1. Introduction

1.1 This guidance should be used for all EIA, major and local above planning application consultations with SEPA for windfarm developments. However, the methodology discussed in this guidance note is not appropriate to assess deep excavations where dewatering will be required for example a deep road cutting or large quarries. Such dewatering is controlled via the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). For this category of developments where dewatering volumes are above the GBR of less than 10m^3 per day, the principles outlined in SEPA's WAT-RM-11 Regulatory Method should be applied

1.1 SEPA has a responsibility to protect groundwater abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTE). Foundations, borrow pits and linear infrastructure such as roads, tracks and trenches can disrupt groundwater flow and impact upon these sensitive receptors. Such impacts will vary depending on the scale and location of the development.

1.2 The methodology summarised in the flowchart in Appendix 1 and detailed below sets out how we assess impacts on groundwater abstractions and GWDTE in planning applications for windfarm developments. It delivers a consistent, proportional and streamlined approach based on tiered risk-assessment.

1.3 Dewatering of below-ground works may change the quantity of groundwater supplying nearby abstractions and GWDTE. Such de-watering is controlled via The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). Sufficient information is required in relation to this to allow SEPA to advise the determining authority of the likelihood of an authorisation being granted in line with *LUPS GU15 Planning guidance in relation to SEPA-regulated sites and processes*. This is not discussed further in this guidance.

1.4 Discharge of contaminated groundwater/surface water may cause physical or chemical contamination. Such discharges are controlled via CAR and therefore sufficient information is required in relation to this to allow SEPA to advise the determining authority of the likelihood of an authorisation being granted in line with *LUPS GU15 Planning guidance in relation to SEPA-regulated sites and processes*. This is not discussed further in this guidance.

2. Scoping Response and Pre-Application Engagement

Information to be included with the Environmental Statement or Supporting information

2.1 The Windfarm Scoping Letter LUPS-L-14 - EIA Scoping - Windfarm sets out the information requirements below and should be used in appropriate scoping responses and pre-application advice.

2.2 Mapping and subsequent avoidance of groundwater abstractions and GWDTE in development proposals will avoid delay and expense. This process removes the need for further assessment, mitigation, monitoring and potential remediation resulting in expense and delays for a project both during and after construction. The information set out below should be provided by an applicant at the earliest opportunity

2.3 A copy of the form at Appendix 2 must be completed by the applicant and submitted with the supporting information set out below. Completion of this form confirms that the applicant has assessed the information provided to us.

2.4 **We request that the developer submit maps showing clearly:**

a) all proposed infrastructure, including temporary works;
b) overlain with details of the extent and depths of all proposed excavations (excavations should also include all insertions and foundations);
c) overlain with groundwater abstractions and GWDTE; and
d) showing the relevant specified buffer zones (100m and 250m).

2.5 Further details are provided (including a sample map) at Appendix 3.

Groundwater Abstractions

2.6 All groundwater abstractions within the following distances of development need to be identified, in order to assess potential risk.

a) within 100m radius of all excavations less than 1m in depth;
b) within 250m of all excavations deeper than 1m.

2.7 This covers both public and private water supply groundwater abstractions, both within and outwith the site boundary. It is critical that it is the actual source of the abstraction and not the property that it supplies that is identified and this should also include points of use located beyond the radius if the abstraction source lies within the zone.

2.8 Information on all groundwater abstractions must be obtained by a site walkover with additional information from SEPA, local authorities and local residents. Information that SEPA holds on groundwater abstractions under our regulatory regime can be obtained through our Access to Information scheme http://www.sepa.org.uk/about_us/customer_services_directory/advice_and_information/access_to_information.aspx. However, we do not hold information on abstractions of less than $10m^3$ a day as this is covered by General Binding Rules

2.9 The following information for each identified water supply source should be submitted:

- Source location (including National Grid co-ordinates);
- Source type eg spring, borehole etc;
- Use eg domestic water supply for house, water troughs for livestock, supply to industrial/commercial premises;
- Abstraction rate (this could be estimated from, for example, the number of people/animals using the supply).

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

2.10 GWDTE are specifically protected under the Water Framework Directive and are sensitive receptors to the pressures that are potentially caused by development.

2.11 In order to assess the potential risk to GWDTE, a Phase 1 habitat survey should be provided, with the guidance 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' being used to identify wetland types, both within and outwith the

site boundary, within the following distances of development as a minimum (for the purpose of micro-siting a wider expanse may be surveyed):

a) within 100m radius of all excavations less than 1m in depth;
b) within 250m of all excavations deeper than 1m.

2.12 However, if it is suspected that there may be relevant habitats on site, a National Vegetation Classification NVC survey can be provided and/or if SNH have requested a NVC survey for all or part of the site then SEPA will accept this information.

2.13 SEPA holds some information on the occurrence of GWDTE, predominantly within designated sites (SSSIs, SPAs and SACs). However, there are non-designated wetlands that include GWDTE outwith these areas that are not listed. To identify non-designated GWDTE, The guidance 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' should be used to identify all wetland areas within the Phase 1 habitat survey.

2.14 A National Vegetation Classification (NVC) survey will be required as part of a site specific detailed quantitative and/or qualitative risk assessment for proposed infrastructure involving excavation below a depth of 1m within 250m of sensitive receptors (See Option 4 at para 3.13 below). In all other cases, a Phase 1 survey with the identification of wetland types using SNIFFER (2009).will suffice.

Detailed Qualitative and/or Quantitative Risk Assessment

2.15 We require detailed site specific qualitative and/or quantitative risk assessments within the ES or Supporting Information in the following higher risk situations:

a) for proposed infrastructure within 250 m of groundwater abstractions or GWDTE, where the infrastructure will require excavation below a depth of 1m. Typically, this includes borrow pits and turbine foundations but may include access roads and other infrastructure;

b) where an applicant is unable to meet Condition B below. This condition seeks monitoring. See sections 3.11 – 3.13 below for detailed advice.

3 Procedure: Information Received and Assessed

3.1 When the consultation material is received by SEPA, the planner checks to see if the information in Appendix 3 A1.-7. is provided. If there is any doubt as to whether the required information is provided or is adequate, SEPA Planning Officer to consult Water Resources Unit (WRU) for groundwater abstractions and/or Ecology Unit for GWDTE prior to objecting to a planning application.

Option 1 - Lack of Information

3.2 If inadequate information is provided, we will object to the application due to lack of information to identify potential unacceptable environmental impacts on groundwater abstractions and GWDTE. We will identify what additional information is required (as set out above) in order to address this objection. There is no need for SEPA Planning Officer to consult WRU or Ecology Unit.

Option 2 - No significant impact on groundwater abstractions or GWDTE - either no receptors identified or buffer zones will be implemented (required by condition) or contingency plans to ensure security of supply to groundwater abstractions have been agreed with landowners.

3.3 If adequate information is provided and it shows there are no groundwater abstractions or GWDTE present, we will respond with no objection in relation to these aspects.

3.4 If adequate information is provided and there are groundwater abstractions or GWDTE present, but impact is avoided because all proposed development is outwith the buffer zones, we will respond with no objection in relation to these aspects. However, we will request Condition A to prevent micro-siting of development into the buffer zones

3.5 Alternatively, if groundwater abstractions are identified within the buffer zones, confirmation could be provided that the groundwater abstraction owners have agreed contingency plans including temporary or permanent replacement of a groundwater supply in order to provide security of supply. (Note that SEPA are not able to comment on the alteration or the provision of alternative supplies, the acceptance of which can only be agreed between the applicant and the supply owner.) In this situation we will respond with no objection in relation to groundwater abstractions.

3.6 In all of these situations, the SEPA Planning Officer should not consult WRU or Ecology Unit.

Planning Condition (A) – Implementation of Buffer Zones
*The buffer zones around groundwater dependent terrestrial ecosystems and/or groundwater abstractions identified on Plan XX (**insert reference from planning application)** shall be implemented in full throughout the construction, operation and decommissioning of the development. There shall be no development, machinery movement or operations within the buffer zones without the agreement of the Planning Authority in consultation with SEPA. The buffer zone shall be demarcated on the ground*

Reason: In order to prevent potential unacceptable impacts on groundwater abstractions and/or groundwater dependent terrestrial ecosystems.

Informative: The buffer zone shall be 100 m for all development with excavations or intrusions less than 1 metre depth. The buffer zone shall be 250 m for all development with excavations or intrusions greater than 1 metre depth.

Option 3 - Excavations or intrusions within buffer zone are less than 1m in depth - appropriate monitoring required by condition - to ensure that potential risks have been successfully mitigated against

3.7 If development is shown on submitted information to be located within 250m of groundwater abstractions or GWDTE, then the SEPA Planning Officer checks the type and depth of excavations proposed.

3.8 If the proposals involve development on a sensitive receptor e.g. groundwater abstraction or GWDTE, go to Option 4 below.

3.9 If the proposals involve excavations deeper than 1m within 250m of sensitive receptors, go to Option 4 below.

3.10 If the proposals involve only excavations shallower than 1m depth between 100m – 250m of sensitive receptors, SEPA responds with no objections to this aspect of the proposals.

3.11 If the proposals involve excavations shallower than 1m, but which are within 100m of sensitive receptors, this is a higher risk situation. The applicant needs to ensure that sensitive receptors will not be adversely impacted. However, SEPA considers that this can be done through the use of appropriate mitigation measures following current best practice. Where SEPA considers the mitigation proposed is adequate, there will therefore be no further assessment by SEPA of proposed mitigation measures or the monitoring proposals prior to determination of the planning application and SEPA Planning Officer responds requesting Condition B below. It is the responsibility of the applicant to design the scheme and the monitoring to achieve the requirements of Condition B.

3.12 We also respond to advise that if the applicant does not wish to have Condition B attached to any grant of planning consent they must provide detailed qualitative and/or quantitative risk assessments to SEPA prior to any grant of planning consent which demonstrate that the proposals will not have a significant impact on the groundwater flow and groundwater quality feeding identified sensitive receptors through the proposed design, construction and operation of the infrastructure (see Option 4 below). There is no need for SEPA Planning Service to consult WRU or Ecology Unit.

Planning Condition B – Monitoring

*The design, construction and maintenance of all infrastructure (as shown on Plan XX (**insert reference from planning application**)) must ensure that the quality and quantity of the groundwater that feeds sensitive receptors (groundwater abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTE)) downstream from any infrastructure does not statistically significantly change and the development does not act as a preferential pathway to groundwater flow*

This must be demonstrated by on-going monitoring of the groundwater as set out in SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m Deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem) (Appendix 4 to SEPA Planning Guidance LUPS-31 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem).

The monitoring results demonstrating whether the quality of groundwater and/or hydrological connectivity is being maintained must be presented to the Planning Authority in consultation with SEPA annually from the commencement of development in the required format. If monitoring identifies that the requirements are not being met, remedial action must be taken within 6 months in agreement with the Planning Authority in consultation with SEPA.

No excavations greater than 1m deep within 100m of sensitive receptors should take place unless agreed in writing with the Planning Authority in consultation with SEPA.

Informatives:
Guidance on design and construction is provided in FCE SNH Floating Roads on Peat, 2010 and in SEPA/SNH guidance document "Good Practice during Wind Farm Construction" (Second Edition, 2013).

This condition relates to both temporary and permanent infrastructure.

Reason: In order to prevent potential unacceptable environmental impacts to sensitive receptors including groundwater abstractions and/or groundwater dependent terrestrial ecosystems.

3.13 This condition refers to SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem) which is attached at Appendix 5 to this guidance.

3.14 It is emphasised that it is the responsibility of the developer to ensure that the design, construction and monitoring of the infrastructure meets the requirement of the condition. The developer should also adhere to CAR requirements where appropriate

Option 4: Infrastructure on sensitive receptors or involving excavations deeper than 1m depth within 250m of sensitive receptors or unable to comply with Condition B - potential significant risk to identified receptors - bespoke risk assessment required

3.15 For infrastructure involving development on a sensitive receptor and/or excavation below a depth of 1m within 250m of sensitive receptors, SEPA considers that mitigation measures alone may not adequately protect sensitive receptors. Therefore applicants must provide detailed qualitative and/or quantitative risk assessments which demonstrate that the proposals will not have a significant impact on the groundwater flow and groundwater quality feeding identified sensitive receptors through the proposed design, construction and operation of the infrastructure.

3.16 An applicant who considers that they will be unable to meet the requirements of Condition B above must also provide a detailed quantitative and/or qualitative risk assessment.

3.17 The requirements for the detailed qualitative and/or quantitative risk assessment will be site specific. However, applicants must develop an initial site specific Conceptual Site Model (CSM) detailing the local geology, hydrology, ecology and hydrogeological regime at the site. This can be a desk study reviewing available geological, hydrogeological and ecological (SNIFFER categories) information. The generic hydroecological functioning of SNIFFER categories is available from 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' http://www.sepa.org.uk/science_and_research/what_we_do/biodiversity/wetlands.aspx

3.18 Based upon the outcomes of the CSM, applicants must design and carry out a site and receptor specific detailed risk assessment and site investigation. Investigations could include a detailed ecological survey (to National Vegetation Classification level) and/or intrusive site investigation, which may include the excavations of trial pits and/or installation of groundwater piezometers or boreholes to monitor the baseline groundwater levels. It may also be necessary to undertake permeability tests and chemical water quality testing depending on the hydroecological and hydrogeological complexity and uncertainties determined by the CSM. If a quantitative hydrogeological assessment is required, the assessment should also establish the size of the zone of contribution feeding the groundwater supplying the receptor and identify the proportion of flow that will be reduced as a direct consequence of the development.

3.19 For a detailed ecological survey of GWDTE, a list of NVC communities that may be dependent on groundwater is included in Appendix 4. Wetlands containing these communities should be considered to be GWDTE unless further information can be provided to demonstrate this is not the case. For example, some of the NVC communities listed in Appendix 4 may be considered GWDTE only in certain hydrogeological settings. As a general guide only, NVC communities which may have limited dependency on groundwater in certain settings are marked in yellow and with an asterisk on the list. NVC communities that are likely to be considered sensitive GWDTE in certain hydrogeological settings are marked in red on the list below.
Following completion of all investigations, the initial conceptual hydrogeological model and associated risk assessments should be reviewed and revised as appropriate.

3.20 Prior to undertaking detailed risk assessment, an applicant can consult SEPA in order to determine if their proposed approach would be acceptable. It should be noted that ecological surveying and intrusive investigation accompanied by a suitable baseline monitoring programme can be a costly and timely exercise which is likely to need the involvement of professional ecological and/or hydrogeological consultants.

3.21 SEPA Planning Service will identify applications on initial screening with infrastructure involving excavations greater than 1m depth within 250m of sensitive receptors, and those with excavations less than 1m depth within 100m of sensitive receptors which are unable to comply with Condition B. SEPA Planning Service will determine if a risk assessment/site investigation has been provided and if so consult SEPA Water Resources Unit if groundwater abstractions are identified or SEPA Water Resources Unit and SEPA Ecology Unit if GWDTE are identified.

3.22 SEPA Planning Service will object to an application on the grounds of potential unacceptable environmental impacts until a risk assessment/site investigation is provided to the satisfaction of SEPA. If it is unclear if a risk assessment/site investigation has been provided, SEPA Planning Service should consult internally prior to objecting.

3.23 Submitted risk assessments and associated site investigations will be reviewed by WRU for those relating to groundwater abstractions and/or Ecology Unit for those relating to GWDTE, who will respond with bespoke advice. If necessary they will liaise with each other within the given timescale for internal consultees. SEPA Planning Service will then respond to the consulting party with advice.

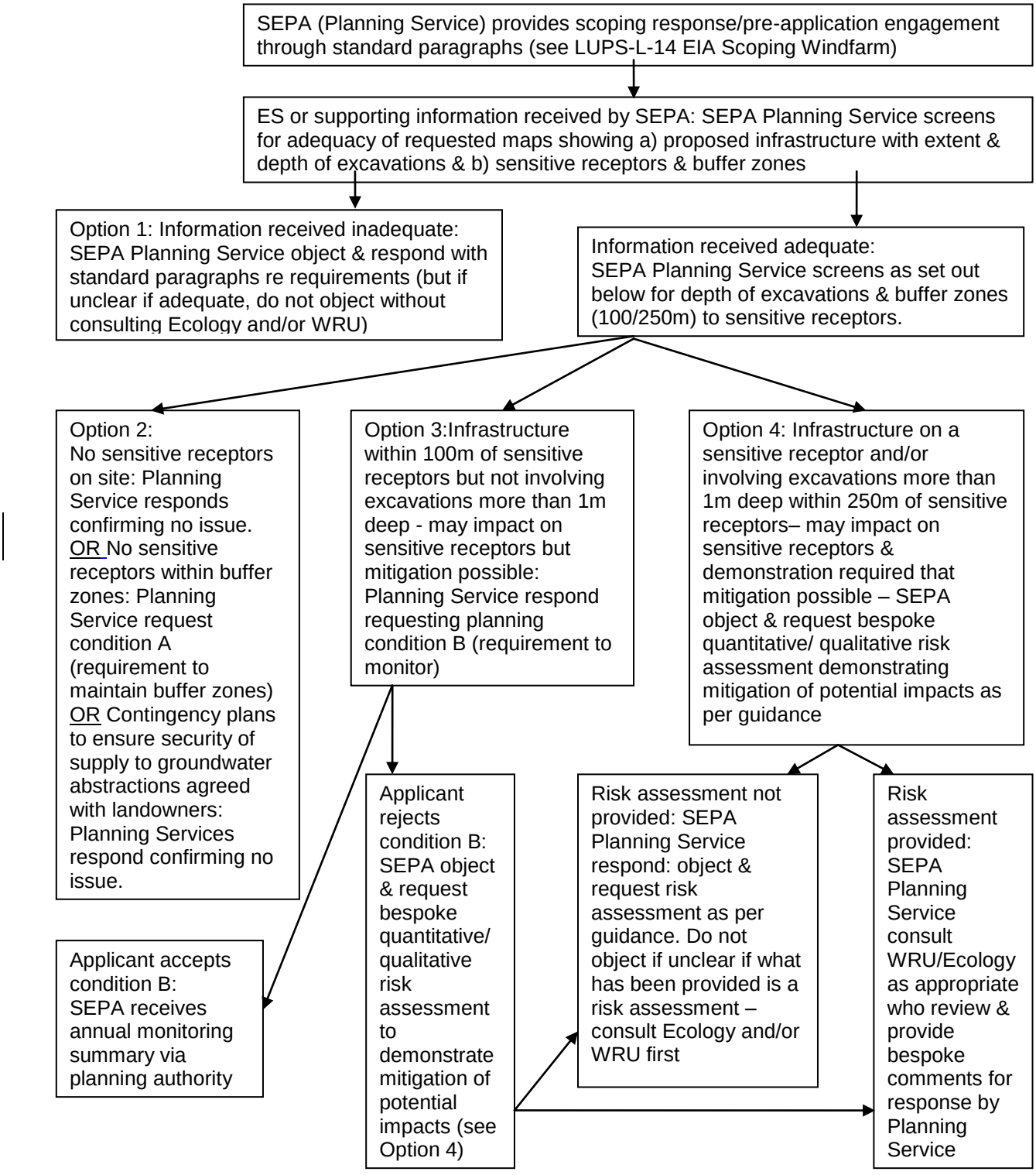
3.24 If SEPA does not consider that the submitted risk assessments and/or site investigation is satisfactory in assessing the potential risk to identified sensitive receptors then SEPA will object and request further information from the applicant that satisfactorily demonstrates that sensitive receptors are protected. If SEPA does not consider any mitigation is capable of reducing the risk to identified receptors to an acceptable level then SEPA will object in principle in order to protect the sensitive receptor.

3.25 If the assessment demonstrates that the development is unlikely to cause unacceptable impact on identified sensitive receptors and SEPA supports this, then SEPA will respond with no objections to this aspect of the proposals.

3.26 If the assessment demonstrates that the potential risk of unacceptable impact on sensitive receptors can be satisfactorily mitigated by the implementation of proposed bespoke mitigation measures, then SEPA will object unless planning conditions to ensure this mitigation is undertaken are attached to any grant of planning consent. SEPA may also request planning condition B to ensure monitoring.

Appendix 1: Flowchart Summary

Consideration of GWDTE and Groundwater Abstractions (Sensitive Receptors) through SEPA's Planning Function



Appendix 2: Checklist for Submitted Information - Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTE)

	Information Requirements	Circle to confirm	ES reference: Figure / Section	SEPA Actions
1	Plans showing all proposed infrastructure, including temporary works	Yes		If not provided – SEPA will object due to lack of information and request the required plans
2	Plans overlain with details of the extent and depths of all proposed excavations	Yes		If not provided – SEPA will object due to lack of information and request the required plans
3	Plans show the relevant specified buffer zones (100m and 250m)	Yes		If not provided – SEPA will object due to lack of information and request the required plans
4	Plans overlain with source of groundwater abstractions: - all groundwater abstractions within 100m radius of all excavations shallower than 1m - all groundwater abstractions within 250m of all excavations deeper than 1m Or statement provided to confirm none	Yes		If not provided - SEPA will object due to lack of information and request the required plans
5	Plans overlain with GWDTE (Phase 1 habitat survey) data: - within 100m radius of all excavations shallower than 1 m; - within 250m of all excavations deeper than 1m. Or statement provided to confirm none	Yes		If not provided – SEPA will object due to lack of information and request the required plans
6	Applicant can confirm one of following (as shown on above plans): i) no groundwater abstractions and GWDTE on site; ii) groundwater abstractions and/or GWDTE identified and 250m buffer zones implemented iii) confirmation that the groundwater abstraction owners have agreed contingency plans including temporary or permanent	Yes		If confirmed SEPA will request condition A (maintenance of buffer zones) as specified in SEPA guidance note Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems

	replacement of a groundwater supply.			
7	Applicant can confirm above plans show excavations or intrusions within 100m buffer zone are shallower than 1m	Yes		If confirmed SEPA will request condition B (monitoring) as set out in above guidance
8	Applicant can confirm above plans show excavations or intrusions are on/in a groundwater abstraction or GWDTE	Yes		If confirmed SEPA will require a bespoke risk assessment
9	Applicant can confirm infrastructure involves excavations deeper than 1m within 250m of sensitive receptors or unable to comply with monitoring requirements of Condition B	Yes		If confirmed SEPA will require a bespoke risk assessment
10	Bespoke risk assessment provided	Yes		SEPA will provide a bespoke response

Signature:	Organisation:	Date:

Appendix 3
Mapping Information for risk assessment of groundwater abstractions & groundwater dependent terrestrial ecosystems (GWDTE).

As a minimum, SEPA request that the following information is provided:

A. Map containing the following information (to screen whether the development could impact on groundwater abstractions or GWDTE).

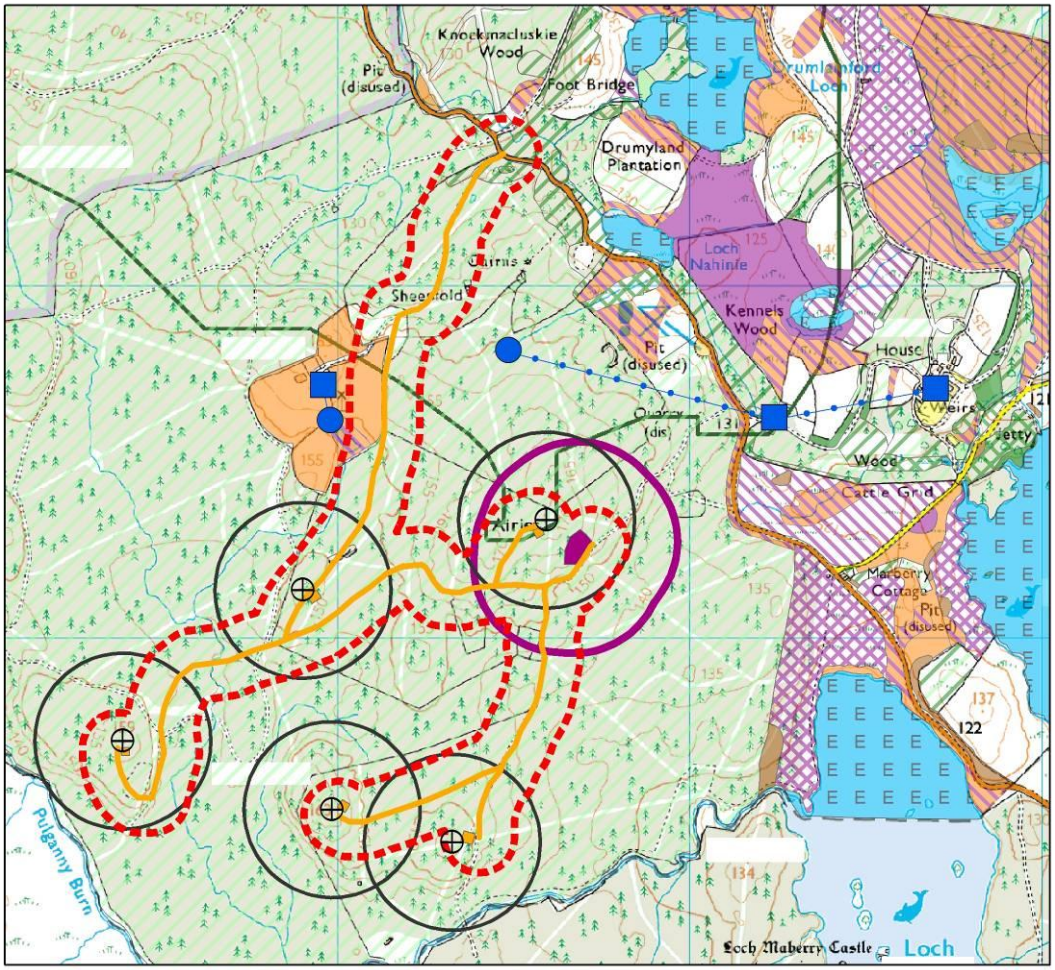
1. Base layer (ordnance survey master map 1: 10,000 – 1:20,000) showing topography and altitude (10m contour lines).
2. Water features (rivers, streams, lochs, ponds, ditches, issues, collects etc) including flow directions
3. Development infrastructure (permanent and temporary including roads, tracks, cuttings, hardstanding, laydown area, compounds, cable trenches, pipe lines /penstocks, borrow pits, any buildings including substations/powerhouses)
4. Depth of excavation /intrusion into the ground of the development infrastructure
5. Appropriate buffer zone around the infrastructure (100m for excavations/intrusions less than 1m depth & 250m for excavations/intrusions more than 1m depth).
6. Location of groundwater abstraction sources including private drinking water supplies
7. Location & extent of wetlands that could be groundwater dependent resulting from Phase 1 survey with the identification of wetland types using SNIFFER (2009).

An example of this map is shown in Figure 1

No further maps are required where all groundwater abstractions and GWDTE are outwith the appropriate buffer zones around the infrastructure. Where any groundwater abstractions or GWDTE are within the appropriate buffer zones around the infrastructure, further maps are required as detailed below.

B. Map containing the following information (to show where mitigation is proposed to ensure that the development is not impacting on the groundwater supplying groundwater abstractions or GWDTE).

1. Base layer (ordnance survey master map 1:2,000 – 1:5,000) showing topography and altitude (10m contour lines)
2. Water features (rivers, streams, lochs, ponds, ditches, issues, springs, collects etc) including flow directions.
3. Development infrastructure (permanent and temporary including roads, tracks, cuttings, hardstanding, laydown area, compounds, cable trenches, pipe lines /penstocks, borrow pits, any buildings including substations/powerhouses).
4. Depth of excavation /intrusion into the ground of the development infrastructure
5. Appropriate buffer zone around the infrastructure (100m for excavations/intrusions less than 1m depth & 250m for excavations/intrusions more than 1m depth).
6. Location of groundwater abstraction sources including private drinking water supplies.
7. Location and extent of wetlands that could be groundwater dependent resulting from Phase 1 survey with identification of wetland types using SNIFFER (2009).
8. Likely groundwater flow direction where a groundwater abstraction source or GWDTE is within an infrastructure buffer.
9. Location and type of mitigation that is proposed to ensure that groundwater flows to a groundwater abstraction or GWDTE are maintained.



Legend

- Borrow Pit - Excavation > 1m deep
- Borrow Pit Buffer - 250m
- Crane Pad
- Track Buffer - 100m
- Turbine Buffer - 250m
- Track - Excavation < 1m Deep
- Water Supply
- Turbine - Excavation > 1m deep
- PWS Source Location
- PWS Supplied Property
- Broardleaved Woodland - semi-natural
- Broardleaved Woodland - plantation
- Coniferous Woodland - semi-natural
- Coniferous Woodland - plantation
- Mixed Woodland - semi-natural
- Mixed Woodland - plantation
- Scrub - dense/continuous
- Neutral Grassland - unimproved
- Neutral Grassland - semi-improved
- Marsh/Marshy Grassland
- Bracken - continuous
- Dry Dwarf Shrub Heath - acid
- Blanket Sphagnum Bog
- Raised Sphagnum Bog
- Wet Modified Bog
- Dry Modified Bog
- Standing Water - eutrophic
- Running Water - eutrophic
- Cultivated/Disturbed Land - amenity grassland

N

1:15,000

0 75 150 300 450 600 750 Meters

0 0.1 0.2 0.4 Miles

Helpdesk ref: N/A. Produced: 07/02/2013

Figure 1
Wetland Phase 1 Habitat & Groundwater Abstractions
Fictional Wind Farm Example

SEPA Scottish Environment Protection Agency

Appendix 4

NVC communities, which if present, indicate that a wetland is likely to be either highly groundwater dependent (marked as red) or moderately groundwater dependent (marked as yellow and with an asterisk) depending on the hydrogeological setting. (The table is modified from 'UKTAG list of NVC communities and associated groundwater dependency scores (2008)' which contains a full list for all NVCs and UK groundwater dependency scores.)

NVC Community	NVC Community Name
M5	*Carex rostrata - Sphagnum squarrosum* mire
M6	*Carex echinata - Sphagnum recurvum* mire
M7	*Carex curta - Sphagnum russowii* mire
M8	*Carex rostrata - Sphagnum warnstorfii* mire
M9	*Carex rostrata - Calliergon cuspidatum/C.giganteum* mire
M10	*Carex dioica - Pinguicula vulgaris* mire
M11	*Carex demissa - Saxifraga aizoides* mire
M12	*Carex saxatilis* mire
M13	*Schoenus nigricans - Juncus subnodulosus* mire
M14	*Schoenus nigricans - Narthecium ossifragum*
M15 *	*Scirpus cespitosus - Erica tetralix* wet heath
M16	*Erica tetralix - Sphagnum compactum* wet heath
M21	*Narthecium ossifragum - Sphagnum papillosum* valley mire
M22	*Juncus subnodulosus - Cirsium palustre* fen meadow
M23	*Juncus effusus/acutiflorus - Galium palustre* rush-pasture
M24	*Molinia caeruleae - Cirsium dissectum fen meadow*
M25 *	*Molinia caerulea - Potentilla erecta* mire
M26 *	*Molinia caerulea - Crepis paludosa* mire
M27 *	*Filipendula ulmaria - Angelica sylvestris* mire
M28 *	*Iris Pseudacorus - Filipendula ulmaria* mire

NVC Community	NVC Community Name
M29	*Hypericum elodes - Potamogeton polygonifolius* soakway
M30 *	*Hydrocotylo – Baldellion*
M31	*Anthelia julacea - Sphagnum auriculatum* spring
M32	*Philonotis fontana - Saxifraga stellaris* spring
M33	*Pohlia wahlenbergii* var. *glacialis* spring
M34	*Carex demissa - Koenigia islandica* flush
M35	*Ranunculus omiophyllus - Montia fontana* rill
M36	Lowland springs and streambanks of shaded situations
M37	*Cratoneuron commutatum* springs
M38	*Cratoneuron commutatum* springs
S2 *	*Cladium mariscus* swamp and sedge beds
S3 *	*Carex paniculata* sedge swamp
S7 *	*Carex acutiformis* swamp
S11	*Carex vesicaria* swamp
S24	*Phragmites australis - Peucedanum palustre* tall-herb fen
S25 *	*Phragmites australis - Eupatorium cannabinum* tall-herb fen
S27 *	*Carex rostrata - Potentilla palustris* tall-herb fen
MG4 *	*Alopecurus pratensis - Sanguisorba officinalis*
MG8 *	*Cynosurus cristatus - Caltha palustris* lowland neutral grassland
MG9 *	*Holcus lanatus - Deschampsia cespitosa* grassland
MG10 *	*Holcus lanatus - Juncus effusus* rush-pasture
MG11 *	Inland wet grassland, *Festuca rubra-Agrostis stolonifera-Potentilla anserina* grassland

NVC Community	NVC Community Name
W1 *	*Salix cinerea - Galium palustre* woodland
W2 *	*Salix cinerea - Betula pubescens - Phragmites australis* woodland
W3 *	*Salix pentandra - Carex rostrata* woodland
W4	*Betula pubescens - Molinia caerulea* woodland
W5 *	*Alnus glutinosa - Carex paniculata* woodland
W6 *	*Alnus glutinosa - Urtica dioica* woodland
W7	Residual alluvial forests (*Alnus glutinoso-incanae*)
W20	*Salix lapponum – Luzula sylvatica* scrub
CG10	*Festuca ovina – Agrostis capillaris – Thymus praecox* grassland (when not on limestone)
CG11	*Festuca ovina - Agrostis capillaris - Alchemilla alpina* grassland (when not on limestone)
CG12	*Festuca ovina – Alchemilla alpina – Silene acaulis* dwarf-herb community
U6 *	*Juncus squarrosus - Festuca ovina* grassland
U15	*Saxifraga aizoides – Alchemilla glabra*
U16	*Luzula sylvatica – Vaccinium myrtillus* tall herb community
U17	*Luzula sylvatica – Geum rivale* tall herb community
SD13	*Salix repens -Bryum pseudotriquetrum* dune-slack community
SD14	*Salix repens -Campylium stellatum* dune-slack community
SD15	*Salix repens-Calliergon cuspidatum* dune-slack community
SD16	*Salix repens - Holcus Lanatus* dune slack community
SD17	*Potentilla anserina-Carex nigra* dune-slack community

Appendix 5
SEPA Technical Guidance Note1:
The Monitoring of Infrastructure with Excavations Less than 1m Deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem)

1. Introduction

1.1 Where groundwater abstractions or Groundwater Dependant Terrestrial Ecosystems (GWDTEs) are identified within the 100m buffer zone from excavations less than 1m deep (generally linear infrastructure such as roads, tracks and trenches), the applicant will need to ensure that these sensitive receptors shall not be adversely impacted through the use of best practice construction techniques.

1.2 Developers will need to demonstrate that best practice construction techniques are working properly by undertaking monitoring and must identify appropriate remedial works when required.

1.3 SEPA recommends the use of best practice construction techniques as set out in FCE SNH Floating Roads on Peat, 2010 and in SEPA/SNH guidance document "Good Practice during Wind Farm Construction" (2013) to ensure that the infrastructure does not statistically significantly[1] affect groundwater flow or chemistry to sensitive receptors. However SEPA does not offer guidance on the detailed design of infrastructure or prescribe a specific method or technique for construction as environmental conditions and engineering constraints will be site specific and construction techniques will require a tailored approach in order to negate risks to identified sensitive receptors.

1.4 In addition to the above appropriate design and mitigation, SEPA requests that the developer puts in place monitoring that assesses the quantitative and chemical effect of the linear infrastructure to ensure that the groundwater flow and quality are not statistically significantly changed, which would put the sensitive receptors at risk. The design of the monitoring must be such that data is capable of being statistically analysed and demonstrating changes if they do occur; see Section 3 for further details.

1.5 The developer will need to identify a plan of action to remediate problems where statistically significant changes to the groundwater flow or chemistries to sensitive receptors are identified and propose this to the Planning Authority for their agreement. The Planning Authority can seek advice from SEPA. Remedial action must be taken within 6 months in agreement with the Planning Authority in consultation with SEPA.

2. Monitoring

2.1 Monitoring must provide an evidence base which demonstrates that the construction and maintenance of infrastructure is proceeding as intended and that it has not resulted in a statistically significant quantitative or qualitative change to groundwater flows through the infrastructure that could impact on identified sensitive receptors.

2.2 In order to achieve this we strongly advise that developers need to undertake pre-

[1] P <0.05

construction monitoring which would define the baseline conditions. Monitoring during construction, or where this is not possible monitoring immediately post construction of the mitigative measure, should also be conducted to provide an early warning of adverse impacts.

2.3 Good Practice During Wind Farm Construction (2013) recommends that a suitably qualified professional engineering geologist/geotechnical engineer will be able to advise on appropriate methods of ground investigation and associated sampling and laboratory testing. A suitably qualified professional ecologist will also be needed to advise on the most appropriate location for GWDTE monitoring.

2.4 Where a GWDTE is the identified sensitive receptor, SEPA requests that the quality of the GWDTE is measured every year (minimum of 1 fixed quadrat to NVC level (http://jncc.defra.gov.uk/pdf/pub06_NVCusershandbook2006.pdf) with additional fixed point photography)

2.5 Table 1 below outlines the minimum monitoring point assessment specified by SEPA and Table 2 provides details of the minimum monitoring frequency and analytical requirements of the monitoring regime.

Table 1 – Summary of minimum monitoring point assessment

Receptor	Purpose	Monitoring Point	Number and spacing of monitoring points
GWDTE	To assess levels and quality changes	Hand driven groundwater monitoring wells	A mimimum of 1 upgradient and 2 downgradient. The number of monitoring points on a development site should present a representative sample[2] of all construction techniques used in mitigation.
GW Abstractions	To assess quality and levels	Groundwater abstraction source	Each groundwater abstraction source within 100m of linear infrastructure

Table 2 – Outline of minimum monitoring requirements

Receptor	Frequency of monitoring			Parameters
	Pre-construction	During construction	Post construction	
GWDTE	Where possible a minimum of 10 samples equally spaced in time over a minimum of 6 months prior to	Not required	A minimum of 10 measurements per year. Monitoring reports to be	Water level

[2] 'Representative sample': A minimum of triplicate sampling where the number of mitigation measures of a particular construction technique allows.

	construction starting. This needs to include at least 5 samples in the summer period to account for summer drawdown		submitted annually. Monitoring to be conducted for a minimum of 3 years and subsequently until it is demonstrated with statistical certainty that the hydrology is not impacted. This may require remediation and adjustments to the initial mitigation constructed if proved to be unsuitable.	
GW Abstractions	Monthly for 12 months prior to the construction phase	Fortnightly for the duration of the construction of the infrastructure with 100m of the receptor	Monthly for a minimum of 1 year and until that time that it can be demonstrated that there is no significant impact.	Water level, temperature, pH, electrical conductivity, dissolved oxygen, alkalinity, ammoniacal nitrogen, TON, TOC, BOD, COD, TDS, Ca, Mg, Na, K, SO_4, HCO_3, Cl, Fe, Mn

2.6 The monitoring results must be analysed and interpreted to demonstrate whether the quantitative and chemical components of the hydrological connectivity across the infrastructure are not statistically significantly impacted and must be presented for the written approval of the Planning Authority in consultation with SEPA annually from the commencement of development in the format outlined below.

3. Indicative outline of monitoring report

1. Map for each 'mitigation' showing the 'construction/mitigation' and associated monitoring points and location of sensitive receptors at an appropriate scale.
2. Table showing per monitoring point:
   a. Details of monitoring points (such as construction logs, including depth, diameter and response zones for groundwater wells or existing groundwater abstractions)
   b. Soil types encountered during installation (basic description)

c. Altitude (to Ordnance datum) of soil level at the monitoring location
d. Location (to nearest 25cm) of monitoring point using National Grid Reference co-ordinates
e. Distance to other monitoring points that are associated with the same 'construction/ mitigation'

3. Monitoring results (level and, where appropriate, chemistries) in a spreadsheet format also indicating which monitoring locations / samples have not been obtained and the reason why.
   a. monitoring results submitted in an electronic format such as an excel spreadsheet in the appendix
   b. level results presented relative to soil surface (metres below ground level (mbgl)) and relative to Ordnance datum (meters above Ordnance Datum (mAOD))
   c. the chemical results need to indicate units of measurement and sensitivity of the analytical technique
4. Evaluation /analysis of the monitoring results
   a. Statistically analyse the level data per 'mitigation/ construction' so that it details if the construction has resulted in a statistically deviation from the pre-construction situation over the last reporting period and show what the statistical significance of this deviation is. Note that trend analysis also should be undertaken.
   b. Where appropriate, statistically analyse the chemical data per 'mitigation/ construction' so that it details if the construction has resulted in a statistically deviation from the pre- construction situation and show what the statistical significance of this deviation is. Note that trend analysis also should be undertaken. It is recommended that piper diagrams are utilised to present relative concentrations of ions in solution in order to graphically represent changes in groundwater chemistry.

3.1 If monitoring identifies statistically significant change to the quantitative and chemical components of the hydrological connectivity across the infrastructure, then the developer must:-

- where the receptor is a GWDTE: propose and implement remedial action within 6 months of this becoming apparent from the monitoring results;
- where the receptor is a groundwater abstraction: Immediately inform the supply owner and propose and implement temporary solutions and implement remedial action within 6 months of this becoming apparent from the monitoring results.

3.2 The remedial action must be designed and carried out in agreement with the Planning Authority in consultation with SEPA.

Published Guidance

SNH/SEPA Good Practice during Wind Farm Construction (Second Edition, 2013)

FCE SNH Floating Roads on Peat, 2010,

APPENDIX 6
Further guidance and legislation

SEPA Guidance Note 4: LUPS-GU4 Planning Guidance on Wind farm Development, 2014.

SEPA Guidance Note 18: LUPS-GU18 Planning Guidance on Hydropower Developments, 2013

Guidance on Developments on Peatland: Site Survey and Best Practice

FCE SNH: Floating Roads on Peat, August 2010

SNH Good practice during windfarm construction, Second Edition, 2013

The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) – A Practical Guide, 2014

The delineation of capture zones around small sources – T Keating, M.J. Packman, A. Peacock – 1998, The Geological Society

Manual on treatment of small water supply system – P.J Jackson – 2001, Department of the Environment, Transport and the Regions

Groundwater Source Protection Zones – Review of Method – 2009, Environment Agency.

BS5930:1999 Code of Practice for Site Investigations – British Standard, 1999

'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland'

UKTAG (2008) List of NVC communities and associated groundwater dependency scores. (as amended)

APPENDIX 7
Text for SEPA Planning Responses

Option 1 – Information Inadequate

We **object** to this planning application on the grounds of lack of information on potential impacts on *groundwater abstractions/groundwater dependent terrestrial ecosystem.* We will remove this objection if the information detailed below is provided to our satisfaction.

We request maps are provided showing clearly:

a) all proposed infrastructure, including temporary works;
b) overlain with details of the extent and depths of all proposed excavations (excavations should also include all insertions and foundations);
c) overlain with groundwater abstractions and/or GWDTE; and
d) showing the relevant specified buffer zones (100m and 250m).

Groundwater Abstractions
All groundwater abstractions within the following distances of development need to be identified, in order to assess potential risk.

a) within 100m radius of all excavations less than 1m in depth;
b) within 250m of all excavations deeper than 1m.

This covers both public and private water supply groundwater abstractions, both within and outwith the site boundary. It is critical that it is the actual source of the abstraction and not the property that it supplies that is identified and this should also include points of use located beyond the radius if the abstraction source lies within the zone.

Information on all groundwater abstractions must be obtained by a site walkover with additional information from SEPA, local authorities and local residents. Information that SEPA holds on groundwater abstractions under our regulatory regime can be obtained through our Access to Information scheme. http://www.sepa.org.uk/about_us/customer_services_directory/advice_and_information/access_to_information.aspx. However, we do not hold information on abstractions of less than $10m^3$ a day as this is covered by General Binding Rules

The following information for each identified water supply source should be submitted:

- Source location (including National Grid co-ordinates);
- Source type eg spring, borehole etc;
- Use eg domestic water supply for house, water troughs for livestock, supply to industrial/commercial premises;
- Abstraction rate (this could be estimated from, for example, the number of people/animals using the supply).

Groundwater Dependent Terrestrial Ecosystems (GWDTE)
GWDTE are specifically protected under the Water Framework Directive and are sensitive receptors to the pressures that are potentially caused by development.

In order to assess the potential risk to GWDTE, a Phase 1 habitat survey should be provided, with the guidance 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' being used to identify wetland types, both within and outwith the site boundary, within the following distances of development as a minimum (for the purpose of micro-siting a wider expanse may be surveyed):

a) within 100m radius of all excavations less than 1m in depth;
b) within 250m of all excavations deeper than 1m.

However, SNH should also be consulted and if they have requested a National Vegetation Classification (NVC) survey for all or part of the site then SEPA will accept this information.

SEPA holds some information on the occurrence of GWDTE, predominantly within designated sites (SSSIs, SPAs and SACs). This information is available via the SE-Web (http://www.environment.scotland.gov.uk/map.aspx). However, there are non-designated wetlands that include GWDTE outwith these areas that are not listed. To identify non-designated GWDTE, The guidance 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' should be used to identify all wetland areas within the Phase 1 habitat survey.

A National Vegetation Classification (NVC) survey will be required as part of a site specific detailed quantitative and/or qualitative risk assessment for proposed infrastructure involving excavation below a depth of 1m within 250m of sensitive receptors . In all other cases a Phase 1 survey with the identification of wetland types using SNIFFER (2009).will suffice.

Option 2 No significant impact on groundwater abstractions or GWDTE - either no receptors identified or buffer zones will be implemented (required by condition)

The information provided demonstrates that there are no groundwater abstractions or GWDTE present, we therefore have no objection in relation to these aspects in terms of our interests.

OR

The information provided demonstrates that there are groundwater abstractions or GWDTE present, but impact is avoided because all proposed development is outwith the buffer zones. We therefore have **no objection** to these aspects but **request** that the **condition** below is attached to any grant of planning consent to prevent development moving into the buffer zones, through, for example, micro-siting.. If this matter is not to be addressed by a condition attached to any grant of planning consent, please consider this as an **objection** from SEPA.

> ***Planning Condition – Implementation of Buffer Zones***
> *The buffer zones around groundwater dependent terrestrial ecosystems and/or groundwater abstractions identified on Plan XX (**insert reference from planning application)** shall be implemented in full throughout the construction, operation and decommissioning of the development. There shall be no development, machinery movement or operations within the buffer zones without the agreement of the Planning Authority in consultation with SEPA. The buffer zone shall be demarcated on the ground*
>
> *Reason: In order to prevent potential unacceptable impacts on groundwater abstractions and/or groundwater dependent terrestrial ecosystems.*
>
> *Informative: The buffer zone shall be 100 m for all development with excavations or intrusions less than 1 metre depth. The buffer zone shall be 250 m for all development with excavations or intrusions greater than 1 metre depth.*

OR

The information provided demonstrates that groundwater abstractions have been identified within the buffer zones and confirmation has been provided that the groundwater abstraction owners have agreed contingency plans including temporary or permanent replacement of a groundwater supply in order to provide security of supply. (Note that SEPA are not able to comment on the alteration or the provision of alternative supplies, the acceptance of which can only be agreed between the applicant and the supply owner.). We therefore have no objection in relation to these aspects in terms of our interests.

Option 3 - Excavations or intrusions within buffer zone are less than 1m in depth - appropriate monitoring required by condition - to ensure that potential risks have been successfully mitigated against

The information provided demonstrates that the proposals involve only excavations shallower than 1m depth between 100m – 250m of sensitive receptors. We therefore have no objection to this aspect of the proposals.

OR

The information provided demonstrates that the proposals involve excavations shallower than 1m, but which are within 100m of sensitive receptors. This is a higher risk situation. The applicant needs to ensure that sensitive receptors will not be adversely impacted. SEPA considers that this can be done through the use of appropriate mitigation measures following current best practice. However, there will be no further assessment by SEPA of proposed mitigation measures or the monitoring proposals prior to determination of the planning application. We have **no objection** to this aspect of the planning application but **request** that the **condition** below is attached to any grant of planning consent. If this matter is not to be addressed by a condition attached to any grant of planning consent, please consider this as an **objection** from SEPA. It is the responsibility of the applicant to design the scheme and the monitoring to achieve the requirements of the condition.

We also advise that if the applicant does not wish to have the condition attached to any grant of planning consent they must provide detailed qualitative and/or quantitative risk assessments to the satisfaction of SEPA **prior** to any grant of planning consent. These must demonstrate that the proposals will not have a significant impact on the groundwater flow and groundwater quality feeding identified sensitive receptors through the proposed design, construction and operation of the infrastructure. If required, please consult us further for advice on these risk assessments.

> ***Planning Condition – Monitoring***
> *The design, construction and maintenance of all infrastructure (as shown on Plan XX (**insert reference from planning application**)) must ensure that the quality and quantity of the groundwater that feeds sensitive receptors (groundwater abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTE)) downstream from infrastructure does not statistically significantly change and the development does not act as a preferential pathway to groundwater flow*
>
> *This must be demonstrated by on-going monitoring of the groundwater as set out in SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m Deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem) (Appendix 4 to SEPA Planning Guidance LUPS-31 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem).*
>
> *The monitoring results demonstrating whether the quality of groundwater and/or hydrological connectivity is being maintained must be presented to the Planning Authority in consultation with SEPA annually from the commencement of development in the required format. If monitoring identifies that the requirements are not being met,*

remedial action must be taken within 6 months in agreement with the Planning Authority in consultation with SEPA.

No excavations greater than 1m deep within 100m of sensitive receptors should take place unless agreed in writing with the Planning Authority in consultation with SEPA.

Informatives:
Guidance on design and construction is provided in FCE SNH Floating Roads on Peat, 2010 and in SEPA/SNH guidance document "Good Practice during Wind Farm Construction" (Second Edition, 2013).

This condition relates to both temporary and permanent infrastructure.

Reason: In order to prevent potential unacceptable environmental impacts to sensitive receptors including groundwater abstractions and/or groundwater dependent terrestrial ecosystems.

This condition refers to SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m Deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem).

It is emphasised that it is the responsibility of the developer to ensure that the design, construction and monitoring of the infrastructure meets the requirement of the condition. The developer should also adhere to CAR requirements where appropriate

Option 4: Infrastructure involving development on a sensitive receptor and/or excavations deeper than 1m depth within 250m of sensitive receptors or unable to comply with Condition B - potential significant risk to identified receptors - bespoke risk assessment required

From the information provided, it is identified that infrastructure is proposed on sensitive receptor(s) and/or involving excavation below a depth of 1m within 250m of sensitive receptors. SEPA considers that mitigation measures alone may not adequately protect sensitive receptors. Therefore we **object** to this planning application due to lack of information on the potential impacts on sensitive receptors (groundwater abstractions and groundwater dependent terrestrial ecosystems). We will remove this objection if the information detailed below is provided to our satisfaction.

We **request** the provision of detailed qualitative and/or quantitative risk assessments which demonstrate that the proposals will not have a significant impact on the groundwater flow and groundwater quality feeding identified sensitive receptors through the proposed design, construction and operation of the infrastructure.

The requirements for the detailed qualitative and/or quantitative risk assessment will be site specific. However, applicants must develop an initial site specific Conceptual Site Model (CSM) detailing the local geology, hydrology, ecology and hydrogeological regime at the site. This can be a desk study reviewing available geological, hydrogeological and ecological (SNIFFER categories) information. The generic hydroecological functioning of SNIFFER categories is available from 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' http://www.sepa.org.uk/science_and_research/what_we_do/biodiversity/wetlands.aspx)

For a detailed ecological survey of GWDTE, a list of NVC communities that may be dependent on groundwater is included in Appendix 4 of LUPSGU31. Wetlands containing these communities should be considered to be GWDTE unless further information can be provided to demonstrate this is not the case. For example, some of the NVC communities listed in Appendix 4 may be considered GWDTE only in certain hydrogeological settings. As a general guide only, NVC communities which may have limited dependency on groundwater in certain settings are marked in yellow and with an asterisk on the list. NVC communities that are likely to be considered sensitive GWDTE in certain hydrogeological settings are marked in red on the list below.

If a site investigation demonstrates that groundwater is likely to be intercepted during the development, it may be necessary to undertake a quantitative hydrogeological assessment which should establish the size of the zone of contribution feeding the groundwater supplying the receptor and identify the proportion of flow that will be reduced as a direct consequence of the development. For groundwater abstractions that have been assessed as being adversely impacted quantitatively and/or qualitatively by the development, it should be demonstrated that the developer has agreed with the supply owner to provide an alternative water supply if required.

Following the initial CSM and detailed design of the site investigation and qualitative and/or quantitative risk assessment, an applicant can consult SEPA in order to determine if their proposed approach would be acceptable. It should be noted that ecological surveying and intrusive investigation accompanied by a suitable baseline monitoring programme can be a

costly and timely exercise which is likely to need the involvement of professional ecological and/or hydrogeological consultants.

Removal of objection at Option 4 – guidance on bespoke response from WRU and/or Ecology Unit

On the basis of the additional information provided (*Ref: a detailed qualitative and/or quantative risk assessment),* we consider that the proposed mitigation measures adequately protect sensitive receptors. We therefore **remove our objection** to this planning application but **request** that the **condition(s)** outlined below is/are attached to any grant of planning consent. If this matter is not to be addressed by a condition attached to any grant of planning consent, please consider this as an **objection** from SEPA.

Planning Condition - Mitigation
The design, construction and maintenance of all infrastructure (as shown on Plan XX) must be in accordance with the mitigation measures shown in document XX.

Reason: In order to prevent potential unacceptable environmental impacts to sensitive receptors including groundwater abstractions and/or groundwater dependent terrestrial ecosystems.

AND/OR

Planning Condition – Monitoring
*The design, construction and maintenance of all infrastructure (as shown on Plan XX (**insert reference from planning application**)) must ensure that the quality and quantity of the groundwater that feeds sensitive receptors (groundwater abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTE)) downstream from infrastructure does not statistically significantly change and the development does not act as a preferential pathway to groundwater flow*

This must be demonstrated by on-going monitoring of the groundwater, so long as the infrastructure is in place, as set out in SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m Deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem) (Appendix 4 to SEPA Planning Guidance LUPS-31 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem).

The monitoring results demonstrating whether the quality of groundwater and/or hydrological connectivity is being maintained must be presented to the Planning Authority in consultation with SEPA annually from the commencement of development in the required format. If monitoring identifies that the requirements are not being met, remedial action must be taken within 6 months in agreement with the Planning Authority in consultation with SEPA.

No excavations greater than 1m deep within 100m of sensitive receptors should take place unless agreed in writing with the Planning Authority in consultation with SEPA.

Informatives:

Guidance on design and construction is provided in FCE SNH Floating Roads on Peat, 2010 and in SEPA/SNH guidance document "Good Practice during Wind Farm Construction" (Second Edition, 2013).

This condition relates to both temporary and permanent infrastructure.

Reason: In order to prevent potential unacceptable environmental impacts to sensitive receptors including groundwater abstractions and/or groundwater dependent terrestrial ecosystems.

This condition refers to SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem)

It is emphasised that it is the responsibility of the developer to ensure that the design, construction and monitoring of the infrastructure meets the requirement of the condition. The developer should also adhere to CAR requirements where appropriate.