Low Level Waste Repository:
Site Optimisation and Closure Works
Environmental Statement

Appendix E: Landscape and Visual Impact Assessment
June 2011

Prepared for

LLW Repository Ltd

Revision Schedule

Appendix E: Landscape and Visual Impact Assessment
June 2011

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1 Introduction

1.1 Objectives

1.1.1 This Appendix contains a Landscape and Visual Impact Assessment (LVIA) of the proposed optimisation and closure works at the LLWR site and assesses the proposed optimisation and closure works at the LLWR site (the Scheme) as detailed in Volume I of the ES. Associated Figures are included in the rear of this volume of the ES.

1.1.2 The purpose of this LVIA is to:

- provide an overview of the existing or "baseline" landscape character and visual context of the site, drawn from published data;
- assess the implications and effects of the proposed development and capping on landscape character and visual amenity i.e. consider likely impacts from the development;
- consider relevant mitigation; and
- provide an assessment of the nature and significance of residual predicted effects (i.e. those impacts which cannot practicably be further reduced through mitigation) of the development and capping works, in order to inform the planning process.

1.2 Scope

1.2.1 The location of the LLWR site is shown on Figure 10.1 "Landscape & Visual Context and Photoviewpoint Locations".

1.2.2 The scope of the LVIA is to assess landscape and visual effects of the scheme on the baseline landscape character and visual context of the LLWR site, identify mitigation and assess significance of the effects. The assessment considers effects at the following stages;

- during the sequential capping and operational life of the site, including disposal of LLW within the vaults;
- on completion of capping of the vaults and trenches;
- 10 years after completion of capping, allowing a period for planting to mature.

1.3 Structure

1.3.1 Following assessment of the baseline landscape and visual context of the development the LVIA assesses the:

- sensitivity of receptors, whether the landscape or visual receptors;
- magnitude of effects, whether adverse of beneficial; and
- significance of the effects based on a comparison of sensitivity of receptor to magnitude of effects.

1.3.2 The LVIA is structured as outlined below:

- Introduction
- Baseline Landscape Character Assessment
- Potential Landscape Effects of the Proposed Development
- Baseline Visual Assessment
- Potential Visual Effects of the Proposed Development
- Summary of Visual Impacts and Significance
- Conclusion

1.4 Methodology

1.4.1 The format and content of this assessment is based on guidance from the Countryside Agency/Scottish Natural Heritage and the Landscape Institute and Institute of Environmental Management and Assessment given in:

- Guidelines for Landscape and Visual Impact Assessment, Second Edition, IEMA/LI 2002 (GLVIA); and
- Landscape Character Assessment, (Guidance for England & Scotland) 2002 (CA/SNH 2002).

1.4.2 These publications, supplemented by additional government guidance and topic papers, form the standard reference for undertaking landscape character and visual assessment in the UK.

1.4.3 The guidance referred to above recommends a two stage approach to landscape and visual assessment comprising an initial desktop Study and review of published information, including designations, followed by a site based visit.

1.5 Terminology

1.5.1 For the purposes of the LVIA, a clear distinction is drawn between landscape and visual impacts as follows:

- Landscape impacts: relate to the impacts of the proposed development upon the physical characteristics or components of the landscape. Together, these form the character of that landscape (e.g. landform, vegetation, and buildings); and
- Visual impacts: relate to the changes arising from development to individual 'receptors' views of that landscape (e.g. local residents, footpath users or passing motorists).

1.6 Baseline Conditions

1.6.1 The LVIA prepared in 2007 by the Ian Brown Consultancy in relation to the construction and operation of Vault 9 (as distinct to its capping) has been consulted as a baseline reference in addition to the work undertaken for this LVIA.

1.6.2 The baseline landscape and visual conditions were assessed through both desktop and site appraisal during the early part of 2011 (i.e. with deciduous vegetation not in leaf), specifically during a site visit on 28 January 2011.

1.6.3 The combination of these two sources is taken as the baseline against which the proposed development is assessed.

1.7 Study Area

1.7.1 The Study Area for the assessment of the landscape and visual impacts has been defined, in part, by the Zone of Theoretical Visibility (ZTV) of the final capping landform, modelled on the maximum theoretical visibility within a bare-earth model. This has been modified by professional judgement to encompass a representative Study Area, appropriate for the nature of the development, as identified on Figure 10.1.

1.7.2 The ZTV has been established by initial analysis of topographic maps, 3D digital modelling and terrain analysis followed by field survey verification.

1.8 Technical Difficulties

1.8.1 No technical difficulties or practical problems were encountered in carrying out the landscape and visual assessment presented in this document although private land outside of the control of the applicant, including properties closest to the proposed development, was not accessed.

1.9 Figures

1.9.1 The following Figures referenced in this LVIA are included in Volume III of the ES:

- Figure 3.7: LLWR Restoration Masterplan
- Figure 10.1: Landscape & Visual Context and Photoviewpoint Locations;
- Figure 10.2: Landscape Character Areas;
- Figure 10.3: Landform Analysis;
- Figure 10.4: Local Landscape Character & Designations;
- Figure 10.5: Zone of Theoretical Visibility (ZTV) of the Final Landform;
- Figures 10.6 to 10.11: Photoviewpoints 1 to 14;
- Figure 10.12: Sightline Sections
- Figures 10.13 to 10.16: Photomontages from Summer View, The Stubble, Stony Howe and Stubble Green.

2 Baseline Landscape Character Assessment

2.1 Introduction

2.1.1 The LVIA which accompanied the 2007 Vault 9 Environmental Statement, verified by reference to published sources, has been used as a relevant source of baseline landscape and visual data, supplemented by reference to more recently published reports and in-situ survey.

2.2 National, County Council & Local Council Landscape Designations

2.2.1 The site does not lie within any area of national or local landscape designation such as a National park, an Area of Outstanding Natural Beauty (AONB) or Area of Great Landscape Value or similar local landscape designation.

2.2.2 Designations or land use categories which relate fully, or in part, to landscape value in the vicinity of the LLWR site are shown on Figure 10.4, if located within the Study area, and include:

- The Lake District National Park;
- Land owned by the National Trust;
- 'Landscape of County Importance' between Sellafield and St Bees Head;
- Coastal Zones (Developed / Undeveloped) – the LLWR site lies within an undeveloped zone;
- Access Land outside the National Park boundary, including the Drigg Dunes and Beach which adjoins the LLW Repository boundary;
- Drigg Coast SAC / SSSI;
- Site of Walls Castle Roman fort and remains of Roman bath house at Ravenglass (*Glannaventa*);
- Muncaster Castle;
- Ravenglass Conservation Area.

2.2.3 Conservation Areas and listed buildings, whilst not a specific landscape designation, reflect landscape and architectural quality and may therefore relevant to development proposals which may impact upon them. The impact on listed buildings and conservation areas is considered under the Cultural Heritage assessment.

2.3 National Character Areas

2.3.1 National Character Areas (NCAs), identified by Natural England, form the national level of landscape assessment within which other smaller scale assessments are undertaken, including those carried out by Local Authorities and site-specific assessments.

2.3.2 The NCAs are used as a tool to define management objectives for the county that seek to strengthen landscape characteristics and retain diversity through the adoption of targeted strategies for landscape development.

2.3.3 Overlaying the LLWR site onto a GIS base of the National Character Areas indicates that the Site falls within NCA 07 "West Cumbria Coastal Plain", whilst the Study Area encompasses both NCA 07 and NCA 08 "Cumbria High Fells".

The key characteristics of the West Cumbria Coastal Plain (NCA07)

2.3.4 The key characteristics of NCA 07, relevant to the development site, reproduced from the written description on the Natural England website, are:

Table 2.1: NCA 07 West Cumbria Coastal Plain

NCA 07 Key Characteristics
Strong industrial history associated formerly with the mining of coal and iron ore and more recently, the chemical industry, power generation and nuclear reprocessing.
Varied open coastline of mudflats, shingle and pebble beaches with localised sections of dunes, sandy beaches and sandstone cliffs.
Lowland river valleys with limited semi-natural ancient woodland, lowland raised mires and expansive estuarine landscapes with a range of intertidal habitats.
Gently undulating or flat improved pasture with hedgerows, wind-sheared trees and wire fences, occasional woodlands and copses, wetlands and herb-rich meadows.
Open agricultural landscapes that have extensive views to the higher fells in the east.
Extensive urban fringe areas within the coastal belt with large highly visible factories and manufacturing and processing plants, particularly near Workington, Whitehaven, Sellafield and Barrow.

2.3.5 The landscape context of the LLWR site exhibits many of these key characteristics and they are taken as an appropriate description of it, although the industrial/urban influences are of more significance immediately adjacent to the LLWR site.

2.3.6 Although the facilities of the LLWR and Sellafield detract from their local settings, the underlying rural character of the 'Coastal Plain' in the Study area is generally intact.

2.3.7 Similarly whilst there is an indirect effect on the landscape character of NCA 08 "Cumbria High Fells" from the LLWR site, derived from industrialisation in proximity to it, it does not form a significant detracting factor.

2.4 Local Landscape Assessments

2.4.1 The 'Cumbria Landscape Classification', 1995 and 'Technical Paper 5 – Landscape Character', 2003, both published by Cumbria County Council, characterised the Cumbrian landscape. The recent publication of the Cumbria Landscape Character Guidance and Toolkit (Parts 1 and 2) published as a consultation draft in July 2010 reviewed the 13 broad landscape types and 37 sub types in the original landscape assessment.

2.4.2 The review confirmed that the landscape types are still largely appropriate for Cumbria. Some boundary changes were made to better reflect the character in 2010 and to better align with the Lake District National Park landscape character assessment. The LLWR site remains on the transition between Type 5 Lowland LCA, within the Sub-type 5b Low Farmland, and Type 2 Coastal Margins, Sub-type 2a Dunes & Beaches.

2.4.3 The location of the LLWR site in relation to these landscape types is indicated on Figure 10.4.

2.4.4 The key characteristics of the two character types are provided in the table below, taken from the Cumbria Landscape Character Guidance and Toolkit (Parts 1 and 2) July 2010:

Table 2.2: Cumbria Landscape Character Guidance and Toolkit 2010, Landscape Character Types Key Characteristics

LCA 5b Low Farmland	LCA2a Dunes & Beaches
Undulating and rolling topography.	Hummocky dunes and flat raised beaches.
Intensely farmed agricultural pasture dominates.	Beaches of mud, sand, shingle and pebbles.
Patchy areas of woodland provide contrast to the pasture.	Semi-natural grassland dominates.
Woodland is uncommon west towards the coast.	Isolated farms and linear stone villages
Fields are large and rectangular.	Bounded by small roads leading to minor tracks and paths.
Hedges, hedgerow trees and fences bound fields and criss-cross up and over the rolling landscape.	Strong sense of tranquillity in some parts.

2.4.5 Other landscape types within the Study area but not directly adjacent to the LLWR site include.

- Type 1a – Intertidal Flats
- Type 11a – Foothills

2.4.6 The LLWR site context is regarded as being typical of the Sub-type 5B and sub-type 2a landscapes described in Table 2.2 although the LLWR site itself is industrial in character and atypical of the landscape context, as described below.

2.5 Site Specific Landscape Assessment

2.5.1 Landscape character assessment is a hierarchical process descending from the national to regional to local scale and ultimately to site-specific studies. The regional and county based landscape character assessments referred to in this assessment are at a scale further up the hierarchy and serve to provide an overview of landscape context in which to place the site specific townscape context.

2.5.2 A site-specific landscape assessment has been undertaken in order to identify the key characteristics of the landscape and also to make an assessment of factors such as the landscape quality, sensitivity and capacity to absorb change or development. The site-specific assessment deals both with the application site and land in the immediate vicinity which in this case, based on the nature of the landscape, has been confined to the landscape context/Study area defined on Figure 10.1.

2.5.3 The site-specific assessment adds detail to the less specific assessments undertaken at a broader scale, including those from Natural England and the Cumbria Landscape Character Guidance and Toolkit (Parts 1 and 2) July 2010.

Site Context and Description

2.5.4 The LLWR site occupies approximately 110ha and is located approximately 1.0km to the west of Drigg and immediately west of the Cumbria Coast railway line. The southern section of the LLWR, including the Site Access lies immediately to the south of Trenches 1 to 7. The railway acts as a physical barrier and largely defines the extent of built development to the east as well as defining the eastern boundary of the LLWR.

2.5.5 The current land-uses include; the capped trenches, areas of waste storage in vaults, offices and other LLWR uses, buildings and peripheral storage areas and a belt of maturing tree cover on the northern and eastern boundaries with more recent planting on the southern and parts of the western boundaries.

2.5.6 The LLWR site is highly visible in close proximity but becomes increasingly difficult to distinguish within a short distance due to the absence of clearly identifiable features and the similarity of the built development in scale and colour to buildings in the vicinity. Similarly, with the exception of the perimeter fence, the LLWR site merges visually with the sand dunes from a number of locations such that it is not visually prominent.

Landscape Characteristics

Topography

2.5.7 Refer to Figure 10.3, which shows the landform context/analysis by height within the Study area.

2.5.8 The LLWR site is located in land which has an elevation varying typically between 20 to 30m aOD. The LLWR site slopes gently to the south-west from approximately 20m above sea level at the north eastern boundary to approximately 7m above sea level on the south western boundary. Ground levels in the vicinity of the site follow the general trend of the Coastal Plain by gradually rising from the shore to the foothills of, and then steeply upward to, the Cumbria High Fells which dominate the landform and reach a height of over 200m aOD within the Study

area and ultimately to over 900m within the Scafell massif which is visible on clear days. Landform within the coastal plain is largely gently sloping within the low farmland but locally more undulating in the dunes.

2.5.9 Within the Study area the outlying ridgeline of Muncaster Fell and Irton Pike form dominant areas of higher ground extending from the high fells into the Coastal Plain.

2.5.10 Contours at a 25m interval and height shaded landform within the Study area are illustrated on Figure 10.3, "Landform Analysis".

Drainage

2.5.11 The landscape of the Study area is dominated by the presence of the sea and the winding estuary of the River Irt which extends inland before becoming a small river which is only occasionally locally visible. Standing freshwater in the form of lakes or ponds does not form a conspicuous element of the landscape. A network of ditches and drains takes water from the farmland towards the coast.

Land use

2.5.12 Land within the site is not prominently visible apart from in close proximity on the boundary. The boundary itself imparts a military/industrial character to the immediate area as a result of the nature and height of the perimeter fences. The railway and coal yard to the north of the development reinforce this character.

2.5.13 Away from the LLWR site, land use along the shore, within the dunes and beaches landscape sub-type is dominated by tidal flats, sand dunes and occasional low lying fields used as pasture with few hedges. Agricultural land to the east, within the 'Coastal Plain' is a medium scale pastoral landscape of medium to large fields of improved pasture bounded by hedgerows with increasing numbers of hedgerow trees extending into the foothills of the fells. In clear weather, almost everywhere offers distant views of the high fells.

2.5.14 The boundary between the dunes and the coastal plain is intersected by a network of minor public roads and private lanes, many of which are Public Rights of Way.

2.5.15 Drigg is the closest village, situated immediately east of the site. Holmrook is approximately 1.5km to the north east of Drigg and approximately 2km east of the Reference Disposal Area. The village of Seascale is located approximately 1 km to the north of the site and the development site whilst Ravenglass is located 3km from the southern boundary of the site and 4 km from the development site (Figure 10.1). The villages of Drigg, Holmrook and Ravenglass have retained a traditional character although the larger Seascale has a more urban character. Groups of properties occur in close proximity to the LLWR site, for example along the B5344 and adjacent to and associated with the Cumbria Coast railway line.

2.5.16 The industrial complex of Sellafield is a prominent but distant element in the landscape but beyond the Study area of this assessment.

Public Rights of Way

2.5.17 A relatively dense network of Public Rights of Way is present in to the east of the LLWR site and adjacent to the northern boundary. Land to the west includes Access Land within the

foreshore and dunes but is accessed, in practice, by a series of well defined paths. The Cumbria Coastal Way runs along the shore, at the base of the sand face.

Vegetation

2.5.18 Woodland on the boundary of the two landscape sub-types is limited to occasional copses of limited size but becomes increasingly prevalent towards the foothills of the Fells. Hedges are limited adjacent to the dunes but become increasingly prevalent and well managed further inland before disappearing altogether as the fells rise upward.

2.6 Designations

2.6.1 The LLRS site has no designations relating to landscape quality.

2.7 Landscape Quality

2.7.1 The landscape surrounding the LLWR site, within the Study area identified on Figure 10.1 varies from very high quality within the National Park through high quality in the more intact and well managed areas of the coastal plain including the conservation area of Ravenglass and medium to locally low quality (for example along the bridleway to the north) in the immediate vicinity of the LLWR site itself where the perimeter fence and industrial buildings within the LLW Repository exert an existing adverse influence on landscape character.

2.7.2 The area of the dunes forming the Drigg Coast SSSI/SAC complex has a typically more varied and less coherent land-use than further inland, reflecting the influence of the sea and the exposure to weather. As a result the sensitivity of the area of the dunes and beaches closest to the LLWR site, taking its current influence on character into account is assessed as medium.

2.8 Landscape Sensitivity

2.8.1 Assessment of the sensitivity of the landscape resource is important to determine whether a landscape type or area can accommodate change arising from a development without detrimental effects. This capacity to accommodate change is identified in the GLVIA (para. 7.16) as being dependent on existing land use, the pattern and scale of the landscape, visual enclosure/openness, scope for mitigation in character with the existing landscape and the value placed on the landscape.

2.8.2 The Countryside Agency/Scottish Natural Heritage Topic Paper 6 drew a distinction between:

- overall landscape sensitivity – i.e. inherent sensitivity irrespective of the type of change proposed; and
- specific sensitivity to a particular type of change or development.

2.8.3 The former is relevant to strategic studies/zoning and is the basis for designations of quality whereas the latter is considered within a specific impact assessment. Landscape sensitivity to particular projects is based on judgments on natural factors, cultural factors, landscape quality/condition and aesthetic factors

2.8.4 The sensitivity of the landscape to change is the degree to which a particular landscape can accommodate changes or new features without unacceptable detrimental effects to its essential characteristics.

2.8.5 The Study Area overall is considered to be of medium sensitivity to the proposed development, which is essentially a continuation of an existing use, for the following reasons:

- the development footprint would not extend beyond the current boundaries of the LLWR site, allowing retention in tact of the surrounding landscape;
- the landscape context includes an established similar use on the LLWR site, and in close proximity within the southern half of the LLWR;
- loss of perimeter tree and shrub planting within the LLWR site, primarily on the northern and eastern boundaries does not constitute permanent loss of a characteristic landscape element and can be replicated through replanting, albeit over a period of decades. Visual impacts arising from this are dealt with separately.

2.8.6 The landscape assessment will consider the specific sensitivity to a particular type of change or development would affect the baseline landscape and over what timescale.

2.9 Landscape Capacity

2.9.1 The Countryside Agency (now Natural England)/Scottish Natural Heritage published Topic Paper 6 (2003) in relation to sensitivity and capacity to clarify the links between the two. The 2002 Landscape Assessment Guidance defined capacity as:

2.9.2 “the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change proposed.”

2.9.3 A landscape of low capacity to accommodate a particular development would indicate a lower ability to accommodate change and as a result, depending on magnitude of impact, a potential impact of greater significance.

2.9.4 In the case of the proposed development at the LLWR the landscape currently includes similar operations over the northern part of the LLWR site and would not therefore introduce a new land-use.

2.9.5 The development site therefore has a high capacity to accommodate the proposed development.

2.10 Tranquillity

2.10.1 The site lies within a predominantly tranquil landscape, the Cumbria Landscape Character Guidance and Toolkit (Part 1) July 2010, page 31, notes that

“the dunes offer shelter and a feeling of intimacy with plants and providing a rich variety of interest. Most enjoy a sense of tranquillity and remoteness.” And

The feeling of tranquillity arising from 'naturalness' of the landscapes is sensitive to unsympathetic development and noisy land uses.

2.10.2 Overall, therefore, the LLWR site context is considered to be of high tranquillity.

2.11 Summary of Baseline Landscape Assessment

2.11.1 The appraisal of the baseline landscape of the proposed development identifies that:

- The LLWR site is atypical of the landscape context being semi-industrial in a predominantly rural landscape;
- Existing woodland planting within the LLWR site contributes to local landscape character and is locally important in limiting views of the LLWR site;
- no original, characteristic, landscape elements of value would be lost as a result of the development;
- The landscape has a high capacity to accommodate the proposed development, which is currently present on the LLWR site;
- The Study Area is assessed, against the criteria given in the GLVIA and through professional judgment, as being of medium sensitivity to the type of development proposed;
- Most of the landscape of the Study area is considered to be of very high/high quality, incorporating characteristic landscape elements and features in a way which is sympathetic with the surrounding landscape;
- Locally in close proximity to the LLWR site the landscape is assessed as being of medium quality.

2.11.2 A graphic representation of the landscape context is provided on Figure 10.2, “Landscape Character Areas”, Figure 10.3 “Landform Analysis” and Figure 10.4 “Land Use”.

3 Potential Landscape Effects of the Proposed Development.

3.1 Introduction

3.1.1 The details of the development assessed as they relate to the LVIA, may be summarised as:

- sequential removal of perimeter trees and shrubs within the LLWR boundary fence to prepare/construct the outer landform or "shoulder" of the cap to an appropriately engineered specification;
- sequential formation of the perimeter shoulder landform in advance of capping of the vaults and trenches;
- sequential vault construction (V10-V14);
- operational activity of the placement/stacking of containers over the life of the vaults;
- sequential capping of the LLWR to achieve a single domed, grassed and planted landform as indicated on Figure 3.7 in Volume III of the ES;
- ongoing capping and works in the period 2013 to 2079 and landscape management of the restored Trenches and Vaults beyond that.
- the capping would be achieved using the existing temporary facilities, therefore no new permanent buildings are proposed;
- it is intended to use parts of the existing facility for soils and materials storage.

3.1.2 Activity within the LLWR would be similar in nature to that currently experienced.

3.2 Timescales of Effects

3.2.1 Sequential vault construction, placement of storage containers and capping is programmed to occur periodically up to 2079. For the purposes of the LVIA the final landform and associated planting is considered to be a permanent development.

3.3 Assessment of Magnitude of Landscape Effects

3.3.1 The GLVIA indicate that the magnitude of a landscape impact relates to:

- the size, extent or degree of change to a landscape or to individual landscape components;
- whether there is a direct impact resulting in the loss of landscape components, or change beyond the land take of the scheme having an impact on the character of the area; and
- whether the impact is permanent or temporary.

3.4 Potential Landscape Effects of the Development

3.4.1 Development may have an adverse or beneficial effect on landscape character through removal of characteristic landscape elements, such as agricultural land, or the introduction of uncharacteristic elements which contrast with the existing landscape character or the creation of elements that achieve biodiversity/landscape objectives through the re-establishment of characteristic landscape features.

3.4.2 Potential landscape effects applicable to the proposed development include:

- removal of semi-mature planting on the LLWR site boundary which has been planted in order to screen the existing LLWR development;
- removal of existing grassed land, temporary capping earthworks and re-establishment of grassland;
- creation of a new, permanent, landform;
- the establishment of a fully restored Trenches and Vaults of natural appearance which is appropriate for the landscape context.

3.4.3 The actual extent, scale and impact of these landscape/townscape effects, taking mitigation into account, are described in the landscape assessment.

3.5 Potential Indirect Landscape Effects of the Development

3.5.1 Indirect landscape effects may result from cumulative impacts within the wider landscape arising from direct impacts on site or external influences off site, such as traffic/dust/water which may change landscape character.

3.5.2 The proposed development would not give rise to any identifiable indirect effects on landscape character.

3.6 Mitigation and Enhancement of Landscape Effects

3.6.1 Removal of the perimeter woodland is an unavoidable consequence of the engineered construction of the vault. Mitigation of this effect is proposed by sequential, early replanting of the perimeter woodland on the northern and eastern boundaries.

3.6.2 The boundary in land-use and landscape character between the dunes and the LLWR site is currently abrupt – mitigation of the proposed development will include a more gradual transition between the two in order to more fully assimilate the northern part of the LLWR site into the landscape context.

3.7 Residual Landscape Effects and Significance

3.7.1 The GLVIA suggest that the evaluation of landscape effects be graded from high to low in a minimum of four categories (para 7.18), including both adverse and beneficial effects. The guidelines acknowledge that there is no standard methodology for the quantification of the scale/magnitude of landscape effects but state that the following factors apply:

- the scale or degree of change to the landscape resource;
- the nature of the effect and its duration; and
- the permanence and reversibility of effects.

3.7.2 Each of these factors has been considered in this assessment along with other factors and criteria as given in the GLVIA such as the sensitivity of the landscape to change, landscape quality and the capacity of the landscape to accommodate the proposed development.

Residual Landscape Effects

3.7.3 The development would not involve any loss of landscape elements of value or that cannot be replaced. Neither would it introduce an additional land use to those currently arising from the operation of the LLWR site – however it would extend the influence of the site through temporarily increased visibility.

3.7.4 Overall the impacts of the capping of the LLWR on the baseline landscape character are considered to be of medium adverse in the short-term, i.e. during the capping sequence and no adverse impact in the long term, i.e. beyond 2079.

3.7.5 In the period from 2013 to 2017 replacement planting for that lost in the initial engineering works would develop and increasingly, beyond 2017, become a viable replacement for the original perimeter planting lost as a consequence of the development.

3.7.6 Beyond 2028 the parts of the site used for disposal would be fully integrated into the landscape in terms of land-use and landform but the perimeter security fencing would continue to exert an industrial influence on landscape character, as is currently the case in the baseline landscape.

Significance of Residual Landscape Effects

3.7.7 Perimeter planting lost as a consequence of the capping of the LLWR is a relatively recent landscape element which exists as a result of the LLWR rather than an existing landscape element which was incorporated into the LLWR site. It is therefore capable of being successfully replaced with similar planting.

3.7.8 The proposed landform of the capped vault is appropriate for the context and would not significantly increase ground levels such that they would be incongruous in the locality.

3.7.9 The predicted significance of landscape impacts is summarised in Table 3.1.

3.7.10 Overall it is assessed that the development would have a slight effect on the baseline landscape character of the Study Area, largely as a result of the removal of perimeter planting, during operation and no effect post operation. Post closure some scope exists for the northern part of the LLWR site to contribute to replication of characteristic landscape elements and to achieve landscape management objectives.

Table 3.1: Outline Landscape Magnitude & Significance Summary

Landscape Characteristics	Sensitivity	Effect magnitude		Overall Significance	
		Operation	Post Operation	Operation	Post Operation
National designation	n/a	-	-	-	-
Local designation	n/a	-	-	-	-
Other Value Criteria					
Site Landscape Quality	Low	High	Low (Beneficial)	Moderate	Negligible
Wider Landscape Quality *Study Area	High	Very Low	Low (Beneficial)	Slight	Moderate (beneficial)
Landscape Capacity	High	-	-	-	-
Cultural Associations	n/a	-	-	-	-
Tranquillity	High	Very Low	none	Slight	none
Site Landscape Character	Medium	Medium	Low (Beneficial)	Moderate	Slight(beneficial)
Wider Landscape Character *Study Area	High	Very Low	none	Slight	none
Mitigation Potential					
Replication of landscape elements	Low	Low (Beneficial)	Low (Beneficial)	Negligible (Beneficial)	Negligible (Beneficial)
Achievement of landscape management objectives	Low	Low (Beneficial)	Low (Beneficial)	Negligible (Beneficial)	Negligible (Beneficial)

Table 3.2: Significance Matrix

Significance matrix		Sensitivity				
		Very high	High	Medium	Low	Very low
Magnitude	**Very High Magnitude**	Major	Very Large	Large	Substantial	Moderate
	High Magnitude	Very Large	Large	Substantial	Moderate	Slight
	Medium Magnitude	Large	Substantial	Moderate	Slight	Negligible
	Low Magnitude	Substantial	Moderate	Slight	Negligible	Insignificant
	Very Low Magnitude	Moderate	Slight	Negligible	Insignificant	Very Insignificant

4 Baseline Visual Assessment

4.1 Methodology & General Visibility

4.1.1 The existing visibility of the LLWR site (in particular the trench cap) was initially assessed by a desktop Study of an Ordnance Survey 1:10,000 plan in order to identify potential viewpoints and the potential Zone of Theoretical Visibility (ZTV)/visual envelope of the application site. In addition, prior to the site visit a ZTV analysis of the maximum theoretical visibility of the site was undertaken in LSS using a terrain model of the site and a digital terrain model (DTM) of the surrounding landscape.

4.1.2 Viewpoint locations were largely those used for the 2007 LVIA, prepared by the Ian Brown Consultancy. The adoption of these locations, agreed in principle with Cumbria County Council in advance, has been supplemented by the inclusion of a number of additional viewpoints in order to attempt to further assess the potential visibility of the proposed capping from locations in close proximity. A number of very distant viewpoints included in the 2007 LVIA were dropped due to the insignificant degree of visibility of the LLWR site.

4.1.3 The maximum theoretical availability of the final capping landform from surrounding locations within the Study area, modelled on landform data and not taking intervening built development or vegetation into account is illustrated on Figure 10.5. The in-situ site survey, recorded in photopanoramas, records the availability of actual views from external locations.

4.1.4 Photographs were taken from publicly accessible viewpoints in January 2011 and the location and direction of view recorded on a plan, see Figure 10.1, “Landscape & Visual Context and Photoviewpoint Locations”. Weather conditions where bright and clear with good visibility but deteriorating with distance by the afternoon. Photoviewpoints are shown on Figures 10.6 to 10.11.

4.2 Directional Views

Views from Locations to the North

4.2.2 The existing LLWR site, in particular the trench cap, is visible at a distance, partially screened by the perimeter planting, from residential locations on the southern edge of Seascale, including Rueberry Drive (refer to Viewpoint 4). Views in close proximity are obtained from the bridleway on the northern boundary of the LLWR site (including views into Vault 8), from Summer View adjacent to the railway (viewpoint 1) and from the road to Stony How Farm (viewpoint 3). With the exception of the views from Summer View and the bridleway on the boundary the LLWR site is not easily discernible from the north at present.

Views from Locations to the South

4.2.3 Views are obtained from Shore Road, in the vicinity of the property known as Sandy Acre, and from the dunes in proximity to it (viewpoint 5). Distant views are obtained from the vicinity of Hall Carleton (viewpoint 11) and from the elevated section of the A595 on the western edge of Ravenglass (viewpoint 9). Although the panorama from Ravenglass village/conservation area undoubtedly includes the south of the LLWR site it was not discernible as an identifiable element of the view (viewpoint 8).

Views from Locations to the East

4.2.4 Relatively open views of the LLWR site (in particular the trench cap) are obtained from the B5344 in the vicinity of Stubble Green (viewpoint 14) and from footpaths/bridleways in the vicinity (viewpoint 7). More distant views are possible in clear visibility from elevated locations in the foothills of the fells, such as Irton Pike (viewpoint 12), Muncaster Fell (viewpoint 10) and locations above Gosforth (viewpoint 13). Views from this quadrant include distant views from within the National Park, including from the high fells, although the LLWR site is not easily discernible among the surrounding built development of Seascale, Drigg and isolated properties.

Views from Locations to the West

4.2.5 Locations within the dunes to the immediate west of the LLWR site offer locally open views into the LLWR site in close proximity. Views from the main footpath running along the dunes, elevated from the shore, offer more distant and intermittent glimpsed views. (viewpoints 6a,6b and 6c). Potential views from the shore itself are limited by the sand face and lower elevation of the viewer.

4.3 Visual Envelope

4.3.1 The maximum zone of theoretical visibility (ZTV) of the final capping landform, modelled at a maximum of 33m height and based on a 100m grid analysis, is illustrated on Figure 10.5.

4.3.2 The analysis maps every 100m square from which the target object, in this case the final capped landform, is theoretically visible by a viewer at 1.8m height.

4.3.3 The ZTV analysis is worst case i.e. it does not include screening effect derived from buildings walls/hedges, woodland or other features in the landscape apart from landform. It is, in effect, a bare earth model in which the only screening identified is that from landform/topography.

4.4 Nature & Sensitivity of Viewpoints

4.4.1 The Guidelines for Landscape and Visual Impact Assessment (paragraphs 7.31 to 7.35) note that sensitivity of receptors depends on a number of factors. The assessment of visual impacts is structured by receptor group. The sensitivity of each receptor group can be categorised as being high, medium or low. Visual impacts result from change to the appearance of the landscape as a result of the development proposals either intruding into, or obstructing existing views, or by their overall impact on visual amenity and character. The sensitivity of receptors relates principally to three factors:

- receptor's function whilst exposed to view;
- degree of exposure to view; and
- period of exposure to view.

4.4.2 The criteria used to assess the magnitude of visual impacts are as follows:

- value of existing views;

- degree of change to existing views;
- the availability and amenity of the alternative views; and
- distance to receptor.

4.4.3 Impacts may be considered as beneficial (i.e. positive) as well as adverse. The magnitude of a visual impact in this LVIA may be described as very high, high, medium, low or very low.

4.4.4 Professional judgement is inherent in determining the category of impact. The assessment of visual impacts is based upon views obtained at the time of assessment. Where significant differences in impact between summer and winter are apparent, these are identified.

4.4.5 The sensitivity of viewpoints is generally categorised as very high, high, medium, low or very low in accordance with the terminology adopted in the current guidance (GLVIA).

4.4.6 The sensitivity of visual receptors within this assessment is provided in Section 7 below with an explanation of the reason for the categorisation (see Figure 10.1 for photoviewpoint locations)

4.4.7 The sensitivity of a receptor and the level of impact upon it can be combined to assess the significance of the resultant effects.

4.5 Representative Viewpoints

4.5.1 In total 14 viewpoints have been chosen to represent the typical range of views of the LLWR site obtained from within the ZTV. These were agreed with Cumbria County Council in advance of undertaking the LVIA site visit and for purposes of consistency and comparison, include a significant number of locations identified in the 2007 Vault 9 LVIA.

Views from Houses/Residential Locations

4.5.2 A summary of views experienced from various categories of viewpoint is provided below. Primary viewpoints include:

- properties at Summer View to the immediate north-east of the trench cap (viewpoint 1);
- a small number of properties, local to the LLWR site, on the B5344 including those at Stubble Green (viewpoint 14) and the Stubble (viewpoint 15);
- Sandy Acre to the immediate south of the magazines (viewpoint 5);
- Properties on the immediate southern edge of Seascale (viewpoint 4);
- distant views from elevated properties to the east of the LLWR site, including those within the National Park boundary and some outside of the Study Area(viewpoint 13);

4.5.3 The ZTV analysis identifies other potential views but these are peripheral and the analysis does not include screening derived from buildings or vegetation.

Views from Public Rights of Way

4.5.4 The most significant views from PRoW are those obtained from the bridleway on the northern boundary of the site (viewpoint 2) but other views are obtained from PROW in the wider

landscape (viewpoint 7) and fell walking/recreational locations such as Muncaster Fell and Irton Pike.

Views from Roads

4.5.5 The LLWR site is visible from:

- localised sections of the B5344 around Stubble Green and Seascale;
- localised sections of the A595 in the vicinity of Ravenglass;
- elevated roads to the east of Gosforth, outside of the Study Area shown on Figure 10.1;

Screening/Obstructive Elements

4.5.6 Existing screening of the LLWR from locations to the east is largely derived from tree and shrub planting, of varying ages, located on the LLWR site boundary. From the west the undulating nature of the sand dunes and the lower elevation of the viewpoints results in only intermittent visibility of parts of the LLWR site.

4.5.7 Views from locations to the north and south of the LLWR site are, with the exception of the bridleway and from Sandy Acre, more distant and partially or fully obstructed by a combination of landform and vegetation. As a result the LLWR site is not well defined within the panorama. Views from Seascale and Ravenglass fall into this category.

Summary of Visual Context

4.5.8 Views of the existing LLWR landforms, perimeter fencing and planting are obtained in close proximity from a small number of residences and from Public Rights of Way. No view of vaults was identified from external locations.

4.5.9 Distant views are obtained from the southern fringe of residential properties in Seascale but no definite views of the existing LLWR were identified from Ravenglass, although the 2007 LVIA identifies visibility of a roof within the LLWR site. Distant views are also obtained from elevated locations within the Lake District National Park.

4.5.10 The proposed capping of the vaults and trenches would typically increase ground levels above those currently found on LLWR site by an average of 4m above the highest existing landform, with a maximum increase at the top of the trench cap landform of 7m from 26m aOD currently to 33m aOD.

4.5.11 Visibility of the proposed landform, at maximum height, is therefore potentially greater than the existing landform. However existing visibility, in conjunction with the 3D modelling, provides a good indication of potential views.

5 Potential Visual Effects of the Proposed Development

5.1.1 Changes in views may give rise to adverse or beneficial visual effects through obstruction in views, alteration of the components of the view and through the opening up of new views by the removal of screening.

5.1.2 Potential visual effects arising from the development, excluding mitigation, may include:

- Change in the nature of views and increased visibility of previously screened areas of the development site would occur as a result of removal of the perimeter tree planting within its boundary, particularly n the northern and eastern edges, in the early stages of the development.
- during the construction period there would be potential for visual impact arising from temporary use of cranes/machinery etc and potential visibility of high stacking of LLWR disposal containers for waste storage, which add to intrusion within a view.
- visual impact arising from the height, scale and nature of the landform and the degree to which this would change the nature of the view.
- Visual impact from temporary stockpiles;
- light emitted from the LLWR site exceeding the luminance currently present in the area.

5.1.3 The extent to which the proposed development would give rise to additional visual impact during operation to that identified in the baseline visual assessment is considered in Section 7 in relation to the representative viewpoints. Sightline sections for a number of key receptors are shown on Figure 10.12. Photomontages illustrating the final grassed landform and based on 3-D modelling are shown for Summer View, The Stubble, Stony Howe and Stubble Green as Figures 10.13 to 10.16 respectively.

5.1.4 The comments on visual impact should be read in conjunction with the construction sequence drawing (Appendix A in the ES) which indicates the phasing of capping and container placement and the directional impact that has in relation to individual viewpoints.

6 Proposed Mitigation of Visual Effects

6.1.1 Mitigation of the potential visibility of filling and capping is closely related to an understanding of the construction sequence and timescales of operations associated with it. The construction sequence with indicative timescales is outlined in Figure 3.6 in Volume 1 of the ES. Relevant elements are highlighted below.

6.1.2 Activity programmed for Phase 1, in the period 2013 to 2015, includes initial removal of the perimeter planting on the northern and eastern boundaries followed cap shoulder construction and replanting of the perimeter followed by profiling fill on part of the trenches. The profile fill would be temporarily seeded until finally capped and restored during Phase 2. Phase 2 works do not commence until 2018 thus allowing the perimeter planting undertaken in 2013/2014 to achieve a minimum of 4 years growth before further works take place along the boundary.

6.1.3 Key points to note from the programme are:

- early replanting of the perimeter shoulder landform in Phase 1 with an appropriate mix of native trees and shrubs to act as a long term visual barrier for future filling and capping. The area of planting is extends along the eastern boundary to the railway sidings and vegetation will also be increased at the south western corner of the site.
- by the time vault filling takes place within the centre/highpoint of the northern part of the LLWR site (Vault 10) the planting will have achieved a minimum of 9 years growth with 13 years growth by the cessation of filling in Vault 10.
- by the time profiling over the trenches takes place closest to the properties at Stubble Green in 2023, as part of Phase 3, planting along the eastern boundary will have had 9 years growth.

6.1.4 Mitigation of the potential visual effects of the development therefore comprises:

- early establishment of an appropriate perimeter screen of native trees and shrubs to replace that lost at the commencement of capping;
- progressive use of a perimeter landform established prior to filling within the main body of the area of the Trenches/Vaults.
- Retention of existing woodland, and recent established planting, to act as a screen for the temporary stockpiles in Area C and D within the main LLWR site;
- temporary seeding of areas of profiled fill before permanent capping in order to minimise visual impact from bare earth;
- a sequence of capping and filling which creates a final landform on the Trenches which acts as a screen, supplemented by the perimeter planting for the majority of viewpoints and closest properties which lie to the east of the LLWR site;
- in the event that high stacked storage containers are visible from external locations temporary soil storage mounds would be placed and seeded in order to screen them;
- timescales which allow perimeter planting to be well established prior to disposal and capping operations.

6.1.5 Given that effective screening of visual impact will be closely related to growth rates of trees and shrubs we have used the following estimates (Table 6.1) of anticipated growth, based on professional judgement and experience of managing native tree and shrub planting. The figures assume use of tree shelters, mulch, typical soil conditions, appropriate maintenance and fertiliser input to promote growth. The figures take into consideration the relatively exposed maritime location.

Table 6.1: Assumed Growth Rates of Perimeter Screen Planting

	Height at Planting	Height at 3 years	Height at 5 Years	Height at 10 Years	Height at 20 Years
Native Tree*	0.75m	1.25m	2.5m	5m	8m
Native Shrub*	0.75m	1.25m	2.5m	4m	4.5m

*assume average growth rate species i.e. not fastest or slowest.

7 Residual Visual Effects Taking Mitigation Into Account

7.1.1 This section of the LVIA presents the predicted visual effects of the proposed development, at representative viewpoints, taking mitigation into account.

7.1.2 The effects are described for each viewpoint during operation, capping and post restoration in the following tables. In the case of the proposed development the timescales of operation, extending into many decades (from 2013 to 2079) are such that progressive restoration and minimisation of the footprint of filling/capping operations becomes an important consideration in understanding impacts.

7.1.3 For each viewpoint the LVIA therefore identifies the period of impact during operations and the long-term impact of the restored site.

Viewpoint 1: Bridleway along north boundary of Repository near Summer View					
Receptor Type	**Sensitivity**	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Recreational	H	Low: the existing LLWR is a distinctive element of the view, largely as a result of the 2.5m fenceline but otherwise resemble a grassed landform typical for the locality.	**Operational** Medium: the removal of the boundary vegetation within the LLWR and subsequent capping earthworks along the perimeter would be viewed prominently. Sections from the viewpoint through the container stacks indicate that they would not be visible. The duration of impact would be from 2013 for approximately 5 years at which point the planting will be at the height of the fenceline and fully screening the landform beyond in summer, with partial screening in the winter. **Post Operation** None: The overall appearance would be of a wooded perimeter obstructing long views. The landform would be at a greater elevation and hence slightly more prominent on the skyline if viewed through the perimeter screening belt.	Substantial for 5 years and thereafter none.	None

Viewpoint 2: Bridleway along North boundary of Repository					
Receptor Type	**Sensitivity**	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Recreational	H	Medium: the LLWR site is visible in close proximity as a central part of a narrow panorama. Impact is derived largely as a result of the fenceline rather than any other elements of the LLWR.	**Operational** High: the proposed capping earthworks would be openly visible until the boundary landform shoulder is constructed and potentially after that as it rises to the final landform height. In the early stages of the operation, high stacking of containers would temporarily break the skyline until the capping advances to the crest of the slope in this sector of the site. Subsequent capping and container storage would be screened by the restoration landform. **Post Operation** None: The overall appearance would be of a woodland edge similar to that to the RHS of the PROW.	Substantial for 5 years and thereafter none.	None

Viewpoint 3: Lane passing Stony How Farm					
Receptor Type	**Sensitivity**	**Existing Magnitude of Visual Impact**	**Predicted Additional Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Recreational/Highway	H	Very Low: the existing LLWR is an indistinctive element of the view. A section of planting on the perimeter of the LLWR site is visible adjacent to woodland to be retained to the north of the bridleway.	**Operational** Very Low: the removal of the boundary vegetation within the LLWR would slightly reduce the extent of woodland in the view. Placement of the profiling layer within Phase 1, if visible would form a minor element of the view for a maximum of 5 years from 2013 and would be seeded as an interim restoration measure to reduce contrast with the surrounding landscape.. **Post Operation** None: The overall appearance would be of a wooded perimeter merging with the woodland block to the north of the LLWR.	Slight for 5 years and thereafter none.	None

Viewpoint 4: Rueberry Drive, Seascale					
Receptor Type	**Sensitivity**	**Existing Magnitude of Visual Impact**	**Predicted Additional Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Recreational	M	Very Low: the existing LLWR is a distinctive element of the view, largely as a result of the 2.5m fenceline on the western boundary and the screening landform to the rear. Woodland at the northern end of the LLWR site is visible but In other respects the trench cap currently resembles a grassed landform typical for the locality.	**Operational** Low: the distance of the viewpoint and the fact that the view is backlit for much of the day puts most of the panorama in shadow. Phase 1 impacts would be fully, substantially screened by woodland on the northern boundary of the site. The western section of the LLWR site would be more prominently viewed during the evening. The removal of the boundary vegetation within the LLWR would not impact the view. Removal of the existing screen landform on the western boundary of the site during Phase 2 would be viewed as a distant operation of low visual impact and the landform would be sequentially replaced by the proposed landform shoulder which would resemble the existing screening landform. Thereafter the capped landform would substantially screen future phases although extension of the landform shoulder would be partially visible briefly in subsequent phases. **Post Operation** None: The overall appearance would be of a grassed sloping landform fully integrated into the surrounding landscape.	Slight, primarily for the duration of Phase 2 from 2018 to 2022 and thereafter increasingly diminished temporary impact.	None

Viewpoint 5: Shore Road - Cumbria Coastal Way Adjacent to Sandy Acre					
Receptor Type	**Sensitivity**	**Existing Magnitude of Visual Impact**	**Predicted Additional Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Recreational/Highway	H	High: the existing PCM magazine buildings are currently prominent behind the boundary planting which will screen them in time. However the northern half of the LLWR to be capped is not visible due to the intervening buildings and screening landform.	**Operational** Low: the area of profiling and capping within Phases 1 to 8 is not visible with the exception of Vault 14 at the south-western end of Phase 8. Existing planting along the western site boundary will increase screening of the southern section of the LLWR by the end of Phase 1. Visibility of the capping would therefore be restricted to temporary views of the stockpiles in Area C and D during Phase 1. During Phase 2 the views of stockpiles and other elements of the southern section of the LLWR would be increasingly reduced by the tree and shrub planting currently in place. **Post Operation** None: The overall appearance would be of woodland to the rear of the foreground fields, fully screening the LLWR.	Moderate for 5 years and thereafter slight for a further 5 years until the end of Phase 2.	None

Viewpoint 6: Dunes between Shore Road and Carl Crag					
Receptor Type	**Sensitivity**	**Existing Magnitude of Visual Impact**	**Predicted Additional Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Recreational	M** (**infrequently visited)	Very Low: the existing LLWR is not visible from adjacent to the car park (viewpoint 6c) or the main path between the dunes and the foreshore. (viewpoint 6a) A view of the western screening landform is obtained by heading eastwards from the path into the dunes (viewpoint 6b).	**Operational** Medium: Sequential removal and then reconstruction of the existing mounding on the western boundary of the LLWR site would periodically be visible from within the dunes (viewpoint 6b) but not the main footpath (viewpoint 6a and 6c). However, this would occur over short periods and the replacement landform would be constructed sufficiently high to screen stacked containers and planted to create a woodland edge to the site. Periodic views of machines achieving the final capping profile would be obtained. **Post Operation** None: Woodland on the capped and restored parts of the site would merge with the sand dunes and appear as a natural element of the landscape.	Moderate for short intense periods for several months for each phase during the full life of the development i.e. from Phase 1 to Phase 8. Slight to no visual impact for the majority of the life of the development site.	None

Viewpoint 7: Bridleway between Drigg and Drigg Cross					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Recreational	H	Very Low: the existing LLWR is not a distinctive element of the view/clearly visible. The 2007 LVIA notes that the capping mound of Trenches 1-7, forms the western skyline in the vicinity of Stubble Green but it is not clearly identifiable as part of the LLWR.	**Operational** Very Low: the removal of the boundary vegetation within the LLWR and subsequent capping earthworks would not be clearly visible due to the effect of distance. After that the long term screening benefit of planting along the eastern boundary completed at the start of Phase 1 will effectively screen operations. **Post Operation** None: The LLWR would be fully merged into the adjacent landscape and not form a distinctive element in the view.	Slight for 5 years and thereafter none.	None

Viewpoint 8: Ravenglass Village					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Recreational	H	None: the LLWR is not visible from this central area of Ravenglass. The 2007 LVIA recorded a view from the slipway to the south of the village which did include a view of one of the LLWR buildings.	**Operational** None: No view of the capping would be obtained from either location. **Post Operation** None: No view of the restored Trenches/Vaults would be obtained from either location.	None	None

Viewpoint 9: A595 Near Ravenglass Village					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Highway	L	Very Low: The LLWR site is visible but is a distant and minor element of a broad panorama.	**Operational** Very Low: The capping would not register as an identifiable operation giving rise to a level of visual impact greater than that currently present. **Post Operation** None: The LLWR capped area would be fully merged into the adjacent landscape and not form a distinctive element in the view.	Insignificant	None

Viewpoint 10: Muncaster Fell at the Top of Hooker Crag					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Recreational	M	Very Low: the LLWR is a very minor element of a broad panorama. It is visible largely as a result of the buildings on site, which are seen in the context of other buildings at Drigg/Holrook and Seascale and are of similar scale and appearance.	**Operational** Very Low: Due to the effect of distance the capping operations would not register as an identifiable change in the panorama. No increase in the level of visual impact currently present from the LLWR site. **Post Operation** None: The LLWR capped area would be fully merged into the adjacent landscape and not form a distinctive element in the view.	Negligible	None

Viewpoint 11: Road Adjacent to Railway Near Hall Carleton					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Highway	L	Very Low: the LLWR is not identifiable but does lie within the view. The 2007 LVIA recorded the view from the adjacent railway which is not publicly accessible on foot.	**Operational** None: the northern section of the LLWR site is not visible and capping operations would have no visual impact at this location. **Post Operation** None: no view.	None	None

Viewpoint 12: Top of Irton Pike					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Recreational	M	Very Low: the LLWR is a very minor element of a broad panorama. It is visible largely as a result of the buildings on site, which are seen in the context of other buildings at Drigg/Holrook and Seascale and are of similar scale and appearance.	**Operational** Very Low: Due to the effect of distance the capping operations would not register as an identifiable change in the panorama. No increase in the level of visual impact currently present. **Post Operation** None: The LLWR capped area would be fully merged into the adjacent landscape and not form a distinctive element in the view.	Negligible	None

Viewpoint 13: Footpath Near Wind Hall Above Gosforth					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Recreational	M	Very Low: the LLWR is identifiable, although not on the day of the recorded panorama, but does not form a prominent element of the view.	**Operational** Very Low: the LLWR site is visible but capping operations would have no significant additional visual impact at this location. **Post Operation** None: The LLWR capped area would be fully merged into the adjacent landscape and not form a distinctive element in the view. .	Very Insignificant	None

Viewpoint 14: B5344 Near Stubble Green					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential/ Highway	H	Very Low: the capped landform of Trenches 1 to 7 forms the skyline in the central part of the view but appears as a natural grassed landform similar to those in the adjacent landscape.	**Operational** Low: some vegetation on the RHS of the panorama would be removed at the start of Phase 1. Initial formation of the shoulder landform and subsequent profiling and capping operations over the eastern section of the capping area (trenches 1 to 7) would be visible periodically during Phases 1 and 2 but by commencement of Phase 3 in 2023 perimeter woodland planting undertaken in 2013 will have created a woodland edge along the eastern boundary of the LLWR which will screen operations. **Post Operation** None: the development area would be viewed as a woodland belt forming the skyline.	Moderate	None

Viewpoint 15: The Stubble					
Receptor Type	**Sensitivity***	**Existing Magnitude of Visual Impact**	**Predicted Magnitude of Visual Impact /Operational Phase & Post Restoration**	**Significance of Additional Visual Impact**	
				During Operation	**Post Operation**
Residential	H	Medium: the existing LLWR and adjacent railway form the main elements in the panorama. The grassed landform of trenches 1 to 7 is viewed behind the boundary screen of vegetation.	**Operational** Medium: the removal of the boundary vegetation within the LLWR and subsequent capping earthworks in Phase 1 along the perimeter would be viewed openly, although not in close proximity. The duration of impact would be from 2013 for approximately 5 years at which point the planting will be at the height of the fenceline and fully screening the landform beyond in summer, with partial screening in the winter. Capping operations in close proximity to the viewpoint are phased towards the end of operations i.e. Phase 5 onwards from 203, by which time mitigation planting will be well established. **Post Operation** None: The overall appearance would be of a wooded perimeter, similar to that on the existing site, obstructing long views. The landform would be at a greater elevation and hence slightly more prominent on the skyline if viewed through the perimeter screening belt.	Substantial for 5 years and thereafter none.	None

8 Summary of Visual Impacts and Significance

8.1.1 Visual impacts of the proposed vault construction and capping have been assessed for 15 locations in the immediate and far vicinity of the development site.

8.1.2 The GLVIA identifies a number of criteria for evaluating visual effects. These have been used, along with professional judgment as the basis for the assessment.

8.1.3 The significance of visual impact ranges from very insignificant to substantial depending on location. The range depends on the receptor sensitivity and the extent to which the proposed capping operations would influence visual amenity or detract from the existing panorama.

8.1.4 The most significant visual impact would occur over a relatively short period of 5 years for locations closest to the LLWR site boundary including the PRoW on the northern boundary (2a/2b), properties at Summer View (1) and The Stubble (15). For viewpoints within the sand dunes closest to the LLWR site boundary (6b) removal of the perimeter screening bund and immature planting on it would result in substantial visual impact over short periods throughout the life of the development.

8.1.5 Visual impact of moderate significance would occur temporarily at Stubble Green (14) and from the vicinity of Sandy Acre on Shore Road (5).

8.1.6 For the remaining 9 viewpoint locations visual impact would be of negligible significance – in most cases the LLWR site is not prominent and vault construction and capping operations would be a minor and indistinct element of the view and/or fully screened by mitigation planting proposed for the site boundary.

9 Conclusion

9.1.1 A Chartered Landscape Architect has undertaken a landscape and visual impact assessment in accordance with current guidance.

9.1.2 The significance of the capping of the LLWR on landscape character has been assessed by comparison of the sensitivity of the landscape with the magnitude of the landscape effects.

9.1.3 Perimeter planting lost as a consequence of the capping of the LLWR is a relatively recent landscape element which exists as a result of the LLWR rather than an existing landscape element which was incorporated into the LLWR site. It is therefore capable of being successfully replaced with similar planting.

9.1.4 The proposed landform of the capped vault is appropriate for the context and would not significantly increase ground levels such that they would be incongruous in the locality.

9.1.5 Overall it is assessed that the development would have a slight effect on the baseline landscape character of the Study Area, largely as a result of the removal of perimeter planting, during operation and no effect post operation. Post operation some scope exists for the LLWR site to contribute to replication of characteristic landscape elements and to achieve landscape management objectives.

9.1.6 Visual impacts of the capping have been assessed for 15 representative locations in the immediate and far vicinity of the LLWR site. In addition the maximum zone of theoretical visibility (ZTV) of the final landform has been modelled and plotted as a guide to the location, extent and magnitude of visual impact.

9.1.7 The most significant visual impact would occur over a relatively short period of 5 years for locations closest to the LLWR site boundary including the PRoW on the northern boundary (2a/2b), properties at Summer View (1) and The Stubble (15) For viewpoints within the sand dunes closest to the LLWR site boundary (6b) removal of the perimeter screening bund and immature planting on it would result in substantial visual impact over short periods throughout the life of the development.

9.1.8 Visual impact of moderate significance would occur temporarily at Stubble Green (14) and from the vicinity of Sandy Acre on Shore Road (5).

9.1.9 For the remaining 9 viewpoint locations visual impact would be of negligible significance – in most cases the LLWR site is not prominent and vault construction and capping operations would be a minor and indistinct element of the view and/or fully screened by mitigation planting proposed for the site boundary.

Annex A: Terminology/Glossary of Terms

Landscape: comprises those physical components that together form the appearance of land, including its shapes, colours and textures. Landscape also reflects the way in which these various components combine to create distinctive landscape character, particular to specific localities.

Zone of Theoretical Visibility (ZTV): the area within which views of the proposed scheme may be obtained, partly determining the extent of the study area. The extent of the ZTV is determined by many factors, including topography and intermediate visual intrusions such as hedges, buildings and blocks of woodland which that create areas of visual "dead ground."

Landscape Character Area (LCAs): Landscape Character Areas (LCAs) are areas of homogenous landscape character. Typical landscape components defining character include landform, land cover, vegetation, settlement pattern, remoteness and degree of tranquillity.

Visual Receptors: people who can achieve key viewpoints, which are within the ZTV and occur from publicly accessible roads, footpaths and other open spaces are identified. Individual visual receptors groups (e.g. local residents, walkers on public footpaths, business employees, passing motorists and train passengers) within the ZTV are also identified and categorised in terms of their sensitivity to visual change e.g. local residents, walkers on public footpaths, business employees, passing motorists and train passengers.

Baseline Conditions: the baseline landscape and visual conditions were assessed through both desk and site appraisal during 2011.

The Study Area: The Study Area for the assessment of the landscape and visual impacts is defined by the ZTV. This defines the extent of the Scheme within which views of the landfill may be achieved.

Annex B: Landscape Assessment Methodology

Landscape Quality

The assessment of landscape quality within the Study Area has been undertaken on the basis of overall condition and aesthetic appeal, relative to the following landscape- setting five-point scale As follows:

- *Very High:* Areas and/or features which that have a particularly high value, by nature of their condition, high scenic qualities, strong characteristics (such as pattern and land cover), cultural associations, and/or relative *position* and amenity, including level of tranquillity. These are likely to be, but not necessarily, within a National Park, Area of Outstanding Natural Beauty, Registered Park and Garden or within a World Heritage Site;
- *High:* Areas and/or features that that are considered to be of high value by virtue of their positive characteristics, sense of place or local or cultural associations. These areas will be of regional or local importance and are likely to be, but not necessarily, designated by the planning authority as being of landscape value;
- *Moderate:* Landscapes and/or features which that retain a positive character and a sense of place and/or are of local interest or have local cultural associations. These areas are unlikely to be designated for their landscape value;
- *Low:* Landscapes in fair to poor condition which that have undergone change to the extent that they no longer have a distinctive local character, or particular aesthetic quality, or they lack cultural associations;
- *Very Low:* Degraded landscapes and/or features in poor condition whose distinctive character and aesthetic quality has been seriously damaged.

Guidance on landscape character assessment highlights consideration of landscape quality as an important consideration.

Locally distinctive features have also been appraised against the following indicators:

- *Scale*: the geographical scale at which the feature is important (local, national, international);
- *Importance*: *the* reason why the feature is important, such as reasons for designation; and
- *Rarity*: the relative *abundance* of the feature, or its trend in relation to a target level.

Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular LCA can accommodate changes or new features without unacceptable detrimental effects to its essential characteristics. Criteria used in this study to determine the sensitivity of landscape character include:

- the distinctiveness of character and quality of the existing landscape;
- the vulnerability of the key components determining character;
- the nature of predicted impacts, the degree of change that would result and the ability of the landscape to accommodate that change; and

- the significance of the landscape resource in a local, regional and national context.

The table below summarises the classification of landscape sensitivity and the criteria used to define sensitivity to change, is as set out in the Guidelines for Landscape and Visual Impact Assessment for Environmental Assessment (LI & IEMA, 2002).

Classification of Landscape Sensitivity

Description	Sensitivity
For example, important components or landscape of particularly distinctive character susceptible to relatively small changes.	High
For example, a landscape of moderately valued characteristics Reasonably tolerant of change	Medium
For example, a relatively unimportant landscape, the nature of Which is potentially tolerant of substantial change	Low

Magnitude of Landscape Impacts

The magnitude of a landscape impact relates to:

- the size, extent or degree of change to landscape character or individual landscape components;
- whether there is a direct impact resulting in the loss of landscape components, or change beyond the land take of the Scheme having an impact on the character of the area; and
- whether the impact is permanent or temporary.

Classification of Magnitude of Landscape Impact

Description	Magnitude
Permanent large scale significant change in landscape characteristics and change in landscape character.	Very High
Notable change in landscape characteristics over an extensive area ranging to very intensive change over a more limited area.	High
Moderate change to landscape elements in a localised area or minor change over a larger area.	Medium
Minor but noticeable changes over a localised area or moderate temporary changes over a short-term timescale.	Low
Virtually imperceptible change in any landscape component.	Very Low

Significance of Landscape Effects

The significance of the effect of the Scheme on each LCA can be determined by combining the magnitude of the impact with the sensitivity of each area to change. Criteria used to derive significance are illustrated in the table below, which is based on the GLVIA.

Significance of Landscape Effects (Beneficial or Adverse)

		SENSITIVITY				
		Very High	**High**	**Medium**	**Low**	**Very Low**
MAGNITUDE	**Very High**	Major	Very Large	Large	Substantial	Moderate
	High	Very Large	Large	Substantial	Moderate	Slight
	Medium	Large	Substantial	Moderate	Slight	Negligible
	Low	Substantial	Moderate	Slight	Negligible	Insignificant
	Very Low	Moderate	Slight	Negligible	Insignificant	Insignificant

Examples of what this means in terms of landscape change are provided in below:

Landscape Significance

Significance	Comment
Large beneficial (positive) effect	The proposals would: • integrate very successfully with the scale, landform and pattern of the landscape; • enable the complete restoration of sense of place and scale through well-designed planting and mitigation measures, (i.e. characteristic features are enhanced through the use of local materials and species to fit the proposal into the landscape); • enable a high sense of quality to be restored or enhanced through beneficial landscaping and sensitive design in a landscape that is of a formally recognised quality; or • complement government objectives to regenerate degraded countryside.

Significance	Comment
Moderate beneficial (positive) effect	The proposals provide an opportunity to enhance the landscape because: • they fit very well with the scale, landform and pattern of the landscape; • there is potential, through mitigation, to enable the restoration of characteristic features, partially lost or diminished as the result of changes resulting from intensive farming or inappropriate development; • they will enable a sense of place and scale to be restored through well-designed planting and mitigation measures, (i.e. characteristic features are enhanced through the use of local materials and species to fit the proposal into the landscape); • they enable some sense of quality to be restored or enhanced through beneficial landscaping and sensitive design in a landscape that is not of any formally recognised quality; • they further government objectives to regenerate degraded countryside.
Slight beneficial (positive) effect	The proposals: • fit well with the scale, landform and pattern of the landscape; or • incorporate measures for mitigation to ensure they will blend in well with surrounding landscape; • will enable some sense of place and scale to be restored through well-designed planting and mitigation measures; • maintain or enhance existing landscape character in an area that is not a designated landscape, nor vulnerable to change; • avoid conflict with government policy towards protection of the countryside.
Neutral effect	The proposals are well designed to: • complement the scale, landform and pattern of the landscape; or • incorporate measures for mitigation to ensure that the Scheme will blend in well with surrounding landscape features and landscape elements; • avoid being visually intrusive nor have an adverse effect on the current level of tranquillity of the landscape through which the route passes; • maintain existing landscape character in an area that is not a designated landscape, that is neither of national or local high quality nor vulnerable to change; • avoid conflict with government policy towards protection of the countryside.

Significance	Comment
Slight adverse (negative) effect	The proposals: • do not quite fit the landform and scale of the landscape; or • although not very visually intrusive, will impact on certain views into and across the area; • cannot be completely mitigated for because of the nature of the proposal itself or the character of the landscape through which it passes; • affect an area of recognised landscape quality; • conflict with local authority policies for protecting the local character of the countryside.
Moderate adverse (negative) effect	The proposals are: • out of scale with the landscape, or at odds with the local pattern and landform; • are visually intrusive and will adversely impact on the landscape; • not possible to fully mitigate for, that is, mitigation will not prevent the Scheme from scarring the landscape in the longer term, as some features of interest will be partly destroyed or their setting reduced or removed; • will have an adverse impact on a landscape of recognised quality or on vulnerable and important characteristic features or elements; • in conflict with local and national policies to protect open land and nationally recognised countryside as set out in Planning Policy Statement (PPS)7 and Planning Policy Guidance PPG2.
Large adverse (negative) effect	The proposals are very damaging to the landscape in that they: • are at considerable variance with the landform, scale and pattern of the landscape; • are visually intrusive and would disrupt fine and valued views of the area; • are likely to degrade, diminish or even destroy the integrity of a range of characteristic features and elements and their setting; or • will be substantially damaging to a high-quality or highly vulnerable landscape, causing it to change and be considerably diminished in quality; • cannot be adequately mitigated for; • are in serious conflict with government policy for the protection of nationally recognised countryside as set out in PPS7.

Significance	Comment
Very large adverse (negative) effect	The proposals would result in exceptionally severe adverse impacts on the landscape because they: • are at complete variance with the landform, scale and pattern • of the landscape; • are highly visual and extremely intrusive, destroying fine and valued views both into and across the area; • would irrevocably damage or degrade, badly diminish or even destroy the integrity of characteristic features and elements and their setting; • would cause a very high-quality or highly vulnerable landscape to be irrevocably changed and its quality very considerably diminished; • could not be mitigated for, that is, there are no measures that would protect or replace the loss of a nationally important landscape; • cannot be reconciled with government policy for the protection of nationally recognised countryside as set out in PPS7.

Annex C: Visual Assessment Methodology

Visual impacts result from change to the appearance of the landscape as a result of the development proposals either intruding into, or obstructing existing views, or by their overall impact on visual amenity and character. Where relevant, seasonal differences in impact are identified. The sensitivity of receptors re*lates principally to three factors as follows:*

- receptor's function whilst exposed to view;
- Degree of exposure to view; and
- period of exposure to view.

Visual Receptors: Within the ZTV a number of visual receptor groups of differing sensitivity are identified as follows.

Very High Sensitivity

- Residential locations in an area of designated landscape quality;
- Users of *public* rights of way in an area of designated landscape quality;

High Sensitivity

- local residents although the context of the dwelling may influence sensitivity;
- *users* of public rights of way;
- *equestrians* on bridleways;

Medium Sensitivity

- *Distant* residential locations from which the site forms a minor part of the panorama.
- *Users* of distant public rights of way from which the site forms a minor part of the panorama.

Low Sensitivity

- *Train* passengers.
- *Vehicle* travellers on the road network;

Very Low Sensitivity

- *Farm* workers; and
- *Employees* of local businesses.

The criteria used to assess the magnitude of visual impacts are as follows:

- *Value* of existing views;
- *Degree* of change to existing views;
- the availability and amenity of the alternative views;
- *distance* to receptor;

- *impacts* may be considered as beneficial (i.e. positive) as well as adverse.

The magnitude of a visual impact can be described as high, medium low or negligible. Whilst there is professional judgement inherent in determining the category of impact, the assessment process is both systematic and structured. The assessment of visual impacts is based upon a comparative winter views. Where significant differences in impact between summer and winter are apparent, these are identified.

The sensitivity of a receptor and the level of impact upon it can be combined to assess the significance of the resultant effects – refer to the following table.

Significance Criteria for Visual Effects (Beneficial or Adverse)

SIGNIFICANCE MATRIX		SENSITIVITY				
		Very High	**High**	**Medium**	**Low**	**Very Low**
MAGNITUDE	**Very High Magnitude**	Major (MJ)	Very Large (VL)	Large (L)	Substantial (Sub)	Moderate (M)
	High Magnitude	Very Large (VL)	Large (L)	Substantial (Sub)	Moderate (M)	Slight (S)
	Medium Magnitude	Large (L)	Substantial (Sub)	Moderate (M)	Slight (S)	Negligible (N)
	Low Magnitude	Substantial (Sub)	Moderate (M)	Slight (S)	Negligible (N)	Insignificant (I)
	Very Low Magnitude	Moderate (M)	Slight (S)	Negligible (N)	Insignificant (I)	Very Insignificant (VI)
	Zero	Zero	Zero	Zero	Zero	Zero

The criteria detailed above can be described upon the basis of the following descriptions (based on DMRB Volume 11, Section 3, Part 5, Chapter 4, Paragraph 4):

- Major (adverse): where the Scheme would cause a major significant deterioration in the existing view;
- Very Large (adverse): where the Scheme would cause a very large significant deterioration in the existing view;
- Large (adverse): where the Scheme would cause a large significant deterioration in the existing view;
- Substantial (adverse): where the Scheme would cause a significant deterioration in the existing view;
- Moderate (adverse): where the Scheme would cause a noticeable deterioration in the existing view;
- Slight (adverse): where the scheme would cause a perceptible deterioration in the existing view;
- Negligible (adverse): where the Scheme would cause a barely perceptible deterioration in the existing view;

- No change: where the Scheme would cause no discernible deterioration or improvement in the existing view;
- Negligible (beneficial): where the Scheme would cause a barely perceptible improvement in the existing view;
- Slight (beneficial): where the Scheme would cause a perceptible improvement in the existing view;
- Moderate (beneficial): where the Scheme would cause a noticeable improvement in the existing view; and
- Substantial (beneficial): where the Scheme would cause a significant improvement in the existing view.