



**Premise**

MIRVAC

# **Everleigh Development**

## **WATER SUPPLY NETWORK MODEL INVESTIGATION REPORT**

Report No: MIRSGB/R02003394

Rev: B

28 September 2020

**PLANS AND DOCUMENTS  
referred to in the PDA  
DEVELOPMENT APPROVAL**

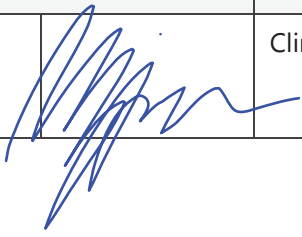
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| Prepared By                   |                                                                                     | Reviewed By                                      |                                                                                      | Authorised By |                                                                                       |
| Thomas Bradshaw<br>RPEQ 14390 |  | Michael Majzner                                  |  | Clint Thorp   |  |

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## **1. INTRODUCTION**

Mirvac engaged Premise to undertake a hydraulic modelling investigation of the internal water supply network for a 3451 Lot Everleigh development located in the suburb of Greenbank, Logan City. The development is located off Teviot Road on land parcels described as 434/RP845844, 9/S312355 and 205/RP845844.

The development forms part of a major urban community which is under the control of Economic Development Queensland (EDQ). The gross area of the site is approximately 481 hectares and is situated in the Greater Flagstone PDA declared under the Economic Development Act 2012.

The intent of this study is to undertake an assessment of the water supply system for the development site to ensure compliance with Logan Water Infrastructure Alliance's (LWIA) Desired Standards of Service (DSS). This report also provides professional engineering advices on relevant servicing requirements for the site as new land stages are progressively released.

## **2. OBJECTIVES**

The objectives of this study are as follows: -

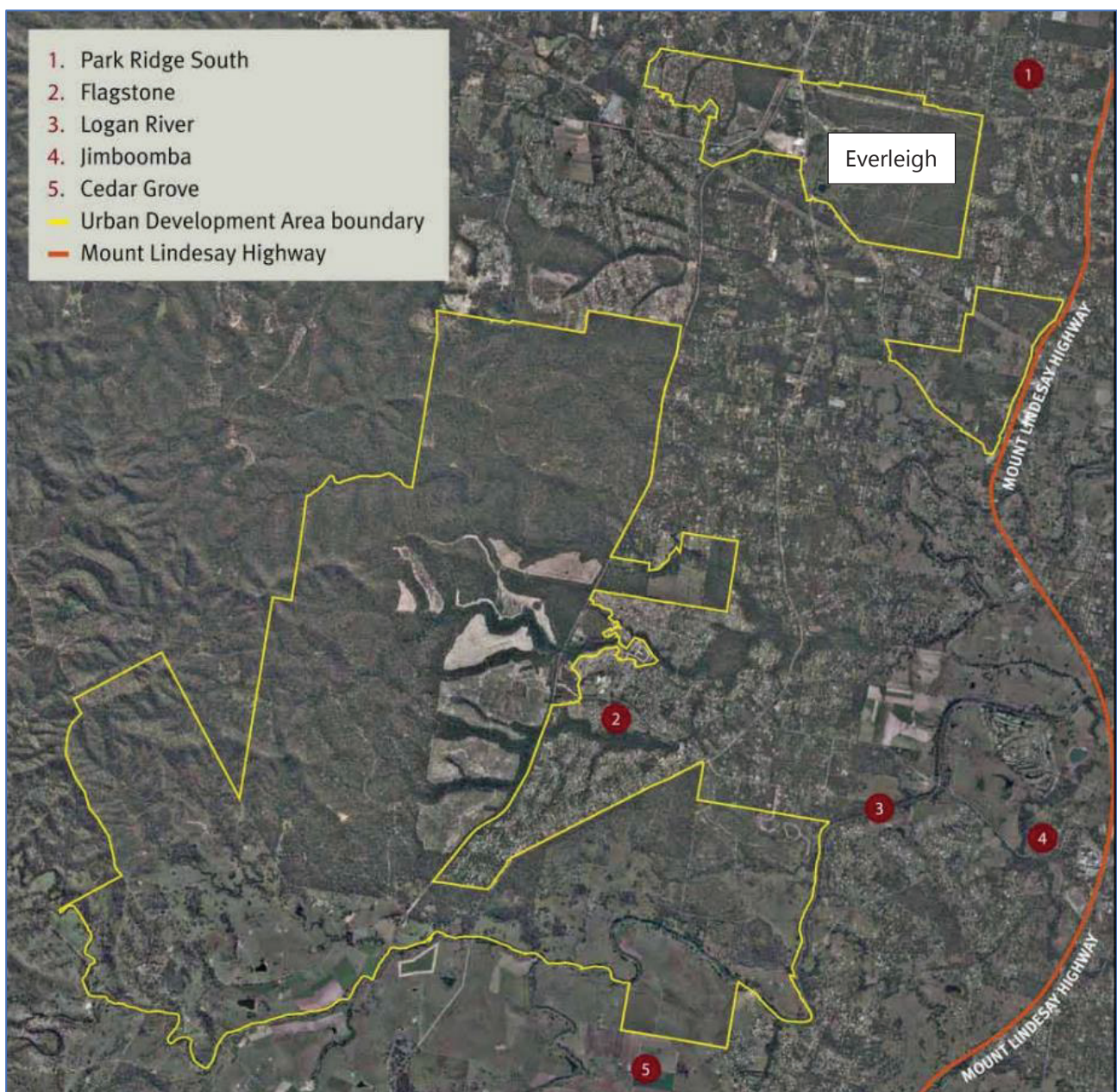
1. Review LWIAs water supply strategy reports prepared for the Greater Flagstone Priority Development Area (PDA) which includes a strategy report for the Greenbank region;
2. Establish an equivalent population estimate (EP) for the development site which includes 3,452 residential allotments, a Neighbourhood Centre, a Primary School and a Regional Sports and Recreation Park;
3. Establish a network model incorporating the as built infrastructure for Precinct 1 and school site, as well as modifications proposed by LWIA in respect to external servicing requirements;
4. Assess and identify the network infrastructure required to service demands attributable to the ultimate development population as well as any interim stages;
5. To ensure that LWIA are made aware of any inherent risks associated with servicing the development;
6. Present all findings and recommendations in a technical investigation report demonstrating that the whole of the development site can be reliably serviced in line with LWIA's Desired Standards of Service (DSS).

All investigations were undertaken in consultation with LWIA's Planning staff to ensure alignment with anticipated future direction and strategy for external infrastructure proposed for the greater Greenbank Region.

### 3. SITE DESCRIPTION

The proposed development site is bounded to the east by Teviot Road and Greenbank Road to the south. There are existing developed lots located on the eastern fringe of development site (these being in the Wearing Park Area). Access to the development site is currently via Teviot Road on the west side. A further (future) access to the site will be provided via Greenbank Road on the southern side once development proceeds in that particular area. A concept plan for the proposed Everleigh Development in the context of the Greater Flagstone PDA is shown indicatively below in Figure 3.1.

**Figure 3.1: Greater Flagstone UDA Context Plan (extract from Greater Flagstone UDA Development Scheme)**



The developable area of the site is estimated to be in the order of 397 hectares and consists of several different land uses, areas and lot yields, all of which are summarised in Table 3.1.

The total residential yield is estimated to be in the order of about 3,451 lots. An indicative lot layout and contour plan of the overall development site is included in Appendix A.

**Table 3.1: Land Uses and Lot Yield**

| Land Use                                                                                      | Area (Ha)  | Approximate Number of Lots |
|-----------------------------------------------------------------------------------------------|------------|----------------------------|
| Residential (including a mixture of Standard Residential and Medium Density Residential Lots) | 240        | 3,451                      |
| Neighbourhood Centre                                                                          | 5          |                            |
| State Primary School                                                                          | 7          |                            |
| Regional Sports and Recreation Park                                                           | 25         |                            |
| <b>Total</b>                                                                                  | <b>397</b> | <b>3,451</b>               |

The elevation of the developable land varies from about RL 30 (Precincts 5, 6 and 7) to RL 73 (Precinct 11 and 12).

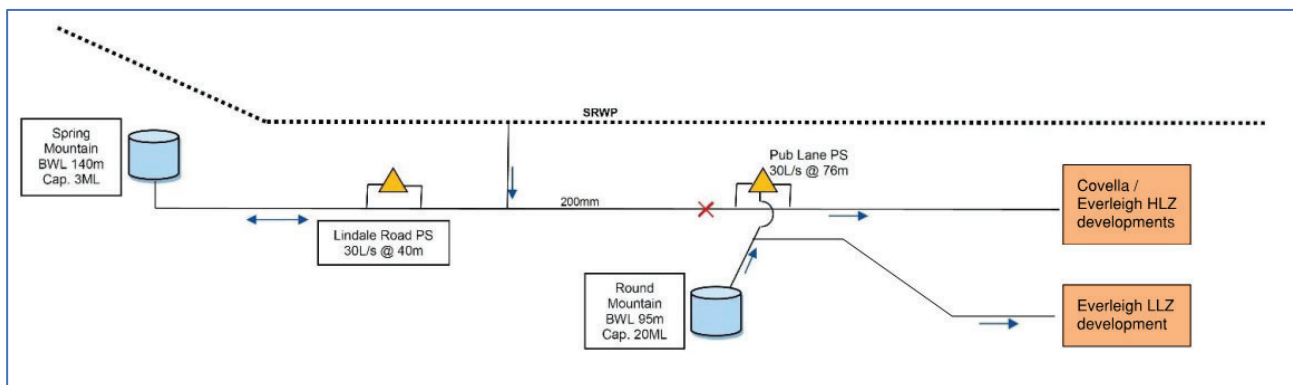
## 4. WATER SUPPLY NETWORK AND PROPOSED SERVICING STRATEGY

Existing developed areas within the Greater Flagstone Region are currently serviced via two main reservoirs, these being as follows: -

- Round Mountain Reservoir (BWL of RL95); and
- Spring Mountain reservoir (BWL 140m).

The above infrastructure is shown indicatively on Figure 4.1.

**Figure 4.1: Schematic representation of LCC servicing strategy (Option 2, LS-021)**



### 4.1 EVERLEIGH DEVELOPMENT AS BUILT AREAS

Mirvac has obtained approval from LCC to proceed with Precinct 1 located on the southern side of Everleigh Drive (which comprises approximately 365 Lots) and the school site and associated infrastructure which is located centrally within the development. At the time of writing this report, individual lots within Precinct 1 were being sold and developed and construction on the bulk earthworks and roadworks for the school site had commenced.

Water supply to Precinct 1 and the school site is currently sourced from the Teviot Road trunk main which under the present distribution strategy is supplied from Spring Mountain Reservoir which has a BWL at RL140. To ensure network pressures are maintained within DSS guidelines, a pressure management device has been installed on the DN250 supply offtake from the existing Teviot Road trunk main.

### 4.2 LWIA PROPOSED SERVICING STRATEGY

The current water supply servicing arrangement supplying new and existing developed areas in the Greenbank region is proposed to be modified. According to LWIA's Planning and Investigation Report for the Greenbank Region (Ref 4), all elevated areas located within the proposed "Everleigh" and the "Covella" development sites will be serviced via a pressure boosted supply from Round Mountain reservoir. The works will be facilitated via the implementation of a second set of pressure boosting pumps in the existing Pub Lane Pump Station.

Developed areas located on the western side of Pub Lane Pump station will be serviced via existing Pub Lane pumps as well as the Lindale Road Pump Station boosting supply into Spring Mountain Reservoir. The regions

located to the west of Pub Lane Pump station are not the subject of this investigation and have not been considered further in this report.

In summary, under the revised servicing strategy, allotments situated on land with elevation less than RL50 will be serviced directly from Round Mountain reservoir via the existing trunk main along Greenbank Road. All elevated allotments (i.e. land parcels situated on land with elevations greater than RL50) will be serviced via the proposed boosted supply arrangement from Pub Lane pump station.

Further information concerning LWIAs proposed servicing strategy for the Greenbank and surrounding areas is provided in the above referenced report. A schematic representation of LWIAs proposed servicing strategy is presented in Figure 4.1.

The proposed Everleigh development will be provided with a network of reticulation mains which will be adequately sized to service the water supply and firefighting needs for all developed lots. All water infrastructure will be designed according to the SEQ Code, LWIA development guidelines and other guidelines and standards referenced herein this report.

The elevated region of the Everleigh network, i.e. all allotments and land parcels situated on elevated land above RL50 are hereafter referred to as the High-Level Zone (HLZ). The region containing allotments and land parcels on land less than RL 50 is referred to as the Low-Level Zone (LLZ).

## 5. EQUIVALENT POPULATION ASSESSMENT

The Everleigh development will comprise a combination of approximately 3,451 residential allotments, a Neighbourhood Centre, a Primary School and a Regional Sports and Recreation Park. The equivalent population corresponding to each land use has been determined based on values provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement for residential land use whereas non-residential uses have been estimated based on values provided in the approved IMP (ref 6).

The network model has been produced based on a development layout that has a density which is considered as the projected upper limit for the site. Adopting the upper limit provides flexibility within the model for protentional future planning layout alterations.

The use conversion factors (EP/unit), as provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement, has been adopted in the network modelling and can be found Table 5.1 below.

**Table 5.1: Demand Limit – Use Conversion Factors (Greater Flagstone PDA Sub-Regional Infrastructure Agreement)**

| USES                                                                                          |                                     |                   | CONVERSION FACTORS                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------|-------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential Uses                                                                              | Pre 1 January 2016                  | detached dwelling | 2.91EP/dwelling                                                                                                                                                                                                                                                |
|                                                                                               |                                     | attached dwelling | 1.83EP/dwelling                                                                                                                                                                                                                                                |
|                                                                                               | On or after 1 January 2016<br>7 Ha  | detached dwelling | 2.8EP/dwelling                                                                                                                                                                                                                                                 |
|                                                                                               |                                     | attached dwelling | 1.78EP/dwelling                                                                                                                                                                                                                                                |
| Retail uses (excluding showrooms)                                                             |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Showrooms                                                                                     |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Commercial uses                                                                               |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Industrial uses                                                                               |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Service, community and other uses (excluding child care centre and educational establishment) |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Child Care Centre                                                                             |                                     |                   | 0.25EP/pupil and staff                                                                                                                                                                                                                                         |
| Educational establishment                                                                     | Primary school                      |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                          |
|                                                                                               | Secondary school                    |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                          |
|                                                                                               | Any other educational establishment |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                          |
| Sport, recreation and entertainment uses                                                      |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Tourism uses                                                                                  |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Rural uses                                                                                    |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |
| Mixed use (being a development combining residential uses and any other use)                  |                                     |                   | The conversion factor for the Residential uses and, if the mixed use includes a Child care centre or Educational establishment, the conversion factor for the Child care centre and Educations establishment (as applicable and as set out above) plus 15EP/ha |
| Any other uses                                                                                |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                        |

A summary of the population estimates for each land use within the development site is presented below in Table 5.2.

**Table 5.2: Equivalent Population (EP) Assessment**

| Land Use                                 | Dwellings    | Unit Rate       | Residential EP | Non-residential EP | Total EP        |
|------------------------------------------|--------------|-----------------|----------------|--------------------|-----------------|
| Residential use – detached dwelling      | 3,159        | 2.8EP/dwelling  | 8,845          | -                  | 8,845           |
| Residential use – detached dwelling      | 674          | 1.78EP/dwelling | 1,199          | -                  | 1,199           |
| Retail uses (excluding show rooms)       | -            | 30EP/ha         | -              | 102                | 102             |
| Showrooms                                | -            | -               | -              | -                  | -               |
| Commercial uses                          | -            | -               | -              | -                  | -               |
| Industrial uses                          | -            | -               | -              | -                  | -               |
| Service, community and other uses        | -            | 30EP/ha         | -              | 96                 | 96              |
| Child care centre                        | -            | -               | -              | -                  | -               |
| Educational establishment                | -            | 1.05EP/ha*      | -              | 368*               | 368*            |
| Sport, recreation and entertainment uses | -            | -               | -              | 26 <sup>#</sup>    | 26 <sup>#</sup> |
| Tourism uses                             | -            | -               | -              | -                  | -               |
| Rural uses                               | -            | -               | -              | -                  | -               |
| Mixed use                                | -            | -               | -              | -                  | -               |
| Any other uses                           | -            | -               | -              | -                  | -               |
| <b>Total</b>                             | <b>3,833</b> |                 | <b>10,045</b>  | <b>592</b>         | <b>10,636</b>   |

\* It was determined that the nominated Greater Flagstone PDA Sub-Regional Infrastructure Agreement value for the school site was too low and hence this higher EP value has been adopted (1.05 EP/Ha).

<sup>#</sup> Value was adopted in accordance with the EDQ approved MWH Water and Sewer IMP.

The approximate fraction split in population between the HLZ and LLZ within the Everleigh development is estimated to be in the order of about 60 / 40 respectively.

Initial staging for the proposed Everleigh development has already commenced with Precinct 1 (which comprises approximately 365 Lots) located on the south side of Everleigh Drive and the Primary School site located on the northern side of Ivory Parkway. Future development will generally proceed in a northerly clockwise direction (away from Everleigh Drive) in line with the staging plan presented in Appendix B.

Based on the approved Water and Sewer Infrastructure Master Plan (ref 6) for Everleigh, the uptake (or sales) of residential allotments in Everleigh is estimated to be in the order of about 18 lots per month or 216 lots per year. Based on these figures, growth in residential and non-residential lots (as well as population) can be calculated, refer Table 5.3 below.

**Table 5.3: Everleigh Development Population Projections**

| Planning Horizon | Residential EP                                                                                                | Non-Residential EP (1)                                                                    | Total           |
|------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------|
| 2020             | 365 detached dwellings<br>@2.8EP/dwelling = 1,022EP                                                           |                                                                                           | 1,022EP         |
| 2025             | 1,333 detached dwellings<br>@2.8EP/dwelling = 3,979EP<br>167 attached dwellings<br>@1.78EP/dwelling = 297EP   | State Primary School (368EP)<br>Neighbourhood centre (198EP)<br>Sport & Recreation (26EP) | 4,868EP         |
| 2030             | 2,378 detached dwellings<br>@2.8EP/dwelling = 6,658EP<br>279 attached dwellings<br>@1.78EP/dwelling = 497EP   | State Primary School (368EP)<br>Neighbourhood centre (198EP)<br>Sport & Recreation (26EP) | 7,747EP         |
| 2035             | 3,159 detached dwellings<br>@2.8EP/dwelling = 8,845EP<br>674 attached dwellings<br>@1.78EP/dwelling = 1,199EP | State Primary School (368EP)<br>Neighbourhood centre (198EP)<br>Sport & Recreation (26EP) | 10,636EP        |
| <b>Ultimate</b>  | <b>10,044EP</b>                                                                                               | <b>592EP</b>                                                                              | <b>10,636EP</b> |

The proposed development layout for Everleigh is subject to change as planning for the development continues to occur. Revision to the configuration and sizing of water mains and related infrastructure may be required if the lot yield or development layout was to change significantly to that assessed herein.

Further to the above, the rate of population growth within the subject region is based on advices of developers and service providers. Projections given herein should be considered as indicative only and be subject to an ongoing review by the developer.

## 6. WATER DEMANDS

### 6.1 Residential and Non-residential water demands

In accordance with LWIAs Desired Standards of Service (DSS) (Ref 1), an average day potable water demand (AD) of 165 L/EP/day has been adopted for this study. In addition to this demand, an “unaccounted for” water allowance of 25 L/EP/day has also been factored into the assessment.

A summary of the demands and peaking factors adopted for this investigation are summarised in Table 6.1.

**Table 6.1: Design Parameters - Water Demands and Modelling Factors**

| Parameter       | Adopted Value |                 |
|-----------------|---------------|-----------------|
|                 | Residential   | Non-Residential |
| AD Demand       | 165 L/EP/day  | 165 L/EP/day    |
| Unaccounted for | 25 L/EP/day   | 25 L/EP/day     |
| MDMM / AD Ratio | 1.3           | 1.2             |
| MD / AD Ratio   | 1.7           | 1.3             |
| PH / AD Ratio   | 3.1           | 2.0             |

AD = Average Day

MDMM = Mean Day Maximum Month

MD = Maximum Day

PH = Peak Hour

Based on the population assessment and demand factors, the equivalent maximum day demand for Everleigh is estimated to be in the order of about 39 L/s excluding irrigation and firefighting demands. Peak hour demands may be as high as 67 L/s. Refer below for LWIA’s requirements relating to firefighting and irrigation demands.

### 6.2 Firefighting

In accordance with LWIA’s DSS, design firefighting flow rates for the likes of residential and commercial development in the Logan Region is 15 L/s (2 hours) and 30 L/s (4 hours) respectively. The minimum network pressure criterion during a firefighting event is 12 metres at the property boundary to the subject site and at any point within the network. Firefighting demands are to be applied to the model simultaneously when background demands are equivalent to two thirds of peak hour (PH).

### 6.3 Irrigation

It is being proposed that parks and general open space within the development site will be irrigated using harvested stormwater as the primary source of supply. Mirvac have advised that when stormwater supply source is unavailable, the potable water network may be needed from time to time to supplement irrigation demands. For this reason, the potable water network will need to be sized to ensure that irrigation demands can be accommodated.

Table 6.2 presents a summary of the likely irrigation areas and corresponding irrigation demands considered for this assessment.

**Table 6.2: Irrigation Demands**

| Area                                | Approx. Area (Ha) | Irrigation Demand (L/s)                         | Irrigation Times (hrs) | Precinct           |
|-------------------------------------|-------------------|-------------------------------------------------|------------------------|--------------------|
| <b>Low Level Zone</b>               |                   |                                                 |                        |                    |
| Major Linear Park 801 (I-01)        | 0.79              | 1.8                                             | 4                      | P1                 |
| Regional Recreation Park 802 (I-02) | 1.52              | 3.5                                             | 4                      | P1                 |
| Neighbourhood Park 803 (I-03)       | 0.50              | 1.2                                             | 4                      | P1                 |
| Regional Recreation Park 804 (I-04) | 1.04              | 2.4                                             | 4                      | Between P1 & P9    |
| Regional Recreation Park 805 (I-05) | 0.54              | 1.2                                             | 4                      | Between P1 and BSF |
| Neighbourhood Park P3 (I-06)        | 0.53              | 1.2                                             | 4                      | P3                 |
| Park P9 (2 areas) (I-10)            | 0.97              | 2.2                                             | 4                      | P9                 |
| Sports and Rec Park                 | 24.6              | 37.9 (reduced by 40% = 21.7 L/s) – Refer note 1 | 6                      | Sport & Rec Park   |
| <b>Elevated Level Zone</b>          |                   |                                                 |                        |                    |
| School (50%)                        | 3.50              | 5.4                                             | 6                      | School             |
| Park P3 (I-07)                      | 0.27              | 0.6                                             | 4                      | P3                 |
| Park P5 (I-08)                      | 0.46              | 1.1                                             | 4                      | P5                 |
| Neighbourhood Park P6 & P8 (I-09)   | 2.34              | 5.4                                             | 4                      | P6                 |
| Park P10 (3 areas) (I-11)           | 0.87              | 2.0                                             | 4                      | P11                |
| Neighbourhood Park P11 (I-12)       | 0.72              | 1.7                                             | 4                      | P11                |
| Park P11 (I-13)                     | 1.27              | 2.9                                             | 4                      | P11                |

1. In the interest of limiting the instantaneous application rate and to avoid oversizing of water mains, the irrigation rate for the Sports and Recreation Park was adjusted to a marginally lower value.

## 7. HYDRAULIC MODELLING

### 7.1 Referenced Standards and Guidelines

Standards, codes and design guidelines considered relevant to this investigation are referenced in Section 10 of this report.

### 7.2 Model Establishment

Below is a summary of the parameters, assumptions and limitations adopted for the purpose of model establishment and analysis.

- The network model was established and assessed using Bentley WaterCAD Connect Series 2 software using the Extended Period Simulation functionality over three (3) consecutive maximum days (MD). It is noted for the purposes of providing modelling files to LCC / LWIA for their review, model output files will be provided directly from Bentley WaterCAD.
- The network model was developed and assessed accordance with the requirements of (in order of precedence):
  - Greater Flagstone PDA Sub-Regional Infrastructure Agreement;
  - LCC's / LWIA's Desired Standards of Service (DSS);
  - SEQ Design & Construction Code
- The external servicing strategy for Everleigh is based on Option #2 outlined in LWIA's Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021 (Revision E.1 dated 05/07/2018), stating that elevated regions will be serviced via a pressure boosted supply from Round Mountain and that non-elevated areas will be supplied via gravity from Round Mountain.
- Confirming that as per the correspondence received from LWIA (refer attached email dated 23/01/2020) a second connection will be provided into the estate off the Teviot Road trunk main into the HLZ. This is currently planned to occur at the intersection of Leanne Court / Teviot Road / Anderson Drive.
- It is assumed that the existing pressure management device (PRV) installed on Everleigh Drive which connects to the 300mm dia Teviot Road trunk main (i.e. to manage pressures within Precinct 1) will remain as the primary point of supply to the Elevated Zone (ELZ) until such time as the future stages are brought online in alignment with the current planned development staging. It is anticipated that an additional PRV will be required off the second connection into the HLZ at the intersection of Leanne Court / Teviot Road / Anderson Drive.
- The whole of site modelling has assumed that all currently designed / constructed water mains in Precinct 1, Ivory Parkway and the School Site will remain and will not be changing – i.e. these being fixed elements in the model.
- Under the ultimate supply strategy for the development, the high-level Pressure Zone (HLZ) is defined as all land situated above RL50 whereas allotments situated on land less than RL50 fall within the Low-level Pressure Zone (LLZ) which is supplied directly from Round Mountain Reservoir;
- The model for Precinct 1 within the Bentley WaterCAD model was established based on As Constructed / design plans.
- The model for future precincts was established based on the internal road network, allotment layout plans and latest master planning advice provided by Mirvac.
- Nodal elevations were based on the most recent whole of site bulk earthworks modelling completed by Premise.

- Boundary Conditions (BCs) were modelled as fixed Hydraulic Grade (HGL) conditions for the respective pressure zones under the ultimate peak hour demand and firefighting conditions (refer LWIA correspondence in Appendix C). A summary of the Boundary Conditions advised by LWIA for the respective pressure zones within the Everleigh Network are as follows.

| Zone                                                          | BC (HGL m) |
|---------------------------------------------------------------|------------|
| LLZ (Greenbank Rd)                                            | 85m        |
| HLZ (Teviot Rd Spring Mountain Supply Zone)                   | 120m       |
| HLZ (Teviot Rd LWIA revised servicing strategy for Greenbank) | 107m       |

- BCs are generally representative of the lowest possible HGL value experienced during peak hour demands. Maximum (off peak) pressures at the external connection locations were not advised by LWIA;
- The boundary between pressure zones is designated within the model via the absence of a pipe link or by inactive pipe topology;
- The following friction factors were adopted for internal reticulation mains within the model.

| Pipe Size     | HW C Factor |
|---------------|-------------|
| < = 150       | 110         |
| 150 to <= 300 | 120         |
| >300 < = 600  | 130         |

- Average Day (AD) demands were applied to the model based on EP determinations, corresponding unit demands and unaccounted for water use defined in Sections 4 and Section 5 of this report;
- Demands were factored by a MD/AD ratio of 1.7 for residential areas and 1.3 for non-residential areas;
- Separate diurnal demand patterns were applied to the model for residential areas and commercial regions with maximum hour (MH) peaking factors of 1.83 (for residential areas) and 1.54 (for commercial areas);
- Firefighting demands were applied to the model based on LWIA DSS requirements;
- Non-essential demands (e.g. irrigation) were applied during off peak periods (e.g. midnight through 4am).
- External water storage upgrades were not assessed. It is assumed that LWIA will examine the requirement for upgrading existing storage reserves to support all approved future development within the region and that is not part of this assessment.
- Minimum pressure and related performance requirements for onsite irrigation appliances were not assessed. In instances whereby an onsite irrigation system requires a minimum pressure and/ or performance requirement over and above what can be provided by the Water Authority (which is what has been allowed for in our modelling), it is assumed that the respective property owner will design their own onsite infrastructure to ensure adequate service is able to be provided.
- In respect to firefighting, AS2419 may necessitate the need for fire hydrant coverage for the likes of a commercial development with a performance capability different (or potentially more onerous) to that required by LCC's / LWIA's Desired Standards of Service (DSS). In the event that an individual property (e.g. School) requires fire hydrant coverage and performance over and above the performance that LWIA can provide and the whole of site water model has allowed for, the property or lease owner will

need to assess and design their own onsite infrastructure to service such firefighting requirements in line with the relevant Australian Standard/s. Design firefighting requirements set down within AS2419 and related Australian Standards have not been assessed nor considered herein this report.

- It is assumed that all risks associated with the external servicing strategy (including provision for alternative supply) for the broader Greenbank area rests with the Water Authority and have not been considered in our whole of site water modelling.

## 7.3 Network Assessment

A hydraulic analysis was undertaken to assess the infrastructure required to service the proposed interim and ultimate stages of the Everleigh Development. A progressive approach was adopted to examine the behaviour and capacity of the network when subject to: -

- Interim "existing" Everleigh development demands (i.e. baseline demands from P1 and the School site);
- Interim "staged" Everleigh development demands (i.e. future demands attributable to P7 through P13); and
- Ultimate development demands (i.e. demands attributable to all precincts).

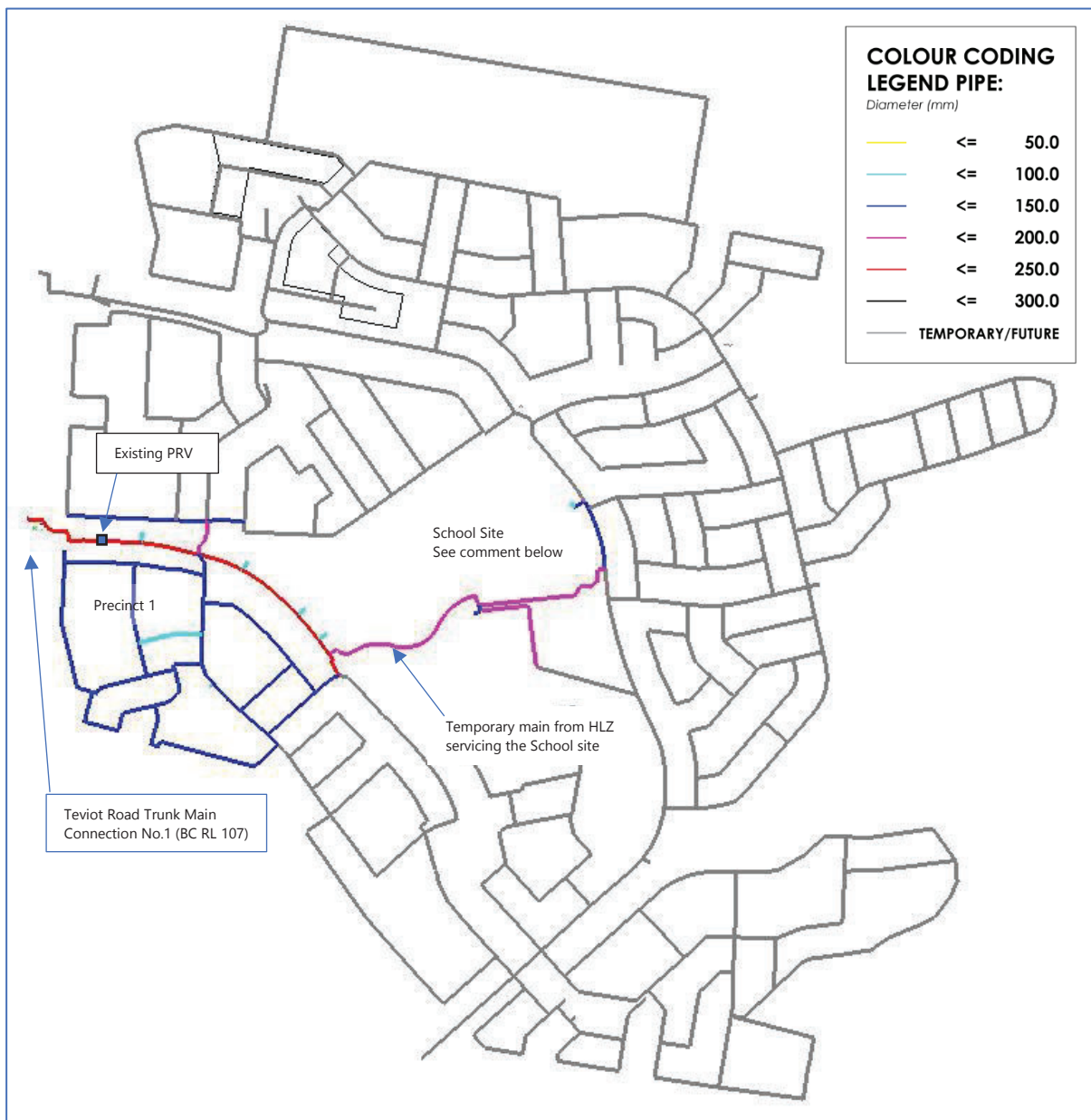
Results from the hydraulic modelling assessment are discussed and summarised in the following Sections. A full outline of the WaterCAD model output results including nodal and pipe flow parameters have been provided in Appendix E.

### 7.3.1 INTERIM DEVELOPMENT STAGE (PRECINCT 1 AND SCHOOL SITE)

Figure 7.1 presents an illustration of the water infrastructure servicing P1 as well as the temporary infrastructure servicing the school site. It should be noted that at the time of writing this report, all water mains indicated in Figure 7.1 had been constructed and were in service.

The water mains indicated in grey represent the water main layout attributable to future Precincts. The same colour coding applies to Figures 7.2 and 7.3.

**Figure 7.1: Interim Development Stage (Precinct 1) and School Site (Existing Built Infrastructure)**



At the time of writing this report, the water mains indicated in Figure 7.1 had already been constructed and were in service.

The school site was being serviced via a temporary DN200 main running in an easterly direction from the HLZ along Ivory Parkway and then along Anderson Drive as indicated by the pink and blue line shown on Figure 7.1. The main from the HLZ servicing the school site is considered temporary only until such time as the LLZ supply main from Round Mountain pressure zone (i.e. connection to Greenbank Road trunk main) is constructed.

Results from the modelling assessment for the existing network servicing Precinct P1 and the School are summarised as follows: -

The assessment revealed that all allotments within Precinct 1 are able to be serviced via a single connection to the Teviot Road trunk main (as indicated in Figure 7.1 above);

The maximum allotment elevation within Precinct 1 is estimated to be about RL 66. To ensure that pressures within P1 and school site comply with LWIA's DSS, it is recommended that the PRV be set to maintain downstream pressures at a value not exceeding RL96. Based on the PRV set point value, pressures were assessed to be about 30m at the highest elevated lot in P1 and about 52m at the school site.

The existing PRV must remain in service until such time as the LLZ supply main from Greenbank Road is constructed and placed into service. Pressure settings for the PRV will most likely need to be continually adjusted as new land stages (at higher elevations) are progressively released.

When the network was subject to firefighting demands, pressures in P1 and in the vicinity of the school site remained well in excess of 12m;

Hydraulic losses and velocities in network pipes during peak hour demands remained well within DSS guidelines.

A summary of the model results for Precinct 1 are presented in Appendix D of this report.

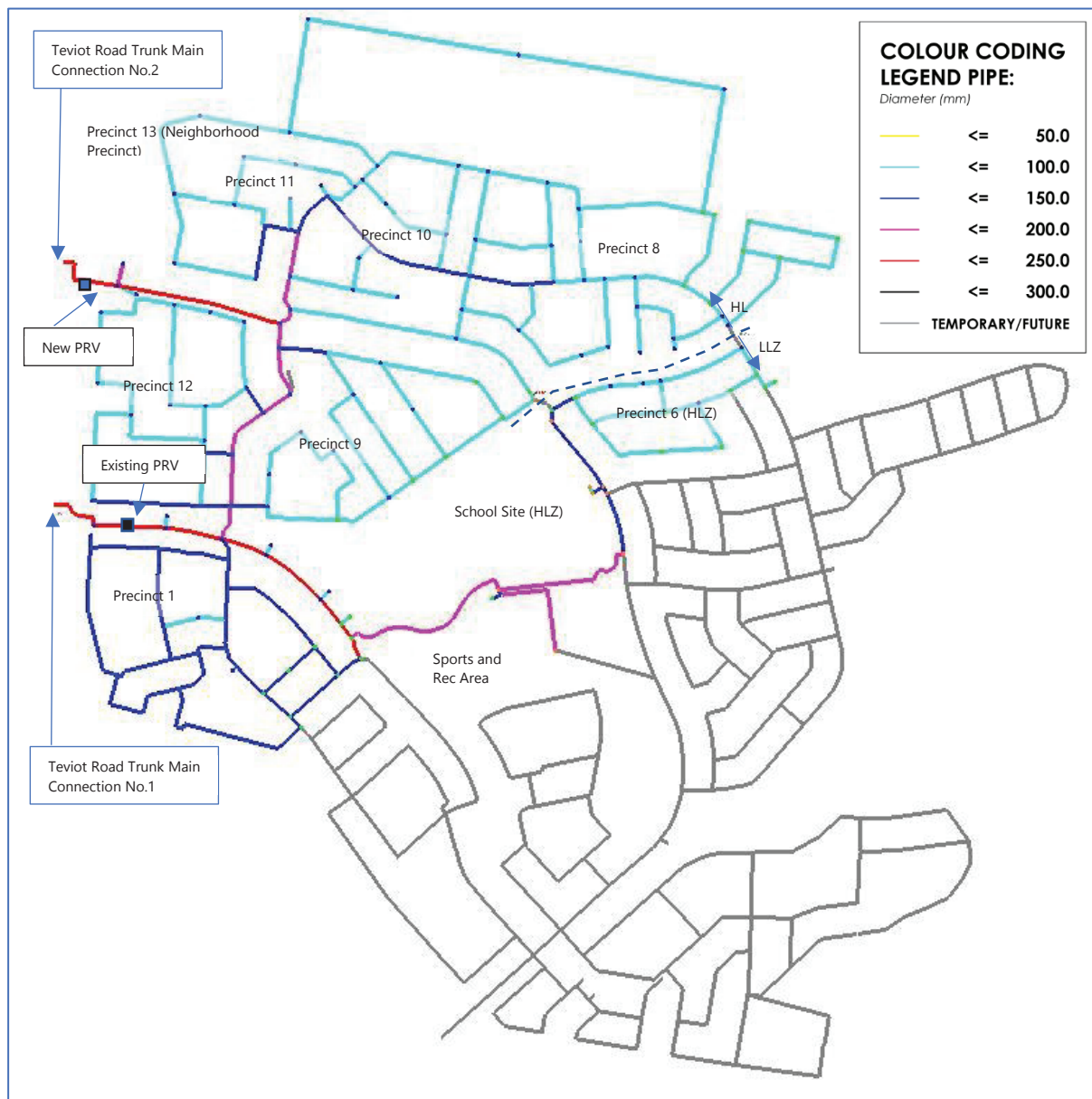
### **7.3.2 INTERIM DEVELOPMENT STAGES (P6 TO P12)**

Mirvac is planning to develop the elevated regions of the Everleigh development initially as shown in the preliminary Precinct Staging Plan presented in Appendix B. The sequence of development will generally proceed in a clockwise direction commencing with P12 located immediately north of Everleigh Drive followed by P9 etc. The intended construction sequence for the various Precincts within the Everleigh Development is as follows.

- Precinct 1 (P1) – HLZ (existing);
- School Site (PS) – HLZ (existing);
- Precinct 12 – HLZ;
- Precinct 9 – HLZ;
- Precinct 13 (Neighbourhood Centre) – HLZ;
- Precinct 10 – HLZ;
- Precinct 11 – HLZ;
- Precinct 8 – HLZ;
- Precinct 6 – LLZ;
- Precinct 7 – LLZ;
- Precinct 5 – LLZ;
- Other Precincts (refer ultimate servicing scenario).

Figure 7.2 presents an illustration of the hydraulic model layout for the above mentioned HLZ Precincts as well as an interim servicing option for P6.

**Figure 7.2: Interim Development Stage (Precincts 1, 6 and 8 to 12) and School Site**



Comments in respect to the water modelling assessment for the above described interim staging plan are as follows.

Demands attributable to the above-mentioned precincts (i.e. all of the HLZ) will not be able to be accommodated via a single connection to the Teviot Road trunk main. The assessment revealed that the second connection to Teviot Road trunk main is required to ensure that network residual pressures (particularly within the developable regions located above RL70) and head loss gradients for internal reticulation are maintained within DSS limitations.

Further to the above, advice received from LWIA suggested that the provision of a single connection only to the HLZ (i.e. from the Teviot Road trunk main) may present a significant risk in that, if the primary point of supply from Teviot Road trunk main was removed from service for maintenance, repair or other reason, continuity of supply to approximately 2,300 customers will be disrupted. Accordingly, for this reason, LWIA

have requested Mirvac to provide a second connection to the HLZ from the existing Teviot Road trunk main to mitigate this risk.

With both external connections in place, all allotments are able to be reliably serviced in line with LWIA's DSS.

It is recommended that the second Teviot Road connection be constructed prior to developing P13 or any land located at RL70 or above.

To ensure compliance with LWIA's DSS in respect to minimum service pressures for Precincts P8 through P12 (with a maximum internal elevation of RL73) it is recommended that the PRV be set at a value to maintain internal network pressures not exceeding RL105. In the event that the School site is to be supplied via the temporary connection from the HLZ, the assessment revealed that pressures in the vicinity of the school site may exceed the maximum target pressure of 55m albeit only marginally. For this reason, it is recommended that Mirvac consult with the site engineers for the school and advise that marginally higher pressures may warrant installation of pressure management devices on the domestic water connections.

According to the preliminary staging plan, following completion of Precinct P8, future land stages (including P7) will generally proceed in a southerly direction towards Greenbank Road. Under the ultimate development scenario, Precinct P7 will be serviced via the LLZ connection from Greenbank Road. To facilitate the preferred interim staging for Precinct P7, two options have been considered, these being as follows: -

- construct a temporary cross connection main from the HLZ; or
- bring forward the capital works (i.e. trunk main from Greenbank Road) in advance of development works for within the LLZ.

Based on a review of the above options, the latter option may result in low pipeline flows and poor turnover in the distribution system (particularly during the early stages of development of P7). Such circumstances may impact on potable water quality (i.e. deterioration in free chlorine residual within the network) at the point of use and is hereby not recommended at this stage.

To avoid the need to manage concerns with water quality, it is recommended that Mirvac seek approval from LWIA to implement a temporary cross connection from the HLZ initially to service the properties in P7 above say RL45 (i.e. before constructing the supply main from Greenbank Road). Pressures in P7 will most likely exceed maximum target pressures if serviced via the HLZ albeit only marginally.

Development of the northern sections of Precinct P7 or a portion thereof should be sufficient to facilitate turn over in the distribution network which in turn will reduce the risk of incurring water quality issues when the trunk main from Greenbank Road is eventually constructed and placed into service.

Results from the hydraulic modelling assessment for Precincts P7 through P12 are summarised as follows. The assessment assumes that Mirvac will proceed with the option to service elevated properties (above RL45 in Precinct P7) via the temporary connection from the HLZ as described.

The assessment revealed that all allotments are able to be reliably serviced via the two independent connections to the external Teviot Road trunk main. With the two connections in service, hydraulic losses and pipe velocities within the HLZ distribution system during PH demands remained well within DSS guidelines and associated DSS parameters.

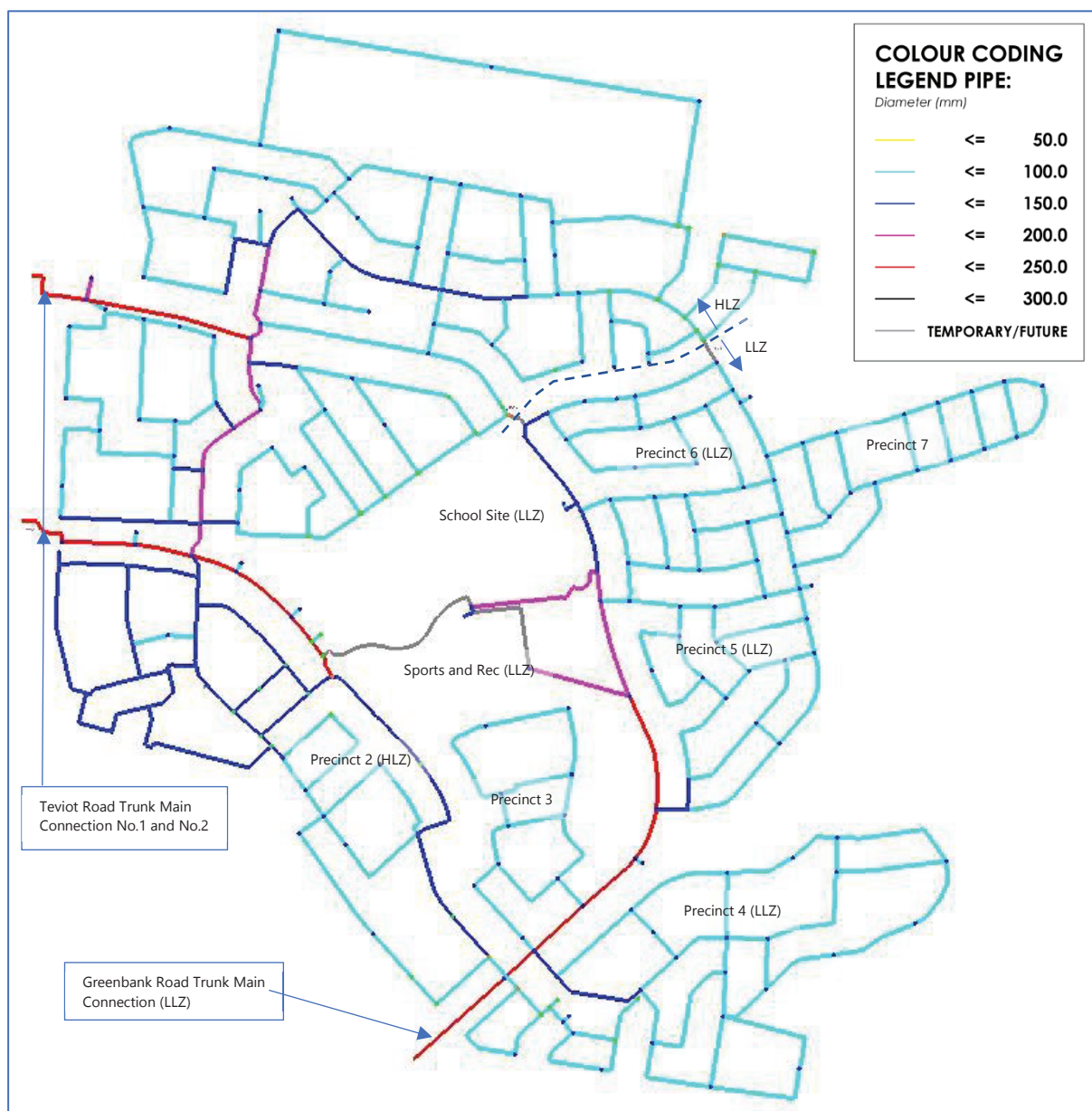
When subject to firefighting loads (i.e. 15 L/s for residential and 30 L/s for commercial), pressures within Precinct 6 and 8 through 12 remained well in excess of 12m.

A summary of the model results for the nominated interim stages of the development are presented in Appendix D of this report.

### 7.3.3 ULTIMATE DEVELOPMENT

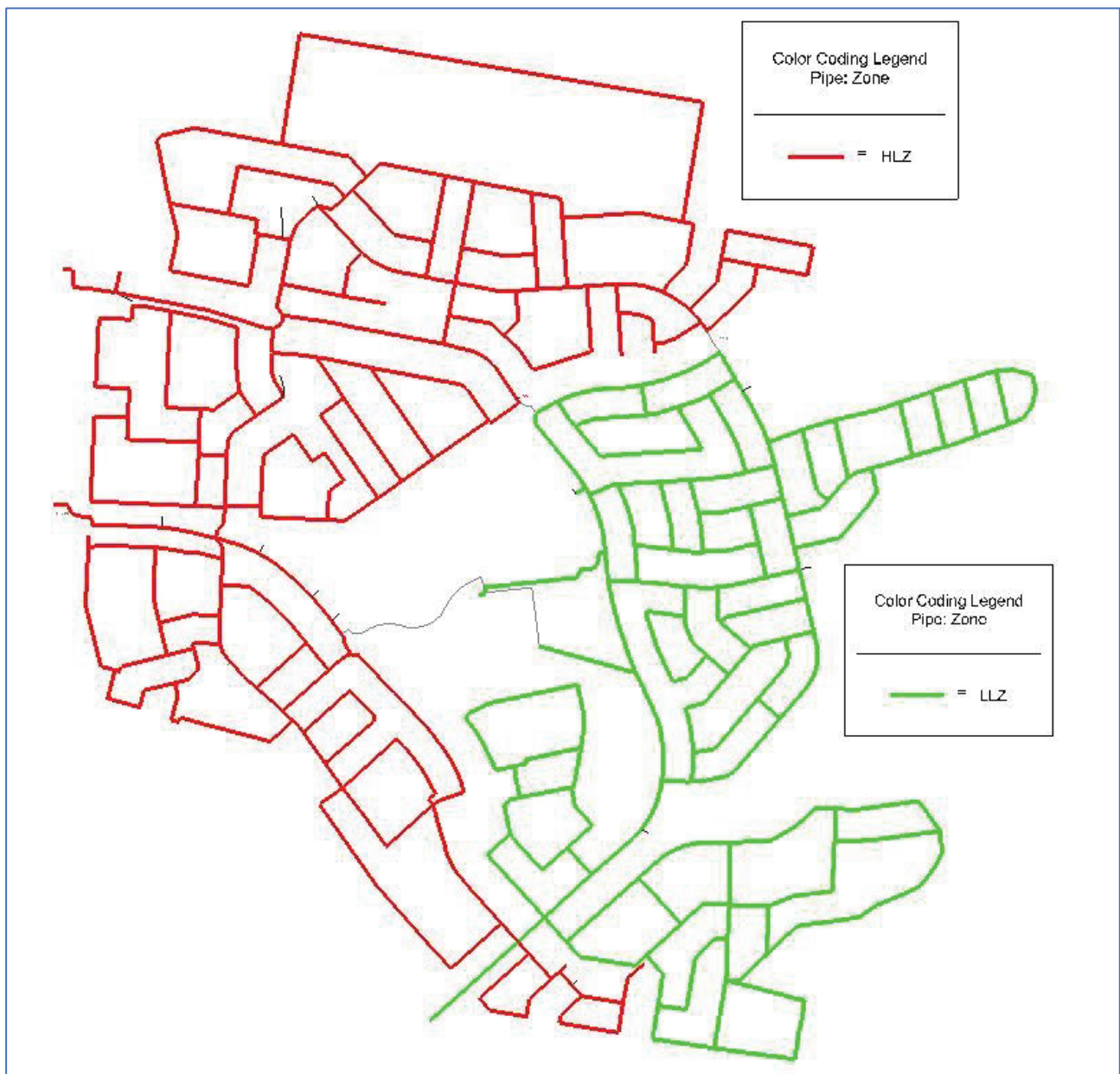
Figure 7.3 presents an illustration of the mains layout and hydraulic model for ultimate development scenario for Eveleigh. The temporary infrastructure provided to service interim stages of the Everleigh development as described in the previous section is assumed to be decommissioned prior to proceeding with developing future precincts under the ultimate scenario.

**Figure 7.3: Ultimate Development**



The extent of the HLZ and LLZ split is as designated in Figure 7.4.

**Figure 7.4: HLZ and LLZ Water Network**



The capacity of the ultimate Everleigh network was examined using the hydraulic model. The assessment work revealed that: -

The proposed network of mains has sufficient capacity to accommodate ultimate demands within both the HLZ and LLZ via the connection points to the external network at Greenbank Road and Teviot Road for the LLZ and HLZ respectively.

Based on the Boundary Condition advice for Greenbank Road trunk main, there is adequate pressure available in the network to service all elevated allotments up to and including RL50.

Ultimately, once all Precincts have been constructed and the external supply strategy has been modified, it is recommended that further hydraulic modelling be undertaken to confirm whether the PRV installed on the

Teviot Road trunk main offtake will be required (as it is understood that the original intent of the PRV assembly was to manage pressures from the Spring Mountain supply zone). If Pub Lane pump station is able to provide reasonably consistent and constant pressures to the serviced areas in the HLZ, there may be grounds to consider decommissioning the PRV as commented on above.

The proposed DN250 water main supplying the low-level zone from Greenbank Road (as well as a minor number of internal network mains in both the HLZ and LLZ) exceeded the recommended guideline value for head loss when irrigation demands were applied albeit only marginally. Having said this, pressures in the HLZ and LLZ remained in excess of the minimum DSS pressure criterion at all times. Accordingly, it is not recommended that internal network mains be upgraded simply for the purposes of irrigation as the potable water network in this instance is not the primary source of supply for the proposed irrigation demands.

Figure 7.3 illustrates the recommended permanent solution for all internal water supply network mains for the Everleigh development.

The output reports for residual pressures and other relevant network characteristics within the HLZ and LLZ under the ultimate development scenario are presented in Appendix D of this report.

## 7.4 OPERATIONAL RISK

Supply to the Everleigh development is proposed to be managed via independent connections from Greenbank Road (for the LLZ) and Teviot Road (for the HLZ).

Based on the assessment undertaken, the network is considered capable of reliably servicing development demands. However, in the event that either external connections are taken out of service for whatever reason, there is a risk that supply to a substantial number of customers will be interrupted. Such events may impose significant undue nuisance to the Service Provider by way of having to address numerous customer complaints and the like in respect to unplanned service outages and the like.

During the course of the investigation, LWIA requested that a secondary connection be provided to the HLZ from Teviot Road trunk main as a means to mitigate the risk.

For the LLZ, only one connection has been proposed (this being from Greenbank Road) to service approximately 1150 allotments as well as the School and Sports and Recreation facility. LWIA was consulted during the course of the project regarding the provision of a single point of supply to the LLZ. The consultation with LWIA also included a discussion in respect to the potential risk associated with the loss of supply if the Greenbank Road service was disrupted for whatever reason.

A subsequent agreement was reached with LWIA, this being to implement provisions for a cross connection with a temporary pressure management device (i.e. between the HLZ and LLZ) to facilitate supply continuity to the LLZ when the Greenbank Road service is disrupted.

Correspondence between Mirvac's appointed consultants and LWIA in respect to this matter is presented in Appendix C of this report.

## 8. SUMMARY

Below is a summary of the conclusions drawn from this report.

1. The current external strategy report relevant to the Everleigh Development is the Logan Water Infrastructure Alliance (LWIA), Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021. All referenced documents are listed in Section 10 of this report.
2. The recommended External Servicing Strategy for the Everleigh development is Option 2 indicating that elevated allotments (i.e. allotments above RL 50) be serviced via the boosted supply arrangement from Round Mountain. The remaining regions within the development site (i.e. LLZ) is proposed to be supplied via gravity from Round Mountain reservoir supply zone;
3. The equivalent population (EP) applicable to the overall Everleigh Development is estimated to be in the order of 10,636 EP (inclusive of residential and non-residential population);
4. A WaterCAD model was developed to model existing as built works (i.e. for P1 and temporary infrastructure to servicing the school site). The model was extended to include future proposed water infrastructure needed to service interim and ultimate demands within the respective precincts for the Everleigh development. Refer Figures 7.1 through 7.3 for the proposed water infrastructure and network layouts.
5. The PRV settings may need to be adjusted as new land stages are progressively released (i.e. to ensure adequate service pressures are delivered to elevated allotments). It is recommended that Mirvac notify the site engineers at school and advise them of the anticipated marginally higher residual pressures (in the short term whilst the site is supplied from the HLZ). Further, the engineers may opt to consider the installation of temporary pressure management devices on their domestic water connection
6. The preferred staging plan for Everleigh is to commence developing Precincts P12, P9, P13, P10, P11, P8 (all of which lie within the HLZ) followed by P6 and the balance of land located on the southern side of P6 in the LLZ. Servicing of Precincts in the HLZ can be achieved by simply extending the network in a northerly direction in line with the main sizes recommended in Section 7.
7. The second Teviot Road connection to the HLZ is required prior to developing P13 or any land located at RL70 or above.
8. The recommended interim servicing requirements for Precinct P6 is to supply all lots above RL45 via a temporary cross connection from the HLZ and seek a relaxation of the DSS maximum target pressure from LWIA until such time as the supply main from Greenbank Road is constructed.
9. The recommended action to service P6 from the HLZ will ultimately reduce the risk associated with incurring adverse water quality issues (i.e. in the event that servicing P6 from Greenbank Road proceeds in advance of development);
10. Operational risk issues associated with the development have been identified as part of the assessment, this being in relation to the provision for alternative servicing requirements for the respective internal pressure zones in the event that external supply was interrupted for any length of time. Provisions to implement a second connection to the HLZ has been stipulated as a requirement by LWIA whereas nothing has been specifically mentioned for the balance of land supplied from Greenbank Road. A recommendation has been made to raise this issue with LWIA for consideration with the intent to de-risk the process leading into the operational works stage for future Precincts.

## **9. RECOMMENDATION**

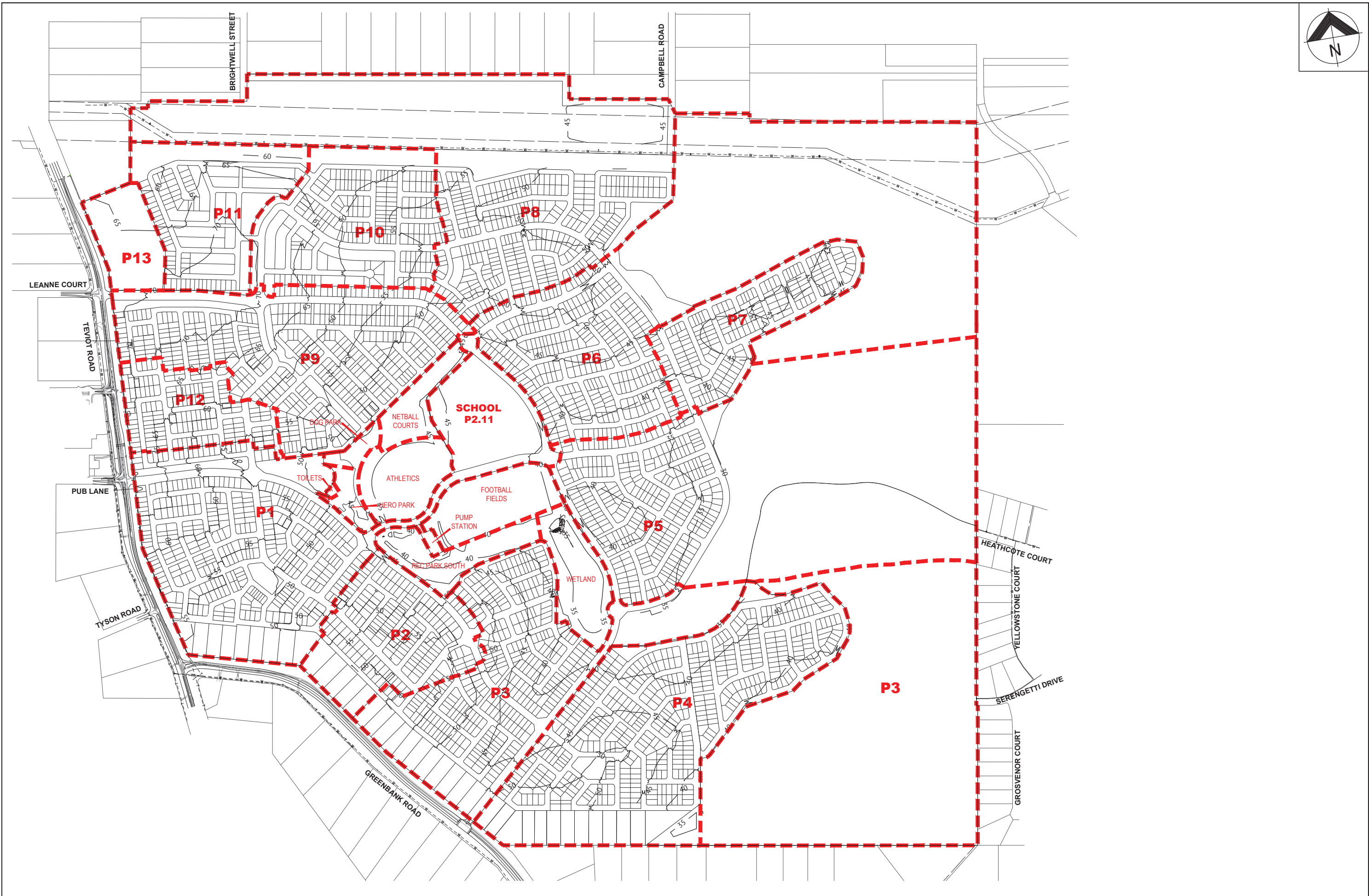
Based on the assessment work undertaken, it is recommended that Mirvac: -

1. adopt this technical report as a basis for model establishment, analysis and direction for the necessary water supply servicing requirements for the proposed Everleigh Development.
2. consult with the site engineers at the school and advise them that the site may experience marginally higher residual pressures whilst the site is supplied temporarily from the HLZ); and
3. consult with LWIA in respect to the operational risks in connection with the temporary supply arrangement to P6 as well as the limited alternative supply options available to the LLZ in the event that supply main from Greenbank Road is removed from service for whatever reason.

## 10. REFERENCES

1. Local Government Infrastructure Plan (LGIP), Summary of Extrinsic Material for the Water and Sewerage Networks (including Appendix 1 Desired Standards of Service for Water Supply Networks);
2. SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code), DESIGN CRITERIA.
3. SEQ Water Service Providers Water Supply Drawings;
4. Logan Water Infrastructure Alliance (LWIA), Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021
5. Logan Water Infrastructure Alliance (LWIA), Planning & Investigation Report, Logan South - Water Servicing Strategy Review Task Number: LS-018
6. MWH REPORT, Teviot Road, Greenbank Development - Water and Sewer Infrastructure Master Plan, Prepared for Mirvac, 29/5/2017
7. Water Supply Code of Australia (WSA03);
8. DNRW Planning Guidelines for Water Supply and Sewerage, 2005 (now referred to as DEWS);
9. Greater Flagstone PDA Sub-Regional Infrastructure Agreement

## A.1 APPENDIX A - PROPOSED DEVELOPMENT LAYOUT AND CONTOUR PLAN



| REVISIONS |     | REVISIONS      |     |
|-----------|-----|----------------|-----|
| DATE      | REV | DESCRIPTION    | APP |
|           | A   | ORIGINAL ISSUE |     |
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LEVEL 1, 100 BRUNSWICK STREET  
PO BOX 361  
FORTITUDE VALLEY, QLD 4006  
PH: (07) 3253 2222  
WEB: [www.premise.com.au](http://www.premise.com.au)

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| DESIGNED                  |  |
| CHECKED                   |  |
| PROJECT MANAGER           |  |
| ENGINEERING CERTIFICATION |  |

SCALE

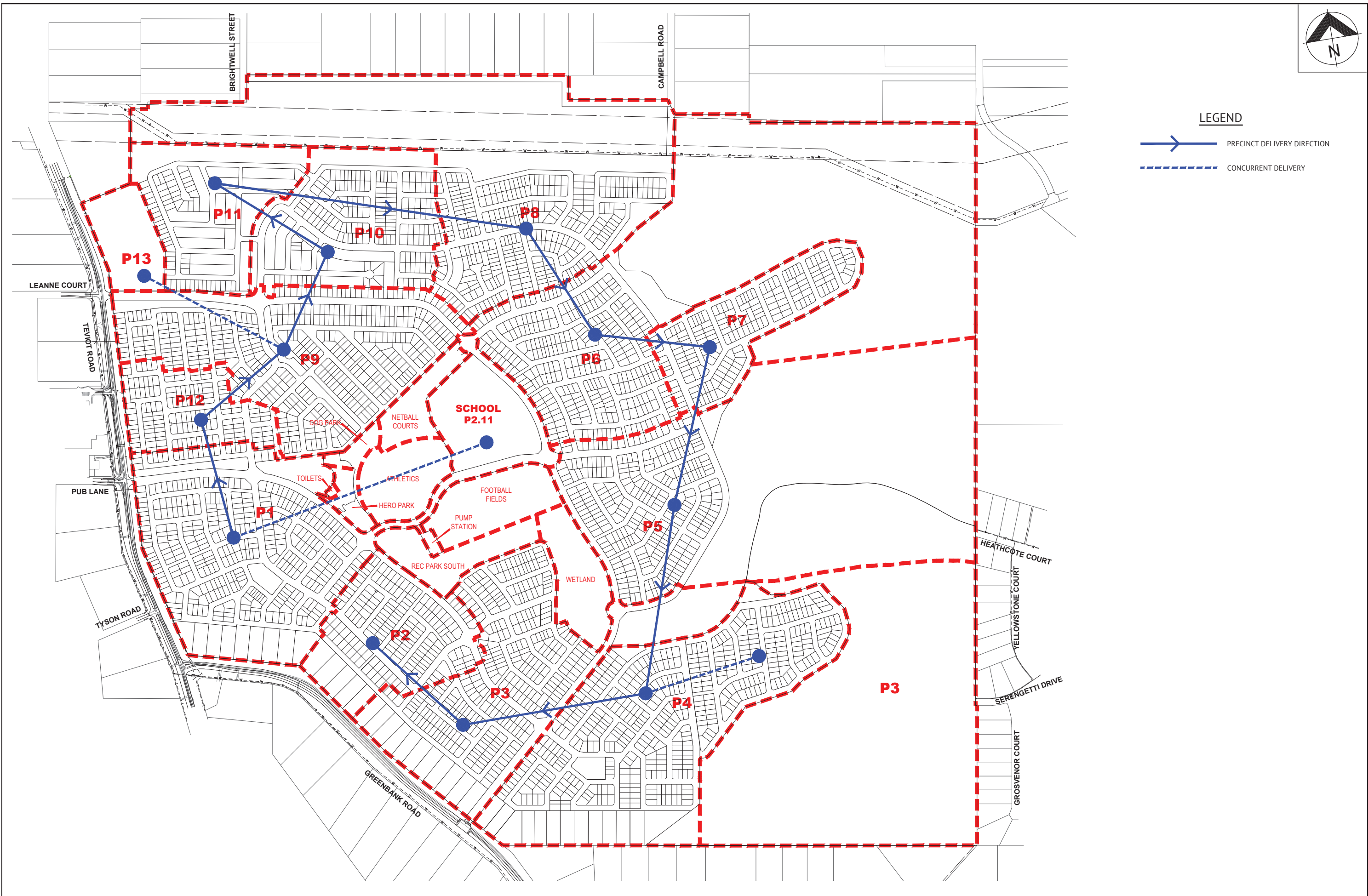


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ORIGINAL SHEET SIZE A1

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|-------------|-----------------------------------------------|
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| PROJECT     | PROPOSED SUBDIVISION                          |
| LOCATION    | GREENBANK ROAD, GREENBANK                     |
| SHEET TITLE | EVERLEIGH DEVELOPMENT LAYOUT AND CONTOUR PLAN |

|              |        |
|--------------|--------|
| JOB CODE     | MIRSGB |
| SHEET NUMBER |        |
| REV          |        |

## A.2 APPENDIX B - EVERLEIGH STAGING PLAN



| A    |     | ORIGINAL ISSUE | REVISIONS |  | REC | APP |
|------|-----|----------------|-----------|--|-----|-----|
| DATE | REV | DESCRIPTION    |           |  |     |     |
|      |     |                |           |  |     |     |
|      |     |                |           |  |     |     |
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LEVEL 1, 100 BRUNSWICK STREET  
PO BOX 361  
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PH: (07) 3253 2222  
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| ENGINEERING CERTIFICATION |  |

SCALE



SCALE 1:5000 (A1)

ORIGINAL SHEET SIZE A1

|             |                                            |
|-------------|--------------------------------------------|
| CLIENT      | MIRVAC                                     |
| PROJECT     | PROPOSED SUBDIVISION                       |
| LOCATION    | GREENBANK ROAD, GREENBANK                  |
| SHEET TITLE | FY21 Q3 OPC REF PLAN - PRECINCT SEQUENCING |

|              |        |
|--------------|--------|
| JOB CODE     | MIRSGB |
| SHEET NUMBER | OPC004 |
| REV          | A      |

## A.3 APPENDIX C – LWIA CORRESPONDENCE (BOUNDARY CONDITION ADVICES)

## Michael Majzner

---

**From:** Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>  
**Sent:** Friday, 5 June 2020 10:42 AM  
**To:** Michael Majzner; tom.bradshaw@bbdengineering.com.au  
**Cc:** WaterDA; Herath, Kumara; Ryan Llewelyn  
**Subject:** RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Michael,

Apologies for the delayed response.

From a planning perspective I don't see any issues with the proposed layout. A second connection to the high level area was driven by the need for contingency to support a large development without storage support. This in turn add some redundancy to the low level area (pressure management concerns aside).

Further future development may also provide a secondary connection to the Munruben network.

Kind Regards

**Jeremy Thomas** | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**  
Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |  
[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)  
[logan.qld.gov.au](http://logan.qld.gov.au) | [facebook.com/logancitycouncil](https://facebook.com/logancitycouncil) | [twitter.com/logancc](https://twitter.com/logancc)

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**From:** Michael Majzner <michael.majzner@premise.com.au>  
**Sent:** Thursday, May 21, 2020 3:45 PM  
**To:** Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>; tom.bradshaw@bbdengineering.com.au  
**Cc:** WaterDA <WaterDA@logan.qld.gov.au>; Herath, Kumara <KumaraHerath@logan.qld.gov.au>; Ryan Llewelyn <ryan.llewelyn@premise.com.au>  
**Subject:** RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Jeremy,

Premise are chasing your input regarding the security of supply for the LLZ within Everleigh (circa 1500 lots).

We currently have a single connection from Greenbank Road trunk water main to service the LLZ within Everleigh. In the case of contingency conditions whereby supply is temporarily lost from the single Greenbank road connection, we have connectivity available to the HLZ (boosted Round Mountain supply) via boundary valves. We have undertaken some modelling for this scenario and depending on the initial pressures setting of the PRV, we're getting pressures up to about 80m max in the network. Mostly during off peak periods.

Figure 7.4: HLZ and LLZ Water Network



To finalise our model and reporting, we are seeking your advice on whether Logan City Council are agreeable to this above outcome?

Let me know if you have any questions on this.

Regards,



**MICHAEL MAJZNER**  
**Senior Designer**

T 07 3253 2222

E [michael.majzner@premise.com.au](mailto:michael.majzner@premise.com.au)

A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



---

**From:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Sent:** Thursday, 23 January 2020 2:12 PM

**To:** [tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)

**Cc:** WaterDA <[WaterDA@logan.qld.gov.au](mailto:WaterDA@logan.qld.gov.au)>; Herath, Kumara <[KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au)>; Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>

**Subject:** RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Quick addendum – given the scale of the HL zone we'd probably be looking for a second connection into the Everleigh HL zone for security of supply if feasible, I think I remember one planned in earlier proposals? Please consider this in your detailed planning.

Kind Regards

**Jeremy Thomas** | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**

Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |

[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)

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---

**From:** Thomas, Jeremy

**Sent:** Thursday, 23 January 2020 2:09 PM

**To:** [tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)

**Cc:** WaterDA <[WaterDA@logan.qld.gov.au](mailto:WaterDA@logan.qld.gov.au)>; Herath, Kumara <[KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au)>; Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>

**Subject:** FW: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Tom,

Please see requested boundary conditions appended below. Noting the significant increase in HL level demands from our initial estimates (which were fairly coarse based on average area densities and contour lines), I can see that the draft network layout between high and low level zones appears to be a prudent approach given the topographical and zoning constraints. The revised servicing strategy for the area can accommodate the increase based on our initial modelling review, depending on actual staging and external developments within the zone this will likely trigger a pump upgrade sooner than we have initially forecast and the scope of the upgrade will also be larger. I don't anticipate either of these factors will be a significant issue from a planning perspective.

Kind Regards

**Jeremy Thomas** | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**

Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |

[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)

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---

**From:** Ryan, Brad <[BradRyan@logan.qld.gov.au](mailto:BradRyan@logan.qld.gov.au)>

**Sent:** Thursday, 23 January 2020 1:32 PM

**To:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Subject:** RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Jeremy,

Boundary conditions using the connection details provided are as follows:

- **Teviot Road Trunk Main Connection - via Pub Lane pump station**  
107m head, 41m pressure, 66m elevation
- **Greenbank Road trunk main connection – via Round Mountain reservoir**  
85m head, 35m pressure, 50m elevation

The proposed distribution of demand has a larger portion on the Pub Lane pump station than current planning has allowed.

Current planning Pub Lane PS ultimate size - 45L/s @ 18m.

Proposed demand distribution Pub Lane PS size – 80 L/s @25m.

Thanks, Brad Ryan.

---

**From:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Sent:** Thursday, 23 January 2020 9:56 AM

**To:** Ryan, Brad <[BradRyan@logan.qld.gov.au](mailto:BradRyan@logan.qld.gov.au)>

**Subject:** FW: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Ok cleared that up – Ultimate boundary conditions for the two points please

Kind Regards

**Jeremy Thomas** | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**

Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |

[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)

[logan.qld.gov.au](http://logan.qld.gov.au) | [facebook.com/logancitycouncil](https://facebook.com/logancitycouncil) | [twitter.com/logancc](https://twitter.com/logancc)

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---

**From:** Tom Bradshaw <[tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)>

**Sent:** Thursday, 23 January 2020 8:14 AM

**To:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Cc:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>

**Subject:** RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Jeremy – I have revised the BC request to only request the BCs that will most likely apply to ultimate case for Everleigh and the proposed trunk main connection locations. Please see below in red, this should qualify matters.

BC Request 1 Teviot Road Trunk Main Connection (HLZ)

PH (1900 hr) – 45 Ls (**Correct - See attached**)

FF – 51 L/s (at 2/3 MH) (**Correct - see attached**)

Irrigation Demand – ~~71 L/s (4am off peak)~~. **This appears to be a new requirement and could be problematic with an anticipated off-peak supply via the Grid required to support Beaudesert planned. With drought conditions prevailing there may also be issues with this volume of potable water for irrigation purposes.** ~~Re the irrigation flows, disregard. This BC was requested primarily as a sensitivity assessment off the trunk main. Depending on irrigation settings there maybe a requirement to increase flows for shorter period.~~

BC Request 2 Greenbank Road trunk main connection (LLZ)

PH – 26 L/s (correct – see attached)

~~FF – 70 L/s (at 2/3 MH)~~ **This appears high based on the above PH flow, what fire flow demand has been applied here?** ~~Reduced to 51 L/s – see attached. Fire fighting settings in model corrected to reflect LWIA requirements.~~

Irrigation demand (including portion of residential) – ~~65 L/s (4am off peak)~~. ~~Disregard – see above.~~

---

**From:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Sent:** Wednesday, 22 January 2020 2:29 PM

**To:** Tom Bradshaw <[tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)>

**Cc:** Herath, Kumara <[KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au)>; WaterDA <[WaterDA@logan.qld.gov.au](mailto:WaterDA@logan.qld.gov.au)>; Ryan, Brad <[BradRyan@logan.qld.gov.au](mailto:BradRyan@logan.qld.gov.au)>

**Subject:** RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Tom,

Can you confirm the Planning report referenced (LS-021?). I think there probably more than a little ambiguity within the context of the supply strategy and sources. The Whole Logan South Water Supply Area is serviced by Round Mountain and large areas are boosted.

The initial and existing Everleigh connection is serviced by the Spring Mountain reservoir / Pub Lane Pump Station (ex. Round Mountain), when the current pump capacity is reached (or potentially prior to address WQ challenges) the zone will be split with Pub Lane no longer supplying Spring Mountain reservoir and transitioning into a booster

supply from Round Mountain servicing elevated areas including Everleigh (>55m). Elevation lower than 55m are anticipated to be serviced directly off Round Mountain gravity.

We'll provide updated boundary conditions based on the latest model shortly. However, can you confirm the demands indicated?

BC Request 1 Teviot Road Trunk Main Connection (HLZ)

PH (1900 hr) – 45 L/s

FF – 51 L/s (at 2/3 MH)

Irrig. Demand (including portion of residential) – 71 L/s (4am off peak) **This appears to be a new requirement and could be problematic with an anticipated off-peak supply via the Grid required to support Beaudesert planned. With drought conditions prevailing there may also be issues with this volume of potable water for irrigation purposes.**

BC Request 2 Greenbank Road trunk main connection (LLZ)

PH – 26 L/s

FF - 70 L/s (at 2/3 MH) **This appears high based on the above PH flow, what fire flow demand has been applied here?**

Irrig demand (including portion of residential) – 65 L/s (4am off peak). **As above.**

Kind Regards

**Jeremy Thomas** | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**

Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |

[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)

[logan.qld.gov.au](http://logan.qld.gov.au) | [facebook.com/logancitycouncil](https://facebook.com/logancitycouncil) | [twitter.com/logancc](https://twitter.com/logancc)

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**From:** Herath, Kumara <[KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au)>

**Sent:** Monday, 20 January 2020 8:37 AM

**To:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Cc:** WaterDA <[WaterDA@logan.qld.gov.au](mailto:WaterDA@logan.qld.gov.au)>

**Subject:** FW: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Good Morning Jeremy

Please see the e mail below from Thomas from bbd Water Engineering, he has been engaged in water planning works for Everleigh by the developer.

Can you please respond to him ( cc to me as well ), I also would like to request for a plan showing the service strategy for the area.

Regards

**Kumara Herath** | Water Development Services Engineer | Water Infrastructure Branch | **Logan City Council**

Phone: 07 3412 4728 | PO Box 3226 Logan City DC Qld 4114 | [kumaraherath@logan.qld.gov.au](mailto:kumaraherath@logan.qld.gov.au)

[www.logan.qld.gov.au](http://www.logan.qld.gov.au) | [facebook.com/logancitycouncil](https://facebook.com/logancitycouncil) | [twitter.com/logancc](https://twitter.com/logancc)

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**From:** Tom Bradshaw [[mailto: tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)]

**Sent:** Tuesday, 14 January 2020 9:59 AM

**To:** WaterDA <[WaterDA@logan.qld.gov.au](mailto:WaterDA@logan.qld.gov.au)>

**Cc:** Herath, Kumara <[KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au)>; Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>; Michael Majzner <[michael.majzner@premise.com.au](mailto:michael.majzner@premise.com.au)>

**Subject:** WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Kumara, Thanks very much for your time regarding Everleigh yesterday, please find below and attached our request for boundary condition assessment for Everleigh development in Greenbank. 2 BCs are required, one for the proposed HLZ and the other for the LLZ, further information and background is provided below.

In accordance with LWIAs Planning & Investigation Report outlining the Water Servicing Strategy for Greenbank and we note that LWIA are proposing to source water for the development using only Round Mountain supply (ie option 2). We understand from the report conclusions, that supply to the elevated regions will now be via boosted supply from Round Mountain supply zone whereas low lying areas will continue to be serviced via gravity supply from Round Mountain. This strategy is in contrast to the previous adopted servicing strategy for the respective areas and according we are seeking updates on boundary condition advices at the proposed connection points to existing trunk services in Teviot Road (for ELZ) and Greenbank Road (for LLZ) as per the attached diagram. Trust attached is legible. If not, please give me a call to clarify.

Without going into too much details in regards to background demands, the attached is a representation of the likely max demands for the development in both the immediate instance and long term planning scenario. All demands include the relevant portion of irrigation, PH and fire (commercial based for school and rec parks).

BC Request 1 Teviot Road Trunk Main Connection (HLZ)

PH (1900 hr) – 45 Ls

FF – 51 L/s (at 2/3 MH)

Irrig. Demand (including portion of residential) – 71 L/s (4am off peak)

BC Request 2 Greenbank Road trunk main connection (LLZ)

PH – 26 L/s

FF - 70 L/s (at 2/3 MH)

Irrig demand (including portion of residential) – 65 L/s (4am off peak)

Let me know if you require further clarification.

Kind Regards

**Thomas Bradshaw**

Principal Water and Utilities Engineer, North Queensland  
BE Hons, CPEng, RPEQ, NER, MIEAust



**M:** 0407 139 238 **E:** [tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)

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## A.4 APPENDIX D – LWIA, LCC WDS, & EDQ CONFIRMATION OF MODELLING PARAMETERS

## Michael Majzner

---

**From:** Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>  
**Sent:** Friday, 20 March 2020 6:35 AM  
**To:** Joshua Stone  
**Cc:** Clint Thorp; Mark Clancy (mark.clancy@mirvac.com); jason.augustine@mirvac.com; Michael Majzner; Tom Bradshaw; Thomas, Jeremy; KumaraHerath@logan.qld.gov.au; WaterDA  
**Subject:** RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Hi Josh,

EDQ agrees with the assumptions, parameters and limitations for the updated water network model as identified below.

Cheers,



**Queensland  
Government**

Marco Bonotto  
Principal Engineer – Technical Services  
**Economic Development Queensland**  
Department of State Development,  
Manufacturing, Infrastructure and Planning  
P 07 3452 7696 | E [marco.bonotto@dsdmip.qld.gov.au](mailto:marco.bonotto@dsdmip.qld.gov.au)  
Level 14, 1 William Street, Brisbane QLD 4000  
GPO Box 2202, Brisbane QLD 4001  
[www.dsdmip.qld.gov.au](http://www.dsdmip.qld.gov.au)

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---

**From:** Joshua Stone <joshua.stone@premise.com.au>  
**Sent:** Thursday, 19 March 2020 3:15 PM  
**To:** Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>  
**Cc:** Clint Thorp <clint.thorp@premise.com.au>; Mark Clancy (mark.clancy@mirvac.com) <mark.clancy@mirvac.com>; jason.augustine@mirvac.com; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>; Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>; KumaraHerath@logan.qld.gov.au; WaterDA <WaterDA@logan.qld.gov.au>  
**Subject:** RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Thanks Marco.

Please refer attached email correspondence confirming that LWIA and LCC WDS are in agreeance with the below modelling parameters and modelling assumptions.

Can you please now provide EDQ endorsement via return email that we may now proceed with the finalisation of our WOS water model for Everleigh.



**JOSHUA STONE**  
**Senior Project Manager**

**T** 07 3253 2222 | **M** 0408 063 479

**E** [joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)

**A** Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



---

**From:** Marco Bonotto <[Marco.Bonotto@dsdmip.qld.gov.au](mailto:Marco.Bonotto@dsdmip.qld.gov.au)>

**Sent:** Tuesday, 17 March 2020 8:45 AM

**To:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>

**Cc:** Clint Thorp <[clint.thorp@premise.com.au](mailto:clint.thorp@premise.com.au)>; Mark Clancy ([mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)) <[mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)>

**Subject:** RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Josh,

Considering the extensive consultation that has already been occurred between yourself and Logan Water in this regard, I recommend you are liaising directly with them in relation to the acceptance assumptions, parameters and limitations for the water network model you are working at.

Please let me know if you have any issue with that.

Cheers,



Marco Bonotto  
Principal Engineer – Technical Services  
**Economic Development Queensland**  
Department of State Development,  
Manufacturing, Infrastructure and Planning

P 07 3452 7696 | E [marco.bonotto@dsdmip.qld.gov.au](mailto:marco.bonotto@dsdmip.qld.gov.au)  
Level 14, 1 William Street, Brisbane QLD 4000  
GPO Box 2202, Brisbane QLD 4001  
[www.dsdmip.qld.gov.au](http://www.dsdmip.qld.gov.au)

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---

**From:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>

**Sent:** Monday, 16 March 2020 10:11 AM

**To:** [KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au); Marco Bonotto <[Marco.Bonotto@dsdmip.qld.gov.au](mailto:Marco.Bonotto@dsdmip.qld.gov.au)>; Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>

**Cc:** Mark Clancy ([mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)) <[mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)>; [jason.augustine@mirvac.com](mailto:jason.augustine@mirvac.com); Clint Thorp <[clint.thorp@premise.com.au](mailto:clint.thorp@premise.com.au)>; Madeleine Hartley-Davis <[madeleine.hartleydavis@premise.com.au](mailto:madeleine.hartleydavis@premise.com.au)>; Michael Majzner <[michael.majzner@premise.com.au](mailto:michael.majzner@premise.com.au)>; Tom Bradshaw <[tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)>

**Subject:** RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Kumara / Jeremy / Marco,

Just following up on my below communication.

We were hoping to have a response from yourselves by last Friday. Are you able to come back to me with when we can expect your response as we are keen to avoid any program delays.

Thanks gents. Look forward to hearing from you.



**JOSHUA STONE**  
**Senior Project Manager**

**T** 07 3253 2222 | **M** 0408 063 479  
**E** [joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)  
**A** Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



---

**From:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>

**Sent:** Thursday, 5 March 2020 11:56 AM

**To:** [KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au); Jeremy Thomas <[jeremy.thomas@loganwia.com.au](mailto:jeremy.thomas@loganwia.com.au)>; Marco Bonotto <[Marco.Bonotto@dsdmip.qld.gov.au](mailto:Marco.Bonotto@dsdmip.qld.gov.au)>

**Cc:** Mark Clancy (<[mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)> <[mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)>; [jason.augustine@mirvac.com](mailto:jason.augustine@mirvac.com); Clint Thorp <[clint.thorp@premise.com.au](mailto:clint.thorp@premise.com.au)>; Madeleine Hartley-Davis <[madeleine.hartleydavis@premise.com.au](mailto:madeleine.hartleydavis@premise.com.au)>; Michael Majzner <[michael.majzner@premise.com.au](mailto:michael.majzner@premise.com.au)>; Tom Bradshaw <[tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)>

**Subject:** Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Kumara / Jeremy / Marco,

Hope you have all been well.

As you are aware, we are working on the whole of site water network modelling update for the Everleigh project.

We have listed out below all of the modelling parameters, assumptions and limitations adopted for the purposes of this modelling update and require your written confirmation by Friday the 13<sup>th</sup> March to avoid program delays (email response back to me is fine) that you have reviewed the below and are accepting of these:

1. The network model was established and assessed using Bentley WaterCAD Connect Series 2 software using the Extended time series analysis functionality over three (3) consecutive maximum days (MD). It is noted for the purposes of providing our modelling files to LCC / LWIA for their review, we will be providing this output directly from Bentley WaterCAD.
2. The network model was developed and assessed accordance with the requirements of (in order of precedence):
  - o Greater Flagstone PDA Sub-Regional Infrastructure Agreement;
  - o LCC's / LWIA's Desired Standards of Service (DSS);
  - o SEQ Design & Construction Code
3. The external servicing strategy for Everleigh is based on Option #2 outlined in LWIA's Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021 (Revision E.1 dated 05/07/2018), stating that elevated regions will be serviced via a pressure boosted supply from Round Mountain and that non-elevated areas will be supplied via gravity from Round Mountain.
4. Confirming that as per the correspondence received from LWIA (refer attached email dated 23/01/2020) we will be providing a second connection into the estate off the Teviot Road trunk main into the HLZ. This is currently planned to occur at the intersection of Leanne Court / Teviot Road / Anderson Drive.

5. It is assumed that the existing pressure management device (PRV) installed on Everleigh Drive which connects to the 300mm dia Teviot Road trunk main (i.e. to manage pressures within Precinct 1) will remain as the primary point of supply to the Elevated Zone (ELZ) until such time as the future stages are brought online in alignment with the current planned development roll out. It is anticipated that an additional PRV will be required off the second connection into the HLZ at the intersection of Leanne Court / Teviot Road / Anderson Drive.
6. The whole of site modelling has assumed that all currently designed / constructed water mains in Precinct 1, Ivory Parkway and the School Site will remain as proposed and will not be changing – i.e. these are fixed points in the model.
7. Boundary Conditions (BC's) were modelled as fixed Hydraulic Grade (HGL) values for the elevated and non-elevated pressure zones within the network (refer LWIA correspondence attached and listed below for your reference). Please refer attached email received from LWIA dated 23/01/2020 outlining the agreed boundary conditions to be adopted. These have also been summarised below for clarity:
  - Teviot Road Trunk Main Connection - via Pub Lane pump station
    - 107m head, 41m pressure, 66m elevation
  - Greenbank Road trunk main connection – via Round Mountain reservoir
    - 85m head, 35m pressure, 50m elevation
8. It has been assumed that the BC's are generally representative of the lowest possible HGL value likely to be experienced at the external connection points during peak hour demand periods.
9. It has been assumed that the elevated pressure zone is defined as all land situated above RL50. This was confirmed with LWIA (refer attached correspondence dated 24/01/2020).
10. The boundary between pressure zones will be designated within the Bentley WaterCAD model via the absence of a pipe link.
11. The model for Precinct 1 within the Bentley WaterCAD model was established based on As Constructed / design plans.
12. The model for future precincts was established based on the internal road network, allotment layout plans and latest master planning advice provided by Mirvac.
13. Nodal elevations were based on the most recent whole of site bulk earthworks modelling carried out by Premise.
14. The following friction factors were adopted for the internal reticulation mains within the model:
 

| Pipe Size     | HW C Factor |
|---------------|-------------|
| < = 150       | 110         |
| 150 to <= 300 | 120         |
| >300 < = 600  | 130         |
15. The following use conversion factors (EP/unit), as provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement, has been adopted in the network modelling.

### SCHEDULE 3

#### DEMAND LIMIT – USE CONVERSION FACTORS

| USES                                                                                          |                                     |                   | CONVERSION FACTORS                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential uses                                                                              | Pre 1 January 2016                  | detached dwelling | 2.91EP/dwelling                                                                                                                                                                                                                                               |
|                                                                                               |                                     | attached dwelling | 1.83EP/dwelling                                                                                                                                                                                                                                               |
|                                                                                               | On or after 1 January 2016          | detached dwelling | 2.8EP/dwelling                                                                                                                                                                                                                                                |
|                                                                                               |                                     | attached dwelling | 1.78EP/dwelling                                                                                                                                                                                                                                               |
| Retail uses (excluding showrooms)                                                             |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Showrooms                                                                                     |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Commercial uses                                                                               |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Industrial uses                                                                               |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Service, community and other uses (excluding child care centre and educational establishment) |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Child care centre                                                                             |                                     |                   | 0.25EP/pupil and staff                                                                                                                                                                                                                                        |
| Educational establishment                                                                     | Primary school                      |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                         |
|                                                                                               | Secondary school                    |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                         |
|                                                                                               | Any other educational establishment |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                         |
| Sport, recreation and entertainment uses                                                      |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Tourism uses                                                                                  |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Rural uses                                                                                    |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Mixed use (being a development combining residential uses and any other use)                  |                                     |                   | The conversion factor for the Residential uses and, if the mixed use includes a Child care centre or Educational establishment, the conversion factor for the Child care centre and Educational establishment (as applicable) (as set out above) plus 15EP/ha |
| Any other uses                                                                                |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |

In this Schedule 3, conversion factors per hectare (ha) are to be calculated using the area of the registered lot(s).

16. The network model has been produced based on a development layout that has a density which is considered as the projected upper limit for the site. Adopting the upper limit provides flexibility within the model for protentional future planning layout alterations. The adopted densities are listed in the below summarised land uses and overall EP calculations table:

| USES                                | Dwellings | Residential EP | Non-Residential EP | Total EP |
|-------------------------------------|-----------|----------------|--------------------|----------|
| Residential use - detached dwelling | 3,159     | 8,845          | -                  | 8,845    |
| Residential use - attached dwelling | 674       | 1,199          | -                  | 1,199    |
| Retail uses (excluding showrooms)   | -         | -              | 102                | 102      |
| Showrooms                           | -         | -              | -                  | -        |
| Commercial uses                     | -         | -              | -                  | -        |
| Industrial uses                     | -         | -              | -                  | -        |
| Service, community and other uses   | -         | -              | 96                 | 96       |
| Child care centre                   | -         | -              | -                  | -        |
| Educational establishment           | -         | -              | 368*               | 368*     |

|                                          |              |               |            |               |
|------------------------------------------|--------------|---------------|------------|---------------|
| Sport, recreation and entertainment uses | -            | -             | -          | -             |
| Tourism uses                             | -            | -             | -          | -             |
| Rural uses                               | -            | -             | -          | -             |
| Mixed use                                | -            | -             | -          | -             |
| Any other uses                           | -            | -             | -          | -             |
| <b>Total</b>                             | <b>3,833</b> | <b>10,045</b> | <b>566</b> | <b>10,610</b> |

\* rmined that the nominated Greater Flagstone PDA Sub-Regional Infrastructure Agreement value for the school site was too low and hence this higher EP value has been adopted (1.05 EP/Ha).

17. Demands were factored by a MD/AD ratio of 1.7 for residential areas and 1.3 for non-residential areas.
18. Separate diurnal demand patterns were applied to the model for residential areas and commercial regions with maximum hour (MH) peaking factors of 1.83 (for residential areas) and 1.54 (for commercial areas).
19. Non-essential demands (e.g. irrigation) were applied during off peak periods (e.g. midnight through 4am).
20. External water storage upgrades were not assessed. It is assumed that LWIA will examine the requirement for upgrading existing storage reserves to support all approved future development within the region and that is not part of this assessment.
21. Minimum pressure and related performance requirements for onsite irrigation appliances were not assessed. In instances whereby an onsite irrigation system requires a minimum pressure and/ or performance requirement over and above what can be provided by the Water Authority (which is what has been allowed for in our modelling), it is assumed that the respective property owner will design their own onsite infrastructure to ensure adequate service is able to be provided.
22. In respect to firefighting, AS2419 may necessitate the need for fire hydrant coverage for the likes of a commercial development with a performance capability different (or potentially more onerous) to that required by LCC's / LWIA's Desired Standards of Service (DSS). In the event that an individual property (e.g. School) requires fire hydrant coverage and performance over and above the performance that LWIA can provide and the whole of site water model has allowed for, the property or lease owner will need to assess and design their own onsite infrastructure to service such firefighting requirements in line with the relevant Australian Standard/s. Design firefighting requirements set down within AS2419 and related Australian Standards have not been assessed nor considered herein this report.
23. It is assumed that all risks associated with the external servicing strategy (including provision for alternative supply) for the broader Greenbank area rests with the Water Authority and have not been considered in our whole of site water modelling.

Thanks Kumara / Jeremy / Marco – please do not hesitate to contact me if you have any questions.

Following your confirmation to the above, we will then be able to finalise our revised whole of site modelling and associated reporting and issue to all parties.

Look forward to hearing from you all.



**JOSHUA STONE**  
**Senior Project Manager**

**T** 07 3253 2222 | **M** 0408 063 479  
**E** [joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)  
**A** Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



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## Michael Majzner

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**From:** Herath, Kumara <KumaraHerath@logan.qld.gov.au>  
**Sent:** Thursday, 19 March 2020 2:46 PM  
**To:** Joshua Stone  
**Cc:** WaterDA  
**Subject:** RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Josh

WDS is happy with Jeremy's comments and recommendations as mentioned below.

Regards

**Kumara Herath** | Water Development Services Engineer | Water Infrastructure Branch | **Logan City Council**  
Phone: 07 3412 4728 | PO Box 3226 Logan City DC Qld 4114 | [kumaraherath@logan.qld.gov.au](mailto:kumaraherath@logan.qld.gov.au)  
[www.logan.qld.gov.au](http://www.logan.qld.gov.au) | [facebook.com/logancitycouncil](https://facebook.com/logancitycouncil) | [twitter.com/logancc](https://twitter.com/logancc)

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**From:** Joshua Stone [mailto:joshua.stone@premise.com.au]  
**Sent:** Thursday, 19 March 2020 1:17 PM  
**To:** Herath, Kumara <KumaraHerath@logan.qld.gov.au>  
**Cc:** WaterDA <WaterDA@logan.qld.gov.au>; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>  
**Subject:** RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Thanks Kumara,

The below from Jeremy looks positive and that he is in agreeance with our modelling parameters.

Can I ask that you now also provide your endorsement of the parameters based on Jeremy's acceptance to allow our WOS modelling to be finalised.

Thanks Kumara. Look forward to hearing from you.



**JOSHUA STONE**  
**Senior Project Manager**

**T** 07 3253 2222 | **M** 0408 063 479  
**E** [joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)  
**A** Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



---

**From:** Herath, Kumara <[KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au)>  
**Sent:** Thursday, 19 March 2020 12:07 PM  
**To:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>  
**Cc:** WaterDA <[WaterDA@logan.qld.gov.au](mailto:WaterDA@logan.qld.gov.au)>  
**Subject:** FW: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Josh

Please see the response from Jeremy Thomas to your enquiry

Regards

**Kumara Herath** | Water Development Services Engineer | Water Infrastructure Branch | **Logan City Council**  
Phone: 07 3412 4728 | PO Box 3226 Logan City DC Qld 4114 | [kumaraherath@logan.qld.gov.au](mailto:kumaraherath@logan.qld.gov.au)  
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---

**From:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>  
**Sent:** Thursday, 5 March 2020 11:59 AM  
**To:** Thomas, Jeremy <[JeremyThomas@logan.qld.gov.au](mailto:JeremyThomas@logan.qld.gov.au)>  
**Cc:** Madeleine Hartley-Davis <[madeleine.hartleydavis@premise.com.au](mailto:madeleine.hartleydavis@premise.com.au)>; Michael Majzner <[michael.majzner@premise.com.au](mailto:michael.majzner@premise.com.au)>  
**Subject:** FW: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Jeremy,

Got a bounce back from your other email address – am sending this to you again.



**JOSHUA STONE**  
**Senior Project Manager**

**T** 07 3253 2222 | **M** 0408 063 479  
**E** [joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)  
**A** Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



---

**From:** Joshua Stone <[joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)>  
**Sent:** Thursday, 5 March 2020 11:56 AM  
**To:** [KumaraHerath@logan.qld.gov.au](mailto:KumaraHerath@logan.qld.gov.au); Jeremy Thomas <[jeremy.thomas@loganwia.com.au](mailto:jeremy.thomas@loganwia.com.au)>; Marco Bonotto <[Marco.Bonotto@dsdmip.qld.gov.au](mailto:Marco.Bonotto@dsdmip.qld.gov.au)>  
**Cc:** Mark Clancy ([mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)) <[mark.clancy@mirvac.com](mailto:mark.clancy@mirvac.com)>; [jason.augustine@mirvac.com](mailto:jason.augustine@mirvac.com); Clint Thorp

<[clint.thorp@premise.com.au](mailto:clint.thorp@premise.com.au)>; Madeleine Hartley-Davis <[madeleine.hartleydavis@premise.com.au](mailto:madeleine.hartleydavis@premise.com.au)>; Michael Majzner <[michael.majzner@premise.com.au](mailto:michael.majzner@premise.com.au)>; Tom Bradshaw <[tom.bradshaw@bbdengineering.com.au](mailto:tom.bradshaw@bbdengineering.com.au)>

**Subject:** Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Kumara / Jeremy / Marco,

Hope you have all been well.

As you are aware, we are working on the whole of site water network modelling update for the Everleigh project.

We have listed out below all of the modelling parameters, assumptions and limitations adopted for the purposes of this modelling update and require your written confirmation by Friday the 13<sup>th</sup> March to avoid program delays (email response back to me is fine) that you have reviewed the below and are accepting of these:

1. The network model was established and assessed using Bentley WaterCAD Connect Series 2 software using the Extended time series analysis functionality over three (3) consecutive maximum days (MD). It is noted for the purposes of providing our modelling files to LCC / LWIA for their review, we will be providing this output directly from Bentley WaterCAD. **Noted. No issue -WaterCAD can export EPANet format which can be imported into InfoWATER**
2. The network model was developed and assessed accordance with the requirements of (in order of precedence): **Noted, and agree with hierarchy.**
  - Greater Flagstone PDA Sub-Regional Infrastructure Agreement;
  - LCC's / LWIA's Desired Standards of Service (DSS);
  - SEQ Design & Construction Code
3. The external servicing strategy for Everleigh is based on Option #2 outlined in LWIA's Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021 (Revision E.1 dated 05/07/2018), stating that elevated regions will be serviced via a pressure boosted supply from Round Mountain and that non-elevated areas will be supplied via gravity from Round Mountain. **Agreed.**
4. Confirming that as per the correspondence received from LWIA (refer attached email dated 23/01/2020) we will be providing a second connection into the estate off the Teviot Road trunk main into the HLZ. This is currently planned to occur at the intersection of Leanne Court / Teviot Road / Anderson Drive. **Agreed**
5. It is assumed that the existing pressure management device (PRV) installed on Everleigh Drive which connects to the 300mm dia Teviot Road trunk main (i.e. to manage pressures within Precinct 1) will remain as the primary point of supply to the Elevated Zone (ELZ) until such time as the future stages are brought online in alignment with the current planned development roll out. It is anticipated that an additional PRV will be required off the second connection into the HLZ at the intersection of Leanne Court / Teviot Road / Anderson Drive. **Agreed**
6. The whole of site modelling has assumed that all currently designed / constructed water mains in Precinct 1, Ivory Parkway and the School Site will remain as proposed and will not be changing – i.e. these are fixed points in the model. **Agreed**
7. Boundary Conditions (BC's) were modelled as fixed Hydraulic Grade (HGL) values for the elevated and non-elevated pressure zones within the network (refer LWIA correspondence attached and listed below for your reference). Please refer attached email received from LWIA dated 23/01/2020 outlining the agreed boundary conditions to be adopted. These have also been summarised below for clarity:
  - Teviot Road Trunk Main Connection - via Pub Lane pump station
    - 107m head, 41m pressure, 66m elevation
  - Greenbank Road trunk main connection – via Round Mountain reservoir
    - 85m head, 35m pressure, 50m elevation

**While we have noted a lower head available in the latest model for the elevated area with the updated strategy, however, this would be resolved by a pump upgrade to maintain the BC's previously agreed to. We will need the final model to assess the likely timing of the pump upgrade (likely to be brought forward).**

8. It has been assumed that the BC's are generally representative of the lowest possible HGL value likely to be experienced at the external connection points during peak hour demand periods. **That is correct.**
9. It has been assumed that the elevated pressure zone is defined as all land situated above RL50. This was confirmed with LWIA (refer attached correspondence dated 24/01/2020). **That is correct. There may be**

some 'wiggle room' for a small number of properties should the modelling output satisfactorily demonstrate that DSS can be exceeded with reasonable allowances for unknowns/losses.

10. The boundary between pressure zones will be designated within the Bentley WaterCAD model via the absence of a pipe link. **Noted**
11. The model for Precinct 1 within the Bentley WaterCAD model was established based on As Constructed / design plans. **Noted**
12. The model for future precincts was established based on the internal road network, allotment layout plans and latest master planning advice provided by Mirvac. **Noted**
13. Nodal elevations were based on the most recent whole of site bulk earthworks modelling carried out by Premise. **Noted**
14. The following friction factors were adopted for the internal reticulation mains within the model:

| Pipe Size     | HW C Factor |
|---------------|-------------|
| < = 150       | 110         |
| 150 to <= 300 | 120         |
| >300 <= 600   | 130         |

**Noted and acceptable. We find that Colebrook White provides a better outcome as the above coefficients are conservative, however unlikely to impact significantly on reticulation mains.**

15. The following use conversion factors (EP/unit), as provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement, has been adopted in the network modelling. **Noted**

### SCHEDULE 3

#### DEMAND LIMIT – USE CONVERSION FACTORS

| USES                                                                                          |                                     |                   | CONVERSION FACTORS                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential uses                                                                              | Pre 1 January 2016                  | detached dwelling | 2.91EP/dwelling                                                                                                                                                                                                                                               |
|                                                                                               |                                     | attached dwelling | 1.83EP/dwelling                                                                                                                                                                                                                                               |
|                                                                                               | On or after 1 January 2016          | detached dwelling | 2.8EP/dwelling                                                                                                                                                                                                                                                |
|                                                                                               |                                     | attached dwelling | 1.78EP/dwelling                                                                                                                                                                                                                                               |
| Retail uses (excluding showrooms)                                                             |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Showrooms                                                                                     |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Commercial uses                                                                               |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Industrial uses                                                                               |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Service, community and other uses (excluding child care centre and educational establishment) |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Child care centre                                                                             |                                     |                   | 0.25EP/pupil and staff                                                                                                                                                                                                                                        |
| Educational establishment                                                                     | Primary school                      |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                         |
|                                                                                               | Secondary school                    |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                         |
|                                                                                               | Any other educational establishment |                   | 0.1EP/pupil and staff                                                                                                                                                                                                                                         |
| Sport, recreation and entertainment uses                                                      |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Tourism uses                                                                                  |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Rural uses                                                                                    |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |
| Mixed use (being a development combining residential uses and any other use)                  |                                     |                   | The conversion factor for the Residential uses and, if the mixed use includes a Child care centre or Educational establishment, the conversion factor for the Child care centre and Educational establishment (as applicable) (as set out above) plus 15EP/ha |
| Any other uses                                                                                |                                     |                   | 30EP/ha                                                                                                                                                                                                                                                       |

In this Schedule 3, conversion factors per hectare (ha) are to be calculated using the area of the registered lot(s).

16. The network model has been produced based on a development layout that has a density which is considered as the projected upper limit for the site. Adopting the upper limit provides flexibility within the model for protentional future planning layout alterations. The adopted densities are listed in the below summarised land uses and overall EP calculations table:

| USES                                | Dwellings | Residential EP | Non-Residential EP | Total EP |
|-------------------------------------|-----------|----------------|--------------------|----------|
| Residential use - detached dwelling | 3,159     | 8,845          | -                  | 8,845    |
| Residential use - attached dwelling | 674       | 1,199          | -                  | 1,199    |
| Retail uses (excluding showrooms)   | -         | -              | 102                | 102      |
| Showrooms                           | -         | -              | -                  | -        |
| Commercial uses                     | -         | -              | -                  | -        |
| Industrial uses                     | -         | -              | -                  | -        |
| Service, community and other uses   | -         | -              | 96                 | 96       |
| Child care centre                   | -         | -              | -                  | -        |
| Educational establishment           | -         | -              | 368*               | 368*     |

|                                          |              |               |            |               |
|------------------------------------------|--------------|---------------|------------|---------------|
| Sport, recreation and entertainment uses | -            | -             | -          | -             |
| Tourism uses                             | -            | -             | -          | -             |
| Rural uses                               | -            | -             | -          | -             |
| Mixed use                                | -            | -             | -          | -             |
| Any other uses                           | -            | -             | -          | -             |
| <b>Total</b>                             | <b>3,833</b> | <b>10,045</b> | <b>566</b> | <b>10,610</b> |

\* rmined that the nominated Greater Flagstone PDA Sub-Regional Infrastructure Agreement value for the school site was too low and hence this higher EP value has been adopted (1.05 EP/Ha). **Noted**

17. Demands were factored by a MD/AD ratio of 1.7 for residential areas and 1.3 for non-residential areas. **Noted**
18. Separate diurnal demand patterns were applied to the model for residential areas and commercial regions with maximum hour (MH) peaking factors of 1.83 (for residential areas) and 1.54 (for commercial areas). **Noted**
19. Non-essential demands (e.g. irrigation) were applied during off peak periods (e.g. midnight through 4am). **Noted**
20. External water storage upgrades were not assessed. It is assumed that LWIA will examine the requirement for upgrading existing storage reserves to support all approved future development within the region and that is not part of this assessment. **Agreed.**
21. Minimum pressure and related performance requirements for onsite irrigation appliances were not assessed. In instances whereby an onsite irrigation system requires a minimum pressure and/ or performance requirement over and above what can be provided by the Water Authority (which is what has been allowed for in our modelling), it is assumed that the respective property owner will design their own onsite infrastructure to ensure adequate service is able to be provided. **Agreed (subject to approvals for such uses by Council)**
22. In respect to firefighting, AS2419 may necessitate the need for fire hydrant coverage for the likes of a commercial development with a performance capability different (or potentially more onerous) to that required by LCC's / LWIA's Desired Standards of Service (DSS). In the event that an individual property (e.g. School) requires fire hydrant coverage and performance over and above the performance that LWIA can provide and the whole of site water model has allowed for, the property or lease owner will need to assess and design their own onsite infrastructure to service such firefighting requirements in line with the relevant Australian Standard/s. Design firefighting requirements set down within AS2419 and related Australian Standards have not been assessed nor considered herein this report. **Agreed.**
23. It is assumed that all risks associated with the external servicing strategy (including provision for alternative supply) for the broader Greenbank area rests with the Water Authority and have not been considered in our whole of site water modelling. **Agreed**

Thanks Kumara / Jeremy / Marco – please do not hesitate to contact me if you have any questions.

Following your confirmation to the above, we will then be able to finalise our revised whole of site modelling and associated reporting and issue to all parties.

Look forward to hearing from you all.



**JOSHUA STONE**  
**Senior Project Manager**

**T** 07 3253 2222 | **M** 0408 063 479  
**E** [joshua.stone@premise.com.au](mailto:joshua.stone@premise.com.au)  
**A** Level 1, 100 Brunswick St, Fortitude Valley QLD 4006



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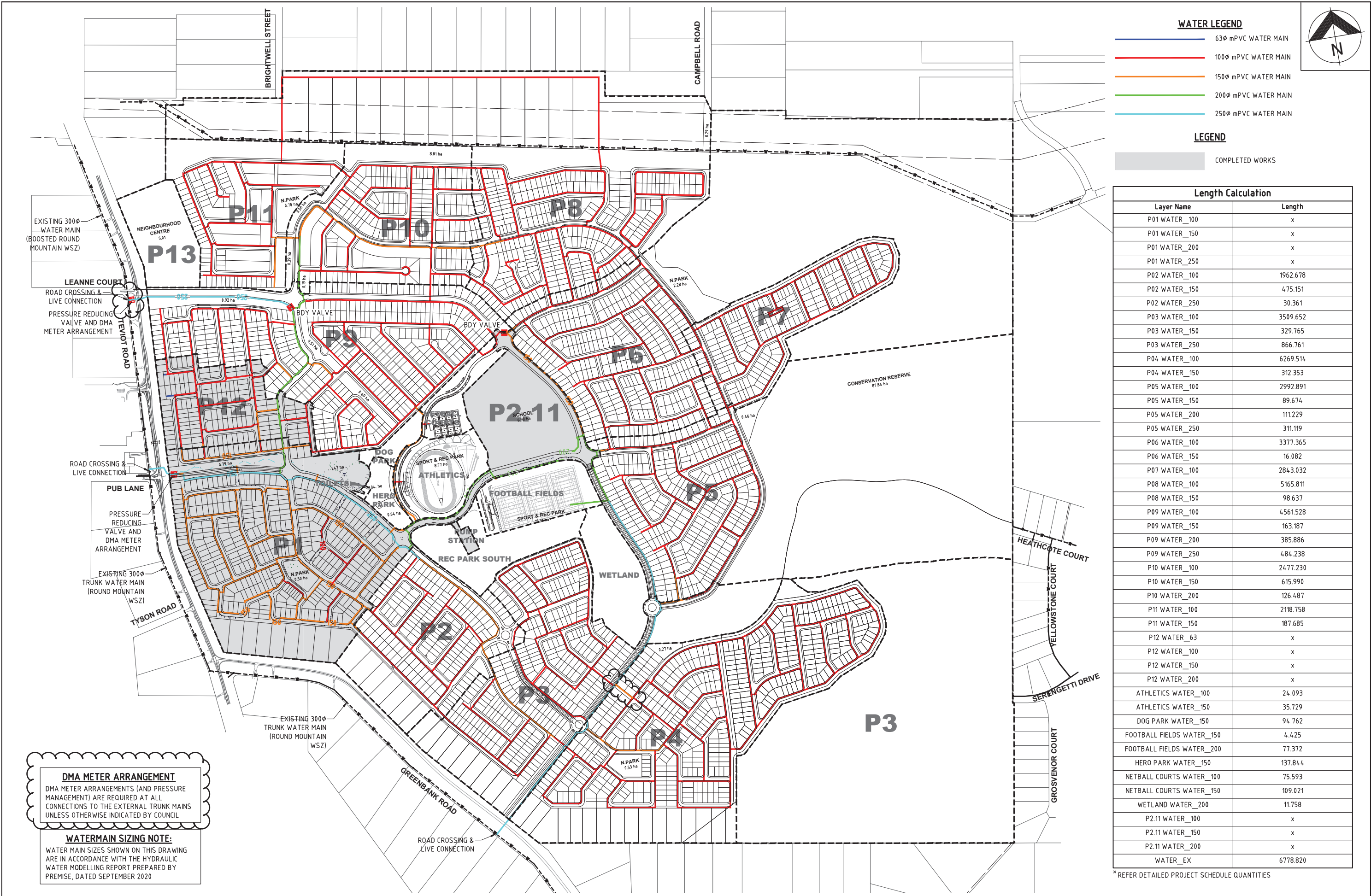
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## A.5 APPENDIX E – MODEL RESULTS



**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
LLZ and HLZ Extents - Time: 19.00 hours



**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Junction Table - Time: 19.00 hours**

| Label  | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|--------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| B-002  | 45.0             | 2                                    | 0.434           | <Collection: 2 items>  | 103.9                  | 58.8                |
| B-003  | 48.5             | 0                                    | 0.000           | <Collection: 0 items>  | 103.9                  | 55.3                |
| B-004  | 48.5             | 0                                    | 0.000           | <Collection: 0 items>  | 103.9                  | 55.3                |
| B-005  | 51.0             | 0                                    | 0.000           | <Collection: 0 items>  | 103.9                  | 52.8                |
| B-006  | 50.5             | 2                                    | 0.246           | <Collection: 2 items>  | 103.9                  | 53.2                |
| B-007  | 49.5             | 0                                    | 0.000           | <Collection: 0 items>  | 103.9                  | 54.2                |
| B-008  | 50.0             | 0                                    | 0.000           | <Collection: 0 items>  | 103.9                  | 53.7                |
| B-009  | 53.0             | 2                                    | 0.359           | <Collection: 2 items>  | 103.9                  | 50.8                |
| B-010  | 49.0             | 0                                    | 0.000           | <Collection: 0 items>  | 103.9                  | 54.8                |
| B-011  | 50.5             | 2                                    | 0.321           | <Collection: 2 items>  | 103.9                  | 53.2                |
| B-012  | 44.0             | 2                                    | 0.227           | <Collection: 2 items>  | 103.9                  | 59.8                |
| B-013  | 49.0             | 2                                    | 0.302           | <Collection: 2 items>  | 104.0                  | 54.8                |
| B-014  | 46.5             | 2                                    | 0.284           | <Collection: 2 items>  | 103.9                  | 57.3                |
| B-014a | 48.9             | 2                                    | 0.528           | <Collection: 2 items>  | 103.9                  | 54.9                |
| B-015  | 52.5             | 2                                    | 0.472           | <Collection: 2 items>  | 103.9                  | 51.3                |
| B-016  | 55.0             | 2                                    | 0.227           | <Collection: 2 items>  | 104.0                  | 48.9                |
| B-016a | 52.2             | 2                                    | 0.510           | <Collection: 2 items>  | 104.0                  | 51.7                |
| B-017  | 60.0             | 2                                    | 0.510           | <Collection: 2 items>  | 104.0                  | 43.9                |
| B-018  | 58.0             | 2                                    | 0.264           | <Collection: 2 items>  | 104.0                  | 45.9                |
| B-018a | 60.7             | 2                                    | 0.321           | <Collection: 2 items>  | 104.0                  | 43.2                |
| B-019  | 51.0             | 2                                    | 0.585           | <Collection: 2 items>  | 104.0                  | 52.9                |
| B-021  | 51.5             | 2                                    | 0.246           | <Collection: 2 items>  | 104.2                  | 52.6                |
| B-022  | 49.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 55.1                |
| B-023  | 47.0             | 2                                    | 0.434           | <Collection: 2 items>  | 104.2                  | 57.1                |
| B-023a | 48.7             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 55.4                |
| B-023b | 48.8             | 2                                    | 0.340           | <Collection: 2 items>  | 104.3                  | 55.3                |
| B-024  | 45.5             | 2                                    | 0.434           | <Collection: 2 items>  | 104.2                  | 58.5                |
| B-025  | 46.0             | 2                                    | 0.528           | <Collection: 2 items>  | 104.3                  | 58.2                |
| B-025a | 48.9             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 55.2                |
| B-026  | 45.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 59.2                |
| B-027  | 50.5             | 2                                    | 0.548           | <Collection: 2 items>  | 104.2                  | 53.6                |
| B-028  | 53.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 50.6                |
| B-028a | 55.7             | 2                                    | 0.264           | <Collection: 2 items>  | 104.3                  | 48.5                |
| B-029  | 54.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 50.1                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Junction Table - Time: 19.00 hours**

| Label  | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|--------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| B-030  | 52.0             | 2                                    | 0.472           | <Collection: 2 items>  | 104.2                  | 52.1                |
| B-030a | 50.7             | 2                                    | 0.113           | <Collection: 2 items>  | 104.2                  | 53.4                |
| B-031  | 54.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 49.6                |
| B-031a | 56.8             | 2                                    | 1.208           | <Collection: 2 items>  | 104.2                  | 47.4                |
| B-031b | 56.2             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 48.0                |
| B-032  | 56.0             | 2                                    | 0.359           | <Collection: 2 items>  | 104.2                  | 48.1                |
| B-033  | 48.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 56.2                |
| B-034  | 52.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 52.2                |
| B-035  | 54.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 50.2                |
| B-036  | 58.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 46.2                |
| B-036a | 53.3             | 2                                    | 0.246           | <Collection: 2 items>  | 104.3                  | 50.9                |
| B-037  | 56.0             | 2                                    | 0.510           | <Collection: 2 items>  | 104.3                  | 48.2                |
| B-038  | 62.0             | 2                                    | 0.453           | <Collection: 2 items>  | 104.3                  | 42.2                |
| B-038a | 60.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 44.1                |
| B-039  | 63.0             | 2                                    | 0.264           | <Collection: 2 items>  | 104.2                  | 41.2                |
| B-039a | 61.6             | 2                                    | 0.661           | <Collection: 2 items>  | 104.2                  | 42.5                |
| B-040  | 66.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.2                  | 38.2                |
| B-041  | 55.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 49.3                |
| B-042  | 61.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 43.3                |
| B-043  | 54.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.5                  | 50.4                |
| B-044  | 56.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.5                  | 48.4                |
| B-045  | 66.0             | 2                                    | 0.434           | <Collection: 2 items>  | 104.5                  | 38.4                |
| B-045a | 66.1             | 2                                    | 0.416           | <Collection: 2 items>  | 104.5                  | 38.3                |
| B-046  | 57.5             | 2                                    | 0.302           | <Collection: 2 items>  | 104.6                  | 47.0                |
| B-047  | 58.0             | 2                                    | 0.396           | <Collection: 2 items>  | 104.6                  | 46.5                |
| B-048  | 60.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.6                  | 44.5                |
| B-049  | 66.5             | 2                                    | 0.680           | <Collection: 2 items>  | 104.5                  | 37.9                |
| B-049a | 70.0             | 2                                    | 0.472           | <Collection: 2 items>  | 104.5                  | 34.4                |
| B-050  | 63.0             | 2                                    | 0.453           | <Collection: 2 items>  | 104.6                  | 41.5                |
| B-051  | 62.5             | 2                                    | 0.396           | <Collection: 2 items>  | 104.7                  | 42.2                |
| B-052  | 66.0             | 2                                    | 0.227           | <Collection: 2 items>  | 104.7                  | 38.6                |
| B-053  | 72.6             | 2                                    | 0.548           | <Collection: 2 items>  | 104.5                  | 31.9                |
| B-054  | 71.0             | 2                                    | 0.227           | <Collection: 2 items>  | 104.5                  | 33.4                |
| B-055  | 52.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.5                  | 52.4                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Junction Table - Time: 19.00 hours**

| Label  | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|--------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| B-055a | 54.5             | 2                                    | 0.340           | <Collection: 2 items>  | 104.5                  | 49.9                |
| B-055b | 59.0             | 2                                    | 0.246           | <Collection: 2 items>  | 104.5                  | 45.4                |
| B-056  | 49.5             | 2                                    | 0.246           | <Collection: 2 items>  | 104.5                  | 54.9                |
| B-057  | 55.0             | 2                                    | 0.416           | <Collection: 2 items>  | 104.5                  | 49.4                |
| B-058  | 50.5             | 2                                    | 0.227           | <Collection: 2 items>  | 104.7                  | 54.1                |
| B-058a | 48.0             | 2                                    | 0.302           | <Collection: 2 items>  | 104.8                  | 56.6                |
| B-059  | 56.0             | 2                                    | 0.585           | <Collection: 2 items>  | 104.8                  | 48.7                |
| B-060  | 66.5             | 0                                    | 0.000           | <Collection: 0 items>  | 105.1                  | 38.6                |
| B-061  | 62.0             | 2                                    | 0.321           | <Collection: 2 items>  | 105.0                  | 43.0                |
| B-062  | 46.5             | 2                                    | 0.264           | <Collection: 2 items>  | 104.8                  | 58.2                |
| B-063  | 52.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.8                  | 52.7                |
| B-064  | 57.0             | 2                                    | 0.623           | <Collection: 2 items>  | 104.8                  | 47.7                |
| B-064a | 49.8             | 2                                    | 0.606           | <Collection: 2 items>  | 104.8                  | 54.9                |
| B-065  | 46.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.8                  | 58.2                |
| B-066  | 44.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.8                  | 60.2                |
| B-077  | 62.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.9                  | 42.8                |
| B-079  | 66.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 38.3                |
| B-080  | 73.0             | 2                                    | 0.264           | <Collection: 2 items>  | 104.6                  | 31.5                |
| B-081  | 64.0             | 2                                    | 0.340           | <Collection: 2 items>  | 104.6                  | 40.5                |
| B-082  | 70.0             | 2                                    | 0.246           | <Collection: 2 items>  | 104.6                  | 34.5                |
| I-02   | 50.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 53.7                |
| I-04   | 51.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 52.7                |
| I-05   | 48.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 56.2                |
| S-001  | 70.0             | 2                                    | 0.378           | <Collection: 2 items>  | 105.3                  | 35.2                |
| S-002  | 56.0             | 2                                    | 0.737           | <Collection: 2 items>  | 104.7                  | 48.6                |
| S-003  | 46.0             | 2                                    | 0.378           | <Collection: 2 items>  | 104.7                  | 58.5                |
| S-004  | 69.0             | 0                                    | 0.000           | <Collection: 0 items>  | 105.2                  | 36.1                |
| S-004a | 60.0             | 2                                    | 0.151           | <Collection: 2 items>  | 104.9                  | 44.8                |
| S-005  | 69.0             | 2                                    | 0.510           | <Collection: 2 items>  | 105.1                  | 36.0                |
| S-006  | 67.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.9                  | 37.3                |
| S-007  | 66.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.8                  | 38.7                |
| S-008  | 65.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.7                  | 39.2                |
| S-008a | 62.6             | 2                                    | 0.264           | <Collection: 2 items>  | 104.7                  | 42.0                |
| S-009  | 64.0             | 2                                    | 0.321           | <Collection: 2 items>  | 104.7                  | 40.6                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Junction Table - Time: 19.00 hours**

| Label  | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|--------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| S-010  | 61.5             | 2                                    | 0.434           | <Collection: 2 items>  | 104.6                  | 43.1                |
| S-011  | 60.0             | 2                                    | 0.491           | <Collection: 2 items>  | 104.6                  | 44.5                |
| S-012  | 57.0             | 2                                    | 0.227           | <Collection: 2 items>  | 104.6                  | 47.5                |
| S-013  | 53.0             | 2                                    | 0.302           | <Collection: 2 items>  | 104.5                  | 51.4                |
| S-014  | 72.0             | 2                                    | 0.302           | <Collection: 2 items>  | 105.0                  | 32.9                |
| S-015  | 73.0             | 4                                    | 0.491           | <Collection: 4 items>  | 105.0                  | 31.9                |
| S-016  | 73.0             | 2                                    | 0.707           | <Collection: 2 items>  | 104.9                  | 31.8                |
| S-017  | 65.0             | 2                                    | 0.396           | <Collection: 2 items>  | 104.8                  | 39.8                |
| S-018  | 62.5             | 2                                    | 0.302           | <Collection: 2 items>  | 104.8                  | 42.2                |
| S-019  | 65.0             | 2                                    | 0.132           | <Collection: 2 items>  | 104.7                  | 39.6                |
| S-020  | 71.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.9                  | 33.8                |
| S-021  | 59.0             | 2                                    | 0.189           | <Collection: 2 items>  | 104.7                  | 45.6                |
| S-022  | 56.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.7                  | 48.1                |
| S-023  | 56.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.7                  | 48.1                |
| S-024  | 56.0             | 2                                    | 0.302           | <Collection: 2 items>  | 104.6                  | 48.5                |
| S-025  | 53.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.6                  | 51.0                |
| S-026  | 53.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.6                  | 51.5                |
| S-027  | 52.5             | 2                                    | 0.189           | <Collection: 2 items>  | 104.5                  | 51.9                |
| S-027a | 52.8             | 2                                    | 0.453           | <Collection: 2 items>  | 104.5                  | 51.6                |
| S-028  | 51.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.5                  | 53.4                |
| S-029  | 50.0             | 2                                    | 0.340           | <Collection: 2 items>  | 104.4                  | 54.3                |
| S-030  | 49.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 55.3                |
| S-031  | 49.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 54.8                |
| S-032  | 50.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 54.3                |
| S-033  | 50.0             | 2                                    | 0.548           | <Collection: 2 items>  | 104.4                  | 54.3                |
| S-034  | 56.5             | 2                                    | 0.340           | <Collection: 2 items>  | 104.7                  | 48.1                |
| S-035  | 54.0             | 2                                    | 0.378           | <Collection: 2 items>  | 104.6                  | 50.5                |
| S-036  | 51.0             | 2                                    | 0.416           | <Collection: 2 items>  | 104.6                  | 53.5                |
| S-037  | 46.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.5                  | 57.9                |
| S-038  | 46.5             | 2                                    | 0.528           | <Collection: 2 items>  | 104.5                  | 57.8                |
| S-039  | 45.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 59.3                |
| S-040  | 48.0             | 2                                    | 0.416           | <Collection: 2 items>  | 104.4                  | 56.3                |
| S-041  | 47.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 57.3                |
| S-042  | 58.0             | 2                                    | 0.246           | <Collection: 2 items>  | 104.6                  | 46.5                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Junction Table - Time: 19.00 hours**

| Label                     | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|---------------------------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| S-043                     | 53.0             | 2                                    | 0.302           | <Collection: 2 items>  | 104.6                  | 51.5                |
| S-044                     | 50.0             | 2                                    | 0.396           | <Collection: 2 items>  | 104.5                  | 54.4                |
| S-044a                    | 53.0             | 2                                    | 0.416           | <Collection: 2 items>  | 104.5                  | 51.4                |
| S-045                     | 51.0             | 2                                    | 0.378           | <Collection: 2 items>  | 104.4                  | 53.3                |
| S-046                     | 53.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 51.3                |
| S-047                     | 51.5             | 2                                    | 0.396           | <Collection: 2 items>  | 104.4                  | 52.8                |
| S-048                     | 51.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.4                  | 53.3                |
| S-049                     | 56.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.7                  | 48.6                |
| S-051                     | 52.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.5                  | 51.9                |
| S-052                     | 66.5             | 0                                    | 0.000           | <Collection: 0 items>  | 104.8                  | 38.2                |
| S-053                     | 72.0             | 0                                    | 0.000           | <Collection: 0 items>  | 105.1                  | 33.0                |
| S-054                     | 46.5             | 2                                    | 0.302           | <Collection: 2 items>  | 104.4                  | 57.8                |
| S-055                     | 71.0             | 2                                    | 0.000           | <Collection: 2 items>  | 106.5                  | 35.4                |
| S-100                     | 70.1             | 0                                    | 0.000           | <Collection: 0 items>  | 105.3                  | 35.1                |
| S-105                     | 62.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.9                  | 42.8                |
| S-110                     | 63.0             | 2                                    | 1.624           | <Collection: 2 items>  | 104.8                  | 41.7                |
| S-115                     | 64.0             | 0                                    | 0.000           | <Collection: 0 items>  | 104.8                  | 40.7                |
| S-120                     | 66.0             | 2                                    | 1.321           | <Collection: 2 items>  | 104.8                  | 38.7                |
| S-NEIGHBOURHOOD<br>CENTRE | 68.5             | 2                                    | 0.493           | <Collection: 2 items>  | 106.5                  | 37.9                |
| T-1001                    | 46.7             | 0                                    | 0.000           | <Collection: 0 items>  | 104.3                  | 57.5                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 96  | P148 HLZ | 76                        | B-043      | B-041     | 200.0            | PVC      | 120.0               | 13.484        | 0.429             | 1.314                          | HLZ  |
| 364 | P149 HLZ | 102                       | S-006      | S-005     | 150.0            | PVC      | 110.0               | -6.435        | 0.364             | 1.592                          | HLZ  |
| 370 | P150 HLZ | 180                       | S-015      | S-016     | 100.0            | PVC      | 110.0               | 1.384         | 0.176             | 0.666                          | HLZ  |
| 379 | P151 HLZ | 72                        | S-006      | S-007     | 100.0            | PVC      | 110.0               | 2.406         | 0.306             | 1.855                          | HLZ  |
| 384 | P152 HLZ | 118                       | S-014      | S-015     | 150.0            | PVC      | 110.0               | 1.875         | 0.106             | 0.162                          | HLZ  |
| 386 | P153 HLZ | 105                       | S-014      | S-020     | 100.0            | PVC      | 110.0               | 1.974         | 0.251             | 1.286                          | HLZ  |
| 388 | P154 HLZ | 155                       | S-016      | S-017     | 100.0            | PVC      | 110.0               | 0.677         | 0.086             | 0.177                          | HLZ  |
| 390 | P155 HLZ | 134                       | S-020      | S-017     | 100.0            | PVC      | 110.0               | 0.790         | 0.101             | 0.236                          | HLZ  |
| 395 | P156 HLZ | 236                       | S-017      | S-018     | 100.0            | PVC      | 110.0               | 1.071         | 0.136             | 0.414                          | HLZ  |
| 402 | P157 HLZ | 66                        | S-027      | S-026     | 100.0            | PVC      | 110.0               | -1.763        | 0.224             | 1.043                          | HLZ  |
| 406 | P158 HLZ | 191                       | S-009      | S-010     | 100.0            | PVC      | 110.0               | 0.956         | 0.122             | 0.336                          | HLZ  |
| 413 | P159 HLZ | 24                        | S-007      | S-008     | 100.0            | PVC      | 110.0               | 2.268         | 0.289             | 1.663                          | HLZ  |
| 414 | P160 HLZ | 43                        | S-008      | S-009     | 100.0            | PVC      | 110.0               | 1.284         | 0.163             | 0.580                          | HLZ  |
| 416 | P161 HLZ | 151                       | S-010      | S-034     | 100.0            | PVC      | 110.0               | -0.756        | 0.096             | 0.217                          | HLZ  |
| 417 | P162 HLZ | 80                        | S-034      | S-022     | 100.0            | PVC      | 110.0               | -0.375        | 0.048             | 0.059                          | HLZ  |
| 420 | P163 HLZ | 66                        | S-010      | S-011     | 100.0            | PVC      | 110.0               | 1.278         | 0.163             | 0.575                          | HLZ  |
| 421 | P164 HLZ | 131                       | S-011      | S-012     | 100.0            | PVC      | 110.0               | 0.859         | 0.109             | 0.276                          | HLZ  |
| 427 | P165 HLZ | 151                       | S-011      | S-035     | 100.0            | PVC      | 110.0               | -0.073        | 0.009             | 0.003                          | HLZ  |
| 428 | P166 HLZ | 80                        | S-035      | S-024     | 100.0            | PVC      | 110.0               | -1.032        | 0.131             | 0.387                          | HLZ  |
| 430 | P167 HLZ | 137                       | S-012      | S-036     | 100.0            | PVC      | 110.0               | -0.508        | 0.065             | 0.104                          | HLZ  |
| 431 | P168 HLZ | 79                        | S-036      | S-026     | 100.0            | PVC      | 110.0               | -0.342        | 0.044             | 0.050                          | HLZ  |
| 432 | P169 HLZ | 167                       | S-035      | S-036     | 100.0            | PVC      | 110.0               | 0.582         | 0.074             | 0.134                          | HLZ  |
| 434 | P170 HLZ | 100                       | S-005      | S-004     | 200.0            | PVC      | 120.0               | -11.095       | 0.353             | 0.916                          | HLZ  |
| 435 | P171 HLZ | 75                        | S-004      | S-001     | 200.0            | PVC      | 120.0               | -13.391       | 0.426             | 1.297                          | HLZ  |
| 437 | P172 HLZ | 38                        | S-022      | S-021     | 150.0            | PVC      | 110.0               | -4.361        | 0.247             | 0.775                          | HLZ  |
| 441 | P173 HLZ | 40                        | S-024      | S-023     | 150.0            | PVC      | 110.0               | -3.986        | 0.226             | 0.656                          | HLZ  |
| 442 | P174 HLZ | 27                        | S-023      | S-022     | 150.0            | PVC      | 110.0               | -3.986        | 0.226             | 0.656                          | HLZ  |
| 445 | P175 HLZ | 44                        | S-028      | S-027     | 100.0            | PVC      | 110.0               | -1.332        | 0.170             | 0.621                          | HLZ  |
| 448 | P176 HLZ | 49                        | S-026      | S-025     | 150.0            | PVC      | 110.0               | -2.105        | 0.119             | 0.201                          | HLZ  |
| 449 | P177 HLZ | 138                       | S-025      | S-024     | 150.0            | PVC      | 110.0               | -2.544        | 0.144             | 0.286                          | HLZ  |
| 453 | P178 HLZ | 113                       | S-025      | S-043     | 100.0            | PVC      | 110.0               | 0.440         | 0.056             | 0.080                          | HLZ  |
| 456 | P179 HLZ | 66                        | S-029      | S-028     | 100.0            | PVC      | 110.0               | -1.638        | 0.209             | 0.911                          | HLZ  |
| 458 | P180 HLZ | 65                        | S-029      | S-045     | 100.0            | PVC      | 110.0               | 0.951         | 0.121             | 0.332                          | HLZ  |
| 460 | P181 HLZ | 99                        | S-045      | S-046     | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 467 | P182 HLZ | 23                        | S-033      | S-032     | 100.0            | PVC      | 110.0               | -0.762        | 0.097             | 0.221                          | HLZ  |
| 471 | P183 HLZ | 39                        | S-032      | S-031     | 100.0            | PVC      | 110.0               | -0.586        | 0.075             | 0.136                          | HLZ  |
| 475 | P184 HLZ | 69                        | S-031      | S-030     | 100.0            | PVC      | 110.0               | -1.089        | 0.139             | 0.428                          | HLZ  |
| 476 | P185 HLZ | 109                       | S-030      | S-029     | 100.0            | PVC      | 110.0               | -0.348        | 0.044             | 0.052                          | HLZ  |
| 478 | P186 HLZ | 175                       | S-030      | S-038     | 100.0            | PVC      | 110.0               | -0.741        | 0.094             | 0.210                          | HLZ  |
| 480 | P187 HLZ | 111                       | S-012      | S-013     | 100.0            | PVC      | 110.0               | 1.140         | 0.145             | 0.466                          | HLZ  |
| 486 | P188 HLZ | 366                       | S-001      | S-002     | 100.0            | PVC      | 110.0               | 2.233         | 0.284             | 1.616                          | HLZ  |
| 488 | P189 HLZ | 65                        | S-042      | S-002     | 100.0            | PVC      | 110.0               | -1.119        | 0.142             | 0.449                          | HLZ  |
| 490 | P190 HLZ | 207                       | S-002      | S-003     | 100.0            | PVC      | 110.0               | 0.378         | 0.048             | 0.060                          | HLZ  |
| 491 | P191 HLZ | 20                        | S-003      | B-066     | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 495 | P192 HLZ | 133                       | S-045      | S-047     | 100.0            | PVC      | 110.0               | 0.573         | 0.073             | 0.130                          | HLZ  |
| 496 | P193 HLZ | 118                       | S-047      | S-032     | 100.0            | PVC      | 110.0               | 0.177         | 0.022             | 0.015                          | HLZ  |
| 498 | P194 HLZ | 22                        | S-047      | S-048     | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 500 | P195 HLZ | 176                       | S-043      | S-044     | 100.0            | PVC      | 110.0               | 1.118         | 0.142             | 0.449                          | HLZ  |
| 507 | P196 HLZ | 198                       | S-018      | S-019     | 100.0            | PVC      | 110.0               | 0.769         | 0.098             | 0.224                          | HLZ  |
| 508 | P197 HLZ | 214                       | S-019      | S-009     | 100.0            | PVC      | 110.0               | -0.006        | 0.001             | 0.000                          | HLZ  |
| 510 | P198 HLZ | 250                       | S-019      | S-049     | 100.0            | PVC      | 110.0               | 0.643         | 0.082             | 0.161                          | HLZ  |
| 512 | P199 HLZ | 465                       | S-049      | S-050     | 100.0            | PVC      | 110.0               | 0.643         | 0.082             | 0.161                          | HLZ  |
| 514 | P200 HLZ | 453                       | S-050      | S-051     | 100.0            | PVC      | 110.0               | 0.643         | 0.082             | 0.161                          | HLZ  |
| 516 | P201 HLZ | 25                        | S-038      | S-037     | 100.0            | PVC      | 110.0               | -1.270        | 0.162             | 0.568                          | HLZ  |
| 517 | P202 HLZ | 273                       | S-037      | S-013     | 100.0            | PVC      | 110.0               | -0.627        | 0.080             | 0.154                          | HLZ  |
| 518 | P203 HLZ | 272                       | S-051      | S-037     | 100.0            | PVC      | 110.0               | 0.643         | 0.082             | 0.161                          | HLZ  |
| 521 | P204 HLZ | 141                       | S-031      | S-054     | 100.0            | PVC      | 110.0               | 0.503         | 0.064             | 0.102                          | HLZ  |
| 523 | P205 HLZ | 64                        | S-054      | S-039     | 100.0            | PVC      | 110.0               | 0.187         | 0.024             | 0.016                          | HLZ  |
| 524 | P206 HLZ | 197                       | S-039      | S-040     | 100.0            | PVC      | 110.0               | 0.187         | 0.024             | 0.016                          | HLZ  |
| 526 | P207 HLZ | 192                       | S-033      | S-041     | 100.0            | PVC      | 110.0               | 0.215         | 0.027             | 0.021                          | HLZ  |
| 527 | P208 HLZ | 180                       | S-041      | S-040     | 100.0            | PVC      | 110.0               | 0.229         | 0.029             | 0.024                          | HLZ  |
| 528 | P209 HLZ | 82                        | S-054      | S-041     | 100.0            | PVC      | 110.0               | 0.014         | 0.002             | 0.000                          | HLZ  |
| 531 | P210 HLZ | 109                       | S-052      | S-020     | 100.0            | PVC      | 110.0               | -1.184        | 0.151             | 0.499                          | HLZ  |
| 546 | P211 HLZ | 76                        | B-002      | B-003     | 100.0            | PVC      | 110.0               | 0.614         | 0.078             | 0.148                          | HLZ  |
| 548 | P212 HLZ | 268                       | B-002      | B-009     | 100.0            | PVC      | 110.0               | 0.312         | 0.040             | 0.042                          | HLZ  |
| 549 | P213 HLZ | 110                       | B-009      | B-003     | 100.0            | PVC      | 110.0               | -0.047        | 0.006             | 0.001                          | HLZ  |
| 553 | P214 HLZ | 25                        | B-003      | B-004     | 100.0            | PVC      | 110.0               | 0.567         | 0.072             | 0.127                          | HLZ  |
| 554 | P215 HLZ | 23                        | B-004      | B-010     | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 558 | P216 HLZ | 94                        | B-006      | B-007     | 100.0            | PVC      | 110.0               | 0.163         | 0.021             | 0.013                          | HLZ  |
| 560 | P217 HLZ | 89                        | B-007      | B-011     | 100.0            | PVC      | 110.0               | 0.163         | 0.021             | 0.013                          | HLZ  |
| 561 | P218 HLZ | 193                       | B-011      | B-006     | 100.0            | PVC      | 110.0               | -0.158        | 0.020             | 0.012                          | HLZ  |
| 563 | P219 HLZ | 108                       | B-007      | B-008     | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 568 | P220 HLZ | 152                       | B-012      | B-014     | 100.0            | PVC      | 110.0               | 0.476         | 0.061             | 0.092                          | HLZ  |
| 572 | P221 HLZ | 117                       | B-012      | B-013     | 150.0            | PVC      | 110.0               | -2.063        | 0.117             | 0.194                          | HLZ  |
| 577 | P222 HLZ | 227                       | B-017      | B-016     | 100.0            | PVC      | 110.0               | -0.078        | 0.010             | 0.003                          | HLZ  |
| 580 | P223 HLZ | 187                       | B-016      | B-019     | 100.0            | PVC      | 110.0               | 0.218         | 0.028             | 0.022                          | HLZ  |
| 583 | P224 HLZ | 78                        | B-018      | B-017     | 100.0            | PVC      | 110.0               | 0.432         | 0.055             | 0.077                          | HLZ  |
| 584 | P225 HLZ | 164                       | B-019      | B-018     | 100.0            | PVC      | 110.0               | -0.367        | 0.047             | 0.057                          | HLZ  |
| 590 | P226 HLZ | 141                       | B-024      | B-021     | 100.0            | PVC      | 110.0               | -1.048        | 0.133             | 0.398                          | HLZ  |
| 592 | P227 HLZ | 62                        | B-026      | B-025     | 150.0            | PVC      | 110.0               | 3.545         | 0.201             | 0.528                          | HLZ  |
| 593 | P228 HLZ | 138                       | B-025      | B-023     | 150.0            | PVC      | 110.0               | 1.959         | 0.111             | 0.176                          | HLZ  |
| 601 | P229 HLZ | 31                        | B-023      | B-022     | 150.0            | PVC      | 110.0               | 2.606         | 0.147             | 0.298                          | HLZ  |
| 602 | P230 HLZ | 36                        | B-022      | B-021     | 150.0            | PVC      | 110.0               | 3.080         | 0.174             | 0.407                          | HLZ  |
| 616 | P231 HLZ | 111                       | B-030      | B-029     | 150.0            | PVC      | 110.0               | -0.782        | 0.044             | 0.032                          | HLZ  |
| 618 | P232 HLZ | 62                        | B-031      | B-029     | 150.0            | PVC      | 110.0               | -0.329        | 0.019             | 0.006                          | HLZ  |
| 619 | P233 HLZ | 73                        | B-029      | B-028     | 150.0            | PVC      | 110.0               | -1.111        | 0.063             | 0.062                          | HLZ  |
| 623 | P234 HLZ | 52                        | B-041      | B-037     | 150.0            | PVC      | 110.0               | 5.937         | 0.336             | 1.372                          | HLZ  |
| 624 | P235 HLZ | 60                        | B-037      | B-036     | 150.0            | PVC      | 110.0               | 2.978         | 0.169             | 0.382                          | HLZ  |
| 625 | P236 HLZ | 153                       | B-038      | B-037     | 150.0            | PVC      | 110.0               | -2.449        | 0.139             | 0.266                          | HLZ  |
| 627 | P237 HLZ | 251                       | B-030      | B-032     | 150.0            | PVC      | 110.0               | -0.278        | 0.016             | 0.005                          | HLZ  |
| 631 | P238 HLZ | 150                       | B-039      | B-038     | 150.0            | PVC      | 110.0               | -1.036        | 0.059             | 0.054                          | HLZ  |
| 634 | P239 HLZ | 66                        | B-043      | B-044     | 150.0            | PVC      | 110.0               | -1.123        | 0.064             | 0.063                          | HLZ  |
| 636 | P240 HLZ | 236                       | B-044      | B-045     | 150.0            | PVC      | 110.0               | 0.417         | 0.024             | 0.010                          | HLZ  |
| 640 | P241 HLZ | 210                       | B-049      | B-048     | 100.0            | PVC      | 110.0               | -1.025        | 0.130             | 0.382                          | HLZ  |
| 642 | P242 HLZ | 27                        | B-048      | B-047     | 100.0            | PVC      | 110.0               | -0.258        | 0.033             | 0.030                          | HLZ  |
| 643 | P243 HLZ | 116                       | B-047      | B-044     | 100.0            | PVC      | 110.0               | 1.540         | 0.196             | 0.812                          | HLZ  |
| 646 | P244 HLZ | 115                       | B-046      | B-043     | 200.0            | PVC      | 120.0               | 11.492        | 0.366             | 0.977                          | HLZ  |
| 647 | P245 HLZ | 63                        | B-047      | B-046     | 150.0            | PVC      | 110.0               | -2.194        | 0.124             | 0.217                          | HLZ  |
| 649 | P246 HLZ | 74                        | B-048      | B-050     | 100.0            | PVC      | 110.0               | -0.767        | 0.098             | 0.223                          | HLZ  |
| 651 | P247 HLZ | 101                       | B-050      | B-052     | 100.0            | PVC      | 110.0               | -1.980        | 0.252             | 1.293                          | HLZ  |
| 657 | P248 HLZ | 189                       | B-054      | B-053     | 100.0            | PVC      | 110.0               | -0.787        | 0.100             | 0.234                          | HLZ  |
| 660 | P249 HLZ | 121                       | B-051      | B-046     | 200.0            | PVC      | 120.0               | 13.989        | 0.445             | 1.406                          | HLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node                     | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|------------|-------------------------------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 661 | P250 HLZ | 66                        | B-052      | B-051                         | 150.0            | PVC      | 110.0               | -3.632        | 0.206             | 0.552                          | HLZ  |
| 668 | P251 HLZ | 123                       | B-064      | B-061                         | 100.0            | PVC      | 110.0               | -2.251        | 0.287             | 1.640                          | HLZ  |
| 673 | P252 HLZ | 126                       | B-062      | B-063                         | 100.0            | PVC      | 110.0               | -0.800        | 0.102             | 0.242                          | HLZ  |
| 674 | P253 HLZ | 122                       | B-063      | B-064                         | 100.0            | PVC      | 110.0               | -0.800        | 0.102             | 0.242                          | HLZ  |
| 679 | P254 HLZ | 292                       | B-059      | B-058                         | 100.0            | PVC      | 110.0               | 1.001         | 0.127             | 0.366                          | HLZ  |
| 683 | P255 HLZ | 101                       | B-061      | B-060                         | 150.0            | PVC      | 110.0               | -5.043        | 0.285             | 1.014                          | HLZ  |
| 685 | P256 LLZ | 111                       | B-059      | B-061                         | 100.0            | PVC      | 110.0               | -2.471        | 0.315             | 1.950                          | HLZ  |
| 692 | P257 LLZ | 129                       | B-058      | B-056                         | 100.0            | PVC      | 110.0               | 2.115         | 0.269             | 1.461                          | HLZ  |
| 693 | P258 HLZ | 175                       | B-056      | B-055                         | 100.0            | PVC      | 110.0               | 0.995         | 0.127             | 0.362                          | HLZ  |
| 694 | P259 HLZ | 182                       | B-057      | B-056                         | 100.0            | PVC      | 110.0               | -0.874        | 0.111             | 0.285                          | HLZ  |
| 698 | P260 HLZ | 151                       | B-062      | B-065                         | 100.0            | PVC      | 110.0               | -0.222        | 0.028             | 0.022                          | HLZ  |
| 701 | P261 HLZ | 86                        | B-065      | B-066                         | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 734 | P262 HLZ | 125                       | B-042      | B-041                         | 250.0            | PVC      | 120.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 738 | P263 HLZ | 103                       | B-041      | B-035                         | 250.0            | PVC      | 120.0               | 7.547         | 0.154             | 0.151                          | HLZ  |
| 743 | P264 HLZ | 27                        | B-039      | B-040                         | 150.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 744 | P265 HLZ | 128                       | B-031      | B-032                         | 150.0            | PVC      | 110.0               | 0.527         | 0.030             | 0.015                          | HLZ  |
| 745 | P266 HLZ | 81                        | B-043      | B-055                         | 150.0            | PVC      | 110.0               | -0.868        | 0.049             | 0.039                          | HLZ  |
| 747 | P267 HLZ | 154                       | B-035      | B-034                         | 250.0            | PVC      | 120.0               | 7.547         | 0.154             | 0.151                          | HLZ  |
| 752 | P268 HLZ | 69                        | B-034      | B-033                         | 250.0            | PVC      | 120.0               | 7.547         | 0.154             | 0.151                          | HLZ  |
| 758 | P269 HLZ | 48                        | B-028      | B-027                         | 150.0            | PVC      | 110.0               | 0.360         | 0.020             | 0.008                          | HLZ  |
| 763 | P270 HLZ | 42                        | B-004      | B-005                         | 100.0            | PVC      | 110.0               | 0.567         | 0.072             | 0.127                          | HLZ  |
| 764 | P271 HLZ | 32                        | B-005      | B-006                         | 100.0            | PVC      | 110.0               | 0.567         | 0.072             | 0.127                          | HLZ  |
| 770 | P272 HLZ | 18                        | S-005      | S-053                         | 150.0            | PVC      | 110.0               | 4.151         | 0.235             | 0.707                          | HLZ  |
| 771 | P273 HLZ | 56                        | S-053      | S-014                         | 150.0            | PVC      | 110.0               | 4.151         | 0.235             | 0.707                          | HLZ  |
| 778 | P274 HLZ | 212                       | B-016      | B-020                         | 150.0            | PVC      | 110.0               | -3.397        | 0.192             | 0.488                          | HLZ  |
| 779 | P275 HLZ | 272                       | B-020      | B-026                         | 150.0            | PVC      | 110.0               | -4.002        | 0.226             | 0.661                          | HLZ  |
| 783 | P276 HLZ | 49                        | S-055      | S-NEIGHBOUR<br>HOOD<br>CENTRE | 200.0            | PVC      | 120.0               | 0.493         | 0.016             | 0.003                          | HLZ  |
| 789 | P277 HLZ | 70                        | B-051      | B-077                         | 200.0            | PVC      | 120.0               | -18.017       | 0.573             | 2.247                          | HLZ  |
| 790 | P278 HLZ | 107                       | B-077      | B-060                         | 200.0            | PVC      | 120.0               | -18.017       | 0.573             | 2.247                          | HLZ  |
| 825 | P279 HLZ | 86                        | PRV-2      | Teviot Rd<br>Connection 1     | 250.0            | PVC      | 120.0               | 0.000         | 0.000             | 0.000                          | HLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID   | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|------|----------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 834  | P280 HLZ | 156                       | B-042      | B-079     | 250.0            | PVC      | 120.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 835  | P281 HLZ | 35                        | B-079      | PRV-2     | 250.0            | PVC      | 120.0               | 0.000         | 0.000             | 0.000                          | HLZ  |
| 841  | P282 HLZ | 79                        | B-080      | B-053     | 100.0            | PVC      | 110.0               | 0.915         | 0.117             | 0.310                          | HLZ  |
| 848  | P283 HLZ | 217                       | B-053      | B-081     | 100.0            | PVC      | 110.0               | -0.420        | 0.053             | 0.073                          | HLZ  |
| 849  | P284 HLZ | 77                        | B-081      | B-050     | 100.0            | PVC      | 110.0               | -0.759        | 0.097             | 0.219                          | HLZ  |
| 851  | P285 HLZ | 144                       | B-052      | B-082     | 100.0            | PVC      | 110.0               | 1.425         | 0.181             | 0.704                          | HLZ  |
| 852  | P286 HLZ | 77                        | B-082      | B-080     | 100.0            | PVC      | 110.0               | 1.180         | 0.150             | 0.496                          | HLZ  |
| 961  | P287 HLZ | 61                        | S-044      | S-044a    | 100.0            | PVC      | 110.0               | 0.722         | 0.092             | 0.200                          | HLZ  |
| 962  | P288 HLZ | 148                       | S-044a     | S-028     | 100.0            | PVC      | 110.0               | 0.306         | 0.039             | 0.041                          | HLZ  |
| 976  | P289 HLZ | 136                       | S-042      | S-043     | 100.0            | PVC      | 110.0               | 0.981         | 0.125             | 0.352                          | HLZ  |
| 978  | P290 HLZ | 88                        | B-062      | B-058a    | 100.0            | PVC      | 110.0               | 0.758         | 0.096             | 0.218                          | HLZ  |
| 979  | P291 HLZ | 64                        | B-058a     | B-058     | 100.0            | PVC      | 110.0               | 1.341         | 0.171             | 0.628                          | HLZ  |
| 980  | P292 HLZ | 227                       | B-059      | B-058a    | 100.0            | PVC      | 110.0               | 0.885         | 0.113             | 0.291                          | HLZ  |
| 983  | P293 HLZ | 108                       | B-055b     | B-057     | 100.0            | PVC      | 110.0               | -0.459        | 0.058             | 0.086                          | HLZ  |
| 985  | P294 HLZ | 270                       | B-015      | B-018a    | 100.0            | PVC      | 110.0               | -0.808        | 0.103             | 0.246                          | HLZ  |
| 987  | P295 HLZ | 64                        | B-018      | B-018a    | 100.0            | PVC      | 110.0               | 1.129         | 0.144             | 0.457                          | HLZ  |
| 991  | P296 HLZ | 92                        | B-012      | B-002     | 100.0            | PVC      | 110.0               | 1.360         | 0.173             | 0.645                          | HLZ  |
| 1024 | P297 HLZ | 39                        | B-033      | T-1001    | 250.0            | PVC      | 120.0               | 7.547         | 0.154             | 0.151                          | HLZ  |
| 1025 | P298 HLZ | 50                        | T-1001     | B-026     | 250.0            | PVC      | 120.0               | 7.547         | 0.154             | 0.151                          | HLZ  |
| 1042 | P299 HLZ | 85                        | B-021      | B-021a    | 100.0            | PVC      | 110.0               | 1.787         | 0.227             | 1.070                          | HLZ  |
| 1043 | P300 HLZ | 68                        | B-021a     | B-018     | 100.0            | PVC      | 110.0               | 2.193         | 0.279             | 1.563                          | HLZ  |
| 1044 | P301 HLZ | 236                       | B-024      | B-021a    | 100.0            | PVC      | 110.0               | 0.613         | 0.078             | 0.148                          | HLZ  |
| 1046 | P302 HLZ | 97                        | B-065      | B-064a    | 100.0            | PVC      | 110.0               | -0.222        | 0.028             | 0.023                          | HLZ  |
| 1047 | P303 HLZ | 212                       | B-064a     | B-064     | 100.0            | PVC      | 110.0               | -0.828        | 0.105             | 0.257                          | HLZ  |
| 1052 | P304 HLZ | 72                        | S-013      | S-027a    | 100.0            | PVC      | 110.0               | 0.211         | 0.027             | 0.021                          | HLZ  |
| 1053 | P305 HLZ | 84                        | S-027a     | S-027     | 100.0            | PVC      | 110.0               | -0.242        | 0.031             | 0.026                          | HLZ  |
| 1055 | P306 HLZ | 73                        | S-008      | S-008a    | 100.0            | PVC      | 110.0               | 0.985         | 0.125             | 0.355                          | HLZ  |
| 1056 | P307 HLZ | 153                       | S-008a     | S-034     | 100.0            | PVC      | 110.0               | 0.720         | 0.092             | 0.199                          | HLZ  |
| 1058 | P308 HLZ | 127                       | B-036      | B-036a    | 150.0            | PVC      | 110.0               | 0.796         | 0.045             | 0.033                          | HLZ  |
| 1061 | P309 HLZ | 245                       | B-032      | B-039a    | 150.0            | PVC      | 110.0               | -0.111        | 0.006             | 0.001                          | HLZ  |
| 1062 | P310 HLZ | 59                        | B-039a     | B-039     | 150.0            | PVC      | 110.0               | -0.772        | 0.044             | 0.031                          | HLZ  |
| 1065 | P311 HLZ | 64                        | B-038a     | B-038     | 150.0            | PVC      | 110.0               | -0.960        | 0.054             | 0.047                          | HLZ  |
| 1067 | P312 HLZ | 74                        | B-031      | B-031a    | 150.0            | PVC      | 110.0               | -0.198        | 0.011             | 0.003                          | HLZ  |
| 1068 | P313 HLZ | 107                       | B-031a     | B-038a    | 150.0            | PVC      | 110.0               | -0.960        | 0.054             | 0.047                          | HLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID   | Label    | Length<br>(Scaled)<br>(m) | Start Node                  | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|------|----------|---------------------------|-----------------------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 1070 | P314 HLZ | 68                        | B-036                       | B-028a    | 150.0            | PVC      | 110.0               | 2.182         | 0.123             | 0.215                          | HLZ  |
| 1071 | P315 HLZ | 64                        | B-028a                      | B-028     | 150.0            | PVC      | 110.0               | 1.471         | 0.083             | 0.104                          | HLZ  |
| 1074 | P316 HLZ | 79                        | B-031a                      | B-031b    | 100.0            | PVC      | 110.0               | -0.446        | 0.057             | 0.082                          | HLZ  |
| 1075 | P317 HLZ | 60                        | B-031b                      | B-028a    | 100.0            | PVC      | 110.0               | -0.446        | 0.057             | 0.082                          | HLZ  |
| 1077 | P318 HLZ | 222                       | B-022                       | B-030a    | 150.0            | PVC      | 110.0               | -0.475        | 0.027             | 0.013                          | HLZ  |
| 1078 | P319 HLZ | 171                       | B-030a                      | B-030     | 150.0            | PVC      | 110.0               | -0.588        | 0.033             | 0.019                          | HLZ  |
| 1080 | P320 HLZ | 117                       | B-036a                      | B-025a    | 150.0            | PVC      | 110.0               | 0.551         | 0.031             | 0.017                          | HLZ  |
| 1081 | P321 HLZ | 79                        | B-025a                      | B-025     | 150.0            | PVC      | 110.0               | -1.058        | 0.060             | 0.056                          | HLZ  |
| 1083 | P322 HLZ | 82                        | B-027                       | B-023a    | 150.0            | PVC      | 110.0               | -0.188        | 0.011             | 0.002                          | HLZ  |
| 1084 | P323 HLZ | 79                        | B-023a                      | B-023     | 150.0            | PVC      | 110.0               | 1.081         | 0.061             | 0.058                          | HLZ  |
| 1087 | P324 HLZ | 77                        | B-025a                      | B-023b    | 150.0            | PVC      | 110.0               | 1.608         | 0.091             | 0.122                          | HLZ  |
| 1088 | P325 HLZ | 74                        | B-023b                      | B-023a    | 150.0            | PVC      | 110.0               | 1.269         | 0.072             | 0.079                          | HLZ  |
| 1177 | P326 HLZ | 141                       | B-049                       | B-049a    | 100.0            | PVC      | 110.0               | -0.088        | 0.011             | 0.004                          | HLZ  |
| 1178 | P327 HLZ | 154                       | B-049a                      | B-054     | 100.0            | PVC      | 110.0               | -0.560        | 0.071             | 0.125                          | HLZ  |
| 1180 | P328 HLZ | 68                        | B-045                       | B-045a    | 100.0            | PVC      | 110.0               | -0.017        | 0.002             | 0.000                          | HLZ  |
| 1181 | P329 HLZ | 199                       | B-045a                      | B-049     | 100.0            | PVC      | 110.0               | -0.433        | 0.055             | 0.077                          | HLZ  |
| 1183 | P330 HLZ | 70                        | B-055                       | B-055a    | 100.0            | PVC      | 110.0               | 0.126         | 0.016             | 0.008                          | HLZ  |
| 1184 | P331 HLZ | 127                       | B-055a                      | B-055b    | 100.0            | PVC      | 110.0               | -0.213        | 0.027             | 0.021                          | HLZ  |
| 1186 | P332 HLZ | 81                        | B-014                       | B-014a    | 100.0            | PVC      | 110.0               | 0.192         | 0.024             | 0.017                          | HLZ  |
| 1187 | P333 HLZ | 123                       | B-014a                      | B-015     | 100.0            | PVC      | 110.0               | -0.336        | 0.043             | 0.048                          | HLZ  |
| 1189 | P334 HLZ | 115                       | B-013                       | B-016a    | 150.0            | PVC      | 110.0               | -2.365        | 0.134             | 0.249                          | HLZ  |
| 1190 | P335 HLZ | 82                        | B-016a                      | B-016     | 150.0            | PVC      | 110.0               | -2.875        | 0.163             | 0.358                          | HLZ  |
| 1223 | P337 HLZ | 364                       | S-100                       | S-055     | 250.0            | PVC      | 120.0               | -39.062       | 0.796             | 3.177                          | HLZ  |
| 1225 | P338 HLZ | 43                        | S-001                       | S-100     | 200.0            | PVC      | 120.0               | -16.002       | 0.509             | 1.804                          | HLZ  |
| 1226 | P339 HLZ | 54                        | S-100                       | B-060     | 200.0            | PVC      | 120.0               | 23.060        | 0.734             | 3.549                          | HLZ  |
| 1228 | P340 HLZ | 121                       | Teviot Road<br>Connection 2 | PRV-3     | 250.0            | PVC      | 120.0               | 39.555        | 0.806             | 3.251                          | HLZ  |
| 1229 | P341 HLZ | 36                        | PRV-3                       | S-055     | 250.0            | PVC      | 120.0               | 39.555        | 0.806             | 3.251                          | HLZ  |
| 1231 | P342 HLZ | 140                       | S-004                       | S-105     | 100.0            | PVC      | 110.0               | 2.296         | 0.292             | 1.702                          | HLZ  |
| 1232 | P343 HLZ | 98                        | S-105                       | S-004a    | 100.0            | PVC      | 110.0               | 0.151         | 0.019             | 0.011                          | HLZ  |
| 1234 | P344 HLZ | 71                        | S-105                       | S-110     | 100.0            | PVC      | 110.0               | 2.145         | 0.273             | 1.500                          | HLZ  |
| 1236 | P345 HLZ | 119                       | S-021                       | S-115     | 150.0            | PVC      | 110.0               | -4.550        | 0.257             | 0.838                          | HLZ  |
| 1237 | P346 HLZ | 144                       | S-115                       | S-006     | 150.0            | PVC      | 110.0               | -4.029        | 0.228             | 0.669                          | HLZ  |
| 1238 | P347 HLZ | 40                        | S-110                       | S-115     | 100.0            | PVC      | 110.0               | 0.521         | 0.066             | 0.109                          | HLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)**  
**Pipe Table - Time: 19.00 hours**

| ID   | Label          | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone              |
|------|----------------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|-------------------|
| 1240 | P348 HLZ       | 144                       | S-007      | S-120     | 100.0            | PVC      | 110.0               | 0.138         | 0.018             | 0.009                          | HLZ               |
| 1241 | P349 HLZ       | 112                       | S-120      | S-052     | 100.0            | PVC      | 110.0               | -1.184        | 0.151             | 0.499                          | HLZ               |
| 1249 | P350 HLZ       | 75                        | S-042      | S-024     | 100.0            | PVC      | 110.0               | -0.107        | 0.014             | 0.006                          | HLZ               |
| 755  | P355 HLZ IRRIG | 24                        | B-033      | I-05      | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | HLZ<br>Irrigation |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
LLZ and HLZ Extents - Time: 19.00 hours



**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Junction Table - Time: 19.00 hours**

| Label              | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|--------------------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| B-067              | 44.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.7                   | 39.1                |
| B-068              | 46.0             | 2                                    | 0.340           | <Collection: 2 items>  | 83.7                   | 37.6                |
| B-068a             | 49.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 34.0                |
| B-068b             | 50.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 33.0                |
| B-069              | 50.5             | 2                                    | 0.585           | <Collection: 2 items>  | 83.6                   | 33.0                |
| B-070              | 48.5             | 2                                    | 0.453           | <Collection: 2 items>  | 83.6                   | 35.0                |
| B-071              | 45.3             | 2                                    | 0.491           | <Collection: 2 items>  | 83.6                   | 38.2                |
| B-071a             | 47.0             | 2                                    | 0.246           | <Collection: 2 items>  | 83.6                   | 36.5                |
| B-072              | 50.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 33.0                |
| B-073              | 49.0             | 2                                    | 0.510           | <Collection: 2 items>  | 83.6                   | 34.5                |
| B-074              | 43.5             | 2                                    | 0.359           | <Collection: 2 items>  | 83.6                   | 40.0                |
| B-075              | 49.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 34.0                |
| B-076              | 47.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 36.0                |
| B-078              | 45.0             | 2                                    | 0.396           | <Collection: 2 items>  | 83.6                   | 38.5                |
| I-07               | 35.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.2                   | 49.1                |
| I-SCHOOL           | 40.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.8                   | 43.2                |
| I-SPORT & REC PARK | 36.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.1                   | 48.0                |
| J-269              | 45.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 38.5                |
| J-272              | 43.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 40.4                |
| J-273              | 44.1             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 39.3                |
| J-274              | 45.1             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 38.3                |
| J-275              | 44.7             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 38.7                |
| J-276              | 45.4             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 38.0                |
| J-277              | 45.3             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 38.1                |
| J-288              | 43.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 40.6                |
| J-291              | 38.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.7                   | 45.1                |
| L-001              | 42.5             | 0                                    | 0.000           | <Collection: 0 items>  | 84.6                   | 42.0                |
| L-002              | 42.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.4                   | 42.3                |
| L-003              | 46.0             | 2                                    | 0.340           | <Collection: 2 items>  | 84.2                   | 38.1                |
| L-004              | 49.0             | 2                                    | 0.491           | <Collection: 2 items>  | 83.9                   | 34.9                |
| L-005              | 47.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.7                   | 36.7                |
| L-006              | 45.0             | 2                                    | 0.264           | <Collection: 2 items>  | 83.7                   | 38.7                |
| L-007              | 41.0             | 2                                    | 0.151           | <Collection: 2 items>  | 83.5                   | 42.4                |
| L-008              | 40.5             | 2                                    | 0.528           | <Collection: 2 items>  | 83.7                   | 43.2                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Junction Table - Time: 19.00 hours**

| Label  | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|--------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| L-008a | 35.0             | 2                                    | 0.321           | <Collection: 2 items>  | 83.5                   | 48.4                |
| L-009  | 45.5             | 2                                    | 0.359           | <Collection: 2 items>  | 83.6                   | 38.0                |
| L-010  | 36.5             | 2                                    | 0.548           | <Collection: 2 items>  | 83.4                   | 46.8                |
| L-010a | 41.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.4                   | 42.3                |
| L-012  | 43.0             | 2                                    | 0.378           | <Collection: 2 items>  | 83.5                   | 40.4                |
| L-013  | 38.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.2                   | 46.1                |
| L-014  | 40.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.0                   | 43.9                |
| L-015  | 41.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.8                   | 42.7                |
| L-016  | 41.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.8                   | 42.7                |
| L-017  | 43.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.7                   | 40.6                |
| L-018  | 37.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.1                   | 47.0                |
| L-019  | 31.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.7                   | 52.1                |
| L-020  | 34.0             | 2                                    | 0.264           | <Collection: 2 items>  | 83.6                   | 49.5                |
| L-021  | 38.0             | 2                                    | 0.321           | <Collection: 2 items>  | 83.6                   | 45.5                |
| L-022  | 40.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 43.5                |
| L-023  | 43.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 40.5                |
| L-024  | 45.0             | 2                                    | 0.453           | <Collection: 2 items>  | 83.6                   | 38.5                |
| L-025  | 40.0             | 2                                    | 0.321           | <Collection: 2 items>  | 83.8                   | 43.7                |
| L-026  | 39.0             | 2                                    | 0.284           | <Collection: 2 items>  | 83.7                   | 44.6                |
| L-027  | 37.0             | 2                                    | 0.302           | <Collection: 2 items>  | 83.7                   | 46.6                |
| L-027a | 36.5             | 2                                    | 0.189           | <Collection: 2 items>  | 83.7                   | 47.1                |
| L-028  | 35.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 48.5                |
| L-029  | 40.0             | 2                                    | 0.321           | <Collection: 2 items>  | 83.7                   | 43.6                |
| L-030  | 38.5             | 2                                    | 0.227           | <Collection: 2 items>  | 83.6                   | 45.0                |
| L-031  | 37.5             | 2                                    | 0.208           | <Collection: 2 items>  | 83.6                   | 46.0                |
| L-032  | 42.0             | 2                                    | 0.623           | <Collection: 2 items>  | 83.7                   | 41.6                |
| L-033  | 44.0             | 2                                    | 0.246           | <Collection: 2 items>  | 83.6                   | 39.5                |
| L-034  | 43.0             | 2                                    | 0.396           | <Collection: 2 items>  | 84.4                   | 41.3                |
| L-034a | 45.0             | 2                                    | 0.284           | <Collection: 2 items>  | 84.3                   | 39.1                |
| L-035  | 45.9             | 2                                    | 0.623           | <Collection: 2 items>  | 84.2                   | 38.2                |
| L-035a | 44.3             | 0                                    | 0.000           | <Collection: 0 items>  | 84.2                   | 39.9                |
| L-036  | 47.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.2                   | 37.1                |
| L-037  | 41.5             | 2                                    | 0.387           | <Collection: 2 items>  | 84.2                   | 42.6                |
| L-038  | 49.0             | 2                                    | 0.623           | <Collection: 2 items>  | 84.2                   | 35.1                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Junction Table - Time: 19.00 hours**

| Label     | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|-----------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| L-039     | 39.0             | 2                                    | 0.208           | <Collection: 2 items>  | 84.2                   | 45.1                |
| L-040     | 38.5             | 2                                    | 0.359           | <Collection: 2 items>  | 84.2                   | 45.6                |
| L-040a    | 41.0             | 2                                    | 0.396           | <Collection: 2 items>  | 84.2                   | 43.1                |
| L-041     | 35.5             | 2                                    | 0.302           | <Collection: 2 items>  | 84.2                   | 48.6                |
| L-042     | 44.5             | 0                                    | 0.000           | <Collection: 0 items>  | 83.5                   | 38.9                |
| L-043     | 46.0             | 2                                    | 0.959           | <Collection: 2 items>  | 83.5                   | 37.4                |
| L-044     | 43.5             | 2                                    | 0.227           | <Collection: 2 items>  | 83.5                   | 39.9                |
| L-045     | 41.0             | 2                                    | 0.396           | <Collection: 2 items>  | 84.3                   | 43.2                |
| L-046     | 40.0             | 0                                    | 0.000           | <Collection: 0 items>  | 84.1                   | 44.0                |
| L-047     | 46.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.6                   | 37.5                |
| L-1000    | 35.0             | 2                                    | 0.151           | <Collection: 2 items>  | 83.6                   | 48.5                |
| L-1005    | 46.0             | 2                                    | 0.151           | <Collection: 2 items>  | 83.5                   | 37.5                |
| L-1010    | 42.5             | 2                                    | 0.302           | <Collection: 2 items>  | 83.5                   | 41.0                |
| L-1015    | 46.0             | 2                                    | 0.189           | <Collection: 2 items>  | 83.5                   | 37.5                |
| L-1020    | 44.0             | 2                                    | 0.396           | <Collection: 2 items>  | 83.5                   | 39.4                |
| L-1025    | 38.0             | 2                                    | 1.039           | <Collection: 2 items>  | 84.0                   | 45.9                |
| L-1030    | 35.0             | 2                                    | 0.510           | <Collection: 2 items>  | 83.7                   | 48.6                |
| L-1035    | 36.0             | 2                                    | 0.416           | <Collection: 2 items>  | 83.9                   | 47.8                |
| L-1040    | 37.0             | 2                                    | 0.434           | <Collection: 2 items>  | 83.7                   | 46.6                |
| L-1045    | 32.5             | 2                                    | 0.321           | <Collection: 2 items>  | 83.7                   | 51.1                |
| L-1050    | 40.5             | 2                                    | 0.208           | <Collection: 2 items>  | 83.6                   | 43.0                |
| L-1055    | 41.5             | 2                                    | 0.227           | <Collection: 2 items>  | 83.6                   | 42.0                |
| L-1060    | 39.5             | 2                                    | 0.264           | <Collection: 2 items>  | 83.6                   | 44.1                |
| L-1065    | 40.0             | 2                                    | 0.227           | <Collection: 2 items>  | 83.7                   | 43.6                |
| L-1075    | 41.0             | 2                                    | 0.887           | <Collection: 2 items>  | 83.7                   | 42.6                |
| L-1080    | 38.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.7                   | 45.6                |
| L-1085    | 33.6             | 0                                    | 0.000           | <Collection: 0 items>  | 83.9                   | 50.1                |
| L-1090    | 37.0             | 2                                    | 2.075           | <Collection: 2 items>  | 83.3                   | 46.2                |
| L-ECO-001 | 43.0             | 2                                    | 0.359           | <Collection: 2 items>  | 83.4                   | 40.3                |
| L-ECO-002 | 42.0             | 2                                    | 0.887           | <Collection: 2 items>  | 83.4                   | 41.3                |
| L-ECO-003 | 41.0             | 2                                    | 0.491           | <Collection: 2 items>  | 83.4                   | 42.3                |
| L-ECO-004 | 40.0             | 2                                    | 0.378           | <Collection: 2 items>  | 83.4                   | 43.3                |
| L-ECO-005 | 40.0             | 2                                    | 0.359           | <Collection: 2 items>  | 83.4                   | 43.3                |
| L-ECO-006 | 37.0             | 2                                    | 0.396           | <Collection: 2 items>  | 83.4                   | 46.3                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Junction Table - Time: 19.00 hours**

| Label                   | Elevation<br>(m) | Unit Demand<br>Collection<br><Count> | Demand<br>(L/s) | Unit Demand Collection | Hydraulic Grade<br>(m) | Pressure<br>(m H2O) |
|-------------------------|------------------|--------------------------------------|-----------------|------------------------|------------------------|---------------------|
| L-ECO-008               | 37.0             | 2                                    | 0.416           | <Collection: 2 items>  | 83.4                   | 46.4                |
| L-ECO_007               | 41.0             | 0                                    | 0.000           | <Collection: 0 items>  | 83.4                   | 42.3                |
| L-SCHOOL                | 40.5             | 2                                    | 0.991           | <Collection: 2 items>  | 83.8                   | 43.2                |
| L-SPORT & REC CLUBHOUSE | 45.5             | 2                                    | 0.081           | <Collection: 2 items>  | 83.9                   | 38.4                |
| T-1010                  | 40.3             | 0                                    | 0.000           | <Collection: 0 items>  | 83.9                   | 43.5                |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 119 | P001 LLZ | 26                        | L-016      | L-SCHOOL  | 150.0            | PVC      | 110.0               | 0.991         | 0.056             | 0.050                          | LLZ  |
| 141 | P002 LLZ | 182                       | L-016      | L-017     | 150.0            | PVC      | 110.0               | 3.042         | 0.172             | 0.398                          | LLZ  |
| 178 | P003 LLZ | 75                        | L-005      | L-006     | 100.0            | PVC      | 110.0               | -0.044        | 0.006             | 0.001                          | LLZ  |
| 183 | P004 LLZ | 104                       | L-004      | L-005     | 100.0            | PVC      | 110.0               | 2.386         | 0.304             | 1.827                          | LLZ  |
| 197 | P005 LLZ | 205                       | L-003      | L-004     | 150.0            | PVC      | 110.0               | 5.813         | 0.329             | 1.319                          | LLZ  |
| 198 | P006 LLZ | 215                       | L-008      | L-003     | 100.0            | PVC      | 110.0               | -2.589        | 0.330             | 2.125                          | LLZ  |
| 199 | P007 LLZ | 67                        | L-006      | L-008     | 100.0            | PVC      | 110.0               | -0.308        | 0.039             | 0.041                          | LLZ  |
| 211 | P008 LLZ | 75                        | L-012      | L-007     | 100.0            | PVC      | 110.0               | -0.824        | 0.105             | 0.255                          | LLZ  |
| 224 | P009 LLZ | 71                        | L-036      | L-038     | 100.0            | PVC      | 110.0               | 0.863         | 0.110             | 0.278                          | LLZ  |
| 228 | P010 LLZ | 144                       | L-040      | L-039     | 100.0            | PVC      | 110.0               | -0.438        | 0.056             | 0.079                          | LLZ  |
| 230 | P011 LLZ | 123                       | L-036      | L-037     | 100.0            | PVC      | 110.0               | 0.153         | 0.019             | 0.011                          | LLZ  |
| 232 | P012 LLZ | 89                        | L-039      | L-037     | 100.0            | PVC      | 110.0               | -0.723        | 0.092             | 0.200                          | LLZ  |
| 233 | P013 LLZ | 165                       | L-038      | L-039     | 100.0            | PVC      | 110.0               | -0.078        | 0.010             | 0.003                          | LLZ  |
| 235 | P014 LLZ | 68                        | L-013      | L-018     | 150.0            | PVC      | 110.0               | 5.980         | 0.338             | 1.390                          | LLZ  |
| 249 | P015 LLZ | 18                        | L-015      | L-016     | 150.0            | PVC      | 110.0               | 4.033         | 0.228             | 0.670                          | LLZ  |
| 251 | P016 LLZ | 67                        | L-015      | L-032     | 100.0            | PVC      | 110.0               | 1.812         | 0.231             | 1.098                          | LLZ  |
| 259 | P017 LLZ | 108                       | L-027      | L-025     | 100.0            | PVC      | 110.0               | -1.260        | 0.160             | 0.560                          | LLZ  |
| 260 | P018 LLZ | 63                        | L-025      | L-014     | 100.0            | PVC      | 110.0               | -3.211        | 0.409             | 3.168                          | LLZ  |
| 262 | P019 LLZ | 83                        | L-025      | L-029     | 100.0            | PVC      | 110.0               | 1.631         | 0.208             | 0.903                          | LLZ  |
| 263 | P020 LLZ | 143                       | L-029      | L-032     | 100.0            | PVC      | 110.0               | 0.026         | 0.003             | 0.000                          | LLZ  |
| 265 | P021 LLZ | 77                        | L-020      | L-028     | 100.0            | PVC      | 110.0               | -0.369        | 0.047             | 0.058                          | LLZ  |
| 268 | P022 LLZ | 79                        | L-028      | L-031     | 100.0            | PVC      | 110.0               | 0.758         | 0.096             | 0.218                          | LLZ  |
| 270 | P023 LLZ | 41                        | L-021      | L-022     | 100.0            | PVC      | 110.0               | -0.449        | 0.057             | 0.083                          | LLZ  |
| 271 | P024 LLZ | 75                        | L-022      | L-023     | 100.0            | PVC      | 110.0               | 0.507         | 0.064             | 0.104                          | LLZ  |
| 276 | P025 LLZ | 126                       | L-030      | L-031     | 100.0            | PVC      | 110.0               | 0.191         | 0.024             | 0.017                          | LLZ  |
| 283 | P026 LLZ | 54                        | L-023      | L-024     | 100.0            | PVC      | 110.0               | 0.774         | 0.099             | 0.227                          | LLZ  |
| 286 | P027 LLZ | 124                       | L-042      | L-044     | 100.0            | PVC      | 110.0               | 0.169         | 0.022             | 0.014                          | LLZ  |
| 293 | P028 LLZ | 143                       | L-002      | L-045     | 250.0            | PVC      | 120.0               | 17.282        | 0.352             | 0.702                          | LLZ  |
| 318 | P029 LLZ | 127                       | L-004      | L-009     | 100.0            | PVC      | 110.0               | 2.936         | 0.374             | 2.682                          | LLZ  |
| 319 | P030 LLZ | 215                       | L-009      | L-010     | 100.0            | PVC      | 110.0               | 1.546         | 0.197             | 0.818                          | LLZ  |
| 323 | P031 LLZ | 271                       | L-009      | L-012     | 100.0            | PVC      | 110.0               | 1.031         | 0.131             | 0.386                          | LLZ  |
| 327 | P032 LLZ | 106                       | L-035      | L-036     | 100.0            | PVC      | 110.0               | 1.016         | 0.129             | 0.376                          | LLZ  |
| 342 | P033 LLZ | 260                       | Round Mt   | L-001     | 250.0            | PVC      | 120.0               | 27.832        | 0.567             | 1.696                          | LLZ  |
| 344 | P034 LLZ | 89                        | L-001      | L-002     | 250.0            | PVC      | 120.0               | 27.832        | 0.567             | 1.696                          | LLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node            | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|-----------------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 345 | P035 LLZ | 74                        | L-002                 | L-003     | 150.0            | PVC      | 110.0               | 8.741         | 0.495             | 2.808                          | LLZ  |
| 346 | P036 LLZ | 37                        | L-002                 | L-034     | 100.0            | PVC      | 110.0               | 1.809         | 0.230             | 1.094                          | LLZ  |
| 348 | P037 LLZ | 151                       | L-045                 | L-041     | 250.0            | PVC      | 120.0               | 15.419        | 0.314             | 0.568                          | LLZ  |
| 349 | P038 LLZ | 118                       | L-041                 | L-013     | 250.0            | PVC      | 120.0               | 15.117        | 0.308             | 0.548                          | LLZ  |
| 357 | P039 LLZ | 163                       | L-ECO-002             | L-ECO-003 | 100.0            | PVC      | 110.0               | 0.146         | 0.019             | 0.010                          | LLZ  |
| 359 | P040 LLZ | 191                       | L-ECO-003             | L-ECO-004 | 100.0            | PVC      | 110.0               | -0.345        | 0.044             | 0.051                          | LLZ  |
| 538 | P041 LLZ | 255                       | L-013                 | L-046     | 250.0            | PVC      | 120.0               | 9.137         | 0.186             | 0.216                          | LLZ  |
| 539 | P042 LLZ | 215                       | L-046                 | L-014     | 200.0            | PVC      | 120.0               | 9.137         | 0.291             | 0.639                          | LLZ  |
| 541 | P043 LLZ | 225                       | I-SPORT &<br>REC PARK | L-046     | 200.0            | PVC      | 120.0               | 0.000         | 0.000             | 0.000                          | LLZ  |
| 704 | P044 LLZ | 56                        | B-068                 | B-067     | 150.0            | PVC      | 110.0               | -3.042        | 0.172             | 0.398                          | LLZ  |
| 706 | P045 LLZ | 70                        | B-068                 | B-078     | 100.0            | PVC      | 110.0               | 1.608         | 0.205             | 0.880                          | LLZ  |
| 708 | P046 LLZ | 163                       | B-078                 | B-070     | 100.0            | PVC      | 110.0               | 0.596         | 0.076             | 0.140                          | LLZ  |
| 710 | P047 LLZ | 193                       | B-075                 | B-069     | 100.0            | PVC      | 110.0               | -0.272        | 0.035             | 0.033                          | LLZ  |
| 712 | P048 LLZ | 69                        | B-070                 | B-069     | 100.0            | PVC      | 110.0               | -0.236        | 0.030             | 0.025                          | LLZ  |
| 714 | P049 LLZ | 75                        | B-070                 | B-072     | 100.0            | PVC      | 110.0               | 0.379         | 0.048             | 0.061                          | LLZ  |
| 717 | P050 LLZ | 183                       | B-071                 | B-078     | 100.0            | PVC      | 110.0               | -0.616        | 0.078             | 0.149                          | LLZ  |
| 719 | P051 LLZ | 74                        | B-072                 | B-073     | 100.0            | PVC      | 110.0               | 0.258         | 0.033             | 0.030                          | LLZ  |
| 723 | P052 LLZ | 68                        | B-073                 | B-076     | 100.0            | PVC      | 110.0               | 0.044         | 0.006             | 0.001                          | LLZ  |
| 725 | P053 LLZ | 129                       | L-024                 | L-047     | 100.0            | PVC      | 110.0               | -0.316        | 0.040             | 0.043                          | LLZ  |
| 728 | P054 LLZ | 68                        | B-076                 | B-075     | 100.0            | PVC      | 110.0               | -0.272        | 0.035             | 0.033                          | LLZ  |
| 730 | P055 LLZ | 195                       | B-073                 | B-074     | 100.0            | PVC      | 110.0               | -0.295        | 0.038             | 0.038                          | LLZ  |
| 837 | P056 LLZ | 88                        | L-007                 | L-ECO-001 | 100.0            | PVC      | 110.0               | 1.619         | 0.206             | 0.891                          | LLZ  |
| 855 | P057 LLZ | 49                        | L-020                 | L-1000    | 100.0            | PVC      | 110.0               | 1.609         | 0.205             | 0.881                          | LLZ  |
| 856 | P058 LLZ | 74                        | L-1000                | L-021     | 100.0            | PVC      | 110.0               | 0.757         | 0.096             | 0.218                          | LLZ  |
| 859 | P059 LLZ | 96                        | L-1005                | L-042     | 100.0            | PVC      | 110.0               | 0.681         | 0.087             | 0.179                          | LLZ  |
| 860 | P060 LLZ | 292                       | L-1000                | L-1005    | 100.0            | PVC      | 110.0               | 0.701         | 0.089             | 0.189                          | LLZ  |
| 866 | P061 LLZ | 102                       | L-021                 | L-1010    | 100.0            | PVC      | 110.0               | 0.886         | 0.113             | 0.292                          | LLZ  |
| 869 | P062 LLZ | 82                        | L-024                 | J-269     | 100.0            | PVC      | 110.0               | 0.638         | 0.081             | 0.159                          | LLZ  |
| 871 | P063 LLZ | 174                       | L-1010                | J-269     | 100.0            | PVC      | 110.0               | 0.012         | 0.002             | 0.000                          | LLZ  |
| 873 | P064 LLZ | 68                        | L-1010                | L-1015    | 100.0            | PVC      | 110.0               | 0.571         | 0.073             | 0.129                          | LLZ  |
| 874 | P065 LLZ | 58                        | L-1015                | L-1005    | 100.0            | PVC      | 110.0               | 0.131         | 0.017             | 0.008                          | LLZ  |
| 876 | P066 LLZ | 76                        | J-269                 | L-1020    | 100.0            | PVC      | 110.0               | 0.650         | 0.083             | 0.164                          | LLZ  |
| 877 | P067 LLZ | 151                       | L-1020                | L-044     | 100.0            | PVC      | 110.0               | 0.505         | 0.064             | 0.103                          | LLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Pipe Table - Time: 19.00 hours**

| ID  | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|-----|----------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 878 | P068 LLZ | 133                       | L-1015     | L-1020    | 100.0            | PVC      | 110.0               | 0.252         | 0.032             | 0.028                          | LLZ  |
| 880 | P069 LLZ | 75                        | L-042      | J-272     | 100.0            | PVC      | 110.0               | 0.512         | 0.065             | 0.105                          | LLZ  |
| 884 | P070 LLZ | 76                        | J-273      | L-044     | 100.0            | PVC      | 110.0               | -0.447        | 0.057             | 0.082                          | LLZ  |
| 885 | P071 LLZ | 127                       | J-272      | J-273     | 100.0            | PVC      | 110.0               | 0.031         | 0.004             | 0.001                          | LLZ  |
| 887 | P072 LLZ | 76                        | J-272      | J-274     | 100.0            | PVC      | 110.0               | 0.481         | 0.061             | 0.094                          | LLZ  |
| 891 | P073 LLZ | 76                        | J-275      | J-273     | 100.0            | PVC      | 110.0               | -0.478        | 0.061             | 0.093                          | LLZ  |
| 892 | P074 LLZ | 127                       | J-274      | J-275     | 100.0            | PVC      | 110.0               | 0.008         | 0.001             | 0.000                          | LLZ  |
| 894 | P075 LLZ | 75                        | J-274      | J-276     | 100.0            | PVC      | 110.0               | 0.473         | 0.060             | 0.091                          | LLZ  |
| 895 | P076 LLZ | 141                       | J-276      | L-043     | 100.0            | PVC      | 110.0               | 0.416         | 0.053             | 0.072                          | LLZ  |
| 897 | P077 LLZ | 84                        | L-043      | J-277     | 100.0            | PVC      | 110.0               | -0.543        | 0.069             | 0.118                          | LLZ  |
| 898 | P078 LLZ | 74                        | J-277      | J-275     | 100.0            | PVC      | 110.0               | -0.486        | 0.062             | 0.096                          | LLZ  |
| 899 | P079 LLZ | 123                       | J-276      | J-277     | 100.0            | PVC      | 110.0               | 0.057         | 0.007             | 0.002                          | LLZ  |
| 901 | P080 LLZ | 64                        | L-018      | L-1025    | 150.0            | PVC      | 110.0               | 4.447         | 0.252             | 0.803                          | LLZ  |
| 902 | P081 LLZ | 230                       | L-1025     | L-026     | 100.0            | PVC      | 110.0               | 1.886         | 0.240             | 1.182                          | LLZ  |
| 905 | P082 LLZ | 67                        | L-1030     | L-019     | 100.0            | PVC      | 110.0               | 0.305         | 0.039             | 0.040                          | LLZ  |
| 908 | P083 LLZ | 256                       | L-018      | L-1085    | 100.0            | PVC      | 110.0               | 1.532         | 0.195             | 0.805                          | LLZ  |
| 909 | P084 LLZ | 224                       | L-1085     | L-019     | 100.0            | PVC      | 110.0               | 1.217         | 0.155             | 0.525                          | LLZ  |
| 911 | P085 LLZ | 198                       | L-1025     | L-1035    | 100.0            | PVC      | 110.0               | 1.522         | 0.194             | 0.795                          | LLZ  |
| 912 | P086 LLZ | 160                       | L-1035     | L-1030    | 100.0            | PVC      | 110.0               | 1.422         | 0.181             | 0.701                          | LLZ  |
| 913 | P087 LLZ | 67                        | L-1085     | L-1035    | 100.0            | PVC      | 110.0               | 0.315         | 0.040             | 0.043                          | LLZ  |
| 915 | P088 LLZ | 76                        | L-026      | L-1080    | 100.0            | PVC      | 110.0               | 0.529         | 0.067             | 0.112                          | LLZ  |
| 916 | P089 LLZ | 81                        | L-1080     | L-1030    | 100.0            | PVC      | 110.0               | -0.608        | 0.077             | 0.145                          | LLZ  |
| 918 | P090 LLZ | 110                       | L-028      | L-027a    | 100.0            | PVC      | 110.0               | -1.127        | 0.143             | 0.455                          | LLZ  |
| 919 | P091 LLZ | 76                        | L-027a     | L-027     | 100.0            | PVC      | 110.0               | -0.917        | 0.117             | 0.311                          | LLZ  |
| 922 | P092 LLZ | 93                        | L-1080     | L-1040    | 100.0            | PVC      | 110.0               | 1.137         | 0.145             | 0.463                          | LLZ  |
| 923 | P093 LLZ | 78                        | L-1040     | L-027a    | 100.0            | PVC      | 110.0               | 0.399         | 0.051             | 0.067                          | LLZ  |
| 925 | P094 LLZ | 75                        | L-019      | L-1045    | 100.0            | PVC      | 110.0               | 1.522         | 0.194             | 0.794                          | LLZ  |
| 926 | P095 LLZ | 67                        | L-1045     | L-020     | 100.0            | PVC      | 110.0               | 1.504         | 0.192             | 0.777                          | LLZ  |
| 927 | P096 LLZ | 202                       | L-1040     | L-1045    | 100.0            | PVC      | 110.0               | 0.303         | 0.039             | 0.040                          | LLZ  |
| 929 | P097 LLZ | 85                        | L-031      | L-1050    | 100.0            | PVC      | 110.0               | 0.741         | 0.094             | 0.210                          | LLZ  |
| 930 | P098 LLZ | 76                        | L-1050     | L-022     | 100.0            | PVC      | 110.0               | 0.956         | 0.122             | 0.336                          | LLZ  |
| 932 | P099 LLZ | 86                        | L-030      | L-1055    | 100.0            | PVC      | 110.0               | 0.580         | 0.074             | 0.133                          | LLZ  |
| 933 | P100 LLZ | 79                        | L-1055     | L-033     | 100.0            | PVC      | 110.0               | -0.069        | 0.009             | 0.003                          | LLZ  |
| 934 | P101 LLZ | 116                       | L-1050     | L-1055    | 100.0            | PVC      | 110.0               | -0.422        | 0.054             | 0.074                          | LLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Pipe Table - Time: 19.00 hours**

| ID   | Label    | Length<br>(Scaled)<br>(m) | Start Node | Stop Node                     | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone |
|------|----------|---------------------------|------------|-------------------------------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|------|
| 936  | P102 LLZ | 96                        | L-032      | J-288                         | 100.0            | PVC      | 110.0               | 1.215         | 0.155             | 0.524                          | LLZ  |
| 937  | P103 LLZ | 66                        | J-288      | L-033                         | 100.0            | PVC      | 110.0               | 1.237         | 0.157             | 0.541                          | LLZ  |
| 939  | P104 LLZ | 86                        | L-029      | L-1060                        | 100.0            | PVC      | 110.0               | 1.284         | 0.163             | 0.580                          | LLZ  |
| 940  | P105 LLZ | 68                        | L-1060     | L-030                         | 100.0            | PVC      | 110.0               | 0.998         | 0.127             | 0.363                          | LLZ  |
| 941  | P106 LLZ | 155                       | J-288      | L-1060                        | 100.0            | PVC      | 110.0               | -0.022        | 0.003             | 0.000                          | LLZ  |
| 943  | P107 LLZ | 66                        | L-026      | L-1065                        | 100.0            | PVC      | 110.0               | 1.073         | 0.137             | 0.416                          | LLZ  |
| 946  | P108 LLZ | 105                       | L-1065     | J-291                         | 100.0            | PVC      | 110.0               | 0.361         | 0.046             | 0.055                          | LLZ  |
| 947  | P109 LLZ | 66                        | J-291      | L-027                         | 100.0            | PVC      | 110.0               | -0.041        | 0.005             | 0.001                          | LLZ  |
| 965  | P110 LLZ | 83                        | B-068a     | B-068                         | 100.0            | PVC      | 110.0               | -1.094        | 0.139             | 0.431                          | LLZ  |
| 967  | P111 LLZ | 38                        | B-069      | B-068b                        | 100.0            | PVC      | 110.0               | -1.094        | 0.139             | 0.431                          | LLZ  |
| 968  | P112 LLZ | 71                        | B-068b     | B-068a                        | 100.0            | PVC      | 110.0               | -1.094        | 0.139             | 0.431                          | LLZ  |
| 970  | P113 LLZ | 113                       | B-072      | B-071a                        | 100.0            | PVC      | 110.0               | 0.121         | 0.015             | 0.007                          | LLZ  |
| 971  | P114 LLZ | 131                       | B-071a     | B-071                         | 100.0            | PVC      | 110.0               | -0.125        | 0.016             | 0.008                          | LLZ  |
| 989  | P115 LLZ | 142                       | L-007      | L-008a                        | 100.0            | PVC      | 110.0               | -0.164        | 0.021             | 0.013                          | LLZ  |
| 990  | P116 LLZ | 231                       | L-008a     | L-008                         | 100.0            | PVC      | 110.0               | -1.752        | 0.223             | 1.031                          | LLZ  |
| 999  | P117 LLZ | 179                       | L-037      | L-035a                        | 100.0            | PVC      | 110.0               | -0.957        | 0.122             | 0.337                          | LLZ  |
| 1000 | P118 LLZ | 184                       | L-035a     | L-035                         | 100.0            | PVC      | 110.0               | 0.509         | 0.065             | 0.105                          | LLZ  |
| 1001 | P119 LLZ | 80                        | L-035a     | L-045                         | 100.0            | PVC      | 110.0               | -1.467        | 0.187             | 0.742                          | LLZ  |
| 1032 | P120 LLZ | 65                        | L-014      | T-1010                        | 200.0            | PVC      | 120.0               | 5.926         | 0.189             | 0.287                          | LLZ  |
| 1033 | P121 LLZ | 136                       | T-1010     | L-015                         | 150.0            | PVC      | 110.0               | 5.845         | 0.331             | 1.333                          | LLZ  |
| 1039 | P122 LLZ | 314                       | T-1005     | T-1010                        | 200.0            | PVC      | 120.0               | -0.081        | 0.003             | 0.000                          | LLZ  |
| 1040 | P123 LLZ | 31                        | T-1005     | L-SPORT &<br>REC<br>CLUBHOUSE | 150.0            | PVC      | 110.0               | 0.081         | 0.005             | 0.001                          | LLZ  |
| 1154 | P124 LLZ | 125                       | L-005      | L-007                         | 100.0            | PVC      | 110.0               | 2.430         | 0.309             | 1.890                          | LLZ  |
| 1157 | P125 LLZ | 155                       | L-010      | L-010a                        | 100.0            | PVC      | 110.0               | -0.041        | 0.005             | 0.001                          | LLZ  |
| 1158 | P126 LLZ | 95                        | L-010a     | L-012                         | 100.0            | PVC      | 110.0               | -1.477        | 0.188             | 0.752                          | LLZ  |
| 1161 | P127 LLZ | 117                       | L-010a     | L-ECO-005                     | 100.0            | PVC      | 110.0               | 0.400         | 0.051             | 0.067                          | LLZ  |
| 1162 | P128 LLZ | 171                       | L-ECO-005  | L-ECO-004                     | 100.0            | PVC      | 110.0               | 0.723         | 0.092             | 0.200                          | LLZ  |
| 1163 | P129 LLZ | 109                       | L-ECO-001  | L-ECO-005                     | 100.0            | PVC      | 110.0               | 0.682         | 0.087             | 0.180                          | LLZ  |
| 1167 | P130 LLZ | 272                       | L-ECO-006  | L-ECO-002                     | 100.0            | PVC      | 110.0               | 0.498         | 0.063             | 0.100                          | LLZ  |
| 1169 | P131 LLZ | 259                       | L-ECO-001  | L-ECO_007                     | 100.0            | PVC      | 110.0               | 0.578         | 0.074             | 0.132                          | LLZ  |
| 1170 | P132 LLZ | 238                       | L-ECO_007  | L-ECO-002                     | 100.0            | PVC      | 110.0               | 0.536         | 0.068             | 0.115                          | LLZ  |
| 1171 | P133 LLZ | 74                        | L-ECO-006  | L-ECO_007                     | 100.0            | PVC      | 110.0               | -0.043        | 0.005             | 0.001                          | LLZ  |

**Greenbank (Everleigh) Water Supply Network Model**  
**Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)**  
**Pipe Table - Time: 19.00 hours**

| ID   | Label          | Length<br>(Scaled)<br>(m) | Start Node | Stop Node | Diameter<br>(mm) | Material | Hazen-Williams<br>C | Flow<br>(L/s) | Velocity<br>(m/s) | Headloss<br>Gradient<br>(m/km) | Zone              |
|------|----------------|---------------------------|------------|-----------|------------------|----------|---------------------|---------------|-------------------|--------------------------------|-------------------|
| 1173 | P134 LLZ       | 149                       | L-008a     | L-ECO-008 | 100.0            | PVC      | 110.0               | 1.267         | 0.161             | 0.566                          | LLZ               |
| 1174 | P135 LLZ       | 113                       | L-ECO-008  | L-ECO-006 | 100.0            | PVC      | 110.0               | 0.852         | 0.108             | 0.271                          | LLZ               |
| 1192 | P136 LLZ       | 154                       | L-034      | L-034a    | 100.0            | PVC      | 110.0               | 1.413         | 0.180             | 0.692                          | LLZ               |
| 1193 | P137 LLZ       | 70                        | L-034a     | L-035     | 100.0            | PVC      | 110.0               | 1.129         | 0.144             | 0.457                          | LLZ               |
| 1195 | P138 LLZ       | 262                       | L-038      | L-040a    | 100.0            | PVC      | 110.0               | 0.318         | 0.040             | 0.044                          | LLZ               |
| 1196 | P139 LLZ       | 182                       | L-040a     | L-040     | 100.0            | PVC      | 110.0               | -0.079        | 0.010             | 0.003                          | LLZ               |
| 1198 | P140 LLZ       | 183                       | L-1065     | L-1075    | 100.0            | PVC      | 110.0               | 0.485         | 0.062             | 0.096                          | LLZ               |
| 1199 | P141 LLZ       | 172                       | L-1075     | J-291     | 100.0            | PVC      | 110.0               | -0.402        | 0.051             | 0.068                          | LLZ               |
| 1200 | P142 LLZ       | 25                        | L-017      | B-067     | 150.0            | PVC      | 110.0               | 3.042         | 0.172             | 0.397                          | LLZ               |
| 1201 | P143 LLZ       | 32                        | B-076      | L-047     | 100.0            | PVC      | 110.0               | 0.316         | 0.040             | 0.043                          | LLZ               |
| 1204 | P144 LLZ       | 127                       | L-033      | B-074     | 100.0            | PVC      | 110.0               | 0.922         | 0.117             | 0.314                          | LLZ               |
| 1205 | P145 LLZ       | 67                        | B-074      | L-023     | 100.0            | PVC      | 110.0               | 0.268         | 0.034             | 0.032                          | LLZ               |
| 1247 | P146 LLZ       | 249                       | L-010      | L-1090    | 100.0            | PVC      | 110.0               | 1.038         | 0.132             | 0.392                          | LLZ               |
| 1248 | P147 LLZ       | 250                       | L-1090     | L-010a    | 100.0            | PVC      | 110.0               | -1.037        | 0.132             | 0.390                          | LLZ               |
| 991  | P296 HLZ       | 92                        | B-012      | B-002     | 100.0            | PVC      | 110.0               | 1.360         | 0.173             | 0.645                          | HLZ               |
| 785  | P364 LLZ IRRIG | 19                        | L-041      | I-07      | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | LLZ<br>Irrigation |
| 798  | P366 LLZ IRRIG | 15                        | L-SCHOOL   | I-SCHOOL  | 100.0            | PVC      | 110.0               | 0.000         | 0.000             | 0.000                          | LLZ<br>Irrigation |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes HLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|-------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| B-058 | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 31.4                                            | 14.7                                                       | 0.0                                            | 14.7                                                         | S-016                                          |
| B-043 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 36.9                                            | 16.8                                                       | 0.0                                            | 16.8                                                         | S-016                                          |
| B-003 | 15.000                         | 18.409                            | 15.000                          | 18.409                             | 12.0                                             | 29.1                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| S-005 | 15.000                         | 28.263                            | 15.460                          | 28.722                             | 12.0                                             | 16.1                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-001 | 15.000                         | 30.000                            | 15.341                          | 30.341                             | 12.0                                             | 16.0                                            | 12.7                                                       | 0.0                                            | 12.7                                                         | S-016                                          |
| B-041 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 37.3                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-026 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 46.5                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-023 | 15.000                         | 30.000                            | 15.392                          | 30.392                             | 12.0                                             | 43.7                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| S-055 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 14.8                                            | 13.2                                                       | 0.0                                            | 13.2                                                         | S-016                                          |
| S-015 | 15.000                         | 22.418                            | 15.443                          | 22.860                             | 12.0                                             | 12.0                                            | 12.5                                                       | 0.0                                            | 12.5                                                         | S-016                                          |
| B-016 | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 30.3                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-066 | 15.000                         | 19.635                            | 15.000                          | 19.635                             | 12.0                                             | 30.4                                            | 16.5                                                       | 0.0                                            | 16.5                                                         | S-016                                          |
| S-006 | 15.000                         | 27.681                            | 15.000                          | 27.681                             | 12.0                                             | 16.5                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-027 | 15.000                         | 27.491                            | 15.170                          | 27.662                             | 12.0                                             | 25.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-016 | 15.000                         | 16.247                            | 15.637                          | 16.885                             | 12.0                                             | 12.0                                            | 15.3                                                       | 0.0                                            | 15.3                                                         | S-015                                          |
| S-009 | 15.000                         | 26.529                            | 15.289                          | 26.818                             | 12.0                                             | 16.9                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-007 | 15.000                         | 26.617                            | 15.000                          | 26.617                             | 12.0                                             | 16.3                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-014 | 15.000                         | 25.457                            | 15.273                          | 25.729                             | 12.0                                             | 13.0                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-015                                          |
| S-020 | 15.000                         | 23.582                            | 15.000                          | 23.582                             | 12.0                                             | 12.0                                            | 12.1                                                       | 0.0                                            | 12.1                                                         | S-016                                          |
| S-017 | 15.000                         | 20.375                            | 15.357                          | 20.732                             | 12.0                                             | 18.5                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-018 | 15.000                         | 22.995                            | 15.273                          | 23.268                             | 12.0                                             | 14.0                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-012 | 15.000                         | 27.468                            | 15.205                          | 27.672                             | 12.0                                             | 21.0                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-026 | 15.000                         | 27.569                            | 15.000                          | 27.569                             | 12.0                                             | 27.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-010 | 15.000                         | 27.126                            | 15.392                          | 27.517                             | 12.0                                             | 18.2                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-022 | 15.000                         | 27.613                            | 15.000                          | 27.613                             | 12.0                                             | 25.7                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-008 | 15.000                         | 26.681                            | 15.000                          | 26.681                             | 12.0                                             | 16.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-034 | 15.000                         | 27.247                            | 15.306                          | 27.553                             | 12.0                                             | 23.7                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-011 | 15.000                         | 27.354                            | 15.443                          | 27.797                             | 12.0                                             | 19.2                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-024 | 15.000                         | 27.631                            | 15.273                          | 27.904                             | 12.0                                             | 25.7                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-035 | 15.000                         | 27.530                            | 15.341                          | 27.871                             | 12.0                                             | 25.1                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-036 | 15.000                         | 27.526                            | 15.375                          | 27.900                             | 12.0                                             | 27.6                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-004 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 16.2                                            | 12.1                                                       | 0.0                                            | 12.1                                                         | S-016                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes HLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|-------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| S-021 | 15.000                         | 27.657                            | 15.170                          | 27.827                             | 12.0                                             | 23.3                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-023 | 15.000                         | 27.618                            | 15.000                          | 27.618                             | 12.0                                             | 25.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-028 | 15.000                         | 27.477                            | 15.000                          | 27.477                             | 12.0                                             | 25.3                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-025 | 15.000                         | 27.590                            | 15.000                          | 27.590                             | 12.0                                             | 27.2                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-043 | 15.000                         | 27.664                            | 15.273                          | 27.937                             | 12.0                                             | 24.8                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-029 | 15.000                         | 26.867                            | 15.306                          | 27.173                             | 12.0                                             | 22.6                                            | 12.2                                                       | 0.0                                            | 12.2                                                         | S-016                                          |
| S-045 | 15.000                         | 26.751                            | 15.341                          | 27.092                             | 12.0                                             | 17.0                                            | 12.2                                                       | 0.0                                            | 12.2                                                         | S-016                                          |
| S-046 | 15.000                         | 19.635                            | 15.000                          | 19.635                             | 12.0                                             | 16.7                                            | 14.7                                                       | 0.0                                            | 14.7                                                         | S-016                                          |
| S-032 | 15.000                         | 27.406                            | 15.000                          | 27.406                             | 12.0                                             | 15.1                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-033 | 15.000                         | 24.365                            | 15.494                          | 24.859                             | 12.0                                             | 18.1                                            | 13.1                                                       | 0.0                                            | 13.1                                                         | S-016                                          |
| S-040 | 15.000                         | 23.364                            | 15.375                          | 23.739                             | 12.0                                             | 12.1                                            | 13.5                                                       | 0.0                                            | 13.5                                                         | S-016                                          |
| S-031 | 15.000                         | 27.404                            | 15.000                          | 27.404                             | 12.0                                             | 16.5                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-030 | 15.000                         | 27.382                            | 15.000                          | 27.382                             | 12.0                                             | 21.2                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-038 | 15.000                         | 27.255                            | 15.476                          | 27.731                             | 12.0                                             | 23.9                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-013 | 15.000                         | 27.449                            | 15.273                          | 27.722                             | 12.0                                             | 23.3                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-042 | 15.000                         | 28.011                            | 15.221                          | 28.232                             | 12.0                                             | 21.3                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-002 | 15.000                         | 28.594                            | 15.664                          | 29.258                             | 12.0                                             | 19.9                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-003 | 15.000                         | 19.294                            | 15.341                          | 19.635                             | 12.0                                             | 21.4                                            | 15.0                                                       | 0.0                                            | 15.0                                                         | S-016                                          |
| S-047 | 15.000                         | 27.382                            | 15.357                          | 27.739                             | 12.0                                             | 12.2                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-048 | 15.000                         | 19.635                            | 15.000                          | 19.635                             | 12.0                                             | 22.7                                            | 14.7                                                       | 0.0                                            | 14.7                                                         | S-016                                          |
| S-044 | 15.000                         | 27.560                            | 15.357                          | 27.918                             | 12.0                                             | 21.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-019 | 15.000                         | 24.745                            | 15.119                          | 24.864                             | 12.0                                             | 12.0                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-049 | 15.000                         | 22.203                            | 15.000                          | 22.203                             | 12.0                                             | 13.5                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-050                                          |
| S-051 | 15.000                         | 21.588                            | 15.000                          | 21.588                             | 12.0                                             | 16.3                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-050                                          |
| S-037 | 15.000                         | 27.231                            | 15.000                          | 27.231                             | 12.0                                             | 24.6                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-054 | 15.000                         | 26.944                            | 15.273                          | 27.217                             | 12.0                                             | 12.8                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-040                                          |
| S-039 | 15.000                         | 25.743                            | 15.000                          | 25.743                             | 12.0                                             | 12.6                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-040                                          |
| S-041 | 15.000                         | 26.669                            | 15.000                          | 26.669                             | 12.0                                             | 12.4                                            | 12.1                                                       | 0.0                                            | 12.1                                                         | S-040                                          |
| S-052 | 15.000                         | 24.723                            | 15.000                          | 24.723                             | 12.0                                             | 12.1                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| B-002 | 15.000                         | 18.409                            | 15.392                          | 18.801                             | 12.0                                             | 35.5                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| B-009 | 15.000                         | 18.409                            | 15.324                          | 18.733                             | 12.0                                             | 23.1                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| B-010 | 15.000                         | 18.409                            | 15.000                          | 18.409                             | 12.0                                             | 25.2                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes HLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|-------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| B-004 | 15.000                         | 18.409                            | 15.000                          | 18.409                             | 12.0                                             | 27.3                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| B-006 | 15.000                         | 18.409                            | 15.221                          | 18.630                             | 12.0                                             | 20.0                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| B-007 | 15.000                         | 18.409                            | 15.000                          | 18.409                             | 12.0                                             | 18.1                                            | 17.6                                                       | 0.0                                            | 17.6                                                         | B-008                                          |
| B-011 | 15.000                         | 18.409                            | 15.289                          | 18.698                             | 12.0                                             | 16.3                                            | 18.6                                                       | 0.0                                            | 18.6                                                         | B-008                                          |
| B-008 | 15.000                         | 17.850                            | 15.000                          | 17.850                             | 12.0                                             | 12.0                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| B-012 | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 36.5                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-014 | 15.000                         | 30.000                            | 15.256                          | 30.256                             | 12.0                                             | 24.4                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-015 | 15.000                         | 30.000                            | 15.426                          | 30.426                             | 12.0                                             | 15.4                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-013 | 15.000                         | 30.000                            | 15.273                          | 30.273                             | 12.0                                             | 33.1                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-017 | 15.000                         | 30.000                            | 15.460                          | 30.460                             | 12.0                                             | 19.9                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-019 | 15.000                         | 30.000                            | 15.528                          | 30.528                             | 12.0                                             | 26.5                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-018 | 15.000                         | 30.000                            | 15.238                          | 30.238                             | 12.0                                             | 26.5                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-024 | 15.000                         | 30.000                            | 15.392                          | 30.392                             | 12.0                                             | 35.5                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-021 | 15.000                         | 30.000                            | 15.221                          | 30.221                             | 12.0                                             | 38.4                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-025 | 15.000                         | 30.000                            | 15.476                          | 30.476                             | 12.0                                             | 45.1                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-036 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 33.1                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-022 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 41.5                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-030 | 15.000                         | 30.000                            | 15.426                          | 30.426                             | 12.0                                             | 38.2                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-028 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 37.3                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-031 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 36.0                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-029 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 36.6                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-038 | 15.000                         | 30.000                            | 15.408                          | 30.408                             | 12.0                                             | 28.4                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-037 | 15.000                         | 30.000                            | 15.460                          | 30.460                             | 12.0                                             | 35.4                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-032 | 15.000                         | 30.000                            | 15.324                          | 30.324                             | 12.0                                             | 34.0                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-039 | 15.000                         | 30.000                            | 15.238                          | 30.238                             | 12.0                                             | 26.3                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-044 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 33.8                                            | 16.6                                                       | 0.0                                            | 16.6                                                         | S-016                                          |
| B-045 | 15.000                         | 30.000                            | 15.392                          | 30.392                             | 12.0                                             | 20.2                                            | 16.5                                                       | 0.0                                            | 16.5                                                         | S-016                                          |
| B-049 | 15.000                         | 30.000                            | 15.613                          | 30.613                             | 12.0                                             | 15.1                                            | 13.1                                                       | 0.0                                            | 13.1                                                         | B-049a                                         |
| B-048 | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 26.8                                            | 15.1                                                       | 0.0                                            | 15.1                                                         | B-080                                          |
| B-047 | 15.000                         | 30.000                            | 15.357                          | 30.357                             | 12.0                                             | 30.0                                            | 15.9                                                       | 0.0                                            | 15.9                                                         | B-080                                          |
| B-046 | 15.000                         | 30.000                            | 15.273                          | 30.273                             | 12.0                                             | 32.3                                            | 16.0                                                       | 0.0                                            | 16.0                                                         | S-016                                          |
| B-050 | 15.000                         | 30.000                            | 15.408                          | 30.408                             | 12.0                                             | 21.6                                            | 13.6                                                       | 0.0                                            | 13.6                                                         | B-080                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes HLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label                          | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|--------------------------------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| B-052                          | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 19.3                                            | 13.4                                                       | 0.0                                            | 13.4                                                         | B-080                                          |
| B-053                          | 15.000                         | 22.159                            | 15.494                          | 22.652                             | 12.0                                             | 12.0                                            | 12.8                                                       | 0.0                                            | 12.8                                                         | B-080                                          |
| B-054                          | 15.000                         | 20.142                            | 15.205                          | 20.347                             | 12.0                                             | 12.0                                            | 15.2                                                       | 0.0                                            | 15.2                                                         | B-053                                          |
| B-051                          | 15.000                         | 30.000                            | 15.357                          | 30.357                             | 12.0                                             | 26.3                                            | 15.2                                                       | 0.0                                            | 15.2                                                         | S-016                                          |
| B-064                          | 15.000                         | 30.000                            | 15.562                          | 30.562                             | 12.0                                             | 21.1                                            | 14.2                                                       | 0.0                                            | 14.2                                                         | S-016                                          |
| B-061                          | 15.000                         | 30.000                            | 15.289                          | 30.289                             | 12.0                                             | 23.8                                            | 14.0                                                       | 0.0                                            | 14.0                                                         | S-016                                          |
| B-062                          | 15.000                         | 30.000                            | 15.238                          | 30.238                             | 12.0                                             | 31.4                                            | 14.3                                                       | 0.0                                            | 14.3                                                         | S-016                                          |
| B-063                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 21.9                                            | 14.3                                                       | 0.0                                            | 14.3                                                         | S-016                                          |
| B-059                          | 15.000                         | 30.000                            | 15.528                          | 30.528                             | 12.0                                             | 25.2                                            | 14.4                                                       | 0.0                                            | 14.4                                                         | S-016                                          |
| B-060                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 20.7                                            | 13.7                                                       | 0.0                                            | 13.7                                                         | S-016                                          |
| B-055                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 37.2                                            | 16.4                                                       | 0.0                                            | 16.4                                                         | S-016                                          |
| B-057                          | 15.000                         | 30.000                            | 15.375                          | 30.375                             | 12.0                                             | 21.4                                            | 15.9                                                       | 0.0                                            | 15.9                                                         | S-016                                          |
| B-056                          | 15.000                         | 30.000                            | 15.221                          | 30.221                             | 12.0                                             | 34.0                                            | 15.6                                                       | 0.0                                            | 15.6                                                         | S-016                                          |
| B-065                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 23.2                                            | 14.3                                                       | 0.0                                            | 14.3                                                         | S-016                                          |
| B-042                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 32.3                                            | 18.6                                                       | 0.0                                            | 18.6                                                         | S-016                                          |
| B-035                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 38.0                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| I-02                           | 15.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-040                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 22.6                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-034                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 39.8                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| I-04                           | 15.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-033                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 43.7                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| I-05                           | 15.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-027                          | 15.000                         | 30.000                            | 15.494                          | 30.494                             | 12.0                                             | 40.1                                            | 17.9                                                       | 0.0                                            | 17.9                                                         | S-016                                          |
| B-005                          | 15.000                         | 18.409                            | 15.000                          | 18.409                             | 12.0                                             | 21.8                                            | 18.7                                                       | 0.0                                            | 18.7                                                         | S-016                                          |
| S-053                          | 15.000                         | 27.456                            | 15.000                          | 27.456                             | 12.0                                             | 13.0                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-<br>NEIGHBOURH<br>OOD CENTRE | 30.000                         | 33.929                            | 31.148                          | 35.076                             | 12.0                                             | 15.5                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| B-077                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 26.1                                            | 14.6                                                       | 0.0                                            | 14.6                                                         | S-016                                          |
| B-079                          | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 28.7                                            | 19.5                                                       | 0.0                                            | 19.5                                                         | S-016                                          |
| B-080                          | 15.000                         | 20.123                            | 15.238                          | 20.361                             | 12.0                                             | 12.0                                            | 14.4                                                       | 0.0                                            | 14.4                                                         | B-053                                          |
| B-081                          | 15.000                         | 29.463                            | 15.306                          | 29.770                             | 12.0                                             | 15.9                                            | 12.2                                                       | 0.0                                            | 12.2                                                         | B-053                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes HLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label  | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|--------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| B-082  | 15.000                         | 22.803                            | 15.221                          | 23.024                             | 12.0                                             | 13.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | B-080                                          |
| S-044a | 15.000                         | 27.537                            | 15.375                          | 27.912                             | 12.0                                             | 18.4                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | S-016                                          |
| S-004a | 15.000                         | 19.499                            | 15.136                          | 19.635                             | 12.0                                             | 17.5                                            | 15.0                                                       | 0.0                                            | 15.0                                                         | S-016                                          |
| B-058a | 15.000                         | 30.000                            | 15.273                          | 30.273                             | 12.0                                             | 33.1                                            | 14.5                                                       | 0.0                                            | 14.5                                                         | S-016                                          |
| B-055b | 15.000                         | 30.000                            | 15.221                          | 30.221                             | 12.0                                             | 18.0                                            | 16.1                                                       | 0.0                                            | 16.1                                                         | S-016                                          |
| B-018a | 15.000                         | 24.832                            | 15.289                          | 25.121                             | 12.0                                             | 21.7                                            | 18.2                                                       | 0.0                                            | 18.2                                                         | S-016                                          |
| T-1001 | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-064a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-027a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-008a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-036a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-039a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-038a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-031a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-028a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-031b | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-030a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-025a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-023a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-023b | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-049a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-045a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-055a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-014a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-016a | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-100  | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-105  | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-110  | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-115  | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| S-120  | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes LLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label    | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|----------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| L-002    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 41.0                                            | 33.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-013    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 43.5                                            | 33.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-067    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 29.9                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-005    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 24.5                                            | 27.6                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-020    | 15.000                         | 30.000                            | 15.238                          | 30.238                             | 12.0                                             | 40.7                                            | 30.0                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-021    | 15.000                         | 30.000                            | 15.289                          | 30.289                             | 12.0                                             | 35.1                                            | 28.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-075    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 18.2                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-042    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 18.5                                            | 17.6                                                       | 0.0                                            | 17.6                                                         | L-043                                          |
| L-016    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 35.9                                            | 31.4                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-SCHOOL | 30.000                         | 41.871                            | 32.308                          | 44.179                             | 12.0                                             | 30.7                                            | 27.6                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-017    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 31.6                                            | 30.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-006    | 15.000                         | 30.000                            | 15.238                          | 30.238                             | 12.0                                             | 24.2                                            | 25.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-007    | 15.000                         | 30.000                            | 15.136                          | 30.136                             | 12.0                                             | 27.4                                            | 25.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-004    | 15.000                         | 30.000                            | 15.443                          | 30.443                             | 12.0                                             | 26.9                                            | 29.0                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-010    | 15.000                         | 30.000                            | 15.494                          | 30.494                             | 12.0                                             | 25.4                                            | 24.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-008    | 15.000                         | 30.000                            | 15.476                          | 30.476                             | 12.0                                             | 30.1                                            | 26.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-003    | 15.000                         | 30.000                            | 15.306                          | 30.306                             | 12.0                                             | 34.4                                            | 31.2                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-009    | 15.000                         | 30.000                            | 15.324                          | 30.324                             | 12.0                                             | 22.2                                            | 27.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-012    | 15.000                         | 30.000                            | 15.341                          | 30.341                             | 12.0                                             | 23.7                                            | 25.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-036    | 15.000                         | 29.177                            | 15.000                          | 29.177                             | 12.0                                             | 21.2                                            | 19.6                                                       | 0.0                                            | 19.6                                                         | L-038                                          |
| L-038    | 15.000                         | 28.945                            | 15.562                          | 29.506                             | 12.0                                             | 15.3                                            | 22.1                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-040    | 15.000                         | 28.920                            | 15.324                          | 29.244                             | 12.0                                             | 16.3                                            | 16.7                                                       | 0.0                                            | 16.7                                                         | L-038                                          |
| L-039    | 15.000                         | 28.884                            | 15.187                          | 29.071                             | 12.0                                             | 24.9                                            | 17.6                                                       | 0.0                                            | 17.6                                                         | L-038                                          |
| L-037    | 15.000                         | 28.614                            | 15.349                          | 28.963                             | 12.0                                             | 26.8                                            | 20.6                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-018    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 43.0                                            | 33.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-026    | 15.000                         | 30.000                            | 15.256                          | 30.256                             | 12.0                                             | 35.7                                            | 32.2                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-019    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 43.3                                            | 31.8                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-027    | 15.000                         | 30.000                            | 15.273                          | 30.273                             | 12.0                                             | 38.0                                            | 31.9                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-015    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 36.2                                            | 31.6                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-032    | 15.000                         | 30.000                            | 15.562                          | 30.562                             | 12.0                                             | 33.1                                            | 31.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-033    | 15.000                         | 30.000                            | 15.221                          | 30.221                             | 12.0                                             | 29.8                                            | 30.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-023    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 30.3                                            | 28.9                                                       | 0.0                                            | 19.7                                                         | S-016                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes LLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label                         | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|-------------------------------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| L-025                         | 15.000                         | 30.000                            | 15.289                          | 30.289                             | 12.0                                             | 36.7                                            | 32.2                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-029                         | 15.000                         | 30.000                            | 15.289                          | 30.289                             | 12.0                                             | 35.0                                            | 31.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-028                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 39.6                                            | 30.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-031                         | 15.000                         | 30.000                            | 15.187                          | 30.187                             | 12.0                                             | 36.3                                            | 30.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-022                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 33.7                                            | 28.9                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-030                         | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 35.3                                            | 30.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-043                         | 15.000                         | 24.408                            | 15.865                          | 25.273                             | 12.0                                             | 12.0                                            | 16.3                                                       | 0.0                                            | 16.3                                                         | J-276                                          |
| L-044                         | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 19.0                                            | 17.4                                                       | 0.0                                            | 17.4                                                         | L-043                                          |
| L-024                         | 15.000                         | 30.000                            | 15.408                          | 30.408                             | 12.0                                             | 27.4                                            | 28.2                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-045                         | 15.000                         | 30.000                            | 15.357                          | 30.357                             | 12.0                                             | 41.5                                            | 33.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-SPORT &<br>REC<br>CLUBHOUSE | 30.000                         | 43.991                            | 30.188                          | 44.179                             | 12.0                                             | 24.8                                            | 29.6                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-034                         | 15.000                         | 23.663                            | 15.357                          | 24.021                             | 12.0                                             | 37.6                                            | 32.8                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-014                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 39.4                                            | 33.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-001                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 41.0                                            | 34.1                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-041                         | 15.000                         | 30.000                            | 15.273                          | 30.273                             | 12.0                                             | 46.4                                            | 33.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-ECO-001                     | 15.000                         | 30.000                            | 15.324                          | 30.324                             | 12.0                                             | 21.3                                            | 24.1                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-ECO-002                     | 15.000                         | 30.000                            | 15.800                          | 30.800                             | 12.0                                             | 12.8                                            | 17.2                                                       | 0.0                                            | 17.2                                                         | L-ECO-003                                      |
| L-ECO-003                     | 15.000                         | 28.446                            | 15.443                          | 28.889                             | 12.0                                             | 12.0                                            | 19.0                                                       | 0.0                                            | 19.0                                                         | L-ECO-002                                      |
| L-ECO-004                     | 15.000                         | 30.000                            | 15.341                          | 30.341                             | 12.0                                             | 12.4                                            | 16.7                                                       | 0.0                                            | 16.7                                                         | L-ECO-003                                      |
| L-046                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 40.8                                            | 33.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| I-SPORT &<br>REC PARK         | 30.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| B-068                         | 15.000                         | 30.000                            | 15.306                          | 30.306                             | 12.0                                             | 27.9                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-078                         | 15.000                         | 30.000                            | 15.357                          | 30.357                             | 12.0                                             | 25.6                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-070                         | 15.000                         | 30.000                            | 15.408                          | 30.408                             | 12.0                                             | 22.3                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-069                         | 15.000                         | 30.000                            | 15.528                          | 30.528                             | 12.0                                             | 20.0                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-072                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 20.1                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-071                         | 15.000                         | 30.000                            | 15.443                          | 30.443                             | 12.0                                             | 16.9                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-073                         | 15.000                         | 30.000                            | 15.460                          | 30.460                             | 12.0                                             | 22.6                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-076                         | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 23.7                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes LLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label    | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|----------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| L-047    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 24.2                                            | 29.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-074    | 15.000                         | 30.000                            | 15.324                          | 30.324                             | 12.0                                             | 29.2                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| I-07     | 15.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| I-SCHOOL | 15.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-1000   | 15.000                         | 30.000                            | 15.136                          | 30.136                             | 12.0                                             | 38.2                                            | 28.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1005   | 15.000                         | 30.000                            | 15.136                          | 30.136                             | 12.0                                             | 21.9                                            | 22.8                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1010   | 15.000                         | 30.000                            | 15.273                          | 30.273                             | 12.0                                             | 27.7                                            | 25.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| J-269    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 25.2                                            | 25.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1015   | 15.000                         | 30.000                            | 15.170                          | 30.170                             | 12.0                                             | 23.0                                            | 24.1                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1020   | 15.000                         | 30.000                            | 15.357                          | 30.357                             | 12.0                                             | 24.0                                            | 23.3                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| J-272    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 16.1                                            | 13.8                                                       | 0.0                                            | 13.8                                                         | L-043                                          |
| J-273    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 14.9                                            | 13.7                                                       | 0.0                                            | 13.7                                                         | L-043                                          |
| J-274    | 15.000                         | 28.675                            | 15.000                          | 28.675                             | 12.0                                             | 12.3                                            | 12.1                                                       | 0.0                                            | 12.1                                                         | L-043                                          |
| J-275    | 15.000                         | 28.655                            | 15.000                          | 28.655                             | 12.0                                             | 12.7                                            | 12.0                                                       | 0.0                                            | 12.0                                                         | L-043                                          |
| J-276    | 15.000                         | 26.671                            | 15.000                          | 26.671                             | 12.0                                             | 12.0                                            | 12.2                                                       | 0.0                                            | 12.2                                                         | L-043                                          |
| J-277    | 15.000                         | 26.528                            | 15.000                          | 26.528                             | 12.0                                             | 12.3                                            | 12.1                                                       | 0.0                                            | 12.1                                                         | L-043                                          |
| L-1025   | 15.000                         | 30.000                            | 15.937                          | 30.937                             | 12.0                                             | 41.1                                            | 33.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1030   | 15.000                         | 30.000                            | 15.460                          | 30.460                             | 12.0                                             | 40.0                                            | 32.0                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1085   | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 41.1                                            | 32.8                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1035   | 15.000                         | 30.000                            | 15.375                          | 30.375                             | 12.0                                             | 39.1                                            | 32.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1080   | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 37.2                                            | 31.9                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-027a   | 15.000                         | 30.000                            | 15.170                          | 30.170                             | 12.0                                             | 38.5                                            | 31.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1040   | 15.000                         | 30.000                            | 15.392                          | 30.392                             | 12.0                                             | 37.4                                            | 31.5                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1045   | 15.000                         | 30.000                            | 15.289                          | 30.289                             | 12.0                                             | 42.2                                            | 31.1                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1050   | 15.000                         | 30.000                            | 15.187                          | 30.187                             | 12.0                                             | 33.1                                            | 29.9                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1055   | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 32.1                                            | 30.2                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| J-288    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 31.1                                            | 30.8                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1060   | 15.000                         | 30.000                            | 15.238                          | 30.238                             | 12.0                                             | 34.6                                            | 30.9                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-1065   | 15.000                         | 30.000                            | 15.205                          | 30.205                             | 12.0                                             | 32.2                                            | 32.0                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| J-291    | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 33.8                                            | 32.0                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-068a   | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 19.8                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| B-068b   | 15.000                         | 30.000                            | 15.000                          | 30.000                             | 12.0                                             | 18.8                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |

**Greenbank (Everleigh) Water Supply Network Model**  
**Fire Fighting Report (Ultimate) All Nodes LLZ**  
**Fire Flow Report - Time: 0.00 hours**

| Label     | Fire Flow<br>(Needed)<br>(L/s) | Fire Flow<br>(Available)<br>(L/s) | Flow (Total<br>Needed)<br>(L/s) | Flow (Total<br>Available)<br>(L/s) | Pressure<br>(Residual<br>Lower Limit)<br>(m H2O) | Pressure<br>(Calculated<br>Residual)<br>(m H2O) | Pressure<br>(Calculated<br>Zone Lower<br>Limit)<br>(m H2O) | Pressure<br>(System Lower<br>Limit)<br>(m H2O) | Pressure<br>(Calculated<br>System Lower<br>Limit)<br>(m H2O) | Junction w/<br>Minimum<br>Pressure<br>(System) |
|-----------|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|--------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|
| B-071a    | 15.000                         | 30.000                            | 15.221                          | 30.221                             | 12.0                                             | 16.7                                            | 19.7                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-008a    | 15.000                         | 30.000                            | 15.289                          | 30.289                             | 12.0                                             | 30.6                                            | 26.2                                                       | 0.0                                            | 19.7                                                         | S-016                                          |
| L-035a    | 15.000                         | (N/A)                             | (N/A)                           | (N/A)                              | 12.0                                             | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| T-1010    | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-035     | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-ECO-005 | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-010a    | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-ECO-006 | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-ECO_007 | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-ECO-008 | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-034a    | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-040a    | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-1075    | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |
| L-1090    | 0.000                          | (N/A)                             | (N/A)                           | (N/A)                              | 0.0                                              | (N/A)                                           | (N/A)                                                      | 0.0                                            | (N/A)                                                        | (N/A)                                          |