



# LINDEMAN GREAT BARRIER REEF RESORT PROJECT

## ENVIRONMENTAL IMPACT STATEMENT

### APPENDIX Y - VISUAL AMENITY LITERATURE REVIEW

*Addendum: This EIS was initially prepared assuming that the safe harbour was to be part of the Lindeman Great Barrier Reef Resort Project. With the commencement of the Great Barrier Reef Marine Park Authority's (GBRMPA) Dredging Coral Reef Habitat Policy (2016), further impacts on Great Barrier Reef coral reef habitats from yet more bleaching, and the recent impacts from Tropical Cyclone Debbie, the proponent no longer seeks assessment and approval to construct a safe harbour at Lindeman Island. Instead the proponent seeks assessment and approval for upgrades to the existing jetty and additional moorings in sheltered locations around the island to enable the resort's marine craft to obtain safe shelter under a range of wind and wave conditions. Accordingly, remaining references to, and images of, a safe harbour on various figures and maps in the EIS are no longer current.*



LINDEMAN<sup>®</sup>  
ISLAND  
GREAT BARRIER REEF

# Lindeman Great Barrier Reef Resort Project

Visual Amenity  
Literature Review



Prepared for White Horse  
Australia Lindeman Pty Ltd  
27 October 2015

## Visual Amenity - Literature review

### Approaches to Landscape Evaluation

#### *Competing Paradigms*

Scenic quality has been studied over the past 40 years in order to develop explanatory theories of human landscape preferences, as reviewed by Chenoweth EPLA et al (1997), SEQ Regional Amenity Study (2004-2005)<sup>1</sup> and Lothian (2009). Although landscape appreciation is subjective, these studies have provided systematic approaches to measurement and prediction of what constitutes and changes scenic quality. For non-urban landscapes, a range of landscape assessment paradigms (or analysis typologies) have been used and published, which may be broadly categorised as either formal inventories (usually by experts) or approaches that rely to varying degrees on public responses and perceptions (psycho-physical, cognitive or experiential paradigms and scenic preference studies). In general, physical descriptions mainly involve expert assessments using standardised criteria, while phenomenological or psycho-physical approaches mainly or partly involve evaluation by observers or the wider community. Lothian (2009) describes this dichotomy as the 'physical paradigm' (beauty is an intrinsic quality of the landscape) and the 'preference paradigm' (beauty lies in the eye of the beholder), and suggests that this fundamental distinction prevents the merging of the two approaches. He further considers that, while physical studies are more widely used (mainly due to practical considerations of feasibility), they have failed to develop a credible or repeatable method. Although physical (expert) evaluation can be significantly improved by using criteria based on public perception studies, scenic preference studies (using photographs as scenery surrogates are increasingly proving more reliable (Lothian 2009).

#### *Physical / Expert Evaluation*

In Australia, broadscale analysis and assessment of scenic landscape values from the 1970s through to the 1990s generally adopted and adapted the physical / expert model of the US Visual Management System (VMS) (U.S. Department of Agriculture, Forest Service 1974, updated as the Scenic Management System 1995). The VMS/SMS approach combined Visual Prominence and relative Scenic Quality, the latter based on criteria derived from formal aesthetics (line, form and composition) and from research into aesthetic preferences. Broad topographic units were rated, assuming that scenic quality increases with:

- naturalness;
- presence of water and land-water edges;
- uniqueness in land and water features;
- relative topographic relief and ruggedness;
- vegetation diversity and landscape variety generally; and
- patchwork effects in agricultural landscapes and edge diversity in forests.

Similar approaches continue to be used as procedural standards and guidelines in Western Australia<sup>2</sup> and elsewhere.

These US-derived approaches differ from those in Britain, where the established procedures include formal aesthetic criteria (form and composition) together with other components as assessed by landscape experts, but the evaluations are more descriptive and related to character and contribution to scenic quality, and less reliant on standardised categories and relative values. Guidelines for field survey categorise the landscape in general "Landscape Types" (such as Flat/Undulating Wooded Farmland, Marshland Fringe etc.) and as place-specific "Landscape Character Areas" described in terms of local distinctiveness, landform and

---

<sup>1</sup> South East Queensland Regional Scenic Amenity Study (2004 ) *Interim Scenic Amenity Maps and Guidelines to Protect High Scenic Amenity in SEQ*

<sup>2</sup> WA Planning Commission and Dept for Planning & Infrastructure (2007) *Visual landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design*

geology, land cover and ecology, archaeology and history, built environment and cultural associations. Within each Landscape Character Area, “Local Landscape Types” are identified through field assessment of:

- landcover (mainly vegetation)
- dominant elements (mainly built form and water features)
- landform
- aesthetic factors
- condition
- ability to accommodate change
- most appropriate management

#### *Preference-based / Experiential Evaluation*

The scenic preferences study undertaken in South East Queensland<sup>3</sup> are the most extensive yet undertaken in Australia, and have been combined with GIS terrain mapping to provide a repeatable broadscale assessment of “scenic amenity” (Visual Exposure X Scenic Preferences). The South East Queensland Regional Scenic Amenity Study “*identified characteristics of views that influenced scenic preferences and based on this, maps of highly preferred scenery were prepared. The scenic preferences were combined with maps of visibility to map scenic amenity on a 1 – 10 scale*” (Lothian 2009). This methodology is now adopted as the SEQ Regional Plan Guideline 8, and is particularly suited to broadscale mapping to assist land use planning. Although Preston’s Scenic Assessment Methodology has been criticised for its reliance on visual exposure (Lothian 2009), the restricted photo-based ‘framing’ of expansive landscape settings, its unsuitability for urban places and the limited range of landscape attributes<sup>4</sup>, it has been a major advance in developing a repeatable approach to scenic quality as perceived by the community. Scenic amenity data currently map specific parameters rather than holistic landscape values, but may in the future provide a consistent base for adding extra layers such as landscape character, cultural values and sensitivity to change. The latter is commonly mapped at present as Visual Absorption Capability (VAC).

#### *Evaluation for Visual Impact Assessment*

Notwithstanding the above, the slow progress towards a generally-accepted method for broadscale evaluation of landscape quality has had only limited applicability for site-specific or project-related visual impact assessment. There is no single method which balances the ‘objective’ attributes of the seen landscape and the ‘subjective’ appreciation of scenic quality, for planning, impact assessment and development control.

While scenic amenity and landscape quality mapping has proven valuable for planning purposes in non-urban areas, they have been less successful in predicting the impacts of proposed developments and associated landscape changes. In general, maps indicating areas of high scenic quality and landscape values (such as the SEQ Scenic Amenity mapping) are appropriately used as ‘flags’ or triggers for more detailed impact assessment, and the latter uses different approaches and ‘tools’, taking into account other factors.

Techniques and terminology adopted in visual impact assessment vary widely between expert practitioners (Humphreys Reynolds Perkins Dent Is 2003-05, SKM Hummock Hill Island EIS 2010, URS Naturelink Cableway EIA 1998), but generally include some or all of the following:

#### (a) Description of existing landscape values, opportunities and constraints:

Existing maps or documents indicating scenic quality, scenic routes, heritage and cultural / social values, tourism assets, landscape features and iconic or ‘special’ places, as verified or amended by site-specific assessment

<sup>3</sup> South East Queensland regional Scenic Amenity Study (2005) *What’s in a View? Vols 1, 2 and 3*

<sup>4</sup> AILA (Qld) 2009 *Position Paper on SEQ Scenic Amenity & the Scenic Amenity Guideline 8*

- Description of the site and its landscape context, including physical attributes (landform, features and land use), landscape character, remoteness / wilderness values, regional/local image elements and current/future development pattern; and
- Landscape sensitivity to or tolerance of development, disturbance and change (eg Visual Absorption Capacity).

(b) Predicted appearance of the proposed development in its local context, presented as accurately and objectively as possible:

- Viewshed (or *intervisibility*) mapping, viewlines and cross-sections to show parts of the landscape, observer positions, lookouts and 'receptors' likely be within view of proposed development, either modelled from topographic data only, or field-checked and modified to take into account local view screening;
- Graphic representation (eg. models of built form massing, photomontages, sketches, fly-through models etc) showing what the proposed development will look like, including (where appropriate) its appearance on completion and after a reasonable period of growth of planted vegetation;
- Shadow diagrams and other modelling, sight lines and calculations to address specific impacts such as privacy, access to sunlight etc.

(c) Response to constraints and mitigation measures

- Assessment of project design responses to community concerns, landscape constraints and scenic values;
- Visual integration, design controls, screening and other impact mitigation measures.

(d) Compliance or conflict with statutory requirements, planning intentions and documented values:

- Compliance with policies and regional / strategic planning intent;
- Assessment against performance requirements such as codes, building heights, bulk and scale etc.

(e) Community and stakeholder consultation regarding social and cultural values associated with the landscape, potential visual impacts, concerns and proposed mitigation measures; and

(f) Expert opinions eg.

- Consistency with existing or emerging character and other developments approved or likely in the surrounding area;

Acceptability or otherwise of the proposal, notwithstanding the likely changes to landscape appearance and values

#### Coastal Zone Landscape Evaluation

*Trial Visual Evaluation Procedure: Brouwer & Chenoweth 1994*

Analysis and assessment of scenic landscape values in Queensland's coastal zone in the 1990s adapted the physical / expert model of the VMS/SMS approach of combining visual prominence with ratings for scenic quality. Five 'Scenic Quality Indicators' (landform, waterform, landcover, naturalness and built form) were used by Brouwer & Chenoweth (1994) for a trial application in coastal parts of the Whitsunday Shire.

*A View of the Coast: EDAW Australia 1996*

A systematic overview of landscape values along the entire Queensland coastline used similar scenic quality indicators. The coastline was classified and divided into landscape types and scenic quality indicators (landform, landcover, water and the land/water interface) categorised eg as steep and rugged coastal

landforms, and naturalness and diversity in landcover. Categories for the land/water interface included fringing reefs, rocky headlands and sweeping beaches. These were subsequently rated as:

- High Scenic Quality: areas which have scenic qualities that are highly outstanding and distinctive or unique state-wide, national or international aesthetic value;
- Moderate Scenic Quality: areas with some scenic qualities somewhat distinctive with regional or state-wide aesthetic values; and
- Low Scenic Quality: areas with scenic qualities commonly occurring elsewhere along the coast; having some regional or local aesthetic values.

*Coastal Landscape Assessment Methodology: Chenoweth EPLA et al 1997*

The scenic quality indicators used in the above studies were subsequently validated or amended through calibrated field assessments and community focus groups, for the Coastal Landscape Assessment Methodology in an intensive study of four coastal regions in Queensland (*Coastal Landscapes of Queensland* - Chenoweth EPLA et al 1997), using detailed 5-point scale ratings (Very High to Low) for the following six scenic quality indicators:

- Naturalness - the proportion and integrity of the landscape in apparently undeveloped natural condition;
- Vegetation and Wildlife - diversity and contrast of the vegetative land cover and associated fauna (if present);
- Landform - diversity and contrast (height, slope, pattern features) of the topography;
- Water and Shoreline - diversity and contrast of the shoreline, and the presence, extent and character of water forms;
- Pattern - focal points, diversity, harmony, rhythm and juxtaposition of elements; and
- Built Form and Activity - the contribution of built elements and cultural landscape modifications, and associated human activity.

The mapped landscape units in this 1997 study were “Landscape Settings”, on the premise that coastal landscapes are viewed by visitors and residents as a series of scenes within viewsheds such as valleys and bays, and these settings frame their experiences and activities. The descriptive framework combined some of the features of the US and British approaches. Within each Setting various ‘Land Types’ (foothills, wetlands, headlands, settlement patterns, ranges, peaks etc) were described and rated for landscape integrity and sensitivity, taking into account significant view corridors, viewing distances (foreground, midground, background) and Visual Absorption Capacity (the capacity of the landscape to ‘hide’ development).

This Coastal Landscape Assessment Methodology provided several layers of assessment of Landscape Settings, each using a 5-point scale as follows:

- Composite Scenic Quality (rated Very High to Low) based on the ratings of each of the six indicators, weighted to reflect the importance of water and shoreline. Very High and High ratings implied regional significance, which may include exceptionally scenic places of State, national or international significance;
- Sensitivity (Very Sensitive to Extremely Tolerant);
- Scenic Integrity (All Integral to Degraded);
- Contribution to regional identity (Strong or Distinctive to Weak);
- Scenic Significance (Very High, High, Moderately High, Moderate or Local), taking into account contribution to identity and integrity and sensitivity

*Dent Island EIS: Chenoweth EPLA and Humphreys Reynolds Perkins 2003*

Assessment of visual impacts of a golf course on Dent Island in the Whitsundays (Chenoweth EPLA and Humphreys Reynolds Perkins 2003 and 2005, for Hamilton Island Enterprises) adopted the 1997 Coastal Landscape Assessment Methodology, combined with an analysis of World Heritage aesthetic values. The 2003 Dent Island assessment included viewshed analysis, Landscape Settings, Landscape Sensitivity and Visual Absorption Capacity of various land types, and scenic quality ratings. Dent Island had been previously

assessed as part of a trial landscape evaluation procedure in the Whitsunday Region by Brouwer and Chenoweth (1993), and the 2003 Dent Island EIS verified the earlier broadscale assessment with more detailed studies. In this case, the relatively simple topography of a single central Island ridge parallel to the mainland and Whitsunday Passage divided Dent Island into two viewsheds, and one of the main visual impact constraints on development planning was location and height of built form so that the skyline remained free of development as seen from either side.

*Magnetic Island: Wilson Morrison & Ptnrs (1990) and Kenchington & Hegerl (2005)*

A study of Magnetic Island by Wilson Morrison and Partners in 1990 (Appendix 5 of GHD: Magnetic Island Management Plan, for Townsville City Council) is cited by Kenchington and Hegerl (2005) as part of the assessment of World Heritage values (see 3.3 below). The 1990 study was a systematic landscape quality assessment based on qualitative criteria for rating relative quality as seen from particular locations, mapping Magnetic Island in five categories of Landscape Quality: Distinctive, Very High, High and Medium plus an uncategorised central area.

Kenchington and Hegerl also cited visitor surveys as a resource for identifying the social and contemporary cultural values of Magnetic Island viz. the “*relaxed, peaceful tranquil atmosphere*” and “*natural beauty*” as the most appealing aspects of the Island.



## References

- NRC northern resource consultants (2015) 'Lindeman Island Resort, Terrestrial Flora and Fauna Technical Report' prepared for White Horse (Australia) Holdings Pty Ltd
- Brouwer, C & Chenoweth & Assoc. 1994, Visual Assessment Procedure for the Queensland Coast.
- Chenoweth et. al 1997, Coastal Landscapes of Queensland, Brisbane.
- Chenoweth EPLA et al (1997) 'A View of the Coast Coastal Landscapes of Queensland'
- Chenoweth & HRP (for Hamilton Island Enterprises) 2003, 2005 Dent Island Golf Course Resort EIS
- DERM (2004) South East Queensland Regional Scenic Amenity Study 'Interim Scenic Amenity Maps and Guidelines to Protect High Scenic Amenity in SEQ'
- EDAW for Department of Environment (QLD) 1996, 'A View of the Coast: An Overview of the Scenic Resources of the Queensland Coast.
- Environment Australia 1981, Great Barrier Reef World Heritage Values; August 2011 ([www.environment.gov.au/heritage/places/world/great-barrier-reef/values.html](http://www.environment.gov.au/heritage/places/world/great-barrier-reef/values.html))
- Environmental Protection Agency, 2006, Biodiversity Planning Assessment Central Queensland Coast Flora, Fauna and Landscape Expert Panel Report, Queensland Government.
- Kenchington & Hegerl, 2005, World Heritage Values Magnetic Island Report; for Department of Environment & Heritage.
- Lothian, A., 2009. Flinders Ranges Landscape Quality Assessment Project. Report for the SA Dept for Environment & Heritage.
- Lucas, P. et al. 1997 The Outstanding Universal Value of the Great Barrier Reef World Heritage Area, Townsville.
- Office of Urban Management (2007) South East Queensland Regional Plan 2005-2026: Implementation Guideline No. 8 Identifying and Protecting Scenic Amenity Values.
- Office of Urban Management & SEQROC et. al (2005) SEQ Regional Scenic Amenity Study 'What's in a View?', Volumes 1, 2 and 3.
- US Department of Agriculture (1974) US Visual Management System (VMS) (updated as the Scenic Management System 1995).
- WA Planning Commission and Department for Planning & Infrastructure (2007), Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design.
- Wilson Morrison and Partners 1990 'Report on Visual Analysis' cited in Kenchington & Hegerl 2005