TA 9.3: Private Water Supplies Assessment

Technical Appendix 9.3: Private Water Supplies Assessment

1.1 Introduction

1.1.1 The purpose of this Technical Appendix is to identify the location of Private Water Supplies (PWS) relative to the Proposed Development, and to undertake an assessment of potential impacts on them.

1.1.2 A PWS is considered to be a small abstraction of less than 10 m^3 per day from a source such as a borehole, spring/ well or surface water body. The Scottish Environment Protection Agency (SEPA) typically requires that all groundwater abstractions be identified within 100 m of proposed roads, tracks and trenches or within 250 m from borrow pits and foundations[1]. In addition to screening for PWS within these buffers, this assessment also considers other supplies, within a 2 km study area, in potential hydrological connection to the Proposed Development.

1.1.3 PWS are categorised as Type A, or Regulated Supplies that serve 50 or more persons in total or which serve commercial properties (regulated under The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017)[2], and Type B, or Exempt Supplies that serve only domestic properties (regulated under The Private Water Supplies (Scotland) Regulations 2006)[3].

1.2 Private Water Supply Locations

1.2.1 Following a request for information by Ramboll, Moray Council and Aberdeenshire Council provided the location of PWS within a 5 km radius of the Proposed Development (received on 15 December 2020 and 11 December 2020 respectively). Subsequent to the receipt of information from the local authorities, a questionnaire was issued to households on the Site or which draw supplies from within the Site, at which the presence of a PWS was identified. One response was received which confirmed the presence of a known PWS at Cabrach Church. No further responses were received.

1.2.2 PWS abstraction sources located within 2 km of the Site are identified below in Table 9.3.1 and in Figure 9.3.1. Moray Council have provided the locations of PWS abstraction sources and the location of end use, this distinction is not made in information provided by Aberdeenshire and therefore it is assumed that PWS locations provided within Aberdeenshire are abstraction sources, as these represent the more sensitive receptors to potential alteration in quality or quantity of water supply. PWS to the north of the River Fiddich are not included in the assessment as these are not in potential hydrological or hydrogeological connection to the Site and are in excess of 2.8 km from any areas on which development is proposed.

Table 9.3.1: Private Water Supply Abstraction Sources

Reference (see Figure 9.3.1)	PWS Category	Source Type	X	Y	PWS User Name
1*	Type B	Well	338327	832053	Tomballie
2*	Type B	Well	338335	832040	Tomballie
3*	Type B	Borehole	338096	831361	Cabrach Church
4*	Type B	Spring	337736	832325	Ardluie, Cabrach
5*	Type B	Well	337746	832118	Kildonan, Cabrach
6*	Type A	Well	336091	833853	Ballochford, Cabrach
7*	REG2	Spring	338684	833276	Easterton Huntly Moray
8*	B	Spring	337736	832327	Ardluie Bungalow
9*	REG2	Well	336634	833241	Rhinturk Cabrach
10	B	Spring	339878	832481	Hillock of Echt
11	REG2	Stream	338133	831086	Inverharroch Cottage
12	Type B	Spring	338464	831396	Lesmurdie Cabrach
13	Type B	Spring	336228	832437	Todholes, Cabrach
14	Type B	Spring	337190	831894	Cabrach Burntreble Cottage
15	Type B	Spring	340407	833475	Cabrach Tomnaven
16	Type A	Spring	336537	829883	Grouse Inn
17	Type A	Spring	337504	830549	Grouse Inn
18	Type A	Spring	337855	830415	Grouse Inn
19	Type A	Spring	338068	831052	Inverharroch
20	Type A	Spring	338596	830925	Inverharroch
21	Type B	Spring	339599	834102	Belcherrie
22	Type B	Spring	339178	833682	Succoth Cabrach
23	Type B	Spring	338099	830620	Dalriach
24	Type B	Spring	338162	830676	Dalriach
25	Type B	Unknown	341911	834776	Meikle Gowls,
26	Type B	Unknown	341925	834984	Back Of Hill
27	Type B	Unknown	341343	835057	Waterside Gouls
28	Type B	Unknown	341153	835144	Mill Of Lynebain
29	Type B	Unknown	341286	835301	Lynebain
30	Type B	Unknown	341290	835307	Lynebain Cottage
31	Type B	Spring	341129	836143	Backside
32	Type B	Spring	341582	836312	Tighnaird
33	Type B	Unknown	341591	836318	The Old School House
34	Type A	Spring	341817	836643	Mains of Beldorney
35	Type B	Spring	342090	836937	The Cottage
36	Type B	Spring	342123	836959	Farm Managers House Beldorney
37	Type B	Unknown	342123	836959	Gardeners Cottage Beldorney
38	Type B	Spring	342118	837073	Gamekeepers House Beldorney,

* Located within the Site

[1] LUPS-GU31 , SEPA 2017 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems

[2] https://www.legislation.gov.uk/ssi/2017/282/contents/made

[3] https://www.legislation.gov.uk/ssi/2006/209/contents/made

1.2.3 PWS end use locations within 2 km of the Site are identified below in Table 9.3.2 and in Figure 9.3.1.

Table 9.3.2: Private Water Supply End Use Locations

Reference (see Figure 9.3.1)	Source Type	X	Y	PWS User Name
U1	Spring	338018	830442	Grouse Inn
U2	Spring	337949	830495	Barrel Creations
U3	Spring	338072	831092	Inverharroch
U4	Spring	338197	831191	Cabrach Primary School
U5	Spring	338136	831193	Dorran House
U6	Spring	338227	831196	Schoolhouse Lower Cabrach
U7	Spring	340053	834077	Belcherrie Farm
U8	Spring	339850	833906	Greenloan
U9	Spring	339867	832495	Hillock Lower
U10	Stream	338072	831092	Inverharroch
U11	Spring	338436	831358	Lesmurdie House
U12	Spring	338488	831428	Miltown
U13	Spring	336264	832412	Todholes
U14	Spring	339656	833347	Succoth
U15	Spring	339622	833349	Craiglewie
U16	Spring	338135	830696	Dalriach
U17	Spring	337205	831884	Burntreble
U18	Spring	340410	833489	Tomnaven
U19	Well	338109	831310	Manse House
U20	Well	338361	831658	Tombain
U21	Spring	337428	832290	Ardluie
U22	Well	337570	831693	Kildonan
U23	Well	336016	833657	Ballochford
U24	Spring	339527	833032	Easterton
U25	Spring	337438	832240	Ardluie
U26	Borehole	338093	831310	The Old Kirk
U27	Well	336630	832936	Rhinturk

1.2.4 According to BGS 1:625,000 hydrogeological mapping the Site is underlain by a Low Productivity aquifer in which flow is virtually all through fractures and other discontinuities.

1.3 Potential Impacts

1.3.1 In the absence of appropriate construction techniques and mitigation measures there could be potential, for excavation of soil and bedrock to cause localised disruption and interruption to groundwater flow. Interruption of groundwater flow could potentially reduce the supply of groundwater to PWS thereby causing an alteration/ change in the quality or quantity of and/or the physical or biological characteristics of the PWS. Contamination of groundwater could also cause physical or chemical contamination to the PWS.

1.3.2 There is also a potential for works to alter in-channel or overland flow regimes through excavations, disruption to artificial drains, exposure of bare earth or rock and the construction of new or upgrades to existing watercourse crossings. Such activity could affect water quality at PWS from surface water sources.

1.3.3 Nine (9) PWS abstraction sources are located on the Site. No PWS sources are located within 250 m of proposed infrastructure or development and therefore the Proposed Development is unlikely to impact groundwater flow and groundwater quality feeding PWS, in line with SEPA guidance[1] further detailed qualitative and/ or quantitative risk assessment is not required at these locations.

1.3.4 The Rhinturk [sic] Cabrach PWS source (PWS Ref 9) is located approximately 280 m to the north west of the proposed upgraded section of existing access track at an upslope location elevated from the track by approximately 27 m. Water abstracted from this location is conveyed to Rinturk Farm (PWS Ref U27) which is situated approximately 105 m north west and approximately 18 m upslope of the proposed access track. As the abstraction source is outwith a 250 m buffer and upslope of the proposed access track it is highly unlikely that water flow or quality would be affected at this location. The route of conveyance of water supply to Rinturk Farm does not cross the access track and remains at a minimum elevation of 18 m above the track. The Proposed Development, which represents an upgrade to an existing track at this location, would therefore not impact the water supply route to Rinturk Farm.

1.3.5 All further PWS abstraction sources and user locations identified in Tables 9.3.1 and 9.3.2 are in excess of 800 m from proposed infrastructure.

1.3.6 In the north west of the Site, an area of peat restoration and riparian planting is proposed, as described in Technical Appendix 7.5: Outline Habitat Management Plan. These could involve re-wetting/ possibly ditch blocking if appropriate, at a location upgradient of the Ballochford. Such works would restore groundwater recharge and would not be expected to lead to any impacts on water quality. Therefore no negative impact on the PSW, which is fed from a well, would be expected.

1.3.7 An area of grassland/ heathland management is proposed in the south at Kelman Hill. This is upgradient of, and within 250 m of, several PWS. However, the habitat management would consist of management to encourage the continued use through a sensitive grazing regime and heather/ scrub removal (when required). Such habitat management would have no negative impact on water quality or downstream water resource.

1.3.8 Therefore, taking into account the hydrogeological context, risk from alteration to the groundwater regime is considered highly unlikely.

1.3.9 Three (3) PWS sources (PWS Refs 7, 21 and 22) are downslope to the south of the Proposed Development, at a minimum distance of 850 m. Small lengths of track are within the upper end of the catchments within which the PWS are located. PWS abstractions at these locations are from springs that could be supported by surface water runoff and shallow groundwater flow. However, abstractions at these locations are at a significant distance from the Proposed Development and are not in direct hydrological connection via surface water features. Furthermore, the PWS abstractions are situated in upslope locations from drains or surface water features to which runoff from the Site could occur. PWS at these locations are therefore assessed not to be in hydrological connection to areas on which development is proposed.

1.3.10 Further PWS abstraction locations are situated outside of catchments within which direct surface water runoff from the Proposed Development could drain to, or are upslope of surface water features and watercourses in further downstream connection from the Site. All PWS identified within the 2 km study area are therefore assessed to be outside of potential hydrological connectivity to the Proposed Development.

1.3.11 PWS located at a greater distance than 2 km from the Site are considered highly unlikely to be within hydrological connection to the Site and have been scoped out of further assessment.

1.4 Site Best Practice and Environmental Management

1.4.1 The construction works would follow best practice principles to be set out within the detailed CEMP. An Outline CEMP setting out the general principles of Site management is included in Technical Appendix 2.1: OCEMP.

1.4.2 To ensure that all drainage measures employed during the construction phase of the Proposed Development are maintained appropriately and remain effective, the performance of the drainage measures would be monitored. The drainage management works would be supervised by the Ecological Clerk of Works (ECoW). All monitoring and supervision of the drainage management works would be recorded.

1.4.3 The best practice measures to be set out in the CEMP would accord with guidance such as that published by Scottish Natural Heritage (SNH) (now known as NatureScot) and SEPA, and would be prepared by the Principal Contractor. The following best practice measures are considered applicable to the Proposed Development:

- Engineering activities such as culverts, bridges, watercourse diversions, bank modifications and dams would be avoided wherever possible in order to maintain the natural state of the water environment;
- Appropriate buffer zones between water bodies and construction areas would be established;
- No large capacity build-up of surface water would occur that could lead to additional loadings being placed on the surrounding ground that could lead to soil failure, especially in areas with peat stability concerns;
- Any effects on natural flora and fauna would be minimised, and there would be no indirect impacts on any surrounding designated sites;
- Pollution prevention and environmental protection legislation would be adhered to;
- Works would be allowed to progress efficiently without flash wash-out events affecting partially completed sections; and
- The completed development would be suitably operated with the minimum maintenance to the installed drainage systems.

1.5 Conclusions

1.5.1 The assessment has concluded that the risk of potential impact to PWS as a result of the Proposed Development would be negligible.

Legend

- Site Boundary
- Proposed Turbine
- Proposed Turbine Hardstanding
- Proposed Temporary Construction Compound (CC)
- Proposed Substation
- Proposed Met Mast
- Proposed Met Mast Hardstanding
- Proposed Borrow Pit Search Area
- Proposed New Track
- Proposed Existing Track Upgrade
- Proposed Emergency Vehicle Access
- Proposed Turning Head
- 2 km Study Area
- Moray PWS Sources
- Moray PWS Users
- Aberdeenshire PWS
- Moray Sources 250 m Study Area
- Aberdeenshire Sources 250 m Study Area

PWS locations as provided by Moray and Aberdeenshire Councils. Data provided by Aberdeenshire Council does not distinguish between PWS sources and users, therefore it is assumed in mapping that all PWS are potential sources and 250 m buffer applied.

Figure Title

Figure 9.3.1: Private Water Supplies

Project Name

Craig Watch Wind Farm
EIA Report

Project Number	Figure No.
1620010178	9.3.1
Date	Prepared By
May 2022	AB
Scale	Issue
1:35,000 @A3	1

Client

Craig Watch Wind Farm Limited

RAMBOLL

0 500 1,000 Metres

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Technical Appendix 10: Traffic, Transport and Access

TA 10.1: Transport Assessment

TA 10.2: Abnormal Indivisible Load Route Survey

TA 10.1: Transport Assessment

Pell Frischmann

Craig Watch Wind Farm

Transport Assessment

April 2022

Report Ref.	**Document1**					
File Path	**Document1**					
Rev	**Suit**	**Description**	**Date**	**Originator**	**Checker**	**Approver**
1		Transport Assessment – Draft for Client Comment	08/03/22	E Moran	G Buchan	G Buchan
2		Update 1	09/03/2022	E Moran	G Buchan	G Buchan
3		Updated with Client Comments	23/03/2022	E Moran	G Buchan	G Buchan
4		Final	28/04/2022	E Moran	G Buchan	G Buchan

Ref. reference. Rev revision. Suit suitability.

Prepared for

Ramboll

240 Blackfriars Road
London
SE1 8NW

Prepared by

Pell Frischmann

93 George Street
Edinburgh
EH2 3ES

RAMBOLL

Pell Frischmann

Contents

Figures

Craig Watch Wind Farm
Transport AssessmentTransport Assessment

Tables

Appendices

Pell Frischmann

1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by Ramboll, on behalf of Craig Watch Wind Farm Limited, to undertake a Transport Assessment (TA) for the proposed Craig Watch Wind Farm, located approximately 8 km to the southeast of the burgh of Dufftown, Moray. The Site is located within both Moray Council and Aberdeenshire Council areas.

The report identifies the key transport and access issues associated with the Proposed Development, including the route for abnormal loads. The TA identifies where the Proposed Development may require mitigation works to accommodate the predicted traffic; however, the detailed design of these remedial works is beyond the agreed scope of this report.

1.2 Report Structure

Following this introduction, the TA report is structures as follows:

- Chapter Two describes the Proposed Development;
- Chapter Three reviews the relevant transport and planning policies;
- Chapter Four sets out the methodology used within this assessment;
- Chapter Five describes the baseline transport conditions;
- Chapter Six describes the trip generation and distribution of traffic in the study area;
- Chapter Seven summarises the traffic impact assessment;
- Chapter Eight considers mitigation proposals for development related traffic within the study network; and
- Chapter Nine summarises the findings of the TA and outlines the key conclusions.

2 Site Background

2.1 Site Location

The Proposed Development is situated on a portion of land approximately 8 km to the southeast of Dufftown and 15 km to the southwest of Huntly. The Site is approximately 1,121 hectares (ha) and is bound by the A941 to the south west. A minor road runs along and across the Site's eastern and southeastern boundary, in the River Deveron valley. The existing Site comprises a combination of plantation woodland, marshy grassland and bogland.

The location of the Proposed Development is shown in Figure 1.

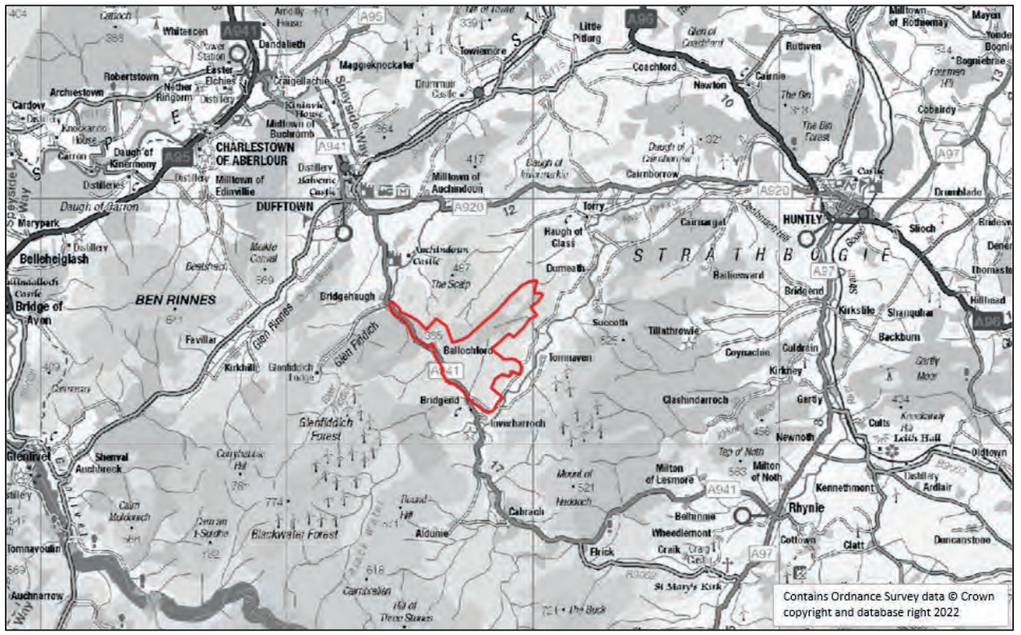


Figure 1 Site Location Plan

2.2 Proposed Development

A Scoping Request was sent to the Scottish Government on 23 November 2020 which included a scheme for up to 18 wind turbines with a tip height of up to 200m. Following additional studies and consultations, it was decided to reduce the number of turbines from 18 to 11. This TA will therefore consider the traffic impacts associated with the revised scheme comprising 11 wind turbines with a maximum tip height of 200m.

The proposals also include the following:

- Associated permanent turbine foundations and crane hardstanding;
- A permanent free-standing meteorological mast including associated foundation and hardstanding;
- A total of approximately 9.4 km of on-site tracks with associated water crossings, passing place and turning heads of which 2.18 km will be formed through upgrading existing tracks. Additionally, a total of approximately 0.76 km of on-site emergency access track is also proposed;

- A main Site Access junction for use during construction and operation, designed to accommodate abnormal indivisible loads required for turbine component delivery as well as to provide parking for component deliveries;
- A substation compound, including an energy storage unit (if required) and control building (if required). Any storage would fall within the substation area;
- Two temporary Site construction compounds;
- A network of on Site buried electrical cables connecting the turbines to the on Site substation;
- Engineering operations which include for example turbine foundations, access tracks, and peat excavation and restoration work; and
- Associated ancillary works, including:
    - Habitat management plan areas, forest felling and replanting;
    - Extraction of rock from borrow pits (if suitable); and
    - Concrete batching plant. This would be located within the temporary construction areas and/or borrow pit search areas.

The Proposed Development will be designed to have an operational life of 33 years.

2.3 Candidate Turbines

Craig Watch Wind Farm Limited has indicated that they wish to consider the use of a Siemens SGRE155 turbine at a tip height of 200m as the candidate turbine for the Site. Details of the turbine components have been supplied by Siemens and are as follows:

Table 1 Turbine Dimensions

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	76.571	4.424	3.000	25.600
Nacelle	14.620	4.200	3.500	84.000
Drive Train	7.000	3.600	3.400	83.000
Hub	4.800	4.500	4.200	50.000
Base Tower	14.034	4.800	4.800	84.400
Mid Tower 1	19.880	4.800	4.800	84.300
Mid Tower 2	22.400	4.800	4.794	73.900
Mid Tower 3	28.560	4.794	4.102	72.000
Top Tower	35.040	4.102	3.574	70.300

The selection of the final turbine model and specification will be subject to a commercial procurement process following consent of the application. The assumed dimensions may therefore vary from those assumed as part of the of the route assessments.

Examples of the vehicles and trailers that are likely to be transported are shown in Figures 2 and 3.

Figure 2 Super Wing Carrier with Loaded Turbine Blade

Figure 3 Typical Tower Transport Trailer

3 Policy Context

3.1 Introduction

An overview of relevant transport planning policies has been undertaken and is summarised below for national and local government policies.

3.2 National Policy and Guidance

3.2.1 The Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment (IEA), 1993)

The Guidelines for the Environmental Assessment of Road Traffic outlines rules for the screening process to define the scale and extent of the assessment:

- *"Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and*
- *Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more."*

3.2.2 Scottish Planning Policy

The Scottish Planning Policy (SPP) was developed to set out the national planning policies which demonstrates the priorities of Scottish Ministers' for the operation of the planning system as well as for the development and use of land. The document notes that:

"Where a new development or a change of use is likely to generate a significant increase in the number of trips, a transport assessment should be carried out. This should identify any potential cumulative effects which need to be addressed."

In relation to the construction of new developments, the SPP notes:

"Consideration should be given to appropriate planning restrictions on construction and operation related transport modes when granting planning permission, especially where bulk material movements are expected, for example freight from extraction operations."

3.2.3 National Planning Framework 3 (2014)

Scotland's National Planning Framework (NPF3) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Scottish Government's development priorities over the next 20 to 30 years and identifies national developments which support the development strategy. Scotland's third NPF was laid in the Scottish Parliament on 23 June 2014.

The Draft National Planning Framework 4 (DNPF4) was laid in Parliament on 10 November 2021 and will be considered by Scottish Parliament for up to 120 days. In relation to transportation, Policy 19: Green Energy within the DNPF4 notes that:

"…development proposals for renewable energy developments must take into account:

- *cumulative impacts – taking into account the cumulative impact of existing and consented energy development;*
- *public access, including impact on long-distance walking and cycling routes and scenic routes; and*
- *impacts on road traffic and on adjacent trunk roads.*

3.2.4 Onshore Wind Turbines: Online Renewables Planning Advice (2014)

The most recent Scottish Government advice note regarding onshore wind turbines was published in 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

In terms of road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable. This is important for the movement of abnormal indivisible loads during the construction period, ongoing planned maintenance and for the decommissioning phase.

3.2.5 Transport Assessment Guidance (2012)

Transport Scotland's (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.

The document notes that a TA will be required where a development is likely to have significant transport impacts but that the specific scope and contents of a TA will vary for developments, depending on location, scale, and type of development.

3.2.6 Planning Advice Note (PAN) 75 (2005)

9.3.11 Planning Advice Note (PAN) 75: Planning for Transport provides advice on the requirements for Transport Assessments. The document notes that:

"… transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning."

"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal...For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."

3.3 Local Policy

3.3.1 Moray Local Development Plan (2020)

The Moray Local Development Plan (MLDP) was formally adopted on 27 July 2020 and sets out how Moray Council area is to develop over the next 10 years. Policy DP9 Renewable Energy outlines the criteria which all renewable energy proposals must follow which includes addressing:

"… any unacceptable significant adverse impacts including…traffic impact mitigation during both construction and operation"

3.3.2 Moray Onshore Wind Energy Non-Statutory Guidance (2020)

Moray Onshore Wind Energy Non-Statutory Guidance is a supplementary guidance document to the MLDP. In relation to transportation issues, the guidance document notes:

Safety – *"To minimise the risk to road and rail users, the Council requires a safeguarding distance of 1.5 times the height to blade tip."*

Location – *"The applicant should assess whether the access roads are suitable for the transportation of all components and construction traffic necessary to deliver the Proposed Development. Any bridges or other*

structures must also be assessed to confirm if they can support the vehicles and loads being transported to the Site. Any sections of the route which will require modification to allow transportation of components should be identified, potential effects assessed, and mitigation proposals provided. The applicant must demonstrate that abnormal loads can be safely transported in such a way that minimises inconvenience to other road users and that the environmental effects of this and other construction traffic, after mitigation, are acceptable. Swept path analysis should be provided by the developer."

Visual Distraction – *"Any potential for visual distraction should be minimised by the provision of a clear, continuous view of the wind farm that develops over the maximum possible length of approach carriageway. The potential for distraction may be greater than with other roadside features (advertisements, etc.) but a clear view from distance will considerably reduce the temptation for drivers to turn their heads when passing the turbines. Moray Local Development Plan ONSHORE WIND ENERGY NON-STATUTORY GUIDANCE 36 Wind farms should not be located where motorists need to pay particular attention to the driving task, such as the immediate vicinity of road junctions, sharp or unexpected bends and crossings for pedestrians and cyclists. The existing accident record and type of accidents occurring near the proposed wind turbine(s) may also need to be analysed. Applicants should note that locations with a history of rear end shunt accidents will be treated with particular caution. This information can be obtained from the Council's transportation section."*

Access – *"For proposals above 35m to blade tip the applicant will be asked to prepare a Transport Assessment (TA) covering the construction, operation and decommissioning stages of the development for consideration at the preapplication stage. To avoid delays and ensure a robust assessment the Transport Assessment Scoping must be submitted for approval. The TA, which will normally be part of the EIA, should demonstrate the likely impacts of the development on the road network and on road users and clearly define the access routes to the wind farm development. From this, the acceptability of the proposal should be determined, and any mitigating measures should be identified. In some cases, it may be necessary for the applicant to undertake modifications to the road to facilitate delivery of components and/or minimise disruption to other road users. The applicant may also be required to undertake a dry run of the delivery of the largest components to ensure delivery is possible in a way that minimises disruption. Requirements for strengthening bridges may also be requested. In addition to these thresholds, the requirement for a TA or Transport Statement (TS) will be triggered because of location, surrounding road network condition, where the rotor blade length exceeds 18m and where the proposal is for 3 or more turbines. As part of the TA and EIA, the applicant will be required to provide a comparison of the future baseline traffic numbers with and without construction traffic that would be generated by the project. There may be a number of wind turbine proposals that use a common port and/or access route and pass through the same towns. Where cumulative impact is likely then a cumulative TA should form part of the EIA to consider the impacts of abnormal traffic movements relating to the proposals."*

Trunk Road – *"Developers should contact Transport Scotland for further advice where the proposed turbine(s) are close to the trunk road network or will require using the trunk road network to access the site. Transport Scotland encourages pre-application discussions with wind farm developers so that the construction, operation, maintenance and decommissioning of proposed Sites can be considered at an early stage of the application process."*

3.3.3 Aberdeenshire Local Development Plan (2017)

The Aberdeenshire Local Development Plan (ALDP) was formally adopted on 17 April 2017. Policy C2 Renewable Energy notes that:

"All windfarms must be appropriately Sited and designed and avoid unacceptable environmental effects taking into account the cumulative effects of existing and consented wind turbines… Unacceptable significant adverse effects on the amenity of dwelling houses or tourism and recreation interests including core paths and other established routes used for public walking, riding or cycling should also be avoided."

3.3.4 Use of Wind Energy in Aberdeenshire: Guidance for Developers – Supplementary Planning Guidance (2005)

In relation to transportation, the supplementary guidance document states that:

"Consideration should be given to potential cumulative impact on … traffic and transport…"

It should be noted that Aberdeenshire Council is currently at Stage 3 (Examination) of the local development plan process for their Local Development Plan 2022. It is expected that the LDP 2022 will be adopted in the first half of 2022.

3.3.5 Policy Summary

The Proposed Development can align with the stated policy objectives and the design of the Site and proposed mitigation measures will ensure compliance with national and local objectives.

4 Study Methodology

4.1 Introduction

There are three phases of the life of the Proposed Development. All three phases have been considered in this assessment and are as follows:

- The Construction Phase;
- The Operational Phase; and
- The Decommissioning Phase.

4.2 Project Phases – Transport Overview

Of the three aforementioned phases, the construction phase is considered to have the greatest impact in terms of transport. Construction plant, bulk materials and turbine sections will be transported to Site, these may potentially cause a significant increase in traffic on the study network.

The decommissioning phase involves fewer trips on the network than the construction phase, as minor elements of infrastructure are likely to be left in place, adding to local infrastructure that can potentially be used for further agricultural or leisure uses in the future.

The operational phase is restricted to occasional maintenance operation which generate significantly lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network.

It should be noted however that the construction effects are temporary and transitory in nature.

4.3 Scoping Discussions

The Applicant submitted a request for scoping opinion to the Scottish Ministers in respect of the Environmental Impact Assessment which included a section considering traffic and transport. Scoping consultations were also undertaken with both Moray Council and Aberdeenshire Council Officers.

5 Baseline Conditions

5.1 Access Arrangement

The Proposed Development would be accessed directly from the A941, within the Moray Council area, to the north of Bridgend. A new Site access junction will be provided which will meet turbine manufacturer requirements, located at the existing access to Rinturk Farm.

The Site access junction bell mouth will be surfaced and constructed to adoptable standards. The remaining access tracks throughout the Site will be private. The first 15m of the access junction will be surfaced in bituminous macadam. Appropriate junction markings and reflective junction markers will be provided at the access bell mouth. The new junction will provide an indicative visibility splay of 4.5m x 160m in both directions.

5.2 Study Area Determination

Consultation was undertaken between the Applicant, Moray Council and Aberdeenshire Council to determine the scope of the TA. The consultation centred around data collection count Sites, likely points of origin for materials to assist in developing a suitable study network.

The study area includes local roads that are likely to experience increased traffic flows resulting from the Proposed Development. The geographic scope was determined through a review of Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

The Proposed Development will take access directly from a new priority junction located on the A941. Access for construction materials would be predominantly from the north with quarried materials, where required and in addition to material from borrow pits, likely to come from suppliers located along the A941. Materials for the on-Site batching of concrete will also arrive from the north and will use the A941 to access the construction Site.

Abnormal loads associated with the wind turbines will access the Site from the Port of Dundee, as although the Port of Aberdeen is closer, it does not have sufficient capacity for wind turbine components and access from Inverness, the next nearest port, is not considered feasible due to constraints through the town of Keith. Loads will travel from the Port of Dundee to the Site via the A90, A96, A920 and A941.

The study area for the assessment has therefore been assumed to be as follows:

- A941, to the north of the Site access junction through to Dufftown;
- A941, through Dufftown;
- A920, between Dufftown and Huntly; and
- A96, through Huntly.

The study area network is illustrated in Figure 4. The AIL route will be used for the turbine component movements and is shown in green in the figure, while the general access routes are shown by a yellow broken line.

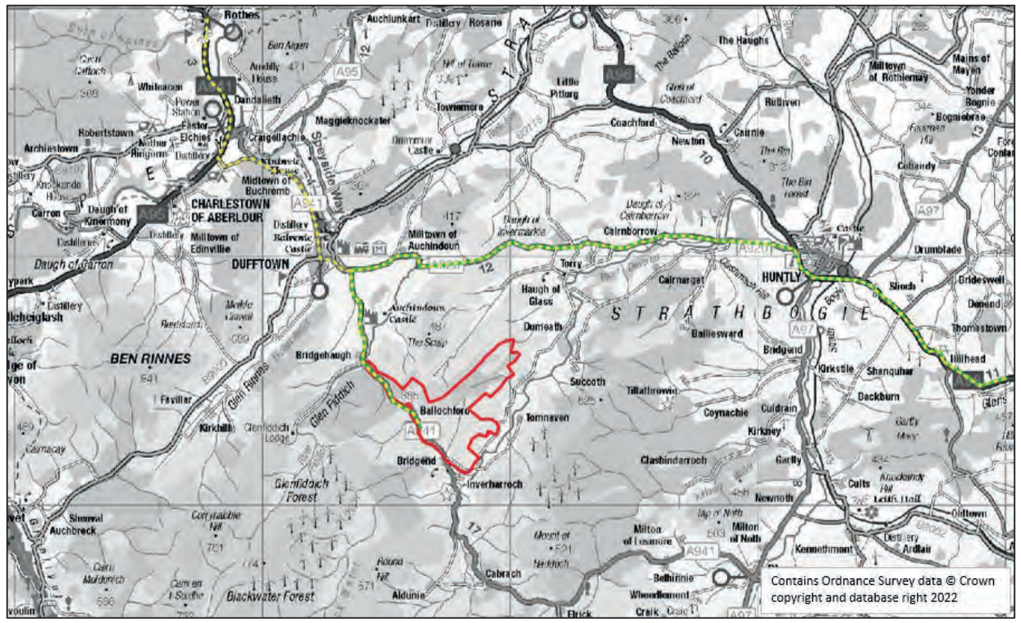


Figure 4 Assessment Study Area

5.3 Pedestrian and Cyclist Networks

There are a number of Core Paths which are located throughout Dufftown which are in the vicinity of the anticipated construction traffic route. These Core Paths comprise a combination of off-road paths and public roads / roadside paths and are as follows:

- Core Path SP09 extends along B9009 Conval Street and A941 Fife Street and concludes near the A941 / Mortlach Church access junction. Core Path SP09 is approximately 1 km in length and is designated as a public road / roadside path.
- Core Path SP08 is a combination of off-road paths and public roads / roadside paths. Core Path SP08 commences near the A491 Fife Street / Cowie Avenue junction and continues south westbound along Cowie Avenue.
- Core Path IW01 is a combination of off-road paths and public roads / roadside paths and connects with Core Path SP09 to provide a connection to the north to Mount Crescent.
- Core Path SP07 is designated as an off-road path which commences near the A941, approximately 240m to the west of the A941 / A920 priority junction.
- To the south of Dufftown, Core Path SP29 is an off-road core path which commences in Bridgehaugh, near the A941. Core Path SP29 continues southwest through Glen Fiddich.
- To the north of Auchmair, Core Path SP30 links the A941 to SP29 towards Cairngorms National Park.

A review of Sustrans' National Cycle Route (NCR) map (https://www.sustrans.org.uk/national-cycle-network) does not show any national cycle routes on the A941.

5.4 Road Access

5.4.1 A941

Access to the Site would be taken directly from the A941 via a newly constructed access priority junction. In the vicinity of the proposed access, the A941 is a two-way single carriageway with number of passing places along its length and is subject to the national speed limit. The A941 is maintained by both Moray Council and Aberdeenshire Council as it connects Elgin, to the north-west of the Site to Rhynie, to the southeast.

5.4.2 A920

The A920 is a two-way single carriageway which links Dufftown to Huntly. The A920 lies in both Moray Council and Aberdeenshire Council areas and is subject to the national speed limit.

5.4.3 A96

The A96 forms part of the trunk road network and provides a strategic connection between Inverness and Aberdeen via Huntly, Keith and Nairn. The A96 is maintained by BEAR Scotland and is subject to the national speed limit, apart from through towns and villages where the speed limit is reduced.

5.5 Existing Traffic Conditions

Traffic data has been sourced from historic traffic count data obtained from the Department for Transport (DfT) database for the following locations outlined in Table 2:

Table 2 DfT Survey Locations

Site Ref.	Survey Locations	Count ID	Lat / Long
1	A96, at Huntly	11019	57.44234600, -2.79916830
2	A920, west of Cairnborrow	74322	57.45154300, -2.91815080
3	A941, in Dufftown	10987	57.44409000, -3.11789660
4	A941, north of Dufftown	40989	57.47029200, -3.14120570
5	A941, near Site access	30989	57.41588600, -3.09705880

The locations of the DfT Count Points are shown in Figure 5.

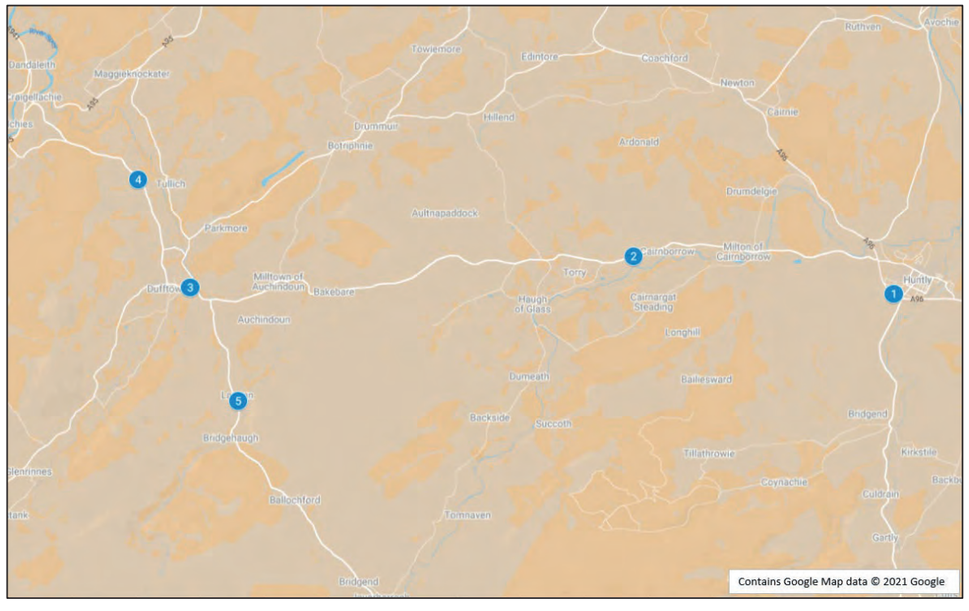


Figure 5 Traffic Information Site Locations

The traffic data sourced from the DfT database comprised 2019 data. National Road Traffic Forecasts (NRTF) low growth factors were applied to the 2019 data to estimate 2021 flows (2019 / 2021 = 1.016).

The Sites were identified as being areas where sensitive receptors on the access route would be located. A full receptor sensitivity and effect review is prepared in the Chapter 10 of the EIAR Volume 2. The traffic count data allowed the traffic flows to be split into vehicle classes and the data has been summarised into cars / light good vehicles (Lights) and heavy goods vehicles (HGVs) (all goods vehicles > 3.5 tonnes gross maximum weight).

Table 3 summarises the 24-hour average daily traffic data estimated at the count Sites over a seven-day period.

Table 3 24-hour Average Traffic Data (2021)

Site Ref.	Survey Locations	Cars & LGV	HGV	Total
1	A96, at Huntly	9607	752	10359
2	A920, west of Cairnborrow	1212	213	1425
3	A941, in Dufftown	1899	99	1997
4	A941, north of Dufftown	3531	347	3878
5	A941, near Site access	233	13	246

Please note minor variances due to rounding may occur.

5.6 Accident Review

Road traffic accident data for the three year period commencing 01 January 2018 through to 31 December 2020 was obtained for the A941 in the vicinity of the Proposed Development, the A920 and near the A920 / A96 access junction. This information was sourced from the online resource CrashMap.co.uk which uses data collected by police about road traffic crashes occurring on British roads where an accident occurred.

The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death.

A summary of analysis of the accidents indicates that:

- A total of eight accidents were recorded along the A941 in the vicinity of the Proposed Development, the A920, between the A96 and A941, and near the A920 / A96 access junction within the three-year period;
- Of the eight accidents, six were classified as serious and two were classified as slight. No fatalities were recorded along the links assessed as part of the accident review;
- A total of four accidents were recorded along the A941 between Rhynie, in the southeast, and Rothes, to the north which were all recorded as serious. One of the incidents recorded was a single vehicle accident which involved a motorcycle, while another separate incident involved three vehicles which included HGVs and cars;
- Two accidents were recorded along the A96, within 1 km of the A96 / A920 western access. Approximately 615m to the north of the A96 / A920 western access, a slight accident was recorded at the A96 / B9022 junction which was recorded as slight and involved cars. A serious accident was recorded at the A96 / A920 eastern access and involved cars; and
- A total of two incidents were recorded along the A920, between the A96 and A941, of which one was classified as serious and one as slight. The accident classified as slight was a two vehicle collision involving cars. The accident classified as serious involved a car and resulted in a pedestrian casualty.

5.7 Baseline Traffic Conditions

Construction of the project could commence during 2024, if consent is granted, and is anticipated to take up to 18 months, depending on weather conditions and ecological considerations.

To assess the likely effects during the construction and typical operational phase, base year traffic flows were forecast by applying a NRTF low growth factor to the 2021 flows in Table 4. This will be used in the Construction Peak Traffic Impact Assessment.

Table 4 24-hour Average Traffic Data (2024)

Site Ref.	Survey Locations	Cars & LGV	HGV	Total
1	A96, at Huntly	9761	764	10525
2	A920, west of Cairnborrow	1231	217	1448
3	A941, in Dufftown	1929	100	2029
4	A941, north of Dufftown	3587	353	3940
5	A941, near Site access	236	13	250

Please note minor variances due to rounding may occur.

6 Trip Generation and Distribution

During the 18 month construction period, the following traffic will require access to the Site:

- Staff transport, in either cars or minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as concrete materials and crushed rock; and
- Abnormal loads comprising wind turbine sections and also heavy lift crane(s).

Average monthly traffic flow data were used to establish the construction trips associated with the Site based on the assumptions detailed in the following sections.

6.1.1 Construction Staff

Staff would arrive in non-HGV vehicles and where possible will be encouraged to car share. The workforce onsite will depend on the activities undertaken, but, based on previous wind farm construction Site experience for a project of this scale which suggests three staff per turbine during the short peak period of construction is likely, the maximum number of staff expected onsite will be around 33 per day.

For the purposes of estimating traffic movements, it was assumed that 40% of staff would be transported by minibus and 60% would arrive by car (single car occupancy was assumed as the worst case at this stage with potentially fewer movements through car sharing).

Based on these assumptions, staff transport cars and light vehicles would account for a maximum of 44 vehicle trips (22 inbound and 22 outbound) per day during the peak period of construction.

6.1.2 Abnormal Indivisible Load Deliveries

The turbines are broken down into components for transport to the Site. The nacelle, blade and tower sections are classified as Abnormal Indivisible Loads (AIL) due to their weight, length, width and height when loaded. For the purposes of the report, the 'worst case' numbers of components requiring transport are illustrated in Table 5.

In addition to the turbine deliveries, two high capacity erection cranes would be needed to offload a number of components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that are escorted by boom and ballast trucks to allow full mobilisation onsite. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease the overall erection of the turbines.

Escort vehicles would accompany the AIL convoys to support the traffic management measures. Up to three vehicles would be deployed and it is assumed that three turbine components would be delivered per convoy.

Table 5 Turbine Components

Component	Number of Components per Turbine
Rotor Blades	3
Tower Sections	5
Nacelle	1
Hub	1
Drive Train	1
Nose Cone	1
Transformer	1
Ancillary	1
Site Parts	0.2

6.1.3 General Deliveries

Throughout the construction phase, general deliveries will be made to the Site by means of HGV. These would include fuel, Site office supplies and staff welfare. At the height of construction, it is assumed that up to 40 journeys to Site are made (20 in and 20 out) per month.

6.1.4 Material Deliveries

Various materials will need to be delivered to Site to form the Site-based infrastructure. At the outset, HGV deliveries will deliver plant and initial material deliveries to the Site to enable the formation of the Site compound and to delivery construction machinery.

The Site is large enough to warrant on-Site batching of concrete. All turbine and substation foundation concrete will be mixed on Site, with deliveries of cement powder and water being delivered by HGV tankers. Sand and aggregate will be delivered by tipper HGV and is expected to originate at quarries located to the east of Dufftown along the A941.

Individual deliveries associated with the raw materials required for onsite batching have been estimated and result in inbound trips of 38 cement tankers, 551 sand and aggregate tippers and 221 water tankers.

Reinforcement required in the foundations across the Site are detailed in Table 6 below.

Table 6 Steel Reinforcement Deliveries

Element	Weight / Installation (t)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Turbine Foundation	150	1650	30	55	110
Substation / Met Mast	46	46	30	2	4

The on-Site access tracks and hardstands will be constructed from crushed rock and material won from the Site via borrow pit. This material would also be used to help create the crane pads and has already been assessed as being suitable for use on the Site. To provide a robust assessment, it has been assumed that 50% of the required material will be imported to the Site from the nearest suitable quarry (located to the east of Dufftown).

The access tracks would generally be 6 m in width and would be designed to accommodate 13 tonne axle loads. In addition to the roads, crane pads will be constructed to enable the turbine erection process. The tracks, crane pads and compounds will require geotextile in the foundations.

Geotextile will be delivered to Site in rolls. A total of 288 large rolls may be required at Site and would be delivered by HGV.

Cables will connect each turbine to the internal substation and control building. Trip estimates for the cable materials are provided below in Tables 7 and 8.

Three cables are to be provided within each cable trench and would be backfilled with cable sand. The cable materials would be likely sourced from Sites along the A96 corridor. A small amount of ducting will also be provided where additional protection is required.

Table 7 Cable Trip Estimate

Element	Total Cable Length (m)	Length per Drum (m)	Number of Drums	Inbound Trips	Total Journeys
Cables	21660	500	43	5	10

Table 8 Cable Sand Trip Estimate

Element	Volume / Installation (m3)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Cable Sand	2437	20	195	390

A substation and control building will be constructed on the Site. This will require deliveries of building materials and structural elements and would result in 75 journeys.

It is assumed that battery deliveries will result in 50 journeys (25 inbound trips and 25 outbound trips).

Timber felling to allow construction works will be required. The forestry review of the Site indicates that during construction it is expected that 2730 journeys (1365 inbound trips and 1365 outbound trips) will be required.

The resulting traffic generation estimates have been plotted onto the indicative construction programme to illustrate the peak journeys on the network. Table 9 illustrates the trip generation throughout the construction programme.

Table 9 Construction Traffic Profile

Activity	Class	Month																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Site Investigation / Forestry Felling	HGV	341	341	341	341	341	341	341	341								50	50		
Site Establishment / Plant Deliveries	HGV	50	50	20															20	
General Deliveries	HGV	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	
Access Track Works	HGV		1766	1766	1766	1766	1766	1766	1766	1766										
Concrete Material Deliveries	HGV					135	135	135	135	135	135	203								
Reinforcement Deliveries	HGV					29	29	29	29											
Substation Construction and Battery Deliveries	HGV											31	31	31	31					
Cable & Ducting Deliveries	HGV							111	111	111	111	111								
Cabling Sand	HGV							98	98	98	98	98								
Geotextile Deliveries	HGV		14			14		14		14										
Cranage	HGV										24	24					24			
AIL Deliveries	HGV											52	52	52	52	52	52	52		
Site Reinstatement and Restoration	HGV												20	20	20	20	20	20	20	
AIL Escorts	Car & LGV											41	41	41	41	41	41			
Commissioning	Car & LGV												15	15	15	15	15	15	15	
Staff	Car & LGV	194	194	194	194	968	968	968	968	968	968	968	968	968	968	968	968	774	484	
Total HGV		431	2212	2167	2147	2325	2311	2533	2519	2164	407	326	123	143	143	112	186	110	80	
Total Cars / LGV		194	194	194	194	968	968	968	968	968	968	1009	1009	1024	1024	1024	1024	789	499	
Total Movements		625	2405	2361	2341	3293	3279	3501	3487	3132	1375	1335	1132	1167	1167	1136	1210	899	579	
Total HGV per Day		20	101	99	98	106	105	115	115	98	19	15	6	7	7	5	8	5	4	
Total Cars / LGV per Day		9	9	9	9	44	44	44	44	44	44	46	46	47	47	47	47	36	23	
Total per Day		28	109	107	106	150	149	159	159	142	63	61	51	53	53	52	55	41	26	

Please note minor variances due to rounding may occur.

The peak of construction occurs in Month 8 with 159 journeys (44 Car / Lights and 115 HGV journeys).

6.1.5 Distribution of Construction Trips

The distribution of development traffic on the network would vary depending on the types of loads being transported. The assumptions for the distribution of construction traffic during the peak months would be as follows:

- All construction traffic enters the Site via the Site access junction leading from the A941.
- Deliveries associated with the batching of concrete on Site will arrive via the north along the A941.
- Sand and aggregate for use in the on-Site batching plant will be sourced from local quarries. For the purposes of the assessment, it is assumed that all material will be taken from the quarries located to the east of Dufftown via the A941 but avoiding the town. The Balance of Plant (BoP) contractor will confirm final quarry and material sourcing with Moray Council in the Construction Traffic Management Plan (CTMP);
- Aggregate materials associated with the access tracks and hard standings will be sourced from local quarries. The nearest quarry to the Site is Parkmore;
- Is it assumed that timber exported from the Site will travel along the A920 and A96, towards a suitable port;
- HGV deliveries associated with the High Voltage (HV) electrical installation, control buildings, batteries, etc. will arrive via the A96, to the south;
- Staff working at the Site are likely to be based locally. It is assumed that 40% will arrive via Dufftown, 40% via Huntly and 20% via the A941, to the south; and
- General Site deliveries will be via the east of the Site, along the A96. These are generally smaller rigid HGV vehicles.

Loads relating to the turbine components would be delivered from Port of Dundee via the route shown in Figure 6, which is the nearest feasible Port of Entry (PoE).

Access from Inverness, the next closest port is not considered feasible due to constraints located within the town of Keith. There are no feasible ports or strategic routes to Site other than that described below.

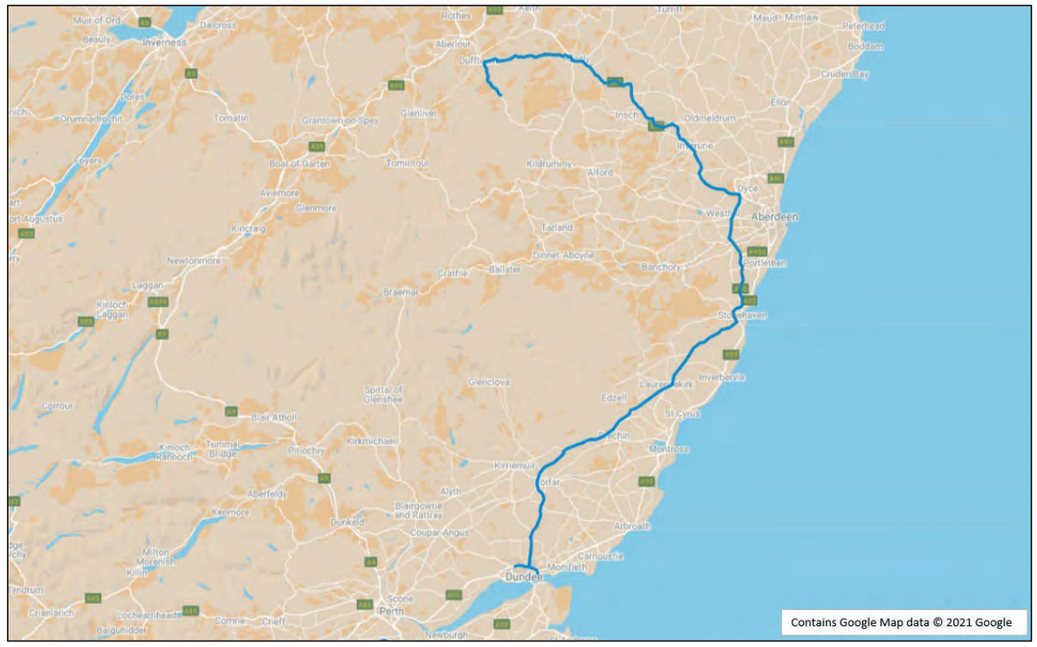


Figure 6 AIL Route

The access route would be as follows:

- Loads would depart the Port of Dundee via the east exit gate and continue over Stannergate Bridge to the roundabout, exiting onto Strips of Craigie Road;
- Loads would continue straight at the roundabout onto the Kingsway using the existing island overrun areas;
- Loads would continue west on the Kingsway until the junction with the B960 where loads will exit the Kingsway and proceed around the roundabout to re-join the Kingsway eastbound;
- Loads would continue on the Kingsway before turning left onto the A90 and proceeding north;
- Loads would continue on the A90 until the Craibstone junction, exiting to proceed along the Craibstone Junction Link before turning left at the Craibstone Roundabout to join the A96 bound north west;
- Loads would exit the A96 at Huntly, turning left onto the westbound A920; and
- Loads would exit the A920 east of Dufftown, turning left onto the A941 and proceeding south to the proposed Site access.

The peak traffic flows have been developed and are shown in Table 10.

Table 10 Peak Construction Traffic

Site Ref.	Survey Locations	Cars & LGV	HGV	Total
1	A96, at Huntly	18	34	52
2	A920, west of Cairnborrow	18	34	52
3	A941, in Dufftown	18	0	18
4	A941, north of Dufftown	18	0	18
5	A941, near Site access	44	115	159

Please note minor variances due to rounding may occur.

6.2 Committed Developments

A review of online planning applications was undertaken to identify any consented onshore wind farm or other significant developments within the vicinity of the Proposed Development. This identified that planning permission for Hill of Towie II Wind Farm was deemed to be granted for 16 wind turbines with a maximum blade tip height of 125m. A review of the planning application documents suggests that construction traffic associated with Hill of Towie II Wind Farm will not impact the Proposed Development's study area, and as such is not included as Committed Development.

Garbet Wind Farm comprises seven turbines up to 190m blade tip height. In November 2021, Moray Council decided to refuse the application for planning permission.

Clashindarroch II Wind Farm proposals comprise 14 wind turbines with a maximum blade tip height of 180m. In February 2021, Aberdeenshire Council decided to object to the application for planning permission.

Appeals have been lodged for Garbet Wind Farm and Clashindarroch II Wind Farm and both cases have been transferred to the Scottish Government's Planning and Environmental Appeals Division (DPEA) for examination. As the wind farms have not received planning permission, they cannot be considered as committed developments.

Clashindarroch Extension and Clashindarroch Extension 2 Wind Farm are currently in the scoping stage of the planning application. As the wind farm has not been granted planning consent, it cannot be included as committed development.

The use of NRTF low growth factors for background traffic is considered robust for addressing smaller, non-significant traffic generation caused by smaller developments within the study area. As such, a robust assessment case has been provided in this report.

6.3 Decommissioning Phase

Prior to decommissioning of the Site, a traffic assessment would be undertaken, and appropriate traffic management procedures followed.

The decommissioning phase would result in fewer trips on the road network than the construction or operational phases as it is considered likely that elements of infrastructure such as access tracks would be left in place and structures may be broken up onsite to allow transport by a reduced number of HGV.

7 Traffic Impact Assessment

7.1 Construction Impact

The peak month traffic data was combined with the future year (2024) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is illustrated in percentage increases for each class of vehicle. This is illustrated in Table 11.

Table 11 2024 Peak Monthly Daily Traffic Data

Site Ref.	Survey Location	Cars & LGV	HGV	Total Traffic	Cars & LGV % Increase	HGV % Increase	Total Traffic % Increase
1	A96, at Huntly	9779	798	10577	0.18%	4.48%	0.49%
2	A920, west of Cairnborrow	1249	251	1500	1.43%	15.79%	3.58%
3	A941, in Dufftown	1947	100	2047	0.91%	0.00%	0.87%
4	A941, north of Dufftown	3605	353	3958	0.49%	0.00%	0.45%
5	A941, near Site access	280	128	408	18.61%	853.27%	63.45%

The total traffic movements are not predicted to increase by more than 30% on all of the study network, with the exception of the A941 south of Dufftown.

The table shows that traffic movements will increase by a total of 63.5% and the HGV movements will increase by 853% along the A941, near the Site access. Whilst these increases are statistically significant, they are generally caused by relatively low total and HGV flows on this road which will see an additional 44 Cars & LGV and 115 HGV journeys every day. This represents a total of approximately 5 inbound HGV trips every hour which is not considered significant in terms of overall traffic flows.

It should also be noted the construction phase is transitory in nature and the peak of construction activities is short-lived.

A review of the existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESA Manual”. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in Table 12.

Table 12 2024 Peak Traffic Flow Capacity Review

Site Ref.	Survey Location	2024 Baseline Flow	2024 Base + Development Flows	Theoretical Road Capacity (12hr)	Spare Road Capacity %
1	A96, at Huntly	10525	10577	21600	51.03%
2	A920, west of Cairnborrow	1448	1500	21600	93.06%
3	A941, in Dufftown	2029	2047	19200	89.34%
4	A941, north of Dufftown	3940	3958	19200	79.39%
5	A941, near Site access	250	408	1920	78.73%

The results indicate there are no road capacity issues with the Proposed Development and sufficient spare capacity exists within the trunk and local road network to accommodate construction phase traffic.

8 Proposed Traffic Mitigation Measures

8.1 Construction Phase

The following measures would be implemented through a Construction Traffic Management Plan (CTMP) during the construction phase. The CTMP would be agreed with Moray Council and Aberdeenshire Council prior to construction works commencing:

- Agree AIL route modifications and improvements with Moray Council, Aberdeenshire Council, Transport Scotland and other relevant stakeholders. Works will include the following:
  - Temporary removal of obstacles such as street furniture, bollards, road signs, barriers, guardrails, traffic signal / post and telegraph pole;
  - Trimming / removal of vegetation,
  - Introduction of temporary traffic management and parking measures,
  - Provision of load bearing surface along sections of the route,
  - Road widening,
  - Bank reprofiling,
  - Culverting of drainage ditch;
  - Lower the edge of raised roundabout island at Pitkerro Roundabout;
  - Creating a new track through the A90 Stonehaven Roundabout; and
  - Provision of new Site access junction to the Proposed Development.
- Where possible the detailed design process would minimise the volume of material to be imported to Site to help reduce HGV numbers;
- A Site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times);
- An AIL Transport Management Plan;
- All materials delivery lorries (dry materials) would be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the Site entrance, depending on the views of Moray Council;
- Normal Site working hours would be limited to between 0700 and 1900 (Monday to Friday) and 0700 and 1300 (Saturday) though component delivery and turbine erection may take place outside these hours;
- Appropriate traffic management measures would be put in place on the A941 in the vicinity of the junction providing access to the Site to avoid conflict with general traffic, subject to the agreement of the road’s authority. Typical measures would include HGV turning and crossing signs and/ or banksmen at the Site access and warning signs;
- Provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the Site.
- Adoption of a voluntary speed limit of 20 mph for all construction vehicles along A941, in the vicinity of the Site access;
- All drivers would be required to attend an induction to include:
  - A tool box talk safety briefing;
  - The need for appropriate care and speed control;
  - A briefing on driver speed reduction agreements (to slow Site traffic at sensitive locations through the villages); and

- Identification of the required access routes and the controls to ensure no departure from these routes.

Moray Council will require an agreement to cover the cost of abnormal wear and tear on A941 within 200 m of the Site access junction.

Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

8.2 Abnormal Load Management Plan

There are a number of traffic management measures that could help reduce the effect of abnormal load convoys.

All abnormal load deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys would travel in the early morning periods before peak times while general construction traffic would generally avoid the morning and evening peak periods.

The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.

Advance warning signs would be installed on the approaches to the affected road network. Information signage could be installed to help assist drivers and an example is illustrated in Figure 7. Flip up panels (shown in grey) would be used to mask over days where convoys would not be operating. When no convoys are moving, the sign would be bagged over by the Traffic Management contractor.

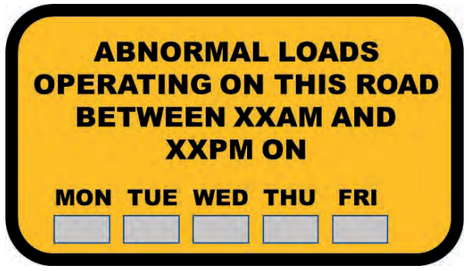


Figure 7 General Site Location

This signage will assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).

The location and numbers of signs would be agreed post consent and would form part of the wider traffic management proposals for the project.

The Abnormal Load Transport Management Plan would also include:

- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking;

- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as Dufftown Highland Games and other local events;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

8.3 Public Information

Information on the turbine convoys would be provided on social media and to local media outlets such as local papers and local radio to help assist the public.

Information would relate to expected vehicle movements from the port of entry through to the Site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

The applicant would also ensure information was distributed through its communication team via the project website, local newsletters and social media.

8.4 Convoy System

A police escort would be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.

The abnormal loads convoys would be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.

The times in which the convoys would travel will need to be agreed with Police Scotland who have sole discretion on when loads can be moved.

8.5 Staff Sustainable Access Plan

A Staff Travel Plan would be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include:

- Appointment of a Travel Plan Coordinator (TPC);
- Provision of public transport information;
- Mini-bus service for transport of Site staff;
- Promotion of a car sharing scheme; and
- Car parking management.

8.6 Operational Phase Mitigation

Site entrance roads will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the Site access track drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

9 Summary and Conclusions

Pell Frischmann was commissioned by Ramboll to undertake a Transport Assessment (TA) for the proposed Craig Watch Wind Farm, on behalf of Craig Watch Wind Farm Limited.

Existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network.

The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 8 of the construction programme. During this month, an average of 115 HGV movements is predicted per day and it is estimated that there would be a further 44 car and light van movements per day to transport construction workers to and from the Site.

A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of the construction phase traffic flows.

No link capacity issues are expected on any of the roads assessed due to the additional movements associated with the Proposed Development. The effects of construction traffic are temporary in nature and are transitory.

Appendix A Site Access Junction – General Arrangement

LEGEND:

- PROPOSED EDGE OF CARRIAGEWAY
- VISIBILITY SPLAYS
- PROPOSED ROAD MARKING (Diag. No. 1010)

NOTES:

1. 215m IS THE DESIRABLE STOPPING SITE DISTANCE REQUIRED FOR THAE MAIN ROAD AND IT'S DESIGN SPEED OF 100kph.
2. 160m IS THE STOPPING SITE DISTANCE THAT IS THE ALLOWABLE RELAXATION FROM THE DESIRED DISTANCE.

RAMBOLL

tel 01224 652 200 fax 01224 652 244 info@altra.co.uk
www.ramboll.co.uk

CRAIG WATCH WIND FARM

SITE ENTRANCE GENERAL ARRANGEMENT (SKETCH)

Rev	Description	Date	By	Chk	App
P01	PRELIMINARY	29/04 2022	BH	SM	CN

PREIMINARY

Project No:	Scale (@A3):	Drawn:	Date:
1620010178	1:1,250	BH	APRIL 22

Drawing No: RAM-XX-XX-SK-C-0001

Rev: P01

03/05/2022 18:17:38

TA 10.2: Abnormal Indivisible Load Route Survey

Pell Frischmann

Craig Watch Wind Farm

Appendix 10.2: Abnormal Indivisible Load Route Survey

April 2022

Revision Record					
Rev	**Description**	**Date**	**Originator**	**Checker**	**Approver**
A	Draft	02/030/2021	J Stirrat	T Lockett	G Buchan
B	Issue	28/04/2022	J Stirrat	T Lockett	G Buchan

Prepared for:

Statkraft
41 Moorgate
London
EC2R 6PP

Prepared by:

Pell Frischmann
93 George Street
Edinburgh
EH2 3ES

Statkraft

Pell Frischmann

Contents

Figures

Tables

Appendices

Craig Watch Wind Farm RSR

1 Introduction

1.1 Purpose of the Report

Pell Frischmann (PF) has been commissioned by Statkraft to undertake a survey of the Abnormal Indivisible Load (AIL) delivery route for wind turbine loads associated with the construction and development of Craig Watch Wind Farm, located south of Dufftown, Morayshire.

The Route Survey Review (RSR) has been prepared to help inform Statkraft on the issues associated with the development of the site with regards to off-site transport and access for AIL traffic.

The report identifies the key issues associated with AIL deliveries and notes that remedial works, either in form of physical works or as traffic management interventions will be required to accommodate the predicted loads.

The detailed designs of any remedial works are beyond the agreed scope of works between PF and Statkraft at this point in time.

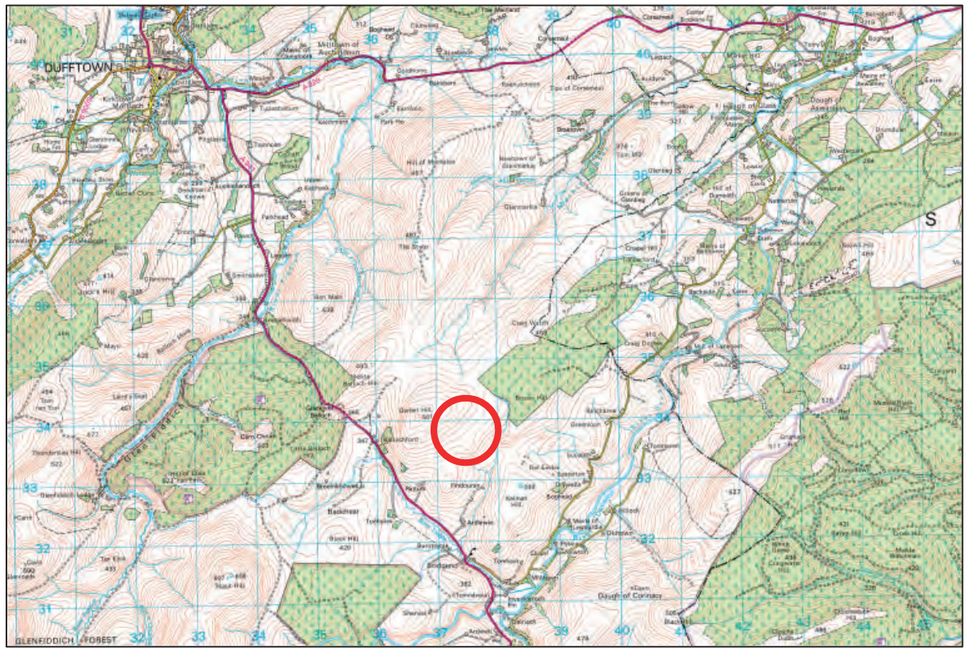
It is the responsibility of the turbine supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction (depending upon contract). The supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration for all road users is in line with the relevant legislation at the time of delivery.

2 Site Background

2.1 Site Location

The development site is located to the south of Dufftown, Moray. Figure 1 illustrates the general site location.

Figure 1: Site Location Plan



2.2 Candidate Turbines

Statkraft have indicated that they wish to consider the use of a Siemens SGRE155 turbine at a tip height of 200m. Tower and hub dimensions have been supplied by Siemens and are indicated below in Table 1.

Table 1: Turbine Dimensions

Component	Length (m)	Width (m)	Height / Min Diameter (m)	Weight (t)
Blade	76.571	4.424	3.000	25.600
Nacelle	14.620	4.200	3.500	84.000
Drive Train	7.000	3.600	3.400	83.000
Hub	4.800	4.500	4.200	50.000
Base Tower	14.034	4.800	4.800	84.400
Mid Tower 1	19.880	4.800	4.800	84.300
Mid Tower 2	22.400	4.800	4.794	73.900
Mid Tower 3	28.560	4.794	4.102	72.000
Top Tower	35.040	4.102	3.574	70.300

To provide a robust assessment scenario based upon the known issues along the access route, it has been assumed that all blades would be carried on a Superwing trailer to reduce the need for mitigation in constrained sections of the route.

At a limited number of locations, a scissor lift enabled superwing carrier could be used to help reduce the severity of the mitigation works. Where the scissor lift would need to be elevated it has been noted in the assessment reviews. All overhead utilities and obstructions should be removed at locations where the blade is carried in the raised position.

Towers would be carried in a 4+7 clamp adaptor style trailer, whereas loads such as the hub, nacelle housing and top towers would be carried on a six-axle step frame trailer.

Examples of the types of trailer are illustrated in Figures 2 and 3 below.

Figure 2: Superwing Carrier Trailer

Figure 3: Tower Trailer

3 Access Route Review

3.1 Port of Entry

The nearest feasible Port of Entry (PoE) for the site is the Port of Dundee. The Port of Aberdeen, while closer, does not have sufficient capacity for use by wind turbine components due to a lack of storage capacity and a focus on off-shore oil and gas. Dundee has been used extensively as a renewable energy delivery hub including for deliveries of components to Mid Hill Wind Farm. The port has been upgraded to ensure that abnormal loads can easily exit the port and join onto the road network.

Access from Inverness, the next closest port is not considered feasible due to constraints located within the town of Keith. There are no feasible ports or strategic routes to site other than that described below.

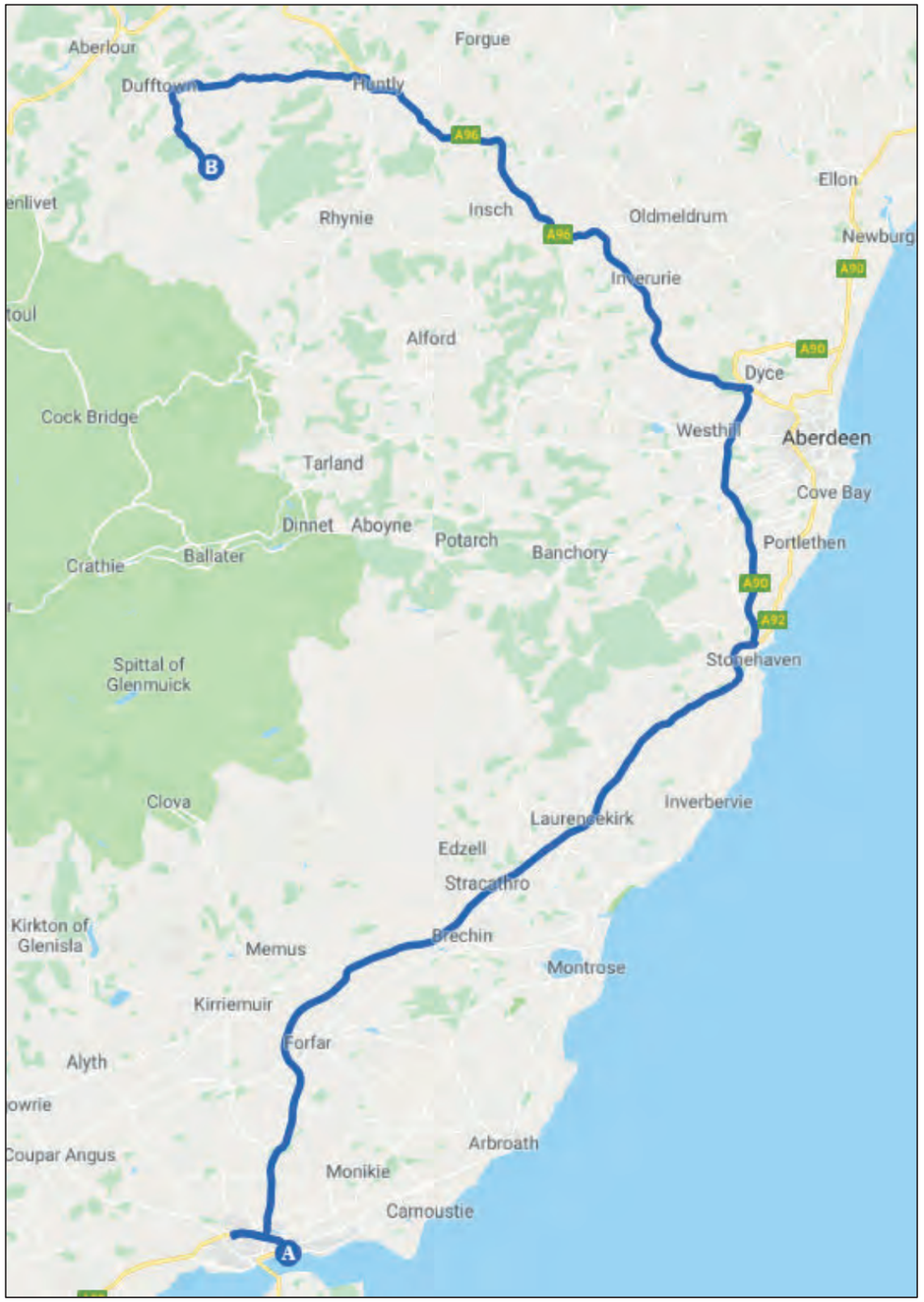
3.2 Access Route

The proposed access route to the site access junction from the Port of Dundee is as follows:

- Loads would depart the Port of Dundee via the east exit gate and continue over Stannergate Bridge to the roundabout, exiting onto Strips of Craigie Road;
- Loads would continue straight at the roundabout onto the Kingsway using the existing island overrun areas;
- Loads would continue west on the Kingsway until the junction with the B960 where loads will exit the Kingsway and proceed around the roundabout to re-join the Kingsway eastbound;
- Loads would continue on the Kingsway before turning left onto the A90 and proceeding north;
- Loads would continue on the A90 until the Craibstone junction, exiting to proceed along the Craibstone Junction Link before turning left at the Craibstone Roundabout to join the A96 bound north west;
- Loads would exit the A96 at Huntly, turning left onto the westbound A920; and
- Loads would exit the A920 east of Dufftown, turning left onto the A941 and proceeding south to the proposed site access.

The proposed access route is illustrated in Figures 4.

Figure 4: Proposed Access Routes



3.3 Route Constraints

The constraints noted in the review of the route from Port of Dundee are detailed in Table 2.

Plans illustrating the location of the constraints and a detailed list of POI are provided in Appendix A.

Should the scissor lift trailer be used to raise the blade over obstacles, all overhead utilities and obstacles should be removed. Blades should be lowered follow the completion of the manoeuvre.

Table 2: Contraint Points and Details (Port of Dundee - SIte)

POI	Key Constraint	Details
1	**Dock East Gate** 	Loads will exit the port gate and continue straight ahead onto Broughty Ferry Road.
2	**Stannergate Roundabout** 	Loads will continue onto Strips of Craigie Road at the roundabout (2nd exit) utilising the existing overrun area. Loads will be able to utilise the existing overrun area with minimal additional works. Socketed bollards within the roundabout centre island will need to be removed and vegetation trimmed. The splitter island north of the roundabout should be flattened and one bollard should be removed. Swept path assessment SPA01 is included in Appendix B.
3	**Strips of Craigie Road** 	Loads will pass a number of traffic islands on Strips on Craigie Road where street furniture should be removed during deliveries. Parking will need to be temporarily suspended at locations where loads need to manoeuvre. A Temporary Traffic Regulation Order (TTRO) may be required.

POI	Key Constraint	Details
4	**Strips of Craigie / A92 Roundabout** 	Loads will continue onto Kingsway East at the roundabout (2nd exit) utilising the existing overrun area. Loads are expected to oversail areas to the south west of the existing overrun areas. Socketed bollards within the roundabout splitter islands will need to be removed. One lit bollard, one lighting column, one lit road sign, and one road sign to be relocated. Permission should be sought to utilise the existing overrun areas. Loads will oversail the south western verge of the central island where the wall needs to be lowered. Swept path assessment SPA02 is included in Appendix B.
5	**Kingsway East / Mid Craigie Roundabout** 	Loads will continue ahead on Kingsway East at the roundabout (2nd exit). The escort vehicles should ensure that the loads have full access to the entry, circulating, and departure lanes of the junction. Loads will oversail the central reserve on approach to the roundabout where one lit road sign should be removed. Loads will oversail the south western verge on approach and exit where the guardrails should be removed. Loads will oversail the south western verge of the roundabout island where a height clearance check of the loads over the raised island should be completed during the test run Swept path assessment SPA03 is included in Appendix B.

POI	Key Constraint	Details
6	**Pitkerro / Roundabout** 	Loads will continue ahead on Kingsway East at the roundabout (2nd exit). The escort vehicles should ensure that the loads have full access to the entry, circulating, and departure lanes of the junction. Loads will overrun and oversail the northern verge on approach to the roundabout where a load bearing surface should be laid with one road sign and one lighting column to be relocated. Loads will oversail the southern footway on approach where the pedestrian barrier should be oversailed and the utilities protected. Loads will overrun and oversail the southern edge of the raised roundabout island which should be lowered and a load bearing surface laid. Three lit chevron signs and three signs should be removed. Loads will overrun and oversail the southern exit arm to where a load bearing surface should be laid in order to reduce mitigation to the central island. Existing utilities should be protected. Swept path assessment SPA04 is included in Appendix B.
7	**Old Glamis Road Roundabout** 	Loads will continue ahead on the A90 Kingsway at the roundabout (2nd exit). Loads will oversail the central reserve on approach to the roundabout. Loads will oversail the southern verge on approach where the safety barrier and one lighting column should be removed. Loads will oversail the southern verge of the central island where one lit sign and two chevron signs should be set back. Swept path assessment SPA05 is included in Appendix B.
8	**Strathmartine Road Roundabout** 	Loads will continue ahead on the A90 Kingsway at the roundabout (2nd exit). Loads will oversail both verges of the approach road but now works are required. The central island of the junction will be subject to load oversail. One lit sign and two chevron signs should be relocated. Swept path assessment SPA06 is included in Appendix B.

POI	Key Constraint	Details
9	**A90 / B960 Roundabout** 	Loads will undertake a u-turn and continue onto the A90 Kingsway eastbound at the roundabout (6th exit). Loads will oversail the northern verge of the offslip and overrun the southern verge where a load bearing surface should be laid. One road signs, one lighting column and a section of guard rail should be removed. Loads will oversail the first exit splitter island where one road sign, one lighting column and one bollard should be removed. Loads will then oversail the southern edge of the roundabout island where two traffic signs should be removed and vegetation cutback. Loads will oversail the second exits splitter island where one road sign, one lighting column and one bollard should be removed. Loads will also oversail and overrun the western footpath where a load bearing surface should be laid and one lighting column should be removed. Loads will oversail the barrier. Loads will overrun and oversail the northern edge of the roundabout island where a load bearing surface should be laid. Three road signs, one set of chevron signs and the safety barrier should be removed. Loads will overrun and oversail the north western footway where a load bearing surface should be laid. A section of guardrail and one lighting column should be removed. Loads will overrun and oversail the MacAlpine Road traffic island where a load bearing surface should be laid and one road sign and one bollard should be removed. Detailed discussions with Dundee City Council, Transport Scotland and BEAR Scotland will be required regarding the mitigation in this location. Swept path assessment SPA07 is included in Appendix B.
8	**Strathmartine Road Roundabout** 	Loads will return eastbound through the Strathmartine Roundabout. Loads will oversail both verge of the approach road where one lit road sign, one lighting column and guardrail should be removed on the northern verge. Loads will oversail the northern edge of the roundabout island where one lit road sign, two chevron signs and the roundabout island sign should be set back. Swept path assessment SPA08 is included in Appendix B.

POI	Key Constraint	Details
7	**Old Glamis Road Roundabout** 	Loads will return eastbound through the Old Glamis Road Roundabout. Loads will oversail the northern edge of the central reserve and northern verge of the road on approach to the roundabout where the blade tip will oversail the safety barrier. Loads will oversail the northern edge of the roundabout island where one lit road sign, two chevron signs should be removed. Swept path assessment SPA09 is included in Appendix B.
10	**A90 Kingsway / A90 Forfar Road Junction** 	Loads will turn left from the A90 Kingsway onto the A90 Forfar Road. Loads will oversail the central reserve and the oncoming carriageway where two road signs and one signal pole should be relocated and oncoming traffic held back. Oncoming traffic on the A90 Kingsway will need to be held during manoeuvres. Loads are expected to overrun and oversail the splitter island of the left turn. A load bearing surface should be laid and street furniture removed. One pedestrian push button and two signal poles should be provided with hinged columns to allow lowering during deliveries. The blade tip would oversail the pedestrian guard rail. Loads will oversail the north western verge on the inside of the left bend where one signal head should be set back and the containment kerb height should be removed and replaced with a standard kerb. A section of pedestrian guard rail, one road sign and two lighting columns should be removed. Detailed discussions with Transport Scotland and BEAR Scotland will be required regarding the mitigation in this location. *It would be possible to remove the requirement for the removal of the street furniture within the central reserve on approach and the splitter island should the scissor lift trailer be used. The blade would need to be lifted immediately prior to the junction to avoid any overhead utility works. It should be lowered immediately after the junction. All overhead utilities and obstructions would need to be removed should the blade be raised through the junction.* Swept path assessment SPA010 is included in Appendix B.

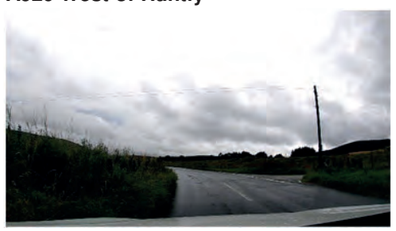
POI	Key Constraint	Details
11	**A90 / Fintry Drive Roundabout** 	Loads will continue ahead on the A90 at the roundabout (2nd exit). Loads will oversail the western verge of the entry arm but no works are required. Loads will oversail the western edge of the roundabout island where two road signs and one set of chevrons signs should be relocated. Swept path assessment SPA11 is included in Appendix B.
12	**A90 / Jack Martin Way Roundabout** 	Loads will continue ahead on the A90 at the roundabout (2nd exit). Loads will oversail the central reserve on approach where the blade tip will oversail the safety barrier. Loads will oversail the western verge on entry where one lighting column should be removed. Loads will oversail the western verge of the exit arm, and over the central island itself although no physical mitigation is required. Swept path assessment SPA12 is included in Appendix B.
13	**A90 / AWPR Stonehaven Junction** 	Loads would diverge from the A90 onto the A90 AWPR. Loads will oversail both sides of the carriageway through the bend where four road signs should be removed. On the approach to the roundabout, loads would oversail the inside verge where one lighting column should be removed. Swept path assessment SPA13 is included in Appendix B.
14	**A90 Stonehaven Roundabout** 	It is proposed that in order to reduce modification costs and increase the ease of movements for the loads that a new track will be created through the roundabout. Loads will overrun and oversail the approach splitter island where a load bearing surface should be laid and one road sign and one bollard should be removed. Existing utilities should be protected. Loads will overrun and oversail the north eastern half of the roundabout island where a load bearing surface should be laid and one lit chevron sign should be removed. Loads will overrun and oversail the exit splitter island where a load bearing surface should be laid and one bollard, one sign and one lighting column should be removed. Swept path assessment SPA14 is included in Appendix B.

POI	Key Constraint	Details
15	**A90 Cleanhill Roundabout** 	Loads would take the first exit and continue northbound. Loads would oversail the central reserve of the entry arm where the blade tip will oversail the barrier. Loads will oversail the western verge of the entry arm where two lighting columns should be removed. Loads will oversail the western verge of the central island and the western verge on exit, but no works are required. Swept path assessment SPA15 is included in Appendix B.
16	**A90 / C89c Craibstone Junction** 	Loads would exit the A90 and proceed to Craibstone Junction, where they will turn right at the traffic lights. Loads would oversail the western verge on approach to the junction where two lighting columns and one lit road sign should be removed. Loads will oversail the splitter island where two road signs should be removed and one traffic signal should be hinged to allow it to be lowered during deliveries. A section of guard rail should be removed. Loads would oversail and overrun onto the inside verge and will require the removal of two traffic signals, one lit road sign and one lighting column should be removed. A section of guard rail should be removed and a load bearing surface laid. Loads would also oversail the central reserve where one traffic signal and one traffic bollard should be removed. Loads would oversail and overrun the northern verge where a load bearing surface should be laid. It is recommended that land searches are completed for all areas at this location to identify any areas of third party land. An alternative to this manoeuvre would be for loads to continue on the A90 and undertake a U turn at the next roundabout and then depart the road at the east side of the junction. A further assessment of this would be required if this option is adopted. Swept path assessment SPA16 is included in Appendix B.

POI	Key Constraint	Details
17	**C89c / A96 Craibstone Roundabout** 	Loads would proceed to take the first exit at the roundabout to join the A96 westbound. Loads would oversail the right-hand verge on approach to the roundabout where two traffic signal heads, one call post, one road sign and guardrail should be removed. Loads would also oversail the inside bend on traversing where one traffic signal head and one lighting column should be removed. Loads will oversail the exit arm central reverse where one road sign and one lighting column should be removed. Loads will oversail the southern verge of the exit arm where one traffic signal head and guardrail should be removed. Swept path assessment SPA17 is included in Appendix B.
18	**A96 Clinterty Roundabout** 	Loads would take the second exit at the roundabout, continuing on the A96. On approach to the roundabout loads would oversail into the northern and southern verges where the blade tip will oversail the barrier on the south. Loads would require an overrun area of load bearing surface to be laid on the southern edge of the roundabout. Oversail would also occur here, requiring the removal of one chevron sign and one road sign. Swept path assessment SPA18 is included in Appendix B.
19	**A96 Kinellar Roundabout** 	Loads would take the second exit at the roundabout, continuing on the A96. Loads will oversail the entry arm central reserve where the blade tip will oversail the barrier. One lighting column should be removed. On approach to the roundabout loads would oversail the southern verge where the blade tip will oversail the safety barrier and one lighting column should be removed. Loads would oversail the southern edge of the central island, requiring the removal of one lit chevron sign. The height clearance for loads over the raised roundabout should be confirmed during the test run. Swept path assessment SPA19 is included in Appendix B.

POI	Key Constraint	Details
20	**A96 Broomhill Roundabout** 	Loads would take the second exit at the roundabout, continuing on the A96. On approach to the roundabout loads would oversail the western verge where the blade tip will oversail the safety barrier and one lighting column should be removed. A land search should be completed to confirm the extent of adopted boundary available. Loads would then oversail the western edge of the roundabout central island, requiring the removal of one lit chevron sign. The height clearance for loads over the raised roundabout should be confirmed during the test run. Loads would oversail the western verge on exiting the roundabout, however this requires no physical mitigation. Swept path assessment SPA20 is included in Appendix B.
21	**A96 Thainstone Roundabout** 	Loads would take the second exit at the roundabout, continuing on the A96. On approach and exit to the roundabout loads would oversail the western footways. Loads would oversail and overrun the western verge of the central island when traversing the roundabout, requiring the removal of two lit chevron signs and the trimming of vegetation. A load bearing surface should be laid. Swept path assessment SP21 is included in Appendix B.
22	**A96 Inverurie Roundabout** 	Loads would take the second exit at the roundabout, continuing on the A96. On approach to the roundabout loads will oversail the western verge where one lighting column and vegetation should be removed. Loads will oversail the western edge of the roundabout where one chevron sign and vegetation should be removed. Loads will oversail the exit arms splitter island where one lighting column and one road sign should be removed. Two bollards should be oversailed. Loads will oversail the western verge of the exit arm, but no works are required. Swept path assessment SPA22 is included in Appendix B.

POI	Key Constraint	Details
23	**A96 Blackhall Roundabout** 	It is proposed that loads will contraflow the roundabout in order to minimise mitigation requirements. Loads will oversail the eastern verge on approach where one lighting column should be removed. Loads will oversail the north eastern edge of the roundabout island where one set of chevron signs should be removed. Loads will oversail the north eastern exit verge where one lighting column should be removed. Swept path assessment SPA23 is included in Appendix B.
24	**A96 Pitcaple** 	Loads would continue along the A96, straddling both lanes at this point and requiring police to halt oncoming traffic beyond the bend.
25	**A96 / B9002 Junction** 	Loads would continue along the A96, straddling both lanes at this point and requiring police to halt oncoming traffic beyond the bend.
26	**A96 North East of Westhall** 	Throughout the route, the tree canopy needs to be trimmed to provide a clear 5m head height. Trimming of the tree canopy can be subject to ecological constraints and it is suggested that early consultation with Transport Scotland is undertaken to agree cutting times and permits.

POI	Key Constraint	Details
27	**A96 Huntly Roundabout** 	Loads would take the second exit at the roundabout, continuing on the A96. On approach to the roundabout loads would oversail the southern verge where vegetation should be trimmed. Loads would then oversail and overrun the southern edge of the roundabout island where a load bearing surface should be laid and one traffic bollard should be removed along with vegetation. Loads would oversail the western splitter island and western verge of the exit arm, requiring no physical mitigation. Swept path assessment SPA24 is included in Appendix B.
28	**A96 West of Huntly** 	The clearances to overhead power lines at this location should be reviewed with the utility provider prior to loads moving to ensure that there is sufficient head height and flashover protection for all temperature ranges.
29	**A96 / A920 West Junction** 	Loads would exit the A96 and turn left onto the A920. Loads will oversail the eastern verge and splitter island on approach to the junction where the blade tip will oversail two traffic bollards and one road sign should be removed. Loads will oversail the verge on the inside of the left turn where one traffic bollard, fence, vegetation and one road sign should be removed. **Third party land** is required. Loads will oversail the northern verge on exit from the junction however no physical mitigation is required. Swept path assessment SPA25 is included in Appendix B.
30	**A920 West of Huntly** 	Loads would continue west on the A920. Loads will oversail both verges through the section. Loads will overrun and oversail the northern verge through the first bend where a load bearing surface should be laid and the fence removed. **Third party land** is required. Swept path assessment SPA26 is included in Appendix B.