TABEC
Civil Engineering Consultants

WATTLE GROVE
LOCAL STRUCTURE PLAN
ENGINEERING SERVICING REPORT

HESPERIA PROJECTS PTY LTD ATF
WATTLE GROVE TRUST

CLIENT: HESPERIA

PROJECT: WATTLE GROVE

TITLE: LSP ENGINEERING SERVICING REPORT

DOCUMENT REVIEW				
Revision	Date Issued	Written By	Reviewed By	Approved By
A	3.12.2021	BF	CB	BF
B	15.12.2021	BF	CB	BF
C	11.08.2025	BF	AB	BF
D	13.08.2025	BF	AB	BF

TABLE OF CONTENTS

TABLE OF FIGURES

1 INTRODUCTION

TABEC Pty Ltd has prepared the following servicing report for Hesperia Projects Pty Ltd ATF Wattle Grove Trust (Hesperia) to support the Wattle Grove Local Structure Plan (LSP) for the future urban development of the site.

The report provides engineering advice on the capability and future infrastructure requirements of the site to support the proposed development and the civil engineering influences on the development plan form. In particular the report considers earthworks, roads, drainage, wastewater, water, gas, power, and communication servicing requirements to support development.

The investigation, servicing recommendations and preparation of the report is primarily based on preliminary advice from the various authorities. The information is current at the time of preparing the report and is therefore subject to change as planning and development progresses in and around the site.

The proposed Wattle Grove LSP prepared by element. is presented below:

Figure 1 – Wattle Grove Local Structure Plan (element., August 2025)

2 THE STUDY AREA

2.1 Site Description

The site consists of multiple landowners, covers an area of approximately 120ha and is located around 15km southeast of the Perth CBD within the Shire of Kalamunda. The site is generally bounded by Boundary Road to the west, Crystal Brook Road to the north, the City of Kalamunda/Gosnells local government boundary to the east and Tonkin Highway to the south, whilst the existing Brentwood and Victoria Roads traverse the site.

The Western Australian Planning Commission's (WAPC) North-East Sub-Regional Planning Framework, adopted in March 2018, identifies the Wattle Grove site as Urban Expansion. The City of Kalamunda's Local Planning Strategy 2010 identifies Wattle Grove as an Investigation Area, and the site falls within the City's current Wattle Grove South (Crystal Brook) planning project area.

The site is currently zoned 'Rural' under the Metropolitan Regional Scheme (MRS) and the City of Kalamunda Town Planning Scheme. The proposed MRS amendment that has been lodged will rezone the site to 'Urban'.

The site is identified by the red boundary/shading on Figure 2 presented below:

Figure 2 – Wattle Grove LSP Area

2.2 Landform and Topography

The site is generally cleared with short length grass and shrubs, though some of the existing semi-rural lots contain trees and the majority have existing houses, multiple sheds, and other small structures. Though most properties are used for residential purposes some are or were utilised for commercial purposes (ie. turf farm, disused poultry farm) and others contain extensive areas of stockpiled materials and old vehicles/machinery etc.

We understand, where possible, there is a desire to retain and incorporate appropriate trees and vegetation within the proposed development and this will guide the design and earthworks planning for the site.

The site generally slopes from east to west at grades between 0.3% to 1.6%. Existing ground levels fall from ~RL36m AHD along the eastern boundary to ~RL21m AHD in the west.

The site contains no existing waterways, though the turf farm did once have a dam which has since been filled.

The site contains a mapped resource enhancement wetland adjacent to Tonkin Highway in the southern corner of the turf farm, though from a review of the historical aerial photos the wetland site has been filled. A second resource enhancement wetland is located at the northern end of the site adjacent to the Tonkin Highway and Welshpool Road intersection.

A Bush Forever area and the Greater Brixton Street Wetlands are located to the west of the site, on the other side of Tonkin Highway between Brook Road and Boundary Road.

Figure 3 – Wetland Mapping (MNG Access, July 2025)

2.3 Ground Conditions

Preliminary geotechnical investigations were undertaken by Douglas Partners in late 2020 and 2022 over various lots within the Victoria Road portion of the site.

The shallow ground conditions encountered within the test pits generally comprise topsoil overlying Bassendean Sand (generally medium dense to dense, light grey sand) and Yoganup Formation (yellow-brown sand with various fines content). The sand from the Yoganup Formation includes a fines content that increases with depth. Additionally, relatively shallow uncontrolled fill was encountered at isolated locations, with cemented sand (coffee rock) also being encountered at a couple of locations.

In-situ infiltration testing undertaken by Douglas Partners resulted in permeabilities greater than 20m/day in the Bassendean Sand and between 2.4m/day and 7.1m/day in the Yoganup Formation.

From a geotechnical standpoint, Douglas Partners have advised the land is considered to be physically capable of development provided suitable site preparation is undertaken.

2.4 Groundwater

The Department of Water and Environmental Regulation's (DWER) online Perth Groundwater Map shows groundwater levels across the site range from 11.5mAHD in the northwestern corner of the site to 16.0mAHD in the eastern boundary area.

The DWER levels are based on May 2003 data and are representative of a summer minimum condition. DWER historical maximum groundwater level mapping does not cover the LSP area.

Across the LSP area and its immediate surrounds, Hyd2o currently monitor groundwater levels at 23 bores. Bores installed comprise of both shallow and deep bores placed to capture both the superficial aquifer and any potential perched systems across the site.

Based on the monitoring program, Hyd2o have mapped average annual maximum groundwater levels (AAMGL) for the site. Contours at the site range from approximately 16mAHD in the northeastern region to approximately 19mAHD on the western boundary of the site, with a regional groundwater depth ranging from 4m to 20m below natural surface. Hence the LSP area has good clearance to regional groundwater.

Previously installed bores by others indicated some perching is evident in groundwater levels in the northwestern corner of the LSP area near Tonkin Highway. The bores installed by Hyd2o where soil profile indicated perching may occur were recorded dry on all occasions. Hence no perching was evident at most bores within the LSP area.

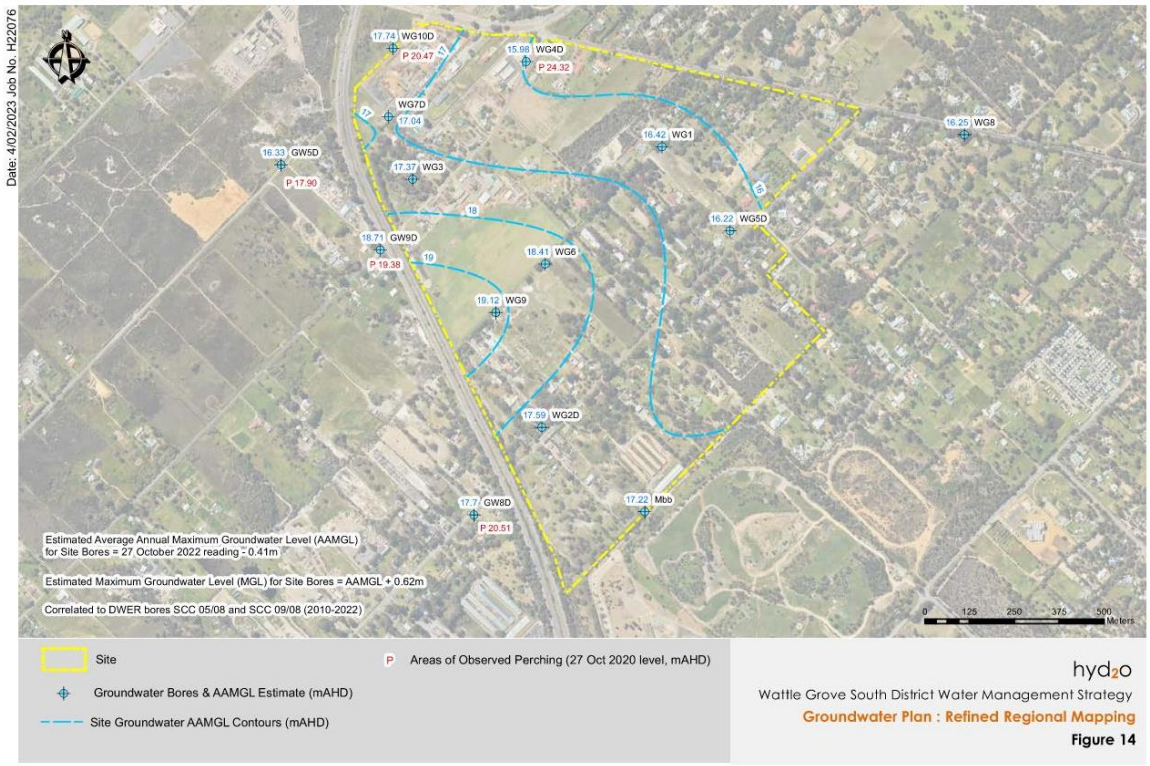

Figure 4 – Groundwater Plan (hyd2o, February 2023)

2.5 Acid Sulfate Soils

The Swan Coastal Plain Acid Sulfate Soils (ASS) Risk Map (DWER) designates the site location as having a moderate to low risk of ASS disturbance risk occurring within 3m of natural surface as illustrated in the figure below.

With reference to DWER endorsed guidelines, investigation of ASS as part of a future subdivision of the site is recommended in areas of moderate to low risk for the following:

- Excavation of greater than 100m^3 from below the natural water table; and/or
- Where dewatering (temporary or permanent) is proposed to be undertaken.

If ASS is to be disturbed, a suitably qualified environmental consultant would be engaged to conduct an investigation of the area and if necessary, prepare an ASS Management Plan. The ASS Management Plan will detail the actions to minimise and mitigate potential adverse environmental effects during the works.

Figure 5 – Acid Sulfate Soil Risk Mapping (DWER)

3 SITEWORKS AND EARTHWORKS

Development of the site will require the demolition of existing buildings and structures prior to undertaking site earthworks, servicing, and roadworks. Following demolition, siteworks and earthworking will take place to provide for a desired development form while addressing any engineering constraints of the site. These constraints could include:

- Existing ground conditions (soil types, any areas of uncontrolled fill or loose sands, etc).
- Conservation areas and tree retention.
- Interface with the Dampier Bunbury Natural Gas Pipeline easement.
- Interface with Welshpool Road East and the future Tonkin Highway flyover.
- Existing Brentwood Road and Victoria Road and the unmade Boundary Road reserve.
- Existing 66kV power transmission line in Brentwood Road.
- Existing services in Brentwood Road and Victoria Road.
- Interface with adjacent properties.

The geotechnical investigation indicates that the site's existing ground conditions are suitable for the proposed development. The sand is considered suitable for excavation and re-use as structural fill without impacting the site classification. Additionally, the constraints regarding any loose soils or uncontrolled fill that may exist at the site can be managed during typical earthworks site preparation procedures.

It is anticipated that siteworks to support the proposed residential development will generally comprise the identification and marking of trees to be retained, demolition, removal of grasses and weeds, stripping and blending of topsoil, earthworking of the existing ground surface and the importation of relatively low volumes of sand fill.

Additionally, the geotechnical investigation has indicated that the sandy topsoil is considered suitable for re-use in the earthworks. Following stripping and stockpiling, the topsoil can be screened and the screened topsoil then blended with clean sand. A preliminary blending ratio of approximately 2:1 (clean sand: topsoil/organic sand) was suggested but will be refined in consultation with the geotechnical engineer following assessment of the material resulting from the screening operations. Any material considered unsuitable for use as fill will be removed from the site or used in non-structural areas.

The earthworks will also incorporate some imported sand filling of the site to improve drainage as well as potentially achieving a better site classification in some locations. The imported material used for filling should be a free drainage clean sand material having a fines content less than 5% and permeability greater than 5m/day to avoid the imported material having a negative impact on site drainage.

It is generally intended to grade the development to create flat allotments, while maintaining the general landform of the site and ensuring positive drainage to the road and drainage areas for disposal. Earthwork levels will need to match as close as practicable to the surrounding interface and accommodate existing infrastructure whilst there is also an intent to retain and incorporate existing trees and vegetation where possible within road reserve and public open space areas.

The installation of subsoil drainage is not expected to be required given the likely clearance to post-development groundwater water levels. However, direct lot drainage connections may be required in some areas due to the reduced permeability of the existing Yoganup soils and/or for smaller lots.

The earthworks for the site will be based on achieving a targeted site classification in accordance with AS2870. Following suitable site preparation, the site would be classified as:

- 'Class A' where there is at least 1.8m of sand present overlying any clayey materials.
- 'Class S' where there is at least 1.2m of sand present overlying any clayey materials.

Generally, a site classification of "Class S" is anticipated post development, although a "Class A" site classification is likely to be appropriate in some areas.

Test pits undertaken as part of the preliminary geotechnical investigation are all located within the southern portion of the site and represent a small portion of the LSP area. As such, other varied ground conditions not encountered in the geotechnical investigations may exist. Therefore, it is recommended that further detailed geotechnical investigations are undertaken during the detailed design phase of any future development within the LSP.

4 ROADS

The site is well connected to the regional road network including Tonkin Highway, Welshpool Road East, Crystal Brook Road and Kelvin Road. Roe Highway is also located to the west of the site and is accessible from the site via the Welshpool Road East or Tonkin Highway interchanges.

The site also contains the existing Brentwood Road, Victoria Road and Boundary Road reserves. Brentwood Road and Victoria Road are currently rural styled roads that are unkerbed sealed roads with table drains on both sides. The unmade Boundary Road is currently an unsealed gravel track with no drainage.

Access to the proposed development can be achieved from the existing Welshpool Road East and Crystal Brook Road, along with a logical internal road network connecting the existing Victoria Road and Brentwood Road. Tonkin Highway is a controlled access road and therefore no direct connection to the highway would be permitted.

It is anticipated that the existing Brentwood and Victoria roads, within the site may require upgrading to accommodate the new traffic conditions that would result from the change to an urban residential setting. Upgrading is anticipated to include the widening of the existing pavement, kerbing, an asphalt wearing course and in consultation with the City of Kalamunda will seek to preserve the rural character of the area.

Internally, the road network is likely to include a combination of laneways, access streets and a neighbourhood connector between Brentwood and Victoria Roads. The road network will be in accordance with the current Liveable Neighbourhoods, City of Kalamunda standards and IPWEA Subdivision Guidelines.

A network of dual use and pedestrian footpaths will also be required to facilitate pedestrian movement throughout the development.

Figure 6 – Victoria Road: from Crystal Brook Road looking Southwest (Google Street View, April 2023)

Figure 7 – Brentwood Road: from Crystal Brook Road looking Southwest (Google Street View, April 2023)

Figure 8 – Boundary Road: from Welshpool Road East looking Southwest (Google Street View, April 2023)

Welshpool Road East is currently kerbed and drained, with an asphalt finish and incorporates concrete pedestrian paths. Therefore, it is not expected that Council will require any upgrading of the road adjacent to the development, except possibly at any proposed intersections. Crystal Brook Road is currently sealed, kerbed, and drained however, may require an upgrade to the seal adjacent to the site over time.

It is anticipated that the site could be developed, with development having minimal impact to the current operation of the surrounding road network. PTG Consulting have undertaken a traffic assessment to support the proposed LSP.

5 STORMWATER DRAINAGE

Hyd2o has prepared a District Water Management Strategy (DWMS) to support the rezoning of the area and a Local Water Management Strategy (LWMS) to support the LSP for the site.

UWMP's will be required in order to progress subdivision or further development of the site.

In summary, stormwater runoff from the site generally flows via overland flow across the site from east to west, following the natural topography and existing road reserves. Stormwater will be managed to ensure that post-development flow rates are within pre-development levels and that the development of the site is protected from flooding in major storm events.

A conventional piped network will be designed to manage road runoff discharging to swales/basins located within the low areas of the site. These basins/swales will act to attenuate the runoff to predevelopment levels prior to it discharging to existing culvert outfalls under Tonkin Highway. The existing Bunbury to Dampier Natural Gas Pipeline corridor will be utilised for major event stormwater management and therefore minimise the provision of large-scale standalone storage infrastructure within the site.

The first 15mm of rainfall, will be retained and treated within biofiltration systems prior to infiltration to ensure water quality objectives are met. These systems will be distributed throughout the development.

It is expected that runoff from individual lots will generally be managed using soakwell systems to retain and infiltrate roof runoff within individual lots. Where the lot size and/or underlying soils won't enable the use of soakwells, direct lot drainage connections may be required.

Stormwater Management, with the aims of Water Sensitive Urban Design, will be in accordance with the requirements of Australian Rainfall and Runoff and the City of Kalamunda.

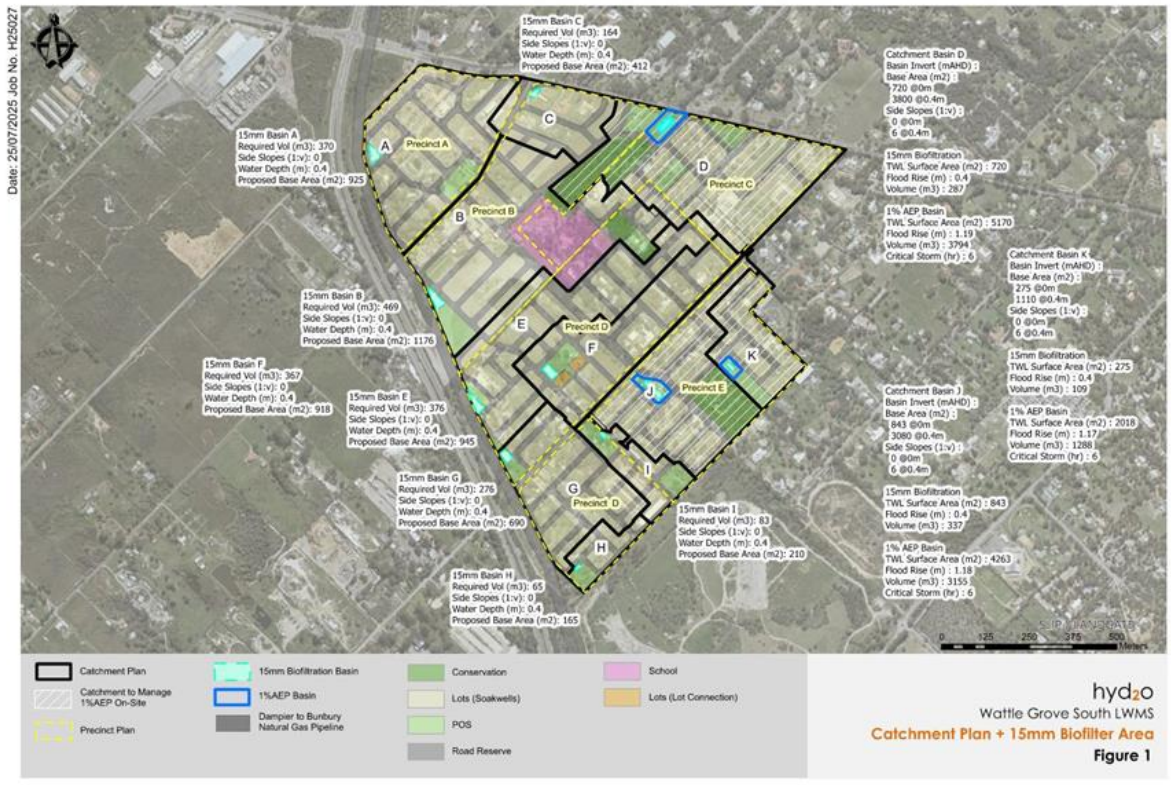

Figure 9 – Wattle Grove Preliminary Drainage Catchment Plan (hyd2o, July 2025)

6 WASTEWATER

The Wattle Grove LSP area is not currently serviced by a wastewater scheme, but the site is within the Water Corporation license area and covered by the Wattle Grove Sewer District (SD) conceptual wastewater planning.

Water Corporation long-term planning shows the site ultimately being serviced via a gravity sewer extension to the southwest along Brentwood Road and Bickley Road connecting to the existing DN900 branch sewer main located in Bickley Road, near Dulwich Street in Maddington.

The major works to ultimately service the Wattle Grove SD include:

- ~1.4km of DN750 gravity sewer along Bickley Road, including a section under Roe Highway;
- ~830m of DN600 gravity sewer along Bickley Road;
- ~1.5km of DN600 gravity sewer along Brentwood Road; and
- ~750m of DN450 sewer along Brentwood Road up to Tonkin Highway.

The long-term wastewater planning is shown below.

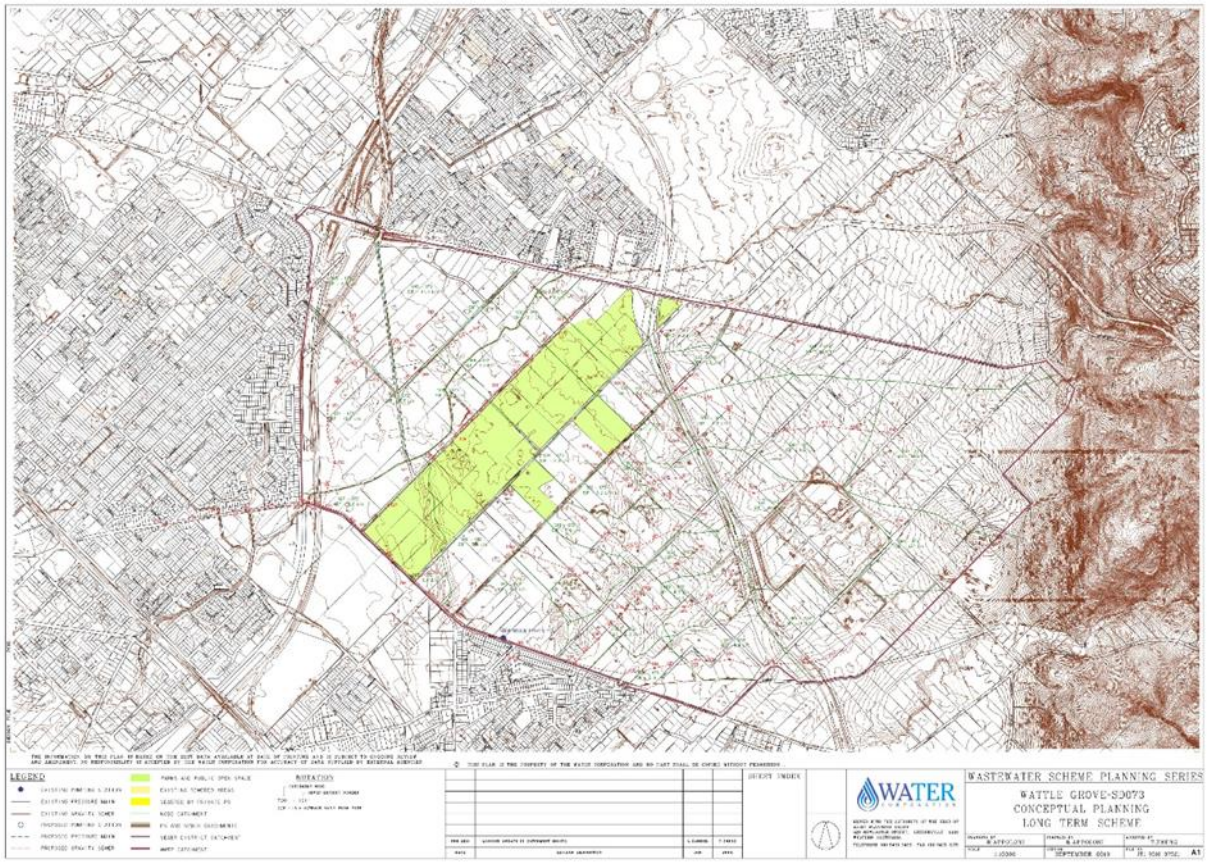

Figure 10 – Wastewater Long Term Planning (Water Corporation)

To enable the initial development of the site, an interim solution involving the extension of gravity sewer mains from the Wanaping Road Pump Station No. 7 along Wanaping Road, Bickley Road and Brentwood Road to the site is proposed.

The interim works to service the LSP include:

- ~700m of DN300 gravity sewer along Wanaping Road;
- ~230m of DN600 gravity sewer along Bickley Road;

- ~1.6km of DN450 gravity sewer along Brentwood Road; and
- ~550m of DN375 sewer along Brentwood Road.

A Water Corporation scoping report for the delivery of the interim solution is currently being prepared and the preliminary concept plan is shown below.

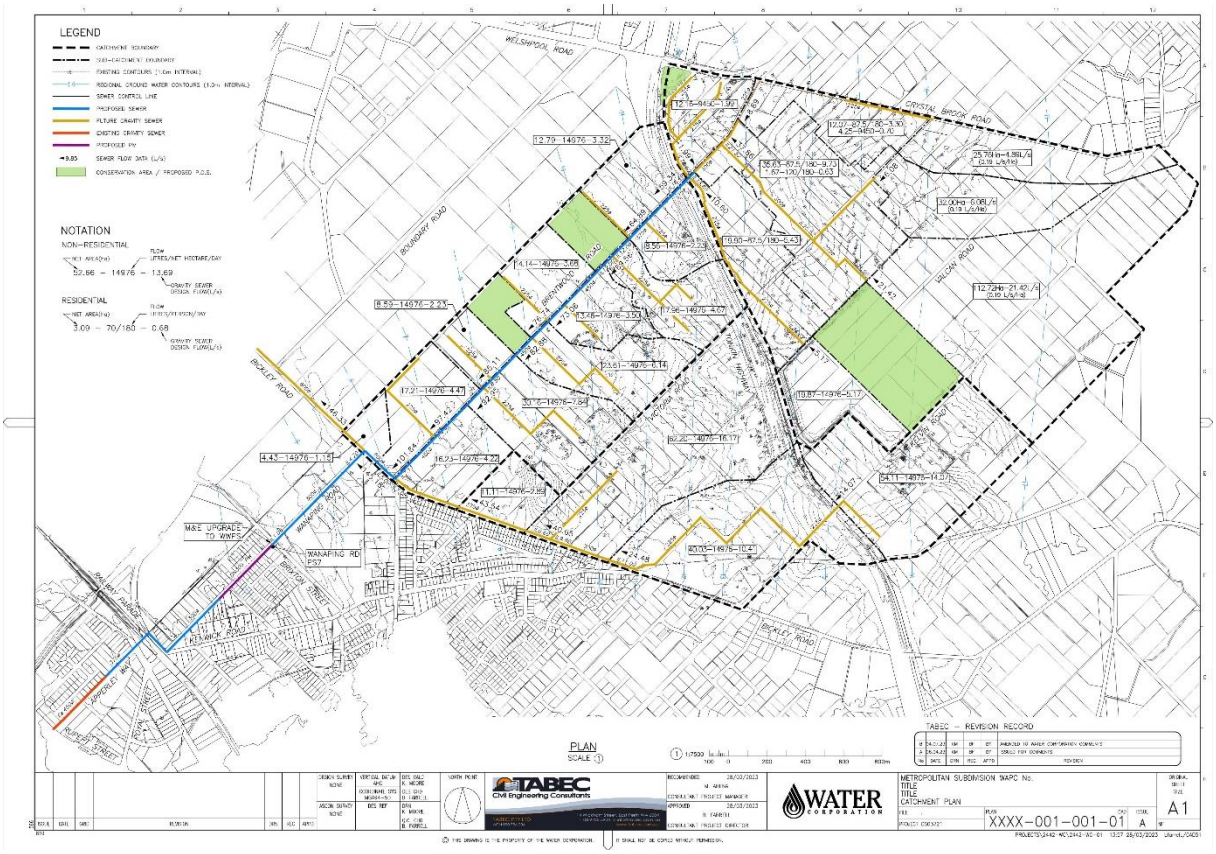

Figure 11 – Wastewater Interim Option (TABEC/Water Corporation)

The ultimate and interim gravity outfall options would ordinarily be a Water Corporation funded items due to the size of the sewer mains, however it has not yet been included in the Water Corporation 5-year capital investment programme (CIP). An application will be made for the proposed interim outfall works to be included in the CIP and therefore funded by the Corporation.

Providing the site with an internal reticulated sewer system will be achieved through the orderly development of the site. Wastewater infrastructure will be designed and constructed in accordance with Water Corporation standards and requirements.

7 WATER SUPPLY

The Wattle Grove LSP area is within the Water Corporation license area for the provision of reticulated water.

With respect to water planning, the site is situated at the eastern edge of the Trunk Mains PRV scheme. As the site is currently zoned 'Rural', the Water Corporation's water planning is based on this zoning, which arose from the WAPC's Foothills Structure Plan. The Water Corporation has advised the water planning will be revised as the land is rezoned to 'Urban'.

Water supply to the site is currently via the DN1400 Canning/Foothills Trunk Main that runs south to north along the base of the foothills. Supply occurs through various Pressure Reducing Valves (PRVs) located along the trunk main. The nearest PRVs to the site are the Boyle Lane PRV to the south, and the Hale Road PRV to the north. The sketch below, provided by the Water Corporation, shows the arrangement described above and the HGL route.

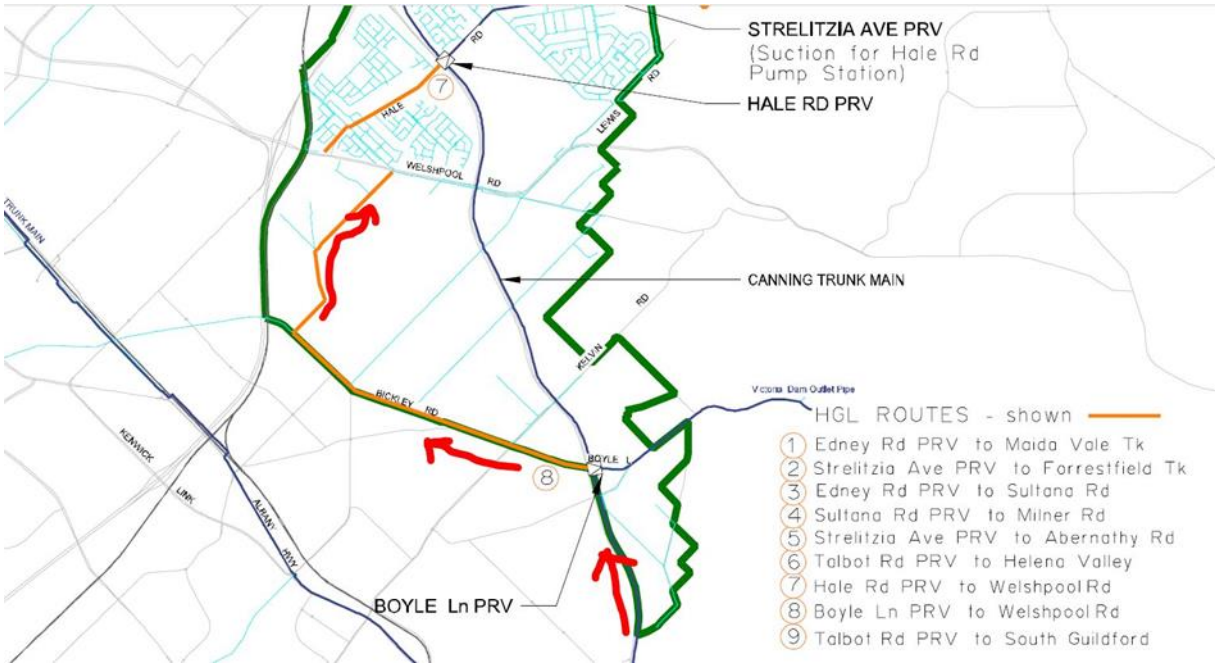

Figure 12 – Existing Water Supply (Water Corporation)

The existing water distribution main from the Boyle Lane PRV is a DN460 – DN510 cast iron main running north-west along Bickley Road. The existing reticulation mains that extend off this distribution main to serve the areas to the east, including the site, are as follows:

- Victoria Road: DN100 Cast Iron.
- Brentwood Road: DN150 PVC and Cast Iron.
- Welshpool East Road – Crystal Brook Road: DN150 Steel and Ductile Iron. Noting there is a zone valve at the corner of Crystal Brook Road and Victoria Road which is the break between the PRV zone and the upper High Level (HL) zone.
- Brook Road-Grove Road-Logistics Road: DN200 Ductile Iron and DN180 PE.

The site and services in the Urban Expansion area will be included in the Water Corporation's water planning and hydraulic modelling undertaken to determine the impact on existing customers and the changes required to the size and timing of future distribution mains.

In the interim, the Water Corporation has advised that water supply to a future urban development of the site will be supplied from the Trunk Main PRV scheme. An extension of the existing mains adjacent to and throughout the site will not have sufficient capacity or pressure to serve the proposed development, and as such, the initial supply is likely to be via new water reticulation mains, typically DN250 PVC and DN200 PVC as required. The Water Corporation will undertake planning and will follow in with distribution mains in the future as needed.

The nearest distribution supply is located to the southwest of the site in Bickley Road. The distribution main could be extended to site via either Victoria Road or Brentwood Road, approximately 1.6km and 2.1km from the site respectively to provide a water supply.

An internal water reticulation network will also be constructed within the site to provide a service to all lots in accordance with the Water Corporation's requirements.

8 POWER SUPPLY

The site has a 66kV high voltage (HV) overhead power line extending along the southeastern side of Brentwood Road. The site also has 22kV HV overhead power lines running along the north-western side of Brentwood Road and Victoria Road and a low voltage (LV) overhead power line on the southeastern side of Boundary Road.

The existing HV feeders will be able to provide power to the proposed development of the site from the Welshpool and Maddington zone substations.

Western Power will require the 22kV HV overhead power lines that are adjacent to the proposed residential development to be undergrounded as part of the subdivision works.

Figure 13 – Western Power Existing Power Network (Western Power, July 2025)

The Western Power Network Capacity Mapping Tool indicates that there is capacity in the existing network to service the initial stages of development within the site. The mapping tool indicates that the capacity for the north-western portion of the site is between 15MVA-20MVA, whilst the southeastern portion immediately adjacent to Victoria Road has a capacity of less than 5MVA. As development increases, Western Power will need to carry out various system reinforcement measures to maintain adequate supply.

Based on the Western Power UDS Manual requirements and the potential development yield, the estimated load for the proposed residential development of the LSP site is in the order of 6.5MVA.

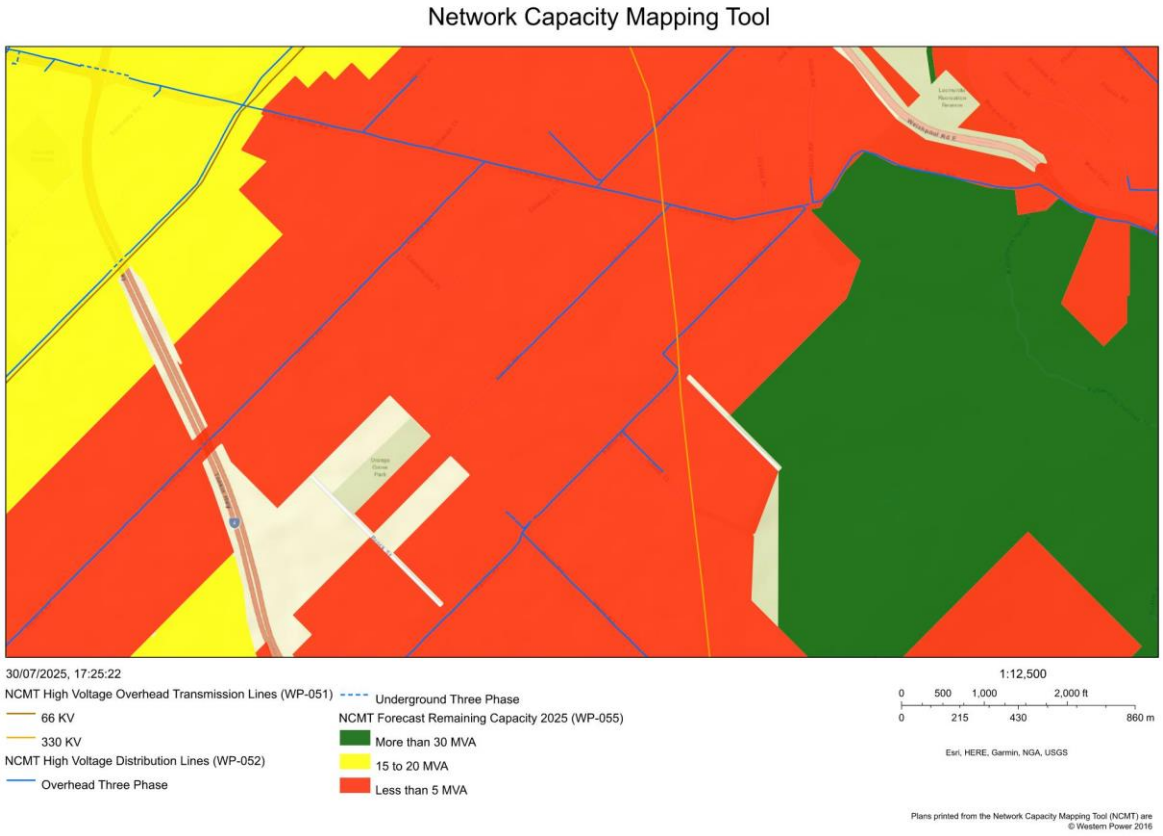

Figure 14 – Western Power Network Capacity 2025 (Western Power)

Within the development HV cables will connect to the switchgear and transformers which will function to reduce the voltage suitable for consumer usage. Generally, the switchgear and transformers would be in POS and green areas throughout the development, with a transformer and switchgear also likely to be located on the proposed school site. However, this is dependent on the staged layout for the development and will be determined during detail design.

Due to the presence of the Dampier Bunbury Natural Gas Pipeline (DBNGP) adjacent to Tonkin Highway and existing steel water mains, Earth Potential Rise (EPR) studies for any proposed transformer locations will likely be required.

Power will then be reticulated underground throughout the development. Low voltage (LV) feeders will extend from each transformer feeding the pillar units servicing each new lot. The provision of LV and HV interconnection to the adjoining development areas will also have to be catered for.

Street lighting will also be required as part of the development in accordance with Western Power and City of Kalamunda guidelines.

9 TELECOMMUNICATIONS

The site is within the NBN fibre network and NBN fixed line services are available within the site.

The existing road reserves within the study area contain NBN services and it is expected that the pit and pipe network would be extended through the site as part of the development. Alternative providers such as Opticomm, have advised that they can also provide communication services for any proposed development of the site.

10 GAS SUPPLY

10.1 ATCO Gas

There is no reticulated gas supply within the site or generally within the immediately adjacent area. However, an ATCO Gas high-pressure gas main is located in Welshpool Road East to the west of the site, terminating near the Lancelot Garden cul-de-sac, Wattle Grove. Welshpool Road East also contains a medium-pressure gas main that extends through the existing Wattle Grove residential development north of Welshpool Road East and west of Tonkin Highway.

In discussions with ATCO, a connection to and extension of the existing high-pressure main in Welshpool Road East could allow a reticulated gas network to be provided to the site.

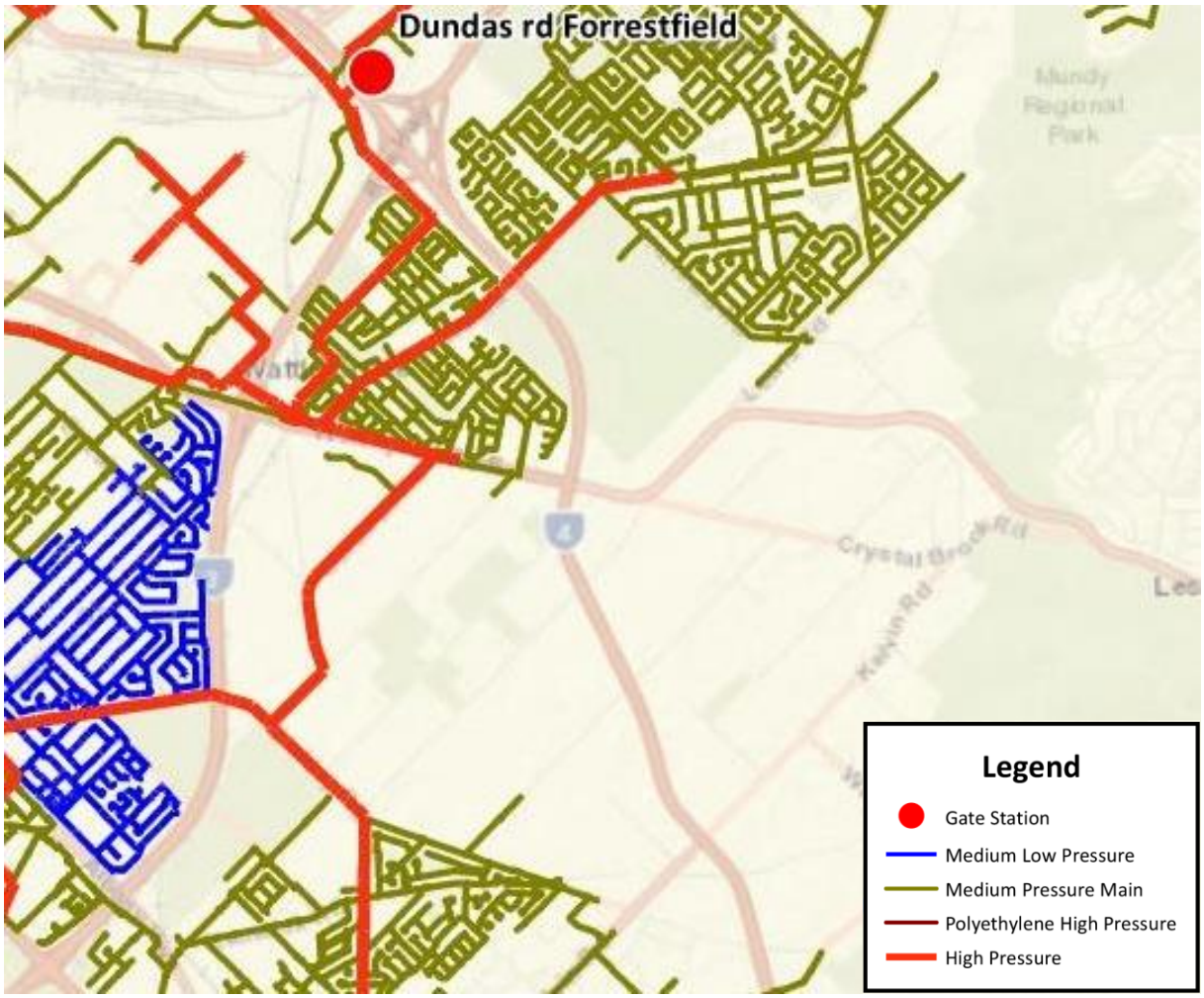

Figure 15 – Existing ATCO Gas Network, Wattle Grove (ATCO, 2025)

10.2 Dampier Bunbury Natural Gas Pipeline

There is an easement for the Dampier Bunbury Natural Gas Pipeline (DBNGP) immediately east of Tonkin Highway, adjacent to the site. The DBNGP corridor houses a major high-pressure gas pipeline that supplies natural gas to essential heavy and light industry, power generation and homes within Western Australia. The Department of Planning, Lands and Heritage (DPLH) manages the DBNGP corridor under the Dampier to Bunbury Pipeline Act 1997 (DBPA), on behalf of the DBNGP Land Access Minister.

Site planning and design should promote compatible uses, particularly public open space in the gas pipeline corridor/easements.

Roads and service crossings in the gas pipeline corridor/easements should be as close as practicable to perpendicular to the corridor/easements and may be approved subject to appropriate conditions recommended by the pipeline owners.

Several quantitative risk assessments of the DBNGP in the Perth metropolitan region have been undertaken and identify setback distances from the edge of the corridor/easements for sensitive developments as well as residential, commercial, and industrial development. The Australian Gas Infrastructure Group has advised that the DBNGP in this location is built to a residential (T1) standard and as such, the nominated setback distance for the section of the DBNGP adjacent to the site are:

Pipeline	Setback Distance		
	Sensitive	Residential	Industrial/ Commercial
DBNGP2 Between Muchea and Kwinana	90m	0m	0m

For proposals within the setback distances, a pipeline risk management plan will be required to demonstrate that the risk from the pipeline is within acceptable risk levels. The risk management plan may require a risk assessment, which is the responsibility of the applicant and must be undertaken in consultation with the pipeline owner.

11 CONCLUSION

Given the location, the Wattle Grove LSP area is strategically placed to accommodate urban development. The site is accessible from the existing road network and there are overall servicing strategies in place to allow the development of this landholding.

Based on the preliminary engineering servicing review, no engineering or servicing constraints to the development of the site have been identified.