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# 10. Water Environment

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## 10.1 Introduction

- 10.1.1 This chapter presents the preliminary assessment of the likely significant effects of the Project with respect to the Water Environment, including flood risk and the Water Framework Directive (WFD). The preliminary assessment is based on information obtained to date. It should be read in conjunction with the Project description provided in **Chapter 4: Description of the Proposed Development** of the Draft ES and with respect to relevant parts of the following chapters:
- **Chapter 8: Biodiversity**; and
  - **Chapter 11: Ground Conditions.**
- 10.1.2 This chapter describes:
- the legislation, policy and technical guidance that has informed the assessment (**Section 10.2**);
  - consultation and engagement that has been undertaken and how comments from consultees relating to Water Environment have been addressed (**Section 10.3**);
  - the methods used for baseline data gathering (**Section 10.4**);
  - overall baseline (**Section 10.5**);
  - embedded measures relevant to Water Environment (**Section 10.6**);
  - the scope of the assessment for Water Environment (**Section 10.7**);
  - the methods used for the assessment (**Section 10.8**);
  - the preliminary assessment of Water Environment effects (**Section 10.9**);
  - preliminary assessment of cumulative (inter-project) effects (**Section 10.10**);
  - a summary of the preliminary significance conclusions (**Section 10.11**);
  - an outline of further work to be undertaken for the Environmental Statement (ES) (**Section 10.12**).

## Limitations and assumptions

- 10.1.3 The information provided in this Draft ES is preliminary, the final assessment of likely significant effects will be reported in the final ES. The Draft ES has been produced to fulfil Pennant Walters's consultation duties and enable consultees to develop an informed view of the likely significant effects of the Project.
- 10.1.4 There are no limitations relating to Water Environment that affect the robustness of the preliminary assessment of the potential likely significant effects of the Project.

## 10.2 Relevant legislation, planning policy and technical guidance

- 10.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Water Environment. Further information on policies relevant to the Project is provided in **Chapter 5: Legislation and policy overview** of the Draft ES.

### Legislation

- 10.2.2 A summary of the relevant legislation is given in Error! Reference source not found.

**Table 10.1 Legislation relevant to the Water Environment assessment.**

Legislation document	Context
<b>Control of Pollution Act 1974<sup>1</sup></b>	Makes further provision with respect to waste disposal, water pollution, noise, atmospheric pollution and public health.
<b>Environmental Protection Act 1990<sup>2</sup></b>	Makes provision for the improved control of pollution arising from certain industrial and other processes. It re-enacts the provisions of the Control of Pollution Act 1974 relating to waste on land, including modifications to the functions of the regulatory and other authorities concerned in the collection and disposal of waste and makes further provision in relation to such waste.
<b>Land Drainage Act 1991<sup>3</sup> and 1994<sup>4</sup></b>	Stipulates, in combination with the Water Resources Act, that before work on or near an 'Ordinary Watercourse' <sup>5</sup> is carried out, an Ordinary Watercourse Consent is required. The Flood Defence consenting regime for 'Main Rivers' <sup>6</sup> , which used to be part of this Act, was replaced by flood risk activities permits under the Environmental Permitting Regulations 2016.
<b>Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009<sup>7</sup></b>	States that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter 'Controlled Waters' <sup>9</sup> . The Act was revised by the Water Act 2003, which sets out regulatory controls for water abstraction, water impoundment and protection of water resources. Important for the Project is the potential requirement to obtain a licence for dewatering of engineering works
<b>Water Act 2003<sup>8</sup></b>	

<sup>1</sup> UK Government. (1974). Control of Pollution Act 1974. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1974/40> (Accessed July 2023).

<sup>2</sup> UK Government. (1990). Environmental Protection Act 1990. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1990/43/contents>. (Accessed July 2023).

<sup>3</sup> UK Government. (1991). Land Drainage Act 1991. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1991/59/contents>. (Accessed July 2023).

<sup>4</sup> UK Government. (1994). Land Drainage Act 1994. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1994/25/contents>. (Accessed July 2023).

<sup>5</sup> An Ordinary Watercourse is any river, stream, brook, ditch, drain, culvert, pipe and any other passage through which water may flow which is not designated as Main River

<sup>6</sup> Main rivers are usually larger rivers and streams. They are designated as such and shown on the Main River Map. NRW carries out maintenance, improvement and construction work on main rivers to manage flood risk.

<sup>7</sup> UK Government. (2009). The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009. (Online) Available from: <https://www.legislation.gov.uk/uksi/2009/3104/contents/made>. (Accessed July 2023).

<sup>8</sup> UK Government. (2003). Water Act 2003. (Online) Available from:

<https://www.legislation.gov.uk/ukpga/2003/37/contents>. (Accessed July 2023).

<sup>9</sup> This includes territorial waters, coastal waters, inland freshwaters and groundwaters (section 104, Water Resources Act 1991). (Accessed July 2023).

Legislation document	Context
	and to ensure that any impact on the environment can be mitigated. Provisions for the regulation of water discharges to controlled waters are set out in the Environmental Permitting (England and Wales) Regulations 2016. These have replaced provisions in the earlier Acts.
<b>Environment Act 1995<sup>10</sup></b>	Established the Environment Agency (EA) and gave it responsibility for environmental protection and flood defence. Natural Resources Wales (NRW) was formed in April 2013, largely taking over the functions of the Countryside Council for Wales, Forestry Commission Wales and the Environment Agency in Wales
<b>Water Quality (Water Supply) Regulations 2017 (as amended)<sup>11</sup></b>	Primarily concerned with the quality of water supplied in England for drinking, washing, cooking and food preparation, and for food production, and with arrangements for the publication of information about water quality.
<b>Priority Substances Directive (2008/105/EC) Revision of the Priority Substances Directive (2013/39/EU)<sup>12</sup></b>	Sets out environmental quality standards in the field of water policy for Europe, with the aim of minimising the threat to the aquatic environment and effects such as acute and chronic toxicity to aquatic organisms, accumulation in the ecosystem and losses of habitats and biodiversity, as well as a threat to human health.
<b>The EU Floods Directive (2007/60/EC), as enacted into domestic law by the Flood Risk Regulations 2009<sup>13</sup></b>	Enacted into domestic law by the Flood Risk Regulations 2009. It requires that in accordance with flood risk management plans, there should be a focus on the prevention of flooding, through avoidance of planned development in present and future flood prone areas, and protection by taking measures to reduce the likelihood of flooding.
<b>Flood and Water Management Act 2010<sup>14</sup></b>	Sets out the Government's proposals to improve flood risk management, water quality and ensure water supplies are more secure. The Act includes consideration and responsibilities for managing flood risk and consideration of drainage including the use of Sustainable Drainage Systems (SuDS).
<b>The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015<sup>15</sup></b>	Sets out the environmental standards to be used for the second cycle of river basin plans, covering the period 2016-21. Along with the updated Water Environment (WFD) (England and Wales) Regulations 2003, they transpose Directive 2013/39/EC on environmental quality standards for priority substances.

<sup>10</sup> UK Government. (1995). Environment Act 1995. (Online) Available from: <https://consult.environment-agency.gov.uk/engagement/bostonbarriertwao/results/b.10---environment-act-1995.pdf>. (Accessed July 2023).

<sup>11</sup> UK Government. (2017). Water Quality (Water Supply) Regulations 2017. (Online) Available from: <https://www.legislation.gov.uk/ukxi/2000/3184/contents/made> (Accessed July 2023).

<sup>12</sup> European Parliament. (2013). Directive 2013/39/EU of the European Parliament and of the Council amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy. (Online) Available from: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:226:0001:0017:EN:PDF> (Accessed July 2023).

<sup>13</sup> European Parliament. (2007). Directive 2007/60/EC of the European Parliament and of the Council on the assessment and management of flood risks. (Online) Available from: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0060&from=EN> (Accessed July 2023).

<sup>14</sup> UK Government. (2010). Flood and Water Management Act 2010. (Online) Available from: <https://www.legislation.gov.uk/ukpga/2010/29/contents> (Accessed June 2022).

<sup>15</sup> UK Government. (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations. (Online) Available from: <https://www.legislation.gov.uk/ukxi/2017/407/contents/made> (Accessed July 2023).

Legislation document	Context
<b>Environment (Wales) Act 2016<sup>16</sup></b>	Aims to enable resources in Wales to be managed in a more proactive, sustainable and joined-up way and to establish the legislative framework necessary to tackle climate change. Includes provisions relating to land drainage and establishes a Flood and Coastal Erosion Committee which oversees and provides guidance on wider risks and benefits of flood and coastal erosion risk management in Wales.
<b>Private Water Supplies (Wales) Regulations 2017<sup>17</sup></b>	The Regulations require Local Authorities to monitor Private Water Supplies.
<b>Environmental Permitting (England and Wales) Regulations (EPR), 2016 (as amended)<sup>18</sup></b>	Replaces the previous 2010 regulations. It provides a consolidated framework for environmental permits and exemptions for waste operations and water discharge activities (previously consented under the Water Resources Act 1991, and the Control of Pollution Act 1974), and groundwater activities. It also sets out the powers, functions, and duties of the regulators.
<b>The European Union (EU) Water Framework Directive (2000/60/EC) (WFD)<sup>19</sup> as enacted into domestic law by the Water Environment WFD (England and Wales) (Amendment) Regulations 2017<sup>20</sup></b>	The EU WFD is enacted into domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. A fundamental requirement of the WFD is to attain Good Ecological Status, or Good Ecological Potential within each defined water body, by December 2027 at the latest and to ensure that any deterioration in status is prevented.
<b>Environment Act, 2021<sup>21</sup></b>	The Environment Act (2021) makes provision for Environmental Improvement Plans (EIPs), including a target based approach for water bodies, aligned with the WFD targets. Currently, only one EIP, the Defra 25-year plan has been produced, which sets out the high level (national aspirations) for the environment.

## Planning Policy

- 10.2.3 A summary of the relevant national and local planning policy is given in Error! Reference source not found..

<sup>16</sup> Welsh Government. (2016). Environment (Wales) Act. (Online) Available from <https://gov.wales/sites/default/files/publications/2019-05/environment-wales-act-2016-flood-risk-management-land-drainage.pdf> (Accessed July 2023).

<sup>17</sup> UK Government. (2017). The Private Water Supplies (Wales) Regulations 2017. (Online) Available from: <https://www.legislation.gov.uk/ukws/2017/1041/contents/made> (Accessed July 2023).

<sup>18</sup> UK Government. (2016). The Environmental Permitting (England and Wales) Regulations 2016. (Online) Available from: <https://www.legislation.gov.uk/ukws/2016/1154/contents> (Accessed July 2023).

<sup>19</sup> European Parliament. (2000). Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy. (Online) Available from: [https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF) (Accessed July 2023).

<sup>20</sup> UK Government. (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations. (Online) Available from: <https://www.legislation.gov.uk/ukws/2017/407/contents/made> (Accessed July 2023).

<sup>21</sup> UK Government. (2021). The Environment Act (2021) UK. (Online) Available from: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted> (Accessed July 2023).

**Table 10.2 Planning policy relevant to the Water Environment assessment.**

Planning policy document	Context
<b>National planning policy</b>	
<b>Planning Policy Wales (PPW)<sup>22</sup></b>	<p>The PPW sets out the land use planning policies of the Welsh Government.</p> <p>It details the requirements when constructing new developments including the provision of Sustainable Drainage Systems (SuDS) enabling surface water to be managed and consideration of impacts to water resources (groundwater and ecology).</p>
<b>National Development Framework (Future Wales: The National Plan 2040)<sup>23</sup></b>	<p>This is the national development framework for Wales, which has development plan status.</p> <p><b>Policy 8 – Flooding</b> The policy sets out the requirement for sustainable development which puts a priority on nature-based flood management solutions, as well as supporting strategic growth and regeneration in National and Regional Growth Areas.</p> <p><b>Policy 19 – Strategic Policies for Regional Planning</b> The policy states that environmental consideration when planning developments and managing resources is vital, on a strategic and local scale. Environmental issues identified must be fully assessed and addressed.</p> <p><b>Policy 33 – Cardiff, Newport and the Valleys</b> This policy sets out the ambitions for the Cardiff, Newport and Valleys region of Wales, which includes the Blaenau Gwent county. This is inclusive of development and growth strategies with reference to natural resources, climate change, flooding and biodiversity</p>
<b>Sustainable Drainage (SuDS) Statutory Guidance, Welsh Government<sup>24</sup></b>	<p>The SuDS Statutory Guidance establishes the requirements of Schedule 3 of the Flood and Water Management Act 2010; a framework for the approval and adoption of surface water management systems serving new developments. The SuDS Approval Bodies (SABs) are assigned under the same Act, which give local authorities the responsibility to approve drainage systems for new developments. The overall objective of the legislation is to deliver</p>

<sup>22</sup> Welsh Assembly Government. (2018). *Planning Policy Wales*. (Online) Available from: <https://www.gov.wales/planning-policy-wales> (Accessed June 2023).

<sup>23</sup> Welsh Government. (2021). *National Development Framework (Future Wales)*. (Online) Available from: <https://gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf> (Accessed July 2023).

<sup>24</sup> Welsh Government. (2019). *Sustainable Drainage (SuDS) Statutory Guidance*. (Online) Available from <https://gov.wales/sites/default/files/publications/2019-06/statutory-guidance.pdf> (Accessed July 2023)



effective, multi-purpose SuDS, which will remain effective for the lifetime of the development.

### **The National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales, Welsh Government<sup>25</sup>**

The National Strategy for FCERM in Wales, as required under the Flood and Water Management Act 2010, set out the management approach for risks associated with flooding and coastal erosion across Wales over a 10-year period. Natural Resource Wales (NRW) are responsible for managing the flood risks from the main rivers and sea across Wales; whilst Local Authorities as Lead Local Flood Authorities (LLFA) are responsible for managing risks associated with surface water, groundwater, and Ordinary Watercourses.

### **Technical Advice Note 15 (TAN15)<sup>26</sup>**

Technical Advice Note 15: Development and Flood Risk (TAN15 – July 2004) was produced by the then Welsh Assembly Government (now the Welsh Government). TAN15 provides technical guidance which supplements the policy set out in Planning Policy Wales (Edition 10, December 2018) (Welsh Assembly Government, 2018) in relation to development and flooding, providing a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. Consultation on an updated version of TAN15 has recently been prepared (January 2020). The draft update includes a range of changes to the guidance, in particular it removes reference to the Development Advice Map (DAM) and refers to a “Wales Flood Map” held by NRW. However, the consultation draft clearly states that TAN15 (2004) remains current until such a time that the replacement is confirmed (anticipated to be June 2023). TAN15 (2004) has therefore been used to underpin this assessment. TAN15 is supplemented by the Development Advice Map (DAM) which provides the basis for assessment under TAN15. The DAM was last updated in July 2017.

#### **Justification Test**

The Justification Test is intended to assess the appropriateness of proposed developments, based upon location in respect of flood zones and the type of development proposed.

### **Local planning policy**

#### **Caerphilly County Borough Local Development Plan up to 2021 (Adopted November 2010)<sup>27</sup>**

CW5 Protection of the Water Environment  
This policy states that development proposals will only be permitted if they will not have an

<sup>25</sup> Welsh Government. (2020). The National Strategy for Flood and Coastal Erosion Risk Management in Wales. (Online) Available at: <https://gov.wales/sites/default/files/publications/2021-03/the-national-strategy-for-flood-and-coastal-erosion-risk-management-in-wales.pdf> (Accessed July 2023).

<sup>26</sup> Welsh Government. 2018. Technical Advice Note 15: Development and Flood Risk. (Online) Available at: <https://gov.wales/sites/default/files/publications/2018-09/tan15-development-flood-risk.pdf> (Accessed July 2023)

<sup>27</sup> Caerphilly CBC. 2010. Local Development Plan up to 2021. (Online) Available at: <https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx> (Accessed July 2023).

unacceptable adverse impact upon the water environment and will not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water). This assessment should consider the impact of climate change.

## Technical guidance

10.2.4 A summary of the technical guidance for Water Environment is given in **Table 10.3**.

**Table 10.3 Technical guidance relevant to the Water Environment assessment**

Technical guidance document	Context
<b>NRW - Flood consequence assessments: climate change allowances<sup>28</sup></b>	Guidance regarding uplifts to be applied to hydrological modelling inputs to be used to help minimise vulnerability and provide resilience to the impacts of climate change.
<b>PINS Advice Note 18: The Water Framework Directive<sup>29</sup></b>	This Advice Note has no statutory status and forms part of a suite of advice notes provided by the Planning Inspectorate.
<b>GOV – Guidance: Groundwater risk assessment for your environmental permit<sup>30</sup></b>	Guidance providing information on how to carry out a groundwater risk assessment as part of an application for an environmental permit.
<b>Environment Agency - The Environment Agency's approach to groundwater protection<sup>31</sup></b>	This document updates Groundwater protection: Principles and practice (GP3). It contains position statements which provide information about the Environment Agency's approach to managing and protecting groundwater.
<b>Natural Resources Wales - How to comply with Sustainable Drainage Systems (SuDS) standards<sup>32</sup></b>	Guidance outlining advice to developers and SuDS Advisory Bodies (SABs) on three of the SuDS Standards: S2 hydraulic control, S3 water quality and S5 biodiversity.
<b>Construction Industry Research and Information Association (CIRIA) reports</b>	

<sup>28</sup> Natural Resource Wales. 2018. Flood consequence assessments: climate change allowances. (Online) Available from: <https://gov.wales/sites/default/files/publications/2018-11/flood-consequence-assessments.pdf> (Accessed July 2023).

<sup>29</sup> The Planning Inspectorate. 2017. Advice note eighteen: The Water Framework Directive. (Online) Available from: [https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice\\_note\\_18.pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf) (Accessed July 2023).

<sup>30</sup> GOV.UK, 2018. Guidance - Groundwater risk assessment for your environmental permit. (Online) Available from: <https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit> (Accessed September 2023).

<sup>31</sup> Environment Agency, 2018. The Environment Agency's approach to groundwater protection. (Online) Available from: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/692989/Environment-Agency-approach-to-groundwater-protection.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692989/Environment-Agency-approach-to-groundwater-protection.pdf) (Accessed September 2023).

<sup>32</sup> Natural Resources Wales, 2022. How to comply with Sustainable Drainage Systems (SuDS) standards. (Online) Available from: <https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/how-to-comply-with-sustainable-drainage-systems-standards/?lang=en> (Accessed September 2023).



Technical guidance document	Context
<b>Report C532: Control of Water Pollution from Construction Sites (2001)</b> <sup>33</sup>	Provides practical support for consultants and contractors on how to plan and manage construction projects to control water pollution.
<b>Report C624: Development and Flood Risk - Guidance for the Construction Industry (2004)</b> <sup>34</sup>	Guidance for developers and the construction industry on the implementation of good practice in the assessment and management of flood risk as part of the development process and is intended to promote development that is sustainable in terms of flood risk.
<b>Report C648: Control of Water Pollution from Linear Construction Projects (2006)</b> <sup>35</sup>	Guidance for clients, consultants, designers, contractors, and regulators on how to plan and manage water pollution from linear construction projects.
<b>Report C649: Control of Water Pollution from Linear Construction Projects - Site Guidance (2006)</b> <sup>36</sup>	Guidance specifically aimed at on-site construction personnel working on linear infrastructure construction projects.
<b>Report C650: Environmental Good Practice on Site, second edition (2005)</b> <sup>37</sup>	Provides practical guidance about managing construction on-site to control environmental impacts.
<b>Report C651: Environmental Good Practice - Pocket Book (2005)</b> <sup>38</sup>	Contains a series of good practice checklists to follow while working on a project, from design and planning through the construction phase on-site, to project completion.
<b>Report C689: Culvert Design and Operation Guide (2010)</b> <sup>39</sup>	Comprehensive guidance covering a range of issues pertinent to the management and design of culverts.
<b>Report C692: Environmental Good Practice on Site (2010)</b> <sup>40</sup>	General good practice guidance and practical advice for the management of construction sites to minimise environmental impacts.
<b>Report C698: Site Handbook for the</b>	Guidance for site engineers and SuDS practitioners on the construction of SuDS to facilitate their effective implementation within developments.

<sup>33</sup> Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Hendrie, M. and Owens, D. 2001. Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors. C532. London: CIRIA.

<sup>34</sup> Lancaster, J., Preene, M. and Marshall, C. 2004. Development and Flood Risk – Guidance for the Construction Industry. C624. London: CIRIA.

<sup>35</sup> Murnane, E., Heap, A. and Swain, A. 2006. Control of Water Pollution from Linear Construction Projects – Technical Guidance. C648. London: CIRIA.

<sup>36</sup> Murnane, E., Heap, A. and Swain, A. 2006. Control of water pollution from Linear Construction Projects – Site Guide. C649. London: CIRIA.

<sup>37</sup> Charles, P. and Connolly, S. 2005. Environmental Good Practice Site Guide (second edition). C650. London: CIRIA.

<sup>38</sup> Chant-Hall, G., Charles, P. and Connolly, S. (2005). Environmental good practice on site – pocket book. C651. London: CIRIA.

<sup>39</sup> Balkham, M., Fosbeary, C., Kitchen, A. and Rickard, C. (2010). Culvert design and operation guide. C689. London: CIRIA.

<sup>40</sup> Audus, I., Charles, P. and Evans, S. (2010). Environmental good practice on site (third edition). C692. London: CIRIA.

Technical guidance document	Context
<b>Construction of SuDS (2007)<sup>41</sup></b>	
<b>Report C753: The SuDS Manual (2015)<sup>42</sup></b>	Best practice guidance on the planning, design, construction, operation and maintenance of SuDS to facilitate their effective implementation within developments.
<b>Pollution Prevention Guidance Notes (PPGs) and Guidance for Pollution Prevention Notes (GPPs)<sup>43</sup></b> (both are maintained by NetRegs and provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales only.)	
<b>GPP 1: Understanding your environmental responsibilities - good environmental practices (October 2020)<sup>44</sup></b>	Guidance document based on relevant legislation and reflects current good practice.
<b>GPP 2: Above ground oil storage tanks (January 2018)<sup>45</sup></b>	Guidance to support the safety of above ground oil storage tanks and minimise the risk of causing pollution.
<b>GPP 3: Use and design of oil separators in surface water drainage systems (March 2022)<sup>46</sup></b>	Guidelines to support decision making on whether an oil separator is needed for a site, and if so what size and type of separator is appropriate.
<b>GPP 5: Works and maintenance in or near water (February 2018)<sup>47</sup></b>	Guidance document based on relevant legislation and setting out current good practice for working in or near water.
<b>PPG 6: Working at construction and demolition sites (2012)<sup>48</sup></b>	Practical advice and guidance to help prevent pollution from construction and demolition sites. Sets out legislative requirements and good practice measures to reduce the risk of a pollution incident.

<sup>41</sup> Woods Ballard, B., Kellagher, R., Martin, P., Jefferies, C., Bray, R. and Shaffer, P. (2007). Site Handbook for the Construction of SUDS. C698. London: CIRIA.

<sup>42</sup> Woods Ballard, S., Wilson, S., Udale-Clarke, H., Illman, S., Scott, T., Ashley, R. and Kellagher, R. (2015). The SuDS Manual. C753. London: CIRIA.

<sup>43</sup> NetRegs. (2021). Guidance for Pollution Prevention (GPPs) - Full list. (Online) Available from: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/guidance-for-pollution-prevention-gpps-full-list/> (Accessed July 2023).

<sup>44</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency. 2020. GPP 1: A general guide to preventing pollution. Available at: <https://www.netregs.org.uk/media/1835/gpp-1.pdf> (Accessed July 2023).

<sup>45</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency 2017. Above ground oil storage tanks: GPP 2. Available at: <https://www.netregs.org.uk/media/1475/gpp-2-pdf-jan-2018.pdf> (Accessed July 2023).

<sup>46</sup> Environment and Heritage Service, Scottish Environmental Protection Agency and Environment Agency. 2022. Use and design of oil separators in surface water drainage systems: GPP 3. Available at: <https://www.netregs.org.uk/media/1899/guidance-for-pollution-prevention-3-2022-update-v2.pdf> (Accessed July 2023).

<sup>47</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency. 2018. Works and maintenance in or near water: GPP 5. Version 1.2. Available at: [https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf?utm\\_source=website&utm\\_medium=social&utm\\_campaign=GPP5%2027112017](https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf?utm_source=website&utm_medium=social&utm_campaign=GPP5%2027112017) (Accessed July 2023).

<sup>48</sup> Environment Agency. 2012. Working at construction and demolition sites: PPG6. Second edition. Bristol: Environment Agency.

Technical guidance document	Context
<b>GPP 8: Safe storage and disposal of used oils (July 2017)</b> <sup>49</sup>	Guidance based on relevant legislation and setting out current good practice for the safe storage and disposal of used oils.
<b>GPP 20: Dewatering underground ducts and chambers (January 2018)</b> <sup>50</sup>	Guidelines for dewatering underground ducts and chambers, based on relevant legislation and setting out current good practice.
<b>GPP 21: Pollution incident response planning (June 2021)</b> <sup>51</sup>	Guidelines setting out current best practice for producing an incident response plan.
<b>GPP 22: Dealing with spills (October 2018)</b> <sup>52</sup>	Guidance applicable to those responsible for storing and transporting materials that could cause pollution if they spill. It may also be useful for those who respond to spills, or those responsible for transporting or storing waste from spills.
<b>GPP 26 Safe storage - drums and intermediate bulk containers (IBCs) (February 2019)</b> <sup>53</sup>	Guidance aimed at site operators and those responsible for the storing and handling of drums and IBCs.

## 10.3 Consultation and Engagement

### Overview

- 10.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 2.4 of Chapter 2: Approach to preparing the Environmental Statement** of the Draft ES.

### Scoping Opinion

- 10.3.2 A Scoping Direction was issued by the Planning Environment Decision Wales (PEDW), on behalf of the Welsh Ministers, on 2<sup>nd</sup> December 2022. A summary of the relevant responses received in the Scoping Opinion in relation to Water Environment and

<sup>49</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency 2017. GPP 8 Safe storage and disposal of used oils. Available at: <https://www.netregs.org.uk/media/1435/gpp-8-vswni.pdf> (Accessed July 2023).

<sup>50</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency (n.d.) GPP 20 Dewatering underground ducts and chambers. Available at: <https://www.netregs.org.uk/media/1477/gpp-20-publisher-pdf-version.pdf> (Accessed July 2023).

<sup>51</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency. 2021. GPP 21: Pollution Incident Response Plans. Available at: <https://www.netregs.org.uk/media/1436/gpp-21-final.pdf> (Accessed July 2023).

<sup>52</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency. 2018. Dealing with spills: GPP 22. Version 1. Available at: <https://www.netregs.org.uk/media/1643/gpp-22-dealing-with-spills.pdf> (Accessed July 2023).

<sup>53</sup> Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environmental Protection Agency. 2019. GPP 26: Safe storage of Drums and Intermediate Bulk Containers (IBCs). Available at: <https://www.netregs.org.uk/media/1885/guidance-for-pollution-prevention-26-2022-updated.pdf> (Accessed July 2023).

confirmation of how these have been addressed within the assessment to date is presented in **Table 10.4**.

**Table 10.4 Summary of EIA Scoping Direction Responses for Water Environment**

Consultee	Consideration	How addressed in this Draft ES
PEDW	<p><b>Section 9.2 Guidance</b> The Applicant's attention is drawn to comments made by NRW that detail additional resources that should be used to inform this section (and any subsequent cross-over chapters) of the ES.</p>	Comment addressed in this table under NRW.
PEDW	<p><b>Section 9.3.16 Peat</b> Comments from the Welsh Government's Land Use and Agriculture team are contained at Appendix 1.</p>	Comments are addressed in <b>Chapter 11: Ground Conditions</b> .
PEDW	<p><b>Table 9.8 Groundwater depth</b> NRW note that there may be the potential for local dewatering of ground water to enable the progression of excavations, and that this should be reviewed and any impacts upon groundwaters and surface waters assessed.</p>	An assessment of the potential impacts of dewatering of excavations are provided in <b>Section 10.9</b> (Preliminary assessment of Water Environment effects). This assessment concludes that, with embedded mitigation in place, the impacts on the water environment receptors are Not Significant.
PEDW	<p><b>Impact assessment and mitigation</b> NRW notes that impact assessment and mitigation should include a water features survey and groundwater risk assessment. Furthermore, the ES should detail how ongoing protection and enhancement will be secured through the lifetime of the development and operation. PEDW would also add that this should be through to decommissioning stages too. Detailed comments made on this matter by NRW can be found at Appendix 1.</p>	Comment addressed in this table under NRW.
PEDW	<p><b>Tables 9.9, 9.10 and 9.11 Definitions of sensitivity</b> PEDW agrees with the table definitions, and would encourage a dialogue between the SAB, LPA, and NRW should any queries arise from the studies.</p>	Recommendation for consultation with the SAB, LPA, and NRW should any queries arise from the studies has been noted.
PEDW	<p><b>Comments from Dwr Cymru</b> The Applicant's attention is drawn to comments made by Dwr Cymru / Welsh Water contained at Appendix 1.</p>	Comment addressed in this table under Dwr Cymru / Welsh Water .
PEDW	<p><b>SuDS Consent</b> Whilst a separate legislative requirement from planning permission, the Applicant's attention is drawn to the statutory SuDS regime that came into force in Wales in January 2019. The</p>	The proposed outline surface water drainage strategy for the Proposed Development is included in the Flood Consequence Assessment (FCA) ( <b>Appendix 10A</b> ) and takes into

Consultee	Consideration	How addressed in this Draft ES
	<p>requirement to obtain SuDS consent prior to construction may require iterative design changes that influence the scheme that is to be assessed within the ES and taken through to application. As such, it is recommended that the applicant contact the local SuDS Approval Body early on.</p>	<p>consideration the Welsh Government's Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems (2019). The proposed outline surface water drainage strategy will be discussed with Caerphilly County Council (as the SuDS Approval Body, SAB) in advance of the final ES submission.</p>
NRW	<p>Additional resources should be used to inform section 9.2</p> <p>Guidance and Legislation: Section 9.2 sets out Policy and Legislation that will be used to inform the ES. We recommend that the resources and guidance listed below are referred to in addition to the that identified in Section 9.2 to inform the ES.</p> <ul style="list-style-type: none"> <li>• The Environment Agency's approach to groundwater protection (<a href="http://publishing.service.gov.uk">publishing.service.gov.uk</a>) which NRW now adopt.</li> <li>• Water &amp; Land Library (<a href="http://10-12laire.co.uk">10-12laire.co.uk</a>)</li> <li>• Groundwater risk assessment for your environmental permit – GOV.UK (<a href="http://www.gov.uk">www.gov.uk</a>) (This is a useful piece of guidance for undertaking groundwater risk assessments and water feature surveys that may be required to assess the impacts to groundwater)</li> <li>• Natural Resources Wales / How to comply with Sustainable Drainage Systems (SuDS) standards</li> </ul>	<p>The suggested resources are included in <b>Section 10.2</b> (Relevant legislation, planning policy and technical guidance) and informed the assessment in <b>Section 10.9</b> (Preliminary Assessment of Water Environment effects).</p>
NRW	<p>We welcome a review of additional information gathering during subsequent EIA stages to confirm the sites which are considered to be water-dependent and potentially affected by the proposed development.</p>	<p>The designated sites for biodiversity conservation within the study area which are considered to be water-dependent and potentially affected by the Proposed Development are presented in <b>Section 10.5</b> (Overall baseline). These sites were identified based on information provided in <b>Chapter 8: Biodiversity</b> of the Draft ES.</p>
NRW	<p>We welcome the consideration of potential future changes to hydrological and hydrogeological conditions at the proposed development site, due to a number of scenarios including climate change, change in abstractions, changes to Water Framework Directive (WFD) waterbody status and interactions with other new developments. This is an important consideration due to the dynamic nature and response of hydrological and hydrogeological features</p>	<p>The assessment of the potential impacts on water environment receptors considers potential future changes to hydrological and hydrogeological conditions at the proposed development site, due to a number of scenarios including climate change (in the FCA (<b>Appendix 10A</b>)), change in abstractions, changes to Water Framework Directive (WFD) waterbody status and interactions with other new developments (<b>Section 10.10</b>)</p>

Consultee	Consideration	How addressed in this Draft ES
		(Assessment of cumulative (inter-project effects))
NRW	We welcome the review of the hydrogeological regime including vulnerability and consideration of the potential impacts upon groundwater quantity, flows and quality and agree this is to remain in scope.	Noted. An assessment of the potential impacts on water environment receptors, including consideration of impacts on groundwater, is provided in <b>Section 10.9</b> (Preliminary assessment of Water Environment effects). This assessment concluded that, with embedded mitigation in place, the impacts on water receptors during the construction, operation and decommissioning phases are Not Significant.
NRW	Table 9.8: Depending on the depth the groundwater and the extent of below ground excavation, there may be the potential for local dewatering of groundwater to enable the progression of excavations. This should be reviewed, and if possible, any potential impacts upon groundwaters and surface waters should be assessed.	An assessment of the potential impacts on water environment receptors from dewatering of excavations is provided in <b>Section 10.9</b> (Preliminary assessment of Water Environment effects). This assessment concludes that, with embedded mitigation in place, the impacts on water receptors during the construction, operation and decommissioning phases are Not Significant.
NRW	Impact assessment and mitigation should include a water features survey and groundwater risk assessment. These sections should also consider adaptation of construction or development methods and techniques as part of mitigation. In line with the wellbeing of future generations act and SMNR (Sustainable Management of Natural Resources) principles, we would suggest that mitigation should include an element of enhancement. I.e. where there are opportunities as part of the development to not only protect the environment from harm opportunities to enhance the quality of the environment should also be implemented. The ES should detail how ongoing protection and enhancement will be secured through the lifetime of the development and operation, and the decommissioning stages.	A water features survey was undertaken by a WSP hydrologist on 19 <sup>th</sup> July 2023. Details are provided in <b>Section 10.5</b> (Overall baseline) and <b>Appendix 10B</b> (Site visit photos). Assessment of impacts to groundwater is provided in <b>Section 10.9</b> (Preliminary assessment of Water Environment effects). This assessment concluded that, with embedded mitigation in place, the impacts on groundwater during the construction, operation and decommissioning phases are Not Significant.
NRW	It is noted in Sections 10.3.23 – 10.3.29 that current and historical land uses are discussed, and subsequent sections address the relevance of this to potential contaminant fate and transport. This should be further explored and quantified; this may indicate that intrusive investigation, qualitative and quantitative risk assessment and possibly remediation are required as part of the ES. Refer to Land contamination risk management (LCRM) –	An assessment of potential impacts from land contamination sources is provided in <b>Chapter 11: Ground Conditions</b> of the Draft ES.



Consultee	Consideration	How addressed in this Draft ES
<b>NRW</b>	<p>GOV.UK (<a href="http://www.gov.uk">www.gov.uk</a>) for further information and guidance on this matter.</p> <p>We would recommend that groundwater and surface water abstractions within, and in the vicinity of, the study area are reviewed and also that the relevance of any identified abstractions are reviewed.</p>	<p>Details on groundwater and surface water abstractions within the study area have been obtained from NRW and CCBC and are provided in <b>Section 10.5</b> (Overall baseline). An assessment of the potential impacts on groundwater surface water abstractions is provided in <b>Section 10.9</b> (Preliminary assessment of Water Environment effects). This assessment concludes that, with embedded mitigation in place, the impacts on groundwater and surface water abstractions during the construction, operation and decommissioning phases are Not Significant.</p>
<b>NRW</b>	<p>We note that a Construction Environmental Management Plan (CEMP) will be produced. We advise this should provide detail on the design and construction methods of any proposed tracks and turbines (including foundation design and likely depth) and the pollution prevention measures that will be put in place to minimise impacts to the water environment. The CEMP should be created following thorough desk study and field surveys and comply with all relevant Guidance for Pollution Prevention (GPPs). To ensure the effectiveness of the CEMP, a water quality monitoring plan should be incorporated to manage any effects on water quality during the construction phase of the proposal. Information will be required on the location of any compounds, storage of oil and the foul drainage arrangements required during site construction and operation.</p>	<p>The Outline CEMP is provided as an Appendix to the Draft ES. This includes compliance with the relevant GPPs, implementation of a water quality monitoring programme and appropriate storage of fuel and oil. The location of the temporary construction compound is provided in Figure 10.1 of the Draft ES. No foul drainage arrangements are required.</p>
<b>Welsh Water</b>	<p>The applicant is also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal.</p>	<p>The proposed access track crosses a DCWW asset at one location. As set out in <b>Table 10.16</b> (Summary of embedded environmental measures), a suitable asset protection design will be developed and agreed with DCWW at detailed design stage. Exact location of all assets will be determined on site prior to construction works.</p>
<b>Torfaen County Borough Council</b>	<p>Drainage As far as I can make out this application does not affect and land drainage or watercourses in Torfaen. There may be a very slight chance that the proposal will affect the water table of the eastern face of the upland area west of</p>	<p>The proposed outline surface water drainage strategy for the Proposed Development is included in the Flood Consequence Assessment (FCA) (<b>Appendix 10A</b>).</p>

Consultee	Consideration	How addressed in this Draft ES
	upper Cwmbran and Fairwater, but until definite plans are submitted this is only speculation on my part.	

## Technical Engagement

- 10.3.3 Data requests were sent to NRW and CCBC to establish the current water environment baseline for the Proposed Development area. Further engagement will be undertaken with the following consultees: CCBC to discuss and agree the proposed outline drainage strategy and watercourse crossings; NRW to discuss and agree the proposed embedded measures for mitigation of potential effects on the pond near Turbine 3; and DCWW to discuss and agree the proposed approach for crossing of DCWW's watermain. A summary of the technical engagement will be provided in the final submission of the ES.

## 10.4 Data gathering methodology

### Study area

- 10.4.1 The water environment study area is defined as the geographic area where direct effects of the Proposed Development on hydrology, hydrogeology and flood risk receptors may occur. The study area shown on **Figure 10.1** covers a 1.5km buffer from the Proposed Development boundary. It is considered that any potential impacts on watercourses would be negligible (and therefore scoped out) beyond 1.5km downstream of the boundary for the Proposed Development.

### Desk Study

- 10.4.2 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 10.5**.

**Table 10.5 Data sources used to inform the Water Environment assessment**

Organisation	Data source	Data provided
<b>British Geological Survey (BGS)</b>	Geoindex Onshore <sup>54</sup>	Aquifer Designation
<b>British Geological Survey</b>	Geology of Britain Viewer <sup>55</sup>	Geology
<b>Cranfield University</b>	LandIS Soilscales viewer <sup>56</sup>	Soil classification

<sup>54</sup> British Geological Survey (BGS) Geoindex Onshore – Aquifer Designation (available online <http://mapapps2.bgs.ac.uk/geoindex/home.html>; accessed July 2023)

<sup>55</sup> BGS Geology of Britain Viewer (available online <https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/>; accessed July 2023)

<sup>56</sup> Cranfield University LandIS Soilscales viewer (available online <http://www.landis.org.uk/soilscales/>; accessed July 2023)

<b>Local Ordnance</b>	OS mapping <sup>57</sup>	Topography and spring locations
<b>Natural Resource Wales (NRW)</b>	Geo portal <sup>58</sup>	Source Protection Zones (SPZs)
<b>Natural Resource Wales (NRW)</b>	Water Watch Wales for Water Framework Directive (WFD) <sup>59</sup>	WFD classification
<b>Natural Resource Wales (NRW)</b>	Flood risk mapping <sup>60</sup>	Flood Risk

## Survey work

10.4.3 A hydrology and flood risk walkover survey was undertaken by a WSP hydrologist on 19<sup>th</sup> July 2023. The objective of the walkover was to visit areas identified within the desk-based review, as being of particular hydrological, hydrogeological or flood risk interest. This included any area with potential to impact the surface water environment or be at risk of flooding due to the proximity of certain construction and operational activities to watercourses and flood zones. Photographs from the site visit are provided within **Appendix 10B**. The locations visited during the site visit included:

- Nant Gawni headwaters near main access road;
- Trosnant brook headwaters;
- Proposed turbine locations;
- Pond near Turbine 3; and
- Watercourse crossing locations by new and existing access track.

## 10.5 Overall baseline

### Current baseline

#### Introduction

- 10.5.1 This section provides a review of the current baseline environmental characteristics for the Proposed Development and study area, with particular reference to the water environment.
- 10.5.2 The geographical extent of the study area extends 1.5km from the Proposed Development boundary. This nominated study area is considered conservative and sufficient for the purposes of this baseline appraisal, based on hydrological knowledge of the area and professional experience. The study area and key hydrological features within this area are shown on **Figure 10.1**.

<sup>57</sup> Local Ordnance Survey (OS) mapping

<sup>58</sup> Natural Resource Wales (NRW) Geo portal for Wales (Lle) (available online <http://lle.gov.wales/catalogue/item/SourceProtectionZonesSPZMerged/?lang=en> ; accessed July 2023)

<sup>59</sup> NRW Water Watch Wales for Water Framework Directive (WFD) Cycle 2 rivers and waterbodies, including status (available online <https://waterwatchwales.naturalresourceswales.gov.uk/en/> ; accessed July 2023);

<sup>60</sup> NRW Flood Risk Maps for flood risk mapping (available online <https://naturalresources.wales/flooding/check-your-flood-risk-by-postcode/?lang=en>; accessed July 2023).

- 10.5.3 The Proposed Development comprises three land parcels: northern, central and southern (**Figure 10.1**).

### Land use and topography

- 10.5.4 The study area comprises a mosaic of agricultural fields and woodland which is shown to have remained largely undeveloped since the 19<sup>th</sup> century. Small developments are present within the Proposed Development boundary, including farms and access tracks. To the west of the wider study area is the A467, industrial and residential developments and various active and disused quarries and remains of coal mining. Land to the east is either forestry or rough grassland. The most significant features of transportation are the A467 and A472 roads; which bypass the Proposed Development at (minimum) distances of 0.7km and 0.4km, respectively (**Figure 10.1**).
- 10.5.5 The Proposed Development is located on the lower hills to the west of the Mynydd Llwyd and Mynydd Maen ridges. The topography generally slopes down from east to west/southwest, into the valleys associated with tributaries to the Afon Ebwy (Nant Gawni and Nant Hafod-fach). The summit of the ridges is 472mAOD, located approximately 0.3km to the east of the study area (NGR: ST 25950 97835). The lowest elevations within the study area are associated with the Ebwy valley, which ranges from 110mAOD to the north and 80mAOD to the south (**Figure 10.1**).
- 10.5.6 The land use and topography across the Proposed Development land parcels are summarised in **Table 10.6**.

**Table 10.6 Summary of baseline land use and topography conditions for the Proposed Development**

Proposed Development land parcel	Land use summary	Approx Highest elevation ( mAOD)	Approx Lowest elevation ( mAOD)	Topography summary
<b>Northern</b>	Located near the Pen-y-caeau farm and comprises the site of a disused quarry, existing farmland, farm buildings, access tracks, and a cider brewery. The land parcel is bordered by areas of managed woodland and further farmland. The minor road, which connects the farms to the A467 and Persondy, bisects the land parcel from east to west. The nearest residential area is Panside village, which is located approximately 0.7km to the west.	410	310	Slopes down from east to west, and is steepest towards the western edge where it coincides with the head of the Nant Gawni valley.
<b>Central</b>	Located to the east of the Cil-Lonydd farm and lies entirely within an agricultural field, which is bordered by hedges and trees. A minor road, tracking northwest to southeast, passes directly to the east of the land parcel. The nearest residential development is High Meadow on the outskirts of Abercarn, which is located approximately 1.4km to the southwest.	355	345	There is a gradual fall in elevation across the land parcel from east to west towards the Nant Hafod-fach valley.

<b>Southern</b>	Comprises an expanse of agricultural fields, inclusive of farm buildings and access tracks. A network of hedges and trees divide the fields within the area. The minor road, which connects the farms to the A467 and Persondy, bisects the site from northwest to southeast. Directly to the northeast is an active sandstone quarry; whilst to the east and west are large areas of managed woodland. The nearest residential development is Persondy on the outskirts of Abercarn, which is located approximately 0.4km to the southwest.	350	290	Slopes down from northeast to southwest towards the Nant Hafod-fach valley, with the gradient steepening towards the western and southern edges.
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## Hydrology

- 10.5.7 There are no watercourses within the Proposed Development area except for an Ordinary Watercourse (unnamed watercourse tributary of Trostant Brook which crosses the northern land parcel) and two tributaries of Nant Gawni (culverted below the access road between the northern and central land parcels) (**Figure 10.1**). These watercourses were all observed to be dry on the walkover survey. The two existing pipe culverts on the tributaries of the Nant Gawni are approximately 40cm in diameter. The culvert in the northern parcel is partially collapsed on the western side (photos in **Appendix 10B**).
- 10.5.8 In the wider study area, there are two Main Rivers (Afon Ebwy on the western edge and the Trostant Brook which is a tributary of Afon Lwyd on the northern edge) and several Ordinary Watercourses including the Nant Gawni, Nant Hafod-fach and Nant Gwyddon, which are tributaries to the Afon Ebwy and generally flow to the west (**Figure 10.1**).
- 10.5.9 The Afon Ebwy flows from north to south through the Ebwy valley, to the west of the Proposed Development. The Afon Ebwy Fach (Main River) confluences with the Afon Ebwy approximately 3km upstream of the study area; yet as it tracks to the south the only inputs to the Afon Ebwy are from minor tributaries (Ordinary Watercourses) until the confluence with the Afon Sirhowy (Main River) approximately 4km downstream of the study area.
- 10.5.10 There are eight springs shown in the OS mapping within the study area; however, none are located within the Proposed Development area (**Figure 10.1**). Three of the springs are located to the north of the study area, on the southern slopes of the Cefn Crib which broadly flow to the south into a minor tributary of the Afon Ebwy. A fourth spring is located to the west on the Craig Swffryd slopes, which flows to the west, directly towards the Afon Ebwy. There are four springs located in the southeast of the study area, which feed several of the headwaters of the Nant Gwyddon.
- 10.5.11 There are 13 ponds located within the study area, with one falling within the Proposed Development site area near turbine 3. The ponds located across the study area, vary in shape, size (<0.1km<sup>2</sup>) and elevation (150mAOD to 405mAOD).
- 10.5.12 **Table 10.7** below summarises the hydrological baseline for the individual Proposed Development land parcels.

**Table 10.7 Summary of baseline hydrology conditions across the Proposed Development**

Proposed Development land parcel	Baseline hydrology summary
<b>Northern</b>	Located entirely within Afon Ebwy catchment, which flows approximately 1.4km to the west of the land parcel. The land parcel intersects the Nant Gawni, an ordinary watercourse and tributary of the Afon Ebwy, and one tributary (unnamed watercourse) of the Trosnant Brook. There are no identified ponds or springs within the land parcel but there are 7 ponds and 5 springs within the wider study area.
<b>Central</b>	Located entirely within the Afon Ebwy catchment, which flows 1.9km to the west of the land parcel. The land parcel does not intersect any identified watercourses, ponds, or springs. The nearest hydrology feature is the Nant Hafod-fach, (tributary of Afon Ebwy) which is located 0.2km to the west of the land parcel. There are 8 ponds and 2 springs within the wider study area.
<b>Southern</b>	Located entirely within the Afon Ebwy catchment, which flows 0.8km to the west of the land parcel. The land parcel does not intersect any watercourses. The closest watercourses (Ordinary Watercourses), Nant Hafod-fach and Nant Gwyddon, are tributaries of Afon Ebwy which flow 0.2km to the west and 0.3km to the east of the land parcel respectively. There is one pond within the land parcel, identified as Pwllgwinau in the OS mapping (NGR: ST 23144 96403). The pond is approximately 0.03km <sup>2</sup> in area and at an elevation of around 345mAOD. There are no identified springs located. There are 9 ponds and 4 springs within the wider study area.

## Geology and soils

- 10.5.13 The LandIS Soilscapes map indicates that the soil type within the Proposed Development area predominantly comprises freely draining acid loamy soils over rock, with a loamy texture and medium carbon content. In the northeast of the Proposed Development area there is an area shown as having very acid loamy upland soils with a wet peaty surface, a peaty texture and high carbon content.
- 10.5.14 A Phase 1 peat depth survey was undertaken by WSP in 2021 and is provided in **Chapter 11: Ground Conditions** of the Draft ES. Based on the findings of the survey, which reported minor peat depths up to 0.01m thick, it was concluded that peat is not present across the Proposed Development area.
- 10.5.15 The BGS online geology mapping indicates that there are no superficial deposits within the Proposed Development area. In the wider study area there is very limited superficial deposits area, and where these are present are consistent with the valley floors. The Afon Ebwy flows across Alluvium (clay, silt, sand, and gravel) and occasional Glaciofluvial Deposits (sand and gravel). The lower reaches of Nant Gawni (tributary of Afon Ebwy) are underlain by Head Deposits (clay, silt, sand and gravel). The Trosnant Brook is underlain by Head (clay, silt and gravel) and Alluvium (clay, silt, sand, and gravel) superficial deposits, the latter of which is characteristic of the Afon Lwyd valley.
- 10.5.16 The study area is underlain by the Carboniferous South Wales Upper Coal Measures Formation, which is described as coal-bearing mudstone/siltstones with seat-earths and minor grey sandstones, coals, and ironstones. The South Wales Upper Coal Measures Formation is comprised of the Hughes Member (sandstones with small, localised areas of mudstone and siltstone) which underlies the Proposed Development area and Rhondda Member (Pennant Sandstones with thin mudstone/siltstone and seat-earth interbeds and



mainly thin coals) which underlies the Afon Ebwy and Nant Gwyddon valleys. BGS borehole logs within the study area show the geology to consist of dark grey gritstone with coal and clay layers, fractured and weathered in places.

## Hydrogeology

- 10.5.17 The South Wales Upper Coal Measures and Alluvium deposits within the study area are classified by NRW as Secondary A Aquifers which by definition are “*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*”. These are generally aquifers formerly classified as minor aquifers.
- 10.5.18 The Proposed Development and the wider study area are not within a Source Protection Zone (SPZ).

## Water Resources - Abstractions

- 10.5.19 The South East Valleys Abstraction Licensing Strategy<sup>61</sup> which encompasses the Proposed Development area, indicates that the Afon Ebwy has water resources available at least 50% of the time. However, there is no water available during low flows.
- 10.5.20 According to the NRW Licensed Water Abstractions dataset, there are no licensed groundwater and surface water abstractions within the Proposed Development area. Within the wider study area there are two abstraction licences, one from a borehole and used for industrial dust suppression and the other from surface water and used for a fish pass (**Table 10.8**). These are shown on **Figure 10.6**.

**Table 10.8 Licensed water abstractions within study area\***

Permit no.	NGR	Source type	Purpose	Max hourly abstraction volume (m <sup>3</sup> /hour)	Distance from Proposed Development boundary (km)	Scoped in/Scoped out
<b>20/56/6 2/0018</b>	ST 22281 96340	Groundwater (borehole)	Industrial dust suppression	2.5	0.24 West	<b>Scoped in</b> as abstraction is downstream from Proposed Development.
<b>WA/056 /0062/0 02</b>	ST 21630 95860	Surface Water (Afon Ebwy)	Fish pass	n/a	0.78 West	<b>Scoped in</b> as abstraction is downstream from Proposed Development.

Notes: \*Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved.

- 10.5.21 Data provided by CCBC indicates that there is one private abstraction within the Proposed Development area at Glan Shon Farm and five additional abstractions within the wider study area, location shown in **Figure 10.6** and details provided in **Table 10.9**).

<sup>61</sup> NRW (2017) South East Valleys Abstraction Licensing Strategy: A licensing strategy to manage water resources sustainably. (Online) Available at: [sev-licensing-strategy-final-nov-17.pdf \(naturalresources.wales\)](#) (Accessed July 2023)

**Table 10.9 Private Water Abstractions within study area**

Name	NGR	Usage	Distance from Proposed Development Boundary (km)	Scoped In/Out
<b>Glan Shon, Newbridge</b>	ST 22467 95970	Domestic use	Within Proposed Development area	<b>Scoped in</b> as abstraction is within Proposed Development area.
<b>Rhyswg Fawr Farm House, Cwmcarn</b>	ST 22662 94602	Domestic use	1.214 South	<b>Scoped in</b> as abstraction is downslope of Proposed Development.
<b>Rhyswg Ganol Farm, Rhyswg Mountain Road, Cwmcarn</b>	ST 23807 94827	Domestic use	1.363 South	<b>Scoped in</b> due to proximity of abstraction to Proposed Development.
<b>Blaengawney Farm, Hafodyrynys, Crumlin</b>	ST 22976 97862	Domestic use	0.098 West	<b>Scoped in</b> as abstraction is downslope of Proposed Development.
<b>Pen Y Caeau Farm, Abercarn, Mountain Road, Hafodyrynys</b>	ST 23236 98284	Domestic use	0.006 North	<b>Scoped in</b> due to proximity of abstraction to Proposed Development.
<b>Cilonydd Farm, Pantside, Newbridge</b>	ST 22893 97164	Domestic use	0.296 West	<b>Scoped in</b> as abstraction is downslope of Proposed Development.

10.5.22 Information provided by DCWW indicates that the new site access road (northwest of the Proposed Development) connecting to Old Pant Road crosses a watermain at two locations (**Figure 10A.9** of the FCA, **Appendix 10A**).

### Water Resources - Discharges

10.5.23 Data provided by NRW indicates there are no discharge consents within the Proposed Development area. There are three discharge consents to surface water and one to groundwater within the wider study area. The discharges are distributed across the watercourses as follows:

- One associated with the Afon Ebwy
- One associated with the Nant Gwyddon
- One associated with the Nant Hafod-fach

## Water Quality

- 10.5.24 As part of the WFD, River Basin Management Plans (RBMPs) have been prepared for all of the river basin districts in England and Wales. The RBMPs are designed to protect and improve the water quality of the water environment by advising on which actions should be taken to tackle water related issues. This includes measures to improve water quality in rivers, lakes, estuaries, coasts and in groundwater. The Water Environment study area is covered by the RBMP for the Severn River Basin District.
- 10.5.25 The Proposed Development area and wider study area are underlain by a WFD reportable groundwater body identified as the SE Valleys Carboniferous Coal Measures (GB40902G201900). The groundwater body has an Overall WFD status of 'Good'. However, it is classified as 'Poor' in terms of its Chemical status (**Table 10.10**). The driving element for not achieving 'Good' WFD status was based on the chemical dependent surface water body status.

**Table 10.10 Summary of the WFD groundwater bodies and associated status definitions within study area**

SE Valleys Carboniferous Coal Measures	
Type	Groundwater
Water body identifier	GB40902G201900
NRW area	WA South East
HMWB	Natural
Overall status	Poor
Chemical status	Poor

Notes: Source: <https://cyfoethnaturiolcymru.sharefile.eu/share/view/sc8f1ea840a594d32a5ac24f3aa3c2350> (Accessed October 2023). Status definitions from 2021 WFD classification (Cycle 3).

- 10.5.26 The study area falls within the Severn River Basin District and lies across the Afon Ebwy (conf Ebbw Fach to Maes-glas) WFD waterbody catchment, with a small area to the northeast crossing over the Afon Lwyd (source to Mon and Brecon Canal) WFD waterbody catchment (**Figure 10.2**). A summary of the WFD surface waterbody catchments, is provided in **Table 10.11**. The Proposed Development land parcels are located entirely within the Afon Ebwy (conf Ebbw Fach to Maes-glas) WFD waterbody catchment, which has achieved an overall classification of 'Moderate' in the 2021 WFD Classification (Cycle 3).

**Table 10.11 Summary of the WFD surface waterbody and its associated status definitions within study area**

	Afon Ebwy - conf Ebbw Fach R to Maes-glas	Afon Lwyd – source to Mon and Brecon Canal
Type	River	River
Waterbody identifier	GB109056026910	GB109056032912

<b>Catchment</b>	South East Valleys	South East Valleys
<b>HMWB</b>	Yes	No
<b>Overall status</b>	Moderate	Moderate
<b>Ecological status</b>	Moderate	Moderate
<b>Chemical status</b>	Moderate	High

Notes: HMWB – heavily modified waterbody

Source: <https://waterwatchwales.naturalresourceswales.gov.uk/en/> (accessed July 2023).

Status definitions from 2021 WFD classifications (Cycle 3).

- 10.5.27 The driving elements<sup>62</sup> for the Afon Ebwy not achieving ‘Good’ WFD status are based upon impacts to fish and polycyclic aromatic hydrocarbons (PAHs) within the river. The driving factors for the Afon Lwyd not achieving ‘Good’ WFD status were fish, and fish and phosphorous pollution. Local targeted measures for the watercourses relate to improved control of diffuse and point source pollutants, as well as improvements to the river hydrogeomorphology for habitat or fish passage. A WFD assessment has been carried out and is provided in **Appendix 10D**.
- 10.5.28 Groundwater quality data and surface water quality data within the study area (2013-2023) were provided by NRW (**Appendix 10C**). The surface water quality monitoring data is summarised in **Table 10.12**, showing the mean values for some of the key surface water quality parameters (where measured). Groundwater quality data is summarised in **Appendix 10C** and shows that groundwater quality is generally good within the study area as nitrate concentrations remain below drinking water standards (50mg/l) and pH is slightly acidic. Heavy metal concentrations are on average below drinking water standards but do occasionally exceed these values.

**Table 10.12 Summary of the NRW surface water quality monitoring data within the vicinity of the Study Area**

Station Name	Watercourse	Distance from Proposed Development (km)	NGR	Average pH	Average Dissolved Oxygen (% saturation)	Average Total Oxidised Nitrogen (mg/l as N)	Average Orthophosphate, reactive (mg/l as P)
<b>R Ebbw Fawr, Newbridge</b>	Afon Ebwy	1.5km W	ST2116596 941	8.00	99.74	0.77	0.03
<b>Ebbw at McCarth</b>	Afon Ebwy	1.2km NW	ST2122098 655	7.90	98.52	0.72	0.03

<sup>62</sup> See: Natural Resources Wales (2022). Water Watch Wales (Online) Available at: <https://waterwatchwales.naturalresourceswales.gov.uk/en/> (Accessed July 2023)

Station Name	Watercourse	Distance from Proposed Development (km)	NGR	Average pH	Average Dissolved Oxygen (% saturation)	Average Total Oxidised Nitrogen (mg/l as N)	Average Orthophosphate, reactive (mg/l as P)
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### y's GRG, Crumlin

Notes: Data for 2013-2023

- 10.5.29 The surface water quality data suggests that average Dissolved Oxygen saturation is sufficiently high to support aquatic life within the Afon Ebwy. Similarly, Nitrogen and Orthophosphate concentrations indicate the river is of good ecological health. Average pH indicates that the river is slightly basic.

### Flood risk

#### Terminology

- 10.5.30 In this chapter, the probability of a flood occurring is expressed in terms of Annual Exceedance Probability (AEP), which is the inverse of the annual maximum return period. For example, the 100-year flood can be expressed as the 1% AEP flood, i.e., a flood that has a 1% chance of being exceeded in any year. **Table 10.13** is provided to clarify the use of the AEP terminology as well as a description of the flood band definitions as used by the NRW, and the Welsh Flood Zones set out in the Welsh Assembly Government's Technical Advice Note 15 (TAN-15) Development Advice Map (DAM) and associated guidance.
- 10.5.30 Technical Advice Note 15: Development and Flood Risk (TAN15 – July 2004)<sup>63</sup> was produced by the then Welsh Assembly Government (now the Welsh Government). TAN15 provides technical guidance which supplements the policy set out in Planning Policy Wales (Edition 11, December 2018) (Welsh Assembly Government, 2018<sup>64</sup>) in relation to development and flooding, providing a framework within which risks arising from both river and coastal flooding, and from additional runoff from development in any location, can be assessed. Consultation on an updated version of TAN15 has been completed (April 2023<sup>65</sup>). The draft update includes a range of changes to the guidance, in particular it removes reference to the Development Advice Map (DAM) and refers to a Flood Map for Planning (FMfP) held by NRW. However, the consultation draft clearly states that TAN15 (2004) remains current until such a time that the replacement is confirmed. TAN15 (2004) has therefore been used to underpin this assessment.
- 10.5.31 The updated FMfP mapping and Flood Risk Assessment Wales Map have been used as a further reference point for the assessment of flood risk to the Proposed Development,

<sup>63</sup> Welsh Government. 2004. *Technical Advice Note 15: Development and Flood Risk*. Planning Policy Wales. (Online) Available from: <https://gov.wales/sites/default/files/publications/2018-09/tan15-development-flood-risk.pdf> (Accessed June 2023).

<sup>64</sup> Welsh Assembly Government. 2018. *Planning Policy Wales*. (Online) Available from: <https://www.gov.wales/planning-policy-wales> (Accessed June 2023)

<sup>65</sup> Welsh Government. 2023. *Technical Advice Note 15: Development, flooding and coastal erosion - further amendments*. (Online) Available from: <https://www.gov.wales/technical-advice-note-tan15-development-flooding-and-coastal-erosion-further-amendments-html> (Accessed June 2023)

given that this is understood to be a more contemporary dataset utilising the latest and improved datasets.

- 10.5.32 A Flood Consequence Assessment (FCA) has been prepared and included as **Appendix 10A**. The flood risk summary is provided in the sub-sections below.

**Table 10.13 Flood Zone definitions and associated annual exceedance probability**

Flood Zone	Probability of flooding	AEP	Definition
<b>Development Advice Map</b>			
<b>Flood Zone A</b>	Considered to be at little or no risk of fluvial or tidal/coastal flooding	-	Used to indicate that justification test is not applicable and no need to consider flood risk further.
<b>Flood Zone B</b>	Areas known to have been flooded in the past evidenced by sedimentary deposits.	-	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1% AEP) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further
<b>Flood Zone C1 (developed and served by significant flood defences)</b>	Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	Equal or greater than 0.1% AEP (river, tidal or coastal)	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
<b>Flood Zone C2 (no significant flood defences)</b>	Areas of the floodplain without significant flood defence infrastructure.	Equal or greater than 0.1% AEP (river, tidal or coastal)	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.
<b>Flood Map for Planning</b>			
<b>Flood Zone 1</b>	Very low probability	<0.1% AEP of flooding	Land with less than 0.1% AEP (1 in 1,000) probability of flooding from rivers or the sea, in any given year,
<b>Flood Zone 2</b>	Low probability	Between 1% and 0.1% AEP of river flooding Between 1% and 0.5% AEP of sea flooding	Land with 0.1% to 1% (1 in 1000 to 1 in 100) probability of flooding from rivers in a given year, including the effects of climate change; or Land with 0.5% to 1% (1 in 200 to 1 in 100) probability of flooding from the sea in a given year, including the effects of climate change.



Flood Zone	Probability of flooding	AEP	Definition
<b>Flood Zone 3</b>	Medium and high probabilities	>1% AEP of river flooding >0.5% AEP of sea flooding	Land having a 1 in 100 or greater probability of river flooding in any year; or Land having a 1 in 200 probability or greater of sea flooding in any year, including the effects of climate change.

#### Flood risk from surface water and small watercourses

<b>Flood Zone 1</b>	Very Low Probability	Less than 0.1% AEP of flooding	Land with less than 1 in 1,000 probability of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.
<b>Flood Zone 2</b>	Low Probability	Between 1% and 0.1% AEP of flooding	Land with between a 1 in 100 and 1 in 1,000 probability of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.
<b>Flood Zone 3</b>	Medium and High Probabilities	> 1% AEP of flooding	Land having a 1 in 100 or greater probability of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.

#### Groundwater flood risk

N/A	N/A	N/A	Flood risk bands assessed by professional judgement, in the absence of criteria set by NRW.
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#### Sewer flood risk

N/A	N/A	N/A	Flood risk bands assessed by professional judgement, in the absence of criteria set by NRW.
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#### Artificial flood risk

N/A	N/A	N/A	Flood risk assessed on the basis of flood extent shown on NRW Flood Risk from Reservoir Map.
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### Historical Flooding

- 10.5.33 NRW's Flood Map for Planning includes extent of historical flood event. The mapping shows that there are no recorded historical flood events within or in proximity to the Proposed Development. The only event recorded within the study area, occurred in Trecelyn in December 1979. This event occurred over 1.5km to the west and at significantly lower elevations (110mAOD) than the Proposed Development (290 to 345mAOD; **Table 10.6**) area.

### Fluvial and Tidal Flood Risk

- 10.5.34 The DAM shows that the Proposed Development area is located entirely within Flood Zone A (little or no risk of fluvial flooding) (**Figure 10.2**). The NRW's FMfP for Rivers (**Figure 10.3**) shows that the Proposed Development area is located entirely within Flood Zone 1; and is therefore at very low probability of flooding from these sources (<0.1% AEP). The closest areas of higher flood risk (FMfP Flood Zones 2 / 3 or DAM Flood Zones B / C) within the wider study area are associated with the Afon Ebwy 700m to the west, the Nant Gwyddon 525m to the south and the Troisant Brook 950m to the north of the study area. This mapped fluvial flooding follows ground at an elevation of 90 to 130, well below the elevation of the Proposed Development (290 to 410mAOD).
- 10.5.35 It is noted that fluvial flood mapping only maps the flood risk associated with the larger watercourses, as such the small watercourses within the study area do not have mapped fluvial Flood Zones. For these watercourses, the Surface Water Flood Risk map (**Figure 10.4**) provides an indication of the extent of flood risk.
- 10.5.36 The risk of flooding from the sea is minimal on account of the elevation of the Proposed Development, which ranges between 290mAOD and 410mAOD (**Table 10.6**), and distance from the coast.
- 10.5.37 On the basis of the Flood Zone classification and elevation of the Proposed Development, the assessed risk of fluvial flooding is considered to be low. Similarly, the locality is not determined to be at risk of tidal flooding, due to the elevation above sea level.

### Surface Water Flood Risk

- 10.5.38 For context, surface water flooding occurs when the intensity of rainfall is greater than the local drainage and infiltration capacity, causing water to flow overland. Where low-points or barriers to flow are present, particularly deep areas of flooding may occur. These areas are not limited to river corridors or floodplains.
- 10.5.39 NRW's FMfP for Surface Water and Small Watercourses indicates that the majority of the Proposed Development (and wider study area) is at very low risk of flooding (Flood Zone 1, <0.1% AEP) from surface water as presented in **Figure 10.4**. Small areas of low to high flood risk (Flood Zones 2 and 3, 0.1% to >3.3% AEP) are shown on localised lower-lying areas which include small watercourses (Nant Gwyddon, Nant Hafod-fach and Nant Gawni) and ponds. A summary of the baseline surface water flood risk across the Proposed Development land parcels is provided in **Table 10.14**.

**Table 10.14 Summary of the baseline surface water flood risk for the Proposed Development**

Proposed development land parcel	Hydrology summary
<b>Northern</b>	Entirely within area of very low risk of flooding from surface water (Flood Zone 1, <0.1% AEP) except for minor flowpath of low to high flood risk (Flood Zones 2 and 3, 0.1% to >3.3% AEP) originating on the southern edge of the land parcel (unnamed tributary of the Nant Gawni).
<b>Central</b>	Entirely within area of very low risk of flooding from surface water (Flood Zone 1, <0.1% AEP).

## Southern

Entirely within area of very low risk of flooding from surface water (Flood Zone 1, <0.1% AEP) except for minor localised areas of low to high risk (Flood Zones 2 and 3, 0.1 to >3.3% AEP) which are associated with a pond (Pwllgwinau) and minor flowpath originating on the western edge of the land parcel (unnamed tributary of the Nant Hafod-fach).

### Groundwater Flood Risk

- 10.5.40 Groundwater flooding arises from water issuing to the surface from the underlying aquifer; tending to take place over long periods of sustained heavy rainfall resulting in elevated groundwater levels. Areas most at risk tend to be situated over permeable geology and are located in low-lying areas where the local water table is close to or at the ground surface.
- 10.5.41 The BGS mapping indicates that there are no superficial deposits in the Proposed Development area. The Hughes Member bedrock underlying the Proposed Development is designated as a Secondary A aquifer and comprises sandstones/gritstones containing localised units of mudstone, clay and siltstone and with permeability likely to be enhanced by fractures. As the Proposed Development occupies a hilltop location between two deeply incised valleys with no expression of shallow groundwater (e.g., springs or wells), it suggests that the geology is relatively permeable and the groundwater table lies at depth.
- 10.5.42 Where groundwater may be encountered, it is likely to be perched and in small quantities. This is due to the Proposed Development area being at a topographic high and the underlying geology comprising bands of both higher and lower permeability bedrock layers. The CCBC Local Flood Risk Management Plan<sup>66</sup> indicates that groundwater flooding is not considered a significant issue the Abercarn area which includes the Proposed Development area.
- 10.5.43 Overall, this suggests that there is low likelihood of encountering groundwater during excavation activities associated with the Proposed Development construction; and where groundwater is encountered it will likely be in small quantities and is not considered to be a significant source of potential flood risk.

### Sewer Flood Risk

- 10.5.44 Sewer flooding occurs when the local capacity of the underground drainage network is exceeded resulting in the surcharging of water to the surface. The discharge of the drainage network into watercourses can also be affected by overall system capacity (i.e., where pumped), or high-water levels in the receiving waters obstructing the drainage of network outfalls. It is anticipated that there are few sewer drainage networks within the Proposed Development site.
- 10.5.45 The Proposed Development is situated away from developed areas. It is anticipated that there are no/few sewer drainage networks within the Proposed Development area within which water levels could feasibly rise to an extent that would result in flooding of the area. Any flows surcharging from minor sewer systems associated with nearby farm buildings (e.g., Glan-Shon Farm within the southern land parcel) would be expected to be minimal/intercepted by the local watercourses. In the wider study area sewer drainage

<sup>66</sup> Caerphilly County Borough Council (2015) Local Flood Risk Management Plan. (Online) Available from: <https://www.caerphilly.gov.uk/caerphillydocs/roads-and-pavements/flood-risk-mgt-plan-dec2015.aspx>. Accessed 30/10/23.

networks serve the towns/villages of Trecelyn and Abercarn but these are at significantly lower elevations (less than 210mAOD) than the Proposed Development (higher than 290mAOD).

- 10.5.46 On this basis, owing to the lack of source, the risk of sewer flooding in the area is considered to be low and is not considered further in this assessment.

### *Artificial Flood Risk*

- 10.5.47 The NRW Reservoir Flood Risk Map (**Figure 10.5**) shows that the Proposed Development area is not within an area of reservoir flood risk. In the wider study area, flooding from artificial sources is predicted along the Afon Ebwy, 700m west of the Proposed Development and at a significantly lower elevation (90 to 125mAOD) than the Proposed Development (290 to 410mAOD). This is associated with potential failure/breach of reservoirs upstream of the study area with flood water flowing south along the valley. No raised bodies of water are proposed as part of the development.
- 10.5.48 On this basis risk of flooding from artificial sources in the area is considered to be low and is not considered further in this assessment.

### *Biodiversity sites*

- 10.5.49 A number of designated sites for biodiversity conservation have been identified within the Water Environment study area and surroundings in **Chapter 8: Biodiversity** of the Draft ES. These include one statutory designated site (Ty'r Hen Forwyn SSSI) and several non-statutory designated sites (SINCs).
- 10.5.50 Ty'r Hen Forwyn SSSI comprises freely draining fields supporting species rich neutral grassland and therefore the conditions of the SSSI are not water dependent. The SSSI is located within the Afon Lwyd waterbody catchment, to the north of the Trosnant Brook; as such there is no potential hydrological connectivity between the Proposed Development and the SSSI.
- 10.5.51 A description of the SINCs within the study area which have a water component, and therefore could potentially be impacted by the Proposed Development is provided in **Table 10.15**.

**Table 10.15 Summary of water-dependent SINCs with potential hydrological connectivity to the Proposed Development (within study area)**

Site	Ecological interest	Distance from Proposed Development	Hydrological/hydrogeological connectivity
<b>Pwllgwinau, East of Newbridge</b>	Muddy pond surrounded by semi-improved pasture with little emergent or aquatic vegetation. Notable for great crested newt, palmate newt, smooth newt and common frog.	Within Proposed Development south land parcel	Within Proposed Development area and in close proximity to turbine 3 and access track.  Scoped into the assessment
<b>Mynydd Maen, East of Newbridge</b>	Comprises a large upland common with extensive areas of acid	Partially within the Proposed Development northern land parcel	Crosses the access road and in close proximity to the Proposed

grassland, heath and bracken with a number of indicator species. Locally significant bryophyte species also present. Secondary features include rock outcrops/dry stone walls, marshy grassland, semi-improved acid grassland aquatic features.

Development. There is potential for the development to affect the SINC.

Scoped into the assessment

<p><b>Coed Cil-Lonydd, East of Newbridge</b></p>	<p>This SINC follows the course of two branches of the wooded Nant Gawni stream and includes two adjoining woodland blocks of former ancient woodland on the steep valley sides. Adjoining woodland SINC areas support a mix of semi-natural woodland.</p>	<p>Adjacent to Proposed Development northern land parcel</p>	<p>Includes the Nant Gawni, downstream of the Proposed Development. There is potential that the Proposed Development could affect the SINC.</p> <p>Scoped into the assessment</p>
<p><b>Gwydon Valley Woodlands, Abercarn</b></p>	<p>Large area of forestry plantation on the site of former ancient woodland. Supports large beech trees and areas of larch plantation. Rock outcrops/dry stone walls and streams present.</p>	<p>Adjacent to Proposed Development central and southern land parcel</p>	<p>In close proximity to the Proposed Development and includes the Nant Gwyddon. There is potential that the Proposed Development could affect the SINC.</p> <p>Scoped into the assessment</p>
<p><b>Craig Gwent Wood Ancient Woodland</b></p>	<p>Comprises a large upland common with extensive areas of acid grassland, heath and bracken. Secondary features include rock outcrops/dry stone walls, marshy grassland, semi-improved acid grassland aquatic features</p>	<p>325m north of Proposed Development northern land parcel</p>	<p>Comprises aquatic features and is located on the edge of Trosnant Brook. There is potential that the Proposed Development could affect the SINC.</p> <p>Scoped into the assessment</p>
<p><b>Coedcae Watkin Dafydd, East of Crumlin</b></p>	<p>A north-west-facing slope supporting a mix of conifer plantation and patches of broadleaved woodland. Patches of acid grassland and flush species supported.</p>	<p>445m northeast of Proposed Development northern land parcel</p>	<p>Tributary of Trosnant Brook flows through and is downstream of Proposed Development. There is potential that the Proposed Development could affect the SINC.</p> <p>Scoped into the assessment</p>

<b>River Ebbw</b>	This SINC comprises the full length of the Afon Ebwy within the county borough and adjacent semi-natural habitats. Represents a significant linear wildlife corridor for fish species and otter..	734m west of Proposed Development	Includes the Afon Ebwy downstream of the Proposed Development. There is potential that the Proposed Development could affect the SINC.  Scoped into the assessment
<b>Monmouth to Brecon Canal</b>	This canal forms an important linear corridor for a variety of species. Supports wetland habitat with good bankside plant communities and broadleaved woodland with an assemblage of semi-natural indicator species.	777m west of the Proposed Development southern land parcel	Includes the Monmouthshire and Brecon Canal downstream of the Proposed Development. There is potential that the Proposed Development could affect the SINC.  Scoped into the assessment
<b>Cwm Pennar, Abercarn</b>	Predominantly woodland with some marshy and semi improved acid grassland. A stream flows within the SINC.	1250m west of Proposed Development southern land parcel	No potential pathway for hydrological connectivity, and therefore unlikely to be affected.  Scoped out of the assessment
<b>Pontbren, North of Crumlin</b>	Predominantly woodland with areas of acid grassland. In the Northeast there is a small, heavily poached pond and small flush/ stream downstream from it.	680m north of Proposed Development northern land parcel	No potential pathway for hydrological connectivity, and therefore unlikely to be affected.  Scoped out of the assessment
<b>Distillery Pond, Abercarn</b>	Pond with wetland vegetation at margins.	1.15km South West of Proposed Development south land parcel	Pond is situated along the Nant Gwyddon and downslope of the Proposed Development. There is potential that the Proposed Development could affect the SINC.  Scoped into the assessment
<b>Cwm Farm Pond</b>	A pond with water-margin vegetation and surrounded by semi-improved and unimproved grassland.	1.05km North of Proposed Development north land parcel	No potential pathway for hydrological connectivity, and therefore unlikely to be affected.



			Scoped out of the assessment
<b>Ebbw River South Tip Section</b>	A section of the Afon Ebwy.	1.33km North West of Proposed Development north land parcel	Upstream of Proposed Development. Scoped out of the assessment
<b>Swffryd-fach</b>	Predominantly grassland with several pools and wet flushes. A small pond is located along the northern boundary	1.11km North of Proposed Development north land parcel	Upstream of Proposed Development. Scoped out of the assessment

## Future baseline

10.5.52 Hydrological and hydrogeological baseline conditions may change even if the Proposed Development is not built out, for the following reasons:

- Climate change will result in increased rainfall seasonality, with generally wetter winters and drier summers; high-intensity rainfall events will become more common. This will lead to greater variation in river flows (low flows and high flows), and increases in flood risk;
- The location and rate of surface water and groundwater abstractions in the area could vary over time and may result in changes to the WFD surface water and groundwater body status and SPZ designations;
- Improvements to WFD waterbody status associated with improvements to individual quality elements (i.e., phosphate reduction) would result in higher-quality, more sensitive waterbodies; and
- Other new development (e.g., urbanisation settlements) along the valley bottoms may result in changes in hydrological baseline such as surface water runoff (flow and pathways) and increase the number of development receptors.

## 10.6 Embedded measures

10.6.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Section 3.4. Table 10.16** outlines how these embedded measures will influence the Water Environment assessment. As a consequence, the potential effects of the Proposed Development are evaluated with these embedded measures in place.

**Table 10.16 Summary of the embedded environmental measures**

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
<b>Construction Phase</b>			
<b>Aquatic environment receptors</b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy Trosnant <b>Brook</b> ), ponds and non-statutory designated sites for biodiversity conservation (SINCs).	Temporary increase in sediment-loading of surface water runoff from construction areas leading to deterioration in the surface water quality environment, deterioration in the status of WFD surface water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation..	<b>ID1 - Good working practices</b> Good working practices will be implemented during construction, with adherence to the Outline Construction Environmental Management Plan (CEMP), which will be secured through a planning consent condition, and relevant guidance.	CEMP
		<b>ID2- Water Management Plan (WMP)</b> Implementation of an appropriate Water Management Plan (WMP) for the construction phase of the Proposed Development, utilising SuDS principles, including collection, conveyance and attenuation/infiltration storage where suitable. Suitable temporary silt fencing, bunding and water quality measures (i.e., silt capture to maintain storage volume) will be included in the design of these works. Sufficient capacity will be provided on-site to hold runoff prior to discharge runoff to ground and/or any water discharge into watercourses is limited to greenfield rates. A water quality monitoring programme will be agreed with NRW and implemented prior, during and following construction to ensure that the measures taken to protect the water environment are effective.	CEMP
		<b>ID3 – Water discharges</b> Further investigation of the viability of infiltration as a means by which surface water runoff and, if required, any water accumulating at the base of the excavations (most likely comprising rainfall runoff) could be discharged to ground will be undertaken through liaison with CCBC and by undertaking soakaway testing	CEMP

exercises. Information from the future Phase 2 Geo-environmental Ground Investigation (details provided in **Chapter 11: Ground Conditions** of the Draft ES) will also be considered to assess the potential for introducing pollutants pathways to groundwater via leaching from contaminated soils. In the case that the soakaway testing concludes that infiltration is not solely sufficient in managing runoff, and discharge to the watercourses is required, this will be subject to a consent from the NRW or CCBC. The water discharge would be suspended if a flood alert or flood warning is in place downstream (and the discharges from the Proposed Development site could feasibly contribute to the flood event).

Any discharge to surface water would be restricted to the greenfield runoff rate and will be treated in a suitable basin/trench before discharging.

CEMP

#### **ID4 - Materials Management Plan**

Excavated materials during construction works should be segregated and stored/ re-used on-Site in accordance with a Materials Management Plan (in compliance with the CL:AIRE Definition of Waste: Code of Practice). Any temporary on-site storage of excavated materials suspected or confirmed to be contaminated will be on impermeable sheeting, covered over and with adequate leachate / runoff drainage to prevent migration of contaminants from the stockpile. Materials will be segregated where possible to prevent cross-contamination occurring. Such materials will only be reused if they are confirmed as suitable for use in line with the requirements of the Materials Management Plan.

CEMP

#### **ID5 – Soil stockpiles**

Stockpiles will be appropriately maintained and have the minimum lifespan possible, with materials being reinstated as construction works progress. Where these remain in situ for 3 months or longer, seeding

management techniques will be used. Stockpiles will be stored exclusively within areas of very low flood risk (Flood Zone A in the DAM or Flood Zone 1 in the FMfP).

CEMP

**ID6 - Standoff distance**

No works will be undertaken within 3m of any watercourse (other than for watercourse crossings and drainage mitigation). Any works within 8m of non-tidal Main River will be subject to a Flood Risk Activity Permit (FRAP) from NRW. Any works within 8m of an Ordinary Watercourse will be subject to a Land Drainage Consent (LDC) from CCBC.

**Aquatic environment receptors**  
Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, , unnamed watercourses), WFD surface waterbodies (Afon Ebwy Trosnant Brook), ponds and non-statutory designated sites for biodiversity conservation (SINCs).

Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance.

See measures **ID1 (Good working practices), ID2 (WMP), ID3 (Water discharges), ID5 (Materials Management Plan) and ID5 (Soil stockpiles)**

CEMP

**ID7 - Watercourse/surface water flow path crossings**

Access tracks crossing mapped surface water flow paths or Ordinary Watercourses (proposed at one location) will require appropriately sized culverts to maintain existing flow conveyance. The design of any new culverts will be confirmed as part of the detailed drainage design and be subject to Ordinary Watercourse consent by CCBC.

CEMP

Crossing points of any pre-existing structures (expected at three locations) will be surveyed prior to construction works (post consent) to establish the structural integrity of the crossings. Suitable mitigation measures will be identified and proposed, where necessary and applicable, to ensure no detrimental impact to the structure. Should it be deemed necessary for the culvert to be upgraded, any new culverts required will be sized at the detailed design stage in consultation and subject to consent from CCBC.

**ID8 - Underground cables**

CEMP

		<p>The underground cables linking the turbines to the substation will be constructed in discrete sections with the reinstatement process commenced in as short a timeframe as practicable.</p>	
<p><b>Aquatic environment receptors</b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy Trosnant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and non-statutory designated sites for biodiversity conservation (SINCs)</p>	<p>Accidental release of pollution into surface water or ground by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p>	<p>See measures <b>ID1 (Good working practices), ID2 (WMP), ID3 (Water discharges) and ID4 (Materials Management Plan)</b></p> <p><b>ID9 – Fuel, oil and chemicals storage (construction phase)</b> Areas of construction compounds that are used for fuel storage, plant maintenance and refuelling will be surfaced with fully impermeable materials to prevent any infiltration of contaminated runoff and contain bunding. An effective accident response protocol will be developed to ensure any spillages or potential pollution incidents are dealt with appropriately including the provision of containment for spills of contaminated liquids. Plant and machinery will be maintained to minimise the risks of oil leaks or similar. Any tanks containing oils, fuels and chemicals will be double skinned. There will be a bunded capacity of 100% of the maximum tank volume for non-hazardous fluids. For fuels or oils the bund capacity will be the larger of 110% of the largest tank volume for single tank bunds, (or, in the case of multi tank bunds, 110% of the largest tank capacity or 25% of the combined tank capacity, whichever is the largest). Fuel storage will be in accordance with Pollution Prevention Guidelines (PPGs). All stores of fuel will be located at least 20m from any watercourses and away from areas at risk of flooding. If concrete batching is to happen on Site, appropriate controls and water treatment facilities are to be agreed with NRW prior to construction. The use of sulphate resistant concrete is recommended.</p>	<p>CEMP</p> <p>CEMP</p>

<p><b>Aquatic environment receptors</b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy and Trosnant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures and non-statutory designates sites for biodiversity conservation (SINCs)</p>	<p>Discharge of potentially polluted water generated from construction activities (e.g. concrete batching, surface water runoff) into surface water or ground leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p>	<p>See measures <b>ID1 (Good working practices), ID2 (WMP), ID3 (Water discharges) and ID4 (Materials Management Plan)</b></p>	<p>CEMP</p>
<p><b>Aquatic environment receptors</b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, , unnamed watercourses), WFD surface waterbodies (Afon Ebwy Trosnant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and non-statutory designates sites for biodiversity conservation (SINCs)</p>	<p>Potential change in groundwater levels due to dewatering of excavations resulting in decrease in groundwater baseflow to watercourses, ponds and springs and deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p>	<p><b>ID10 – Turbine 3 excavation</b> Although shallow groundwater in the underlying Coal Measures is not anticipated, as a precautionary approach, it is proposed that:</p> <ul style="list-style-type: none"> <li>Phase 2 geo-environmental ground investigation, to be completed at the pre-construction stage (<b>Chapter 11: Ground Conditions</b> of the Draft ES), include monitoring of groundwater levels at a borehole (8m deep) between turbine 3 and the pond to confirm local groundwater level conditions;</li> <li>If the borehole is found to be dry, this indicates that there is no hydraulic connectivity between the pond and the turbine foundation excavation. This suggests that the excavation will not impact on water levels in the pond;</li> <li>If the borehole shows the presence of local shallow groundwater at or above the base of the excavation (4m depth), any water accumulating at the base of the excavation will be pumped and returned to the pond P10 overground after solids removal using sheep pens, silt fences or a settlement basin. The</li> </ul>	<p>CEMP</p>



design of these SuDS will comply with the CIRIA C75 Index Approach to managing water quality, which includes for the treatment of suspended solids and will be confirmed as part of the detailed drainage design in consultation with NRW.

<b>Water resources receptors</b> Private and licensed water abstractions	Potential change to water quality of a water supply resource which may affect the viability of an abstraction	See measures <b>ID1 (Good working practices), ID2 (WMP), ID3 (Water discharges), ID4 (Fuel/oil/chemicals storage) and ID5 (Materials Management Plan)</b>	CEMP
<b>Water resources receptors</b> Private and licensed water abstractions	Potential change to yield of a water supply resource which may affect the viability of an abstraction	No mitigation required	
<b>Water resources receptors DCWW's water main intersecting the access track.</b>	Damage to or obstruction of maintenance of DCWW's watermain potentially affecting local water supply	<b><u>ID11- Crossing of DCWW watermain</u></b> A suitable asset protection design for the locations where the proposed access track crosses DCWW's watermain (expected at two locations) will be developed and agreed with DCWW at detailed design stage (post-consent). Site meetings will be held with a DCWW inspector both prior to the construction works commencing (to mark the location and line of the watermain at the proposed crossing locations) and during the access track construction over the watermain.	CEMP
<b>Flood risk receptors People, property, and infrastructure at risk of flooding (downslope and adjacent to the Proposed Development area including properties at Pantside, Abercarn, Swffryd, Hafodyrynys and Newbridge)</b>	Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces (e.g., temporary construction compound (TCC), access tracks, crane pads)	See measures <b>ID4 (WMP) and ID3 (Water discharges).</b>	CEMP
<b>Flood risk receptors</b>	Changes to watercourse flow conveyance as a result of new	See measure <b>ID7 (Watercourse/surface water flow path crossings)</b>	CEMP

**People, property, and infrastructure at risk of flooding (downslope and adjacent to the Proposed Development area including properties at Panside, Abercarn, Swffryd, Hafodyrynys and Newbridge)**

or modified temporary watercourse crossings (e.g. culvert or bridge).

### Operational Phase

**Aquatic environment receptors**  
Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, , unnamed watercourses), WFD surface waterbodies (Afon Ebwy Trosnant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and non-statutory designated sites for biodiversity conservation (SINCs)

Accidental spillage of pollutants (fuel or oil) during maintenance activities leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation..

See measure **ID3 (Water discharges)**

DNS planning condition

#### **ID12 – Detailed drainage design**

Detailed drainage design for the operational wind farm development, utilising SuDS principles including attenuation storage where necessary, to ensure sufficient capacity is available on Site to discharge runoff to ground and/or watercourses (discharge limited to greenfield rates). The detailed drainage design will be prepared in accordance with the Drainage Strategy for the operational wind farm development included in the FCA (**Appendix 10A** of the Draft ES).

DNS planning condition

#### **ID13 – Fuel, oil and chemicals usage (operational phase)**

Following the construction phase there will be no requirement for fuel, oil or chemicals to be stored on Site, however, small quantities of fuel/oil/chemicals may need to be brought onto Site for maintenance activities. In these cases, only the minimum quantities possible should be brought on to Site and must be removed from Site following completion of works. The fuel/oil/chemicals must be kept in the appropriate containers and sealed when not used for refuelling. An effective accident response protocol will be developed to ensure any spillages or potential pollution incidents are dealt with appropriately including the provision of containment for spills of contaminated liquids. Plant and

DNS planning condition

machinery will be maintained to minimise the risks of oil leaks or similar.

**Water resources receptors  
Private and licensed water  
abstractions**

Potential change to water quality of a water supply resource which may affect the viability of an abstraction during maintenance activities

See measures **ID3 (Water discharges), ID12(Detailed Drainage Design) and ID13(Fuel/oil/chemicals storage (operational phase))**

DNS planning condition

**Flood risk receptors  
People, property, and  
infrastructure at risk of flooding  
(downslope and adjacent to the  
Proposed Development area  
including properties at  
Pantside, Abercarn, Swffryd,  
Hafodyrynys and Newbridge)**

Changes to surface water flood risk due to changes in runoff rates resulting creation of impermeable surfaces (e.g., substation, access tracks, crane pads)

See measures **ID3 (Water discharges) and ID12(Detailed Drainage Design)**

DNS planning condition

**ID14 – Temporary components**

Once construction is complete, any temporary components (such as working areas) will be removed, and the ground reinstated to preconstruction conditions. Any excavations will be backfilled using soil stockpile materials, slightly above natural ground level to allow for settlement.

**Flood risk receptors  
People, property, and  
infrastructure at risk of flooding  
(downslope and adjacent to the  
Proposed Development area  
including properties at  
Pantside, Abercarn, Swffryd,  
Hafodyrynys and Newbridge)**

Changes to watercourse flow conveyance as a result of new or modified temporary watercourse crossings (e.g., culvert or bridge).

See measures **ID7 (Watercourse/surface water flow path crossings)**

DNS planning condition

**Decommissioning Phase**

It is anticipated that similar measures to those embedded into the project design for the construction phase will be implemented.

## 10.7 Scope of the assessment

- 10.7.1 The scope of the following assessment is based upon a review of the baseline information detailed in **Section 10.5** and is to be confirmed through further consultation with stakeholders.

### Spatial Scope

- 10.7.2 The spatial scope of the Water Environment assessment covers the area of the Proposed Development, in addition to the associated Water Environment study area, which is defined in **Section 10.4**, and shown in **Figure 10.1**. The study area was defined as a 1.5km buffer around the Proposed Development boundary.
- 10.7.3 The spatial scope for the flood risk receptors includes people, property and infrastructure which would be at risk should flooding be influenced by the Proposed Development. Within this Water Environment chapter, only the potential effects to third party receptors are considered. The FCA (**Appendix 10A** of the Draft ES) assesses aspects of the development itself, in addition to third party receptors, in regard to increased flood risk.

### Temporal Scope

- 10.7.4 The temporal scope of the hydrology assessment is aligned with the period over which the Proposed Development will be carried out; inclusive of the construction, operational and decommissioning phases, as detailed below.
- 10.7.5 This will be achieved by considering the NPS EN-1 climate change emission scenarios appropriate for the Proposed Development's lifetime. The assessment has taken into account potential impacts on current and future water quality and hydromorphology using approaches consistent with the WFD.
- 10.7.6 The wind farm will be designed with an operational life of 30 years. At the end of this period the Applicant has three options; to decommission the wind farm and dismantle and remove the turbines; to apply for an extension to the operating period using existing equipment; or apply to install new equipment on the Site. For the purposes of this assessment, it is assumed that the wind farm will be decommissioned.

### Potential Receptors

- 10.7.7 Three types of receptors have been identified with respect to the water environment assessment:
- Aquatic environment receptors;
  - Water resources receptors; and
  - Flood risk receptors (people, property, and infrastructure at risk of flooding).
- 10.7.8 The principal Water Environment receptors within each of these broad receptor types are summarised in **Table 10.17**. The location of these receptors is shown in **Figure 10.6**.

**Table 10.17 Water Environment receptors subject to potential effects**

Receptor	Receptor ID	Reason for consideration
<b>Aquatic environment receptors - watercourses</b>		
<b>Afon Ebwy</b>	WC1	Main river and WFD surface waterbody (GB109056026910). Potential impacts on water quality.
<b>Nant Gawni</b>	WC2	Ordinary Watercourse. Not designated as a WFD surface waterbody. Discharges into the Afon Ebwy (Main River and WFD surface water body). Potential for impacts on water quality of Nant Gawni and downstream watercourse Afon Ebwy.
<b>Nant Hafod-fach</b>	WC3	Ordinary Watercourse. Not designated as a WFD surface waterbody. Discharges into the Afon Ebwy (Main River and WFD surface water body). Potential for impacts on water quality of Nant Hafod-fach and downstream watercourse Afon Ebwy.
<b>Nant Gwyddon</b>	WC4	Ordinary Watercourse. Not designated as a WFD surface waterbody. Discharges into the Afon Ebwy (Main River and WFD surface water body). Potential for impacts on water quality of Nant Gwyddon and downstream watercourse Afon Ebwy.
<b>Unnamed watercourse 1</b>	WC5	Ordinary Watercourse. Not designated as a WFD surface waterbody. Discharges into the Afon Ebwy (Main River and WFD surface water body). Potential for impacts on water quality of unnamed watercourse and downstream watercourse Afon Ebwy.
<b>Unnamed watercourse 2</b>	WC6	Ordinary Watercourse. Not designated as a WFD surface waterbody. Discharges into the Afon Ebwy (Main River and WFD surface water body). Potential for impacts on water quality of unnamed watercourse and downstream watercourse Afon Ebwy.
<b>Trosnant Brook</b>	WC7	A stretch of the watercourse is designated as a WFD surface waterbody and Main River. Discharges into Afon Lwyd (Main River and WFD surface water body)
<b>Unnamed watercourse 3</b>	WC8	Ordinary Watercourse. Not designated as a WFD surface waterbody. Drains into Trosnant Brook. Potential for impacts on water quality of unnamed watercourse and downstream watercourses Trosnant Brook and Afon Lwyd.
<b>Unnamed watercourse 4</b>	WC9	Ordinary Watercourse. Not designated as a WFD surface waterbody. Drains into Trosnant Brook. Potential for impacts on water quality of unnamed watercourse and downstream watercourses Trosnant Brook and Afon Lwyd.
<b>Unnamed watercourse 5</b>	WC10	Ordinary Watercourse. Not designated as a WFD surface waterbody. Drains into Nant Carn (An ordinary watercourse which discharges into the Afon Ebwy). Potential for impacts on water quality of unnamed watercourse and downstream watercourses Nant Carn and Afon Ebwy

Receptor	Receptor ID	Reason for consideration
<b>Aquatic environment receptors - Aquifers</b>		
<b>SE Valleys Carboniferous Coal Measures WFD Groundwater body</b>	AQ1	WFD groundwater body. Potential for impacts on WFD status as a result of changes to groundwater quality.
<b>Aquatic environment receptors – Ponds</b>	P1 to P13 (ID's based on Chapter 8: Biodiversity of the ES)	One pond (P10) located within the Proposed Development area and a further 12 ponds in the wider study area. Some of the ponds are non-statutory biodiversity designated Sites (SINCs). Potential for impacts on water quality of the ponds.
<b>Aquatic environment receptors – Springs</b>	SP1 to SP8	No springs within Proposed Development area. Total of 8 springs in the wider study area. Potential for impacts on water quality of the springs.
<b>Aquatic environment receptors – Non-statutory nature conservation Sites</b>		
<b>Pwllgwinau, East of Newbridge</b>	C1	Muddy pond (P10) surrounded by semi-improved pasture with little emergent or aquatic vegetation. Notable for great crested newt, palmate newt, smooth newt and common frog.
<b>Mynydd Maen, East of Newbridge</b>	C2	Comprises a large upland common with extensive areas of acid grassland, heath and bracken with a number of indicator species. Locally significant bryophyte species also present. Secondary features include rock outcrops/dry stone walls, marshy grassland, semi-improved acid grassland aquatic features.
<b>Coed Cil-Lonydd, East of Newbridge</b>	C3	This SINC follows the course of two branches of the wooded Nant Gawni stream and includes two adjoining woodland blocks of former ancient woodland on the steep valley sides. Adjoining woodland SINC areas support a mix of semi-natural woodland.
<b>Gwydon Valley Woodlands, Abercarn</b>	C4	Large area of forestry plantation including streams on the site of former ancient woodland. Potential for impact on water quality of the streams.
<b>Craig Gwent Wood Ancient Woodland</b>	C5	Large upland including semi-improved acid grassland aquatic features. Potential for impact on aquatic features.
<b>Coedcae Watkin Dafydd, East of Crumlin</b>	C6	A north-west-facing slope supporting a mix of conifer plantation and patches of broadleaved woodland. Patches of acid grassland and flush species supported. Potential for impact on water quality of the streams.
<b>River Ebbw</b>	C7	Comprises the full length of the Afon Ebwy within the county borough and adjacent semi-natural habitats. Potential for impact on the water quality of Afon Ebwy.
<b>Monmouth to Brecon Canal</b>	C8	This canal forms an important linear corridor for a variety of species. Potential for impact on water quality of the canal.
<b>Distillery Pond, Abercarn</b>	C9	Pond located on the Nant Gwyddon, with wetland vegetation at margins.



Receptor	Receptor ID	Reason for consideration
<b>Water resource receptors</b>		
<b>Licensed groundwater abstraction (industrial dust suppression)</b>	WR1	Located 0.24km west of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Licensed surface water abstraction (for fish pass)</b>	WR2	Located 0.78km west of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Private water supply, Glan Shon, Newbridge</b>	WR3	Located within the Proposed Development area. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Private water supply, Rhyswg Fawr Farm House, Cwmcarn</b>	WR4	Located 1.214km south of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Private water supply, Rhyswg Ganol Farm, Rhyswg Mountain Road, Cwmcarn</b>	WR5	Located 1.363km south of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Private water supply, Blaengawney Farm, Hafodyrynys, Crumlin</b>	WR6	Located 0.098km west of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Private water supply, Pen Y Caeau Farm, Abercarn, Mountain Road, Hafodyrynys</b>	WR7	Located 0.006km north of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>Private water supply, Cilonydd Farm, Panside, Newbridge</b>	WR8	Located 0.296km west of the Proposed Development. Potential increase in pressures on local water resources due to changes to water quality and quantity.
<b>DCWW's watermain</b>	WR9	Watermain intersects the proposed access track at two locations.
<b>Flood risk receptors</b>		
<b>Residential properties, industry/business properties located in and around Hafodyrynys</b>	FR1	Humans/properties/infrastructure downslope of the Proposed Development to the north, and at existing high risk of surface water flooding. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential properties, industry/business properties located in and around Swffryd</b>	FR2	Humans/properties/infrastructure downslope of the Proposed Development to the north with some areas at high risk of surface water flooding. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential properties, industry/business properties located in and around Newbridge</b>	FR3	Humans/properties/infrastructure downslope of the Proposed Development to the west, with large areas at existing high risk of fluvial flooding (associated with the Afon Ebwy) and surface water flooding. Potential for

Receptor	Receptor ID	Reason for consideration
		increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential properties, industry/business properties located in and around Old Pant Road, Panside</b>	FR4	Humans/properties/infrastructure downslope of the Proposed Development to the west with small areas at existing high risk of surface water flooding (associated with the Nant Gawni). Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential properties, industry/business properties located in and around Abercarn</b>	FR5	Humans/properties/infrastructure downslope of the Proposed Development to the west, with large areas at existing high risk of fluvial flooding (associated with the Afon Ebwy) and surface water flooding. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Ty Oakley Farm</b>	FR6	Humans/properties/infrastructure within the northern land parcel of the Proposed Development. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Pen y Caeau Farm</b>	FR7	Humans/properties/infrastructure within the northern land parcel of the Proposed Development. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Cefn-rhos-y-bed-uchaf</b>	FR8	Humans/properties/infrastructure downslope of the Proposed Development to the west. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Blaengawney Farm</b>	FR9	Humans/properties/infrastructure downslope of the Proposed Development to the west. In close proximity to the Nant Gawni. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Cil Lonydd Farm</b>	FR10	Humans/properties/infrastructure downslope of the Proposed Development to the west. In close proximity to the Nant Hafod Fach. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Glan Shon Farm</b>	FR11	Humans/properties/infrastructure within the southern land parcel of the Proposed Development. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Cefn Rhyswg Farm</b>	FR12	Humans/properties/infrastructure downslope of the Proposed Development to the south. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Roxburgh bungalow</b>	FR13	Humans/properties/infrastructure downslope of the Proposed Development to the south. Potential for increased flood risk due to changes in surface water runoff rates and volumes.

Receptor	Receptor ID	Reason for consideration
<b>Residential and farm buildings at Ty Richard Jones farm</b>	FR14	Humans/properties/infrastructure downslope of the Proposed Development to the north. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Cefn Crib Farm</b>	FR15	Humans/properties/infrastructure downslope of the Proposed Development to the north. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Pontbren Cottages</b>	FR16	Humans/properties/infrastructure downslope of the Proposed Development to the north. In close proximity to ordinary watercourse (WC5). Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Cwm Farm</b>	FR17	Humans/properties/infrastructure downslope of the Proposed Development to the north. In close proximity to ordinary watercourse (WC5). Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Residential and farm buildings at Pen y Caeau Farm</b>	FR18	Humans/properties/infrastructure within the northern land parcel of the Proposed Development. Potential for increased flood risk due to changes in surface water runoff rates and volumes.
<b>Brook Bungalow</b>	FR19	Humans/properties/infrastructure downslope of the Proposed Development to the east. In close proximity to the Nant Gwyddon. Potential for increased flood risk due to changes in surface water runoff rates and volumes.

## Aquatic environment receptors

- 10.7.9 The aquatic environment receptors represent a range of potential habitats, species, interactions and pathways that may be affected as a result of the Proposed Development, during the construction, operation and decommission phases of its lifespan. This includes watercourses (Nant Gwani, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy and Trosnant Brook), the underlying aquifer (SE Valleys Carboniferous Coal Measures WFD groundwater body), ponds and springs.
- 10.7.10 Potential effects on the WFD water bodies have been considered in the WFD Assessment (**Appendix 10D**), in a manner which reflects the WFD approach. The assessment has assumed that in the future all watercourses will achieve WFD Good Ecological Status and have been assessed as such.
- 10.7.11 The Proposed Development is located within the Afon Ebwy water body catchment, which is a reportable WFD surface water bodies. The Proposed Development does not directly interact with this Main River; as such any impacts would occur via various tributaries (Ordinary Watercourses) draining from the Proposed Development area.
- 10.7.12 Specific consideration has also been given to the non-statutory designated biodiversity sites (SINCs), which are located within the study area. The SINCs scoped in for further assessment all support water-dependent habitats, as identified within the baseline

analysis, which have potential hydrological connectivity with the Proposed Development activities.

- 10.7.13 Potential effects on specific species and aquatic and riparian biodiversity are assessed within **Chapter 8: Biodiversity** of the Draft ES, which should be read in conjunction with this assessment.

### Water resource receptors

- 10.7.14 The water resources identified within the study area are dependent on surface water and groundwater bodies and springs. Any impact as a result of the Proposed Development to the water bodies or springs would have subsequent impact on the water resources. On this basis, full consideration has been given of the rights of local water users (primarily abstractors) within this assessment. Potential derogation of these rights as a result of the Proposed Development could occur through reduction in water quantity or deterioration in water quality.
- 10.7.15 According to the baseline analysis there is one private abstraction within the Proposed Development, and a total of two licensed and five private abstractions located within the wider study area that have some degree of hydrological connectivity to the Proposed Development. In addition, there is a DCWW watermain crossing the new access track (expected at two locations) in the northern parcel of the Proposed Development area.

### Flood risk receptors

- 10.7.16 Flood risk receptors are defined within this assessment as people, property and infrastructure that could be at risk of flooding. The FCA (**Appendix 10A**) undertaken for this Proposed Development informs the baseline flood risk across the study area. Where a flood risk to an identified receptor exists within the baseline environment it is important that this assessment recognises the potential change in risk arising from the Proposed Development.
- 10.7.17 Review of the available OS mapping and aerial imagery in the FCA (**Appendix 10A**) has identified various potential flood risk receptors in the vicinity of the Proposed Development. This includes residential properties, industry and business properties and farm buildings.

### Likely significant effects

- 10.7.18 The effects on Water Environment receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in Error! Reference source not found. **10.18**. The effects for the decommissioning phase are expected to be similar in nature to the construction phase. As far as is practicable the Proposed Development infrastructure will be removed. Decommissioning effects will typically be temporary, short-term effects that will occur during the break-up and removal of infrastructure.

**Table 10.18 Likely significant effects on water environment receptors scoped in for further assessment**

Receptor type*	Relevant assessment criteria	Likely significant effects
<b>Construction Phase</b>		
<b>Aquatic environment receptors</b>	WFD (Standards and Classification) Directions (England and Wales) 2015	<p>Temporary increase in sediment-loading of surface water runoff from construction areas leading to deterioration in the surface water quality environment, deterioration in the status of WFD surface water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p> <p>Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance.</p> <p>Accidental release of pollution into surface water or ground by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p> <p>Discharge of potentially polluted water generated from construction activities (e.g. dewatering/water ingress activities, concrete batching, surface water runoff) into surface water or groundwater or from leaching of contaminants in soils during infiltration to ground into surface water or groundwater leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p> <p>Potential change in groundwater levels due to dewatering resulting in decrease in groundwater baseflow to watercourses, ponds and springs and deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p>
<b>Water resource receptors</b>	WFD (Standards and Classification) Directions (England and Wales) 2015	<p>Potential change to water quality of a water supply resource which may affect the viability of an abstraction.</p> <p>Potential change to yield of a water supply resource which may affect the viability of an abstraction.</p> <p>Damage to or obstruction of maintenance of DCWW's watermain potentially affecting local water supply</p>
<b>Flood risk receptors (third party receptors)</b>	TAN-15	<p>Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces (e.g., TCC, access tracks, crane pads).</p> <p>Changes to watercourse flow conveyance as a result of new or modified temporary watercourse.</p>
<b>Operational Phase</b>		

Receptor type*	Relevant assessment criteria	Likely significant effects
<b>Aquatic environment receptors</b>	WFD (Standards and Classification) Directions (England and Wales) 2015	Accidental spillage of pollutants (fuel or oil) during maintenance activities leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.
<b>Water resource receptors</b>	WFD (Standards and Classification) Directions (England and Wales) 2015	Potential change to water quality of a water supply resource which may affect the viability of an abstraction
<b>Flood risk receptors (third party receptors)</b>	TAN-15	Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces (e.g., TCC, access tracks, crane pads)  Changes to watercourse flow conveyance as a result of new or modified temporary watercourse

- 10.7.19 The potential effects below have been excluded from further assessment i.e., 'scoped out', on the basis that the effects are not considered likely to be significant:
- Flood risk from tidal, groundwater, sewer and artificial sources during the construction, operational and decommissioning phases. As discussed in **Section 10.5** (Flood Risk), these flood sources pose a low risk to the Proposed Development and therefore are scoped out of the assessment.

## 10.8 Assessment methodology

- 10.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to Environmental Impact Assessment** of the Draft ES, and specifically in **Sections 2.5 to 2.8**. However, whilst this has informed the approach that has been used in this Water Environment assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Water Environment assessment.
- 10.8.2 The significance of an effect resulting from the Proposed Development is primarily determined by the value of a given water feature and the magnitude of the effect. In terms of the hydrology, the key determinants of magnitude relate to surface water quantity (level and flow), and water quality. Depending on the effects on surface water flows, there may also be indirect effects on downstream morphology and sediment dynamics, river water quality and flood risk. The method and criteria used to determine value, magnitude, and significance of effect are described in the sections below.

### Determination of significance

- 10.8.3 The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant



detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are “likely to be significantly affected by the development”.

- 10.8.4 The EIA Regulations do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.
- 10.8.5 **Table 10.19** details the basis for assessing receptor sensitivity. The value of water features is normally related to the importance of the surface water or groundwater feature that might be at risk from effects. The criteria used by WSP in the assessment of water feature value are semi-quantitative, so professional judgement by the assessor has been required.

**Table 10.19 Establishing the sensitivity of water receptors**

Sensitivity	Criteria	Receptor type*	Examples
High	Features with a high yield, quality or rarity with little potential for substitution.	Aquatic environment	<p>Conditions supporting a Site with an international conservation designation (Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site), where the designation is based specifically on aquatic features.</p> <p>WFD surface water body (or part thereof) with overall High status, also any associated upstream non-reportable WFD surface water body or non-WFD surface water body.</p> <p>WFD surface water body (or part thereof) with High status for morphology.</p>
	Water use supporting human health and economic activity at a regional scale.	Water use	Regionally important public surface water or groundwater supply (and associated catchment/GWMU) or permitted discharge.
	Features with a high vulnerability to flooding.	Flood risk	Land use type defined as ‘Emergency Services’ in the TAN15 development categories (e.g., hospitals, ambulance/police stations that are required to operate during flooding and buildings used to provide emergency shelter in time of flood) and essential infrastructure equivalent (i.e., critical national infrastructure, such as essential transport and utility infrastructure).
Medium	Features with a medium yield, quality or rarity, with a limited potential for substitution.	Aquatic environment	Conditions supporting a Site with a national conservation designation (e.g., SSSI, National Nature Reserve (NNR)), where the designation is based specifically on aquatic features.

Sensitivity	Criteria	Receptor type*	Examples
			<p>WFD surface water body (or part thereof) with overall 'Good' status/potential, also any associated upstream non-reportable WFD surface water body or non-WFD surface water body.</p> <p>WFD groundwater body (or part thereof) with overall 'Good' status.</p>
	Medium quality watercourse morphology	Watercourse morphology	A watercourse in natural equilibrium and exhibiting a natural range of fluvial processes and morphological features, with little or no modification or anthropogenic influence.
	Water use supporting human health and economic activity at a local scale.	Water use	<p>Local public surface water and groundwater supply (and associated catchment/GWMU) or permitted discharge.</p> <p>Licensed non-public surface water and groundwater supply abstraction (and associated groundwater catchment) which is relatively large relative to available resource, or where raw water quality is a critical issue, e.g., industrial process water, or permitted discharge.</p>
	Features with a medium vulnerability to flooding.	Flood risk	Land use type defined as 'Highly vulnerable development' in the TAN15 development categories (e.g., educational institutions, most types of residential development and vulnerable industrial development)
<b>Low</b>	Features with a low yield, quality or rarity, with some potential for substitution.	Aquatic environment	<p>Conditions supporting a Site with a local conservation designation (e.g., SINC, Local Nature Reserve (LNR), County Wildlife Site (CWS)), where the designation is based specifically on aquatic features, or an undesignated but highly/moderately water-dependent ecosystem, including a Local Wildlife Site (LWS) and a GWDTE.</p> <p>WFD surface water body (or part thereof) with overall Moderate or lower status/potential, also any associated upstream non-reportable WFD surface water body or non-WFD surface water body.</p> <p>WFD groundwater body (or part thereof) with overall Poor status.</p>
	Low quality watercourse morphology	Watercourse morphology	A watercourse showing signs of modification and recovery to a natural equilibrium, and currently exhibiting a limited range of fluvial processes and morphological features affected by modification or anthropogenic influence.

Sensitivity	Criteria	Receptor type*	Examples
	Water use supporting human health and economic activity at household/individual business scale.	Water use	<p>Licensed non-public surface water and groundwater supply abstraction (and associated catchment/GWMU), which is relatively small relative to available resource, or where raw water quality is not critical, e.g., cooling water, spray irrigation, mineral washing or permitted discharge.</p> <p>Unlicensed potable surface water and groundwater abstraction (and associated catchment) e.g., private domestic water supply, well, spring or permitted discharge.</p>
	Features with a low vulnerability to flooding.	Flood risk	Land use type defined as 'Less vulnerable development' in the TAN15 development categories excluding water compatible development equivalent (e.g., general industrial, employment, commercial and retail development, transport and utilities infrastructure, mineral extraction Sites (except sand and gravel)).
<b>Very Low</b>	Commonplace features with very low yield or quality with good potential for substitution.	Aquatic environment	<p>Conditions supporting an undesignated and low water-dependent ecosystem, including an LWS, GWDTE and pond.</p> <p>Non-reportable WFD surface water body (or part thereof), or non-WFD surface water body, not associated with any downstream WFD surface water body.</p> <p>Non-reportable WFD groundwater body (or part thereof), or non-WFD groundwater body.</p>
	Very low quality watercourse morphology	Watercourse morphology	A highly-modified watercourse changed by channel modification or other anthropogenic pressures, currently exhibiting no active flow processes or morphological diversity.
	Water use does not support human health, and of only limited economic benefit.	Water use	Unlicensed non-potable surface water and groundwater abstraction (and associated catchment) e.g., livestock supply.
	Features that are resilient to flooding.	Flood risk	Land use type defined as 'Other' paragraph 5.3 in the TAN15 development categories which are 'water compatible' development equivalent (e.g., amenity open space, nature conservation and biodiversity, sand and gravel workings, docks, marinas, flood control infrastructure, water transmission infrastructure) and undeveloped land.

\*Receptor types map onto receptor lists as follows:

- Aquatic environment –watercourses, springs and ponds and conditions supporting designated conservation Sites;

- Water use – springs, abstractions, WFD surface water bodies, aquifers/WFD groundwater bodies; and
- Flood risk – humans, properties and infrastructure.

The watercourse morphology receptor type is only relevant when ‘in-channel’ works are proposed.

10.8.6 **Table 10.20** details the basis for assessing magnitude of change. The magnitude of change on water receptors is independent of the value of the receptor, and its assessment is semi-quantitative, based professional judgement.

**Table 10.20 Establishing the magnitude of change**

Magnitude	Criteria	Receptor type*	Examples
<b>High</b>	Results in major change to feature, of sufficient magnitude to affect its use/integrity.	Aquatic environment	Deterioration in river flow regime, morphology, or water quality, leading to sustained, permanent or long-term breach of relevant Conservation Objectives (COs) or non-temporary downgrading (deterioration) of status of WFD surface water body (including downgrading of individual WFD elements) or dependent receptors, or resulting in the inability of the surface water body to attain Good status in line with the measures identified in the RBMP.  Deterioration in groundwater levels, flows or water quality, leading to non-temporary downgrading of status of WFD groundwater body or dependent receptors, or the inability of the groundwater body to attain Good status in line with the measures identified in the RBMP.
		Watercourse morphology	Loss or extensive damage to geomorphological habitat and processes due to extensive modification and/or fine sediment input. Replacement of a large extent of the natural bed and/or banks with artificial material. Extensive change to channel planform.
		Water use	Complete or severely reduced water availability and/or quality, compromising the ability of water users to abstract.
		Flood risk	Change in flood risk resulting in potential loss of life or major damage to the property or infrastructure.
<b>Medium</b>	Results in noticeable change to feature, of sufficient magnitude to affect its use/integrity in some circumstances.	Aquatic environment	Deterioration in river flow regime, morphology or water quality, leading to periodic, short-term and reversible breaches of relevant COs, or potential temporary downgrading of status of surface water body status (including potential temporary downgrading of individual WFD elements) or dependent receptors, although

Magnitude	Criteria	Receptor type*	Examples
			<p>not affecting the ability of the surface water body to achieve future WFD objectives.</p> <p>Deterioration in groundwater levels, flows or water quality, leading to potential temporary downgrading of status of WFD groundwater body or dependent receptors, although not affecting the ability of the groundwater body to achieve future WFD objectives.</p>
		Watercourse morphology	Partial loss or damage to geomorphological habitat and processes due to modifications and/or fine sediment input. Replacement of the natural bed and/or banks with artificial material (total length is more than 3% of water body length).
		Water use	Moderate reduction in water availability and/or quality, which may compromise the ability of the water user to abstract on a temporary basis or for limited periods, with no longer-term impact on the purpose for which the water is used.
		Flood risk	Change in flood risk resulting in potential for moderate damage to the property or infrastructure.
<b>Low</b>	Results in minor change to feature, with insufficient magnitude to affect its use/integrity in most circumstances.	Aquatic environment	<p>Slight change in river flow regime, morphology or water quality, but remaining generally within COs, and with no short-term or permanent change to status of WFD surface water body (of overall status or element status) or dependent receptors.</p> <p>Slight deterioration in groundwater levels, flows or water quality, but with no short-term or permanent downgrading of status of WFD groundwater body or dependent receptors.</p>
		Watercourse morphology	Slight change or deviation from baseline conditions, or partial loss or damage or improvement/ gain to in channel habitat and geomorphological processes due to modifications and/or fine sediment input.
		Water use	Minor reduction in water availability and/or quality, but unlikely to affect the ability of a water user to abstract.
		Flood risk	Change in flood risk resulting in potential for minor damage to property or infrastructure.
<b>Very Low</b>	Results in little or no change to feature, with	Aquatic environment	No or very slight change in river flow regime or surface water quality, and no consequences in terms of COs or status of

Magnitude	Criteria	Receptor type*	Examples
	insufficient magnitude to affect its use/integrity		WFD surface water body or dependent receptors.  No or very slight change in groundwater levels or groundwater quality, and no consequences in terms of status of WFD groundwater body or dependent receptors.
		Watercourse morphology	Very slight change from surface water baseline conditions, approximating to a 'no change' situation.
		Water use	No, or very slight change in water availability or quality and no change in ability of the water user to exercise licenced rights or continue with small private abstraction.
		Flood risk	Increased frequency of flood flows, but which does not pose an increased risk to property or infrastructure.

\*The watercourse morphology receptor type is only relevant when 'in-channel' works are proposed.

\*\*For the purposes of this assessment of change, relevant WFD elements for surface water body classification include:

- all biological quality elements e.g., fish, macrophytes, invertebrates;
- all physico-chemical quality elements e.g., dissolved oxygen, phosphate;
- hydromorphological supporting elements;
- the mitigation measures assessment.

## Significance evaluation methodology

10.8.7 The significance of water-related effects is derived by considering both the value of the feature and the magnitude of change. In this assessment, effects are considered to be significant or not significant according to the matrix in **Table 10.21**, with 'Major' and 'Moderate' effects taken to be 'Significant'. Significance can be 'Beneficial', 'Adverse' or 'Neutral'.

**Table 10.21 Significance evaluation matrix relating to the water environment**

		Magnitude of change			
		High	Medium	Low	Very Low
Value/importance/ value	High	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate	Minor	Negligible	Negligible



	Magnitude of change			
	High	Medium	Low	Very Low
Very Low	(Potentially significant)	(Not significant)	(Not significant)	(Not significant)
	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: 'Significant' effects are those identified as 'Major'. 'Moderate' effects would normally be deemed to be 'significant'. However, there may be some exceptions, depending on the application of professional judgment.

- 10.8.8 In this assessment, only the potential and residual significance of change with respect to the water environment (groundwater levels, flows and quality, and river flows, quality and morphology) and flood risk are considered. It is important to recognise that a 'Significant' change in the water environment does not necessarily result in a 'Significant' change to ecological features. Indeed, because of the different benchmarks and magnitude criteria used by the two assessments, it is possible that a 'Not Significant' change in the water environment can still sit alongside a 'Significant' change in an associated ecological water feature, and vice-versa.

## 10.9 Preliminary assessment of Water Environment effects

- 10.9.1 This section provides an assessment of hydrology-related effects and will be reviewed in light of statutory consultation feedback, further stakeholder engagement and evolution of the detailed design of the Proposed Development

### Assessment of effects of aquatic environment receptors

- 10.9.2 This section summarises the aquatic environment receptors taken forward in this assessment, which are listed in **Table 10.22**. The sensitivity of each receptor has been determined in accordance with the criteria set out in **Table 10.21**.
- 10.9.3 The assessment of impacts on the individual WFD elements is provided in **Appendix 10D** (WFD Assessment) which concludes that the significance of effects is **Not Significant**. The assessment has assumed that in the future all watercourses will achieve WFD Good Ecological Status and have been assessed as such.

**Table 10.22 Aquatic receptors considered under this assessment**

Receptor	Receptor ID	Sensitivity	Rationale
<b>Watercourses</b>			
<b>Afon Ebwy</b>	WC1	Medium	Main River, designated as a WFD surface waterbody, with overall 'Moderate' status.
<b>Nant Gawni</b>	WC2	Low	Ordinary Watercourse. Not designated as a WFD surface water body.

Receptor	Receptor ID	Sensitivity	Rationale
			Discharges into the Afon Ebwy (Main River and WFD surface water body).
<b>Nant Hafod-fach</b>	WC3	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into the Afon Ebwy (Main River and WFD surface water body).
<b>Nant Gwyddon</b>	WC4	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into the Afon Ebwy (Main River and WFD surface water body).
<b>Unnamed watercourse 1</b>	WC5	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into the Afon Ebwy (Main River and WFD surface water body).
<b>Unnamed watercourse 2</b>	WC6	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into the Afon Ebwy (Main River and WFD surface water body).
<b>Unnamed watercourse 3</b>	WC8	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into Afon Lwyd/ Trostant Brook (Main River and WFD surface water body).
<b>Unnamed watercourse 4</b>	WC9	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into Trostant Brook which discharges into Afon Lwyd (Main Rivers and WFD surface water bodies).
<b>Unnamed watercourse 5</b>	WC10	Low	Ordinary Watercourse. Not designated as a WFD surface water body. Discharges into the Nant Carn which discharges to the Afon Ebwy (Main River

Receptor	Receptor ID	Sensitivity	Rationale
			and WFD surface water body).
<b>Trosnant Brook</b>	WC7	Medium	A stretch (from approximately ST247992 to confluence with Afon Lwyd) is designated as a Main River and a WFD surface waterbody, with overall 'Moderate' status.
<b>Aquifers</b>			
<b>SE Valleys Carboniferous Coal Measures</b>	AQ1	Low	Designated WFD groundwater body with 'Poor' Overall WFD status. Groundwater quality likely impacted by former coal mining activities. Underlies the full extent of the Proposed Development area and wider study area.
<b>Ponds</b>			
<b>Pond</b>	P10	Low	Pond within the Proposed Development area (southern land parcel), in close proximity to turbine 3. The pond is designated as a SINC (Pwllgwinau, East of Newbridge, C1) and is notable for several species (great crested newt, palmate newt, smooth newt and common frog)
<b>Ponds (other)</b>	P1 to P9 and P11 to P13	Very Low	Ponds located outside of the Proposed Development area. Ponds not designated for biodiversity conservation.
<b>Springs</b>			
<b>Springs (various locations)</b>		SP1 to SP8	Very Low Springs are not used for water supply
<b>Conditions supporting non-statutory biodiversity conservation sites</b>			

Receptor	Receptor ID	Sensitivity	Rationale
<b>Pwllgwinau, East of Newbridge SINC</b>	C1	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>Mynydd Maen, East of Newbridge SINC</b>	C2	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>Coed Cil-Lonydd, East of Newbridge SINC</b>	C3	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>Gwydon Valley Woodlands, Abercarn SINC</b>	C4	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>Craig Gwent Wood Ancient Woodland SINC</b>	C5	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>Coedcae Watkin Dafydd, East of Crumlin</b>	C6	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>River Ebbw SINC</b>	C7	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.
<b>Monmouth to Brecon Canal</b>	C8	Low	Site with a local nature conservation designation (SINC), where the designation is based specifically on aquatic features.

## Construction phase

*Temporary increase sediment-loading of surface water runoff from construction areas leading to deterioration in the surface water quality environment, deterioration in the status of WFD surface water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation*

- 10.9.4 Construction works associated with the Proposed Development have the potential to generate sediment-laden runoff. Activities that could potentially produce sediment-laden runoff include:
- Runoff from the TCC, internal access tracks and working areas;
  - Excavation works associated with the construction of the substation, wind turbine foundations, crane pads and underground cables connecting the turbines; and
  - Temporary use and management of soil stockpiles.
- 10.9.5 The proposed embedded environmental measures to limit sediment-laden runoff are set out in **Table 10.16**. These measures would be secured through a planning condition, likely via the Outline CEMP and include implementing good working practices and adherence to the CEMP; in addition to specific measures relating to the Water Management Plan (WMP) (**Appendix B** of the **Outline CEMP**), implementation of a water quality monitoring programme, and suitable management of soil stockpiles and excavated materials. The WMP will utilise SuDS principles to reduce the discharge to greenfield runoff rates and prevent pollution of the water environment.
- 10.9.6 Construction of the access tracks includes one new crossing of a minor ditch found to be dry during the site survey (Ordinary Watercourse WC8, tributary of Trostant Brook) (**Table 3.2** and **Figure 10A.6** of the FCA in **Appendix 10A**). It is anticipated that the consenting power of CCBC will be enforced to ensure that the future detailed designs of these crossings will limit sediment-laden runoff.
- 10.9.7 Crossing points of any pre-existing structures (expected at two locations in the Nant Gawni which were found to be dry during the site survey **Figure 10.1**) will be surveyed prior to construction works (post consent) to establish the structural integrity of the crossings. Suitable mitigation measures will be identified and proposed, where necessary and applicable, to ensure no detrimental impact to the structures. Should it be deemed necessary for the culverts to be upgraded, any new culverts required will be sized at the detailed design stage in consultation and subject to consent from CCBC.
- 10.9.8 The magnitude of potential effects of sediment-laden runoff on the aquatic environment receptors with the proposed embedded environmental measures in place is determined to be Low for receptors within or in close proximity to the Proposed Development area (Nant Gawni and unnamed watercourses WC8 and WC9, local biodiversity sites C1-C4 and ponds P1, P4 and P10) and Very Low for receptors located outside of the Proposed Development area (Main Rivers Afon Ebwy and Trostant Brook, Ordinary Watercourses Nant Gwyddon, Nant Hafod-fach and unnamed watercourses WC5 and WC6, local biodiversity sites C5-C8, ponds P2-P3, P5-P9 and P11-P13 and springs)..
- 10.9.9 Consideration of the magnitude of change to the aquatic environment receptors (Very Low and Low), in conjunction with their determined sensitivity (Medium for Afon Ebwy, and Trostant Brook; Low for Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses and local biodiversity sites; Very low to Low for ponds and springs) finds that the significance of effects to the aquatic environment receptors in this preliminary assessment is **Not Significant**.

*Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance*

- 10.9.10 Any potential increases in sediment-laden runoff could also result in increased silt deposition within watercourses network affecting the hydromorphology of the watercourses. Those measures described above and detailed in **Table 10.16** to limit sediment-laden runoff will also prevent any resultant sediment deposition and changes to watercourse hydromorphology such that the magnitude of change on the hydromorphology and flow conveyance of the watercourses is Low for the Ordinary Watercourses Nant Gawni and unnamed watercourses WC8 and WC9 which intersect or are within close proximity to the Proposed Development area. The magnitude of change is determined to be Very Low for watercourses located outside of the Proposed Development area (Main Rivers Afon Ebwy and Trosnant Brook, and Ordinary Watercourses Nant Gwyddon, Nant Hafod-fach and unnamed watercourses WC5 and WC6).
- 10.9.11 Consideration of the sensitivity of the watercourses (Low and Medium) in combination with the potential magnitude of change to the receptors (Very Low and Low), finds that the significance of effects to the aquatic environment receptors in this preliminary assessment is **Not Significant**.

*Accidental release of pollution into surface water or ground by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity*

- 10.9.12 Construction works have the potential to further affect water quality conditions and therefore aquatic environment receptors (and water resource receptors) within associated water features via:
- Accidental spillage of fuel, oil or other chemicals used during construction;
  - Mobilisation/leaching of contaminants, where present, from soils during excavation works; and
  - Concrete leaching.
- 10.9.13 The proposed embedded measures to prevent surface and groundwater water pollution are set out in **Table 10.16**.
- 10.9.14 The magnitude of change from all identified potential effects of mobilisation of contaminants from contaminated soil, accidental spillages of oils/fuel and concrete leaching is determined to be Very Low in regard to the Afon Ebwy (larger dilution capacity and located at greater distance from the Proposed Development) and Low in regard to Trosnant Brook, Ordinary Watercourses, local biodiversity sites, ponds and springs. Consideration of the sensitivity of the aquatic environment receptors (Medium for Afon Ebwy and Trosnant Brook; Low for the Ordinary Watercourses, local biodiversity sites and Very Low to Low for ponds and Very Low for springs) in combination with the potential magnitude of change acting upon them, finds that the significance of effects on the aquatic environment receptors in this preliminary assessment is **Not Significant**.



*Discharge of potentially polluted water generated from construction activities (e.g., concrete batching, surface water runoff) into surface water or ground leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity*

- 10.9.15 Discharge of water generated from construction activities into surface water or ground has the potential to affect water quality conditions and therefore aquatic environment receptors (and water resource receptors) within associated water features via:
- Potentially polluted groundwater and water ingress pumped from excavations. Baseline groundwater quality is likely to be poor due to impacts associated with former coal mining activities in the area;
  - Potentially polluted surface water runoff (e.g., suspended solids);
  - Discharge of surface runoff and, if required, any water accumulating at the base of the excavations, to ground via infiltration resulting in contaminant leaching from contaminated soils. The Phase 1 Geo-environmental desk study<sup>67</sup> has identified potential localised sources of land contamination on the Proposed Development area which are discussed in detail in **Chapter 11: Ground Conditions** of the Draft ES; and
  - Concrete leaching.
- 10.9.16 Those measures described above and detailed in **Table 10.16** Error! Reference source not found. to prevent surface water and groundwater pollution from accidental release of pollution will also prevent pollution of water generated in the construction activities which will be treated prior to discharge into surface water or ground.
- 10.9.17 The viability of infiltration as a means by which surface water runoff and, if required, any water accumulating in the base of the excavations (most likely to primarily comprise rainfall runoff) could be discharged to ground will be undertaken through liaison with CCBC and by undertaking soakaway testing exercises. Information from the future Phase 2 Geo-environmental Ground Investigation (details provided in **Chapter 11: Ground Conditions** of the Draft ES) will also be considered to assess the potential for introducing pollutant pathways to groundwater via leaching from contaminated soils. The magnitude of change from the identified potential effects resulting from deterioration of water quality, with the embedded measures in place (**Table 10.16**), is determined to be Very Low in regard to Afon Ebwy (larger dilution capacity and located at greater distance from the Proposed Development) and Low in regard to Trosnant Brook, Ordinary Watercourses, local biodiversity sites, ponds and springs.
- 10.9.18 Consideration of the sensitivity of the aquatic environment receptors (Very Low, Low and Medium) in combination with the potential magnitude of change acting upon them (Very Low and Low) finds that the significance of effects on the aquatic environment receptors in this preliminary assessment is **Not Significant**.

*Potential change in groundwater levels due to dewatering resulting in decrease in groundwater baseflow to aquatic environment receptors*

- 10.9.19 Dewatering of excavations has the potential to lead to a decline in local groundwater levels and subsequent decline in groundwater baseflow to watercourses, ponds and springs, deterioration in WFD water bodies status and conditions supporting biodiversity sites within the study area.

<sup>67</sup> Mynydd Maen Wind Farm, Phase 1 Geoenvironmental Desk Study (Ref. 807379-WOOD-RP-OC-00001\_P01.1, August 2023).

- 10.9.20 Dewatering of excavations associated with the construction of the Proposed Development is unlikely to be required or is of limited extent due to:
- Limited depth and small footprint of the excavations (detailed construction specifications will depend on the ground conditions encountered, but will typically be 20m diameter x 4m depth for the turbine foundation and 0.60-1.5m width x up to 1.5m depth for the underground cable connecting the turbines);
  - Excavations will be temporary (approximately 4-6 weeks as a conservative estimate);
  - The Hughes Member bedrock underlying the Proposed Development is designated as a Secondary A aquifer and comprises sandstones/gritstones containing localised units of mudstone, clay and siltstone and with a permeability likely to be enhanced by fractures. As the Proposed Development occupies a hilltop location between two deeply incised valleys with no expression of shallow groundwater (e.g., springs or wells) (**Figure 10.7**), it suggests that the geology is relatively permeable and the groundwater table lies at depth. In addition, the area is likely to be artificially drained by the workings at Hafod Quarry to the west. These workings are likely to have intercepted groundwater in the Coal Measures. This suggests that the potential for encountering shallow groundwater during excavations into the Coal Measures is limited, and where encountered, it is likely to be of low sensitivity, perched and in small quantities.
- 10.9.21 There are no watercourses, ponds or springs within 235 m of the turbines except for pond P10 (also a SINC) which is 63m north of turbine 3. Geological mapping doesn't show the presence of superficial deposits, however, local BGS borehole logs (ref ST29NW66 and ST29NW52) show the presence of silty clay layers in the top 4 to 6m of the siltstone/gritstone. This suggests that the pond may be overlying low permeability superficial deposits and is sustained mainly via surface runoff. Although shallow groundwater in the underlying Coal Measures is not anticipated, as a precautionary approach, it is proposed that:
- Phase 2 geo-environmental ground investigation, to be completed at the pre-construction stage (**Chapter 11: Ground Conditions** of the Draft ES), include monitoring of groundwater levels at a borehole (8m deep) between turbine 3 and the pond to confirm local groundwater level conditions;
  - If the borehole is found to be dry, this indicates that there is no hydraulic connectivity between the pond and the turbine foundation excavation. This suggests that the excavation will not impact on water levels in the pond;
  - If the borehole shows the presence of local shallow groundwater at or above the base of the excavation (4m depth), it is proposed that any water accumulating at the base of the excavation is pumped and returned to the pond overground after solids removal using sheep pens, silt fences or a settlement basin. The design of these SuDS will comply with the CIRIA C75 Index Approach to managing water quality, which includes for the treatment of suspended solids and will be confirmed as part of the detailed drainage design in consultation with NRW.
- 10.9.22 On this basis, the magnitude of change from the identified potential effects resulting from the unlikely requirement for dewatering of the excavations, with the embedded measures in place (**Table 10.16**), is determined to be Low. Consideration of the sensitivity of the aquatic environment receptors (Very Low, Low and Medium) in combination with the potential magnitude of change acting upon them (Low), finds that the significance of effects on aquatic environment receptors is, in this preliminary assessment, **Not Significant**.

## Operational phase

*Accidental spillage of pollutants (fuel or oil) during maintenance activities leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity*

- 10.9.23 Following the construction phase, small quantities of fuel/oil/chemicals would need to be brought onto the Proposed Development area for maintenance activities. The embedded measures for the operational phase of the development listed in **Table 10.16**, include measures to control the potential impacts of accidental fuel, oil or chemical release as a result of maintenance activities.
- 10.9.24 The magnitude of change from the identified potential effects resulting from deterioration of water quality is determined to be Very Low in regard to Afon Ebwy (larger dilution capacity and located at greater distance from the Proposed Development) and Low in regard to Trosnant Brook, Ordinary Watercourses, local biodiversity sites, ponds and springs. Consideration of the sensitivity of the aquatic environment receptors (Medium for Afon Ebwy and Trosnant Brook; Low for Ordinary Watercourses and local biodiversity sites and Very Low to Low for the ponds and Very Low for the springs) in combination with the potential magnitude of change acting upon them finds that the significance of effects on the water resource receptors in this preliminary assessment is **Not Significant**.

## Assessment of effects on water resource receptors

- 10.9.25 This section summarises the water resource receptors taken forward in this assessment, which are listed in **Table 10.23**. The sensitivity of each receptor has been determined in accordance with the criteria set out in **Table 10.19**.

**Table 10.23 Water resource receptors considered under this assessment**

Receptor	Receptor ID	Sensitivity	Rationale
Groundwater abstraction	WR1	Low	Licensed non-public groundwater abstraction 0.24 km of the Proposed Development boundary. Abstraction is for industrial water suppression (raw water quality is not critical).
Surface water abstraction from Afon Ebwy	WR2	Low	Licensed non-public surface water abstraction 0.78 km of the Proposed Development boundary. Abstraction is for fish bypass (raw water quality is not critical).
Private water supply (Glan Shon, Newbridge)	WR3	Low	Private domestic water supplies (assumed potable as worst-case scenario), which is considered to be small relative to available resource.
Private water supply (Rhyswg Fawr Farm House, Cwmcarn)	WR4	Low	
Private water supply (Rhyswg Ganol Farm, Rhyswg Mountain Road, Cwmcarn)	WR5	Low	

Receptor	Receptor ID	Sensitivity	Rationale
Private water supply (Blaengawney Farm, Hafodyrynys, Crumlin)	WR6	Low	
Private water supply (Pen Y Caeau Farm, Abercarn, Mountain Road, Hafodyrynys)	WR7	Low	
Private water supply (Cilonydd Farm, Panside, Newbridge)	WR8	Low	
DCWW's water main	WR9	Medium	Proposed access track crosses the water main at two locations. The scale of the water main is unknown, though there is assumed to be potential for short-term impact to local water supply in the event of structural damage.

## Construction phase

### *Potential change to water quality of a water supply resource which may affect the viability of an abstraction*

- 10.9.26 Those activities with the potential to affect the water resources receptors via potential changes to the water quality of watercourses and aquifer (potential for increases in sediment laden runoff or pollution by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching for example), together with the embedded measures associated with these, are presented in the aquatic environment receptors section above.
- 10.9.27 With the embedded measures in place (**Table 10.16** Error! Reference source not found.), the magnitude of change from all the identified potential effects on the water resource receptors is considered to be Very Low. Taking into account the receptor sensitivity (Low and Medium) in combination with the potential magnitude of change acting upon them (Very Low), finds that the significance of effects on the water resource receptors from the construction of the Proposed Development in this preliminary assessment is **Not Significant**.

### *Potential change to yield of a water supply resource which may affect the viability of an abstraction*

- 10.9.28 Dewatering of excavations has the potential to lead to a temporary decline in local groundwater levels and subsequent decline in groundwater baseflow to watercourses, and decline in the yield (or even derogation) of the water abstractions within the study area.
- 10.9.29 There are no private water abstractions within 400m or licensed water abstraction within 800m of the turbines (**Figure 10.6** and **Tables 10.8 and 10.9**). As discussed in the Assessment of effects on aquatic environment receptors above, groundwater in the Coal Measures is likely to be at depth and dewatering of excavations associated with the construction of the Proposed Development is unlikely to be required or is of limited extent. This suggests that the magnitude of change from the potential effects of dewatering activities on local groundwater levels and local abstractions is Low in this preliminary assessment.

- 10.9.30 The magnitude of change from the identified potential effects resulting from dewatering activities on the water resource receptors (water abstractions), is determined to be Low taking into account the duration, depth and footprint of the excavations and limited potential for encountering shallow groundwater during excavations. Consideration of the sensitivity of the water resource receptors (Low) in combination with the potential magnitude of change acting upon them (Low) and with the specified embedded environmental measures in place, finds that in this preliminary assessment the significance of effects on the water resource receptors is **Not Significant**.

*Potential short-term impact to water supply due to damage or obstruction of maintenance of DCWW's watermain*

- 10.9.31 Where possible, crossing of DCWW's watermains has been kept to a minimum (no structure is to be sited within a minimum distance of 3m from the centre line of the pipes). The proposed access track associated with the Proposed Development intersects the watermain at two locations (**Figure 10A.9 of the FCA, Appendix 10A**), introducing the potential for structural damage associated with vehicle loads or obstruction of DCWW's maintenance activities. This could lead to impact to local water supply provided by the watermain.
- 10.9.32 The proposed embedded environmental measures to protect the watermain will be agreed in consultation with DCWW and are set out in **Table 10.16** Error! Reference source not found.. These measures would be secured through a planning condition, likely via the CEMP. A suitable asset protection design for the locations where the proposed access track crosses DCWW's watermain will be developed and agreed with DCWW at detailed design stage. Site meetings will be held with a DCWW inspector both prior to the construction works commencing (to mark the location and line of the watermain at the proposed crossing locations) and during the access track construction over the watermain.
- 10.9.33 With the proposed embedded environmental measures in place, the magnitude of change (potential effects of structural damage or obstruction to maintenance activities of the watermain) is determined to be Low. Consideration of the sensitivity of the watermain (Medium) in combination with the potential magnitude of change acting upon it (Low), finds that the significance of effects on the watermain in this preliminary assessment is **Not Significant**.

## Operational phase

*Potential change to water quality of a water supply resource which may affect the viability of an abstraction during maintenance activities*

- 10.9.34 Those activities with the potential to affect the water resources receptors via potential changes to the water quality of watercourses upstream of the receptor (potential for change in water quality via accidental spillage/release of pollutants), together with the embedded measures associated with these, are presented in the aquatic environment receptors section above. The magnitude of change from all the identified potential effects on the water resource receptors with the embedded measures in place, is considered to be Very Low.
- 10.9.35 Taking into account the receptor sensitivity (Low) in combination with the potential magnitude of change acting upon them (Very Low), finds that the significance of effects on the water resource receptors is in this preliminary assessment **Not Significant**.



## Assessment of effects on flood risk receptors

10.9.36 The following summarises the flood risk receptor groups taken forward in this assessment, which are listed in **Table 10.24**. The sensitivity of these receptors has been identified in accordance with the criteria outlined in **Table 10.19**. Surface water flooding was identified as the key flood risk mechanisms at the Proposed Development in **Section 10.5** and is discussed further below.

**Table 10.24 Flood risk receptors considered under this assessment**

Receptor	Receptor ID	Sensitivity	Rationale
Residential properties, industry/business properties located in and around Hafodyrynys	FR1	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential properties, industry/business properties located in and around Swffryd	FR2	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential properties, industry/business properties located in and around Newbridge	FR3	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential properties, industry/business properties located in and around Old Pant Road, Pantside	FR4	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential properties, industry/business properties located in and around Abercarn	FR5	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential and farm buildings at Ty Oakley Farm	FR6	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential and farm buildings at Pen y Caeau Farm	FR7	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential and farm buildings at Cefn-rhos-y-bed-uchaf	FR8	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential and farm buildings at Blaengawney Farm	FR9	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
Residential and farm buildings at Cil Lonydd Farm	FR10	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.



<b>Residential and farm buildings at Glan Shon Farm</b>	FR11	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Residential and farm buildings at Cefn Rhyswg Farm</b>	FR12	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Roxburgh bungalow</b>	FR13	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Residential and farm buildings at Ty Richard Jones farm</b>	FR14	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Residential and farm buildings at Cefn Crib Farm</b>	FR15	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Pontbren Cottages</b>	FR16	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Residential and farm buildings at Cwm Farm</b>	FR17	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Residential and farm buildings at Pen y Caea u Farm</b>	FR18	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.
<b>Brook Bungalow</b>	FR19	Medium	Land use type defined as 'Highly vulnerable development' under the TAN15 guidance.

## Construction and operational phases

### *Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces (e.g., TCC, access tracks, crane pads)*

- 10.9.37 During the construction and operational phases of the Wind Farm development, new areas of hardstanding / compacted ground (e.g., crane pads and substation), although localised and of limited extent, will increase the overall extent of low permeability surfaces. Without effective surface water management measures, this could lead to a potential increase in runoff rates and a subsequent increase in risk of flooding to the flood risk receptors.
- 10.9.38 As outlined in the FCA (**Appendix 10A**), a WMP for the construction phase and Detailed Drainage Design for operational phase of the Proposed Development, will be prepared to manage surface runoff utilising SuDS principles including attenuation storage where necessary. Surface water runoff will be discharged to ground and/or to watercourses. Further investigation of the viability of infiltration as a means by which surface water runoff could be discharged to ground will be undertaken post- ES, through liaison with CCBC and by undertaking soakaway testing exercises. In the case that the soakaway testing concludes that infiltration is not solely sufficient in managing runoff, and discharge to the watercourses is required, this will be subject to a consent from the NRW or CCBC.
- 10.9.39 It is concluded that the Proposed Development during the construction and operational phases, with the specified embedded environmental measures in place (**Table 10.16** Error! Reference source not found.) will not result in increases in surface water runoff, as such

the magnitude of change is considered to be Very Low. Consideration of the sensitivity of the flood risk receptors (Medium, given these are primarily residential), in combination with the magnitude of change acting upon the receptors (Very Low), concludes that the significance of effects on the flood risk receptors in this preliminary assessment is **Not Significant**.

*Changes to surface water flow conveyance arising from the presence of new or modified permanent watercourse crossings*

- 10.9.40 If not appropriately designed, any temporary and permanent (access) crossings of watercourses have the potential to adversely affect flow conveyance within the affected watercourses and therefore to influence flood depths. If watercourse crossings are required to enable access over any watercourses, these would be appropriately sized to maintain existing flow conveyance.
- 10.9.41 Construction of the access tracks includes one new crossing of a minor ditch found to be dry during the site survey (Ordinary Watercourse WC8, tributary of Trostant Brook) (**Table 3.2** and **Figure 10A.6** of the FCA in **Appendix 10A**). The future detailed designs of this crossing will be subject to consent by CCBC and will be designed to minimise change to existing watercourse flow conveyance (embedded measures in **Table 10.16**).
- 10.9.42 Crossing points of any pre-existing structures (expected at two locations in the Nant Gawni; **Figure 10.1**) will be surveyed prior to construction works (post consent) to establish the structural integrity of the crossings. Suitable mitigation measures will be identified and proposed, where necessary and applicable, to ensure no detrimental impact to the structure. Should it be deemed necessary for the culverts to be upgraded, any new culverts required will be sized at the detailed design stage in consultation and subject to consent from CCBC.
- 10.9.43 The magnitude of change from the potential effects associated with the watercourse/surface water flow paths crossings, with the specified embedded environmental measures in place (**Table 10.16**), is determined to be Very Low. Consideration of the sensitivity of the flood risk receptors (Medium), in combination with the magnitude of change acting upon the receptors, concludes that the significance of effects on the flood risk receptors is in this preliminary assessment **Not Significant**.

## Decommissioning Phase

- 10.9.44 Future decommissioning phase effects are considered to be similar to construction phase effects, although with a lesser duration (less than one year) and against a future baseline which accounts for the anticipated impacts of climate change on the water environment. The outline drainage strategy included in the FCA (**Appendix 10A** of the Draft ES) includes a climate change allowance of 40% (precautionary upper end estimate up to 2080s) which suggests that similar sized SuDS features as used during the operational phase are required to control runoff to greenfield discharge rates in the decommissioning phase. Decommissioning of the Proposed Development with the specified embedded environmental measures in place (**Table 10.16**), would not result in increases in the rate of surface runoff and therefore the potential magnitude of the effects is Very Low.
- 10.9.45 Consideration of the sensitivity of the flood risk receptors (Medium) in combination with the potential magnitude of change acting upon the receptors (Very Low), concludes that the significance of effects on the flood risk receptors is in this preliminary assessment **Not Significant**.

## 10.10 Assessment of cumulative (inter-project) effects

### Introduction

10.10.1 A Cumulative Effects Assessment (CEA) has been undertaken for the Proposed Development which examines the result from the combined effects of the Proposed Development with other developments on the same hydrology or flood risk receptor and the contribution of the Proposed Development to those impacts.

### Cumulative effects assessment

10.10.2 For hydrology, the study area outlined in **Section 10.4** has been applied for the CEA to ensure direct and indirect cumulative effects can be appropriately identified and assessed.

10.10.3 A tiered approach to the CEA has been set out in **Chapter 2: Approach to Environmental Impact Assessment** of the Draft ES and can be summarised as follows:

- Tier 1: developments under construction, permitted applications, and submitted applications;
- Tier 2: Other DNS developments where a Scoping Report has been submitted to PEDW; and
- Tier 3: Other DNS developments where a Scoping Report has not yet been submitted to PEDW, or where developments are identified in Development Plans or other plans as appropriate.

10.10.4 Only those developments in the short list in **Chapter 2: Approach to Environmental Impact Assessment** of the Draft ES that fall within the water environment study area have significant potential to result in cumulative effects with the Proposed Development. All developments falling outside the water environment study area are excluded from the CEA on the basis that either:

1. There is no pathway for cumulative hydrological effects; or
2. The embedded measures that will be included in the other developments are suitable to fully avoid, manage and if appropriate mitigate potential water environment effects associated with that development.

10.10.5 On the basis of the above, the specific developments contained within the short list in **Chapter 2: Approach to Environmental Impact Assessment** of the Draft ES that fall within the water environment study area are considered in this CEA, as discussed in **Table 10.25**.

10.10.6 A simple qualitative assessment (as justified in **Table 10.25**) of the potential for significant cumulative effects to arise is carried out in **Table 10.26**. This indicates that there is no potential for the developments contained within the short list to result in significant cumulative effects with the Proposed Development.

**Table 10.25 Developments to be considered as part of the Water Environment CEA**

Development Name	Development type	Project	Status	Tier	Level of detail of CEA to be adopted
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<b>Mynydd Maen Solar Farm (DNS/CAS-02446-R8X8W2)</b>	Proposed solar farm, access, and ancillary development	DNS/CAS-02446-R8X8W2	No planning application has been submitted to date, although a scoping request was submitted in August 2023.	Tier 2	The Mynydd Maen Solar Farm development site is located immediately to the west of the central land parcel of the Proposed Development. A simple qualitative assessment of cumulative effects has been carried out (in <b>Table 10.26</b> below).
<b>Mynydd Maen Wind Farm (DNS/3276725)</b>	Wind farm of up to 15 turbines with a maximum tip height of 149.9m.	DNS/3276725	Notification of intention to submit was submitted to PEDW in July 2023.	Tier 2	The Mynydd Maen Wind Farm proposed site is located on the eastern edge of the northern land parcel of the Proposed Development. A simple qualitative assessment of cumulative hydrological effects has been carried out (in <b>Table 10.26</b> below).

**Table 10.26 CEA for Water Environment**

Project	Discussion
<b>Mynydd Maen Solar Farm (DNS/CAS-02446-R8X8W2)</b>	<p>The project EIA Scoping Request<sup>68</sup>, provides details on the solar farm development. Both the solar development site and the Proposed Development are located within the Afon Ebwy catchment.</p> <p>Timescales are currently not available however if approved construction is likely to overlap with construction of the Proposed Development. It is assumed that effective embedded measures (agreed via planning) will be successfully implemented during the development of the site, including good industry practice measures for runoff and silt management and pollution prevention. Furthermore, it is assumed that runoff from any new permanent, impermeable surfaces associated with the project would be appropriately managed to rates agreed with the CCBC. On this basis it is determined that the potential effects to water environment receptors as a result of the solar farm development will be not significant. As such any cumulative effects between the solar farm development site and the Proposed Development would be negligible and therefore not significant.</p>
<b>Mynydd Maen Wind Farm (DNS/3276725)</b>	<p>The project EIA Scoping Report<sup>69</sup>, provides details on the proposed wind farm development. The Proposed Development and most of the wind farm development site are located within the Afon Ebwy catchment.</p> <p>The wind farm development includes 15 turbines, access tracks, a substation and TCC. It is assumed that construction would commence in 2026 and last for approximately 24 to 36 months. The Scoping Report indicates that implementation of the CEMP will ensure that any adverse impacts on the water</p>

<sup>68</sup> Welsh Government. Planning Casework. (online). Available at:

<https://planningcasework.service.gov.wales/searchresults?q=CAS-02446-R8X8W2> [Accessed 30/10/23]

<sup>69</sup> Welsh Government. Planning Casework. (online). Available at:

<https://planningcasework.service.gov.wales/searchresults?q=DNS%2F3276725> [Accessed 30/10/23]

environment and flood risk is appropriately mitigated and as such no significant impacts are predicted, and therefore this topic has been scoped out of the ES. It also states that surface water runoff will be managed through the use of SuDS, which will be secured through a separate application to the SuDS Approving Body. On this basis it is determined that the potential effects to water environment receptors as a result of the wind farm development will be not significant. As such any cumulative effects between the wind farm development site and the Proposed Development would be negligible and therefore not significant.

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## 10.11 Preliminary significance conclusions

- 10.11.1 A summary of the results of the preliminary Water Environment assessment is provided in **Table 10.27**.

**Table 10.27 Preliminary summary of significance of effects**

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<b>Construction (and Decommissioning) phase</b>				
<p><b><u>Aquatic environment receptors</u></b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy, Trosnant Brook), ponds and non-statutory designated sites for biodiversity conservation (SINCs).</p> <p><b><u>Potential Effect</u></b> Temporary increase sediment-loading of surface water runoff from construction areas leading to deterioration in the surface water quality environment, deterioration in the status of WFD surface water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation conservation sites</p>	Very Low (least sensitive) to Medium (most sensitive)	Very Low and Low	Negligible to Minor (Not Significant)	Adoption of suitable embedded measures to limit sediment-laden runoff including standard good working practices, maintaining the stand-off distances from watercourses, appropriate management of soil stockpiles, development and implementation of a WMP utilising SuDS principles, including collection, conveyance and attenuation/infiltration storage.
<p><b><u>Aquatic environment receptors</u></b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy and Trosnant Brook)</p> <p><b><u>Potential Effect</u></b> Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance.</p>	Low (least sensitive) to Medium (most sensitive)	Very Low and Low	Negligible to Minor (Not Significant)	Effective implementation of the embedded measures designed to avoid the release of silt-laden runoff.
<p><b><u>Aquatic environment receptors</u></b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies</p>	Very low (least sensitive) to Medium (most sensitive)	Very Low and Low	Negligible to Minor (Not Significant)	Implementation of the embedded measures designed to prevent pollution of surface water and groundwater. These include appropriate pollution prevention measures in line



Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<p>(Afon Ebwy and Troisant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and non-statutory designated sites for biodiversity conservation (SINCs)</p> <p><b>Potential Effect</b> Accidental release of pollution into surface water or ground by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation (SINCs)</p>				<p>with recommended guidance, pollution incident response planning, water quality monitoring programme, implementation of the WMP for the construction phase, fuel and oil storage design, and development and implementation of a Materials Management Plan to manage potentially contaminated excavated material. If concrete batching is to happen on Site, appropriate controls and water treatment facilities are to be agreed with NRW prior to construction. The use of sulphate resistant concrete is recommended.</p>
<p><b>Aquatic environment receptors</b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy and Troisant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and designates sites for biodiversity conservation (SINCs)</p> <p><b>Potential Effect</b> Discharge of potentially polluted water generated from construction activities (concrete batching, surface water runoff) into surface water or ground or from leaching of contaminants in soils during infiltration to ground leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD water bodies and deterioration in the</p>	<p>Very low (least sensitive) to Medium (most sensitive)</p>	<p>Very Low and Low</p>	<p>Negligible to Minor (Not Significant)</p>	<p>Implementation of the embedded measures designed to prevent pollution of surface water and groundwater. These include appropriate pollution prevention measures in line with recommended guidance, pollution incident response planning, water quality monitoring programme, implementation of the WMP for the construction phase, fuel and oil storage design, and development and implementation of a Materials Management Plan to manage potentially contaminated excavated material. If concrete batching is to happen on Site, appropriate controls and water treatment facilities are to be agreed with NRW prior to construction. Further investigation of the viability of infiltration will be undertaken through liaison with CCBC and by considering information from the future Phase 2 Geo-</p>

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<p><b>conditions supporting local</b> designates sites for biodiversity conservation (SINCs)</p>				environmental Ground Investigation.
<p><b><u>Aquatic environment receptors</u></b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy and Trostant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and non-statutory designates sites for biodiversity conservation (SINCs)</p> <p><b><u>Potential Effect</u></b> Potential change in groundwater levels due to dewatering of excavations resulting in decrease in groundwater baseflow to watercourses, ponds and springs and deterioration in the status of WFD water bodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p>	Very low (least sensitive) to Medium (most sensitive)	Low	Negligible to Minor (Not Significant)	Although shallow groundwater in the underlying Coal Measures is not anticipated, as a precautionary approach, the Phase 2 geo-environmental ground investigation will include confirmation of groundwater conditions near turbine 3 and, if required, pumping of water from excavation into the pond P10.
<p><b><u>Water resource receptors</u></b> Private and licensed water abstractions</p> <p><b><u>Potential Effect</u></b> Potential change to water quality of a water supply resource which may affect the viability of an abstraction</p>	Low	Very Low	Negligible (Not Significant)	Implementation of embedded measures designed to prevent pollution of surface water and groundwater and to limit sediment-laden runoff (set out above for the aquatic environment receptors).
<p><b><u>Water resource receptors</u></b> Private and licensed water abstractions</p> <p><b><u>Potential Effect</u></b> Potential change to yield of a water supply resource which may affect the viability of an abstraction</p>	Low	Low	Negligible (Not Significant)	Limited duration, depth and footprint of the excavations and limited potential for encountering groundwater during excavations.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<p><b><u>Water resource receptors</u></b> DCWW watermain</p> <p><b><u>Potential Effect</u></b> Damage to or obstruction of maintenance of DCWW's watermain potentially affecting local water supply</p>	Medium	Low	Minor (Not Significant)	Implementation of embedded measures to protect structural integrity of the main ensure no impact for local water supply.
<p><b><u>Flood risk receptors (third party receptors)</u></b> People, property, and infrastructure at risk of flooding (downslope and adjacent to the Proposed Development area including properties at Panside, Abercarn, Swffryd, Hafodyrynys and Newbridge)</p> <p><b><u>Potential effect</u></b> Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces (e.g., TCC, access tracks, crane pads)</p>	Medium	Very Low	Negligible (Not Significant)	Limited land take and change in impermeable area. Implementation via WMP of embedded measures designed to provide runoff control/storage using SuDS to ensure no increase in runoff.
<p><b><u>Flood risk receptors (third party receptors)</u></b> People, property, and infrastructure at risk of flooding (downslope and adjacent to the Proposed Development area including properties at Panside, Abercarn, Swffryd, Hafodyrynys and Newbridge)</p> <p><b><u>Potential effect</u></b> Changes to surface water flow conveyance arising from the presence of new or modified permanent watercourse crossings.</p>	Medium	Very Low	Negligible (Not Significant)	Access track crossing mapped surface water flow path will require appropriately sized culvert. The design of any culverts will be confirmed as part of the detailed drainage design. The capacity of any existing culverts should be maintained at a minimum in instances where updates may be required associated with access track improvements and widening. Any new culverts required will be sized at the detailed design stage and will be subject to consent from CCBC.
<b>Operational phase</b>				
<p><b><u>Aquatic environment receptors</u></b> Watercourses (Nant Gawni, Nant Gwyddon, Nant Hafod-</p>	Very Low (least sensitive) to Medium	Very Low	Negligible (Not Significant)	Implementation of embedded measures to control the potential impacts of accidental fuel, oil or chemical release as

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<p>fach, unnamed watercourses), WFD surface waterbodies (Afon Ebwy and Trosnant Brook), ponds, springs, SE Valleys Carboniferous Coal Measures WFD groundwater body and non-statutory designated sites for biodiversity conservation (SINCs)</p> <p><b>Potential Effect</b> Accidental spillage of pollutants (fuel or oil) during maintenance activities leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD waterbodies and deterioration in the conditions supporting local designates sites for biodiversity conservation.</p>	(most sensitive)			<p>a result of maintenance activities on Site. These include appropriate maintenance of vehicles, equipment and wind turbines, development and implementation of a Detailed Drainage Design and an accidental spill response protocol and implementation of standard best practice when using equipment or refuelling.</p>
<p><b>Water resource receptors</b> Private and licensed water abstractions</p> <p><b>Potential Effect</b> Potential change to water quality of a water supply resource which may affect the viability of an abstraction during maintenance activities</p>	Low	Very Low	Negligible (Not Significant)	<p>Implementation of embedded measures designed to prevent pollution of surface water and groundwater (set out above for aquatic environment receptors).</p>
<p><b>Flood risk receptors (third party receptors)</b> People, property, and infrastructure at risk of flooding (downslope and adjacent to the Proposed Development area including properties at Pantside, Abercarn, Swffryd, Hafodyrynys, and Newbridge)</p> <p><b>Potential effect</b> Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces (e.g., substation, access tracks, crane pads)</p>	Medium	Very Low	Negligible (Not Significant)	<p>Limited land take and change in impermeable area. Implementation via Detailed Drainage Design of embedded measures designed to provide runoff control/storage using SuDS to ensure no increase in runoff.</p>

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<p><b><u>Flood risk receptors (third party receptors)</u></b>            People, property, and infrastructure at risk of flooding (downslope and adjacent to the Proposed Development area including properties at Panside, Abercarn, Swffryd, Hafodyrynys, and Newbridge)</p> <p><b><u>Potential effect</u></b>            Changes to watercourse flow conveyance arising from the presence of new or modified permanent watercourse crossings.</p>	Medium	Very Low	Negligible (Not Significant)	Access tracks crossing mapped surface water flow paths or watercourses will require appropriately sized culverts (expected at one location). The design of any culverts will be confirmed as part of the detailed drainage design. Crossing points of any pre-existing structures (expected at three locations) will be surveyed prior to construction works (post consent) to establish the structural integrity of the crossings. Suitable mitigation measures will be identified and proposed, where necessary and applicable, to ensure no detrimental impact to the structure. Should it be deemed necessary for the culvert to be upgraded, any new culverts required will be sized at the detailed design stage in consultation and subject to consent from CCBC.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section** Error! Reference source not found. and is defined as Very Low, Low, Medium and High.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section** Error! Reference source not found. and is defined as Very Low, Low, Medium and High.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as Major (significant), Moderate (potentially significant) or Minor/Negligible (not significant), subject to the evaluation methodology outlined in **Section** Error! Reference source not found..

## 10.12 Further work to be undertaken

- 10.12.1 The information provided in this Draft ES is preliminary, the final assessment of likely significant effects will be reported in the final ES. This section describes the further work to be undertaken to support the Water Environment assessment presented in the ES.
- 10.12.2 The proposed outline surface water drainage strategy for the Proposed Development included in the Draft FCA (**Appendix 10A**) will be agreed in consultation with CCBC and confirmed in the final submission of the ES.
- 10.12.3 The proposed embedded measures for mitigation of potential effects on the pond near turbine 3 will be agreed in consultation with NRW and confirmed in the final submission of the ES.
- 10.12.4 The proposed approach for crossing of DCWW's watermain will be agreed in consultation with DCWW and confirmed in the final submission of the ES.