

Flood Assessment & Stormwater Management Plan

400 Wyatt Road Residential Development, Kagaru

Prepared for 400 Wyatt Pty Ltd





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1. Introduction

Ensilon Consulting has been engaged by 400 Wyatt Pty Ltd to prepare a Flood Assessment and Stormwater Management Plan for a proposed residential subdivision development at Kagaru. The site is located at 400 Wyatt Road, Kagaru (described as Lot 20 on SP 149887) within the EDQ Greater Flagstone PDA.

The application involves Reconfiguring a Lot – One (1) lot into 437 residential lots across seven (7) stages. This includes an environmental park, local park and waterway linear park dedications.

This Flood Assessment and Stormwater Management Plan (SMP) has been prepared to consider and address stormwater management requirements for the proposed development, in accordance with the EDQ Greater Flagstone Planning Scheme, the Queensland Urban Drainage Manual (QUDM) and the State Planning Policy (SPP).

The flood assessment provided in this report is a local flood assessment. The Regional Flood Assessment for the site was recently conducted by Water Technology for the Welco Group in April 2024. The key finding in this report was that regional flood detention was not required for the Welco Site and associated upstream sites such as 400 Wyatt Road are not required to provide detention. This assessment reviewed both the impact of filling in the waterways and the downstream impacts of changes in peak discharge and concluded that:

“The preparation of site-specific hydrological models has been used to demonstrate that the development of the context plan area would not result in a fundamental increase in peak discharge from the site to the receiving waterway without inclusion of any onsite stormwater mitigation (detention) infrastructure. Further, when considering the entirety of the catchment to the receiving waterway, the analysis has demonstrated no change in peak flow rates in the receiving waterway for both long duration and short duration rainfall events. On this basis, onsite stormwater mitigation (detention) infrastructure should not be required to support the context plan.” (p 27)

On this basis, a revised regional flood assessment was considered unnecessary and the hydrological and hydraulic analysis was confined to a local flood assessment for the purpose of determining water surface elevations, velocities and local flood hazards within the development site. Whilst on-site is considered unnecessary for addressing regional flood issues, no actionable nuisance criterion was still applied to discharge into downstream properties, as discussions and obtaining consent from these property owners is still ongoing.

2. Site Characteristics

2.1 Location

The development site is located on 400 Wyatt Road. The total site area is 40.09 hectares. The site is bound by Wyatt Road to the south and existing rural properties to the north, east and west. The adjacent proposed Welco site is located to the south and further east.

Refer to Figure 2.1 for an aerial image of the site and its location within the surrounding area.

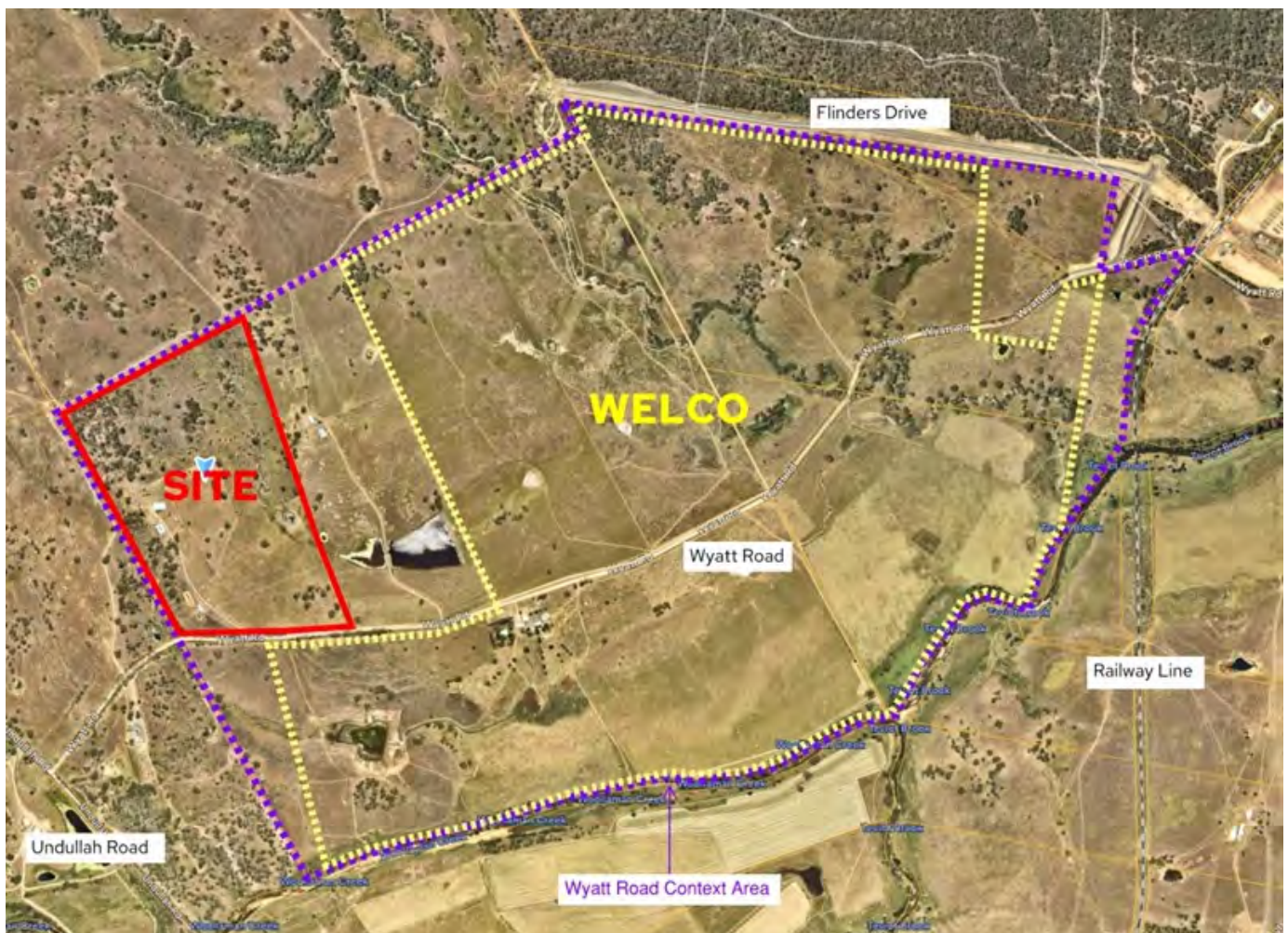


Figure 2.1 Location of Development Site (Source: Nearmap 2026)

2.2 Land Use

The current land use is rural, and each lot contains fences and small farm dams and existing rural residential dwellings and structures.

The proposed development consists of 437 residential allotments, containing varying lot sizes generally between 200 m² to 600+m². It is expected that the development will start in 2028 with 62 lots and be fully completed in the year 2029. Refer to the Proposed Development Layout documentation provided in Appendix A for details.

The layout of the proposed development is shown in Figure 2.2, and a larger plan is located in Appendix A.

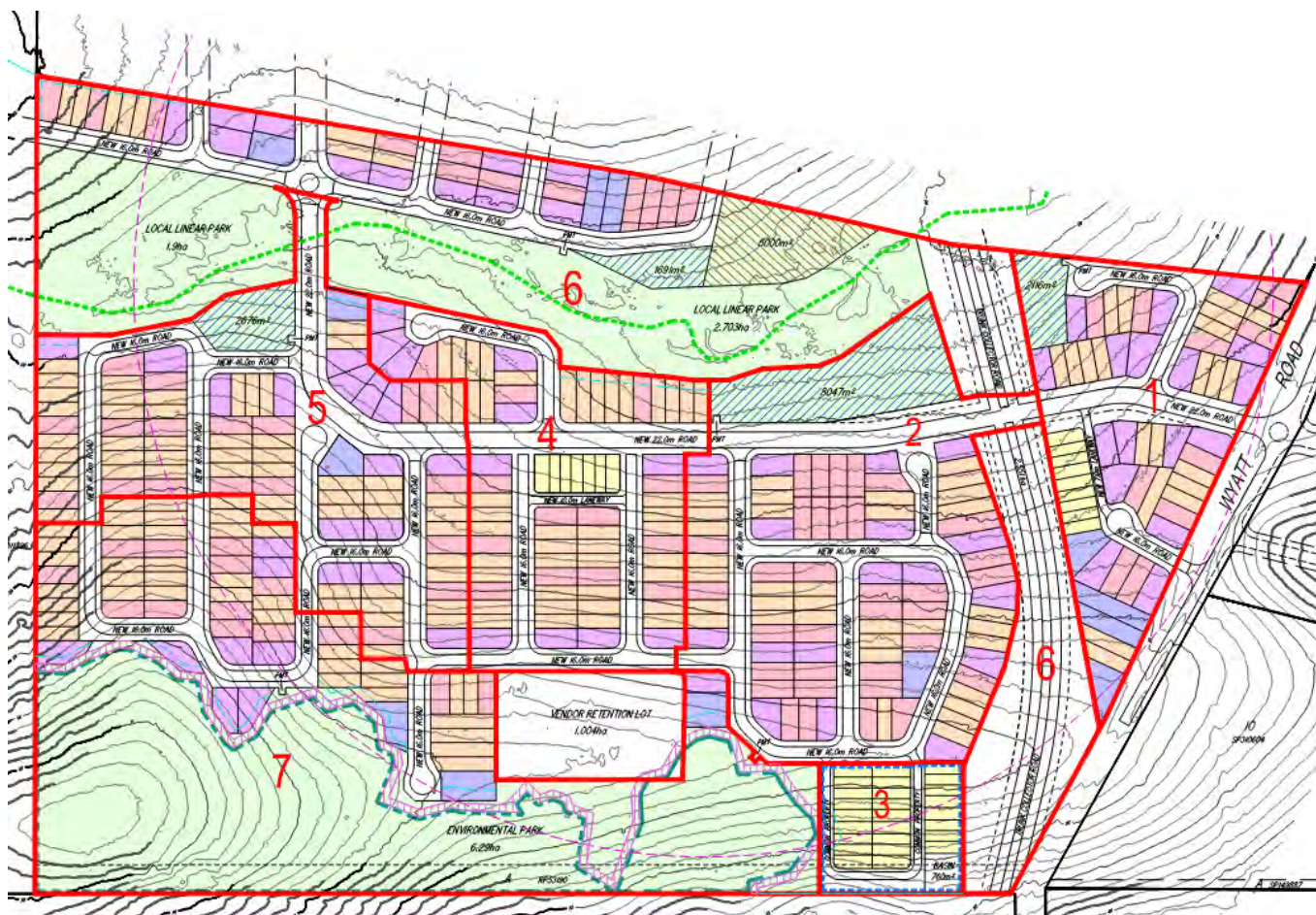


Figure 2.2 Proposed Site Layout of Development (Source: JF&P 2026)

2.3 Topography and Site Drainage

The site generally falls south at approximate grades of between 6-8% with occasional short slopes of between 2-3% within drainage lines. Given the undeveloped nature of the site, stormwater runoff follows the existing surface topography and generally discharges across the south-eastern boundary, although a small segment of catchment discharges to the west. A number of small farm dams are located along minor watercourses. Figure 2.3 presents the topography of the site and surrounds via a contour map sourced from available LiDAR information.

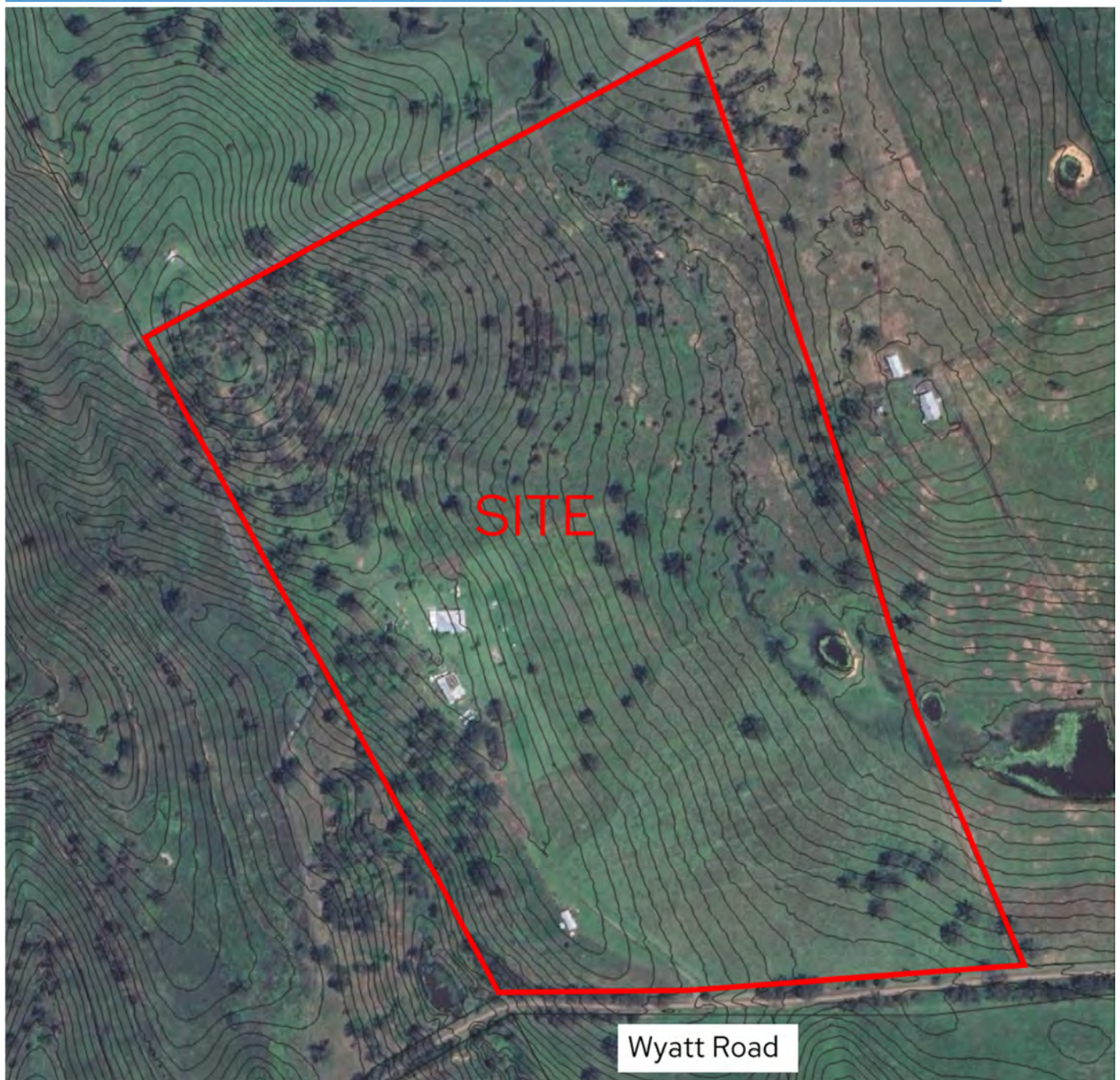


Figure 2.3 Development Site (in red) and Contour Map with 1m contour intervals
(Source: QSpatial 2026)

There is no formal mapping for both flood hazards and overland paths for the subject site, however, the site is characterised by uniform sheet flow on slopes, with incised minor flow channels within the main waterway (See Figure 2.4). Based on site inspections and review of historical aerial photography, these flow paths now appear to be stabilised through revegetation. The site has also been significantly modified with the introduction of on-line dams, and these dams will be removed in areas where residential allotments and linear parks will be placed.

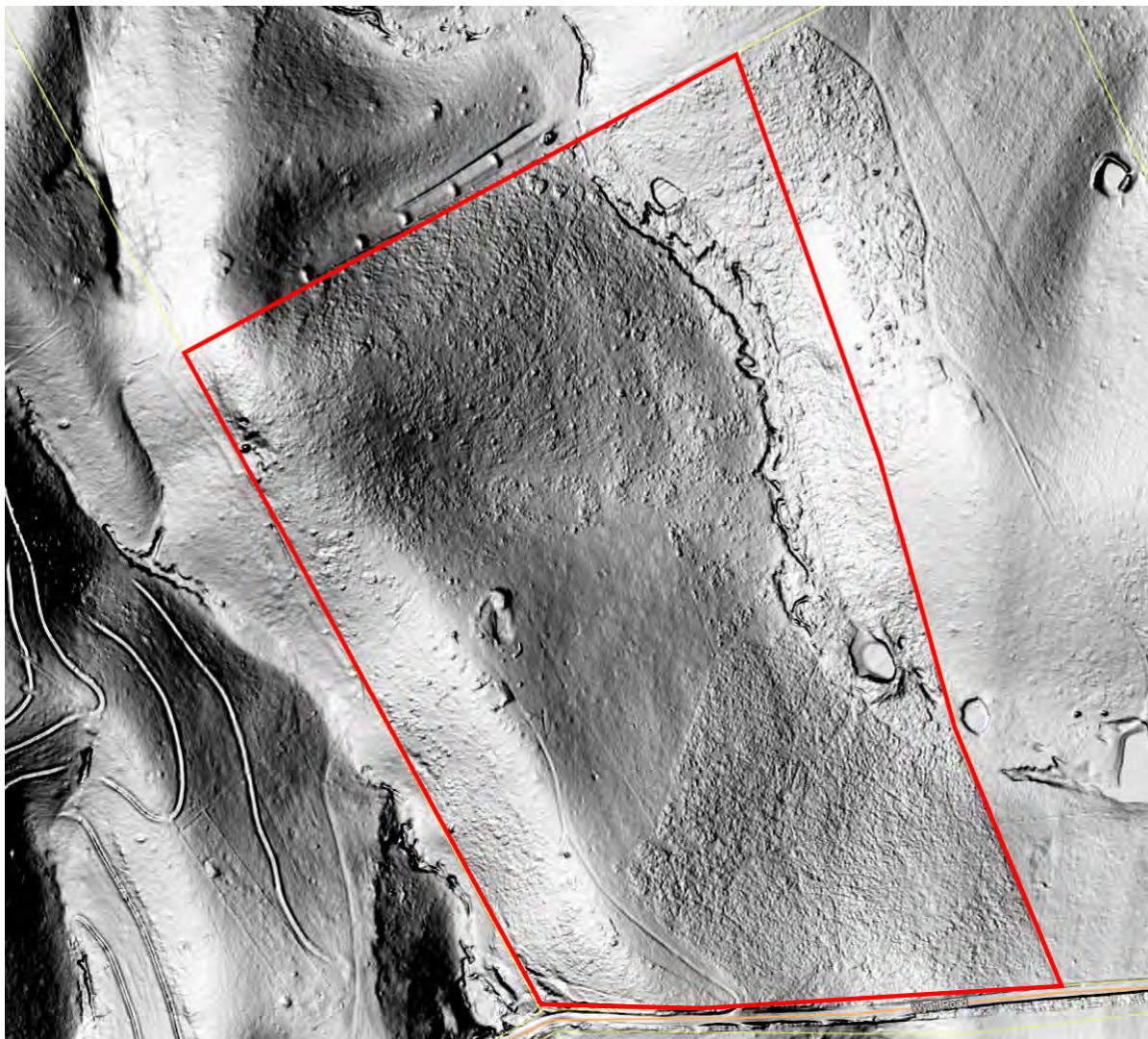


Figure 2.4 Hillshade multidirectional mapping of the site (Source: Queensland Globe 2026)

2.4 Existing Drainage Infrastructure

The development site, in its current undeveloped form, contains no existing stormwater drainage infrastructure. Additionally, there is no existing stormwater drainage infrastructure in the immediate vicinity downstream of the site as the surrounding lots have not yet been developed.

Drainage along the verge of Wyatt Road currently consists of grass swale with property access culverts.

3. Stormwater Management Considerations

In accordance with the EDQ Greater Flagstone Planning Scheme, the essential drainage considerations are:

Stormwater Quantity Management

Development must provide on-site appropriate detention measures to achieve the following at the boundary of the development site:

- a. no increase in peak flow rates from the development site for all events up to the 1% AEP;
- b. no increase in peak velocities; and
- c. no external impact either from redirection and/or concentration of flows.

Where online detention is proposed, pre and post-development comparison must be carried out for all events up to the 1% AEP starting from the local catchment critical duration to the upstream contributing catchment critical duration to ensure the performance of online detention basin. It should be noted that detention is not required to achieve regional flood requirements

Stormwater Quality Management

Developments must satisfy or exceed the following design objectives in accordance with the State Planning Policy relating to stormwater quality by limiting the quantity (load) of stormwater pollutants discharged into the receiving water from development:

- i. Gross pollutants (>5 mm) – 90% reduction in mean annual load;
- ii. Total suspended solids (TSS) – 80% reduction in mean annual load;
- iii. Total phosphorus (TP) – 60% reduction in mean annual load;
- iv. Total nitrogen (TN) – 45% reduction in mean annual load; and

The design of all stormwater treatment devices must be undertaken in accordance with Healthy Waterways (2006 or current version) Water Sensitive Urban Design – Technical Guidelines for South East Queensland and for bioretention systems, the Water by Design (2012) Bioretention Technical Design Guidelines.

Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised using methods which will achieve effective short-term stabilisation. Proprietary stormwater treatment devices may be approved for use in private community title applications where these devices are endorsed through SQIDEP protocol. Proprietary products will not be accepted in cases where stormwater infrastructure is to be dedicated to Council.

4. Stormwater Quantity Management

4.1 Point of Discharge

As described in Section 2.3, the topography of the development site generally results in a stormwater discharge to the southeast. These points of discharge are detailed in Figure 4.1. Whilst there is discharge into western adjacent properties this discharge is undeveloped natural flow. There is a small catchment near Wyatt Road that discharges towards Wyatt Road and is under the control of EDQ. This is a Lawful Point of Discharge (LPOD). However, flow converging to the south-eastern site boundary will discharge into 348 Wyatt Road (Lot 21 on SP164832). Early discussions with the neighbour and Welco (further to the east) have confirmed that proposed discharge points align with proposed waterway features or drainage features such as road drainage. Whilst this flowpath is a Stream Order 1 watercourse and an established waterway, efforts are ongoing to establish an easement or dedication over this watercourse towards the Welco site.

Refer to the Preliminary Roadworks and Drainage Layout Plans attached in Appendix B for details on the points of discharge.

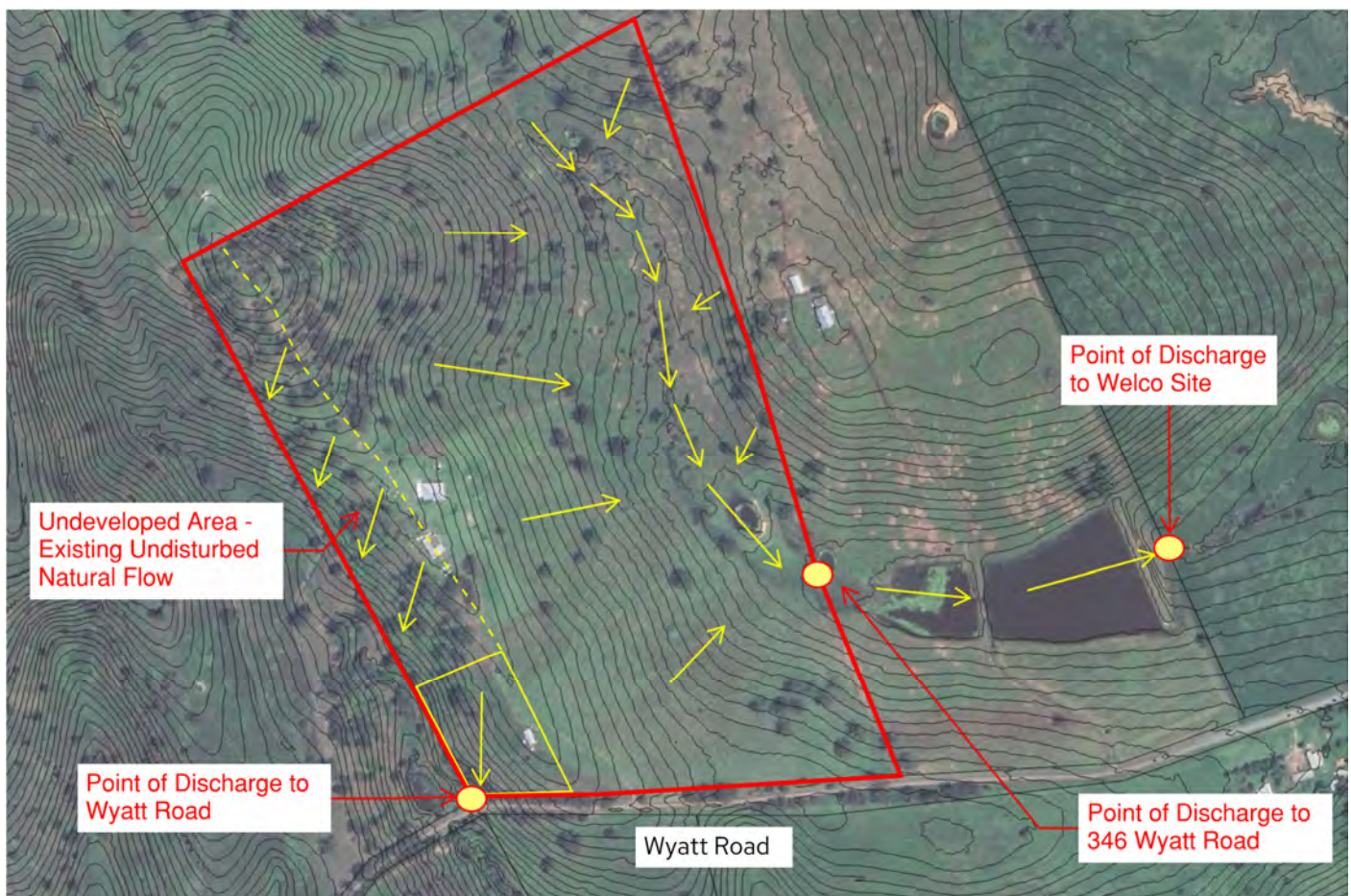


Figure 4.1 Points of Discharge

4.2 Hydrology - Predeveloped Flow

To assess the impact of the proposed development on peak stormwater flow rates for a variety of design storm events, a WBNM hydrological analysis has been undertaken. The Intensity Frequency Duration (IFD) was obtained from the BOM IFD website based on the approximate latitude and longitude of the development site (LAT: -27.843, LONG: 152.8875). Table 4.1 presents the hydrological parameters used in the model generally based off data obtained from the ARR Data Hub.

Table 4.1 WBNM (DRAINS) Model Parameters

Catchment Surface	Initial Loss	Continuing Loss
Pervious	20 mm	1.6 mm/hr
Impervious	1 mm	0 mm/hr

The assumed lag parameter was 1.6, in line with ARR recommendations. Sub-catchment characteristics such as fraction impervious were assessed from available topographical data, review of aerial imagery, current land use, and proposed development characteristics. The existing fraction impervious for existing sub catchments within the development site has been assessed as 5% to account for dwellings and minor roads based on the rural land use based on a review of aerial imagery. Storm losses were generally consistent with those obtained from the ARR Data hub. All upstream dams were assumed to be full. All rainfall depths were adjusted by climate change factors assuming scenario SSP 2-4.5 at 2090. Figure 4.3 presents the existing sub-catchment areas for the catchment.



Figure 4.3 Existing Site Sub-Catchments (See Appendix C for Larger Plan)

4.3 Hydrology - Post developed Flow and Mitigated Case

The proposed development will yield approximately up to 18.5 dwellings per hectare, such that the following minor and major storm events are applicable in accordance with QUDM:

- | | | |
|--------------------|---|---|
| Minor Design Storm | - | 39% Annual Exceedance Probability (AEP) |
| Major Design Storm | - | 1% Annual Exceedance Probability (AEP) |

The post-development catchment plan is shown in Figure 4.5 and highlights the sub-catchment areas for the overall catchment. The assumed fraction impervious for fully developed areas is 0.8 which matches adjacent flood models.



Figure 4.5 Post-developed Site Catchment (See Appendix C for Larger Plan)

The proposed development has the potential to increase peak stormwater flow rates compared to the existing conditions due to large increases in impervious area in some subcatchments. To mitigate the development impacts on peak stormwater flow rates, a detention basin (located at Node B3) will be provided along with a cross-drainage culvert (located at Node A31). These stormwater management strategies will enable the stormwater discharge from the development to closely approximate the existing (and pre-developed) conditions.

The stormwater management basins will consist of bio-retention facilities for stormwater quality treatment including the volume required for the bio-retention extended detention. Refer to the Preliminary Roadworks and Drainage Layout Plan and the Bio-retention Basin Layout Plan provided in Appendix B for details.

A detention basin (Basin C) is required for Catchment B3 (community titles site). This basin does not require EDD storage for water quality as the inflow is pretreated with a proprietary stormwater quality device. The stage-storage for the detention storage (excluding the required extended detention depth storage of the biofiltration compartment) are provided in Tables 4.2. The storage volumes have been extracted from the digital terrain model of the proposed basins using 12D software.

Table 4.2 Basin Detention Storage

Basin	Levels	RL (AHD m)	Cumulative Storage (m ³)
A	Base of detention compartment	51.2	0
	Weir Level	53.2	550
	Top of Bund Level	53.6	660

The outlet arrangement details of the detention component of the basin are presented in Table 4.3.

Works within fish mapped waterways will be carried out in accordance with the Accepted Development Requirements (ADR).

Table 4.3 Basin Detention Storage and Outlet Arrangements

Basin	Component	Size	Level(s)
A	Inlet Chamber Orifice	Nil	Nil
	Inlet Pit	Nil	Nil
	Pipe Outlet	DN300	USIL 51.2m
	Weir	Length = 3 m	Weir Level = 53.2m

To assess the proposed detention storage system for the development and analyse the detention storages impact on peak stormwater flow rates, a post-developed hydrological model was created using WBNM (DRAINS). These hydrographs were then inserted into the hydraulic model to further analyse the effect of on-line detention provided by the cross-drainage culvert located in Stage 4. See Figure 4.6 for the WBNM post developed model.

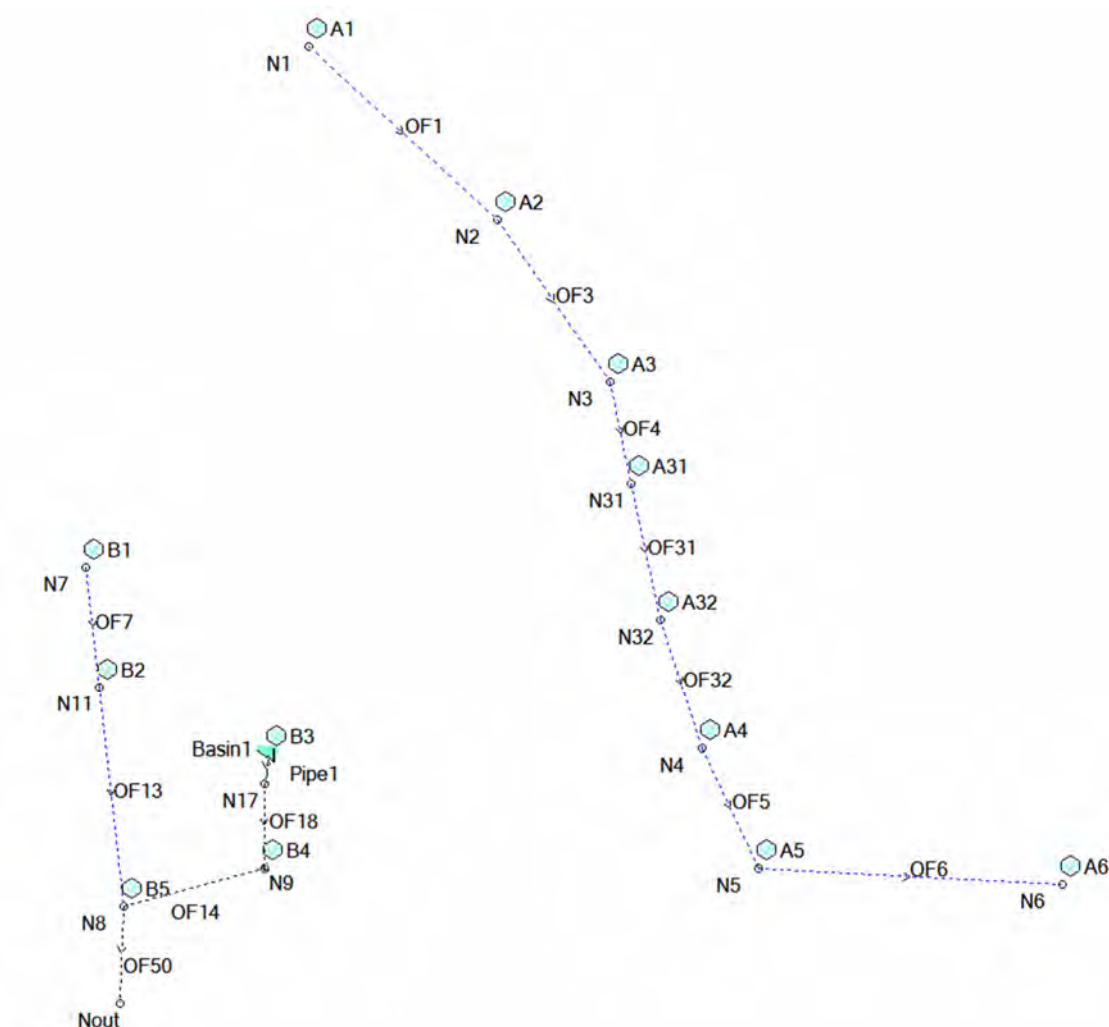


Figure 4.6 Post-developed (Mitigated) WBNM Model

The median storm ensemble results of the WBNM (DRAINS) model for durations run between 10 minutes to 6 hours are presented in Tables 4.4 to 4.5, which provides a comparison of the pre-developed model peak stormwater flow rates to the post-developed mitigated model peak stormwater flow rates at the point of discharge, highlighting that the post-developed peak flow rates were less than the corresponding pre-developed peak flow rates at the assessed points of discharge (POD).

Table 4.4 Subcatchment (POD 1 Node A5 at OF6) - Site Discharge WBNM Modelling Results

Design Storm Event	Pre-developed Peak Flow Rate (m ³ /s)	Post-developed (Mitigated) Peak Flow Rate (m ³ /s)
39%	5.11 (120m E7)	5.02 (120m E8)
20% AEP	7.37 (60m E5)	7.32 (120m E8)
5% AEP	12.6 (60m E5)	12.5 (120m E9)
1% AEP	19.8 (90m E3)	19.5 (90m E7)

Note: Median critical storm duration (mins) and ensemble storm are shown in brackets

Table 4.5 Subcatchment (POD 2 Node B5 at OF50) - Site Discharge WBNM Modelling Results

Design Storm Event	Pre-developed Peak Flow Rate (m ³ /s)	Post-developed (Mitigated) Peak Flow Rate (m ³ /s)
39% AEP	2.42 (60m E4)	2.39 (60m E4)
20% AEP	3.51 (60m E4)	3.46 (60m E4)
5% AEP	5.76 (45m E7)	5.66 (45m E7)
1% AEP	8.24 (45m E3)	8.09 (45m E3)

In terms of inundation criteria, the proposed basin stormwater performance is highlighted in Table 4.6.

Table 4.6 Maximum depth of basin inundation for the critical 5% AEP storm

Basin	QUDM Requirement	Proposed Design
C (Stage 2B)	<= 1.2 m	1.39 m

Based on the 5% AEP inundation results, Basin C will be fenced to reduce casual access to the basin during flood events. This basin is located in Stage 2B and will be under body corporate control. Post-developed mitigated hydrographs are provided in Appendix C for reference.

The results of the WBNM (DRAINS) model have demonstrated that the detention storage volumes and online detention arrangements proposed for each of the site discharges will mitigate the stormwater quantity impacts of the development on the peak stormwater flow rates across a range of events.

4.4 Hydraulic Model Development

A HEC-RAS 2D hydraulic model was developed for this study using HEC-RAS version 6.6. The cell area covered the main catchment flow paths that were subject to inundation. This model extent was to ensure that backwater effects were properly accounted for. The HEC-RAS 2D model boundaries within the catchment extent are illustrated in Figure 4.7.

4.4.1 Model Topography

The hydraulic model topography for the HEC-RAS 2D model was based on publicly sourced LiDAR information. Some minor localized update amendments were made to the model topography within the HEC-RAS model. This was primarily to install model weir flow surfaces over culverts, reset culvert apron levels and slightly modify some jagged unphysical LiDAR surface artifacts which created localised numerical instabilities in model runs.

4.4.2 Manning's Roughness

Hydraulic (Manning's) roughness for the model domain was delineated based on shapefile datasets developed for the hydraulics model. The model domain was split into the roughness categories shown in Table 4.7.

Table 4.7 Hydraulic Roughness Categories and Manning's 'n' values (Source: ARR19)

Roughness Category	Manning's 'n'
Urban Buildings	1.0
Major Roads	0.020
Grassed Open Space and Pasture	0.045
Dense Vegetation	0.080

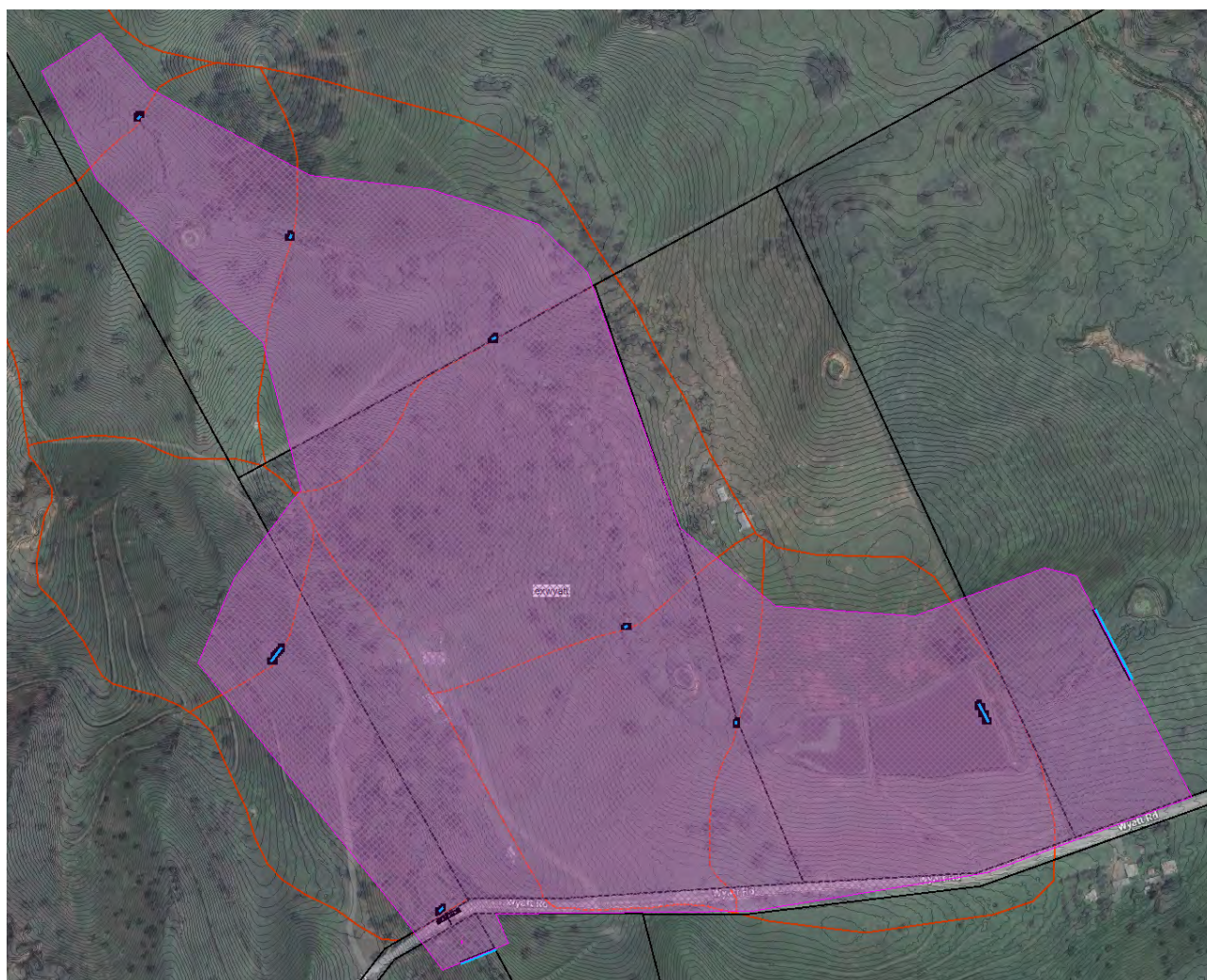


Figure 4.7 Hydraulic model 2D cell boundary (solid line)

4.4.3 Model Boundaries

The 2D model cell boundaries are shown in Figure 4.7. The model boundaries have been delineated to ensure that the main flow paths within the catchment have been captured.

The inflow boundaries conditions were represented by 2D boundary condition polylines which were generally oriented towards the downstream extent of the respective sub catchment. The downstream boundary condition for tailwater was modelled as a normal depth calculation with a friction slope of 0.005.

4.4.4 Hydraulic Structures

Hydraulic structures for the HEC-RAS 2D model were included as one-dimensional elements. The structure locations and dimensions were based on the structures identified in a field inspection conducted on 8 April 2026 and incorporated into the hydraulic model.

4.4.5 Model Parameters

In this study, the HECRAS 2D Pardiso solver was used. The equation set employed was the SWE-ELM algorithm which modelled the St Venant equations and ensured momentum conservation. A conservative turbulence model was also employed using a Smagorinsky coefficient of 0.05. Adaptive Courant value-based time-stepping was employed with upper and lower limits of Courant values set at 0.9 and 0.45 respectively.

4.5 Pre Developed Hydraulics

The predeveloped hydraulics were modelled for a range of AEP events based on the output generated from Section 4.2. This included the validation of this model for various scenarios.

4.5.1 Hydraulic Structures

Hydraulic structures for the HEC-RAS 2D model were included as one-dimensional elements. The structure locations and dimensions were based on the structures identified. The hydraulic structures modelled as part of the pre-developed local model are further detailed in Table 4.8.

Table 4.8 Hydraulic Control Structures – Predeveloped Case

Structure	Description
Wyatt Road Culverts	1 x 450 RCP located 35m west of the western site boundary of 400 Wyatt Road

4.5.2 Model Parameters

A grid cell size for the predeveloped hydraulic model was selected to be of sufficient accuracy to capture the major flow drainage features such as channel and floodplains within the catchment while maintaining reasonable model simulation times. A cell size of 5 m was found to be suitable for the purpose of this study, and this represents a reasonable balance between computational efficiency and accuracy.

4.5.3. Validation

Peak flow rates generated for the pre-developed local HEC-RAS 2D model created in this study were validated against the Rational Method calculation using the Modified Friends Equation. This calculation assumed a Manning ‘n’ of 0.045 for total flow path length of 2.37 km. The calculation was conducted at the eastern boundary of 400 Wyatt Roads. Validation results show that peak flow rates were within 10-15% and this is considered to be acceptable (See Table 4.9).

4.5.4. Pre-developed Assessment Results

The peak flow rates for predeveloped HEC-RAS 2D model for the 0.5 EY, 20%, 5% and 1% AEP storm events for the eastern boundary of the site (POD-2) are detailed in Table 4.9.

Table 4.9 (POD 1) – Site Discharge Modelling Results

Design Storm Event	Peak Flow Rate (HECRAS) (m³/s)	Peak Flow Rate (Rational Method) (m³/s)
0.5 EY	6.95	7.6
20% AEP	11.85	10.5
5% AEP	17.51	15.3
1% AEP	26.02	22.8

The peak water level, water depth, velocity, and hazard (depth x velocity) were exported as flood maps for the study area and relevant upstream and downstream extents. These figures can be found in Appendix E of this report.

4.6 Post Developed Hydraulics

A post-developed model was further developed using the model developed in Section 4.5. Internal hydrological inflows were updated to reflect land-use changes attributed to the development. These changes also included estate earthworks, swales, drainage channels, basins and cross-drainage culverts.

4.6.1 Catchment Data and Land Use

The post-developed analysis for areas outside of the development site relied on the same fraction impervious and catchment roughness values used for the pre-developed analysis as detailed in Table 4.7. However, the areas of proposed development within the site comprised mainly of low-density residential, at approximately 18.5 dwellings/ha. Consequently, a fraction impervious of 0.80 was adopted for the developed residential portions within the development in line with QUDM recommendations.

4.6.2 Model Topography

Similar to the pre-developed case, the hydraulic model topography for the HEC-RAS 2D model was based on publicly accessed LiDAR information. Areas outside of the proposed development boundary remained unaltered as per the pre-developed case. Areas inside the proposed development boundary that were proposed to be earth-worked were modelled and overlaid on the overall catchment surface and then modified in the HEC-RAS geometry files for input into the hydraulic model. Instances of earthworks that have been incorporated into the design surface are as follows:

- **Estate Earthworks.** Estate earthworks have been designed to ensure that new residential allotments are 500mm above the defined flood level (1% AEP) in accordance with planning scheme requirements.
- **Bioretention Basin.** Basins were not designed to incorporate detention storage (except for the basin in Stage 2B). The extended detention storage required for the wetland water quality design was also excluded from all detention storage calculations.
- **Western Swale.** Improvements to an existing minor swale located on the western site boundary are proposed. The purpose of these swale improvements is to intercept post-developed run-off entering the adjacent neighbor (1109 Undullah Rd) and ensure that it is discharged to the Wyatt Road reserve.
- **Cross Drainage Culverts.** A cross-drainage culvert has been proposed to cross the main waterway. These culverts partly act as on-line detention.

It should be noted that culverts for the future Wyatt Road realignment will be designed at a later date and have not featured in this analysis.

4.6.3 Manning's Roughness

There is no change to the hydraulic roughness values (Manning's) adopted for the pre-developed case as outlined in Table 4.7.

4.6.4 Model Boundaries

No changes to the hydraulic model boundaries have been made in comparison to the pre-developed case.

4.6.5 Hydraulic Structures

All hydraulic structures included in the pre-developed case have been retained. There are no changes proposed to the hydraulic structures external to the proposed development site. Details on the hydraulic structure changes are highlighted in Table 4.10.

Table 4.10 Additional Hydraulic Control Structures – Post-developed Case

Structure	Description
Cross Drainage Culvert at Stage 4	A planted trapezoidal channel with 1 in 4 batters, bed width =5.0m, average depth=300mm. This is located along the northern boundary, to intercept and redirect upstream flow around the development site. This channel then outlets into a 'level spreader' approximately 80m long with IL 39.11m to redistribute stormwater and ensure that stormwater is discharged in an unconcentrated form generally as per the pre-developed conditions.

Risk assessments for the relevant culverts will be drafted during the detailed design and submitted as part of future PCC submissions.

4.6.6 Model Parameters

Similar to the pre-developed case, a computational grid size of 5m was adopted.

4.7 Post-developed Assessment Results

The post-developed HEC-RAS 2D model was run for 39%, 20%, 5%, and 1% AEP flood events.

The peak water level, water depth, velocity, and hazard (depth x velocity) were exported as flood maps for the study area and relevant upstream and downstream extents. These figures can be found in Appendix E of this report.

Figure 4.8 shows afflux was recorded upstream of the Stage 5 culverts as well some small, localised areas along the waterway within the site. However, there was negligible afflux predicted within adjacent properties with recorded afflux values well less than 50mm, which is acceptable for rural properties. Furthermore, there are no sensitive receptors recorded within mapped waterways.



Figure 4.8 Afflux Mapping for 1% AEP event

Overall, the various hydraulic results mapping showed that the development is able to effectively mitigate the hydraulic impacts of the proposed development on downstream properties post-development. In particular, water surface impact mapping (afflux mapping), as shown in Appendix E, generally demonstrates that the downstream post-developed water surface elevation was less than the predeveloped water surface elevation. The instances of afflux are minor and are predicted to not adversely impact adjacent sensitive receptors. According to Babister and Retallick (2022), an assessment of afflux should consider the nature of adjacent receptors, the land use and the frequency of events. In this case, the land use is rural and contains no sensitive receptors.

5 Stormwater Quality Management

5.1 Stormwater Quality Objectives

In accordance with Figure 2.5 of the Urban Stormwater Quality Planning Guideline 2010, the proposed development site is located within the South-East Queensland region for stormwater quality design objectives. The stormwater quality design objectives for key pollutants to be targeted and the minimum reduction in mean annual loads from unmitigated development for Southeast Queensland, extracted from Table 2.2 of the Urban Stormwater Quality Planning Guideline 2010, are provided in Table 5.1.

**Table 5.1 Stormwater Quality Design Objectives for Southeast Queensland
(Source: Urban Stormwater Quality Planning Guideline 2010)**

Pollutant	Minimum Reduction in Mean Annual Loads from Unmitigated Development
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (GP)	90%

5.2 Modelling Approach

A quantitative assessment of stormwater runoff quality has been undertaken for the operational phase of the proposed development. The predicted future (operational phase) reduction in mean annual loads of key pollutants, in comparison to the unmitigated development, have been identified using the 'Model for Urban Stormwater Improvement Conceptualisation' (MUSIC). MUSIC is a stormwater quality modelling program that provides estimates of stormwater pollutant generation and the performance of stormwater management measures, used in either series or parallel, to form a 'treatment train'. Input parameters for the MUSIC model Version 6.4 were adopted in accordance with the Water by Design MUSIC Modelling Guidelines 2018 (MUSIC Modelling Guidelines).

5.3 Meteorological Data

Meteorological Data is based off the Greenbank (Bureau of Meteorology Weather Station 40659) meteorological data and a 6-minute time step used.

5.4 Source Nodes

Sub-catchment boundaries were established from the design surface created across the development site based on proposed road grading, allotment grading and schematic drainage network layout plan. The developed catchment is shown in Appendix B.

Source nodes were modelled based on the sub-catchment extents, and the proposed residential land use with MUSIC input parameters adopted as per the MUSIC Modelling Guidelines (2018). As such, the MUSIC model consisted of lumped residential source nodes, with fraction impervious value of 70% in accordance with Table 3.7 of the MUSIC Modelling Guidelines. A summary of source node catchment areas and land use is provided in Table 5.2.

Table 5.2 MUSIC Model Source Node Catchments

Sub-Catchment	Area (ha)	Land Use
A	3.97	Residential
B	12.63	Residential
C	0.96	Residential
D	4.67	Residential
E	2.55	Residential
Park	0.5	Residential

Complete source node parameters used for the proposed development MUSIC model are provided in Appendix D for reference.

5.5 Treatment Methodology & Treatment Nodes

Bio-retention basins are proposed for the development site to satisfy the stormwater quality design objectives specified for Southeast Queensland in the Urban Stormwater Quality Planning Guideline 2010.

One proprietary water quality treatment device is proposed for the community titles site (Catchment C).

Refer to the Preliminary Bio-retention Basin Layout Plan attached in Appendix B for details.

Information regarding the types of stormwater quality treatment devices selected for the proposed development is discussed in Table 5.3.

Table 5.3 Stormwater Quality Treatment Devices selected for Development

Treatment Device	Summary
A	Bio-retention Basin: • 470m² filter area • 500mm filter depth with saturated zone • 300mm extended detention depth • 36 m² Sediment Forebay
B	Bio-retention Basin: • 820m² filter area (split filtration zones) • 500mm filter depth with saturated zone • 300mm extended detention depth • 112 m² Sediment Forebay
C	Proprietary WQ Treatment Device: • Humesfilter UPT3600
D	Bio-retention Basin: • 400m² filter area • 500mm filter depth with saturated zone • 300mm extended detention depth • 40 m² Sediment Forebay
E	Bio-retention Basin: • 180m² filter area • 500mm filter depth with saturated zone • 300mm extended detention depth • 24 m² Sediment Forebay

5.6 Treatment Train & Results

The treatment train proposed for the development site, and as modelled in MUSIC, is presented in Figure 5.1.

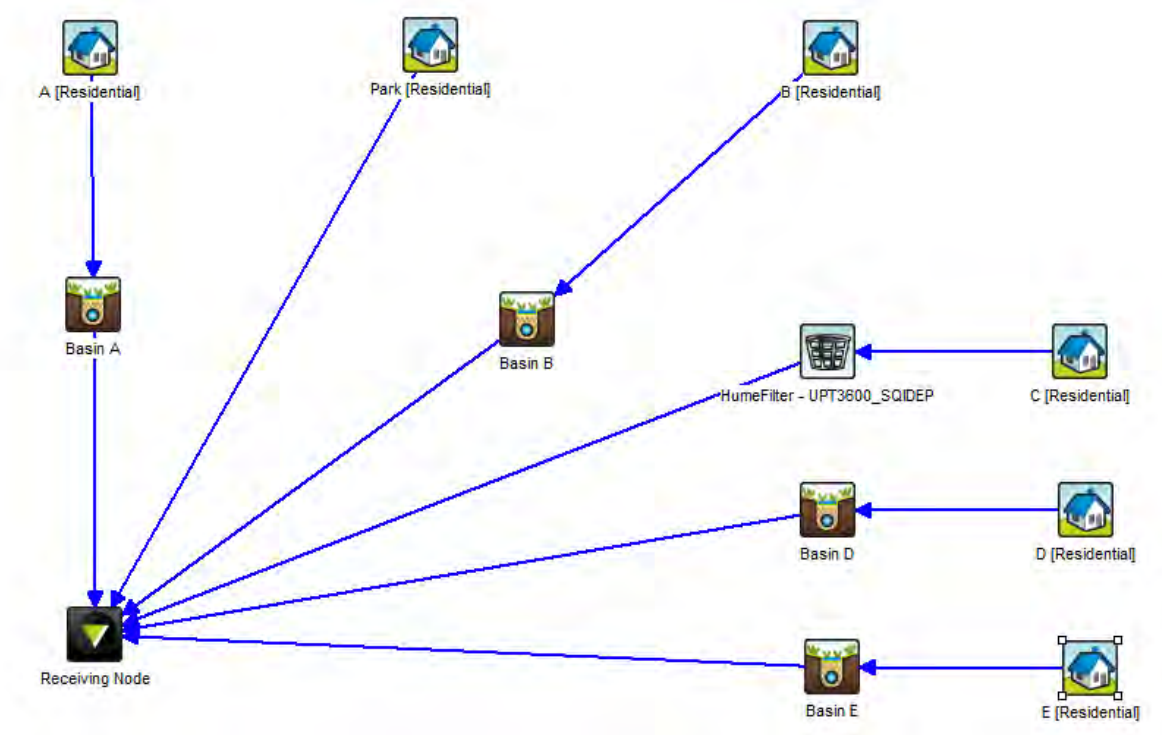


Figure 5.1 MUSIC Model Proposed Treatment Train

The results of the proposed treatment train, in terms of reduction in mean annual loads (when compared to the unmitigated development), are presented in Figure 5.2.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	125	121	3.1
Total Suspended Solids (kg/yr)	27100	4740	82.5
Total Phosphorus (kg/yr)	54.2	13.7	74.7
Total Nitrogen (kg/yr)	262	135	48.4
Gross Pollutants (kg/yr)	3570	22.5	99.4

Figure 5.2 Proposed Treatment Train Effectiveness Results

Figure 5.2 demonstrates that the reduction in mean annual loads of key pollutants from the development, as a result of the proposed treatment train, all exceed the design objectives identified in the Urban Stormwater Quality Planning Guideline 2010 for catchments in Southeast Queensland.

5.7 Construction Phase Stormwater Quality Management

5.7.1 Reference and Guidelines

Erosion and sediment control management for the development should be in accordance with the International Erosion Control Association (IECA) Best Management Practices (2008), the Institute of Engineers (QLD) 'Sediment and Erosion Control Guidelines' and Council requirements.

All erosion and sediment control devices used during and after construction is to be in line with current best management practices and all practical measures applicable to the site. Erosion and Sediment Control Measures should include, but not be limited to, details within the Erosion and Sediment Control Plan Drawings to be provided at detailed design stage.

As per the Environmental Protection Act (EPA) 1994 all personnel must comply with the general environmental controls under Sections 319 and 320, provided as follows:

- Section 319 of the EPA states that all people involved in the project, from design to construction, are to act in accordance with the 'general environmental duty'. This requires all reasonable and practicable measures to be adopted to prevent or minimise environmental harm. Consequently, any erosion and sediment control devices proposed or implemented on site must represent current best management practices and all practical measures applicable to the site.
- In addition, Section 320 of the EPA, all personnel have a legally binding duty to notify their employer, their Local Regulatory Authority and the Environmental Protection Agency (QLD) should they become aware of a potential or actual incident of environmental harm. The Principal Contractor should therefore be aware of their responsibility to ensure all people on site are aware of their environmental duties.

5.7.2 Responsibility

In addition to the above, it is the responsibility of the Contractor to put in place all the erosion and sediment control measures on site until all disturbed areas are reinstated including maintenance of such measures. The Contractor is, at all times, responsible for the erosion and sediment control measures to ensure minimal environmental harm and compliance with Council's standards.

5.8 Proposed Erosion & Sediment Control Measures

During the construction phase of the development, an Erosion and Sediment Control Program will be implemented to minimise water quality impacts.

This Program will be developed by the Contractor that is engaged to design and construct the development and hence, not be available until closer to the start of construction.

Details of the required construction phase sediment and erosions control measures will be provided on the engineering drawings (detailed design phase) and shall be in accordance with the SPP.

The Contractor shall be responsible for the preparation and implementation of an Erosion and Sediment Control Program and meeting the required minimum construction phase water quality objectives.

The information below is provided to identify controls and procedures, which could be adopted to mitigate erosion and sediment impacts, including who is responsible for them, and is recommended to be incorporated into the Erosion and Sediment Control Program.

5.8.1 Pre-Construction

- Establish a single stabilised entry/exit point for each stage of construction. This point should also include a vehicle shakedown device to mitigate the transportation of dust and dirt.
- Sediment fences are to be placed along the low side of the site to slow flow, reduce scour and capture sediment runoff. Soil testing needs to be undertaken (if required) to confirm the type of sediment fence most suitable for the site.
- Areas for plant and construction material storage are to be designated along with associated diversion drains and spillage holding ponds.
- Prepare a detailed erosion and sediment control plan suitable for the site and the proposed development layout prior to starting work.
- Incorporate measures to address potential acid sulfate soils.
- Site personnel must be inducted on to the sediment and erosion control measures implemented on site.

5.8.2 During Construction

- Progressive stabilization of exposed areas.
- Construction activities are to be confined to the necessary construction areas.
- Tracking the excavation and stockpiling of materials.
- Incorporate measures to address potential acid sulfate soils.
- The provision of a construction entry/exit point and shakedown area to prevent the tracking of debris from vehicles onto public roads. Only one construction exit should be nominated to limit the movement of construction equipment.

- Transport loads that are subject to loss through wind or spillage shall be covered or sealed to prevent entry of pollutants into the stormwater system.
- Regular inspection and maintenance of sediment fences, sediment basins, and other erosion control measures. Following rainfall events greater than 50mm, inspection of erosion control measures and removal of collected material should be undertaken. Replacement of any damaged equipment should be performed immediately.

5.8.3 Post Construction

The Contractor/Developer will be responsible for the maintenance of erosion and sediment control devices from the possession of the site until ground surface stabilisation has occurred to the satisfaction of the Superintendent and the Principal. The Sediment and Erosion Control Management Plans should be provided to all people involved with the Project, including sub-contractors, private certifiers, body corporates, and regulators. These guidelines have been formed in accordance with the Healthy Waterways Fact Sheet 'Erosion and Sediment Control Management Plans' and the 'Best Practice Erosion and Sediment Control'.

6. Conclusion

This Stormwater Management Plan has been prepared to address the essential drainage considerations for the issuance of an approval to reconfigure a lot in accordance with the Greater Flagstone EDQ Planning Scheme.

This report demonstrates that the proposed development can be drained in a manner that mimics the features of the existing drainage scenario prior to development. WBNM (DRAINS) modelling of the site stormwater discharge has demonstrated that through the proposed on-line detention and associated outlet arrangements, peak stormwater flow rates can be mitigated to the conditions which occur under existing conditions prior to development.

In relation to stormwater quality treatment, MUSIC software has been used to demonstrate that the treatment achieved by the proposed bio-retention basin exceed the design objectives for reductions in mean annual loads of key pollutants in accordance with EDQ requirements.

Stormwater drainage infrastructure will be provided as part of the development works, to cater for stormwater runoff from the site, and stormwater flows that enter the site from external catchments in accordance with EDQ standards and QUDM.

This report has shown that the proposed residential development has made adequate allowance for management of stormwater in accordance with EDQ requirements.

7. Qualifications and Limitations

Due regard should be given to the limitations and constraints involved in the stormwater management plans and reports which must be considered by future users of the information to correctly interpret the outcomes and outputs from this study. The following points summarise the main limitations and uncertainties associated with this study:

- LiDAR inherently has issues with accuracy. As part of this project, the LiDAR has been reviewed through critical locations in the model. However, locations may not be accurately represented in the LiDAR topography which may affect hydraulic results.
- There are errors in LiDAR accuracy which should be considered when using design flood levels and design planning levels.
- From time to time, there may be minor errors introduced into DEMs when LiDAR is reprojected between different GDA datums or when post-developed surfaces are retriangulated and merged back into surrounding LiDAR tiles.
- Uncertainties in hydraulic modelling parameters and model discretisation. While these have been minimised through adopting industry standard parameter values, uncertainties will remain.
- Whilst the hydraulic assessment is a highly comprehensive detailed investigation, the models represent a point in time and are based on available data. Triggers for revisiting or reworking the study will depend on the significance of change to the study outcomes which will need to be assessed accordingly. Such triggers could include major flood events, improvements to design rainfalls, increased certainty on the effects of climate change, significant advancements in modelling techniques and major civil works.
- Not all structures within the catchment have been reviewed or inspected during the site visits. There may be errors in the council database which have been used to inform this study.
- The earthworks model which this study relies on may change or be modified in the future; either because of changes enacted by the Developer in future development applications or by future asset owners and their respective agents.

In preparing this document, including all relevant calculations and modelling, Ensilon Consulting has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.

Ensilon Consulting has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and documents are as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.

Ensilon Consulting reserves the right to review and amend any aspect of the works performed including any opinions and recommendations from the works included or referred to in the works if:

- Additional sources of information not presently available (for whatever reason) are provided or become known to Ensilon Consulting; or
- Ensilon Consulting considers it prudent to revise any aspect of the works in light of any information which becomes known to it after the date of submission.

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If any claim or demand is made by any person against Ensilon Consulting on the basis of detriment sustained or alleged to have been sustained as a result of reliance upon the report or information therein, Ensilon will rely upon this provision as a defence to any such claim or demand.

This report does not provide legal advice or legal interpretation in any way whatsoever.

8. RPEQ Certification Statement

As a Registered Professional Engineer of Queensland (RPEQ) for this project, on behalf of Ensilon Consulting, I certify that the modelling undertaken as part of this assessment has been undertaken by suitably qualified persons in accordance with current engineering guidelines and generally complies with the Queensland Urban Drainage Manual and EDQ Guidelines.

This stormwater management plan has been based on the following data and assumptions detailed below:

- GIS data of existing drainage infrastructure,
- LiDAR Data available from Elvis,
- Proposed development earthworks DEM provided by Ensilon Consulting,
- Proposed development layout plans provided by JF&P Consultants,
- Rainfall data from BOM,
- Aerial imagery by Nearmap & Google.

The modelling assumptions detailed in this report are subject to the qualifications and limitations detailed in Section 7.



Jason Harley

Principal Engineer, Ensilon Consulting

BE(Hon), BSurv(Hon), MEngSc. RPEQ 05665

9. References

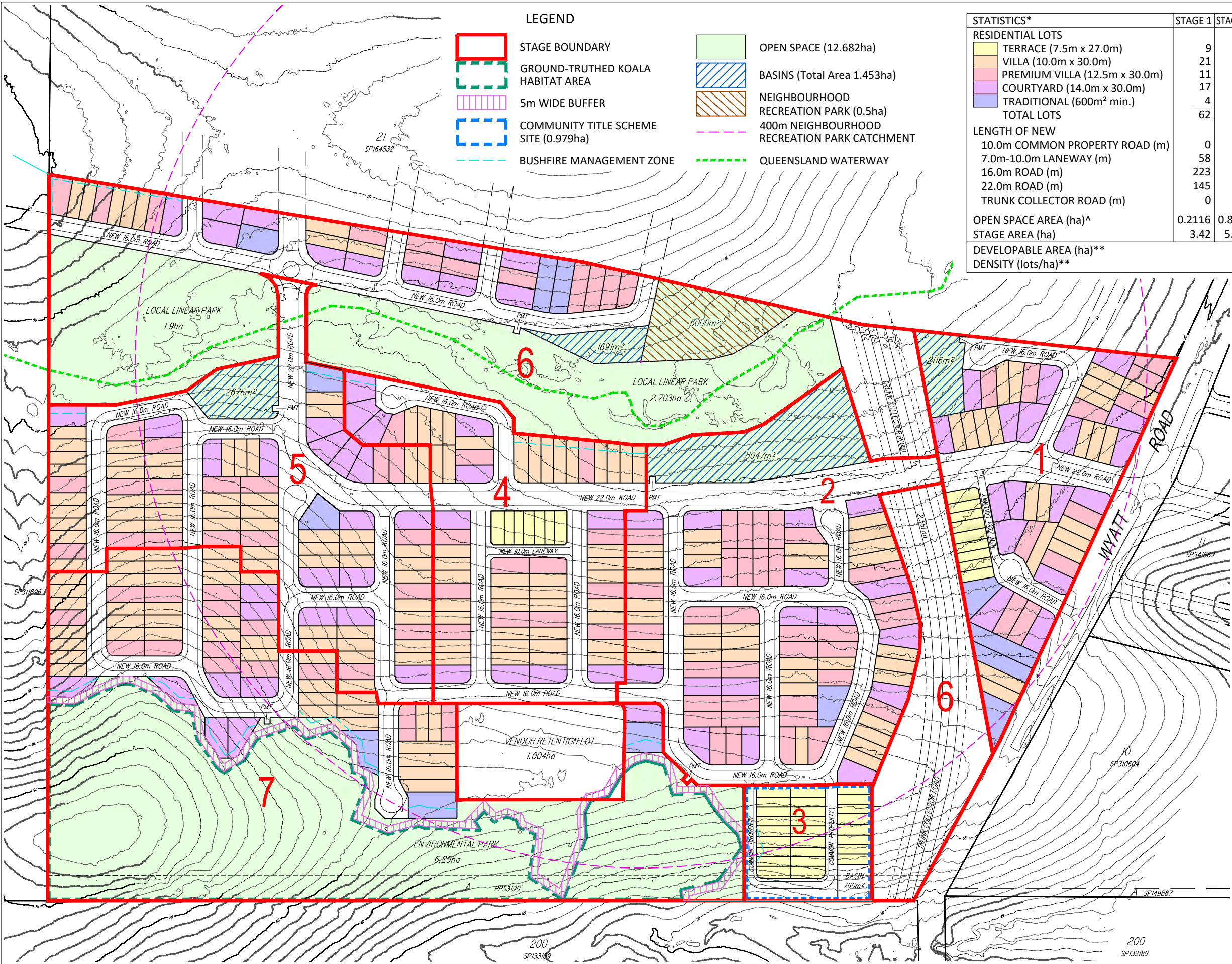
EDQ (2011), Greater Flagstone Priority Development Area (PDA) Development Scheme.

IPWEAQ (2017), Queensland Urban Drainage Manual, 4th Ed., Queensland

Water by Design (2018), MUSIC Modelling Guidelines

Water Technology (2024), Concept Flood Assessment and Stormwater Management Plan, Wyatt Road, Kagaru, Welco Group, 4 April 2024.

Appendix A - Proposed Development Layout



LEGEND

- STAGE BOUNDARY

GROUND-TRUTHED KOALA HABITAT AREA

5m WIDE BUFFER

COMMUNITY TITLE SCHEME SITE (0.979ha)

BUSHFIRE MANAGEMENT ZONE
- OPEN SPACE (12.682ha)

BASINS (Total Area 1.453ha)

NEIGHBOURHOOD RECREATION PARK (0.5ha)

400m NEIGHBOURHOOD RECREATION PARK CATCHMENT

QUEENSLAND WATERWAY

STATISTICS*	STAGE 1	STAGE 2A	STAGE 2B	STAGE 3	STAGE 4	STAGE 5	STAGE 6	TOTAL
RESIDENTIAL LOTS								
TERRACE (7.5m x 27.0m)	9	0	26	7	0	0	0	42 (10%)
VILLA (10.0m x 30.0m)	21	34	0	42	54	8	40	199 (45%)
PREMIUM VILLA (12.5m x 30.0m)	11	35	0	13	18	12	14	103 (24%)
COURTYARD (14.0m x 30.0m)	17	17	0	11	15	11	9	80 (18%)
TRADITIONAL (600m ² min.)	4	1	0	0	2	3	3	13 (3%)
TOTAL LOTS	62	87	26	73	89	34	66	437 (100%)
LENGTH OF NEW								
10.0m COMMON PROPERTY ROAD (m)	0	0	215	0	0	0	0	215
7.0m-10.0m LANEWAY (m)	58	0	0	60	0	0	0	118
16.0m ROAD (m)	223	820	0	570	756	585	456	3410
22.0m ROAD (m)	145	184	0	170	258	53	0	810
TRUNK COLLECTOR ROAD (m)	0	25	0	0	0	440	0	465
OPEN SPACE AREA (ha)^	0.2116	0.8047	0	0	0.2676	5.2721	6.29	12.846
STAGE AREA (ha)	3.42	5.974	0.926	3.828	5.195	10.231	9.512	39.086
DEVELOPABLE AREA (ha)**								23.689
DENSITY (lots/ha)**								18.4

* Excludes Vendor Retention Lot (1.004ha)
^ Includes Local Linear Park, Environmental Park, Neighbourhood Recreation Park & Stormwater Basins
** Excludes Open Space (12.846ha) & Trunk Collector Road (2.551ha)

PROPERTY DESCRIPTION
LOT 20 ON SP149887
TOTAL AREA 40.09 ha

NOTES

- (1) This plan was prepared for the purpose and exclusive use of 400 WYATT PTY LTD to accompany an application to ECONOMIC DEVELOPMENT QUEENSLAND for a Development Permit to Reconfigure the land described in the plan and is not to be used for any other purpose or by any other person or corporation. JFP URBAN CONSULTANTS PTY LTD accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this plan in contravention to the terms of this clause or clauses 2, 3, 4, 5, 6 or 7 hereof.
- (2) The contours on this plan are from Orthophoto mapping and are suitable only for the purpose of this application. The accuracy of the contours has not been verified and no reliance should be placed upon such contours for any purpose other than for the purpose of this application.
- (3) The MGA boundaries utilised for this plan are based on information from EDWARDS SURVEYING PTY LTD.
- (4) The dimensions, areas, size and location of improvements, flood information (if shown) and number of lots shown on this plan are approximate only and may vary.
- (5) Safety in Design
The Urban Design for the layout proposal has been developed to meet the stated project brief, as expressed in JFP Urban Consultants Offer for the works, and the Design Standards stipulated by the Local Authority named on this plan.
Non-standard design solutions adopted in the preparation of the layout are listed as follows;
• None
- (6) The State Government proposes changes to the Queensland Development Code to reflect the provisions of the National Construction Code 2022. These changes once implemented will have an impact on the design of the future dwellings on the proposed allotments identified on this plan. The amendments to the QDC may also be subject to transitional provisions and we would strongly recommend that you discuss these matters further with your preferred Building Certifier.
- (7) This plan may not be reproduced unless these notes are included.

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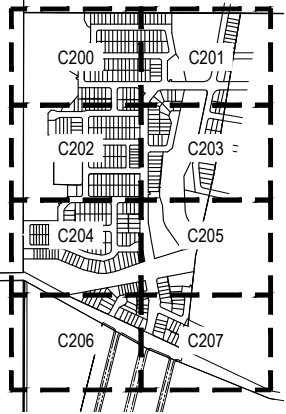
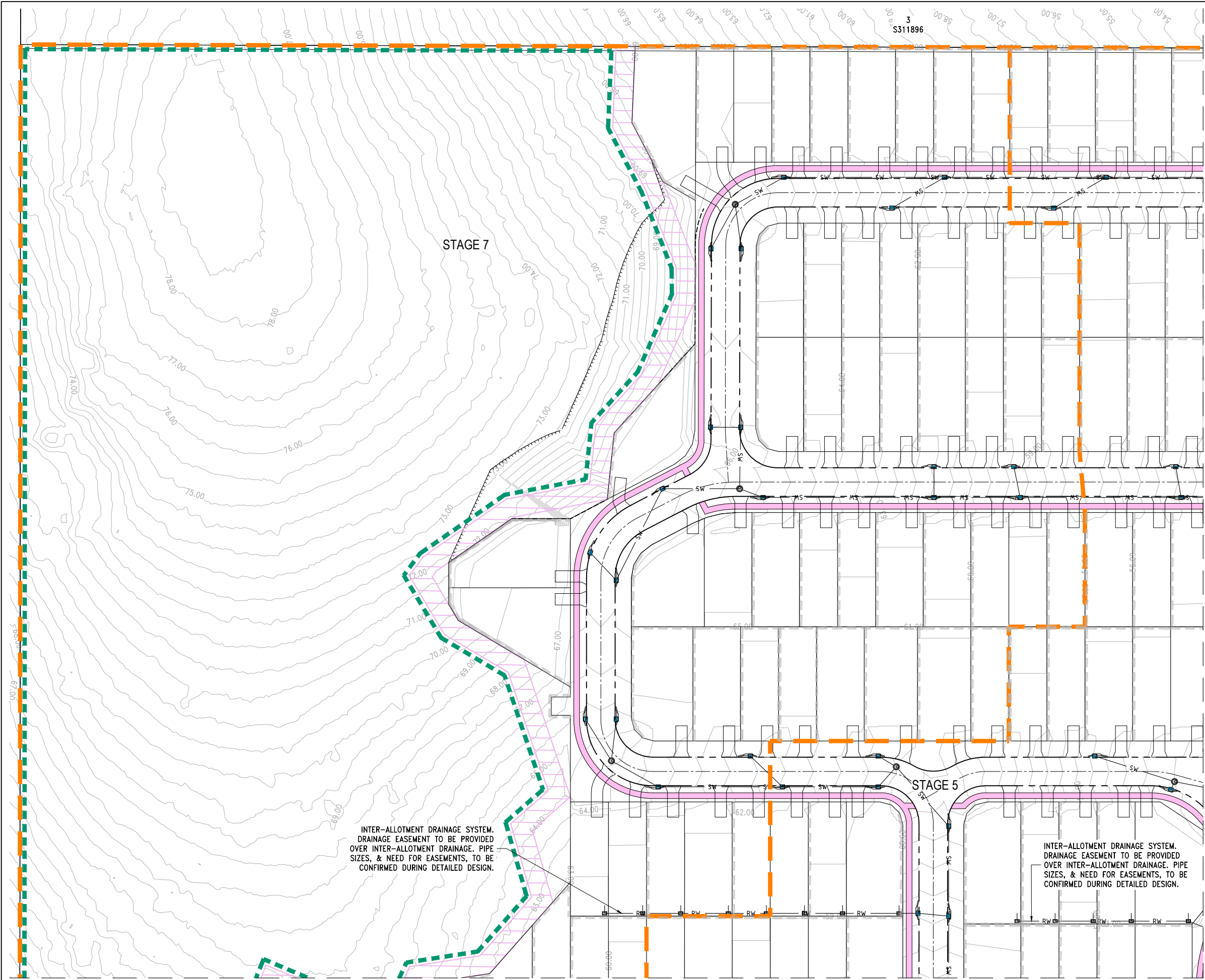
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RECONFIGURATION MASTER PLAN
400 WYATT PTY LTD
400 WYATT ROAD, KAGARU

DETAILS:
JOB NUMBER:
B4955PA1_DA1 D1 B
SHEET:
1 OF 8
DATE:
26th May 2026

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Appendix B – Preliminary Engineering Drawings



KEYMAP
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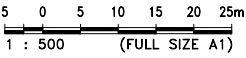
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LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED STAGE BOUNDARY
- PROPOSED KERB AND CHANNEL
- PROPOSED ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR (1m INTERVALS)
- PROPOSED STORMWATER LINE
- PROPOSED ROOFWATER LINE
- PROPOSED STORMWATER STRUCTURE
- PROPOSED ROOFWATER STRUCTURE
- EARTHWORKS BATTER TOP
- EARTHWORKS BATTER BOTTOM
- 1.5m FOOTPATH
- 3.0m SHARED FOOTPATH
- PROPOSED SLEEPER RETAINING WALL
- PROPOSED CUTOFF DRAIN
- QUEENSLAND WATERWAY
- INDICATIVE FUTURE DRIVEWAY
- 5m WIDE BUFFER
- GROUND-TRUTHED KOALA HABITAT AREAS
- PROPOSED LINEMARKING
- PROPOSED RAISED ISLANDS
- FUTURE LOT BOUNDARY
- FUTURE KERB AND CHANNEL

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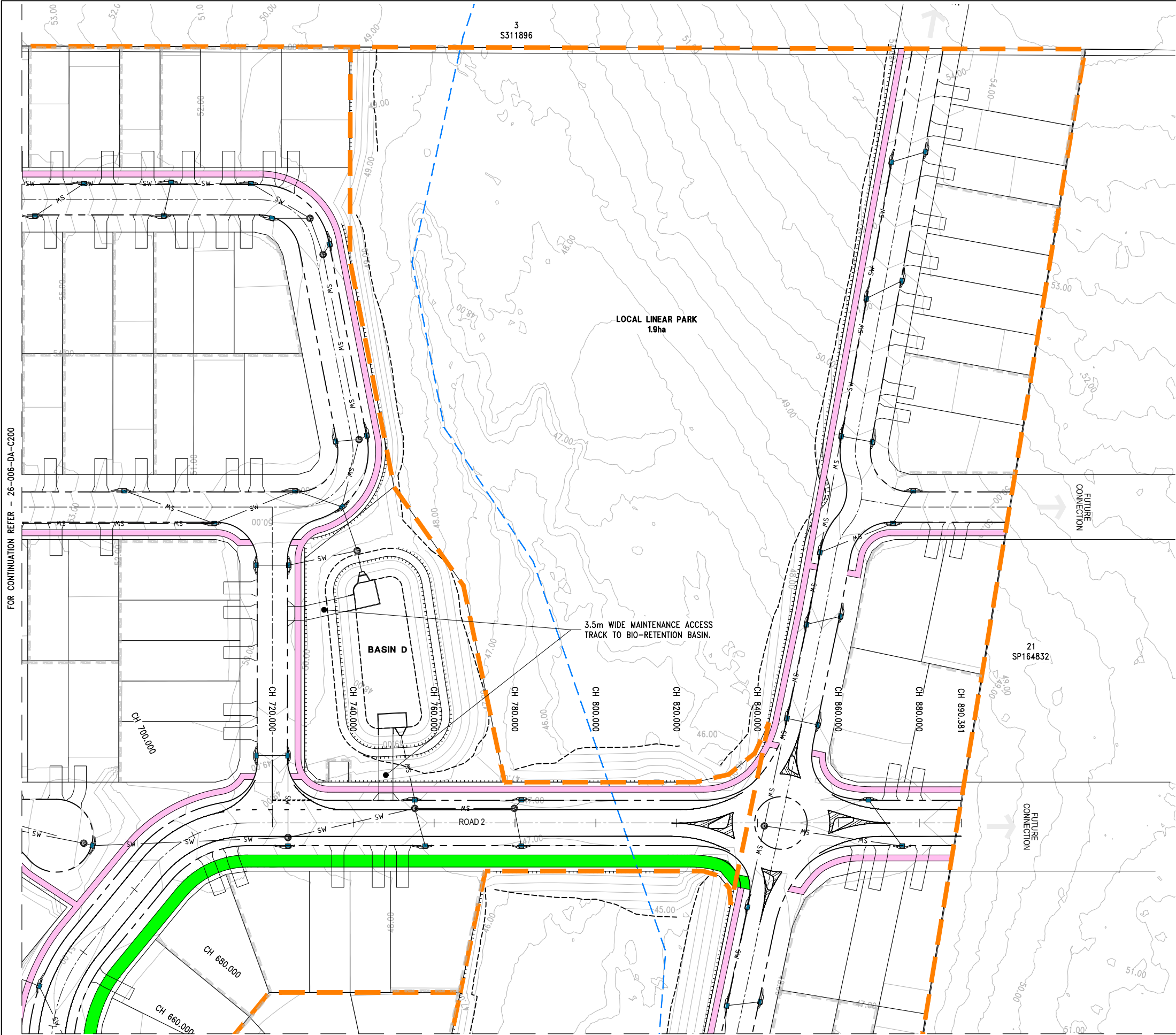
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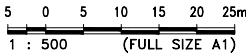
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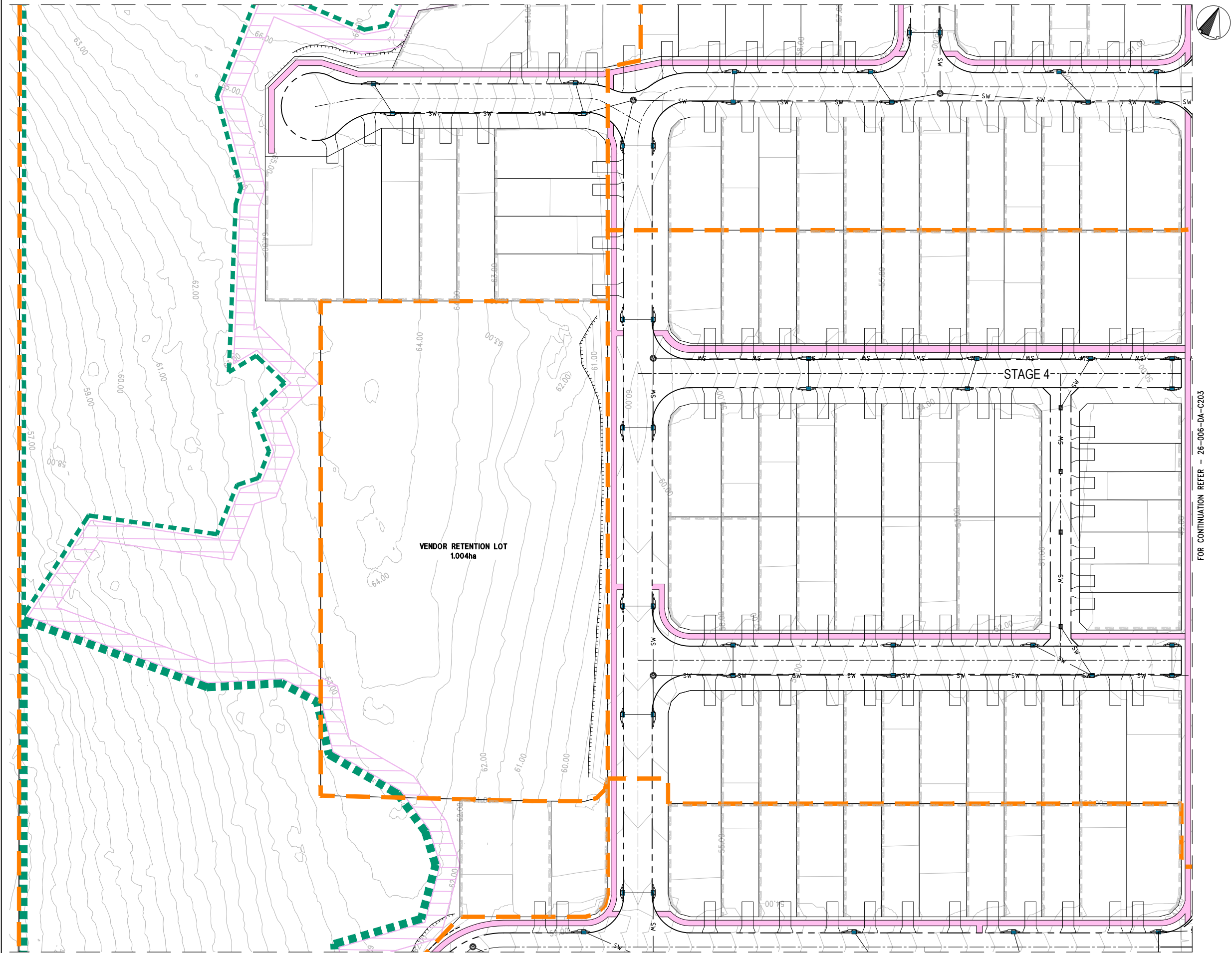


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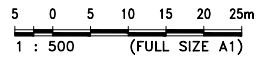
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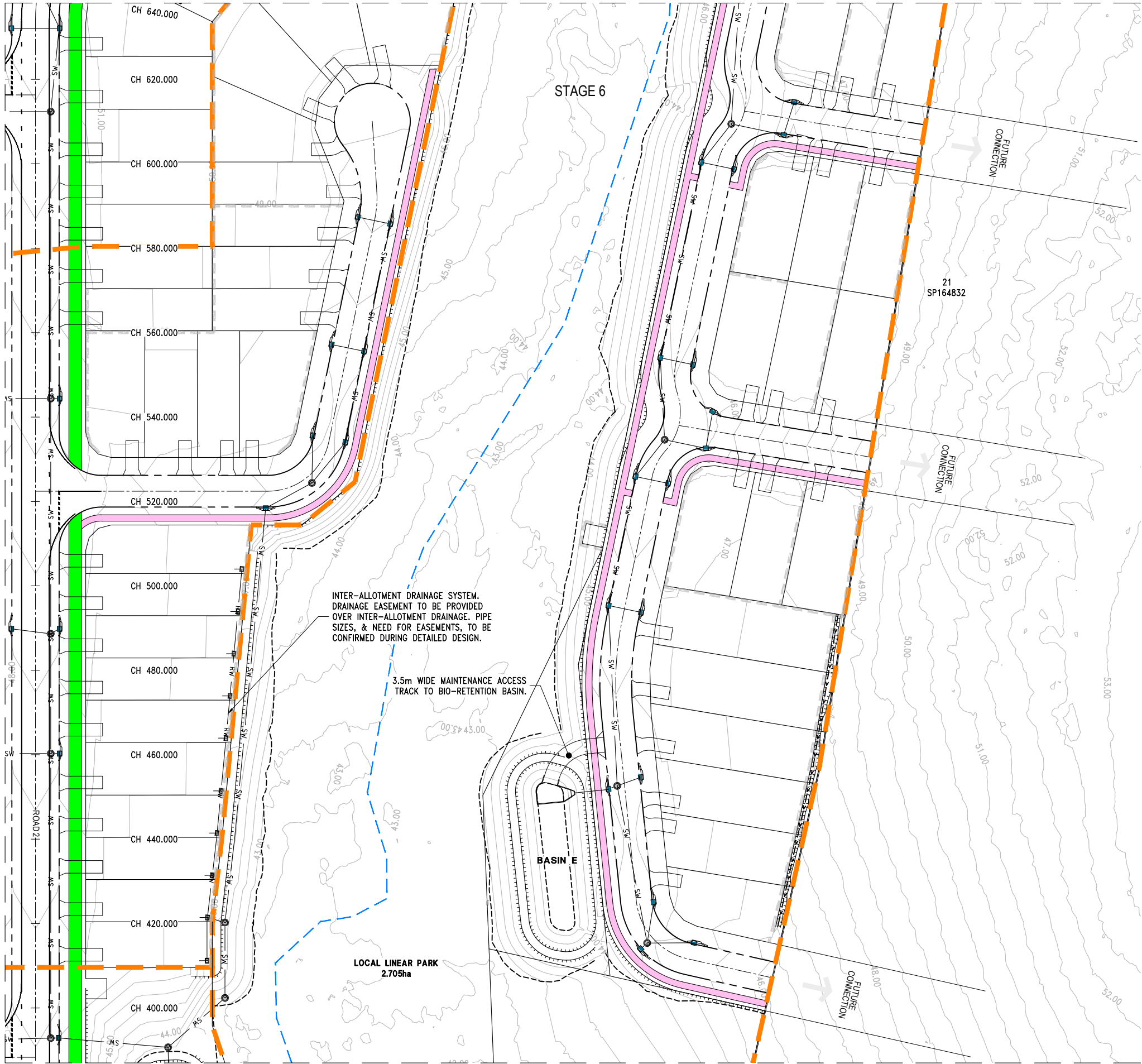
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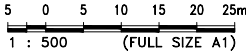
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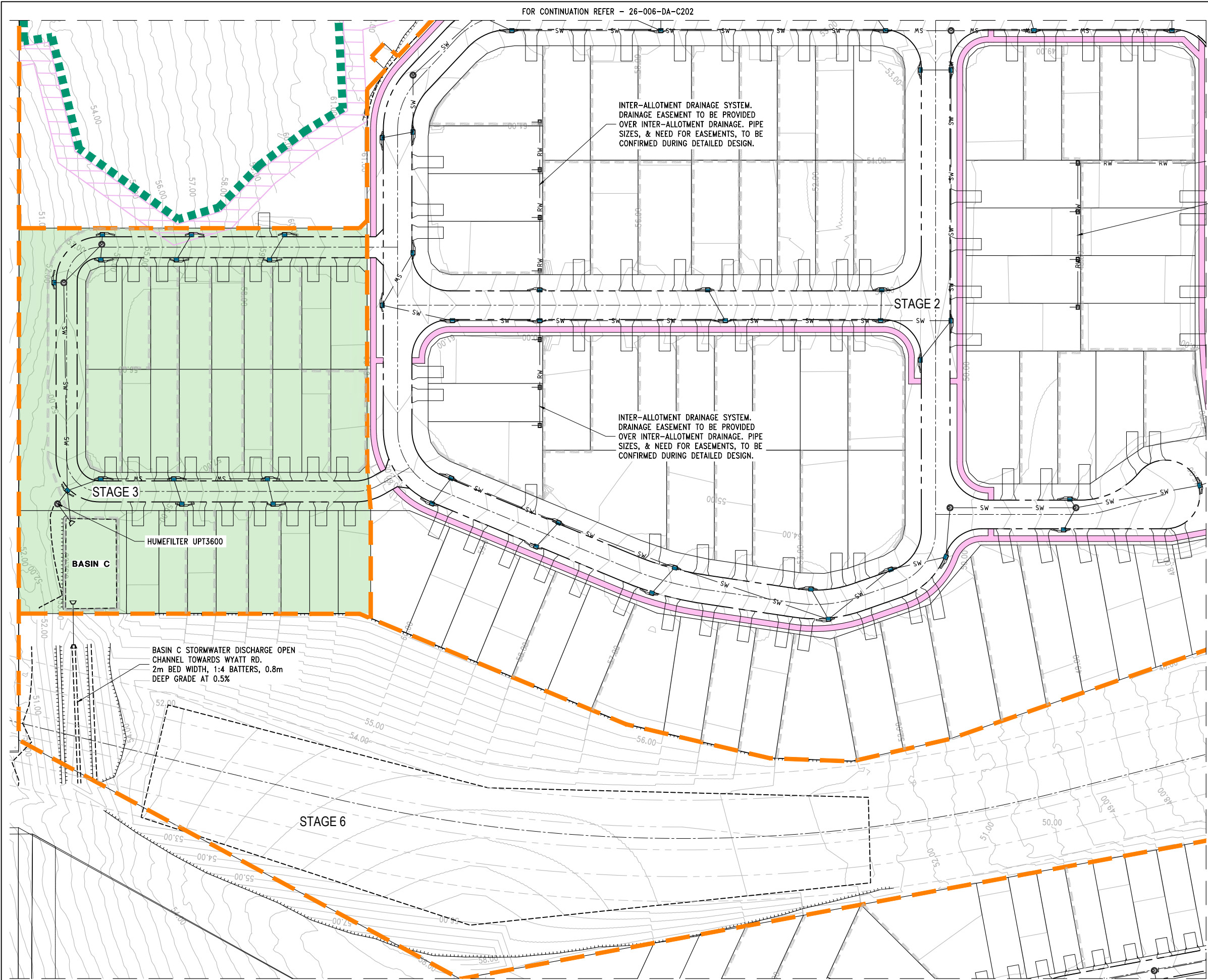
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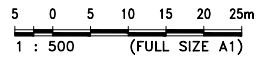
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NOTE:
GREEN HATCHED AREA DELINEATES THE PROPOSED COMMUNITY TITLES AREA.

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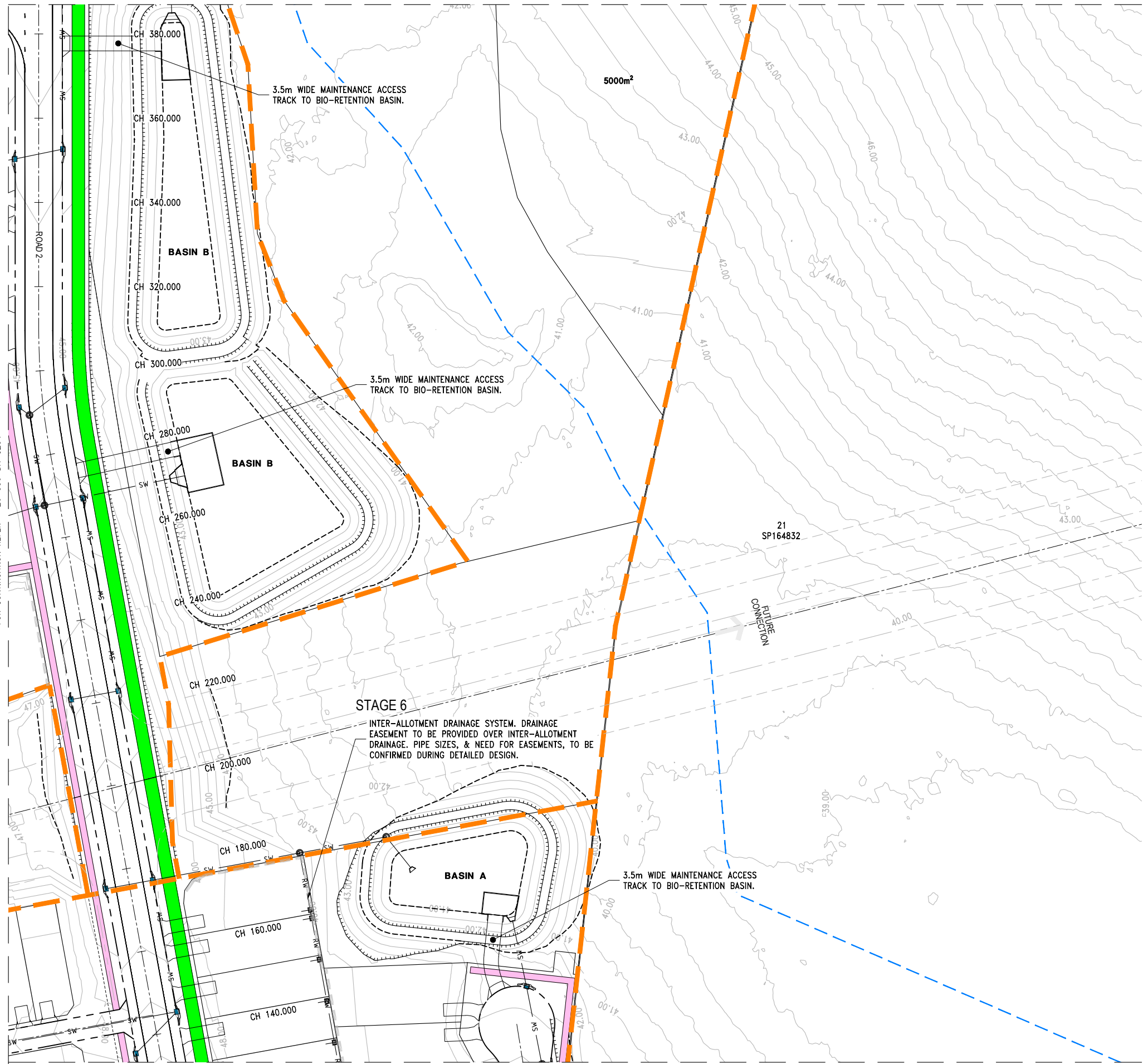
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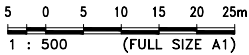
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FOR CONTINUATION REFER - 26-006-DA-C207

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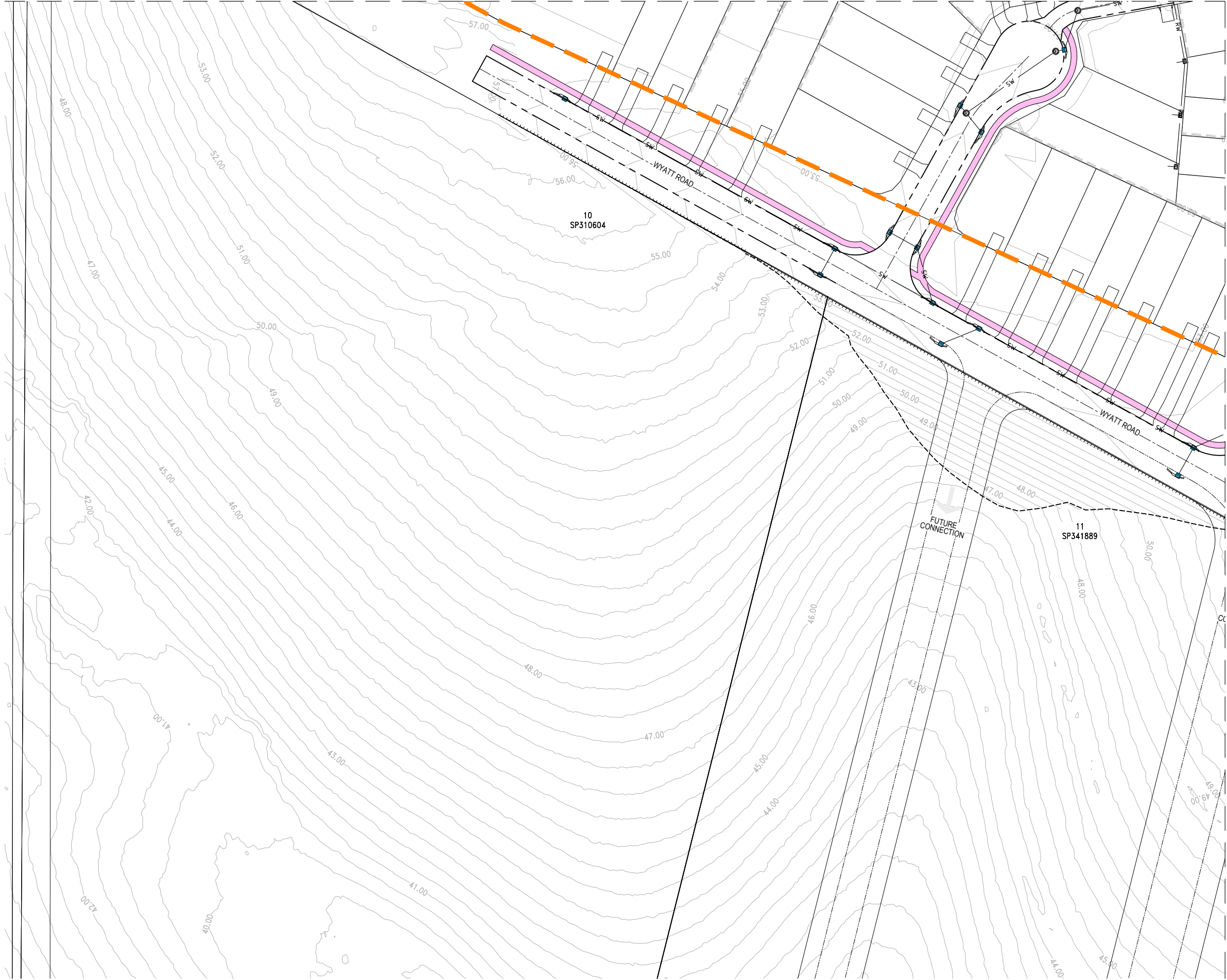
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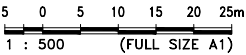
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RPEQ: _____ DATE: _____

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CLIENT
400 WYATT Pty Ltd

TITLE
ROADWORKS AND DRAINAGE
LAYOUT PLAN
SHEET 7 OF 8

PROJECT
400 WYATT ROAD, KAGARU
RESIDENTIAL DEVELOPMENT

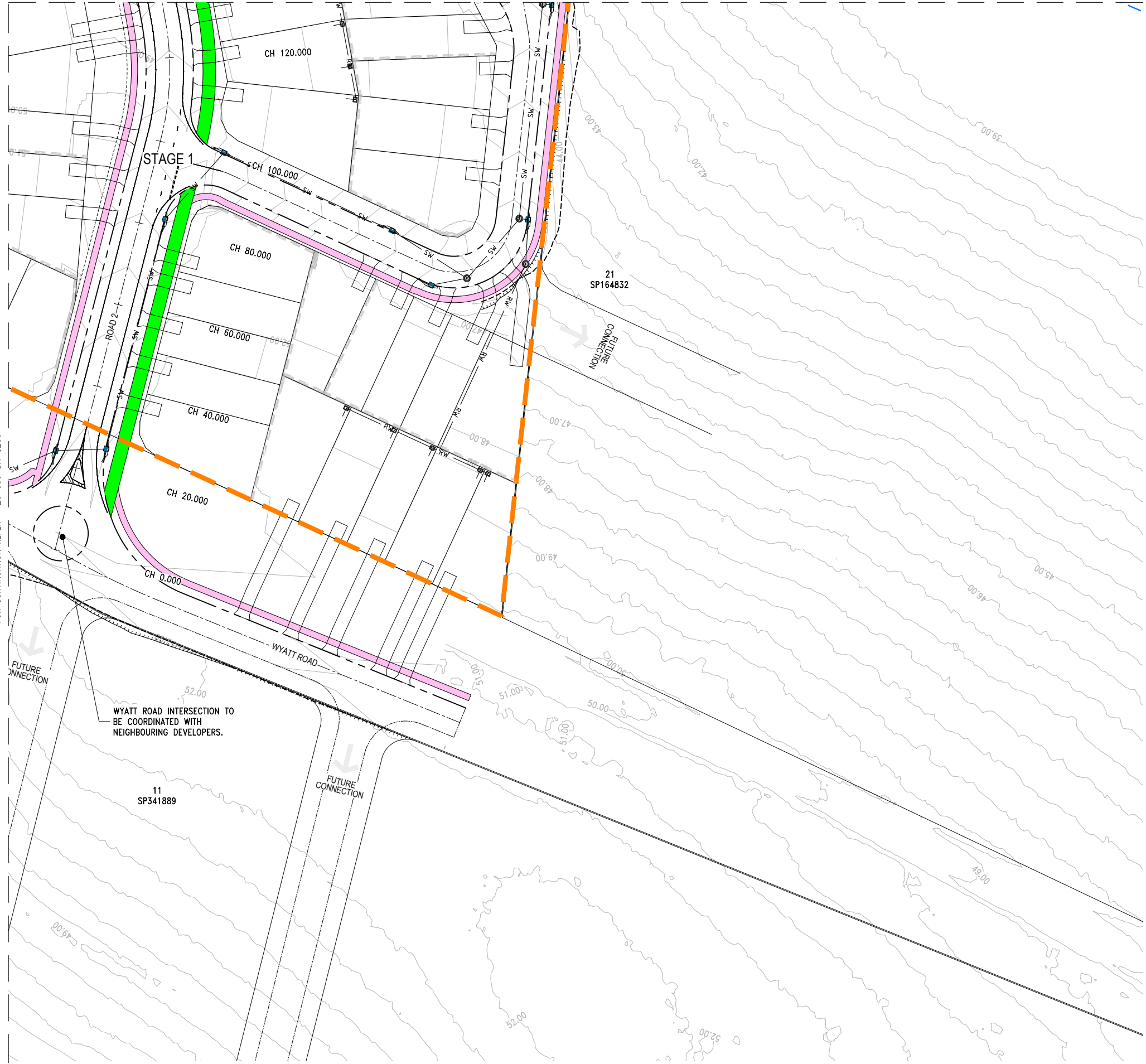
STATUS
FOR APPROVAL

DESIGNED	DRAWN	APPROVED	DATE	SCALE @ A1	SHEET
NM	NM	-	27/05/26	1:500	7 of 8
PROJECT No	DRAWING No	REV			
26-006	C206	A			

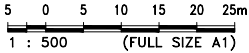


NOTE:
REFER DRAWING C200 FOR LEGEND
AND KEYMAP.

FOR CONTINUATION REFER - 26-006-DA-C206



REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



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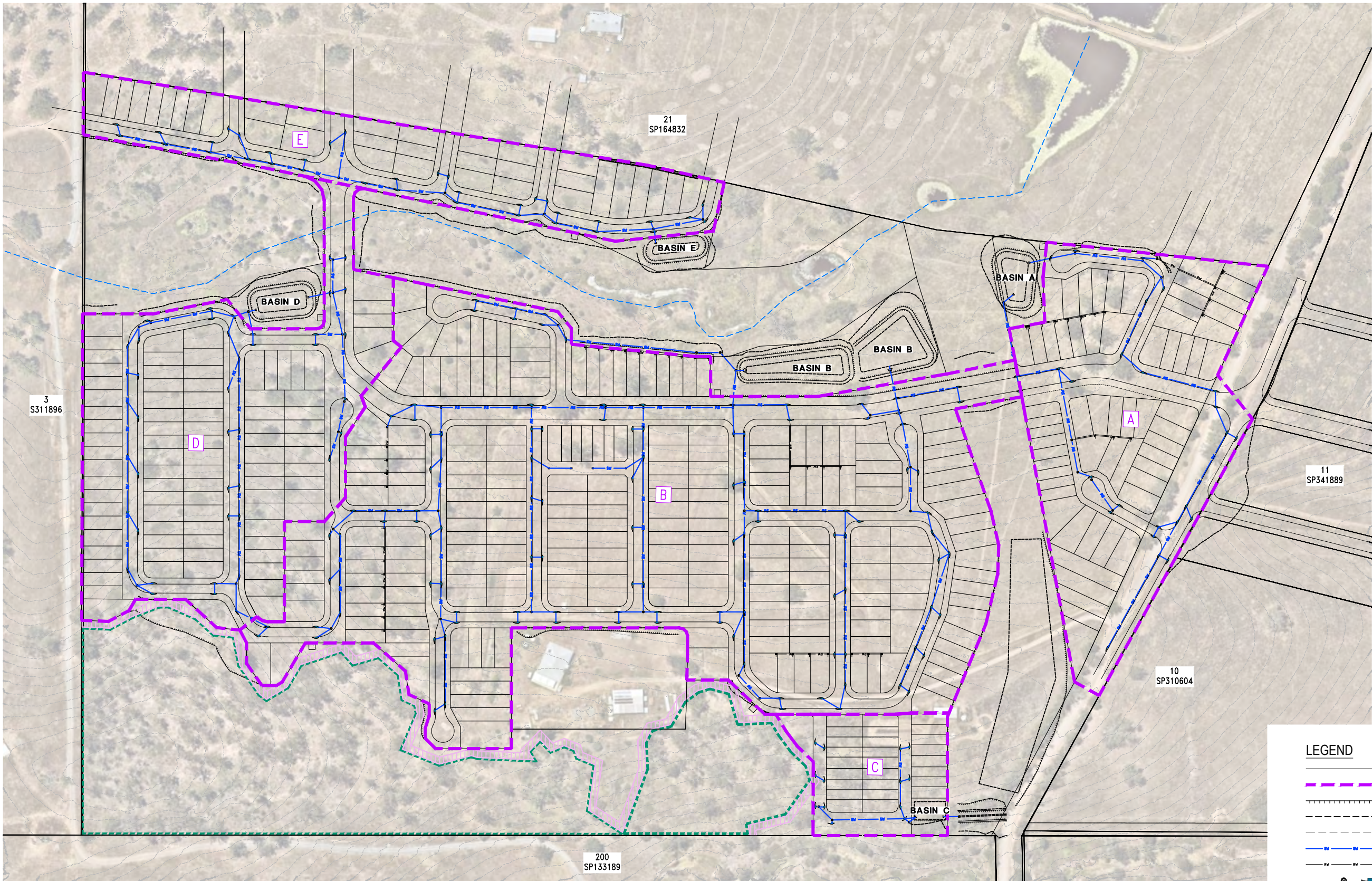
CLIENT
400 WYATT Pty Ltd

TITLE
ROADWORKS AND DRAINAGE
LAYOUT PLAN
SHEET 8 OF 8

PROJECT
400 WYATT ROAD, KAGARU
RESIDENTIAL DEVELOPMENT

STATUS
FOR APPROVAL

DESIGNED	DRAWN	APPROVED	DATE	SCALE	A1	SHEET
NM	NM	-	27/05/26	1:500		8 of 8
PROJECT No	DRAWING No	REV				
26-006	C207	A				



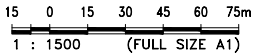
CATCHMENT TABLE

CATCHMENT NAME	CATCHMENT AREA (ha)
A	3.97
B	12.63
C	0.96
D	4.67
E	2.55

LEGEND

- PROPOSED LOT BOUNDARY
- STORMWATER QUALITY CATCHMENT
- EARTHWORKS BATTER TOP
- EARTHWORKS BATTER BOTTOM
- EXISTING SURFACE CONTOUR (1m INTERVALS)
- PROPOSED STORMWATER LINE
- PROPOSED ROOFWATER LINE
- PROPOSED STORMWATER STRUCTURE
- PROPOSED ROOFWATER STRUCTURE
- STORMWATER QUALITY CATCHMENT LABEL
- QUEENSLAND WATERWAY
- 5m WIDE BUFFER
- GROUND-TRUTHED KOALA HABITAT AREAS

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



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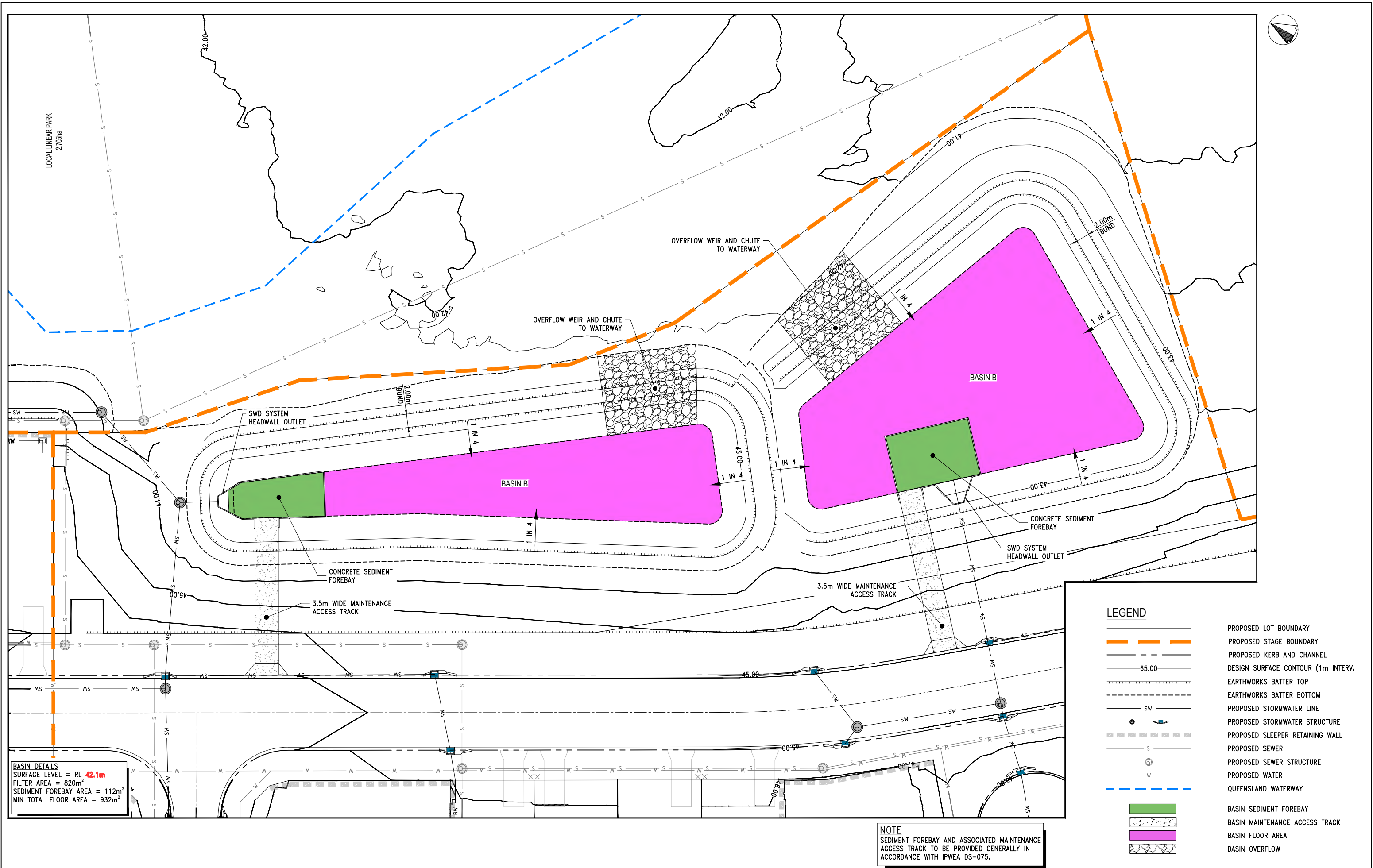
CLIENT
400 WYATT Pty Ltd

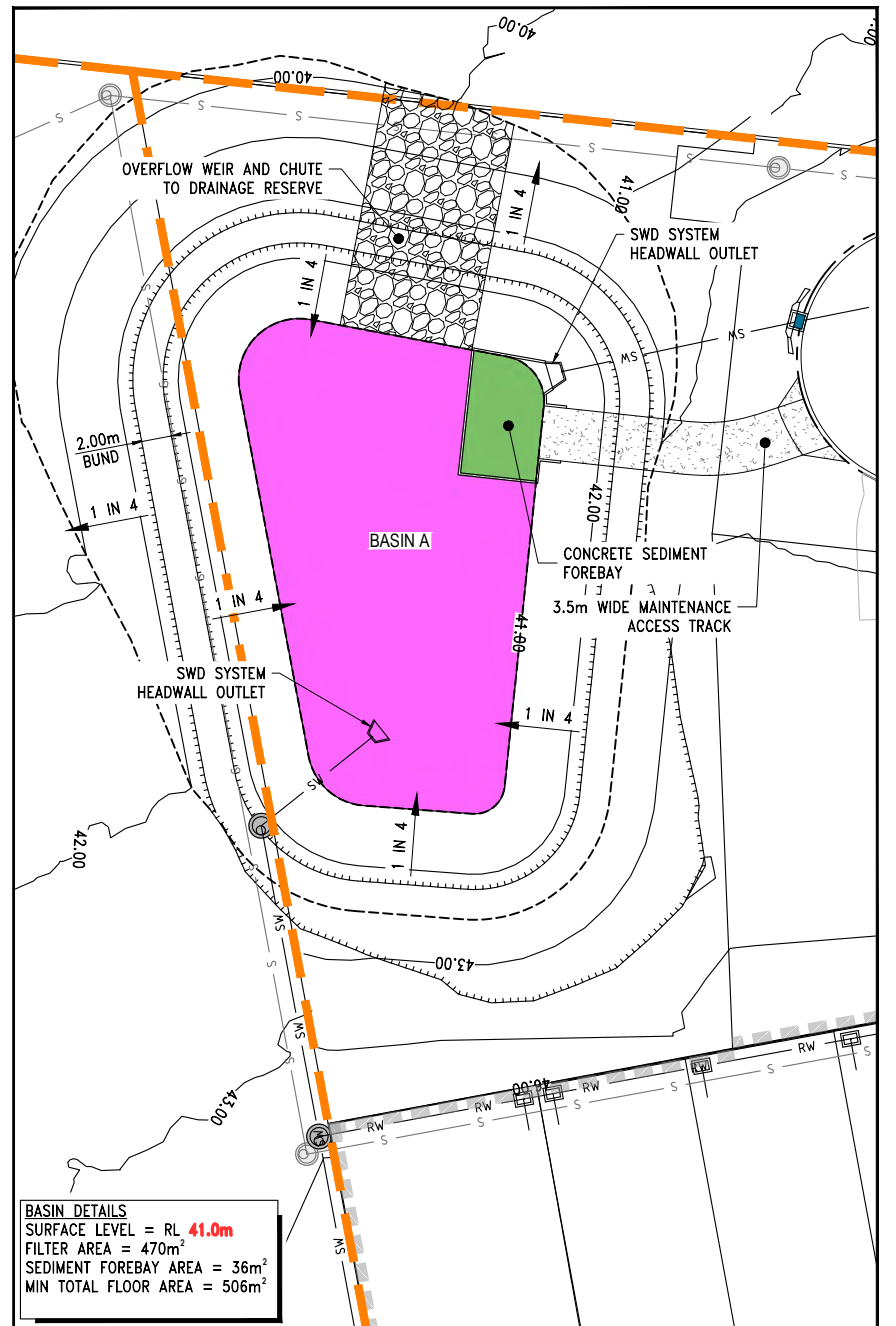
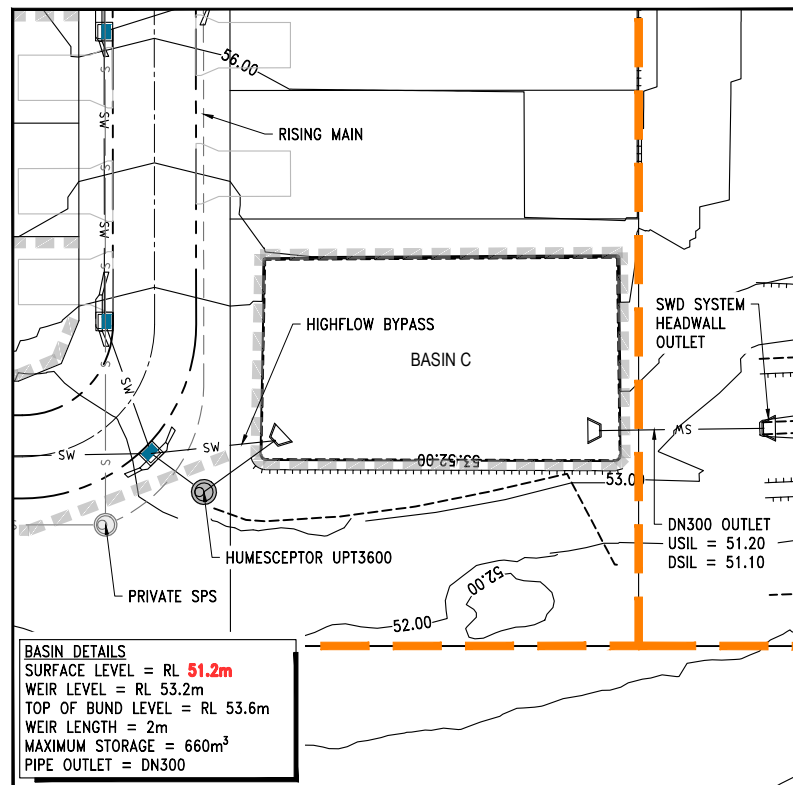
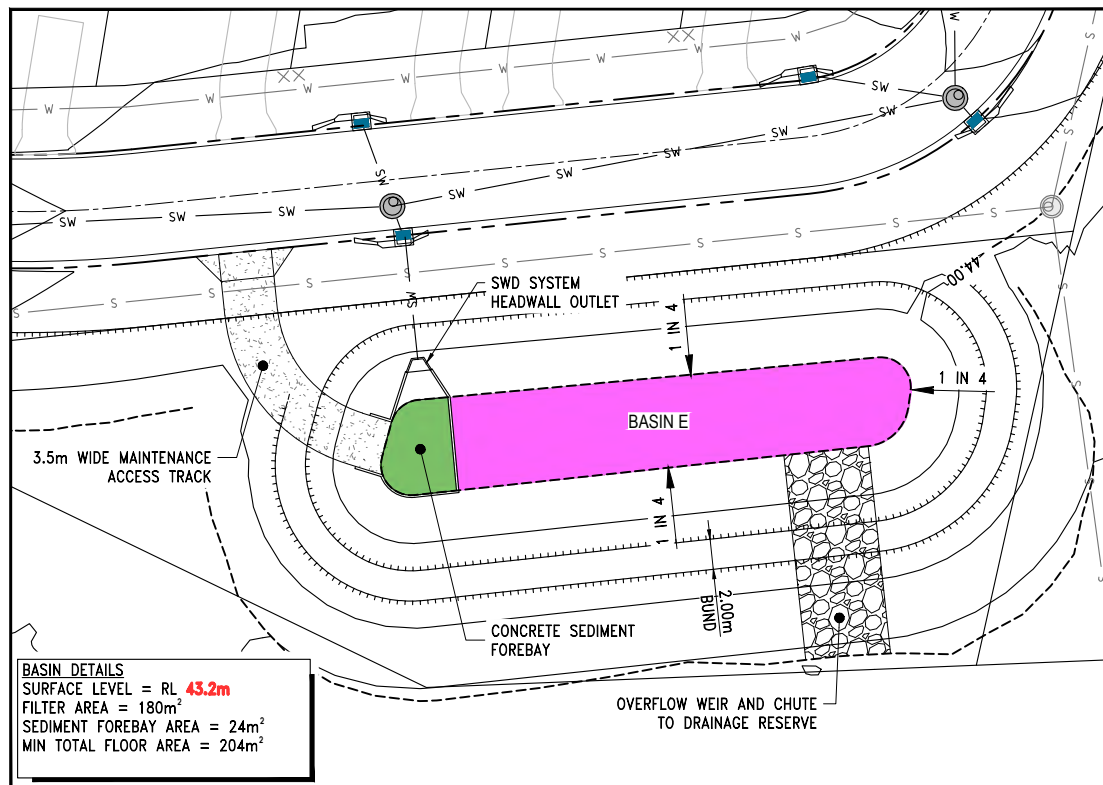
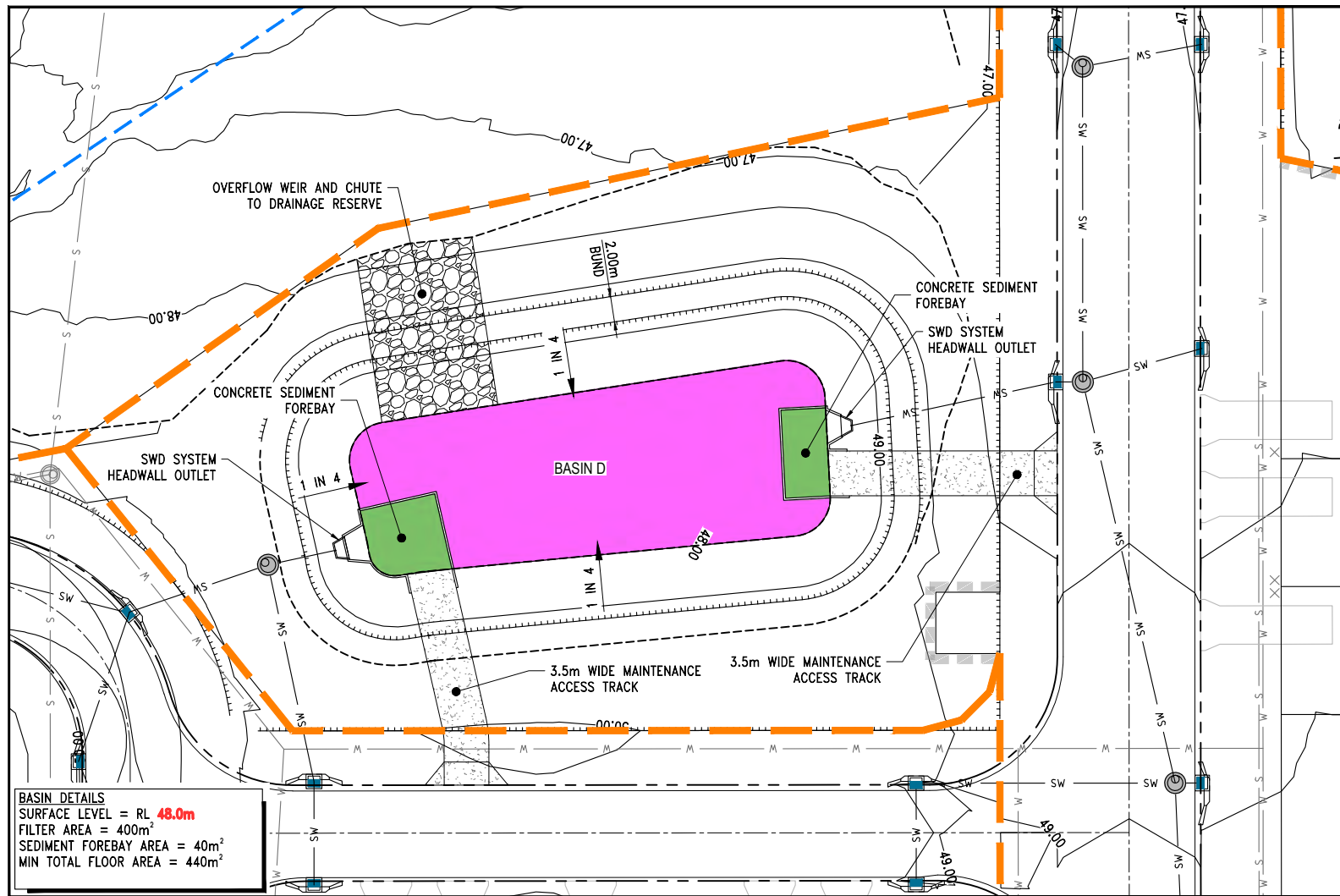
TITLE
STORMWATER QUALITY CATCHMENT LAYOUT PLAN

PROJECT
400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT

STATUS
FOR APPROVAL

DESIGNED	DRAWN	APPROVED	DATE	SCALE	SHEET
NM	NM	-	27/05/26	1:1500	1 of 1
PROJECT No	DRAWING No	REV			
26-006	C210	A			





NOTE:
REFER DRAWING C211 FOR LEGEND.

NOTE
SEDIMENT FOREBAY AND ASSOCIATED MAINTENANCE ACCESS TRACK TO BE PROVIDED GENERALLY IN ACCORDANCE WITH IPWEA DS-075.

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26

5 0 5 10m
1 : 250 (FULL SIZE A1)

NAME:
RPEQ:

DATE:

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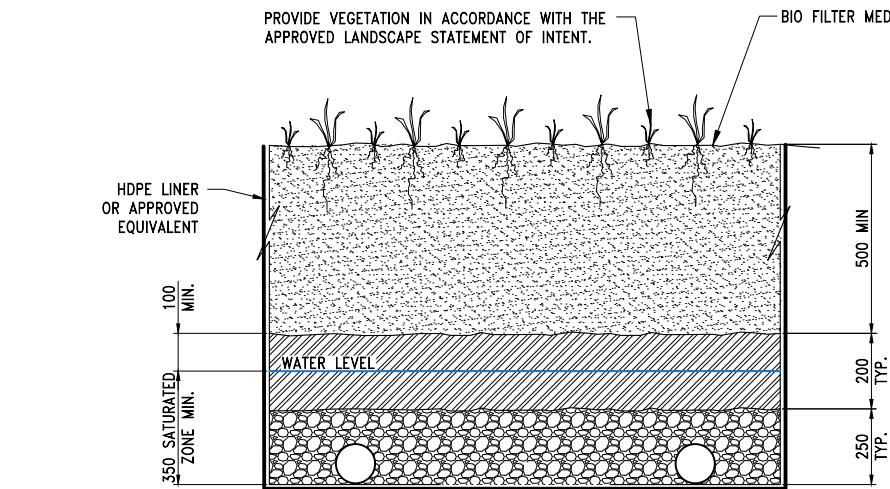
CLIENT
400 WYATT Pty Ltd

TITLE
BIORETENTION BASIN LAYOUT PLAN
SHEET 2 OF 2

PROJECT
400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT

STATUS
FOR APPROVAL

DESIGNED	DRAWN	APPROVED	DATE	SCALE	SHEET
NM	NM	-	27/05/26	1:250	2 of 2
PROJECT No	DRAWING No				REV
26-006	C212				A



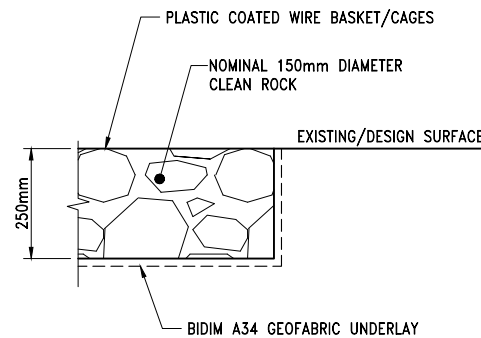
TYPICAL UNDER DRAINAGE:
 Ø150mm SLOTTED RIGID PIPE (uPVC OR SIMILAR TO AS 2439.1) OR APPROVED EQUIVALENT, 0.5% MIN. GRADE, SPACED EQUALLY AT MAX. 2.0m CENTRES, END OF LINE TO INCLUDE FLUSHING POINTS, (REFER IPWEAQ STANDARD DRAWING WSUD-001 & WSUD-004)

BIO-RETENTION MEDIA CROSS SECTION
 N.T.S.

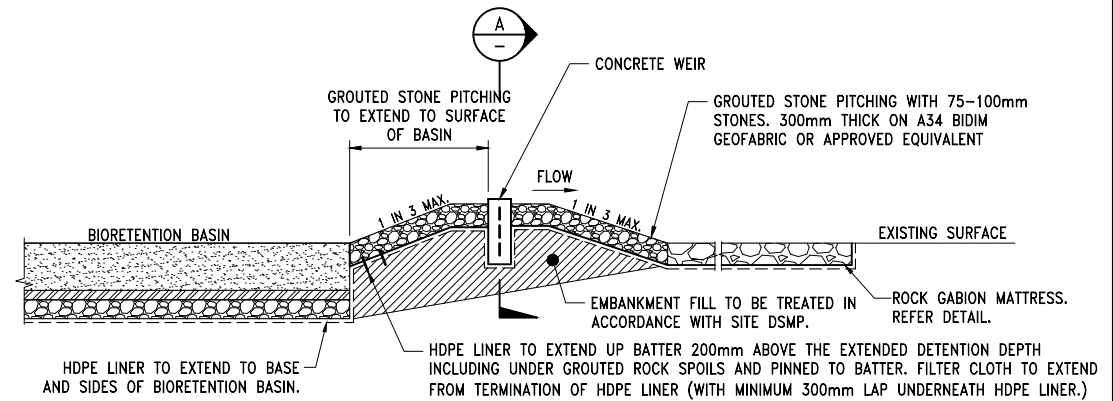
FILTER MEDIA
 SANDY LOAM WITH 400-500mm/hr SATURATED HYDRAULIC CONDUCTIVITY. IN-SITU HYDRAULIC CONDUCTIVITY TO REACH 180mm/hr ONCE SETTLEMENT AND COMPACTION HAS TAKEN PLACE. PARTICLE SIZE DISTRIBUTION AS FOLLOWS:
 CLAY & SILT <3% (<0.05mm)
 VERY FINE SAND 5-30% (0.05-0.15mm)
 FINE SAND 10-30% (0.15-0.25mm)
 MEDIUM TO COARSE SAND 40-60% (0.25-1.0mm)
 COARSE SAND 7-10% (1.0-2.0mm)
 FINE GRAVEL <3% (2.0-3.4mm)
 ORGANIC CONTENT 5% (w/w) MAX.
 pH BETWEEN 5.5-7.5
 PHOSPHORUS CONCENTRATION <100mg/kg

TRANSITION LAYER
 1mm COARSE SAND (DESIGNED IAW WSUD TDG SECTION 5.3.4.3)
DRAINAGE LAYER
 2-5mm SCREENINGS COARSE SAND/GRAVEL (DESIGNED IAW WSUD TDG SECTION 5.3.4.2)

MUST MEET BIORETENTION MEDIA SPECIFIED IN THE WATER BY DESIGN CONSTRUCTION AND ESTABLISHMENT GUIDELINES: SWALES, BIORETENTION SYSTEMS & WETLANDS AND FAWB. THE REQUIRED MINIMUM FILTER MEDIA DEPTH IS 0.5m TO ACHIEVE THE WATER QUALITY OBJECTIVES BUT 0.7m FILTER DEPTH HAS BEEN NOMINATED AT THE REQUEST OF ICC

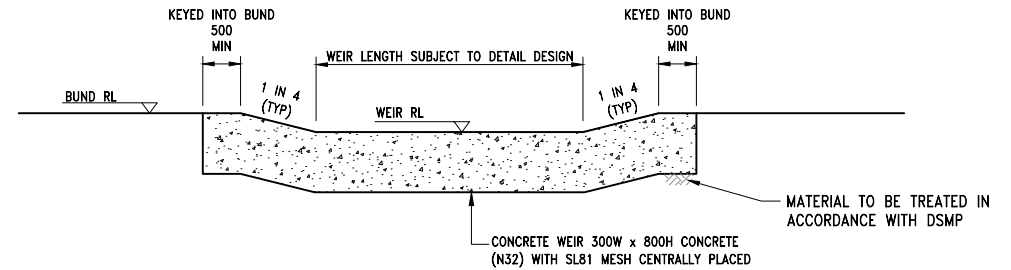


ROCK GABION MATTRESS PROTECTION DETAIL
 SCALE N.T.S.

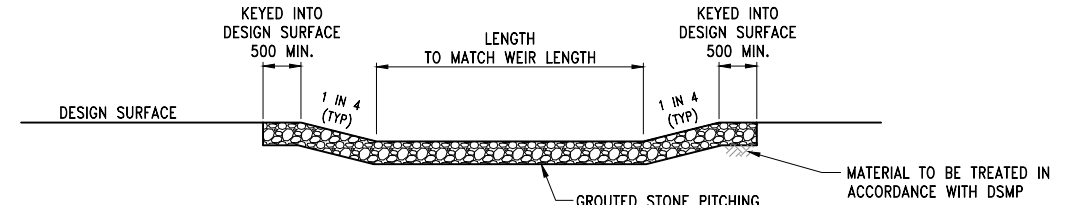


WEIR DETAIL
 SCALE N.T.S.

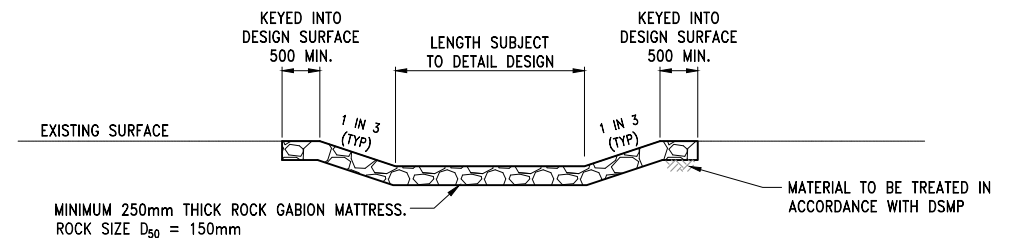
NOTE
 INSITU MATERIAL TO BE TESTED AND APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO WEIR CONSTRUCTION.



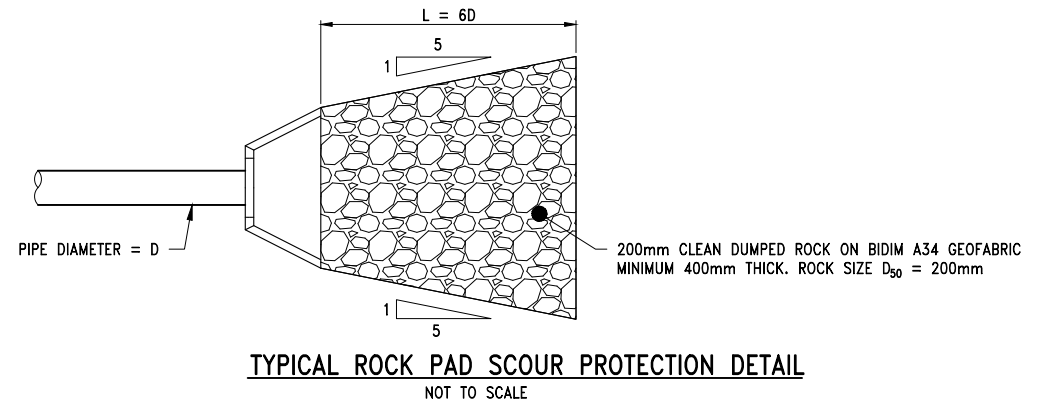
SECTION A - TYPICAL WEIR SECTION
 SCALE N.T.S.



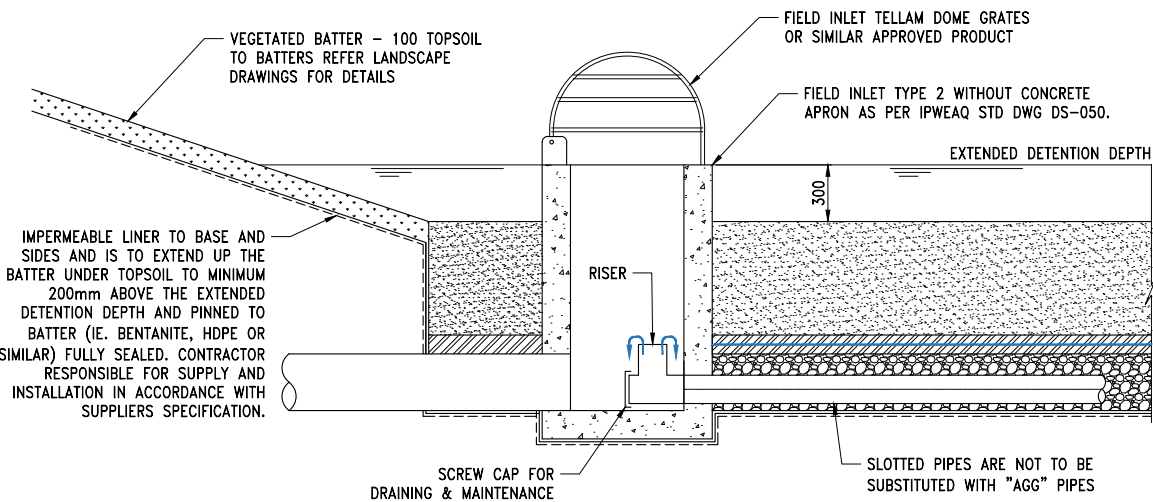
TYPICAL GROUDED STONE PITCHING CHANNEL SECTION
 SCALE N.T.S.



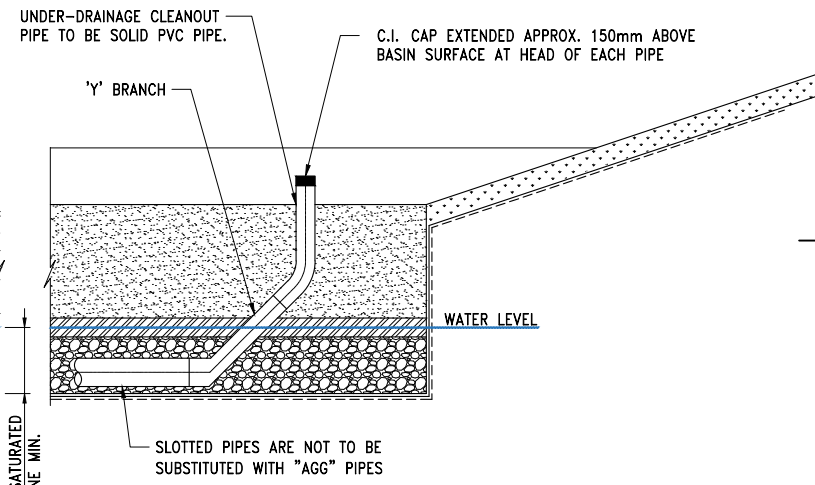
TYPICAL ROCK GABION MATTRESS CHANNEL SECTION
 SCALE N.T.S.



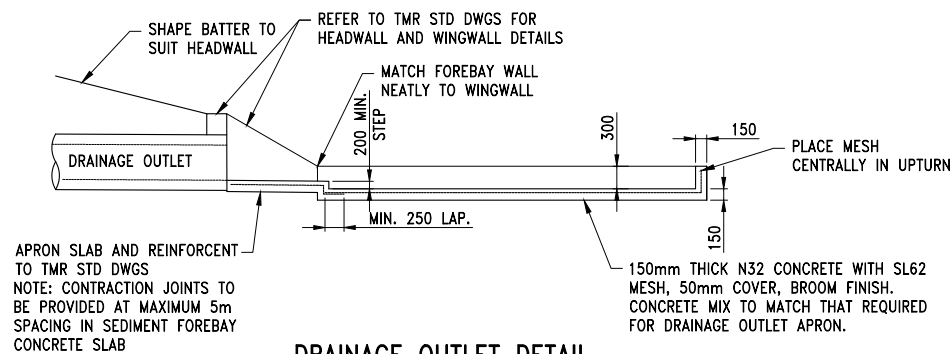
TYPICAL ROCK PAD SCOUR PROTECTION DETAIL
 NOT TO SCALE



TYPICAL BASIN OVERFLOW PIT ELEVATION
 SCALE 1:20

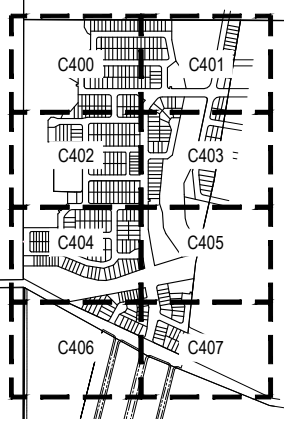
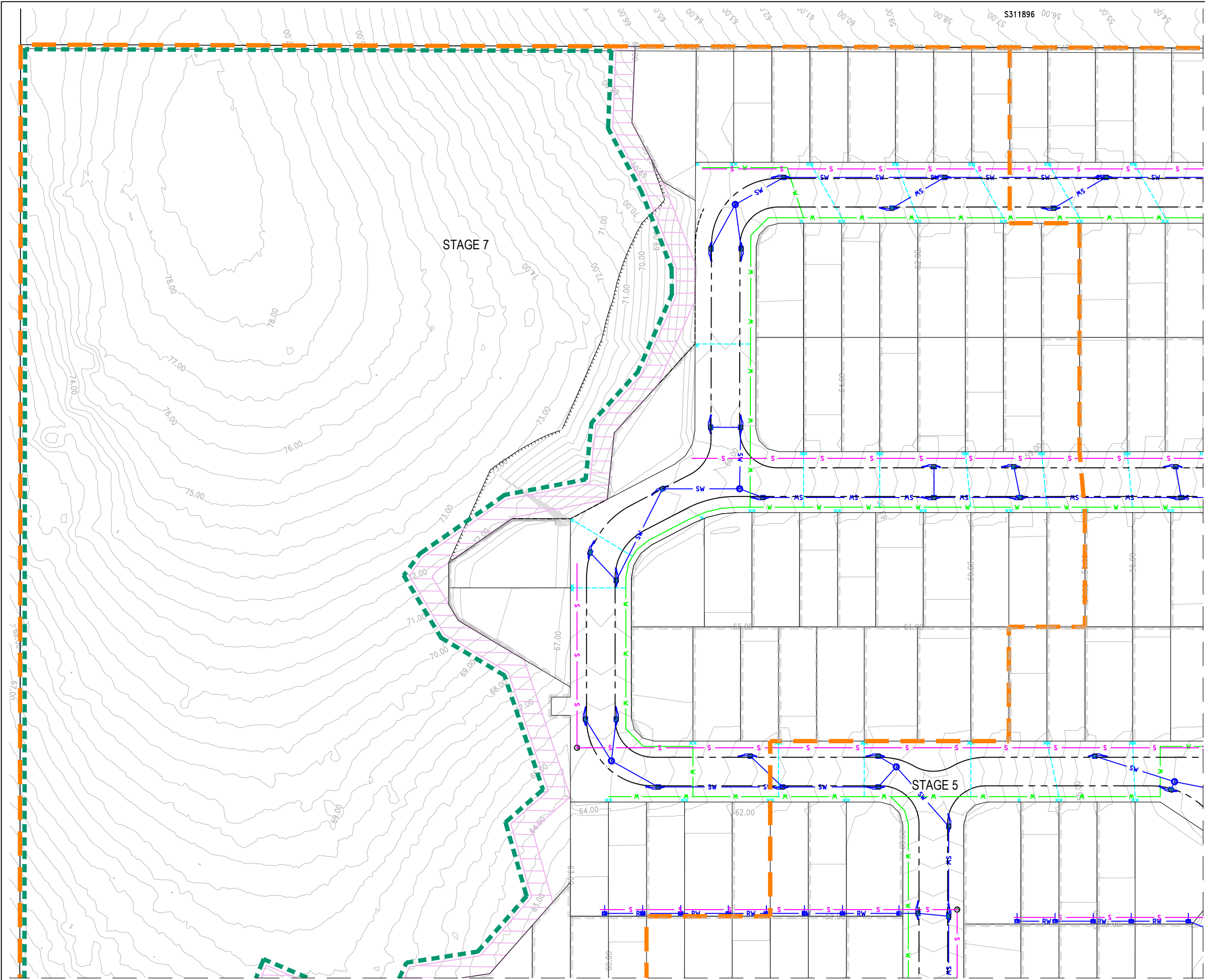


TYPICAL BASIN OVERFLOW PIT PLAN VIEW
 SCALE 1:20



DRAINAGE OUTLET DETAIL
 SCALE 1:5

REV	DESCRIPTION	BY	DES	DATE	NAME:	DATE:	CLIENT	PROJECT	STATUS	DESIGNED	DRAWN	APPROVED	DATE	SCALE	SHEET
A	FOR APPROVAL	NM	NM	27/05/26	RPEQ:		Ensilon Pty Ltd ACN 644 618 253	400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT	FOR APPROVAL	NM	NM	-	27/05/26	1:500	1 of 1
					Approved by, for and on behalf of Ensilon					PROJECT No	DRAWING No	DATE	SCALE	REV	
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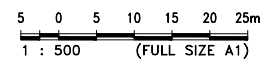
KEYMAP
NOT TO SCALE

FOR CONTINUATION REFER - 26-006-DA-C401

- LEGEND**
- PROPOSED LOT BOUNDARY
 - PROPOSED STAGE BOUNDARY
 - PROPOSED SLEEPER RETAINING WALL
 - PROPOSED KERB AND CHANNEL
 - DESIGN SURFACE CONTOUR (1m INTERVALS)
 - PROPOSED SEWER
 - PROPOSED PRIVATE RISING MAIN
 - PROPOSED STORMWATER LINE
 - PROPOSED STORMWATER STRUCTURE
 - PROPOSED ROOFWATER STRUCTURE
 - PROPOSED ROOFWATER LINE
 - EARTHWORKS BATTER TOP
 - EARTHWORKS BATTER BOTTOM
 - PROPOSED WATER
 - PROPOSED WATER CONDUIT AND SERVICE
 - PROPOSED SEWER STRUCTURE
 - PROPOSED CUTOFF DRAIN
 - QUEENSLAND WATERWAY
 - FUTURE LOT BOUNDARY
 - FUTURE KERB AND CHANNEL

FOR CONTINUATION REFER - 26-006-DA-C402

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



NAME:
RPEQ:
DATE:

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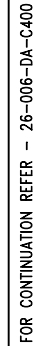


CLIENT
400 WYATT Pty Ltd

TITLE
SERVICES LAYOUT
SHEET 1 OF 8

PROJECT		STATUS						
400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT		FOR APPROVAL						
DESIGNED	DRAWN	APPROVED	DATE	SCALE	BY	SHEET		
NM	NM	-	27/05/26	1:500		1 of 8		
PROJECT No		DRAWING No					REV	
26-006		C400					A	

A circle with a shaded sector and an unshaded sector. The shaded sector is a small wedge-shaped region at the bottom left, and the unshaded sector is a larger wedge-shaped region at the top right. The two sectors are adjacent, sharing a common vertex at the center of the circle.



NAME: RPEQ:	DATE:
<u>Approved by, for and on behalf of Ensilon</u>	
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PROJECT
400 WYATT ROAD, KAGARU
RESIDENTIAL DEVELOPMENT

FOR APPROVAL

DESIGNED NM	DRAWN NM	APPROVED -	DATE 27/05/26	SCALE @ A1 1:500	SHEET 2 of 8
PROJECT No 26-006		DRAWING No C401			REV A



FOR CONTINUATION REFER - 26-006-DA-C403

NAME:
RPEQ: DATE:

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TITLE
SERVICES LAYOUT
SHEET 3 OF 8

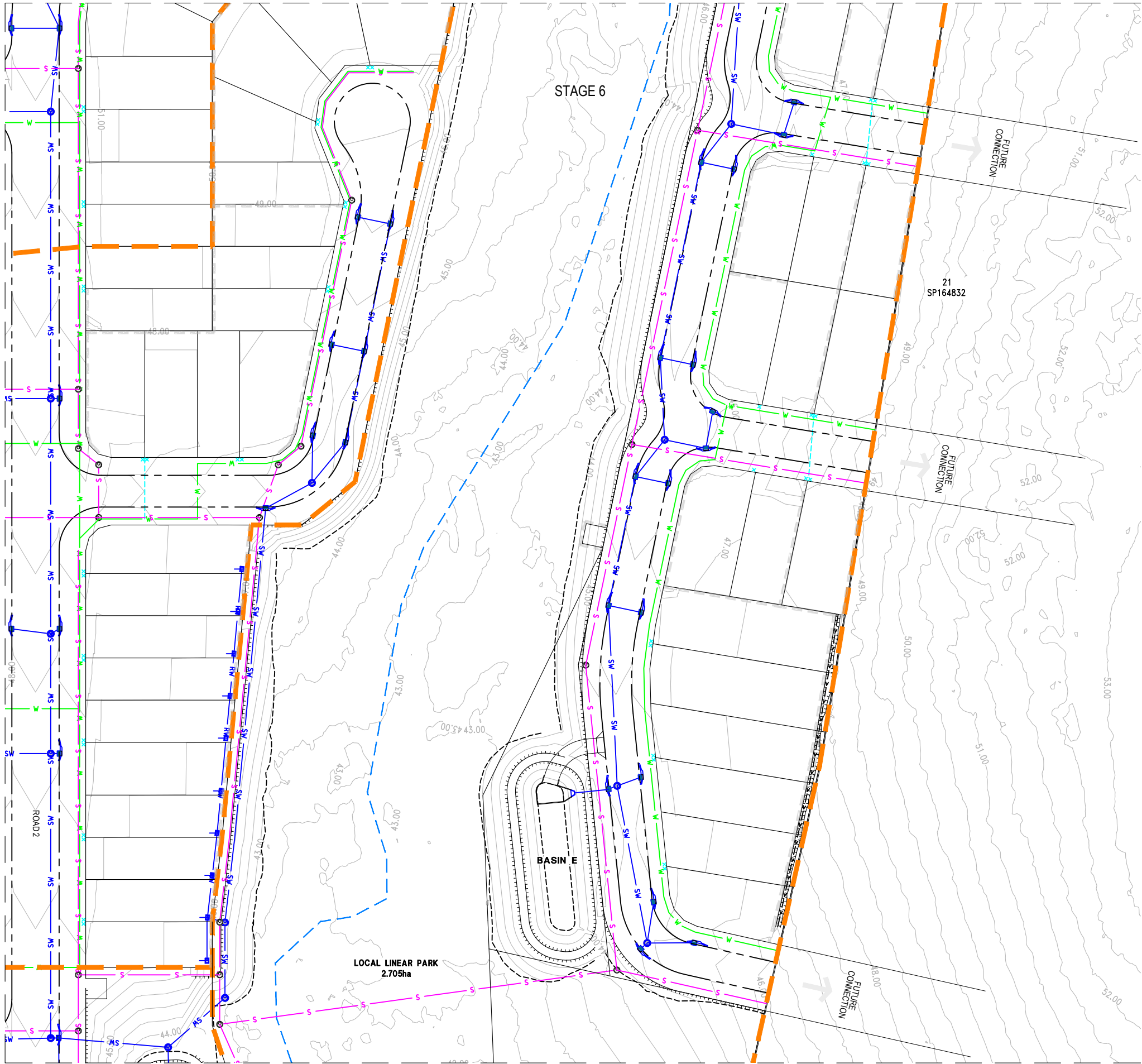
PROJECT
400 WYATT ROAD, KAGARU
RESIDENTIAL DEVELOPMENT

STATUS FOR APPROVAL

DESIGNED NM	DRAWN NM	APPROVED -	DATE 27/05/26	SCALE • A1 1:500	SHEET 3 of 8
PROJECT No 26-006		DRAWING No C402			REV A

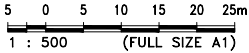
NOTE:
REFER DRAWING C400 FOR LEGEND
AND KEYMAP.

FOR CONTINUATION REFER - 26-006-DA-C402



FOR CONTINUATION REFER - 26-006-DA-C405

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



NAME:
RPEQ:
DATE:

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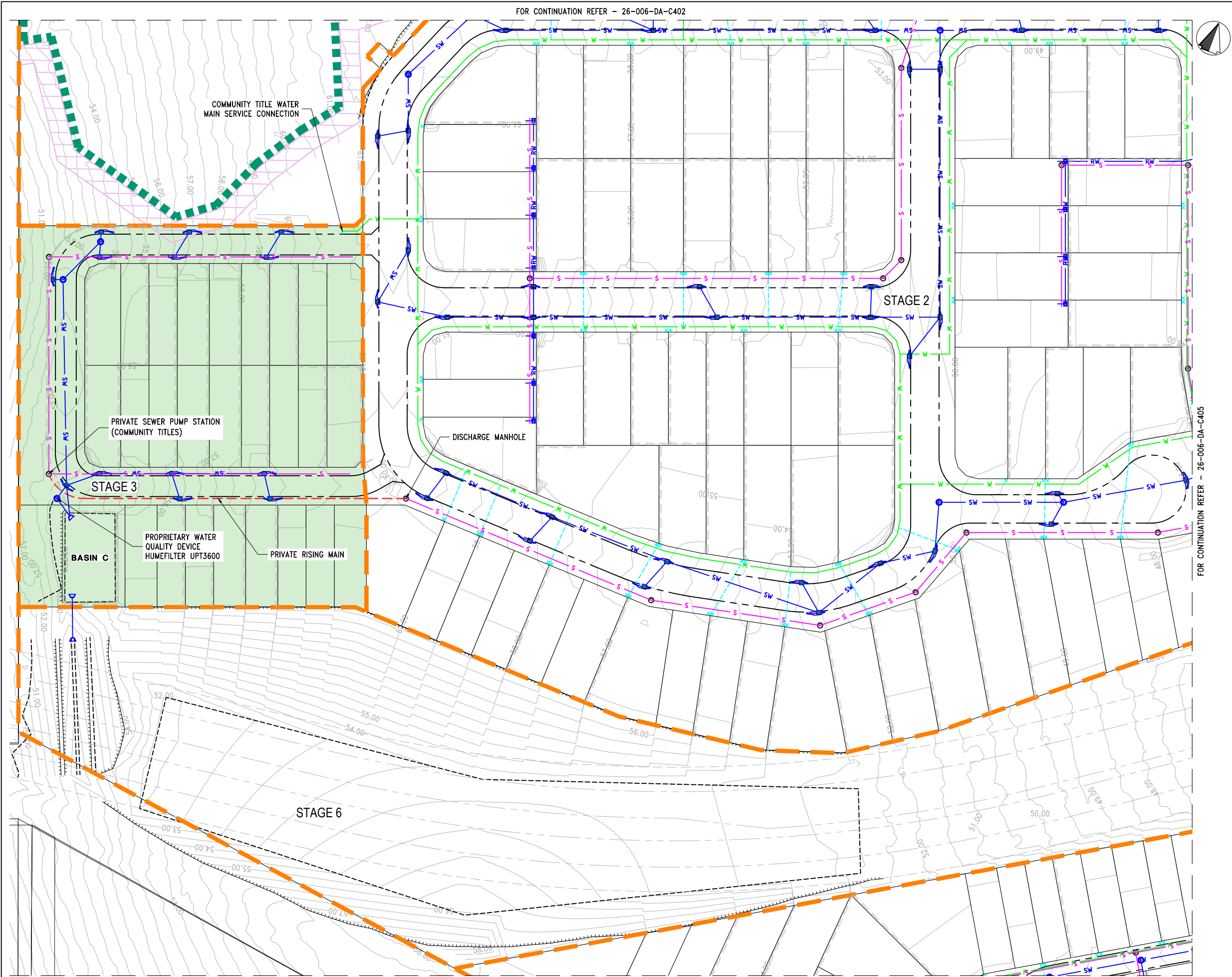
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CLIENT	400 WYATT Pty Ltd
TITLE	SERVICES LAYOUT SHEET 4 OF 8

PROJECT	400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT
STATUS	FOR APPROVAL

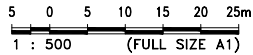
DESIGNED	DRAWN	APPROVED	DATE	SCALE	SHEET
NM	NM	-	27/05/26	1:500	4 of 8
PROJECT No	DRAWING No	REV			
26-006	C403	A			



NOTE:
REFER DRAWING C400 FOR LEGEND
AND KEYMAP.

NOTE:
GREEN HATCHED AREA DELINEATES
THE PROPOSED COMMUNITY TITLES
AREA.

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



FOR CONTINUATION REFER - 26-006-DA-C406

NAME: RPEQ:	DATE:
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TITLE	SERVICES LAYOUT SHEET 5 OF 8

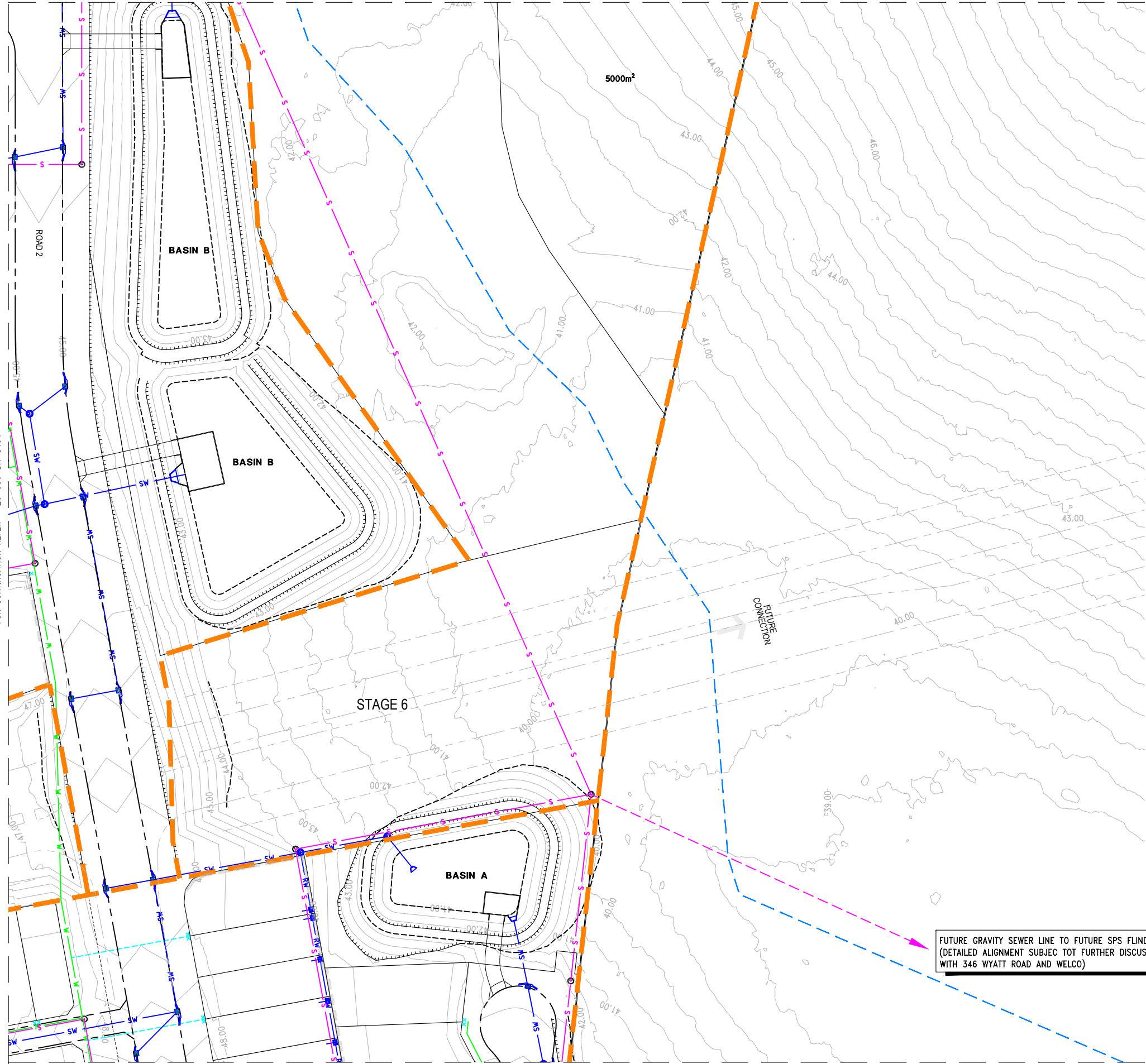
PROJECT	400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT
STATUS	FOR APPROVAL

DESIGNED	DRAWN	APPROVED	DATE	SCALE	SHEET
NM	NM	-	27/05/26	1:500	5 of 8
PROJECT No	DRAWING No	REV			
26-006	C404	A			



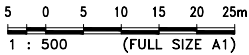
NOTE:
REFER DRAWING C400 FOR LEGEND
AND KEYMAP.

FOR CONTINUATION REFER - 26-006-DA-C404



FOR CONTINUATION REFER - 26-006-DA-C407

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



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RPEQ: _____ DATE: _____

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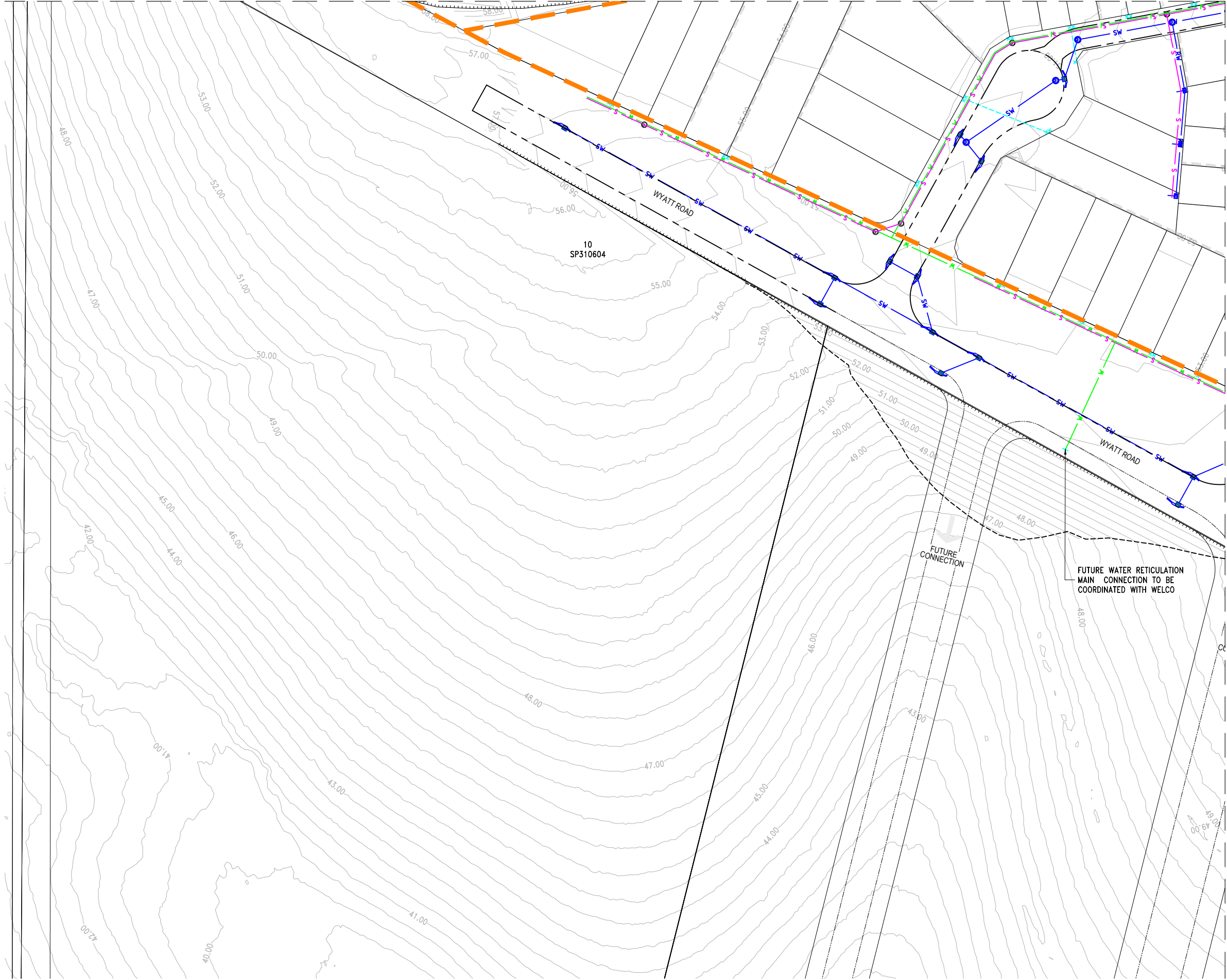
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CLIENT	400 WYATT Pty Ltd
TITLE	SERVICES LAYOUT SHEET 6 OF 8

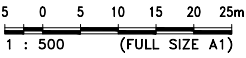
PROJECT										
400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT										
STATUS										
FOR APPROVAL				DESIGNED NM	DRAWN NM	APPROVED -	DATE 27/05/26	SCALE 1:500	SHEET 6 OF 8	
PROJECT No 26-006				DRAWING No C405				REV A		

NOTE:
REFER DRAWING C400 FOR LEGEND
AND KEYMAP.



FOR CONTINUATION REFER - 26-006-DA-C207

REV	DESCRIPTION	BY	DES	DATE
A	FOR APPROVAL	NM	NM	27/05/26



NAME:
RPEQ: _____ DATE: _____
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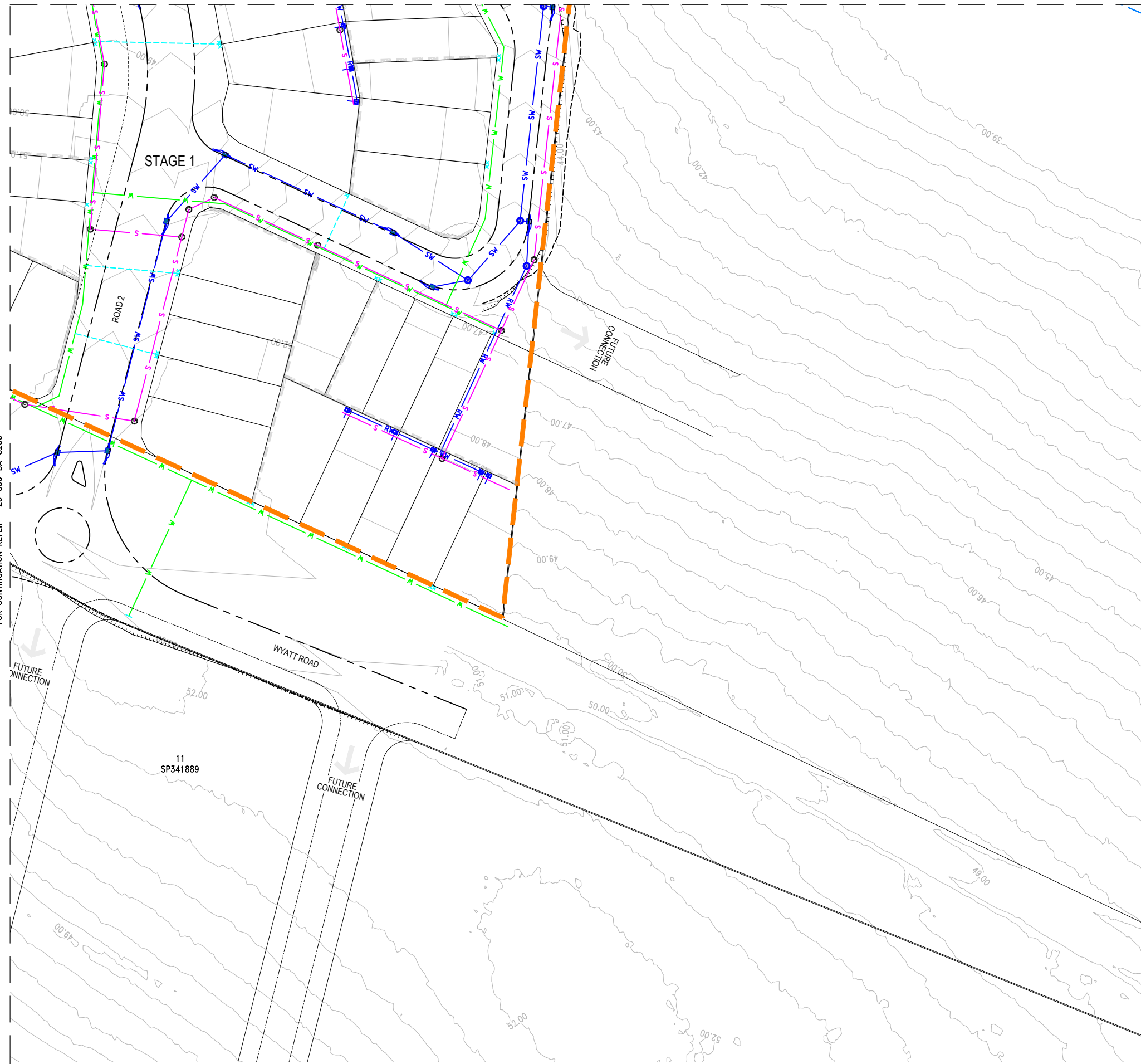
CLIENT
400 WYATT Pty Ltd
TITLE
SERVICES LAYOUT
SHEET 7 OF 8

PROJECT
400 WYATT ROAD, KAGARU
RESIDENTIAL DEVELOPMENT

STATUS
FOR APPROVAL

DESIGNED	DRAWN	APPROVED	DATE	SCALE	SHEET
NM	NM	-	27/05/26	1:500	7 of 8
PROJECT No	DRAWING No	REV			
26-006	C406	A			

FOR CONTINUATION REFER - 26-006-DA-C206

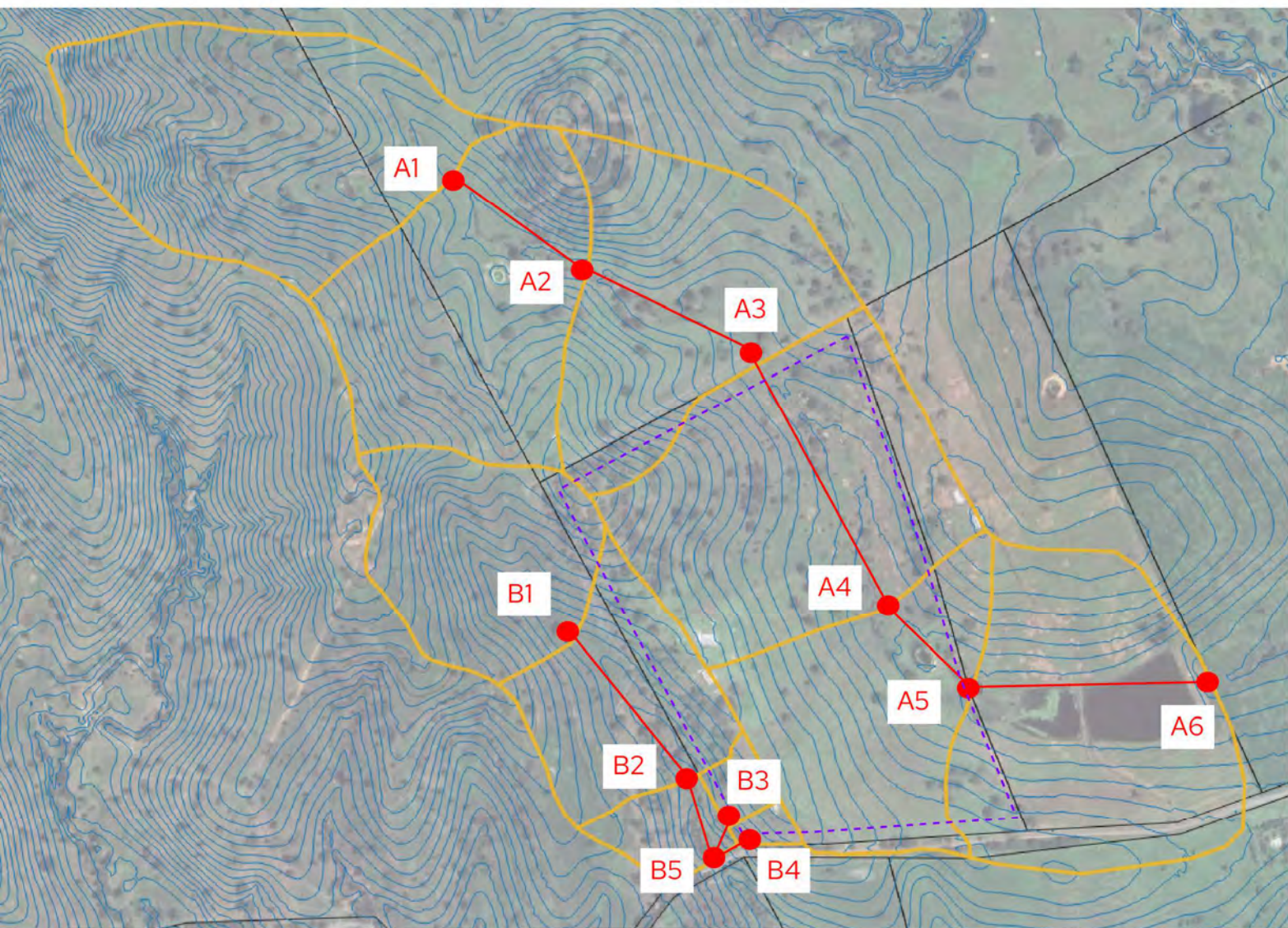


REV	DESCRIPTION	BY	DES	DATE		NAME: RPEQ:	DATE:	Ensilon Pty Ltd ACN 644 618 253	CLIENT 400 WYATT Pty Ltd	PROJECT 400 WYATT ROAD, KAGARU RESIDENTIAL DEVELOPMENT												
A	FOR APPROVAL	NM	NM	27/05/26																		
						Approved by, for and on behalf of Ensilon		http://www.ensilon.com.au © Copyright	TITLE SERVICES LAYOUT SHEET 8 OF 8	STATUS FOR APPROVAL												
						This drawing has been produced for the exclusive use of the client (nominated on this document). No third party is to rely on this document without written permission from Ensilon. This drawing is not to be constructed from unless "Issued for construction" is displayed and only where signed by an RPEQ. © Copyright				<table><tr><td>DESIGNED NM</td><td>DRAWN NM</td><td>APPROVED -</td><td>DATE 27/05/26</td><td>SCALE 1:500</td><td>SHEET 8 of 8</td></tr><tr><td colspan="2">PROJECT No 26-006</td><td colspan="2">DRAWING No C407</td><td colspan="2">REV A</td></tr></table>	DESIGNED NM	DRAWN NM	APPROVED -	DATE 27/05/26	SCALE 1:500	SHEET 8 of 8	PROJECT No 26-006		DRAWING No C407		REV A	
DESIGNED NM	DRAWN NM	APPROVED -	DATE 27/05/26	SCALE 1:500	SHEET 8 of 8																	
PROJECT No 26-006		DRAWING No C407		REV A																		

50510152025m

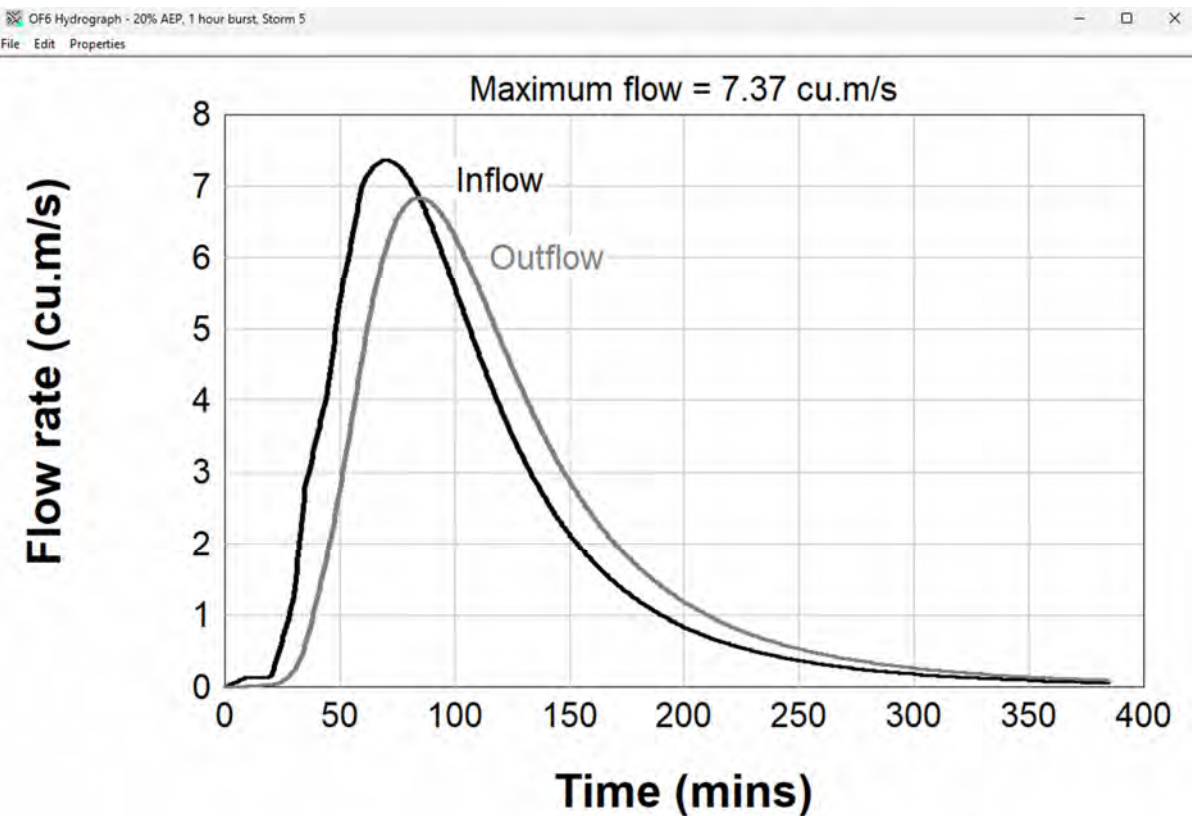
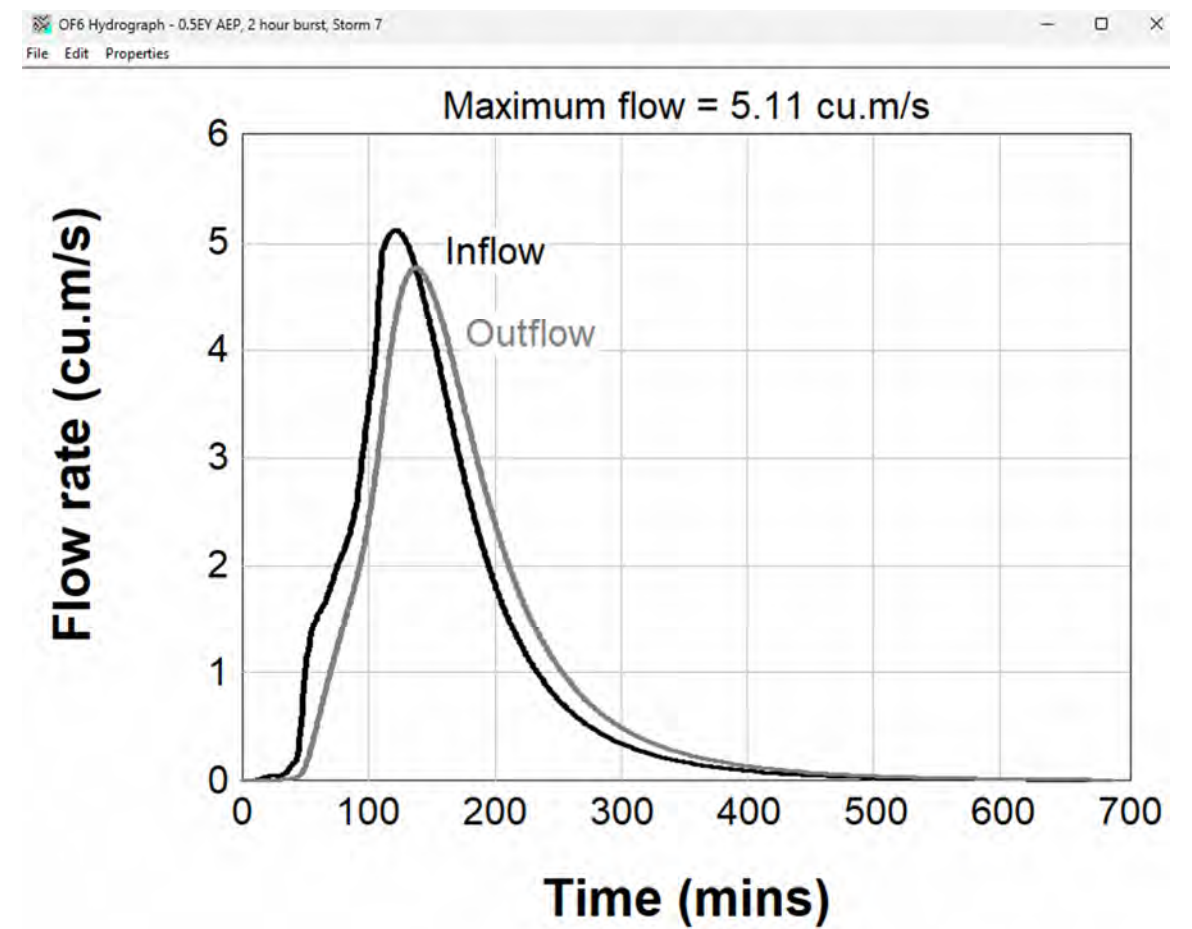
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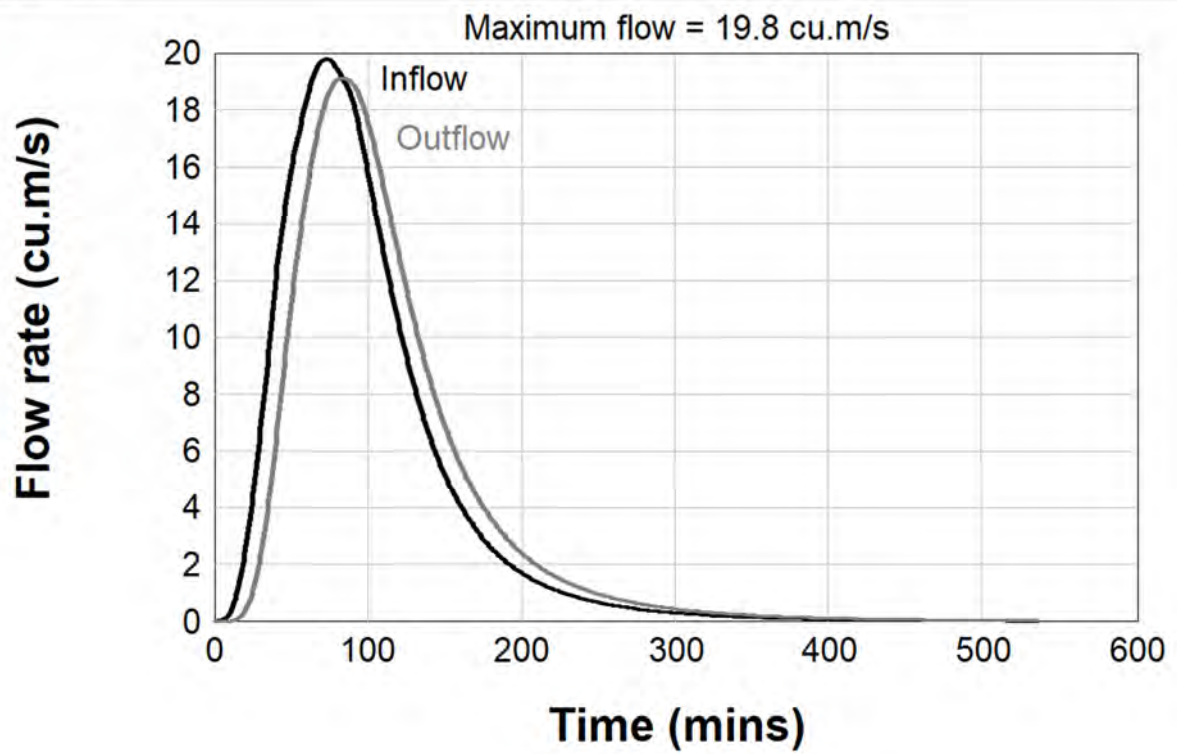
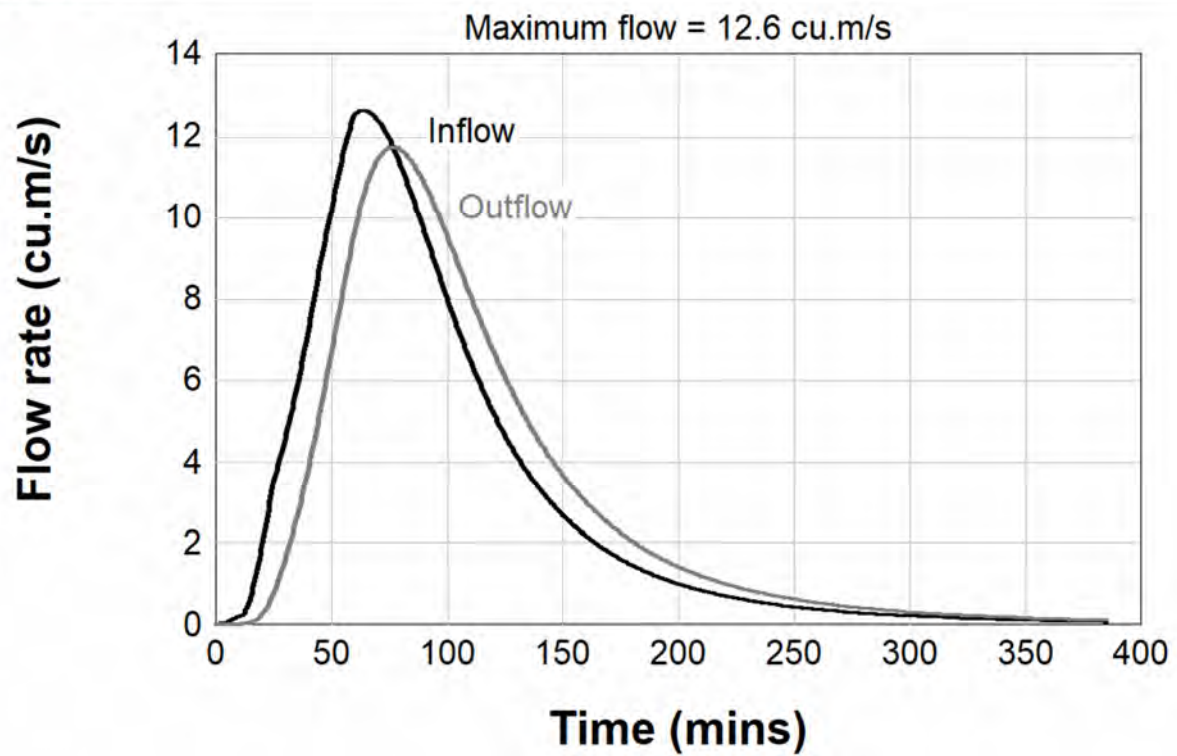
Appendix C – WBNM Hydrographs



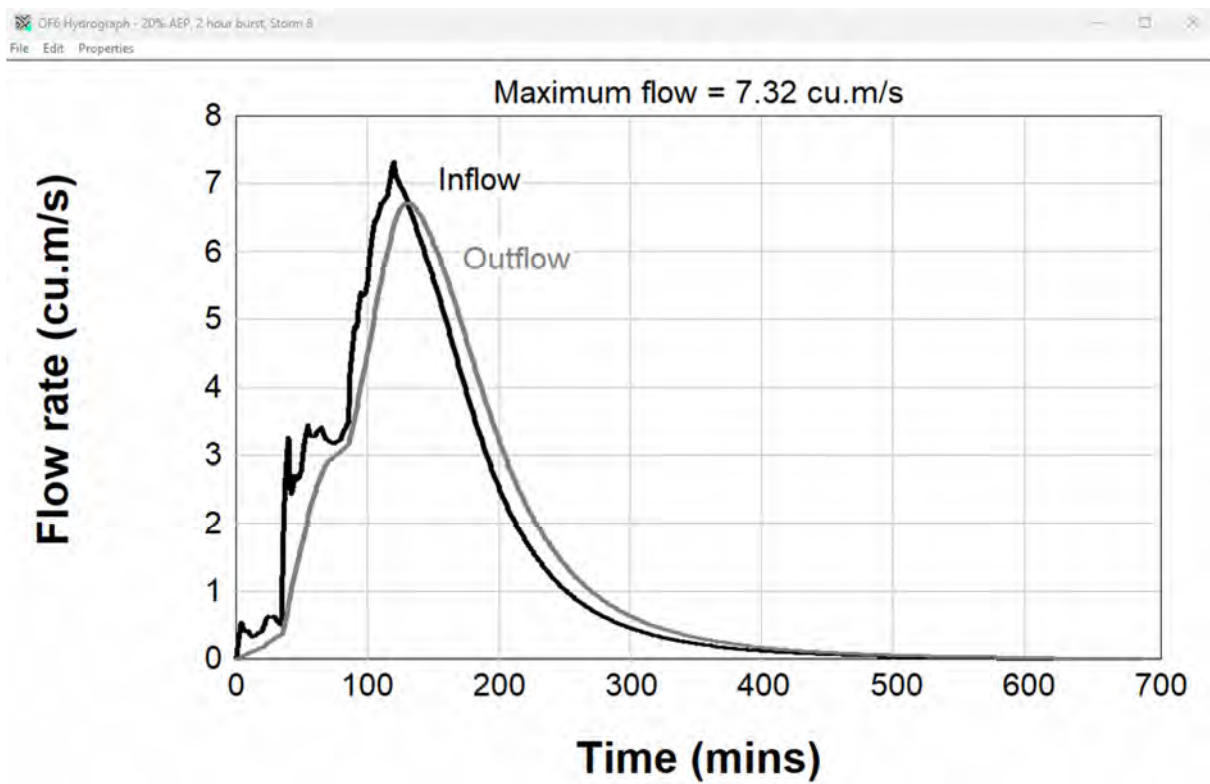
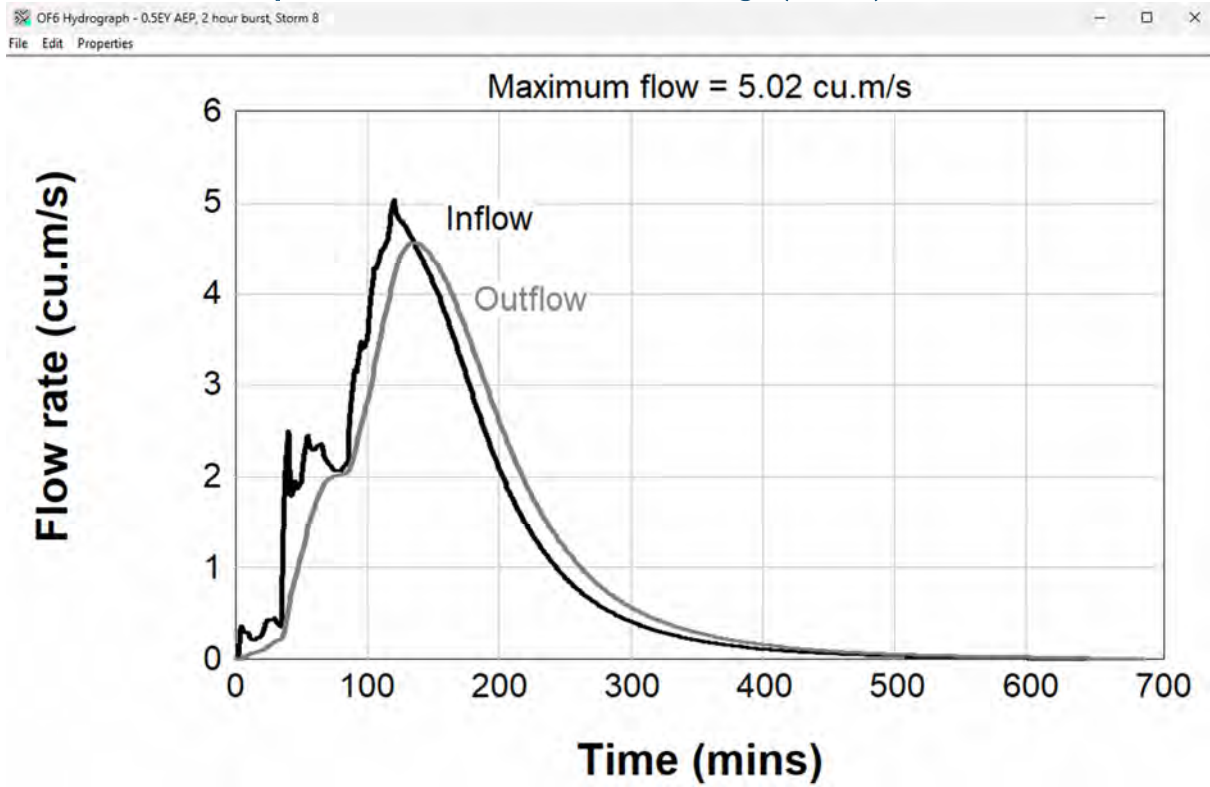


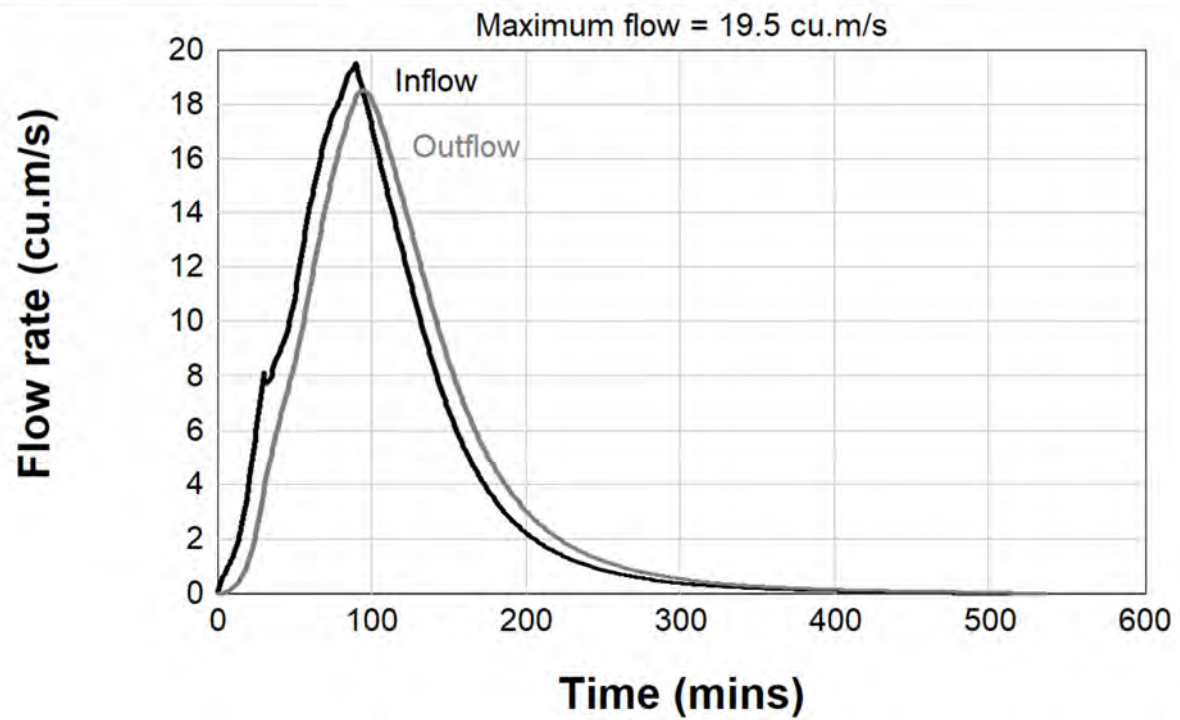
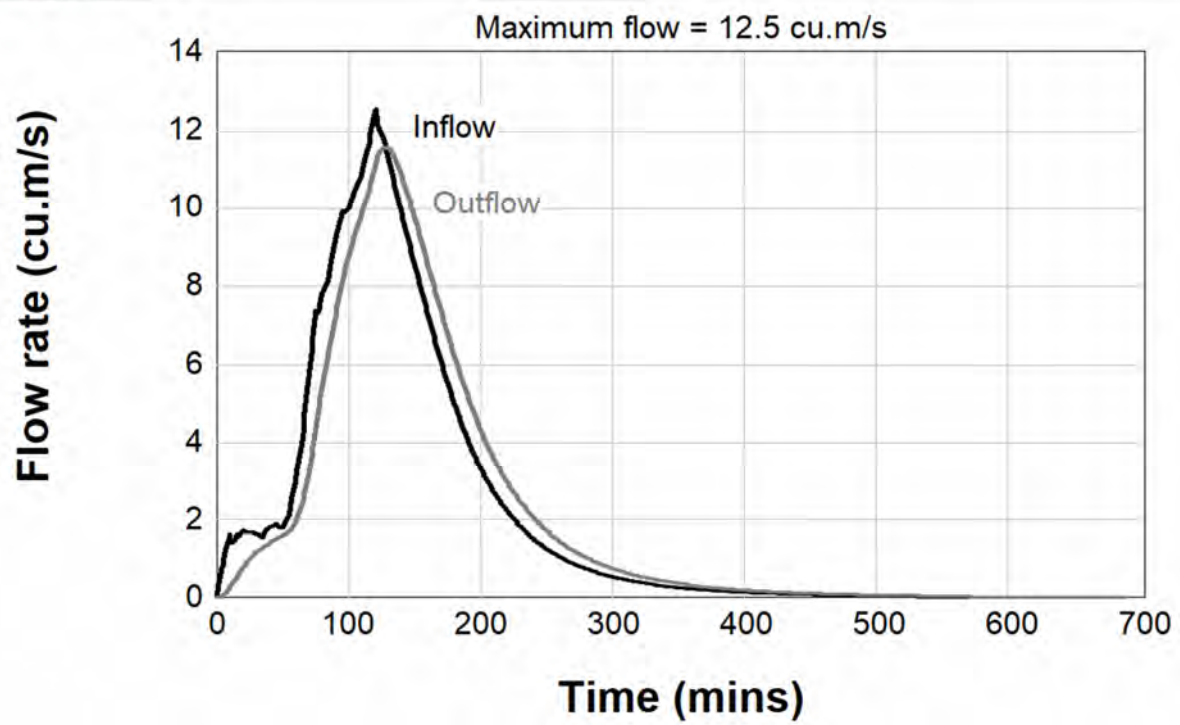
Predeveloped Peak Flow at Point of Discharge (POD 1) – OF6 Node A5



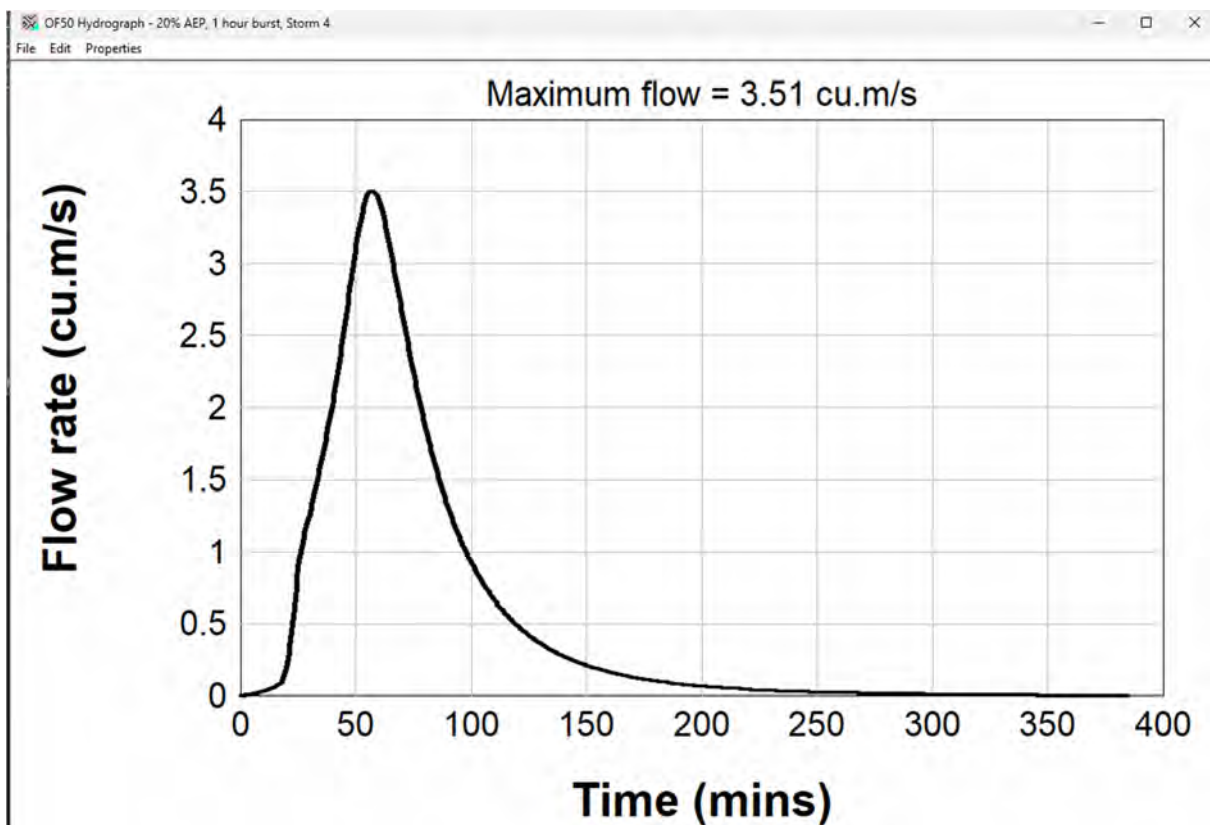
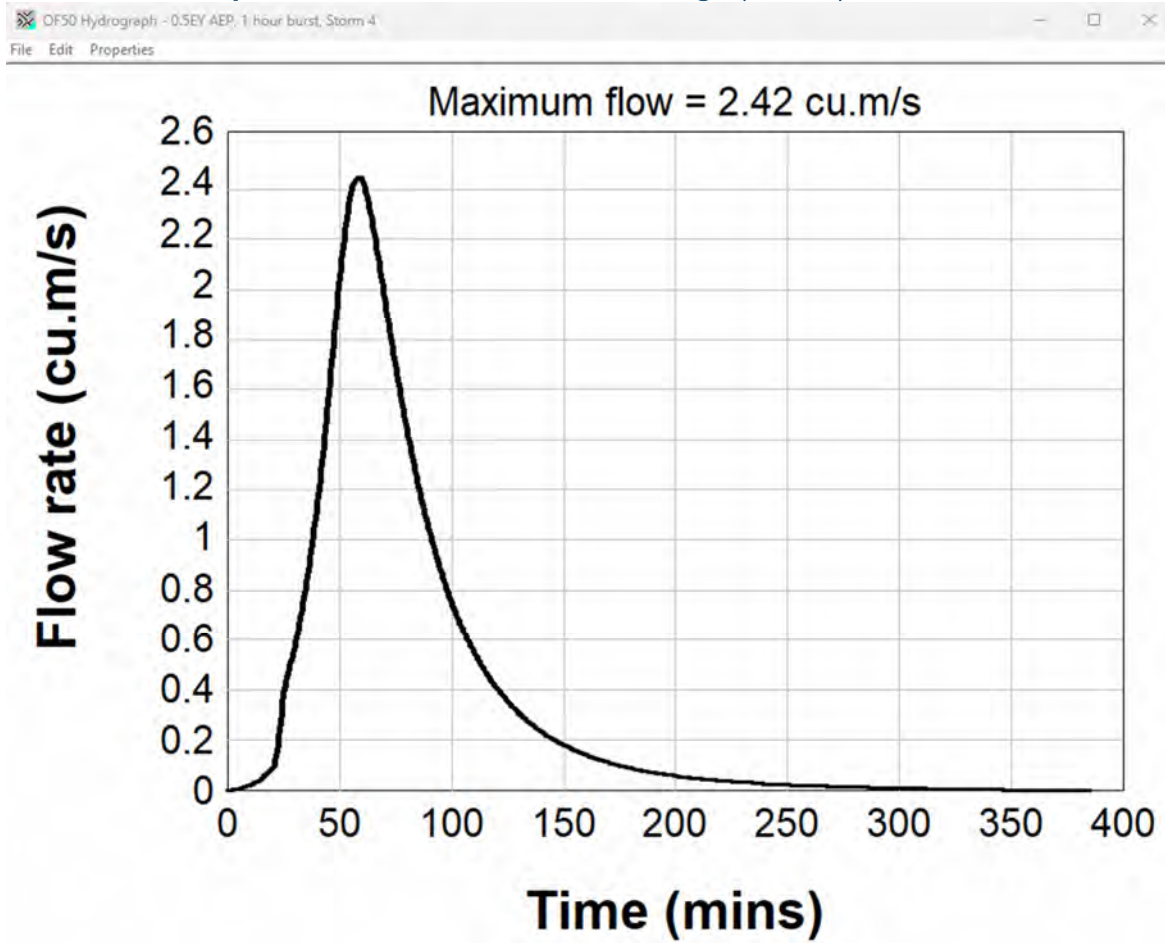


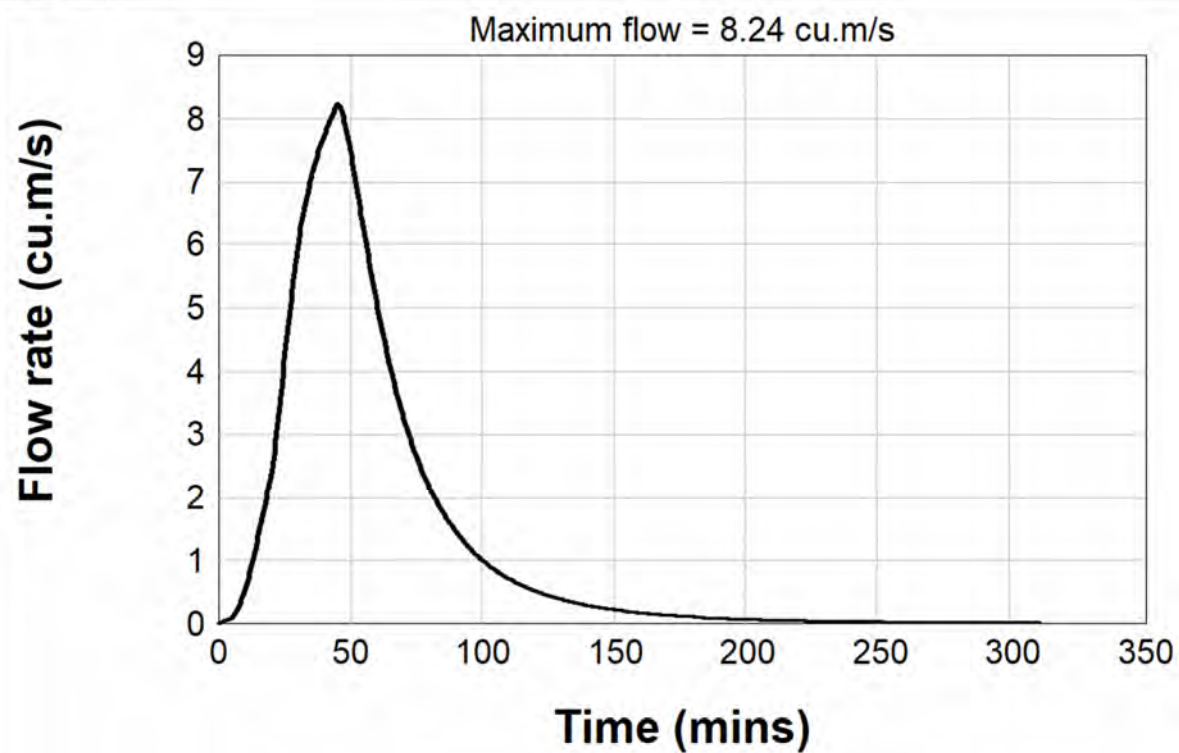
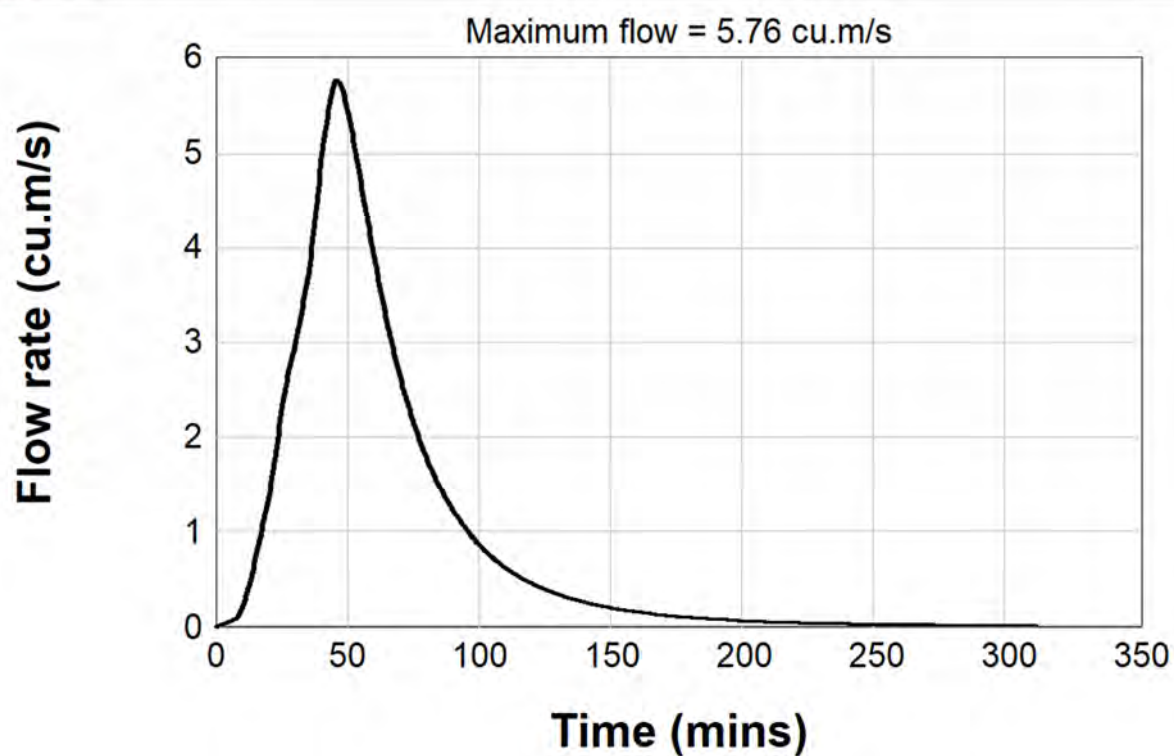
Postdeveloped Peak Flow at Point of Discharge (POD 1) – OF6 Node A5





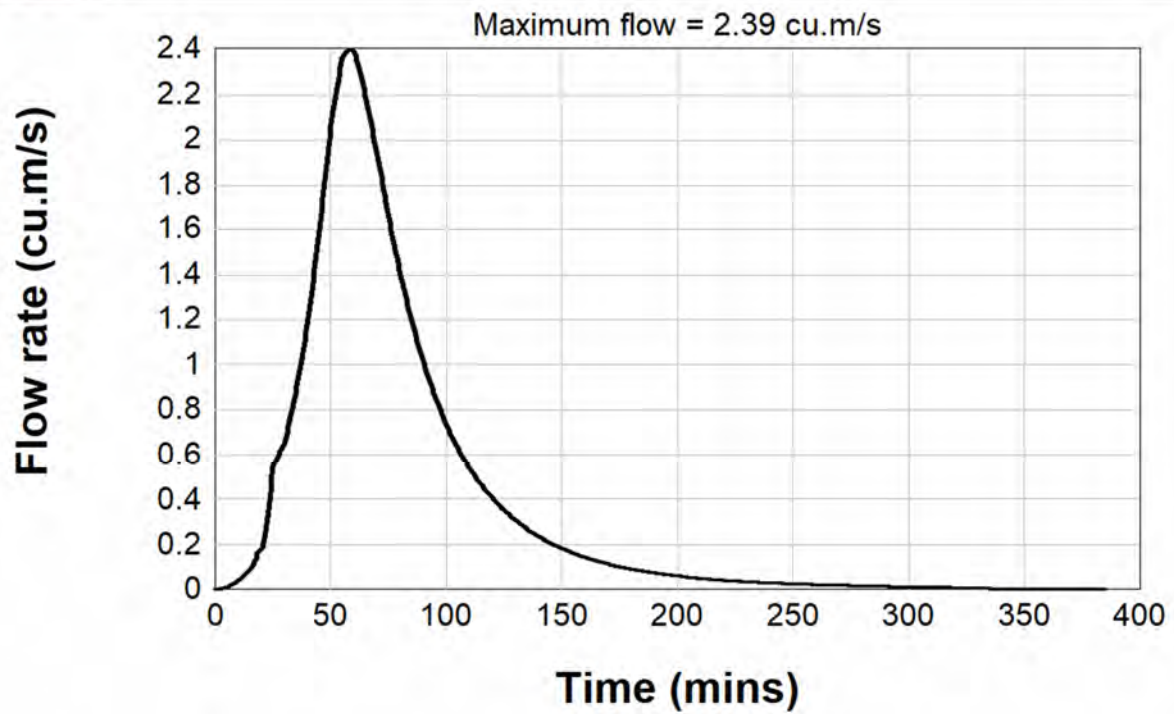
Predeveloped Peak Flow at Point of Discharge (POD 2) – OF50 Node B5



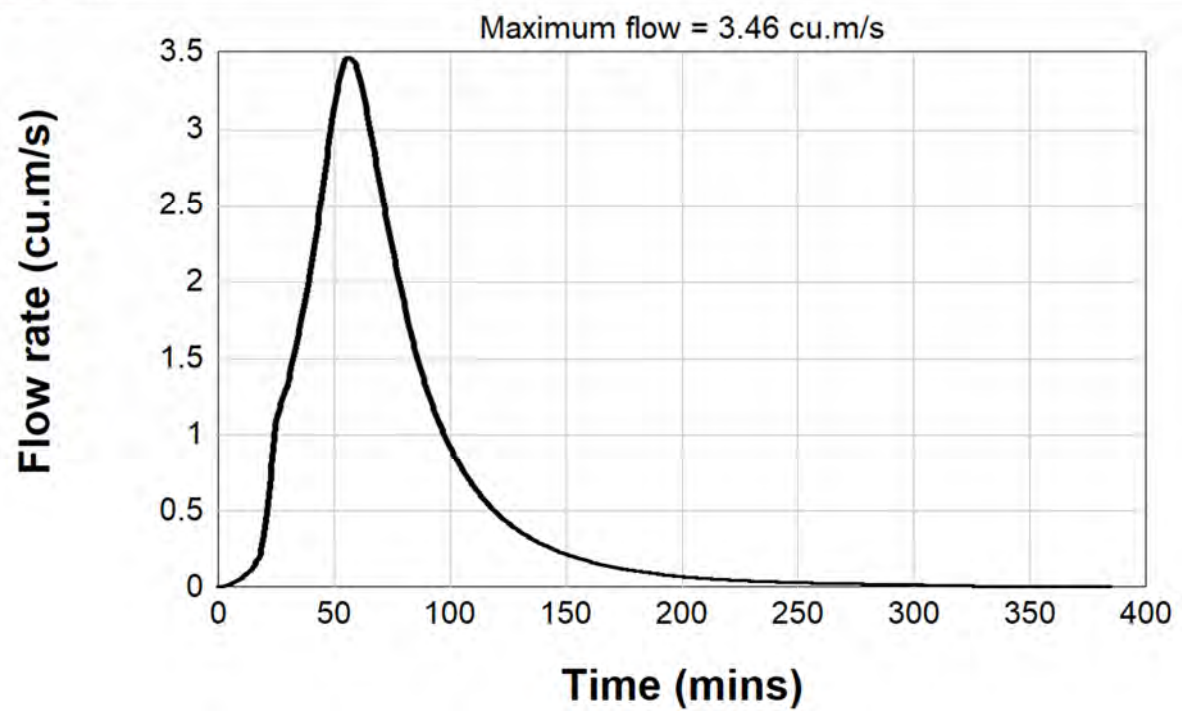


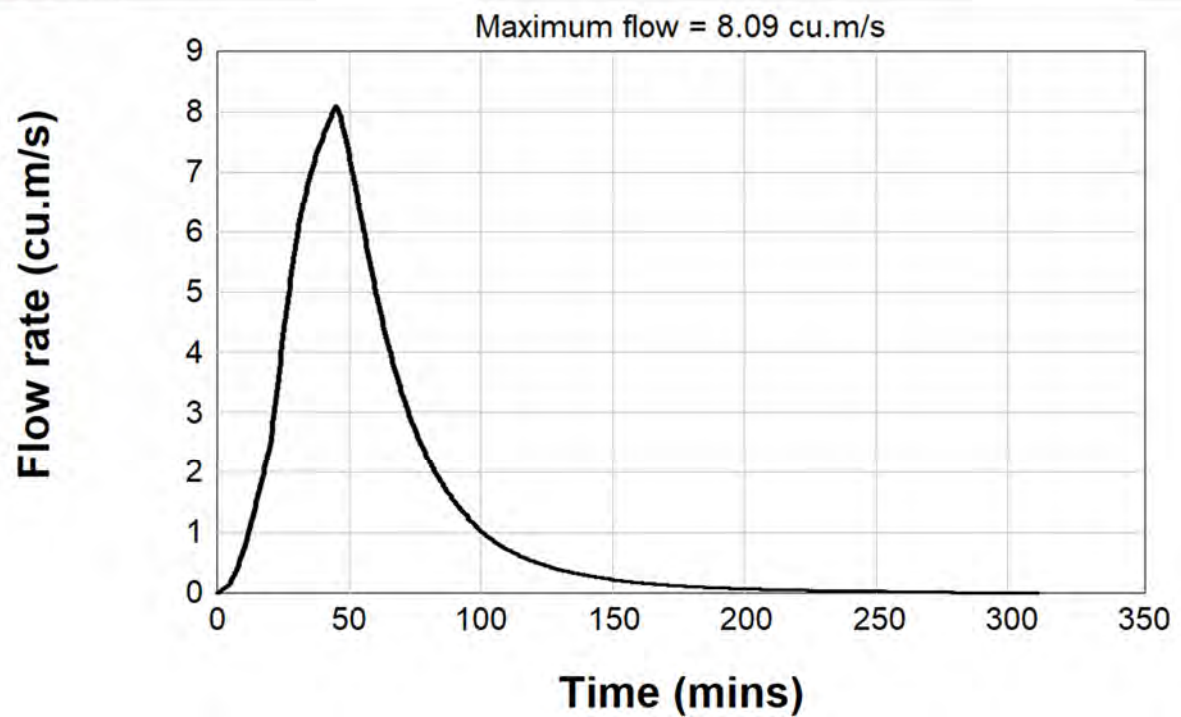
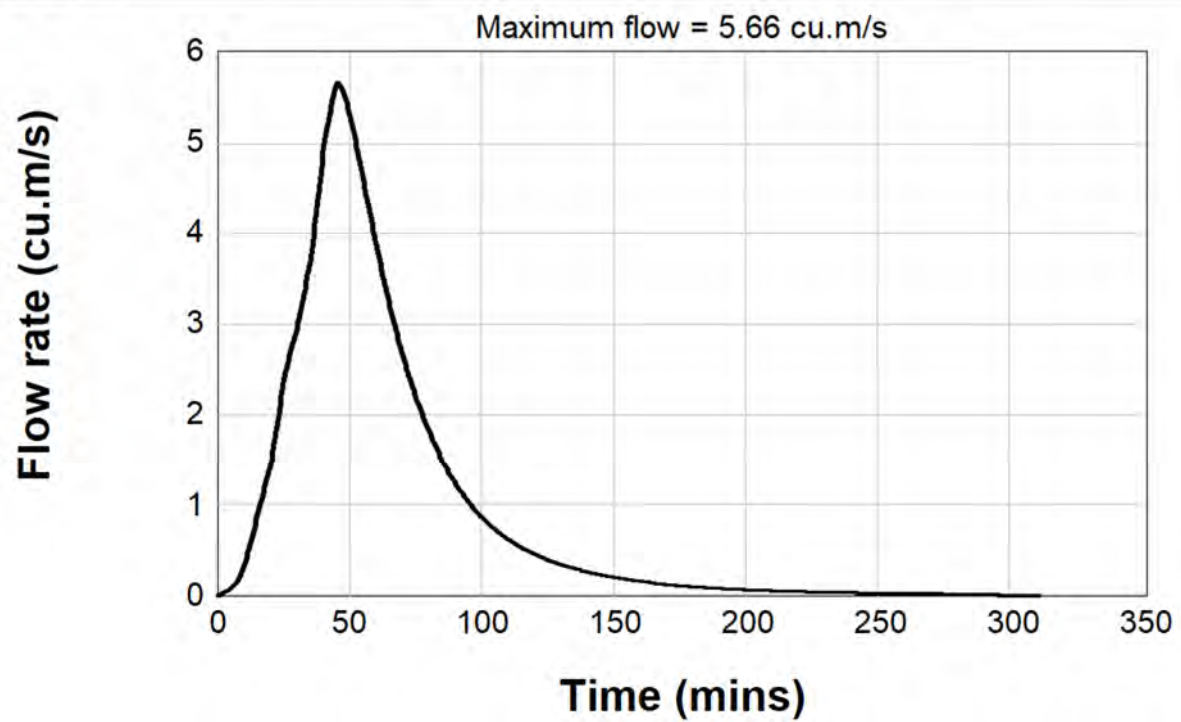
Postdeveloped Peak Flow at Point of Discharge (POD 2) – OF50 Node B5

OF50 Hydrograph - 0.5EY AEP, 1 hour burst, Storm 4
File Edit Properties



OF50 Hydrograph - 20% AEP, 1 hour burst, Storm 4
File Edit Properties





Appendix D – MUSIC Model Information

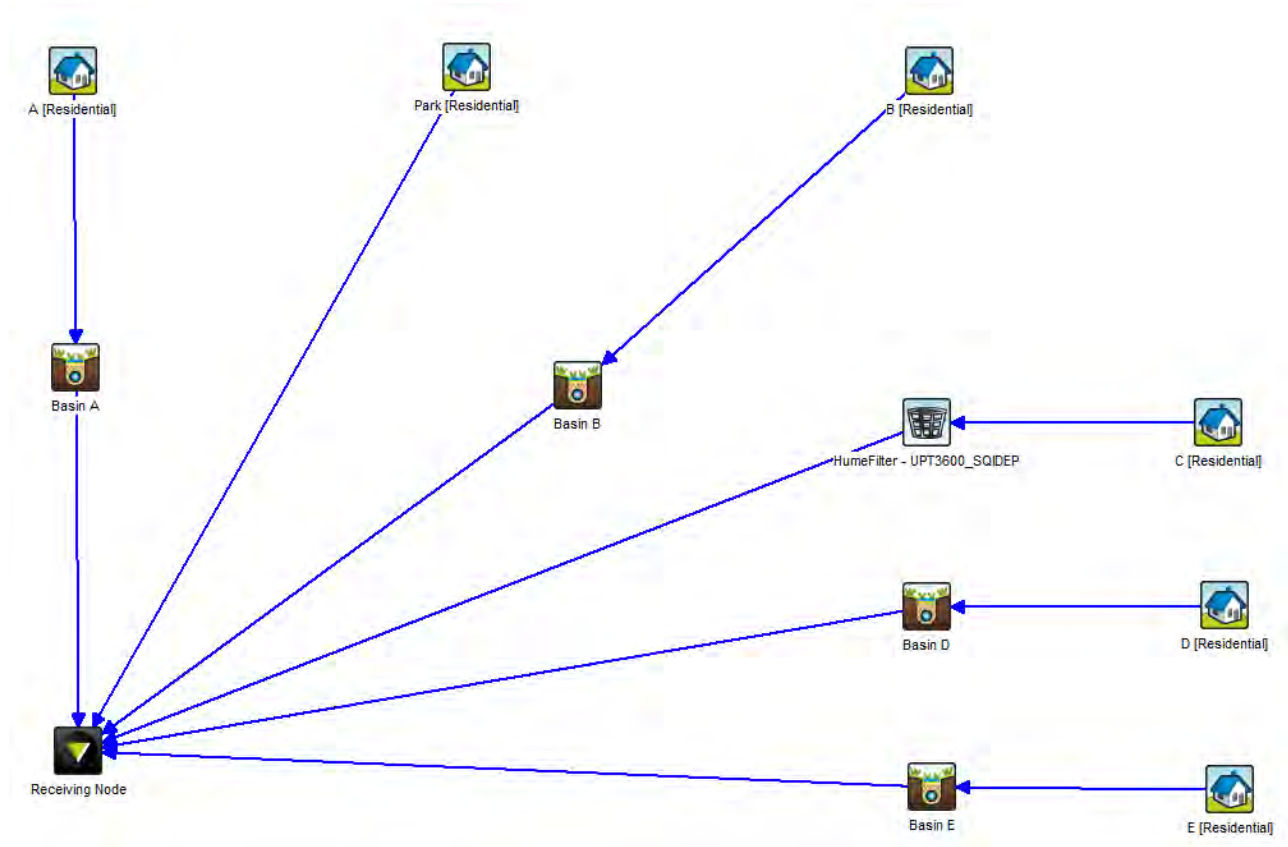


Figure E1 MUSIC Model Proposed Treatment Train

Table E2 MUSIC Baseflow and Stormflow Concentration Parameters (Source: MUSIC Modelling Guidelines)

LANDUSE	FLOW TYPE	TSS LOG ¹⁰ VALUES		TP LOG ¹⁰ VALUES		TN LOG ¹⁰ VALUES	
		MEAN	ST. DEV	MEAN	ST. DEV	MEAN	ST. DEV
Urban residential	Baseflow	1.00	0.34	-0.97	0.31	0.20	0.20
	Stormflow	2.18	0.39	-0.47	0.32	0.26	0.23

Table E3 MUSIC Rainfall Parameters for Southeast Queensland (Source: MUSIC Modelling Guidelines)

Properties of C6 - Page 2 of 5

Rainfall-Runoff Parameters

Impervious Area Properties

Rainfall Threshold (mm/day)	1.00
-----------------------------	------

Pervious Area Properties

Soil Storage Capacity (mm)	500
Initial Storage (% of Capacity)	10
Field Capacity (mm)	200
Infiltration Capacity Coefficient - a	211.0
Infiltration Capacity Exponent - b	5.00

Groundwater Properties

Initial Depth (mm)	50
Daily Recharge Rate (%)	28.00
Daily Baseflow Rate (%)	27.00
Daily Deep Seepage Rate (%)	0.00

Cancel Back Next

Properties of Basin A

Location

Inlet Properties

Low Flow By-pass (cubic metres per sec)

High Flow By-pass (cubic metres per sec)

Storage Properties

Extended Detention Depth (metres)

Surface Area (square metres)

Filter and Media Properties

Filter Area (square metres)

Unlined Filter Media Perimeter (metres)

Saturated Hydraulic Conductivity (mm/hour)

Filter Depth (metres)

TN Content of Filter Media (mg/kg)

Orthophosphate Content of Filter Media (mg/kg)

Infiltration Properties

Exfiltration Rate (mm/hr)

Lining Properties

Is Base Lined? ☒ Yes ☐ No

Vegetation Properties

☒ Vegetated with Effective Nutrient Removal Plants

☐ Vegetated with Ineffective Nutrient Removal Plants

☐ Unvegetated

Outlet Properties

Overflow Weir Width (metres)

Underdrain Present? ☒ Yes ☐ No

Submerged Zone With Carbon Present? ☐ Yes ☒ No

Depth (metres)

Fluxes... Notes... More

Cancel Back Finish

Properties of Basin B

Location

Inlet Properties

Low Flow By-pass (cubic metres per sec)

High Flow By-pass (cubic metres per sec)

Storage Properties

Extended Detention Depth (metres)

Surface Area (square metres)

Filter and Media Properties

Filter Area (square metres)

Unlined Filter Media Perimeter (metres)

Saturated Hydraulic Conductivity (mm/hour)

Filter Depth (metres)

TN Content of Filter Media (mg/kg)

Orthophosphate Content of Filter Media (mg/kg)

Infiltration Properties

Exfiltration Rate (mm/hr)

Lining Properties

Is Base Lined? ☒ Yes ☐ No

Vegetation Properties

☒ Vegetated with Effective Nutrient Removal Plants

☐ Vegetated with Ineffective Nutrient Removal Plants

☐ Unvegetated

Outlet Properties

Overflow Weir Width (metres)

Underdrain Present? ☒ Yes ☐ No

Submerged Zone With Carbon Present? ☐ Yes ☒ No

Depth (metres)

Fluxes... Notes... More

Cancel Back Finish

Properties of HumeFilter - UPT3600_SQIDEP

Location: HumeFilter - UPT3600_SQIDEP

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000

High Flow By-pass (cubic metres per sec): 0.16000

Target Element

☒ Gross Pollutants (kg/ML) ☐ Total Phosphorus (mg/L)

☐ Total Suspended Solids (mg/L) ☐ Total Nitrogen (mg/L)

Gross Pollutants (kg/ML)

Transfer Functions

☒ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency

☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
1000.0000	100.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Fluxes... Notes...

Cancel Back Finish

Properties of Basin D

Location: Basin D

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.000

High Flow By-pass (cubic metres per sec): 100.000

Storage Properties

Extended Detention Depth (metres): 0.30

Surface Area (square metres): 424.00

Filter and Media Properties

Filter Area (square metres): 400.00

Unlined Filter Media Perimeter (metres): 0.01

Saturated Hydraulic Conductivity (mm/hour): 200.00

Filter Depth (metres): 0.50

TN Content of Filter Media (mg/kg): 400

Orthophosphate Content of Filter Media (mg/kg): 30.0

Infiltration Properties

Exfiltration Rate (mm/hr): 0.00

Lining Properties

Is Base Lined? ☒ Yes ☐ No

Vegetation Properties

☒ Vegetated with Effective Nutrient Removal Plants

☐ Vegetated with Ineffective Nutrient Removal Plants

☐ Unvegetated

Outlet Properties

Overflow Weir Width (metres): 40.00

Underdrain Present? ☒ Yes ☐ No

Submerged Zone With Carbon Present? ☐ Yes ☒ No

Depth (metres): 0.45

Fluxes... Notes... More

Cancel Back Finish

Properties of Basin E

Location: Basin E

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.000

High Flow By-pass (cubic metres per sec): 100.000

Storage Properties

Extended Detention Depth (metres): 0.30

Surface Area (square metres): 191.00

Filter and Media Properties

Filter Area (square metres): 180.00

Unlined Filter Media Perimeter (metres): 0.01

Saturated Hydraulic Conductivity (mm/hour): 200.00

Filter Depth (metres): 0.50

TN Content of Filter Media (mg/kg): 400

Orthophosphate Content of Filter Media (mg/kg): 30.0

Infiltration Properties

Exfiltration Rate (mm/hr): 0.00

Lining Properties

Is Base Lined? ☒ Yes ☐ No

Vegetation Properties

☒ Vegetated with Effective Nutrient Removal Plants

☐ Vegetated with Ineffective Nutrient Removal Plants

☐ Unvegetated

Outlet Properties

Overflow Weir Width (metres): 18.00

Underdrain Present? ☒ Yes ☐ No

Submerged Zone With Carbon Present? ☐ Yes ☒ No

Depth (metres): 0.45

Fluxes... Notes... More

Cancel Back Finish

Figure E2 Bio-retention Basins and Swales as modelled in MUSIC

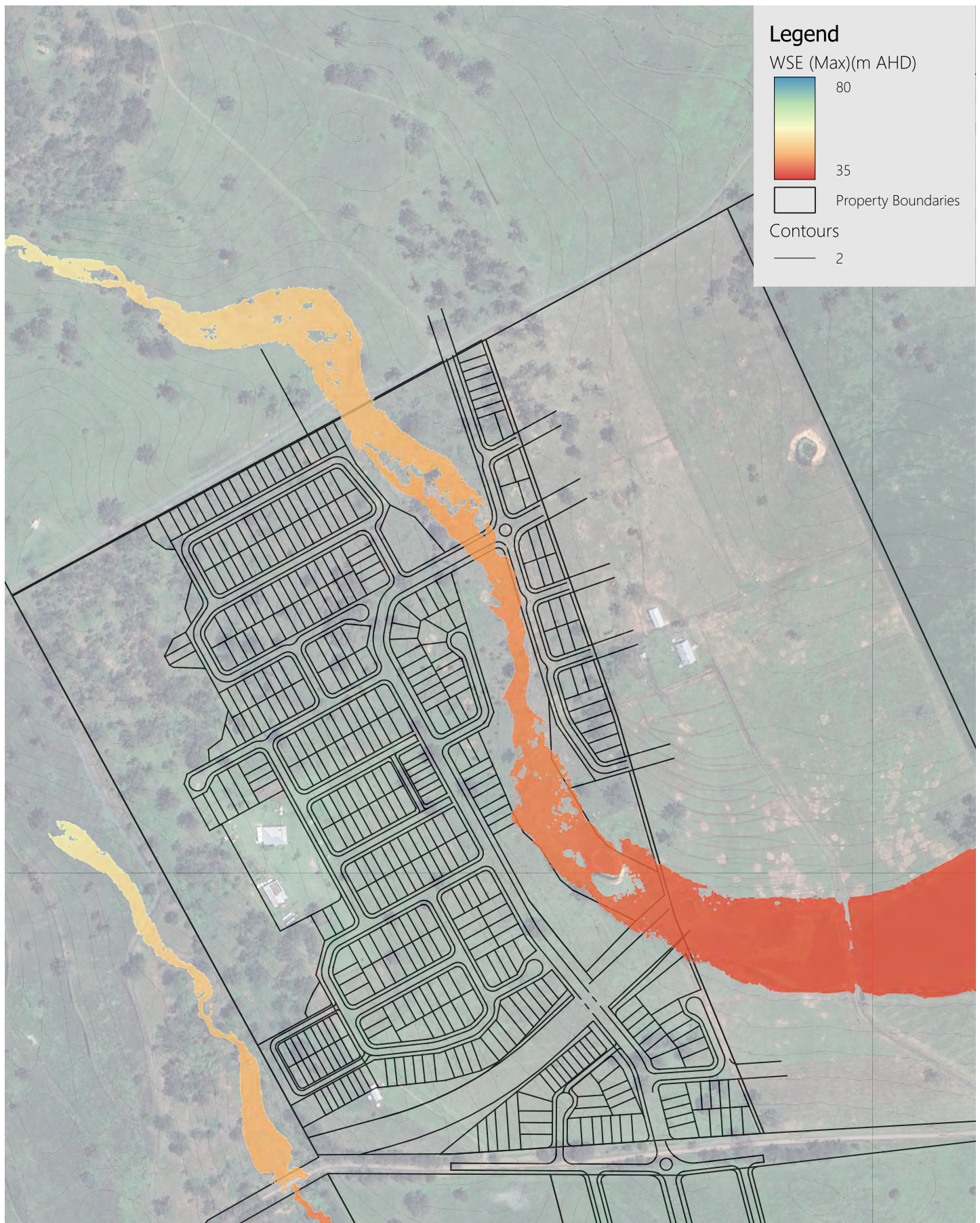
Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	125	121	3.1
Total Suspended Solids (kg/yr)	27100	4740	82.5
Total Phosphorus (kg/yr)	54.2	13.7	74.7
Total Nitrogen (kg/yr)	262	135	48.4
Gross Pollutants (kg/yr)	3570	22.5	99.4

Print Save

Figure E4 – MUSIC Model Treatment Train Effectiveness

Appendix E – Flood Maps



Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**39% AEP Calculated Water Surface Elevation
Pre-Developed**

Plan No. 001

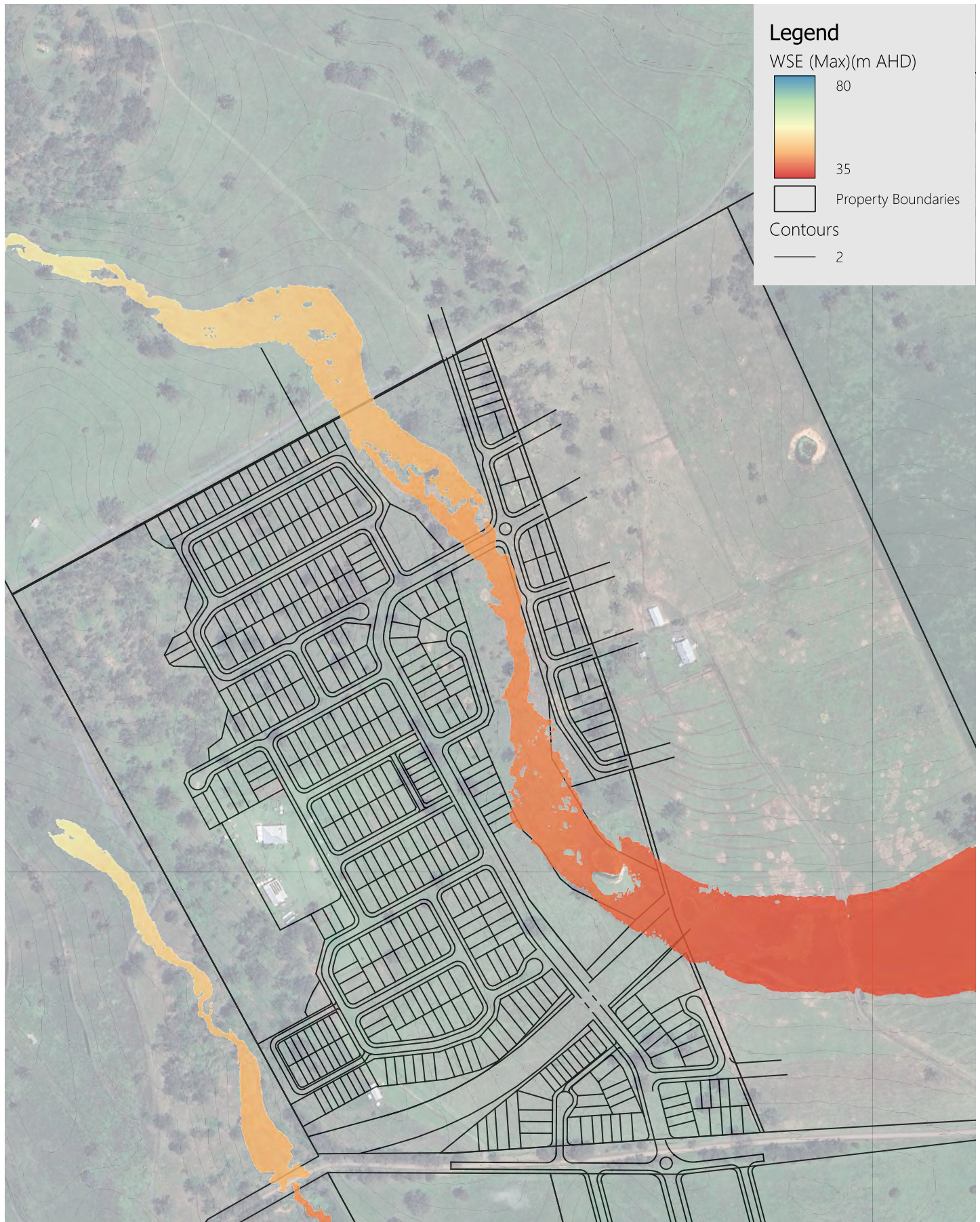
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Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Legend

WSE (Max)(m AHD)

80

35

Property Boundaries

Contours

2

Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Water Surface Elevation

Pre-Developed

Plan No. 009

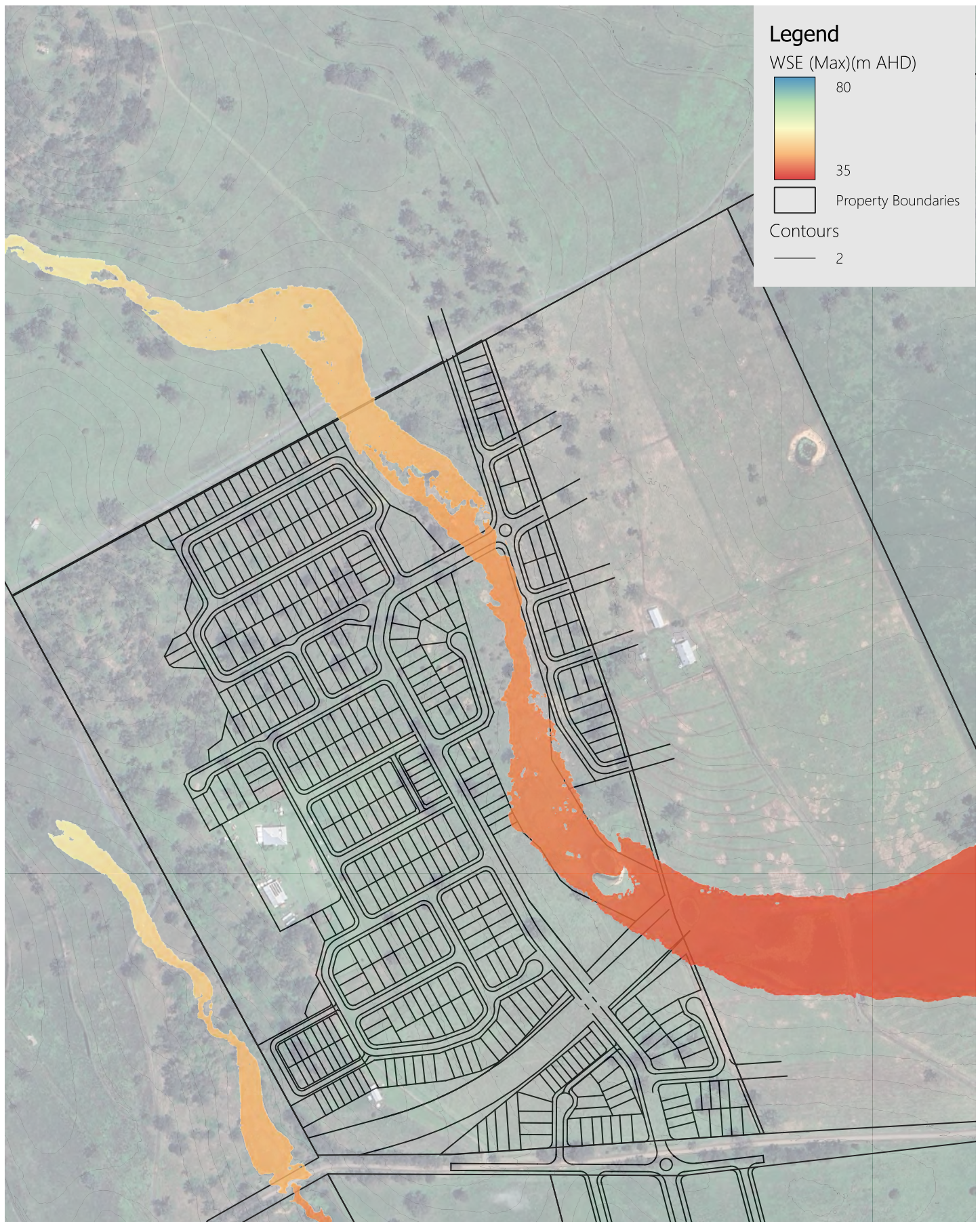
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Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

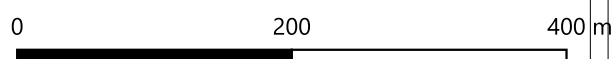
400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**5% AEP Calculated Water Surface Elevation
Pre-Developed**

Plan No. 017



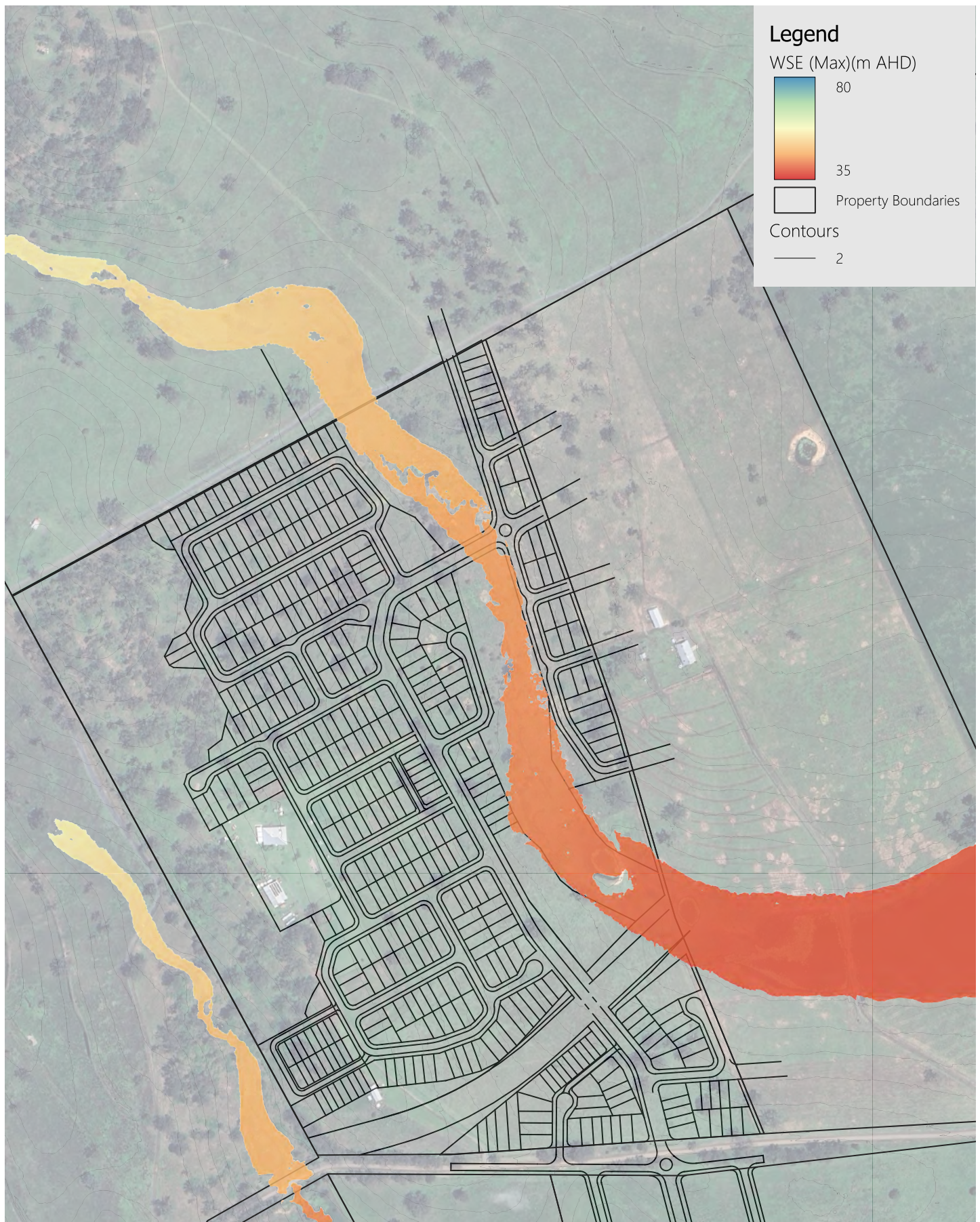
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CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**1% AEP Calculated Water Surface Elevation
Pre-Developed**

Plan No. 025

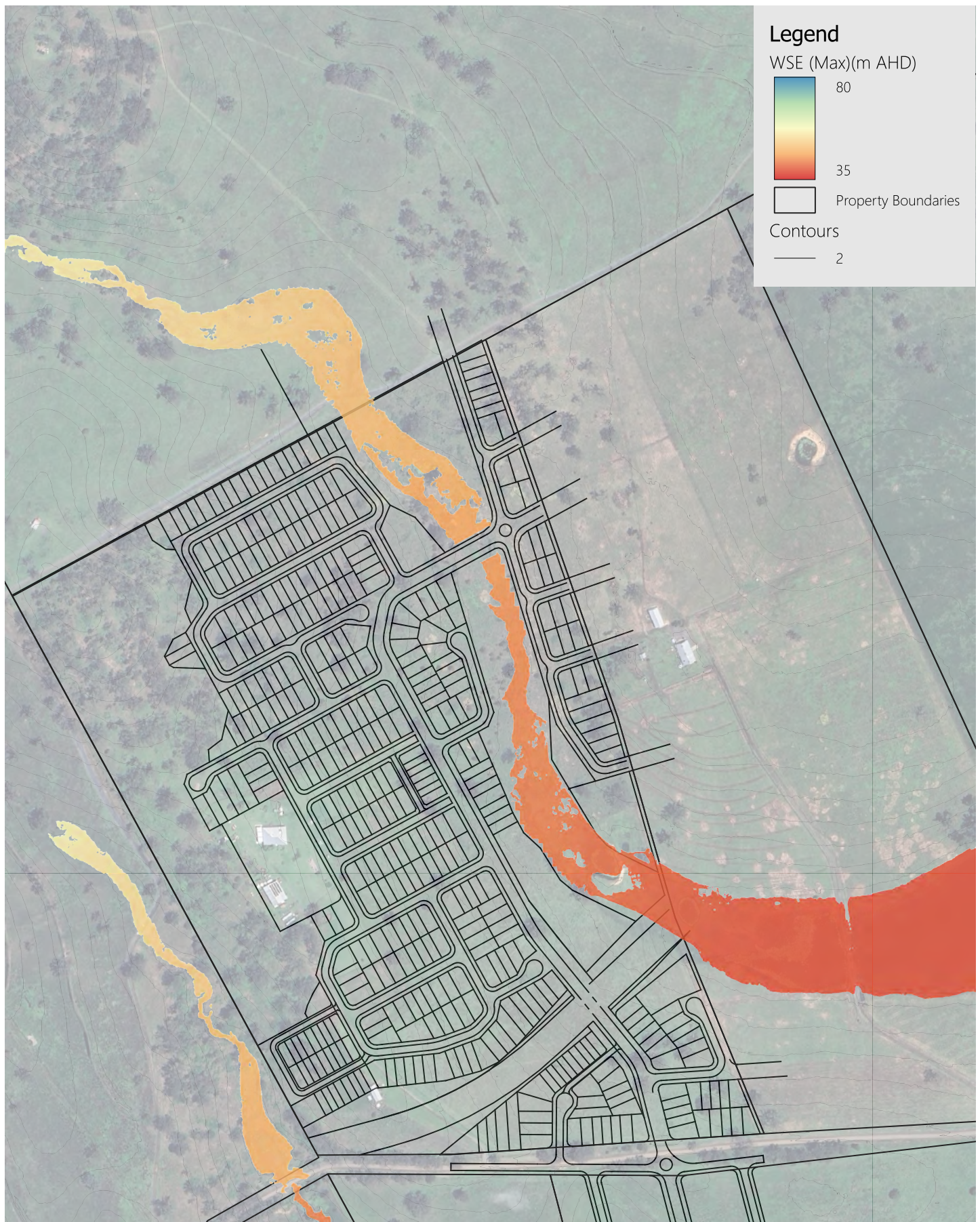


Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**39% AEP Calculated Water Surface Elevation
Post-Developed**

Plan No. 005

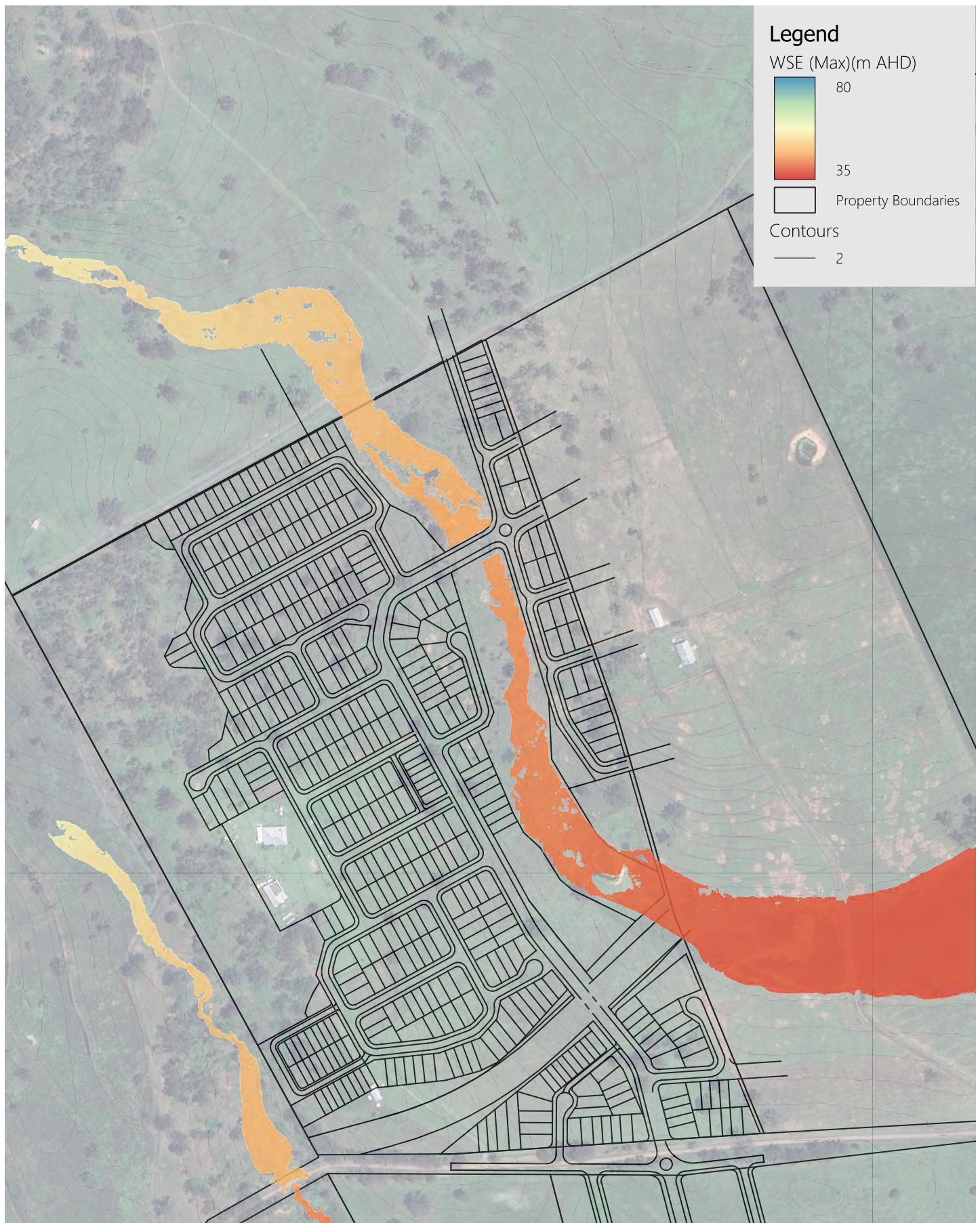
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Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Water Surface Elevation

Post-Developed

Plan No. 013

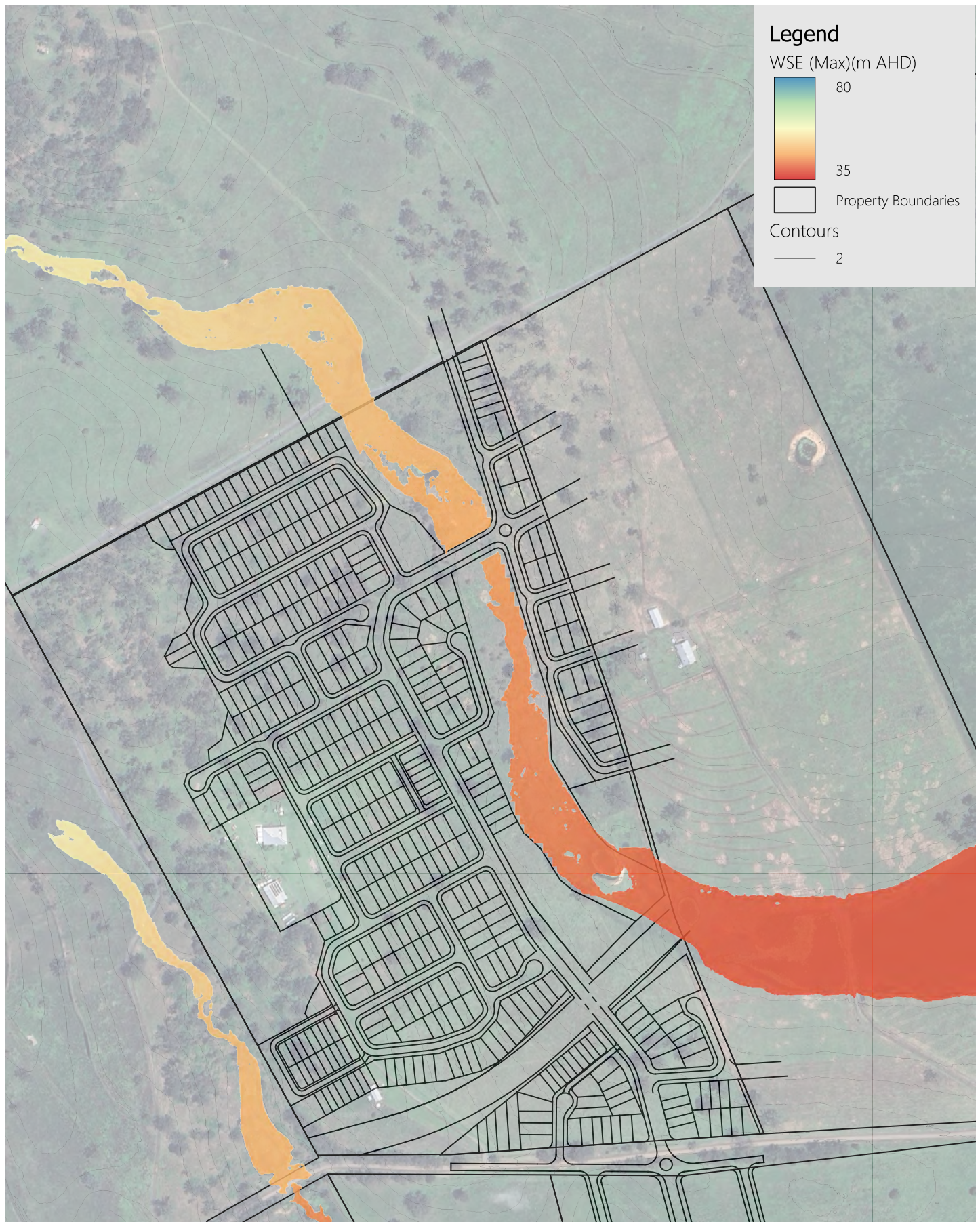


Source: QSpatial
 CRS: GDA2020 / MGA
 Zone 56
 Job: 26-006
 Revision: 01
 Scale: 1:5,500 @ A4
 Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**5% AEP Calculated Water Surface Elevation
Post-Developed**

Plan No. 021

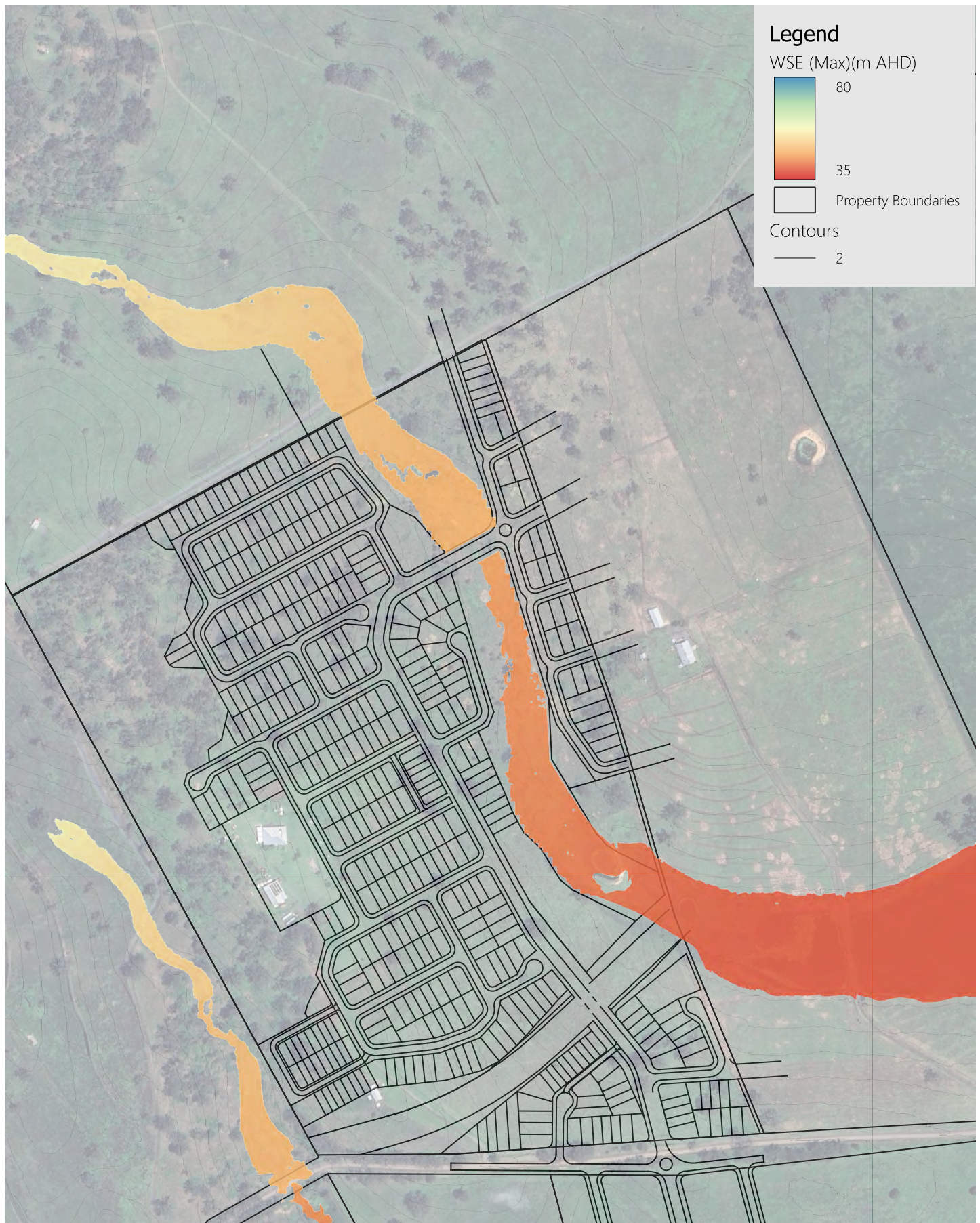
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Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Water Surface Elevation

Post-Developed

Plan No. 029

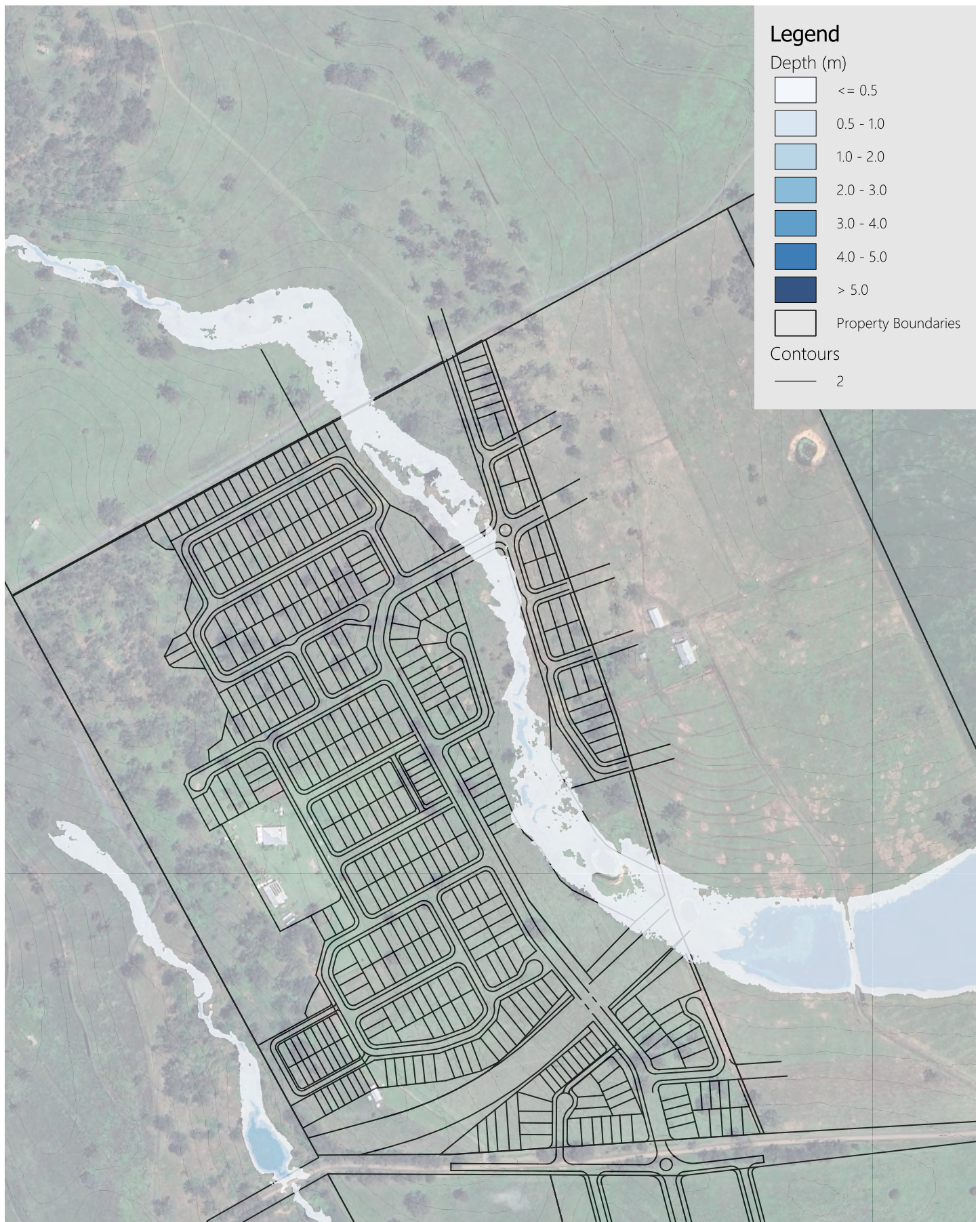
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Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

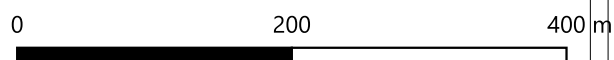
400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

39% AEP Calculated Depth Pre Developed

Plan No. 002

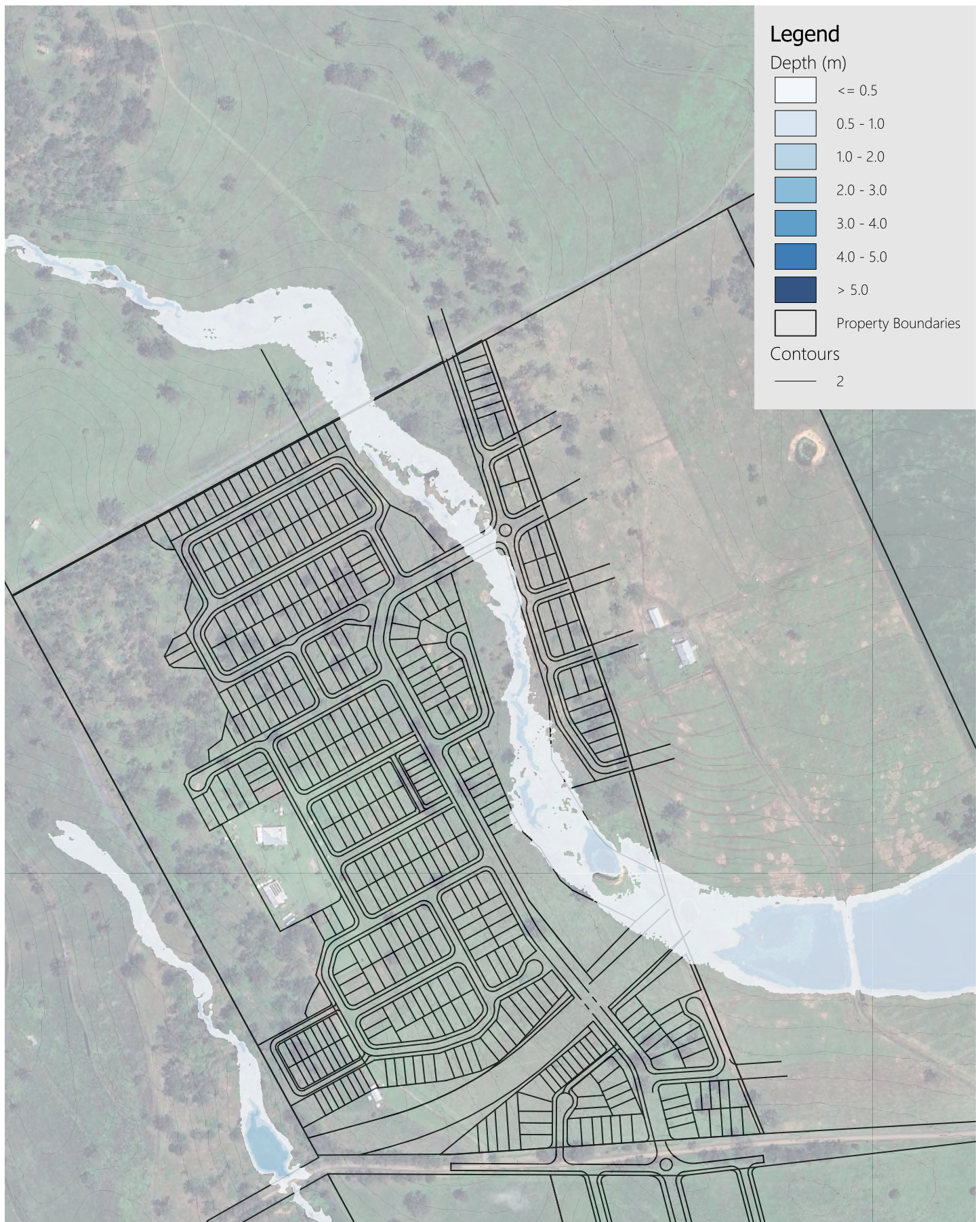


Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Depth Pre Developed

Plan No. 010

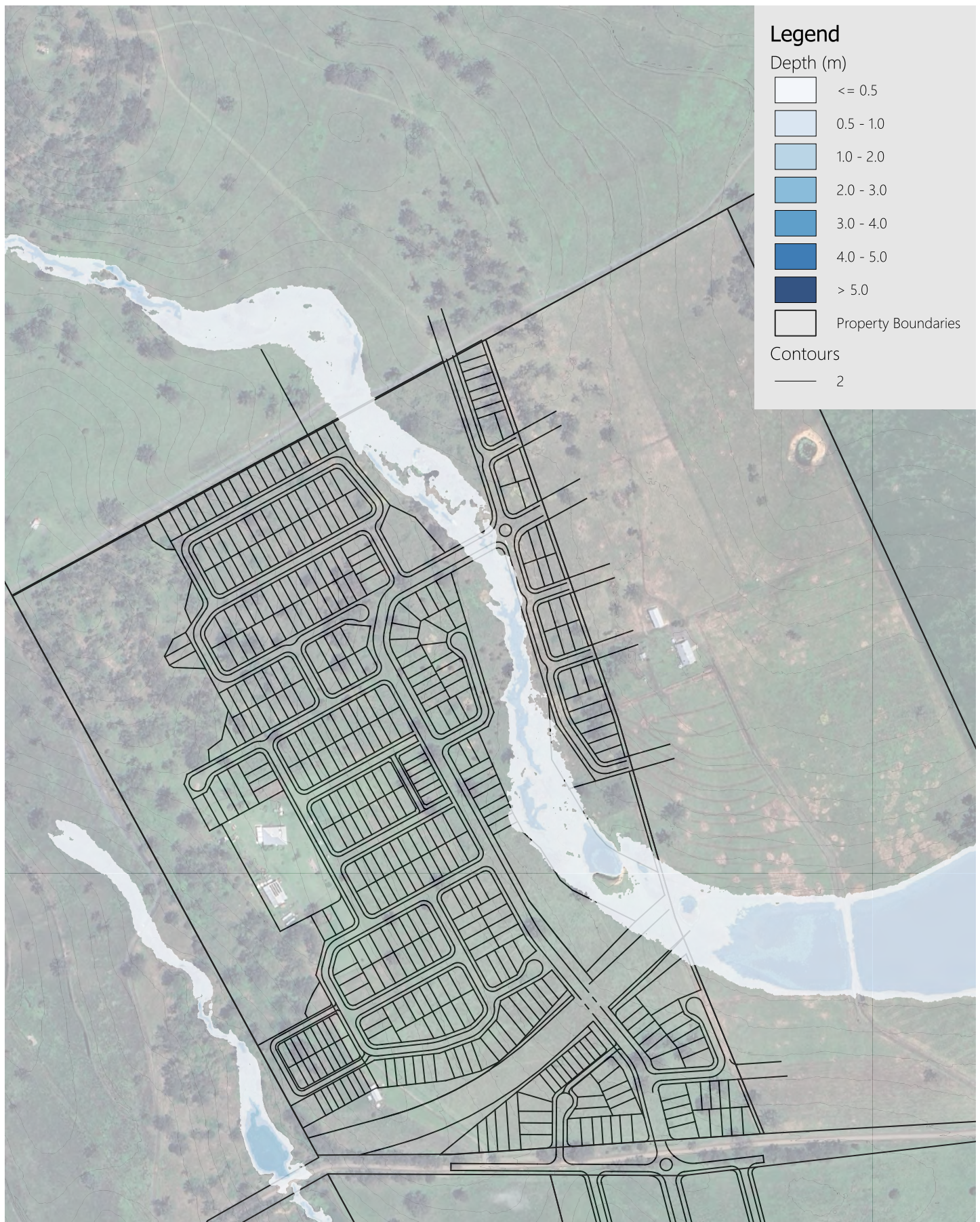


Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

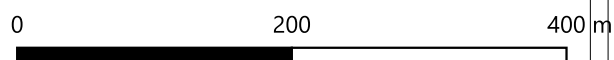
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400 Wyatt Road Kagaru Residential

5% AEP Calculated Depth Pre Developed

Plan No. 018

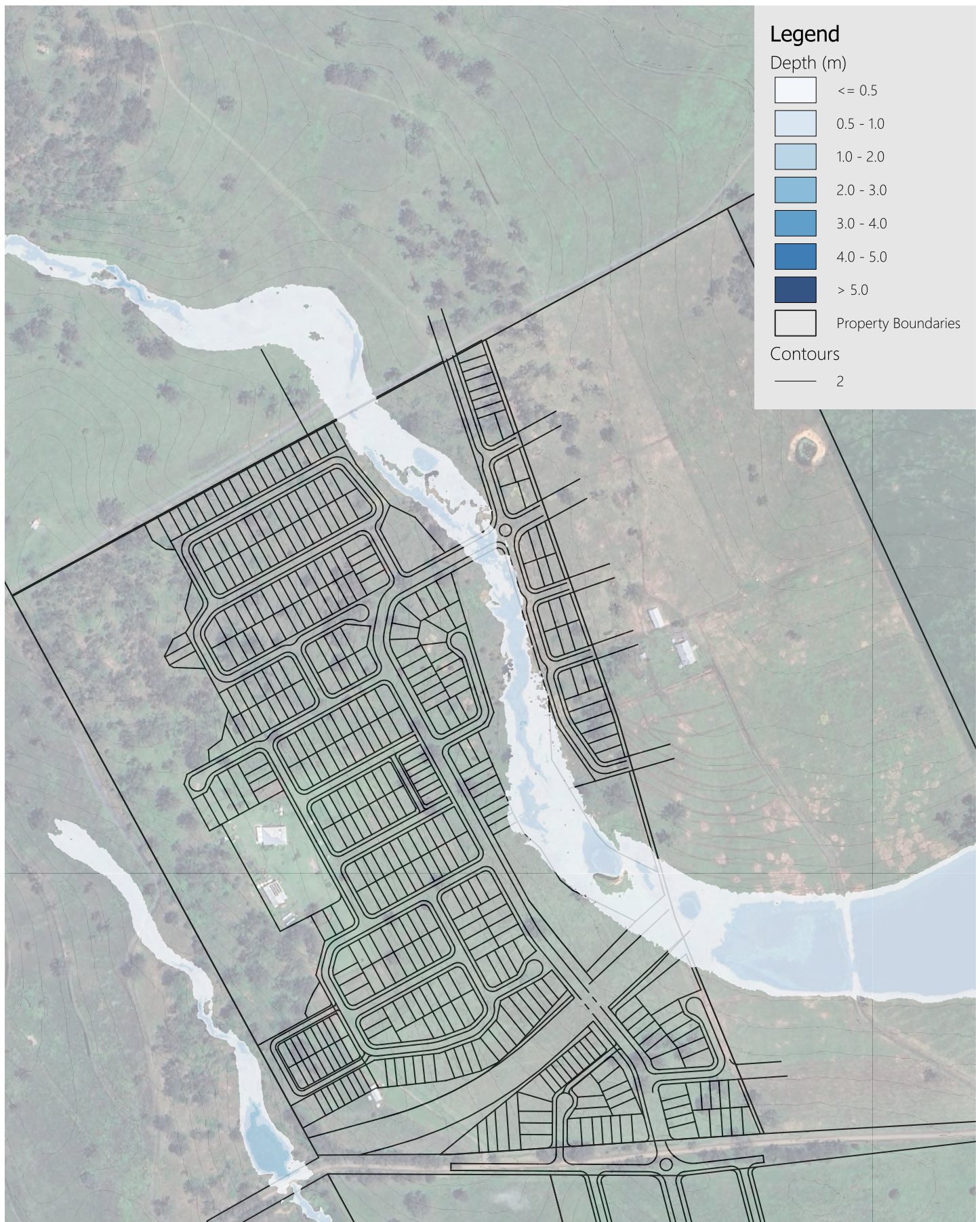


Source: QSpatial
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Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Depth Pre Developed

Plan No. 026



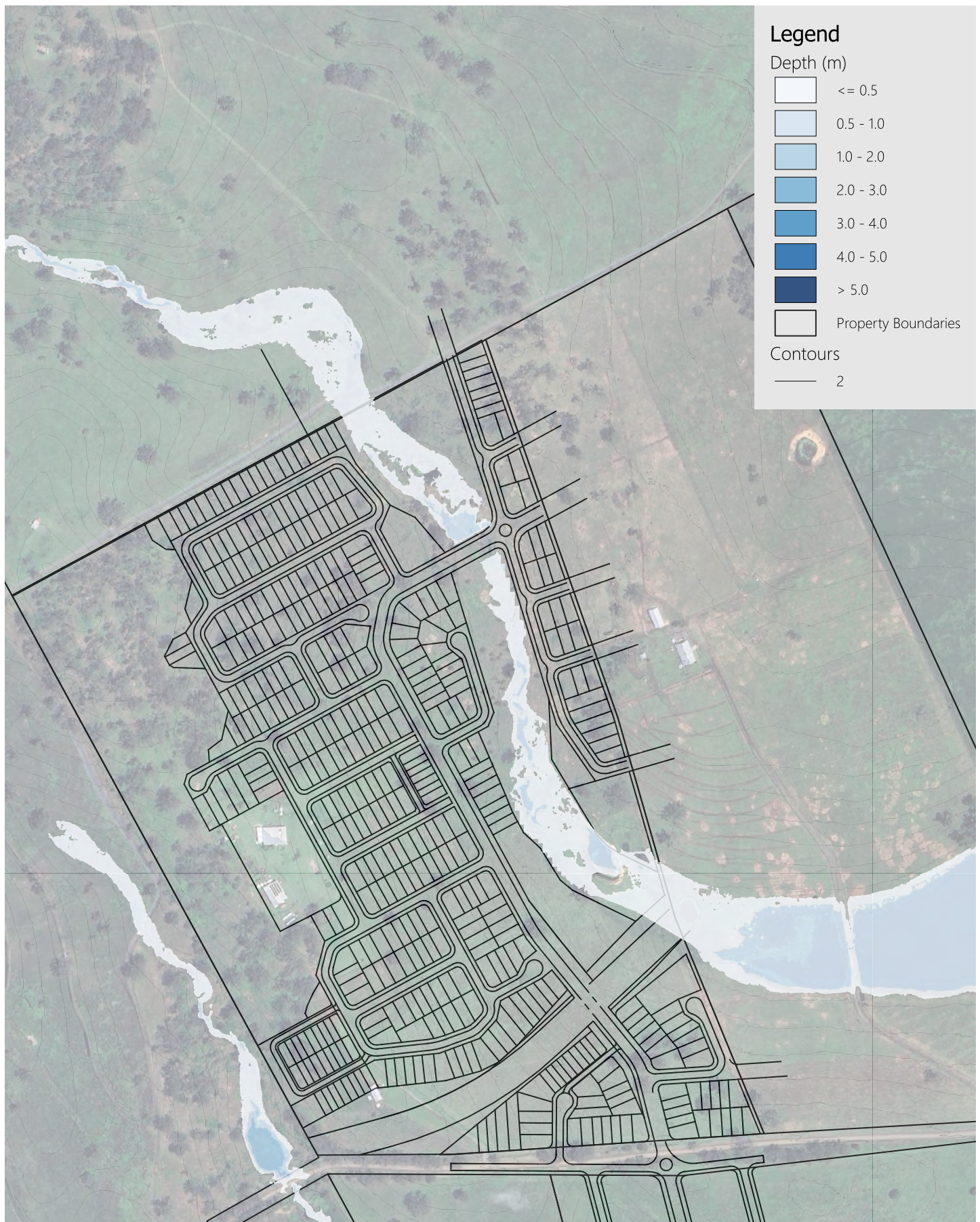
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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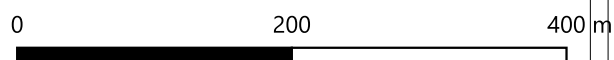
400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

39% AEP Calculated Depth Post Developed

Plan No. 006

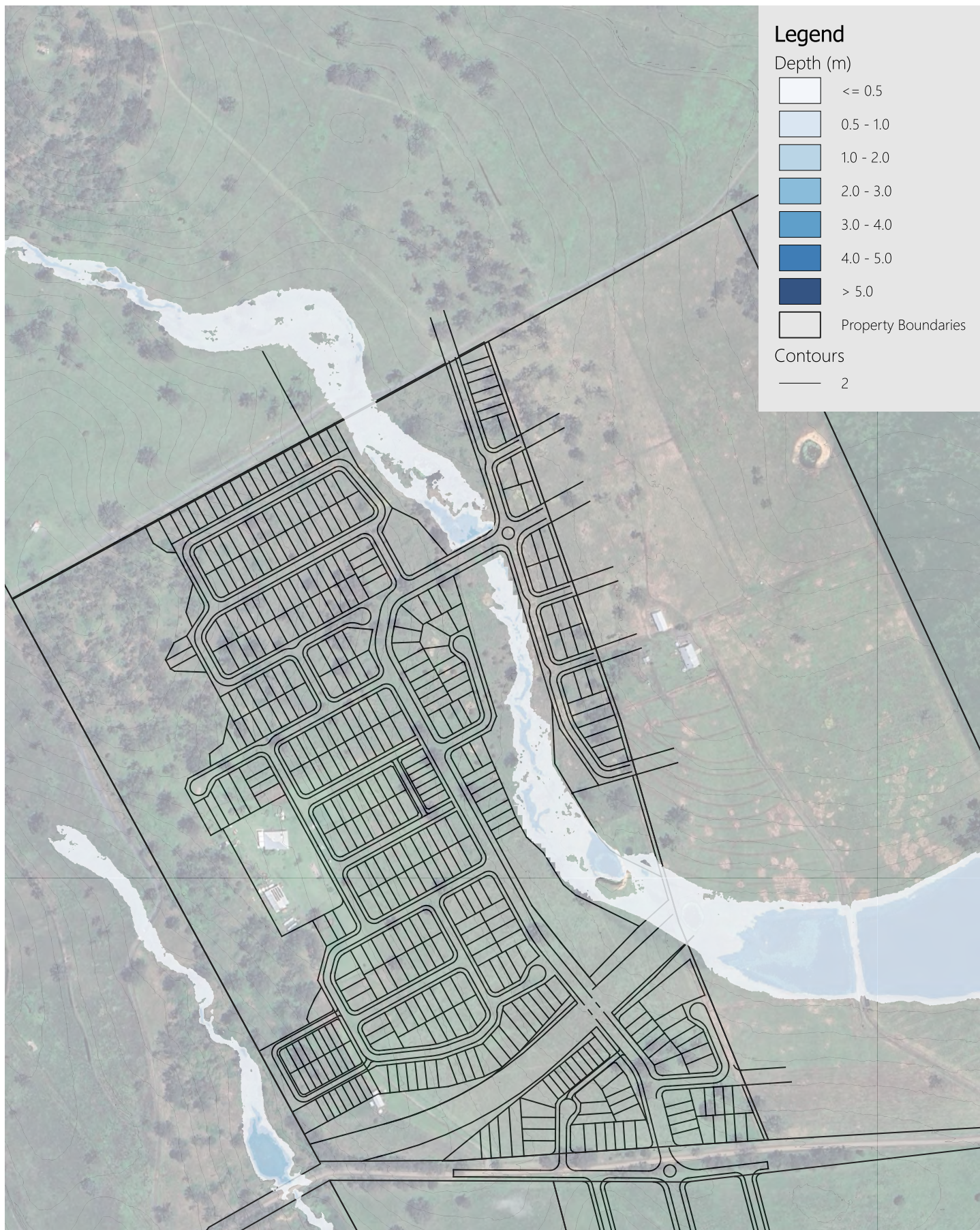


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CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Depth Post Developed

Plan No. 014



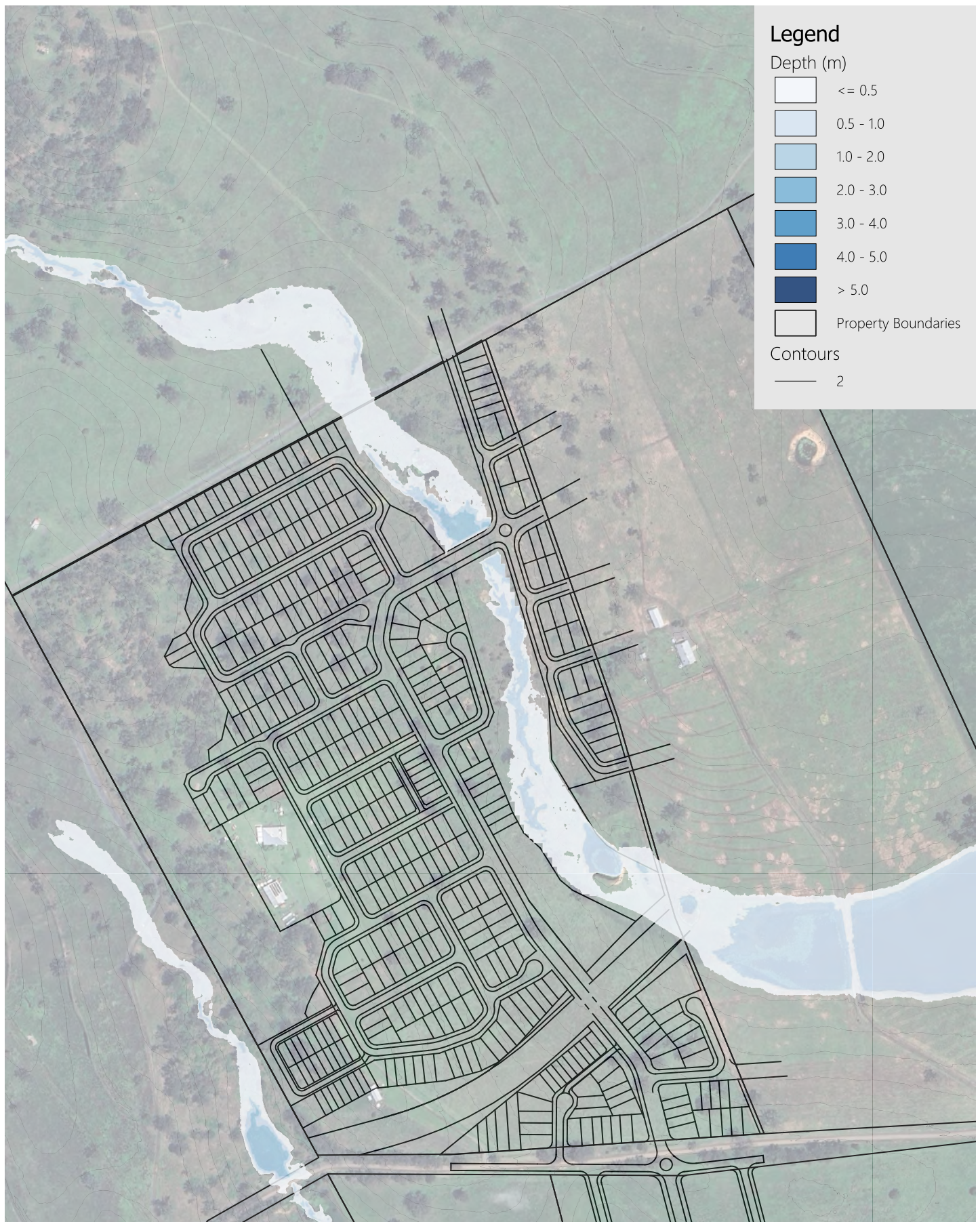
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

5% AEP Calculated Depth Post Developed

Plan No. 022

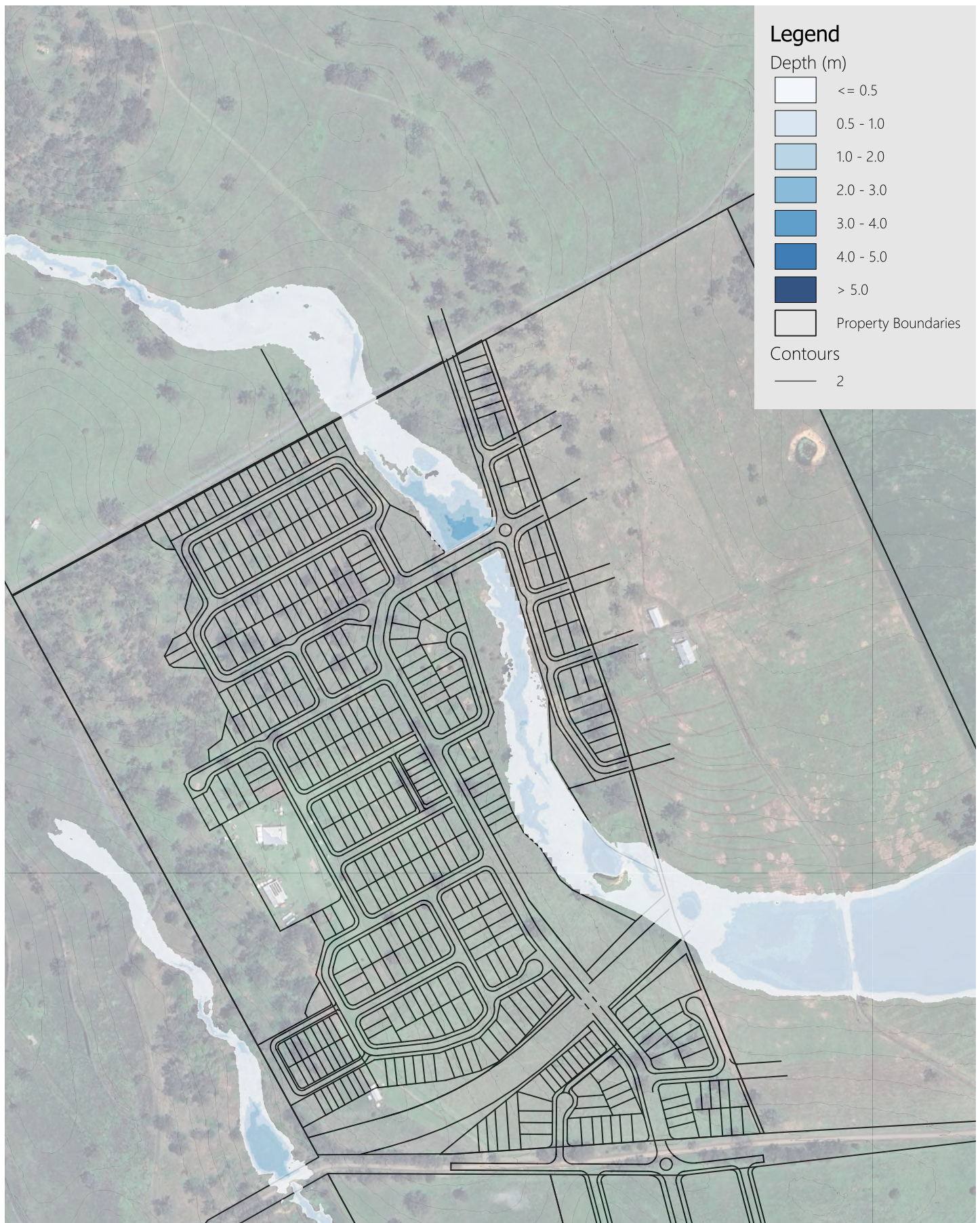


Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

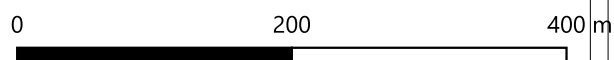
400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Depth Post Developed

Plan No. 030

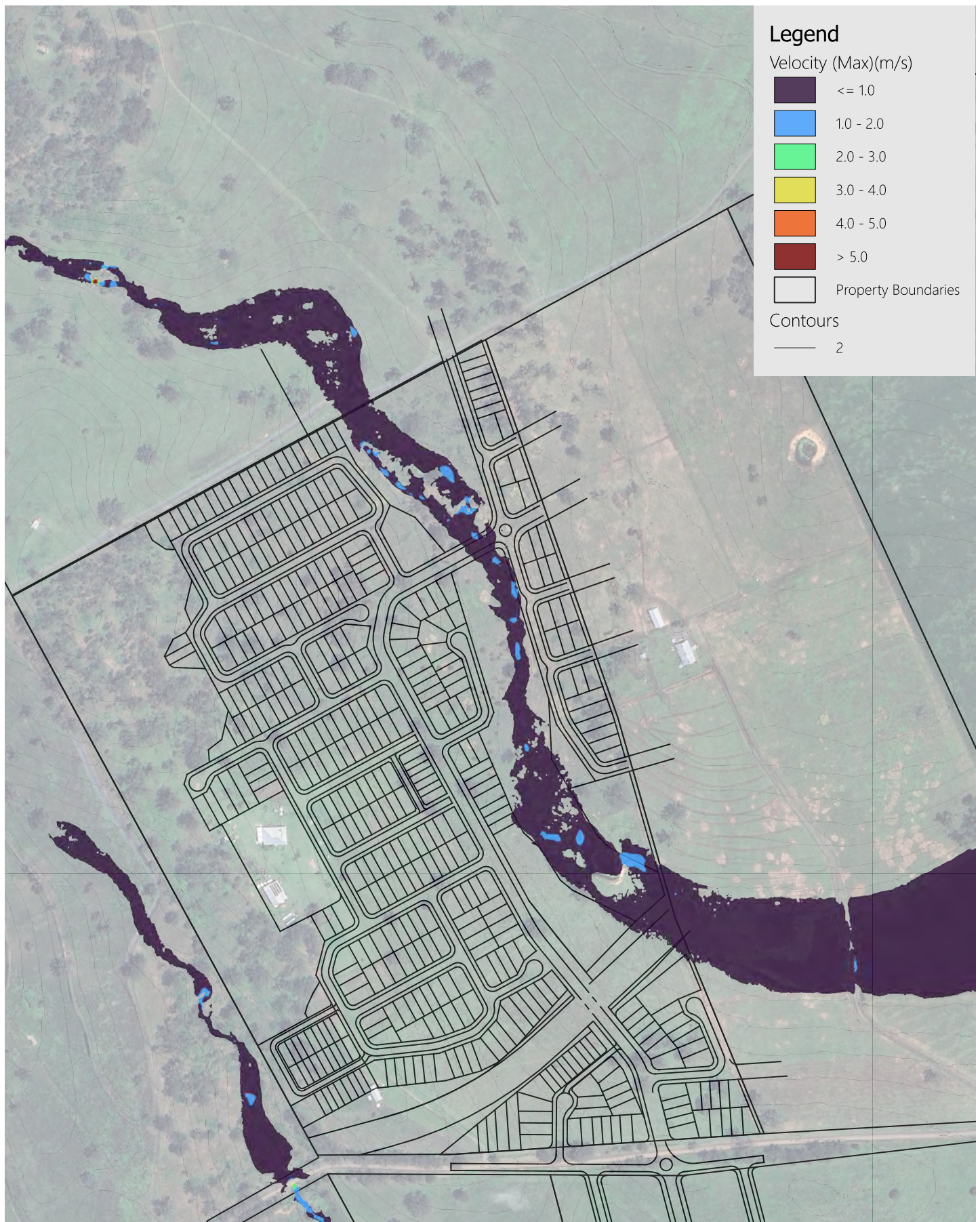


Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

39% AEP Calculated Calculated Velocity Pre Developed

Plan No. 003

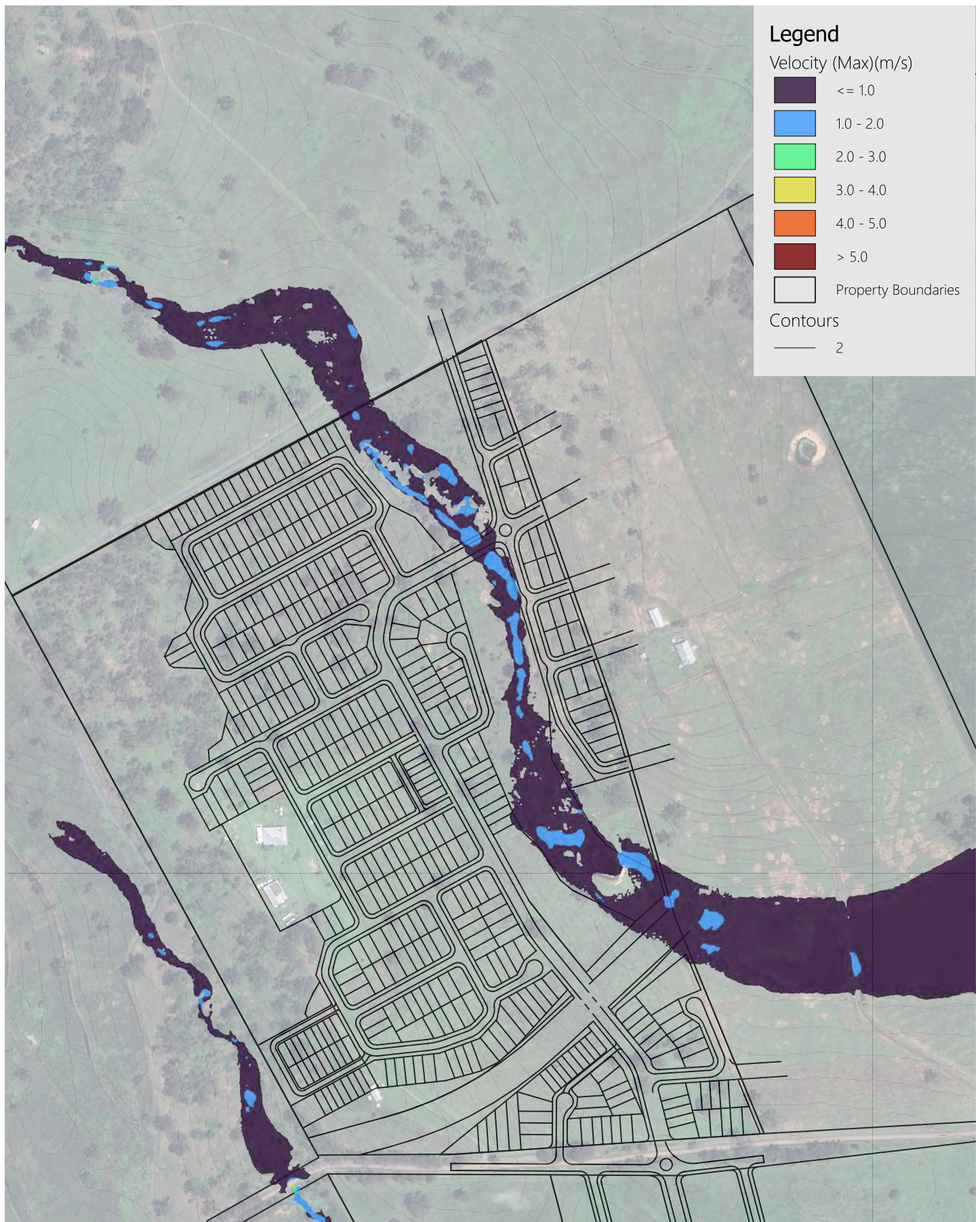
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Calculated Velocity Pre Developed

Plan No. 011

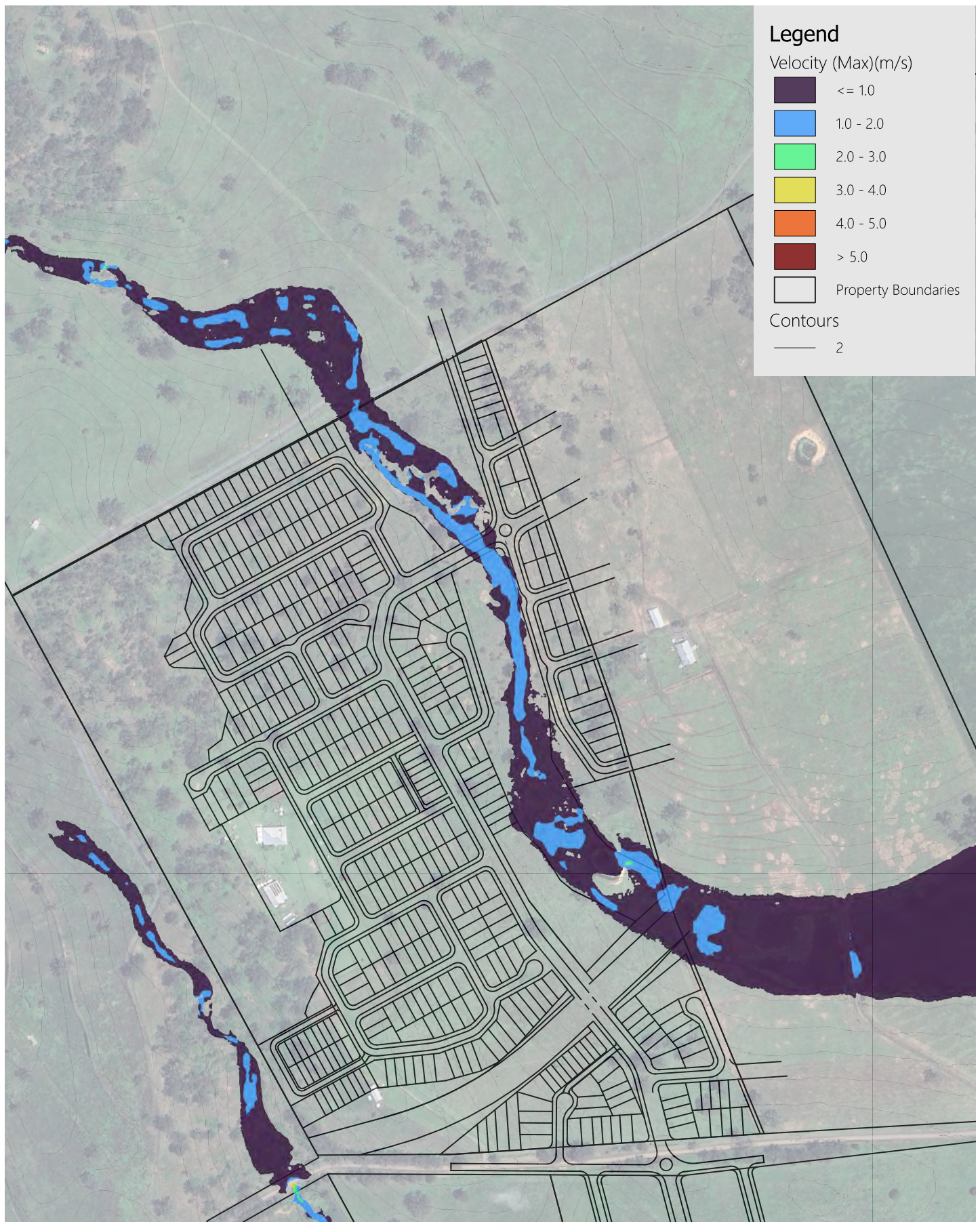
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Legend

Velocity (Max)(m/s)

≤ 1.0

1.0 - 2.0

2.0 - 3.0

3.0 - 4.0

4.0 - 5.0

> 5.0

Property Boundaries

Contours

2

Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

5% AEP Calculated Calculated Velocity Pre Developed

Plan No. 019

0 200 400 m

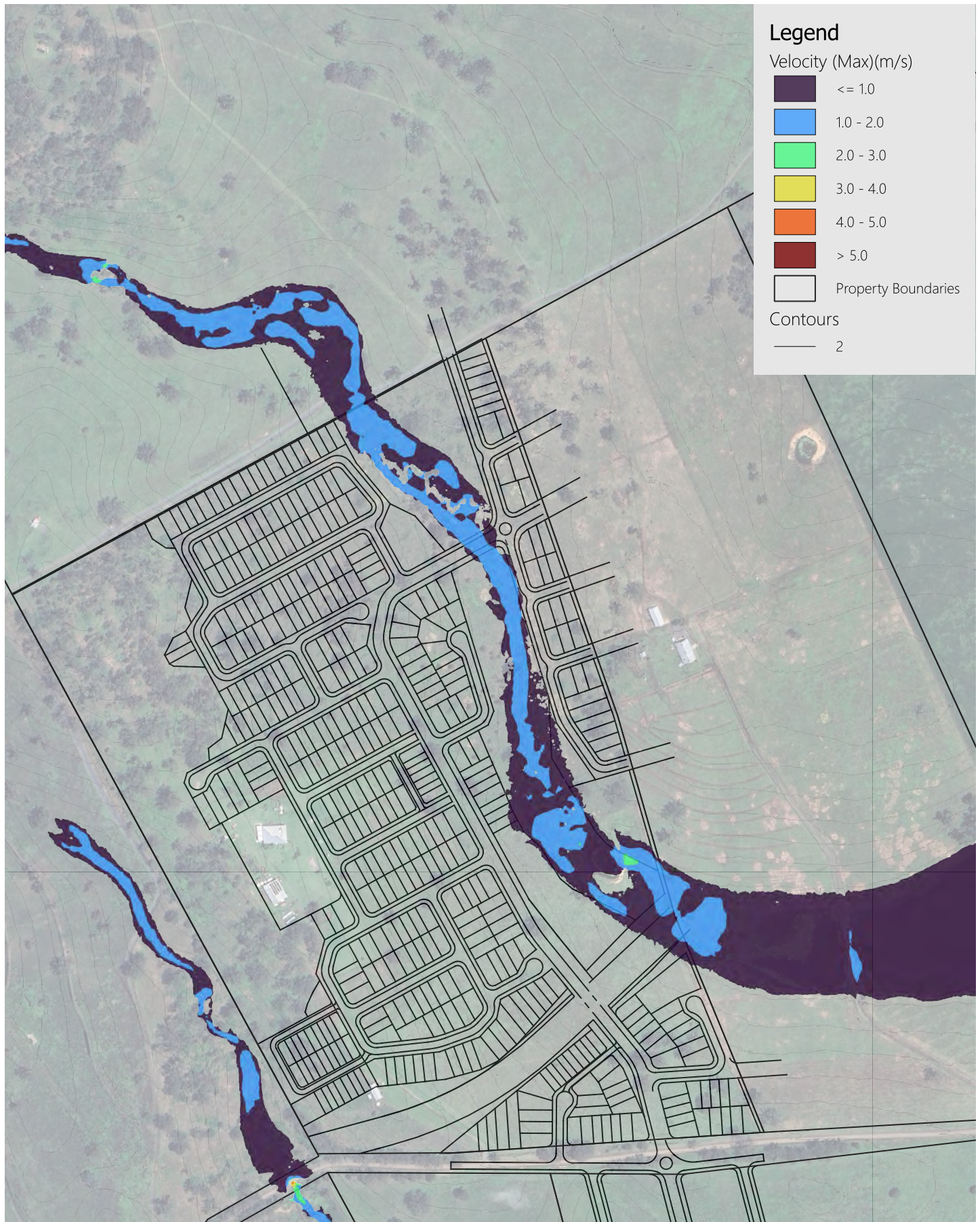
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Calculated Velocity Pre Developed

Plan No. 027

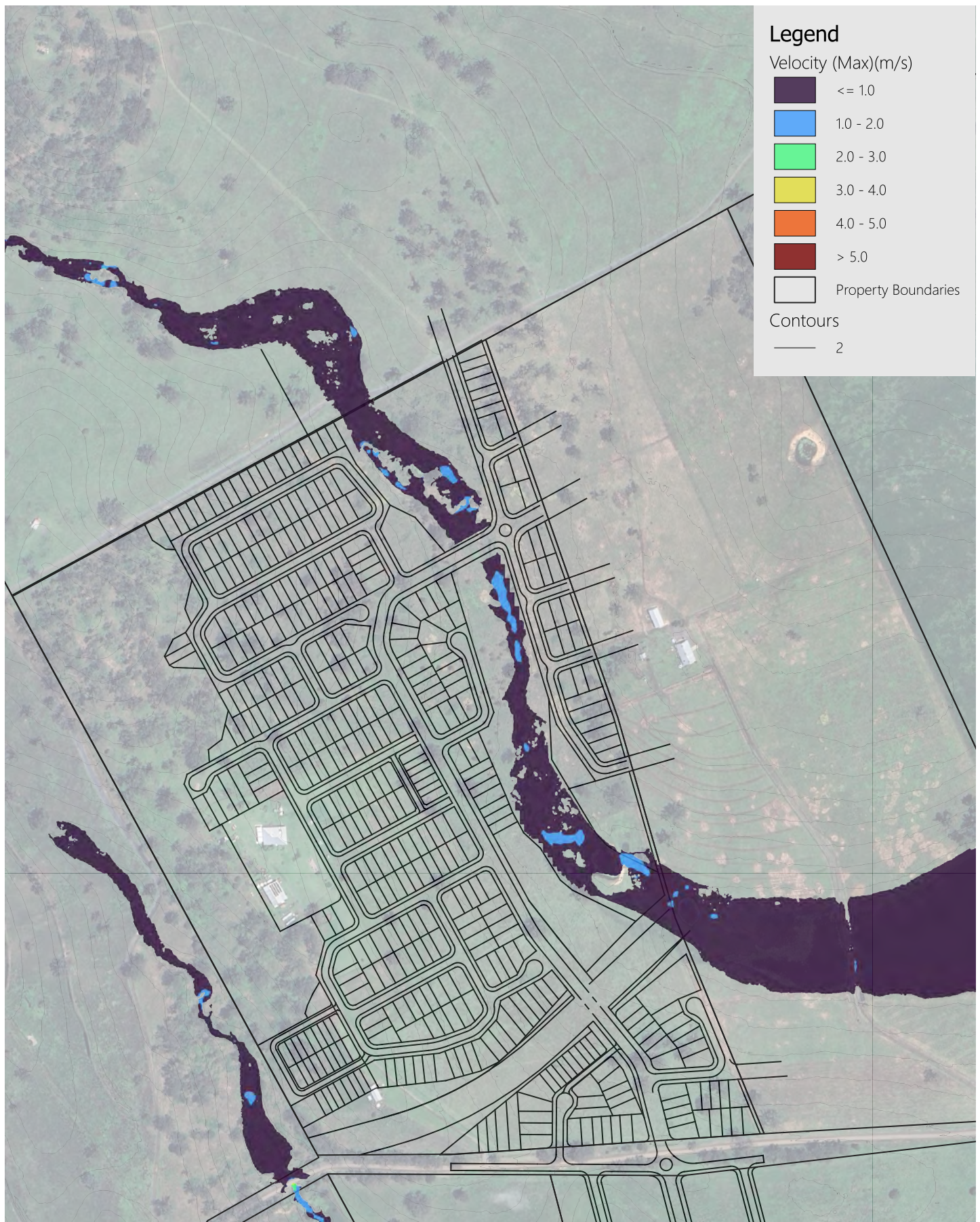
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

39% AEP Calculated Calculated Velocity Post Developed

Plan No. 007

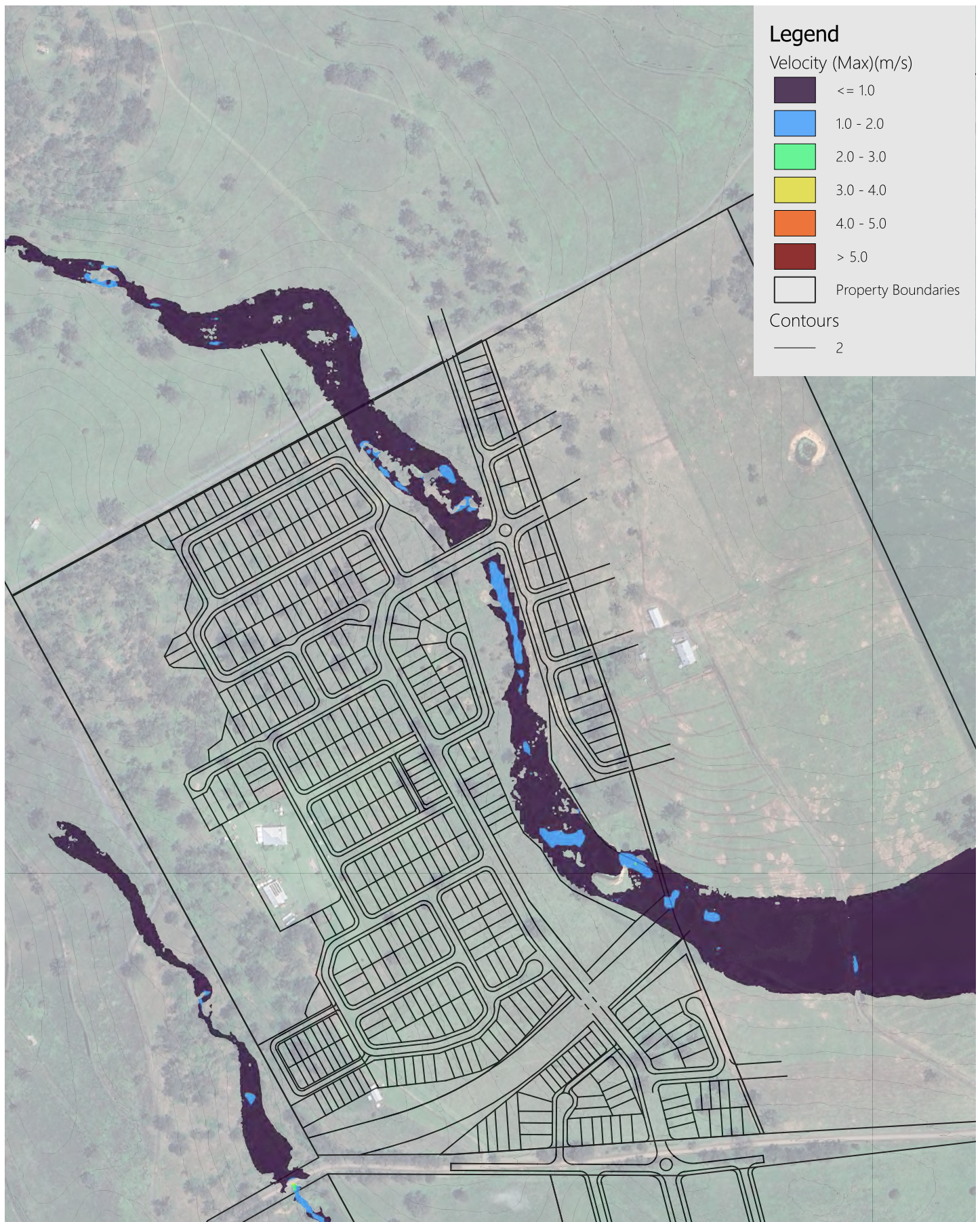
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Calculated Velocity Post Developed

Plan No. 015

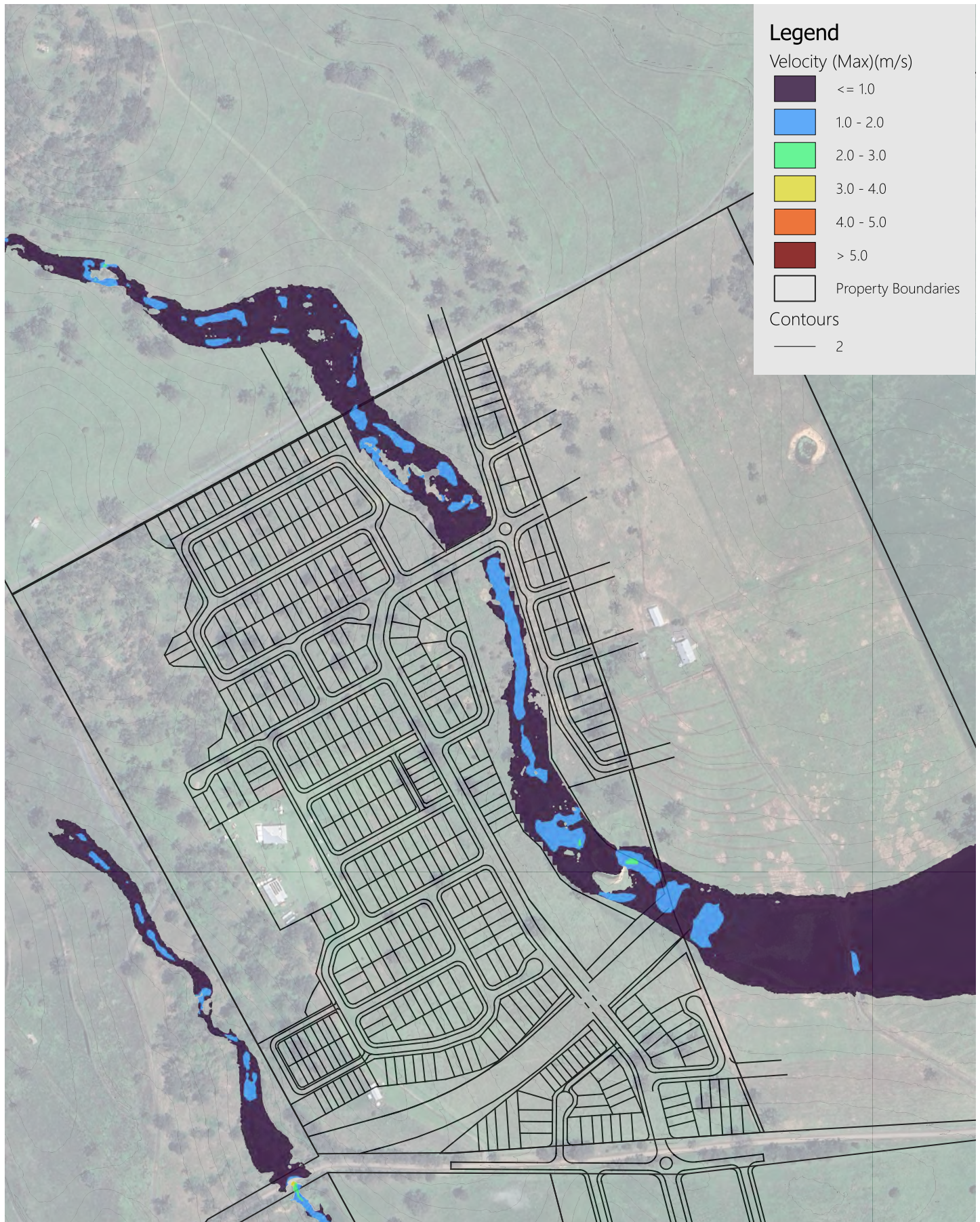
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

5% AEP Calculated Calculated Velocity Post Developed

Plan No. 023

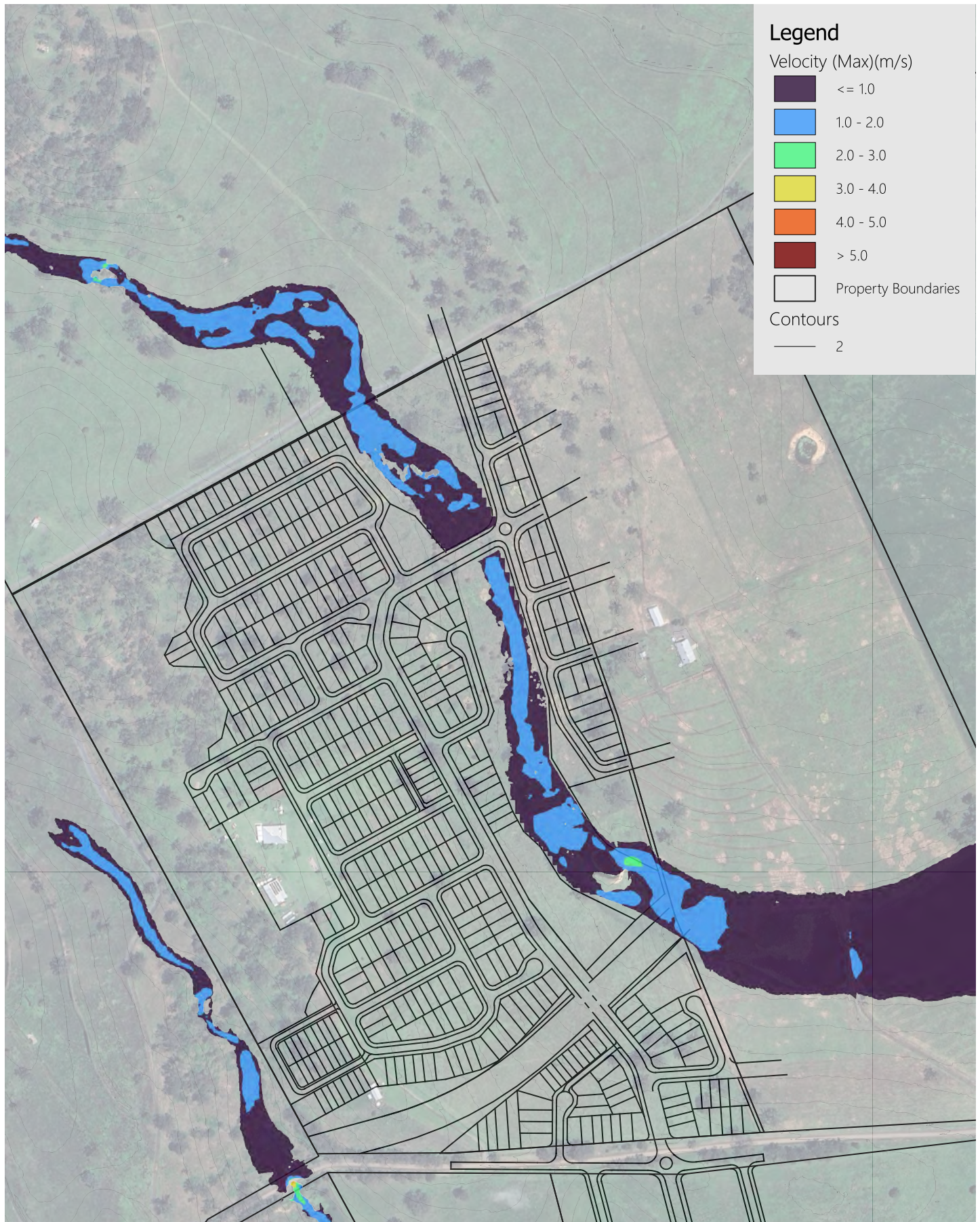
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Calculated Velocity Post Developed

Plan No. 031

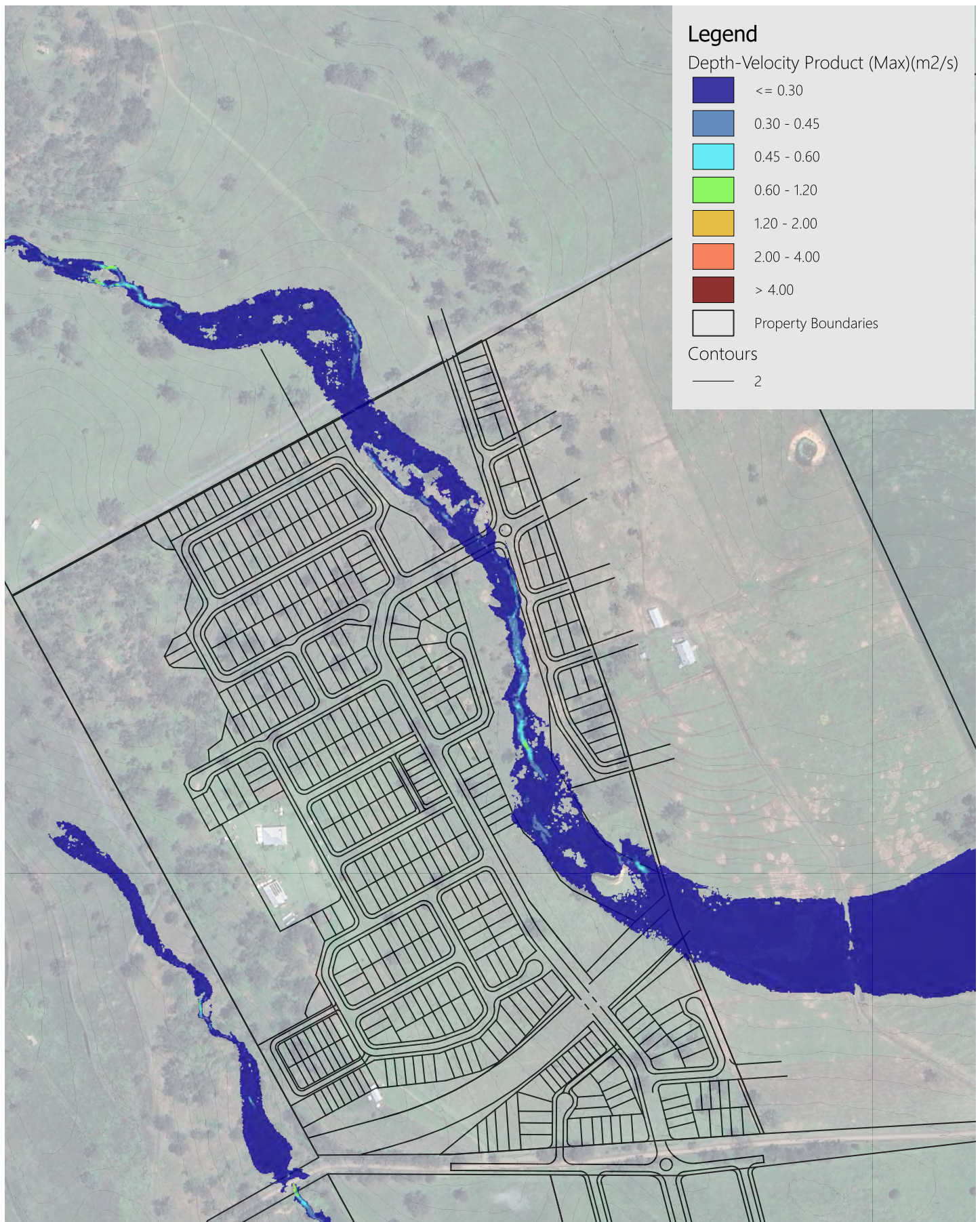


Source: QSpatial
 CRS: GDA2020 / MGA
 Zone 56
 Job: 26-006
 Revision: 01
 Scale: 1:5,500 @ A4
 Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**39% AEP Calculated Depth-Velocity Product
Pre Developed**

Plan No. 004

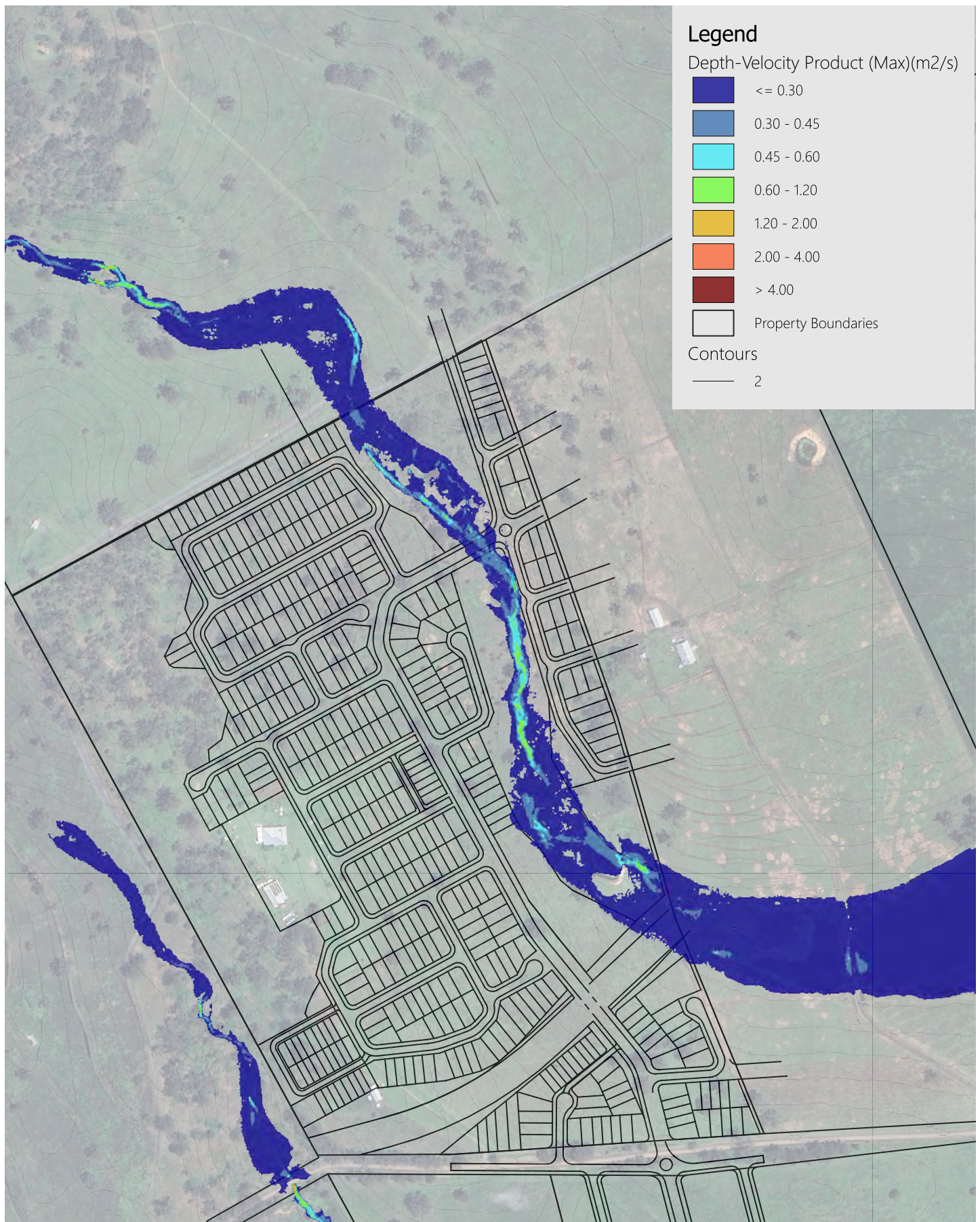
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**20% AEP Calculated Depth-Velocity Product
Pre Developed**

Plan No. 012

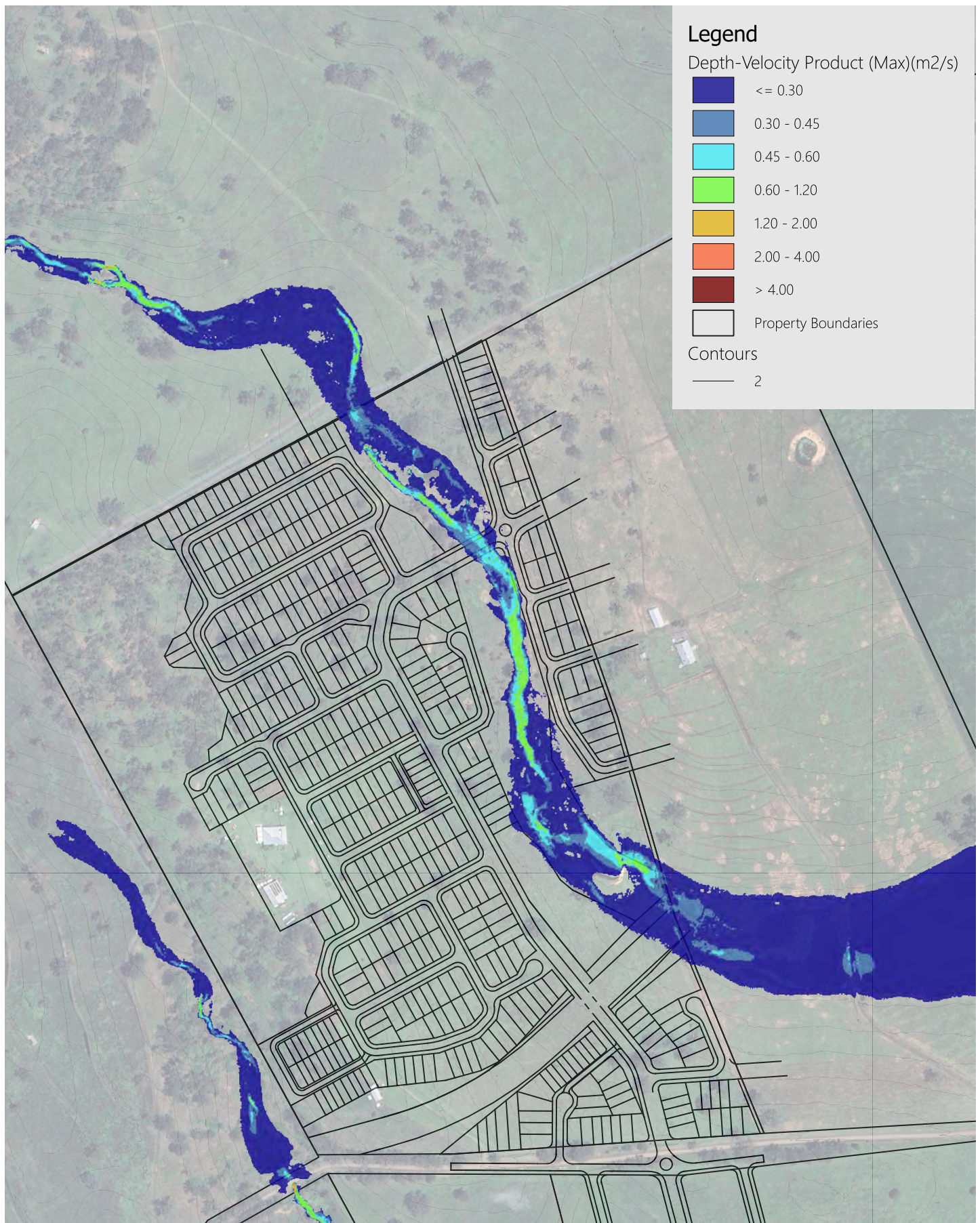
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

5% AEP Calculated Depth-Velocity Product

Pre Developed

Plan No. 020

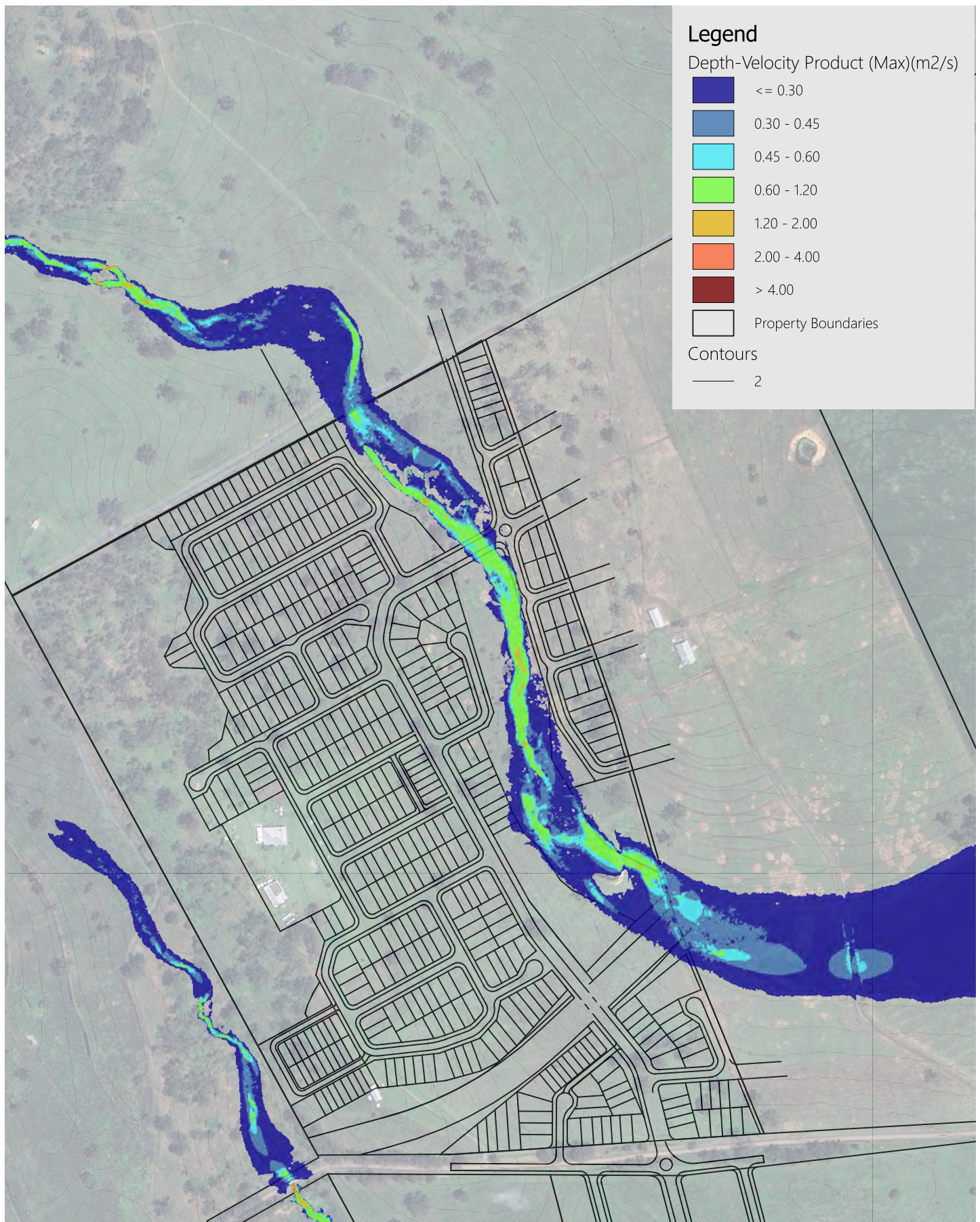
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**1% AEP Calculated Depth-Velocity Product
Pre Developed**

Plan No. 028

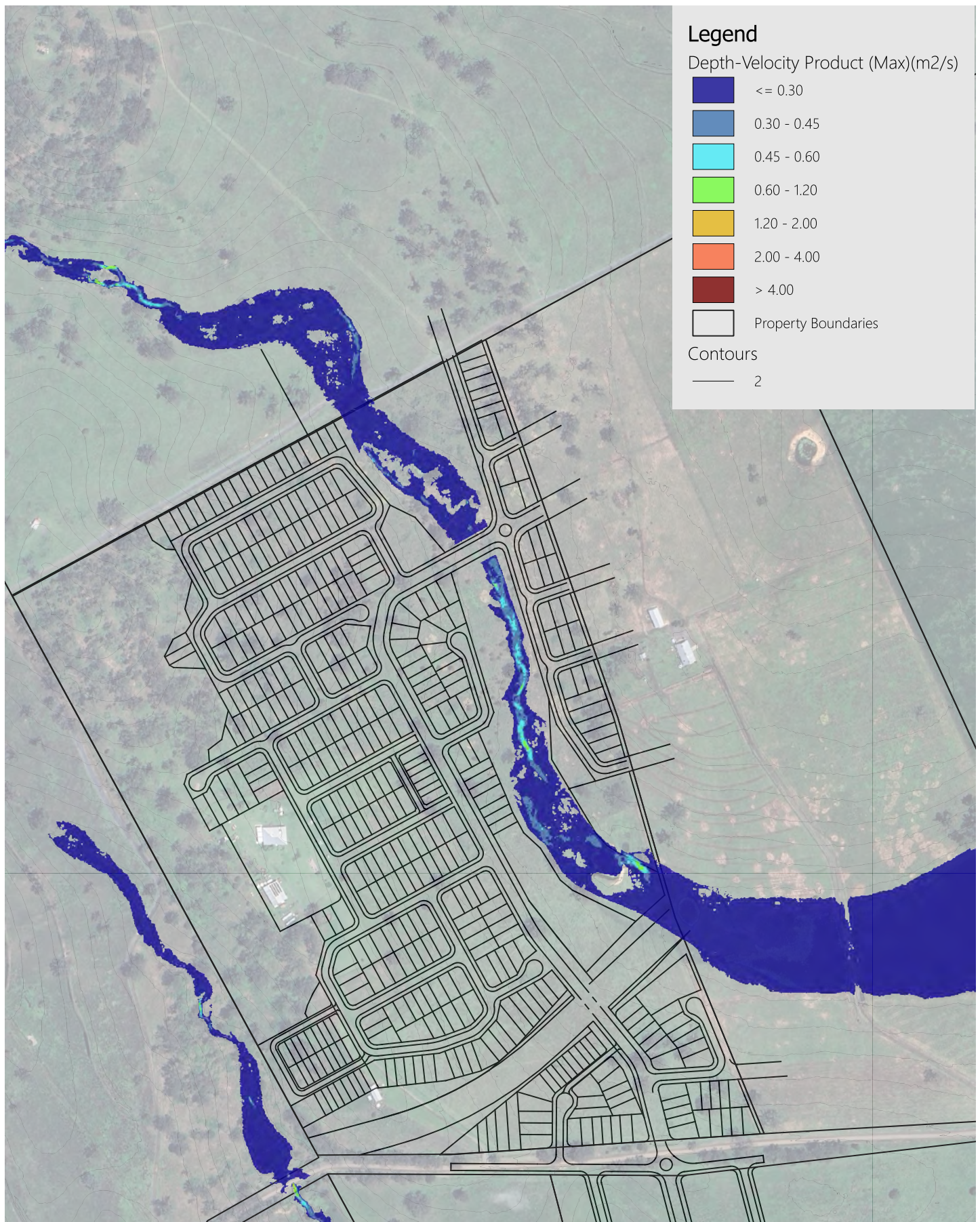
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**39% AEP Calculated Depth-Velocity Product
Post Developed**

Plan No. 008

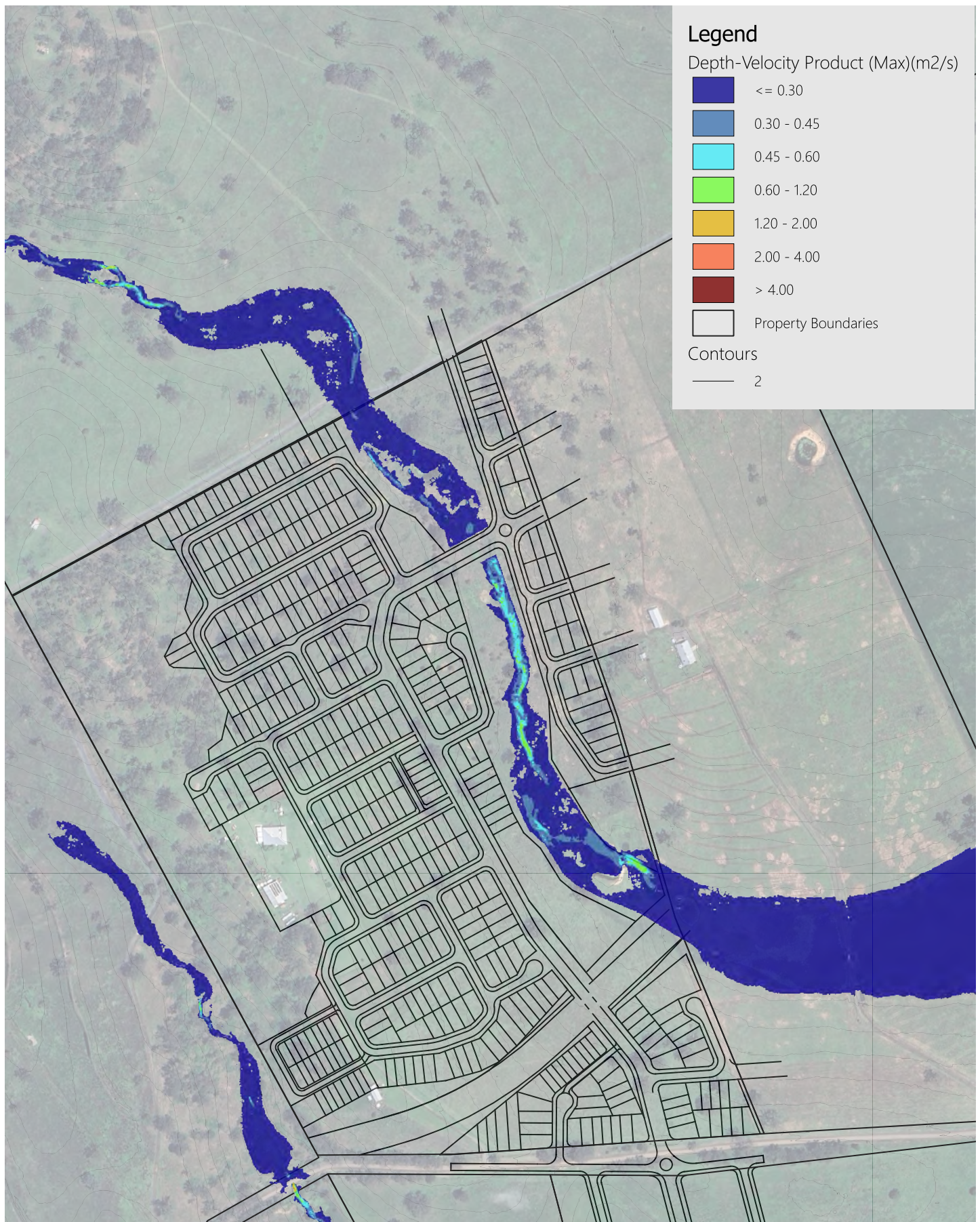
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**20% AEP Calculated Depth-Velocity Product
Post Developed**

Plan No. 016

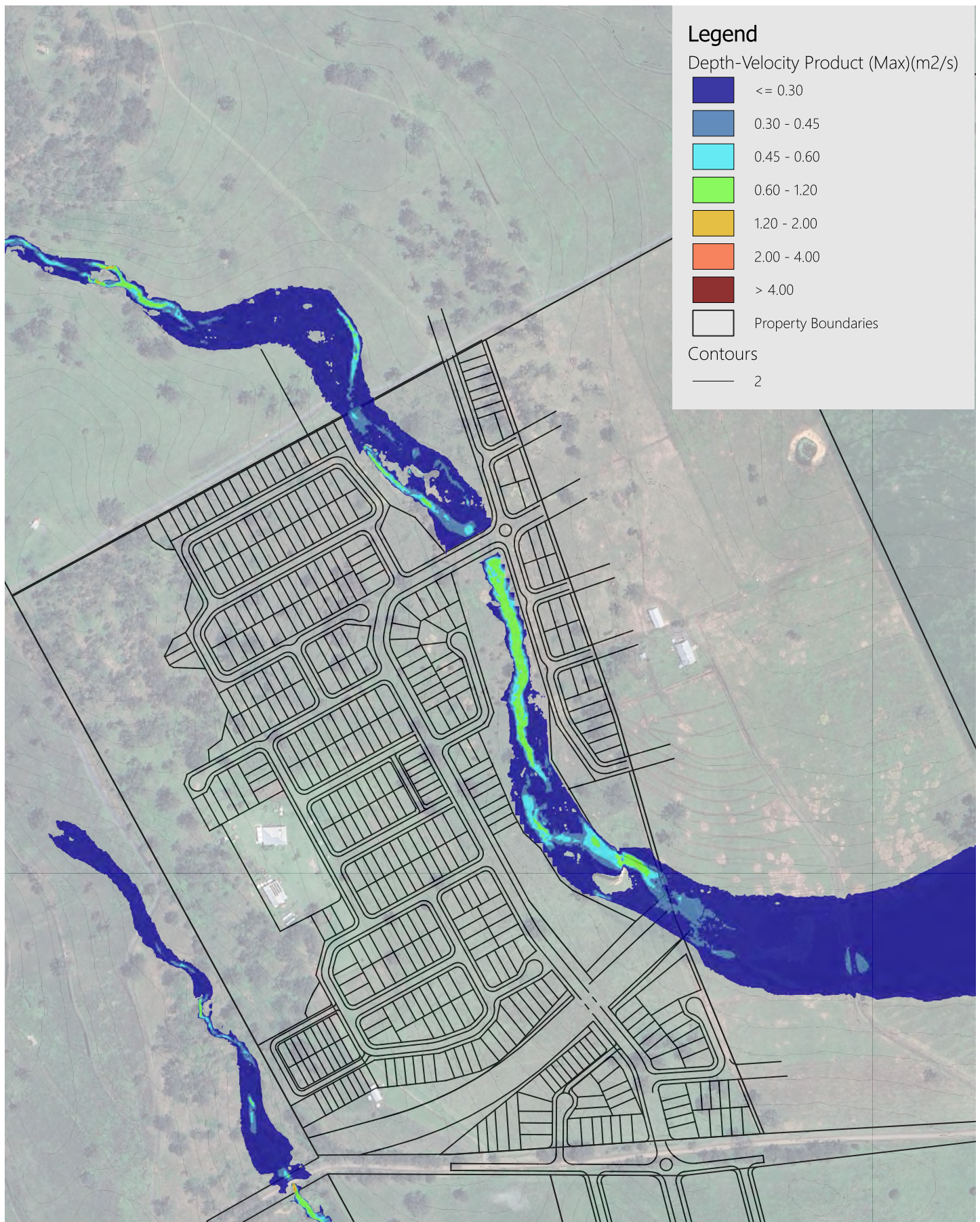
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

**5% AEP Calculated Depth-Velocity Product
Post Developed**

Plan No. 024

0 200 400 m

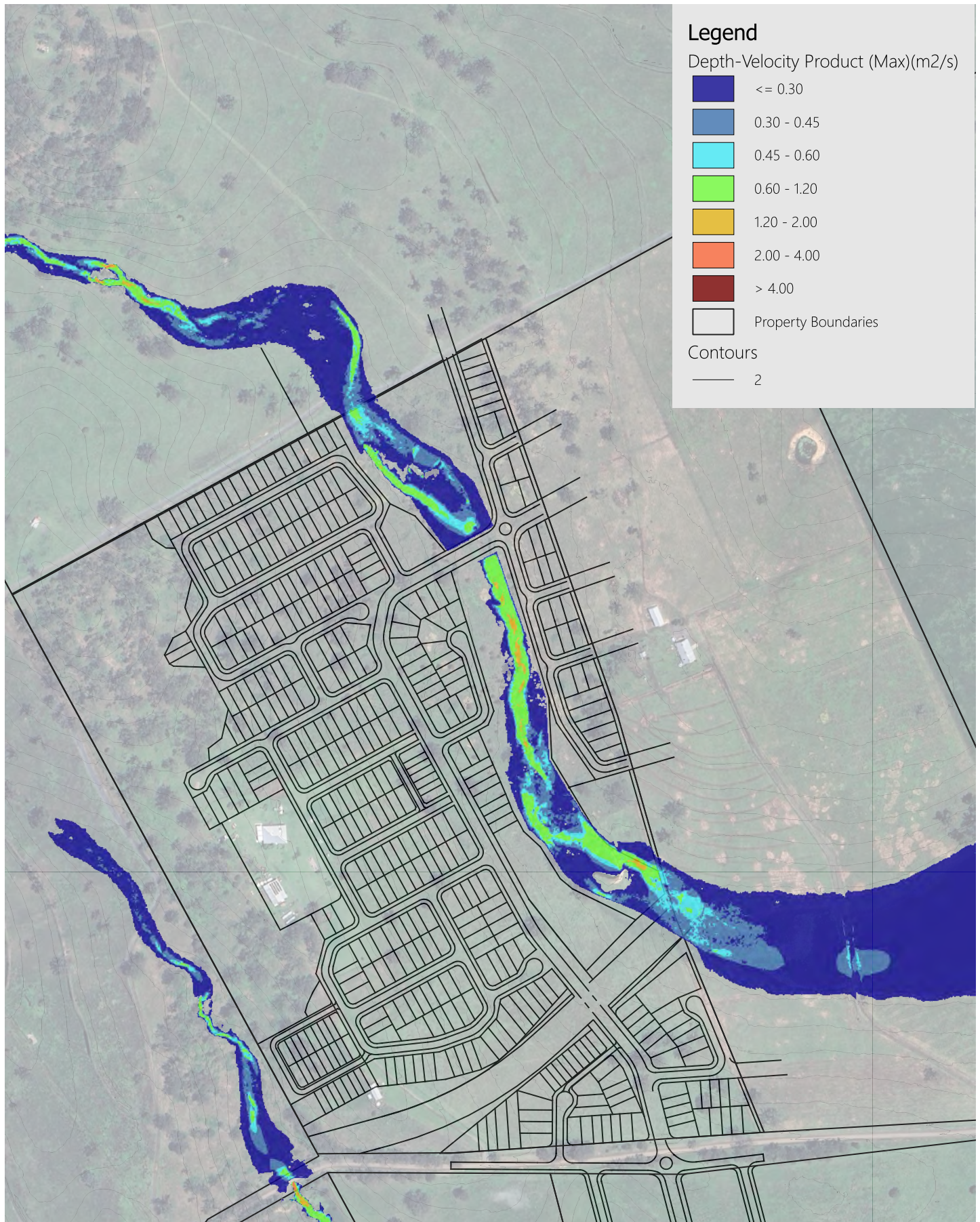
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Depth-Velocity Product Post Developed

Plan No. 032

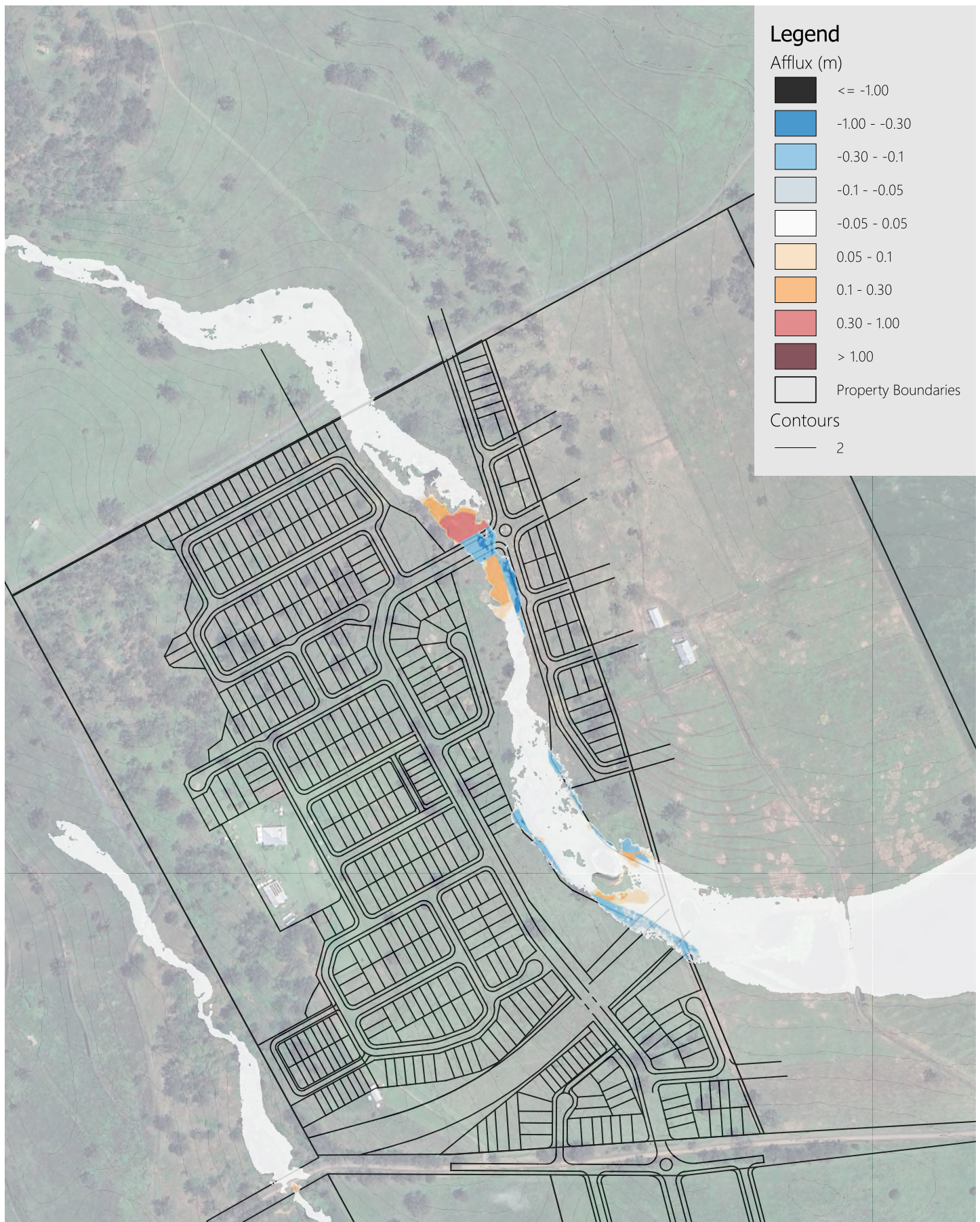
0 200 400 m

Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

39% AEP Calculated Afflux

Plan No. 033



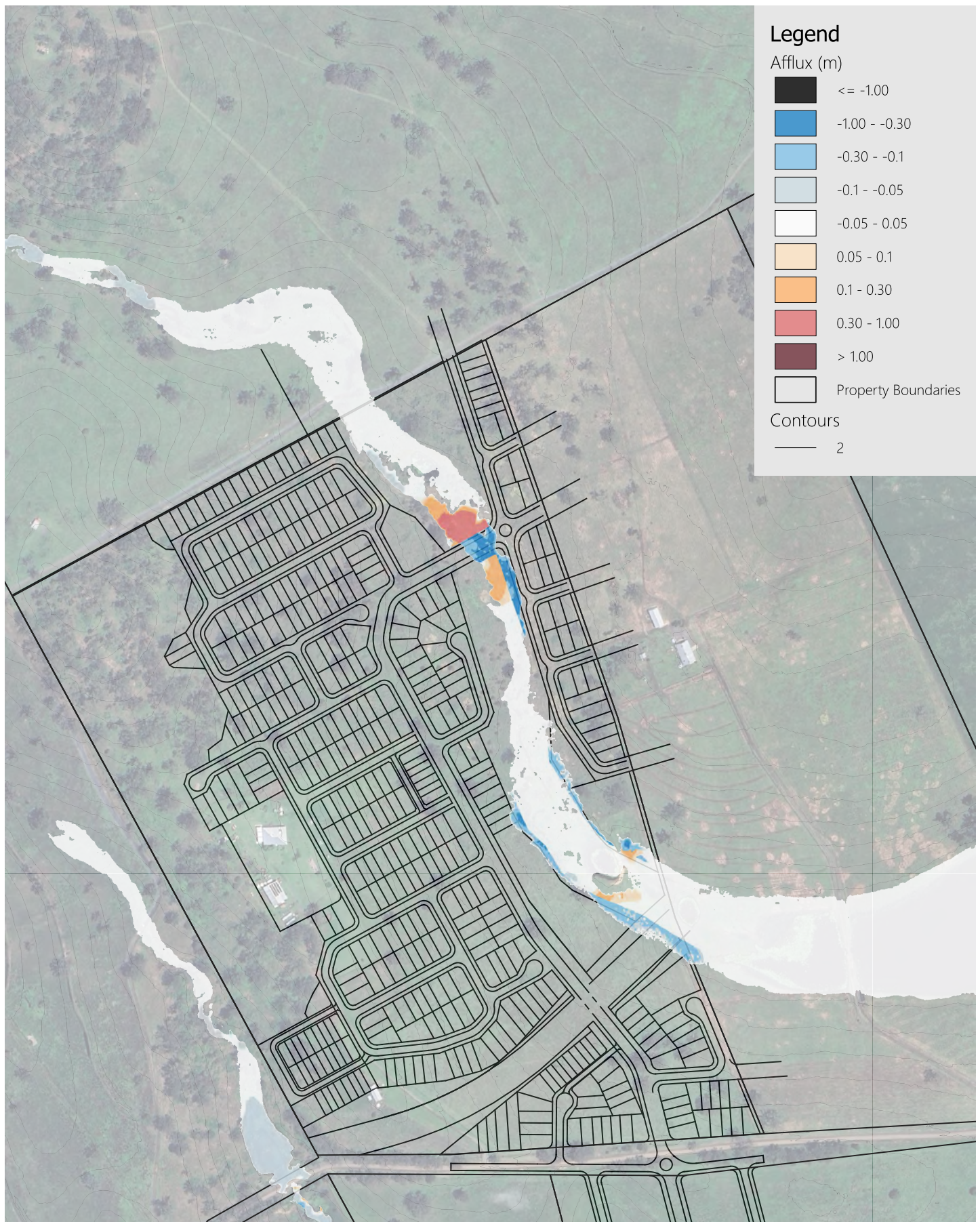
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

20% AEP Calculated Afflux

Plan No. 034



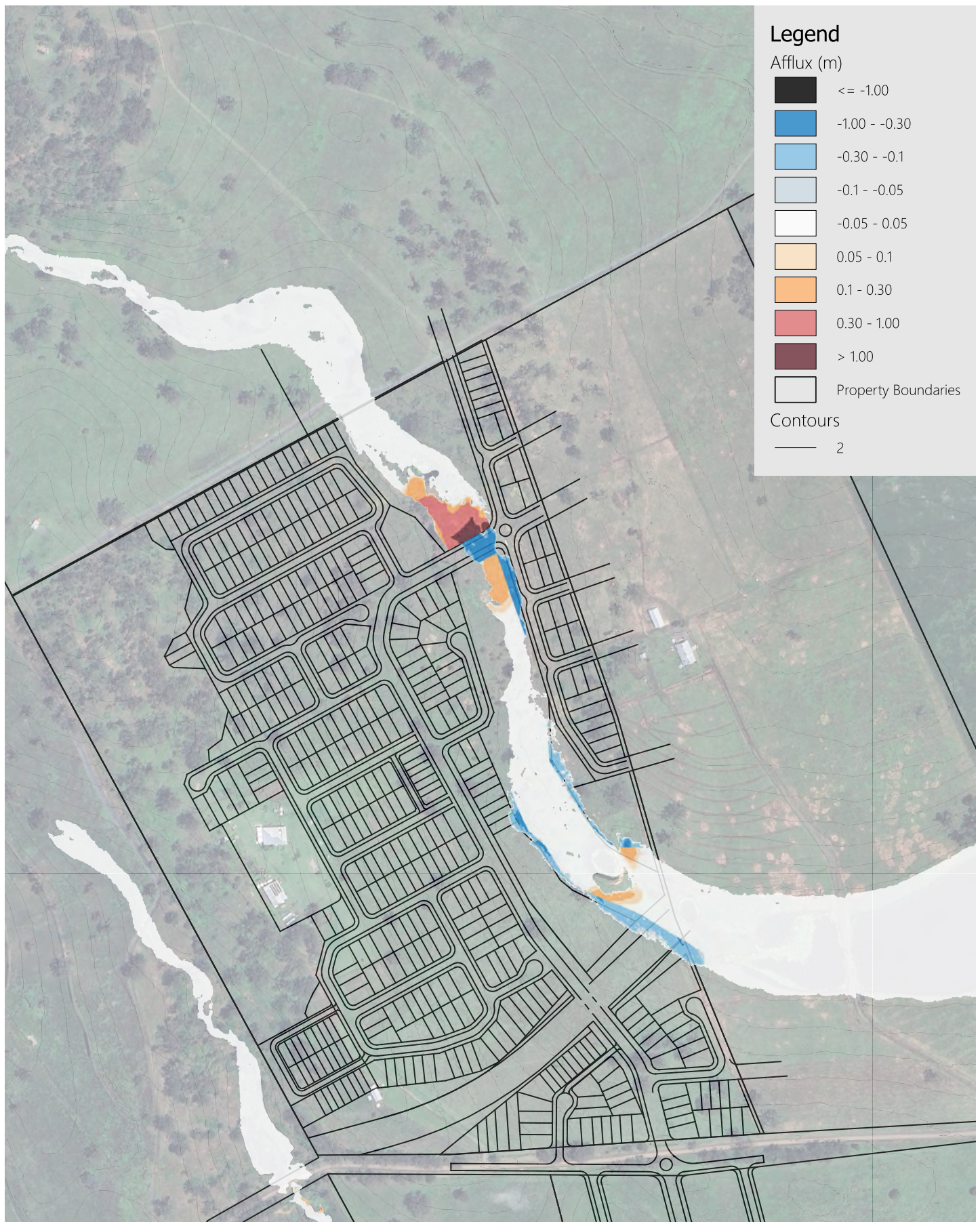
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

5% AEP Calculated Afflux

Plan No. 035



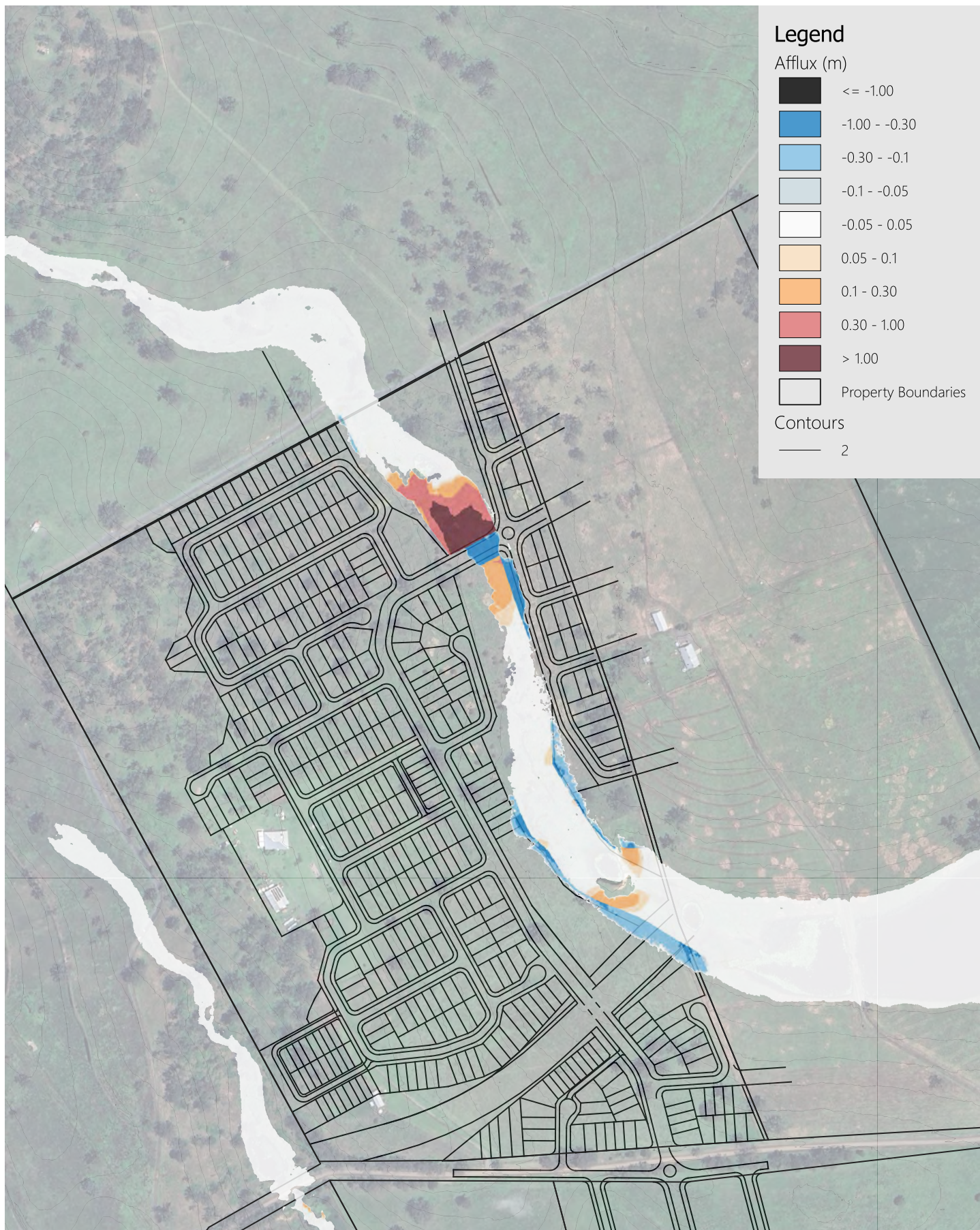
Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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Client

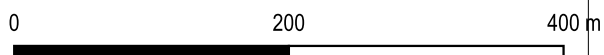
400 Wyatt Pty Ltd



400 Wyatt Road Kagaru Residential

1% AEP Calculated Afflux

Plan No. 036



Source: QSpatial
CRS: GDA2020 / MGA
Zone 56
Job: 26-006
Revision: 01
Scale: 1:5,500 @ A4
Date: 19May26



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