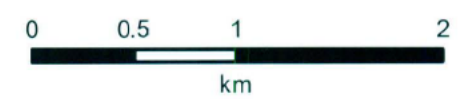


- ▬ Investigation Area Boundary
- ▬ National Land
- ▬ Land subject P4 Plantation Forestry Zoning
- ▬ Major Utility Installations Prohibited
- Development potential to be determined (having regard for heritage and/or ecological values)
- Designated Area
- NU1 Broadacre
- Special Requirements apply flanking Main Avenues, Federal Highway and Approach Roads

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Source: ACTPLA (2009), SMEC (2009)



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6.0 Constraints and Opportunities

6.1 Characterisation of the Potential Development

Future development is possible in Investigation Areas A, B, C and D of the Majura Valley, requiring the provision of appropriate services. Services under consideration include water, sewer, electricity, gas and telecommunications. The proposal is characterised under the relevant planning instruments in the following sections.

6.1.1 National Capital Plan

Appendix A to the NCP sets out the land use definitions of relevance to the plan, including 'public utility', defined under the NCP as the use of land for the following utility undertakings:

- a) Headwork and network undertakings for the provision of sewerage and drainage services or the reticulation of water, electricity, or gas except for gas manufacture and storage;
- b) Communication facilities, including Australia Post facilities, Telecom facilities, television/radio broadcasting facilities, and air navigation communication facilities;
- c) Municipal uses, including street cleaning depots, public toilets, parks and gardens depots, works depots and associated uses.

The potential employment uses falls within the above definition and is therefore accurately characterised as 'Public Utility'.

6.1.2 Territory Plan

Section 13 of the TP provides definitions of relevance to the Plan, including:

Major Utility Installation (Major Service Conduit) – the major bulk water supply and reticulation mains having a diameter equal to or greater than 675mm, trunk sewers having a diameter or of greater than 750mm, stormwater main drains having a diameter of equal to or greater than 900mm or comprising open drains or waterways, transmission lines having a voltage greater than 66kV, gas mains having a diameter greater than 100mm and major telecommunication cable ducts having a width equal to or greater than 1000mm, coaxial cables and optical fibre cables.

The proposed development falls within this definition and is therefore accurately described as 'Major Utility Installation' under the TP.

6.2 ACTPLA Potential Development Scenarios

ACTPLA produced a preliminary estimate of working populations (Table 8) for potential developments to be located in Investigation Areas A, B, C and D. These scenarios are based upon the outcomes of the EBPS, and therefore do not take into account physical, environmental and servicing constraints.

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Table 8 ACTPLA preliminary estimates of working populations

Investigation Area	Existing Uses	Approx Total Area of Investigation Area (Ha)*	Estimated Net Developable Area (Ha)**	Potential Land Uses/ Role	Estimated Employee Density (jobs/ha)	Indicative Timeframe for Land Release	Estimated Working Population 2021***	Estimated Working Population 2031	Estimated Working Population 2041
A Mount Majura Scenario A – No Change	Rural uses, Mount Majura Winery, Truffle Farm.	222	N/A	Uses permissible under Broadacre zone in the Territory Plan (see ACTPLA web site) Likely continuation of current uses-rural, tourism and recreation.	N/A	Development at any stage under current Broadacre zoning.	N/A. Minimal change to current situation unless a major development occurs (Note: Broadacre zone provides for a large range of possible uses)	Same as year 2021	Same as year 2021
Scenario B- Includes resort or tourist facility on 20 ha. Balance of area unchanged.	As above	20 resort/ facility 202 unchanged 222 Total	20	Tourist facility/ resort	-	Not known – if a proposal arises.	50	50	50
B Majura Valley North Likely Scenario- Majority of area	Rural and recreational uses (e.g.: Girl Guides camp)	486	291 subject to clarification of heritage values.	Industry (e.g.: manufacturing, component assembly), transport, warehousing, storage, security and defence support	10	2021-2036 depending on timing of road and infrastructure investment	Nil, unless brought forward due to infrastructure services being in place.	1455 (50% of 2041 pop)	2910
Designated Area (National Capital Plan)	Rural lease	82	N/A (Unlikely to be developed for employment as is Designated Land)	Uses permissible under Broadacre zone in the Territory Plan and under Designated Land provisions of the NCP. Likely continuation of rural uses	N/A	At any stage under current Broadacre zoning.	No/ minimal change to current situation unless developed for other 'Broadacre' uses	Same as for 2021	Same as for 2021
	Majura Pines Recreation Area	82	N/A (Unlikely to be developed for employment as is Designated Land)	Majura Pines forest area unlikely to be developed	N/A	N/A (development unlikely)	No change	No change	No change
TOTAL AREA B		650	291					1455	2910
C Majura Valley South									
Scenario A- Whole Investigation Area	Rural	153	91 subject to clarification of ecological and heritage values	Industry (e.g.: manufacturing, component assembly, storage, freight and logistics, transport, airport related, security and defence support)	20	2015-2036 depending on market demand and timing of road/ infrastructure investment.	1365	1820	1820
Scenario B- Whole Investigation Area + Defence land if transferred from Commonwealth	Rural	251	150 subject to clarification of ecological and heritage values	Industry (e.g.: manufacturing, component assembly), storage, freight and logistics, transport, airport related, security and defence support	20	2015-2036 depending on market demand and timing of road/ infrastructure investment.	1500 (50% of total)	3000	3000
D Pialligo									
Scenario A – Retain as is NB: Most likely scenario	Peri-urban. Retail plant nurseries and bulk landscape supplies, crafts, cafes, agriculture, limited residential, winery.	102	102 on basis of continuation of current uses (i.e.: no new roads etc associated with major development)	Retain and enhance or develop for uses under existing Broadacre Zone	Estimated currently 240 jobs in Pialligo and 79 residents	N/A Continuation of current uses and expansion	280 (+80 residents)	300 (+80 residents)	340 (+ 80 residents)
Scenario B – 2 parts: (a) 30% of investigation area developed for higher order employment (based on lease period expiring around 2031 onwards)	As above	102 but assuming only 30% (30.6) available due to leasing issues	(a) 18.36 (60% of 30.6)	(a) Campus style business park, innovative emerging industries & light industries.	(a) 30	2031 onwards	(a) Nil	(a) Nil	(a) 550
(b) Balance of Total	As above	102	(b) 71.4 (102- 30.6)	(b) Retain and enhance uses under	(b) 238 jobs		(b) Nil	(b) Nil	(b) 238 (+56)

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Investigation Area	Existing Uses	Approx Total Area of Investigation Area (Ha)*	Estimated Net Developable Area (Ha)**	Potential Land Uses/ Role	Estimated Employee Density (jobs/ha)	Indicative Timeframe for Land Release	Estimated Working Population 2021***	Estimated Working Population 2031	Estimated Working Population 2041
Area – retain and enhance current uses				existing Broadacre Zone	(70% of 2041 jobs – see Scenario A) + 56 residents (70% of estimated 2041 population)				residents)
TOTAL Scenario B	-	-	102	-	-	-	Nil	Nil	788 + 56 residents
Scenario C – Whole of Net Developable Area developed for higher order employment	As above	102	61.2	Campus style business park, innovative emerging industries & light industries.	30	2021- 2036 but towards end of this period, if at all.	Nil	Nil	1836

The approx area excludes major roads and other non-developable areas. In some cases total area is to be confirmed, having regard to heritage and/or ecological factors.

**Estimated developable area is 60% of the total investigation area (accounting for landscaping, roads, infrastructure and services etc). In some cases the area is to be confirmed, having regard to heritage and/ or ecological factors

*** Calculated as Estimated Net Developable Area (Ha) x Estimated Employment Density (jobs/ha)

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6.3 Summary of Constraints

6.3.1 Planning Constraints

The key planning constraints and opportunities in relation to the potential development scenarios are shown on Figure 7 and summarised in the table below.

Table 9 Planning Constraints and Opportunities

Opportunities	Constraints
Works on Territory Land are permissible and subject to merit track assessment.	Potential visual impact of works on Inner Hills Designated Area. Certain telecommunications works would require justification for location in this area, with underground cabling the preferred method.
Works on National Land are permitted subject to relevant provisions of NCP.	Investigation Areas A, B, C and D are affected by Airport Noise Clearance Zone.
Opportunity to link works with proposed transport infrastructure corridor (Majura Parkway and VHST).	Within part of Investigation Area D major utility installations are identified as a prohibited use.
Works are consistent with strategic vision for the area as an Employment Corridor, particularly Investigation Area C and the proximity to the Airport.	The development is to conform to development control plans agreed with by the Authority. There is potential for constraints to be imposed upon the proposed works by these plans.
Development of land in Investigation Area C is identified as short term priority for development.	A portion of Investigation Area B and the whole of Investigation Area C are identified as requiring further investigation to determine development potential due to identified ecological and/or heritage values. These values may impose certain constraints on the proposed works.
	Development for the purpose of a 'tourist facility' is a prohibited land use in Investigation Area D (Pialligo area's A and B) under the Territory Plan.
	<p>A number of land uses identified in the development scenarios are currently prohibited under the NUZ1 Broadacre Zoning, including:</p> <ul style="list-style-type: none"> • Industry • Transport • Freight and logistics • Airport related • Business Park • Innovative emerging industries • Light industries • Warehousing. <p>A draft variation to the Territory Plan would be required to change the current zoning.</p>

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6.3.2 Physical Constraints

Topography

The ground slope within the Investigation Areas ranges from 0-5% up to 35-45%, as illustrated in Figure 8. It is desirable to have ground slopes of less than 10% for industrial developments. However varying types of industrial developments require different ranges of slope on which to build. Slopes greater than 15% are very difficult to develop, slopes between 10% and 15% are undesirable but may be feasible, slopes between 5% and 10% are generally conditional upon the nature of the development.

When taken into consideration, the following items illustrate why it is not desirable or cost effective to develop slopes steeper than 15% for industrial use:

- Retaining walls or benching will be required to create a flat surface on which to build.
- Removal of trees and other vegetation may affect stability of the soil.
- Servicing constraints, such as the provision of stormwater drainage.
- Steep roads are not desirable for commercial and waste collection vehicles.

Additional investigation, particularly geotechnical, is required to determine the viability of developing slopes greater than 15% within the Investigation Areas. All areas with a slope greater than 15% are shaded as a constraint in the constraint drawings included in Appendices A – D.

Woolshed Creek

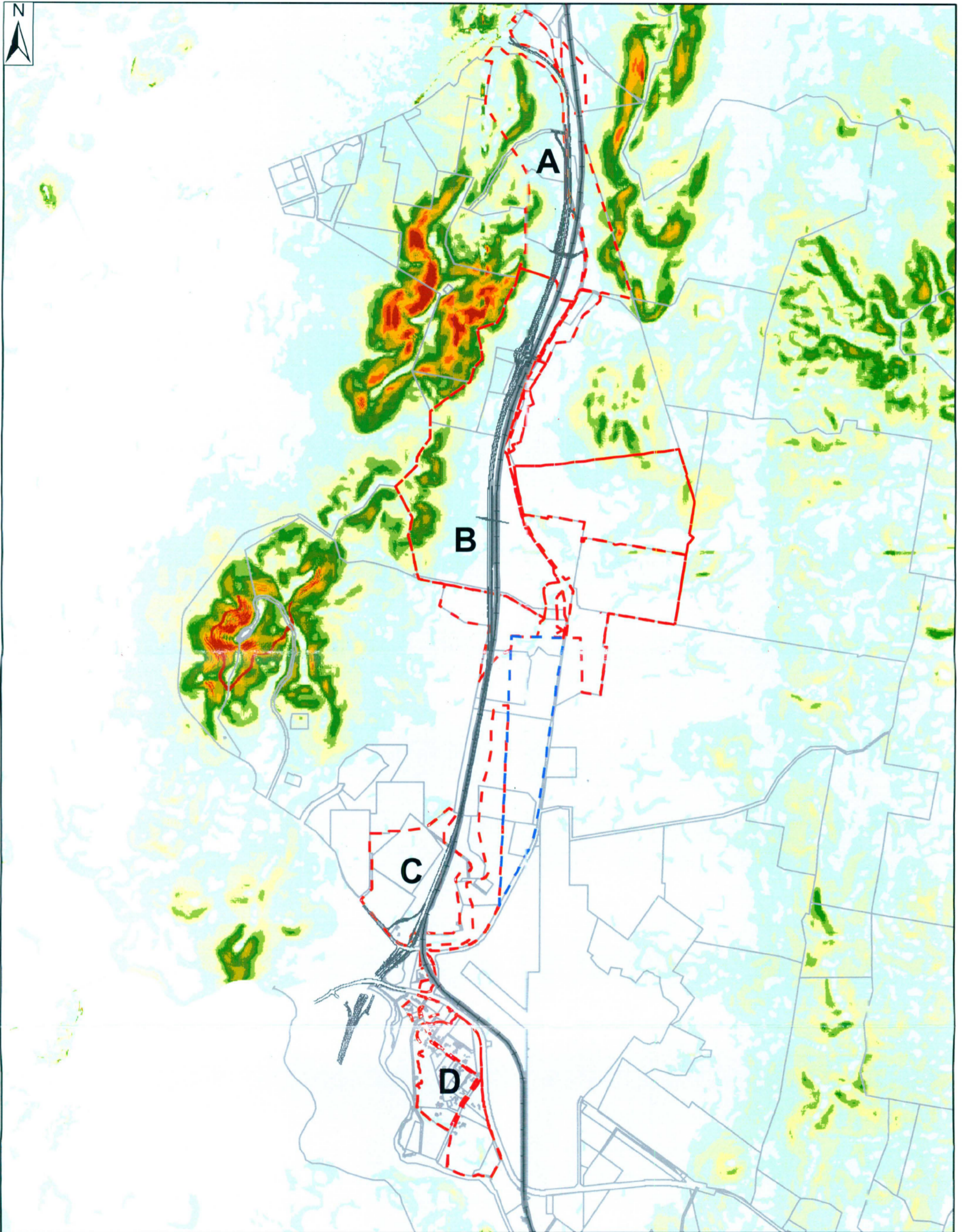
Woolshed Creek (refer to Section 4.0) is located within Investigation Areas B and C. All land located within Woolshed Creek's 100 year flood line is included as a constraint, i.e. not developable.

Easements

Easements for existing services may be required for existing services located within Investigation Areas A, B, C and D, as described in Section 7.0. Service authorities were not able to provide required easement sizes, so a width of 5 m has been assumed for all services.

Majura Parkway

A corridor with of approximately 150 m has been allowed for the future Majura Parkway and VHST. The corridor extends approximately 25 m to either side of the parkway's anticipated limit of earthworks.



Slope (%)		Investigation Area Boundary
0 - 5	26 - 30	[Red dashed line]
6 - 10	31 - 35	[Blue dashed line]
11 - 15	36 - 40	[Grey solid line]
16 - 20	41 - 45	
21 - 25	46 - 50	
	50 +	

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SLOPE ANALYSIS

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Source: ACTPLA (2009), SMEC (2009)



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6.3.3 Ecological and Heritage Constraints

Within the Investigation Areas, there are a number of identified ecological and heritage constraints. Investigation areas A and B are characterised by woodland vegetation that ranges from substantially and severely modified to higher quality Box Gum Woodland² endangered ecological community (EEC). This EEC is relatively well represented at a local scale, with approximately 700 hectares of the community identified within the adjacent Mount Ainslie and Mount Majura Nature Reserve. In the south of the Majura Valley, Investigation Area C is characterised by grassland which is recognised as one of the most significant areas within the ACT for the conservation of threatened species. The area contains habitat for the threatened Grassland Earless Dragon, the Golden Sun Moth, and the Striped Legless Lizard. Investigation Area D in the Pialligo area conversely contains no substantial biodiversity constraints.

In terms of heritage constraints, previous investigations have identified numerous relics, some of which have not been assessed in detail for heritage status. However there are a number of known and listed heritage items, including the Gladefield Homestead, and Majura House within Investigation Area B, and the Duntroon Woolshed and Dove Cottage in Investigation Area C. Other heritage items include potential Aboriginal Scarred trees, and scattered artefact deposits, which will need to be considered and assessed in more detail when specific development scenarios are more clearly understood. It is expected that these constraints are not significant, in that most adverse impacts can be avoided, with careful planning and siting of development activities and alignment of associated infrastructure.

² It should be noted that owing to the nature of the investigation, ecological constraints have largely been identified from a desktop study, drawing on available information sources. In this context there is the potential for areas not identified as Box Gum Woodland EEC by Territory and Municipal Services, to actually fit the criteria for listing as the EEC under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This issue will need to be further explored in more detail, as planning progresses.

DRAFT**6.4 Net Developable Area**

There are physical, servicing, ecological and heritage constraints within the Investigation Areas, as described in the preceding sections. These constraints are explained in detail and graphically illustrated in Section 3 of the Appendices. Table 10 illustrates net areas available for development once the constraints are subtracted from the potential development scenarios nominated by ACTPLA.

Table 10 Summary of investigation areas

i	Area (ha)	Constraints (ha)	Net Developable Area - roads and open spaces (ha)	Net Developable Area - excluding roads and open spaces (ha)
A				
Scenario A	222	Not applicable	Zero – Possible Broadacre zone development or minimal changes to existing uses.	
Scenario B	222	Not applicable – potential 20 ha development to be located to avoid constraints.	20 ha total for a potential tourist facility or resort.	
B				
Scenario A	650	99	100	233
C				
Scenario A	153	50	41	62
Scenario B	251*	76	70	105
D				
Scenario A	102	Not applicable	Not applicable - Retain and enhance or develop for uses under existing Broadacre Zone	
Scenario A Part 1	102	Not applicable	13	18
Scenario B Part 2	102	Not applicable	31	71

*includes approximately 98 ha of National Land

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7.0 Servicing Strategy

Sections 7.1 through 7.5 provide an overview of the existing and proposed services infrastructure for the entire project area. More detailed information, including maps, applicable to each individual Investigation Area is included within the corresponding Investigation Area chapters.

The terminology of 'developer' is used to reference the entity which will ultimately be responsible for constructing the potential developments described in this report. The 'developer' may be a private or government entity.

Both existing and proposed services are illustrated in Figure 9 (water), Figure 10 (sewer), Figure 11 (gas), Figure 12 (electricity), and Figure 13 (telecommunications).

7.1 Water

The existing reservoirs in Upper Hackett and Campbell are not capable of providing water service to the Investigation Areas located above 650 m. One to two new reservoirs may be required, depending upon the location of the potential development within Investigation Areas A and B.

The ground elevations in Investigation Areas A and B may require the construction of a new Majura (TWL 720) high zone reservoir to provide service to elevations between 650 m and 690 m. Water will be pumped from the Upper Hackett reservoir to the new Majura reservoir. The Upper Hackett reservoir will cater for the remainder of Investigation Areas A and B, and the Campbell reservoir will cater for Investigation Areas C and D.

Construction of the new Majura reservoir (if required) would involve the clearing of approximately 3.5 hectares of high quality woodland vegetation, and the clearing of an easement expected to be approximately 10m wide for underground piping connecting the reservoir to other water infrastructure. Considering these impacts would occur within or likely close proximity to the nature reserve, and given the high quality nature of the woodland, impacts are likely to be significant under ACT legislation and potentially Commonwealth legislation also. Although the easement could likely be partially rehabilitated, the reservoir would result in the permanent destruction of this woodland, and could potentially require biodiversity offsets to manage these residual and unavoidable impacts if the reservoir is located in this area.

The need for the new Majura reservoir is dependent upon where the potential developments will be located within Investigation Areas A and B. The land area located above the 650 m contour generally has slopes in excess of 15%, which is difficult to develop. Therefore, the requirement for the reservoir cannot be determined until the potential developments progress into a more detailed design phase. It is assumed that the reservoir will be required for the purpose of this report.

A second super high zone reservoir, Upper Majura, will be required to supply water to the area of development above the 690 contour. This includes the western sides of Investigation Areas A and B. However, the ground slope in these areas ranges from 15 – 40%. It would be difficult to develop these steep areas for industrial use, as noted in Section 6.3.2. Therefore it is not anticipated that an Upper Majura reservoir will be required, and there is no further discussion regarding it in this report.

The new Majura reservoir, pump station, rising main and bulk supply main would be constructed by ActewAGL. The developer will be responsible for constructing distributor mains from the reservoirs for the potential developments.

The capacity information supplied by ActewAGL is based upon their own model used for master planning, which takes into account potential developments such as those within the Majura Valley. The demand information in Section 7.1.1 provided more accurate inputs into ActewAGL's model based upon the proposed potential development scenarios.

7.1.1 Water Demand

Design demands for the potential development scenarios have been calculated based on the *ACTEW Water Supply and Sewerage Standards* (ACTEW Corporation, Release 2, Amendment 3 – October 2006). The design flows are considered conservative and will need to be refined by hydraulic modelling in future in the concept design stage of the project.

The values used to calculate the design demands, and are summarised in Table 11.

DRAFT**Table 11 Water Demands**

Investigation Area	Area (ha)	Land Use [^]	Maximum Hourly Rate (L/S/Net Hectare)	Maximum Hourly Rate (L/S)	Evening Peak Hour Percentage (of Maximum Hourly Rate)
A					
Scenario A – No Change	----	*	----	----	----
Scenario B- Includes resort or tourist facility on 20 ha. Balance of area unchanged.	20	Suburban hotels or clubs	1.5	30	100
B					
Scenario A- Likely Scenario Majority of area	388	Light industrial	0.9	349.2	60
Scenario B- Designated Area (National Capital Plan)	82	*	----	----	----
Majura Pines Recreation Area	82	*	----	----	----
C					
Scenario A- Whole Investigation Area	103	Light industrial	0.9	92.7	60
Scenario B- Whole Investigation Area + Defence land if transferred from Commonwealth	175	Light industrial	0.9	157.5	60
D					
Scenario A – Retain as is NB: Most likely scenario	102	Future development, details unknown	1.05	107.1	100
Scenario B – 2 parts: (a) 30% of investigation area developed for higher order employment (based on lease period expiring around 2031 onwards)	31	Office buildings (3 storey or more)/ light industrial	1.8/ 0.9	42.3	60
(b) Balance of Total Area – retain and enhance current uses	71	Future development, details unknown	1.05	74.6	100

* No change to existing development, therefore no increase in demand

[^]As categorized by ACTEW Water Supply and Sewerage Standards



- Existing Water Main (Other)
- Existing Water Main Reticulation (100mm)
- Existing Water Main Reticulation (150mm)
- Existing Water Main Reticulation (225mm)
- Existing Water Main Distribution (300mm)
- Existing Water Main Distribution (375mm)
- Proposed Water Main
- RL 650m contour (Supply from Upper Hackett reservoir)
- RL 690m contour (Upper limit of high zone - Supply from new Majura reservoir)
- Investigation Area Boundary
- National Land
- Proposed Majura Parkway & VHST Route

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WATER SERVICES

Source: ActewAGL (2009),
ACTPLA (2009), SMEC (2009)



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7.2 Sewer

The MSPS and the adjacent 2.2 ML emergency storage is nearing capacity for wet weather flows. Preliminary ActewAGL modelling indicates that the potential developments will exceed the wet weather capacity of the MSPS by up to 200% in 2031 and 2041.

The peak wet weather flows from the potential development are expected to significantly exceed the capacity of the FSTP. However, conveying dry weather flows from the FSTP to the south Canberra gravity system may enable the FSTP to treat dry weather flows.

Further investigation is required into the proposed program of the FSTP improvements to ensure that it will not restrict development within the Majura Valley. The work can be completed as the project moves into a more detailed design phase - once the locations of potential development are known and more accurate sewer flows can be modelled.

The capacity of the MSPS is also a constraint to the development of Investigation Areas A through D. Two options are available:

- Construction of a package treatment plant within the development.
- Construction of a new wet weather storage tank or an addition to the MSPS tank, and possible improvements to the MSPS.

Typically, if developments such as this are planned well in advance, in consultation with ACTEW and ActewAGL, the developer will not be financially responsible for increased capacity improvements, i.e. pump station or emergency storage.

The capacity information supplied by ActewAGL is based upon their model used for master planning, which takes into account potential developments such as those within the Majura Valley. The demand information in Section 7.2.1 provided more accurate inputs into ActewAGL's model based upon the proposed development scenarios.

7.2.1 Design Sewer Flow

Design sewer flows are calculated based on the *ACTEW Water Supply and Sewerage Standards* (ACTEW Corporation, Release 2, Amendment 3 – October 2006). The design flows are considered conservative and will need to be refined by hydraulic modelling in future in the concept design stage of the project.

The criteria used to calculate these demands are summarized in Table 12 and Table 13.

Table 12 Wastewater design flows

Land Use	Equivalent Population (EP)	Unit
Residential:		
• Low density (less than 15 dwellings per ha)	3.6	Per dwelling unit
• Medium density	2.5	Per dwelling unit
• High density (more than 80 dwellings per ha)	2.0	Per dwelling unit
Commercial facilities:		
• Shops and offices	0.3	Per employee
• Public visitor buildings or sport spectator facilities	0.05	Per short stay visitor
• Restaurants and clubs	0.1	Per seat
• Tourist or hospital accommodation	0.5	Per bed
Industrial:		
• Dry trades	0.3	Per employee
• Wet trades	*	Assess on a case by case basis
Institutional:		
• Schools and educational facilities	0.2	Per student or staff

Source: *ACTEW Water Supply and Sewerage Standards*

DRAFT**Table 13 Wastewater Design Criteria**

Item	Design Criteria	Units	Wastewater
Design Flow	Average Dry Weather Flow f (ADWF)	L/s	ADWF = TEP/288 + 1/3 TPF TPF = Total pumped flow
Design Flow	Peak Dry Weather Flow (PDWF _G)	L/s	PDWF = PDWF _G + 2/3 TPF PDWF _G = PDWF from gravity sources
Design Flow	Peak infiltration and inflow (PII) for non-residential areas	L/s	PII = 0.944(INSA + CNSA) ⁶¹ INSA = Industrial Net Sewered Area CNSA = Commercial Net Sewered Area
Design Flow	Peak Wet Weather Flow (PWWF)		PWWF = PII + PDWF _G + TPF

Source: ACTEW Water Supply and Sewerage Standards

The land use areas proposed as potential developments summarised in Table 10 were used to calculate the projected sewage flows noted in Table 14.

Table 14 Projected sewer demand

Investigation Area	Area (ha)	EP	TEP	ADWF (L/s)	PDWF (L/s)	PII (L/s)	PII + PDWF (L/s)
A							
Scenario A – No Change	----	----	----	----	----	----	*
Scenario B- Includes resort or tourist facility on 20 ha. Balance of area unchanged.	20	0.3	15	0.1	0.2	10.7	10.9
B							
Scenario A - Likely Scenario Majority of area	388	0.3	1164	4.0	11.6	118.0	129.6
Scenario B - Designated Area (National Capital Plan)	----	----	----	----	----	----	*
C							
Scenario A- Whole Investigation Area	103	0.3	618	2.1	6.6	40.3	46.9
Scenario B- Whole Investigation Area + Defence land if transferred from Commonwealth	175	0.3	1050	3.6	10.6	61.9	72.5
D							
Scenario A – Retain as is NB: Most likely scenario	102	0.3	30	0.1	0.4	46.0	46.4
Scenario B – 2 parts: (a) 30% of investigation area developed for higher order employment (based on lease period expiring around 2031 onwards)	31	0.3	93	0.3	1.2	15.2	16.4
(b) Balance of Total Area – retain and enhance current uses	71	0.3 / 2.5	104	0.4	1.3	34.3	35.7

*No change to existing development, therefore no increase in demand



- Proposed Sewer Gravity Main
- Sewer Easement
- Existing Sewer Gravity Trunk Main
- Existing Sewer Gravity Reticulation Main
- Existing Sewer Rising Main
- Existing Sewer Manhole
- Investigation Area Boundary
- National Land
- Proposed Majura Parkway & VHST Route

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SEWER SERVICES
 Source: ActewAGL (2009), ACTPLA (2009), SMEC (2009)

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10

0 0.5 1 2
 Kilometers

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7.3 Gas

The existing gas reticulation system which provides service to the airport is near capacity, however the 250 mm diameter primary main has adequate capacity to service the potential developments. A new off-take station would be required to transfer the gas supply from the primary main to reticulation mains to provide service to the potential developments. The ultimate size of the off-take station is based upon the size of the development, but it could occupy an area of approximately 30 m x 60 m.

Other adjacent developments, such as Fairbairn, will also require this off-take station. AFP (located adjacent to Investigation Areas A and B) has expressed an interest in having a gas connection as well. Possible locations for the AFP/ Fairbairn/ Majura off-take station include near the AFP property on Majura Road (option 1), and north of the airport near Majura Lane (option 2). The ultimate location and cost of the off-take station are dependent upon the timing of future developments. For example, if the Majura Valley development proceeds first, then the developer will be responsible for the cost of the off-take station. However, if the Fairbairn development proceeds first then the Majura Valley developer may only be responsible for any additional infrastructure at the off-take station to convey the gas to the development.

Jemena has indicated that a new off-take station (option no. 2) would be beneficial to surrounding developments, particularly Canberra International Airport.

Off-take stations generally take eighteen to thirty-six months to plan, design and construct. They may cost up to \$3 million.

7.4 Electricity

Existing infrastructure within the Investigation Areas does not have adequate capacity to service the potential developments. The Investigation Areas would need to be serviced from the new Eastlake Zone Substation, which is scheduled to be operational in late 2012. New 11 kV underground feeders would be required from the substation to a new distribution station(s) to be located within the potential developments. Each distribution station will occupy an area of approximately 6.5 m², and will have planting and building setbacks of up to 3 m. The distribution stations can be located once development progresses into the detailed design stage.

The new 11kV feeders and the distribution stations will be funded entirely by ActewAGL. Electrical reticulation cable and street lighting will be funded by the developer.

The high voltage (11kV) overhead lines located throughout Investigation Area A may be relocated to a trench within future road verges at the developer's expense, or a 10 m wide easement may be maintained. Relocating overhead lines to an underground trench will cost approximately \$250 per metre.

7.5 Telecommunication

7.5.1 TransACT

TransACT infrastructure would need to be extended from Campbell to provide service to the Investigation Areas. The developer's contribution for these improvements will be a percentage of the cost to TransACT. TransACT will first need to prepare a business case to look at the viability of servicing the development and the estimated cost to the developer.

TransACT's cost for providing service to the boundary of the Investigation Areas may be approximately \$700,000.

7.5.2 Telstra

An easement will be required above the Sydney-Melbourne-Gundaroo integrity data cable. Telstra is not able to provide an easement width at this time, so a 5 m wide easement has been assumed for the purposes of this study. The remaining Telstra infrastructure located within Investigation Areas A and B may be relocated to shared trenches within future road reserves.

Telstra has advised that it is possible to extend existing infrastructure into the Investigation Areas to provide telecommunications services. There is a spare conduit along Majura Road that may be utilized. However, the anticipated spare capacity at the time of development has not been modelled by Telstra.

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Telstra is not able to provide additional information until the project progresses into a more detailed design phase. However, they are likely to install additional conduits under the proposed Majura Parkway to cater for the proposed development in the Investigation Areas.

7.5.3 ICON

ICON and Intact are government owned carriers which only supply services to ACT and Commonwealth facilities, including schools. ICON infrastructure will not be extended unless the potential development includes government facilities.

7.6 Summary of High Level Infrastructure Costs

Table 15 contains construction cost estimates for providing network wide upgrades to service Investigation Areas A, B, C and D. These costs include 40% contingency, and are exclusive of GST.

Table 15 Summary of servicing costs

Description	Approximate Cost (excluding GST)	
	Option 1*	Option 2*
Investigation Area A	\$7,098,000	\$7,098,000
Investigation Area B	\$14,420,000	\$14,812,000
Investigation Area C	\$16,408,000	\$16,016,000
Investigation Area D	\$4,102,000	\$2,170,000
Total:	\$42,028,000	\$40,096,000

*The cost of gas infrastructure servicing is dependent upon the location of the future off-take station.

- Option 1: Off-take station located within Investigation Area B.
- Option 2: Off-take station located within Investigation Area C.

Some network wide improvements such as the FSTP, MSPS, and 11 kV electricity feeders shall be at the expense of ActewAGL. Infrastructure costs are described in greater detail within each of the appendices.



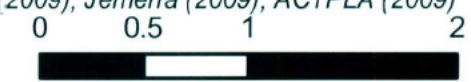
- Proposed Gas Pipeline
- Existing Gas Main - Other
- Gas Main - 250mm
- Investigation Area Boundary
- National Land

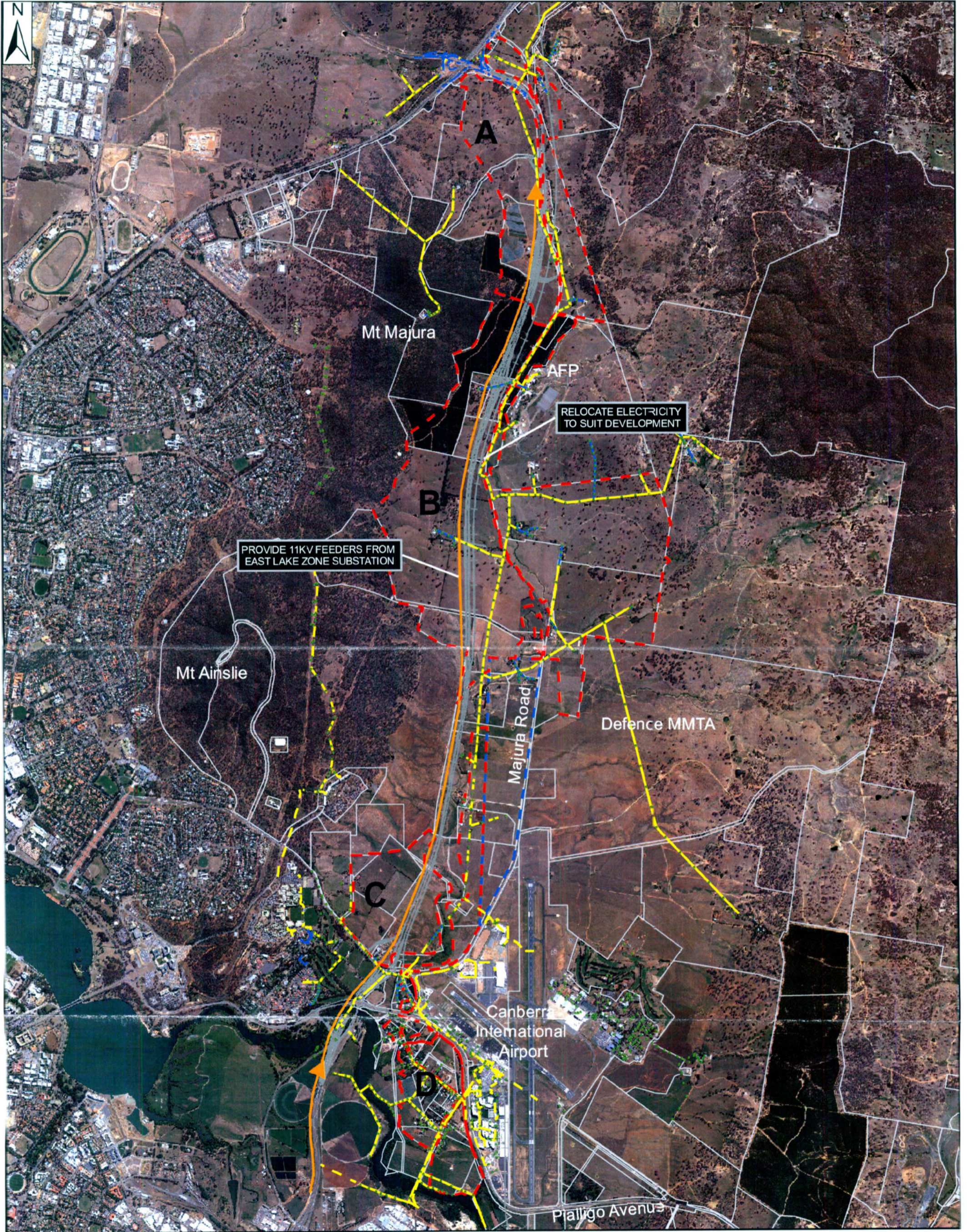
— Proposed Majura Parkway & VHST Route

**MAJURA VALLEY ENGINEERING
FEASIBILITY STUDY
GAS SERVICES**

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60143881

Source: SMEC (2009), Jemena (2009), ACTPLA (2009)





- Proposed 11Kv Underground
- Existing Electricity 11Kv Overhead
- Existing Electricity 11Kv Underground
- Existing Electricity LV Overhead
- Existing Electricity LV Underground

- Powerpoles
- - - Investigation Area Boundary
- National Land
- Proposed Majura Parkway & VHST Route

MAJURA VALLEY ENGINEERING
FEASIBILITY STUDY
ELECTRICAL SERVICES

Source: ActewAGL (2009), ACTPLA (2009), SMEC (2009)

0 0.5 1 2



Kilometers

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