Teesside Converter Station and DC Cable Route Community Update

24 October 2012

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Meeting Agenda

- Introduction to Forewind and the Dogger Bank Wind Farm
- Description of onshore infrastructure
  - National Grid Substation
  - Converter Stations
  - Cables
- Site selection update
  - Landfall
  - Converter stations
  - Cable route
- Q&A Session

Key Forewind Contacts

- Chris Nunn - Onshore Environmental Impact Assessment Manager
- Nikki Smith - Stakeholder Manager
- Andy Guyton – Onshore Consent Manager
- Chris Gibbs – Project Developer

Community Feedback Agreement

Nikki Smith – Stakeholder Manager

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Introduction to Forewind and the Dogger Bank Wind Farm

Andy Guyton – Onshore Consent Manager

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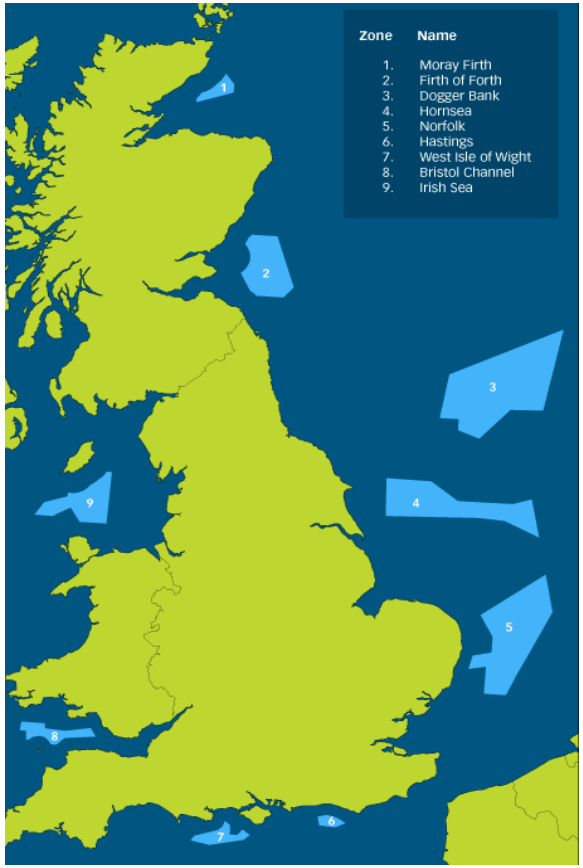
Forewind – Who Are We?

- A consortium of four major energy companies

About Forewind

- Forewind's mission is to deliver development consents for safe, viable offshore wind capacity.

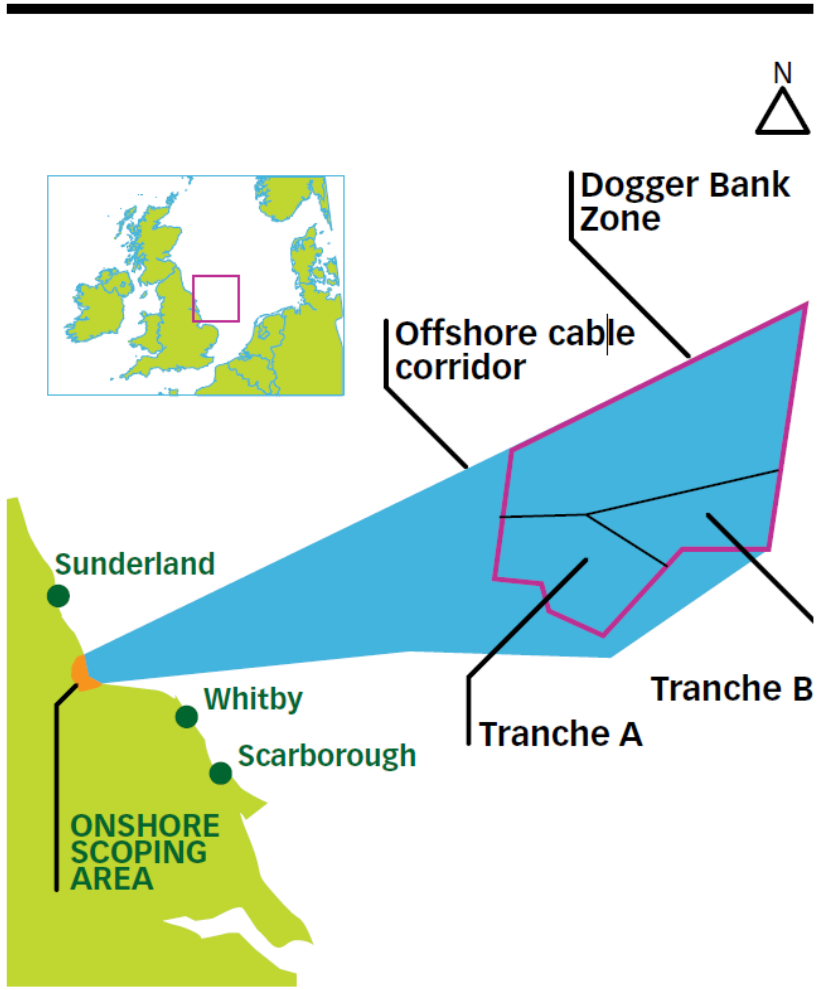


Forewind is developing Zone 3, one of the development concessions offered by The Crown Estate as part of its Round 3 Offshore Wind programme.

UK Offshore Wind Map

Dogger Bank Key Facts

- Capacity: Agreed target 9 GW.
- Area: 8,660km^2 (3,350 sq. miles); equivalent to size of North Yorkshire.
- Distance: 125-290 km (80-180 miles) from shore.
- Depth: 18-63 m (60-210 ft); c.4 GW in <30m water depth, c.8 GW in <35m water depth; shallow compared with other zones.
- Wind: High wind speeds of >10 m/s average wind speed across the zone.
- History: A "dogger“ was a type of Dutch fishing boat that commonly worked in the North Sea in the seventeenth century.

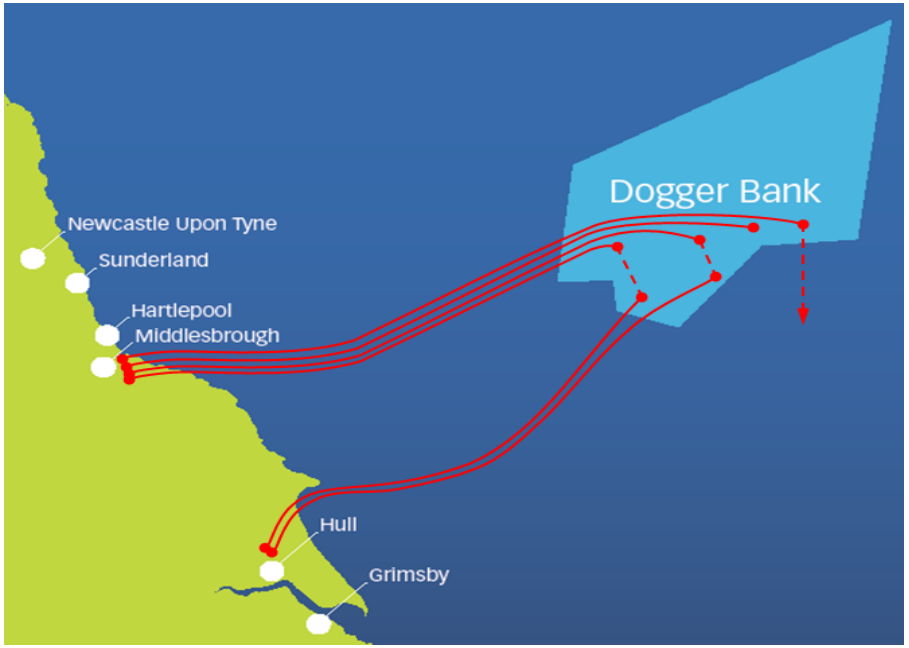


Dogger Bank Teesside (As consulted on for Phase 1 of statutory consultation)

Grid Connections

- Develop the Dogger Bank Zone in four tranches (or four phases).
- Each tranche - up to three projects, each with a generating capacity of up to 1.2GW.
- Each project will require its own connection to the National Grid.
- 2 Projects connecting into existing Creyke Beck onshore substation near Cottingham in the East Riding of Yorkshire.
- 4 Projects connecting into Teesside, 2 connecting into existing Lackenby onshore substation

Connection point		Connection date
A – Creyke Beck	Yorkshire	Apr 2016
A – Lackenby	Teesside	Apr 2017
B – Lackenby	Teesside	Apr 2018
B – Creyke Beck	Yorkshire	Apr 2019
C – To be confirmed	Teesside	Apr 2019
D – To be confirmed	Teesside	Apr 2020



Forewind has secured grid connection points for 6 GW of capacity.

Consenting

- Projects of this scale are defined *'Nationally Significant Infrastructure Projects'* (NSIP)
- Applications comprise:
  - Development Consent Order (DCO)
  - Incl. Environmental Impact Assessment (EIA)
- Pre-application consultation is mandatory – statutory stakeholders include the Local Planning Authority and Parish Councils
- Examined by Planning Inspectorate
  - http://infrastructure.planningportal.gov.uk/
- Determined by the Secretary of State
- The Local Planning Authority is invited to submit a Local Impact Report
- All consultees have the opportunity to submit a representation once the application is made

Consultation

- Stakeholder consultation is a key element of the pre-application process
- Phase 1 of statutory consultation was from 24th May to the 27th June
- Phase 2 will be in Autumn of 2013
- In between statutory consultation periods, Forewind consult certain stakeholders on specific issues e.g. siting the converter station
- Consultation strategy set out in the Stakeholder Engagement Plan, Fisheries Liaison Plan and Statement of Community Consultation (SoCC)
- All consultation will be documented in the Consultation Report

Consenting Programme

- Q4 2010 – Preliminary site selection work (offshore focused)
- Q4 2011 – Q2 2012 – Onshore and offshore surveys
- Q2 2012 – Scoping report submitted
- Q2 2012 – Phase 1 of statutory consultation
- Q2 2012 – Q2 2013 – Further surveys, preparation of EIA, non-statutory consultation
- Q4 2013 – Phase 2 of statutory consultation (Draft EIA)
- Q1 2014 – Application submission to Planning Inspectorate
- Q2 – Q4 2014 – Application examination
- Q2 2015 – Application Determined by SoS

Any Questions?

Description of Onshore Infrastructure: Substations, Converter Stations and HVDC Cables

Chris Gibbs – Project Developer

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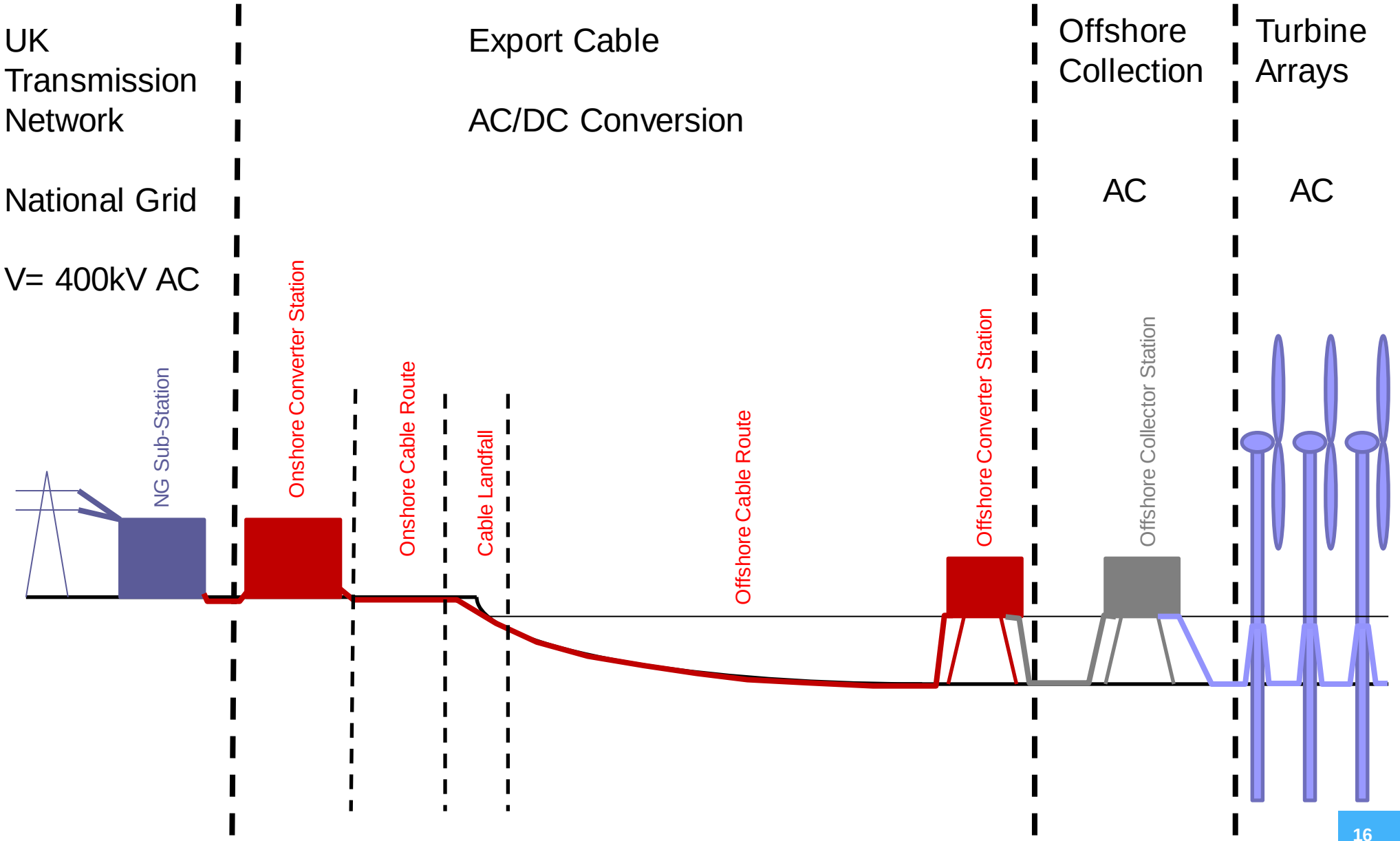
Dogger Bank Power Transmission to Shore



Example of a converter station 1
SIEMENS Trans Bay HVDC Station (USA)

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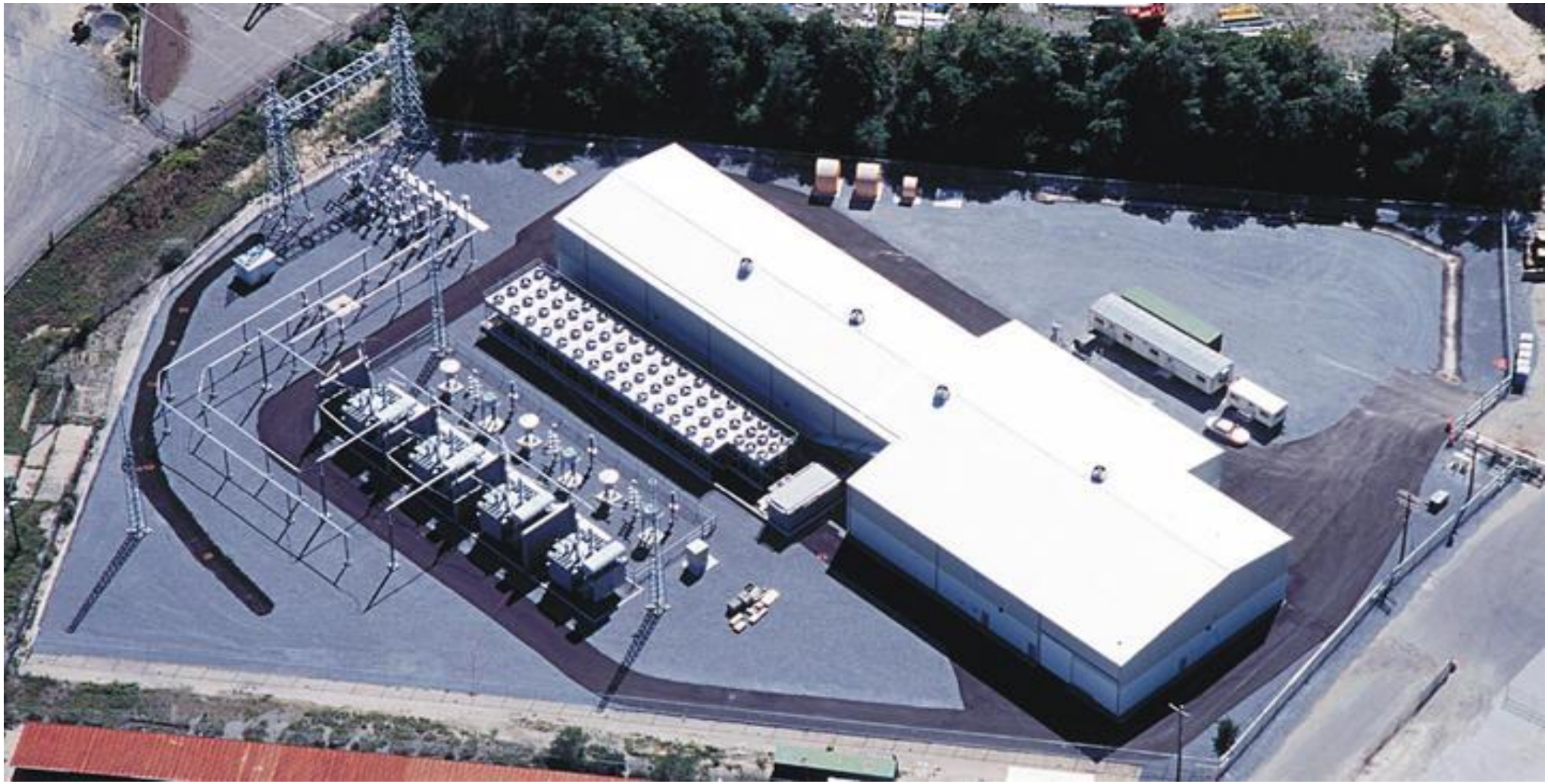
Valve Hall is High-Tech

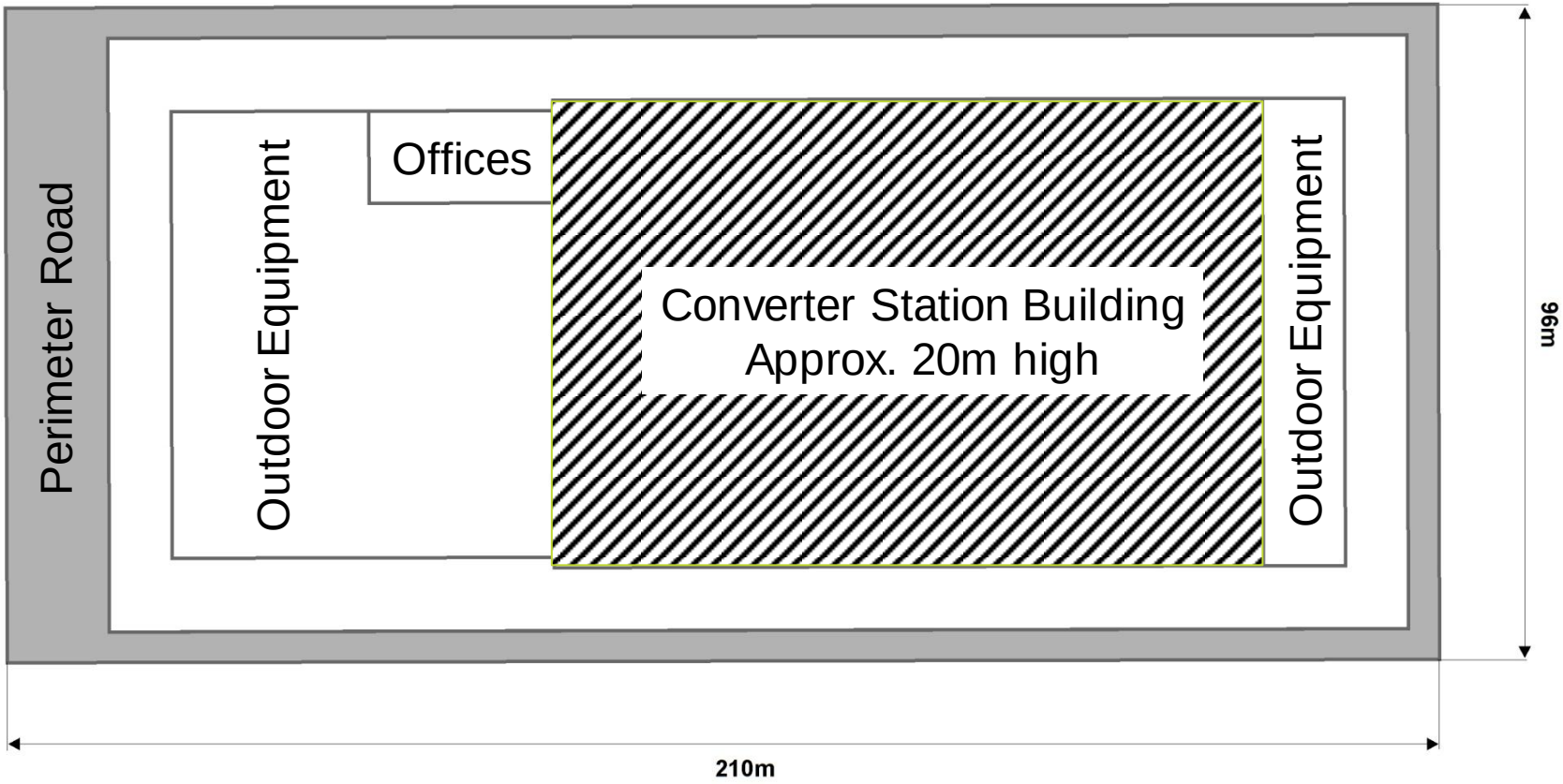
Indoor Filter Equipment

Example 2
ABB Shoreham HVDC Station (USA)



Example 3
SIEMENS Murraylink Victoria (South Australia)

Proposed Converter Station Layout

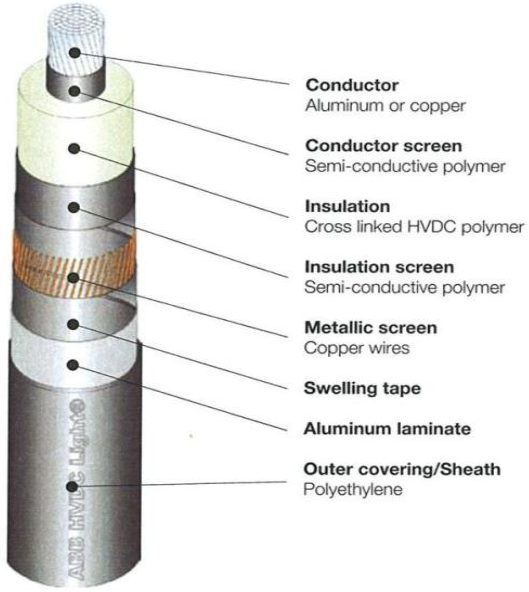


Equivalent to two football pitches long and one and a half football pitches wide

Onshore cable system - facts

Cable installation techniques:

- Open cut trenching – preferred method
- Trenchless techniques (HDD) at landfall and obstacles



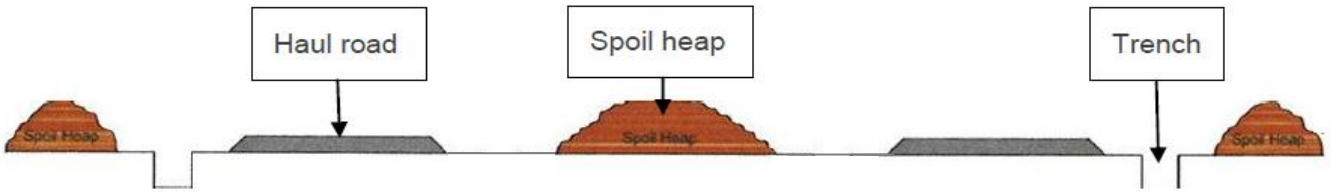
Cable laying - facts:

- Two DC cables and one fibre optic cable per trench
- Trench will be approx. 1.2m deep and max 1.5m wide
- Max cable diameter 120mm
- Construction corridor width – 18m per 1GW project
- Total construction corridor width – 72m for all four projects

Onshore cabling: construction, maintenance and decommissioning

Open cut trenching:

- Temporary haul road width – approx. 6m per project
- Trenches cut and shored up (timber, hydraulic or box shoring)
- Cables laid in up to 1km long sections
- Construction working width - up to 18m (trenches and spacing between and haul road)
- Trench floor prepared with cement bound sand (CBS) if necessary and cables winched into place
- Ducting may be required (from joint bay to joint bay)

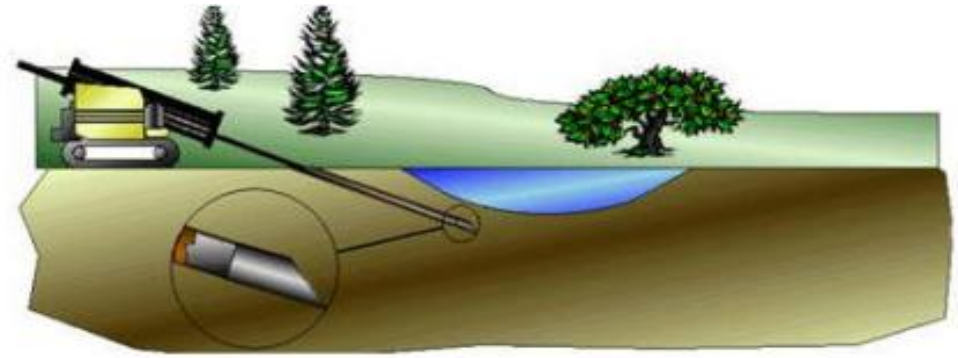


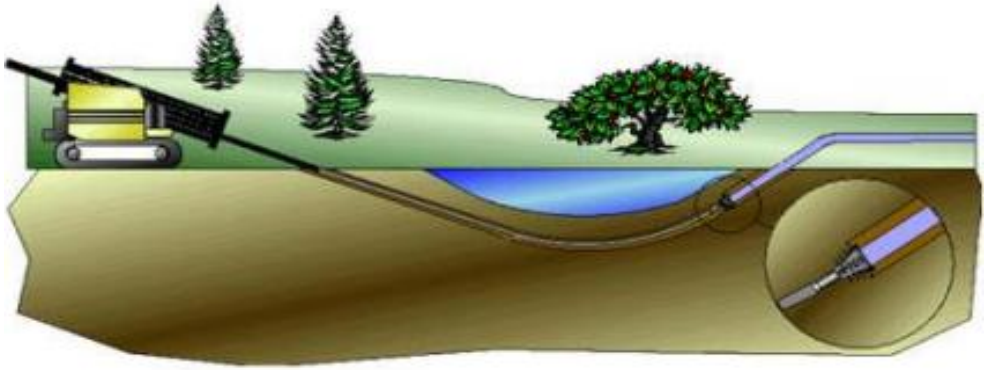
Onshore cabling: Horizontal Directional Drilling

Trenchless – Horizontal Directional Drilling - used to minimize construction impact on traffic and environment. HDD site compound size will be typically 53x30m.

The process can take from one to two weeks for a bore and will include:

- drilling a pilot hole
- reaming to make hole bigger
- pulling a conduit pipe
- pulling the cable through the conduit





Any Questions?

Site Selection Overview:
Landfall, Converter Station Locations and Cable Route

Chris Nunn – Onshore EIA Manager

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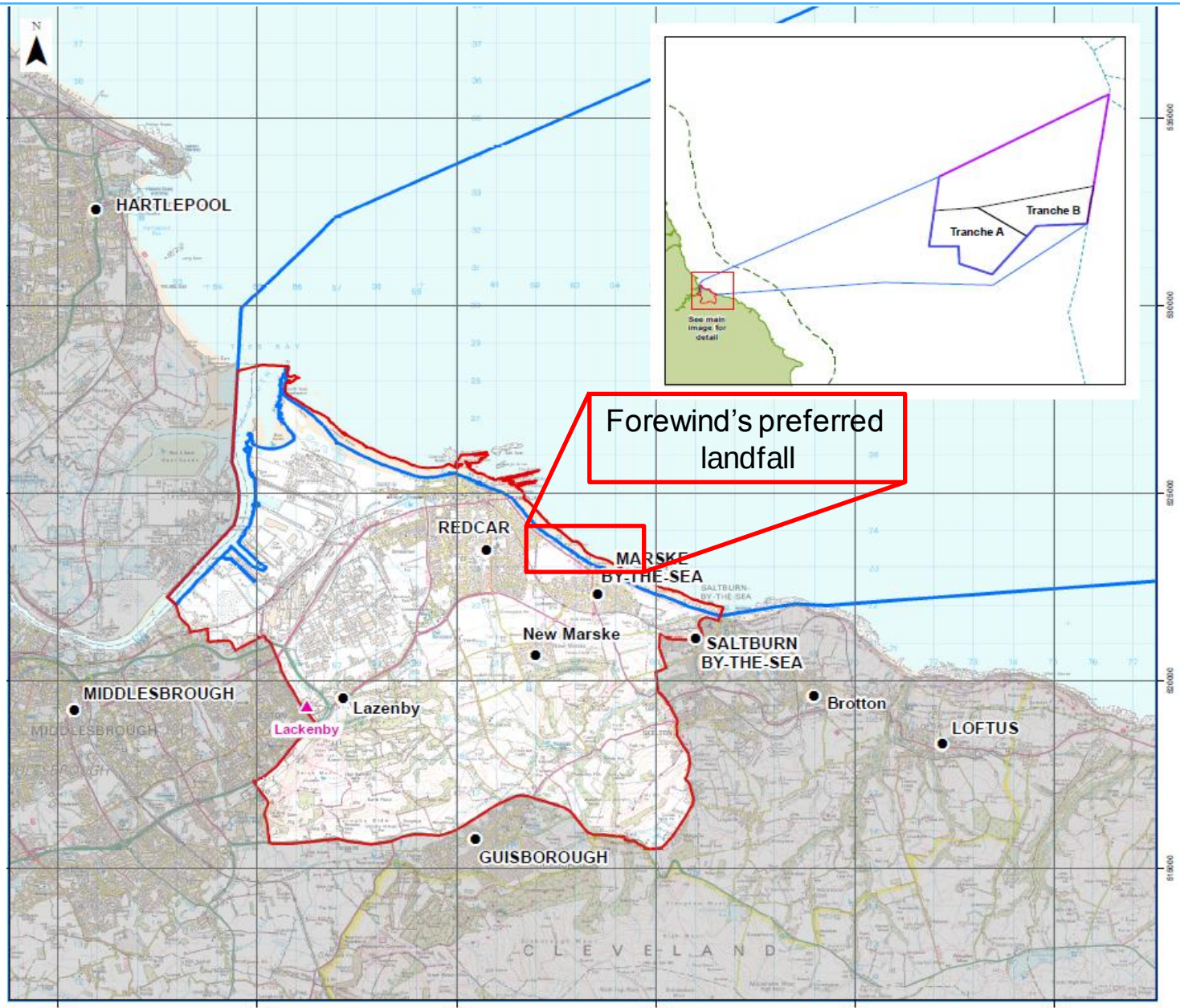
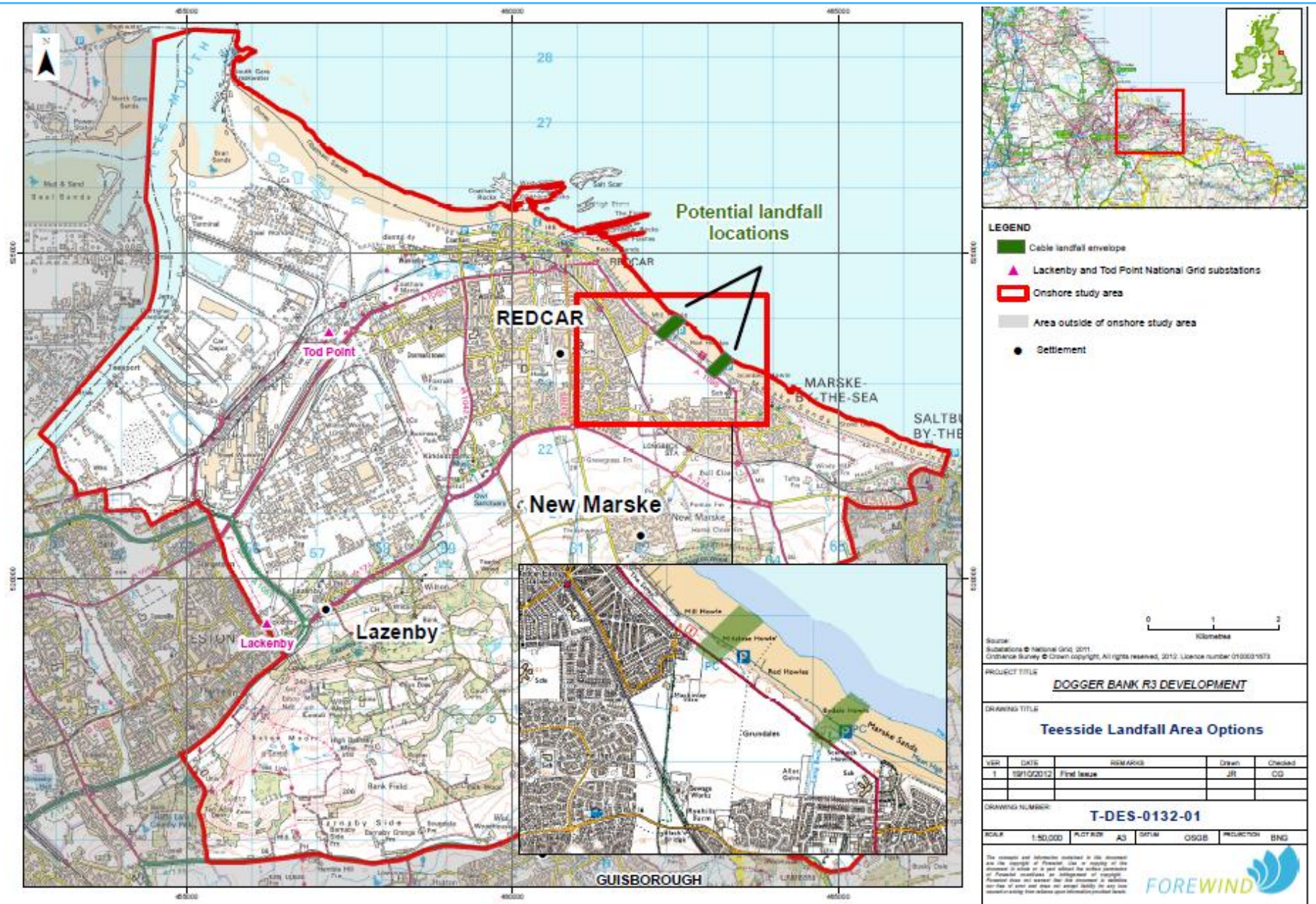
Teesside Study Area

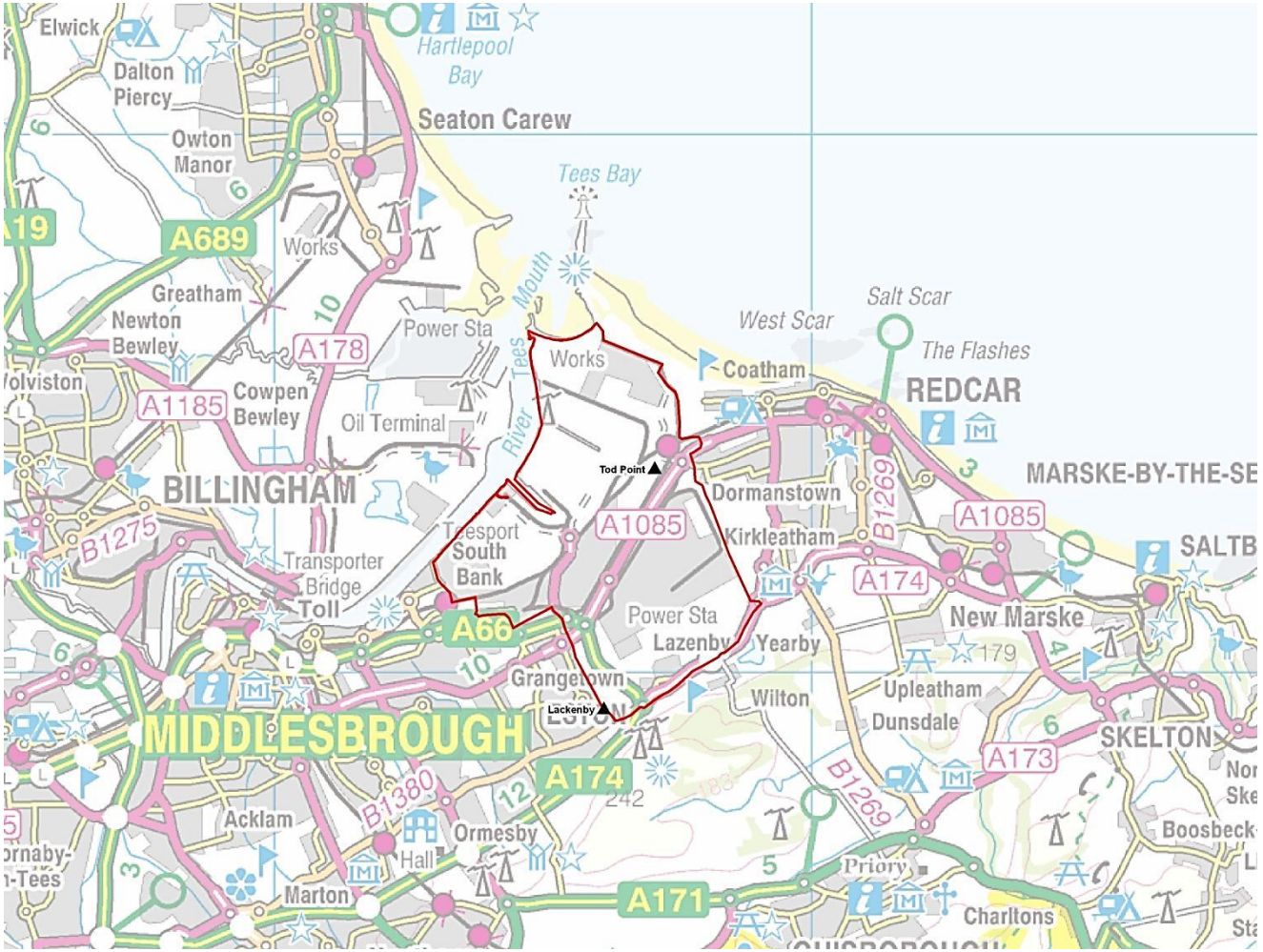


Preferred Landfall Location



Converter Station Study Area

- Located between Middlesbrough and Redcar adjacent to the Tees Estuary;
- Approximate size is 2,255 ha;
- Predominant land use is industrial, comprised of Tata Steel Teesside, Wilton International Chemical Complex and Teesport Docks
- 3 main A roads, number of railway lines, numerous archaeological records and no statutory designations within the study area boundary.



Converter Station Site Selection: Preliminary Work

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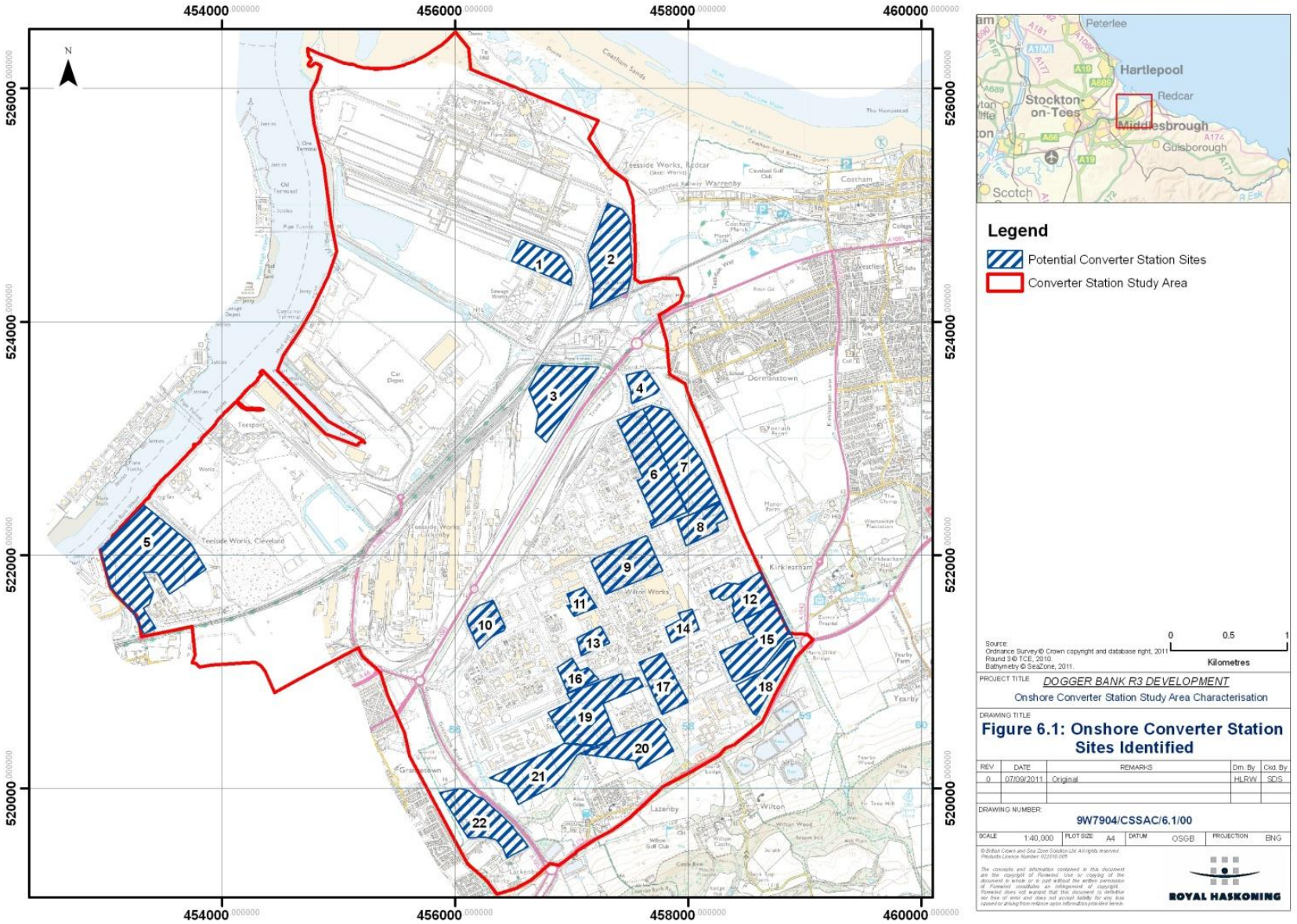
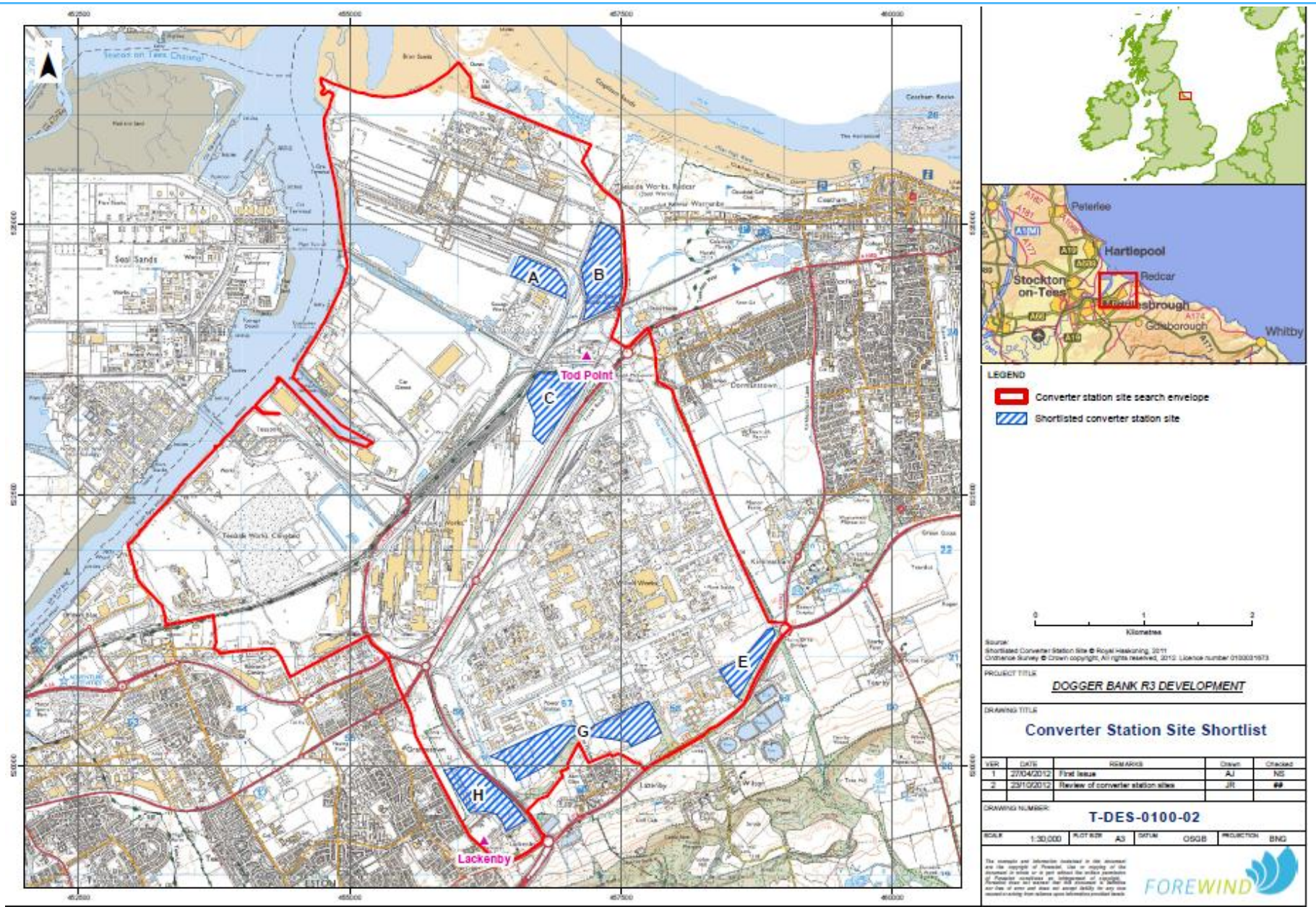


Site Selection Factors

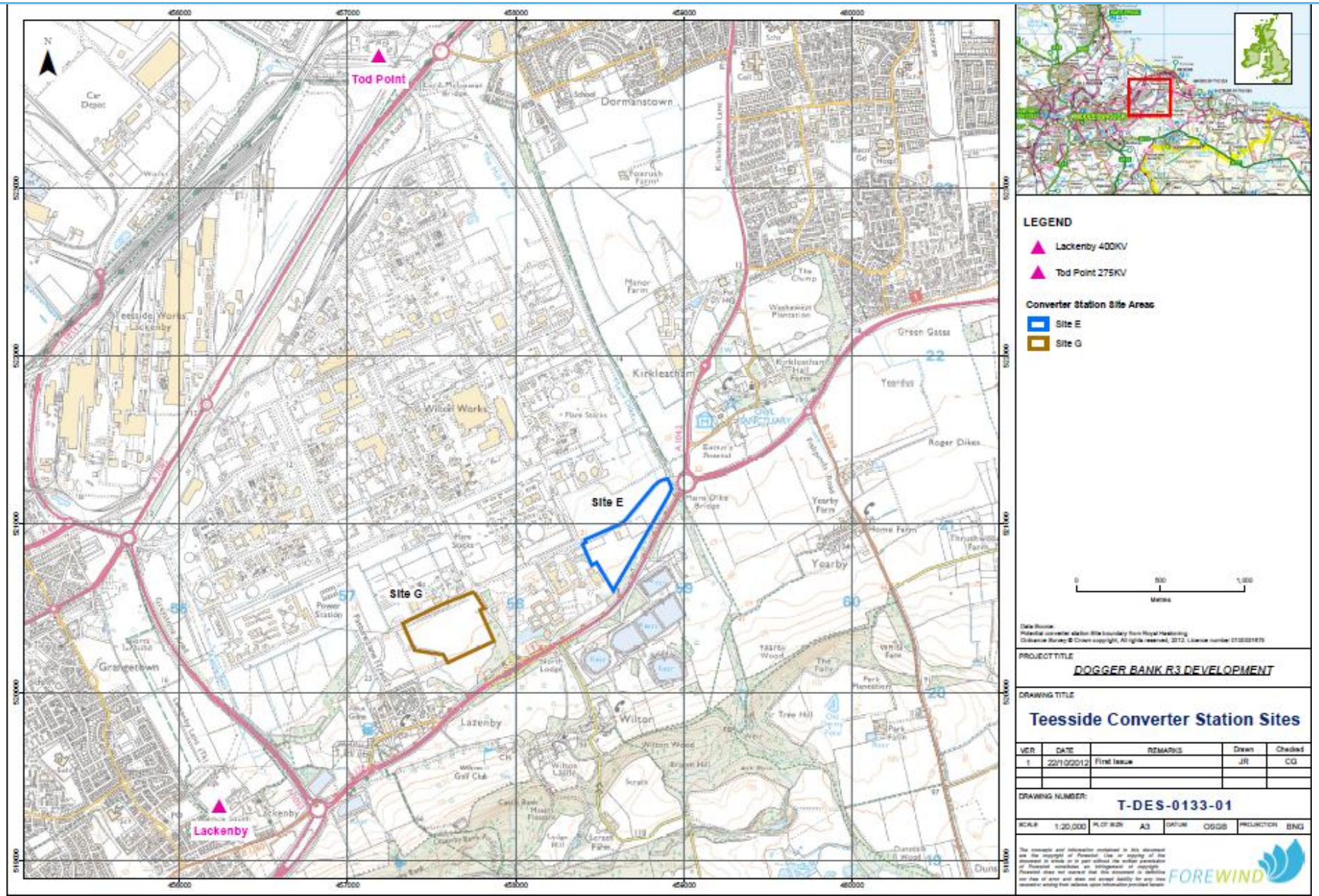
The considerations for identifying a preferred site were:

- Physical dimensions of converter station and associated infrastructure;
- Landscape and visual;
- Noise;
- Access;
- Ecology;
- Land quality;
- Ability to cable to site; and
- Land availability.

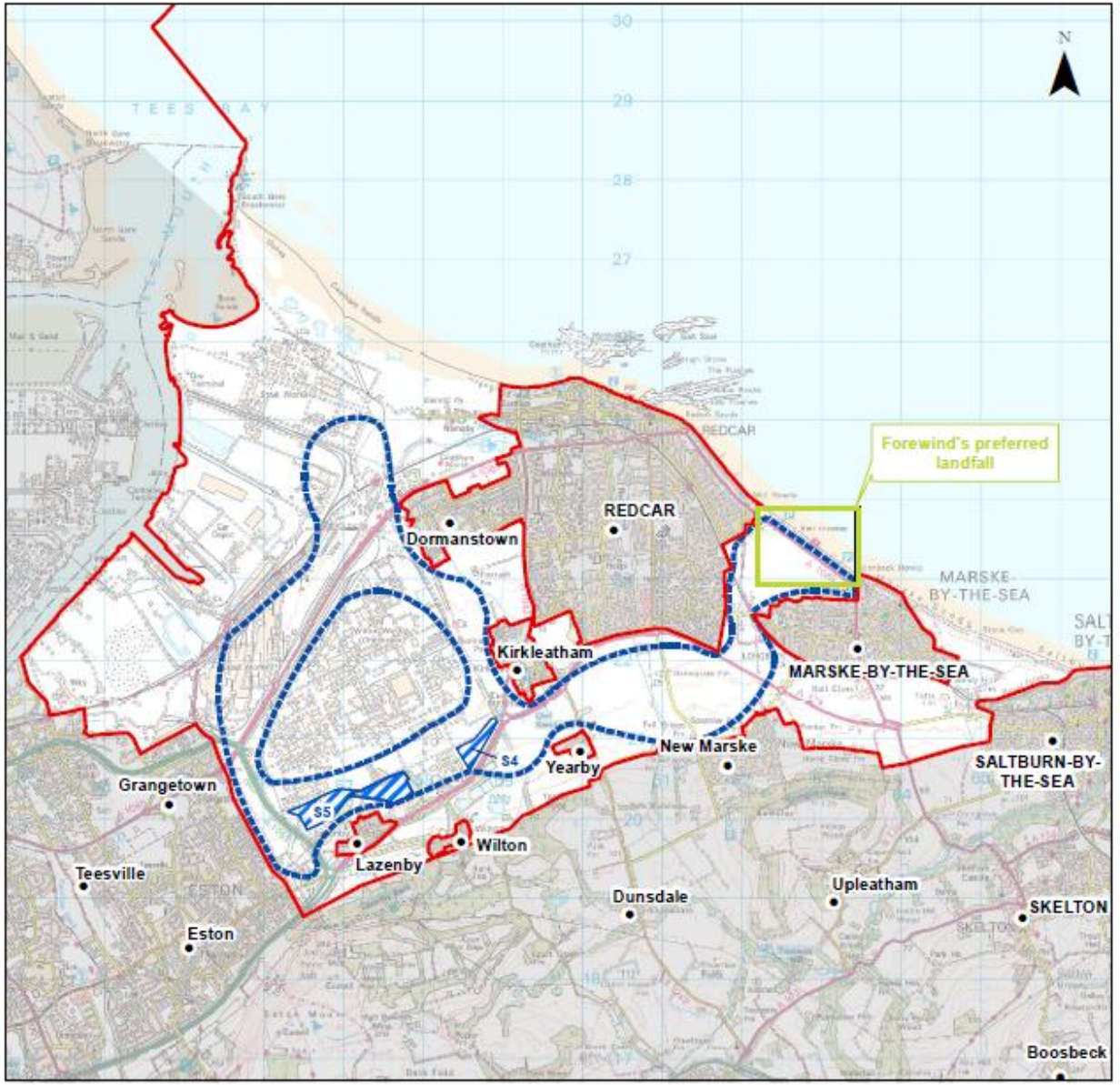
Converter Station Site Shortlist



Preferred Converter Station Sites



Teesside Study Envelope



LEGEND

- Settlements
- Forewind's preferred landfall
- Teesside Scoping Envelope
- Indicative area for onshore cabling
- Potential converter station sites
- Outside of scoping envelope
- Tranche boundary
- Dogger Bank

0 1 Kilometres

PROJECT TITLE

DOGGER BANK R3 DEVELOPMENT

DRAWING TITLE

Dogger Bank Teesside

VER	DATE	REMARKS	Drawn	Checked
1	14/05/2011	First issue	EB	NS
2	25/10/2012	Revised converter station sites	JR	##

DRAWING NUMBER: T-MIS-0036-02

SCALE	PLOT SIZE	DATUM	PROJECTION
1:75,000	A4	OSGB36	BNG

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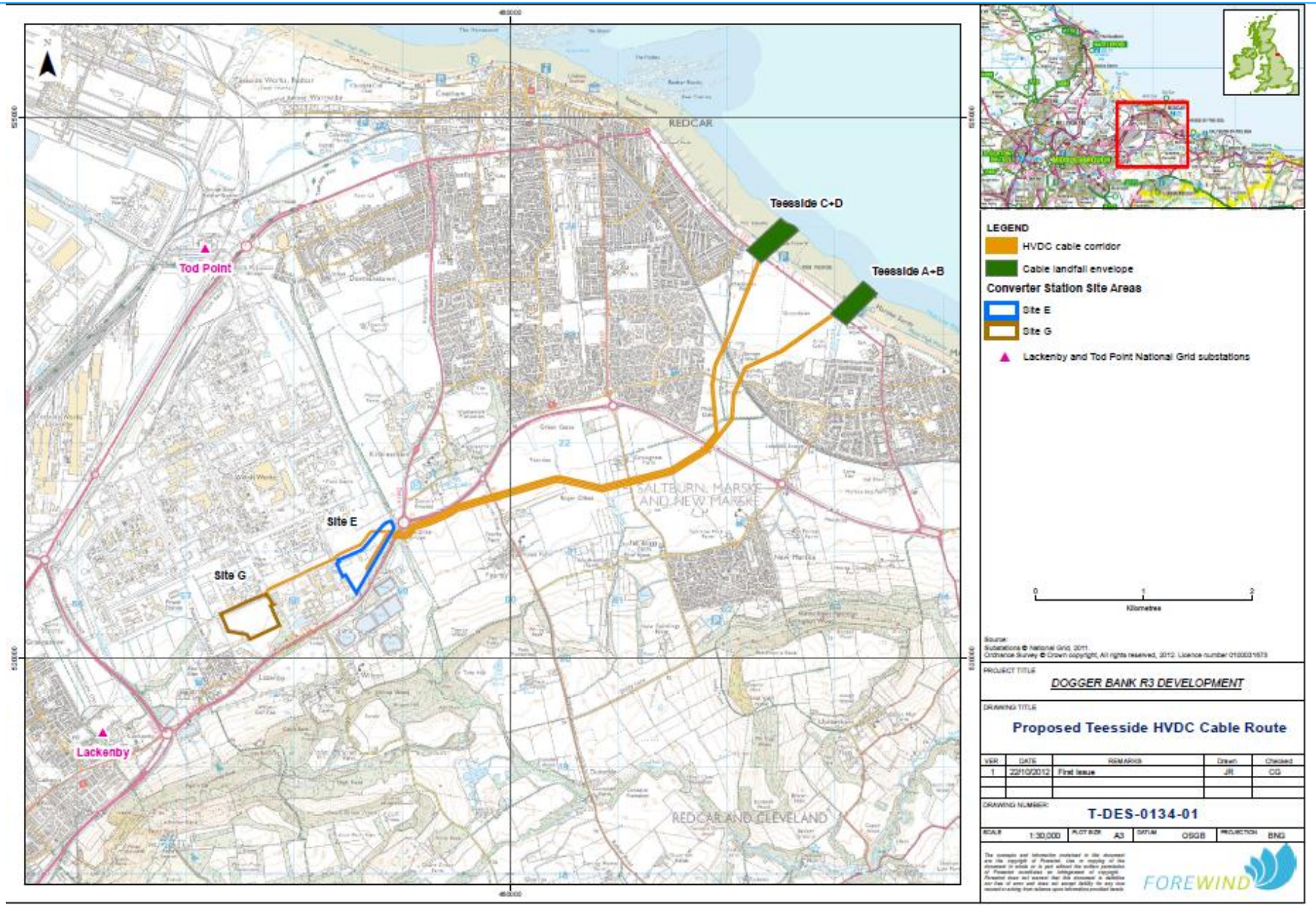
Cable Site Selection Factors

The considerations for identifying a preferred cable route were:

- Physical space for cables;
- Access;
- Ecology;
- Land quality;
- Flood risks
- Archaeological remains
- Ability to lay cable; and
- Land availability.

Teesside Project Infrastructure



Any Questions?

Next Steps

Nikki Smith – Stakeholder Manager

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Next steps

- Write to community groups with an update on site selection and request feedback
- Consider community feedback on cable routes and converter station sites
- Commence onshore environmental surveys and environmental impact assessment

- Further update meetings like this?

Thank you

Any Questions?

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