# Appendix 8.3:

## Bat Survey Report (2013)

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# Tyrone Cavan Interconnector Bat Survey Report (2013)

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Tyrone Cavan Interconnector Bat Survey Report

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# 1 Introduction

## 1.1 Introduction

The Proposed Development includes the construction of a 400,000 volt (400kV) overhead line in Counties Tyrone and Armagh, and an associated 275/400kV substation in the townland of Turleenan (near Moy), County Tyrone. The overhead line will run for a distance of approximately 34km to the Republic of Ireland border. The overhead line, the substation and associated development are referred to in this report as "the Proposed Development."

The Proposed Development forms the Northern Ireland element of the "Tyrone – Cavan Interconnector", which is being jointly promoted by SONI and EirGrid, forming part of a major cross-border development to improve interconnection between the NIE transmission system in Northern Ireland and the ESB transmission system in the Republic of Ireland.

Bat surveys have been carried out at the site during 2009, 2010, 2011, and 2012. These 2013 surveys have been carried out to ensure that the data presented was contemporary and any seasonal variations were adequately reported.

## 1.2 Site Setting

The area of the Proposed Development comprises mainly species poor arable fields with associated species poor heavily managed hedgerows and trees. There are some areas of semi- improved and improved grassland.

## 1.3 Summary of Bat Legislation

Bats in Northern Ireland are protected under the Conservation (Natural Habitats etc) Regulations (Northern Ireland) 1995 (as amended). Bats are listed under Schedule 2 of the Regulations, which make it an offence to:

1. Deliberately capture, injure or kill a bat;
2. Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
4. Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; and/or,
5. Intentionally or recklessly obstruct access to a bat roost.

## 1.4 Quality Assurance

AECOM is BS EN ISO 9001:2008, BS EN ISO 14001:2004 and OHSAS 18001:2007 Health and Safety certified.

## 1.5 Summary of Previous Data

The bat surveys undertaken in 2009/2010 had a bespoke methodology agreed with NIEA based on adapting the NIEA (Jan 09) Bat Survey – Specific Requirements as well as best practice from the Bat Conservation Trust, Bat Surveys – Good Practice Guidelines (2007) for the Proposed Development. A number of steps were carried out to finalise the methodology and included a review of a Phase 1 Habitat Survey Report, a desk based assessed (review of aerial photography to identify any features likely to provide roosting, commuting, and foraging suitability for bats that had the potential to be affected by the Proposed Development. A daytime assessment at each location was conducted to assess the potential for roosting bats to be present in any mature trees. The daytime assessment looked for dead/damaged limbs, scratch marks, urine stains, droppings etc. on any mature and semi-mature trees.

It was agreed with NIEA that hedges unlikely to harbour bat roosts (i.e. those without mature, standard trees, monoculture hedges and those structurally modified by flailing/cutting) did not require a bat roost survey but did require the identification of bat flightlines (commuting routes) between roosts and foraging areas. NIEA agreed that flight-line surveys could be carried out during the 2010 survey season to allow the most significant areas to be prioritised for survey during 2009.

During 2009/2010 transect surveys which concentrated on the areas surrounding the proposed tower locations were carried out. The 2009/2010 surveys were undertaken to assess the presence or absence of bats within the study area, however because a triage approach was taken relating to the linear features which would be surveyed, the footprint of the study area was approximately 75% of the entire line route. The following species were recorded at least once during the 2009/2010 surveys:

- Daubenton's bat;
- Whiskered bat;
- Natterer's bat;
- Leisler's bat;
- Nathusius' pipistrelle;
- Common pipistrelle;
- Soprano pipistrelle; and
- Brown long-eared bat.

A temporary night time roost (two Leisler's bats seen emerging from a tree) was recorded in June 2009 at an alder tree in the proposed sub-station site.

In 2011 driven transect surveys were undertaken for following reasons:

- to verify the results of the 2009/2010 surveys;
- to extend the survey area to provide an assessment of bat activity across the wider landscape surrounding the Proposed Development; and,
- to consider the activity of the local bat population over an additional year to allow for climatic variation across years; and to include an additional survey methodology that considered bat activity along 70-80% of the study area over a single survey period.

The results of the driven transects provided an overall coverage of bat activity at a regional level; it did not provide information associated with the exact location of the Proposed Development. The following species were recorded:

- Leisler's bat;
- Common pipistrelle;
- Soprano pipistrelle; and
- unidentified bats of the *Pipistrellus* genus.

Driven transects concentrated on the minor road network surrounding the Proposed Development. The survey lacked the geographic precision to be able to state bat activity levels in the locations of the proposed tower bases and at adjacent linear features.

In 2012 surveys were undertaken broadly following the methodology suggested in the Bat Survey-Good Practice Guidelines (2012)[1] and the limitations of the previous 2009/2010, 2011 surveys were addressed where possible.

Automated monitoring was carried out from May until September 2012, to capture bat calls in areas which had previously been unavailable due to land access issues.

As approximately 97% of the Proposed Development site was accessible, a series of walked dusk activity surveys were carried out during August to October 2012. The activity surveys were carried out following predetermined transect and listening points which incorporated the proposed tower locations and linear features such as tree lines and hedgerows. Each transect was approximately 3km long and the number of listening stops in each transect was dependant on the number of linear features and tower bases which were present along each transect. Listening stops were conducted where the route of the Proposed

[1] Hundt L (2012) Bat Surveys–Good Practice Guidelines. 2nd edition. Bat Conservation Trust

Development crossed a linear feature or in locations where the route of the Proposed Development runs adjacent to a linear feature. In accordance with the BCT Good Practice Bat Survey Guidelines (Hundt, 2012) each static listening point lasted three minutes and the transects were walked at a 'steady' brisk pace, where the terrain permitted.

Transects commenced 30 minutes prior to sunset and continued for at least two hours. Where a dawn survey was undertaken, monitoring began 2 hours before sunrise and ended 30 minutes after sunrise.

The majority of the site was surveyed once, which didn't present the opportunity to rotate the survey direction and limit bias. There were five occasions where two surveys were recorded (in the vicinity of towers 13,41,42,60 and 78) on these occasions the opportunity was taken to rotate the survey direction.

The 2012 activity and remote detector surveys identified the following species within the survey area:

- - Common pipistrelle;
- - Soprano pipistrelle;
- - Nathusius' pipistrelle;
- - Leisler's;
- - Unidentified bats of the *Pipistrellus* genus;
- - Whiskered/Brandt's bat [2];
- - Natterer's bat; and
- - Unidentified bats of the *Myotis* genus

In total 1,765 calls were identified as bat passes during the static detector surveys. The species with the highest total percentageactivity was Leisler's bat (66.01%). Common pipistrelles were the second highest recorded bat species (15.81%). The bats of the ipistrellus genus were represented in the recordings, however bats of the Myotis genus were a small percentage of the over all (2.25%). During the walked transects, a total of, 372 bat passes were recorded from August to October 2012. Soprano pipistrelle bats made up 33% of the total bat passes recorded (transect and listening points), with common pipistrelle occupying a further 32% of bat passes.

[2] Brandt's bat is likely absent / very rare in Ireland but due to the complexity of separation from whiskered cannot be ruled out

# 2 Methodology

## 2.1 Introduction

This chapter provides the methodologies of the bat surveys undertaken in 2013.

## 2.2 Tree Assessment for Bats

During April and May 2013, a visual inspection of mature / large trees situated along the Proposed Development was carried out to determine the presence of any features indicative of supporting bat roosts. Trees growing within a 100m zone of the centre line of the Proposed Development were assessed and evaluated according to a number of criteria as per BCT 2012 guidelines[3].

Features and field signs that were looked for during the survey (which increase the risk that bats will use a tree as a roost) and common field signs are provided in Table 1 below. During this tree inspection, the trees were given a category according to its bat potential (see Table 2). These features were assessed by a suitably qualified ecologist from the ground following the BCT 2012 Guidelines (Hundt, 2012). The trees identified and assessed are shown on Figures 7A-7U.

**Table 1: Common features of trees used by bats for roosting and field signs which may indicate use by bats[4]**

| Features of Trees Used as Bat Roosts | Signs Indicating Possible Use by Bats |
|---|---|
| Natural holes | Tiny scratches around entry point |
| Cracks / splits in major limbs | Staining around entry point |
| Loose bark | Bat droppings in / around / below entrance |
| Behind dense, thick-stemmed ivy | Audible squeaking at dusk or in warm weather |
| Hollows / cavities | Flies around entry point |
| Dense epicormic growth (bats can roost within) | Distinctive smell of bats |
| Bird and bat boxes | Smoothing of surfaces around cavity |

[3] Hundt L (2012) Bat Surveys – Good Practice Guidelines. 2nd edition. Bat Conservation Trust
[4] adapted from Table 8.3 in Hundt L 2012 Bat Surveys – Good Practice Guidelines. 2nd edition. Bat Conservation Trust.

**Table 2: Protocol for visual inspection of trees** [5]

| Tree category and description | Stage 1<br>Initial Survey Requirements | Stage 2<br>Further measures to inform Proposed mitigation | Stage 3<br>Likely Mitigation |
|---|---|---|---|
| Known or confirmed roost | Follow SNCO guidance and these guidelines wherever possible, to establish the extent to which bats use the site. This is particularly important for roosts of high risk species and/or roosts of district or higher importance and above | | The tree can be felled only under EPS licence following installation of equivalent habitats as replacement. |
| **Category 1*** Trees with multiple, highly suitable features capable of supporting larger roosts | Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the likely use of the roost, number and species of bat, by analysis of droppings or other field evidence<br><br>***A consultant ecologist is required*** | Avoid disturbance to trees where possible.<br><br>Further dusk and pre-dawn survey to establish the presence of bats, and if present, the species and numbers of bats and type of roost to inform the requirements for mitigation if felling is required. | Felling would be undertaken taking reasonable avoidance measures such as 'soft felling' to minimise the risk of harm to individual bats |
| **Category 1** Trees with definite bat potential, supporting few suitable features than Category 1* trees or with potential for use by single bats | Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the potential use of suitable cavities, based on the habitat preferences of bats<br><br>***A consultant ecologist is required*** | Avoid disturbance to trees, where possible.<br>More detailed off the ground visual assessment.<br><br>Further dusk and pre-dawn survey to establish the presence of bats, and if present, the species and numbers of bats and type of roost to inform the requirements for mitigation if felling is required. | Trees with confirmed roosts following further survey are upgraded to Category 1* and felled under licence as above.<br><br>Trees with no confirmed roosts may be downgraded to Category 2 dependant on survey findings |
| **Category 2** Trees with no obvious potential, although the trees is of a size and age that elevated surveys may result in cracks or crevices being found, or the tree supports some features which may have some limited potential to support bats | None<br><br>***A consultant ecologist is unlikely to be required*** | Avoid disturbance to trees, where possible.<br>No further surveys. | Trees may be felled taking reasonable measures.<br><br>Stop works and seek advice in the event bats are found, in order to comply with the relevant legislation |
| **Category 3** Trees with no potential to support bats | None<br>***A consultant ecologist is not required unless new evidence is found*** | None | No mitigation for bats is required |

## 2.3 Building Assessment for Bats

Table 3 below (taken from Table 8.2 BCT 2012 guidelines) lists some features of buildings and built structures that were taken into consideration during the building suitability assessment phase of the project.

Table 4 (taken from Box 8.4 BCT 2012 guidance) provides a list of the evidence and features which if encountered would identify the building as a bat roost or potential bat roost. Table 4 also provides a list of evidence of use by bats and features of the building or built structure taken into consideration during the assessment.

**Table 3: The features of buildings/built structures that are correlated with their use by bats in summer**

[5] Adapted from Table 8.4 in Hundt L (2012) Bat Surveys – Good Practice Guidelines. 2nd edition. Bat Conservation Trust.

| Likelihood of bats being present | Feature of the building or built structure and its location |
|---|---|
| Higher | Pre-20th century or early 20th century construction.[6]<br>Agricultural buildings of traditional brick, stone or timber construction.<br>Large and complicated roof void with unobstructed flying spaces.<br>Large (>20 cm) roof timbers with mortice joints, cracks and holes.<br>Entrances for bats to fly through.<br>Poorly maintained fabric providing ready access points for bats into roofs, walls, bridges, but at the same time not too draughty and cool.<br>Roof warmed by sun, in particular south facing roofs.<br>Weatherboarding and/or hanging tiles with gaps.<br>Low level of disturbance by humans.<br>Bridge structures, follies, aqueducts and viaducts over water and/or wet ground.<br>For rarer species, buildings or built structures in the core area of their distribution.<br>Buildings and built structures in proximity to each other providing a variety of roosting opportunities throughout the year,<br>Buildings or built structures close to good foraging habitat, in particular mature trees, parkland, woodland or wetland, especially in a rural setting. |
| Lower | Modern, well maintained buildings[7] or built structures that provide few opportunities for access by bats.<br>Small, cluttered roof space.<br>Buildings and built structures comprised primarily of prefabricated steel and sheet materials.<br>Cool, shaded, light or draughty roof voids.<br>Roof voids with a dense cover of cobwebs and no sections of clean ridge board.<br>High level of regular disturbance.<br>Highly urbanised location with few or no mature trees, parkland, woodland or wetland.<br>High levels of external lighting. |

[6] Pre-1914 buildings may present the greatest likelihood of providing roost space for bats due to their design, materials used and age. Pre-1990 buildings, especially when close to good foraging habitat, and with favoured features such as cavity walls and soffits, also have a high likelihood of providing roost sites for some bat species.

[7] Post-1990 buildings are generally less likely than older buildings to house roosts; however, some modern designs provide access to suitable roosting spaces for bats. Pipistrelles in particular occupy modern buildings and built structures providing that there are suitable access gaps (>8mm) and provided the structure has appropriate characteristics for roosting

**Table 4: Evidence of use by bats and features of the building or built structure to be taken into account during initial assessment**

| Evidence of use by bats | Features of the building or built structure |
|---|---|
| Location and number of any live bats.<br>Location and number of any corpses or skeletons.<br>Location and number of droppings.<br>Notes of relative freshness, shape, and size of droppings.<br>Location and quantity of feeding remains.<br>Locations of clean and cobweb-free timbers, crevices and holes.<br>Location of characteristic staining from urine and/or grease marks.<br>Location of known and potential access points to the roost.<br>Location of the characteristic smell of bats if no other evidence is recorded. | Type.<br>Age.<br>Aspect.<br>Wall construction, in particular the type of brick or stone used to build the walls and whether it has cavity walls or rubble filled walls.<br>Form of the roof, in particular gable ends, hipped roofs etc, and the nature and condition of the roof covering.<br>Presence of hanging tiles, weather boarding etc.<br>Nature of the eaves, in particular if they are sealed by a soffit or boxed eave and the tightness of the fit to the exterior walls.<br>Presence and condition of lead flashing.<br>Gaps under eaves around windows, under tiles, lead flashing etc.<br>Presence and type of roof lining.<br>Presence of roof insulation.<br>Presence of water tanks in the loft (not if covered or not).<br>Structure of the roof including the truss type, age, and nature of timber work.<br>Information or evidence of work having been undertaken that could affect the use of structure by bats. |

## 2.4 Transect Surveys

A series of 86 walked transects (totalling 120km, combined length which included tower locations and proposed access tracks) were carried out between May and the end of July 2013. These surveys were conducted to ensure survey of the entire site was completed (where access allowed) and to allow a comparison of activity between the years of survey whilst also providing a set of contemporary data on which to assess the application.

Access to 75.5% of the proposed bat transect routes on land within the Proposed Development incorporating both the overhead line route and associated access tracks and stringing locations was available. The transect routes were chosen to provide a representative sample of all habitat types within the Proposed Development but focussed on hedgerows to be impacted and habitat which had recorded higher levels of bat activity in previous years survey. The purpose of the 2013 surveys were to ensure surveys covered a full bat survey season during 2012/ 2013 as land access was only provided late in the bat survey season in 2012. The surveys were also carried out to corroborate the bat activity records collected during previous years' surveys.

These transects provide good coverage of the site, and allow comparison with the 2012 AECOM survey results.

Surveys conducted took account of both the NIEA Survey Specific Requirements (10/01/11 Bat Surveys – NIEA Specific Requirements) and the 2012 Bat Conservation Trust (BCT) Bat Surveys - Good Practice Guidelines[8].

[8] Hundt L (2012) Bat Surveys – Good Practice Guidelines. 2nd edition. Bat Conservation Trust

### 2.4.1 Dusk Surveys

Each walked transect was conducted by a surveyor(s) using a heterodyne, frequency division or time expansion bat detector with recording function so that all bat numbers and bat passes were recorded for subsequent analysis. Each transect was walked at a constant speed along a pre-determined route with regular listening points. The listening points were situated along the route of the Proposed Development where it crosses a linear feature or in locations where the route of the Proposed Development runs adjacent to a linear feature. During the surveys, each surveyor recorded the number of estimated bats and bat passes for subsequent analysis. The number of bats relates to the individuals observed, where obvious passes by the same bat were not double counted. This number of passes thus recorded a higher total than number of bats. Bat activity was recorded for at least 3 minutes at each listening point, as well as continuously between each of the points (refer to Figure series 1 to 3 for the transect locations). The data collected was used to provide an index of bat activity along each transect and thus along the overhead line route. Surveys commenced at 15 to 30 minutes before sunset (to allow for the differing emergence times of bat species) and continued for at least 2 hours after sunset. Surveys were carried out during suitable weather conditions

Data collected from the transect surveys was analysed to species level where possible using BatSound and Analook sound analysis software.

The surveyed area included the footprint of the proposed substation and 102 proposed tower locations. The proposed substation site was surveyed twice in 2013 and the opportunity was taken to rotate the survey direction.

Out of the 102 proposed tower locations, 65 were surveyed in 2013 (where the surveyor had access to the field in which the proposed tower was located); the remaining 37 proposed tower locations could not be surveyed as land access was not permitted. Of the 65 proposed tower locations surveyed, over half (47) were surveyed twice and on 11 of these occasions the opportunity was taken to rotate the survey direction to reduce the potential bias related to the time of the survey work. The remainder of the proposed tower locations (18) were surveyed only once during 2013 which did not present the opportunity to rotate the survey direction and limit bias. Out of the total of 65 proposed tower locations surveyed in 2013, 24 had previously been surveyed in 2012.

## 2.5 Emergence and Re-entry Surveys

### 2.5.1 Introduction

Emergence and re-entry surveys were carried out following the results of a tree and building assessment for bats carried out in April and May 2013.

### 2.5.2 Emergence Surveys

Two exit surveys were carried out in May 2013. One exit survey was carried out 26th May 2013 at an alder tree within the substation site, and one at the tin roofed barn/shed within the substation site. One exit survey was carried out on 27th May 2013 at the ash tree to the east of the proposed Tower 60.

The surveys commenced between 15 to 30 minutes prior to sunset and continued for at least 2 hours after sunset. Any bats exiting the trees/structure were recorded as were the number of bats and passes heard/seen during the survey. The locations of the trees/structures surveyed are shown on Figures 8A-8E.

### 2.5.3 Re-entry Surveys

Re-entry surveys were carried out in May, June and July 2013.

On 24th May 2013 a re-entry survey of the alder tree located in the north-eastern area of the substation site was carried out, and on 28th May 2013 a re-entry survey was carried out at the tin roofed shed within the substation site. On 25th June 2013 a re-entry survey of the alder tree located in the north-eastern area of the substation site and a re-entry survey of the tin roofed barn/shed within the substation site were carried out. On 27th June 2013 and 19th July 2013 re-entry surveys were carried out at the ash tree to the east of proposed Tower 60.

The re-entry surveys commenced two hours before sunrise and were completed at sunrise or up to 30mins after sunrise. The number of bats and passes and swarming behaviour was recorded and any bats entering the trees/structure were also recorded. The locations of the trees/structures surveyed are shown on Figures 8A to 8E.

The survey dates and locations are detailed in Table 3. In accordance with BCT guidance the weather conditions for each survey were recorded and were considered favourable for bats. Surveys were not undertaken when conditions were considered unfavourable. Weather conditions for each survey are given in Annex A.

### 2.6 Dates and Locations of Surveys

Table 5 provides the survey dates, locations and survey types for the 2013 bat surveys

**Table 5 Survey Dates and Locations**

| Date | Dusk Activity Survey / Tower Location Area | Exit Survey/Location (Dusk) | Re-entry Survey /Location (Dawn) |
|---|---|---|---|
| May | | | |
| 21st May 2013 | Substation area, T1-T8 | | |
| 22nd May 2013 | T10-T16 | | |
| 23rd May 2013 | T41-T44 | | |
| 24th May 2013 | | | Alder tree located in the north-eastern area of the substation site |
| 26th May 2013 | Tin roofed barn/shed in the substation site | Alder tree located in the north-eastern area of the substation site and the tin roofed barn/shed in the same area | |
| 27th May 2013 | | Ash tree to the east of T60 | |
| 28th May 2013 | T49-53 | | Tin roofed barn/shed in the substation site |
| 29th May 2013 | T12, T29-T30 | | |
| 30th May 2013 | T59 | | |
| June 2013 | | | |
| 5th June 2013 | T1-7 | | |
| 22nd June 2013 | T87 | | |
| 24th June 2013 | T8-T11, T12 Access Lane, T13-T16, T20-T21, T23, T26- | | |

| Date | Dusk Activity Survey / Tower Location Area | Exit Survey/Location (Dusk) | Re-entry Survey /Location (Dawn) |
|---|---|---|---|
| | 29<br>N.B. T22 hedgelines (northwest and southwest) were surveyed from accessible adjacent land | | |
| 25th June 2013 | T41-T45, T47-T49, T49-T53 and T62-T63 | | Alder tree located in the north-eastern area of the substation site and the tin roofed barn/shed in the same area |
| 26th June 2013 | T59-T61 including T61 access road, T64, T65, T67, and T77-79 | | Substation site |
| 27th June 2013 | T23, T25 – T26, T28, T29, T30, , T80-T83,T87 and access roads, T97 and accessible land north and west of-T98 | | Ash Tree to the east of Tower 60 |
| July 2013 | | | |
| 15th July 2013 | T60-61, T62 (and access road), T64 | | |
| 16th July 2013 | T65, T67-T68, T74-75, 78 T79-80 | | |
| 19th July 2013 | None | | Ash Tree to the east of Tower 60 |
| 22nd July 2013 | T81-T83, T87 and T87 access route, T97, T99, T100, and accessible land north of T101 | | |
| 25th July 2013 | T25, ,T33(and access road), T34, T45, T47,T55 – T66 | | |
| 30th July 2013 | T91-T92 and border | | |

## 2.7 Survey Limitations

In some cases, access for bat surveys was not granted or surveys could not proceed as a result of Health and Safety issues in the area.

Due to limited access a number of Tower locations were not available during the 2013 surveys - these were towers T17, T18, T19, T22, T31, T32, T33, T35, T36, T37, T38, T39, T40, T57, T58, T66, T70, T71, T72, T73, T76, T85, T86, T88, T89, T90, T92, T93, T94, T95, T96, T101 and T102.

Due to Health and Safety considerations (e.g. animals on site which had not been identified by landowner, T54, T56, T69, T84 and T98 were not surveyed. In the case of T84, the field in which it is proposed was surveyed from the north western hedgerow, which was 40m from the tower locations.

Not all towers were surveyed twice during the 2013 surveys due to either Health and Safety issues or land access not being granted for a second survey.

No pre-dawn activity surveys were carried out in 2013.

Pre-dawn re-entry survey at the ash tree in the vicinity of T60 (19/07/2013) there was fog at dawn (although bat detector and recorder would still function normally). The tree being surveyed only had coverage from eastern side due to livestock present at western side.

## 2.8 Personnel

The following staff undertook the 2013 bat surveys: Dr Kevin Hume BSc (Hons) MCIEEM; Danielle Thompson (GradCIEEM); Seán Meehan (GradCIEEM); Brendan Kemp (AIEMA); Joe Martin (MIEnSci); and Mary Maguire (AIEMA, MIEnvSc, CSci).

# 3 Results

## 3.1 Introduction

This section provides the results of the 2013 bat surveys.

## 3.2 Tree Assessment

The results of the tree assessment for bats is presented in Table 6 and on Figures 7A to 7S. The features, field signs, and categorisation of each tree are based on BCT Guidelines (Hundt, 2012)[9] Tables 1 and 2 are adapted from this document.

**Table 6: Tree Assessment for Bats**

| Tree Reference (Figures 7A to 7S) | Tree Species | Estimated height (m) | Trunk girth (m) | Features | Category |
|---|---|---|---|---|---|
| 1 | *Fraxinus excelsior* | 20 | 2.5 | None | 3 |
| 2 | *Pinus sp.* | 16 | 2 | None | 3 |
| 3 | *Aesculus hippocastanum* | 16 | 3 | None | 3 |
| 4 | *Quercus sp.* | 16 | 2.4 | None | 3 |
| 5 | *Alnus glutinosa* | 13 | 1.9 | Dead tree, with visible cavities and crevices | Known/ confirmed roost |
| 6 | *Quercus sp.* | 22 | 4 | None | 3 |
| 7 | *Pinus sp.* | 16 | 2 | None | 3 |
| 8 | *Populus tremula* | 20 | 4 | None | 3 |
| 9 | *Fraxinus excelsior* | 16 | 3 | None | 3 |
| 10 | *Fraxinus excelsior* | 17 | 3.5 | None | 3 |
| 11 | *Fagus sylvatica* (approx 30 in number) | 18 (average height) | 2 (average girth) | None | 3 |
| 12 | *Salix sp.* | 19 | 2 | Decayed branches | 2 |
| 13 | *Fagus sylvatica* | 20 | 3 | None | 3 |
| 14 | *Fagus sylvatica* (5 in number) | 18 (average height) | 2.5 (average girth) | None | 3 |
| 15 | *Fraxinus excelsior* | 18 | 3 | None | 3 |
| 16 | *Fagus sylvatica* | 18 | 3 | None | 3 |
| 17 | *Fagus sylvatica* (8 in number) | 20 (average height) | 3.5 (average girth) | None | 3 |
| 18 | *Fraxinus excelsior* | 16 | 2 | Cavity in a dead branch and extensive ivy growth. | 2 |
| 19 | *Fraxinus excelsior* | 17 | 2 | None | 3 |
| 20 | *Populus tremula* | 15 | 3 | Deep cracks and fissures on bark | 2 |
| 21 | *Fraxinus excelsior* | 18 | 2 | None | 3 |
| 22 | *Quercus sp.* | 21 | 3 | None | 3 |
| 23 | *Fagus sylvatica* (x2), *Tilia* sp.(x4) | 20 (average height) | 3 (average girth) | None | 3 |
| 24 | *Fraxinus excelsior* | 15 | 1.7 | Cavities on some branches | 2 |
| 25 | *Quercus* sp. | 20 | 35 | None | 3 |
| 26 | Wooded area with numerous tree species: *Fraxinus excelsior* *Quercus* sp Ilex aquifolium *Acer pseudoplatanus*, *Tilia* sp *Aesculus hippocastanum* | Some large and mature trees present. No features suitable for bats were recorded | | | 3 |

[9] Hundt L (2012) Bat Surveys – Good Practice Guidelines. 2nd edition. Bat Conservation Trust

| Tree Reference (Figures 7A to 7S) | Tree Species | Estimated height (m) | Trunk girth (m) | Features | Category |
|---|---|---|---|---|---|
| | *Fagus sylvatica*<br>*Populus tremula* | | | | |
| 27 | *Salix* sp. | 18 | 3 | None | 3 |
| 28 | *Fraxinus excelsior* | 17 | 2.5 | Visible cavities and crevices at 12 metre mark on tree | 1 |
| 29 | *Fraxinus excelsior* | 19 | 2.4 | None | 3 |
| 30 | *Fraxinus excelsior* | 16 | 2.1 | None | 3 |
| 31 | Wooded area with many tree species including:<br>*Fraxinus excelsior*<br>*Quercus* sp<br>Ilex aquifolium<br>Cratageous monogyna<br>*Acer pseudoplatanus*,<br>Corylus avellana<br>*Fagus sylvatica* | An extensive area of woodland with a variety of tree species, with trees of varying ages but no veteran trees present. No features suitable for bats were recorded. | | | 3 |
| 32 | Numerous trees at farmyard (principally *Fagus sylvatica*) | A number of large mature beech trees grow around a farmyard but none display any signs of ageing such as dead limbs/cavities. | | | 3 |
| 33 | Wooded area with many tree species including:<br>*Fraxinus excelsior*<br>*Quercus* sp<br>Ilex aquifolium<br>Cratageous monogyna<br>*Acer pseudoplatanus*,<br>Corylus avellana *Fagus sylvatica* | A small area of woodland containing trees of various ages. No obvious candidate trees were located here. | | | 3 |
| 34 | *Fagus sylvatica* | 8 | 1.7 | Tree split due to wind. No obvious features but bats could access remaining standing trunk | 2 |
| 35 | *Acer pseudoplatanus* | 16 | 1.7 | 2 small cavities observed at 12m mark in main trunk offering limited potential for bats | 2 |

One tree was categorised as a known/confirmed bat roost (2 Leisler's bats recorded emerging from tree at 23.05 on 13th June 2009 and was considered to be a temporary night roost). One tree was given a Category 1 rating. The remainder of the trees were categorised as 2 or 3. Surveys for the known roost and the Category 1 tree were subject to subsequent emergence and re-entry surveys (refer to Tables 9 and 10).

## 3.3 Building Assessment

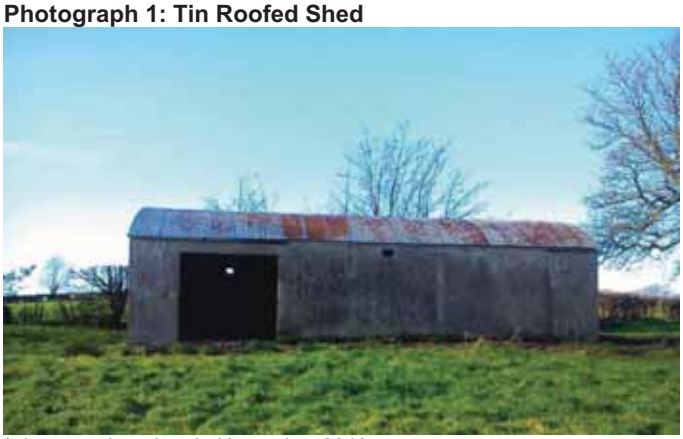
The tin roofed shed/barn was assessed for bat roost potential in early 2013. Table 3 was used in the assessment of this building.

### 3.3.1 Building Description

The building is a single storey cow shed and is approximately 50-75 years old and comprises a single skin of concrete blocks with mortar which has been rendered on the exterior (refer to Photograph 1 ). The roof is fitted with a corrugated metal roof in the main with some sections of transparent corrugated plastic to provide light. The metal roof has been nailed into place onto wooden beams, and steel reinforcements which are cemented into the roof.

The shed was split into a feeder area and a store. There is no main door on the building (just a large open space), and in the northern wall of the shed, there is a rotten wooden door with large gaps. There are windows which comprised unglazed open gaps in the blockwork and there are small spaces between the roof and the block work. On the exterior of building, there are cobweb free cracks and on the interior, cracks which are cobweb free continue until outside. There are no eaves, soffit boards or cladding present.

**Photograph 1: Tin Roofed Shed**



*photographs taken in November 2013

### 3.3.2 Evidence and Likelihood of Bats

During the day time assessment, external inspection, conducted from the ground, revealed no evidence of bat usage. There was some potential for bats in the form of access points such as through the broken door, windows, and small gaps between the roof and blockwork, however due to the open windows, open doorway, and broken door (to the north-west of the building), the barn/shed is open to changing weather conditions.

Internally, there were no live bats or corpses recorded, and no droppings were observed. There were no urine or grease marks present and no smell of bats. The shed floor was covered in mud/manure and bedding. There were beetles, beetle shell fragments, ash keys (seeds), and a single butterfly wing trapped in cobwebs on the northern wall and north-western corner, by the door (refer to Photographs 2 & 3 below).

The entire store area was covered in cobwebs to the extent they are collapsing off the walls, where this has happened other webs have been spun.

**Table 7: Showing two photographs from the interior of the tin roofed shed**

| Photograph 2: Cobwebs with ash keys and beetle shell fragments | Photograph 3: A Solitary butterfly wing in cobwebs on northern wall |
|---|---|
|  |  |

The likelihood of bats being present was considered to be defined as ‘Lower’, and as such a minimum of one dusk emergence /pre-dawn re-entry survey was recommended in accordance with BCT 2012 guidelines.

### 3.4 Activity Transect Surveys Results

Surveys were conducted between May and July 2013 and the results are shown in Table 8. The following species were recorded: common pipistrelle, soprano pipistrelle, Leisler's bat, *Myotis* spp., and Nathusius' pipistrelle bats (results are shown on Figure series 4 to 6).

The category "Unidentified bat" was used in cases where a bat was seen and not heard, or where there was evidence of bat presence but there was file distortion in the recording, resulting in non identification. The term "*Pipistrellus spp*" was used in cases where a pipistrelle bat was seen and not heard, or where the bat recorded had a peak frequency of between 38kHz and 42kHz, thereby not providing enough evidence that the pipistrelle was common or soprano.

**Table 8: Results of 2013 Dusk Transect Surveys**

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **21/05/2013** | **Dusk** | T1-T2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 |
| **21/05/2013** | **Dusk** | T3, T4, T5 | 3 | 2 | 0 | 0 | 2 | 0 | 0 | 7 |
| **21/05/2013** | **Dusk** | T6, T7, T8 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| **22/05/2013** | **Dusk** | T10, T11,T12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| **22/05/2013** | **Dusk** | T13, T14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **22/05/2013** | **Dusk** | T15, T16 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| **23/05/2013** | **Dusk** | T41, T42, T43 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 6 |
| **23/05/2013** | **Dusk** | T44 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| **28/05/2013** | **Dusk** | T49, T50, T51, T52, T53 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 5 |
| **29/05/2013** | **Dusk** | T12 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| **29/05/2013** | **Dusk** | T29 T30 | 5 | 8 | 0 | 4 | 2 | 15 | 0 | 34 |
| **30/05/2013** | **Dusk** | T61 Access Road Area | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 4 |
| **30/05/2013** | **Dusk** | T59 | | 9 | 0 | 0 | 0 | 0 | 0 | 9 |
| **05/06/2013** | **Dusk** | T7 T6 T5 T4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **05/06/2013** | **Dusk** | T1 T2 T3 T4 | 6 | 2 | 0 | 0 | 5 | 1 | 0 | 14 |

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **05/06/2013** | **Dusk** | T1 T2 T3 T4 | 5 | 1 | 0 | 0 | 0 | 0 | 3 | 9 |
| **24/06/2013** | **Dusk** | T8 T9 T10 T11 | 7 | 5 | 0 | 8 | 6 | 0 | 0 | 26 |
| **24/06/2013** | **Dusk** | T12 Access lane T13 T14 T15 T16 | 1 | 0 | 0 | 2 | 0 | 0 | 17 | 20 |
| **24/06/2013** | **Dusk** | T20 T21 T23 (N.B. T22 hedgelines northwest and southwest surveyed from accessible land | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 4 |
| **24/06/2013** | **Dusk** | T26 T27 T28 T29 | 5 | 9 | 0 | 6 | | 0 | 0 | 20 |
| **25/06/2013** | **Dusk** | T41 T42 T43 | 12 | 7 | 0 | 4 | 3 | 0 | 0 | 26 |
| **25/06/2013** | **Dusk** | T43 T44 T45 | 14 | 6 | 0 | 6 | 0 | 0 | 0 | 26 |
| **25/06/2013** | **Dusk** | T47 T48 T49 | 5 | 20 | 0 | 0 | 2 | 0 | 0 | 27 |
| **25/06/2013** | **Dusk** | T49 T50 T51 T52, T53 | 9 | 5 | 0 | 12 | 8 | 0 | 1 | 35 |
| **25/06/2013** | **Dusk** | T62 T63 | 5 | 1 | | 21 | 7 | 0 | | 34 |
| **26/06/2013** | **Dusk** | T59 T60, T61 including T61 access road | 13 | 0 | 0 | 21 | 0 | 0 | 0 | 34 |

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **26/06/2013** | **Dusk** | T64 T65 T67 | 8 | 2 | 0 | 5 | 3 | 0 | 5 | 23 |
| **26/06/2013** | **Dusk** | T77 T78 T79 | 4 | 2 | 0 | 1 | 1 | 0 | 0 | 8 |
| **27/06/2013** | **Dusk** | T23 T24 T25 and east of T30 | 17 | 4 | 0 | 0 | 7 | 0 | 0 | 28 |
| **27/06/2013** | **Dusk** | T28, T29, T30, | 8 | 26 | 1 | 7 | 12 | 1 | 0 | 55 |
| **27/06/2013** | **Dusk** | T80, T81, T82, T83, 40M NW of T84 | 8 | 7 | 0 | 17 | 3 | 0 | 0 | 35 |
| **27/06/2013** | **Dusk** | T87 and access | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 3 |
| **27/06/2013** | **Dusk** | T97,and accessible land north and west of T98 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 5 |
| **15/07/2013** | **Dusk** | T60, T61, and T64 | 11 | | 0 | 6 | 0 | 0 | 0 | 17 |
| **15/07/2013** | **Dusk** | T62 , and access road | 5 | 0 | 13 | 12 | 0 | 0 | 0 | 30 |
| **16/07/2013** | **Dusk** | T79, T80 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 3 |
| **16/07/2013** | **Dusk** | T65, T67 and T78 | 5 | 0 | 0 | 2 | 2 | 0 | 7 | 16 |
| **16/07/2013** | **Dusk** | T74, T75 | 1 | 0 | 11 | | 1 | 0 | 0 | 13 |
| **22/07/2013** | **Dusk** | T99, T100, and transect on accessible land north of T101 | 17 | 0 | 4 | 2 | 3 | 0 | 0 | 26 |
| **22/07/2013** | **Dusk** | T97 | 18 | 0 | 0 | 4 | 8 | 0 | 0 | 30 |

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **22/07/2013** | **Dusk** | T87 and T87 access route | 5 | 2 | 1 | 4 | 0 | 0 | 0 | 12 |
| **22/07/2013** | **Dusk** | T81, T82, T83, | 2 | 0 | 2 | 0 | 0 | 0 | 4 | 8 |
| **25/07/2013** | **Dusk** | T33, (accessible area and access route) T45, T47,T55 | 2 | 2 | 0 | 1 | 3 | 0 | 0 | 8 |
| **25/07/2013** | **Dusk** | T34, T47 | 6 | 8 | 0 | 2 | 0 | 0 | 0 | 16 |
| **25/07/2013** | **Dusk** | T25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **25/07/2013** | **Dusk** | Static survey by field gate south of T55 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| **30/07/2013** | **Dusk** | T91, T92 and border | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| **TOTAL** | | | **219** | **153** | **32** | **151** | **83** | **17** | **53** | 708 |

During the surveys, each surveyor recorded the number of estimated bats and bat passes for subsequent analysis. The number of bats relates to the individuals observed, where obvious passes by the same bat were not double counted. This number of passes thus recorded a higher total than number of bats.

The total number of bats recorded during the transect surveys was 708 bats. The species with the highest number recorded over the transect surveys was common pipistrelle bat with 219 bats recorded and with Leisler's bat being the species with the second highest number of bats recorded (153 bats). The least recorded bat was Nathusius' pipistrelle with 17 bats of this species recorded over the transects.

The highest number of bats recorded during any one survey was Leisler's bat during the dusk survey of 27/06/2013, 15 of these bats were recorded in the vicinity of Towers 28 and 29.

The data was analysed in MS Excel and used to give an estimate of relative bat activity displayed as Bat Activity Index (BAI)[10]. Table 9 below provides the length of surveys used to measure BAI. Table 10 provides the Bat Activity Index (BAI) for each of the species encountered on each of the dusk activity surveys.

**Table 9: Date and Time Units**

| Date | Length of survey (hrs) |
|---|---|
| 21/05/2013 | 1.85 |
| 22/05/2013 | 2 |
| 23/05/2013 | 1.9 |
| 28/05/2013 | 1.75 |
| 29/05/2013 | 1.75 |
| 30/05/2013 | 1.7 |
| 05/06/2013 | 2.55 |
| 24/06/2013 | 2.5 |
| 25/06/2013 | 2.5 |
| 26/06/2013 | 2.55 |
| 27/06/2013 | 2.5 |
| 15/07/2013 | 2.6 |
| 16/07/2013 | 2.6 |
| 22/07/2013 | 2.5 |
| 25/07/2013 | 2.75 |
| 30/07/2013 | 2 |

[10] Bat Activity Index = bat passes / per hour

**Table 10: Bat Activity Index (BAI) per hour**

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **21/05/2013** | **Dusk** | T1-T2 | 0.00 | 0.54 | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 1.08 |
| **21/05/2013** | **Dusk** | T3, T4, T5 | 1.62 | 1.08 | 0.00 | 0.00 | 1.08 | 0.00 | 0.00 | 3.78 |
| **21/05/2013** | **Dusk** | T6, T7, T8 | 0.00 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.08 |
| **22/05/2013** | **Dusk** | T10, T11,T12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.50 |
| **22/05/2013** | **Dusk** | T13, T14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **22/05/2013** | **Dusk** | T15, T16 | 0.00 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.50 |
| **23/05/2013** | **Dusk** | T41, T42, T43 | 0.53 | 2.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.16 |
| **23/05/2013** | **Dusk** | T44 | 0.00 | 2.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.11 |
| **28/05/2013** | **Dusk** | T49, T50, T51, T52, T53 | 0.57 | 2.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.86 |
| **29/05/2013** | **Dusk** | T12 | 0.00 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.14 |
| **29/05/2013** | **Dusk** | T29 T30 | 2.86 | 4.57 | 0.00 | 2.29 | 1.14 | 8.57 | 0.00 | 19.43 |
| **30/05/2013** | **Dusk** | T61 Access Road Area | 1.18 | 0.00 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 | 2.35 |
| **30/05/2013** | **Dusk** | T59 | 0.00 | 5.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.29 |
| **05/06/2013** | **Dusk** | T7 T6 T5 T4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **05/06/2013** | **Dusk** | T1 T2 T3 T4 | 2.35 | 0.78 | 0.00 | 0.00 | 1.96 | 0.39 | 0.00 | 5.49 |
| **05/06/2013** | **Dusk** | T1 T2 T3 T4 | 1.96 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 | 3.53 |
| **24/06/2013** | **Dusk** | T8 T9 T10 T11 | 2.80 | 2.00 | 0.00 | 3.20 | 2.40 | 0.00 | 0.00 | 10.40 |
| **24/06/2013** | **Dusk** | T12 Access lane T13 T14 T15 T16 | 0.40 | 0.00 | 0.00 | 0.80 | 0.00 | 0.00 | 6.80 | 8.00 |

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **24/06/2013** | **Dusk** | T20 T21 T23 (N.B. T22 hedgelines northwest and southwest surveyed from accessible land | 0.40 | 0.80 | 0.00 | 0.40 | 0.00 | 0.00 | 0.00 | 1.60 |
| **24/06/2013** | **Dusk** | T26 T27 T28 T29 | 2.00 | 3.60 | 0.00 | 2.40 | 0.00 | 0.00 | 0.00 | 8.00 |
| **25/06/2013** | **Dusk** | T41 T42 T43 | 4.80 | 2.80 | 0.00 | 1.60 | 1.20 | 0.00 | 0.00 | 10.40 |
| **25/06/2013** | **Dusk** | T43 T44 T45 | 5.60 | 2.40 | 0.00 | 2.40 | 0.00 | 0.00 | 0.00 | 10.40 |
| **25/06/2013** | **Dusk** | T47 T48 T49 | 2.00 | 8.00 | 0.00 | 0.00 | 0.80 | 0.00 | 0.00 | 10.80 |
| **25/06/2013** | **Dusk** | T49 T50 T51 T52, T53 | 3.60 | 2.00 | 0.00 | 4.80 | 3.20 | 0.00 | 0.40 | 14.00 |
| **25/06/2013** | **Dusk** | T62 T63 | 2.00 | 0.40 | 0.00 | 8.40 | 2.80 | 0.00 | 0.00 | 13.60 |
| **26/06/2013** | **Dusk** | T59 T60, T61 including T61 access road | 5.10 | 0.00 | 0.00 | 8.24 | 0.00 | 0.00 | 0.00 | 13.33 |
| **26/06/2013** | **Dusk** | T64 T65 T67 | 3.14 | 0.78 | 0.00 | 1.96 | 1.18 | 0.00 | 1.96 | 9.02 |
| **26/06/2013** | **Dusk** | T77 T78 T79 | 1.57 | 0.78 | 0.00 | 0.39 | 0.39 | 0.00 | 0.00 | 3.14 |
| **27/06/2013** | **Dusk** | T23 T24 T25 and east of T30 | 6.80 | 1.60 | 0.00 | 0.00 | 2.80 | 0.00 | 0.00 | 11.20 |
| **27/06/2013** | **Dusk** | T28, T29, T30, | 3.20 | 10.40 | 0.40 | 2.80 | 4.80 | 0.40 | 0.00 | 22.00 |

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **27/06/2013** | **Dusk** | T80, T81, T82, T83, 40M NW of T84 | 3.20 | 2.80 | 0.00 | 6.80 | 1.20 | 0.00 | 0.00 | 14.00 |
| **27/06/2013** | **Dusk** | T87 and access | 0.40 | 0.00 | 0.00 | 0.80 | 0.00 | 0.00 | 0.00 | 1.20 |
| **27/06/2013** | **Dusk** | T97,and accessible land north and west of T98 | 0.80 | 0.40 | 0.00 | 0.40 | 0.40 | 0.00 | 0.00 | 2.00 |
| **15/07/2013** | **Dusk** | T60, T61, and T64 | 4.23 | 0.00 | 0.00 | 2.31 | 0.00 | 0.00 | 0.00 | 6.54 |
| **15/07/2013** | **Dusk** | T62 , and access road | 1.92 | 0.00 | 5.00 | 4.62 | 0.00 | 0.00 | 0.00 | 11.54 |
| **16/07/2013** | **Dusk** | T79, T80 | 0.38 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 1.15 |
| **16/07/2013** | **Dusk** | T65, T67 and T78 | 1.92 | 0.00 | 0.00 | 0.77 | 0.77 | 0.00 | 2.69 | 6.15 |
| **16/07/2013** | **Dusk** | T74, T75 | 0.38 | 0.00 | 4.23 | 0.00 | 0.38 | 0.00 | 0.00 | 5.00 |
| **22/07/2013** | **Dusk** | T99, T100, and transect on accessible land north of T101 | 6.80 | 0.00 | 1.60 | 0.80 | 1.20 | 0.00 | 0.00 | 10.40 |
| **22/07/2013** | **Dusk** | T97 | 7.20 | 0.00 | 0.00 | 1.60 | 3.20 | 0.00 | 0.00 | 12.00 |
| **22/07/2013** | **Dusk** | T87 and T87 access route | 2.00 | 0.80 | 0.40 | 1.60 | 0.00 | 0.00 | 0.00 | 4.80 |
| **22/07/2013** | **Dusk** | T81, T82, T83, | 0.80 | 0.00 | 0.80 | 0.00 | 0.00 | 0.00 | 1.60 | 3.20 |

| Date | Survey | Proposed Tower Transects | Common Pipistrelle | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Nathusius' | Unidentified Bat | Survey Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **25/07/2013** | **Dusk** | T33, (accessible area and access route) T45, T47,T55 | 0.73 | 0.73 | 0.00 | 0.36 | 1.09 | 0.00 | 0.00 | 2.91 |
| **25/07/2013** | **Dusk** | T34, T47 | 2.18 | 2.91 | 0.00 | 0.73 | 0.00 | 0.00 | 0.00 | 5.82 |
| **25/07/2013** | **Dusk** | T25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **25/07/2013** | **Dusk** | Static survey by field gate south of T55 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.09 |
| **30/07/2013** | **Dusk** | T91, T92 and border | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.50 | 7.50 |

The species with the highest BAI is Leisler's bat which is due to the number of Leisler's bats (26) recorded during the dusk survey of 27/06/2013. Soprano pipistrelle bats had the second highest BAI per hour. Nathusius' pipistrelle bats had the lowest BAI due to the small numbers recorded. The survey with the most bat activity per hour was that of 27/06/2013 (towers 28, 29, and 30), again due to the high number of Leisler's bats. The survey with the second highest BAI/hours was on 29/05/2013 which also included Towers 29- 30.

### 3.5 Emergence and Re-Entry Survey Results

Tables 11 and 12 below provide the results of the Emergence and Re-entry Surveys (the results are shown on Figures 9A to 9C).

**Table 11: Emergence Survey Results 2013**

| Date | Survey | Location | Common Pip | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Unidentified Bat | Survey Total | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 26/05/2013 | Emergence | Tree 5 (alder) within proposed substation site | 0 | 18 | 0 | | 0 | 0 | 18 | No bat emerged from tree (known roost) in substations area. The Leisler's bats were recorded commuting and foraging during the survey |
| 26/05/2013 | Emergence | Barn/shed with tin roof at the proposed substation | 1 | 0 | 0 | 0 | 0 | | 1 | 1 common pipistrelle emerged from the tin roofed barn/shed at 22.00* (19 minutes after sunset. |
| 27/05/2013 | Emergence | Tree 28 (ash) east of Tower 60 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | Common pipistrelle bat emerged from tree east of location of proposed Tower 60 at 22:05. |

*N.B. this building was originally classed as Low potential for bat, but as a bat was recorded emerging from the building, a further two re-entry surveys were recommended and carried out.

**Table 12: Re-entry Survey Results 2013**

| Date | Survey | Location | Common Pip | Leisler's Bat | Myotis spp | Pipistrellus spp | Soprano Pipistrelle | Unidentified Bat | Survey Total | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 24/05/2013 | Pre-dawn | Tree 5 (alder) at the proposed substation site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No bats recorded re-entering the tree/ tin roofed barn/shed. |
| 28/05/2013 | Pre-dawn | Barn/shed with tin roof at the proposed substation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No bats observed or recorded entering the barn/shed during the survey. |
| 25/06/2013 | Pre-dawn | Tree 5 (alder) at the proposed substation site | 0 | 29 | 0 | 4 | 1 | 0 | 34 | Species observed commuting/foraging only – No bats seen swarming or re-entering tree or barn/shed. |
| 25/06/2013 | Pre-dawn | Barn/shed with tin roof at the proposed substation | 0 | 25 | 0 | 1 | 1 | 0 | 27 | All bats observed commuting. No bats recorded re-entering the barn/shed. |
| 27/06/2013 | Pre-dawn | Tree 28 (ash) east of Tower 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No bats observed swarming or entering the tree. |
| 19/07/2013 | Pre-dawn | Tree 28 (ash) east of Tower 60 | 0 | 3 | 0 | 1 | 2 | 0 | 6 | Soprano pipistrelle bat heard not seen potentially re-entered the tree. The remainder of the bats recorded were foraging/commuting only |

One emergence and two re-entry surveys were conducted at the substation site at the alder tree (a previously confirmed roost) and at the tin roofed barn/shed. No bats were seen emerging or re-entering the tree during the 2013 surveys, but a common pipistrelle bat emerged from the tin roofed shed during the May survey. This area is also used by bats for foraging and commuting.

One emergence and two re-entry surveys were carried out at the ash tree located to the east of the proposed location of Tower 60. A common pipistrelle bat was recorded emerging from the tree during the May 2013 survey. During the June 2013 survey no bats were recorded swarming or entering the tree. During the July 2013 survey a soprano pipistrelle bat was heard in proximity of the tree but was not seen re-entering the tree as there was reduced visibility through the presence of fog. This area is also used by bats for foraging and commuting.

# 4 Discussion, Recommendations and Enhancements

## 4.1 Introduction

This section provides the discussion of the results of the 2013 surveys in conjunction with the previous years' surveys. Also included in the section are the mitigation and enhancement measures.

## 4.2 Discussion

### 4.2.1 Activity Surveys

Dusk activity surveys were carried out between the months of May and July 2013 at locations close to 69 of the proposed tower locations. The 2013 surveys included all accessible transects/tower locations and additional transect/tower locations which did not have access granted in 2012. The species recorded during the 2013 survey were common, soprano and Nathusius' pipistrelle bats, Leisler's bat and bats of the *Myotis* genus. The species recorded in 2013 are the same as 2012 but had the addition of Nathusius' pipistrelle. Nathusius' pipistrelle was recorded during the 2009/2010 surveys. Brown long-eared bats and Daubenton's bats were also recorded in 2009/2010 but not during 2012 or 2013.

A total of 708 bats were recorded during the 2013 surveys with common pipistrelle bats being the species with the highest number of bats recorded (219) and Leisler's bat being the species with the second highest number of bats recorded (153). Nathusius' pipistrelle was the species with the least number of bats recorded (17).

The highest number of bats recorded during any one survey was Leisler's bat during the dusk survey of 27/06/2013 (26 bats), 15 of these bats were recorded in the vicinity of Towers 28 and 29. Bats were recorded foraging and commuting during this survey.

The species with the highest Bat Activity Index was Leisler's bat which is due to the number of Leisler's bats (26) recorded during the dusk survey of 27/06/2013. Soprano pipistrelle bats had the second highest BAI per hour. Nathusius' bats had the lowest BAI due to the small numbers recorded.

The survey with the most bat activity per hour was that of 27/06/2013 (Towers 28, 29, and 30), again due to the high number of Leisler's bats. The survey with the second highest BAI was on 29/05/2013 which also included Towers 29- 30. The areas surrounding the proposed Towers 29- 30 comprise an orchard and open fields, with good connectivity to the wider landscape. Bats were recorded primarily foraging but also commuting in these areas.

The third highest overall activity (BAI) was recorded on 25/06/2013 (T62 and T63). Tower 63 was highlighted in the 2012 surveys as one of the areas of highest bat activity.

In May the proposed towers with the highest numbers of bats and bat activity were T29 – T30. In June, the proposed towers with the highest numbers of bats and bat activity included proposed Towers 28-, 29 and 30 also. In July proposed towers 62 and T97-98 had the highest (the same) activity (N.B T29- T30 were not surveyed in July 2013).

In 2012 T78 and T63 had the highest amount of bat activity and in 2009 T6 had the highest amount of bat passes with 242. In 2009 T29 had the lowest number of bat passes at 14.

#### 4.2.1.1 Foraging Hotspots

A number of foraging hotspots were recorded during the 2013 surveys and include the following proposed towers/areas:

- Substation- foraging Leisler's bats were recorded here;
- T1- T4 the hotspots were located around the farm buildings;
- T10-T11 the hotspots were focussed along the hedges, roads and at a barn/shed;
- T28 –T29, T30 the hotspots here include the orchard and area adjacent to the orchard;
- T41 the hotspots included the hedges, roads and close to Tullysaran House;

- T45 the hotpots here included a large garden tree and hedge lined road;
- T47- T49 the hotspots include the farmyard;
- T58-T61 the hotspots include the hedge line to the north of T60, hedge line by Laneway, the access road and hedge line south T60;
- T62-T63 the hotspots included the farmyard west, the lane and the hedge lines;
- T80-T83 the hotspots are located north of proposed tower 81, the hedge northwest of proposed tower 81 and the Drumhilly road;
- T97- T98 the hotspots area located along the hedge lines and tracks in close proximity to proposed tower T97 and T98; and,
- T100- T101- the hotspots here include a hedge line by marshy ground between T100 and T101 and other hedge lines in the vicinity.

Foraging at a number of these locations was also recorded during the 2011 and 2012 bat surveys.

Bats were recorded foraging in other areas, but not in as high numbers or for the prolonged time as those areas listed above.

During the surveys commuting bats followed trees lines, hedges, roads and path ways, however on a small number of occasions bats were recorded commuting across open land. No patterns of regular commuting of large numbers of bats were detected that may be indicative of significant roost sites close to the Proposed Development.

A number of bats were recorded early in the survey indicating potential roost locations close by; this includes the surveys at the following towers/areas:

- T1- T2 the first Leisler's Bat was recorded 27mins after sunset there are farm buildings in the vicinity which may support a roost;
- T12, 13, 14, 15 the first bat of the *Pipistrellus* genus was recorded 5 minutes after sunset and was recorded crossing an open field. There is woodland to the east of this location and a hedge/tree line to the south. There are farm buildings in the vicinity, but further afield;
- T62-T63 the first bat of the *Pipistrellus* genus was recorded less than 30 minutes after sunset. There are two farm buildings in proximity to the location where the first bat was recorded which may support a roost; and,
- T80-T83 the first bat of the Pipistrellus genus was recorded 33minutes after sunset in the area of proposed Tower 81. There is a line of trees to the west of the Proposed Development which will not be affected by the works that may support a roost.

It is not considered that any of the locations relating to these early recordings and potential roost sites would be affected by the Proposed Development. None of the habitat/ buildings, where the potential roost(s) may be, will be disturbed by the Proposed Development and linear features connecting these sites to the wider countryside will not be impacted.

### 4.2.2 Emergence and Re-entry Surveys

Emergence and re-entry surveys were carried out in 2013. The surveys were carried out at the known roost (2009 Leisler's) which is an alder tree within the substation area, the tin roofed barn/shed in the same area, and at the ash tree to the east of T60.

A common pipistrelle bat was recorded emerging from the tin roofed barn/shed (26.05.2013), however, no bats were recorded re-entering this structure. A soprano pipistrelle bat was recorded emerging from the ash tree to the east of T60 (27.05.2013), and a common pipistrelle was considered to have entered this tree during a re-entry survey (weather conditions and access limitations meant that this could not be confirmed at that time). All of the surveys followed BCT 2012 guidance.

Surveys at the known roost (a Leisler's bat feeding roost recorded in 2009) at the alder tree in the substation site did not record any swarming activity in the vicinity of this tree, nor were any bats seen emerging or re-entering this tree during 2013. Due to the legislation afforded to all bat roosts, although not in use during the time of the survey, a roost is protected at all times. A feeding roost is not considered to be of significance individually. Leisler's bats were recording using this roost in 2009 and are considered to be common and widespread in Northern Ireland.

The surveys to date have confirmed that the roosts at the tin roofed barn/shed in the substation site and the roost at ash tree to east of the T60 support small numbers of common pipistrelle bats (tin roofed shed and potentially ash tree to the east of T60), and soprano pipistrelle at the ash tree to east of the T60. The bats were recorded only once during the 2013 surveys, a finding consistent with transient, summer day roosts. These roosts are therefore not considered to be of significance individually, due to the roosting bat species (common and soprano pipistrelle) being common and widespread in the local and wider areas.

However, as bats are European Protected Species, a licence will be required to disturb / destroy any of the aforementioned trees and building as they are classed as known roosts. The recommendations section details the requirements for licensing.

## 4.3 Recommendations

There are three confirmed bat roosts within the Proposed Development. Based on the current understanding of the Proposed Development and the understanding of current roosts, a European Protected Species (EPS) licence for bats will be required.

As all three features (two trees and a building) will be disturbed (i.e. require removal), an EPS licence must be in place before any enabling activities commence, to ensure that the works proceed in line with Northern Irish and EU legislation.

The proposed construction period for the Proposed Development is three years, with ground works beginning a year in advance. This four year time period allows SONI to establish bat roost mitigation where necessary, establish if the mitigation is working and then remove or translocate the tree roosts if necessary. Removal of trees/buildings which may contain bat roosts will have to be undertaken under the supervision of a licensed bat ecologist and/or accredited agents.

A minimum of 100 bat boxes will be erected along the line route, adjacent to those hedgerows where mature trees or trees with a dense covering of ivy have been pollarded. This is precautionary compensation and enhancement as lack of available bat roosts can be a limiting factor in many populations. These boxes will be erected prior to the commencement of vegetation clearance connected with the construction and or operation of the Proposed Development. A range of bat box designs and sizes will be deployed.

The use of these artificial bat boxes as roosts will be monitored by a licensed bat worker as part of the post-construction monitoring programme. This will be a condition of the licence issued to destroy the known roosts.

# 5 Conclusion

Extensive survey work has been conducted for bats between 2009 and 2013 within and outwith the footprint of the Proposed Development. A range of survey methodologies have been used which have assessed the value of the Proposed Development to foraging, commuting and roosting bats. The extended survey period over a number of years has illustrated that the Proposed Development supports a diverse population of bats in relatively small numbers. Occasional hotspots of foraging have been identified and these are likely to change depending upon wind direction and local land use. Overall the pattern of activity is typical of the habitat types and the region. Primarily arable and pasture land with a lack of mature trees and buildings does not provide significant opportunities for bats and this probably reflects the relatively low levels of activity along much of the Proposed Development route. Three features (two trees and one building) have been proven to support occasional roosting by a small number of bats and these will need to be removed under licence prior to enabling works commencing which will include site specific mitigation measures to ensure roost replacement. The Proposed Development has few opportunities for roosting bats at present and the planned enhancement measure of placing 100 bat boxes of various types along the route of the Proposed Development will provide significantly more opportunities for roosting bats in the future.

The Proposed Development may disturb small numbers of foraging bats temporarily during the construction period and will displace three known roosts sites. Mitigation measures pre, during and post construction will ensure that there is no adverse impact upon the conservation status of any bat species locally and will ultimately provide significantly greater roosting opportunities than at present which may lead to an increase in the number of bats using the area.

# Annex A Survey Times and Weather Conditions 2013

**Table A1 Dusk Transect Surveys Times and Weather Conditions**

| Survey Date | Sunset/ Sunrise Times | Start Time | Finish Time | Weather Conditions | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Temp (°C) Start | Cloud Cover (%) Start | Wind Speed (Beaufort average) Start | Temp (°C) Finish | Cloud Cover (%) Finish | Wind Speed (Beaufort average) Finish | Recent Rain? |
| 21/05/2013 | 21.33 | 21.00 | 22.50 | 10°C | 95% | 1 | 9°C | 95% | 1 | No |
| 22/05/2013 | 21.34 | 21.05 | 23.07 | 9°C | 50% | 1 | 8°C | 65% | 1 | Light rain |
| 23/05/2013 | 21.35 | 21.05 | 23.00 | 9°C | 50% | 1 | 8°C | 65% | 1 | Light rain |
| 26/05/2013 | 21.37 | 21.05 | 23.30 | 9°C | 100% | 1 | 8°C | 100% | 1 | No |
| 28/05/2013 | 21.45 | 21.15 | 23.00 | 9°C | 70% | 1 | 8°C | 80% | 1 | No |
| 29/05/2013 | 21.50 | 21.15 | 23.00 | 11°C | 40% | 1 | 8°C | 30% | 1 | No |
| 30/05/2013 | 21.52 | 21.20 | 23.00 | 12°C | 70% | 1 | 10°C | 70% | 1 | No |
| 05/06/2013 | 21.55 | 21.20 | 23.55 | 17°C | 50% | 1 | 15°C | 70% | 1 | No |
| 24/06/2013 | 22.05 | 21.35 | 00.05 | 15°C | 60% | 1 | 14°C | 75% | 1 | No |
| 25/06/2013 | 22.05 | 21.35 | 00.05 | 16°C | 30% | 1 | 14°C | 30% | 1 | No |
| 26/06/2013 | 22.05 | 21.30 | 00.05 | 16°C | 30% | 1 | 15°C | 40% | 1 | No |
| 27/06/2013 | 22.05 | 21.30 | 00.01 | 17°C | 100% | 3 | 17°C | 100% | 3 | No |
| 15/07/2013 | 21.55 | 21.30 | 00.10 | 20°C | 80% | 1 | 19°C | 80% | 1 | No |
| 16/07/2013 | 21.55 | 21.30 | 00.10 | 20°C | 65% | 1 | 19°C | 70% | 1 | No |
| 22/07/2013 | 21.45 | 21.20 | 23.47 | 18°C | 100% | 3 | 17°C | 100% | 3 | No |
| 25/07/2013 | 21.39 | 21.15 | 23.59 | 18°C | 50% | 1 | 17°C | 80% | 1 | No |
| 30/07/2013 | 21.00 | 21.30 | 23.30 | 14°C | 30% | 1 | 13°C | 40% | 1 | No |

**Table A2 Exit Survey Times and Weather Conditions 2013**

| Survey Date | Sunset/Sunrise Times | Start Time | Finish Time | Weather Conditions | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Temp (°C) Start | Cloud Cover (%) Start | Wind Speed (Beaufort average) Start | Temp (°C) Finish | Cloud Cover (%) Finish | Wind Speed (Beaufort average) Finish | Recent Rain? Other comments |
| 26/05/2013 | 21.37 | 21.05 | 23.30 | 9°C | 100% | 1 | 8°C | 100% | 1 | No |
| 27/06/2013 | 21.41 | 21.10 | 23.41 | 12°C | 100% | 1 | 10°C | 100% | 1 | No |

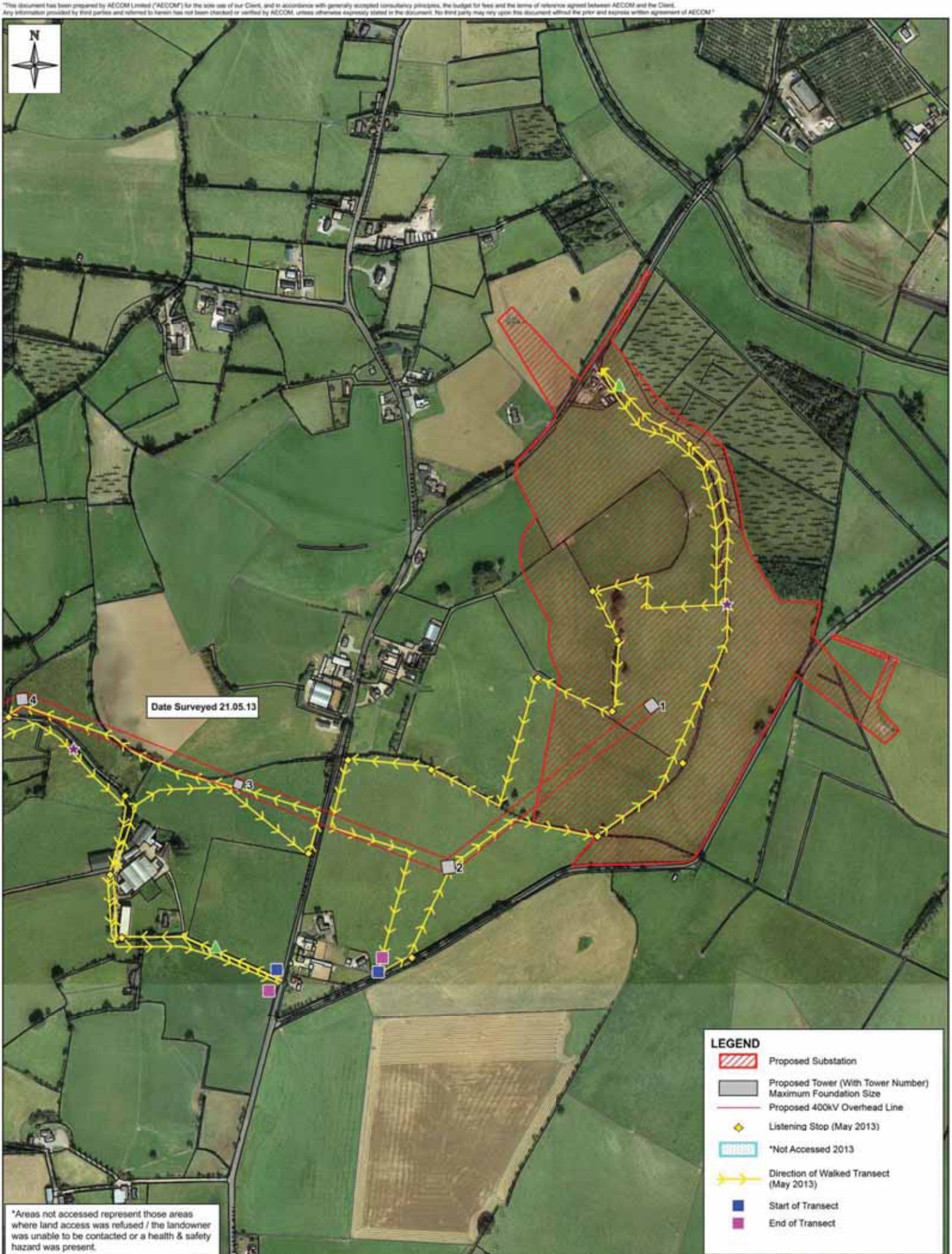
**Table A3 Re-entry Survey Times and Weather Conditions 2013**

| Survey Date | Sunset / Sunrise Times | Start Time | Finish Time | Weather Conditions | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Temp (°C) Start | Cloud Cover (%) Start | Wind Speed (Beaufort average) Start | Temp (°C) Finish | Cloud Cover (%) Finish | Wind Speed (Beaufort average) Finish | Recent Rain? Other comments |
| 24/05/2013 | 5.04 | 03.00 | 05.35 | 9°C | 100% | 1 | 8°C | 100% | 1 | No |
| 25/05/2013 | 04.48 | 02.45 | 05.20 | 10°C | 70% | 1 | 11°C | 70% | 1 | No |
| 28/05/2013 | 04.59 | 02.59 | 05.29 | 9°C | 100% | 1 | 8°C | 100% | 1 | No |
| 26/06/2013 | 04.53 | 03.01 | 05.15 | 8°C | 50% | 1 | 10°C | 60% | 1 | No |
| 27/06/2013 | 04.49 | 02.50 | 05.20 | 9°C | 60% | 1 | 20°C | 60% | 1 | No |
| 19/07/2013 | 05.18 | 03.01 | 05.15 | 8°C | 30% | 1 | 12°C | 100% | 1 | Fog reduced visibility at the end of the survey |

# Figures

Figure Series 1 – May Activity Survey Transect Routes and Listening Stop Locations

Figures 1A to 1U



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Title: FIGURE 1A BAT SURVEY METHODOLOGY MAY 2013 (SHEET 1 OF 21)

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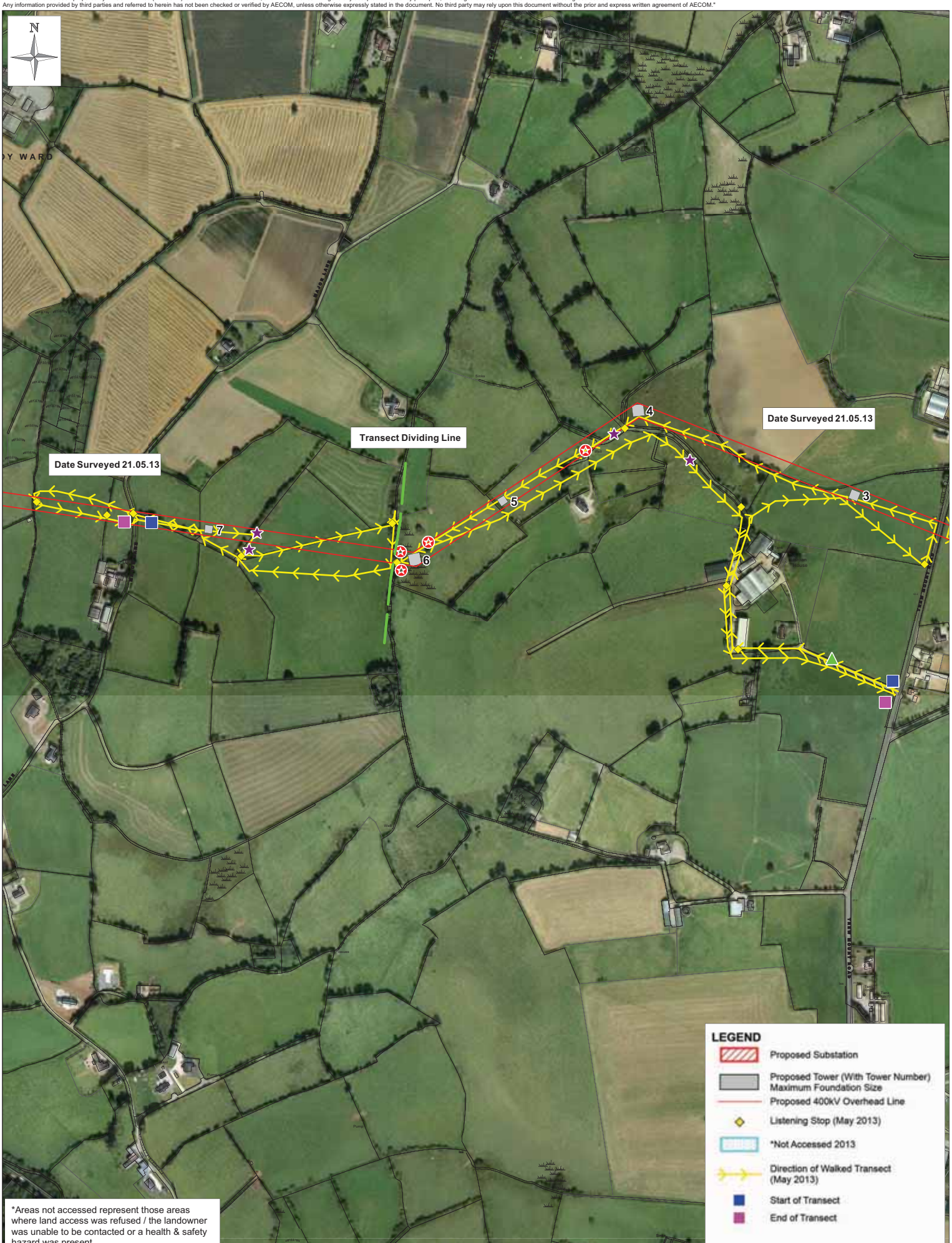




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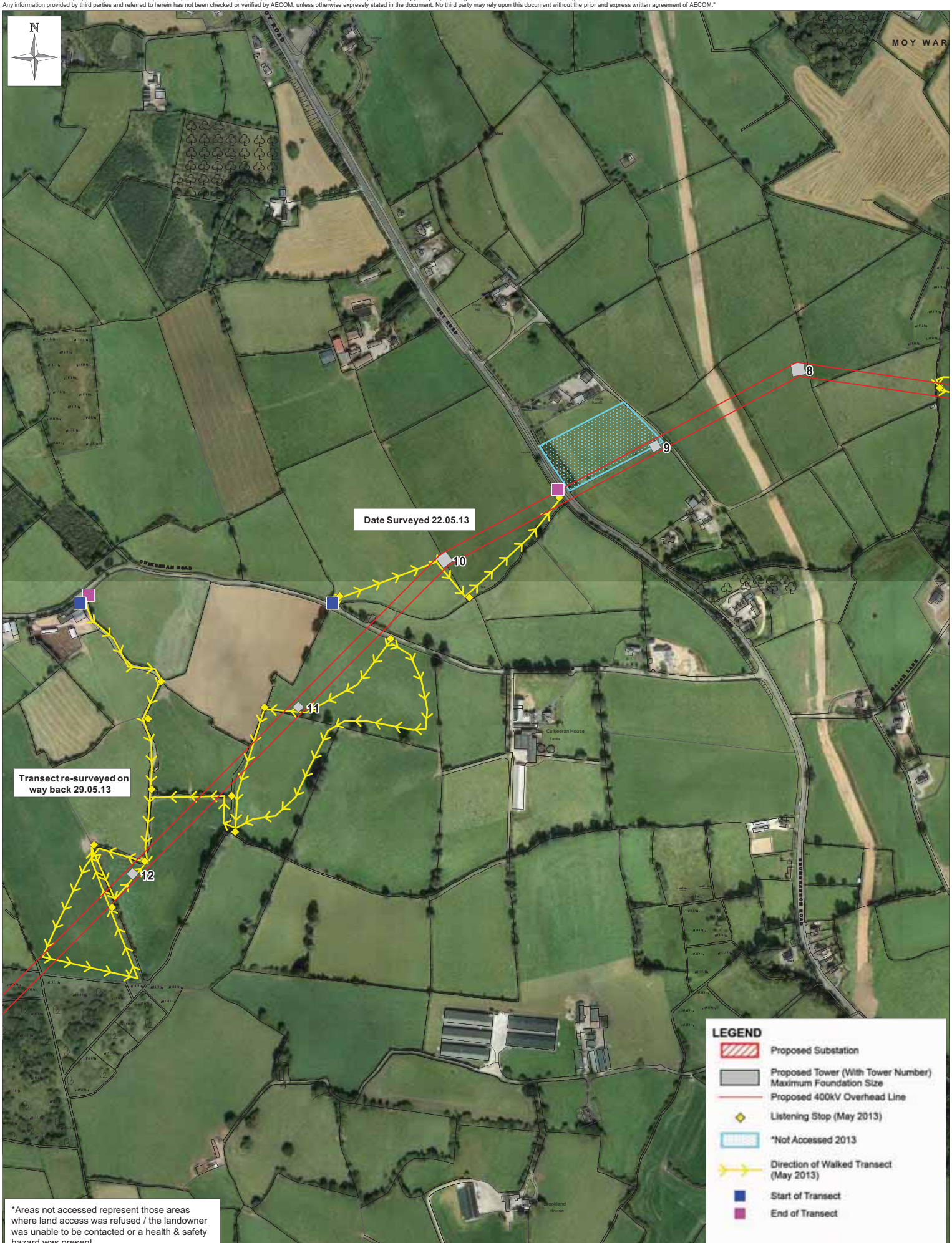




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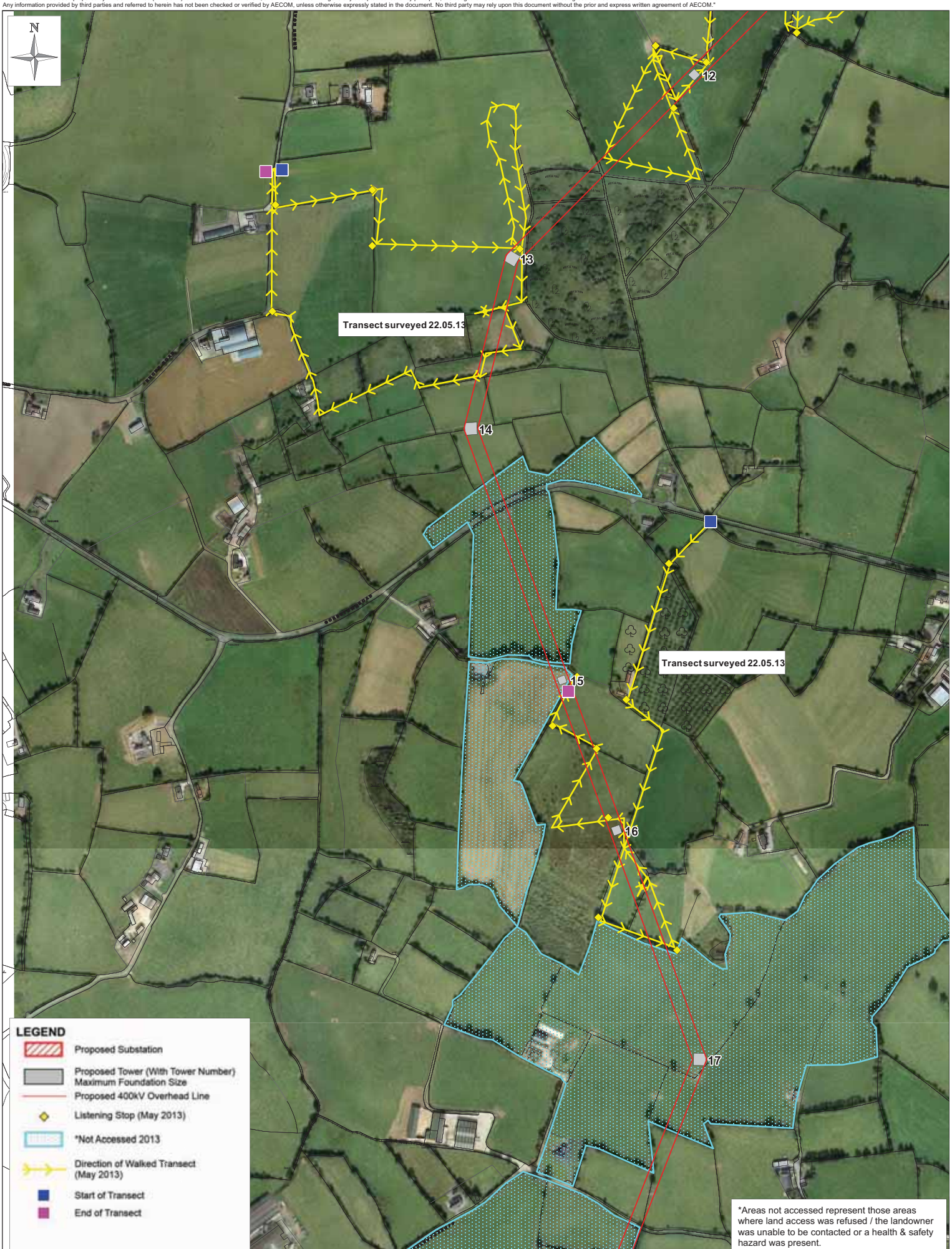




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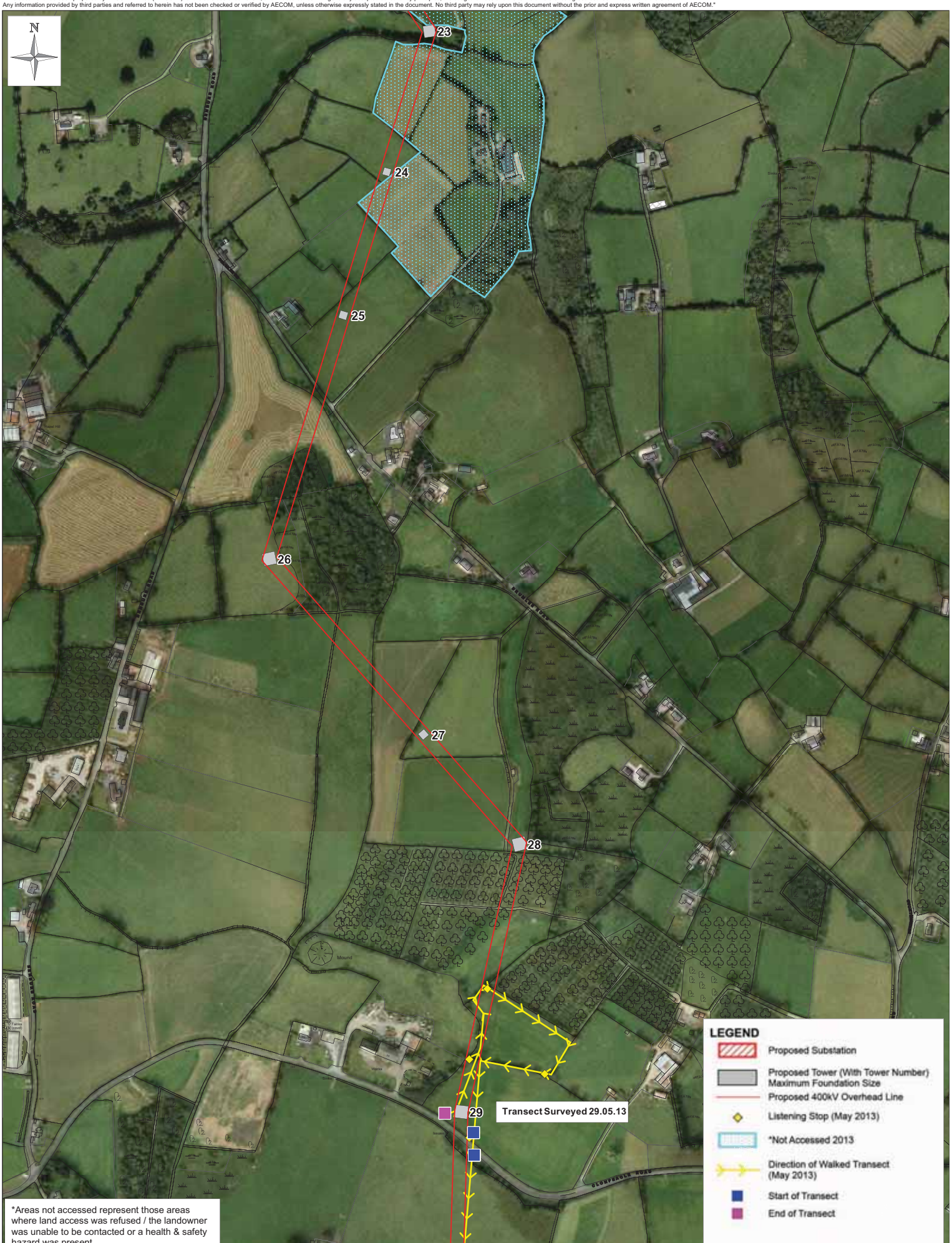




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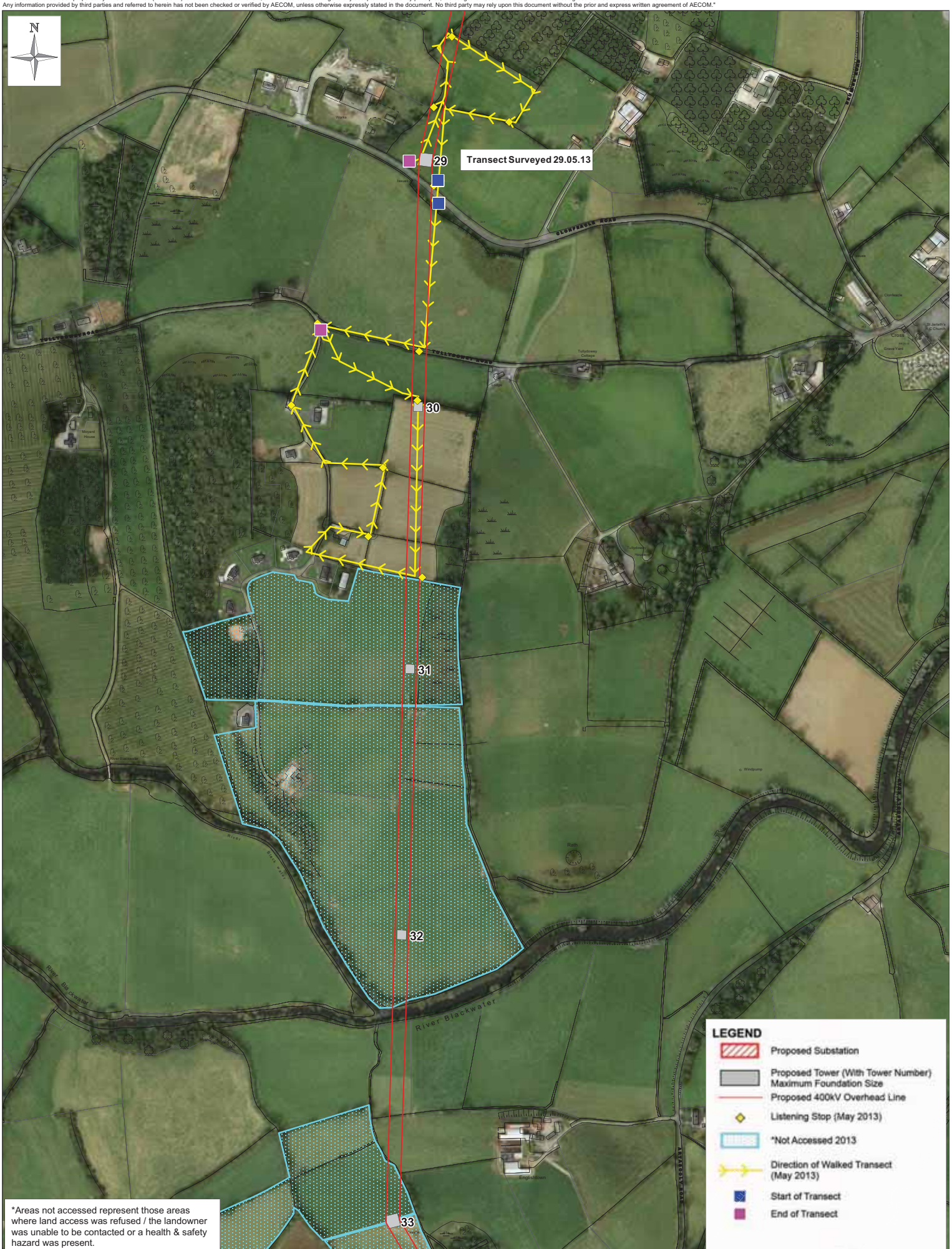




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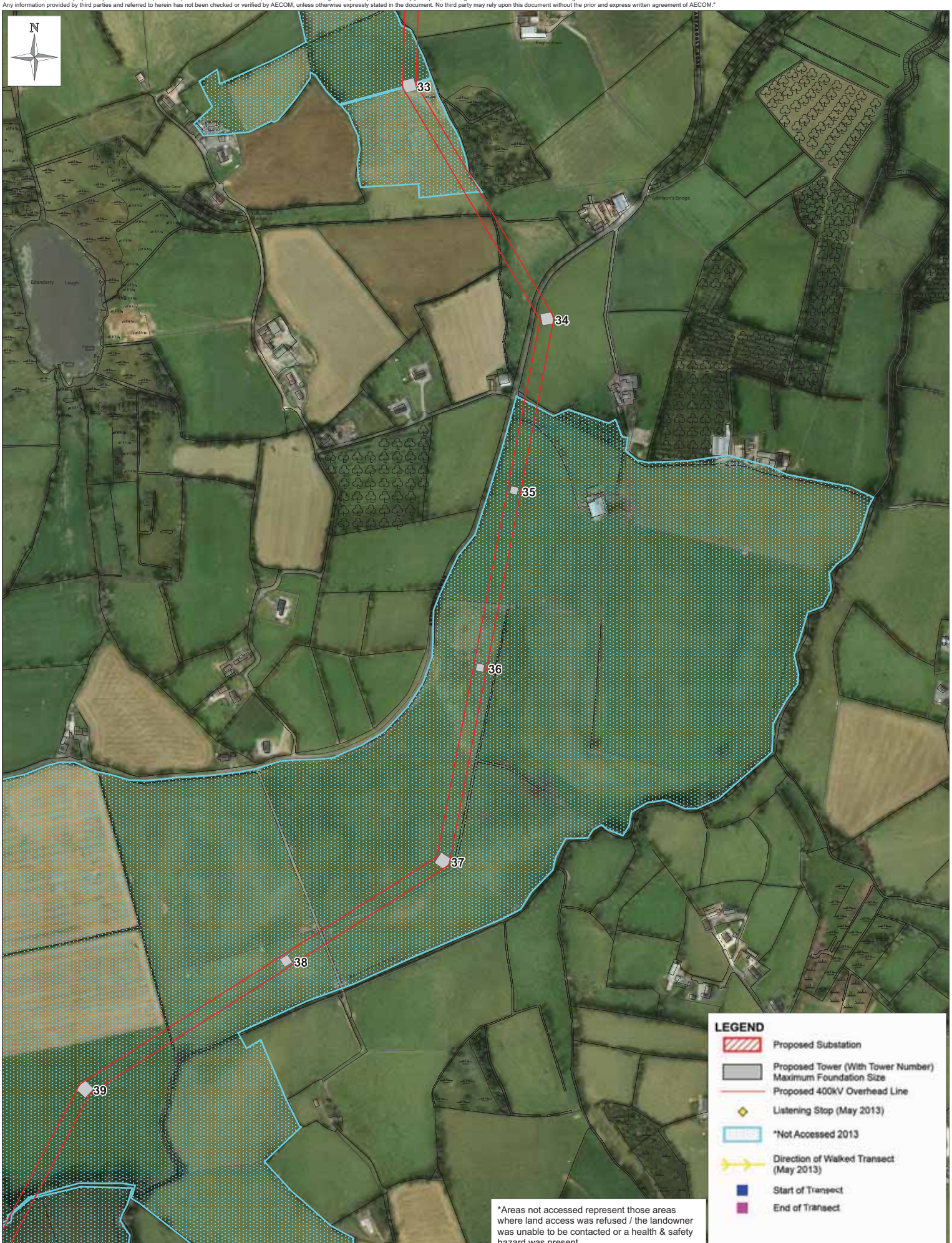




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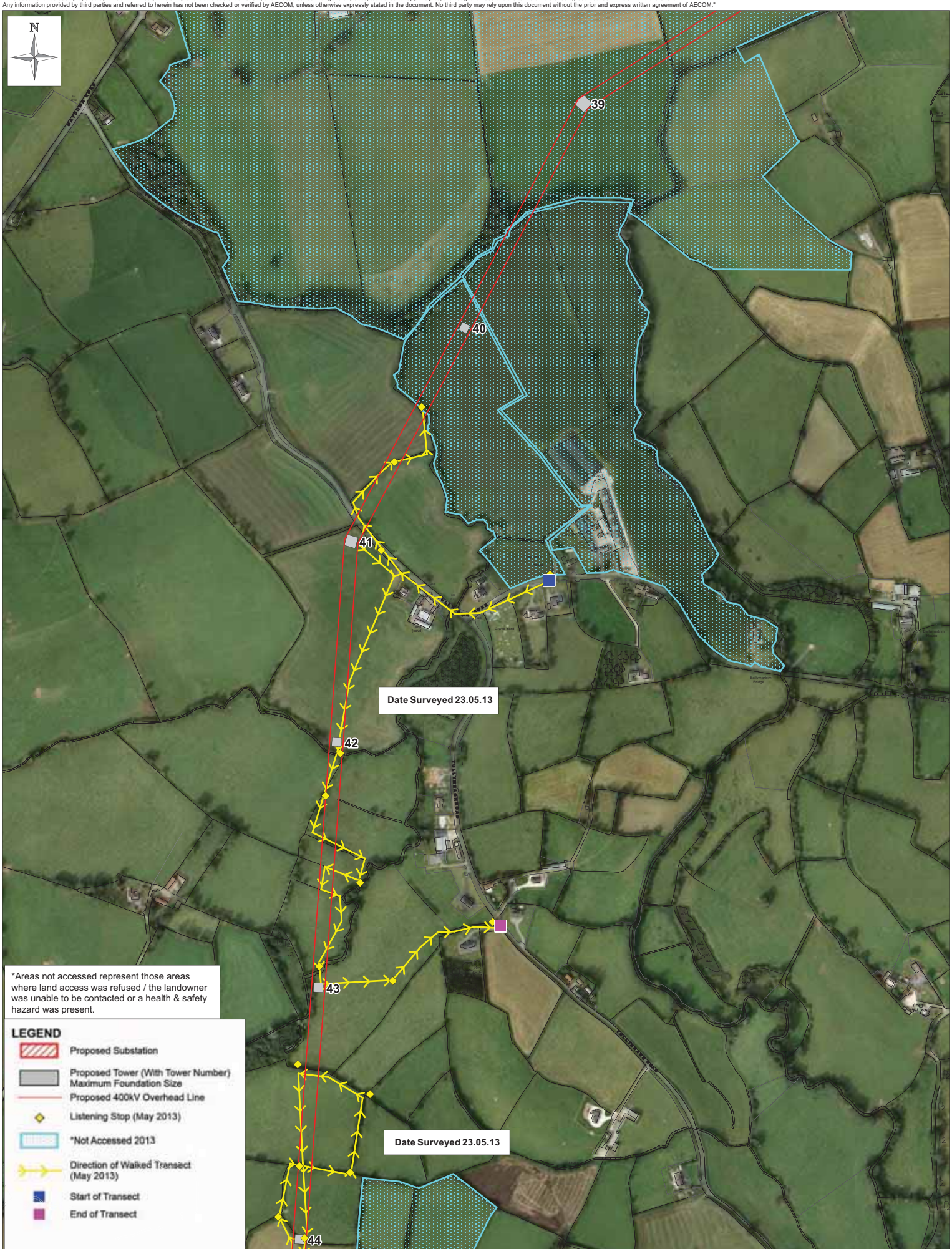




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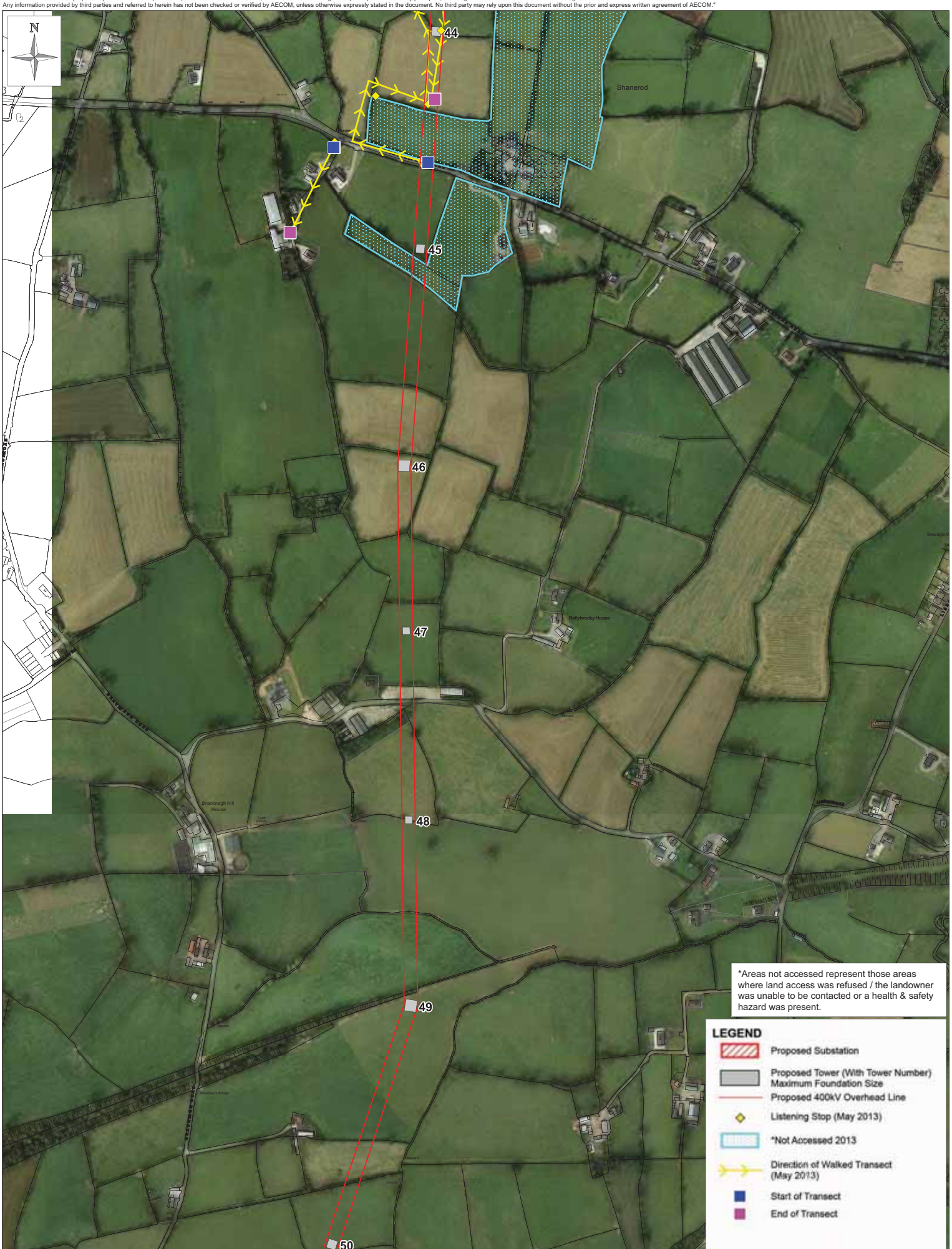




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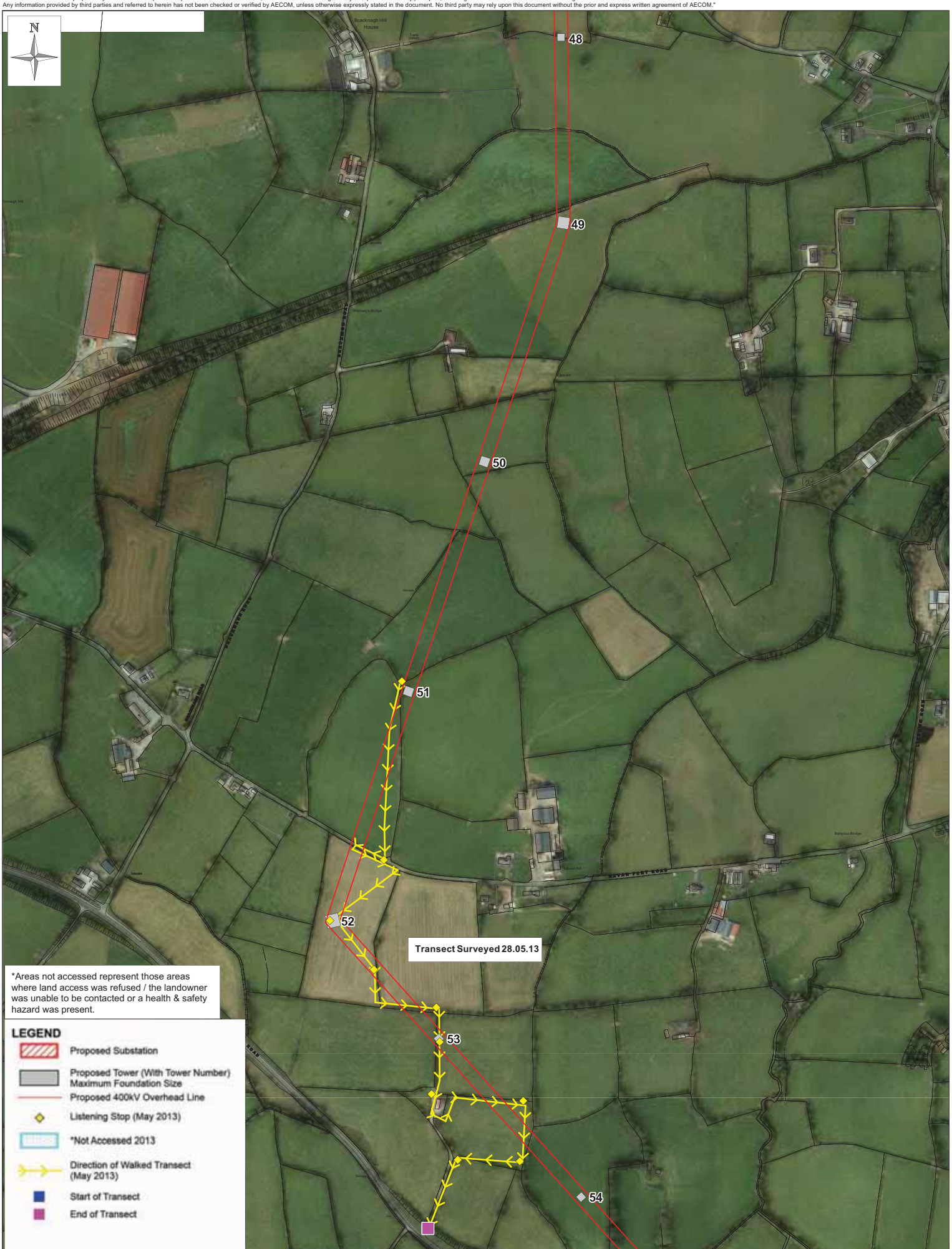




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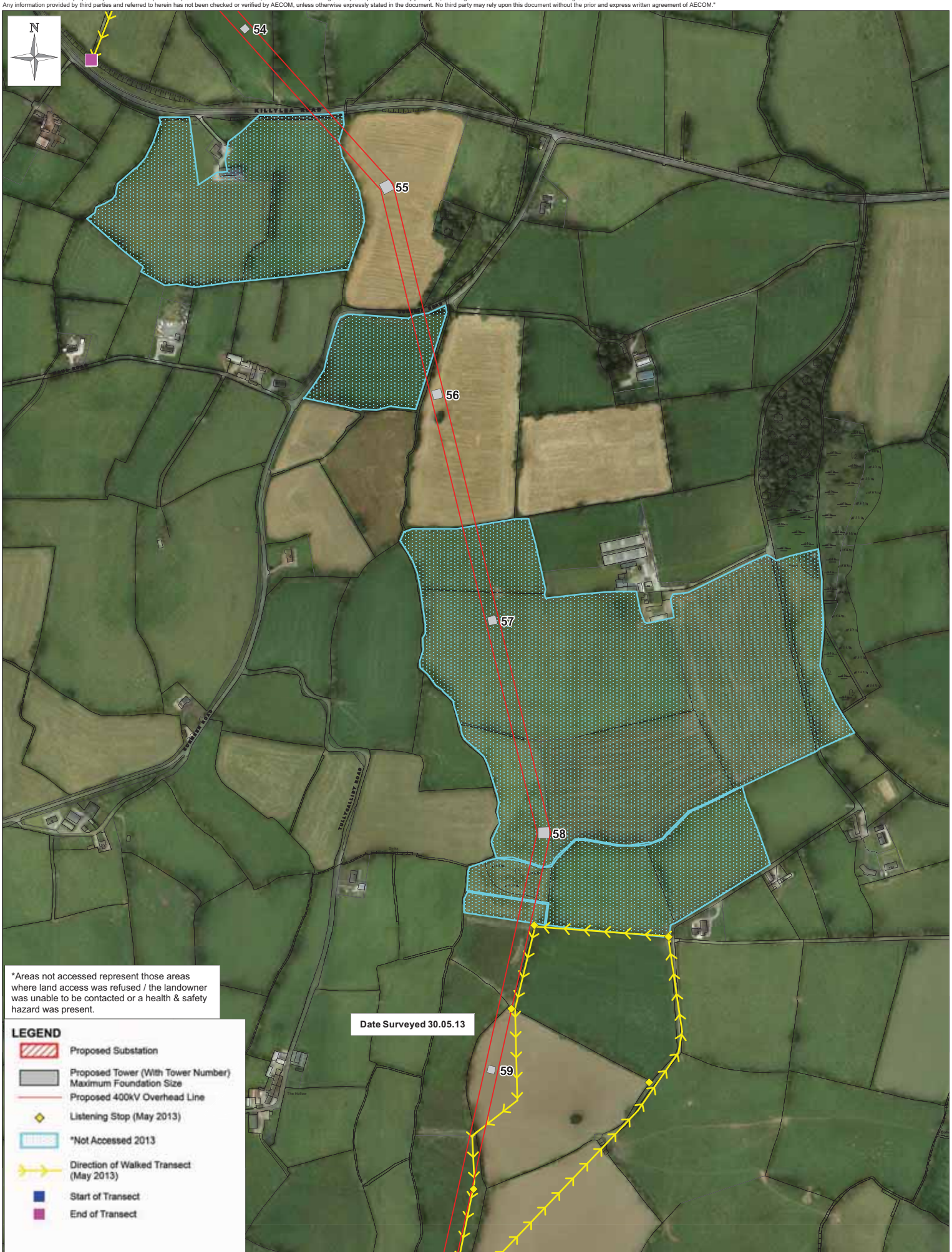
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1K






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1L
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 12 OF 21)

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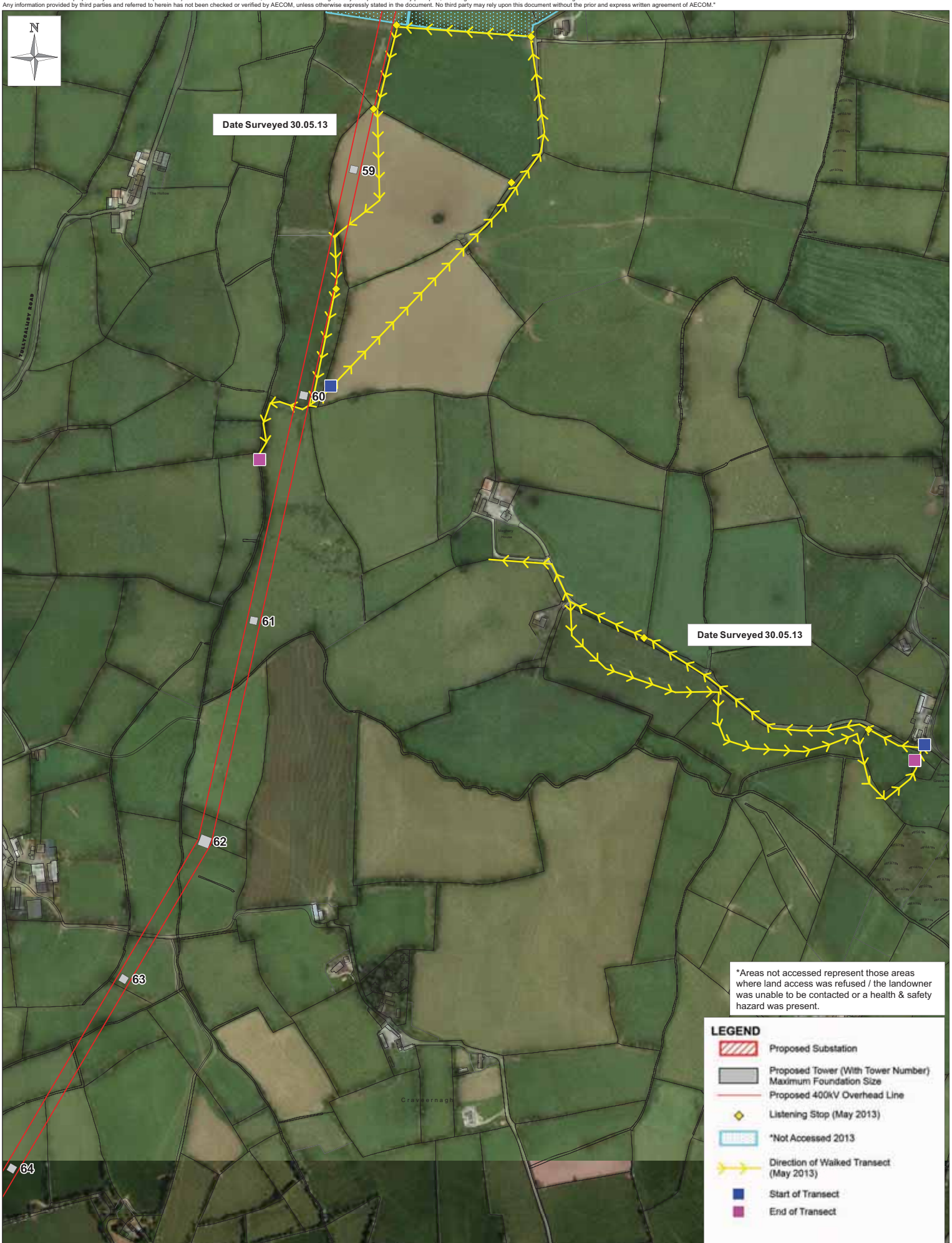
| Chk'd: MM | App'd: FL |
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1L






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1M
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 13 OF 21)

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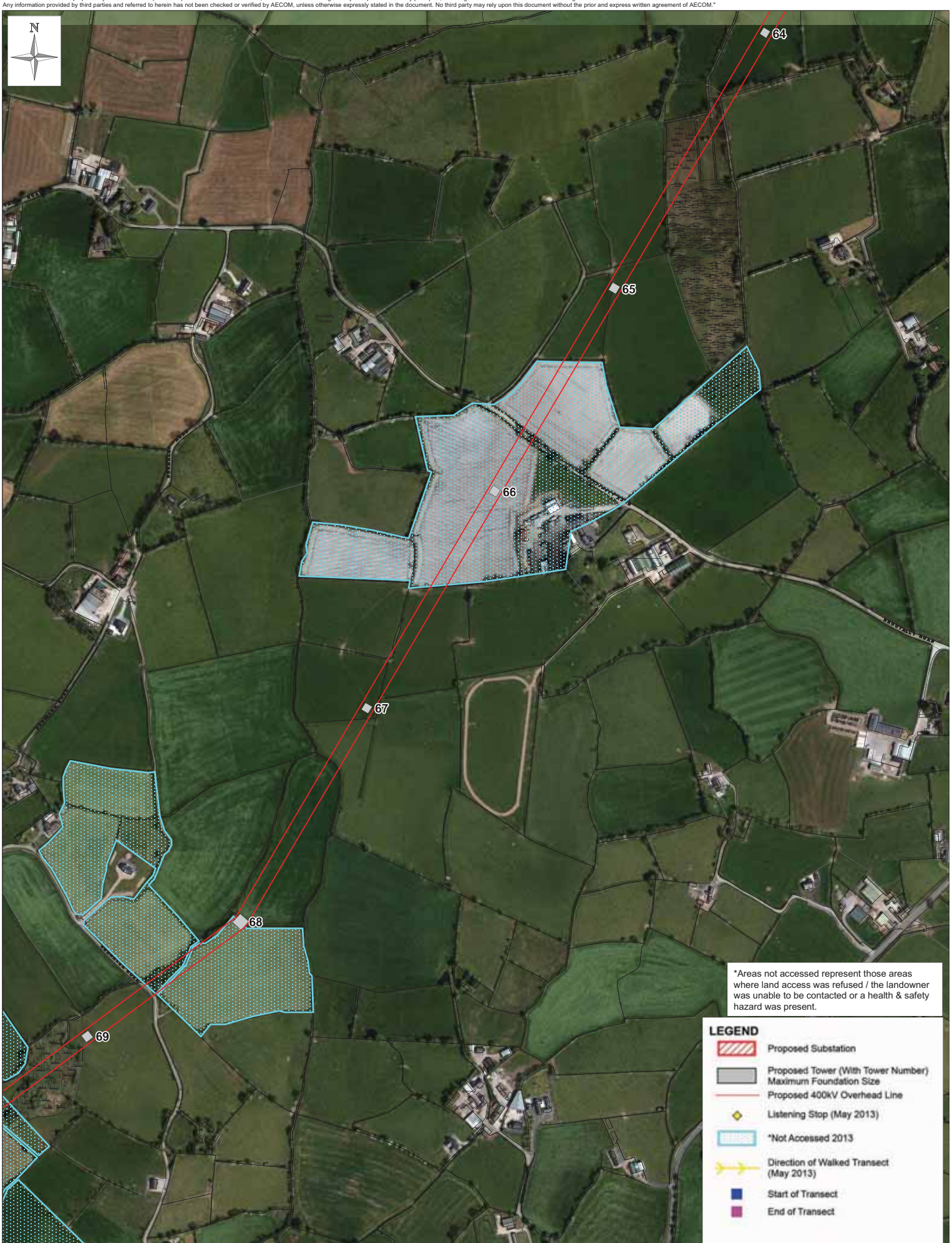
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1M






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1N
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 14 OF 21)

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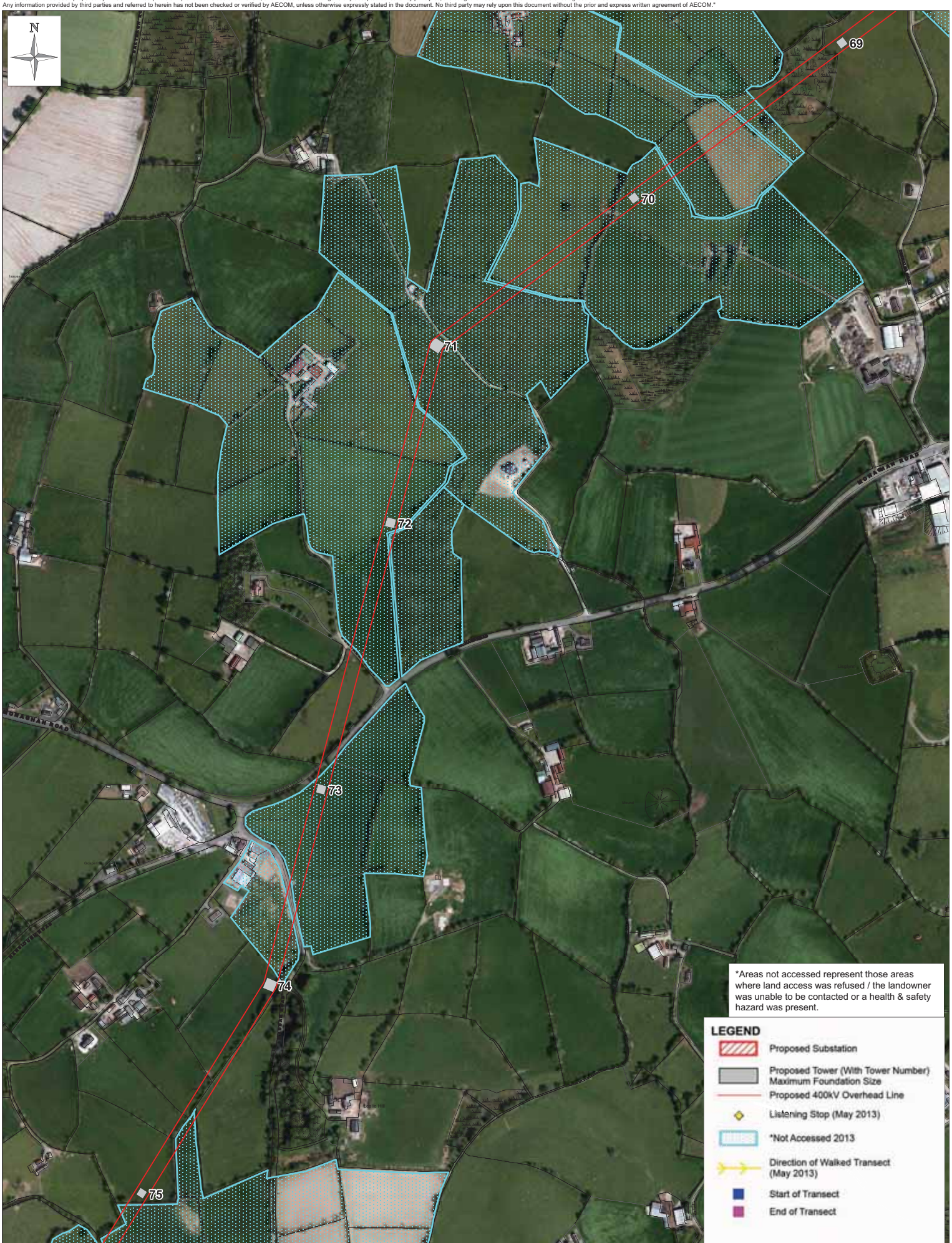
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1N






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1O
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 15 OF 21)

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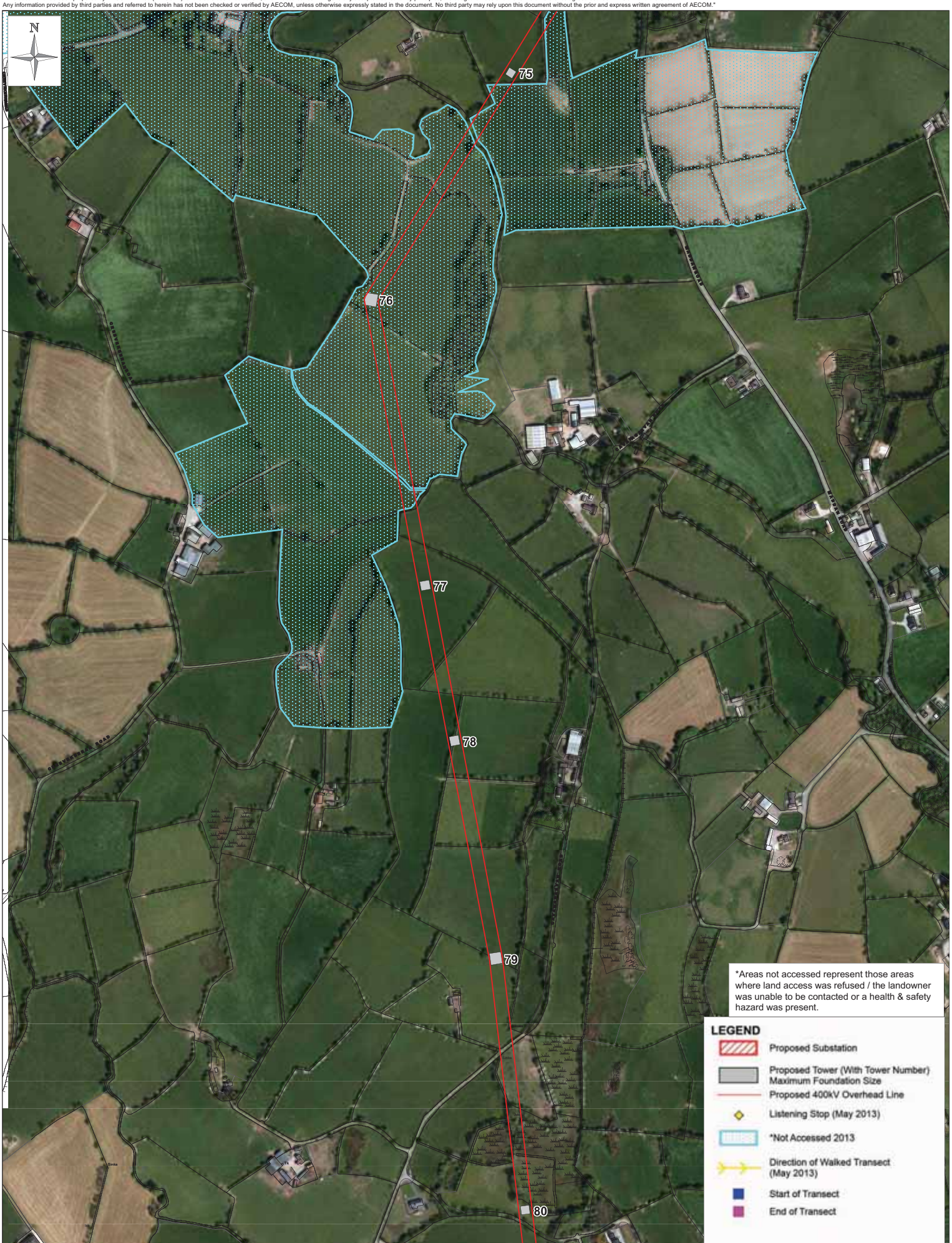
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1O






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1P
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 16 OF 21)

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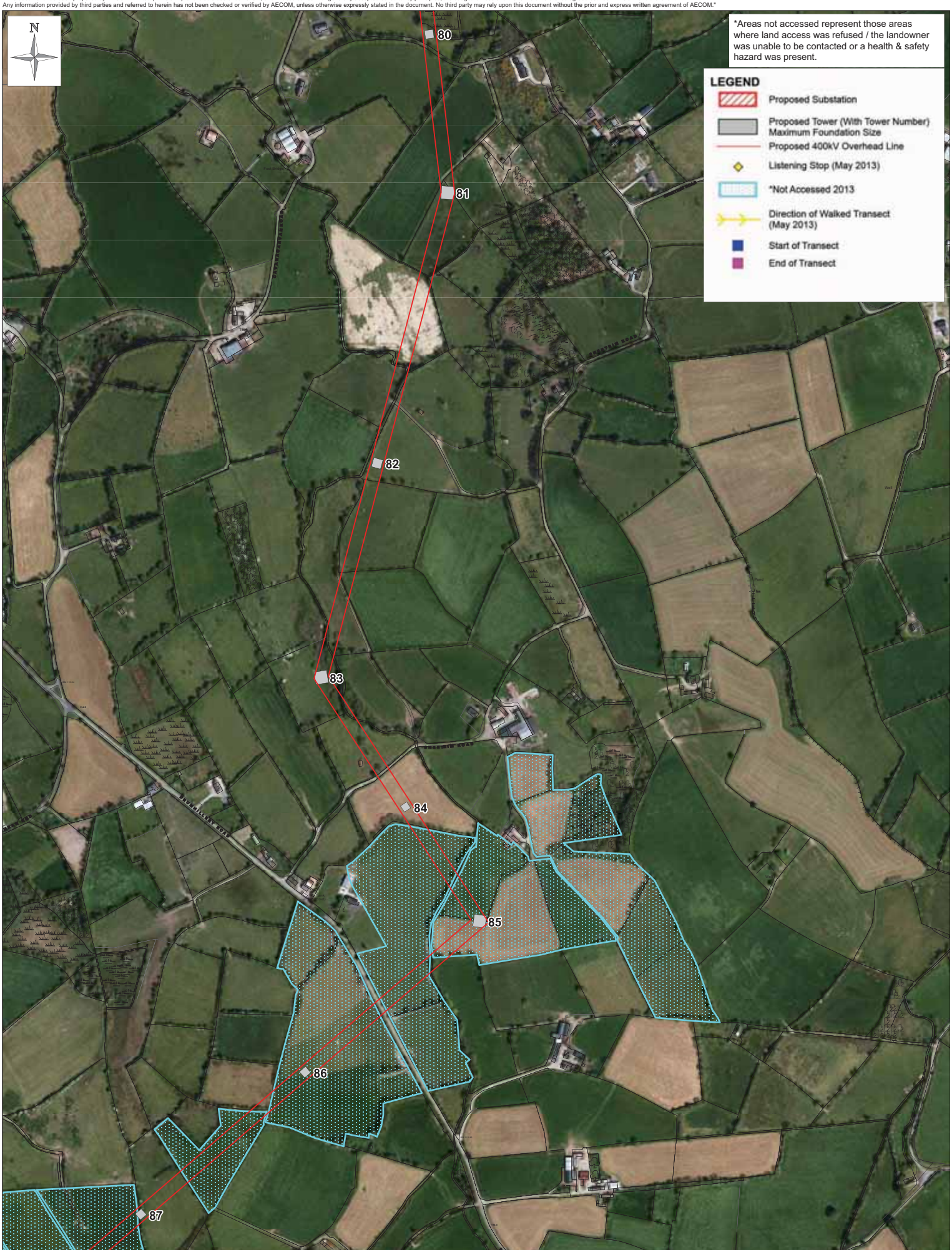
| Chk'd: MM | App'd: FL |
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1P






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1Q
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 17 OF 21)

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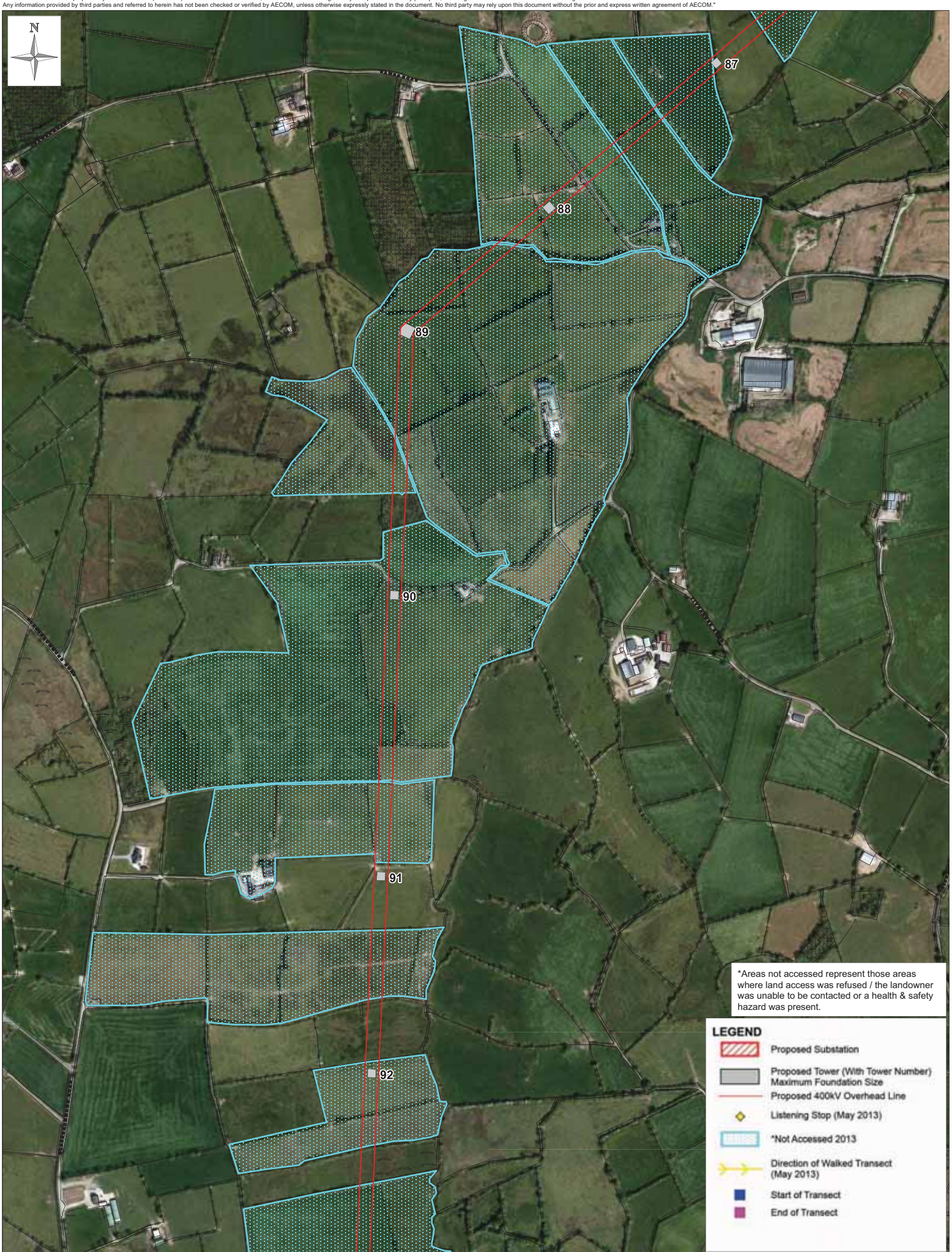
No: 60032220/3528/1Q






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1R
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 18 OF 21)

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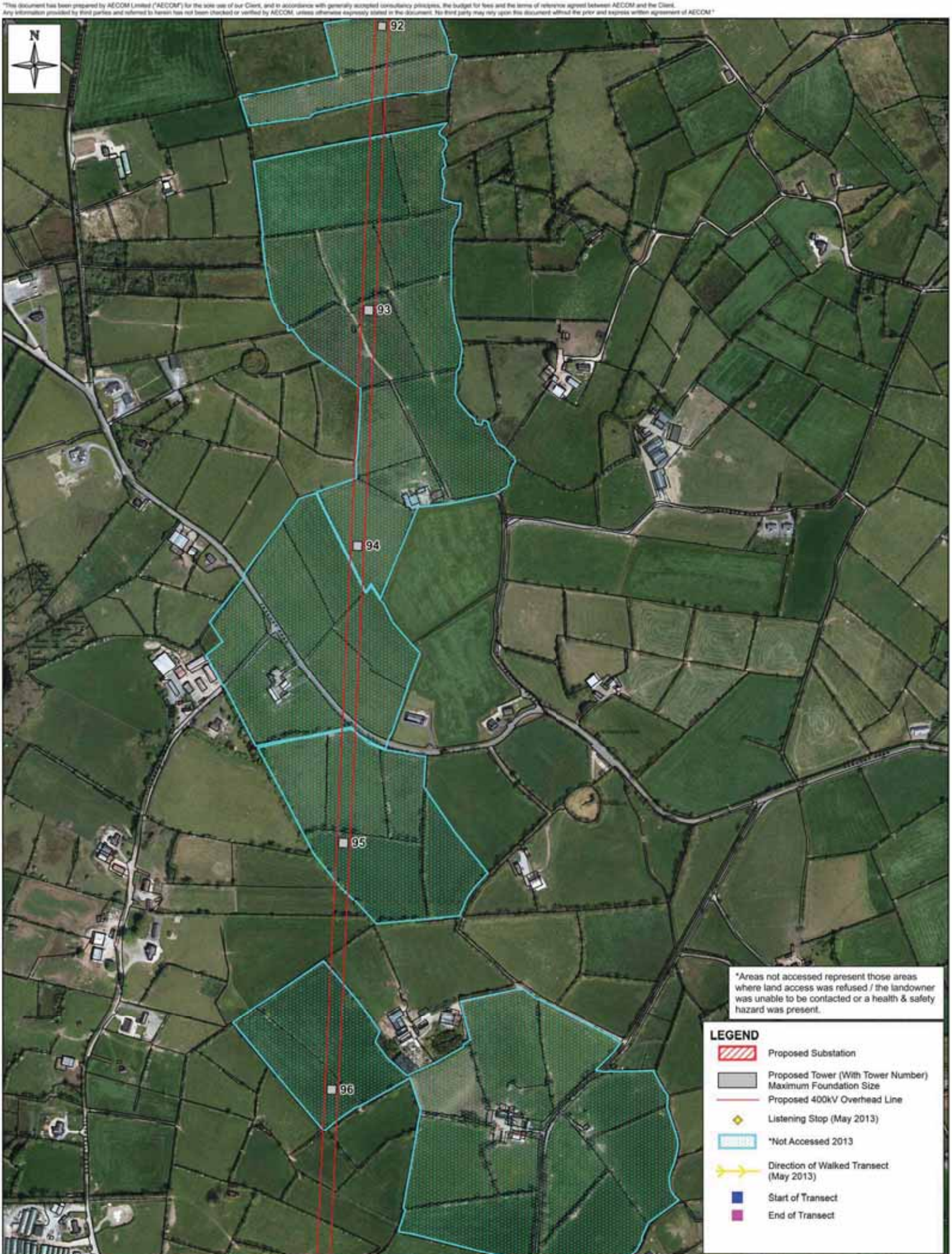
| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1R






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1S
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 19 OF 21)

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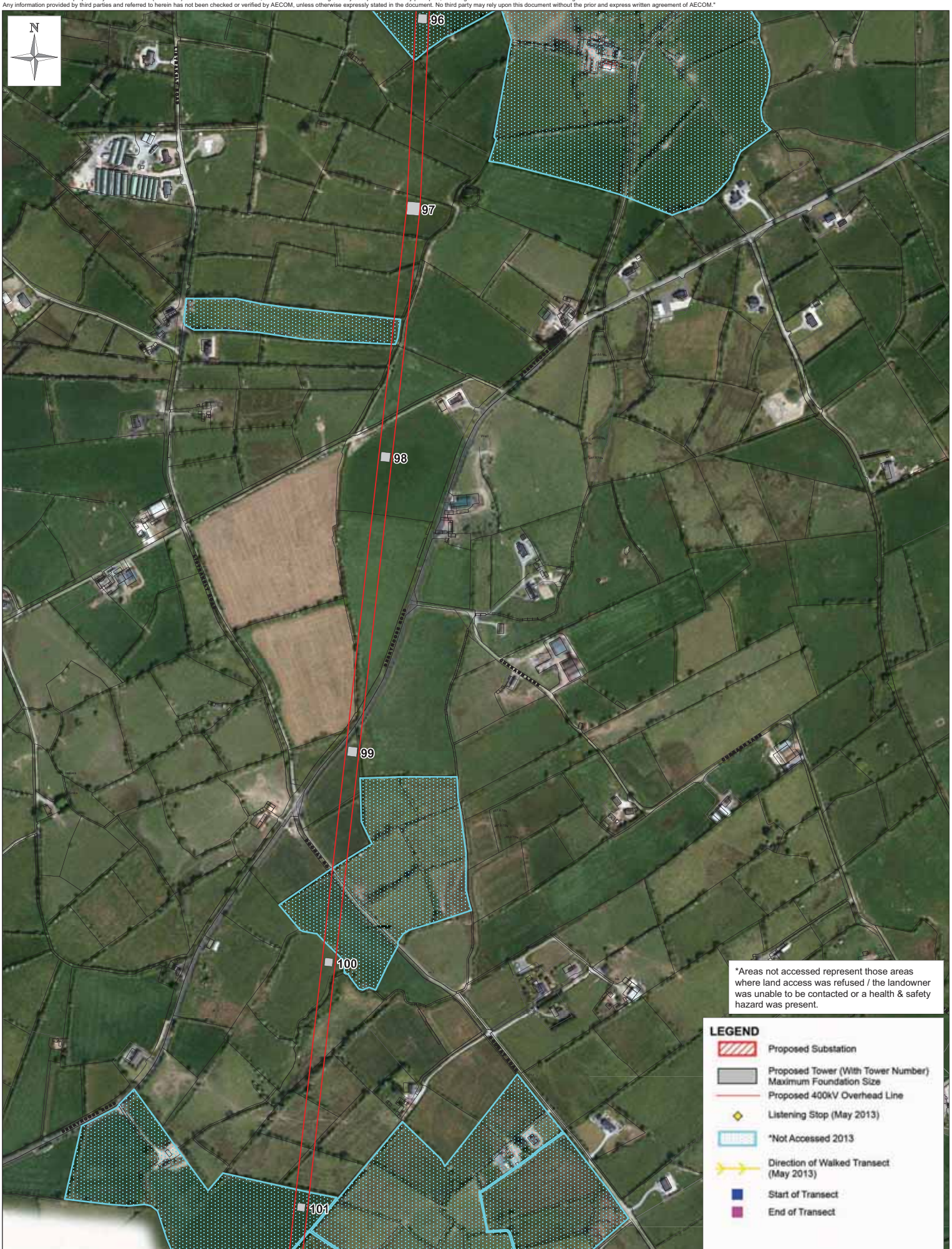
| Chk'd: MM | App'd: FL |
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1S






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1T
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 20 OF 21)

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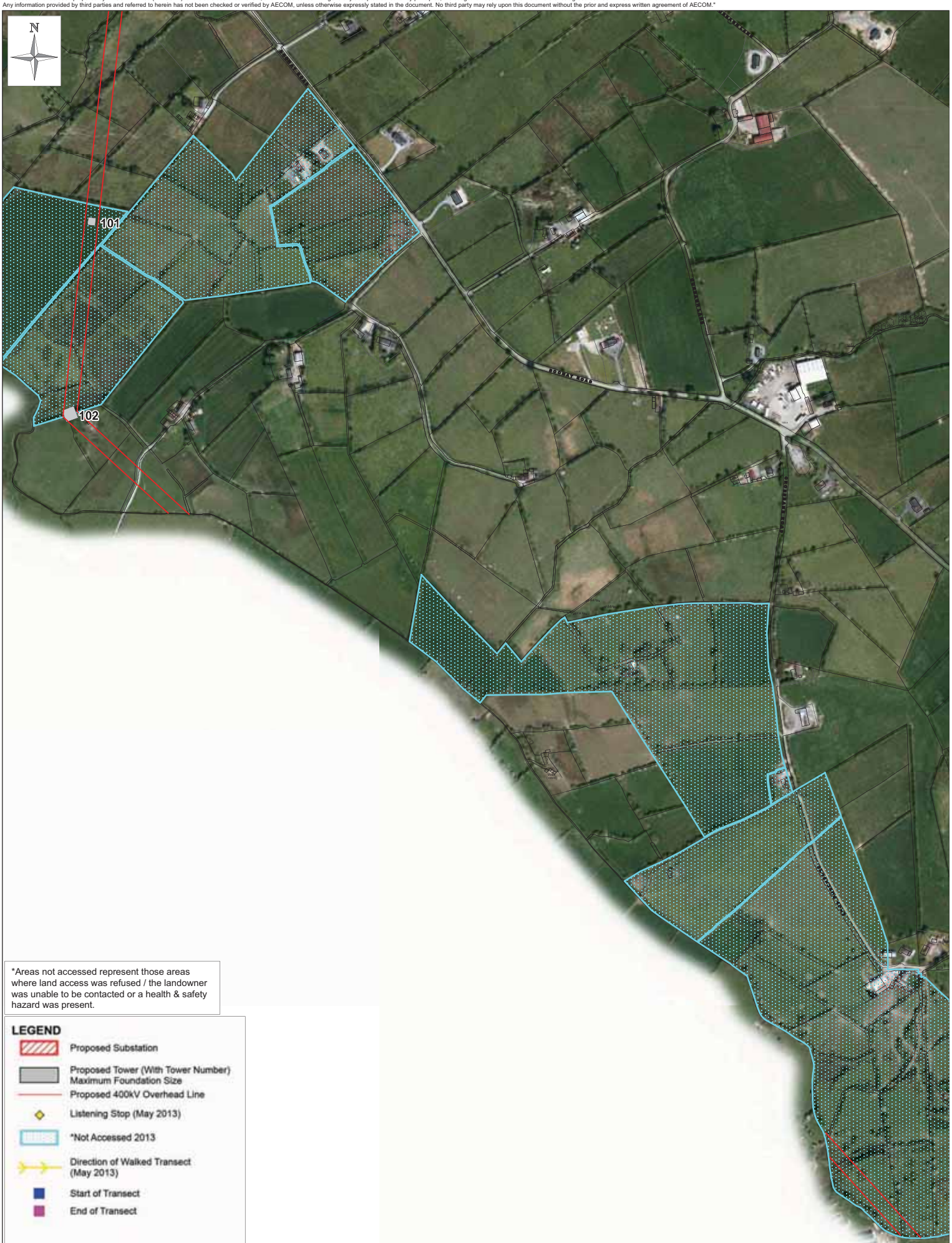
No: 60032220/3528/1T




*Areas not accessed represent those areas where land access was refused / the landowner was unable to be contacted or a health & safety hazard was present.

**LEGEND**

- Proposed Substation
- Proposed Tower (With Tower Number) Maximum Foundation Size
- Proposed 400kV Overhead Line
- Listening Stop (May 2013)
- *Not Accessed 2013
- Direction of Walked Transect (May 2013)
- Start of Transect
- End of Transect



Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1U
BAT SURVEY METHODOLOGY MAY 2013
(SHEET 21 OF 21)

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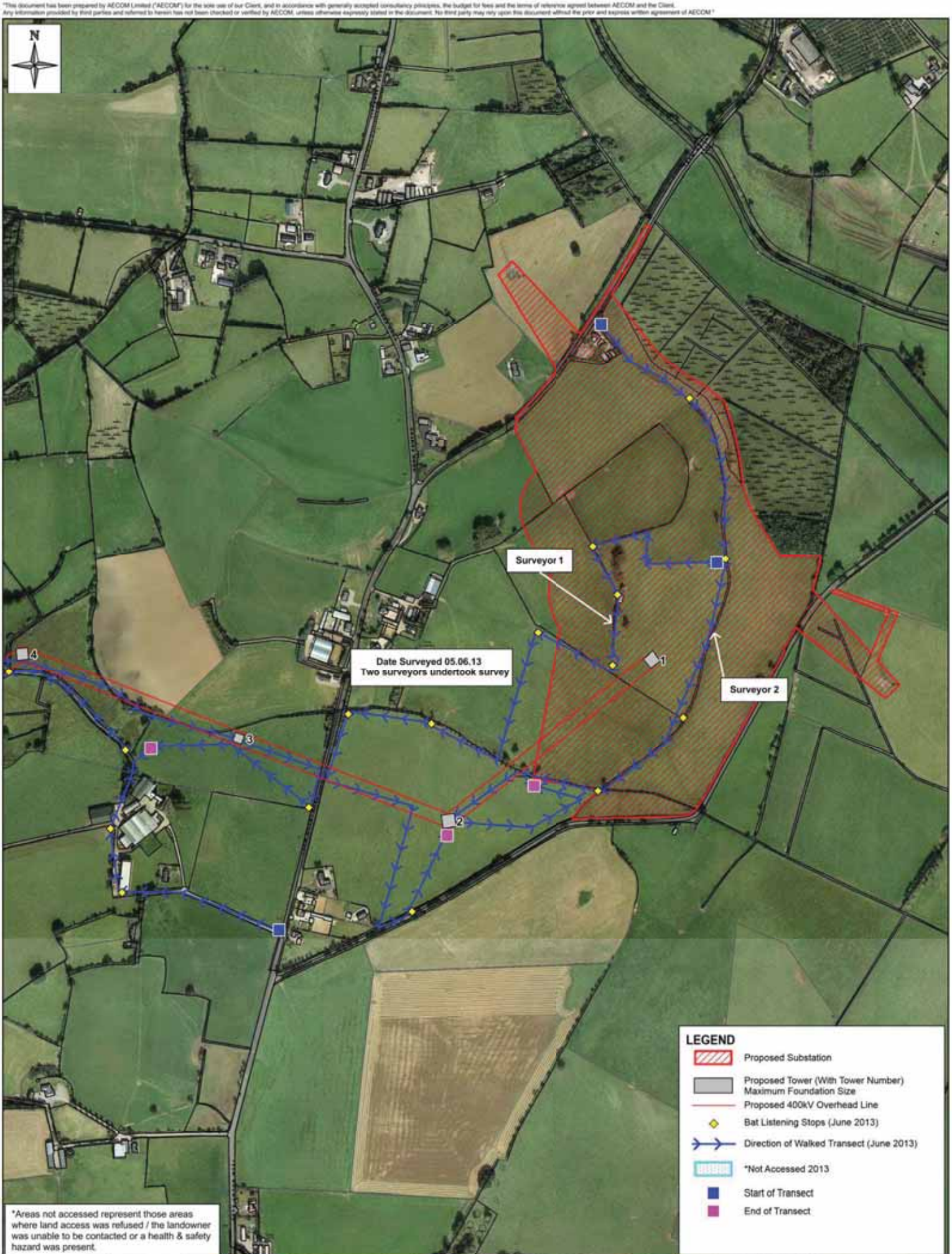
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/1U

Figure Series 2 – June Activity Survey Transect Routes and Listening Stop Locations

Figures 2A to 2U






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2A
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 1 OF 21)

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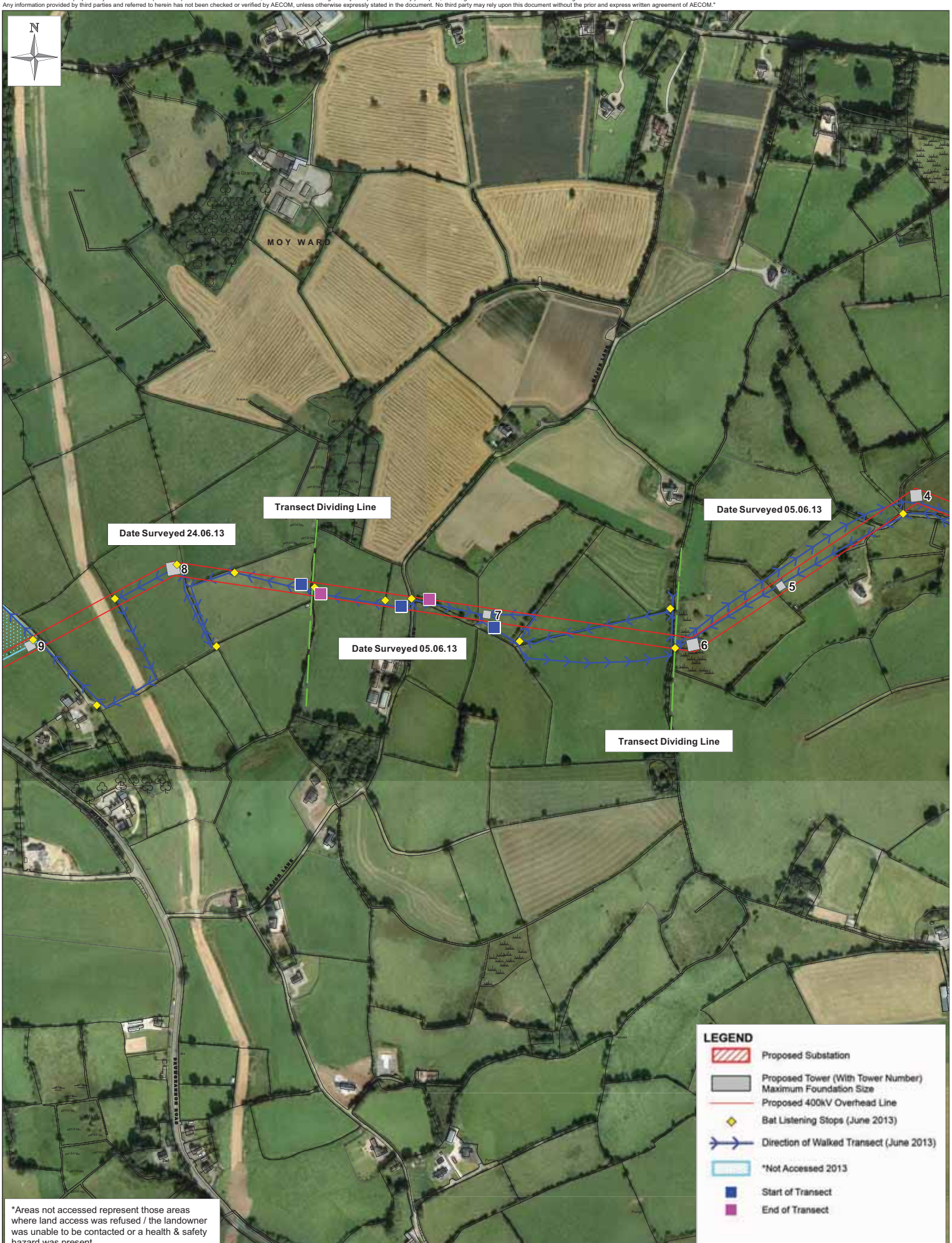
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2A






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2B BAT SURVEY METHODOLOGY JUNE 2013 (SHEET 2 OF 21)

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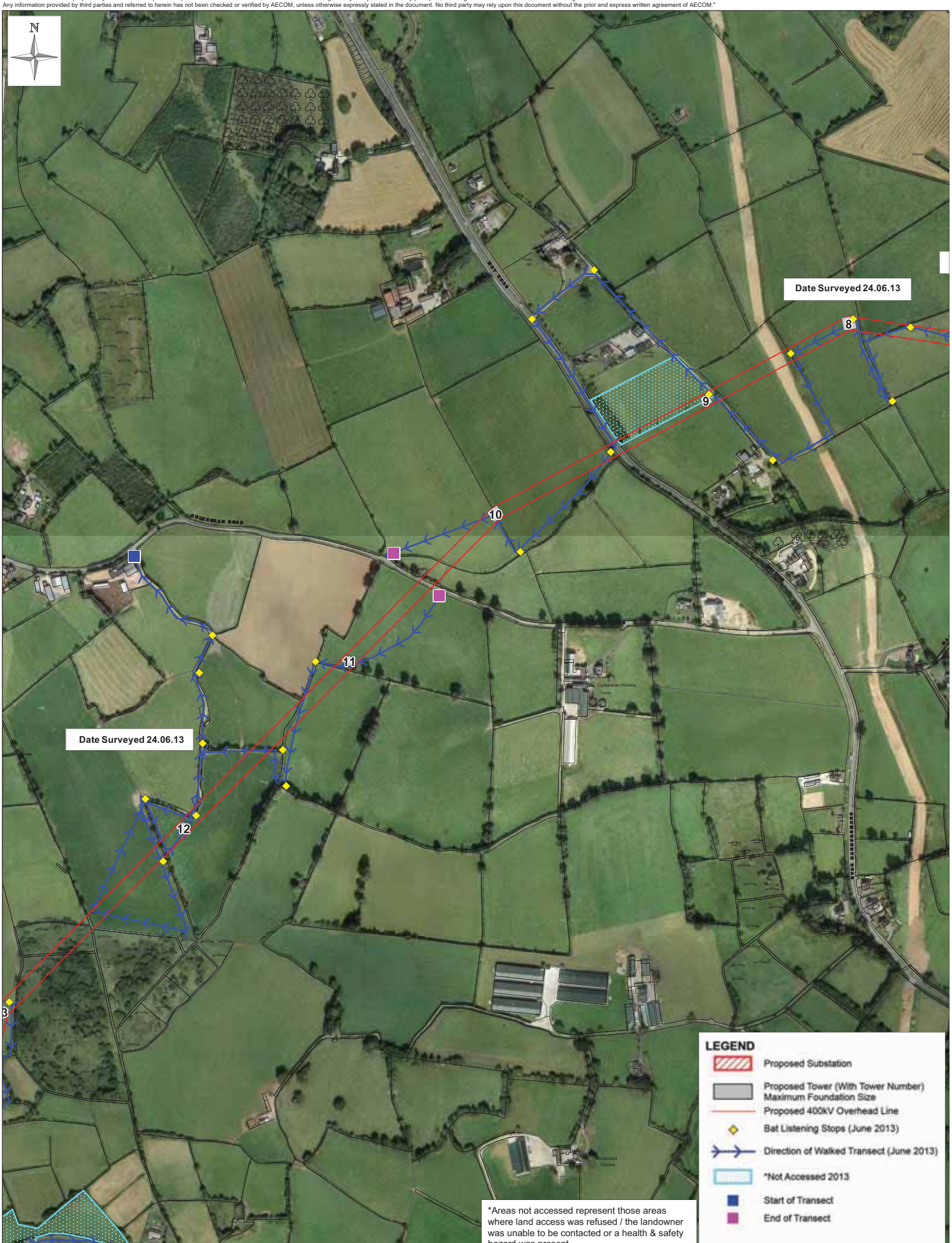
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2B






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2C
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 3 OF 21)

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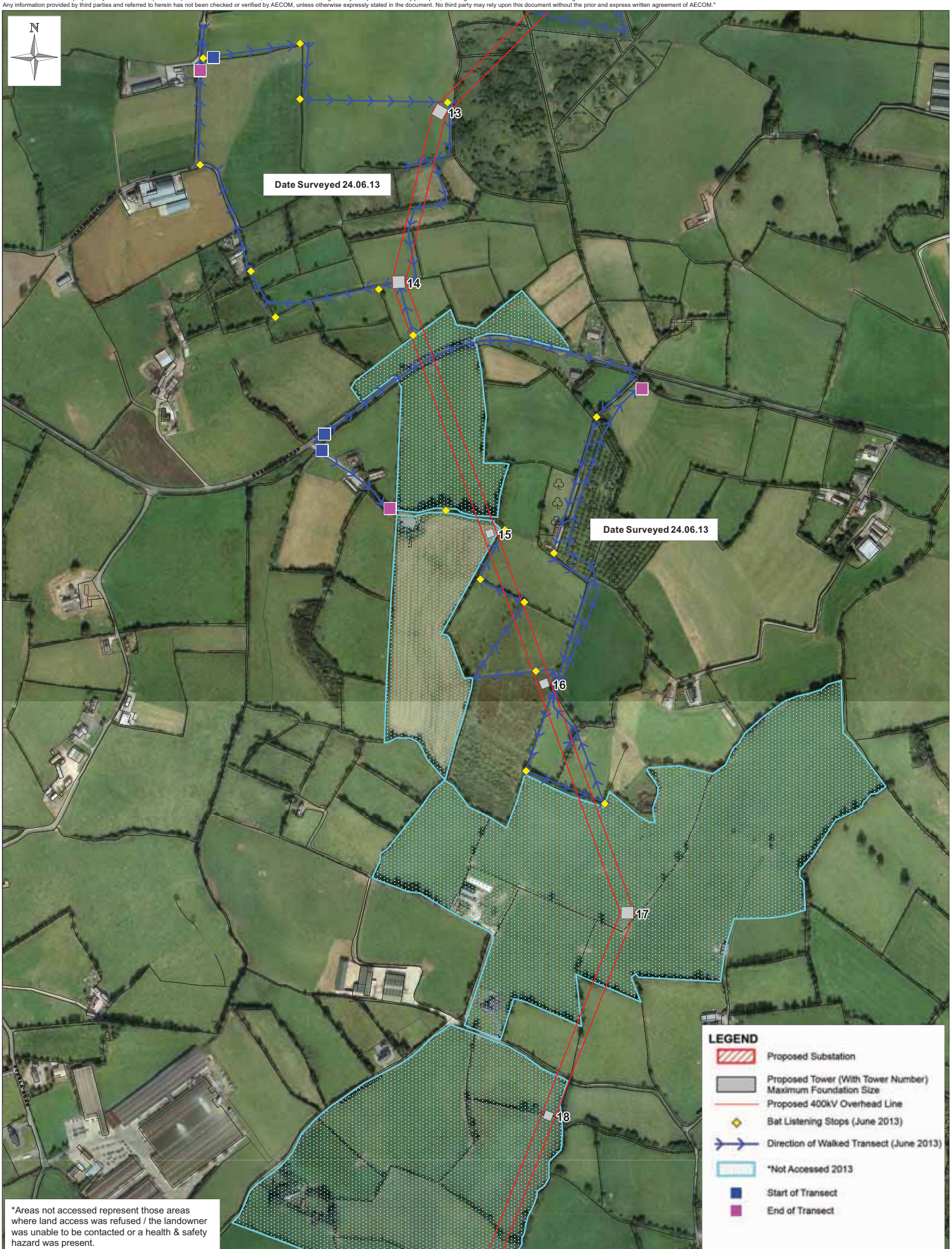
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2C






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2D BAT SURVEY METHODOLOGY JUNE 2013 (SHEET 4 OF 21)

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No: 60032220/3528/2D




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2E BAT SURVEY METHODOLOGY JUNE 2013 (SHEET 5 OF 21)

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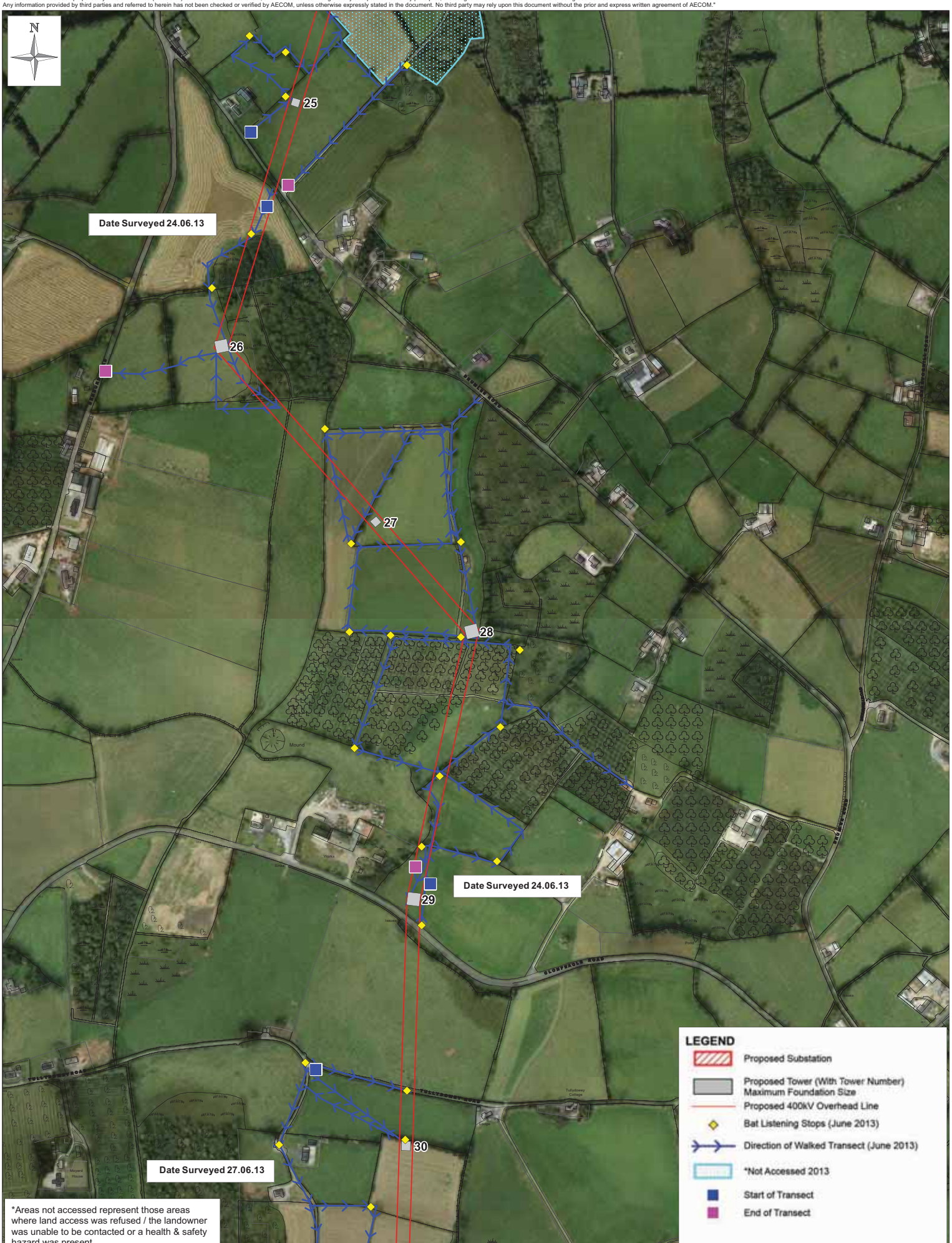
No: 60032220/3528/2E






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2F
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 6 OF 21)

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| Chk'd: MM | App'd: FL |
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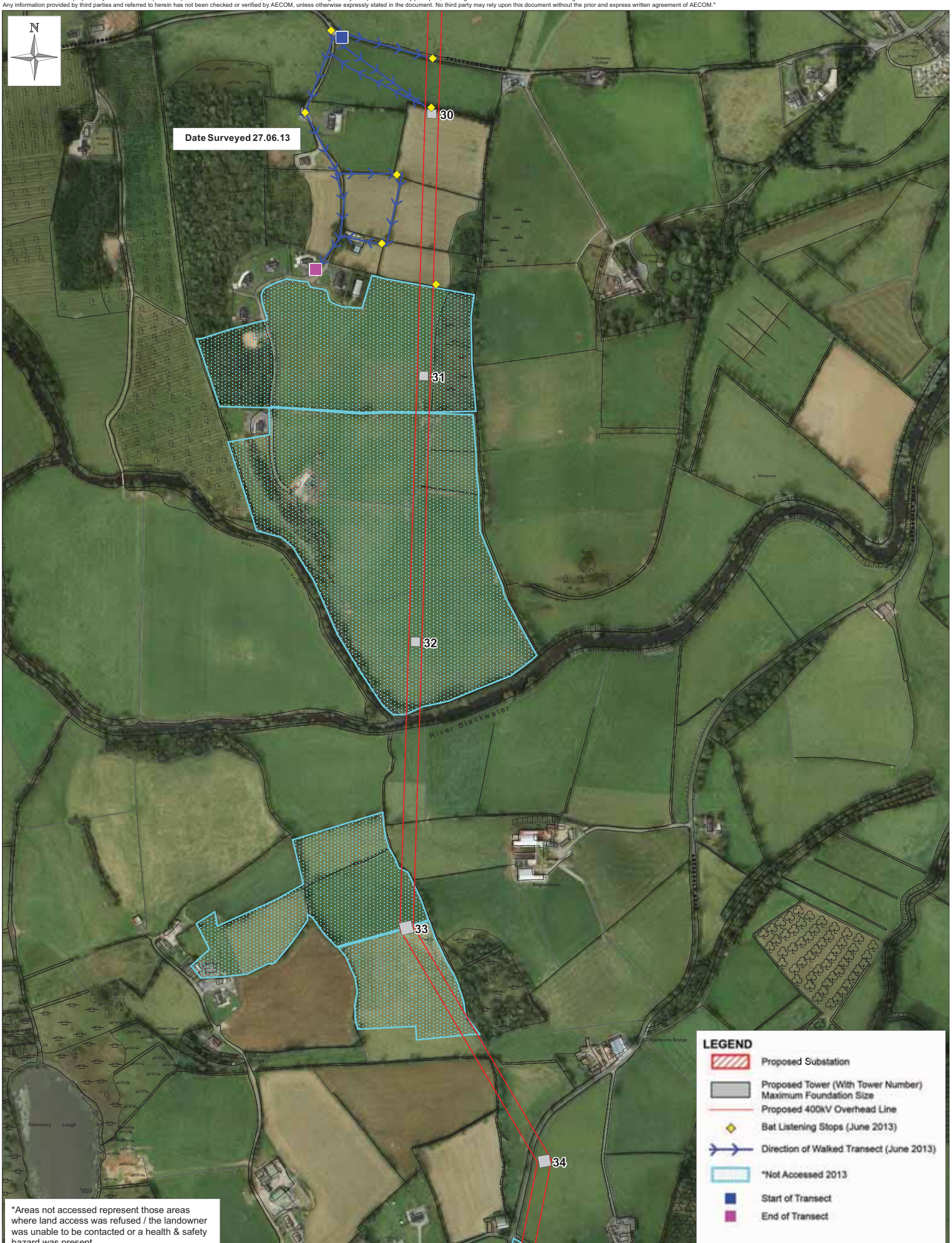
No: 60032220/3528/2F






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2G
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 7 OF 21)

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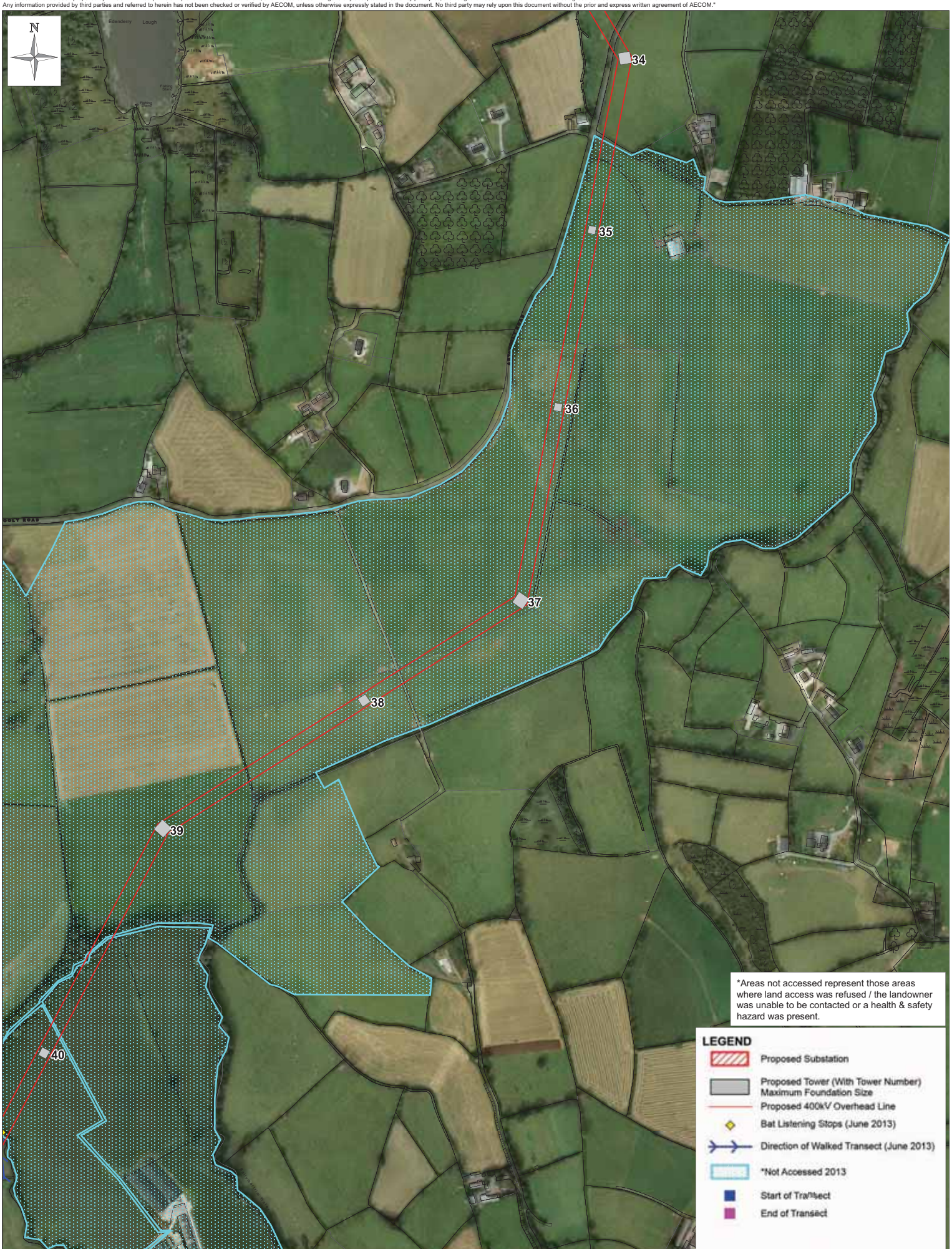
No: 60032220/3528/2G






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2H BAT SURVEY METHODOLOGY JUNE 2013 (SHEET 8 OF 21)

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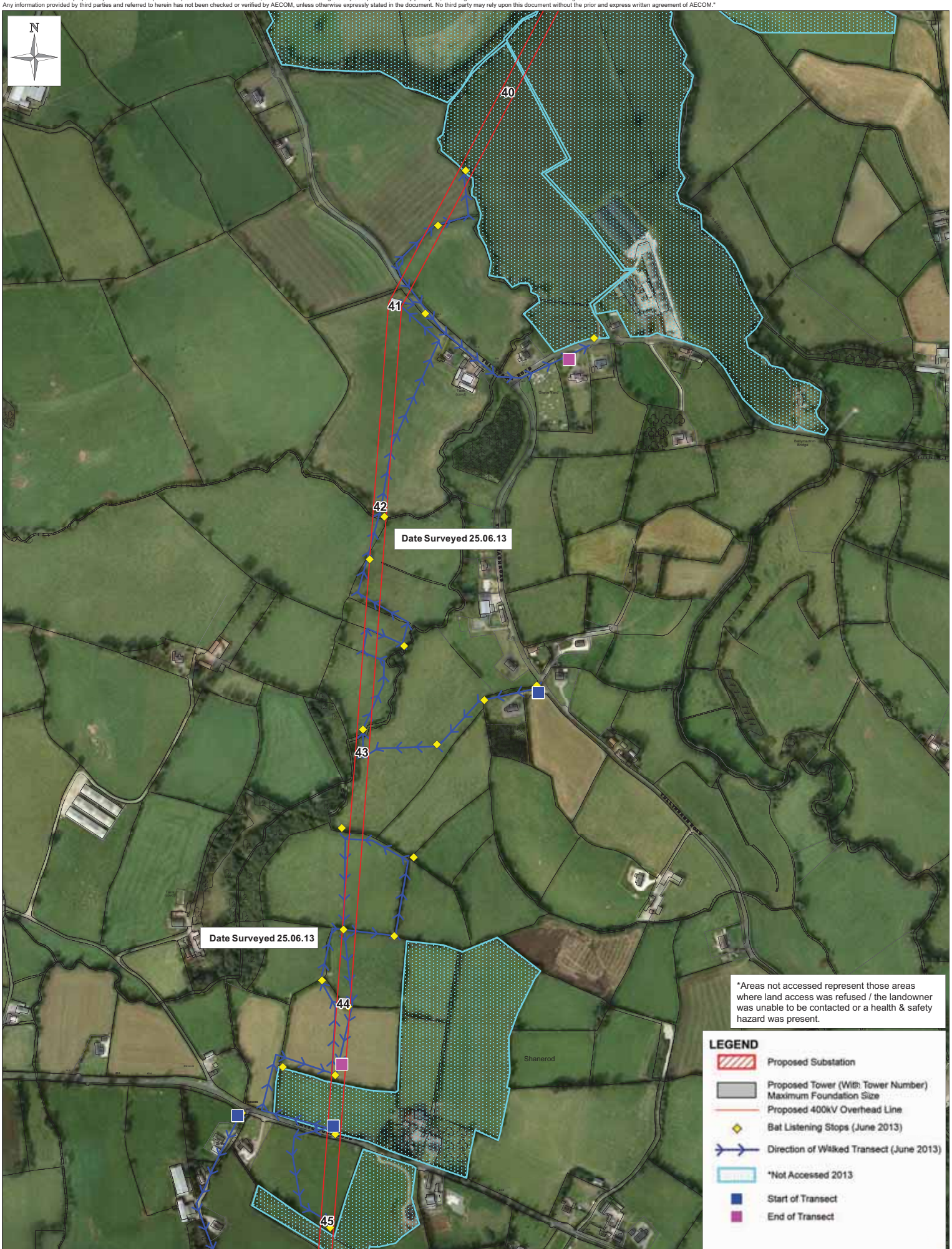
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2H






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2I
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 9 OF 21)

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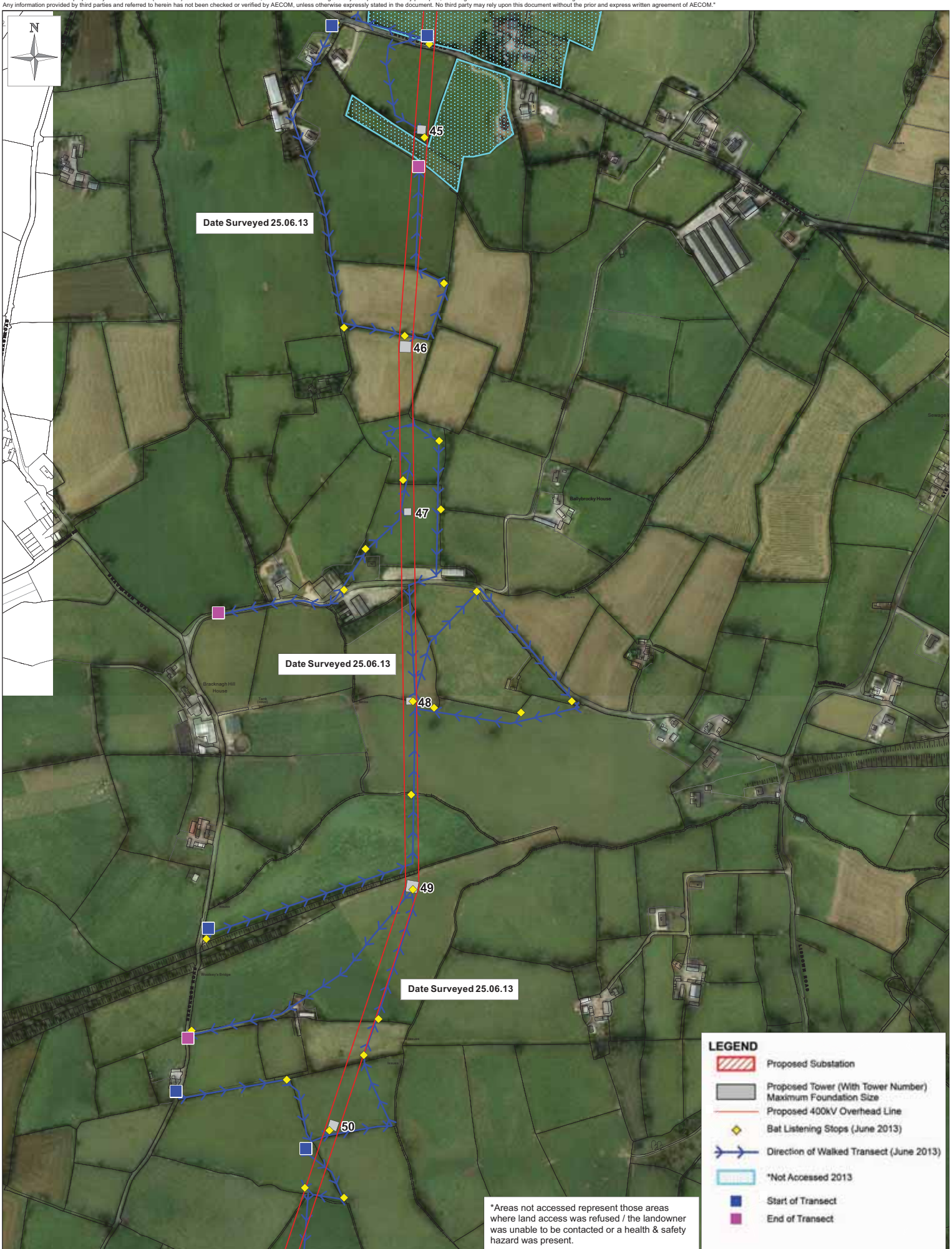
No: 60032220/3528/2I






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2J
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 10 OF 21)

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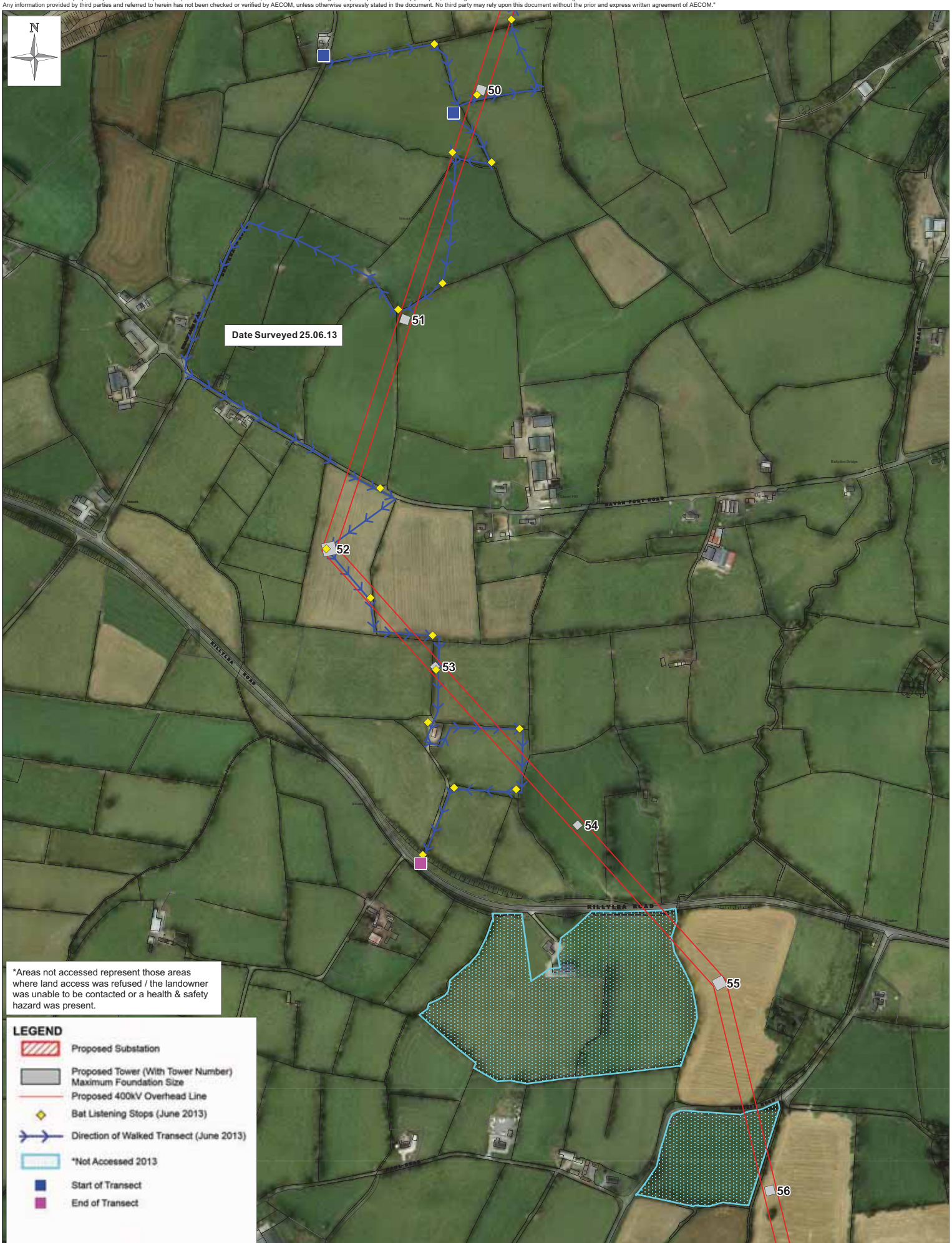
| Chk'd: MM | App'd: FL |
| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2J






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2K BAT SURVEY METHODOLOGY JUNE 2013 (SHEET 11 OF 21)

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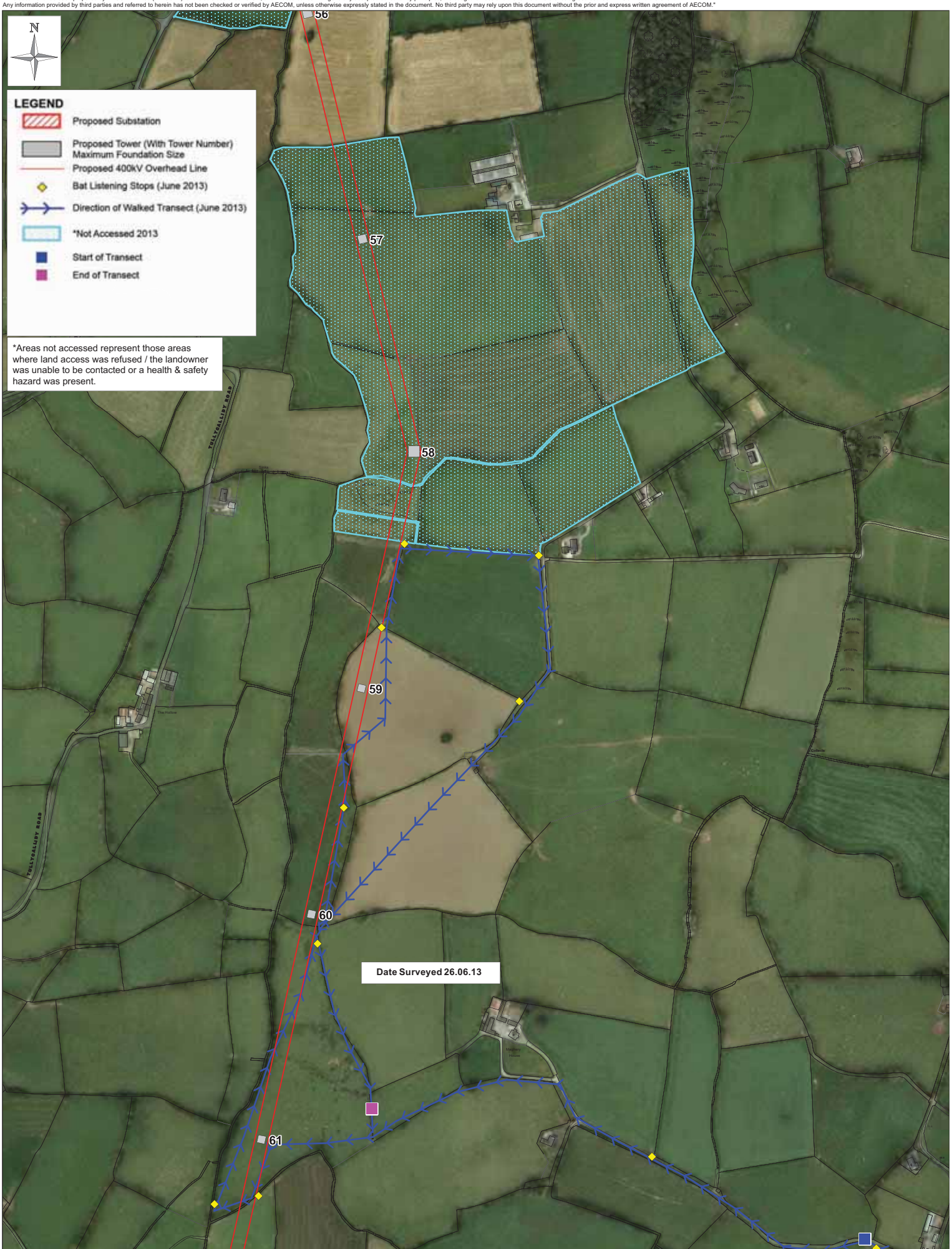
No: 60032220/3528/2K






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2L
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 12 OF 21)

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| Chk'd: MM | App'd: FL |
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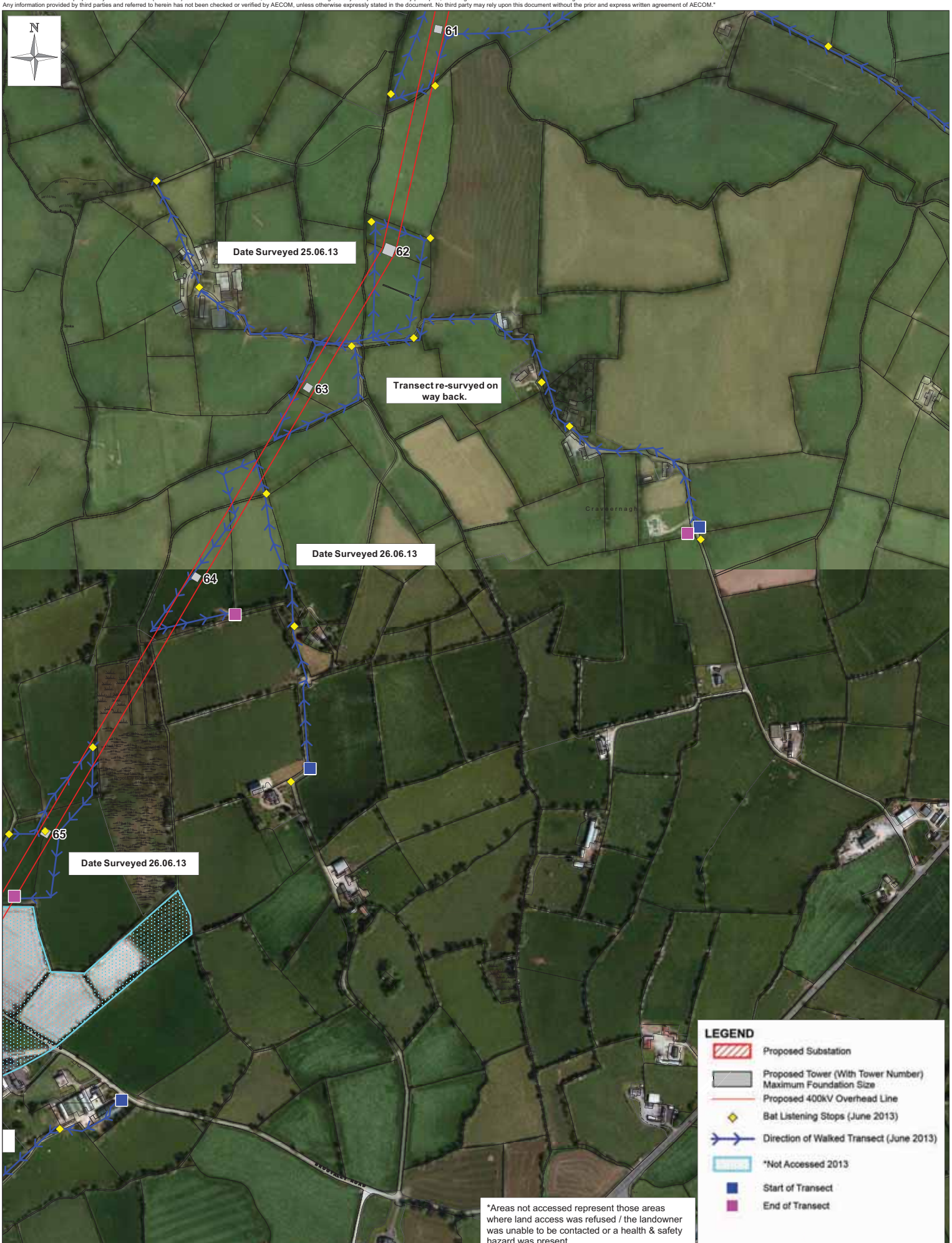
No: 60032220/3528/2L






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2M
BAT SURVEY METHODOLOGY JUNE 2013
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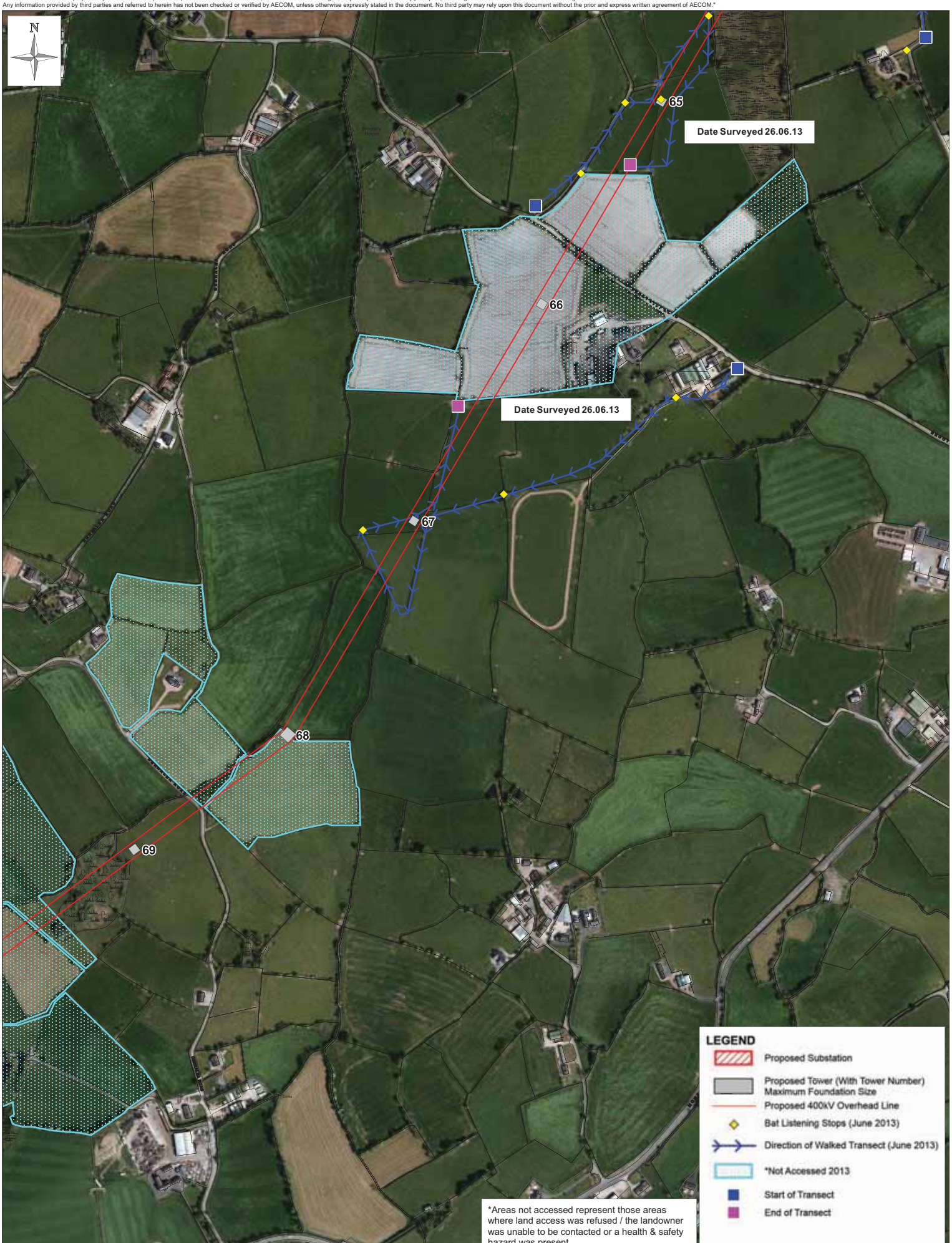
No: 60032220/3528/2M






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2N
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 14 OF 21)

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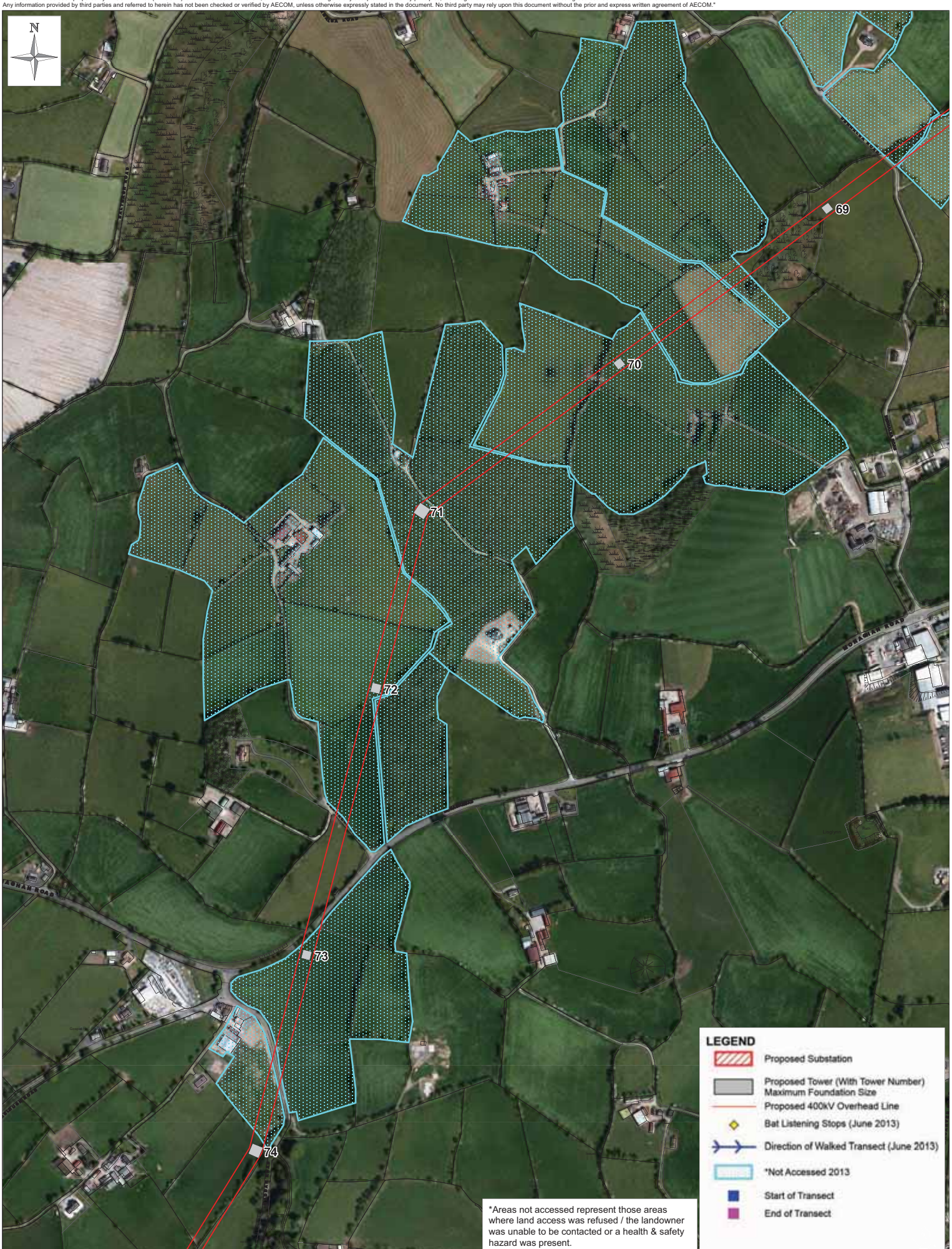
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2N






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2O
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 15 OF 21)

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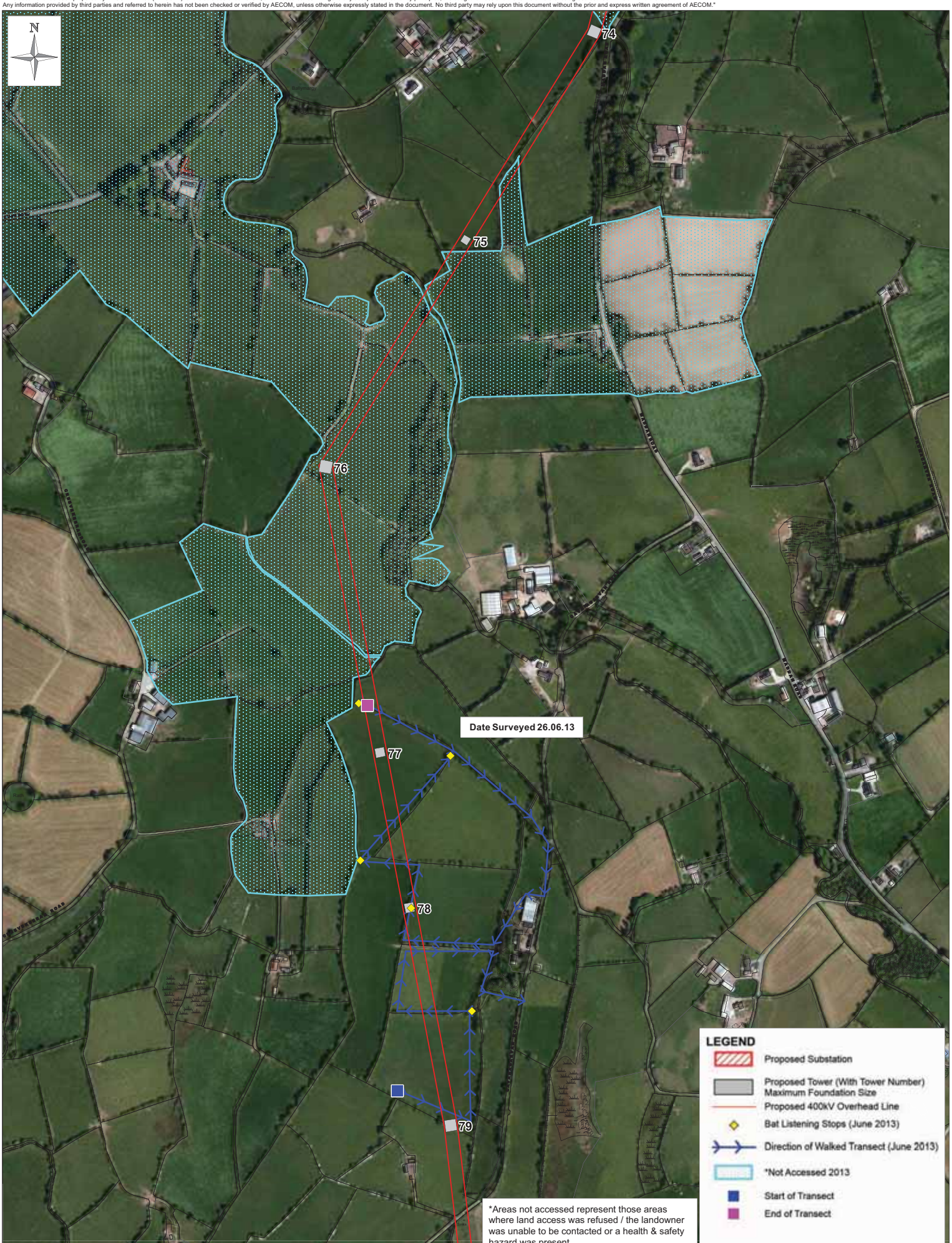
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2O






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2P
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 16 OF 21)

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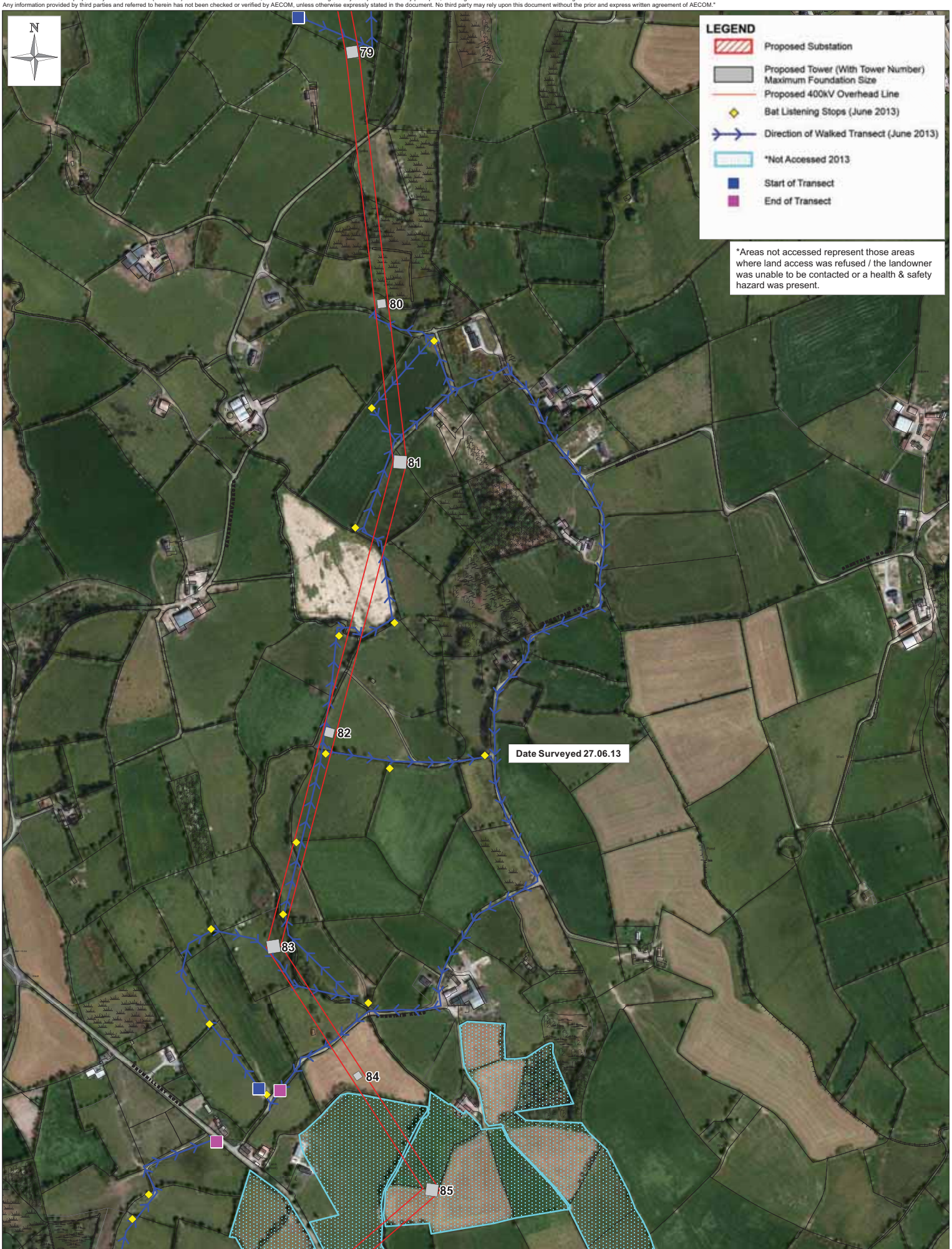
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2P






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2Q
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 17 OF 21)

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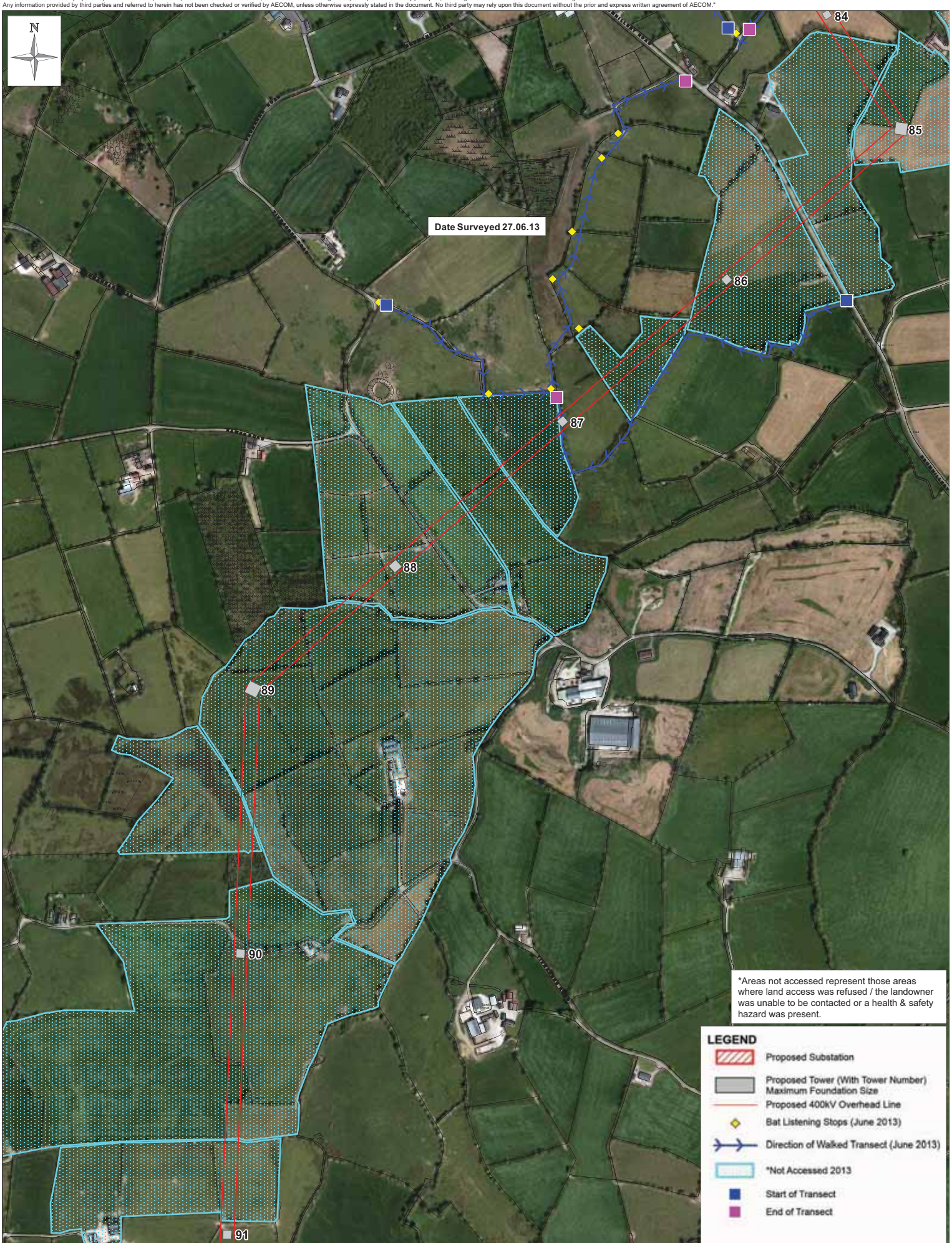
No: 60032220/3528/2Q






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2R BAT SURVEY METHODOLOGY JUNE 2013 (SHEET 18 OF 21)

AECOM
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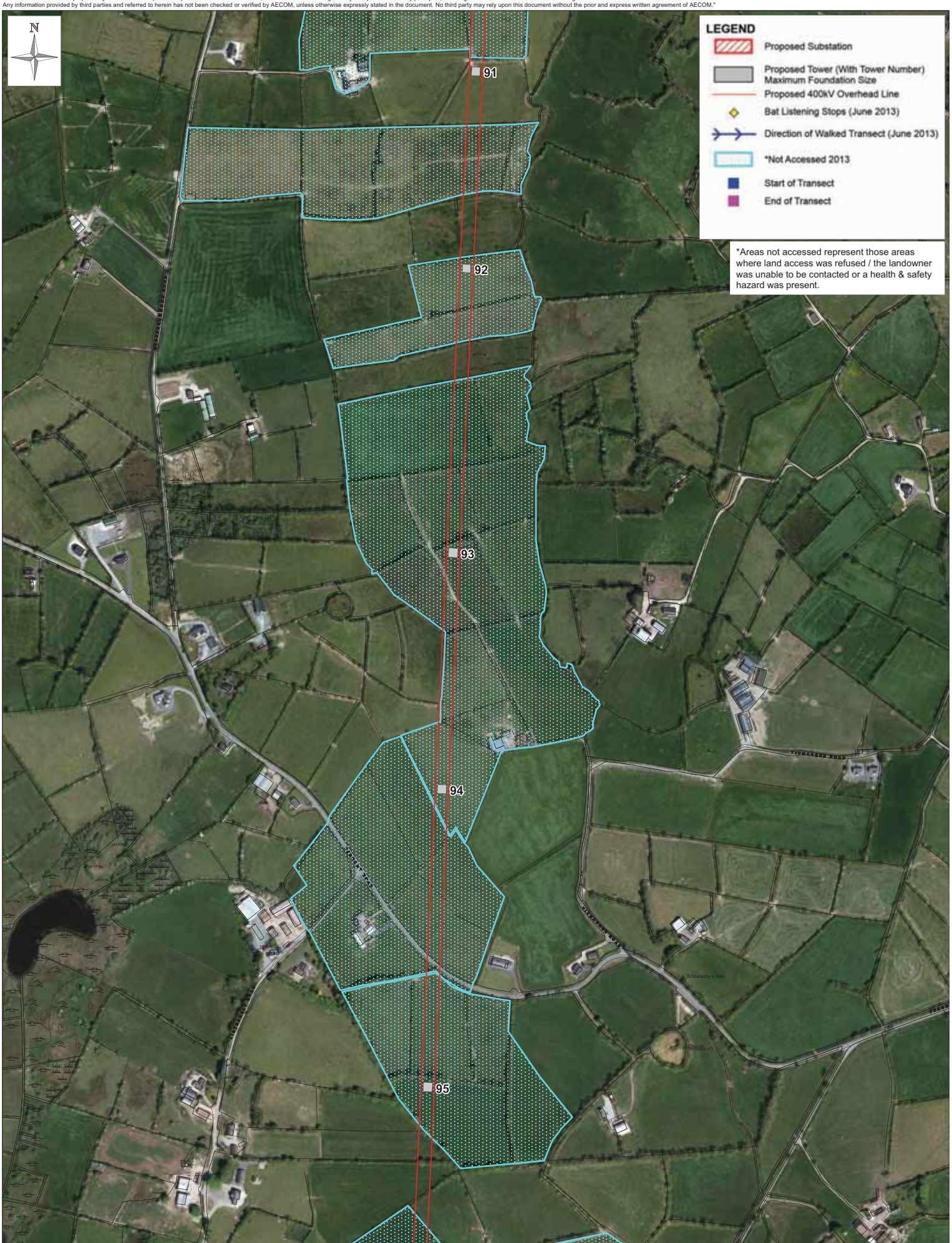
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2R






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2S
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 19 OF 21)

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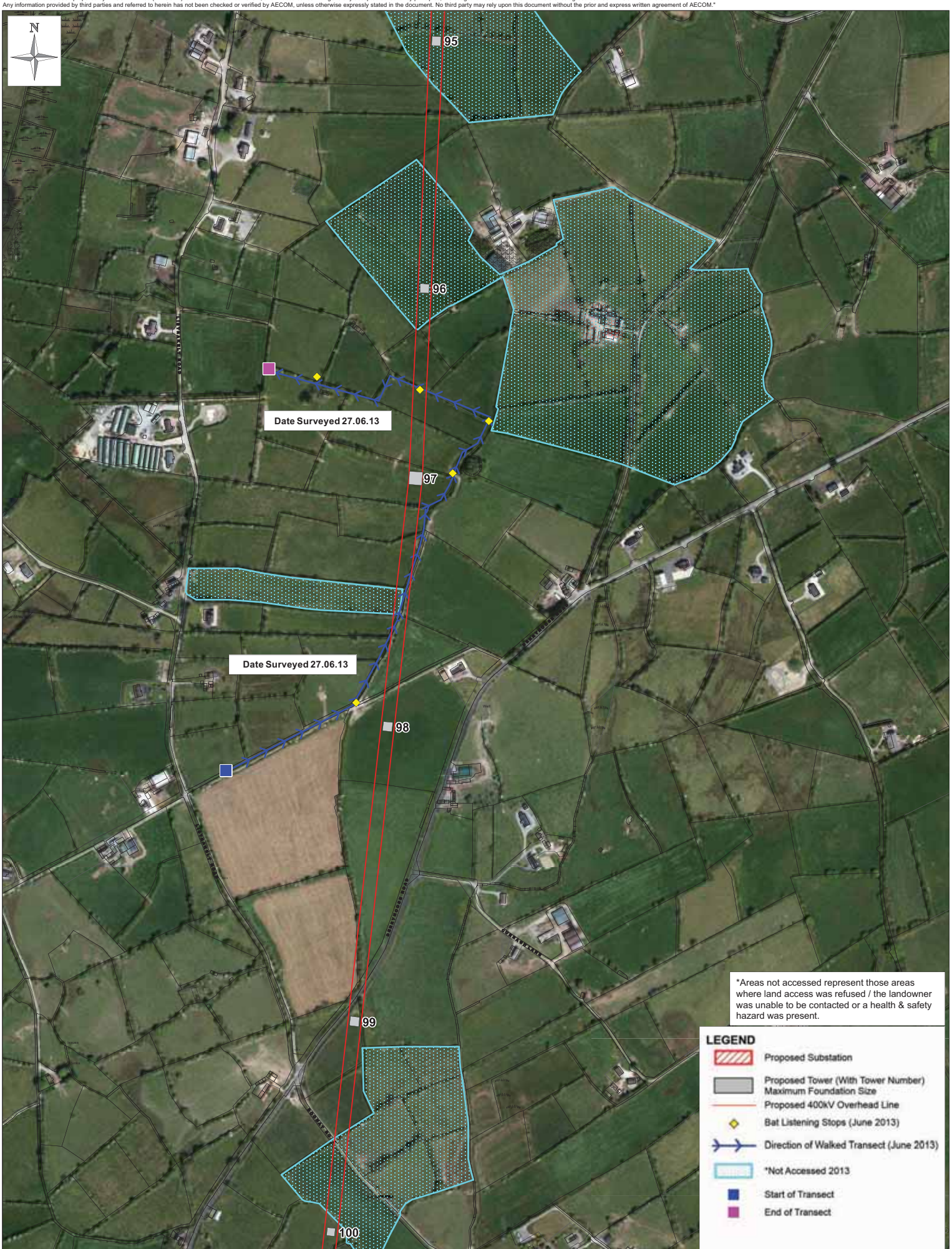
No: 60032220/3528/2S






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2T
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 20 OF 21)

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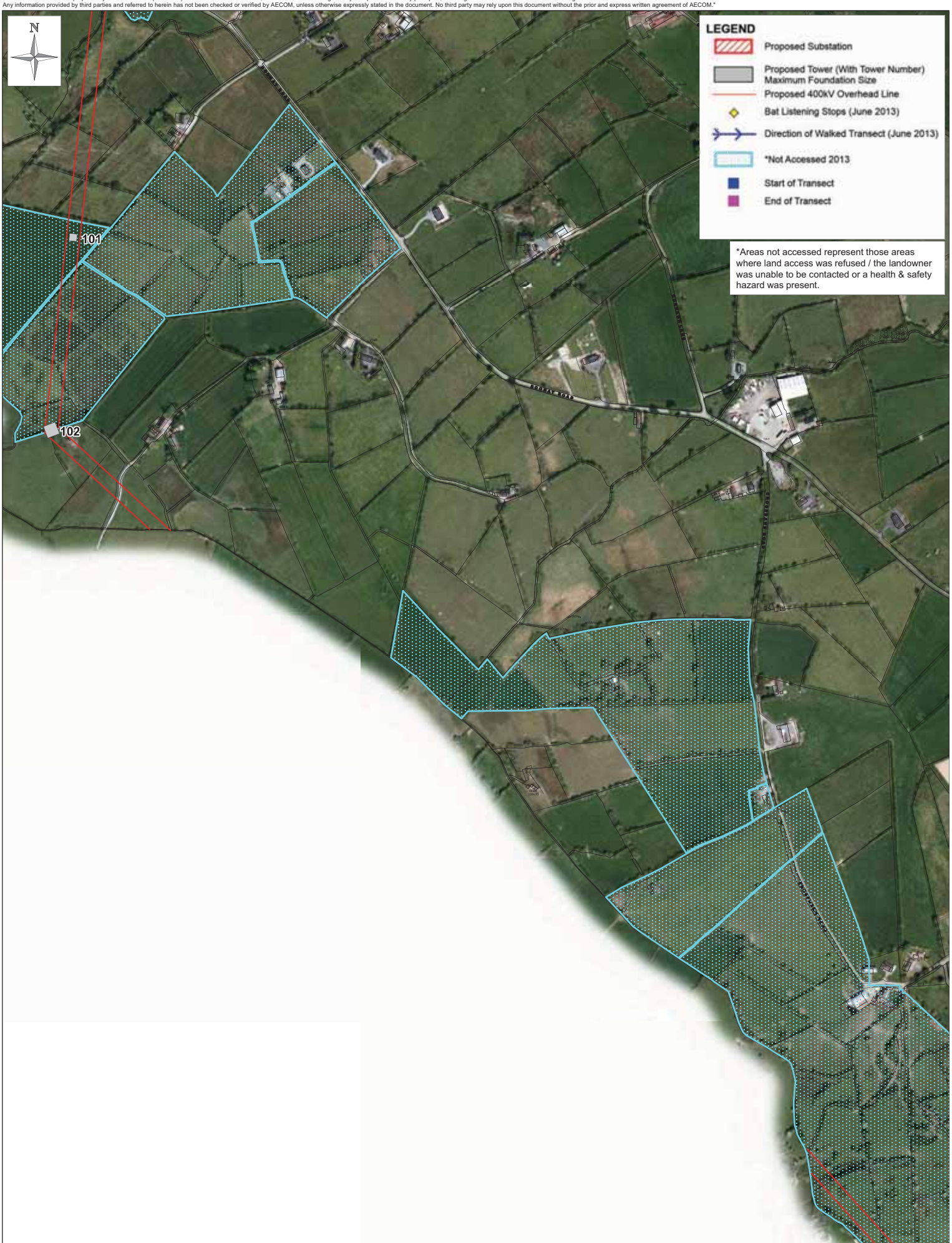
| Chk'd: MM | App'd: FL |
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2T






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 2U
BAT SURVEY METHODOLOGY JUNE 2013
(SHEET 21 OF 21)

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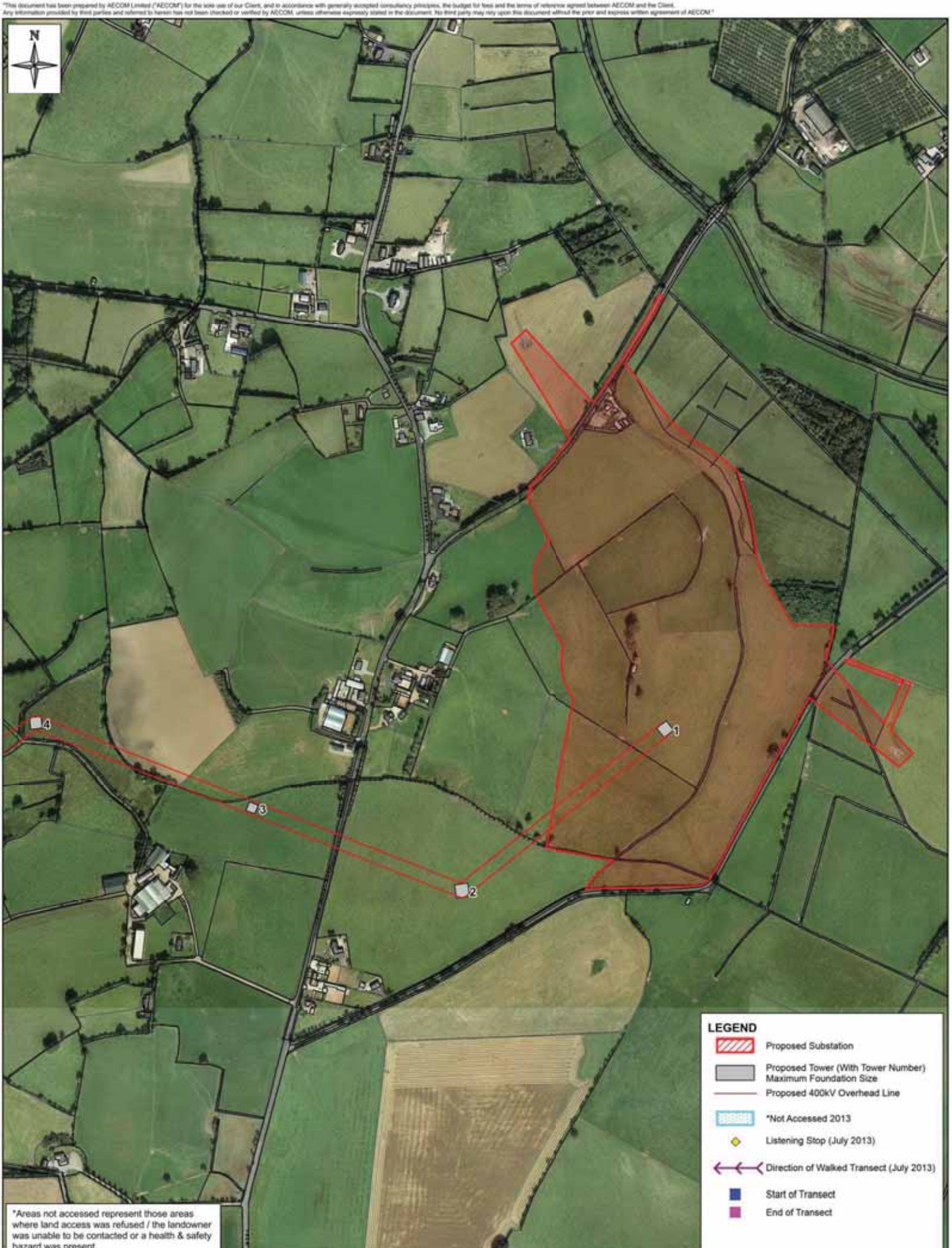
| Chk'd: MM | App'd: FL |
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/2U

Figure Series 3 – July Activity Survey Transect Routes and Listening Stop Locations

Figures 3A to 3U






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3A BAT SURVEY METHODOLOGY JULY 2013 (SHEET 1 OF 21)

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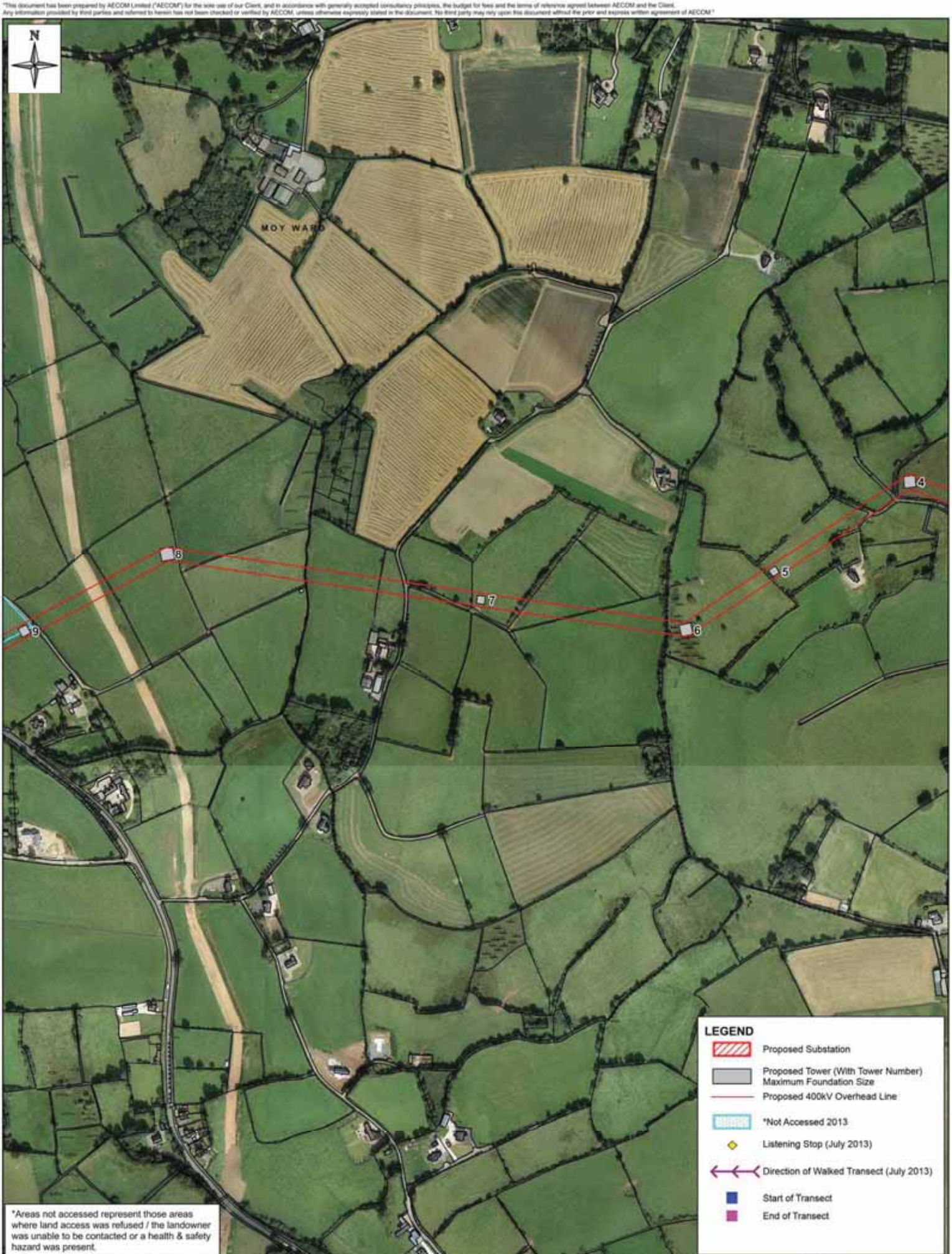
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3A






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3B BAT SURVEY METHODOLOGY JULY 2013 (SHEET 2 OF 21)

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| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3B




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3C BAT SURVEY METHODOLOGY JULY 2013 (SHEET 3 OF 21)

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| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3C


*Areas not accessed represent those areas where land access was refused / the landowner was unable to be contacted or a health & safety hazard was present.

**LEGEND**

- Proposed Substation
- Proposed Tower (With Tower Number) Maximum Foundation Size
- Proposed 400kV Overhead Line
- *Not Accessed 2013
- Listening Stop (July 2013)
- Direction of Walked Transect (July 2013)
- Start of Transect
- End of Transect



Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3D BAT SURVEY METHODOLOGY JULY 2013 (SHEET 4 OF 21)

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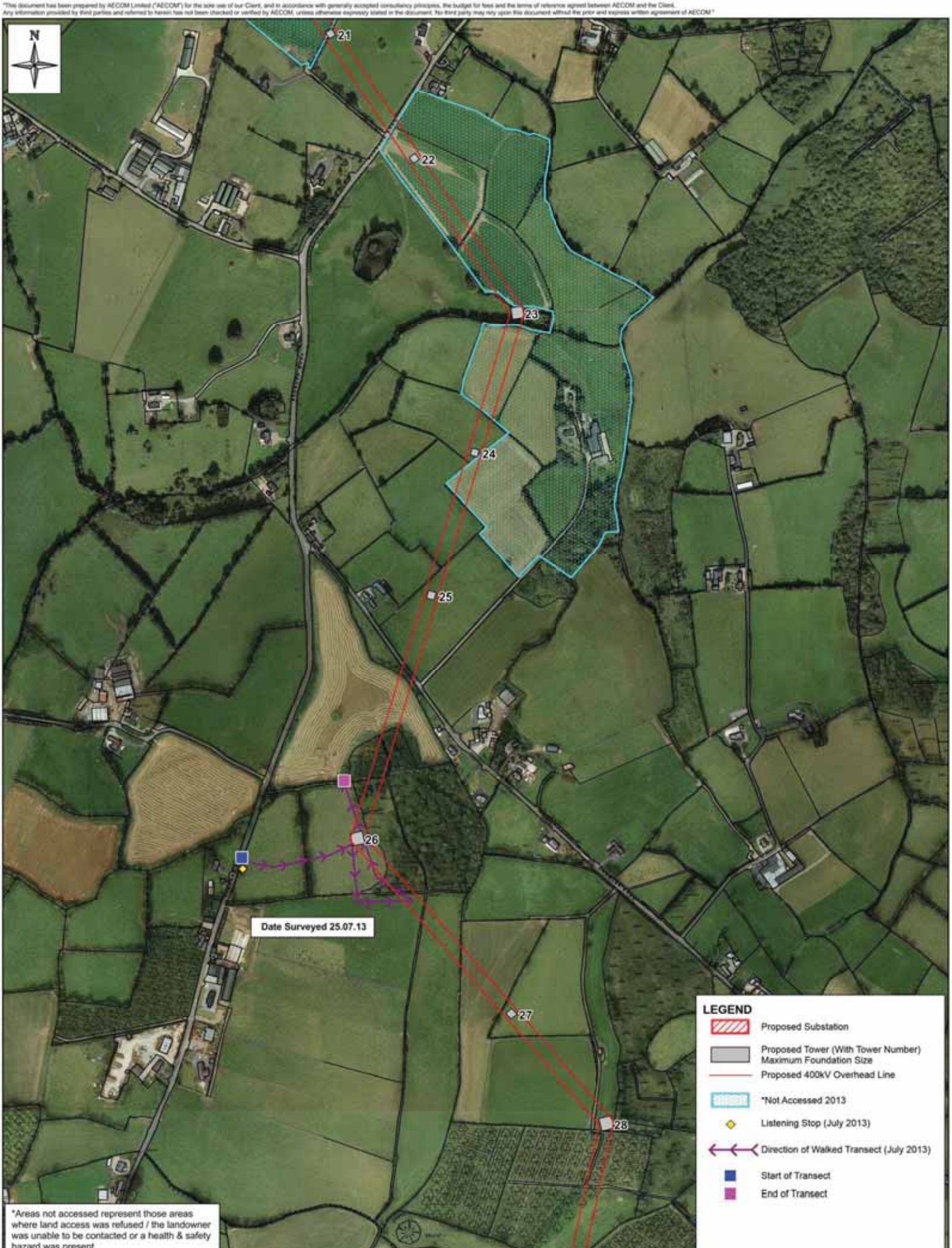
| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3D






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3E BAT SURVEY METHODOLOGY JULY 2013 (SHEET 5 OF 21)

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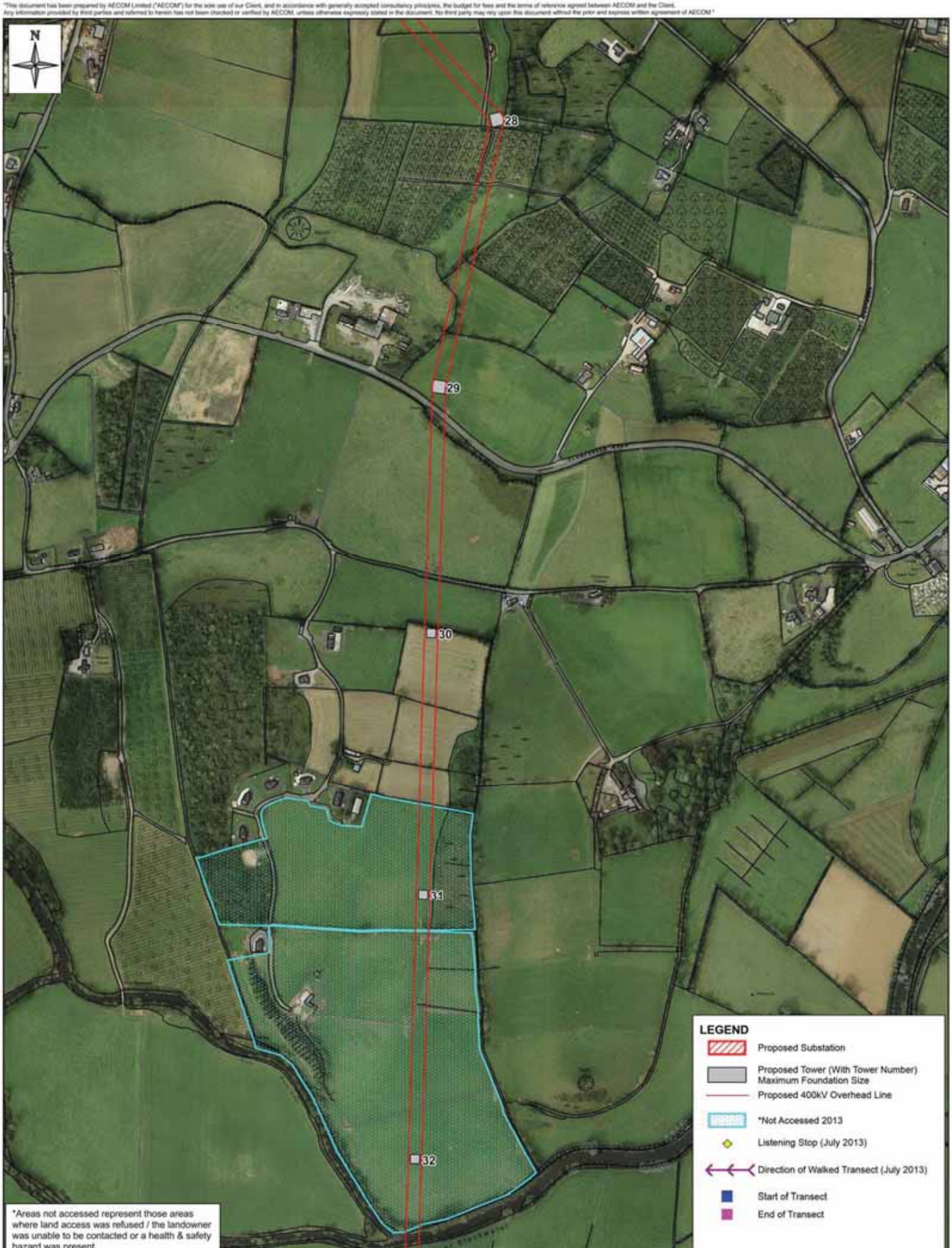
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3E






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3F
BAT SURVEY METHODOLOGY JULY 2013
(SHEET 6 OF 21)

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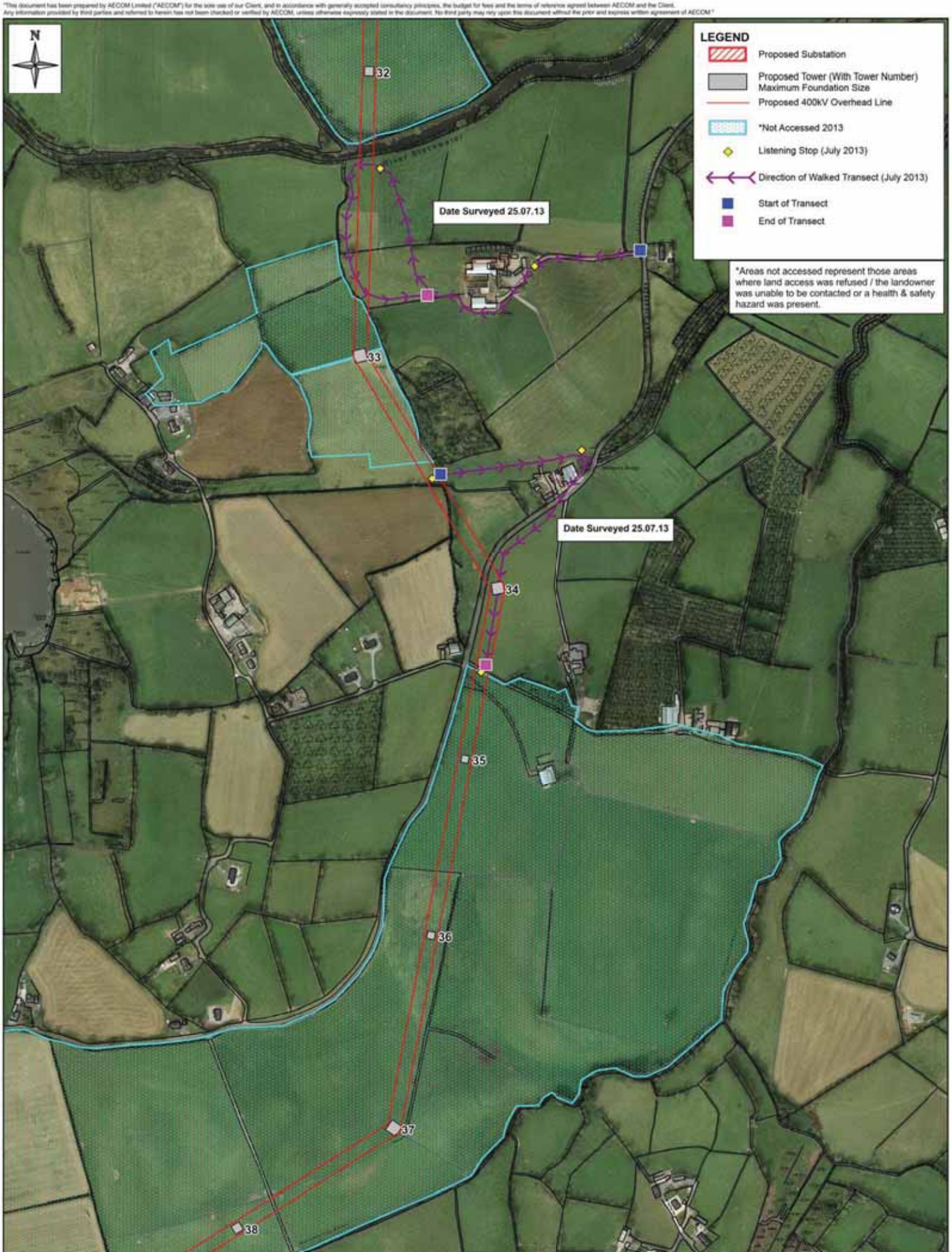
No: 60032220/3528/3F






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3G BAT SURVEY METHODOLOGY JULY 2013 (SHEET 7 OF 21)

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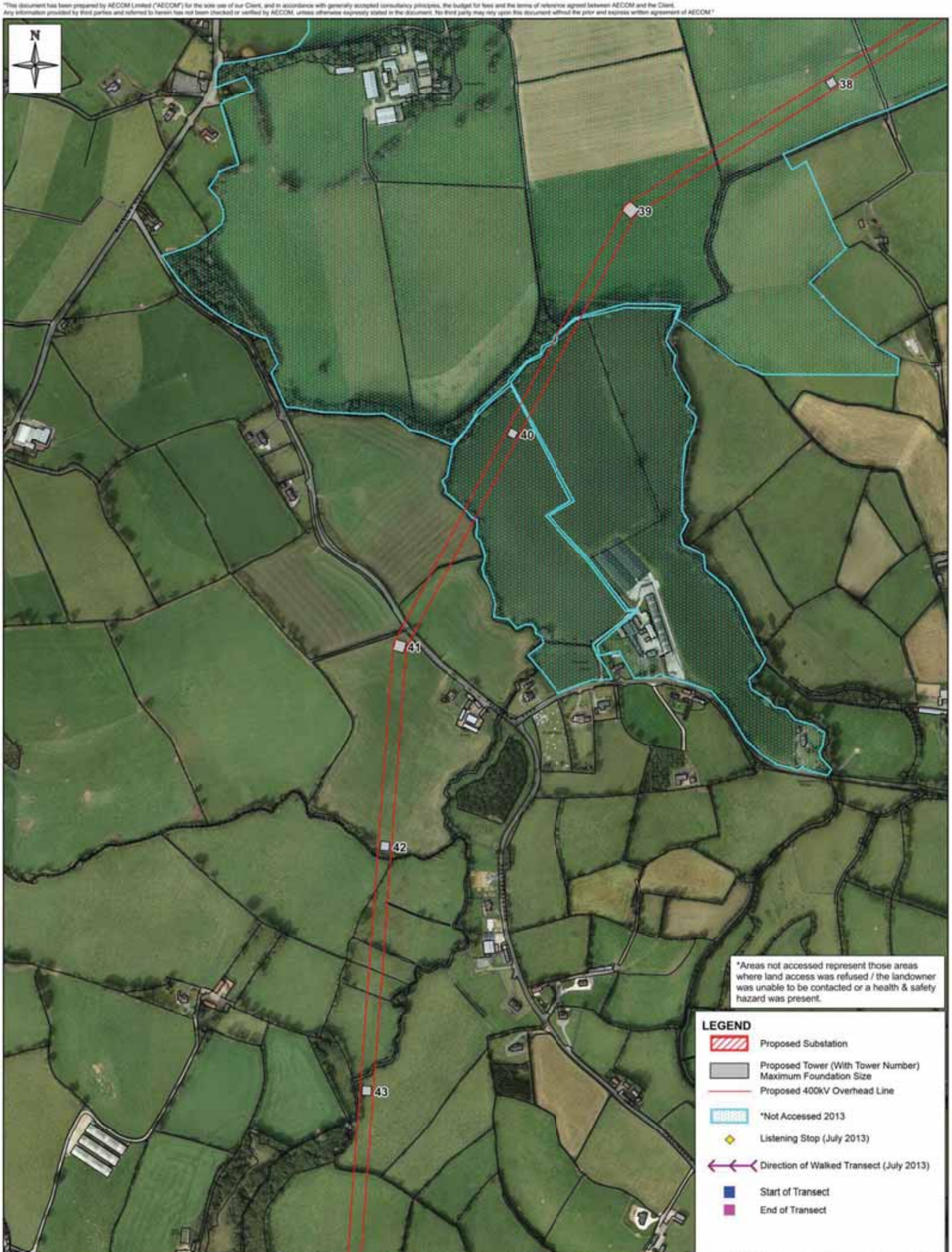
No: 60032220/3528/3G






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3H BAT SURVEY METHODOLOGY JULY 2013 (SHEET 8 OF 21)

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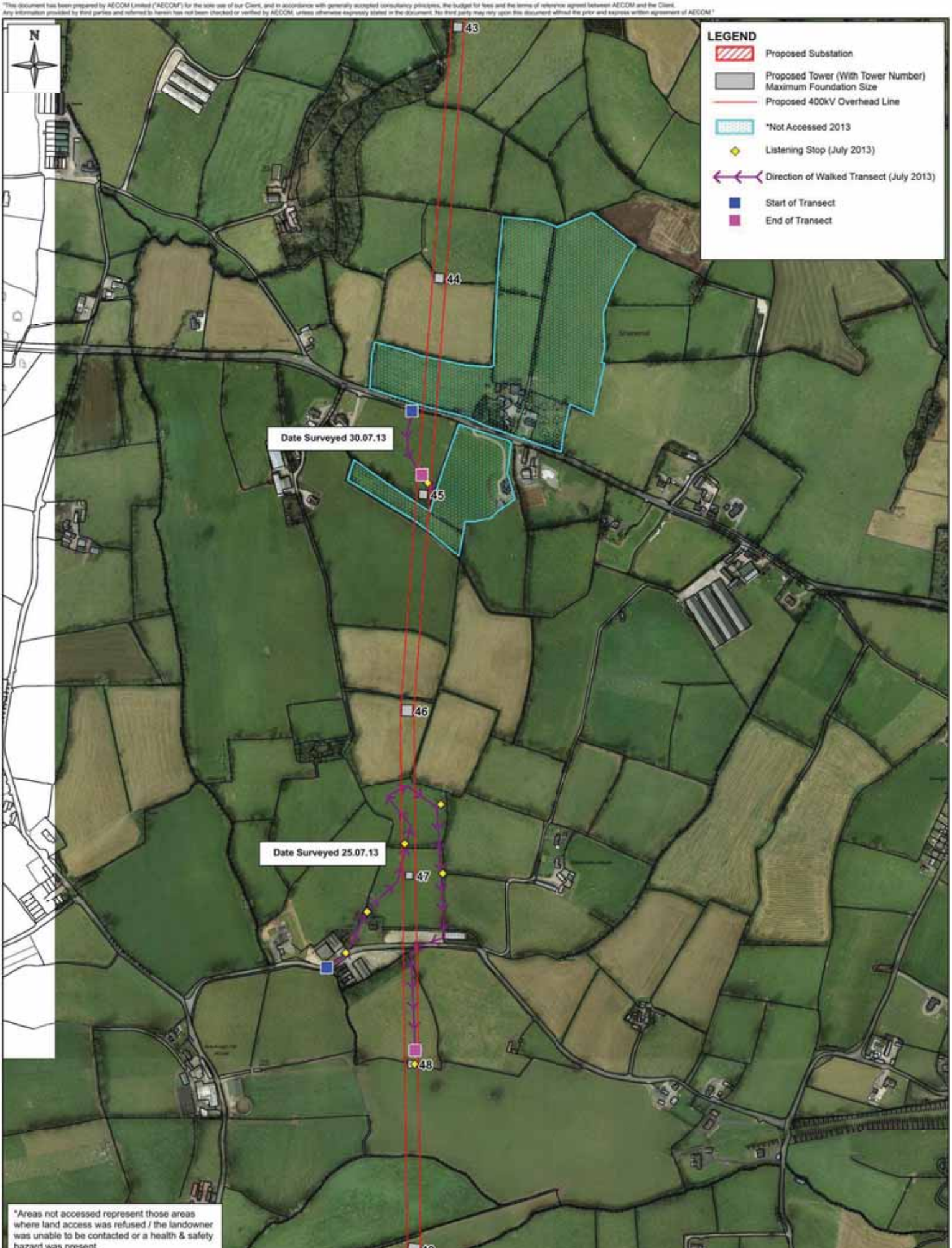
No: 60032220/3528/3H






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3I BAT SURVEY METHODOLOGY JULY 2013 (SHEET 9 OF 21)

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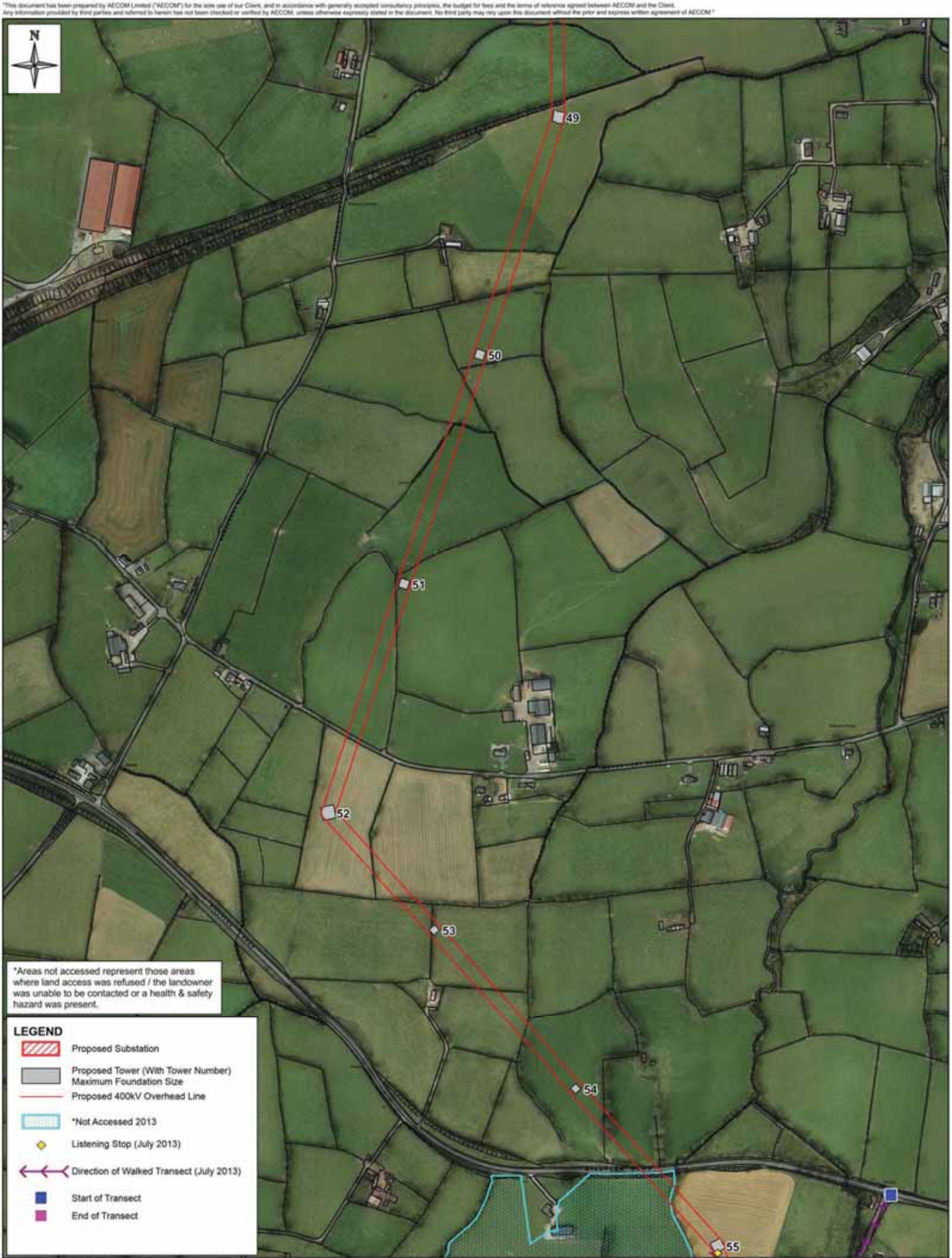
No: 60032220/3528/3I






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3J BAT SURVEY METHODOLOGY JULY 2013 (SHEET 10 OF 21)

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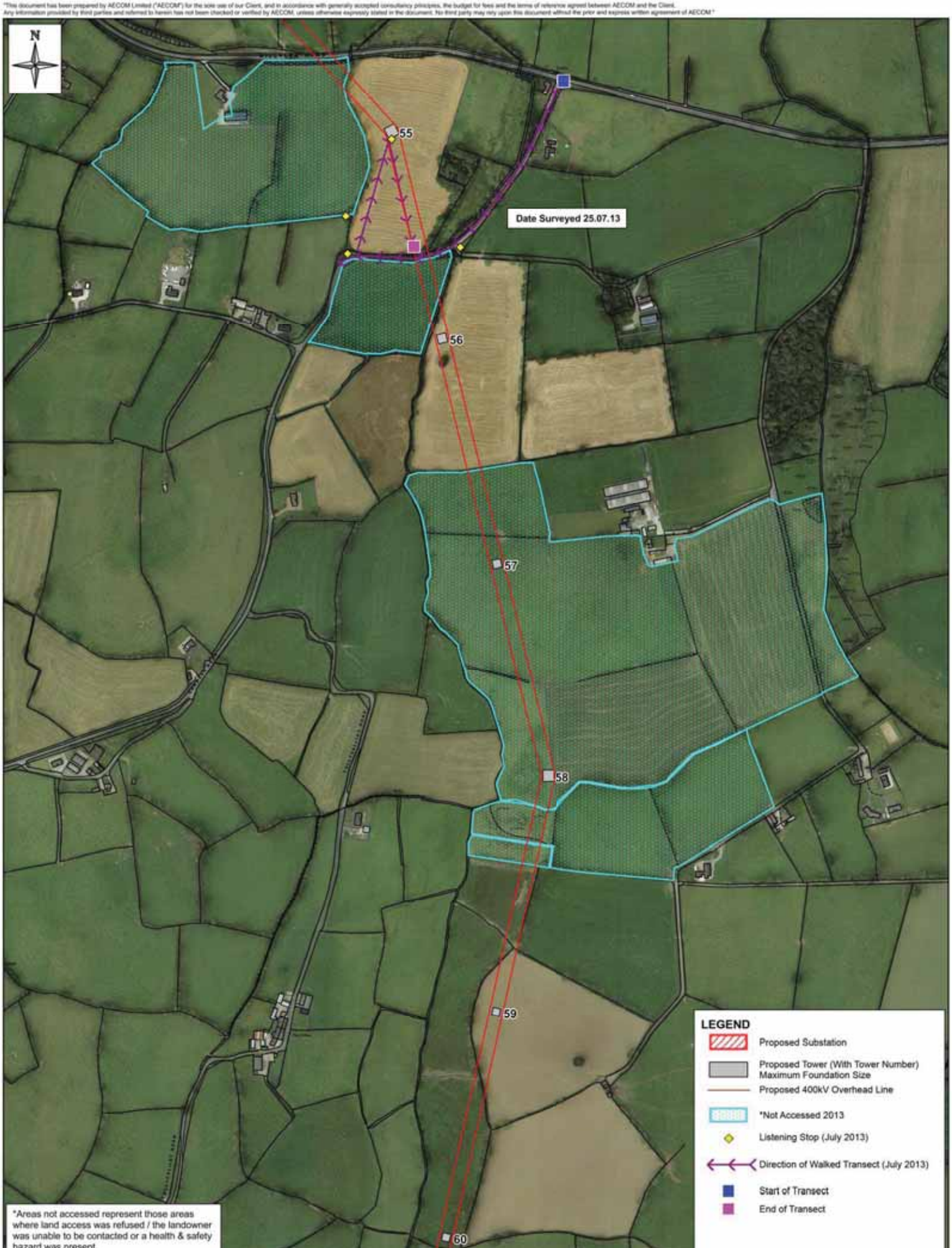
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3J






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3K
BAT SURVEY METHODOLOGY JULY 2013
(SHEET 11 OF 21)

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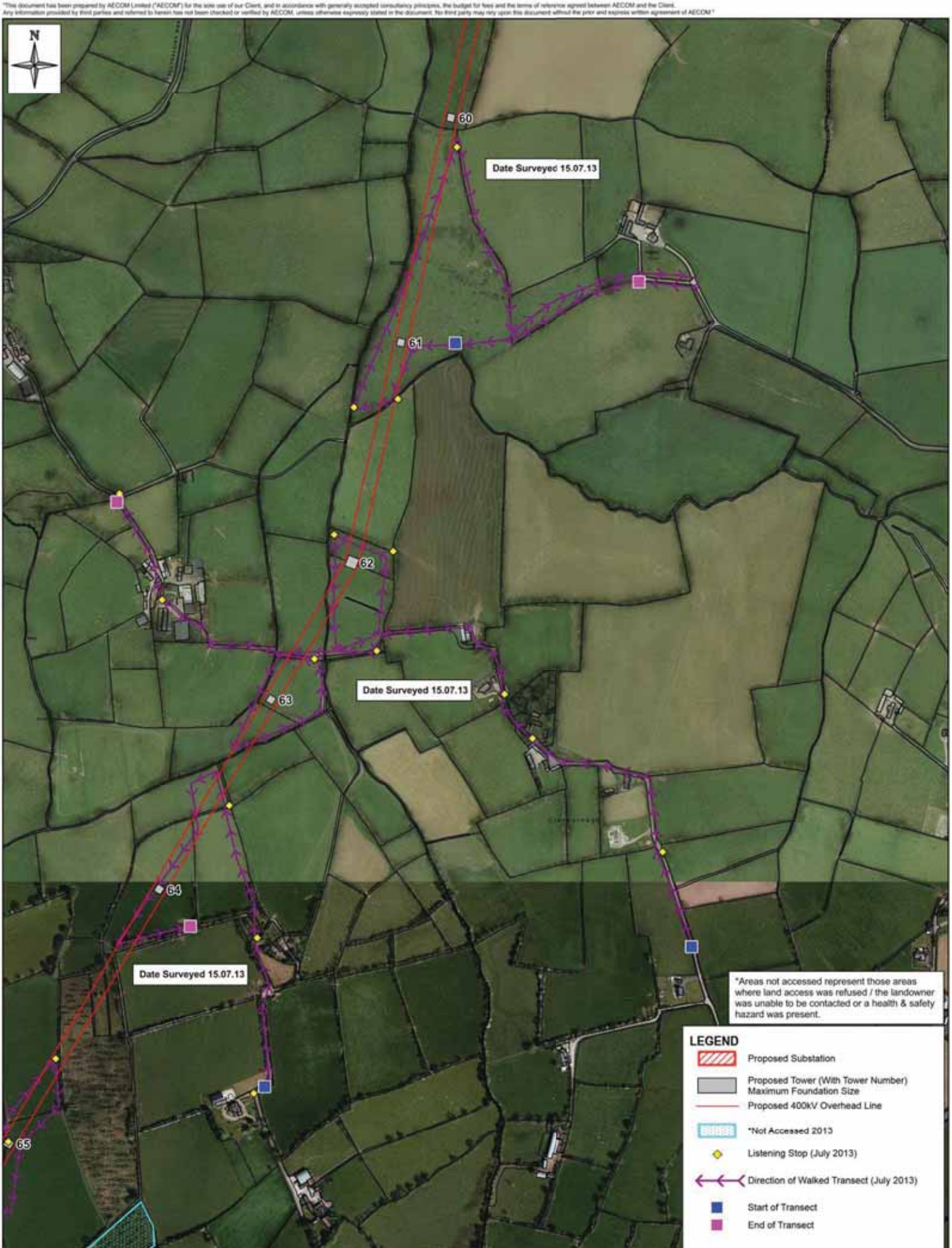
No: 60032220/3528/3K






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3L BAT SURVEY METHODOLOGY JULY 2013 (SHEET 12 OF 21)

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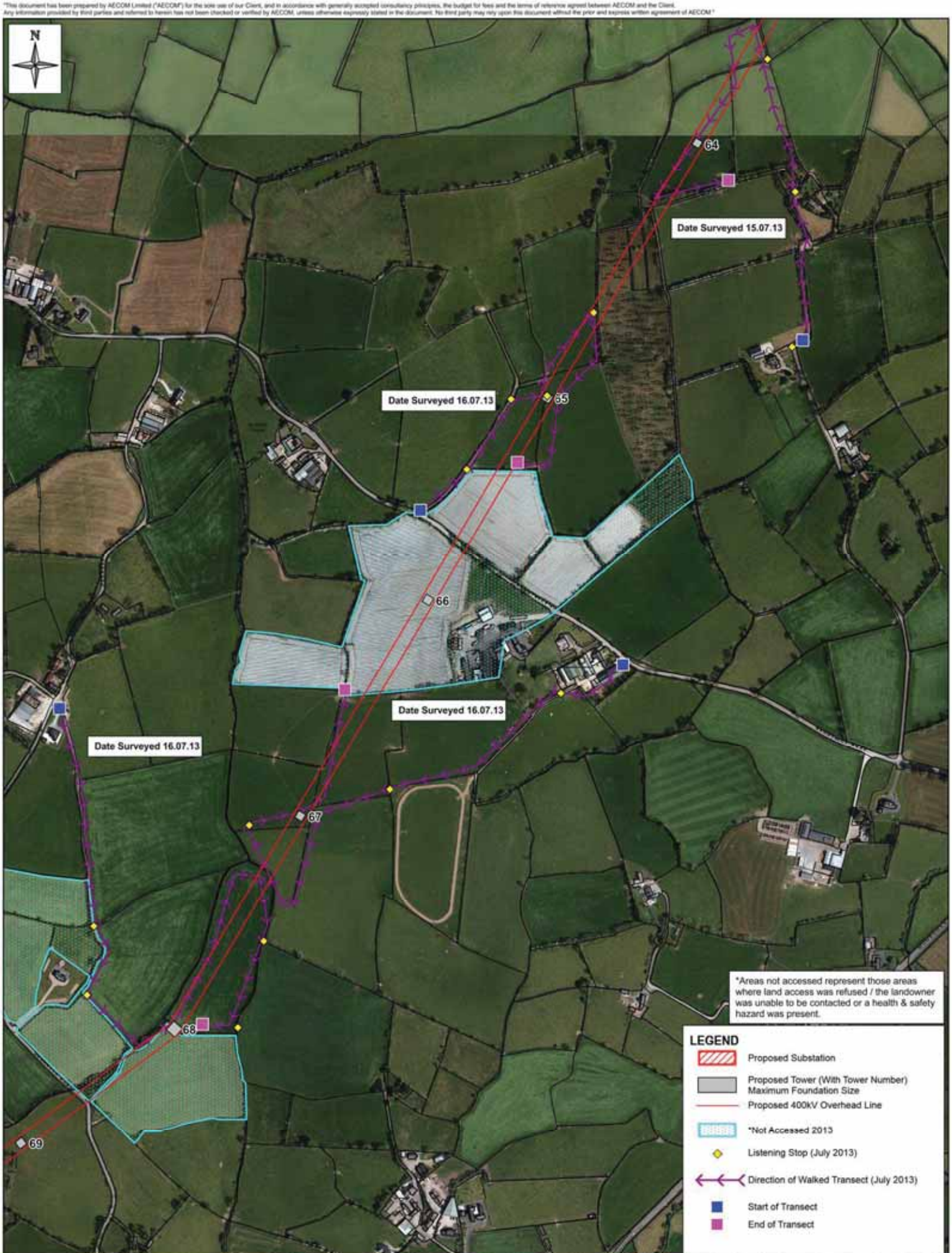
No: 60032220/3528/3L






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3M BAT SURVEY METHODOLOGY JULY 2013 (SHEET 13 OF 21)

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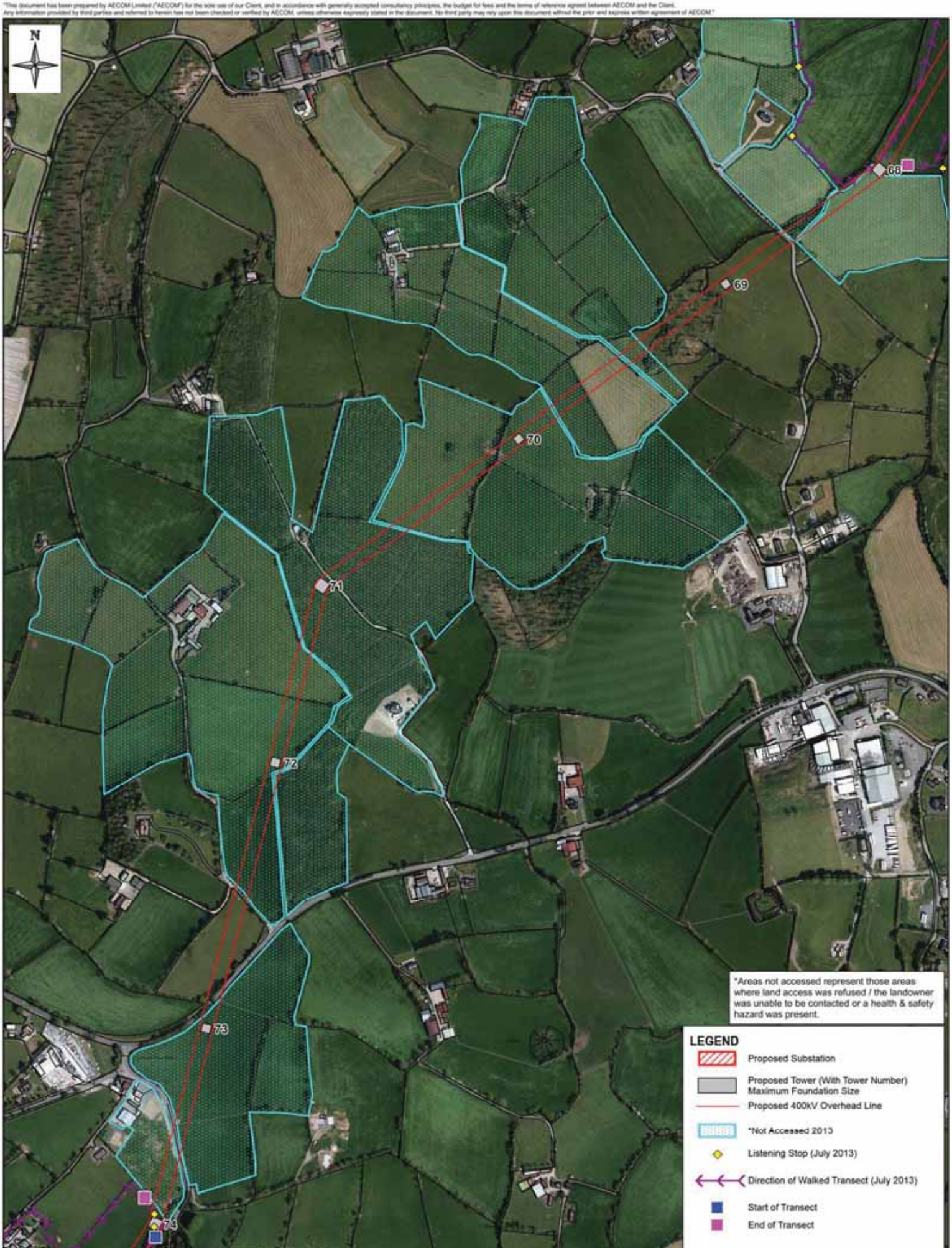
No: 60032220/3528/3M






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3N BAT SURVEY METHODOLOGY JULY 2013 (SHEET 14 OF 21)

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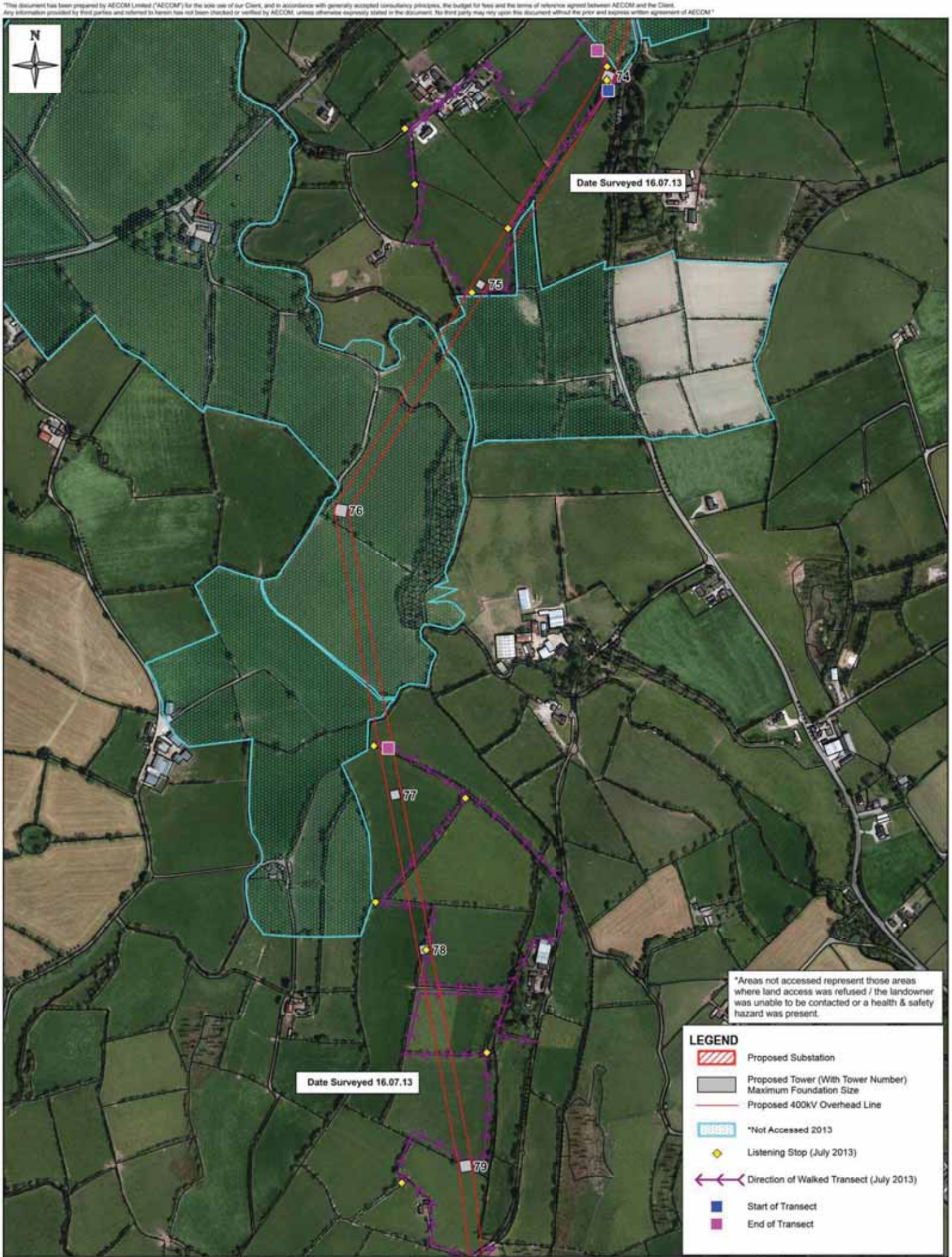
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3N






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3O BAT SURVEY METHODOLOGY JULY 2013 (SHEET 15 OF 21)

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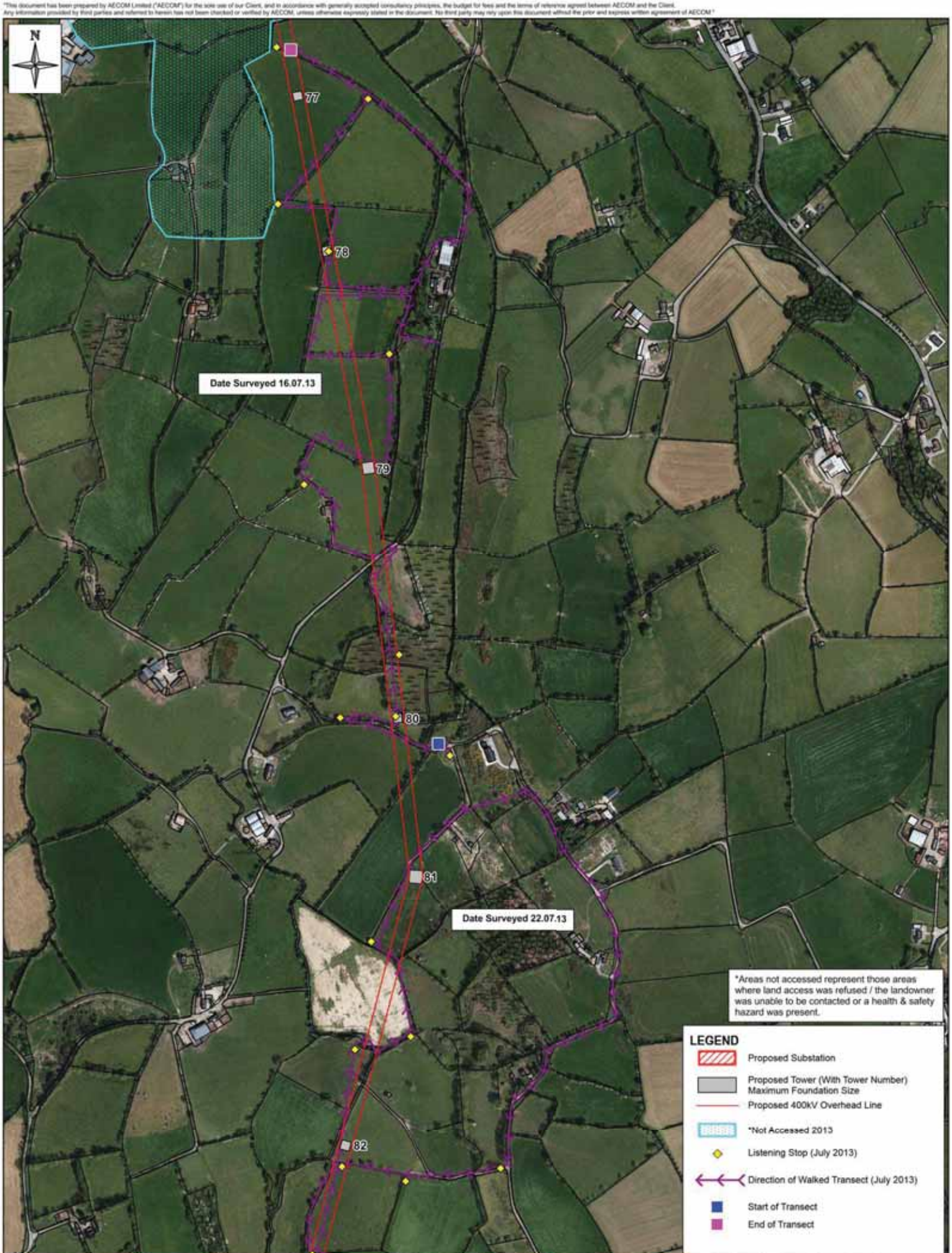
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3O






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3P BAT SURVEY METHODOLOGY JULY 2013 (SHEET 16 OF 21)

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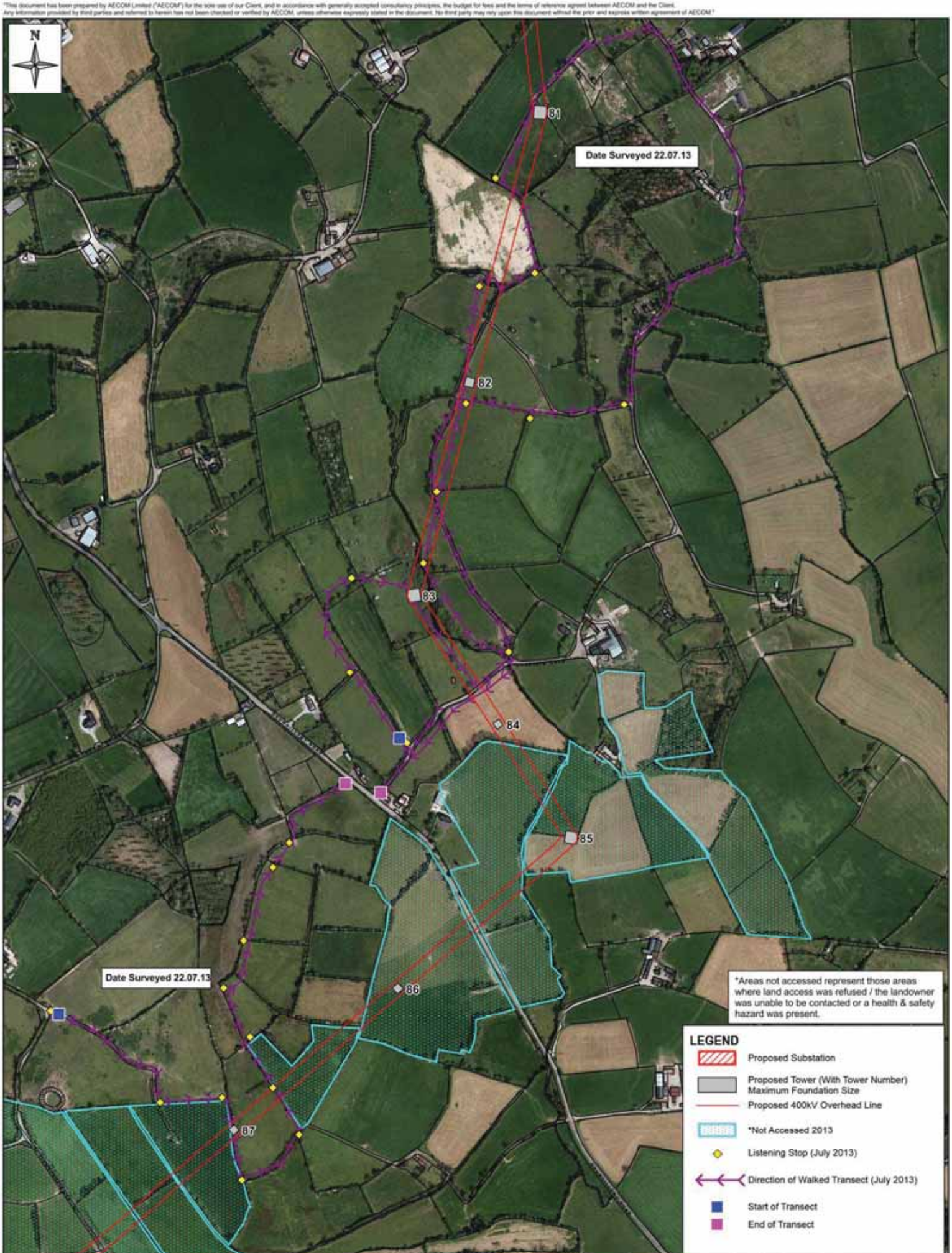
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3P






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3Q BAT SURVEY METHODOLOGY JULY 2013 (SHEET 17 OF 21)

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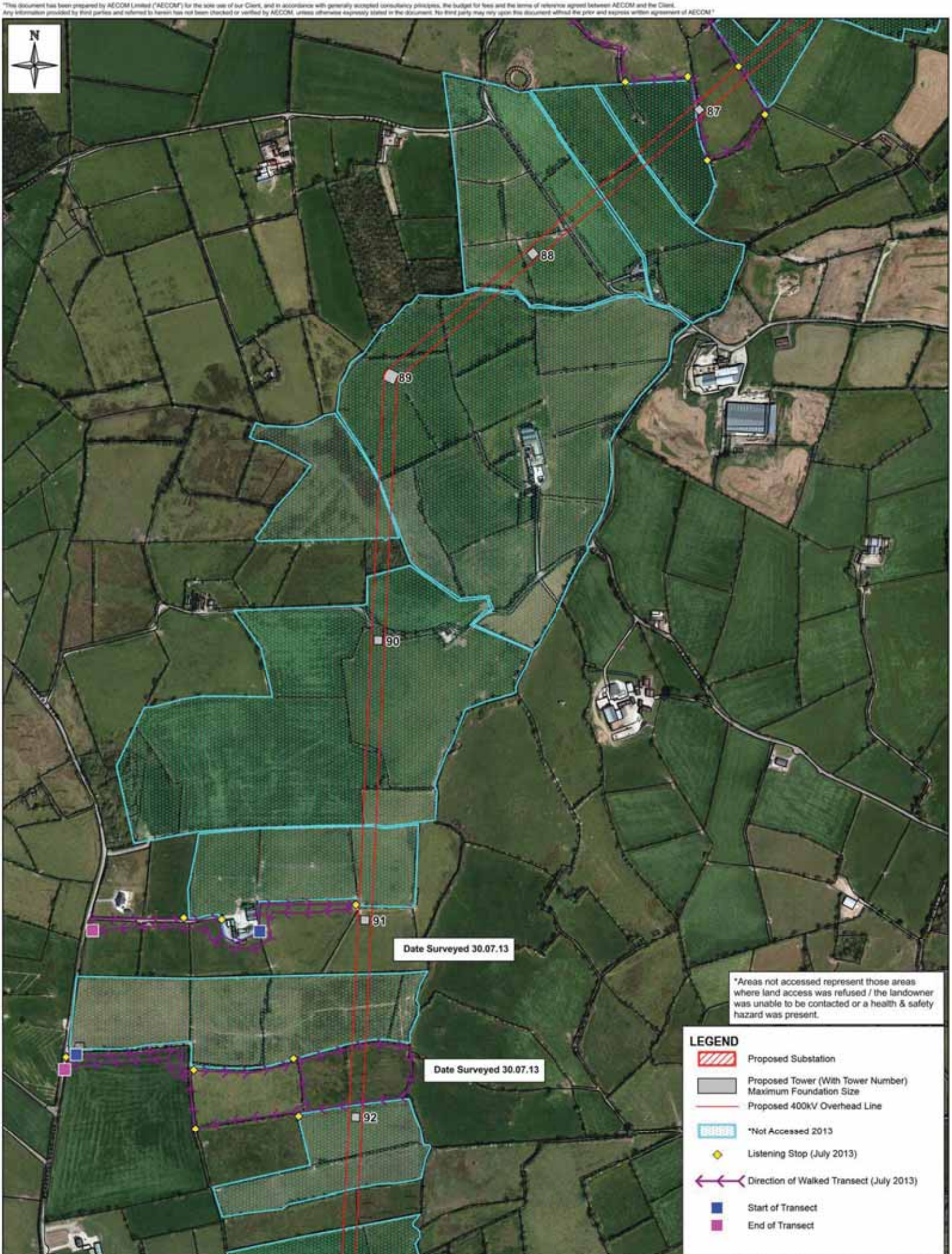
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3Q






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3R BAT SURVEY METHODOLOGY JULY 2013 (SHEET 18 OF 21)

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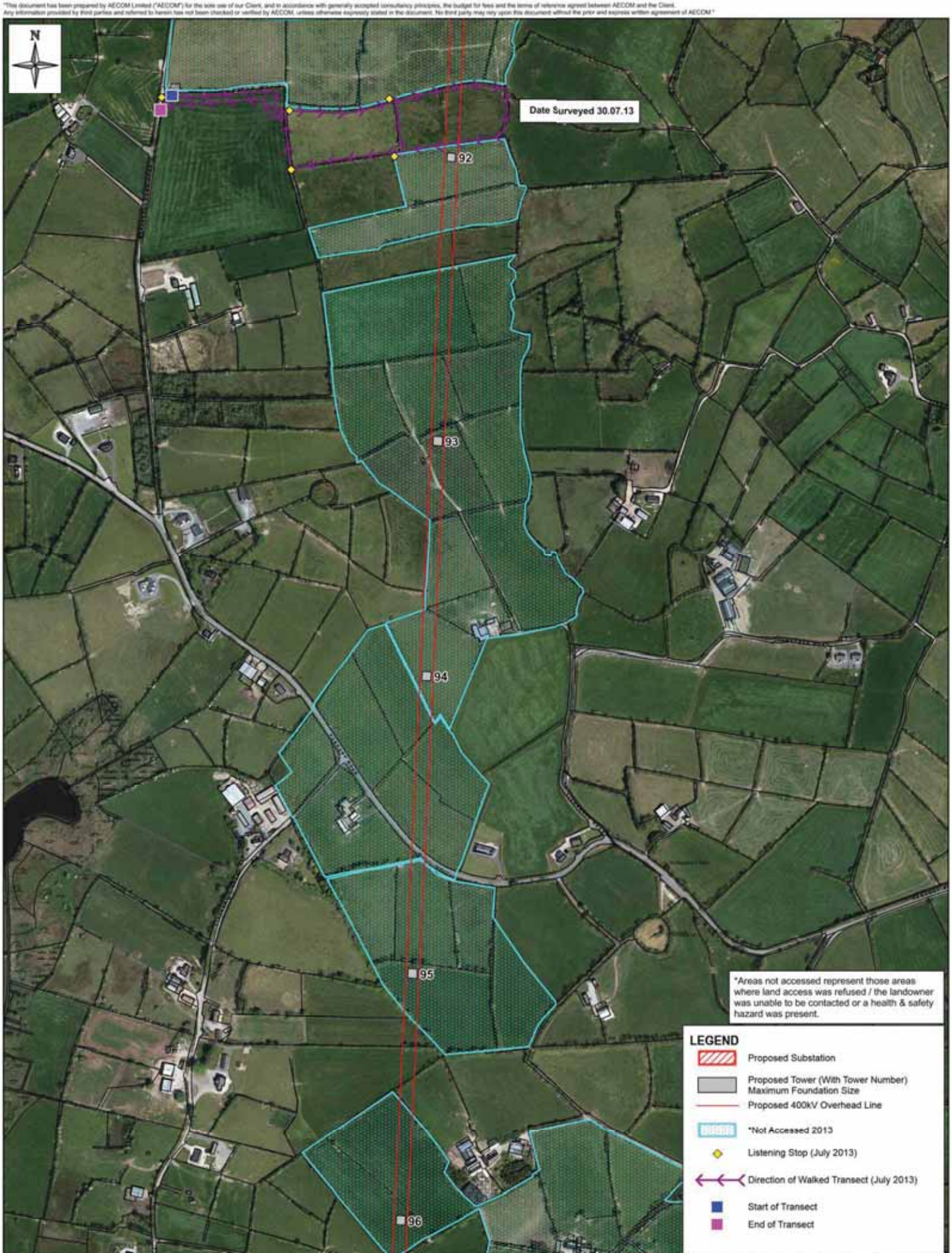
| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3R






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3S BAT SURVEY METHODOLOGYJULY 2013 (SHEET 19 OF 21)

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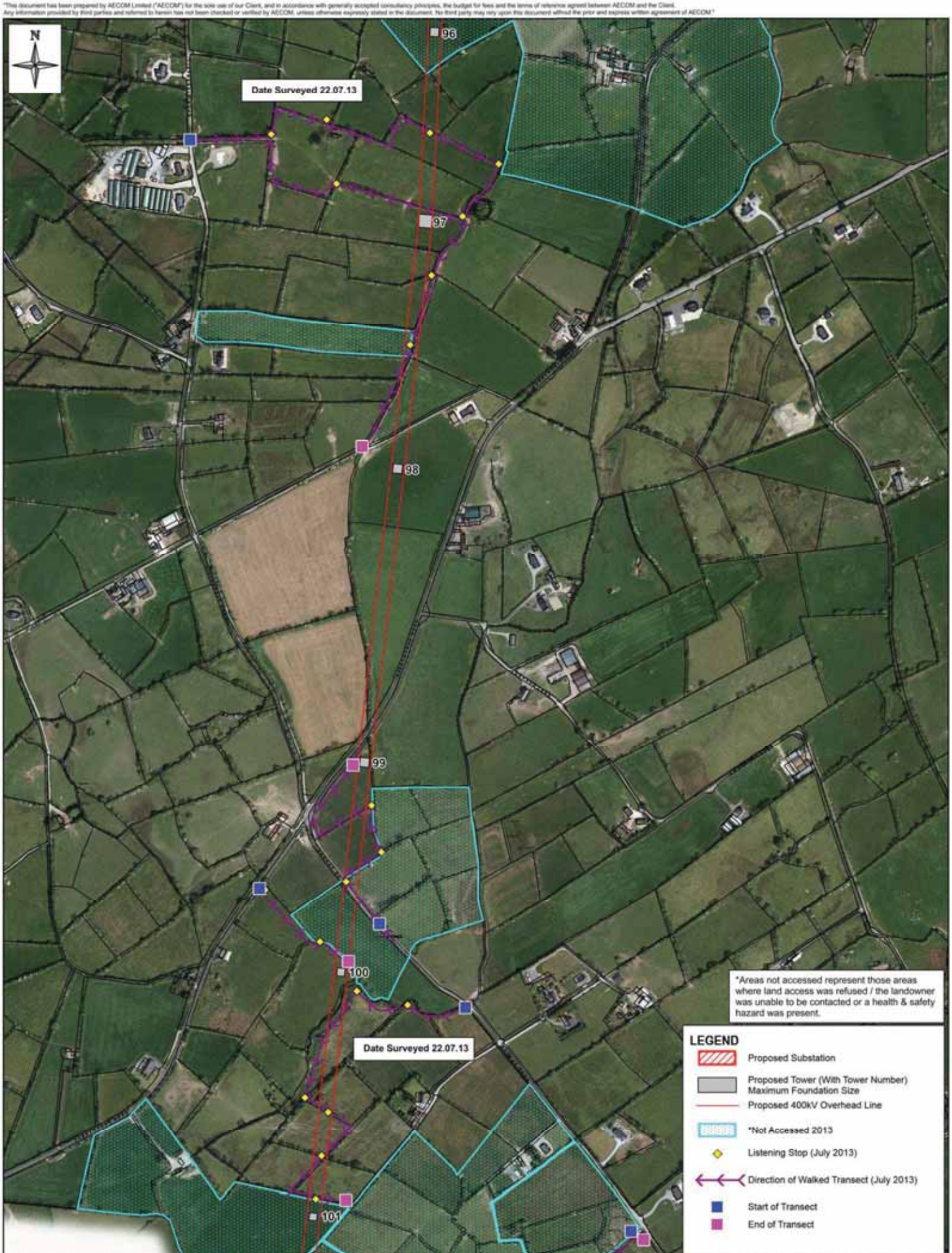
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3S






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3T
BAT SURVEY METHODOLOGY JULY 2013
(SHEET 20 OF 21)

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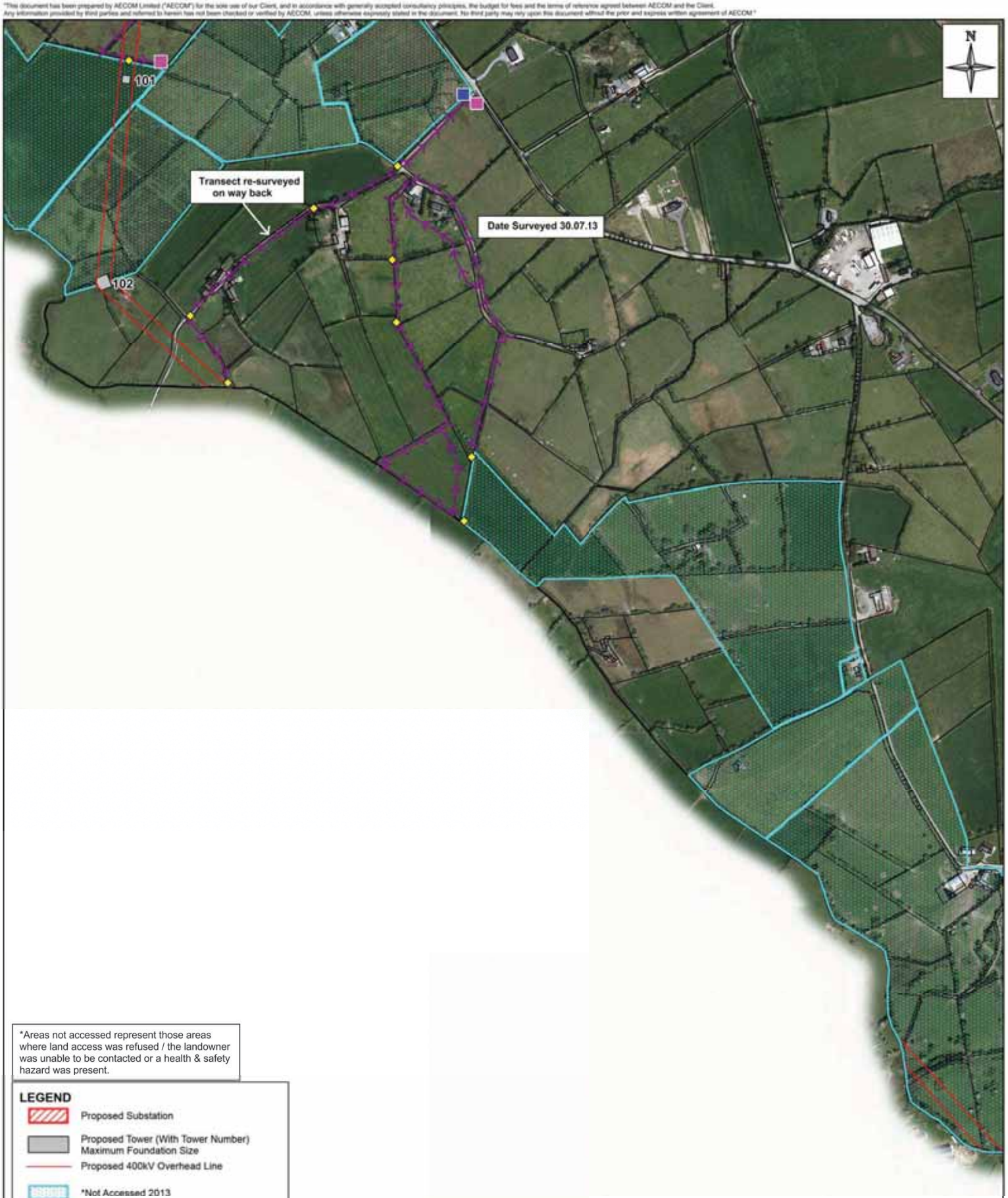
No: 60032220/3528/3T




*Areas not accessed represent those areas where land access was refused / the landowner was unable to be contacted or a health & safety hazard was present.

**LEGEND**

- Proposed Substation
- Proposed Tower (With Tower Number) Maximum Foundation Size
- Proposed 400kV Overhead Line
- *Not Accessed 2013
- Listening Stop (July 2013)
- Direction of Walked Transect (July 2013)
- Start of Transect
- End of Transect



Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 3U BAT SURVEY METHODOLOGY JULY 2013 (SHEET 21 OF 21)

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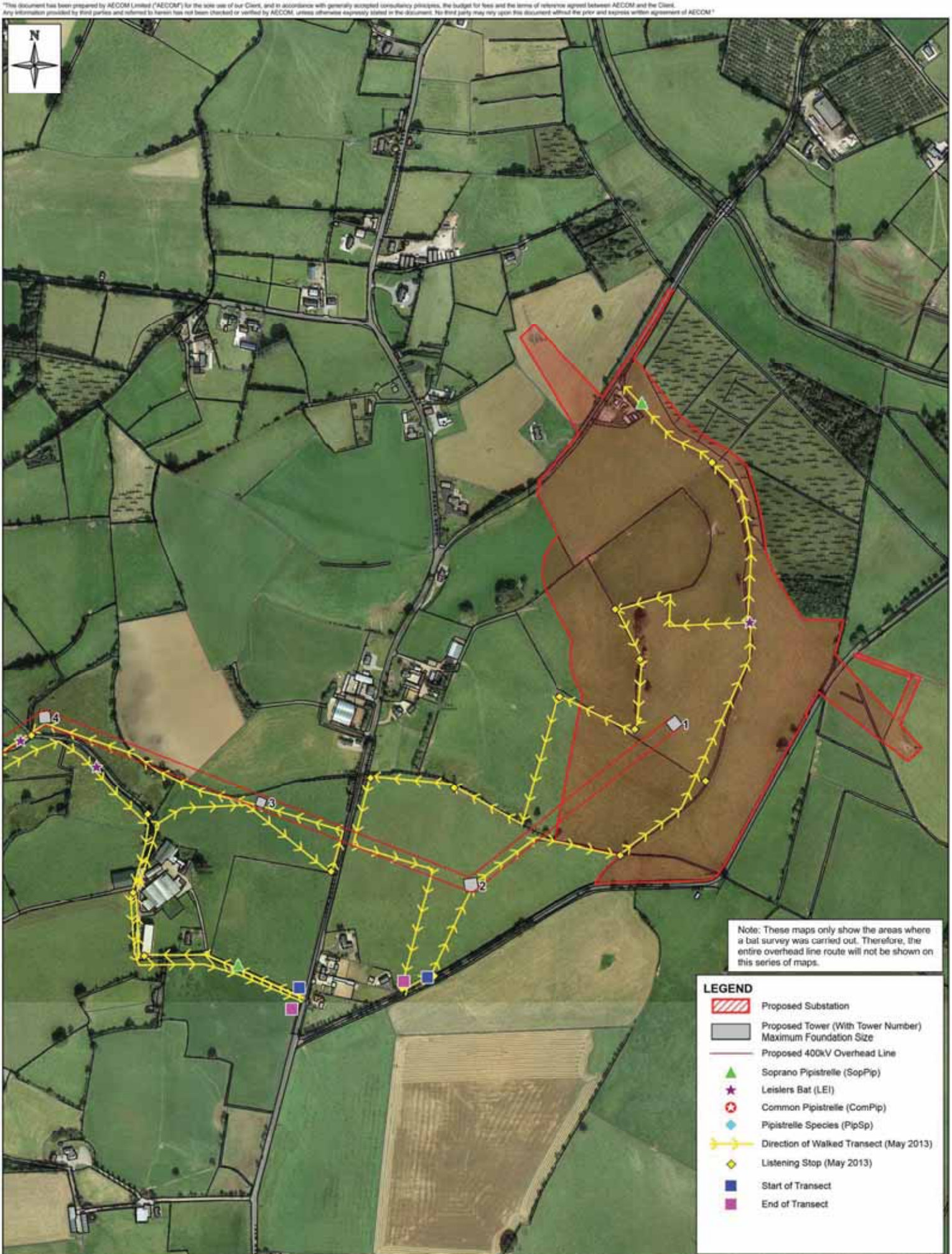
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/3U

Figures Series 4 – May Activity Survey Results

Figures 4A to 4G






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4A BAT SURVEY RESULTS MAY 2013 (SHEET 1 OF 7)

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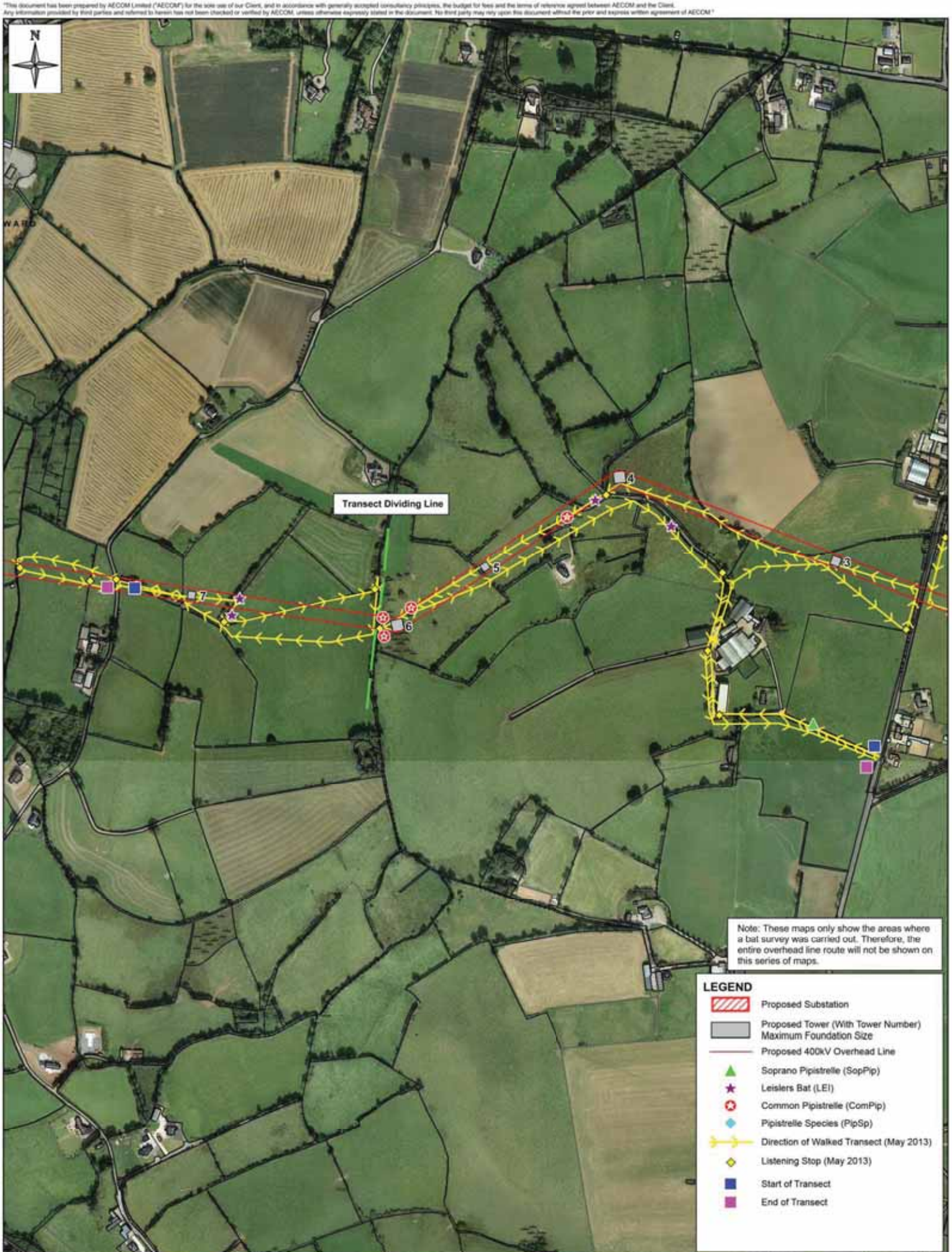
No: 60032220/3528/4A






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4B BAT SURVEY RESULTS MAY 2013 (SHEET 2 OF 7)

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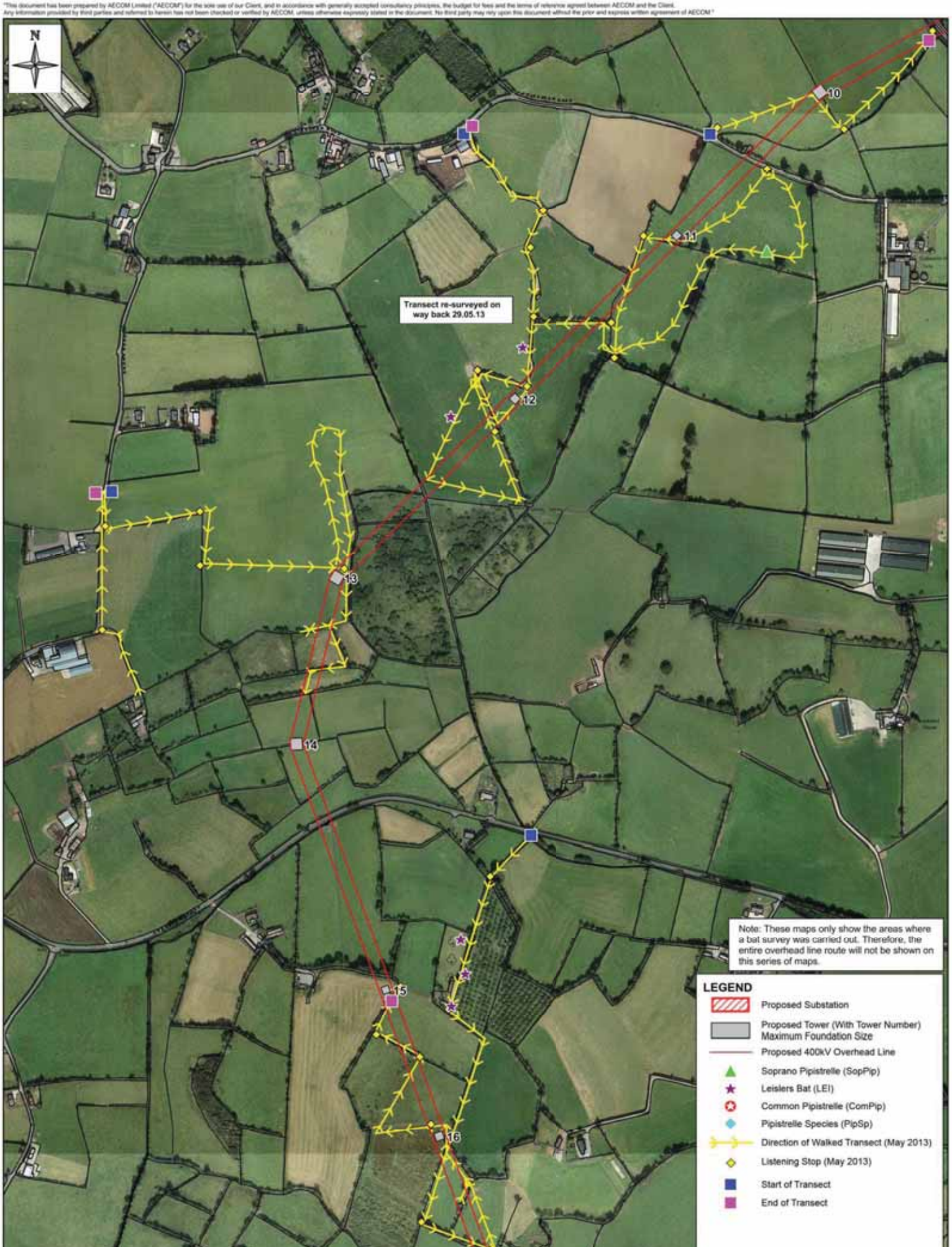
| Date: 10/11/2013 | | Scale: 1:5,000 @ A3 | |

No: 60032220/3528/4B






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4C BAT SURVEY RESULTS MAY 2013 (SHEET 3 OF 7)

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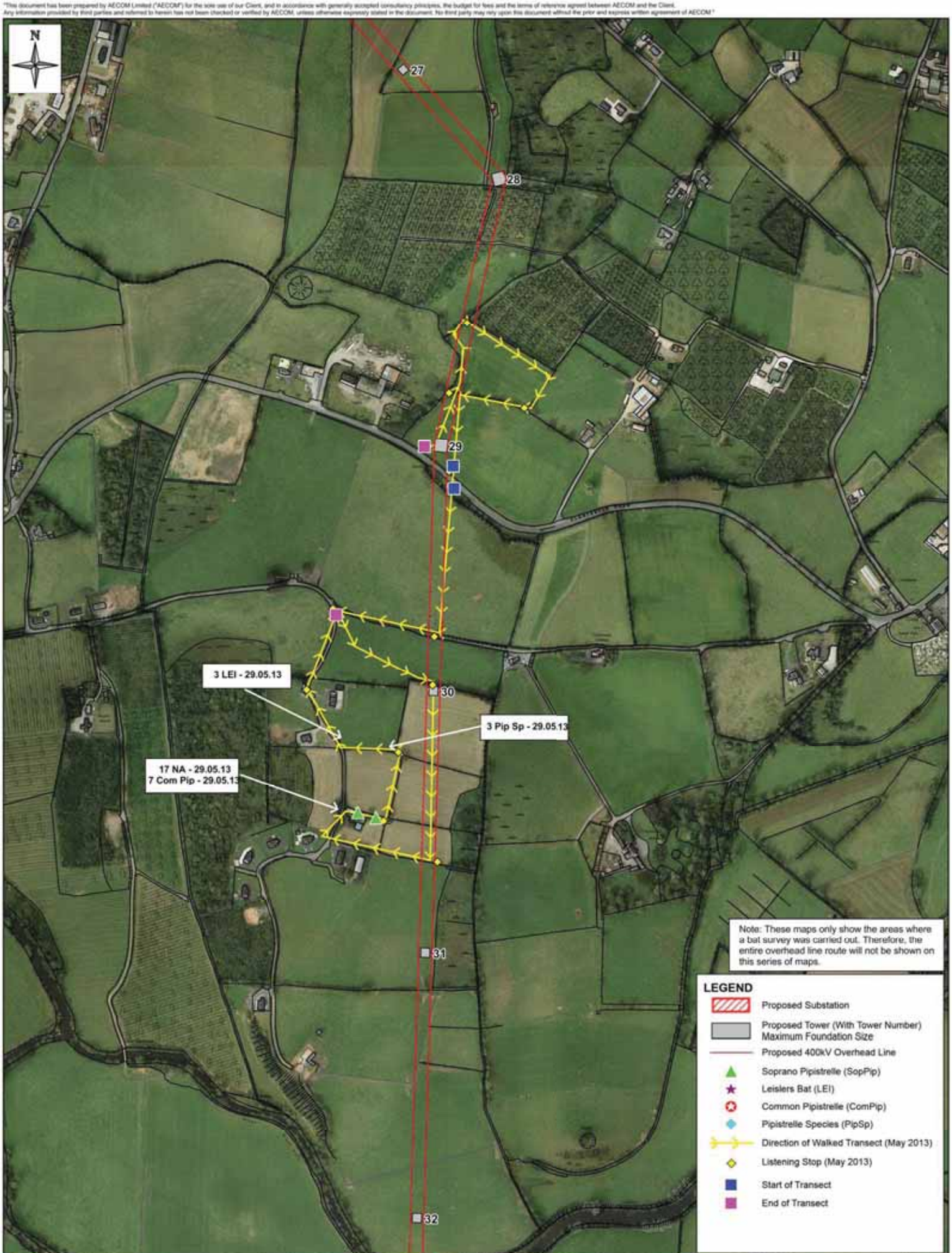
| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/4C






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4D BAT SURVEY RESULTS MAY 2013 (SHEET 4 OF 7)

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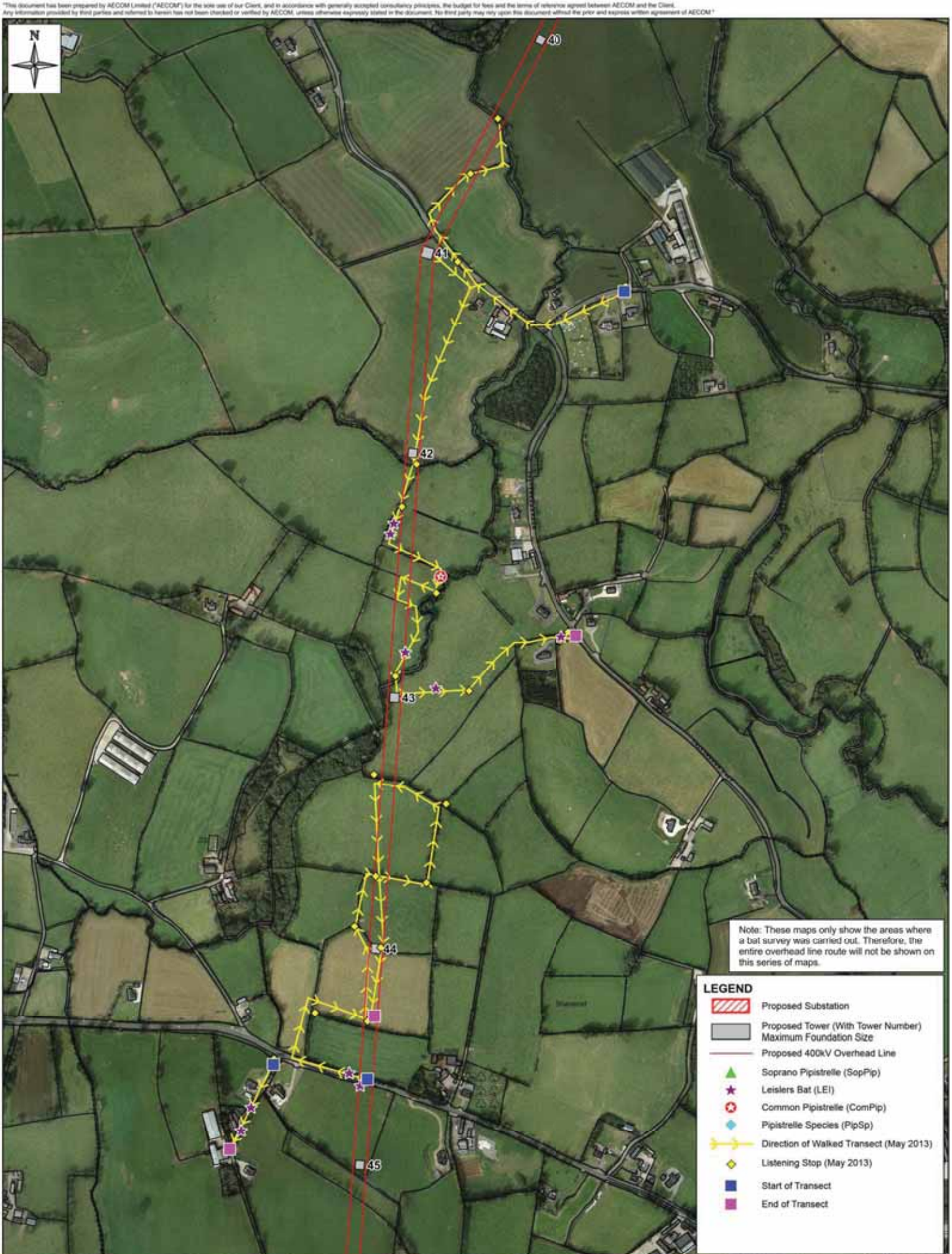
| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/4D






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4E
BAT SURVEY RESULTS MAY 2013
(SHEET 5 OF 7)

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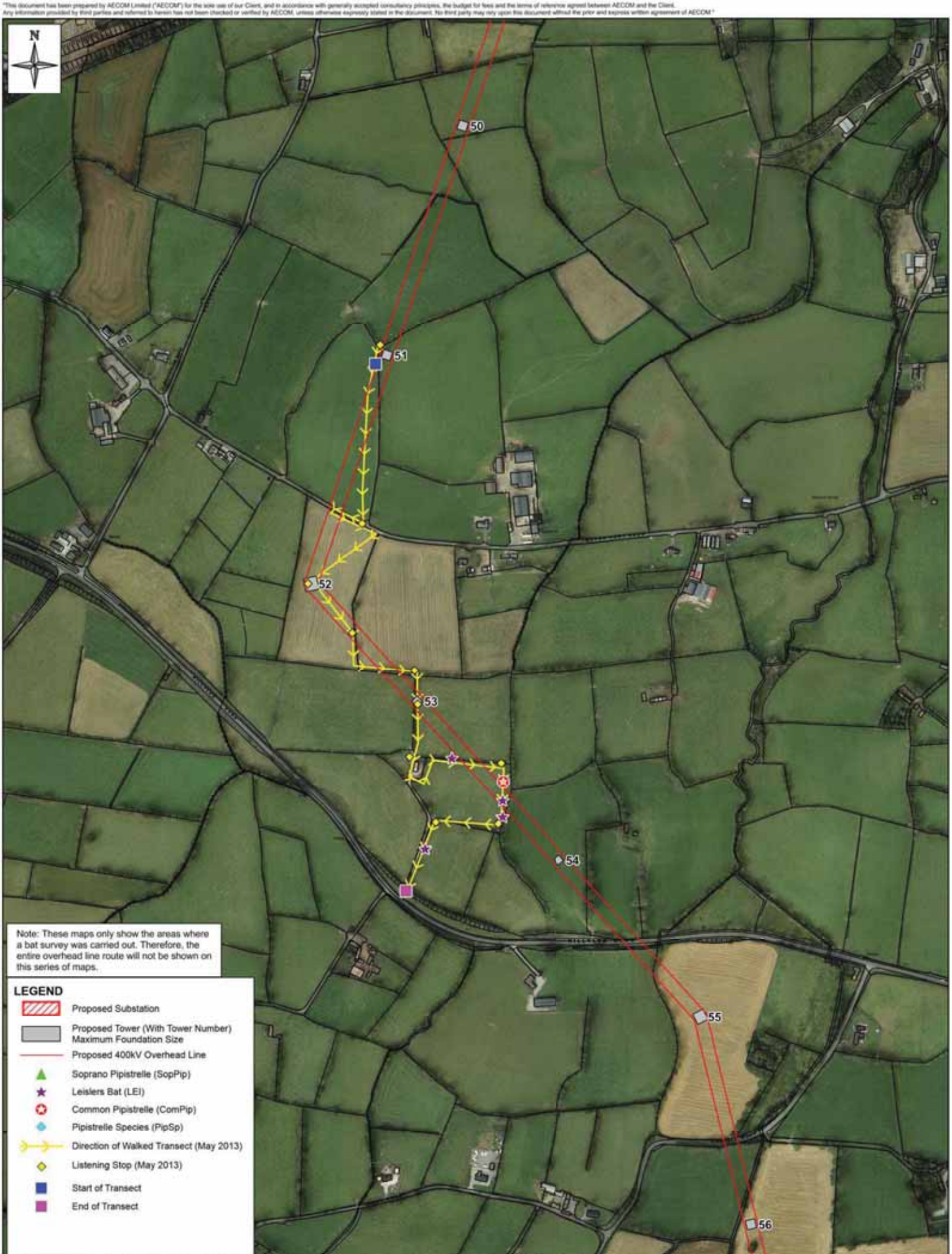
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/4E




Note: These maps only show the areas where a bat survey was carried out. Therefore, the entire overhead line route will not be shown on this series of maps.

**LEGEND**

- Proposed Substation
- Proposed Tower (With Tower Number) Maximum Foundation Size
- Proposed 400kV Overhead Line
- Soprano Pipistrelle (SopPip)
- Leislers Bat (LEI)
- Common Pipistrelle (ComPip)
- Pipistrelle Species (PipSp)
- Direction of Walked Transect (May 2013)
- Listening Stop (May 2013)
- Start of Transect
- End of Transect



Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4F BAT SURVEY RESULTS MAY 2013 (SHEET 6 OF 7)

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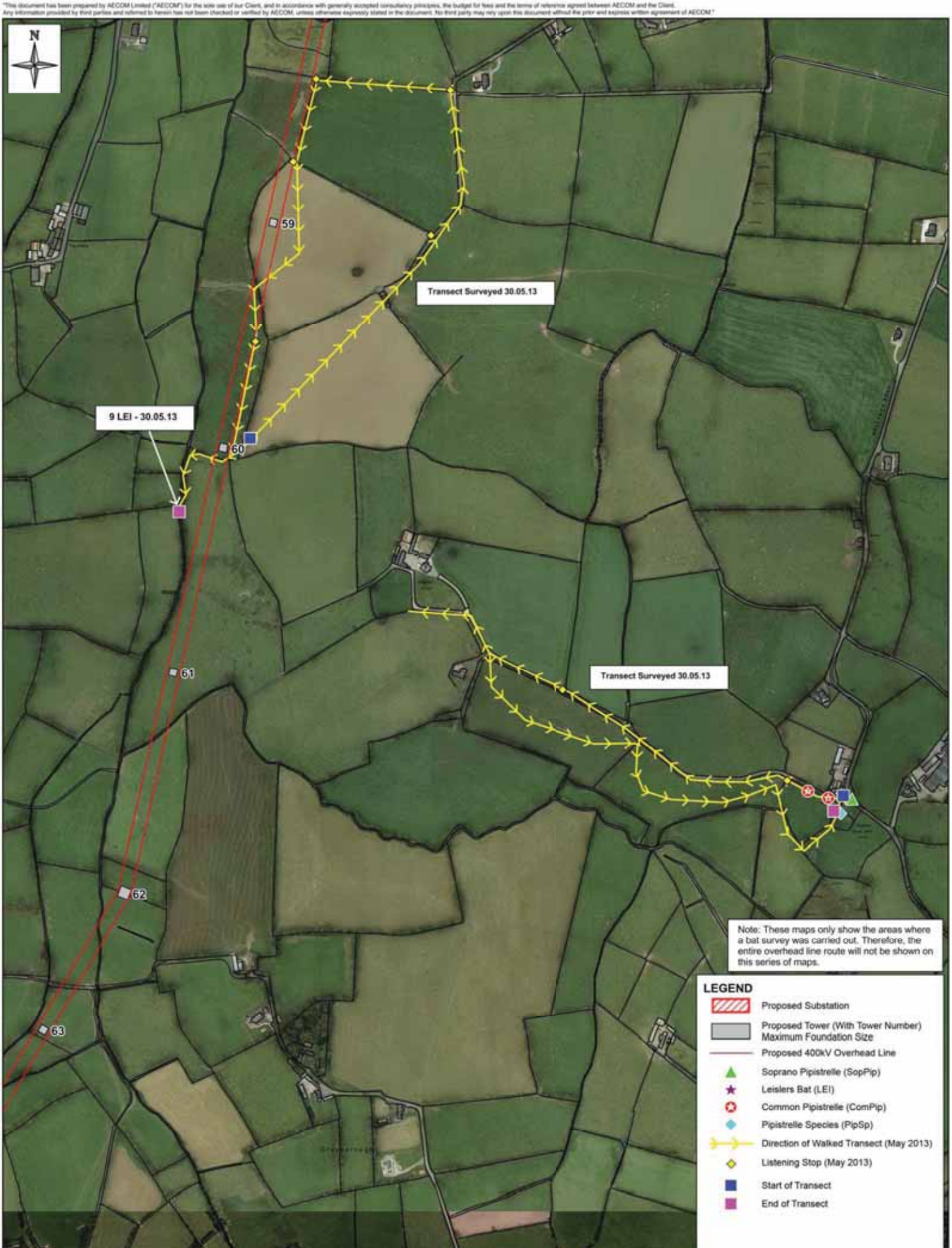
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/4F






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 4G
BAT SURVEY RESULTS MAY 2013
(SHEET 7 OF 7)

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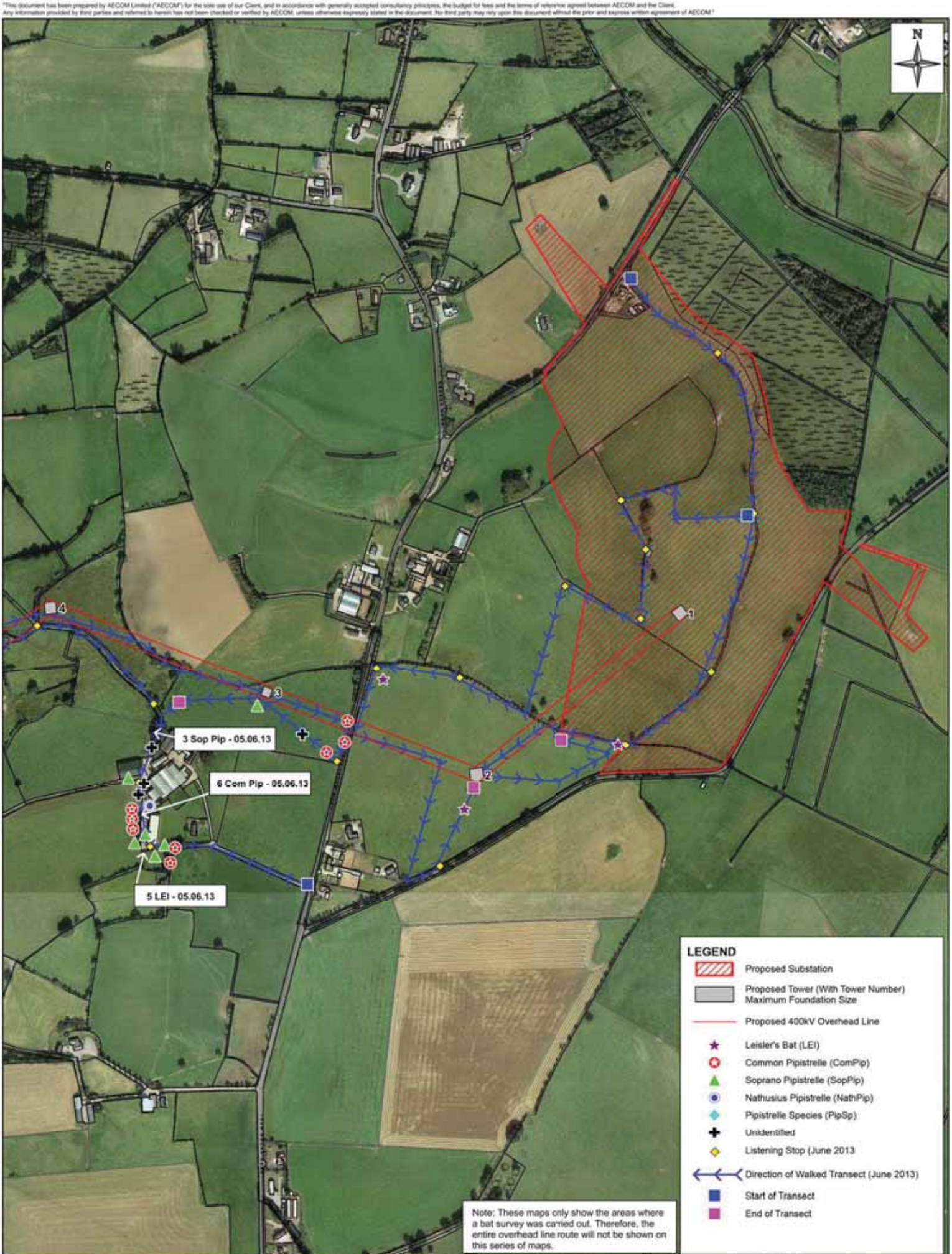
| Chk'd: MM | App'd: FL |
| Date: 14/10/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/4G

Figures Series 5 – June Activity Survey Results

Figures 5A to 5M






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5A BAT SURVEY RESULTS JUNE 2013 (SHEET 1 OF 13)

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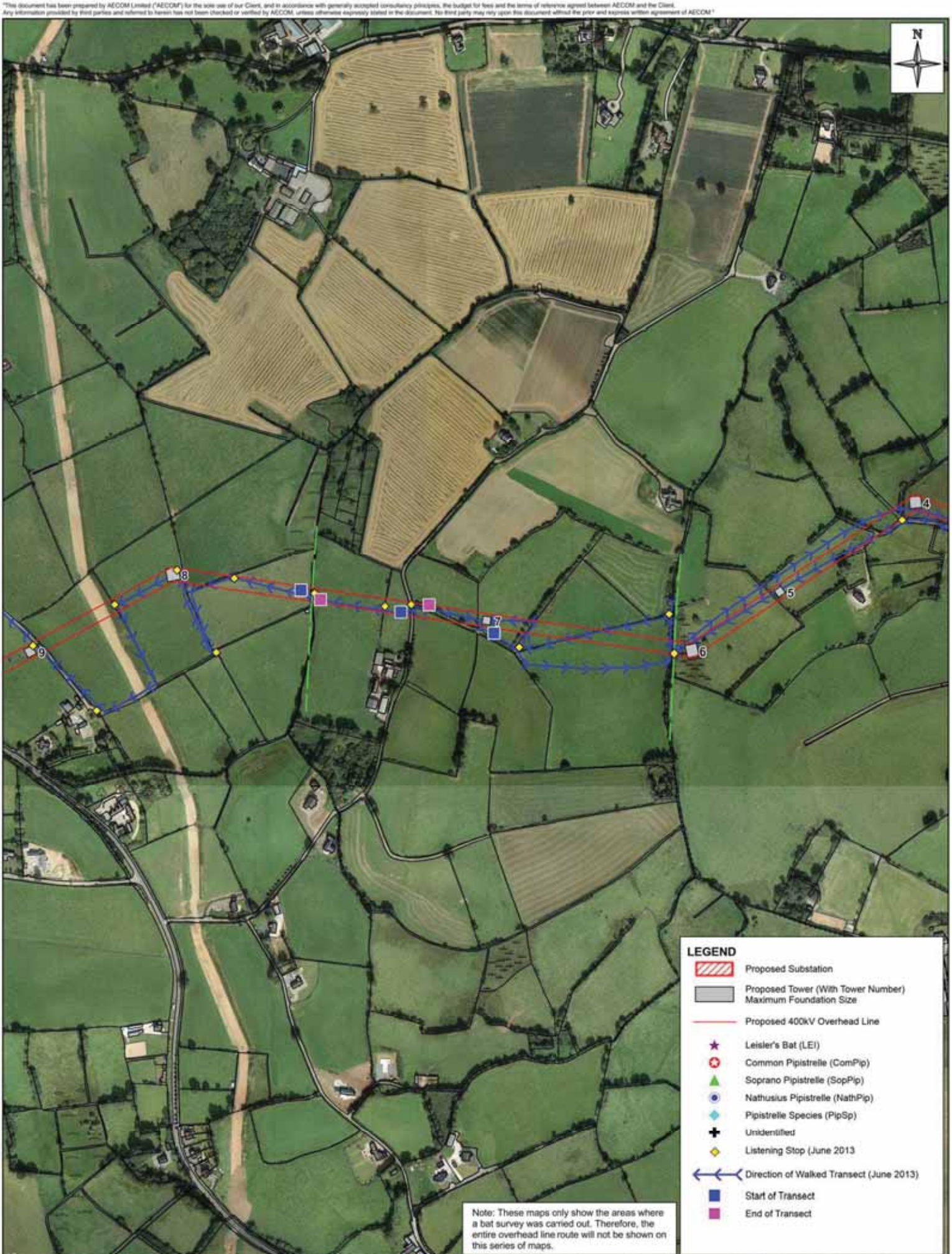
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/5A






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5B BAT SURVEY RESULTS JUNE 2013 (SHEET 2 OF 13)

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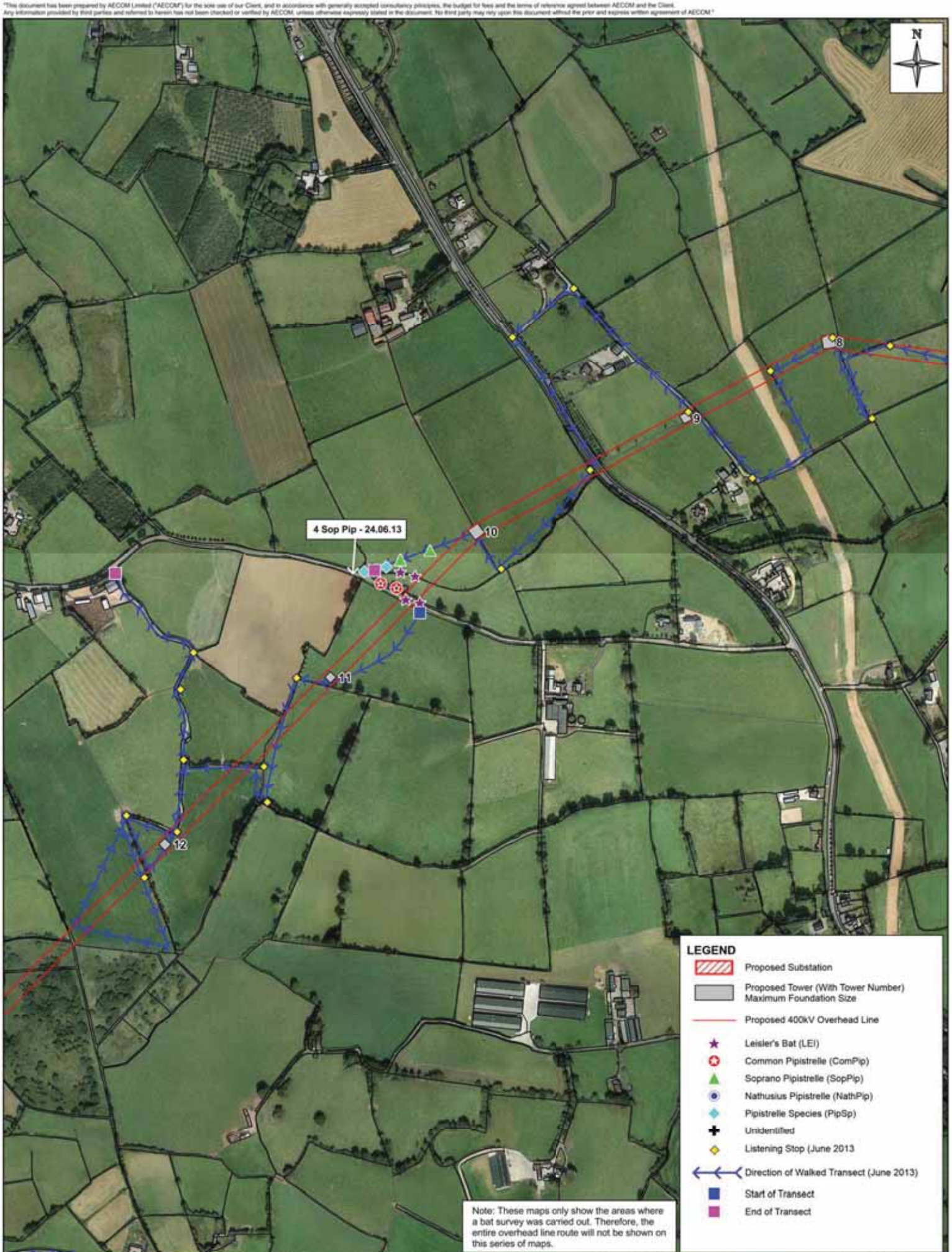
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/5B






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5C BAT SURVEY RESULTS JUNE 2013 (SHEET 3 OF 13)

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| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

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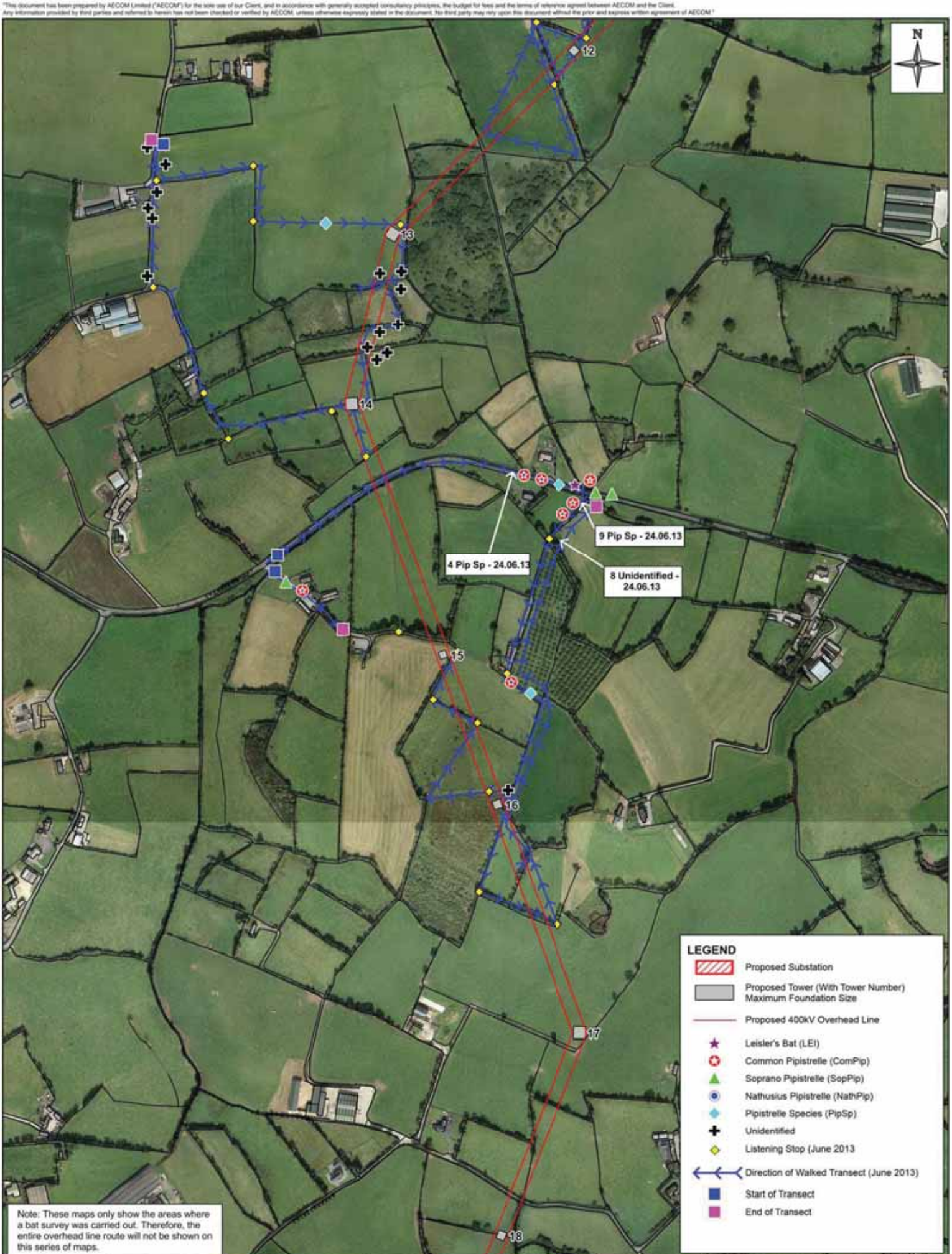




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5D BAT SURVEY RESULTS JUNE 2013 (SHEET 4 OF 13)

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| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

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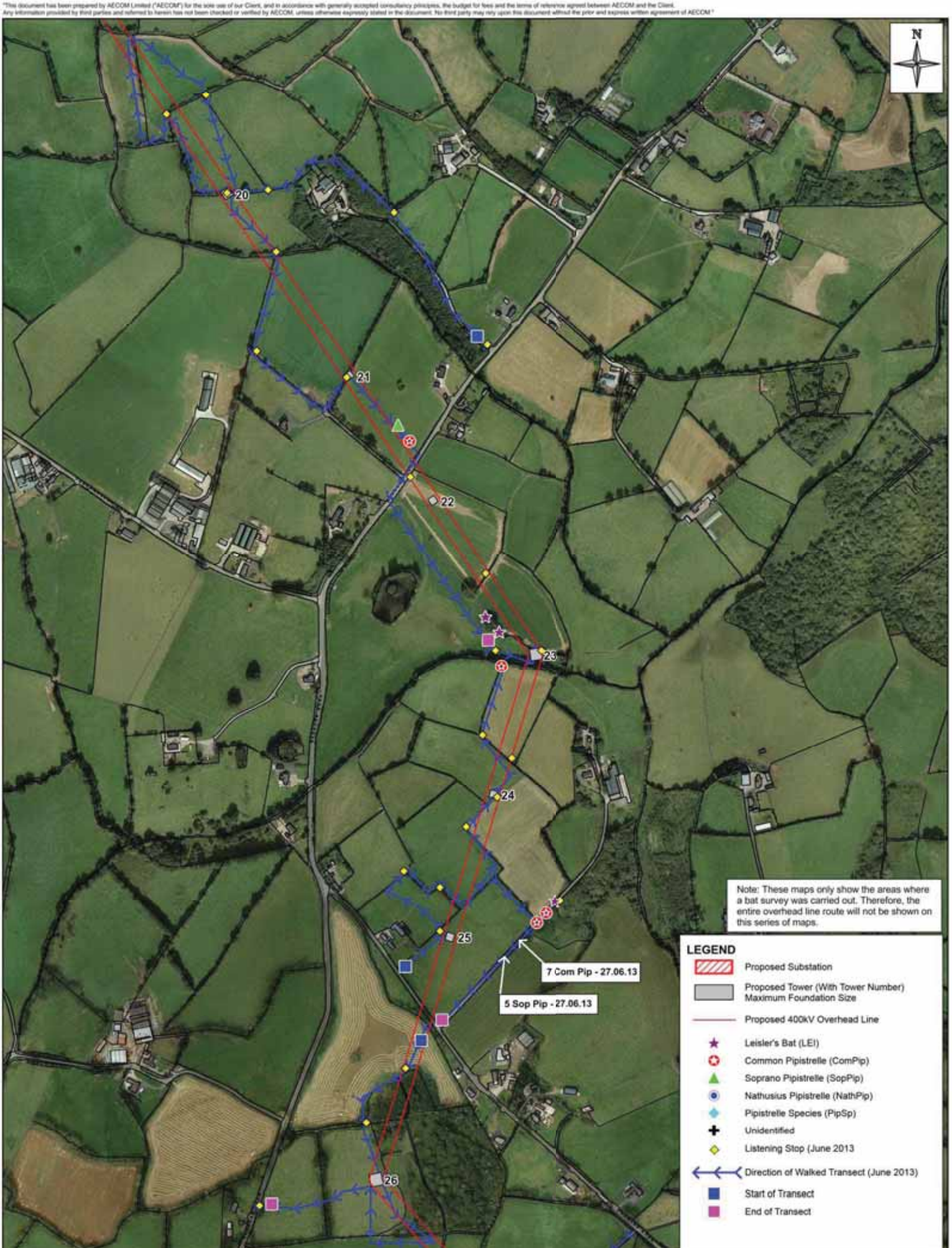




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5E BAT SURVEY RESULTS JUNE 2013 (SHEET 5 OF 13)

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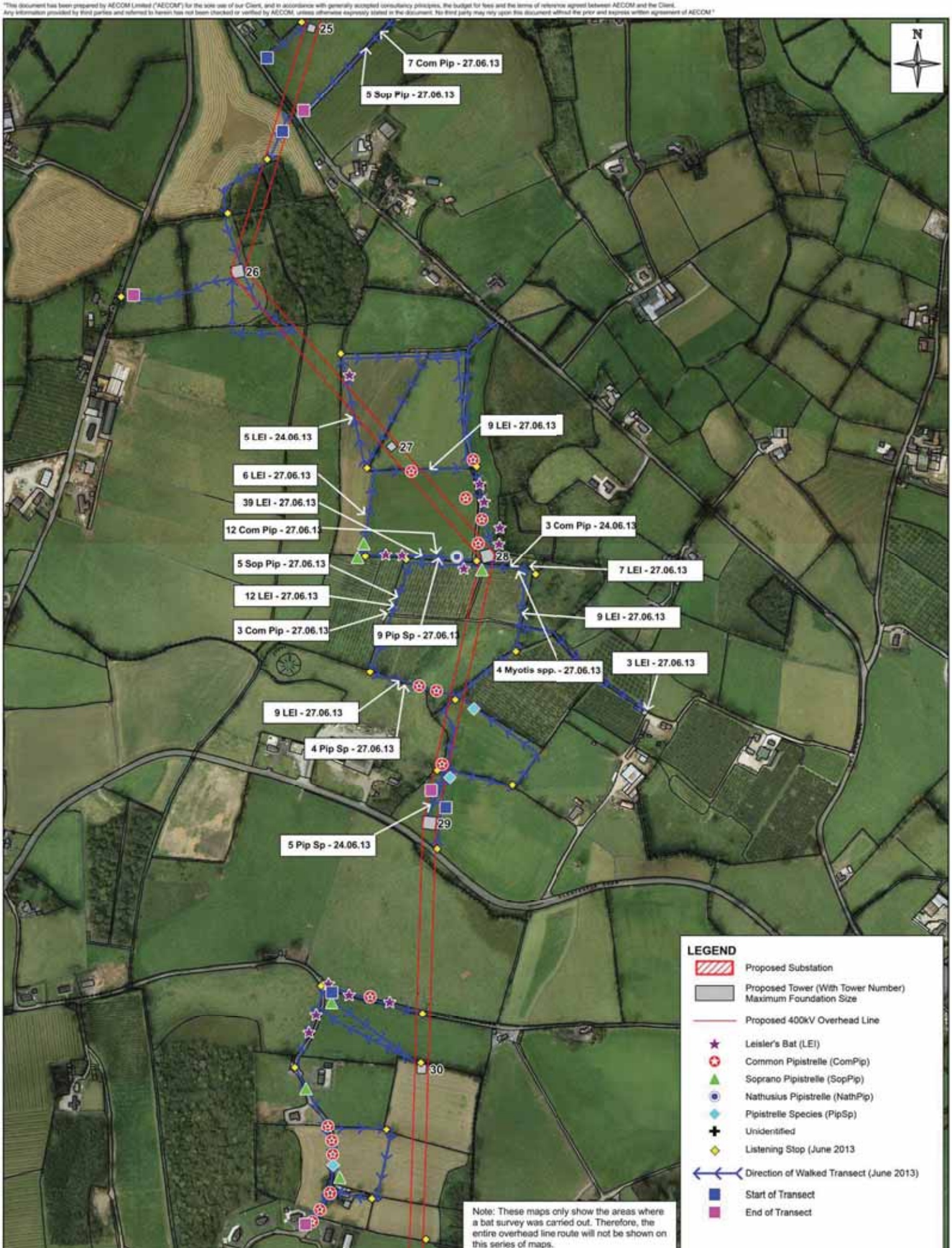
No: 60032220/3528/5E






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5F BAT SURVEY RESULTS JUNE 2013 (SHEET 6 OF 13)

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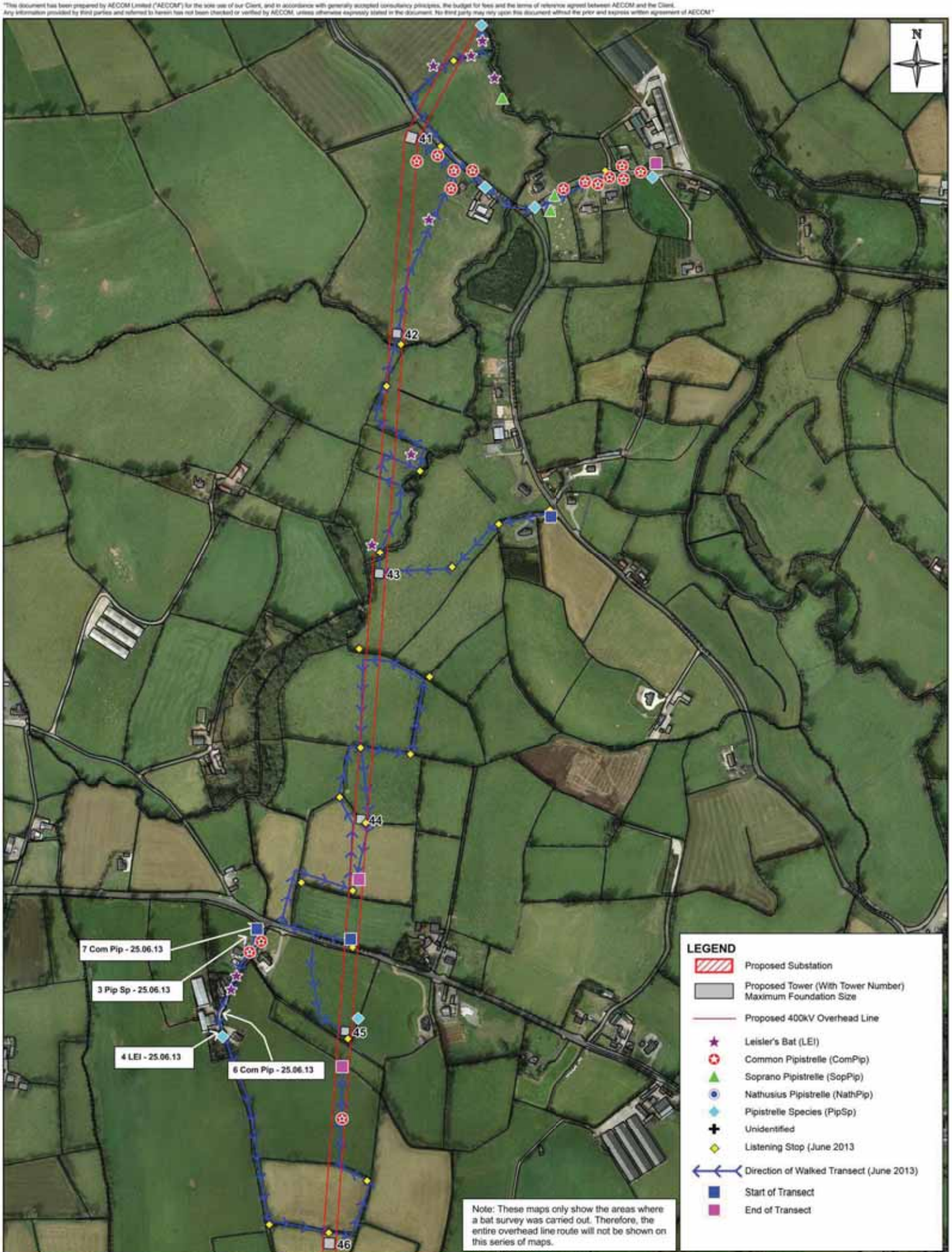
No: 60032220/3528/5F






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5G BAT SURVEY RESULTS JUNE 2013 (SHEET 7 OF 13)

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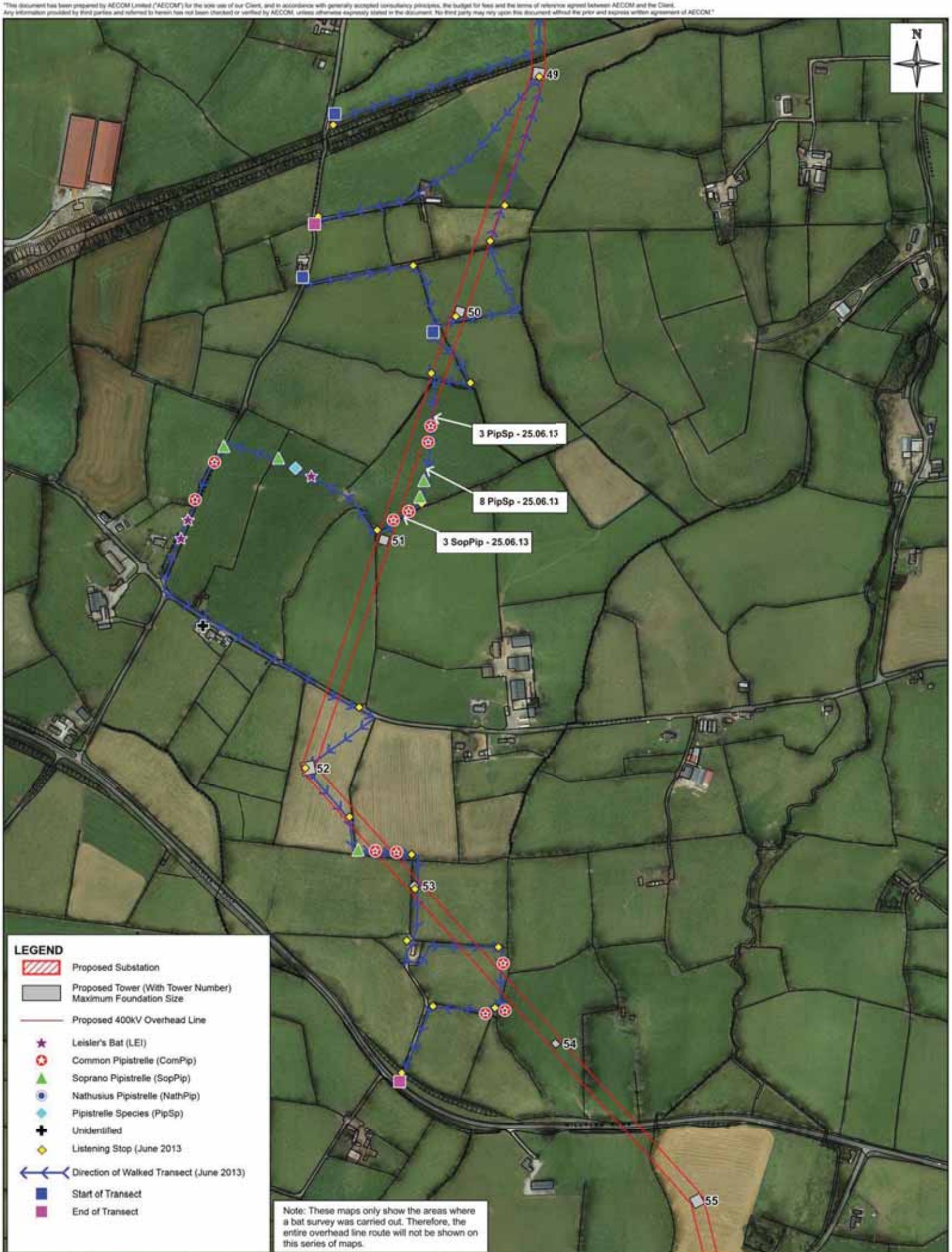
No: 60032220/3528/5G






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5H
BAT SURVEY RESULTS JUNE 2013
(SHEET 8 OF 13)

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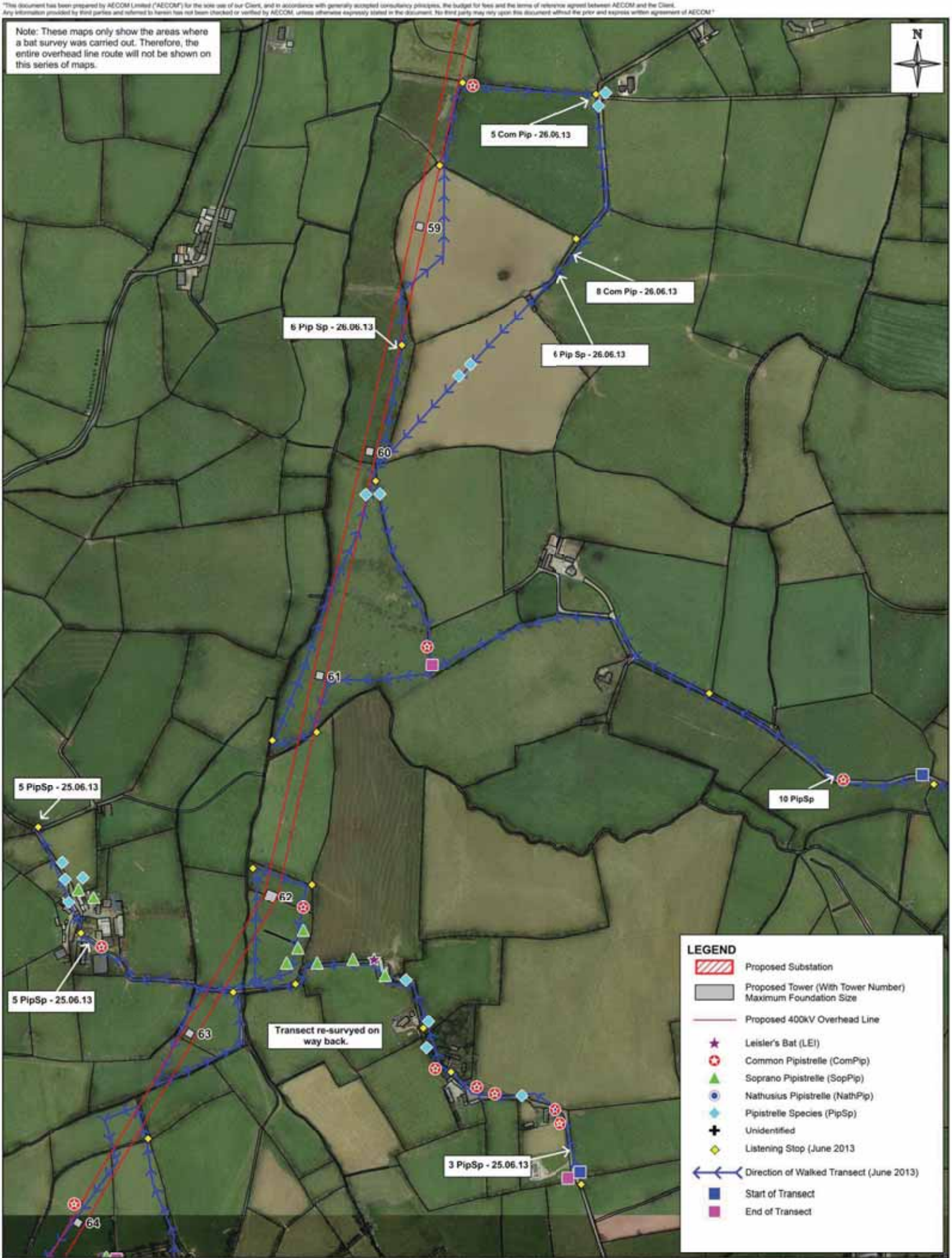
No: 60032220/3528/5H






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5I BAT SURVEY RESULTS JUNE 2013 (SHEET 9 OF 13)

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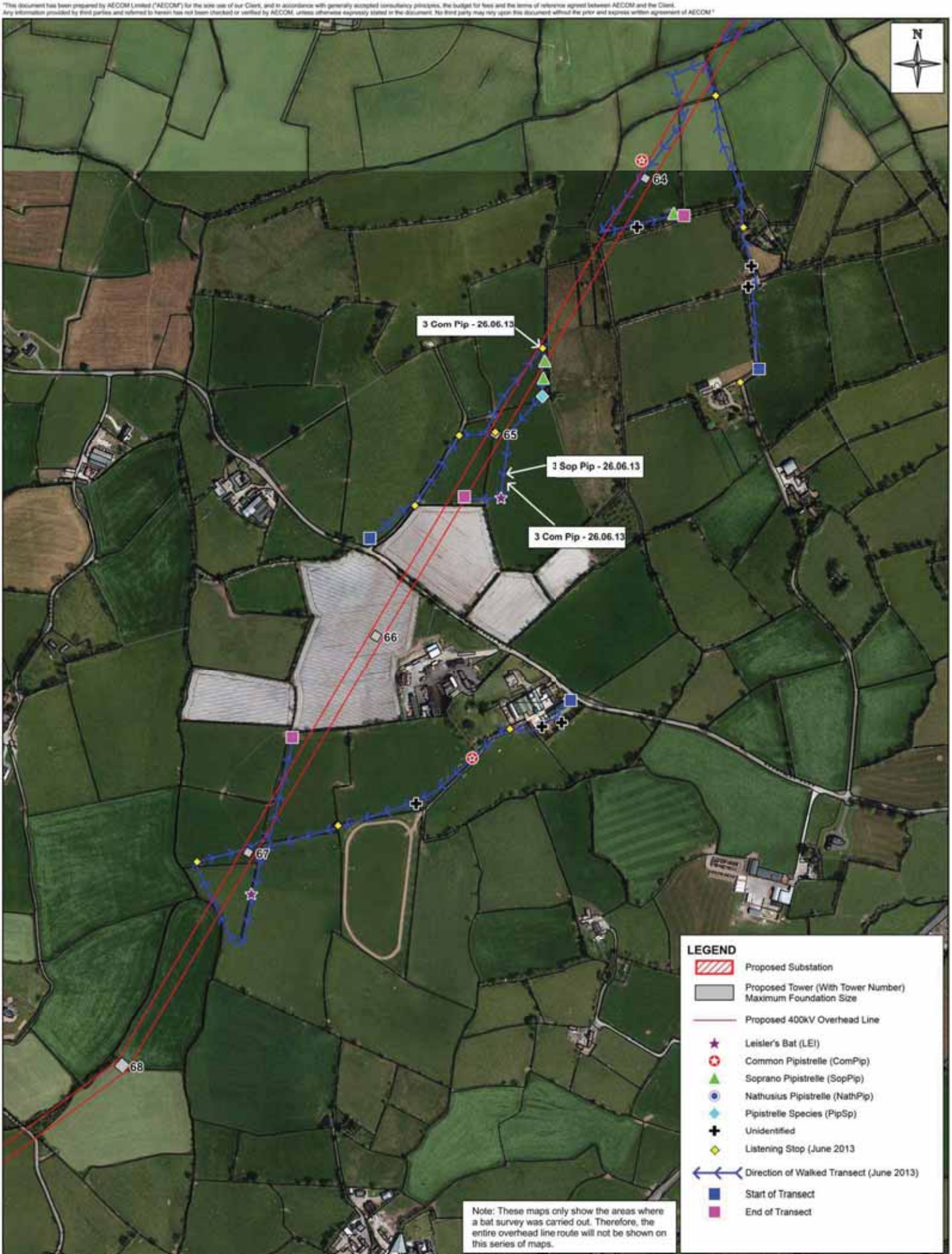
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/5I






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5J BAT SURVEY RESULTS JUNE 2013 (SHEET 10 OF 13)

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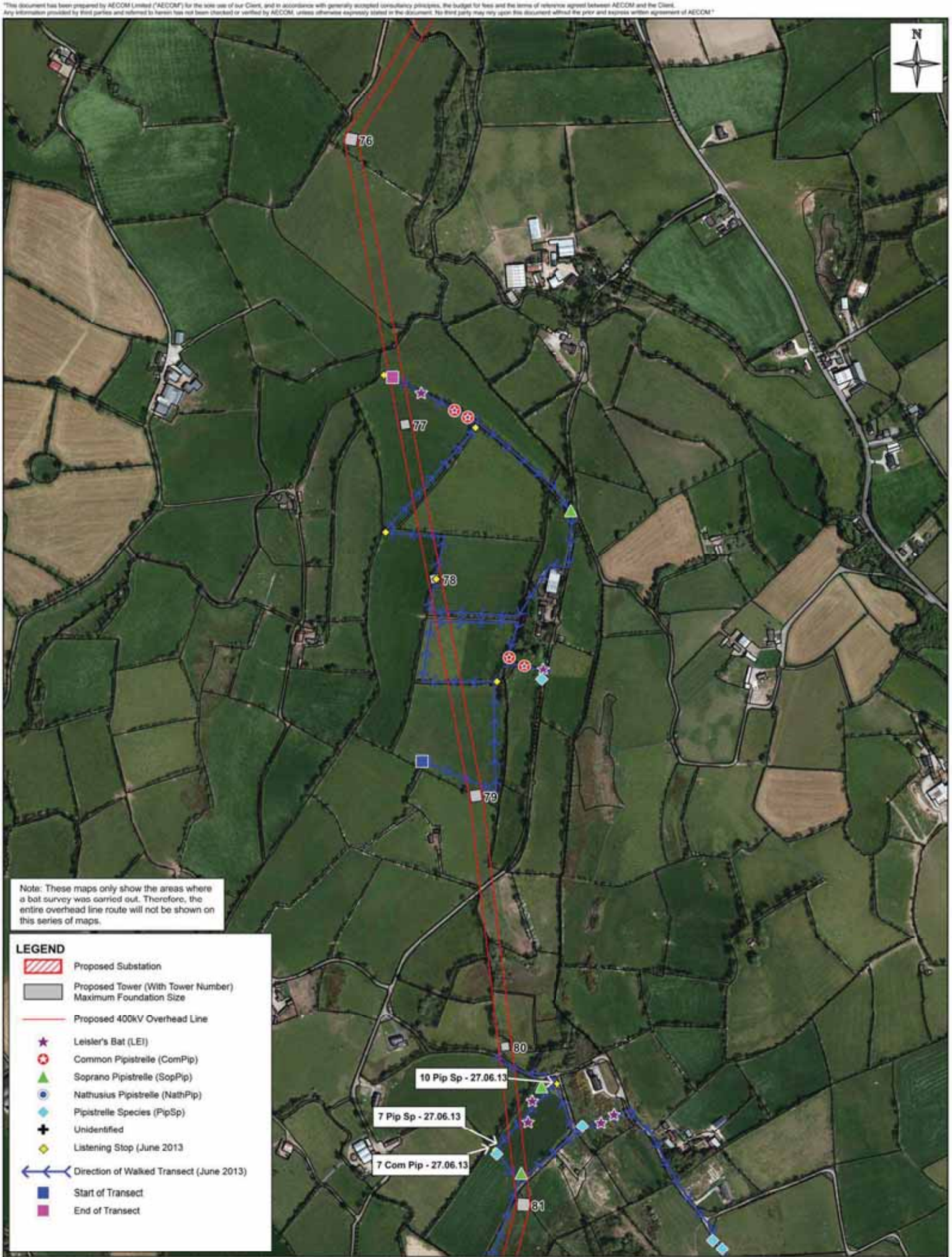
| Date: 10/11/2013 | | Scale: 1:5,000 @ A3 | |

No: 60032220/3528/5J






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5K
BAT SURVEY RESULTS JUNE 2013
(SHEET 11 OF 13)

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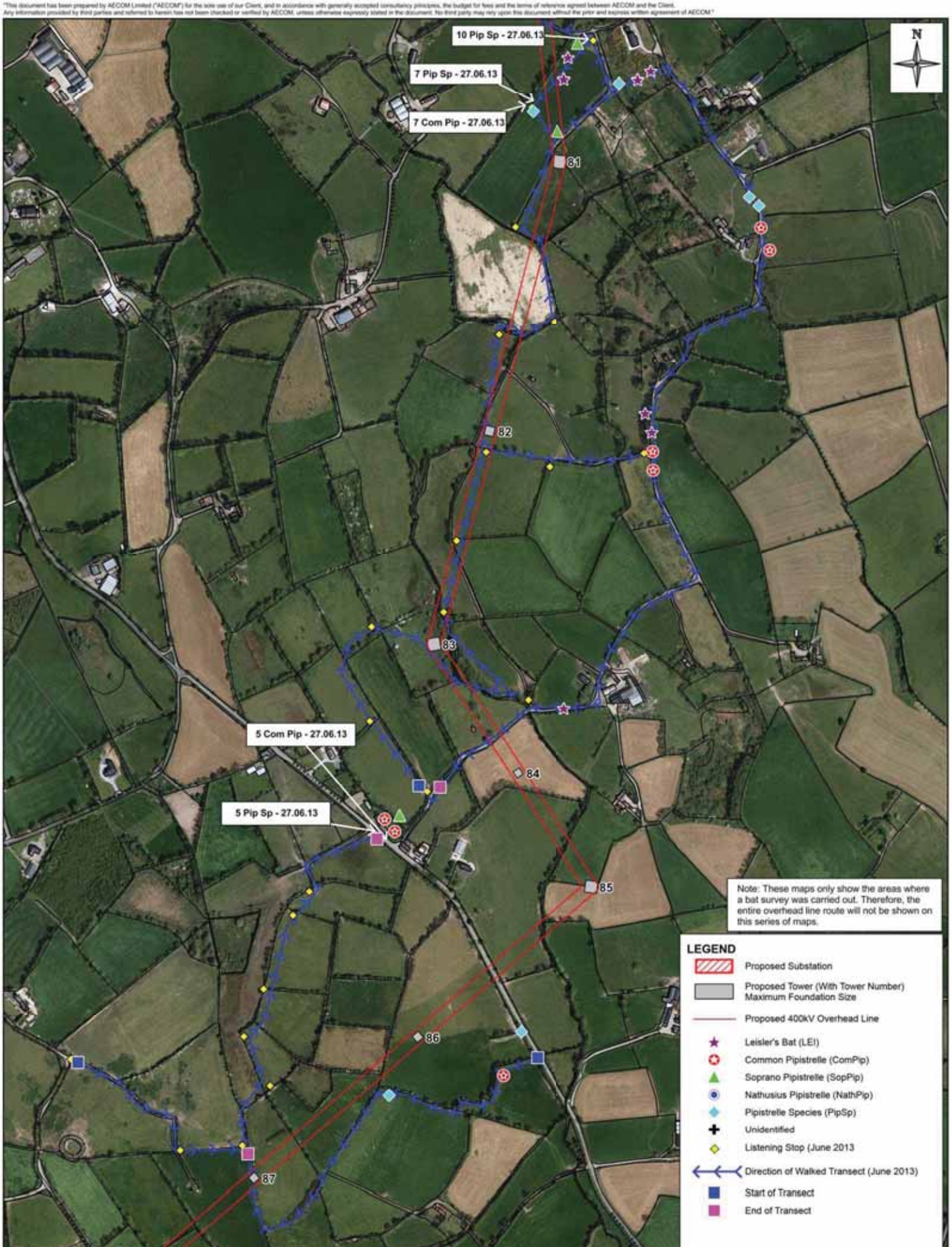
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/5K






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5L BAT SURVEY RESULTS JUNE 2013 (SHEET 12 OF 13)

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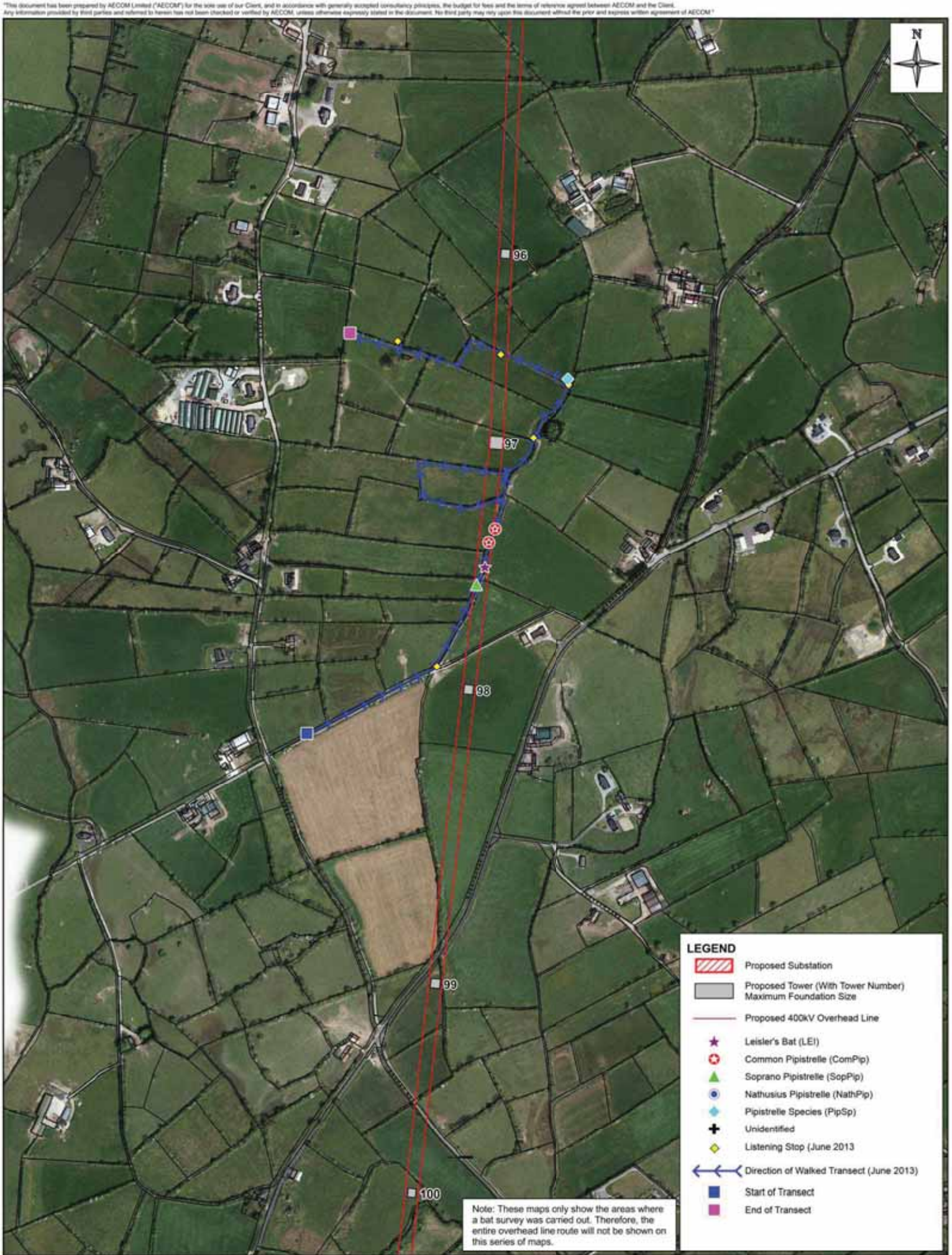
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/5L






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 5M BAT SURVEY RESULTS JUNE 2013 (SHEET 13 OF 13)

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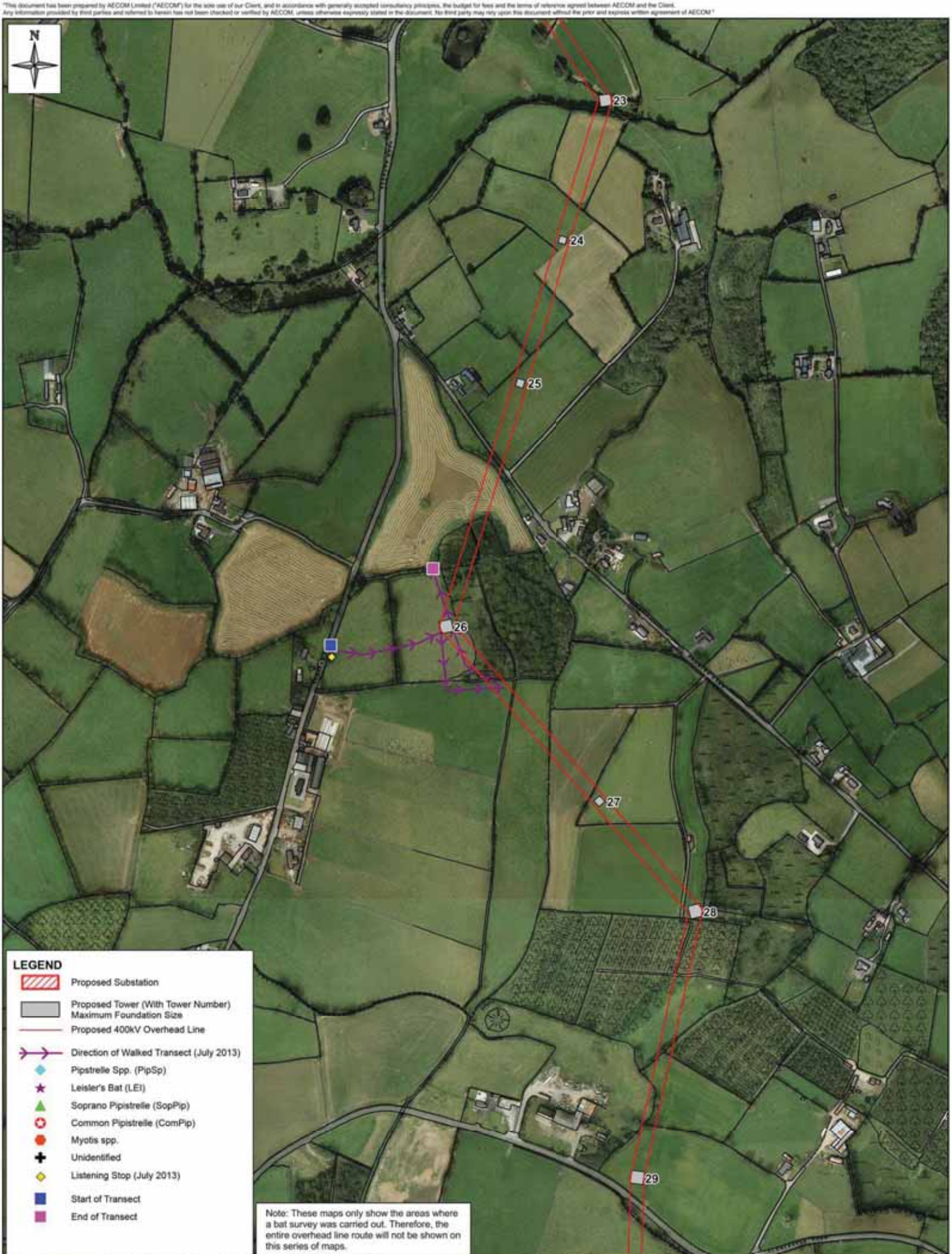
| Design: GB | Drawn: JM |
| Chk'd: MM | App'd: FL |
| Date: 10/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/5M

Figures Series 6 – July Activity Survey Results

Figures 6A to 6K






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6A BAT SURVEY RESULTS JULY 2013 (SHEET 1 OF 11)

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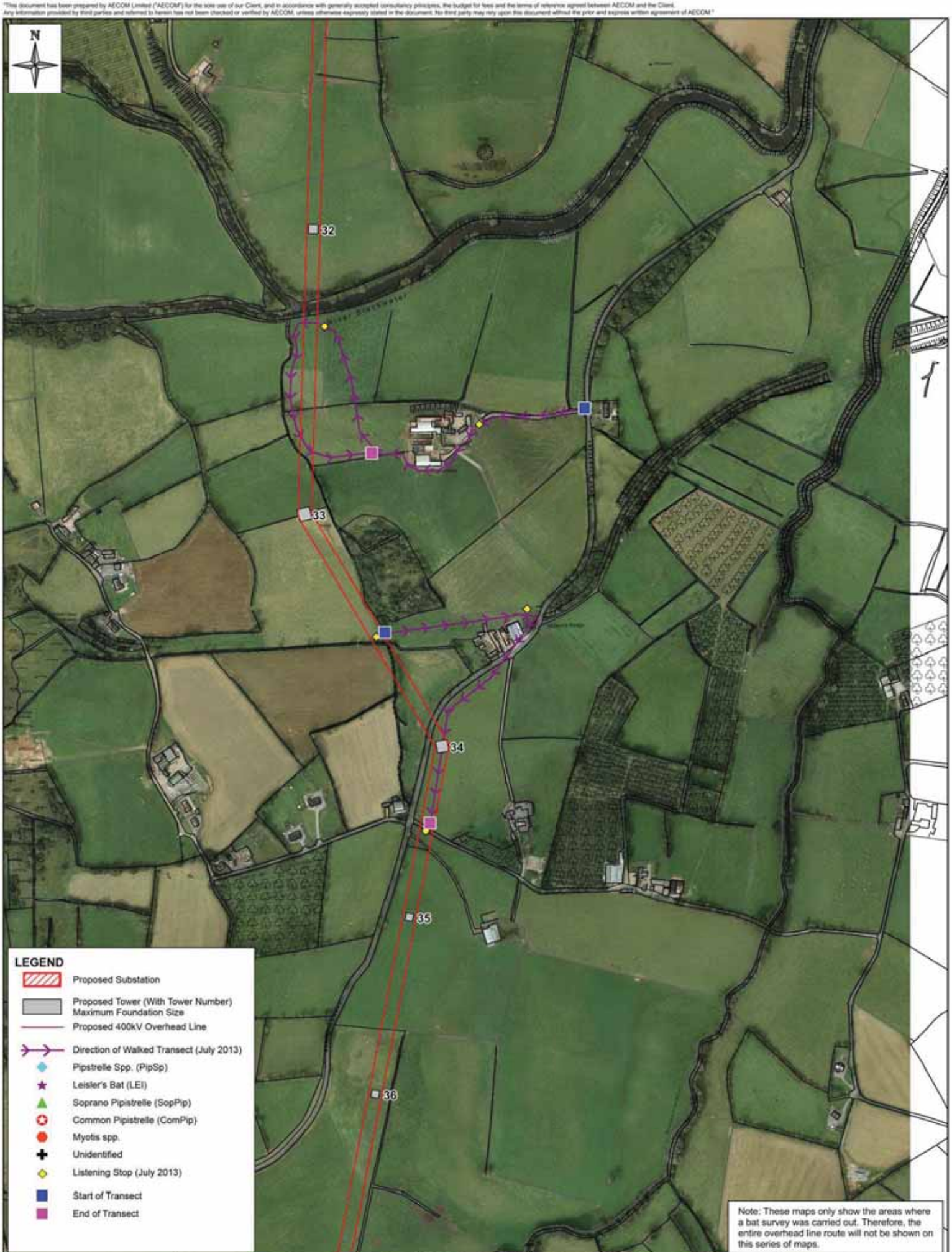
No: 60032220/3528/6A






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6B BAT SURVEY RESULTS JULY 2013 (SHEET 2 OF 11)

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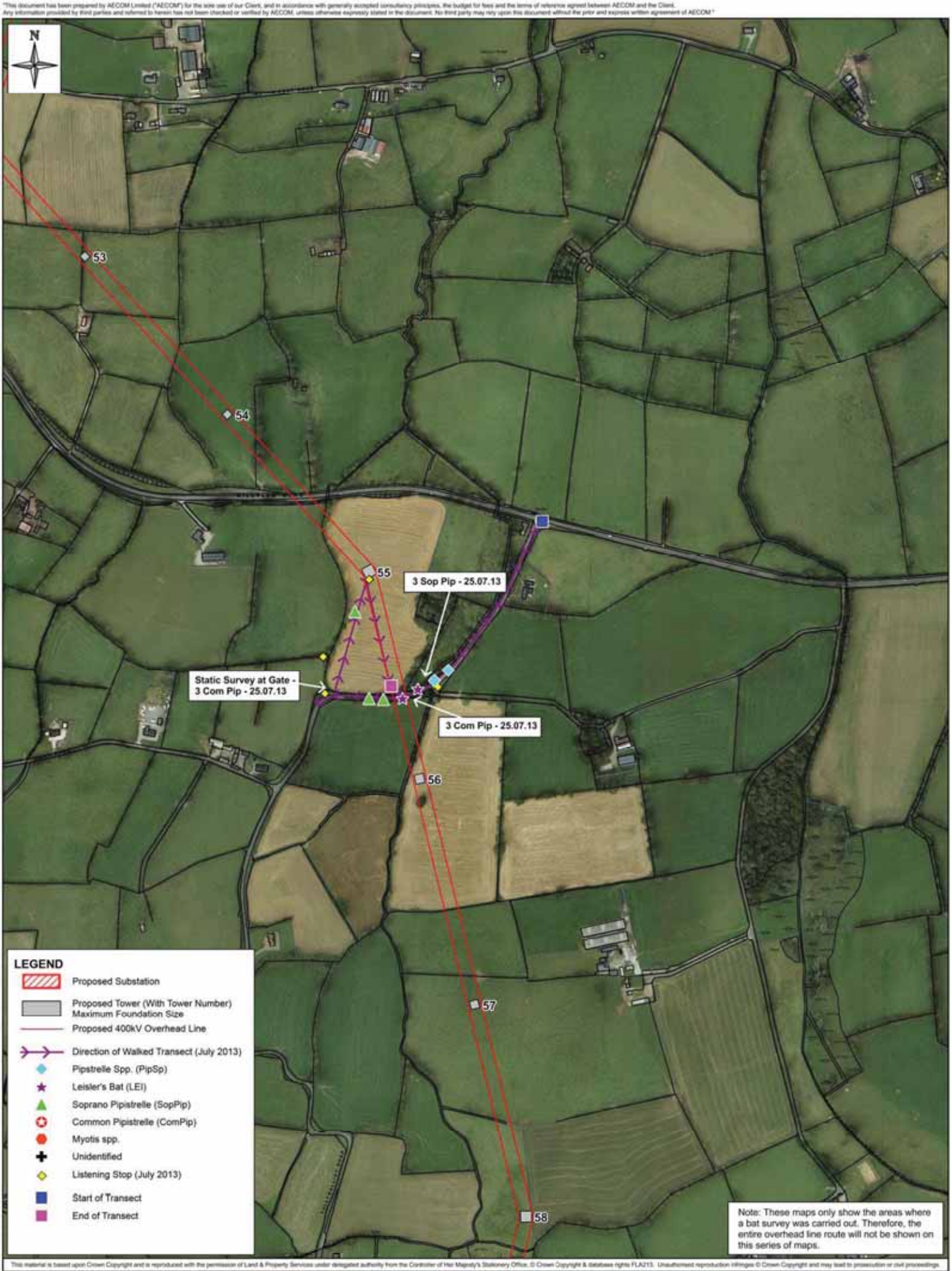
No: 60032220/3528/6B






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6C BAT SURVEY RESULTS JULY 2013 (SHEET 3 OF 11)

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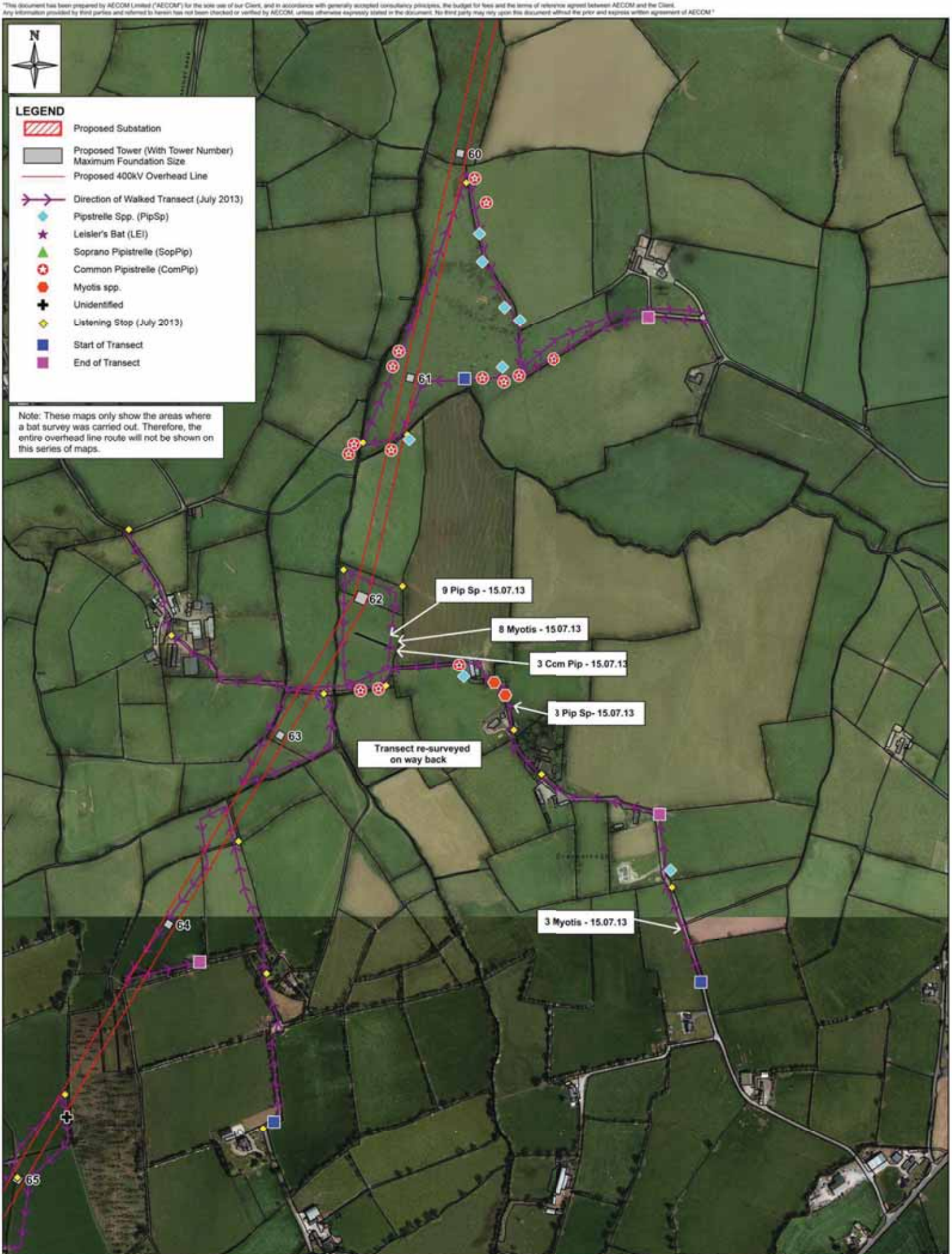
No: 60032220/3528/6C






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6D
BAT SURVEY RESULTS JULY 2013
(SHEET 4 OF 11)

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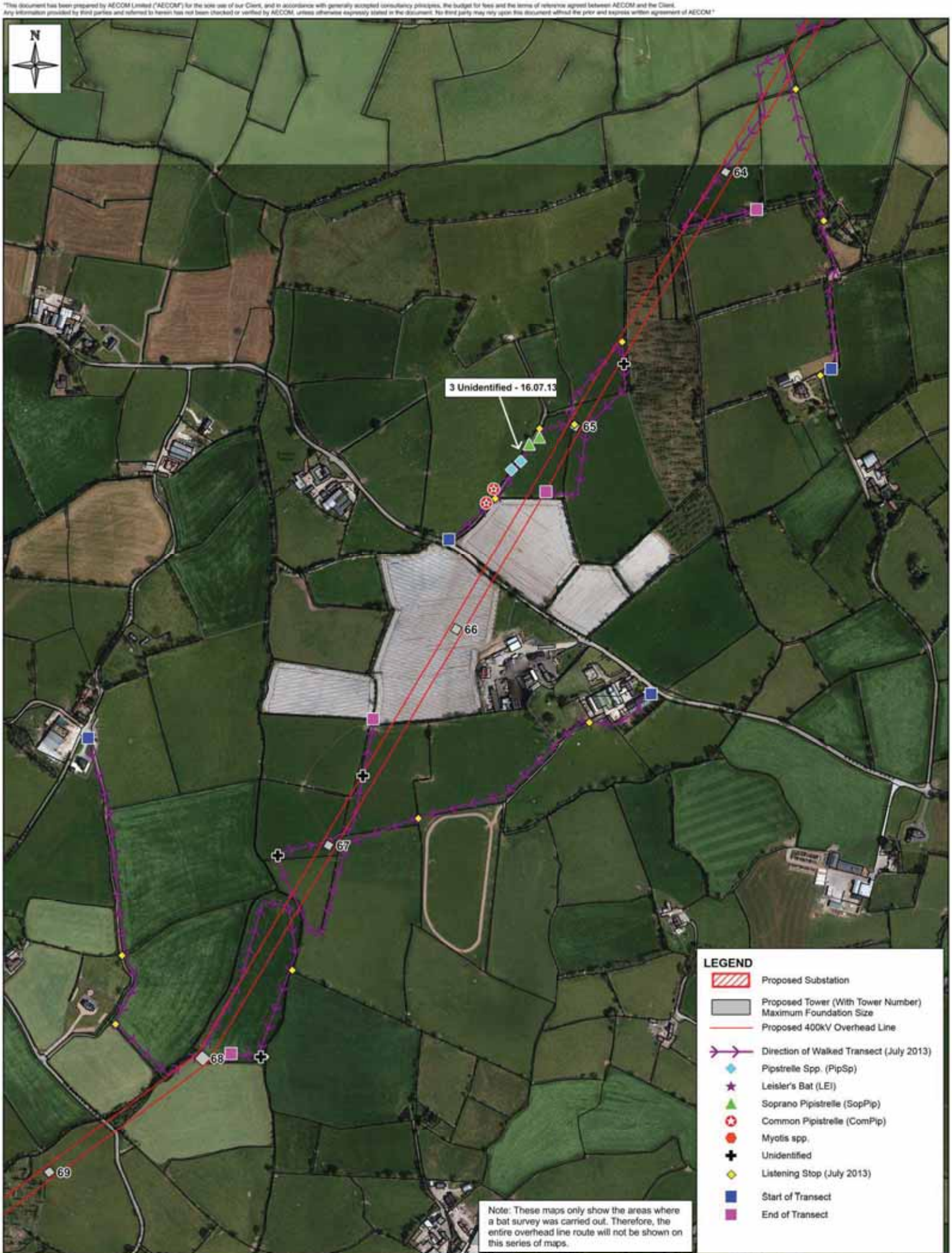
No: 60032220/3528/6D






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6E BAT SURVEY RESULTS JULY 2013 (SHEET 5 OF 11)

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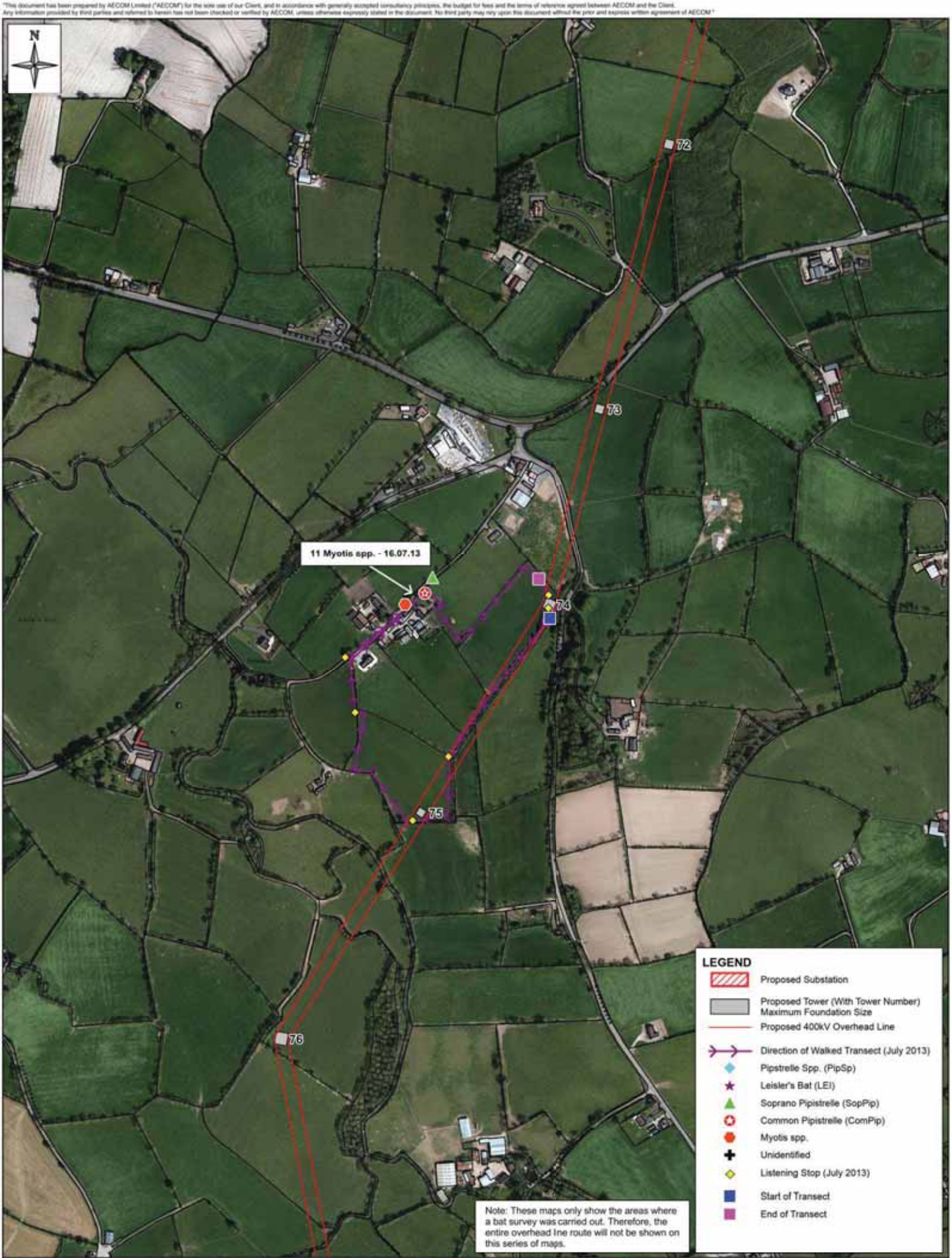
No: 60032220/3528/6E






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6F
BAT SURVEY RESULTS JULY 2013
(SHEET 6 OF 11)

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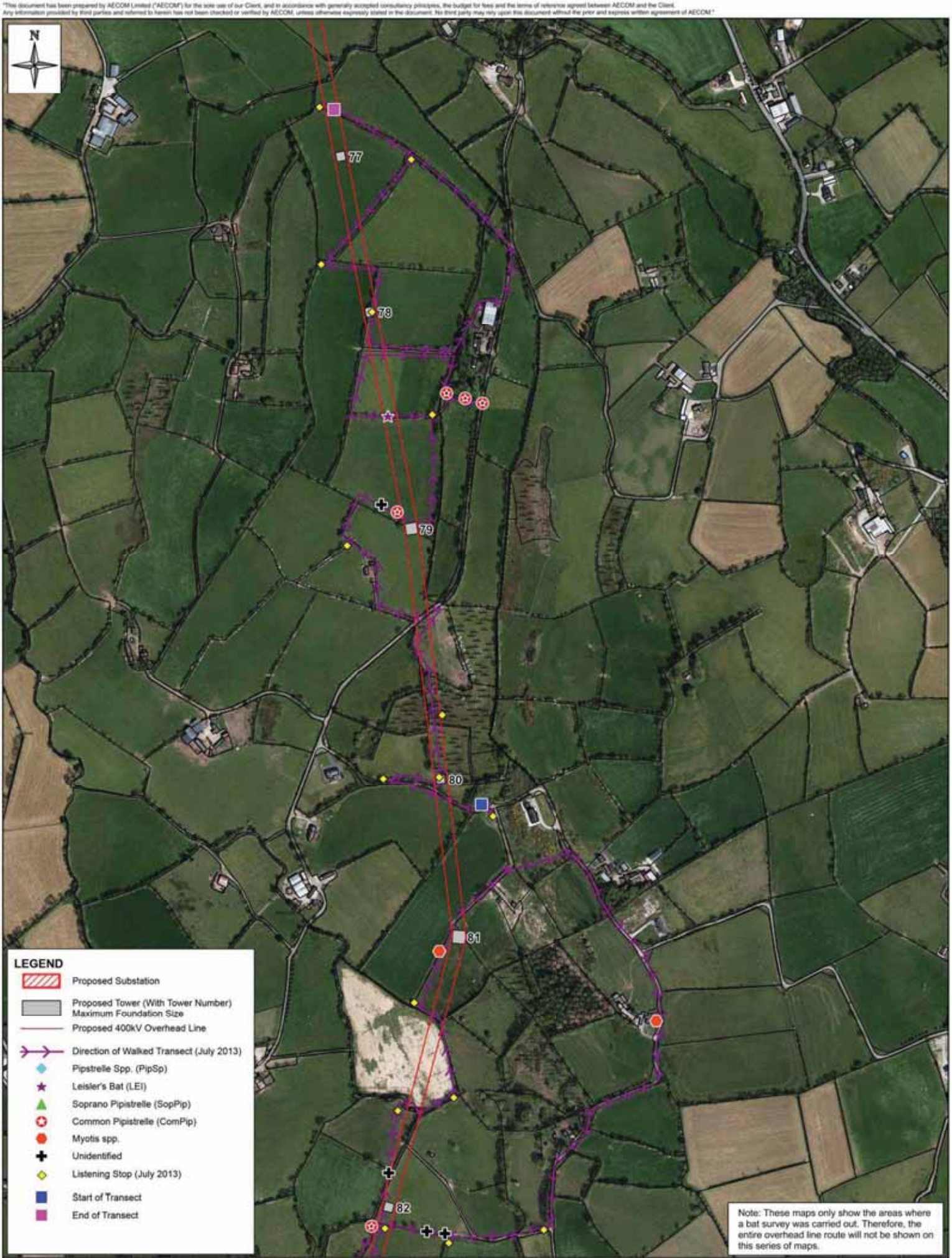
No: 60032220/3528/6F






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6G
BAT SURVEY RESULTS JULY 2013
(SHEET 7 OF 11)

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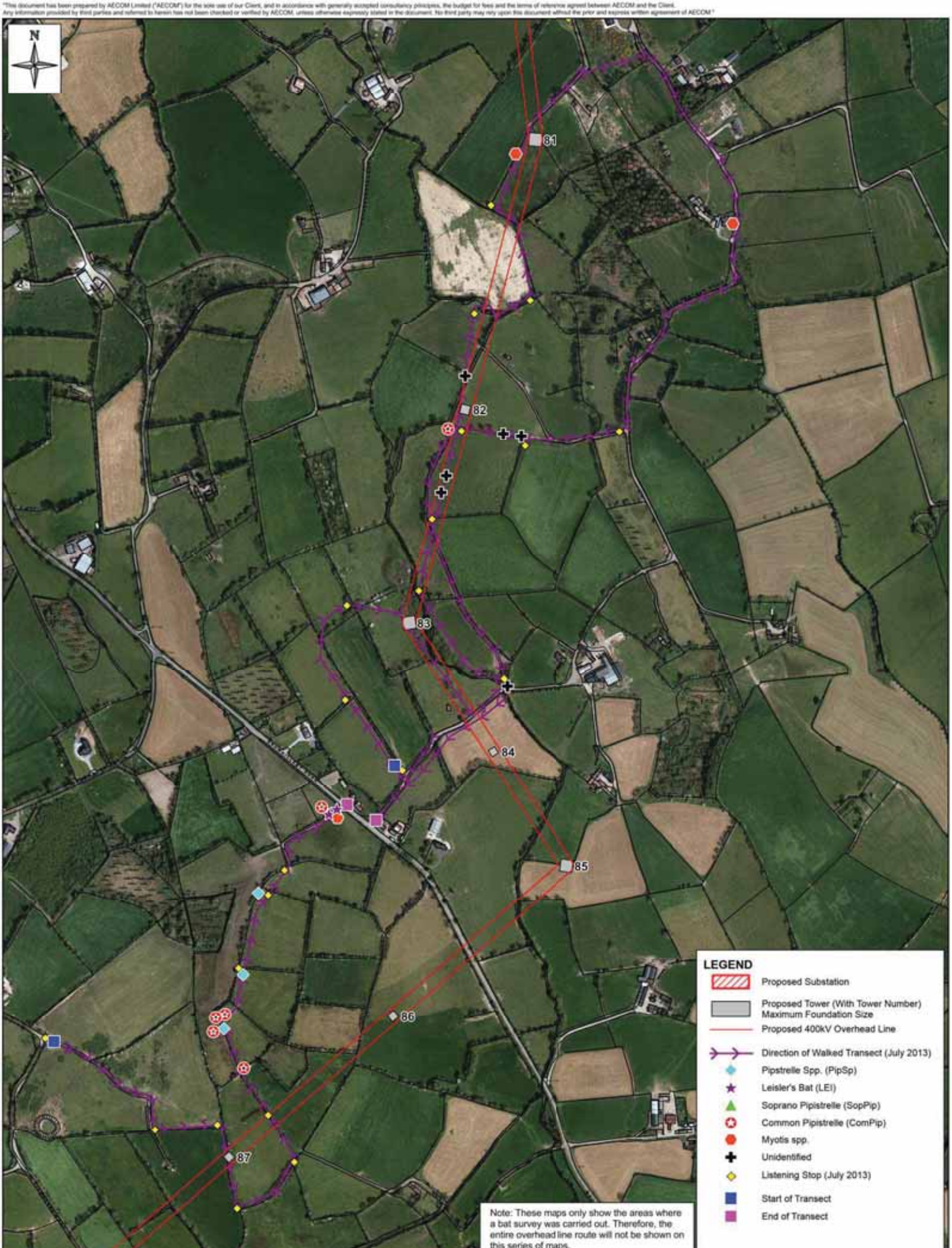
No: 60032220/3528/6G






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6H
BAT SURVEY RESULTS JULY 2013
(SHEET 8 OF 11)

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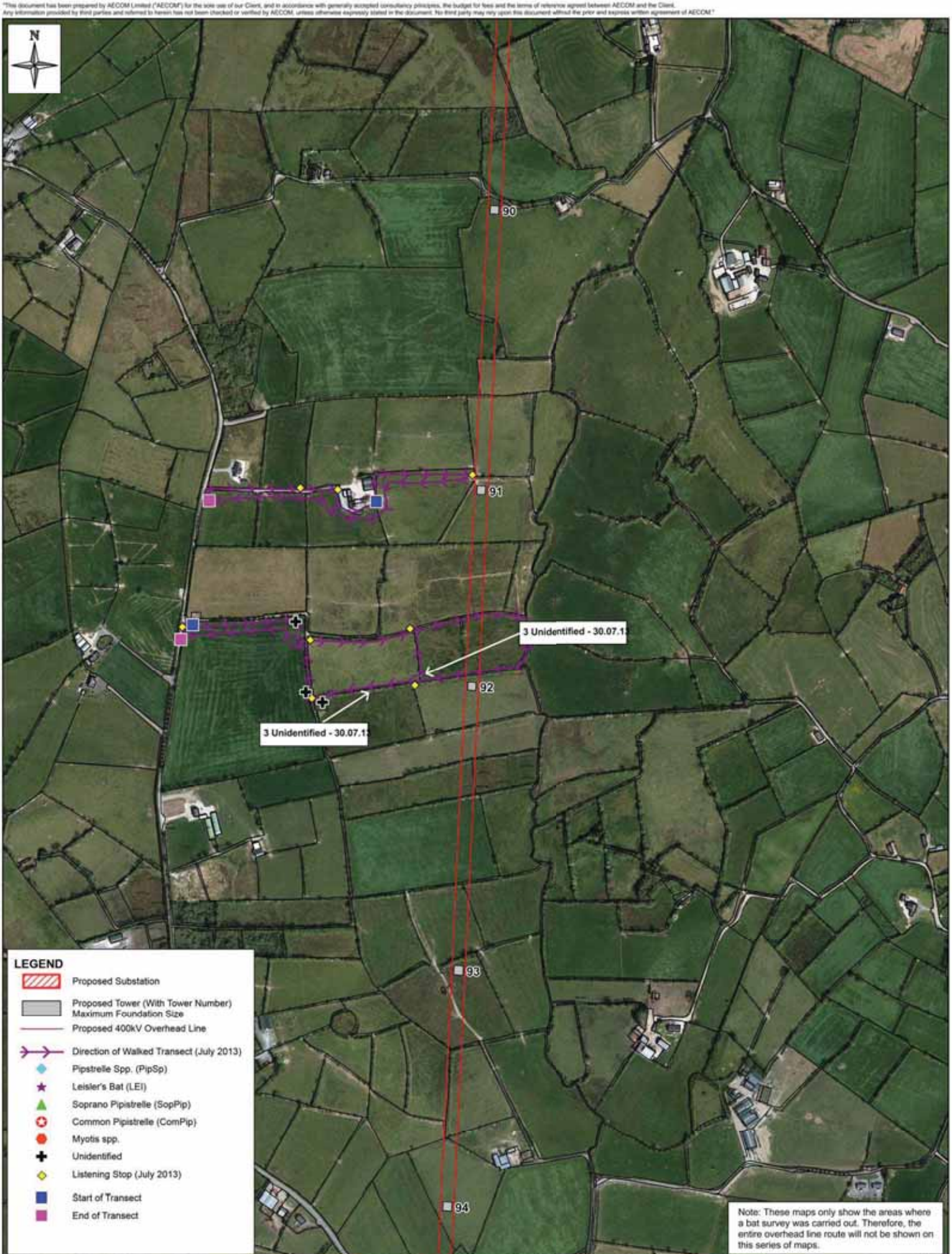
No: 60032220/3528/6H






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6I BAT SURVEY RESULTS JULY 2013 (SHEET 9 OF 11)

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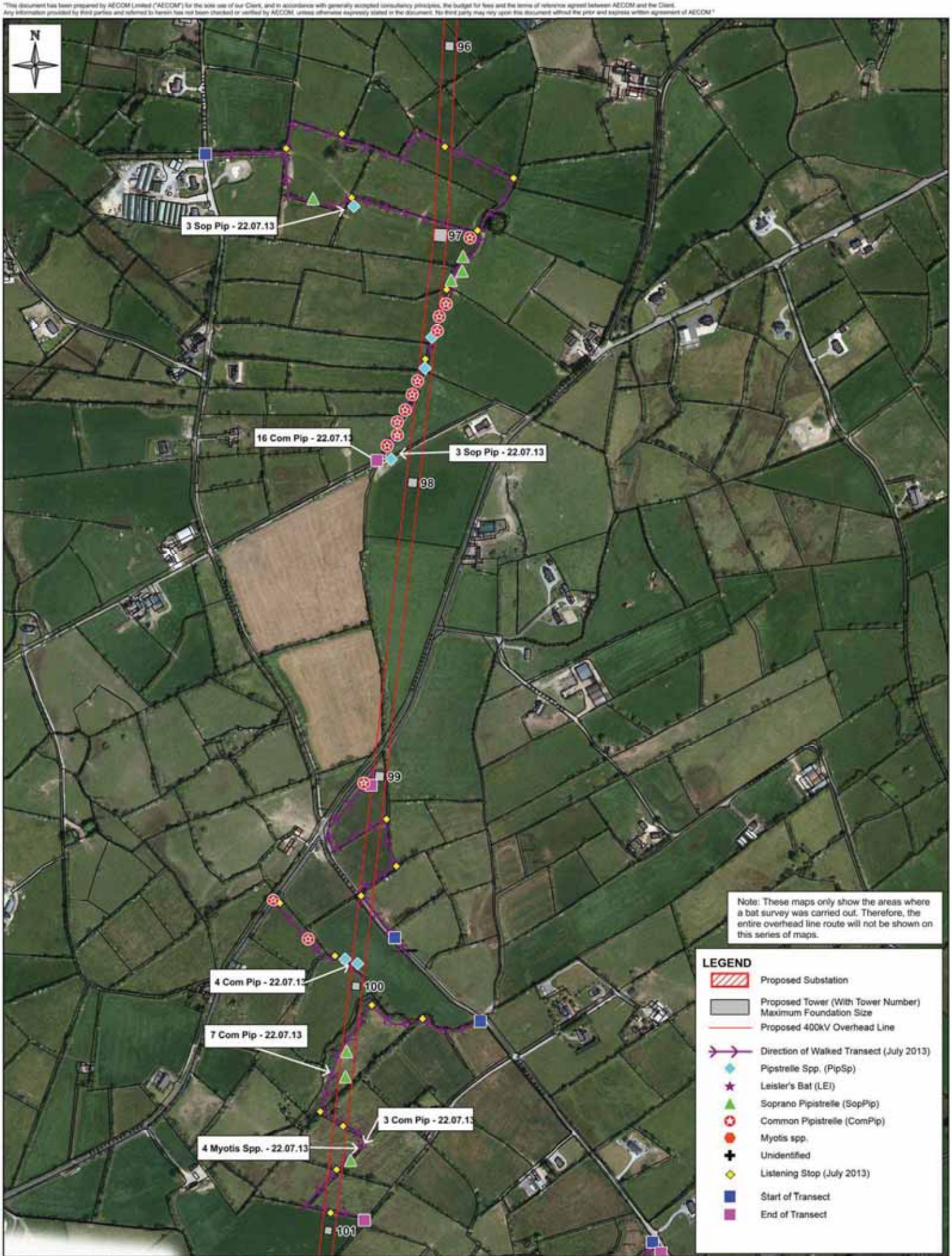
No: 60032220/3528/6I






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6J
BAT SURVEY RESULTS JULY 2013
(SHEET 10 OF 11)

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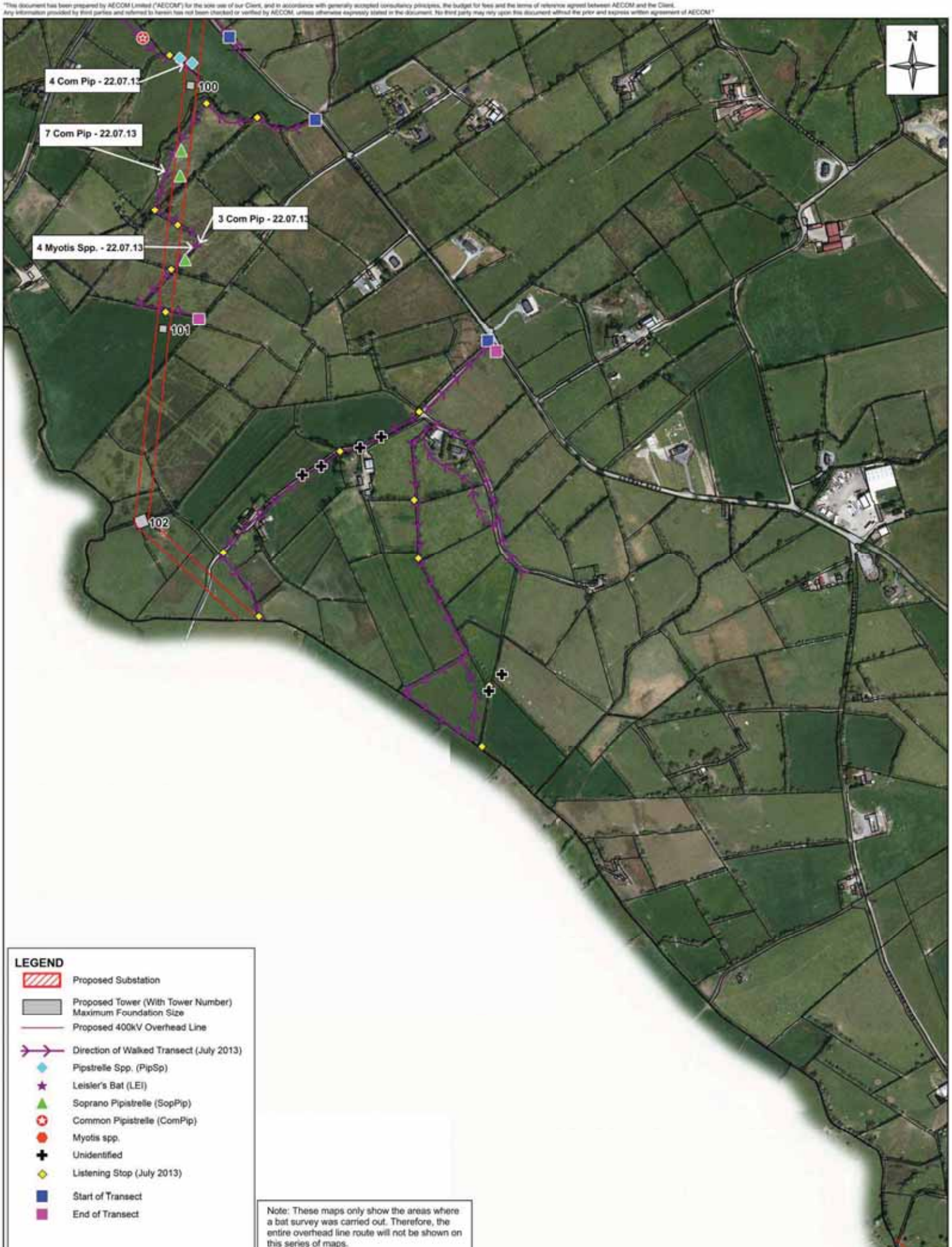
No: 60032220/3528/6J




**LEGEND**

- Proposed Substation
- Proposed Tower (With Tower Number) Maximum Foundation Size
- Proposed 400kV Overhead Line
- Direction of Walked Transect (July 2013)
- Pipstrelle Spp. (PipSp)
- Leisler's Bat (LEI)
- Soprano Pipistrelle (SopPip)
- Common Pipistrelle (ComPip)
- Myotis spp.
- Unidentified
- Listening Stop (July 2013)
- Start of Transect
- End of Transect

Note: These maps only show the areas where a bat survey was carried out. Therefore, the entire overhead line route will not be shown on this series of maps.



Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 6K BAT SURVEY RESULTS JULY 2013 (SHEET 11 OF 11)

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| Date: 14/11/2013 | Scale: 1:5,000 @ A3 |

No: 60032220/3528/6K

Figures Series 7 – Location of trees and buildings assessed for bat roost potential

Figures 7A to 7S




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7A TREES AND BUILDINGS ASSESSED FOR BAT ROOST POTENTIAL (SHEET 1 OF 19)

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No: 60032220/3528/R1




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7B TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 2 OF 19)

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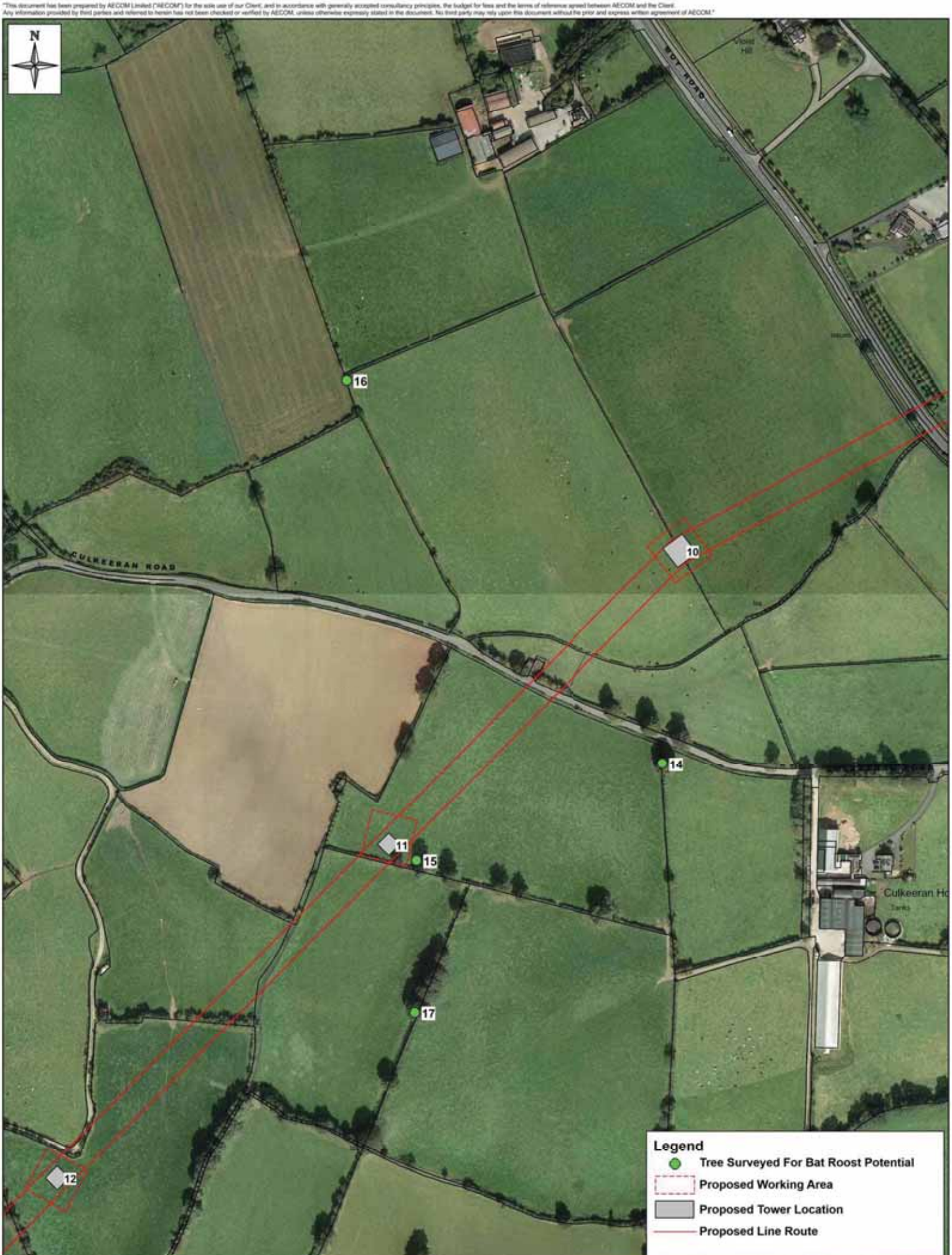
| Date: 22/11/2013 | Scale: 1:2500@A3 |

No: 60032220/3528/R2






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7C TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 3 OF 19)

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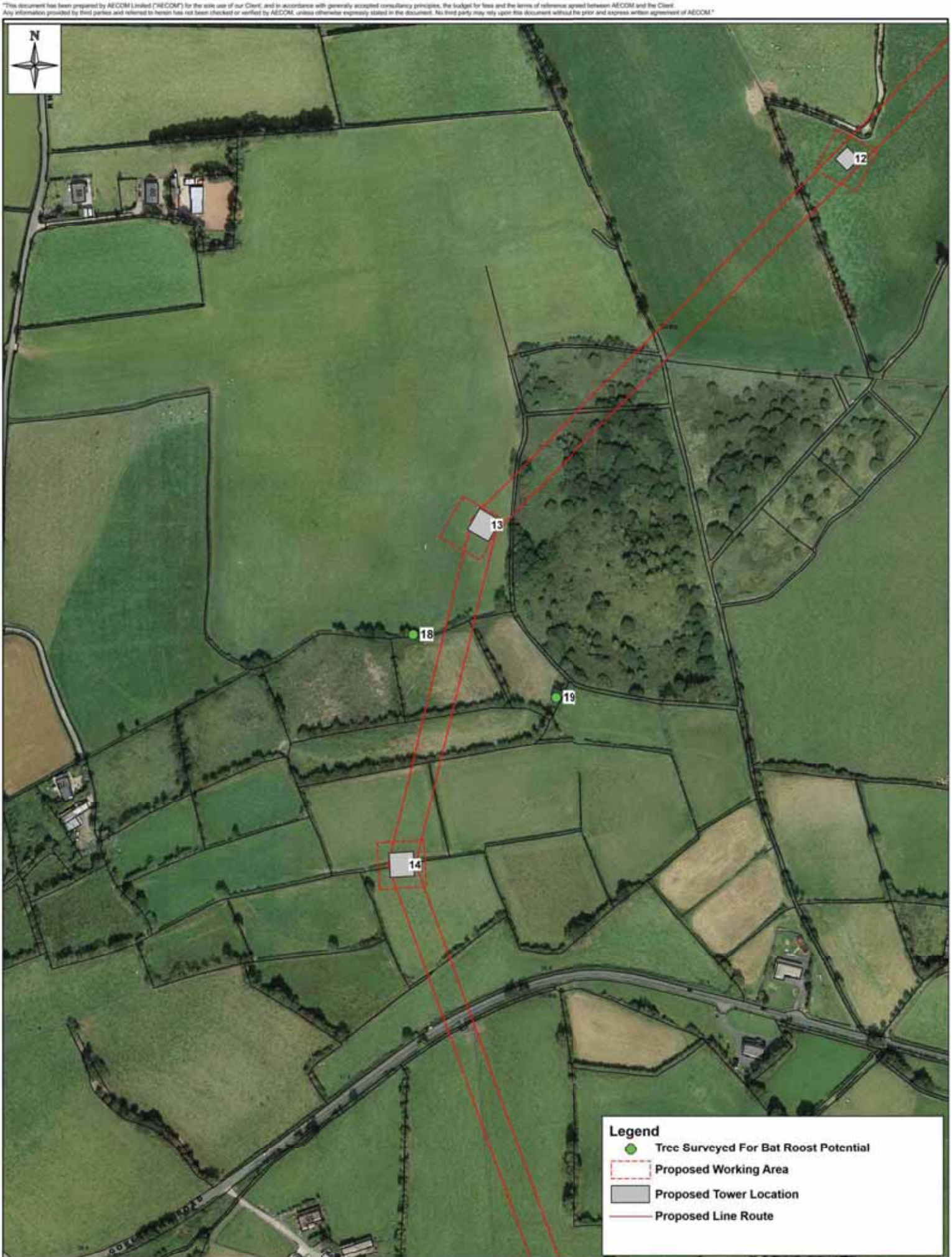
No: 60032220/3528/R3






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7D TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 4 OF 19)

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| Date: 22/11/2013 | Scale: 1:2500@A3 |

No: 60032220/3528/R4




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7E TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 5 OF 19)

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No: 60032220/3528/R5




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7F TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 6 OF 19)

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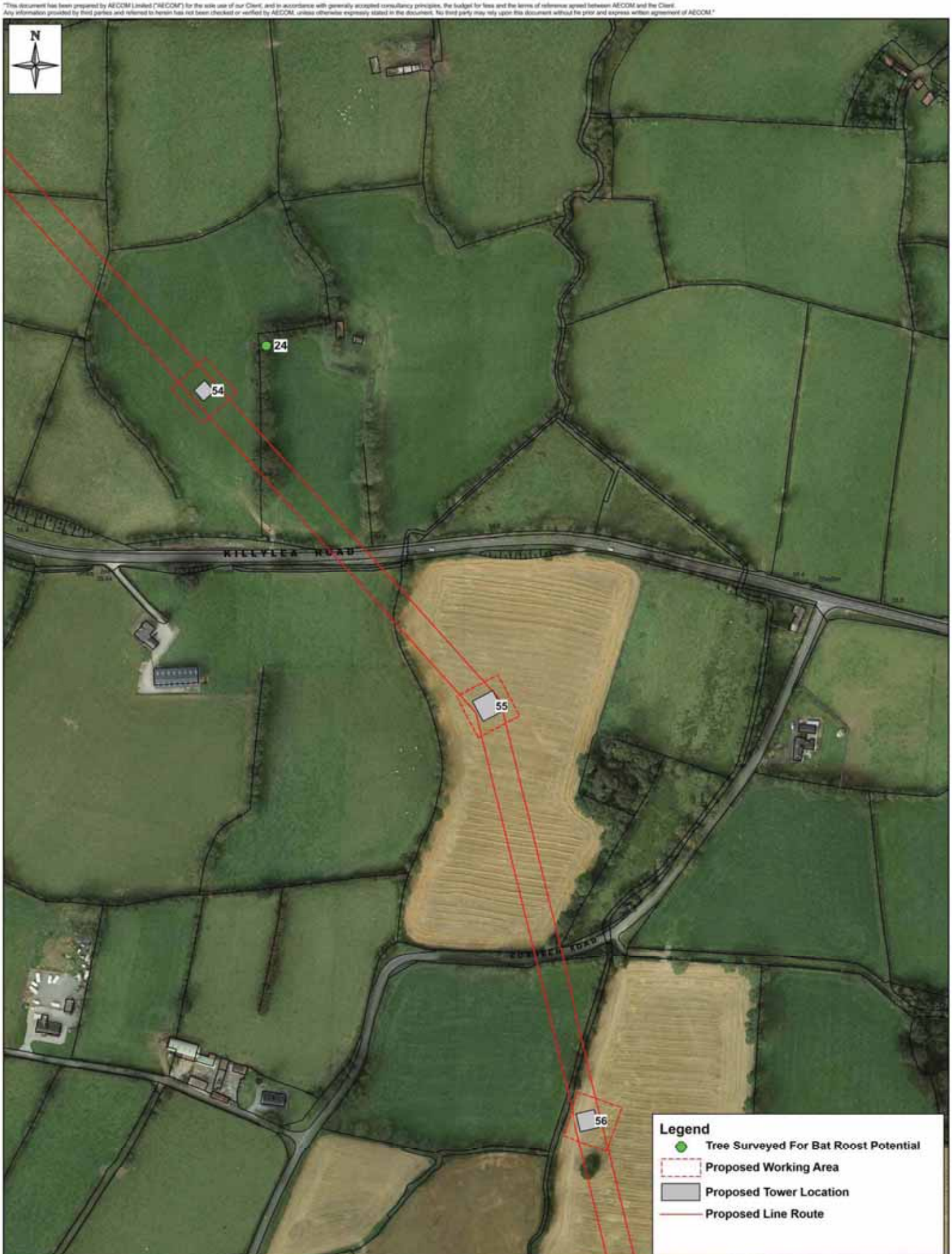
No: 60032220/3528/R6






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7G TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 7 OF 19)

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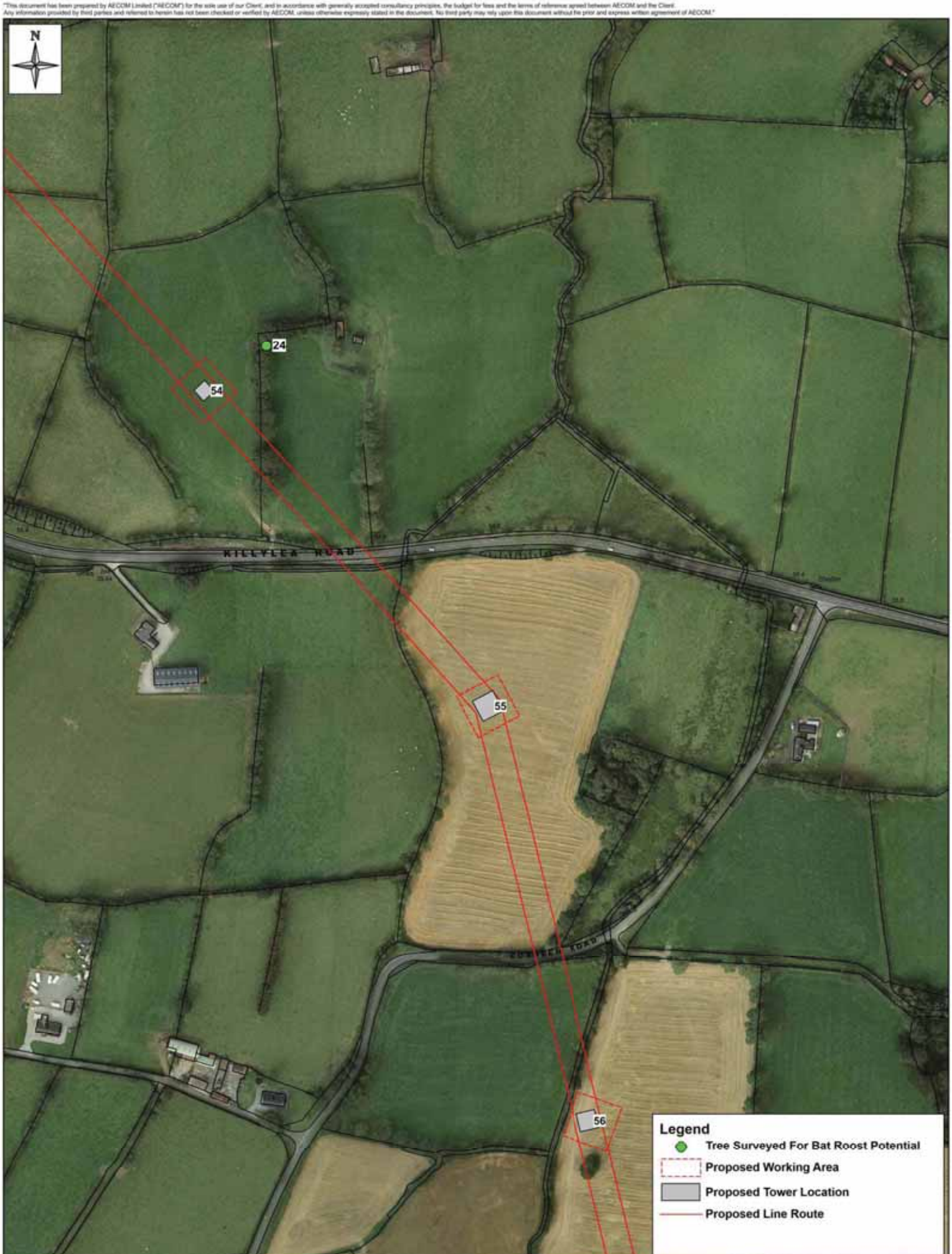
No: 60032220/3528/R7






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7H TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 8 OF 19)

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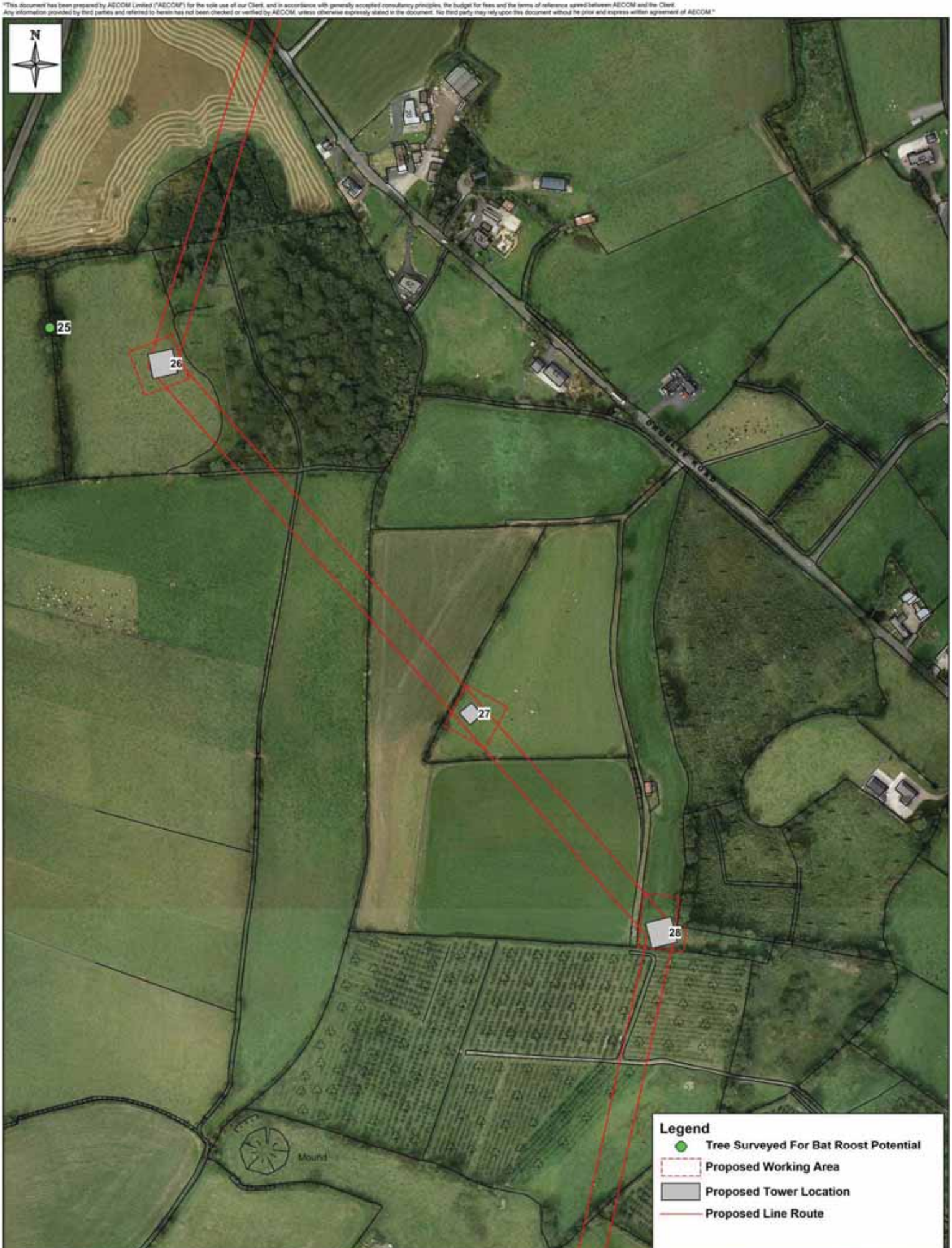
No: 60032220/3528/R8






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7I TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 9 OF 19)

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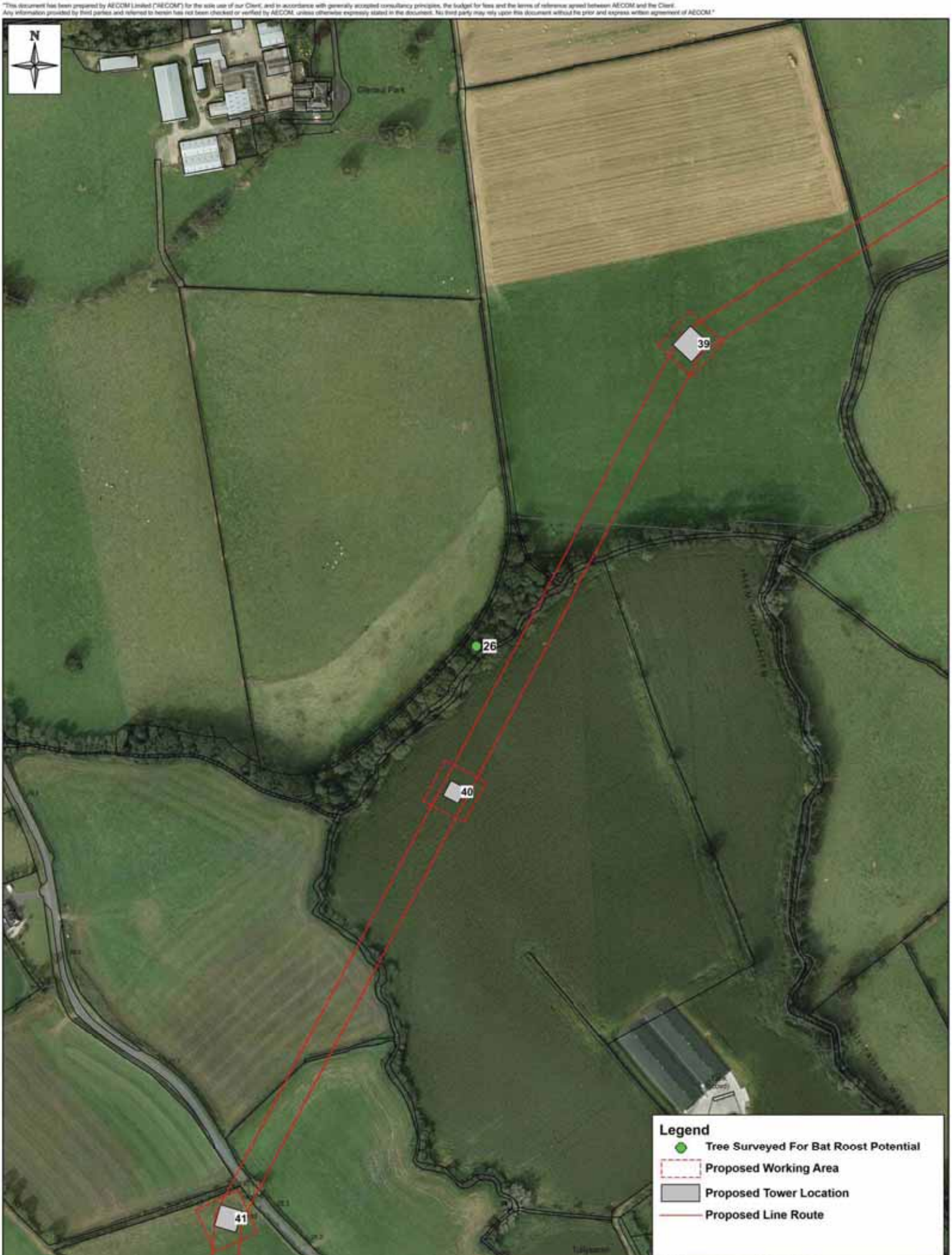
No: 60032220/3528/RI






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7J TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 10 OF 19)

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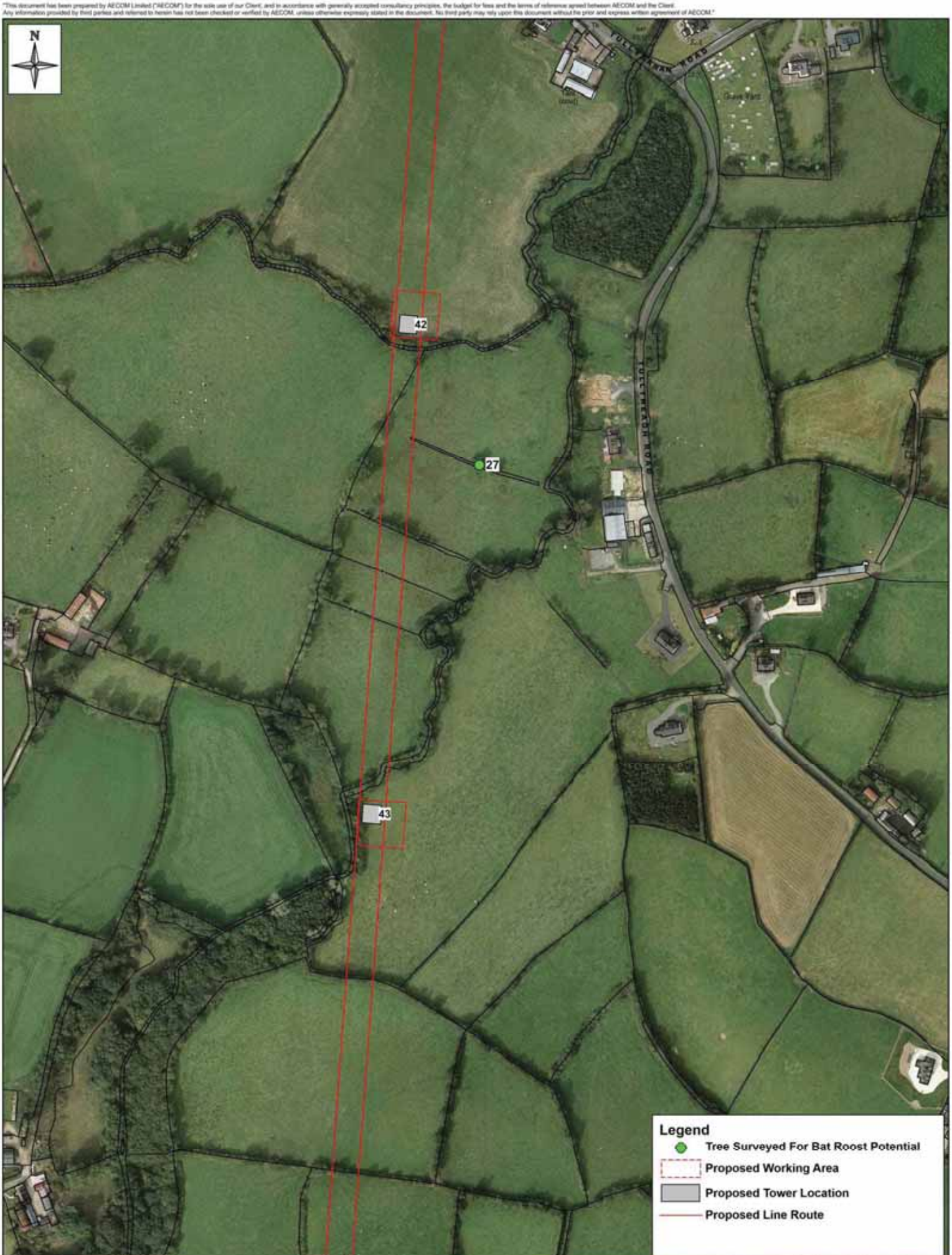
| Date: 22/11/2013 | Scale: 1:2500@A3 |

No: 60032220/3528/R10






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7K TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 11 OF 19)

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No: 60032220/3528/R11




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7L TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 12 OF 19)

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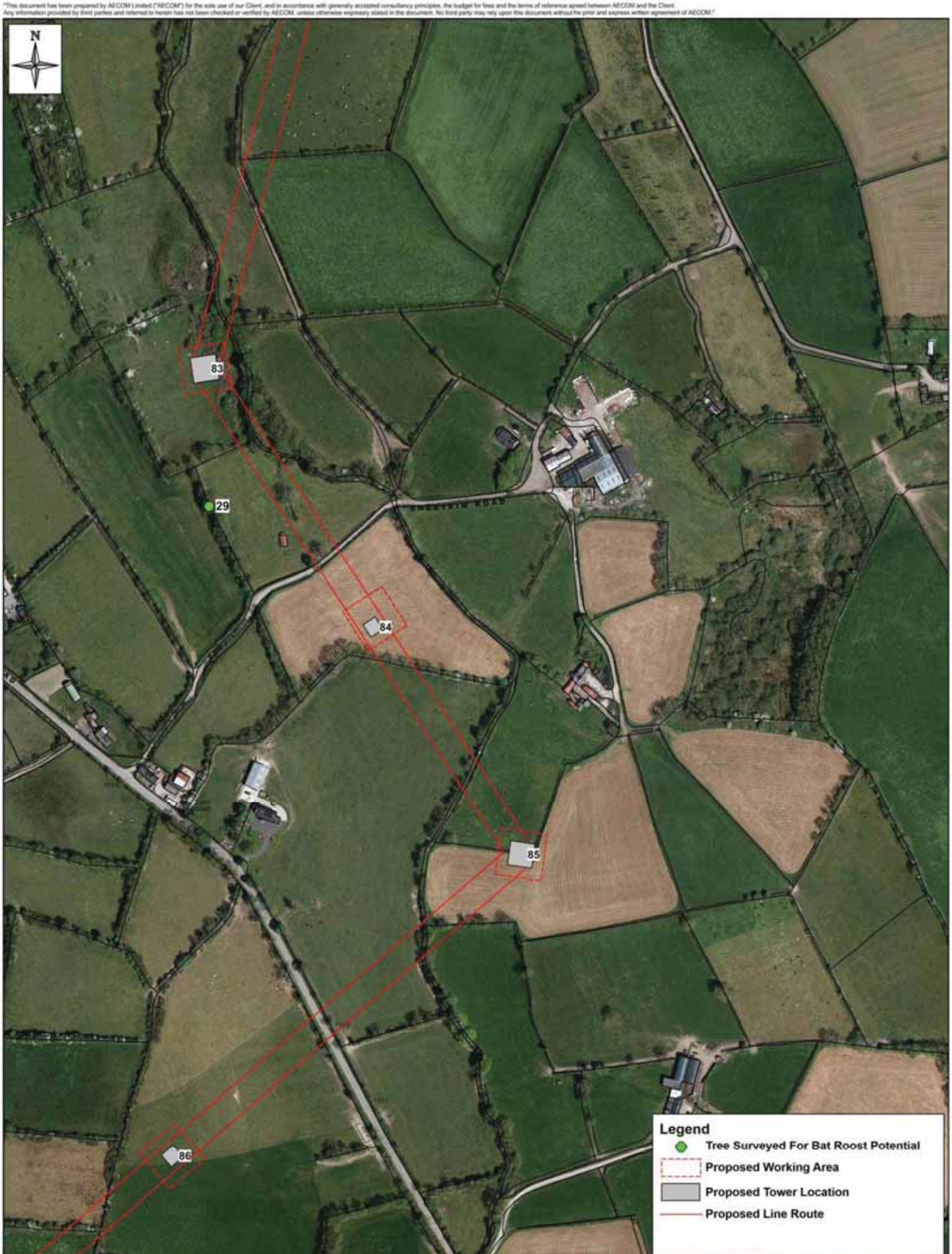
| Date: 22/11/2013 | Scale: 1:2500@A3 |

No: 60032220/3528/R12






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7M TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 13 OF 19)

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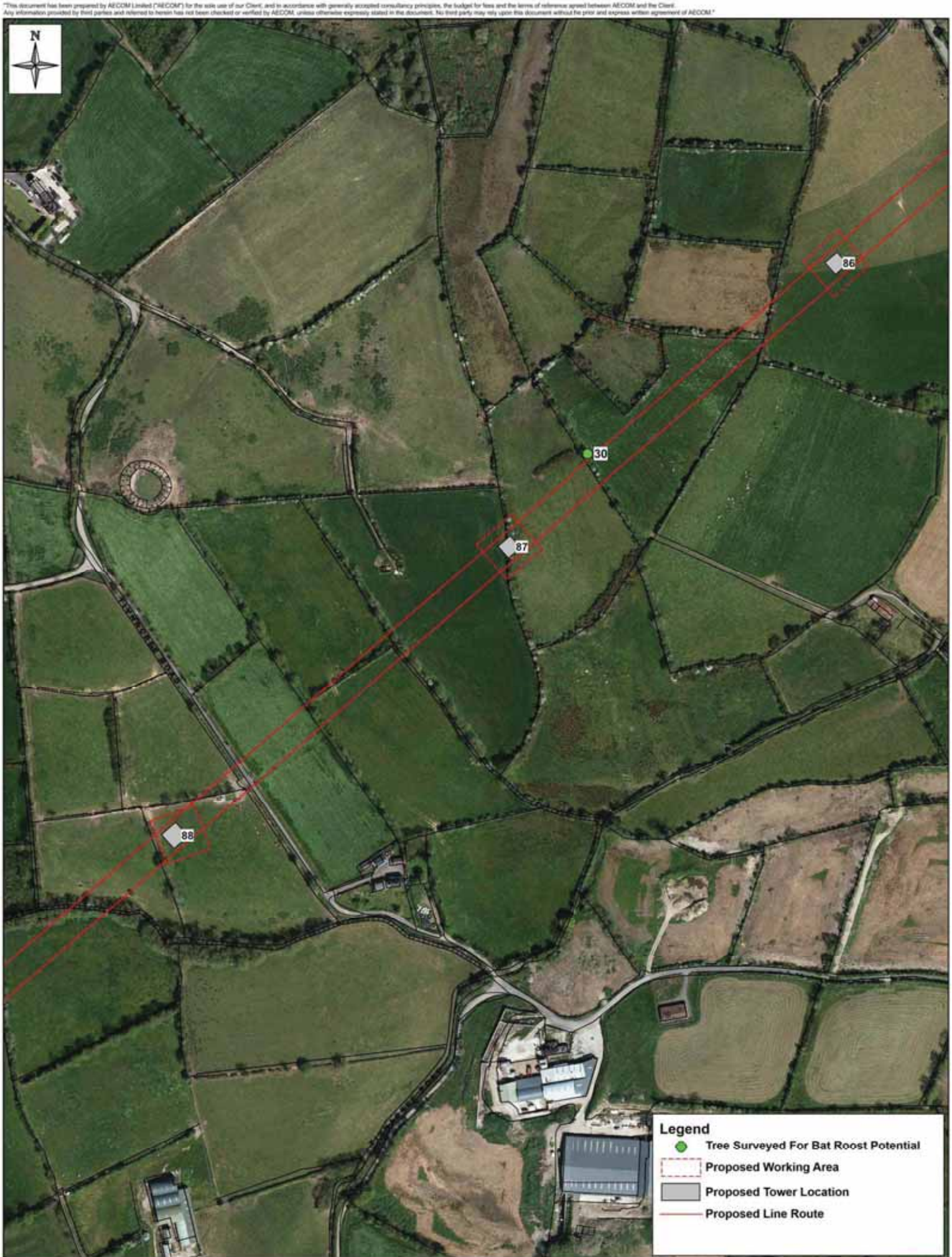
No: 60032220/3528/R13






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7N TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 14 OF 19)

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No: 60032220/3528/R14




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7O TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 15 OF 19)

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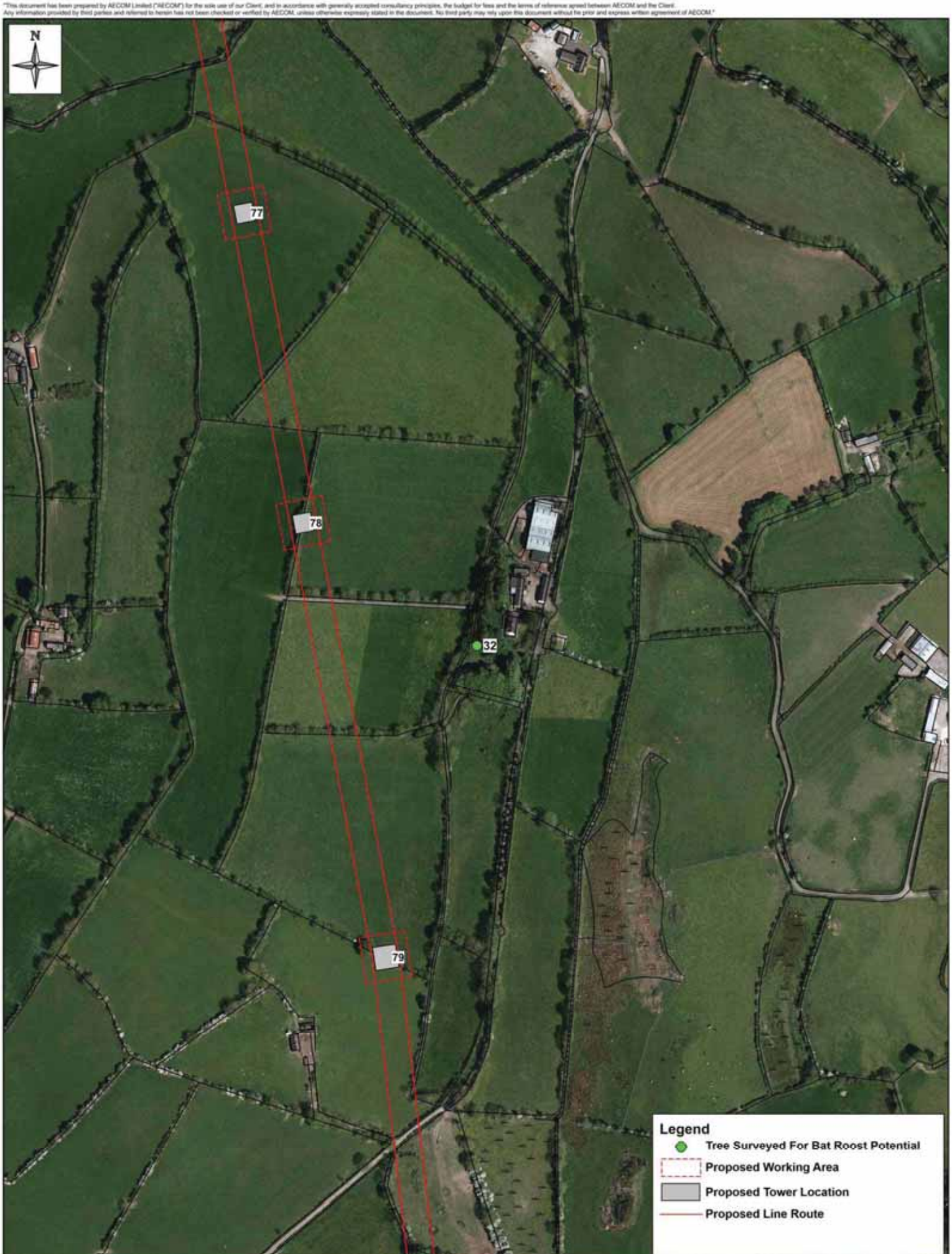
No: 60032220/3528/R15






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7P TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 16 OF 19)

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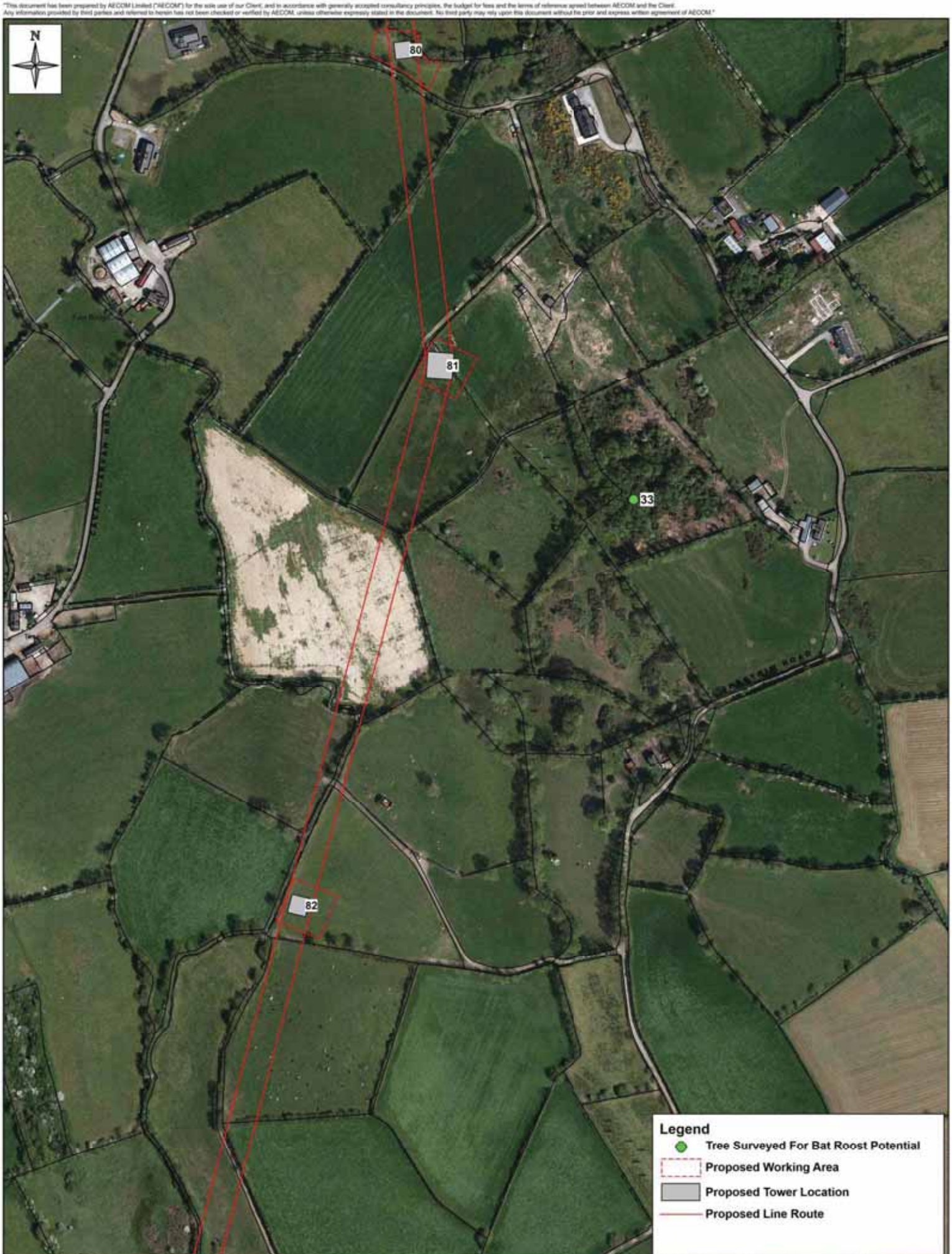
No: 60032220/3528/R16






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7Q TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 17 OF 19)

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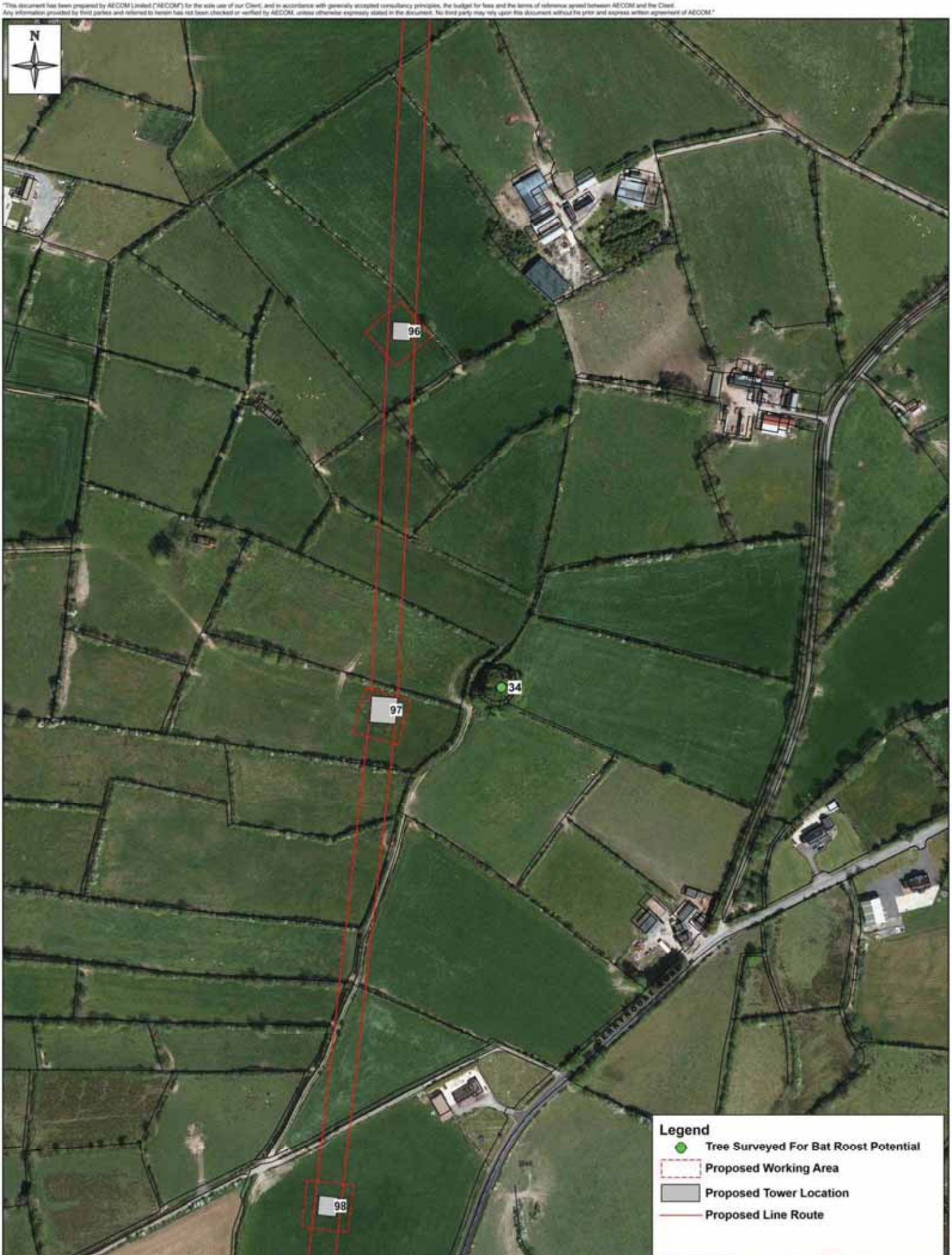
No: 60032220/3528/R17






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7R TREES ASSESSED FOR BAT ROOST POTENTIAL (SHEET 18 OF 19)

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No: 60032220/3528/R18


**Legend**

- Tree Surveyed For Bat Roost Potential
- Proposed Working Area
- Proposed Tower Location
- Proposed Line Route



Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 7S TREE ASSESSED FOR BAT ROOST POTENTIAL (SHEET 19 OF 19)

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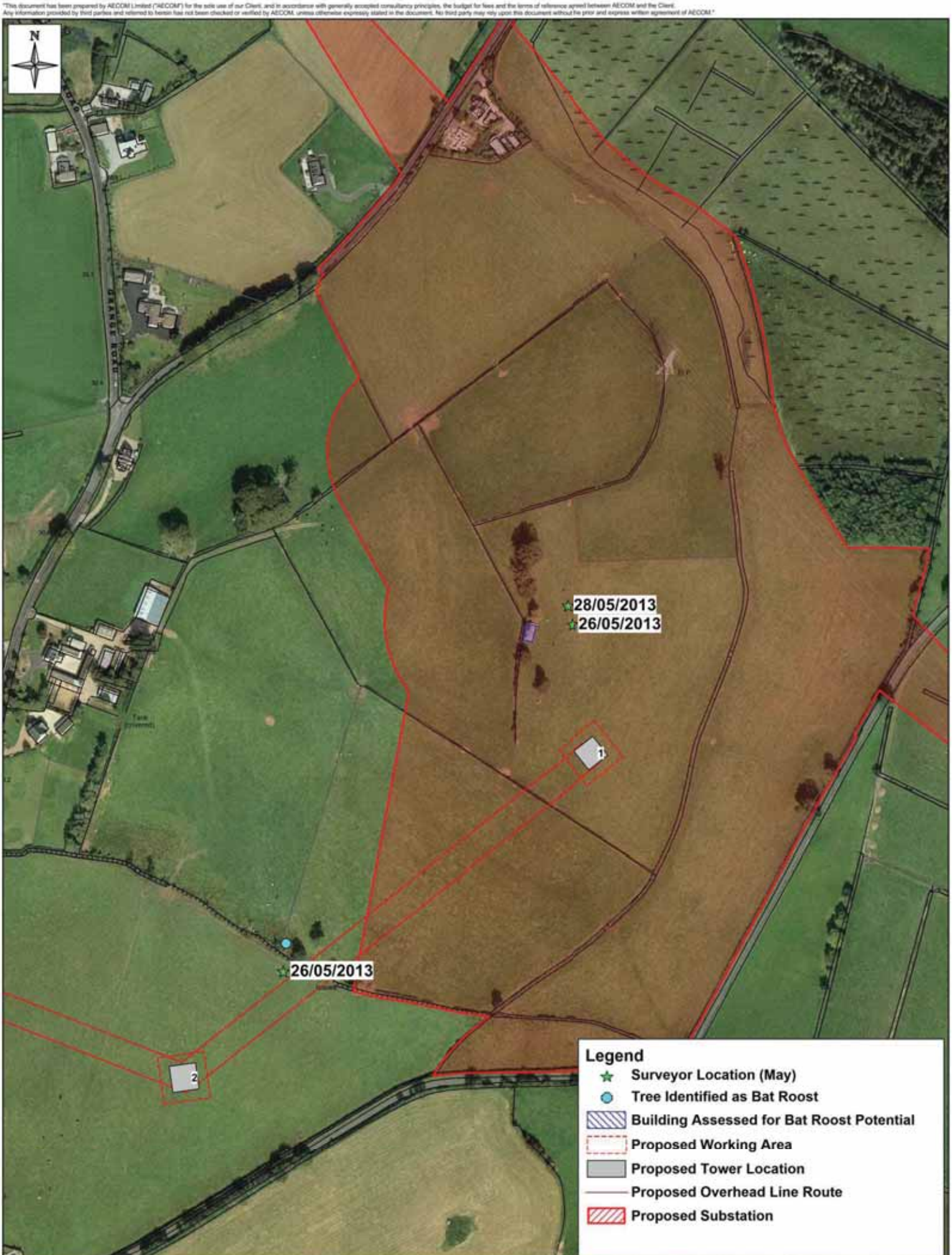
No: 60032220/3528/R19

Figures Series 8 – Bat Roost Surveyor Locations

Figures 8A to 8E






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 8A SURVEYOR LOCATIONS DURING ROOST WATCH MAY 2013 (SHEET 1 OF 5)

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No: 60032220/3528/RM1




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 8B SURVEYOR LOCATIONS DURING ROOST WATCH MAY 2013 (SHEET 2 OF 5)

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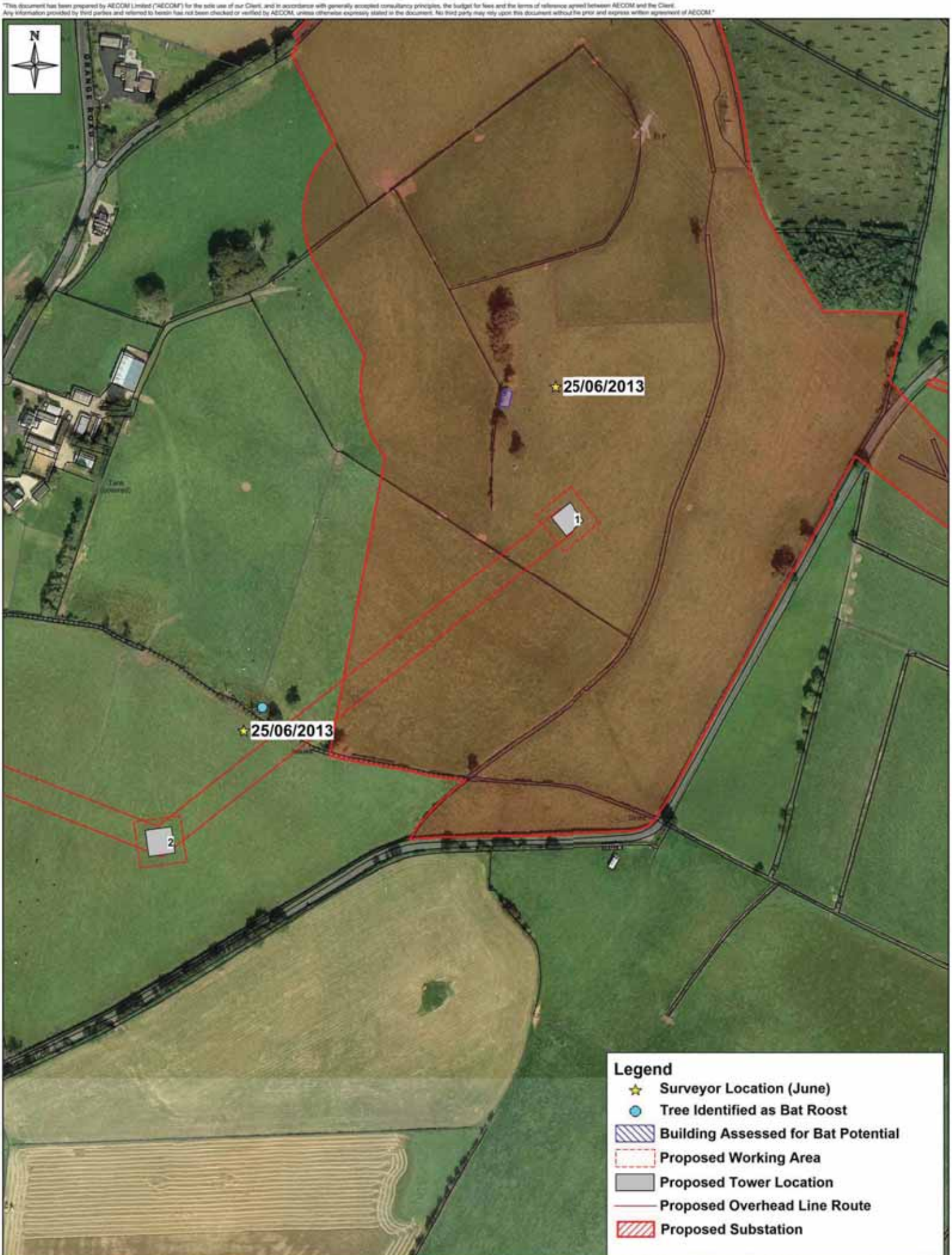
No: 60032220/3528/RM2






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 8C SURVEYOR LOCATIONS DURING ROOST WATCH JUNE 2013 (SHEET 3 OF 5)

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No: 60032220/3528/RM3




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 8D SURVEYOR LOCATIONS DURING ROOST WATCH JUNE 2013 (SHEET 4 OF 5)

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No: 60032220/3528/RM4




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 8E SURVEYOR LOCATIONS DURING ROOST WATCH JUNE 2013 (SHEET 5 OF 5)

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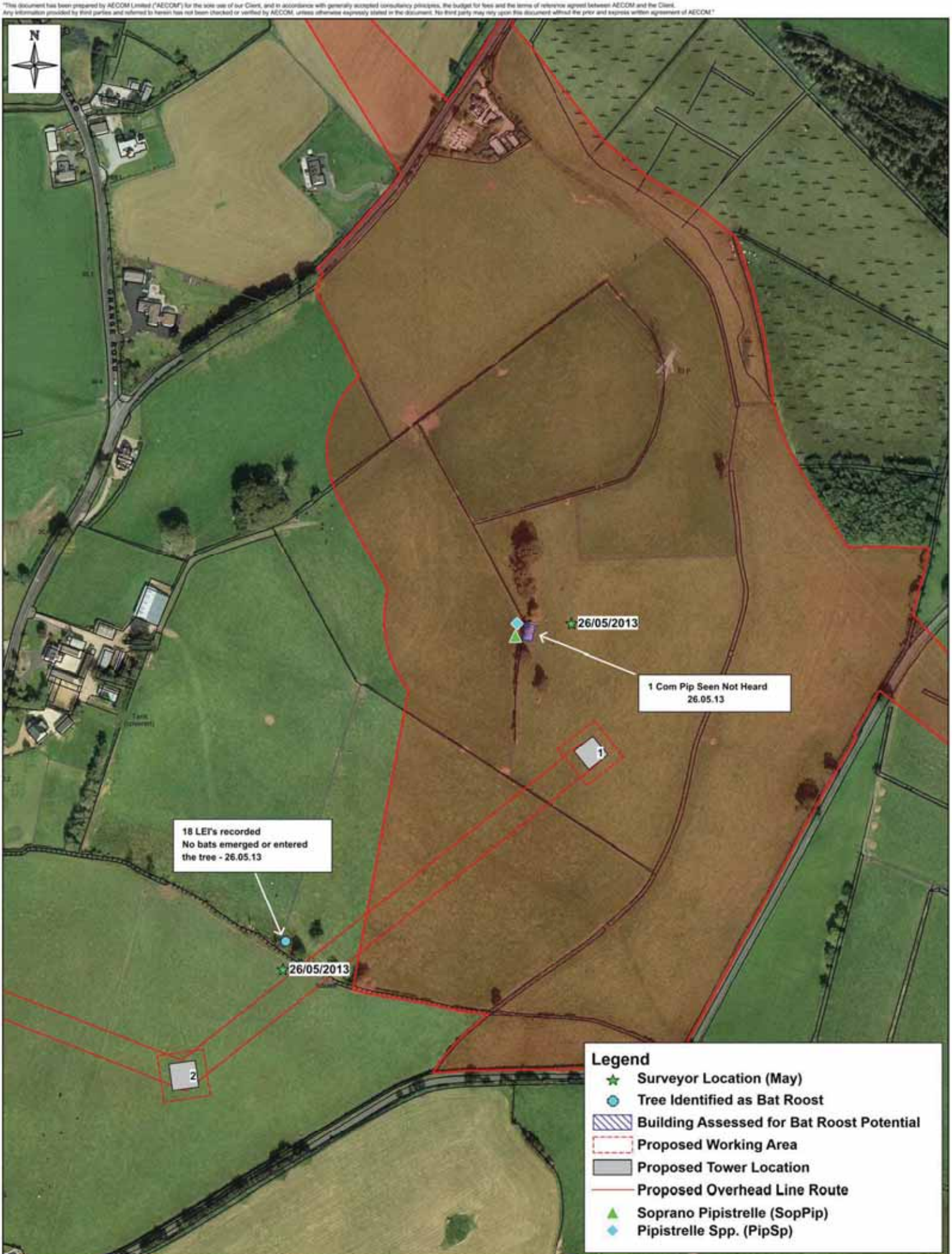
No: 60032220/3528/RM5

Figures Series 9 – Bat Roost Survey Results

Figures 9A to 9C






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 9A ROOST WATCH BAT RESULTS MAY 2013 (SHEET 1 OF 3)

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9th Floor
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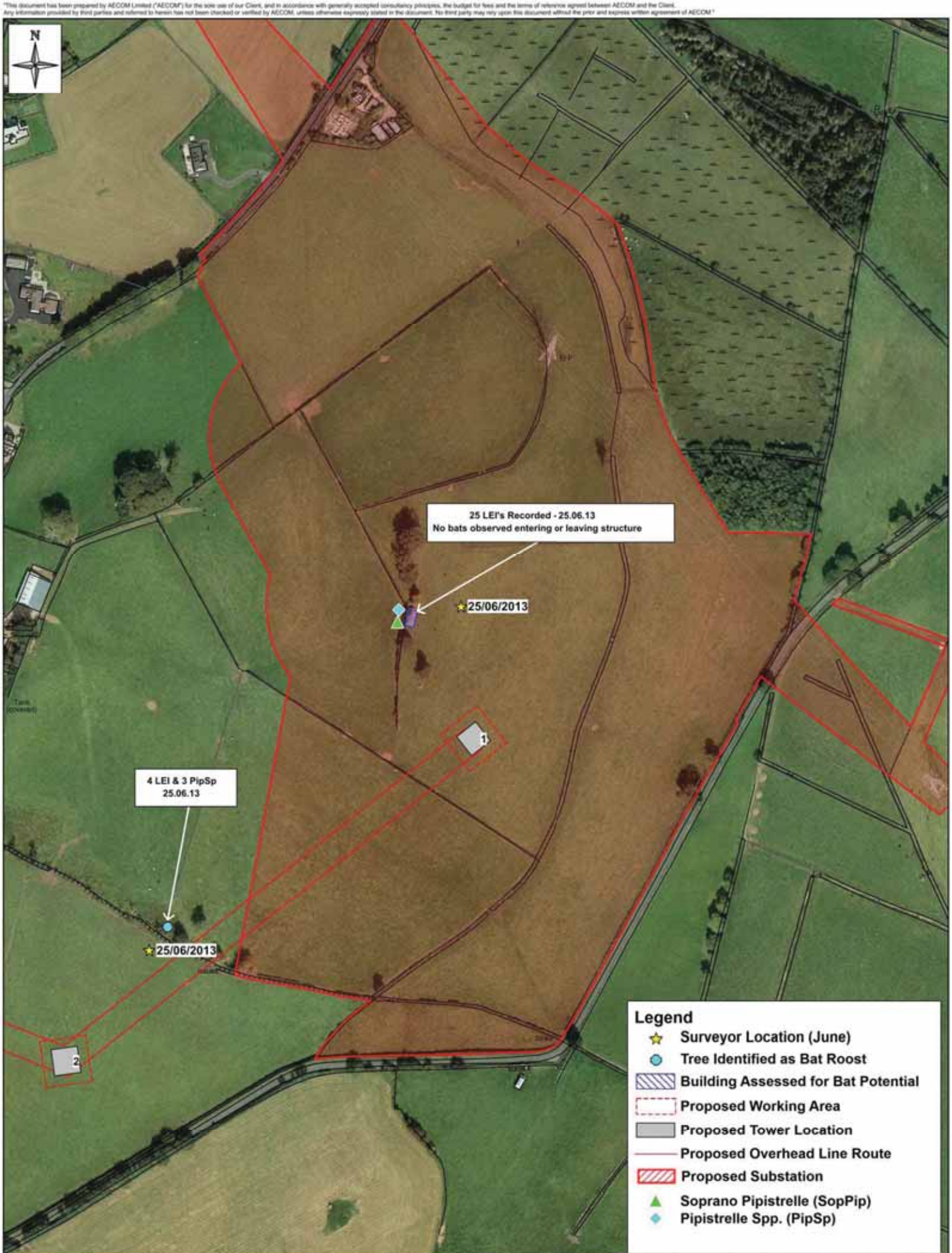




Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 9B ROOST WATCH BAT RESULTS JUNE 2013 (SHEET 2 OF 3)

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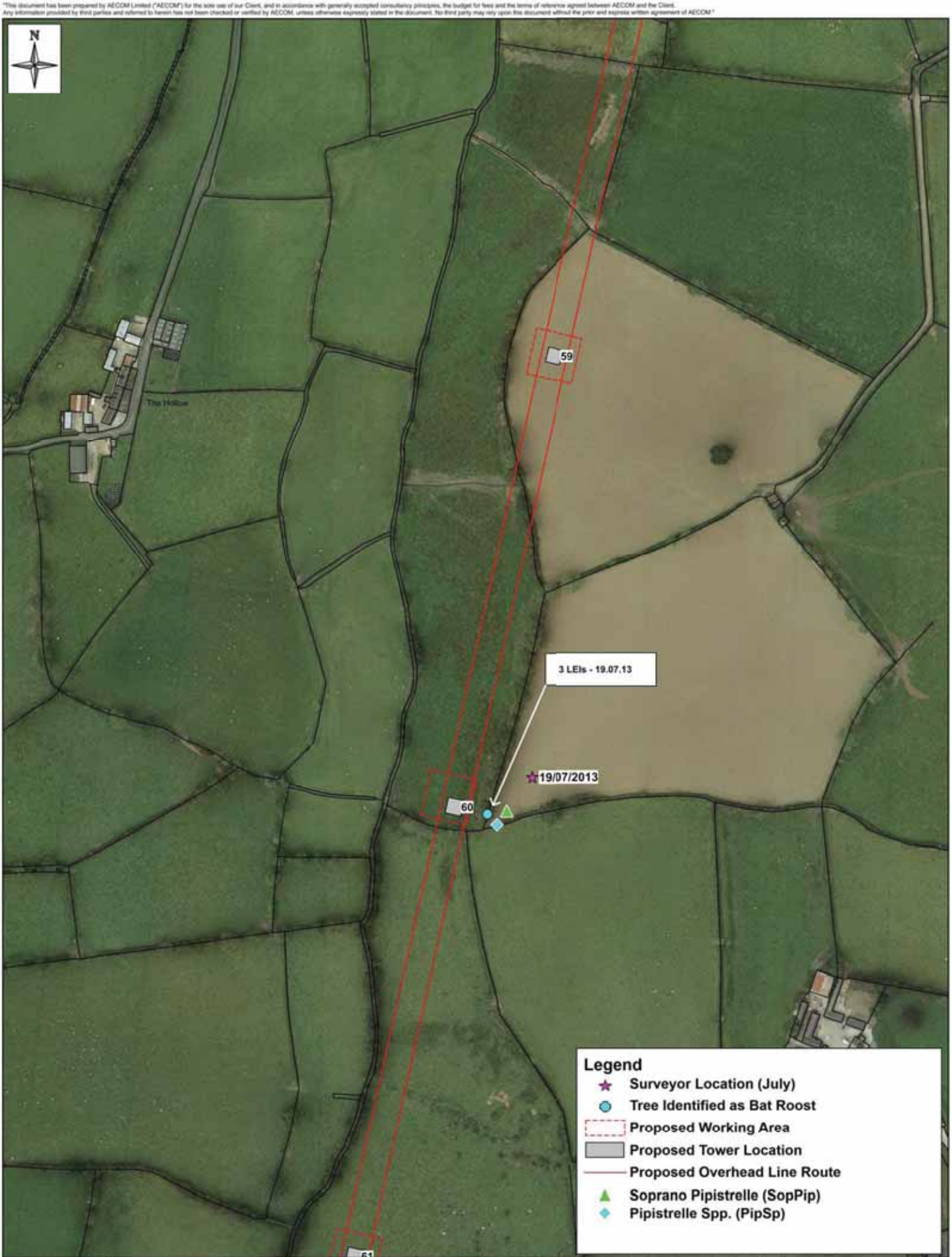
No: 60032220/3528/9B






Client: Northern Ireland Electricity

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 9C SURVEYOR LOCATIONS ROOST WATCH RESULTS JULY 2013 (SHEET 3 OF 3)

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| Chk'd: GB | App'd: KW |
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No: 60032220/3528/9C