



London Array

Operations and Maintenance

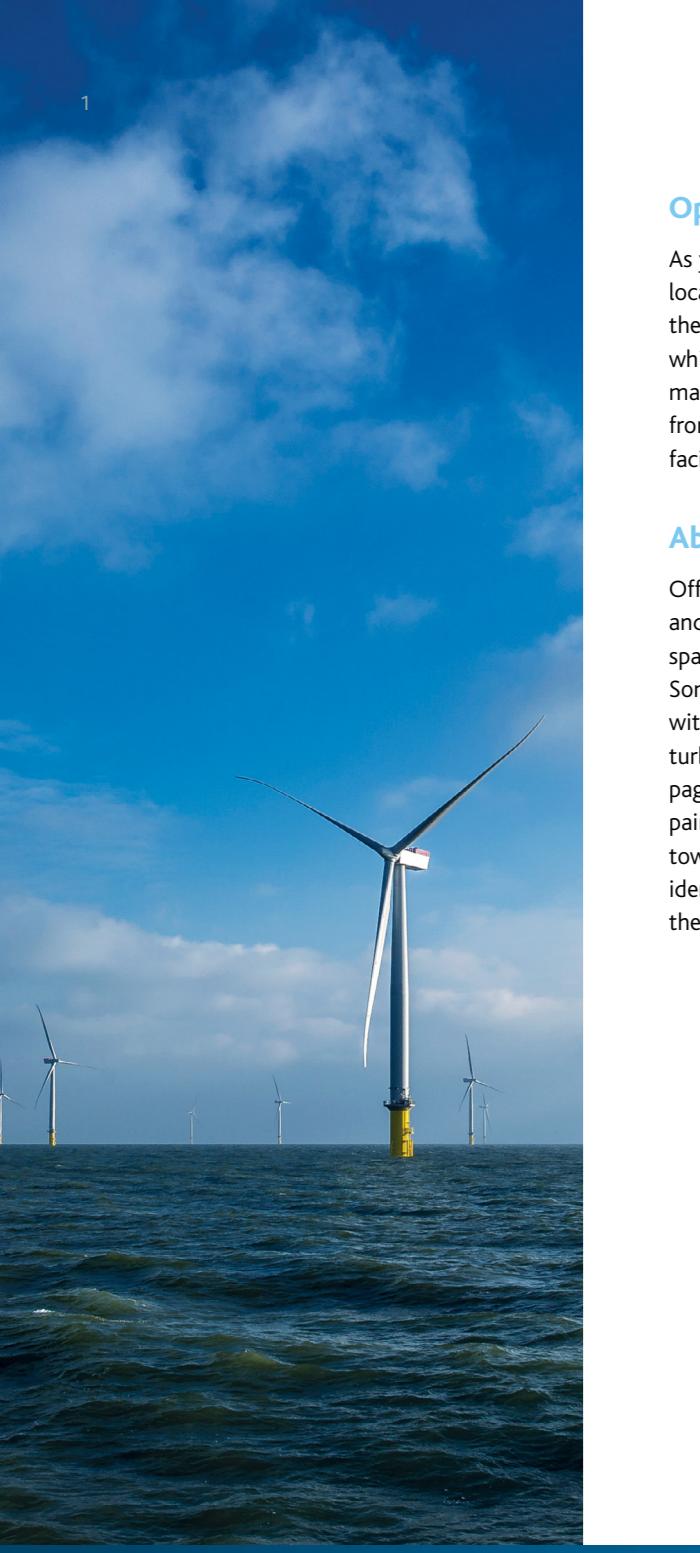
londonarray.com

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London Array partners



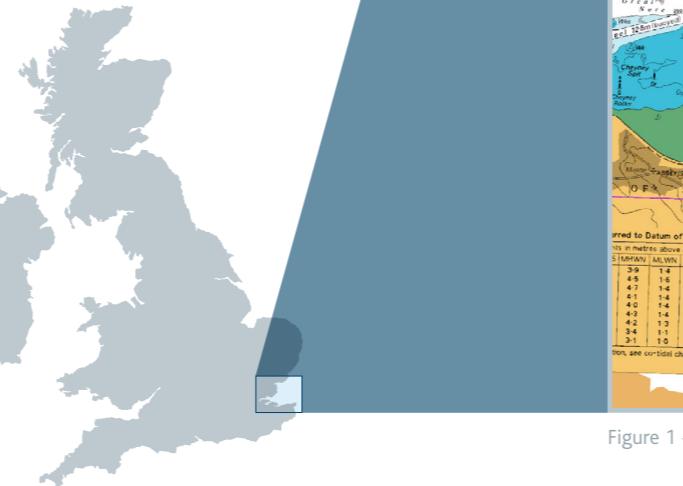


Operations and Maintenance phase

As you may know, London Array is an offshore wind farm located in the outer Thames Estuary, around 20km from the Kent and Essex coasts. The wind farm is now finished, which means we'll be carrying out routine operations and maintenance activities to keep it up and running, managed from our dedicated Operations & Maintenance (O&M) facility at Ramsgate Harbour.

About the wind farm

Offshore, London Array is made up of 175 wind turbines and two offshore substations. The rows of turbines are spaced 1,000m apart, with 650m between each turbine. Some turbines on the boundary of the wind farm are fitted with marine navigation lights and foghorns and all boundary turbines have red aviation warning lights (see figure 2 on page 4). Each turbine has a unique identification number painted at 120° intervals around the base of the turbine tower, for example, LA D02. Please quote the relevant identification number/s, if you need to get in touch with the Thames Coastguard or us.



Navigation within the wind farm and Foulger's Gat

Free navigation is allowed throughout the entire wind farm. However, we've introduced Advisory Caution Zones, to help you navigate safely, as there are certain hazards. To help you navigate safely through Foulger's Gat, the traditional navigation route for leisure craft crossing the Thames Estuary, there's now a designated route for marine traffic, spanning 700m to 800m through the turbines (highlighted in yellow on figure 2). Further information for navigation through the Foulger's Gat is available at londonarray.com

London Array is in an area where the seabed is made up mainly of sand, and because of wave and tidal action, this sand seabed can move significantly. As a result, it's possible that the high voltage cables that were buried when the wind farm was built could become exposed and get snagged by fishing gear or boat anchors. Fishermen should therefore be aware of the route the array and export cables take, as shown opposite and on figure 2. **We advise leisure craft not to anchor within the wind farm, unless it's an emergency.**

Except for emergencies, it's prohibited to moor a boat to a turbine, access a turbine platform or enter a turbine.

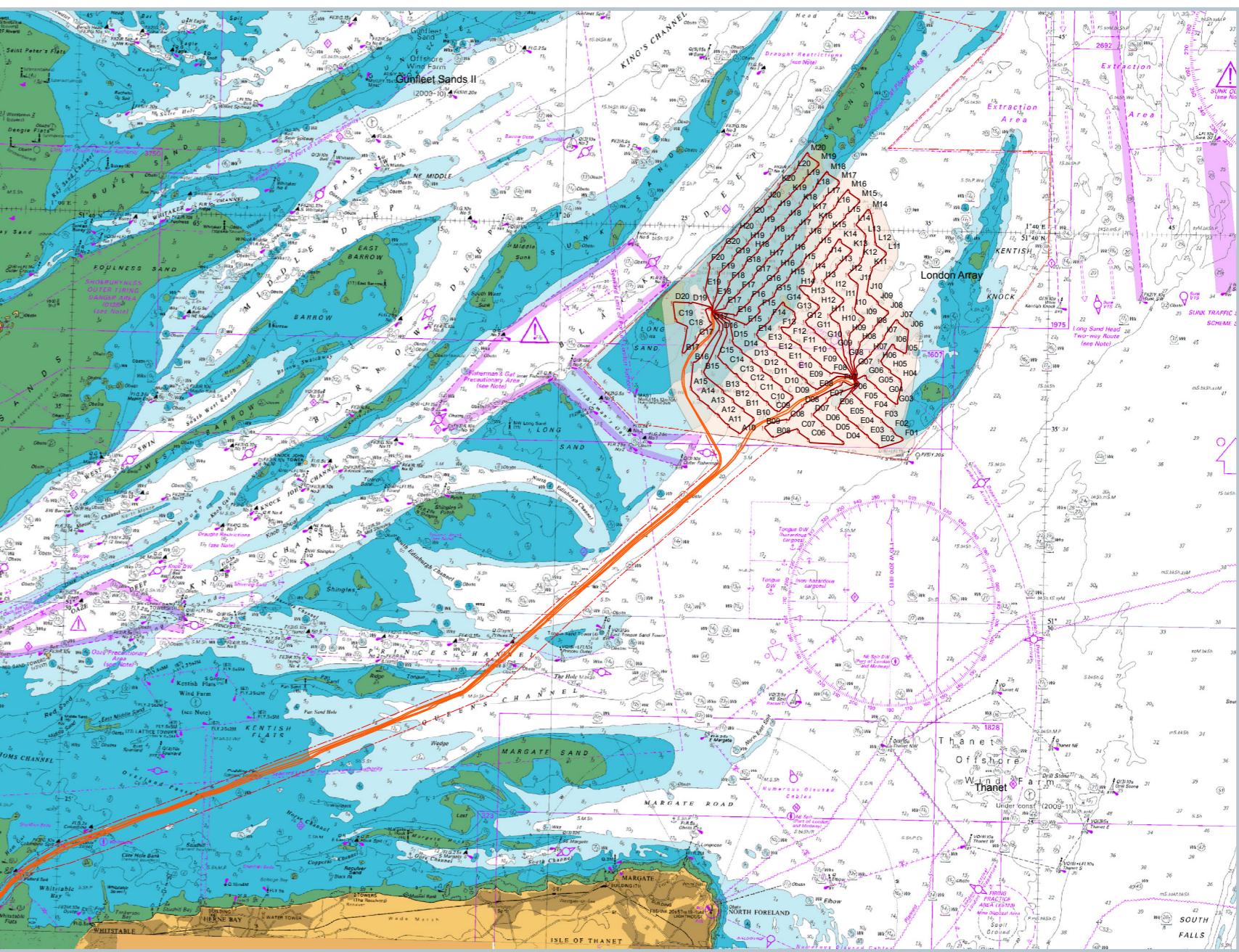
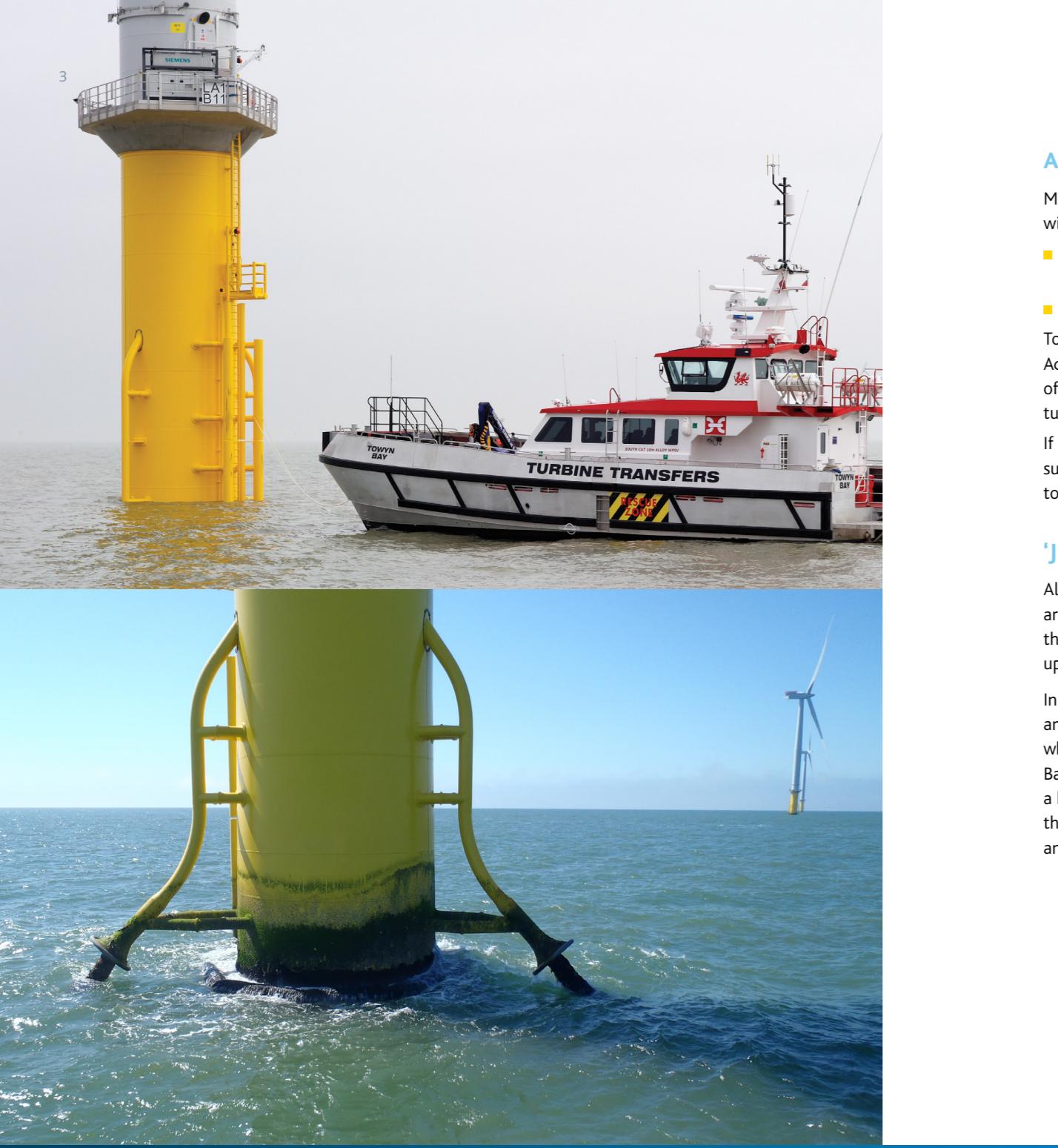


Figure 1 - Location map



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Advisory Caution Zones

Mariners should be aware of certain navigational hazards within the wind farm, especially in places where the water is shallow, including:

- 'J' tube structures protruding up to 4m from turbine foundations (see figure 2)
- Service vessels manoeuvring close to the turbine access ladders.

To help you navigate these hazards safely, we've introduced Advisory Caution Zones of 50m around all wind turbines and offshore substations. Please stay at least 50m away from all turbines and offshore substations at all times.

If we need to make major repairs to the turbines or offshore substations, these Advisory Caution Zones will be increased to 500m, in the interests of safety.

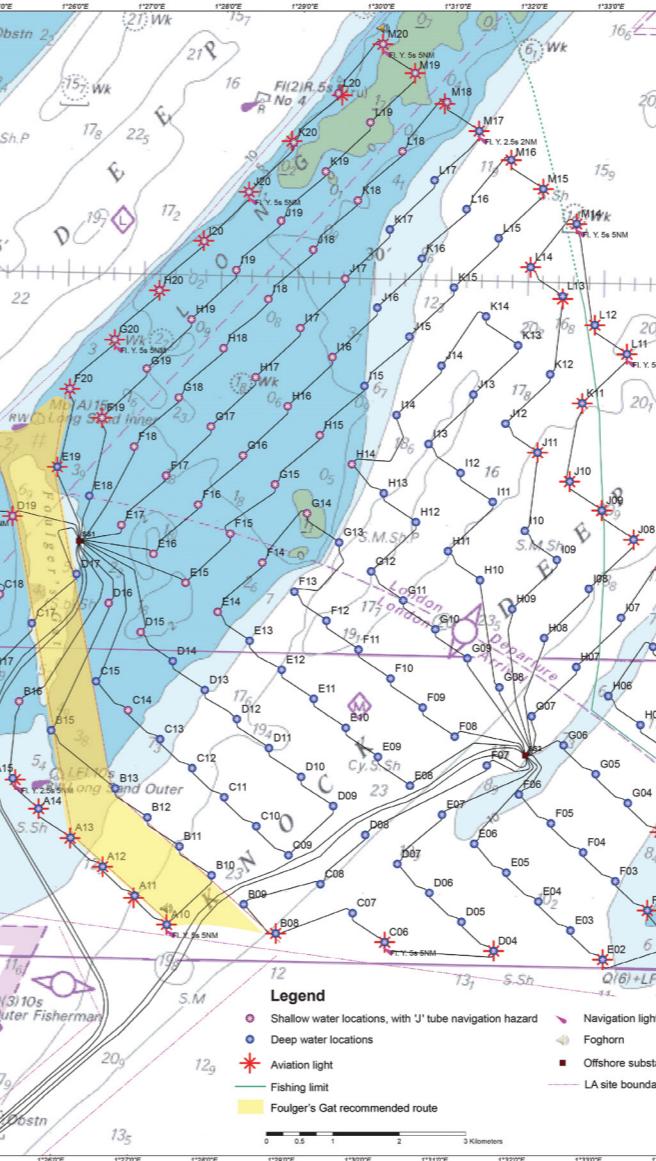
'J' tube hazard to navigation

All our wind turbines are connected together by high voltage array cables. These cables are guided into each turbine foundation through a 'J' tube structure (see image on the left), which protrudes up to 4m upwards from the foundations.

In places where the water is deep, these 'J' tubes are at a safe depth and can be navigated over at both high and low tide. However, where the water is shallow, around the turbines on the Long Sand Bank, the 'J' tubes finish at a bell mouth, the top of which is fixed at a height of 2.4m above Chart Datum. At high water, the sea covers these 'J' tube bell mouths, but they can't be navigated over safely, and are therefore a hazard to navigation.

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Figure 2 - Site diagram



Code of Practice for fishing boats and fishing within the wind farm

In order to maintain the safety of fishing boats and other vessels, including London Array workboats, we ask all commercial fishing boats to observe our Code of Practice, set out in the points below:

- Offshore, the wind farm includes 175 wind turbines and two offshore substations, all of which are serviced regularly by our workboats. In the interests of safety, there is an Advisory Caution Zone of 50m around all these structures and we ask you to stay at least 50m away from them please.
- We advise you to give a wide berth to workboats actively working within London Array. When we're carrying out major maintenance activities, there will be large vessels within the wind farm and we'll introduce an Advisory Caution Zone of 500m around them.
- When fishing near the turbines, we'd advise you to keep a reasonable working distance from any fisherman who has already shot gear, to avoid snagging it and causing an incident.
- Please do your best to avoid damaging the high voltage array cables and the four high voltage export cables that connect the wind farm to the shore in the Swale channel. If you do snag a cable or foul a turbine, please get in touch with the Thames Coastguard on **VHF Channel 16**. The London Array Offshore Coordinator on duty can be contacted during daytime working hours by calling **07920 854358** or by calling our emergency contact number on **01843 855788**, which is available 24/7.
- If you snag an undersea cable with your fishing gear or anchor, please don't haul on it, as this could cause more damage. The gear or anchor should be cut and we'll help you clear it.
- When fishing close to a turbine or offshore substation, please allow for the drift of the tide and keep clearly outside of the Advisory Caution Zones. The London Array Offshore Coordinator on duty or one of our workboats may contact you when you're fishing inside the wind farm, to let you know where we're working. You must follow our requests to keep clear, in the interests of safety.
- When you're fishing inside the wind farm, we suggest you let our Offshore Coordinator or adjacent workboats know where you intend to fish, or where your gear has been placed and how long you intend to leave it there for.

Marking pots, traps and nets

The 12 mile fisheries limit runs through London Array. This means that any fishing gear shot within the wind farm, inside the 12 mile limit must be marked as set out in the Kent and Essex Inshore Fisheries and Conservation Authority (IFCA) regulations. Any gear shot within the wind farm, outside the 12 mile limit must be marked as set out in the EU regulations (EU404/2011 articles 8-17 inclusive).

Markings set out in the Kent and Essex IFCA regulations include:

Marking pots and traps

Marker buoys and similar objects floating on the surface, intended to show the location of fishing pots and traps, should be clearly marked at all times with the letters and numbers of the vessel to which they belong, or the name and address of the owner setting the pots and traps.

Placing and use of fixed engines

No fixed net should be left uncleared for a period of more than 30 hours, except in the case of bad weather, illness of the crew or engine failure. If you can't clear a fixed net within this time you should let the Kent and Essex IFCA Office and our Offshore Coordinator know.

Each fleet of nets, or if set alone, each individual net, should be marked by a dahn buoy at each end, extending at least 1.5m above the surface of the water when the pole is in a vertical position and carrying a flag measuring at least 30cm x 30cm. All dahn buoys should be clearly marked with the vessel registration number, or the name and address of the owner of the vessel setting the net.

The net, or fleet of nets, should have a total length of no more than 1,000m and should be manageable, to avoid fouling any of the structures in the wind farm.

Remember

If you have any problems, please get in touch with our Offshore Coordinator on:

- **07920 854358** during daytime working hours
- or call our emergency contact phone number on **01843 855788**, which is available 24/7.

If your vessel, or someone on board is at risk, please call the Thames Coastguard immediately on **VHF Channel 16**.

London Array Wind Farm WTG and Substations coordinates (WGS 84)

WTG	Latitude	Longitude	WTG	Latitude	Longitude
A10	51° 34.715'N	01° 27.455'E	D06	51° 35.015'N	01° 30.872'E
A11	51° 34.925'N	01° 27.018'E	D07	51° 35.247'N	01° 30.433'E
A12	51° 35.174'N	01° 26.607'E	D08	51° 35.475'N	01° 30.021'E
A13	51° 35.400'N	01° 26.175'E	D09	51° 35.705'N	01° 29.595'E
A14	51° 35.634'N	01° 25.755'E	D10	51° 35.935'N	01° 29.169'E
A15	51° 35.865'N	01° 25.443'E	D11	51° 36.170'N	01° 28.733'E
B08	51° 34.660'N	01° 28.881'E	D12	51° 36.395'N	01° 28.317'E
B09	51° 34.886'N	01° 28.448'E	D13	51° 36.625'N	01° 27.891'E
B10	51° 35.121'N	01° 28.029'E	D14	51° 36.855'N	01° 27.465'E
B11	51° 35.351'N	01° 27.603'E	D15	51° 37.086'N	01° 27.039'E
B12	51° 35.581'N	01° 27.177'E	D16	51° 37.316'N	01° 26.613'E
B13	51° 35.811'N	01° 26.751'E	D17	51° 37.535'N	01° 26.206'E
B15	51° 36.271'N	01° 25.900'E	D19	51° 38.006'N	01° 25.335'E
B16	51° 36.501'N	01° 25.473'E	D20	51° 38.024'N	01° 24.612'E
B17	51° 36.738'N	01° 25.090'E	E02	51° 34.501'N	01° 33.146'E
C06	51° 34.607'N	01° 30.302'E	E03	51° 34.732'N	01° 32.720'E
C07	51° 34.837'N	01° 29.876'E	E04	51° 34.962'N	01° 32.294'E
C08	51° 35.085'N	01° 29.418'E	E05	51° 35.192'N	01° 31.868'E
C09	51° 35.298'N	01° 29.025'E	E06	51° 35.422'N	01° 31.442'E
C10	51° 35.528'N	01° 28.599'E	E07	51° 35.652'N	01° 31.016'E
C11	51° 35.758'N	01° 28.173'E	E08	51° 35.882'N	01° 30.590'E
C12	51° 35.988'N	01° 27.747'E	E09	51° 36.112'N	01° 30.165'E
C13	51° 36.220'N	01° 27.324'E	E10	51° 36.330'N	01° 29.727'E
C14	51° 36.448'N	01° 26.895'E	E11	51° 36.573'N	01° 29.313'E
C15	51° 36.678'N	01° 26.469'E	E12	51° 36.802'N	01° 28.886'E
C17	51° 37.138'N	01° 25.616'E	E13	51° 37.033'N	01° 28.461'E
C18	51° 37.369'N	01° 25.191'E	E14	51° 37.263'N	01° 28.035'E
C19	51° 37.599'N	01° 24.765'E	E15	51° 37.493'N	01° 27.609'E
D04	51° 34.554'N	01° 31.724'E	E16	51° 37.723'N	01° 27.183'E
D05	51° 34.784'N	01° 31.298'E	E17	51° 37.953'N	01° 26.757'E

London Array Wind Farm WTG and Substations coordinates (WGS 84)

WTG	Latitude	Longitude	WTG	Latitude	Longitude									
E18	51° 38.183'N	01° 26.331'E	G11	51° 37.390'N	01° 30.446'E	I08	51° 37.511'N	01° 32.871'E	K13	51° 39.477'N	01° 31.885'E			
E19	51° 38.413'N	01° 25.904'E	G12	51° 37.617'N	01° 30.027'E	I09	51° 37.741'N	01° 32.446'E	K14	51° 39.707'N	01° 31.458'E			
F01	51° 34.679'N	01° 34.143'E	G13	51° 37.847'N	01° 29.601'E	I10	51° 37.971'N	01° 32.020'E	K15	51° 39.954'N	01° 30.995'E			
F02	51° 34.909'N	01° 33.716'E	G14	51° 38.077'N	01° 29.176'E	I11	51° 38.201'N	01° 31.594'E	K16	51° 40.167'N	01° 30.607'E			
F03	51° 35.139'N	01° 33.290'E	G15	51° 38.307'N	01° 28.749'E	I12	51° 38.431'N	01° 31.168'E	K17	51° 40.402'N	01° 30.164'E			
F04	51° 35.369'N	01° 32.864'E	G16	51° 38.537'N	01° 28.323'E	I13	51° 38.662'N	01° 30.742'E	K18	51° 40.621'N	01° 29.773'E			
F05	51° 35.599'N	01° 32.438'E	G17	51° 38.768'N	01° 27.897'E	I14	51° 38.892'N	01° 30.316'E	K19	51° 40.858'N	01° 29.328'E			
F06	51° 35.834'N	01° 32.004'E	G18	51° 39.006'N	01° 27.482'E	I15	51° 39.122'N	01° 29.890'E	K20	51° 41.100'N	01° 28.879'E			
F07	51° 36.059'N	01° 31.586'E	G19	51° 39.228'N	01° 27.045'E	I16	51° 39.352'N	01° 29.464'E	L11	51° 39.424'N	01° 33.306'E			
F08	51° 36.289'N	01° 31.160'E	G20	51° 39.458'N	01° 26.619'E	I17	51° 39.582'N	01° 29.038'E	L12	51° 39.654'N	01° 32.880'E			
F09	51° 36.519'N	01° 30.735'E	H04	51° 36.183'N	01° 34.004'E	I18	51° 39.812'N	01° 28.612'E	L13	51° 39.862'N	01° 32.455'E			
F10	51° 36.749'N	01° 30.309'E	H05	51° 36.413'N	01° 33.579'E	I19	51° 40.042'N	01° 28.186'E	L14	51° 40.114'N	01° 32.028'E			
F11	51° 36.988'N	01° 29.896'E	H06	51° 36.644'N	01° 33.152'E	I20	51° 40.276'N	01° 27.753'E	L15	51° 40.345'N	01° 31.602'E			
F12	51° 37.210'N	01° 29.457'E	H07	51° 36.857'N	01° 32.766'E	J06	51° 37.452'N	01° 34.282'E	L16	51° 40.575'N	01° 31.176'E			
F13	51° 37.440'N	01° 29.031'E	H08	51° 37.104'N	01° 32.301'E	J07	51° 37.681'N	01° 33.856'E	L17	51° 40.805'N	01° 30.750'E			
F14	51° 37.670'N	01° 28.605'E	H09	51° 37.334'N	01° 31.876'E	J08	51° 37.918'N	01° 33.442'E	L18	51° 41.035'N	01° 30.324'E			
F15	51° 37.900'N	01° 28.179'E	H10	51° 37.564'N	01° 31.450'E	J09	51° 38.150'N	01° 33.019'E	L19	51° 41.265'N	01° 29.899'E			
F16	51° 38.130'N	01° 27.753'E	H11	51° 37.794'N	01° 31.023'E	J10	51° 38.380'N	01° 32.593'E	L20	51° 41.481'N	01° 29.523'E			
F17	51° 38.360'N	01° 27.327'E	H12	51° 38.024'N	01° 30.598'E	J11	51° 38.610'N	01° 32.167'E	M14	51° 40.473'N	01° 32.617'E			
F18	51° 38.590'N	01° 26.901'E	H13	51° 38.254'N	01° 30.172'E	J12	51° 38.840'N	01° 31.741'E	M15	51° 40.752'N	01° 32.173'E			
F19	51° 38.820'N	01° 26.475'E	H14	51° 38.484'N	01° 29.746'E	J13								