Kintore Hydrogen Plant

Environmental Impact Assessment Report
Chapter 7: Archaeology and Cultural Heritage

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Kintore Hydrogen
A STATERA COMPANY

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https://www.kintorehydrogen.co.uk/

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1 Introduction

1.1 Purpose of this chapter

1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents the findings of Environmental Impact Assessment (EIA) work undertaken concerning potential impacts of Kintore Hydrogen Plant on Archaeology and Cultural Heritage.

1.1.2 This EIAR chapter:

- presents the archaeological and cultural heritage baseline established from desk studies, surveys and consultation to date;
- presents the potential environmental effects on archaeology and cultural heritage arising from Kintore Hydrogen Plant, based on the information gathered and the analysis and assessments undertaken;
- identifies any assumptions and limitations encountered in compiling the environmental information; and
- highlights any necessary monitoring and/or mitigation measures that could prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process.

1.1.3 The EIAR chapter is accompanied by the following figures contained within this chapter:

- Figure 3.1: Inner study area: site boundary
- Figure 3.2: Inner study area: 500 m buffer
- Figure 3.3: Outer study area: designated heritage assets
- Figure 3.4 to Figure 3.13: Photographs

1.1.4 The EIAR chapter is also accompanied by the following visualisations which have been produced for the Archaeology and Cultural Heritage chapter, which are in Volume 3.

- Figure 7.14: Cultural Heritage Visualisation Location 1 – South Fornet, stone circle 250m NW of (SM 12353)
- Figure 7.15: Cultural Heritage Visualisation Location 2 – Castle of Hallforest (SM 92)
- Figure 7.16: Cultural Heritage Visualisation Location 3 – Glack, cairn 245m WNW of (SM 12120)
- Figure 7.17: Cultural Heritage Visualisation Location 4 – Bruce's Camp, hillfort (SM 12523)
- Figure 7.18: Cultural Heritage Visualisation Location 5 – The Hedges, enclosure 480m S of (SM 12438)
- Figure 7.19: Cultural Heritage Visualisation Location 6 – Kilm Cottage, palisaded enclosure 555m S of (SM 12463)
- Figure 7.20: Cultural Heritage Visualisation Location 7 – The Slacks, Kirkhill Forest, burial cairn, hut circles and cairnfield (SM 9245)

1.1.5 The report also cross references the following visualisation which has been produced for Chapter 6: Landscape and Visual (see Table 2.2).

- Figure 6.5A-C - Visualisation Location 5 – Near South Leylodge

1.1.6 The EIAR chapter is accompanied three gazetteers contained within the Volume 3, Appendix 7.1: Tabulation of Cultural Heritage Assets. This appendix has three tables:

- Tabulation of cultural heritage assets within the site boundary
- Tabulation of cultural heritage assets within a 500 m buffer of the site boundary
- Tabulation of designated heritage assets within the Outer Study Area

1.2 Legislation and planning policy context

Legislation

1.2.1 The following legislation has informed the scope of the archaeology and cultural heritage assessment:

- Ancient Monuments and Archaeological Areas Act 1979[1].
- Planning (Listed Buildings and Conservation Areas (Scotland) Act 1997 (as amended by Historic Environment (Amendment) (Scotland) Act 2011)[2].
- Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013[3].

- Town and Country Planning (Environmental Impact Assessment) Regulations 2017[4].

Planning policies

1.2.2 Of relevance to the cultural heritage assessment are the following policy documents:

- National Planning Framework (NPF 4)[5].
    - Policy 7: Historic Assets and Places;
- Historic Environment Policy for Scotland (HEPS) (2019)[6].
- Aberdeenshire Local Development Plan 2023 (LDP)[7].

1.2.3 The LDP contains the following policies relevant to the proposed development with regard to archaeology and cultural heritage:

- Policy HE 1 Protecting Listed Buildings, Scheduled Monuments and Archaeological Sites (including other historic buildings)
- Policy HE 2 Protecting Historic, Cultural and Conservation Areas

1.3 Consultation

1.3.1 Key issues raised during scoping and post-scoping consultation specific to archaeology and cultural heritage are listed in Table 1.1, together with details of how these issues have been considered in the production of this EIAR and cross-references to where this information may be found. Scoping and post-scoping consultation was undertaken with Historic Environment Scotland (HES) and the Aberdeenshire Council Archaeology Service (ACAS). The Aberdeenshire Council (AC) Built Heritage Environment Planner for the Garioch area was also contacted; however, no consultation response was received.

Table 1.1: Key points raised during scoping and consultation to date

Date	Consultee and type of response	Points raised	How and where addressed
03 October 2023	ACAS Scoping Response	Confirmed that they were content with the proposed methodology for assessment of archaeological and cultural heritage impacts to be used in the EIAR.	Noted. The methodology used for the assessment is outlined in Section 2.
		Recommended consulting the Aberdeenshire Council's Built Heritage Team as well as Historic Environment Scotland.	The AC Built Heritage Environment Planner was contacted; however, no consultation response was received. Historic Environment Scotland provided a scoping response which is outlined below.
26 October 2023	HES Scoping Response	Stated that the HES response covers World Heritage Sites, Scheduled Monuments and their settings, Category A Listed Buildings and their settings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and Historic Marine Protected Areas, and that the Aberdeenshire Council should be consulted for advice regarding heritage assets not covered by HES.	Noted. The ACAS consultation responses are detailed in this table.
		<u>Assessment methodology</u> Stated that they are generally content with the assessment methodology set out in the Scoping Report but made the following points: • It was considered that the 500 m Inner Study Area would be insufficient to thoroughly identify cultural heritage assets that may experience impacts as a result of the proposed development, however noted that this does not affect assets within the HES remit. • HES recommend that zone of theoretical visibility (ZTV) data should be used to identify designated heritage assets that could have their setting impacted by the proposed development (including those outwith the 5 km Outer Study Area). An initial assessment should be undertaken to determine the potential for effects to their setting to arise. This assessment should demonstrate a full appreciation of the setting of each heritage asset where potentially significant impacts are identified. • It was noted that the Archaeology and Cultural Heritage chapter of the scoping report used terminology for impact magnitude and significance of effect that differed from what was outlined in the overall Approach to the EIA (scoping chapter 5). Suggested that this could cause confusion when reading through the EIAR. Recommended that consistent assessment conventions are used throughout the EIAR or that the Archaeology and Cultural Heritage chapter explains the reasoning for the differences. • Recommended that where initial assessment identifies potential significant impacts on cultural heritage assets wireframe visualisations are produced. If the potential impacts are confirmed as being significant, then photomontages should also be prepared for the relevant assets.	• We consider that the 500 m Inner Study Area, used for obtaining Historic Environment Record (HER) data, is suitable for understanding the archaeological potential of the proposed development site. This study area has been approved by ACAS. • ZTV data is presented in Figure 3.3. The ZTV and has been used to identify theoretical visibility from designated heritage assets in the Outer Study Area. This information and assessment are tabulated in Appendix 7.1 and a setting assessment is presented in Section 4. The wider ZTV was also reviewed to identify any additional Scheduled Monuments outwith the 5 km Outer Study Area that could have their setting impacted by the proposed development. One additional Scheduled Monument, The Slacks, Kirkhill Forest, Burial Cairn, Hut Circles And Cairnfield (SM 9245) has been scoped into the assessment, and a wireline visualisation has been produced following a post-scoping request from HES, outlined below. • The methodology follows an approach recommended in the 'Environmental Impact Assessment Handbook' (SNH and HES 2018) which differs slightly from the methodology based on DMRB guidance which has been used in some of the other chapters. • Proposed cultural heritage visualisations were issued to HES as part of the post-scoping consultation. Additional visualisations have been included following receipt of their post-scoping consultation which is outlined below.
		<u>Potential direct impacts</u> Noted that there are two Scheduled Monuments in the site boundary: • South Leylodge Steading, stone circle 110m W of (SM 12350); and • Aberdeenshire Canal, remains of, S of Dalwearie (SM 7675). HES state that they expect any potential impacts on these Scheduled Monuments to be considered in the EIAR and to be mitigated by design.	Built-in design mitigation is provided in Section 2.9, Table 2.8. The proposed development has been designed so that neither of these Scheduled Monuments will be physically impacted by it.
		<u>Potential indirect impacts</u> Recommended that the assessment of indirect impacts should be scoped into the EIAR.	Scoped into the assessment.

Date	Consultee and type of response	Points raised	How and where addressed
		Potential setting impacts It was stated that the proposed development is likely to adversely impact the setting of the Scheduled Monument 'South Leylodge Steading, stone circle 110m W of' (SM 12350) located in the site boundary. It was recommended that the EIAR should seek to understand the Scheduled Monument's setting and seek to avoid impacts where they are likely to occur. It is HES' opinion that the southern area of the proposed Hydrogen Plant development is unlikely to suitable to accommodate these proposals without resulting in a detrimental impact on the Scheduled Monument's setting. The scoping response also identified a number of Scheduled Monument located in the 500 m Inner Study Area and 5 km Outer Study Area which could receive setting impacts. HES expects that designated assets identified using the proposed methodology set out in the Scoping Report will be assessed for potential impacts to their settings and clear justification should be provided where assets are scoped out of further consideration.	An initial setting assessment of all of the designated heritage assets within the 5 km Outer Study Area is tabulated in Appendix 7.1 and a more detailed setting assessment is presented in Section 4.
		Potential cumulative impacts It was stated that potential cumulative impacts should be assessed for the proposed development in combination with other developments in the vicinity.	Developments included in the cumulative impact assessment are identified in Table 5.1. The cumulative impact assessment is provided in Section 5.
19 March 2024	ACAS Post-Scoping Consultation	Confirmed that the proposed cultural heritage visualisations were acceptable, and no further visualisations were proposed.	The agreed cultural heritage visualisations are detailed in Section 2.6 (Table 2.2) and presented in Figures 7.14 to 7.20..
		Noted that the redline boundary for the proposed electrical connection, underground hydrogen export pipeline and underground water pipelines had changed from that presented in the scoping report and reiterated that the full routes of these be included in any cultural heritage assessment.	The full extent of the proposed development has been assessed within the cultural heritage assessment (this chapter).
01 May 2024	HES Post-Scoping Consultation	Reiterated previous scoping advice that ZTV data should be used to identify designated heritage assets that could have their setting impacted by the proposed development (including those outwith the 5 km Outer Study Area).	Response as outlined above.
		Stated that to assess the impact that the proposed development would have on the setting of South Leylodge Steading, stone circle 110 m W of (SM 12350) HES expect a photomontage from the Scheduled Monument looking towards the development, and from another viewpoint looking towards the Scheduled Monument with the development backdropping it. A suggested location was provided for this viewpoint, located just to the south of the viewpoint proposed by CFA.	The location for a second visualisation proposed by HES (at 376729, 813216) is located slightly to the south of the photomontage (LVIA VL5 Figure 6.5A-C) produced for the assessment, which shows the South Leylodge Steading, stone circle 110 m W of (SM 12350). As such it was not considered that a second visualisation was likely to offer substantially different information to aid the assessment.
		Recommended that wireline visualisations should be provided for the following Scheduled Monuments: • The Hedges, enclosure 480 m S of (SM 12438); and • Kilm Cottage, palisaded enclosure 555 m S of (SM 12463).	Baseline photographs and wirelines for these Scheduled Monuments are presented in Figure 7.18 and Figure 7.19.

Date	Consultee and type of response	Points raised	How and where addressed
		Recommend that wireline visualisations be produced for all Scheduled Monuments in the 5 km Outer Study Area which have any form of predicted visibility of the proposed development. If those visualisations identify the potential for significant impacts, then photomontages may be requested.	We consider that the cultural heritage viewpoints which are included in the chapter (Table 2.2), including those additional monuments requested by HES, provide a good overall representation of the views from the Scheduled Monuments within the 5 km Outer Study Area. The Scheduled Monuments within the 5 km Outer Study Area that have predicted bare-earth visibility, but which do not have visualisations, lie within or in close proximity to Kintore town. Any visibility of the proposed development from these Scheduled Monuments would be either entirely screened by surrounding buildings or the development would be seen beyond the Kintore townscape (built environment). Wireline visualisations which only provide bare-earth representation would not show the screening which is provided by the surrounding built environment. Therefore, the inclusion of wirelines from all the monuments in the 5 km Outer Study Area that have any predicted visibility of the development would add little to the EIA. For this reason, not all the Scheduled Monuments within the 5 km Outer Study Area that have predicted bare-earth visibility have been provided with a wireline visualisation.
		Requested a wireline visualisation for the following Scheduled Monument that is located outwith the 5 km Outer Study Area: • The Slacks, Kirkhill Forest, Burial Cairn, Hut Circles And Cairnfield (SM 9245).	A wireline for this Scheduled Monument is presented in Figure 7.20.

2 Assessment Approach

2.1 Guidance

2.1.1 Recognition has been taken of the following best practice guidance:

- SNH and HES Environmental Impact Assessment Handbook (2018)[8].
- IEMA, CIfA, IHBC Principles of Cultural Heritage Impact Assessment (2021)[9].
- CIfA Code of Conduct (2022)[10].
- CIfA Standard and Guidance for Historic Environment Desk-Based Assessment (2020)[11].
- CIfA Standard and Guidance for Commissioning Work or Providing Consultancy Advice on Archaeology and the Historic Environment (2020)[12].
- HES Designation Policy and Selection Guidance (2019)[13].
- HES Managing Change in the Historic Environment: Setting (2016)[14].
- Planning Advice Note 1/2013: Environmental Impact Assessment (PAN 1/2013)[15].
- Planning Advice Note 2/2011: Planning and Archaeology (PAN 2/2011)[16].

2.2 Study areas

2.2.1 The following study areas have been used to undertake the archaeology and cultural heritage assessment:

- The Inner Study Area (
- Figure 3.1 and
- Figure 3.2): the proposed development site, defined by the site red line boundary, within which the proposed development, and associated infrastructure will be constructed, forms the study area for the identification of heritage assets that could receive direct or indirect effects arising from the construction of the proposed development. A buffer zone extending to 500 m around the proposed development site boundary has been used to further inform the archaeological potential of the proposed development site.
- The Outer Study Area (Figure 3.3): a wider study area extending 5 km around the electrolysis plant element of the proposed development has been used for the identification of cultural heritage assets (including those within the Inner Study Area) whose settings may be affected by the proposed development (including cumulative effects). Post-scoping consultation has been undertaken, and the wider ZTV has also been assessed to identify any designated assets beyond 5 km that have settings that may be especially sensitive to the proposed development for inclusion within the assessment.

2.3 Temporal scope

2.3.1 The assessment covers impacts occurring during the construction phase (direct and indirect effects) and those persisting through the operational phase (setting effects).

2.4 Baseline study

Desktop study

2.4.1 A desk-based assessment has been conducted covering the Inner Study Area to identify all known heritage assets, designated or otherwise, that could be directly affected by the proposed development, and to inform an assessment of the archaeological potential of the proposed development site.

2.4.2 Information on archaeology and cultural heritage matters was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 2.1 below.

Table 2.1: Summary of desktop study sources

Title and summary	Source	Year	Refs.
HER data obtained for the Inner Study Area	Aberdeenshire Council	2024	17
GIS Spatial Data Warehouse, accessed to obtain designated heritage asset data for the Inner and Outer Study Areas	HES	2024	18
National Record of the Historic Environment (NRHE)	HES	2024	19
Historic mapping	National Library of Scotland (NLS) Map images website	2024	20
Modern aerial photographic imagery	Google Earth; Bing	2024	21, 22
Historic Land-Use Assessment Data for Scotland (HLAmap)	HES	2024	23

Title and summary	Source	Year	Refs.
LIDAR Composite Digital Terrain Model (DTM)	Scottish Remote Sensing Portal	2024	24

Field survey

2.4.3 A field survey was conducted on 29 and 30 April 2024. The field survey was conducted in order to inform the EIA, with the following aims:

- to assess the present baseline condition of the cultural heritage assets which had been identified in the proposed development site through the desk-based assessment;
- to identify any further features of cultural heritage interest which had not previously been identified by the desk-based assessment; and
- to assess the proposed development site for its potential to contain currently unrecorded, buried archaeological remains.

2.4.4 Identified sites were recorded on pro-forma monument recording forms and by digital photography, and their positions were logged using a Global Positioning System (GPS).

2.4.5 Site visits were also undertaken to key designated heritage assets in the Outer Study Area, identified through analysis of the proposed development's ZTV, where it was considered, on the basis of professional judgement, that the effect on their settings could be significant.

2.5 Uncertainties and/or data limitations

2.5.1 The cultural heritage baseline conditions within the Study Areas have been established through detailed desk-based assessment and verified by walk-over field survey. The data acquisition relies in part on data derived from national and local Historic Environment Records (HER) and designations lists. It is assumed that the data acquired was accurate and up to date at the time it was obtained.

2.5.2 The reconnaissance field survey was carried out when ground and vegetation conditions were good for the identification of low relief features. As such, the resulting baseline conditions described are believed to be an accurate assessment of the visible archaeological remains present.

2.6 Impact assessment criteria

2.6.1 The impact assessment criteria for the Archaeology and Cultural Heritage chapter, as set out below, has been agreed through EIA Scoping. Please note that some of the conventions used differ slightly from the methodology which is set out in Chapter 4: Environmental Impact Assessment Methodology to provide heritage- and archaeology-specific criteria in line with SNH and HES guidance as set out below.

2.6.2 The effects of the Proposed Development on cultural heritage assets have been assessed on the basis of their type (direct effects, indirect impacts, setting impacts, and cumulative impacts) and nature (adverse or beneficial), following an approach recommended in the 'Environmental Impact Assessment Handbook'[25] (SNH and HES 2018). The assessment has taken into account the value/sensitivity of the heritage asset, and its setting, and the magnitude of the predicted impact.

- Direct impacts: occur where the physical fabric of the asset is removed or damaged, or where it is preserved or conserved, as a direct result of the proposal. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
- Indirect impacts: occur where the fabric of an asset, or buried archaeological remains, is removed or damaged, or where it is preserved or conserved, as an indirect result of the proposal even though the asset may lie some distance from the proposal. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
- Setting impacts: these are generally direct and result from the proposal causing change within the setting of a heritage asset that affects its cultural significance or the way in which it is understood, appreciated, and experienced. Such impacts are generally, but not exclusively, visual, occurring directly as a result of the appearance of the proposal in the surroundings of the asset. However, they may relate to other senses or factors, such as noise, odour or emissions, or historical relationships that do not relate entirely to intervisibility, such as historic patterns of land-use and related historic features. Such impacts may occur at any stage of a proposal's lifespan and may be permanent, reversible, or temporary.
- Cumulative impacts: can relate to the physical fabric or setting of assets. They may arise as a result of impact interactions, either of different impacts of the proposal itself, or additive impacts resulting from incremental changes caused by the proposal together with other projects already in the planning system or allocated in a Local Development Plan.

- Adverse effects: are those that detract from or reduce cultural significance or special interest of heritage assets or their settings.
- Beneficial effects: are those that preserve, enhance or better reveal the cultural significance or special interest of heritage assets or their settings.

Assessment of the effects on setting

2.6.3 The SNH/HES EIA Handbook (2018) Appendix 1, paragraph 42 advises that:

"In the context of cultural heritage impact assessment, the receptors are the heritage assets and impacts will be considered in terms of the change in their cultural significance".

2.6.4 Historic Environment Scotland's guidance document, 'Managing Change in the Historic Environment: Setting' (HES 2016), notes that:

"Setting can be important to the way in which historic structures or places are understood, appreciated and experienced. It can often be integral to a historic asset's cultural significance."

"Setting often extends beyond the property boundary or 'curtilage' of an individual historic asset into a broader landscape context".

2.6.5 The guidance also advises that:

"If proposed development is likely to affect the setting of a key historic asset, an objective written assessment should be prepared by the applicant to inform the decision-making process. The conclusions should take into account the significance of the asset and its setting and attempt to quantify the extent of any impact. The methodology and level of information should be tailored to the circumstances of each case".

2.6.6 The guidance recommends that there are three stages in assessing the impact of a development on the setting of a historic asset or place:

- Stage 1: identify the historic assets that might be affected by the proposed development;
- Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated and experienced; and,
- Stage 3: evaluate the potential impact of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated.

2.6.7 The SNH/HES EIA Handbook (2018) Appendix 1, paragraph 43 advises that:

"When considering setting impacts, visual change should not be equated directly with adverse impact. Rather the impact should be assessed with reference to the degree that the proposal affects those aspects of setting that contribute to the asset's cultural significance".

2.6.8 Following these recommendations, the proposed development ZTV (Figure 3.3) has been used to identify those designated heritage assets from which there would be theoretical visibility of the proposed development, and the degree of theoretical visibility. The methodology and criteria used to produce the ZTV is provided in Chapter 6: Landscape and Visual.

2.6.9 All of those designated heritage assets in the Outer Study Area, and those outwith the Outer Study Area that have scoped in following an initial review and post-scoping consultation, are included in the tabulated assessments in Appendix 7.1 (Table 3.1), where the magnitude of impact on the setting is assessed according to the thresholds set out in Table 2.4 and significance of effect is determined based on the methodology outlined in paragraph 2.6.14 and Table 2.5. These assets are shown in Figure 3.3.

2.6.10 The following cultural heritage visualisations outlined in Table 2.2 have been defined through assessment of the ZTV and scoping and post-consultation with ACAS and HES (see Table 1.1). Note: photomontages were originally proposed for several visualisations, however photowires (including a baseline photo and wireline) have been produced instead as the assessed layout is high-level with final design details currently unconfirmed. It was not possible to access one of the Scheduled Monuments 'Glack, cairn 245 m WNW of' (SM 12120) to take a photograph and so a wireline has been produced for this visualisation (Figure 7.16).

Table 2.2: Visualisations used in the cultural heritage assessment

Figure	Site Name	Reference No.	Viewpoint Location		Comments
			Easting	Northing	
Figure 6.5A-C	South Leylodge Steading, stone circle 110 m W of	SM 12350	376718	813242	Cross reference has been made to the LVIA VP 5 photowire. The LVIA viewpoint is from the junction of farm tracks with the public road outside 'South Leylodge Steading, stone circle 110 m W of', looking northwest including stone circle in foreground.

Figure	Site Name	Reference No.	Viewpoint Location		Comments
			Easting	Northing	
Figure 7.14	South Fornet, stone circle 250 m NW of	SM 12353	378290	810978	Baseline photo and wireline. This site stands on elevated high ground with all round visibility, including theoretical intervisibility with SM 12350. The viewpoint is from within the stone circle.
Figure 7.15	Castle of Hallforest	SM 92	377742	815443	Baseline photo and wireline. This site stands in cultivated farmland in an open setting with restricted visibility mainly oriented to the east. Rising ground to the southwest. Viewpoint located to northeast of remains to show tower with proposed development in the background.
Figure 7.16	Glack, cairn 245 m WNW of	SM 12120	373520	811533	Wireline. This site lies within commercial forestry in an area of windthrow from where outward view to the northeast towards the proposed development is screened by standing forestry trees. The viewpoint is from the top of the cairn.
Figure 7.17	Bruce's Camp, hillfort	SM 12523	376752	818980	Baseline photo and wireline. This site lies within commercial forestry where trees screen views to the south towards the proposed development. The viewpoint selected is on the southern rampart of the hillfort on the edge of the commercial forestry with a possible open view.
Figure 7.18	The Hedges, enclosure 480 m S of	SM 12438	380888	815770	Baseline photo and wireline. The site lies within fields under arable cultivation. The viewpoint is from the centre of the Scheduled Monument.
Figure 7.19	Kilm Cottage, palisaded enclosure 555 m S of	SM 12463	381338	815810	Baseline photo and wireline. The site lies within fields under arable cultivation. The viewpoint is from the centre of the Scheduled Monument.
Figure 7.20	The Slacks, Kirkhill Forest, burial cairn, hut circles and cairnfield	SM 9245	384231	814314	Wireline. The site lies within commercial forestry on a west facing slope. The viewpoint is from the centre of the Scheduled Monument.

Sensitivity of receptors

2.6.11 Cultural heritage assets are assigned value/importance through the designation process. Designation ensures that sites and places are recognised and protected by law through the planning system and other regulatory processes. The level of protection and how a site or place is managed varies depending on the type of designation and the laws and policies that apply to it (HES, 2019).

2.6.12 The criteria for defining sensitivity in this chapter are outlined in Table 2.3 which summarises the relative sensitivity of heritage assets (including their settings) relevant to the Proposed Development, based on the guidance set out in the SNH/HES EIA Handbook (version 5; 2018).

Table 2.3: Sensitivity of heritage assets

Sensitivity	Definition / criteria
High	Assets valued at an international or national level, including: • Scheduled Monuments • Category A Listed Buildings • Inventory Gardens and Designed Landscapes • Inventory Historic Battlefields • Non-designated assets that meet the relevant criteria for designation (including sites recorded in HERs as non-statutory register (NSR) sites of presumed national importance)
Medium	Assets valued at a regional level, including: • Archaeological sites and areas that have regional value (contributing to the aims of regional research frameworks, or as identified as such in the Aberdeenshire HER) • Non-Inventory Designed Landscapes (NIDL) (where these are identified in Local Authority records) • Category B Listed Buildings • Conservation Areas
Low	Assets valued at a local level, including: • Archaeological sites that have local heritage value • Category C Listed buildings • Unlisted historic buildings and townscapes with local (vernacular) characteristics
Negligible	Assets of little or no intrinsic heritage value, including: • Artefact find-spots (where the artefacts are no longer in situ and where their provenance is uncertain) • Poorly preserved examples of particular types of features (e.g. quarries and gravel pits, dilapidated sheepfolds, etc)

Magnitude of impact

2.6.13 The magnitude of impact (adverse or beneficial) has been assessed in the categories, high, medium, low, and negligible and described in Table 2.4.

Table 2.4: Criteria for magnitude of impact

Magnitude of impact	Criteria
High	Adverse: changes to the fabric or setting of a heritage asset resulting in the complete or near complete loss of the asset's cultural significance. Changes that substantially detract from how a heritage asset is understood, appreciated, and experienced.
	Beneficial: preservation of a heritage asset in situ where it would otherwise be completely or almost completely lost. Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated, and experienced.
Medium	Adverse: changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural significance such that this quality is appreciably altered. Changes that appreciably detract from how a heritage asset is understood, appreciated, and experienced.
	Beneficial: changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored. Changes that improve the way in which the heritage asset is understood, appreciated, and experienced.
Low	Adverse: changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural significance such that this quality is slightly altered. Changes that slightly detract from how a heritage asset is understood, appreciated, and experienced.
	Beneficial: changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
Negligible	Changes to fabric or setting of a heritage asset that leave its cultural significance unchanged and do not affect how it is understood, appreciated, and experienced.

Significance of effect

2.6.14 The sensitivity of the asset (Table 2.3) and the magnitude of the predicted impact (Table 2.4) have been used to inform an assessment of the significance of the effect (direct effect or effect on setting), summarised using the matrix set out in Table 2.5. The matrix employs a graduated scale of significance (from negligible to major effects) and where two outcomes are possible through application of the matrix, expert judgment supported by reasoned justification, has been used to determine the level of significance.

Table 2.5: Matrix used for the assessment of the significance of an effect

		Sensitivity of receptor			
		High	Medium	Low	Negligible
Magnitude of impact	High	Major	Major / Moderate	Moderate / Minor	Minor / Negligible
	Medium	Major / Moderate	Moderate	Moderate / Minor	Minor / Negligible
	Low	Moderate / Minor	Moderate / Minor	Minor	Negligible
	Negligible	Minor / Negligible	Minor / Negligible	Negligible	Negligible

2.6.15 **Major** and **moderate** effects are considered to be '**significant**' in the context of the EIA Regulations. Minor and negligible effects are considered to be 'not significant' in the context of the EIA Regulations.

2.6.16 Where a significant effect on the setting of an asset is predicted as a result of change within its surroundings, an assessment will be made as to whether that effect would result in a significant adverse effect on the integrity of its setting (NPF4 Policy 7(h)(ii)). For the purpose of the assessment, the integrity of the setting is considered to be maintained if the setting's contribution to the cultural significance of the monument, and its capacity to convey that significance to visitors, would not be compromised by the proposed development either alone or cumulatively with other developments.

2.7 Maximum design envelope parameters for assessment

2.7.1 The maximum design envelope parameters identified in Table 2.6 have been selected as those having the potential to result in the greatest effect on an identified receptors or receptor groups. These parameters have been identified based on the overview description of the development provided in Chapter 2: Project Description and Site Setting.

2.7.2 Effects of greater adverse significance are not predicted to arise should other development designs, within the project design envelope parameters, be taken forward.

2.8 Impacts scoped out of the assessment

The impacts listed in Table 2.7 have been scoped out of the assessment for Archaeology and Cultural Heritage as agreed through the EIA scoping process detailed in Chapter 5: Scoping and Consultation.

Table 2.6: Maximum design envelope parameters assessed

Potential impact	Maximum design parameter	Justification
Construction phase		
Direct physical impacts to the Scheduled Monument 'South Leylodge Steading, stone circle 110 m W of' (**SM 12350**).	The maximum design envelope does not include development extending as far as the Scheduled Monument.	To avoid any direct physical impacts to the Scheduled Monument arising as a result of the proposed development.
Operation phase		
Impacts to the setting of designated heritage assets in the Outer Study Area.	Limits on the flare height and building heights in different parts of the site based on its topography have been embedded into the maximum design envelope.	To minimise potential for visual impacts on the settings of cultural heritage assets.

Table 2.7: Impacts scoped out of the assessment

Potential impact	Justification
Construction and Operation phase	
Assessment of the effects of the proposed development on the settings of World Heritage Sites, Inventory Historic Battlefields, Conservation Areas and Marine Resources.	There are no assets with these designations within the Inner or Outer Study Areas.

2.9 Mitigation measures adopted as part of Kintore Hydrogen Plant

2.9.1 A number of measures have been designed into Kintore Hydrogen Plant to reduce the potential for impacts on Archaeology and Cultural Heritage. These are listed in Table 2.8.

Table 2.8: Designed-in mitigation measures

Measures adopted as part of Kintore Hydrogen Plant	Justification
The proposed development has been iteratively designed so that no access tracks or pipelines will cross the Scheduled Monument: 'Aberdeenshire Canal, remains of, S of Dalwearie' (**SM 7675**).	To avoid any direct physical impacts to the Scheduled Monument arising as a result of the proposed development.
The proposed development's maximum design envelope does not include development extending as far as the Scheduled Monument: 'South Leylodge Steading, stone circle 110 m W of' (**SM 12350**).	To avoid any direct physical impacts to the Scheduled Monument arising as a result of the proposed development.
Provision has been made within the Landscape Management Plan (within the Design Principles Statement) and Biodiversity Enhancement and Management Plan (BEMP) for the avoidance of 'Bandshed Moss, possible cairn' (**3**) within the proposed area of landscaping, ecological restoration and biodiversity enhancement.	To avoid any direct physical impacts to this cultural heritage asset arising as a result of the proposed development.
A Written Scheme of Investigation (WSI) detailing a programme of archaeological investigation and mitigation will be agreed with ACAS. The works detailed in the WSI will carried out prior construction to identify any and record archaeological remains. The works will also inform the requirement for any further mitigation to be undertaken during the construction phase.	To identify and preserve or record any vulnerable remains that are not currently recorded.
As set out in the Outline Construction Environmental Management Plan (Outline CEMP) submitted with the application, formal arrangements will be in place for any other, unforeseen, archaeological discoveries made by construction contractors to be reported to a retained professional archaeological organisation as an Archaeological Clerk of Works (ACoW). These arrangements would require unexpected discoveries to be assessed by the ACoW and dealt with appropriately and would make clear the legal responsibilities placed upon those who make unexpected discoveries of archaeological significance.	To identify and preserve or record any archaeological remains that are not currently recorded.
The proposed development has been iteratively designed with attention to minimising visibility of buildings and structures in the landscape (including limits on building heights in different parts of the site based on its topography), and with a proposed masterplan of screening landscape planting, as detailed further in Chapter 6: Landscape and Visual.	To minimise potential for visual impacts on the settings of cultural heritage assets.

3 Baseline environment

3.1 Current baseline

Inner study area

Historic Landscape Characterisation

3.1.1 The site boundary encompasses the electrolysis plant development area at its westernmost extent, a water abstraction/discharge area with a pump house/water treatment works at its east adjacent to the River Don, and an above-ground installation for blending hydrogen into the gas network, which are connected by proposed water and hydrogen pipeline routes. The redline boundary also includes areas allocated for temporary compounds, planting and landscaping.

3.1.2 Across its full extent, the site boundary overlays a landscape characterised by improved agricultural fields, used for both arable and pasture associated with individual farmsteads. The HLAmap[23] records these as a combination of 'Rectilinear Fields and Farms' and 'Planned Rectilinear Fields and Farms' described as rectilinear field boundaries and farmsteads characteristic of agricultural improvements since the 1700s or indicative of fields and associated farmsteads laid out in a single plan during agricultural improvements, typically between 1700 and 1900. The HLAmap also records several areas 'Rough Grazing' and 'Plantation' reflecting in part areas of poorer quality of land which have not been adapted for intensive agriculture.

3.1.3 The northern half of the electrolysis plant development area comprises improved fields, though these are not as regular in form as those in its southern half. At the north is an area of rough grazing, either side of the Dewsford Burn, shown on the 1st Edition Ordnance Survey map as bordering 'Hartshill Plantation' at its north and east, and partly overlaying 'Bandshed Moss' at its west. Two small farmsteads, 'Dewsford' (**13**) and 'Backstyles' (**9**) are recorded on that same map in this area. The southern half of the electrolysis plant development area comprises more regular, rectilinear improved fields. Within these southern fields there is located the remains of a prehistoric recumbent stone circle: 'South Leylodge Steading, stone circle 110 m W of' (**1** / **SM 12350**).

3.1.4 At the eastern end of the site boundary, close to the River Don, the site boundary lies adjacent to a preserved section of the Aberdeenshire Canal which opened in 1805 and operated until 1854. Here the proposed water pipeline route also crosses the Aberdeen to Inverness line of the Great North of Scotland Railway which replaced the canal and was built roughly along the route of the former canal, removing much of its course (HES 2024)[26].

Designated cultural heritage assets in the site boundary (Figure 3.1)

3.1.5 There is one Scheduled Monument located in the site boundary: 'South Leylodge Steading, stone circle 110 m W of' (**1** / **SM 12350**). The monument, the remains of a recumbent stone circle dated to the Late Neolithic or Early Bronze Age, comprises a large, recumbent granite boulder set between two flanking monoliths (Figure 3.4). This is all that survives of the former stone circle, which is estimated to have been 18 m in diameter. Evidence for the rest of the circle is likely to survive below ground. The monument is located in the southeastern corner of the proposed electrolysis plant development area approximately 25 m north of the public highway. This Scheduled Monument has a heritage value at the national level and is of high sensitivity.

Non-designated cultural heritage assets in the site boundary (Figure 3.1)

<u>Prehistoric</u>

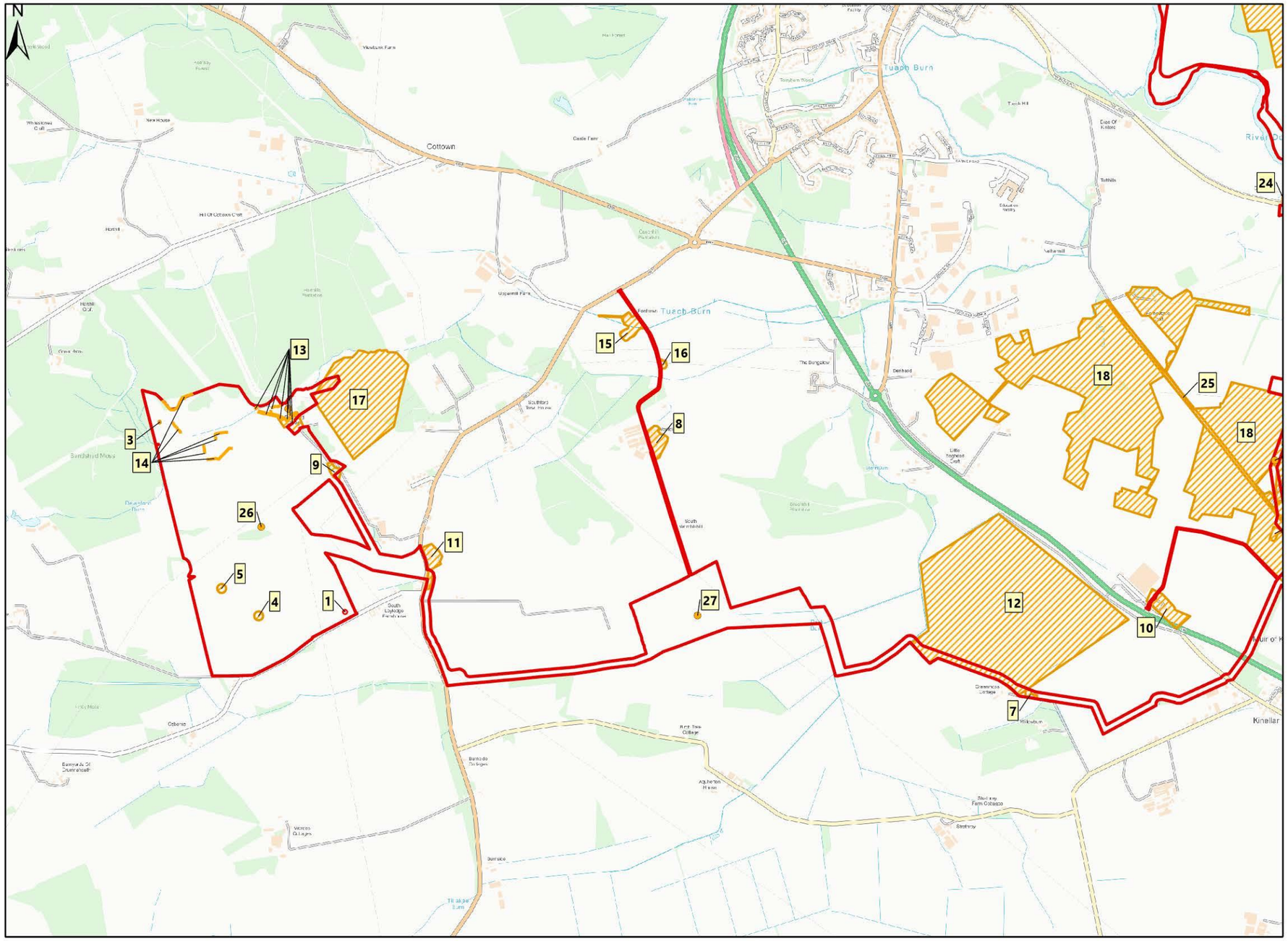
3.1.6 In the northwestern corner of the electrolysis plant development area a possible burial cairn (**3;** Figure 3.5) was identified during the field survey in an area of scrub land to the north of Dewsford Burn. The possible burial cairn comprised a small mound of rounded boulders and stones, measuring approximately 3 m by 5 m and 0.4 m in height, atop which a tree was growing. Based upon the size, shape and location it has been interpreted as being more likely a potential burial cairn than a stone clearance cairn. If proved to be a prehistoric burial cairn, it may provide valuable evidence relating to prehistoric burial and settlement practices, and therefore assessed as being of heritage value at the regional level and of medium sensitivity.

<u>Medieval and post-medieval: settlement and agriculture</u>

3.1.7 There are two cattle rubbing stones (**4** and **5**) located in the southern half of the electrolysis plant development area. These stones are recorded on the 1st edition (*Aberdeenshire, Sheet LXIV*, 1869) and 2nd edition (*Aberdeenshire Sheet LXIV.*SE, 1901) Ordnance Survey maps annotated 'Standing Stone'.

3.1.8 The southernmost stone (**4**; Figure 3.6) measures approximately 1.9 m in length (east-northeast to west-southwest) by 0.5 m in width and 0.4 m high. The stone has been split, and half of a 'plug and feather' borehole is evident in section on its upper face. There are lots of plough scores on the north face, suggesting that it was never a standing stone.

3.1.9 The northernmost stone (**5**; Figure 3.7) measures approximately 2 m in length (east to west) by 1.1 m in thickness and 1.6 m in height. It appeared to be more characteristic of a glacial erratic, so has not been placed here. Whilst it may have subsequently been used as a cattle rubbing stone, it is a natural feature and therefore has been scoped out of further assessment within this chapter.



KINTORE HYDROGEN PLANT

Date:	14/06/2024
Paper size:	A3
Scale:	1:20,000

0 125 250 500 750 1000 Metres

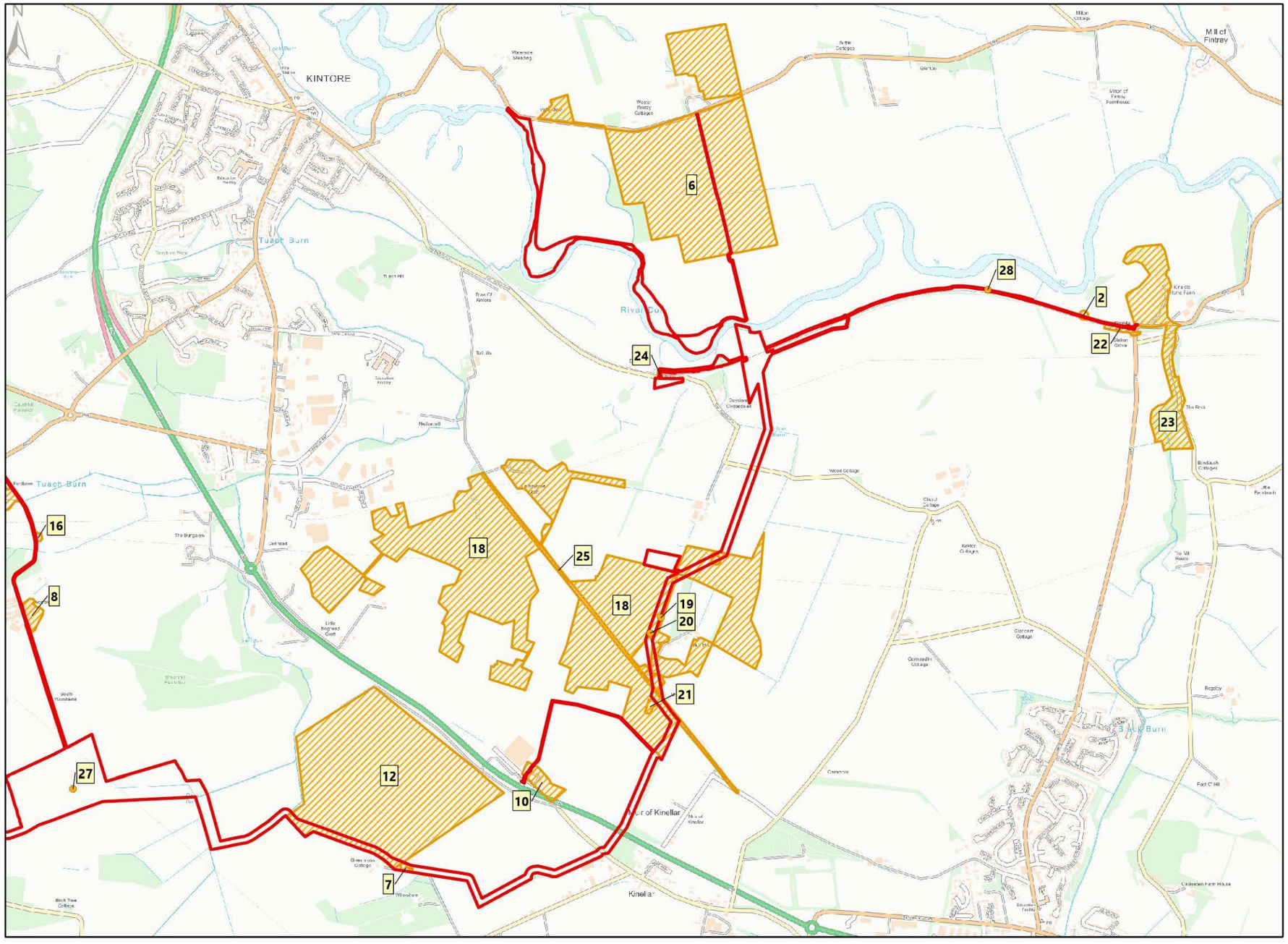
Key:

- Proposed Development Site
- Scheduled Monument
- Cultural Heritage Asset (point)
- Cultural Heritage Asset (line)
- Cultural Heritage Asset (polygon)

Kintore Hydrogen
A STATERA COMPANY

Inner Study Area:
Proposed Development Site

Status:	FINAL
Revision:	V1
Drawn by:	SG
Approved by:	JT



KINTORE HYDROGEN PLANT

Date:	14/06/2024
Paper size:	A3
Scale:	1:20,000

0 125 250 500 750 1000 Metres

Key:

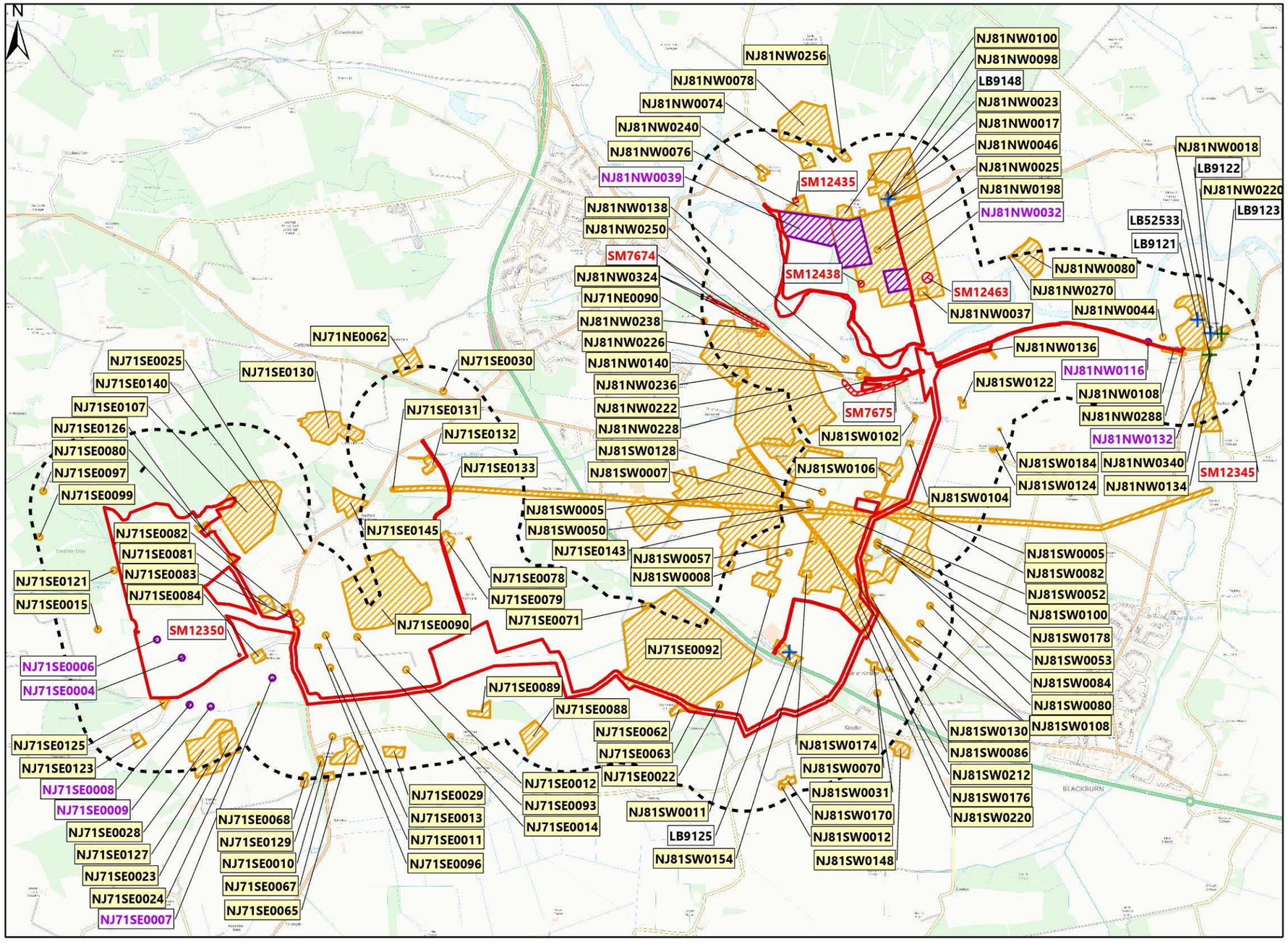
- Proposed Development Site
- Scheduled Monument
- Cultural Heritage Asset (point)
- Cultural Heritage Asset (line)
- Cultural Heritage Asset (polygon)

Kintore Hydrogen
A STATERA COMPANY

Inner Study Area:
Proposed Development Site

Status:	FINAL
Revision:	V1
Drawn by:	SG
Approved by:	JT

Figure 3.1: Inner study area: site boundary



KINTORE HYDROGEN PLANT

Date:	14/06/2024
Paper size:	A3
Scale:	1:30,000

0 200 400 800 1200 1600 Metres

Key:

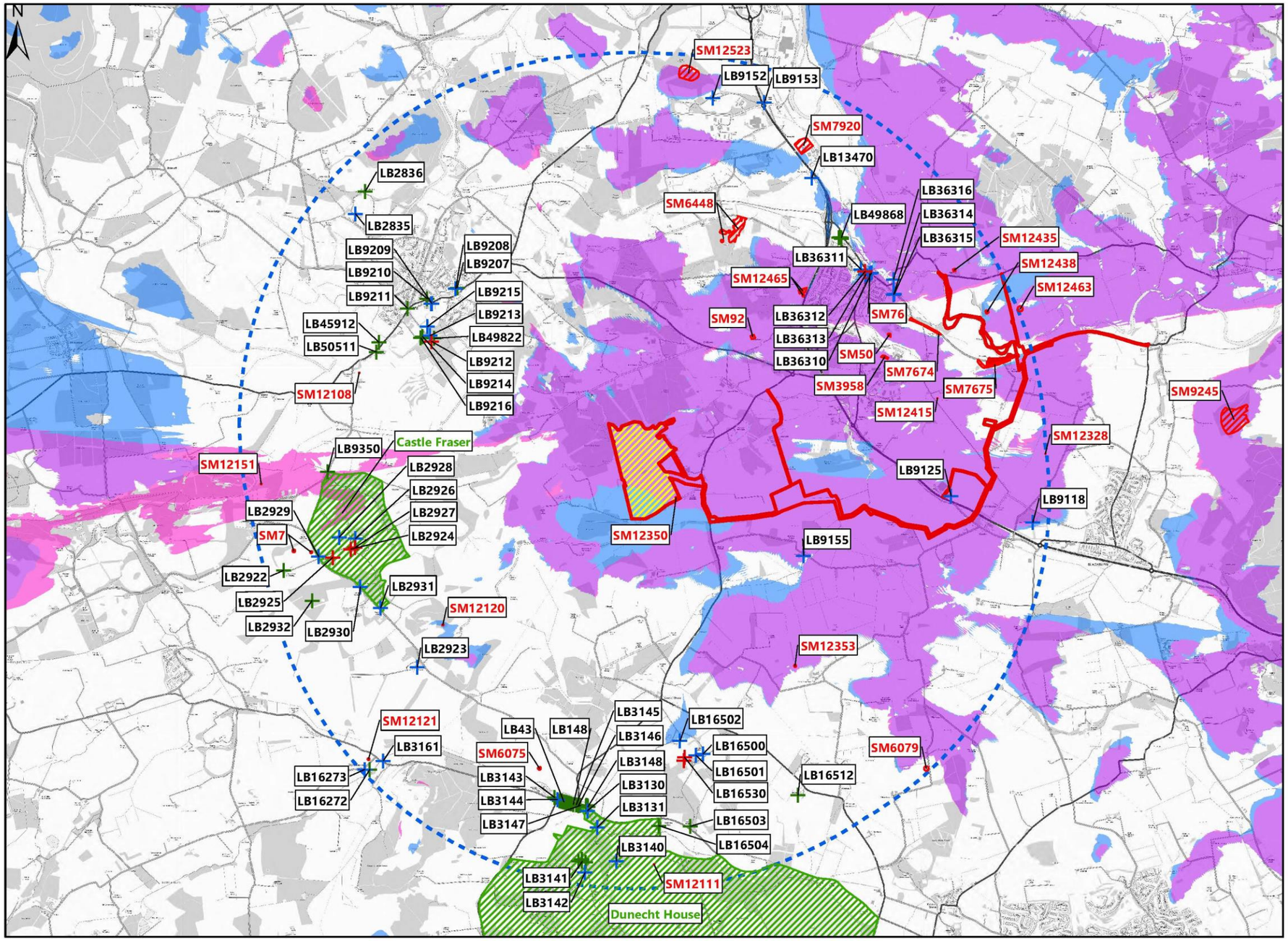
- Proposed Development Site
- 500m Inner Study Area
- Scheduled Monument
- Listed Building Category B
- Listed Building Category C
- HER Non-Designated Site (Standard)
- HER Non-Designated Site (Regionally Significant)

Kintore Hydrogen
A STATERA COMPANY

Inner Study Area:
Site Boundary

Status:	FINAL
Revision:	V1
Drawn by:	SG
Approved by:	JT

Figure 3.2: Inner study area: 500 m buffer



KINTORE HYDROGEN PLANT

Date:	02/08/2024
Paper size:	A3
Scale: 1:60,000	

0 0 1 1 2 3 Kilometers

Key:

- Proposed Development Site
- Electrolysis Plant Development Area
- 5km Outer Study Area
- Scheduled Monument
- Listed Building Category A
- Listed Building Category B
- Listed Building Category C
- Inventory Garden and Designed Landscape

Zone of Theoretical Visibility (ZTV)

- Electrolysis Plant
- Ground Flare
- Electrolysis Plant and Ground Flare

Kintore Hydrogen
A STATERA COMPANY

Outer Study Area

Status:	FINAL
Revision:	V2
Drawn by:	SG
Approved by:	JT

Figure 3.3: Outer study area: designated heritage assets

Figure 3.4: Photograph of the southwest facing elevation of the remains of 'South Leylodge Steading, stone circle 110m W of' (1 / SM 12350), facing northeast.

Figure 3.5: Possible prehistoric burial cairn (3) located in the northwestern corner of the electrolysis plant development area, to the north of Dewsford Burn.

Figure 3.6: Cattle rubbing stone (4) which lies prone on the ground. Southernmost of two such stones located in the southern half of the electrolysis plant development area.

Figure 3.7: Probable glacial erratic (5) may subsequently have been used as a cattle rubbing stone. Northernmost of two such stones located in the southern half of the electrolysis plant development area.

3.1.10 These two stones form part of the local historic landscape, and are assessed as being of local heritage value, and of low sensitivity.

3.1.11 Several farmsteads, crofts and cottages recorded in the HER and Canmore are located within, or partly intersected by the proposed development site.

3.1.12 Within the northeastern corner of the electrolysis plant development area is Dewsford farmstead (**13**). The farmstead is shown on the 1st edition (*Aberdeenshire, Sheet LXIV*, 1869) and 2nd edition (*Aberdeenshire Sheet LXIV.NE*, 1901) Ordnance Survey maps as a group of three roofed buildings and a possible unroofed structure or enclosure.

3.1.13 The farmstead is still extant, and those buildings located outside of the proposed development site are still occupied. The northernmost of those buildings (Figure 3.8) depicted on historic mapping is now derelict. The building is lime and stone built with roughly coursed stones. The gable ends stand to full height and there are fireplaces internally at each gable. A later harled extension is present on its south side.

3.1.14 To the north of this derelict building are the remains of many low stone walls (Figure 3.9), outlining the possible unroofed building or enclosure depicted on historic maps, as well as at least one possible other structure and demarcating trackways and field boundaries. Further stone walls and stone and turf dykes (**14**) are located to the west of the farmstead, likely demarcating further field boundaries.

3.1.15 To the south of Dewsford farmstead, the 1st edition (*Aberdeenshire, Sheet LXIV*, 1969) and 2nd edition (*Aberdeenshire Sheet LXIV.NE*, 1901) Ordnance Survey maps record a row of cottages and an outbuilding recorded as 'Backstyles' (**9**). These structures are no longer extant, but the remains of the buildings (e.g. Figure 3.10) are located within a copse of trees beside the present trackway leading to Dewsford farmstead. In addition to the buildings, there are several sections of low stone walling or possible field clearance.

3.1.16 East Leylodge (**11**) is a small farmstead which is still in use. A former pond, now infilled, is located to the south of the farmstead within the site boundary, crossed by the hydrogen and water pipeline route. The pond is first recorded on the 1st edition Ordnance Survey map (*Aberdeenshire, Sheet LXIV* 1869) within an area of rough grazing, and is subsequently labelled, on the 2nd Edition Ordnance Survey map (*Aberdeenshire Sheet LXIV.SE* 1901), as a 'Mill Dam'.

3.1.17 Three farmsteads are recorded in the HER along the proposed access route to the above-ground installation for gas export, which is an existing farm access road. The site boundary, which encompasses the farm access road here, is adjacent to their mapped boundaries. These are Fordtown (**15**), and a nearby croft (**16**) and Womblehill (**8**). The 1st edition Ordnance Survey map (*Aberdeenshire, Sheet LXIV* 1869) records all these as groups of agricultural buildings, though each is reduced in size on the subsequent 2nd edition Ordnance Survey mapping (*Aberdeenshire Sheet LXIV.NE* and *Aberdeenshire Sheet LXIV.SE*, 1901). Further to the east, the proposed development utilises an existing trackway though the Boghead farmstead (**10**), which is still extant and occupies a now enlarged plot adjacent to the A96.

3.1.18 An L-shaped building (**7**), probably associated with Greenmoss farmstead is recorded on the 1st edition (Aberdeenshire, Sheet LXIV, 1969) Ordnance Survey map within the site boundary along the proposed water pipeline route. The building does not appear on the 2nd edition Ordnance Survey map, and so was evidently demolished before the end of the 19th century. No evidence of the building is now present above ground, but buried remains may still be present below ground.

3.1.19 In the eastern half of the proposed development site, along the proposed water pipeline route, a number of 'Tumuli' are recorded on the 1st edition Ordnance Survey map (*Aberdeenshire, Sheet LXIV* 1869). Some had been noted in the 19th century to contain bones, and others, urns containing ashes and burnt bone. A walkover survey (**18**) was conducted across part of this area in 2012[27], which identified several clearance cairns but none which were thought to be burial cairns. During the field survey conducted as part of this assessment, two small clearance cairns (**19** and **20**) were recorded. These did not correspond to any 'Tumuli' recorded on historic mapping.

3.1.20 As derelict, or demolished structures (including above ground and buried remains), or features associated with historic farmsteads and agricultural activities, these assets form elements of the local historic landscape and are assessed to be of heritage value at the local level and of low sensitivity.

3.1.21 The northeastern corner of the proposed development site incorporates an existing access trackway which will be utilised by the proposed development. This overlaps slightly with the mapped extent of a non-inventory designed landscape (**23**) (though it will remain unchanged) surrounding the 19th century Category B listed Kinaldie House (**LB 9121**). This designed landscape is of regional heritage value and medium sensitivity.

Figure 3.8: View facing north, providing an overview of derelict building remains which were part of the Dewsford farmstead (13).

Figure 3.9: Enclosure and walls to the northeast of Dewsford farmstead (13).

Figure 3.10: The stone foundation remains of Backstyles cottages (9).

Figure 3.11: Aberdeenshire Canal milestone No.12 (2) within a stone wall on the north side of the railway.

Post-medieval: industrial and infrastructure

3.1.22 A section of General Wade's Military Road (**25**), which was built in the 1700s, is depicted as crossing the proposed development site boundary on the 1st edition (Aberdeenshire, Sheet LXIV, 1969) Ordnance Survey map. Where it crosses the site boundary (water pipeline route), it follows a modern lane named 'the Skair'. If present, archaeological remains associated with the original military road within the proposed development site, below the modern road surface, may be of evidential value, providing information about its construction at one section of a much larger feature. Any such remains would be considered to be of local heritage value, and of low sensitivity.

3.1.23 The Aberdeenshire Canal was largely overlain by the Great North of Scotland Railway, but some evidence of the canal still survives. Within the application site boundary, a temporary construction access route to the intake/outfall location is proposed along the northern side of the railway line. Along this route, there is a milestone, 'No. 12' (**2**; Figure 3.11), which is now located within a stone dyke on the northern side of the railway. Along this same stretch of railway, a Canmore entry records a steep terrace (**28**) which may be a section of the former canal towpath; however, this couldn't be identified during the field survey. Likely if it was present, it would be located outside of the site boundary, being incorporated into the present railway embankment.

3.1.24 The temporary construction access route to the intake/outfall location also passes the former Kinaldie Station (**22**). The station was closed to regular passenger traffic in 1964 and all that remains are the edges of the west- and east-bound platforms. All of the former railway buildings have been demolished. Further west, the extant Dalweary Railway Bridge (**24**) carries the railway line over a farm access track. These features associated with the current (in use), and past (demolished) local railway infrastructure are of assessed as being of local heritage value and of low sensitivity.

Modern

3.1.25 There is one cultural heritage asset dated to the modern period. This relates to a series of glider traps (**12**) which were reportedly located in a field at Concraig Dairy during the Second World War. The glider traps were removed from the field after the war, and none now remain in the field. As such this asset is assessed as being of negligible sensitivity.

Miscellaneous

3.1.26 The Canmore database records two small former quarries (**26**) recorded on 20th century Ordnance Survey maps and now surviving as partially infilled features within the electrolysis plant development area. To the east, within an area proposed for use as the gas connection compound area (above-ground installation), the Canmore database records a small pit (**27**), present on 19th century Ordnance Survey maps, and visible now as a small depression, with stones left on its edges following extraction of sand and gravel. As minor historical features, with little or no archaeological potential, these features are considered to be of little heritage value and of negligible sensitivity.

Designated cultural heritage assets in the 500 m site boundary buffer (Figure 3.2)

Scheduled Monuments

3.1.27 There are six Scheduled Monuments located within a 500 m buffer from the site boundary. These are cultural heritage assets valued at a national level and of high sensitivity.

3.1.28 Two of these (**SM7 674** and **SM 7675**) are sections of the Aberdeenshire Canal. One of these (**SM 7675**) is located immediately adjacent to the site boundary, in an area proposed for use as a temporary construction compound. The monument includes an infilled section of canal (Figure 3.12) and the remains of a small stone-built structure (Figure 3.13), which may have been associated with a smithy serving the canal.

3.1.29 The other four Scheduled Monuments relate to prehistoric settlement, and comprise:

- Gouk Stone, standing stone (**SM 12345**): a single standing stone which is likely to dates to the late Neolithic or Bronze Age.
- Valleyview, cairn 90 m ENE of (**SM 12435**): a burial cairn of Neolithic or Bronze Age date.
- The Hedges, enclosure 480 m S of (**SM 12438**): the remains of a later prehistoric enclosed settlement.
- Kilm Cottage, palisaded enclosure 555 m S of (**SM 12463**): the remains of a hut circle of late Bronze Age or Iron Age date.

Listed Buildings

3.1.30 There are six Listed Buildings located within a 500 m buffer from the site boundary.

3.1.31 Four of the Listed buildings are Category B listed:

- Kinaldie House (**LB 9121**): House, built c.1800, with significant demolition, modification, and rebuilding in c.1835 and c.1880.
- Kinaldie Doocot (**LB 9122**): a possible early 18th century doocot/dovecot, stone built.
- Boghead Farmhouse (**LB 9125**): a farmhouse, built c.1800.

- Wester Fintray Farmhouse (**LB 9148**): a farmhouse, built c.1800.

3.1.32 Two of the Listed Buildings are Category C listed:

- Kinaldie Home Farm (**LB 9123**): farm buildings forming a courtyard built early 19th century.
- Former Canal Aqueduct over Black Burn, Kinaldie (**LB 52533**): a former canal aqueduct which caried the Aberdeenshire Canal across the Black Burn, and now used as a road bridge.

Non-designated cultural heritage assets in the 500 m site boundary buffer (Figure 3.2)

Prehistoric

3.1.33 There are a large number of cultural heritage assets dating broadly to the prehistoric period located within a 500 m buffer from the site boundary. Many of these were recorded in the 19th century and early 20th century, likely during agricultural improvements. They include burial cairns, some with stone cists within (**NJ71SE 0015**; **NJ81SW 0011**; **NJ81SW 0012**; **NJ81SW 0050**); a standing stone (**NJ71SE 0010**); and find spots of bronze axes (**NJ71SE 0022**; **NJ81SW 0008**) and flint arrowheads (**NJ81SW 0007**; **NJ81SW 0031**). Several stone and earthwork features have also been interpreted as being prehistoric hut circles (**NJ71SE 0029**; **NJ71SE 0090**) but may just as likely be post-medieval stock enclosures.

3.1.34 Stone axes (**NJ81NW 0017**) and flint arrowheads (**NJ81NW 0025**) have been found around the Wester Fintray farm at the northeastern edge of the proposed development site. A programme of archaeological investigation (the Kintore Landscape Project[28]) conducted across several fields at Wester Fintray farm has also identified further flint tools, tentatively dated to the Mesolithic period. A later prehistoric enclosed settlement was also investigated, and subsequently designated as a Scheduled Monument (**SM 12438**). A number of Bronze Age and Neolithic flint artefacts were recovered. during test pitting across fields that contained possible ring-ditches (**NJ81NW 0032**; **NJ81NW 0037**) appearing as cropmarks on aerial photographs., In another area of cropmarks, excavation recorded part of a late Bronze Age or Iron Age palisaded enclosure which is now designated as a Scheduled Monument (**SM 12463**). A more extensive area of cropmark features (**NJ81NW 0039**) which includes further ring-ditches, pits, a pit alignment, and field boundary ditches has also been recorded at Wester Fintray.

Figure 3.12: View west across infilled section of the Aberdeenshire Canal (SM 7675). The adjacent field on its north is proposed for use as a temporary construction compound.

Figure 3.13: Overview of the remains of a stone building, associated with the Aberdeenshire Canal (SM 7675). Facing north toward the present-day railway line.

3.1.35 A programme of archaeological evaluation (**NJ81NW 0222**) conducted in 2016 by Murray Archaeological Services Ltd[29] in advance of residential development on the

eastern side of Kintore recorded two concentrations of prehistoric settlement activity on the south facing slopes at the southern part of the site. Radiocarbon dating using samples taken from excavated features returned a Neolithic, Bronze Age and Iron Age date range.

Medieval and post-medieval: agricultural and industrial

3.1.36 The remains of a turf and stone built building (**NJ71SE 0140**) was excavated in advance of the construction of an extension to the Kintore substation, immediately east of the proposed electrolysis plant development area. The building, interpreted as a possible byre-house was dated by pottery recovered from the internal floor surface, was dated as being in use during the 14th and 15th centuries AD (Kilpatrick 2017)[30]. Medieval activity was also recorded on the east side of Kintore during the programme of archaeological evaluation (**NJ81NW 0222**) described above.

3.1.37 The majority of the cultural heritage assets which have been recorded within 500 m of the proposed development site in the Aberdeenshire HER relate to post-medieval farmsteads (**NJ71SE 0062**; **NJ71SE 0081**; **NJ71SE 0084**; **NJ71SE 0121**; **NJ71SE 0123**; **NJ71SE 0130**; **NJ81NW 0098**; **NJ81NW 0140**; **NJ81NW 0220**; **NJ81NW 0236**; **NJ81NW 0324**; **NJ81NW 0238**; **NJ81NW 0240**; **NJ81SW 0057**; **NJ81SW 0106**; **NJ81SW 0122**; **NJ81SW 0148**; **NJ81SW 0170**; **NJ81SW 0178**); crofts (**NJ71SE 0071**; **NJ81SW 0130**); cottages (**NJ71SE 0067**; **NJ71SE 0082**; **NJ71SE 0093**; **NJ71SE 0096**; **NJ71SE 0129**; **NJ81NW 0100**; **NJ81SW 0070**; **NJ81SW 0102**; **NJ81SW 0104**; **NJ81SW 0124**; **NJ81SW 0174**; **NJ81SW 0180**; **NJ81SW 0184**; **NJ81SW 0212**); and other buildings (**NJ81NW 0136**; **NJ81NW 0270**; **NJ81SW 0086**) many of which are still in use, and some which have been demolished and are recorded only from 19th century Ordnance Survey mapping.

3.1.38 Many areas of rig and furrow (**NJ71SE 0023**; **NJ71SE 0028**; **NJ71SE 0089**; **NJ71SE 0090**; **NJ81NW 0074**; **NJ81NW 0076**; **NJ81NW 0078**; **NJ81NW 0080**) pertaining to medieval and post-medieval arable cultivation are recorded as earthwork and cropmark features. Other features associated with the historic landscape include stock enclosures (**NJ81SW 0052**); numerous cattle rubbing stones or possible boundary stones (**NJ71SE 0007**; **NJ71SE 0008**; **NJ71SE 0009**; **NJ71SE 0011**; **NJ71SE 0012**; **NJ71SE 0013**; **NJ71SE 0014**) many of which were recorded on the 1st edition Ordnance Survey map (1869) as 'Standing Stones' but have subsequently been reclassified; and other boundary stones (**NJ71SE 0097**; **NJ71SE 0099**; **NJ81NW 0138**; **NJ81SW 0080**; **NJ81SW 0082**; **NJ81SW 0084**) specifically labelled as such on the 1st edition Ordnance Survey map.

3.1.39 Other recorded features, primarily transcribed from historic mapping, or present as extant structures, include bridges (**NJ71SE0024**; **NJ81NW0132**; **NJ81NW0288**; **NJ81NW0234**; **NJ81NW0250**); a smithy (**NJ71SE0025**); a school (**NJ71SE0125**); wells (**NJ71SE 0030**; **NJ81SW 0053**; **NJ81SW 0128**); a mill pond (**NJ81NW 0256**); quarries (**NJ71SE0065**; **NJ71SE0078**); and sand and gravel workings (**NJ71SE0068**; **NJ81SW0108**).

Undated

3.1.40 Several cropmark features (**NJ71SE 0088**; **NJ71NE 0062**) identified from aerial photographs, and suggestive of enclosures, are recorded in the Aberdeenshire HER. These features may have an archaeological origin; however, they remain undated.

Archaeological potential

3.1.41 There is extensive evidence of prehistoric activity within the Inner Study Area. Archaeological evidence ranges in date from the Mesolithic to the Iron Age periods. Much of this evidence comprises monuments such as burial cairns and standing stones, some of which were discovered, and destroyed during agricultural improvements. Archaeological investigations, for example those carried out at Wester Fintray Farm as part of the Kintore Landscape Project, however, show that archaeological remains survive well below ground, even in areas which are under arable cultivation.

3.1.42 As such it is assessed that there is a moderate potential for hitherto unrecorded archaeological remains dating to the prehistoric period to be present throughout the proposed development site boundary. The archaeological potential for archaeological remains may be higher in those locations proximate to known archaeological sites, such as the 'South Leylodge Steading, stone circle 110 m W of' (**1** / **SM 12350**) or possible burial cairn (**3**). Any such archaeological remains have the potential to provide evidence of the prehistoric landscape, and contribute to regional and national research frameworks, and therefore could be of regional or possibly national heritage value, and of medium to high sensitivity.

3.1.43 The majority of evidence for archaeological and historic sites within the Inner Study Area is related to the post-medieval, and to a lesser extent, medieval, landscape including evidence of agricultural and industrial activities. The majority of these are discrete features, and of low sensitivity. The potential to encounter further hitherto unrecorded medieval and post-medieval sites of local heritage value (low sensitivity) is assessed to be low. The exception to this being where the proposed development site immediately borders a section of the Aberdeenshire Canal (**SM 7675**). It is assessed that there is a moderate potential for archaeological remains associated with this monument to be identified out with the boundary which is defined as a Scheduled Monument. Any such remains associated with the Scheduled Monument could also be of national heritage value, and therefore of high sensitivity.

Outer study area

3.1.44 Within the Outer Study Area there are 25 Scheduled Monuments, two Inventory Garden and Designed Landscapes, six Category A Listed Buildings, 33 Category B Listed Buildings and 25 Category C Listed Buildings.

3.1.45 All of these designated assets are listed in Appendix 7.1, which includes details of their theoretical visibility with the proposed development based on analysis of the 'bare-earth' ZTV, and a tabulated initial assessment of potential setting impacts which may arise. Where potential significant setting impacts have been identified through the tabulated assessment, a more detailed assessment is presented in Section 4 of this chapter.

3.1.46 There are no other designated cultural heritage assets (Conservation Areas, Inventory Battlefields or World Heritage Sites) within the Outer Study Area.

3.2 Future baseline

3.2.1 If the proposed development was not to proceed, it is probable that there would be little or no change to the baseline condition of the various heritage assets and features that presently survive within the proposed development site. Agricultural land-use would continue, and that activity would continue to degrade any hitherto unrecorded buried archaeological remains or deposits that may be present within the proposed development site.

3.2.2 The designated heritage assets in the Inner Study Area (including the proposed development site) and the Outer Study Area would continue to receive statutory protection.

4 Assessment of Effects

4.1 Construction phase

Direct physical impacts

4.1.1 Direct (physical) effects on cultural heritage assets may arise from demolition of existing buildings/structures, and during ground-disturbing activities that occur during construction works (such as those required for the construction of the Kintore Hydrogen Plant, and associated infrastructure including pipelines, permanent roads temporary construction access tracks, car parking, services and drainage, etc.), which may damage, and possibly destroy, cultural heritage remains.

4.1.2 Direct effects may also occur through above-ground disturbance, for example, as a result of vehicle movement over cultural heritage features or storage of construction materials upon them. Direct effects on cultural heritage assets are normally adverse, permanent, and irreversible.

Magnitude of impact, sensitivity and significance of effect

4.1.3 Potential direct impacts arising from construction of the proposed development, taking into account embedded mitigation measures (Section 2.9) but prior to further mitigation, are predicted on nine cultural heritage assets. Further mitigation measures to avoid or reduce the predicted effect are set out in paragraphs 4.1.5 and 4.1.6.

- *South Leylodge, cattle rubbing stone* (**4**): This post-medieval cattle rubbing stone is located in an area proposed for groundworks associated with landscaping, such as the creation of bunding to screen the development. Without any form of mitigation, the stone would be destroyed as a result of these activities, and the magnitude of impact is therefore considered to be **high**. This would result in a **high** magnitude impact on an asset of **low** sensitivity. Overall, and based on professional judgement, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *Greenmoss, building (destroyed)* (**7**): The location of this, since demolished, farm building depicted on the 1st edition Ordnance Survey map (*Aberdeenshire, Sheet LXIV*, 1869) is within the proposed water pipeline route. Excavation in advance of laying the pipeline is likely to partially disturb or damage archaeological remains associated with this demolished building should they survive below the present ground surface, but unlikely to remove them entirely. This would result in an impact that is considered to be of **medium** magnitude on an asset of **low** sensitivity. Overall, and based on professional judgement, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *Backstyles, remains of cottages* (**9**): The remains of these former cottages, comprising only stone foundation, are mostly located within woodland which is due to be retained as part of the proposed development. It is possible however that sections of walling close to the present trackway could be affected by adjacent development, including widening of access, etc., however the overall magnitude of impact would be **low**. A **low** magnitude impact on an asset of **low** sensitivity would result in a **minor** adverse effect, which is not significant.

- *East Leylodge, pond south of farmstead* (**11**): The infilled remains of a pond, recorded as a ‘Mill Dam’ on historic mapping, south of East Leylodge farmstead is within the proposed water and hydrogen pipeline route. Excavation in advance of laying the pipelines is likely to disturb or damage archaeological remains associated with this historic feature across its full length, but unlikely to remove/destroy it entirely. The impact is therefore considered to be of **medium** magnitude on an asset of **low** sensitivity. Overall, and based on professional judgement, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *Dewsford, farmstead* (**13**): the remains of a derelict lime and stone built building and many low stone walls outlining the possible foundations of other buildings or enclosures, as well as demarcating trackways and field boundaries are located within the footprint of the proposed electrolysis development area and would therefore be destroyed as part of the proposed development. The magnitude of impact is therefore considered to be **high**. This would result in a **high** magnitude impact on an asset of **low** sensitivity. Overall, and based on professional judgement, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *Dewsford, walls/banks* (**14**): These low stone walls and turf banks are located within the footprint of the proposed electrolysis development area and would therefore be removed as part of the proposed development. The magnitude of impact is therefore considered to be **high**. This would result in a **high** magnitude impact on an asset of **low** sensitivity. Overall, and based on professional judgement, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *Hill of Boghead, Clearance Cairns* (**19** and **20**): These two possible clearance cairns are located within the proposed water pipeline route. Excavation in advance of laying the pipeline is likely to remove these archaeological features. This would

result in a **high** magnitude impact on an asset of **low** sensitivity. Overall, and based on professional judgement, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *North Leylodge, quarries* (**26**) and *South Womblehill, pit* (**27**): minor historical features, relating to former extraction activities with little or no archaeological potential. These may be removed as a result of the proposed development. The magnitude of impact is therefore considered to be **high**. This would result in a **high** magnitude impact on an asset of **negligible** sensitivity. Overall, it is predicted that this would result in a **minor** adverse effect, which is not significant.

- *Previously unrecorded archaeological remains*: There is the possibility that ground disturbance during construction of the proposed development, could disturb or destroy any hitherto unrecorded buried archaeological remains that may be present in the undeveloped/undisturbed areas of the proposed development site. Direct impacts on previously unrecorded archaeological remains could be of **high** magnitude. Impacts of **high** magnitude on archaeological remains that could potentially be of **medium** or **high** sensitivity could, if such remains are present, result in **moderate** or **major** adverse effects, which could be significant.

4.1.4 Provision has been made within the Landscape Management Plan (within the Design Principles Statement) and BEMP for the avoidance of the following cultural heritage asset as part of embedded mitigation measures (Section 2.9), and so no direct physical impacts are therefore predicted:

- *Bandshed Moss, possible cairn* (**3**).

Further mitigation or enhancement

4.1.5 The emphasis in Planning Advice Note (PAN) 2/2011: Planning and Archaeology (PAN) is for the preservation of important remains *in situ* where practicable and by record where preservation is not possible. The mitigation measures presented below therefore take into account this planning guidance and provide various options for protection or recording, ensuring that, where practical, surviving assets are preserved intact to retain the present historic landscape.

- *Previously unrecorded archaeological remains*: It is possible that, due to the assessed moderate potential for further hitherto unrecorded archaeological remains to survive within the proposed development site, further investigation will be required by ACAS. Prior to construction a programme of archaeological investigation and mitigation would be agreed through consultation with ACAS, the scope of which would then be set out in a Written Scheme of Investigation (WSI) for the approval of ACAS. This work will allow for any features to be investigated and recorded to an appropriate standard, with follow-on set-piece excavation of any vulnerable remains and reporting to an acceptable standard undertaken as appropriate.

- If significant discoveries are made during any archaeological works carried out, and preservation *in situ* of any sites or features identified is not possible, provision would be made for their excavation, where necessary. This provision would include the consequent production of written reports on the findings, with post-excavation analyses and publication of the results of the work, where appropriate.

- As noted in the designed-in mitigation (Table 2.8), formal arrangements would also be put in place for any other, unforeseen, archaeological discoveries made by construction contractors to be reported to a retained professional archaeological organisation as an Archaeological Clerk of Works (ACoW). These arrangements would require unexpected discoveries to be assessed by the ACoW and dealt with appropriately and would make clear the legal responsibilities placed upon those who make unexpected discoveries of archaeological significance (such as building remains, human remains, artefacts, etc). These arrangements would be explained in toolbox talks presented by the ACoW.

4.1.6 Although no significant adverse effects have been predicted for the following cultural heritage assets, the applicant proposes the following additional mitigation to minimise the adverse effects.

- *South Leylodge, cattle rubbing stone* (**4**): arrangements will be made for the removal of the stone from its current location to avoid potential damage.

- *Greenmoss, building (destroyed)* (**7**); *Backstyles, remains of cottages* (**9**); *East Leylodge, pond south of farmstead* (**11**); and *Hill of Boghead, Clearance Cairns* (**19** and **20**): where these known archaeological features of low sensitivity have been predicted be adversely effected by the proposed development, but cannot be avoided it is recommended that a programme of archaeological recording and mitigation is conducted in order to preserve by record any archaeological remains which are disturbed. This would be undertaken in line with the process outlined above.

- *Dewsford, farmstead* (**13**) and *Dewsford, walls/banks* (**14**): Prior to construction works an archaeological building recording survey would be undertaken to record those features that would be adversely affected by the proposed development. The scope of this work would be set out in a WSI and agreed with ACAS.

4.1.7 For the following cultural heritage assets, no significant adverse effects have been predicted and no further mitigation is considered to be required.

- *North Leylodge, quarries* (**26**) and *South Womblehill, pit* (**27**).

Residual effect

4.1.8 For cultural heritage assets within the proposed development site, the completion of the programme of mitigation works set out above would minimise or offset the loss of any archaeological remains that may occur as a result of construction of the proposed development.

4.1.9 Taking the proposed mitigation into account, any residual effect arising from construction of the proposed development in relation to direct effects on the cultural heritage resource within the proposed development site is predicted to be of no more than **minor** adverse effect which is **not significant**.

Indirect impacts

4.1.10 No indirect impacts have been identified as arising as a result of the construction of the proposed development.

Setting impacts

4.1.11 Construction activities such as those required for the construction of the Kintore Hydrogen Plant, and associated infrastructure including pipelines, permanent roads temporary construction access tracks, car parking, services and drainage, have the potential to affect the settings of sites of heritage assets both within the proposed development site and the Outer Study Area. These construction activities would however be temporary and would have no permanent effects. Therefore, temporary impacts on the settings of designated heritage assets during the construction phase have not been assessed on a site-by-site basis and are considered no greater than assessed below for permanent operational effects.

Future monitoring

4.1.12 No future monitoring is proposed as any direct physical impacts to cultural heritage assets arising during the construction phase will be addressed in line with the mitigation measures which have been set out.

4.2 Operational phase

Direct physical impacts

4.2.1 No direct physical impacts have been identified as arising as a result of the operation of the proposed development.

Indirect impacts

4.2.2 No indirect impacts have been identified as arising as a result of the operation of the proposed development.

Setting impacts

4.2.3 The presence of the proposed development could result in adverse effects on the settings of designated cultural heritage assets within the Outer Study Area. The assessment of effects on the setting of heritage assets has been carried out with reference to the nature, scale and layout of the proposed development as defined by the maximum design envelope parameters.

4.2.4 The locations of designated heritage assets in the Outer Study Area are shown on Figure 3.3 and are listed in Appendix 7.1. Appendix 7.1 also contains the tabulated results of an initial setting assessment conducted to ascertain whether potential significant setting impacts may arise as a result of the proposed development.

4.2.5 Potentially significant setting impacts have been identified for the following designated heritage assets in the Outer Study Area:

- South Leylodge Steading, stone circle 110 m W of (**SM 12350**); and
- South Fornet, stone circle 250 m NW of (**SM 12353**).

Magnitude of impact, sensitivity and significance of effect

South Leylodge Steading, stone circle 110 m W of (**SM 12350**)

4.2.6 This Scheduled Monument comprises the remains of a recumbent stone circle dating to the late Neolithic or early Bronze Age. It is a cultural heritage asset valued at the national level and of **high** sensitivity.

4.2.7 The monument survives as a large, recumbent granite boulder set between two flanking monoliths (Figure 3.4). This is all that survives of the former stone circle, which is estimated to have been 18 m in diameter and evidence for the rest of the circle likely survives below ground. It is located within an improved pasture field on a gentle south-facing slope and occupies a relatively low-lying position in the landscape. There are two existing overhead power lines (steel lattice towers) currently in close proximity.

4.2.8 The cultural significance of the monument is derived from its intrinsic characteristics, representing the structural remains of a recumbent stone circle; and its contextual characteristics (including setting) being part of a group of geographically confined and carefully positioned prehistoric monuments in the Strathdon area. The low-lying position of this stone circle contrasts with the more prominent positions of other stone

circles in Strathdon. It is situated within what is presently an open agricultural landscape, and the position affords some long-distance views to the south which could have been important to its landscape positioning. For example, it has notable intervisibility with *South Fornet, stone circle 250 m NW of* (**SM 12353**). That monument is located in a more prominent landscape position c.2.7 km to the southeast. This intervisibility may have been intentional and therefore a key aspect of its setting.

4.2.9 The proposed development would introduce woodland planting, and beyond that, new buildings comprising the Kintore Hydrogen Plant, into the agricultural fields immediately to the north and northwest of the stone circle. The LVIA visualisation VL5 (Figure 6.5A-C) shows the location of the proposed development in relation to the Scheduled Monument.

4.2.10 The proposed development would be visible as a low-lying feature in the backdrop of views towards the Scheduled Monument from the south and southeast. The view to the northwest from the monument would be appreciably altered by visibility of the proposed development in the foreground. However, long distance views in this direction are largely limited by rising topography and would not be interrupted. Other key aspects of the stone circle's setting such as intervisibility with *South Fornet, stone circle 250 m NW of* (**SM 12353**) and south facing views would not be interrupted and appreciation of its position in the surrounding rural landscape would not be appreciably diminished. The intrinsic (physical) characteristics would be unchanged.

4.2.11 Overall, and based on professional judgement, the impact to the cultural significance of the Scheduled Monument, resulting from changes to its setting, is assessed to be of a **low** magnitude. This would result in a **minor** adverse effect, which is not significant.

South Fornet, stone circle 250 m NW of (**SM 12353**)

4.2.12 This Scheduled Monument comprises the remains of a recumbent stone circle dating to the late Neolithic or early Bronze Age. It is a cultural heritage asset valued at the national level and of **high** sensitivity.

4.2.13 The monument survives as a low, roughly circular rubble cairn and platform with two upstanding monoliths and at least two fallen monoliths within the body of the cairn. It is located on the edge of an improved pasture field which is on high ground approximately 180 m above sea level.

4.2.14 The cultural significance of the monument is derived from its intrinsic characteristics, representing the structural remains of a recumbent stone circle; and its contextual characteristics (including setting) being part of a group of geographically confined and carefully positioned prehistoric monuments in the Strathdon area. In addition to its relationship with other prehistoric in the Strathdon area, the position of the stone circle on high ground gives it a prominence in the local landscape from which it is afforded panoramic views including long distance views to the north, and northwest towards Bennachie. Intervisibility with other monuments such as the *South Leylodge Steading, stone circle 110 m W of* (**SM 12350**) may have also been important to its position.

4.2.15 The proposed development would introduce new buildings comprising the Kintore Hydrogen Plant, to the agricultural landscape 2.72 km to the northwest of the Scheduled Monument. ZTV (Figure 3.3) and photowire visualisations (Figure 7.14) indicate that these buildings are likely to be visible in landscape views from the monument.

4.2.16 The proposed development would be seen in views to the northwest of the Scheduled Monument, although screening from the proposed woodland planting would limit visibility of the new buildings. Where visible, they would be seen slightly to the west of, and in context with, the existing 400 kV Kintore Substation. Due to the position of the proposed development in lower-lying ground it would be backdropped by the terrain and would not interrupt long distance views from the Scheduled Monument towards Bennachie. Intervisibility with the *South Leylodge Steading, stone circle 110 m W of* (**SM 12350**) would also not be interrupted. The Scheduled Monument's intrinsic (physical) characteristics would be unchanged.

4.2.17 Overall, and based on professional judgement, the impact to the cultural significance of the Scheduled Monument, resulting from changes to its setting, is assessed to be of a **low** magnitude. This would result in a **minor** adverse effect, which is not significant.

Further mitigation or enhancement

4.2.18 No mitigation additional to that which is already designed-in to the proposed development (including limits on building heights in different parts of the site based on its topography and proposed screening landscape planting) is recommended.

Residual effect

4.2.19 As no additional mitigation is proposed the residual effects are the same as the predicted effects, which are **not significant**.

Future monitoring

4.2.20 No future monitoring is proposed. No considerable changes to the proposed development are expected during its operational lifespan. As such the effects to designated heritage assets arising as a result of impacts to their settings would be as predicted.

4.3 Inter-related effects

4.3.1 No inter-related effects, those associated with different aspects of the construction or operation of Kintore Hydrogen Plant on the same receptor, have been identified during the assessment.

4.3.2 The inter-related effects between landscape and visual impacts and cultural heritage impacts have been considered fully in this chapter, on the basis of proposed development visualisations and landscape character evidence drawn from Chapter 6: Landscape and Visual.

5 Cumulative Effects Assessment

5.1.1 A full list of cumulative developments is provided in Chapter 17: Summary of Cumulative Effects and the locations of these developments are shown in that chapter. Table 5.1 lists the cumulative developments selected, based on professional judgement, as the schemes having potential to contribute to cumulative impacts on cultural heritage receptors. These developments have been selected as they are located within proximity to the proposed development and therefore may be present within views towards and from the two Scheduled Monuments included in the setting assessment presented in Section 4, and so could increase predicted setting impacts.

5.1.2 The applicant is also aware of a potential proposal for a 200 megawatt battery storage facility that could be located on farmland north of the proposed Kintore Hydrogen Plant above-ground installation (AGI) for the hydrogen export connection. No documents or details concerning the development are available at the time of undertaking the CEA.

5.1.3 Qualitatively, a development of this type and scale could have cumulative effects on the setting of designated heritage assets with Kintore Hydrogen Plant. However, without further detail of the proposal, it is not possible to make an assessment as to whether these could have the potential to be significant. It is anticipated that the battery storage plant applicant, in the course of undertaking its EIA including CEA, would identify and mitigate any significant adverse effects of the battery storage plant together with Kintore Hydrogen Plant.

Table 5.1: Cumulative developments identified for inclusion within the archaeology and cultural heritage cumulative assessment

ID	Planning ref.	Description	Address
1	APP/2022/2022	Scheme comprises formation of battery energy storage system (BESS) (49.9 megawatts), construction of substation, welfare facility, security fencing, CCTV, floodlighting, formation of access, attenuation basin and associated infrastructure.	South Leylodge Farmhouse, Kintore, Inverurie, Grampian, AB51 0XY
2	APP/2023/2310 (prev. ENQ/2023/0382)	Installation of Battery Energy Storage System (BESS) with Installed Capacity of 49.9MW, Substation and Associated Infrastructure.	Kintore Substation Kintore, Kintore, Inverurie, Grampian, AB51 0
5	APP/2022/0651	Scheme comprises national for construction of enclosed 132 kv gas insulated switchgear substation and associated infrastructure (formation of substation platform, fenced compound with cctv, siting of battery storage container, formation of access tracks, sustainable urban drainage system basin, temporary construction of compound and landscaping electricity substation comprising platform area, control building, battery storage container, associated plant and infrastructure, fencing, cctv, access tracks, sustainable urban drainage system basin and landscaping.	Land South East Of Kintore Grid Electricity Substation Leylodge Kintore Aberdeenshire AB51 0XY
6	APP/2020/1437	Scheme comprises national for electricity substation comprising platform area, control building, associated plant and infrastructure, ancillary facilities, landscape works and road alterations and improvement works.	Land To The West Of Kintore Electricity Substation Leylodge Kintore Aberdeenshire AB51 0XZ

South Leylodge Steading, stone circle 110 m W of (**SM 12350**)

5.1.4 The proposed scheme at South Leylodge Farmhouse (APP/2022/2022) is located adjacent to the east and south site boundary of the proposed development. It comprises a battery energy storage development, which is anticipated to be low-lying and would be backdropped to the north by the proposed development. It is unlikely to considerably change the predicted baseline character (as identified on LVIA visualisation VL5 Figure 6.5A-C) in views from the South Leylodge Steading, stone circle 110 m W of (**SM 12350**) in this direction should both developments be consented.

5.1.5 The proposed schemes at and around Kintore Substation (APP/2023/2310, APP/2022/0651 and APP/2020/1437) comprise additional substation elements and battery energy storage schemes. These proposed developments all closely surround the existing 400 kV Kintore Substation. They are unlikely to considerably change the existing baseline character in views from the Scheduled Monument in this direction.

5.1.6 None of these developments would interrupt intervisibility with South Fornet stone circle 250 m NW of (**SM 12353**) or south facing views from the Scheduled Monument which have been identified as key aspects of its setting.

5.1.7 The cumulative impact to the setting of South Leylodge Steading, stone circle 110 m W of (**SM 12350**) should those developments also be consented, would likely be no greater than the effect of the proposed development alone. Therefore, the impact to the cultural significance of the Scheduled Monument, resulting from changes to its setting, is predicted to be as assessed in Section 4. That is, an impact of **low** magnitude resulting in a **minor** adverse effect, which is not significant.

South Fornet, stone circle 250 m NW of (**SM 12353**)

5.1.8 The proposed scheme at South Leylodge Farmhouse (APP/2022/2022) is unlikely to considerably change the predicted baseline character (as identified on Figure 7.14) in views from South Fornet, stone circle 250 m NW of (**SM 12353**) towards the proposed development should both developments be consented.

5.1.9 The proposed schemes surrounding at and around Kintore Substation (APP/2023/2310, APP/2022/0651 and APP/2020/1437) are unlikely to considerably change the existing baseline character in views from the Scheduled Monument in this direction.

5.1.10 None of these developments will interrupt long distance views from the Scheduled Monument towards Bennachie or intervisibility with the South Leylodge Steading, stone circle 110 m W of (**SM 12350**) which have been identified as key aspects of its setting.

5.1.11 The cumulative impact to the setting of the South Fornet, stone circle 250 m NW of (**SM 12353**) should those developments also be consented, would likely be no greater than the effect of the proposed development alone. Therefore, the impact to the cultural significance of the Scheduled Monument, resulting from changes to its setting, is predicted to be as assessed in Section 4. That is, an impact of **low** magnitude resulting in a **minor** adverse effect, which is not significant.

6 Conclusion and Summary

6.1.1 A desk-based assessment and field survey have been carried out for the proposed Kintore Hydrogen Plant development. The assessment has been informed by consultation with HES and ACAS.

6.1.2 Twenty-eight cultural heritage assets were identified within the site boundary (Figure 3.1; Appendix 7.1). This includes one asset of high sensitivity; a Scheduled Monument South Leylodge Steading, stone circle 110 m W of (**SM 12350**) of prehistoric date; and two assets of medium sensitivity: Kinaldie, Canal Milestone (**2**) a milestone for the former 19th century Aberdeenshire Canal; and Bandshed Moss, Possible Cairn (**3**) a possible burial cairn of prehistoric date. The majority of the remaining assets identified in the site boundary were related to post-medieval agricultural landscape and of low sensitivity.

6.1.3 An assessment of the known cultural heritage resource within the site boundary and a 500 m buffer of the site boundary indicates that there is a **moderate** potential for hitherto unrecorded archaeological remains dating to the prehistoric period to be present throughout the proposed development site boundary. This archaeological potential may be higher in those locations proximate to known archaeological sites of prehistoric date. Any such archaeological remains could potentially be of **medium** to **high** sensitivity. The potential to encounter hitherto unrecorded medieval and post-medieval sites is assessed to be **low**. The exception to this being where the proposed development site immediately borders a section of the Aberdeenshire Canal (**SM 7675**). Any such remains associated with the Scheduled Monument could also be of national heritage value, and therefore of **high** sensitivity.

6.1.4 The proposed development's maximum design envelope does not include development extending as far as the South Leylodge Steading, stone circle 110 m W of (**SM 12350**) Scheduled Monument. Provision has been made within the Landscape Management Plan (within the Design Principles Statement) and BEMP for the avoidance of works disturbing the heritage asset Bandshed Moss, possible cairn (**3**) and for removal to avoid physical damage to the asset South Leylodge, cattle rubbing stone (**4**). As such no direct physical impacts are predicted for these cultural heritage assets.

6.1.5 Potential direct impacts arising from construction of the proposed development are predicted on seven cultural heritage assets of **low** sensitivity and two cultural heritage assets of **negligible** sensitivity. In each case the predicted effects are predicted to be of **minor** significance, which is not significant.

6.1.6 With the exception of those two assets of negligible sensitivity it has been recommended that a programme of archaeological recording and mitigation is conducted in order to preserve by record any archaeological remains which are disturbed.

6.1.7 It is possible that construction activities could also disturb or destroy any hitherto unrecorded buried archaeological remains, resulting in impacts potentially of high magnitude. Further investigation will therefore be required by ACAS and a programme of archaeological investigation and mitigation would be agreed through consultation with ACAS and set out in a Written Scheme of Investigation.

6.1.8 Formal arrangements would also be put in place for any other, unforeseen, archaeological discoveries made by construction contractors to be reported to a retained professional archaeological organisation as an Archaeological Clerk of Works.

6.1.9 A setting assessment has been conducted to ascertain whether potential significant setting impacts to designated heritage assets in the Outer Study Area may arise as a result of the proposed development. In EIA scoping, the potential for significant setting impacts to arise was suggested for two Scheduled Monuments: South Leylodge Steading, stone circle 110 m W of (**SM 12350**); and South Fornet, stone circle 250 m NW of (**SM 12353**). It was assessed that the impact to the cultural significance of these Scheduled Monuments of **high** sensitivity, resulting from changes to their settings' (including cumulative impacts), would be of a **low** magnitude. This would result in a **minor** adverse effect, which is not significant.

Table 6.1: Summary of potential environment effects, mitigation and monitoring

Description of impact	Measures adopted as part of the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional mitigation measures	Residual effect	Proposed monitoring
Construction phase							
Direct physical impacts to South Leylodge, cattle rubbing stone (**4**)	n/a	High	Low	Minor	Removal of the stone from its current location to avoid potential damage.	Negligible	None
Direct physical impacts to 'Greenmoss, building (destroyed)' (**7**)	n/a	Medium	Low	Minor	A programme of archaeological recording and mitigation will be conducted in order to preserve by record any archaeological remains which are disturbed.	Minor	None
Direct physical impacts to 'Backstyles, remains of cottages' (**9**)	n/a	Low	Low	Minor		Minor	None
Direct physical impacts to 'East Leylodge, pond south of farmstead' (**11**)	n/a	Medium	Low	Minor		Minor	None
Direct physical impacts to 'Dewsford, farmstead' (**13**)	n/a	High	Low	Minor		Minor	None
Direct physical impacts to 'Dewsford, walls/banks' (**14**)	n/a	High	Low	Minor		Minor	None
Direct physical impacts to 'Hill of Boghead, Clearance Cairns' (**19** and **20**)	n/a	High	Low	Minor		Minor	None
Direct physical impacts to 'North Leylodge, quarries' (**26**)	n/a	High	Negligible	Minor	None	Minor	None
Direct physical impacts to 'South Womblehill, pit' (**27**)	n/a	High	Negligible	Minor	None	Minor	None
Direct physical impacts to previously unrecorded archaeological remains	n/a	High	Medium to high	Moderate to major	A programme of archaeological recording and mitigation will be conducted in order to preserve by record any archaeological remains which are disturbed.	Minor	None
Operation phase							

Description of impact	Measures adopted as part of the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional mitigation measures	Residual effect	Proposed monitoring
Impacts to the setting of Scheduled Monument 'South Leylodge Steading, stone circle 110 m W of' (**SM 12350**)	The proposed development has been iteratively designed with attention to minimising visibility of buildings and structures in the landscape (including limits on building heights in different parts of the site based on its topography), and with a proposed masterplan of screening landscape planting.	Low	High	Minor	None	Minor	None
Impacts to the setting of Scheduled Monument 'South Fornet, stone circle 250 m NW of' (**SM 12353**)	As above.	Low	High	Minor	None	Minor	None

References

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