

We welcome the opportunity to present proposals which will shortly be submitted as a full planning application to Bassetlaw District Council on land at the former High Marnham Power Station.

The proposals comprise:

- An 8 MW Electrolytic “Green” Hydrogen Production Plant, and distribution trailer loading facility

And

- An Ammonia “Cracker” prototype facility for the production of hydrogen and distribution via HGV tube trailers

JG Pears has now been successfully operating its biomass combined heat and power plant (CHP) at Low Marnham since early 2018, being self-sufficient for the majority of its Low Marnham site heat and energy requirements and exporting excess electricity to the National Grid via the High Marnham substation. Category 1 meat and bone meal is used as the fuel source which otherwise would have gone to landfill. The ash from the CHP is returned to the land in the form of a fertiliser.

The Company’s latest business investment strategy is to strengthen and diversify its business, building and attracting synergistic low and net zero carbon developments.

As part of the recent Government Net Zero announcement, the “H2 Production Plant at High Marnham” project has been shortlisted for grant funding support under the Hydrogen Business Model and Net Zero Hydrogen Fund. The Government’s aim is to kickstart the low carbon hydrogen economy across the UK, helping meet the ambition of up to 1GW of electrolytic hydrogen production capacity in operation or construction by 2025.

JG Pears Group and Geopura intend to form a Joint Venture company, Hy Marnham Green Energy, that will deliver and operate the hydrogen production facilities at their site at High Marnham. GeoPura and Siemens Energy will design and install the plant and equipment on site.

Your feedback on the proposals is welcome. Please take the time to speak with a representative of the project team and complete one of our comment forms.

The following boards describe the current proposals in more detail.

We welcome your thoughts on our scheme, and if there are any local issues or circumstances that you feel the development should reflect.



Site Location Plan



“Green” Hydrogen Production Plant

“Green” hydrogen is used to refer to the production of hydrogen using renewable power sources only. Electrolytic Hydrogen Production means the production of hydrogen by splitting water into hydrogen and oxygen using electricity, by means of an electrolyser.

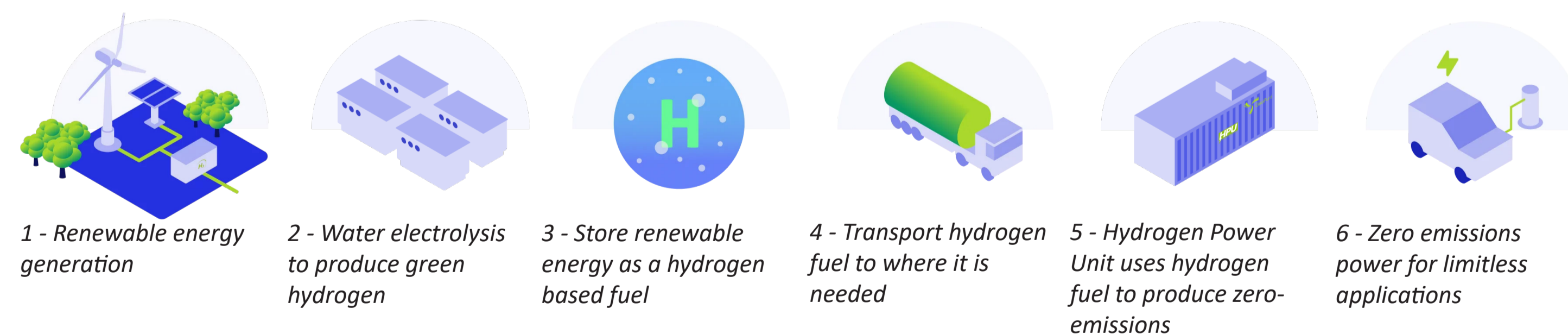
Hy Marnham Green Energy propose to use renewable energy produced from solar arrays from the adjoining land (owned by J G Pears Group, permitted by Bassetlaw District Council under planning application reference 22/00707/FUL). A further power source, should it be required, is the existing Biomass Power Plant (owned and operated by JG Pears) at the JG Pears Low Marnham site, via a pre-existing private-wire electrical connection to High Marnham.

The Process

The process involves passing electricity through ultra-pure water in an electrolyser to produce hydrogen and oxygen. The hydrogen produced is then compressed before the gas is pumped into mobile HGV tube trailers for dispatch.

The oxygen will currently be vented to atmosphere, although it is hoped future uses for this gas can be found. The plant will produce a small amount of waste water produced from the water purification process, which is proposed to be discharged into the River Trent under a condition in the corresponding Environmental Permit.

Green hydrogen effectively stores renewable energy for use at a later date and in a different place, enabling renewable energy to become an even greater contributor to our global energy needs.

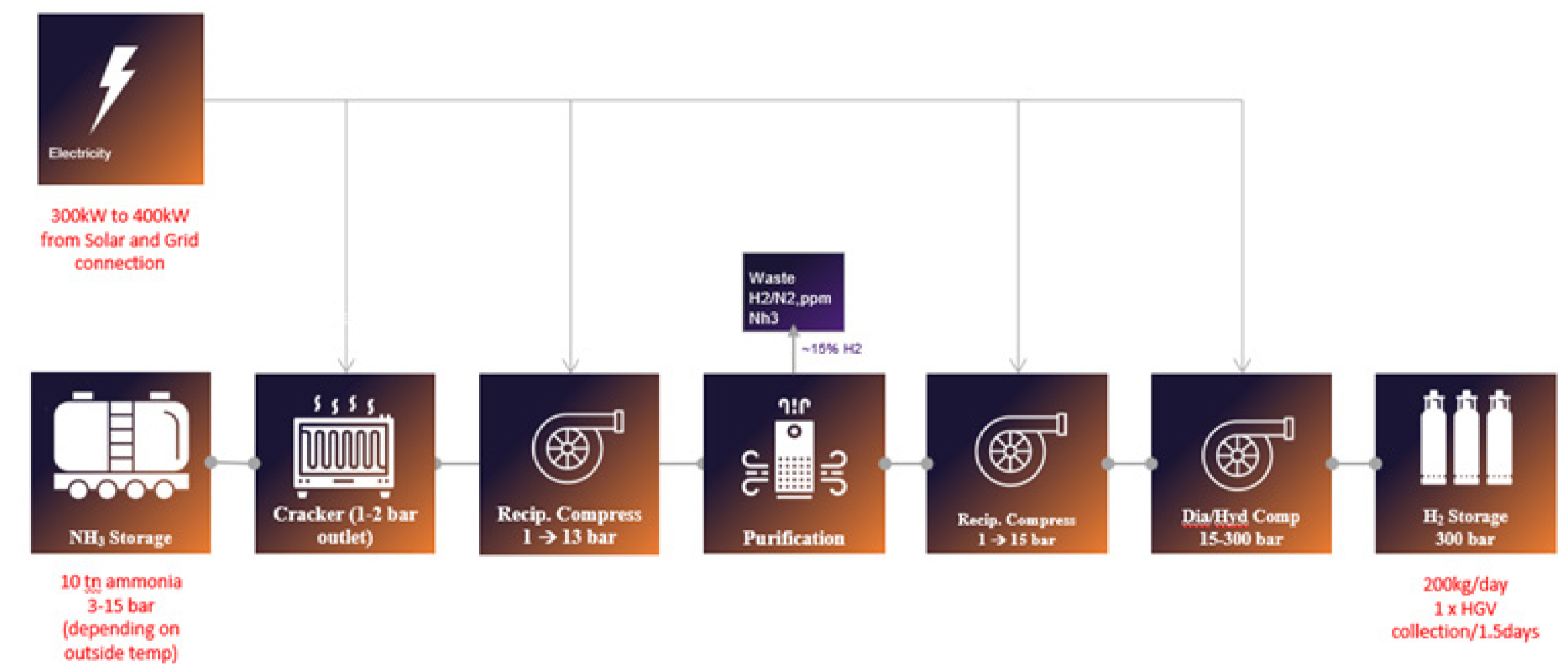


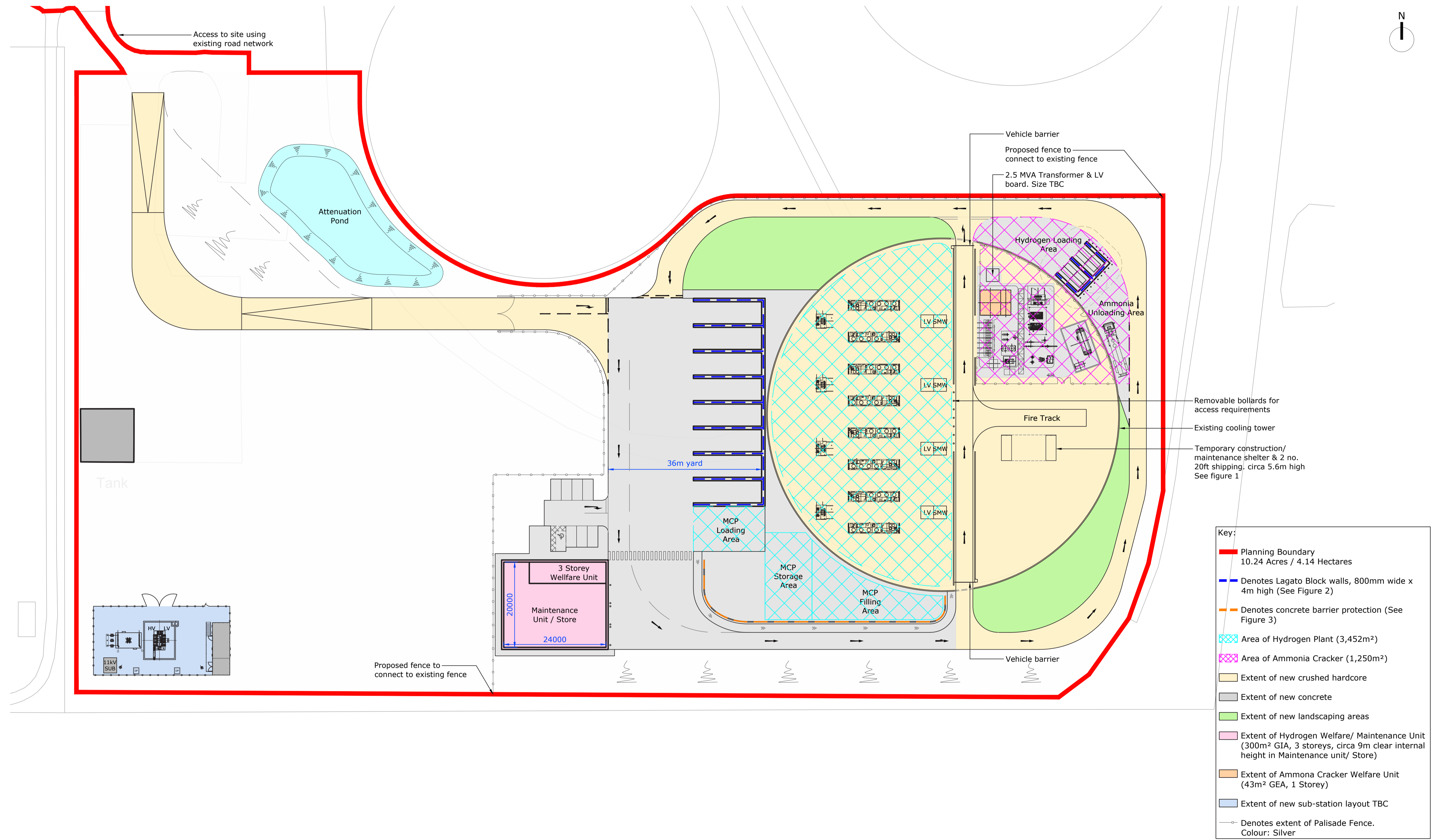
Ammonia “Cracker” Prototype Facility

The proposal will include a small prototype facility to develop and demonstrate a system capable of producing hydrogen from “cracked” ammonia. The prototype will use ammonia to deliver 200kg of hydrogen a day, which will be loaded directly into a mobile HGV tube trailer. The plant will produce approximately 3 tanker loads per week.

The Process

1. Liquid ammonia is stored in a pressurised tank, which evaporates and decompresses before entering the ammonia cracker.
2. In the cracker, the ammonia is heated via heat exchangers and an electrical heater, and is cracked into hydrogen (H₂), nitrogen (N₂) and trace ammonia (NH₃).
3. The product is cooled to ambient temperature and compressed before entering a hydrogen purification unit, removing the nitrogen and any unreacted ammonia.
4. High purity hydrogen is obtained and compressed for storage in a mobile hydrogen storage tank (HGV tube trailer) before dispatch.





“Green” Hydrogen Production Plant

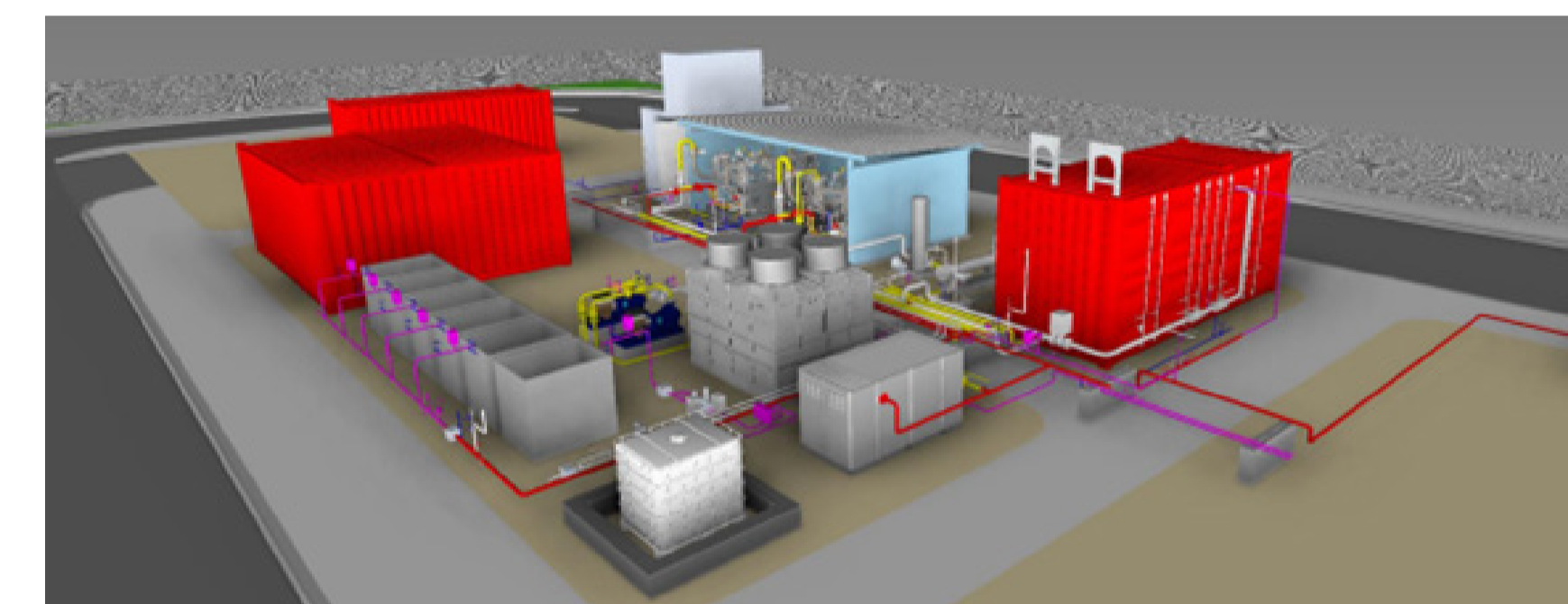
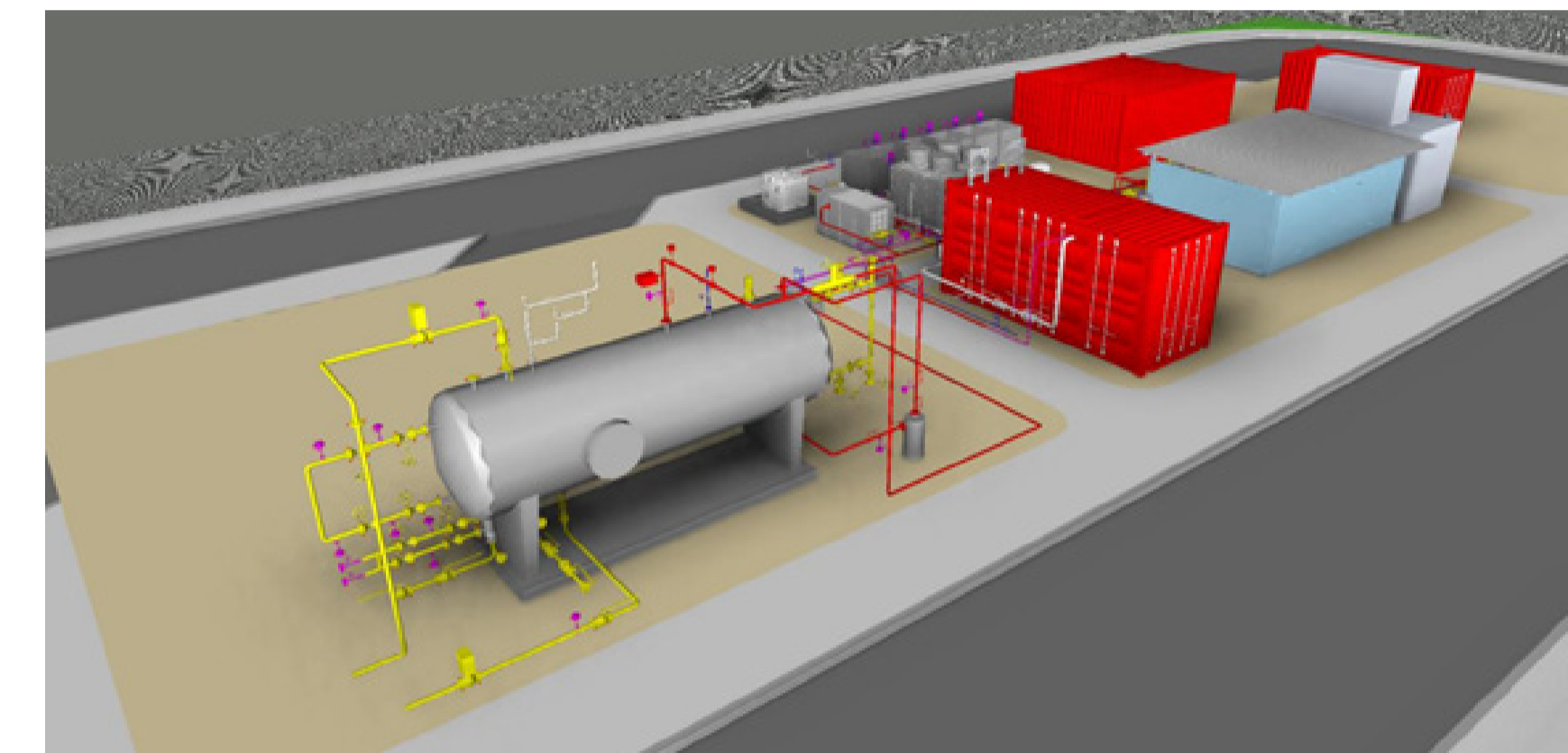
The proposed development will comprise a low level of built form, including:

- Hard standing vehicular access track, tanker loading area and HGV parking area.
- Vessels, pipes, pumps, compressors, tanks, valves and control equipment housed in permanent steel support structures.
- A three-storey building containing a vehicle maintenance unit, staff welfare facilities and control room.
- Step-down electricity transformers, electrolysers and compressors, similar in appearance to shipping containers, measuring 12.2 metres long, 2.5 metres wide and 2.6 metres in height.
- Vents will be fixed to the electrolyser units, which will have a maximum height of 7.7 metres.



Ammonia “Cracker” Prototype Facility

The ammonia “cracker” proposal is a small prototype facility and will comprise several 20 ft long shipping containers, in addition to vessels, pipes, pumps, compressors, tanks, valves and control equipment housed in permanent steel support structures.



Is it safe?

A number of hydrogen’s properties make it safer to handle and use than fuels commonly used today. For example, hydrogen is practically non-toxic by inhalation and carries no risk of contamination to soil, groundwater or surface water bodies. In addition, because hydrogen is much lighter than air, it dissipates rapidly upwards if it is released, allowing for quick dispersal in the unlikely event of a leak.

Industry-recognised design methodologies have been used to identify and address the hazards associated with the plant, including the hazards from hydrogen and ammonia. In practice, this means minimising the risk by design where appropriate and implementing control measures (such as safety and control systems, procedures, operator training and supervision) to reduce risks to tolerable levels. These approaches are well-developed in the industry.

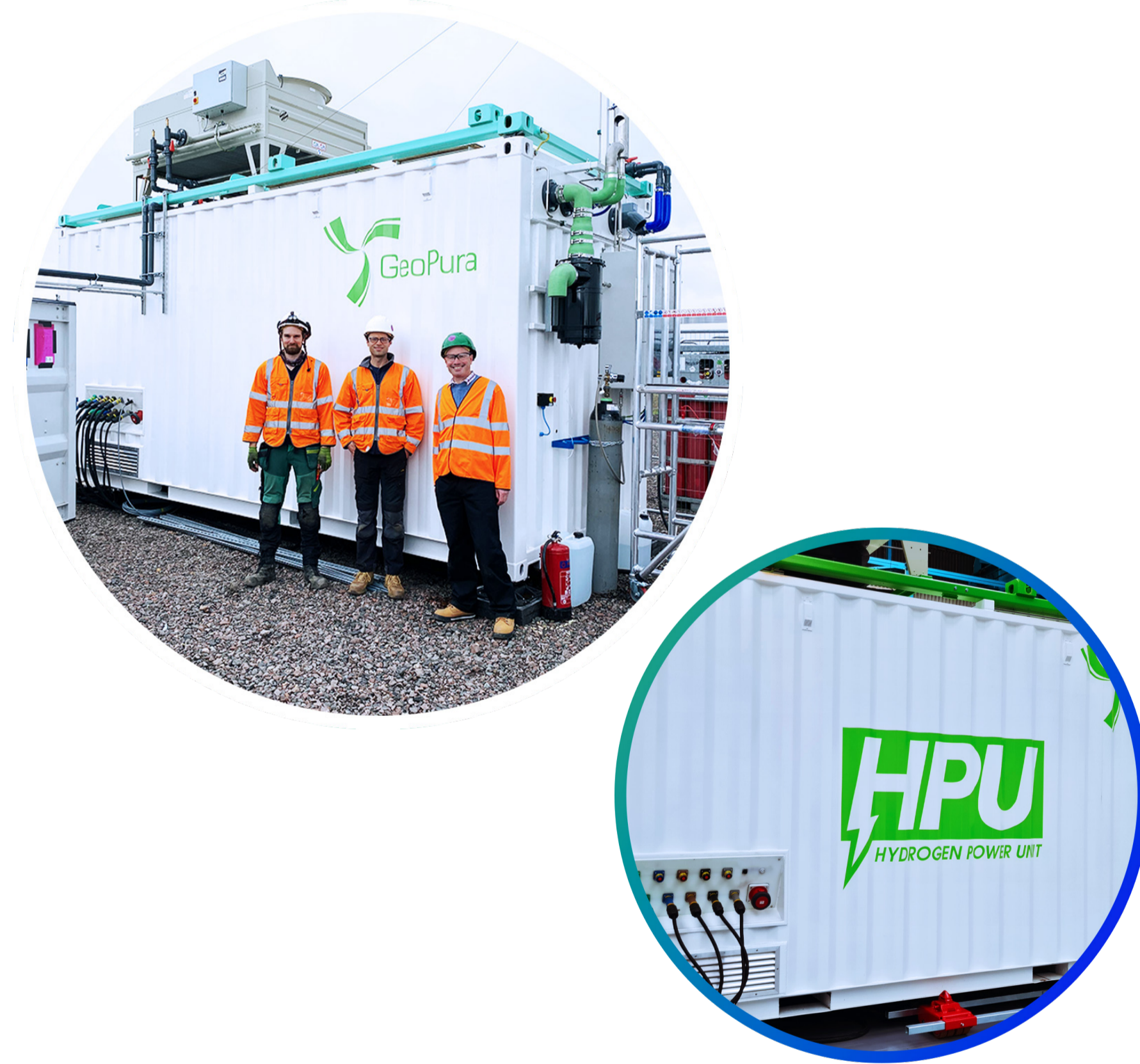
The Local Planning Authority and the Health and Safety Executive (HSE) are the consenting bodies. Regulators will closely scrutinise how the plant has been designed and how it is controlled, operated and monitored.

In addition, the hydrogen plant will require an Environmental Permit under the Environmental Permitting (England and Wales) Regulations SI 2020/675. An Environmental Permit application was submitted to the Environment Agency in May 2023. The Environment Agency will carry out their own review and consultation process on this application.

Noise

A Noise Impact Assessment will accompany the planning application submission. The noise impacts are anticipated to be limited and are not likely to be perceptible to sensitive receptors above background noise levels.

Any potential sources of noise will be designed out via equipment specification, and the use of acoustic housing around the noisiest equipment. As such, there would be no significant effects during the operation of the proposed development.



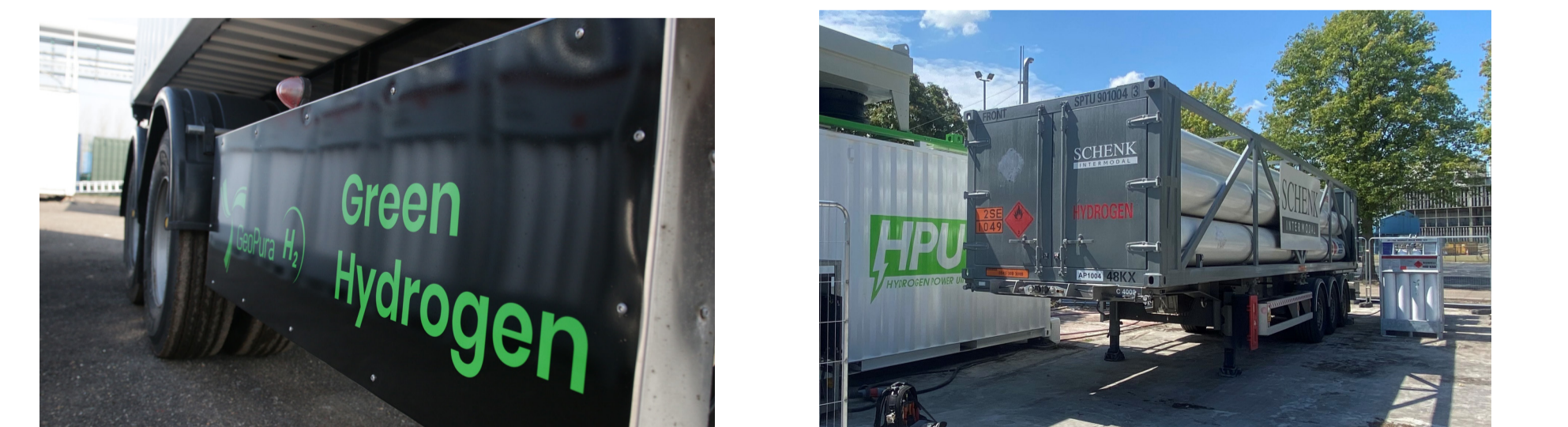
Access and Vehicle Movements

The proposed development will utilise the existing access onto Fledborough Road, which served the old coal fired power station, and is suitable for use by HGVs. The road through the site to where the power station used to stand, still remains.

The proposals will not lead to a large increase in HGV movements on the local highway network. It is anticipated that the hydrogen production plant will produce approximately 3 tonnes of hydrogen per day, requiring a maximum of 10 two-way trips a day based on 300kg capacity tankers. The ammonia cracker prototype will produce 200kg of hydrogen a day, stored in 1 no. 300kg capacity mobile HGV tube trailer. As such, this proposal will generate approximately 3 tanker loads per week.

A Transport Assessment will accompany the planning application. The Highways Consultant considers that the effect of the change in traffic levels on the local highway network would not be significant, based on traffic count data and junction capacity assessments undertaken. It is considered that the cumulative impacts on the road network, taking into account the approved and committed JG Pears developments, would not be significant

Traffic management plans for the routing of HGVs during construction and operation will be prepared to minimise the possibility of heavy goods traffic using inappropriate routes to and from the site, in the interests of maintaining highway efficiency and safety.

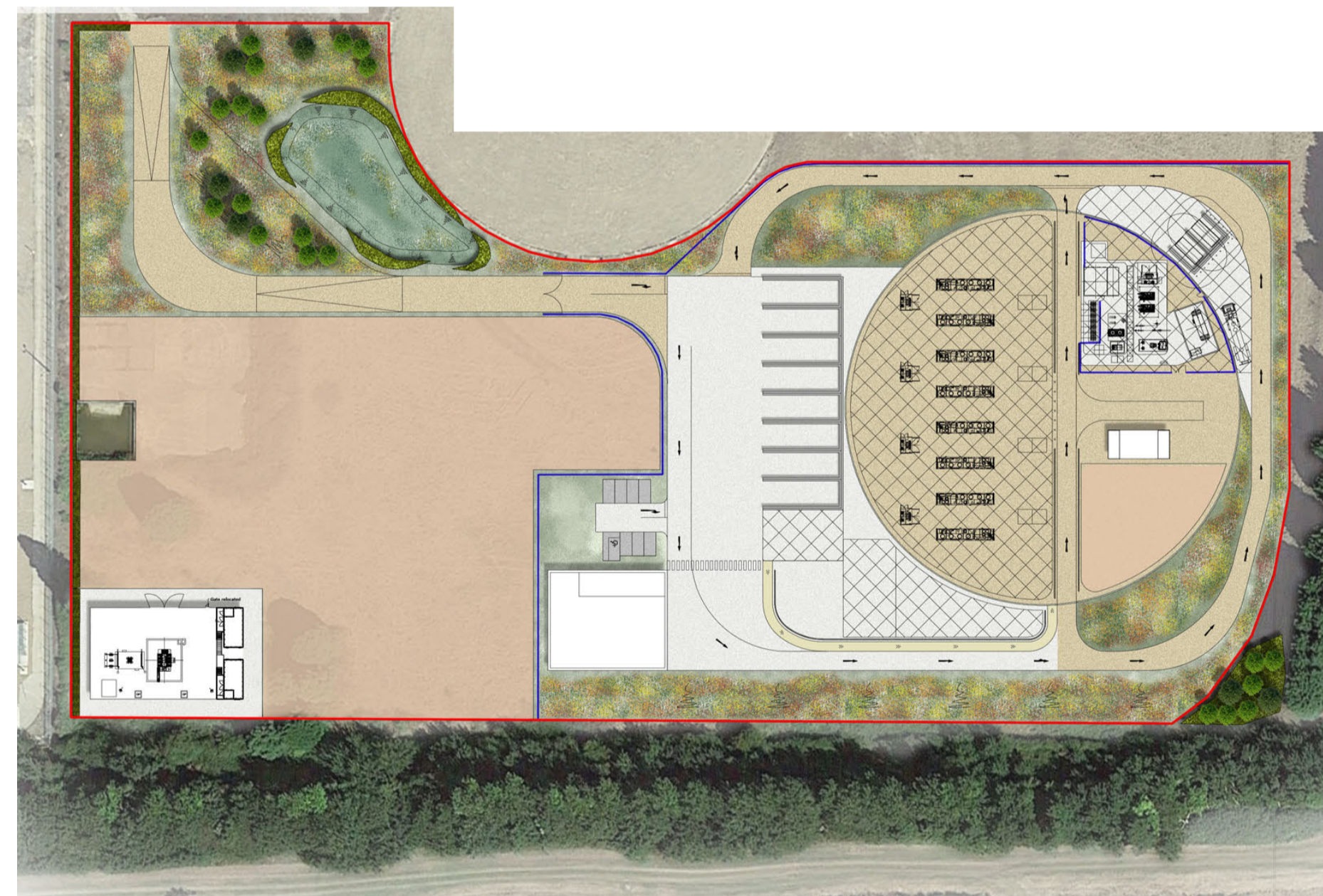


Landscape and Visual Impact

A Landscape and Visual Impact Assessment has been undertaken to assess the landscape and visual effects of the proposals and associated landscaping. By the nature of the site's location, and considering the scale and extent of the proposals, the anticipated influence of the proposals will be localised and well contained.

By virtue of the site's enclosed nature, visual amenity is limited and confined to the immediate areas enclosing the site by reason of the intervening vegetation. Existing industrial and utility infrastructure (i.e. the National Grid Sub-Station) will remain the most visually dominant feature in the landscape following development.

The proposal will retain and enhance perimeter vegetation with the planting of suitable native tree species to help maintain the relatively enclosed feel of this area of the site as well as to promote on-site biodiversity enhancements.



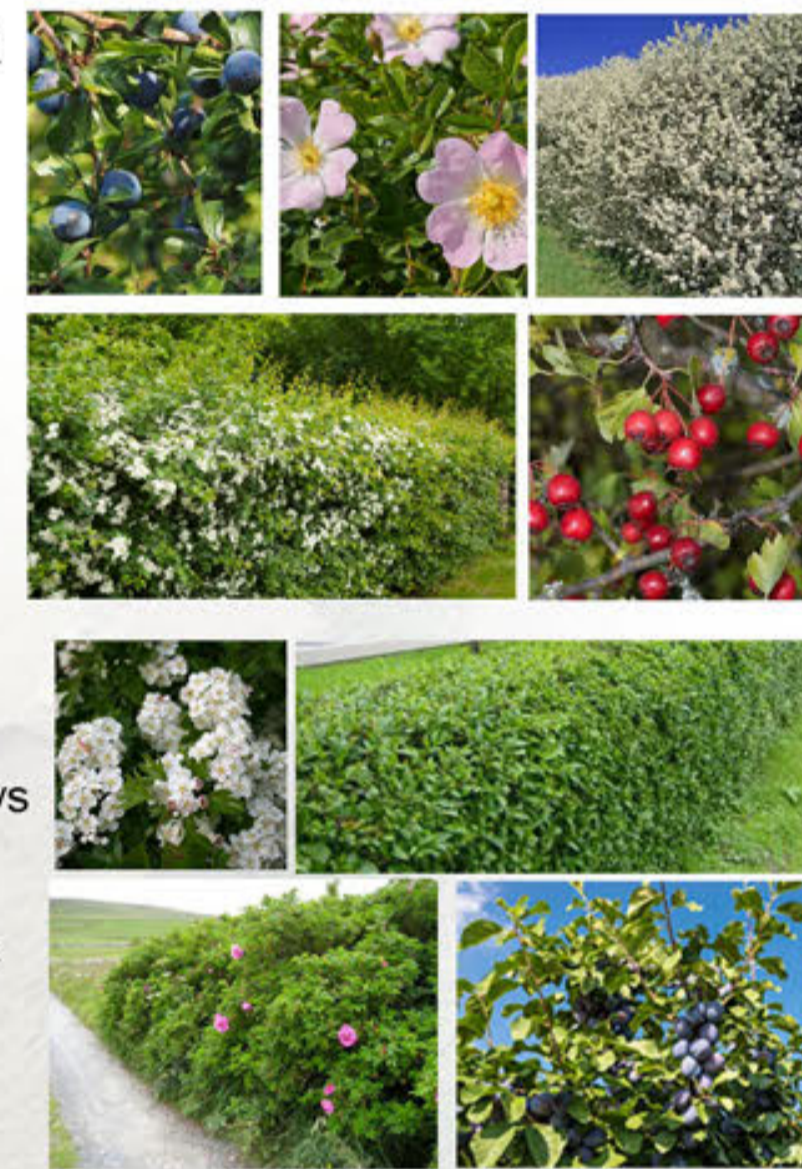
Indicative Landscape Plan

Ecology

An Ecological Appraisal will accompany the planning application. Given the site comprises previously developed land it is unlikely that the proposed development would give rise to significant effects in respect of ecological matters. For any minor effects there will be scope to offset these and the potential for net gains to biodiversity.

Native Shrub & Hedge Planting

- Acer campestre
- Cornus sanguinea
- Corylus avellana
- Crataegus monogyna
- Ilex aquifolium
- Ligustrum vulgare
- Prunus spinosa
- Rhamnus cathartica
- Rosa canina
- Sambucus nigra
- Viburnum lantana
- Viburnum opulus



Mixed Native Hedgerows

- 10% Cornus sanguinea
- 10% Corylus avellana
- 40% Crataegus monogyna
- 5% Ligustrum vulgare
- 25% Prunus spinosa
- 5% Rosa canina
- 5% Viburnum lantana

Species Rich Wildflower Grass

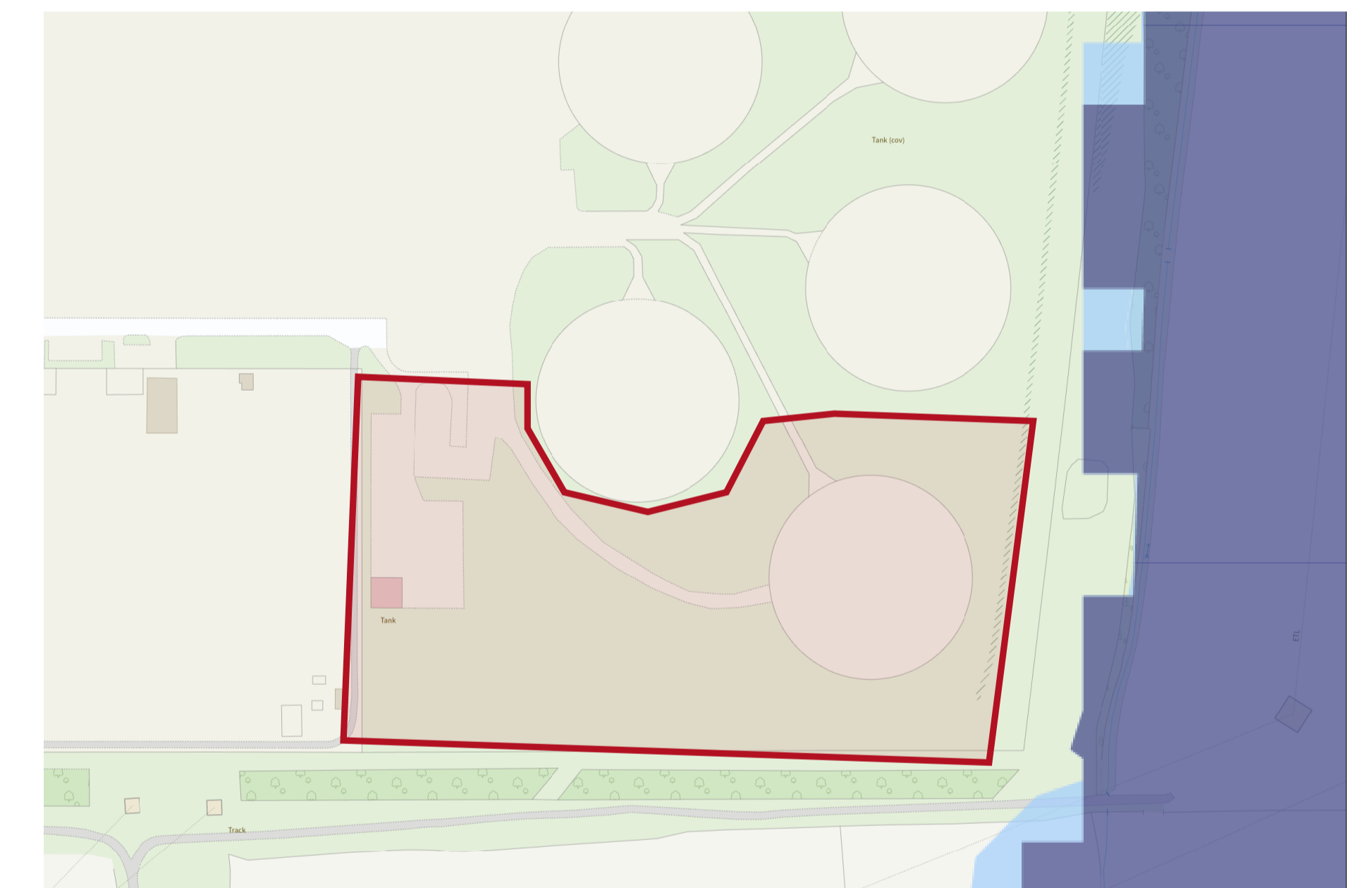
- Emorsgate EM2 General Purpose
- Meadow Mix, EH1 Hedgerow Mix & EM10 Tussock Mix



Flood Risk and Drainage

The site lies wholly in Flood Zone 1 where the risk of river flooding is low (even when taking into account the effects of climate change). The planning application will be supported by a full Flood Risk Assessment and Drainage Strategy that will include Sustainable Urban Drainage Systems (SuDS).

The incorporation of sustainable drainage systems as part of the proposed development will ensure there is no likely significant effects on flooding or hydrology and flow rates will be contained to better than existing Greenfield run off rates.



Environment Agency Flood Risk Map

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

Scheme Benefits

- Provides a sustainable means of energy generation, with the production of a maximum of 3 tonnes of hydrogen per day from renewable energy sources.
- As recognised in the Government's hydrogen strategy, green hydrogen supports the integration of renewables with added benefits for energy security and resilience.
- Green hydrogen will be used as a fuel for sectors that are difficult to electrify (e.g. construction sites, long-term infrastructure projects, events, film and TV production, transport, in addition to the thermal odour abatement plant at Low Marnham).
- The redevelopment of this site would reduce the need for development on undeveloped greenfield sites.
- It would not lead to the loss of agricultural land or result in any encroachment into the countryside.
- The scale of development is appropriate. The anticipated influence of the proposals will be localised and well contained.



Low Marnham

What Happens Next?

1. We welcome your views on the proposals and would ask you to fill in the comments form and place it in the collection box provided.
2. If you take a form away with you and wish to post it to us, please send the completed form to Framptons Planning in the pre-paid envelope provided.
3. The exhibition material is available at: www.framptons-planning.com. You may make your comments online using this link.
4. Your comments will be considered in finalising the proposals of our planning application when it is submitted to Bassetlaw District Council.
5. Once the application is submitted, the Council will undertake their own consultation when you will have the opportunity to submit further comments if you so wish.
6. It is anticipated that the planning application will be submitted to Bassetlaw District Council in the next two weeks.

Thank you for attending this exhibition, we hope it has been of interest to you.

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