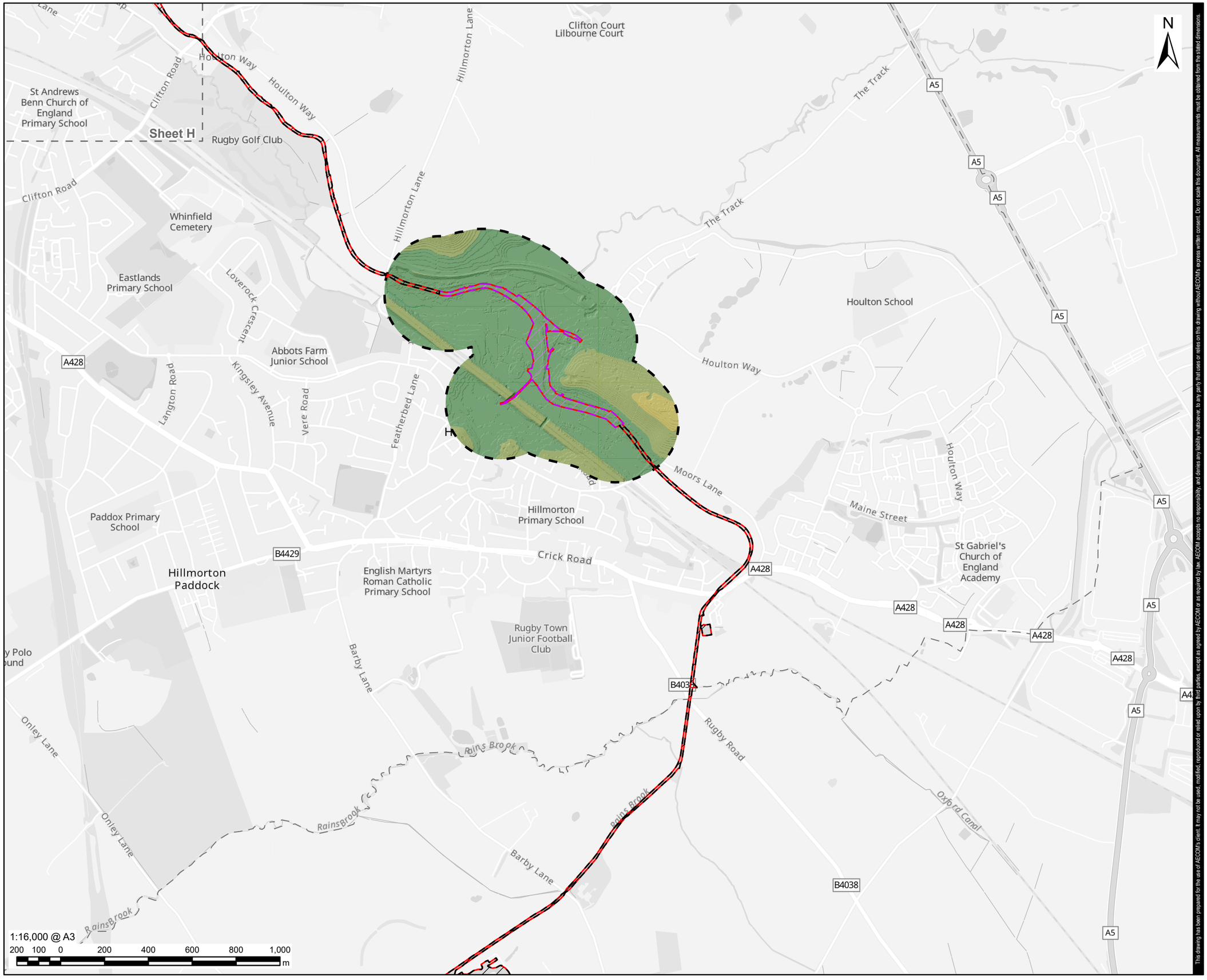

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120

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FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet I

FIGURE NUMBER

Figure 22-A3-17

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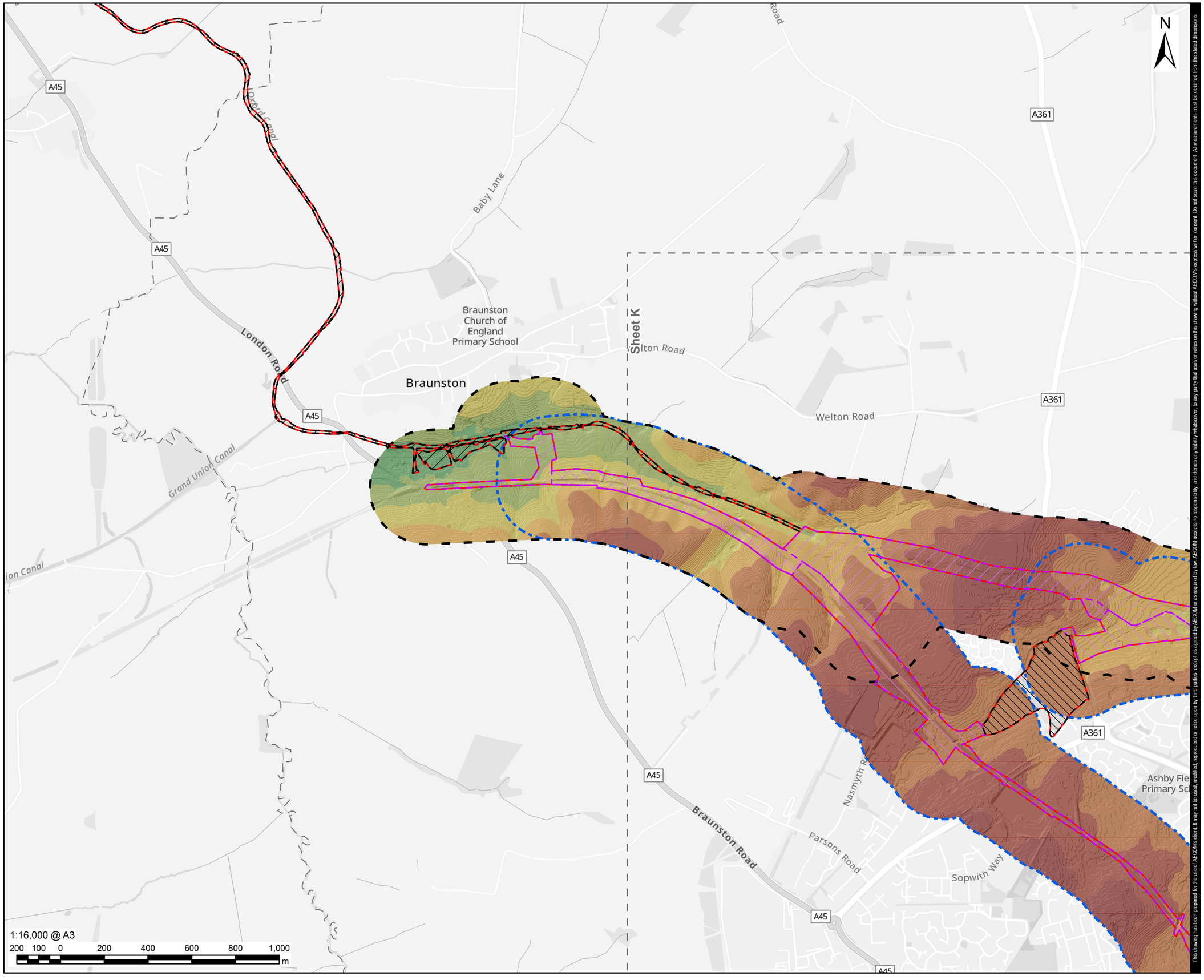

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Part 3 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet J

FIGURE NUMBER

Figure 22-A3-17

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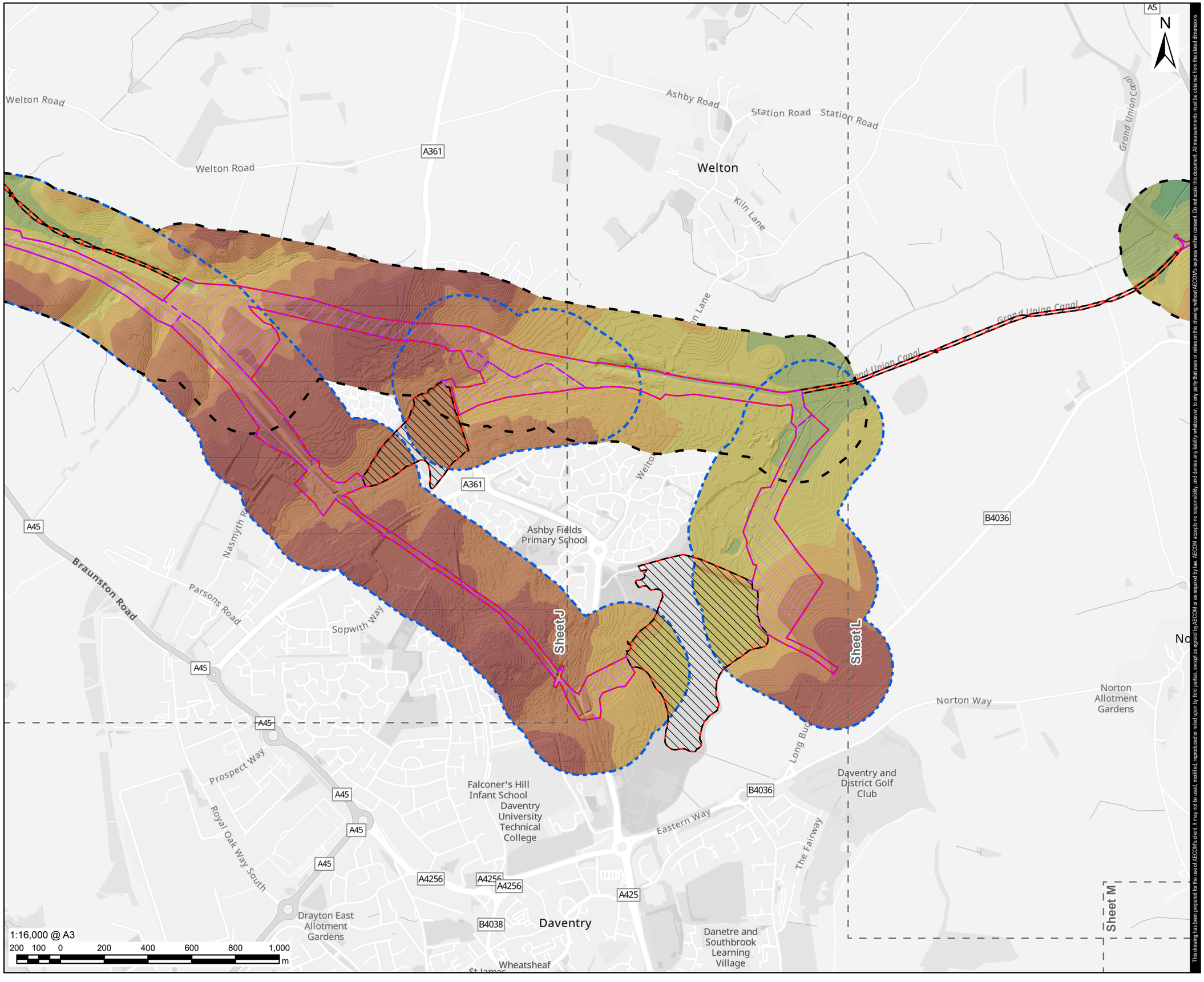

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Part 3 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180
- > 180 to 190

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet K

FIGURE NUMBER

Figure 22-A3-17

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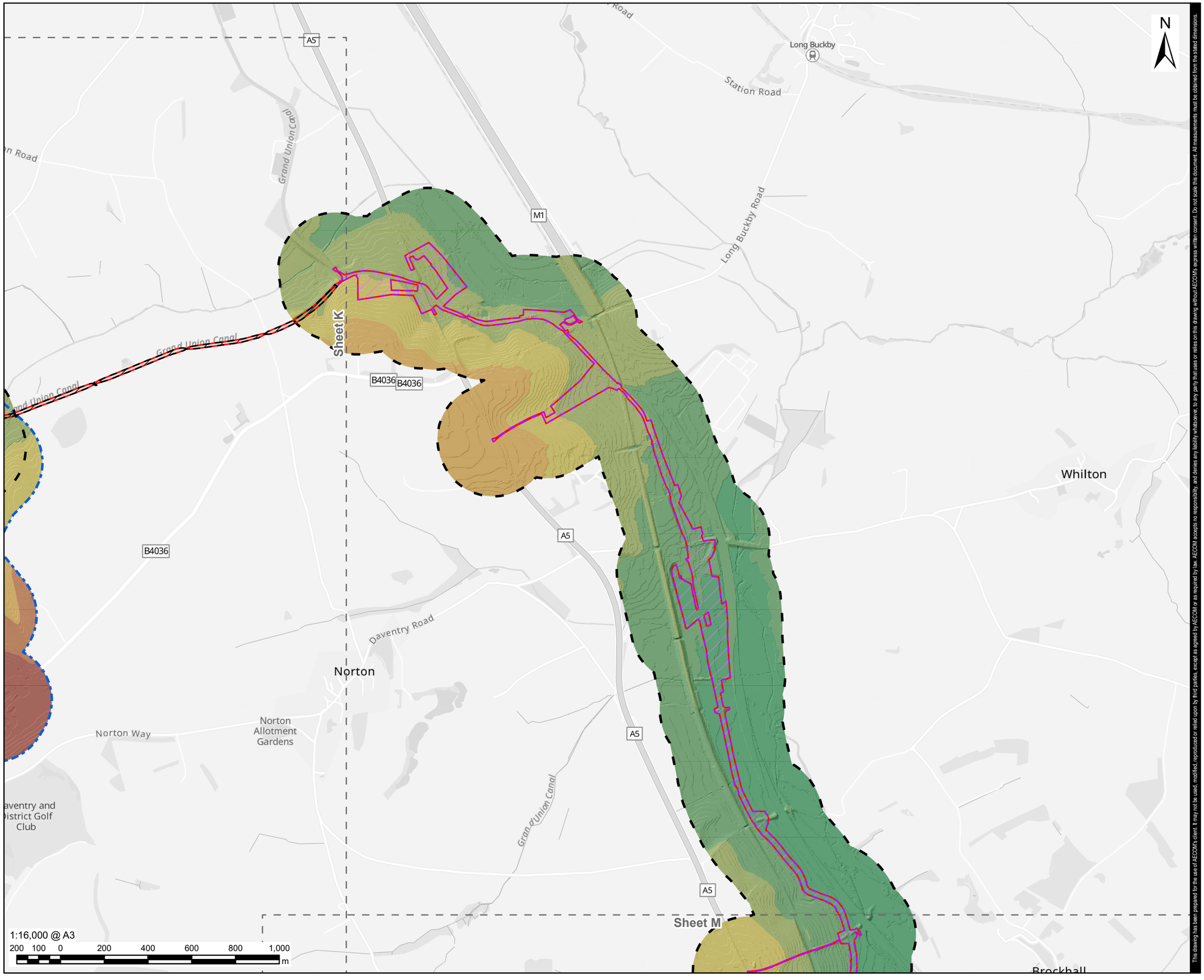

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Part 3 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180
- > 180 to 190
- > 190 to 200

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet L

FIGURE NUMBER

Figure 22-A3-17

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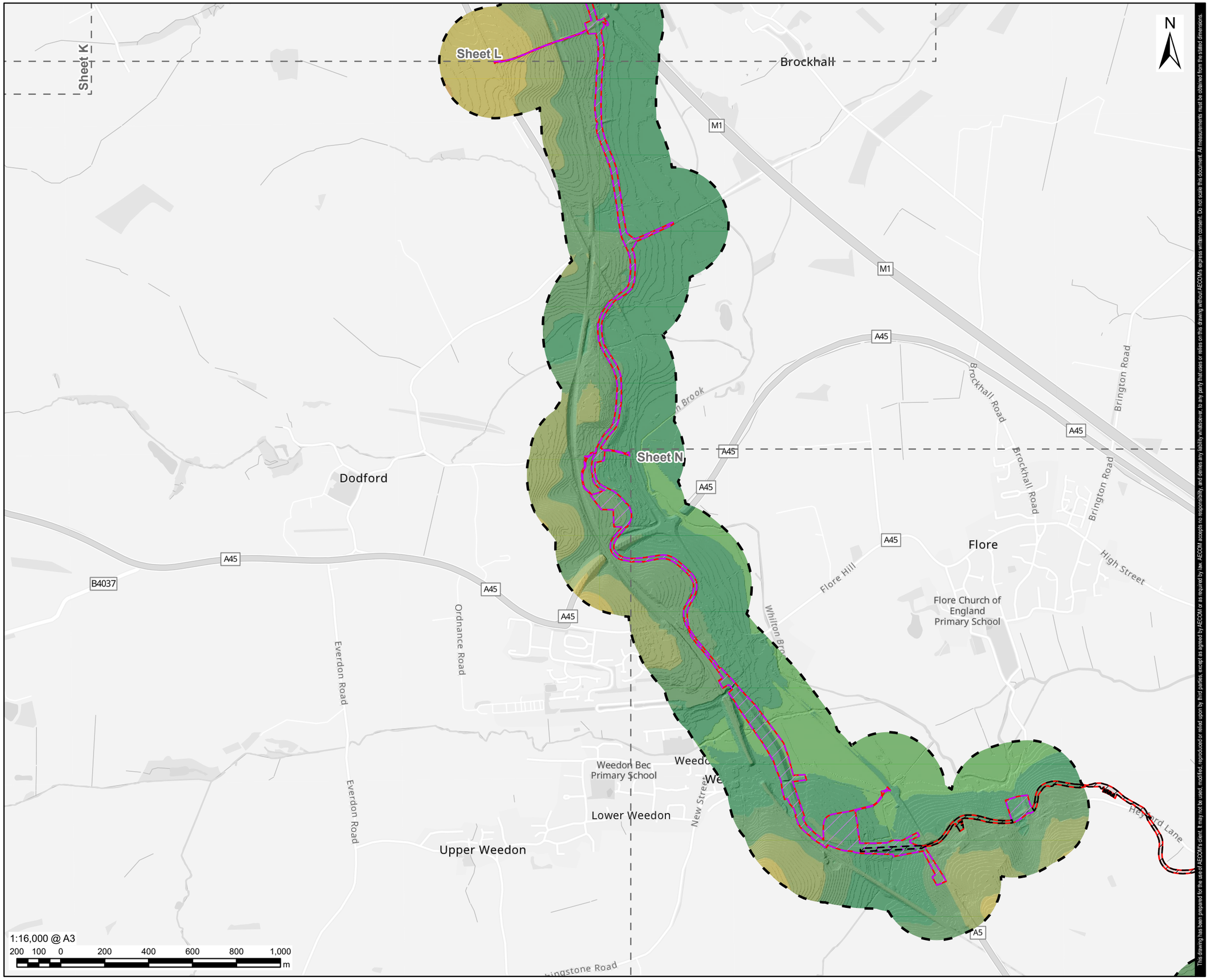

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet M

FIGURE NUMBER

Figure 22-A3-17

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2025-11-25

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet N

FIGURE NUMBER

Figure 22-A3-17

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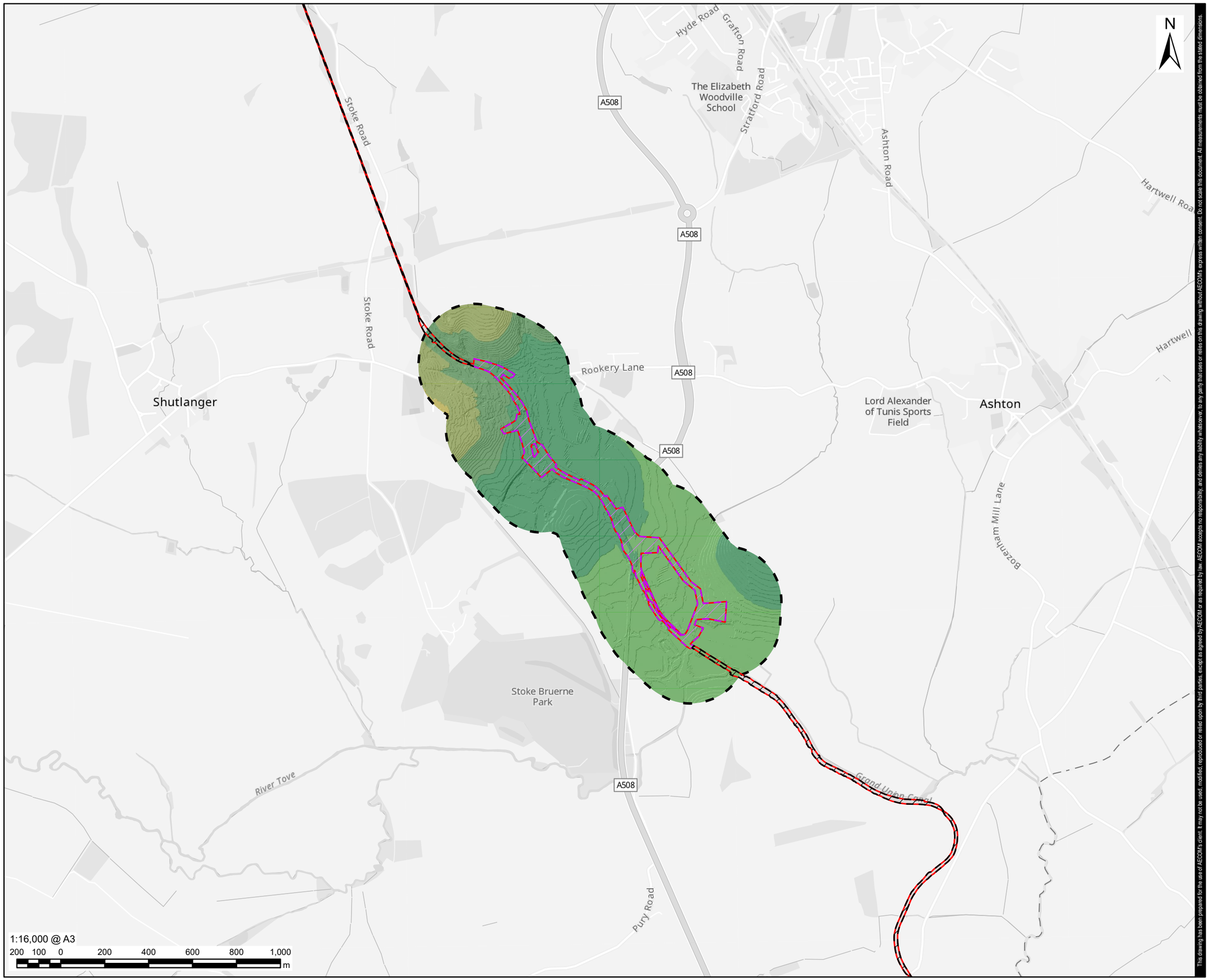

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits

LiDAR Digital Terrain Model (m)

- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet O

FIGURE NUMBER

Figure 22-A3-17

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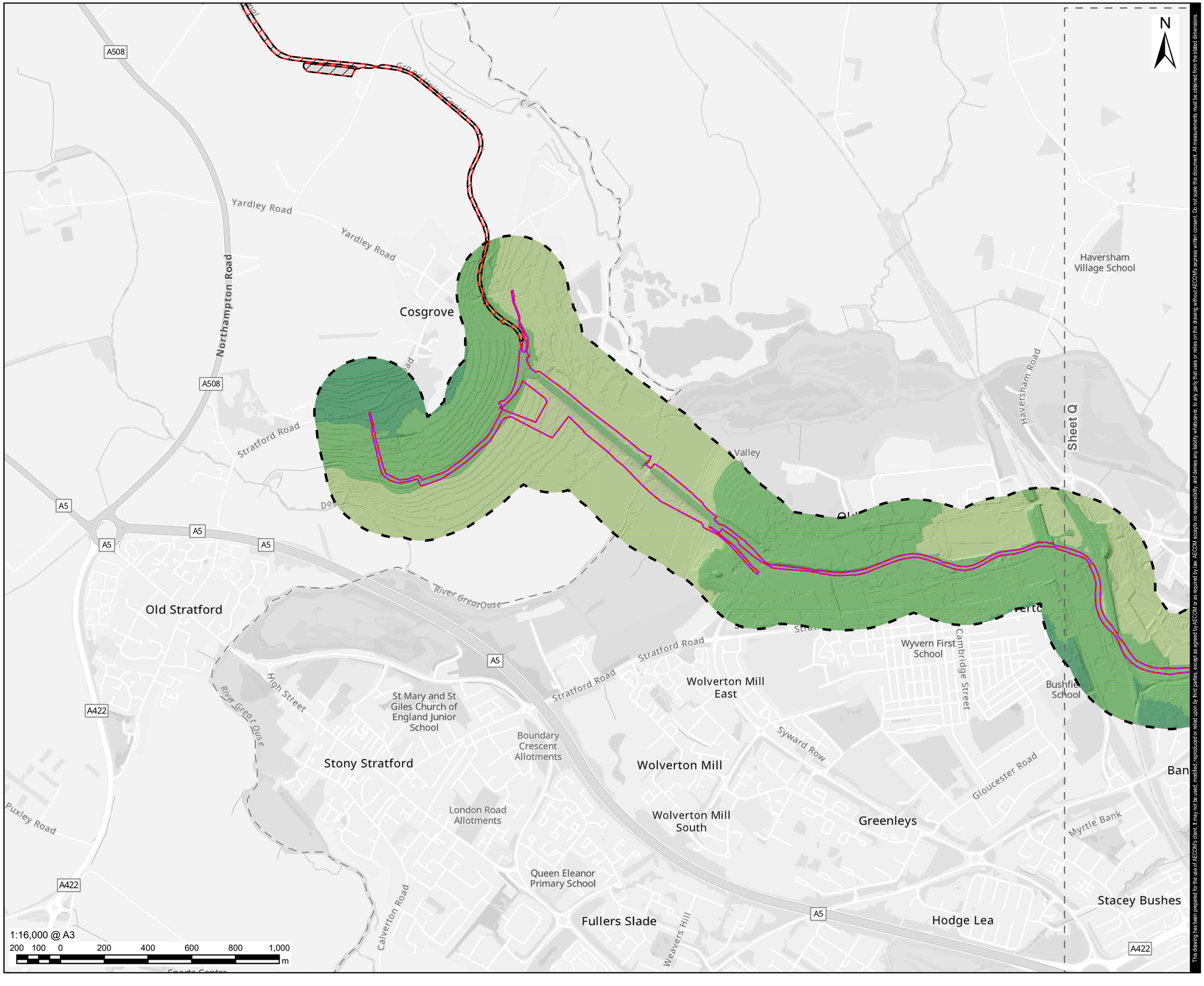

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 50 to 60
- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet P

FIGURE NUMBER

Figure 22-A3-17

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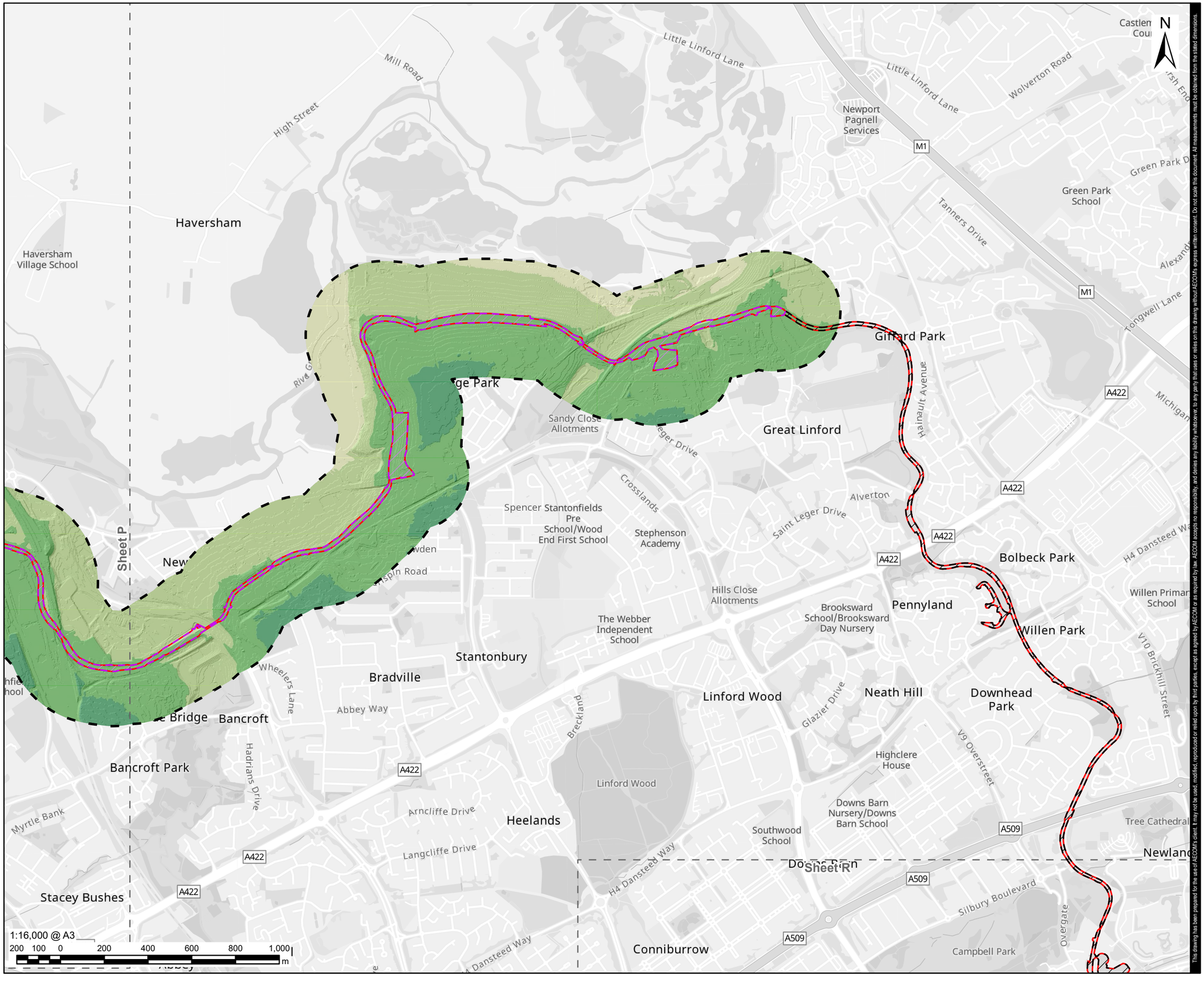

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 50 to 60
- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet Q

FIGURE NUMBER

Figure 22-A3-17

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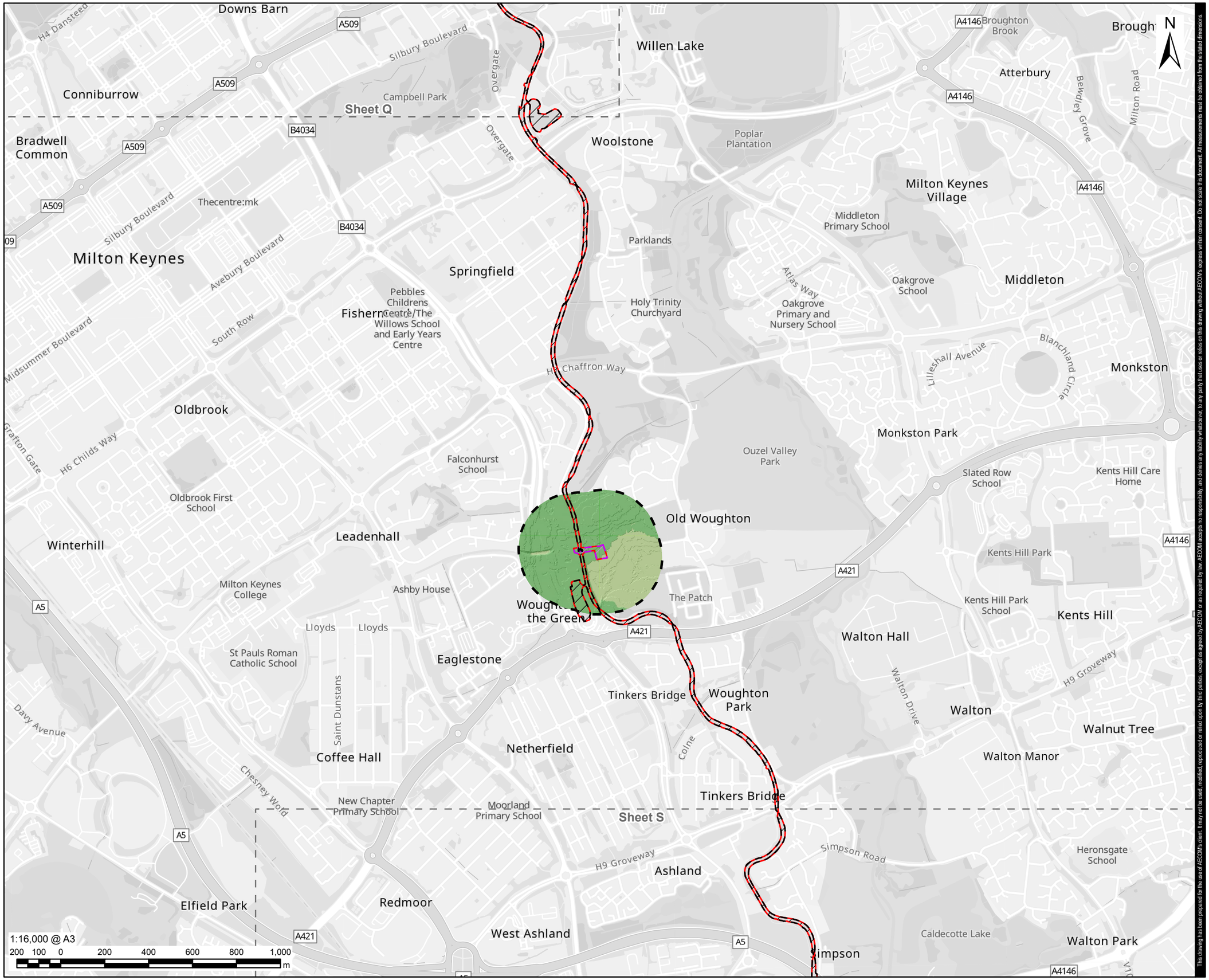

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet R

FIGURE NUMBER

Figure 22-A3-17

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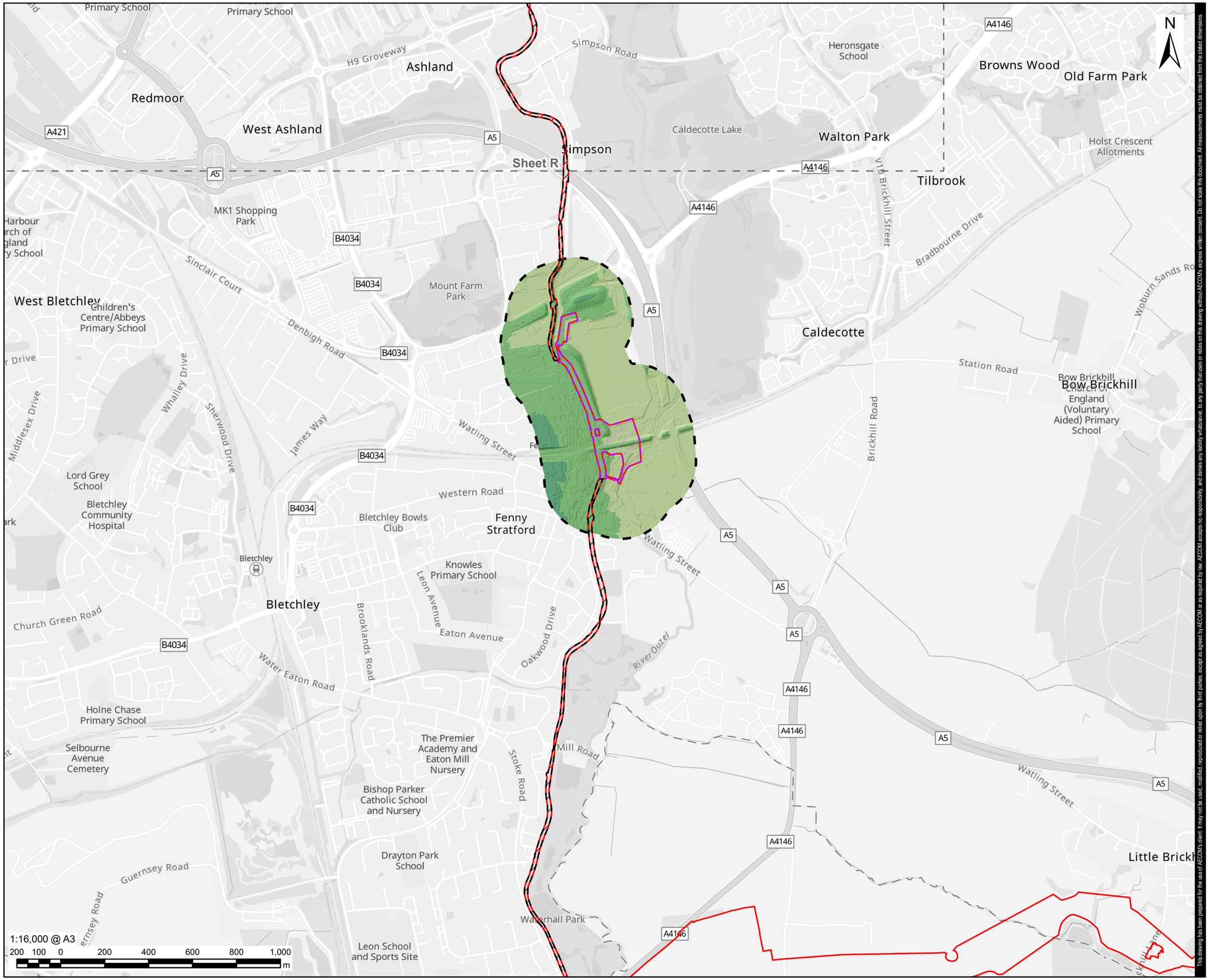

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 LiDAR Plan
Sheet S

FIGURE NUMBER

Figure 22-A3-17

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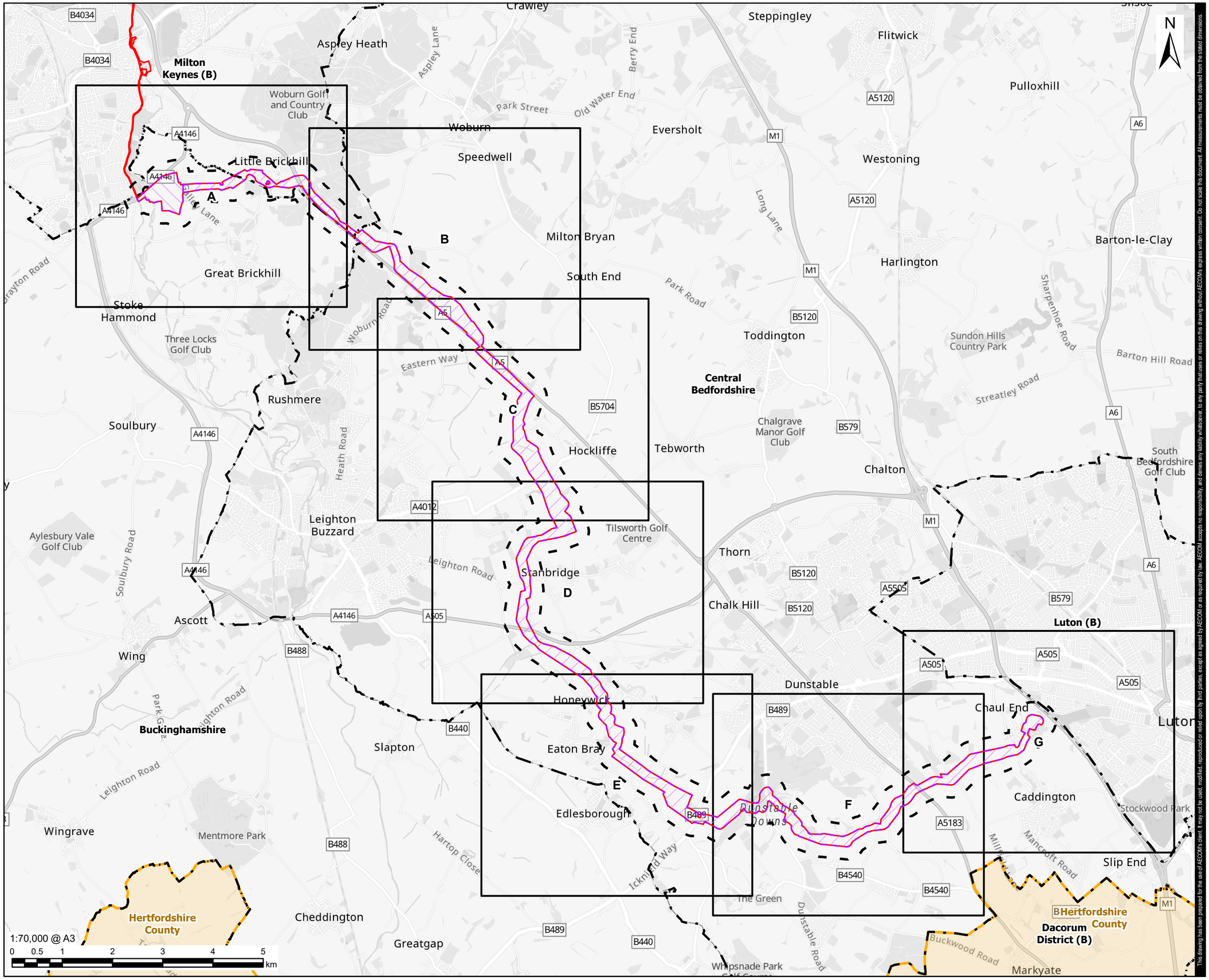

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LEGEND

- Part 4a
- Part 4b
- 250m Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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PROJECT NUMBER

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FIGURE TITLE

Part 4 LiDAR Plan Overview

FIGURE NUMBER

Figure 22-A3-18

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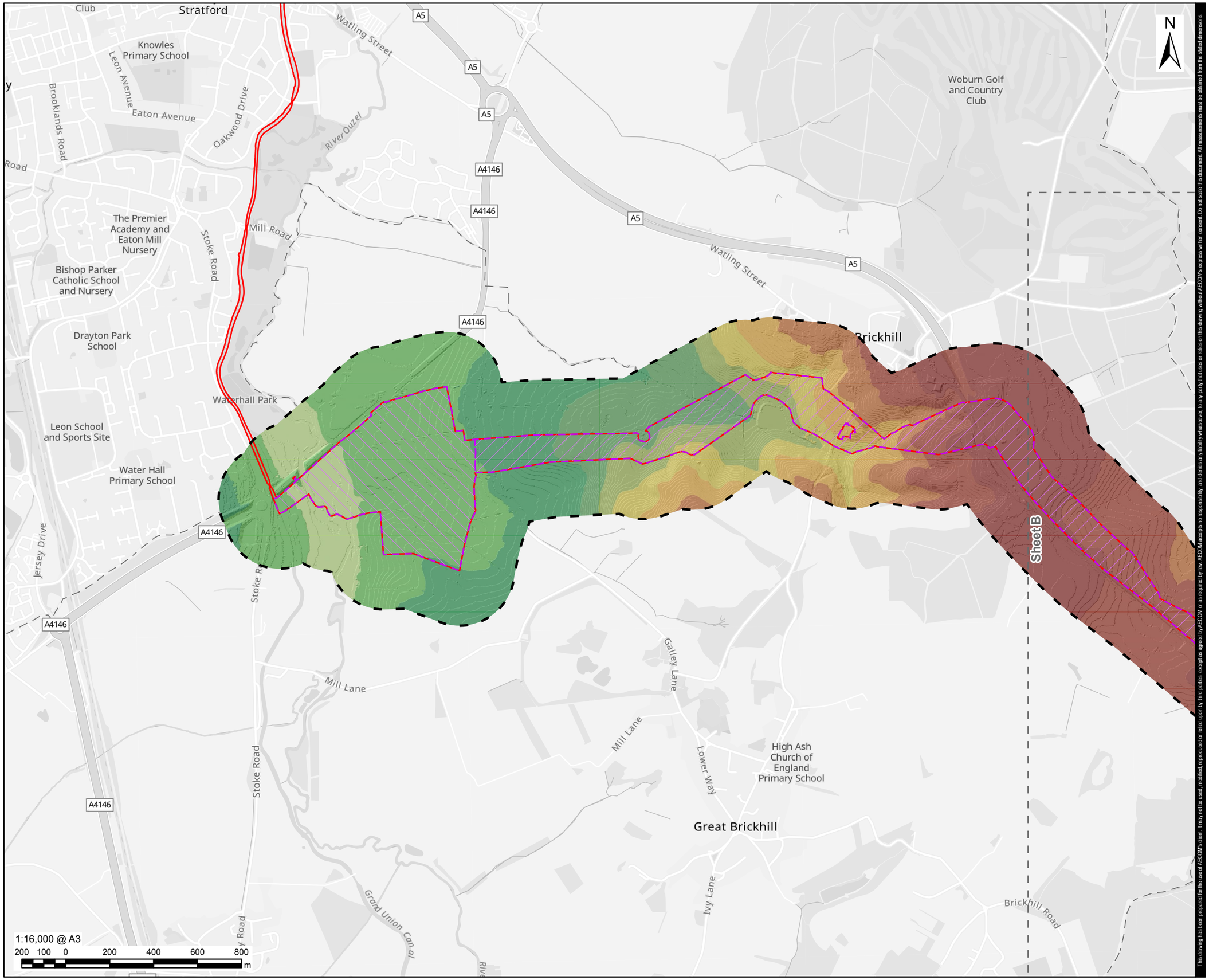

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LEGEND

- Part 4a
- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 60 to 70
- > 70 to 80
- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 4 LiDAR Plan
Sheet A

FIGURE NUMBER

Figure 22-A3-18

Revision: 0 Drawn: WC Checked: JW Approved: LB Date: 2025-11-25

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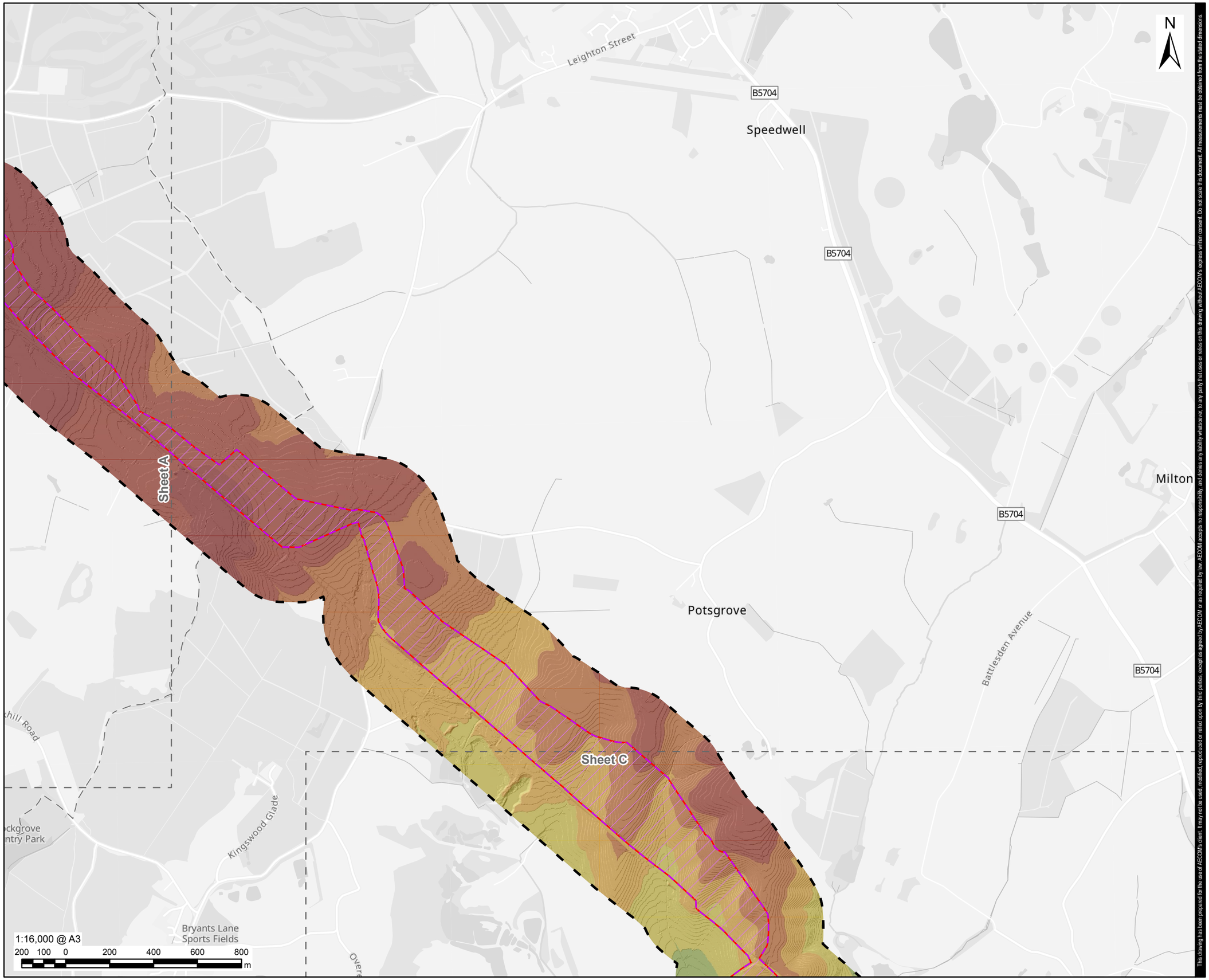

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www.aecom.com

LEGEND

- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Part 4 LiDAR Plan
Sheet B

FIGURE NUMBER

Figure 22-A3-18

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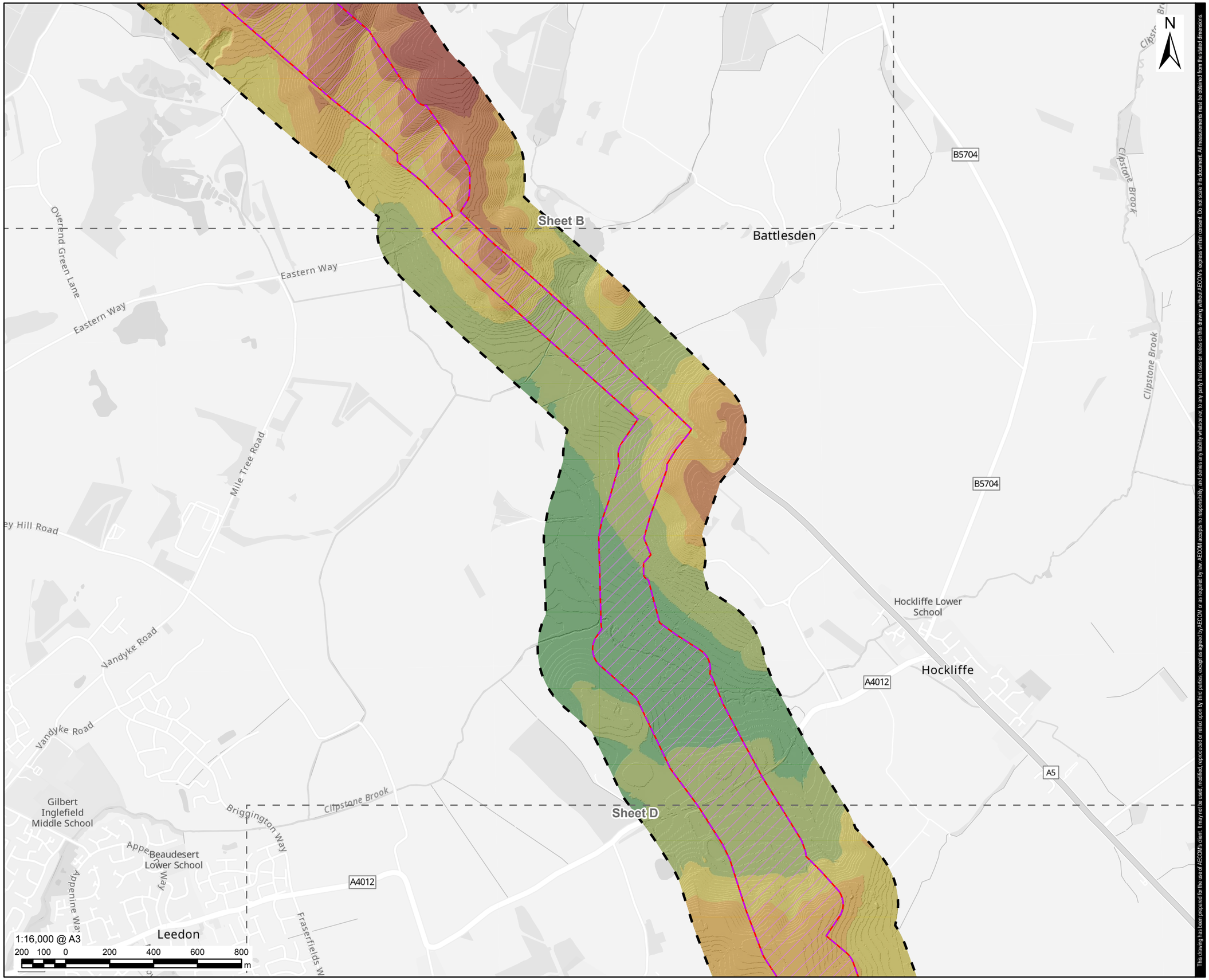

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LEGEND

- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 4 LiDAR Plan
Sheet C

FIGURE NUMBER

Figure 22-A3-18

Revision: 0 Drawn: WC Checked: JW Approved: LB Date: 2025-11-25

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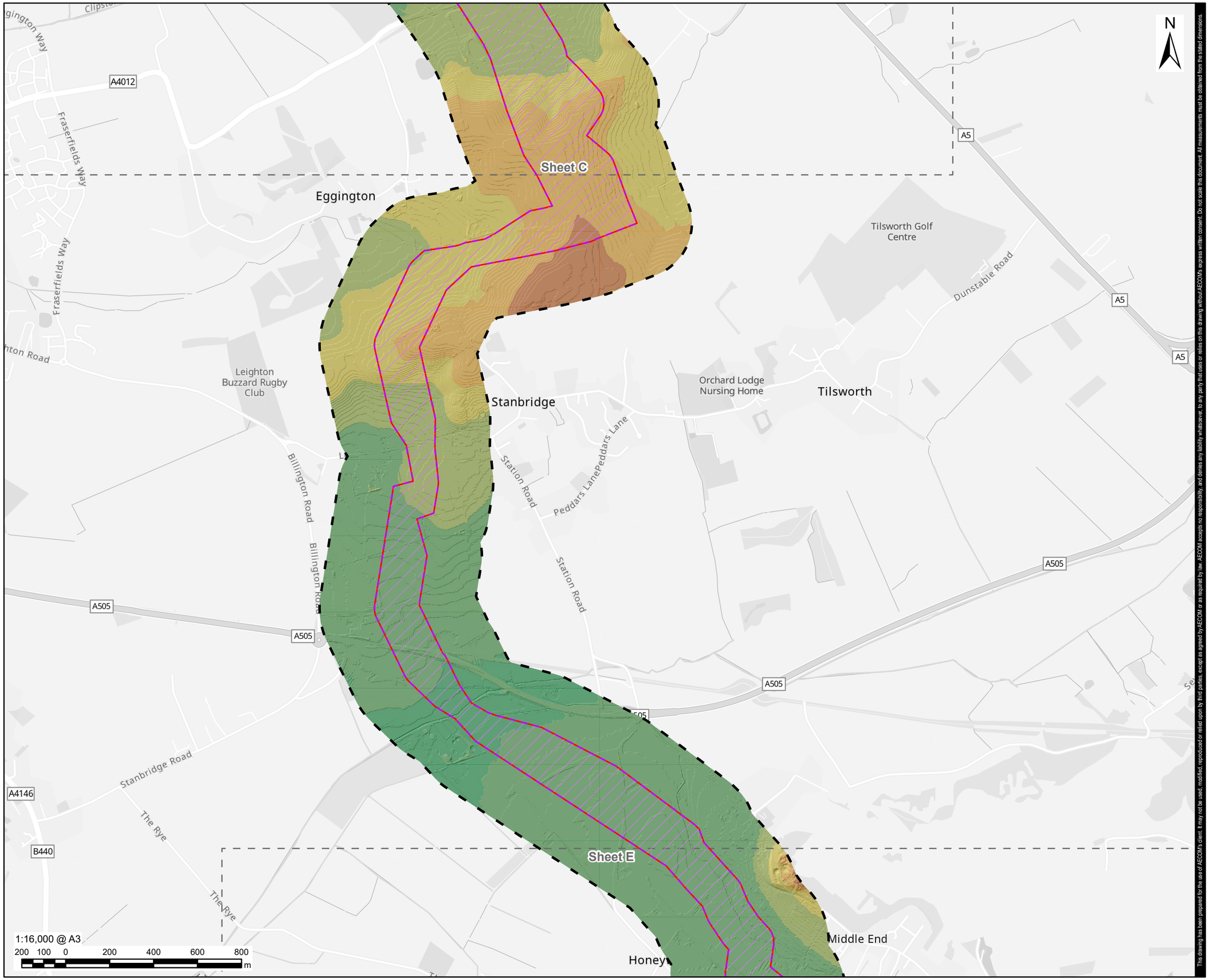

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LEGEND

- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160

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ISSUE PURPOSE

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FIGURE TITLE

Part 4 LiDAR Plan
Sheet D

FIGURE NUMBER

Figure 22-A3-18

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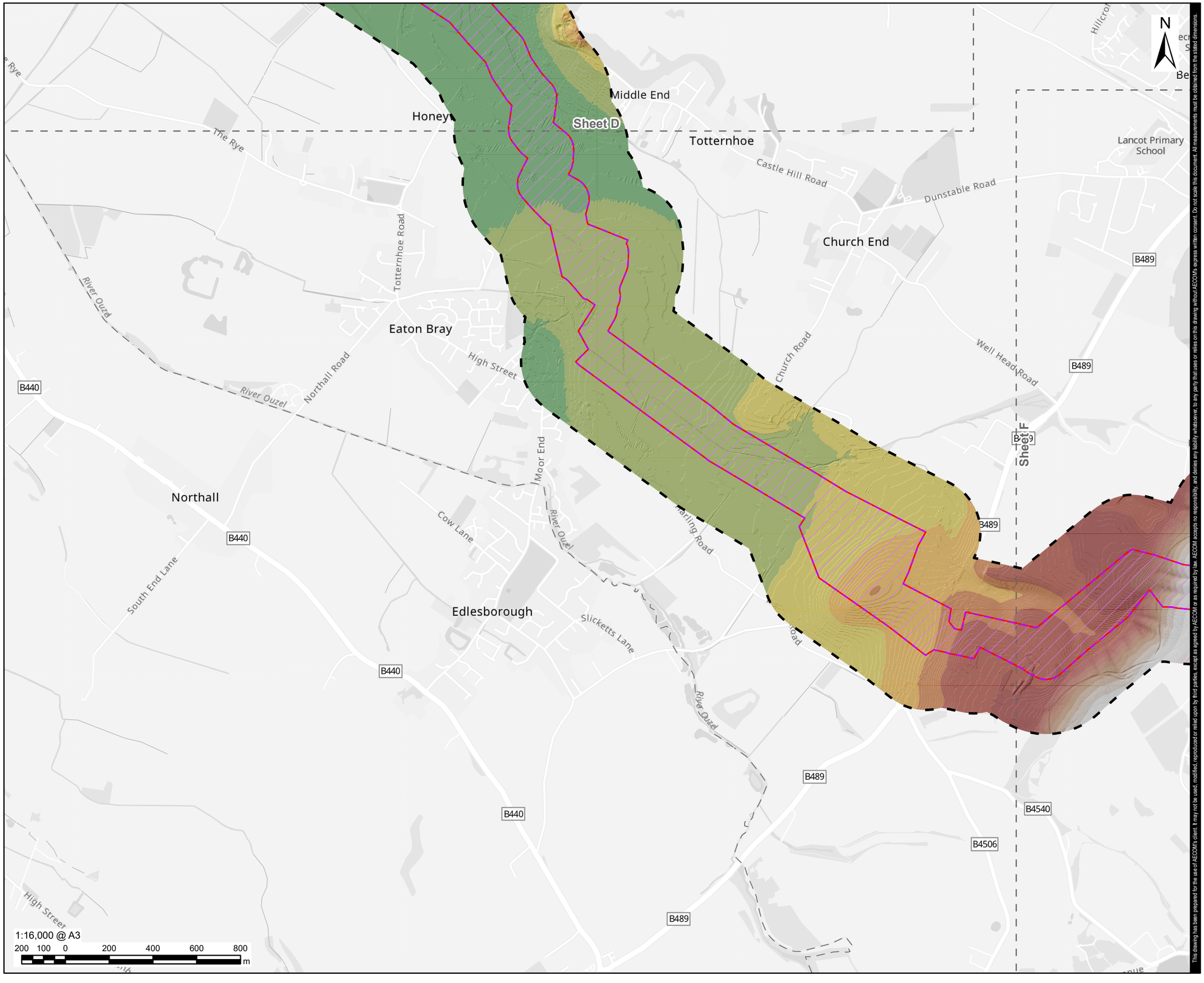

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LEGEND

- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 80 to 90
- > 90 to 100
- > 100 to 110
- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180
- > 180 to 190
- > 190 to 200
- > 200 to 210
- > 210 to 220
- > 220 to 230
- > 230 to 240
- > 240

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FIGURE TITLE

Part 4 LiDAR Plan
Sheet E

FIGURE NUMBER

Figure 22-A3-18

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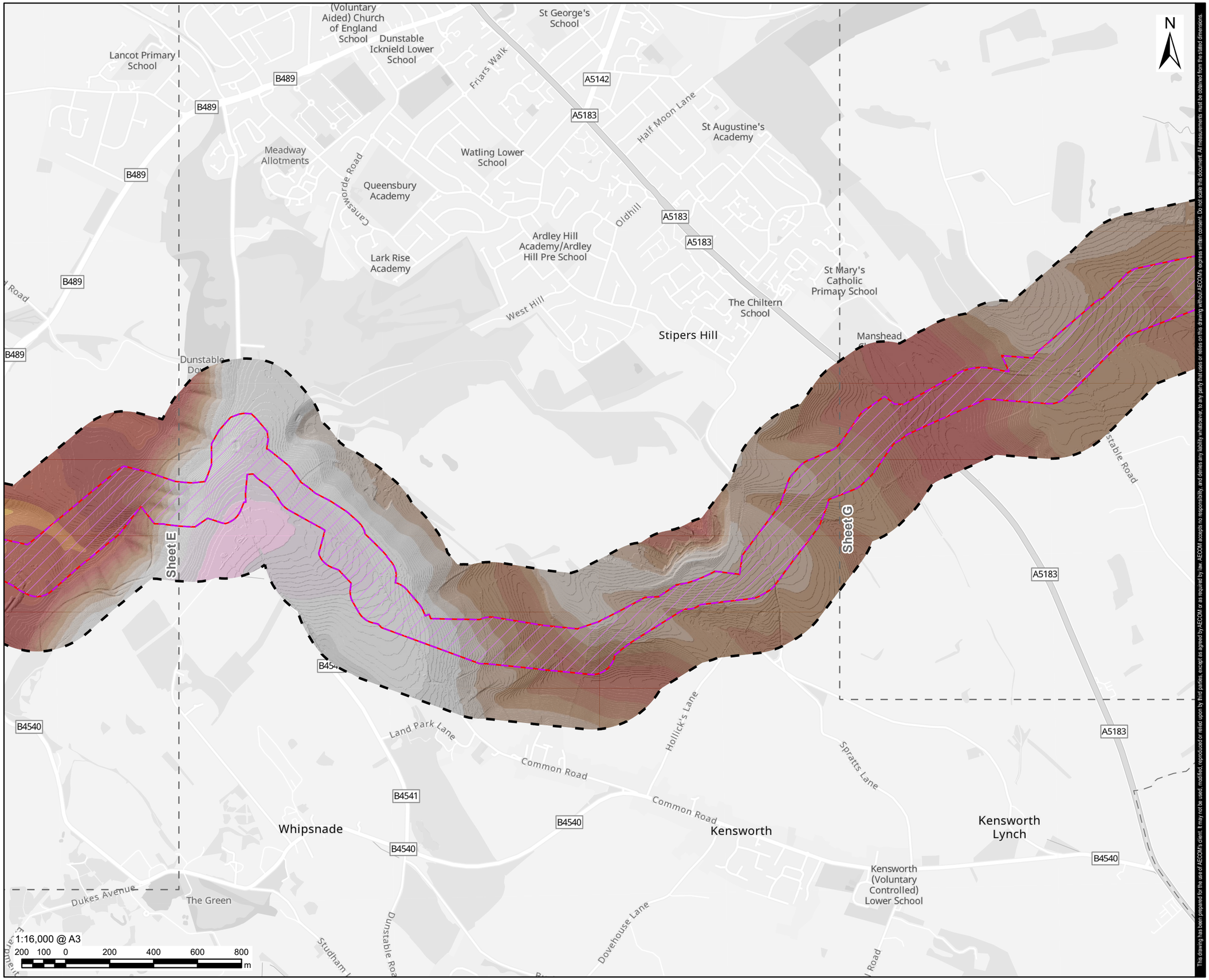

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LEGEND

- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 110 to 120
- > 120 to 130
- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180
- > 180 to 190
- > 190 to 200
- > 200 to 210
- > 210 to 220
- > 220 to 230
- > 230 to 240
- > 240

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FIGURE TITLE

Part 4 LiDAR Plan
Sheet F

FIGURE NUMBER

Figure 22-A3-18

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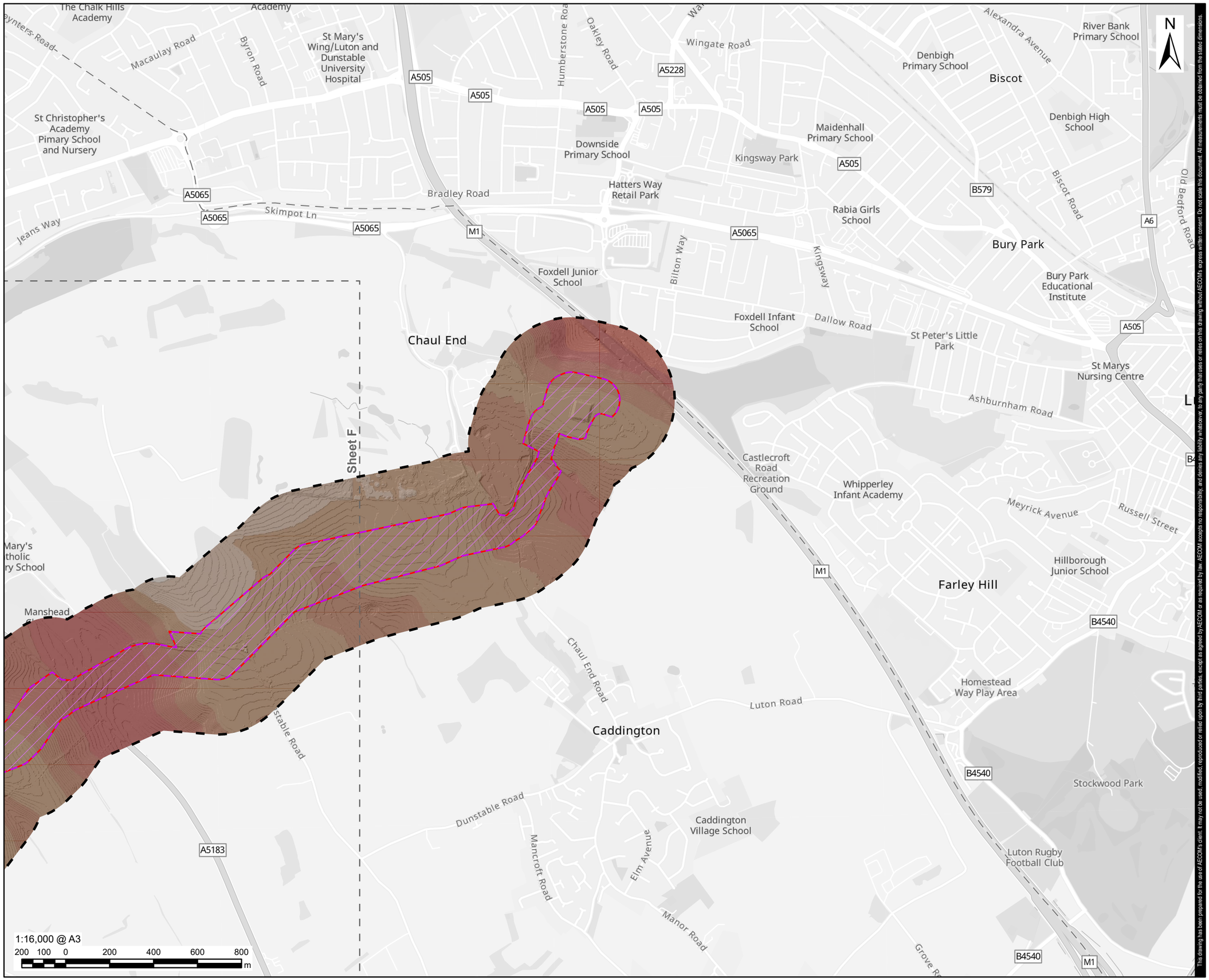

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LEGEND

- Part 4b
- 250m Study Area
- Preliminary Order Limits
- Sheet Extent

LiDAR Digital Terrain Model (m)

- > 130 to 140
- > 140 to 150
- > 150 to 160
- > 160 to 170
- > 170 to 180
- > 180 to 190
- > 190 to 200
- > 200 to 210
- > 210 to 220

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FIGURE TITLE

Part 4 LiDAR Plan
Sheet G

FIGURE NUMBER

Figure 22-A3-18

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Annex 3-2: Present Day Flood Risk

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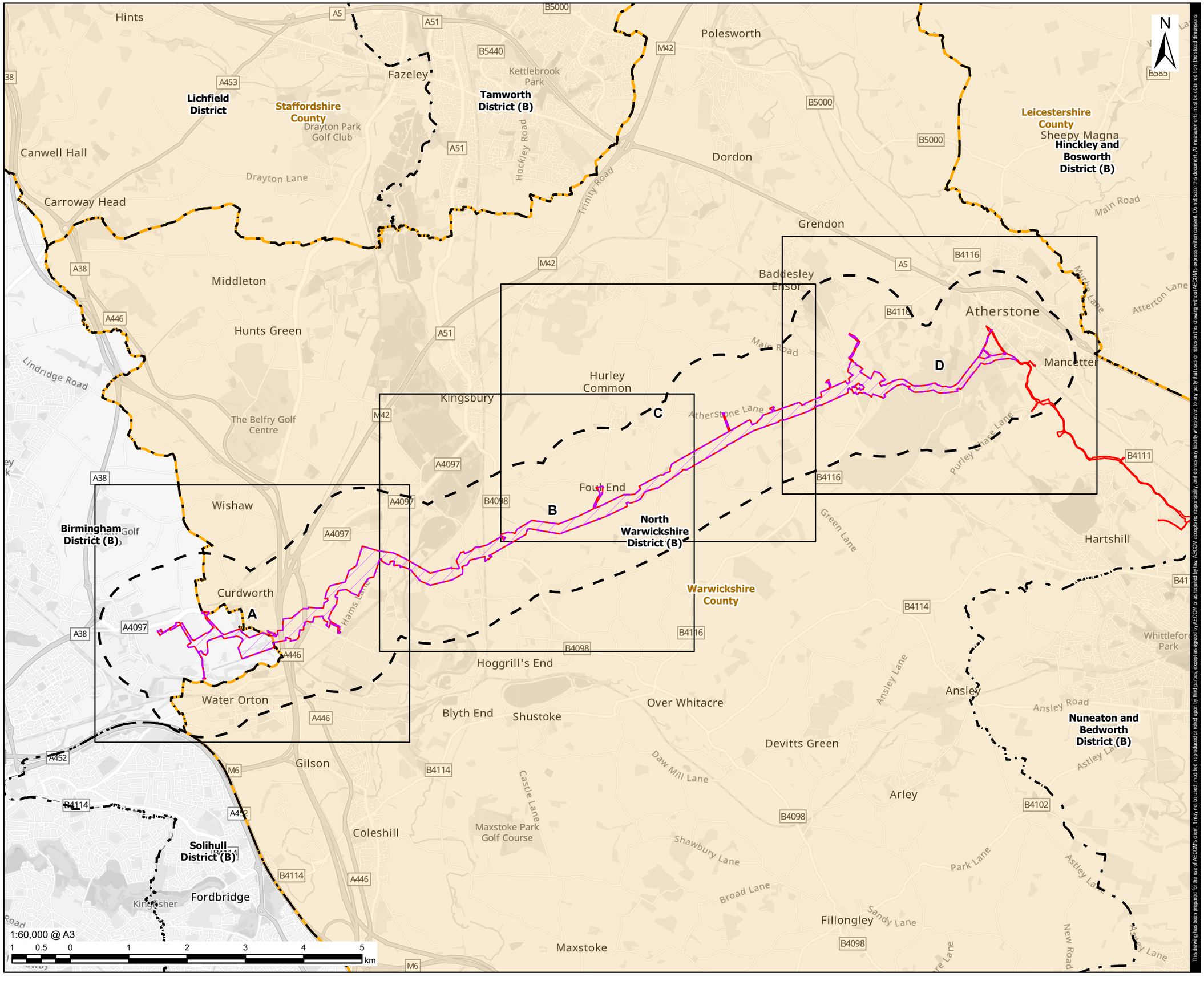

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

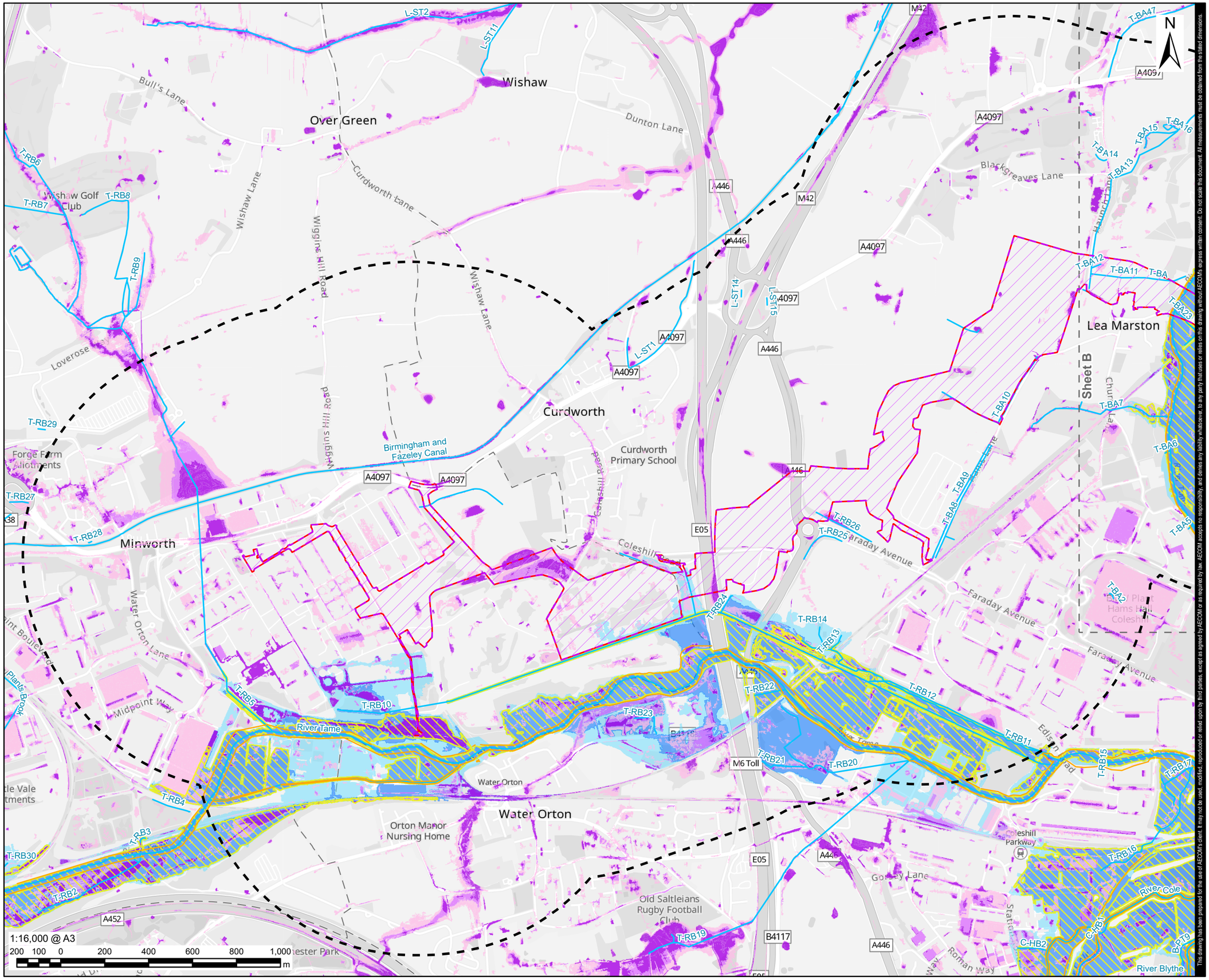
Part 1 Present Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-1

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2025-11-25

Filename: C:\Users\joanna.waters\AECOM\Affinity Water GUC GIS team - Affinity Water EIA Project\02_Maps\PEI_Report\Appendices\Water_A5_FRA\Chapter_22_A5_FRA_Part_1_Figs_Water_Env_and_Flood_Risk.aprx



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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 1 Present Day Flood Risk (Fluvial and Surface Water) Sheet A

FIGURE NUMBER

Figure 22-A3-1

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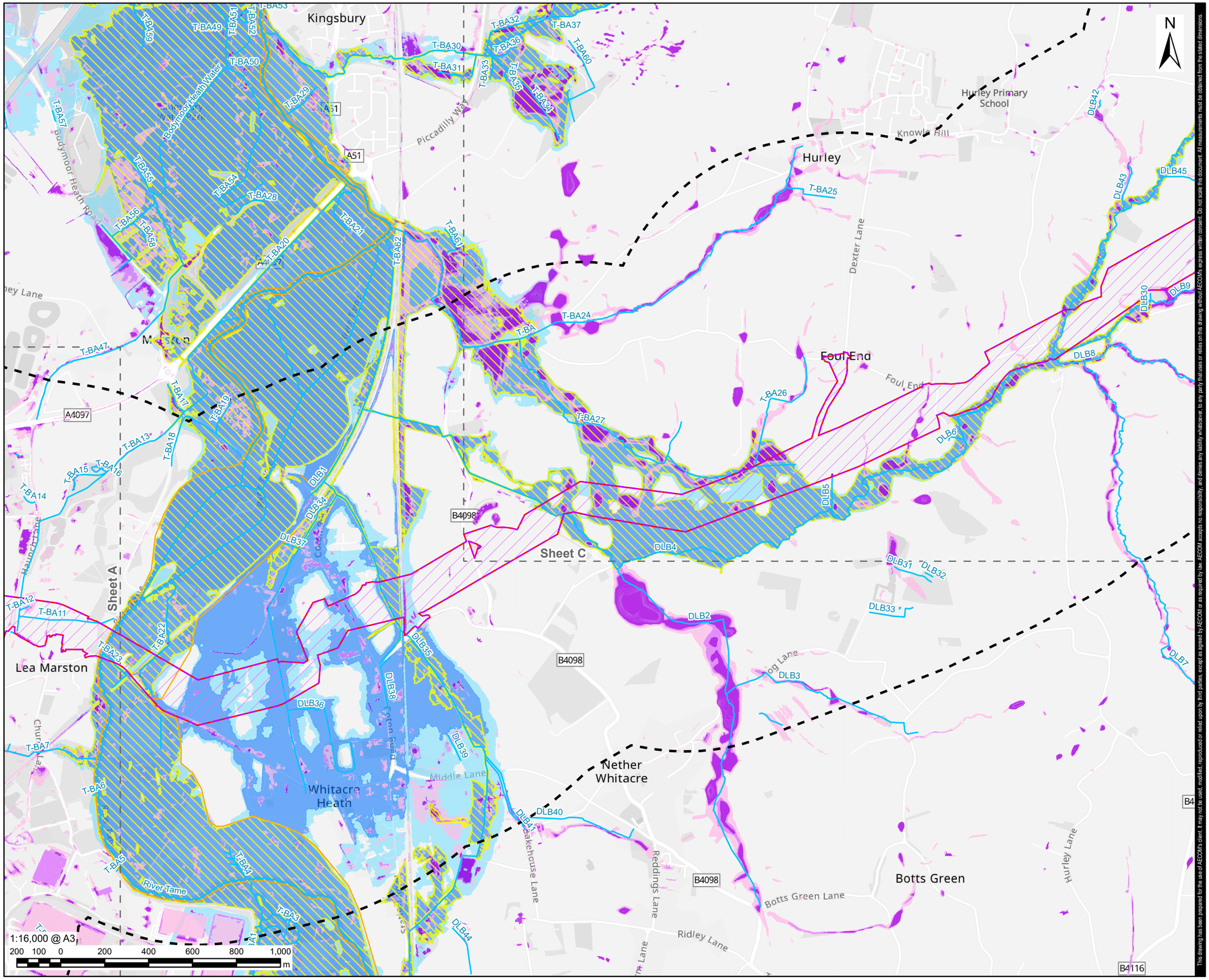

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 1 Present Day Flood Risk (Fluvial and Surface Water) Sheet B

FIGURE NUMBER

Figure 22-A3-1

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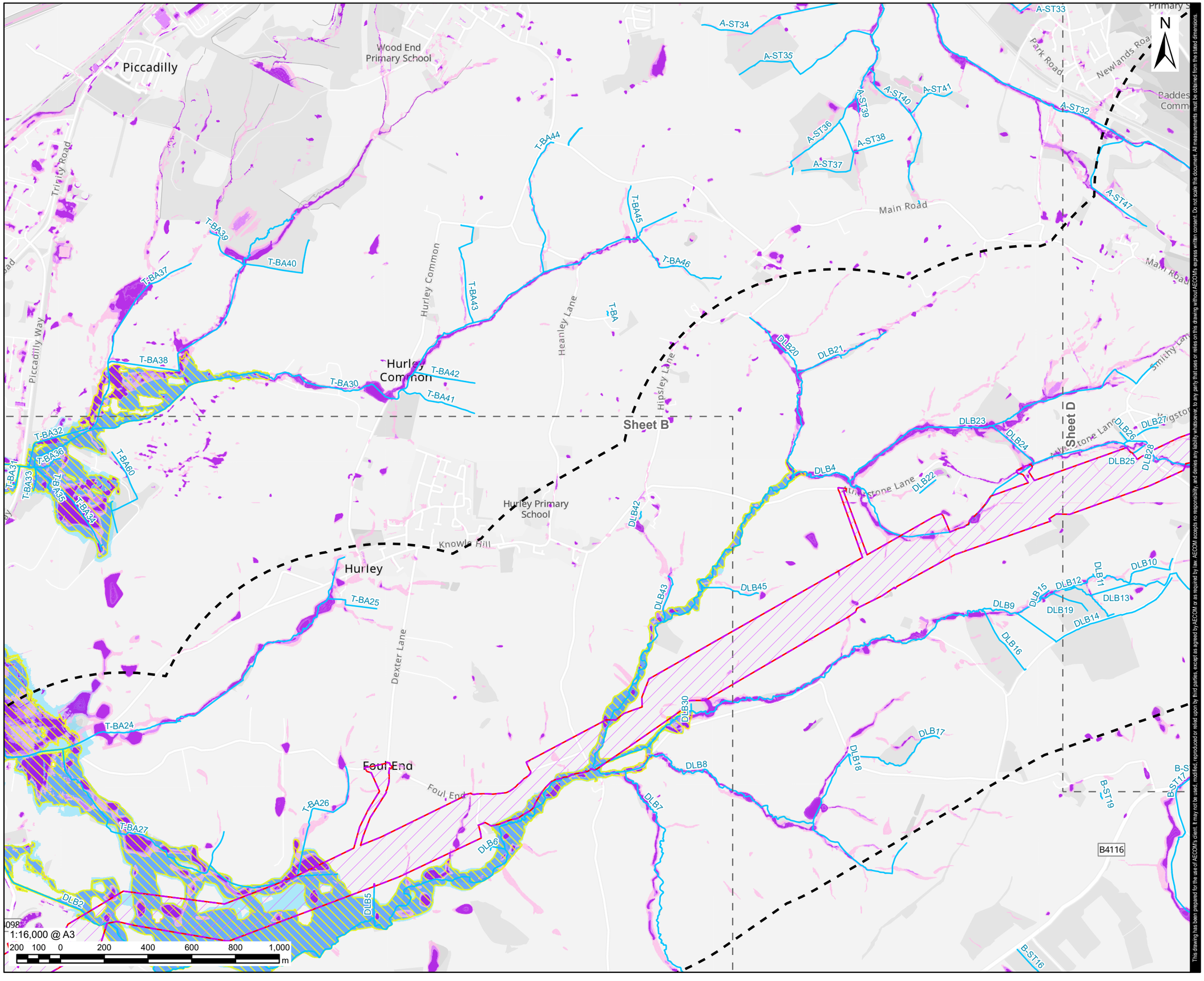

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 1 Present Day Flood Risk (Fluvial and Surface Water) Sheet C

FIGURE NUMBER

Figure 22-A3-1

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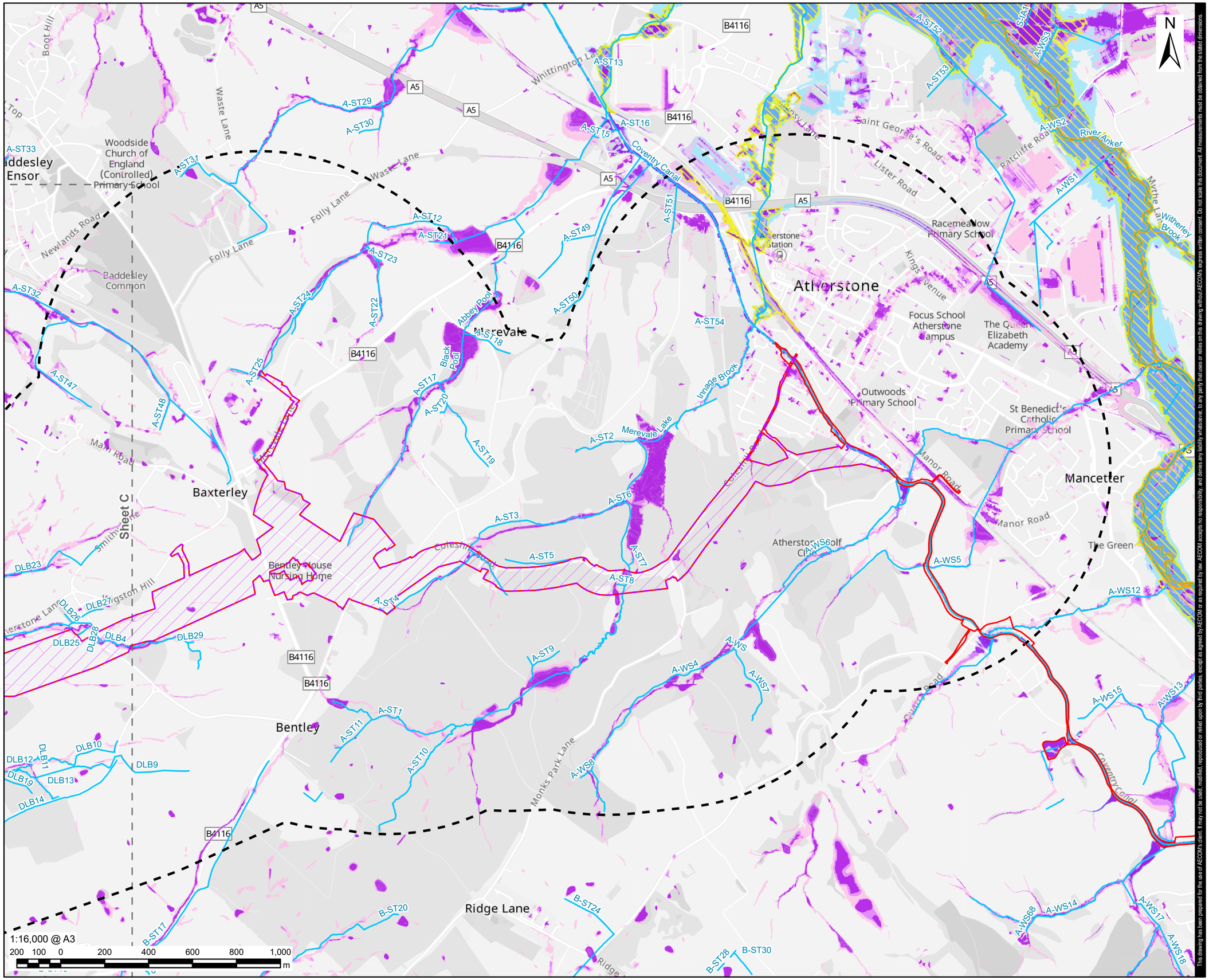

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 1 Present Day Flood Risk (Fluvial and Surface Water) Sheet D

FIGURE NUMBER

Figure 22-A3-1

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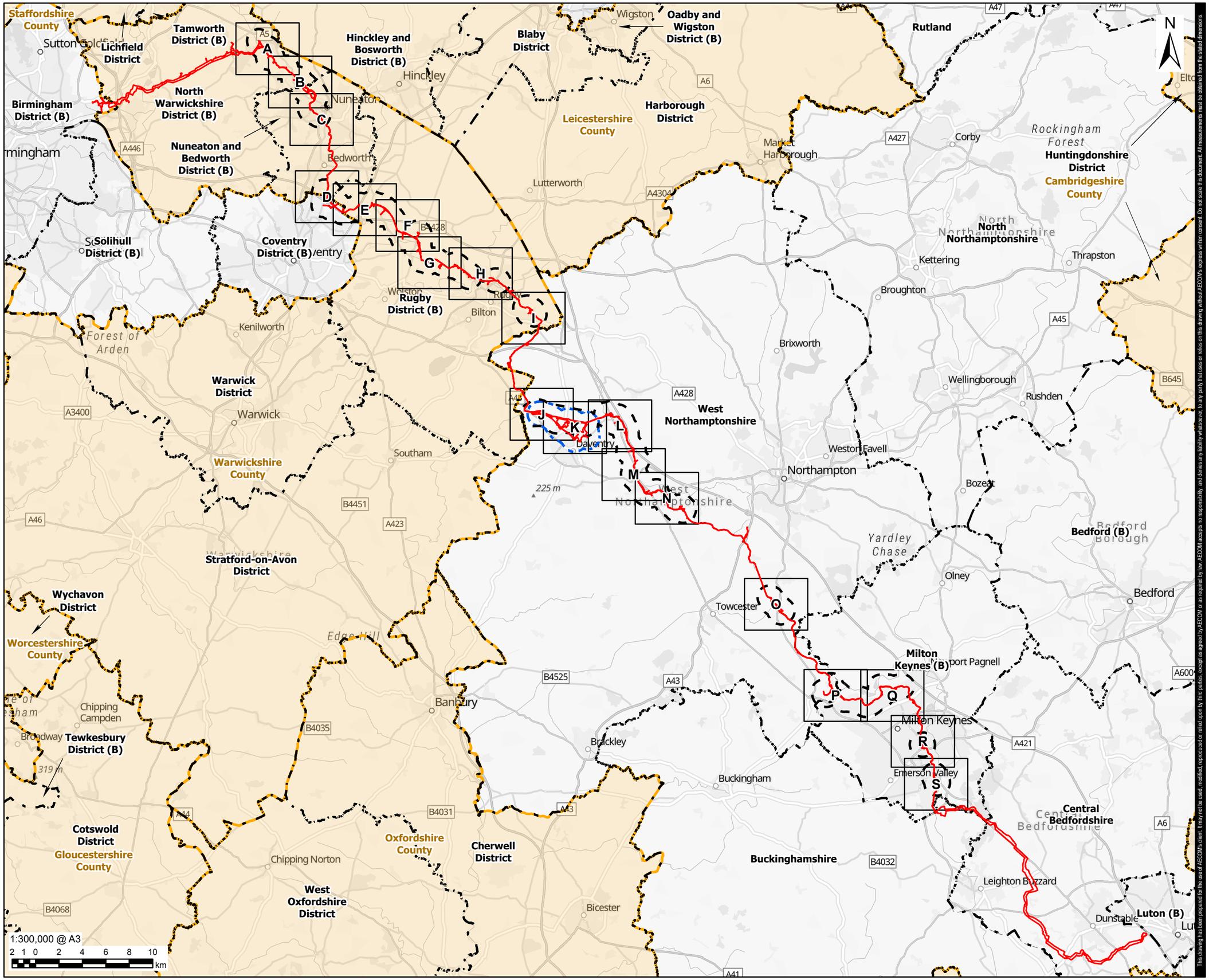

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LEGEND

- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-2

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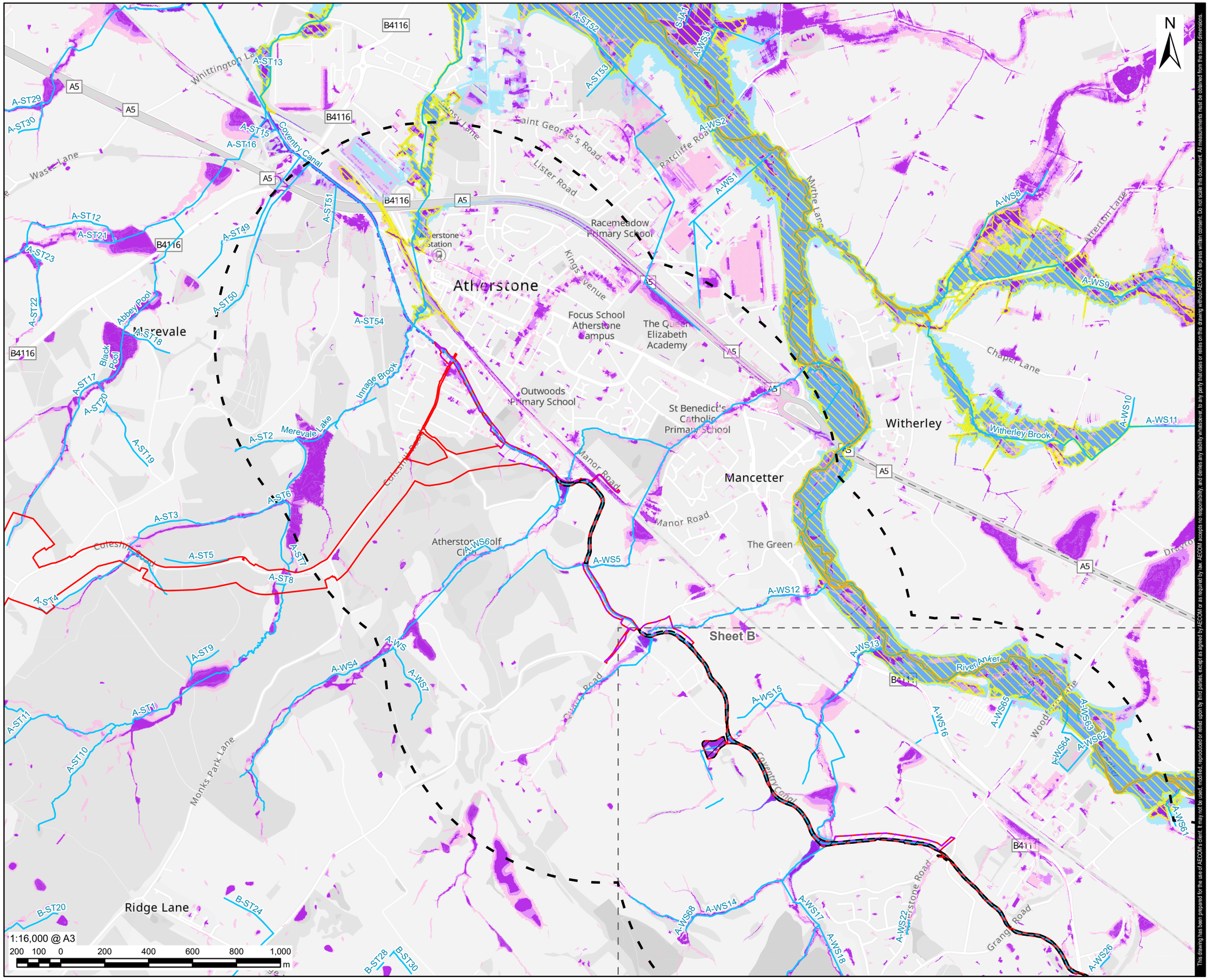

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet A

FIGURE NUMBER

Figure 22-A3-2

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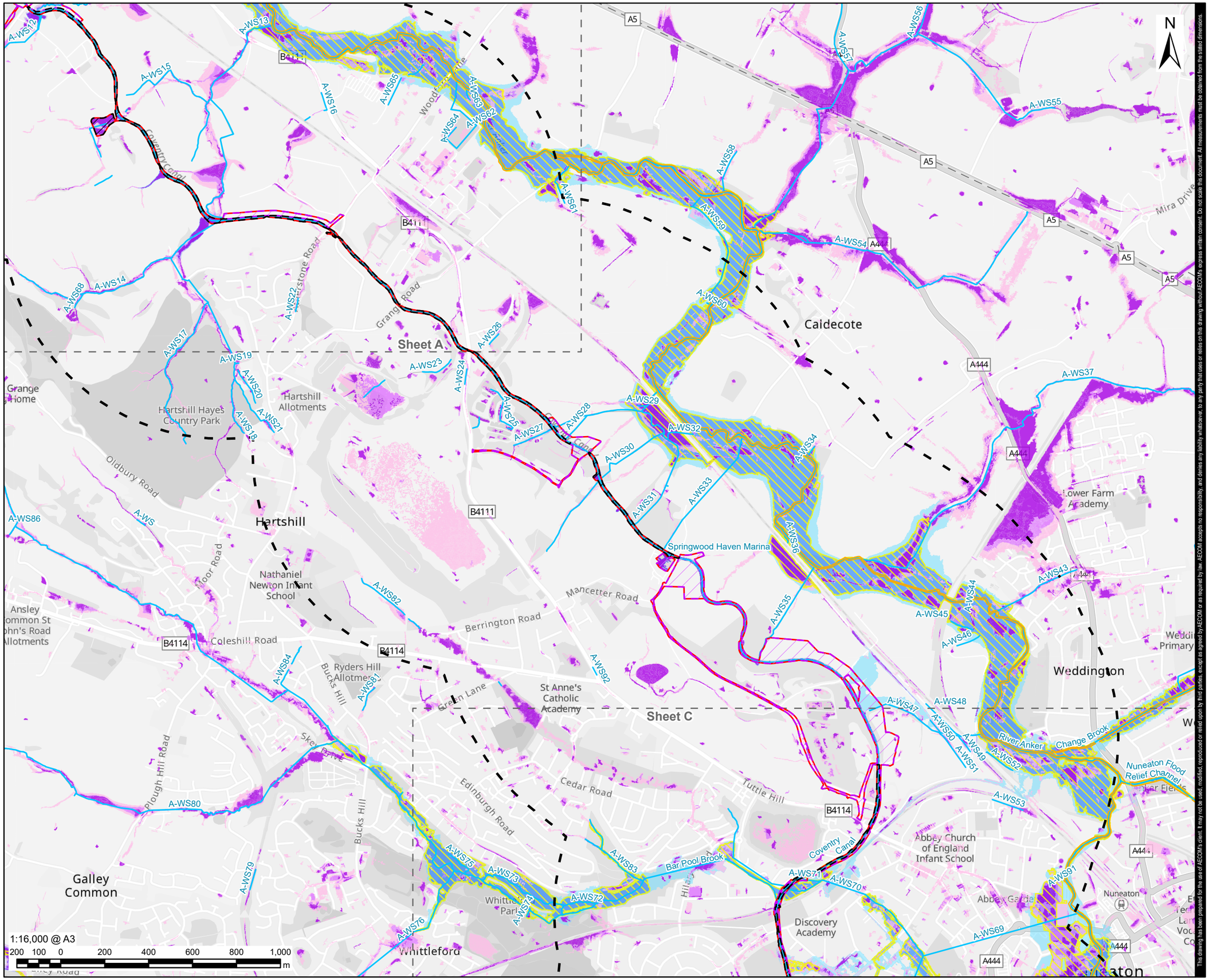

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet B

FIGURE NUMBER

Figure 22-A3-2

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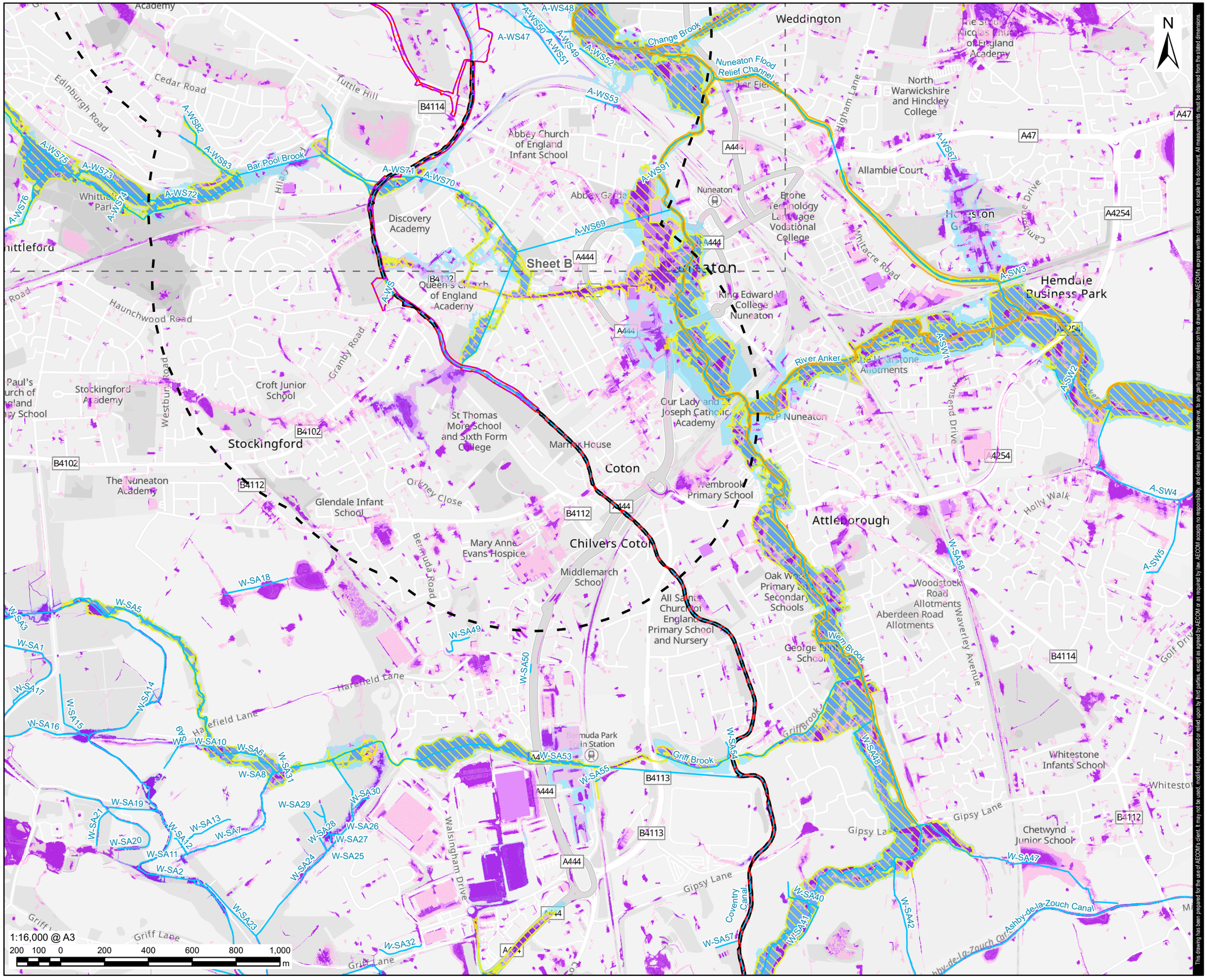

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet C

FIGURE NUMBER

Figure 22-A3-2

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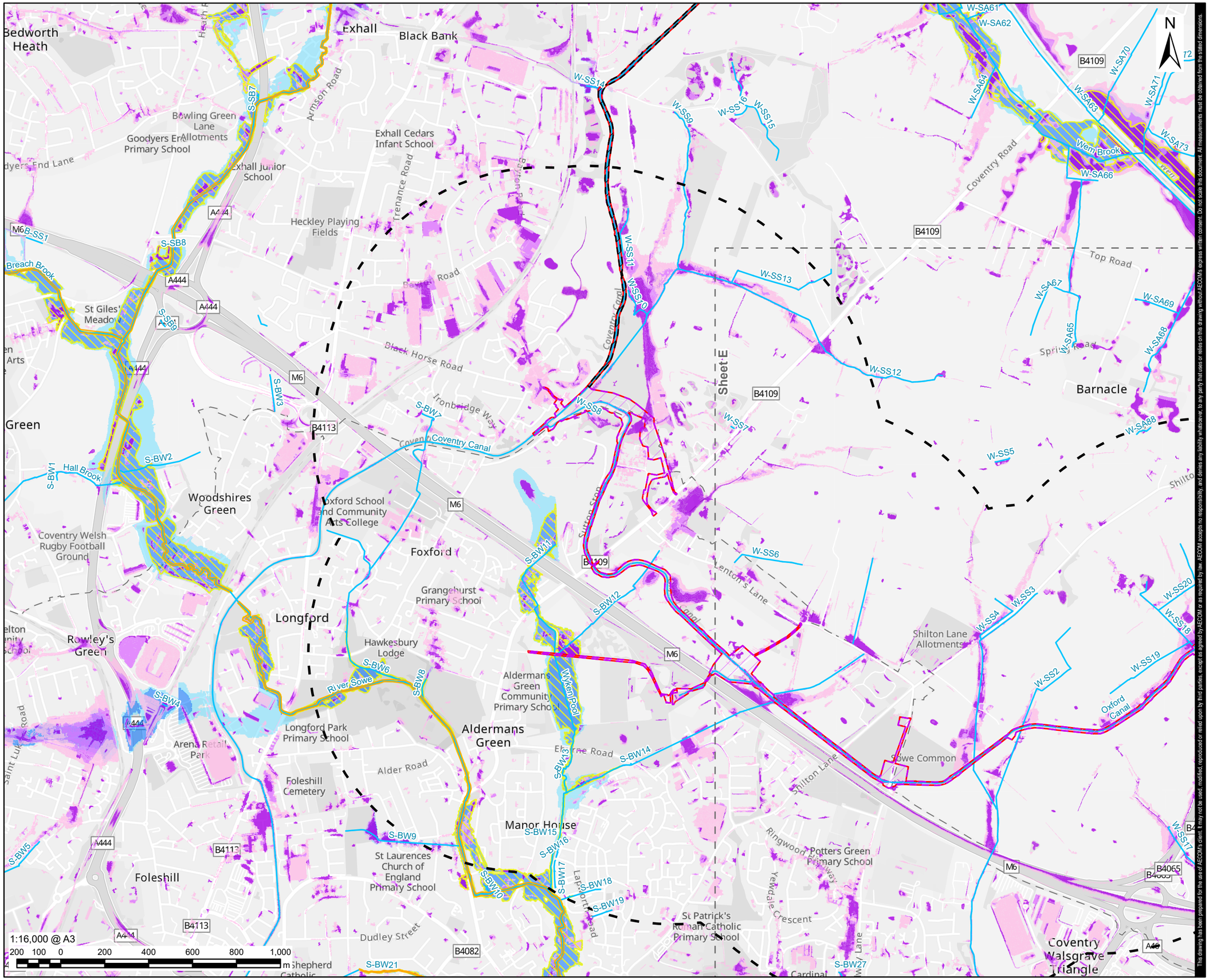

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet D

FIGURE NUMBER

Figure 22-A3-2

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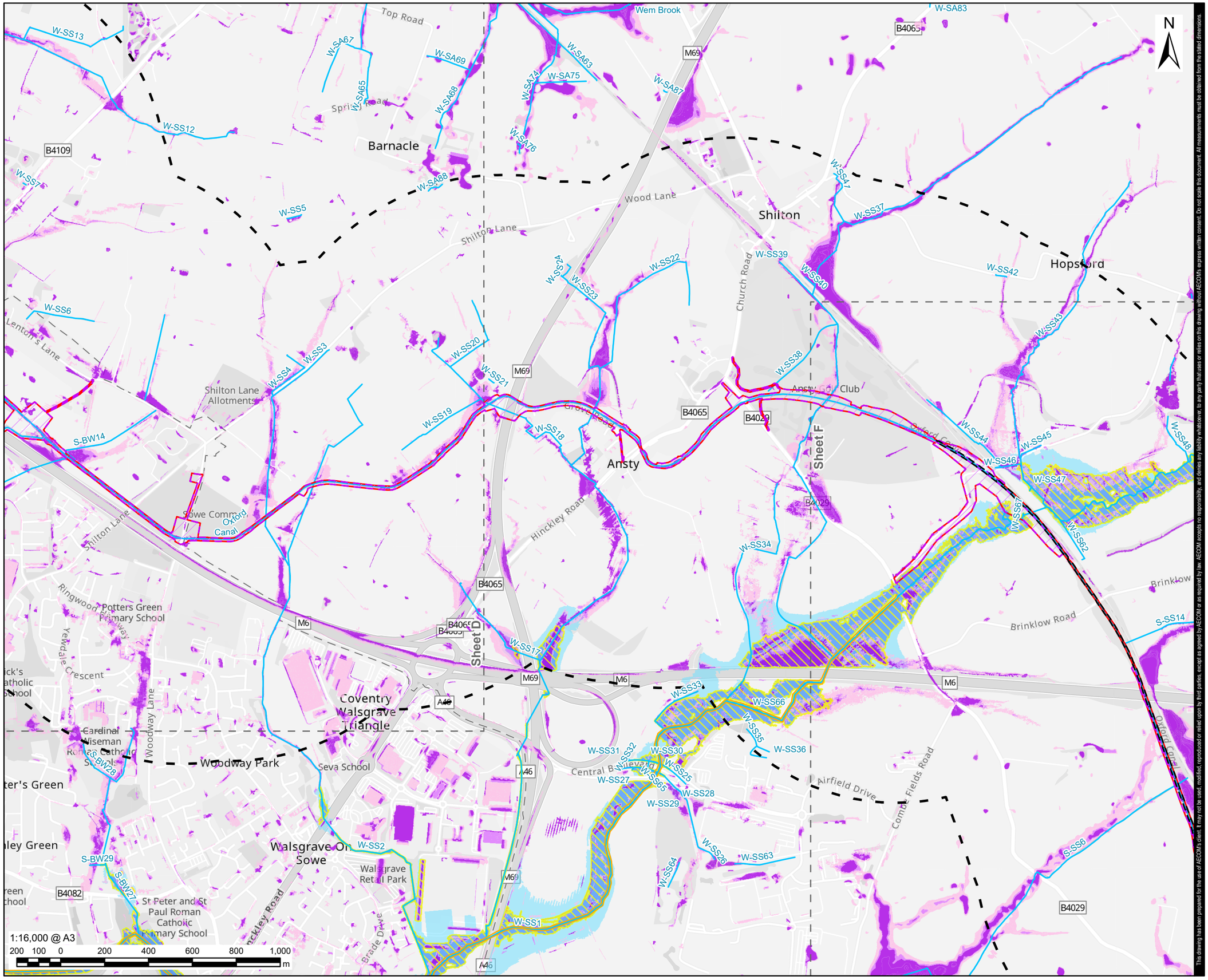

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet E

FIGURE NUMBER

Figure 22-A3-2

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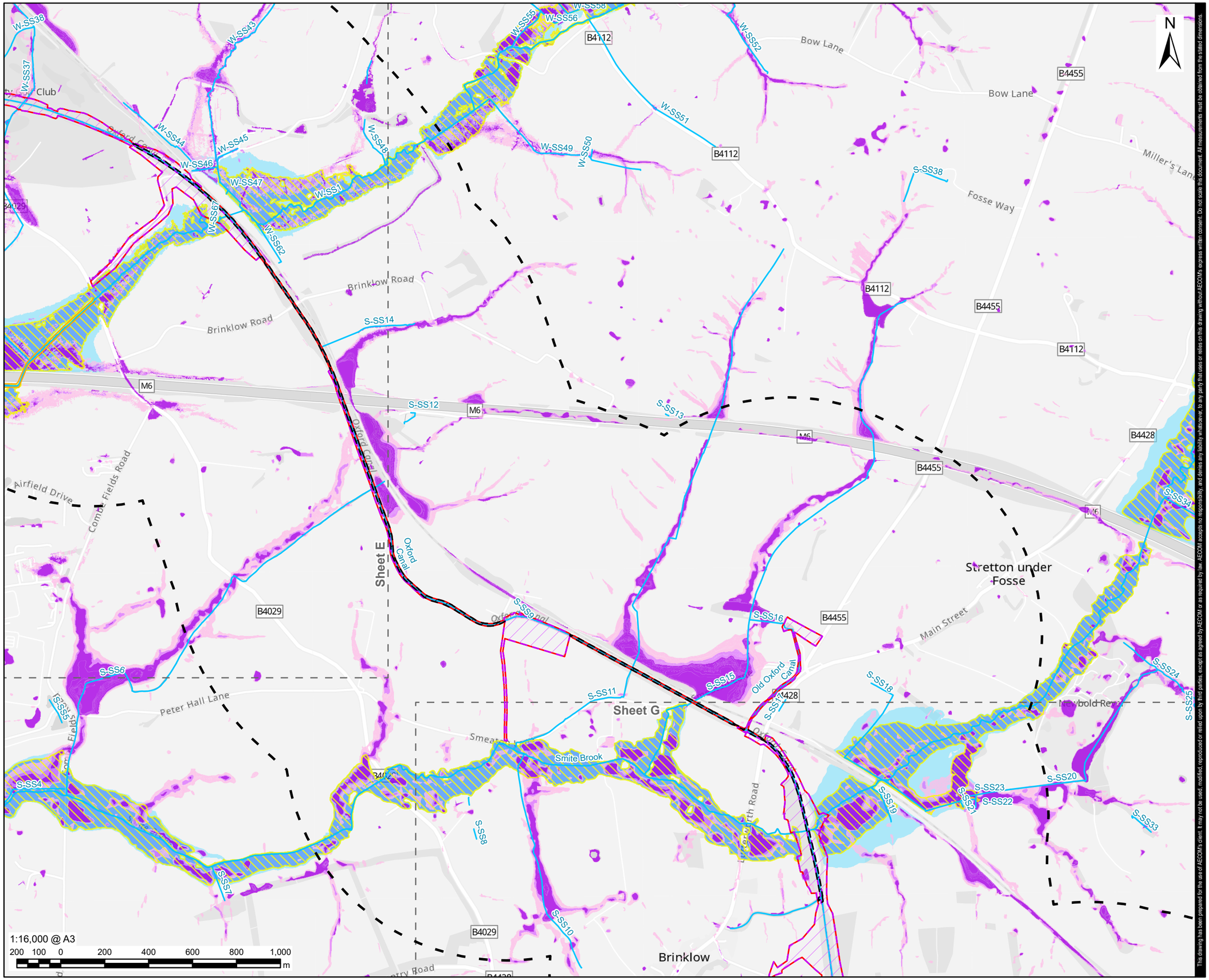

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet F

FIGURE NUMBER

Figure 22-A3-2

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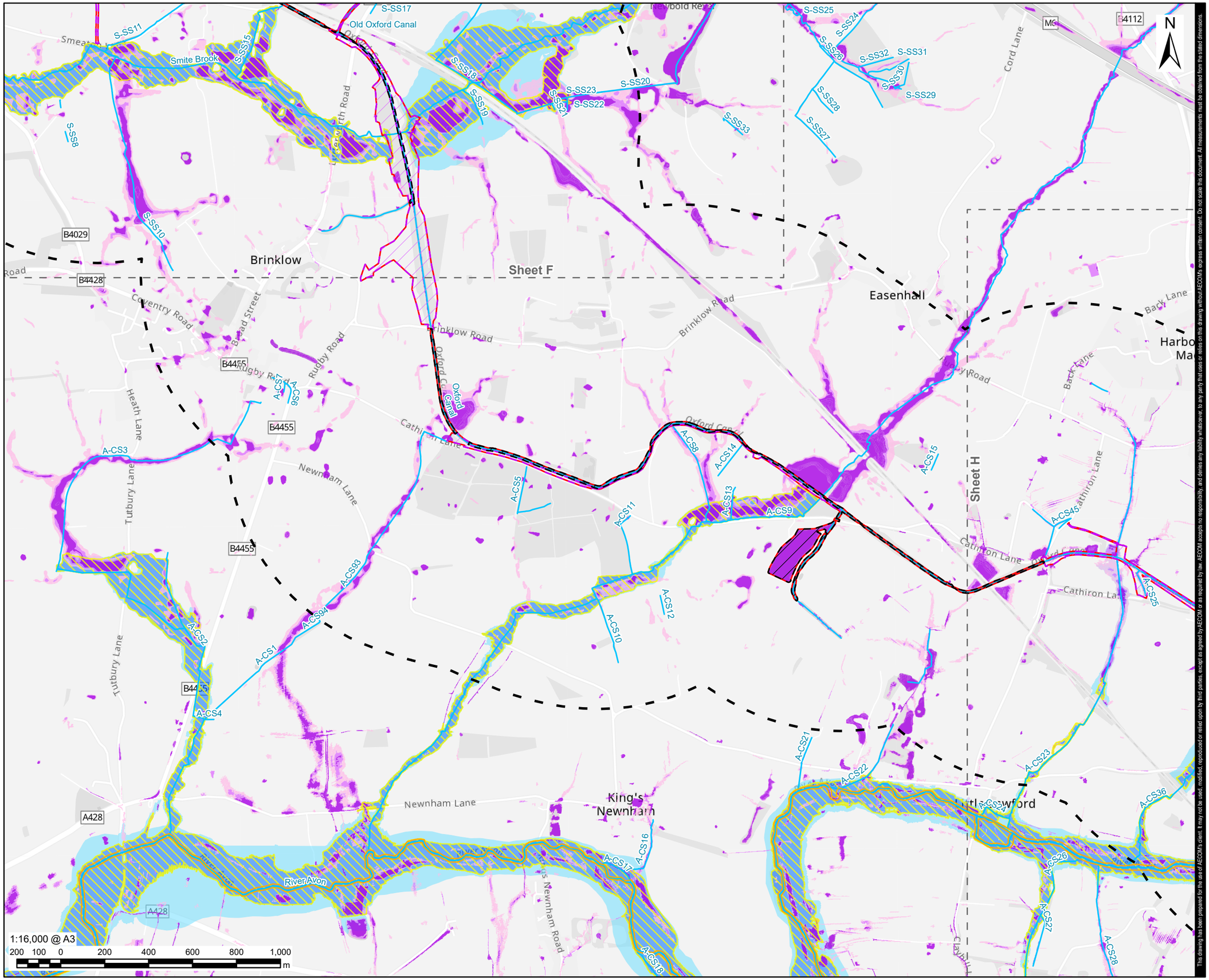

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet G

FIGURE NUMBER

Figure 22-A3-2

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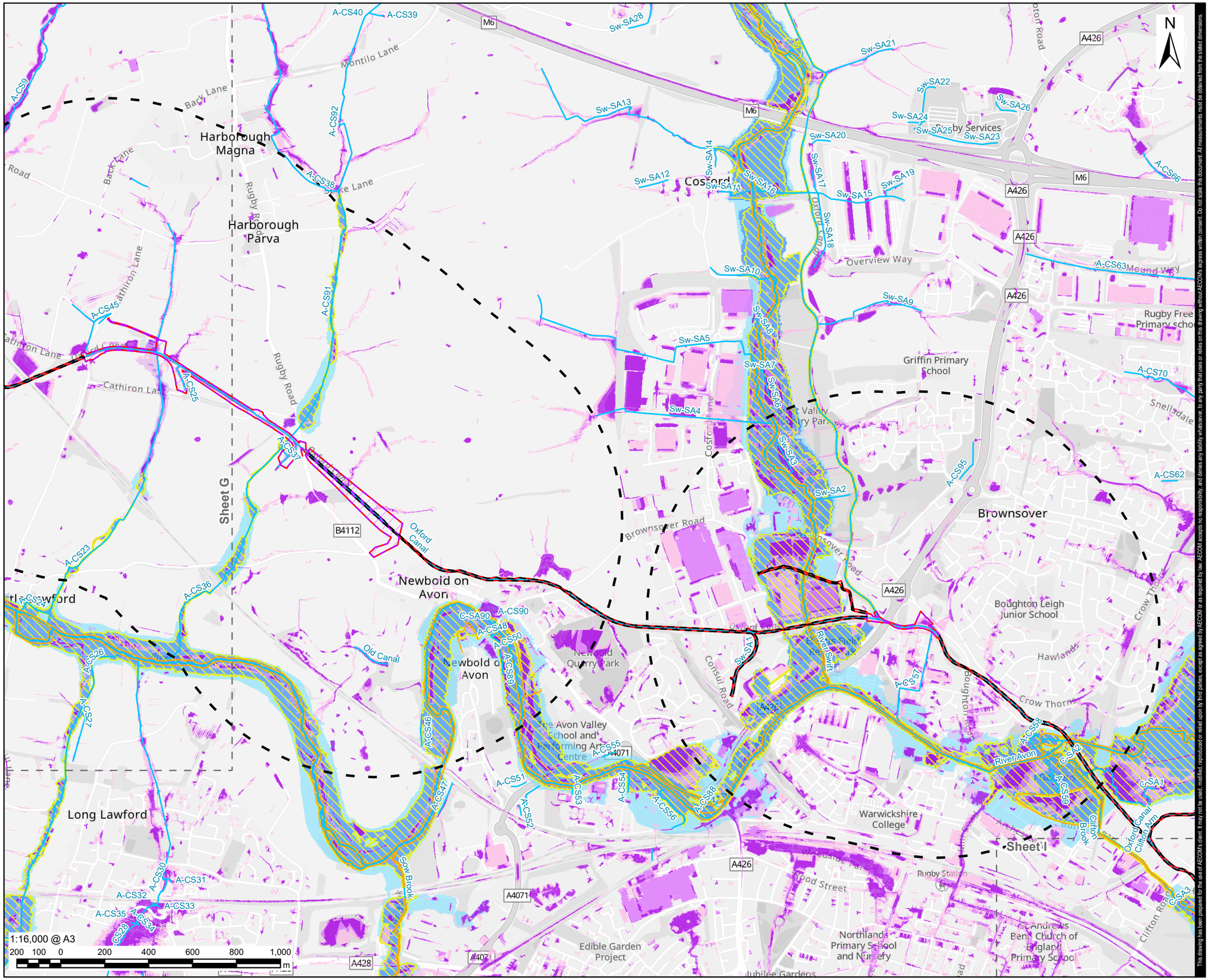

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet H

FIGURE NUMBER

Figure 22-A3-2

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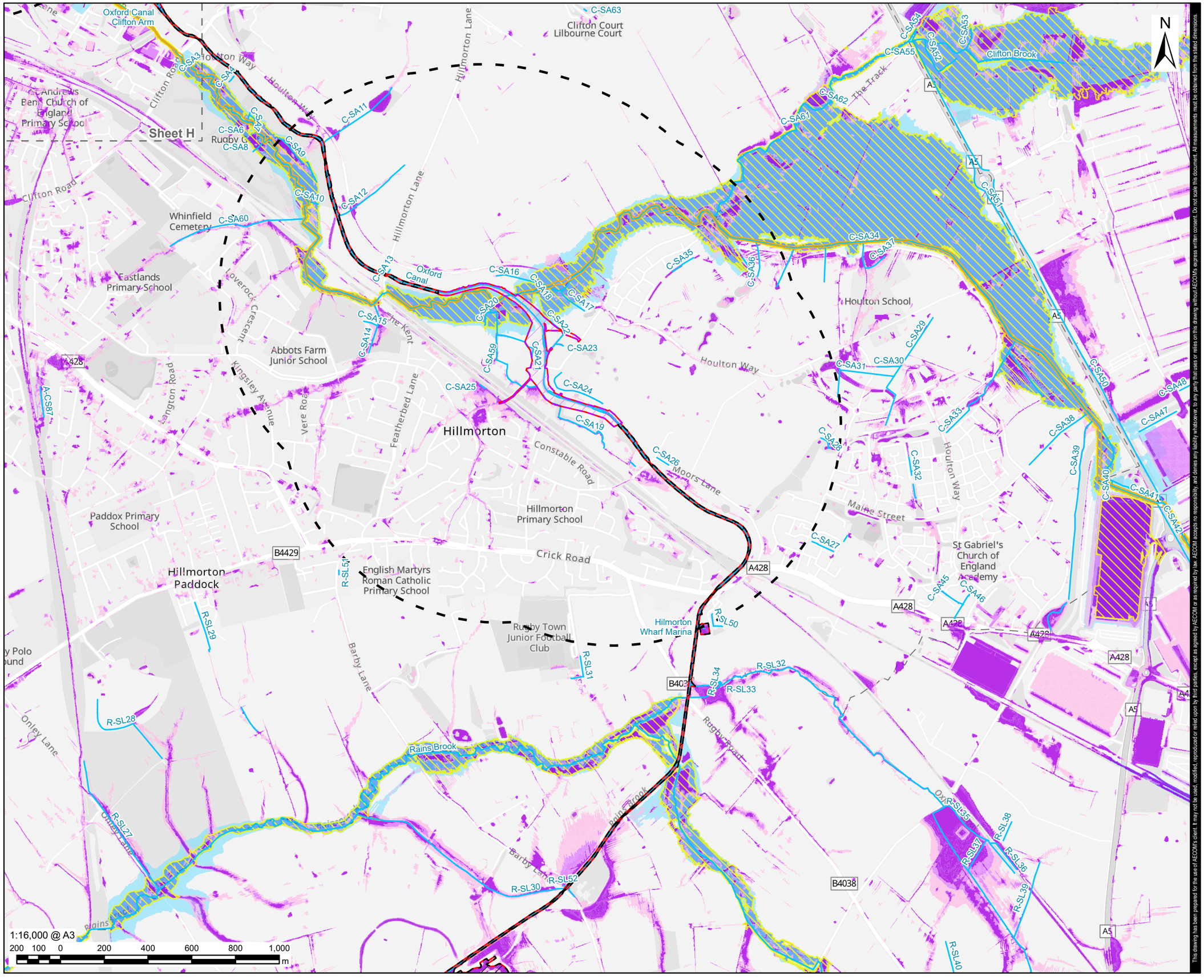

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
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Defended Flood Present Day

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet I

FIGURE NUMBER

Figure 22-A3-2

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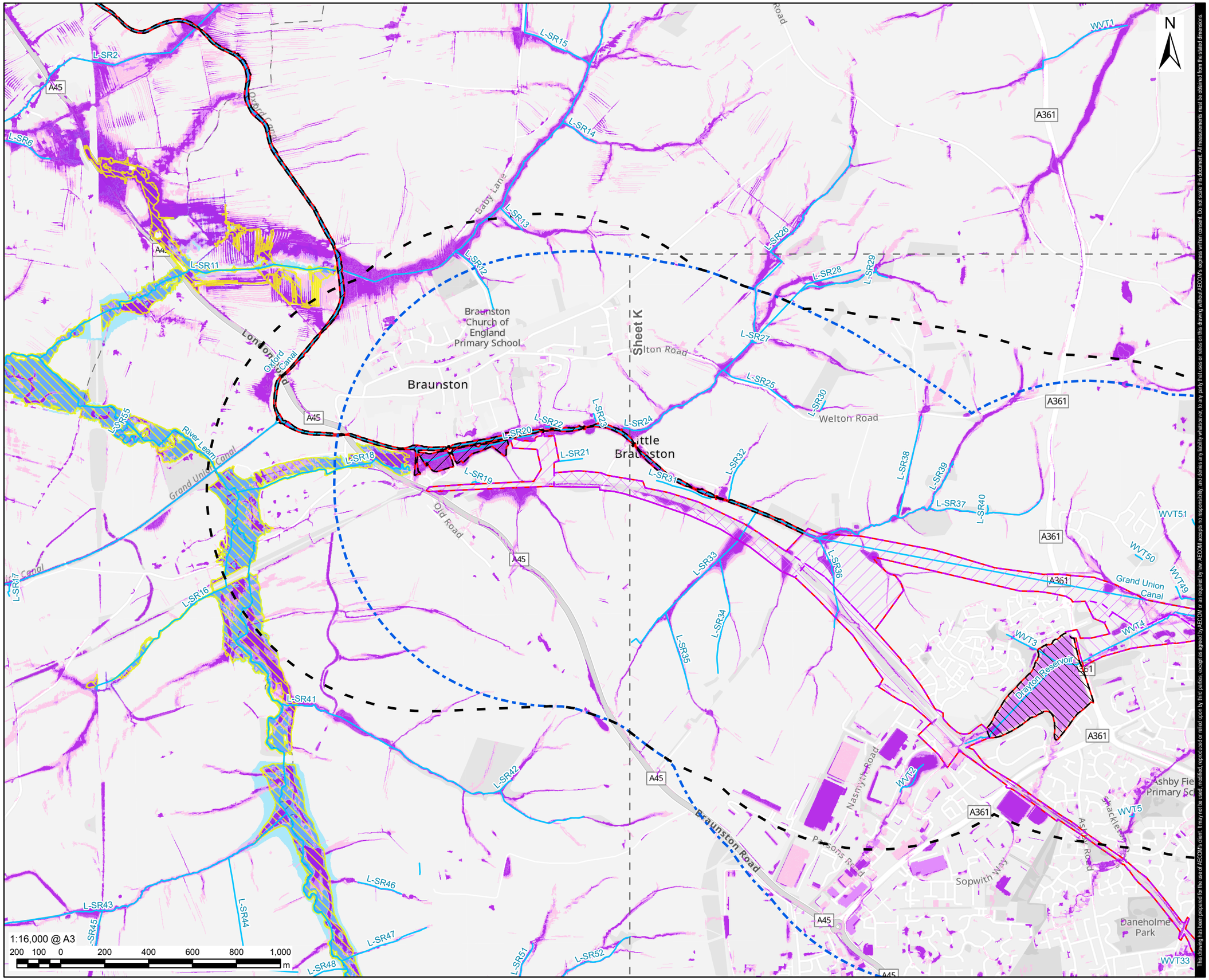

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Basingstoke, RG21 7PP
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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet J

FIGURE NUMBER

Figure 22-A3-2

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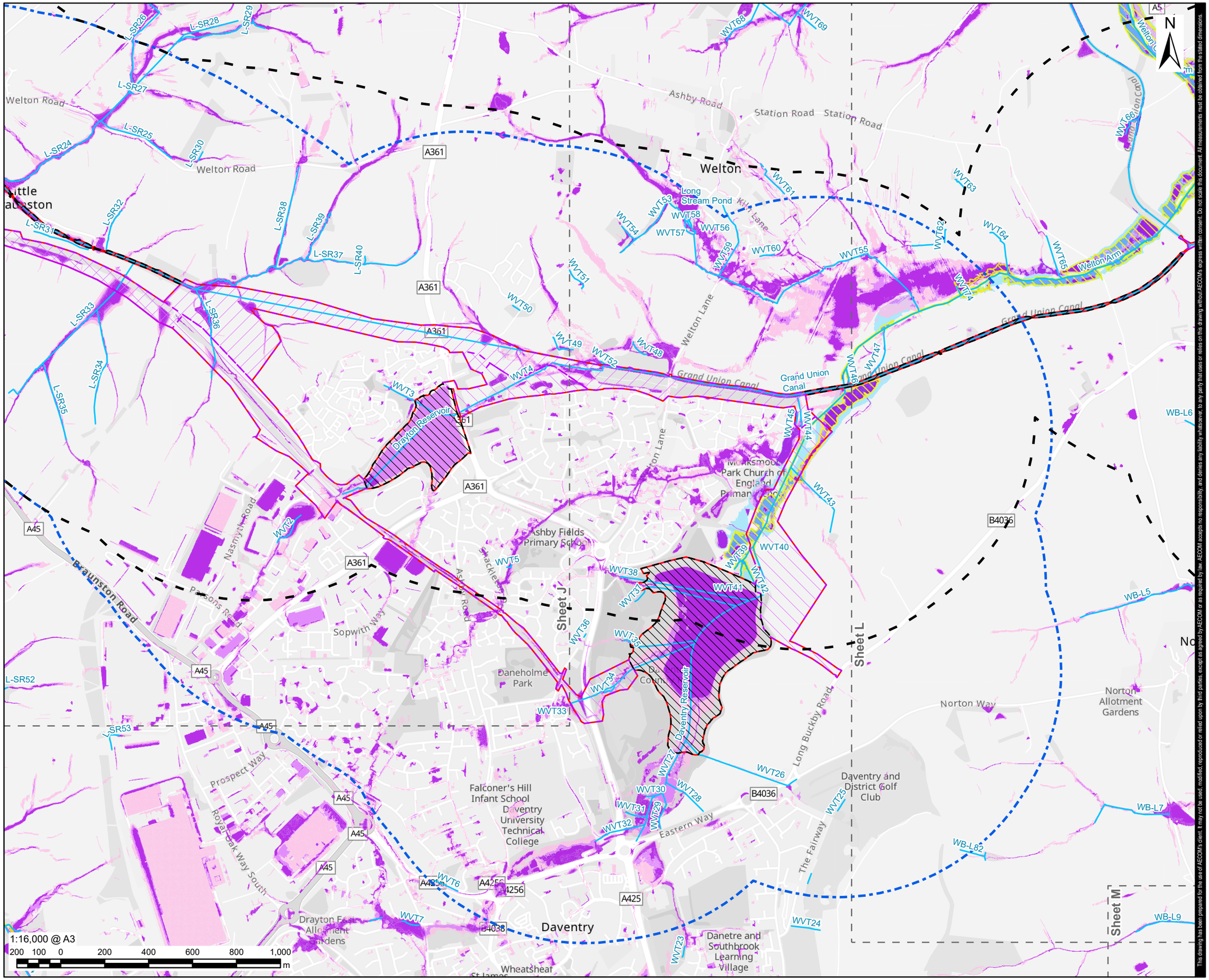

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet K

FIGURE NUMBER

Figure 22-A3-2

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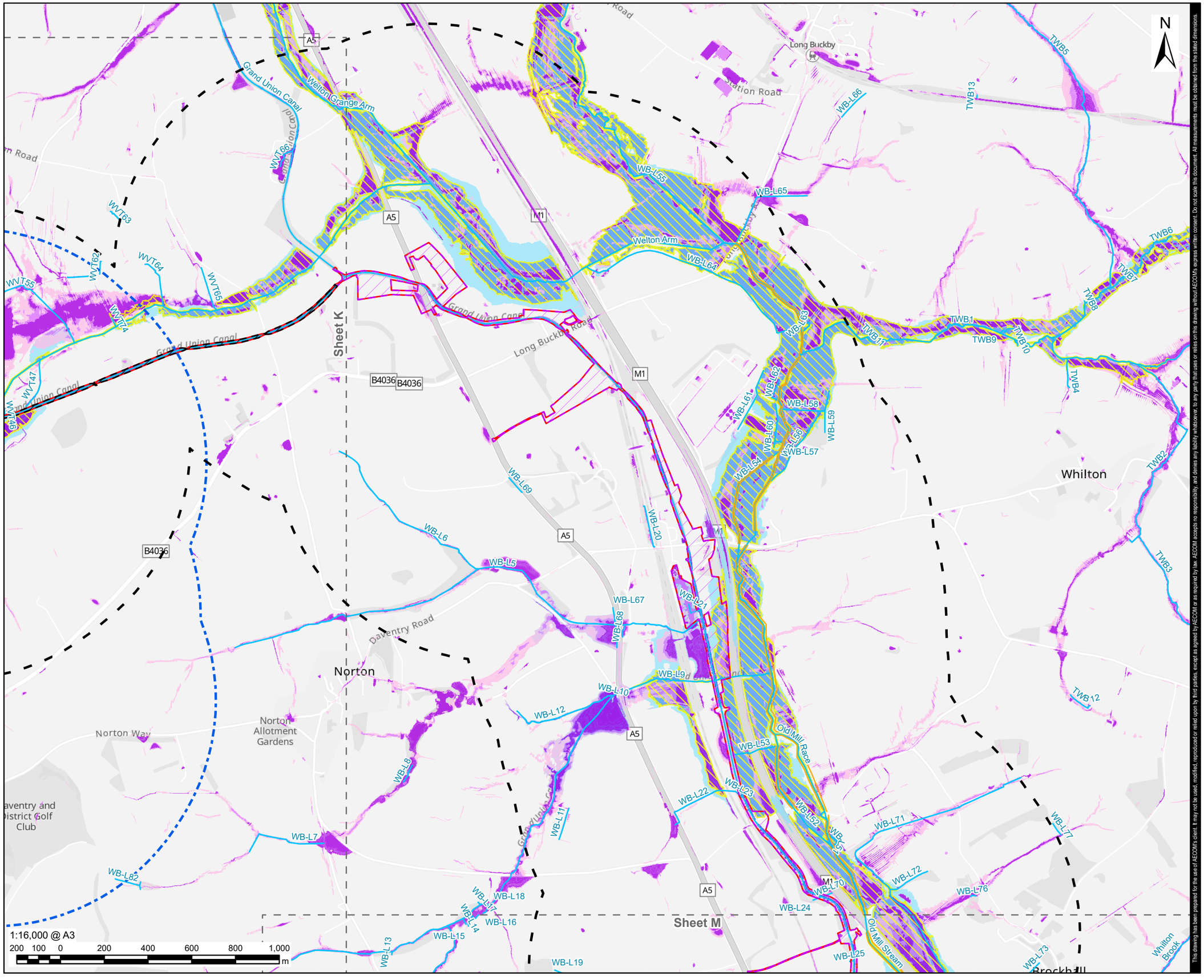

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet L

FIGURE NUMBER

Figure 22-A3-2

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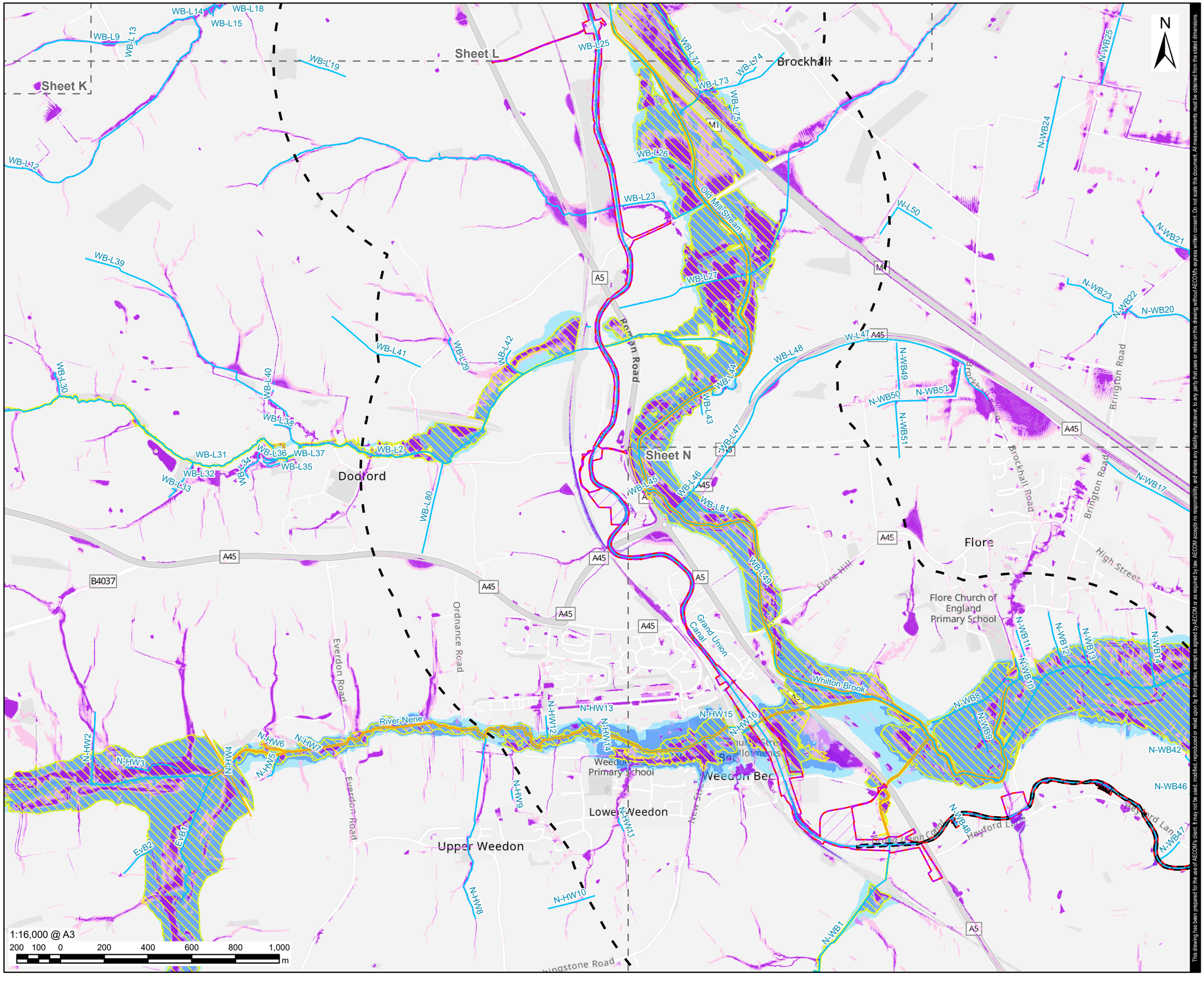

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet M

FIGURE NUMBER

Figure 22-A3-2

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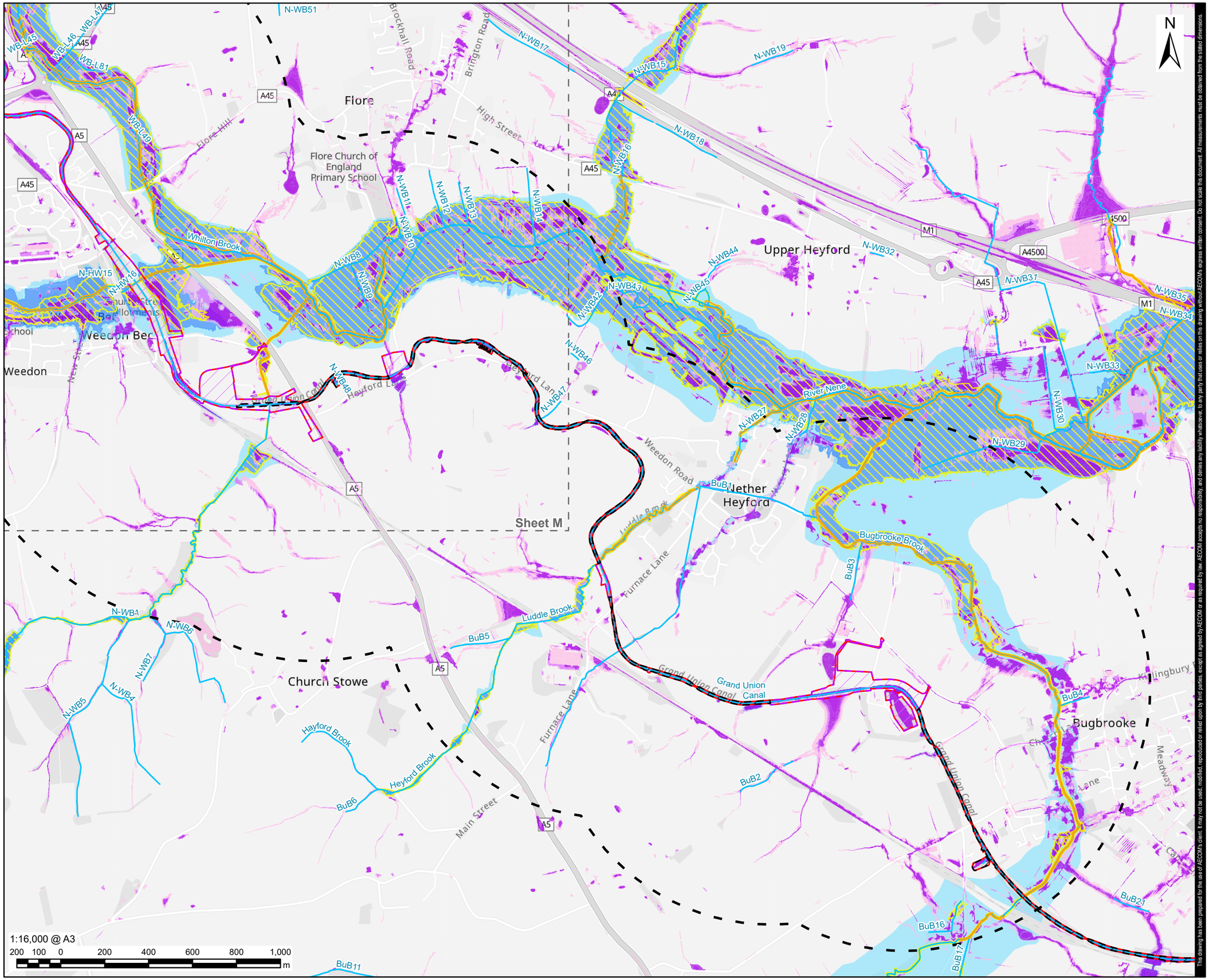

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet N

FIGURE NUMBER

Figure 22-A3-2

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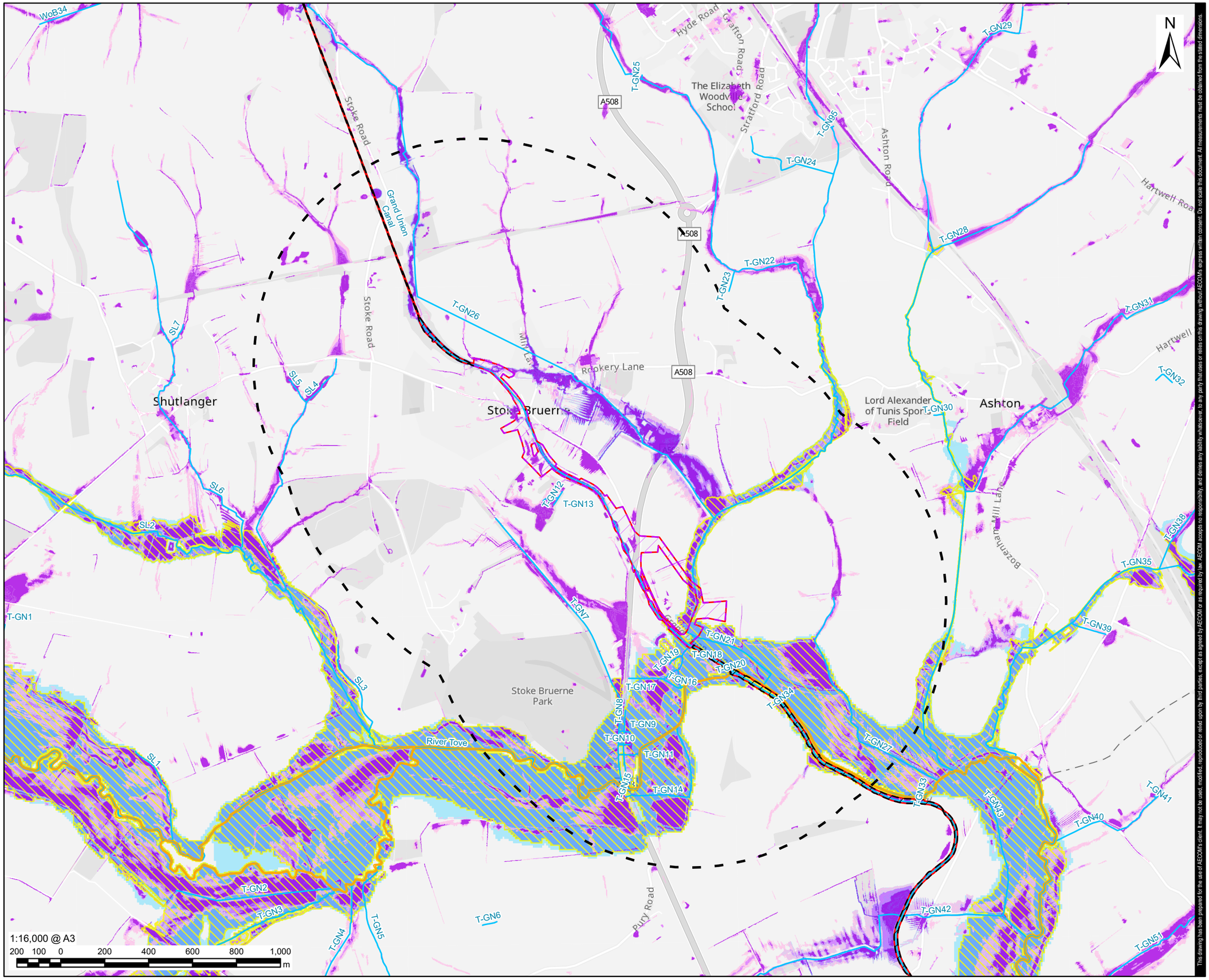

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet O

FIGURE NUMBER

Figure 22-A3-2

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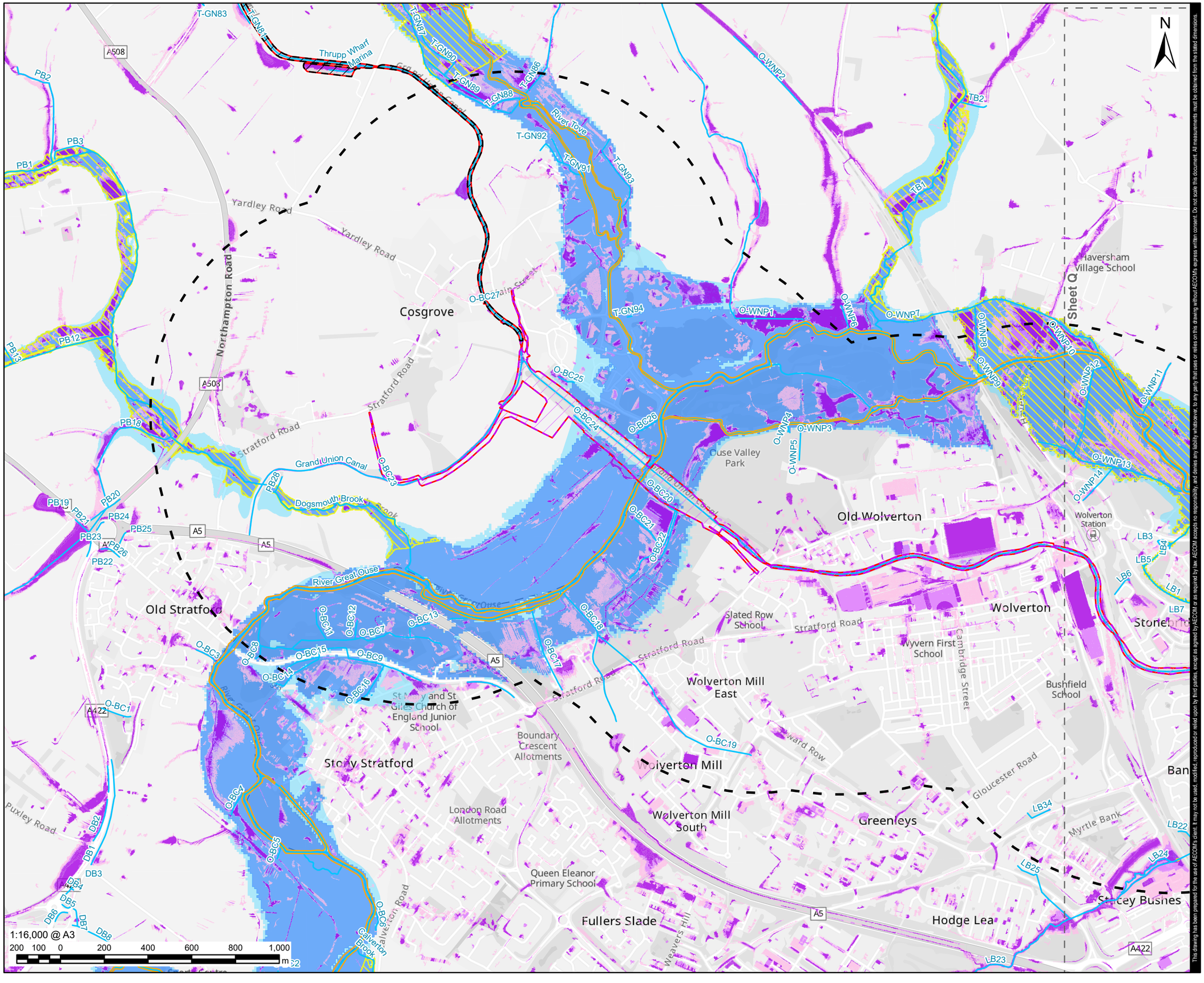

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LEGEND

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- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet P

FIGURE NUMBER

Figure 22-A3-2

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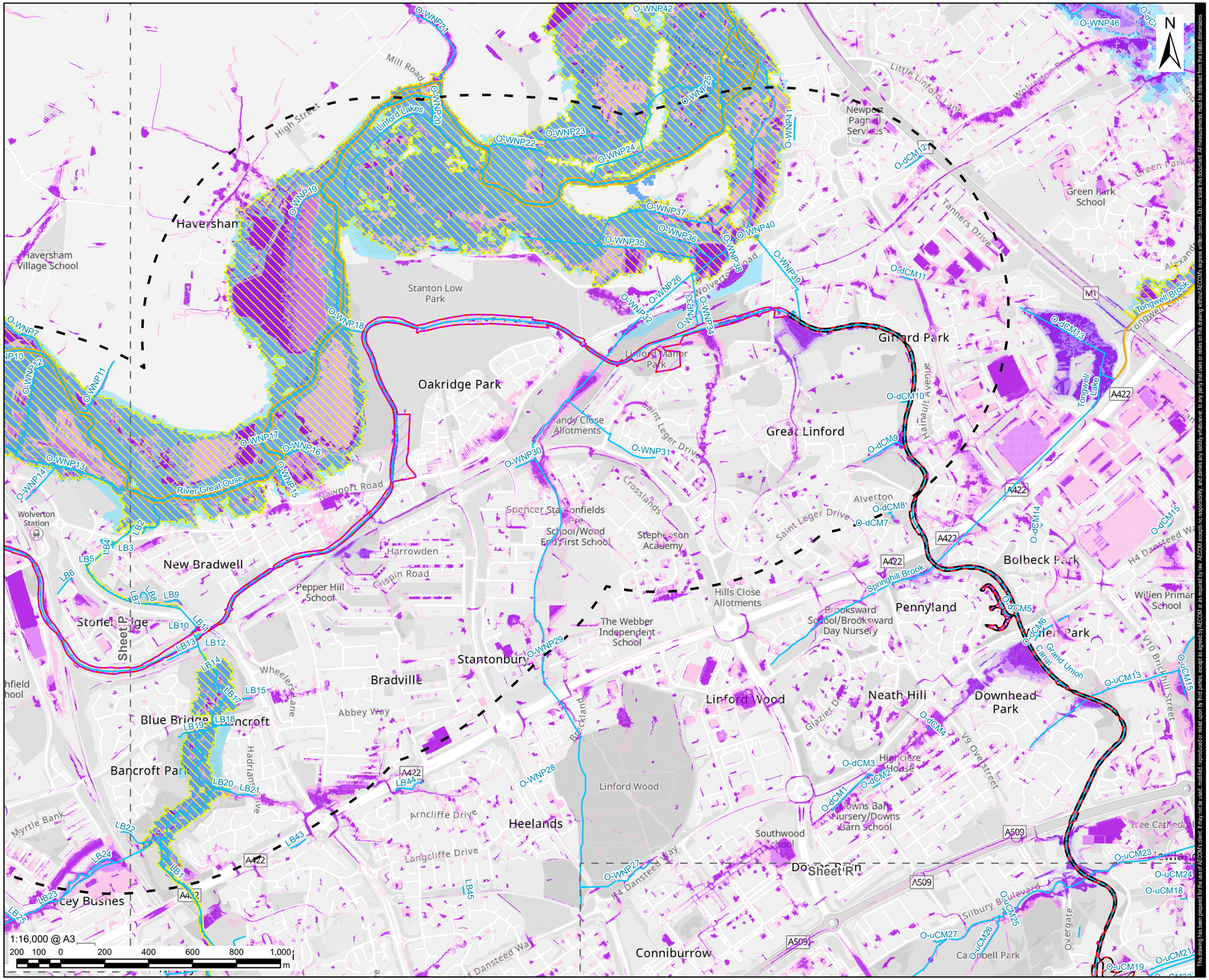

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet Q

FIGURE NUMBER

Figure 22-A3-2

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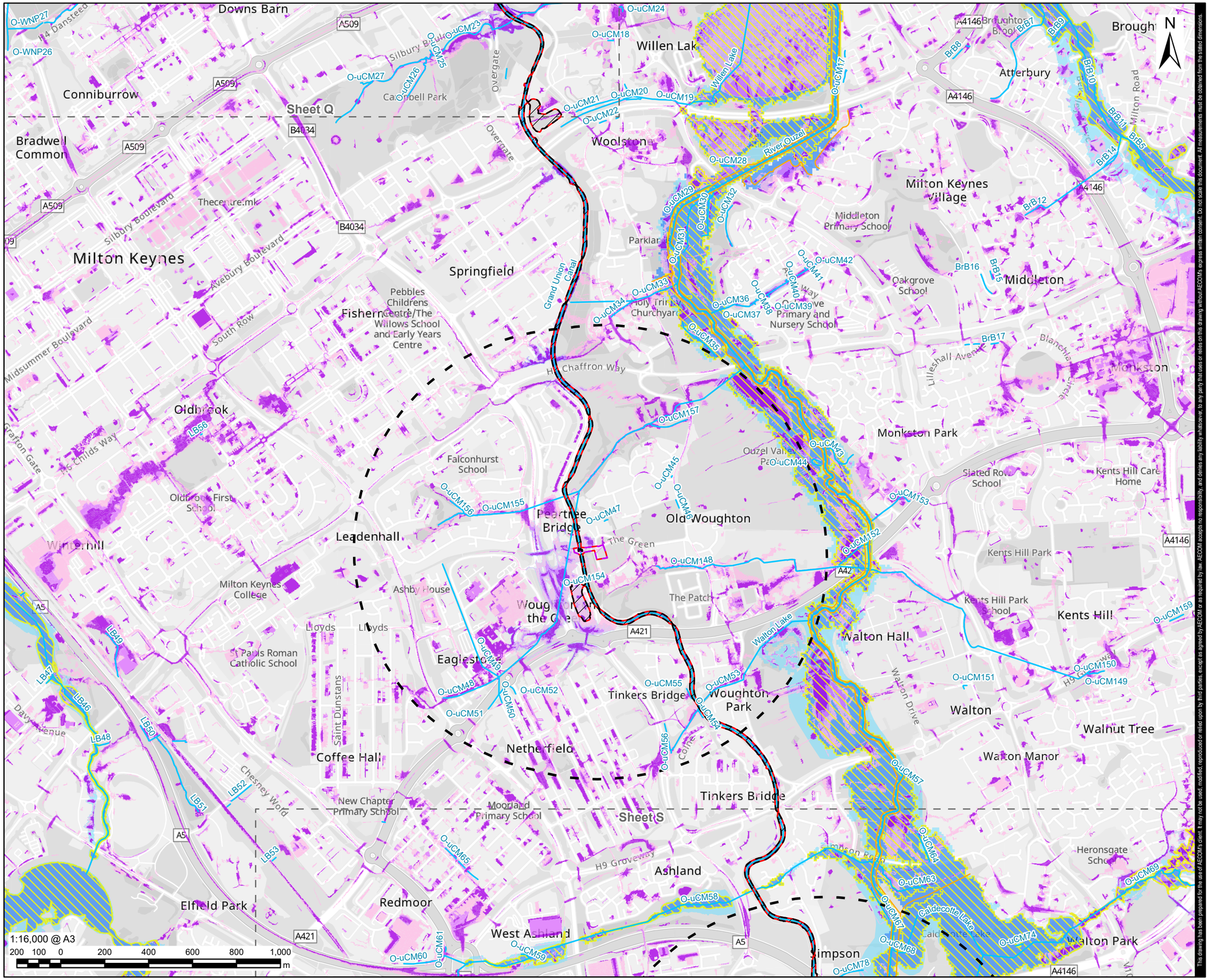

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet R

FIGURE NUMBER

Figure 22-A3-2

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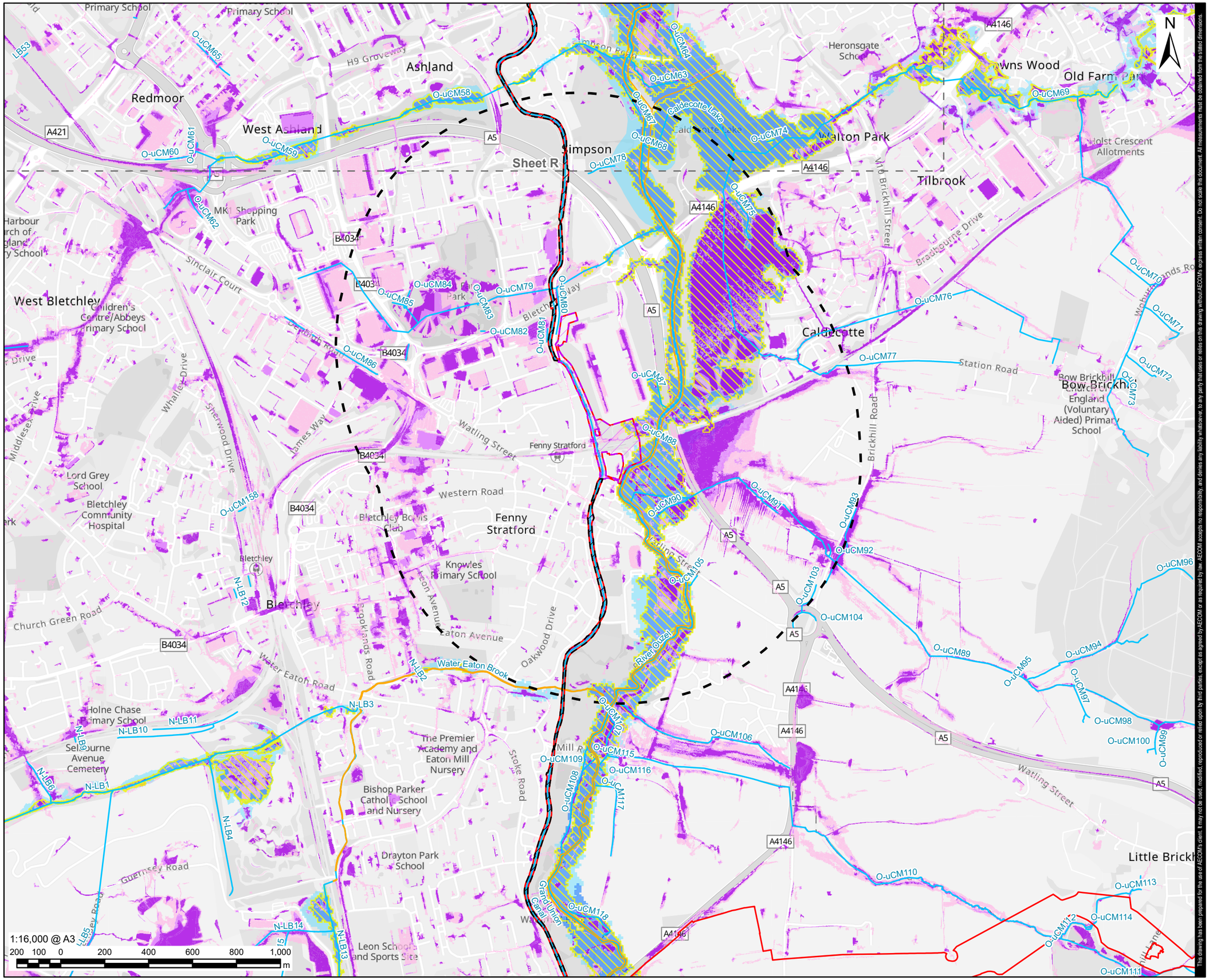

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LEGEND

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- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Present Day Flood Risk (Fluvial and Surface Water)
Sheet S

FIGURE NUMBER

Figure 22-A3-2

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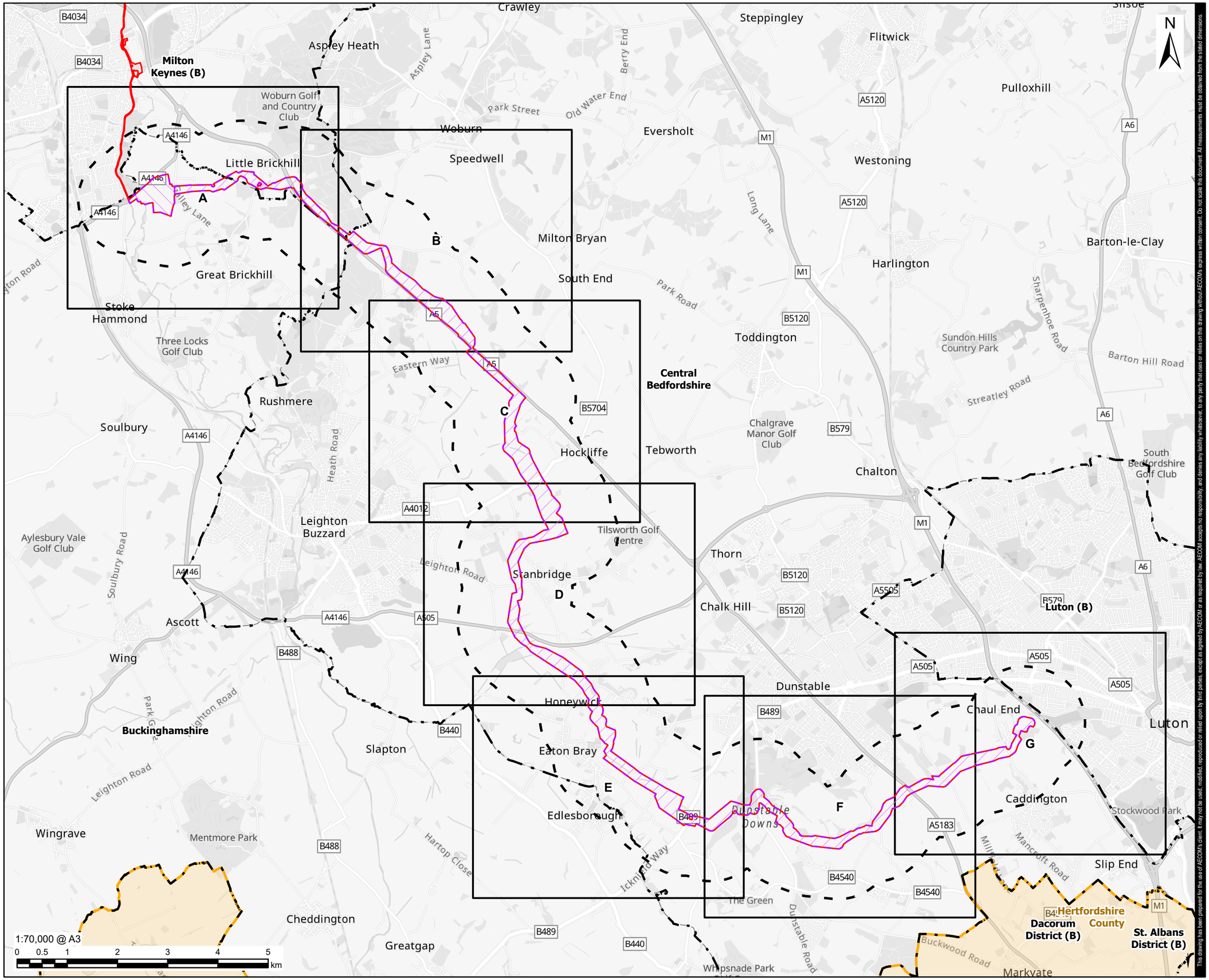

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-3

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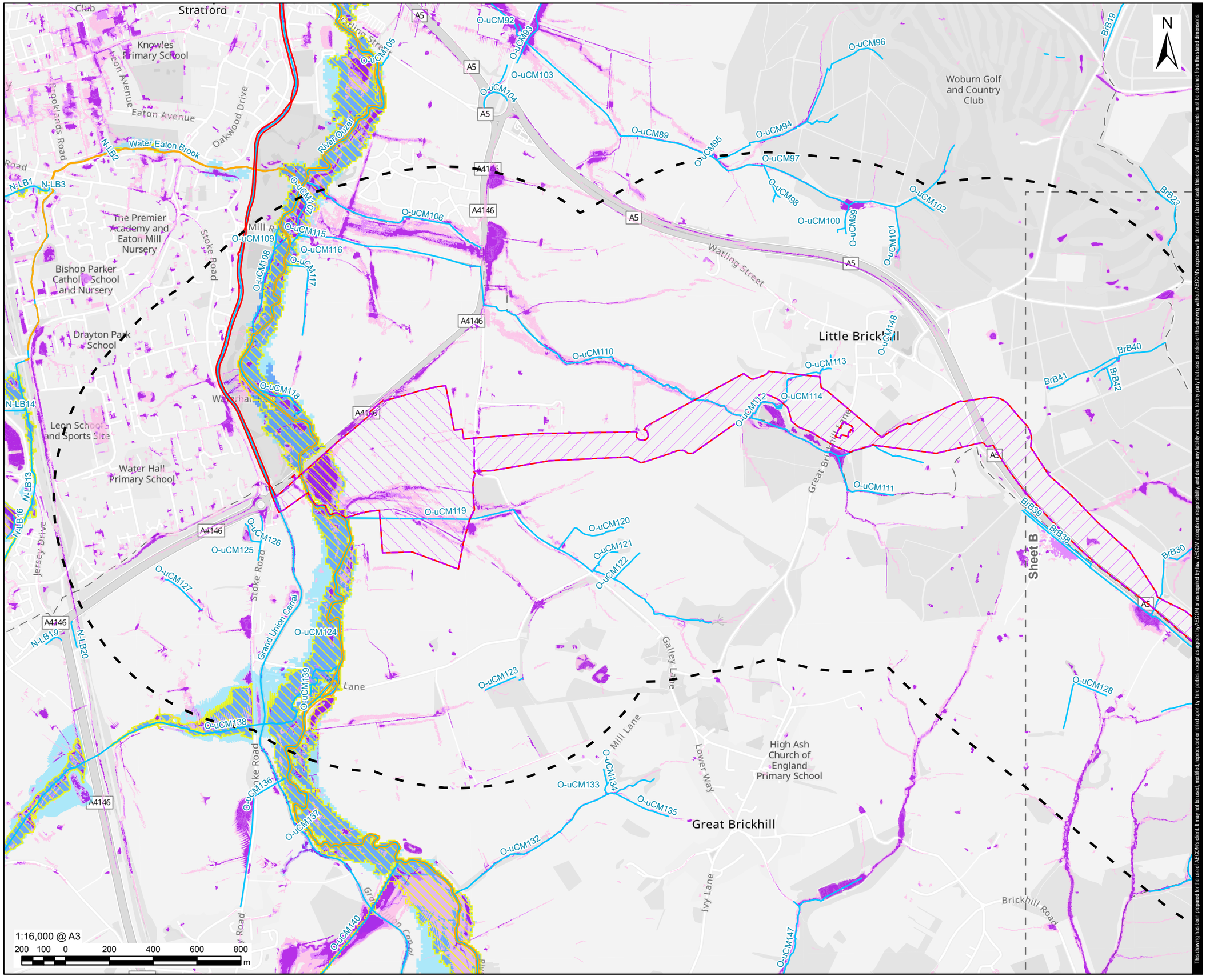

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet A

FIGURE NUMBER

Figure 22-A3-3

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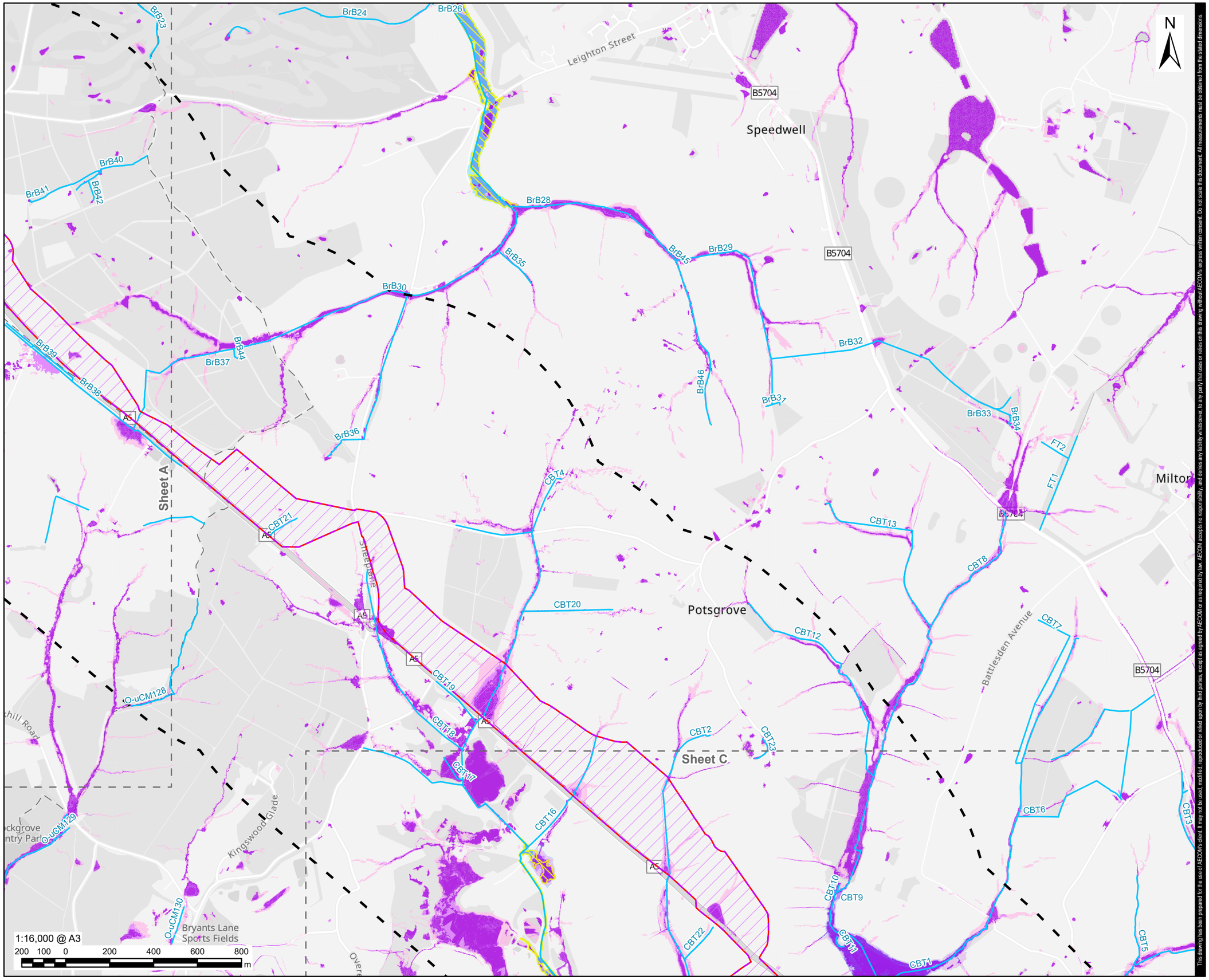

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet B

FIGURE NUMBER

Figure 22-A3-3

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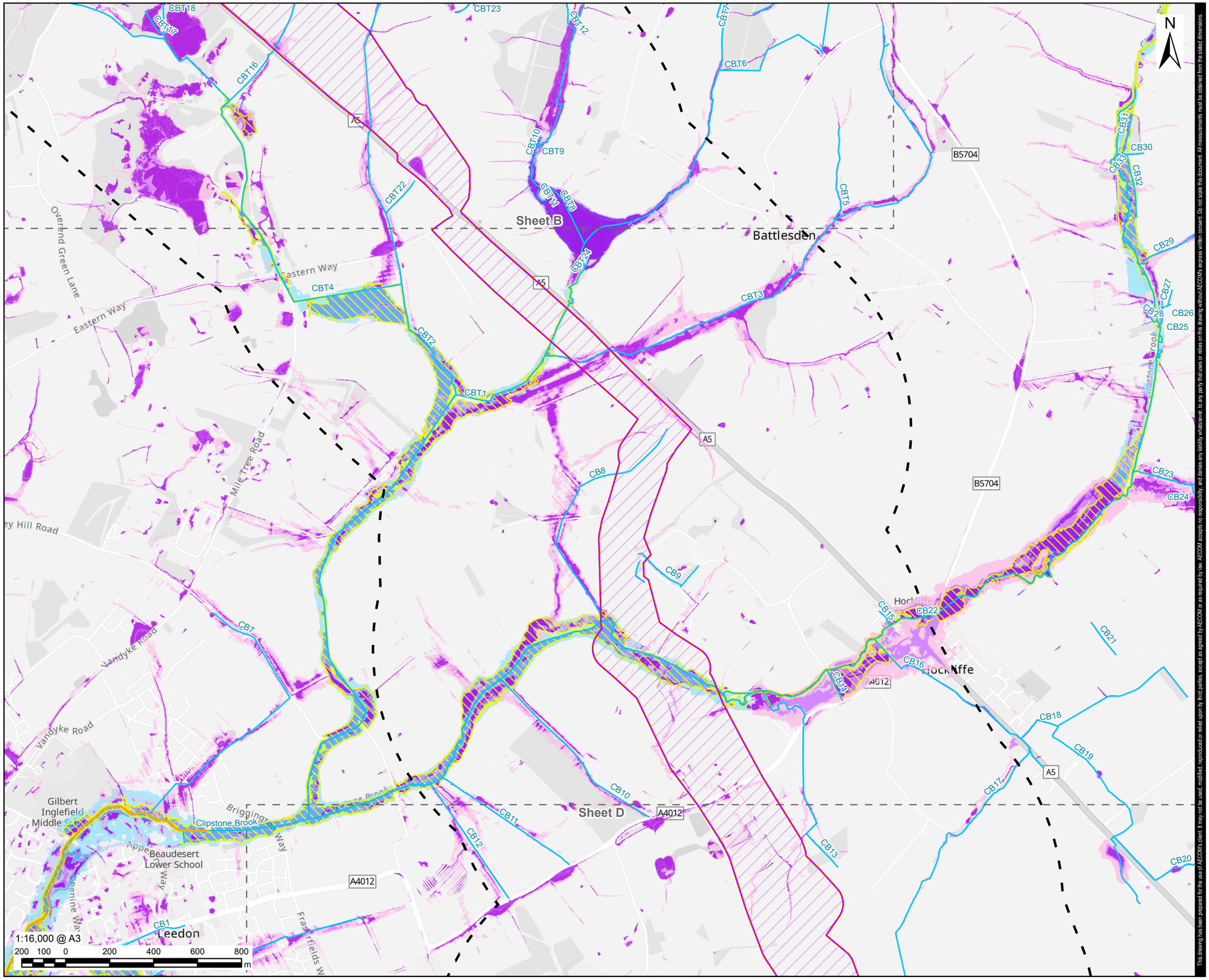

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet C

FIGURE NUMBER

Figure 22-A3-3

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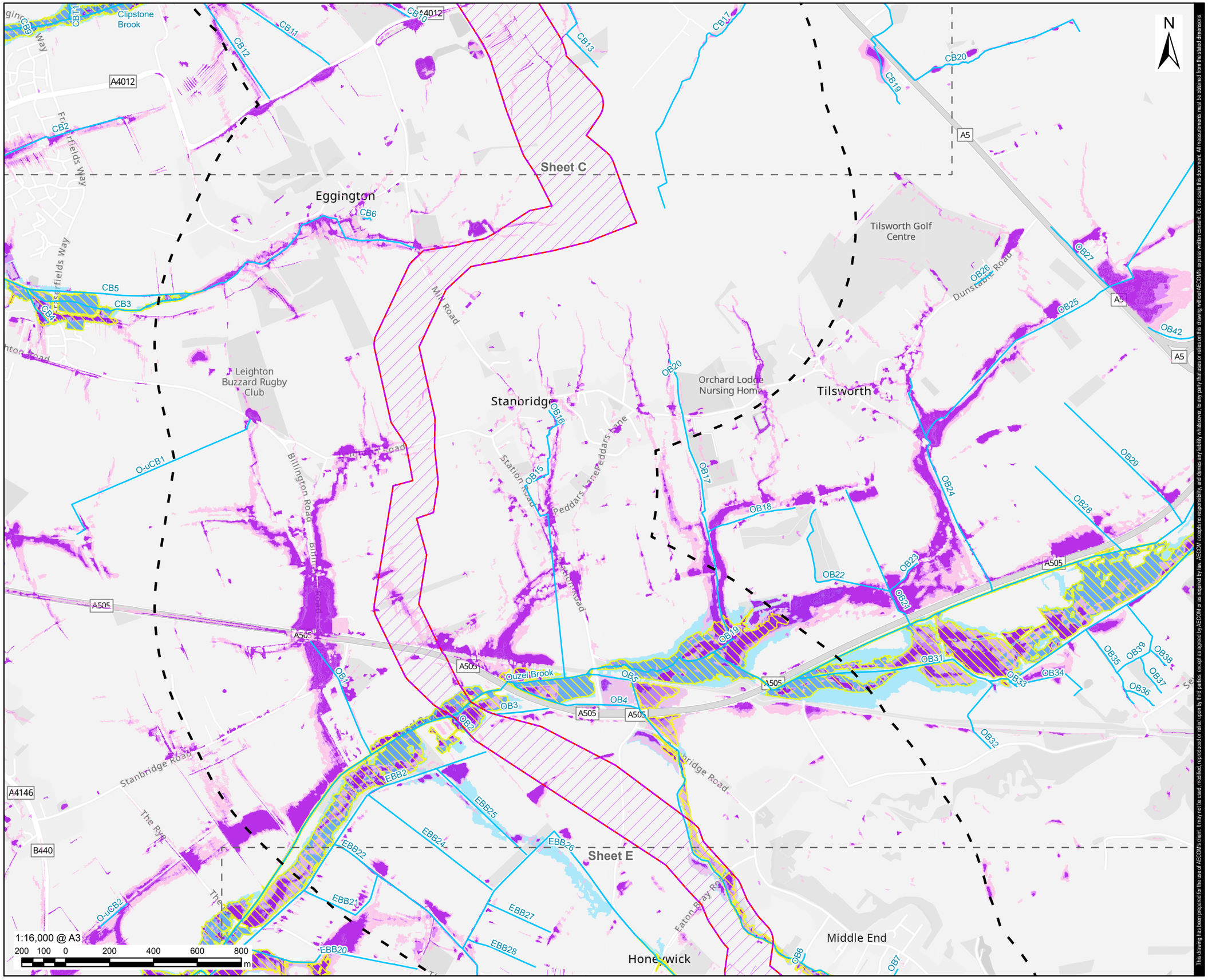

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet D

FIGURE NUMBER

Figure 22-A3-3

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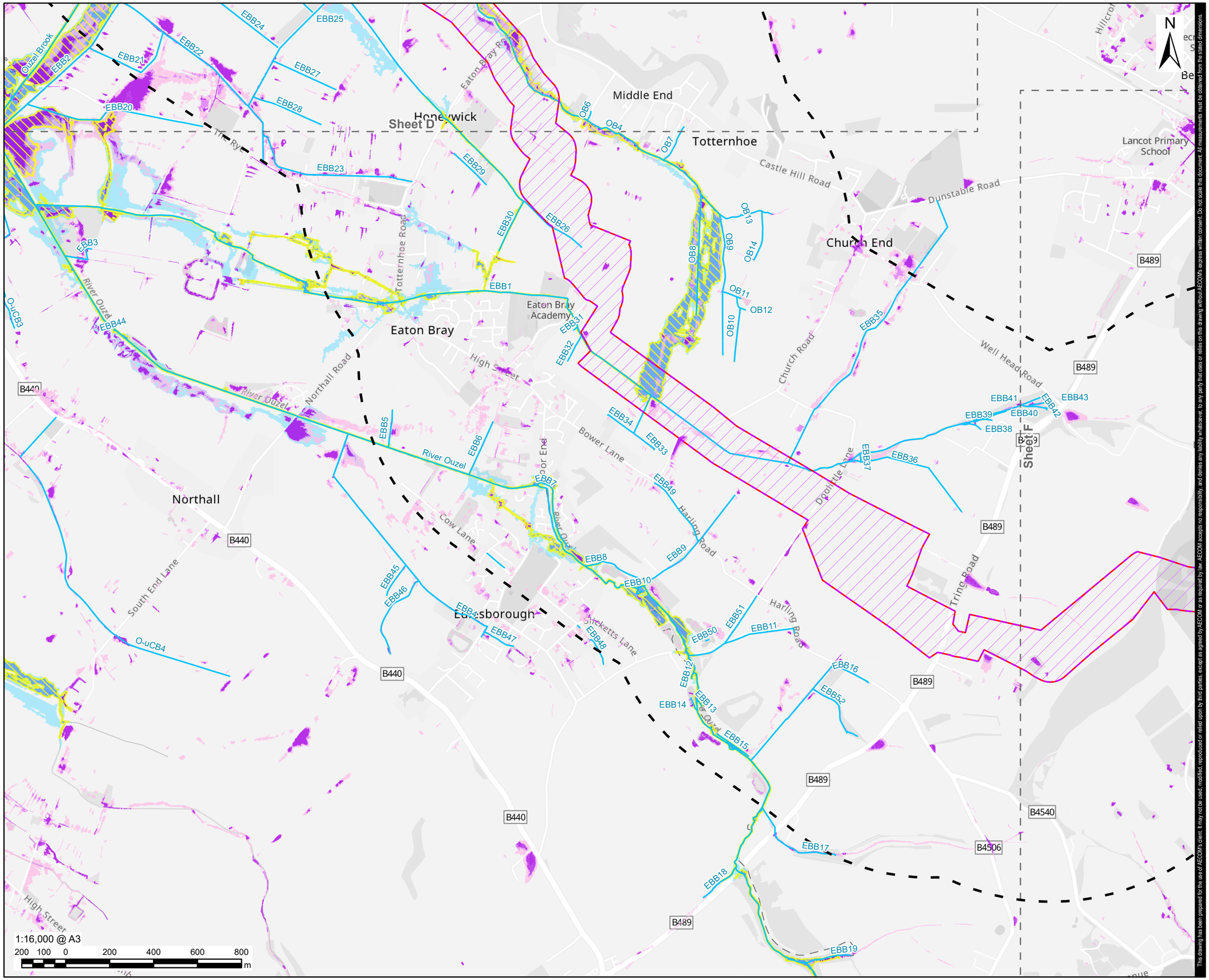

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet E

FIGURE NUMBER

Figure 22-A3-3

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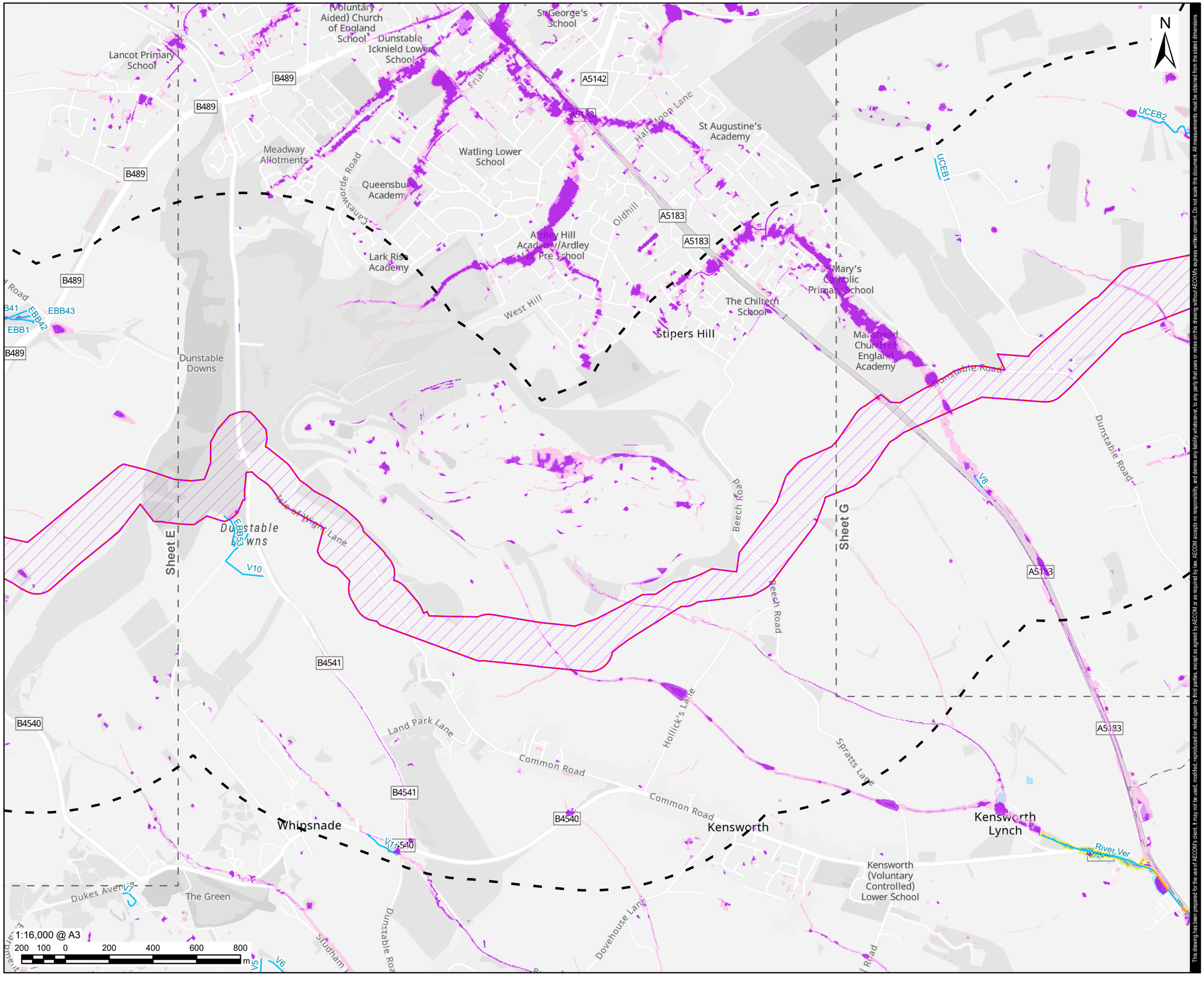

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet F

FIGURE NUMBER

Figure 22-A3-3

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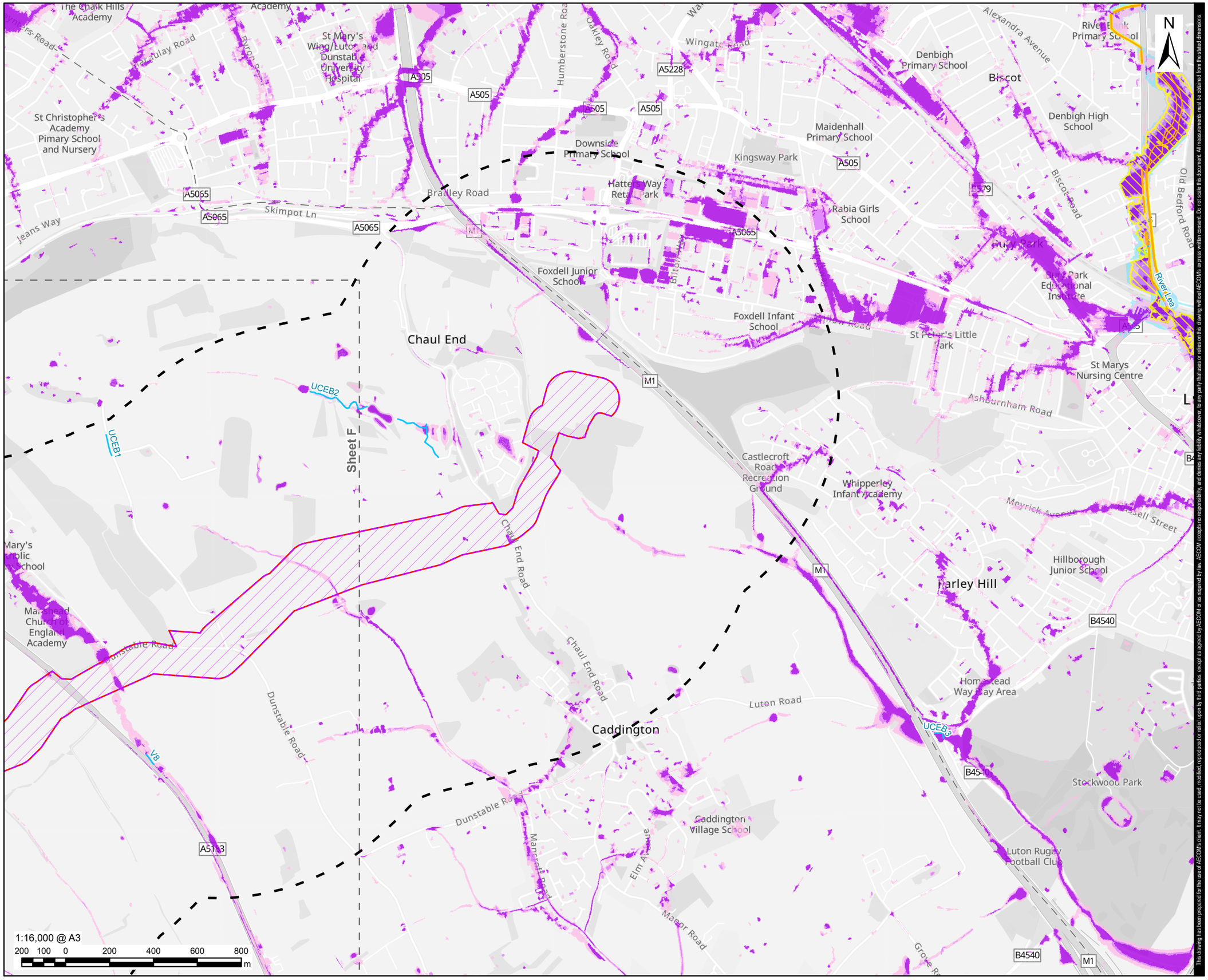

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Fluvial Flooding

- Flood Zone 2
- Flood Zone 3

Risk of Flooding from Surface Water (RoFSW)

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Present Day

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Part 4 Present Day Flood Risk (Fluvial and Surface Water) Sheet G

FIGURE NUMBER

Figure 22-A3-3

Annex3-3: Future Flood Risk

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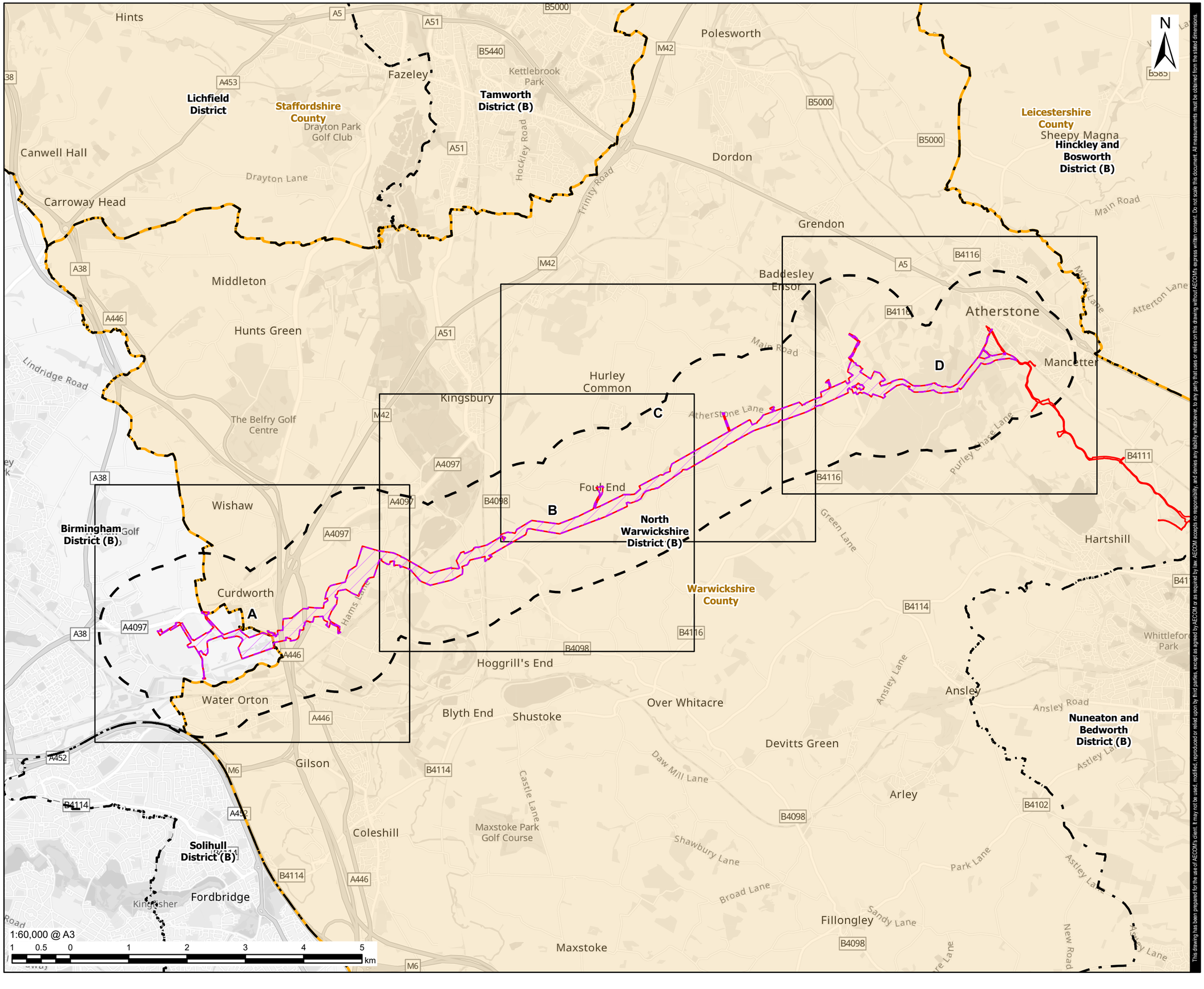

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LEGEND

- Part 1
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- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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FIGURE TITLE

Part 1 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-4

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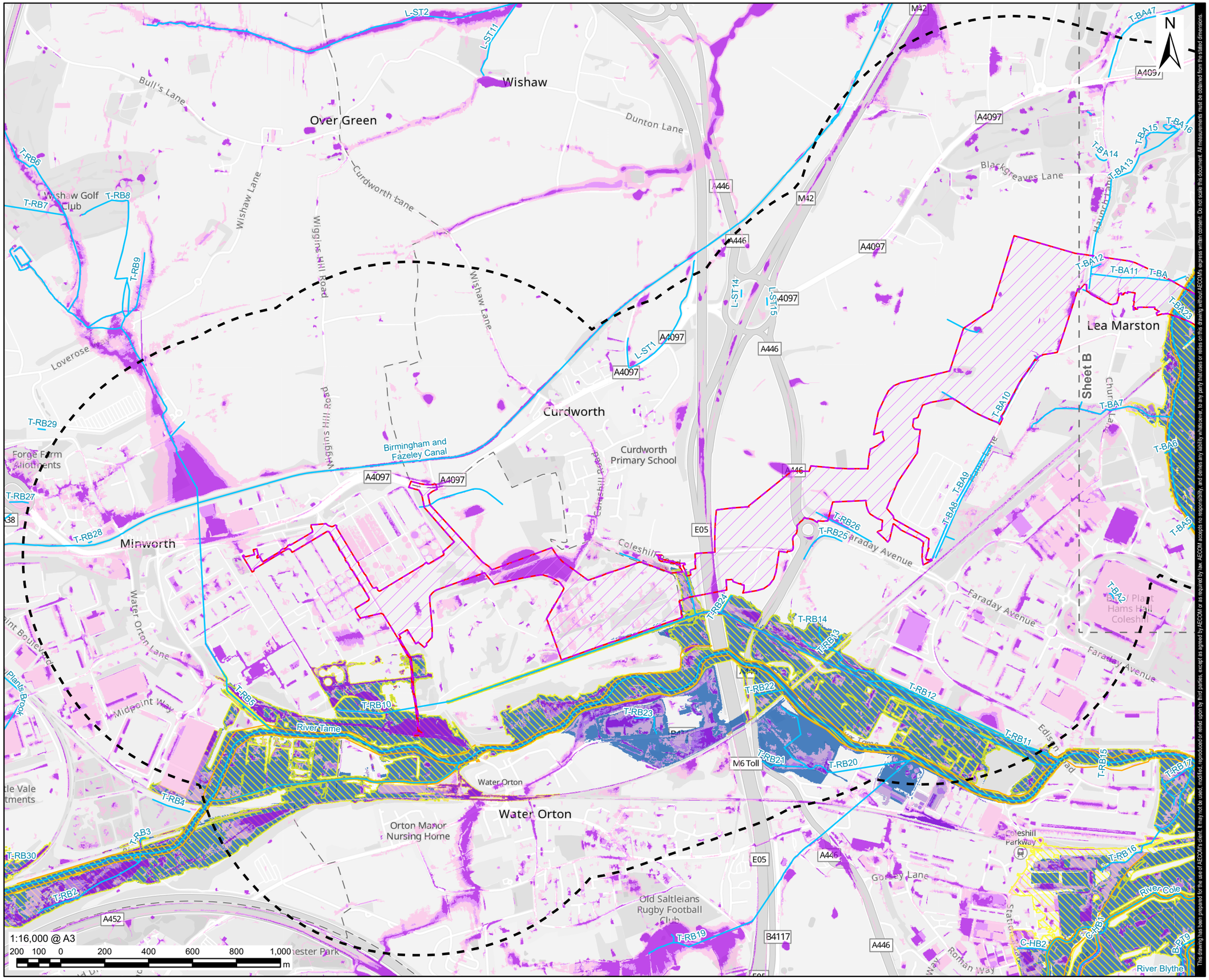

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Part 1 Future Day Flood Risk (Fluvial and Surface Water) Sheet A

FIGURE NUMBER

Figure 22-A3-4

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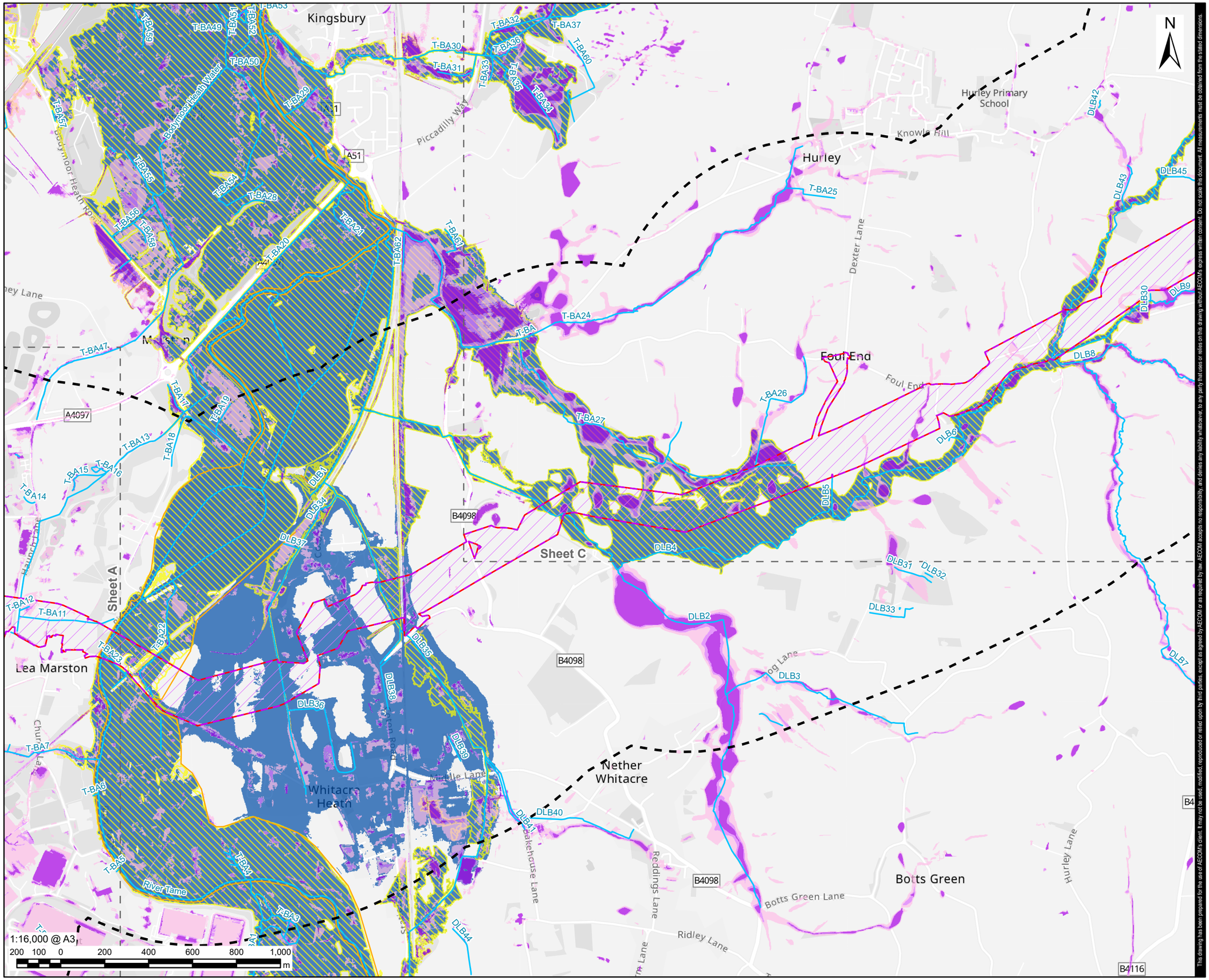

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Part 1 Future Day Flood Risk (Fluvial and Surface Water) Sheet B

FIGURE NUMBER

Figure 22-A3-4

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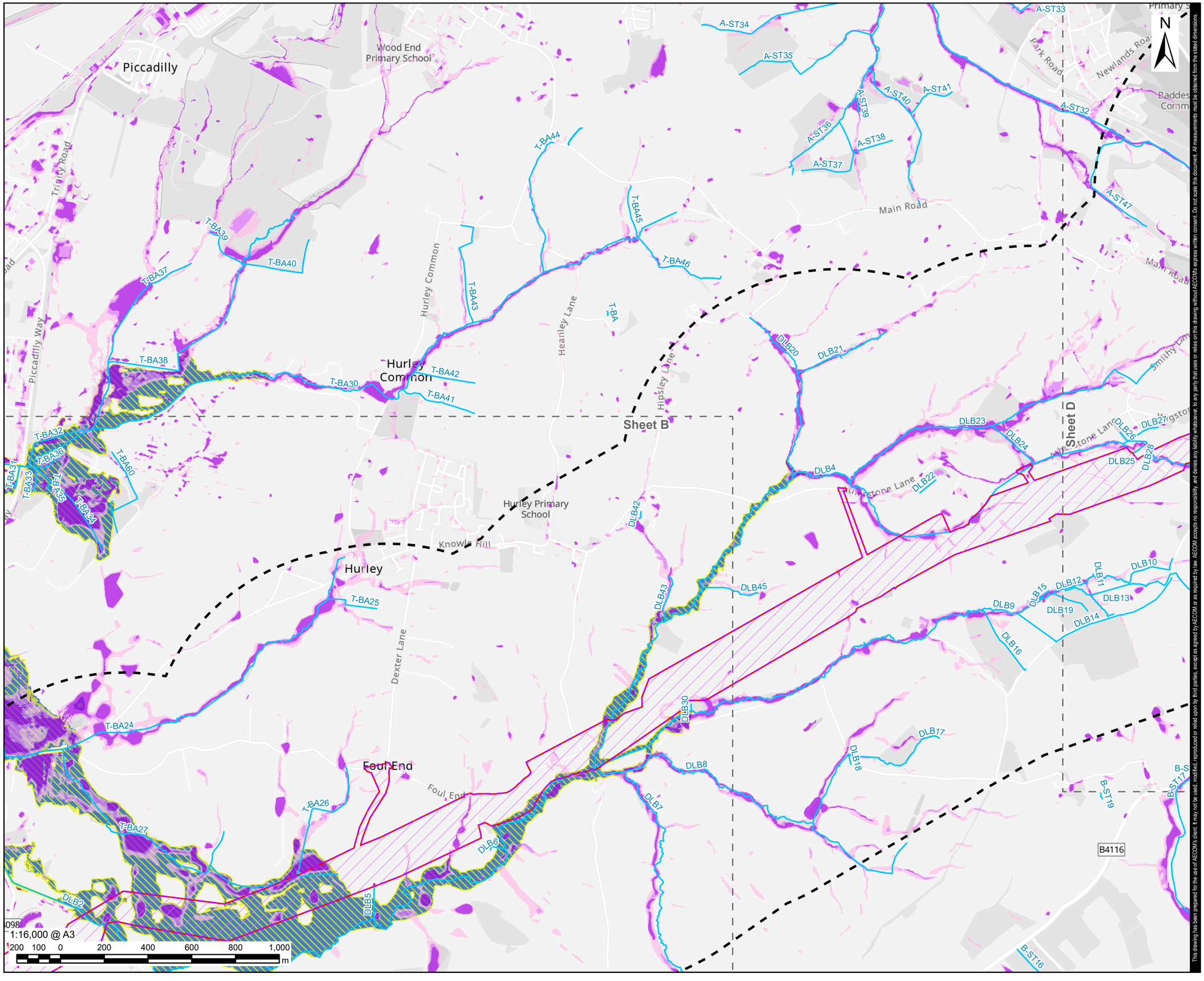

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 Future Day Flood Risk (Fluvial and Surface Water) Sheet C

FIGURE NUMBER

Figure 22-A3-4

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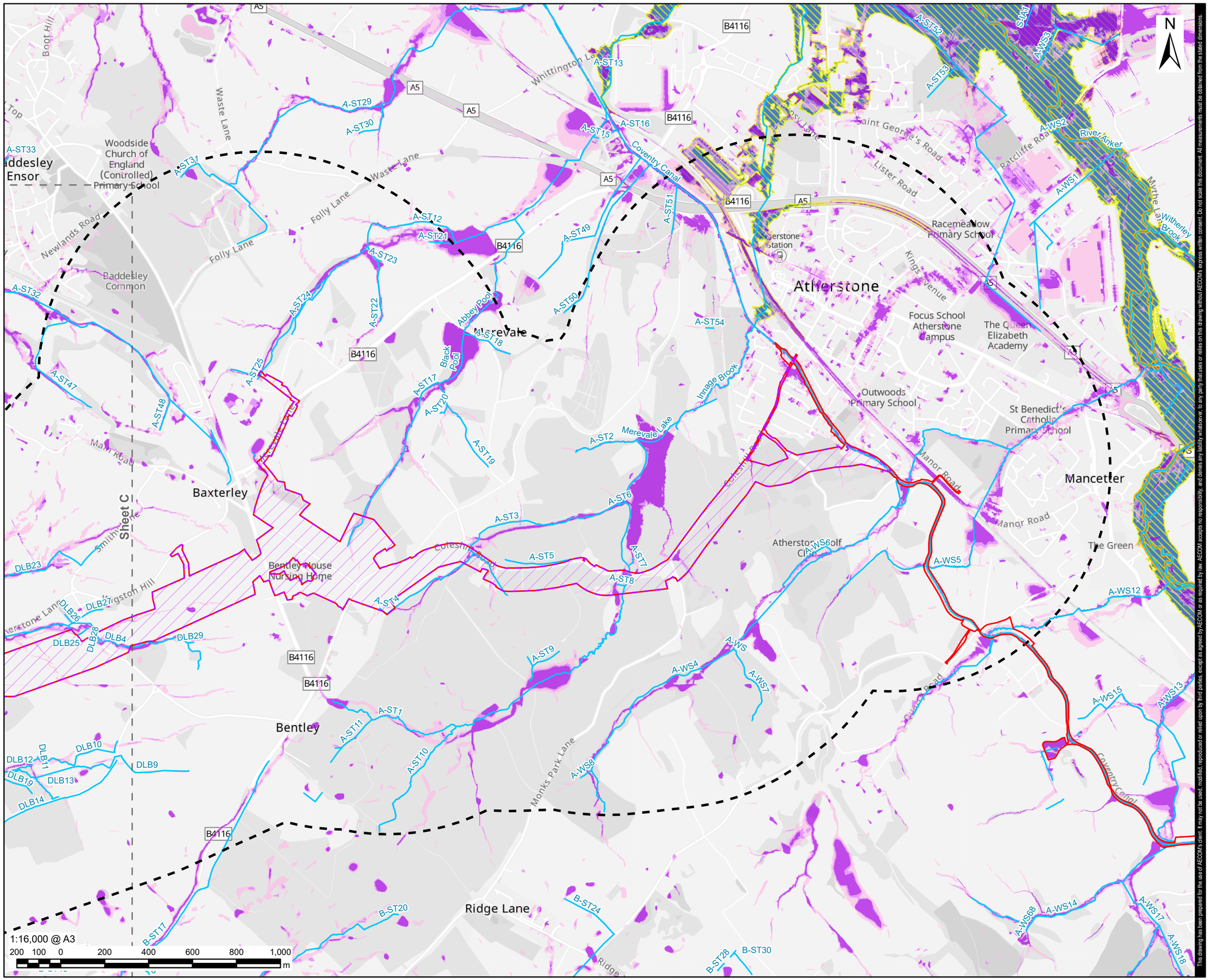

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 Future Day Flood Risk (Fluvial and Surface Water) Sheet D

FIGURE NUMBER

Figure 22-A3-4

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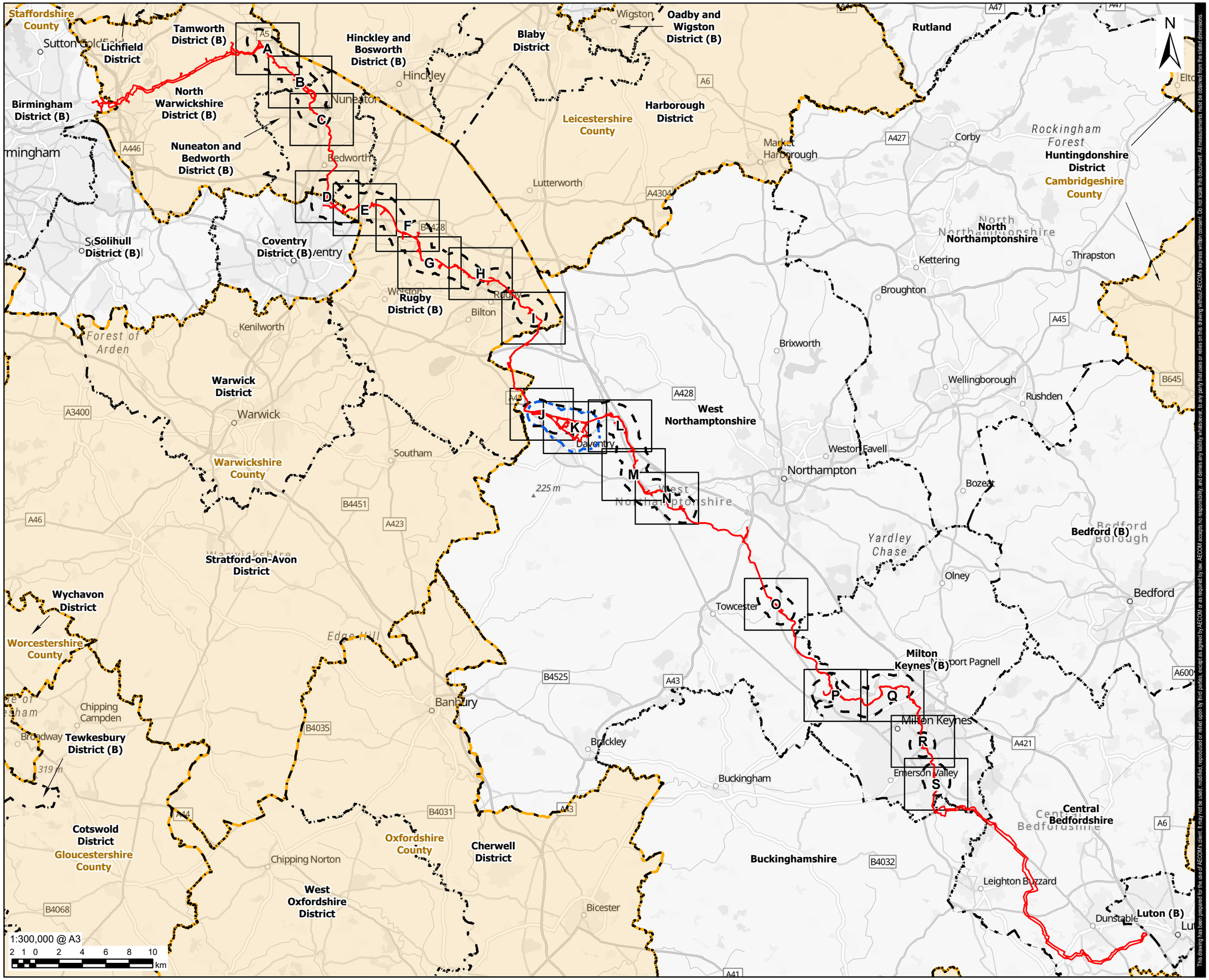

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LEGEND

- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-5

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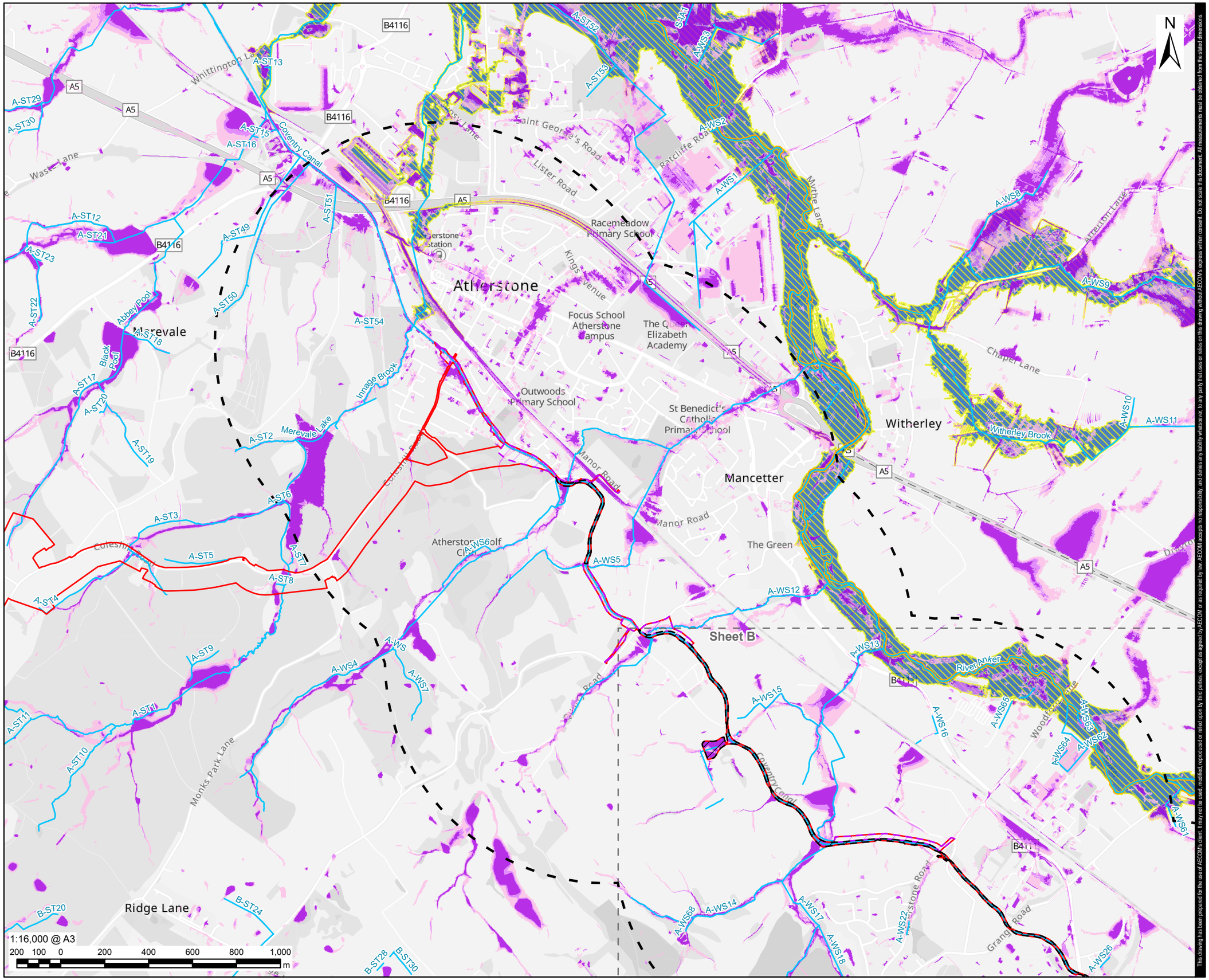

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet A

FIGURE NUMBER

Figure 22-A3-5

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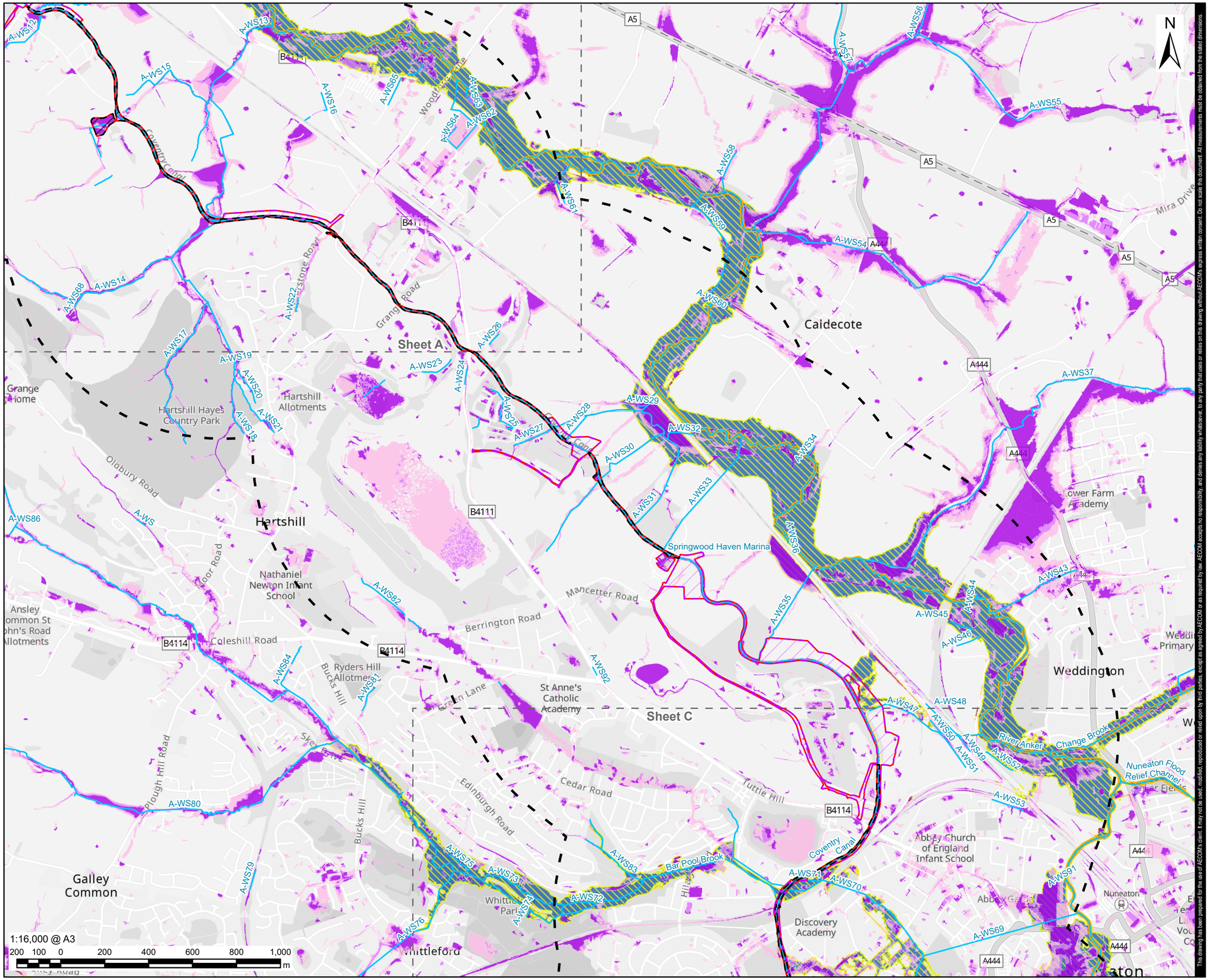

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet B

FIGURE NUMBER

Figure 22-A3-5

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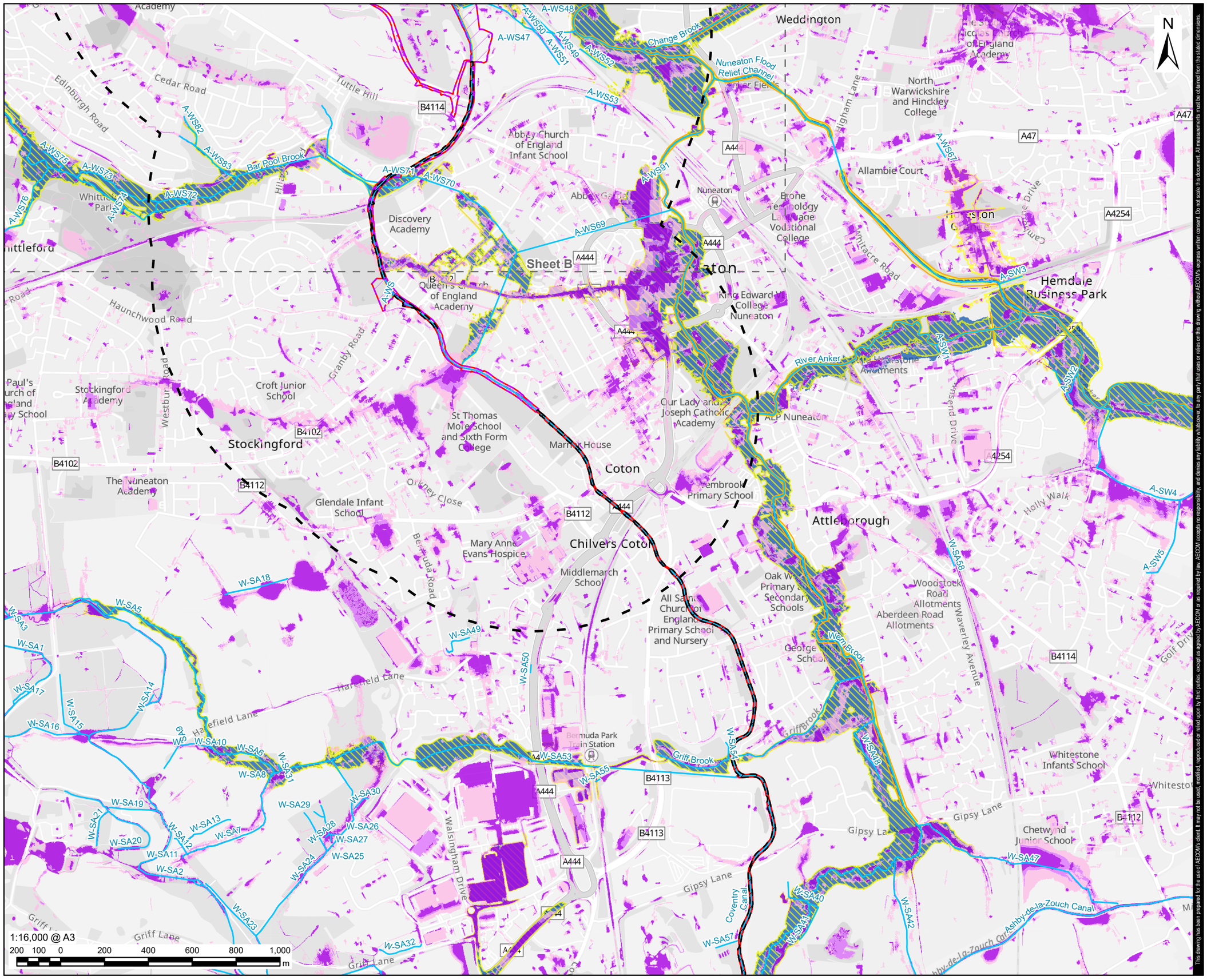

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet C

FIGURE NUMBER

Figure 22-A3-5

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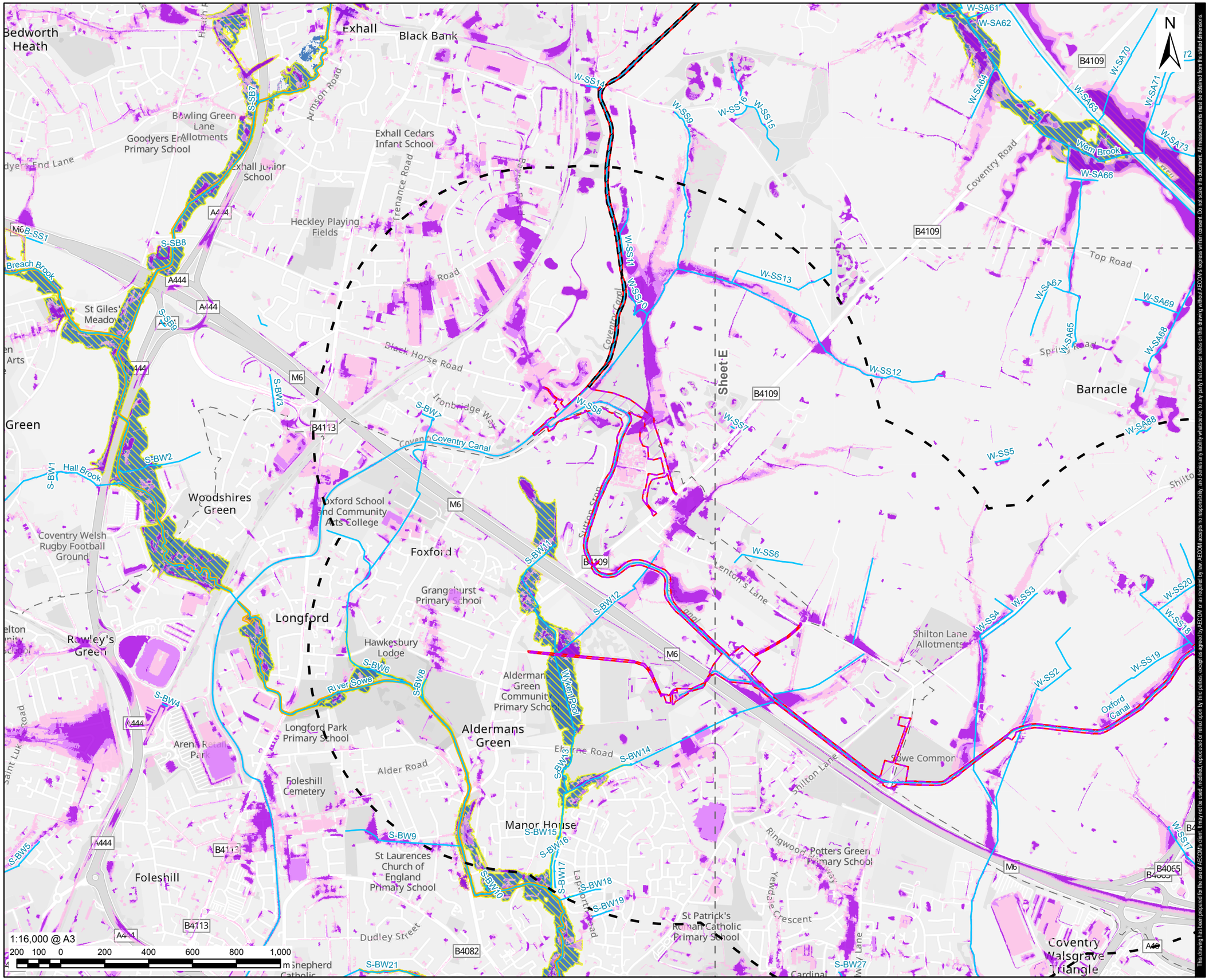

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet D

FIGURE NUMBER

Figure 22-A3-5

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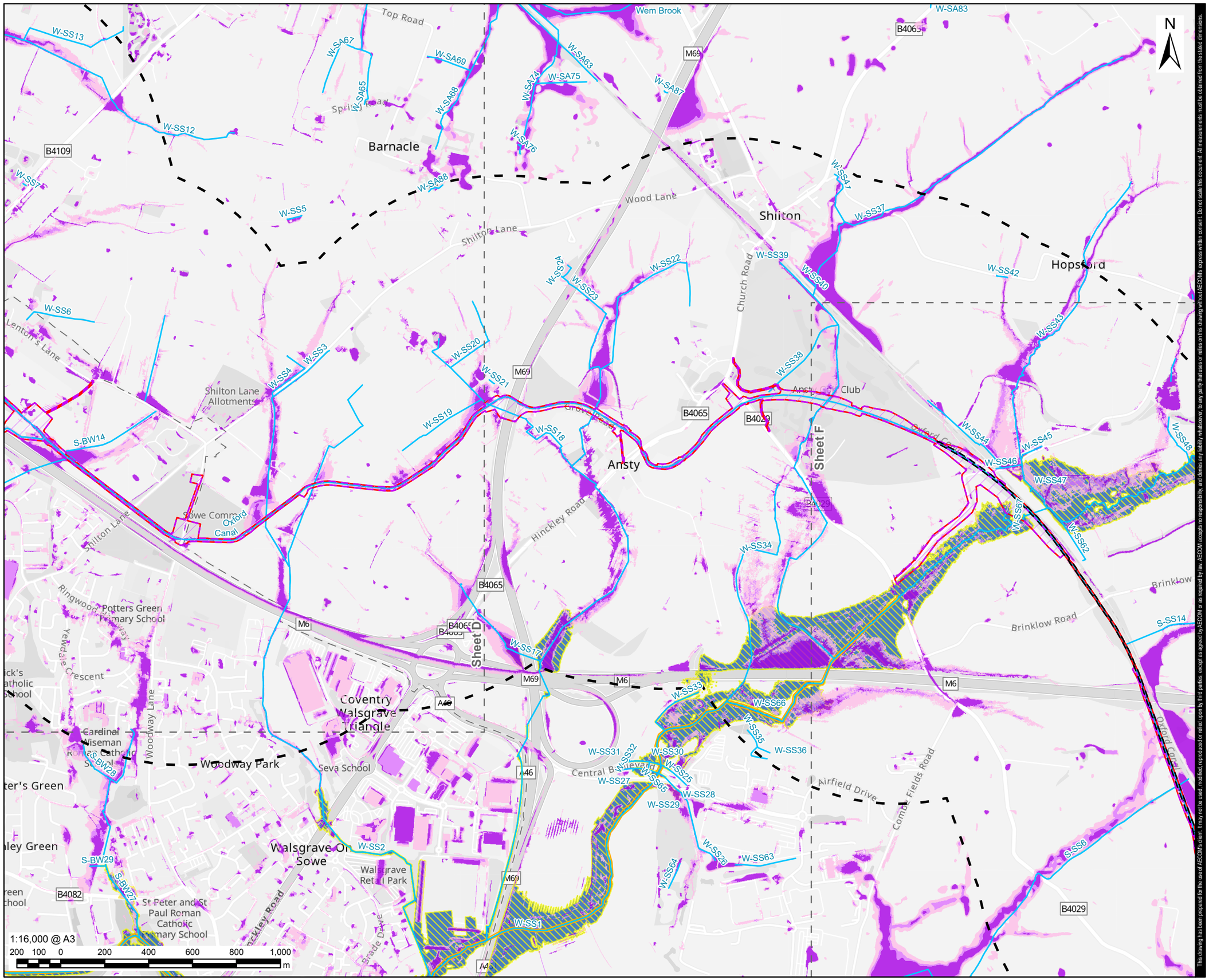

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet E

FIGURE NUMBER

Figure 22-A3-5

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet F

FIGURE NUMBER

Figure 22-A3-5

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet G

FIGURE NUMBER

Figure 22-A3-5

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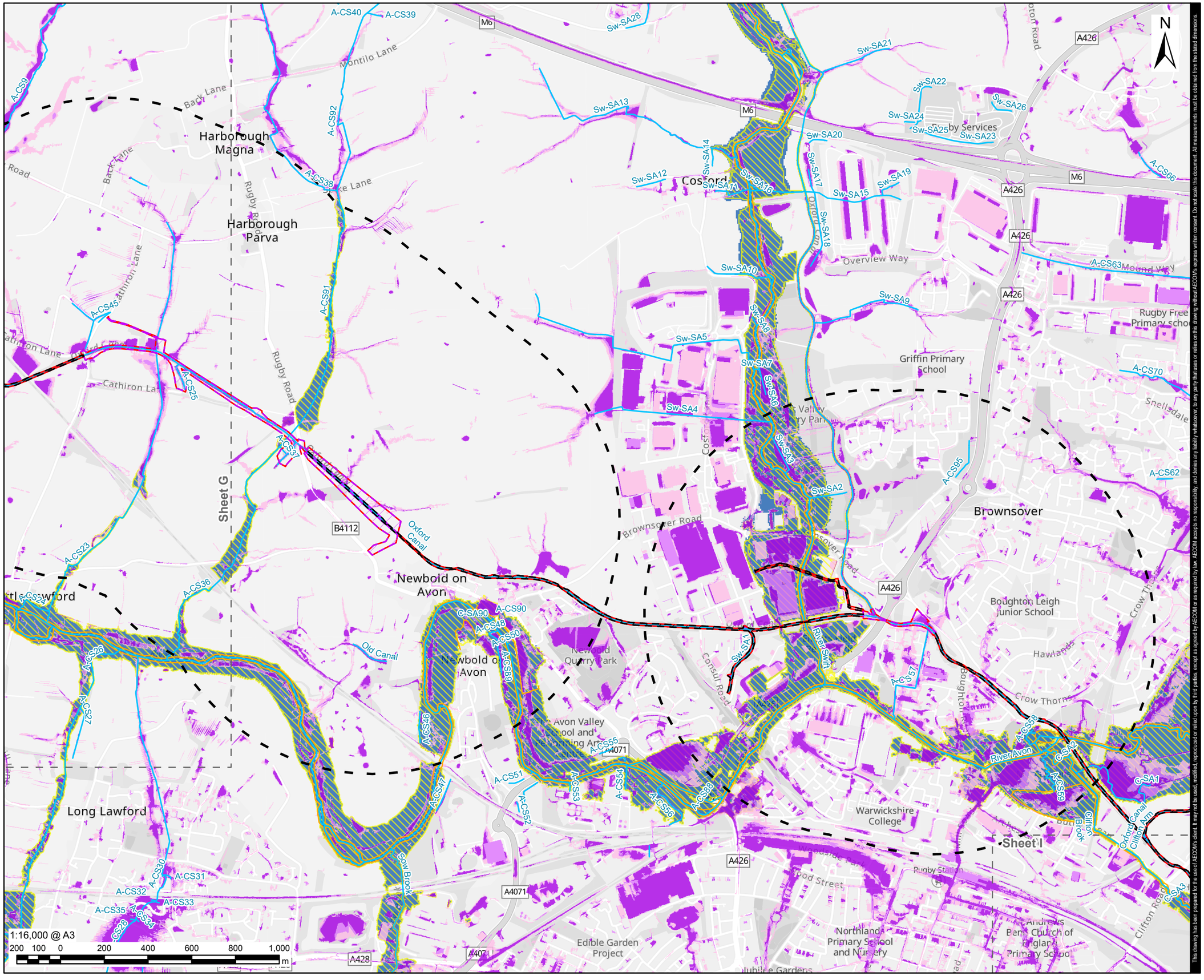

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet H

FIGURE NUMBER

Figure 22-A3-5

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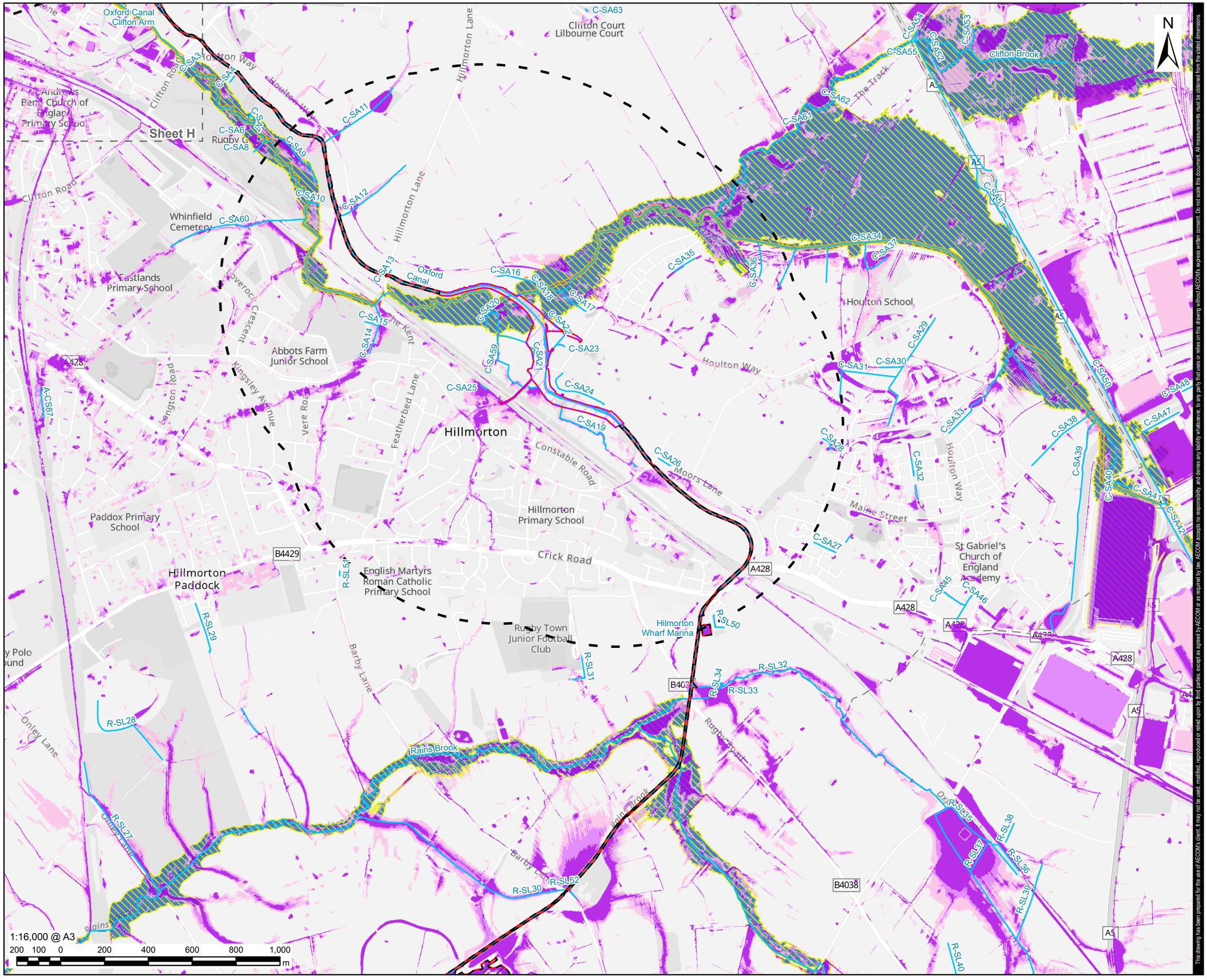

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

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Defended Flood Climate Change

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Undefended Flood Climate Change

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet I

FIGURE NUMBER

Figure 22-A3-5

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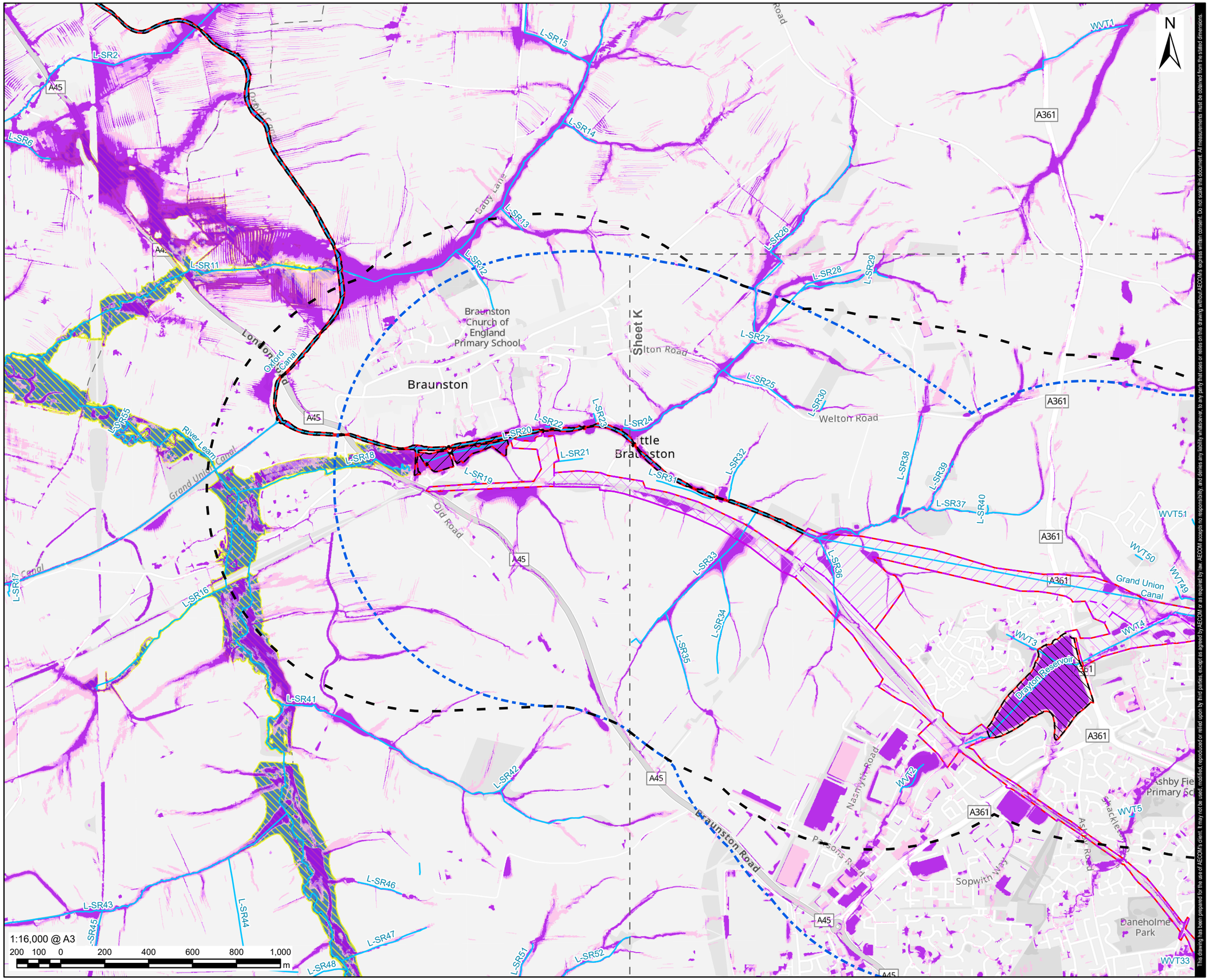

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet J

FIGURE NUMBER

Figure 22-A3-5

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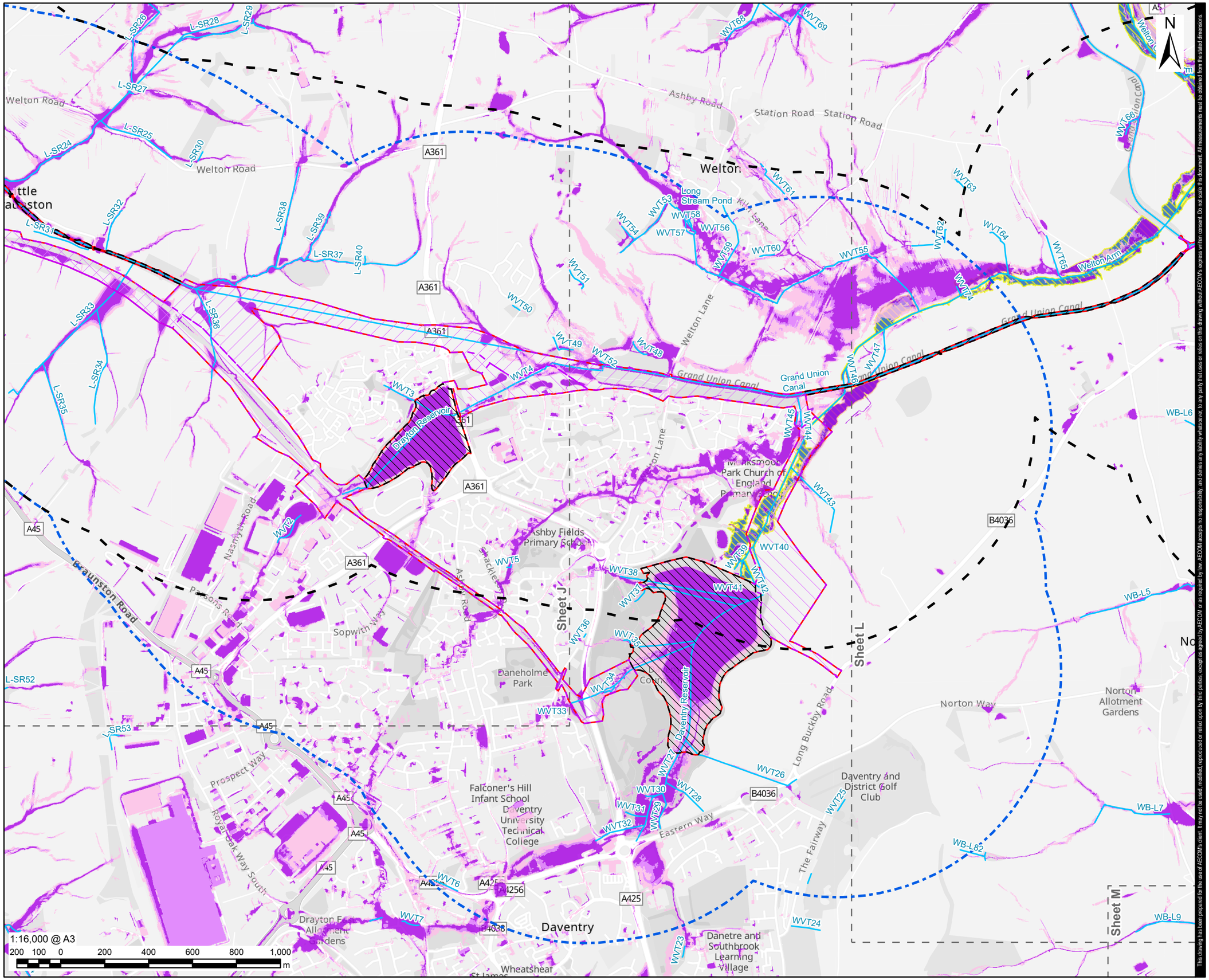

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet K

FIGURE NUMBER

Figure 22-A3-5

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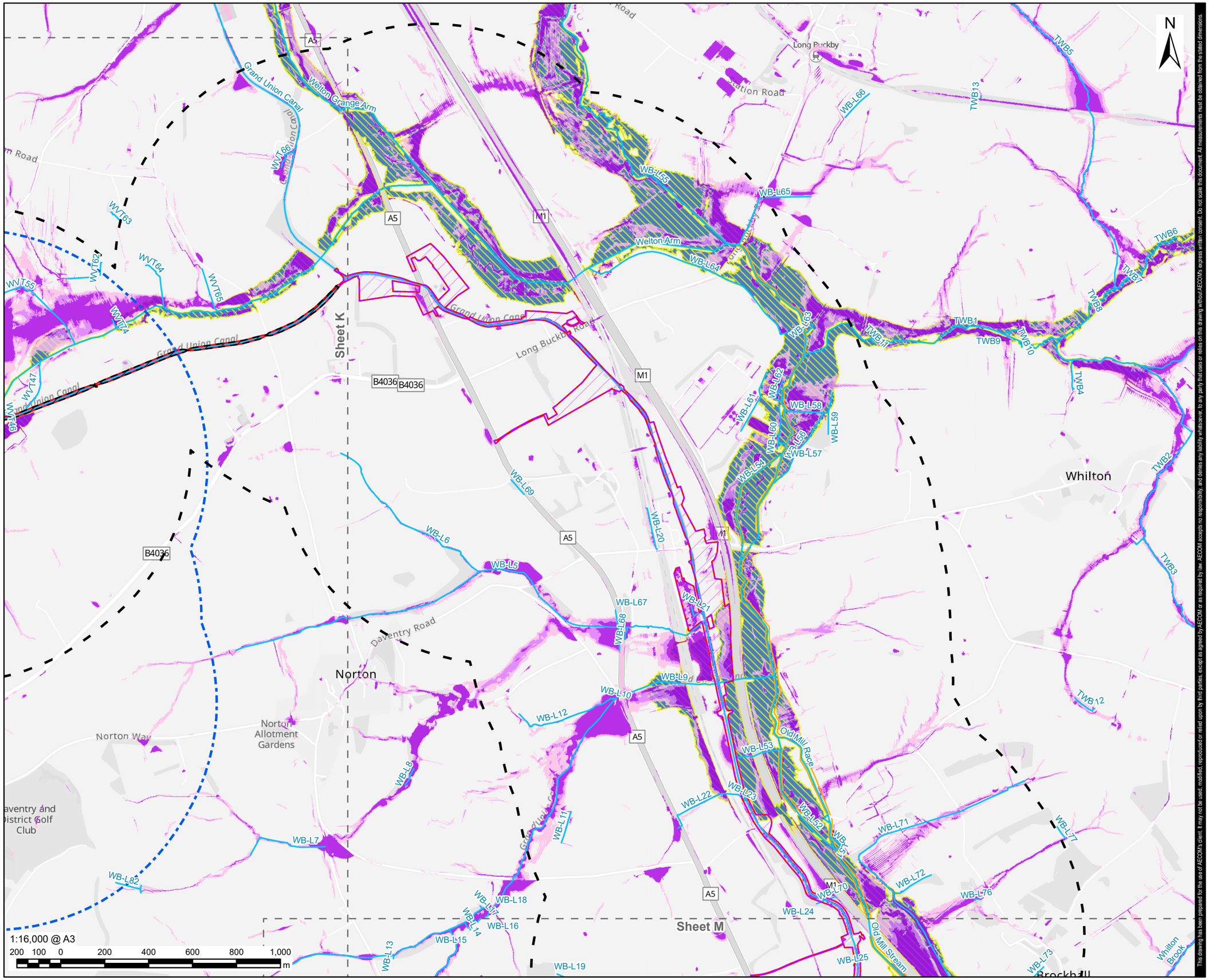

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet L

FIGURE NUMBER

Figure 22-A3-5

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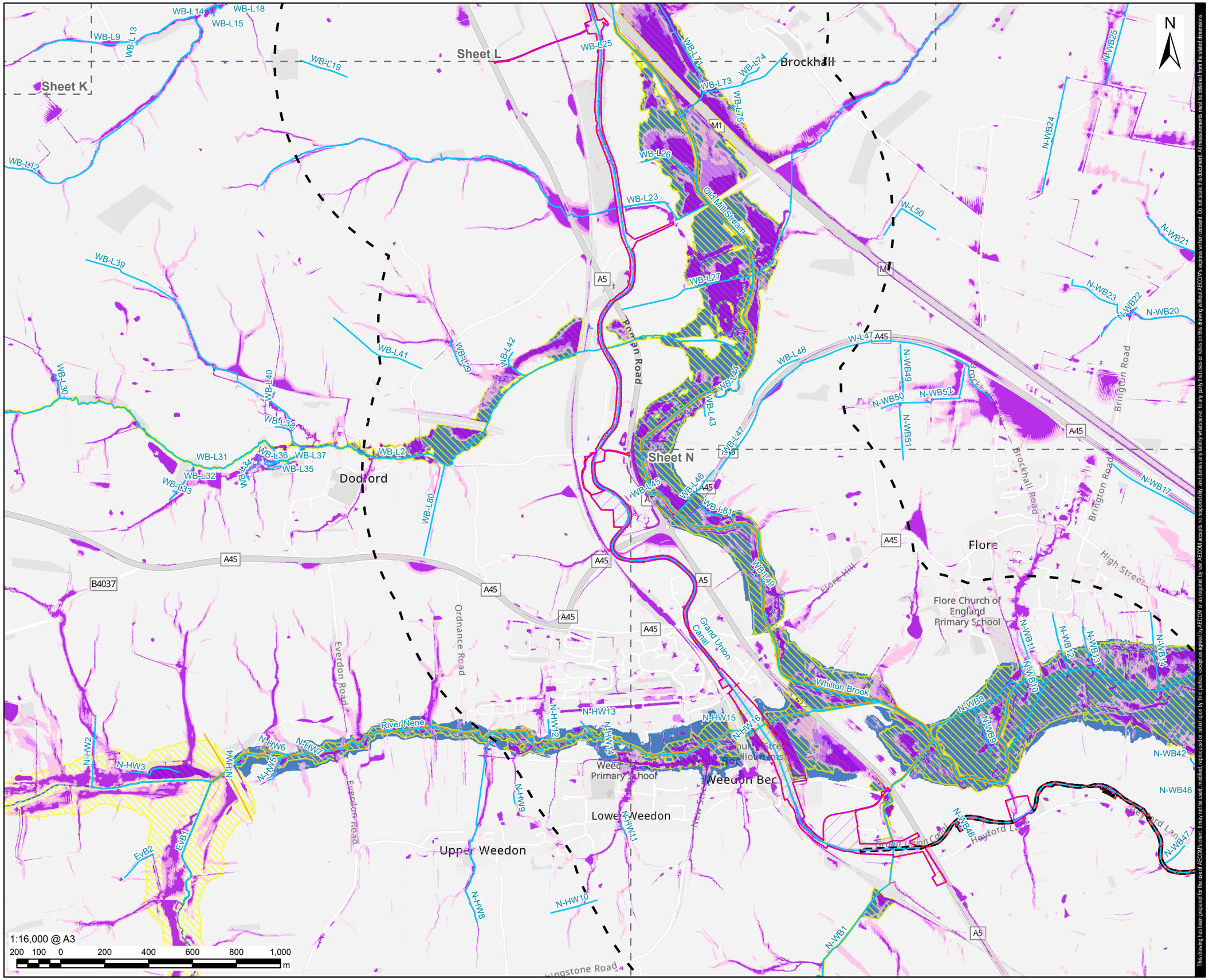

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet M

FIGURE NUMBER

Figure 22-A3-5

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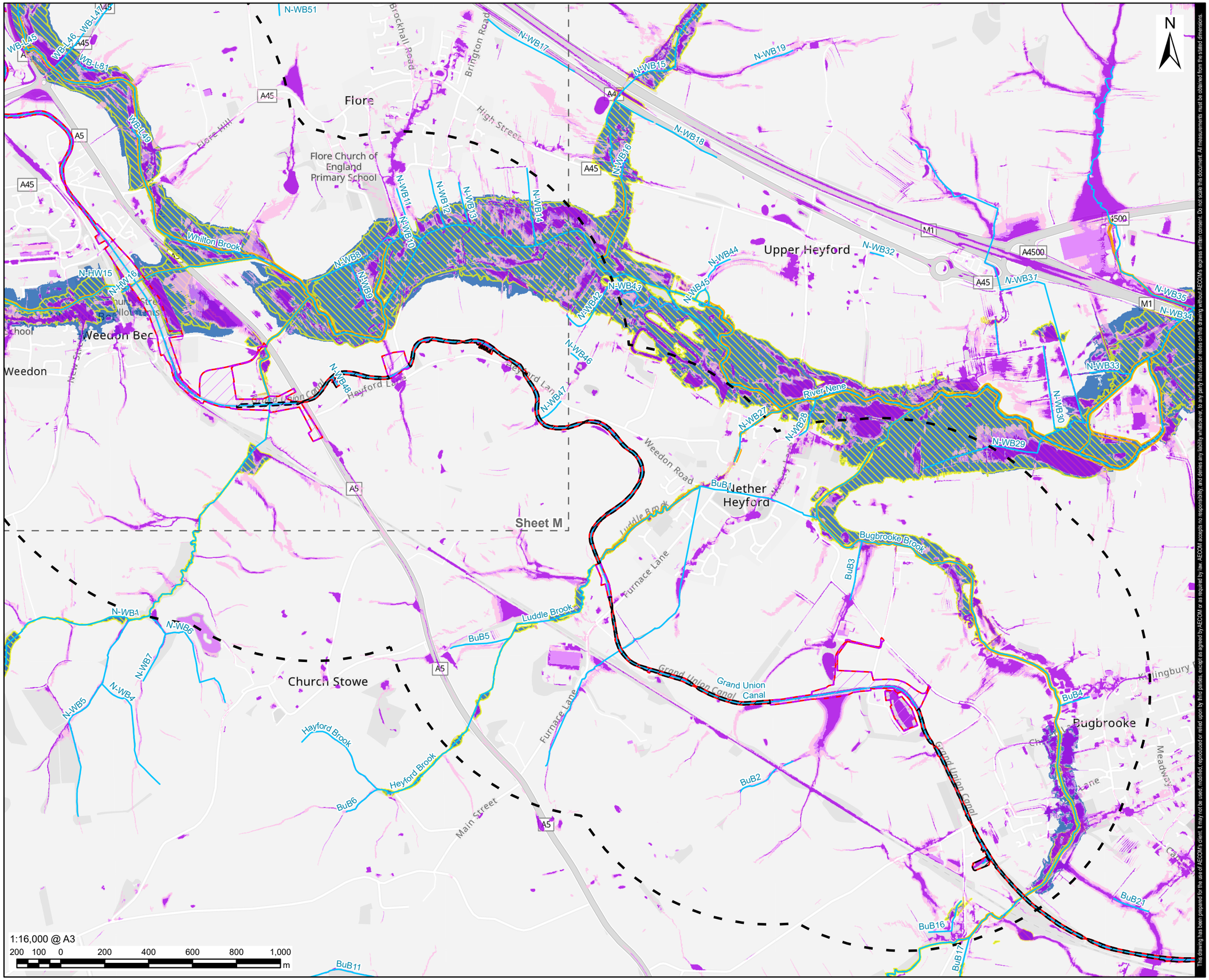

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
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Defended Flood Climate Change

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Undefended Flood Climate Change

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet N

FIGURE NUMBER

Figure 22-A3-5

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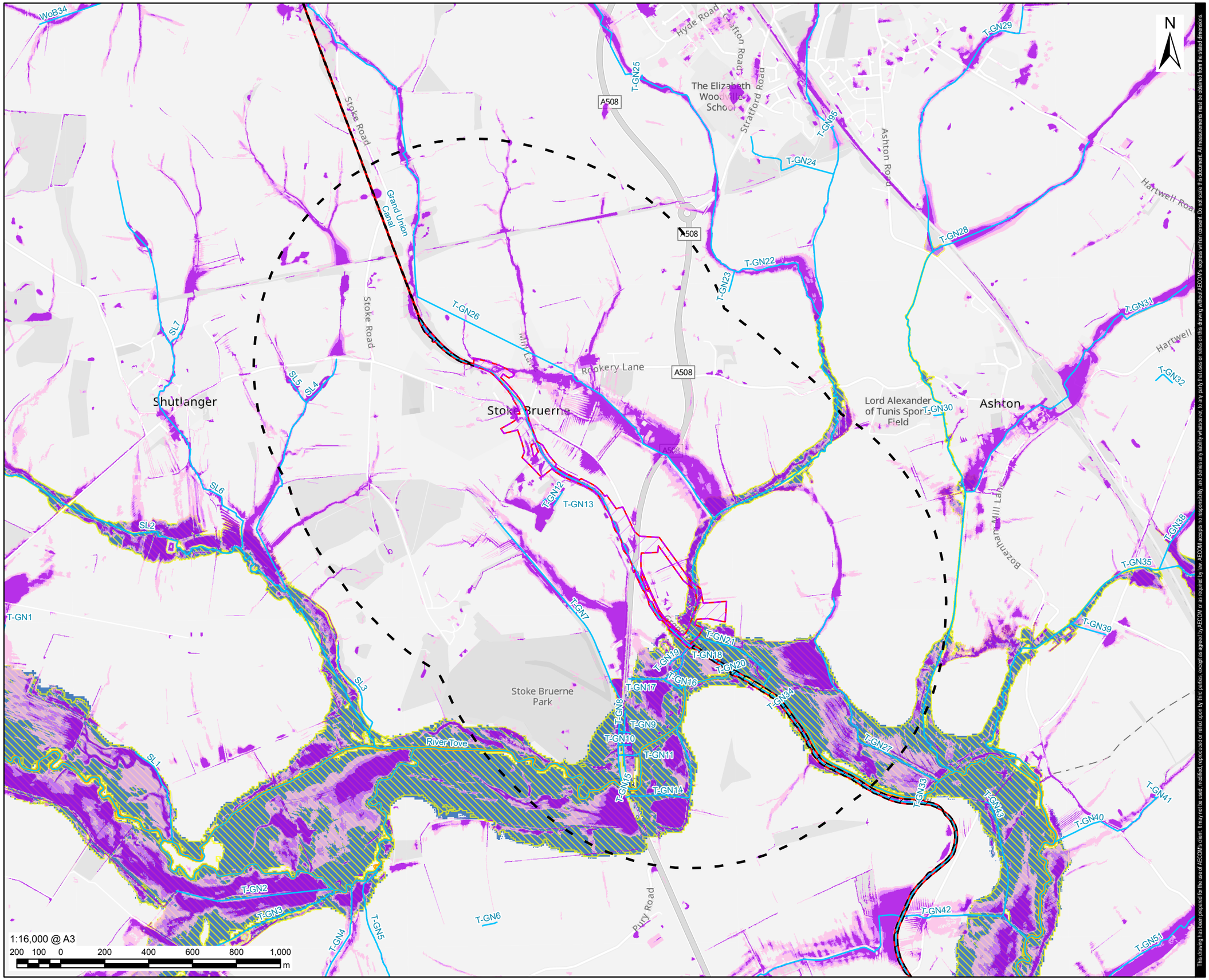

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Ordinary Watercourses
- Flood Defence

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water) Sheet O

FIGURE NUMBER

Figure 22-A3-5

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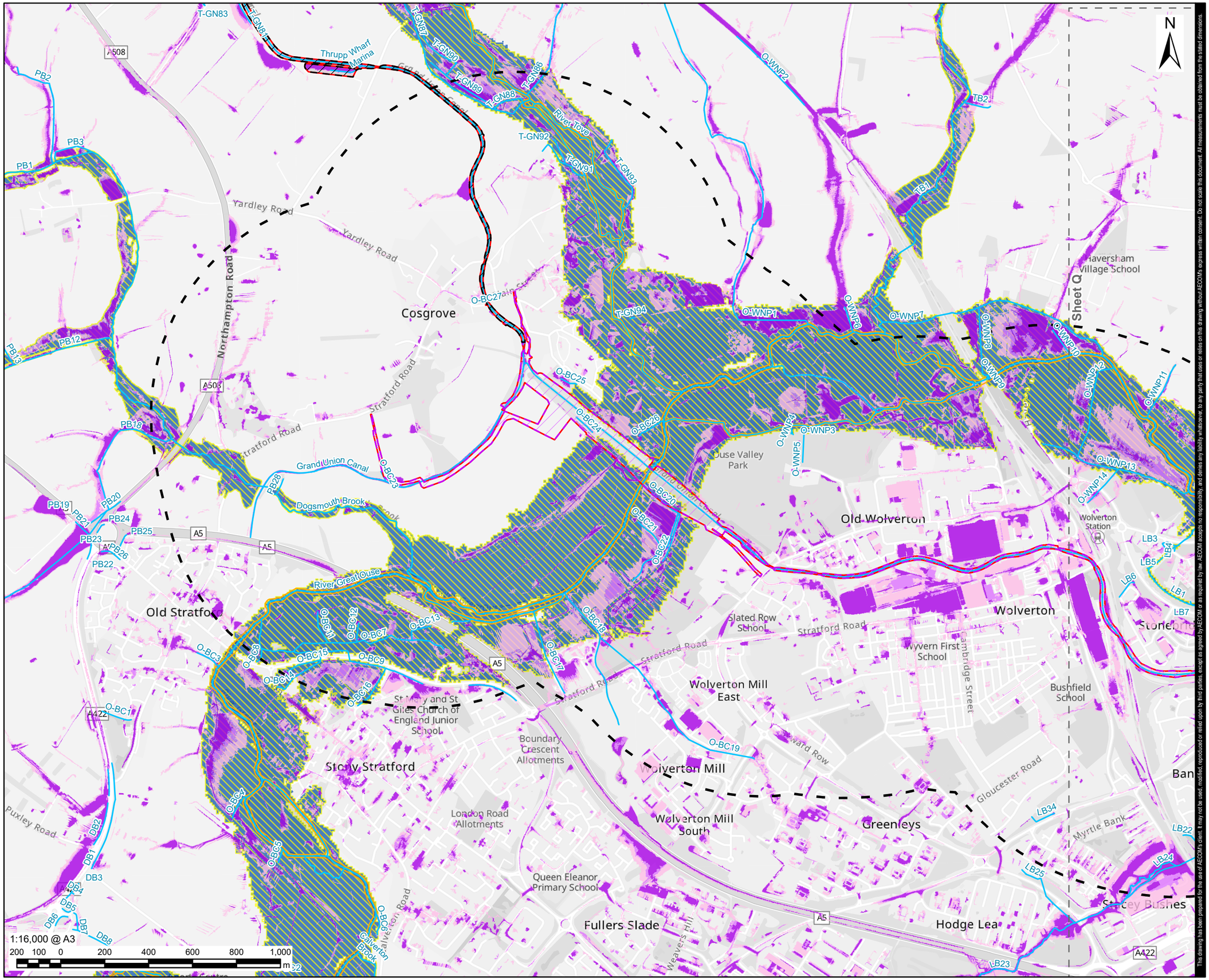

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LEGEND

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- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

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Defended Flood Climate Change

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Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet P

FIGURE NUMBER

Figure 22-A3-5

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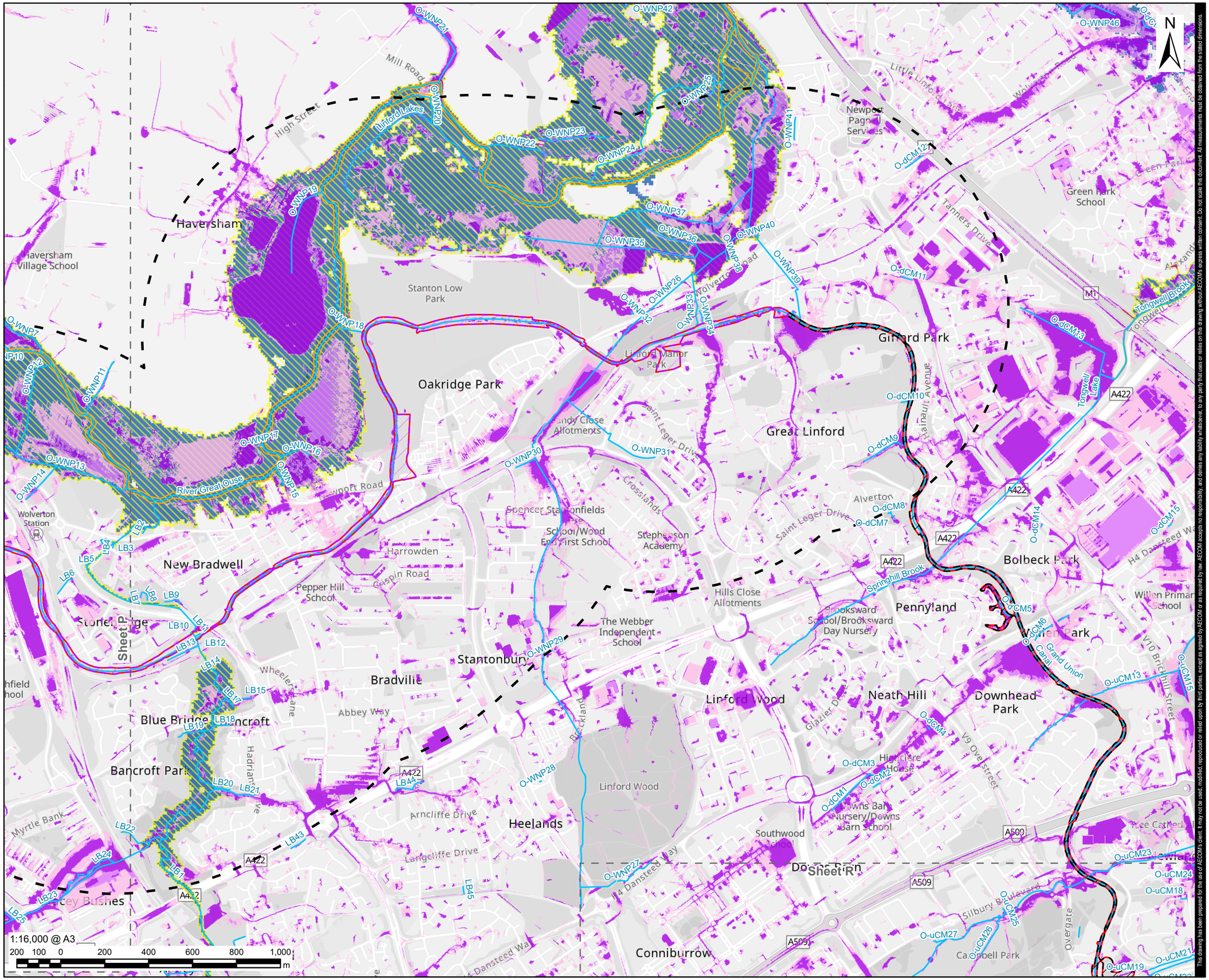

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LEGEND

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- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)
- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet Q

FIGURE NUMBER

Figure 22-A3-5

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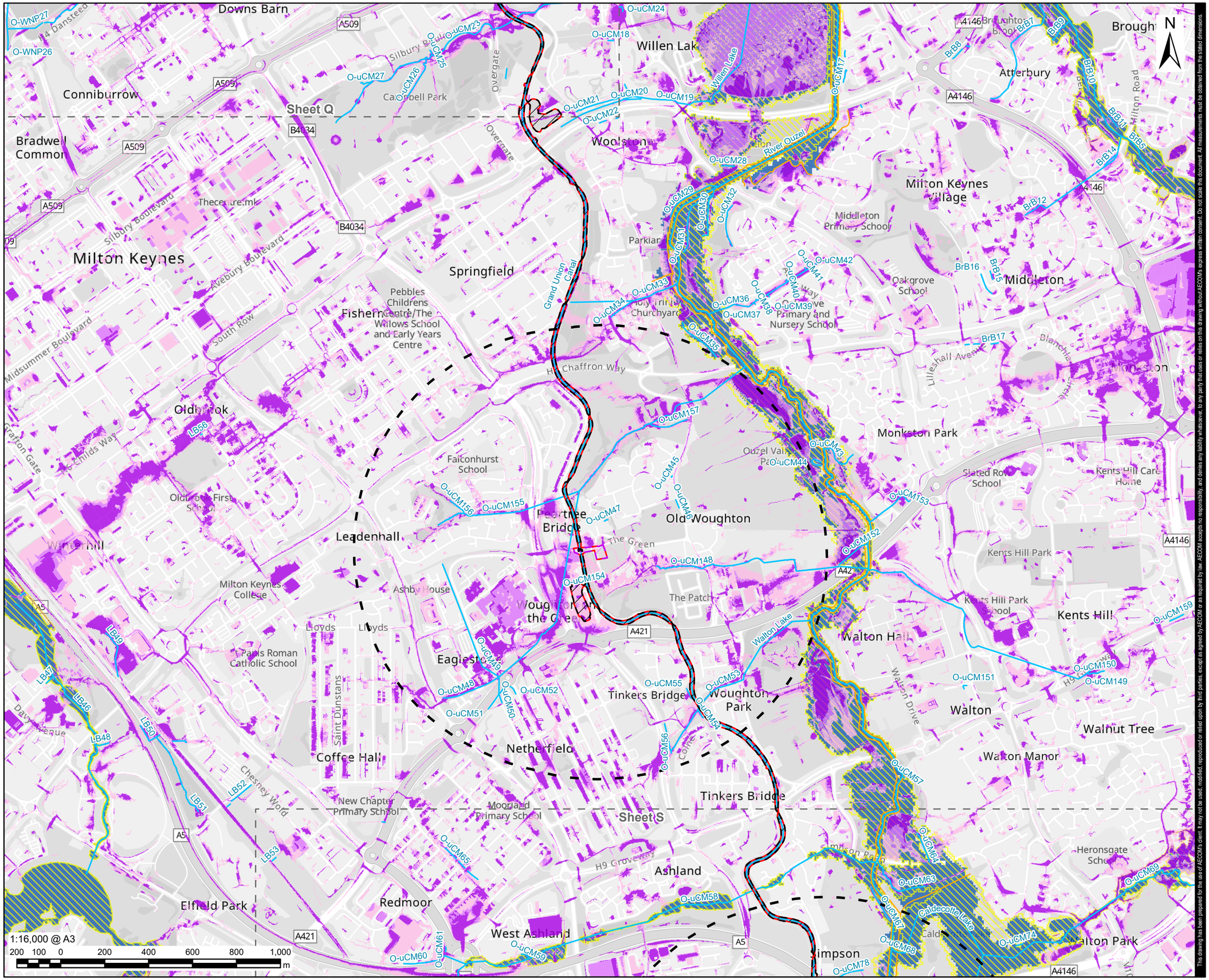

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

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- 1% AEP (Medium Probability)
- 0.1% AEP (Low Probability)

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water) Sheet R

FIGURE NUMBER

Figure 22-A3-5

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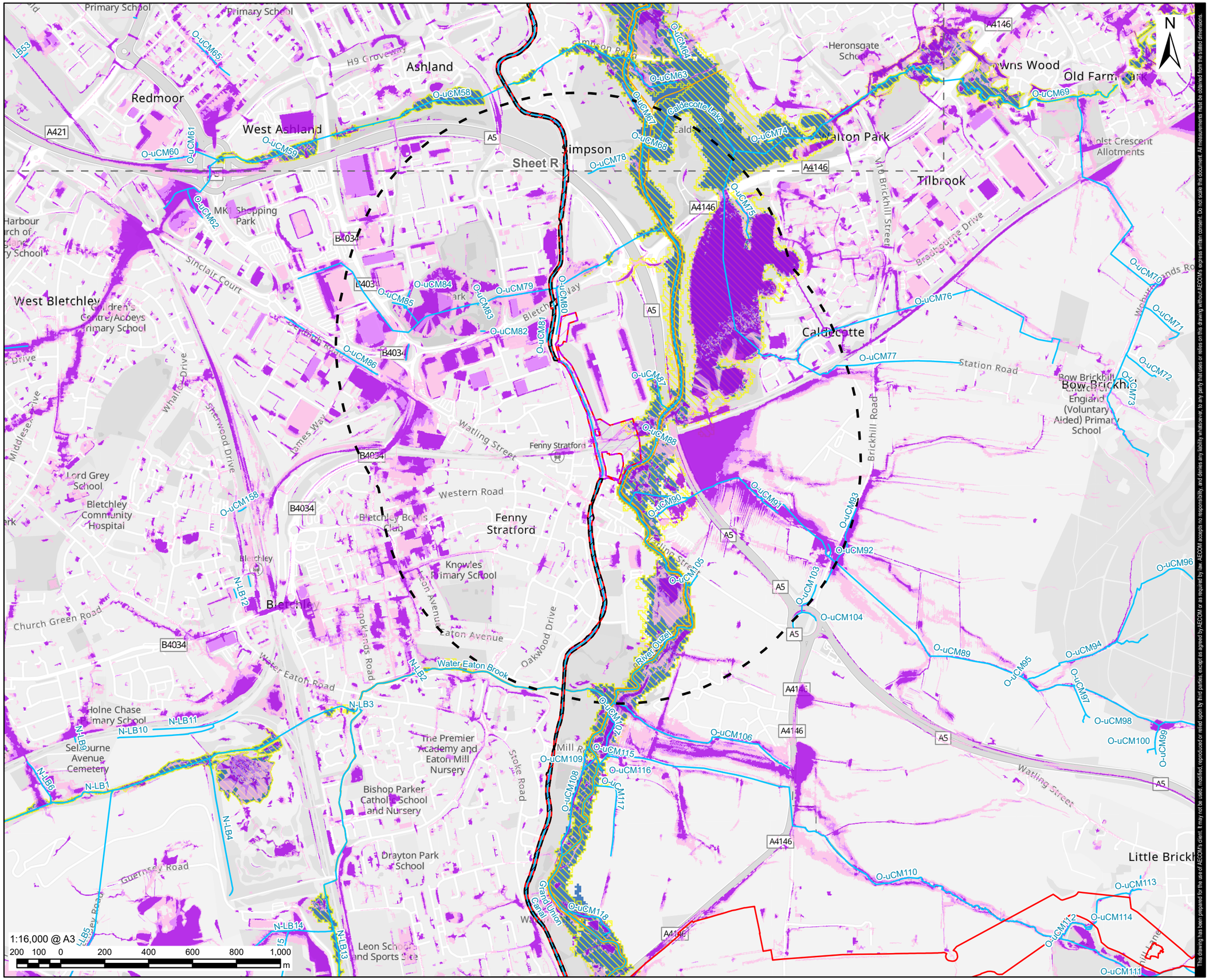

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
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FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Future Day Flood Risk (Fluvial and Surface Water)
Sheet S

FIGURE NUMBER

Figure 22-A3-5

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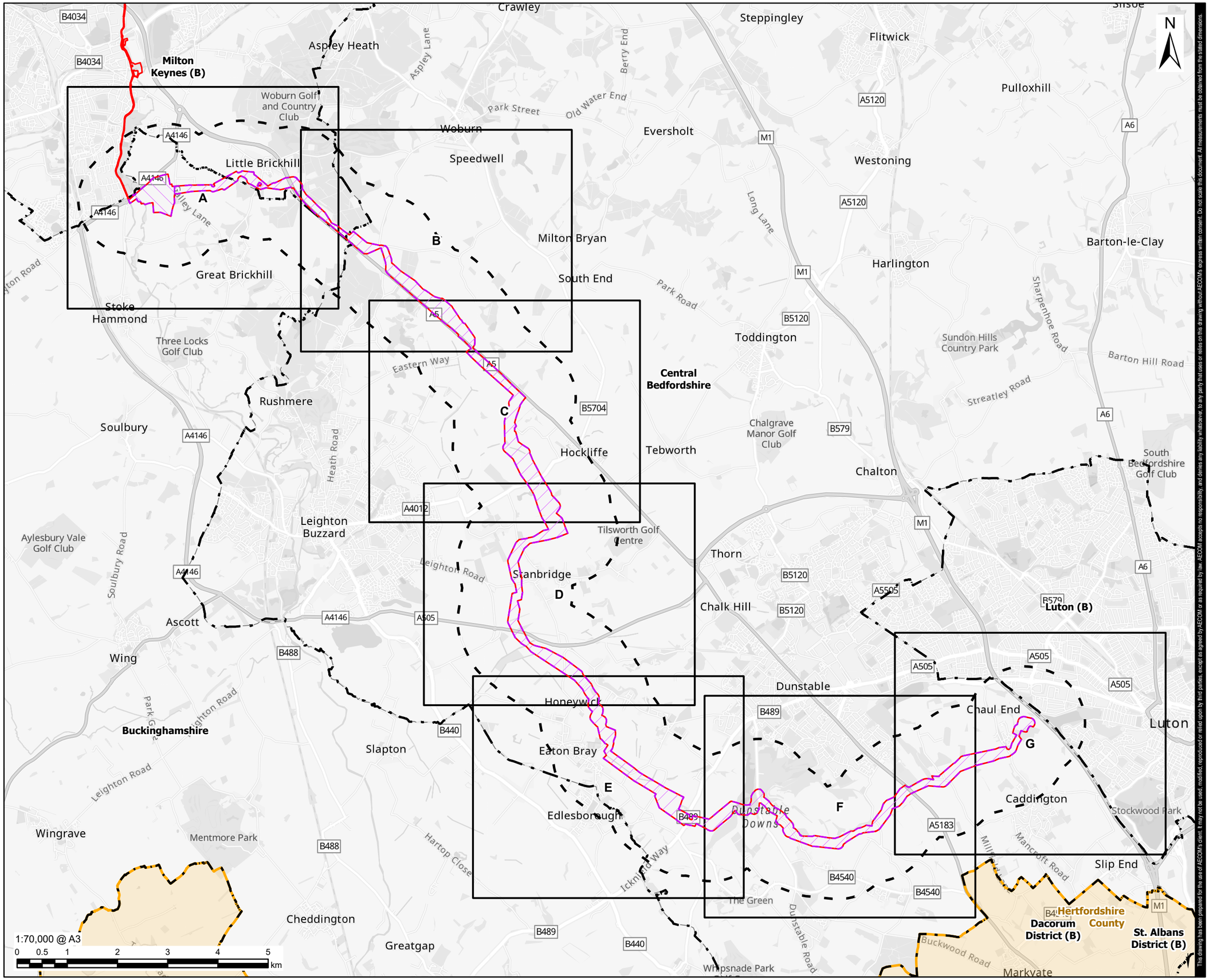

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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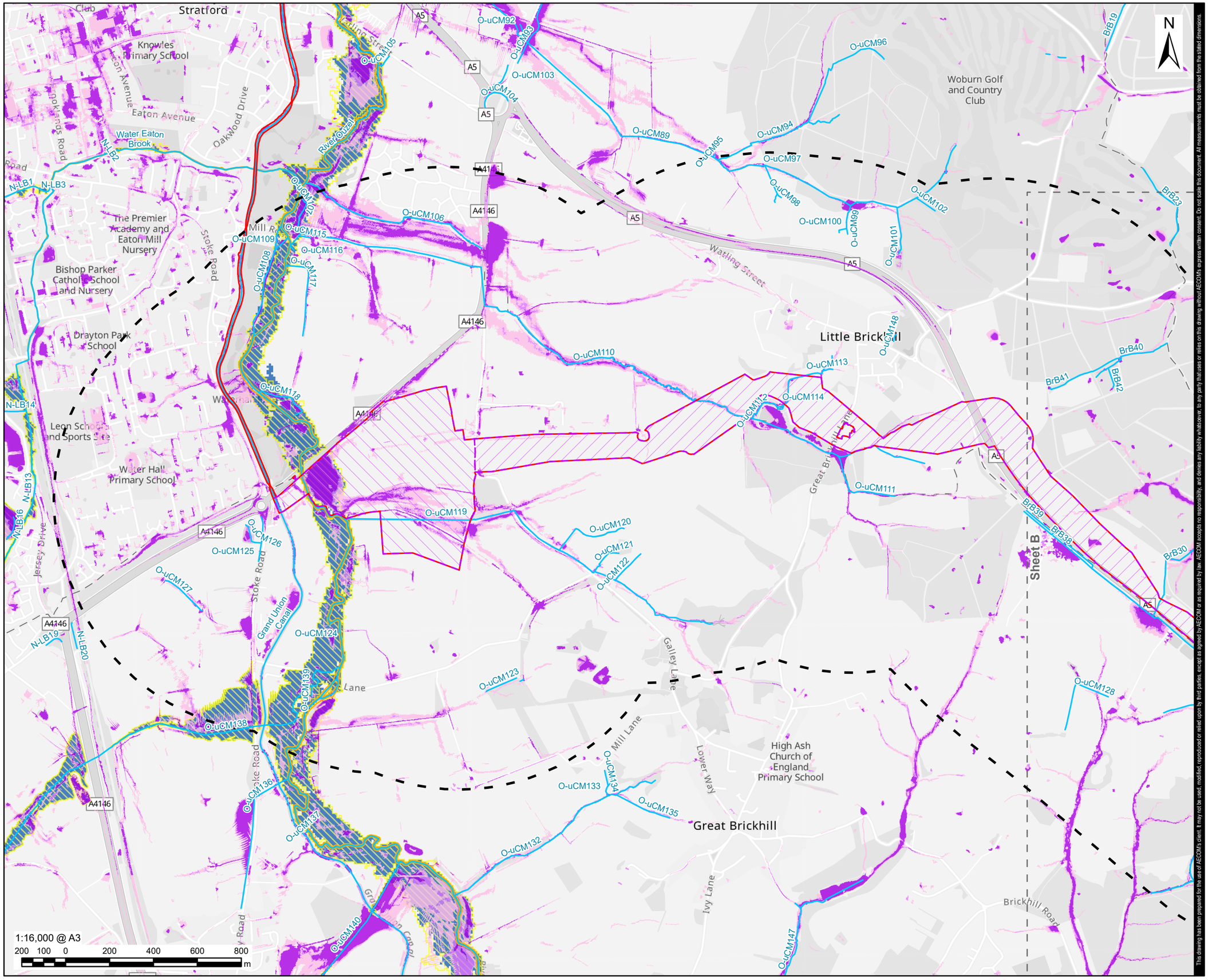

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

- 3.3% AEP (High Probability)'
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- 0.1% AEP (Low Probability)

Defended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

Undefended Flood Climate Change

- 1% AEP (1 in 100) Rivers/ 0.5% AEP (1 in 200) Sea

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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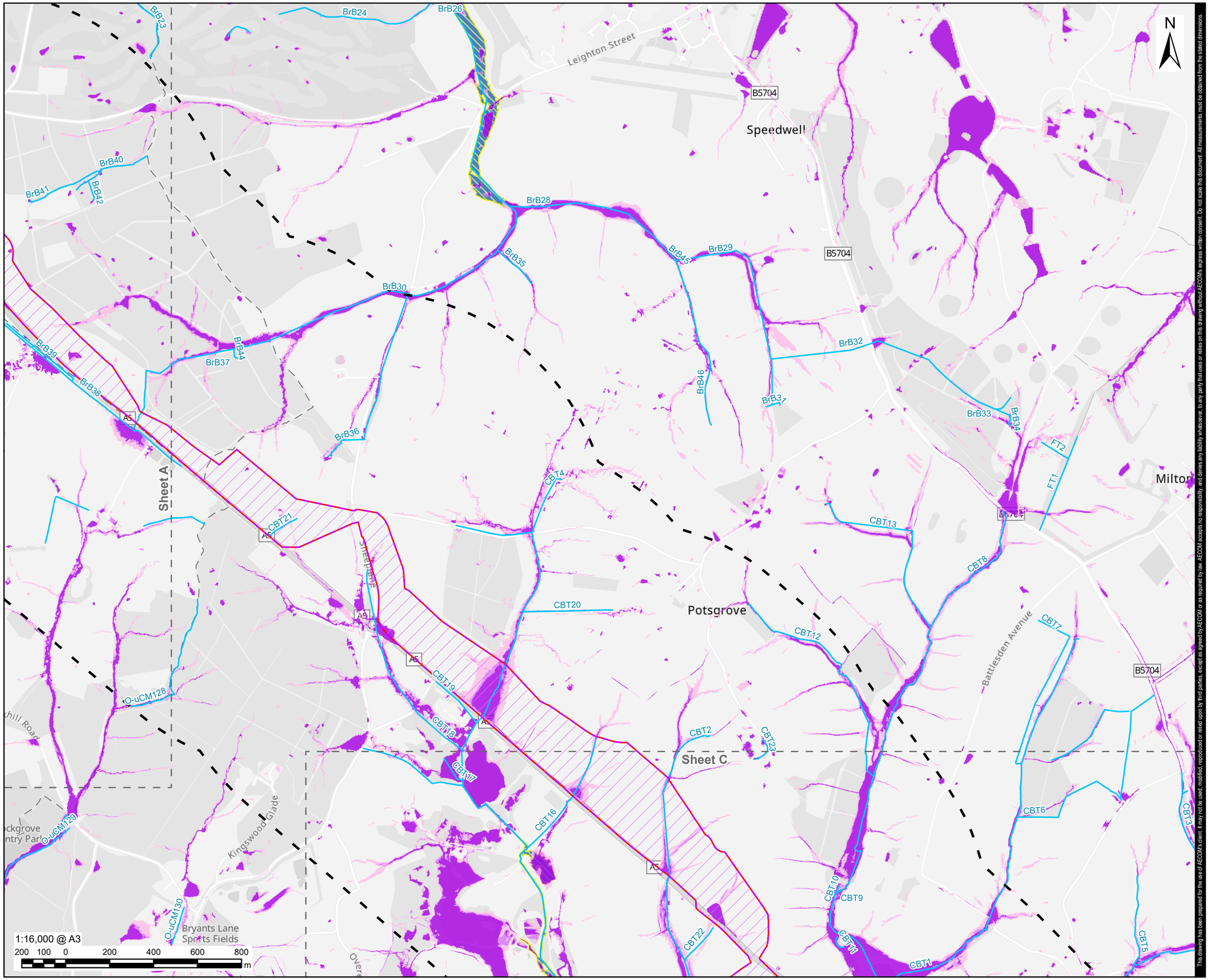

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

Risk of Flooding from Surface Water (RoFSW) Plus Climate Change

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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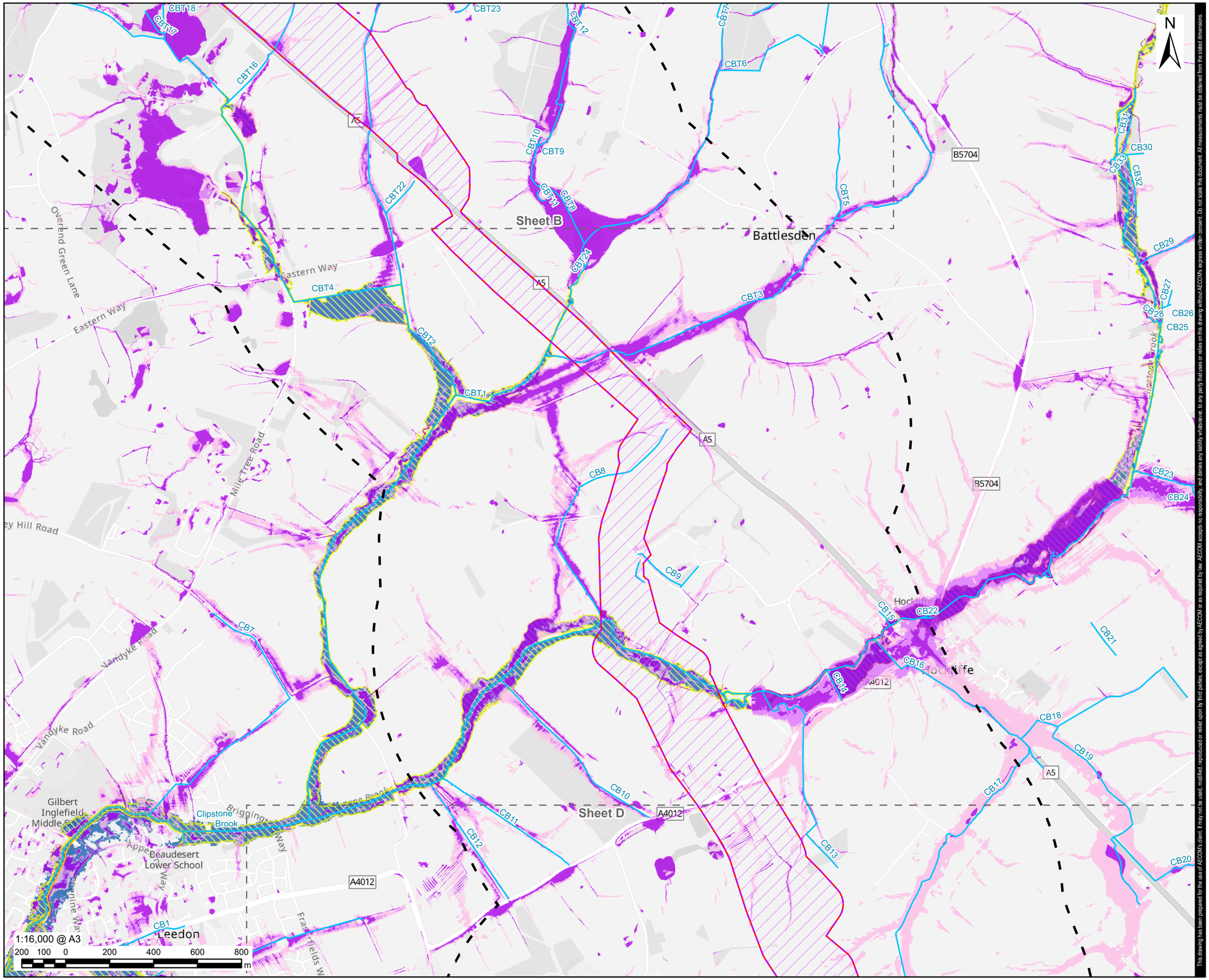

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Ordinary Watercourses
- Flood Defence

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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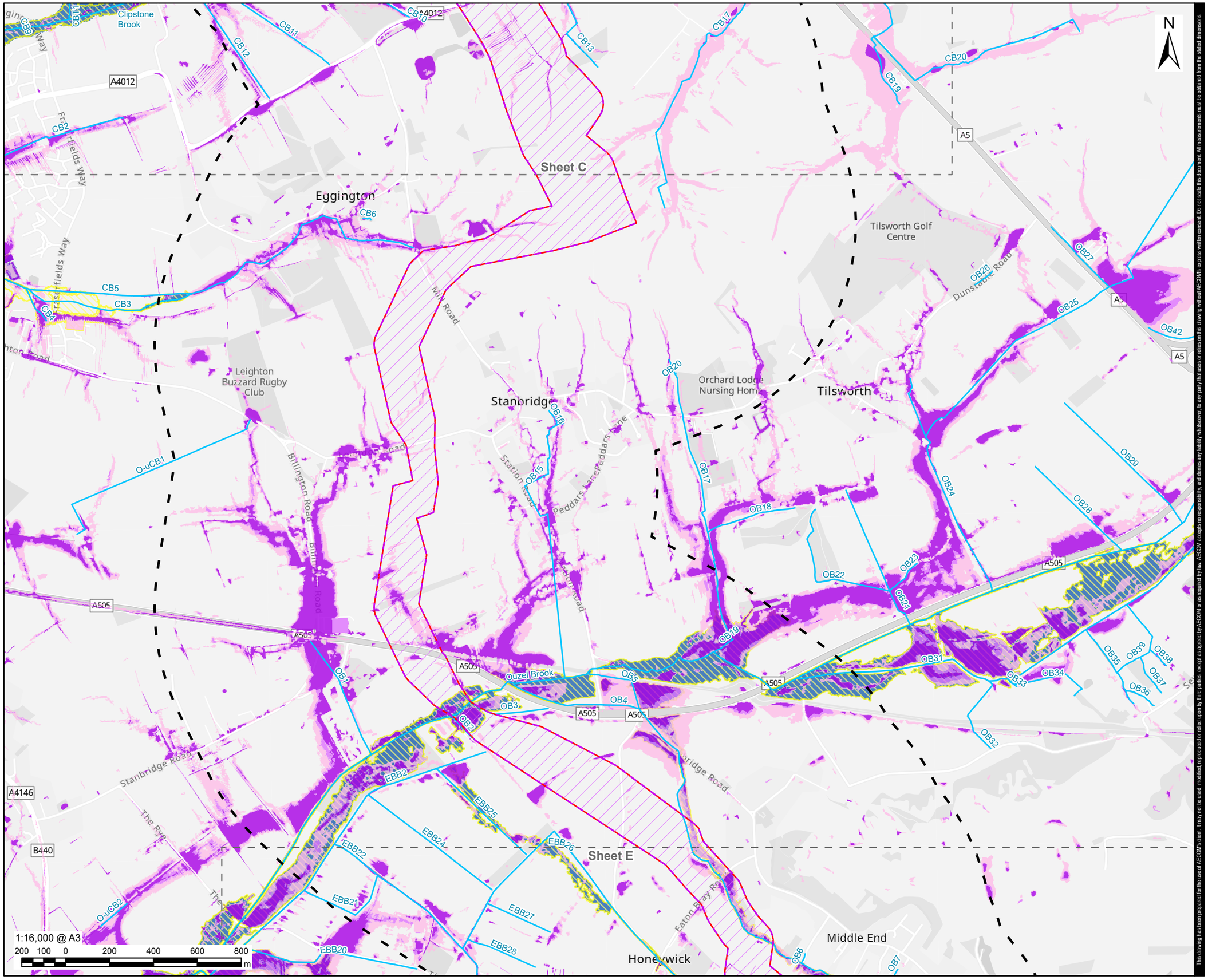

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LEGEND

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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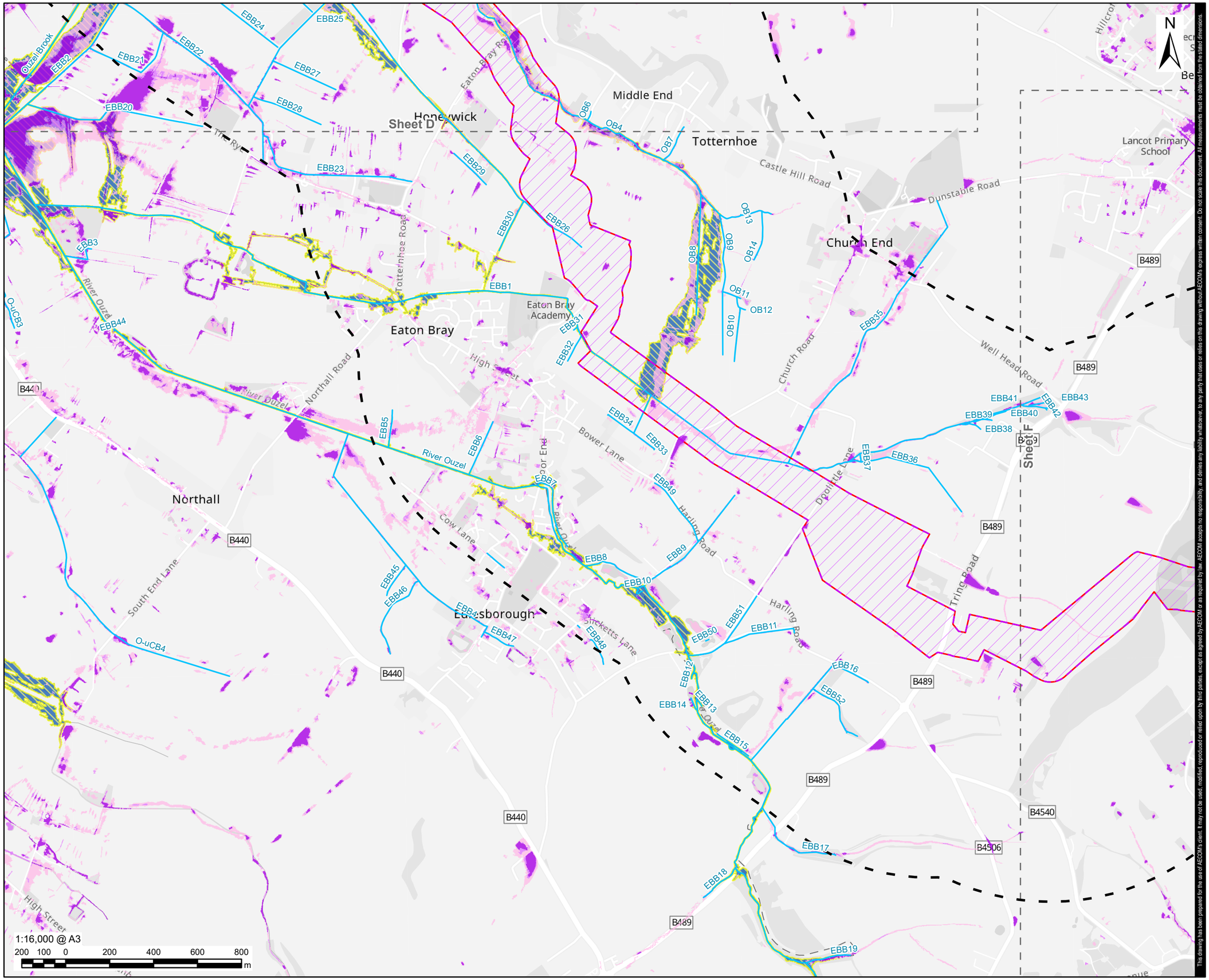

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ISSUE PURPOSE

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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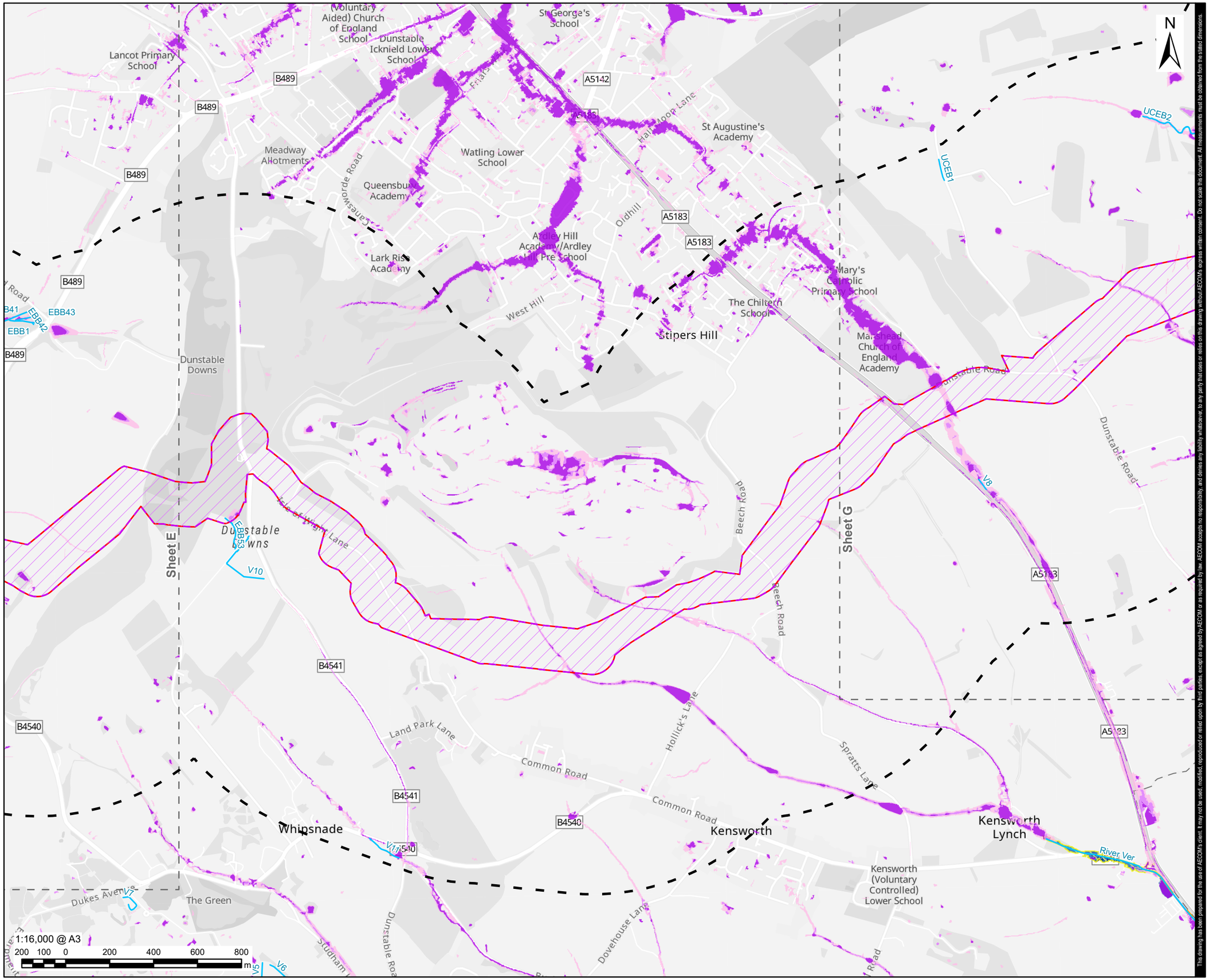

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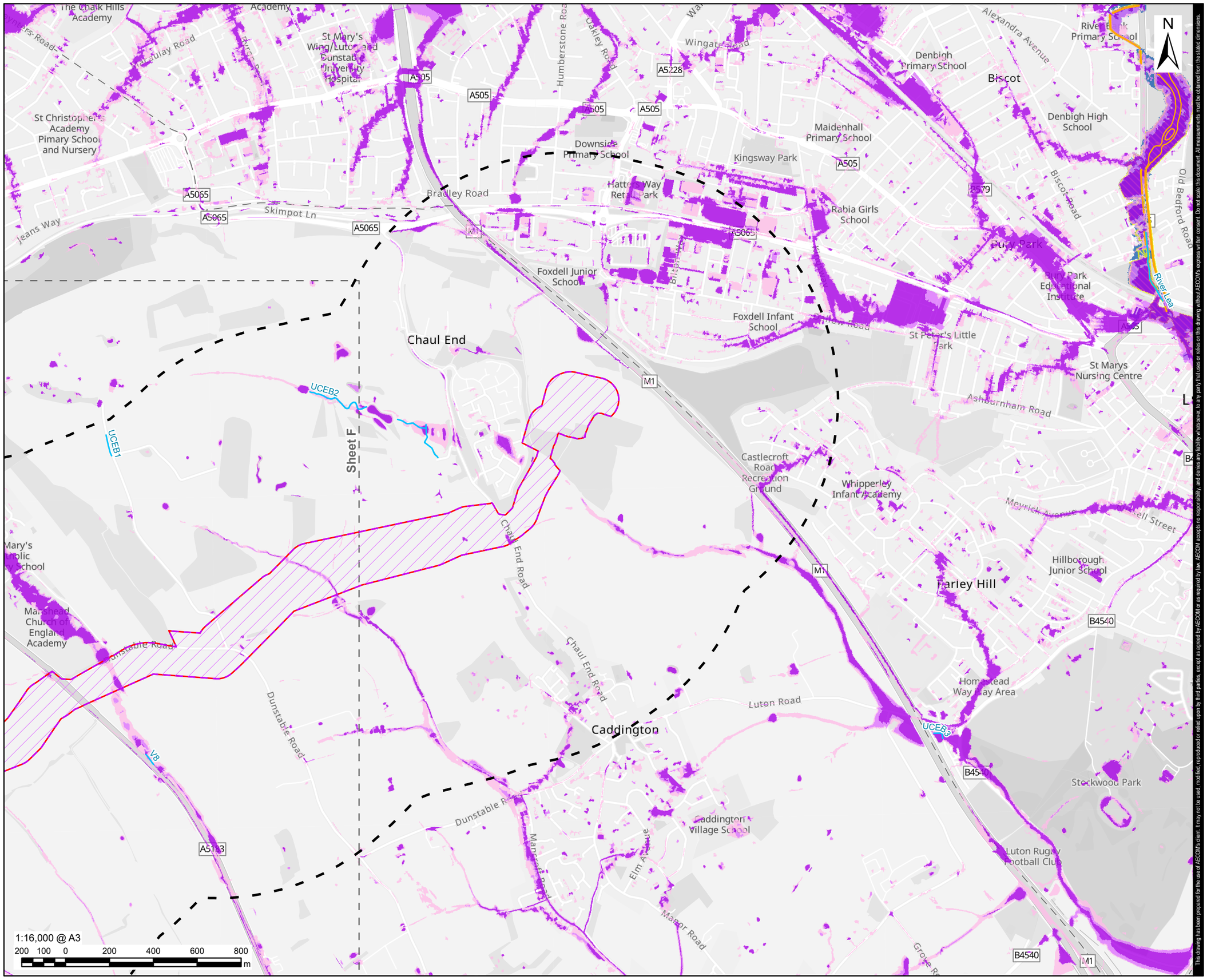
FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6



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LEGEND

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FIGURE TITLE

Part 4 Future Day Flood Risk (Fluvial and Surface Water) Overview

FIGURE NUMBER

Figure 22-A3-6

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Annex 3-4: Environment Agency Flood Model Extents

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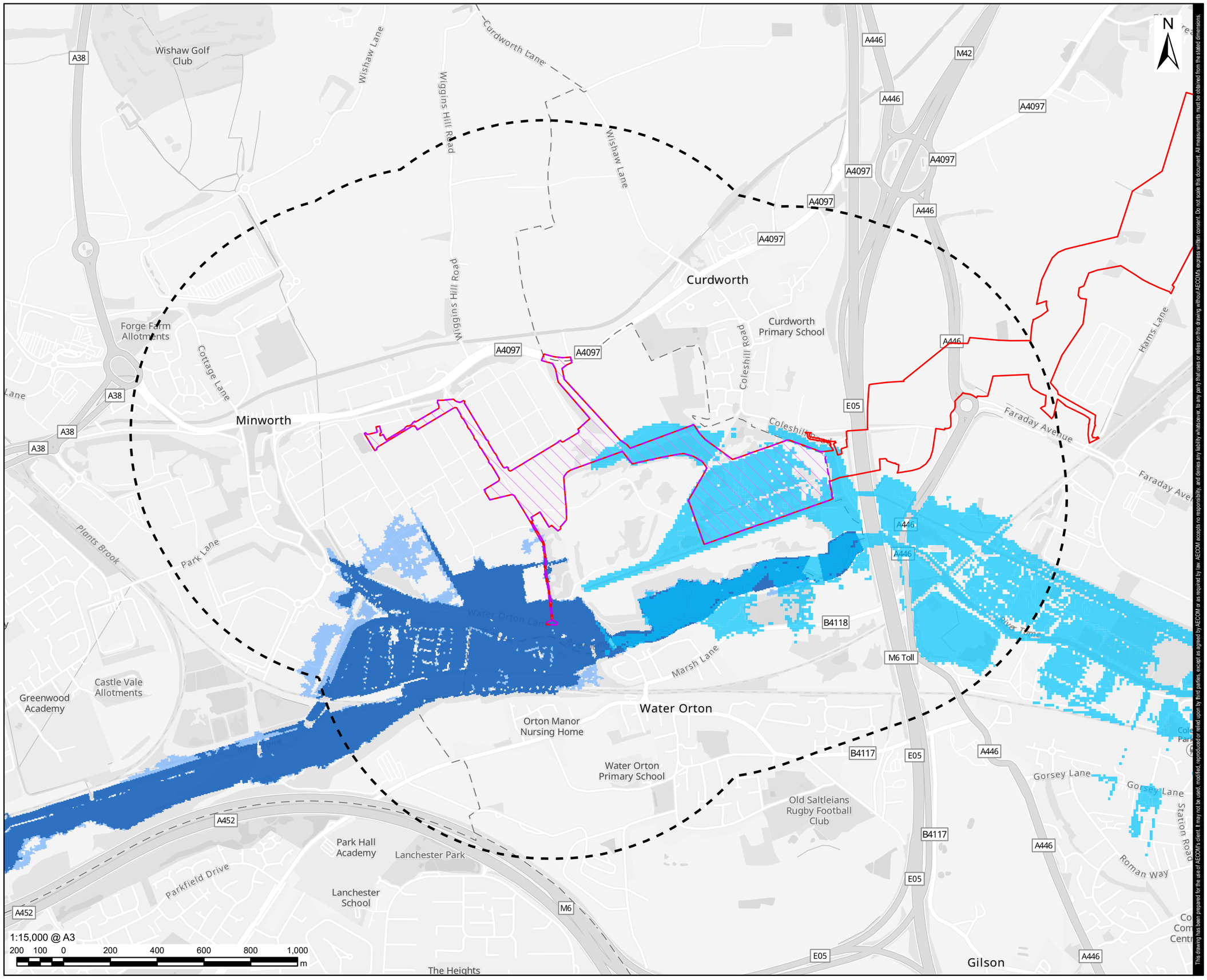

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LEGEND

- Part 1a
- Part 1a - 1km Study Area
- Preliminary Order Limits
- Lower Tame 2013 – 100 + CC

Bromford (River Tame) 2013 – 100 year and 100 year + 23% CC

- 1% AEP Flood Extent
- 1% AEP + 23% CC Extent

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 1a Environment Agency - Detailed Model Output

FIGURE NUMBER

Figure 22-A3-19

Annex 3-5: Susceptibility of Groundwater Flooding

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2026-01-14

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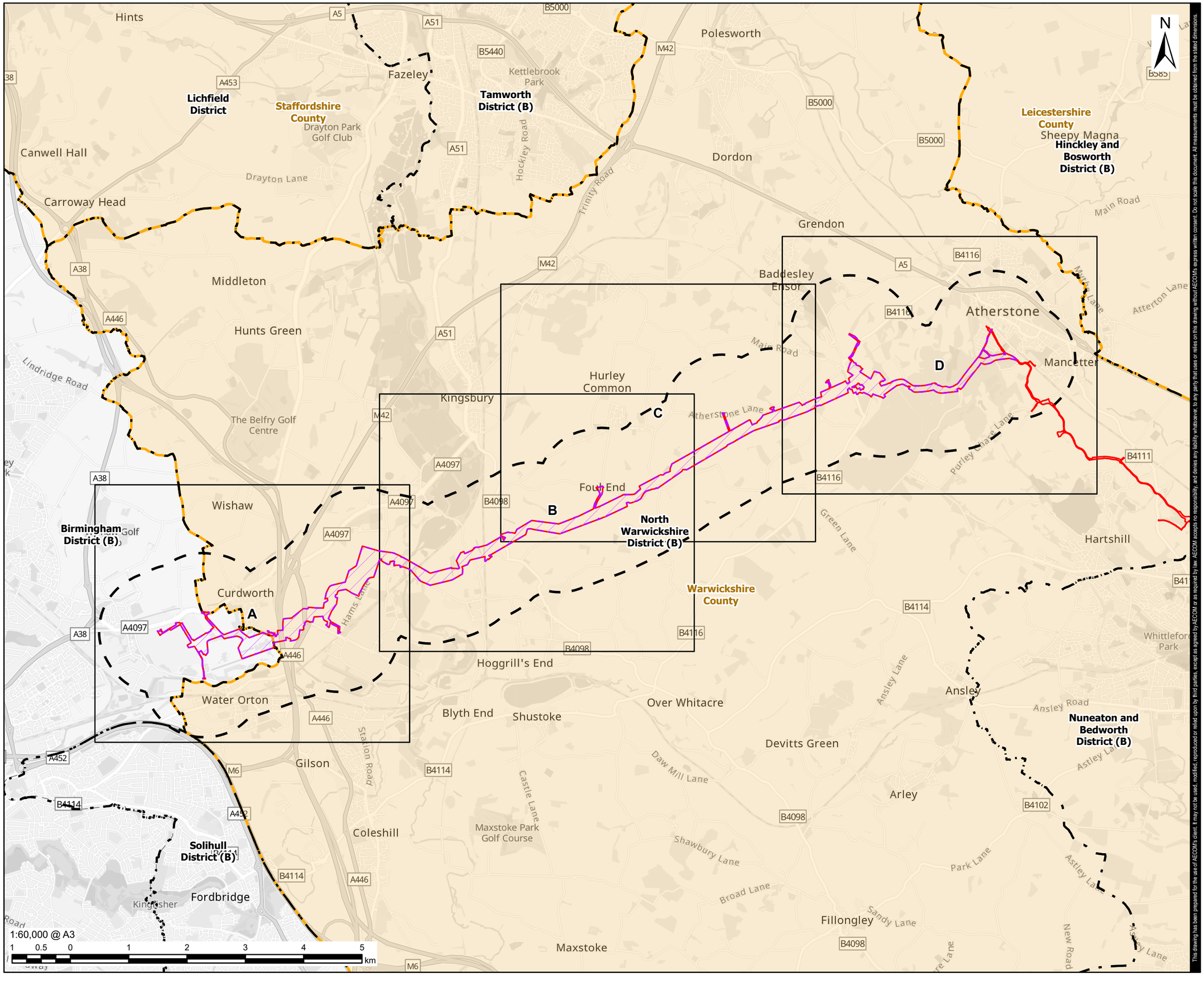

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 Susceptibility to Groundwater Flooding Overview

FIGURE NUMBER

Figure 22-A3-10

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2026-01-14

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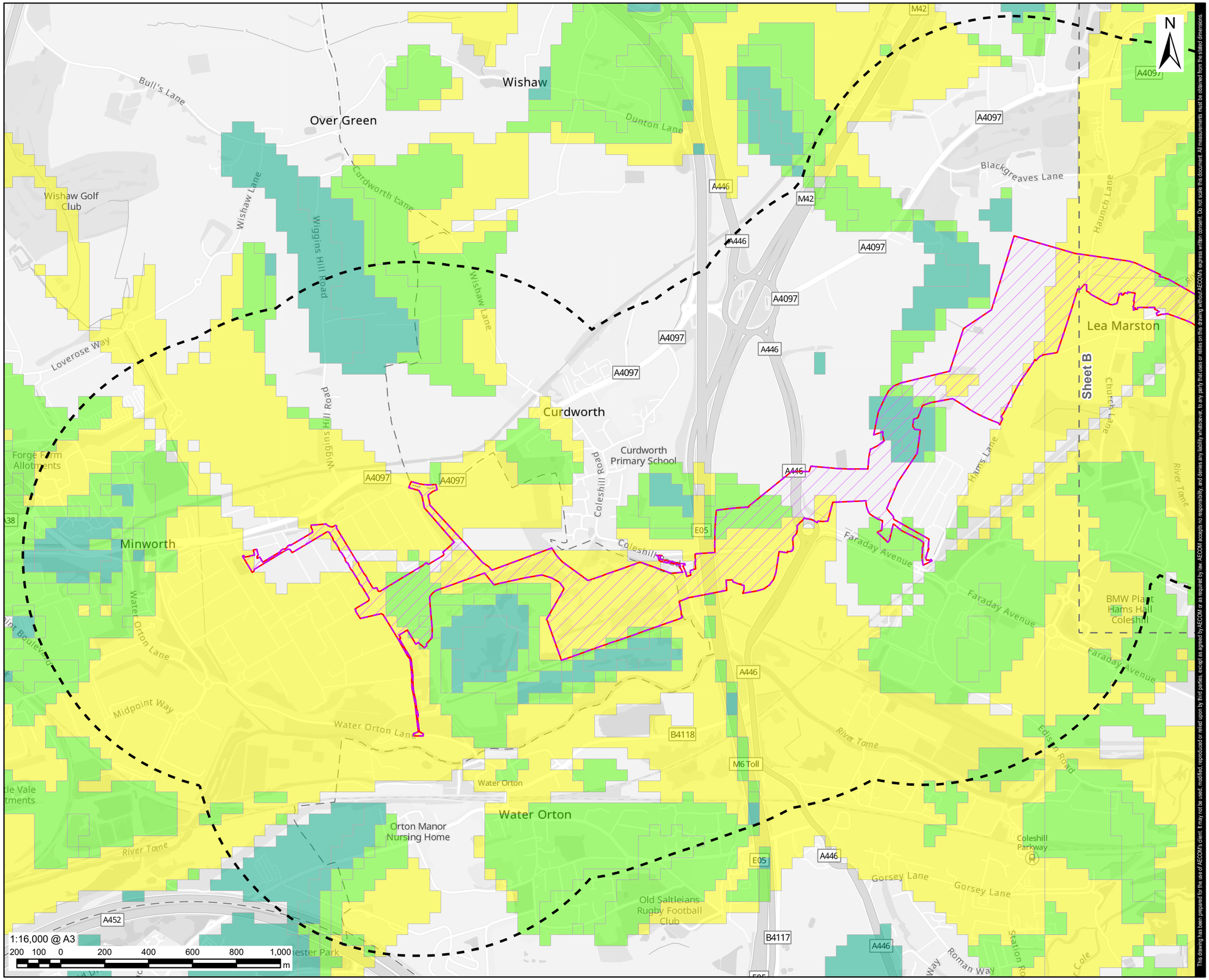

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 1 Susceptibility to Groundwater Flooding
Sheet A

FIGURE NUMBER

Figure 22-A3-10

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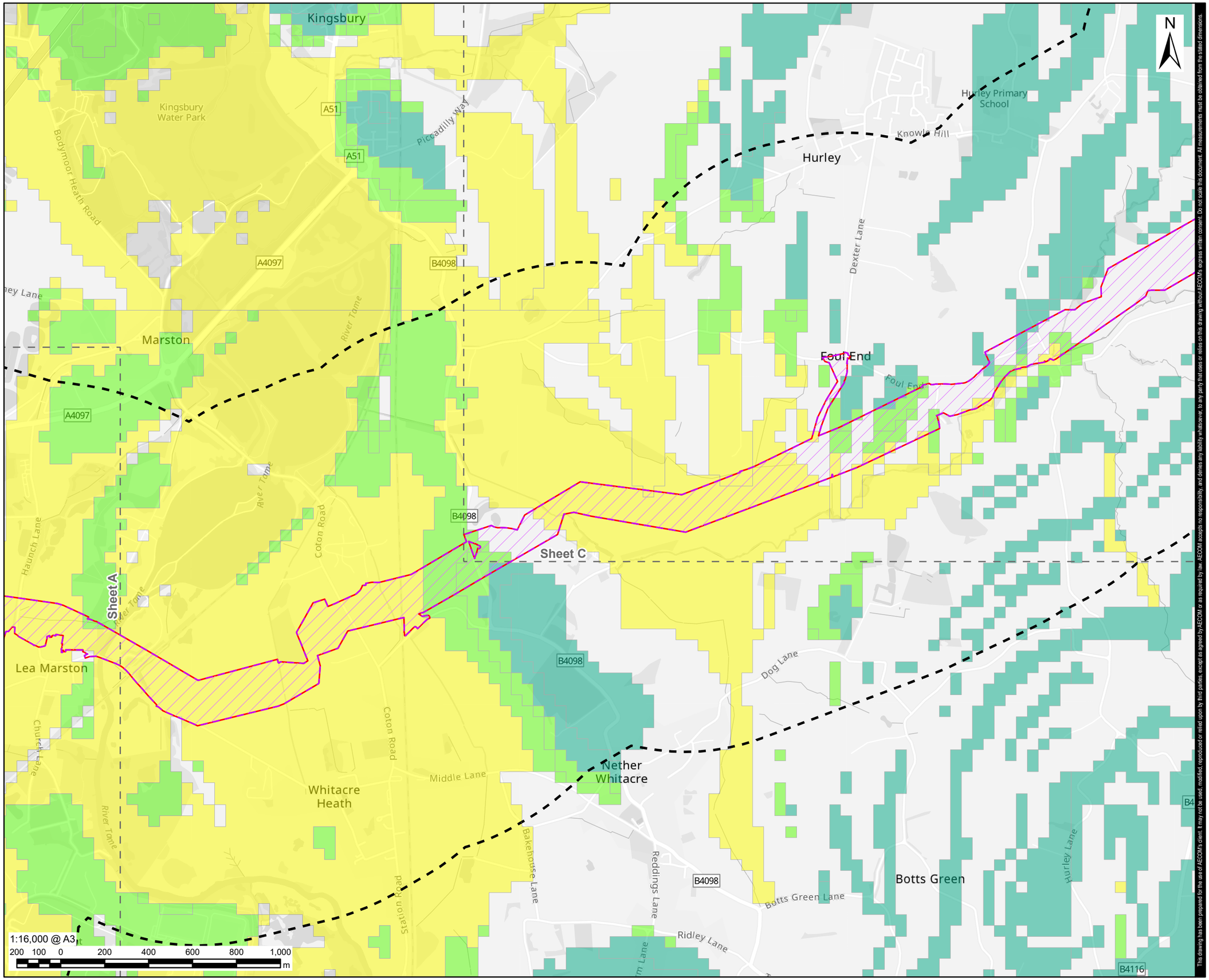

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FIGURE TITLE

Part 1 Susceptibility to Groundwater Flooding
Sheet B

FIGURE NUMBER

Figure 22-A3-10

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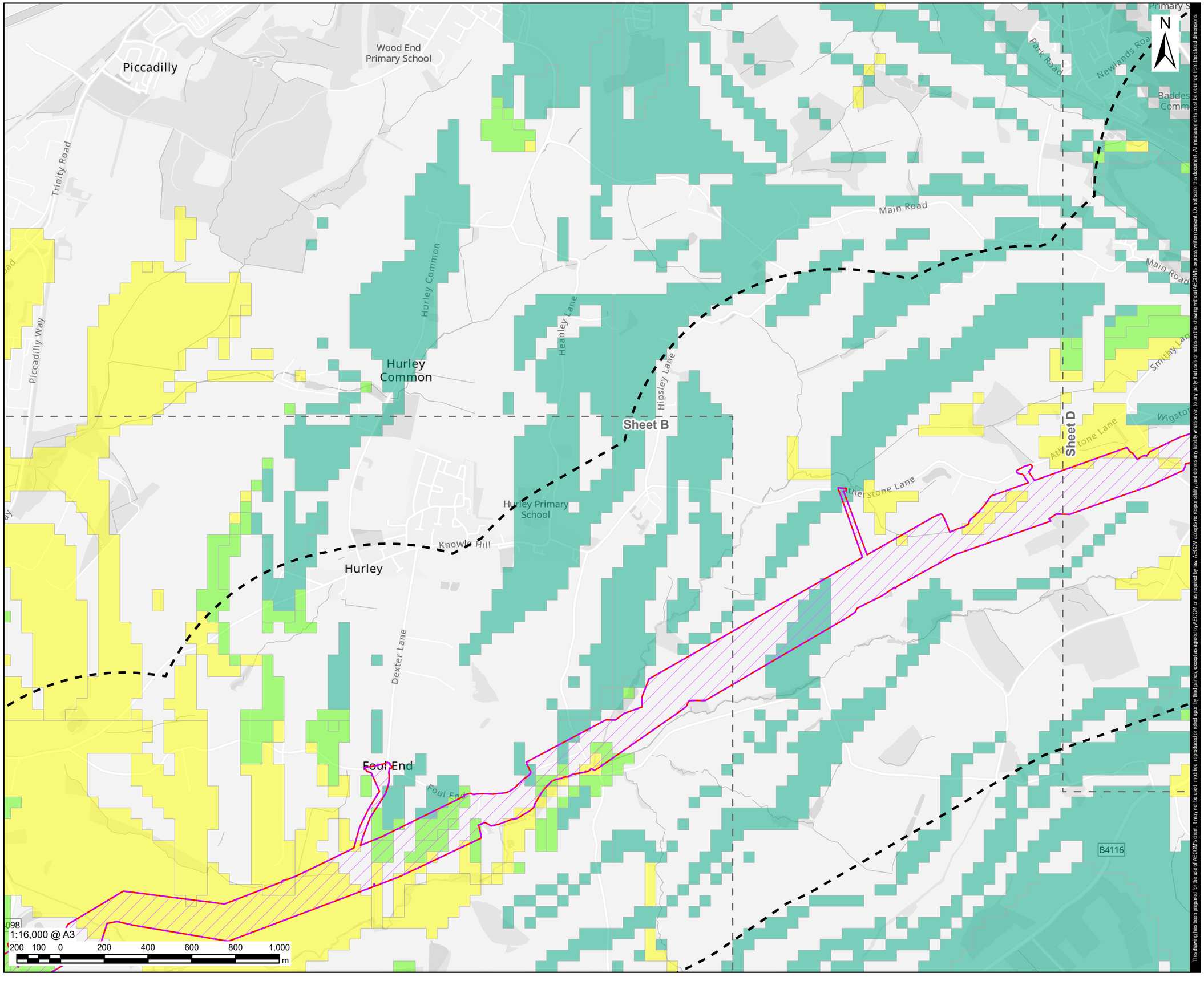

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FIGURE TITLE

Part 1 Susceptibility to Groundwater Flooding
Sheet C

FIGURE NUMBER

Figure 22-A3-10

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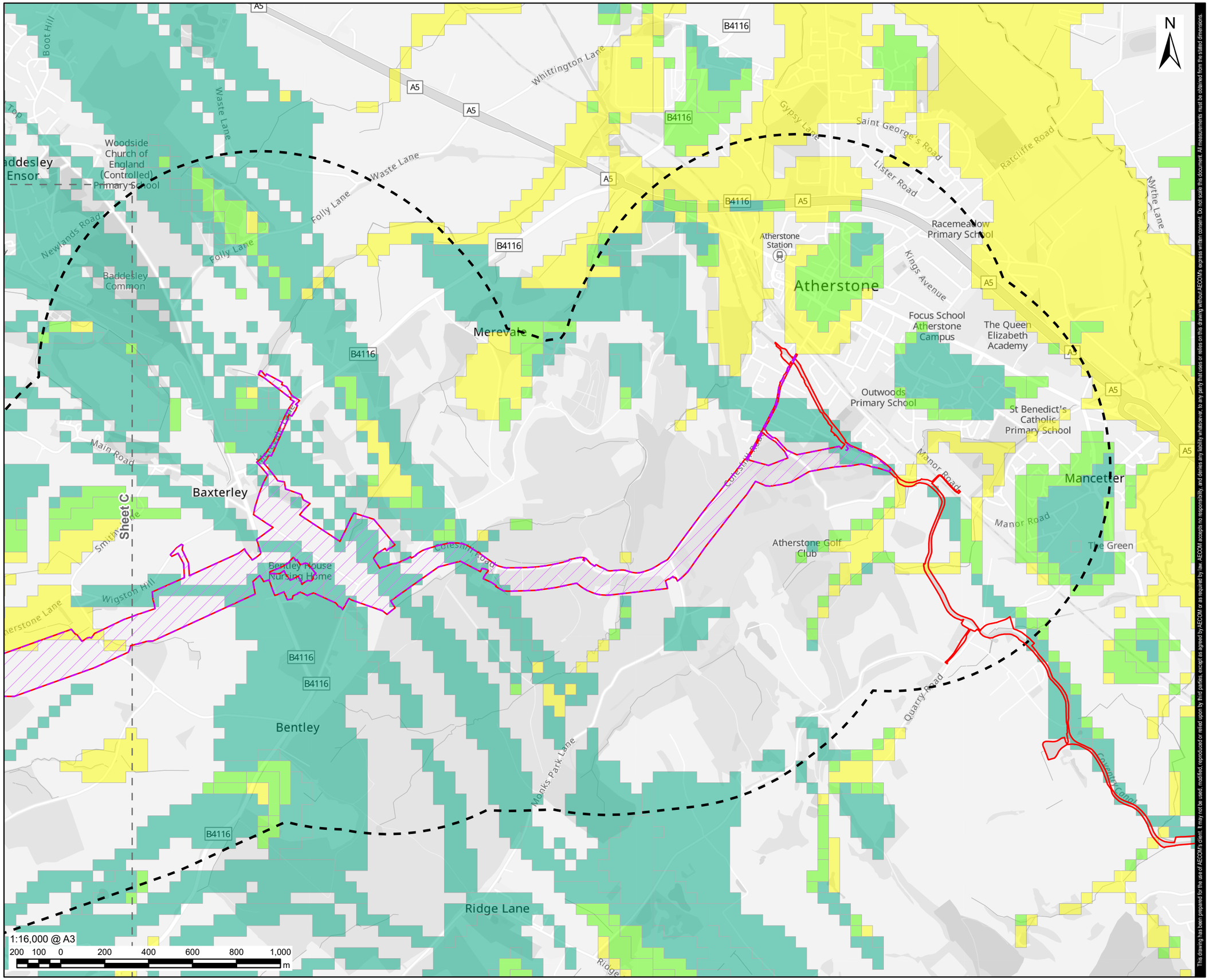

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FIGURE TITLE

Part 1 Susceptibility to Groundwater Flooding
Sheet D

FIGURE NUMBER

Figure 22-A3-10

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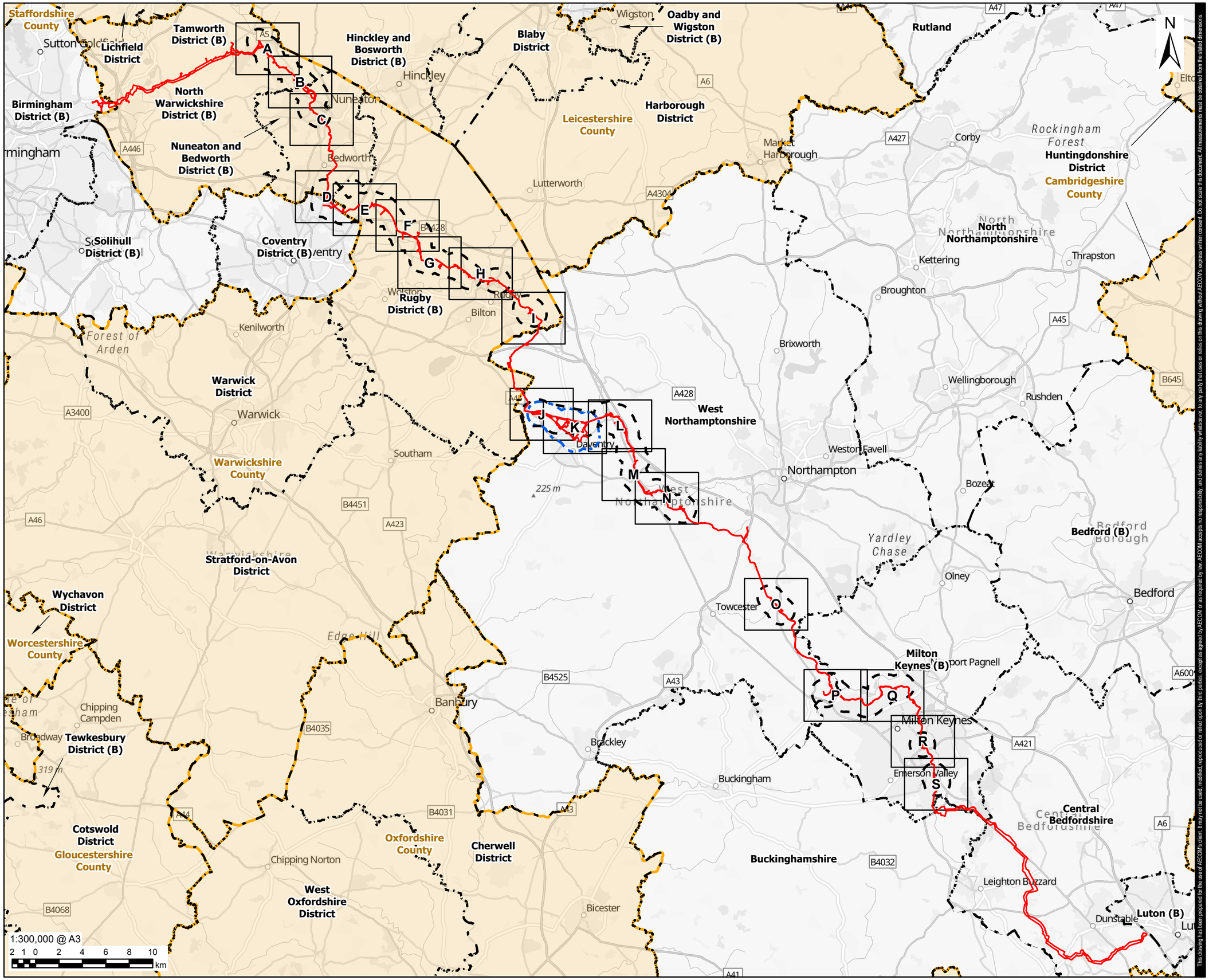

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LEGEND

- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

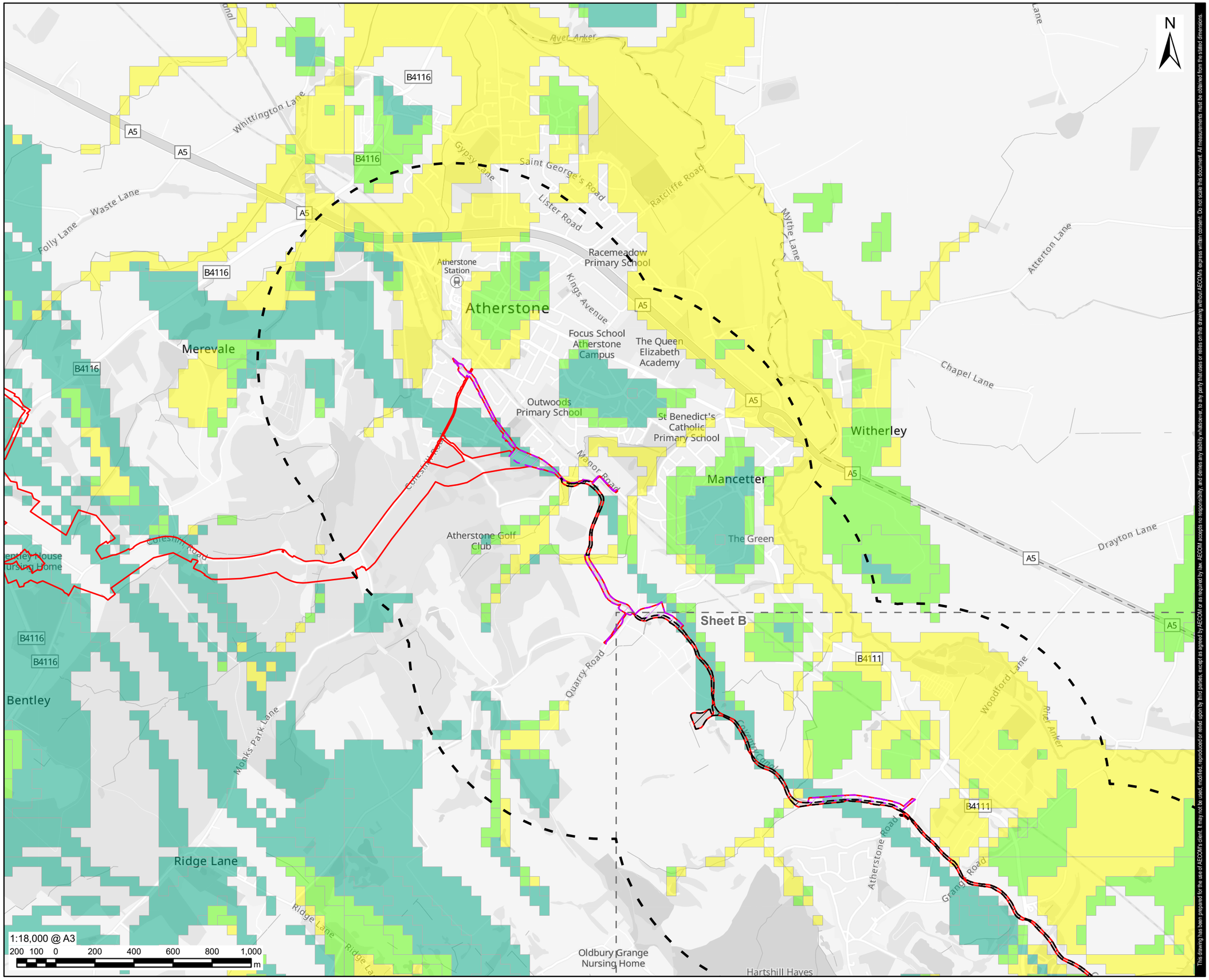
60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding Overview

FIGURE NUMBER

Figure 22-A3-11



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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet A

FIGURE NUMBER

Figure 22-A3-11

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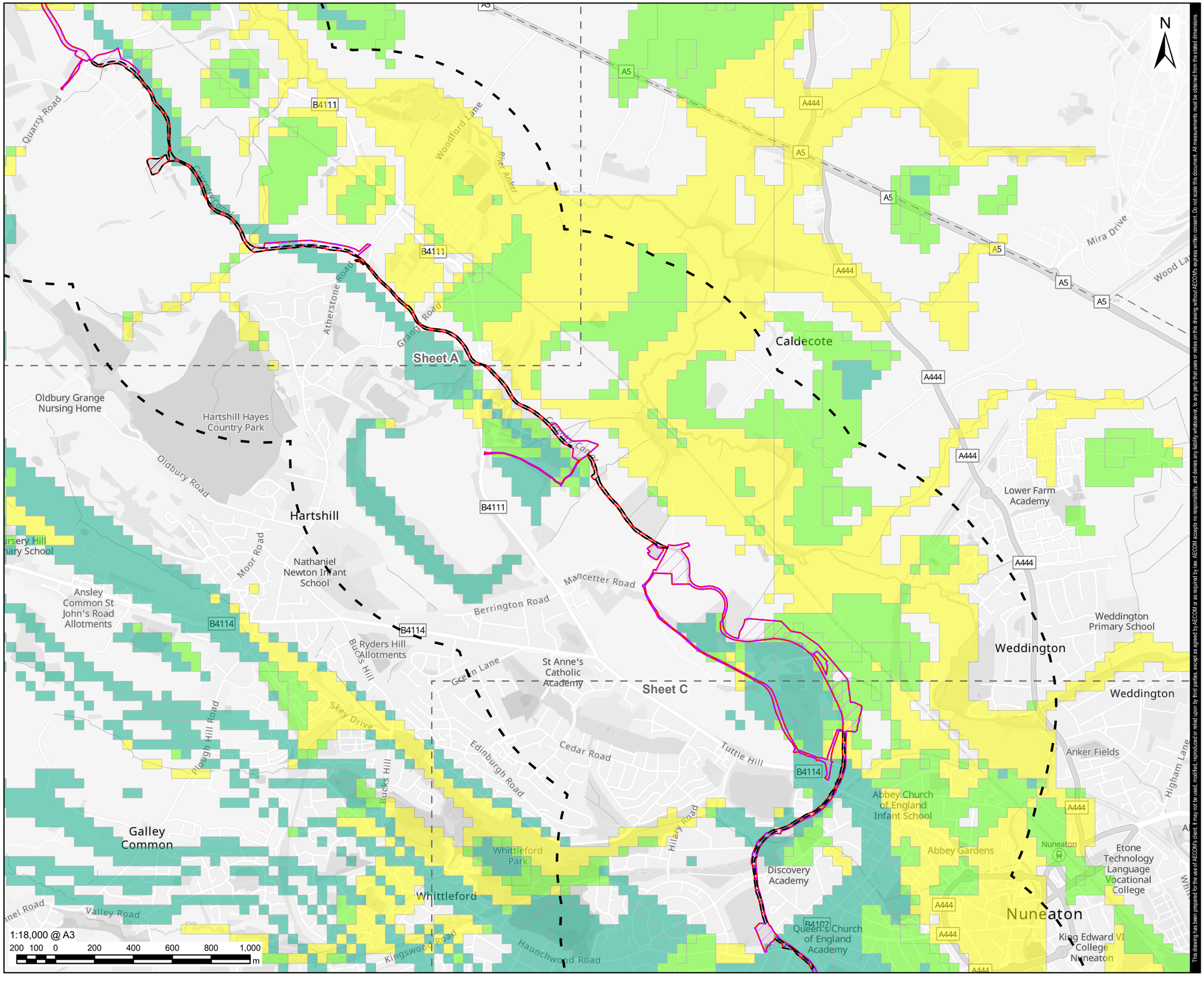

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet B

FIGURE NUMBER

Figure 22-A3-11

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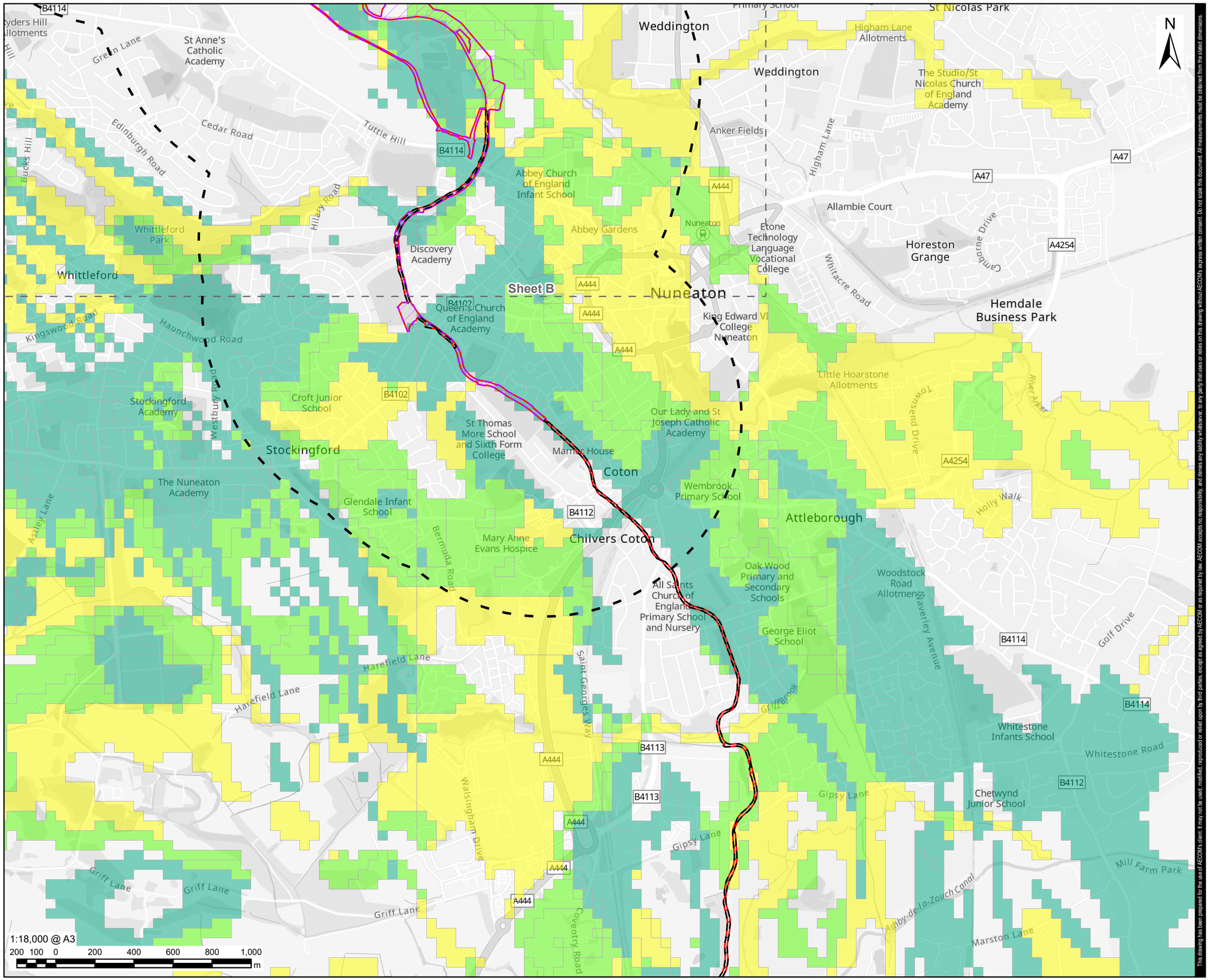

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet C

FIGURE NUMBER

Figure 22-A3-11

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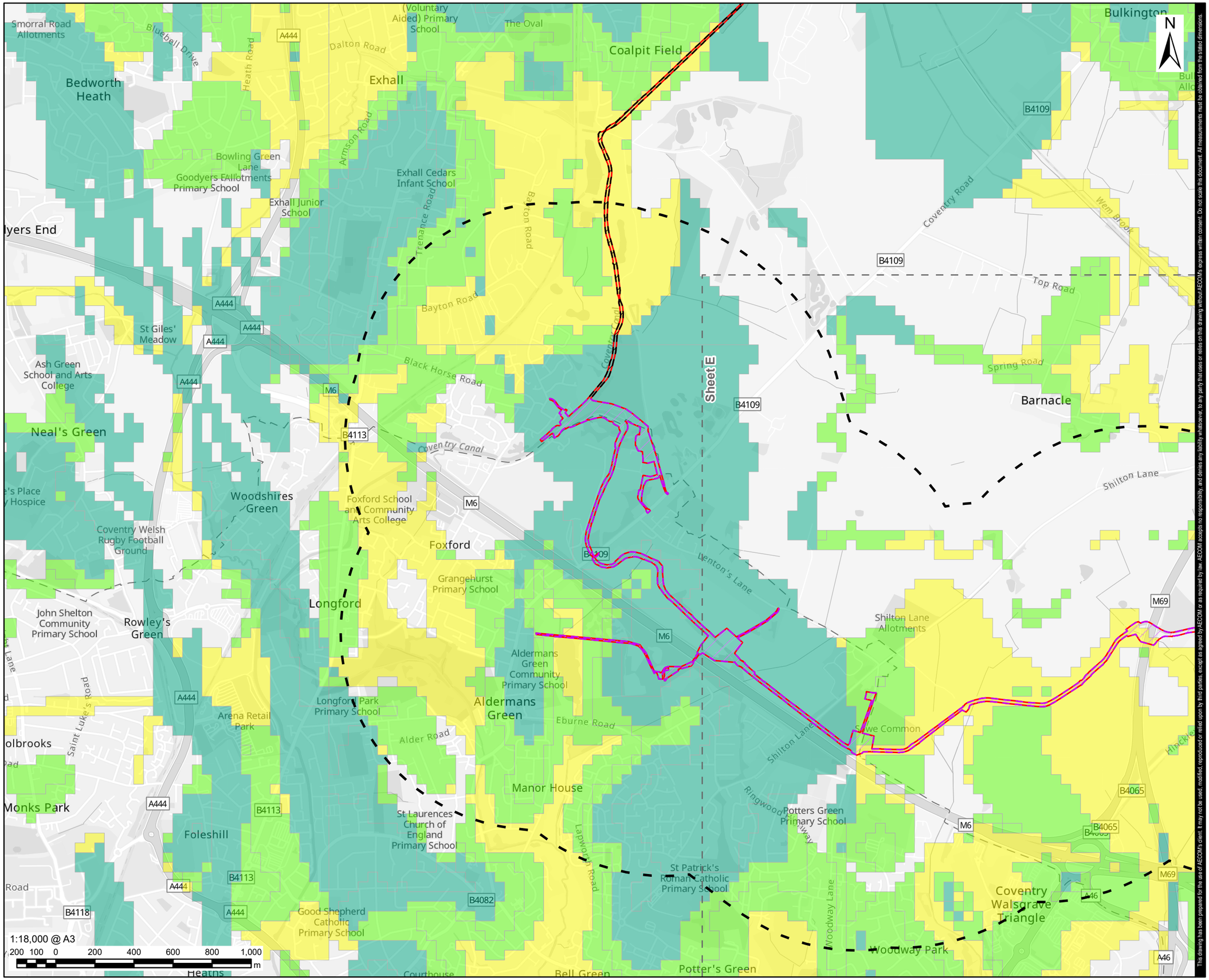

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet D

FIGURE NUMBER

Figure 22-A3-11

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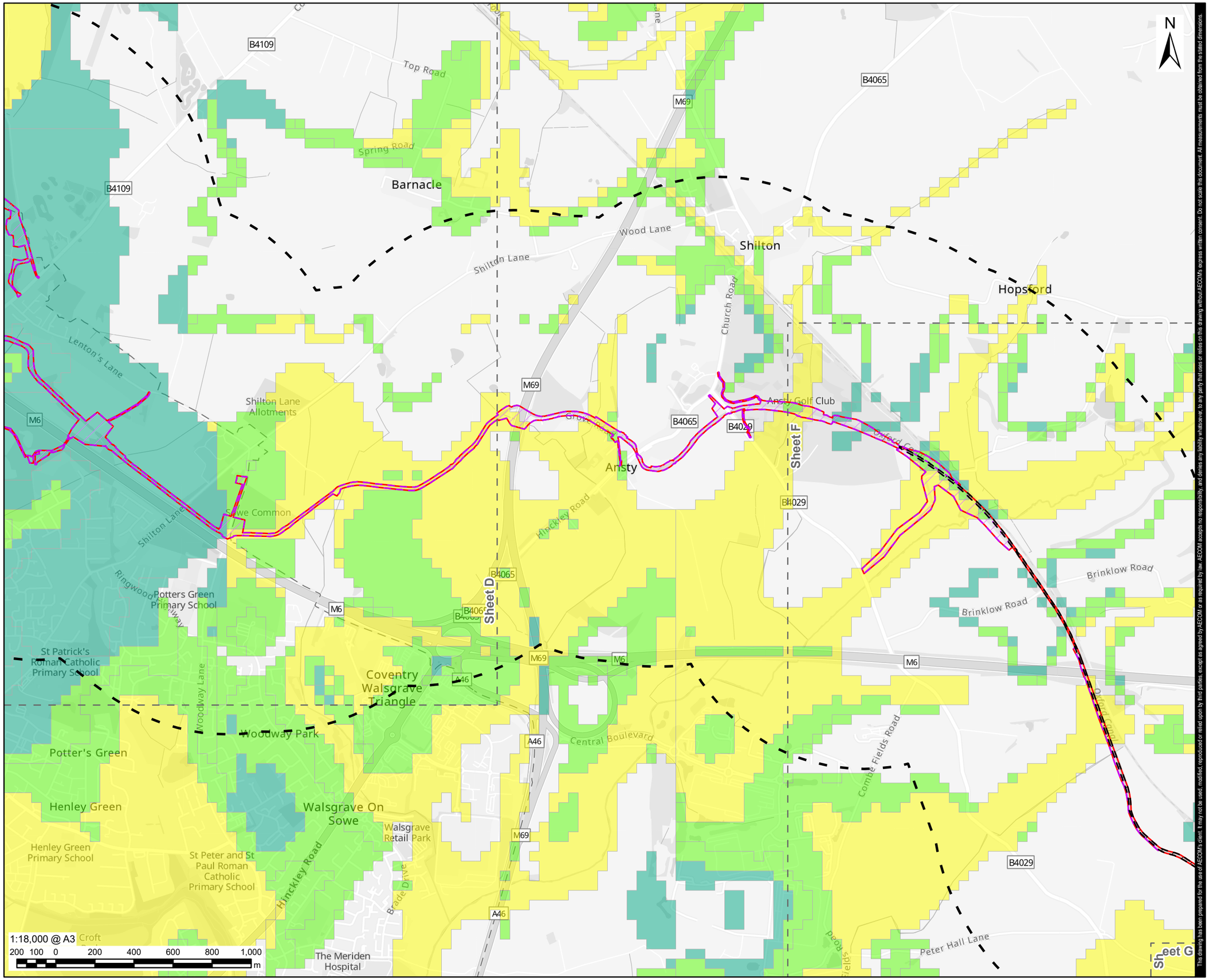

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet E

FIGURE NUMBER

Figure 22-A3-11

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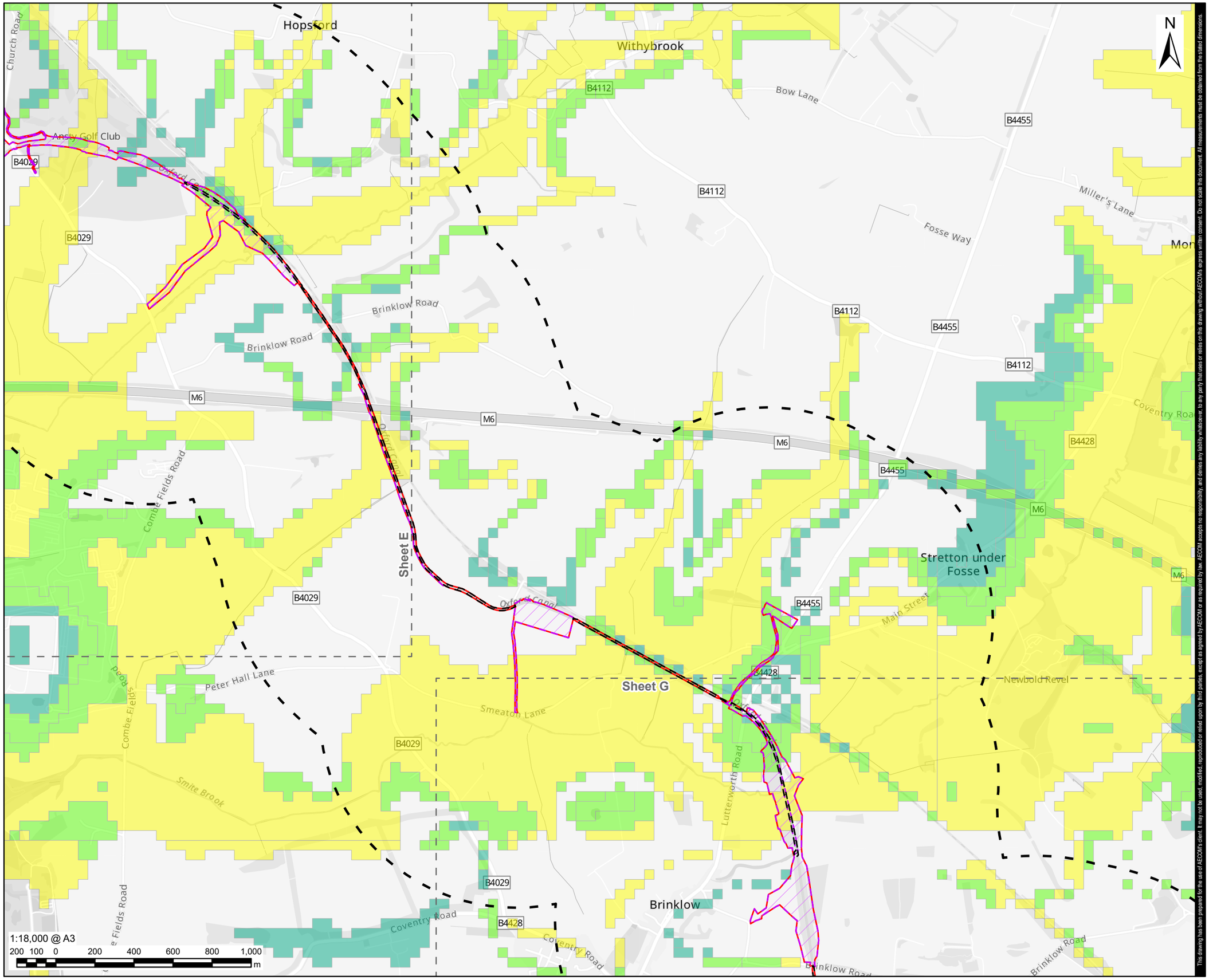

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CONSULTANT

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www.aecom.com

LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet F

FIGURE NUMBER

Figure 22-A3-11

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2026-01-14
Filename: C:\Users\joanna.waters\AECOM\Affinity Water GUC GIS team - Affinity Water EIA Project\02_Maps\PEI_Report\Appendices\Water_A3_FRA\Chapter_22_A3_FRA_Parts_2_3_Figs_Water_Env_and_Flood_Risk.aprx

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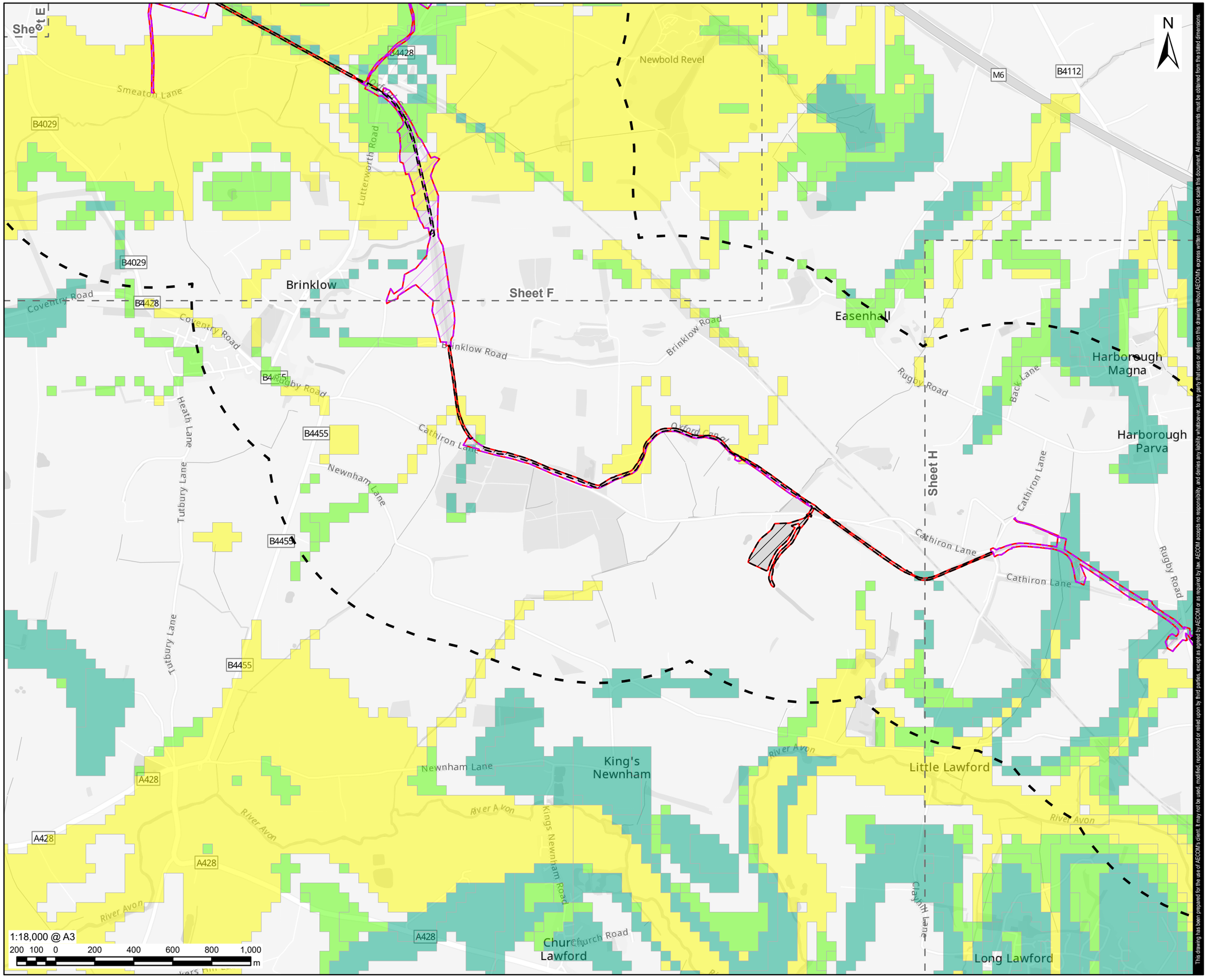

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

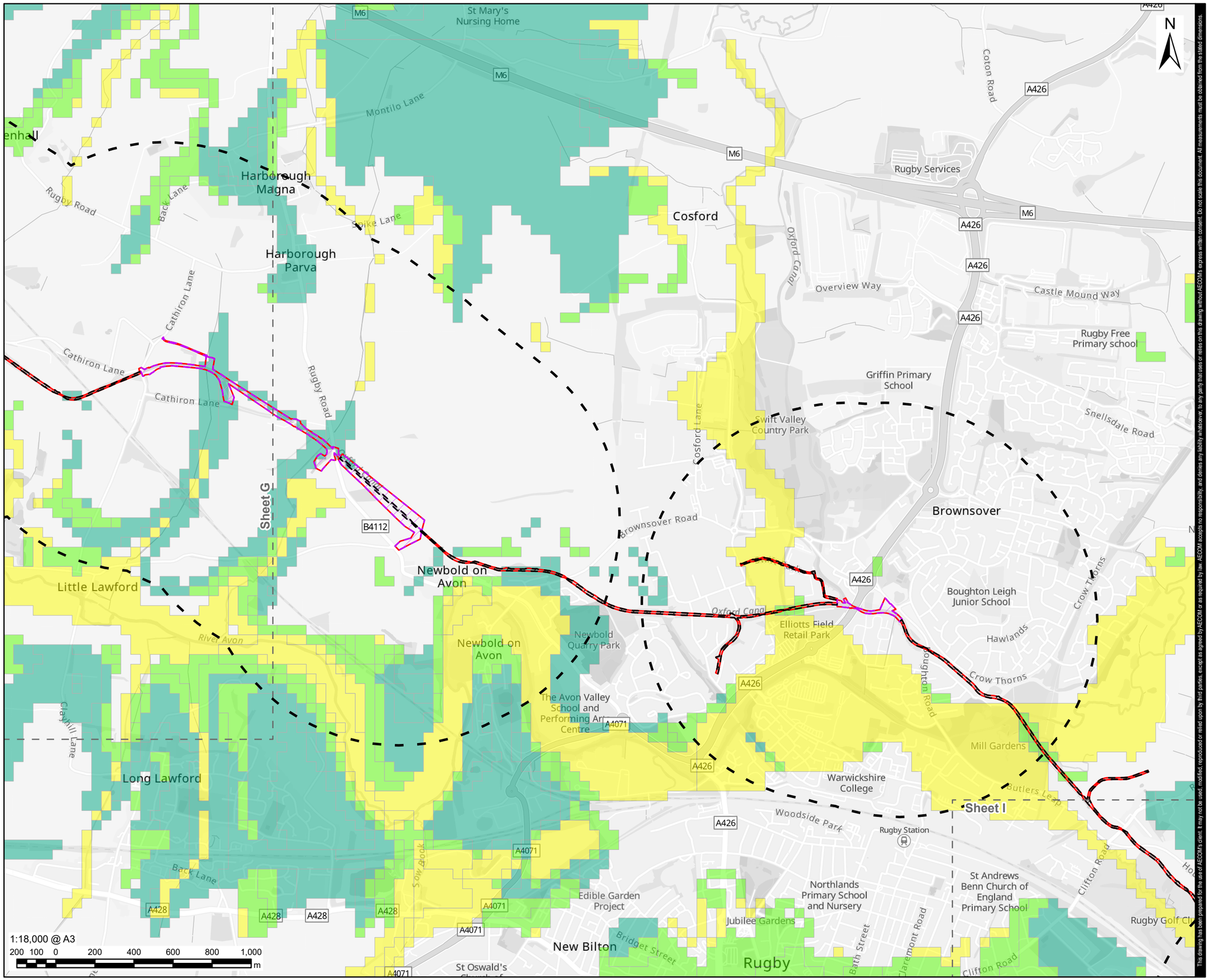
Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet G

FIGURE NUMBER

Figure 22-A3-11

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2026-01-14

Filename: C:\Users\joanna.waters\AECOM\Affinity Water GUC GIS team - Affinity Water EIA Project\02_Maps\PEI_Report\AppendicesWater_A3_FRA\Chapter_22_A3_FRA_Parts_2_3_Figs_Water_Env_and_Flood_Risk.aprx



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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet H

FIGURE NUMBER

Figure 22-A3-11

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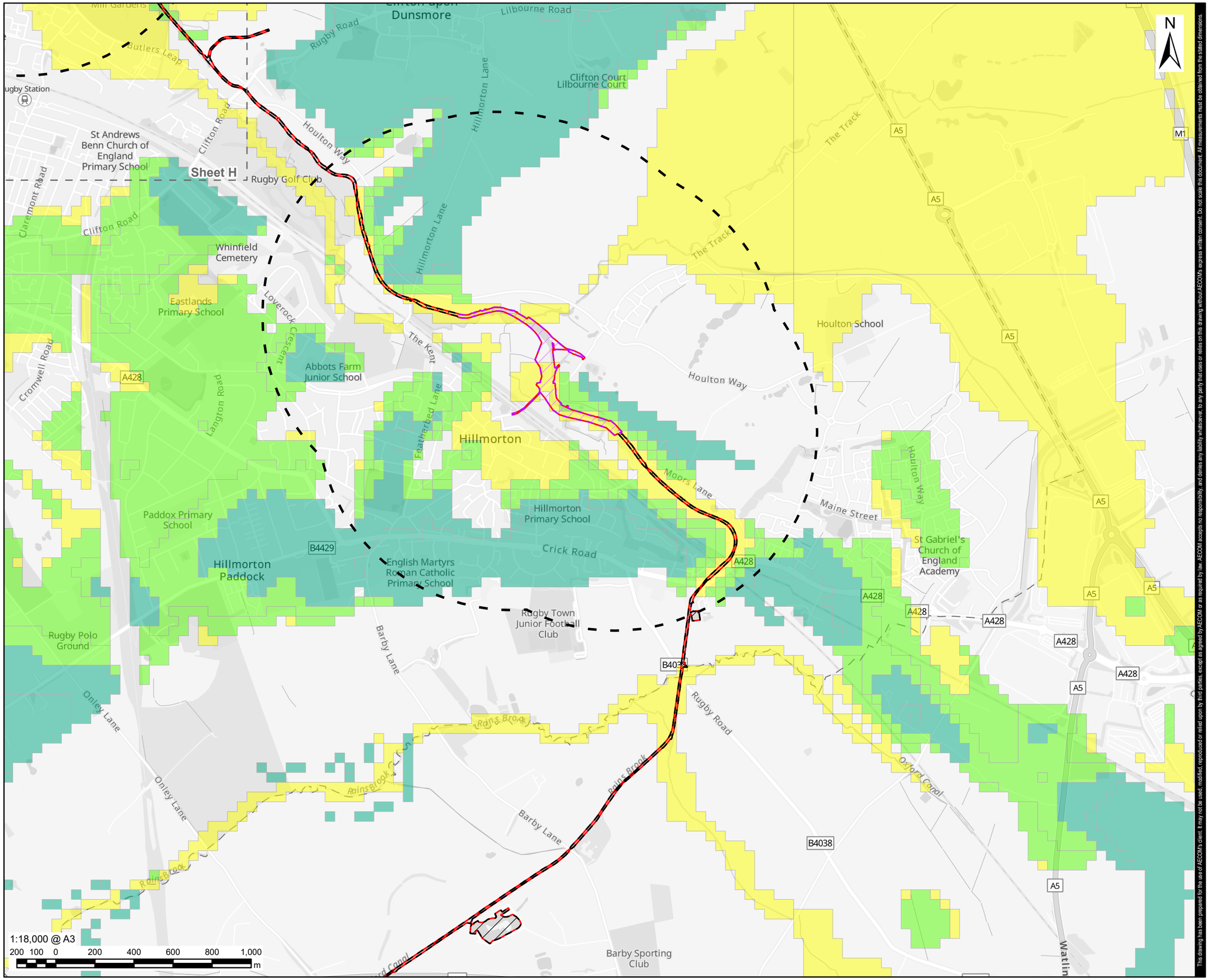

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet I

FIGURE NUMBER

Figure 22-A3-11

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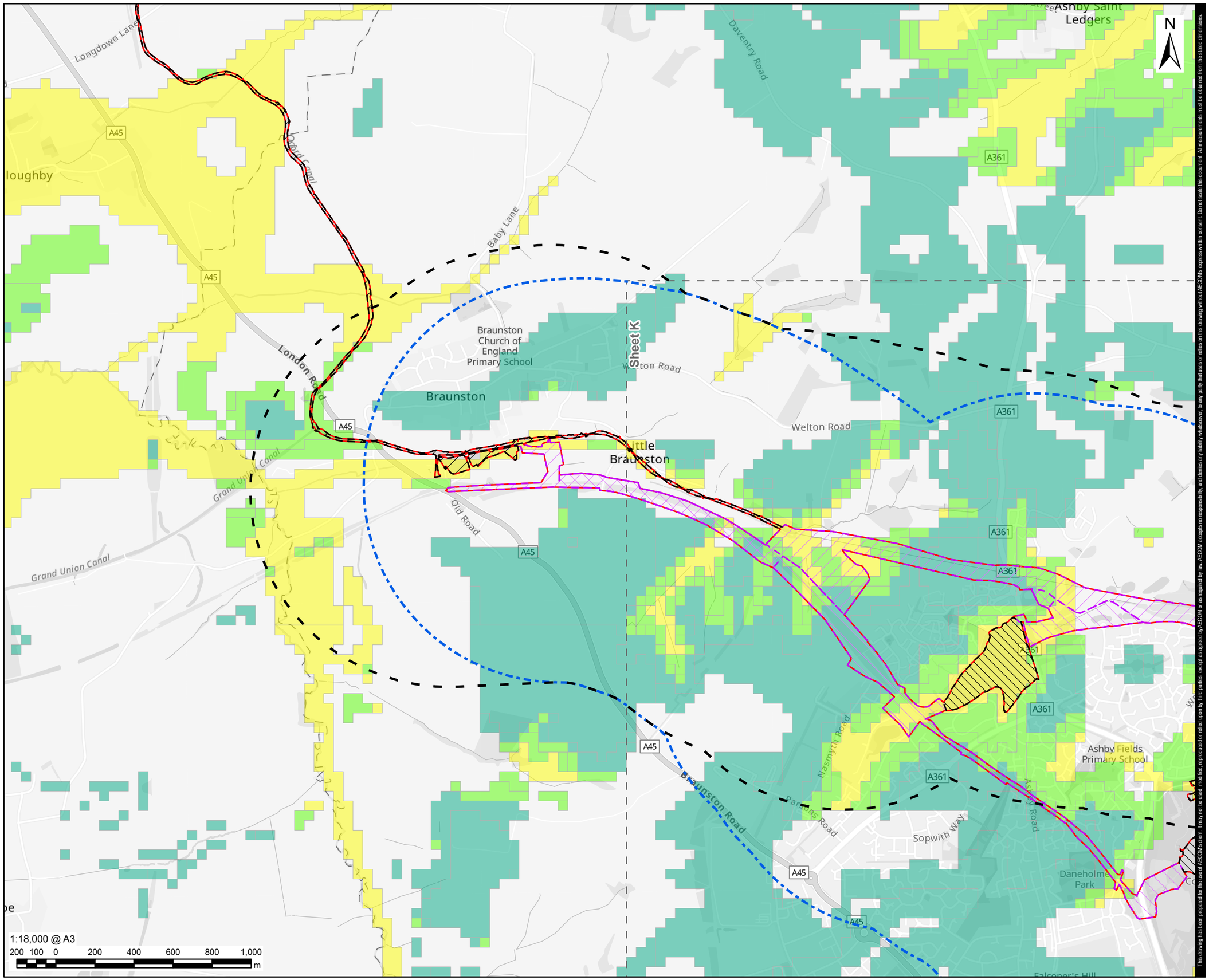

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet J

FIGURE NUMBER

Figure 22-A3-11

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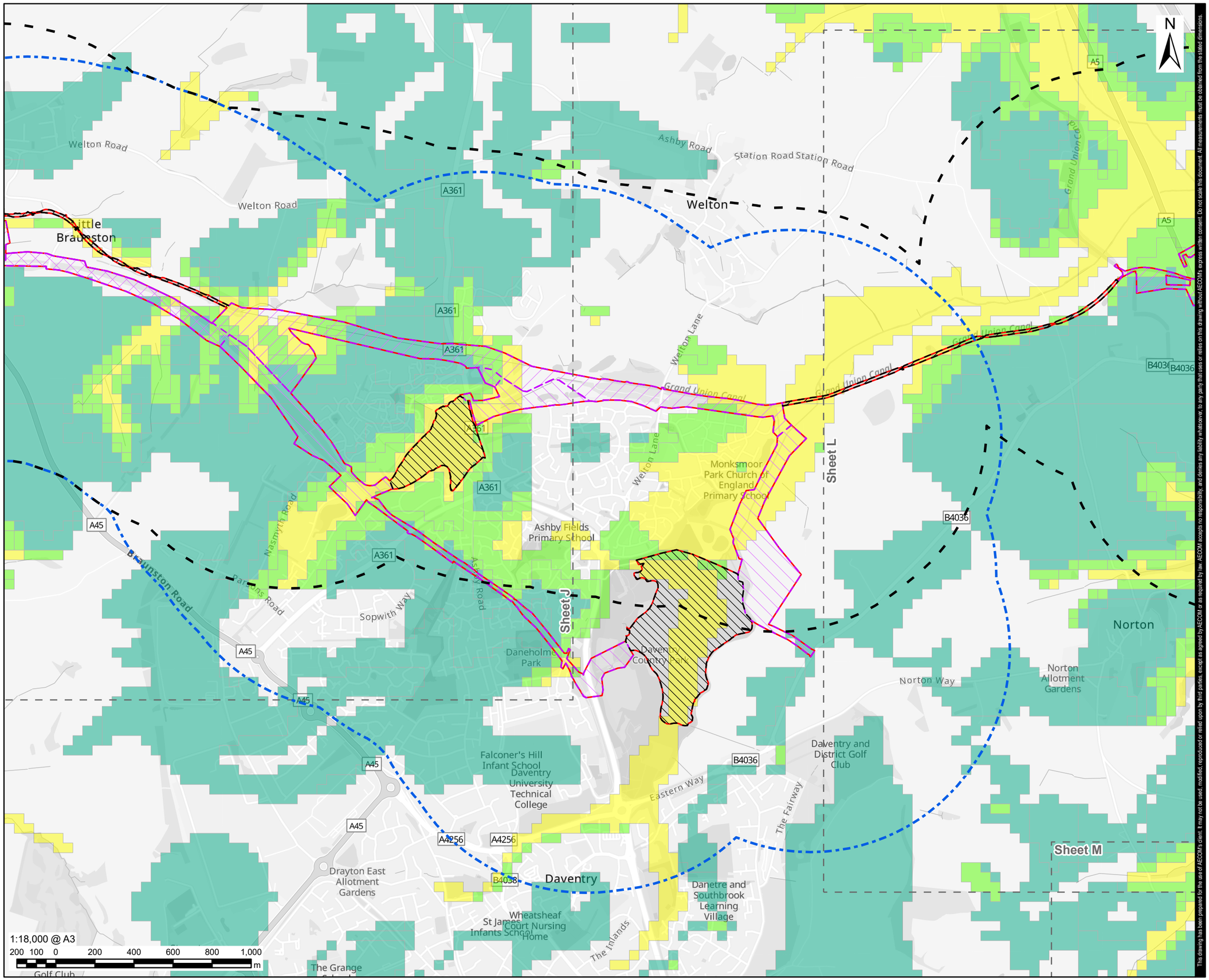

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet K

FIGURE NUMBER

Figure 22-A3-11

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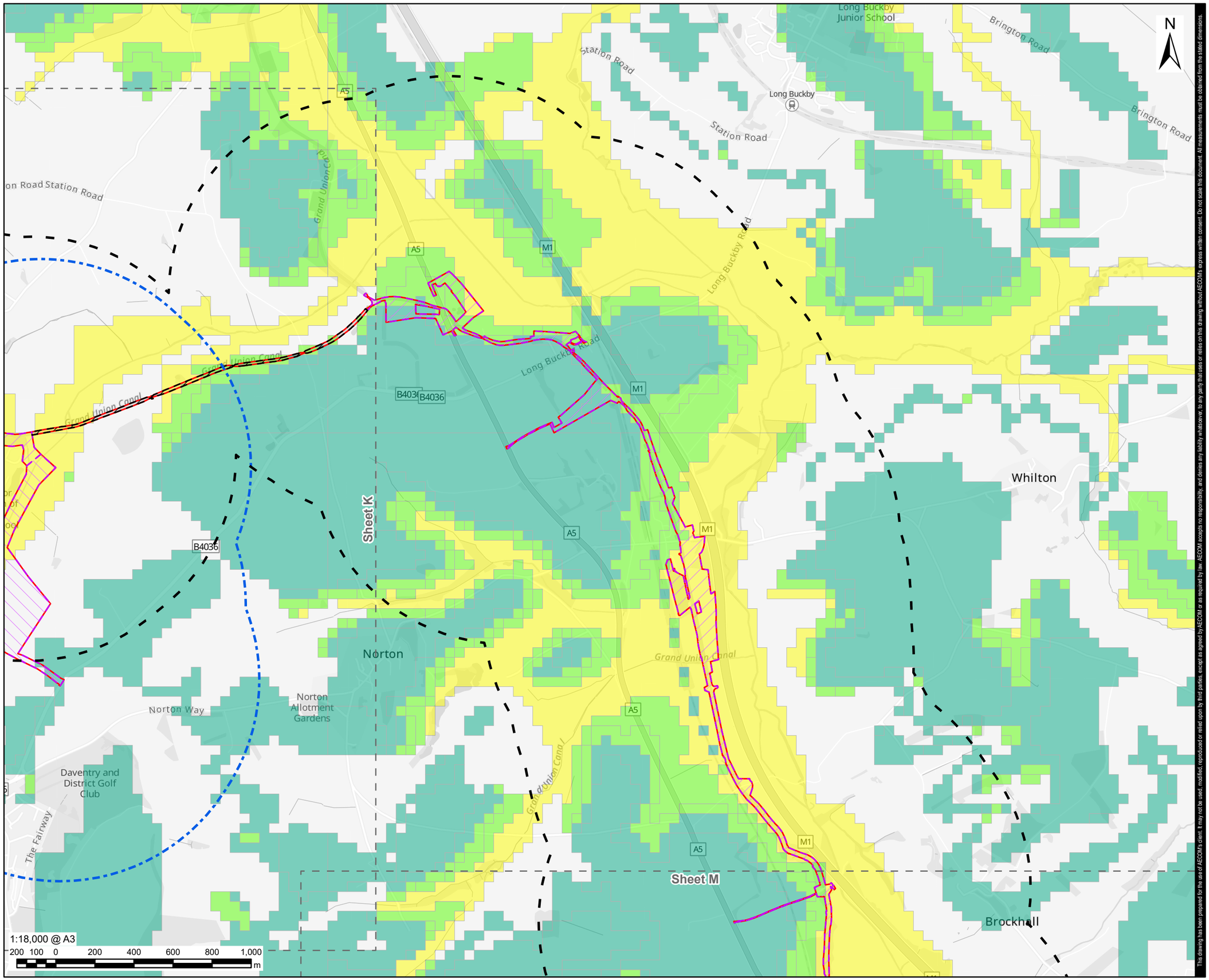

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet L

FIGURE NUMBER

Figure 22-A3-11

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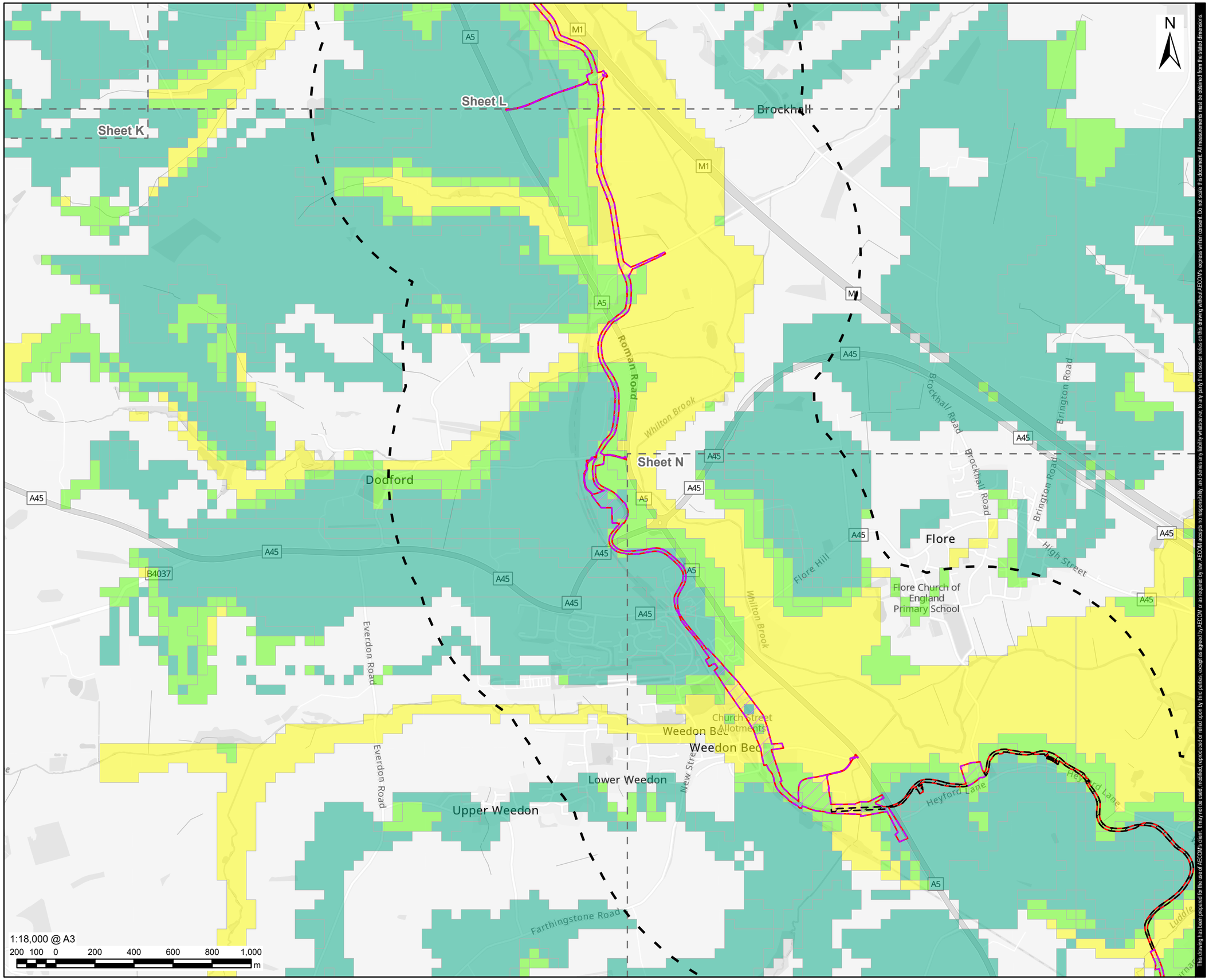

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet M

FIGURE NUMBER

Figure 22-A3-11

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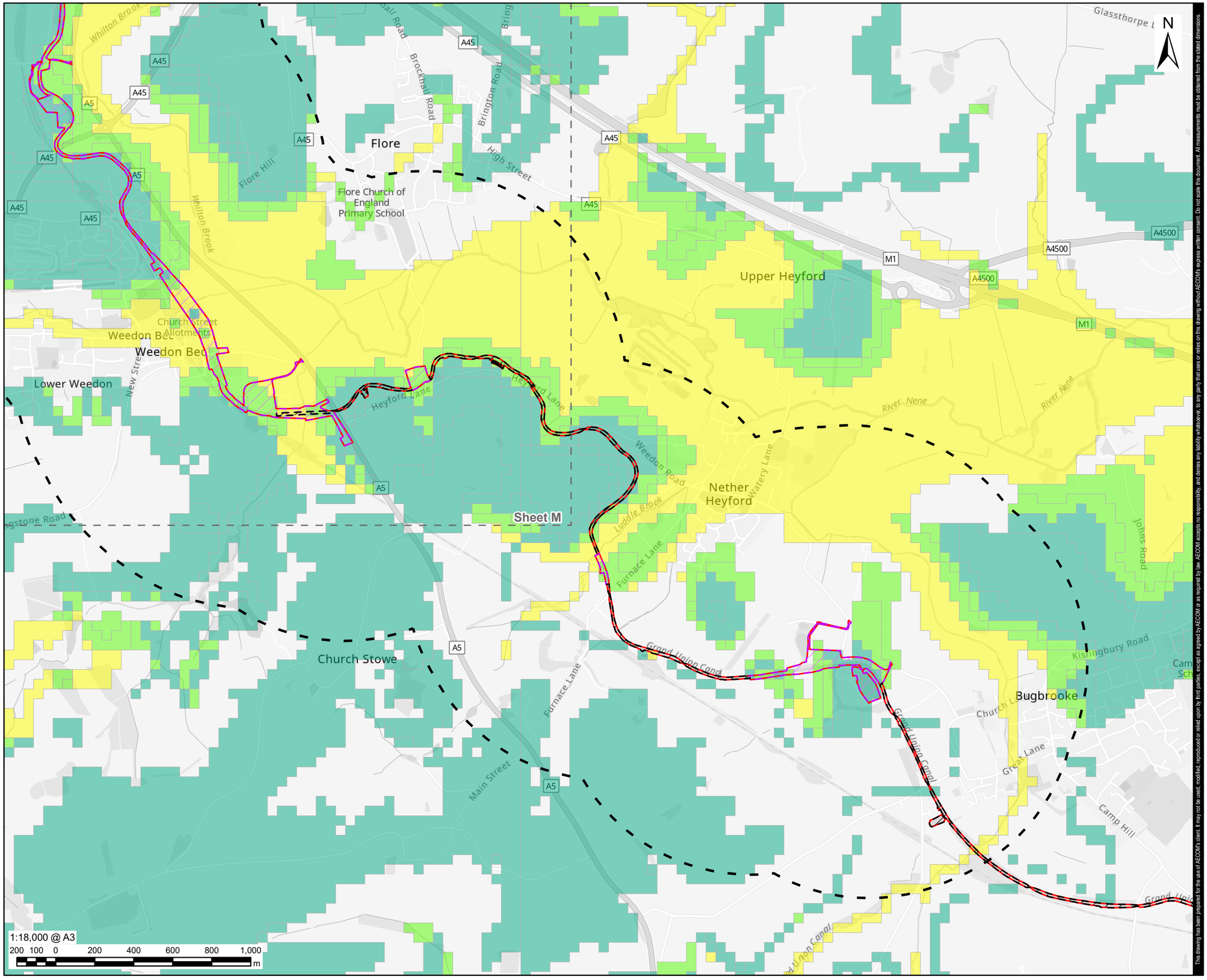

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet N

FIGURE NUMBER

Figure 22-A3-11

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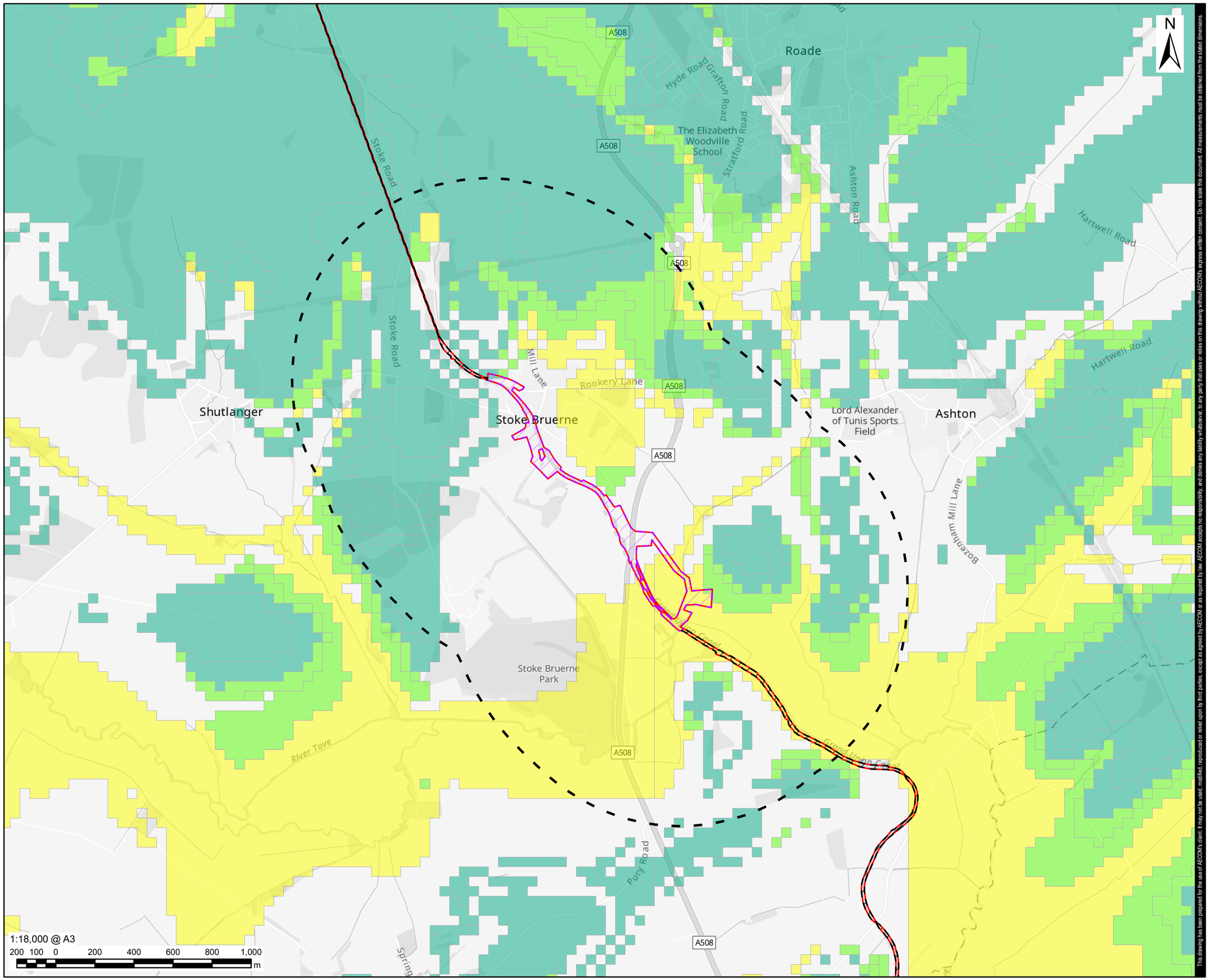

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet O

FIGURE NUMBER

Figure 22-A3-11

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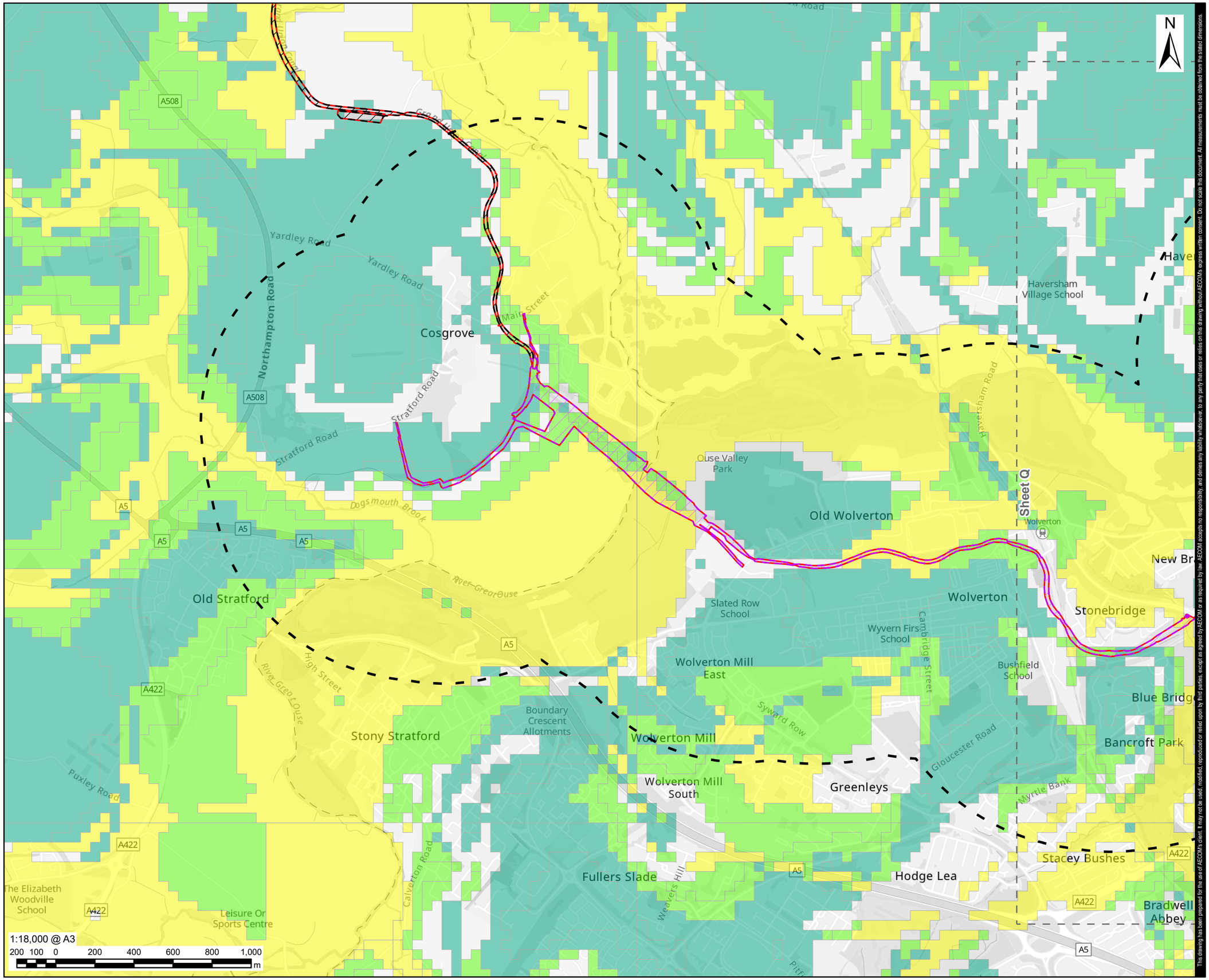

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet P

FIGURE NUMBER

Figure 22-A3-11

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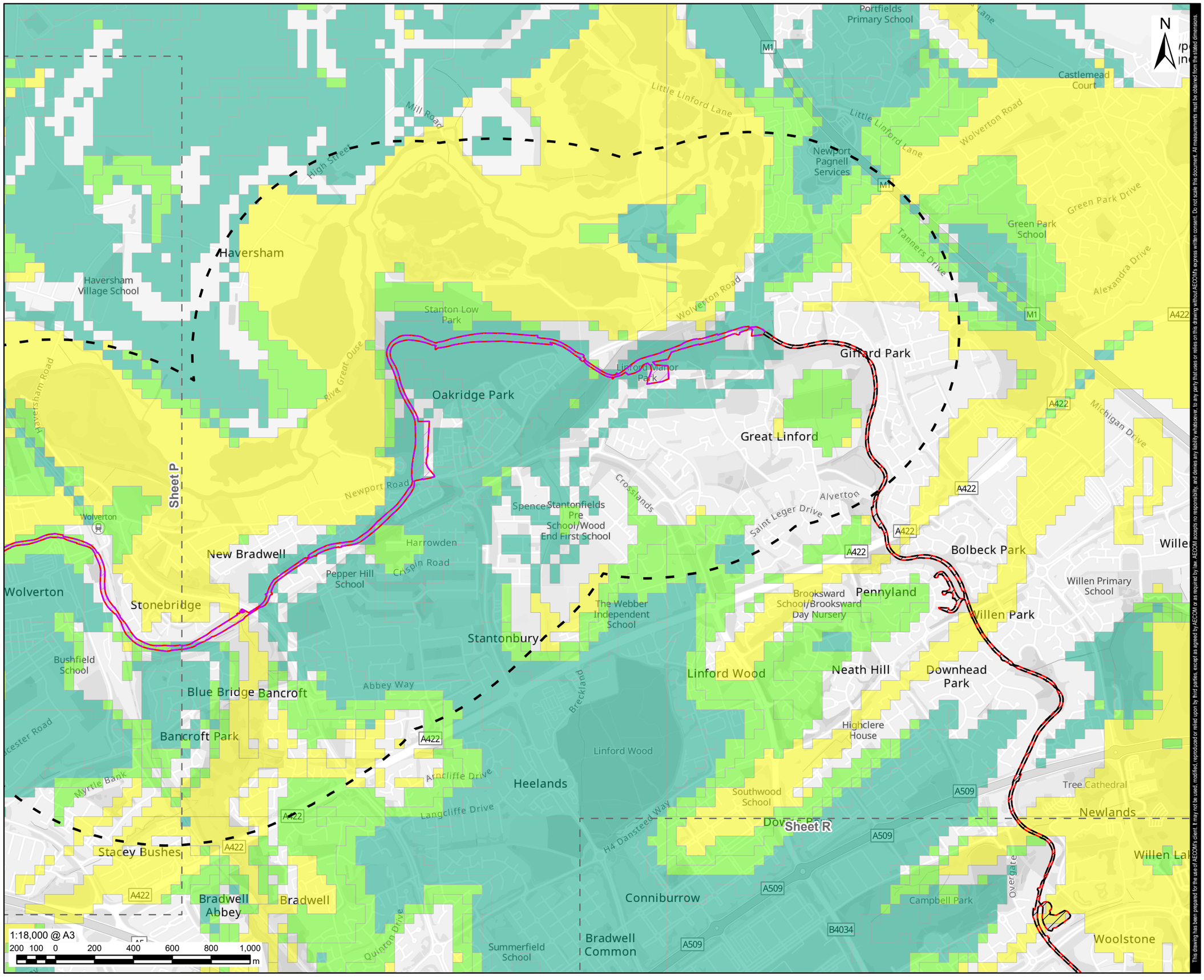

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Alencon Link
Basingstoke, RG21 7PP
www.aecom.com

LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet Q

FIGURE NUMBER

Figure 22-A3-11

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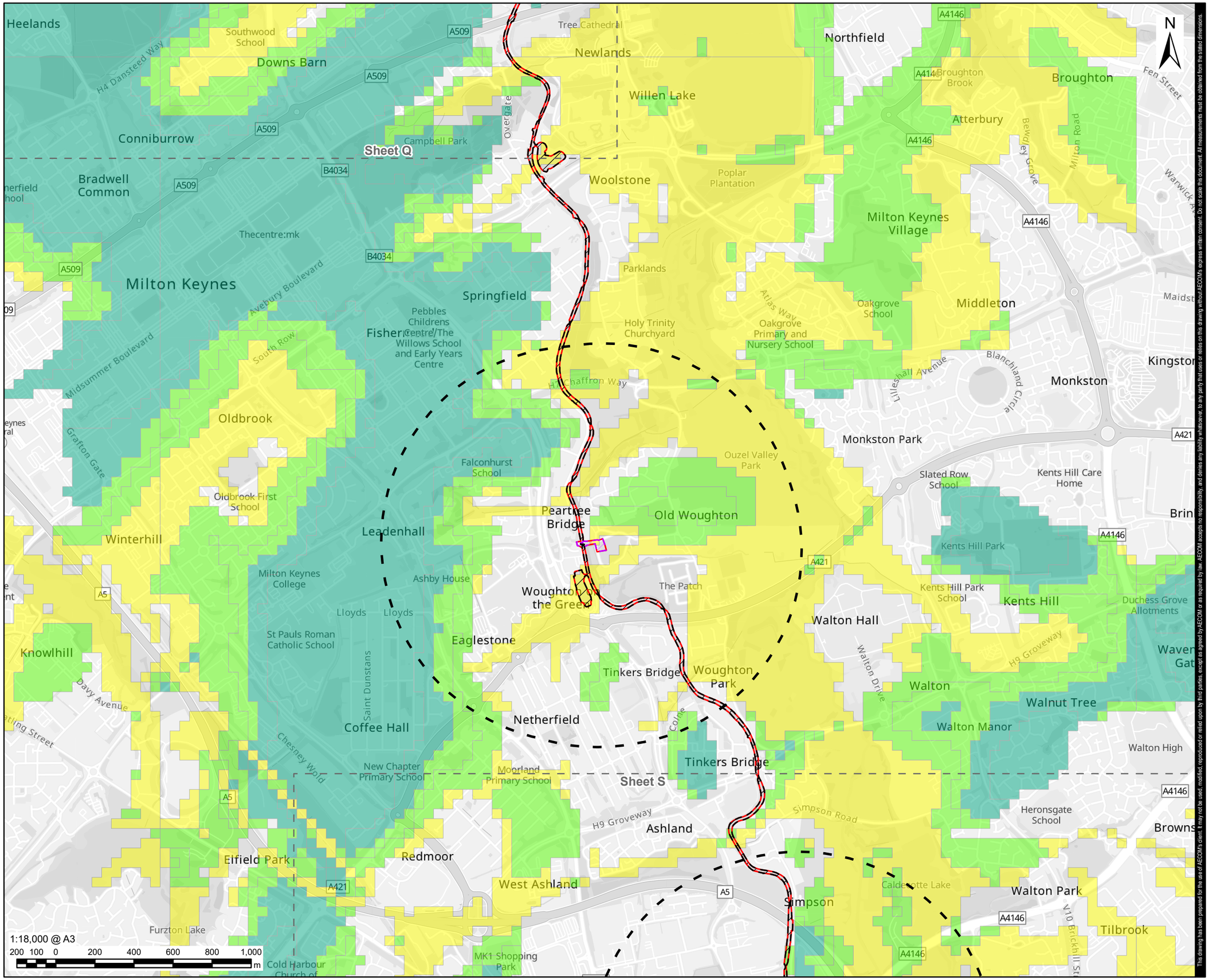

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet R

FIGURE NUMBER

Figure 22-A3-11

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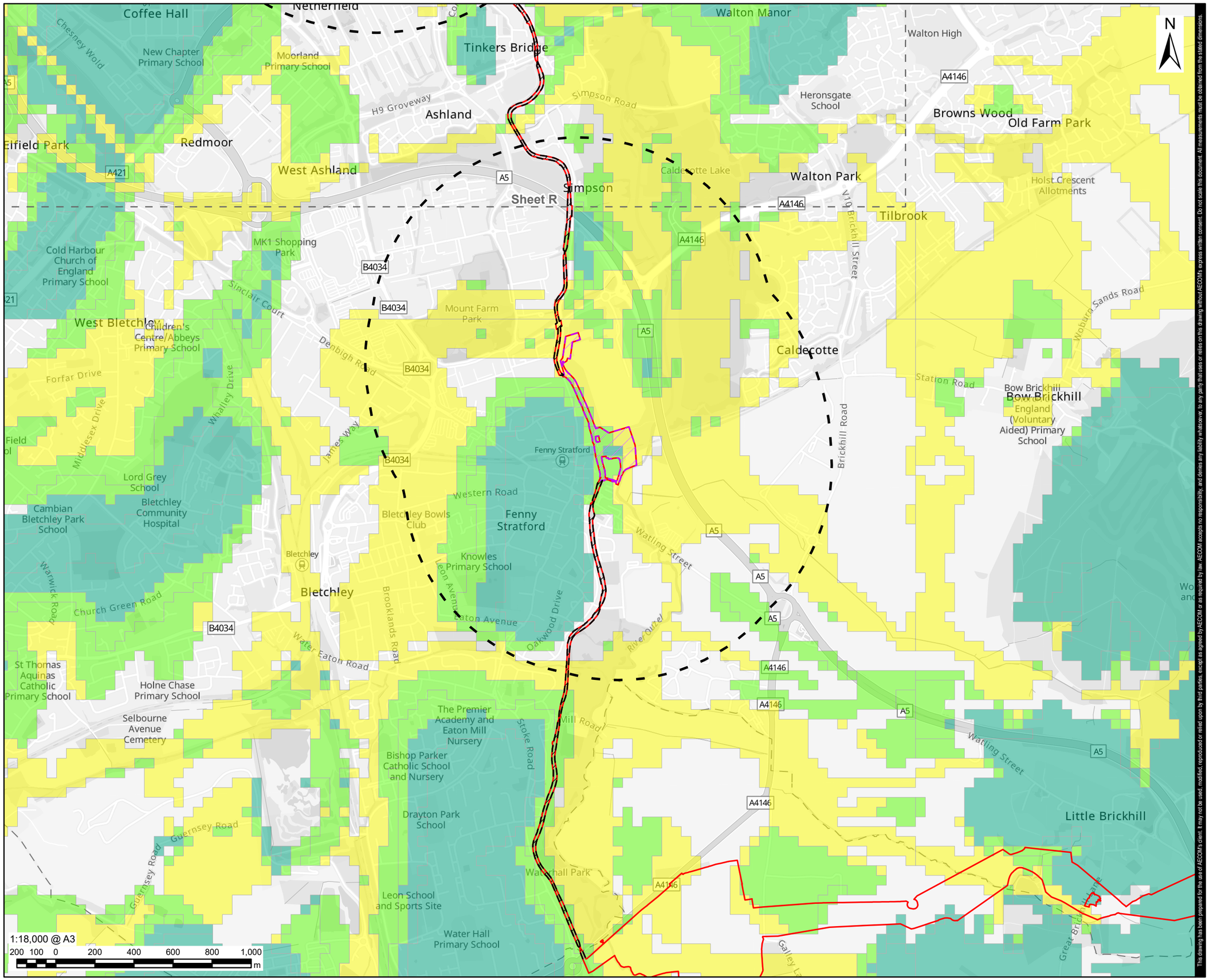

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Susceptibility to Groundwater Flooding
Sheet S

FIGURE NUMBER

Figure 22-A3-11

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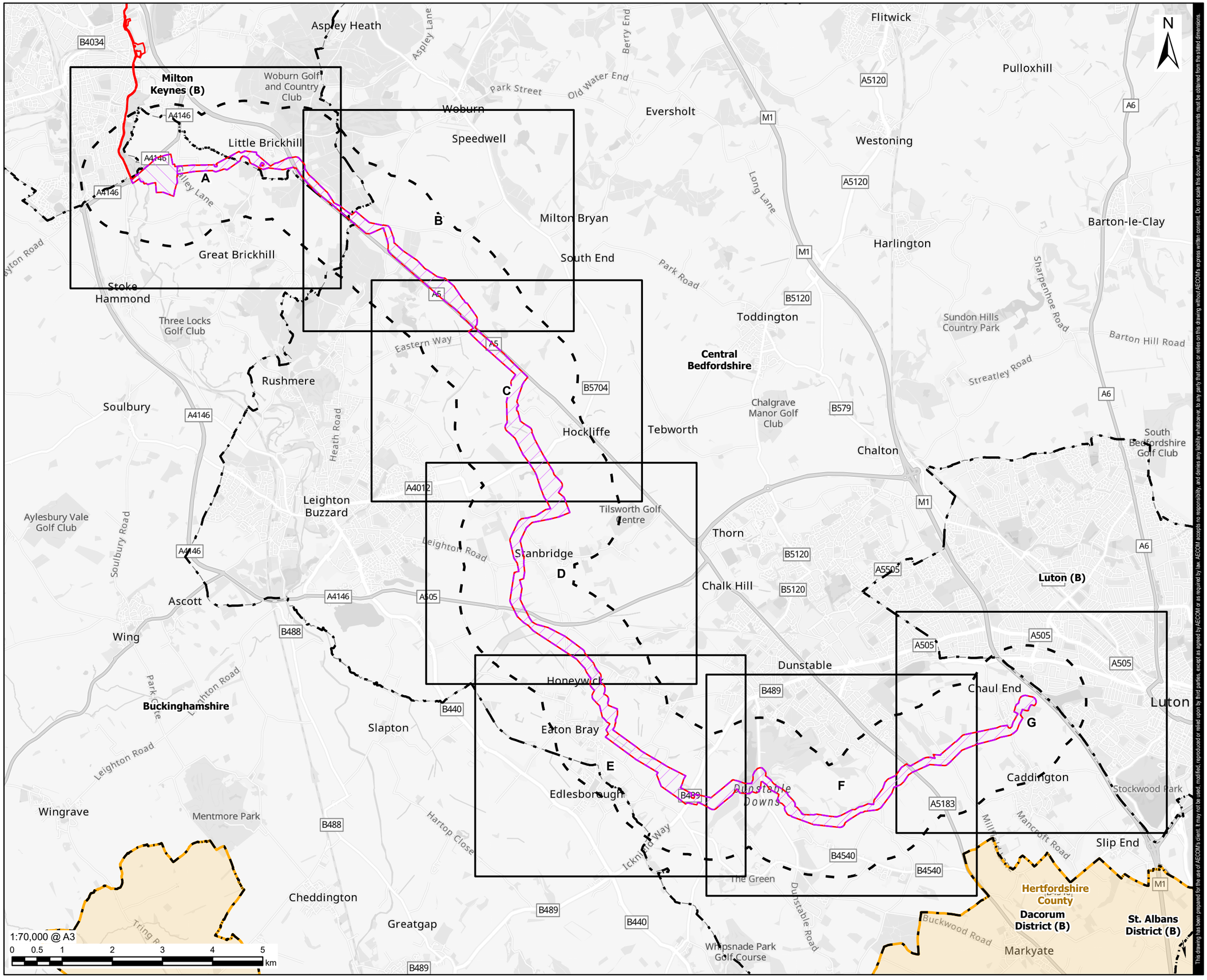

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding Overview

FIGURE NUMBER

Figure 22-A3-12

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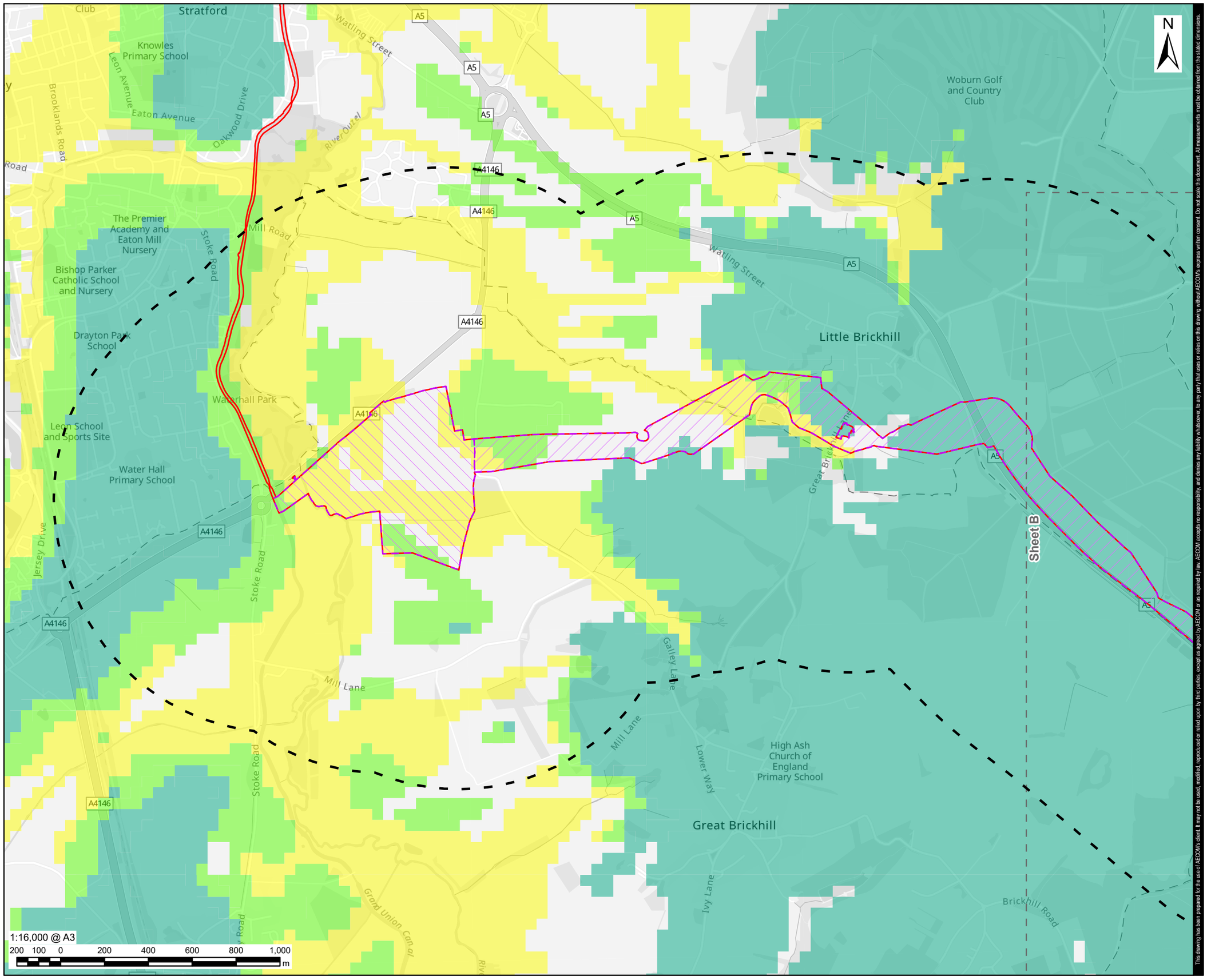

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet A

FIGURE NUMBER

Figure 22-A3-12

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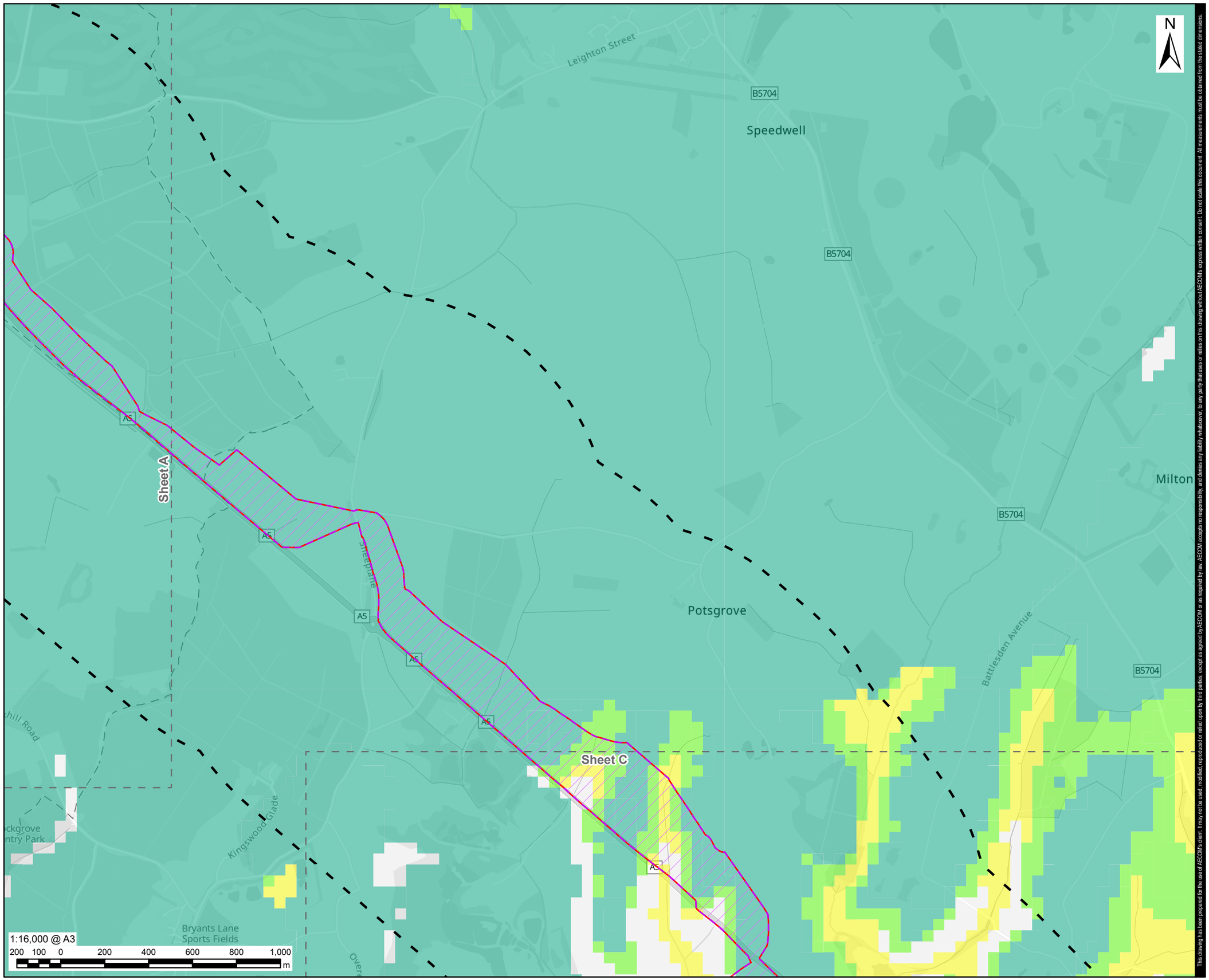

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet B

FIGURE NUMBER

Figure 22-A3-12

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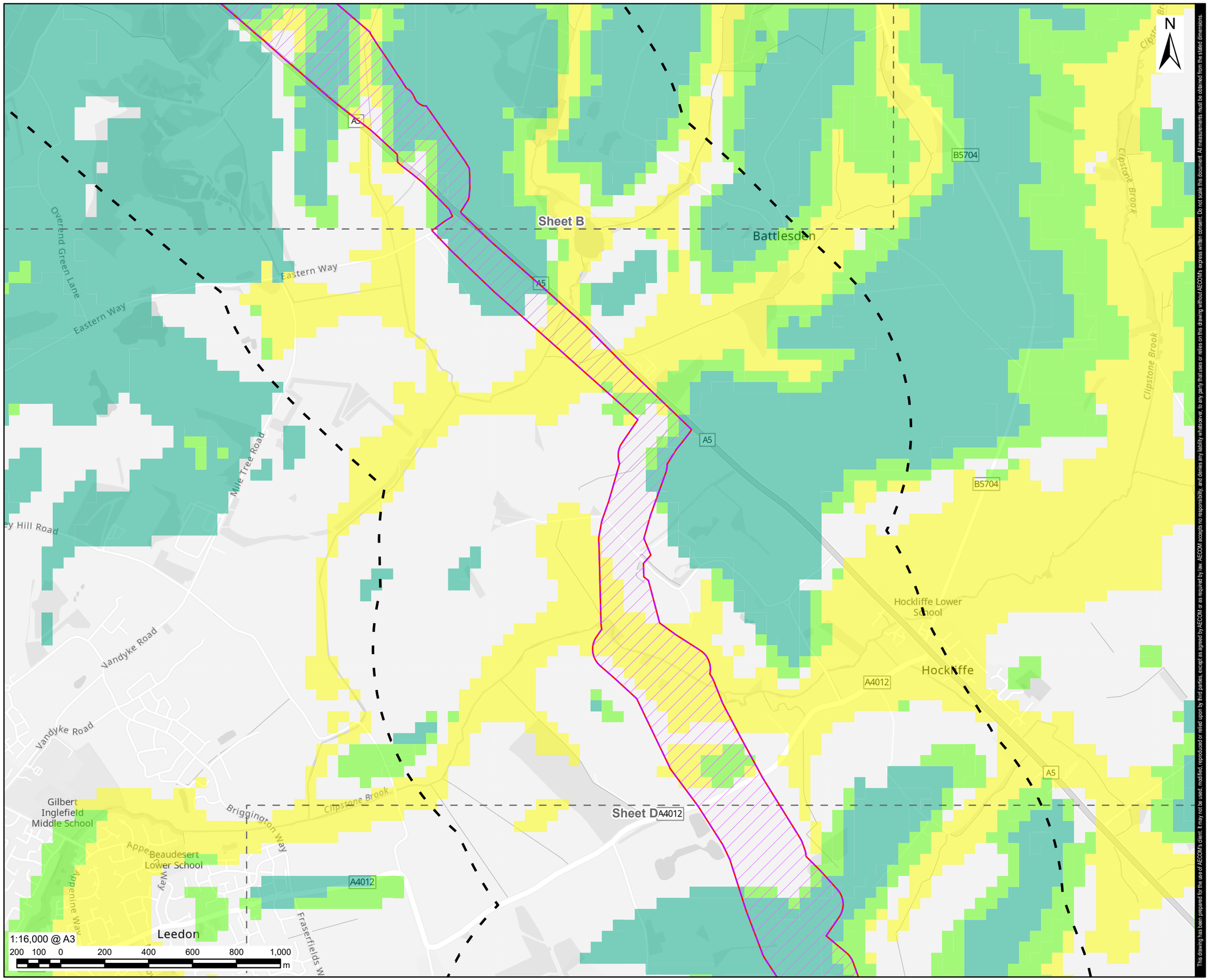

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet C

FIGURE NUMBER

Figure 22-A3-12

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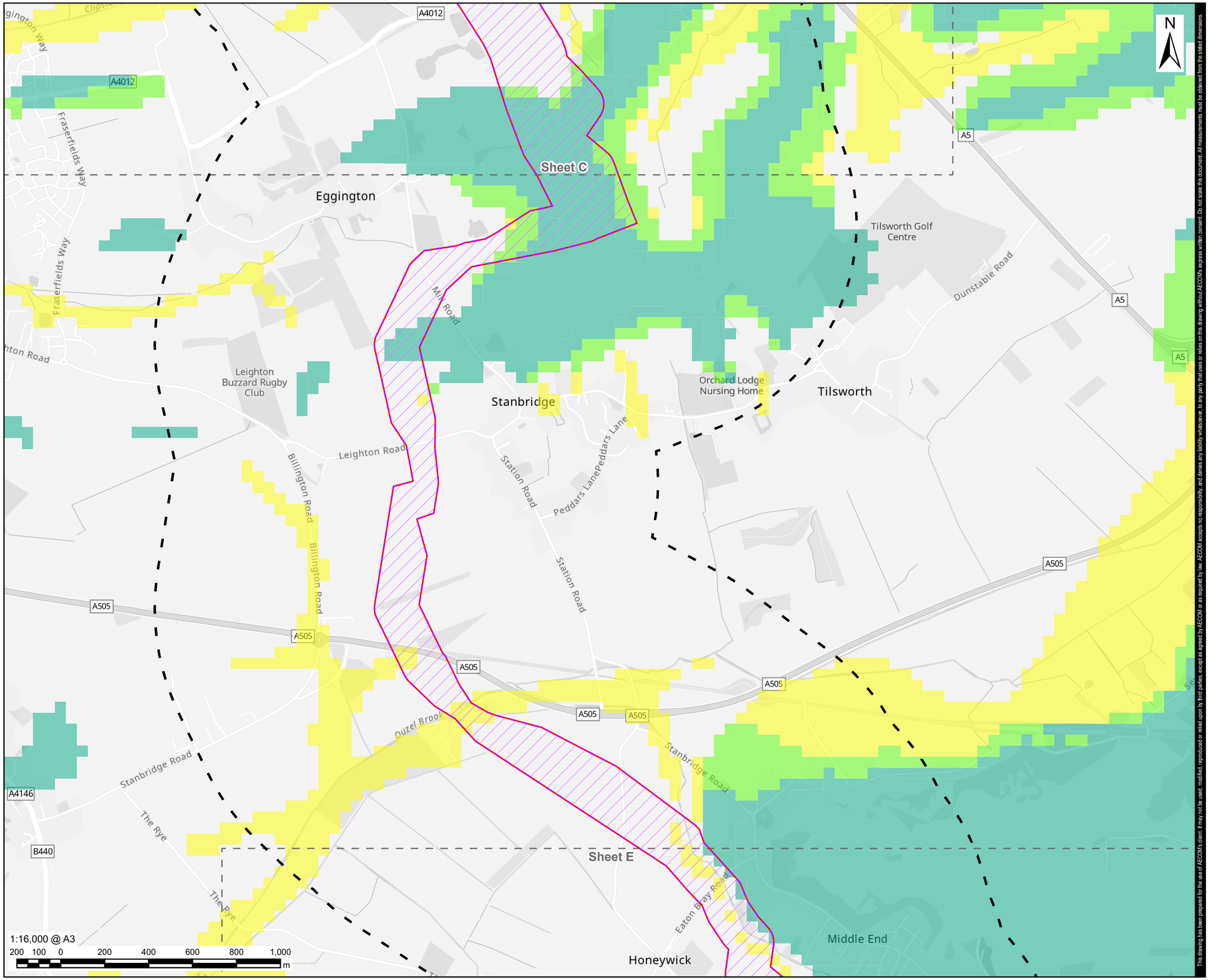

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet D

FIGURE NUMBER

Figure 22-A3-12

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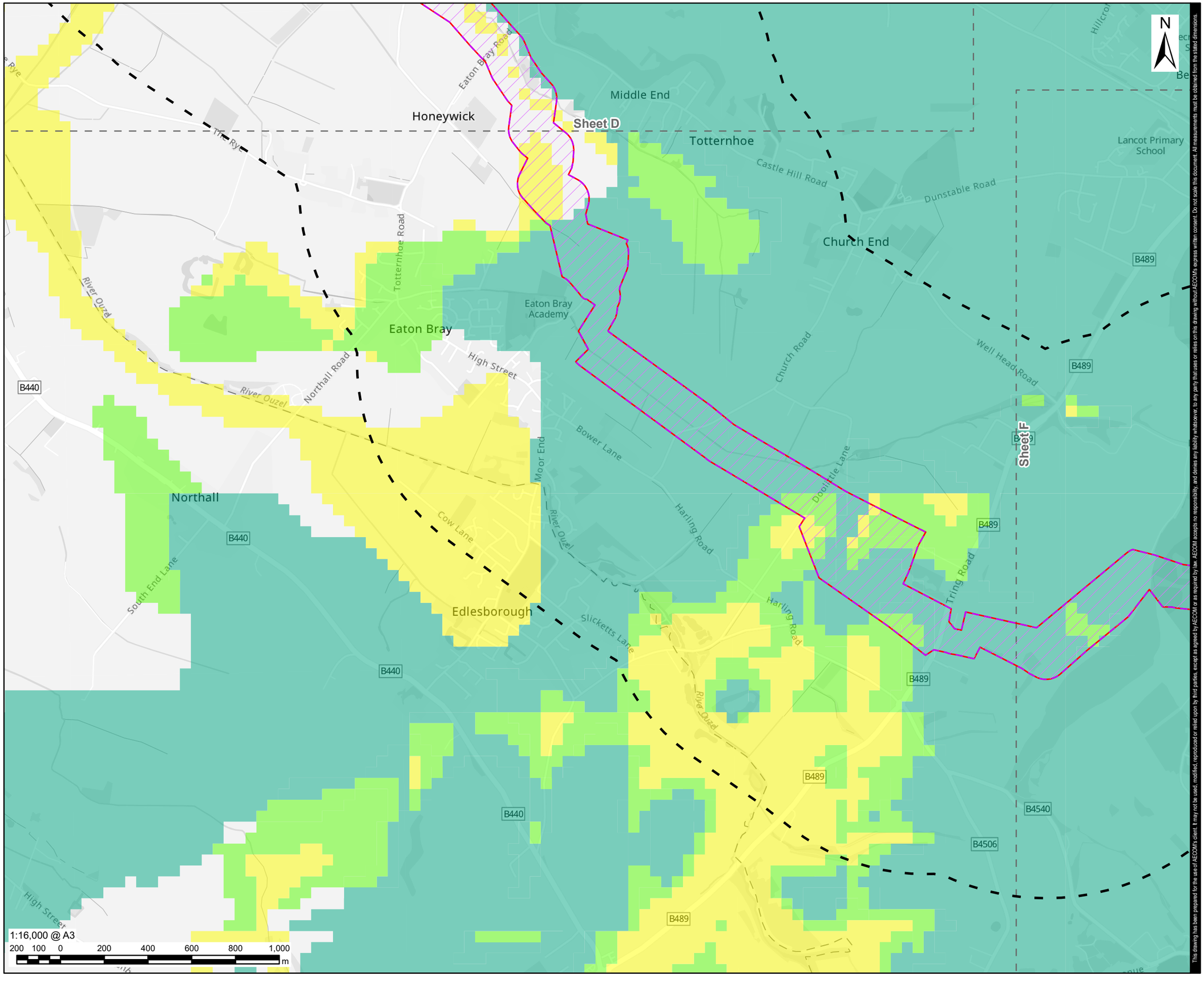

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet E

FIGURE NUMBER

Figure 22-A3-12

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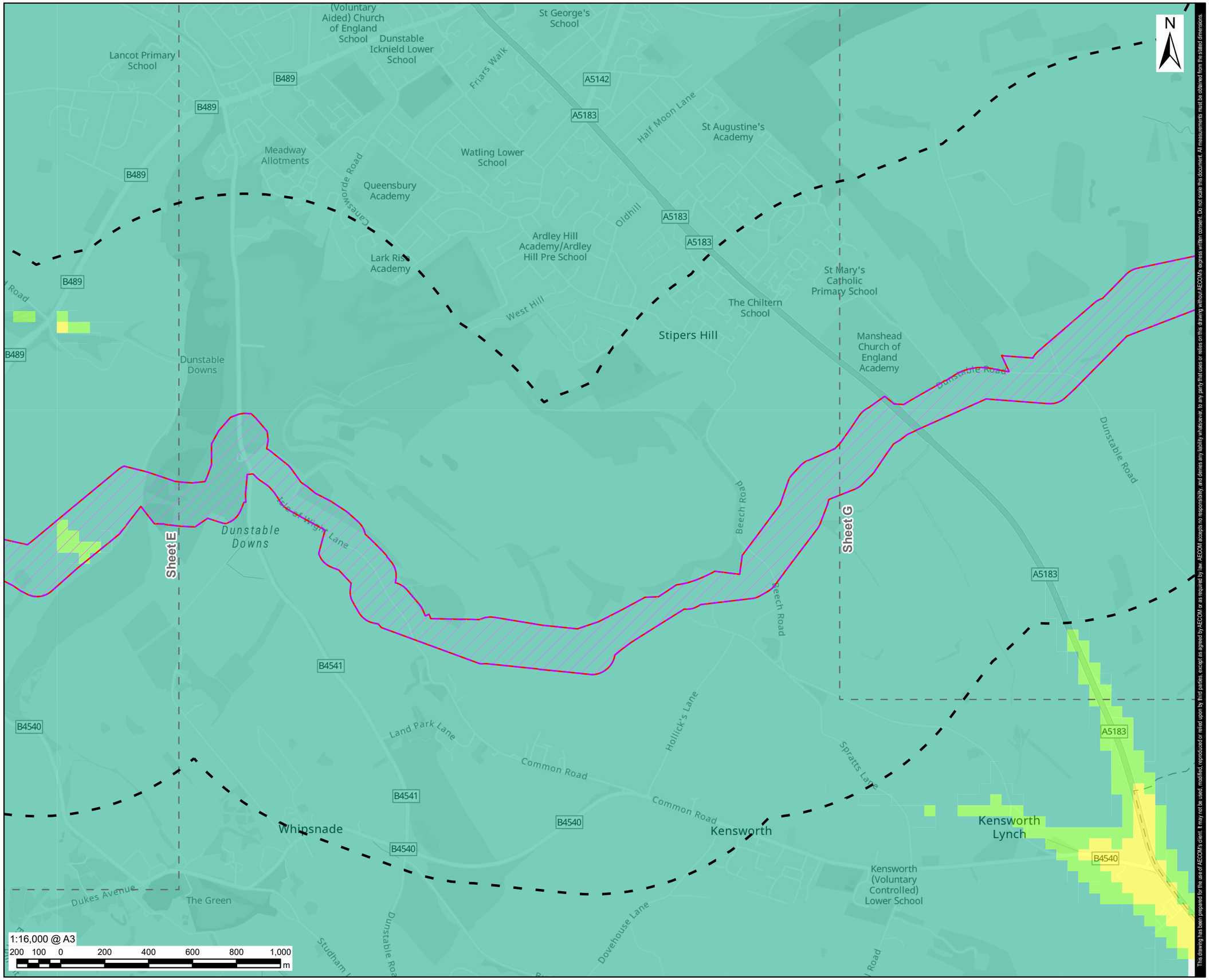

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet F

FIGURE NUMBER

Figure 22-A3-12

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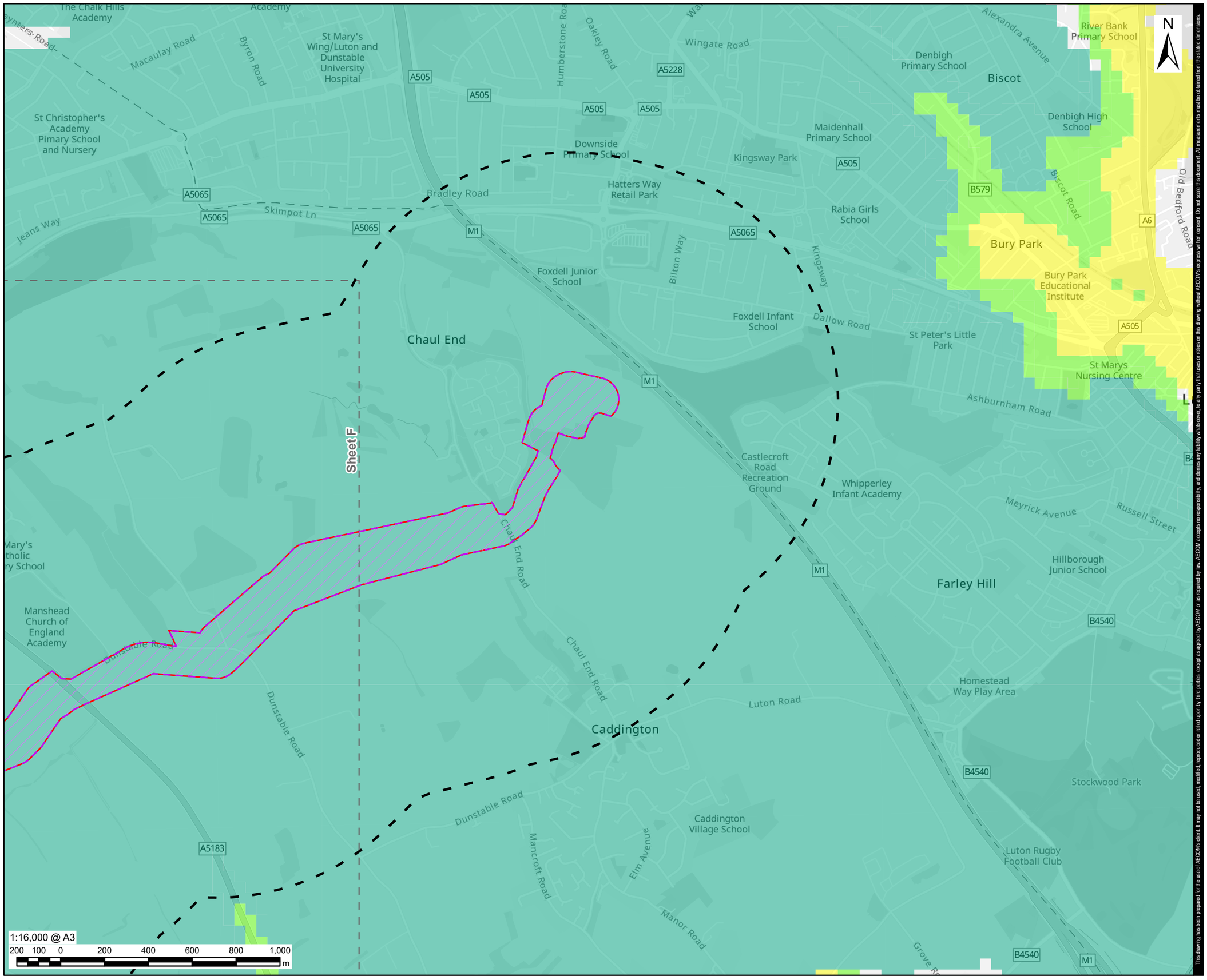

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

BGS Groundwater Flooding Susceptibility

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Susceptibility to Groundwater Flooding
Sheet G

FIGURE NUMBER

Figure 22-A3-12

Annex 3-6: Reservoir Flood Risk

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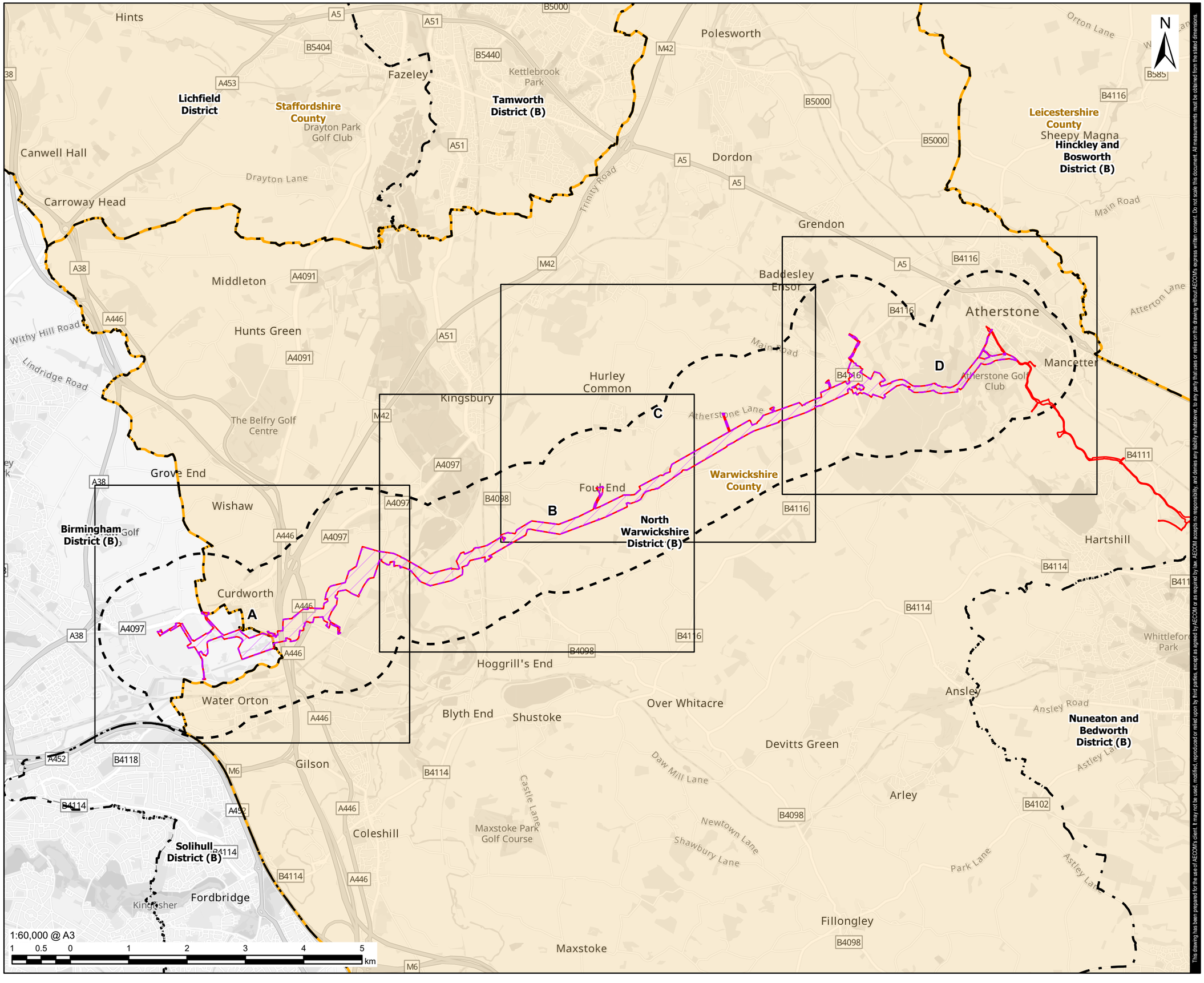

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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FIGURE TITLE

Part 1 Risk of Flooding from Reservoirs Overview

FIGURE NUMBER

Figure 22-A3-7

Revision: 0 Drawn: DD Checked: JW Approved: LB Date: 2025-11-17

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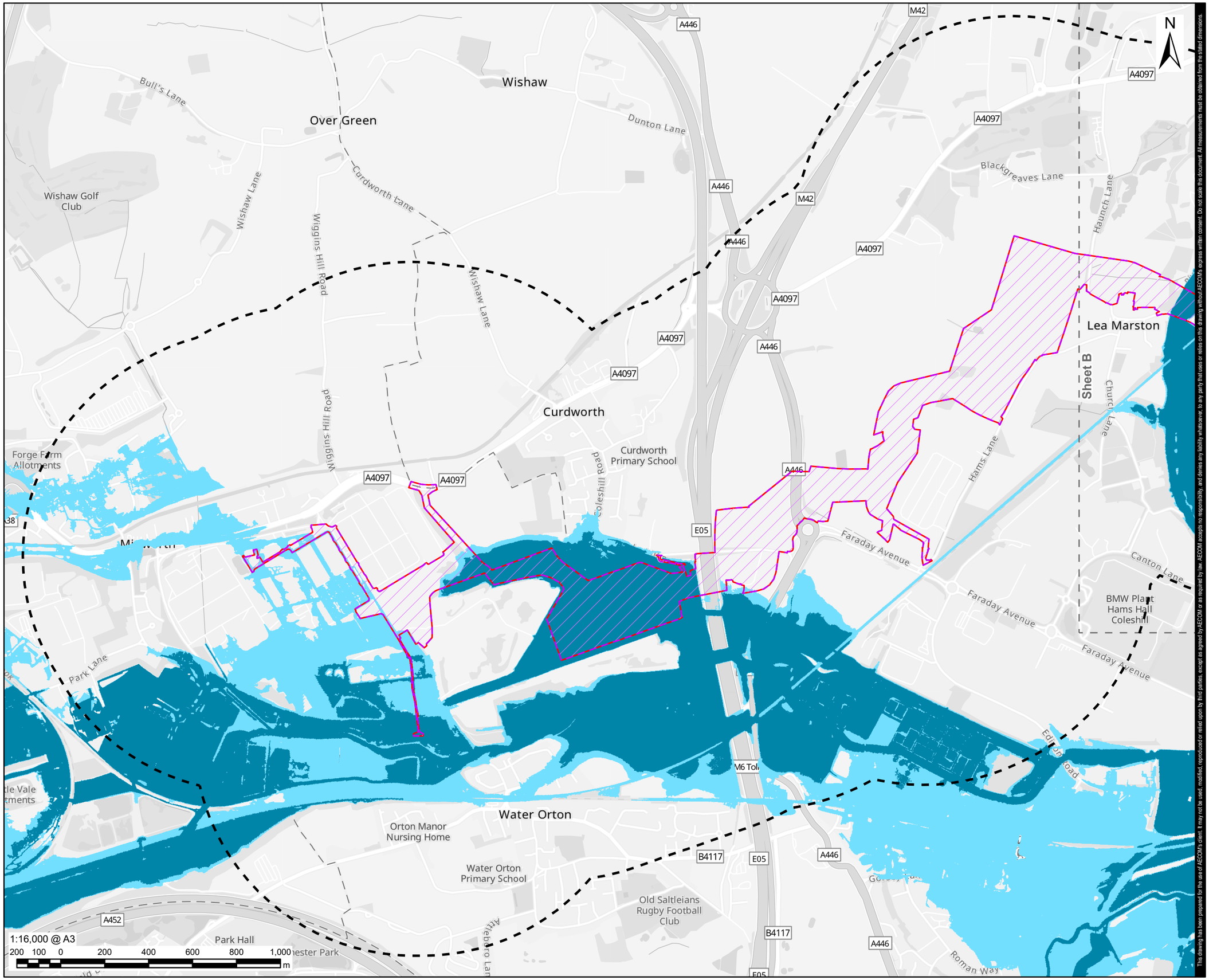

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 Risk of Flooding from Reservoirs Sheet A

FIGURE NUMBER

Figure 22-A3-7

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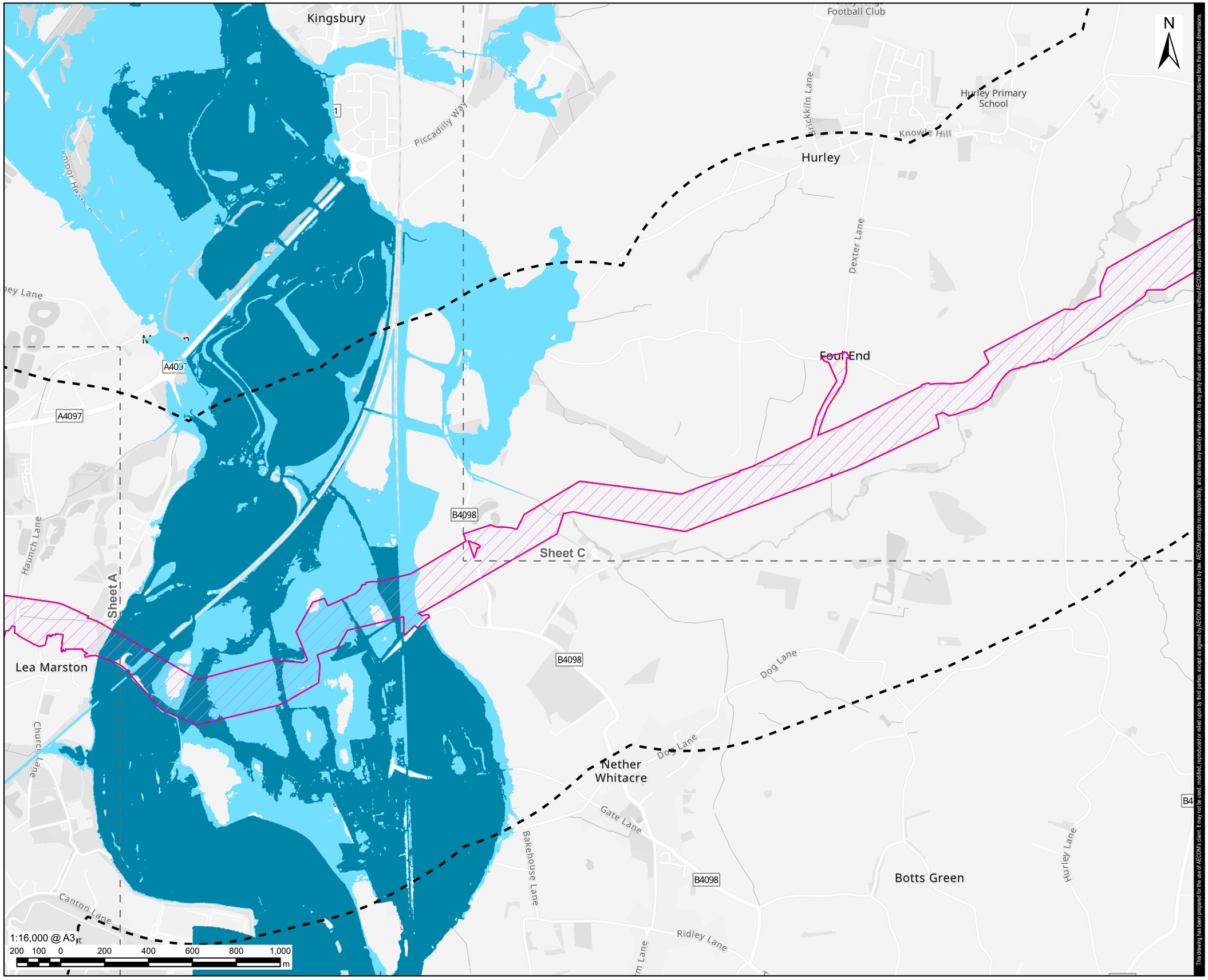

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 Risk of Flooding from Reservoirs Sheet B

FIGURE NUMBER

Figure 22-A3-7

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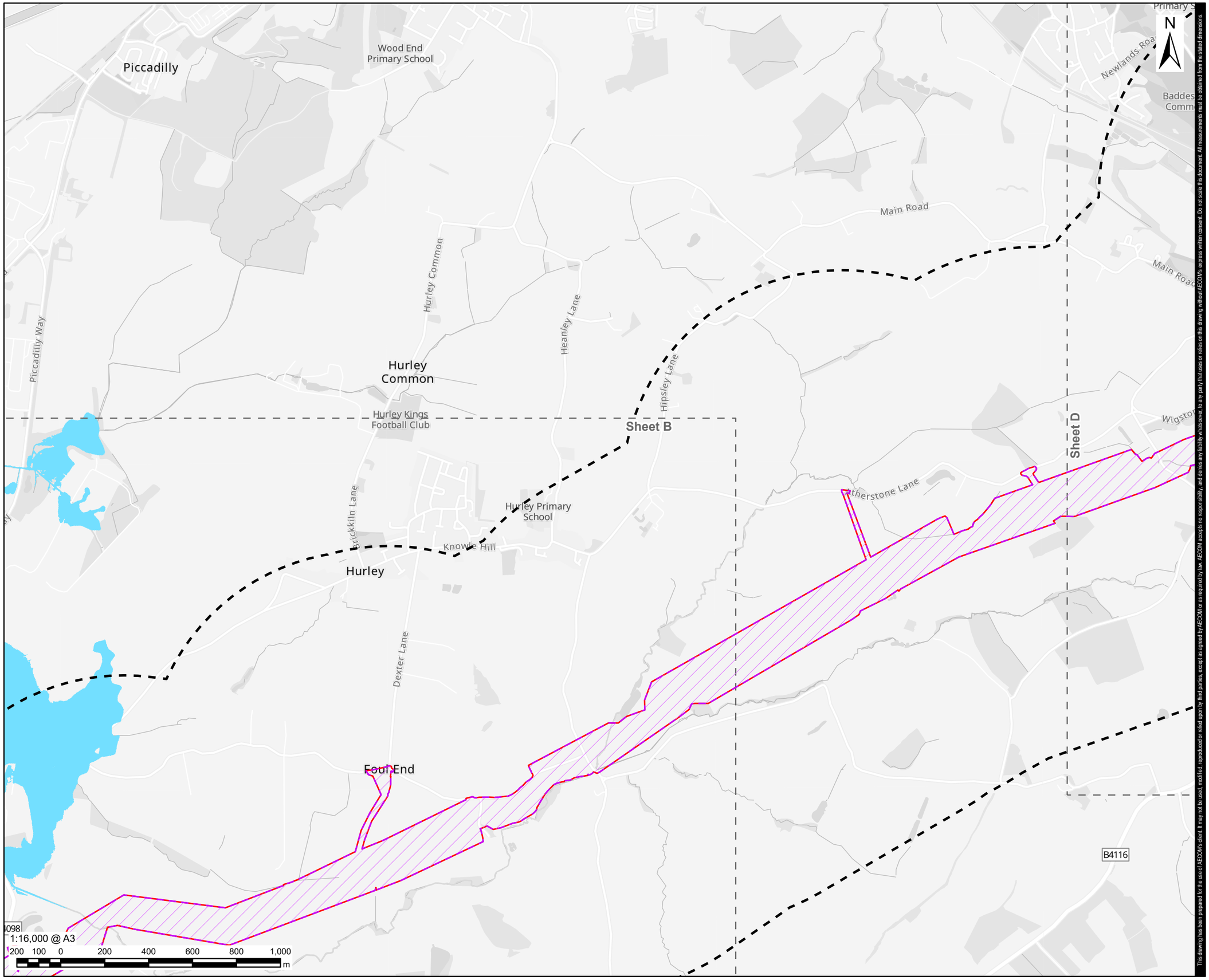

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Wet Day

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Part 1 Risk of Flooding from Reservoirs
Sheet C

FIGURE NUMBER

Figure 22-A3-7

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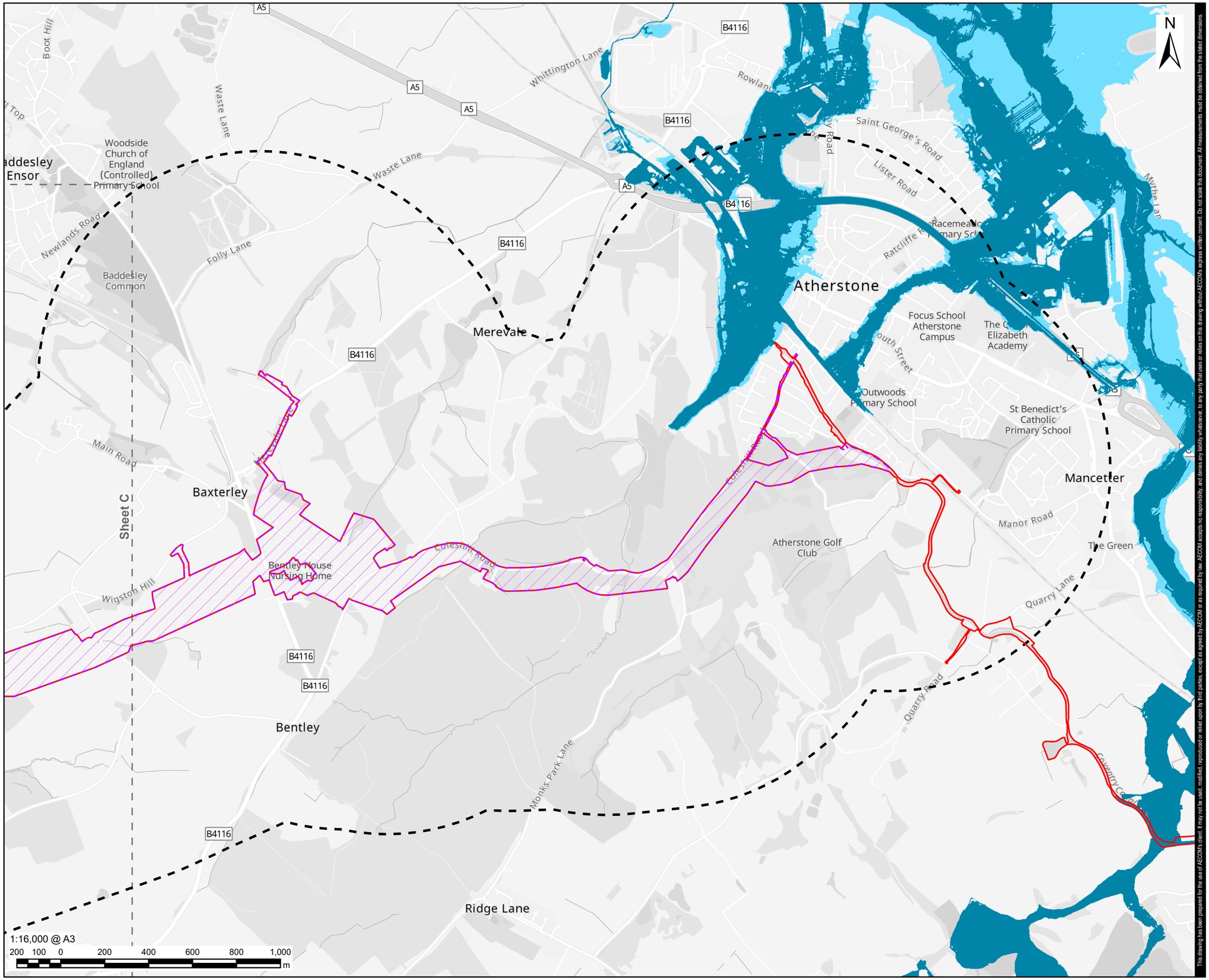

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LEGEND

- Part 1
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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FIGURE TITLE

Part 1 Risk of Flooding from Reservoirs Sheet D

FIGURE NUMBER

Figure 22-A3-7

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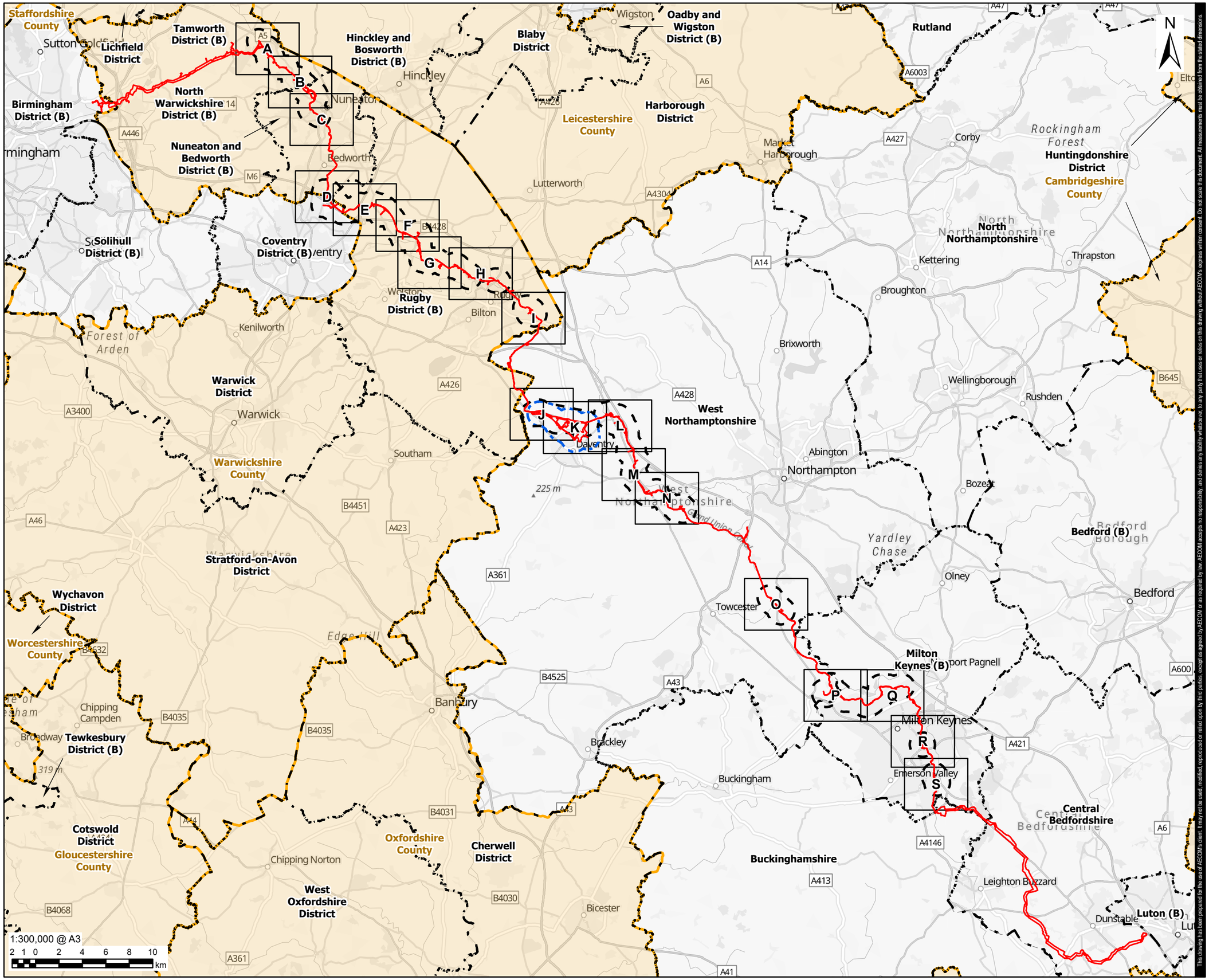

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LEGEND

- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs Overview

FIGURE NUMBER

Figure 22-A3-8

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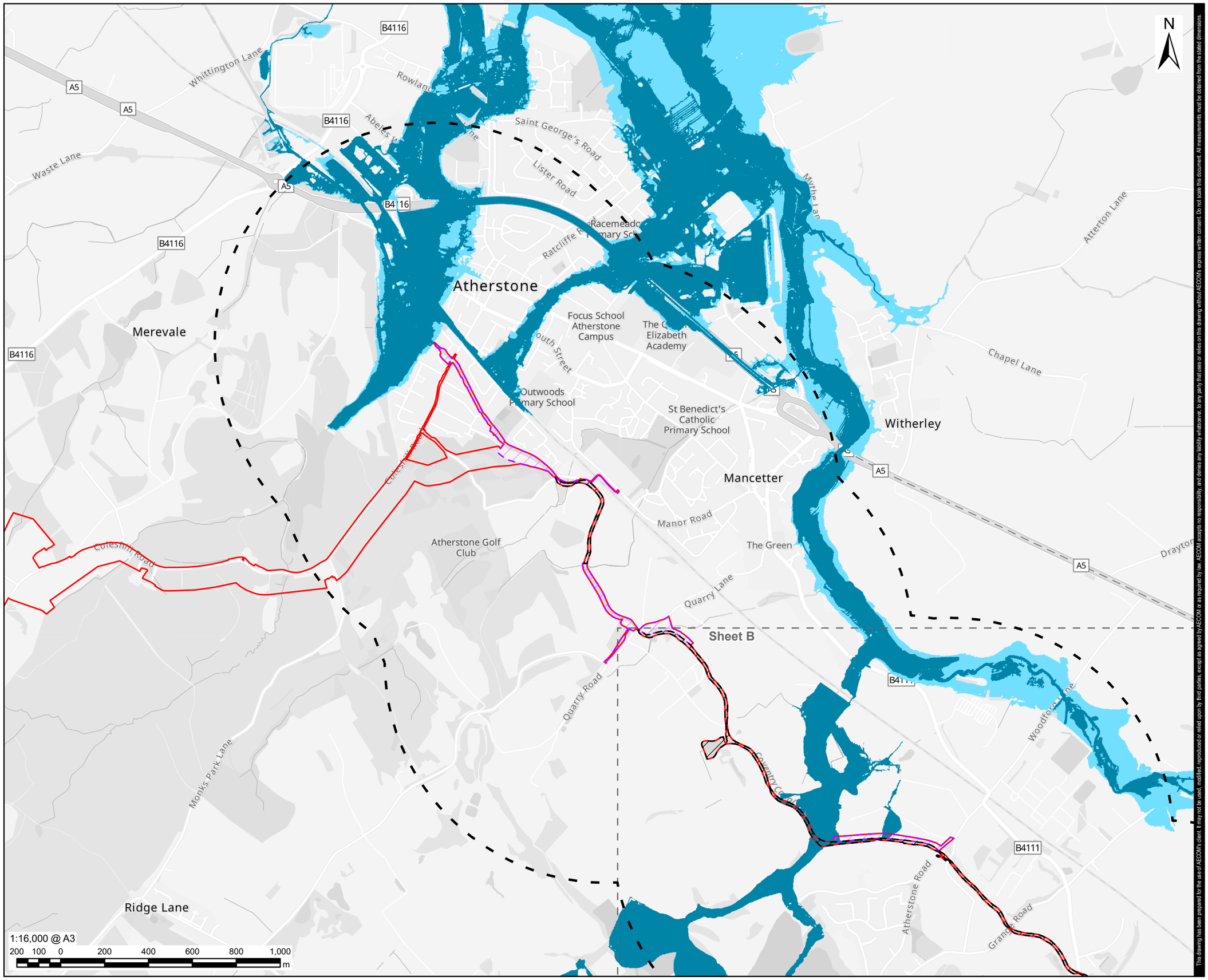

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet A

FIGURE NUMBER

Figure 22-A3-8

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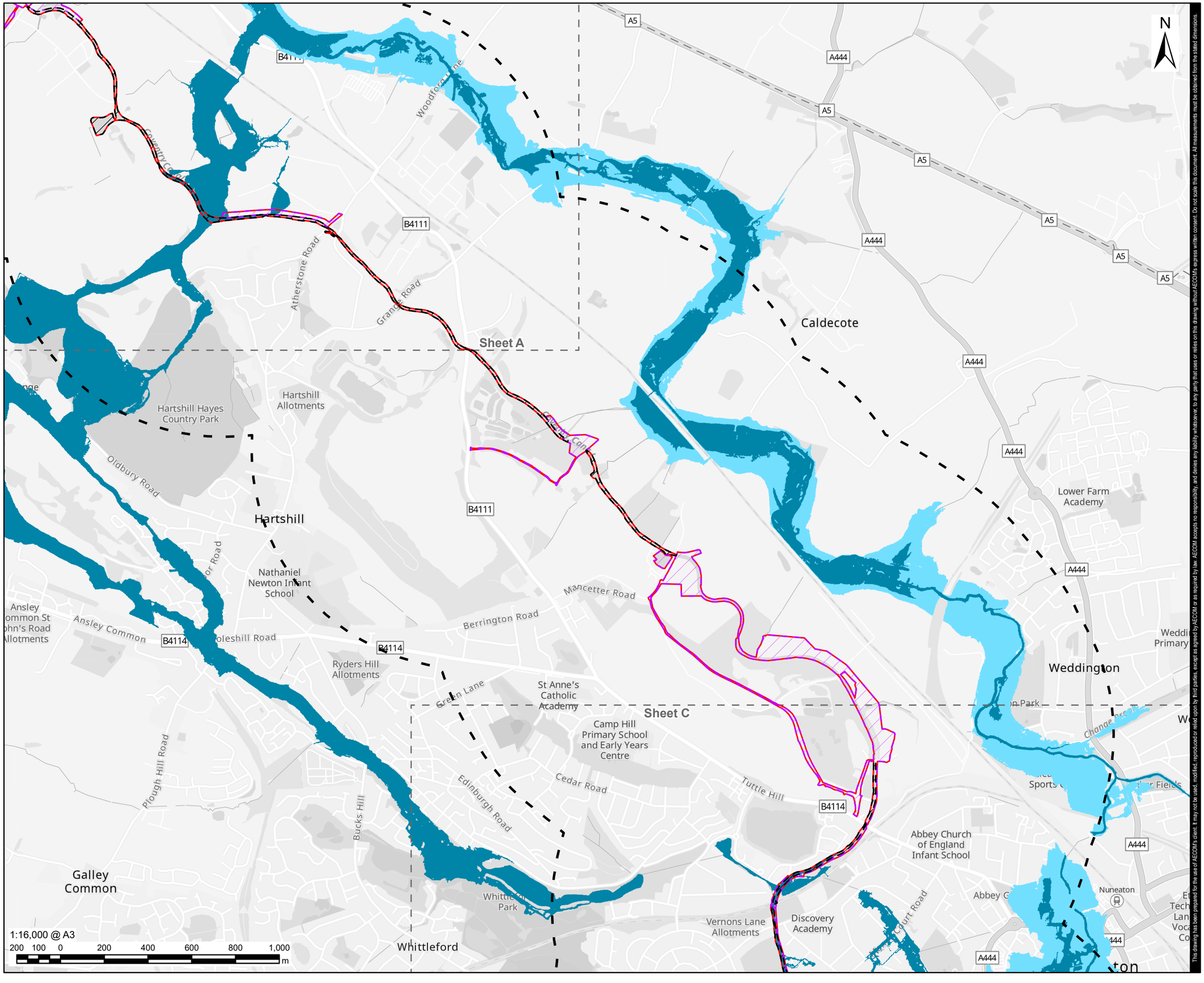

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet B

FIGURE NUMBER

Figure 22-A3-8

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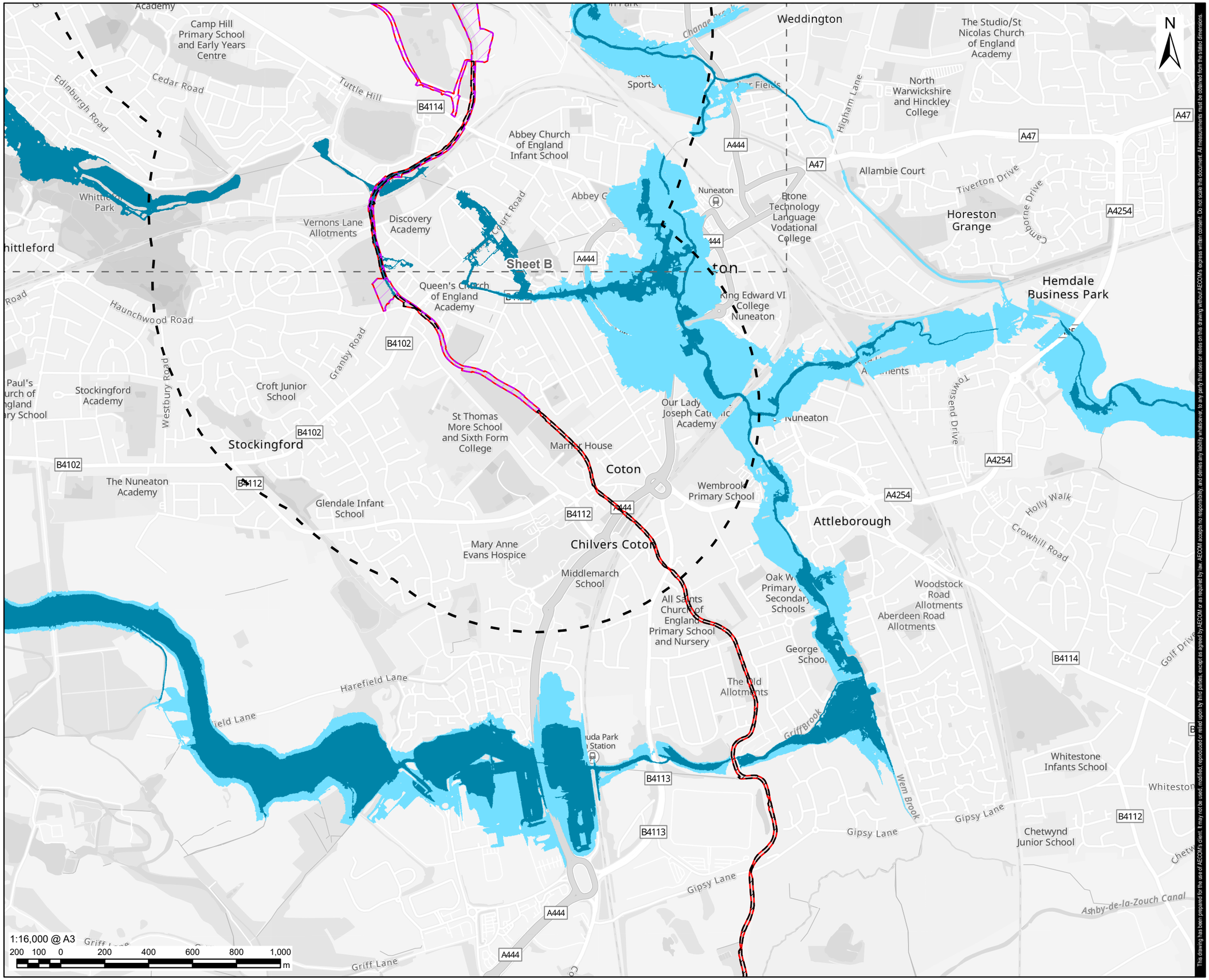

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet C

FIGURE NUMBER

Figure 22-A3-8

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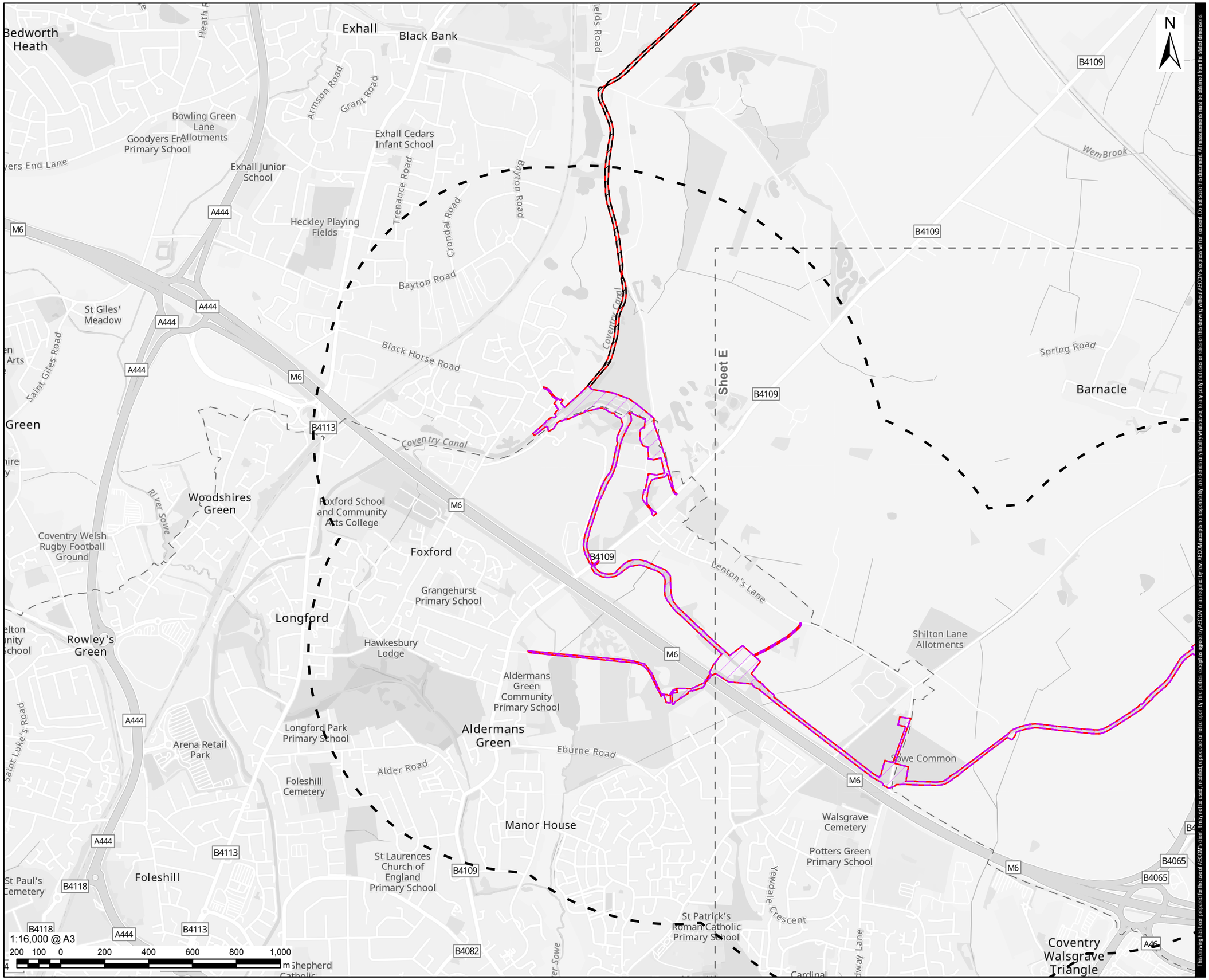

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet D

FIGURE NUMBER

Figure 22-A3-8

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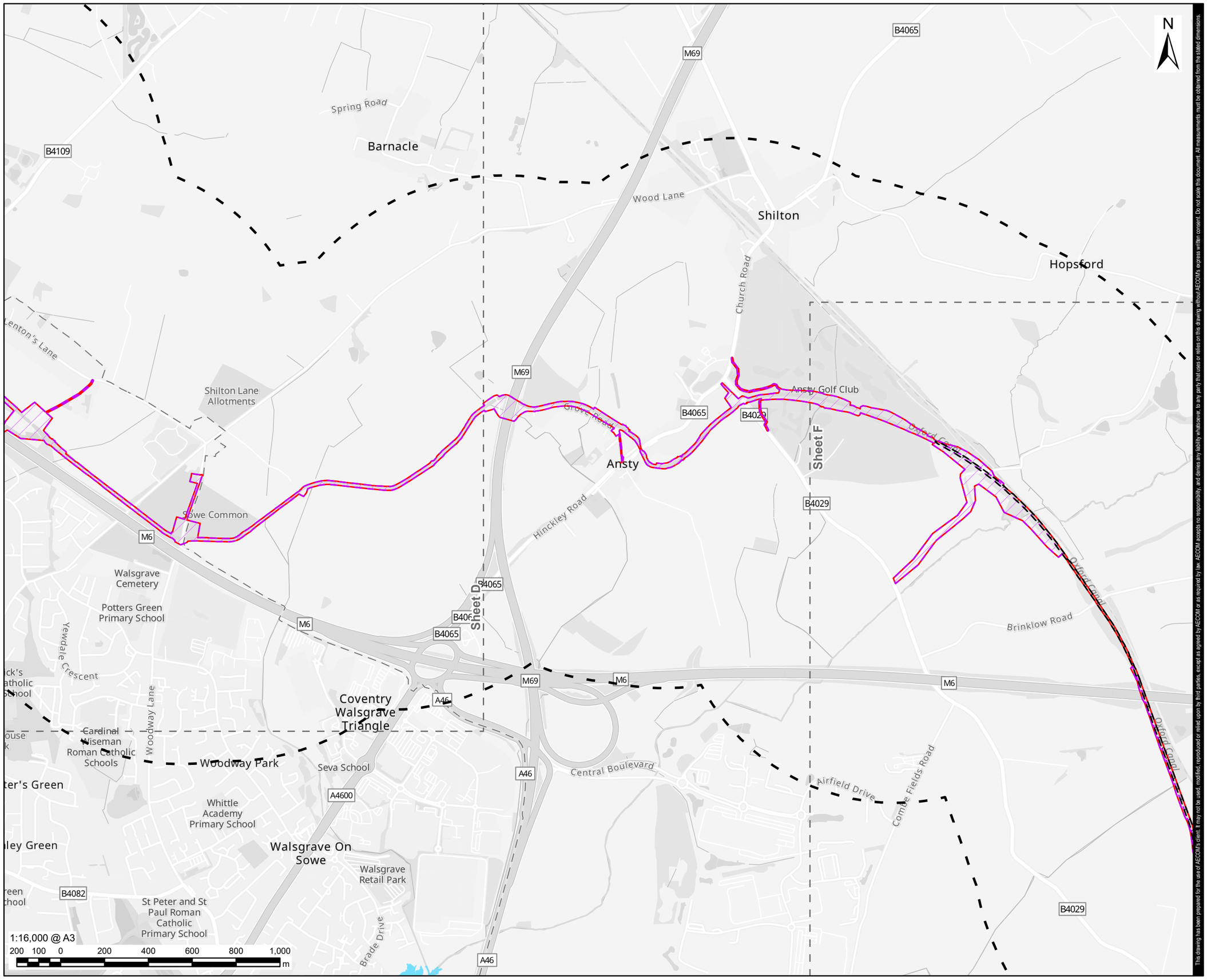

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent
- Wet Day

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet E

FIGURE NUMBER

Figure 22-A3-8

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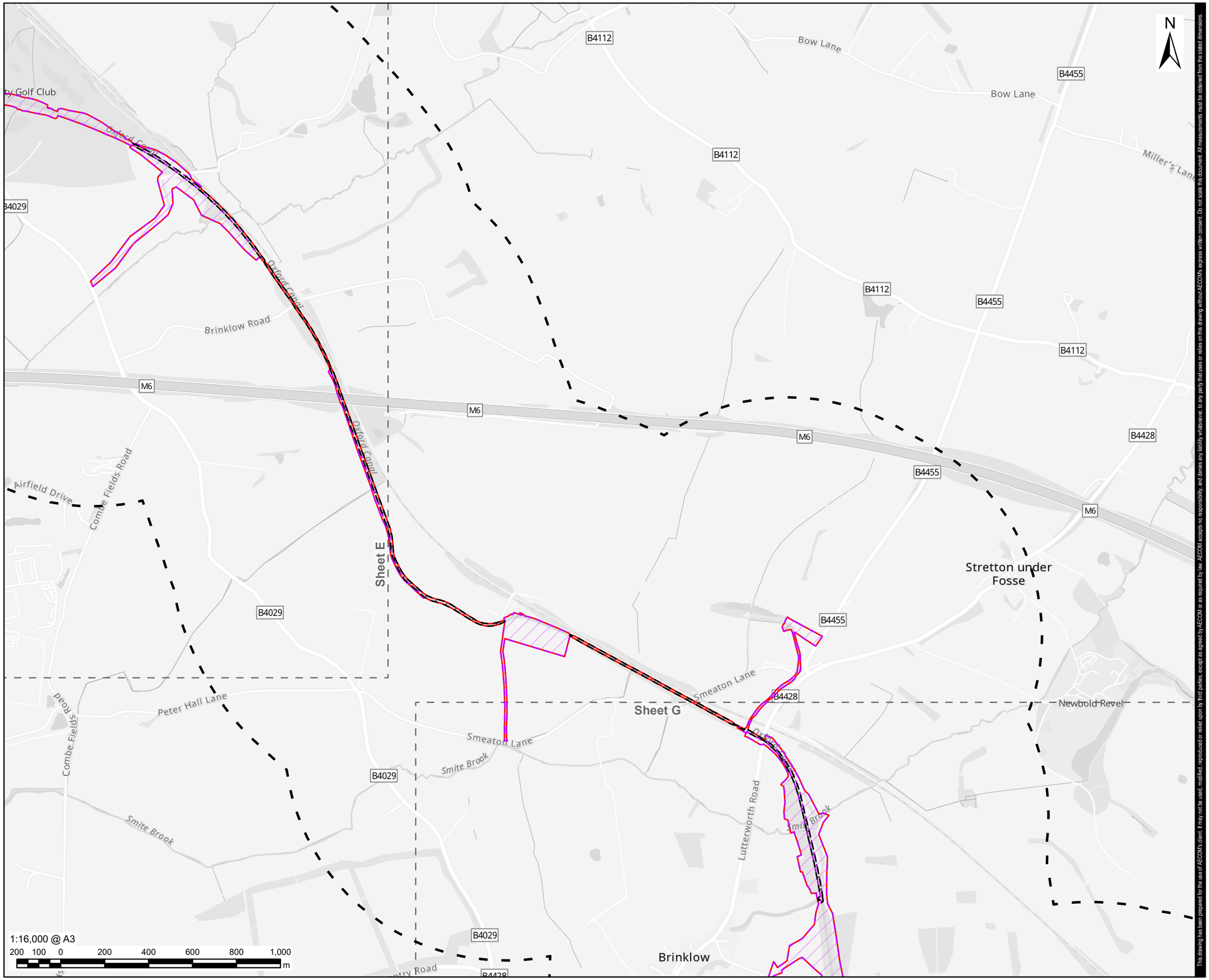

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet F

FIGURE NUMBER

Figure 22-A3-8

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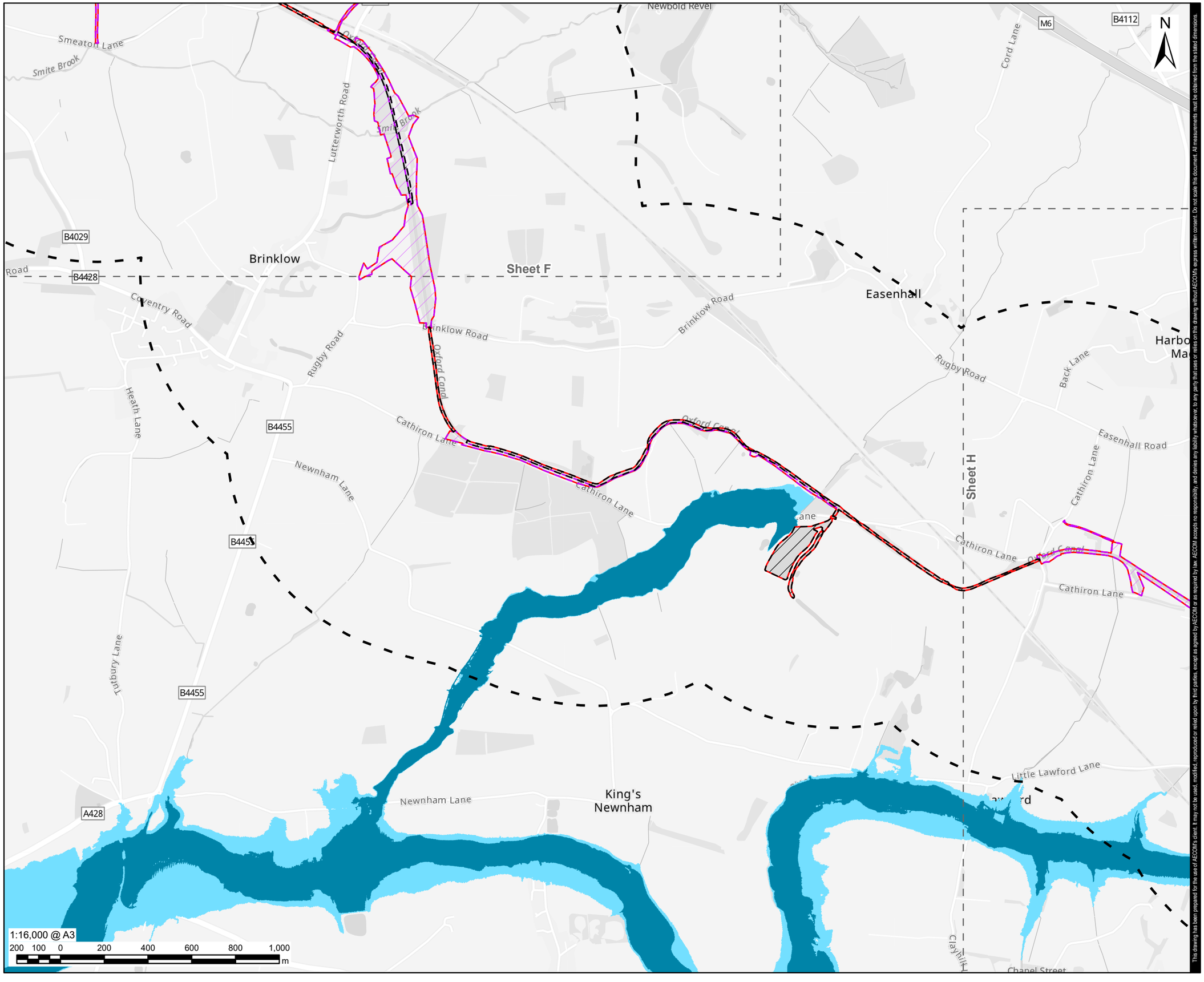

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet G

FIGURE NUMBER

Figure 22-A3-8

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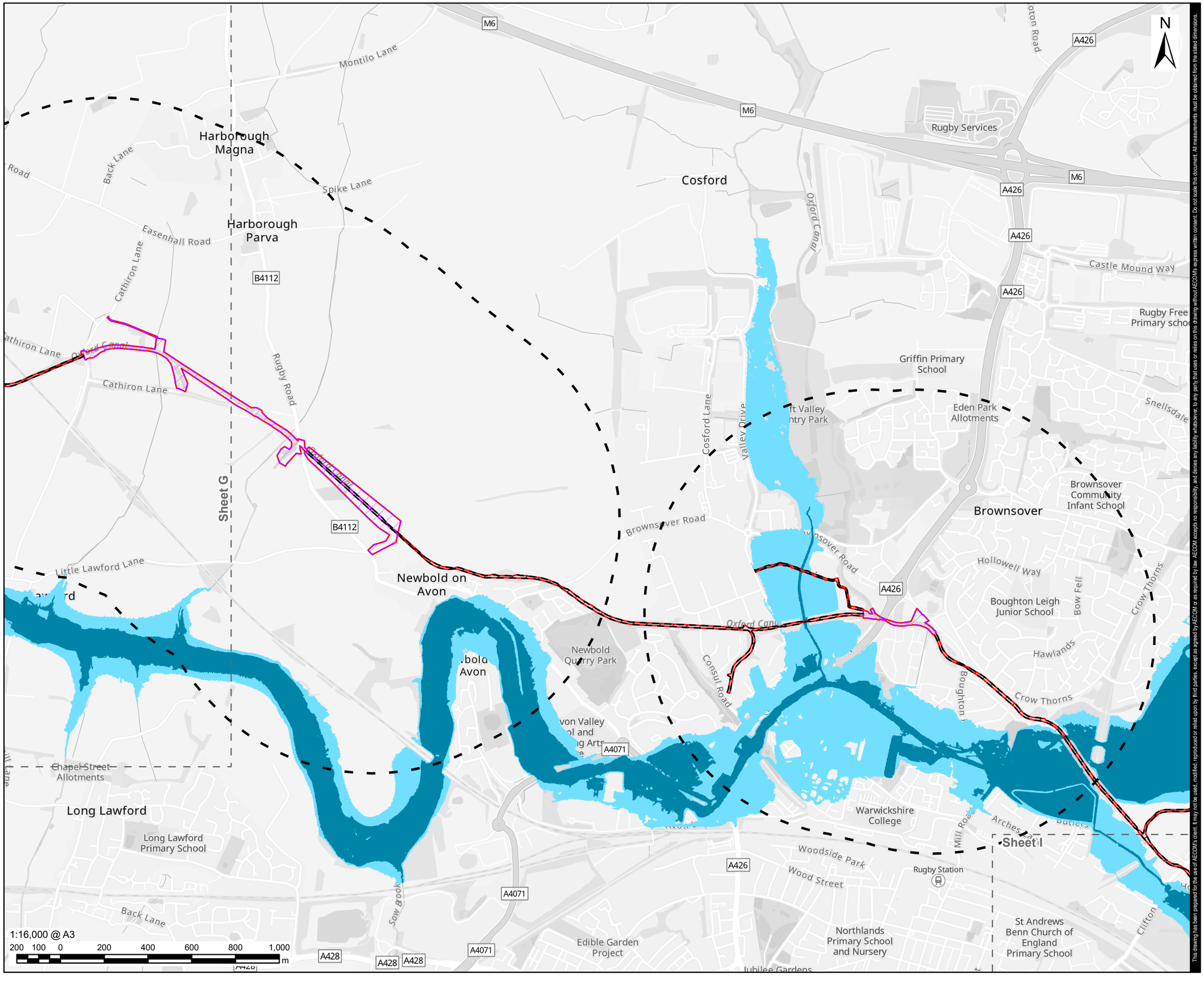

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

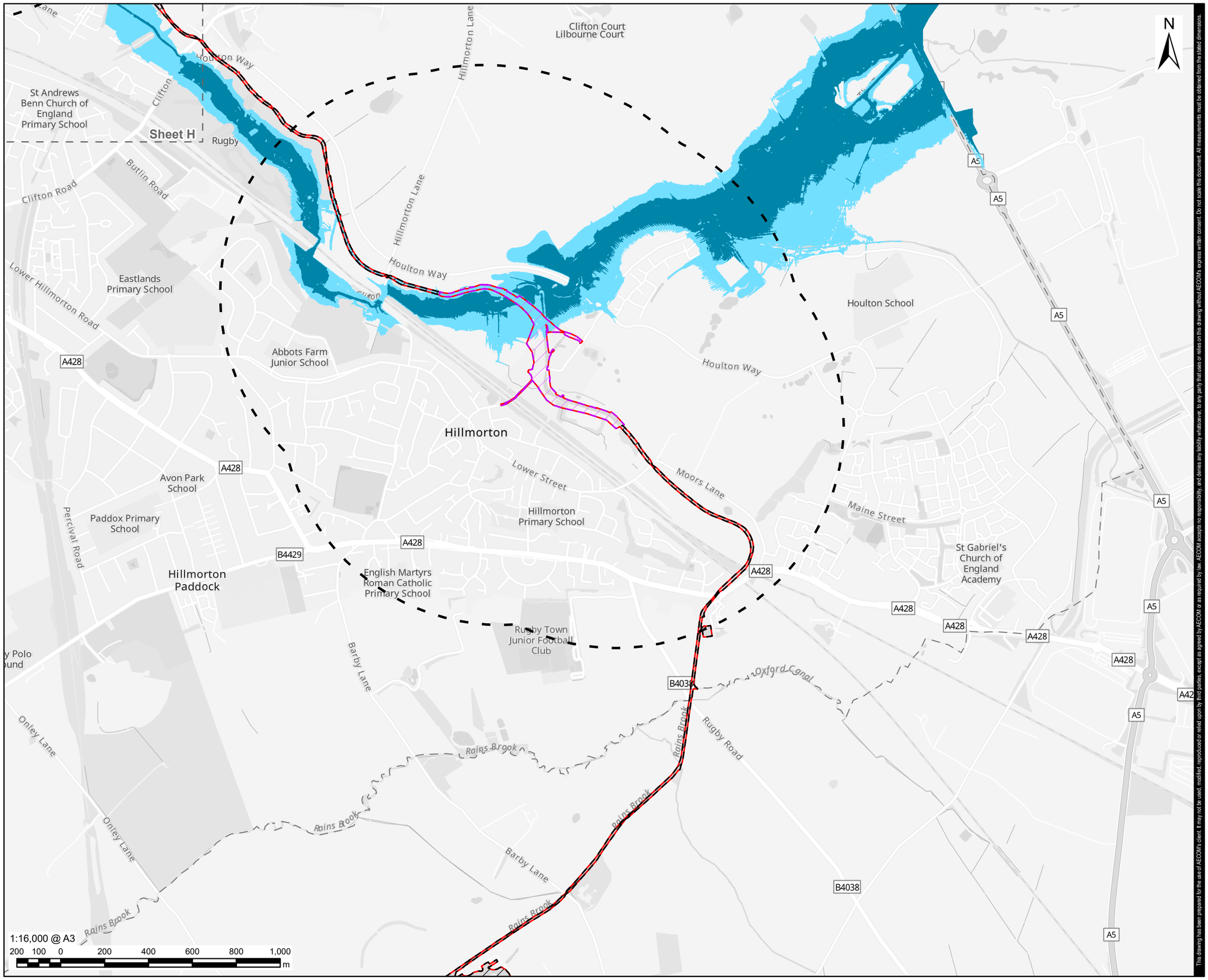
60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet H

FIGURE NUMBER

Figure 22-A3-8



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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet I

FIGURE NUMBER

Figure 22-A3-8

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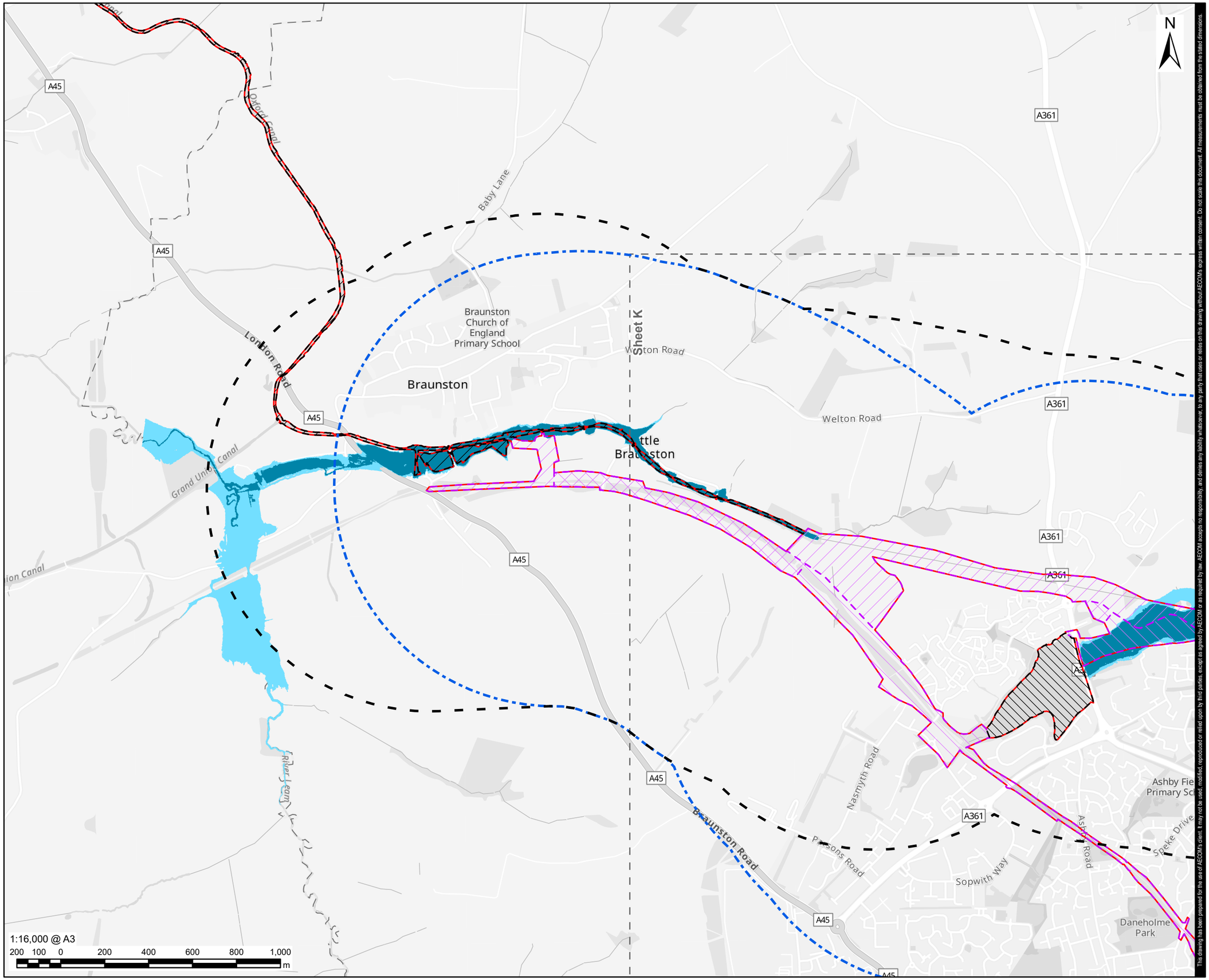

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet J

FIGURE NUMBER

Figure 22-A3-8

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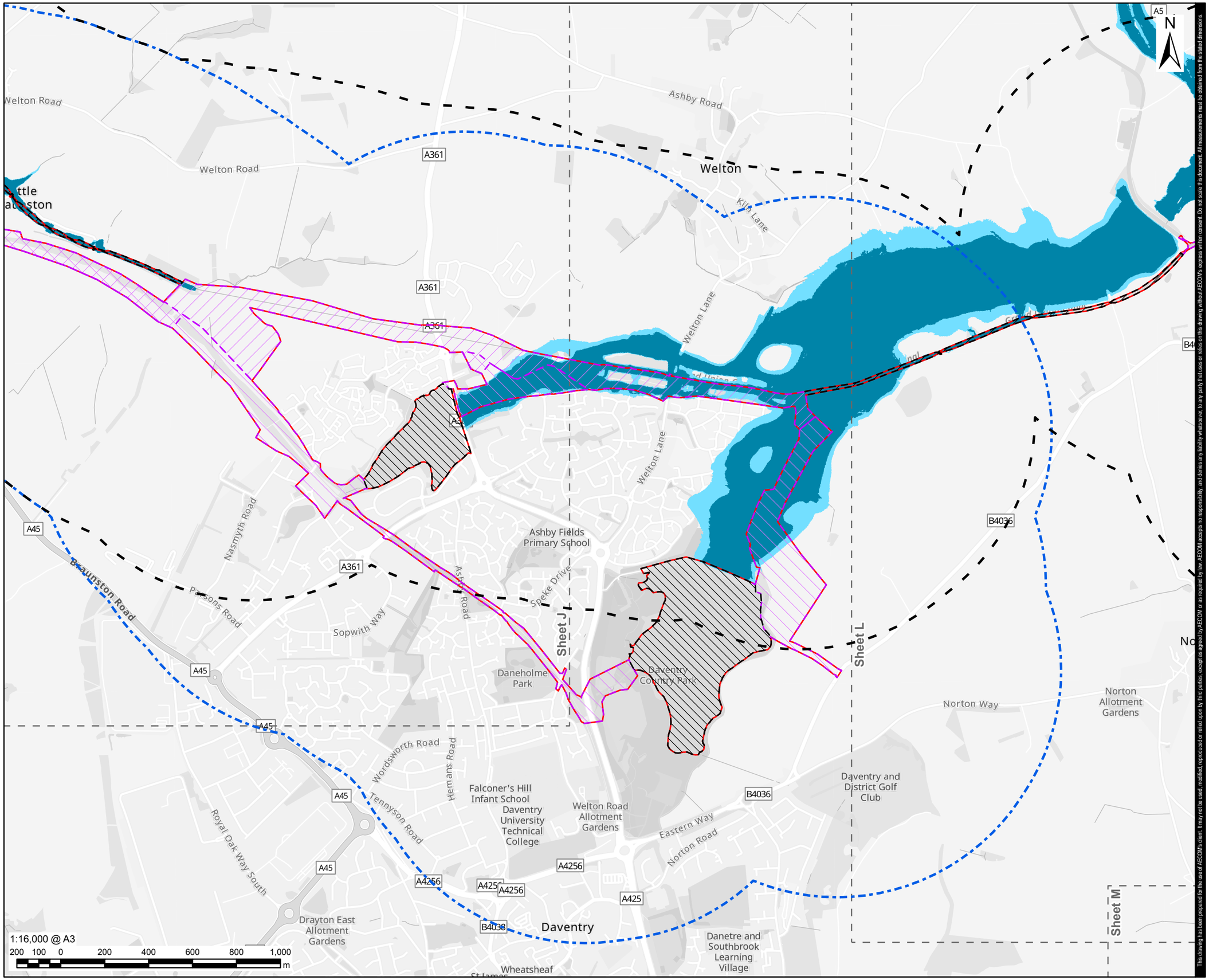

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LEGEND

- Part 2 - Indicative Work Area
- Part 3 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 3 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet K

FIGURE NUMBER

Figure 22-A3-8

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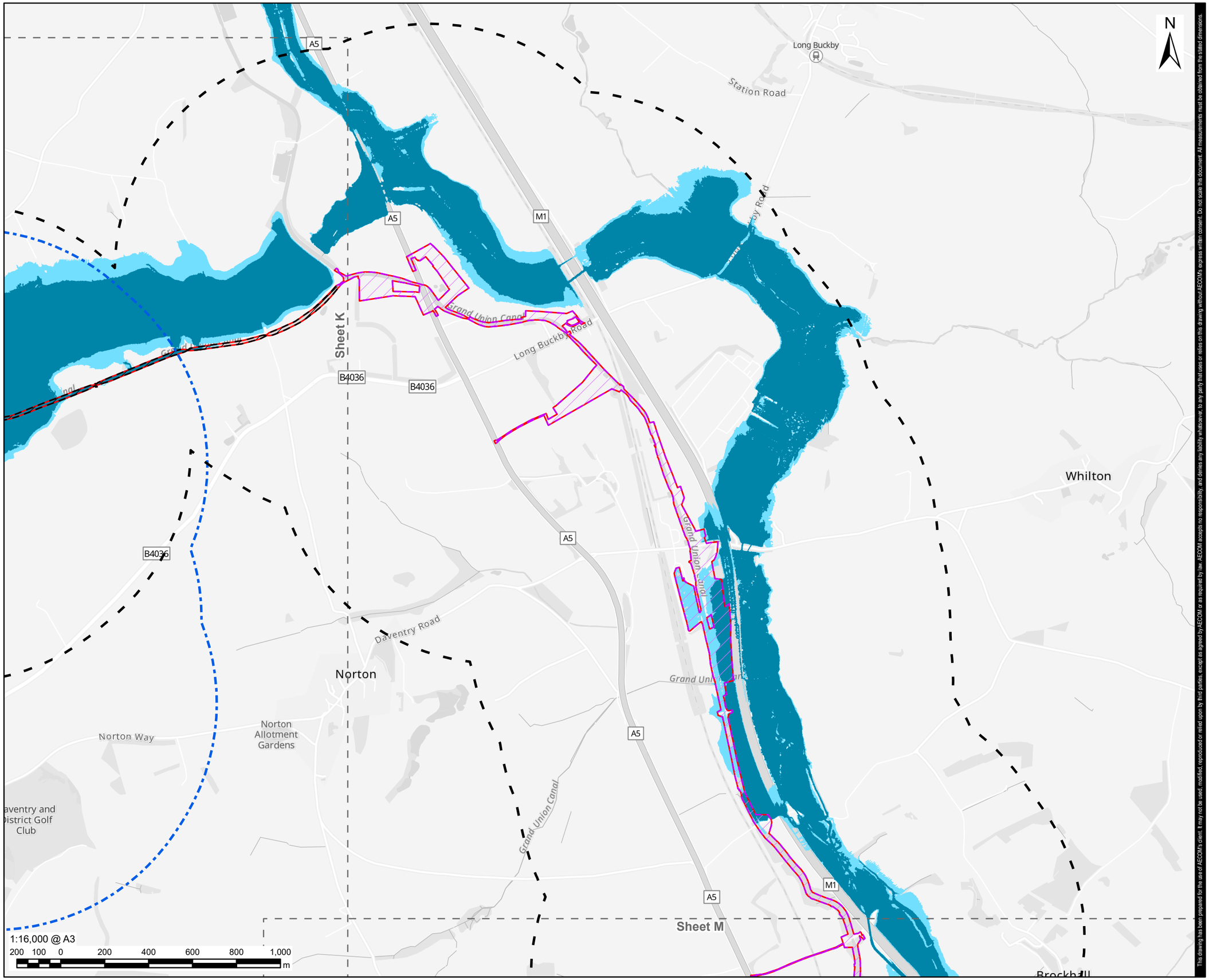

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Part 3 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet L

FIGURE NUMBER

Figure 22-A3-8

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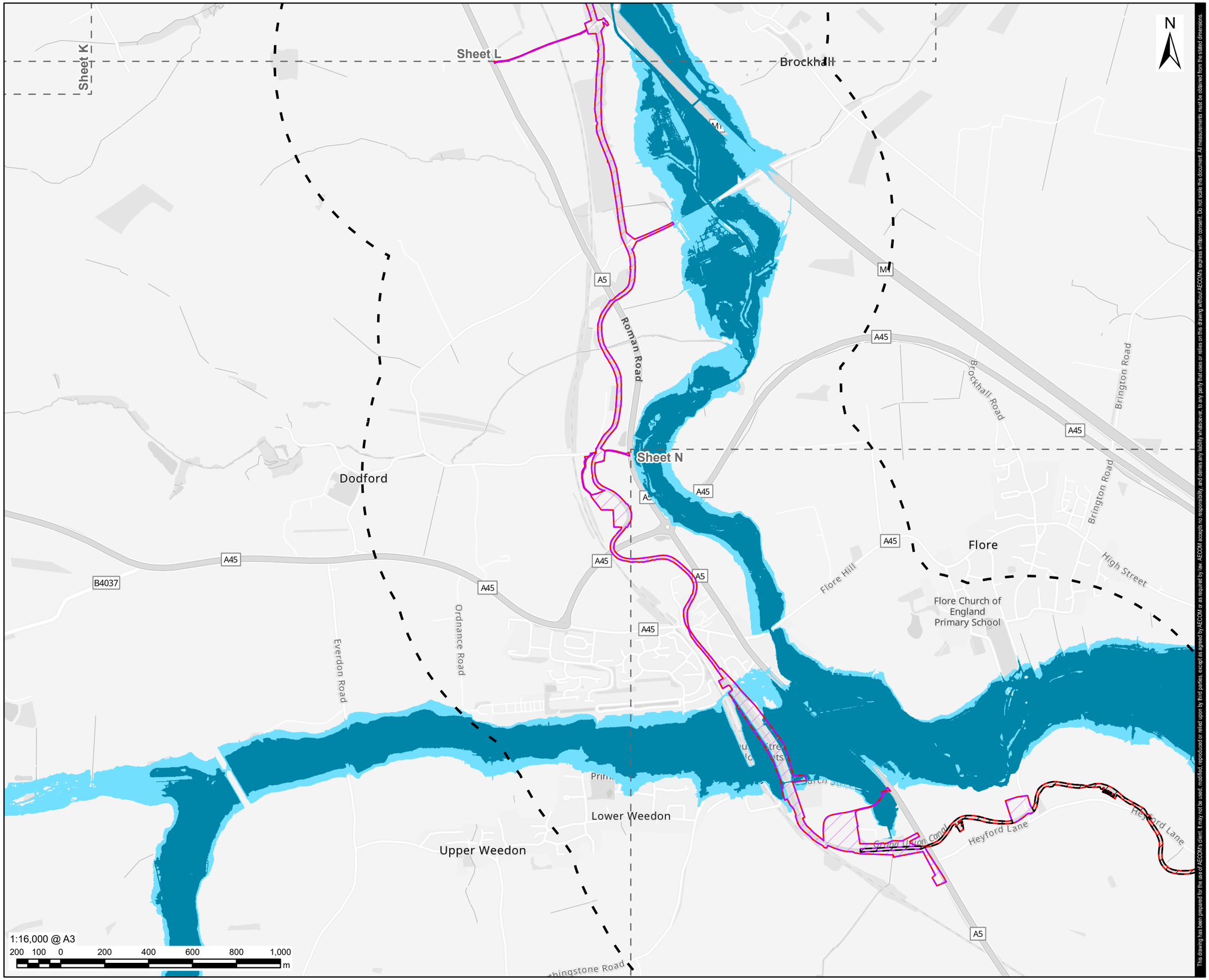

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet M

FIGURE NUMBER

Figure 22-A3-8

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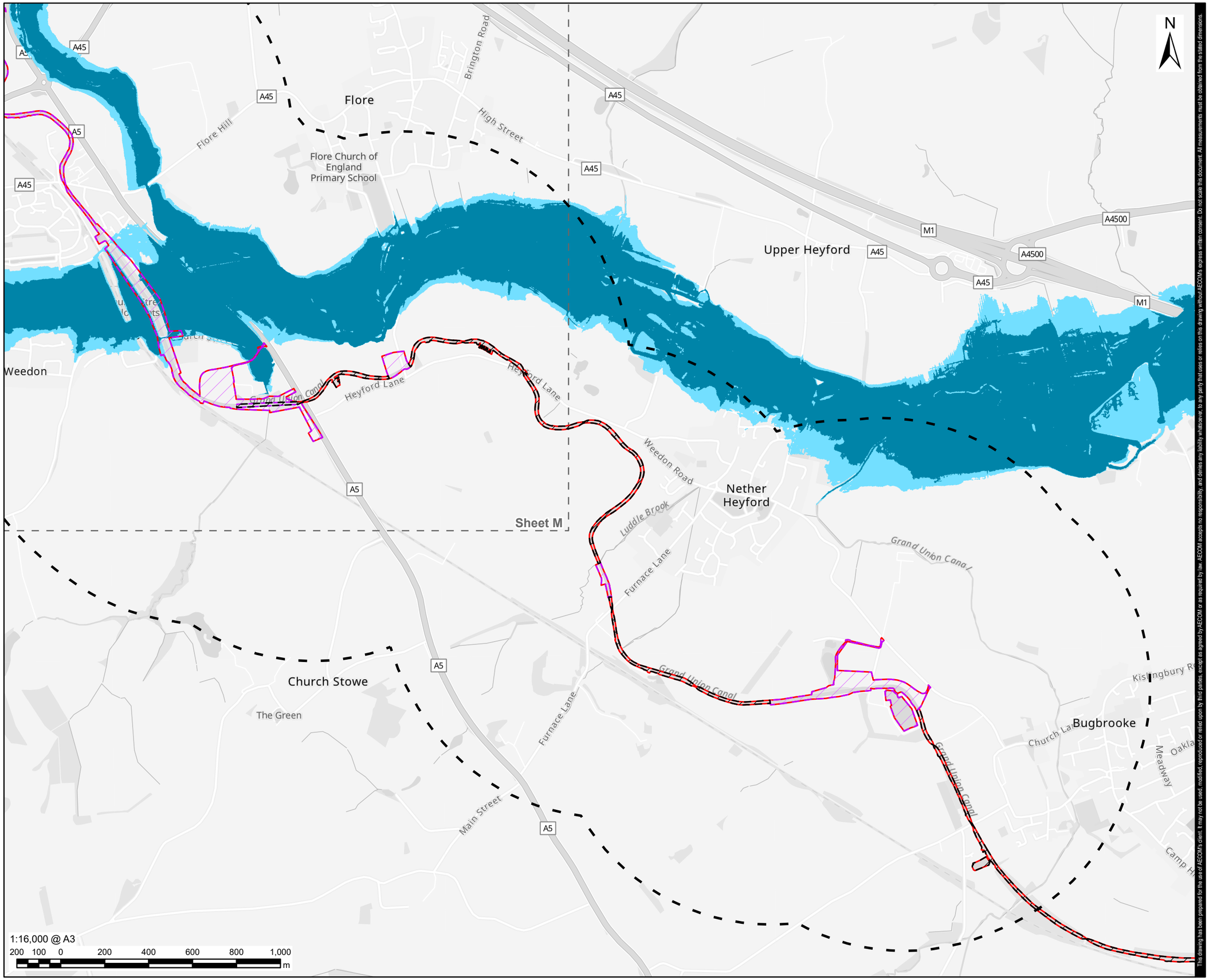

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet N

FIGURE NUMBER

Figure 22-A3-8

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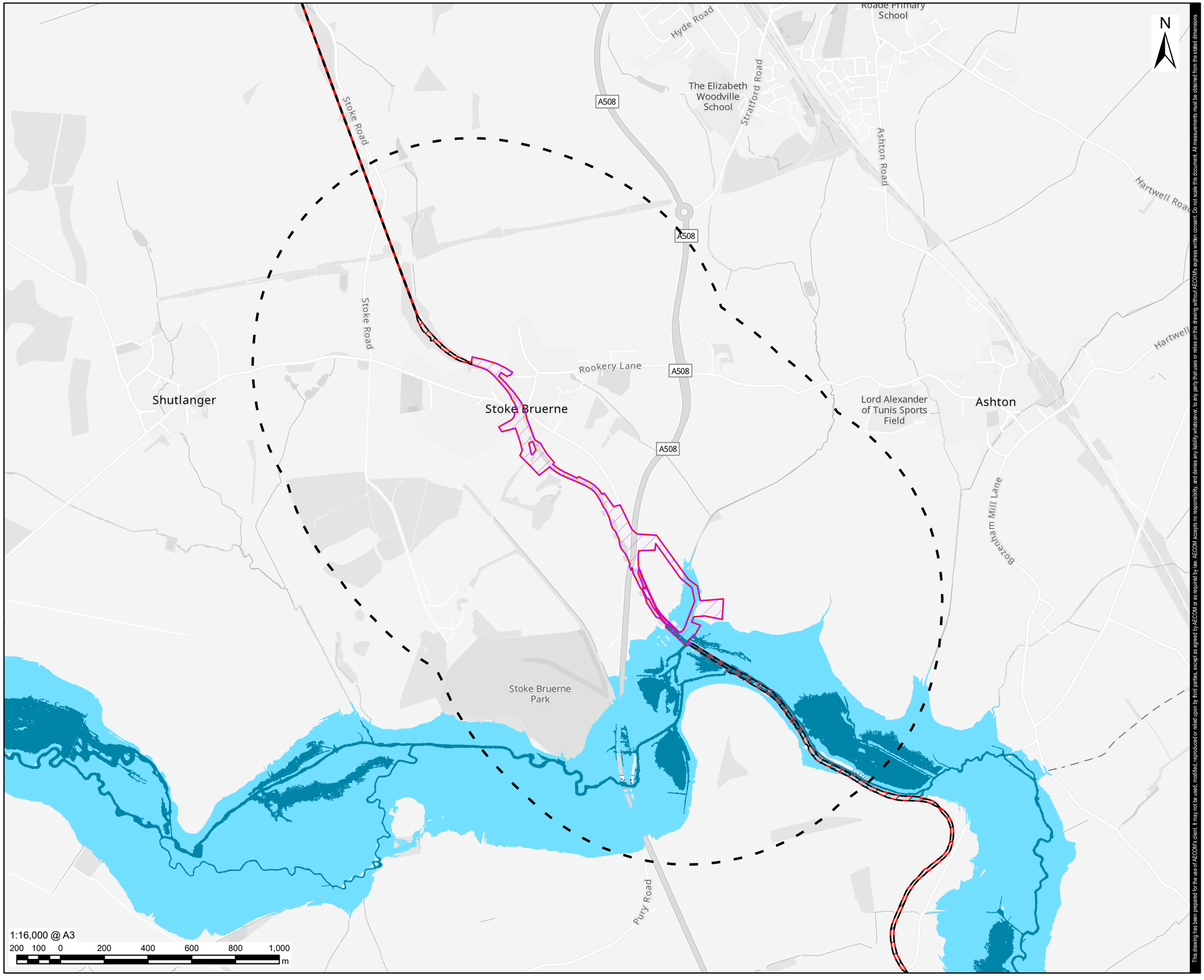

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits

Reservoir Flood Extent

- Dry Day
- Wet Day

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet O

FIGURE NUMBER

Figure 22-A3-8

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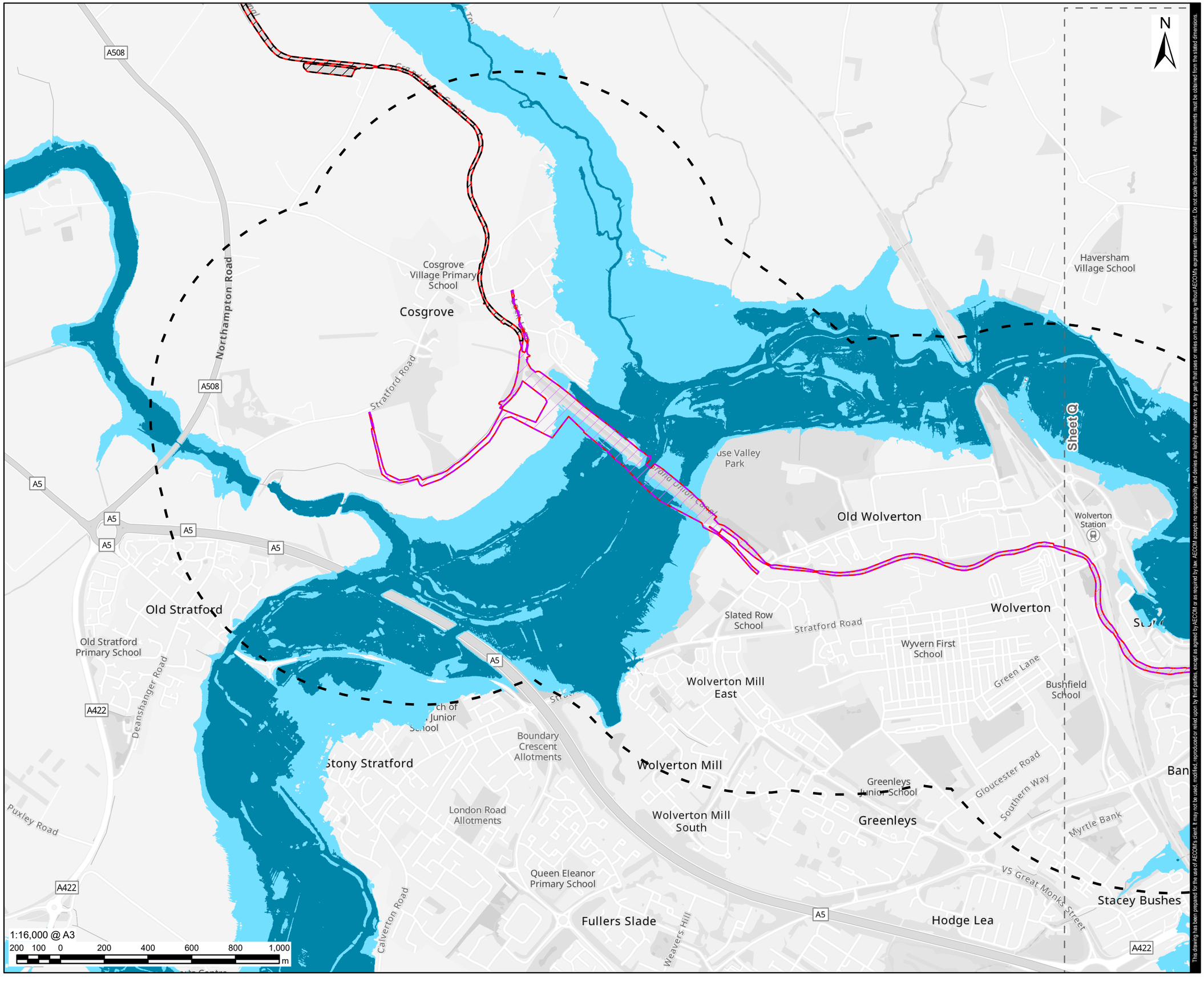

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet P

FIGURE NUMBER

Figure 22-A3-8

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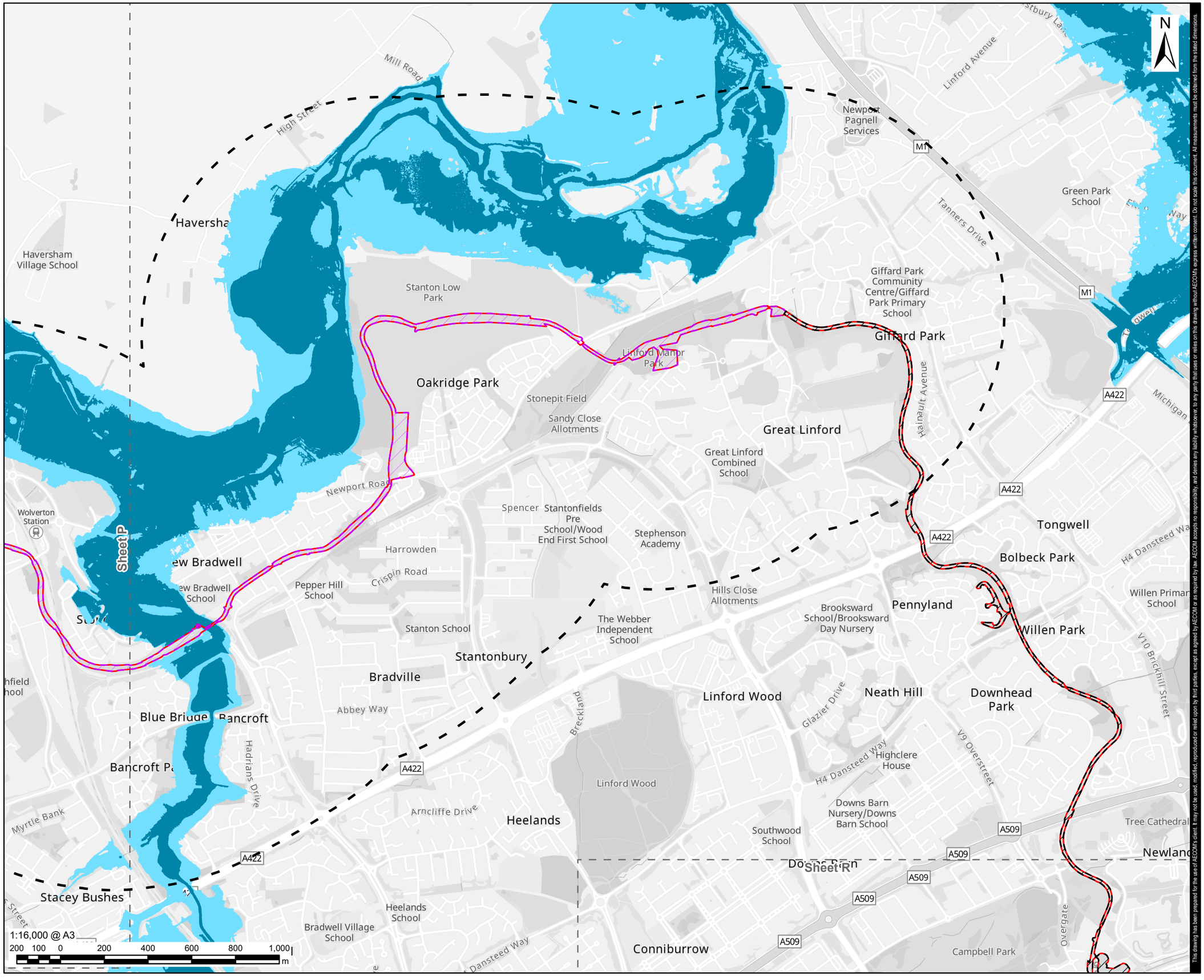

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet Q

FIGURE NUMBER

Figure 22-A3-8

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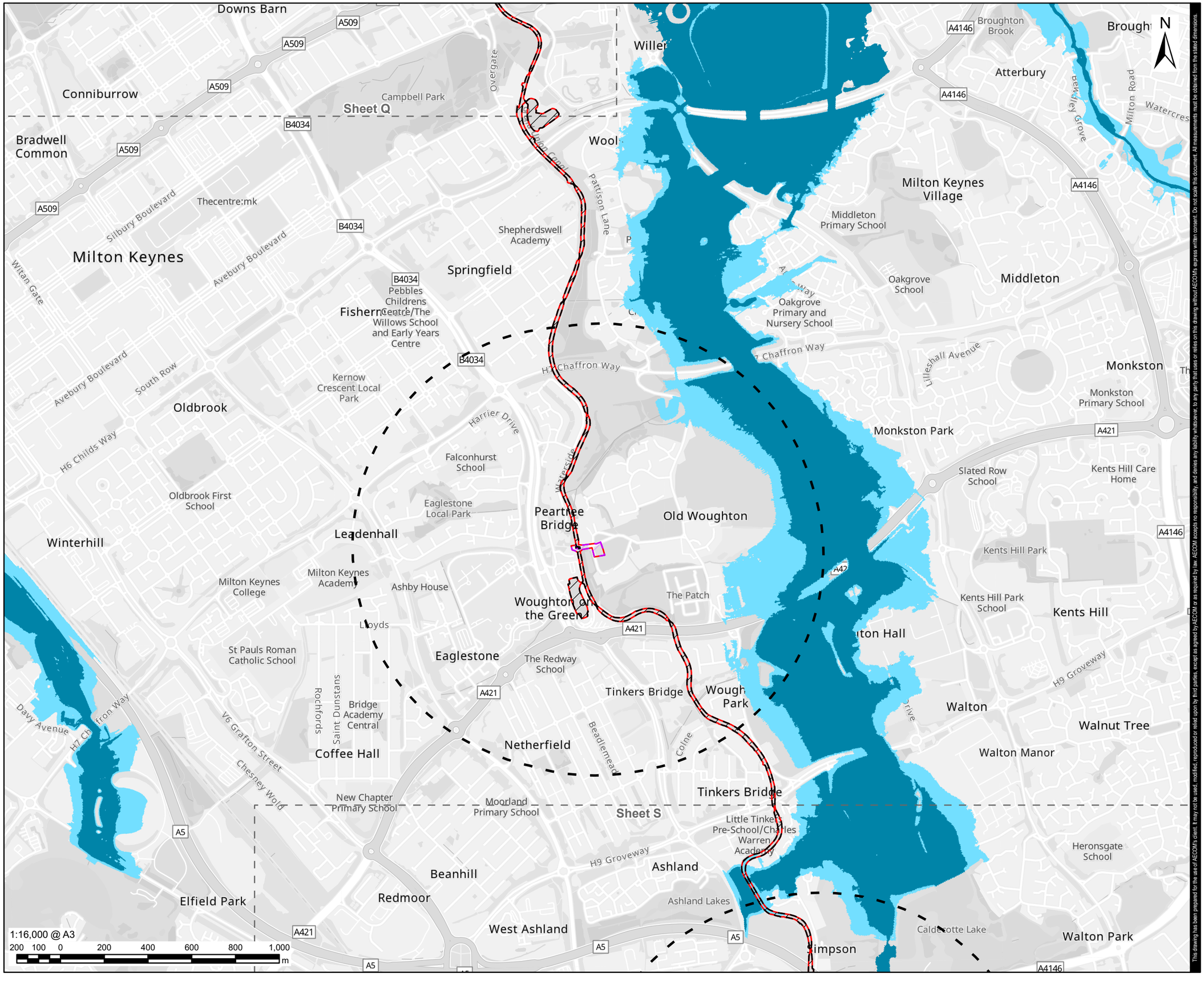

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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7. Study areas are based on Parts 2 (Indicative Work Area) and 3 (Indicative Work Area), Preliminary Order Limits. Parts 2 & 3 (Indicative Non-Work Area) Preliminary Order Limits are excluded as no physical works are proposed.

ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet R

FIGURE NUMBER

Figure 22-A3-8

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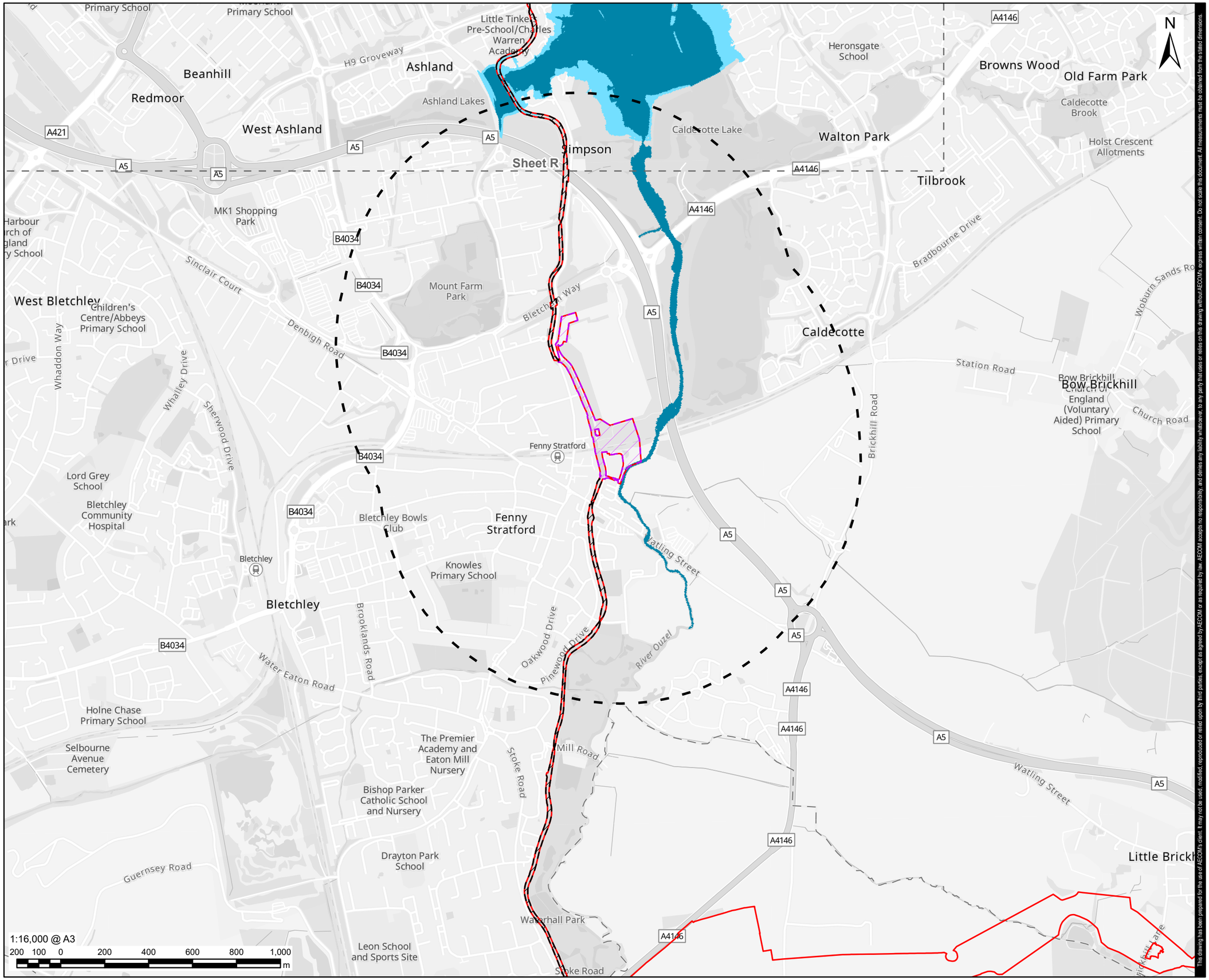

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LEGEND

- Part 2 - Indicative Work Area
- Part 2 - Indicative Non-Work Area
- Part 2 - 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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ISSUE PURPOSE

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PROJECT NUMBER

60720432

FIGURE TITLE

Parts 2 & 3 Risk of Flooding from Reservoirs
Sheet S

FIGURE NUMBER

Figure 22-A3-8

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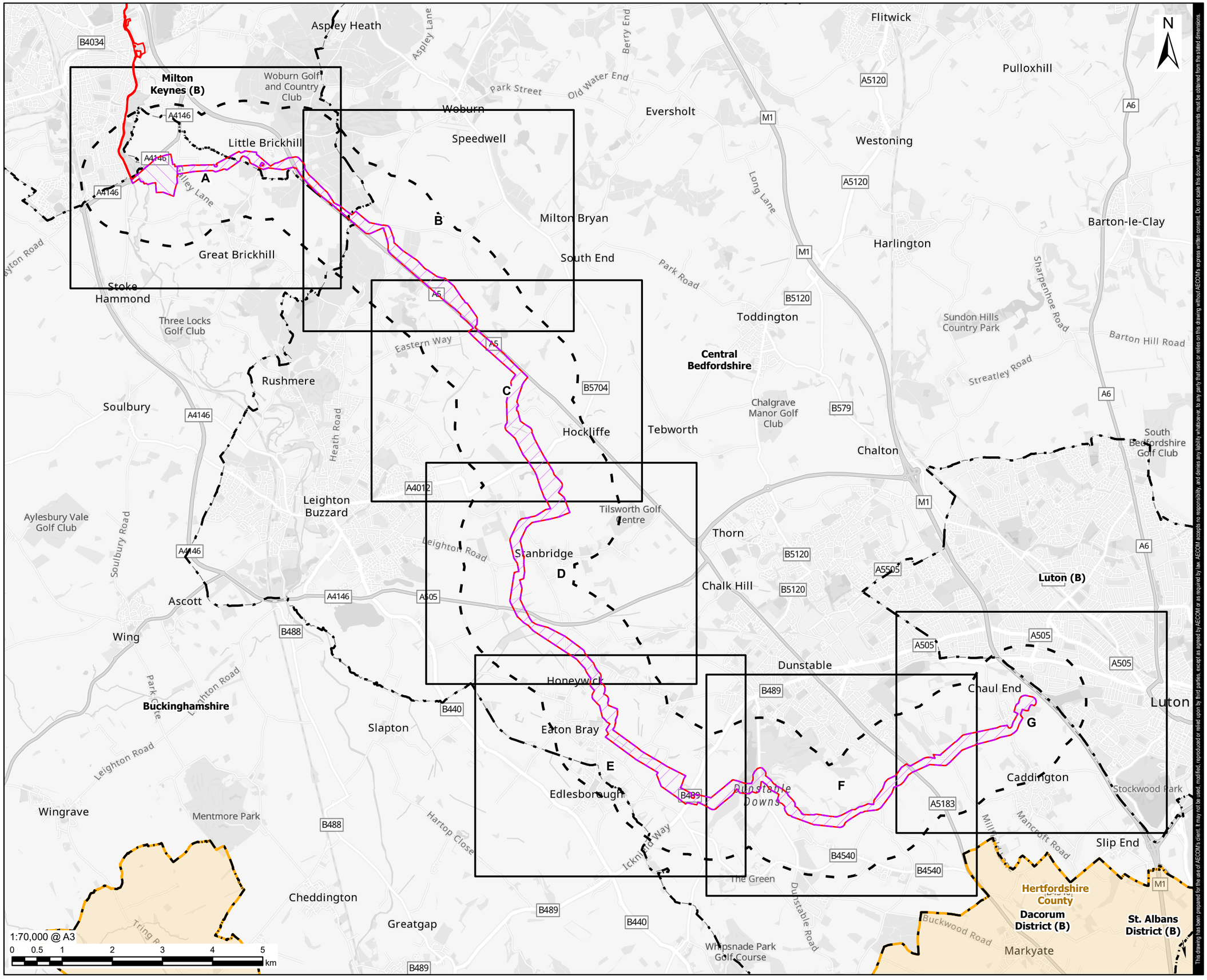

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- District Boundary
- County Boundary
- Sheet Extent

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Overview

FIGURE NUMBER

Figure 22-A3-9

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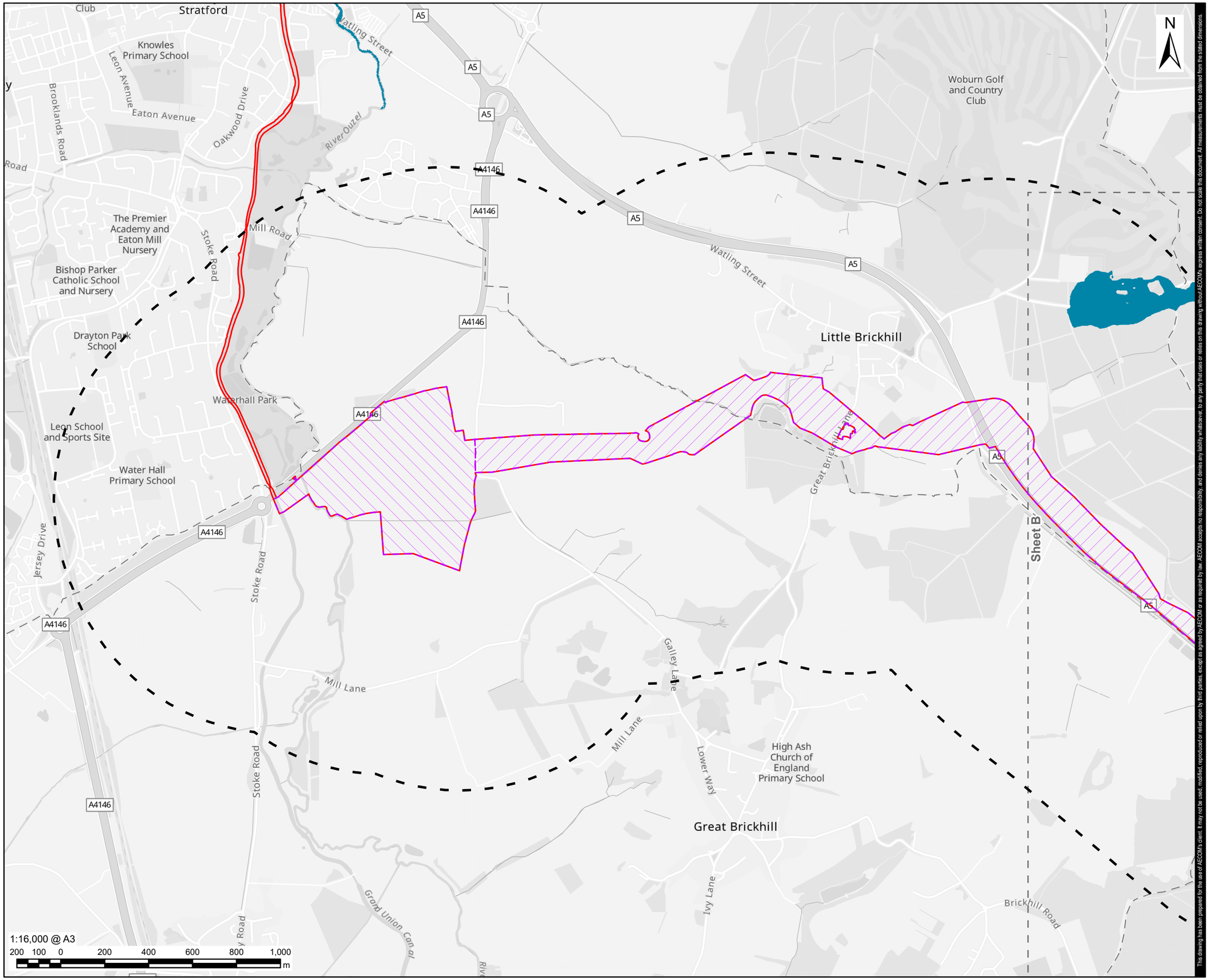

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LEGEND

- Part 4a
- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet A

FIGURE NUMBER

Figure 22-A3-9

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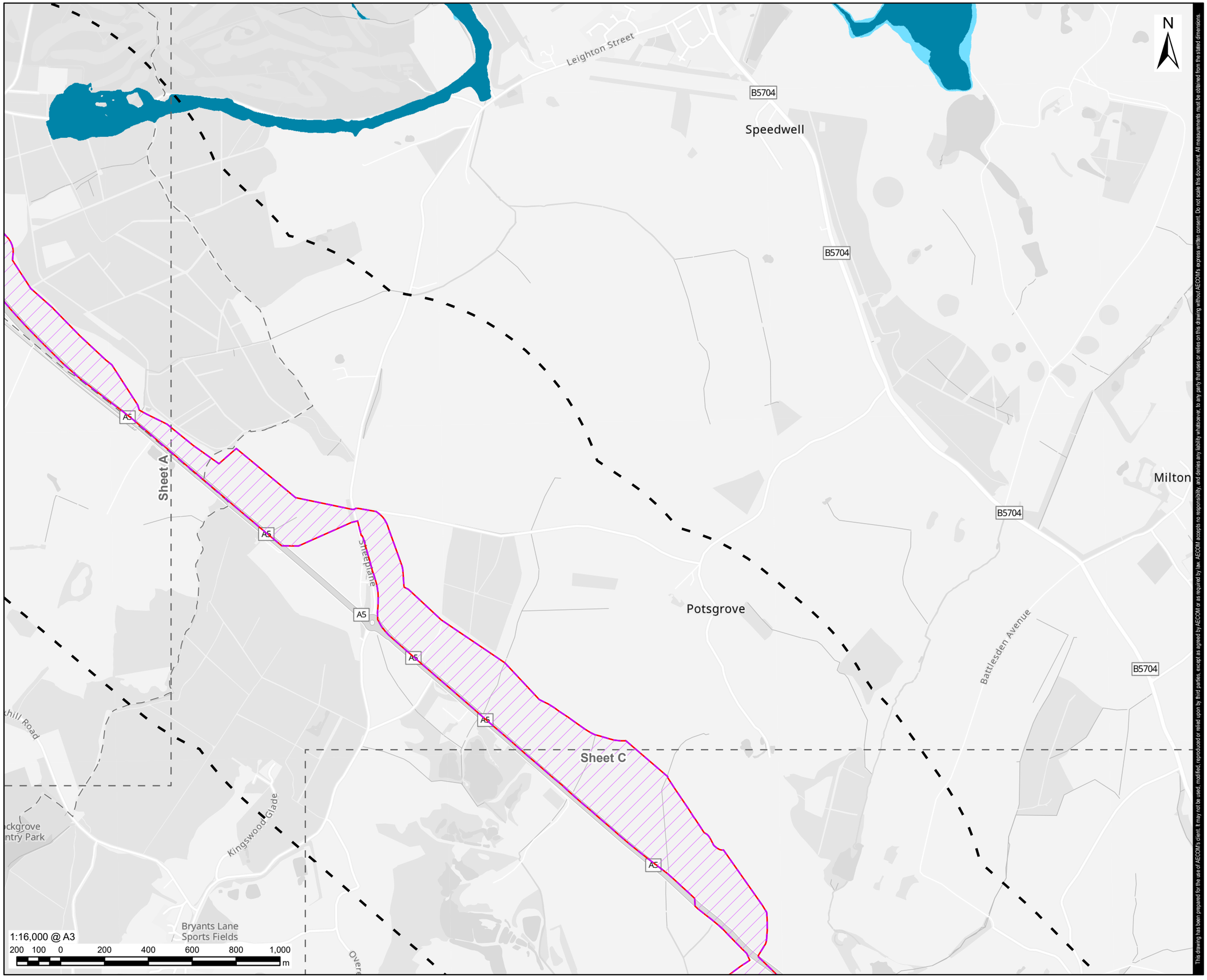

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

Reservoir Flood Extent

- Dry Day
- Wet Day

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet B

FIGURE NUMBER

Figure 22-A3-9

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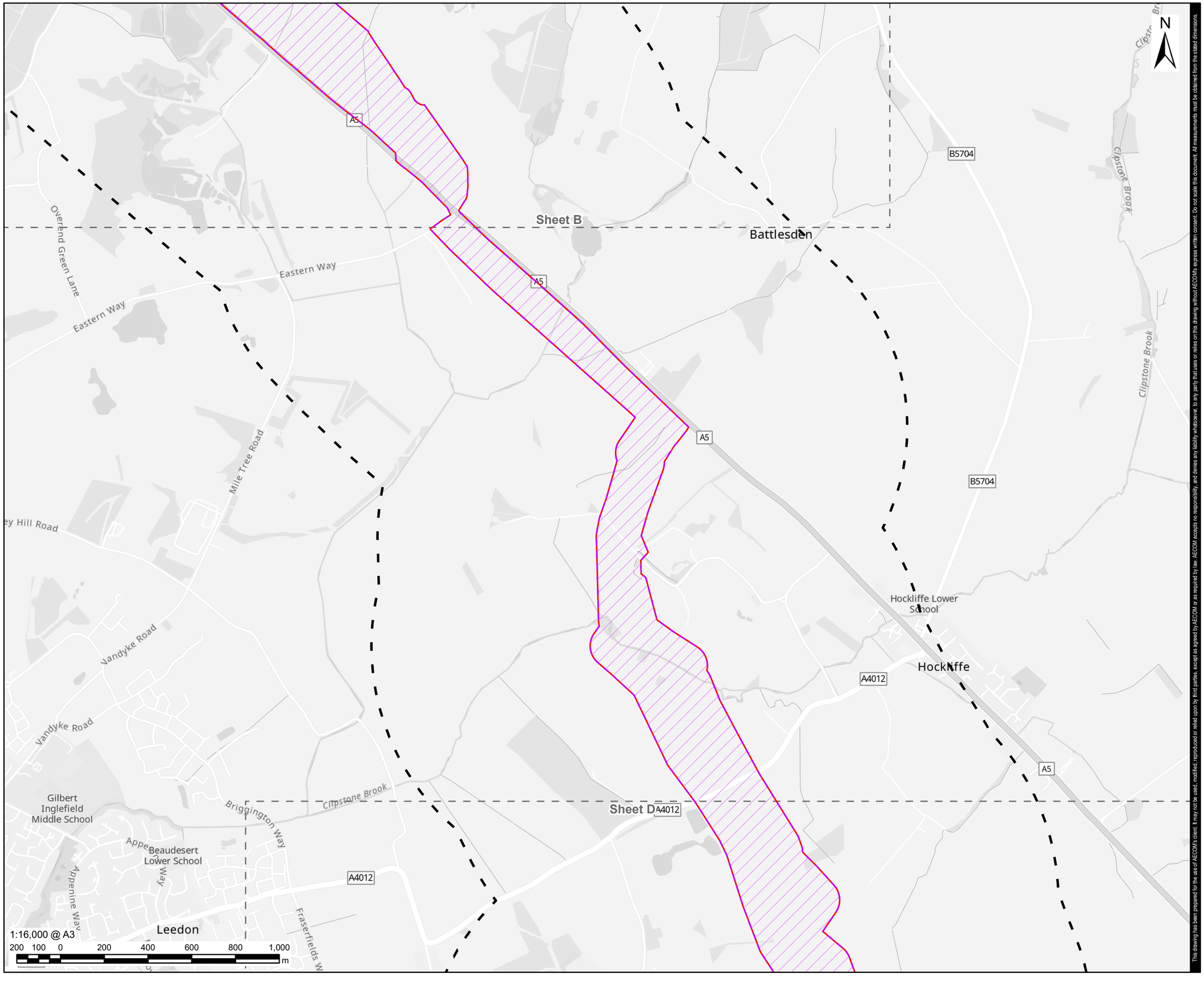

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet C

FIGURE NUMBER

Figure 22-A3-9

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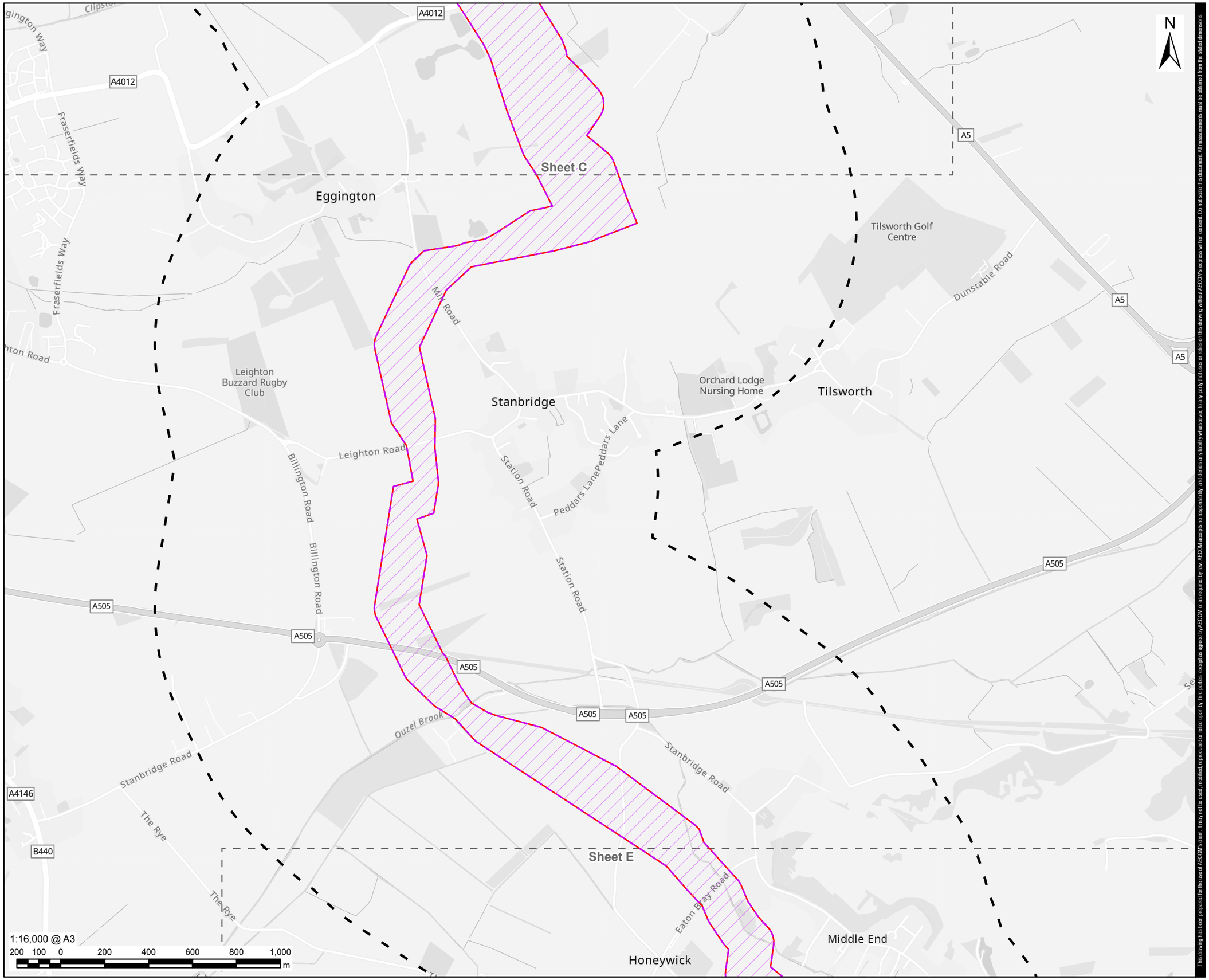

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet D

FIGURE NUMBER

Figure 22-A3-9

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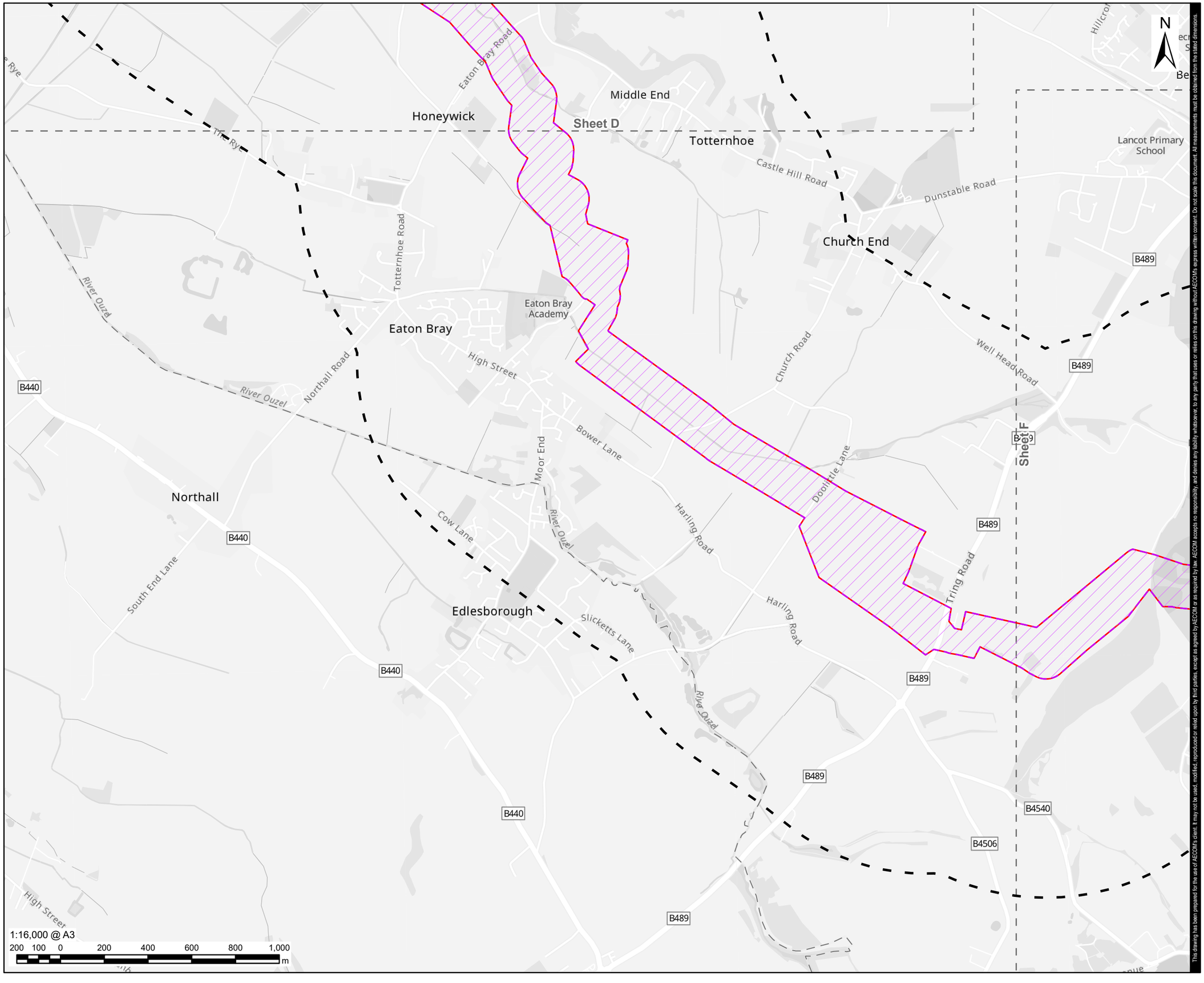

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet E

FIGURE NUMBER

Figure 22-A3-9

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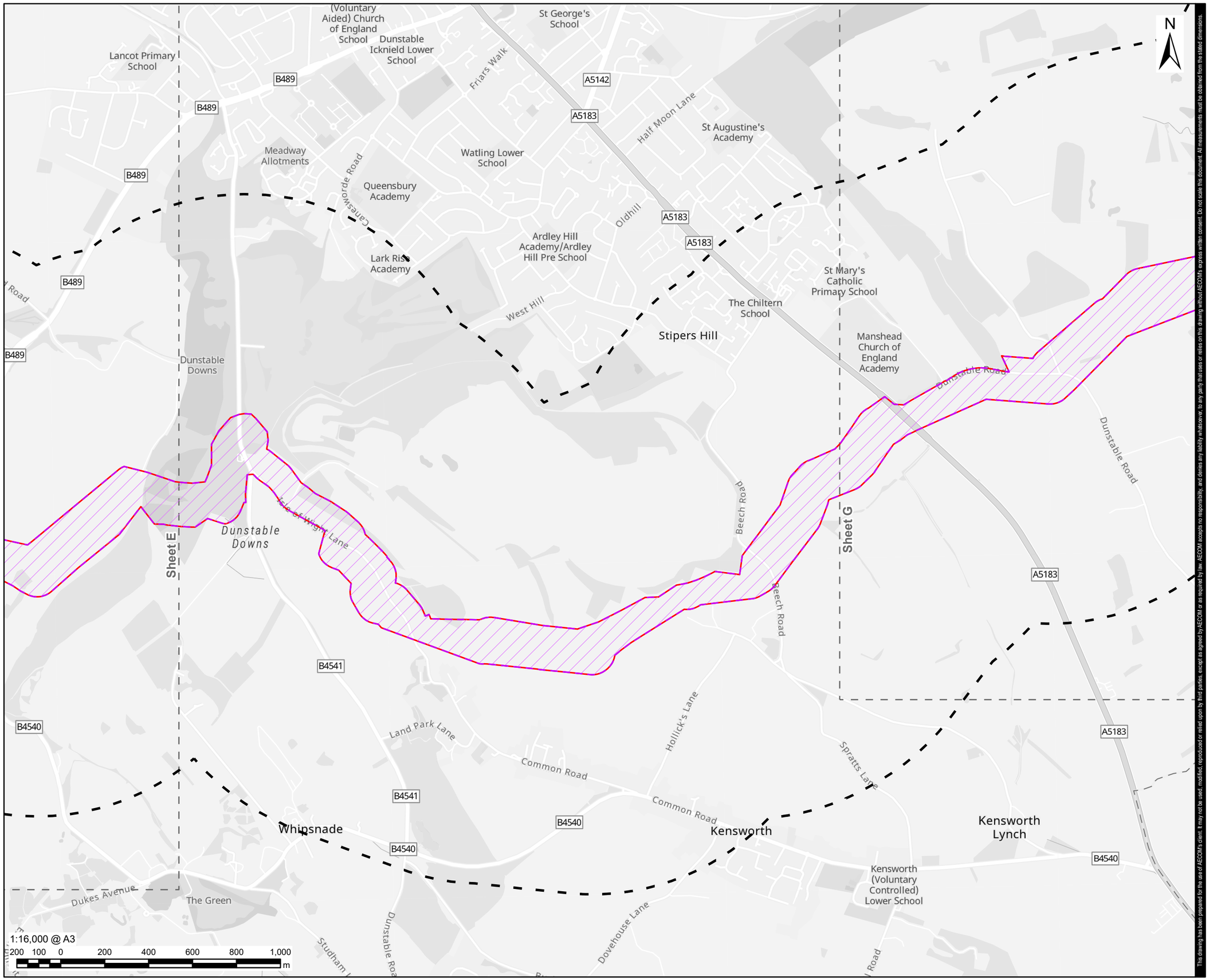

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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PROJECT NUMBER

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet F

FIGURE NUMBER

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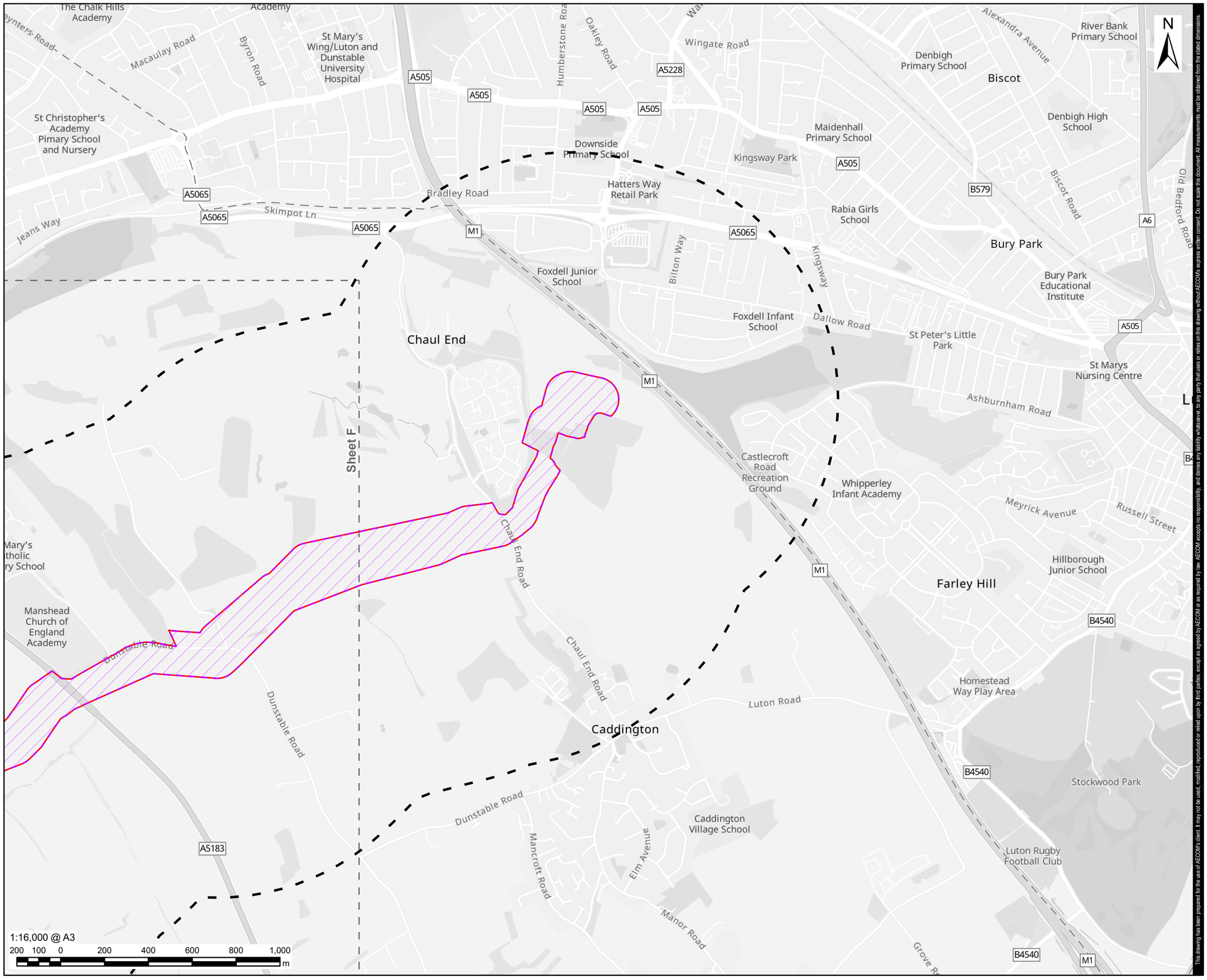

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LEGEND

- Part 4b
- 1km Study Area
- Preliminary Order Limits
- Sheet Extent

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FIGURE TITLE

Part 4 Risk of Flooding from Reservoirs Sheet G

FIGURE NUMBER

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