

APPENDIX

7042 – Additional Specialist Studies

Introduction

A list of proposed specialist studies has been compiled based on issues addressed in the report to Council, issues raised in any previous relevant studies and strategies, relevant Section 117 Ministerial Directions and any issues raised by agencies as a result of Section 62 consultations (as advised by the Department of Planning and Infrastructure - refer to Section 1.3 of the Brief)

The specialist studies should address the matters outlined but not be limited to them if it is considered that additional investigations are required.

If it is considered that additional studies are required then these should be included in your response to the Brief with detailed reasons as to why they are necessary. Council may or may not support the need for these additional studies.

The specialist studies required to be addressed in the Specialist Studies are outlined below. Each study is set out in the following manner:

- Issue
- Output
- Objectives
- Tasks / Methodology

In response to the Brief, the Consultant can additionally suggest alternate approaches which may deliver the required outputs/objectives in a cost effective and timely manner.

The Consultant is advised that the proposed rezoning may (depending upon the outcome of the studies) create in the order of 40 new rural/residential lots, each having a minimum size 4,000m², on the subject land. Many lots will be of much greater size where the site constraints, natural features and flora dictate. The subdivision and development of the subject land will be undertaken by the landowners, either individually or in cooperation with adjoining owners.

The Consultant will be supplied, free of charge, the support documents listed below. The Consultant may use the whole or any part of these documents in response to the Brief, subject to the Consultant's review, verification of sufficiency and any necessary upgrading deemed for the response. The Consultant is required to provide its additional calculations for the effect of the abovementioned potential new residential lots.

1. State and Regional Planning Context

Output

- A detailed Justification Report that clearly examines the consistency of the proposal with the objectives of the relevant State, regional and local plans and strategies as listed below.

Objectives

- To examine the consistency of the proposal with the relevant State, regional and local plans and strategies listed below.

Tasks/Methodology

- Review the proposal's consistency with the objectives of the following strategies and plans:
 - State Plan (updated March 2010);
 - Metropolitan Plan for Sydney 2036;
 - *Draft South West Subregional Strategy*,
 - *Picton Tahmoor Thirlmere Urban Area Implementation Strategy*
 - *The Wollondilly Vision 2025 and Community Strategic Plan 2030*.
 - *Metropolitan Transport Plan: Connecting the City of Cities*;
 - *Section 117 Ministerial Directions*
 - Sydney Regional Environmental Plan No. 2 Hawkesbury - Nepean River (No. 2 -1997)
 - *Wollondilly Local Environmental Plan 2011*
 - *Draft Wollondilly Growth Management Strategy 2011*

2. Biodiversity

Output

- Identify, locate and describe the biodiversity values of the study area
- Rank and map areas of high, moderate and or low biodiversity values.
- A comprehensive understanding of the flora, fauna and biodiversity values of the study area and its environmental context in the region.
- Assess and recommend strategies to conserve the ecological attributes of the landscape.
- Develop a strategy to conserve biodiversity values, in accordance with the principles and objectives of the Threatened Species Conservation Act 1995, (and relevant Department of Planning and Infrastructure Guidelines) of the study area and improve remnant vegetation communities and regional linkages to support native flora and fauna.
- Develop principles for the integration of rural/ residential development and the ecological values of the study area, whilst considering the likely requirements for bushfire management and asset protection.
- Recommend zoning regimes and minimum lot sizes to support and maintain the ecological values of the study area.

Objectives

- Field identification and description of flora and fauna communities of the study area, with reference to existing maps, aerial photography, reports and studies.
- An assessment of the condition and the recovery potential of the identified communities.
- Ensure statutory obligations for the protection and management of threatened species and native vegetation can be met
- To identify Bio-banking potential within the study area.
- Identify biodiversity values that developer contributions should address

Tasks/Methodology

- An assessment of biodiversity related matters relevant to the study area should be undertaken in accordance with Department of Planning and Infrastructure's General Guidelines for Strategic Planning (or equivalent), with reference to the Wollondilly Development Control Plan 2011 Natural Resource – Potential Biodiversity Map.
- The biodiversity assessment should cover three distinct stages:
 1. flora and fauna assessment (terrestrial and aquatic);
 2. analysis of ecological biodiversity values for the study area as a whole.
 3. ranking and mapping of areas of high, moderate or low ecological and biodiversity value based on the results of steps 1 and 2.
- A report detailing the results of steps 1 to 3 with clear recommendations on how to conserve and enhance the ecological and biodiversity features of the study area.

3. Bushfire

Output

- Broadly examine the level of bushfire risk posed to the future development of the study area with reference to Rural Fire Services mapping.
- A review of the existing road network and available reticulation water supply network suitability for fire fighting;
- A review of the necessity for fire trails around the study area;

Objectives

- To assess the study areas ability as a whole to satisfy the requirements of existing legislation;
- To assess whether the statutory requirements of bushfire protection and management are capable of being met.
- To identify bushfire management needs that developer contributions should address.

Tasks/Methodology

- Assess and identify the bushfire hazard and risk for future development of the study area.
- Assess whether the future development of the study area is capable of compliance with the Wollondilly Bushfire Risk Management Plan, Section 117 Ministerial Direction No A.4 Planning for Bushfire Protection, NSW Rural Fires Act 1997 and RFS Planning for Bushfire Protection Guidelines 2006.
- The Bushfire hazard and risk assessment needs to give due consideration to the likely rehabilitation of riparian corridors and the recommendations of the biodiversity study to preserve and enhance ecological communities on the study area.
- Identify the potential risk and solutions to minimise the impact that bushfire protection/hazard reduction/asset management may have on threatened species and biodiversity values of the subject area having regard to the Bushfire Environmental Assessment Code for NSW and Bushfire Hazard Reduction Assessment Guidelines.

4. Aboriginal and European Heritage

Output

- Preparation of an Aboriginal and European Heritage Assessment of known and potential heritage values, with reference to Schedule 5 of the Wollondilly Local Environmental Plan 2011 and associated Heritage Maps. .
- Develop appropriate strategies and recommendations for further assessment at the development application stage to manage these heritage values for the study area.

Objectives - Aboriginal

- To identify, assess and map aboriginal cultural heritage places, areas of archaeological potential and Aboriginal heritage value across the study area with reference to Schedule 5 of the Wollondilly Local Environmental Plan 2011 and associated Heritage Maps;
- Provide an overview of existing information regarding Aboriginal heritage within the study area and the broader regional context.
- To involve Aboriginal stakeholder groups in the consultation process for Aboriginal heritage assessment in accordance with the Office of Environment and Heritage Final Community Consultation Requirements.
- To develop appropriate management recommendations and strategies for areas of Aboriginal heritage significance.

Objectives - European

- Provide an overview of significant existing or potential cultural landscapes, conservation areas, view and vistas within the study area, with reference to Schedule 5 of the Wollondilly Local Environmental Plan 2011 and associated Heritage Maps..
- Identification of appropriate zone boundary definitions and development control recommendations to conserve significant items, settings and to manage possible land use conflicts.

Tasks/Methodology - Aboriginal

- An assessment of Aboriginal heritage values relevant to the study area should be undertaken with reference to Department of Planning and Infrastructure's General Guidelines for Strategic Planning and Schedule 5 of the Wollondilly Local Environmental Plan 2011 and associated Heritage Maps.
- This shall incorporate two stages:
 1. The preparation of Aboriginal archaeological assessment - identification and assessment of Aboriginal objects and making recommendations for their management.
 2. The preparation of a cultural heritage assessment - involving consultation with Aboriginal stakeholders (groups and individuals) and can include assessment of historical, oral history and broader values.
- The outcomes of the two stages shall be combined into mapping of high, moderate and low Aboriginal cultural value.
- Recommendations to manage Aboriginal heritage values across the study area will be developed.

Tasks/Methodology - European

- Provide an overview of significant existing or potential European heritage within the study area with reference to Schedule 5 of the Wollondilly Local Environmental Plan 2011 and associated Heritage Maps.
- Identify, assess and map any European cultural heritage places, values and archaeological potential within the study area, based on an initial 'desktop' analysis and necessary fieldwork to satisfy the requirements of Council and other relevant authorities
- The Heritage Act 1997, National Trust and the NSW National Parks and Wildlife Service heritage databases should be consulted in order to identify any existing items of heritage significance in the study area affected by the proposal.
- Develop recommendation for the management of any European heritage values within the study area is required.

5. Water Quality and Flood Risk

Output

- Preparation of an integrated water quality management plan.
- Assess the likelihood of mainstream or overland flooding on the study area and any impact of the proposed development on upstream/downstream communities.

Objectives

- To prepare an integrated water quality management plan for the study area.
- To assess the level of impact of stormwater runoff and effluent disposal on Myrtle and Redbank Creeks and the broader Hawkesbury - Nepean catchment from proposed development within the study area.
- To recommend actions and strategies to ameliorate potential negative impacts on the receiving waters.

- To incorporate the principles of Water Sensitive Urban Design and Managing Urban Stormwater as outlined in Department of Planning and Infrastructure's General Guidelines for Strategic Planning. To establish the likelihood of flooding impact/risk on the study area and any impacts the proposed development may have on the flooding behaviour upon upstream/downstream communities.
- To identify water quality management needs that developer contributions should address.

Tasks/Methodology

- Document and map the nature of the existing catchments identifying natural drainage systems (permanent and intermittent) and man-made drainage systems from existing topographic mapping supplied by the proponent
- Summarise Government endorsed objectives and strategies for water quality and catchment management pertaining to the proposed development.
- Identify riparian enhancement activities and their role in stormwater treatment and design in this regard the principles contain in the publication, Water Sensitive Urban Design should be incorporated into the report.
- Develop a water balance equation for the study area incorporating wastewater, stormwater that optimises reuse and minimises potable use.
- Assess the likelihood of mainstream and overland flooding for the study area and the impact of the proposed development on upstream/downstream communities.
- Should a flood risk be determined, develop appropriate strategies to mitigate the risk consistent with the NSW Floodplain Development Manual (2005) and Section 117 Ministerial Direction No. 4.Flood Prone Land.

6. Parking, Traffic and Transport

Output

- An update to the Gabites Porter Traffic Impact Study strategic network model (TRACKS) in accordance with the RTA Guide to Traffic Generating Developments, which will be provided by Council.
- An assessment of the need for State and local traffic infrastructure upgrades to support the proposed development of the study area.

Objectives

- To identify the impact of the proposed future development of the study area on local road networks.
- To determine the level of any State and/or local traffic infrastructure upgrades required.
- To explore options which facilitate the provision for shared pathway linkages to neighbouring towns and for public transport.
- To identify parking, traffic and transport infrastructure needs that developer contributions should address.

Tasks/Methodology

- The assessment should give consideration to the impacts of the proposed development on Remembrance Drive, utilising:
 1. Council's Traffic Impact Study strategic network model (TRACKS) to determine traffic distributions to and from the study site; and
 2. Intersection modelling using SIDRA to assess any junctions significantly impacted upon.
- Identify suitable infrastructure required to ameliorate and traffic and safety impacts associated with the proposed development of the study area.
- Identification of pedestrian, cyclist and public transport infrastructure needs required to service the proposed development.
- Identify the timing of the infrastructure and appropriate planning mechanism to ensure the infrastructure is provided.

8. Agricultural Land Capability

Output

- An agricultural land capability assessment that broadly examines:
 1. if there will be any loss of current agricultural potential; and
 2. if there is any loss of future agricultural land potential ;
 3. if there are any constraints associated with the proposed development that could impede agricultural development within the study area and adjoining land , including identification of possible land use conflicts and the means to ameliorate these conflicts.
- Rezoning of land which provides an acceptable level of social, agricultural and economic sustainability and harmony.

Objectives

- To identify if there will be any loss of current agricultural development within the study area;
- To identify if there is any potential for future agricultural development within the study area;
- To identify if there are any constraints impeding agricultural development within the study area;
- To determine if there is any edge impact between the study area and adjoining agricultural land;
- To determine the appropriate level of development to minimise agricultural land use conflict;

Tasks/Methodology

- Examine the capability of the study area to support agricultural production.
- Examine potential for future agricultural land uses by reference to the Wollondilly Local Environmental Plan 2011;
- Prepare constraints and opportunities mapping for any current and future agricultural development based on social, agricultural and economic sustainability; including recommendations to ameliorate and land use conflicts.

9. State and local infrastructure

Output

- An assessment of the provision of appropriate State and local infrastructure.

Objectives

- To assess the need for a State developer agreement to fund provision of necessary infrastructure.
- To assess the availability of infrastructure required enabling connection of the study area to water, telephone and drainage services.
- To assess infrastructure required for the provision of services and pedestrian/cycleway/bus transport infrastructure, community facilities and open space identified as necessary by the specialist studies.
- An assessment of the need for the dedication of roads and open space (this may include the potential landscape buffer/habitat corridor) and funding considerations with regard to the ongoing management and maintenance of any such roads and open space.
- To identify the impact of the proposed development on local roads networks.

Tasks/Methodology

- Analysis of findings of the specialist studies and structure plan to determine the timing and mechanism for delivery of infrastructure necessitated by the future subdivision development.

10. Socio-Economic Assessment

Output

- A social and economic impact analysis for the proposed rezoning from a rural to an appropriate zone to permit rural/residential housing.

Objectives

- To identify the socio-economic impacts associated with the proposed development.

Tasks/Methodology

- Analysis of the socio-economic impact, if any, of the loss of rural land on the local and regional economy compared to both the 'do nothing scenario' and the change to an appropriate zone to permit rural/residential housing. .
- Quantify the demand for rural/ residential housing in the area.
- Investigate options and assess the feasibility for achieving affordable and diverse housing with reference to the Housing NSW's analysis for Wollondilly Shire and their publication Housing Market Analysis - Explanatory Notes and Fact Sheets. Liaise with the Department of Housing in this regard.
- Examine the need for additional community facilities, open space and services which may arise as a result of the change to an appropriate zone.

11. Contaminated Land

Output

- A preliminary "desk top" Contaminated Site Report as required in accordance with *SEPP 55 - Remediation of Land*.
- Field Verification of potential contamination sites;
- Recommendation for the future development controls for the management and assessment of these potential contamination sites at the development application stage;

Objectives

- To determine if there is any expectation of contamination of the study area associated with previous agricultural land uses and the likely sources of that contamination;
- To establish the nature and extent of any identified contamination and determine proposed remediation actions to allow proposed development.

Tasks/Methodology

- Perform a "desk top" review the Wollondilly Contaminated Lands Register to establish if there is any record of contamination within the study area;
- Determine and document the need for field verification and, where necessary, undertake and document field work.
- A preliminary Contaminated Site Investigation is required in accordance with *SEPP 55 – Remediation of Land* of the study area to determine the level of contamination as a consequence of previous agricultural land uses.
- In undertaking a Contaminated Site Investigation, the successful consultant will be provided with land use history, aerial photography and other relevant information held by Council to assist in the preliminary determination;
- Dependent on the level of potential contamination develop a schedule of actions and types of remediation works that will need to be undertaken at the development application stage.

12. Salinity

Output

- A site specific Urban Salinity Assessment which considers the necessary land use planning phases throughout the assessment process;
- An examination and analysis of the Salinity Hazard existent on the site;
- Practical and relevant information regarding effective salinity planning responses

Objectives

- To assess the Salinity Hazard of the site to determine whether development will be affected salinity, or whether salinity will be affected by development.
- To aid in the formulation of Planning Responses that address the off-site, long term and cumulative impacts of the development

- To provide guideline for appropriate land uses and management practices on land affected by salinity
- To assess the potential damage to building and infrastructure, as well as environmental values that may be caused by salinity on and off the development site.
- To assess whether the manner in which land use and development on the site is having a significant effect on the groundwater systems, waterways, drainage lines and soils.

Tasks/Methodology

- Conduct an assessment and collect information on-site in order to determine what further information is required, as well as what further tests and research must be conducted.
- Conduct detailed onsite analysis by methods such as digging soil test pits and installing peizometers
- Assess information gathered and undertake further laboratory analysis of selected soils and water samples and interpretations of results.
- Select appropriate management and evaluation techniques to suit the salt and water processes and the development.

13. Geotechnical Report

Output

- An assessment of the geotechnical constraints posed by the development site which provides an accurate description of these constraints, their nature and potential methods of mitigation.
- An evaluation of the Instability Risk of the development site.
- A Guideline for appropriate and suitable development for the site in relation to Geotechnical constraints.

Objectives

- To delineate appropriate building envelopes for the proposed development to utilise with regard to slope stability and on-site disposal of wastewater;
- To allow for a guideline to be formulated regarding suitable development practice on land with geotechnical constraints;
- To assess the Instability Risk of the development site and provide a classification of the potential instability on the site, the reasons for this instability, and the implication posed for development;
- To provide detail on other elements related to geotechnical constraints such as drainage, water storage and soil and water management devices;
- To determine a minimum allotment size based on geotechnical constraints;

Tasks/Methodology

- Desktop review of available information including soil profile mapping
- Conduct a site assessment including mapping of geotechnical constraints;
- Recommend maximum slopes for dwellings and residential infrastructure;
- Assess information gathered and undertake further analysis of soils and land capability;
- Select appropriate management and evaluation techniques to suit future building and wastewater irrigation onto the future development;

- This task should be carried out having regard to the Onsite Wastewater Feasibility addressed below.

14. Onsite Wastewater Feasibility

Output

- An assessment of the onsite wastewater feasibility of the development site;
- A description and analysis of the potential effluent management and treatment unit's to be used on site.
- A description of the management requirements necessary for the use of an effluent disposal area.

Objectives

- To assess the onsite wastewater feasibility of the site based on soils and geotechnical constraints;
- To provide information on the management requirements of an effluent disposal area, with the appropriate guideline and any additional requirements;
- To recommend the most suitable effluent treatment system to be used on the site, as well as including information about other possible unit's.
- To provide information regarding nutrient loading and water balance calculations base on the Environment and health Protection Guidelines 1998.

Tasks/Methodology

- Desktop review of available information including soil profile mapping
- Conduct a site assessment including sampling of soils in locations suitable for wastewater irrigation ;
- Laboratory assessment of samples;
- Recommend minimum subsurface and surface spray irrigation area requirements;
- Recommend maximum slopes, minimum setbacks for dwellings and residential infrastructure to irrigation areas;

15. On site flooding

Output

- An assessment of the risk of flooding on the site;
- An assessment of the risk of the flooding of roads to and from the site;

Objectives

- To ascertain the risk of flooding at the site;
- To ascertain the risk of flooding to roads that access the site;

Tasks/Methodology

- Desktop review of available information including existing flood mapping;
- Conduct a flood analysis using industry standard software such as "Rafts" or "Rivers";
- Provide a 1% AEP flood level at the site and a recommended freeboard based on the accuracy of the flood modelling.

