Ardill Payne & PARTNERS

ENGINEERS PLANNERS SURVEYORS ENVIRONMENTAL PROJECT MANAGEMENT

RILEY'S HILL DEVELOPMENT

Lot 100 DP 1201719

Hills Road, Riley's Hill

WATER AND SEWER INFRASTRUCTURE SERVICING REPORT

Submission to:

Richmond Valley Council

for:

Monal Pty Ltd

September 2021

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3	**14.09.21**	**P. Ghasemzadeh**		**J. Kay**	

Revision No:	Description
0	First Issue
1	Revised based on new development plan
2	Revised based on new development plan
3	**Updated based on Council comments on planning proposal dated May 2021**

Table of Contents

Abbreviations

The following abbreviations have been used in this report.

AHD	Australian Height Datum
APP	Ardill Payne and Partners
DCP	Development Control Plan
DEM	Digital Elevation Model
DN	Nominal Diameter
DSP	Development Servicing Plan
DA	Development Application
EP	Equivalent Population
ET	Equivalent Tenement
NRLG	Northern Rivers Local Government
PDWF	Peak Dry Weather Flow
PWWF	Peak Wet Weather Flow
RVC	Richmond Valley Council
SPS	Sewage Pumping Station
STP	Sewage Treatment Plant
TWL	Top Water Level
WSA	Water Services Association of Australia

1. Introduction

Ardill Payne and Partners has been commissioned by Monal Pty Ltd to undertake water and sewer infrastructure planning investigations for the possible future rezoning and subdivision/development of Lot 100 DP 1201719 at Hills Road, Riley's Hill. The study has been undertaken to support and inform a planning proposal for rezoning of the 8.3ha site to a village zone to permit future residential subdivision and development. A detail site survey is included in Attachment 1. The Development plan is shown Attachment 2.

The Department of Planning issued a conditional Gateway Determination (Dated 16th February 2018) in respect of the subject land as follows:

"Planning Proposal (Department Ref: PP_2018_RICHM_001_00): to rezone part of Lot 100 DP 1201719 at Hills Road, Rileys Hill from RU1 Primary Production to RU5 Village and change the minimum lot size from 40 hectares to 600m^2 to enable the land to be developed for low density residential purposes."

This water and sewer infrastructure servicing plan has been prepared to address part of Condition 1, viz:

1. Prior to community consultation the following site investigations are to be undertaken and the planning proposal amended if necessary to reflect the outcomes of the site investigations. The site investigations are to be included in the material used for community consultation:
   a. an ecological assessment;
   b. a preliminary site contamination assessment including soil sampling as appropriate and to the satisfaction of Council;
   c. an Aboriginal cultural heritage assessment;
   d. an assessment of the potential impacts of the Rileys Hill Quarry operations, including a land use conflict risk assessment for potential blasting, noise, traffic and vibration impacts, should the operation of the quarry be resumed;
   e. a traffic impact assessment;
   f. a flood study;
   g. a bushfire hazard risk assessment;
   h. an infrastructure servicing plan; and
   i. an acid sulfate soils assessment.

This report has been prepared in consultation with RVC regarding the existing water and sewer infrastructure at Riley's Hill and the development's water and sewer services requirements.

The water demand and sewer load calculations in this report are based on the new 35 lot development proposal. The previous version of the report was prepared based on 37 lots and the earliest issue based on 70 lots.

The proposed water and sewer infrastructure will be detailed at the DA and detailed design stages.

2. Water Supply

Riley's Hill water supply system has sufficient capacity to provide for the proposed development. The site can be connected to the existing network and upgrading the existing system for servicing the site will not be required. However, RVC may require further investigation of the site water supply requirements for firefighting.

2.1. Water Supply Strategy

Riley's Hill and Broadwater are connected to a common water supply system. Rous Water supplies the system at Broadwater Reservoir No. 1. From this point, the reservoirs and network are owned and administrated by RVC. Riley's Hill water is supplied through a 4km long, 100mm diameter water main from the Broadwater reservoirs. RVC's DSP assigns a projected total water demand of 318 ET in 2019 and 405 ET in 2039 to Broadwater/Riley's Hill combined area. The capacity of the existing system is specified as 505 ET and as such the existing system will be able to provide for the proposed 35 ET development (one ET assigned to each lot).

Council believes that with consideration of the relatively small size of the Riley's Hill water main further firefighting provisions for the gradually development village may be required. Any site specific provisions in this regard needs to be studied further at the DA stage.

2.2. Water Supply System

Riley's Hill water supply system is shown in Figure 2, Attachment 2. The subject site will be connected to the existing 100mm main at Hill's Road. Riley's Hill is fed from B/W Reservoir 2 which has a top water level of 55m AHD. The site is located lower than the majority of the existing properties at Riley's Hill, therefore no pressure issue for supply is anticipated.

Hydraulic modelling and detailed design of the site internal water network, including fire hydrants, will be undertaken at the DA stage.

3. Sewerage

Early assessments indicated that the additional sewer from the proposed development would overload the existing Riley's Hill STP. In the minutes of the meeting dated 21st November 2017 it was requested by RVC that an infrastructure servicing plan be undertaken to determine what upgrades to the Riley's Hill sewer system may be required.

In 2018 a meeting was held with RVC to ensure that the sewer infrastructure planning would be in compliance with the existing services and Council requirements. An interim report including the main design parameters, the existing sewer system capacity and the design loads was submitted to and reviewed by RVC.

Later in 2020 the number of the proposed lots was reduced from 70 to 35 which allows the existing STP service the site with the current capacity. More details regarding Riley's Hill and the site sewer system is provided below.

3.1. Proposed Sewer System

The proposed sewer system for the site is shown in Figures 3 and 4 in Attachment 2. Based on the site topography, a full gravity sewer network can be developed to a discharge point at the south-east corner of the site. The site discharge point is placed at a location with a surface elevation of about 5m AHD. A low head SPS can be installed at the site discharge point. The SPS rising main can be connected to a new manhole with an approximate surface elevation of 9m AHD at the highest point along the proposed rising main route. A gravity line can be constructed from the rising main discharge man-hole to either the existing, the upgraded STP or a new STP on the RVC owned land at Lot 10 DP 864012.

Development of the rising main along the proposed route would require an 8m long easement to be acquired along the boundary of either Lot 516 DP 755624 or Lot 11 DP 864012. The rest of the proposed rising main and gravity line is located within the subject site or Council owned land. The proposed site sewer system concept is shown in Figures 3 & 4, Attachment 2.

3.2. Design Loads

The site design loads have been calculated based on the following assumptions and presented in Table 3.1 below:

- Total load of 35 ET (1 ET per lot)
- 1 ET equal to 2.3 EP (RVC requirement)
- ADWF of 240 L/EP/d (Section 6 of NRLG D12)
- PDWF of 4.6 x ADWF (RVC requirement)
- PWWF of 7 x ADWF (Section 6 of NRLG D12)

Table 3.1: Site sewer loads

Condition	Load per EP (L/day)	Site Load (L/day)	Site Load (L/s)
ADWF	240	19320	0.22
PDWF	1104	88872	1.03
PWWF	1680	135240	1.57

3.3. Riley's Hill Sewer System Upgrades

Based on the RVC's DSP, the existing STP is currently providing for approximately 100 EP sewer load. This treatment plant has a design capacity of 200 EP and will be able to accommodate the expected additional 80.5 EP load from the fully developed subject site.

The proposed development will necessitate to bring the future upgrades forward. The available options to increase the current sewer treatment capacity for future further developments include:

- adding additional modules to the existing modular STP
- installation of a separate additional STP
- decommissioning the existing STP and installing a new plant with higher treatment capacity

RVC has advised that the upgraded or new treatment plant will be located within the Council owned land at Lot 10 DP 864012. In selecting the best of the above options, the age of the existing plant, disruptions in servicing the existing customers, site topography and the available space within RVC's land should be considered. The subject site and RVC land boundaries are shown in Figure 3.1 below.

At this stage it is considered that the existing STP could provide for the proposed development.

Figure 3.1: Subject site and existing STP locality plan

4. Conclusion

4.1. Water

The existing water supply system to Riley's Hill village has adequate capacity to provide the required water for the future possible residential development. At the DA stage RVC may call for further investigations regarding the site firefighting requirements to ensure sufficiency of the water supply provisions with concerns about the limiting size of the Riley's Hill water main for the growing village.

The connection point to the existing reticulation will be at Hill's Road.

4.2. Sewerage

The site sewerage can be gravity discharged to a small SPS located close to the site's eastern boundary. The collected sewer at the SPS can be pumped to the existing Riley's Hill STP. The STP has sufficient capacity to meet the development additional loads.

Additional treatment capacity can be provided for future developments by upgrading or replacement of the existing STP. However, RVC notes that the development bring the future upgrades forward.

5. Scope of Engagement

This report has been prepared by Ardill Payne & Partners at the request of Monal Pty Ltd to support the rezoning application for their land at Riley's Hill and is not to be used for any other purpose or by any other person or corporation.

This report has been prepared from the information provided to us and from other information obtained as a result of enquiries made by us. APP accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this document for a purpose other than that described above.

APP declares that it does not have, nor expects to have, a beneficial interest in the subject project.

To avoid this advice being used inappropriately it is recommended that you consult with APP before conveying the information to another who may not fully understand the objectives of the report. This report is meant only for the subject site/project and should not be applied to any other.

6. Attachments

Attachment 1	Site Survey and Subdivision Plan
Attachment 2	Development Plan and Figures

ATTACHMENT 1

Attachment 1: Site Survey and Subdivision Plan

Note – Level Datum

Level Datum: AHD
Origin: PM.8580D (RL 2.682 AHD)
Contour Interval: 0.5m

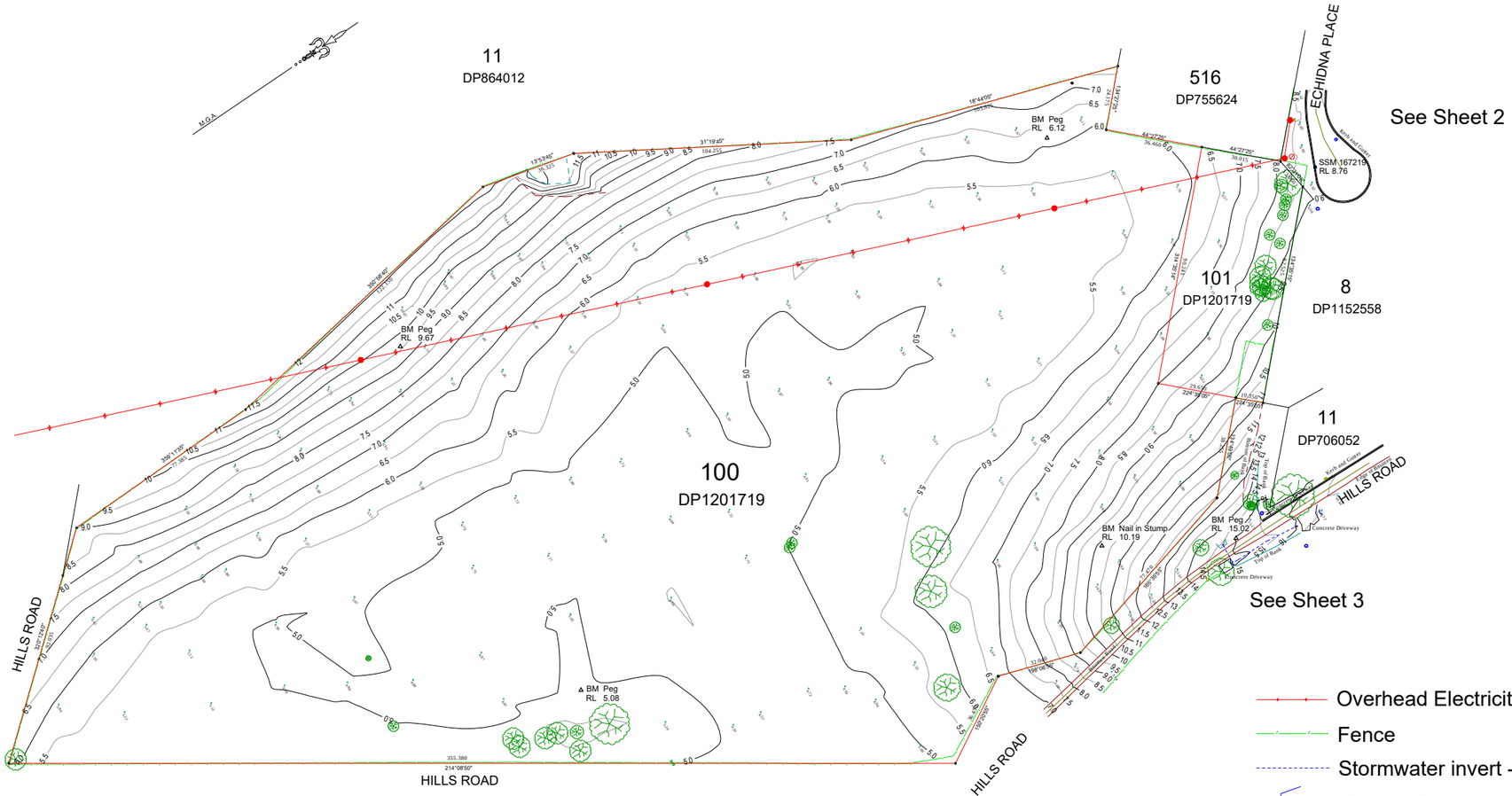
NOTE: For Surveyed Points, refer to Autocad Layers:
"X–MARK" "X–CODE" & "X–RL"

Note – Underground Services

The location of the services shown hereon have been derived from the field survey of visible components. The exact location of these services has not been investigated, and any others may therefore vary and should be verified with the relevant authorities and or the "Dial before you Dig" service prior to any works being undertaken.
Should any work be undertaken on or adjacent to the site to which this survey refers it is the responsibility of the person doing the work to locate any service that may be affected by that work.
Whilst due care was used in compiling this information, no responsibility will be accepted or taken by Ardill Payne & Partners for any inacuracies or omissions shown or not shown hereon.

Note – Survey Intent

This survey was undertaken to locate the visible site features, including the topography & improvements thereon. As such, no boundary fixation was undertaken to accurately determine the parcel boundaries, the available land area or it's dimensions. The dimensions shown have been derived from the relevant registered plans held by the Land Titles Office. No work was undertaken to verify these dimensions. Should accurate boundary locations be required, further survey work would need to be undertaken to accurately locate the boundaries, which may include the registration of a survey redefining the property.



Overhead Electricity
Fence
Stormwater invert - open drain
Stormwater Headwall
Comms Pit
Stay Pole
Power Pole
Stormwater manhole
Sewer manhole
For Tree information refer the the Layer x-CODE

Issue	Date	Amendment	App'd

Client: ALAN CARDY

Project: Proposed Rezoning & Subdivision
Hills Road, Rileys Hill
Lot 100 DP 1201719

Title: CONTOUR & DETAIL SURVEY
Sheet 1 of 3

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Surveyed	BJ /LT	Scale at A1	1:1000
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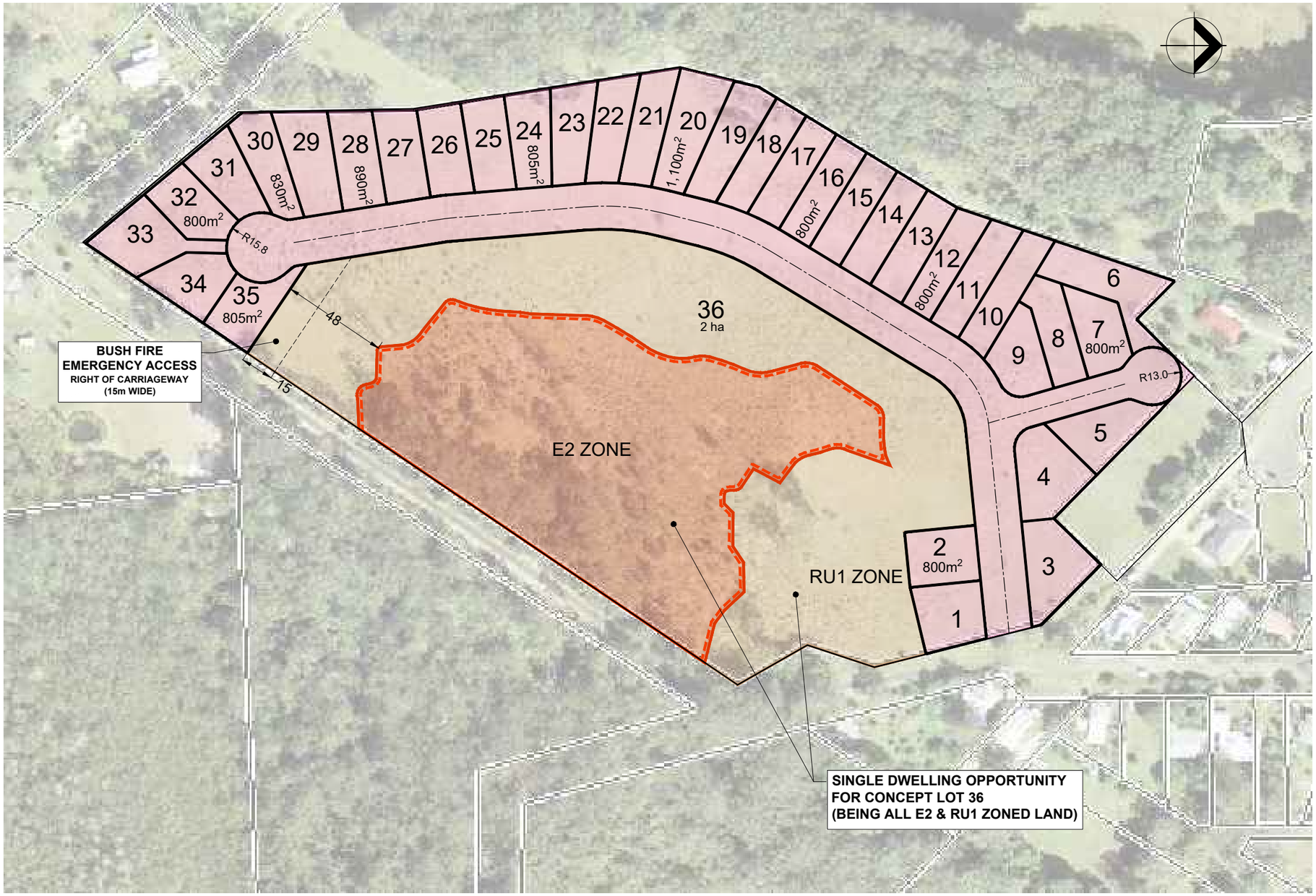
Checked	RJJ	Acad File	8174 DS.DWG
Approved		Ccad File	8174DS.mjo
Job No.	8174	Dwg No.	S01
Date	17/8/16	Issue	



TOTAL LOTS = 36

41,736 m²	RU5 ZONE MIN LOT SIZE 800m²
21,436 m²	RU1 ZONE MIN LOT SIZE 2 ha
19,456 m²	E2 ZONE MIN LOT SIZE 2 ha

This plan is NOT to be used for construction purposes unless it carries the approval stamp of the local authority.

Issue	Date	Description	App'd
P6	02/09/2020	Amended Lot Layout	
P5	15/04/20	Dimensions Amended	
P4	15/04/20	Dimensions Added	
P3	25/02/20	Council Review	
P2	11/02/20	Council Review	
P1	28/05/19	Council Review	

Client: Alan Cardy

Project:
Proposed Rezoning
Lots 100 DP1201719
Hills Road, Rileys Hill

Title: Concept Subdivision Layout Plan

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Approved		Date	APRIL 2019
		Datum	AHD
Job No.	8174	Dwg No.	SP1
		Issue	P6

ATTACHMENT 2

Attachment 2: Development Plan and Figures

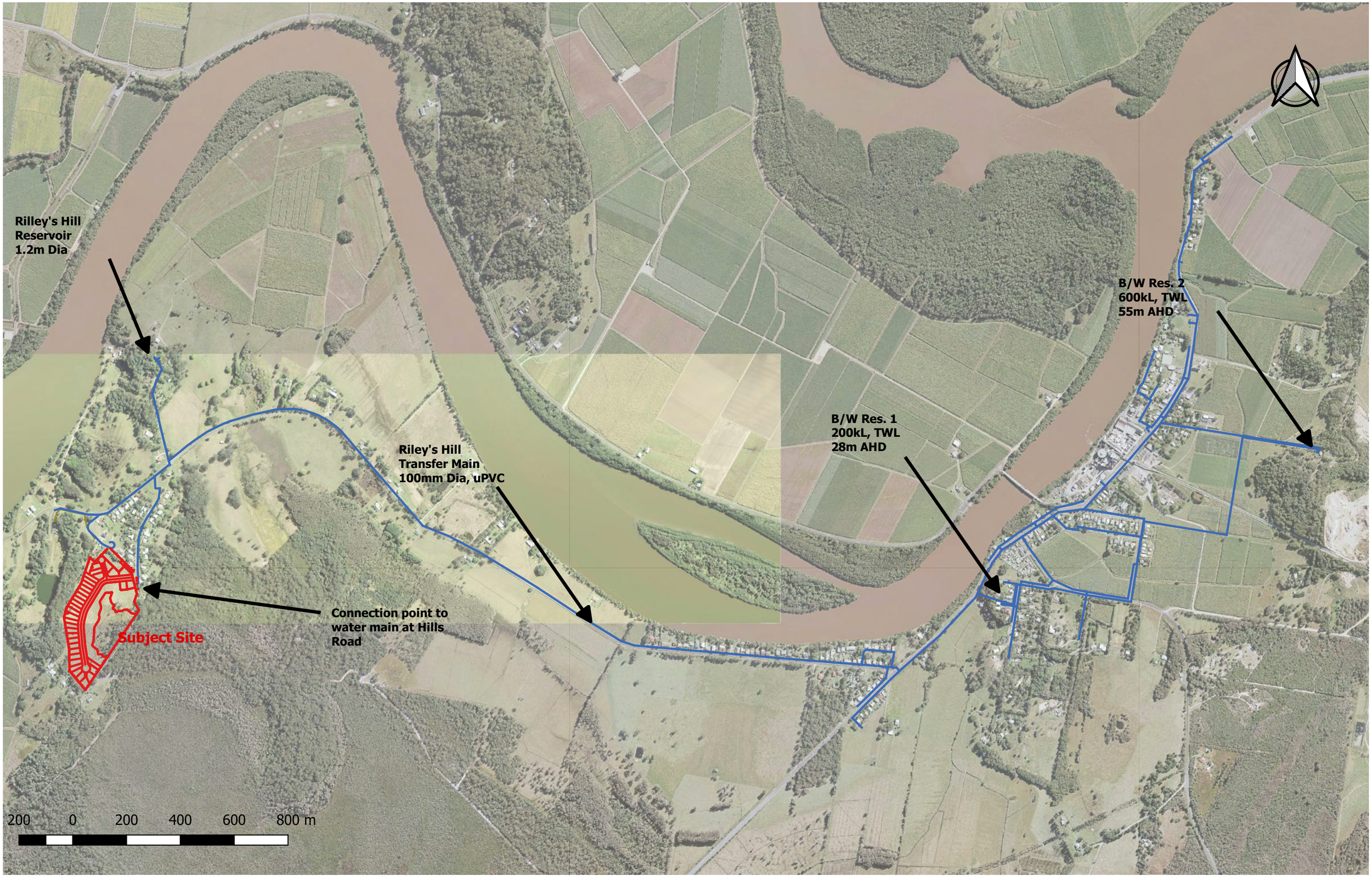

Figure 1: Riley's Hill water supply system

Ardill Payne & PARTNERS

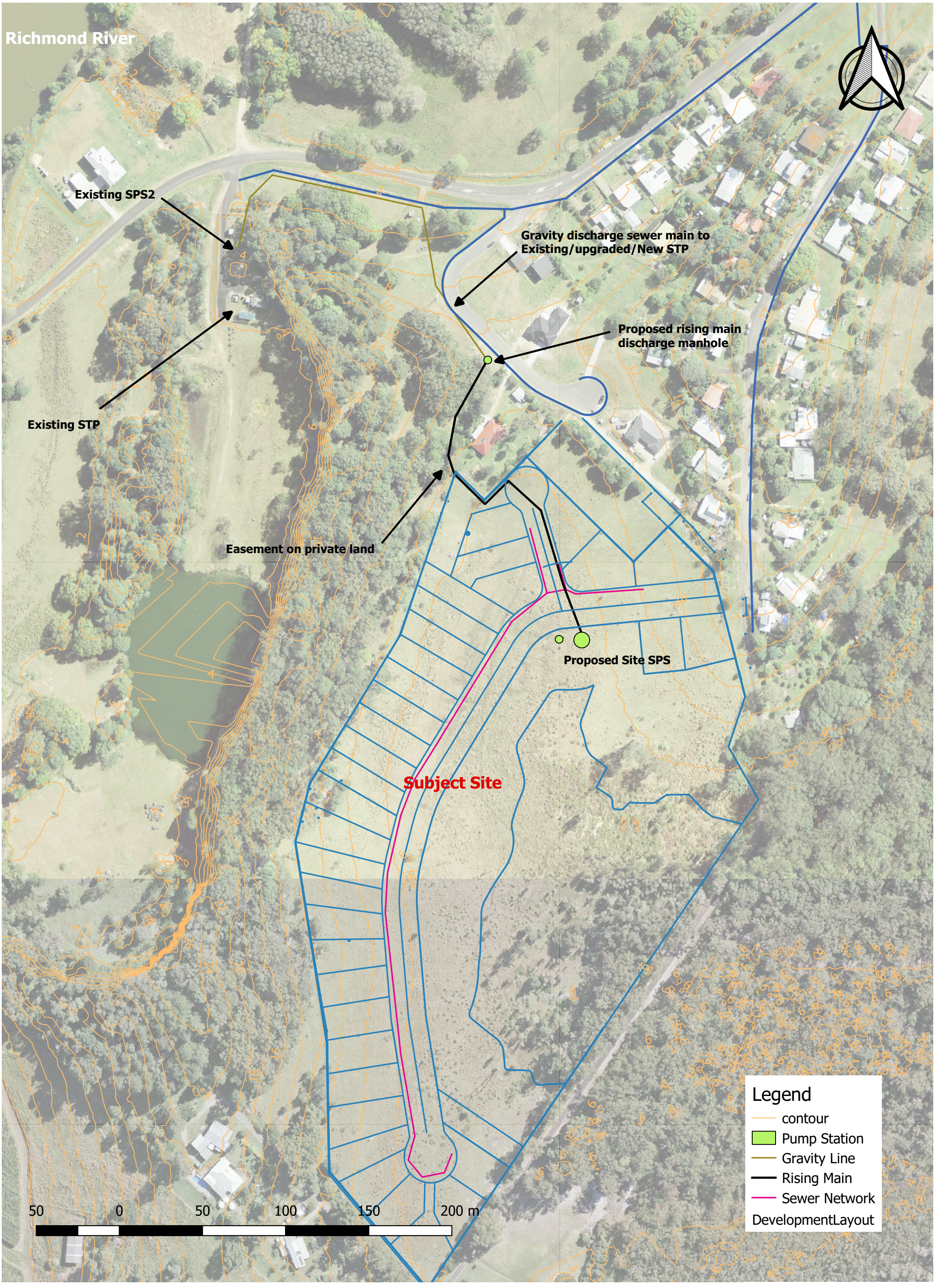

Figure 2: Site Elevations and Hills Road development proposed sewer system

Ardill Payne & PARTNERS

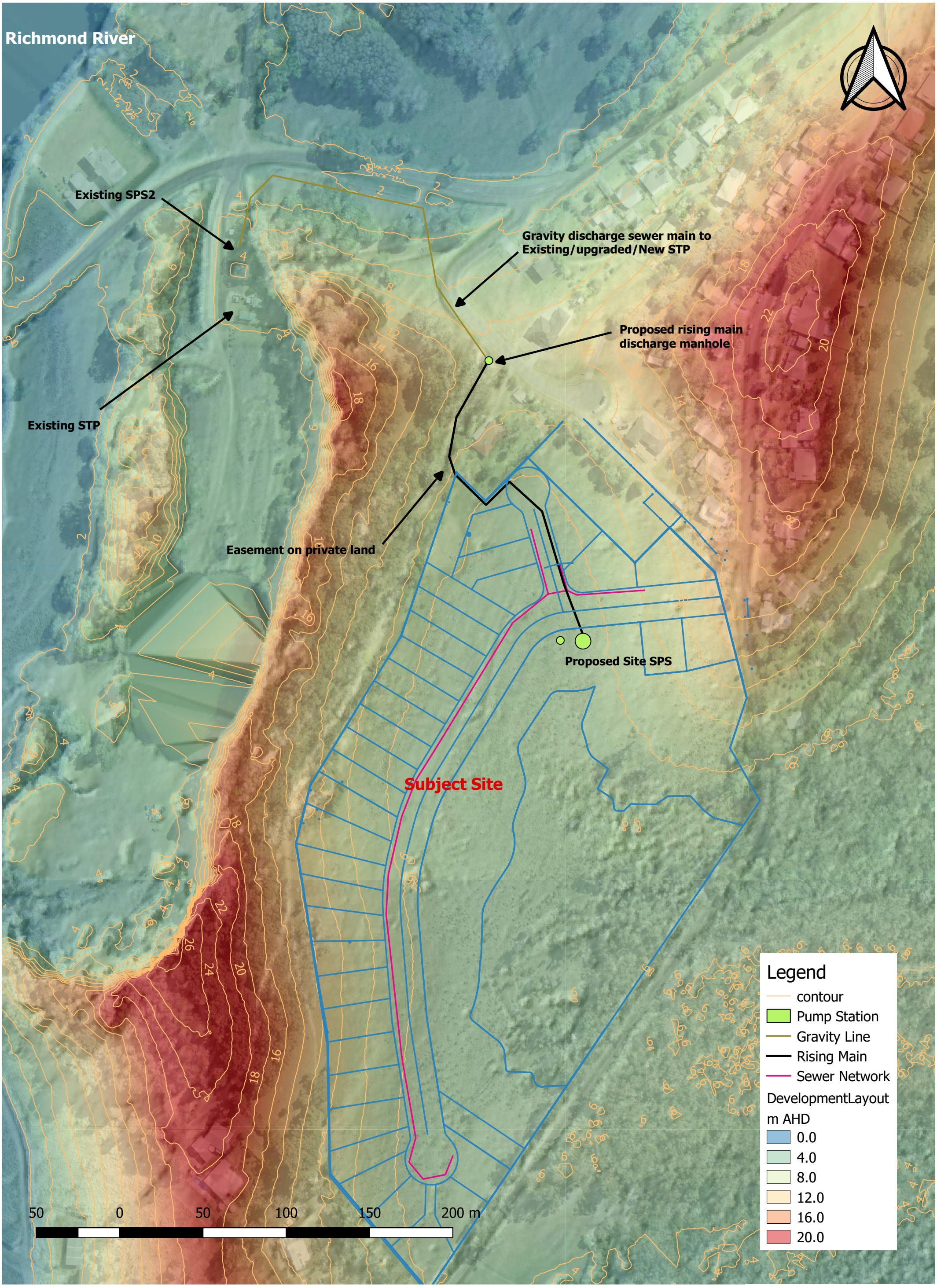

Figure 3: Site Elevations and Hills Road development proposed sewer system

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