PSP 1094

Quarry Hills

Precinct Structure Plan Background Report



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Level 25, 35 Collins Street Melbourne Victoria 3000

Telephone: 03 9651 9600 Facsimile: 03 9651 9623



1. Metropolitan & regional context

The metropolitan/regional context for the Precinct is shown in Plan 1.

1.1. North Growth Corridor Plan

The Quarry Hills precinct area is located within the City of Whittlesea and situated within Melbourne's Northern Growth Corridor. The precinct was identified suitable for residential land use within the *Growth Corridor Plans*.

The precinct is generally well located in the metropolitan context, situated only 25 kilometres from the CBD to the south, with access to major metropolitan road infrastructure, including the Hume Freeway and Metropolitan Ring Road.

The City of Whittlesea is experiencing rapid population growth associated with growth area development in its north in South Morang, Mernda, Doreen, Epping and Wollert and urban renewal in its southern established suburbs of Epping, Bundoora, Lalor and Thomastown. Development capacity in Whittlesea's existing growth areas corridor is forecast to be exhausted over the next five to ten years. As a result, further urban growth in Whittlesea will be concentrated in Wollert, Donnybrook and Woodstock.

The eastern most boundary of the precinct area makes up the western extent of the Quarry Hills Regional Parkland. An extension to the existing Quarry Hills Regional Park will be facilitated along the western boundary of the precinct area as a result of development on this site. Section 173 agreements have been signed by all of the landowners in the precinct to transfer parcels of land outside the new Urban Growth Boundary to Council to enable the rezoning and potential development of parcels within the Urban Growth Boundary.

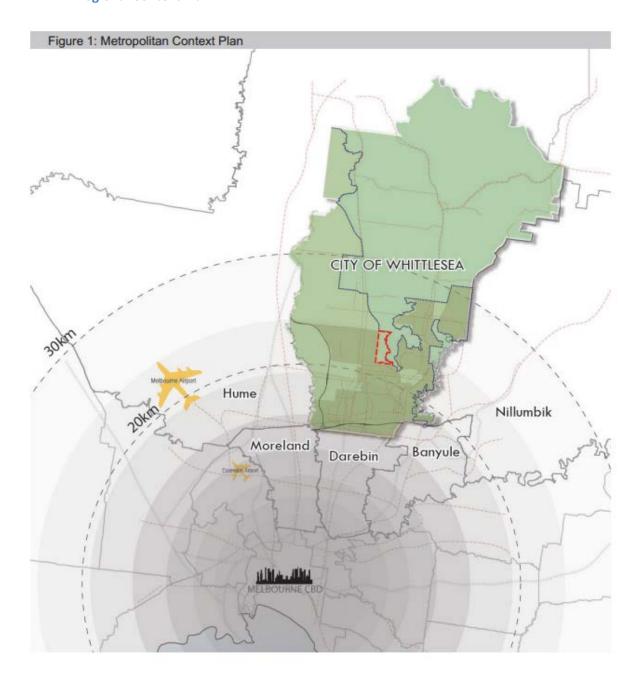
A potential future major park entry node has been identified immediately north of the precinct, as well secondary nodes linking to high points and established viewing platforms to the east of the precinct.

1.2. Surrounding Precincts

Within adjoining developments, a range of activity centres which include community facilities, have been planned. The most convenient of these will be located within both the Aurora and Lyndarum Town Centres to the west of the subject area. Active Open Space areas are also planned for each of these development areas and will be accessed by the future Quarry Hills community via Harvest Home Road and Lehmanns Road.



PLAN 1 – Regional Context Plan

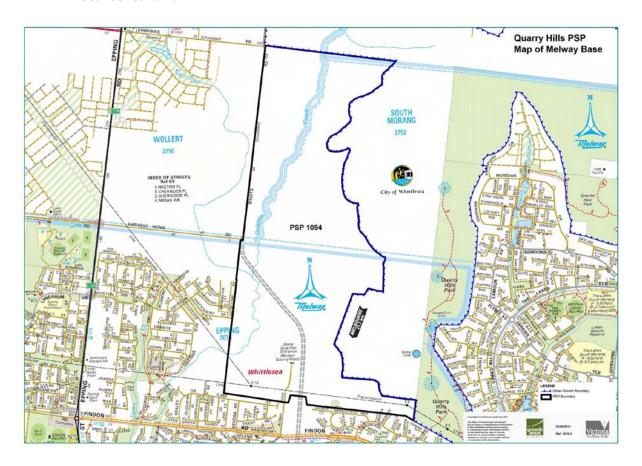




2. Local context

The local context for the Precinct is shown in Plan 2.

PLAN 2 - Local Context Plan





2.1. Local context

Current Land Uses

The Quarry Hills Precinct Structure Plan (PSP) (1094) is 278.62 hectares and is bounded by the proposed E6 freeway, the rear of properties on Ilani Street, Lauren Court and Dransfield Way, the proposed Quarry Hills regional park and an easterly extension of Lehmanns Road (both of which form the new Urban Growth Boundary). It lies immediately east of the Harvest Home and Epping North East structure plan areas.

Land use within the Quarry Hills precinct area is largely rural living in nature, with many of the sites containing residential dwellings, a range of farm buildings and associated stock infrastructure/storage vards.

The E6 corridor forms the western boundary for the majority of the precinct area. The potential impact of the E6 corridor on local movements has been mitigated by identifying crossing points for traffic, cycle and pedestrian movements.

The Darebin Creek traverses the precinct through its western boundary, generally in a north-south direction and contains habitat for the Growling Grass Frog and sites of cultural heritage significance.

Opportunities for the precinct to have strong links to the Quarry Hills Regional Parkland, to the east of the precinct, have been maximised through the use of pedestrian and bicycle paths which provide for clear and logical entry points into the parkland and from the broader parkland into the precinct structure plan area.

It is noted that Council has approved the Quarry Hills Bushland Park Masterplan which identifies a range of walking tracks, entry nodes and look out points.

A portion of the south-eastern extent of the precinct contains an existing quarry operated by Boral and is currently utilised for the extraction of Hornsfels (which requires blasting), processing plant and concrete batching plant. Boral supports residential development at the periphery of the current extent of the quarry, however it is acknowledged that the transition from a quarry to residential development will need to be carefully staged. Any new residential development will need to be protected from amenity impacts associated with the quarry; as such development within 500 metres of the Works Authority Extractive Works Area will need to be referred to the Department of State Development, Business and Innovation. The geotechnical reformation of the land to be redeveloped for residential uses will also need to be carefully planned to ensure that the landforms are rehabilitated to support the nominated land use.

Topography and landform

The Quarry Hills precinct area is unique in that it maintains a highly undulating landform which reaches its ultimate steepness along the most eastern extent of the site. The rest of the land, is characterised by a varying level of undulation and indentations associated with the Darebin Creek environs (towards the western boundary).



History

In terms of Aboriginal Cultural Heritage it is known that the Quarry Hills themselves were a highly utilised north-south movement corridor and within the parkland boundary many artefacts have been found.

Within the precinct area, it is noted that the banks for the Darebin Creek are thought to have been utilised for hunting and gathering purposes as evidenced within the Ecology and Heritage Partner's study commissioned for the Quarry Hills PSP (July 2012) discussed later in this paper.

The Quarry Hills precinct area has, in its more recent history been utilised for farming, agricultural and quarrying purposes. It is noted that the sites to the north of the Boral Quarry have likely been ploughed over the years for agricultural purposes and that low numbers of stock have been raised on several sites in the past for the purpose of dairy operations and cattle sales.

Notably, there are two 19th Century cobblestone buildings, which are located within the PSP area and these have been previously identified in the Whittlesea Heritage Study by Gould, 1991.

Surrounding neighbourhoods

The Quarry Hill Precinct adjoins the developing suburbs of Epping North to the west, established parts of Epping to the south and the Quarry Hills Regional Park to the east. The developing suburbs of South Morang and Mernda sit east and north-east of the precinct but are separated by the Quarry Hills Regional Park interest area

Transport and movement

The proposed E6 Transport Corridor forms the majority of the western boundary of the Quarry Hills Precinct and traverses the south-west part of the precinct. The proposed E6 is a long term proposition with construction unlikely to commence in the next 15-20 years.

Other major road related transport infrastructure relevant to the Quarry Hills precinct includes the following:

- Craigieburn Bypass, which can be accessed from Quarry Hills via Craigieburn East Road (a second interchange is planned in the future via Findon Road. The Craigieburn Bypass enable travel southwards to the Metropolitan Ring Road and thereafter to Melbourne's northern freeway network (City Link, Hume Freeway, Calder Freeway) and to existing and future employment nodes in Epping, Somerton, Donnybrook and Beveridge
- Harvest Home Road will likely form the primary access point to the Quarry Hills Precinct area and provide connections to the surrounding road network.
- Lehmanns Road will provide access to the northern parts of the Quarry Hills PSP.
- Findon Road will ultimately provide a connection between the Craigieburn Bypass and Gorge Road.

Public Transport



Rail transport is currently provided at Epping and South Morang. A high capacity public transport corridor has been protected as part of the planning for the Epping North Growth Corridor. This corridor provides for a potential spur line to branch off the South Morang rain line between Lalor station and Epping Station and extend to Wollert Major Town Centre. Timing of the development of this transport link is uncertain although it will provide an alternative source of public transport services for Quarry Hills residents. It is noted that the recently approved Northern Growth Corridor Plan earmarks this link as part of the higher capacity public transport network and promotes the initial development of Bus Rapid Transit services along this route.

Local bus services will be ultimately be available to Quarry Hills residents via the internal and surrounding road network.

Town centres and Employment

Town Centres

Quarry Hills is well located with respect to access to higher order town centres in the surrounding region, including the existing Epping Principal Activity Centre and South Morang Activity Centre. Planned higher order centres at Wollert and Aurora will be accessible via the surrounding road and bus network.

The Lyndarum Neighbourhood Activity Centre, located approximately 2km (by road) to the west of Quarry Hills PSP, is the closest neighbourhood centre anchored by a supermarket (Essential Economics, 2012). Other planned neighbourhood activity centres planned in the Epping North Growth Corridor are at Aurora on Edgars Road and in Wollert on Epping Road.

The proposed E6 corridor will present a barrier to the extent to which activity centres in surrounding neighbourhoods can be can be accessed by the future residents of the Quarry Hills Precinct area and that has informed the consideration of the size and viability of the proposed centre within the PSP.

Employment

A number of key employment areas are located in the northern region of Melbourne with further tracts of employment land identified in the *Northern Growth Corridor Plan*).

The major existing employment land locations in the region (other than the abovementioned activity centres) currently include employment estates in Epping, Somerton, Thomastown and Campbellfield.

As these industrial estates are now approaching capacity, new areas of employment land have been designated further to the north at Kalkallo, Mickleham, Beveridge, Donnybrook, Wollert and Merrifield. Land along Cooper Street between the Craigieburn Bypass and Merri Creek (Cooper Street West) is identified for energy-related development and may in the future be developed for industrial purposes.



The Northern Growth Corridor will be a key area in which the future employment and industrial requirements of metropolitan Melbourne will be located. It is noted that there are several existing and proposed industrial/employment nodes located within relatively close proximity of the PSP area including the Melbourne Wholesale Markets, which are currently under development, the Northpoint Employment Park and the proposed future Intermodal Freight Facility within Beveridge to the north of the PSP area.

On this basis, it is envisaged that future residents of Quarry Hills will have access to a range of employment opportunities in the surrounding region both in town centres and in purpose built employment parks.

Open Space

The Quarry Hills PSP area is a unique development proposed at the foothills of the Quarry Hills Regional Parkland. The total potential future footprint of the parkland will be in excess of 1100 hectares (currently approximately 450 hectares).

Landowners within Quarry Hills ultimately will facilitate the transfer of approximately 180 hectares of land into the park. This will be easily accessible for residents and visitors to the area. A range of passive and active recreation opportunities are currently being investigated by the City of Whittlesea, but it is likely that these will include pursuits such as walking, jogging, bike riding, etc, along with picnic areas, viewing platforms and information signage relating to the historical and environmental aspects of the region.

Additionally, the Darebin Creek dissects the Quarry Hills Precinct along its western boundary and it is considered that the PSP will provide for walking and cycling trails alongside this important creekline.

Given the topography and projected population for this area, it will be difficult to provide for significant formal active open space facilities. Opportunities for higher order soccer, football and netball facilities can be found within neighbouring developments to west and north west of the subject sites.

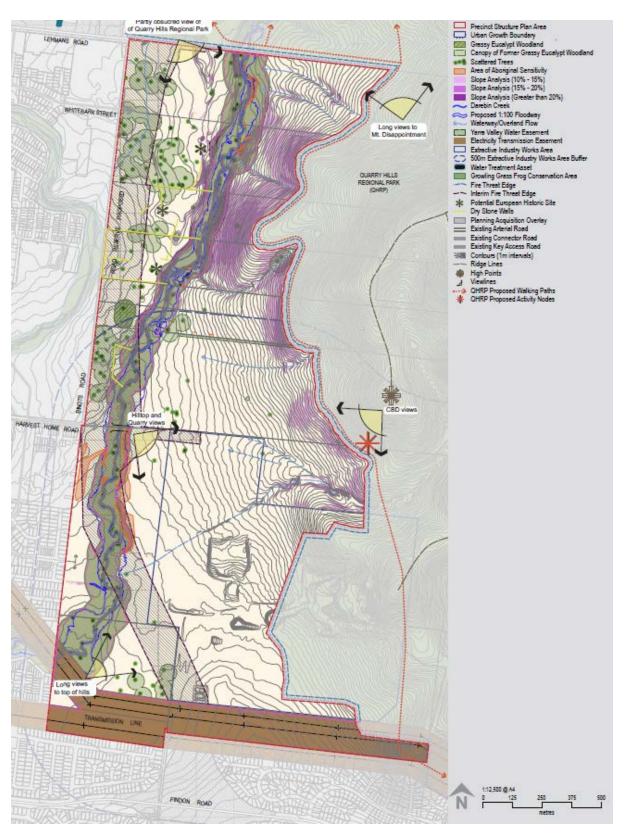
Community facilities

A range of existing and planned community facilities will be located within reasonably close proximity of the Quarry Hills Precinct within the neighbouring Lyndarum and Aurora estates. It is noted that as the site is quite constrained by the level of population it can maintain, it will predominantly rely upon surrounding high order services to the supplement the community facilities which be developed in the precinct area.



3. Precinct Features

The features of the Precinct are illustrated in Plan 3.





The major precinct features of the Quarry Hills PSP are as follows:

- Only six land owners are represented in the Quarry Hills PSP.
- The precinct will maintain excellent access to local and regional open space opportunities as
 it will be connected to the Quarry Hills Regional Parkland and is dissected through its
 western boundary by the Darebin Creek. Both spaces will provide for a broad range of
 recreation opportunities.
- A range of historical attributes and features are located across the precinct and into the adjoining Quarry Hills Regional Parkland.
- The PSP is located at the northern edge of the Epping Road growth corridor and adjoins
 existing urban areas of Epping, in the south, making access to utilities and services relatively
 simple.
- Adjoins the developing areas of Epping North and Harvest Home Road with several estates currently being developed to the west of the subject area.
- A large Hornsfels quarry is currently located within the PSP boundary. The site includes a quarry processing plan, a concrete batching plant and associated ancillary plant, equipment, works and buildings. The quarry features blasting to remove the rock (hornfel) and is a major stone and rock resource within the northern corridor. Once operation of the site has ceased and has been rehabilitated, sections on the periphery of the current quarry hole itself will be suitable for some development, however, the quarry hole itself will be handed over to Council as per the existing section 173 agreement and any remediation requirements required by DEDJTR for open space and recreation use. Creative reuse and re-design options are currently being investigated by Council as part of the Quarry Hills Regional Parkland Master Plan.
- Topography of the Quarry Hills PSP will allow for city and rural views. Quarry Hills PSP is unusual in a growth area planning context for northern Melbourne, as the topography is undulating (not flat like other nearby growth areas) and provides opportunities for rural and city views (Essential Economics, 2012).
- In terms of physical constraints, the southern boundary of the PSP is formed by a transmission easement, while the proposed E6 makes up the majority of the western boundary of the precinct. Both of these present significant connectivity and movement constraints, along with reducing the developable area of the precinct.
- As noted above the site is traversed by the proposed E6 corridor which will provide for access opportunities into the broader road network of metropolitan Melbourne, but conversely, it will restrict the level of traffic and pedestrian movement into neighbouring developments to the west of the PSP area.
- Local connections within and into the Quarry Hills PSP area will be limited for a range of
 reasons including the proposed E6 alignment, existing developments to the south of the PSP
 area and the location of the Darebin Creek. It is likely the primary access to the area is from
 an extension of Harvest Home Road in an easterly direction across the planned E6, Findon
 Road to the south and Lehmanns Road to the north. Whitebark Street and another local
 access road have been identified to ensure connectivity with the precincts to the west.



In order to fully understand the opportunities and constraints of the Quarry Hills PSP area, Council, along with the Metropolitan Planning Authority, have commissioned a series of background technical documents. Each of these site features and constraints have been thoroughly investigated through technical reporting and site assessments and will be discussed within the following sections of this report.

3.1. Lot size and ownership pattern

Lot size and ownership pattern

Lot sizes within the precinct are relatively large and rural in nature. Lot sizes range from approximately 24 hectares to 179 hectares (Boral Quarry site).

The PSP area has a largely consistent land ownership pattern, with 11 lots owned by a total of 6 landowners. There is potential for the northern most properties to be sold collectively to one purchaser. Until that time it is noted that:

- 150-152 Bindts Road, Wollert and 130 Bindts Road Wollert remain in single ownership;
- 100 Bindts Road, Wollert and 90 Bindts Road, Wollert remain in single ownership;
- 40 Bindts Road, Wollert and 60 Bindts Road, Wollert remain in single ownership;
- 10a Bindts Road, Wollert remains in single ownership;
- 10b and 10c Bindts Road Wollert remain in single ownership; and
- 26 Ilani Street, Epping remains in single ownership

3.2. Heritage

3.2.1 Aboriginal heritage

Ecology and Heritage Partners undertook an assessment on behalf of the MPA to provide a preliminary assessment of the Aboriginal and post-contact heritage values within the Quarry Hills precinct area. The consultants undertook a desk top and field based archaeological survey in order to identify heritage places and areas of archaeological sensitivity.

The following activities were undertaking in the preparation of the cultural heritage assessment:

- A review of the relevant heritage databases (e.g. Victorian Aboriginal Heritage Register [VAHR] at Aboriginal Affairs Victoria [AAV], Local Government Heritage Overlays, Heritage Victoria [HV] Inventory and Register, National Trust) and other relevant available literature;
- A brief review of the land use of the activity area to determine the likely archaeological value that may be found;
- An assessment of any implications of Commonwealth and State environmental legislation and Government policy associated with the proposed development;
- A discussion of any opportunities and constraints associated with the activity area; and
- An archaeological survey in order to identify Aboriginal and historical cultural heritage places and areas of archaeological sensitivity.

The cultural heritage assessment is preliminary at this stage although detailed consultation with key Aboriginal stakeholders has taken place via project meetings and an archaeological ground survey of the activity area has been completed. The assessment can be used as the desktop and standard



assessment components of a complex Cultural Heritage Management Plan. This will minimise the time and cost to landowners in the future.

Twenty two (22) Aboriginal archaeological sites were recorded during the field assessment. Eleven of these sites are stone artefact scatters; the remaining eleven sites being isolated artefacts.

Key Recommendations and Findings

The assessment recommended that a 'complex assessment' as part of a Cultural Heritage Management Plan (CHMP) be undertaken which includes an archaeological subsurface testing program to establish the nature, extent and significance of all Aboriginal cultural heritage in the activity area (in accordance with r.60 and r.61 of the Aboriginal Heritage Regulations 2007). This must include consultation with the relevant Aboriginal stakeholders, AAV, Sponsor and cultural heritage advisor to agree on an appropriate sampling methodology suitable to the subsurface testing of Aboriginal cultural heritage within the activity area. The complex assessment will focus within the areas of cultural heritage sensitivity, Aboriginal archaeological likelihood and the primary aims will be to:

- Establish the presence of any subsurface Aboriginal archaeological deposits;
- Define the nature, extent and significance of any subsurface Aboriginal archaeological deposits; and
- Determine the nature and condition of any stratigraphy.

The assessment recommended that a methodology to sample the areas of sensitivity will be to excavate a series of representative test pits (e.g. 1m x 1m test pits and / or 50cm x 50cm shovel test pits) removing sediments with horizontal control in excavation units (spits) of either 50mm or 100mm (or following the natural stratigraphy where present) by using accepted stratigraphic methods and standard hand-held tools such as: trowel, spade / shovel, hand pick / mattock, sieve and brus/ pan (Ecology and Heritage Partners, August 2012).

Further details regarding the artefacts that were uncovered and the areas that have been identified as significant are expanded upon in the Aboriginal and Historical Heritage Assessment – Ecology and Heritage Partners, August 2012.

3.2.2 European (post-contact) heritage

Along with previous municipal wide heritage study commissioned by the City of Whittlesea, Gould (1990), Bell (2005) and the more recent peer review and update by Context (2011), **Ecology and Heritage Partners** were commissioned to also consider the existing European heritage which is located within the Quarry Hills PSP area.

Preliminary Key Findings and Recommendations-

Properties which have been previously identified as holding local significance have been found at 90 and 100 Bindts Road, Wollert. The property has been identified as Ewert Farmhouse and is considered to be historically and aesthetically significant to the City of Whittlesea.



The bluestone dwelling, dairy and remnant dry stone walls would have been part of a broader farm complex and are considered to be in relatively good condition. It is noted that both of these properties were previously identified within the Heritage Study undertaken by Bell, 2005.

Further, it was found that:

- the bluestone house and dairy (90 Bindts Road) has some aesthetic value, although the house has been fully renovated and will not be listed on the Heritage Inventory. Both structures have considerable social value as they formed part of a larger farming complex in a more extensive farming community (Bell 2005: 21-22, 24); and
- The Bluestone House and Stables (100 Bindts Road) were not investigated or recorded during the assessment due to time constraints; however, their location and the need for further assessment was duly noted (Bell 2005: 22). In terms of recommendations, it noted that further research work is to be undertaken for these sites with the Bell document.

The specific recommendation for 90 and 100 Bindts Road structures (Bell 2005: 30) requires that these structures be fully researched, documented and recorded be placed on the Heritage Overlay and to assess the likelihood of historical archaeological deposits; if this is the case then these structures should be placed on the Heritage Inventory.

3.3. Land contamination

Cardno Lane Piper conducted a preliminary environmental site assessment regarding the contamination status of the Quarry Hills PSP area and the degree of further assessment potentially required to assess the suitability of the study area for its intended use.

A review of the site history and observations made during site inspections have identified a number of potential sources of contamination. The sites can be summarised as having the following associated uses:

- Historical or current potential for chemical storage
- Filling/Waste area
- Stockyards
- Grazing and Farming
- Quarry

Four properties are ranked as having a *High potential* for contamination. Land use activities which contribute to this assessment include quarrying and stockyards, both of which are ranked as High under the DSE risk ranking scheme for potential contamination. These properties may require an environmental audit to be applied if the land is redeveloped for sensitive uses.

Five properties where past and current land use has included filling, market gardens, fuel storage or an industrial activity are ranked as possessing a *Medium potential* for contamination. These properties will require an Environmental Site Assessment (DSE Assessment Level B) if the land is redeveloped for sensitive use.

For the remaining properties the site conditions and infrastructure have a low potential for contamination and are unlikely to require further assessment.



The table below highlights the recommended actions for the areas identified as High and Medium:

Land Parcel Identifier (Title Number)	Property Address	Current or Historic Potentially Contaminating Activity	DSE Risk Rank	Recommended Actions (subject to finalisation of proposed land use)
10A/TP372528	10A Bindts Rd	stockyard (cattle), workshop, AST	High	Site inspection, removal of AST and debris, limited soil investigation
2/PS645734 TP890376	10B and 10C Bindts Rd	quarrying, earth removal, fill	High	Site inspection, environmental assessment after closure of quarry
TP858238	150-152 Bindts Rd	workshop, fill material, waste disposal, fuel use, chemical use	High	Limited soil investigation
1/TP113170	60 Bindts Rd	workshop	Medium	Site inspection
TP843630	100 Bindts Rd	workshop for horse training	Medium	Site inspection
TP372528	130 Bindts Rd	fill material, storage of demolition debris, fuel use, chemical use	Medium	Removal of waste and soil assessment
2/TP113170	40 Bindts Rd	workshop, fuel use	Medium	Site inspection
1/PS528408	90 Bindts Rd	market garden, workshop, fuel use	Medium	Site inspection

3.4. Topography & drainage

CPG (now Spiire) were engaged by the City of Whittlesea to undertake both Phase1 and Phase 2 Integrated Water Management (IWMS) analysis of the Quarry Hills PSP area.

The purpose of the Phase 1 Report was to provide a suite of information and key considerations which will need to be reflected within the broader Integrated Water Management of the Quarry Hills PSP. The key considerations and recommendations contained below have been used to inform the direction of the Phase 2 IWMS which will be discussed in the following sections of this paper.



Site characteristics are important for the purposes of the Phase 1 analysis and it is noted within the report that:

- The Quarry Hills PSP encompasses multiple sub catchments, however all are associated the Darebin Creek catchment.
- Grades are generally steep in the order of 3 15%.
- The Darebin Creek runs through the site on the western side of the site along with the proposed E6 alignment.
- Land to the north of the subject site is outside of the UGB and will not be developed.
- The Darebin Creek is a nominated Growling Grass Frog Corridor.

Key Considerations and Recommendations:

- The need for retardation to manage flood protection and waterway health in the Darebin Creek systems is of utmost importance. The catchment itself is approximately 12,500ha in size and the Quarry Hills PSP is located within the catchment's most upper reaches.
- Investigation suggests that if retardation is undertaken for the upstream development, the development of Quarry Hills will not increase the peak flows to Darebin Creek. This will be affected depending on how upstream developments retard flows on Darebin Creek.
- Careful urban design is required to allow for the conveyance of overland flows and delay the
 onset of drainage reserves. The urban design layout should be done to allow for suitable
 conveyance of overland flows to authority standards. Further environmental studies are
 required on the existing waterways and the existing dam to determine the extent of
 redevelopment that can be undertaken.
- Active open space such as sports ovals should be considered to be implemented as part of the retarding basins and to have protection to 10 year ARI inundation storm events.
- Significant earthworks have been undertaken within the Quarry Hills PSP from the quarry activities. An understanding of the final land form is to be established to allow for the planning of the development of the sub catchments within the PSP area. Depending on the final landform to be produced for the Quarry site, the existing quarry excavation may be suited to being utilized as a catchment scale retarding basin. This should be considered as part of the whole catchment strategy.

Any existing Melbourne Water Corporation requirements for retardation upstream are to be understood and they should have input into further hydrologic modelling to appreciate the flows into the Quarry Hills PSP area.

3.5. Biodiversity

3.6.1 Biodiversity

Prior to European settlement the precinct was dominated by a number of ecological vegetation communities. Since European settlement the vegetation has been altered due to agricultural and farming practices. The precinct has been largely cleared for agriculture however there are several areas of remnant native vegetation.



The time stamped data from the Department of Environment and Primary Industries (DEPI) shows the vegetation types identified within the precincts were:

- Treed Grassy Eucalypt Woodland (GEW)
- Derived Grassland of Grassy Eucalypt Woodland
- Scattered Trees (as nominated as tree canopy of former GEW)

3.6.2 Biodiversity Conservation Strategy

The Biodiversity Conservation Strategy (BCS) was approved by the Minister for Environment, Heritage and Water on 5 September 2013. The BCS provides strategic direction for the retention and removal of Matters of Environment Significance (MNES).

A series of documents form part of the BCS objectives and implementation. The relevant documents to the precinct are:

- Sub-regional Species Strategy for the Growling Grass Frog
- Sub-regional Species Strategy for the Golden Sun Moth
- Striped Legless Lizard Salvage and Translocation Plan
- Draft Habitat compensation under the Biodiversity Conservation Strategy

For details on the BCS nominated conservation areas, survey requirements, salvage and translocation and offsets requirements please refer to the above outlined documents.

3.6.3 Retention & offset requirements

The BCS does not identify conservation areas to be retained in PSP 1094. Where scattered trees are being retained (meeting the City of Whittlesea Tree Retention policy requirements) offsets may not be required. All other vegetation may be offset and cleared.

3.6.4 Conservation Areas

A number of conservation areas are identified within or abutting the precinct. Their contributions to the protection of biodiversity in the state vary from Growling Grass Frog to nature conservation to open space that contains scattered trees.

Conservation Area no. 34 comprises part of the Darebin Creek Growling Grass Frog (GGF) reserve. Darebin Creek, which bisects the precinct, is identified in the BCS as Growling Grass Frog Conservation Area (Category 1 habitat). It is intended that Category 1 habitat areas are retained for their high quality Growling Grass Frog habitat. Growling Grass Frogs have been recorded along the Darebin Creek. The key rationale for the protection of these areas in the BCS is it 'protects an important population of Growling Grass Frog and ensures connectivity between populations within the northern growth corridor'.

This reserve protects remnant native riparian vegetation and nationally significant habitat for the threatened GGF.

Category 2, other suitable habitat has been identified in the precinct mainly along existing water bodies and creek tributaries. The BCS has identified that Category 2 habitat can be cleared.



3.6.5 Scattered Trees – Abroicultural Assessment

Treelogic was engaged by the MPA to undertake an arboricultural assessment of trees located within the Quarry Hills PSP area.

Tree surveys were undertaken and applied an assessment methodology which included trees over 150mm trunk diameter measured at breast height (1.4m above surrounding ground level).

A total of two hundred and fifty five (255) tree features were identified comprising 223 individual trees and 32 tree groups comprising approximately 1,521 additional trees. Many of these trees were found to be located within the Darebin Creek corridor and other natural drainage lines and it has also been identified that there are a high number of significant trees located within the proposed E6 corridor.

It was found that:

- The majority of trees inspected were River Red Gum trees with 207 features comprising 200 individual trees and 7 groups which included approximately 147 additional trees.
- Two hundred and three (203) indigenous tree features, considered to be naturally occurring
 on site, exist within the tree study area including 201 River Red Gum, 1 Swamp Gum and 1
 Candlebark. Permit and offset requirements would apply to these trees were they to be
 removed.
- The remainder of trees inspected on site were introduced specimens of Victorian of Australian native and exotic origin that had been planted for windrows, woodlots or ornamental, amenity or garden purposes.

In order to adequately assesses the existing quality and health of the trees, all were attributed an arboricultural rating which reflects the retention value of the trees. In doing so, the following was found:

- Twenty four (24) trees were attributed an arboricultural rating of High.
- One hundred and sixty six (166) tree features were attributed an arboricultural rating of Moderate.
- Fifty six (56) tree features were attributed a Low arboricultural rating due to health and or structural deficiencies or being of small size.
- Nine trees (9) were attributed an arboricultural rating of none which were structurally defective and unsuitable to retain for arboricultural reasons.
- The retention and management of aging River Red Gums in an urban setting can be best accommodated through assigning generous tree protection distances and considerate design that minimizes disturbance around the trees and avoids the placement of targets around the tree.
- Consideration must be given to preserving River Red Gum trees within open space sufficient
 for the canopy spread plus one metre and it is also noted that the use of open space areas
 should be encouraged as a means to provide for the protection of some trees which are
 given lower ratings.



 While low rated trees generally are not considered worthy of being a constraint on development, the retention of Low rated River Red Gum must be considered under the planning scheme.

In terms of retention and conservation it is important to note that High and Moderate rated trees represent the best opportunity to retain established trees of fair or better quality and which the relevant planning schemes would seek to protect.

3.6. Visual Character Assessment

This *City of Whittlesea* prepared a report for the Metropolitan Planning Authority (MPA) and Council to identify existing visual features of the Quarry Hills Precinct Structure Plan (PSP) area and provide recommendations as to how to sensitively integrate these features into future urban development. The City of Whittlesea's growth corridors are highly valued for their existing visual character features. The Quarry Hills PSP area boasts many natural and heritage visual character features providing a solid foundation for an urban development with strong local identity. The significant number, quality and character of River Red Gums within the Quarry Hills PSP area make them the defining landscape feature. In addition, the Darebin Creek, Quarry Hills Regional Park and view corridors to mountain ranges and the city provide a distinctive landscape framework. The dry stone walls and heritage structures provide a direct link to historical rural use and add to the visual interest and cultural identity of the area.

3.7. Bushfire threat and management actions

Land within the precinct is at some risk of bushfire, however the risks can be managed with appropriate development controls. The bushfire risk does not present significant obstacles to development. In addition to building requirements for the interfacing properties, ongoing Council management of the Quarry Hill Regional Park will ensure that fire risk is managed appropriately.

The Country Fire Authority (CFA) does not have any fire station infrastructure within the precinct and will be looking to provide suppression services from outside the CFA area. Development of the PSP will increase the fire threat being serviced by the PSP and contributes to the requirements for additional infrastructure (upgraded appliances) and increased demands on members, including training to meet this increased risk.



4. Future Urban Structure

4.1. Transport and Movement

Sinclair Knight Merz (SKM now Jacobs) were commissioned by Council to provide traffic modelling and SIDRA intersection analyses. In addition to testing Jacobs also designed the functional layouts of the intersections and bridges and provided costings.

In 2012 Jacobs developed the Northern Growth Corridor transport model for GAA. This model is a refinement of the Victorian Integrated Transport Model (VITM) and is presently assisting future planning in Hume, Whittlesea and Mitchell (Wallan).

The Jacobs report for Quarry Hills describes the assumptions used in the strategic transport modelling process and provides traffic and public transport forecasts for several land use and infrastructure scenarios in 2026 and 2046. Estimated traffic volumes have been applied in a more detailed analysis of several key intersections in the PSP which has identified the likely future intersection configurations needed to accommodate future traffic demand.

The modelling indicates that the proposed road network within Quarry Hills will have sufficient capacity to accommodate forecast traffic volumes in 2026 (interim) and 2046 (ultimate). Some of the key findings are summarised below.

North-South Connector

Most traffic forecast within the Quarry Hills PSP is expected to be local to the area, although the North-South Connector will attract some additional through traffic if the OMR and E6 are not constructed. The analysis indicates that a two-lane road would be sufficient to accommodate forecast traffic volumes.

Harvest Home Road

Harvest Home Road will provide a key connection between Quarry Hills and areas to the west of the PSP area. The analysis indicates that Harvest Home Road may attract some east-west traffic moving between Epping and Findon Road, but otherwise serves an access function for the town centre.

E6

In the scenarios containing the E6, the E6 is forecast to be moderately congested in the peak periods, with predominantly southbound flows in the AM peak and northbound flows in the PM peak. The E6 is expected to help reduce congestion on Epping Road.

Findon Road

Some capacity constraints were observed in the 2046 model results for Findon Road where it meets the North- South Connector. This was especially the case in the eastern sections of Findon Road where there is only a single lane has been modelled in each direction. Although this is outside the Quarry Hills PSP area, these results suggest that additional capacity may be needed for Findon Road by 2050.



SIDRA Analysis

The analysis shows that all performance criteria have been met while not over providing intersection infrastructure.

4.2. Activity Centres, Employment Areas and Restricted Retail

Essential Economics were commissioned to undertake a report which would provide advice on the size, type and location of activity centres which might be supported by the future Quarry Hills PSP. As part of this, the report would also seek to provide advice on the potential location of activity centres in order to inform the urban structure for the Quarry Hills PSP.

The purpose of the report was to not only provide advice on the level of commercial and retail provision which could be supported within the PSP, but also to consider potential employment opportunities within the precinct and to identify the level of employment opportunities that future residents of the precinct might be able to access.

Generally, a range of scenarios would normally be considered in such a piece of work, but given the constraints of the subject precinct and its potential for residential yield, it was considered that only a low-moderate growth scenario would be considered for the Quarry Hills PSP area.

Inputs included:

- Existing zones applying to the land, including the Farming Zone, Special Use Zone 4, Green Wedge Zone and the Rural Conservation Zone.
- Indicative future urban form as proposed in the Melbourne North Growth Corridor Plan (MNGCP).
- Information contained in a Concept Masterplan prepared for the area by private landowners, as expressed in a letter to the City of Whittlesea dated 23 July 2010.
- The existing and potential future activity centre hierarchy in the surrounding region, including the scale and role of centres in Epping North, Aurora and Wollert.
- Information contained in relevant structure plan documents, including the Epping North East Local Structure Plan and the Aurora Development Plan Part 2.

Key findings and recommendations:

The key findings and recommendations for the Quarry Hills PSP area are as follows

Expected dwelling yield and population:

It is expected that the most likely dwelling yield within the Quarry Hills PSP area will be somewhere in the range of 1,900-2,500 which would contain a population of between 5,600-7,500 based on a dwelling yield of approximately 15-20 lots per hectare.



Potential activity centres:

Based on a potential residential catchment of 7,500 a local town centre has been identified as the most viable option for the precinct. This would include:

Supermarket floorspace: 3,000m2
 Speciality retail floorspace: 2,000m2
 Total retail floorspace: 5,000m2

• Non-retail commercial floorspace: 1,250m2

Total commercial floorspace: 6,250m2Approximate land area requirements: 2.1ha

The most logical location for the local town centre is at the junction of the extension of Harvest Home Road and the major north-south connector road within the PSP area.

Further, it is noted that there may be some opportunity for the development of a small local activity centre (500 m²) on the main north-south connector road, in order to serve the more isolated northern sections of the PSP area.

Employment opportunities

Based on the proposed local town centre and the potential to develop some form of higher density development at its periphery, which could include some forms of home based employment, the report states that there is the potential for approximately 655 jobs to be created within the precinct.

Residents would also be able to tap into the employment opportunities across the wider region through the broader road network.

Issues and constraints:

The catchment for a local town centre in Quarry Hills PSP will be influenced by the following:

- Planned E6 to the west: which will be a major physical barrier restricting the ability for a centre in Quarry Hills to attract customers to the west.
- Transmission easement to the south: which is a physical barrier reducing the ability of Quarry Hills centre to attract customers from the south.
- Urban growth boundary to the north: limiting any future development to the north of the PSP.
- Quarry Hills Regional Park to the east: limiting the ability to attract customers from the east.
- Location of other centres: including the Lyndarum Neighbourhood Centre approximately 2km (by road) to the west and higher order centres to the south and west (i.e. South Morang, Epping, Wollert and Aurora).

Local Town Centres (LTC) are planned to be developed in the surrounding precincts of Lockerbie, Donnybrook, Woodstock and Beveridge. LTCs provide for day-to-day and weekly needs, with a supermarket and supporting retail, commercial and community uses. Local town centres create a focus for social interaction within communities.



Neighbourhood Convenience Centres are generally co-located with schools, community centres and open space in residential areas. These centres supplement the higher order centres in providing for day-to-day needs offering basic goods and services.

Existing employment precincts include those at Amaroo Business Park, south of the precinct and at Folkstone and Merrifield, to the west of the precinct.

4.3. Open Space and Community Infrastructure

Consultants *ASR Research Pty Ltd* provided a detailed analysis of community infrastructure issues and requirements across three population scenarios associated with the preparation of the Quarry Hills Precinct Structure Plan (PSP) area.

The assessment involved:

- Review of the planning and policy documents that have relevance for social and community infrastructure provision in the Melbourne North Growth Region and its component growth areas
- Analysis of the population forecasts for the Northern Melbourne Growth Region and its component growth areas.
- Audit of existing and planned social and community infrastructure in the Whittlesea municipality and, where relevant, the broader Melbourne North Growth Region and an assessment of the capacity of this infrastructure to cater for the Wollert and Quarry Hills PSP areas.
- The development of infrastructure provision standards and facility models for the community infrastructure provision in the Wollert and Quarry Hills PSP areas.
- A quantitative analysis of the demand for community infrastructure generated by:
 - The Wollert and Quarry Hills PSP areas and the Epping North-Wollert Area (for all infrastructure levels).
 - The Whittlesea Growth Sub-Region and the Northern Melbourne Growth Region (for sub-municipal, municipal and regional level infrastructure).
 - A qualitative assessment of the social and community infrastructure needs in Wollert and Quarry Hills in the context of infrastructure needs and provision in Epping-Wollert and, where relevant, across the Whittlesea Growth Sub-Region, Whittlesea Municipal Area and the Northern Melbourne Growth Region.
 - Provision ratios were derived from a number of sources, including (but not limited to) standards used by Federal and State Government Departments and Agencies and the GAA Precinct Structure Planning Guidelines.



Key Findings

A summary of the community infrastructure related recommendations is as follows:

- Develop an integrated community activities centre which comprises 2 licensed preschool rooms, 2 consulting rooms for maternal and child health and visiting services, neighbourhood house and activities rooms.
- Provide an open space reserve that is suitable for informal play.
- Provide 4 local parks in the open space reserve, on the Darebin Creek, at the foot of Quarry Hills and/or within the residential areas. Provide playgrounds in the parks.
- Develop a community garden. Integrate it with the open space reserve.
- Develop a path network which links the key facilities proposed for Quarry Hills (community activity centre, recreation reserve, local parks and Quarry Hills Bushland Park) and connect it to the proposed Darebin Creek Regional Trail.
- Seek formal confirmation from Department of Education and Early Childhood Development (DEECD) as to whether it will provide a school in Quarry Hills.
- Develop the Quarry Hills Bushland Park.
- Assess the feasibility of developing an orienteering course and competition mountain bike venue in the Quarry Hills Bushland Park.
- Encourage the private sector to provide nursing homes and independent living facilities in Quarry Hills.
- Encourage the Office of Housing and developers to make provision for affordable/social housing in Quarry Hills.



5. Utility and Service Infrastructure

5.1. Main Drainage and Integrated Water Management

CPG (now Spiire) was commissioned to undertake an assessment of drainage and development of an Integrated Water Management Strategy (IWMS). Below are the main findings of their assessment:

The objective of the IWMS is to identify various sustainable water management systems and practices across a range of scales and sources to produce an integrated outcome. This integrated management system is designed to protect and enhance the Quarry Hills precinct waterways and their surrounding environments by:

- Minimising potable water consumption
- Minimising the impacts of increased runoff due to development
- Minimising the increase in pollutants from runoff due to development
- Utilising a range of alternate sources (rainwater, stormwater, recycled water, grey water) and
- Implementing a number of measures for water quality treatment and reuse.

This objective can be achieved through a number of initiatives and ideologies that combine to produce the integrated water management strategy.

Within the Quarry Hills precinct, recommended conveyance and flood mitigation measures are limited to the enhancement of natural waterways to facilitate storm flow conveyance.

The Quarry Hills IWMS recommends that a 'train' of treatment measures be adopted to meet these requirements. The base case scenario of this investigation meets Best Practice requirements, whilst the full IWMS strategy provides results above the minimum requirements. The IWMS measures remove pollutants from runoff while also providing 'choke' points to retard flows and reduce peak flow rates by the use of:

- Sedimentation basins, wetlands and raingardens at a regional level strategically located within each catchment
- No direct connection to a waterway without prior treatment
- Stormwater harvesting at active open space locations

5.2. Water Supply and Sewerage

CPG (now Spiire) was commissioned to undertake an assessment of utility servicing for the Quarry Hills PSP area. Below are the main findings of their assessment:

Sewerage

Sewerage will be made available for the PSP area; the Upper Darebin Creek Branch Sewer is planned to service the precinct.



Should development in the north of the precinct proceed that in the south the first 1.2km of the Upper Darebin Branch Sewer would be required in the short to medium term. If this service is not available, bring forward options would need consideration. These might include developer contributions for early construction of the branch sewer, a temporary connection to Findon Creek Branch Sewer by gravity if possible, or pumping along Harvest Home Road subject to Yarra Valley Water approval (CPG, 2012).

Water Supply

Potable water is available. Quarry Hills sits within the broader Epping North corridor which is supplied via Melbourne water distribution mains to a Melbourne Water reservoir in nearby Quarry Hills Park. A trunk main traverses the Quarry Hills Precinct approximately 400m north of Harvest Home Road (CPG, 2012).

Recycled Water Supply

Recycled water is currently limited for the Quarry Hills PSP area; YVW will need to commit to significant augmentation of the Epping North System. Recycled water will be mandated in the Quarry Hills Precinct. The supply of recycled water to the Quarry Hills precinct relies on the construction of the following major Epping North infrastructure:

- Harvest Home Road trunk main 600mm in diameter to the supply storage, approximately 6.2 km long
- Quarry Hills Class A storage
- Trunk distribution main 525mm in diameter from the Class A storage to supply the mandated recycled water area (CPG, 2012)

5.3. Electricity Supply

The PSP area has major transmission easements on the southern boundary. These easements vary in width up to 143m. The easements are significant elements to be considered in any urban design response. SP AusNet (the responsible authority for both the electricity transmission and distribution networks) will need to provide specific technical guidance on development within their easement. The following general principles will apply however:

- No urban development will be permitted within the easement.
- Strict height limitations apply for all works including landscaping.
- Roads will be permitted to cross the easement but must be perpendicular and not within 30m of a pylon.
- Height limits will need to be considered where road crossings are proposed It is recommended that SP AusNet provided specifics on their pylon locations and a map of "no go" zones to inform the urban design. This information has not currently been provided.



Supply is currently available via high voltage 22KV overhead lines to Quarry Hills along Bindts Road. SP AusNet has advised staging of development within Quarry Hills is flexible. Currently these lines are charged from Epping and Kalkallo zoned substations. The zoned substation in Wollert will ultimately charge these lines. The Wollert zoned substation in Harvest Home Road is expected to be required within four years but will require 18 months lead time to construct if demand requires this earlier (CPG, 2012).

5.4. Gas Supply

A new City Gate is to be constructed by APA in Craigieburn East Road to supply gas to the precinct. This will be coupled with an extension to the distribution network for approximately 3km east along Craigieburn East Road from the City Gate. Under current policy the City Gate and distribution network along the Craigieburn East Road would be funded by APA subject to a cost benefit analysis considering forecast revenue from the growth area (CPG, 2012).

5.5. Telecommunications

NBN Co is the responsible agency for the delivery of the National Broadband Network. Telecommunication design and installation in all new residential estates greater than 100 lots will be administered through the NBN Co system. Telstra are no longer responsible for the supply of new networks although their existing infrastructure will continue to be utilised while required.

There are current Telstra assets within the Quarry Hills Precinct. These are generally services to rural allotments and the cabling follows existing road reserves within the precinct. NBN Co has not planned how the network will roll out across the Quarry Hills Precinct. NBN Co will use existing Telstra conduits subject to location and condition. Should development require removal of existing road reservations containing Telstra assets, further enquiries with Telstra and NBN Co will be required regarding relocation of existing assets (CPG, 2012).

Further detail and mapping can be found in Quarry Hills Precinct Structure Plan 1094 – Utilities Infrastructure Servicing Assessment, CPG, 2012.



6. Development Contributions

The Quarry Hills PSP and development contributions plan have been prepared by the Metropolitan Planning Authority in collaboration with the City of Whittlesea, Government agencies, service authorities and major stakeholders.

The DCP has been developed to support the provision of works, services and facilities that will be used by the future residents of the Quarry Hills PSP.

The DCP outlines projects required to ensure that future residents of the Quarry Hills Area can be provided with access to necessary services and transport infrastructure.

The DCP establishes a framework for development proponents to contribute a fair proportion towards the cost of works and services for the new development at the Quarry Hills. It ensures the cost of providing new infrastructure and services is shared equitably between various developers and the wider community. Fairness requires costs to be apportioned according to the projected share of use and the required works, services and facilities items.

The key projects that are funded wholly or in part by the DCP are:

Lehmann's Road – Bindts Road to west edge of Darebin Creek
Harvest Home Road- Saltlake Boulevard to north- south connector
North-South connector either side of Darebin Creek located on 90 Bindts Road (either side of bridge to cover BCS land)
Whitebark Street from Bindts Road to the eastern edge of the E6 PAO on the boundary of 150-152 and 130 Bindts road
Local Road portion with E6 PAO from north boundary of 26 Ilani Street into 10C Bindts Road
Southern section of north-south connector within Transmission Easement onto Findon Road
Harvest Home Road and north south connector
North South Connector and Findon Road
Darebin Creek- Lehmans Road
Darebin Creek- North South Connector
Darebin Creek- Harvest Home Road
Darebin Creek Pedestrian and Cyclist Bridge located on 100 Bindts Road
Darebin Creek Pedestrian and Cyclist Bridge located on 10C Bindts Road
Quarry Hills Community Facility
Quarry Hills Central Multi Purpose Open Space



7. Technical Studies referenced in the Background Report

- Aboriginal and Historical Heritage Assessment (Ecology and Heritage Partners)
- · Arboricultural Assessment (Tree Logic)
- Activity Centre and Employment Analysis (Essential Economics)
- · Social and Community Infrastructure Assessment (ASR Research)
- · Integrated Water Management Strategy with Phase 1 Catchment Analysis (CPG/Spiire Australia Pty Ltd)
- · Utilities Infrastructure Servicing Assessment (CPG Australia Pty Ltd)
- · Phase 1 Environmental Site Contamination Assessment (Cardno Lane Piper)
- Development Contribution Land Assessment (Urbis)
- Developer Contribution Plan Costing Community Facilities and Open Space (Prowse Quantity Surveyors)
- · Strategic Traffic Modelling and SIDRA: Quarry Hills (Jacobs/ SKM)
- · Visual Character Assessment (City of Whittlesea)

Complete background technical reports are publicly available on the MPA website.

