HORIZON NUCLEAR POWER

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5 Air quality

5.1 Introduction

5.1.1 This chapter describes the assessment of potential air quality effects resulting from the construction, operation and decommissioning of the Park and Ride Facility at Dalar Hir (hereafter referred to as the 'Park and Ride').

5.1.2 The potential emission sources that are considered in this chapter include emissions of pollutants from construction plant and machinery and dust emissions. The chapter excludes the air quality effects associated with emissions from traffic during construction or operation of the Park and Ride. These effects are considered in the assessment contained within chapter C4 (air quality effects of traffic) (Application Reference Number: 6.3.4), which covers project-wide effects of road traffic upon air quality. Combustion plant emissions during operation are also screened out from assessment.

5.1.3 Please refer to chapter B5 (air quality) (Application Reference Number: 6.2.5) for the technical basis for the assessment including a summary of legislation, policy and guidance; key points arising in consultation that have guided the air quality assessment; and assessment methodologies and criteria.

5.1.4 The chapter is supported by appendix F5-1 (Construction Dust Assessment – the Park and Ride facility at Dalar Hir) (Application Reference Number: 6.6.13), which is cross-referenced in the text where relevant.

5.2 Study area

5.2.1 This section describes the study area relevant to the air quality assessment for the Park and Ride.

5.2.2 The approach for defining the study area is described in chapter B5 (Application Reference Number: 6.2.5). For dust emissions during the construction and decommissioning of the Park and Ride, the assessment of human receptors focuses on areas extending up to 350m from the site boundary (as represented by the Order Limits – see figure F5-1) (Application Reference Number: 6.6.38). This distance is based on Institute of Air Quality Management (IAQM) guidance for identifying when an assessment of dust effect is required [RD1]. Potential effects at distances greater than 350m will be less than those effects at locations closer to the site boundary and any mitigation measures applied to protect sensitive receptors within 350m would help to reduce any possible effects beyond 350m. The effects of trackout also need to be determined up to 50m from the edge of the local road network, within 500m of the Park and Ride site entrance. Trackout is defined as the transport of dust or mud from the construction site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. In line with the IAQM guidance [RD1], the assessment has also considered relevant ecological receptors up to 50m from the site boundary.

5.2.3 A qualitative assessment of emissions from plant and machinery (i.e. Non-road Mobile Machinery) during construction and decommissioning of the Park and Ride has been carried out which considers the potential effects at the nearest receptors based on the scale of the activities. Therefore, it was not necessary to define a specific study area based on a set distance from the site for the assessment of emissions from plant and machinery.

5.3 Baseline environment

5.3.1 This section provides a summary of the baseline conditions for air quality within the study area described in section 5.2.

5.3.2 The detailed methodology and approach followed to define the baseline is outlined in appendix B5-1 (baseline data synopsis report – air quality) (Application Reference Number: 6.2.18).

Identification of key air quality receptors

5.3.3 This section considers the sensitive receptors that are either close to, or within, the relevant study area for the assessment of the Park and Ride. This includes both human and ecological receptors.

Human receptors

5.3.4 The Park and Ride and surrounding areas are rural in nature, with a number of isolated farm properties nearby. The Bryngoleu farmhouse is located approximately 200m to the east of the Park and Ride. The Gwyddfor Residential Home is approximately 250m northeast of the site. Other nearby human receptor locations include a small number of homes which are about 300m or more to the north and south of the site boundary.

5.3.5 The Cartio Môn Go-Karting centre is located between the site and the Bryngoleu farmhouse, and is about 50m to the east of the site boundary at the nearest point of the track, with a Driver and Vehicle Standards Agency weighbridge and lorry checkpoint over 100m to the western site boundary.

5.3.6 For the assessment of dust emissions, a receptor count has been carried out for sensitive receptors within 350m of the Park and Ride. This count identified that there are 38 highly sensitive receptors, such as residential properties, and these sensitive receptors were all between 100m and 350m from the Park and Ride. The full counts used to inform the sensitivity of the area are provided in appendix F5-1 (Application Reference Number: 6.6.13).

5.3.7 There are no Public Rights of Way that pass through the proposed Park and Ride. The nearest footpath is approximately 320m to the north and the National Cycle Route 8 runs along the minor road over 300m to the south of the Park and Ride.

5.3.8 Figure F5-1 (Application Reference Number: 6.6.38) shows the location of the human receptors within the study area.

Ecological receptors

5.3.9 The nearest relevant ecological receptor is Llyn Traffwll Site of Special Scientific Interest, located approximately 830m to the south of the site. This site lies well outside the study area of 50m considered for this assessment.

Existing air quality

5.3.10 The review of existing air quality set out in this chapter considers dust deposition, particulate matter (which includes PM_{10} and $PM_{2.5}$[1]), nitrogen dioxide (NO_2), carbon monoxide (CO) and sulphur dioxide (SO_2) as these are the pollutants of concern in relation to construction dust or emissions from construction plant and machinery.

5.3.11 The review of baseline conditions indicates that the existing air quality in the vicinity of the Park and Ride appears to be good, and concentrations of air pollutants are generally well within the relevant Air Quality Objectives (AQOs). Through the Local Air Quality Management process, the Isle of Anglesey County Council (IACC) has not identified any relevant exposure areas where the AQOs are exceeded, or could potentially be exceeded in the vicinity of the Park and Ride.

5.3.12 The review of baseline air quality for the Wylfa Newydd Project including in the vicinity of the Park and Ride, is set out in appendix B5-1 (Application Reference Number: 6.2.18). This appendix also sets out all of the references to where the source data have been derived. The data available for each pollutant to describe the air quality baseline in the vicinity of the Park and Ride are discussed in more detail below.

Nitrogen dioxide measurements

5.3.13 To characterise the environmental baseline, an air quality monitoring survey was initiated by Horizon Nuclear Power (Wylfa) Limited with the IACC in February 2016. The survey focused on NO_2, and comprised diffusion tube measurements at locations in the vicinity of the Park and Ride. Measurements were also carried out in the vicinity of the other Associated Development site locations, and adjacent to the road network which would experience increases in traffic flows as a result of the Wylfa Newydd Project.

5.3.14 Table F5-1 presents the 2016 measured annual mean NO_2 concentrations recorded at roadside locations close to the A55, including location C2 which is adjacent to the southern site boundary of the Park and Ride. The locations of the measurements are shown in appendix B5-1 (Application Reference Number: 6.2.18) or shown in figure F5-1 (Application Reference Number: 6.6.38) where these are within or close to the study areas.

[1] PM_{10} and $PM_{2.5}$ is particulate matter with an aerodynamic diameter of 10 microns or less and 2.5 microns or less, respectively.

Table F5-1 Summary of 2016 NO_2 diffusion tube data

Monitoring location	Approximate distance to A55	Annual mean concentration (µg/m^3)
A55 at Llanfair Pwllgwyngyll (lay-by)	1m	39.7
A – A55 at Llanfair Pwllgwyngyll	3m	45.2
B – Adjacent to A55 near Junction 5 of the A55, located at an elevated location on an access road to a bridge crossing the A55	16m	9.8
C2 – A5 Holyhead Road near Junction 4 of the A55 adjacent to the Park and Ride	100m	11.3
D – A5025 Valley, adjacent to the A5025	700m	15.3

Note 1: µg/m^3 - Micrograms per cubic metre, the principal unit of measurement for the concentration of an air pollutant in ambient air.

5.3.15 The highest recorded concentrations are the two measurements adjacent to the A55. The A55 lay-by monitoring location is approximately 1m from the kerb of the A55. The latest measured concentration of 39.7µg/m^3 recorded in 2016 is just within the annual mean AQO of 40µg/m^3. An annual mean concentration of 45.2µg/m^3 was also recorded at diffusion tube monitoring location A located adjacent to the A55, approximately 750m to the northeast of the lay-by monitoring location. The nearest residential property to the A55 in this area is over 20m from the kerbside. Air pollution concentrations decrease rapidly further away from a road source. The IACC estimated that the concentration at 20m from the kerbside would be much lower, at approximately 19µg/m^3 [RD2].

5.3.16 Concentrations of NO_2 at the other monitoring locations further from the A55 are lower and well within the annual mean AQO of 40µg/m^3. The data suggest that elevated concentrations of NO_2 exist in close proximity to the A55 but the concentrations decrease rapidly towards concentrations more representative of rural concentrations within a relatively short distance from the A55. The Park and Ride is set back over 100m from the A55 and there are also no human receptors such as residential properties within 30m of the A55 within 350m of the Park and Ride. The average NO_2 concentration of 11.3µg/m^3 recorded at monitoring location C2 at Holyhead Road (i.e. directly south of the Park and Ride) is considered to be representative of concentrations at the Park and Ride.

PM_{10} and $PM_{2.5}$ measurements

5.3.17 Measurements of PM_{10} and $PM_{2.5}$ were recorded by the IACC in 2013/14 and 2016 at, or close to, the Wylfa Newydd Development Area approximately 15km to the north of the Park and Ride. The recorded annual mean concentrations were 14.4µg/m^3 and 14.9µg/m^3 for PM_{10} and 7.8µg/m^3 and 7.4µg/m^3 for $PM_{2.5}$, respectively. The monitoring locations are

representative of rural locations on Anglesey, but would also contain some contribution from sea salt particles due to their location close to the northern coast.

5.3.18 The IACC undertakes PM_{10} and $PM_{2.5}$ monitoring at other inland locations closer to the Park and Ride including a location at Llynfaes approximately 6km to the east, but this is located near to a quarry and is not representative of background conditions. The IACC has also carried out monitoring at Llangefni, over 13km east of the Park and Ride. However, this is an urban background monitoring location and not likely to be directly representative of the existing conditions at the Park and Ride.

5.3.19 Despite the variations in locations across Anglesey and range of location types, the measured concentrations are all relatively low and are well within the PM_{10} and $PM_{2.5}$ annual mean AQOs of 40µg/m^3 and 25µg/m^3, respectively.

SO_2 and CO measurements

5.3.20 The IACC, like most local authorities across the UK, has not undertaken any relevant measurements of SO_2 and CO.

5.3.21 In general, concentrations of these pollutants are relatively low and are highly unlikely to exceed the AQOs. Most local authorities across the UK do not monitor these pollutants unless there is a specific requirement such as the presence of a significant industrial source. Concentrations would be expected to be well below the relevant AQOs in the vicinity of the Park and Ride.

Dust deposition measurements

5.3.22 In 2012, 2013 and 2016, the IACC carried out measurements of dust deposition at several locations in the vicinity of the Wylfa Newydd Development Area, approximately 15km north of the Park and Ride. The measured dust deposition rates ranged from 25.8 milligrams per square metre per day (mg/m^2/day) to 35.8mg/m^2/day based on monthly measurements. These were reported by the IACC to be indicative of dust deposition levels for 'open country' and are well below the levels of dust deposition that could possibly affect amenity. Suggested guidelines for the level of dust deposition which may give rise to complaints range from 140mg/m^2/day for open countryside to 200mg/m^2/day for residential areas and outskirts of towns [RD3]. Dust deposition rates above 200mg/m^2/day could also affect sensitive vegetation [RD4]. The value for indicating when complaints are likely, based on site-specific baseline measurement data in the vicinity of the Wylfa Newydd Development Area, would be lower than the 140mg/m^2/day value as the baseline measurements are generally lower than the UK-wide rural dataset. The measurements are also below the levels of dust deposition rates that could potentially affect sensitive vegetation.

5.3.23 The dust deposition measurements recorded in the vicinity of the Wylfa Newydd Development Area would be broadly representative of the dust deposition in most rural locations on Anglesey that are not close to specific sources of dust. The majority of sensitive locations in the vicinity of the Park

and Ride are well over 200m from the A55 and would be considered as rural locations. As there are no other significant sources of dust emissions near to the Park and Ride, the dust deposition at nearby receptors would be expected to be similar to the rural measurements recorded in the vicinity of the Wylfa Newydd Development Area.

Background mapping data

5.3.24 The Department for Environment, Food and Rural Affairs and the devolved administrations produce empirically derived background maps of pollutant concentrations. The 2013 background map concentrations for NO_2, PM_{10} and $PM_{2.5}$ and 2001 background map concentrations for SO_2 and CO for the 1km by 1km grid squares representing the receptors close to the Park and Ride are shown in table F5-2.

Table F5-2 Summary of background map concentration

Pollutant	Annual mean concentration (µg/m3)
	Range based on identified human receptor locations
NO_2	4.7 – 5.8
PM_{10}	10.2 – 10.8
$PM_{2.5}$	6.9 – 7.2
SO_2	1.3 – 1.5
CO	140 – 144

5.3.25 The background map concentrations would generally be representative of concentrations experienced away from pollution sources. For example, NO_2 concentrations measured close to a road would be higher than the background map concentration for the same 1km by 1km grid square. This is evidenced in the comparison of the 2013 background map concentration range of 4.7µg/m^3 to 5.8µg/m^3 listed in table F5-2 compared to the measurement of 11.3µg/m^3 recorded by diffusion tube C2 close to the A5 and A55 presented in table F5-1. There are a small number of human receptors in the vicinity of the Park and Ride which are a similar distance to the A5 or A55 as diffusion tube C2, and the measured NO_2 concentration would be considered to be more representative of existing concentrations at these locations. Most receptors are over 200m from the A5 or A55 and the background map concentrations would be representative of the existing air quality at these locations.

5.3.26 The background map PM_{10} concentrations are also lower than the measured PM_{10} concentrations recorded at the Wylfa Newydd Development Area (14.4µg/m^3 and 14.9µg/m^3). Although these measurements are likely to contain some contribution from sea salt particles which could explain the higher concentrations, the background map concentrations are not considered to be representative of existing PM_{10} concentrations at all receptors close to the Park and Ride. For $PM_{2.5}$, the background map concentrations are similar to the measured concentrations.

5.3.27 For CO and SO_2, in the absence of monitored data, the background map concentrations are considered to be representative of the existing air quality concentrations. These pollutants are not generally associated with road traffic emissions. Unlike NO_2, the concentrations of these pollutants would be similar to the background concentrations.

Evolution of the air quality baseline

5.3.28 The evolution of baseline air quality is summarised in section 5.4 of chapter B5 (Application Reference Number: 6.2.5) and described in detail in appendix B5-1 (Application Reference Number: 6.2.18). This concluded that using existing data to represent the background concentrations of pollutants for the future year assessments was a suitably conservative approach.

5.3.29 The existing concentrations of pollutants at receptors close to the A55 would increase due to the additional road traffic associated with the Wylfa Newydd Project. This is assessed within chapter C4 (Application Reference Number: 6.3.4).

Summary

5.3.30 At locations in the vicinity of the Park and Ride where sensitive human receptors are present, air quality is generally good and concentrations of pollutants are well below the relevant AQOs.

5.3.31 The construction dust assessment requires the existing PM_{10} concentration to determine the sensitivity of the area for the assessment of potential human health effects. The highest measured PM_{10} concentration recorded close to the Wylfa Newydd Development Area (a concentration of 14.9µg/m^3) was used to represent the background PM_{10} concentration at the receptor locations close to the Park and Ride, which are mostly rural locations. In accordance with the IAQM methodology [RD1], the contribution from other local sources was also taken into account. In this case, the contribution of road traffic emissions on the A55 to the background concentration, predicted to occur during the construction phase of the Park and Ride, was included using dispersion modelling. This resulted in a maximum predicted total PM_{10} concentration of 16.1µg/m^3 at any of the relevant receptors to be considered as part of the construction dust assessment. Details of the dispersion modelling of road traffic emissions are provided in chapter C4 (Application Reference Number: 6.3.4).

5.4 Design basis and activities

5.4.1 This section sets out the design basis for the 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 will be adopted to reduce adverse effects as inherent design features or by implementation of standard industry good working practice.

5.4.2 As described in chapter F1 (proposed development) (Application Reference Number: 6.6.1), the application for development consent is based on a

parameter approach. The assessment described within this chapter has taken into consideration the flexibility afforded by the parameters. A worst case scenario has therefore been assessed from an air quality perspective within the parameters described in chapter F1 (Application Reference Number: 6.6.1).

5.4.3 The potential sources of air pollutants and dust emissions associated with the proposed Park and Ride considered within this chapter are:

- construction phase – emissions to air of pollutants from plant and machinery (primarily Non-road Mobile Machinery) and dust emissions generated by activities such as earthworks or vehicle movements on dusty surfaces; and
- decommissioning phase – emissions to air of pollutants from plant and machinery and dust generated from decommissioning activities.

5.4.4 All traffic-related air quality effects are assessed in chapter C4 (Application Reference Number: 6.3.4). In addition, during the operational phase, to provide hot water/heating to the bus facilities building there would be a small efficient, low emission gas-fired boiler system. This would be at a domestic-scale and well below the criteria set out in the Environmental Protection UK (EPUK)/IAQM guidance [RD5] for identifying when an assessment would be required. Therefore, there are no air quality effects associated with the operational phase of the Park and Ride considered in this chapter.

5.4.5 There are no sources of odour that require consideration in this assessment.

Construction

5.4.6 The design and construction of the Park and Ride would be in accordance with the description provided in chapter F1 (Application Reference Number: 6.6.1) of this volume. The main elements that could affect air quality relate to the emissions of pollutants or dust during the construction of the Park and Ride.

Basis of assessment and assumptions

5.4.7 For dust emissions, the assessment was undertaken on the basis that all activities, as categorised within the IAQM guidance [RD1] (i.e. demolition, earthworks, construction and trackout), take place at the boundary of the Park and Ride. This represents a conservative assumption as in practice most activities would not take place at the site boundary, thus increasing the distance between the source and the receptor.

5.4.8 The diesel-powered construction plant and machinery operating on site at the various stages over the construction period are anticipated to consist of a mixture of the following types:

- 20 tonne bulldozer;
- 22 tonne and 20 tonne excavator;
- 23 tonne dumper truck;
- tipper lorry;

- 8 tonne wheeled backhoe loader;
- vibratory roller;
- road planer;
- fork lift;
- 105 tonne and 55 tonne mobile crane;
- piling rig;
- concrete pump; and
- cement mixer.

5.4.9 An average of 11 construction plant and machinery items are anticipated to be in operation simultaneously when the main construction plant are operating. The maximum number of plant and machinery in operation at any one time during the construction is 23, which occurs for just one month of the construction programme.

5.4.10 The plant number and types were estimated by experienced construction engineers based on the proposed construction activities and programme. There is potential for minor variations in the plant types or plant numbers from those presented. However, any minor variations in the plant type or number would not affect the outcome of the assessment presented in this chapter.

Embedded mitigation

5.4.11 No embedded mitigation has been identified for air quality during construction of the Park and Ride.

Good practice mitigation

5.4.12 The assessment process has identified the good practice mitigation which would be required to control the effects of dust emissions during construction. A suite of good practice mitigation measures recommended by the IAQM guidance [RD1] is set out in section 7 of appendix F5-1 (Application Reference Number: 6.6.13). The relevant and appropriate measures to mitigate dust emissions generated by the construction works have been taken forward from those set out in appendix F5-1 (Application Reference Number: 6.6.13) to the air quality management strategies within the Wylfa Newydd Code of Construction Practice (CoCP) (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10). A summary of some of the measures are set out below.

- Plan site layout so that machinery and dust generating activities are located as far as practicable from nearby sensitive receptors.
- Control site runoff of water or mud.
- No bonfires and burning of waste materials.
- Comprehensive measures and working methods to prevent and reduce dust emissions at their source, including but not limited to:

- where there is a risk of dust nuisance, use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques;
- ensuring an adequate water supply for effective dust/particulate matter suppression/ mitigation;
- where there is a risk of dust nuisance, control drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;
- ensuring equipment is readily available on site to clean any dry spillages, clean up spillages as soon as reasonably practicable using wet cleaning methods where appropriate;
- where there is a risk of dust nuisance, using enclosed chutes and conveyors and covered skips, where practicable;
- using water suppression during demolition activities and on internal site haul roads;
- implementing a wheel-washing system (with rumble grids) to reduce trackout; and
- sheeting of vehicles containing dusty/friable materials when entering and leaving the site.

- Dust deposition monitoring survey and visual inspections of the site and works (including the site boundary and off-site locations) to check compliance with dust management procedures and effectiveness of the mitigation measures and dust controls.
- Develop and implement procedures for liaising with stakeholders (including the local community and the IACC), including procedures and protocols for receiving complaints and subsequent investigations and responses.
- Construction workers would be trained as appropriate to increase their awareness of environmental concerns including dust management.

5.4.13 The measures to control dust emissions and monitor the effectiveness of the mitigation are specified within the air quality management strategies in the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10). This has been developed and informed by the measures recommended as part of the IAQM guidance [RD1].

5.4.14 The mitigation that is considered to represent good practice for the control of emissions from plant and machinery includes the following:

- no idling engines;
- use lower power settings where practicable;
- using mains electricity or battery-powered equipment where practicable to avoid the use of petrol or diesel generators;

- the average emissions across the fleet of relevant Non-Road Mobile Machinery would be equivalent to the EU Stage IIIB emission standards (EC Directive 97/68/EC) introduced in January 2011 for the engine sizes relevant to the works; and
- maintenance of construction plant and machinery in accordance with the manufacturers' instructions to reduce the risk of elevated emissions due to poor engine/emissions abatement performance, and to ensure that any malfunctions are swiftly repaired.

5.4.15 The mitigation measures to reduce pollutant emissions are included in the air quality management strategies set out within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10).

Operation

5.4.16 Traffic-related air quality effects are assessed in chapter C4 (Application Reference Number: 6.3.4). There are no other potentially significant air quality effects associated with the operational phase of the Park and Ride.

Decommissioning

5.4.17 The decommissioning of the Park and Ride would be in accordance with the description provided in chapter F1 of this volume (Application Reference Number: 6.6.1). The main elements that could affect air quality relate to the emissions of dust during the decommissioning.

Basis of assessment and assumptions

5.4.18 The potential effects on air quality during the decommissioning of the Park and Ride would be smaller in scale than the construction phase. There would also be some demolition activities required for the removal of the Park and Ride buildings which could lead to dust emissions.

5.4.19 A detailed programme of decommissioning works, including plant list and quantities of materials to be moved or processed, is not available, since these activities would commence at the end of the operating stage of the Park and Ride.

5.4.20 For the purposes of this assessment, it has been assumed that the magnitude of air quality effects associated with the decommissioning activities would be less than that associated with the construction activities due to the following:

- there would be less requirement for earthworks compared to the construction stage; and
- not all construction materials brought to the site would need to be removed, for example packaging, pallets and some excavated materials will have been removed during construction.

Embedded mitigation

5.4.21 No embedded mitigation has been identified for air quality during decommissioning of the Park and Ride.

Good practice mitigation

5.4.22 A range of good practice mitigation measures, such as those detailed for the construction phase regarding emissions of dust as set out in paragraphs 5.4.12 to 5.4.14, would also be employed during the decommissioning stage.

5.5 Assessment of effects

5.5.1 This section presents the findings of the assessment of effects associated with the construction, operation and decommissioning of the Park and Ride.

Construction

Emissions of dust

5.5.2 The assessment of the potential effects from dust emissions during the construction of the Park and Ride is set out in full in appendix F5-1 (Application Reference Number: 6.6.13).

Human receptors

5.5.3 The assessment has identified that there are potentially sensitive dust receptors located near to the northern and eastern boundary of the Park and Ride. The sensitivity of the area, which takes into consideration the number and distance of receptors from the site and baseline conditions, is summarised as being low sensitivity with respect to emissions of PM_{10} and $PM_{2.5}$; and, medium sensitivity with respect to changes in dust deposition rates and associated effects on amenity.

5.5.4 Consideration of meteorological conditions has identified that there is the potential for dust generated on-site to be blown towards receptors. Receptors located to the east and northeast will be downwind more frequently.

5.5.5 The scale of the works has been used to judge the potential dust emission magnitude for the different types of dust generating activities. Prior to good practice mitigation measures being implemented, these are large dust emission magnitude for earthworks, medium dust emission magnitude for trackout and small dust emission magnitudes for demolition and construction activities.

5.5.6 When combining the sensitivity of the area and the dust emission magnitudes following the IAQM guidance [RD1], it is considered that, principally due to the low sensitivity of the area, the earthworks activities proposed are predicted to be a low risk for human health effects as there is limited potential for emissions of PM_{10} and $PM_{2.5}$ to increase baseline concentrations to a value that is above the AQOs set for the protection of human health. Demolition, construction and trackout activities were assessed as a negligible risk. For potential dust soiling effects, there is

predicted to be a low risk from earthworks, principally due to the lack of high sensitivity receptors within 100m of the site. It is unlikely that dust deposition rates could be increased by an amount that residents and other receptors could perceive, however, there could still be the potential for infrequent, short-term episodes when baseline dust deposition rates could be increased. There is a negligible risk of demolition, construction and trackout activities causing significant dust soiling effects.

5.5.7 The dust risks summarised above for each activity were used to identify the recommended level of good practice mitigation and control measures as part of the dust assessment (appendix F5-1, Application Reference Number: 6.6.13). The proposed mitigation measures to be implemented are set out in the air quality management strategies within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10), as summarised earlier in this chapter. Some measures set out in appendix F5-1 (Application Reference Number: 6.6.13) are considered to be not applicable or practicable (as the IAQM guidance covers a wide variety of development types and locations) and have not been taken forward into the air quality management strategies within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10). Other measures have also been amended to make them specific to the construction activities.

5.5.8 Although the risks of causing adverse health effects or dust annoyance during earthworks are low, mitigation methods are available to manage emissions of dust so that the potential for significant off-site effects do not occur (i.e. during extended periods of dry weather and high wind speeds or other abnormal events). Such measures are considered to be normal good practice that would be adopted by any contractor meeting the requirements of the air quality management strategies set out within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10). It is considered that each of the potentially dust generating activities can be managed using normal good practices [RD1] so as to prevent significant effects at any off-site receptor.

5.5.9 This should be considered in conjunction with the analysis of local climatic conditions which shows that the likelihood of dust being emitted by wind erosion and being transported to off-site receptor locations is relatively low.

5.5.10 IAQM guidance [RD1] notes that with the application of good practice mitigation measures of the type available for use on this project, the environmental effect will not be significant at any off-site receptor. IAQM guidance [RD1] also notes that, even with a rigorous package of mitigation measures in place, such as is proposed in the air quality management strategies set out within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10), occasional impacts may occur. The air quality management strategies set out within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10) provides a framework by which the level of mitigation is adapted to respond

proactively (such as the use of additional mitigation measures) to the changing risk of dust emissions, so that significant effects are prevented.

5.5.11 Therefore, with the mitigation measures applied as specified in the air quality management strategies within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10), notwithstanding the measures amended or not taken forward from the appendix F5-1 (Application Reference Number: 6.6.13), the likely effect of dust emissions on human health and amenity during construction is concluded to be not significant.

Ecological receptors

5.5.12 The risks of effects from dust on ecological receptors during the construction of the Park and Ride were screened out from the assessment, as there are no ecological receptors within 50m of the site, or within 50m of the access roads up to 500m from the site entrance. On this basis, the effects of dust on the nearest relevant ecological receptor, the Llyn Traffwll Site of Special Scientific Interest (approximately 830m south) would be negligible and not significant.

Emissions from plant and machinery

5.5.13 IAQM guidance [RD1] specifies the following in relation to the assessment of emissions to air from construction plant and machinery:

"Experience of assessing the exhaust emissions from on-site plant (also known as Non-Road Mobile Machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed."

5.5.14 The phased construction programme takes place over a relatively large area of over approximately 19.5 hectares. Within this phased construction programme, there are relatively low numbers of comparatively small sized plant and machinery items operating simultaneously (an average of 11 plant items and maximum of 23, as discussed in paragraph 5.4.9). Taking these factors into account, with the low existing air quality concentrations at locations of relevant exposure for the assessment (as discussed in paragraph 5.3.30), the potential effect on local air quality at human and ecological receptors in the vicinity of the site would be negligible. On this basis, and in line with IAQM guidance [RD1], this aspect has been screened out from requiring a detailed assessment, and the effect on air quality from construction plant and machinery emissions is considered to be not significant.

Operation

5.5.15 As traffic-related air quality effects are assessed in chapter C4 (Application Reference Number: 6.3.4), there are no potentially significant air quality effects associated with the operational phase of the Park and Ride.

Decommissioning

Emissions of dust

5.5.16 The potential for generating dust emissions is likely to be lower than during the construction stage, as most of the decommissioning activities would include the demolition/removal of the buildings/structures and removal of the car park surface. The amount of earthworks would be smaller than required for the construction stage.

5.5.17 Therefore, taking into account that similar good practice mitigation measures to those proposed for the construction phase would be implemented, it is concluded that the effects at both human and ecological receptors are categorised as not significant.

5.5.18 It is envisaged that the decommissioning would be undertaken in accordance with measures and strategies similar to those set out in the air quality management strategies within the Wylfa Newydd CoCP (Application Reference Number: 8.6) and Park and Ride sub-CoCP (Application Reference Number: 8.10) for the construction stage, and including other relevant good practice guidelines in force at the time of decommissioning. However, it is likely that particular attention would need to be given to the prevention of emissions of concrete/cement dusts during the demolition of the Park and Ride to avoid potential health effects.

5.5.19 In summary, it is assumed that there could still be a low risk of effects for some of the decommissioning activities, but it is envisaged that these would be effectively mitigated to be not significant by the implementation of the good practice mitigation measures, similar to those which would be used for the construction phase.

Emissions from decommissioning plant and machinery

5.5.20 The decommissioning activities would be smaller in scale than those during the construction stage. As these would be in the future, emissions of pollutants from the plant and machinery would be similar or lower than during construction (as more stringent emission standards are introduced for newer plant over the next 10 years).

5.5.21 The plant list and programme for the decommissioning activities have not yet been compiled. However, these decommissioning activities are likely to be lesser in scale than those during the construction stage. On this basis, this aspect has been screened out from requiring a detailed assessment in line with the IAQM guidance [RD1], and the effect is considered to be not significant.

5.6 Additional mitigation

5.6.1 In accordance with chapter B1 (introduction to the assessment process) (Application Reference Number: 6.2.1), good practice mitigation measures relevant to air quality were taken into account when determining the 'pre-mitigation' significance of effects. These are detailed in the design basis and activities section of this chapter.

5.6.2 As no potentially significant effects have been identified, no additional mitigation measures are proposed.

5.7 Residual effects

5.7.1 This assessment has shown that, taking into account the good practice mitigation, there are no potentially significant effects and there is no requirement for additional mitigation.

5.8 References

Table F5-3 Schedule of references

ID	Reference
RD1	Institute of Air Quality Management (IAQM). 2016. *IAQM Guidance on the assessment of dust from demolition and construction*. *Version 1.1*. London: Institute of Air Quality Management.
RD2	Isle of Anglesey County Council (IACC). 2016. *2016 Air Quality Progress Report for Isle of Anglesey County Council, Draft Report.* Llangefni: Isle of Anglesey County Council.
RD3	Vallack, H. W. and Shillito, D. E. 1998. Suggested guidelines for deposited ambient dust. *Atmospheric Environment*, Vol. 32 (16.08.1998), pp. 2737-2744.
RD4	Environment Agency. 2003. Assessment of noise disturbance upon birds and dust on vegetation and invertebrate species. Report Ref. 6502-E.075EA.
RD5	Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM). 2017. *Land-Use Planning and Development Control: Planning for Air Quality*. London: Institute of Air Quality Management. Version 1.2, January 2017.