Caboolture Morayfield Principal Activity Centre

Part 5: Infrastructure and Capital Works Plan

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Moreton Bay Regional Council

Queensland Government

Caboolture Morayfield Principal Activity Centre Master Plan
Part 5 - Infrastructure Plan and Capital Works Plan

Moreton Bay Regional Council

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1. Introduction

This document is part of the Caboolture Morayfield Principal Activity Centre (CMPAC) Master Plan and should be read in conjunction with Part 1 – Master Plan and other companion parts (Figure 1-1).

Figure 1.1 CMPAC Master Plan structure

This document identifies the physical infrastructure required to support implementation of the CMPAC Master Plan. The document outlines the current state analysis of the infrastructure network, opportunities and constraints and discusses the principles and strategies to support the Master Plan.

1.1 Methodology and limitations

The professional opinions expressed in this document are predominantly based on the reports of previous work done by others, the Moreton Bay Regional Council Infrastructure Planning Scheme Policies, and discussions with Council staff and utility providers. Detail modelling work was not included in the scope of this project. Therefore, requirements for further detail investigations, during the development assessment phase, to verify and develop the strategies proposed in this document have been suggested where appropriate.

Initial research was undertaken of existing and planned trunk infrastructure (storm water, water and sewerage) to establish a base case scenario upon which future or alternative development patterns and densities may be tested. The initial research and investigation was also undertaken to establish any constraints and opportunities that may be present and that may influence the way that development may occur and the likely impacts that this may have on the infrastructure networks.

The outcome of this investigation into trunk infrastructure provided a base level data about these infrastructure networks as a layer to the constraints and opportunities matrix that supported the overall strategic planning for the CMPAC. The plans for the CMPAC were tested on the individual infrastructure networks to establish the impacts and, if necessary, the associated system upgrades.

The initial research was greatly assisted by the MBRC, Caboolture ShirePlan, Planning Scheme Policies – Trunk Infrastructure Contributions for Stormwater, Water Supply and Sewer. These documents represent current planning of these key infrastructure networks and provide a sound base for this initial investigation. MBRC documents provide a high quality analysis of the current infrastructure and planned upgrades to support the ultimate population of the CMPAC area, based on the assumptions under the current planning scheme and in accordance with its adopted ‘Desired Standards of Service’.

2. Planning assumptions

2.1 Population projections under the CMPAC Master Plan

The ultimate development scenario under the proposed Master Plan (Part 1) will result in an increase in residential population of the CMPAC area of 15,000 and working population of 20,000.

The development of the CMPAC area is expected to take place progressively over the next 20 years. Population projections under the CMPAC Master Plan for the Precincts 2, 4 and 5 (Figure 2.1 below) are not significantly different from the assumptions under the current Caboolture ShirePlan. However, the CMPAC Master Plan proposes a significant increase in the population projections within Precincts 1 and 3. Future densification is proposed in Caboolture South.

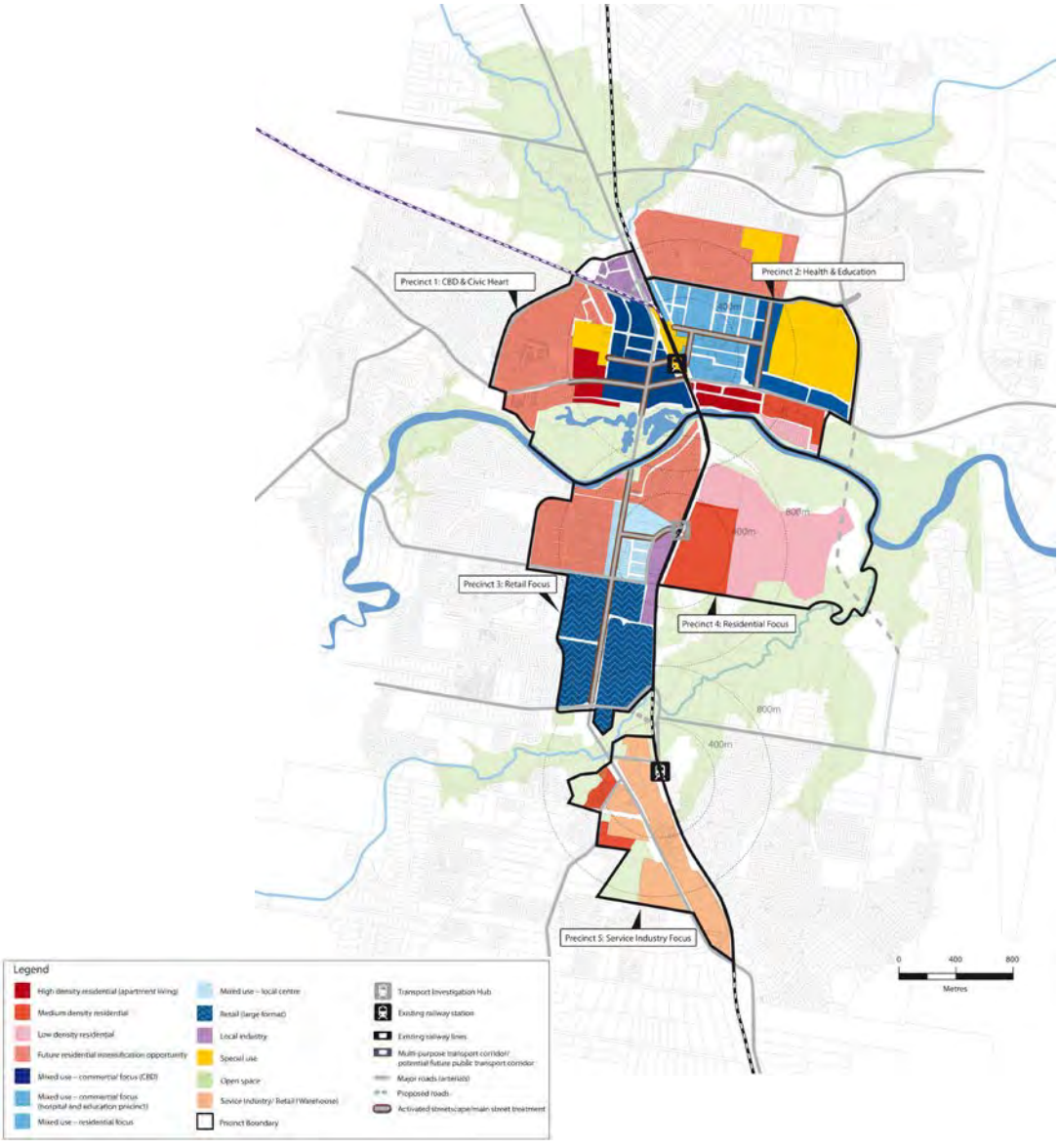


Figure 2.1 CMPAC Master Plan land use designations

2.2 Vision and objectives

The vision for this Infrastructure Plan is to ensure provision of efficient and quality infrastructure to support implementation of the Master Plan vision for the CMPAC to 2031. The Infrastructure Plan was developed to achieve the following objectives:

- The infrastructure will be delivered in an economical manner, incorporating sustainability concepts.
- While meeting the demands of the new developments, the strategy to upgrade and integrate existing infrastructure will conform to current best practice guidelines of MBRC and other regulatory bodies.
- The phasing of development will take into account and integrate well with future regional service upgrades planned by MBRC and other state entities.

2.3 Rationale and design principles

Access to quality infrastructure and services are important factors that are required to support the vision for CMPAC transformation in a long term.

While existing services within the CMPAC area adequately cater for existing land uses, significant upgrades will be required to meet the demands of the CMPAC Master Plan, taking into consideration the increased population, age of the existing infrastructure, realignment of roads and the higher standards that are required of modern infrastructure.

The following details key design principles guiding the development of this Infrastructure Plan.

- In order to ensure efficient use of land, service corridors to accommodate water, sewer, power and information and communication technology (ICT) infrastructure will be integrated efficiently within the road reserves.
- Treatment of surface water runoff will be a priority in line with best practice guidelines. Treatment chains will be integrated within road and drainage reserves and existing flood plains will be retained. Large extents of land within the Master Plan precincts are developed and as such the redevelopment and densification is not expected to result in significant increase in impervious areas or storm water runoff.
- The number of sewage pumping stations within the Master Plan area will be kept to a minimum in order to reduce maintenance costs and gravity sewers at greater depths will be provided in line with Council Guidelines. Infrastructure upgrades will be carried out in stages as development progresses. Trunk infrastructure provision will be incorporated into Council's future capital works program and Moreton Bay Regional Council Priority Infrastructure Plan.
- Best practice guidelines with regards to integrated water management strategies will be adopted. This will include rainwater tanks within individual developments and the possible extension of the existing recycled water trunk main to service Precincts 1 and 3 west of the rail line. Adoption of alternative water supplies will offset some of the potable water supply upgrades that will otherwise be required.

3. Infrastructure plan strategies

3.1 Stormwater and flooding

3.1.1 Context, opportunities and constraints

3.1.1.1 Current state analysis

Stormwater and flooding are discussed together in this section as they are associated issues that are catchment based and their management has a direct impact on future development.

The core precincts within the Master Plan area are predominately developed as urban land with roads and stormwater drainage infrastructure. The exceptions are those areas that are flood prone and the large parcel of rural land east to the rail corridor and south of the Caboolture River (Precinct 4). This land is currently the subject of a development application for approximately 1,600 residential lots.

The Caboolture ShirePlan Planning Scheme Policy 21 E - Trunk Infrastructure Contributions – Stormwater includes maps of the current and planned stormwater infrastructure for both water quantity (conveyance, detention) and water quality (SQIDS, Corridor re-vegetation etc). At present, council's planning work is not advanced enough to identify any major drainage pipe/culvert upgrade works within the Master Plan precincts other than cross road culverts in McKean Street, in Morayfield Road on a tributary of Sheepstation Creek and at the rail underpass and causeway at William Berry Drive and Visentin Road. There are a number of detention basins proposed within each of the catchments on tributary creeks. Council in August 2010 adopted the Caboolture River Recovery Plan that focuses on improving the rivers health.

Council does not keep a data base of localized flooding, but it must be assumed that as there are only limited culverts and pipe drainage capital works contemplated within the drainage infrastructure plan, the current above and below ground drainage, within the core study area is adequate. Council is however currently preparing the Moreton Bay Regional Council Regional Floodplain Database which will be used to predict where and how flooding may occur. This will allow Council to provide better quality information to the community, including better flood warnings and advice on how to protect your property.

A primary consideration within the Council's planning documents for both stormwater and sewerage treatment and disposal, is the quality of the receiving water bodies, and in particular the Caboolture River. Council has advised that the recent healthy waterways report for the Caboolture River produced a ranking of C-. Council is very focused in improving the water quality of this river through the careful management and future planning around discharges into it.

The 'future stormwater' plans within the Planning Scheme Policy 21 E -Trunk Infrastructure Contributions – Stormwater, primarily describe works for improvement to water quality within the tributaries and streams feeding the Caboolture River. It is evident that work has been underway for some time in improving the streams and corridors surrounding them to improve water quality and the general amenity within each of the catchments. These works include bio-retention basins and extensive planting within the riparian zone. Although the current

ranking of the Caboolture River is C- this is an improvement in quality compared to past historical data.

The Master Plan precincts are spread across three catchments. These are Wararba Creek catchment to the north, Caboolture River catchment in the middle and the Sheepstation Creek catchment to the south which drains into the Caboolture River at the eastern extremity of the study area. Existing and planned stormwater drainage infrastructure and the associated catchments within the Master Plan area are shown on Figure 1-1 in the appendix.

The three river/stream catchments each have an associated regional flood plain. The flood plain mapping for the Q100 or 1% AEP is depicted within Figure 1-2 in the appendix. The flood mapping provides an indicative limit to development as evidenced to the pattern of growth. The exceptions are the Precinct 4, referred to above, and some commercial development (Leda Shopping Centre and surrounds) around Sheepstation Creek between Morayfield Road and the rail corridor which will be discussed below.

The flood plain established by the three river catchments divides and fragments the CMPAC. The principal impacts are associated with the flooding of the Caboolture River and Sheepstation Creek which effectively preclude any continuity of development along Morayfield Road. Flood height estimates contained within the Caboolture Shire Council 'Caboolture Flood Study' April 1994, prepared by AWE estimate the Q100 flood heights for the Caboolture River at Morayfield Road at 9.62 m, the Q50 at 9.02 and the Q10 at 7.58. It is understood that sections of Morayfield road and the existing road and bridge are below this level and flood at the Q10. This is a wide floodway approximately 370 m along the road which acts as a causeway.

Flood height estimates contained within the 'Review of Flood Study for Sheepstation Creek (Revised) dated March 2005, prepared by Sargent Consulting estimate the Q100 flood height for Sheepstation Creek at Morayfield Road at 8.23 m whereas the road level is 7.50 m. The report suggests that the road will remain untrafficable in this event for a period of six hours with a depth > 0.3 m. Q10 and Q50 flood level information is not available for Sheepstation Creek.

3.1.1.2 Opportunities and constraints

The Master Plan area is significantly constrained in terms of flood immunity and the developable area somewhat defined by the flood limits described above, however within the developable area there are no obvious and apparent constraints to development associated with stormwater drainage.

Council has a strong policy position within the Stormwater Code of the Caboolture ShirePlan and Planning Scheme Policy 19 Stormwater, dealing with stormwater management within new development. The desired standards of service for stormwater are further reinforced within the Planning Scheme Policy 21 E - Trunk Infrastructure Contributions – Stormwater.

In summary, all developers are required to:

- preserve the pre-developed peak flows from their site, typically via on site stormwater detention
- provide for major and minor flow conveyance up to Q100
- ensure that properties have required level of flood immunity in accordance with Division 16- Reconfiguring a Lot code

- demonstrate a specified percentage reduction in pollutant loads for their development site for stormwater prior to its release
- implement best practice in controlling sediment and erosion within their site during the construction phase
- implement Water Sensitive Urban Design practices to treat stormwater at the source
- implement stormwater harvesting and reuse within the site

All of the above are designed to ensure that future developments embrace best practice in stormwater management and to prevent any adverse impact on the downstream stormwater drainage system in terms of both water quality and quantity, consistent with Council's desired standards of service for its own works.

Stormwater may be captured on site as rainwater and used for a variety of purposes contemplated under the Caboolture ShirePlan Water Sustainability Code. This aspect will be further discussed below in regard to water supply.

Council's position on development within or adjacent to the floodplain is described within it planning scheme and referenced in the Reconfiguring a Lot Code of the Caboolture ShirePlan and Policy 4 Design and Development Manual. Development must not result in any loss of flood plain storage or impede the conveyance of flood water to the determent of any other property, as demonstrated by flood modelling. Council will permit filling within the flood plain but only in circumstances where the above tests can be passed.

Council has also permitted development to occur in the Sheepstation Creek floodplain that addresses flood storage and conveyance by building on structure. Development adjacent to William Berry Drive has been built upon columns and suspended slabs with floor levels above flood and with free draining basement car parking that is totally immersed in a major flood event. The development is subject to a flood management plan that controls access to the car park in times of flooding and does not contain any residential land use. Council has in this way enabled development to occur on land that would otherwise be sterilized due to the flood constraints. It is essential, in these instances, that the property has frontage and or access to land that is above the Q100 flood level for emergency access purposes i.e. the property is not isolated within the flood plain.

Council's planning scheme policies and codes provide clear guidance on development within and adjacent to the floodplain. Caboolture Shire Planning Scheme Policy 21 E - Trunk Infrastructure Contributions – Stormwater identifies future 'drainage corridor reserves' that are to be acquired/dedicated over time either within the development application/assessment process or through funding that is supported by the contributions scheme. These reserves are typically within the areas that are flood prone and associated with the main channel flows and conveyance. It is unlikely therefore that the establishment of the reserves will constrain the potential development footprint beyond that imposed by the other planning scheme requirements described above.

3.1.2 Principles and strategies

Principles associated with flooding and stormwater drainage that are relevant to the development of the CMPAC are:

- development should not place property or people at risk from flooding due to any loss of flood storage or flood conveyance
- development should maximise the use of developable land without the need to compromise built form outcomes by establishing within the fringes of the flood plain
- adhere to appropriate setbacks from the river to manage river bank stability issues
- development should employ measures that treat stormwater at source, through Water Sensitive Urban Design Principles, to achieve controls over water quality and quantity before release to the receiving environment
- development should provide for and dedicate drainage corridor reserves, consistent with Council's PSP21E Trunk Infrastructure Contributions – Stormwater, to facilitate efficient stormwater conveyance
- stormwater should be considered as a resource that can be used to balance the demands on potable supplies and minimise the use of waste water.

Precincts 1, 2, 3 and 5 within the Master Plan area are predominately developed as urban land with roads and stormwater drainage infrastructure. The development intensification within these precincts recommended in the Master Plan will be predominantly realised through high rise buildings and redevelopment of existing built form. As such redevelopment and intensification visioned in the Master Plan are not expected to significantly change the surface water runoff quantities.

The Master Plan does not trigger the need for any major drainage infrastructure other than that is planned within the current Council Planning Scheme. The Master Plan will provide significant opportunities to incorporate rain water capture and re-use mechanisms and surface water quality improvement devices as the redevelopment progresses. Moreton Bay Regional Council's Policy Guidelines on stormwater management will guide the redevelopment within the Master Plan Precincts in terms of best practice design.

3.2 Water and recycled water

3.2.1 Context, opportunities and constraints

3.2.1.1 Current state analysis

The Master Plan area is serviced with reticulated potable water drawn from an existing water treatment plant located on the Caboolture River at King Street and from the regional bulk water supplier. The existing water treatment plant draws water from the Caboolture River at a weir located downstream of the Morayfield Road Bridge and rail corridor. Caboolture receives 15 Ml/d from the treatment plant and river with the balance derived from the bulk supply main running south from Caloundra, west of the town.

In the preparation of Planning Scheme Policy – Trunk Infrastructure Contributions 21 F – Water Supply, Unitywater analysed the existing water reticulation network against the current and future planning scheme population and demand. The analyses lead to preliminary design and sizing of new mains and associated infrastructure to support the future demand. Existing and future/additional infrastructure within the Master Plan area are mapped in Figure 1-3 in the appendix.

Water, in addition to that provided by the local water treatment plant, will be drawn from the bulk supply and fed to the major reservoirs at Morayfield to the south and Elimbah to the north. Supply mains will run north and south respectively, from the reservoirs to service the urban area to its design population as modelled within the current planning scheme policy of the Council. The distribution areas between the two source reservoirs will intersect at some point south of the Caboolture River. Council's water supply network has been analysed and designed around an Average Day Demand (AD) of 296 L/EP/day (230 x 1.2) + system losses.

3.2.1.2 Opportunities and constraints

Caboolture ShirePlan's Water Sustainability Code, supports the implementation of rainwater tanks and grey water harvesting to augment the potable water supply and describes how these sources of water may be used in Class 1, 2 and 10 buildings for toilet flushing and cold water supply to washing machines. The replacement of potable water with water from another source for toilet flushing, washing machines and landscaping can result in significant reduction in the consumption of potable water.

Reliance on these measures to reduce potable water consumption cannot be relied upon unless they are mandated within planning controls, plumbed into buildings and monitored for compliance against the demand and flow targets.

The WWTP has capacity to treat effluent to Class A+ at approximately 9 Ml/day. It is currently treating approximately 8 Ml/day and a maximum of 4Ml/d day has been piped for reuse with the balance discharged to the river. Treated recycled water from the WWTP has only limited application at this time due to the extent of reticulation mains laid to date. These extend to some residential development to the north and south. However Unitywater are not supportive of any future expansion of the recycled water network to homes.

Council's Total Water Cycle Management Plan is currently under development in collaboration with Unitywater and the Queensland Water Commission. The TWCMP is intended to address the water supply capacity issues in the Caboolture catchment as part of the broader considerations of natural flow, water conservation, diversity in new water supplies and the preservation of water quality for the community and the environment.

3.2.2 Principles and strategies

Principles associated with water supply and management that are relevant to the development of the CMPAC are:

- the development should apply principles that will support a sustainable supply of water to the Moreton Bay Region as a whole.
- the development should, adopt a Total Water Cycle Management Plan that aligns with the TWCMP adopted by Council.
- the development should seek to make mandatory water saving fixtures, fittings and plumbing connections that will deliver certainty to the water reduction targets.

The total projected increase (realistic scenario) in population from the Master Plan area precincts is 20,000EPW. Two strips of areas that are earmarked for densification, contribute significantly to this increase. These strips are shown shaded in green on Figure 3.1.

The increase in demand for water from the potable water supply resulting from the population intensification will be managed by staged augmentation of existing water mains and connecting to the 500 diameter trunk bulk water supply main (planned for 2013) at Beerburrum Road to the north of Caboolture Train Station. Additional spurs will also be constructed along Church Street and Fortune Esplanade to cater for the growth planned south of Caboolture River. Potable water main augmentation strategy is shown in Figure 3.1 below.

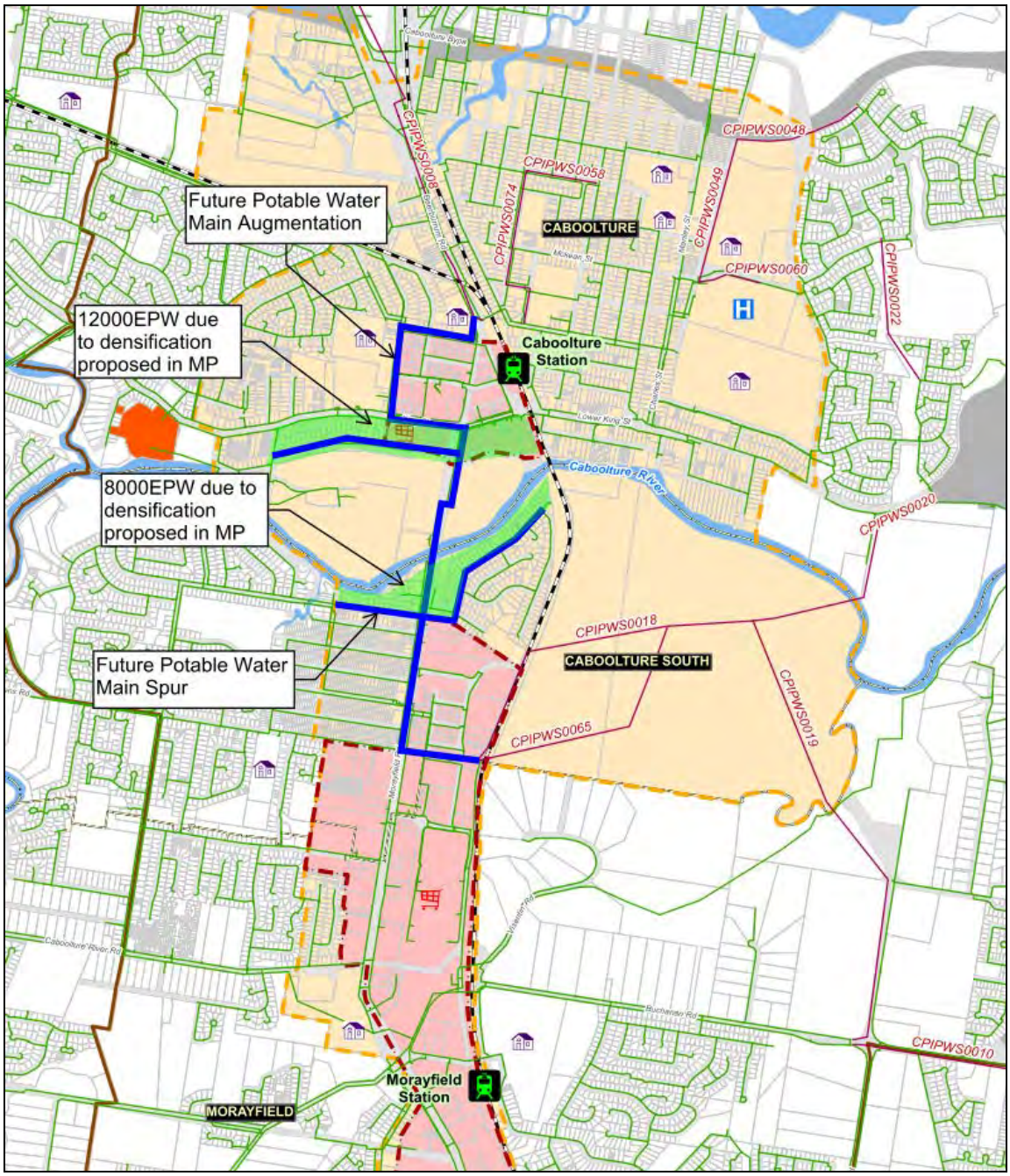


Figure 3.1 Potable water main augmentation

3.3 Sewer

3.3.1 Context, opportunities and constraints

3.3.1.1 Current state analysis

The Master Plan area is well serviced with reticulated sewer draining to a waste water treatment plant (WWTP) at Weier Road, Caboolture South. Trunk sewer network consists of gravity sewers, pumping stations and rising mains. The WWTP has capacity to treat effluent to class A+ before it is released to the Caboolture River under license (downstream from the water treatment plant weir intake) The current WWTP has a capacity of 40,000 EP and is currently being upgraded to 60,000 EP. It is anticipated, by Unitywater, that the planned upgrade will be consumed by the anticipated planning scheme growth demand.

Unitywater undertook an analysis of its sewer network against the current and future planning scheme population and demand. The analyses lead to preliminary design and sizing of new mains and associated infrastructure to support the future demand. Existing and future/additional sewer infrastructure within the Master Plan area and location of manholes are shown in figures 1-4 and 1-5 in the Appendix.

New subdivision developments have included the implementation of Reduced Infiltration Gravity Sewers (RIGS) to reduce the infiltration of stormwater into the sewers. Unitywater, like many other water/sewer authorities have yet to see any benefit of this system.

Unitywater has adopted an Average Dry Weather Flow rate of 185 L/EP/day with a peaking factor of six times this number for Wet Weather Flows. Trunk mains are all gravity mains 225 mm in diameter and greater.

3.3.1.2 Opportunities and constraints

There are no physical constraints to increasing the capacity of the sewerage reticulation systems as is evidenced by the analysis and preliminary design work undertaken in the preparation of the Caboolture Shire Planning Scheme Policy 21 D – Trunk Infrastructure Contributions – Sewerage. The only limitation is on the capacity of the WWTP with regards to limitations imposed by an Environmental License that controls effluent discharge to the Caboolture River.

There is a potential opportunity, building upon the discussion under the water section above, to limit the demand on the potable supply and encourage the use of treated water and thereby reducing the discharge to the Caboolture River. Class A+ treated recycled water can be reticulated to the areas of increased density to supply water for toilet flushing and laundries in residential properties, and toilet flushing and limited contact use in commercial, industrial development.

The replacement of potable water with recycled water for such uses will provide the certainty to enable mandatory installation and a guaranteed reduction in the potable water demand. The increased utilisation of recycled water will also limit the quantity of treated effluent that is discharged to the river ensuring that the licence provisions are not exceeded. Under this scenario, rainwater collected and stored in tanks will be used for irrigation and not internal use so as not to reduce the uptake of recycled water.

Council has established a model of all properties within the WWTP catchment and assigned to each property its current and anticipated population growth over time expressed as population or Gross Floor Area (GFA). The model attaches the demand to the nearest available sewer manhole, converts the demand to Equivalent Persons (EPs) and then to flows, enabling this data to be inserted into the Unitywater, sewer network model. In this way the current and future population was modelled against the network to determine its capacity and adequacy or otherwise. This same model can be used to test the addition or modification to the planned population with adjustment to EP's based upon the scenario described above, to ensure that the system capacity is not exceeded.

3.3.2 Principles and strategies

Principles associated with waste water infrastructure that are relevant to the development of the PAC are:

- the development should apply principles that will support a sustainable treatment and disposal of waste water within the South Caboolture Sewerage Service Catchment
- the development should, by means of innovative and practical water design achieve a water balance that, where possible will reduce the quantity of treated effluent that is discharged to the Caboolture River
- the development should seek to make mandatory water saving fixtures, fittings and plumbing connections that will deliver certainty to the recycled water reuse targets and contribute to the reduction of discharge to the river.

EPS Estimates

The EPS estimates, based on Caboolture ShirePlan and the proposed Master Plan, for the five precincts are tabulated below in Tables 3.1 and 3.2 for comparison.

Table 3.1 EPS – Caboolture ShirePlan

		Master Plan Precinct									
CSP Zone	EPS/Ha	1		2		3		4		5	
		Area (Ha)	EPS	Area (Ha)	EPS	Area (Ha)	EPS	Area (Ha)	EPS	Area (Ha)	EPS
Metro Centre	30	26.8	804	3.2	96	58.4	1752	0	0	47. 1	1413
Residential A	60	28.9	1734	2.6	156	27.3	1638	67.5	4050	5.4	330
Residential B	67	31.8	2131	70.2	4703	20.3	1360	19.5	1307	1.5	100.5
Special Use	10	13.4	134	40.8	408	0.8	8	0	0	0	0
Light Industry	15	7.6	114	0	0	0	0	0	0	0	0
Total			4917		5363		4758		5357		1843.5

Table 3.2 EPS – CMPAC Master Plan

Land Use Type	EP/ 100 m2 GFA	Master Plan Precinct									
		1		2		3		4		5	
		GFA (m2)	EPS	GFA (m2)	EPS	GFA (m2)	EPS	GFA (m2)	EPS	GFA (m2)	EPS
Retail	0.9	135,500	1220	87,000	783	797,000	7173	0	0	0	0
Office	2.5	269,250	6731	102,000	2550	30,000	750	0	0	0	0
Industry	0.45	38,000	171	0	0	38,000	171	0	0	479,355	2157
Community	0.3	66750	200	60,000	180	30,000	90	0	0	0	0
Residential		528,000	11344	180,000	4368	345,000	8260		4360	144,500	650
Total			19666		7881		16444		4360		2807

The ultimate population projection (beyond 2031) for the proposed Master Plan is significantly higher than the current Caboolture ShirePlan. The Precincts 2, 4 (east of the railway) and 5 forecasts remain almost. However Precincts 1 and 3 projections show a significant increase. Current scheme 9,675 EPS as compared to the proposed Master Plan forecast of 36,110 EPS. These are 'ultimate' projections beyond the 2031 planning horizon. The 'realistic' projections are significantly lower and are estimated as 25,000 EPS.

The total projected increase (realistic scenario) in EPS from the Master Plan area precincts is 20,000EPS. Two strips of areas that are earmarked for densification, contribute significantly to this increase. These strips are shown shaded in green on Figure 3.3.

Significant sewer infrastructure augmentation works will be required to service the Master Plan Precincts. Gravity sewer augmentations will be required to connect the Precinct 1 high rise densification area to the existing pumping station at Dux Street. This pumping station may require an upgrade and further duplication of the existing rising main to direct the increased flows to the WWTP. Gravity sewer augmentation will also be required to cater for the increased flows from the Precinct 2 densification area. Council has plans for sewer augmentation along Morayfield road. The pipe diameters may have to be upsized to handle the increased flows. Further Sewer augmentation may also be required from Morayfield road to the WWTP at Weier Road.

The sewer augmentation works described above will convey the increased flows to the WWTP. The capacity of the WWTP may also have to be further increased. Current plant is at capacity handling 40,000EPS. The plant is currently undergoing an upgrade to handle 60,000EPS. New developments, notably the Precinct 4 are expected to consume a significant component of this upgrade. As such there will be only limited spare capacity available to cater for the Master Plan growth scenario. In the short term the WWTP with its current upgrade may be able to service the CMPAC development. However further upgrades of the WWTP will be required to service the ultimate development scenario. This will be constrained by the environmental discharge licence that is enforced by State Government. As such it is necessary to develop a comprehensive strategy to further upgrade the WWTP while conforming to DERM's requirements.

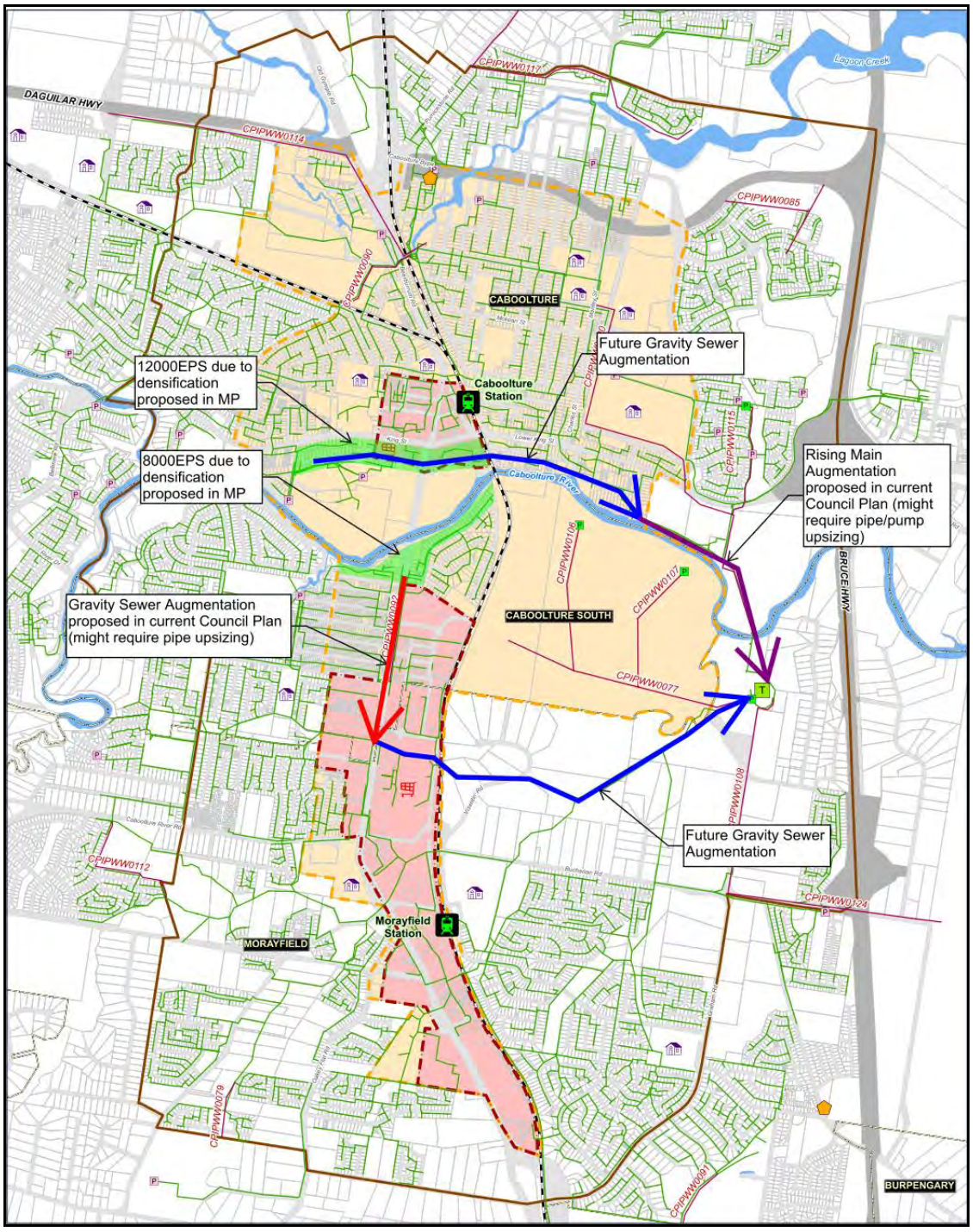


Figure 3.2 Sewer servicing strategy

3.4 Telecommunication

3.4.1 Context, opportunities and constraints

3.4.1.1 Current state analysis

The Master Plan area is well serviced by Telecommunication infrastructure. Telstra has recently completed a major project that allows for direct fibre connection in the Caboolture - Redcliffe area to Telstra's NextIP Network. Telstra's NextIP Network is monitored by the Global Operation Centre 24/7 and allows high-speed, reliable IP connectivity across Australia and internationally.

Telstra has extensive fibre routes installed in the region and plan to support rapid growth and high density developments. A map indicating fibre optic cable locations within the Master Plan area and an approximation to the level of ADSL availability is attached as Figure 1-7 in the appendix. Fibre routes are shown in yellow along Morayfield Road, Beerburrum Road, King Street, Caboolture River Road and a number of smaller roads.

3.4.1.2 Opportunities and constraints

Telstra has extensive ADSL and NextG wireless broadband coverage within the Master Plan area. As such Telstra is currently able to offer a very broad spectrum of products from telephony services, NextG wireless services through to the latest in multiple Gigabit Ethernet services. The Caboolture/Morayfield area is at the forefront of Telstra’s planning and infrastructure deployment considerations. The telecommunication service provider is expected to readily assess the needs of the development within the CMPAC at various stages and provide state of the art communication infrastructure and connections as the development progressed.

3.4.2 Principles and strategies

The development should take advantage of the availability of fibre connections and access to high-speed reliable communication infrastructure in the area. Building designs should incorporate smart networking conduits to facilitate easy access to cabling. Infrastructure corridors on the verges of internal roads should accommodate sufficient space within for cable routing.

3.5 Electricity and gas

3.5.1 Context, opportunities and constraints

3.5.1.1 Current state analysis

The Master Plan area is serviced with reticulated electricity. There should be no constraint to future expansion or alternative planning densities associated with these utility services. The existing energy infrastructure networks within the development area can be upgraded and extended to cater for future growth.

Energex, Investra (APA Group) and other service providers should be consulted in order to facilitate the installation work and any relocation due to road upgrades and realignment.

Energex has one 33/11 kV zone substation in the Master Plan area with 33 kV and 11 kV sub-transmission lines supplying the area. Figure 1.8 shows the existing electricity network for the area. Caboolture Substation (CBT) has been recently upgraded, and will be further upgraded if and when required. Energex currently has no future substations proposed within the CMPAC area. However further substations have been proposed in the greater Caboolture Morayfield area.

There is existing reticulated natural gas infrastructure south of the development area. APA group operates the gas distribution and transmission assets in the region. APA has indicated that there are plans to extend these networks in the future. This will depend on future growth and demand that might be triggered by a major consumer.

3.5.1.2 Opportunities and constraints

Energex is expected to readily assess the needs of the development within the CMPAC at various stages and upgrade existing infrastructure where required. Energex works on a system of rolling five year plans. Any new developments must be identified and included within their plan in order to be considered for funding. Energex should be given as much notice as possible of the development plans along with estimates of population yields and land use details for estimating loads and allowing for new cable installations in their capital works programme.

In order to determine the future electricity requirements the following items must be considered: street lighting, traffic management, possible new rail supplies, number and type of new buildings - housing/commercial.

As a general guide, Energex applies the following load factors:

- Homes: 3–5 kVA
- Air-conditioned commercial floor space: 120 VA per sqm
- Restaurants: 180 VA per sqm.

Although the existing sub stations in the area may be able to cater for the initial stages of development, the ultimate development may require a new zone substation with 33 kV interconnection with the other sub stations as development proceeds. The new substation will require an area of 2,000–4,000 sqm depending on capacity. It is suggested that a suitable site for a substation be determined within an industrial park or similar. It will take up to three years for a new substation to be established and up to eighteen months for installation of new 11 kV feeders.

Supply of additional quantities of gas to cater for the needs of the proposed development is not expected to pose significant issues. However OEAM will have to be consulted early to ensure the coordination of planning, design and timely delivery of the upgrade and extension of the reticulation network as well as to integrate efficiently with the installation of other services and any relocation due to road upgrades and realignment.

3.5.2 Principles and strategies

The Master Plan area is well serviced by energy infrastructure. There are no significant constraints to expand this infrastructure in order to cater for future growth. However the utility providers must be consulted early to ensure timely upgrades into the future.

Industry and political leaders, in a recent conference 'Green Cities-09', have pledged their support and commitment for the implementation of sustainable developments that incorporate green technologies. Others emphasized the importance of energy and resource efficiency in our built environment by reflecting on the theme that 'anyone who is not building a green building is building in obsolescence'. The planned development is ideally placed to take advantage of such trends and lead the way by exploring in detail and implementing strategies for integrated, sustainable and efficient utilization of energy.

Buildings should be designed to be energy efficient to reduce the demand for power. Photo-Voltaic or solar power installations should also be considered wherever possible to complement energy consumed from the power grid. Hot water installations, lighting in courtyards, car parks and internal roads are ideally suited for such applications.

Any new electricity cables should preferably be installed during the road works before the top surfaces are laid and to minimise cost and disruption. New telecoms cables can be installed in the same trenches required for new electricity cables. Close cooperation between such service providers and developers will be required to coordinate work programmes, optimize space requirements within utility corridors and facilitate access as required.

Feasibility of central energy plants may be investigated where sufficient demand exists, such as a medical precinct or an industrial precinct. Cost efficiencies are achieved by taking advantage of off peak energy utilisation and scale of economy by servicing a large number of buildings that are planned within the precincts, which can share energy needs.

4. Infrastructure Capital Works Plan

4.1 Cost estimate

The estimates have been prepared based on the Land Use Strategy and population forecasts of the CMPAC Master Plan and planning assumptions outlined in Chapter 2 of this report. The estimates provide below does not include road infrastructure upgrades and the service relocations associated with it. This will be included separately under Part 4 – Transport Plan and Capital Works Plan. The estimates provided herein have the potential to vary significantly depending on the interaction of a number of factors that may influence the development within the CMPAC. The key factors will include:

- degree of interaction between the public and private sector facilities
- the extent of infrastructure development carried out by private entities and that left to be delivered by the State/Council
- the uncertainties with regards to the treatment plant effluent discharge limitations that might require alternate strategies for managing sewage
- timing and staging of projects.

Table 4.1 Trunk infrastructure cost estimate

Item Ref.	Infrastructure component	Quantity	Unit	Rate	Total
1.1	Gravity sewer along King Street	2000	m	2,500	5,000,000
1.2	Gravity sewer along Morayfield Road	750	m	2,500	1,875,000
1.3	Sewer augmentation from Morayfield Road to WWTP	2200	m	1,500	3,300,000
1.4	Upgrade of Dux Street Pumping Station	1	No.	500,000	500,000
1.5	Rising main augmentation from Dux Street pumping station to WWTP	1300	m	1,000	1,300,000
1.6	Upgrade of WWTP by 20,000EPS	1	No.	30,000,000	30,000,000
Total Sewer Infrastructure					**41,975,000**
2.1	Recycled Water main Buchanan Road to King Street along Morayfield Road	2700	m	1,000	2,700,000
2.2	Recycled water main, King Street to Mewett Street	2200	m	1,500	3,300,000

2.3	Recycled water main spur, Church Street – Fortune Esplanade	1200	m	1,000	1,200,000
Total Recycled Water Infrastructure					**7,200,000**
3.1	Potable water pipe augmentation, Beerburrum Road to King Street	800	m	1,500	1,200,000
3.2	Potable water pipe augmentation along Morayfield Road	2000	m	1,500	3,000,000
3.3	Potable water pipe spur, Elliott Street	900	m	1,000	900,000
3.4	Potable water pipe spur, Church Street and Fortune Esplanade	1200	m	1,000	1,200,000
Total Potable Water Infrastructure					**6,300,000**
Sub Total					55,475,000
Preliminaries, Management and Margins (25%)					13,868,750
Design and Construction contingencies (25%)					13,868,750
Fees (15%)					8,321,250
Total Infrastructure Cost					**91,533,750**

4.2 Implementation strategy and Capital Works Program

The existing infrastructure will service the growth in the immediate future. However the predicted growth beyond the 5-year horizon will necessitate significant upgrades and augmentations of water, recycled water and sewer infrastructure. Critical pieces of such infrastructure are listed in Table 4.1 above. These infrastructure upgrades will be triggered at various times and respond to growth patterns in the 5–20 year time frame and beyond.

Table 4.2 below shows the forecast programme of delivery. When the CMPAC Master Plan is adopted, it is expected that the Council will review the infrastructure upgrades and delivery programme outlined herein and include the relevant upgrades in Council's future Capital Works Program and the MBRC Priority Infrastructure Plan were appropriate.

Table 4.2 Capital works programme

Item Ref.	Infrastructure component	Anticipated year of commencement of construction
1.1	Gravity sewer along King Street	2022
1.2	Gravity sewer along Morayfield Road	2015
1.3	Sewer augmentation from Morayfield Road to WWTP	2020

1.4	Upgrade of Dux Street Pumping Station	2023
1.5	Rising main augmentation from Dux Street pumping station to WWTP	2023
1.6	Upgrade of WWTP by 20,000EPS	2025
2.1	Recycled Water main Buchanan Rd to King Street along Morayfield Road	2015
2.2	Recycled water main, King Street to Mewett Street	2016
2.3	Recycled water main spur, Church Street – Fortune Esplanade	2020
3.1	Potable water pipe augmentation, Beerburrum Road to King Street	2022
3.2	Potable water pipe augmentation along Morayfield Road	2023
3.3	Potable water pipe spur, Elliott Street	2024
3.4	Potable water pipe spur, Church Street and Fortune Esplanade	2025

Funding Strategy

The Moreton Bay Regional Roadmap (August 2010) developed by Regional Development Australia Moreton Bay Inc (RDA) identifies MBRC as one of the fastest growing regions in South East Queensland with a forecast increase in population of 250,000 by 2031. The roadmap calls for significant increase in infrastructure to match the growth.

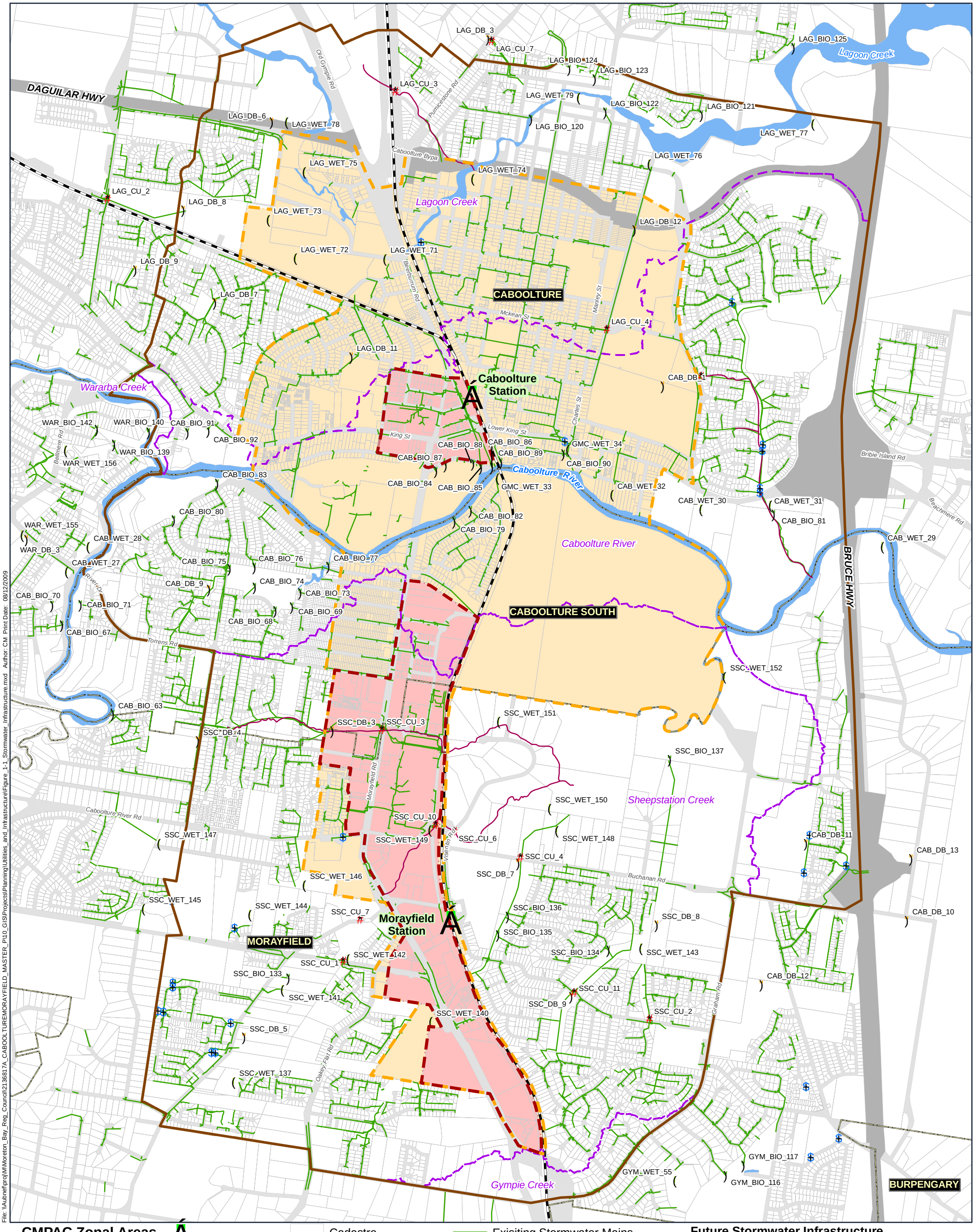
The regional roadmap also acknowledges that the investment in infrastructure in the past has only attracted a small percentage (3%) of the regional investment in infrastructure (SEQIP) and, not matched the pattern of growth. The RDA also identifies the CMPAC as one of the major projects and recommends the implementation of the Master Plan.

The infrastructure upgrades in general will be delivered through the Council's Capital Works Program and will be funded by infrastructure contributions from developments and council's general revenue.

Appendix A

Supporting figures

Caboolture Morayfield Principal Activity Centre | **Figure 1-1**



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CMPAC Zonal Areas
- Subcore Areas
- Core Area
- Frame Area

- Railway Station
- Railway
- Localities

- Cadastre
- Waterways
- Waterway Catchments
- Road Reserves

- Exisiting Stormwater Mains
- Existing Improvement Device (SQID)
- Future Stormwater Channel

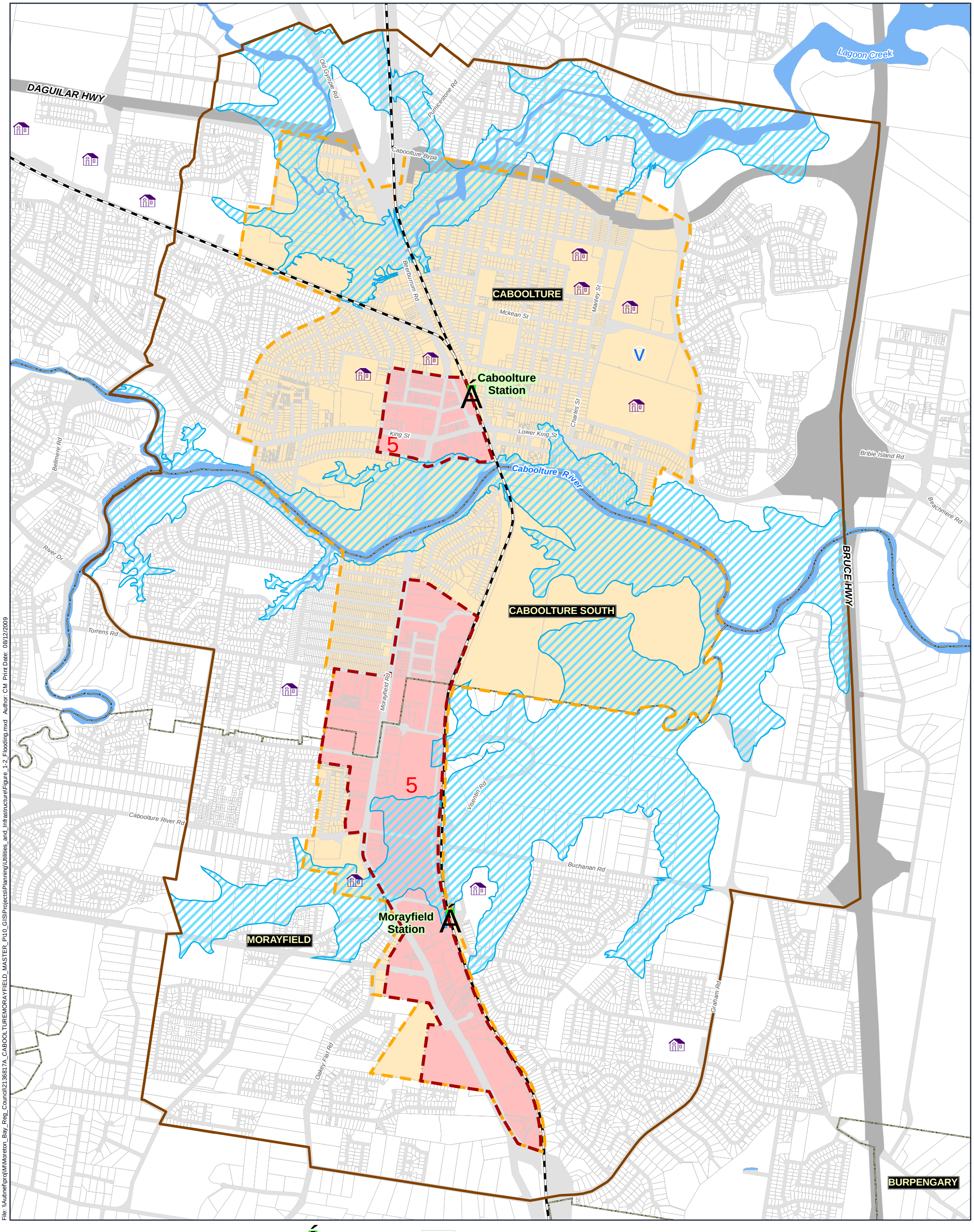
Future Stormwater Infrastructure
- Bioretention Basin
- Crossing Upgrade
- Detention Basin
- Wetland

Source: Moreton Bay Regional Council, 2009
StreetPro, Version 2008. 10, Pitney Bowes Software, 2008
Digital Cadastral Data Base, Department of Natural Resources and Mines, 2009

0 200 400 600 800 1,000
Metres

Stormwater drainage infrastructure

PARSONS BRINCKERHOFF


DAGUILAR HWY
Old Gympie Rd
Pumicestone Rd
Caboolture Bypa
Lagoon Creek
CABOOLTURE
Mckean St
Manley St
Beerburrum Rd
Caboolture Station
King St
Lower King St
Charles St
Bribie Island Rd
Caboolture River
Bellmere Rd
River Dr
Beachmere Rd
BRUCE HWY
CABOOLTURE SOUTH
Torrens Rd
Morayfield Rd
Caboolture River Rd
Visentin Rd
Buchanan Rd
Morayfield Station
MORAYFIELD
Graham Rd
Oakey Flat Rd
BURPENGARY
5
5
V
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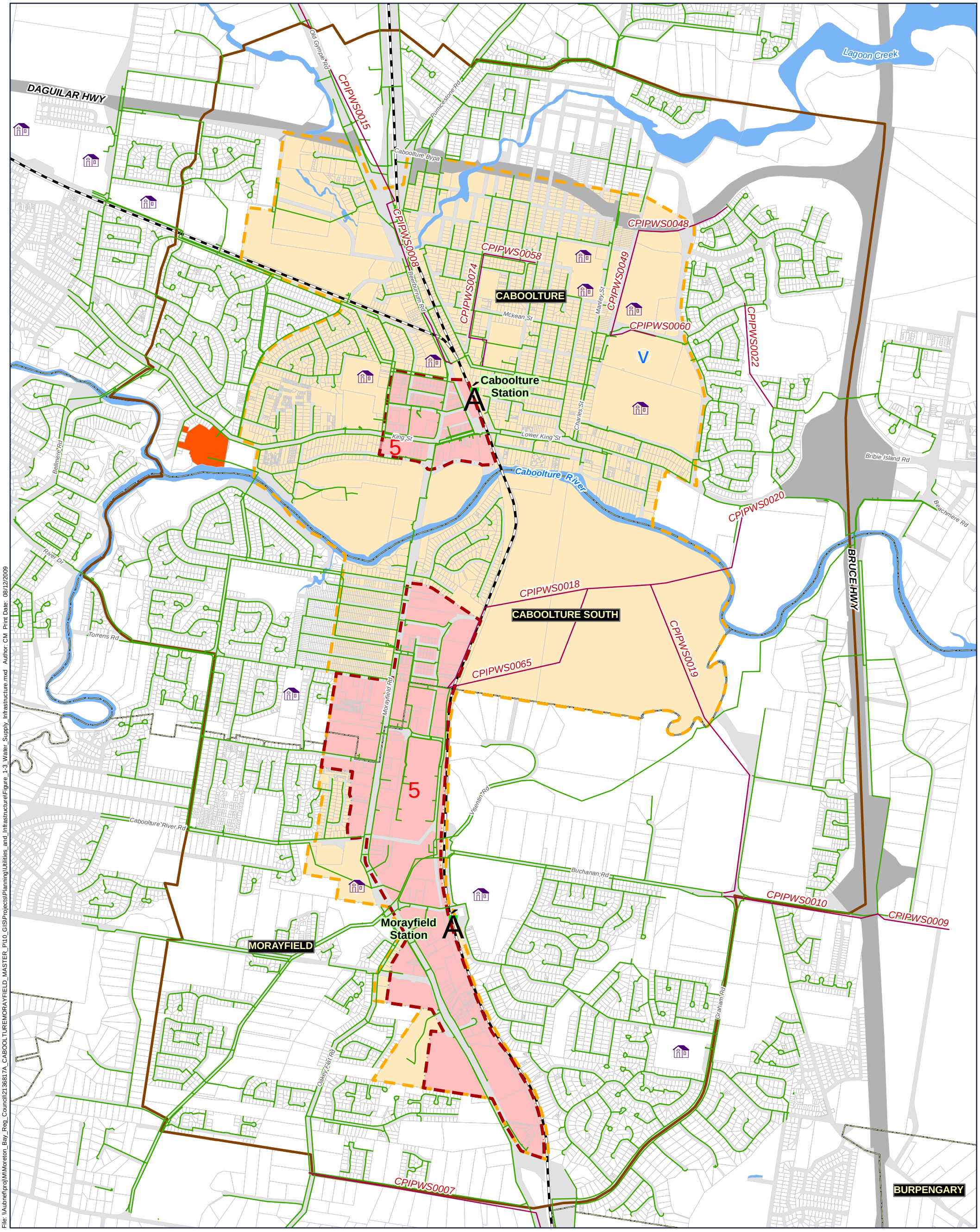
CMPAC Zonal Areas
Subcore Areas
Core Area
Frame Area
Hospital
School
Shopping Centre
Railway Station
Railway
Localities
Cadastre
Waterways
Road Reserves
Indicative 100 Year Flood Event
Source: Moreton Bay Regional Council, 2009
StreetPro, Version 2008. 10, Pitney Bowes Software, 2008
Digital Cadastral Data Base, Department of Natural Resources and Mines, 2009
Z
0 200 400 600 800 1,000
Metres
Flooding
PARSONS BRINCKERHOFF

Caboolture Morayfield Principal Activity Centre | **Figure 1-3**



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CMPAC Zonal Areas
- Subcore Areas
- Core Area
- Frame Area

- V Hospital
- School
- 5 Shopping Centre
- Á Railway Station
- Railway
- Localities
- Cadastre
- Waterways
- Road Reserves
- Water Treatment Plant
- Existing Water Mains
- Future Water Mains

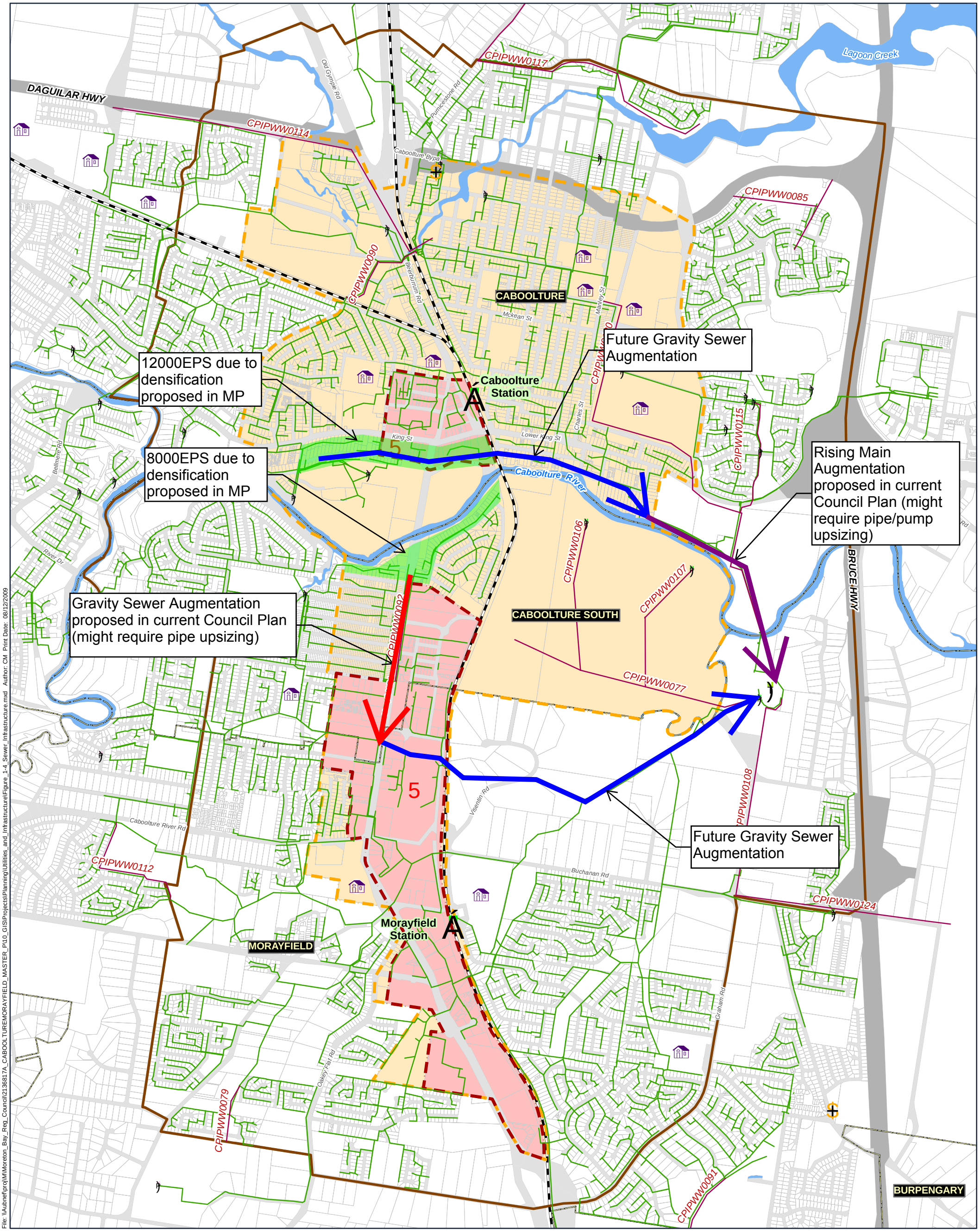
Source: Moreton Bay Regional Council, 2009
StreetPro, Version 2008. 10, Pitney Bowes Software, 2008
Digital Cadastral Data Base, Department of Natural Resources and Mines, 2009

N

0 200 400 600 800 1,000
Metres

Water supply infrastructure

PARSONS BRINCKERHOFF


DAGUILAR HWY
CPIPWW0114
CPIPWW0117
Lagoon Creek
Old Gympie Rd
Pumicestone Rd
Caboolture Bypass
CPIPWW0085
CPIPWW0090
Beerburrum Rd
CABOOLTURE
Mckean St
Manley St
Future Gravity Sewer Augmentation
12000EPS due to densification proposed in MP
Caboolture Station
King St
Lower King St
Charles St
CPIPWW0115
8000EPS due to densification proposed in MP
Caboolture River
Rising Main Augmentation proposed in current Council Plan (might require pipe/pump upsizing)
Bellmere Rd
River Dr
CPIPWW0106
CPIPWW0107
BRUCE HWY
Gravity Sewer Augmentation proposed in current Council Plan (might require pipe upsizing)
CPIPWW0092
CABOOLTURE SOUTH
CPIPWW0077
CPIPWW0108
Visentin Rd
Caboolture River Rd
CPIPWW0112
Future Gravity Sewer Augmentation
Buchanan Rd
CPIPWW0124
Morayfield Station
MORAYFIELD
Graham Rd
Oakey Flat Rd
CPIPWW0079
CPIPWW0091
BURPENGARY
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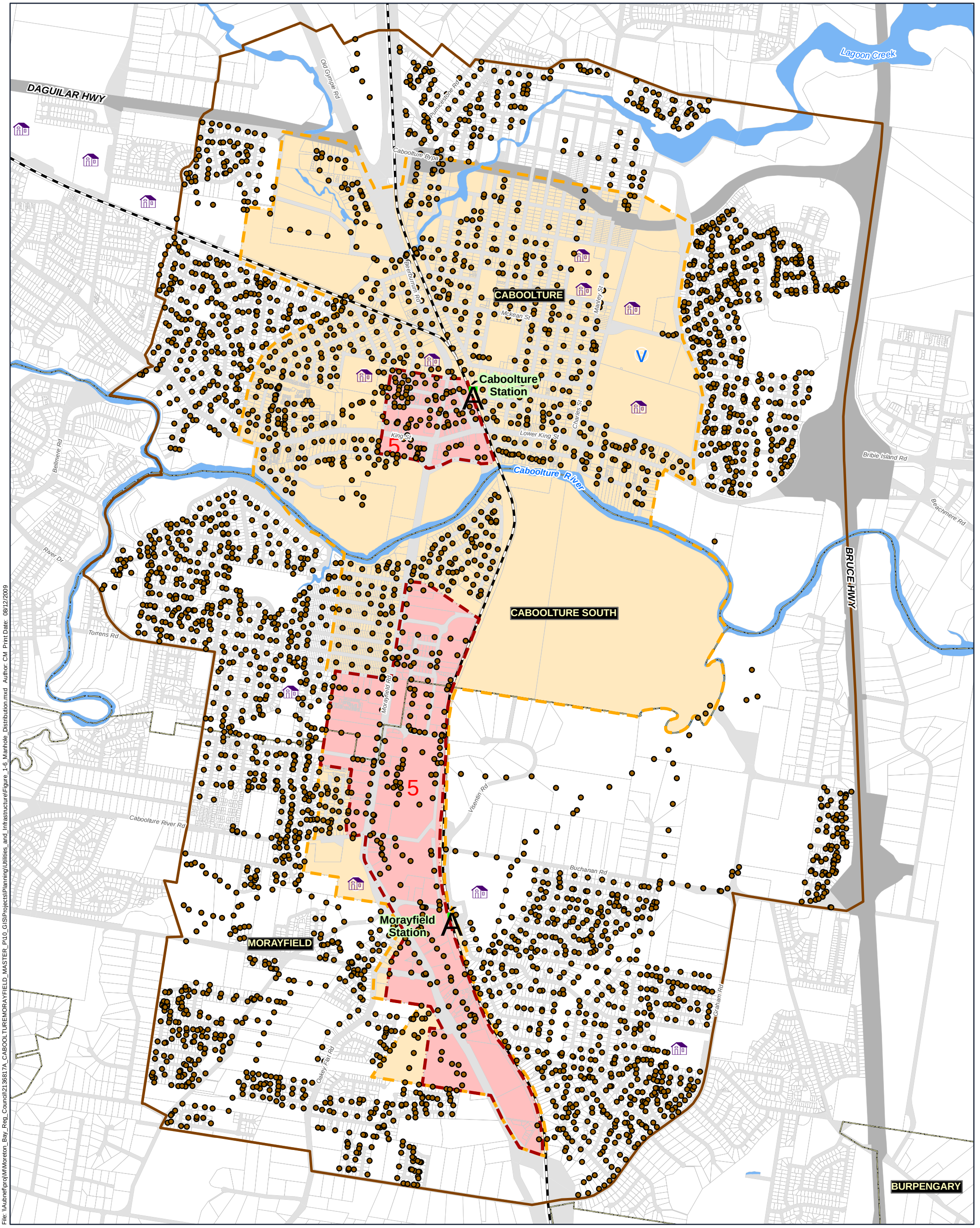
CMPAC Zonal Areas
Subcore Areas
Core Area
Frame Area
Hospital
School
Shopping Centre
Railway Station
Railway
Localities
Cadastre
Waterways
Road Reserves
Existing Sewer Mains
Future Sewer Mains
Sewer Treatment Plant
Sewer Holding Tank
Sewer Pump
Existing Pump
Future Pump
Source: Moreton Bay Regional Council, 2009
StreetPro, Version 2008. 10, Pitney Bowes Software, 2008
Digital Cadastral Data Base, Department of Natural Resources and Mines, 2009
N
0 200 400 600 800 1,000
Metres
Sewer infrastructure
PARSONS BRINCKERHOFF

Caboolture Morayfield Principal Activity Centre

Figure 1-5



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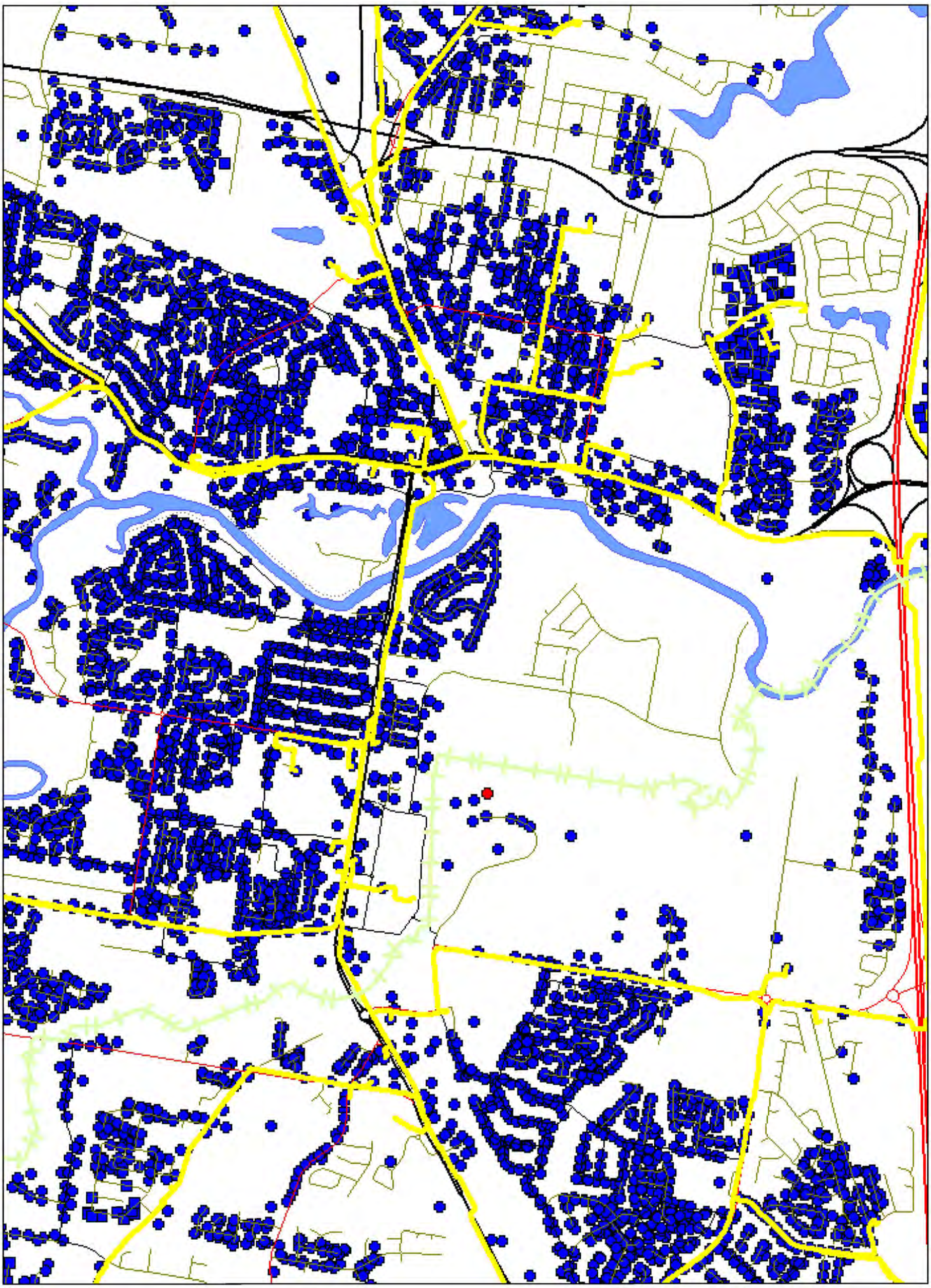

Source: Moreton Bay Regional Council, 2009

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0 200 400 600 800 1,000

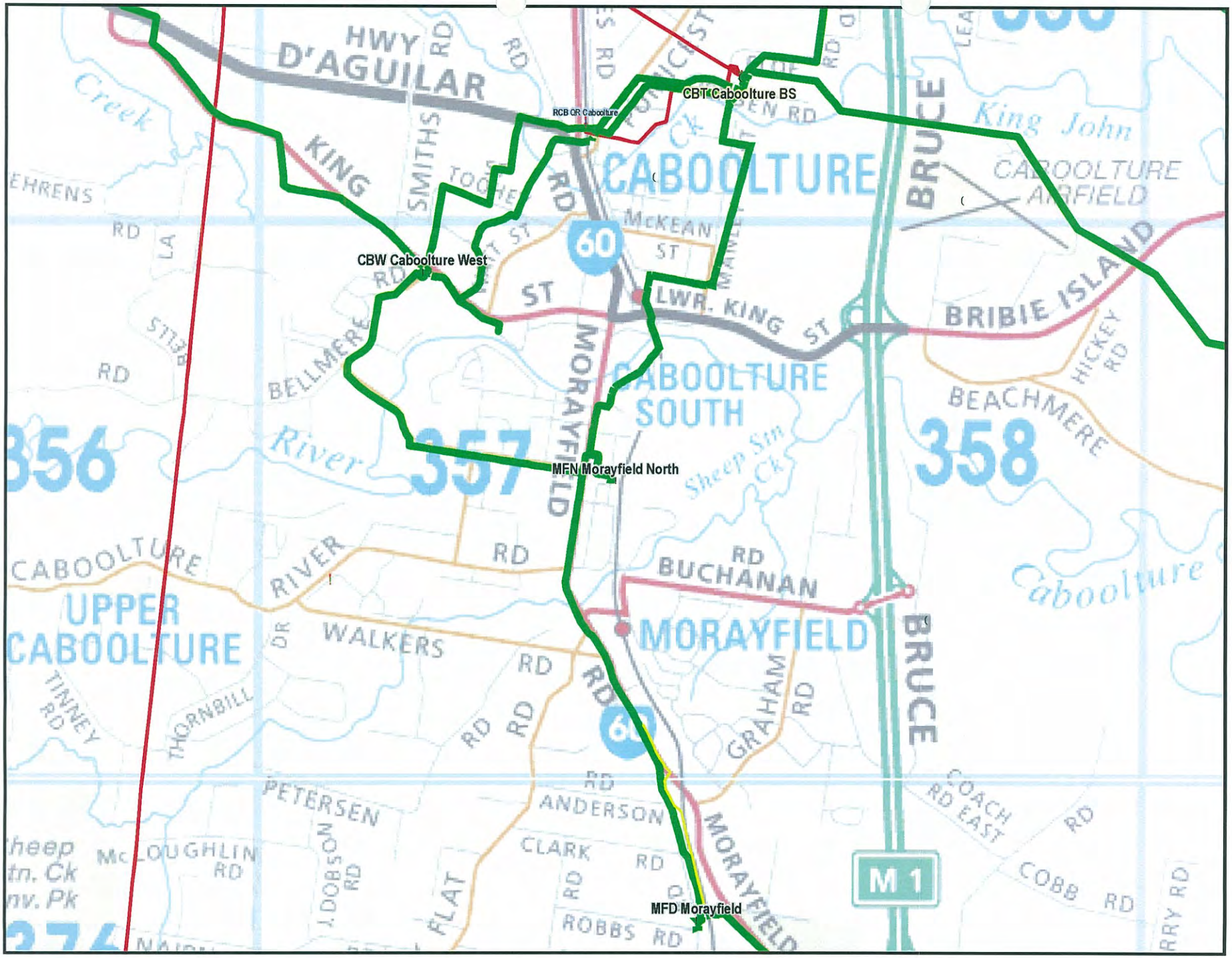
Metres

Optic cable locations

PARSONS BRINCKERHOFF

File: \\Aubnet\proj\MMoreton_Bay_Reg_Council\2136817A_CABOOLTUREMORAYFIELD_MASTER_P10_GIS\Projects\Planning\Utilities_and_Infrastructure\Figure_1-7_Optic_Cable_Locations.mxd Author: CM Print Date: 08/12/2009

Existing Electricity Network - Caboolture/Morayfield Area



Legend

Substations_DPlanData

Description, Status, SourceType

- Existing 33/11 Zone
- Existing 110(132)/11 Zone
- Existing MV Customer
- Existing HV Customer
- Existing Switching Station
- Existing Bulk Supply
- Existing Transmission
- Future 33/11 Zone
- Future 110(132)/11 Zone
- Future MV Customer
- Future HV Customer
- Future Switching Station
- Future Bulk Supply
- Powerlink Existing
- Powerlink Proposed

EGX 33 Energised at 11kV

Construction

- 33kV OH
- 33kV UG

EGX 33 kV

Construction

- 33kV OH
- 33kV UG

EGX 110kV

Construction

- 110kV OH
- 110kV UG

This map has been prepared for in-house use to show the ENERGEX network augmentations proposed by the current Network Strategic Plan. Placement of network augmentations does not indicate that the project is approved or committed.

Date: 01-Oct-2008
Name: ja010

Transverse Mercator Projection
AGD84 (AMG Zone 56)

1:32,000

0 250 500 1,000
Meters

energex
positive energy