Royal HaskoningDHV
Enhancing Society Together

Section 20 Appendix 20.1
LVIA Methodology

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1. Introduction

The purpose of the landscape and visual assessment (LVIA) process is to identify the potential effects of a proposed development on the landscape and visual amenity resource of the area in which the development is located.

The European Landscape Convention (ELC), to which the UK is a signatory, adopts the following definition of landscape:

Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. (Council of Europe, 2000)

The key principle established by this definition is that it moves beyond the idea that landscape is only a matter of aesthetics and visual amenity and that a holistic assessment approach should be taken, based on the nature of the development proposal and the characteristics of the area in which it is proposed.

Article 2 of the ELC makes it clear that the definition of landscape is inclusive and applies equally to rural, urban and marine areas, and whatever their condition may be:

Subject to the provisions contained in Article 15, this convention applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban. It includes land, inland water and marine areas. It concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes. (Council of Europe, 2000)

LVIA is either carried out formally as part of the Environmental Impact Assessment (EIA) process or informally as a contribution to an 'appraisal' or general understanding of the environmental effects of a development. In both cases the general principles and approach remain the same but the 'appraisal' approach may be simplified.

The key purpose of EIA Directives and legislation is to ensure that *likely significant effects* on the environment are taken into account during the development control process. This methodology has been prepared to identify *likely significant landscape and visual effects* to inform the EIA and decision making process, but also to identify lesser effects, to help provide a rounded picture of the effect a development proposal may have on its landscape and visual context.

The terminology adopted in the LVIA assessment makes a clear distinction between **impact**, as the action being taken and **effect** being the result of that action.

2. Guidance and Approach

This assessment methodology has been developed from the general guidance given in the following publications:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition Landscape Institute & Institute of Environmental Management and Assessment 2013;
- Landscape Character Assessment Guidance, Land Use Consultants & University of Sheffield on behalf of the Countryside Agency & Scottish National Heritage, 2002;
- Guidelines for Environmental Impact Assessment, Institute of Environmental Management and Assessment, 2004.

It should be noted that the above guidance does not provide a prescriptive LVIA methodology and relies on practitioners to develop their own specific methodologies based on the characteristics of the development proposal at hand and the landscape in which it is located, combined with professional judgement and experience. This methodology sets out the general approach to the LVIA process adopted by Estell Warren Ltd. Project specific methodology (as described in

section 7 below) would be further defined based on the nature of the development, the characteristics of the landscape setting and the outcome of discussions with the planning authority and key stakeholders.

EIA Regulations[1] specify that an assessment of likely significant effects should cover certain aspects of a proposed development, these are set out in Table 1 below and cross referenced to the LVIA process for clarity:

Table 1: Relationship between EIA Regulations and LVIA Process

EIA Aspects	Interpretation of EIA Aspects Within LVIA Process/ Reporting
Direct effects	Direct physical effects of a proposal should be described in the LVIA, including quantities where appropriate (for example, loss of Xha broadleaved woodland).
Indirect and secondary effects	Indirect effects include perceptual and visual effects on landscape character and visual effects on specific receptors. Secondary effects may include further LVIA effects arising from related development, which may be remote from the development site itself (for example, borrow pits, requirement for additional permanent power supplies, off site drainage improvements).
Cumulative effects	The LVIA process should identify, in consultation with the planning authority, whether cumulative effects are likely to arise or not, based on the nature of the development proposal and its context. If potential for cumulative LVIA effects exists the assessment should address this issue.
Whether effects are likely to be short, medium or long term	The LVIA process should identify effects during various stages of a project including the construction stage and/or phased implementation.
Whether effects are temporary or permanent	In relation to the above, the LVIA process should identify whether effects are temporary or permanent (eg are they reversible or irreversible). For certain developments LVIA effects at decommissioning stage should also be assessed.
Whether effects are positive or negative	This is interpreted as either a *beneficial* (positive) or *adverse* (negative) effect in LVIA terms.

3. *Use of Selected Viewpoint or Complete Receptor Assessment*

The GLVIA (at paragraphs 6.16 to 6.24) discuss the use of representative 'viewpoints' as part of the LVIA process. In some cases, depending on the nature of the proposed development and sensitivity of the landscape context, it may be more appropriate to undertake a full assessment of receptors rather than base the assessment on a limited range of viewpoints.

For this assessment all visual receptors within 1km of the development boundary have been considered in the assessment and selected receptors beyond this distance have been assessed where intervisibility with the development would occur.

[1] Schedule 4, Part 1 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2011

4. Overview of Assessment Process

The assessment process comprises:

- Establishment of the *landscape* baseline condition through identification of physical and perceptual landscape characteristics within the site and the surrounding study area (in the form of landscape character assessment) and identification of landscape designations or special interests (including related planning policies);

- Establishment of the *visual* baseline condition through identification and analysis of the existing visual resource that may be affected including the extent and nature of principle views to the proposed development from visual receptors in the study area;

- Identification of landscape and visual receptors to be assessed and assignation of their sensitivity to change;

- Assessment of the occurrence, magnitude and significance of the effects of the proposed development on landscape and visual receptors;

- Iterative development of design changes and/or mitigation measures to avoid, reduce or offset identified adverse effects;

- Re-assessment of effects, on the assumption of established mitigation measures being in place, to identify any residual environmental effects.

Two categories of effects are considered:

- Landscape effects relate to changes in the physical fabric, and/or character of the landscape. Landscape effects may include direct impact upon specific physical landscape elements (for example loss of distinctive topography, woodland or hedgerows) or effects on wider landscape character (for example available views of the development, lighting or sound effects, which may affect how the wider landscape is perceived). Effects on areas of designated landscape (for example National Parks) are also included in this category;

- Visual effects relate to changes that would occur in the composition of view character as a result of implementing a development. View receptors include residents, users of public rights of way, of roads and of recreational facilities. Effects in views from cultural heritage features (for example World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, other sites of archaeological interest, Listed Buildings and Conservation Areas) may also considered within this category where they are known to be of tourist or community importance.

The key part of the assessment process is the identification of the *significance* of landscape and visual effects. In identifying *significance* a number of factors are considered, including the *sensitivity* of the affected landscape or visual receptor to change, the *magnitude* of the effect and whether effects are beneficial or adverse.

The relative *sensitivity* to change of the landscape and visual resource may vary, for example; a small-scale rural landscape with historic features may be more sensitive to change than an area of undulating topography with enlarged field patterns or an urban fringe landscape which has been modified by man-made detractors. Residents and users of public rights of way would normally be considered more sensitive to change than drivers, given the relative speed at which the observer moves and the transitory nature of views from roads.

The magnitude of an effect depends on the degree to which physical landscape change, landscape character change or change in view character would occur as a result of the development being implemented.

The *duration* and *reversibility* of effects is also taken into account.

For physical landscape features the assessment of magnitude takes into account whether the change is considered to be irreversible or reversible over the short (0-5 years), medium (5-15 years) or long term (15 years plus). For example, removal of ancient semi-natural woodland may be considered irreversible whereas removal of recently planted woodland may be reversible over the short to medium term.

For landscape character and visual receptors the duration and reversibility of a development is identified and noted separately, with the assessment setting out different magnitude (and significance) results for different distinct periods or stages of a development. For example, the effects of a mineral extraction development would be assessed separately for the operational and post operational stages, to allow a clear understanding of the different changes on the landscape or within views over time, including the effects that may be associated with landscape mitigation measures. Timescales for identified LVIA effects should correspond with those set out in the ES for the development as a whole.

5. Extent of Study Area

A 1km study area, extending from the outer limits of the proposed development has been used. Landscape and visual receptors within this distance have been identified and considered within the assessment.

In addition, wider landscape receptors and selected visual receptors which obtain intervisibility with the proposed development have also been considered in the assessment.

6. Zone of Theoretical Visibility

Zone of theoretical visibility mapping has not been used for this assessment on the basis that a sufficiently accurate model could not reasonably be prepared to reflect the complex array of man-made structures and detailed topography that surrounds the development site and influences views towards it.

7. Assessment Limitations

Site assessment is undertaken by a qualified landscape architect using publicly accessible viewpoints. Assessment of residential property and other non-accessible receptors is estimated based on effects identified from the closest publicly accessible areas.

The assessment of visual effects is based on views from ground floor areas, including gardens for residential property.

Visual containment and screening provided by vegetation cover does not remain constant throughout the year. The assessment of effects is based on an estimate of worst case winter views, where deciduous woody species have lost their leaves and a filtering branch structure remains. Where possible, depending on assessment timescale, a combination of in-leaf and out of leaf photographs will be taken and included within the LVIA report.

8. Assessment of Landscape Effects

The GLVIA state (at paragraph 5.1):

An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. (LI & IEMA, 2013)

The landscape baseline should be established using existing Landscape Character Assessment (LCA) studies (where available, of relevant scale and up to date) or additional/ new LCA should be undertaken in accordance with current guidelines to establish Landscape Character Areas within the study area. Where existing LCA information is to be used a judgement should be made as to accuracy and suitability for the purposes of LVIA; for example are key characteristics representative of what is seen on the ground? Are character area boundaries accurate and consistent?

Landscape receptors may include Landscape Character Areas, specific Landscape Types within the Character Areas, and international, national or locally designated areas and features (for example National Parks, Areas of Outstanding Natural Beauty, Special Landscape Areas and Areas of High/ Great Landscape Value). The GLVIA identifies that within the overall framework of LCA and landscape designations more specific landscape receptors, or components, may be identified such as *overall character and key characteristics, individual elements or features, and specific aesthetic or perceptual aspects*. A key part of the LVIA process is to establish which range of landscape receptors are likely to be affected by a proposed development before taking them forward for assessment.

The *sensitivity* of identified landscape receptors can be derived from a judgement of the *value* attached to a landscape and its *susceptibility* to the specific change associated with the type of development being assessed (see GLVIA Figure 5.1 and paragraphs 5.39 to 5.47). It should be noted that the sensitivity of a landscape receptor to the type of development being assessed may be different to the inherent sensitivity that may be identified in general LCA or other sensitivity studies.

Determination of Landscape Receptor Value

As noted at paragraph 5.45 of the GLVIA the value of landscape receptors will, to a degree, reflect landscape designations, but may be moderated by consideration of the range of factors set out in Box 5.1 of the GLVIA. In the same vein a non-designated landscape may be given a higher value based on consideration of the Box 5.1 factors.

The following approach is used to identify landscape quality:

- Identify any designations assigned to the landscape and give an initial value according to the level of designation;
- Moderate the initial value based on an assessment of criteria given in Box 5.1 to give a final value.

Table 2 sets out typical criteria for assessing landscape value:

Table 2: Assessment of Landscape Receptor Value		
Low	**Medium**	**High**
Non-designated landscapes.	Locally designated landscapes.	Internationally and nationally designated landscapes and landscape features.
Consideration of other value criteria (assessed on a project by project basis with examples given below)		
Condition/ quality		
A landscape with no or few areas intact and/or in poor condition.	A landscape with some areas that are intact and/or in reasonable condition.	A landscape with most areas intact and/or in good condition.
Scenic quality		
A landscape of little or no aesthetic appeal.	A landscape of some aesthetic appeal.	A landscape of high aesthetic appeal.

Rarity and representativeness		
A landscape which does not contain rare landscape types or features.	A landscape which contains distinct but not rare landscape types or features.	A landscape which contains one or more rare landscape types or features.
Conservation interests		
A landscape with no or limited cultural and/or nature conservation content.	A landscape with some cultural and/or nature conservation content.	A landscape with rich cultural and/or nature conservation content.
Recreation value		
A landscape with no or limited contribution to recreational experience.	A landscape which provides some contribution to recreational experience.	A distinct landscape which forms a strong contribution to recreational experience.
Perceptual aspects		
A landscape with prominent detractors, probably part of the key characteristics.	A landscape with detractors that also retains some perceptual values.	A wild, tranquil or unspoilt landscape without noticeable detractors.
Cultural associations		
A landscape without recorded associations.	A landscape with some and/or moderately valued associations.	A landscape of rich and/or highly valued associations.
Overall judgement of landscape value		
Low value – receptor poorly reflects high and medium value criteria above.	**Medium value** – receptor moderately reflects high and medium value criteria above.	**High value** – receptor strongly reflects high and medium value criteria above.

Value judgements will be recorded for each landscape receptor using the above format.

Determination of susceptibility

The susceptibility of a landscape receptor to change is assessed based on the broad criteria below in combination with consideration of the nature of the development proposal. Table 3 is shown as an example, criteria may change depending on project type. Susceptibility assessment will distinguish between receptors which are expected to be directly (eg physically) or indirectly (eg visually, aurally) affected, to ensure that the final judgement on sensitivity reflects the likely effects of a scheme rather than overall landscape sensitivity to change.

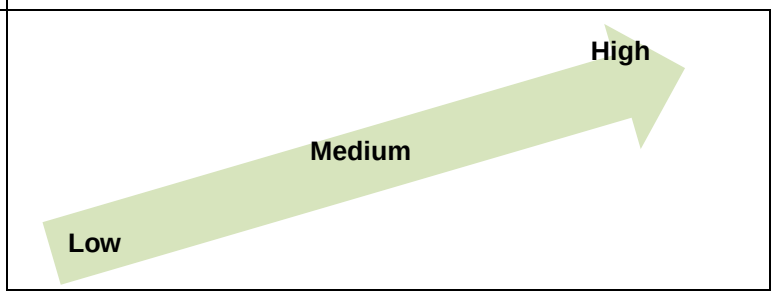
Table 3: Assessment of Landscape Receptor Susceptibility		
Less susceptible to change	***Moderately susceptible to change***	***Highly susceptible to change***
Pattern, complexity and physical susceptibility to change		
A simple, monotonous and/or degraded landscape with common/ indistinct features and minimal variation in landscape pattern.	A landscape with mostly intact pattern and/or with a degree of complexity and with features mostly in reasonable condition.	A strongly patterned/ textured or a simple but distinctive landscape and/or with high value features and essentially intact.
Visual susceptibility to change		
A very enclosed landscape which contains or strongly filters views, with an absence of visual landmarks and a lack of intervisibility with designated landscapes.	A partially enclosed landscape with some visual containment and filtering, possible limited intervisibility with visual landmarks and designated landscapes.	An open or exposed landscape with extensive intervisibility and no or very limited visual filtering or enclosure. Prominent visual landmarks may be present, and intervisibility with designated landscapes may occur.

Experiential susceptibility		
A landscape with prominent visual and/or aural intrusion and close relationship with large scale built development/ infrastructure. A landscape which contains many light sources and essentially suffers from light pollution.	A partially tranquil landscape with limited visual and/or aural intrusion, some relationship with built development/ infrastructure may be present. A landscape which contains some light sources.	A very tranquil, wild or remote landscape with little or no sense of visual or aural intrusion. A landscape which contains very few light sources and provides dark skies.

Sensitivity

The general relationship between value, susceptibility and sensitivity is shown in Table 4.

Table 4: Assessment of Landscape Sensitivity	**Susceptibility of landscape receptor**		
	Low	Medium	High
Receptor value High			
Medium			
Low			



Determination of sensitivity is based on professional judgement, however, high value/ high susceptibility receptors are likely to be highly sensitive to change, with lower value and/or low susceptibility receptors being likely to be of low sensitivity to change. A three point scale is used to define landscape receptor sensitivity:

- High
- Medium
- Low

Magnitude

The magnitude of change arising from a development on landscape receptors is identified using broad criteria derived from the Guidelines (size/ scale of change, degree of contrast or integration, duration and reversibility). Magnitude of change values for landscape receptors may be interpreted as shown in Table 5.

Table 5: Assessment of Magnitude of Change for Landscape Receptors	
Magnitude	**Typical Criteria for Landscape Receptors**
High	Major removal or addition of landscape features or removal of localised but unusual or distinctive landscape features and/or addition of new conspicuous features and elements which may alter the character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are not replaceable or are replaceable only in the long term.

Medium	Moderate removal or addition of landscape features and/or addition of new noticeable features and elements which would be clearly visible but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are replaceable in the medium term.
Low	Minor removal or addition of landscape features and/or addition of new discrete features and elements which would be perceptible within but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are readily replaceable in the short term.
Negligible	Barely perceptible removal or addition of landscape features would occur and the development would be barely perceptible in visual/ character terms.

Beneficial or Adverse Change

Magnitude is also assessed as being either a beneficial or adverse change where:

- For beneficial change the proposed development, or part of it, would appear in keeping with existing landscape character and would make a positive visual and/or physical contribution to key characteristics. Removal of uncharacteristic features would also be a beneficial change;

- For adverse change the proposed development, or part of it, would be perceived as an alien or intrusive component in the context of existing landscape character and would have a negative visual and/ or physical effect on key characteristics.

Perceptual Effects

Certain landscape characteristics may relate to perceptual qualities, for example tranquillity, wildness, sounds, human activities or the presence and movement of wildlife.

Where appropriate, an assessment of effects on perceptual landscape qualities should be undertaken. Available quantitative evidence from other EIA disciplines for example noise, lighting, transport or ecology assessments, may be used to help inform an understanding of the degree of potential change to perceptual qualities. It should be recognised, however, that LVIA commentary on effects on perceptual characteristics is likely to remain subjective.

9. Assessment of Visual Effects

For *visual receptors* the criteria adopted for classification of sensitivity and magnitude are as follows:

Sensitivity

A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity for each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself.

Exceptions to the above principle may include users of the landscape in heavily industrialised or urban areas, where expectations of the experiential contribution made by the landscape are often likely to be less than for open countryside. Drivers on faster roads (eg 'A' and 'B' class roads and motorways) are considered to be of lower sensitivity than those using minor country lanes, where the purpose of the journey may include an element of appreciating the surroundings, rather than simply moving from A to B.

Effects in views from cultural heritage sites are included where appropriate, for example when they are known to be used by tourists, form part of the overall tourist experience (for example where they are a noticeable contributor to the key characteristics of a place) or where they form a local community feature. Effects on the setting of cultural heritage features are not included in this assessment and would be covered separately under the Cultural Heritage section of the ES where appropriate.

Table 6: Visual Receptor Sensitivity	
Sensitivity	**Typical Criteria for Visual Receptors**
High	Users of residential properties, public rights of way, named viewpoints and scenic roads or railways. Users of cultural heritage features including World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, Listed Buildings and Conservation Areas where they are known to be tourist destinations or places used by local communities.
Medium	Users of public rights of way (urban or industrial areas) play areas, sporting and outdoor active recreational facilities and rural roads.
Low	Users of office and employment areas, industrial areas and the main road and rail network.

Magnitude

The magnitude of change arising from a development on visual receptors is identified using broad criteria derived from the Guidelines (size/ scale of change, degree of contrast or integration, duration and reversibility). Magnitude of change values for visual receptors may be interpreted as shown in Table 7.

Table 7: Assessment of Magnitude of Change for Visual Receptors	
Magnitude	**Typical Criteria for Visual Receptors**
High	The proposed development, or part of it, would become the dominant feature or focal point of the view.
Medium	The proposed development, or part of it, would form a noticeable feature or element of the view.
Low	The proposed development, or part of it, would be perceptible but would not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the proposed development would be discernible, or the development is at such a distance that it would form a barely noticeable feature or element of the view.

Beneficial or Adverse Change

Magnitude is assessed as being either a beneficial or adverse change where:

- For beneficial change the proposed development, or part of it, would be perceived as a positive addition in the context of existing view character;
- For adverse change the proposed development, or part of it, would be perceived as an alien or intrusive component in the context of existing view character.

View Value

Where a view is recognised as being of special value, for example in relation to a scenic drive, a named panoramic viewpoint or distinct views which feature in literature or art, this would be recorded and commentary provided in the assessment.

10. Significance of Landscape and Visual Effects

The *significance* of an effect is dependent on the *sensitivity* of a landscape resource or visual receptor and the *magnitude* of the change. The significance of an effect can be understood to occur on a sliding scale between sensitivity and magnitude as shown in Table 8.

Table 8: Assessment of Significance

		Sensitivity of receptor		
		Low	Medium	High
Magnitude of change	High			Major
	Medium		Moderate	
	Low	Minor		
	Negligible	Negligible		

Professional judgement and experience is used to identify levels of significance of effect for each receptor with the outcome being reported on a six point scale:

- Major
- Moderate major
- Moderate
- Minor moderate
- Minor
- Negligible

The points on the scale can generally be defined as shown in Table 9. The intermediary categories of minor negligible, minor moderate and moderate major will be used where the significance of effect is considered to fall between the broad definitions outlined below.

Table 9: Definition of Significance Scale	
Criteria	**Description**
Major	Large scale changes in landscape or visual conditions, affecting high sensitivity receptors.
Moderate	Noticeable changes in landscape or visual conditions, likely to be affecting high or medium sensitivity receptors.
Minor	Small changes in landscape or visual conditions, affecting any receptors.
Negligible	Insignificant changes in landscape or visual conditions, affecting any receptors.

For the purposes of this report **moderate, moderate/major** and **major effects** should be considered as likely significant effects in terms of EIA Regulations.

The identified *significance* of an effect carries forward the *beneficial* or *adverse* nature of the effect identified in the assessment of *magnitude*.

11. Duration and Permanency of Effects, Assessment of Mitigation Measures and Residual Effects

A development may have different effects on landscape and visual receptors at different points in time. For example, construction effects may be different to operational effects, or a project may be built in discrete phases.

The assessment process should identify and record the effects on landscape and visual receptors at appropriate stages in the life of a development and state whether these effects are temporary or permanent and over which timescales they would occur.

For physical loss of landscape features the potential reversibility (or irreversibility) of the effect is taken into account in the assessment of magnitude of change. Where reversible effects occur commentary should also be provided on the timescales likely to be involved in re-establishing the feature (short term 0-5 years, medium term 5-15 years or long term 15 years plus). For landscape character and visual effects duration and permanency are taken into account through the assessment of the scheme at distinct stages, with key relationships being drawn out in supporting text.

Built-in mitigation measures are taken into account as part of the initial assessment of effects. The longer term effect of mitigation measures, for example planting works, is identified separately by assessing subsequent phases and/or the long term residual effects of a scheme. Where a project involves the planned long term removal of development features, as may occur in renewable energy schemes for example, this would also be taken into account during the assessment of residual effects.

12. Cumulative Effects

The 2002 edition of the GLVIA provides a definition of cumulative landscape and visual effects as those that:

'result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.'

Discussions with the planning authority and key stakeholders should be undertaken to establish whether likely cumulative significant effects could arise from landscape and visual changes

associated with the development proposal. 'Actions likely to occur in the foreseeable future' should be interpreted as live or approved planning applications.

In this instance cumulative development is considered to consist of the existing industrial development that surrounds the proposed development site and the expectation that further new, or replacement similar scale industrial development could replace existing development or infill currently vacant development plots.

The assessment takes the cumulative effect of existing development into account as part of the study area baseline and within the reporting of overall landscape and visual effects.

13. Iterative EIA Process and Mitigation Design

EIA and project development activities are normally parallel processes. The outcome of EIA studies should feed back into the design process to ensure environmental factors are taken account of, with the overall aim of avoiding adverse environmental effects in the first instance or reducing unavoidable impacts to acceptable levels.

Based on the initial findings of the LVIA process design changes and/or landscape measures may be proposed to help integrate a development into its landscape setting and to mitigate any adverse landscape or visual effects that have been identified. The LVIA should record this process and identify which measures have been incorporated into a scheme.

End.