HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Wylfa Newydd Project

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8 Surface water and groundwater

8.1 Introduction

8.1.1 This chapter describes the assessment of potential surface water and groundwater effects resulting from the construction, operation and decommissioning of the Logistics Centre at Parc Cybi (hereafter referred to as the 'Logistics Centre').

8.1.2 Please refer to chapter B8 (surface water and groundwater) (Application Reference Number: 6.2.8) for the technical basis for the assessment including a summary of legislation, policy and guidance; key points arising in consultation that have guided the surface water and groundwater assessment; and assessment methodologies and criteria.

8.2 Study area

8.2.1 This section describes the study areas relevant to the surface water, fluvial geomorphology and groundwater assessment for the Logistics Centre.

Surface water

8.2.2 The study area for surface water focuses on the indicative areas of land that could be physically affected by the Logistics Centre, covering the development site and extending at least 500m in all directions (figure H8-1, Application Reference Number: 6.8.29). This study area has been based on professional judgement, the use of which is outlined in section 8.4 of chapter B8 (Application Reference Number: 6.2.8). The initial assessment of the site found that 500m allows the inclusion of any surrounding water features that may be hydrologically linked to the Logistics Centre, as well as any off-site receptors that may be affected by the proposed development.

Fluvial geomorphology

8.2.3 A study area of 250m in all directions around the Logistics Centre has been considered for fluvial geomorphology. This allows any watercourses within the local vicinity to be identified and provides a sufficient distance upstream and downstream to consider any changes in morphological processes. As the watercourse channels at the Logistics Centre are small and of poor quality, the study area of 250m was deemed appropriate as effects are unlikely to be noticeable further than this.

Groundwater

8.2.4 The study area for the groundwater assessment includes all groundwater-associated receptors that could be physically affected by the Logistics Centre. The groundwater study area extends to a distance of 1km in all directions around the Logistics Centre (figure H8-1, Application Reference Number: 6.8.29). The size of the study area is based on professional judgement regarding the maximum potential extent of effects likely in the type of aquifer present and the nature and scale of the development. Due to the size of the

Logistics Centre, the nature of the development and the nature of the aquifers present, there is limited potential for long-term, wide-ranging effects on groundwater, and therefore the study area of 1km is deemed appropriate.

8.2.5 Vertically, the groundwater assessment has considered the possible effects on the groundwater environment in the underlying bedrock aquifer, which is considered as a groundwater receptor within the study area.

8.3 Baseline environment

8.3.1 This section provides a summary of the baseline conditions for surface water and groundwater within the study areas described in section 8.2.

Surface water

Catchment and water features

8.3.2 The baseline details below have been derived from published information and from a site walkover completed by Jacobs staff in May 2017. All receptors have been allocated a value based on the criteria provided in table B8-11 in chapter B8 (Application Reference Number: 6.2.8) of this Environmental Statement.

8.3.3 The Logistics Centre is located on Holy Island (Ynys Gybi) which does not have any main rivers, so the Logistics Centre is not within any significant catchments. There are three small watercourses recorded within the study area. One watercourse (Unnamed watercourse 1 on figure H8-1, Application Reference Number: 6.8.29) flows along the north of the site at the boundary between the Logistics Centre and the A55. This watercourse flows in a west to east direction and outfalls to the A55 attenuation pond (figure H8-1). This watercourse is considered to be a low value receptor, as it is not a designated watercourse and flow is intermittent. The A55 attenuation pond is considered to be of low value as it is not a designated water feature and does not have a continuous flow feeding it, so there are periods when it is dry.

8.3.4 The second watercourse (Unnamed watercourse 2 on figure H8-1, Application Reference Number: 6.8.29) was found to be dry during the site walkover but originates to the west of the proposed Logistics Centre site. It flows in a southwest to northeast direction, passing through a culvert under Parc Cybi Road. The watercourse flows northeast and outfalls into Unnamed watercourse 1. The watercourse is considered to be a low value receptor with intermittent flow, and acts more as a drainage channel.

8.3.5 A third watercourse (Unnamed watercourse 3 on figure H8-1, Application Reference Number: 6.8.29) flows to the east of the proposed Logistics Centre site in a southwest to northeast direction, through a culvert under the A55. This watercourse is considered to be a low value receptor as it is a minor watercourse of local environmental importance.

8.3.6 Holyhead Bay, which is located downstream, approximately 1km northeast, is outside of the study area. However, as this is considered to be a high value receptor and the most important surface water body in the area it has been assessed here to determine if it should be included in the impact assessment.

There are no direct outfalls from the proposed Logistics Centre to the marine environment, but there are discharges from the Logistics Centre drainage to a pond and subsequent watercourse that does discharge to Holyhead Bay. This watercourse and other watercourses between the proposed Logistics Centre and Holyhead Bay are small unnamed watercourses with poorly defined channels. Given the length of the pathway and the role of the pond (attenuation pond for the A55), plus the quality of the watercourses and the fact there is not a clear, defined drainage route to Holyhead Bay, there is unlikely to be a significant effect. Therefore, Holyhead Bay has been scoped out of the assessment as a sensitive receptor for surface water.

Flood risk

8.3.7 The proposed Logistics Centre would be located within flood zone A of the *Technical Advice Note* (TAN) *15: Development Advice Map* [RD1], implying that there is little to no risk of fluvial flooding (see figure H8-1-2 in appendix H8-1, Application Reference Number: 6.8.16). The watercourses in the area will not have been included in the modelling for the TAN 15 flood maps due to their small size, so the risk of flooding from the watercourses cannot be accurately determined. However, there have been no recorded flood events in the area, and surface water discharges will be restricted by culverts within the study area. Therefore, the risk of fluvial flooding is considered to be low. This is assessed in detail in the Flood Consequence Assessment (FCA) in appendix H8-1 (Application Reference Number: 6.8.16).

8.3.8 According to the surface water flood risk maps produced by Natural Resources Wales (NRW) [RD2], an area at risk of surface water flooding has been identified in the southernmost part of the proposed Logistics Centre site, south of the rock outcrop (figure H8-1-3 in appendix H8-1, Application Reference Number: 6.8.16). The flood risk is defined as medium in some areas, so each year this part of the site has between a 1 in 100 (1%) and 1 in 30 (3.3%) chance of flooding. It is considered likely that the development would include some levelling of the site in the access areas, and therefore the risk from this source of flooding would be removed.

8.3.9 Within the surrounding land, there is an area of medium risk associated with hardstanding to the southwest of the site. A small area of high risk is associated with the inlet to the drainage pond south of the A55, and there are some areas of medium and high risk directly associated with the channels of the watercourses in the study area.

8.3.10 A number of off-site flood receptors have been identified. These include the Scottish Power Energy Networks facility and the mast, which are approximately 150m to the west of the proposed Logistics Centre site. As well as this, there is the Road King truck stop, which is located to the southwest of the proposed Logistics Centre site on the opposite side of Parc Cybi Road; and the A55 which is located immediately to the north. On the opposite side of the A55, there is a closed aluminium works and a retail park. There would be no increase in runoff from the Logistics Site following development, and therefore no increase in flood risk to these off-site receptors.

8.3.11 The full analysis of flood risk is presented in the FCA, provided in appendix H8-1 (Application Reference Number: 6.8.16).

Surface water quality

8.3.12 No information on surface water quality is available for the watercourses within the study area. The nearest information on surface water quality is from Cleifiog at Valley, to the southeast, which has a moderate overall Water Framework Directive (WFD) status with a good chemical status. It is assumed that the watercourses within the study area are, at best, similar in quality given that the study area catchments are small and of similar geology, although they do contain more urban development which could act as a source of pollution.

Surface water abstractions and discharges

8.3.13 Surface water can be abstracted from watercourses for a variety of uses including potable supply, agriculture (for watering crops or as a water supply for animals) or industrial uses. Anglesey is a licence-exempt area and so NRW does not hold any records of abstractions from surface water. There is unlikely to be any use of the watercourses for potable abstraction given their small size, intermittent nature and availability of mains water. Surface water would also need to be treated prior to use, and this is considered beyond the normal capability of small households.

8.3.14 There are no known industrial water discharges within the study area, but there could be agricultural water discharges present that have not been officially recorded.

Fluvial geomorphology

8.3.15 During the site walkover in May 2017, the watercourses within the study area were found to have artificially modified channels and are likely to all be man-made or straightened for agricultural purposes. The channels were poorly established with flow appearing to be intermittent. There were limited morphological features within the channels and the watercourses were not directly connected to any larger, sensitive watercourses downstream. In addition, there is no potential for any morphological changes to watercourses upstream. The receptors are therefore of negligible value with respect to geomorphological attributes, and fluvial geomorphology has been scoped out of this assessment.

Groundwater

Soils, geology and aquifer characteristics

8.3.16 A detailed description of the soils, geology and made ground is included in chapter H7 (soils and geology) (Application Reference Number: 6.8.7). Only elements pertinent to the groundwater assessment are included below.

8.3.17 Made ground (black-brown clayey, gravelly, cobbly, medium sand with slate concrete and tile) is present at the proposed Logistics Centre site, ranging from depths of between 0.3m and 1.3m below ground level and confined to

the southern and northern extents of the study area. Hardstanding is also present along parts of the southern and northern site boundaries.

8.3.18 The soils within the study area are defined as "*freely draining slightly acidic loamy soils*" [RD3]. The infiltration potential at the site is therefore likely to be high in areas not covered by hardstanding. It was noted during the site walkover in May 2017 that there were a number of rocky outcrops in the south of the site.

8.3.19 With the exception of a small area in the southwest of the site, which is underlain by glaciofluvial sand and gravel (maximum known thickness of 1.6m), the whole of the proposed Logistics Centre site is underlain by superficial deposits comprised of brown to grey clayey to coarse sand and gravel glacial till material. Borehole investigations note that these deposits occurred between ground level and 4.7m below ground level with a maximum thickness of 3.9m (see chapter H7, Application Reference Number: 6.8.7). The till is defined by NRW as a Secondary (undifferentiated) aquifer with relatively low permeability (depending upon clay content) and limited significance for groundwater supply or river base flow. Where the till matrix is dominated by clays recharge to groundwater is likely to be very low, with rates estimated by the British Geological Survey [RD4] in other parts of the UK as typically being around 20% of the total annual effective rainfall. Till can be very heterogeneous, and although there will be differences in different parts of the UK, the percentage recharge is likely to be broadly around this value where the matrix is clay dominated.

8.3.20 It is possible that the sand and gravel deposits in the southwest of the site form a perched aquifer resulting from the percolation of surface water through the loam soils, into the sand and gravel, and impeded by the less permeable underlying glacial till (it is anticipated, though not certain that the sand and gravel is underlain by till). This sand and gravel aquifer is defined as a Secondary A superficial aquifer by NRW. A Secondary A aquifer is defined as an aquifer that has permeable layers capable of supporting water supplies at a local level. These aquifers can also be important for base flow to rivers. Given that the extent of the sand and gravel at the proposed Logistics Centre is relatively small, groundwater yields from this deposit are likely to be small. Nonetheless, as the aquifer is a Secondary A, based on the criteria detailed in table B8-10 in chapter B8 of this Environmental Statement (Application Reference Number: 6.2.8), the value of this receptor is assessed as medium for the groundwater assessment.

8.3.21 The bedrock underlying the proposed Logistics Centre site comprises mica schist and psammite, belonging to the New Harbour Group rock formation. The bedrock is defined by NRW as a Secondary B aquifer, which is predominantly lower permeability layers of rock, that may store and yield limited amounts of groundwater.

Groundwater quality

8.3.22 NRW does not have any groundwater monitoring boreholes in the area, and as a result, no groundwater sampling for chemical analysis has been

undertaken. The baseline assessment is therefore informed by the general aquifer quality designation information provided by NRW.

8.3.23 According to NRW [RD5], the Ynys Môn Secondary WFD groundwater body as a whole is currently achieving poor quality status. The quality status is likely to be spatially very variable across the WFD water body, and the areas of poor quality could be due to localised pollution associated with historical mining activities at Parys Mountain which is located south of Amlwch town, approximately 20km northeast of the proposed Logistics Centre.

8.3.24 Where the glacial till at the proposed Logistics Centre site is dominated by clays, it affords the bedrock aquifer some protection from any above-ground contaminant sources, although this also depends on the till thickness and the depth to the water table. Whilst the quality of any groundwater present in the sand and gravel deposits could be slightly degraded, due to local agricultural practices, based on the available information and land use in the area, the groundwater quality at the proposed Logistics Centre site is likely to be better than that stated for the whole WFD water body.

Groundwater flow and levels

8.3.25 Given the absence of groundwater-monitoring boreholes in the area, there is no groundwater level or flow data available for this assessment. With the exception of the small area of sand and gravel in the southwest of the site (which may have perched groundwater within it), the geology indicates that there is unlikely to be a groundwater resource associated with the superficial deposits. Most incident rainfall in the study area will infiltrate into the loam soil and become runoff, once the infiltration capacity of the soil has been exceeded, or become shallow throughflow to local streams and ditches.

8.3.26 The general groundwater flow direction in the bedrock, at the regional scale, is likely to be north and/or west towards the coast. Groundwater from bedrock is unlikely to support streams and drains on-site due to the low permeability drift cover.

Groundwater abstractions

8.3.27 The proposed Logistics Centre site lies in an area that was, until January 2018, exempt from groundwater abstraction licensing, and NRW does not therefore hold any records of groundwater abstractions in the area. The Isle of Anglesey County Council (IACC) does hold details of Private Water Supplies (PWSs) and public wells for its administrative boundary. However, current regulations do not require the local authority to monitor PWSs to an individual dwelling, and hence this list, although useful, may be incomplete.

8.3.28 The data provided by the IACC indicate that there are no known public wells within 1km of the proposed Logistics Centre, but that there is one known PWS within this area. The abstraction is a residential PWS for a single property that lies 425m south-southeast of the site (table H8-1, figure H8-1). Abstractions such as this from Secondary B aquifers are always small, as, due to the inherent nature of the aquifers, they cannot support large abstractions. The typical recharge area/zone of influence for a small abstraction in a Secondary B aquifer is likely to be of the order of several hundred metres. Given its

distance from the proposed Logistics Centre, this abstraction is unlikely to be significantly affected. In line with the assessment criteria in chapter B8 (Application Reference Number: 6.2.8), the value of this receptor is assessed as low for the groundwater assessment.

Table H8-1 PWSs within 1km radius of the Logistics Centre

Address	Usage	Easting	Northing	Distance from site	Direction from site
Tyddyn Uchaf, Penrhos, Holyhead, LL65 2TR	Single residential property	225956	380211	425m	South-southeast

8.3.29 Ordnance Survey mapping shows the presence of two wells (figure H8-1, Application Reference Number: 6.8.29) within the study area at the following locations:

- 470m to the northwest near Tyddyn-pioden; and
- 780m to the south at Trearddur Mews.

8.3.30 These wells are not recorded by the IACC and so they are unlikely (though this is not certain) to be used for potable purposes, although they could be used for agricultural purposes, or they could be redundant wells. Due to the distance of the second of these from the proposed Logistics Centre, it is not considered further in this assessment. However, the well near Tyddyn-pioden is considered as a receptor, albeit of low value, as if it is used, it is unlikely to be for potable supply.

8.3.31 There is also the potential for small unlicensed abstractions to be present within 1km of the site that are not recorded in the list provided by the IACC, but there is limited likelihood of this given the presence of mains water across this area.

Groundwater dependant terrestrial ecosystems

8.3.32 Based on publically available mapping, there are no sites with ecological designation within the study area or its immediate surrounds. The closest ecologically designated area is Beddmanarch-Cymyran Site of Special Scientific Interest, which lies more than 1km east of the proposed Logistics Centre site and is an area of tidal mudflats, with limited groundwater dependency. Based on this information, there are no groundwater dependant terrestrial ecosystems that need to be considered as receptors.

Water Framework Directive

8.3.33 Holyhead Bay is a WFD water body that has a moderate status [RD5]. As there would be no direct outfalls from the proposed Logistics Centre, this receptor has been scoped out of the WFD assessment.

8.3.34 The bedrock aquifer underlying the proposed Logistics Centre forms part of the Ynys Môn Secondary WFD groundwater body that covers much of Anglesey. The aquifer was designated in 2015 as being of 'Good' quantitative

status, with no significant pressures on groundwater resources and with sufficient water to support stream flows and groundwater inputs to terrestrial ecosystems.

8.3.35 There are no fluvial WFD water bodies on Holy Island (reported for either Cycle 1 or Cycle 2 of the Western Wales River Basin Management Plan [RD6]), and therefore there is no WFD information on the current status of the watercourses in this location.

Summary of receptors

8.3.36 Surface water and groundwater receptors that have been identified and that could potentially be affected by the proposed Logistics Centre are listed in table H8-2. Fluvial geomorphology has been scoped out for further assessment as detailed above.

Table H8-2 Summary of water environment receptors

Category	Key receptors	Value[1]
Hydrology	Unnamed watercourse 1, to the north of the proposed Logistics Centre, which flows in a west to east direction adjacent to the A55	Low
	Unnamed watercourse 2, southwest of the proposed Logistics Centre, which flows in a southwest to northeast direction and outfalls to a pond.	Low
	Unnamed watercourse 3, to the east of the proposed Logistics Centre, which flows in a southwest to northeast direction	Low
Groundwater	Secondary (undifferentiated) aquifer (till)	Low
	Secondary B Bedrock Aquifer	Low
	Groundwater in the sand and gravel deposits (Secondary A Superficial Aquifer)	Medium
	Residential PWS 425m south-southeast of the proposed Logistics Centre	Low
	Well shown near Tyddyn-pioden on Ordnance Survey map	Low

Note 1: basis of value is defined in chapter B8 of this Environmental Statement (Application Reference Number: 6.2.8).

Evolution of the baseline

8.3.37 Over a medium- to long-term period, climate change could potentially alter the hydrological regime of the watercourses. This is assessed as part of the surface water baseline. Increased frequency/severity of droughts and floods could potentially lead to the watercourses adjusting to different patterns of erosion and deposition. However, it is likely that the adjustment would remain localised and of relatively low magnitude given the channel types.

8.4 Design basis and activities

8.4.1 This section sets out the design basis for this assessment of effects. It sets out where any assumptions have been made to enable the assessment to be carried out at this stage in the evolution of the design. This section also identifies the embedded and good practice mitigation that would be adopted to reduce adverse effects as inherent design features or by implementation of standard industry good working practice. Details of the design for the Logistics Centre are provided in chapter H1 (proposed development) (Application Reference Number: 6.8.1), along with detailed descriptions of the development phases and activities.

8.4.2 As described in chapter H1 (Application Reference Number: 6.8.1), the approach adopted for the design of the Logistics Centre has been to utilise a parameter approach to the development. Parameters have been set for the five main buildings: the Covered Inspection Bay in Parameter Zone 7-1; the Welfare/Security Building in Parameter Zone 7-2; the Vehicle Scanner in Parameter Zone 7-3; the Driver Instruction Kiosk in Parameter Zone 7-4; and the Security entry/exit kiosk in Parameter Zone 7-5. The location and extent of these Parameter Zones is shown on figure H1-5 (Application Reference Number: 6.8.29), and the relevant maximum parameters for the buildings are also detailed in table H1-1 in chapter H1 (Application Reference Number: 6.8.1).

8.4.3 The parameters listed in chapter H1 (Application Reference Number: 6.8.1) only allow the size of the buildings to be changed and so have no substantial effect on the surface water or groundwater assessments. Although making a building smaller would reduce the amount of runoff from that building, as the surrounding area would remain as hardstanding the total rainfall moving to drain and the rainfall/runoff relationship would remain the same. Similarly, as the total area of impermeable ground (hardstanding and buildings) would not change there would be no change to groundwater recharge. A worst case scenario has therefore been assessed from a surface water and groundwater perspective within the parameters described in chapter H1 (Application Reference Number: 6.8.1) and on the basis of assessment and assumptions outlined below.

Construction

8.4.4 A summary is given below of the activities and design basis associated with the construction of the Logistics Centre.

Basis of assessment and assumptions

8.4.5 There are a number of construction activities required for the Logistics Centre that could affect surface water and groundwater during the approximate 15-month construction phase. The activities include:

- site clearance, including vegetation clearance;
- locating and establishing site compound and welfare facilities;
- construction of buildings (it is assumed that these would require minimal foundations);

- construction of car parking areas and new access road;
- construction of drainage outfall to the existing pond northwest of the Logistics Centre; and
- earthworks including:
  - changing ground levels to create an acceptable gradient for heavy goods vehicles (HGVs) to park on; and
  - topsoil strip removed from the footprint of the proposed hardstanding in order to provide a level platform for construction, with soil reused on-site or removed, with no long-term topsoil storage on-site. It is possible that low permeability till would be removed, but this would be replaced by hardstanding which would provide aquifer protection.

8.4.6 It has been assumed that there would not be a requirement for dewatering as part of any construction activity as there is no deep construction proposed; or, if there is a requirement, it would be small scale, localised, short-term and would likely be exempt for permitting under current regulations.

Embedded mitigation

8.4.7 No embedded mitigation has been proposed as part of the construction phase.

Good practice mitigation

8.4.8 Good practice mitigation would comprise the adherence to all relevant legislation, statutory and non-statutory guidance as detailed in chapter B8 of this Environmental Statement (Application Reference Number: 6.2.8) and as stated in the Wylfa Newydd Code of Construction Practice (CoCP) (Application Reference Number: 8.6).

8.4.9 The Wylfa Newydd CoCP (Application Reference Number: 8.6) and Logistics Centre sub-CoCP (Application Reference Number: 8.11) set out the overarching pollution management principles to be applied across the Logistics Centre site through the construction period. The CoCPs detail good practice procedures that the Contractor would be required to follow. The implementation of this mitigation would be the responsibility of the Contractor, with no work being commenced before all contractors are familiar with the CoCPs. This would include management of materials, management of drainage and sediment, and emergency response procedures. The processes for checking and reporting compliance would be detailed, as would the process for changes if significant pollution of the water environment were to be identified. Specific good practice, as outlined in the CoCPs, would include the following.

- A risk assessment would be undertaken for use of any cementitious materials within 50m of any active watercourse. Appropriate controls, proportionate to the level of risk identified, would be applied to the works.
- All refuelling, oiling and greasing would take place above drip trays or on impermeable surfaces (e.g. plant nappy) with sealed drainage and an oil interceptor, which provides protection to underground strata and watercourses, and away from drains as far as is reasonably practicable.

Vehicles and plant would not be left unattended during refuelling. Appropriate spill kits would be easily accessible during these activities. Only construction equipment and vehicles free of oil/fuel leaks which could cause material contamination would be permitted on-site. Drip trays would be placed below static mechanical plant.

- Measures would be taken to prevent the deposition of silt or other material arising from work operations in existing watercourses or catchment areas. The measures would accord with the principles set out in industry guidelines, including NRW's *Works and maintenance in or near or water: GPP 5* [RD7]. Measures include use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens, as well as consideration of the type of plant used and the time of year for working in watercourses.

8.4.10 As stated in the Wylfa Newydd CoCP (Application Reference Number: 8.6), any temporary storage of over 200 litres of oil in drums and mobile bowsers, as well as ancillary pipe work, valves, filters, sight gauges and equipment require secondary containment, e.g. bunding or drip trays (in accordance with the Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016). Emergency response procedures would be developed to deal with any spills or leaks of fuels or oils.

8.4.11 Good practice mitigation during construction would include following guidance on pollution control and relevant Construction Industry Research and Information Association (CIRIA) guidance on good construction practice, such as *Control of water pollution from construction sites: Guidance for consultants and contractors* [RD8], as stated in the Wylfa Newydd CoCP (Application Reference Number: 8.6).

8.4.12 As stated in the Wylfa Newydd CoCP (Application Reference Number: 8.6), in order to reduce the potential effect of culverts and outfalls, the structures would be designed following industry guidelines including CIRIA, particularly C689, *Culvert Design and Operating Guide* [RD9]. The size and extent of outfall structures and inverts would be set appropriately at detailed design.

8.4.13 Horizon would install appropriate drainage onsite prior to main construction to manage run-off. This would include sediment settlement ponds and/or appropriate treatment to manage flows and meet water quality thresholds (Environmental Quality Standards). If required, an application would be made for an Environmental Permit which would set limits on the concentrations of substances which could be discharged to protect the receiving surface water. In addition, the proposed outfall structure may also require an application for an ordinary watercourse consent from the IACC. The need for such applications will be determined after discussions with NRW and the IACC once detailed design is complete.

Operation

8.4.14 A summary is given below of the activities and design basis associated with the operation of the Logistics Centre.

Basis of assessment and assumptions

8.4.15 The operation of the Logistics Centre would involve HGVs arriving at the site and being logged and inspected before parking, to await their allocated time to proceed to the Power Station. Vehicles would be scanned by a scanning facility to detect any security threats, and an area provided for physical inspection of vehicles should further investigation be needed. A welfare and office building would therefore be present on the site. It is anticipated that the Logistics Centre would be operational for approximately 10 years, and during this time it would operate for 24 hours a day, seven days a week.

8.4.16 The foul water from the Logistics Centre would discharge to an existing sewer and foul water pumping station, located to the northwest of the site.

8.4.17 There would be no bulk fuel storage or vehicle refuelling on-site during operation of the Logistics Centre.

Embedded mitigation

8.4.18 All surface runoff would be passed through an oil/water interceptor before passing through a below-ground geocellular attenuation tank. The vehicle hardstanding would be constructed using impermeable paving, and surface runoff would be routed through a below-ground geocellular storage system. This would be used to attenuate flood events. The maximum discharge would be reduced to the runoff rates set out in [RD10] as detailed in the FCA (appendix H8-1 (Application Reference Number: 6.8.16)).

Good practice mitigation

8.4.19 As stated in the Wylfa Newydd CoCP (Application Reference Number: 8.6), mitigation that would apply during operation of the Logistics Centre is outlined below and has been used in this chapter to assess the potential effects of the Logistics Centre on the water environment.

- Surface water drainage from all parking areas where there is a potential of leaks of fuels, oils or other liquids would incorporate attenuation and appropriate pollution treatment.
- Regular inspection, maintenance and management of the oil interceptors and the drainage system would take place.
- There would be regular inspection of the parking area for fuel and oils.
- Spill response and clean-up procedures would be implemented to prevent pollution of watercourses.

Decommissioning

8.4.20 A summary is given below of the activities and design basis associated with the decommissioning of the Logistics Centre.

Basis of assessment and assumptions

8.4.21 It is assumed that after the operational lifetime of the Logistics Centre, the site would not be returned to its previous state and would remain available for

another use (yet to be determined). The decommissioning phase would entail the removal of the welfare/security building, the inspection bay covering, the security scanner and the security kiosks.

8.5 Assessment of effects

8.5.1 This section presents the findings of the assessment of effects associated with the construction, operation and decommissioning of the Logistics Centre. The methodology used for the assessment, including the basis of the values ascribed, is detailed in section 8.4 of chapter B8 (Application Reference Number: 6.2.8).

Construction

Surface water

8.5.2 The key issues of the construction phase of the Logistics Centre on the surface water environment are related to water quality. The potential effects include:

- degradation of surface water quality due to leaks and spillages of fuels or oils used in construction plant;
- degradation of surface water quality due to spillage of cementitious materials, either via groundwater migration or via surface flow pathways; and
- degradation of water quality due to high sediment loadings in runoff from demolition and earthworks.

8.5.3 There is not anticipated to be any measureable change in surface water quality due to the storage and use of fuel and oil in construction. The potential magnitude of change on water quality from leaks and spillages of fuels or oils is therefore considered to be negligible. This is due to:

- the application of a buffer zone around watercourses for the storage of fuel and oil;
- storing fuel and oil in an appropriate manner as required by the legislation and by following good practice as outlined in the Wylfa Newydd CoCP (Application Reference Number: 8.6);
- the formulation of management procedures for fuel dispensing in accordance with the management strategy set out in the Wylfa Newydd CoCP (Application Reference Number: 8.6); and
- the formulation of management procedures for dealing with any leaks or spills in accordance with the management strategy set out in the Wylfa Newydd CoCP (Application Reference Number: 8.6).

8.5.4 It would be the responsibility of the Contractor to implement the mitigation measures following the good practice detailed in the Wylfa Newydd CoCP (Application Reference Number: 8.6). The residual effect on the surface water environment would therefore be negligible, which is not a significant effect.

8.5.5 To reduce the potential effect on water quality, wherever possible, concrete would be batched off-site and concrete components delivered as needed. There would be no concrete pouring within 50m of a watercourse without a bespoke risk assessment. With the application of these mitigation measures, which would be implemented by all Contractors on site, the magnitude of change on water quality would be negligible and the potential residual effect would also be negligible. This would not be a significant effect.

8.5.6 To alleviate the potential impact of high sediment loading, good practice would be followed as detailed in section 8.4 and the Wylfa Newydd CoCP (Application Reference Number: 8.6). This could require the use of sediment control such as silt fences, attenuation and settlement. With the application of these mitigation measures, the magnitude of change on water quality would be small and the significance of impact would be minor. This would not be a significant effect.

Flood risk

8.5.7 An FCA has been undertaken and is included at appendix H8-1 (Application Reference Number: 6.8.16). The assessment follows the requirements of TAN 15 [RD1], which focuses on the flood risks of a development post-construction, but, due to the relatively short timescale of construction activities (which would not be affected by climate change), does not consider the risks during construction. These risks are therefore considered below.

8.5.8 During construction, the risk of flooding at a site is initially the same as that identified for the baseline condition, but depending upon the nature and timing of the construction activities, that risk could change, principally through either an increase in exposure of people and plant or through changes to landforms that might increase the risk of flooding elsewhere. However, the risks are normally managed by the contractor's construction management procedures, which may (depending upon site location) include flood risk procedures that draw on NRW issued flood warnings or Met Office issued weather warnings.

8.5.9 It is normally the case that drainage is one of the first elements of the construction. Where such drainage is an integral part of flood risk management, including attenuation facilities for instance, then this can be assessed in a similar way to the risks during operation, albeit without consideration of climate change.

8.5.10 The key issues relating to the construction phase of the Logistics Centre on flood risk include:

- high sediment loading within watercourses from construction activities causing a reduction in conveyance in culverts downstream;
- localised flooding within the site in areas where direct rainfall and/or runoff from off-site exceeds the design standard of the construction drainage system; and
- increase in surface water flooding risk within the Logistics Centre as a result of soil compaction and an increase in impermeable areas causing greater rates of surface runoff.

8.5.11 Due to the current low risk of surface water flooding to the site, the proposed drainage system would be sufficient to capture surface flows and prevent an increase in surface water flooding to both on-site and off-site receptors (more details are provided in appendix H8-1 (Application Reference Number: 6.8.16). The drainage system has been designed to manage surface water runoff above greenfield rates for all events up to the one in 100 year event incorporating anticipated climate change, which, combined with the levelling of the site for HGV parking, means that the risk from surface water is considered to be low. Therefore, the magnitude of change is considered to be small and the significance of effect is considered to be minor. This would not be a significant effect.

Groundwater

8.5.12 Changes to groundwater quality could occur due to leaks and/or spills of fuels or other polluting materials used in plant or for construction activities. In the event of a leak or spill, potential contamination could migrate into the glacial till, superficial sand and gravel and/or the bedrock aquifer and affect groundwater quality, although where clayey in nature the glacial till would limit contaminant migration into the underlying bedrock. The effectiveness of this would depend on the thickness of the glacial till (especially if this were reduced as part of site levelling) and the bedrock water level. With implementation of the mitigation measures, such as controlling on-site fuel storage and refuelling activities (as detailed above for surface water) and use of spill kits, the magnitude of change to groundwater receptors would be negligible. The residual effects on the glacial till, superficial sand and gravel, bedrock aquifer and any wells or abstractions would also be negligible. This would not be a significant effect.

8.5.13 Changes to groundwater quality could occur from the leaching of soils. As the site is predominantly greenfield, with historical use as agricultural land, and the current area of hardstanding and made ground (from road, rail and retail park development) comprise a negligible proportion of the site, the magnitude of change to groundwater receptors would be small to negligible. The residual effects on the glacial till, superficial sand and gravel, bedrock aquifer and any wells or abstractions would be minor adverse to negligible. This would not be a significant effect.

8.5.14 Increased impermeable areas created during the construction period, including construction compounds and compacted ground, could reduce rainwater reaching the groundwater table, potentially altering local recharge rates and resource availability for PWSs, groundwater levels and groundwater flow directions. However, the proposed Logistics Centre would be largely underlain by low permeability glacial till, which, where it has a clay matrix, currently limits recharge to groundwater. Furthermore, the impermeable areas created during construction would form only a very small proportion of the wider groundwater catchment. The magnitude of change to groundwater receptors would be negligible and so the residual effect on the Secondary aquifers, and any abstractions from the aquifer would also be negligible. As the extent of the sand and gravel aquifer beneath the proposed Logistics Centre is limited to a small area in the southwest of the site, the magnitude of

any change in recharge would be small and the residual effect minor adverse. This would not be a significant effect.

Operation

Surface water

8.5.15 The nature of the Logistics Centre's use means that the increased amount of traffic to the site would result in an increase in the risk of leaks and spillages from vehicles on-site. The inclusion of the oil/water separator in the drainage design, clear speed limits and traffic flow management to avoid collisions and the exclusion of any bulk fuel storage and refuelling on-site would mitigate this. Embedded mitigation such as oil/water separators and traffic control is part of the design. All contractors would be made aware of these measures before beginning works and would be required to follow the operational procedures. Taking into account the mitigation procedures, the magnitude of change is considered to be negligible, the significance of effect would be negligible and this would therefore not be a significant effect.

Flood risk

8.5.16 The FCA (appendix H8-1, Application Reference Number: 6.8.16) assesses the flood risk associated with the Logistics Centre post-construction. The method applied within the FCA to determine the significance of effect (which is informed by TAN 15 [RD1] as outlined in appendix H8-1-3 of the FCA, Application Reference Number: 6.8.16) differs from the methodology used for this Environmental Impact Assessment (see section 8.4 of chapter B8, Application Reference Number: 6.2.8). The key differences relate to how the value of the receptor and the magnitude are assigned, which therefore drives slightly differing significances of effect.

8.5.17 In order to assess the flood risk consistently with other surface water and groundwater effects within this Environmental Statement, the following assessment of flood risk during operation of the Logistics Centre considers changes that would potentially be caused by the development. The assessment therefore assigns a magnitude of change to the risk of flooding to receptors based on the method stated in section 8.4 of chapter B8 (Application Reference Number: 6.2.8). The FCA (Application Reference Number: 6.8.16) is the key source of information for this assessment; however, given the difference in methods between the FCA and the Environmental Statement, the magnitude of change within this assessment is not directly comparable to the magnitude of hazard or flood risk within the FCA. Nevertheless, whilst the significance of effect may vary between the FCA and the Environmental Statement, the overall conclusions are consistent (i.e. there is either a significant or not significant effect).

8.5.18 Flood risk within the study area may be affected by the increase in impermeable areas, as there would be increased runoff from the site. Furthermore, the installation of any outfall for discharge of rainfall runoff to the existing pond may increase flood risk as flow is passed directly to the pond, altering the flow regime. Given the design of the outfall, the presence of a below-ground attenuation facility, the drainage system, plus the fact that runoff

rates would be restricted to the greenfield rate, the magnitude of change is considered to be negligible, as is the significance of impact. There is not considered to be any increase in flood risk to the off-site receptors either, due to the incorporation of the attenuation system and the discharge at greenfield rates. As a result, there is considered to be a negligible but positive benefit for more severe storm events.

Groundwater

8.5.19 Due to the presence of extensive hardstanding and drainage across the site, there would not be any pathway to groundwater in the bedrock, so there would be no risk to groundwater quality from fuel or oil leakage from vehicles on-site.

8.5.20 As the new area of hardstanding is a small part of the existing Secondary aquifer catchments and where clayey in nature the superficial deposits that currently exist across the site already limit groundwater recharge, the magnitude of change in recharge is assessed as negligible. Therefore, the residual effect on groundwater flows or levels would be negligible. The area of the superficial sand and gravel covered by the proposed Logistics Centre would be small, and in part would not be covered by hardstanding but by landscaped areas at the site boundary. The magnitude of change to the recharge of this Secondary A aquifer would be small and the residual effect would therefore be minor adverse. This would not be a significant effect.

Decommissioning

8.5.21 As there are no proposals to remove any of the peripheral fencing/landscaping, hardstanding areas or drainage as part of the decommissioning works, there would be no effect on the surface water or groundwater environments.

8.6 Additional mitigation

8.6.1 There would be no requirement for additional mitigation associated with the construction, operation or decommissioning of the proposed Logistics Centre.

8.7 Residual effects

8.7.1 No significant adverse effects were identified for surface water and groundwater.

8.7.2 Minor effects identified in the assessment of effects section are summarised in appendix I3-1 (master residual effects table) (Application Reference Number: 6.9.8).

8.7.3 Taking into account the embedded and good practice mitigation detailed in this chapter, no significant residual effects have been identified associated with the construction, operation or decommissioning of the proposed Logistics Centre.

8.8 References

Table H8-3 Schedule of references

ID	Reference
RD1	Welsh Assembly Government. 2004. *Technical Advice Note* (TAN) *15: Development and Flood Risk*. [Online]. [Accessed: 16 June 2017]. Available from: http://gov.wales/docs/desh/publications/040701tan15en.pdf.
RD2	Natural Resources Wales. 2017. *Long term flood risk*. [Online]. [Accessed: 05 June 2017]. Available from: https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en.
RD3	Cranfield Soil and Water Institute. 2017. *Soilscapes*. [Online]. [Accessed: 16 June 2017]. Available from: http://www.landis.org.uk/soilscapes/.
RD4	British Geological Survey. 1997. The Hydrogeological Classification of Superficial Clay: The Hydrogeological Characterisation of Glacial Till and Glacio-lacustrine Sediments in Shropshire. Technical Report W29. Bristol: Environment Agency.
RD5	Natural Resources Wales. *Water Watch Wales Map Gallery*. [Online]. [Accessed: 16 June 2017]. Available from: http://waterwatchwales.naturalresourceswales.gov.uk/en/.
RD6	Natural Resources Wales. 2015. *Western Wales River Basin Management Plan 2015 – 2021*. [Online]. [Accessed: 11 December 2017]. Available from: https://naturalresources.wales/media/676165/wwrbdsummary.pdf.
RD7	Northern Ireland Environment Agency; the Department of Agriculture, Environment and Rural Affairs; the Scottish Environment Protection Agency; and Natural Resources Wales. 2017. *Works and maintenance in or near water: GPP 5*. [Online]. [Accessed: 29 June 2017]. Available from: http://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf.
RD8	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.
RD9	Balkham, M., Fosbeary, C., Kitchen, A. and Rickard, C. 2010. *Culvert Design and Operating Guide* (C689). London: CIRIA.
RD10	Atkins. 2008. Parc Cybi, Anglesey: Plot Drainage Statement document 5035112/62/DG/ZT/01.