

Riverside Energy Park

Preliminary Environmental Information Report

CHAPTER:

05

PLANNING INSPECTORATE REFERENCE NUMBER:
EN010093

ALTERNATIVES CONSIDERED

June 2018 | Revision 0

Planning Act 2008 | Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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5 Alternatives Considered

5.1 Introduction

- 5.1.1 The Infrastructure EIA Regulations 2017 require that an Environmental Statement (ES) should include a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) that have been studied by the developer which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects.
- 5.1.2 The consideration of alternatives and design evolution have been undertaken with the aim of preventing or reducing adverse environmental effects (following the hierarchy of avoid, reduce and if possible remedy).
- 5.1.3 A staged process was adopted in considering alternatives for the Proposed Development, firstly considering the suitability of the Riverside Energy Park (REP) site, followed by an options appraisal for alternative layouts for the Main REP Building and other key components within the REP site. Following this, construction phase options for the marine environment were considered, along with options for the Electrical Connection route and potential Main Temporary Construction Compounds.
- 5.1.4 PINS Advice Note 7 (Version 6, December 2017) (AN 7) identifies that PINS considers a good ES to be one that (inter alia):

“...explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment”.

- 5.1.5 The reasonable alternatives considered for the Proposed Development are described below.

5.2 Suitability of the REP site

- 5.2.1 National Policy Statement (NPS) EN-1 (Ref 4-1) paras 4.4.1 and 4.4.2 states that:

“This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option. However, applicants are obliged to include in their ES, as a matter of fact, information about the main alternatives they have studied. This should include an indication of the main reasons for the applicant’s choice, taking into account the environmental, social, and economic effects and including, where relevant, technical and commercial feasibility”.

- 5.2.2 In deciding upon the location for the Proposed Development, the Applicant has had regard to a number of factors such as those described in NPS EN-3. However, in line with paragraph 2.1.3 of NPS EN-3, *‘It is for energy companies to decide what applications to bring forward and the Government does not seek to direct applicants to particular sites for renewable energy infrastructure...’.*
- 5.2.3 Given that the Applicant owns the majority of the REP site, along with the proximity of associated road and jetty links with the River Thames, the location was considered ideally suited for the Proposed Development. Whilst it was noted that the REP site would potentially interact with some non-statutory ecological designations, for the numerous reasons identified below the REP site was considered advantageous and consideration of alternative sites was not deemed necessary.
- Located adjacent to the existing RRRF, REP would have access to the existing purpose-built jetty and the River Thames network beyond. The jetty is already utilised by RRRF and has sufficient capacity to accommodate REP deliveries and removals with no modification

or improvement works required. Utilising the jetty would result in fewer road deliveries required with a subsequent reduction in the potential for effects to the environment. The ability to use the Applicant's established and unique river network is a significant benefit;

- It has existing road access to the Strategic Road Network (SRN) via Norman Road. This access point is already utilised by vehicles accessing RRRF, thus it is known that standard waste delivery and export vehicles could access REP without the need for new or upgrading works;
- It has existing mains water and foul sewage connections with sufficient capacity to service REP, preventing the requirement for provision of additional infrastructure and thus further reducing potential effects to the environment;
- There is adequate footprint to accommodate the required REP plant and equipment;
- It was considered technically feasible to connect to the electricity distribution network with a high likelihood of avoiding substantial intrusive works within greenfield land or other private ownership, due to the utilisation of previously developed or disturbed land (public highway and verges or existing cable routes);
- It was considered to be at a sufficient distance from sensitive residential receptors to limit impacts (i.e. in terms of noise), as RRRF is a similar development which operates highly successfully;
- It does not directly conflict with any statutory environmental designations (apart from being located within a flood zone, however the REP site benefits from flood defences);
- It is located within an existing urban/industrialised environment, with an existing precedent set for similar and other tall structures within the local environment on both banks of the River Thames; and
- The site benefits from proximity to proposed developments that local authorities already intend to be served by a potential local district heating network, to which REP could further contribute alongside RRRF.

5.3 Alternative Layouts

5.3.1 The Applicant's intention is to use similar technology to Riverside Resource Recovery Facility (RRRF) for the Energy Recovery Facility (ERF) element of the Proposed Development. This allows proven and deliverable technology to be employed along with the integrated benefits of Anaerobic Digestion, Battery Storage and Solar Photovoltaics. The scale of development required to support the proposal fits within existing established site boundaries, e.g. Crossness Local Nature Reserve (LNR) to the west and south, the River Thames flood bank to the north and RRRF to the east.

5.3.2 The characteristics of the REP site allows for a limited number of options in relation to the specific orientation of the Main REP Building and other key components. Other specific site constraints to layout include ensuring existing RRRF operations are not inhibited, the established location of entry to the REP site via the existing jetty and from Norman Road and ground level drainage and dyke systems.

5.3.3 As part of the process to assess orientations within the REP site, four orthogonal layout options were initially considered. Key considerations within this process included:

- Continued operation of RRRF; and
- The ability to utilise existing infrastructure (SRN access and jetty), whilst being able to operate as a standalone facility.

- 5.3.4 The ERF and Anaerobic Digestion components of REP are particularly reliant on a process flow through each facility. For example, the discharge emissions stack for the ERF lies at the opposite end of the Main REP Building to the tipping hall, as these components are at each end of the linear waste thermal treatment process and result in a predominantly rectangular main building form, albeit wider at the tipping hall end. Therefore, the four layout options considered were:
1. North to south orientation with the stack at the south and the tipping hall at the north;
 2. North to south orientation with the stack at the north and the tipping hall at the south;
 3. East to west orientation with the stack at the west and the tipping hall to the east; and
 4. East to west orientation with the stack at the east and the tipping hall to the west.
- 5.3.5 Arrangements on two main orthogonal axes were considered more appropriate, both due to the challenges of achieving an efficient skewed arrangement (between RRRF infrastructure to the east and the Crossness LNR boundary to the west) and the relationship to other buildings adopting similar orientations in the local context.
- 5.3.6 The options appraisal resulted in options three and four being discounted. As waste deliveries would enter the REP site either from the jetty to the north or from Norman Road to the south, an east to west orientation of REP would result in increased vehicle congestion, a more complex route and conflict of movements to the tipping hall. An east to west orientation would also potentially create a 'wall' of building and infrastructure parallel to the Thames River Path, and block more views to and from the River Thames.
- 5.3.7 A north to south orientation was therefore considered to be more in keeping with the orientation of existing surrounding infrastructure (RRRF and the Thames Water Sewage Treatment Works), as well as providing a more efficient routing system within the REP site for vehicular deliveries from the jetty and Norman Road. In addition, a north to south orientation reduces the blocking of views to and from the River Thames when compared with an east to west orientation.
- 5.3.8 Following the appraisal of orientations for REP, a strengths, weaknesses, opportunities and threats (SWOT) analysis was conducted on options one and two. The layouts were considered in the context of a range of environmental strengths and weaknesses; the outcomes allowed a preferred option to be taken forward within the detailed design and EIA process.
- 5.3.9 The SWOT analysis identified that there was no discernible difference between options one and two in terms of potential effects on the environment in relation to:
- i. noise and vibration - due to the distance from the nearest noise-sensitive receptor (NSR);
 - ii. air quality – due to the minor change in stack location between options; and
 - iii. historic environment, ground conditions, and hydrology and flood risk – as the footprint of the two options is approximately the same.
- 5.3.10 The layout of REP was not considered to affect off site transport, potential impacts to human health or socio-economic impacts.
- 5.3.11 In relation to the TVIA it was identified that option two would introduce a narrower built form along the Thames River Path, and could be considered to be less dominant in views from the path, as well as likely having a reduced shadowing effect to the Thames River Path.
- 5.3.12 In addition, it was considered beneficial for the stack to be located at the northern end of the facility, as it would prevent shadowing over the roof of the Main REP Building, allowing

maximum potential for unobscured generation from the roof-mounted Solar Photovoltaic installation.

- 5.3.13 For these reasons, option two was considered to be more favourable than option one as it resulted in less potential for giving rise to effects on the environment, as well as maximising the opportunity for Solar Photovoltaic generation.

5.4 Proposed Works in the Marine Environment

- 5.4.1 Within the Scoping Report submitted to the Secretary of State in November 2017, temporary works within the River Thames were included to potentially facilitate construction of REP. **Figure 5.1, Appendix A.1** shows the Indicative Application Boundary presented in the Scoping Report and the extent of the marine environment identified at that time as being potentially affected.

- 5.4.2 Two potential construction options were considered:

- i. the installation of a temporary causeway across the intertidal zone where self-propelled multi-axle trailers would have rolled the construction modules off a barge; and
- ii. the use of a lift crane, either located on a jetty head constructed in the river or constructed near the river bank, which would have directly lifted construction modules from a barge into the REP site.

- 5.4.3 Both options would have required the need to lift construction modules over the flood defence wall and the Thames River Path. It was considered that some localised dredging may have been required to ensure adequate and safe vessel access and stability during the tidal cycle.

- 5.4.4 Further refinement of the project and likely construction methodologies concluded that it was not favourable to undertake works within the River Thames. Instead, the Applicant is proposing to utilise the existing jetty and road network where possible, to bring plant and equipment to site and during operation for the delivery of fuel. This approach is reflected in the relevant assessments presented in this PEIR.

- 5.4.5 This project refinement has removed the need for intrusive works (foundations and capital dredging) greatly reducing the potential to give rise to significant adverse effects on the marine environment. The River Thames is still proposed to be used during the construction and operational phases of the Proposed Development, however this would not require any new works in the river and all activities would make use of the existing jetty and mooring points. The Indicative Application Boundary shown in **Figure 1.2, Appendix A.1** identifies the updated area of marine environment now proposed for non-intrusive working.

5.5 Electrical Connection

Electrical Connection Point

- 5.5.1 Two options for the new electricity connection point were initially considered as described in the EIA Scoping Report (see **Figure 5.1, Appendix A.1**, which shows the Indicative Application Boundary considered at the Scoping stage):
- Electrical Connection route to Renwick Road, Barking – the new cable route would head north west from the REP site and follow the existing RRRF Electrical Connection route, to an Electrical Connection Point north of the River Thames at the existing National Grid substation on Renwick Road, Barking. This option would utilise the existing electricity cable tunnel under the River Thames; and

- Electrical Connection route to Littlebrook substation – the new cable would be routed within the existing road network to the existing National Grid Littlebrook substation in Dartford.
- 5.5.2 Through working with UKPN, it was determined that the Electrical Connection route to Littlebrook substation should be progressed.
- 5.5.3 The Electrical Connection route to Barking would have required crossing the River Thames via a UKPN owned 1.7 m diameter utilities tunnel, which accommodated power and telecommunication cables.. During the early feasibility work for the grid connection for REP, UKPN investigated the use of other existing cables routed through the tunnel and found that all the cables were in use and could not be removed to accommodate cables for RRRF. The use of the utilities tunnel was therefore discounted by UKPN due to the lack of space.
- 5.5.4 Additionally, during technical feasibility studies, the upgrade of the existing cables to accommodate ratings for both RRRF and REP was investigated by UKPN who confirmed that this was not feasible due to existing potential overheating problems inside the utilities tunnel.
- 5.5.5 Construction of a new tunnel was therefore ruled out on the basis that this would not be viable relative to a route to Littlebrook substation. This decision took account of UKPN's licence obligations under the Electricity Act.
- 5.5.6 Accordingly, the Electrical Connection route to Littlebrook substation has been progressed as the Electrical Connection solution for the Proposed Development.

Development of the Electrical Connection route to Littlebrook substation

- 5.5.7 Further work with UKPN, who are undertaking more detailed studies of potential routings, resulted in alternative routes for the Electrical Connection to the Littlebrook substation (Routes 1, 1A, 2A and 2B) being developed, as identified in **Figure 5.2, Appendix A.1** and outlined below.
- Route 1 follows a route along the public highways A2016 and A206;
 - Route 1A leaves the REP site and follows Norman Road south, to re-join Route 1 at its junction with the A2016;
 - Route 2A diverts away from Route 1 and follows Anderson Way, Church Manorway, Lower Road, West Street, Erith High Street, Manor Road, Slade Green Road, Hazel Road, Moat Lane and Howbury Lane where it re-joins Route 1 at its junction with the A206; and
 - Route 2B diverts away from Route 1 at A206/Joyce Green Lane roundabout, and follows Joyce Green Lane, a gravel path routed off the public highway and a busway routed east where it re-joins Route 1 at its junction with Rennie Drive.
- 5.5.8 At this stage, a final decision on the Electrical Connection route to Littlebrook substation will be undertaken in consultation with UKPN and taking into account feedback from our consultation process. For the purpose of the assessments presented in this PEIR, all route options have been considered.

5.6 Alternative Main Temporary Construction Compounds

- 5.6.1 The REP site incorporates areas for temporary use during the construction phase. However, given the characteristics of the REP site, there is insufficient space to accommodate all construction laydown, fabrication, welfare and parking provision within the site boundaries. This is particularly the case as the footprint of the permanent works increases through construction.
- 5.6.2 An initial desktop exercise of potential Main Temporary Construction Compounds was therefore undertaken to identify off site areas considered suitable for use as Temporary Construction

Compounds, after which a further assessment of the identified sites was undertaken to determine which were considered to be more suitable from an environmental and technical perspective.

5.6.3 The criteria considered in identifying potential Compounds were as follows:

- A minimum site area (26,000 sqm) was required. Sites smaller than this were not considered adequate for use in the construction phase;
- To maintain a reasonable degree of construction efficiency in the movement of staff, materials and plant, a maximum distance of 2.5 km from the REP site was applied;
- To avoid difficulties in the transport of off-site fabricated components from a Compound to the REP site, a maximum distance of 0.5 km from the A2016 was applied; and
- Proximity to residential areas were considered, with the aim of reducing potential disturbance to sensitive receptors.

5.6.4 An initial list of nine sites was identified which met the above criteria and were taken to the next stage for detailed consideration.

5.6.5 Of the nine sites, two would have needed to be combined to provide the required area and were thus considered less favourable than those which individually met the area requirements. In addition, one of these areas was located within 500 m of residential properties, further reducing its suitability.

5.6.6 The seven remaining sites were considered, however four were discounted for the following reasons:

- One was located within 100 m of a Sport and Recreation facility, a school, and a public open space;
- One was within an area designated as public open space;
- One was located within 500 m of residential properties and was not considered suitable for laydown purposes; and
- One was located within 2.5 km of the REP site but on the northern bank of the River Thames. This was not considered suitable for car parking, fabrication or storage, nor was it considered logistically feasible or safe to present the construction workforce on a regular schedule to access the REP site via a crossing of the River Thames.

5.6.7 Of the three sites which remained, all were determined to be technically feasible and were considered to be subject to fewer environmental constraints. Two sites were located to the west of Crabtree Manorway North (both adjacent to each other, and both meeting the area requirements). The site on land west of Norman Road (immediately south of the REP site) was also considered technically feasible.

5.6.8 The Indicative Application Boundary shown in **Figure 5.1, Appendix A.1** (Scoping stage) includes both of the previously considered Main Temporary Construction Compounds at Norman Road and Crabtree Manorway North.

5.6.9 The Applicant established that all the sites were subject, to a significant extent, to extant planning permissions that were due to be implemented prior to REP's intended 2021 construction commencement. In some cases the Applicant were advised that construction works were commencing or imminent. In other cases, elements of an overall outline permission had already been implemented and further phases were understood to be imminent.

- 5.6.10 In light of the above, and particularly the suitability of the site on land west of Norman Road, the Crabtree Manorway North sites were not progressed and will not form part of the REP DCO application.

5.7 Alternative Vehicular Access Arrangements

- 5.7.1 Due to the existing access points at the REP site, from the existing jetty to the north and from Norman Road to the south, no additional access arrangements were considered necessary for the REP site. In any event, constraints exist to land based access in respect of the adjacent Crossness LNR and surrounding development.

5.8 Do Nothing Alternative

- 5.8.1 The 'Do Nothing' scenario is not considered appropriate given the established need for new energy generation and waste treatment in London, including a need for low carbon and renewable energy generation, and policy support for increased use of the river. Another disadvantage of the 'Do Nothing' scenario would be the lack of additional investment in the local economy, as well as a lack of opportunity for potential future provision of local district heating for the local area.