17 CUMULATIVE EFFECTS

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17.1 Introduction

17.1.1 This chapter provides a summary of the approach to the cumulative effects assessment and identifies and outlines the cumulative effects associated with the Development, both for intra-project (where a single receptor is affected by multiple aspects of a project, worsening the effect) and inter-project effects (where effects are exacerbated due to the construction or operation of other projects that are not yet built).

17.1.2 Inter-project cumulative effects can be defined as the effects on the environment that result from incremental changes caused by the combination of the Development together with other past, present and reasonably foreseeable future developments. Potential cumulative effects encompass effects that can result from individually minor but collectively significant developments which may occur simultaneously, sequentially, or in an interactive manner, and can be predicted to take place over a period of time.

17.1.3 Since the submission of the Draft ES, a grid connection offer has been received from SP Manweb, which provides information on the proposed electrical connection and is the basis of the cumulative assessment provided in section 17.8. The route of the proposed electrical connection is shown in Figure 4.14.

17.2 Summary of Relevant Legislation, Planning Policy and Guidance

EIA Regulations

17.2.1 The Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2009 (as amended) (the EIA Regulations) (Ref. 18.1) require the likely significant cumulative effects (Schedule 4 Part 1 Section 19), and the inter-relationship of likely significant effects (Schedule 4 Part 1 Section

20) of the Development on aspects of the environment, to be described and assessed.

Overarching National Policy Statement for Energy (EN-1)

17.2.2 The Overarching National Policy Statement for Energy (NPS EN-1) (Ref.18.2) states the following in relation to requirements for the assessment of cumulative effects:

Section 4.2.5 - 'When considering cumulative effects, the Environmental Statement (ES) should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other developments (including projects for which consent has been sought or granted, as well as those already in existence).'

17.2.3 Inter-relationships between effects are also referred to as follows:

Section 4.2.6 - 'The Infrastructure Planning Commission (IPC) (now the Planning Inspectorate (PINS)) should consider how the accumulation of, and interrelationship between, effects might affect the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place.'

Guidance

17.2.4 Guidance that is applicable to each specific topic assessment is identified in the relevant Chapters (Chapter 5 to 14).

17.2.5 PINS Advice Note Nine: Rochdale Envelope (Ref.18.3) states that:

'The inter-relationship between aspects of the proposed development should be assessed and careful consideration should be given by the developer to explain how inter-relationships have been assessed in order to address the environmental impacts of the proposal as a whole.'

17.2.6 Advice Note Nine also establishes that 'other developments' and more specifically 'major developments' need to be identified to assess the probable significant effects against the baseline position. Built and operational developments are included in this baseline. The 'major developments' that should be considered within the cumulative assessment include those that are:

- Under construction;
- Permitted application(s), but not yet implemented;
- Submitted applications(s) not yet determined;
- Projects on the Planning Inspectorate's Programme of Projects;
- Identified in the relevant Development Plan; and
- Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

17.2.7 This list is also included in the document 'Planning Act 2008 Guidance on the Pre-Application Process' (Ref.18.4). This document acknowledges that it is not always easy for applicants to assess potential cumulative effects due to the lack of information available and that a pragmatic approach should therefore be taken when determining what is feasible and reasonable.

17.3 Methods

17.3.1 The cumulative effects assessment follows the guidelines as set by the Institute of Environmental Management and Assessment (IEMA) and advice from the Planning Inspectorate (PINS).

17.3.2 IEMA's guidelines recognise two major sources of cumulative effects:

- **Intra-project effects** – These occur where a single receptor is affected by more than one source of effect arising from different aspects of the Development. An example of an intra-project effect would be where a local resident is affected by dust, noise and traffic disruption during the construction of a scheme, with the result being a greater nuisance than each individual effect alone; and
- **Inter-project effects** – These effects occur as a result of a number of proposed developments, which individually might not be significant, but when considered together could create a significant cumulative effect on a shared receptor, and could include developments separate from and related to the Development.

17.4 Consultation

17.4.1 Through the 2011 Scoping Report for the approved scheme was agreed with Gwynedd Council and EAW (now NRW) that there were no cumulative developments that needed to be assessed as part of the 2012 ES.

17.4.2 As part of the PINS Scoping Opinion and through early consultation with the statutory consultees, it was confirmed that the construction of the new Wylfa Newydd nuclear power station would require assessment. The Scoping Report submitted to PINS outlined that the scope was to be limited to the likely significant effects on socio-economic and traffic related receptors and effects, as these are considered to be the only receptors shared between the Development and Wylfa Newydd nuclear power station. No objections or comments on this scope were received by NRW or Gwynedd Council.

17.4.3 On the 26th March 2015 a meeting was held with Horizon Nuclear Power, regarding the proposals for Wylfa Newydd nuclear power station, specifically to discuss the assessment of cumulative effects. It was agreed that the timescales, the assumptions for workforce figures and transport for Wylfa Newydd and its associated development and infrastructure projects would be those cited in the *Wylfa Newydd Project Pre-Application Consultation – Stage One Preliminary Environmental Information Report*, which supported the consultation period for the project held between 29th September 2014 and 8th December 2014. The minutes of this meeting are included in Volume 3, Appendix 17.1

17.4.4 As the District Network Operator, SP Manweb is responsible for the development and operation of the connection of the Development to the electricity distribution network. Therefore the connection will undergo a separate application process. At present it is assumed this connection will be via buried cable along the existing highway network (as illustrated in Figure 4.14). As a result, the electrical connection will also be considered within the assessment of inter-project cumulative effects.

17.4.5 Section 42 responses from both Gwynedd Council and NRW identified the requirement to assess the cumulative effects of the Development with the Caernarfon to Bontnewydd Bypass proposal. Proposals for the 9.8km

bypass went to public consultation in March 2015 and it is these details that have been used as the basis of the cumulative assessment.

17.4.6 From consultation with NRW and Gwynedd Council it has been agreed that the intra-project effects will include the various components of the project being constructed (as outlined in Chapter 4 Project Description).

17.4.7 A draft of this chapter was provided within the Draft ES (dated February 2015) to the section 42 consultees as part of the preliminary environmental information (PEI). Apart from the request to include the Caernarfon to Bontnewydd Bypass, no other comments were received.

17.5 Sources of Intra-Project Effects

17.5.1 For the purpose of this assessment, consideration will be given to the additive or amplified effects resulting from between environmental effects on 'shared receptors' and also where sources of effect from different components of the Development may combine to be of greater significance than when considered alone i.e. the quarry reprofiling, construction of the dams, drilling of the penstock, and switchgear station.

17.5.2 There are unlikely to be any intra-project effects from the operation and decommissioning phases of the Development and so these are not considered further.

Construction of the Development

17.5.3 The construction timetable is outlined in Table 4-2 in Chapter 4 Project Description. This table highlights that once the site compounds are established and enabling works completed, there may be various elements of the Development which will be constructed in parallel with each other. This is mainly from Year 1 Q4 to Year 3 Q1, therefore the majority of the potential in-combination effects will be within a period of 18 months.

17.5.4 However some of the components of the Development will employ very different construction methods. For example the establishment and reprofiling of the quarries will use different plant and equipment to that used for drilling the penstock. In addition, exposure to shared receptors will vary depending on the construction programme and whether the works are above

ground (dam construction, power house and pumping station), or below ground (drilling of the penstock), and their location within the site (eg reprofiling of quarry walls).

Shared Receptors

17.5.5 Shared receptors from individual elements of the Development (e.g. construction of Q1 and Q6 plus penstock on local communities) may comprise the following:

Water Environment

- Ecological and water quality effects on Llyn Padarn SSSI and Nant y Betws / Afon Gwyrfai from potential operational transfer of water between Llyn Padarn and the Afon Gwyrfai, and scour and / or run-off during construction activities.

Faunal Species and Populations

- Noise and disturbance from simultaneous works; and
- Loss of habitat.

Local Communities, Tourism and Recreation and Public Access

- Noise and Vibration effects on local communities from blasting during construction due to the close proximity to residents;
- Traffic effects from increased vehicle numbers during the construction phase;
- Potential impacts on private water supplies from dust and construction activities;
- Production of dust during the construction phase;
- Diversions of PROWs; and
- Socio-economic effects on local communities during the construction phase from the creation of jobs.

17.5.6 It is unlikely that there would be any intra-project shared receptors within the following topic areas and so these are scoped out:

- Transport – construction to Q1 and Q6 will have separate routes from the A4244 and A4086 junction;
- Landscape – due to the topography between Q1 and Q6, it is not possible to see both reservoirs and/or dam structures from the same viewpoint / receptor;
- Archaeology – as archaeological assets are relatively compact and clustered together, it is considered that there are no intra-project effects as such, and all conceivable effects are fully considered in Chapter 11.

17.6 Assessment of Potential Intra-Project Effects

17.6.1 The ES has assessed the potential effects based upon results of baseline surveys and data collection regarding the Development and the information available regarding the various phases of the Development. Any limitations to the baseline surveys or data collection are outlined in the technical chapters as appropriate.

17.6.2 Table 17-1 outlines the potential intra-project cumulative effects from the Development, and are mainly focused in the construction phase.

17.6.3 As previously described it is considered unlikely that there will be any intra-project effects during operation or decommissioning, and so the assessment only considers construction stage effects.

Table 17-1 Intra-Project Cumulative Effects		
Key: Red = Adverse; Green = Beneficial; D = Dust; A = Air Pollutants; WP = Water Pollution; N = Noise; V = Visual; T = Transport; S = Socio-economic; H = Habitats; Dir = Direct loss[1]; ( ) = minor effects, unlikely to add to the overall significance of Development effects.		
Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
Local Communities (Llanberis & Waunfawr)	(D) A (N) (T) (S)	<u>Effects from multiple parts of the Development</u> The construction of the Development will result in construction activity and additional vehicles both within the Order Limits and along access routes. As this activity increases, so does the potential magnitude of intra-project effects. This will culminate in peak in-combination construction periods from Year 1 Q4 to Year 3 Q1 of the proposed construction period when the maximum number of construction staff will be present onsite. Effects will be centred on those using and living on the A4244 as the construction traffic separates at the junction with the A4086 – with Q6 traffic turning left on to the A4086 towards Llanberis and the Q1 traffic turning right towards Cwm Y Glo. Therefore the only shared receptor is the A4244 resulting in a temporary localised minor additive cumulative adverse effect. An increase in traffic flows during the construction period may have an impact on local communities, specifically Waunfawr. However, there are separate routes for both quarries and mitigation is proposed through a CTMP (within the CoCP) this will result in a **negligible in-combination effect**. Noise generating activities occurring during construction include excavation, reprofiling and blasting, with vibration being a potential effect in the latter activity. However, once the mitigation measures secured in the CoCP for surface plant and general construction activities, including the effect of descending into the quarry at depth,

[1] Direct Loss – complete loss of receptor such as habitat loss, public amenity or view.

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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		these will minimise any significant cumulative effects which are expected to be **negligible**, with the exception of blasting. This will be a temporary, localised effect and only in one quarry at any given time as outlined in Table 4-2. Therefore these effects are considered as a **minor** additive cumulative effect. The Contractor will liaise with Gwynedd Council and the appointed Liaison Officer / Clerk of Works to establish working guidelines and communication to the local residents at times of blasting to reduce the cumulative noise and vibration impacts of construction works. In addition, there will be no effects from the drilling method of the penstock due to the depth of the drill route. It is considered that, with the implementation of these mitigation measures, the cumulative effects will remain **negligible**. It is likely that the pumping station construction will occur at the same time as the main works at Q6 and so there maybe be some in-combination effects from movement of plants and machinery from Q6 to the pumping station compound and also in the reverse. This is to ensure a smaller compound at the pumping station. There may also be some in-combination effects of the construction of both the onshore (pumping station) and offshore (pipework) works. The Principal Contractor will endeavour to minimise all disruption but in the interests of health and safety there may be times when both the area immediately around the pumping station and pipework will be in construction at the same time and require sufficient working area. It is proposed to minimise disturbance even further by timing the works outside the school holidays and communicating the programme through the Environmental Clerk of Works when it is confirmed. Therefore it is considered that with the implementation of these measures,

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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		the cumulative effects on tourism and users of Llyn Padarn will be an additive minor adverse effect. <u>Effects from multiple topics</u> Construction works, such as excavations and blasting will generate dust and noise which could impact on the surrounding communities, namely Waunfawr and Llanberis. Noise management and dust control measures confirmed in the CoCP will be applied to works on the Development. In addition, it is unlikely that the blasting will occur in both quarries at the same time. There are no likely dust effects from the drilling method of the penstock and this is unlikely to occur at the same time as the blasting. There are no significant construction developments that may lead to significant cumulative effects have been identified within the extent of potential impacts that may arise; 350m of the boundary of a site or within 50 m of route(s) used by construction vehicles on the public highway, or 500 m from the site entrance. The results from the noise and air quality impact assessments indicate that emissions should have a **negligible to minor** cumulative effect if appropriate mitigation measures and DCO Requirements are implemented.
Private Water Supplies	D WP	<u>Effects from multiple topics</u> There is the potential for both dust and water pollution to affect private water supplies, mainly from activities surrounding Q6 and drilling of the penstock. However given that the penstock is being tunnelled at depth, and appropriate mitigation measures (such as the WTMP and DMP) aligned to the construction activities at Q6 are to be

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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		implemented, it is unlikely that there will be any in-combination effect from dust. Therefore the effects are considered **negligible**.
Tourist and Recreational Attractions	(T)	<u>Effects from multiple parts of the Development</u> There may be potential for disturbance to outdoor tourist attractions along the A4244 from construction traffic being delivered from the A5. However, as noted in paragraph 17.5.7, construction traffic will follow separate access routes for Q1 and Q6, and the impact of construction traffic is not likely to be significant (Chapter 12, Traffic and Transport). Therefore effects on tourism and outdoor recreational attractions are considered **minor adverse**. Effects on the users of Llyn Padarn and the lagoons is covered under Local Communities.
Public Access – Public Rights of Way (PRoWs)	(T) (V) (N) (D)	<u>Effects from multiple parts of the Development</u> Temporary diversions will be required at both Q1 and Q6 during construction, with a permanent diversion needed at Q1. There are no PROWs which are affected by the construction at both Q1 and Q6. Users of the PROW along Green Road to Q1 will be subject to construction traffic moving along that route. The improvements to Green Road will allow for regular passing places by larger vehicles so that those users on foot and in vehicles can pass without any risk.

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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		Closer to the construction compounds at Q1 and Q6, users of the PROWs will be subject to a temporary visual loss of the immediate area due to the temporary construction. During critical path activities such as blasting, PROWs may be temporarily closed for safety reasons and these activities will be advertised extensively via the liaison group and Clerk of Works. <u>Effects from multiple topics</u> Dependent upon the timing of construction, users of PROWs may have adverse effects from the noise and dust which may be generated by the construction at these sites. Although there are a number of sources of effects on users of PROWs, the effects remain limited in duration (temporary during construction only) and in terms of the length of PROW affected. There are also individual mitigation measures in the NMP, CTMP and CoCP, that will help to reduce the magnitude of effects. It is therefore considered that these intra-project effects are of a **minor adverse** effect.
Water Environment	(WP)	<u>Effects from multiple parts of the Development</u> There is some potential for water quality effects on the water environment during construction as multiple elements will be constructed simultaneously. However the Q1 and Q2 – Q8 watersheds are separate and therefore there is no pathway for intra-

Table 17-1 Intra-Project Cumulative Effects		
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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		project effects during construction. Water pollution and / or run-off during construction could damage the integrity of the Llyn Padarn SSSI or Afon Gwyrfai SAC (via the Nant Y Betws) by harming or killing species. Effects will be controlled through the mitigation measures outlined in Chapter 7 Ecology and Chapter 16 Environment Management and those measures incorporated into the CoCP. Throughout construction, best practice pollution prevention measures in line with current NRW / EA construction guidelines will be adhered to where works are being undertaken near to Llyn Padarn, including during the construction of the pumping station. This will minimise the risk of the effects on water quality, aquatic habitats and the integrity of the SSSI, and therefore the cumulative impacts are considered to be **minor adverse**.
Ecology	H N	<u>Effects from multiple parts of the Development</u> The Environment Agency Guidance H1: Environmental Risk Assessment. Annex F – Air Emissions (Environment Agency, 2011) states that conservation sites need only be considered where they fall within set distances of the activity: • Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar sites within 10km of the installation; and • Sites of Special Scientific Interest (SSSIs), National nature reserves (NNRs), Local Nature Reserves (LNRs), local wildlife sites and ancient woodland within 2km of the location of the installation.

Table 17-1 Intra-Project Cumulative Effects		
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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		Table 7-13 of Chapter 7 Ecology lists the designated sites within 2km of the Development. The potential intra-project effects can be attributed to total habitat loss and displacement of existing species found in more than one individual component of the Development. Potential habitat loss from construction is outlined in Section 7. and is as follows (figures in brackets are taking into account the area of identified habitat and not in relation to the full Order Limits): • 0.1ha (2.3%) of low value mixed woodland (semi natural) for the construction of the pumping station and removal of 0.5ha (10.7%) of medium value broadleaved semi-natural woodland from the construction of the pumping station and a section of the Q1 dam; • Removal of 2.1ha (12.3%) of low value dry heath / acid grassland for the construction of the Q1 dam and Cefn Du LWS; • Habitat loss within the quarries including 11 tunnels, 10 of which are bat roosts due to the flooding of Q1 and Q6; • Permanent removal of 9ha (13.1%) of quarry spoil habitat in Bwlch-y-Groed Quarry LWS; • Permanent removal of 10.7ha (16.1%) of low value coniferous woodland habitat in

Table 17-1 Intra-Project Cumulative Effects

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Receptor with potential for multiple effects	Potential Intra-Project Effects	Comments
		the Coed Donen Las LWS; • Temporary disturbance of 0.4ha (3%) and permanent removal of 4ha (32.7 %) of the low value woodland habitat of the Glyn Rhonwy Woodland Quarry Mosaic LWS • Removal of <0.001ha of the heath habitat of the Llwyn Coed Heath LWS for the Q6 dam; • Removal of 8ha (72.7%) of negligible value coniferous woodland for the creation of the permanent spoil tips at Q1; • Removal of 9.1ha of negligible ecological value bare ground in the industrial platforms and car park at Q1 for the construction of the dams and power house; Chapter 7 Ecology has assessed the loss of each individual habitat as not significant because the losses are very minor compared to the overall habitat within the Order Limits and as these habitats are abundant within the wider landscape, there will be limited fragmentation of species from within the Order Limits. In addition, 8.85ha of new spoil waste habitat will be created as a result of the construction of the permanent excess spoil mounds in addition to the faces of the dams themselves. The reinstatement of slate waste habitat will be in line with *Restoring Habitats of High Conservation Value after Quarrying, Best Practice Manual (Bangor University et al, 2003).* A HMP will also be implemented to ensure that any loss of habitat is minimised where possible and that the areas are allowed to reinstate naturally after construction has been completed or is part of a wider landscaping

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Receptor with potential for multiple effects	**Potential Intra-Project Effects**	**Comments**
		programme into the operational phase. The cumulative loss of bat habitat will be mitigated by the provision of alternative habitat within the Bat Mitigation Strategy, already approved by Gwynedd Council and NRW (through the bat license). It is unlikely that there will simultaneous blasting and critical path construction activities ongoing in both quarries at the same time and therefore this should mitigate any effects on sensitive species, such as breeding birds, within the middle quarries of Q3, Q4 and Q5. No works are proposed in these quarries. Any noise effects will be temporary and timing of critical works such as blasting will be considered. Therefore the combined loss of these habitats is considered to be not significant in relation to the in-combination effects on ecology.

17.7 Sources of Inter-Project Effects

17.7.1 A review of the planning applications and proposed developments within the area around the Development was undertaken to scope any other projects that were considered to constitute 'major development' schemes. A further review was undertaken to determine which developments had the potential to result in likely significant cumulative effects with the Development.

17.7.2 The sources of potential cumulative effects in the vicinity of Glyn Rhonwy have been identified as:

- The electrical connection and the switchgear station to connect the Development to the electricity distribution system (to be developed and owned by SP Manweb);
- The construction of Wylfa Newydd Nuclear Power Station and its associated infrastructure and developments; and
- The construction of the Caernarfon to Bontnewydd bypass.

17.7.3 From the results of the updated Water Framework Directive assessment, consideration has been given to the potential for intra-cumulative effects on water quality in Llyn Padarn and the Afon Seiont from the Development in addition to the upstream Dinorwig pumped storage scheme. Therefore this has been included within this cumulative assessment.

17.7.4 The locations of these projects, for which inter-project effects are considered, are shown in Volume 4, Figure 17.1.

17.7.5 Table 17-2 outlines the cumulative construction programme anticipated for the Development and the other developments considered in the inter-project cumulative effects. This illustrates where construction activities are anticipated to overlap between the projects.

17.8 Assessment of Potential Inter-Project Effects

Assessment of the Development in-combination with Electrical Connection

17.8.1 Specific details of the 132kV electrical connection have yet to be confirmed by SP Manweb, the District Network Operator (DNO). This assessment is therefore based upon the details known at the time of writing:

- that the 132kv electrical connection will be underground;
- will mostly be routed within the existing public highway boundary; and
- point of connection will be at the joint bay outside Pentir 132kv substation and the switchgear at the Glyn Rhonwy power house.

17.8.2 The electrical connection will start at the Pentir substation, approximately 7km to the north east of the Development. The indicative route provided by SP Manweb follows the A4244, turning left on to the A4086 and then into the private road network of the Glyn Rhonwy Industrial Estate. It will terminate in the onsite switchgear within the power house. There is a potential deviation from this route, to the north of the A4086 on the footpath along the southern bank of Llyn Padarn, prior to joining the Glyn Rhonwy Industrial Estate roads.

17.8.3 No details of the switchgear are available at this time but on the basis of the conditions of the grid connection offer, this will be gas insulated and enclosed within the power house building.

17.8.4 Where the construction activities of both components (the electrical connection and the Development) would be seen at the same time, it is likely that they would be perceived as a single construction activity rather than two separate ones, especially when viewed from high ground viewpoints. The perception of the construction activities associated with Q6 (connection to the onsite switchgear) would be relatively limited due to distance and also the private nature of the Development within the Industrial Estate platforms.

17.8.5 It is considered that due to these elements, the construction of the electrical connection would not be seen from the wider landscape, nearby settlements or indeed by the majority of the visual receptors identified within Chapter 6 Landscape Character & Visual Amenity. In addition, the excavation for the electrical connection would only require a shallow trench and therefore it is unlikely that there would be any need for any tree removal. Therefore in combination with the power house, this is considered a **negligible** effect.

17.8.6 The narrow trench and confined working area will minimise the production of dust during the installation. Dust is therefore considered to have no potential for cumulative effects.

17.8.7 It is recognised that the users of the A4244 have encountered some local adverse effects in the past from the repair to the 400kV electrical connection from Dinorwig to the Pentir substation, which is also in the highway verge. Therefore there may be the perception that these works will be of the same scale and disruption. It is not possible to provide details at this stage about the duration of construction works or the method of installation. An initial grid connection offer statement prepared by SP Manweb considers disruption to have a **temporary minor adverse** effect.

17.8.8 This high level assessment considers that the inter-project effects from construction traffic travelling to the Development (deliveries of plant and materials and construction workers) will be limited as there are alternative access routes to the A4244 from Llanberis, Cwm y Glo and Caernarfon.

17.8.9 Given the information provided by SP Manweb, in their grid connection offer statement for an underground electrical connection, it is considered that this high level assessment currently concludes a **temporary negligible to minor adverse effect**. This is considered not significant.

Assessment of the Development in-combination with Wylfa Newydd Nuclear Power Station

17.8.10 As stated in the Scoping Letter issued on 12th November 2014 and reiterated in the Scoping Report issued in 5th January 2015 the inter-project cumulative assessment will be limited to an assessment of socio-economic and traffic and transport impacts. All other potential cumulative environmental effects have been scoped out. This is due to the substantial distance separating the Wylfa Newydd Nuclear Power Station and the Development, which consequently means there are few potential shared receptors.

17.8.11 Therefore, the inter-project in-combination assessment focuses on the various elements which make up the Development only where this may have effects on shared receptors.

17.8.12 The Wylfa Newydd project encompasses several individual but connected projects, which together comprise the main build and commissioning of the proposed nuclear power station. These include the following with the timescales taken from the Stage 1 Preliminary Environmental Information Report (Volume 1):

- Enabling works (for up to 5.5 years starting 2014 to mid-2019);
- A5025 highway improvements (up to 5 years starting in 2016 to 2020);
- Wylfa Gateway complex (starting mid-2015 for 2 years until mid-2017);
- Logistics centre (up to 2-3 years starting in 2017 until 2020);
- Park and ride facilities (up to 2-3 years starting in 2017 until 2020;
- Temporary worker accommodation (up to 2-3 years starting 2017 until 2020);
- Main construction and commissioning of unit 1 (for up to 6-7 years starting in 2018); and
- Main construction and commissioning of unit 2 (for up to 6-7 years starting in 2020).

17.8.13 A programme showing these timescales against the proposed timescales for the Development is shown in Table 17-2.

17.8.14 The following sections outline the potential cumulative effects from the Development and Wylfa Newydd Nuclear Power Station. Effects are described on a topic basis as agreed during the meeting on the 28th March 2015.

Table 17-2 Cumulative Construction Program

Project	Duration	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Glyn Rhonwy Pumped Storage	3.5 - 4 years															
Glyn Rhonwy Grid Connection	<1 year															
Wylfa Newydd Enabling Works[2]	Up to 5.5 years															
Wylfa Newydd A5025 Highway Improvements	5 years															
Wylfa Gateway Complex	2 years															
Wylfa Newydd Logistics Centre	2-3 years															
Wylfa Newydd Park & Ride Facilities	2-3 years															
Wylfa Newydd Temporary Worker Accommodation	2-3 years															
Wylfa Newydd Unit 1 Construction	6-7 years															
Wylfa Newydd Unit 2 Construction	6-7 years															
Caernarfon Bypass[3]	2 years															

[2] Wylfa Newydd Project Statement of Community Consultation (http://www.horizonnuclearpower.com/files/downloads/SOCC/SOCC%202104%20(English)%20(FINAL-LR).pdf)
[3] A487 Caernarfon to Bontnewydd Bypass consultation documents (http://www.cbbypass.co.uk/consultation/documents)

Traffic & Transport

17.8.15 Access to the local road networks for both developments is anticipated to be via the A5, a high quality and capacity route which gives access to the wider network in North Wales. The construction traffic for both developments will then use different local networks to reach the respective construction sites, i.e. Wylfa Newydd construction traffic would use local routes north west to Anglesey (A55 and A5025) whereas Glyn Rhonwy construction traffic would use routes south of Bangor at the A4244 junction towards Llanberis.

17.8.16 Whilst the A5025 highway improvements are likely to start within the same timescales as the construction period for the Development, any related effects will be localised to the A5025 which is not connected to any routes associated with the Development. Any “offline” highway improvements will be much later in the proposed 5 years construction period and therefore past the peak of construction for the Development. Therefore it is unlikely that cumulative effects would impact upon any traffic sharing the A5 network.

17.8.17 The primary source of traffic on the local network would be the commuting workforces for both the Development and Wylfa Newydd. However Wylfa Newydd proposes to provide a workers village within 25 minutes of the site and will also provide park and ride schemes to reduce the increase in overall traffic volumes. Wylfa Newydd have an alternative option of a marine offloading for larger plant and material deliveries, however as nothing is secured at this time, we have assumed the A5 delivery route as a worst case.

17.8.18 Due to the distance between the two developments, the staggered timing of enabling and peak construction periods of both development plus the potential alternative means for Wlyfa Newydd to reduce traffic volumes if required, there are also no cumulative effects anticipated on local road networks including the A5.

Socio-economics – Local Economy & Employment

17.8.19 There is the potential for some overlap in the construction timescales for the Development and the pre-construction and enabling works and initial main construction stage of Wylfa Newydd Nuclear Power Station.

17.8.20 As a proportion of the construction workforce could be outsourced from the local area for both developments it is anticipated that there will be a positive cumulative effect on the economy in North Wales from the requirement of general engineering and construction skills. The scale of peak employment for both developments will not coincide and is different between the developments, with up to 300 workers for the Development and up to 8500 for Wylfa Newydd (i.e. only 3.4% of the total workforce for the two projects will be relate to the Development.

17.8.21 Furthermore there is the potential for up-skilling in the North Wales area, namely Anglesey, Gwynedd and Conwy, due to both developments requiring specific engineering and construction skills. However it is recognised that this will not be specifically restricted to general construction skills as both developments will require very specific engineering and construction skill sets (working in confined spaces and at height for example). Therefore this is anticipated to be a **minor beneficial** cumulative effect.

17.8.22 Wylfa Newydd Nuclear Power Station has plans to build a bespoke construction village to accommodate workers during their construction period. When compared to the relatively small numbers of construction workers required for the Glyn Rhonwy Development, and the fact that the majority of the workforce for the Glyn Rhonwy Development is anticipated to be sourced from within 15 km of the development, it is therefore anticipated that there will be a negligible cumulative effect on available accommodation and bedspace, or local amenities (e.g. local NHS services) within the local area.

<u>Socio-economics – Tourism</u>

17.8.23 It is considered that neither development would attract tourists. However the cumulative impact on tourist attractions and the perception to visitors using local transport routes has been considered. There are no shared local

access routes, as outlined in sections 17.8.12-17.8.13, and it is therefore anticipated that the cumulative effect on the local road network will be negligible and consequently tourism facilities located alongside or accessed via these local networks will not be affected cumulatively.

17.8.24 Due to the substantial distance between Wylfa Newydd Nuclear Power Station and the Development there are no cumulative effects anticipated on tourism or recreational receptors.

Assessment of the Development in-combination with Caernarfon to Bontnewydd Bypass

17.8.25 The Caernarfon to Bontnewydd bypass is a 9.8km single carriage way connecting Goat roundabout and the Plas Menai junction on the A487. The bypass will extend northwards from Goat roundabout, to the west of the A487 before heading eastwards north of Bontnewydd. The route will then pass between Cibyn industrial estate (north) and Glan Gwna Caravan Park (south) extending in a north-easterly direction. The bypass then rejoins the A487 at the Plas Menai junction to the north. See Figure 17.1.Cumulative effects between the construction of the bypass and the Development are likely to pertain to traffic and transport and socio-economics. Given the scales of the projects and the distance between the construction areas, it is not anticipated that there will be any other shared receptors.

17.8.26 There will likely be an increased volume in traffic and also potential disruptions and closures to some local routes to accommodate construction of the bypass. However road closures and diversions are unlikely to be significant as only a short section of the proposed bypass is to utilise the existing network, and it is assumed only discrete areas will be used for construction access elsewhere.

17.8.27 Presuming appropriate mitigation is adopted during the construction of the bypass, such as diversions and warnings to road users, and the scale of construction activities, these potential effects will be minimised. As the works will also be temporary, in-combination effects on the local highway network are likely to be **minor adverse**.

17.8.28 Both the Development and the contractors of the bypass are committed to investing locally where possible. The bypass has set a target to invest 75% of the construction spend on local suppliers, providing employment and the utilisation of existing skills and services within the area. This in combination with the construction of the Development is likely to result in up-skilling of the area and make a positive contribution to the local economy and employment. These effects are likely to be **minor beneficial**.

17.8.29 As shown in Table 17-2, the overlapping construction periods may result in reduced bed availability for visiting tourists to the area. However as above, the commitment of the projects to invest locally will reduce the requirement to house large workforces. Taking the scale of the projects and the capacity within the surrounding area in to account, and the fact that construction is temporary, effects on tourism are likely to be **minor adverse**.

Assessment of the Development In-combination with Dinorwig Pumped Storage Scheme

17.8.30 The Dinorwig pumped storage scheme is located approximately 1km to the east of the Development and has an output of 1758MW, which is substantially larger than the Development at Glyn Rhonwy. Chapter 4 Project Description outlines how the schemes are fundamentally different in terms of how they are operated, including the volumes of water and interaction with nearby water bodies.

17.8.31 Dinorwig abstracts and releases water directly into the impounded area of Llyn Peris since its first operation in 1974, which is immediately upstream of Llyn Padarn. As part of the revised WFD assessment and water resources impact assessment, baseline water quality and water level data for Llyn Padarn has been used. This would take into account any long term effects of the Dinorwig operation on this water body as part of the baseline data collection.

17.8.32 Both construction dewatering and the infrequent operational discharges proposed by the Development will be controlled by the respective environmental permits. Given the strict controls implemented by NRW to be demonstrated by the operator through regular monitoring and reporting,

potential effects on Llyn Padarn will be minimised. In addition, the Development is essentially a 'closed-system' and will not use Llyn Padarn as the tailpond in the same way that the Dinorwig operation uses Llyn Peris. Therefore, it is unlikely that there will be any in-combination effects and so effects are considered to be **negligible**,

17.9 Summary

17.9.1 The intra-project combined effects on shared receptors and inter-project effects have been described and assessed in this chapter. Inter project effects have been assessed for traffic and socio-economics only for Wylfa Newydd Nuclear Power Station and Caernarfon to Bontnewydd Bypass. Dinorwig has been assessed in relation to water quality.

17.9.2 It is considered that the intra-project combined effects on shared receptors are of negligible and minor effects, and are unlikely to add to the overall significance of the effects of the Development. Therefore the intra-project cumulative effects are **Not Significant**.

17.9.3 It is also considered that no significant inter-project effects resulting from the Development and the development of the electrical connection for the Development, the Wylfa Newydd Nuclear Power Station or the Caernarfon to Bontnewydd Bypass will occur.

17.10 References

Wylfa Newydd Project Statement of Community Consultation http://www.horizonnuclearpower.com/files/downloads/SOCC/SOCC%202104%20(English)%20(FINAL-LR).pdf, Accessed 30th March 2015.

A487 Caernarfon to Bontnewydd Bypass consultation documents http://www.cbbypass.co.uk/consultation/documents. Accessed 23rd March 2015.

Wylfa Newydd Project Pre-Application Consultation – Stage One Preliminary Environmental Information Report