



ARCUS

**GREEN INFRASTRUCTURE STATEMENT AND BIODIVERSITY
METRIC ASSESSMENT**

SWANSEA NORTH ENERGY MANAGEMENT FACILITY

FOR STATKRAFT UK LTD

JUNE 2020



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1 INTRODUCTION

This report has been prepared on behalf of Statkraft UK Ltd (the Applicant) in relation to a planning application made to Swansea Council for the construction of an energy management facility (the Development) on land east of the Swansea North substation (the Site).

This report uses the DEFRA Biodiversity Metric 2.0 Calculation Tool Beta Test¹ (re published December 2019) to produce a quantifiable amount of biodiversity units produced post-construction, and compare them to the baseline biodiversity unit's pre-construction to determine if the Development will result in a net gain or net loss in biodiversity.

2 METHODOLOGY

This report has been produced in accordance with the methodology set out in the following guidance documents:

- The Biodiversity Metric 2.0 – User Guide – Beta Test²; and
- The Biodiversity Metric 2.0 – Technical Supplement – Beta Test³.

Two access road options have been presented in this report. Option 1 utilises the consented Abergelli Power Station access road as the access route to the Site. Option 2 provides a separate access route to the Site, independent of the Abergelli Power Station route. It should be noted that whilst the Abergelli Power Station access road lies within the Site's redline boundary, no enhancement or creation measures can be implemented here as part of this Development.

Appendix 1 and 2 show the inputs and results produced by the metrics. If required by the Council the completed metric excel workbook can be provided.

The following documents submitted as part of the planning application have been used to inform this report:

- Preliminary Ecological Appraisal and Phase 1 Habitat Survey Map; and
- Landscape and Biodiversity Management Plan.

The Phase I Habitat Survey Map and the Landscape and Biodiversity Management Plan are included in Appendix 3.

2.1 Option 1

2.1.1 *Baseline, Pre-construction Biodiversity Units*

Baseline habitat information was taken from the Phase 1 Habitat Survey⁴ undertaken in September 2019 by a professional Ecologist.

Identified baseline habitats within the Site include:

- Neutral Grassland – semi-improved;
- Improved Grassland; and
- Broadleaved Woodland.

The location of these habitats can be found in Appendix 3.

¹ Available at <http://publications.naturalengland.org.uk/publication/5850908674228224>

² Department for Environment Food and Rural Affairs (DEFRA) (July 2019). The Biodiversity Metric 2.0 auditing and accounting for biodiversity user guide Beta version. Available at <http://publications.naturalengland.org.uk/publication/5850908674228224> [Accessed 06/02/2020].

³ Department for Environment Food and Rural Affairs (DEFRA) (July 2019). The Biodiversity Metric 2.0 Technical Supplement Beta Test. Available at Department for Environment Food and Rural Affairs (DEFRA) (July 2019). [Accessed 11/05/2020].

⁴ Arcus Consultancy Services Ltd (2020). Swansea North Battery Storage Preliminary Ecological Appraisal.

The list of habitats provided in the DEFRA calculator are not all directly comparable with the habitats identified within the Application boundary. As a result, professional judgement has been used to best match habitat types to those available within the DEFRA calculator. This includes best matching the neutral grassland and improved grassland to a suitable alternative habitat within the metric.

The condition of the habitats has been determined by a professional Ecologist.

The area or length of habitats has been estimated using online mapping. There is a slight difference in total site area at the onsite baseline (4.59 ha) and the total onsite area post construction (4.57 ha). This difference is due to limitations associated with survey work and desk-based mapping. Given the small difference in habitats lost (2.47 ha) and habitats created (2.45), this is unlikely to make a significant difference to the biodiversity metric calculations.

Following the Biodiversity Metric assessment, the redline boundary was amended from 4.59 ha to 5.53 ha. The additional 0.94 ha of land gained will remain in situ post construction and will not be enhanced or lost to the Development. As a result, the metric has not included this additional 0.94 ha.

2.1.2 Post Construction Biodiversity Units

Following construction, the existing Broadleaved Woodland will be retained and left in-situ.

Some of the neutral grassland will be enhanced post construction, into grassland to be managed to increase species richness and Tussocky Grassland for Marsh Fritillary butterfly.

Further details on measures used to enhance this habitat can be found in the Landscape and Biodiversity Management Plan included in Appendix 2.

Following construction, new habitats will be created which include:

- Developed Land – the proposed battery storage containers, inverters, Energy management modules, transformers, coolers, ancillary infrastructure and access road (which includes the consented Abergelli Power Station access road);
- Proposed Bare Ground – found in between development infrastructure.
- Proposed Attenuation Ponds;
- Proposed Native Species Woodland and Scrub Mix; and
- Proposed Fescue/Bent Mix with Wildflowers.

The accelerated succession tool has been used for the proposed native species woodland and scrub. Existing baseline grassland will not be removed post-construction, but will be managed to eventually form the new more diverse habitat.

2.2 Option 2

2.2.1 Baseline, Pre-construction Biodiversity Units

As the same redline boundary has been used for Options 1 and 2, the baseline for both are the same (see section 2.1.1).

The area or length of habitats has been estimated using online mapping. There is a slight difference in total site area at the onsite baseline (4.59 ha) and the total onsite area post construction (4.57 ha). This difference is due to limitations associated with survey work and desk-based mapping. Given the small difference in habitats lost (2.53 ha) and habitats created (2.51), this is unlikely to make a significant difference to the biodiversity metric calculations.

2.2.2 Post Construction Biodiversity Units

If Option 2 is taken forward, the creation of this access route will require the removal of a small area of Broadleaved Woodland to make way for this access route. The remaining woodland will be left in-situ.

Some of the neutral grassland will be enhanced post construction, into grassland to be managed to increase species richness and Tussocky Grassland for Marsh Fritillary butterfly.

Further details on measures used to enhance this habitat can be found in the Landscape and Biodiversity Management Plan included in Appendix 2.

Following construction, new habitats will be created which include:

- Developed Land – the proposed battery storage containers, inverters, Energy management modules, transformers, coolers, ancillary infrastructure and option 2 access road and the consented Abergelli Power Station access road;
- Proposed Bare Ground – found in between development infrastructure.
- Proposed Attenuation Ponds;
- Proposed Native Species Woodland and Scrub Mix; and
- Proposed Fescue/Bent Mix with Wildflowers.

The accelerated succession tool has been used for the proposed native species woodland and scrub. Existing baseline grassland will not be removed post-construction, but will be managed to eventually form the new more diverse habitat.

2.3 Offsite

2.3.1 Baseline Biodiversity Units

Given the relatively small size of the Application boundary, additional offsite planting has been proposed adjacent to the proposed Development, but within the same landownership parcel. This is proposed for both Option 1 and Option 2. This will not only further improve the biodiversity and ecological connectivity between onsite and offsite habitat, but also help to screen any views of the Development.

The baseline of this offsite area was assessed during the Phase 1 Habitat Survey for the Development. The habitat identified was the same as the onsite baseline – neutral grassland – semi-improved with some broadleaved scattered trees. No hedgerows were present at the baseline.

The condition of the habitats has been determined by a professional Ecologist.

2.3.2 Baseline Biodiversity Units Post Construction

All existing broadleaved scattered trees will be retained in-situ.

Some of the neutral grassland will be enhanced post construction, into grassland to be managed to increase species richness and Tussocky Grassland for Marsh Fritillary butterfly.

Further details on measures used to enhance this habitat can be found in the Landscape and Biodiversity Management Plan included in Appendix 2.

Native species woodland and scrub mixed will be added to the offsite area. The accelerated succession tool has been used for the proposed native species woodland and scrub. Existing offsite grassland will not be removed, but will be managed to eventually form the new more diverse habitat.

A new species rich hedgerow with trees will also be planted offsite.

3 RESULTS

Results produced by the calculator can be found in Appendix 1 of this report.

3.1 Option 1

The metric has shown there to be a **9.95% net gain** in biodiversity onsite if Option 1 were taken forward. The number of habitat units onsite has increased from 32.24 to 35.45.

3.2 Option 2

The metric has shown there to be a **8.46% net gain** in biodiversity onsite if Option 1 were taken forward. The number of habitat units onsite has increased from 32.24 to 34.97.

3.3 Offsite

The metric has shown there to be a **103% net gain** in biodiversity offsite post construction. The offsite habitat units have increased from 8.56 to 17.38. The addition of a new hedgerow to the offsite area, increases the number of hedgerow units to 0.14 offsite post construction.

3.4 Summary

An overall net gain of 37.31% has been achieved for Option 1 (this includes onsite and offsite measures).

An overall net gain of 35.82% has been achieved for Option 2 (this includes onsite and offsite measures).

APPENDIX 1 – OPTION 1 BIODIVERSITY METRICS INPUTS AND RESULTS

North Swansea Battery
A-1 Site Habitat Baseline

Condense / Show Columns Condense / Show Rows
Main Menu Instructions

Ref	Habitats and areas			Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance			Suggested action to address habitat losses	Ecological baseline Total habitat units
	Broad Habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier		
1	Grassland	Grassland - Other neutral grassland	1.89	Medium	4	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	15.12
2	Grassland	Grassland - Modified grassland	1.12	Low	2	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required	4.48
3	Woodland and forest	Woodland and forest - Other woodland; broadleaved	1.58	Medium	4	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	12.64
4															
5															
		Total site area ha	4.59											Total Site baseline	32.24

Retention category biodiversity value								Bespoke compensation agreed for unacceptable losses	Comments	
Area retained	Area enhanced	Area succession	Baseline units retained	Baseline units enhanced	Baseline units succession	Area lost	Units lost		Assessor comments	Reviewer comments
0	0.02	0.52	0.00	0.16	4.16	1.35	10.80	Yes	Area of Semi-Improved Neutral Grassland identified from Phase 1 Assessment. Some will be enhanced to the existing Tussocky Grassland for Marsh Fritillary butterfly and the remaining will be altered to eventually make up the native species woodland and scrub mix proposed in the LBMP.	
0	0	0	0.00	0.00	0.00	1.12	4.48	Yes	Grassland along access track to be removed to make way for access road to power station. Already approved.	
1.58	0	0	12.64	0.00	0.00	0.00	0.00	No	Area of woodland will be retained in full if option 1 is taken forward.	
1.58	0.02	0.52	12.64	0.16	4.16	2.47	15.28			

North Swansea Battery
A-2 Site Habitat Creation

Condense / Show Columns

Condense / Show Rows

Main Menu

Instructions

Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Post development/ post intervention habitats										Habitat units delivered	Comments	
						Ecological connectivity			Strategic significance			Temporal multiplier		Difficulty multipliers			Assessor comments	Reviewer comments
						Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Time to target condition/years	Time to target multiplier	Difficulty of creation category	Difficulty of creation multiplier			
Grassland - Other neutral grassland	0.11	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	15	0.586	Low	1	0.77	Proposed Fescue and Bent with wildflower mix.	
Urban - Artificial lake or pond	0.08	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5	0.837	Low	1	0.80	Attenuation Ponds.	
Sparsely vegetated land - Other inland rock and scree	0.03	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	20	0.490	Medium	0.67	0.12	Cut slopes to provide nesting sites for burrowing bees and wasps.	
Urban - Developed land; sealed surface	1.79	V.Low	0	N/A - Other	0	N/A	Assessment not appropriate	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	1.000	Low	1	0.00	Development Infrastructure and option 1 access track.	
Urban - Vacant/derelict land/ bareground	0.44	Low	2	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0.965	Low	1	2.55	Areas of bare ground between battery infrastructure.	
Totals	2.45														Total Units	4.24		

Check Areas- Area of development and habitat creation must match the area of habitats lost

Baseline ref	Baseline habitats		Post development/ post intervention habitats										Comments	
	Baseline habitat	Proposed habitat	Change in distinctiveness and condition				Ecological connectivity score	Strategic significance	Temporal multiplier	Difficulty of creation category	Habitat units delivered			
			Distinctiveness change	Condition change	Area ha	Distinctiveness						Condition	Assessor comments	Reviewer comments
1	Grassland - Other neutral grassland	Woodland and forest - Other woodland; broadleaved	Medium - Medium	Moderate - Good	0.52	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	32+	Medium	18.36	SI grassland to be managed to create native species woodland and scrub mix.	
Total site area					0.52							18.36		

North Swansea Battery
D-1 Off Site Habitat Baseline

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Baseline ref	Habitats and areas			Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance			Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value								Bespoke compensation agreed for unacceptable losses	Comments	
	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier			Total habitat units	Area retained	Area enhanced	Area succession	Baseline units retained	Baseline units enhanced	Baseline units succession	Area lost		Units lost	Assessor comments
1	Grassland	Grassland - Other neutral grassland	1.06	Medium	4	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	8.48	0	0.49	0.57	0	3.92	4.56	0.00	0.00	Yes	Area of SI grassland in offsite area adjacent to site.		
2	Urban	Urban - Street Tree	0.0203	Low	2	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0.08	0.0203	0	0	0.0812	0.00	0.00	0.00	0.00	No	Trees to be retained.		
3																										
4																										
5		Total site area ha	1.06										8.56	0.02	0.49	0.57	0.08	3.92	4.56	0.00	0.00					

D-4 Off Site Habitat Succession

Condense / Show Columns

Condense / Show Rows

Main Menu

Instructions

Baseline habitats		Post development/ post intervention habitats													
Baseline ref	Baseline habitat	Proposed habitat	Change in distinctiveness and condition		Area ha	Distinctiveness	Condition	Ecological connectivity score	Strategic significance	Temporal multiplier	Difficulty of creation category	Spatial risk multiplier	Habitat units delivered	Comments	
			Distinctiveness change	Condition change										Assessor comments	Reviewer comments
1	Grassland - Other neutral grassland	Woodland and forest - Other woodland; broadleaved	Medium - Medium	Moderate - Good	0.57	Medium	Good	High	Area/compensation not in local strategy/ no local strategy	32+	Medium	Compensation inside LPA or NCA, or deemed to be sufficiently local, to site of biodiversity loss	12.23	If grassland to be modified into woodland and scrub.	
					Total site area	0.57							12.23		

North Swansea Battery
E-2 Off Site Hedge Creation

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Baseline ref	New hedge number	Proposed habitats		Distinctiveness	Score	Condition	Score	Ecological connectivity			Strategic significance			Spatial risk multiplier		Temporal multiplier		Difficulty multiplier		Hedge units delivered	Comments	
		Habitat type	Length km					Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Spatial risk category	Spatial risk multiplier	Time to target condition/years	Time to target multiplier	Difficulty of creation category	Difficulty of creation multiplier		Assessor comments	Reviewer comments
1	1	Native Species Rich Hedgerow with trees	0.0346	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation inside LPA or NCA, or deemed to be sufficiently local, to site of biodiversity loss	1	20	0.490	Medium	0.67	0.14	New hedgerow.	
2																						
3																						
4																						
5																						
Total Length/KM			0.03																	0.14		

North Swansea Battery

Headline Results

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On-site baseline	<i>Habitat units</i>	32.24
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
On-site post-intervention (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	35.45
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site baseline	<i>Habitat units</i>	8.56
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site post-intervention (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	17.38
	<i>Hedgerow units</i>	0.14
	<i>River units</i>	0.00
Total net unit change (including all on-site & off-site habitat retention/creation)	<i>Habitat units</i>	12.03
	<i>Hedgerow units</i>	0.14
	<i>River units</i>	0.00
Total net % change (including all on-site & off-site habitat creation + retained habitats)	<i>Habitat units</i>	37.31%
	<i>Hedgerow units</i>	Check Data
	<i>River units</i>	0.00%

APPENDIX 2 – OPTION 2 BIODIVERSITY METRICS INPUTS AND RESULTS

Swansea North Battery - Option 2
A-1 Site Habitat Baseline

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Ref	Habitats and areas			Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance			Suggested action to address habitat losses	Ecological baseline Total habitat units
	Broad Habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier		
1	Grassland	Grassland - Other neutral grassland	1.89	Medium	4	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	15.12
2	Grassland	Grassland - Modified grassland	1.12	Low	2	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required	4.48
3	Woodland and forest	Woodland and forest - Other woodland; broadleaved	1.58	Medium	4	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	12.64
4															
5															
		Total site area ha	4.59											Total Site baseline	32.24

Retention category biodiversity value								Bespoke compensation agreed for unacceptable losses	Comments	
Area retained	Area enhanced	Area succession	Baseline units retained	Baseline units enhanced	Baseline units succession	Area lost	Units lost		Assessor comments	Reviewer comments
0	0.02	0.52	0.00	0.16	4.16	1.35	10.80	Yes	Area of Semi-Improved Neutral Grassland identified from Phase 1 Assessment. Some will be enhanced to the existing Tussocky Grassland for Marsh Fritillary butterfly and the remaining will be altered to eventually make up the native species woodland and scrub mix proposed in the LBMP.	
0	0	0	0.00	0.00	0.00	1.12	4.48	Yes	Grassland along access track to be removed to make way for access road to power station. Already approved.	
1.52	0	0	12.16	0.00	0.00	0.06	0.48	Yes	Some woodland to be removed to make way for access route in option 2.	
1.52	0.02	0.52	12.16	0.16	4.16	2.53	15.76			

Swansea North Battery - Option 2
A-2 Site Habitat Creation

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Post development/ post intervention habitats										Habitat units delivered	Comments	
						Ecological connectivity			Strategic significance			Temporal multiplier		Difficulty multipliers			Assessor comments	Reviewer comments
						Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Time to target condition/years	Time to target multiplier	Difficulty of creation category	Difficulty of creation multiplier			
Grassland - Other neutral grassland	0.11	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	15	0.586	Low	1	0.77	Proposed Fescue and Bent with wildflower mix.	
Urban - Artificial lake or pond	0.08	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5	0.837	Low	1	0.80	Proposed attenuation ponds.	
Sparsely vegetated land - Other inland rock and scree	0.03	Medium	4	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	20	0.490	Medium	0.67	0.12	Cut slopes to provide nesting sites for burrowing bees and wasps.	
Urban - Developed land; sealed surface	1.85	V.Low	0	N/A - Other	0	N/A	Assessment not appropriate	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	1.000	Low	1	0.00	Development Infrastructure and option 2 access track plus approved track for Abergelli	
Urban - Vacant/derelict land/ bareground	0.44	Low	2	Good	3	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0.965	Low	1	2.55	Areas of bare ground between battery infrastructure.	
Totals	2.51														Total Units	4.24		

Check Areas- Area of development and habitat creation must match the area of habitats lost

A-3 Site Habitat Enhancement

Condense / Show Columns

Condense / Show Rows

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Instructions

Baseline habitats		Post development/ post intervention habitats					Change in distinctiveness and condition		Area (hectares)	Distinctiveness	Condition	Ecological connectivity Ecological connectivity score	Strategic significance	Temporal multiplier	Difficulty multipliers Difficulty of enhancement category	Habitat units delivered	Comments	
Baseline ref	Baseline habitat	Proposed habitat (Pre-populated but can be overridden)	Distinctiveness change	Condition change	Area (hectares)	Distinctiveness	Condition	Ecological connectivity Ecological connectivity score									Strategic significance	Temporal multiplier
1	Grassland - Other neutral grassland	Grassland - Other neutral grassland	Medium - Medium	Moderate - Good	0.02	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	15	Low	0.21	Area of SI grassland enhanced to create grazing grass to be managed to increase species richness.					
					Total site area	0.02						Enhancement total	0.21					

Swansea North Battery - Option 2

A-4 Site Habitat Succession

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Baseline ref	Baseline habitats	Post development/ post intervention habitats											Comments	
	Baseline habitat	Proposed habitat	Change in distinctiveness and condition		Area ha	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Temporal multiplier	Difficulty	Habitat units delivered	Assessor comments	Reviewer comments
			Distinctiveness change	Condition change				Ecological connectivity score	Strategic significance	Time to target condition/years	Difficulty of creation category			
1	Grassland - Other neutral grassland	Woodland and forest - Other woodland; broadleaved	Medium - Medium	Moderate - Good	0.52	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	32+	Medium	18.36	SI grassland to be managed to create native species woodland and scrub mix.	
Total site area					0.52							18.36		

Swansea North Battery - Option 2
D-1 Off Site Habitat Baseline

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Baseline ref	Habitats and areas			Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance			Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value							Bespoke compensation agreed for unacceptable losses	Comments	
	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier			Total habitat units	Area retained	Area enhanced	Area succession	Baseline units retained	Baseline units enhanced	Baseline units succession		Area lost	Units lost
1	Grassland	Grassland - Other neutral grassland	1.06	Medium	4	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	8.48	0	0.49	0.57	0	3.92	4.56	0.00	0.00	Yes	Area of SI grassland in offsite area adjacent to site.	
2	Urban	Urban - Street Tree	0.0203	Low	2	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0.08	0.0203	0	0	0.0812	0.00	0.00	0.00	0.00	No	Trees to be retained.	
3																									
4																									
5		Total site area ha	1.06											8.56	0.02	0.49	0.57	0.08	3.92	4.56	0.00	0.00			

Swansea North Battery - Option 2
E-2 Off Site Hedge Creation

Condense / Show Columns Condense / Show Rows

Main Menu Instructions

Baseline ref	New hedge number	Proposed habitats		Distinctiveness	Score	Condition	Score	Ecological connectivity			Strategic significance			Spatial risk multiplier		Temporal multiplier		Difficulty multiplier		Hedge units delivered	Comments		
		Habitat type	Length km					Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Spatial risk category	Spatial risk multiplier	Time to target condition/years	Time to target multiplier	Difficulty of creation category	Difficulty of creation multiplier		Assessor comments	Reviewer comments	
1		Native Species Rich Hedgerow with trees	0.0346	Medium	4	Good	3	Medium	Moderately connected habitat	1.1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation inside LPA or NCA, or deemed to be sufficiently local, to site of biodiversity loss	1	20	0.490	Medium	0.67	0.15	New Hedgerow		
2																							
3																							
4																							
5																							
Total Length/KM			0.03																				

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On-site baseline	<i>Habitat units</i>	32.24
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00

On-site post-intervention (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	34.97
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00

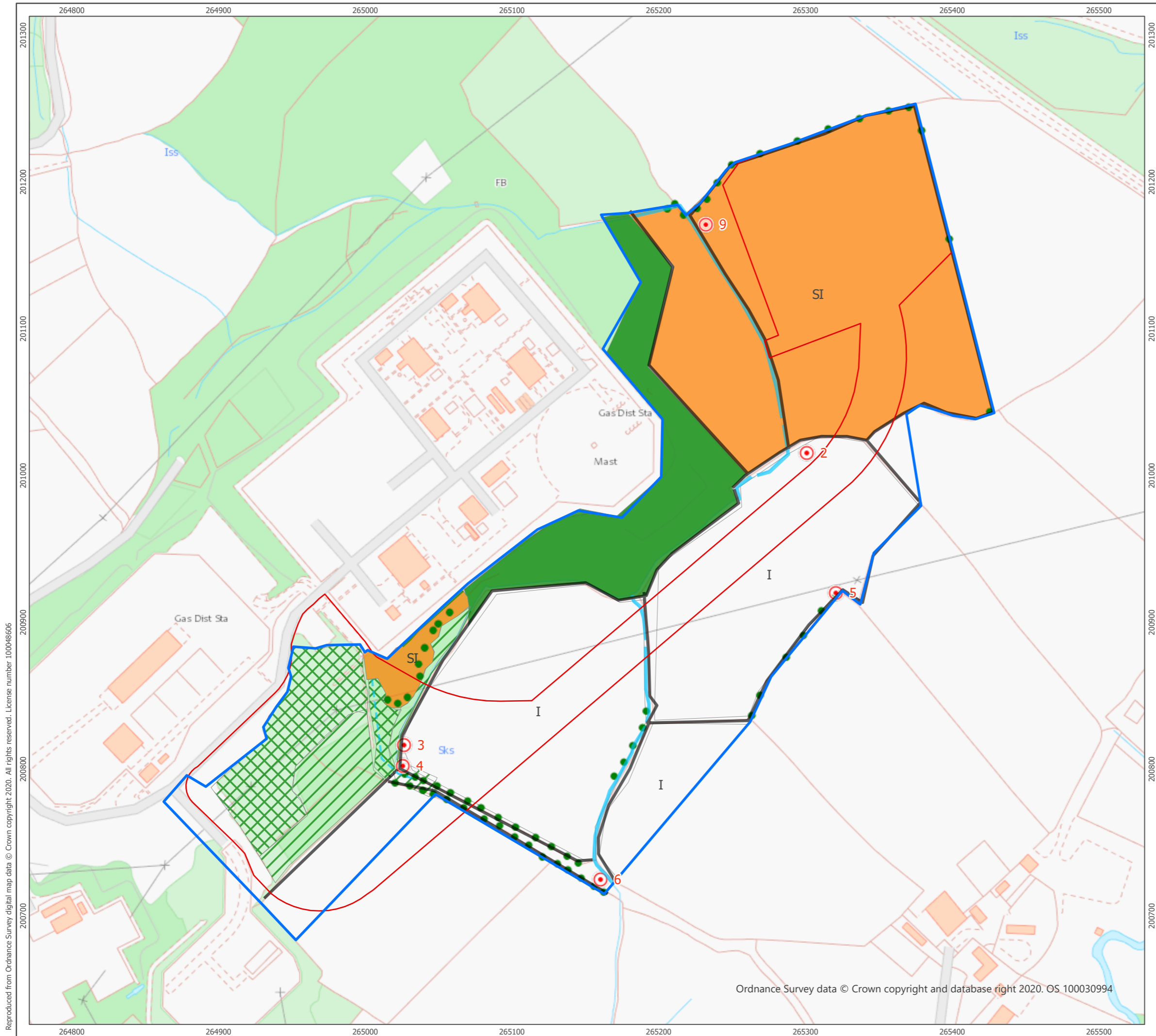
Off-site baseline	<i>Habitat units</i>	8.56
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00

Off-site post-intervention (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	17.38
	<i>Hedgerow units</i>	0.15
	<i>River units</i>	0.00

Total net unit change (including all on-site & off-site habitat retention/creation)	<i>Habitat units</i>	11.55
	<i>Hedgerow units</i>	0.15
	<i>River units</i>	0.00

Total net % change (including all on-site & off-site habitat creation + retained habitats)	<i>Habitat units</i>	35.82%
	<i>Hedgerow units</i>	Check Data
	<i>River units</i>	0.00%

**APPENDIX 3 – PHASE 1 MAP AND LANDSCAPE AND BIODIVERSITY
MANAGEMENT PLAN**



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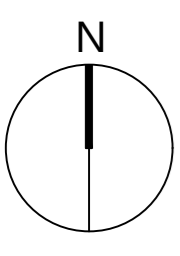
- Proposed Development Area
- Survey Areas
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Scrub - dense/continuous
- SI Neutral grassland - semi-improved
- I Improved grassland
- Running water
- Intact hedge - species-poor
- Hedge with trees - native species-rich
- Fence
- Dry ditch
- Broadleaved parkland/scattered trees
- 0 Target Note



Produced By: CW	Ref: 3421-REP-002
Checked By: DH	Date: 16/06/2020

Phase 1 Habitat Plan
Figure 1

**Swansea North
Energy Management Facility
Preliminary Ecological Appraisal**



PLANTING NOTES

The handling of plants to be in accordance with National Plant Specification 'Handling and Establishing Landscape Plants'. All plants and planting operations are to comply with the requirements and recommendations of all current relevant British Standard specification including but not limited to:

- BS 8545: Trees: From Nursery to Independence in the Landscape
- BS 3936-1:1992: Nursery stock: Specification for trees and shrubs
- BS 3882:2015: Specification for topsoil
- BS 4428:1989: Code of practice for general landscape operations (excluding hard surfaces) (AMD 6784)
- BS 5837: 2012: Trees in relation to design, demolition and construction. Recommendations

All planting to be carried out during appropriate climatic conditions from mid-November to mid-March. Existing topsoil and/or imported, clean/inert horticultural ameliorants from sustainable sources. Contractor to satisfy himself of measurements on site and the full extent of works before pricing.

Clearance
Cut back all grass and perennial vegetation including brambles, suckering and epicormic growth to a height of 25-50mm across site. All rubbish, debris and existing redundant infrastructure to be removed. Stone picking of all stones and debris over 25mm to be undertaken. All trees and shrubs to be retained to be protected during works in line with BS5837:2012.

Topsoil
Existing topsoil must be cultivated in accordance with BS 3882:2015 outside RPAs of existing trees. No cultivation should take place in wet/waterlogged conditions and within the RPAs of existing trees.

Trees

The hedgerow trees will be planted as whips (100-125 cm), pit planted to accommodate all the roots and provided with a supporting stake and 1.2m high tree shelter to ensure they are noticed when mechanical trimming commences.

Native Species Woodland and Shrub Mix
Plants shall be randomly mixed throughout the beds in groups of 3 or 5. Planting shall be at the specified density.

Native Species Hedgerow Mix
Hedges to comprise a double staggered row of plants 450mm apart within each row, overall 5 plants per linear metre. Species mixed throughout the hedge line in random groups of 3/5. 500mm wide trench excavated to take plants and topsoil cultivated to 450mm depth prior to application of fertiliser. All native planting shall be of local provenance.

Mulch

Hedge planting to receive 75mm depth pulverised bark mulch.

Plant position

Final position of trees and shrubs subject to confirmation of service location and approval of statutory undertakers. Allow for location of service information prior to work commencing on site.

Grass Seeding

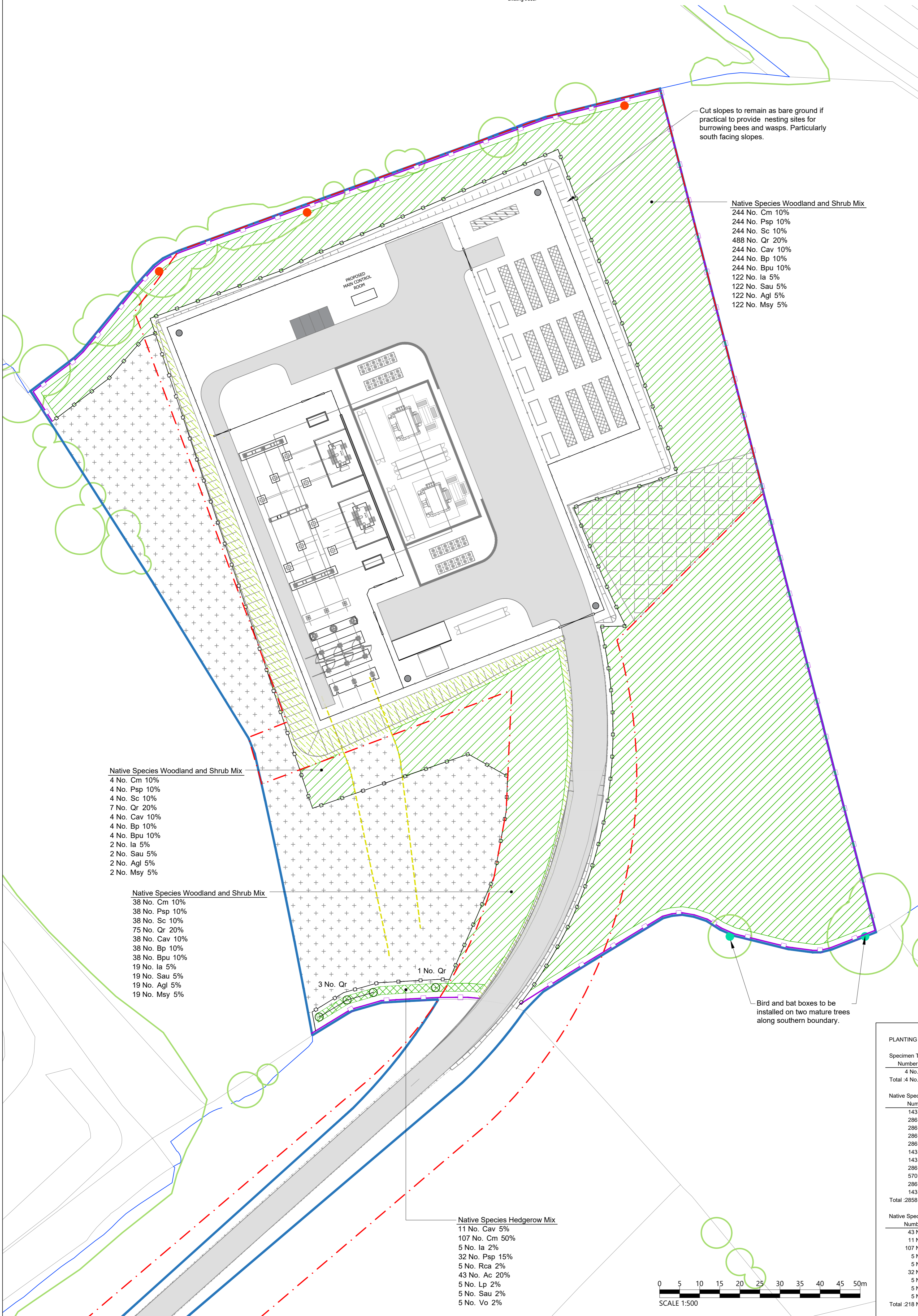
All seeding areas to be hydro-seeded with proposed grass and wildflower mix.

Planting Season

Bare-root shrubs to be planted between mid-November and mid-March dependent upon the planting season.

KEY

- Site Boundary
- Land Under Control of The Applicant
- Existing Tree/vegetation to be Retained
- Existing Ditch
- Existing Fence
- PROPOSED FEATURES
 - Proposed Native Species Woodland and Shrub Mix
Approx. Total Area: 1.06ha, 0.25/m²
 - Proposed Native Species Hedgerow Mix
Approx. Total Length: 42.6m, 5/lin
 - Proposed Hedgerow Tree
 - Existing Grazing Grass to be managed to increase species richness and Tussocky Grassland for Marsh Fritillary butterfly
 - Proposed Fescue/Bent Mix with Wildflowers
Approx. Total Area: 0.11ha
 - Proposed Battery Storage
 - Proposed Inverter
 - Proposed Switchgear Container
 - Proposed E-House
 - Proposed E-House Enclosed in Building
 - Proposed Cooler
 - Proposed Diesel Generator
 - Proposed Transformer with 7.0m High Connecting Bus Bars
 - Proposed Track
 - Proposed Fire Stop Wall
 - Proposed 2.4m Security Fencing
 - Proposed Indicative Stock Fencing
 - Proposed Gate
 - Proposed Drainage
 - Proposed Underground 400 kV Cable
 - Proposed Underground 400 kV Cable 4m Buffer
 - Proposed Log and Brush Piles Location
 - Proposed Bird and Bat Boxes Location
 - Proposed Temporary Laydown Area



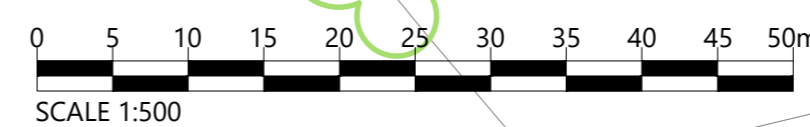
- Native Species Woodland and Shrub Mix**
- 4 No. Cm 10%
 - 4 No. Psp 10%
 - 4 No. Sc 10%
 - 7 No. Qr 20%
 - 4 No. Cav 10%
 - 4 No. Bp 10%
 - 4 No. Bpu 10%
 - 2 No. Ia 5%
 - 2 No. Sau 5%
 - 2 No. Agl 5%
 - 2 No. Msy 5%

- Native Species Woodland and Shrub Mix**
- 38 No. Cm 10%
 - 38 No. Psp 10%
 - 38 No. Sc 10%
 - 75 No. Qr 20%
 - 38 No. Cav 10%
 - 38 No. Bp 10%
 - 38 No. Bpu 10%
 - 19 No. Ia 5%
 - 19 No. Sau 5%
 - 19 No. Agl 5%
 - 19 No. Msy 5%

- Native Species Hedgerow Mix**
- 11 No. Cav 5%
 - 107 No. Cm 50%
 - 5 No. Ia 2%
 - 32 No. Psp 15%
 - 5 No. Rca 2%
 - 43 No. Ac 20%
 - 5 No. Lp 2%
 - 5 No. Sau 2%
 - 5 No. Vo 2%

- Native Species Woodland and Shrub Mix**
- 244 No. Cm 10%
 - 244 No. Psp 10%
 - 244 No. Sc 10%
 - 488 No. Qr 20%
 - 244 No. Cav 10%
 - 244 No. Bp 10%
 - 244 No. Bpu 10%
 - 122 No. Ia 5%
 - 122 No. Sau 5%
 - 122 No. Agl 5%
 - 122 No. Msy 5%

Bird and bat boxes to be installed on two mature trees along southern boundary.



PLANTING SCHEDULE

Number	Abbreviation	Species	Height	Girth	Specification
4 No.	Qr	Quercus robur	100-125cm	Whip	
Total :4 No.					
Number	Abbreviation	Species	Height	Specification	Spacing
143 No.	Agl	Alnus glutinosa	60-80cm	1+1 :BR :Transplant	0.25m ²
286 No.	Bp	Betula pendula	60-80cm	1+1 :BR :Transplant	0.25m ²
286 No.	Bpu	Betula pubescens	60-80cm	1+1 :BR :Transplant	0.25m ²
286 No.	Cav	Corylus avellana	60-80cm	1+1 :BR :Transplant	0.25m ²
286 No.	Cm	Crataegus monogyna	60-80cm	1+1 :BR :Transplant	0.25m ²
143 No.	Ia	Ilex aquifolium	60-80cm	1+1 :BR :Transplant	0.25m ²
143 No.	Msy	Malus sylvestris	60-80cm	1+1 :BR :Transplant	0.25m ²
286 No.	Psp	Prunus spinosa	60-80cm	1+1 :BR :Transplant	0.25m ²
570 No.	Qr	Quercus robur	60-80cm	1+1 :BR :Transplant	0.25m ²
286 No.	Sc	Salix cinerea	60-80cm	1+1 :BR :Transplant	0.25m ²
143 No.	Sau	Sorbus aucuparia	60-80cm	1+1 :BR :Transplant	0.25m ²
Total :2858 No.					
Number	Abbreviation	Species	Height	Specification	Spacing
43 No.	Ac	Acer campestre	60-80cm	1+1 :BR :Transplant	5m
11 No.	Cav	Corylus avellana	60-80cm	1+1 :BR :Transplant	5m
107 No.	Cm	Crataegus monogyna	60-80cm	1+1 :BR :Transplant	5m
5 No.	Ia	Ilex aquifolium	60-80cm	1+1 :BR :Transplant	5m
5 No.	Lp	Lonicera periclymenum	60-80cm	1+1 :BR :Transplant	5m
32 No.	Psp	Prunus spinosa	60-80cm	1+1 :BR :Transplant	5m
5 No.	Rca	Rosa canina	60-80cm	1+1 :BR :Transplant	5m
5 No.	Sau	Sorbus aucuparia	60-80cm	1+1 :BR :Transplant	5m
5 No.	Vo	Viburnum opulus	60-80cm	1+1 :BR :Transplant	5m
Total :218 No.					

- Notes:**
1. Log and brush piles located in partial shade along northern boundary.
 2. Woodland, shrub and hedgerow planting to limit views from properties to the east, south and north and provide additional habitat.
 3. No planting undertaken over underground cable area.
 4. Batters (except southern slopes) seeded with fescue/bent species mix and to include suitable wildflower spp. to attract wall butterfly.
 5. Planting to be planted 2m offset from existing/proposed drainage/ditch.

REVISION SCHEDULE

Rev	Date	Description
A	26.05.2020	Revised matching the latest planning layout plan (WM)
B	24.06.2020	Revised matching the latest planning layout plan (LH)

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PROJECT: Swanssea North Energy Management Facility

TITLE: Landscape and Biodiversity Mitigation Plan

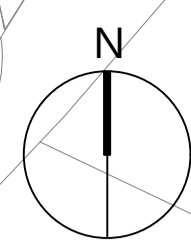
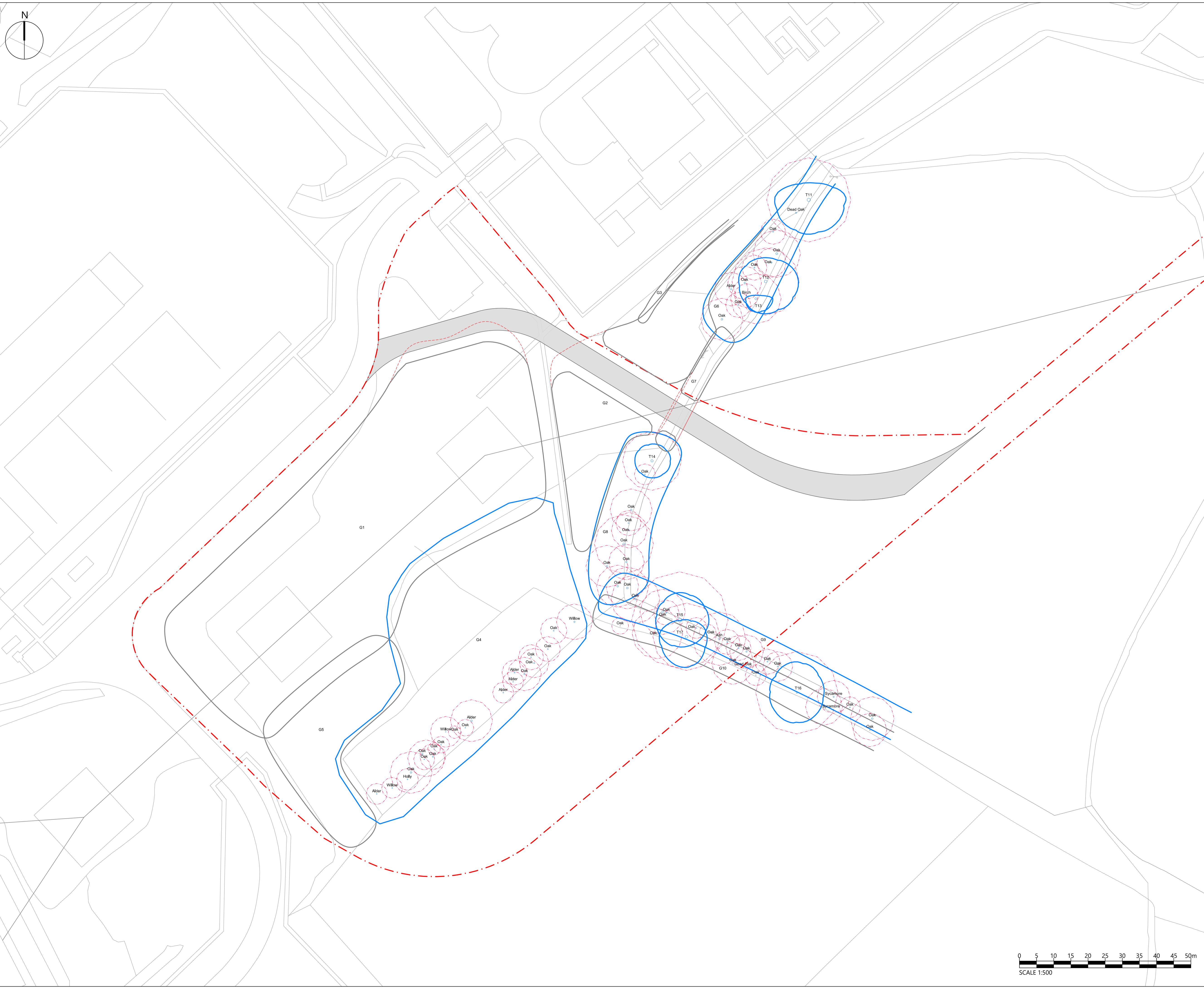
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DATE: 07.05.20 **SCALE:** 1:500@A1

DRAWN: WM **DRAWING NO.:** 3421-DR-LAN-101

CHECKED: GW **REVISION:** B

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KEY

	Site Boundary
	Existing Category B Tree to be Retained
	Existing Category C Tree to be Retained
	Existing Tree and Vegetation to be Removed
	RPA (Root protection area)
	Proposed Access Track

REVISION SCHEDULE

Rev	Date	Description

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PROJECT: Swansea North Energy Management Facility
TITLE: Tree Impacts Plan
CLIENT: Statkraft UK

DATE: 16.06.20 SCALE: 1:500@A1
DRAWN: WM DRAWING NO.: 3421-DR-ARB-102
CHECKED: GW REVISION: -

