



Appendix A
Community Consultation



Introduction

The Stakeholder consultation for this project included a workshop with Residents, owners, stakeholders, and local and state government representatives.

This section provides a summary of the outcomes of the workshops for consideration as part of the preparation of the DCP and Structure Plan for North Boambee Valley.



Workshop Agenda

The Public Workshop was conducted on Wednesday 10 October from 5:30 to 7:30 pm at the Coffs Harbour Ex - Services Club, Coffs Harbour. Council and GHD sent invitations regarding the workshop to residents and stakeholders of North Boambee Valley.

A total of 63 participants attended the workshop. Council representatives in attendance were Sharon Smith (Acting Manager– Land Use Planning), Mark Salter (Director – Land Use, Health and Development), Councillor Rod McKelvey (Deputy Mayor), Councillor Bill Palmer, and Councillor David Featherstone. GHDs workshop facilitator was Tom Ryan.

The workshop format was held over a two-hour period and involved small group exercises to enable active participation by attendees through a number of different communication channels. The overall purpose of the workshop was to provide an opportunity for stakeholders to identify issues, needs and constraints and propose measures for the future development of North Boambee Valley.

Supporting the workshop outcomes was a fact sheet and feedback form that residents and stakeholders were requested to complete at, or soon after, the workshop to document specific requirements or information relating to their concerns. As at 30 October 2007, GHD had received 18 completed feedback forms.

In summary, the workshop provided an opportunity for discussion and issues identification from a whole group perspective while the feedback form assisted in obtaining specific resident information and concerns on additional information.

Workshop Outcomes

Issues Identification

The first group exercise focused on the top issues for North Boambee Valley in terms of its future development. A summary of this exercise for the workshop is detailed below.

GHD presented the 4 issues they considered important in the development of the Plans, which included:

- ▶ What will be the character of North Boambee Valley?



- ▶ What land uses are appropriate for the area?
- ▶ How would you like to see the environment protected?
- ▶ What type of infrastructure do you want in North Boambee Valley? This included community / social, traffic management and services.

Other issues identified by participants as a group included the following:

- ▶ **Quarry buffer zone** – numerous participants raised the issue of the size of the quarry buffer area. The participants believed it would sterilise and reduce the value of the land from further development. Some participants also believed that the land currently utilised for banana plantations is no longer profitable and many farmers are poisoning the plantations.
- ▶ **Noise from the quarry trucks** – a participant was concerned about the noise from the trucks arriving and exiting along North Boambee Road to the quarry, especially in terms of future residential development and the affect it may have on the residents.
- ▶ **Conflicts with heavy vehicles** – relates to the conflicts, existing and potential, between the quarry's heavy vehicles and pedestrians and local traffic along North Boambee Road.
- ▶ **Character of the east and west of the valley** – the issue was raised concerning the likely differences or similarities between the areas east and west of the RTA's preferred Pacific Highway bypass route.
- ▶ **Densities**- this issue related to the type of housing and lot sizes that will be proposed. Concerns were raised that the densities will have an affect on the character of the area.
- ▶ **Fencing** - there were concerns that high fencing will affect the streetscape. It was discussed that there was a need to maintain a streetscape without fencing.
- ▶ **Consideration of agricultural land** – the issue was raised with regards to the protection of the existing agricultural land within North Boambee Valley as a resource for Coffs Harbour.
- ▶ **Size of rural residential lots** – a participant discussed the issue of potential rural residential land west of the RTA's preferred Pacific Highway bypass route and wanted clarification on how large the lots might be.
- ▶ **Range of Land Uses** - As part of the discussion a participant raised the issue of a need to look at a range of land uses including residential, rural residential and industrial development.
- ▶ **Industrial Development** – a participant highlighted if there was any need for industrial development in North Boambee Valley.
- ▶ **Traffic Management** – several participants believed that the management of vehicles and pedestrians need careful consideration especially with the RTA's preferred Pacific Highway bypass route.



- ▶ **Intersection of North Boambee Road and the Pacific Highway** - several group members regarded the current traffic management from the Pacific Highway to North Boambee Road as insufficient. In addition, the traffic during school times was raised as a potential problem for the future development of the area.
- ▶ **Parks** – one participant defined the opportunity for large-scale parks. It was discussed that there is an insufficient number of parks in the area.

Issues Ranking

Participants were asked to rank their top three issues for further discussion in the second group exercise. Some issues were grouped if they were similar and these groupings were discussed with participants after the refreshment break.

The results of this ranking or voting process for the workshop are detailed in the table below.

Table 8 Issues Ranking

Workshop	Number of Votes
Traffic Management	24
Quarry buffer zone	21
Size of rural residential lots	14
Intersection of North Boambee Road and the Pacific Highway	14
Conflicts with heavy vehicles	12
Noise from the quarry trucks	7
Consideration of agricultural land	6
Parks	6
Densities	5
Range of Land Uses	5
Character of the eastern and western sides of the bypass	3
Fencing	0
Industrial Development	0

Action Planning

The second workshop exercise involved small groups discussing the selected issue in more detail, responding as much as possible to the description of the issue or opportunity, costs & benefits, resources, actions, and timings. Some issues identified were grouped if they were similar and these groupings were discussed. The outcomes of this exercise are summarised below. A number of the aerial maps provided a reference to the workshop groups.



Issue: Quarry Buffer

- ▶ The group defined the main elements of the quarry as having a 25 to 30 year life that extracts 10 million tonnes over this time. The height of the quarry was identified as 65 R.L. Blasting occurs twice a month and there are approximately 40 truck movements a day.
- ▶ A Department of Primary Industry representative within the group recommended a 1-kilometre buffer zone as preferable. It was recognised that the quarry operation should continue, as it is an important resource in the area.
- ▶ The benefits included the employment of 20 persons plus numerous sub contractors. It was also a de-facto preservation of agricultural land and character. The group understood that the retention of the quarry would ensure cheaper resource costs. There was the possibility that at the end of the quarry life there should be rehabilitation of the area and then future residential expansion. The quarry buffer was seen to protect the environmental backdrop for the city.
- ▶ The group saw the constraints of the quarry as locking up land for future urban use.
- ▶ Compensation for those landowners that would be affected was raised. However, it was concluded that this was unlikely to occur.
- ▶ The group concluded that there needs for clarity on the size of the buffer area.

Issues: Traffic Management/ Intersection of North Boambee Road and the Pacific Highway/ Conflicts with heavy vehicles

The group defined the main issues as being the Bishop Druitt College traffic, the quarry traffic as well as only one access into the Lakes Estate as there is no link to Hall Road.

The opportunities were identified as follows:

- ▶ Separating the quarry traffic from the residential traffic or a dedicated route for the quarry;
- ▶ The group didn't want Englands Road and North Boambee Road as an intersection with the proposed Pacific Highway;
- ▶ The lights on the existing Pacific Highway need to be changed to have more green time during peak school hours;
- ▶ The proposed urban development, west of the proposed Pacific Highway bypass needs to feed to Englands Road;
- ▶ A duplicate lane or a slip lane needs to occur at access to the school;
- ▶ The Plan needs to address the separation of roads, cycleway and footpaths;
- ▶ Encourage traffic calming measures including narrow road perceptions, retain on-street parking and encourage roundabouts;
- ▶ Needs to be a continuation of Halls Road;
- ▶ A north-south connection is needed to connect Buchermans and Coramba Road;
- ▶ A visual distinction between arterial and collector roads needs to be encouraged;
- ▶ An extra intersection with the proposed Pacific Highway bypass and North Boambee Valley needs to be considered;
- ▶ A bus route though the area needs to be encouraged;
- ▶ A link or a ring road is needed from North Boambee Road to Englands Road;



- ▶ A constraint that the group identified was the current two feeder roads into the Pacific Highway (North Boambee Road to Englands Road).

Issue – Land Uses / Size of rural residential lots/ Densities

Two groups considered land use. Their discussions are detailed below.

Group 1

- ▶ This group agreed that the proposed industrial areas in the southern portion of North Boambee Valley were a feasible land use. They agreed it will provide employment and will service the south of Coffs Harbour. The group discussed that the appropriate infrastructure especially roads needs careful consideration and they agreed that the industrial areas should not approach the northern areas towards North Boambee Road.
- ▶ One participant identified the flood prone land in the southern portion of North Boambee Valley as possible playing fields and they considered compensation for the loss of development was needed.
- ▶ Opportunities, which the group supported for the proposed residential areas in the northern portion of North Boambee Valley, were the retention of the aesthetic values and the preservation of the existing vegetation in the area. To west of the RTA's preferred Pacific Highway bypass route, the group agreed this area should be developed with completely different land uses and character to the east of the proposed Pacific Highway bypass.
- ▶ The group identified possible environmentally sustainable measures were needed for development such as water tanks. The group saw the protection of some productive agricultural land was important but equally important was the development of low productive land.
- ▶ The main constraints that the group identified was the increase in run off due to future development.
- ▶ A participant suggested the quarry buffer area could be retained for wildlife conservation.
- ▶ The main land uses the group supported were a mixture of facilities including schools, parks, jobs, aged care, medical facilities etc. A mixture of lot sizes were also recommended by the group including hobby farms such as 2-hectare lots mixed with 1 hectare and 1000 m² lots. However, one participant felt that it was not economically feasible in terms of infrastructure provision to have large lots and recommended smaller lots to be included.
- ▶ The group agreed that no high rise should be included therefore the Plan should include a two-storey height limit.

Group 2

- ▶ This group agreed to retain the higher densities to the east of the RTA's preferred Pacific Highway bypass route and reduce the densities to the west. The group agreed that to the east of the RTA's preferred Pacific Highway bypass route would continue as it is presented thus far.
- ▶ The group determined that possible opportunities in North Boambee Valley were to maintain the environment and therefore control development to achieve this. Other opportunities, west of the proposed RTA's preferred Pacific Highway bypass route were the protection of the rural environment whilst still maintaining the interests of the existing environments.
- ▶ Possible land uses included residential, schools and parkland to the north and rural residential to the south of North Boambee Road.



- ▶ The group considered constraints to development as power lines, Koala habitat, topography, flood prone land, the quarry buffer and the existing transport infrastructure.
- ▶ Resources in this area were seen as the quarry and the natural environment.

Issue - Character of North Boambee Valley

- ▶ The group agreed that the character to the east of the RTA's preferred Pacific Highway bypass route has been determined already through the existing approved development. The only option is to discuss the character west of the RTA's preferred Pacific Highway bypass route.
- ▶ The group first identified a mixture of characters in this area including residential, industrial and rural.
- ▶ The industrial areas proposed for the southern areas were discussed and the group believed this was appropriate for the area as it was an extension of the existing uses to the east of the study area. The group established there were several constraints to this area and therefore small lot industrial uses such as high tech parks should be allowed. The group agreed the proposed industrial development should be well designed with no commercial development such as bulky goods retailing.
- ▶ The group, following a discussion, agreed that large lot rural or rural residential uses were not appropriate as they believed it would have less attraction for developers. The group saw conservation housing as more appropriate as the area needed to be sustainable, with plenty of open space and integrity.
- ▶ Vegetation corridors and the protection of Koalas were seen as an integral part of the development and therefore the area should be developed in pockets surrounded by vegetation.
- ▶ The group agreed, future development should consider integrating the housing with the topography. Therefore, the protection of the ridgelines was discussed and the protection of the views down the valley was an element to be considered in the Plan.
- ▶ Mixed development in a village model was needed which will service the immediate population such as shops. Public transport and other services were seen as an integral component of this development.

Feedback Form

Supporting the workshop outcomes was a facts sheet and feedback form that residents and stakeholders were requested to complete at, or soon after, the workshop to document specific requirements or information relating to their concerns. As at 30 October 2007, GHD had received 18 completed feedback forms. The following presents a summary of the results of the feedback forms.



1. What three elements do you think the Development Control Plan needs to address?

- ▶ Access to the Lakes Development needs to be considered/ such as a through road.
- ▶ More open space;
- ▶ Environmental considerations;
- ▶ Already been approved and therefore should be consistent with these approvals;
- ▶ The DCP cannot change greatly from the current development;
- ▶ Needs more good sized blocks;
- ▶ Friendly family living;
- ▶ The traffic flow to/ from the Pacific Highway / general traffic management;
- ▶ Run off after storms;
- ▶ Inclusion/ consideration of a heavy haulage road such as Englands Road for quarry traffic/ away from residential development. Ensure incompatible land uses does not occur along North Boambee Road due to heavy vehicles;
- ▶ Connectively to shops
- ▶ Open space/ walking / cycling provisions;
- ▶ Opportunity for higher density development;
- ▶ Greater consideration for flood prone land;
- ▶ Useable DCP that clearly sets out guidelines; and
- ▶ Established infrastructure corridors.

2. What three elements do you think the Structure Plan needs to address?

Elements the respondents considered needed to be addressed in the Structure Plan include:

Issue – Quarry

- ▶ Quarry Buffer including the development of rural residential development on the buffer zone and steeper areas;
- ▶ Reduction of value of properties due to quarry buffer;
- ▶ Inclusion/ consideration of a heavy haulage road such as Englands Road for quarry traffic/ away from residential development.

Issue – Traffic

- ▶ Effective traffic management;
- ▶ Access and Traffic including cycle ways and walk ways;
- ▶ Environmental considerations including the retention of the existing vegetation and Koala habitat.



Issue – Land Uses and Character

- Densities i.e. lot sizes – including a mixture of residential lot sizes;
- Retain some areas as large lot residential (semi rural);
- No high density development;
- Inclusion of eco friendly development with corridors of vegetation;
- Family friendly living;
- Biodiversity;
- Community formation (not just isolated residential areas);
- Efficient use of unconstrained land;
- Retentions of vegetation near waterways;
- Retention of Koala habitats and corridors linking to the State forest;
- Additional parks are needed; and
- Use of flood prone land should be a combination of retention basins, playing fields and environmental uses.

3. How would you like to hear North Boambee Valley described in 20 years?

- Beautiful valley / scenic valley/ uniquely beautiful/ beautifully layered residential / picturesque;
- The best place to live on the North Coast/ environmentally the best / desirable;
- Urban area/ model urban development/ peaceful urban atmosphere;
- Retention of vegetation/ Koala/ leafy feel / no camphor laurels/ corridors restored/ bio- diverse
- Country feel/ rural;
- Village atmosphere;
- Coastal design;
- Mixed densities/ mixed use;
- Close contact with city facilities;
- Open space;
- Self contained / basic services;
- Visible ridgelines;
- Eco friendly;
- Family friendly;
- Preserved productive agricultural zone;
- Quarry not threaten the atmosphere; and
- Well designed technology parks.

4. Additional Comments

- No mix of industrial and residential;



- ▶ Industrial confined to current area;
- ▶ Industrial land is needed/ no bulky goods retailing / service industry
- ▶ Quarry buffer needs to be addressed;
- ▶ Use of vegetation corridors as open space;
- ▶ Separate vehicles and pedestrians and cyclists;
- ▶ Revision of study area;
- ▶ Need a time frame on the rezoning; and
- ▶ Protection of natural resources.

Conclusion

The workshop identified a range of issues for consideration in preparing the DCP and structure plan. Some issues were common to both the workshop and feedback form such as the reduction of the quarry buffer, alternative haulage road, effective traffic management, mixed land uses and the retention of the vegetation. The outcomes of the workshop as well as the responses contained in the feedback forms will be reviewed and considered in the DCP and structure plan.



Appendix B
Land Suitability Analysis



Land Suitability Analysis

1. Introduction

This report provides a methodology for the assessment of environmental constraints within the North Boambee Valley. The methodology aims to identify and evaluate the constraints, which will impact upon the ability of the North Boambee Valley to accommodate residential and industrial development. This process is called a land suitability analysis.

Key criteria are identified for a range of issues, including economic indicators such as accessibility and commercial attractiveness, limits to acceptable social impacts and environmental thresholds and capacities for development and land use. The identification of a sound methodology will also enable the community and landowners to better understand the process of planning, site selection and development.

Ultimately, the application of a sound methodology will help industry to invest in and develop appropriate sites within North Boambee Valley that best serve the needs of the local community and regional economy and the community.

2. Land Suitability Analysis

The methodology for determining appropriate land use focuses on those features of the landscape that pose limitations to development. These areas may be divided into the categories of economic, social and environmental limitations.

Natural features primarily define the environmental limitations. These constraints will strongly influence the preparation of a 'land constraints map'. The land constraints map is a composite map containing a number of overlays. These overlays include but are not limited to maps of environmental protection, potential bushfire, the potential risk of flooding, and the location of prime agricultural land. The integration of the overlays enables the user to recognise infrastructure and institutional opportunities or constraints.

Some environmental constraints create prohibitions to development eg quarry buffer zone. Other constraints identify less desirable areas that generate the need for mitigation measures eg bushfire hazards. A suitability analysis eliminates lands where development is prohibited or has constraints limiting the type or density of development based on agreed criteria.

The role of identifying areas appropriate for development can be taken by Council in an attempt to encourage investment in areas with a low environmental risk. Once Council has determined areas of low environmental risk at a broadscale, this information can subsequently be used by investors to target areas for further investigation. Detailed site investigation can then be undertaken by investors as part of their risk assessment and decision making process. Residential development and industrial businesses respond to a range of measures, which not only include the location of the site but also the size, price and access to the site.

The land suitability approach used in this report only identifies and ranks key environmental, and infrastructure factors that are important for development. In assessing further economic and social factors, a number of elements must be considered to determine whether sustainable development can be achieved. These economic and social elements are based on industry standards, which may have an impact on the preferred development, as shown in Appendix Figure 1 below.



Appendix Figure 1 Land Suitability Analysis Framework





The following assessment of environmental constraints determines the supply of land. Some of the constraints below create prohibitions against future development. Other constraints merely require further investigation or mitigation matters that may influence the location, type and density of development.

In determining land suitable for residential and industrial development purposes a ranking system has been formulated and applied to the various constraints that apply to North Boambee Valley. This comparison identifies which constraints are limiting. Some rankings reflect some constraints that are limiting and highlights the constraints that can be overcome through mitigation measures and management. Once identified, the ranking for each constraint is then mapped for each system in the North Boambee Valley.

The environmental constraints ranking system includes the following:

1. Most suitable for development (relatively unconstrained); a feature that is suitable for the proposed use.
2. Suitable for development with some controls;
3. Marginally suitable for development – may require further investigation and / or specific engineering solution or exclusion of certain areas;
4. Selective development only – subject to further assessment, limited and appropriately designed development may be possible; and
5. Not suitable for development: a feature that absolutely precludes development.

In determining performance ratings, the following issues were considered:

- ▶ Legislative requirements, for example, requirements to obtain permits to clear vegetation;
- ▶ Land use planning considerations and the need to maintain appropriate land uses and amenity;
- ▶ Environmental values and sensitivities, and the need to protect ecosystems and species; and
- ▶ Engineering performance and associated broad cost considerations.

A summary of the ranking and assessment can be found in Table 9.

The methodology to assess the suitability of North Boambee Valley was developed in 2 stages. The first stage involves ranking the constraints through five types of environmental criteria. The second stage involves multi-criteria analysis and requires consideration of the relative importance of each criterion compared to other criteria, which are then weighted. The weightings were then assessed on a GIS modelling and analysis technique was used to overlay geographic data for each of the evaluation criteria. Subsequently, the modelling allocates areas of potential growth for residential and industrial purposes.



3. Multi-Criteria Analysis

Multi-Criteria Analysis requires consideration of the relative importance of each criterion compared to other criteria. A paired comparison method was selected for weighting of criteria. This approach required each criterion to be compared to each of the other criteria to determine which of the two (paired) criteria is considered more important, and by how much. By considering the number of times any particular criteria is rated as more important than any other, and the levels of importance, the criteria can then be ranked as a set in terms of importance. For this project, only environmental criteria were compared to each other. Weightings were normalised so that they are between 1 and 100 for each criteria.

4. GIS Analysis

Once evaluation criteria and weightings were undertaken, a GIS modelling and analysis technique was used to overlay geographic data for each of the evaluation criteria.

The steps involved in the GIS analysis to identify areas that are overall more or less suitable for the urban or employment lands development are described below:

- ▶ Datasets were sourced from Coffs Harbour Council and were imported into an ESRI geodatabase;
- ▶ The data applied for each evaluation criterion were compiled and analysed according to the performance ratings on a series of grids across the study area. In general, the grids were in the order of 5 m x 5 m cells, however in some cases the grid size was varied to ensure the data will be properly represented;
- ▶ The weightings were applied to each criterion and the overall score for each evaluation criterion in each grid calculated. The GIS model then compiled scores across all the evaluation criteria for each grid and identified areas that are more or less suitable for urban or employment lands development. The weighted overlays were added together and multiplied by a specified weighting. As a result, an overall sensitivity map was produced. The lower the score, the more attractive the site for development;
- ▶ The Multi-Criteria Analysis was performed using ESRI's ArcGis Version 9.1.

5. Limitations

While the Multi-Criteria Analysis technique is a powerful tool for screening broad study areas, it must be noted that there are a number of limitations including:

- ▶ Inability to represent all of the critical aspects that determine suitability for development in a geographic format;
- ▶ Accuracy and currency of some data;
- ▶ Absence of data (eg climate change affects, ground water vulnerability);
- ▶ Coarseness of some of the assumptions that may be made in determining performance ratings and weightings for evaluation criteria; and
- ▶ Coarseness of some of the 'rounding off' of areas that are identified by the modelling process as having some suitability for development.

6. Environmental Criteria

6.1 Public Recreation and State Forest Zones



Public recreation and State Forest zones are not available for development regardless of physical characteristics and a ranking of 5 will be used for the purposes of this report.

6.2 Acid Sulfate Soils

Acid Sulfate Soils are likely to occur when soils are drained, excavated or dredged. These soils include those that are producing acid (actual acid sulfate soils) and those that could become acid producing (potential acid sulfate soils).

Potential acid sulfate soils are naturally occurring soils containing iron sulfides (pyrite). They become actual acid sulfate soils when the pyrite is exposed to air, usually because of human activity. Once oxidised the addition of water results in the production of sulfuric acid.

In July, 2000, The National Working Party on ASS released the *National Strategy for the Management of Coastal Acid Sulfate Soils*. The Strategy provides a framework for governments, industry and the community to manage development on these soils. It seeks an integrated approach to management and provides general background about the impacts of acid drainage.

The Coffs Harbour City Council *LEP 2000* states that any acid sulfate soil areas that may be disturbed, due to development, will require Council's consent and an acid sulfate soil management plan in accordance with the Acid Sulfate Soil Manual. Coffs Harbour City Council has adopted the former Department of Land and Water Conservation, *Guidelines for the Use of Acid Sulfate Soil Risk Maps* (1998).

Acid sulfate soil areas are divided into 3 primary map classes which indicate the risk of encountering problems with it and the depth in the soil profile at which it is likely to occur. The classes include high probability of occurrence of acid sulfate soils, low probability of occurrence of acid sulfate soils and no known occurrence of acid sulfate soils. The mapping has been designed to provide information on acid sulfate soil distribution and indicate land uses, which are likely to create an environmental risk by disturbing acid sulfate soils.

Affected areas in North Boambee Valley only have low probability of occurrence and are contained only in a small portion of the investigation area. Low probability of occurrence will have a ranking of 2 (refer to Appendix C Appendix Figure 8 for acid sulfate map)

6.3 Threatened Species and Vegetation Management

Coffs Harbour LGA contains important habitat for a diverse array of native fauna and flora. Certain areas have high conservation value and contain a number of endangered ecological communities and regionally significant vegetation communities. The location of flood prone lands, the retention of vegetation corridors and their associated buffers establish the basis for a network of habitat links and/or corridors within the area.



The *Threatened Species Conservation Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999* aim to protect threatened species and significant flora and fauna corridors. It is therefore necessary to incorporate appropriate constraints for vegetation management. It is also a requirement of the Mid North Coast Regional Strategy (2006) and the North Coast REP, 1988 that significant vegetation be protected. It is therefore necessary to incorporate appropriate constraints for vegetation management in any land suitability analysis.

The *Vegetation of the Coffs Harbour City Council LGA* (1996) identifies vegetation communities and identifies the conservation significance of these communities. The study identifies 10 broad vegetation communities and 63 vegetation types within those communities within the Coffs Harbour LGA. It then uses a very detailed methodology to assess the climate soil topography, geological history, land use, fire, ecological status, ecological sensitivity and threatened species requirements of each vegetation community. The vegetation communities identified in North Boambee include Tall Open Forest, Swamp Forest, Open Forest, Riparian Vegetation and other unidentified vegetation. Each vegetation community has a range of planning principles and controls associated with its conservation significance and was ranked accordingly.

Riparian Vegetation and Swamp Forest consists mainly of vegetation types of high regional significance and includes the most valuable ecological assets in the North Boambee Valley. In terms of riparian vegetation and swamp forest vegetation legislation prevents prevent removal, disturbance, fragmentation or isolation of this vegetation and therefore should be ranked 5.

Tall Open Forests comprises of vegetation types that are both regionally significant and is of ecologically significant. Tall Open Forests that are regionally significant (referred to on the maps as Tall Open Forest – Community 1) are of high value and as stated above legislation prevents prevent removal, disturbance, fragmentation or isolation of this vegetation and therefore should be ranked 5. Tall Open Forests that are of ecological significance (referred to on the maps as Tall Open Forest – Community 2) contain tree species utilised by Koalas. Planning controls aim to minimise further loss, fragmentation or isolation of this vegetation community and for the purposes of this report will be ranked 4.

Open Forests comprises of vegetation types that are both regionally significant and is of ecologically significant. Open Forests that are regionally significant (referred to on the maps as Open Forest – Community 1) are of high value and as stated above legislation prevents prevent removal, disturbance, fragmentation or isolation of this vegetation and therefore should be ranked 5. Open Forests that are of ecological significance (referred to on the maps as Open Forest – Community 2) contain tree species utilised by Koalas. Planning controls aim to minimise further loss, fragmentation or isolation of this vegetation community and for the purposes of this report will be ranked 4.

A series of communities were unidentified in vegetation study it is current industry practice to assume they are of high ecological value until further studies can be completed on the site.

Therefore for the purposes of this report it should be ranked 5 (refer to Appendix C Appendix Figure 8 for vegetation map).



6.4 Koala Habitat

The *Coffs Harbour City Council Koala Plan of Management* (1999) provides a consistent approach to koala management and planning throughout the LGA. Koala habitat has been defined and mapped in this plan and specific management and planning guidelines established. Council's planning policy is designed to protect Koala habitat, reduce threats to Koala survival and health, allow for free movement of Koalas across the development site where appropriate and provide enhancement planting where possible.

There are three types of Koala habitat that have been mapped Primary Koala Habitat, Secondary Koala Habitat and Tertiary Koala Habitat. These categories relate to the value of the habitat with Primary Habitat being the most important and Tertiary Habitat the least important.

As Primary Koala Habitat aims to prevent further clearing, disturbance, fragmentation or isolation of this habitat and the planning controls have zero net loss in these areas, it will therefore be ranked 5.

Secondary Koala Habitat aims to minimise further loss, fragmentation or isolation of this habitat and as the planning controls have a minimal net loss of this habitat, it will therefore be ranked 4.

Tertiary Koala Habitat encourages minimal removal or disturbance to preferred Koala tree species and reducing barriers to Koala movement, it therefore will be ranked 3 (refer to Appendix Figure 13 for Koala habitat map)

6.5 Bushfire Hazard Management

The *Rural Fires Act 1997* and *EP&A Act 1979* ensure all development must comply with the requirements of these documents. These requirements include the identification of bushfire-prone areas and the provision of Asset Protection Zones (APZ's).

Bushfire protection can be seen as a major development constraint, especially land located within or adjacent to bushfire prone areas. The slope of the land, aspect and the vegetation types present, determines the level of bushfire hazard.

Coffs Harbour City Council categorises bushfire prone land into Vegetation Category 1 and Vegetation Category 2. Vegetation Category 1 is bushfire prone land is that land within (or within 100 m) of a high bushfire hazard area. Category 2 bushfire prone land is that land within (or within 30 m) of a medium bushfire hazard area.

Opportunities exist to manage the interface between new development and surrounding vegetation, including perimeter roads. More detailed assessment of bushfire management will be undertaken in conjunction with future development, including local road design and measures to ensure that development is located and designed having regard to degrees of bushfire risk.

The perimeter of the land interfacing the hazard should be minimized yet development can proceed within it. Where adequate fire protection measures cannot be established, development should be prohibited. As development is likely to occur with mitigation measures, development within category 2 will be ranked as 2 including the 30-metre buffer.

Where as development within category 1 is within a high bush fire hazard only selective development is likely to occur and ranked 3 including the 100-metre buffer (refer to Appendix C Appendix Figure 9 for bushfire hazard map).



6.6 Topography

Slope is a significant factor influencing soil erosion, drainage and bushfire hazard. Slopes greater than 14 degrees (25%) are likely to have geological constraints and are susceptible to mass movement and high to very high erosion hazard. In addition, slopes greater than 14 degrees can cause installation problems for effluent treatment systems from being evenly distributed across the site therefore affecting the performance of the system. Particularly within industrial areas higher slopes make truck manoeuvres difficult.

Protected lands are listed under the Native Vegetation Conservation Act 1997 and represent land that generally has a slope greater than 18 degrees (33%) from the horizontal; and land situated in, or within 20 metres of the bed or bank of any specified river or lake or land that is in the opinion of the Minister, environmentally sensitive, effected or liable to be effected by soil erosion. Therefore, lands with a slope greater than 14 degrees should be excluded from further development and ranked 5.

Relatively flat grades (less than 10 degrees (17%) significantly reduce costs associated with the installation of infrastructure to service proposed development. Therefore due to the cost efficiency of lesser grades for industrial and commercial development a ranking of 1 will be used for slopes less than 10 degrees (NSW PEC: 1978).

Within the residential precincts slopes between 17 % and 25% present a high bush fire danger for dwellings, footings require a great deal of cut and fill, access is difficult and they present a greater erosion hazard. In areas with these grades development is more difficult (NSW Rural Fire Service: 2006). However, with specific engineering solutions development is possible and therefore slopes between 17 and 25 % have not been seen as a hard constraint (refer to Appendix C Appendix Figure 5 for topography map).

Within the industrial precincts slopes constraints can be overcome by careful design, earthworks, and by adoption of site management techniques that ensure land surface stability. Given the shortage of developable industrial land and the current high levels of demand, costs incurred are unlikely to preclude development. Therefore for the purposes of this structure plan slopes over 17% will require further investigation (such as cut and fill techniques) and will be not be considered as a hard constraint. Therefore for the purposes of this structure plan slopes over 17% require further investigation and will be ranked 3.

6.7 Flood Liable Land

Flood liable land presents a constraint to development as it has implications with regard to the provision of infrastructure and cost implications applying to hydraulic infrastructure, roads and services installed within floodplains.



The flood constraint is based on the indicative 1 in 100 year flood level. Planning controls for the constraint are outlined in *Coffs Harbour City Council LEP 2000, Floodplain Development and Management, Study and Floodplain Risk Management Study*. Coffs Harbour Council's Floodplain Risk Management strategy is to minimise future potential flood damage both by structural protection and by planning controls to ensure that only appropriate and compatible development occurs on floodplains in the future.

The *North Boambee Valley Flood Study* (1991) profiled the catchment areas and the existing creek system. The study identified high, low and low fringe flood areas. The study distinguishes between low and high hazard categories based on depth of floodwaters and average flood velocities. A high hazard depth is 1.0 metre or more and a low hazard depth is less than 0.8 metres.

Flooding is a constraint for urban land in the North Boambee Valley (West). Appendix Figure 12 illustrates the areas of flood prone land, located along the Newport's Creek and its tributaries, which was based on the Bewsher Consulting, *North Boambee Valley Flood Study* (1991).

The current flood studies for this area date back to 1991 and do not consider the affects of the RTA's preferred Pacific Highway bypass route. Flood data from the RTA preferred Pacific Highway bypass route was not available at the time of preparing this structure plan.

Appendix Figure 12 illustrates sections previously identified in the Bewsher Consulting (1991) flood study as high hazard floodway. These sections within the study area are not designated watercourses and therefore it may be possible to be replaced by an engineering solution. Therefore these areas have been identified as 'flood ways subject to further investigation' and are not considered a hard constraint.

Further studies need to be undertaken to determine the extent of this constraint. Development in the North Boambee Valley needs to be flood modelled in detail with constraints and controls imposed to ensure that there are no adverse impacts from flooding on adjoining areas. In particular, areas downstream of the study area, such as the Health Campus and Industrial Estate. There may be opportunities in the design of the RTA's preferred Pacific Highway bypass route to incorporate flood mitigation measures, such as detention basins, and the RTA need to be approached to explore these options

For the purposes of this report high hazard floodway will be ranked 5 and low hazard and low hazard fringe floodway and flood ways subject to further investigation will be ranked 3 (refer to Appendix C Appendix Figure 12 for flood liable land map).

6.8 Extractive Industries

North Boambee Valley contains an extractive industry, which has been identified by the Department of Urban Affairs and Planning as being of regional significance (DUAP, 1999).

This site should be protected from encroachment by incompatible urban land uses until the resource has been exhausted. The Department of Primary Industries (formerly Department of Mineral

Resources) has identified in a Section 117 Direction each site as unsuitable for urban development.

Existing extractive industry sites including a buffer will be ranked 5.



A buffer area around the extractive industry is needed in North Boambee, which will be affected by quarrying activities such as noise, dust and visual intrusion. A buffer is being created in this circumstance for the purposes of mitigating these impacts on the proposed adjoining land uses of residential and industrial development. It is also desirable to identify an appropriate buffer to prevent the sterilisation of a resource from the pressures of land use conflicts.

Extractive industries should be protected from encroachment by incompatible land uses (including urban development) until the resource has been exhausted. North Boambee Valley contains an extractive industry, which has been identified by the Department of Urban Affairs and Planning as being of regional significance (DUAP, 1999). A buffer area around the extractive industry is needed in North Boambee, which will be affected by quarrying activities such as noise, dust and visual intrusion. A buffer is being created in this circumstance for the purposes of mitigating these impacts on the proposed adjoining land uses of residential and industrial development. It is also desirable to identify an appropriate buffer to prevent the sterilisation of a resource from the pressures of land use conflicts.

The Department of Planning (Mineral Resources Division) has recommended a buffer around hard rock quarries including the North Boambee quarry involving blasting for the above reasons. A 1 km buffer is the preferred distance for recommended by the department for residential areas. However, the Department states a lesser distance is feasible for industrial zones. Therefore, a distance of 750 metres is recommended for potential industrial areas pending an appropriate risk assessment is completed prior to any rezoning.

Therefore, for the purposes of this report the buffer will be ranked 5 (refer to Appendix Figure 11 for extractive industries map).

6.9 Contaminated Lands - Banana Lands

Portions of North Boambee Valley have been identified as potentially contaminated land due to the former use of the land for banana cultivation. Banana cultivation formally used arsenic and dieldrin as insecticides.

The *Environmental Planning and Assessment Act 1993 (EP&A Act)* and *State Environmental Protection Policy 55 (SEPP 55)* require Coffs Harbour City Council to consider the suitability of land for a proposed development. The risk to health and the environment from contamination must be included in a preliminary assessment, which includes a preliminary site inspection of the contaminated lands. SEPP 55 requires that Council be satisfied that a site is suitable for its proposed use or can and will be made suitable. A site can be made suitable through measures such as site remediation.

Therefore, for these reasons any contaminated lands within North Boambee Valley will be ranked 2 (refer to Appendix Figure 10 for contaminated lands map).

6.10 RTA Preferred Pacific Highway Bypass Route

Council at its meeting on the 17 May 2007 recommended to incorporate the Coffs Harbour Pacific Highway Planning Strategy into the North Boambee Valley DCP and Structure Plan. The preferred route for the Coffs Harbour Highway Planning Strategy was announced in December 2004. The preferred route (inner south 1) is proposed to be located within the North Boambee Valley.

The announced bypass must be considered as a constraint for any future development with a realistic road easement of 150 metres and therefore will be ranked 5 (refer to Appendix C Appendix Figure 4 for RTA's preferred Pacific Highway bypass route map).



Table 9 Land Suitability Analysis: Environmental Constraints

	Constraint Criteria	Ranking
1.	Public Recreation and State Forest Zones	5
2.	Acid Sulfate Soils – Low Probability	2
3.	Vegetation Management:	
	Riparian Vegetation	5
	Swamp Forest	5
	Tall Open Forest – community 1	5
	Tall Open Forest – community 2	4
	Open Forest – community 1	5
	Open Forest – community 2	4
	Unidentified Vegetation	5
4.	Koala Habitat	
	Primary Habitat	5
	Secondary Habitat	4
	Tertiary Habitat	3
5.	Bushfire Hazard Management:	
	Category 1	3
	Category 2	2
6.	Topography:	
	Less than 10 degrees slopes (17%)	1
	10 degrees - 14 degrees slopes (17%-25%)	3
	Greater than 14 degrees slopes (25%)	5
7.	Flood Liable Land	
	High hazard flooding	5
	Low hazard and low hazard fringe	3
	Floodways subject to further investigation	3
8.	Extractive Industries with a 1 kilometre buffer	5
9.	Contaminated Lands	2
10.	Banana Lands	5



Constraint Criteria	Ranking
11. Pacific Highway Preferred Route with 150 road easement	5

The above rankings have been used to compile a constraints map for the North Boambee Valley (West) Structure Plan.