

Bat Survey Report

Moanmore Lower Wind Farm, Co. Clare.

January 2025

Prepared for:

Moanmore Lower Green Energy



O'DONNELL 
ENVIRONMENTAL

Summary

Project: Bat survey in relation to the proposed wind farm at Moanmore Lower, Co. Clare

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Company Profile: O'Donnell Environmental is an independent environmental consultancy established by Tom O'Donnell in 2019. O'Donnell Environmental is a Chartered Institute of Ecology and Environmental Management (CIEEM) 'Registered Practice' which demonstrates our commitment to high professional standards, accountability and the delivery of the best outcomes for biodiversity and our Clients.

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1 Introduction

O'Donnell Environmental Ltd. was commissioned by Moanmore Lower Green Energy Ltd. to undertake bat surveys reporting in relation to a proposed wind energy development in southwest Clare. The proposed project involves the development of a three-turbine wind farm at Moanmore, 3km northwest of the town of Kilrush, Co. Clare. The proposed includes for a Turbine Delivery Route (TDR) and one Grid Connection Routes (GCR) to Tullabrack 110kV Substation. Although not included in current application an alternative GCR to Moneypoint Power Station was assessed in terms of potential for impacts on bats. Site location maps are presented in **Figures 1.1a** and **1.1b**.

The aim of the current study was to determine and evaluate the likely importance of the study area and its immediate environs to bats.

1.1 PROPOSED WORKS

The proposed development works are described in Chapter 2 of the EIAR and are summarised as follows:

- Erection of three 4-5MW wind turbines with an overall ground to blade tip height of 150m. The candidate wind turbine will have a rotor diameter of 136m and a hub height of 82m.
- Construction of site access tracks, turbine hardstand areas and turbine foundations.
- Construction of one new site entrance along the Turbine Delivery Route with access onto the adjoining local road network (L6132).
- Construction of one temporary construction compound with associated temporary site offices, parking areas and security fencing.
- Construction of new internal site access tracks and upgrade of existing site track, to include all associated drainage.
- Development of a site drainage network.
- Construction of one electrical substation with all associated electrical plant and equipment, security fencing, lightening protection, security cameras and gates, and all ancillary structures and works.
- One permanent spoil storage area.
- All wind farm internal cabling connecting the wind turbines to the electrical substation.
- All works associated with the permanent connection of the wind farm to the national electricity grid comprising a 38kV underground cable in permanent cable ducts from the proposed, permanent, on-site substation and to the existing Tullabrack 110kV ESNB Substation.
- Two flood compensation areas.
- Vertical realignment of an existing crest curve on the L6132 local road in order to prevent grounding of abnormal load vehicles during delivery of turbine components.
- Construction of a blade transfer area.
- Ancillary forestry felling to facilitate construction and operation of the development.
- Upgrade of an existing site entrance onto the adjoining local road network (L2034) including the demolition of an existing wall and removal of hedgerow at the site entrance to facilitate abnormal load vehicles during delivery of turbine components.
- Landscaping and all associated ancillary works.

It is estimated that the construction phase will take approx. 10 months to complete, inclusive of all works proposed along the Grid Connection Route and Turbine Delivery Route. Planning permission is sought

for a period of 15 years and an operational life of 40 years from the date of commissioning of the entire wind farm. Part of the substation and all of the grid connection will be handed over to ESB networks to own and operate. As part of the national grid infrastructure, their life can extend beyond the life of the wind farm. Accordingly, permission is sought for the grid connection and substation in perpetuity.

This report assesses the impacts of the temporary and permanent construction works, as well as the potential impacts of the operational phase and decommissioning of the proposed wind farm and their effects on the local bat population.

The potential effects on bats due to elements of the proposed development include the following:

- Vulnerability of bats to collision with turbines resulting in injury or mortality.
- Loss of features with potential for bat roosting.
- Loss of potential foraging or commuting habitat for bats.
- Displacement of individuals or populations.

1.2 LEGAL STATUS OF BATS

All bat species and their roosting sites are protected under both national and international law. The purpose of this legislation is to maintain and restore bat populations within their natural range. Where human activities have the potential to compromise bat populations, measures are required to be put in place to avoid impacts or compensate and mitigate for those impacts. A grant of planning permission does not constitute a licence or permit to disturb bats or interfere with their breeding or resting places.

The key legislation which provides protection to bats is as follows:

- Wildlife Act (1976) and subsequent amendments which makes it unlawful to intentionally disturb, injure or kill a bat or disturb its resting place without a licence to derogate from Regulation 23 of the Habitats Regulations 1997, issued by National Parks & Wildlife Service (NPWS).
- The EU Habitats Directive (which has been transposed into Irish law with the European Communities (Birds and Natural Habitats) Regulations 2011) seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bat species are listed in Annex IV, while Annex II provides additional protection for the Lesser Horseshoe Bat.

1.3 STATEMENT OF COMPETENCE

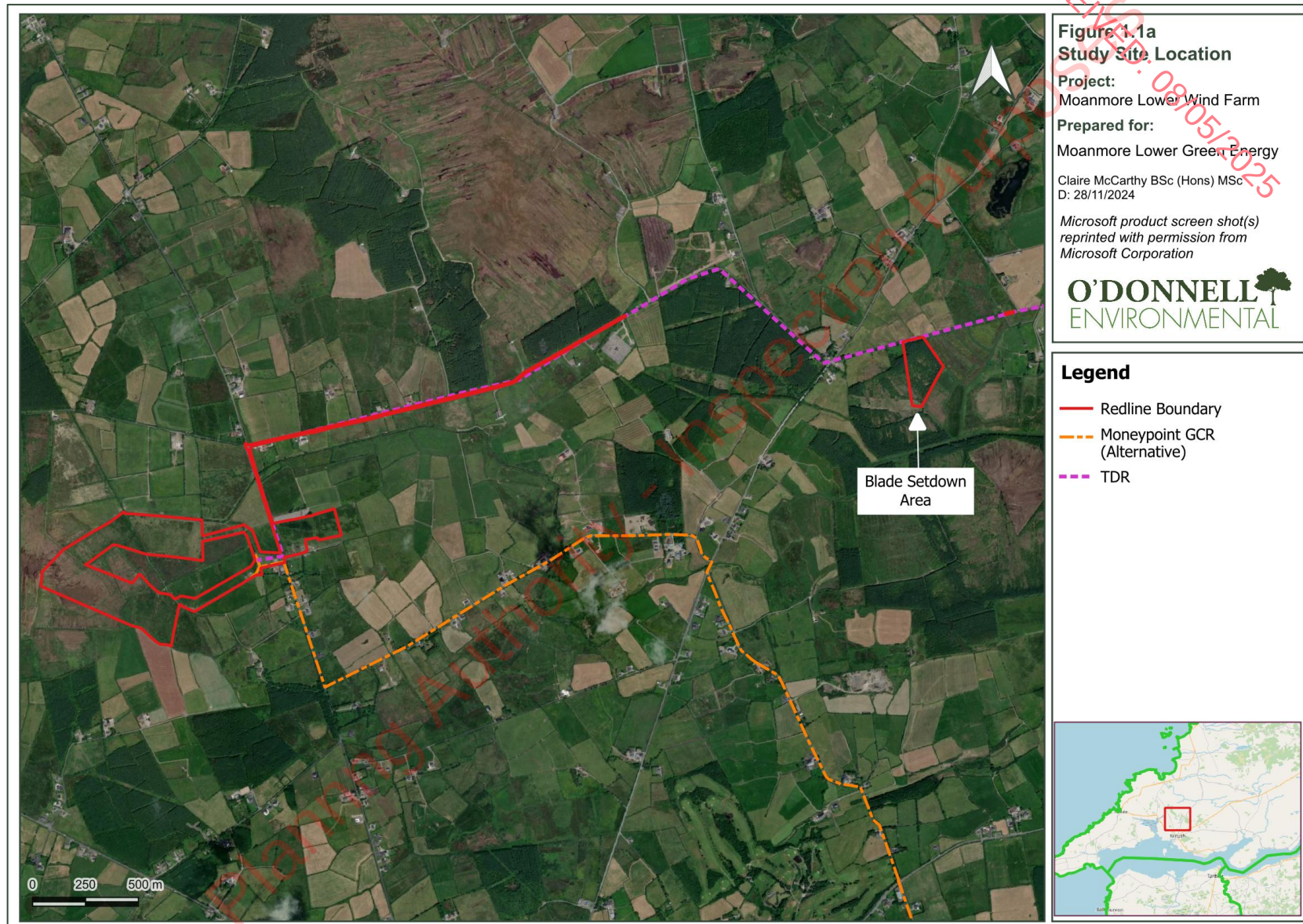
O'Donnell Environmental is an independent environmental consultancy established by Tom O'Donnell in 2019. O'Donnell Environmental is a Chartered Institute of Ecology and Environmental Management (CIEEM) 'Registered Practice' which demonstrates our commitment to high professional standards, accountability and the delivery of the best outcomes for biodiversity and our Clients.

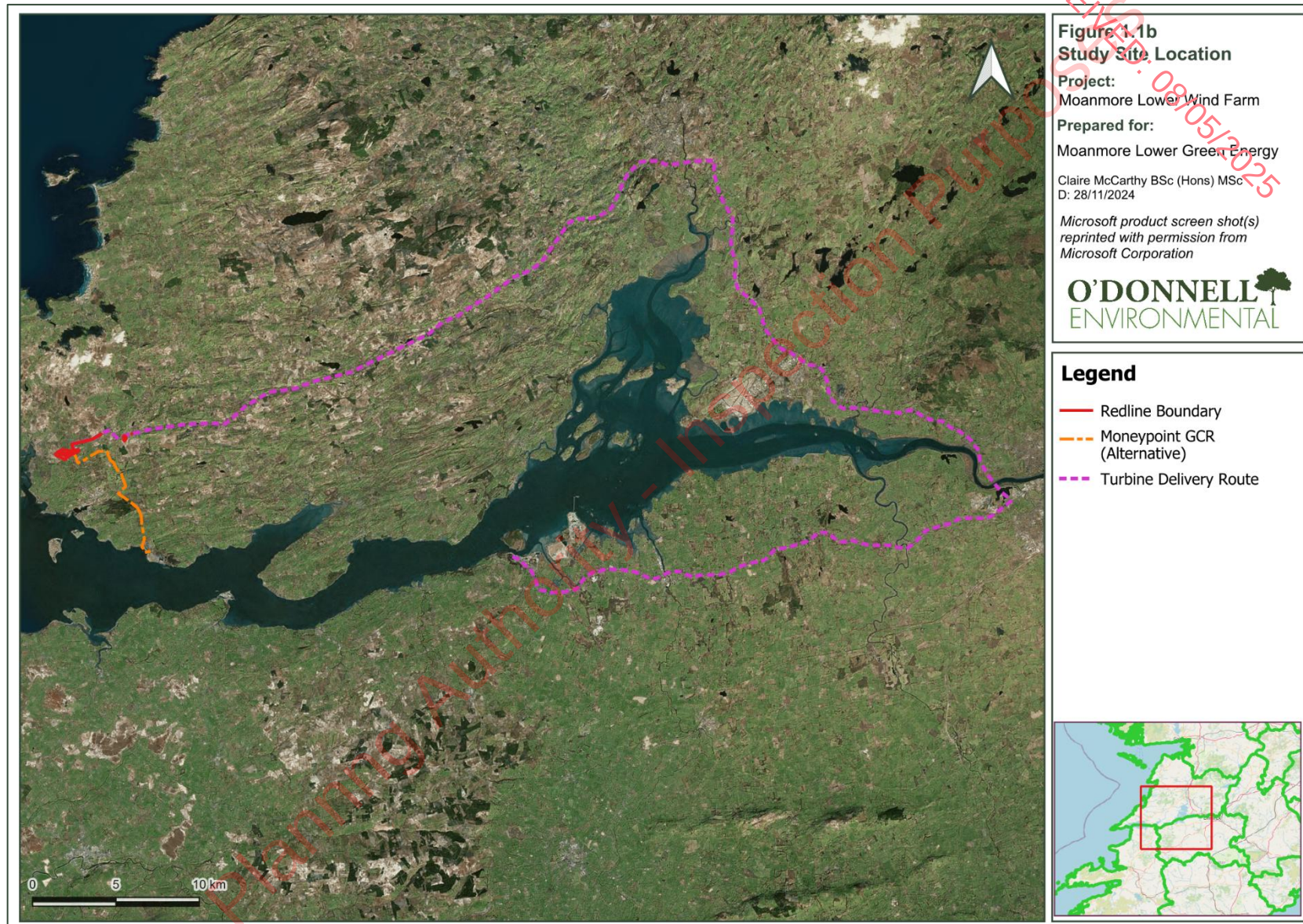
Tom O'Donnell is a Chartered Environmentalist and a full member of the Chartered Institute of Ecology and Environmental Management. He was awarded a BSc in Environmental and Earth System Science [Applied Ecology] in 2007 and an MSc in Ecological Assessment in 2009, both from UCC. Tom has over 16 years professional experience in the environmental industry, including working on projects such as windfarms, overhead power lines, roads, cycleways and residential developments. Tom is licensed by NPWS for roost disturbance (Ref: DER/BAT 2023-16) and to capture bats (C25/2023).

Claire McCarthy BSc (Hons) MSc is a Qualifying member of the Chartered Institute of Ecology and Environmental Management. She was awarded a BSc in Biological, Earth and Environmental Sciences

[Zoology] in 2018 and an MSc in Marine Biology in 2022, both from UCC. Claire has contributed to the preparation of EIAR and EclA reports for renewable energy developments and has experience in preliminary roost assessments and bat activity surveys. Claire is licensed by NPWS for bat roost disturbance (Ref: DER-BAT-2025-42) and photography of all bat species (092/2024).

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2 Methodology

This assessment was carried for a study area which comprises the wind farm site, the two GCRs (to Tullabrack and the alternative to Moneypoint) and the TDR. The assessment was carried out through a desktop review, daytime visual inspection of potential bat roosting features and passive detector surveys. Each of these elements are described below.

2.1 DESKTOP REVIEW

A desktop review of publicly available relevant data was undertaken on the National Biodiversity Data Centre (NBDC)¹ and National Parks & Wildlife Service (NPWS)² websites. The National Biodiversity Data Centre was reviewed for relevant data, specifically i) existing species records for the 10km square in which the study site is located (Q95) and ii) an indication of the relative importance of the wider landscape in which the study site is located, based on Model of Bat Landscapes for Ireland (Lundy et al., 2011). In the latter, the index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. A protected species data request was submitted to NPWS for information not otherwise publicly available regarding protected species such as the Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat.

Bat Conservation Ireland (BCI) conducted a search of their records database at the request of O'Donnell Environmental Ltd. on 5th May 2023. The relevant search area included a 30km radius from a central point within the proposed site. Known roost locations in the target area as well as activity records from BCI Volunteer based surveys and ad-hoc activity records submitted by Ecological Consultants were provided. Where roost locations occur in private dwellings the location provided refers to relevant 1km grid square.

Relevant ecological reports and correspondence submitted as part of previous planning applications relating to nearby sites (Clare Co. Co. Ref. 24/60143; ABP Ref. PL03.319961); Clare Co. Co. Ref. 18/679) were considered in the preparation of this current report.

2.2 POTENTIAL ROOST ASSESSMENT

Preliminary Roost Assessment (PRA) and Ground Level Tree Assessment (GLTA) surveys were carried out following Collins (2023). Targeted daytime surveys were carried out by Tom O'Donnell and Claire McCarthy on the 12th of September and 19th of November 2024 to determine the presence of bats or Potential Roosting Features (PRFs) where proposed works may impact directly or indirectly on a PRF within the study area including the turbine delivery and grid connection route options. Features inspected included bridges, buildings and trees. Of specific interest are sites which may support significant roosts such as maternity roosts, winter roosting sites and autumn swarming sites.

Potential roost assessment surveys were non-destructive, and relevant PRFs were visually inspected from ground level to identify any evidence of bat roosting. Further inspections of potential roosting features were carried out using a torch and endoscope and those at height were accessed using a 5-meter ladder where necessary and safely possible. Signs of bat use include bat droppings, feeding remains, potential bat access points identified by characteristic staining and scratches, noise made by bats etc.

¹ <https://maps.biodiversityireland.ie/Map>. Accessed 05/09/2024.

² <https://www.npws.ie/protected-sites>. Accessed 05/09/2024.

The potential suitability of structures for roosting bats was classified according to the guidelines in Collins (2023), see **Table 2.1** below. Selected photographs of features surveyed are shown in **Section 3.2**.

Table 2.1. Scheme for describing the potential suitability of structures for bats.

Suitability	Description
None	No habitat features likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).
Negligible	No obvious habitat features likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable and not a classic cool/stable hibernation site but could be used by individual hibernating bats).
Moderate	A structure with one or more potential roost sites that could be used by bats due their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.

After 'Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition)', Collins (2023).

In relation to trees, Collins (2023) has moved away from the subjective approach used in Collins (2016) for categorising individual PRFs in trees. Collins (2023) acknowledges the subjectivity of the previous approach and the many constraints associated with surveying trees for bats. The preliminary ecological appraisal, now termed the Daytime Bat Walkover (DBW), of trees present on site follows the categorisations scheme outlined in **Table 2.2**.

In line with Marnell et al. (2022), a risk-based approach was adopted in relation to survey of individual trees for the presence of PRFs. Marnell et al. (2022) recommends a risk-based approach, in which trees with a high probability of use by bats should be subject to survey. Factors listed as increasing the probability of trees being used by roosting bats include ancient woodland, large trees with complex growth form, visible damage etc. Factors listed as decreasing the probability of trees being used by roosting bats include “coniferous plantation with no specimen trees” and “young trees with simple growth form and little damage”.

Table 2.2. Scheme for describing the potential suitability of PRFs in trees on a proposed development site for bats.

Suitability	Description
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further Assessment Required to establish if PRFs are present in the tree.
PRF	A tree with at least one PRF present.

Following the confirmation of the possible presence of PRFs in trees, the assessment of suitability is further refined during the Ground Level Tree Assessment (GLTA), whereby the potential suitability of such PRFs is now categorised according to the system detailed in **Table 2.3** below.

Table 2.3. Scheme for describing the potential suitability of PRFs in trees for bats.

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

Winter is the optimal season to survey trees for PRFs. In winter reduced leaf cover maximises light penetration and minimises obstruction of vision (BTHK (2018), Collins (2023)). While ground-level tree surveys can confirm the presence of roosting bats, they often cannot conclusively confirm the absence of roosting bats (Collins, 2023). In trees, evidence of recent bat occupation can rapidly disappear. For example, droppings can persist in buildings for many years while they generally do not persist for long in tree roosts.

Tree roosts have been shown to be used in a more transient manner than buildings with many species exhibiting roost switching behaviour (Collins, 2023). For example, Waters et al. (1999) observed roost switching in Leisler's Bats every 2 to 10 days during the active season.

For the above reasons, this report takes a conservative approach when considering bat roosting potential of trees. This approach reflects the fact that any tree with bat potential may be used at some point or another and the conservation importance of multiple roosting opportunities is poorly understood.

2.2.1 Potential Significant Roosts

NatureScot (2021) recommends that key roosting features which could support maternity roosts and significant hibernation and / or swarming sites on the wind farm site be identified in a search area extending to 200m plus one rotor radius from the "site boundary". The potential for significant roosts was investigated within an area extending to a minimum of 268m from the 'redline' boundary (as it relates to turbines) (see **Figure 1.1a**). Features with potential to accommodate significant bat roosts were identified through examination of OSI historic 6" mapping, aerial imagery as well as ground truthing. Some of the historic features identified by historic mapping no longer exist. Remaining features were surveyed for the presence of bats and their suitability to roosting bats was assessed according to the scheme outlined in Collins (2023). Features considered included bridges, culverts, buildings and trees. Information on known mines and caves was identified through the examination of publicly available information produced by Geological Survey Ireland.

2.3 BAT ACTIVITY SURVEYS

Bat activity at the proposed wind farm site was investigated through the use of passive bat detection.

The Technical Review Board for the 4th Edition of 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Collins 2023) debated the continued use of transect surveys and the comparative benefits and limitations of transect surveys and static passive monitoring are discussed.

Transect surveys are a useful starting point on large sites, allowing us to respond to new information immediately, giving an impression of bat activity across any given site with the additional benefit of observing bat behaviour. However, this survey type only provides a snapshot in time, at a certain time and location. Limitations of this survey type are related to the subjectivity of the Ecologist carrying out the survey, in terms of consistency and repeatability. Additional to this, the accessibility of the habitat and the security of the Ecologist must be considered when carrying out active transect surveys.

Active transect surveys were not considered warranted at the proposed wind farm site due to the nature of the habitats present and the low likelihood of encountering a significant roost proximal to the proposed turbine locations. It is considered that sufficient coverage was achieved for habitats locally through the use of passive detection to evaluate the likely importance of the study area and its immediate environs to bats.

2.3.1 Passive Bat Surveys

In order to inform an assessment of the likely impacts of the proposed wind energy development on bats, surveys were carried out to characterise the importance of the proposed site to such volant mammals. An ultrasonic passive detector survey was carried out at the site to record bat activity in the area from which information on species composition, relative abundance and landscape usage could be derived. This multi-season passive detector survey was carried out from spring 2023 until autumn 2024 following NatureScot (2021) guidelines, with modifications for an Irish context, and NIEA Guidance (2024).



Plate 2.1 – Song Meter Mini Bat Ultrasonic full-spectrum detector deployed at a proposed Turbine location.

Passive bat detectors were deployed at three monitoring stations within the wind farm site for three seasonal periods in 2023 and three seasonal periods in 2024, to record general bat activity in locations corresponding to the proposed design available at the time of deployment (**Figure 2.1**). The likelihood of design changes is acknowledged in NatureScot (2021) and in this instance, all three proposed turbine locations were altered slightly in the final design. Wildlife Acoustic's SM4 full-spectrum bat detectors and Song Meter Mini Bat Ultrasonic full-spectrum detectors were deployed at suitable locations as proximal to the proposed turbine locations (available at the time of survey) as safely feasible. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise and the GPS locations were set on each detector. The detectors automatically adjust their start and finish times based on sunrise and sunset.

The detector for the 'Bat_01' monitoring station was deployed at a proxy location across all survey periods in 2023, as it could not be safely deployed at the exact Turbine 1 location proposed. The 'Bat_01' monitoring station was located as close to the proposed turbine as safely feasible, ultimately located on a fence line along a watercourse (EPA name: Moyasta 27). Enclosures were constructed at the proposed turbine locations for the 2024 survey period and all detectors were deployed at the locations corresponding the design available at the time, within built enclosures (see **Plate 2.1**).

The locations of detectors deployed are provided in **Table 2.4** below and shown in **Figure 2.1**. Details of the survey periods are shown in **Table 2.5**.

Table 2.4 Passive Bat Monitoring Survey Locations

	Ref.	Latitude	Longitude
2023	Bat_01 (proxy)	52.665598	-9.511286
	Bat_02	52.662857	-9.517036
	Bat_03	52.661315	-9.510525
2024	Bat_01	52.664937	-9.510903
	Bat_02	52.662806	-9.517123
	Bat_03	52.661302	-9.510564

Individual bats of the same species cannot be distinguished by their echolocation alone and therefore 'bat registrations' are used as a measure of activity. A bat registration is defined as the presence of an individual species echolocation within a recording of maximum 15 seconds duration. All bat registrations recorded during this study follow these criteria, allowing comparison between monitoring stations. It is important to note that bat registrations do not equate to number of individuals.

A Davis 'EnviroMonitor' weather monitoring station was erected at a suitable location (52.662339, -9.510374) (see **Plate 2.2**), which was considered to record weather conditions representative of those at the proposed site. Relevant parameters (temperature, wind speed, rainfall) were recorded to demonstrate that weather conditions on each survey night were suitable, as set out in the NIEA (2024).



Plate 2.2 - Weather station erected at a suitably safe location in proximity to the proposed wind farm development site.

Monitoring periods follow guidance in NatureScot (2021) and NIEA (2024). The minimum number of good-weather survey nights for each of the three seasonal surveys was:

- Spring - 10 nights
- Summer - 20 nights
- Autumn - 10 nights

Appropriate weather conditions for bat activity in lowland sites (<200m) are described as temperatures of 10°C and above for most of the survey period, maximum ground level wind speed of 18km/hr and no heavy rainfall (NIEA, 2024). Appropriate weather conditions prevailed during the three survey periods, for both years. It is considered that appropriate coverage was achieved in the passive bat detection surveys.

Although commonly applied in Ireland, the NatureScot (2021) guidelines 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation' were written for a Scottish context. While survey effort and design are carried out according to the guidelines in this study, the guidelines were adapted to an Irish context in the following ways:

- NatureScot (2021) recommends the use of an online tool, 'Ecobat' to provide a measure of relative bat activity. The tool compares site specific inputted data to a comparator database to provide an interpretation of the level of bat activity compared to other sites in Britain. The tool is not considered to be appropriate for use as yet in an Irish context (data is heavily weighted by data collected in the UK where there are a different range of bat species and differing ecology). In relation to Ecobat, NIEA (2024) states that "caution should be exercised when using the tool as it has a significant bias towards results from Great Britain and there is a paucity of data from Northern Ireland or Ireland where we have a significantly different species assemblage. Therefore, it is currently unlikely to produce results which accurately reflect the species composition and bat activity levels normally encountered on wind turbine sites in Northern Ireland". At the time of writing, the EcoBat tool is offline and has been since June 2022. Interpretation of relative activity levels at the proposed site versus other similar sites in Ireland relies on the expertise and experience of the authors.
- Assessment of vulnerability of bats to wind farms, including assessment of collision risk, generally follows the procedure outlined in NatureScot (2021) but with amendments in line with NIEA (2024) to reflect the Irish species assemblage and the different relative abundance of individual species (e.g. Leisler's Bat) in an Irish context.

Table 2.5 Details of passive monitoring periods.

	Date [Night Of]	Sunset	Sunrise	Appropriate Weather	Bat_01	Bat_02	Bat_03
Spring 2023	13/04/2023	20:33	06:47		✓	✓	✓
	14/04/2023	20:34	06:45		✓	✓	✓
	15/04/2023	20:36	06:43	✓	✓	✓	✓
	16/05/2023	20:38	06:40	✓	✓	✓	✓
	17/05/2023	20:40	06:38	✓	✓	✓	✓
	18/05/2023	20:41	06:36	✓	✓	✓	✓
	19/04/2023	20:43	06:34	✓	✓	✓	✓
	20/04/2023	20:45	06:31		✓	✓	✓
	21/04/2023	20:47	06:29		✓	✓	✓
	22/04/2023	20:48	06:27		✓	✓	✓
	23/04/2023	20:50	06:25		✓	✓	✓
	24/04/2023	20:52	06:23		✓	✓	✓
	25/04/2023	20:54	06:21		✓	✓	✓
	26/04/2023	20:55	06:19	✓	✓	✓	✓
	27/04/2023	20:57	06:16	✓	✓	✓	✓
	28/04/2023	20:59	06:14	✓	✓	✓	✓
	29/04/2023	21:01	06:12	✓	✓	✓	✓
	30/04/2023	21:02	06:10	✓	✓	✓	✓
	01/05/2023	21:04	06:08	✓	✓	✓	✓
	02/05/2023	21:06	06:06	✓	✓	✓	✓
	03/05/2023	21:08	06:04	✓	✓	✓	✓
Summer 2023	01/06/2023	21:51	05:21	✓	✓	✓	✓
	02/06/2023	21:52	05:20	✓	✓	✓	✓
	03/06/2023	21:53	05:19	✓	✓	✓	✓
	04/06/2023	21:54	05:19	✓	✓	✓	✓
	05/06/2023	21:55	05:18	✓	✓	✓	✓
	06/06/2023	21:56	05:17	✓	✓	✓	✓
	07/06/2023	21:57	05:17	✓	✓	✓	✓
	08/06/2023	21:58	05:16	✓	✓	✓	✓
	09/06/2023	21:59	05:15	✓	✓	✓	✓
	10/06/2023	22:00	05:15	✓	✓	✓	✓
	11/06/2023	22:01	05:15	✓	✓	✓	✓

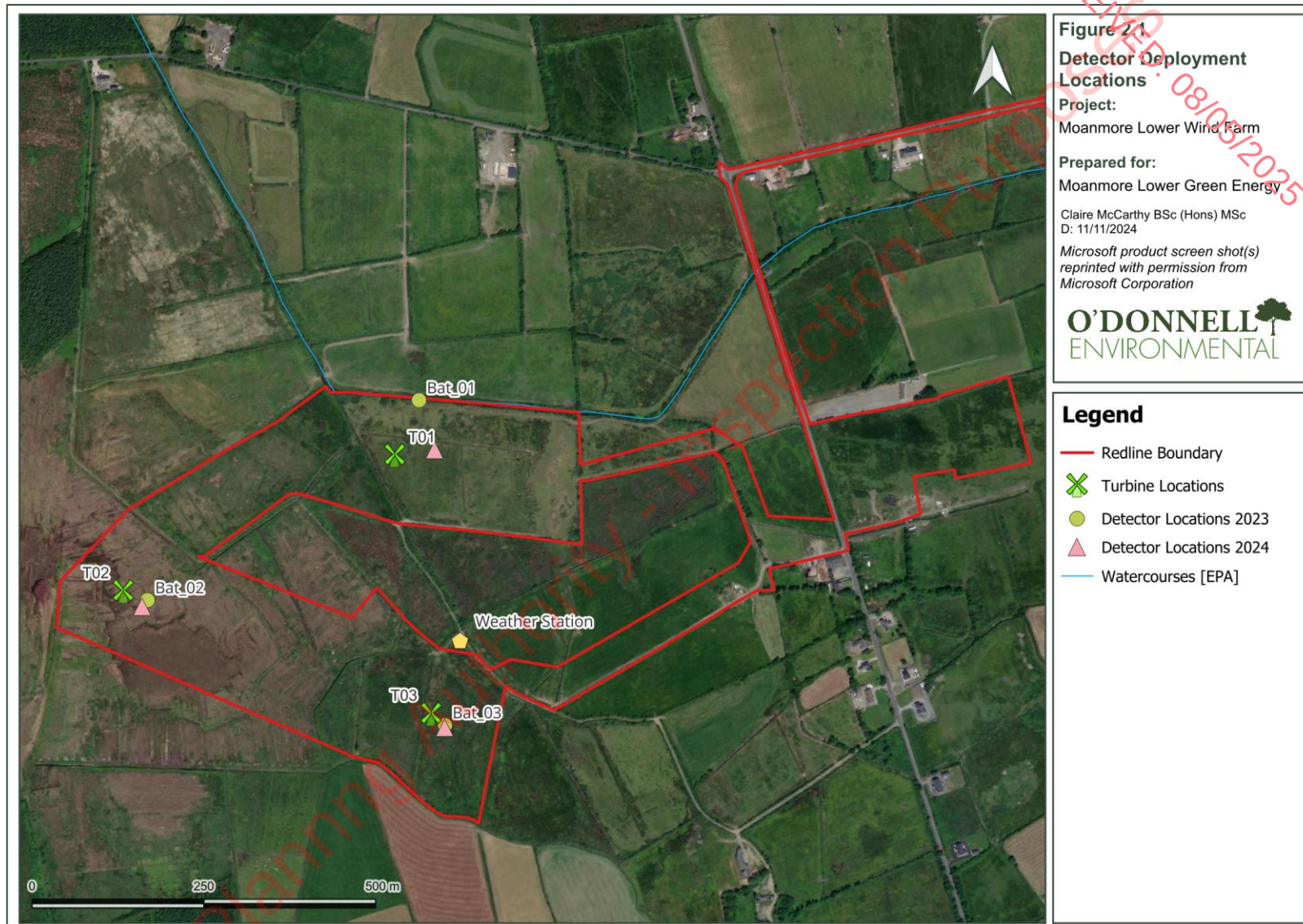
	12/06/2023	22:01	05:14	✓	✓	✓	✓
	13/06/2023	22:02	05:14	✓	✓	✓	✓
	14/06/2023	22:02	05:14	✓	✓	✓	✓
	15/06/2023	22:03	05:13	✓	✓	✓	✓
	16/06/2023	22:04	05:13	✓	✓	✓	✓
	17/06/2023	22:04	05:13	✓	✓	✓	✓
	18/06/2023	22:04	05:13	✓	✓	✓	✓
	19/06/2023	22:05	05:13	✓	✓	✓	✓
	20/06/2023	22:05	05:13	✓	✓	✓	✓
	21/06/2023	22:05	05:13	✓	✓	✓	✓
	22/06/2023	22:05	05:13	✓	✓	✓	✓
	23/06/2023	22:06	05:14	✓	✓	✓	✓
	24/06/2023	22:06	05:14	✓	✓	✓	✓
	25/06/2023	22:06	05:14	✓	✓	✓	✓
Autumn 2023	31/08/2023	20:29	06:48	✓	✓	✓	✓
	01/09/2023	20:26	06:49	✓	✓	✓	✓
	02/09/2023	20:24	06:51	✓	✓	✓	✓
	03/09/2023	20:22	06:53		✓	✓	✓
	04/09/2023	20:20	06:54	✓	✓	✓	✓
	05/09/2023	20:17	06:56	✓	✓	✓	✓
	06/09/2023	20:15	06:58	✓	✓	✓	✓
	07/09/2023	20:12	06:59	✓			
	08/09/2023	20:10	07:01	✓	✓	✓	✓
	09/09/2023	20:08	07:03	✓	✓	✓	✓
	10/09/2023	20:05	07:04	✓	✓	✓	✓
	11/09/2023	20:03	07:06	✓	✓	✓	✓
	12/09/2023	20:01	07:08		✓	✓	✓
	13/09/2023	19:58	07:09	✓	✓	✓	✓
	14/09/2023	19:56	07:11	✓	✓	✓	✓
	15/09/2023	19:53	07:13	✓	✓	✓	✓
	16/09/2023	19:51	07:14	✓	✓	✓	✓
	17/09/2023	19:49	07:16	✓	✓	✓	✓
	18/09/2023	19:46	07:18		✓	✓	✓
	19/09/2023	19:44	07:20		✓	✓	✓
	20/09/2023	19:42	07:21			✓	✓

	21/09/2023	19:39	07:23				✓
Spring 2024	15/04/2024	20:37	06:36		✓	✓	✓
	16/04/2024	20:39	06:34		✓	✓	✓
	17/04/2024	20:41	06:32		✓	✓	✓
	18/04/2024	20:43	06:30	✓	✓	✓	✓
	19/04/2024	20:44	06:28		✓	✓	✓
	20/04/2024	20:46	06:25		✓	✓	✓
	21/04/2024	20:48	06:23		✓	✓	✓
	22/04/2024	20:50	06:21		✓	✓	✓
	23/04/2024	20:52	06:19	✓	✓	✓	✓
	24/04/2024	20:53	06:17		✓	✓	✓
	25/04/2024	20:55	06:15		✓	✓	✓
	26/04/2024	20:57	06:13		✓	✓	✓
	27/04/2024	20:58	06:11		✓	✓	✓
	28/04/2024	21:00	06:09	✓	✓	✓	✓
	29/04/2024	21:02	06:07		✓	✓	✓
	30/04/2024	21:04	06:05		✓	✓	✓
	01/05/2024	21:05	06:03		✓	✓	✓
	02/05/2024	21:07	06:01		✓	✓	✓
	03/05/2024	21:09	05:59	✓	✓	✓	✓
	04/05/2024	21:11	05:57		✓	✓	✓
	05/05/2024	21:12	05:55		✓	✓	✓
	06/05/2024	21:14	05:54	✓	✓	✓	✓
	07/05/2024	21:16	05:52		✓	✓	✓
	08/05/2024	21:17	05:50		✓	✓	✓
	09/05/2024	21:19	05:48	✓	✓	✓	✓
	10/05/2024	21:21	05:47		✓	✓	✓
	11/05/2024	21:22	05:45	✓	✓	✓	✓
	12/05/2024	21:24	05:43	✓	✓	✓	✓
	13/05/2024	21:26	05:42	✓	✓	✓	✓
	14/05/2024	21:27	05:40	✓	✓	✓	✓
	15/05/2024	21:29	05:39		✓	✓	✓
	16/05/2024	21:30	05:37	✓	✓	✓	✓
	17/05/2024	21:32	05:36	✓		✓	
	18/05/2024	21:33	05:34	✓		✓	

	19/05/2024	21:35	05:33	✓			
	20/05/2024	21:36	05:32	✓			
Summer 2024	27/06/2024	22:05	05:16	✓	✓	✓	✓
	28/06/2024	22:05	05:17	✓	✓	✓	✓
	29/06/2024	22:05	05:18	✓	✓	✓	✓
	30/06/2024	22:05	05:18	✓	✓	✓	✓
	01/07/2024	22:04	05:19	✓	✓	✓	✓
	02/07/2024	22:04	05:20	✓	✓	✓	✓
	03/07/2024	22:03	05:21	✓	✓	✓	✓
	04/07/2024	22:03	05:22	✓	✓	✓	✓
	05/07/2024	22:02	05:23	✓	✓	✓	✓
	06/07/2024	22:02	05:24	✓	✓	✓	✓
	07/07/2024	22:01	05:25		✓	✓	✓
	08/07/2024	22:00	05:26	✓	✓	✓	✓
	09/07/2024	21:59	05:27	✓	✓	✓	✓
	10/07/2024	21:59	05:28	✓	✓	✓	✓
	11/07/2024	21:58	05:29	✓	✓	✓	✓
	12/07/2024	21:57	05:30	✓	✓	✓	✓
	13/07/2024	21:56	05:31	✓	✓	✓	✓
	14/07/2024	21:55	05:33	✓	✓	✓	✓
	15/07/2024	21:54	05:34	✓	✓	✓	✓
	16/07/2024	21:53	05:35	✓	✓	✓	✓
	17/07/2024	21:51	05:37	✓	✓	✓	✓
Autumn 2024	02/09/2024	20:22	06:52	✓	✓	✓	✓
	03/09/2024	20:20	06:54	✓	✓	✓	✓
	04/09/2024	20:18	06:56	✓	✓	✓	✓
	05/09/2024	20:15	06:57	✓	✓	✓	✓
	06/09/2024	20:13	06:59	✓	✓	✓	✓
	07/09/2024	20:11	07:01	✓	✓	✓	✓
	08/09/2024	20:08	07:02	✓	✓	✓	✓
	09/09/2024	20:06	07:04	✓	✓	✓	✓
	10/09/2024	20:04	07:06	✓	✓	✓	✓
	11/09/2024	20:01	07:07	✓	✓	✓	✓

Note 1: ✓ Appropriate weather conditions achieved for lowland sites parameters outlined in NIEA, 2024.

Note 2: * Weather Station Offline.



2.4 DATA ANALYSIS

Species identification was aided by post hoc sonogram analysis using Wildlife Acoustics' Kaleidoscope Professional software (v. 5.4.8) and British Trust for Ornithology (BTO) 'Acoustic Pipeline' sound analysis tool. Automatic identifications were manually verified following the parameters set out in Russ (2012; 2021) and Middleton et al. (2014).

2.5 EVALUATION & IMPACT ASSESSMENT

Evaluation of ecological features follows the NRA (now TII) publication 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (2009). Impact assessment follows 'Guidelines on The Information to be Contained in Environmental Impact Assessment Reports' published by the EPA (2022). Reporting generally follows Chartered Institute of Ecology and Environmental Management (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine'.

2.6 SURVEY LIMITATIONS

Weather conditions were optimal during surveys, and the proposed wind farm site and environs were fully accessible. For all three survey seasons in 2023 a proxy location was used for monitoring station 'Bat_01'. This location was not truly representative of the habitat within which the proposed turbine will be located, or the level of activity expected at the proposed turbine location. However, this is not considered a significant limitation given the availability of data from the nearby 'Bat_03' recording station and the similar nature of the habitat (wet grassland) at this monitoring station to that of the proposed Turbine 1 location. It is considered that sufficient coverage of the relevant habitats within the area was obtained across the two survey years.

The final turbine layout varied from that which was available at the time of the 2023 surveys and varied slightly again following the completion of the 2024 surveys. Following best practice guidelines, detectors should be deployed within 15m of the proposed turbine location, where safely feasible. Detectors were deployed >15m from the final turbine locations. In this instance, this is not considered a significant limitation as the nature of the habitats within which the detectors were deployed are the same as those in which the turbines will be located. NatureScot (2021) acknowledges the likelihood of layout changes during the survey of bats on windfarms.

The preferred and alternative grid connection routes were surveyed in their entirety. All structures with potential to support significant bat roosts, that could potentially be impacted by the proposed works were suitably surveyed. The section of the TDR along which facilitation works are proposed was surveyed in its entirety (L6132, L2034 and L2036).

Overall, it is considered that the study was not limited in any significant way.

3 Results

The results of the desktop review and field surveys outlined are presented in detail below.

3.1 DESKTOP REVIEW

The wind farm site itself is not located within any internationally or nationally designated sites. Following NatureScot (2021), a search was undertaken for nationally and internationally designated bat roosting sites within 10km of the proposed wind farm site. No sites which include bats in their conservation interests are present within 10km of the proposed windfarm site, and therefore none are relevant to the current assessment.

National Biodiversity Data Centre (NBDC) holds previous records of bat presence from within the 10km square (Q95) in which the proposed site is located. These records are for Brown Long-eared Bat (*Plecotus auritus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*). It is important to note that an absence of other bat species records is reflective of a lack of surveys undertaken to date rather than absence of bat species.

The overall bat suitability index value (31.11) according to 'Model of Bat Landscapes for Ireland' (Lundy et al., 2011) suggests the landscape in which the proposed site is located is of moderate to high suitability for bats in general. Species specific scores are provided in **Table 3.1** below.

Table 3.1 - Suitability of the study area for the bat species according to 'Model of Bat Landscapes for Ireland' (Lundy et al., 2011).

Common name	Scientific name	Suitability index
All bats	-	31.11
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	41
Brown long-eared bat	<i>Plecotus auritus</i>	51
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	35
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	26
Leisler's bat	<i>Nyctalus leisleri</i>	40
Whiskered bat	<i>Myotis mystacinus</i>	22
Daubenton's bat	<i>Myotis daubentonii</i>	31
Nathusius pipistrelle	<i>Pipistrellus nathusii</i>	15
Natterer's bat	<i>Myotis nattereri</i>	38

Available bat records were provided by Bat Conservation Ireland (BCI) from their database of roost locations and other bat records. Details of known roost locations in the target area as well as results from BCI Volunteer based surveys and records submitted by Ecological Consultants were provided and reviewed. The relevant search area consisted of a 30km radius from a central point within the proposed wind farm site. Where roost locations occur in private dwellings the location shown refers to the 1km grid square in which the roost is located. Roost records are summarised in **Table 3.2** and shown in **Figure 3.1**.

Consideration was given to the location of the proposed site relative to the 'Core Sustenance Zones' (CSZ) of all known bat roosts proximal to the site. When considering development, Collins (2023) states that the CSZ could be used to indicate:

- The area surrounding a communal roost within which development work may impact the flight-paths and foraging habitat of bats using that roost.
- The area within which it may be necessary to ensure no net reduction in the quality and availability of foraging habitat for the colony.

CSZ distances for species known to occur in Ireland range from 1km to 4km although these distances are based on limited information in some instances (Collins, 2023). Roost records were considered within a search area extending to 4km from proposed turbine locations, and no roost records were identified within this 4km radius.

In the absence of information specific to Ireland, CSZ distances provided in Collins (2023) are considered to be best available information. The most proximal roost was recorded at Moneypoint, Co. Clare (R0352), approx. 7km south-east of the proposed site (see **Figure 3.1**). Species recorded at this roost location include Brown Long-eared Bat, Soprano Pipistrelle, Natterer's Bat and Lesser Horseshoe Bat. The proposed wind farm site is located outside of the CSZs for the species of this roost (Collins, 2023).

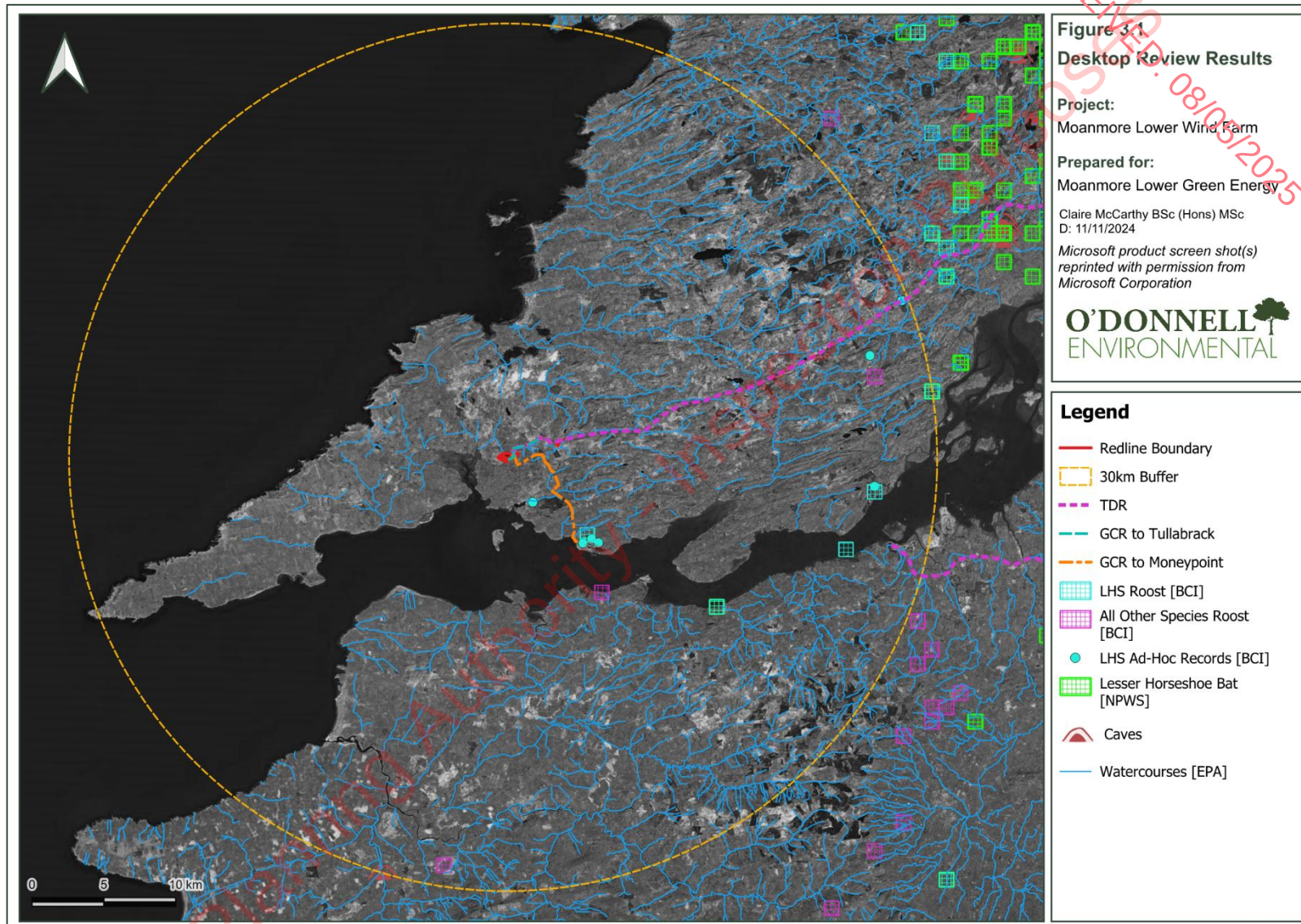
BCI Volunteer based surveys and activity records submitted by Ecological Consultants (Ad-hoc records) were provided and analysed for the presence of the Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat and are shown in **Figure 3.1**. An Ad-hoc record of Common Pipistrelle, Soprano Pipistrelle and Lesser Horseshoe Bat was recorded south of Kilrush town centre, Co. Clare in 2019 (see **Figure 3.1**).

A protected species data request was submitted to NPWS and species records for the relevant area (10km grid squares which the proposed site overlaps; Q85, Q86, Q94 Q95, Q96, R04, R05, R06, R15, R16) were received on 2nd November 2023 and no records were held for the Annex II listed Lesser Horseshoe Bat within the search area.

The proposed project (i.e. all elements contained within the redline boundary) are not located within the relevant CSZ of any known bat roosts. In the event that the alternative grid route to Moneypoint was utilised (following a future assessment and consent) no effects would likely arise on any bat known roost given the nature of the nature and extent of the proposed works, which would be entirely with existing roads.

Table 3.2 – Bat Conservation Ireland bat roost locations within a 30km radius of the proposed windfarm site.

Grid Reference	Record	Species
Q9329	Private	Brown Long-eared Bat
R0352	Private	Brown Long-eared Bat, Lesser Horseshoe Bat, Soprano Pipistrelle, Natterer's Bat
R0448	Private	Whiskered Bat, Soprano Pipistrelle
R1247	Private	Lesser Horseshoe Bat
R2151	Private	Brown Long-eared Bat, Lesser Horseshoe Bat, Pipistrelle spp. (45kHz/55kHz), Whiskered Bat
R2355	Private	Lesser Horseshoe Bat
R2363	Private	Whiskered Bat
R2762	Private	Lesser Horseshoe Bat



3.2 POTENTIAL ROOST ASSESSMENT

Surveys were carried out to identify and investigate potential bat roosting features at the following locations:

- Proposed wind farm site.
- Proposed grid connection route to Tullabrack 110kV Substation (see **Figure 3.2**).
- Proposed alternative grid connection route to Moneypoint Power Station (see **Figure 3.3**).
- Proximal to the facilitation works along the proposed Turbine Delivery Route (see **Figure 3.4**).

During these surveys, all trees and structures (incl. bridges) which might be impacted by the proposed development and which may potentially host significant bat roosts were inspected visually. Preliminary ground level assessment of trees and inspection of structures was carried out following guidance set out in 'Bat Surveys for Professional Ecologists: Good Practice Guidelines', Collins (2023). All residences and unoccupied structures were surveyed externally. A conservative approach was taken when considering the bat roosting potential of structures. Given the scale and temporary nature of the facilitation works involved, this level of survey effort is considered appropriate and no further surveys are warranted.

3.2.1 Potential Roosts at Proposed Windfarm

Features with potential to accommodate significant bat roosts extending to a minimum of 268m from the 'redline' boundary, as it relates to turbines, were considered as part of this assessment. EPA data regarding known locations of caves and historic mining operations was examined in order to identify the presence of any known underground features which could support a significant bat roost. No key features likely to support a significant roost were recorded within this search area.

Tree roosts are reliant upon the presence of specific features which can provide suitable shelter for roosting bats (BTHK, 2018). PRFs in trees form as a result of disease and decay from pruning, cankers, knot-holes, woodpecker-holes, tear-outs etc. Damage is also caused by subsidence cracks, lightning strikes, welds, lifting bark etc. Other features which can offer roosting potential include Ivy cover and fluting (common natural formations found along the stems of trees). As mentioned, tree roosts are shown to be used in a more transient manner than buildings with many species exhibiting roost switching behaviour (Collins, 2023). The roosting potential of trees on the proposed wind farm site was considered and no vintage or 'over-mature' trees were present in the study area. No bat roosts were identified in any tree and no trees with roosting features considered to be above 'Negligible' suitability to roosting bats were present within the proposed wind farm site.

3.2.2 Potential Roosts along the Grid Connection Routes

Visual survey and inspection of Potential Roosting Feature (PRFs) which may be directly or indirectly impacted by the proposed grid connection works was carried out. Trees and structures, including bridges, recorded along both preferred and alternative GCR options were assessed in terms of their suitability to support roosting bats.

Buildings, bridges and other structures can provide bats with ample shelter, stable temperatures and dry conditions considered necessary for the formation of significant roosts (i.e. maternity roosts). Bridges often present suitable crevices for roosting bats which offer suitable conditions and are in an optimal location for foraging bats, being located above a watercourse. Being linear features, river corridors connect habitats within the wider landscape and may be used by bats for commuting. Both

grid routes will require watercourse crossings and the associated bridges and culverts were assessed and are discussed in further detail below.

3.2.2.1 Option 1: GCR to Tullabrack 110kV Substation

A grid connection to Tullabrack 110kV Station is proposed (and included within the 'redline boundary' and will be approx. 2.5km in length and will include one watercourse crossing (52.667307, -9.504266) (see **Figure 3.2**). All structures and trees along the proposed route, thought to have potential to support roosting bats, which might be impacted directly or indirectly by the proposed works were considered as part of this assessment.

No evidence of roosting bats, current or historic, was found along the grid connection route to Tullabrack 110kV Substation at the time of the survey. No trees considered suitable for roosting bats were identified along the route. The general habitat is of agricultural grasslands and coniferous plantation, considered suitable for foraging bats. It is deemed that no PRFs present along the grid connection route are likely to be significantly impacted by the proposed works. The zone of influence of the proposed grid connection route is limited, confined to the immediate works area and is temporary in nature. In the event a bat roost was present within a structure along the route, no potential impacts are likely to arise during the construction or operation of the cable route. The locations of structures assessed are shown in **Table 3.3** and **Figure 3.2**.

The single watercourse crossing ('WC#1') along this grid route will be constructed by means of directional drilling. This will involve the drilling of holes in a horizontal direction for the laying of ducts to contain the 38kV cables beneath the watercourse (see Chapter 2; Section 2.5.10.2 for details). While the watercourse presents suitable foraging and commuting habitat for bats, the bridge, 'S_01', above it was assessed and is considered to be of 'Negligible' suitability for potential roosting bats. The barrel of the bridge is approx. 2m at the highest point and is covered with corrugated sheet metal limiting its roosting suitability (**Plate 3.1a & b**). The spandrel is constructed of concrete providing no crevices suitable for roosting.

Three residences were recorded along the proposed route: 'S_02', 'S_03' and 'S_06'. 'S_02' is a potentially occupied residence. A gap was visible between the gutter, fascia board and the roof tiles (see **Plate 3.2**). This gap may potentially provide access into the internal roof structure of the house which could provide suitable roosting habitat for bats. Additionally, a window on the west facing gable end was open on both occasions that the route was walked, providing access to the interior of the house. This structure is conservatively assigned a 'High' suitability to support potential roosting bats, given the accessibility for bats to enter the structure and the optimal foraging and commuting habitat which surrounds it (watercourse, treelines etc.).

'S_06' is an occupied residence along the grid connection route. The natural slate roof tiles of this structure are lifting in places, presenting gaps in the roof which may provide access into the internal structure. This residence is conservatively deemed to be of 'High' suitability to support potential roosting bats, given the number of potential access/egress points into the internal structure.

'S_03' is a recently renovated building with an extension to the rear. No obvious gaps in the roof tiles, fascia and soffit, lead flashing or other parts of the residence were visible from external survey. However, the eastern gable end was not visible and may present gaps providing access into the structure. This residence is conservatively assigned a 'High' suitability. 'S_04' is also located to the rear of this residence. This structure is without a roof and is believed to be the remnants of an old stone farm building. Gaps are present between the stonework of the structure which are likely to present minor

PRFs but are not likely to support a significant roost. This structure is assigned a 'Low' level of suitability. All other structures ('S_05', 'S_07' and 'S_08') were assigned a 'Low' suitability (see **Table 3.3** below).

Table 3.3 – Suitability of structures along grid connection route to Tullabrack for potential roosting bats.

Ref.	Type	Description	Latitude	Longitude	Suitability
S_01 (WC#1) ³	Bridge	Galvanised sheeting on roof of bridge arch. No suitable crevices for roosting visible.	52.667307	-9.504266	Negligible
S_02	Residence	Potentially unoccupied residence. Surveyed externally. Minor gap visible between the roof tiles and rain gutter. Windows open at front and side at the time of survey.	52.667338	-9.503787	High
S_03	Residence	Occupied residence. Recently renovated. An extension connects to the main residence at the rear.	52.668592	-9.504238	High
S_04	Structure	Stone structure. Remnants of an old farm building. No roof but minor gaps present between stone which could be used by individual bats opportunistically.	52.668537	-9.503977	Low
S_05	Structure	A group of farm buildings, all with corrugated roof. Could be used by individual bats opportunistically.	52.668625	-9.503834	Low
S_06	Residence	Occupied residence. Old roof, with lifting roof slates providing potential gaps for access.	52.668882	-9.501427	High
S_07	Residence	Occupied. No obvious access into internal structure for bats. Surveyed from road only.	52.670116	-9.495597	Low
S_08	Structure	Newly renovated farm buildings. Corrugated iron roof. Old stone walls with no significant gaps. Could be used by individual bats opportunistically.	52.670667	-9.493424	Low



Plate 3.1a Bridge (S_01) over the 'Moyasta_27' watercourse (crossing #1³).



Plate 3.1b Bridge (S_01) over the 'Moyasta_27' watercourse (crossing #1).

³ Moanmore Lower Wind Farm. Grid Connection Route – Option 1 Watercourse Crossing #1 (PDF) (BFA Consulting, 2023).



Plate 3.2 Residence (S_02) present on the eastern side of the bridge (S_01). Minor gap present between the tile and gutter.



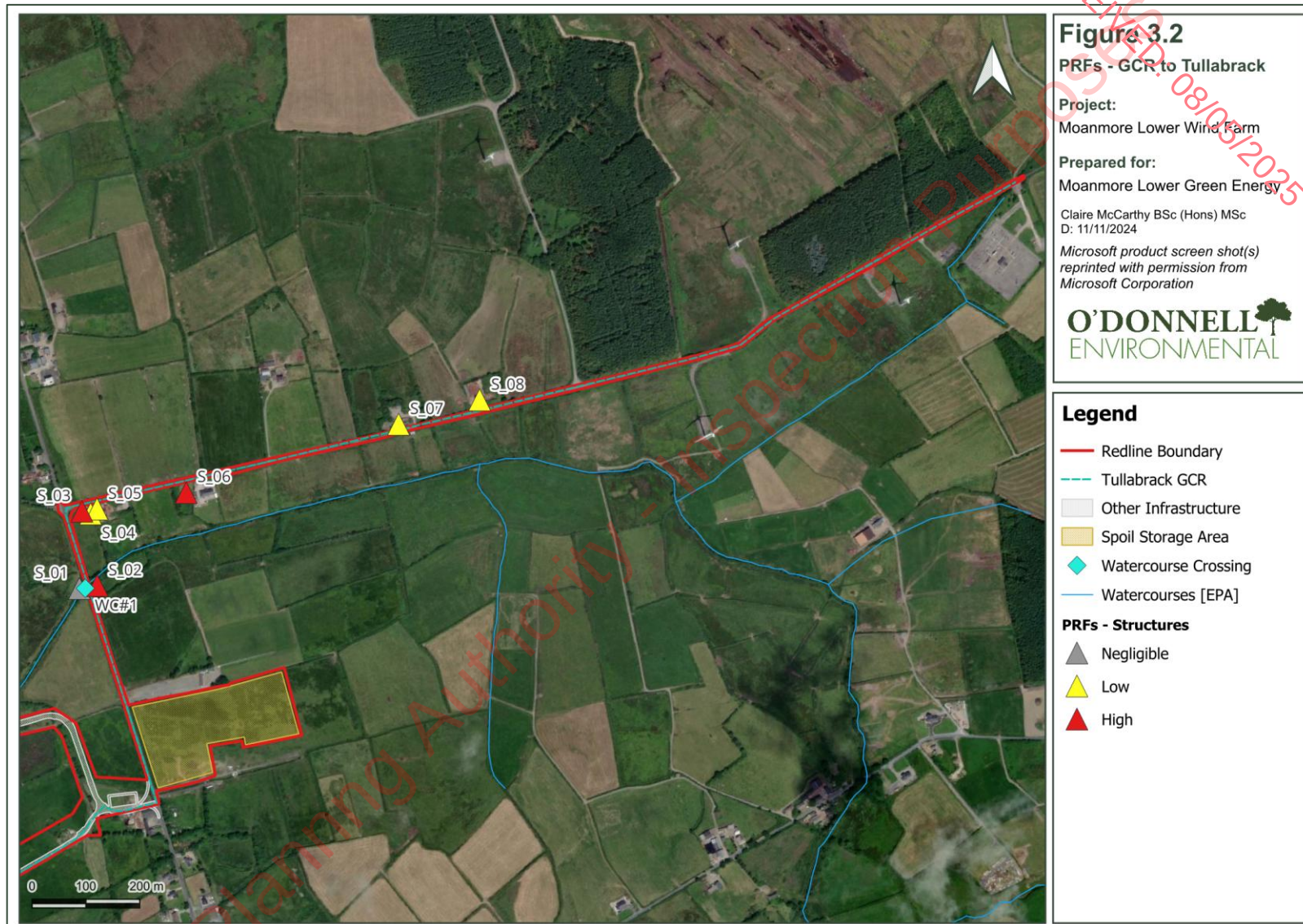
Plate 3.3 Residence (S_03), stone structure (S_04) and other farm buildings (S_05).



Plate 3.4 Occupied residence (S_06) with lifting slate roof tiles providing potential gaps for access.



Plate 3.5 Newly renovated farm buildings (S_08) with corrugated iron roof.



3.2.2.2 Option 2: GCR to Moneypoint Power Station

Although not included within the redline boundary, the alternative GCR to Moneypoint Power Station is considered as part of this assessment in terms of potential cumulative effects. Should this GCR be required it would be subject to further assessment and a separate consenting process.

This alternative route is approx. 10.2km in length and crosses eight watercourses (see **Table 3.4** and **Figure 3.3**). All structures and trees along the proposed route, thought to have potential to support roosting bats, which might be impacted directly or indirectly by the proposed works were considered as part of this assessment. No bat roosts were identified and no evidence of historic roosting by bats was available in any relevant feature along the route. Two structures (excluding bridges and culverts) of 'Low' suitability and five 'PRF-I' suitability trees were considered and are listed in **Table 3.5**.

No evidence of roosting bats, current or historic, was found along the grid connection route to Moneypoint Power station at the time of the survey. No trees considered above 'PRF-I' suitability for roosting bats were identified along the route. The general habitat was of agricultural grasslands, residential dwellings and coniferous plantation. The habitat in general is suitable for foraging bats. No structures or trees of roosting potential along the alternative route are likely to be significantly impacted by the proposed works. The zone of influence of the proposed grid connection route is limited, confined to the immediate works area and is temporary in nature. In the event a bat roost was present within a structure or tree along the route, no potential impacts are likely to arise during the construction or operation of the cable route. The locations of both structures and trees assessed are shown in **Table 3.5** and **Figure 3.3**.

The eight watercourse crossings were assessed for their potential to support roosting bats. Based on the assessment carried out by BFA Consulting it was determined that these crossings will not require HDD and the 20kV underground cables can be installed above the bridge deck and within the road carriageway. According to Billington & Norman (1997) September and October are the best months of the year to identify bridge occupation by bats. These bridges and culverts were surveyed in November, outside of the optimal season.

'WC#2' is a single barrel stone bridge which has been recently pointed. The structure was surveyed in winter and the water level was relatively high (**Plate 3.6a**). Billington and Norman (1997) found that roosts were more frequently recorded in bridges over watercourses with slow flowing water. Additionally, it was found that bridges with barrels less than one meter in height were less likely to be used. In this case, the barrel was at least one meter above the water level at the time of the survey. While no suitable crevices were found in the barrel of the bridge, a potential roosting feature was noted on the upstream spandrel wall (facing south) which is considered to be of 'Low' suitability, in an otherwise featureless structure of 'Negligible' suitability. It is possible that this crevice may be used at least opportunistically by individual bats.

'WC#3' is a tightly constructed single barrel stone bridge (**Plate 3.6d** and **3.6e**). The arch of the barrel is roughly 4.5 meters in height. A fissure exists along the arch of the barrel which was covered in cobwebs at the time of the survey and displayed no evidence of current or historic bat roosts, but is still considered to be of 'Low' suitability. Otherwise, the bridge is considered to be of 'Negligible' suitability for potential roosting bats.

'WC#5' is a double barrel stone bridge (**Plate 3.8f**). The distance between the barrel arches and the water level is approx. one meter. Small crevices are present within the first barrel of the bridge near the

ring stones (**Plate 3.8g**). However, these crevices are close to the water line and are considered less likely to provide suitable roosting opportunities for bats, given the potential to be inundated as the water levels rise. The second barrel has been recently repointed, significantly decreasing its likelihood to be used by roosting bats and is overall considered to be of 'Negligible' suitability.

All other watercourse crossings along this alternative grid connection route are culverts (and one outfall pipe 'WC#9') which are considered to be of 'Negligible' suitability for potential roosting bats given their size and nature.

Table 3.4 – Watercourse crossings proposed to facilitate the connection to Moneypoint Power Station.

Ref.*	Type	Installation Method	Latitude	Longitude	Suitability*
WC#2	Bridge	Trench in roadway or open crossing.	52.66439	-9.48269	Low
WC#3	Bridge	Trench in roadway or open crossing.	52.66399	-9.47234	Low
WC#4	Culvert	Trench in verge.	52.65403	-9.461	Negligible
WC#5	Bridge	Trench in roadway or open crossing.	52.64106	-9.45901	Low
WC#6	Culvert	Trench in verge.	52.63647	-9.4481	Negligible
WC#7	Culvert	Trench in verge.	52.62785	-9.44122	Negligible
WC#8	Culvert	Trench in verge.	52.62205	-9.4398	Negligible
WC#9	Culvert	Trench in verge.	52.6117	-9.43802	Negligible

Note: *Crossing references refer to the Grid Assessment Report (BFA Consulting, 2024).

** Suitability is assigned based on the highest suitability feature present within the structure.



Plate 3.6a Single barrel stone bridge at WC#2.



Plate 3.6b The south facing spandrel wall within which a crevice was discovered and deemed to be of 'Low' suitability.



Plate 3.6c The 'Low' suitability feature assessed.



Plate 3.7d Single barrel stone bridge at WC#3.



Plate 3.7e Recently pointed stonework within the barrel of the bridge.



Plate 3.7f Double barrel stone bridge at WC#5.



Plate 3.8g 'Low' suitability crevices found within barrel 2 of the bridge.



Plate 3.8h Barrel 1 of the bridge presenting no potential roosting features.

Three structures and five trees with potential to support roosting bats were recorded along the alternative grid route to Moneypoint. These trees and structures are listed in **Table 3.5** and shown in **Figure 3.3** below.

Both structures recorded are remnants of old stone farm buildings. Gaps between the stonework are present within both structures which have the potential to support individual roosting bats at least

occasionally. Neither structure possesses the features or conditions considered necessary to support a large number of bats on a regular basis or for longer periods of time given their condition and size.

No trees considered to be of 'PRF-M' suitability (i.e. suitable for multiple bats and may therefore be used by a maternity colony) were recorded along the alternative grid connection route. Five trees of 'PRF-I' suitability were recorded and are listed in **Table 3.5** below. None of the below listed features are likely to be impacted as a result of the proposed works. However, should a roost be present within any of these features there exists potential for temporary, indirect impacts (e.g. noise) during the construction phase, in the absence of mitigation.

Table 3.5 – Suitability of structures and trees along grid connection route to Moneypoint Power Station for potential roosting bats.

Ref.	Type	Description	Latitude	Longitude	Suitability
S_09	Structure	Remnants of two old stone farm buildings. No roof on either. Moderate Ivy cover. Gaps in the stonework present minor PRFs. Open and exposed not likely to support large numbers of bats. May be used opportunistically by single individuals.	52.646132	-9.455983	Low
S_10	Structure	Remnants of old stone farm structure. No roof. Dense Ivy cover at one gable end. Gaps in the stonework present minor PRFs. Open and exposed not likely to support large numbers of bats. May be used opportunistically by single individuals.	52.630561	-9.441580	Low
T_01	Tree	Group of trees along the roadside. Semi-mature to mature specimens. Moderate to dense Ivy cover. View of PRFs restricted at height. May be used opportunistically by single individuals.	52.658338	-9.499084	PRF-I
T_02	Tree	Mature specimen. Dense Ivy cover. Minor PRF visible. Torn limb at approx. 1.5m height 80cm in length, facing north. Shallow but with potential to support individual bats opportunistically.	52.658664	-9.499186	PRF-I
T_03	Tree	Mature specimen. Dense dead Ivy cover. No other PRFs visible.	52.658657	-9.498582	PRF-I
T_04	Tree	Semi-mature specimen. Moderate Ivy cover. No other PRFs visible.	52.655743	-9.464345	PRF-I
T_05	Tree	Mature Beech. No Ivy cover. Large hole approx. 2 meters height. 40cm length. Not possible to determine how deep. May be used opportunistically by single individuals. Large torn limb approx. 1 meter in length. Shallow and not considered suitable for roosting.	52.655603	-9.464377	PRF-I



Plate 3.9a Remnants of an old stone farm building 'S_09'.



Plate 3.9b Gable end of the stone structure, highlighting two crevices suitable to support individual roosting bats occasionally (S_09).



Plate 3.9c Gable end of the stone structure, with suitable crevices and moderate Ivy cover (S_09).



Plate 3.9d Gaps between the stonework on the gable end, providing suitable roosting habitat for individuals bats (S_09).



Plate 3.10 Damage caused from a torn limb on 'T_02', which may be used opportunistically by individual bats.



Plate 3.11 'T_05' showing signs of damage from a torn limb (too shallow to support a significant roost) and a knot-hole which may be used opportunistically by individual bats.



3.2.3 Potential Roosts along Turbine Delivery Route

Although not included in the 'redline' boundary, the Turbine Delivery Route is an essential component of the overall wind farm development, and the potential impact of associated facilitation works is therefore considered. Visual survey and inspection of Potential Roosting Features (PRFs) which may be directly or indirectly impacted by the proposed works was carried out. Only the section of the TDR which will require temporary and permanent facilitation works was considered for this assessment. The remainder of the route which consists of Motorway and National roads, along which no works are proposed, was not considered.

The section of the TDR assessed was generally characterised by sparse distributions of short-length mature treelines and hedgerows and was otherwise generally open and exposed in nature. The relevant potential roosting features along the proposed TDR include trees and structures. The results of this assessment are presented in **Table 3.6** and **Figure 3.4**.

The proposed TDR overlaps with the proposed GCR to Tullabrack Substation. For the purposes of clarity, PRFs located along the TDR which overlap with the GCR to Tullabrack are not repeated in this section. Structures referred to in this section are considered additional to those discussed in *Section 3.2.2.1* (see for details).

Facilitation works along the TDR include road widening, verge strengthening and vertical realignment of the L6132, along its length to the N68 at Dereens cross. Vertical realignment will be permanent. Road widening along the L2034 between Tullabrack Cross and the junction with the L2036 will be carried out to accommodate increased volumes of HGV vehicles associated with the construction of the wind farm. Road widening and road strengthening of the L6132 and L2034 will increase the running width to 4.5m and 5.5m at passing locations to withstand the abnormal vehicles delivering the turbine components. There are three water crossings along the L6312 at which steel plates will be placed on the verge to avoid excavation and ground disturbance.

The development will require clear-felling of 0.845ha of commercial forestry in the Townland of Tullabrack East to facilitate the construction of the blade set down area. The forestry to be felled consists mostly of Sitka Spruce and the felling is expected to take up to one month. Coniferous plantations that lack specimen trees are considered less likely to provide potential roosting opportunities for bats (Marnel et al., 2022).

No evidence of roosting bats was recorded along the proposed TDR. Four structures and 12 trees with bat roosting potential were identified along the portion of the TDR which facilitation works are proposed. Ten of these trees displayed 'PRF-I' suitability, with the potential to support individual bats opportunistically or very small numbers of bats due to size (see **Table 2.3**). Two trees of 'PRF-M' suitability were recorded, with the potential to support multiple roosting bats. Based on current information to date, neither of these trees are proposed for removal to facilitate the delivery of turbine components.

No potential for impacts on any of the structures surveyed are envisaged and no further surveys are deemed necessary. The zone of influence of the proposed works is limited, confined to the immediate works area and is temporary in nature. In the event that a bat roost was present in one of the structures along this route, no potential impacts are likely to arise during the facilitation works proposed for the TDR or the delivery of the turbines components themselves.

Table 3.6 – Suitability of structures and trees along the TDR for bats.

Ref.	Type	Description	Latitude	Longitude	Suitability
S_11	Structure	Stonework single story structure with attic section. No interior access. Exterior examination reveals that some of the roof slates are lifting and the window to the rear of the property is broken, offering potential access into the building.	52.674876	-9.477487	High
S_12	Structure	Disused residence with snowberry and montbretia out front. Building appears to be in good structural condition with no identifiable gaps or crevices.	52.677091	-9.437706	High
S_13	Structure	Stonework shed with asbestos roof directly atop wooden frame. Hole in roof allowing light and water ingress. No evidence of roosting. Gaps in stonework.	52.678712	-9.423380	Moderate
S_14	Structure	Two storey derelict residence with attic space. Stonework below modern plaster exterior. Synthetic tiles with gaps in roof into attic. Interior wall panelling of wood provides baffles for light and water ingress. Open windows along ground and upper floor.	52.680096	-9.409937	High
T_06	Tree	Vertical rot-hole fissure facing north at 3m. Low ivy cover.	52.67340	-9.46565	PRF-I
T_07	Tree	Line of five mature beech trees with minor roosting features visible from roadway such as rot-hole stemming from tear-offs of ancillary limbs of narrow diameter. Located within private residence setback from the road.	52.67287	-9.46491	PRF-I
T_08	Tree	Multi-stem. Rot-hole facing north at 10m and 12m from historic surgery.	52.67284	-9.46374	PRF-I
T_09	Tree	Rot-hole from limb tear-off at 10m facing north.	52.67280	-9.46355	PRF-I
T_10	Tree	Two downward facing minor rot-holes at 7m facing north. Potential for pooling water which reduces suitability.	52.67611	-9.44362	PRF-I
T_11	Tree	Fissure associated with tear-off facing north at 4m. Does not appear to extend inwards to any significant degree.	52.67849	-9.42439	PRF-I
T_12	Tree	Rot-hole at 6m facing north. Becoming overgrown with ivy.	52.67862	-9.42335	PRF-I
T_13	Tree	Tear-out and associated fissure facing southeast at 6m. Cracked limb at 4m facing south. Thick interweaving ivy stems of dead ivy.	52.67944	-9.41551	PRF-M
T_14	Tree	Fissure facing south at 6m. Low ivy cover. No other identifiable features.	52.67942	-9.41569	PRF-I
T_15	Tree	Minor tear-out at 3m facing south. Does not extend inwards to any major degree.	52.67948	-9.41523	PRF-I
T_16	Tree	Major rot-hole at 2m facing north. Minor rot-holes at 8m and 10m facing north overgrown with thick interweaving dead ivy.	52.68092	-9.39426	PRF-M
T_17	Tree	Shallow wound facing northeast at approx. 1m. Partially overgrown with ivy.	52.680787	-9.391560	PRF-I



Plate 3.12 Turn off from the N68 onto the L6312 along which facilitation works are required.



Plate 3.13a Unoccupied single storey stonework building (S_11).



Plate 3.13b Broken window at the rear of 'S_11' providing potential access into the interior of the building.



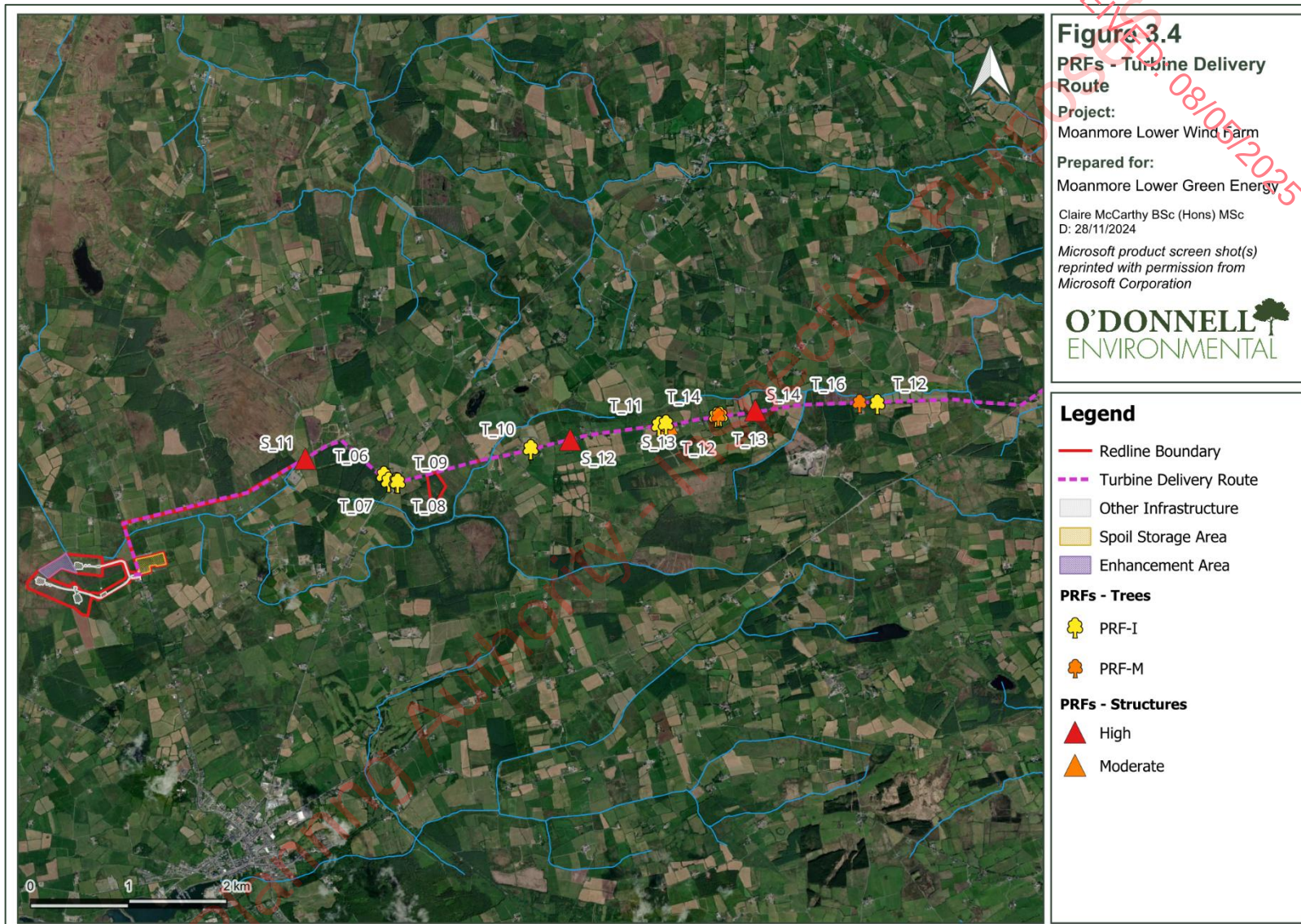
Plate 3.15 Stonework shed with asbestos roof. Large hole within the roof allowing significant light ingress (S_13).



Plate 3.16 Mature Ash displaying 'PRF-M' suitability along the TDR with large cavity (red) resulting from a tear off at height (T_13).



Plate 3.17 Mature Ash displaying 'PRF-M' suitability along the TDR with large cavity (red) resulting from storm damage near the base (T_16).



3.3 BAT ACTIVITY SURVEYS

Bat activity within the zone of influence of the wind farm site was assessed through the use of passive detection. The results of these surveys are described in detail below.

3.3.1 Passive Bat Survey

Ultrasonic detector surveys were carried out at the proposed wind farm site across three seasons in 2023 and 2024 to record bat activity in the area, from which information on species composition, relative abundance and landscape usage could be derived. The surveys were carried out from three monitoring locations based on the turbine layout available at the time of each deployment.

For the 2023 surveys, the passive detector for monitoring station 'Bat_01' was deployed on a fence line along a nearby watercourse. For this reason, the level of activity recorded at this particular location was considerably higher for all species (except Leisler's Bat). It is considered that this level of activity is not truly representative of the level expected at the proposed Turbine 1 location and will be omitted from the discussion below.

Overall, in 2023, a moderate level of activity was recorded at the site between the two monitoring stations, with a high level of species' diversity. A total of 8 bat species were recorded (possibly nine as Whiskered Bats and Brandt's Bats are indistinguishable through ultrasonic detection). Overall, activity was highest in summer with a nightly average of 71.3 registrations. Common Pipistrelle was the most abundantly recorded species for the spring and summer monitoring seasons, with the highest average registrations per night for this species recorded in summer (33.4). Average nightly registrations for Soprano Pipistrelle and Leisler's Bat were highest in the autumn monitoring period (24.9 and 19.3 respectively). When comparing monitoring stations (excluding 'Bat_01') across three seasons in 2023, activity was highest at monitoring station 'Bat_02' for the summer and autumn monitoring periods. Activity levels were similar at both 'Bat_02' and 'Bat_03' monitoring stations for the spring period, with an acutely higher number of registrations recorded at 'Bat_03'.

Monitoring locations in 2024 for all three turbines were considered representative of the habitats within which the turbines will be located. The results of passive monitoring are presented in **Table 3.7**. The total count of registrations recorded in 2024 was 5,735, with the highest level of activity recorded in spring (n=3,210), with a nightly average of 94.4, followed by the summer and autumn monitoring periods. Of the three monitoring stations activity was lowest at 'Bat_03', a similar finding to that of the 2023 monitoring surveys. Activity was highest at monitoring station 'Bat_01' in spring and summer (43.5% and 48.3% respectively), while activity was acutely higher at 'Bat_02' in the autumn monitoring period.

Four species comprised the majority of registrations across the site and across all survey seasons. These species include Common Pipistrelle (37.4%), Leisler's Bat (27.5%), Soprano Pipistrelle (22.7%), and Natterer's Bat (10.9%). These species are all considered common and widespread within and Irish context and are largely considered generalist foraging species, despite their general avoidance of peatland habitat (Roche et al., 2014; Lundy et al., 2011). Although, monitoring station 'Bat_02' is located on cutover bog and activity levels here were low to moderate for the 2024 monitoring period. The notable exception is Natterer's Bat which tends to select more strongly for areas of woodland and riparian habitat (Lundy et al., 2011).

The remaining species' registrations combined accounted for 1.5% of the total registrations recorded during the 2024 monitoring survey: Brown Long-eared Bat (0.66%) and Nathusius' Pipistrelle (0.61%),

Daubenton's Bat (0.14%), *Myotis* sp. (0.05%) and Whiskered Bat (0.02%) and were only recorded in a subset of seasons.

Overall, a moderate level of activity was recorded at the wind farm site for the 2024 monitoring period and a moderate level of species diversity, with eight of the nine resident species recorded. The Annex II species Lesser Horseshoe Bat was not recorded during any of the passive surveys. The Moanmore Lower wind farm site generally lacks bat roosting opportunities and primarily represents a foraging habitat.

3.3.1.1 Spring 2024 Passive Monitoring Survey

A moderate level of species diversity was recorded during the spring 2024 monitoring period, with a total of seven species confirmed. A moderate level of activity was recorded with a total of 3,210 bat registrations across the 34-night survey and a nightly average of 94.4 registrations recorded. Activity levels recorded at 'Bat_01' and 'Bat_02' were roughly twice that recorded at 'Bat_03' for this season. The spring 2024 monitoring period comprised more than half of the bat activity (55.9%) recorded for the three survey seasons in 2024.

Common Pipistrelle was the most abundantly recorded species at each of the monitoring stations and accounted for 47.9% of all registrations recorded during the spring season. Common Pipistrelle activity was highest at monitoring stations 'Bat_01' and 'Bat_02', accounting for 36.8% and 45.4% of registrations recorded here respectively. A peak of 200 Common Pipistrelle registrations was recorded at 'Bat_02' on the 18th of May, the highest peak of any species recorded during the surveys.

Soprano Pipistrelle was the next most commonly recorded species, accounting for 21.6% of all registrations recorded. 49.2% of all Soprano Pipistrelle registrations were recorded at 'Bat_01', with almost equal levels of activity recorded at the other two monitoring stations. A nightly average of 20.4 Soprano Pipistrelle registrations were recorded for this period across the three monitoring stations.

It is known that Common and Soprano Pipistrelle are common and widespread in Ireland and are present in a wide variety of habitat types, and so higher activity levels for these species when compared with others is considered typical.

Leisler's Bat were recorded as the third most common species across the site accounting for 17.4% of all registrations recorded during this passive monitoring season. Leisler's Bats are a relatively large and fast-flying species and have been recorded to have relatively large territories and to travel significant distances to reach preferred foraging habitats (Shiel et al., 2006). While strong habitat associations for the species have been difficult to identify in an Irish context, there is evidence to suggest a positive association with pasture and freshwater habitats (Roche et al., 2014). The sites within which all three turbines are proposed likely represent optimal foraging habitat for this species. A nightly average of 16.4 Leisler's Bat registrations was recorded for this monitoring period across the three monitoring stations. Leisler's Bat is considered to be of relatively high risk of collision with wind turbine blades, due to their higher level of flight (NatureScot, 2021).

Natterer's Bat was recorded at all monitoring stations, a similar finding to that of the 2023 surveys. A peak in Natterer's activity was recorded at 'Bat_01', at which 78.9% of all Natterer's registrations were recorded. On average, across the three monitoring stations, 11.06 Natterer's Bat registrations were recorded per night.

Nathusius' Pipistrelle was recorded at each monitoring station, but activity was low for this season, with a total of 34 registrations and a nightly average of a single registration. Nathusius' Pipistrelle is also

considered to be of relatively high risk of collision with wind turbine blades. Brown Long-eared Bat registrations were recorded at 'Bat_01' and 'Bat_02'. This species is often underrepresented in ultrasonic detection surveys due to their weak echolocation call, which is often only detected within 5m of an individual (Russ, 2012). A total of five Brown Long-eared registrations were recorded across this monitoring period. Similarly low levels of Daubenton's Bat activity were recorded this monitoring season, with a total of four registrations, recorded at 'Bat_01' only. Together these three species accounted for <2% of all registrations recorded.

3.3.1.2 Summer 2024 Passive Monitoring Survey

A moderate level of species diversity was recorded during this monitoring period, with a total of seven species confirmed. Nathusius' Pipistrelle was not recorded this season, but Whiskered Bat was. A total of 1,804 bat registrations were recorded across the 21-night survey and a nightly average of 85.9 registrations. Activity levels recorded at 'Bat_01' were highest for this season (48.3% of all registrations), while activity levels at 'Bat_02' and 'Bat_03' were similar (27.9% and 23.6% respectively). The summer monitoring period was the second most active season of the 2024 monitoring seasons, accounting for 31.5% of all recorded registrations.

Leisler's Bat was the most active species recorded during this season, accounting for almost half of the registrations recorded (43.7%). This species was most actively recorded at 'Bat_01', with almost equal levels of activity at the other two monitoring stations. On average, 37.6 Leisler's Bat registrations were recorded per night for this season, across the three monitoring stations.

Similar levels of activity were recorded for Common and Soprano Pipistrelle this season, representing 23.4% and 21.6% respectively, of all registrations recorded. Both species were most actively recorded at 'Bat_01', with 42.9% of all Common Pipistrelle registrations and 38.05% of all Soprano Pipistrelle registrations recorded here. Similar levels of activity for both species were recorded at monitoring stations 'Bat_02' and 'Bat_03'.

Natterer's Bat was recorded at all monitoring stations, with the highest proportion of registrations recorded at 'Bat_01' at 60.66%. Natterer's Bat accounted for 10.14% of all registrations recorded this season. On average, across the three monitoring stations, 8.7 Natterer's Bat registrations were recorded per night, less than the average recorded for spring.

Brown Long-eared Bat registrations were recorded in small numbers across all the monitoring locations (n=16) and represented <1% of the total registrations recorded during this passive monitoring season. As mentioned previously, Brown Long-eared Bat can be under-recorded due to the low volume of their calls and thus it is a possibility that this species has been under-recorded in this instance. Brown Long-eared Bat activity was highest at 'Bat_01', accounting for 68.8% of registrations, followed by 'Bat_03' and a single registration was recorded at 'Bat_02'.

Daubenton's Bat and Whiskered Bat registrations accounted for <1% of all the registrations recorded. 75% of the total Daubenton's Bat registrations recorded were recorded at 'Bat_03' and this species was not recorded at 'Bat_01'. A single Whiskered Bat registration was recorded at monitoring station 'Bat_02'. This was also the result of the summer monitoring period in 2023. Whiskered Bats and Brandt's Bats are indistinguishable through ultrasonic detection and thus it is possible that this registration represents either species.

3.3.1.3 Autumn 2024 Passive Monitoring Survey

A moderate level of species diversity was recorded during the autumn 2024 monitoring period, with a total of six bat species confirmed (potentially seven as *Myotis sp.* could represent any of three *Myotis* species).

A moderate level of activity was recorded with a total of 721 bat registrations across the 10-night survey period. A nightly average of 72.1 registrations was recorded across three detector locations. Activity levels recorded during the autumn 2024 period were the lowest of the three seasons, accounting for 12.6% of all registrations. Similar levels of activity were recorded across the three monitoring locations, with the majority recorded at 'Bat_02', accounting for 39.5%.

Leisler's Bat and Soprano Pipistrelle activity levels were similar accounting for 32% and 30.6% respectively. Activity levels for both species are considered low to moderate, with average nightly registrations of 23.1 for Leisler's Bat and 22.1 for Soprano Pipistrelle. Both species were recorded across all three monitoring stations and were most commonly recorded at 'Bat_02'.

Common Pipistrelle registrations were the next most recorded, accounting for 25.1% of registrations. The nightly average for this species was 18.1 registrations. Common Pipistrelle activity was concentrated at 'Bat_01' and 'Bat_02'. 30.9% of all registrations recorded at 'Bat_01' were attributed to this species.

A low level of Natterer's Bat activity was recorded this monitoring period, with a nightly average of 6.7 registrations. A similar average was recorded for this species during the autumn 2023 monitoring period (n=5). Natterer's Bat registrations were concentrated at 'Bat_01' and 'Bat_02', accounting for 41.8% and 42.3% respectively.

Brown Long-eared Bat, Nathusius' Pipistrelle and *Myotis sp.* account for <3% of the registrations recorded for this monitoring period. Brown Long-eared Bat and *Myotis sp.* were recorded at all monitoring stations while Nathusius' Pipistrelle was only recorded at 'Bat_03'.

Table 3.7 Results of passive bat monitoring across the two survey years.

	Common Name	Bat_01	Bat_02	Bat_03
Spring 2023	Brown Long-eared Bat	0[0]	0[0]	0.20[1]
	Common Pipistrelle	119.80[302]	9.50[39]	10.30[25]
	Daubenton's Bat	1.90[5]	0[0]	0[0]
	Leisler's Bat	12.30[45]	5.60[20]	5.60[13]
	Myotis sp.	0.10[1]	0[0]	0[0]
	Natterer's Bat	3.20[13]	0.70[2]	1.90[7]
	Soprano Pipistrelle	107.20[275]	4.10[20]	6.70[16]
Summer 2023	Brown Long-eared Bat	0.20[1]	0.20[2]	0.10[2]
	Common Pipistrelle	84.10[165]	22.85[78]	14.95[35]
	Daubenton's Bat	2.50[5]	0.10[2]	0.40[3]
	Leisler's Bat	6.50[15]	10.40[26]	6.05[33]
	Myotis Sp.	0.10[1]	0[0]	0[0]
	Natterer's Bat	12.10[22]	3.15[9]	4.45[16]
	Soprano Pipistrelle	45.15[94]	9.50[25]	5.60[13]
Autumn 2023	Whiskered Bat	0[0]	0.05[1]	0[0]
	Brown Long-eared Bat	0.20[3]	0.40[1]	0.70[4]
	Common Pipistrelle	92.90[1057]	25.10[37]	12.70[34]
	Daubenton's Bat	1.10[14]	0.40[1]	0.50[3]
	Leisler's Bat	8.50[16]	20.90[36]	9.90[17]
	Myotis sp.	0.70[4]	0[0]	0[0]
	Nathusius' Pipistrelle	0.20[1]	0.20[1]	0.10[1]
Spring 2024	Natterer's Bat	4.20[8]	1.70[5]	1.40[3]
	Soprano Pipistrelle	188.10[1266]	28.90[51]	16.50[32]
	Brown Long-eared Bat	0.10[2]	0.10[1]	0[0]
	Common Pipistrelle	29.90[123]	16.50[200]	14.10[34]
	Daubenton's Bat	0.30[2]	0[0]	0[0]
	Leisler's Bat	8.30[15]	8.40[25]	5.30[17]
	Nathusius' Pipistrelle	0.70[2]	0.30[2]	0.80[3]
	Natterer's Bat	14.50[58]	1.50[8]	1.40[5]
	Soprano Pipistrelle	18[91]	6.90[44]	8.70[24]

Summer 2024	Brown Long-eared Bat	0.55[4]	0.05[1]	0.20[1]
	Common Pipistrelle	9[29]	6.95[26]	5.05[15]
	Daubenton's Bat	0.05[1]	0[0]	0.15[1]
	Leisler's Bat	20.90[64]	9.55[21]	8.65[58]
	Natterer's Bat	5[13]	1.50[6]	1.90[6]
	Soprano Pipistrelle	7.35[20]	6.80[20]	5.05[19]
	Whiskered Bat	0[0]	0.05[1]	0[0]
Autumn 2024	Brown Long-eared Bat	0.40[1]	0.80[3]	0.50[2]
	Common Pipistrelle	7.30[20]	6.70[16]	4.10[12]
	Leisler's Bat	5.40[16]	10[24]	7.70[29]
	Myotis sp.	0.10[1]	0.10[1]	0.10[1]
	Nathusius' Pipistrelle	0[0]	0[0]	0.10[1]
	Natterer's Bat	2.80[6]	2.90[10]	1[3]
	Soprano Pipistrelle	7.60[20]	8[16]	6.50[17]

(Note: Data is presented as "average [peak]" where average is the average number of registrations per night on 10 selected nights in the spring and autumn seasons and 20 selected nights in the summer season. Peak data represents the maximum number of nightly registrations from any night in the relevant recording period).

4 Ecological Site Evaluation

The current report describes the proposed study area in terms of roosting and foraging suitability for bats. A comprehensive and appropriate survey effort was employed, and no evidence of bat roosting in either structures or trees present within and immediately adjoining the proposed site could be found. Suitable foraging habitat exists within the proposed wind farm site. Low to moderate levels of bat activity were recorded overall, and the site is not considered remarkable in a local context in terms of its value to foraging bats. The Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat was not recorded.

Taking into account the results of surveys described in this report, the modified nature of the site resulting from turbary and agricultural management, general lack of roosting opportunities and considering its local context, the study site is considered to be of **Local Importance (Lower Value)** for bats.

5 Potential Impacts

The potential impacts of the proposed wind energy development on the bat species recorded at the Moanmore Lower site are discussed in detail below.

5.1 POTENTIAL CUMULATIVE IMPACTS

While a single development may only result in a minor environmental impact, when considered in combination with other impacts it may result in a cumulative impact which could be considered significant (EPA, 2022).

Ecological Impact Assessment aims to determine what if any effects a proposed project would have on ecological conditions, relative to baseline conditions. As part of this process, the potential for cumulative effects is considered. Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2022).

Projects to be considered in an assessment of cumulative effects would include the following types of future development within the same zone of influence:

- Proposals for which consent has been applied which are awaiting determination in any regulatory process (not necessarily limited to planning permission)
- Projects which have been granted consent (not limited to planning permissions) but which have not yet been started or which have been started but are not yet completed (i.e. under construction)
- Proposals which have been refused permission, but which are subject to appeal and the appeal is undetermined to the extent that their details are in the public domain,
- Proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority (CIEEM, 2022).

In some situations, it may be necessary to also consider:

- Constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline.
- Developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan (draft or adopted) (CIEEM, 2022).

There are 16 operational, consented and proposed wind energy developments within 20km of the proposed Moanmore Lower wind farm (see Figure 2.1 of Chapter 2). There are three wind energy developments within 10km of the proposed site, two operational and one proposed (NatureScot, 2021). Moanmore South (seven-turbine) wind farm is the most proximal operational wind farm, located approx. 1.7km northeast of the proposed site boundary, followed by Tullabrack wind farm (six-turbine) at 2.1km northeast of the proposed site. The presence of other wind farms proximal to the proposal is reflected in the site risk assessment process, detailed below.

Other major permitted developments within 10km of the proposed include a Solar PV Energy development (Clare Co. Co. Ref. 18/679) approx. 1km northwest, a residential development at the site of a Convent (Ref. 21/239) approx. 2.7km southwest and a 9-hole pitch and putt course (Ref. 19/380) approx. 2.9km southwest of the proposed site.

A complete list of other major developments within 10km of the proposed wind farm is shown in Chapter 2.

5.2 POTENTIAL CONSTRUCTION PHASE IMPACTS

Wind energy developments present four potential risks to bats (NatureScot, 2021):

- Collision mortality, barotrauma and other injuries.
- Loss or damage to commuting and foraging habitat.
- Loss of, or damage to, roosts.
- Displacement of individuals or populations.

For each of these four risks, the detailed knowledge of bat distribution and activity within the study area gained during the current assessment is used to predict the potential effects of the wind farm on bats. Several bat species were noted within the proposed site, all of which are legally protected under the Irish Wildlife Acts (1976 as amended) and listed on the EU Habitats Directive.

While the site mostly consists of land used for turbary and improved agricultural grassland habitat, with a general lack of roosting opportunities, there exists low productivity foraging habitat and suitable commuting habitat with good connectivity to the surrounding environment. Pasture-based agriculture and peat extraction will continue in undeveloped areas of the site post-construction.

Vegetation removal will be required to facilitate the proposed wind farm, including the site entrance, internal tracks and turbine blade set down area. The impact of this vegetation loss will be reduced foraging and fragmented commuting habitat for bats. Loss of such habitat function has the potential to disturb or displace bats that forage at the site or commute through the site.

The loss of linear features (i.e. hedgerows) to facilitate the construction of the site entrance on the L2034 will be approximately 25m. Internal site tracks follow existing tracks as far as possible (approx. 420m) to minimise additional disturbance and habitat loss. It is estimated that approx. 20m of hedgerow removal is required to facilitate the internal site roads.

Road widening, verge strengthening and vertical realignment of the L6132, along its length to the N68 at Dereens cross is required to facilitate the turbine delivery. Vertical realignment will be permanent. Road widening along the L2034 between Tullabrack Cross and the junction with the L2036 will be carried out to accommodate increased volumes of HGV vehicles associated with the construction of the wind farm. Road widening and realignment will not require any tree or hedgerow removal.

The blade set down area located east of the site will require clear-felling of 0.845ha of commercial forestry and the removal of a section of hedgerow which adjoins the forestry, approx. 70m in length. The forestry to be felled consists mostly of Sitka Spruce. While coniferous plantations that lack specimen trees and are considered less likely to provide potential roosting opportunities for bats (Marnel et al., 2022), this increase in forest edge habitat is likely to increase foraging and commuting locally.

While hedgerows and treelines are common features in the wider landscape, the loss of commuting habitat will potentially displace some bats in the immediate locality of works and marginally reduce habitat connectivity locally. It should be noted that in the context of wind farm development, it is preferable to reduce habitat connectivity in the immediate locality of turbines to reduce the potential for collision and barotrauma to occur.

No bat roosts were confirmed within the site and surveys were characterised by moderate levels of activity. While it is considered that there is no potential for a significant bat roost to occur within the relevant distance of the proposed wind farm development (NatureScot, 2021), it is possible that individual bats or small numbers of bats may roost in trees or existing structures at least occasionally and mitigation measures will be applied to minimise the potential impacts on bats associated with construction related disturbance. No roosting features within trees capable of supporting significant numbers of bats or a maternity colony were noted along either grid connection route and thus the potential for impacts arising are limited. Similarly, considering the scale of the proposed works along the grid connection routes and turbine delivery route, impacts to both private and disused structures are limited.

Construction phase lighting has the potential to attract certain bat species and displace others and floodlighting can be a significant source of disturbance to bat species. However, this impact will be temporary in nature and localized to areas around the site compound. Night-time lighting will be limited in extent (both static lighting, and vehicle headlights) as standard construction works will be carried out mostly during daylight hours.

Construction related run-off or degradation of aquatic habitats through hydrological links could potentially lead to a deterioration of the feeding resource for bats associated with watercourses within the site boundary and in the wider area. Assessment of potential water quality impacts is addressed elsewhere in the EIAR.

Considering the above, in the absence of mitigation, potential effects resulting from the construction phase on bats are considered to be **'permanent, slight negative'** effects at a local level following EPA (2022).

5.3 POTENTIAL OPERATIONAL PHASE IMPACTS

Habitat loss experienced during the construction phase (described above) will continue to persist through the operational phase. The operation of the wind farm at this site has the potential to result in disturbance to commuting and foraging bats. Bat activity at the site was variable with periods of moderate activity occurring for some high collision-risk species. Decreased connectivity resulting from removal of commuting features likely to be used by many bat species (e.g. hedgerows) will persist during the operational phase, but decreased connectivity to proposed turbine locations is desirable in terms of reducing risk of fatality or injury as a result of contact with rotating turbine blades. Collision risk is discussed further below.

5.3.1 Collision Risk

There is little or no published evidence available on prevalence of bat fatalities at wind farms in an Irish context. Where fatalities have been monitored at wind farms in the USA, most losses have been related to periods of migration (www.nationalwind.org).

Both direct collision with turbine blades and barotrauma resulting from close contact with blades have been reported as an issue for bats at wind farms (e.g. Cryan et al., 2009). The susceptibility of bat species likely to be at risk of impacts from wind turbines is partly associated with the likelihood of different species flying at rotor blade height. In an Irish context, Leisler's Bat is considered to have a somewhat greater mortality risk at wind farms than the other species recorded on (or adjacent to) the site, as this species is a relatively large and high-flying species. Leisler's Bats typically do not follow landscape features such as treelines or woodland edges when foraging.

5.3.1.1 Assessment of Collision Risk

A general assessment of vulnerability of bat populations to collision with wind turbines, based on best available scientific information, is provided below. This adapts for use in an Irish context a collision risk scheme provided in NatureScot (2021). NatureScot (2021) provides a generic assessment of bat collision risk for UK species, based on species behaviour and flight categorisation as well as evidence of casualty rates in the UK and Europe. This bat species collision risk assessment is considered to represent best available information for use in an Irish context. For the purposes of this assessment, the results of the most recently completed surveys in 2024 will be considered for the collision risk assessment. The location of the monitoring stations for this survey period are considered more accurate in terms of representing activity levels at proposed turbine locations.

This species collision risk categorisation is used in combination with relative abundance to indicate the potential vulnerability of bat populations. Relative abundance for Irish species was determined in accordance with a scheme for rarity of bat species provided in Wray et al. (2010) in combination with best available population data provided in recent Article 17 reports (NPWS, 2019). The limitations in terms of Irish bat population data is acknowledged in the latter report.

The collision risk estimation scheme for Irish bat species is presented in **Table 5.1** below.

Table 5.1 Scheme for estimation of Irish bat species' population vulnerability to wind energy development.

Relative Abundance	Collision-Risk		
	Low	Medium	High
Common (100,000 plus)			Common Pipistrelle Soprano Pipistrelle
Rarer (10,000 – 100,000)	Daubenton's Bat Brown Long-eared Bat Lesser Horseshoe Bat		Leisler's Bat
Rarest (under 10,000)	Natterer's Bat Whiskered Bat		Nathusius Pipistrelle

Population vulnerability: yellow = low, orange = medium, red = high.

In determining the project specific potential risk to bats, NatureScot (2021) recommends a two-stage process as follows:

- **Stage 1:** Indicatively assess potential site risk based on consideration of habitat present and development related features (i.e. number of turbines, size of turbines and proximity to other wind farms).
- **Stage 2:** Overall assessment of risk for high collision-risk species, considering bat activity results and the relative vulnerability of species.

Initially an assessment of the general site risk based on habitats present was carried out following the scheme presented in SNH (2019) and NatureScot (2021). No trees of potential roosting suitability were recorded local to the proposed wind farm site. The site represents a low productivity foraging habitat which could be used by a small number of foraging bats. Although the site is relatively well connected to the surrounding landscape, it is assigned a habitat risk of 'Low' based on the quality of foraging habitat available and the general lack of roosting opportunities within the site. Although the proposed development consists of ≤10 turbines (three-turbine project) it is considered 'Medium' as there is one proposed and two operational wind farms within 10km of the proposed project. According to the project

size categories in NatureScot (2021), turbines of height >100m are included in the 'Large' project category. This height refers to the 'tip height' of the turbine (P. Taylor (NatureScot), Pers. Comm.). The maximum tip height of the turbines proposed for this development is 150m, however given the number of turbines (significantly less than the threshold for a large site >40 no. turbines) it is considered that 'Medium' remains the appropriate project size category. Based on the above initial site risk assessment, the proposed project is considered to be 'Medium Risk' to bats and a site risk score of 2 is applicable.

The next stage of the process is applicable to 'high collision-risk' species only and utilises information on the activity level recorded on site in each monitoring period. This assessment is intended to identify projects which are of greatest concern in terms of bat collision risk. The following high collision-risk species have been recorded at the current site:

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle

Leisler's bats are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. While Leisler's Bat is rare in a European context, Ireland is a stronghold for the species. They are classified as 'Rarer' for the purposes of this assessment but the minimum population range for the species in Ireland is estimated at 63,000 to 113,000 (NPWS, 2019) and therefore the species may be 'Common'. Leisler's Bats were recorded during activity surveys across the site (see **Table 3.7**). Overall activity levels for Leisler's Bat in the context of the proposed wind farm are considered moderate.

Common Pipistrelle are a common and widespread species in Ireland and considered to be a high-collision risk species due to their foraging ecology and flight characteristics. Common Pipistrelles were one of the most commonly recorded species across the site. Overall activity levels for Common Pipistrelles in the context of the proposed wind farm is considered moderate to high.

Soprano Pipistrelle are another common and widespread species in Ireland which are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. Overall activity levels for Soprano Pipistrelles in the context of the proposed wind farm are considered to be moderate.

Nathusius' Pipistrelle has a fast flight and is slightly less agile in flight than the other Pipistrelle species and is positively associated with broadleaf woodland and areas where pasture is less extensive (Roche et al., 2014). This species is considered to be of high-collision risk due to their foraging ecology and flight characteristics. Nathusius' Pipistrelle was only recorded in spring and autumn, yielding an overall low activity category.

Table 5.2 Overall collision risk assessment of relevant (high-risk) species.

	Species	Site Risk Level	Activity Category	Overall Assessment
Spring 2024	Leisler's Bat	2	Low to Moderate (2)	4
	Common Pipistrelle	2	Low to Moderate (2)	4
	Soprano Pipistrelle	2	Low to Moderate (2)	4
	Nathusius' Pipistrelle	2	Low (1)	2
Summer 2024	Leisler's Bat	2	Low to Moderate (2)	4
	Common Pipistrelle	2	Low to Moderate (2)	4
	Soprano Pipistrelle	2	Low to Moderate (2)	4
Autumn 2024	Leisler's Bat	2	Low to Moderate (2)	4
	Common Pipistrelle	2	Low to Moderate (2)	4
	Soprano Pipistrelle	2	Low to Moderate (2)	4
	Nathusius' Pipistrelle	2	Low (1)	2

Overall Collision Risk Assessment: green = low, orange = medium, red = high.

While activity levels of the above species varied between survey locations (corresponding to proposed turbine locations) it is not possible to determine with any accuracy the different levels of collision risk presented by individual turbines (NatureScot, 2021).

As per NatureScot (2021) there is no requirement to complete an overall risk assessment for low-risk species. The low-risk species recorded at this proposed wind farm site were Brown Long-eared Bat, Daubenton's Bat, Natterer's Bat and Whiskered Bat. Overall activity levels were low for these species and by the virtue of their low potential vulnerability to wind energy developments, no significant collision related risk is likely.

No additional loss of foraging and commuting habitat, relative to that discussed above in relation to the construction phase, will occur during the operational phase. No other significant impacts are likely to occur on bats during the operations phase of the proposed wind farm.

Overall, in the absence of mitigation, the proposed wind farm in its operational phase is likely to have a **'permanent, slight negative'** effect on bats at a local level (following EPA, 2022).

5.4 POTENTIAL DECOMMISSIONING PHASE IMPACTS

No other potential impacts other than those already discussed above for the construction and operational phases are likely to occur during decommissioning. Decommissioning activities are assumed to be similar to construction activities, having similar type risks and sensitive receptors associated with them. However, they are considerably less intrusive.

Overall, the effect of potential impacts on bats during decommissioning of the proposed wind farm is considered to be **'neutral'** at a local level following EPA (2022).

6 Mitigation Measures

The proposed mitigation measures applicable to the construction and operational phases of the proposed wind energy development at Moanmore Lower are discussed in detail below.

6.1 CONSTRUCTION PHASE MITIGATION

Pre-construction surveys will be carried out by an Ecologist immediately prior to the commencement of any required vegetation clearance to establish if the baseline conditions reported herein remain valid, given the potential for delays between reporting and the commencement of construction. This will ensure that any changes in site context in relation to suitability for bats will be highlighted and that any additional mitigation measures which are then required are applied.

6.1.1 Vegetation Clearance

Some sections of hedgerow (WL1) and coniferous plantation (WD4) habitat removal is required to accommodate the development of the new site access roads and turbine blade set down area. Also, NatureScot (2021) recommends a minimum 50m buffer from the blade tip to the nearest key habitat features (e.g. woodland, hedgerow etc.) to be implemented to avoid encouraging bat activity within the 'blade-swept' area. These areas will be maintained vegetation-free during the operational life of the development. A methodology for determining the clearance area at ground level is presented in NatureScot (2021). The clearance area surrounding each individual turbine was calculated using the formula presented in **Figure 6.1**.

Figure 6.1 Methodology for determining the clearance area at ground level (NatureScot, 2021).

Calculate the distance between the edge of the feature and the centre of the tower (b) using the formula:

$$b = \sqrt{(50 + bl)^2 - (hh - fh)^2}$$

where:

bl = blade length,
hh = hub height,
fh = feature height (all in metres).

For the example shown, b = 69.3m.

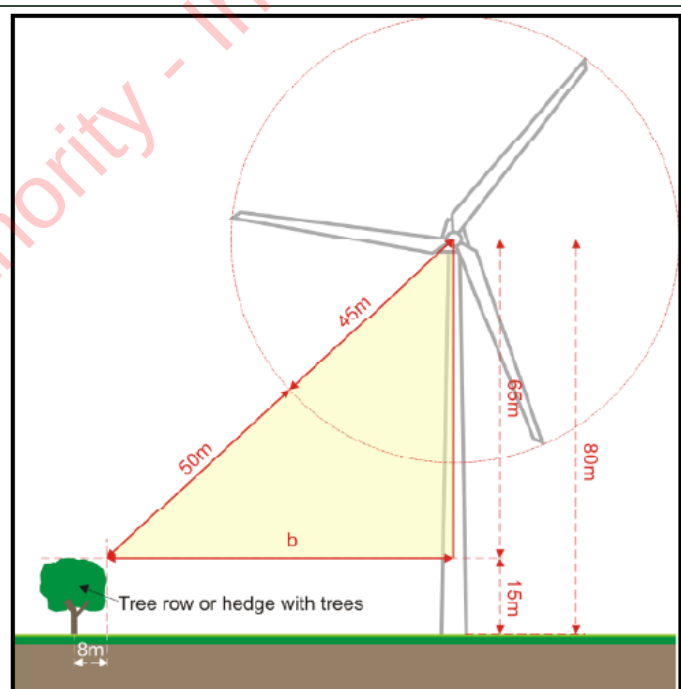


Illustration © Entec Ltd.

Turbine 2 will be located within a cutover bog without significant landscape features and no clearance buffer is required for this turbine. Similarly, Turbine 3 is located within an improved agricultural field with no significant landscape features, besides a deepened drain with a strip of gorse and bramble along its

bank. It is considered that vegetation removal in this instance is not required. The remaining Turbine 1 will be placed within an improved agricultural field, with a low gorse dominated hedge west of the proposed turbine (approx. 2-3 meters high), running north to south, which will be removed to avoid encouraging bat activity in the 'blade-swept' area. No trees of any significant height are present proximal to the proposed locations. For the purposes of calculating the buffer distance required surrounding Turbine 1, a conservative height of 3 meters was chosen as the feature height (fh) of vegetation. This estimated value was input into a formula alongside the associated turbine specifications (see **Section 1.1**) to determine the minimum clearance buffer. Using this information a recommended minimum clearance distance of 87.6m from the center of the tower was calculated. Allowance will be made for replanting of vegetation removed for the purposes of this buffer. No significant landscape features will be created or allowed to develop within this buffer area of any turbine during the operational life of the proposed wind farm.

A comprehensive survey effort was carried out in relation to potential roost features in structures following Collins (2023). Disused structures of 'Low' to 'Moderate' suitability for roosting bats were identified along both grid connection routes assessed and the TDR. No evidence of historic or contemporary roosting was identified at the time of the surveys. Additionally, private residential dwellings are located along the grid connection route and the relevant section of the TDR which were not surveyed internally as part of this assessment. Considering the scale and extent of the proposed facilitation works along the grid connection routes and turbine delivery route, it is not likely that these structures will be significantly affected by the construction phase impacts and thus no mitigation measures are considered.

Construction operations will take place during the hours of daylight in as far as possible to minimise disturbances to bats and other wildlife. It is recognised that key works such as turbine delivery and erection may require night-time working. Two 17m high lightning monopole protection masts are proposed at the control building and a warning light will be fixed to two of the turbines. Otherwise, motion sensitive lighting only will be used.

6.1.2 Derogation License

A derogation license is required where disturbance to a bat roost is likely to occur (Marnell et al., 2022). Based on current information, a derogation license issued under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 is not required to facilitate the proposed works.

6.2 OPERATIONAL PHASE MITIGATION

A 'High' level of overall collision risk has not been identified for any bat species in any of the bat activity seasons. Based on best available information, a 'Medium' overall collision risk level has been identified in relation to high-collision-risk bat species, across all three activity seasons, with the exception of a 'Low' risk for *Nathusius' Pipistrelle* in the autumn period. The limitations of the assessment procedure and knowledge gaps in relation to bats and wind farms are acknowledged herein, particularly in an Irish context.

In addition to the creation of buffers between the proposed turbines and surrounding vegetation (discussed above) reduced rotation speed will be implemented when turbines are idling. 'Feathering' of idling blades may reduce fatality rates by up to 50% and does not result in loss of output (NatureScot,

2021). No additional control measures to avoid/reduce collision related bat fatalities are considered warranted in this instance.

NatureScot (2021) recommends post-construction monitoring is carried out in at least three years post-construction, but not necessarily consecutive years. Post-construction monitoring aims to assess changes in bat activity patterns (e.g. in response to landscape changes such as land management and forestry rotation) and the efficacy of mitigation to inform any changes which may be required to curtailment strategy. Post-construction fatality monitoring and activity surveys will be carried out in years 1, 2, 3, 5 and 10 post-construction and will consist of:

- Passive bat monitoring at all turbine locations in order to monitor changes in activity levels relative to pre-construction baseline information (presented herein).
- Fatality monitoring following the methodology presented in Appendix 4 of NatureScot (2021) or subsequent updates.

Post-construction monitoring data will be analysed and presented in report format to the planning authority. Recommendations will be made in relation to curtailment strategy if required.

Eight bat boxes will be erected at suitable locations outside of the buffer zones identified above, in consultation with a bat-licensed Ecologist. 'Woodcrete' bat boxes will be used as they are durable and long-lasting and do not require maintenance. A mixture of bat box types should be used to cater for seasonal and species requirements. The following products (or similar) are suitable:

- Schwegler 1FS Colony Bat Box 95
- Schwegler 2F Universal Bat Box
- Schwegler 2FN Bat Box 55

Bat boxes should be installed on suitably large trees or specially installed poles. Boxes should be installed at a minimum height of 4 meters above ground level, at suitable aspects (not northern) and in locations which are inaccessible to unaided climbing (to minimise the risk of vandalism) and not vulnerable to artificial light or noise pollution. Monitoring of proposed bat boxes will be carried out by a bat-licensed Ecologist, and relocation of any boxes with no evidence of use in the first year after construction.

All permanent lighting systems will be designed in accordance with ILP (2023)⁴ in order to minimise nuisance through light spillage. All non-essential lighting will be switched off during the hours of darkness. No artificial lighting will illuminate any trees or structures with potential to be used by roosting bats to prevent disturbance upon emergence and re-entry. To reduce the ecological disturbance from artificial lighting, the following guidance is recommended:

- Reduce non-essential external night lighting.
- Lower the angle of external night lighting.
- Use of LEDs, as these emit minimal ultra-violet light.
- White and blue wavelengths should be avoided; wavelength will be <2,700 kelvin.
- Lights should peak higher than 550nm.

6.3 TURBINE DELIVERY ROUTE MITIGATION

Enabling works along the proposed TDR will result in the loss of 0.845ha of commercial forestry to facilitate the construction of the blade set down area and approx. 70m of hedgerow. It is considered

⁴ <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

that further survey of trees with a decreasing probability of use by roosting bats including “coniferous plantation with no specimen trees” is not warranted (Marnell et al., 2022). Although, no evidence of current or historic roosting by bats was recorded along the TDR at the time of survey, the assessment was based on the design information to date and will be subject to future assessment and application, should a delay of more than 24 months occur between this survey and the proposed works. Surveys will be carried out according to Collins (2023). If required, a derogation license will be secured in advance of any tree-felling works, if any, and appropriate mitigation measures will be put in place to avoid or reduce impacts on bats.

6.4 GRID CONNECTION ROUTE MITIGATION

No trees of ‘PRF-M’ suitability were recorded along either grid connection route assessed. Additionally, no tree clearance or tree trimming works are proposed to facilitate the grid connection. Due to the limited and temporary nature of the works proposed, no further surveys or other mitigation measures are considered necessary. Should a delay of more than 24 months occur between survey and the proposed works, it is recommended that a repeat assessment be carried out given the potential for ecological context to change over time.

6.5 DECOMMISSIONING PHASE MITIGATION

The potential for impacts during decommissioning is similar in nature, if not in scope, to those assessed for the Construction Phase. All decommissioning works will be governed by the same requirements to control run-off or potential pollution to watercourses (feeding resources for bats) as have been implemented during the construction phase. Any site compound will need to conform to the construction phase mitigation measures including those related to lighting design. Decommissioning phase works will include the reestablishment of woodland and linear features removed during the construction phase.

7 Residual Effects

The mitigation measures described for the proposed Moanmore Lower wind energy development have been designed to minimise the impact of the development on the local bat populations, from the construction of the wind farm infrastructure including the grid connection route and turbine delivery, through the operational phase and onto decommissioning. In the absence of mitigation, the proposed development would have a **'slight' negative** effect on bats at a local level during both the construction and operational phases (EPA, 2022).

The proposed mitigation measures are expected to avoid or significantly reduce the likelihood of any significant impacts occurring on bats as a result of the construction and operation of the proposed wind farm. Ongoing monitoring and implementation of the mitigation measures will ensure the preservation and future stability of the surrounding foraging and commuting habitats for bats.

With the implementation of the above detailed mitigation measures it is concluded that the development will have an **'imperceptible' negative** residual effect on the bat population at a local level, following EPA (2022). This effect is fully reversible following decommissioning and reinstatement.

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Appendix A – Weather Data

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Date	Time	Temp - °C	Wind Speed - km/hr	Rain - mm	Suitable Survey Nights
Spring 2023					
13/04/2023	20:00:00	9	2	0	
13/04/2023	21:00:00	7	0	0	
13/04/2023	22:00:00	5	0	0	
13/04/2023	23:00:00	5	0	0	
14/04/2023	00:00:00	4	0	0	
14/04/2023	01:00:00	5	0	0	
14/04/2023	02:00:00	5	0	0	
14/04/2023	03:00:00	5	0	0	
14/04/2023	04:00:00	5	0	0	
14/04/2023	05:00:00	4	0	0	
14/04/2023	06:00:00	3	0	0	
14/04/2023	20:00:00	10	6	0	
14/04/2023	21:00:00	8	3	0	
14/04/2023	22:00:00	5	0	0	
14/04/2023	23:00:00	4	0	0	
15/04/2023	00:00:00	3	0	0	
15/04/2023	01:00:00	5	0	0	
15/04/2023	02:00:00	5	0	0	
15/04/2023	03:00:00	3	0	0	
15/04/2023	04:00:00	3	0	0	
15/04/2023	05:00:00	2	0	0	
15/04/2023	06:00:00	4	3	0	1
15/04/2023	20:00:00	11	14	0	
15/04/2023	21:00:00	11	16	0	
15/04/2023	22:00:00	11	14	0	
15/04/2023	23:00:00	11	11	0	
16/04/2023	00:00:00	11	13	0	
16/04/2023	01:00:00	12	10	0	
16/04/2023	02:00:00	12	8	0	
16/04/2023	03:00:00	12	8	0	
16/04/2023	04:00:00	12	8	0	
16/04/2023	05:00:00	12	8	0	2
16/04/2023	06:00:00	12	6	0	
16/04/2023	20:00:00	15	5	0	
16/04/2023	21:00:00	13	2	0	
16/04/2023	22:00:00	11	2	0	
16/04/2023	23:00:00	13	3	0	
17/04/2023	00:00:00	13	5	0	
17/04/2023	01:00:00	13	5	0	
17/04/2023	02:00:00	12	6	0	
17/04/2023	03:00:00	12	5	0	
17/04/2023	04:00:00	12	8	0	3
17/04/2023	05:00:00	12	10	0	
17/04/2023	06:00:00	12	10	0	
17/04/2023	20:00:00	14	11	0	
17/04/2023	21:00:00	12	11	0	
17/04/2023	22:00:00	11	11	0	
17/04/2023	23:00:00	10	10	0	
18/04/2023	00:00:00	9	10	0	
18/04/2023	01:00:00	9	10	0	
18/04/2023	02:00:00	8	6	0	4
18/04/2023	03:00:00	8	10	0	
18/04/2023	04:00:00	9	10	0	
18/04/2023	05:00:00	10	11	0	
18/04/2023	06:00:00	8	8	0	
18/04/2023	20:00:00	15	10	0	
18/04/2023	21:00:00	13	10	0	
18/04/2023	22:00:00	11	10	0	
18/04/2023	23:00:00	10	11	0	
19/04/2023	00:00:00	8	5	0	
19/04/2023	01:00:00	5	0	0	
19/04/2023	02:00:00	6	3	0	
19/04/2023	03:00:00	6	3	0	

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19/04/2023	04:00:00	6	6	0	5
19/04/2023	05:00:00	5	5	0	
19/04/2023	06:00:00	5	5	0	
19/04/2023	20:00:00	13	8	0	
19/04/2023	21:00:00	12	5	0	
19/04/2023	22:00:00	11	5	0.2	
19/04/2023	23:00:00	10	3	0	
20/04/2023	00:00:00	10	6	0	
20/04/2023	01:00:00	9	5	0	
20/04/2023	02:00:00	9	6	0	
20/04/2023	03:00:00	9	6	0	
20/04/2023	04:00:00	9	6	0	
20/04/2023	05:00:00	8	8	0	
20/04/2023	06:00:00	8	13	0	
20/04/2023	20:00:00	13	13	0	
20/04/2023	21:00:00	10	2	0	
20/04/2023	22:00:00	8	5	0	
20/04/2023	23:00:00	8	5	0	
21/04/2023	00:00:00	6	0	0	
21/04/2023	01:00:00	6	3	0	
21/04/2023	02:00:00	6	2	0	
21/04/2023	03:00:00	5	5	0	
21/04/2023	04:00:00	6	10	0	
21/04/2023	05:00:00	5	5	0	
21/04/2023	06:00:00	3	2	0	
21/04/2023	20:00:00	12	6	0	
21/04/2023	21:00:00	11	2	0	
21/04/2023	22:00:00	8	0	0	
21/04/2023	23:00:00	8	0	0	
22/04/2023	00:00:00	9	3	0	
22/04/2023	01:00:00	9	3	0	
22/04/2023	02:00:00	7	0	0	
22/04/2023	03:00:00	7	2	0	
22/04/2023	04:00:00	6	0	0	
22/04/2023	05:00:00	6	0	0	
22/04/2023	06:00:00	7	0	0	
22/04/2023	20:00:00	8	2	0	
22/04/2023	21:00:00	7	3	0	
22/04/2023	22:00:00	7	2	0	
22/04/2023	23:00:00	7	0	0	
23/04/2023	00:00:00	7	0	0	
23/04/2023	01:00:00	7	0	0	
23/04/2023	02:00:00	6	0	0	
23/04/2023	03:00:00	6	0	0	
23/04/2023	04:00:00	7	2	0	
23/04/2023	05:00:00	6	0	0	
23/04/2023	06:00:00	4	0	0	
23/04/2023	20:00:00	11	10	0	
23/04/2023	21:00:00	9	3	0	
23/04/2023	22:00:00	7	0	0	
23/04/2023	23:00:00	5	0	0	
24/04/2023	00:00:00	7	2	0	
24/04/2023	01:00:00	8	3	0	
24/04/2023	02:00:00	8	0	0	
24/04/2023	03:00:00	7	2	0.6	
24/04/2023	04:00:00	7	0	0	
24/04/2023	05:00:00	7	5	0	
24/04/2023	06:00:00	7	5	0	
24/04/2023	20:00:00	10	8	0	
24/04/2023	21:00:00	8	2	0	
24/04/2023	22:00:00	6	3	0	
24/04/2023	23:00:00	5	3	0	
25/04/2023	00:00:00	2	0	0	
25/04/2023	01:00:00	2	0	0	
25/04/2023	02:00:00	1	0	0	
25/04/2023	03:00:00	0	0	0	
25/04/2023	04:00:00	-1	0	0	

25/04/2023	05:00:00	-1	2	0	
25/04/2023	06:00:00	0	2	0	
25/04/2023	20:00:00	10	10	0	
25/04/2023	21:00:00	9	6	0	
25/04/2023	22:00:00	8	6	0	
25/04/2023	23:00:00	8	8	0	
26/04/2023	00:00:00	8	10	0	
26/04/2023	01:00:00	8	10	0	
26/04/2023	02:00:00	8	11	0	
26/04/2023	03:00:00	8	11	0	
26/04/2023	04:00:00	8	13	0	
26/04/2023	05:00:00	7	13	0	
26/04/2023	06:00:00	7	11	0	
26/04/2023	20:00:00	11	11	0	6
26/04/2023	21:00:00	11	11	0	
26/04/2023	22:00:00	10	10	0	
26/04/2023	23:00:00	10	10	0	
27/04/2023	00:00:00	10	10	0	
27/04/2023	01:00:00	10	10	0	
27/04/2023	02:00:00	10	8	0	
27/04/2023	03:00:00	10	6	0	
27/04/2023	04:00:00	10	10	0	
27/04/2023	05:00:00	9	10	0	
27/04/2023	06:00:00	9	8	0	7
27/04/2023	20:00:00	12	3	0.6	
27/04/2023	21:00:00	12	0	0.4	
27/04/2023	22:00:00	11	0	0.2	
27/04/2023	23:00:00	11	0	0	
28/04/2023	00:00:00	11	2	0.2	
28/04/2023	01:00:00	11	3	0	
28/04/2023	02:00:00	11	10	0.2	
28/04/2023	03:00:00	11	10	0	
28/04/2023	04:00:00	11	6	0	
28/04/2023	05:00:00	11	6	0	8
28/04/2023	06:00:00	11	6	0.2	
28/04/2023	20:00:00	15	2	0	
28/04/2023	21:00:00	14	0	0	
28/04/2023	22:00:00	13	0	0	
28/04/2023	23:00:00	12	0	0	
29/04/2023	00:00:00	11	0	0	
29/04/2023	01:00:00	11	0	0	
29/04/2023	02:00:00	12	0	0	
29/04/2023	03:00:00	12	0	0	
29/04/2023	04:00:00	12	0	0	9
29/04/2023	05:00:00	12	0	0	
29/04/2023	06:00:00	12	3	0	
29/04/2023	20:00:00	13	8	0.4	
29/04/2023	21:00:00	13	2	0.4	
29/04/2023	22:00:00	12	0	0	
29/04/2023	23:00:00	12	2	0	
30/04/2023	00:00:00	12	0	0.2	
30/04/2023	01:00:00	12	2	0	
30/04/2023	02:00:00	11	2	0	
30/04/2023	03:00:00	11	2	0	10
30/04/2023	04:00:00	11	2	0	
30/04/2023	05:00:00	10	2	0	
30/04/2023	06:00:00	11	5	0.2	
30/04/2023	20:00:00	12	16	0	
30/04/2023	21:00:00	12	14	0	
30/04/2023	22:00:00	12	10	0	
30/04/2023	23:00:00	11	6	0	
01/05/2023	00:00:00	11	6	0	
01/05/2023	01:00:00	11	6	0	
01/05/2023	02:00:00	11	6	0	
01/05/2023	03:00:00	11	6	0	
01/05/2023	04:00:00	11	5	0	
01/05/2023	05:00:00	11	5	0	

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01/05/2023	06:00:00	11	2	0	11
01/05/2023	20:00:00	14	3	0	
01/05/2023	21:00:00	12	0	0	
01/05/2023	22:00:00	10	0	0	
01/05/2023	23:00:00	9	0	0	
02/05/2023	00:00:00	8	0	0	
02/05/2023	01:00:00	8	0	0	
02/05/2023	02:00:00	6	0	0	
02/05/2023	03:00:00	6	2	0	
02/05/2023	04:00:00	7	0	0	
02/05/2023	05:00:00	6	3	0	
02/05/2023	06:00:00	8	3	0	
02/05/2023	20:00:00	14	8	0	12
02/05/2023	21:00:00	13	8	0	
02/05/2023	22:00:00	12	10	0	
02/05/2023	23:00:00	12	11	0	
03/05/2023	00:00:00	12	10	0	
03/05/2023	01:00:00	11	13	0	
03/05/2023	02:00:00	11	11	0	
03/05/2023	03:00:00	11	13	0	
03/05/2023	04:00:00	11	14	0	
03/05/2023	05:00:00	11	11	0	
03/05/2023	06:00:00	11	11	0	
03/05/2023	20:00:00	--	--	--	
03/05/2023	21:00:00	--	--	--	
03/05/2023	22:00:00	--	--	--	
03/05/2023	23:00:00	--	--	--	
03/05/2023	00:00:00	--	--	--	
04/05/2023	01:00:00	--	--	--	
04/05/2023	02:00:00	--	--	--	
04/05/2023	03:00:00	--	--	--	
04/05/2023	04:00:00	--	--	--	
04/05/2023	05:00:00	--	--	--	
04/05/2023	06:00:00	--	--	--	
Summer 2023					
01/06/2023	21:00:00	20	6	0	1
01/06/2023	22:00:00	18	8	0	
01/06/2023	23:00:00	16	13	0	
02/06/2023	00:00:00	15	10	0	
02/06/2023	01:00:00	13	5	0	
02/06/2023	02:00:00	11	5	0	
02/06/2023	03:00:00	11	6	0	
02/06/2023	04:00:00	10	2	0	
02/06/2023	05:00:00	9	2	0	
02/06/2023	21:00:00	20	2	0	
02/06/2023	22:00:00	16	2	0	
02/06/2023	23:00:00	13	0	0	
03/06/2023	00:00:00	11	3	0	2
03/06/2023	01:00:00	12	5	0	
03/06/2023	02:00:00	10	2	0	
03/06/2023	03:00:00	8	0	0	
03/06/2023	04:00:00	6	0	0	
03/06/2023	05:00:00	6	2	0	
03/06/2023	21:00:00	17	5	0	
03/06/2023	22:00:00	15	3	0	
03/06/2023	23:00:00	12	2	0	
04/06/2023	00:00:00	13	5	0	
04/06/2023	01:00:00	12	2	0	
04/06/2023	02:00:00	11	2	0	
04/06/2023	03:00:00	10	2	0	
04/06/2023	04:00:00	9	3	0	
04/06/2023	05:00:00	7	0	0	
04/06/2023	21:00:00	19	2	0	3
04/06/2023	22:00:00	16	0	0	
04/06/2023	23:00:00	14	3	0	
05/06/2023	00:00:00	14	6	0	
05/06/2023	01:00:00	14	5	0	
05/06/2023	02:00:00	14	5	0	
05/06/2023	03:00:00	14	5	0	
05/06/2023	04:00:00	14	5	0	
05/06/2023	05:00:00	14	5	0	
05/06/2023	06:00:00	14	5	0	
05/06/2023	07:00:00	14	5	0	
05/06/2023	08:00:00	14	5	0	

05/06/2023	02:00:00	13	5	0	
05/06/2023	03:00:00	12	5	0	
05/06/2023	04:00:00	10	5	0	
05/06/2023	05:00:00	10	3	0	
05/06/2023	21:00:00	21	2	0	5
05/06/2023	22:00:00	17	3	0	
05/06/2023	23:00:00	15	5	0	
06/06/2023	00:00:00	14	6	0	
06/06/2023	01:00:00	12	3	0	
06/06/2023	02:00:00	12	3	0	
06/06/2023	03:00:00	11	3	0	
06/06/2023	04:00:00	10	3	0	6
06/06/2023	05:00:00	10	5	0	
06/06/2023	21:00:00	20	6	0	
06/06/2023	22:00:00	16	3	0	
06/06/2023	23:00:00	14	2	0	
07/06/2023	00:00:00	13	3	0	
07/06/2023	01:00:00	11	5	0	
07/06/2023	02:00:00	11	5	0	7
07/06/2023	03:00:00	9	2	0	
07/06/2023	04:00:00	8	0	0	
07/06/2023	05:00:00	8	3	0	
07/06/2023	21:00:00	17	6	0	
07/06/2023	22:00:00	15	6	0	
07/06/2023	23:00:00	13	6	0	8
08/06/2023	00:00:00	12	6	0	
08/06/2023	01:00:00	11	2	0	
08/06/2023	02:00:00	9	2	0	
08/06/2023	03:00:00	9	0	0	
08/06/2023	04:00:00	9	2	0	
08/06/2023	05:00:00	9	3	0	
08/06/2023	21:00:00	18	10	0	9
08/06/2023	22:00:00	16	3	0	
08/06/2023	23:00:00	--	--	--	
09/06/2023	00:00:00	--	--	--	
09/06/2023	01:00:00	--	--	--	
09/06/2023	02:00:00	--	--	--	
09/06/2023	03:00:00	--	--	--	
09/06/2023	04:00:00	--	--	--	10
09/06/2023	05:00:00	--	--	--	
09/06/2023	21:00:00	--	--	--	
09/06/2023	22:00:00	--	--	--	
09/06/2023	23:00:00	--	--	--	
10/06/2023	00:00:00	--	--	--	
10/06/2023	01:00:00	--	--	--	11
10/06/2023	02:00:00	--	--	--	
10/06/2023	03:00:00	--	--	--	
10/06/2023	04:00:00	--	--	--	
10/06/2023	05:00:00	--	--	--	
10/06/2023	21:00:00	--	--	--	
10/06/2023	22:00:00	--	--	--	
10/06/2023	23:00:00	--	--	--	
11/06/2023	00:00:00	--	--	--	
11/06/2023	01:00:00	--	--	--	
11/06/2023	02:00:00	--	--	--	
11/06/2023	03:00:00	--	--	--	
11/06/2023	04:00:00	--	--	--	
11/06/2023	05:00:00	--	--	--	
11/06/2023	21:00:00	--	--	--	11
11/06/2023	22:00:00	--	--	--	
11/06/2023	23:00:00	--	--	--	
12/06/2023	00:00:00	--	--	--	
12/06/2023	01:00:00	--	--	--	
12/06/2023	02:00:00	--	--	--	
12/06/2023	03:00:00	--	--	--	
12/06/2023	04:00:00	--	--	--	
12/06/2023	05:00:00	--	--	--	

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12/06/2023	21:00:00	--	--	--	12
12/06/2023	22:00:00	--	--	--	
12/06/2023	23:00:00	--	--	--	
13/06/2023	00:00:00	--	--	--	
13/06/2023	01:00:00	--	--	--	
13/06/2023	02:00:00	--	--	--	
13/06/2023	03:00:00	--	--	--	
13/06/2023	04:00:00	--	--	--	13
13/06/2023	05:00:00	--	--	--	
13/06/2023	21:00:00	--	--	--	
13/06/2023	22:00:00	--	--	--	
13/06/2023	23:00:00	--	--	--	
14/06/2023	00:00:00	--	--	--	
14/06/2023	01:00:00	--	--	--	
14/06/2023	02:00:00	--	--	--	
14/06/2023	03:00:00	--	--	--	14
14/06/2023	04:00:00	--	--	--	
14/06/2023	05:00:00	--	--	--	
14/06/2023	21:00:00	--	--	--	
14/06/2023	22:00:00	--	--	--	
14/06/2023	23:00:00	--	--	--	
15/06/2023	00:00:00	--	--	--	
15/06/2023	01:00:00	--	--	--	15
15/06/2023	02:00:00	--	--	--	
15/06/2023	03:00:00	--	--	--	
15/06/2023	04:00:00	--	--	--	
15/06/2023	05:00:00	--	--	--	
15/06/2023	21:00:00	--	--	--	
15/06/2023	22:00:00	--	--	--	
15/06/2023	23:00:00	--	--	--	16
16/06/2023	00:00:00	--	--	--	
16/06/2023	01:00:00	--	--	--	
16/06/2023	02:00:00	--	--	--	
16/06/2023	03:00:00	--	--	--	
16/06/2023	04:00:00	--	--	--	
16/06/2023	05:00:00	--	--	--	
16/06/2023	21:00:00	--	--	--	17
16/06/2023	22:00:00	--	--	--	
16/06/2023	23:00:00	--	--	--	
17/06/2023	00:00:00	--	--	--	
17/06/2023	01:00:00	--	--	--	
17/06/2023	02:00:00	--	--	--	
17/06/2023	03:00:00	--	--	--	
17/06/2023	04:00:00	--	--	--	18
17/06/2023	05:00:00	--	--	--	
17/06/2023	21:00:00	--	--	--	
17/06/2023	22:00:00	--	--	--	
17/06/2023	23:00:00	--	--	--	
18/06/2023	00:00:00	--	--	--	
18/06/2023	01:00:00	--	--	--	
18/06/2023	02:00:00	--	--	--	19
18/06/2023	03:00:00	--	--	--	
18/06/2023	04:00:00	--	--	--	
18/06/2023	05:00:00	--	--	--	
18/06/2023	21:00:00	--	--	--	
18/06/2023	22:00:00	--	--	--	
18/06/2023	23:00:00	--	--	--	
19/06/2023	00:00:00	--	--	--	20
19/06/2023	01:00:00	--	--	--	
19/06/2023	02:00:00	--	--	--	
19/06/2023	03:00:00	--	--	--	
19/06/2023	04:00:00	--	--	--	
19/06/2023	05:00:00	--	--	--	
19/06/2023	21:00:00	--	--	--	
19/06/2023	22:00:00	--	--	--	21
19/06/2023	23:00:00	--	--	--	
20/06/2023	00:00:00	--	--	--	

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20/06/2023	01:00:00	--	--	--	19
20/06/2023	02:00:00	--	--	--	
20/06/2023	03:00:00	--	--	--	
20/06/2023	04:00:00	--	--	--	
20/06/2023	05:00:00	--	--	--	
20/06/2023	21:00:00	--	--	--	20
20/06/2023	22:00:00	--	--	--	
20/06/2023	23:00:00	--	--	--	
21/06/2023	00:00:00	--	--	--	
21/06/2023	01:00:00	--	--	--	
21/06/2023	02:00:00	--	--	--	
21/06/2023	03:00:00	--	--	--	21
21/06/2023	04:00:00	--	--	--	
21/06/2023	05:00:00	--	--	--	
21/06/2023	06:00:00	--	--	--	
21/06/2023	21:00:00	--	--	--	
21/06/2023	22:00:00	--	--	--	
21/06/2023	23:00:00	--	--	--	22
22/06/2023	00:00:00	--	--	--	
22/06/2023	01:00:00	--	--	--	
22/06/2023	02:00:00	--	--	--	
22/06/2023	03:00:00	--	--	--	
22/06/2023	04:00:00	--	--	--	
22/06/2023	05:00:00	--	--	--	23
22/06/2023	06:00:00	--	--	--	
22/06/2023	21:00:00	--	--	--	
22/06/2023	22:00:00	--	--	--	
22/06/2023	23:00:00	--	--	--	
23/06/2023	00:00:00	--	--	--	
23/06/2023	01:00:00	--	--	--	24
23/06/2023	02:00:00	--	--	--	
23/06/2023	03:00:00	--	--	--	
23/06/2023	04:00:00	--	--	--	
23/06/2023	05:00:00	--	--	--	
23/06/2023	06:00:00	--	--	--	
23/06/2023	21:00:00	--	--	--	25
23/06/2023	22:00:00	--	--	--	
23/06/2023	23:00:00	--	--	--	
24/06/2023	00:00:00	--	--	--	
24/06/2023	01:00:00	--	--	--	
24/06/2023	02:00:00	--	--	--	
24/06/2023	03:00:00	--	--	--	26
24/06/2023	04:00:00	--	--	--	
24/06/2023	05:00:00	--	--	--	
24/06/2023	06:00:00	--	--	--	
24/06/2023	21:00:00	--	--	--	
24/06/2023	22:00:00	--	--	--	
24/06/2023	23:00:00	--	--	--	27
25/06/2023	00:00:00	--	--	--	
25/06/2023	01:00:00	--	--	--	
25/06/2023	02:00:00	--	--	--	
25/06/2023	03:00:00	--	--	--	
25/06/2023	04:00:00	--	--	--	
25/06/2023	05:00:00	--	--	--	28
25/06/2023	06:00:00	--	--	--	
25/06/2023	21:00:00	--	--	--	
25/06/2023	22:00:00	--	--	--	
25/06/2023	23:00:00	--	--	--	
26/06/2023	00:00:00	--	--	--	29
26/06/2023	01:00:00	--	--	--	
26/06/2023	02:00:00	--	--	--	
26/06/2023	03:00:00	--	--	--	
26/06/2023	04:00:00	--	--	--	
26/06/2023	05:00:00	--	--	--	
26/06/2023	06:00:00	--	--	--	30
26/06/2023	21:00:00	--	--	--	
26/06/2023	22:00:00	--	--	--	
26/06/2023	23:00:00	--	--	--	
26/06/2023	00:00:00	--	--	--	
26/06/2023	01:00:00	--	--	--	
Autumn 2023					31
31/08/2023	20:00:00	16	5	0	

31/08/2023	21:00:00	13	3	0	1
31/08/2023	22:00:00	13	3	0	
31/08/2023	23:00:00	12	2	0	
01/09/2023	00:00:00	12	3	0	
01/09/2023	01:00:00	13	5	0	
01/09/2023	02:00:00	13	6	0	
01/09/2023	03:00:00	14	5	0.6	
01/09/2023	04:00:00	14	5	0.2	
01/09/2023	05:00:00	14	3	0.4	
01/09/2023	06:00:00	13	3	0	
01/09/2023	07:00:00	13	3	0	2
01/09/2023	20:00:00	18	3	0	
01/09/2023	21:00:00	15	0	0	
01/09/2023	22:00:00	13	0	0	
01/09/2023	23:00:00	12	0	0	
02/09/2023	00:00:00	12	0	0	
02/09/2023	01:00:00	10	0	0	
02/09/2023	02:00:00	11	0	0	
02/09/2023	03:00:00	10	2	0	
02/09/2023	04:00:00	12	2	0	
02/09/2023	05:00:00	12	0	0	3
02/09/2023	06:00:00	12	0	0	
02/09/2023	07:00:00	13	3	0	
02/09/2023	20:00:00	17	2	0	
02/09/2023	21:00:00	14	0	0	
02/09/2023	22:00:00	14	0	0	
02/09/2023	23:00:00	14	2	0	
03/09/2023	00:00:00	13	2	0	
03/09/2023	01:00:00	12	0	0	
03/09/2023	02:00:00	14	3	0	4
03/09/2023	03:00:00	14	2	0	
03/09/2023	04:00:00	13	3	0	
03/09/2023	05:00:00	12	0	0	
03/09/2023	06:00:00	12	5	0	
03/09/2023	07:00:00	13	3	0	
03/09/2023	20:00:00	17	0	0	
03/09/2023	21:00:00	13	0	0	
03/09/2023	22:00:00	11	0	0	
03/09/2023	23:00:00	10	0	0	5
04/09/2023	00:00:00	10	0	0	
04/09/2023	01:00:00	9	0	0	
04/09/2023	02:00:00	9	2	0	
04/09/2023	03:00:00	10	0	0	
04/09/2023	04:00:00	9	0	0	
04/09/2023	05:00:00	10	2	0	
04/09/2023	06:00:00	12	0	0	
04/09/2023	07:00:00	11	2	0	
04/09/2023	20:00:00	23	5	0	
04/09/2023	21:00:00	21	2	0	6
04/09/2023	22:00:00	19	2	0	
04/09/2023	23:00:00	20	2	0	
05/09/2023	00:00:00	20	3	0	
05/09/2023	01:00:00	20	3	0	
05/09/2023	02:00:00	20	3	0	
05/09/2023	03:00:00	19	5	0	
05/09/2023	04:00:00	19	2	0	
05/09/2023	05:00:00	17	2	0	
05/09/2023	06:00:00	18	6	0	7
05/09/2023	07:00:00	17	2	0	
05/09/2023	20:00:00	21	11	0	
05/09/2023	21:00:00	19	6	0	
05/09/2023	22:00:00	18	8	0	
05/09/2023	23:00:00	17	3	0	8
06/09/2023	00:00:00	17	5	0	
06/09/2023	01:00:00	15	2	0	
06/09/2023	02:00:00	16	5	0	
06/09/2023	03:00:00	17	8	0	

RECEIVED: 08/05/2025

Inspection Purposes Only!

06/09/2023	04:00:00	16	5	0	
06/09/2023	05:00:00	16	6	0	
06/09/2023	06:00:00	16	5	0	
06/09/2023	07:00:00	17	3	0	
06/09/2023	20:00:00	20	5	0	6
06/09/2023	21:00:00	20	11	0	
06/09/2023	22:00:00	20	5	0	
06/09/2023	23:00:00	18	3	0	
07/09/2023	00:00:00	18	8	0	
07/09/2023	01:00:00	18	10	0	
07/09/2023	02:00:00	18	8	0	
07/09/2023	03:00:00	17	5	0	
07/09/2023	04:00:00	16	2	0	7
07/09/2023	05:00:00	16	0	0	
07/09/2023	06:00:00	16	3	0	
07/09/2023	07:00:00	17	6	0	
07/09/2023	20:00:00	23	0	0	
07/09/2023	21:00:00	20	2	0	
07/09/2023	22:00:00	20	3	0	
07/09/2023	23:00:00	20	3	0	
08/09/2023	00:00:00	19	2	0	8
08/09/2023	01:00:00	18	2	0	
08/09/2023	02:00:00	17	2	0	
08/09/2023	03:00:00	16	2	0	
08/09/2023	04:00:00	16	2	0	
08/09/2023	05:00:00	16	2	0	
08/09/2023	06:00:00	16	0	0	
08/09/2023	07:00:00	14	0	0	
08/09/2023	20:00:00	20	0	0	9
08/09/2023	21:00:00	19	2	0	
08/09/2023	22:00:00	18	2	0	
08/09/2023	23:00:00	18	2	0	
09/09/2023	00:00:00	17	3	0	
09/09/2023	01:00:00	17	0	0	
09/09/2023	02:00:00	16	3	0	
09/09/2023	03:00:00	17	3	0	
09/09/2023	04:00:00	17	2	0	10
09/09/2023	05:00:00	17	2	0	
09/09/2023	06:00:00	17	3	0	
09/09/2023	07:00:00	18	3	0	
09/09/2023	20:00:00	18	2	0	
09/09/2023	21:00:00	17	2	0	
09/09/2023	22:00:00	17	0	0	
09/09/2023	23:00:00	18	0	0	
10/09/2023	00:00:00	17	0	0	
10/09/2023	01:00:00	17	0	0	
10/09/2023	02:00:00	17	0	0	
10/09/2023	03:00:00	17	0	0	
10/09/2023	04:00:00	17	0	0	
10/09/2023	05:00:00	17	0	0	
10/09/2023	06:00:00	16	0	0	
10/09/2023	07:00:00	14	0	0	
10/09/2023	20:00:00	17	2	0	
10/09/2023	21:00:00	17	5	0	
10/09/2023	22:00:00	16	2	0	
10/09/2023	23:00:00	15	2	0	
11/09/2023	00:00:00	16	5	0	
11/09/2023	01:00:00	16	3	0	
11/09/2023	02:00:00	16	5	0	
11/09/2023	03:00:00	16	5	0	
11/09/2023	04:00:00	16	8	0	
11/09/2023	05:00:00	16	10	0	
11/09/2023	06:00:00	16	6	0	
11/09/2023	07:00:00	16	5	0	
11/09/2023	20:00:00	13	6	0.6	
11/09/2023	21:00:00	13	6	0.2	
11/09/2023	22:00:00	13	2	0	

RECEIVED: 08/05/2025

For Inspection Purposes Only!

11/09/2023	23:00:00	13	3	0	11
12/09/2023	00:00:00	12	2	0	
12/09/2023	01:00:00	12	2	0	
12/09/2023	02:00:00	12	3	0	
12/09/2023	03:00:00	11	5	0	
12/09/2023	04:00:00	10	0	0	
12/09/2023	05:00:00	8	0	0	
12/09/2023	06:00:00	7	0	0	
12/09/2023	07:00:00	6	0	0	12
12/09/2023	20:00:00	13	2	0	
12/09/2023	21:00:00	9	0	0	
12/09/2023	22:00:00	7	0	0	
12/09/2023	23:00:00	7	0	0	
13/09/2023	00:00:00	6	0	0	
13/09/2023	01:00:00	6	0	0	
13/09/2023	02:00:00	7	0	0	
13/09/2023	03:00:00	8	2	0	
13/09/2023	04:00:00	8	0	0	12
13/09/2023	05:00:00	7	0	0	
13/09/2023	06:00:00	7	0	0	
13/09/2023	07:00:00	9	3	0	
13/09/2023	20:00:00	15	8	0	
13/09/2023	21:00:00	14	5	0	
13/09/2023	22:00:00	14	3	0	
13/09/2023	23:00:00	13	2	0	13
14/09/2023	00:00:00	13	2	0	
14/09/2023	01:00:00	13	3	0	
14/09/2023	02:00:00	14	5	0	
14/09/2023	03:00:00	12	2	0	
14/09/2023	04:00:00	11	0	0	
14/09/2023	05:00:00	10	2	0	
14/09/2023	06:00:00	10	2	0	13
14/09/2023	07:00:00	10	0	0	
14/09/2023	20:00:00	13	2	0	
14/09/2023	21:00:00	13	2	0.2	
14/09/2023	22:00:00	12	2	0	
14/09/2023	23:00:00	12	2	0.2	
15/09/2023	00:00:00	12	0	0.4	
15/09/2023	01:00:00	11	0	0.2	14
15/09/2023	02:00:00	11	0	0	
15/09/2023	03:00:00	11	0	0	
15/09/2023	04:00:00	11	0	0	
15/09/2023	05:00:00	11	0	0	
15/09/2023	06:00:00	11	0	0	
15/09/2023	07:00:00	11	0	0.2	
15/09/2023	20:00:00	11	3	0	14
15/09/2023	21:00:00	11	3	0	
15/09/2023	22:00:00	10	0	0	
15/09/2023	23:00:00	10	2	0	
16/09/2023	00:00:00	11	3	0	
16/09/2023	01:00:00	11	2	0	
16/09/2023	02:00:00	11	3	0	
16/09/2023	03:00:00	11	3	0	15
16/09/2023	04:00:00	10	5	0	
16/09/2023	05:00:00	10	3	0	
16/09/2023	06:00:00	9	6	0	
16/09/2023	07:00:00	9	3	0	
16/09/2023	20:00:00	14	5	0	
16/09/2023	21:00:00	13	5	0	
16/09/2023	22:00:00	13	5	0	15
16/09/2023	23:00:00	13	5	0	
17/09/2023	00:00:00	13	5	0	
17/09/2023	01:00:00	12	0	0	
17/09/2023	02:00:00	12	2	0	
17/09/2023	03:00:00	12	3	0	15
17/09/2023	04:00:00	12	3	0	
17/09/2023	05:00:00	12	3	0	

17/09/2023	06:00:00	12	2	0	16
17/09/2023	07:00:00	12	0	0.6	
17/09/2023	20:00:00	14	3	0	
17/09/2023	21:00:00	14	2	0	
17/09/2023	22:00:00	14	2	0	
17/09/2023	23:00:00	14	5	0	
18/09/2023	00:00:00	13	5	0	
18/09/2023	01:00:00	12	2	0	
18/09/2023	02:00:00	10	3	0	
18/09/2023	03:00:00	11	5	0	
18/09/2023	04:00:00	13	8	0.4	
18/09/2023	05:00:00	12	8	0	
18/09/2023	06:00:00	11	5	0	
18/09/2023	07:00:00	11	5	0	
18/09/2023	20:00:00	13	13	0	
18/09/2023	21:00:00	13	8	0	
18/09/2023	22:00:00	14	13	0	
18/09/2023	23:00:00	13	14	0.8	
19/09/2023	00:00:00	13	18	0	
19/09/2023	01:00:00	14	21	0	
19/09/2023	02:00:00	14	18	0.8	
19/09/2023	03:00:00	15	21	0.2	
19/09/2023	04:00:00	16	31	0.2	
19/09/2023	05:00:00	16	24	0.2	
19/09/2023	06:00:00	16	23	0.2	
19/09/2023	07:00:00	16	21	0.4	
19/09/2023	20:00:00	16	21	0.2	
19/09/2023	21:00:00	16	23	1.4	
19/09/2023	22:00:00	16	21	0.2	
19/09/2023	23:00:00	17	21	0	
20/09/2023	00:00:00	16	13	0.6	
20/09/2023	01:00:00	16	21	0	
20/09/2023	02:00:00	16	21	0	
20/09/2023	03:00:00	15	24	0	
20/09/2023	04:00:00	14	29	0	
20/09/2023	05:00:00	13	23	0	
20/09/2023	06:00:00	13	21	0	
20/09/2023	07:00:00	12	18	0.4	
20/09/2023	20:00:00	10	6	0	
20/09/2023	21:00:00	10	5	0	
20/09/2023	22:00:00	10	2	0	
20/09/2023	23:00:00	9	6	0	
21/09/2023	00:00:00	10	5	0	
21/09/2023	01:00:00	9	5	0.2	
21/09/2023	02:00:00	9	2	0	
21/09/2023	03:00:00	9	5	0.2	
21/09/2023	04:00:00	9	5	0	
21/09/2023	05:00:00	9	2	0	
21/09/2023	06:00:00	8	0	0	
21/09/2023	07:00:00	7	0	0	
Spring 2024					
15/04/2024	20:00:00	8	16	0	
15/04/2024	21:00:00	8	16	0	
15/04/2024	22:00:00	8	14	0	
15/04/2024	23:00:00	8	13	0	
16/04/2024	00:00:00	8	14	0	
16/04/2024	01:00:00	8	14	0	
16/04/2024	02:00:00	8	13	0	
16/04/2024	03:00:00	8	14	0	
16/04/2024	04:00:00	8	13	0	
16/04/2024	05:00:00	8	14	0	
16/04/2024	06:00:00	8	11	0	
16/04/2024	07:00:00	8	11	0	
16/04/2024	20:00:00	9	10	0	
16/04/2024	21:00:00	8	8	0	
16/04/2024	22:00:00	8	8	0	
16/04/2024	23:00:00	8	6	0	

17/04/2024	00:00:00	8	6	0
17/04/2024	01:00:00	7	6	0
17/04/2024	02:00:00	8	8	0
17/04/2024	03:00:00	8	6	0
17/04/2024	04:00:00	8	6	0
17/04/2024	05:00:00	7	6	0
17/04/2024	06:00:00	8	5	0
17/04/2024	07:00:00	8	6	0
17/04/2024	20:00:00	10	11	0
17/04/2024	21:00:00	9	8	0
17/04/2024	22:00:00	9	6	0
17/04/2024	23:00:00	8	6	0
18/04/2024	00:00:00	9	6	0
18/04/2024	01:00:00	9	5	0
18/04/2024	02:00:00	8	3	0
18/04/2024	03:00:00	9	2	0
18/04/2024	04:00:00	8	2	0
18/04/2024	05:00:00	8	0	0
18/04/2024	06:00:00	8	2	0
18/04/2024	07:00:00	8	2	0
18/04/2024	20:00:00	11	10	0
18/04/2024	21:00:00	10	8	0
18/04/2024	22:00:00	10	8	0
18/04/2024	23:00:00	10	6	0
19/04/2024	00:00:00	10	6	0
19/04/2024	01:00:00	10	6	0
19/04/2024	02:00:00	9	6	0
19/04/2024	03:00:00	9	8	0
19/04/2024	04:00:00	9	6	0
19/04/2024	05:00:00	9	6	0
19/04/2024	06:00:00	9	6	0
19/04/2024	07:00:00	9	6	0.2
19/04/2024	20:00:00	12	5	0
19/04/2024	21:00:00	11	3	0
19/04/2024	22:00:00	10	0	0
19/04/2024	23:00:00	9	0	0
20/04/2024	00:00:00	6	0	0
20/04/2024	01:00:00	4	0	0
20/04/2024	02:00:00	3	0	0
20/04/2024	03:00:00	2	0	0
20/04/2024	04:00:00	2	0	0
20/04/2024	05:00:00	2	0	0
20/04/2024	06:00:00	1	0	0
20/04/2024	07:00:00	1	0	0
20/04/2024	20:00:00	13	5	0
20/04/2024	21:00:00	12	2	0
20/04/2024	22:00:00	9	0	0
20/04/2024	23:00:00	7	0	0
21/04/2024	00:00:00	6	0	0
21/04/2024	01:00:00	4	0	0
21/04/2024	02:00:00	5	0	0
21/04/2024	03:00:00	4	0	0
21/04/2024	04:00:00	3	0	0
21/04/2024	05:00:00	3	0	0
21/04/2024	06:00:00	3	0	0
21/04/2024	07:00:00	2	0	0
21/04/2024	20:00:00	15	5	0
21/04/2024	21:00:00	13	3	0
21/04/2024	22:00:00	9	2	0
21/04/2024	23:00:00	8	2	0
22/04/2024	00:00:00	7	2	0
22/04/2024	01:00:00	7	2	0
22/04/2024	02:00:00	7	2	0
22/04/2024	03:00:00	6	0	0
22/04/2024	04:00:00	7	3	0
22/04/2024	05:00:00	6	2	0
22/04/2024	06:00:00	6	2	0

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22/04/2024	07:00:00	7	0	0
22/04/2024	20:00:00	15	5	0
22/04/2024	21:00:00	12	2	0
22/04/2024	22:00:00	9	0	0
22/04/2024	23:00:00	8	2	0
23/04/2024	00:00:00	7	0	0
23/04/2024	01:00:00	5	0	0
23/04/2024	02:00:00	4	0	0
23/04/2024	03:00:00	5	0	0
23/04/2024	04:00:00	6	2	0
23/04/2024	05:00:00	8	2	0
23/04/2024	06:00:00	9	3	0
23/04/2024	07:00:00	9	5	0
23/04/2024	20:00:00	12	6	0
23/04/2024	21:00:00	11	6	0
23/04/2024	22:00:00	11	6	0
23/04/2024	23:00:00	10	3	0
24/04/2024	00:00:00	9	3	0
24/04/2024	01:00:00	9	0	0
24/04/2024	02:00:00	9	2	0
24/04/2024	03:00:00	9	0	0
24/04/2024	04:00:00	8	0	0
24/04/2024	05:00:00	8	2	0
24/04/2024	06:00:00	8	3	0
24/04/2024	07:00:00	8	0	0
24/04/2024	20:00:00	12	6	0
24/04/2024	21:00:00	9	3	0
24/04/2024	22:00:00	7	2	0
24/04/2024	23:00:00	6	2	0
25/04/2024	00:00:00	7	3	0
25/04/2024	01:00:00	8	2	0
25/04/2024	02:00:00	8	2	0
25/04/2024	03:00:00	8	3	0
25/04/2024	04:00:00	8	2	0.2
25/04/2024	05:00:00	7	0	0
25/04/2024	06:00:00	7	2	0.2
25/04/2024	07:00:00	7	2	0.2
25/04/2024	20:00:00	10	3	0
25/04/2024	21:00:00	10	5	0
25/04/2024	22:00:00	9	8	0
25/04/2024	23:00:00	8	3	0
26/04/2024	00:00:00	8	5	0
26/04/2024	01:00:00	7	3	0
26/04/2024	02:00:00	6	2	0
26/04/2024	03:00:00	6	2	0
26/04/2024	04:00:00	7	6	0
26/04/2024	05:00:00	7	8	0
26/04/2024	06:00:00	6	8	0
26/04/2024	07:00:00	5	8	0
26/04/2024	20:00:00	10	6	0.6
26/04/2024	21:00:00	7	2	0
26/04/2024	22:00:00	6	0	0
26/04/2024	23:00:00	4	2	0
27/04/2024	00:00:00	3	0	0
27/04/2024	01:00:00	3	0	0
27/04/2024	02:00:00	3	2	0
27/04/2024	03:00:00	2	2	0
27/04/2024	04:00:00	1	0	0
27/04/2024	05:00:00	0	2	0
27/04/2024	06:00:00	-1	0	0
27/04/2024	07:00:00	0	0	0
27/04/2024	20:00:00	11	8	0
27/04/2024	21:00:00	8	3	0
27/04/2024	22:00:00	7	3	0
27/04/2024	23:00:00	6	3	0
28/04/2024	00:00:00	5	2	0
28/04/2024	01:00:00	2	2	0

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28/04/2024	02:00:00	1	2	0
28/04/2024	03:00:00	1	2	0
28/04/2024	04:00:00	1	0	0
28/04/2024	05:00:00	1	0	0
28/04/2024	06:00:00	2	2	0
28/04/2024	07:00:00	2	0	0
28/04/2024	20:00:00	11	14	0
28/04/2024	21:00:00	10	11	0
28/04/2024	22:00:00	9	10	0
28/04/2024	23:00:00	9	10	0
29/04/2024	00:00:00	9	10	0
29/04/2024	01:00:00	9	10	0.6
29/04/2024	02:00:00	9	10	0.6
29/04/2024	03:00:00	9	10	0.6
29/04/2024	04:00:00	9	10	1
29/04/2024	05:00:00	9	11	0.6
29/04/2024	06:00:00	9	10	0.8
29/04/2024	07:00:00	9	11	0.8
29/04/2024	20:00:00	9	3	1
29/04/2024	21:00:00	9	2	0.6
29/04/2024	22:00:00	8	2	0
29/04/2024	23:00:00	8	2	0
30/04/2024	00:00:00	8	3	0
30/04/2024	01:00:00	7	3	0
30/04/2024	02:00:00	7	3	0
30/04/2024	03:00:00	7	2	0
30/04/2024	04:00:00	5	0	0
30/04/2024	05:00:00	3	0	0
30/04/2024	06:00:00	3	0	0
30/04/2024	07:00:00	5	0	0
30/04/2024	20:00:00	9	2	0
30/04/2024	21:00:00	9	2	0
30/04/2024	22:00:00	8	6	0
30/04/2024	23:00:00	8	6	0
01/05/2024	00:00:00	7	8	0
01/05/2024	01:00:00	7	6	0
01/05/2024	02:00:00	7	10	0.2
01/05/2024	03:00:00	7	10	0.4
01/05/2024	04:00:00	7	8	0
01/05/2024	05:00:00	7	6	0
01/05/2024	06:00:00	6	2	0
01/05/2024	07:00:00	5	2	0
01/05/2024	20:00:00	14	10	0
01/05/2024	21:00:00	12	5	0
01/05/2024	22:00:00	9	3	0
01/05/2024	23:00:00	8	3	0
02/05/2024	00:00:00	6	0	0
02/05/2024	01:00:00	4	2	0
02/05/2024	02:00:00	4	0	0
02/05/2024	03:00:00	3	0	0
02/05/2024	04:00:00	3	0	0
02/05/2024	05:00:00	4	0	0
02/05/2024	06:00:00	4	0	0
02/05/2024	07:00:00	4	0	0
02/05/2024	20:00:00	9	11	0
02/05/2024	21:00:00	9	10	0.2
02/05/2024	22:00:00	9	8	0.2
02/05/2024	23:00:00	9	5	0
03/05/2024	00:00:00	9	6	0
03/05/2024	01:00:00	9	8	0
03/05/2024	02:00:00	9	8	0
03/05/2024	03:00:00	9	8	0
03/05/2024	04:00:00	9	6	0
03/05/2024	05:00:00	9	5	0
03/05/2024	06:00:00	9	5	0
03/05/2024	07:00:00	9	5	0
03/05/2024	20:00:00	11	8	0

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Classified Authority

Inspection Purposes Only!

03/05/2024	21:00:00	11	6	0
03/05/2024	22:00:00	10	3	0
03/05/2024	23:00:00	10	3	0
04/05/2024	00:00:00	10	5	0
04/05/2024	01:00:00	10	2	0
04/05/2024	02:00:00	10	2	0
04/05/2024	03:00:00	10	2	0
04/05/2024	04:00:00	9	0	0
04/05/2024	05:00:00	8	0	0
04/05/2024	06:00:00	9	2	0
04/05/2024	07:00:00	9	2	0
04/05/2024	20:00:00	12	3	0
04/05/2024	21:00:00	10	0	0
04/05/2024	22:00:00	7	0	0
04/05/2024	23:00:00	5	0	0
05/05/2024	00:00:00	4	0	0
05/05/2024	01:00:00	4	0	0
05/05/2024	02:00:00	3	0	0
05/05/2024	03:00:00	3	0	0
05/05/2024	04:00:00	3	0	0
05/05/2024	05:00:00	3	0	0
05/05/2024	06:00:00	2	0	0
05/05/2024	07:00:00	3	0	0
05/05/2024	20:00:00	14	8	0
05/05/2024	21:00:00	13	6	0
05/05/2024	22:00:00	11	5	0
05/05/2024	23:00:00	10	3	0
06/05/2024	00:00:00	9	0	0
06/05/2024	01:00:00	7	2	0
06/05/2024	02:00:00	6	0	0
06/05/2024	03:00:00	6	0	0
06/05/2024	04:00:00	6	0	0
06/05/2024	05:00:00	7	0	0
06/05/2024	06:00:00	7	0	0
06/05/2024	07:00:00	7	0	0
06/05/2024	20:00:00	13	3	0
06/05/2024	21:00:00	12	3	0
06/05/2024	22:00:00	12	5	0
06/05/2024	23:00:00	11	5	0
07/05/2024	00:00:00	11	5	0
07/05/2024	01:00:00	10	3	0
07/05/2024	02:00:00	10	2	0
07/05/2024	03:00:00	10	3	0
07/05/2024	04:00:00	9	5	0
07/05/2024	05:00:00	9	3	0
07/05/2024	06:00:00	9	3	0
07/05/2024	07:00:00	9	0	0
07/05/2024	20:00:00	13	6	0
07/05/2024	21:00:00	12	3	0
07/05/2024	22:00:00	9	2	0
07/05/2024	23:00:00	8	0	0
08/05/2024	00:00:00	8	0	0
08/05/2024	01:00:00	8	2	0
08/05/2024	02:00:00	7	2	0
08/05/2024	03:00:00	6	2	0
08/05/2024	04:00:00	6	0	0
08/05/2024	05:00:00	6	2	0
08/05/2024	06:00:00	8	3	0
08/05/2024	07:00:00	8	2	0
08/05/2024	20:00:00	15	3	0
08/05/2024	21:00:00	15	2	0
08/05/2024	22:00:00	12	0	0
08/05/2024	23:00:00	9	0	0
09/05/2024	00:00:00	8	0	0
09/05/2024	01:00:00	7	0	0
09/05/2024	02:00:00	7	0	0
09/05/2024	03:00:00	7	2	0

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Inspection Purposes Only!

09/05/2024	04:00:00	7	0	0	
09/05/2024	05:00:00	7	0	0	
09/05/2024	06:00:00	7	0	0	
09/05/2024	07:00:00	8	2	0	
09/05/2024	20:00:00	17	8	0	6
09/05/2024	21:00:00	16	5	0	
09/05/2024	22:00:00	14	3	0	
09/05/2024	23:00:00	13	3	0	
10/05/2024	00:00:00	13	5	0	
10/05/2024	01:00:00	12	5	0	
10/05/2024	02:00:00	11	6	0	
10/05/2024	03:00:00	11	6	0	
10/05/2024	04:00:00	11	10	0	
10/05/2024	05:00:00	10	2	0	
10/05/2024	06:00:00	9	3	0	
10/05/2024	07:00:00	10	2	0	
10/05/2024	20:00:00	19	3	0	
10/05/2024	21:00:00	16	2	0	
10/05/2024	22:00:00	12	2	0	
10/05/2024	23:00:00	10	2	0	
11/05/2024	00:00:00	9	2	0	
11/05/2024	01:00:00	8	2	0	
11/05/2024	02:00:00	8	2	0	
11/05/2024	03:00:00	8	0	0	
11/05/2024	04:00:00	7	2	0	7
11/05/2024	05:00:00	7	0	0	
11/05/2024	06:00:00	7	2	0	
11/05/2024	07:00:00	7	0	0	
11/05/2024	20:00:00	17	3	0	
11/05/2024	21:00:00	15	2	0	
11/05/2024	22:00:00	13	0	0	
11/05/2024	23:00:00	12	2	0	
12/05/2024	00:00:00	13	2	0	
12/05/2024	01:00:00	12	0	0	
12/05/2024	02:00:00	12	0	0	8
12/05/2024	03:00:00	12	0	0	
12/05/2024	04:00:00	12	0	0	
12/05/2024	05:00:00	12	2	0	
12/05/2024	06:00:00	12	2	0	
12/05/2024	07:00:00	12	0	0	
12/05/2024	20:00:00	14	2	0	
12/05/2024	21:00:00	12	0	0	
12/05/2024	22:00:00	11	0	0	
12/05/2024	23:00:00	9	0	0	
13/05/2024	00:00:00	9	0	0	9
13/05/2024	01:00:00	10	2	0.2	
13/05/2024	02:00:00	10	2	0.2	
13/05/2024	03:00:00	11	3	0.2	
13/05/2024	04:00:00	11	5	0.8	
13/05/2024	05:00:00	11	6	2.6	
13/05/2024	06:00:00	10	8	4.4	
13/05/2024	07:00:00	10	10	4	
13/05/2024	20:00:00	14	3	0	
13/05/2024	21:00:00	14	2	0	
13/05/2024	22:00:00	13	0	0	
13/05/2024	23:00:00	12	0	0	
14/05/2024	00:00:00	12	0	0	
14/05/2024	01:00:00	11	0	0	
14/05/2024	02:00:00	9	2	0	
14/05/2024	03:00:00	9	2	0	
14/05/2024	04:00:00	8	0	0	
14/05/2024	05:00:00	7	0	0	
14/05/2024	06:00:00	9	0	0	
14/05/2024	07:00:00	9	0	0	
14/05/2024	20:00:00	13	3	2	
14/05/2024	21:00:00	12	2	0.2	
14/05/2024	22:00:00	12	2	0	

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14/05/2024	23:00:00	11	2	0	10
15/05/2024	00:00:00	11	2	0	
15/05/2024	01:00:00	11	5	0	
15/05/2024	02:00:00	11	3	0	
15/05/2024	03:00:00	10	3	0	
15/05/2024	04:00:00	11	6	0	
15/05/2024	05:00:00	10	5	0	
15/05/2024	06:00:00	9	2	0	
15/05/2024	07:00:00	10	3	0	11
15/05/2024	20:00:00	17	6	0	
15/05/2024	21:00:00	16	0	0	
15/05/2024	22:00:00	13	2	0	
15/05/2024	23:00:00	10	0	0	
16/05/2024	00:00:00	9	0	0	
16/05/2024	01:00:00	8	0	0	
16/05/2024	02:00:00	8	0	0	
16/05/2024	03:00:00	7	0	0	
16/05/2024	04:00:00	6	0	0	11
16/05/2024	05:00:00	7	0	0	
16/05/2024	06:00:00	7	0	0	
16/05/2024	07:00:00	9	0	0	
16/05/2024	20:00:00	15	8	0	
16/05/2024	21:00:00	14	5	0	
16/05/2024	22:00:00	13	3	0	
16/05/2024	23:00:00	12	3	0	12
17/05/2024	00:00:00	12	5	0	
17/05/2024	01:00:00	12	5	0	
17/05/2024	02:00:00	13	5	0	
17/05/2024	03:00:00	13	6	0	
17/05/2024	04:00:00	13	5	0	
17/05/2024	05:00:00	13	6	0	
17/05/2024	06:00:00	13	6	0	
17/05/2024	07:00:00	13	5	0	12
17/05/2024	20:00:00	16	5	0	
17/05/2024	21:00:00	16	5	0	
17/05/2024	22:00:00	14	2	0	
17/05/2024	23:00:00	13	2	0	
18/05/2024	00:00:00	12	5	0	
18/05/2024	01:00:00	12	2	0	
18/05/2024	02:00:00	11	2	0	13
18/05/2024	03:00:00	11	3	0	
18/05/2024	04:00:00	11	3	0	
18/05/2024	05:00:00	11	3	0	
18/05/2024	06:00:00	11	5	0	
18/05/2024	07:00:00	11	3	0	
18/05/2024	20:00:00	15	3	0	
18/05/2024	21:00:00	14	2	0	13
18/05/2024	22:00:00	13	0	0	
18/05/2024	23:00:00	11	0	0	
19/05/2024	00:00:00	10	2	0	
19/05/2024	01:00:00	11	2	0	
19/05/2024	02:00:00	11	0	0	
19/05/2024	03:00:00	10	0	0	
19/05/2024	04:00:00	10	0	0	14
19/05/2024	05:00:00	10	0	0	
19/05/2024	06:00:00	9	0	0	
19/05/2024	07:00:00	9	0	0	
19/05/2024	20:00:00	18	3	0	
19/05/2024	21:00:00	16	3	0	
19/05/2024	22:00:00	13	0	0	
19/05/2024	23:00:00	11	2	0	14
20/05/2024	00:00:00	11	2	0	
20/05/2024	01:00:00	12	3	0	
20/05/2024	02:00:00	11	0	0	
20/05/2024	03:00:00	11	0	0	
20/05/2024	04:00:00	11	0	0	14
20/05/2024	05:00:00	9	0	0	

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20/05/2024	06:00:00	8	0	0	
20/05/2024	07:00:00	8	0	0	
Summer 2024					1
27/06/2024	21:00:00	12	16	0.6	
27/06/2024	22:00:00	12	14	0	
27/06/2024	23:00:00	13	16	0	
28/06/2024	00:00:00	13	18	0	
28/06/2024	01:00:00	13	16	0	
28/06/2024	02:00:00	13	14	0	
28/06/2024	03:00:00	13	11	0	
28/06/2024	04:00:00	13	13	0	
28/06/2024	05:00:00	12	11	0	
28/06/2024	06:00:00	12	11	0	2
28/06/2024	21:00:00	13	5	0	
28/06/2024	22:00:00	13	8	0	
28/06/2024	23:00:00	13	6	0.4	
29/06/2024	00:00:00	12	3	2.4	
29/06/2024	01:00:00	12	5	0.8	
29/06/2024	02:00:00	13	3	3	
29/06/2024	03:00:00	13	5	0.4	
29/06/2024	04:00:00	13	5	0.4	
29/06/2024	05:00:00	13	3	0	
29/06/2024	06:00:00	13	2	0.2	3
29/06/2024	21:00:00	14	10	0	
29/06/2024	22:00:00	13	8	0	
29/06/2024	23:00:00	11	5	0	
30/06/2024	00:00:00	11	3	0	
30/06/2024	01:00:00	10	0	0	
30/06/2024	02:00:00	9	0	0	
30/06/2024	03:00:00	9	2	0	
30/06/2024	04:00:00	11	5	0	
30/06/2024	05:00:00	12	5	0	
30/06/2024	06:00:00	12	2	0	4
30/06/2024	21:00:00	14	6	0	
30/06/2024	22:00:00	13	6	0	
30/06/2024	23:00:00	13	5	0	
01/07/2024	00:00:00	13	5	0	
01/07/2024	01:00:00	12	3	0	
01/07/2024	02:00:00	13	6	0	
01/07/2024	03:00:00	13	8	0	
01/07/2024	04:00:00	12	5	0	
01/07/2024	05:00:00	12	5	0	
01/07/2024	06:00:00	13	8	0	5
01/07/2024	21:00:00	14	8	0	
01/07/2024	22:00:00	12	3	0	
01/07/2024	23:00:00	12	2	0	
02/07/2024	00:00:00	11	2	0	
02/07/2024	01:00:00	9	0	0	
02/07/2024	02:00:00	8	0	0	
02/07/2024	03:00:00	8	0	0	
02/07/2024	04:00:00	8	0	0	
02/07/2024	05:00:00	9	0	0	
02/07/2024	06:00:00	10	0	0	6
02/07/2024	21:00:00	13	14	0	
02/07/2024	22:00:00	13	10	0	
02/07/2024	23:00:00	13	11	0	
03/07/2024	00:00:00	13	11	0	
03/07/2024	01:00:00	13	14	0	
03/07/2024	02:00:00	12	16	0.6	
03/07/2024	03:00:00	12	13	0	
03/07/2024	04:00:00	12	14	0.2	
03/07/2024	05:00:00	13	16	0.4	
03/07/2024	06:00:00	14	16	0.2	
03/07/2024	21:00:00	13	10	0	
03/07/2024	22:00:00	12	8	0	
03/07/2024	23:00:00	12	6	0	
04/07/2024	00:00:00	11	5	0	

04/07/2024	01:00:00	12	11	0	7
04/07/2024	02:00:00	12	11	0	
04/07/2024	03:00:00	12	13	0	
04/07/2024	04:00:00	12	14	0	
04/07/2024	05:00:00	12	14	0	
04/07/2024	06:00:00	12	13	0	
04/07/2024	21:00:00	13	10	0	8
04/07/2024	22:00:00	12	5	0	
04/07/2024	23:00:00	11	3	0	
05/07/2024	00:00:00	11	3	0	
05/07/2024	01:00:00	12	5	0	
05/07/2024	02:00:00	11	2	1	
05/07/2024	03:00:00	11	5	0.2	9
05/07/2024	04:00:00	11	0	0	
05/07/2024	05:00:00	11	0	0	
05/07/2024	06:00:00	11	2	0	
05/07/2024	21:00:00	12	5	0	
05/07/2024	22:00:00	10	2	0	
05/07/2024	23:00:00	10	2	0.6	10
06/07/2024	00:00:00	9	2	0	
06/07/2024	01:00:00	9	2	0.2	
06/07/2024	02:00:00	9	3	0	
06/07/2024	03:00:00	10	5	1.4	
06/07/2024	04:00:00	9	5	0.2	
06/07/2024	05:00:00	9	3	0	11
06/07/2024	06:00:00	9	3	0	
06/07/2024	21:00:00	13	5	0	
06/07/2024	22:00:00	12	0	0	
06/07/2024	23:00:00	11	5	0.2	
07/07/2024	00:00:00	11	2	0	
07/07/2024	01:00:00	10	2	5.4	12
07/07/2024	02:00:00	10	0	0.6	
07/07/2024	03:00:00	10	0	0	
07/07/2024	04:00:00	10	0	1.4	
07/07/2024	05:00:00	10	0	1	
07/07/2024	06:00:00	9	0	0.2	
07/07/2024	21:00:00	15	2	0	13
07/07/2024	22:00:00	14	0	0	
07/07/2024	23:00:00	9	0	0	
08/07/2024	00:00:00	7	0	0	
08/07/2024	01:00:00	6	0	0	
08/07/2024	02:00:00	7	0	0	
08/07/2024	03:00:00	8	0	0	14
08/07/2024	04:00:00	8	0	0	
08/07/2024	05:00:00	7	0	0	
08/07/2024	06:00:00	6	0	0	
08/07/2024	21:00:00	15	6	0	
08/07/2024	22:00:00	14	2	0	15
08/07/2024	23:00:00	14	2	0	
09/07/2024	00:00:00	14	2	0	
09/07/2024	01:00:00	14	2	0	
09/07/2024	02:00:00	13	2	0	
09/07/2024	03:00:00	13	3	0	16
09/07/2024	04:00:00	13	3	0	
09/07/2024	05:00:00	13	5	0	
09/07/2024	06:00:00	13	3	0	
09/07/2024	21:00:00	17	3	0	
09/07/2024	22:00:00	15	2	0	17
09/07/2024	23:00:00	14	2	0	
10/07/2024	00:00:00	12	0	0	
10/07/2024	01:00:00	12	2	0	
10/07/2024	02:00:00	12	2	0	
10/07/2024	03:00:00	13	2	0	18
10/07/2024	04:00:00	13	5	0	
10/07/2024	05:00:00	14	8	0	
10/07/2024	06:00:00	14	8	0	
10/07/2024	21:00:00	15	10	0	

10/07/2024	22:00:00	13	6	0	13
10/07/2024	23:00:00	12	6	0	
11/07/2024	00:00:00	12	5	0	
11/07/2024	01:00:00	12	3	0	
11/07/2024	02:00:00	12	2	0	
11/07/2024	03:00:00	12	3	0	
11/07/2024	04:00:00	12	3	0	
11/07/2024	05:00:00	12	2	0	
11/07/2024	06:00:00	12	2	0	14
11/07/2024	21:00:00	14	5	0	
11/07/2024	22:00:00	14	2	0	
11/07/2024	23:00:00	13	3	0	
12/07/2024	00:00:00	12	2	0	
12/07/2024	01:00:00	12	3	0	
12/07/2024	02:00:00	12	0	0	
12/07/2024	03:00:00	12	0	0	
12/07/2024	04:00:00	12	0	0	
12/07/2024	05:00:00	12	2	0	15
12/07/2024	06:00:00	12	3	0	
12/07/2024	21:00:00	15	6	0	
12/07/2024	22:00:00	14	3	0	
12/07/2024	23:00:00	14	2	0	
13/07/2024	00:00:00	13	2	0	
13/07/2024	01:00:00	13	0	0	
13/07/2024	02:00:00	12	0	0	
13/07/2024	03:00:00	12	0	0	16
13/07/2024	04:00:00	12	0	0	
13/07/2024	05:00:00	12	0	0	
13/07/2024	06:00:00	12	0	0	
13/07/2024	21:00:00	17	2	0	
13/07/2024	22:00:00	15	0	0	
13/07/2024	23:00:00	12	0	0	
14/07/2024	00:00:00	12	0	0	
14/07/2024	01:00:00	12	2	0	17
14/07/2024	02:00:00	13	3	0	
14/07/2024	03:00:00	13	2	0	
14/07/2024	04:00:00	13	0	0	
14/07/2024	05:00:00	12	0	0	
14/07/2024	06:00:00	13	0	0	
14/07/2024	21:00:00	16	2	0	
14/07/2024	22:00:00	15	0	0	
14/07/2024	23:00:00	14	0	0	18
15/07/2024	00:00:00	13	0	0	
15/07/2024	01:00:00	11	0	0	
15/07/2024	02:00:00	10	0	0	
15/07/2024	03:00:00	11	2	0	
15/07/2024	04:00:00	11	0	0	
15/07/2024	05:00:00	10	0	0	
15/07/2024	06:00:00	11	2	0	
15/07/2024	21:00:00	17	5	0	19
15/07/2024	22:00:00	15	2	0	
15/07/2024	23:00:00	15	2	0	
16/07/2024	00:00:00	14	2	0	
16/07/2024	01:00:00	14	3	0	
16/07/2024	02:00:00	14	3	0	
16/07/2024	03:00:00	13	2	0	
16/07/2024	04:00:00	13	5	0	
16/07/2024	05:00:00	13	5	0	19
16/07/2024	06:00:00	13	3	0	
16/07/2024	21:00:00	16	6	0	
16/07/2024	22:00:00	15	5	0	
16/07/2024	23:00:00	14	2	0	
17/07/2024	00:00:00	14	3	0	
17/07/2024	01:00:00	15	2	0	
17/07/2024	02:00:00	14	0	0	
17/07/2024	03:00:00	13	2	0	
17/07/2024	04:00:00	13	3	0	

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17/07/2024	05:00:00	13	8	0	20
17/07/2024	06:00:00	13	5	0	
17/07/2024	21:00:00	15	5	0.8	
17/07/2024	22:00:00	15	5	0.8	
17/07/2024	23:00:00	15	6	0	
18/07/2024	00:00:00	15	8	0	
18/07/2024	01:00:00	15	8	0.2	
18/07/2024	02:00:00	15	10	0	
18/07/2024	03:00:00	15	8	0	
18/07/2024	04:00:00	15	8	0	
18/07/2024	05:00:00	15	6	0	
18/07/2024	06:00:00	15	2	0	
Autumn 2024					
02/09/2024	19:00:00	15	3	0	1
02/09/2024	20:00:00	13	2	0	
02/09/2024	21:00:00	11	0	0	
02/09/2024	22:00:00	11	0	0	
02/09/2024	23:00:00	12	0	0	
03/09/2024	00:00:00	13	3	0	
03/09/2024	01:00:00	14	5	0	
03/09/2024	02:00:00	14	5	0	
03/09/2024	03:00:00	14	5	0	
03/09/2024	04:00:00	14	3	0	
03/09/2024	05:00:00	14	3	0	
03/09/2024	06:00:00	13	2	0	
03/09/2024	07:00:00	13	2	0.2	2
03/09/2024	19:00:00	14	8	0	
03/09/2024	20:00:00	14	5	0	
03/09/2024	21:00:00	13	5	0	
03/09/2024	22:00:00	13	5	0	
03/09/2024	23:00:00	13	5	0	
04/09/2024	00:00:00	12	6	0	
04/09/2024	01:00:00	13	6	0	
04/09/2024	02:00:00	12	6	0	
04/09/2024	03:00:00	12	6	0	
04/09/2024	04:00:00	12	5	0	
04/09/2024	05:00:00	12	6	0	
04/09/2024	06:00:00	12	6	0	
04/09/2024	07:00:00	12	10	0	3
04/09/2024	19:00:00	14	11	0	
04/09/2024	20:00:00	13	6	0	
04/09/2024	21:00:00	12	3	0	
04/09/2024	22:00:00	12	3	0	
04/09/2024	23:00:00	12	5	0	
05/09/2024	00:00:00	11	3	0	
05/09/2024	01:00:00	11	3	0	
05/09/2024	02:00:00	11	3	0	
05/09/2024	03:00:00	11	2	0	
05/09/2024	04:00:00	10	3	0	
05/09/2024	05:00:00	9	2	0	
05/09/2024	06:00:00	9	2	0	
05/09/2024	07:00:00	9	2	0	4
05/09/2024	19:00:00	19	5	0	
05/09/2024	20:00:00	18	3	0	
05/09/2024	21:00:00	16	3	0	
05/09/2024	22:00:00	15	2	0	
05/09/2024	23:00:00	15	3	0	
06/09/2024	00:00:00	14	3	0	
06/09/2024	02:00:00	14	5	0	
06/09/2024	03:00:00	15	8	0	
06/09/2024	04:00:00	14	5	0	
06/09/2024	05:00:00	14	8	0	
06/09/2024	06:00:00	14	6	0	
06/09/2024	07:00:00	14	6	0	
06/09/2024	19:00:00	20	3	0	
06/09/2024	20:00:00	19	2	0	
06/09/2024	21:00:00	16	0	0	

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06/09/2024	22:00:00	14	0	0	5
06/09/2024	23:00:00	13	0	0	
07/09/2024	00:00:00	13	2	0	
07/09/2024	01:00:00	12	0	0	
07/09/2024	02:00:00	11	0	0	
07/09/2024	03:00:00	10	0	0	
07/09/2024	04:00:00	11	2	0	
07/09/2024	05:00:00	10	0	0	
07/09/2024	06:00:00	10	0	0	
07/09/2024	07:00:00	9	0	0	
07/09/2024	19:00:00	20	2	0	6
07/09/2024	20:00:00	18	2	0	
07/09/2024	21:00:00	16	0	0	
07/09/2024	22:00:00	14	0	0	
07/09/2024	23:00:00	15	0	0	
08/09/2024	00:00:00	16	2	0	
08/09/2024	01:00:00	16	2	0	
08/09/2024	02:00:00	16	2	0	
08/09/2024	03:00:00	16	0	0	
08/09/2024	04:00:00	15	2	0	
08/09/2024	05:00:00	15	0	0	7
08/09/2024	06:00:00	15	0	0	
08/09/2024	07:00:00	14	3	0	
08/09/2024	19:00:00	15	13	0	
08/09/2024	20:00:00	14	10	0	
08/09/2024	21:00:00	13	8	0	
08/09/2024	22:00:00	13	8	0	
08/09/2024	23:00:00	13	8	0	
09/09/2024	00:00:00	12	8	0	
09/09/2024	01:00:00	12	8	0	8
09/09/2024	02:00:00	12	5	0	
09/09/2024	03:00:00	12	3	0	
09/09/2024	04:00:00	12	5	0	
09/09/2024	05:00:00	12	8	0	
09/09/2024	06:00:00	12	8	0	
09/09/2024	07:00:00	12	6	0	
09/09/2024	19:00:00	14	13	0	
09/09/2024	20:00:00	14	13	0.2	
09/09/2024	21:00:00	14	11	0.2	9
09/09/2024	22:00:00	14	11	0	
09/09/2024	23:00:00	14	11	0	
10/09/2024	00:00:00	14	13	0	
10/09/2024	01:00:00	14	13	0	
10/09/2024	02:00:00	14	14	0.6	
10/09/2024	03:00:00	14	16	0.2	
10/09/2024	04:00:00	14	16	0	
10/09/2024	05:00:00	14	16	0	
10/09/2024	06:00:00	14	13	0	9
10/09/2024	07:00:00	14	16	0.4	
10/09/2024	19:00:00	12	10	0	
10/09/2024	20:00:00	12	8	0	
10/09/2024	21:00:00	11	10	0	
10/09/2024	22:00:00	11	10	0	
10/09/2024	23:00:00	11	10	0	
11/09/2024	00:00:00	11	10	0.2	
11/09/2024	01:00:00	11	8	0	
11/09/2024	02:00:00	11	10	0	
11/09/2024	03:00:00	12	11	0	
11/09/2024	04:00:00	11	10	0	
11/09/2024	05:00:00	11	10	0	
11/09/2024	06:00:00	11	10	0.2	
11/09/2024	07:00:00	11	10	0	
11/09/2024	19:00:00	13	8	0	
11/09/2024	20:00:00	11	5	0	
11/09/2024	21:00:00	11	5	0	
11/09/2024	22:00:00	11	5	0	
11/09/2024	23:00:00	10	3	0	

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12/09/2024	00:00:00	10	3	0	10
12/09/2024	01:00:00	10	5	0	
12/09/2024	02:00:00	10	2	0.2	
12/09/2024	03:00:00	10	5	0	
12/09/2024	04:00:00	10	5	0	
12/09/2024	05:00:00	9	3	0	
12/09/2024	06:00:00	9	3	0	
12/09/2024	07:00:00	8	2	0	

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info@odonnellenviro.ie