Kintore Hydrogen Plant

Environmental Impact Assessment Report
Appendix 6.1: Technical Methodologies for Visual Representation

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Qualifications

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Appendix 6.1: Technical Methodologies for Visual Representation

1.1 Introduction

1.1.1 The following is a detailed methodology for production of technical outputs contributing to the Landscape and Visual Impact Assessment (LVIA).

1.1.2 The LVIA of the proposed development has been informed by several technical models and drawings. The methods for producing these are described below.

1.1.3 It should be remembered that *"visualisations, whether they are hand drawn sketches, photographs or photomontages, can never exactly match what is experienced in reality. They should, however, provide a representation of the proposal that is accurate enough for the potential impacts to be fully understood"* (SNH, 2017 [1]: para 96, p22) and that *"visualisations in themselves can never provide the full picture in term of potential impacts; they only inform the appraisal process by which judgements are made"* (SNH, 2017 [1]; para 98, p22).

1.1.4 Visualisations referred to in this document are those included in the EIAR. Baseline photography for visualisations has been undertaken by Micah Stanbridge Photography. Editing has been completed by ASH and 3d modelling has been completed by ASH.

1.1.5 This appendix is not applicable to illustrative visualisations / artists impressions shown in the Design Principles Statement (DPS) which accompanies the planning application, by HRI Munro.

The proposed development

1.1.6 The proposed development has been modelled in accordance with the specifics stated in Chapter 2: Project Description and Site Setting, illustrated on Chapter 2: Figure 2.4, and described as the maximum design envelope parameters for the LVIA, in Section 2.6 of Chapter 6: Landscape and Visual Impact Assessment.

Current guidance

1.1.7 The main guidance documents which have informed the technical methodologies used to undertake this LVIA and prepare the supporting drawings and visualisations are as follows:

- Visual Representation of Wind Farms, Version 2.2 (SNH, 2017), referred to as the NatureScot (2017) Guidance [1]; and
- The Landscape Institute (LI) (2019) TGN 06/19 Visual Representation of Development Proposals [2].

1.1.8 Location plans for visualisations have also been provided. These plans illustrate the field of view for each Visualisation Location (VL).

1.2 Zone of Theoretical Visibility (ZTV) production

1.2.1 Zone of Theoretical Visibility (ZTV) diagrams have been prepared using Esri ArcGIS, Version 10.7 (ArcGIS) and an Ordnance Survey (OS) Terrain 5 digital terrain model (DTM) to illustrate the potential visibility of the proposed development. Given the complexity of the proposal, which is comprised of various features, ZTVs have been generated for the main visible above-ground features, based on the maximum design envelope parameters for assessment, which are considered to be the 'worst-case scenario' for the proposed development in LVIA terms:

- Proposed ground flare, located in the very north of the proposed electrolysis plant site area – 132 m AOD (based on max. 30 m height above an indicative ground level of 102m AOD);
- Proposed electrolysis plant, comprising:
  - Proposed buildings, structures and equipment within the **southern** part of the proposed electrolysis plant site area (including an area east of The Knock hilltop) – 134 m AOD (based on 18 m height above an indicative ground level of 116 m AOD);
  - Proposed buildings, structures and equipment within the **northern** part of the proposed electrolysis plant site area – 127 m AOD (based on max. 20 m height above an indicative ground level of 107m AOD); and
  - Proposed buildings, structures and equipment within the **western** part of the proposed electrolysis plant site area (most elevated part of the site, around The Knock hilltop) – 128 m AOD (based on max. 8 m height above an indicative ground level of 120 m AOD).

1.2.2 The ZTVs have been prepared based on a viewer height of 2 m above ground level in line with the NatureScot (2017) Guidance [1], with earth curvature and light refraction set to 0.075.

1.2.3 Terrain 5 is a grid of heightened points with regular five metre post spacing. The software uses this information to create a virtual, three-dimensional, bare ground model which is representative of the earth's surface. It does not take into account elements above the ground such as buildings or trees. Therefore, while the ZTV indicates areas of potential visibility of the proposed development, in reality, not all locations within the ZTV would necessarily afford a view of it. Nevertheless, the ZTV is a valuable tool in both landscape character and visual impact appraisal.

1.2.4 While Terrain 5 is a product which is updated by OS on a quarterly basis, the terrain model was created using data available in 2023. The terrain model has not been updated since that time. This prevents excessive reworking of models and allows for continuity during the appraisal process.

Photography

1.2.5 Photographs have been taken using a full frame sensor (equivalent to a 35mm film frame), digital single lens reflex (DSLR) cameras. Cameras used include:

- Sony ILCE-9 with Sony 50mm f/1.8 Sony DT50mm lens.

1.2.6 The details of the camera and lens used for each VL are included on the relevant photograph or photomontage.

1.2.7 All baseline photographs have been taken in landscape format by a camera attached to a tripod and rotating panoramic head unit (set to 20° intervals) with a levelling base in order to maintain a stable platform for photography work, and to ensure an even overlap for successive panorama images. All photography has been taken at a height of 1.5 m above ground level.

1.2.8 On arrival at each VL, a global positioning system (GPS) navigation device has been switched on and allowed to acquire satellite positions. This device will identify its location, to the nearest metre, using a 12 figure OS grid reference (for example 252294 925050 or NC 52294 25050). In order to increase the accuracy of readings, the grid reference has not been recorded until all other work at the VL has been completed and the GPS device has been switched on for several minutes. This passage of time has allowed the GPS device to increase the accuracy of readings through repeated, automated measurements. All GPS readings taken have been to a maximum of ±5 m accuracy.

1.2.9 At each VL, the grid reference, ground level and camera viewing height has been recorded, along with a brief description of the nature of view, weather conditions and visibility. The camera has embedded details of the date, time, camera make and model, the lens focal length, shutter speed, f-number and ISO speed rating as metadata in each photograph file. A photograph of the tripod position has also been taken.

1.2.10 Baseline photographs have then been downloaded and combined to create 360° baseline panoramic images in cylindrical projection using PTGui software. Where applicable, these have been converted to planar projection using Hugin – Panorama Stitcher software (Hugin).

1.2.11 As detailed in Table 1 below, some adjustments have been made using Adobe Photoshop CC 2019 (Photoshop) to the baseline photographs.

Table 1: Visualisation location photography

VL	OS Grid Coordinates	Date and Time	Weather Conditions	Notes
1	377968, 810799	22/03/2024 07:51	Clear, blue skies, slight haze in distance	Minor enhancement to brightness and contrast.
2	377477, 811053	22/03/2024 08:07	Clear, blue skies, slight haze in distance	Minor enhancement to brightness and contrast.
3	377453, 812723	22/03/2024 08:24	Clear, blue skies, slight haze in distance	Minor enhancement to brightness and contrast.
4	377030, 813301	22/03/2024 08:41	Blue skies, some scattered clouds	Minor enhancement to brightness and contrast.
5	376722, 813246	22/03/2024 08:54	Blue skies, some scattered clouds	Minor enhancement to brightness and contrast.
6	376145, 812967	22/03/2024 09:06	Blue skies, some scattered clouds	Minor enhancement to brightness and contrast.
7	375538, 812625	22/03/2024 09:22	Blue skies, some scattered clouds	Minor enhancement to brightness and contrast.
8	375533, 813355	22/03/2024 09:37	Blue skies, some scattered clouds	Minor enhancement to brightness and contrast.
9	380159, 816456	22/03/2024 07:31	Clear, blue skies, slight haze in distance	Minor enhancement to brightness and contrast.

1.3 Wireline preparation

1.3.1 Wirelines of the proposed development have been created for all VLs using 43D Topos R2 (Topos). Plans of the various proposed development elements have been provided by the client and ASH have created basic 3D models and modified terrain models, modelled into Terrain 5 DTM (see paragraph 1.2.3). These models are based on the maximum design envelope parameters for assessment, which are considered to be the 'worst-case scenario' for the proposed development in LVIA terms. Where appropriate, wirelines have been converted to planar projection using Hugin.

1.3.2 The extent of the wirelines is limited to that included within the 3D model. For this reason, where a very extensive view is obtained, the full backdrop and horizon line visible in photographs is not always represented in the wireline view. Wirelines should therefore always be viewed in combination with baseline photographs and photomontages.

1.3.3 Similar to the limitations of the ZTV, the wireline visualisations provide an indication of the proposed development's potential appearance but do not take account of screening elements such as buildings, trees or minor variations in topography.

1.4 Photowires

1.4.1 Photowires have been prepared where the wirelines are overlaid on top of the baseline photography to illustrate how they relate to existing landscape features. Baseline photographs have not been edited, and therefore photowires do not show any screening. They simply allow the viewer to relate the proposed development to the baseline photograph. In order to view the proposed development more clearly, outlines of the proposed buildings have shown, rather than solid blocks.

1.4.2 In some views (for instance in VL4 and VL5), a difference is perceptible in photowires between the ground height in the baseline photograph, and the bottom of the proposed development. This is because the terrain has been modified in these locations, to account for the proposed indicative platform level, which differs from the existing ground level. This would be refined in the detailed design stage.

1.4.3 For VL5, an additional page has been provided to show the photowire at a 90° horizontal field of view, to illustrate the proposed development in the context of a Scheduled Monument, as requested in consultation for Chapter 7: Archaeology and Cultural Heritage.

1.5 Viewing instructions

1.5.1 The graphic material used in this assessment is for illustrative purposes only and should not be considered as representative of what the human eye will see. While visualisations can give a reasonable impression of the scale and distance to the proposed development, they cannot show exactly what they will look like in reality. This is due to various factors, including the resolution of the image; and the static nature of visualisations which cannot convey movement associated with the proposed development or within the landscape and changing light/ shadows, weather and seasonality etc. As such, visualisations are best viewed at the viewpoint location to appreciate the wider context.

1.5.2 All visualisations should be printed at the specified size and viewed flat at a comfortable arm's length.

1.5.3 If visualisations are viewed on a computer screen, rather than printed at the specified size, they should be enlarged to the full screen height to give a realistic impression. Use of devices with smaller screens, such as tablets, should be avoided for viewing visualisations.

1.5.4 It should be noted that the NatureScot (2017) Guidance [1] 53.5° field of view images, when printed at the correct size, illustrate an image greater than actual size if held at a comfortable arms' length. This is intended to counteract the effects of a loss of relative perspective when viewing a flat image. It is important to note that these visualisations are provided for illustrative purposes to support the LVIA and are presented in a format to conform with the NatureScot (2017) Guidance [1]. Whilst they provide a helpful tool for assessment purposes, the judgements of landscape and visual effects reported in the LVIA are not reached wholly on the basis of these images, but through the landscape architect's professional experience and understanding of how the proposed development would appear in the field.

References

[1] Scottish Natural Heritage (2017), now NatureScot: Visual Representation of Wind Farms. Guidance. Version 2.2. February 2017.

[2] The Landscape Institute (2019) TGN 06/19 Visual Representation of Development Proposals