



EAST WANNEROO PRECINCT 3

ENGINEERING SERVICING REPORT

March 2025

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APPENDIX A – EAST WANNEROO PRECINCT 3 LOCAL STRUCTURE PLAN

1. EXECUTIVE SUMMARY

This report has been prepared by Cossill & Webley (CW) for East Wanneroo Precinct 3. It summarises the results of a review of the engineering aspects which have informed and support the Local Structure Plan.

This report provides details on each major infrastructure type and a servicing strategy for the development of the precinct. The level of detail is preliminary, and acknowledges further work will be required as the planning for the precinct progresses and there is greater certainty on the proposed development.

The engineering review has covered siteworks, roadworks, stormwater drainage, sewerage, water supply and utility services.

The investigation has confirmed the land is capable of supporting the proposed development in accordance with the Local Structure Plan with a logical progressive extension of infrastructure and base capacity.

The existing ground conditions and past land uses will not limit the proposed development.

Road access to the development will be provided via existing roads which bound the Precinct.

Sewerage will be provided for the majority of the Precinct by constructing a permanent wastewater pump station on Elliot Road and supplemented by two temporary pump stations at low points on the eastern boundary, as development progresses.

There is adequate existing water infrastructure to service the Site.

Initial power supply can be provided by connection to the existing high voltage (HV) infrastructure in Elliot and Nicholas Roads. Western Power has advised that ultimately the East Wanneroo Precinct 3 residential development will require a new distribution feeder from the Wangara Substation, to provide the required capacity.

Telecommunications and gas are available from existing services on Lenore Road.

The investigations and preparation of this report is largely based on preliminary advice from the various service authorities. The information is current as of March 2025, and is subject to change as development progresses.

2. INTRODUCTION

This report has been prepared by Cossill & Webley Pty Ltd (CW) for the East Wanneroo Precinct 3 Local Structure Plan (LSP). It summarises the results of a review of the engineering aspects which have informed and support the Local Structure Plan and are related to the future servicing of the developed land.

The preparation of East Wanneroo Precinct 3 Local Structure Plan (LSP) has been carried out by a team of consultants, led by Burgess Design Group and covers an area of approximately 130.8 hectares. The East Wanneroo Precinct 3 LSP is presented in Appendix A for reference.

The East Wanneroo Precinct 3 area is identified by the red boundary presented below in Figure 1.

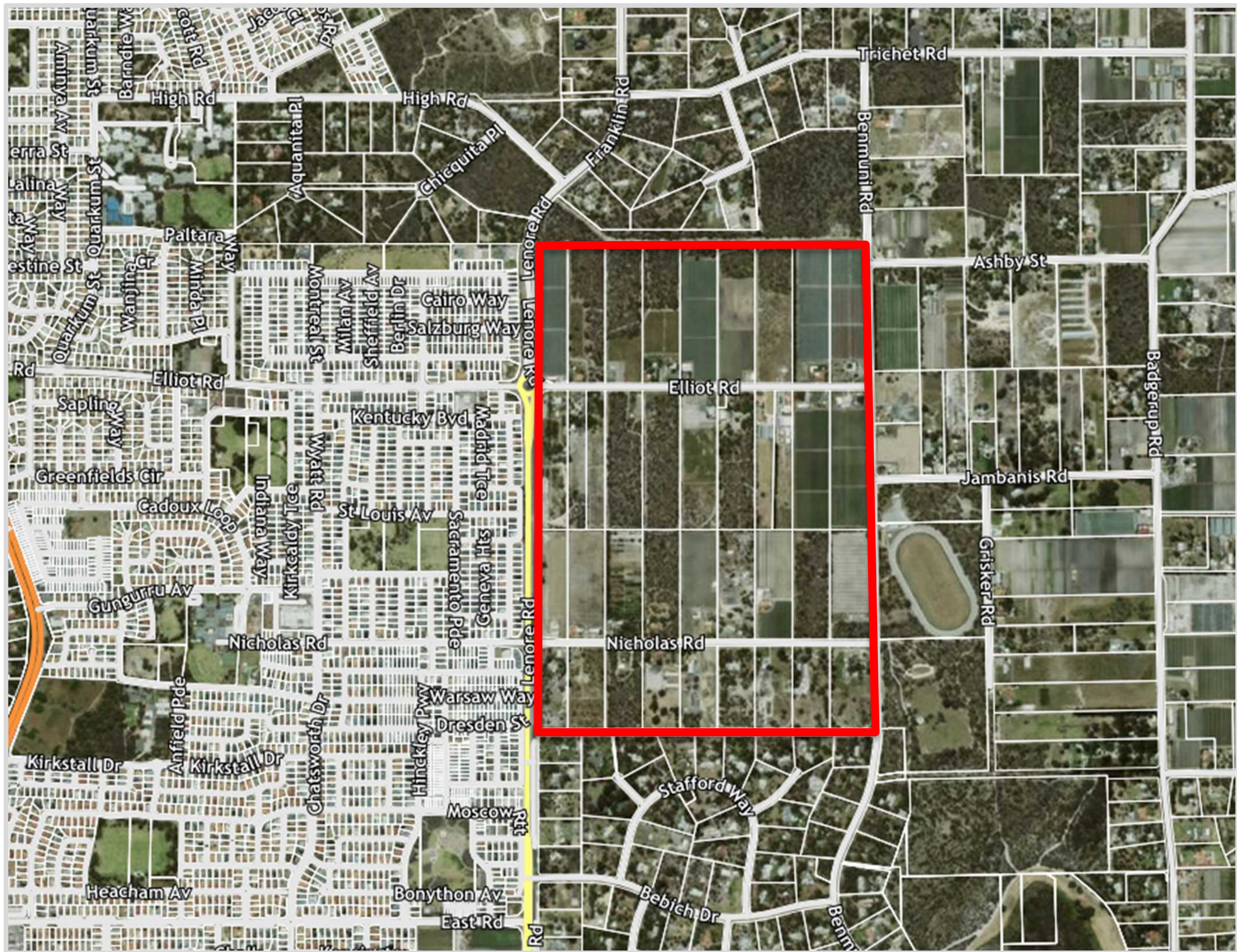


Figure 1 - Site Plan (MetroMap, December 2024)

3. SITE DESCRIPTION

East Wanneroo Precinct 3 is 130.76 hectares in area and is situated within the City of Wanneroo, approximately 25 kilometres north of the Perth city centre, and 11 kilometres east of the Joondalup city centre. The Site is bound by an undeveloped road reserve to the south, which is gazetted and to be named Shenton Road in the future, Lenore Road to the west, bushland and undeveloped access way to the north and Benmuni Road to the east.

As presented in Figure 1 above, majority of the site has been cleared historically, with portions of vegetation remaining on the Site. Approximately half the cleared area is market gardens, with the majority of the remainder being used for grazing, or laydown purposes.

3.1 Acid Sulphate Soils

A desk top review of the Department of Environment and Conservation’s ASS Risk Map for the Northern Metropolitan Region for potential for Acid Sulphate Soils (ASS) indicates the entire Site has no recorded risk of ASS. There is a pocket of land north of the northeast corner of the site which shows high to moderate risk occurring within 3m of the natural soil surface (or deeper) which may impact the development of a boundary road and services and treatment may be required in that area. Treatment of ASS soil and groundwater is a well known process and does not pose a significant cost or development risk.

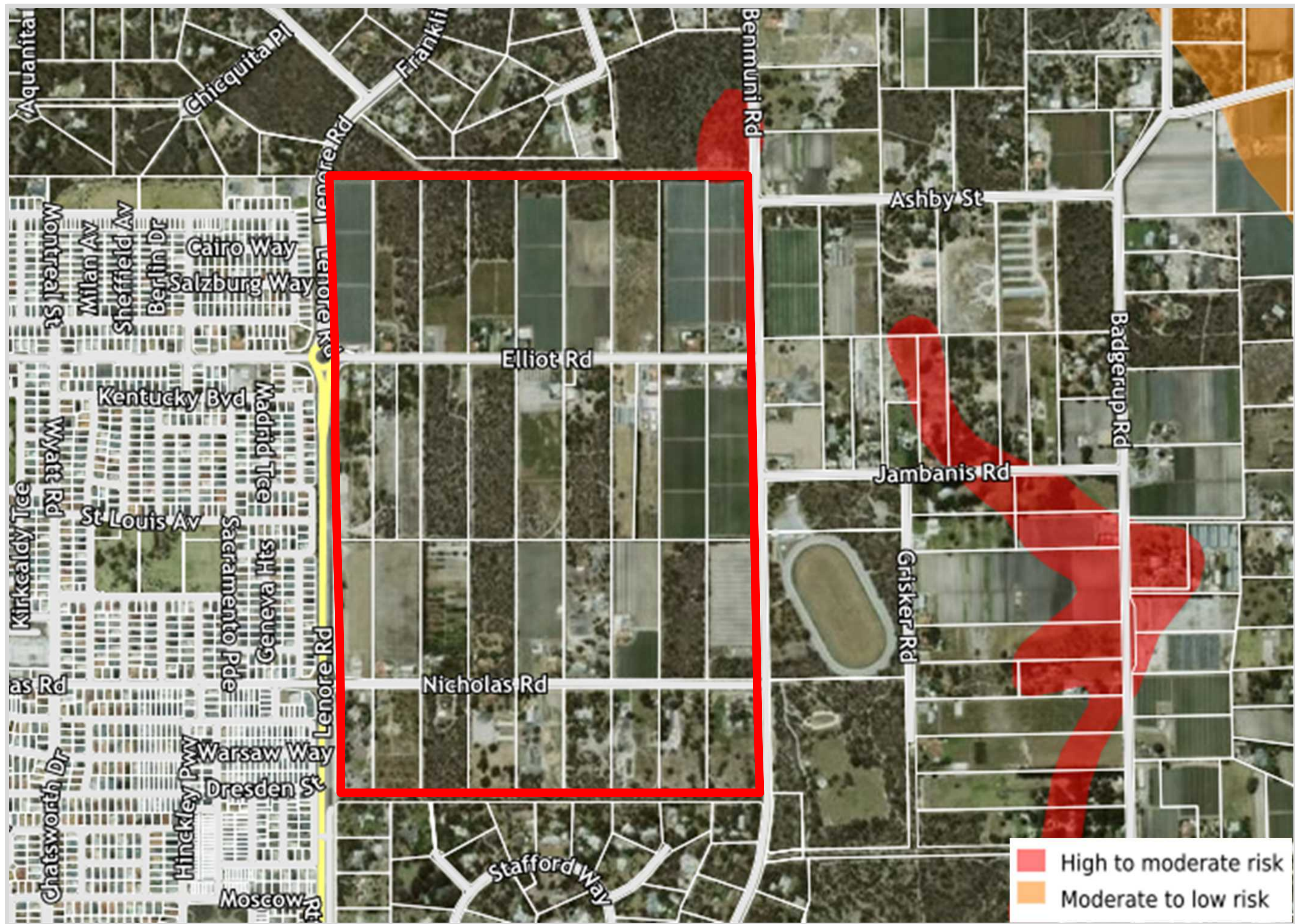


Figure 2 – Acid Sulfate Soils Risk Mapping (MNG Access, December 2024)

3.2 Existing Topography

The Site generally grades down from west to east, from RL86m AHD on the boundary in the vicinity of the intersection of Lenore Road and Nicholas Road, to RL51m AHD at the northeastern corner, and RL50m AHD at the southeastern corner of the Site. Figure 3 below shows the contours across the Site.

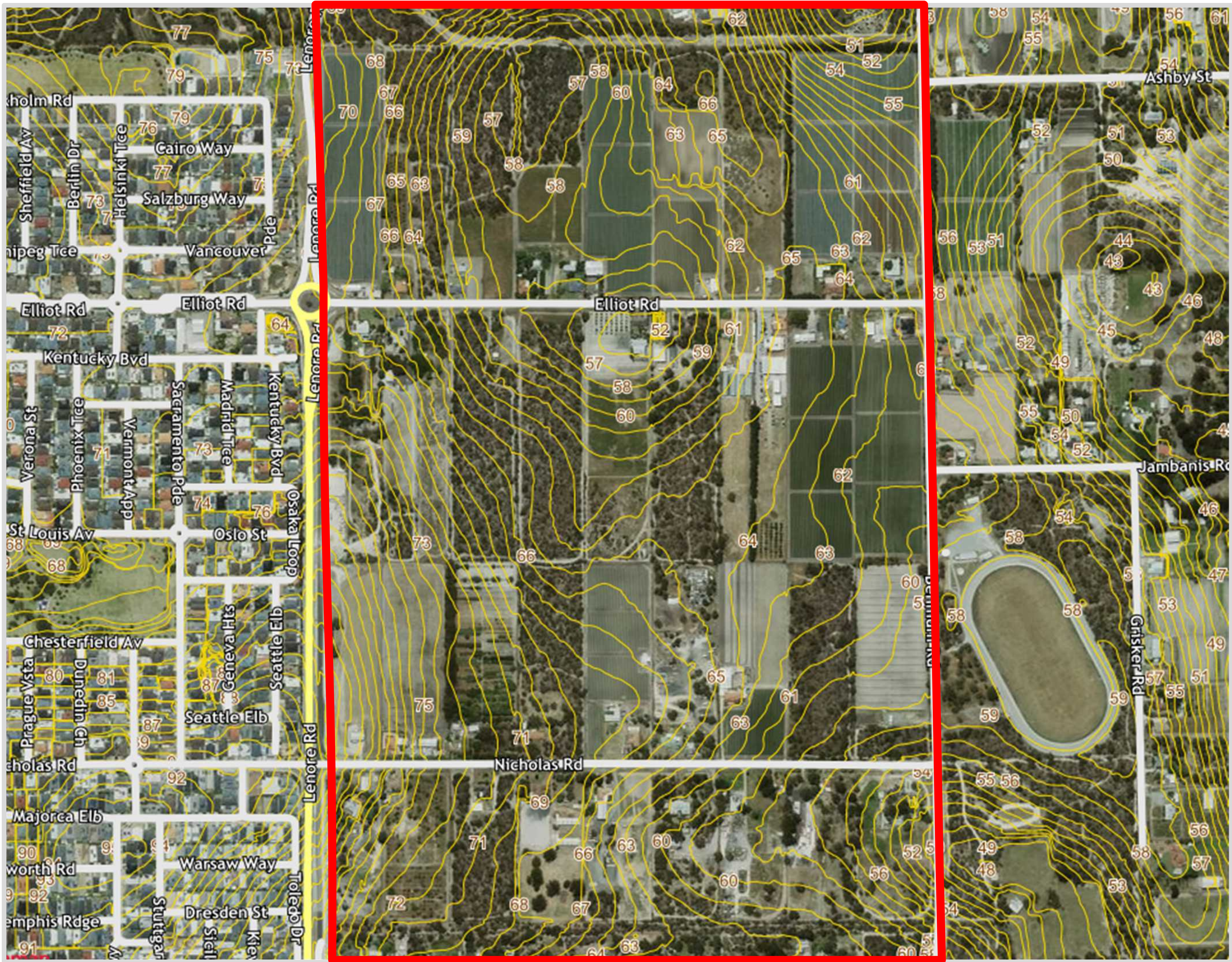


Figure 3 – Site Contours (MNG Maps, December 2024)

3.3 Geology and Landform

An excerpt from the Geological Survey of Western Australia Perth Metropolitan Region soils map for Perth (part 2034 III & 2134 III) is presented below in Figure 4. This indicates the site is underlain by sand (Tamala Limestone, S7) extending through the entire Site area, and is described as “pale and olive yellow, medium to coarse-grained, sub angular to sub-rounded, quartz, trace of feldspar, moderately sorted of residual origin”.

Sand derived from Tamala limestone is generally free draining, with medium permeability, and well-suited to development.



Figure 4 - Geotechnical Information (Geological Survey of WA)

Based on our experience on similar projects within the area, the Site is well suited for future development in terms of topography and geotechnical conditions and will provide a suitable foundation for roads, infrastructure and proposed development. It is anticipated an AS 2870 Classification of “Class A”. A geotechnical investigation will be required to confirm the classification.

3.4 Groundwater

A review of Groundwater mapping shows that the Site has good clearance to groundwater, with the minimum clearance being at least 5m at the Site low points on the eastern boundary.

4. SITEWORKS & EARTHWORKS

Siteworks and Earthworks for the Site will need to accommodate the existing topography, areas of vegetation identified for conservation, and several existing homesteads.

The principle of the earthworks design is to achieve positive outcomes, which include the following:

- Reduction in total home building cost.
- Rationalisation of retaining wall layouts, consistent with the City of Wanneroo specifications.
- Terrace lots up the natural slopes to maintain natural topography.
- Grading roads to follow the existing topography where possible, while catering for proposed gravity services and meet the standards of the required approval agencies.
- Accommodating drainage swales/basins in areas of local public open space.
- Matching existing levels of existing roads and homesteads, POS, and conservation bushland in the area.

The retention of homestead lots will influence the earthworks strategy, and accommodating their existing levels may not necessarily suit the most efficient subdivision earthworks design. This also applies to tying into existing ground levels along neighbouring boundaries of properties. Level differences will require walls, and approval from neighbouring landowners is required to build on the common boundary.

Siteworks and earthworks will generally consist of the following:

- Demolish buildings and hardstands.
- Remove trees including grubbing out roots and stumps.
- Strip the topsoil, all organic material, roots and other unsuitable or deleterious material from the Site. The history of market gardening within the Site may require a deeper than average top soil strip.
- Topsoil unsuitable for re-use may be retained for use on-site as non-structural fill (eg in planted areas outside building areas and sports ovals).
- Proof compact the exposed surface to achieve the level of compaction determined by a Geotechnical Engineer. If weak areas are identified during proof compaction, or the level of compaction is not achieved, further compaction or over-excavation and backfilling with compacted, approved fill of these zones will be required.
- Where fill is required to achieve the required levels, place and compact approved free draining granular fill.

5. DRAINAGE

5.1 Urban Water Management

Stormwater drainage management is a major component of an overall water strategy. Water Sensitive Urban Design (WSUD) techniques are incorporated during planning, design and construction of urban development projects to achieve the desired outcomes.

An Urban Water Management Plan will be required for the site, which will provide the following:

- Defines land area requirements for conveyance of flood flows and protection of future urban development from peak flood events.
- Proposes a drainage strategy appropriate for the local conditions, and outlines potential WSUD initiatives at the inter-allotment and POS scale. The location of areas within Public Open Space (POS) for the WWPS and drainage infrastructure will need to be considered in the subdivision design and POS calculations.
- Prescribes the design criteria for water quantity and quality for each sub-catchment.
- Outlines hydrologic and hydraulic framework parameters and develops the overall drainage network concept.
- Defines an implementation plan for the drainage design strategy.

5.2 Water Quality Management

The sandy soil on Site will allow for onsite storage and dissipation of stormwater. Recharge water quality will be improved through the adoption of 'Best Management Practices' which promote the disposal of runoff via water pollution control facilities (including vegetated swales and basins, detention storages and gross pollutant traps) and the implementation of non-structural source controls (including urban design, street sweeping, community education, low fertiliser landscaping regimes, etc)

5.3 Stormwater Collection and Disposal

Drainage from public roads and lanes would be collected via conventional pit and pipe systems. The drainage collection and conveyance system will be designed to cater for the runoff from storms with up to a 20% annual exceedance probability (AEP) event.

A series of detention basins would be designed to store runoff for the 20%, 10% and 1% AEP events. In all cases, roads and POS would be designed to cater for the surface overflow for more severe storms with building pad levels set at least 300 millimetres above the 1% AEP flood level in roadways and 500 millimetres above the 1% AEP flood level for storage detention basins.

The dispersion of stormwater disposal throughout the site (via soakwells, swales and basins) will maximise the area of recharge down through the soil profile to the shallow aquifer, thereby maximising the potential for nutrient stripping and water quality improvements. The basins will also assist nutrient removal in conjunction with other measures such as suitable vegetation planting and the use of modified soils with high phosphorous retention capacity.

Hyd2o has been engaged as the consulting hydrologist to prepare a Local Water Management Strategy. This includes the identification of drainage catchments and the location of proposed basins within POS areas.

6. ROADS

Lenore Road forms the western boundary of the Site and has direct connection to the Regional Road, Ocean Reef Road (the future Ocean Reef Upper Swan Highway) to the south. Lenore Road is a paved two-lane bidirectional road which is currently being upgraded to four lanes. It has been upgraded to an urban standard from the southern boundary of the Site to the Lenore Road/Elliott Road round-a-bout with kerbs, footpaths, drainage and line markings.

North of the round-a-bout, Lenore Road is constructed to a lower standard, with line markings, but without kerbs, footpaths or drainage.

It is expected that the existing roundabout at the Lenore Road/Elliott Road intersection will ultimately need to be upgraded to accommodate the wider road reserve on Elliott Road.

At the time of writing this report, the intersection of Lenore Road and Nicholas Road is being upgraded.

Benmuni Road on the eastern boundary is a paved two-lane bidirectional road constructed to a rural standard, and is currently classified as a 'Local Distributor'. Benmuni Road will need to be upgraded to a 'Neighbourhood Connector Type A' boulevard road, with a median strip, kerbs, footpaths, drainage and line markings. Round-a-bouts are expected to be required at the Benmuni Road, Ashley St and Nicholas Road intersections.

6.1 Internal Roads and Footpaths

The LSP comprises a network of development roads including neighbourhood connectors and local access roads.

The main internal road within East Wanneroo Precinct 3 will be Elliott Road, which bisects the Site, east to west connecting Lenore and Benmuni Roads. Elliott Road will need to be upgraded to a 45m wide road reserve to accommodate future traffic and public transport needs. There are several existing homesteads abutting Elliott Road, which impact the road layout, creating a slight meandering of the road. The specific cross section of the road reserve will be resolved as the planning process progresses. Elliott Road is expected to be funded as a District DCP item.

Nicholas Road, which crosses Site from east to west, will provide a secondary entrance, and will need to be upgraded to a 'Neighbourhood Connector Road Type B'. The tee intersection with Lenore Road is currently being constructed and will facilitate full movement, with the exception of the western leg which is left-in-left-out only.

A north-south Neighbourhood Connector road will connect Elliott Road to Nicholas Road through the centre of the development.

Lower order roads will connect to the main east-west roads to provide access to land uses.

In all cases the road cross-sections will be designed to cater for utility services on standard verge alignments, street trees, parking embayments where appropriate, off-street and on-street cycling lanes in accordance with the overall pedestrian and cycling network.

The engineering design of roads will be carried out to comply with the Department of Planning's Liveable Neighbourhoods recommendations for design speeds and sight distances and with the requirements of the City of Wanneroo. We anticipate roadworks will generally consist of kerbed and asphalted pavements.

Footpaths will be provided in accordance with Liveable Neighbourhoods and the City of Wanneroo standards.

6.2 Public Transport

The Site is immediately east of Lenore Road Transit Link, which is anticipated to have exclusive bus lanes constructed within the road reserve in the future, as East Wanneroo is developed. An existing bus route on Chatsworth Drive is available, which is within 650m of Site.

7. WASTEWATER

The Water Corporation has provided advice regarding provision of Wastewater to the Site confirming a permanent wastewater pump station (WWPS) is required adjacent to Elliot Road at the low point, known as Jandabup Pump Station S. This pump station is part of the Jandabup Sewer District Plan, as shown in Figure 5. This permanent WWPS will service a significant portion of Precinct 3 and in the ultimate sense will likely discharge via a pressure main and gravity sewer to the south of Ocean Reef Road once the area is more fully developed. The area that can be served by the Jandabup Pump Station S is outlined by the light green line below, and comprises approximately half of the LSP area in the north-west.

The Water Corporation has indicated that Jandabup WWPS S can discharge into the existing DN305 sewer near the intersection of Prindiville Drive and Hartman Drive south of the development, south of Ocean Reef Road. The alignment of the pressure main is yet to be determined, and will be progressed as development occurs. CW understands the permanent Jandabup WWPS S will be funded by the Water Corporation, although it is not currently on Water Corporation's Capital Investment Program.

The remainder of the site does not fall into the catchment for Jandabup WWPS S and in the ultimate sense is reliant on downstream gravity sewer being constructed by others. The timing of this downstream infrastructure is unknown, and likely to be after development of Precinct 3 has occurred. In this scenario two temporary WWPS will be required in order to serve the balance of the LSP area. The most efficient locations for the WWPS is in the north-east and south-east corners at natural low points as noted below. The discharge for these temporary WWPS is dependent on available sewer infrastructure at the time. The temporary WWPS and pressure mains are likely to be at the Developer's cost.

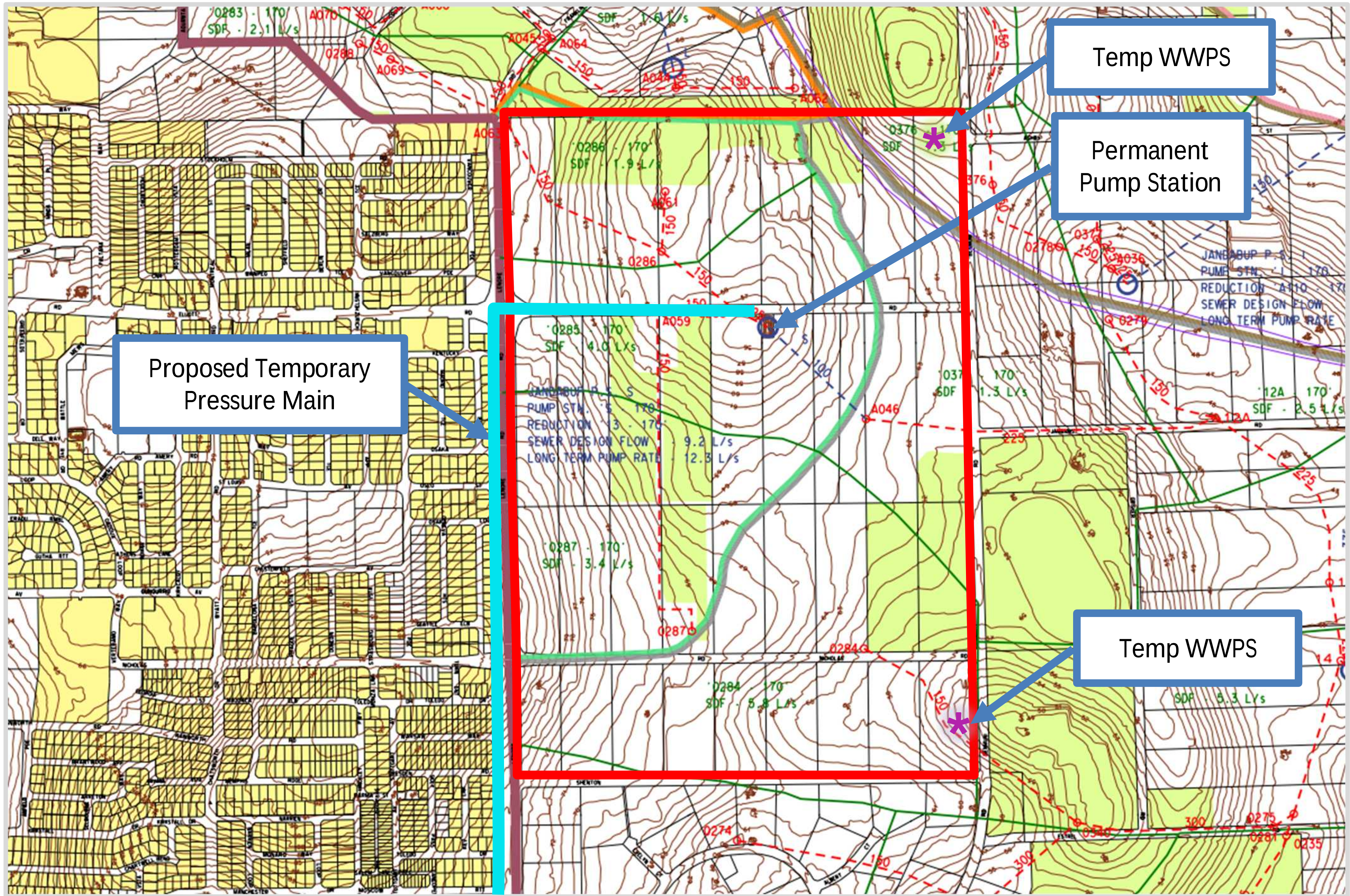


Figure 5 - Conceptual Long Term Wastewater Scheme Planning - Overview (Water Corporation, 2020)

8. WATER RETICULATION

The Site has existing water infrastructure available for connection, as depicted in Figure 6. There is a 610mm steel distribution pipe in the western verge of Lenore Road and a 300mm distribution main in Benmuni Road. In addition, there is a 100mm main in Nicholas Road.

The Water Corporation has advised that the initial frontal stages of East Wanneroo Precinct 3 can be serviced via an extension of reticulation mains from Lenore Road. However, future areas and some areas of elevated land will need to be serviced by extension off the high-level mains. The extent of these areas is not yet confirmed, and The Water Corporation will confirm this at a later stage of the development process.

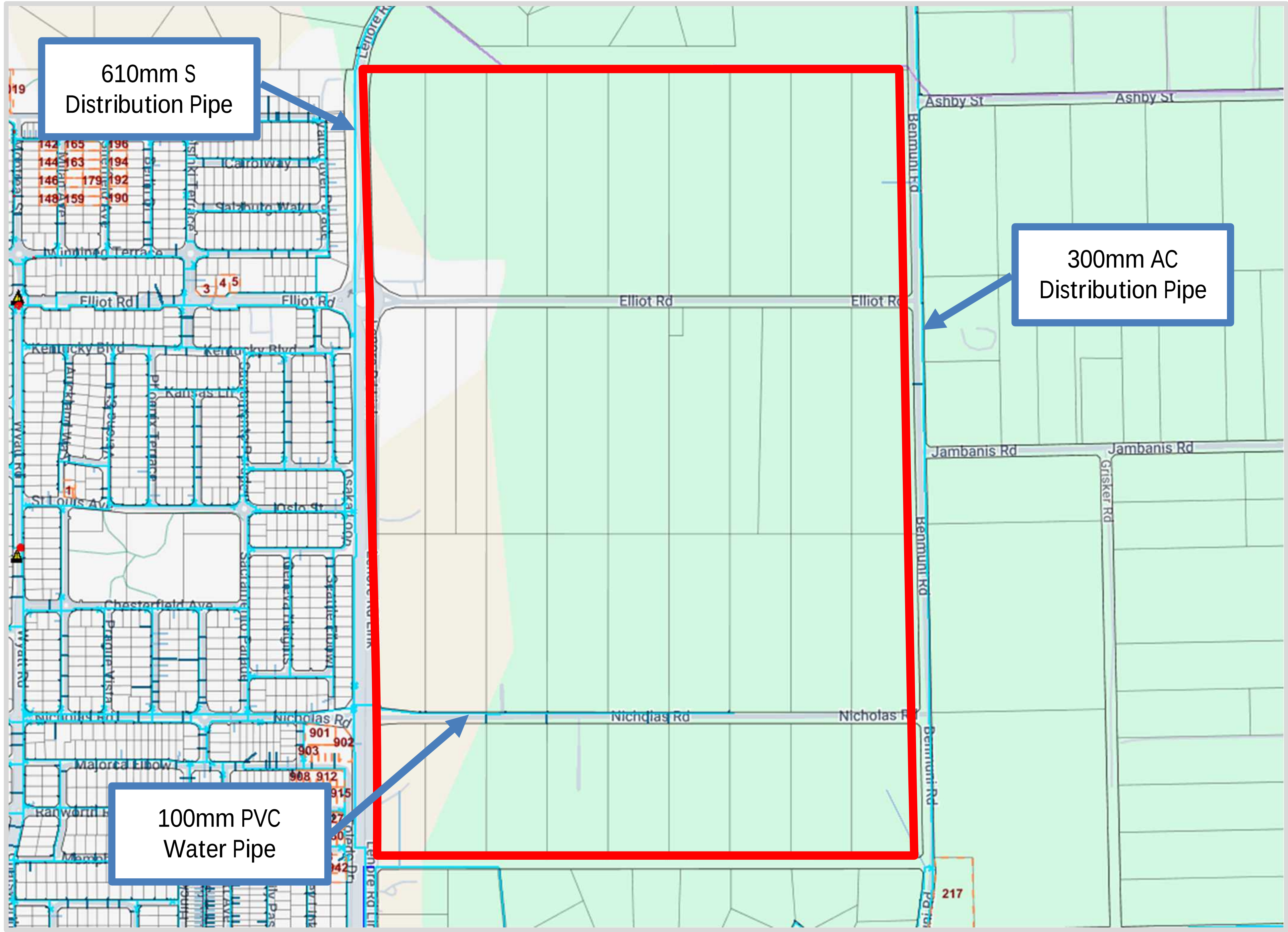


Figure 6 – Water Reticulation Infrastructure (Water Corporation Esinet, Dec 2024)

9. GAS SUPPLY

There are existing DN160, DN110 and DN63 high pressure steel gas mains located in various segments of Lenore Road adjacent to the Site. The DN160 stub at the intersection of Elliot Road and Lenore Road likely can be extended to service the development. Confirmation of gas capacity from ATCO will be required.

10. POWER SUPPLY

Western Power’s Network Mapping Tool confirms there is currently limited spare electricity capacity in the East Wanneroo corridor, and a high voltage feeder to the Wangara substation to the west will ultimately be required to increase capacity to service the Site. Based on R20-R40 zoning, the Site is expected to require approximately 7.9MVA.

There are existing high voltage overhead power lines in Elliot Road, Nicholas Road and Benmuni Road. The lines on Elliot Road and Nicholas Road have been undergrounded under Lenore Road on the western boundary. The remaining overhead lines on Elliot Road and Nicholas Road will require undergrounding. Existing power is shown in Figure 7.

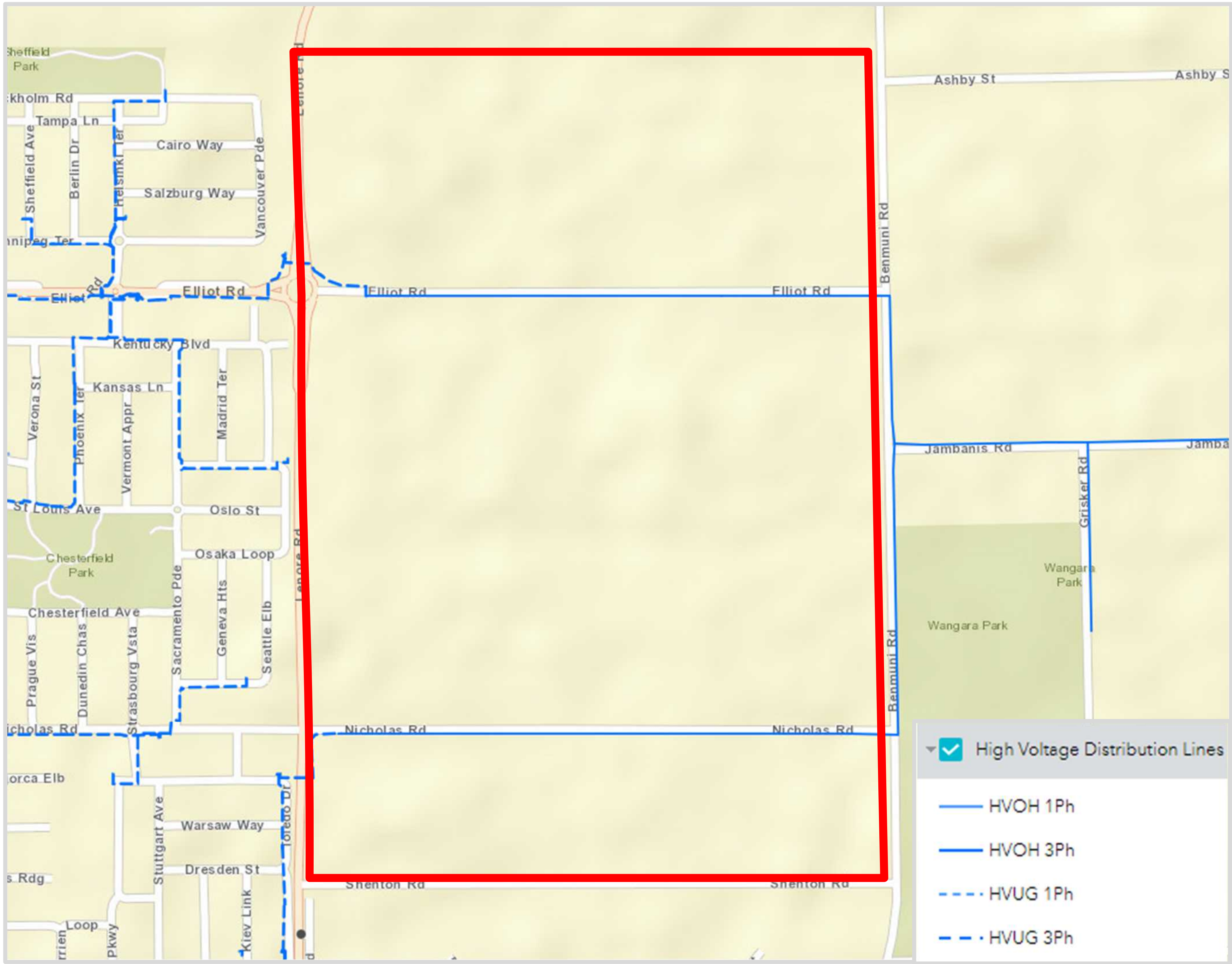


Figure 7 – Existing Power Network (Western Power, 2024)

11. TELECOMMUNICATIONS

The Site is within NBN's fixed line footprint, and can be serviced with optic fibre via a headworks extension from their existing network. There are existing NBN pit and pipe services within Lenore Road, Nicholas Road, Elliot Road, and Benmuni Road that can serve as connections. Some lot connections will require removal by NBN to allow for subdivision.

The current design practice for road reserves, pavement and verge provisions will make adequate allowance for services including broadband in accordance with the agreed Utilities Service Providers handbook. There will be some local land requirements for telecommunications equipment sites which will be accommodated at detailed subdivision stage.

12. CONCLUSION

The Site is well suited for the proposed development outlined in the Local Structure Plan.

The ground conditions are suitable for the proposed development, and will likely achieve a Class A classification.

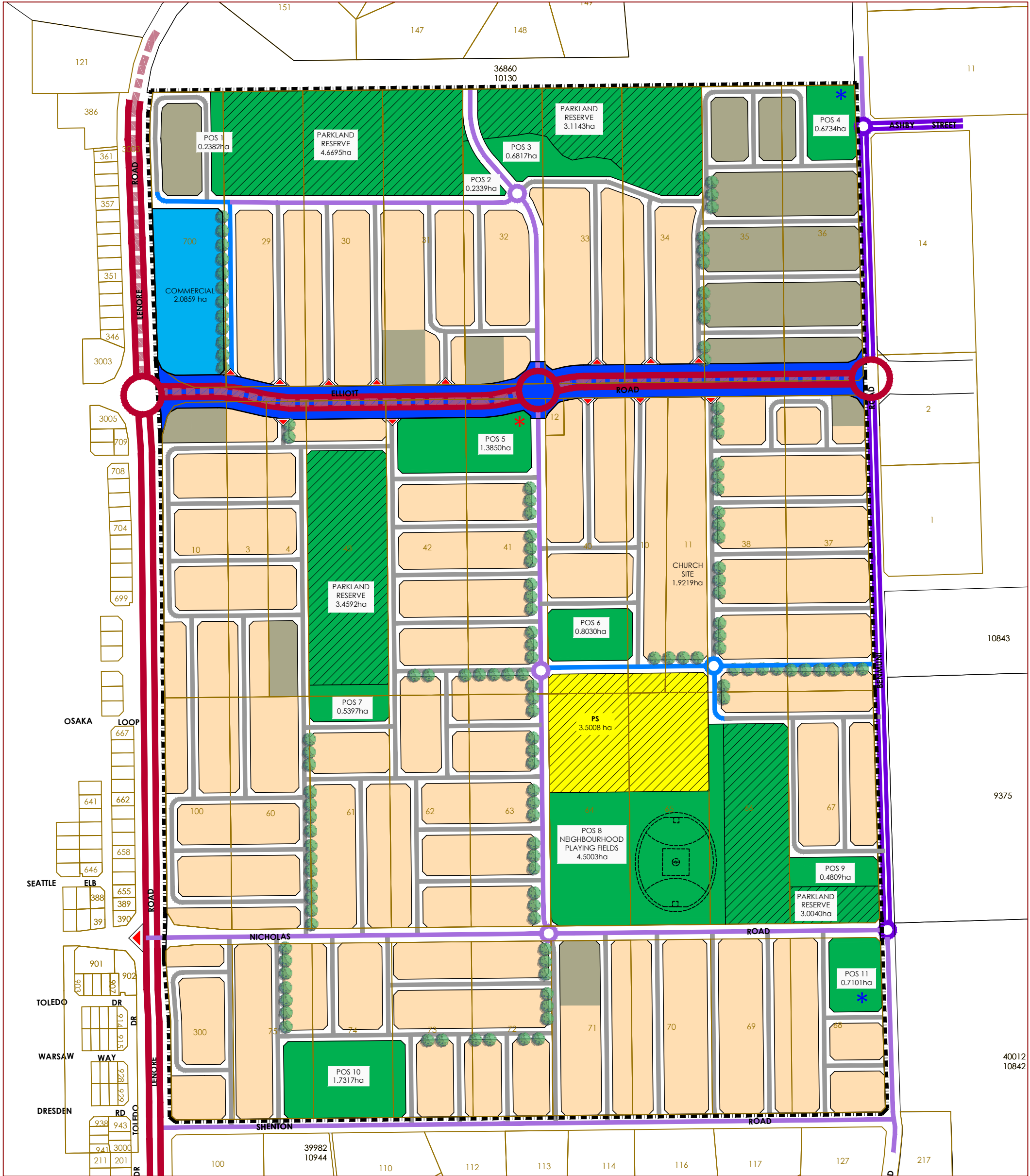
The drainage concept is likely to be straight forward, as there is permeable soil and good clearance to groundwater.

There are known sewer and water strategies to support the development, and the Water Corporation will further progress the sewer supply strategy as the planning becomes more certain.

Power can be connected to the Site, and development can begin to the extent that power capacity is available for initial stages.

APPENDIX A

EAST WANNEROO PRECINCT 3 LOCAL STRUCTURE PLAN



LEGEND

STRUCTURE PLAN AREA

MRS RESERVES

PARKS AND RECREATION

LOCAL SCHEME

RESIDENTIAL R30-R60*

RESIDENTIAL R40-R80

PUBLIC OPEN SPACE

PUBLIC PURPOSES - PRIMARY SCHOOL

PERMANENT WWS

TEMPORARY WWS

COMMERCIAL

MOVEMENT NETWORK

TRANSPORT CORRIDOR (45m)

INTEGRATOR A (35m)

NEIGHBOURHOOD CONNECTOR A (25m)

NEIGHBOURHOOD CONNECTOR B (20m)

ACCESS STREET B (17.9m)

ACCESS STREET D (15.4m**)

ROUNDABOUT INTERSECTION***

LEFT IN/LEFT OUT INTERSECTION***

OTHER

GREEN STREET*

NOTES:

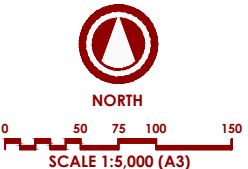
*REFER TO STRUCTURE PLAN REPORT FOR DETAIL.

**MAY BE REDUCED TO 13m ADJACENT TO PUBLIC OPEN SPACE (EXCLUDING AREAS IDENTIFIED FOR CONSERVATION PURPOSES), OR 10m WHERE USED AS A CONTROLLED ACCESS PLACE.

***ALL OTHER INTERSECTIONS TO BE PRIORITY CONTROLLED.



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LOCAL STRUCTURE PLAN
EAST WANNEROO PRECINCT 3
WANNEROO
CITY OF WANNEROO

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