Lake Cathie - Bonny Hills

URBAN GROWTH STAGE 1A
ENVIRONMENTAL STUDY

HASTINGS COUNCIL

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FINAL DRAFT **MARCH 2003**

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1.0 KEY FINDINGS

Review of all the environmental, social and economic issues in this study have indicated that the subject lands are suitable and appropriate for urbanisation, subject to imposition of certain conservation and hazard reduction measures being implemented. These are schedule in the detailed recommendations below

1. That following Hastings council's presentation of documentation to Planning NSW clearly demonstrating hat upgrading of sewage treatment capacity to 12,000 EP for the Lake Cathie – Bonny Hills district is approved by all consent authorities and there is a suitable responsive financial plan in place, the enclosed zoning plan for the subject lands be the subject of a request to planning NSW for issue of a Section 65 Certificate under the EP&A Act, 1979.
2. That following issue of Section 65 Certificate this draft Local Environmental Study be exhibited in conjunction with the draft Master Plan prepared for the Lake Cathie - Bonny Hills district to ensure contextual consistency is preserved.
3. That subsequent to relevant zoning amendments to the Hastings LEP, Council prepares an "umbrella" Development control Plan for the Lake Cathie – Bonny Hills district, based on the master Plan an and requiring preparation of subsidiary parcel – specific DCP's for staged or independent release of affected lands prior to accepting DA's for all such lands,
4. That the Lake Cathie – bonny Hills DCP (and any subsidiaries) required dedication of identified wildlife corridors beyond the LES brief site to the west and south-east of the site boundaries,
5. That through the Lake Cathie – Bonny Hills district DCP and the development consent process, Council limits the population of the catchment to the available capacity of the sewage treatment facility.
6. That the proposed Lake Cathie Bonny Hills DCP include requirements addressing all relevant issues raised in Table 8.2 of this study.

2.0 INTRODUCTION

2.1 CITATION, AUTHOR, CLIENT, COPYRIGHT

This document is prepared on behalf of Hastings Council; Port Macquarie NSW by Deicke Richards Architects P.L. and other attributed consultancies within the document.

It may be cited as the "**Lake Cathie – Bonny Hills draft Local Environmental Study 2003".**

2.2 PREAMBLE

Hastings Council has responded to housing demand from both natural population increase and immigration by determining to identify land within its jurisdiction that is suitable for urban expansion. To achieve this, there is a statutory and regulatory process defined in NSW legislation which must be followed.

Part of that necessary process is the undertaking of a Local Environmental Study – the subject of this report.

2.3 THE BRIEF FROM HASTINGS COUNCIL

Hastings Council has commissioned Deicke Richards Architects to prepare this Local Environmental Study. The specific research requirements are nominated in the brief, a full copy of which may be found in Appendix 1. The core requirements of the brief are extracted below:

ENVIRONMENTAL STUDY

Prepare an environmental study for HUGS Stage 1A, in accordance with specifications of Planning NSW, that covers:

1. *Liaison with relevant Government Authorities and landowners.*
2. *Collation and assessment of relevant data, including:*
   - *a) flooding,*
   - *b) bush fire,*
   - *c) land slip,*
   - *d) acid sulphate soils,*
   - *e) Aboriginal cultural sites,*
   - *f) sites or buildings of cultural value or heritage significance,*
   - *g) significant stands of vegetation,*
   - *h) significant wildlife habitats and corridors that link such areas,*
   - *i) wetlands and their catchments, and*
   - *j) ground and surface water resources.*
3. *Classification of land in terms of development opportunities and constraints.*
4. *Identification of relevant development control objectives and measures required to protect the environment.*

Relevant extracts from the above-mentioned requirements of Planning NSW are included in Appendix 3.

Note that the comments provided by Planning NSW in Appendix 3 appear principally to address undertaking an overall Environmental Study of the Area 14 Lake Cathie –Bonny Hills Master Planning district. But this Study, as commissioned by Hastings Council, is limited roughly to only 75 hectares of the approximate 700 hectares of potentially urbanised land in HUGS release Area 14 (the majority of which was zoned for residential and tourist development in 1984). Under the EP&A Act 1979, the latter lands do not require an Environmental Study prior to dealing with any development application for such purposes. (See **s1.5.1** below for further elaboration).

In consequence, this Study will confine itself to responding to relevant site and contextual issues that arise in the course of data collection for the small fraction of Release Area 14 covered by the specifics of the Hastings Council brief. Nevertheless, all Planning NSW issues raised will be reviewed for relevance to this Study.

2.4 FURTHER GOVERNMENT AGENCY REQUIREMENTS

The Study is also obliged to examine any additional issues identified in the referrals of the proposal to other government agencies as required by Section 62 of the Environmental Planning and Assessment Act 1979.

Government agencies were contacted by Hastings Council in accordance with Section 62. Their responses are tabled in **Appendix 2**.

The agency submissions raised the following additional issues summarised below, which are addressed as they arise within this Study –

AGENCY	ISSUES / REQUIREMENTS
NPWS	Buffer to L. Cathie NP of 50m –100m with restricted public access.
	Protect old growth tallow-wood stands..
	Provide wildlife corridors 250m wide between Queens Lake forest and Lake Cathie and the SEPP44 zone.
EPA	L. Cathie garbage depot
NSWCC	Green belt separation between L. Cathie & Bonny Hills.
	Habitat Linkages lake – forest – coast.
NSW RFS	RESPONSE DEFERRED
DEPT MIN RESOURCES	NIL
NSW DEPT HEALTH	Adequate road linkages to Port Macquarie hospitals.
	Community Health centre site in LC-BH.
	Medical centre site in LC-BH Master Plan.
	Footpaths & Cycleways for public health.
	Hygiene controls on re-use of wastewater.
	WS&S provision.
NSW DET	NIL

3.0 LOCAL ENVIRONMENTAL STUDIES

3.1 ENVIRONMENTAL STUDY REQUIREMENTS

3.1.1 STATUTES

In NSW, not only is planning practice enforced by statute, but certain planning policies called "**instruments**' are also given the force of law.

The NSW Environmental Planning and Assessment Act 1979 (the **EP&AA**) requires that any land identified by Council for urban use and not presently zoned for that purpose must first undergo a rezoning process - which involves amending a particular planning instrument - the Local Environmental Plan (**LEP**) for the area. Before adoption of any such land use changes, a draft LEP amendment must be prepared for public exhibition.

Section 57 of the EP&AA states inter-alia

> *57 Where a council decides to prepare a draft local environmental plan …… it shall prepare an environmental study of the land to which the draft local environmental plan is intended to apply.*

This document is such an Environmental Study. It is generically referred to as a Local Environmental Study. (**LES**). It also contains a draft amendment to the LEP for adoption if the LES is accepted.

However Clause 38 of another EP&AA instrument - the North Coast Regional Environmental Plan (the **REP**) states inter-alia

> *38 Plan preparation—urban land release strategy*
>
> *(1) The council should not prepare a draft local environmental plan which permits development that ……constitutes significant urban growth unless it has adopted an urban land release strategy for the whole of its local government area.*
>
> *(2) A draft local environmental plan referred to in subclause (1) should be generally consistent with the strategy referred to in that subclause.*

which means that an approved urban land release strategy must precede any Local Environmental Study.

THE HASTINGS URBAN GROWTH STRATEGY

On 39th August 2001 the NSW Department of Urban Affairs and Planning ("DUAP", now Planning NSW) formally accepted Hastings Council's "Hastings Urban Growth Strategy 2001" (**HUGS**), thus enabling the various associated Local Environmental Studies to proceed in accordance with Clause 38 of the **REP**. The adopted HUGS Study also set out the priorities and preferred sequence for urban land release.

This LES addresses only the Lake Cathie – Bonny Hills release area termed "Area 14" in the **HUGS** document, and is further limited by the brief received from Hastings Council to a subset of three (3) release areas within Area 14, collectively referred to as **Area 14A**.

See Figure 3 for details.

Concurrent with the preparation of this Local Environmental Study, Deicke Richards Architects have also conducted a community based master planning process for Release Area 14 largely consistent with the requirements in Part 5 of a new instrument - State Environmental Planning Policy No. 71 – Coastal Protection (**SEPP71**), although issue of the brief precedes the gazettal of SEPP71, and is therefore not strictly subject to it. This concurrent process has produced an overall draft Master Plan for the Lake Cathie – Bonny Hills area which also informs this LES process in terms of the likely urban land use (or otherwise) identified in the Master Plan.

The current draft Master Plan is included later as **Figure 6**.

3.1.2 FORMAT AND CONTENT

There are no specific statutory requirements for the format or content of a Local Environmental Study. Section 26 of the **EP&AA** "Contents" allows that a Local Environmental Plan ***may*** make provision for

> *(a) protecting, improving or utilising, to the best advantage, the environment,*
>
> *(b) controlling (whether by the imposing of development standards or otherwise) development,*
>
> *(c) reserving land for use for the purposes of open space, a public place or public reserve within the meaning of the Local Government Act 1993, a national park or other land reserved or dedicated under the National Parks and Wildlife Act 1974, a public cemetery, a public hospital, a public railway, a public school or any other purpose that is prescribed as a public purpose for the purposes of this section,*
>
> *(d) providing, maintaining and retaining, and regulating any matter relating to, affordable housing,*
>
> *(e) protecting or preserving trees or vegetation,*
>
> *(e1) protecting and conserving native animals and plants, including threatened species, populations and ecological communities, and their habitats,*
>
> *(f) controlling any act, matter or thing for or with respect to which provision may be made under paragraph (a) or (e),*
>
> *(g) controlling advertising,*

and any associated LES should presumably explore such matters, where relevant.

Clause 44 of the **REP** broadly expects that:

> ***44 Objectives***
>
> *The objective of this .. (REP) .. in relation to environmental hazards is to locate urban and tourism development on land that is free from flooding, land instability, coastal erosion, bush fire risks, aircraft noise pollution and other environmental hazards.*

and the '*other environmental hazards*' are then listed in Clause 45. These too should be the concern of any LES involving urbanisation.

In addition, certain environmental matters are required to be addressed in Clause 8 of SEPP 71. Whilst the brief preceded the gazettal of **SEPP71,** the policy is nevertheless an appropriate reference for this Study. This is discussed further in **s.3.2.4.**

However, the adoption of the **HUGS** and endorsement by Planning NSW not only went some way towards formally addressing the above issues, it also effectively committed Council to pursuing urban development of certain lands if no significant environmental impediments were discovered in the LES process.

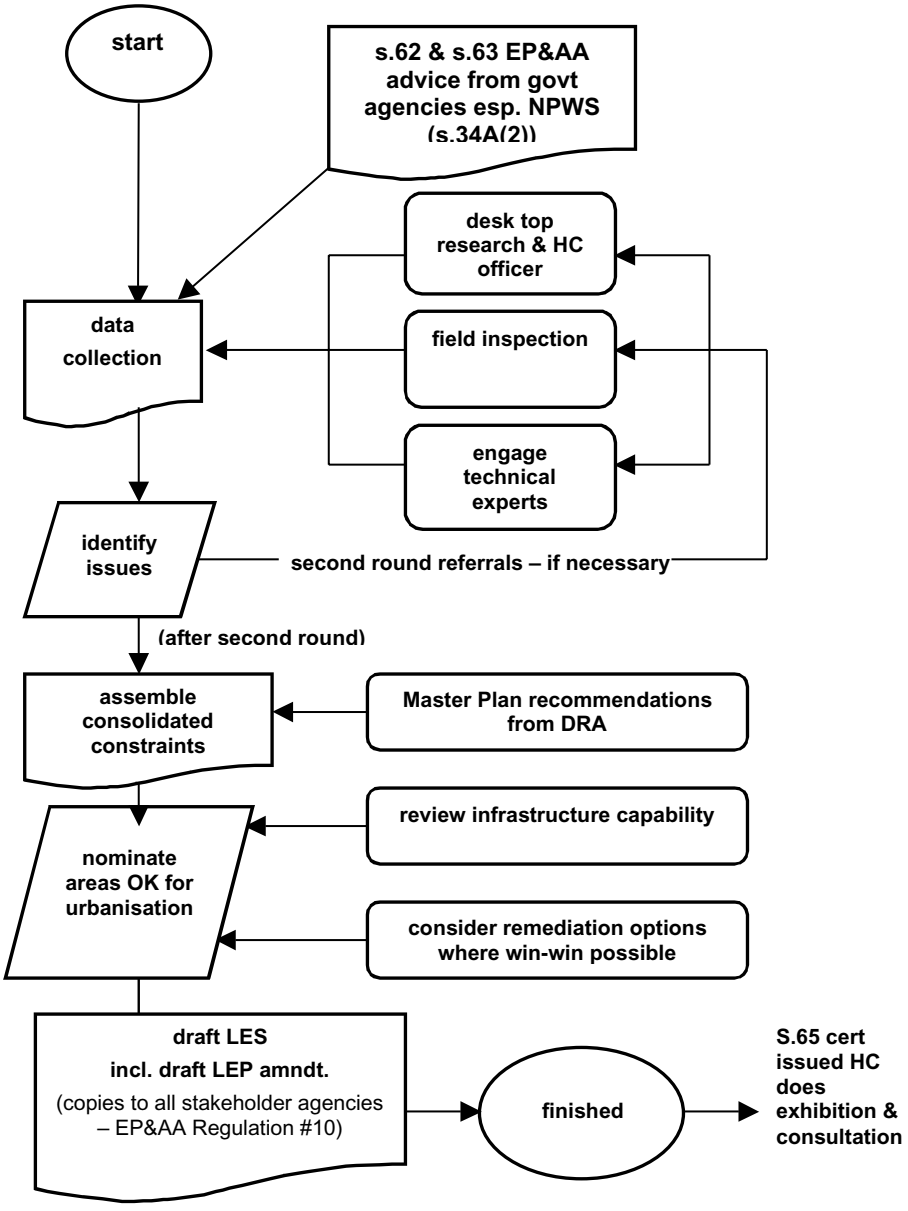
3.1.3 STRUCTURE AND FOCUS

The above discussion clearly indicates that in the absence of Council instructions to the contrary, an LES is not constrained by any mandatory structure and may take whatever form is deemed most appropriate to communicate essential relevant information to stakeholders and decision-makers, so long as the matters mentioned in s.1.3, s.1.4, and s.1.5 are properly addressed.

Therefore, rather than attempting to establish the highest and best land use for the subject lands (the traditional approach), this draft LES simply confines itself to examining whether the subject lands are suitable for urban expansion and tourism development, or not.

The process leading to this outcome is described in the flowchart below.

3.2 THE ENVIRONMENTAL STUDY PROCESS



4.0 DATA COLLECTION

Data used in the Study is derived from *desktop research, site investigation,* and community and agency *consultation.*

4.1 DESKTOP

4.1.1 HASTINGS COUNCIL

Hastings Council has provided extensive archival material for the Study, including previous environmental and infrastructure reports, and extracts from their spatial database (Hastings Geographic Information System – GIS). This material is incorporated in the Study verbatim.

4.1.2 OTHER DOCUMENT RESEARCH

A list of other policy and research documents relied on is provided in Section 3.2

4.2 SITE INVESTIGATION

4.2.1 SITE ENVIRONMENTAL INVESTIGATIONS

In preparing for this Study, Deicke Richards' professional staff inspected, mapped, photographed, and recorded the features of the site. In addition, independent expert sub-consultants were engaged to examine natural and indigenous heritage protection issues, the physical environment (soil, water and landform). the engineering infrastructure capability (transport, drainage, water supply, wastewater disposal and water quality management), and the requirements for future cultural infrastructure (health, education, welfare, emergency services, retail facilities, recreation and public assembly.)

Their reports are incorporated later in the Study text and included in the Appendices where received as a structured document.

4.2.2 EXISTING SITE INFRASTRUCTURE

None of the Study segments under consideration presently has any in-situ engineering or social/cultural infrastructure, although some segments would be able to exploit existing under-utilised services in proximity.

4.3 CONSULTATION

4.3.1 COMMUNITY CONSULTATION

The EP&AA does not require community consultation in the course of preparation of a draft Local Environmental Study. However during the consultation phase of the concurrent Master Plan preparation, there was public exposure of the general findings of the flora and fauna, archaeological, water quality management and infrastructure investigations on the subject lands. There were no objections of factual disagreement or omission raised at that time, although it was evident that some members of the local community had issues with the already adopted HUGS document.

The EP&AA provides for subsequent public exhibition of any completed draft LES once it has been submitted to the Director General and received Section 65 certification. Where substantial issues are raised in public submissions, it may lead to a public hearing under Section 68 of the EP&AA.

4.3.2 GOVERNMENT AGENCY CONSULTATION

NSW State Government authority consultation is mandatory.

Section 62 of the EP&AA requires the (Hastings) Council to consult with

> *"such public authorities or bodies (including authorities of the Commonwealth or other States) as, in its opinion, will or may be affected by that draft local environmental plan, …"*

Hastings Council has written to the authorities it judges may have an interest in rezoning of lands in the Lake Cathie – Bonny Hills district to urban or tourism uses. (The full replies may be found in Appendix 2.of this document.) A synopsis of issues raised in those responses is provided above in **s.1.4,** and those issues are treated as components of the brief.

5.0 THE SITE

The site information collated here is primarily desktop research of data supplied by Hastings Council.

5.1 SITE GEOGRAPHY

5.1.1 LOCALITY

Lake Cathie – Bonny Hills lies on the NSW north coast approximately midway between the 'resort and retirement' towns of Port Macquarie and Laurieton. It is connected to these two towns by a coastal road corridor named locally as "Ocean Drive" and also connected directly to the Pacific Highway to the west by "Houston Mitchell Drive".

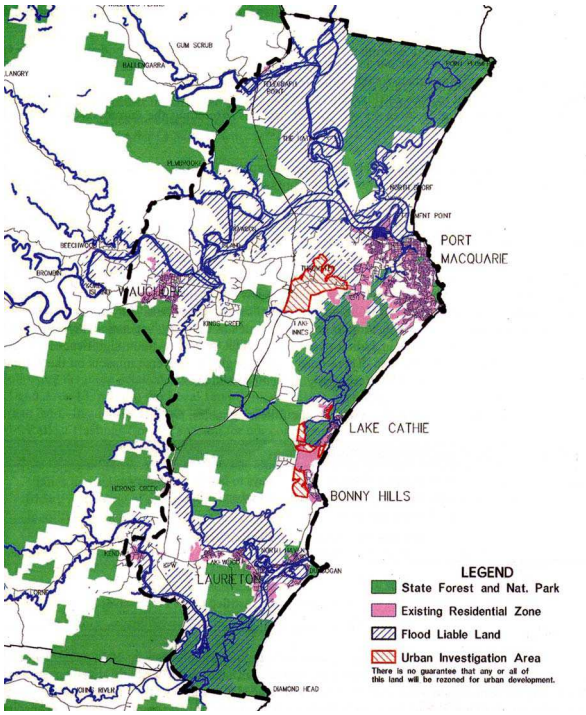


Figure 1 – Locality

5.1.2 LOCATION

The Study Area comprises vacant or sparsely settled coastal lands not already zoned for urban residential purposes in the undulating to flat country between the villages of Lake Cathie and Bonny Hills.

It lies mostly on the western side of Ocean Drive, and is in three (3) discrete segments. Segment 1 is accessed via Houston Mitchell Drive, Forest Park Way and Spring Hill Place, and segments 2 and 3 front Ocean Drive.

Their boundaries are detailed below.

5.1.3 THE URBAN RELEASE AREA

Within the locality, Hastings Council through the 'HUGS' process has identified urban release opportunities within "Area 14" which is the subject of a con-current Master Plan process. Three (3) particular areas within this Area are the subject of this Environmental Study. (See brief in **Appendix 1**). These are hatched vertically in blue and marked UIA Stage 1A in **Figure 2** below. (Note that two further hatched areas at the top of the figure have since been deleted from the original brief.)

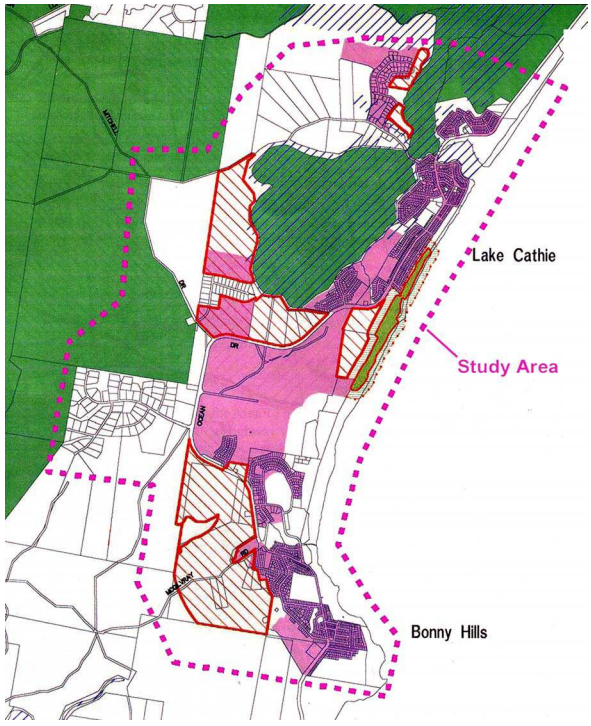


Figure 2 – Plan of HUGS Release Area No. 14

5.1.4 SITE MAP

The LES area only constitutes a small percentage of the overall Master Plan area. The map below more clearly extracts the three (3) discrete areas from HUGS Area 14 which comprise the "site" of this Local Environmental Study. These are henceforth referred to as **Segments 1, 2 & 3** respectively.

Figure 3 - Site Map (3 segments)

5.1.5 LAND PARCELS AND TERRAIN

The cadastral pattern of subdivision and its relation to topography is shown in Figure 4 below.

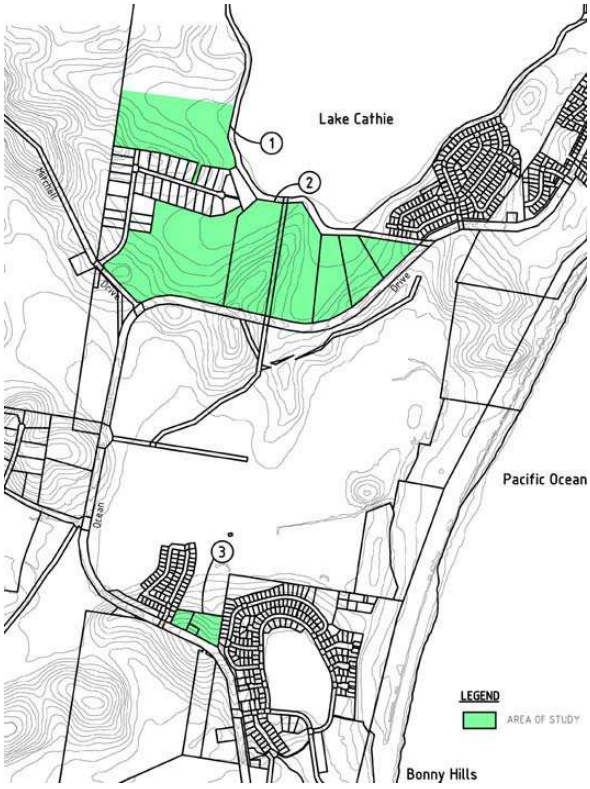


Figure 4 - Land parcels & Topography (2m contours)

5.1.6 OWNERSHIP, TENURE, FRAGMENTATION

All three segments are private freehold property (excluding crown Road Reserves). All, but the most northerly (Segment 1), are currently subdivided into medium sized holdings ranging from around 1 hectare to around 20 hectares.

Segment 1 with Lake Cathie SEPP14 Wetlands backdrop

Segment 2 _ Looking North to Lake Cathie from Ocean Drive

Segment 3 _ Looking North from Ocean Drive

Motel at Eastern end of Segment 2

Rural style residence on Segment 2

5.2 EXISTING PLANNING FRAMEWORK

5.2.1 SITE LAND USE & ZONING CONTEXT

Figure 5 - 2002 Land Use Zoning

From inspection of **Figure 5** it can be seen that the subject lands are currently zoned under Hastings Council's LEP 2001 as below:

SEGMENT	AREA	ZONING	LAND USE
1	~ 15 ha	2(a4)	Low density residential
2 – east sector	~ 38 ha	1(a1)	Rural
-- west sector	~ 20 ha	2(a4)	Low density residential
3	~ 2.5 ha	1(a1)	Rural
TOTAL	75.5 ha		

The Hastings LEP 2001 nominates the relevant zone objectives as:

Zone 1 (a1) Rural

Zone objectives

To protect and encourage utilisation of the productive potential of agricultural, extractive and mineral resources located in rural areas.

To protect the amenity of rural residential subdivision areas.

To prevent the unnecessary, premature or sporadic fragmentation of rural land, to protect the agricultural potential of land and also to ensure that development does not create unreasonable or uneconomic demands for the provision or extension of public amenities and services.

To enable appropriate development where allowed with consent.

Zone 2 (a4) Low Density Residential

Zone objectives

To identify urban land suitable for low-density residential development that is consistent with the protection of environmental qualities of the site.

To enable the provision of services and facilities associated with a residential land use and which are unlikely to adversely affect the residential amenity or environmental qualities in the vicinity.

(a) To enable appropriate development where allowed with consent.

The adopted HUGS report recommends that the above lands be further investigated for potential conversion to:

Zone 2 (a1) Residential

Zone objectives

(a) To identify land suitable for residential purposes.

(b) To ensure the provision of services and facilities associated with residential land uses or which are unlikely to affect residential amenity.

(c) To ensure a variety of housing choice.

(d) To enable appropriate development where allowed with consent.

5.2.2 STATUTORY INSTRUMENTS

The impact of statutory instruments whose contents might impinge on the study area is tabled below, with responses.

Planning Instrument	Comment
Hastings LEP 2001	Discussed in previous section
North Coast REP	Discussed in earlier section
SEPP 14 - Coastal Wetlands	Affects Lake Cathie water body. Discussed in environmental issues.
SEPP 26 - Littoral Rainforests	Not applicable to Study Area
SEPP 71 -Coastal Protection	Discussed in next section

5.2.3 NON-STATUTORY PLANS & POLICIES

The impact of non-statutory policies whose contents might impinge on the study area is tabled below, with responses.

Planning Instrument	Comment
NSW Coastal Policy 1997	Largely superseded by SEPP71, but canvassed below.
North Coast Urban Planning Strategy (Dept. Urban Affairs & Planning 1995)	Hastings Council has observed & incorporated the key premises of this policy in its Hastings Urban Growth Strategy 2001

Planning Instrument	Comment
Hastings Urban Growth Strategy 2001 (HUGS)	Approved by Planning NSW as precedent for this LES.
Draft Hastings Urban Growth Strategy 1999	More comprehensive pre-cursor to HUGS, but condensed and revised in 2001.
Lake Cathie - Lake Innes Estuary Management Plan 1994	Estuary is well outside Study Area although Lake Shores are proximate. Buffer protection and Water Quality management will meet Plan requirements.
Hastings Effluent Management Strategy 1998	Discussed in Study text.
Draft Major Roads and Traffic Study 2001	Discussed in Study text.
Hastings District Water Supply Strategy 1999	Discussed in Study text.
Hastings Urban Stormwater Management Plan 2000	Discussed in Study text.
Draft Vegetation Management Plan (Cooper, and EcoGraph 1999)	Discussed in Study text.

5.2.4 THE NSW COASTAL POLICY

Being within 1 kilometre of the Pacific Ocean the Study Area is affected by "*The NSW Coastal Policy – A Sustainable Future for the NSW Coast*" re-released in 1997. Shortly afterwards, the Minister for Planning re-issued a Direction under Section 117 of the Environmental Planning and Assessment Act 1979 for all local councils in the coastal zone regarding the Coastal Policy 1997. In preparing a draft Local Environmental Plan (LEP), the Direction requires councils to a) include provisions that give effect to and are consistent with the NSW Coastal Policy 1997; and b) not alter, create or remove existing zonings unless a Local Environmental Study for the draft LEP has been prepared and considered by council.

The planning principles in the Policy have since been embodied more comprehensively in SEPP71, and in the draft Urban Design guidelines released by the Coastal Council in 2001. This LES addresses the principles of Coastal Planning generally as expressed in SEPP71.

5.2.5 SEPP 71 SIGNIFICANT COASTAL DEVELOPMENT

Note that the subject lands are within the Coastal Zone as defined in the Coastal Protection Act 1979, and therefore affected by SEPP 71. Clause 8 of SEPP 71 sets out certain environmental matters which must be addressed in the course of preparation of a draft Local Environmental Plan, if relevant, particularly including "*the means to encourage compact towns and cities.*" These matters also must be addressed by this Study.

Furthermore because of the proximity to Lake Cathie, most of the subject land in is also categorised in Schedule 2 of SEPP 71 as a "Sensitive Coastal Location", thus causing any proposed urban subdivision to be deemed "Significant Coastal Development" for which the Minister will be the consent authority.

The full text of SEPP71 may be perused on the Planning NSW website. An abbreviated version of Clause 8 (with irrelevancies and redundancies deleted) is provided below:

SEPP71

8 Matters for consideration (abbreviated)

The matters for consideration when processing a draft LEP or development application are the following:

(d) the suitability of development given its type, location and design and its relationship with the surrounding area,

(e) any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore,

(f) the scenic qualities of the New South Wales coast, and means to protect and improve these qualities,

(g) measures to conserve animals (within the meaning of the Threatened Species Conservation Act 1995*) and plants (within the meaning of that Act), and their habitats,*

(i) existing wildlife corridors and the impact of development on these corridors,

(j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards,

(l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals,

(m) likely impacts of development on the water quality of coastal water bodies,

(n) the conservation and preservation of items of heritage, archaeological or historic significance, and

(o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities,

5.3 EXISTING AND TARGET DEMOGRAPHICS

Setting aside private speculative investment motives, the public need to rezone for urban purposes is driven by the need to match forecast immigration to available residential land stock. The Study should confirm that the land supply generated by any rezoning is adequate to meet forecast demand for urban land, whilst not wastefully alienating farmland and habitat by over-supply.

5.3.1 EXISTING POPULATION

The current permanent population of the Study Area is around 15 persons, although Segment 2 also includes a tourist facility, a small motel, which adds perhaps a similar transient population.

5.3.2 HUGS TARGETS

In Table A3, HUGS identified the expected Lake Cathie – Bonny Hills in-fill rate at 300 persons/annum for the next twenty years, rising from the current 3,900 cap to 9,900 cap. This corresponds to an increase of 2500 dwellings with a related land consumption of around 110ha.

As noted in **s3.2.1** this Environmental Study covers potential release areas of approximately 75ha, even though around 370ha was rezoned for residential purposes in the past 15 years, and that land remains mostly un-consumed.

The degree of utilisation of this already zoned land in the adopted Master Plan will affect the need for the further land releases examined in this Study.

TABLE A3 Housing Balance Sheet: Lake Cathie – Bonny Hills

5 Years Ending	Population		Persons/ Dwelling	Dwellings		Dwellings / Hectare	Land (Ha)		
	Estimate	Change			Change		Used	Rezoned	Usable Reserves
1971	na								
1976	710	na							
1981	1,400	690		792					
1986	1,960	560	3.8	939	147			297	
1991	2,600	640	3.2	1.142	203	12	17	72	
1996	3,200	600	2.5	1,382	240	7	36	5	73
2001	3,900	700	1.8	1,767	385	11	34	0	39
2006	5,400	1,500	2.4	2,392	625	12	52	0	83
2001	6,900	1,500	2.4	3,017	625	12	52	40	71
2016	8,400	1,500	2.4	3,642	625	12	52	30	48
2021	9,900	1,500	2.4	4,267	625	12	52	0	-4

NOTES:

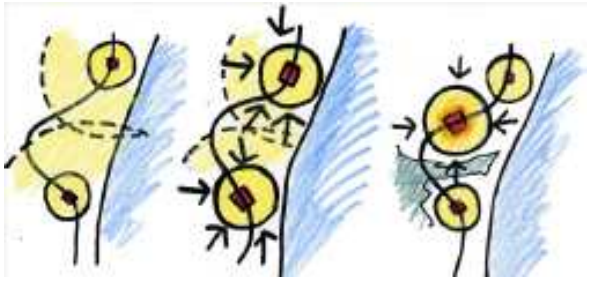
1. Refer to the text for limitations regarding timing of development. No further development can be approved or urban rezoning made until increased sewage treatment capacity is available.
2. Land used: net change in land reserves, excluding rezonings, over 5 years.
3. Land rezoned: net change in vacant land with Residential zoning, over 5 years.
4. Land usable reserves: vacant residential-zoned land over 0.4 hectares. To 2001 includes services land only.
5. Assumed that increased wastewater services capacity will be available by 2006.
6. Date for 2001 is projects, not estimated off actual census data.

5.3.3 THE DRAFT MASTER PLAN

The Study Brief (see **Appendix 1**) includes the preparation of a draft Master Plan for Greater Lake Cathie – Bonny Hills. This is complete and is shown over the page in **Figure 6**.

5.3.4 URBAN DESIGN

In order to conceptualise an appropriate urban form for Area 14, the Master Planning process identified three alternative future strategies.



1 **2** **3**

Future One demonstrates unplanned residential expansion of the two existing villages, most probably of low density. The higher order community needs are not integrated and the resultant housing would be sprawling detached housing offering little housing choice. Pockets of medium density housing could be incorporated, but at edges where views are available rather than supporting centres. Trips to Port Macquarie or Laurieton would be needed for higher order activities.

Future Two sees the growth of Area 14 as urban consolidation and extension of both Lake Cathie and Bonny Hills. Development in the potential growth area between the villages will focus towards these settlements. While both settlements have the potential to expand towards the west, on land closer to the existing village centres, this land is on the edges of the villages, within areas of environmentally and visually significant vegetation. Also, existing developments in these locations are of low density and street connections from these areas to existing places within Area 14 are poor. Therefore, it would be unlikely that higher residential densities and housing choice could occur in these locations if developed.

This future would create considerable change and development pressure for each village with the need to incorporate larger shopping uses, community facilities and medium density housing within the current urban pattern. Redevelopment will require consolidation of lots. Without new centres of any size, the growth areas on the edges of the existing villages would remain as sprawling lower density detached housing and offer little housing choice. This future does not reach the development potential of land that is well located for good urban design outcomes and does not provide a sustainable outcome for the new growth areas.

The third possible future sees the new growth areas as the location of the higher order needs for the growing community configured as another village or villages between the two existing settlements. New growth would focus upon these locations. Within new growth areas, there is more potential for the integration of larger scale retail uses, and a variety of housing densities.

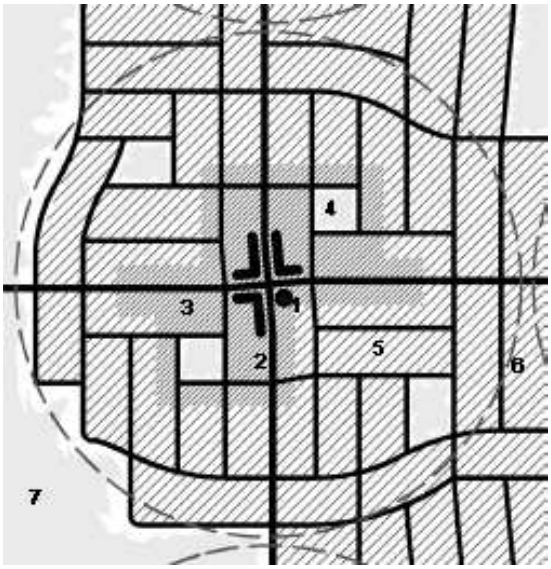
This third possible future is considered to be preferred for the following reasons:

- Lake Cathie and Bonny Hills are separated. There is enough land that is well integrated and connected to the overall urban structure of Area 14 to accommodate new discrete, neighbourhoods or villages between them.
- There are environmental corridors restricting the area of expansion around Lake Cathie and Bonny Hills.
- Larger portions of the site are in single ownerships. This allows appropriate areas of land for large scale uses; supermarkets, community facilities, schools, regional sporting facilities, to the incorporated and their inter relationships will readily achieved.
- The land is undulating and elevated facilitating high quality urban design outcomes.
- •The existing settlements will have less pressure and need for major redevelopment, allowing them to easily retain their existing character.
- Street systems can be designed to accommodate a variety of lot sizes and housing types.

The Master Plan advocated for the new main centre to be immediately to the south of Area Two (2) across Ocean Drive with higher density residential uses proposed close to the centre to create a more sustainable urban outcome. Workplaces can me incorporated in mixed use buildings. The Master Plan virtually requires the bulk of Area Two (2) to be housing while acknowledging the environmental qualities of the area.

Area Three (3) is strategically located on the hill top at the northern end of Bonny Hills and is proposed in the Master Plan to be the focus of a new neighbourhood. N street is identified to allow linking into the town centre from the south. Possible small-scale neighbourhood centre as a "seed" for possible future intensification around this node.

Cluster of neighbourhoods forming a town. Major centre identified. Streets directly connect neighbourhood centres. Large open spaces and bushland frame town. Linear open space corridors through town. Schools located away from centres, on open space corridors



Legend
1 Neighbourhood Centre
2 Main roads linking to adjacent neighbourhoods
3 Higher density residential
4 Park
5 Residential
6 400m radius from centre
7 Environmental Open Space

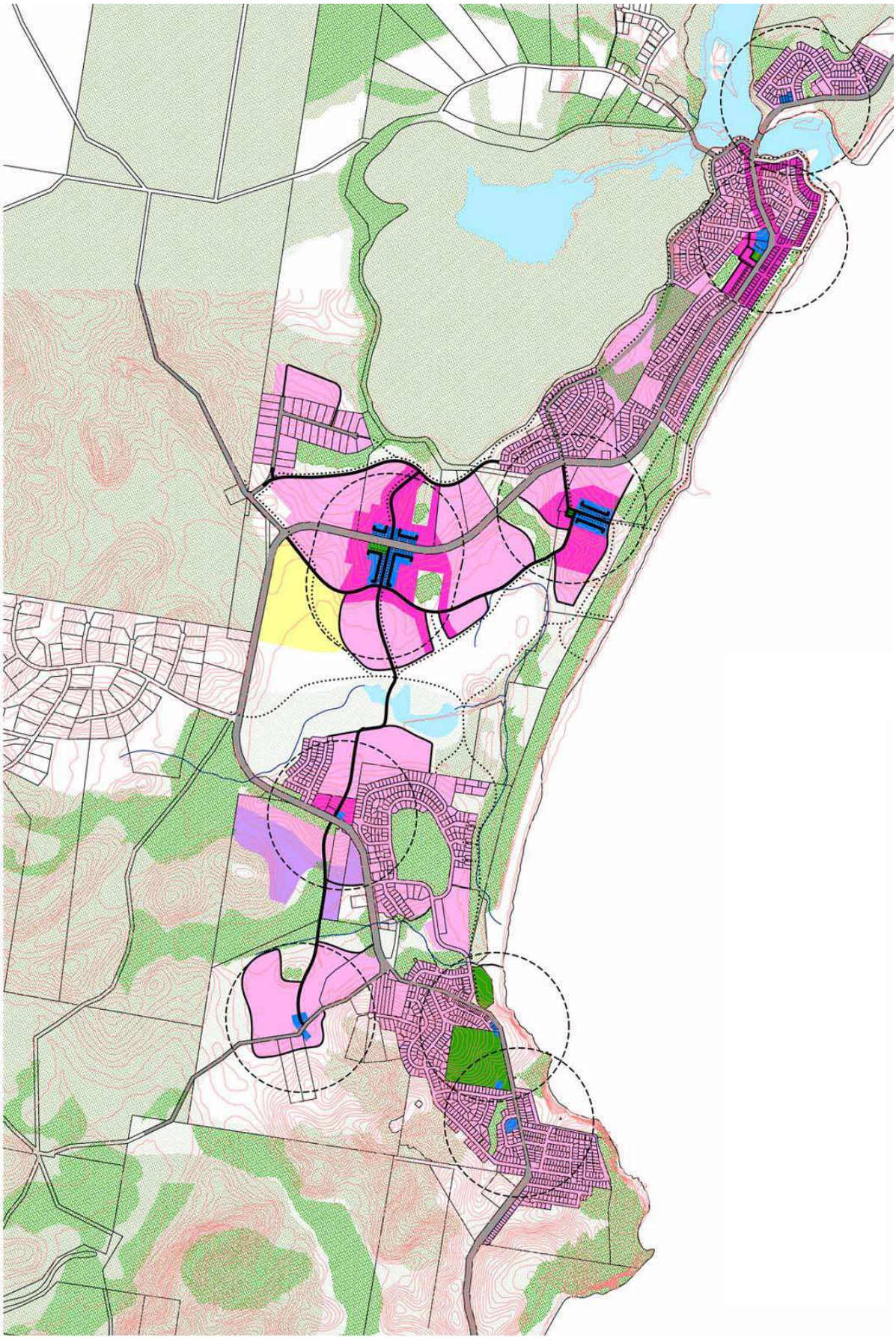


Figure 6 - The draft Master Plan

The draft Master Plan informs the Study in regards to the desired pattern of urban development as it affects the Study Area. In addition it is possible to calculate the area of currently vacant residential-zoned land intended to be urbanised under the Master Plan as about **80 ha**.

Comparing this with the 20 year demographic demand of **110 ha** identified in **s.3.5.1** above, it is clear that only about 30ha more land would require rezoning to meet the HUGS forecasts of release needs in the planning period. In the LES Area, the Master Plan already identifies around **47.5 ha** of compact residential in Segment 3

i.e. a proposed increase of urban-zoned land of **127.5ha** as summarised in the following table:

HUGS Land needed for 20yr. Growth	Within HUGS AREA 14		110ha	110ha
Land urbanized by Master Plan	SECTOR			
	Local Environmental Study Area (UIA Stage 1A)		Existing Residential Zoning (vacant land)	
	Segment 1	5ha		
	Segment 2	40ha		
	Segment 3	2.5ha		
	Sub Total	47.5 ha	80ha	127.5ha

Hence if the existing land zoned urban was developed in accordance with the draft Master Plan, AND all of the Study Area land identified for future urbanisation in the draft Master Plan was rezoned, then the total urban land stock in Greater Lake Cathie – Bonny Hills would be **127.5 ha** - more than adequate for the next twenty years of forecast growth.

Therefore, assuming the draft Master Plan is adopted, this Study will not pursue options for urban rezoning in the Study Area beyond the recommendations of the draft Master Plan

CONSTRAINTS SUMMARY	
Issue	**Action**
Oversupply of land releases in HUGS Area 14	Limit any urban rezoning recommendations to the areas identified in the Area 14 Master Plan 2003 prepared by Deicke Richards Architects.
Integration with contextual land use proposals	Maintain consistency with the Area 14 Master Plan 2003 prepared by Deicke Richards Architects.

6.0 NATURAL (BIO-PHYSICAL) ENVIRONMENT

6.1 AMBIENCE AND AMENITY

6.1.1 SETTING

The site nestles in the lower end of a broad ocean front basin in the foothills of the coastal ranges, between the existing holiday/ dormitory/ retirement villages of Lake Cathie and Bonny Hills. The basin splits into two sub-catchments, one falling into Lake Cathie, and the other into Duchess Creek, before draining to the Pacific Ocean. The Study Area is mostly cleared grassland with scattered remnant native trees, some regrowth and smaller vegetation. The visual backdrop is of the hills to the west clad with Queens lake State Forest and some distinctive mountain peaks – Jolly Nose to the south west and Middle Brother and North Brother to the south. The north segments of the site are framed in the northeast by the peripheral wetland vegetation communities fringing the shores of Lake Cathie, and the managed native forest to the west.

View to Jolly Nose from Ocean Drive

The values in this setting are largely related to visual access to the regional landscape backdrop, and occasionally the ocean. In the event of rezoning in accordance with the Master Plan, the foreground views of open pasture are susceptible to change – but these are the lowest rated contributors to the visual amenity of the Study Area. Access to the background could be affected by insensitive building scale on the former open pasture and therefore this should be protected in any DCP process that succeeds a rezoning approval.

6.1.2 ASPECT

Most of the lands in the Study area have a northerly aspect (some in Segment 2 being a little more north-westerly.) This site orientation is therefore favourable to maximum solar access for solar hot water and solar electricity generation, as well as for passive solar design of dwellings.

There are pleasant views from the elevated portions of the Study Area, although only isolated opportunities for sea views. Lake Cathie itself will generally remain obscured by the perimeter melaleuca forest and other emergent wetland margin species.

6.1.3 CLIMATE

Lake Cathie- Bonny Hills enjoys a pleasant warm temperate climate. Being at latitude 32º, it is at the southern extremity of the sub-tropical climate zone with a rainfall of approximately 100cm per annum. Summer temperature peaks range from 23 to 25 degrees Celsius with winter minima in the 6 to 12 degree Celsius range. The area enjoys prevailing summer winds mostly between north easterly and south easterly, afternoon sea breezes, and close proximity to the Pacific Ocean. It therefore offers moderate outdoor conditions in all seasons; thus encouraging sustainable transport (walking and cycling), and requiring minimal energy inputs to dwellings to maintain liveable conditions.

As such the climate is ideal for sustainable human habitation.

6.1.4 TOPOGRAPHY

Landform. As can be seen from **Figure 5**, the land is between 5m and 20m above sea level. It is generally undulating with few steep slopes or deep defined gullies. This lends itself to the economical construction of road infrastructure, public utilities and housing.

The gently rolling hills also present design opportunities for allowing terraced rows of dwellings access to sunlight, breezes, and retaining pleasant coastal views, even in the context of a compact suburban structure.

Gentle road grades are also conducive to sustainable self-powered transport and walkable neighbourhoods.

Dominant Features. Study requirements from Planning NSW include the protection of "escarpments and hilltops" from inappropriate development where relevant. There are no escarpments or hilltops within the Study Area, although a ridge from the hilltop location of the proposed town centre extends north through segment 2. (see **Figure 5**). Because of the forest and mountain backdrop, development on that ridge is unlikely to interrupt the visible horizon for remote observers.

Access to Views. Clause 8(e) of SEPP71 requires "significant overshadowing or significant loss of views from public places" to be avoided in rezoning activities. The only current public places within the Study or Master Plan Areas tend to be public roads. The generally low profile of the site and the storey height limitations in the Hastings LEP will adequately ensure against this contingency.

CONSTRAINTS SUMMARY	
Issue	**Action**
Visual Access to landscape	Restrict development above 3 storeys
Protect 'escarpments and hilltops" from building profiles on visible horizon	N/A

6.2 HYDROLOGY

There are no Declared Streams, named watercourses or permanent surface waters within the Study Area. Surface stormwater runoff from Segments 1 and 2 drains into Lake Cathie. Ocean Drive forms a ridge watershed to the south of both Segments 2 and 3. Segment 3 drains north into the local Duchess Creek catchment, which enters the sea at Bonny Hills.

The seasonal filling of Lake Cathie may however encroach on the fringes of the northern segments of the Study Area. This has implications for surface water and groundwater protection, as well as for its associated riparian habitat.

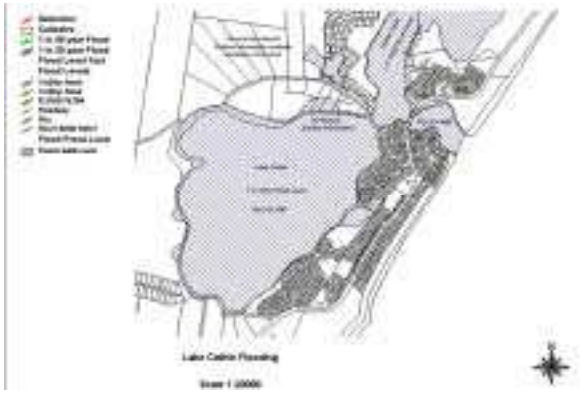


Figure 7 - Lake Cathie Flooding

Groundwater movement patterns are likely to mirror this surface pattern, the hydraulic gradient intercepting the land surface at Lake Cathie and Duchess Creek, outside the study area.

There would not appear to be any serious implications for urbanisation in this pattern, providing "Best Practice" water sensitive design principles are observe in the development process.

(The potential impact of changed land use on drainage and water quality is discussed later in the document.)

CONSTRAINTS SUMMARY

Issue	Action
Flooding encroachment from Lake Cathie into HUGS Area 14	Provide 100m-habitat buffer to SEPP14 wetlands.
Existing surface and sub-surface drainage patterns.	Protect and enhance existing watercourses (with buffers and riparian planting). Adopt water-sensitive design principles to ensure water tables remain charged after urbanisation

6.2.1 RIPARIAN VALUES, WETLANDS

As stated earlier there is no permanent surface water evident in the Study Area, but the seasonal high water mark in Lake Cathie may encroach onto Study Area segments 1 and 2.

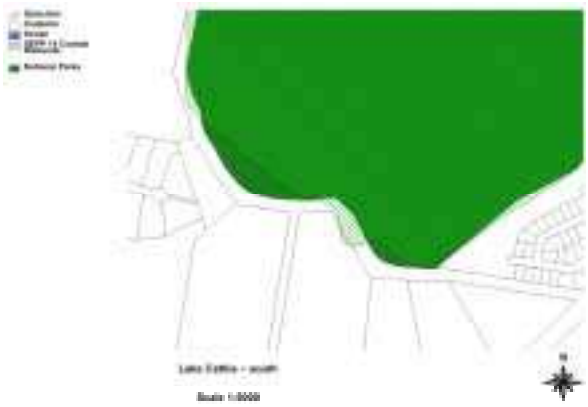


Figure 8 - SEPP14 and National Park Buffer

Lake

Cathie is a designated wetland under State Environmental Planning Policy No. 14 (SEPP14), although the gazetted boundaries of the wetland do not precisely correspond with the boundaries of the National Park proclamation. (Note that only that small part of the SEPP14 area lying outside the National Park is actually subject to the provisions of SEPP14.)

The NPWS submission places a high environmental value on the peripheral habitat surrounding Lake Cathie and its role as a wetland biological filter, protecting the Lake from nutrients and pollutants.

Consequently it would be appropriate for this Study to nominate a suitable riparian buffer (100m.) to the NPWS estate boundaries of the Lake, with appropriate protective zoning to segments 1 and 2. As such a buffer would mostly be outside both SEPP14 and NPWS jurisdiction, designation of the buffer would not necessarily preclude installation of artificial wetlands and the establishment of recreational and educational access trails in the protected margin – subject to their inclusion within an approved Plan of Management.

Typical Buffer Interface between SEPP14 wetland and HUGS release area 14a

The wetland protection buffer would preferably be **in addition** to any bushfire fuel reduction buffer provided to proposed urban development. It would be desirable in the future for Hastings Council to prepare a Plan of Management for any lands transferred to public ownership as a consequence of their buffer status, paying particular regard to the need for excluding domestic and feral cats and dogs from the National Park.

CONSTRAINTS SUMMARY	
Issue	**Action**
SEPP14 Wetland Buffer	Provide 100m. buffer to L. Cathie NP where adjacent to urban release areas.
Buffer Ownership & Zoning.	Allow retention of current ownership where no other public purpose involved (e.g. WQ management, public open space). Zone as 7(h) Environment Protection Habitat.

6.3 SOILS & GEOTECHNICAL INVESTIGATIONS

6.3.1 GEOLOGY

Previous broad scale investigations by Hastings Council in 1981 indicated that Segments 1 and 2 are underlain by deeply weathered metasediments derived from schist, phyllite and slate, whilst Segment 3 is underlain by sandstone conglomerate. The north-eastern lake margins of Segments 1 and 2 also have a sedimentary layer of material eroded from the upper catchment with organic detritus at the surface. These margins therefore have some Acid Sulphate Soil potential which is separately discussed below.

6.3.2 SLOPE STABILITY

Slopes in all of the 3 segments nowhere exceed 1 in 10 (6°) and in consequence there are no issues of slope stability within the Study Area.

6.3.3 SOILS AND GROUND STABILITY

An investigation report prepared by Ardill Payne Associates is presented below:

Soil Landscapes and Geotechnical Assessment

Fig 9.0 details soil landscape zones extracted from draft 1:100,000 mapping of soil landscapes of the Camden Haven currently being prepared by Department of Land and Water Conservation and has yet to be ratified prior to formal publication.

The soil landscapes for Area 14 are described later in this report.

Fig 2.0 also shows a number of individual soil sample assessments recorded within the Department of Land and water Conservation's NSW Soil and Land Information System. Detail reports generated by the Department's Internet database - Soil Profile Attribute Data Environment (SPADE) for 4 samples in generally close proximity to the study area are included in this assessment.

Generally the higher elevations of segments 1 and 2 contain moderately well drained soils of strong structure although they do have the potential to become seasonally waterlogged and are subject to erosion.

Detailed soils investigation should be carried out to determine foundation requirements for future development.

The lower regions of segments 1 and 2, generally following natural gully lines, are characterised by poorly drained soils with high subsoil plasticity, low wet bearing strength and strong acidity. They are also subject to seasonal waterlogging and have the potential to create erosion and foundation hazards.

Segment 3 has moderately well drained soils with low wet bearing strength. The soils in this area also have the potential to create erosion and foundation hazards.

Whilst the soils in the study area do require further investigation to determine appropriate design parameters for future development construction works associated with building foundation, road pavements and drainage infiltration they are not expected to have any significant limiting factor that would preclude future development from occurring.

Figure 9 - Soil Landscapes Mapping Plan

It is clear from the report that due to the shallow topsoil profiles and extensive removal of vegetation other than grasses, potential for erosion exists. This should be recognised and managed in the course of "Water Sensitive Design" of any future subdivision or other development. This Study also proposes extensive rehabilitation of cleared lands to their former habitat role. Both circumstances would improve the current situation, and urban rezoning therefore would promote remediation of existing erosion potential.

Building foundations may be problematic in instances but are well within normal technical capabilities.

CONSTRAINTS SUMMARY	
Issue	**Action**
Topsoil & surface soil potential to erode	Require soil management plans at DA stage incorporating water sensitive design
Building Foundation Suitability	Make provisions in subsequent DCP's for mandatory soil suitability analysis prior to subdivision

6.4 ACID SULPHATE SOILS (ASS)

Engineering examination by Ardill Payne Associates indicate that ASS issues within Segments 1 and 2 are likely to be minor and manageable. Their report is as follows:

Hastings Council has previously prepared broad-scale Acid Sulphate Mapping for its LEP in conjunction with its Development Control Plan No. 34 "Acid Sulphate Soils". It indicates that most of the study area is not likely to be influenced by the presence of actual or potential acid sulphate soils. Those areas which may be affected are generally the lower lying areas adjacent to natural gully lines and coastal lowland. Mapping identifies these areas as having Class 2 or 5 acid sulphate soils. In particular, Class 2 soils encroach into Segment 2 around the fringe of Lake Cathie. Category 5 soils are mapped in the northern portion of Segment 1, generally coincident with the swamp oak/paperbark timbered zone fringing an existing gully draining to Lake Cathie. Some low-lying gully areas within segment 2 are also mapped as Class 5 soils.

DCP 34 requires lodgment of a Development Application for any proposal in mapped Class areas if it involves

Class 2 - Works below natural ground surface, works by which the watertable is likely to be lowered.

Class 5 - Works by which the watertable is likely to be lowered to below 1 metre AHD in adjacent Class 1, 2, 3 or 4 land.

Applications must generally be accompanied with an Acid Sulphate Soil Management Plan.

The Class 2 lands are not affected by urbanization as proposed in the Master Plan, and are recommended as lake edge buffer zones. The Class 5 lands are likely to be retained as public land in any urbanization, and could therefore be partly affected by roads, drainage, and utility construction.

Figure 10 - Acid Sulphate Mapping Plan

A review of natural drainage patterns and contours indicate that stormwater drainage is unlikely to impact acid sulphate soils due to the fact that these works are unlikely to affect ground water levels.

Sewerage reticulation works (particularly sewer pumping stations) may require further investigation into acid sulphate soils parameters. Regardless of their presence, proponents of development may accept that there will be a disturbance of acid sulphate soils associated with infrastructure construction and proceed to assess the potential impacts of disturbing these soils prior to developing a management strategy in accordance with ASSMAC guidelines and obtaining development consent.

Alternatively, proponents may undertake field and laboratory testing to verify whether acid soils are present or not. If not present, they may proceed with their proposal. If acid sulphate soils are present assessment of impacts and development of a management strategy will be necessary.

The above review by Ardill Payne Associates indicates that acid soils may be present in marginal areas, but can be managed within the regimes set up by DCP34 and the EPA.

CONSTRAINTS SUMMARY	
Issue	**Action**
Acid Soils	1. Avoid urbanisation in all Class 2 Acid Soil zones.
	2. Allow public infrastructure development in Class 5 zones subject to compliance with DCP34

6.5 NATURAL HERITAGE

6.5.1 LEGISLATIVE REQUIREMENTS

Councils in NSW are required by the *Environmental Planning and Assessment Act 1979* (EP&AA) to consider conserve and husband biodiversity, to wit:

> *Section 5*
>
> *The objects of this Act are:*
>
> *(a) to encourage:*
>
> *……*
>
> *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
>
> *(vii) ecologically sustainable development*

Ecologically Sustainable Development is defined for NSW legislative purposes in the *Protection of the Environment Administration Act* 1991 - *Section 6*. Briefly it is founded on the precautionary principle, inter-generational equity, and conservation of biodiversity and ecological integrity.

In this context, biodiversity means the variability among living organisms from all sources (including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part) and includes diversity within and between species and the diversity of ecosystems. (Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999.)

Accordingly any proposed alteration to the natural environment must demonstrate due consideration of the above principles.

CONSTRAINTS SUMMARY	
Issue	**Action**
Biodiversity conservation	Protect and buffer existing native wetlands and woodlands.
Ecological Sustainability (w.r.t. the natural environment)	Protect enhance and integrate existing habitat. Protect water quality. Remove exotic species.

Appendix 5 contains the report commissioned from Biolink Pty Ltd, Natural History & Environmental Consultants on the flora and fauna values obtaining to the site. These are summarised in the following sections:

6.5.2 PREVIOUS DISTURBANCE

The Study Area has been subject to modification through various historical land uses including logging, agriculture, and urban development. As a consequence of these activities, the natural environment has been altered quite dramatically, the end result measurable in terms of cleared areas of land, habitat fragmentation, the disruption of natural ecological processes and an increased frequency in the use of fire as a land management tool.

Nevertheless there are remnants of significant vegetation, some of which constitutes important habitat for native fauna.

6.5.3 VEGETATION COMMUNITIES

Previously a study by TFB Ecovision Environmental Consultants in 1998 *Natural Vegetation of Hastings LGA* identified significant plant communities in a small fraction of the Study Area – the balance being tabled as cleared agricultural land. Figure 7 below summarises the relevant findings. (Segment 3 is unaffected).

Figure 11 - Identified Vegetation Communities

FOUR DIGIT VEGETATION CODE

Dry Red Gum	3512	133.83 / 0.83%	62	Eucalyptus tereticomis
Cleared	9203	455.89 / 2.80%	171	N/A
Dry Ironbark – Red gum	3232	79.01 / 0.49%	N/A	Eucalyptus siderophloia
Swamp Mahogany - Broad-leaved Paperbark	4098	424.17 / 2.60%	114	Eucalyptus robusta, Melaleuca quinquenervia
Swamp Oak – Broad-leaved Paperbark	4099	543.42 / 3.35%	116	Melaleuca quinquenervia, Casuarina glauca
Explanation of fifth digits numbers encountered.				
1 = 30%or more canopy projection				
2 = less than 30% canopy projection				
0 = no overstorey canopy projection				

Biolink's investigations also identified significant vegetation in addition to that shown by others in Figure 11, particularly some forested koala habitat behind houses on the southern side of Springhill Place and the old growth Tellowood stand located on Lot 4 DP255923. the latter remnant is located immediate south of Lake Cathie.

In the Biolink environmental report in Appendix 5 it is recommended that

- *All significant areas of native vegetation within the MPA should be incorporated – in their entirety - into a system of open space reserves, habitat links and/or corridors.*
- *All significant areas of native vegetation within the MPA should be afforded ecotonal buffers that have a minimum width of 60 metres (including any OPA requirements associated with the provision of APZs).*
- *Where such buffers traverse cleared lands, they must be regenerated and/or rehabilitated accordingly.*

From the Biolink report it can be seen that the vegetation communities identified by TFB Ecovision in Figure 7 as types 3512, 4098 and 4099, being Forest Red Gum and SEPP14 wetland fringe species respectively, all provide habitat and/or forage for identified vulnerable and endangered species present in the catchment. For these reasons alone they are "significant areas of native vegetation" and should be conserved in their entirety with a 100m buffer as previously recommended.

The need for wildlife corridors to link these remnant vegetation stands and their proposed buffers was examined in the course of preparation of the overall Master Plan for the area (**Figure 6**). Site investigation and aerial photography indicated that there are stands of significant vegetation other than those mentioned in the TFB Ecovision report, and these have been coopted where convenient, into a proposed network of wildlife corridors. The corridors chosen reflect both the need for conservation of existing substantial forest stands, and the need for linkages nominated in the BioLink Report and the draft 2000 Hastings Koala PoM.

6.5.4 HASTINGS KOALA POM 2000

Hastings Council's commissioned but yet-to-be-adopted *Koala Plan of Management* (Coastal Area Part A) December 2000 identified desirable koala movement corridors in HUGS Release Area 14 as below:

Any proposed pattern of wildlife corridors should at least incorporate those nominated in the above diagram extracted from the *Plan of Management*.

6.5.5 TERRESTRIAL AND AVIAN FAUNA

The Biolink Report in **Appendix 5** identified a selection of North Coast Threatened and Endangered species observed or previously observed or likely to exploit existing habitat with Area14.

Whilst no particular recommendations in regard to a single species, other than koalas were made, there were recommendations in regard to general habitat management (reproduced in **Section 4.7.1**), which target the conservation of likely terrestrial and avian fauna.

These particularly include the reinforcement and linking of existing vegetation stands represented photographically in **Figure 10**. The Master Plan in **Figure 6** has adopted these new natural areas and linkages, and opportunities exist (outside the terms of reference of this report) to re-establish native bushland on the flood-prone land cleared for grazing immediately north of Bonny Hills, and along the riparian fringes of Duchess Creek. Pursuing this opportunity would integrate the corridors proposed in **Figure 6** with the existing SEPP26 Littoral Rainforest on the Lake Cathie foreshore and the active koala habitat on the eastern slopes of Bonny Hills.

Figure 12 -Constraints Plan

It is recommended that these corridors both within and outside the Study Area be identified, designated by a protective zoning, and covered by a Plan of Management where vested in the public realm.

This zoning is shown in the draft Amendment to the Hastings LEP.

CONSTRAINTS SUMMARY	
Issue	**Action**
Threatened Species	Habitat extension and integration.
Wildlife Corridors	Create and protectively zone existing and potential wildlife corridors as per Figure 12.
Habitat Integration	Preserve and link native vegetation with wildlife corridors. Provide remnants with 60m min. ecotonal buffers – regenerated & rehabilitated if necessary.
SEPP44 – Koalas	Prepare a Koala Plan of Management for Lot 4 DP255923 and Lot 34 DP 803801 prior to dealing with any development applications for these parcels.
Bush Fire	Ensure all wildlife corridors and new urban areas are established with suitable APZ's in accordance with NSW government policy

7.0 URBAN INFRASTRUCTURE REQUIREMENTS

Urban Physical Infrastructure may be defined as the combination of transport movement pathways and an embedded mosaic of public utility corridors, which deliver and remove water, and channel energy and communications to property. This physical set of engineering facilities is sometimes deemed "*essential*".

In addition there may be a further expectation for Urban Services Infrastructure – human socio-economic activities that address the public transport, health, emergency response, cultural, educational and recreational needs of a resident population. Whilst some of the urban services infrastructure also requires major capital investment (e.g. refuse tips, cemeteries, libraries, community centres etc.) their highest proportion of expense is likely to arise from operating costs. This is often because the hard infrastructure for these services is centralised externally to a release area, and its overall cost is amortised into annual charges, which are distributed across beneficiaries. Alternatively, where urban services are to be delivered internally by the public or private sector, there is usually a population viability threshold involved, which precludes '*up-front*' provision. In either case, this category of infrastructure is not considered "*essential*" in the sense that it may be delivered subsequent to human occupation of a development release area.

Consequently capital investment in "*essential*" physical infrastructure will precede the arrival of residents; whereas provision of "*services*" infrastructure can be deferred until demand is evident. Where public sector capital investment in infrastructure is required, developer charges levied under s.94 of the EP&AA may meet or partially offset both essential and services infrastructure costs. Any residual liability will be met through LG rates and charges, supplied by the private sector, or provided by other tiers of government.

In summary, it is clearly imprudent for Council to proceed with urban land releases without, at least, an assurance of availability of essential physical infrastructure. This is formally recognised in the Hastings LEP.

7.1 HASTINGS LEP ON INFRASTRUCTURE

The LEP requires that the Council not proceed with urban development in the absence of infrastructure deemed to be "essential services" – to wit, water supply, sewerage and drainage.

Clause 13. Availability of essential services

(1) Objectives:

(a) To ensure that development does not occur without adequate measures to protect the environment and the community's health.

(b) To ensure that development occurs in a coordinated and efficient manner and that costs attributable to it are borne equitably.

(2) Consent must not be granted to the carrying out of development on any land unless:

(a) a water supply and facilities for the removal or disposal of sewage and drainage are available to that land, or

(b) arrangements satisfactory to the Council have been made for the provision of that supply and those facilities,

if the proposed use of the land will, in the opinion of the consent authority, generate a need for such a supply or for those facilities.

It is mandatory therefore to ensure that drainage, water supply and sewerage are made available in a timely way for any new land releases. Where the current capacity is inadequate for the future population, there should be engineering and financial strategies in place to meet demand, and evidence of town planning approvals, EPA licensing and budgetary commitment to implement the necessary work.

It is axiomatic that sufficient transport infrastructure to guarantee access and mobility is also essential to new land releases. This has been identified by Planning NSW in its directions to Council.

7.2 SUSTAINABLE INFRASTRUCTURE WITHIN THE MASTERPLAN

The matters for inclusion in the Environmental Study as raised by Planning NSW (see Appendix 3) strongly emphasize the need for compact walkable neighbourhoods with maximised self-containment of employment, shopping, services, education and recreation. Similar precepts drive the urban design policies issued by the Coastal Council as an adjunct to SEPP71.

Such urban forms optimise ecological sustainability as required by various NSW statutes.

The Master Plan prepared by Deicke Richards Architects for the greater Lake Cathie – Bonny Hills urban release area is founded on the above concepts, targeting both economic and ecological sustainability. It anticipates between 10 and 15 dwellings per hectare in the residential component, which clusters around a commercial and civic centre, yet leaves the balance largely as 'green belt'. The green belt includes key protected habitat, restored area of potential habitat, buffer to sensitive habitat, wildlife corridors, riparian buffers, water quality treatment facilities, low fuel bushfire buffers, and structured and passive open space dedications.

The movement network for vehicles and self-powered transport is one key output of the urban form. The street pattern is highly interconnected for efficiency, yet controls traffic speeds and 'rat-run' opportunities sufficiently to deter use of the new neighbourhood streets by Ocean Drive through-traffic. A strong emphasis is placed on provision of attractive bikeways, footpaths, and walking trails having a high level of user amenity and convenience.

The degree of self-sufficiency and self-containment (which largely underpins eco-sustainability) is dependent both on the urban form and on the economic self-sustainability of the commercial component of the Master Plan. Catchment thresholds for economic viability of key businesses and institutions have therefore been embodied in the recommended design.

The three segments of the Environmental Study area are included within the overall Master Plan. Their proposed urban forms integrate with that plan to realise the benefits described above.

7.3 TRANSPORT, ACCESS & MOBILITY

The principles of sustainable transport planning are well accepted and concisely expressed in the Commonwealth Government policy published as the "Australian Model Code for Residential Development" (AMCORD) 1995, in the section entitled "Planning Practice Note 7 – *Transport, Accessibility and the Local Environment*". The principles in that document continue to underpin most Australian public policies dealing with transport issues in new development design.

Organic growth of transport systems is usually both inefficient and destructive to neighbourhood amenity. The rare opportunity to build new communities around a logical sustainable transport system should not be forgone when presented. The basic concepts and ideas to realise this are built around the following:

CONCEPT / IDEA	IMPLICATION
Strategic Thinking	The transport network responds to the ultimate pattern of land use, not just the interim one. Movements are minimised by clustering related land-uses and maximising local economic self-containment.
Linkages Connectivity, Nodes, Foci, Desire Lines	The transport network (and hence urban form) is fundamentally structured around the demand for movement of people & goods generated by the various land uses.
Capacity & Congestion Management	The network is planned to accommodate the predicted flows.
Modal Integration & Exchange	The various modes of available transport are complementary and integrate with each other at points of exchange. Modal choice is maximised (within the bounds of efficiency).
Modal Priority *vs*. Central Proximity	The priority of vehicles over pedestrians diminishes and eventually reverses as the CBD is approached.
Permeability & Legibility	Large block sizes are avoided; self-powered journey lengths are minimised; way-finding is intuitive.
Safety & Security	The detailed design protects users from both accidental and criminal threats.
Destination Facilities	The network provides not only for people and goods movement, but for arrival and departure as well i.e. parking, unloading, public transport shelter, lighting, vehicle servicing, transport information, signage, drinking water, toilets & public telephones.
Class Distinction in Transport Choice	Users of public and self-powered transport enjoy the same level of amenity and are accorded the same priority and dignity as private vehicle users.
Goods Movement	The network recognises and provides for the need for movement of goods as part of regional economic sustainability.
Young, Old, Disabled & Impaired	The needs of transport-disadvantaged sectors of the community are catered for in an equitable manner.

7.3.1 VEHICLE TRANSPORT

Vehicle transport may be characterised as

- Through traffic & external connections, or
- Internal traffic

Internal traffic network capability is always manageable at the design phase. The issue is whether existing & proposed arterial and sub-arterial traffic infrastructure is adequate or will constrain future development.

Adequacy depends on structural capability, geometric capability, road space (capacity), and upgrade feasibility.

Structural Capability. The designed pavement service life of the existing arterial road (Ocean Drive) may be reduced by the additional loadings induced by urban development. Council might choose to recover the costs of earlier replacement through Section 94 of the EP&AA.

Geometric Capability refers to maintaining preferred design speeds and access standards for all traffic, and turning circles for large vehicles. Note that the progressive urbanisation of the catchment will preclude retaining the rural road design standards now prevailing in Ocean Drive. Pedestrian safety and access to property will eventually dictate adopting design speeds similar to those already applying in The Lake Cathie and Bonny Hills village areas. Failure to recognize and pursue this principle will fundamentally undermine the "walkable neighbourhoods" requirement and permanently split the east and west of Ocean Drive into two separate communities.

On the other hand, the current geometric design speed of Ocean Drive is quite high, and it therefore remains an adequate alignment for the foreseeable future.

Capacity is created by roadspace (lanes and lane width) and stream conflict reduction. The traffic report prepared by the Snowy Mountains Engineering Corporation indicated that with all the HUGS population outcomes fully in place, a 2-lane Ocean Drive would continue to operate at Level of Service "C" up the 95th percentile event (see Standards Australian Austroads "Guide to Traffic Engineering Practice" HB69.14-1999 and HB69.13-1995) which is the normal design target for traffic planning.

Introduction of new intersections and could potentially lower Ocean Drive's capacity and hence the operating Level of Service. Similar impacts would result from allowing frontage development. Consequences of this can be offset by introducing additional lanes in proximity of intersections, providing medians and additional or service lanes where frontage development is contemplated, and grade separating pedestrians and cyclists, If, after detailed analysis, the number of intersections nominated in the Master Plan still proves to be too inefficient for through-traffic then a later revision downwards may be necessary. This is not a fundamental impediment to rezoning.

Upgrade Feasibility of Ocean Drive is well catered for by its existing width, if augmentation becomes necessary. The corridor width of 40m minimum is sufficient to accommodate 6 lanes of traffic if ever necessary. The urban design in the Master Plan is generally arranged to provide for amenity buffers between Ocean Drive and residential areas, should the road carriageway be enlarged.,

In summary, there is sufficient present and future arterial road traffic capacity, providing future intersection and frontage development design is managed to maintain reasonable efficiency.

7.3.2 SUSTAINABLE SELF-POWERED TRANSPORT

As mentioned earlier, this would desirably be embodied at design phase.

7.3.3 PUBLIC TRANSPORT

Desirably included at design phase also. Transport exchange points such as 'park & ride', cycle storage, and cab ranks should have land use allocations in a future DCP.

7.3.4 DISABLED & IMPAIRED TRANSPORT

Desirably included at design phase also.

7.3.5 MODAL AVAILABILITY & INTEGRATION

Included in the underpinning principles of the Master Plan and desirably included at design phase. Not an essential zoning issue.

7.3.6 NETWORK ISSUES

Ardill Payne & Assoc. have examined the overall regional network as it affects the Master Plan and therefore the LES Area. Their report is reproduced below:

ACCESS AND ROAD NETWORK

Road access to the area is gained from Port Macquarie, to the north, along Ocean Drive through Lake Cathie proper and from Camden Haven area to the south along Ocean Drive through Bonny Hills.

In addition the area is directly accessed via Houston Mitchell Drive from the Pacific Highway to the west. This road is generally narrow and winding in nature and may require improvements to cater for increased traffic demands generated by future development.

The siting of the release area on Ocean Drive therefore places it favourably within a regional transport context.

In 2001 SMEC Australia Pty Ltd undertook a roads and traffic study for Council. This study has established a road hierarchy plan for all existing roads. This plan recognises Ocean Drive as being retained as the north-south Arterial Road for the area providing a key link to Port Macquarie and Laurieton. The study also recognizes the need for a Bonny Hills By-pass.

Collector through roads should provide for bus access and distribution of traffic to lower order connecting roads within the development areas. The alignment and geometry of bus route streets need to be designed to facilitate bus movement without encouraging high traffic speeds. Designs also need to ensure through traffic utilised the arterial road, Ocean Drive.

All intersection and road designs must reflect the volume and size of vehicles expected to utilise the network and have due regard for safety.

The road network needs to provide a high level of internal accessibility with good connections for vehicle, pedestrian and cycle movement to urban activity centres. There needs to be appropriate traffic management systems to restrain vehicle speeds where necessary and create safe conditions for all users.

Roading may be utilised as part of a buffering system for urban development to the more sensitive areas adjacent Lake Cathie. In addition modification to design elements of Ocean Drive may be required to ensure continuity of wildlife corridors. This may be achieved by the installation of an appropriate wildlife tunnel or similar structure.

CONSTRAINTS SUMMARY

Issue	Action
Sustainable Transport	Master Plan for maximum economic self-containment, and walkable neighbourhoods, facilitate & favour self-powered transport, maintain urban densities.
Accessibility	Proximity OK - all segments are highly accessible from the existing road network, and bus transport system. New and larger intersections may be needed.

CONSTRAINTS SUMMARY continued	
Issue	**Action**
Reduced efficiency of Ocean Drive due to contingent development	Add extra carriageway lanes and intersection approach lanes as required.
Structural Impact on design life of Ocean Drive, and demand-driven need to upgrade Houston-Mitchell Drive	Address through future s.94 Plans at DCP stage if determined as significant.

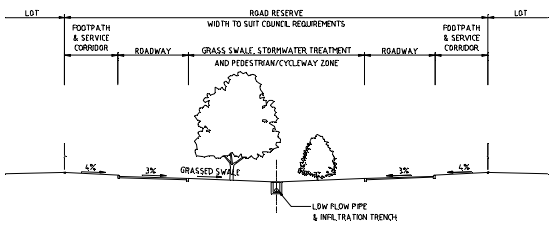
7.4 DRAINAGE, RIPARIAN BUFFERS AND WATER QUALITY MANAGEMENT

Ardill Payne & Associates advise as below>

STORMWATER DRAINAGE

There is a need to prepare a local stormwater management strategy in advance for any new urban area. This is important for both water quality and drainage management. Particularly important are the high standards required by National Parks and Wildlife Service in relation to water quality where urban runoff has the potential to enter closed lake systems such as Lake Cathie.

The LES study areas have the potential to incorporate dual use open space drainage corridors and other water sensitive urban design concepts such as detailed in the figure below.



Typical Cross Section of roadway system with central swale

The use of grass swale zones within road corridors is ideally suited to the two gully areas traversing segment 2. These swales would, in addition to providing a medium for nutrient stripping, carry stormwater runoff to the lower areas of the site. The provision of on-site "dry" detention basins in these lower regions would provide for additional nutrient stripping as well as controlling runoff volumes prior to entering Lake Cathie. Appropriately placed gross pollutant traps at the outlet of the swales would assist in pollution removal.

Where the construction of central grass swales is not possible due to topography, such as in segment 1 development area, grass swales and detention basins should be provided within buffer zones and designed in such a way as to capture and treat runoff from the urbanised areas.

Design and construction of detention basins may be influenced by potential acid sulphate soils as evidenced from acid sulphate soil mapping. This may require specific investigations to determine appropriate floor levels for basins.

Where possible at source control of stormwater should be encouraged. The use of household rainwater tanks, water efficient landscaping and on-site detention to assist in stormwater management is canvassed in Hastings Council's Draft Development Control Plan No.48 – Energy Efficient Water Wise Residential Buildings.

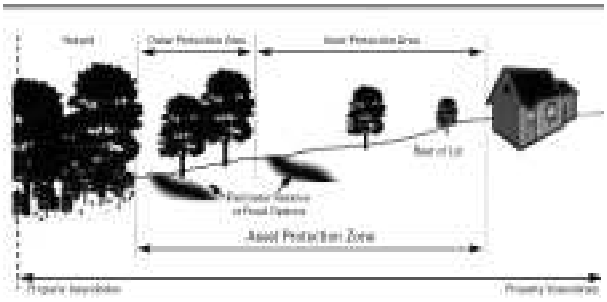
Therefore, urban development within the LES area is not precluded by Stormwater Drainage Issues

CONSTRAINTS SUMMARY	
Issue	**Action**
Water Quality Management from new release area drains to Lake Cathie and Duchess Creek basins.	Provide grassed radial swale drains for filtration and infiltration. Provide GPT's and detention basins between swales and receiving waters, if receiving urban runoff.
Accelerated and increased run-off volumes in artificially lined drainage	Retain natural drainage paths as vegetated riparian corridors serving the urbanised areas.
Acid Sulphate Soils (if encountered in any LES area rezoned so as to permit disturbance).	Observe DCP34 at DA Stage.
Domestic water consumption and Water Table replenishment	Implement DCP No.48 – Energy Efficient Water Wise Residential Buildings at DA stage, and best practice Water Sensitive Design generally.

7.5 BUSHFIRE PROTECTION

7.5.1 PLANNING FOR BUSHFIRE PROTECTION

The NSW Government has recently adopted a policy titled "*Planning for Bushfire Protection*" which is directed at managing the interface between urban areas and bushland or farmland. It is a requirement of the policy that Councils preparing draft Environmental Studies consider *Planning for Bushfire Protection*.



Components of an Asset Protection Zone

Essentially the Policy requires creation of a buffer strip called an Asset Protection Zone (APZ) between new urban areas and bushland. Buffer management must be served by a continuous perimeter road or fire trail within the APZ and accessible from both ends. The buffer comprises of two parts - an Inner Protection Area (IPA) measured from the adopted building line, and an Outer Protection Area (OPA) at the hazard margin. The IPA must be heavily fuel reduced and include the access trail on its outer margins. The OPA beyond the perimeter access trail may be less intensively cleared but must also be hazard reduced.

The APZ buffer width is the sum of the IPA and OPA. The required total APZ buffer width depends on the kind of bushland on the urban interface and whether the intervening land slopes upward or downward towards the Asset which the policy is intended to protect.

When preparing a draft LEP, the Policy requires Councils to identify and restrict land use associated with any necessary APZ buffers. The identified bushfire hazards in the Study Area are limited mainly to land in the proximity of the Lake Cathie environmental buffer strip and the edge of the Queens Lake State Forest. APZ buffers will also be required to any proposed new habitat rehabilitation areas adjoining urban development.

The following table extracted from the Policy indicates that generally for ground slopes between zero and 5° as experienced in the Study Area, the required APZ may vary between 20 metres and 40 metres.

Forests
(Grp 1 see Fig.A2.2)

Slope		APZ = IPA + OPA
> 5°	Upslope	20 = 20 + 0
5-0°		30 = 20 + 10
> 0-5°	Downslope	40 = 30+ 10
> 5-10°		50 = 40 + 10
> 10-15°		60 = 50 + 10
> 15-18°		70 = 60 + 10

Woodlands, heaths, open scrub
(Grp 2 see Fig A2.2)

Slope		APZ = IPA + OPA
> 5°	Upslope	20 = 20 + 0
5-0°		30 = 20 + 10
> 0-5°	Downslope	35 = 25+ 10
> 5-10°		40 = 30 + 10
> 10-15°		50 = 40 + 10
> 15-18°		60 = 50 + 10

Table 4.1
Minimum specifications for Asset Protection Zones (APZ) for Residential Purposed in Bushfire prone Areas

The resultant land use restrictions required for APZ will be included the draft LEP Amendment recommended by the Study.

7.5.2 IMPACTS OF BUSHFIRE PROTECTION

Mandatory clearing in the APZ may remove vegetation which is important habitat. It also generates a quasi-public space which will require management to maintain low bushfire fuel levels.

It is therefore desirable that

- urban expansion areas at the bushland margin be defined as much as possible to be framed with existing cleared land that does not require APZ clearing of significant vegetation, and
- the APZ be created by future developers as public road under the Roads Act thus allowing unfettered entry whilst relieving existing owners of liability for management and the attached Occupational Health & Safety issues.

CONSTRAINTS SUMMARY

Issue	Action
Avoid the need for clearing native bushland to give bushfire protection to new urban areas	Stop proposed urbanisation a minimum of 20m. short of existing or rehabilitated bushland.
Asset protection zones may need legal maintenance access.	Ensure APZ's are on the asset owner's property, are public land, or are covered by easements with s.88B restrictions.

7.6 WATER SUPPLY

Ardill Payne Associates have advised as follows:

Lake Cathie/Bonny Hills is currently serviced by a trunk main from Transit Hill reservoir in Port Macquarie (fed by Port Macquarie supply). This main in addition to serving the Lake Cathie/Bonny Hills area provides water service to communities south to Camden Haven and inland to Kendall (collectively these areas are called the Southern Arm Communities). This 450mm trunk main can supply approximately 17 ML/day to the southern arm system under gravity.

Long range planning, by Hastings Council, for water supply has involved the provision of adequate storage capacity for coastal towns along with a distribution network that has the flexibility to cater for future growth.

Council has identified that in the short-term distribution capacity is adequate to provide water to the existing urban parts of area 14. However, in the longer term water supply augmentation is required.

Council is currently involved in water supply upgrade for the region which involves the construction of a new storage facility (Cawarra Dam), pumping stations and delivery trunk mains. These upgrades have been designed to cater for projected population growth within the shire as outlined in Hastings District Water Supply Augmentation Review of Concept Report dated 1991. That report accounted for a population projection of 10480 (for area 14) in the year 2011 in formulating the water supply upgrade requirements.

That report identified that peak daily demand for the Southern Arm Communities is predicted to rise from 14.9 ML/day in 1991 to 33.5 ML/day in 2011 with an ultimate demand of 38.7 ML/day.

A comparison with population predictions between the HUGS 2001 and the Hastings District Water Supply Augmentation Review of Concept reports is provided in the table below.

Year	Hugs 2001 population	Water Supply report 1999 population	Water Supply report 1999 daily demand
1986	6,707 *	6,537	n/a
1996	10,260 *	11,078	17.8 ML/d
2006	n/a	18,783	28.2 ML/d
2011	n/a	22,770	33.5 ML/d
2021/ ultimate	20,610 *	26,290	38.7 ML/d

* *includes 10% of coastal residue population identified in hugs report and adopts the "medium" growth option (2021 - 21,710 ep for high growth option).*

The above table indicates that the augmentation proposed in Councils report will when completed have excess capacity to that required by current population predictions. The table also shows that the existing trunk main servicing the southern arm communities is currently at or near capacity under peak day demands.

Council is advancing with augmentation and works have been completed on Cawarra Dam wall and take-off tower. Council's Corporate plan 2002 to 2005 identifies that filling of the dam and commissioning of dam pumping station and balance tanks is scheduled for completion by December 2004. A new trunk feeder main from the dam to area 14 is due to be constructed and operational in 2005.

Council has also outlined a commitment to ongoing monitoring of water quality in accordance with NHMRC guidelines and to implement demand management initiatives.

Given the current time schedule for augmentation and Council's ongoing commitment to service improvement the provision of water supply would not hinder the urbanisation of segments 1, 2 & 3.

CONSTRAINTS SUMMARY	
Issue	**Action**
Water supply availability	Program and funding are in place, and there is no apparent impediment to completion. Individual land releases (subdivision consents) should not be allowed to overtake progressive implementation of the plan.
Sustainable Water Use	Council has a 'user-pays' program in place and is supporting re-use and rainwater capture.

7.7 SEWERAGE

Ardill Payne and Partners have advised that there is no impediment to adequate network servicing of the urban investigation area. The existing nearby developed areas are connected to Council's reticulated sewer system via a network of gravity mains and pumping stations for ultimate processing of sewerage at the treatment plant located to the south of Lake Cathie village area and to the east of the study site generally. The treatment Plant currently discharges treated effluent to the dunal system in the coastal zone adjacent the nearby beach.

Council's Corporate Plan 2002 to 2005 has identified a commitment to the ongoing process of developing effluent management strategies to provide concepts for implementation to meet the requirements of the Hastings Urban Growth Strategy.

The HUGS 2001 set forward a timetable for as follows:

Table 4B. Area 14 (Lake Cathie and Bonny Hills)	**Timing**
B1 **Defer approvals for additional housing** (other than on existing vacant lots and currently approved lots).	Until STP capacity above 6,000 ep is approved and under construction.
B2 **Environmental Study, Structure Plan and Staging Plan** for future rezonings to increase total Area 14 population to around 11,000.	Start now.
B3 **Seek approval for STP expansion to 12,000 ep** capacity on the basis of a staged implementation.	Start now.
B4 Finalise design and commence construction of STP expansion to 9,000 ep capacity.	Follow on from 3.
B5 **Consents for subdivision and multi-dwelling development may now be granted**, within limit of total capacity of 9,000 ep. (Current zoned reserves could accommodate around 10,000 people)	Follow on from 4.
B6 **Proceed with staged construction of STP to 12,000 ep** capacity and link with regional effluent management scheme.	Follow from 3, and subject to development activity.
B7 **Rezonings & Consents** may be granted for total population around 11,000 (12,000 ep).	Follow on from 6 (upon start of construction).
Note: ep means equivalent person * refer to Table 1 in Section 9 for explanation.	

Once again Council's Corporate Plan identifies the Lake Cathie/Bonny Hills Treatment Plant upgrade works being scheduled to occur in the period 2003 to 2005.

Conventional gravity sewers are deemed appropriate for all segments of the study area. Segments 1 and 2 may require the provision of additional sewer pumping stations if detailed design investigations reveal it is impractical to gravitate to or augment capacity of the existing pumping stations in nearby developed areas. An assessment of existing contours information reveals development likely to occur in segment 3 should be able to gravitate to existing sewer infrastructure associated with nearby residential development.

At the time of provision of this study Hasting Council was unable to confirm that technical solutions for treatment and disposal, development consent(s) for augmentation of the existing STP, and a business plan for implementation to match anticipated growth were all in place.

Prior to issue of any Section 65 Certificate by Planning NSW it will be necessary to supplement this LES with suitable substantiation in this regard.

The Study's recommendations have been framed accordingly.

CONSTRAINTS SUMMARY	
Issue	**Action**
Treatment Plant feasibility, capacity, and licensing	Defer any urban rezonings until related STPlant capacity is committed and EPA licensing supported.
Pumping and Reticulation feasibility and capacity.	Not a constraint.

7.8 ENERGY, COMMUNICATIONS

Ardill Payne Associates advise that:

The existing residential areas and surrounding rural areas are serviced by Country Energy and Telstra for power and telephone services respectively.

Both power and telephone services will require augmentation to cater for an expanded population consistent with normal processes required of any urbanisation of vacant land.

The provision of these services is not deemed to preclude development of the study area.

8.0 SOCIO-CULTURAL ENVIRONMENT

8.1 EXISTING COMMUNITY & DEMOGRAPHIC CONTEXT

As stated earlier, there are few residents in the LES area. Most would view themselves as attached to one or other of the communities of Lake Cathie or Bonny Hills.

These communities have low levels of full-time employment compared to Australia at large, and their median age is skewed strongly to the "mature" end of the spectrum. The average per capita income is also very low compared to the population at large. This reflects the pattern of immigration to date, which might be summarised as mainly retirees and economic refugees, with a much smaller proportion of middle class and professionals.

Economic development and changes in coastal land affordability could well reverse that pattern in coming years.

8.2 INDIGENOUS HERITAGE

A report prepared by local indigenous heritage consultant Jacqui Collins is provided in Appendix 2

Whilst not identifying any particular sites or artefacts of significance within the Study Area, the report nominates appropriate 'Best Practice' principles for pursuing any subsequent disturbance and redevelopment of the Study Area in the event of rezoning.

Generally speaking the Study Area site is not constrained by the need to protect identified indigenous heritage.

CONSTRAINTS SUMMARY	
Issue	**Action**
Aboriginal artefacts, undiscovered	Ensure future site specific DCP's include discovery protection requirements.
Aboriginal History un-recognised.	Acknowledge traditional owners with art / interpretation in future civic and retail centre.

8.3 BUILT LANDSCAPE – EUROPEAN HERITAGE

The site landscape has been considerably modified since European occupation, primarily by clearing, draining and pasture establishment for the purposes of agriculture.

Generally there are few structures on the Study site. Fencing is common post and wire, with steel droppers, and has little heritage significance.

Segment 1 is vacant, and partly cleared for grazing. There is a motel and several rural residential style dwelling houses of relatively recent vintage in Segment 2 with some sheds. There is a dwelling house on Segment 3, and some limited orchard plantings.

Overall the European cultural heritage is commonly represented elsewhere and not remarkable. The impact of urbanisation on the aesthetics and amenity of the existing built landscape would therefore be minimal.

8.4 ECONOMY, COMMERCE, EMPLOYMENT

Whilst the Shire and hence the overall economy is growing steadily through immigration, , the level of unemployment remains high, as in other north coast centres. There is an absence of skilled job opportunities, and secondary industry generally – other than perhaps retailing. Tertiary industry in the human services area of education, health, finance, and property is present, but limited to serving the current population catchment. The principal export of the region is probably tourism, and increasingly so.

The prospects for economic improvement are related to creating surpluses – either by increasing efficiency, increasing self-reliance (reduced imports) or increased exports. Council's current economic strategy is to increase economic activity in high value traded goods & services e.g. – tourism, regional head offices, manufacturing and secondary processing; and cultivate new small businesses & support existing industry sectors

The effect of a change in land use in the LES Area on the current and prospective economies is examined below.

8.4.1 AGRICULTURE, OTHER INDUSTRY

Conversion of farmland to urban uses reduces agricultural productivity. Some lands are more productive than others – this being largely dependent on soil fertility.

HISTORICAL MAPPING

Hastings Council has advised that soils mapping for suitability for agricultural use was conducted some years ago by the Department of Conservation and Land Management (now Department of Land and Water Conservation). The Council advises that the mapping technique was very coarse and possibly unreliable.

Below is an extract of that map where the darker grey is Ag Class 2, and the light grey is Ag Class 3. White means Ag Class 4 or 5.

Figure 13 – Agricultural Soil Types

*A condensed extract from **DRAFT HUGS 1999:***

6.2.1 Agriculture

Land can be classified into five classes of agricultural capability, according to Department of Agriculture guidelines. Class 1 to 3 comprise various types of prime crop and pasture land, Class 4 is generally only suitable for grazing only, and Class 5 is at most only suitable for rough grazing.

Identification as Class 1 to 3 relies on soil landscape classification done in 1998-99 by the Department of Land and Water Conservation (as described in Section 7.4).

There is negligible Class 1 or 2 land within the Council area and only limited Class 3 land. Parts of Port Macquarie, Area 13, Area 14 and the Camden Haven is Class 2 or 3, but has been fragmented into urban or rural residential lots and is not a viable size for commercial agricultural use. Some other larger parcels are only being used for grazing, and it appears that within the coastal area such land has been valued for potential urban purposes rather than agriculture. Apart from a couple of exceptions (particularly vineyards, which don't require Class 1-3 agricultural land), the nearest commercial farming activities to Port Macquarie are:

- *to the north - tea-tree plantations along the Maria River and Limeburners Creek floodplains,*
- *to the west - at Sancrox, Rawdon Island and Kings Creek,*
- *to the southwest - at Herons Creek.*

The annual value of agricultural production is relatively low, given the size of the Council and the land area used for agricultural activity. While it is considered that the land used for commercial agriculture, or otherwise identified as Class 1 to 3, should be protected (as it is hard to replace), this is not appropriate for land fragmented into separate small ownerships.

New techniques can allow for improved agricultural productivity from land not classed 1, 2 or 3, such as used for the Cassegrain vineyards. It is not possible to identify in advance where such techniques will be used.

It is considered that little would be gained by treating Class 1 to 3 agricultural land as a constraint to urban development for land east of Herons Creek and Sancrox, or south of the Hastings River.

From the information provided in the draft HUGS 1999 above, it is clear that there is little opportunity in the Study Area for exploitation of the existing Class 2 and 3 agricultural land. Given the existing subdivision into small holdings (in rural terms), it is unlikely that any of the farmland would be any longer economically viable for agriculture.

8.4.2 OTHER INDUSTRIES.

It is possible that businesses related to transport, earthmoving, and other large plant items could be based on rural residential properties in the study area. However the Hastings LEP is inclined to favour location of these industries in appropriately zoned areas that are less likely to generate residential amenity issues

Aside from such possibilities, the LES Area is presently devoted principally to rural residential living.

8.4.3 ECONOMIC IMPACT OF URBAN DEVELOPMENT

Economies of scale are a significant economic benefit of increased population.

Smaller .communities frequently suffer from not reaching a population threshold that supports important economic engines – such as supermarkets, banks, secondary schools, hospitals, government offices, etc. The Master Plan for Lake Cathie Bonny Hills is designed to pass a number of such thresholds – enabling local employment in the provision of many services only available externally at present. This assists in economic self-containment (reduced imports) and reduces transport costs. If the town centre proceeds with the facilities indicated in the Master Plan it will become a significant hub or commerce and employment in the district.

Denser forms of subdivision also reduce the asset management costs of public infrastructure per capita, – thus improving the Shire's overall ability to deliver a range of public goods and services to ratepayers..

As elsewhere, there is always a short term economic boost in the course of land development and building construction.

In summary, there are measurable economic benefits attached to urbanisation of the LES Area. The loss of economic production from alienated agricultural land has been shown earlier to be insignificant. Hence there appears to be no major economic constraint to urbanisation.

8.5 CULTURAL INFRASTRUCTURE

New development will generate immigrants with expectations of cultural infrastructure. These will include surf, sporting, service & recreational clubs, hotels, ordinance services, access to recreational opportunities & tourist facilities, visual arts music & theatre, cultural events, schools, churches, libraries, cemeteries community activities & places of assembly.

Not all of these can be economically provided within every community and may need to be regionally supplied. Nevertheless, some will become available locally as the population rises, and others provided externally will become more viable with increased patronage in the catchment.

Hastings Council is well endowed already with many such facilities, and there is no real impediment to extension to a larger population.

8.6 SOCIAL SERVICES INFRASTRUCTURE

Similar comments to the above apply to the needs generated for welfare services (GO's & NGO's), public transport, child care, hospitals, police, ambulance, and other emergency services. Many of these services are supplied by other levels of government or the private sector. Services provided by higher tiers of government routinely follow the patterns of migration and like the private sector, adapt to them.

These presently exist in the Hastings region but are not well represented in the Lake Cathie Bonny Hills area.

The economies of scale provided by a larger more concentrated population in the area will assist in the local generation and viability of such services.

Their current level of supply is characteristic of any fringe area, which might be developed for urban use. Social services infrastructure will always be a consequence of, rather than a precursor to, urban development. Urban development is therefore not constrained by it.

CONSTRAINTS SUMMARY

Issue	Action
Loss of agricultural land	Treat as insignificant due to fragmentation by rural residential subdivision, and limited quality soils.
Cultural Infrastructure	Utilise existing external – allow to grow organically with community
Welfare Infrastructure	Utilise existing external – allow to grow organically with community

9.0 CONSOLIDATED CONSTRAINT REVIEW

9.1 ISSUES IDENTIFIED BY OTHER AGENCIES (S.62 OF EP&AA)

AGENCY	ISSUES / REQUIREMENTS	RESPONSE
NPWS	Buffer to L. Cathie NP of 50m –100m with restricted public access	Provided
	Protect old growth tallow-wood stands	Provided
	Provide wildlife corridors 250m wide between Queens Lake forest and Lake Cathie and the SEPP44 zone.	Provided except east of Ocean Drive
EPA	L. Cathie garbage depot	n.a.
NSWCC	Green belt separation between L. Cathie & Bonny Hills	Provided
	Habitat Linkages lake – forest - coast	Provided.
NSW RFS	RESPONSE DEFERRED	N/A
DEPT MIN RESOURCES	NIL	N/A
NSW DEPT HEALTH	Adequate road linkages to Port Macquarie hospitals	Provided.
	Community Health centre site in LC-BH	Provided.
	Medical centre site in LC-BH Master Plan	Expected.
	Footpaths & Cycleways for public health	Provided.
	Hygiene controls on re-use of wastewater	Not an LES issue.
	WS&S provision	Addressed.
NSW DET	NIL	N/A

9.2 CONSTRAINTS IDENTIFIED IN STUDY

CONSTRAINTS SUMMARY	
Issue	**Action**
Oversupply of land releases in HUGS Area 14	Limit any urban rezoning recommendations to the areas identified in the Area 14 Master Plan 2003 prepared by Deicke Richards Architects.
Integration with contextual land use proposals	Maintain consistency with the Area 14 Master Plan 2003 prepared by Deicke Richards Architects.
Visual Access to landscape	Restrict high-rise development
Protect 'escarpments and hilltops" from building profiles on visible horizon	Nil, as nonesuch included in Release Area 14
Flooding encroachment from Lake Cathie into HUGS Area 14	Provide 100m habitat buffer to SEPP14 wetlands.
Existing surface and sub-surface drainage patterns.	Protect and enhance existing watercourses (with buffers and riparian planting). Adopt water-sensitive design principles to ensure water tables remain charged after urbanisation
SEPP14 Wetland Buffer	Provide 100m. buffer to L. Cathie NP where adjacent to urban release areas.
Buffer Ownership & Zoning.	Allow retention of current ownership where no other public purpose involved (e.g. WQ management, public open space). Zone as 7(h) Environment Protection Habitat.
Topsoil & surface soil potential to erode	Require soil management plans at DA stage incorporating water sensitive design
Building Foundation Suitability	Make provisions in subsequent DCP's for mandatory soil suitability analysis prior to subdivision
Acid Soils	1. Avoid urbanisation in all Class 2 Acid Soil zones. 2. Allow public infrastructure development in Class 5 zones subject to compliance with DCP34.
Biodiversity conservation	Protect and buffer existing native wetlands and woodlands.
Ecological Sustainability (w.r.t. the natural environment)	Protect enhance and integrate existing habitat. Protect water quality. Remove exotic species.
Threatened Species	Habitat extension and integration.
Wildlife Corridors	Create and protectively zone existing and potential wildlife corridors as per Figure 12.
SEPP44 – Koalas	Prepare a Koala Plan of Management for Lot 4 DP255923 and Lot 34 DP 803801 prior to dealing with any development applications for these parcels.
Bush Fire	Ensure all wildlife corridors and new urban areas are established with suitable APZ's in accordance with NSW government policy
Habitat Integration	Preserve and link native vegetation with wildlife corridors. Provide remnants with 60m min. ecotonal buffers – regenerated & rehabilitated if necessary.

Issue	Action
Sustainable Transport	Master Plan for maximum economic self-containment, and walkable neighbourhoods, facilitate & favour self-powered transport, maintain urban densities
Accessibility	Proximity OK - all segments are highly accessible from the existing road network, and bus transport system. New and larger intersections may be needed.
Reduced efficiency of Ocean Drive due to contingent development	Add extra carriageway lanes and intersection approach lanes as required.
Structural Impact on design life of Ocean Drive, and demand-driven need to upgrade Houston-Mitchell Drive	Address through future s.94 Plans at DCP stage if determined as significant.
Water Quality Management from new release area drains to Lake Cathie and Duchess Creek basins.	Provide grassed radial swale drains for filtration and infiltration. Provide GPT's and detention basins between swales and receiving waters, if receiving urban runoff.
Accelerated and increased run-off volumes in artificially lined drainage	Retain natural drainage paths as vegetated riparian corridors serving the urbanised areas.
Acid Sulphate Soils (if encountered in any LES area rezoned so as to permit disturbance).	Observe DCP34 at DA Stage.
Domestic water consumption and Water Table replenishment	Implement DCP No.48 – Energy Efficient Water Wise Residential Buildings at DA stage, and best practice Water Sensitive Design generally.
Avoid the need for clearing native bushland to give bushfire protection to new urban areas	Stop proposed urbanisation a minimum of 20m. short of existing or rehabilitated bushland.
Asset protection zones may need legal maintenance access.	Ensure APZ's are on the asset owner's property, are public land, or are covered by easements with s.88B restrictions.

Issue	Action
Water supply availability	Program and funding are in place, and there is no apparent impediment to completion. Individual land releases (subdivision consents) should not be allowed to overtake progressive implementation of the plan.
Sustainable Water Use	Council has a 'user-pays' program in place and is supporting re-use and rainwater capture.
Treatment Plant feasibility, capacity, and licensing	Defer any urban rezonings until related STPlant capacity is committed and EPA licensing supported.
Pumping and Reticulation feasibility and capacity.	Not a constraint.
Aboriginal artefacts, undiscovered	Ensure future site specific DCP's include discovery protection requirements.
Aboriginal History un-recognised.	Acknowledge traditional owners with art / interpretation in future civic and retail centre.
Loss of agricultural land	Treat as insignificant due to fragmentation by rural residential subdivision, and limited quality soils.
Cultural Infrastructure	Utilise existing external – allow to grow organically with community
Welfare Infrastructure	Utilise existing external – allow to grow organically with community

Issues identified in the above tables have been addressed and incorporated in the recommended zoning plan where appropriate.

10.0STUDY FINDINGS

10.1RECOMMENDATIONS

Review of all the environmental, social and economic issues in this study have indicated that the subject lands are suitable and appropriate for urbanisation, subject to imposition of certain conservation and hazard reduction measures being implemented. These are schedule in the detailed recommendations below

1. That following Hastings council's presentation of documentation to Planning NSW clearly demonstrating hat upgrading of sewage treatment capacity to 12,000 EP for the Lake Cathie – Bonny Hills district is approved by all consent authorities and there is a suitable responsive financial plan in place, the enclosed zoning plan for the subject lands be the subject of a request to planning NSW for issue of a Section 65 Certificate under the EP&A Act, 1979.
2. That following issue of Section 65 Certificate this draft Local Environmental Study be exhibited in conjunction with the draft Master Plan prepared for the Lake Cathie - Bonny Hills district to ensure contextual consistency is preserved.
3. That subsequent to relevant zoning amendments to the Hastings LEP, Council prepares an "umbrella" Development control Plan for the Lake Cathie – Bonny Hills district, based on the master Plan an and requiring preparation of subsidiary parcel – specific DCP's for staged or independent release of affected lands prior to accepting DA's for all such lands,
4. That the Lake Cathie – bonny Hills DCP (and any subsidiaries) required dedication of identified wildlife corridors beyond the LES brief site to the west and south-east of the site boundaries,
5. That through the Lake Cathie – Bonny Hills district DCP and the development consent process, Council limits the population of the catchment to the available capacity of the sewage treatment facility.
6. That the proposed Lake Cathie Bonny Hills DCP include requirements addressing all relevant issues raised in Table 8.2 of this study.

10.2RECOMMENDED ZONING PLAN

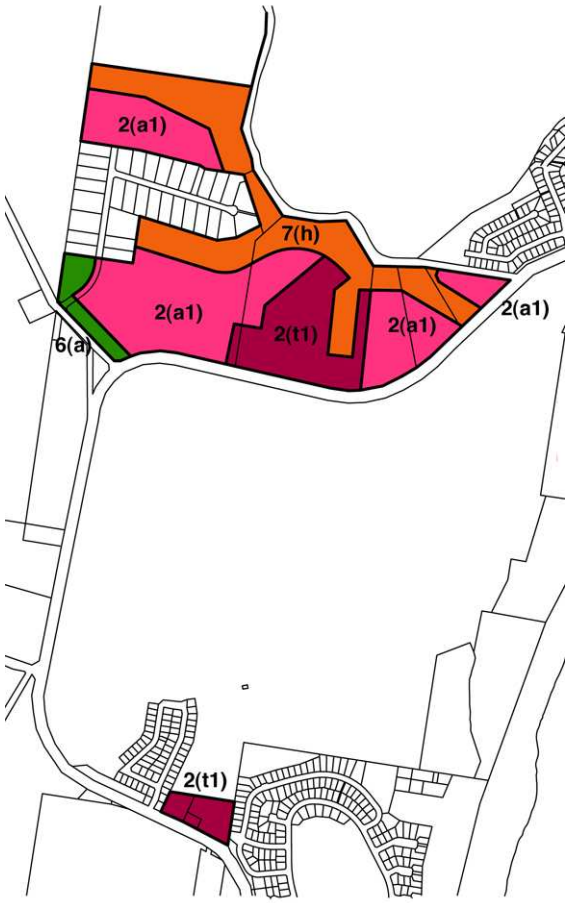


Figure14 -Zoning Map

Hastings Local Environmental Plan 2001 (Amendment No.10)

10.3 MODEL LEP AMENDMENT

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979
HASTINGS LOCAL ENVIRONMENTAL PLAN 2001
AMENDMENT NUMBER 10

Citation

1. This plan may be cited as Hastings Local Environmental Plan 2001 (Amendment No. 10)

Aims and Objectives

2. The Aims of this Plan are

   a to allow the use of approximately 47 hectares of land between Lake Cathie and Bonny Hills for urban residential purposes

   b to allow the use of approximately 10 hectares of land between Lake Cathie and Bonny Hills for public open space

   c to provide environmental protection to approximately 18 hectares of land within the buffer zone on the perimeter of Lake Cathie, and within identified wildlife corridors connecting Lake Cathie to other significant habitat between Lake Cathie and Bonny Hills.

   d to give effect to the Hastings Urban Growth Strategy 2001

Land to Which this Plan Applies

3. This plan applies to land between the villages of Lake Cathie and Bonny Hills within the Council of Hastings being

   Lot 3 on DP 634929
   Lots 1 and 2 on DP 811601
   Lots 33 and 34 on DP803801
   Lot 5 on DP594793
   Lot 4 on DP255923
   Lot 1, 2, 3 on DP706357

   as shown edged heavy black and coloured on the Map marked "Hastings Local Environmental Plan 2001 (Amendment No. 10) and kept in the office of the Hastings Council.

Relationship to Other Environmental Planning Instruments

4 This Plan amends Hastings Local Environmental Plan 2001 in the manner as set out in Clause 5 below.

Amendment of Hastings Local Environmental Plan 2001

5 Hastings Local Environmental Plan 2001 is amended

   a by inserting in Schedule 6 Part 2 the following words:
   'Hastings Local Environmental Plan 2001 (Amendment No. 10)', and

   b by amending the zoning map sheet(s) consistent with Clause 3 above.