TABEC
Civil Engineering Consultants

POINT GREY DEVELOPMENT COMPANY

POINT GREY STRUCTURE PLAN

Engineering Infrastructure Report

JULY 2024

CLIENT: POINT GREY DEVELOPMENT COMPANY

PROJECT: 2222 – POINT GREY STRUCTURE PLAN

TITLE: ENGINEERING INFRASTRUCTURE REPORT

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1 INTRODUCTION

Point Grey Development Company (PGDC) is proposing to develop their Point Grey landholding into a mixed use residential development incorporating a Village Centre and surrounding residential development.

The Village Centre is located in an area formerly shown as a Marina in previous versions of Point Grey Outline Development Plan. As well as removing the previously shown Marina, the revised Masterplan addresses coastal hazard risk by ensuring the footprint for critical infrastructure is located land side of the potential 2120 hazard risk line with appropriate buffer.

The revised Masterplan, prepared by Hatch, is shown below.

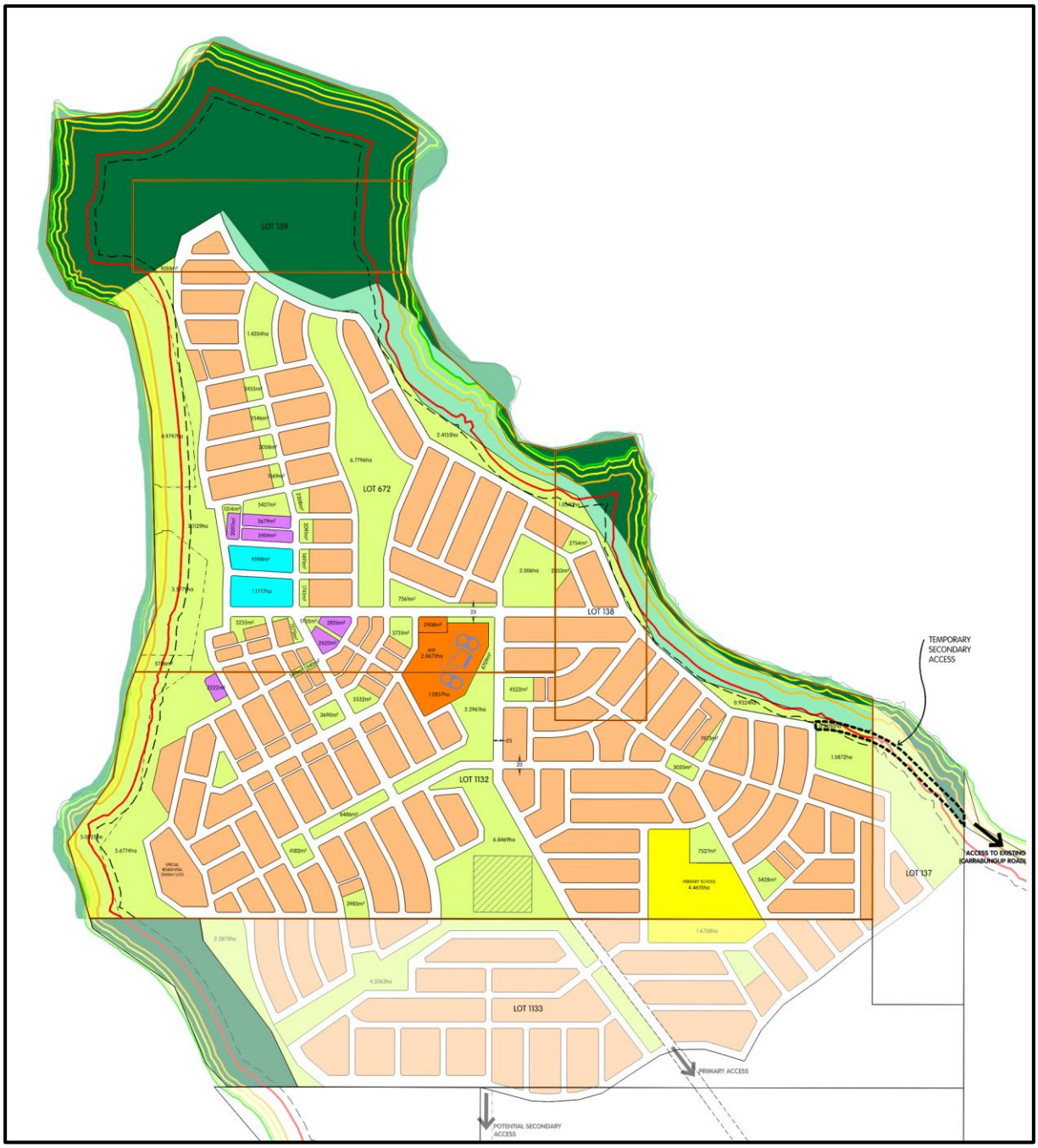

Figure 1 – Masterplan Concept (Hatch, June 2024).

This report focuses on engineering and servicing considerations for the Structure Plan area. An important consideration for the plan is in its implementation and this report will demonstrate that a staged approach will be required as demand for services evolve over the life of the project.

The information provided in this report is current as of July 2024 and is subject to change as development proceeds around the site and surrounding area.

2 THE SITE

2.1 Site Description

The approximately 276ha total PGDC landholding is located about 14km by road, west of Forrest Highway in Shire of Murray and is bordered by Harvey Estuary to the west and Peel Inlet to the north and east.

The historical use of the site is for cattle crazing and as such, much of the site has been cleared of vegetation. At the time of writing, there are still cattle grazing on the property.

Improvements on the property include rural fencing and three sheds located in the eastern portion of the site that are used to support the grazing activity.

In 2011, in anticipation of the following subdivision works, the initial stages of the water and wastewater treatment facility were constructed. This comprises an approximate 1,100 square metre building that will house the proposed water treatment equipment.

2.2 Landform / Topography

Despite the rural activity on the site over many years, the site retains its natural topography, in all areas except the aforementioned water treatment facility building.

There is up to 25m change in elevation across the site with gradients ranging from 1 in 100 up to 1 in 10. The sites highest elevations are shown in green and yellow in the image below.

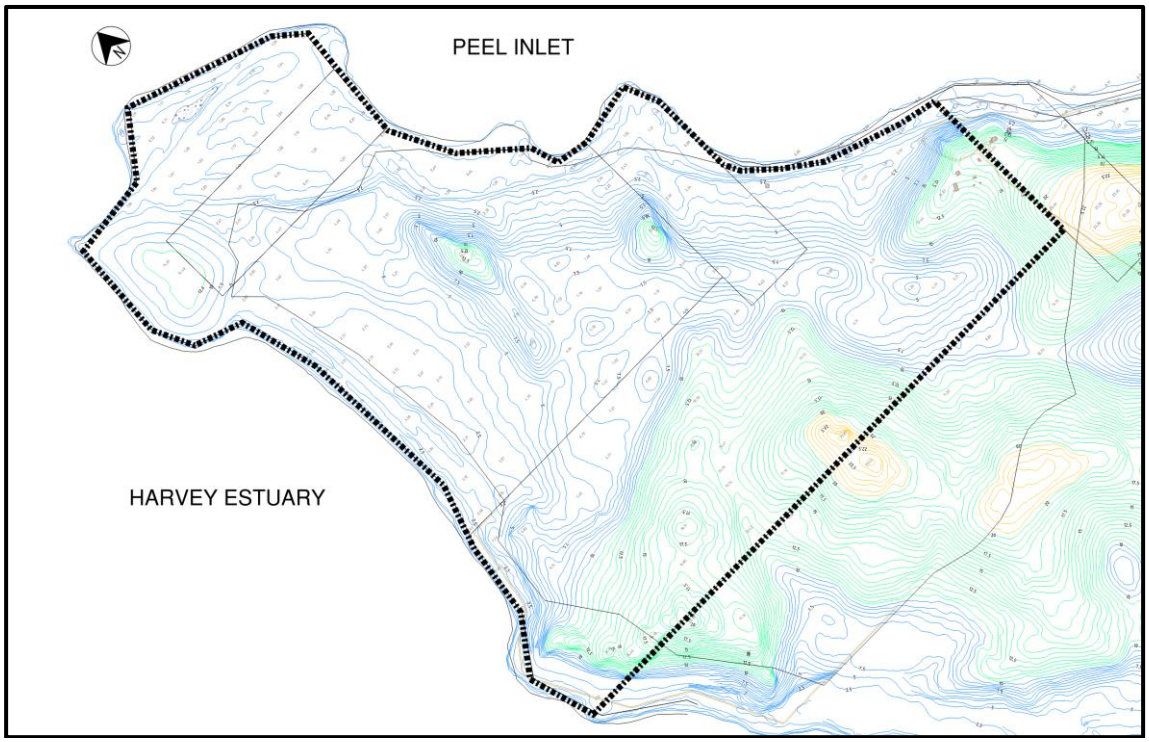

Figure 2 – Topographic Survey (MNG)

2.3 Ground Conditions

A preliminary geotechnical investigation was undertaken by Golder Associates in November 2007. The investigation was carried out by a backhoe, excavating test pits to a depth of around 3.0m. In total, the investigation comprised the excavation of 42 test pits across the full site.

Based on the depth of investigation, the site predominantly comprises sandy soils, with the following exceptions.

A number of limestone rock outcrops exist in some of the areas of the site which are above around 5.0m AHD. By area, these rock outcrops amount to about 12% to 15% of the total project area.

One test pit, located in the eastern margin of the site, indicated a thin layer of clayey sand at a depth of 2.2m from the natural surface. This layer likely won't be intercepted by future construction works as it sits at a level that will ultimately be 3 to 4m below the future development level in that area.

Groundwater encountered during the investigation indicated a level that is equivalent to the water level in the surrounding waterbody which is expected in a sand / limestone site with around 60% of it's boundary as a tidal waterbody.

The earlier investigations for the site included soil permeability testing at 13 different locations around the site. Measured soil permeability ranges from a minimum of 5.3 metres per day up to 40.3 metres per day. The lowest permeability measured were along the eastern foreshore in areas where the elevation is less than 2.0m AHD.

The abovementioned geotechnical investigations did not raise any concerns regarding the suitability of the site for future development.

2.4 Acid Sulfate Soils

A review of the DWER Acid Sulfate Soils (ASS) mapping indicates that Peel Inlet and Harvey Estuary abutting the site are in a high risk area. The areas of the site, generally lower than the 2.0m AHD to 2.5mAHD contour are classified as a moderate risk and the higher, more central portion of the site are in an area as having "no known risk" of ASS.

All works will therefore be required to be undertaken in accordance with an Acid Sulfate Soils and Dewatering Management Strategy (ASSDMS). These measures can include design that avoids where possible, the requirement to excavate soils within areas of potential ASS, and treatment of ASS by lime dosing of the like in areas where avoidance cannot occur, eg gravity sewer and the like.

3 SITEWORKS AND EARTHWORKS

Siteworks to support urban development will generally comprise the selective clearing of existing vegetation, stripping of topsoil, earthworking of the existing ground surface, compaction to areas of existing fill and import of a sand topping to facilitate the proposed form of development.

Careful consideration has been given to the location of POS within the structure plan to ensure that retained vegetation within POS is able to be retained along side development areas that have gradients suitable for residential development.

Initial earthworks modelling has been undertaken which demonstrates that the abovementioned objectives can be achieved within a development form where maximum gradients are 1 in 20 or less. Importantly, existing landform is retained within larger POS aside from some interface battering / shaping at POS margins.

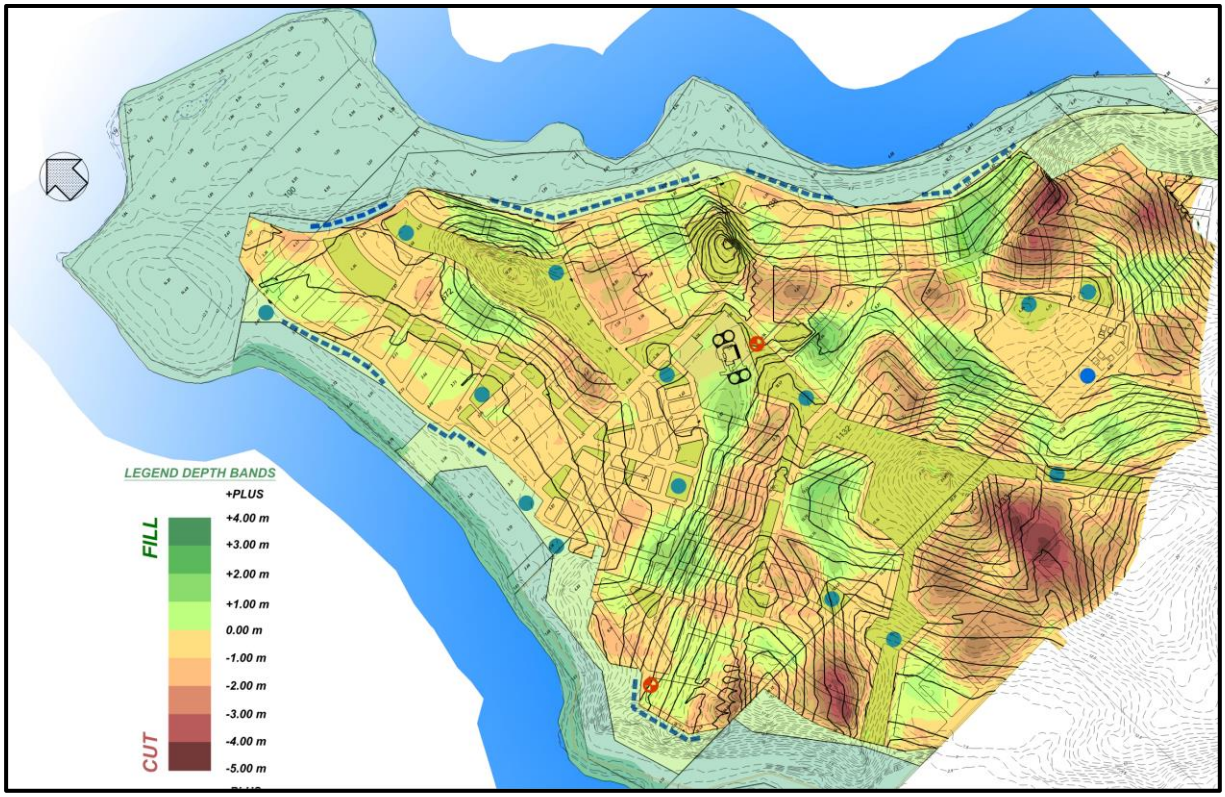

Figure 3 – Proposed earthworks – Depth of cut and fill (TABEC June 2024)

Detailed earthworks design will be undertaken on a staged basis as the project progresses through various stages of subdivision works.

4 ROADS AND TRAFFIC

Significant but likely staged upgrades of the current alignment of road access to the site will be required. This present alignment from the Forrest Highway to Point Grey follows Greenlands Road and Carrabungup Road. The upgrades would include reconstruction and pavement widening and as required, flattening the radii of certain sharp bends to cater for a 90kmh sign post design speed and/or reduced speed limit in areas design to accommodate the higher speed cannot be achieved until such time as the projected daily traffic warrants the upgrade.

Previous versions of the structure provided for significant volumes of traffic accessing the then proposed marina and boat launching facilities. As these facilities are no longer contemplated, the growth in traffic to Point Grey will be more gradual, and this further supports a staged approach to external road upgrades.

External roadworks will require fill from site to raise pavement levels in locations. Much of this fill is sourced from within the Point Grey development area and the concept earthworks contours shown above reflect this requirement.

To satisfy bushfire planning requirements, a secondary emergency egress route from the site is required. This route will in part require some offsite upgrades within existing road reserves to ensure that the egress meets the requirements of bushfire planning.

Within the structure plan area, the roads will be developed with an urban form with asphalt wearing course and concrete kerbing in accordance with Shire of Murray (IPWEA) guidelines.

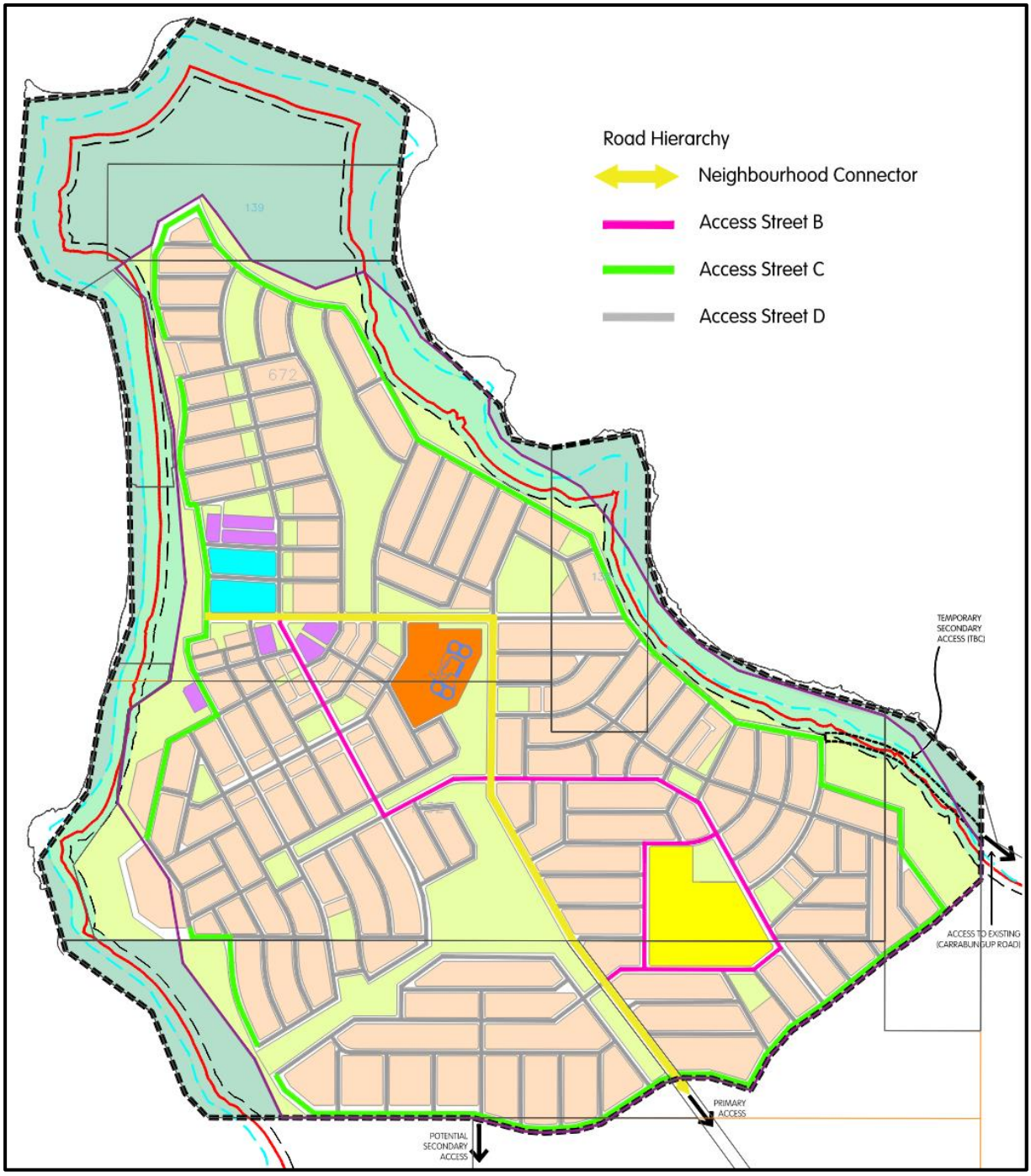

Figure 4 – Proposed road network (Hatch, June 2024)

Complementing the motor vehicle movements will be a network of footpaths for pedestrians. All footpaths and shared paths will be designed and constructed in accordance with Shire of Murray (IPWEA) guidelines.

5 STORMWATER MANAGEMENT

As part of the earlier Outline Development Plan approval for the project, a Local Water Management Strategy (LWMS) was prepared by RPS in 2011. To support the 2024 Structure Plan an LWMS

addendum has been prepared by Emerge Associates. Notwithstanding that the reference to a marina has been has been removed, the LWMS does not alter the principles outlined in the LWMS.

These principles involve collection of stormwater from road reserves in a network of pits and pipes, and conveying that stormwater to one of a number of bio-retention basins or swales located in POS around the site. The LWMS provided sizing of basins and swales that are appropriate to the catchment area and the hydraulic conductivity of the soils at the basin location.

A key principle of the LWMS is that there will be no direct discharge from roads or development lots into the surrounding foreshore.

The LWMS forms a framework for future design of the drainage system for the development, and at that time Urban Water Management Plans will be prepared in accordance with Department of Water requirements, to support the detailed design submissions.

The plan below shows the major and minor drainage catchments from the LWMS Addendum. Catchments are reflective of the different land ownership within the structure plan area to ensure that each can develop independently of one another.

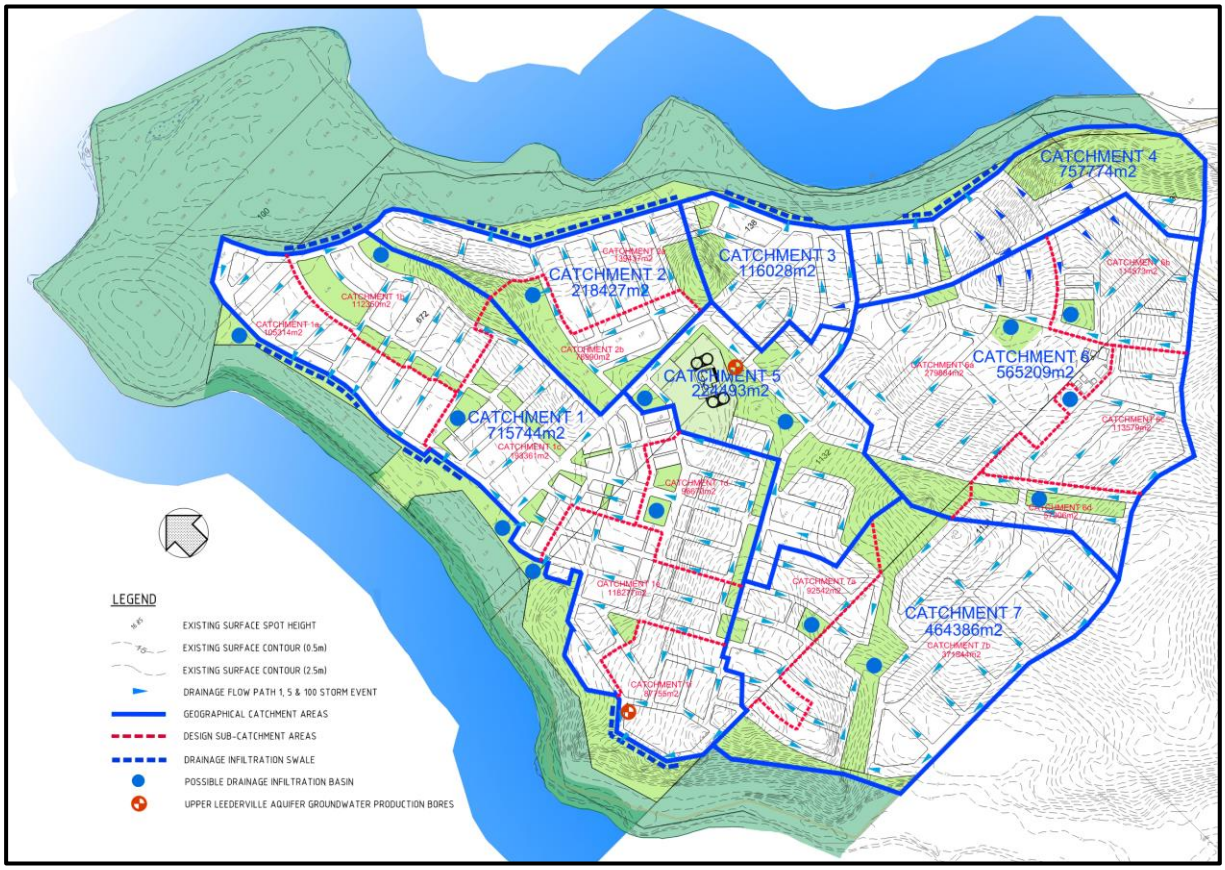

Figure 5 – Local Water Management Strategy – Catchment Plan (TABEC, 2024)

The Structure Plan has provided consideration to stormwater drainage detention and infiltration through the strategically located areas of Public Open Space, primarily located at the lowest portions of the relevant catchment.

While all permanent infiltration basins are planned to be located within POS, the staged nature of development may require some temporary basins to be constructed within areas of future road reserve.

From a stormwater drainage perspective, sufficient land has been provided within the structure plan to accommodate drainage requirements.

6 WATER SUPPLY AND WASTEWATER

PGCD through associated company, Peel Water have been granted a licence by the Economic Regulatory Authority to operate a water supply and wastewater scheme at Point Grey. This approach was taken as the nearest Water Corporation water supply and wastewater assets are located some 25km from the site.

In 2011, PGDC commenced installation of the water treatment system by constructing the earthworks, building and partial fit out. This facility is located to the east of the village centre.

As part of the implementation of development at Point Grey, construction of the remainder of the treatment facility works will need to be completed in a staged manner in order to supply potable water to the development, in addition to treating effluent. The staging will ensure that infrastructure installed does not reach it's service life before it is actually required.

To ensure continuity of supply, the treatment facility will include redundancy in it's power supply system, such as generators or the like.

The water supply network throughout the development will be designed to a standard that is consistent with Water Corporation criteria that is commonplace throughout Western Australia. The supply network will be designed to meet or exceed minimum working pressure requirements and will be rolled out on a staged basis.

This network will include fire hydrants installed throughout the development at a spacing of no greater than 200m which is in accordance with FESA requirements.

The wastewater conveyance network will comprise a network of gravity pipes that will ultimately discharge to one of four sewer pumping stations located around the development. Each of these pump stations will pump the effluent to the water facility for treatment.

Maintenance of the water supply and wastewater system will be undertaken by Peel Water, with funds raised through an annual levy for consumers in addition to consumption charges for potable water supply. The annual levy will be similar to the rate system that Water Corporation use for properties within their own licence areas.

Based on the above, the water supply and wastewater system can adequately address the development requirements within the structure plan area.

7 POWER SUPPLY

At the present time, there is a 10kVa, low voltage power supply servicing the property. This supply as it currently stands, is insufficient to support development on the property. The nearest point of power supply that would be sufficient to service early stages of development is located on Greenlands Road, approximately 200m east of March Road which is approximately 15km from the Point Grey site.

However, as the initial demand for power at Point Grey will be relatively low, it is intended that alternative power supply options will be utilised in the first instance. This could include solar power and a battery storage system with a diesel or gas powered generator backup. It would be intended

that the battery and generator backup would be co-located with the water and wastewater treatment facility.

As the power demand increases as the development proceeds over time, a High Voltage feeder line from the location at Greenlands Road outlined above would be constructed. Further on in the project life, and as the demand for power increases, a secondary feeder, from the Pinjarra zone substation would be required to service the development.

Regardless of the above, the power supply system will respond to, rather than influence the design of the structure plan.

8 TELECOMMUNICATIONS

In 2011, then owner of PGDC entered into an agreement with NBNCo for the provision of telecommunications infrastructure for the development. A requirement of NBNCo is that PGDC install a network of pipes and pits within future road reserves within the development to enable NBNCo to populate the network with their fibre infrastructure.

In the same manner as other services, the telecommunications system will respond to, rather than influence the design of subdivision within the Structure Plan area.

9 GAS SUPPLY

In 2010, Kleenheat Gas provided an offer to PGDC to enter into an agreement for the supply of Liquefied Petroleum Gas to the project. Under this agreement, Kleenheat were to supply the gas storage equipment and arrange for connection from the distribution system to individual dwellings and PGDC were responsible for installing the (pipework) distribution system. Centralised gas storage would be co-located with the water treatment facility.

In the context of the power supply as outlined above the gas reticulation system will reduce the demand for power generation and supply and therefore potentially defer the timing of the offsite power feeders.

However, in the period since 2010, significant advancements have been made in the efficiency of domestic appliances, lighting and air conditioning systems, therefore the provision of gas reticulation throughout the development will be reviewed at a time closer to actual development.

Like the water, power and telecommunications services, the gas supply system will respond to, rather than influence the design of subdivision within the Structure Plan area.

10 SUMMARY

Based on the above, the engineering servicing requirements of Point Grey Structure Plan can be addressed through the orderly design and construction / installation of infrastructure and services.

As outlined above, the civil design and infrastructure required will need to be staged to ensure it is fit for purpose at the relevant time of construction.