

# **Environmental Impact Assessment Report (EIAR)**

## **Volume 6 of 6: Appendices**

### **(Appendix 8.5) Rare Plant Surveys Report**

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**A Survey of Rare Plant Occurrence Along the Proposed Route of  
the Water Supply Project Eastern and Midlands Region**

**Conducted on behalf of TOBIN by Enviroscope Environmental Consultancy**

**Final Version**

**January 2025**

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## 1. Introduction

1. A survey of potential sites for rare plant species occurring along the route of the Water Supply Project Eastern and Midlands Region (the Proposed Project) and previous iterations of the project, was undertaken in August 2022, May and June of 2023, and August 2024.
2. The aim of these surveys was to check for the occurrence of rare flora species within the Proposed Project, i.e., plant species under the 2022 Flora Protection Order (FPO) and Irish Red List (Curtis & McGough [1988], Government of Ireland [2015], and Wyse Jackson *et al.*, [2016]).

## 2. Methods

3. The areas selected for survey were initially identified as part of a desktop study carried out in early 2022 by Dr. Peter Foss on behalf of Wetland Surveys Ireland for TOBIN, to review the distribution and occurrence of the 68 species listed as FPO species on the 2015 Flora Protection Order Schedule (Government of Ireland, 2015), and the 106 species listed on the Ireland Red List (Wyse Jackson *et al.*, 2016), and identify areas as having potential habitat to support rare plant species. A subsequent review was undertaken by Enviroscope Environmental Consultancy of the species listed as FPO species on the 2022 Flora Protection Order Schedule (Government of Ireland, 2022). Only one of the new species listed on the 2022 FPO (i.e. *Pyrola minor*) has been recently recorded close to the Proposed Project. The remaining new species have not been recorded near the Proposed Project, and in most cases, there is no potential habitat for these species to occur within the Proposed Project as many only grow in upland or coastal habitats. *Pyrola minor* is a species of woodland and/or scrub habitat and therefore it is very unlikely to occur within the Proposed Project as the hectad in which it is known to occur (one recent record for hectad S19, approximately 3km northeast of Roscrea, and greater than 1km from the Proposed Project), goes through mainly grassland areas within the Proposed Project. In August 2024 two areas of woodland in County Offaly, which occur within and adjoining the Proposed Project, were checked for the possible occurrence of *Pyrola minor*.
4. The methodology followed during the desktop study of the occurrence of rare flora species along the route of the Proposed Project and previous iterations of the project was as follows:
  - Species distribution data held by National Biodiversity Data Centre (NBDC) for the twenty-six hectads (10x10km square with associated unique letter code) and tetrads (2x2km square with associated unique letter code) through which the Proposed Project and previous iterations of the project crosses, were downloaded in April 2022. The data presented by NBDC on 'Threatened Species' was amalgamated to show all hectads a rare species occurred in. Rare flora data on the NBDC dataset is based on that included in the Irish Red Data Book (Curtis & McGough, 1988), which in some cases includes species now considered to be near threatened (NT) or of least concern (LC) or on the waiting list (WT) as defined by Wyse Jackson *et al.* (2016). Distribution for all species on the Ireland Red List (Wyse Jackson *et al.*, 2016) were subsequently reviewed to assess their occurrence within the hectads crossed by the Proposed Project.
  - Distribution data held by the Botanical Society of Britain & Ireland (BSBI) for all FPO and Ireland Red List species were also reviewed in April 2022 to ensure that all relevant distribution information was captured (i.e., for certain species either older record data or more recent 2010-2020 data and post 2020 data is presented in BSBI dataset, but not included in the NBDC dataset).
  - Where a species was recorded within a hectad(s) and/or tetrad(s) crossed by the Proposed Project, on either the NBDC or BSBI datasets, habitat data as well as general national distribution data was sourced from that provided in Parnell & Curtis (2012). A review of suitable habitat for the species within the Proposed Project was then undertaken based on

habitat mapping and interpretation of aerial photography. The results from this were used to inform the site selection for surveys undertaken in August 2022, May/June of 2023, and August 2024.

5. During the surveys undertaken, the areas along the Proposed Project route and previous iterations of the project were generally walked for periods of between one and four hours, depending on the area to be surveyed and ease of access/location of the site. A brief description of the habitats present was recorded and searches were focussed in areas of apparently suitable habitat identified during the desktop study. When a target species was located, grid references (Irish Grid) were recorded using GPS and the size of the population was estimated. It should be noted, in addition to the surveys of potential sites for rare plant species, botanical and habitat surveys were also undertaken during multidisciplinary walkover surveys along the length of the Proposed Project, as well as targeted habitat surveys. Details of these surveys are outlined in the EIAR Chapter 8 (Biodiversity).

### 3. Results

6. Of the 142 listed species reviewed during the desktop study, 24 FPO and Red Listed species were recorded on the NBDC mapping system; five of these are FPO species, while the remaining 19 are Red Listed. The BSBI mapping scheme listed 40 FPO and Red Listed species; 16 of which were FPO species while the remaining 24 species are Red Listed. In total 43 FPO or Irish Red List flora species were recorded in the NBDC or BSBI datasets as occurring within a hectad forming part of the Proposed Project. One or more FPO and/or Irish Red List flora species have been recorded in every hectad along the Proposed Project.
7. Following a review of suitable habitat within the Proposed Project for these listed species, surveys were recommended for 10 rare species recorded in the hectads along the Proposed Project (eight FPO and two Red Listed) (Table 1). In 2022, a new Flora Protection Order was released by the Department of Housing, Local Government and Heritage and it is noted that one of the species of interest, i.e. *Clinopodium acinos*, is not listed as protected, presumably due to recent information regarding its wider distribution in Ireland.

**Table 1: Rare Species that were Considered to Require Surveys Based on Available Distribution Data and Habitat Availability, with Comments on Targeted Survey Recommendations for the Proposed Project**

Species Name	Location of Suitable Habitat Within the Proposed Project	Status FPO Species	Overall Survey Recommendation	Targeted Survey Comment
Basil thyme ( <i>Clinopodium acinos</i> )	Suitable habitat occurs along the Proposed Project in hectads(s): N52, N62 and possibly in N21, N72, N73	Yes in 2015 FPO but not included in 2022 FPO	Survey recommended due to status of species on the 2015 FPO.	Species appears to be present along significant stretches of route corridor in N52, N62, N72, N73, N21. Hectad surveys should focus on exposed sand, gravel or till along Proposed Project, in quarries, borrow pits and railway or road embankments, especially within Bord na Móna (BnM) works areas and along gravel railway line foundations where plant was recorded by BnM staff in 2018.
Green-flowered helleborine ( <i>Epipactis phyllanthes</i> )	Suitable habitat may occur along the Proposed Project in hectads(s): N00	No	Although not listed as FPO species, survey recommended due to occurrence along route and endangered status of species on Irish Red List.	Additional survey of Proposed Project in the following hectad(s) recommended: N00: S, X and N10: C. Plant previously record by BSBI centred in Birr Castle Demesne area (2000-2009). Habitats include calcareous substrates in scrub, and in beech, oak, and conifer forests.
Slender cotton grass ( <i>Eriophorum gracile</i> )	Suitable habitat occurs along the Proposed Project in hectads(s): S09	Yes	Survey recommended due to status of species on the FPO.	Additional survey of Proposed Project in hectad / tetrad S09: A, recommended on Derrinclare wetland for the occurrence of this species. Habitat conditions likely to be suitable. S09 hectad record for plant from the lagg area on Sharavogue Bog SAC (see The Living Bog website). Derrinclare fen/cutover is located 7km southwest of Sharavogue Bog. Derrinclare cutover was focus of previous Proposed Project surveys and contains significant areas of similar wet fen and bog vegetation.
Red hemp nettle ( <i>Galeopsis angustifolia</i> )	Suitable habitat may occur along the Proposed Project in hectads(s): N62	Yes	Survey recommended due to status of species on the FPO.	Additional survey of Proposed Project in hectad N62 recommended in tetrads E to Z and D to Y. Survey of this species should focus on exposed sand, gravel or till along Proposed Project, on eskers, in quarries, borrow pits and railway or road embankments, especially within BnM works areas. Survey could be undertaken at same time as survey for <i>Clinopodium acinos</i> , which has similar habitat requirements and also occurs in this hectad.

Species Name	Location of Suitable Habitat Within the Proposed Project	Status FPO Species	Overall Survey Recommendation	Targeted Survey Comment
Opposite-leaved pondweed ( <i>Groenlandia densa</i> )	Suitable habitat occurs along the Proposed Project in hectads(s): N42, N72, N93	Yes	Survey recommended due to status of species on the FPO.	Additional survey of Proposed Project in the following hectad/tetrads(s) recommended: N42: A, F, K, L; N72: E and N93: A to V. Key sites for targeted surveys in these hectads would be the aquatic environment in the Grand Canal (N72 near Geashill; N93 near Colganstown / Ringwood) and River Liffey (N93 in Reeves, Friarstown, Castledillon Upper and Ardrass Upper). In N42 some smaller river stretches may merit survey in the following townlands Cloncogher and Ballyduff South.
Hairy St. John's wort ( <i>Hypericum hirsutum</i> )	Suitable habitat occurs along the Proposed Project in hectads(s): N93	Yes	Survey recommended due to status of species on the FPO and recent records from these hectads.	Additional survey of Proposed Project in the following hectad recommended: N93. Key sites for targeted surveys in this hectad would be woods and shady places near the River Liffey (N93 in Reeves, Friarstown, Castledillon Upper and Ardrass Upper), tetrad K.
Green-winged orchid ( <i>Orchis morio</i> ; new name <i>Anacamptis morio</i> )	Suitable habitat occurs along the Proposed Project in hectads(s): N10, N21, R76, R66 and possibly N41, N42, N52, N62, R88, S09, N92 and N93.	No	Although not listed as FPO species, this orchid is listed as Vulnerable on the Irish Red List (2016). Additional survey of Proposed Project in the following hectad(s) recommended.	Additional survey of Proposed Project in the following hectad(s) recommended: N10, N21, R76, R66. Orchid grows in unimproved grassy meadows, especially on limestone-rich soil and sand hills. Although not recorded on Proposed Project surveys undertaken to date, the early flowering time and erratic flowering of the plant in April to May may have resulted in the species being overlooked on previous surveys.
Betony ( <i>Stachys officinalis</i> )	Suitable habitat may occur along the Proposed Project in hectads(s): R88	Yes	Survey recommended due to status of species on the FPO and recent records from this hectad.	Additional survey of Proposed Project in the following hectad recommended: R88. Plant is found in dry grassland, meadows and open woods or bushy places. Sometimes associated with old habitation. In hectad R88 such habitat may occur along route in Ardcroney, Loughourna, Ballycommon and Ballyannymore townlands, tetrads G, L, S, Y.

Species Name	Location of Suitable Habitat Within the Proposed Project	Status FPO Species	Overall Survey Recommendation	Targeted Survey Comment
Bog orchid ( <i>Hammarbya paludosa</i> )	No suitable habitat occurs along the Proposed Project in hectads where species was recorded. Bogs along route all drained and mechanically cut, with exception of small intact bog at N73: L. This tetrad is adjacent to previous tetrad record for this species.	Yes	Survey recommended due to status of species on the FPO. Additional survey of Proposed Project in the following hectad(s) recommended N73: tetrad L.	Autumn survey (mid-September) of intact bog in hectad / tetrad N73: L recommended, especially larger Sphagnum pools and flush areas previously recorded during Proposed Project surveys of this site, approximately 340m northwest of the Proposed Project.
Annual Knawel ( <i>Scleranthus annuus</i> )	It grows in soil pockets among rocks, on bare places, on disturbed sandy soil on heaths, in arable fields, in sand pits, in quarries, and occasionally on shingle on the coast or beside rivers.	Yes	Survey recommended due to status of species on the FPO and listed as Vulnerable on the Irish Red List (2016). Additional survey of Proposed Project recommended in R66.	Additional survey of Proposed Project recommended in hectad R66; tetrads T & S in quarry areas.

8. In total, 53 areas along the Proposed Project and previous iterations of the project, identified as having potential habitat for rare plant species, were mapped (Annex A). These areas contained 40 linear features and 35 polygon features. The features were reviewed and prioritized based on their proximity to the Proposed Project. Areas of high priority included features within the Proposed Project, areas of medium priority included features just within or adjacent to the Proposed Project, and areas of low priority included features outside the Proposed Project. In total 40 high priority areas were identified along the Proposed Project, as areas to be surveyed. Of these 15 were surveyed in August 2022 with the remaining 25 surveyed in May and June of 2023. Two of the 40 sites surveyed were surveyed again in 2024 to check for *Pyrola minor* (a species newly added to the FPO list in 2022).
9. The results of the surveys are presented in Table 2. A total of four populations of *Clinopodium acinos* were found during the surveys. These populations were found growing on exposed, sparsely vegetated mineral soils at Mount Lucas Wind Farm, County Offaly, and Cushaling and Ticknevin, County Kildare. At all of these sites the species was found growing on old bog railway lines which occur on well-drained and calcareous mineral soils. These old bog railway ridges also support a number of other plant species which are indicative of species-rich calcareous grassland vegetation such as *Reseda lutea*, *Tragopogon pratensis*, *Briza media*, *Leontodon hispidus*, *Primula veris*, *Poterium sanguisorba*, *Neottia ovata* and *Anacamptis pyramidalis*. As these populations occur in close proximity to the Proposed Project corridor, it is recommended that translocation and/or avoidance measures be put in place.



**Image 1: Location of a *Clinopodium Acinos* Population at Mount Lucas Shown in Yellow Shading (75m Buffer Area Around the Project Boundary at the Time of Survey is Outlined in Red).**



Image 2: Location of a *Clinopodium acinos* Population at Ticknevin in Yellow Shading (75m Buffer Area Around the Project Boundary at the Time of Survey is Outlined in Red).



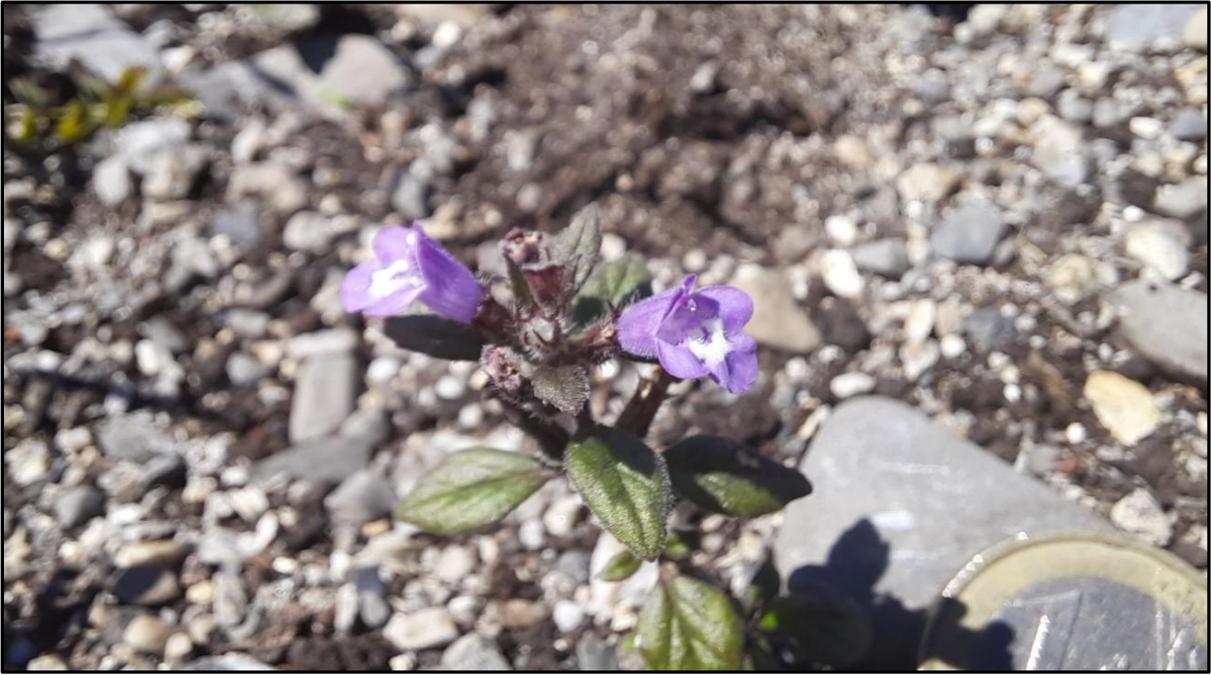
Image 3: Location of a *Clinopodium acinos* Population at Cushaling in Yellow Shading (75m Buffer Area Around the Project Boundary at the Time of Survey is Outlined in Red).



Image 4: Location of a *Clinopodium acinos* Population at the Western Margin of Mount Lucas Wind Farm in Yellow Shading (75m Buffer Area Around the Project Boundary at the Time of Survey is Outlined in Red).



Photo 1: The Habitat of *Clinopodium acinos* at Ticknevin Comprises Bare Mineral Soil Which Supported a Bog Railway Line in the Past.



**Photo 2: Close-up View of *Clinopodium acinos* at Ticknevin**

**Table 2: Outline of Areas Searched for the Possible Presence of Rare Plant Species and the Results**

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 1 – Grassland and quarry areas at Monpelier, Co. Limerick	17/05/2023	<i>Anacamptis morio</i> , <i>Scleranthus annuus</i>	Areas of grassland and active sand quarry were searched for the possible presence of the orchid species <i>Anacamptis morio</i> , however the species was not found. The grassland area to the west of the quarry was semi-improved and grazed by horses with the main plant species <i>Holcus lanatus</i> , <i>Ranunculus repens</i> , <i>Rumex acetosa</i> , <i>Anthoxanthum odoratum</i> , <i>Plantago lanceolata</i> , <i>Dactylis glomerata</i> and <i>Urtica dioica</i> . Indicator plant species of species-rich calcareous grassland were absent. The quarry area itself is an active sand quarry which is not possible to access safely, however visual observations reveal very little vegetation present with no indicators of species-rich calcareous grassland occurring.
Figure 2 – Grassland areas at Fairyhall, Co. Limerick	17/05/2023	<i>Anacamptis morio</i>	The fields in this area were searched for the possible presence of <i>Anacamptis morio</i> , however the species was not found. Most of the fields were found to be dominated by wet grassland dominated by <i>Juncus effusus</i> with frequent <i>Holcus lanatus</i> , <i>Ranunculus repens</i> , <i>Anthoxanthum odoratum</i> and <i>Alopecurus pratensis</i> which is not suitable habitat for <i>Anacamptis morio</i> . The easternmost field in this area was found to be dominated by a drier soil with meadow type (GS2) vegetation, however this type of grassland habitat is not suitable for the species and no other plant indicators of species-rich grassland were found.
Figure 3 – Grassland areas west of Birdhill, Co. Tipperary	17/05/2023	<i>Anacamptis morio</i>	This grassland site comprises a number of fields of improved agricultural grassland on sloping ground which are generally dominated by <i>Ranunculus repens</i> , <i>Lolium perenne</i> and <i>Holcus lanatus</i> . Other frequent species in the vegetation include <i>Bellis perennis</i> , <i>Rumex obtusifolius</i> and <i>Alopecurus pratensis</i> . The vegetation is species-poor and is typical of agricultural fields in the general area which are used for livestock grazing and silage production. The habitat is not suitable for <i>Anacamptis morio</i> and the species was not recorded.

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 5,6 and 7 – Grassland areas south of and east of Ballycommon village	17/05/2023	<i>Stachys officinalis</i> , <i>Epipactis phyllanthes</i>	A walkover survey of the pipeline route to the south and east of Ballycommon village shows that the area is dominated by fields of improved agricultural grassland which are used for grazing and silage production. <i>Lolium perenne</i> and <i>Holcus lanatus</i> tend to be the dominant grass species present with frequent <i>Cirsium arvense</i> , <i>Rumex obtusifolius</i> and <i>Ranunculus repens</i> . Along the eastern banks of the Nenagh river there was evidence of recent pasture reseeding. This type of improved grassland habitat does not constitute suitable habitat for <i>Stachys officinalis</i> which prefers less improved, dry grassland habitat and the species was not recorded. No apparently suitable habitat for <i>Epipactis phyllanthes</i> was located.
Figure 10 – Black River at Derrinclare and adjacent scrub	18/05/2023	<i>Groenlandia densa</i> , <i>Clinopodium acinos</i> <i>Eriophorum gracile</i>	The Black River is a heavily canalised watercourse along this stretch, with dense <i>Sparganium erectum</i> . No <i>Groenlandia densa</i> was recorded during survey. The areas of scrub are dominated by <i>Ulex europaeus</i> , <i>Salix cinerea</i> and <i>Betula pendula</i> , with dense stands of <i>Pteridium aquilinum</i> , and no open, mineral soil areas suitable for <i>Clinopodium acinos</i> , which was not recorded. No suitable habitat for <i>Eriophorum gracile</i> occurs within the willow scrub areas adjacent to the pipeline corridor at Derrinclare. An attempt was made to access the potential <i>Eriophorum gracile</i> site at Derrinclare; however, the area was not accessible due to the presence of dense scrubby woodland and bog vegetation. In any case the potential area is located at least 300m from the Proposed Project with intervening agricultural grassland and drains, so it is considered there is no potential for effects on this species, if present in this area, as a result of the Proposed Project.
Figure 12 – Grassland at Ballymaddock	18/05/2023	<i>Anacamptis morio</i>	This area comprises improved agricultural grassland bounded to the north by the Rapemills River. Typical species of such habitats dominated, with <i>Lolium perenne</i> , <i>Cirsium arvense</i> and <i>Ranunculus acris</i> . The area is cattle grazed, and without any obvious potential suitable habitat for <i>Anacamptis morio</i> , which was not recorded at this site.

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 13 – Poor fen and grassland at Coolfin Glebe	18/05/2023	<i>Clinopodium acinos</i> , <i>Anacamptis morio</i>	This area comprises fields of damp, semi-improved grassland along both sides of a hedgerow-lined local road. An area of poor fen was recorded to the south of the grassland, along the eastern side of the road. The grassland was dominated by <i>Lolium perenne</i> , <i>Juncus effusus</i> and <i>Ranunculus repens</i> , with occasional <i>Filipendula ulmaria</i> . Hedgerows supported <i>Crataegus monogyna</i> , <i>Salix cinerea</i> and scrubby <i>Fraxinus excelsior</i> . The poor fen was characteristically very wet, with <i>Eriophorum angustifolium</i> and <i>Equisetum fluviatile</i> dominating, and occasional <i>Carex diandra</i> . No suitable habitat for <i>Clinopodium acinos</i> or <i>Anacamptis morio</i> was observed, and the species were not recorded.
Figure 15 - Area south of Mount Bolus, Co. Offaly	18/05/2023 and 12/08/2024	<i>Clinopodium acinos</i> , <i>Groenlandia densa</i> , <i>Pyrola minor</i>	This area comprises a partly made road, bounded to the north by a drainage ditch which was mostly dry at the time of survey. Area to the south has been planted for forestry, with some recent felling. The road surface supported some common ruderals including <i>Epilobium montanum</i> and <i>Cerastium glomeratum</i> , but <i>Clinopodium acinos</i> was not recorded. Most of the drainage ditch was relatively dry, with rank grassland species such as <i>Arrhenatherum elatius</i> , while parts that held some standing water were heavily shaded by <i>Crataegus monogyna</i> and <i>Hedera hibernica</i> ; these are not suitable habitats for <i>Groenlandia densa</i> , which was not recorded.  In August 2024 a search was undertaken for <i>Pyrola minor</i> in woodland areas south-east of and adjacent to the Project Boundary at the time of survey, within Rathrobin townland. The woodland, which is considered to be suitable habitat for this species, was generally dominated by tall <i>Betula pubescens</i> and <i>Pinus sylvestris</i> . In the north of the woodland the soil was more mineral in nature with <i>Quercus</i> sp. and <i>Acer pseudoplatanus</i> dominating. The ground layer vegetation was generally dominated by <i>Dryopteris dilatata</i> , <i>Hedera helix</i> and <i>Rubus fruticosus</i> , with <i>Lonicera periclymenum</i> also locally frequent. Although the woodland habitat was in good condition, <i>Pyrola minor</i> was not found, nor was it found in the grassland habitat adjacent to the woodland within which the Project Boundary at the time of survey crosses.

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 16 – Farmyard at Killananny Co. Offaly	18/05/2023	<i>Clinopodium acinos</i> , <i>Galeopsis angustifolia</i>	An area of ruderal recolonisation in a farmyard along the R421 road. Security gates prevented access, however, given its size, it was possible to view the entire site from the roadside. Typical species of hard standing adjacent to farm buildings were recorded, such as <i>Epilobium montanum</i> , <i>Senecio vulgaris</i> and <i>Rumex crispus</i> . The site lacks the friable mineral substrate which the target species require, and neither was observed.
Figure 17,18 and 19 – Streams and ditches at Cloncoher, Co. Offaly	18/05/2023	<i>Groenlandia densa</i>	This area contains a number of narrow streams and ditches in predominantly improved grassland and arable fields. The most promising habitat visited was a steep-sided ditch with fast-flowing spring-fed water which flows to the east. The drain itself appears to have been straightened and cleaned out in recent years and there has been a good deal of clearance of developing Willow/Alder scrub in adjacent land. The vegetation of the drain areas is generally dominated by <i>Nasturtium officinale</i> with frequent <i>Epilobium hirsutum</i> , <i>Apium nodiflorum</i> , <i>Angelica sylvestris</i> and <i>Mentha aquatica</i> . Fast flowing waters such as these are not suitable for the target species <i>Groenlandia densa</i> and the species was not found.

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 20 – Tullamore River at Ballyduff South and woodland at Lugmore, Co. Offaly	16/06/2023 and 12/08/2024	<i>Groenlandia densa</i> and <i>Pyrola minor</i>	<p>This narrow stretch of the Tullamore River generally has a gravelly bed with fast-flowing water. The banks of the river generally have an associated hedgerow dominated by <i>Crataegus monogyna</i> with some <i>Prunus spinosa</i> and <i>Sambucus nigra</i>. Other frequent species along the riverbanks include <i>Urtica dioica</i>, <i>Brachypodium sylvaticum</i>, <i>Rubus fruticosus</i> and <i>Hedera helix</i>. Due to the gravelly, fast-flowing nature of the stream no aquatic vegetation was noted and it was concluded that the area does not provide suitable habitat for the target species <i>Groenlandia densa</i>.</p> <p>An area of deciduous woodland within the Project Boundary at the time of survey, just east of the Geashill to Ballinagar road, was searched for the possible occurrence of <i>Pyrola minor</i>. The woodland occurred on sloping ground with a dry, mineral soil. The main tree species in the woodland canopy was <i>Fraxinus excelsior</i> and most of these trees had been badly affected by ash-dieback disease. Other frequent tree species occurring included <i>Larix</i> sp., <i>Corylus avellana</i> and <i>Crataegus monogyna</i> with <i>Prunus spinosa</i>, <i>Alnus glutinosa</i>, and <i>Euonymus europaeus</i> also occasional. The woodland ground layer was generally dominated by <i>Rubus fruticosus</i> and <i>Hedera helix</i> which accounted for the relatively species-poor ground flora present. <i>Pyrola minor</i> was not recorded during the survey.</p>

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 23 and 24 – Western margin of Mount Lucas wind farm, Co. Offaly	16/06/2023	<i>Clinopodium acinos</i> , <i>Galeopsis angustifolia</i> and <i>Groenlandia densa</i>	This survey area comprises cutaway raised bog habitat which is now regenerating to varying degrees with a modified bog flora. Bare peat is still frequent, however there are substantial areas of previously bare ground which are now dominated by species such as <i>Molinia caerulea</i> , <i>Juncus effusus</i> and <i>Eriophorum angustifolium</i> . There are mineral soil track margins in the area which support quite an interesting flora which is a mix of bog and calcareous grassland species including <i>Molinia caerulea</i> , <i>Briza media</i> , <i>Lotus corniculatus</i> , <i>Potentilla erecta</i> , <i>Leontodon hispidus</i> , <i>Succisa pratensis</i> , <i>Daucus carota</i> , <i>Poterium sanguisorba</i> and <i>Reseda lutea</i> . A small population (c. 5 plants) of <i>Clinopodium acinos</i> were seen growing on mineral soil associated with an old railway bog railway track (Grid reference N 48429 24676). There is an extensive network of deep bog cutaway bog drains in the area and the majority of these were very dry on the day of survey. <i>Groenlandia densa</i> was not seen growing in any of the drains.
Figure 25, 26 and 27 – Former Briquette factory and wind farm at Mount Lucas, Co. Offaly	9/08/2022	<i>Clinopodium acinos</i> , <i>Galeopsis angustifolia</i> and <i>Groenlandia densa</i>	This site consists of the area surrounding the former briquette factory, including the railway sidings and storage sites, the Philipstown Stream as it runs adjacent to the Mount Lucas site, and the margins of the extensive cutaway raised bog now occupied by a windfarm. The Philipstown Stream had significant instream emergent vegetation, with <i>Nastrurtium officinale</i> , <i>Sparganium erectum</i> and <i>Iris pseudacorus</i> ; no <i>Groenlandia densa</i> was observed in this watercourse. Large areas of bare peat dominate the site, with some recolonising <i>Ulex europaeus</i> and <i>Juncus effusus</i> . The Bord na Mona railway network in this site lies on a light mineral soil and supports a range of calcicole species, including a single population of ca. 20 plants of <i>Clinopodium acinos</i> , approximately 50m southeast of the Project Boundary at the time of survey (Image 1). Other species recorded in the vicinity included abundant <i>Poterium sanguisorba</i> and occasional <i>Erigeron acris</i> .

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 28 – Cutaway raised bog margins at Newtown, north-east of Mount Lucas, Co. Offaly	9/08/2022	<i>Clinopodium acinos</i> , <i>Galeopsis angustifolia</i> and <i>Groenlandia densa</i>	This site comprises an extensive area of Bord na Mona cutaway. The south-western edge of the cutaway area was searched but target species were not recorded. Most of the area is dominated by bare peat surface with rank, weedy vegetation, characterised by <i>Pteridium aquilinum</i> , <i>Holcus lanatus</i> and <i>Cirsium arvense</i> , on a wide spoil ridge to the north of a wide drainage channel. Suitable exposed mineral substrate for <i>Clinopodium acinos</i> was not identified. On the day of survey, the wide drainage channel located along the southern margin of the bog was dominated by floating algal mats. <i>Groenlandia densa</i> was not recorded in this drain. Access to the area entails a long walk in from the north through Bord na Mona cutaway.
Figure 29 – Cutaway raised bog at Rathlumber, Co. Offaly	16/06/2023	<i>Clinopodium acinos</i> , <i>Galeopsis angustifolia</i> and <i>Groenlandia densa</i>	Cutaway raised bog margins and bog drains were searched for the presence of the target species, however no populations were recorded. The marginal bog drain had a very limited flora consisting mainly of <i>Juncus bulbosus</i> , <i>Eriophorum angustifolium</i> and <i>Juncus effusus</i> . The cutover bog area was dominated by a largely unvegetated peat surface and it is clear that private peat extraction in the area is ongoing. Areas of exposed mineral gravel necessary for the occurrence of <i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i> do not occur.
Figure 31 – Lands adjacent to Edenderry Power Station	13/06/2023	<i>Clinopodium acinos</i> , <i>Groenlandia densa</i>	The area north of Edenderry Power Station has a network of Bord na Mona railway tracks, with some light and extractive industries. A search of the tracks, adjacent embankments and spoil heaps, and other potentially suitable sites did not turn up any populations of <i>Clinopodium acinos</i> . Other areas of cutaway were dominated by scrub, while the Cushaling River and associated drainage ditches supported species including <i>Glyceria maxima</i> and <i>Phalaris arundinacea</i> , but not <i>Groenlandia densa</i> .

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 32 and 33 – Cutaway raised bog at Kilcumber, Co. Offaly	13/06/2023	<i>Clinopodium acinos</i> and <i>Groenlandia densa</i>	This is an extensive area of Bord na Mona cutaway bog, which is the site of a proposed wind farm, the road network of which was under construction on the day of survey. Large drains, approximately 2-3m deep, cross parts of the site. Several were relatively dry, others supported a broad mix of emergent vegetation, including <i>Typha latifolia</i> , <i>Bidens cernua</i> and <i>Equisetum fluviatile</i> . <i>Groenlandia densa</i> was not recorded. Much of the bog surface was absent of vegetation, with some scrubby regeneration at the margins, <i>Pteridium aquilinum</i> , <i>Ulex europaeus</i> and <i>Salix cinerea</i> being the commonest species. No suitable habitat for <i>Clinopodium acinos</i> was noted, and the species was not recorded.
Figure 34 and 35 – Cutaway raised bog margins in Cushaling, Co. Offaly.	9/08/2022	<i>Clinopodium acinos</i> , <i>Galeopsis angustifolia</i> and <i>Groenlandia densa</i>	Extensive area of Bord na Mona cutaway. South-eastern edge of area searched but target species not recorded. The area is dominated by bare peat surface with occasional small patches of scrub dominated by <i>Ulex europaeus</i> , <i>Molinia caerulea</i> and <i>Pteridium aquilinum</i> . Suitable mineral substrate was not present for <i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i> . There are deep (2 to 4 metres) bog drains present in this area and these were dry on the day of survey. <i>Groenlandia densa</i> was not recorded in bog/roadside drains and it would appear these would not be suitable for the species due to their dry nature.
Figure 36 and 37 - Cutaway bog and drainage ditches, Cushaling, Co. Offaly	13/06/2023	<i>Groenlandia densa</i> , <i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i>	An area with large, deep bog drains running through extensive Bord na Mona cutaway. The cutaway is quite rapidly scrubbing up, with <i>Ulex europaeus</i> and <i>Molinia caerulea</i> the main species noted. Drains were deep, with little in stream vegetation, and <i>Groenlandia densa</i> was not recorded. An old bog railway line, now disused, runs in through cutaway bog in a north-easterly direction towards Ticknevin. The mineral soil associated with this feature creates suitable habitat for a range of more unusual calcareous grassland species including <i>Reseda lutea</i> , <i>Tragopogon pratensis</i> , <i>Briza media</i> , <i>Leontodon hispidus</i> , <i>Primula veris</i> , <i>Poterium sanguisorba</i> , <i>Neottia ovata</i> and <i>Anacamptis pyramidalis</i> . A small population (2 clumps) of <i>Clinopodium acinos</i> was recorded growing along the disused bog railway line at grid reference N 67168 26740.

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 38 – Area of cutaway bog in Ticknevin townland, Co. Kildare	10/08/2022	<i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i>	This area of cutaway raised bog is dominated by a mosaic of bare peat surface and vegetated areas with a high cover of <i>Molinia caerulea</i> , <i>Calluna vulgaris</i> and patchy birch scrub. A significant population of <i>Clinopodium acinos</i> was recorded growing along approximately 400 metres of mineral soil which is associated with a disused bog railway line (Image 2). The population is estimated to be in the region of 200 to 250 plants. Other calcareous grassland plant species recorded growing in association with <i>Clinopodium</i> include <i>Centaurea nigra</i> , <i>Briza media</i> , <i>Leontodon hispidus</i> , <i>Poterium sanguisorba</i> and <i>Reseda lutea</i> . Although most of the population lies outside of the Project Boundary at the time of survey, a small number of plants lie within this zone.
Figure 39 – Grand Canal at Kilpatrick, Co. Kildare	10/08/2022	<i>Groenlandia densa</i>	Species which were recorded from this stretch of canal include <i>Potamogeton natans</i> , <i>Schoenoplectus lacustris</i> , <i>Nuphar lutea</i> and <i>Alisma plantago-aquatica</i> . The target species, <i>Groenlandia densa</i> was not found.
Figure 40 and 41– Cutaway raised bog margins in Drummond, Co. Kildare	10/08/2022	<i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i>	This bog margin is dominated by dense and impenetrable <i>Betula pubescens</i> / <i>Pteridium aquilinum</i> scrub woodland which is not suitable habitat for <i>Clinopodium acinos</i> . Open, gravelly ground of the Carbury Hot Rod Track was also searched but the target species were not found.

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 42 – Area of cutaway bog with extensive Birch scrub development at Drehid, Co. Kildare	10/08/2022	<i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i> , <i>Hammarbya paludosa</i>	This peatland area has a very high cover of Birch scrub/woodland on drained peat. Access from the road to the north was attempted but abandoned due to dense scrub cover. Potential for <i>Clinopodium acinos</i> would appear to be low as the area is dominated by Birch woodland/scrub and there are no significant areas of exposed mineral soil visible on the aerial photographs. A small area of uncut, but dry raised bog to the north of the road and adjacent to the pipeline corridor was searched for <i>Hammarbya paludosa</i> . <i>Hammarbya paludosa</i> is a very rare and diminutive orchid species. The species is confined to very wet, flushed areas of bog in Counties Mayo, Galway, Kerry, Wicklow and Donegal and it is usually found in areas dominated by Sphagnum moss. The only previous record for the species along the Proposed Project is an old, pre-1930 record in the vicinity of Johnstown Bog, Co. Kildare ( <a href="https://bsbi.org/maps">https://bsbi.org/maps</a> ). This area was visited in August of 2022, however the majority of the bog area in question has been industrially cutaway for a number of decades and no suitable habitat for the species exists. A dry bog remnant within Drehid townland, adjacent to the pipeline corridor, was examined for the species however no suitable wet bog habitat was found. Therefore, the need for a repeat survey in mid-September (as previously recommended in Table 1), was scoped out.
Figure 44 – Margins of cutaway bog at Timahoe East Co. Kildare	26/08/2022	<i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i>	Margins of industrial cutaway bog dominated by bare peat surface, semi-improved grassland and scrub habitats present. Typical species recorded growing on the cutaway surfaces include <i>Molinia caerulea</i> , <i>Holcus lanatus</i> , <i>Agrostis capillaris</i> , <i>Juncus effusus</i> , <i>Cirsium arvense</i> and <i>Potentilla anserina</i> . Suitable gravel/mineral substrate was not found to be present, and the target species was not recorded.
Figure 45 – Shallow drain in field at Timahoe East, Co. Kildare.	26/08/2022	<i>Groenlandia densa</i>	A relatively shallow, peaty drain in a field was investigated for the possible presence of <i>Groenlandia densa</i> , however the species was not found. Species noted growing in the shallow water included <i>Apium nodiflorum</i> , <i>Glyceria</i> sp., <i>Filipendula ulmaria</i> , <i>Mentha aquatica</i> and <i>Agrostis stolonifera</i> .

Rare Plant Survey Sheet Number / Location	Survey Date(s)	Target species	Result/Comments
Figure 46 – Margins of cutaway bog at Derryvarroge, Co. Kildare	26/08/2022	<i>Clinopodium acinos</i> and <i>Galeopsis angustifolia</i>	This is an area of industrial cutaway bog margin with a bog railway network present. The area within the project survey corridor is generally dominated by cutaway, bare peat surface with areas of dry uncut bog also present. These areas of cutover are very dry and are generally dominated by <i>Calluna vulgaris</i> and <i>Betula pendula</i> scrub. Areas of mineral soil, suitable for <i>Clinopodium acinos</i> are poorly developed and the species was not recorded.
Figure 47 – Field drains at Barberstown Upper, Co. Kildare	16/06/2023	<i>Groenlandia densa</i>	Deep field drain which is surrounded by intensive cereal fields. Main species recorded growing in the drain were <i>Filipendula ulmaria</i> , <i>Agrostis stolonifera</i> and <i>Apium nodiflorum</i> . <i>Groenlandia densa</i> was not recorded and the potential for the species appears to be low.
Figure 48 and 49 – River Liffey at Ardrass Upper, Co. Kildare	26/08/2022	<i>Hypericum hirsutum</i>	Riverbank areas along the river Liffey were searched, however <i>Hypericum hirsutum</i> was not recorded. The riverbank areas within the project survey corridor are generally dominated by <i>Rubus fruticosus</i> , <i>Arrhenatherum elatius</i> and <i>Urtica dioica</i> with occasional low trees of <i>Salix alba</i> and <i>Alnus glutinosa</i> .
Figure 51 – Lyons Road, south of Celbridge, Co. Kildare	13/08/2022	<i>Hypericum hirsutum</i>	A short stretch of local road crossing the railway line was searched. Typical hedgerow habitat of rich soils occurs, with <i>Crataegus monogyna</i> and <i>Sambucus nigra</i> , with occasional taller <i>Fraxinus excelsior</i> and <i>Acer pseudoplatanus</i> . The ground flora was dominated by rank grasses including <i>Arrhenatherum elatius</i> and <i>Festuca rubra</i> . The target species was not recorded.
Figure 52 and 53 – Grand Canal south of Hazelhatch, Co. Kildare	13/08/2022 & 26/08/2022	<i>Hypericum hirsutum</i> , <i>Groenlandia densa</i>	The Grand Canal and hedgerows lining adjacent towpaths were the focus of the survey in this area. The canal supports typical species of slow-moving water bodies including <i>Phalaris arundinacea</i> , <i>Sparganium erectum</i> , <i>Filipendula ulmaria</i> , <i>Alisma plantago-aquatica</i> , <i>Potamogeton natans</i> , <i>Glyceria maxima</i> , <i>Sagittaria saggitifolia</i> and <i>Nuphar lutea</i> . The hedgerows/linear woodlands comprised a broad selection of native and non-native species, including <i>Ulmus procera</i> , <i>Sambucus nigra</i> , <i>Fraxinus excelsior</i> and <i>Crataegus monogyna</i> , with an understorey including <i>Urtica dioica</i> , <i>Epilobium hirsutum</i> and <i>Vicia sepium</i> . None of the target species were recorded.

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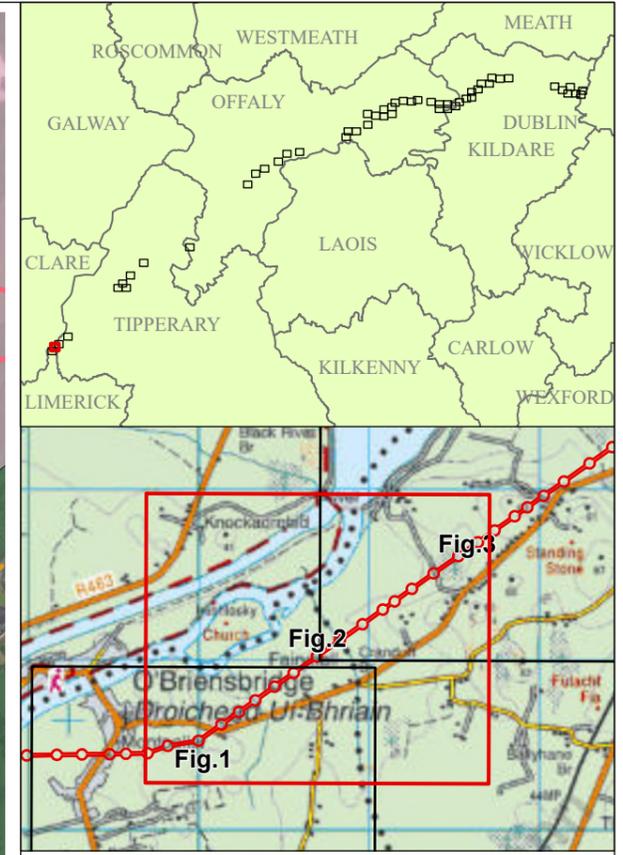
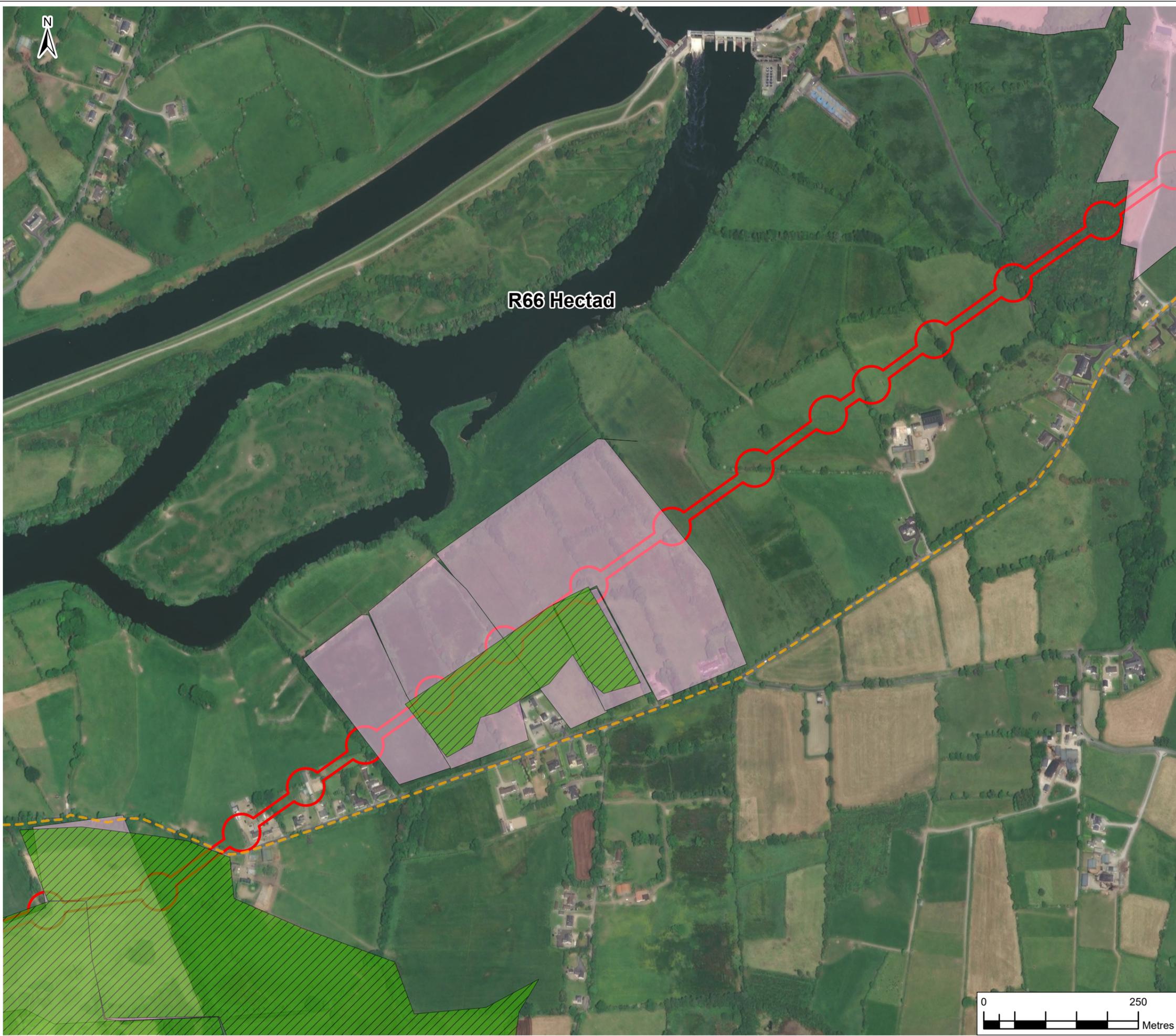
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## **Annex A**

### Rare Plant Target Survey Recommendation Locations





- Legend**
- Planning Application Boundary
  - OSI 10km grid (Hectads)
  - Haul Roads
- Rare plant target survey recommendations**
- WSI Rare Plant Recommendations Polygon Features
  - Rare Plants High Priority Survey Folios
- RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd



**Client**

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Water Supply Project  
Eastern and Midlands Region

**Drawing Title**  
Figure 2  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 2 of 53

**Drawing Status**  
Final - Planning Application

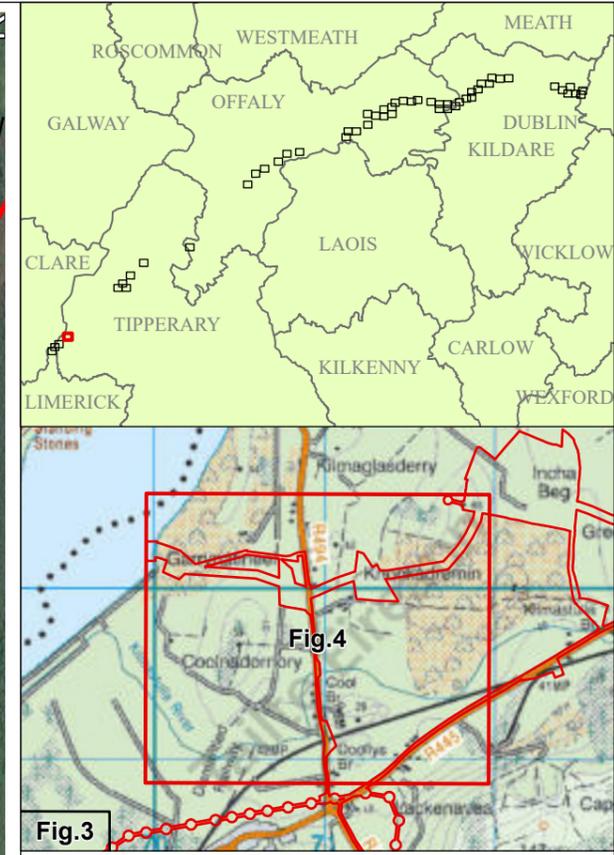
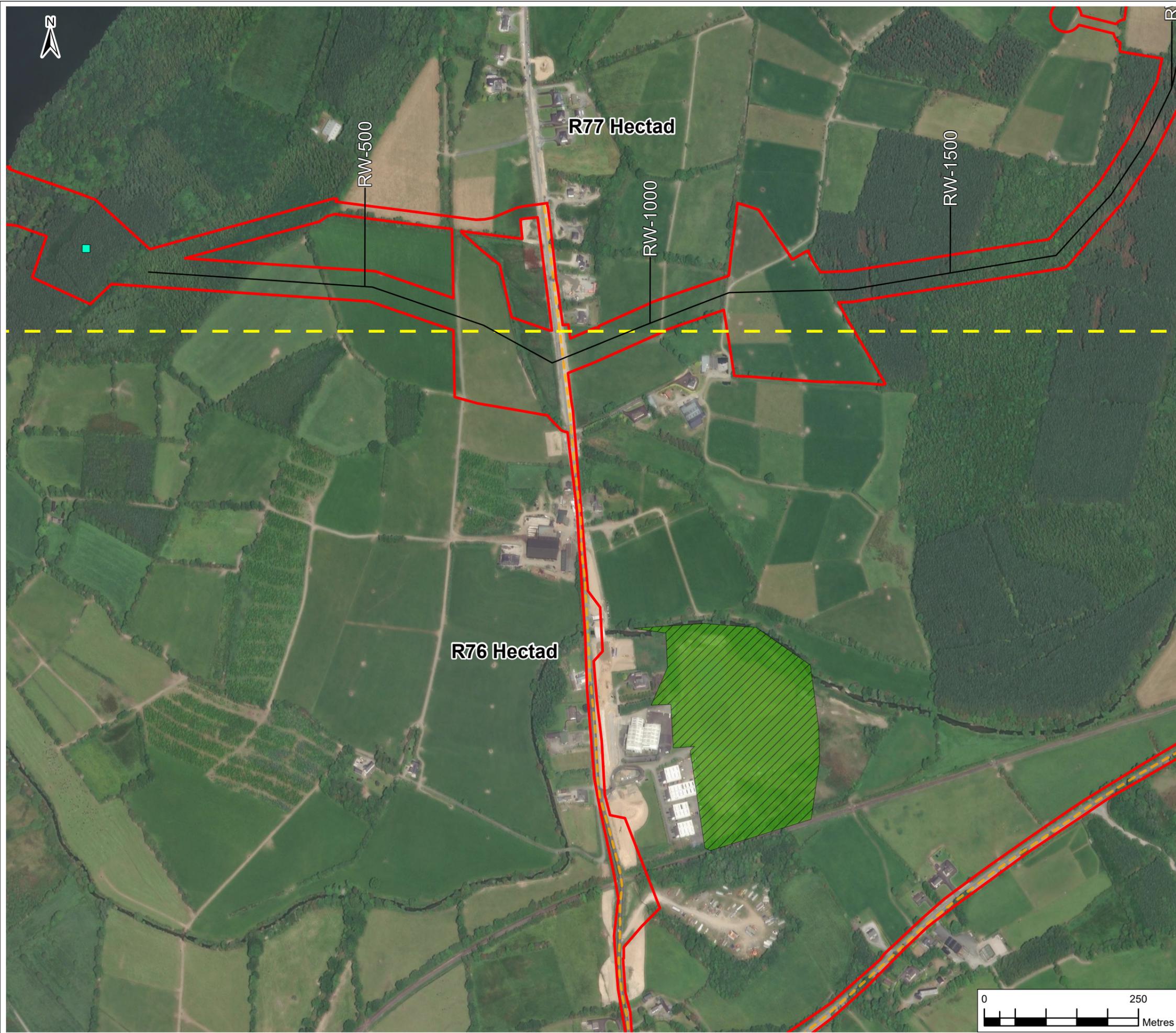
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**Legend**

- Planning Application Boundary
- Raw Water Intake and Pumping Station
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

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F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

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Figure 4  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
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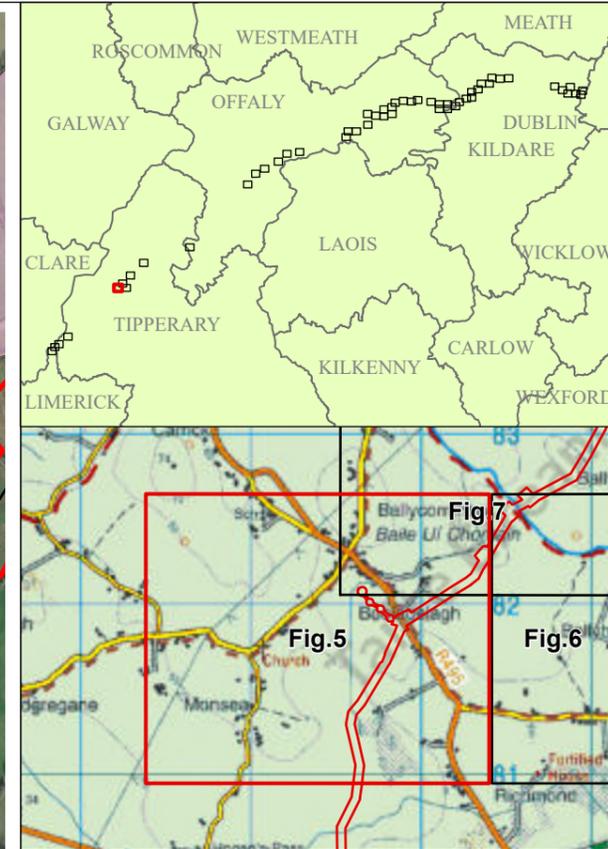
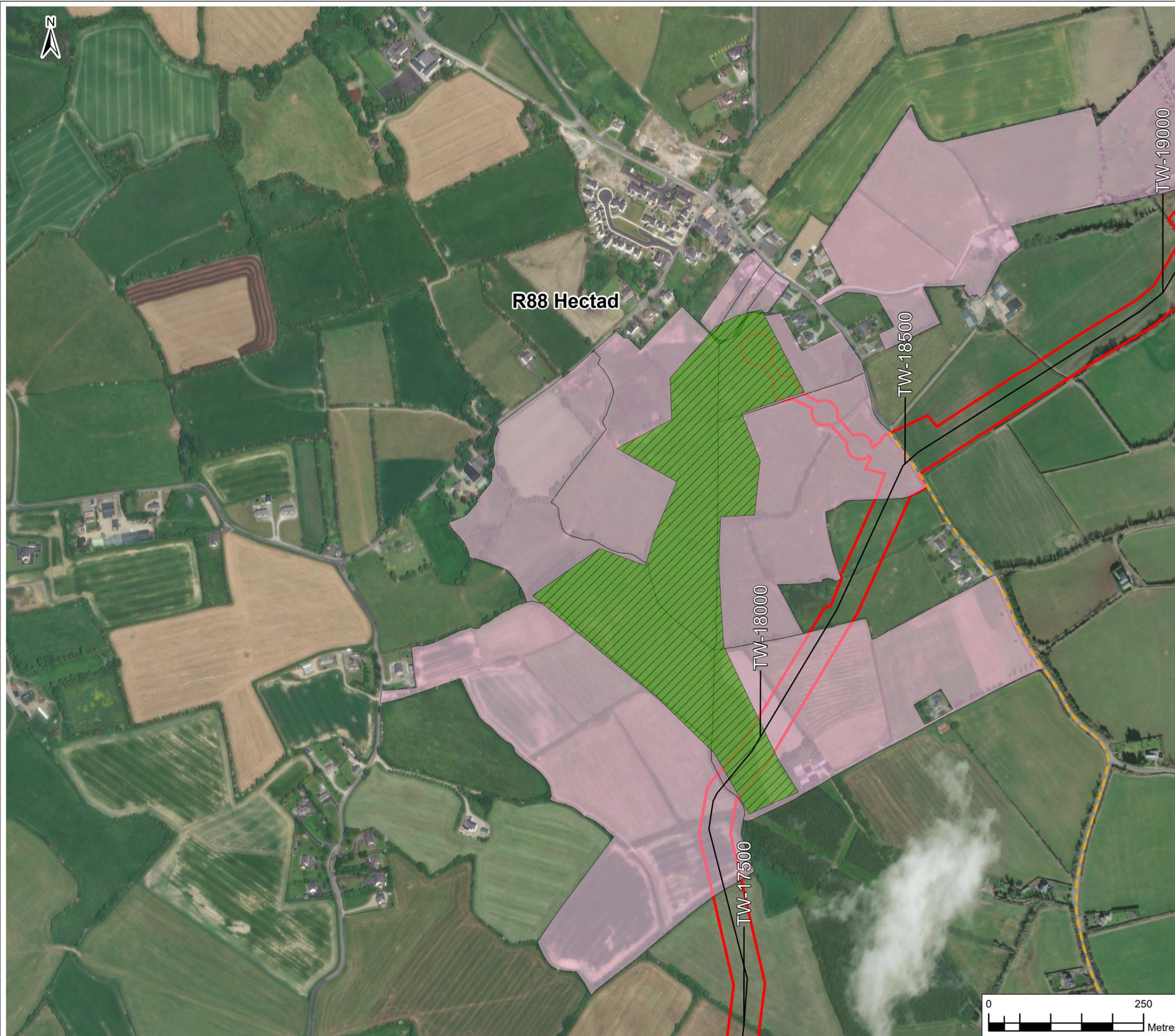
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**Legend**

- Planning Application Boundary
- OS 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
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Figure 5  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 5 of 53

Drawing Status

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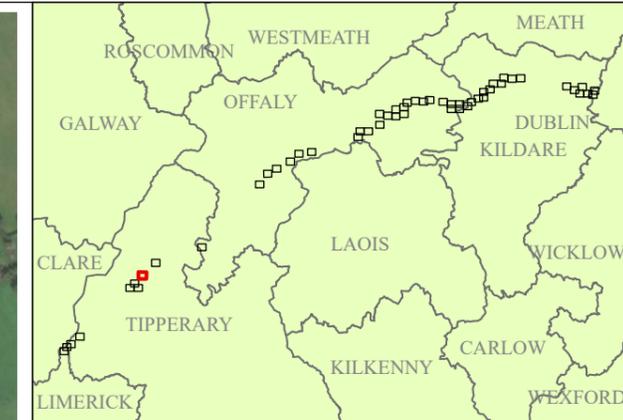
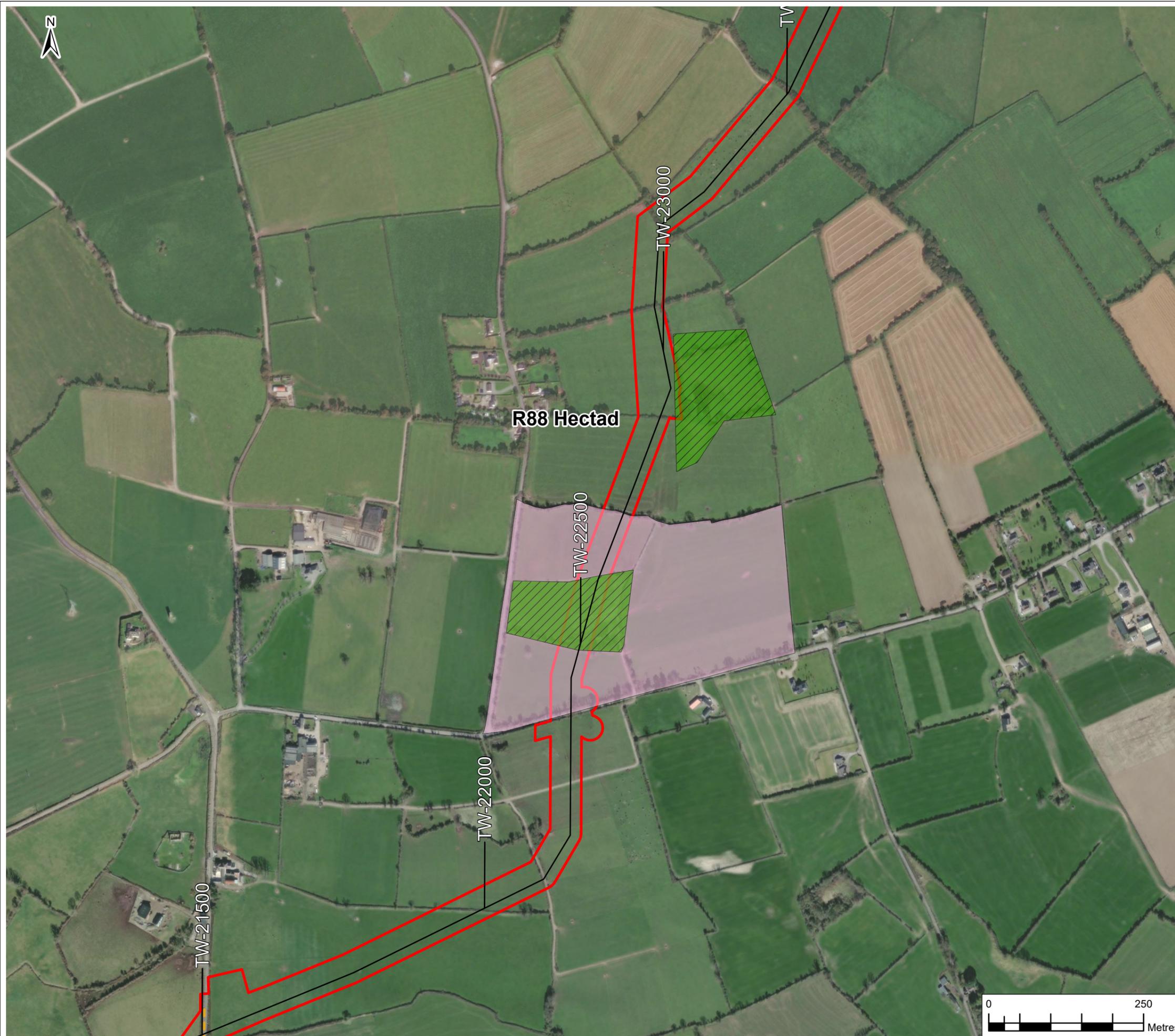


Fig. 7

**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

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F03	21/11/25	Final - Planning Application				



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Eastern and Midlands Region

Drawing Title

Figure 8  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
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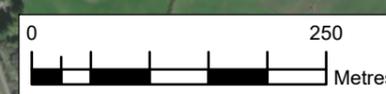
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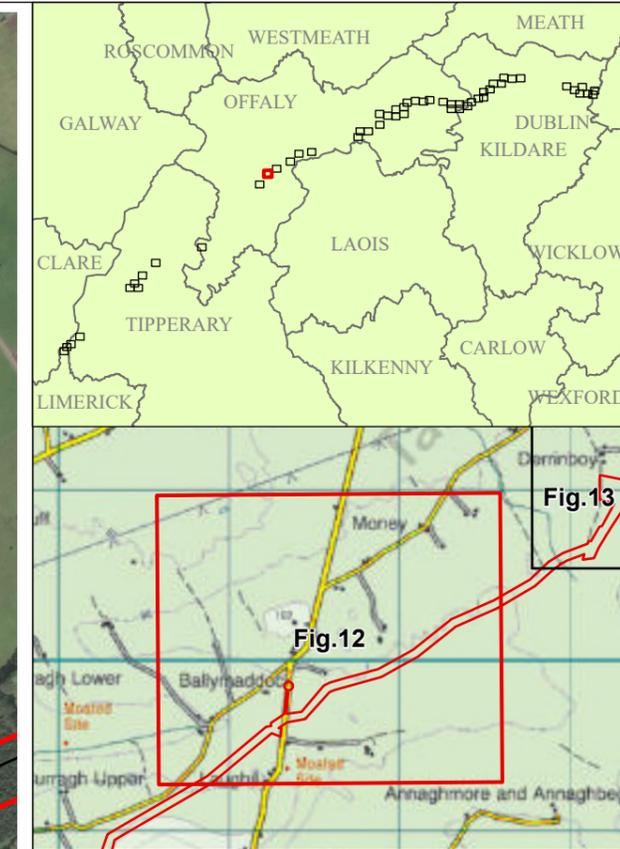
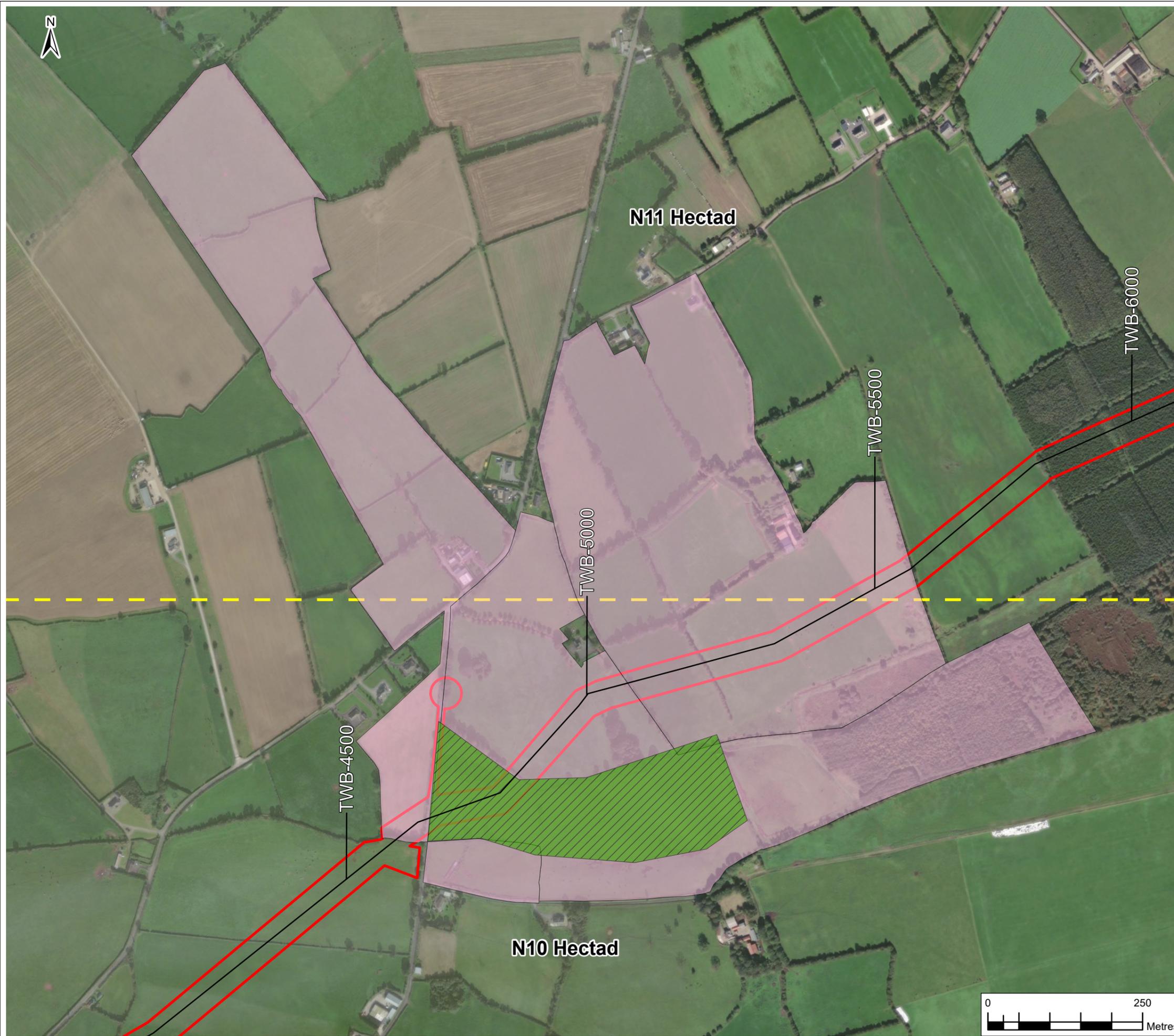
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- Legend**
- Planning Application Boundary
  - OSI 10km grid (Hectads)
  - Indicative Pipeline
- Rare plant target survey recommendations**
- WSI Rare Plant Recommendations Polygon Features
  - Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				

**Jacobs TOBIN**

Client:

Project: Water Supply Project  
Eastern and Midlands Region

Drawing Title: Figure 12  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 12 of 53

Drawing Status: Final - Planning Application

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client:

Project: Water Supply Project  
Eastern and Midlands Region

Drawing Title: **Figure 14**  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 14 of 53

Drawing Status: Final - Planning Application

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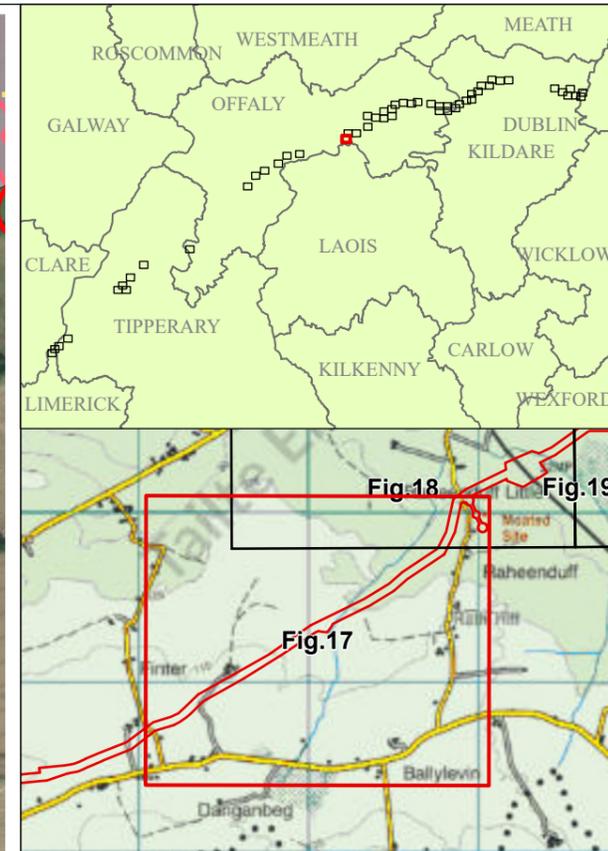
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- WSI Rare Plant Recommendations
- Linear Features
- Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
 TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 17  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 17 of 53

Drawing Status

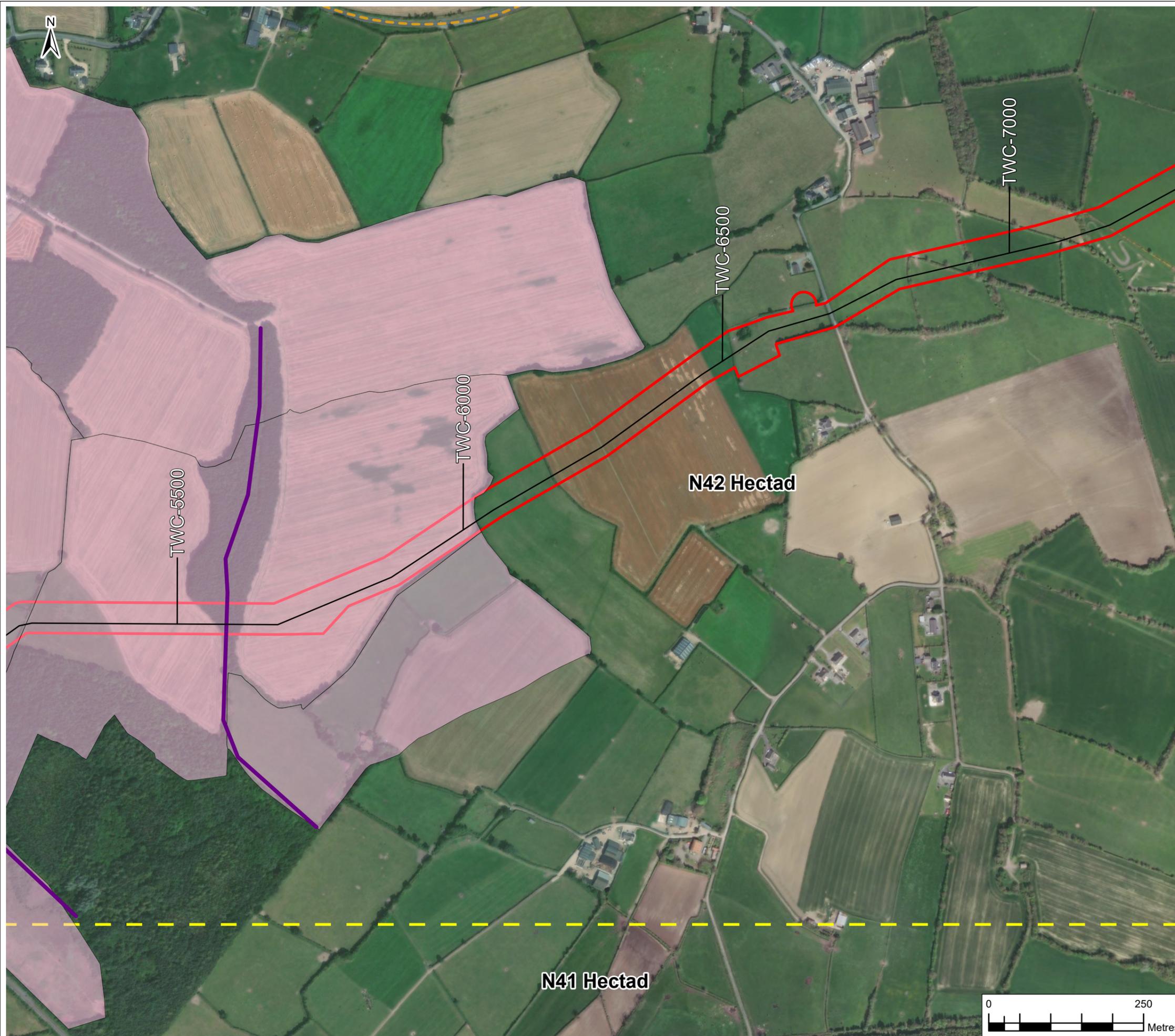
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations
- Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client




Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 19  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 19 of 53

Drawing Status

Final - Planning Application

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- Legend**
- OSI 10km grid (Hectads)
  - Haul Roads
  - Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
 TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				

**Jacobs TOBIN**

Client

Project

Water Supply Project  
 Eastern and Midlands Region

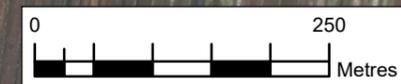
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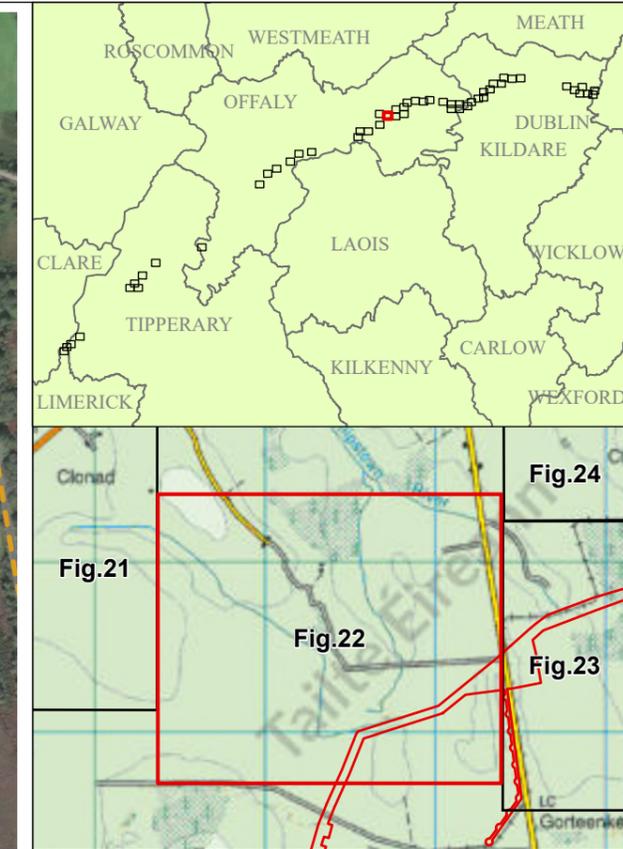
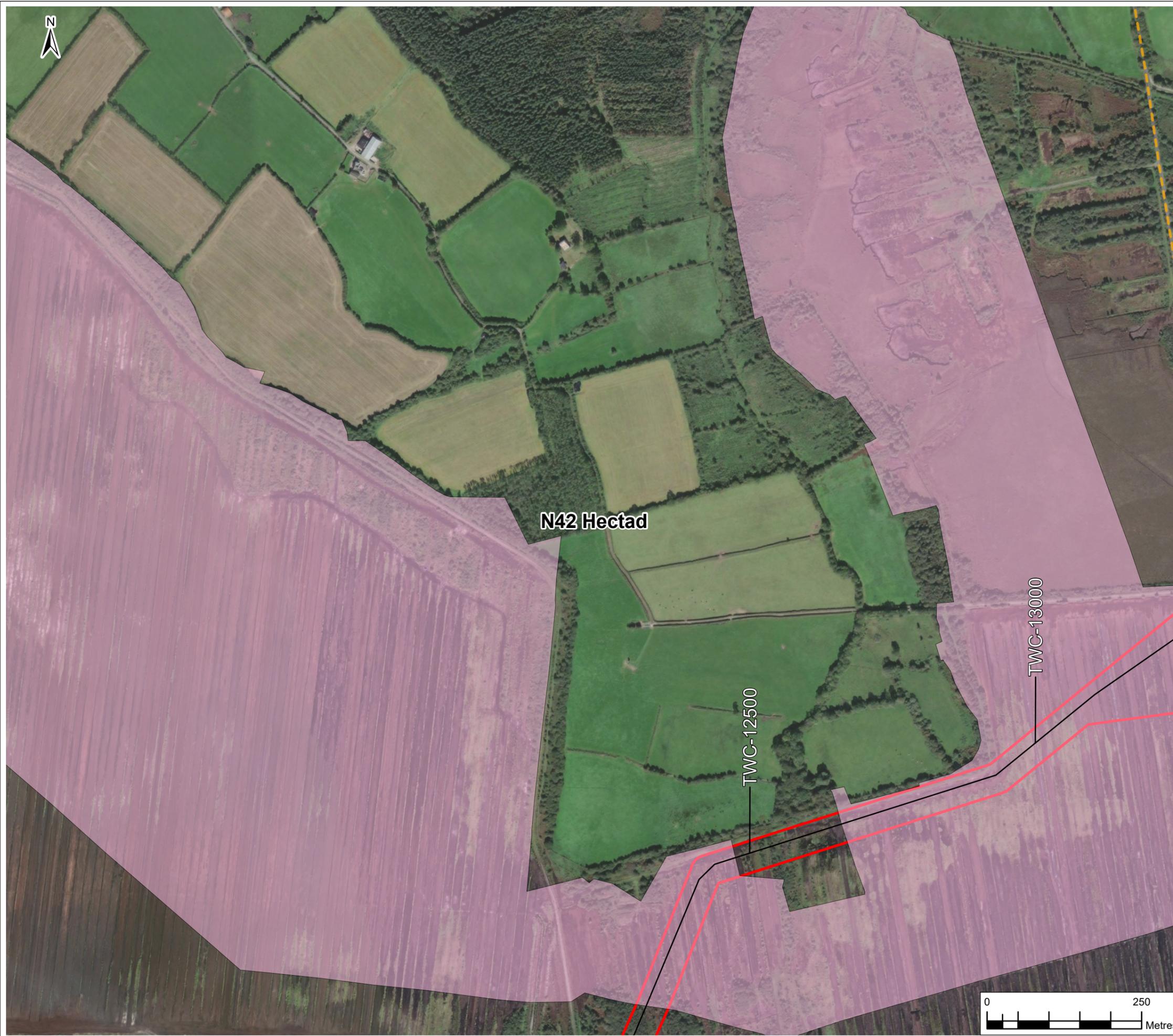
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 Rare Plant Target Survey Recommendation Locations and Survey Areas  
 Sheet 21 of 53

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads
- Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
 TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				



Client

Project  
 Water Supply Project  
 Eastern and Midlands Region

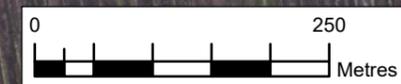
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 Rare Plant Target Survey Recommendation Locations and Survey Areas  
 Sheet 22 of 53

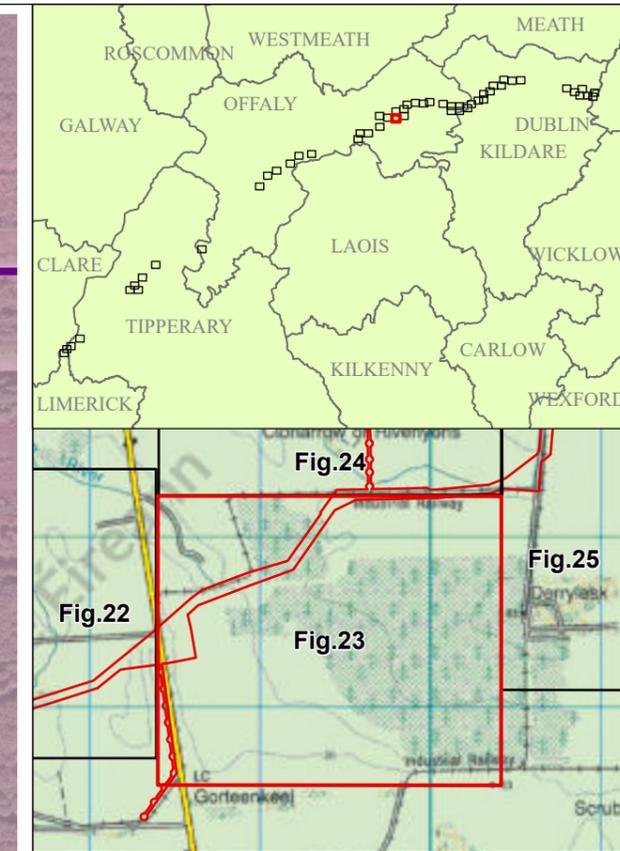
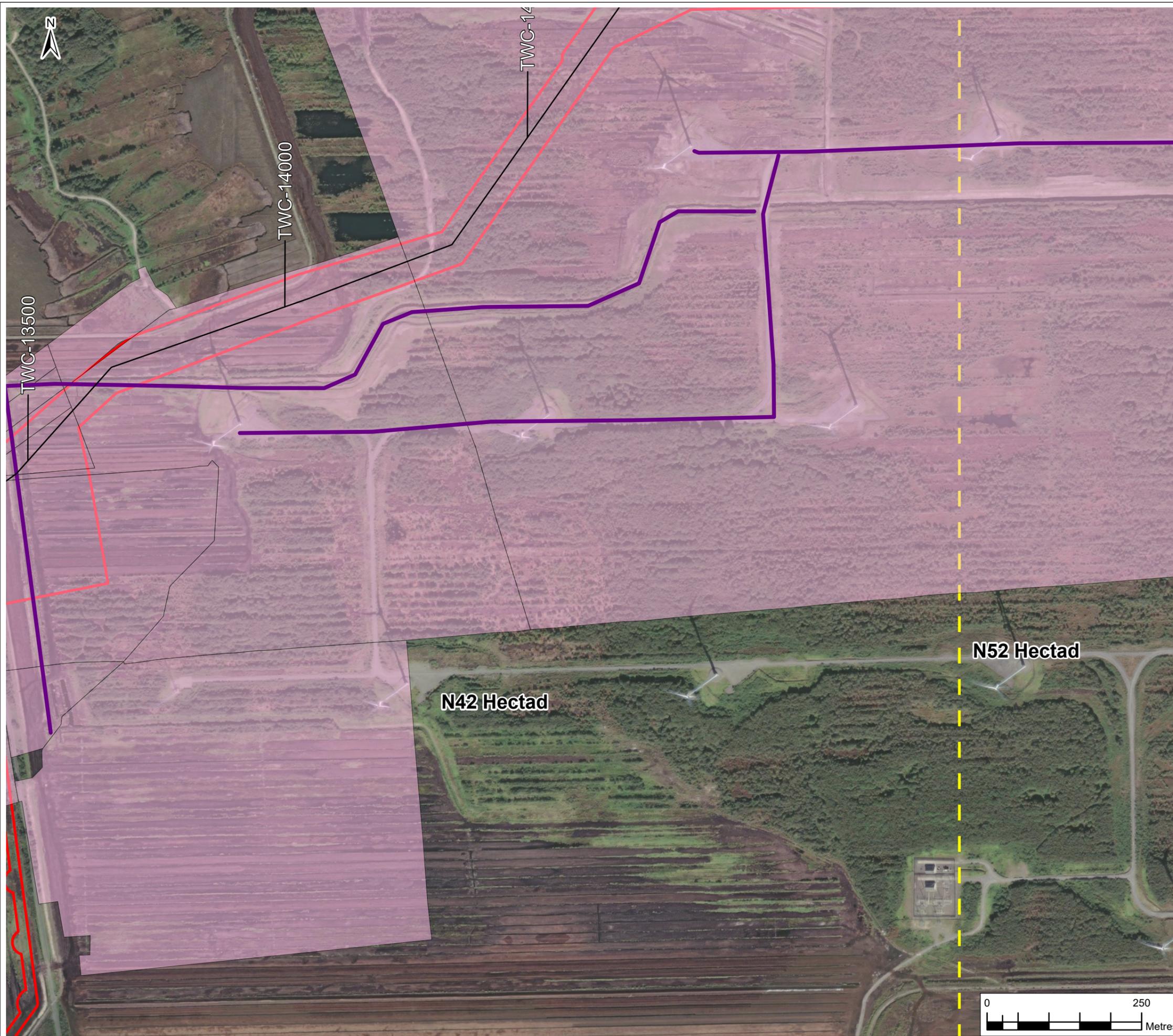
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- WSI Rare Plant Recommendations Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 23  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 23 of 53

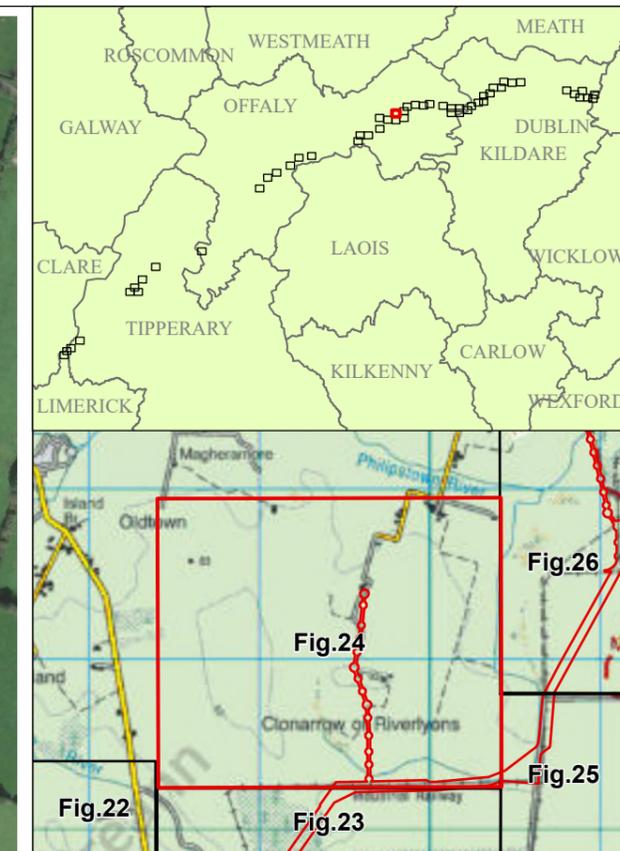
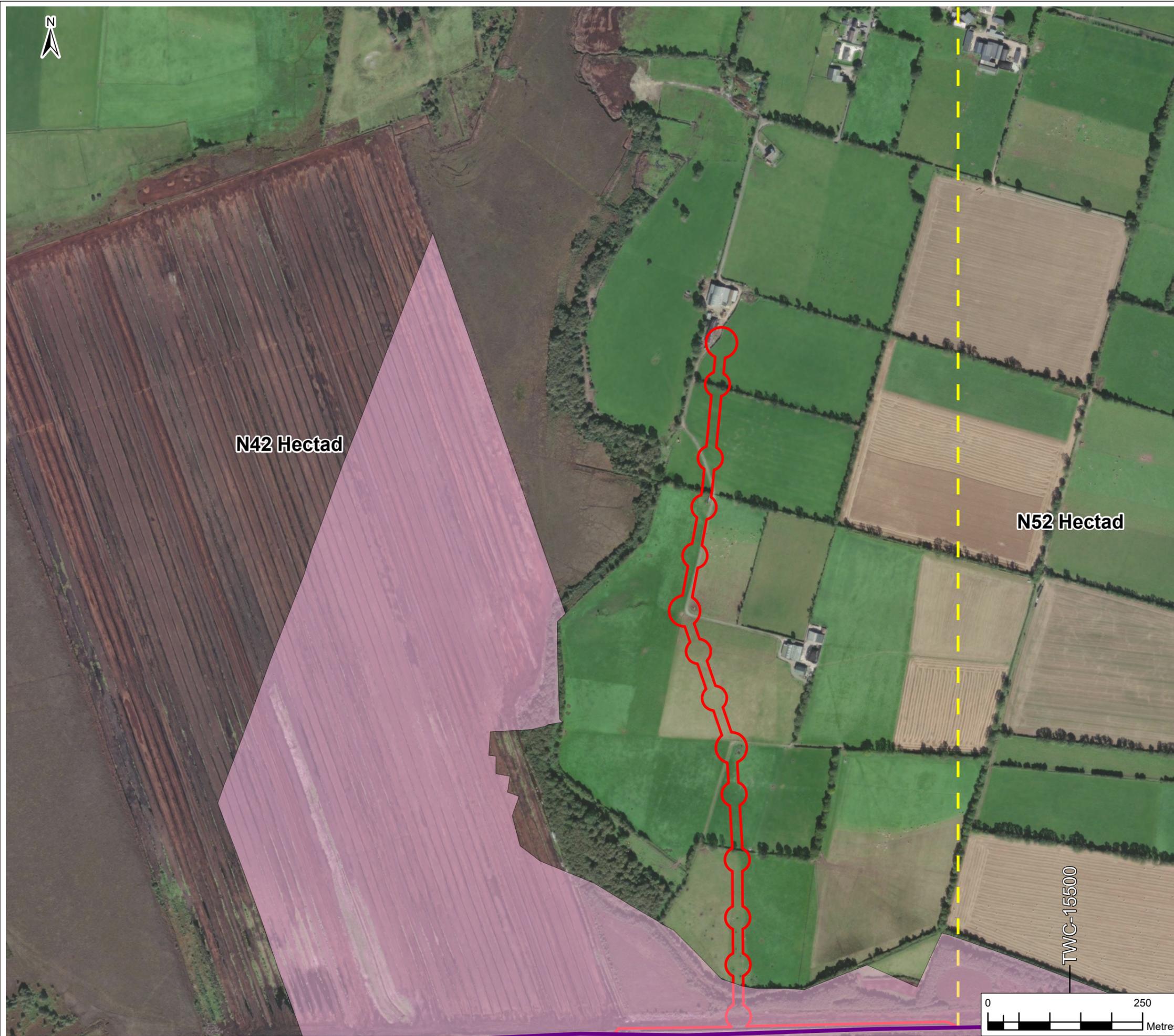
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- Legend**
- Planning Application Boundary
  - OSI 10km grid (Hectads)
  - Indicative Pipeline
- Rare plant target survey recommendations**
- WSI Rare Plant Recommendations Linear Features
  - Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
TW-xxx - Treated Water Chainage

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

# Jacobs TOBIN

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 24  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 24 of 53

Drawing Status

Final - Planning Application

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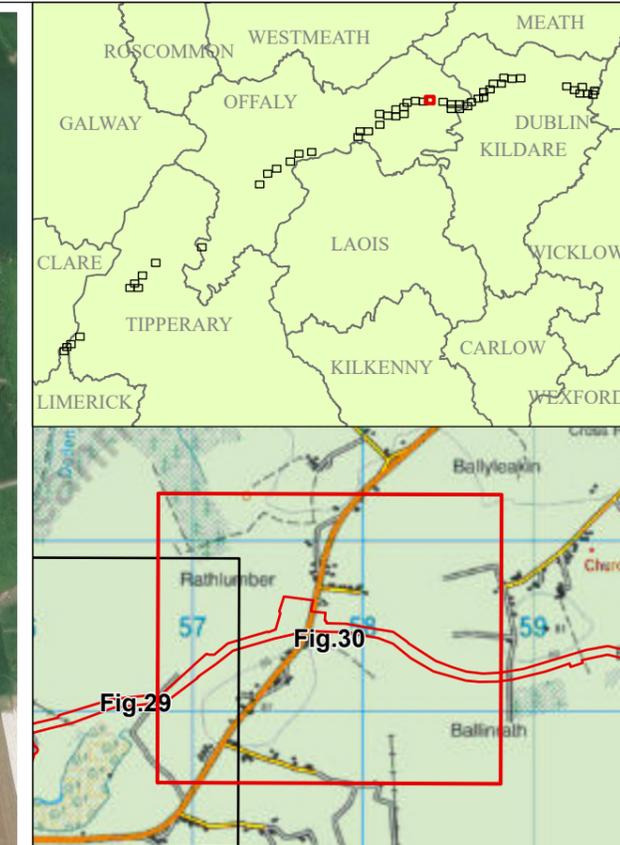
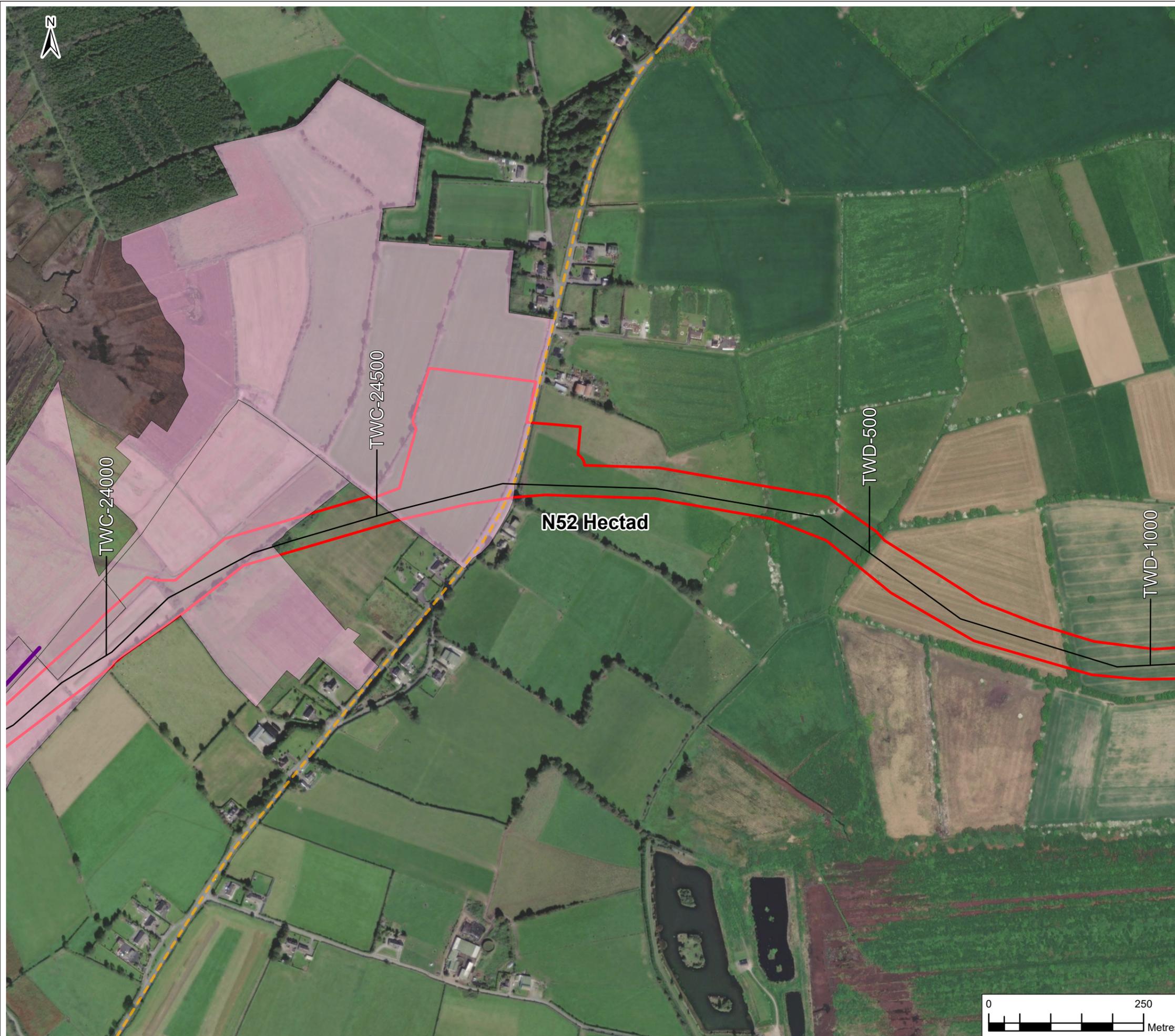












**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations
- Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client:

Project: Water Supply Project  
Eastern and Midlands Region

Drawing Title: **Figure 30**  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 30 of 53

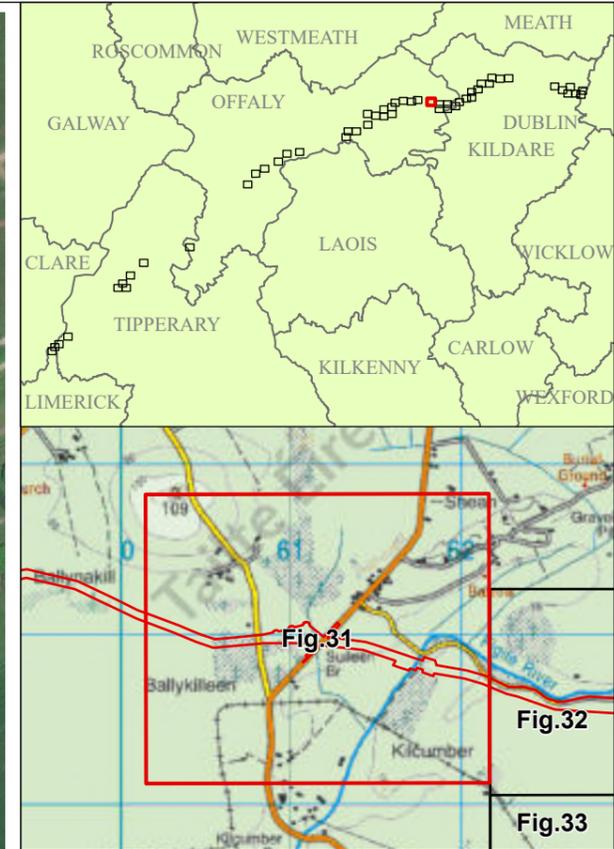
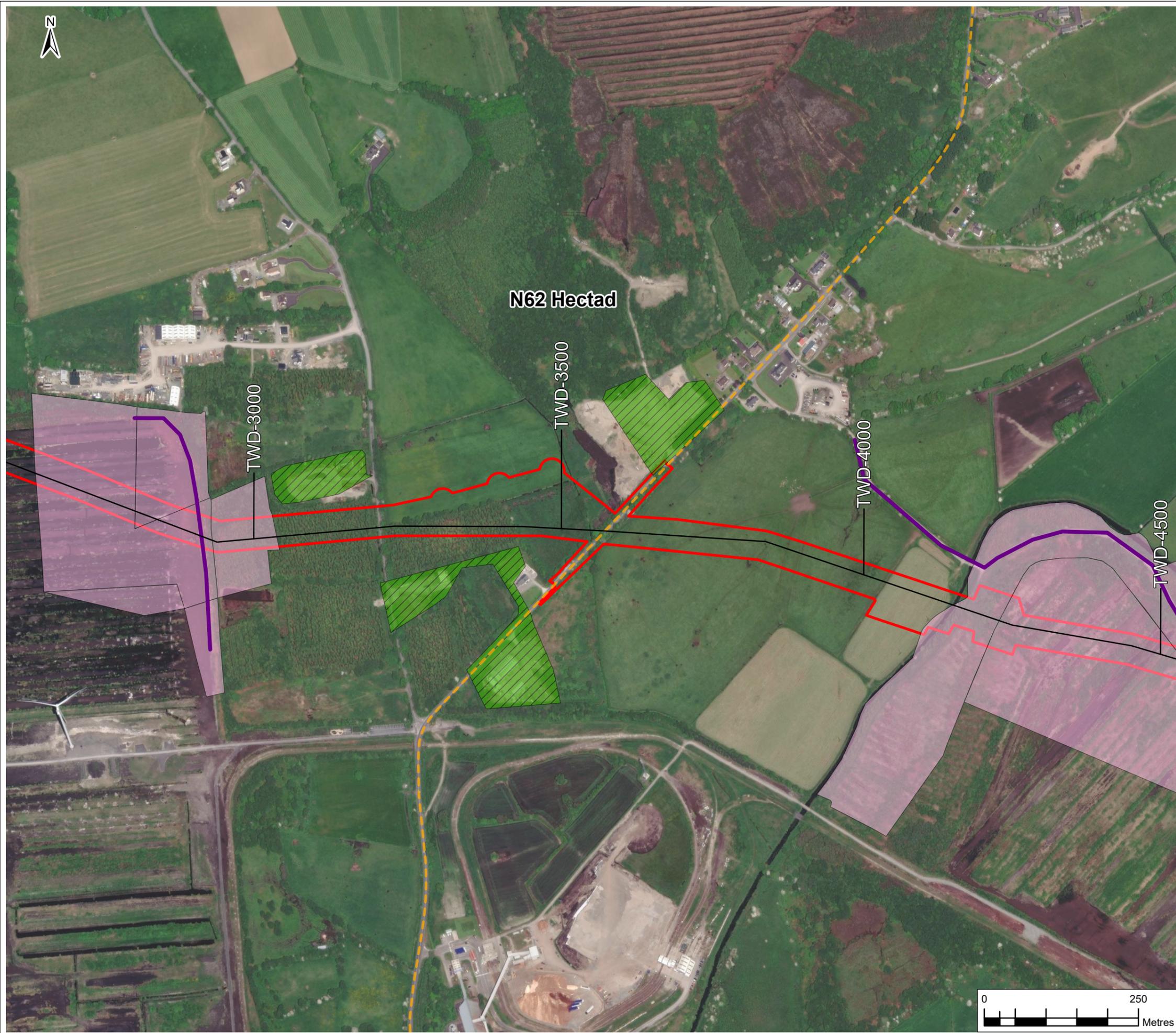
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Linear Features
- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client:

Project: Water Supply Project Eastern and Midlands Region

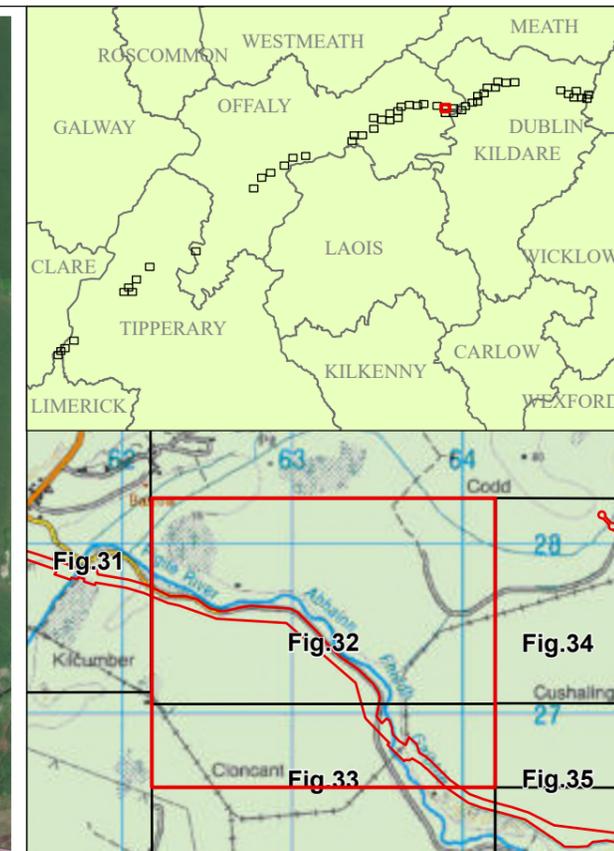
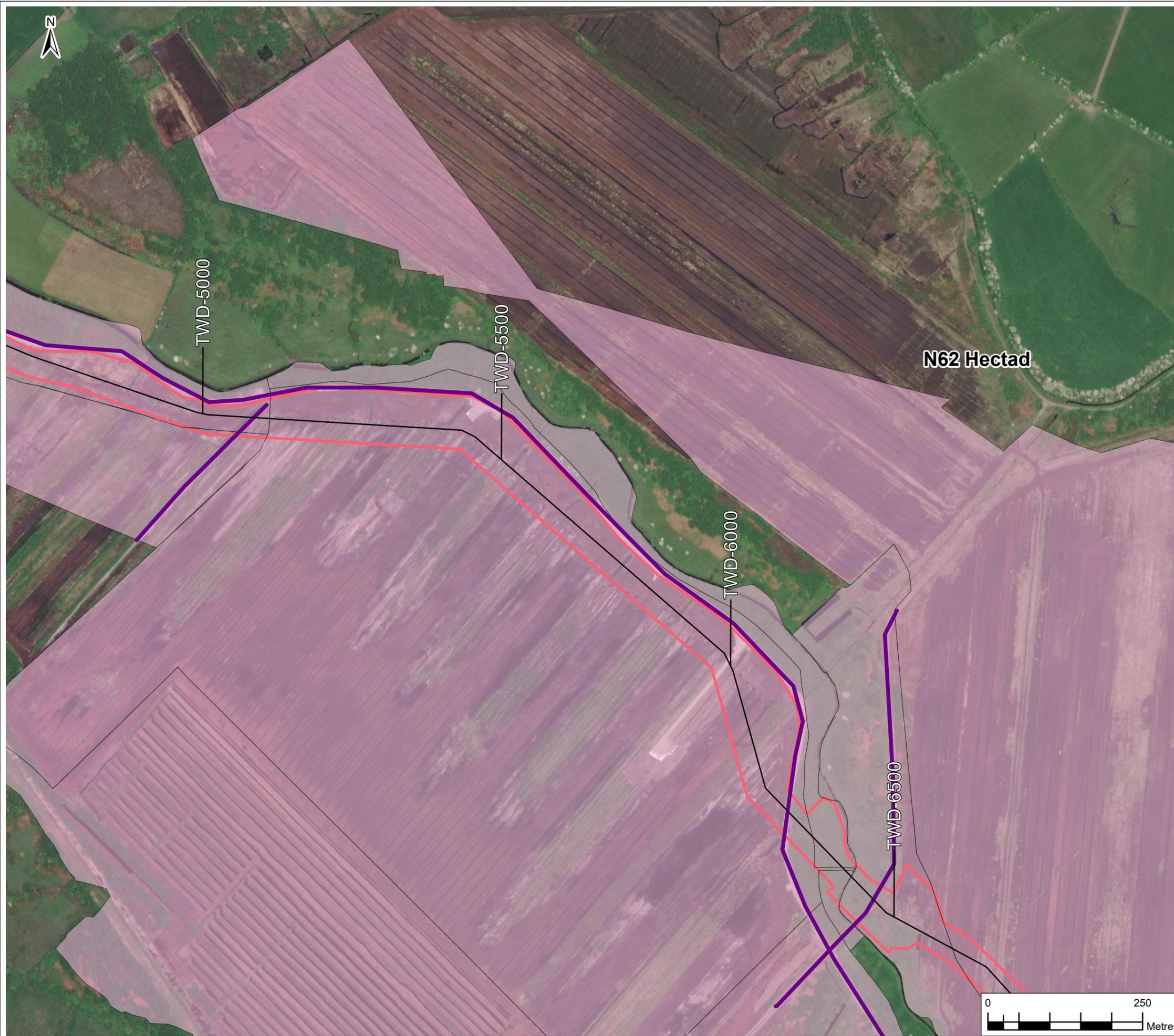
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Drawing Status: Final - Planning Application

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- WSI Rare Plant Recommendations
- Rare Plants High Priority Survey Folios

**Rare plant target survey recommendations**

**Linear Features**

**RW-xxx - Raw Water Chainage**  
**TW-xxx - Treated Water Chainage**

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**JACOBS TOBIN**

Client:

Project: Water Supply Project  
Eastern and Midlands Region

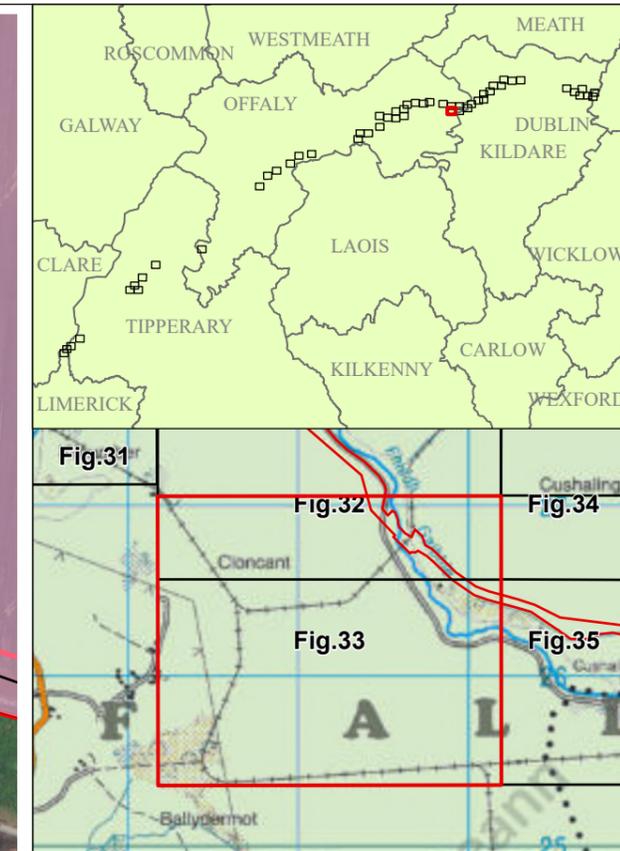
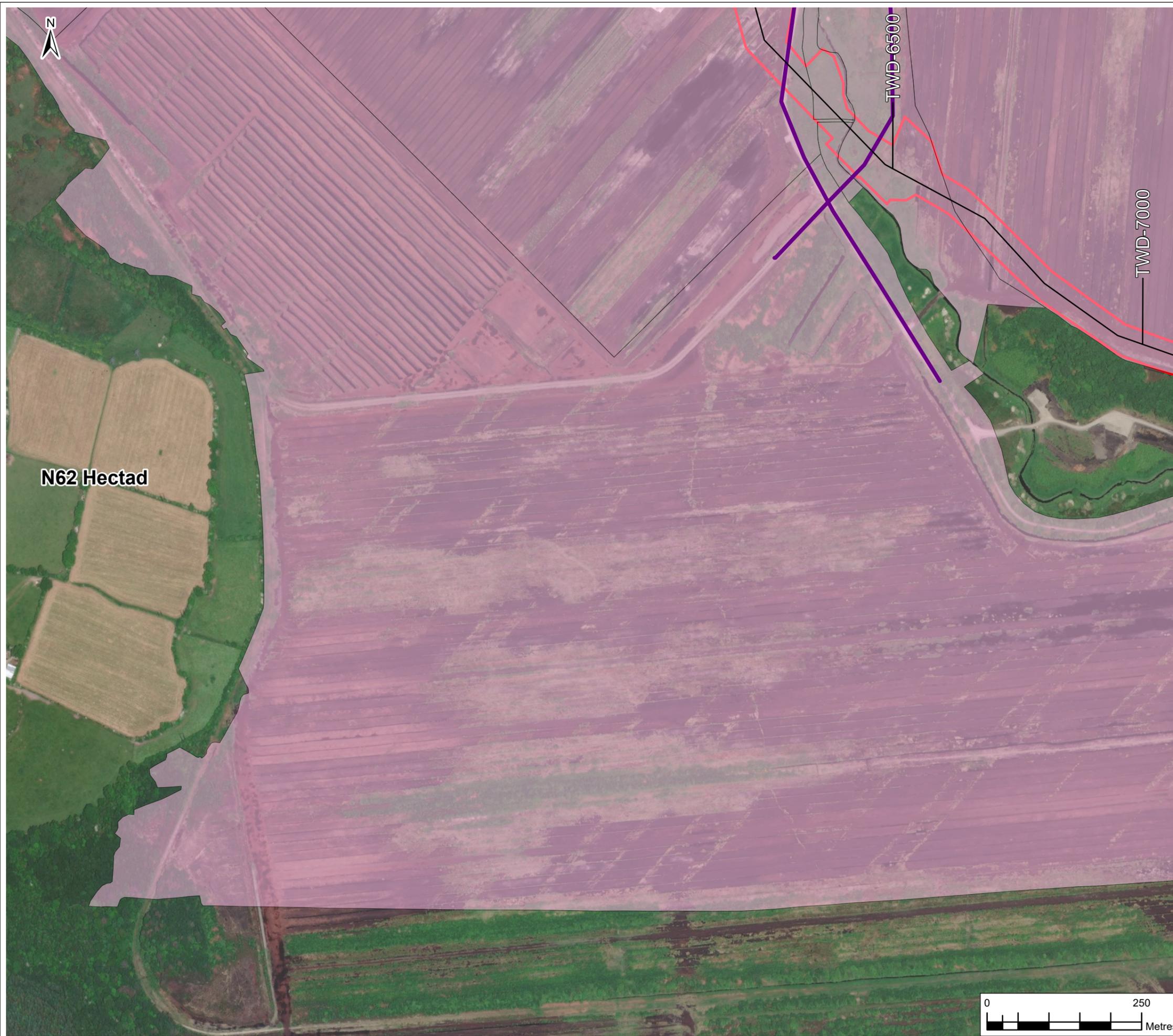
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Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 32 of 53

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- WSI Rare Plant Recommendations Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				

**Jacobs TOBIN**

Client:

Project: Water Supply Project  
Eastern and Midlands Region

Drawing Title: **Figure 33**  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 33 of 53

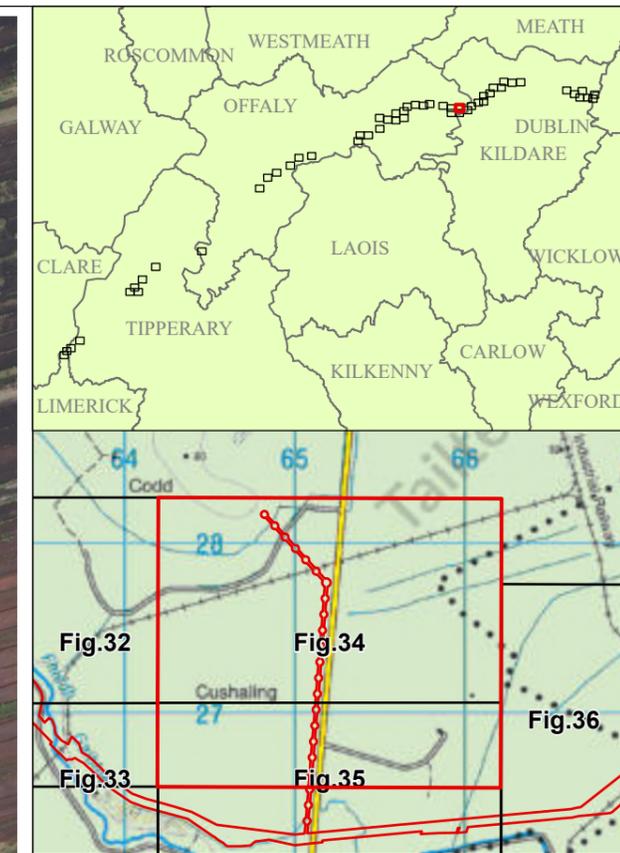
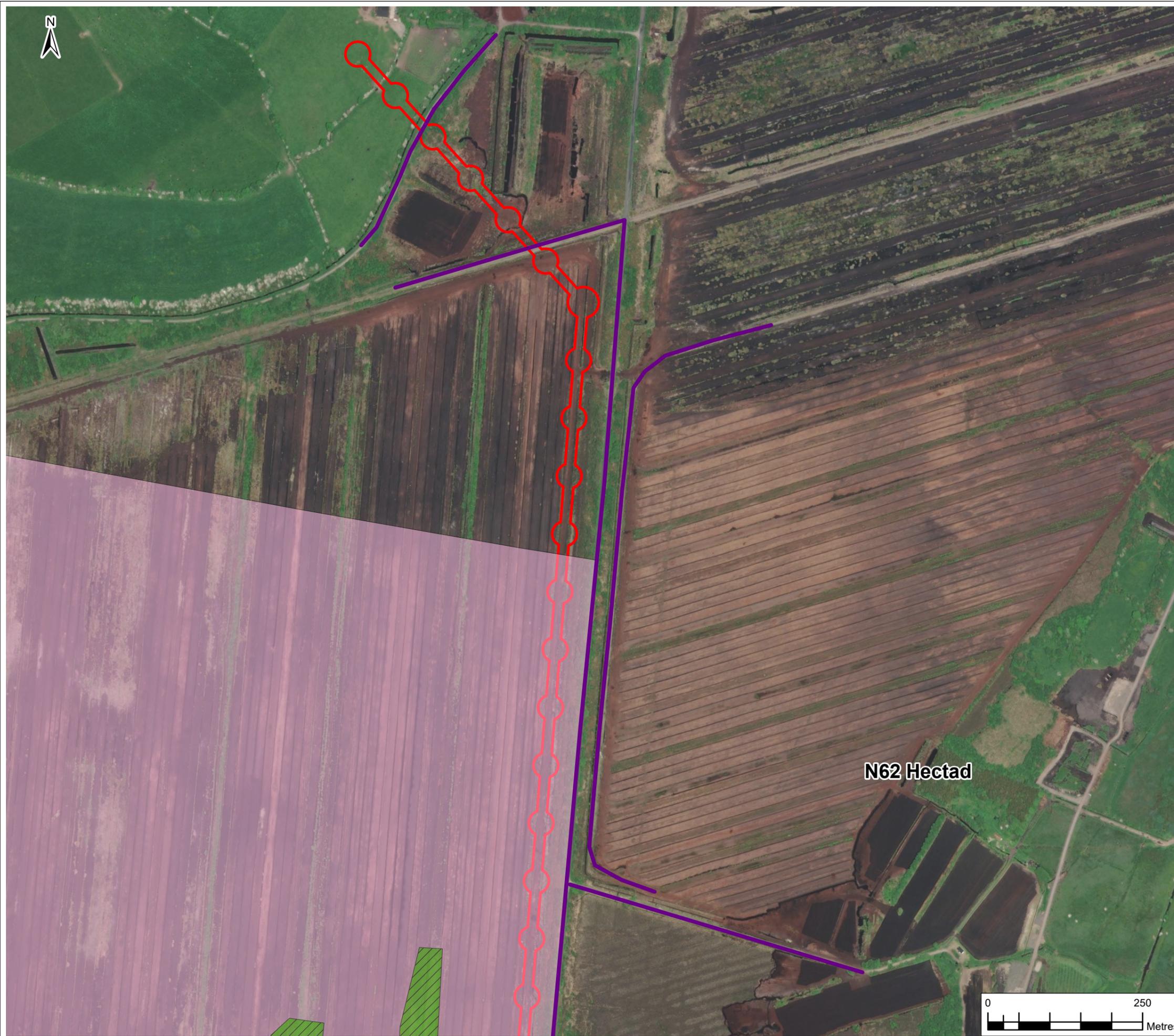
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- WSI Rare Plant Recommendations Linear Features
- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client:

Project: Water Supply Project  
Eastern and Midlands Region

Drawing Title: **Figure 34**  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 34 of 53

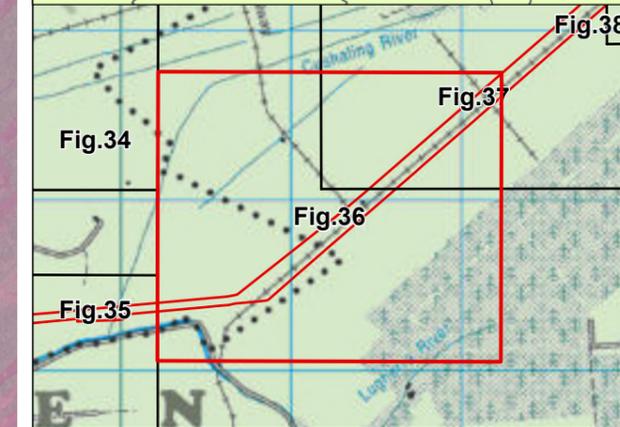
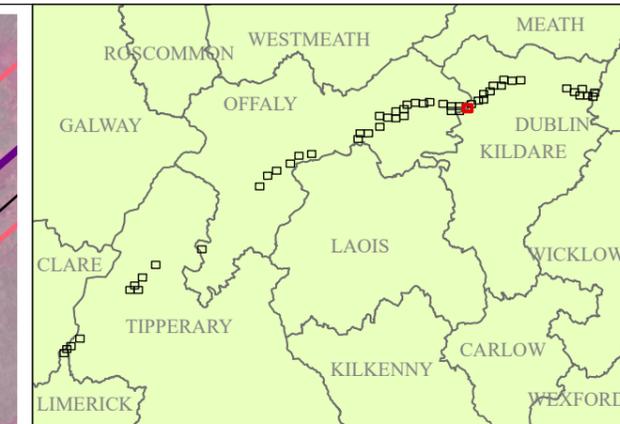
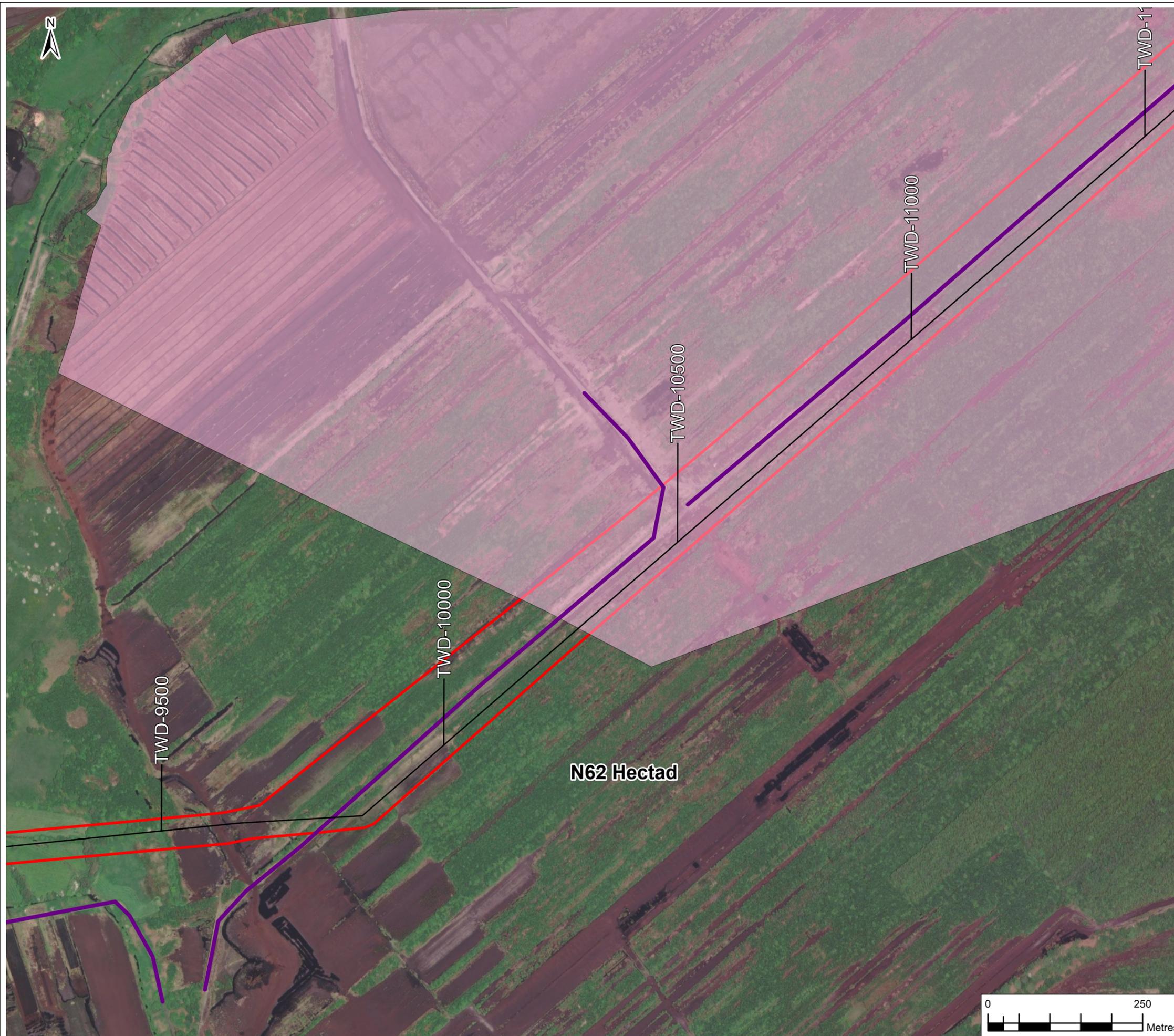
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- Legend**
- Planning Application Boundary
  - OSI 10km grid (Hectads)
  - Indicative Pipeline
  - Rare plant target survey recommendations
  - WSI Rare Plant Recommendations
  - Linear Features
  - Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 36  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 36 of 53

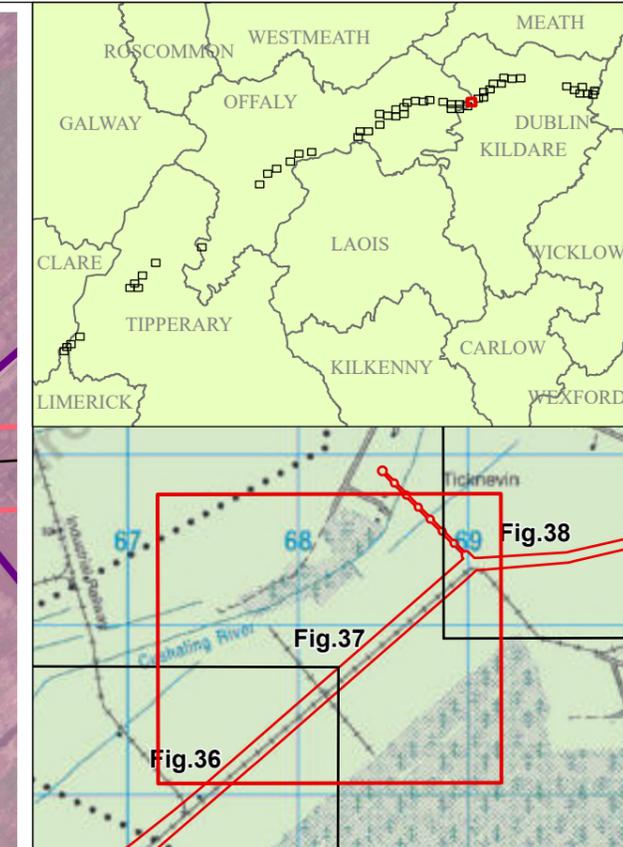
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Final - Planning Application

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 37  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 37 of 53

Drawing Status

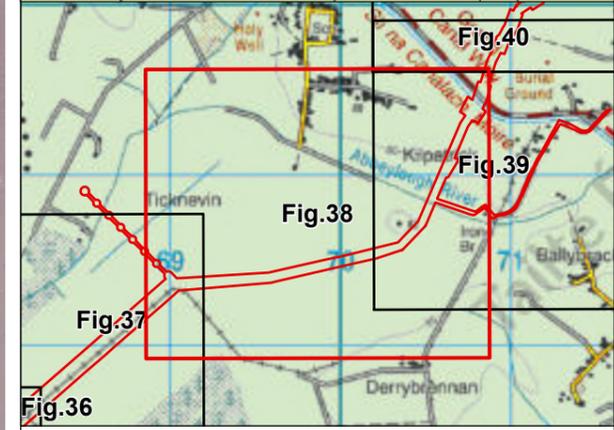
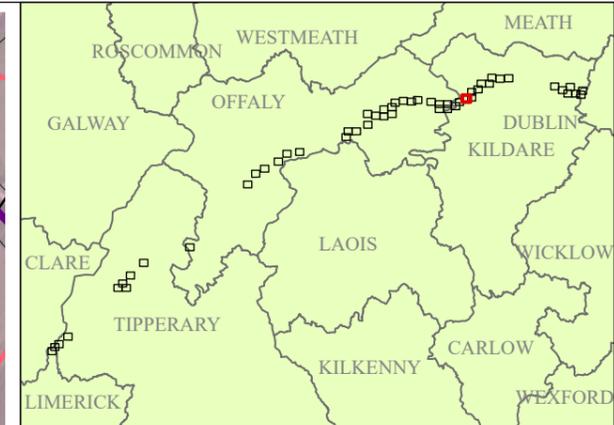
Final - Planning Application

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- WSI Rare Plant Recommendations
- Rare Plants High Priority Survey Folios

Rare plant target survey recommendations

- WSI Rare Plant Recommendations
- Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
 TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 38  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 38 of 53

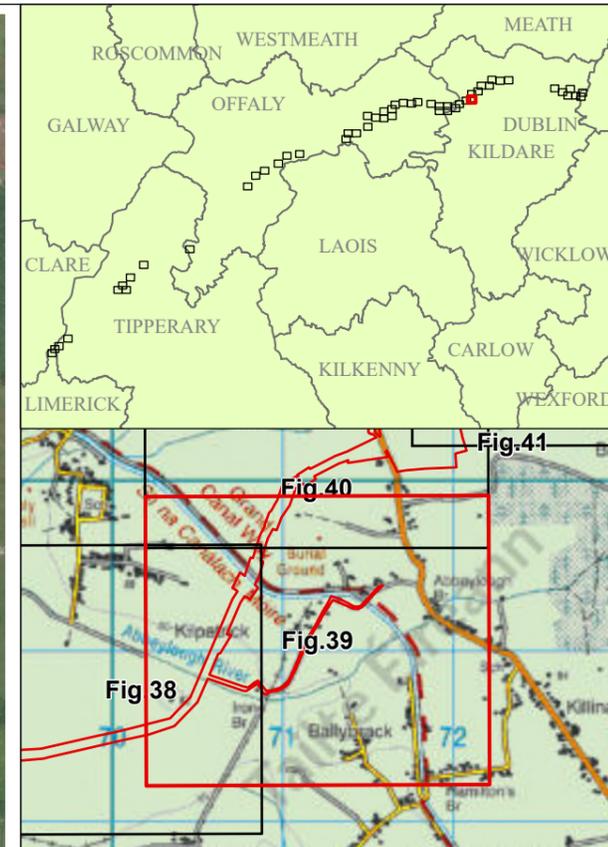
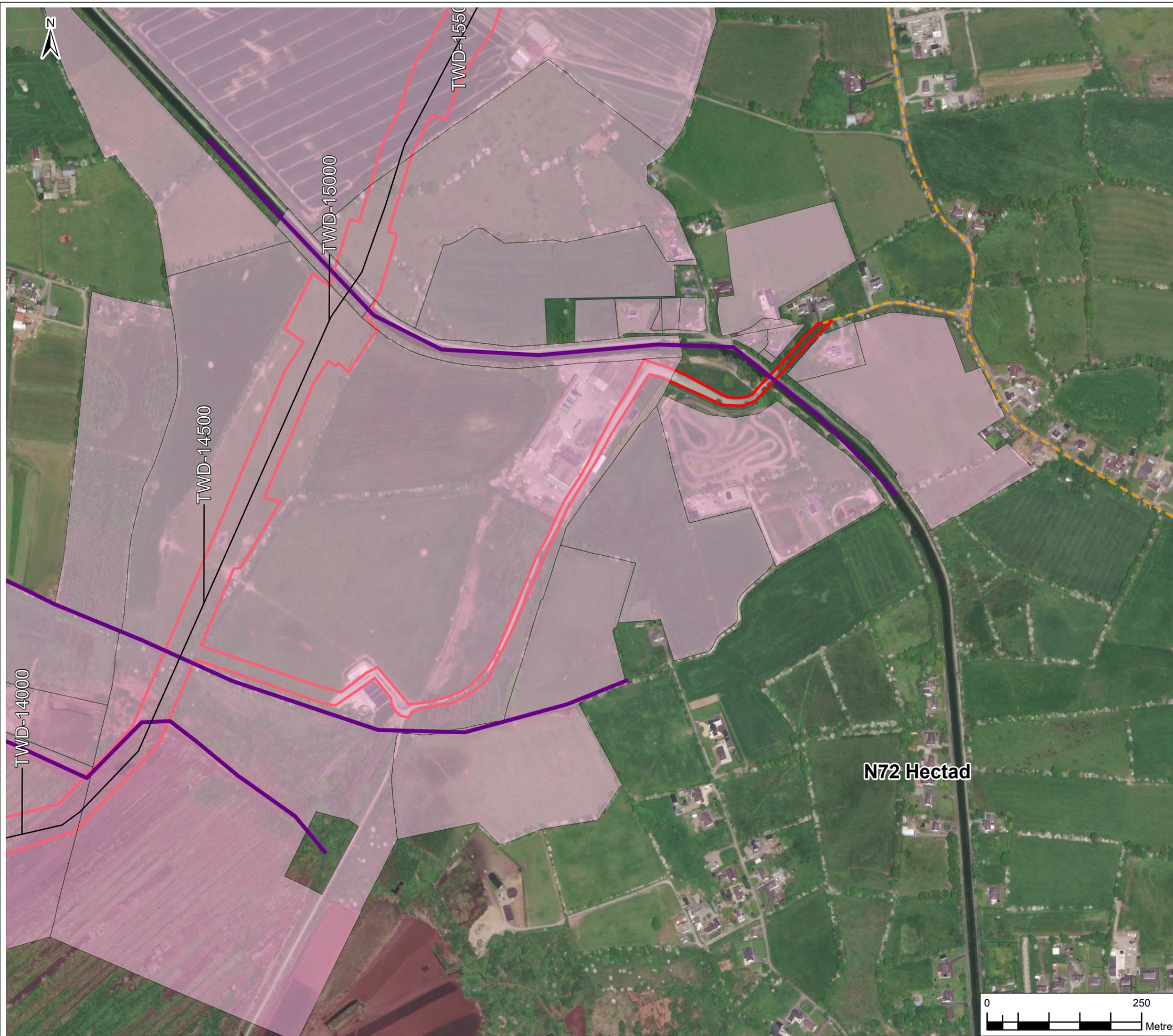
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- Legend**
- Planning Application Boundary
  - OSI 10km grid (Hectads)
  - Indicative Pipeline
  - Haul Roads
  - Rare plant target survey recommendations**
  - WSI Rare Plant Recommendations
  - Linear Features
  - Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 39  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 39 of 53

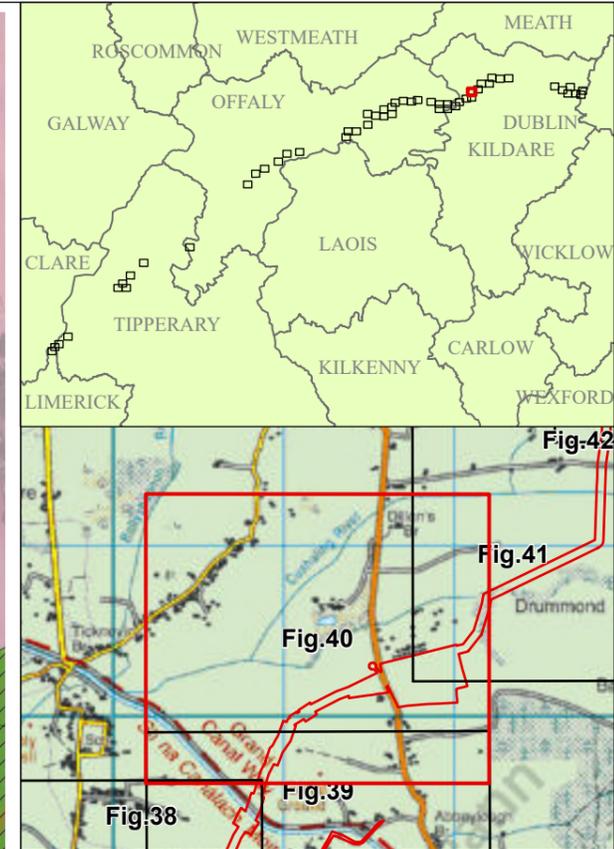
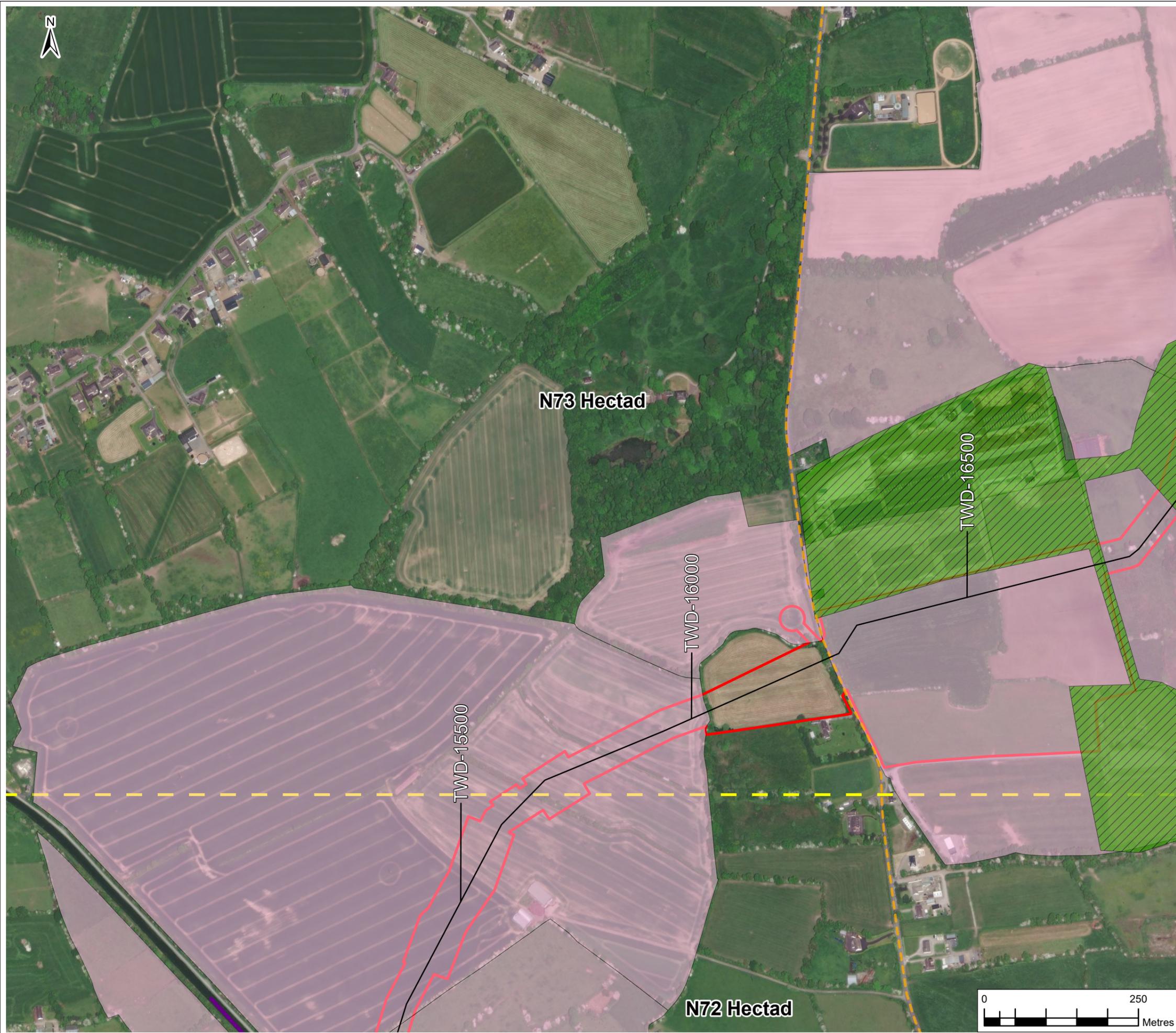
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Final - Planning Application

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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Linear Features
- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

**JACOBS TOBIN**

Client:

Project: Water Supply Project Eastern and Midlands Region

Drawing Title: Figure 40 Rare Plant Target Survey Recommendation Locations and Survey Areas Sheet 40 of 53

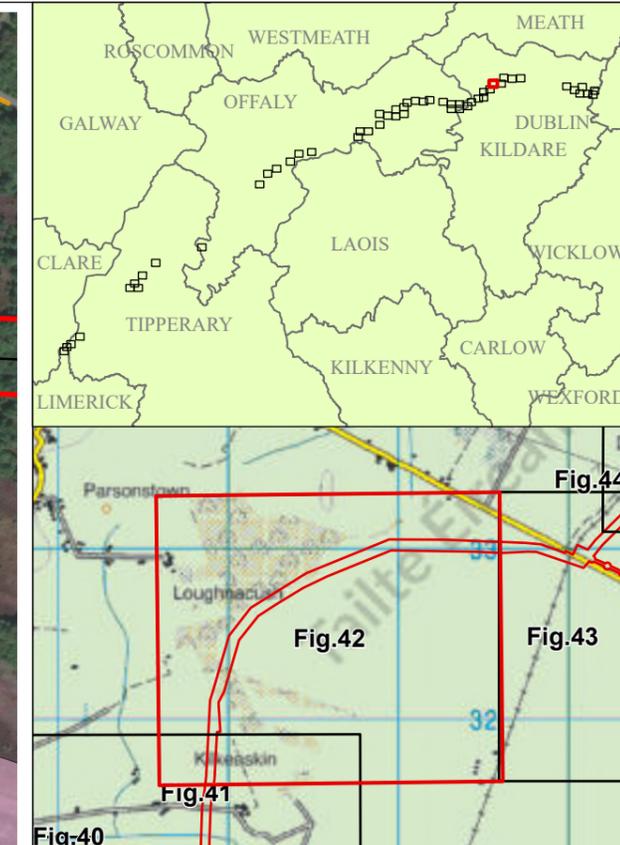
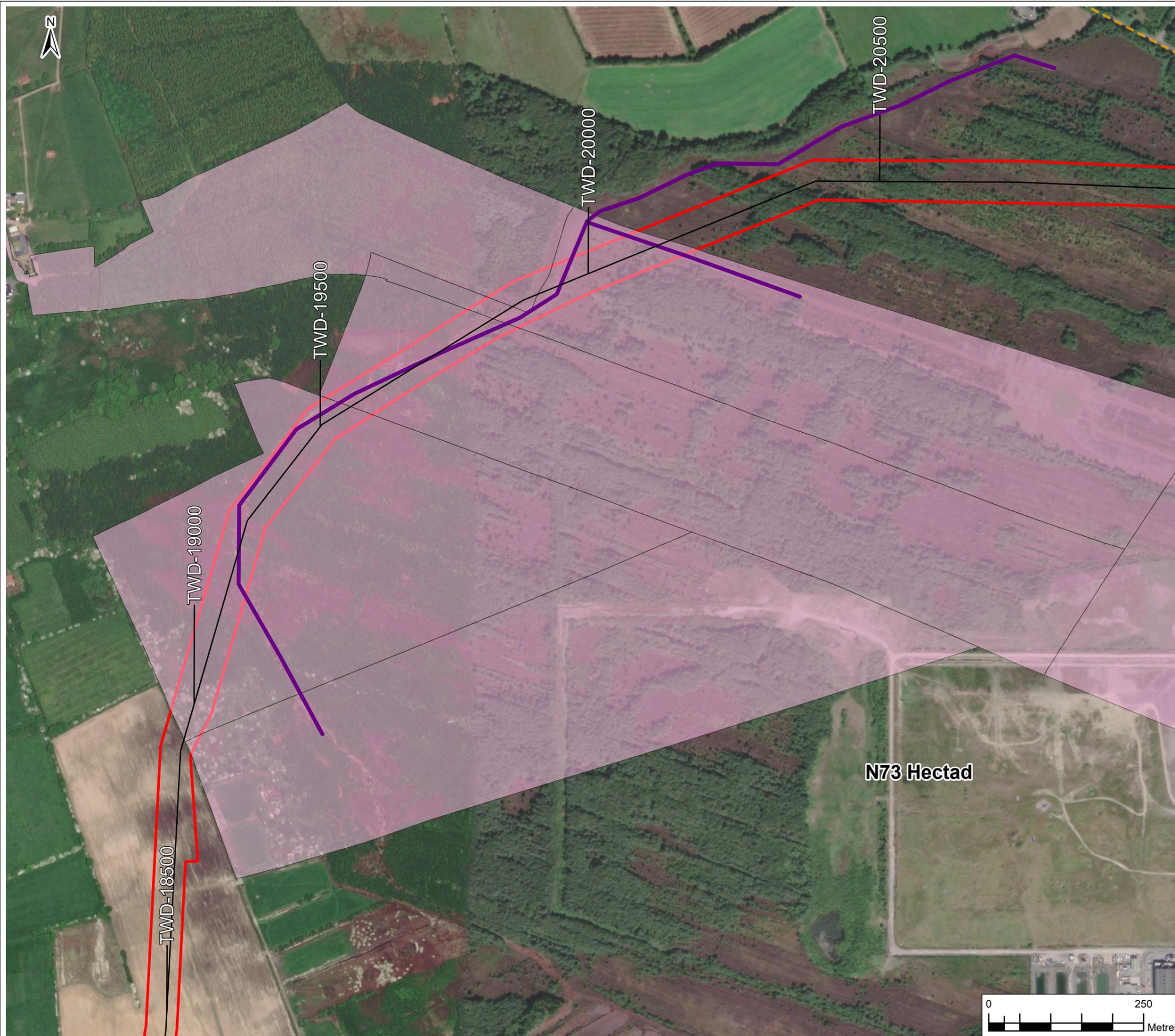
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

# Jacobs TOBIN

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 42  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 42 of 53

Drawing Status

Final - Planning Application

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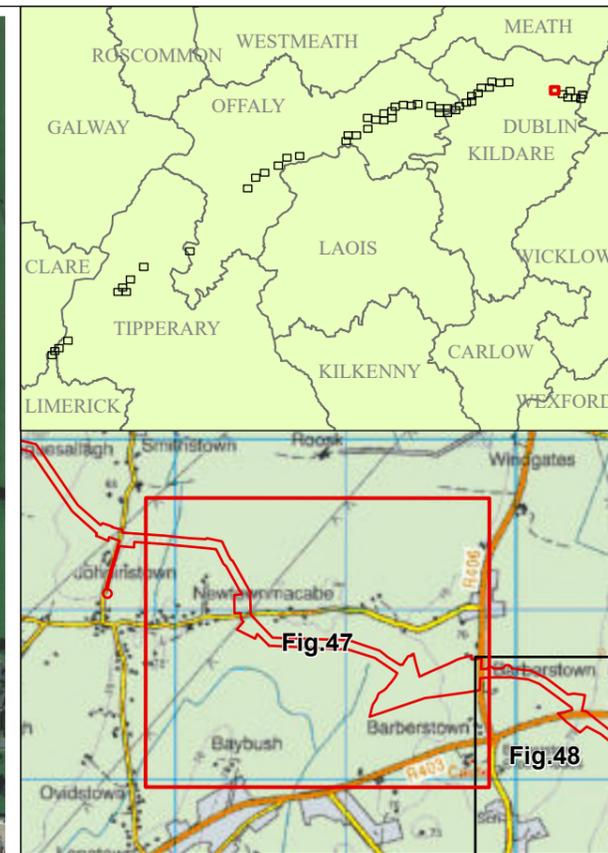
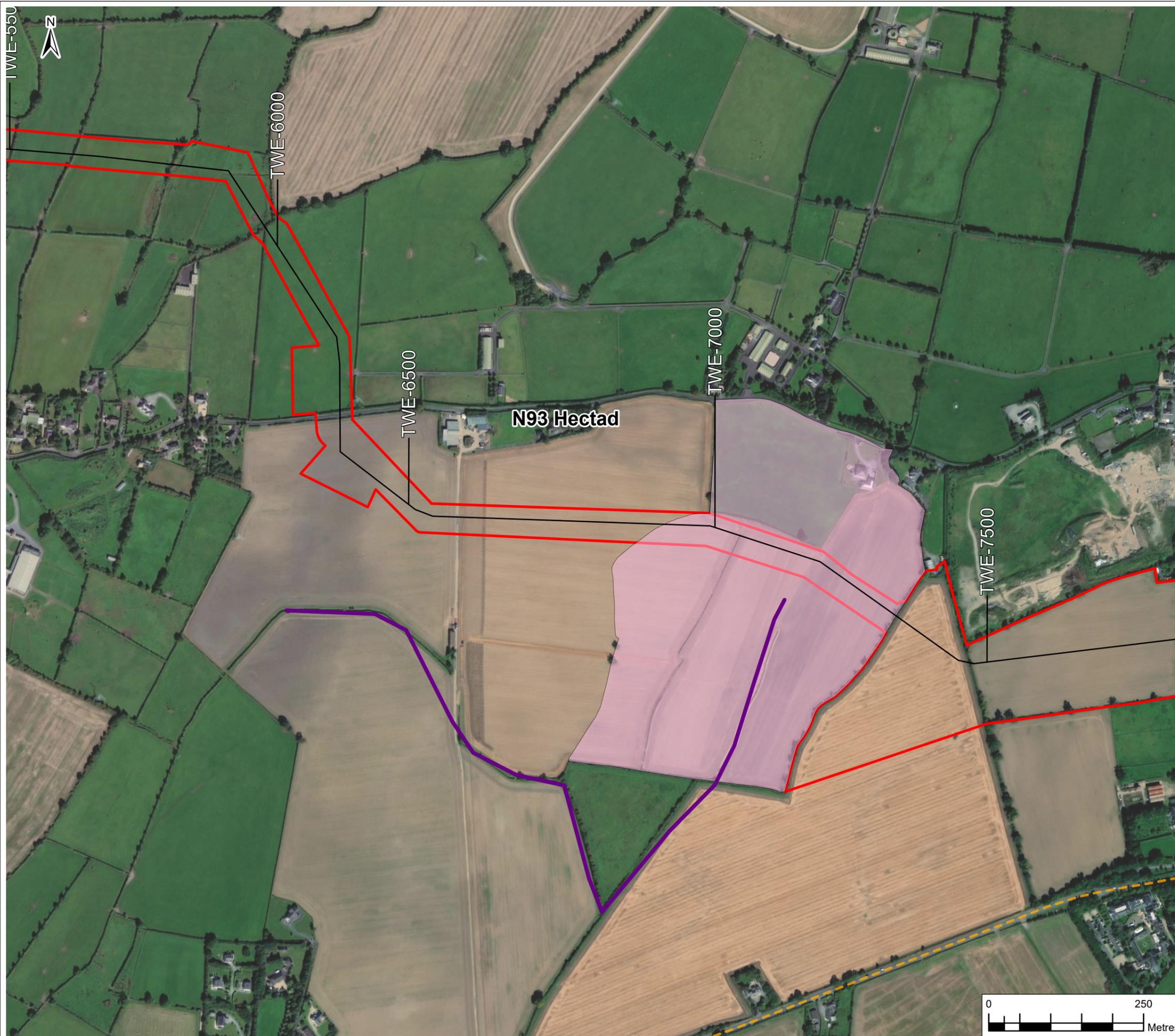
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**Legend**

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations
- Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 47  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 47 of 53

Drawing Status

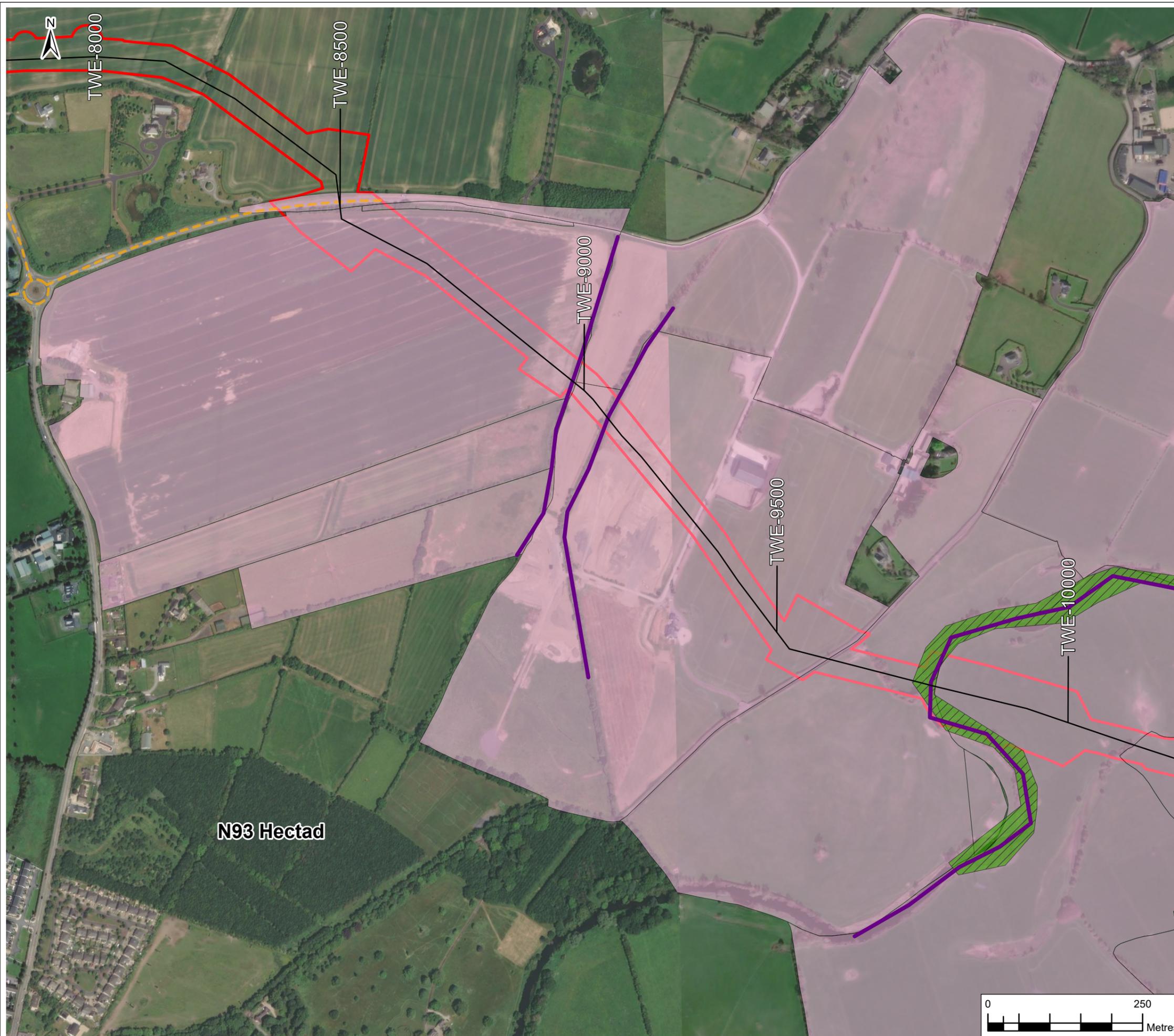
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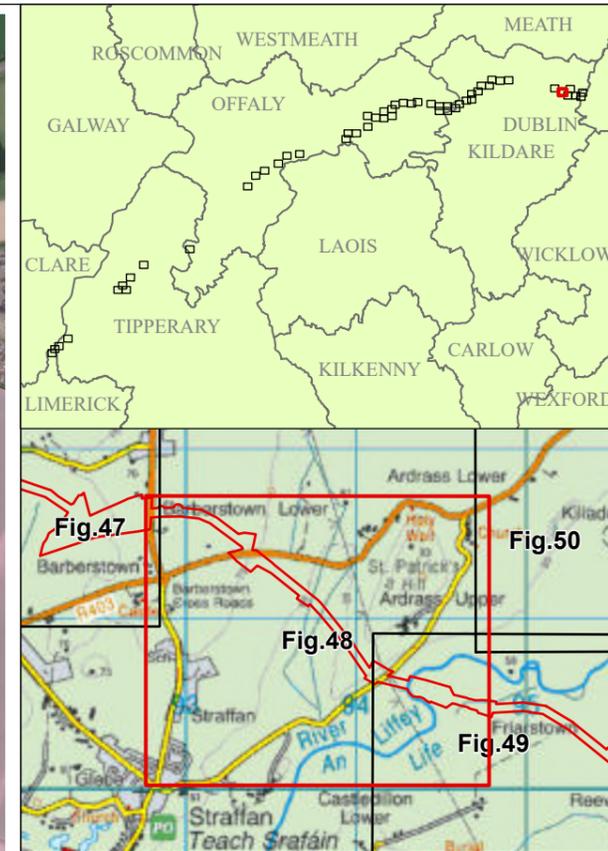


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N93 Hectad



Legend

- Planning Application Boundary
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads
- Rare plant target survey recommendations**
- WSI Rare Plant Recommendations Linear Features
- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
 TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				

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Client

Project

Water Supply Project  
 Eastern and Midlands Region

Drawing Title

Figure 48  
 Rare Plant Target Survey Recommendation Locations and Survey Areas  
 Sheet 48 of 53

Drawing Status

Final - Planning Application

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Jacobs No. 32105801

Client No. 9318

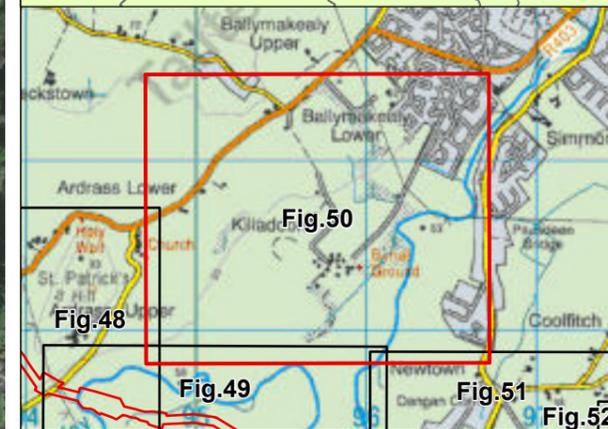
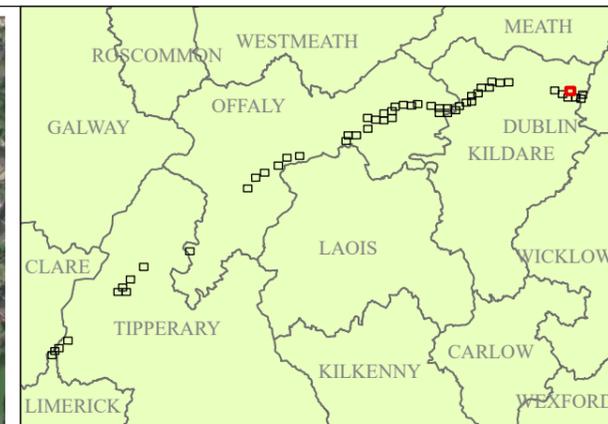
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**Legend**

- OSI 10km grid (Hectads)
- Rare plant target survey recommendations**
- WSI Rare Plant Recommendations Polygon Features
- Rare Plants High Priority Survey Folios

RW-xxx - Raw Water Chainage  
 TW-xxx - Treated Water Chainage

F03	21/11/25	Final - Planning Application	SP	SN	LK	PW
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

**Jacobs TOBIN**

Client

Project

Water Supply Project  
Eastern and Midlands Region

Drawing Title

Figure 50  
Rare Plant Target Survey Recommendation Locations and Survey Areas  
Sheet 50 of 53

Drawing Status

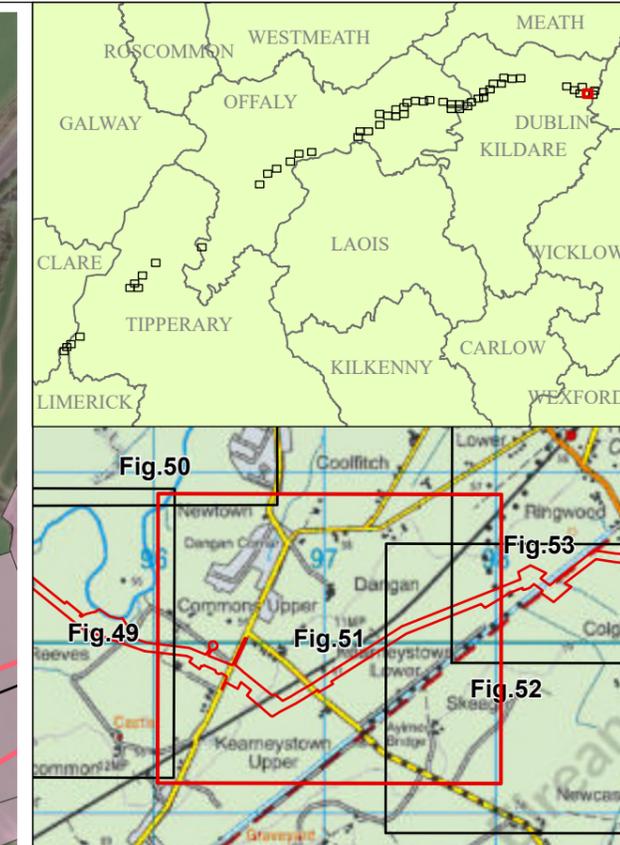
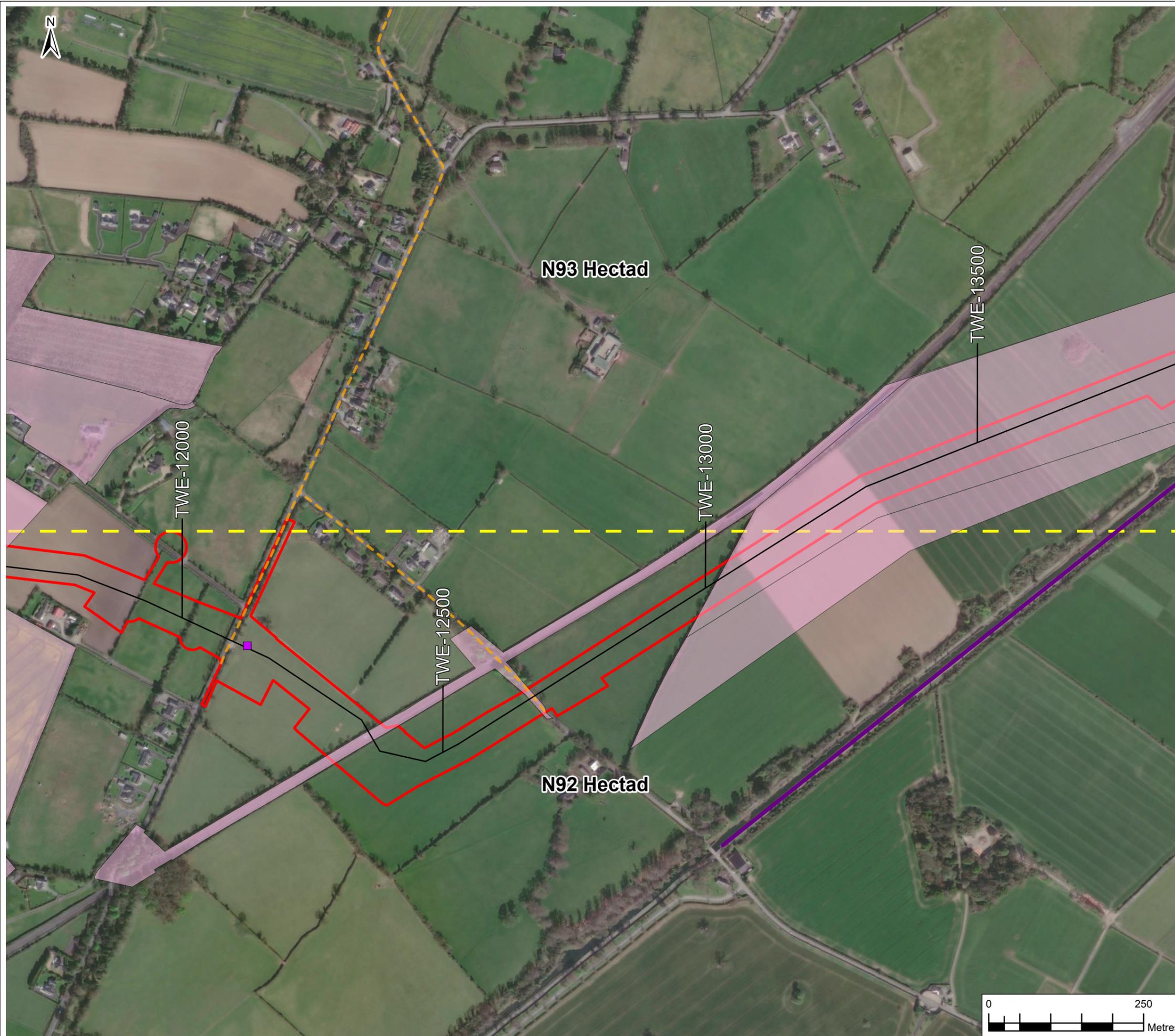
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**Legend**

- Planning Application Boundary
- Flow Control Valve
- OSI 10km grid (Hectads)
- Indicative Pipeline
- Haul Roads

**Rare plant target survey recommendations**

- WSI Rare Plant Recommendations Linear Features
- Rare Plants High Priority Survey Folios

*RW-xxx - Raw Water Chainage*  
*TW-xxx - Treated Water Chainage*

Rev.	Date	Purpose of revision	SP	SN	LK	PW
F03	21/11/25	Final - Planning Application				
			Drawn	Check'd	Rev'd	Appr'd

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Client:

Project: Water Supply Project Eastern and Midlands Region

Drawing Title: Figure 51 Rare Plant Target Survey Recommendation Locations and Survey Areas Sheet 51 of 53

Drawing Status: Final - Planning Application

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Client No.	9318	
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