KAYA CONSULTING

ILI Cato

Data Centre Development in Auchtertool, Fife

FINAL

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1 Introduction

Kaya Consulting Limited was commissioned by ILI Cato Ltd to undertake a Flood Risk Assessment in support of the development of a Data Centre in Auchtertool in Fife.

The site represents a large site of approximately 0.7km^2 to the east of Auchtertool. The site is currently comprised of grassland.

The site is bounded to the north by undeveloped ground; to the east by the local road between Auchtertool and Loch Gelly and the settlement of Auchtertool; to the south by Main Street and to the west farmland and the Mossmorran Plant.

The Dronachy Burn flows through the centre of the site in an easterly direction. This watercourse comprises two tributaries upstream which have their confluence within the western part of the site.

Consultation of the SEPA Flood Map shows flooding from the Dronachy Burn impacting on the western part of the site.

The scope of work includes the following:

- Walkover site visit
- Hydrological assessment for key watercourses, considering 1 in 200-year + climate change flood flow (as required by NPF4)
- Flood modelling of key watercourses and structures using survey obtained for this study
- Calculate flood risk area that will define the developable part of the site
- Surface water flood modelling
- Assessment of risks from other sources
- Flood Risk Assessment report suitable for submission with planning application assuming risks can be avoided, or mitigated

Information made available to Kaya Consulting Limited for the study includes the following:

- Site location map;
- Indicative Masterplan;
- Topographical survey information; &
- LiDAR DTM data.

A general location map of the site is shown in **Figure 1**.

Figure 1: General Site Location

2 Legislative and Policy Aspects

2.1 National Planning Policy Framework

Under the National Planning Framework 4 (NPF4) Flood Risk Management requires explicit consideration of climate change, consistent with the key over-arching policies of NPF4, for example;

Climate mitigation and adaptation – Policy 2

Under 2b) NP4 notes 'Development proposals will be sited and designed to adapt to current and future risks from climate change'

In addition, development leading to improvements to channels and river habitats should be encouraged as shown by;

Biodiversity – Policy 3

Under 3a NPF4 notes 'Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions where possible'

Furthermore, numerous policies point towards assisting in the re-development of brownfield and other previously developed sites.

In terms of Flood Risk the definition of Flood risk area or at risk of flooding is;

For planning purposes, at risk of flooding or in a flood risk area means land or built form with an annual probability of being flooded of greater than 0.5% which must include an appropriate allowance for future climate change.

This risk of flooding is indicated on SEPA's future flood maps or may need to be assessed in a flood risk assessment. An appropriate allowance for climate change should be taken from the latest available guidance and evidence available for application in Scotland. The calculated risk of flooding can take account of any existing, formal flood protection schemes in determining the risk to the site. Where the risk of flooding is less than this threshold, areas will not be considered 'at risk of flooding' for planning purposes, but this does not mean there is no risk at all, just that the risk is sufficiently low to be acceptable for the purpose of planning. This includes areas where the risk of flooding is reduced below this threshold due to a formal flood protection scheme.

NPF4 defines a flood risk area as one that lies within the 200-year + climate change floodplain.

Assessments need to consider flooding from all sources including;

- *Watercourse/Fluvial Flooding*
- *Pluvial Flooding*
- *Sewer Flooding*
- *Groundwater Flooding*
- *Coastal Flooding*

Access to sites during flooding is defined as;

Egress (safe, flood free pedestrian access and egress), A route for the movement of people (not vehicles) of all abilities (on foot or with mobility assistance) between the development and a place of safety outwith the design flood level.

The key policy related to flood risk management is;

Flood Risk and Water Management – Policy 22
Policy Intent – To strengthen resilience to flood risk by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding
a) Development proposals at risk of flooding or in a flood risk area will only be supported if they are for:

i. essential infrastructure where the location is required for operational reasons;
ii. water compatible uses;
iii. redevelopment of an existing building or site for an equal or less vulnerable use; or.
iv. redevelopment of previously used sites in built up areas where the LDP has identified a need to bring these into positive use and where proposals demonstrate that longterm safety and resilience can be secured in accordance with relevant SEPA advice

The protection offered by an existing formal flood protection scheme or one under construction can be taken into account when determining flood risk.
In such cases, it will be demonstrated by the applicant that:

- *all risks of flooding are understood and addressed;*
- *there is no reduction in floodplain capacity, increased risk for others, or a need for future flood protection schemes;*
- *the development remains safe and operational during floods;*
- *flood resistant and resilient materials and construction methods are used; and*
- *future adaptations can be made to accommodate the effects of climate change.*

Additionally, for development proposals meeting criteria part iv), where flood risk is managed at the site rather than avoided these will also require:

- *the first occupied/utilised floor, and the underside of the development if relevant, to be above the flood risk level and have an additional allowance for freeboard; and*
- *that the proposal does not create an island of development and that safe access/ egress can be achieved.*

b) Small scale extensions and alterations to existing buildings will only be supported where they will not significantly increase flood risk.
c) Development proposals will:

i. not increase the risk of surface water flooding to others, or itself be at risk.
ii. manage all rain and surface water through sustainable urban drainage systems (SUDS), which should form part of and integrate with proposed and existing bluegreen infrastructure. All proposals should presume no surface water connection to the combined sewer;
iii. seek to minimise the area of impermeable surface.

d) Development proposals will be supported if they can be connected to the public water mains. If connection is not feasible, the applicant will need to demonstrate that water for drinking water purposes will be sourced from a sustainable water source that is resilient to periods of water scarcity.
e) Development proposals which create, expand or enhance opportunities for natural flood risk management, including blue and green infrastructure, will be supported

Under NPF4 avoidance of land at risk from the 1 in 200-year flood event is the first principle, i.e., no development in areas at risk from the 1 in 200-year + climate change event; but given the focus on brownfield development it would appear NPF4 will give more flexibility in terms of changing the land form within the site to allow development, while promoting natural flood management measures (opening of culverts) and improvements to biodiversity.

For sites close to the coast Policy 10 considers risks from erosion and flooding.
Coastal Development – Policy 10

a) *Development proposals in developed coastal areas will only be supported where the proposal:*

i. does not result in the need for further coastal protection measures taking into account future sea level change; or increase the risk to people of coastal flooding or coastal erosion, including through the loss of natural coastal defences including dune systems; and
ii. is anticipated to be supportable in the long-term, taking into account projected climate change.

b) Development proposals in undeveloped coastal areas will only be supported where they:

i. are necessary to support the blue economy, net zero emissions or to contribute to the economy or wellbeing of communities whose livelihood depend on marine or coastal activities, or is for essential infrastructure, where there is a specific locational need and no other suitable site;
ii. do not result in the need for further coastal protection measures taking into account future sea level change; or increase the risk to people of coastal flooding or coastal erosion, including through the loss of natural coastal defences including dune systems; and
iii. are anticipated to be supportable in the long-term, taking into account projected climate change; or
iv. are designed to have a very short lifespan

c) Development proposals for coastal defence measures will be supported if:

i. they are consistent with relevant coastal or marine plans;
ii. nature-based solutions are utilised and allow for managed future coastal change wherever practical; and
iii. any in-perpetuity hard defense measures can be demonstrated to be necessary to protect essential assets.

d) Where a design statement is submitted with any planning application that may impact on the coast it will take into account, as appropriate, long-term coastal vulnerability and resilience.

2.2 Local Authority Policy and Guidance with Respect to Flood Risk

The Adopted Fife Plan, Policy 12: Flooding and the Water Environment notes that;

Development proposals will only be supported where they can demonstrate that they will not, individually or cumulatively:

- *increase flooding or flood risk from all sources (including surface water drainage measures) on the site or elsewhere;*
- *reduce the water conveyance and storage capacity of a functional flood plain;*
- *detrimentally impact on ecological quality of the water environment, including its natural characteristics, river engineering works, or recreational use;*
- *detrimentally impact on future options for flood management;*
- *require new defences against coastal erosion or coastal flooding; and*
- *increase coastal erosion on the site or elsewhere.*

Flood Risk Assessment

To ascertain the impact on flooding, developers may be required to provide a flood risk assessment addressing potential sources of flooding and the impact on people, properties, or infrastructure at risk.

In medium to high flood risk areas – an annual probability of flooding greater than 0.5% (1:200 years) – a flood risk assessment is required.

In low to medium flood risk areas – annual probability of coastal or watercourse flooding is between 0.1% and 0.5% (1:1,000 to 1:200 years) – a flood risk assessment may be required at the upper end of the probability range, and for essential infrastructure and the most vulnerable uses.

Flood risk assessments should:

- *highlight the measures proposed to mitigate the flood risk and the timescales to implement those measures; and*
- *include an assessment of potential impacts on water quality and the water environment.*

In applying this policy, the flood risk framework in Scottish Planning Policy *will be used to assess and guide development decisions in terms of coastal and watercourse flood risk and surface water flooding.*

<u>*New development should avoid the functional floodplain and medium to high risk areas (an annual probability of coastal or watercourse flooding greater than 0.5% 1:200 years). This particularly applies to essential infrastructure and the most vulnerable uses. If essential infrastructure or the most vulnerable uses are proposed in areas where the risk of flooding is 0.1% (1:1,000 years) or greater a flood risk assessment will be required. Low to medium risk areas (where annual probability of flooding is between 0.1% and 0.5% or 1:1,000 years to 1:200 years) are generally not suitable for civil infrastructure.*</u>

In considering development proposals in coastal areas, regard should be given to the Council's Shoreline Management Plan *which identifies preferred defence options along Fife's coast. It takes into account natural coastal processes, the need for coastal defence, environmental considerations, and planning issues. Development proposals in coastal areas will also be required to demonstrate that they will not be at risk from coastal erosion themselves and will not significantly alter the existing coastal processes, either erosive or accretive.*

Key text related to the definition of flood risk is underlined above.

Fife Council's, 'Design Guidance on Flooding and Surface Water Drainage Requirements, updated as of 10/04/2025 to align with NPF4, sets guidance for the completion of flood risk assessments.

The guidance notes that; 'It should be noted that there is a presumption against development within a site where flooding occurs during a 1 in 200-year event (plus current allowances for climate change)'. This is in line with Fife Council's FIFEPlan (adopted on 21 September 2017) Policy No 12 "Flooding and Water Environment" and is interpreted as requiring that development should be outside of the present-day 200-year + climate change event flood risk zone.

The guidance document references SEPA guidance in terms of climate change allowances.

Fife Council and SEPA would expect a minimum 600mm freeboard (below the finished floor levels), unless a more detailed assessment of freeboard is made. For gardens, Fife Council would expect the extent of a 1 in 200 year flood event plus climate change should be a minimum of 300mm below the lowest garden ground level.

The council operates a self-certification and independent check process.

2.3 SEPA Technical Flood Risk Guidance

SEPA are a statutory consultee to the planning process concerning flood risk. To support its role and to give guidance to practitioners and local authorities SEPA has published a series of guidance documents. The key documents with direct relevance to flood risk assessment are;

1. SEPA (2024), *Flood Risk and Land Use Vulnerability Guidance*, July 2024. https://www.sepa.org.uk%2Fmedia%2Fnvnotwqd%2Fland-use-vulnerability-guidance.docx
2. SEPA (2022), *Technical Flood Risk Guidance for Stakeholders - SEPA requirements for undertaking a Flood Risk Assessment*, June 2022. https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf
3. SEPA (2025), *Climate change allowances for flood risk assessment in land use planning V6*, February 2025. https://www.sepa.org.uk/media/jjwpxuso/climate-change-allowances-guidance_v6.pdf
4. SEPA (2024b) *Position Statement on Development Protected by Formal Flood Protection Schemes.* https://www.sepa.org.uk/media/nlyfx2v3/development-behind-defences.docx
5. SEPA (2024c), *SEPA Flood Risk Standing Advice for Planning Authorities*, July 2024 https://www.sepa.org.uk/media/nckhycrj/flood-risk-standing-advice.docx
6. SEPA (2024d), *SEPA Recommended Riparian Corridor Layer for use in Land Use Planning*, July 2024. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fpuqhuwhn%2Frecommended-riparian-corridor-note.docx&wdOrigin=BROWSELINK

Reference 1 provides SEPA's assessment of land use vulnerability which allows the identification of the appropriate return period to be considered in any flood risk assessment, based on the type of development proposed.

Reference 2 is a technical guidance document intended to outline methodologies that may be appropriate for hydrological and hydraulic modelling and sets out what information SEPA requires to be submitted as part of a Flood Risk Assessment.

Reference 3 outlines the most recent SEPA guidance in terms of flow, rainfall and sea level uplifts for climate change.

Reference 4 provides additional planning guidance with respect to built-development behind flood defences.

Reference 5 provides standing advice for Planning Authorities and Developers for lower risk applications, including category 1 exemptions (where there is no land raising or loss of floodplain capacity), category 2 (Development proposals at flood risk solely from surface water) and category 3 (Development proposals at flood risk solely from groundwater).

Reference 6 provides the SEPA recommended riparian buffers from watercourses.

In addition, The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) describes requirements for any works at or near watercourses that require licensing. SEPA are responsible for the implementation of the Regulations. SEPA's CAR Practical Guide (SEPA, 2021) provides an overview of the regulations, definition of the regimes, levels of authorisation for activities and outlines the General Binding Rules (GBRs). The latest version of the CAR Practical is available online and is regularly updated (https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf).

With relevance to all developments, the Regulations include a requirement that surface water discharge must not result in pollution of the water environment. It also makes Sustainable Drainage Systems (SuDS) a requirement for new development, except for runoff from a single dwelling and discharges to coastal waters.

SEPA has published guidance on recommended riparian corridors that allow space for natural fluvial processes to occur in riparian areas (as well as other attendant environmental benefits including biodiversity, open space, channel maintenance opportunities, pollution reduction and river restoration).

The guidance recommends a minimum riparian corridor width of 10 to 30 m from bank top along both banks of all watercourses dependant on channel width (SEPA, 2024e). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site.

SEPA Recommended Riparian Corridors

Channel Width	Recommended buffer (each side of channel)
<2 m	10 m
2-15 m	15 m
>15 m	30 m

2.4 Guidance and Policy Constraints with Relevance to Current Site

Based on relevant policies and guidance the following sections outlines the principles and constraints under which the flood risk assessment is undertaken.

2.4.1 Land Use Vulnerability and Design Event

The development is for a Data Centre development that is subject to planning control.

Based on SEPA (2024), Data Centre's are thought to be considered as 'Essential Infrastructure' uses in terms of their vulnerability to flood risk. Under NPF4 these developments are considered suitable for land outside the 1 in 200-year Flood Risk Area, with consideration for the effects of climate change. However, there are exceptions under NPF4 (See **Section 6.1**).

The design event for this development is the 1 in 200-year + climate change event.

2.4.2 Constraints on Developable Area

2.4.2.1 Surface Water Flooding

Land affected by surface water flooding can generally be developed assuming the surface water flood risk can be managed through the development of the site drainage system and land drainage to manage surface water entering the site from outside its boundaries. However, in some cases, where sites currently act to store surface water, development could displace surface water and increase flood risk elsewhere. In these cases, there may be a need to leave areas of surface water storage undeveloped and/or provide storage of equivalent volumes of surface water elsewhere in the site.

The assessment will consider surface water flooding risks for the 1 in 200-year + climate change event.

2.4.3 Climate Change Considerations

The development should be resilient against the impacts of climate change, such that properties are not predicted to flood for the design event plus climate change.

SEPA (2024) recommends climate change allowances based on UKCP18. For the study area the impact of climate change on rainfall intensity (applied to catchments <30km^2) is a 39% increase in rainfall total (Tay River Basin). For the study area a 53% increase in peak flows should be applied to catchments 30-50km^2 if this results in a higher flow than the aforementioned 39% increase in rainfall totals.

The assessment will consider increases in rainfall intensity due to climate change of 39% as well as an increase to peak flows of 53%. It will assess the resilience of the site to the impact of climate change on flows. It is noted that these increases may not be consistent with increases considered by Scottish Water for drainage design.

2.4.4 Development Levels and Finished Floor Levels

SEPA notes that adequate freeboard should be provided for developments involving the erection of new buildings and in the majority of cases an adequate freeboard allowance would be 600mm above the design flood level (separate to any climate change allowance that may be applied). It is noted that other freeboards can be recommended if supported by appropriate modelling. For re-developments of existing buildings, the freeboard allowance is considered a recommendation and should be applied as far as practicable.

The assessment will consider Finished Floor Levels based on the 1 in 200-year + climate change design flood level.

2.4.5 Site Access Considerations

It is important that developments can be accessed and left during flood events, so that developments do not form islands within flooded areas.

Fife Council states that safe access/egress must be available at all times during events up to the 1 in 200 year return period plus climate change.

SEPA requires that provision of a safe and flood free route during the design event for any development that introduces overnight accommodation onto a site, which enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area. This refers to river or coastal flooding.

During extreme events there will be surface water flooding on most roads if the event is higher than design conditions. SEPA do not provide guidance for surface water flooding. When considering surface water flooding, local councils generally look for ‘safe’ access to a site, where flood depths are less than approx. 0.3m. However, these requirements vary depending on the size and nature of the site, and the type of development.

Access requirements with respect to flooding will be considered in this assessment.

It is noted that this assessment can only consider the local access restrictions to the site and cannot consider wider, regional access issues, e.g., access to hospitals remote to the site. These wider access issues need to be considered by the appropriate local authority within local plans.

2.4.6 Other Flooding Risks

2.4.6.1 Coastal Flooding

This site lies approximately 4.8km from the Firth of Forth.

Given that existing ground elevations at the site lie between 108m AOD and 134m AOD, the site is not considered to be at risk of coastal flooding.

2.4.6.2 Reservoir Flooding

Consultation of the SEPA reservoir map does not highlight any reservoirs that might pose a flood risk to the site in the event of dam failure.

Reservoirs are subject to strict regulation and maintenance in Scotland according to their risk category. Therefore, flooding of this type is highly unlikely in Scotland and the risk of flooding from reservoir breach or failure at the site is considered low.

2.4.6.3 Site Drainage and Sewer Flooding

The design of the site drainage system will be undertaken by others.

2.4.6.4 Culverts and Watercourses

Fife Council requires that existing access points/routes to culverts and watercourses are maintained or repositioned in agreement with the council's Flood Team. The council also reserves the right to request the construction of additional access points/routes to a watercourse to enable the council to meet its statutory responsibilities.

The risk of fluvial flooding associated with the blockage of culverts and crossings will be considered as part of this flood risk assessment.

2.4.6.5 Existing Flood Defences

SEPA provides guidance with respect to development behind flood prevention schemes. This site is not thought to be directly protected by any existing formal flood defences.

2.4.6.6 Canal Flooding

Canals in Scotland are operated and managed by Scottish Canals. Failures and overtopping of canals are rare and areas at risk are generally known by Scottish Canals who should be consulted for developments located close to any canal.

There are no canals in the vicinity of the site.

2.4.6.7 EASR Regulations

Any crossings or changes to watercourses within the site may require an EASR licence. EASR licences are not required as part of a planning application and are generally conditioned as part of a planning consent. However, during the planning process sufficient information should be provided in a planning application so SEPA can identify whether it is likely that a EASR licence would be granted.

Refer to **Section 6.1.2** where proposals for a new crossing are discussed.

3 Site Location and Description

3.1 Site Location & Watercourses

The site represents a large site of approximately 0.7km^2 to the east of Auchtertool, Fife. The site is currently comprised of grassland.

The site is bounded to the north by undeveloped ground; to the east by the local road between Auchtertool and Loch Gelly and the settlement of Auchtertool; to the south by Main Street and to the west farmland and the Mossmorran Plant. The site is shown in **Photos 1** to **3**.

The **Dronachy Burn** flows through the centre of the site in an easterly direction. This watercourse comprises two tributaries upstream which have their confluence within the western part of the site.

The northern tributary of the Dronachy Burn has its source at Moss Morran and then flows in an easterly direction towards the site (**Photo 4**). Close to the site it turns south and then enters the site, running up against a former railway embankment which separates this tributary from the main southern tributary. The northern tributary is culverted under the railway embankment via a small culvert of approximately 0.62m diameter (**Photo 5**). On the south-side of the embankment the watercourse discharges into the main southern tributary of the Dronachy Burn.

The main southern tributary of the Dronachy Burn also has its source close to Moss Morran. The watercourse flows east through the Mossmorran Plant complex in an easterly direction, entering the site at the western extremity of the site (**Photo 6**). The main tributary flows along the southern side of a former railway embankment, where it has its confluence with the northern tributary (**Photo 7**). The Dronachy Burn then turns in a south-easterly direction for approximately 400m running along the western site boundary (**Photo 8**). The watercourse then turns east and flows through the centre of the site. As it approaches the eastern site boundary there is a weir that holds back some flows and then a waterfall downstream of this point, where the watercourse enters a steeper valley (**Photo 9**). The watercourse than passes under a railway embankment and turns south, running parallel to the Auchtertool to Loch Gelly road. The watercourse flows under a former railway bridge and then turns east under the Auchtertool to Loch Gelly Road (**Photos 10** and **11**). The watercourse then flows in an easterly direction between properties within Auchtertool and flows under a former railway embankment via a culvert. Downstream of Auchtertool the watercourse continues east towards the coast.

Camilla Loch lies approximately 250m to the east of the site. This waterbody drains into the Dronachy Burn close to the Auchtertool to Loch Gelly Road, although the exact route is unknown as part of the trajectory is culverted. It may encroach on the eastern site boundary.

There is a **small drain** in the site marked on OS maps that drains into the northern tributary of the Dronachy Burn close to the western site corner. This may serve to drain part of the north-western part of the site. A drain at Walton East Clump drains east into the Dronachy Burn approximately halfway along the western site boundary of the site. Areas to the west of the site lie within the Mossmorran Industrial complex and could not be accessed. However, the area appears to be quite wet and there is the potential for small drains to exist in this area.

A site location plan, marking the site boundary and key features such as roads, watercourses, culverts and crossings is provided in **Figure 2**.

Figure 2: Site Boundary and Watercourses

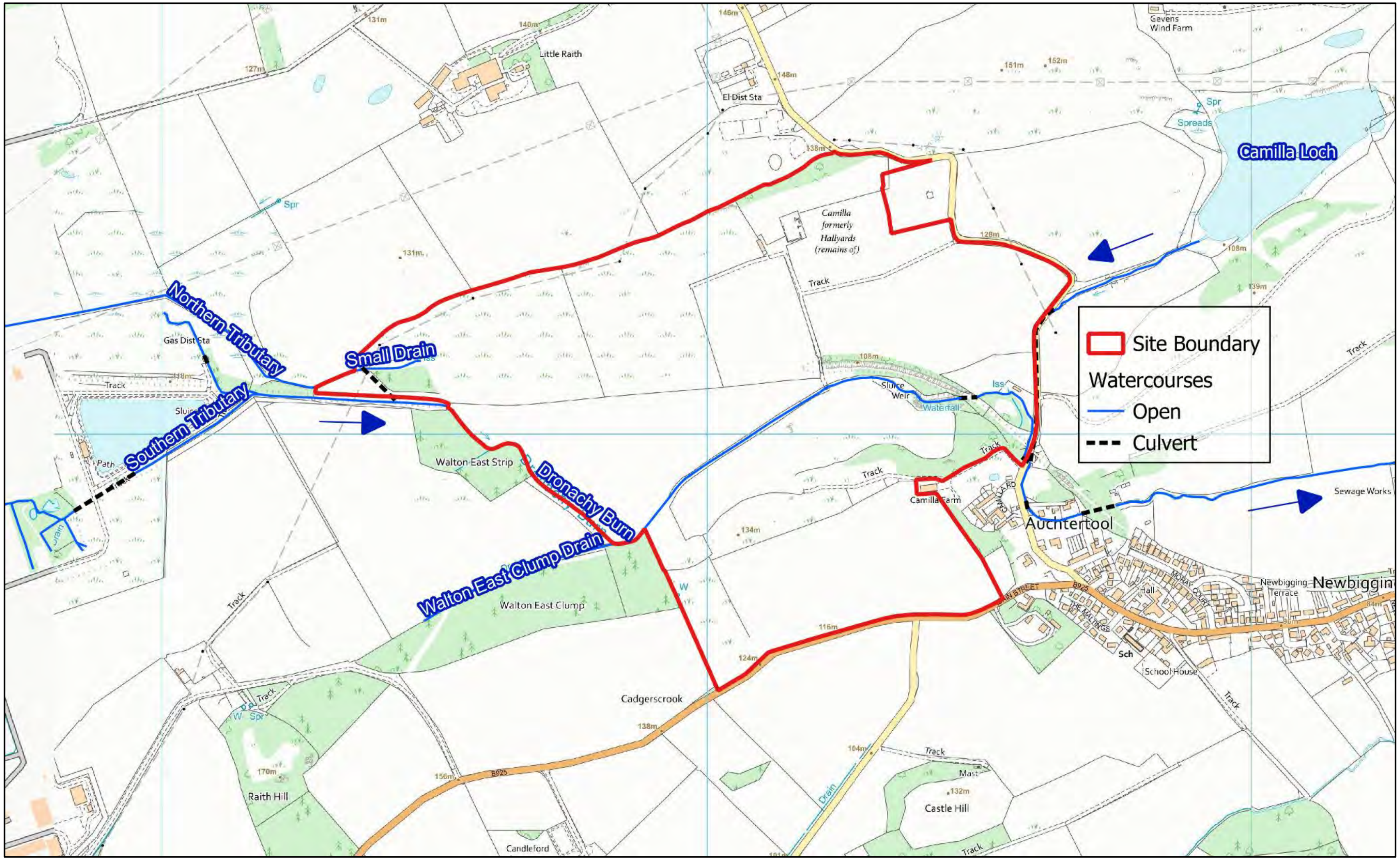


Figure 3: Key Structures & Their Dimensions

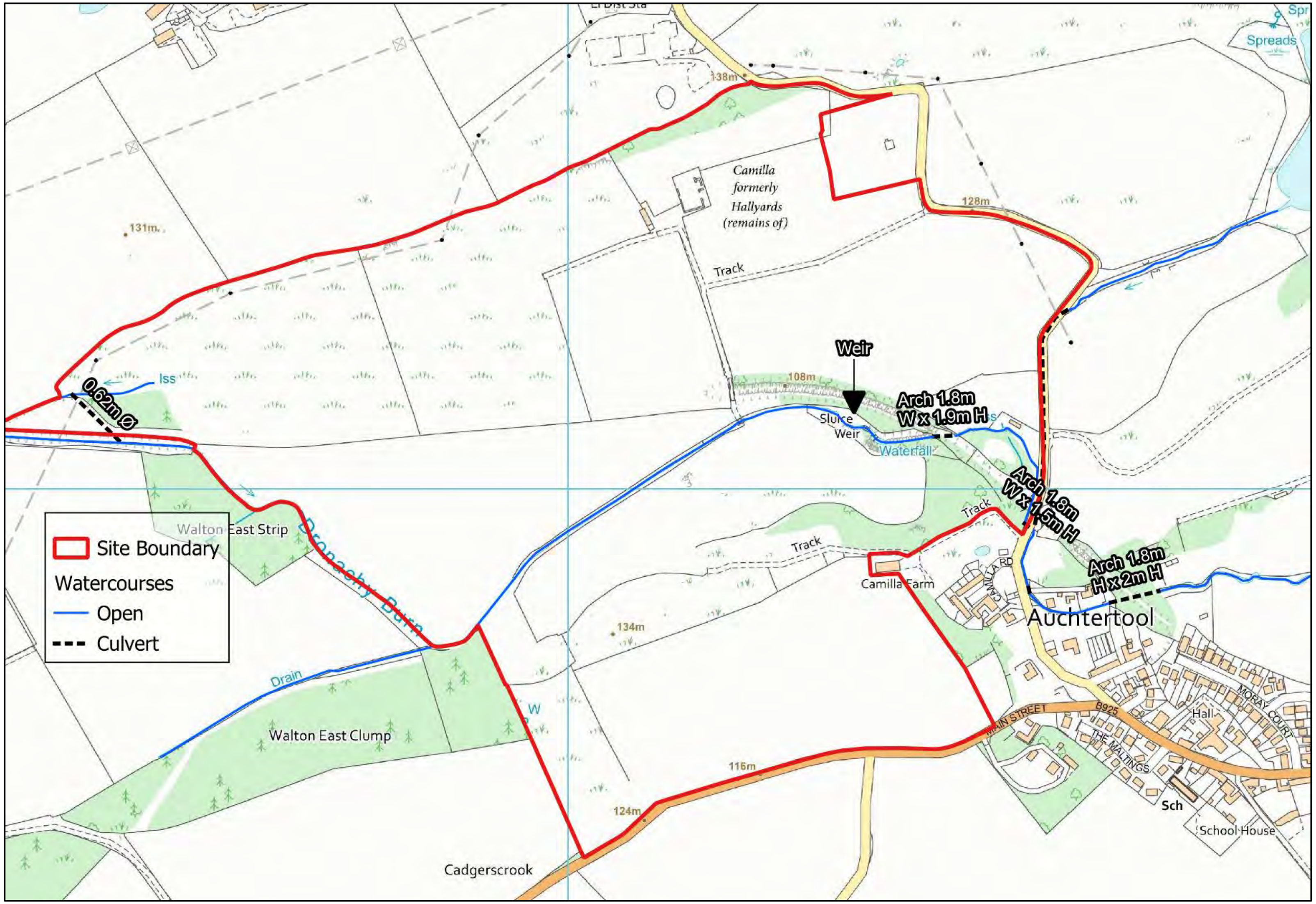


Photo 1: Eastern part of the site looking south towards former railway embankment

Photo 2: Looking from centre of site west along northern site line (Walton E. Strip trees visible)

Photo 3: Looking from centre of site to the western site boundary (Walton E. Strip trees visible)

Photo 4: Northern Tributary of Dronachy Burn looking upstream of the site

Photo 5: 0.62m Diameter Culvert under former railway embankment

Photo 6: Main Southern Tributary of the Dronachy Burn looking upstream of the site

Photo 7: Dronachy Burn looking upstream in west of site. North Trib just outside photo to right

Photo 8: Dronachy Burn looking upstream where it flows along western site boundary

Photo 9: Weir on Dronachy Burn

Photo 10: Dronachy Burn parallel to road looking downstream at former railway bridge

Photo 11: Dronachy Burn on west site of road in Auchtertool looking downstream

3.2 Site Topography

Figure 3 shows the topography of the site, which is based on the latest Phase 5, 0.5m LiDAR DTM data. A section through the local topography is also marked. These are provided in **Figures 4** and **5**.

Ground levels within the site vary from highs of 136m AOD close to the south-western site boundary to lows of approximately 86m AOD along the eastern site boundary of the site. Ground levels within the site vary quite significantly. Much of the north-western part of the site is relatively flat, only varying by a few metres between approximately 114m AOD and 117m AOD. There is some higher ground moving to the east, rising to approximately 125m AOD, before levels slope down steeply towards the eastern site boundary. South of the Dronachy Burn ground levels rise again with a “belt” of raised ground stretching from west to east. Ground levels south of this slope back down but then rise up again to the southern site boundary and the B925.

The site was formerly crossed by a railway line. This has resulted in a raised embankment lying between the two tributaries of the Dronachy Burn in the western part of the site, and a deep cutting (**Photo 12**) in the eastern part of the site that becomes a raised embankment closer to the eastern site boundary.

Ground levels to the north, west and south of the site generally rise up above the levels of the site. Ground levels in Auchtertool to the south-east of the site lie below those of the site.

Figure 4: Site Topography with 1m contours and hill-shading showing section

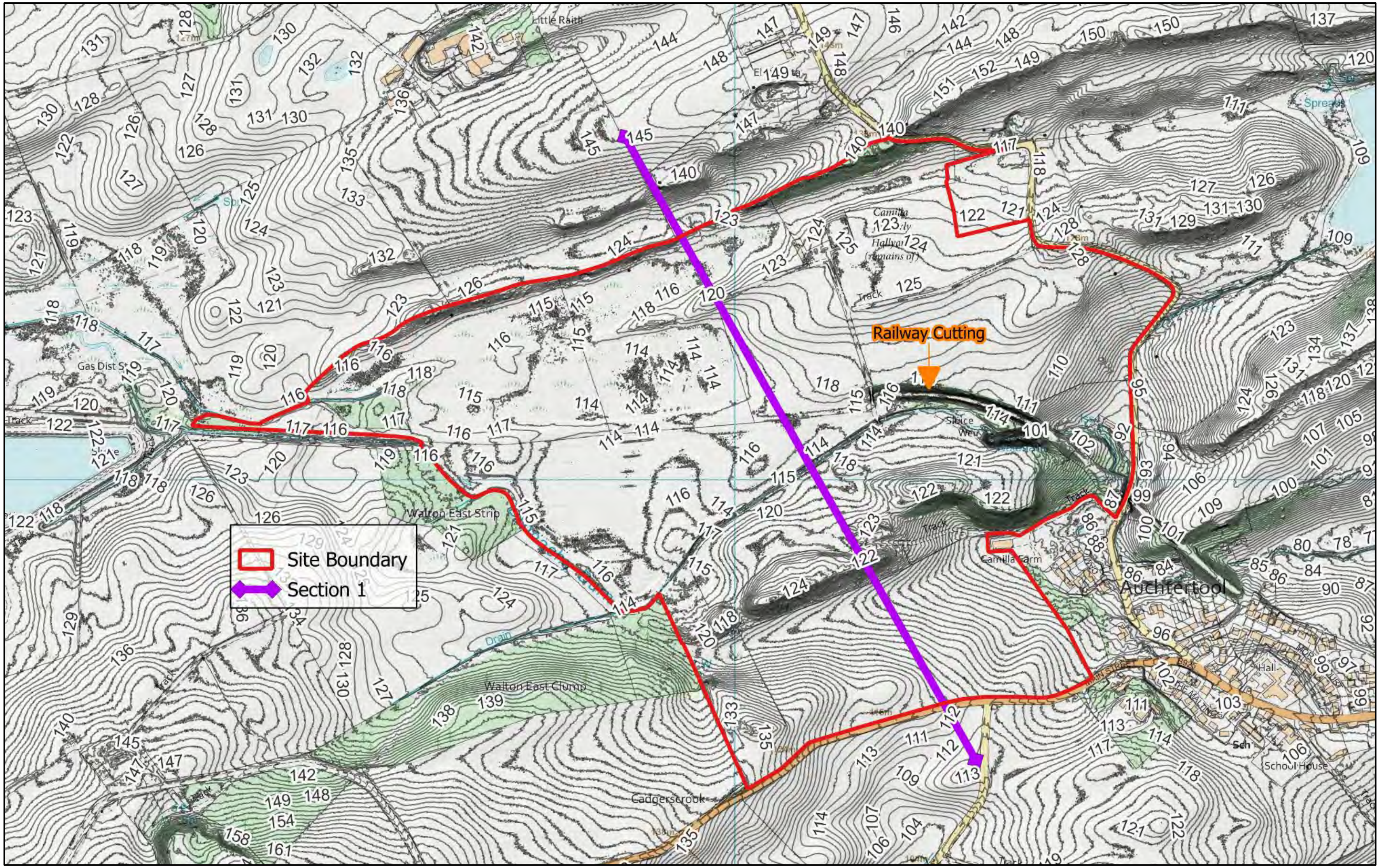


Figure 5: Section – North to South

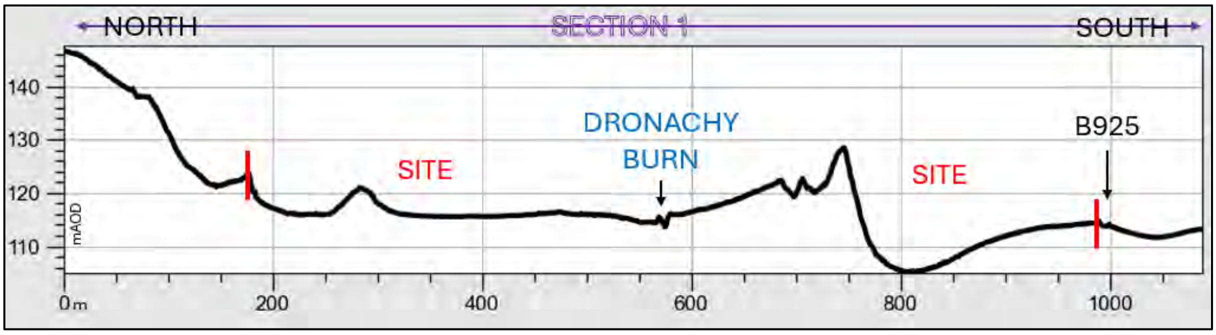


Photo 12: Former railway cutting in eastern part of the site

3.3 Historic Flood Search

A review of the British Hydrological Society (BHS) Chronology of British Hydrological Events website was undertaken searching for the following keywords: “Auchtertool”, “Camilla”, “Hallyards”, “Dronachy Burn” and “Mossmorran”. Searched keywords refer to nearby locations and watercourses.

None of these keywords provided relevant records of flooding.

Online records refer to a castle having been located on the site, known as Hallyards and later Camilla. No references relevant to flooding were identified on these webpages.

The site was historically crossed by a railway line that branched off at Cowdenbeath and went to Kirkcaldy (Kirkcaldy District Railway). According to online resources the railway line opened in 1896 and closed in 1960 (https://www.railscot.co.uk/companies/K/Kirkcaldy_District_Railway_North_British_Railway/). The topography within the site has been altered due to the construction of this railway line. The Dronachy Burn itself where it flows along the southern boundary of the site has not changed significantly, according to historic mapping. However, the embankment that separates the northern tributary from the southern tributary of the Dronachy Burn appears to have been built for the railway, changing the morphology of the watercourse. The distinction can be seen between the OS Six Inch 1840-1880 and the later OS Six Inch 1888-1915 maps.

Historic maps identify a Mill Lade/Race that used to serve a mill in Auchtertool at the very eastern boundary of the site. This was served by water held back by the weir on the Dronachy Burn. This feature appears to have been since filled in and is not present on maps published after the 1950s.

Records from the Fife Council “Agenda and Papers for Meeting of Environment & Protective Services Sub-Committee May 2021”, refers to recorded flooding in August 2020 of Auchtertool on Main Street, at the Maltings and on the Auchtertool Road to Kirkcaldy. The site borders Main Street along the southern site boundary, although flooding reported is more likely to have been reported for areas within the town of Auchtertool.

Fife’s biennial reports on flooding, that were reported from 2003 to 2009 do not make reference to flooding in Auchtertool.

No other records of flooding in this area were identified as part of an internet search.

4 Hydrological Analysis

A hydrological analysis was undertaken to estimate the peak flows that could arrive at the site from the Dronachy Burn.

4.1 Catchment Characterisation & Delineation

The catchment of Dronachy Burn was obtained from the Flood Estimation Handbook (FEH) web service. Also catchment Descriptors for the burn were obtained from the same source for the location downstream of the site in Auchtertool.

There are two main tributaries of the Dronachy Burn that meet at the site, and a number of small drains that discharge into the Dronachy Burn. The site is very large, meaning flows will vary across the site depending on the local catchment inflows. For this reason, the Dronachy Burn catchment was adjusted using LiDAR data and divided into 6 sub-catchments to apportion flows along the line of the river.

A comparison of the FEH catchment and the adjusted catchment is provided in **Figure 6**. This shows a slightly larger catchment area draining to the site, when adjusted using the latest LiDAR.

The division of the adjusted catchment into 6 sub-catchments is shown in **Figure 7**. This again was undertaken using LiDAR, guided by the site walkover. The total catchment area and area of the sub-catchments is provided in **Table 1.**

FEH Catchment Descriptors are provided in the **Appendix**.

Figure 6: FEH Catchment & Adjusted Catchment of Dronachy Burn

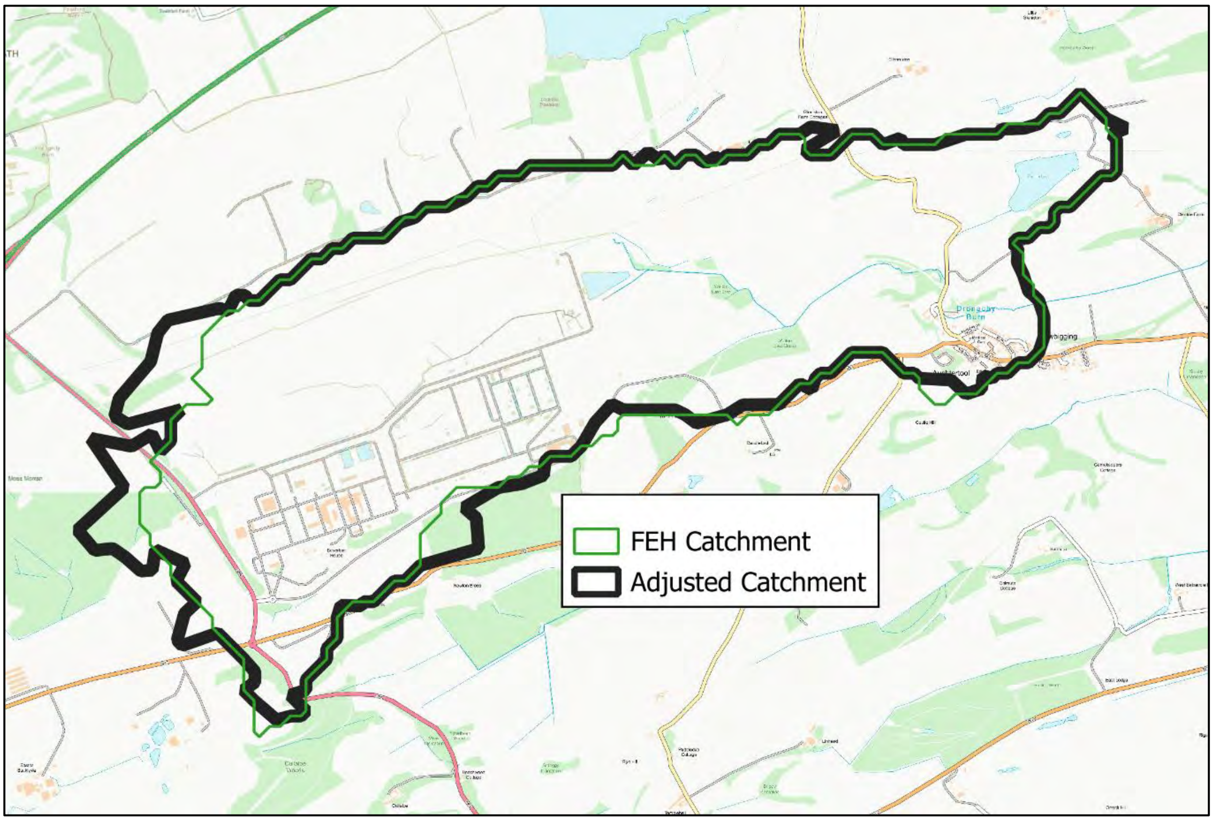


Figure 7: Numbered Sub-catchments

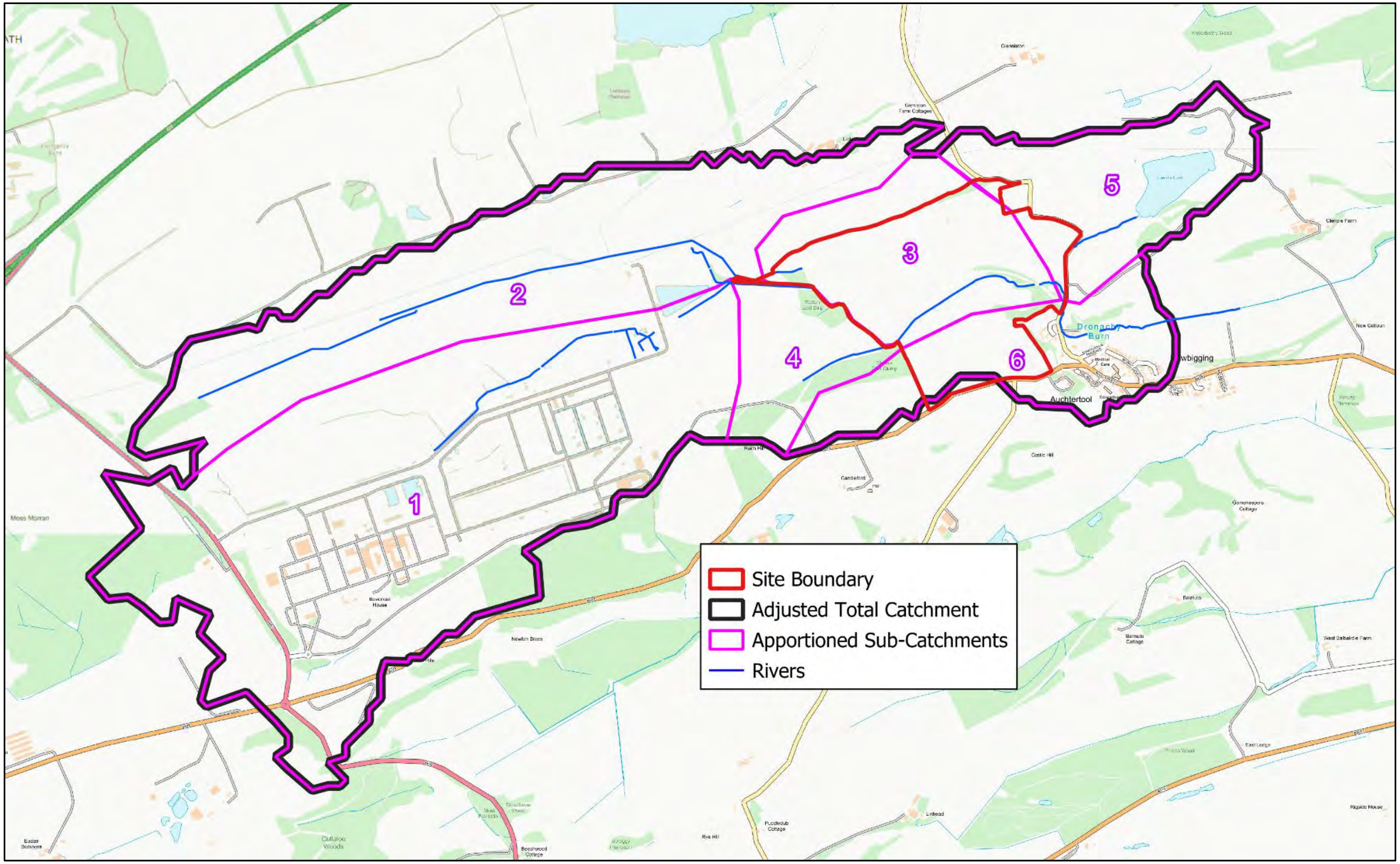


Table 1: Catchment Areas & Sub-catchments

Catchment	Area (km^2)
FEH Catchment	5.99
Adjusted Catchment	6.30
Sub- Catchment	**Area (km^2)**
1	2.71
2	1.49
3	0.61
4	0.56
5	0.31
6	0.62

4.2 Design Flows

The total catchment area of the Dronachy Burn is 6.30km², almost identical to the 5.99km² estimated by the FEH Catchment Descriptors. This suggests the FEH Catchment Descriptors are representative of the catchment.

Peak flows were estimated using the FEH Rainfall-Runoff and ReFH2 methods using these FEH Catchment Descriptors with the adjusted AREA. The results of the estimated design flows are shown in **Table 2**. The flows scaled down to each constituent catchment area are also shown in **Table 3**.

The most conservative estimates, using the FEH Rainfall-Runoff method, were taken forward. Climate change allowances use the Tay River Basin 39% peak rainfall uplift.

Table 2: Peak Flow Estimates - Total Catchment

Method	200-year + Climate Change flow (m^3/s)
FEH Rainfall-Runoff[a]	11.86
ReFH2.3[b]	10.80

Table 3: Peak Flow Estimates for Dronachy Burn at each Sub-catchment

Sub-Catchment	200-year + Climate Change flow (m^3/s)
1	5.10
2	2.80
3	1.15
4	1.06
5	0.58
6	1.17
Total	**11.86**

a Catchment design storm duration = 6.75 hrs

b Catchment design storm duration = 5.50 hrs

5 Hydraulic Modelling

A 1D-2D HEC-RAS model was developed of the Dronachy Burn, using the latest LiDAR DTM data supplemented by a topographical cross-section survey undertaken of the Dronachy Burn specifically for this assessment.

The topographic survey consisted of 30 cross-sections of the channel with a further 9 cross-sections of structures. The survey was undertaken in 2025 to Ordnance Datum.

5.1 Model Development

A 1D-2D HEC-RAS Model was developed of the Dronachy Burn.

72 cross-sections were represented in the model, this includes the topographically surveyed cross-sections upstream, within and downstream of the site, alongside additional sections extracted from LiDAR DTM data further upstream and downstream of the site to further extend the model. LiDAR was employed due to access issues at the Mossmorran Plant upstream of the site. Some interpolated cross-sections were employed between the weir and Culvert 2 approximately 100m downstream of this. This is because there is a waterfall in this location, and many cross-sections are required to maintain model stability.

The model represents 3 reaches, including the northern tributary upstream of the site, the southern tributary upstream of the site and the combined Dronachy Burn where it flows through the site. The model extends for a length of over 3200m. It extends approximately 900m upstream and 550m downstream of the site.

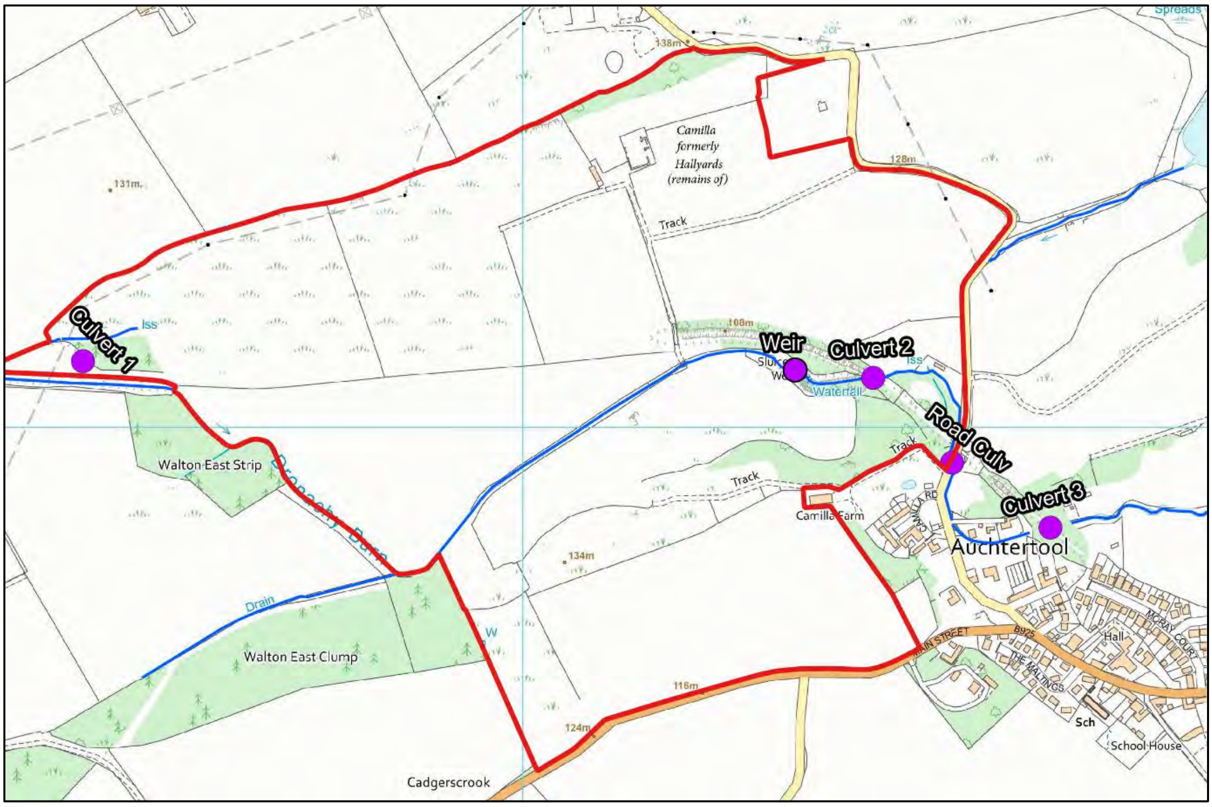
4 main bridges/culverts were added to the model. These are described in **Table 4** and marked in **Figure 8.** All bridges used pressure flow equations if the maximum water level was predicted to reach close to the soffit. The weir located within the site was represented as an inline structure with a coefficient of 1. The weir has a shallow slope immediately downstream of the weir, meaning the weir does not result in a particularly efficient drop, so 1 was considered a representative coefficient. 3 additional weirs were added downstream of the site weir between the weir and the culvert under the former railway line. The drop here is approximately 15m over 100m, which is too steep to represent as a channel and so weirs were added to permit the model to run. These weirs were taken from the bed topography. This was considered a suitable way to represent this drop.

Table 4: Structures represented in the model

Structure	Dimensions	Notes
Culvert 1	0.62m diameter culvert	Pressure Flow Equations
Weir	See XS in Appendix for shape as surveyed	Cd 1
Culvert 2	1.9m W x 1.8m H Arch	Energy Equation
Road Culvert	1.8m W x 1.5m H Arch	Pressure Flow Equations
Culvert 3	1.8m W x 2.0m H Arch but reduced to account for combined sewer running through it to 1.15m wide	Energy Equation

3 more weirs are represented a short distance downstream of Weir due to the 15m drop in this reach. These were based on channel survey

Figure 8: Structures in Model



There are two other structures within the modelled reach that were not represented in the model. The one located in the centre of the site is a flat decked, span structure. Maximum predicted water levels do not reach the soffit of this structure in a 1 in 200-year plus climate change event, meaning the structure does not need to be represented in the model. A second structure is located in Auchtertool. The structure is also a flat decked, span structure that would be anticipated to be overtopped even in small events, with this structure being drowned out in flood events. The structure was removed from the model to improve stability. The watercourse at this structure has a bed level of approximately 83.5m AOD. This is below the ground levels of much of the site and would not be anticipated to have an impact on water levels within the site.

1D roughness values were set based on a site walkover, using Chow (1959). These were set to between 0.045 and 0.05 for the channel bed and 0.055 and 0.1 for the banks.

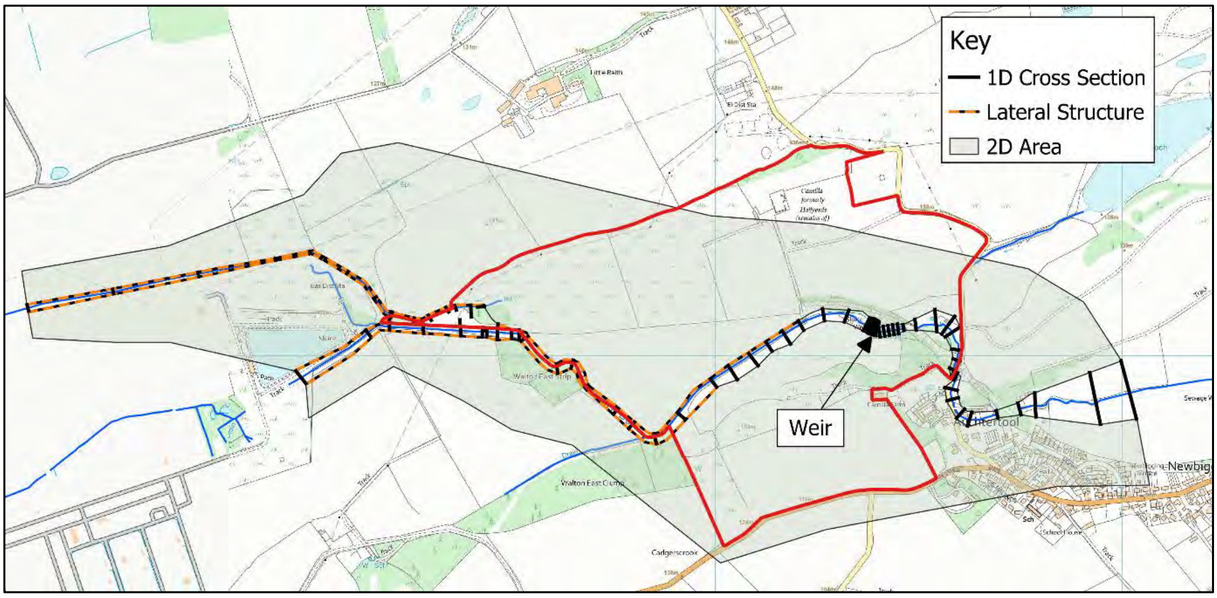
Hydrographs were added at the head of the two tributaries and then as lateral flows along the line of the model in line with the sub-catchments delineated in **Section 4**.

Cross-sections were cut to the top of bank and connected to a 2D model through the use of lateral structures, as is recommended in HEC-RAS. Some cross-sections were extended further to a local high point, where conditions were suitable for representing these flows in 1D. Ultimately, three 2D model domains were connected to the 1D model, one north of the northern tributary; one south of the southern tributary and another between the two tributaries upstream of the site. The model domains were sized so as to not restrict the flood extents. The lateral structures were setup to use a relatively inefficient weir coefficient of 0.8, as would be expected of top of banks. Higher coefficients should only be used where there are embankments or walls. Lateral structures were provided from the head of the two models up to cross-section 780. Downstream of this point all flows remain within bank of the 1D model.

The 2D model uses a flexible cell size. A cell size of 8m was used for much of the model domain away from the main river, reducing to 0.5m in key parts of the site where more detail was required. HEC-RAS uses a sub-grid, meaning the topography at the faces of each cell is employed in the model. This provides significantly more accuracy than models that only calculate a single level/depth per cell (as in Flood Modeller) and permits larger cell sizes to be employed. The grid cell size chosen is appropriate for a model of over 3km length, with a 2D domain covering an area of 80 hectares.

Figure 9 shows an overview of the key model components. More detailed plans are provided in **Appendix B**.

Figure 9: Key Model components Overview (See Appendix B for more detail)



2D roughness values were set based on a site walkover. The vast majority of the site is land for grazing and crop growing, with some areas boggy and a few areas of wood. During the site visit parts of the land had taller grass, suggesting little grazing. The maximum flood extent does not extend to the wooded areas, so roughness values were set to 0.06 for the 2D domain to represent high grass, scattered brush with heavy weeds.

Breaklines were added along key topographical features in the model to represent these in the model.

The model was run using a timestep of 1 second. Mass errors remained below 1%.

Culvert 1 is a smaller culvert of approximately 0.62m diameter. Although there is only limited brush upstream of this structure, with the majority of the catchment being pasture, the small nature of the opening could result in a blockage in the event of some localised vegetation reaching the inlet. A Blockage Matrix was undertaken and a 50% blockage allowance considered representative. The results of the blockage matrix are provided in **Appendix C**. A 50% blockage allowance was considered acceptable due to a general lack of trees, with only limited brush and light vegetation.

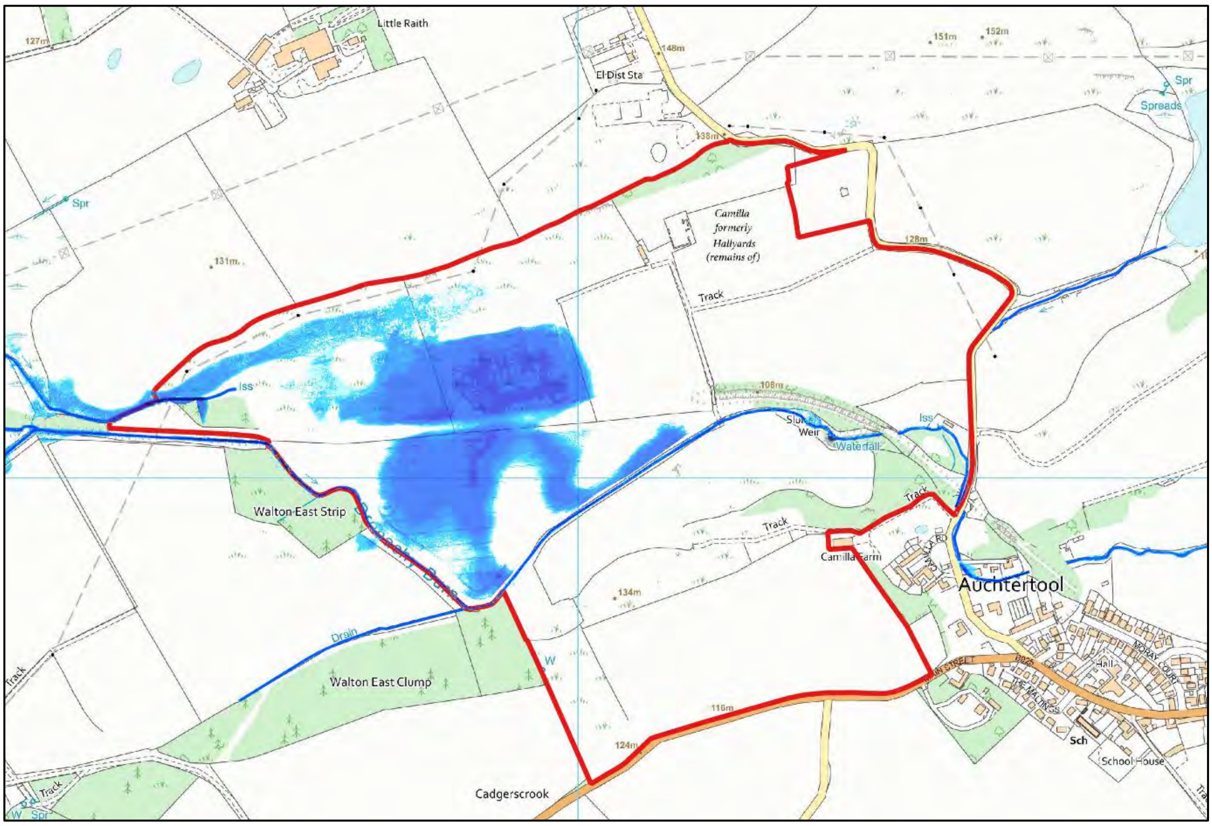
5.2 Model Results

The model was run for the 1 in 200-year plus climate change event with a 50% blockage of Culvert 1. The flood map for this scenario is shown in **Figure 10**.

The results predict flows in the southern tributary of the Dronachy Burn to remain predominantly in bank throughout the modelled reach. Flows in the northern tributary, however, are predicted to spill out of bank upstream of Culvert 1, due to the restriction posed by this structure and the former railway embankment. Flows are then predicted to spill east through the site, flooding the western part of the site before making their way back to the main stem of the Dronachy Burn by around the central part of the site. Flows remain predominantly in bank downstream of this point, although some flooding is predicted through parts of Auchtertool.

The flood extents are similar regardless of the level of blockage applied at Culvert 1, due to its relatively small size compared to the predicted flows.

Figure 10: 1 in 200-year + CC + 50% Blockage (Culvert 1) Flood Map



5.3 Sensitivity Analysis

A model sensitivity analysis provides a statistical illustration of the effect of changing key model parameters on the key model outputs (in this case maximum estimated flood elevations).

By re-running the base model for a range of scenarios with one altered parameter in each respective run, we can isolate and analyse the influence of each parameter on the model outputs. If model parameters are varied within the range of possible input values, then a sensitivity analysis can also provide an indication of uncertainty associated with the model predictions.

The base model incorporates the recommended allowance for climate change and a 50% blockage of Culvert 1.

A sensitivity analysis was undertaken considering the following parameters:

1. A Manning's *n* increase of 20% across the entire 1D and 2D domain and structures (MI20%)
2. A reduction in the downstream boundary gradient from the bed slope to 0.005 (1 in 200)
3. Blockage at the Weir.
4. Blockage at Culvert 2.

The model already incorporates an allowance for climate change and structure blockage.

Increasing the roughness values by 20% results in increases to predicted water levels in key parts of the model up to 0.4m. Increases are greatest in the northern tributary upstream of the site and at the downstream end of the model at Culvert 3. In both instances it is likely that the structures have exacerbated the increase in water levels. The increase in roughness value results in minor increases in flood extents within the site.

A reduction in the slope of the downstream boundary has an impact on the model results close to the downstream boundary. This impact does not extend further upstream than the last 2 cross-sections and so has no impact on modelled water levels at the site. This is well within expectations as the model was extended downstream of Auchtertool which lies well below ground levels at the site.

Blocking the opening of the weir on the Dronachy Burn is predicted to result in an increase in water levels of up to 0.29m immediately upstream of the weir. This reduces to approximately 0 within 6 cross-sections. This means blocking the weir does not have a significant impact on modelled results within the site.

The post-development model (see below) results in some isolated increases and decreases in water levels of up to ±0.01m. All increases occur within the boundaries of the site meaning there is no predicted increase in flood risk to third parties.

The results of sensitivity analysis suggest that the model is not particularly sensitive to changes in key parameters.

Model outputs are provided in **Appendix D**.

5.4 Post-Development Model

The proposed development is considered to be an exception under NPF4, as it involves development considered to be Essential Infrastructure under SEPA's Land Use Vulnerability guidance. This means development can take place in the Flood Risk Area so long as certain criteria, defined under Policy 22 of NPF4, are considered (See **Section 6.1** for discussion). A post-development model of the Dronachy Burn has been developed to show how the development proposals will comply with the necessary criteria.

Culvert 1 represents a restriction which results in flooding of the site. This is not the natural floodplain, as Culvert 1 serves a former railway embankment that is still present in the western part of the site. It is proposed to manage the flooding caused by the embankment/culvert by providing an overland flow pathway along the western boundary of the site that conveys flows to a flood storage area adjacent to the Dronachy Burn. Here flows will be discharged back into the Dronachy Burn. No changes are proposed to the existing embankment. A review was undertaken of removing this embankment but in all attempts to model this, flows were increased downstream which would not be considered acceptable under planning policy.

The proposed data centre development requires a number of large warehouses and, due to their nature, these cannot be allowed to flood. For this reason, the loss of flood storage from amending ground levels within the site is proposed to be provided in a storage area, which will attenuate and discharge flows back into the Dronachy Burn at a restricted rate. The proposed storage area has the potential to provide local ecological improvements through the creation of this wetland feature.

The proposed overland flow pathway and flood storage area have been represented in 2D within the post-development model. The proposals have been developed iteratively with consideration for meeting the criteria for exceptions under Policy 22.

The results of the modelling predict that post-development flood risk would not be increased downstream of the site up to the 1 in 200-year plus climate change event (**Table 5**), meaning there is no reduction in floodplain capacity from the development proposals. The flow over time is shown in **Figure 11**. This shows there would be no increase in flows at any modelled timestep, with minor reductions at certain timesteps. This equates to a reduction in volume being passed downstream and a potential betterment post-development with respect to flood risk downstream. The post-development flood map is shown in **Figure 12**.

SEPA normally ask that compensatory storage is provided on a like for like basis. This is only applicable in natural river systems where the floodplain in question is connected to the watercourse. This is not the case in this instance, with the flooding being “off-line” or where storage is provided at a different part of the site to the area of land raising. What is relevant is that storage is provided in a manner that replicates the present-day flood storage and does not increase flood risk downstream. It is also the case that it may not be possible or desirable to replicate flood storage if it results from man-influence. It is better to create a post-development situation that better replicates a natural flooding process, then trying to reproduce exactly a non-natural situation. Producing a more natural flooding process will also have other environmental benefits in terms of habitat, etc.

Table 5: Comparison of Pre- & Post-Development Stage (m) & Flow (m^3/s) (200+CC+BLK) @ 660

Time (hrs)	Pre-Stage (m AOD)	Post-Stage (m AOD)	Difference (m)	Pre-Flow (m^3/s)	Post-Flow (m^3/s)	Difference (m^3/s)
0	87.95	87.95	0	1.14	1.13	-0.01
0.5	87.95	87.95	0	1.15	1.14	-0.01
1	87.95	87.95	0	1.17	1.15	-0.02
1.5	87.95	87.95	0	1.20	1.18	-0.02
2	87.95	87.95	0	1.24	1.23	-0.01
2.5	87.96	87.96	0	1.30	1.29	-0.01
3	87.97	87.97	0	1.39	1.38	-0.01
3.5	88.00	88.00	0	1.60	1.59	-0.01
4	88.03	88.03	0	1.87	1.86	-0.01
4.5	88.05	88.05	0	2.03	2.02	-0.01
5	88.06	88.06	0	2.10	2.10	0.00
5.5	88.07	88.07	0	2.14	2.14	0.00

6	88.07	88.07	0	2.17	2.17	0.00
6.5	88.08	88.08	0	2.19	2.19	0.00
7	88.08	88.08	0	2.19	2.19	0.00
7.5	88.07	88.07	0	2.19	2.19	0.00
8	88.07	88.07	0	2.17	2.17	0.00
8.5	88.07	88.07	0	2.15	2.15	0.00
9	88.06	88.06	0	2.13	2.13	0.00
9.5	88.06	88.06	0	2.09	2.09	0.00
10	88.05	88.05	0	2.04	2.04	0.00
10.5	88.04	88.04	0	1.95	1.95	0.00
11	88.03	88.03	0	1.81	1.81	0.00
11.5	88.00	88.00	0	1.61	1.61	0.00
12	87.97	87.97	0	1.39	1.39	0.00
12.5	87.96	87.96	0	1.30	1.30	0.00

Figure 11: Comparison of Flow - Pre & Post- Development (Showing no increase post-)

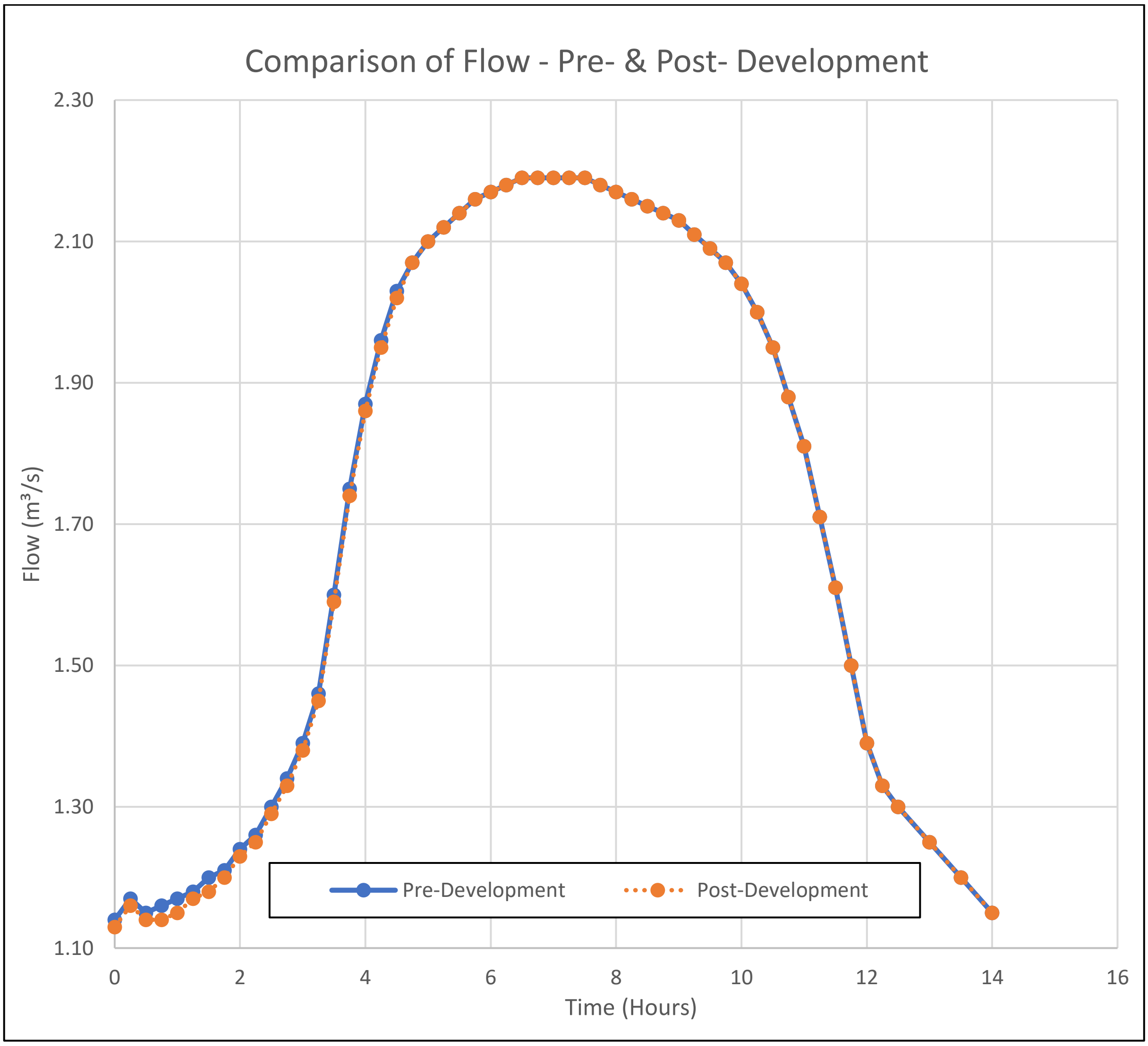
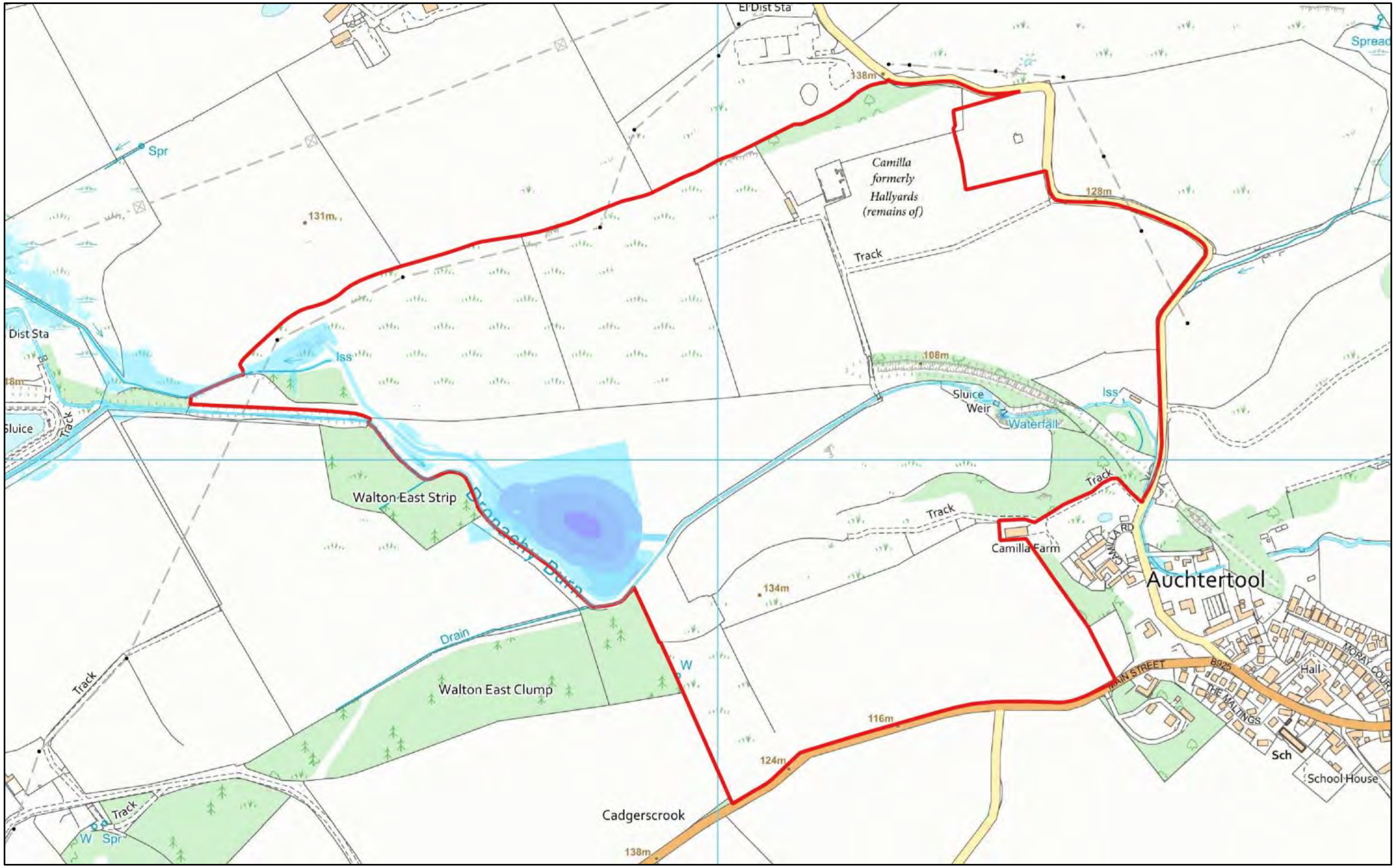


Figure 12: 1 in 200-year + Climate Change + 50% Blockage – Post-Development Flood Map



6 Flood Risk Assessment

6.1 Fluvial Flood Risk

The **Dronachy Burn** flows through the centre of the site in an easterly direction. This watercourse comprises two tributaries upstream which have their confluence within the western part of the site.

A 1D-2D hydraulic model was developed of this watercourse, including the two tributaries and main stem of the burn.

The results predict flooding of the site in a 1 in 200-year plus climate change event, with an allowance for blockage, due to a restriction at Culvert 1. Under NPF4, Policy 22a states that all development should be located outside the Flood Risk Area unless the development falls under one of the exceptions. The development is thought to be meet the "Essential Infrastructure" exception, meaning development can take place in the Flood Risk Area assuming the 5 criteria can be met. This is laid out below in **Table 6**.

Table 6: 5 Criteria required to be met under NPF4 Policy 22a

Criteria	How this will be achieved:
All risks of flooding are understood and addressed	This FRA covers all flood risks to the site
There is no reduction in floodplain capacity, increased risk for others or a need for future flood protection schemes	The results of the post-development modelling do not predict an increase in flood risk downstream of the site. There is no predicted increase in volumes being discharged downstream of the site. Total predicted volumes being passed downstream decrease.
The development remains safe and operational during floods	The development will be located outside the post-development flood risk area. The development is a data centre. This can be operated remotely in emergencies. There are two pedestrian (and vehicular) accesses to the site, one to the east and one to the south. The former would be anticipated to provide a flood free access to the site. The latter would also be anticipated to provide flood free access via a span bridge over the Dronachy Burn.
Flood resistant and resilient materials and construction methods are used	The main development will be located outside the post-development flood risk area, so this is not a requirement.
Future adaptions can be made to accommodate the effects of climate change.	The proposals have located the main development outside of the future flood risk area. Finished Floor Levels and platforms levels will be raised an additional freeboard above this providing additional protection. There is also likely scope to provide property level protection measures to the main development in the future, if required.

Assuming the above recommendations are put in place the flood risk to the proposed development from the Dronachy Burn is not considered to be at risk of flooding up to the 1 in 200-year plus climate change event, in line with NPF4.

6.1.1 Finished Floor Levels

SEPA and most local authorities normally recommend that Finished Floor Levels are raised a minimum of 0.6m above the peak 1 in 200-year plus climate change water level. Fife Council guidance requests that gardens are raised a minimum of 0.3m above the 1 in 200-year plus climate change water level.

The proposed development will consist of a platform in the northern part of the site where data centres (Warehouses) will be located. The above suggests that platform levels should be raised a minimum of 0.3m above the peak in 200-year plus climate change water level of 116.55m AOD. Finished Floor Levels of the data centres could then be raised an additional 0.3m (making 0.6m) above this level, giving a minimum Finished Floor Level of 117.15m AOD.

Maximum water levels decrease as you move downstream along the line of the Dronachy Burn. This means the platform levels and Finished Floor Levels could be designed to decrease further to the east, in line with the decrease in predicted peak water levels.

6.1.2 Proposed Bridge across Dronachy Burn

As part of the development proposals a new bridge structure will be required across the Dronachy Burn. The proposed structure is located close to cross-section 820 (See **Appendix B** for location). The developer is proposing a span structure that will not touch the bed or banks of the watercourse. Both the pre- and post-development model predict flows to remain in bank at this cross-section.

This means the proposed bridge would not be anticipated to have an impact on water level or flood extents and its span design is very much in keeping with the SEPA Good Practice Guide for River Crossings. A SEPA EASR Licence may still be required.

6.2 Surface Water

A watershed analysis was undertaken using Phase 5 LiDAR DTM data and GIS software to identify overland flow pathways at the site and surrounding area (See **Section 4.1**).

8 points where surface water could enter the site have been identified. These are shown in **Figure 13**.

Surface water is predicted to enter the site along the western site boundary at Points 1 to 4. This surface water will either be intercepted by the Dronachy Burn (2, 3 and 4) or be managed post-development as part of the development proposals (1). The flood risk from Dronachy Burn has been considered separately in **Section 6.1**.

Surface water is predicted to enter the site along the western boundary at Point 5, from areas further west of the site. This surface water is predicted to flow east through the site leaving the site at Camilla Farm. This area is not proposed to be developed as part of the development, although a road will pass through this overland flow pathway in a northerly direction. It is recommended that a culvert (Or similar) is provided to allow flows to pass under the proposed road and that the overland flow pathway is maintained post-development. As the overland flow pathway is not a formal watercourse there is unlikely to be a need to obtain a SEPA CAR Licence nor follow SEPA's guidelines for bridge crossings.

Surface water from areas to the north of the site is predicted to enter the site at Point 6 along the northern site boundary. The surface water is then predicted to make its way through the site and discharge to the Dronachy Burn. Development proposals include platforming of this northern part of the site. It is likely that the site will need to be developed to accept this surface water from areas to the north and convey them via a suitable route to the Dronachy Burn.

A very small area of surface water is predicted to enter the site at Point 7. The flood risk from such a small catchment is likely to be limited and built development is not proposed in this area.

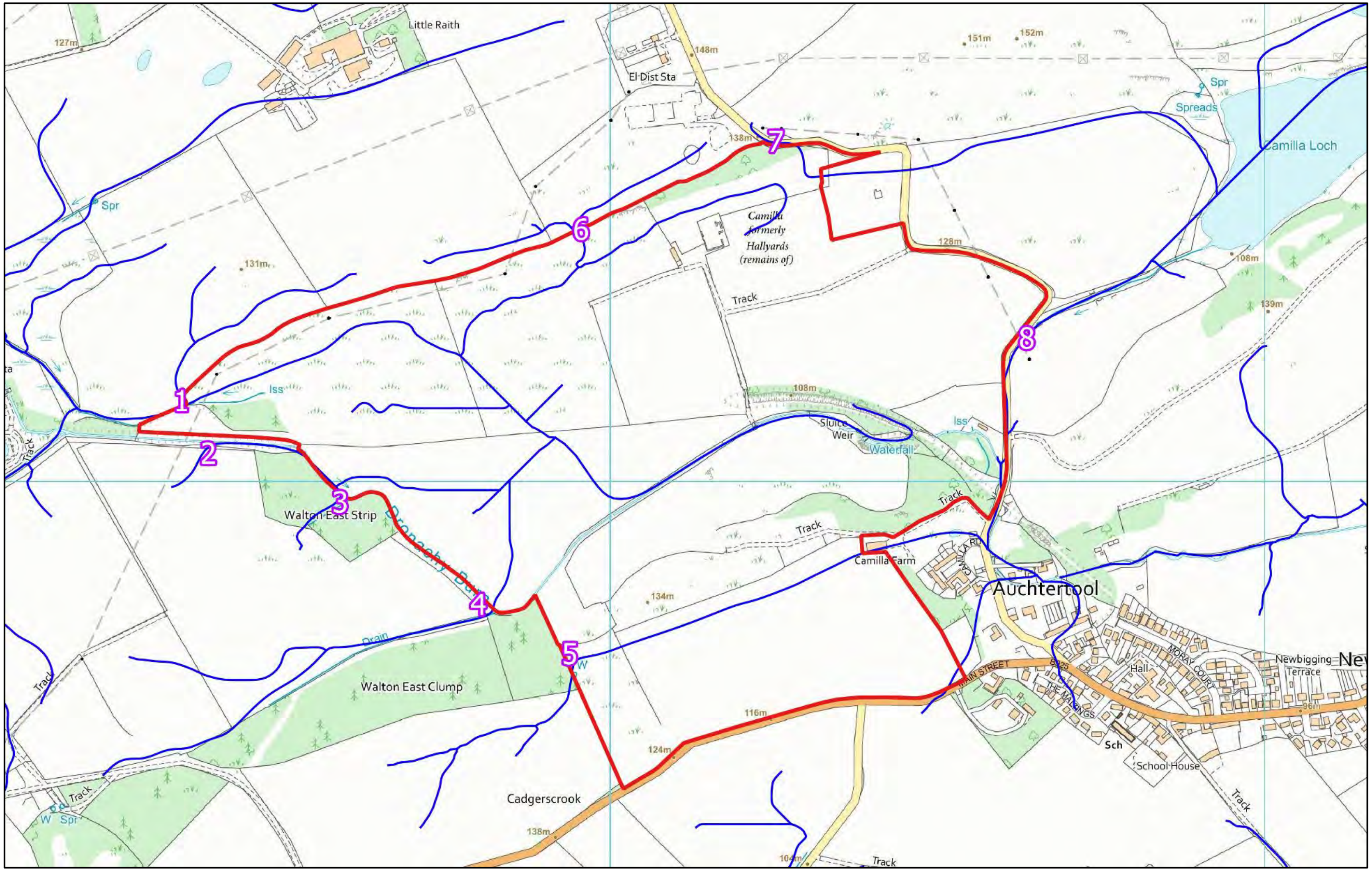
Camilla Loch is predicted to drain towards the site and potentially enter the site at Point 8. This is discussed in more detail in **Section 6.4.1**.

The development includes proposals to revise ground levels and platform an area for development.

Careful level design should be employed to shed ground levels away from proposed buildings and units and towards drainage outlets and landscaped areas. It is recommended that Finished Floor Levels are raised above the immediately surrounding ground levels, so that levels shed away from these properties. See **Section 6.1** for more discussion on Finished Floor Levels.

The site is therefore considered to be at “low” risk of flooding from surface water sources under NPF4, assuming the site is designed in line with recommendations above and suitable drainage measures are put in place.

Figure 13: Overland Flow Pathways & 8 Points



6.3 Groundwater Flooding

The SEPA flood map suggests that some parts of the site and the immediately surrounding area lies within an area at “low” risk of groundwater flooding.

The site is underlain by Scottish Middle Coal Measures formation according to the British Geological Survey (BGS) GeoIndex. This area of coal has likely been historically worked. Areas that have been worked for coal abstraction can have a higher risk of flooding from groundwater sources, although this is very site-specific.

The superficial deposits are composed of glacial clays, according to the British Geological Survey (BGS) GeoIndex. These deposits are likely to have low permeability, although this can vary significantly locally.

A review of a sample of available borehole logs on the British Geological Survey GeoIndex suggests that geology varies throughout the site, with areas of clay, sandstone, siltstone and mudstone, normally underlain by coal of various types.

No water strikes were identified in the sampled borehole logs; however it should be noted that on many borehole logs that specially look to classify coal deposits water is not always noted.

Ultimately, there are some unknowns with respect to the groundwater risk at the site. A site-wide SI/GI is likely to be undertaken to support this development.

It is recommended that groundwater monitoring is undertaken, and suitable mitigation measures put in place if shallow groundwater is identified as part of this work to protect the proposed development and so as to not increase flood risk to third parties.

6.4 Flooding from Infrastructure

6.4.1 Reservoirs & Flood Defences

According to the SEPA Reservoir Map, there are not any reservoirs that are predicted to pose a flood risk to the site in the event of failure.

Camilla Loch lies approximately 250m to the east of the site. This waterbody drains into the Dronachy Burn close to the Auchtertool to Loch Gelly Road, although the exact route is unknown as part of the trajectory is culverted. The loch appears to be natural, without an obvious engineered control. In the event of a failure or flows exceeding the capacity of the loch flows would be anticipated to spill south along the line of the waterbody that drains from the loch, potentially flooding the Auchtertool Road to Kirkcaldy before flows reach the Dronachy Burn. Some flooding of areas surrounding the Dronachy Burn in this area may also occur. Flooding could encroach into the site along the eastern site boundary. Development is not proposed in this area, and it is recommended that all development is located away from the eastern site boundary where the waterbody draining from Camilla Loch flows adjacent to the site boundary.

There is a smaller waterbody immediately west of the site within the Mossmorran Plant. This is likely used as part of the operation of the plant and appears to be well maintained, with access tracks around it. This likely reduces the potential for failure of this feature. In the event of a failure flows would be anticipated to spill into the Dronachy Burn and flow through the site in a similar manner to that described in **Section 6.1**. Measures recommended in **Section 6.1** should also serve to mitigate against this flow risk.

There are not thought to be any formal flood defences that serve to protect the site in this area.

The site is therefore considered to be at a low risk of flooding from reservoir breach or failure or from flood defence failure.

6.4.2 Proposed Drainage System

The design of the proposed site drainage system is not part of this commission. However, as part of the development of the site a drainage system will be necessary to prevent flooding from rainfall landing on the site.

The flow pathways should be designed to convey any excess flows to landscaped areas and suitable discharge locations, without flooding properties, or increasing the risk of flooding to third parties.

Careful level design should be employed to shed development away from properties and towards suitable drainage outlets and landscaped areas.

Discussion of the management of surface water flooding is provided in **Section 6.2**.

6.5 Site Access

Safe access and egress should be provided to the site during extreme flood events so that visitors and residents can be safely evacuated without any undue risk to life.

NPF4 identifies ‘Egress (safe flood free pedestrian access and egress)’ as “A route for the movement of people (not vehicles) of all abilities (on foot or with mobility assistance) between the development and a place of safety outwith the design flood event)”. NPF4 recommends that for sites where flood risk cannot be avoided that ‘the proposal does not create an island of development and that safe access/egress can be achieved’.

The development will have two accesses. One from the east to the local road between Auchtertool and Loch Gelly and another connecting to Main Street (B925) to the south of the site. Pedestrian and vehicular access will be possible via both routes.

Based on the work undertaken in this study both accesses are predicted to provide safe flood free access in a flood event.

7 Summary and Conclusions

Kaya Consulting Limited was commissioned by ILI Cato Ltd to undertake a Flood Risk Assessment in support of the development of a Data Centre near Auchtertool in Fife.

The site represents a large site of approximately 0.7km^2 to the east of Auchtertool, Fife. The site is currently comprised of grassland.

The Dronachy Burn flows through the centre of the site in an easterly direction. This watercourse comprises two tributaries upstream which have their confluence within the western part of the site.

A 1D-2D hydraulic model was developed of this watercourse, including the two tributaries and main stem of the burn.

The results predict flooding of the site in a 1 in 200-year plus climate change event, with an allowance for blockage, due to a restriction at Culvert 1. Under NPF4 Policy 22a states that all development should be located outside the Flood Risk Area unless the development falls under one of the exceptions. The development is thought to be meet the “Essential Infrastructure” exception, meaning development can take place in the Flood Risk Area assuming the 5 criteria can be met. Refer to **Sections 5** and **6.1** for more information on how the site can be developed in line with NPF4.

A surface water flood risk assessment has been undertaken. This has identified areas where surface water could enter the site and proposed recommendations to mitigate against this surface water flood risk. Refer to **Section 6.2** for more information.

Flood risk from other sources including groundwater and infrastructure are considered in **Section 6.3** and **6.4**.

Safe access to and from the site is predicted to be possible in a flood event.

It should be noted that the risk of flooding can be reduced, but not totally eliminated, given the potential for events exceeding design conditions and the inherent uncertainty associated with estimating hydrological parameters for any given site.