



Sunshine Coast Regional Council

Maleny Aquatic Centre Services Connection Options and Feasibility Study

July 2018

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1. Introduction

1.1 Project Background

It is understood that Sunshine Coast Council (SCC) is embarking on project feasibility and viability assessments as part of an overall project business case, for a proposed new Aquatic Centre in North Maleny. SCC have identified two potential sites, in close proximity to one another, being:

- Site 1, which is on the south side of North Maleny Road, just west to the North Maleny Road and Obi Lane intersection. Site 1 is directly west of existing residential properties and has a registered power easement A/RP219820 running through it. Refer to Figure 1, (Appendix A) and site photos (Appendix B). It is recommended that the pool and directly associated public infrastructure and services be moved westwards, to take this aspect of the footprint out from being directly under the existing power line and easement. The balance of the infrastructure, such as car parking, filtration units and similar may be able to be placed under the powerline and associated easement, subject to negotiations with Energex (or relevant authorities), if this allows for a practical site layout. The balance of the discussion below is on the understanding that the site is repositioned approximately 80m west of the current proposed location.
- Site 2, is on the south side of Parkland Drive, to the west of the North Maleny Golf Club and with the Obi Creek located immediately to the west. It is in an open area with no residences close to it. Refer to Figure 2 (Appendix A) and site photos (Appendix B).

These two sites are approximately 1km apart, measured as a straight-line connection. Both sites are located on the same parcel of land, being Lot 14/SP287418.

It is understood that this aquatic centre will comprise:

- A 25m pool 8 lane pool, depth 1.2 to 1.8m, which will be heated to 28-30 degrees
- A program pool, (for water aerobics or similar), 17m x 6.3m and constant depth of 1.2m deep, heated to 30-33 degrees
- Public changing and ablution facilities
- An entrance facility and small staff kiosk.

1.2 Purpose of this report

The purpose of this report is to document the feasibility level bulk services connection assessments and the associated difference in the indicative engineering cost estimates to provide bulk water, wastewater, power and road access to each of the two potential development sites identified by SCC, to inform and guide the SCC site selection process.

1.3 Scope and limitations

This report: has been prepared by GHD for Sunshine Coast Regional Council and may only be used and relied on by Sunshine Coast Regional Council for the purpose agreed between GHD and the Sunshine Coast Regional Council as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Sunshine Coast Regional Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on understandings reached and deductions made by GHD as described in this report (refer Section 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Sunshine Coast Regional Council and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has prepared the feasibility level engineering cost estimate set out in Section 7 of this report ("Cost Estimate") using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD as noted throughout this report.

The Cost Estimate has been prepared for the purpose of determining (at a high level and without the benefit of knowing the existing capacity and exact nature of the bulk connecting services), the services construction cost differentials between the two respective options, which therefore does not cover the full potential cost of the bulk service provision, and must not be used for any other purpose.

The Cost Estimate is a partial feasibility level estimate only. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the services connection works can or will be undertaken at a cost which is the same or less than the Cost Estimate.

1.4 Assumptions

No planning, assessment or calculation of the aquatic centre layout, patronage, operations or maintenance regime or similar has been undertaken at this feasibility stage. Therefore, demand loading assessments have been made either based on indicative potential internal services and amenities configurations or GHD previous experience on similar size aquatic centres.

DBYD data (Appendices C & D) has been sourced for all the known services in the immediate vicinity of the site. It has been assumed that this data is accurate and no further checks or verifications have been undertaken. Unitywater's GIS mapping system was also interrogated to identify existing water and sewer services in the vicinity of Site 1 and 2.

The DBYD also noted the existing Unitywater services. Unitywater's GIS mapping provided further information of the sizing and materials of the existing services. The slope, depth, elevation, capacity, and other information is not made available by Unitywater, without the submission of a Development Application.

SCC has also provided GHD with other engineering assessments undertaken in the general vicinity. A review of these reports has indicated that they did not provide any higher level of services detail information to what was gathered from the DBYD, Unitywater mapping reviews and also liaison with both Energex and Unitywater. These reports were also not able to provide any improved information on the capacity of the existing services to service additional development in the investigation area.

This site services connection assessment has been based on a single site visit and also liaison with both Energex and Unitywater and no existing bulk connection investigations (other than the desk top studies above), existing services capacity (other than the desk top studies above), as built information or similar information has been sourced from the bulk service providers. This approach has been at the specific request of SCC, in order to shorten this project feasibility timeframe.

No network assessments, modelling or similar have therefore been undertaken to inform this assessment.

2. Indicative Amenities Configuration

Our understanding of the indicative amenities configuration required to service an aquatic centre with a 25m lap pool and a programme pool would be one that includes for:

- Entrance and kiosk/canteen which will have a HWB, a sink, provision for power supply to a
 hot water system, basic meal warming and hot plate facilities and general LV power and
 lighting
- Public Amenities (As per Building Code of Australia)
 - Male allow 2 WC, 2 urinals, 3 Showers and 2 hand wash basins
 - Female allow 3 WC, 2 hand wash basins and 3 showers
 - PWD allow 2 each off WC, Showers with chair lifts, hand wash basins.
- Staff
 - Allow 1 unisex PWD WC and shower and 1 hand wash basin
- Floodlighting to the pool areas to allow for early morning and twilight use and general external facility lighting
- Electric pool heating, possibly supplemented with solar. The program pool would most likely be enclosed.
- An entrance or road access to the facility and its parking area.

3. Bulk Water Services

3.1 Indicative Water Demands

There are three types of bulk water demand relevant to the bulk services connection for this type of facility:

- The daily water demand of the general facilities (showers, ablutions and similar)
- The water demand for the pool operation and maintenance
- Emergency water demand for firefighting purposes (being a public facility, it is recommended that this facility has a fire hydrant supply in close proximity)

3.1.1 Swimming Pool Operation and Maintenance

The swimming pool will need access to a potable water supply for the filling, regular topping up and backwash of the pool.

Dependant on the patronage and general water quality requirements, a typical public pool can be backwashed as frequently as twice per week, with each backwash consuming approximately 3% of the pool volume.

The approximate volumes of the respective pools are expected to be as follows:

- Lap pool 250 000 I
- Program pool 130 000 I

For the purposes of assessing the sizing of a bulk water connection, it is understood that the filling and /or topping up of these pools would not be undertaken simultaneously. The filling/ topping up after backwash of the lap pool is therefore the critical pool.

Adopting a 3% backwash volume and with replenishment over a maximum period of 3hrs (as advised by GHD pool specialist) translates into a demand rate of approximately 0.69 L/s.

Under this delivery rate, it would take approximately 100hrs to initially fill the lap pool and approximately half that time to fill the program pool.

3.1.2 Fire Provision Services

Fire flow provision is generally considered under the following categories:

- Residential category with a fire flow provision of 15 L/s for 2 hrs
- High density residential or commercial applications with a fire flow provision of 30 L/s for 4hrs
- Rural residential areas, in which case the water utility often only provides for a 7.5 L/s supply flow. The previous engineering assessments in the general vicinity, as provided by SCC, report that the Unitywater feedback was that this supply area is serviced with a rural residential fire capacity provision.

In this instance, it is considered that provision for a 30 L/s fire flow is appropriate however, this should be reviewed in consultation with Unitywater to confirm if a 7.5 L/s rural residential capacity might be suitable. There is also potential for the pool storage volume to supplement the available fire services flow or to provide for on-site storage to provide the full fire flow demand requirements.

The demand flow rate to provide for adequate fire flow far exceeds the flow rate required to operate and maintain the pool facilities. These two demand requirements will not operate simultaneously hence the provision for fire flow is the primary demand requirement.

3.1.3 Pool Amenities / Facilities

As per the discussion above public change room, showers and ablution facilities will be provided.

Building Code of Australia, Class 9b building (sport venues) provides the following guidelines (male and female facilities allowed for):

Table 3-1 Amenities - Indicative Ablution Facilities Required

Description	Male Facilities	Female Facilities	Staff/kiosk	Total
WC's	2	3	1	6
Showers	3	3	0	6
HWB	2	2	2	6
Urinals	2	0	0	2
PWD Facilities	1	1	1	3

Dual flush WC's use between 4 and 8l / flush (more efficient WC's are available), showers of the order of 0.5L/s and HWB and urinals a minimal instantaneous water flow rate demand.

Table 3-2 Amenities - Indicative Peak Water Loadings

Description	Number of Facilities provided	Instantaneous Water Loading (approximate) L/s	Maximum Instantaneous Total Water Loading L/s
WC's	6	0.5	3.0
Showers	6	0.5	3.0
HWB	6	0.2	1.2
Urinals	2	0.25	0.5
PWD Facilities	3	0.75	2.25
TOTAL			9.95

The instantaneous (peak) water loading in the above table assumes all showers, WC's, HWB, urinals are in simultaneous use. Refinement of the design may enable a reduction factor to this loading, but it is considered acceptable to adopt this demand figure to represent potential peak demand for this feasibility level assessment.

It can be seen that that amenities water demand for this facility will have an impact on the bulk water connection considerations.

3.1.4 Summary Bulk Water Demand

The day to day peak water demand of 9.95 L/s would not occur simultaneously with the backwash, pool filling or fire fighting demand.

From the above assessment, it is considered that the provision of a bulk water supply with a demand capacity of at least 30 L/s and at a residual head of 12m at property boundary, will be adequate to service this facility. In order to keep the water velocity at a reasonable limit (<2.5m/s) to keep friction head losses down, and to provide a service which allows for a hydrant connection, it is recommended that for this feasibility assessment level, allowance should be made for a 150mm dia minimum bulk water connection. A fire risk assessment, more detailed building hydraulics assessments and detail network modelling at detail design stage may demonstrate that a reduction in the peak demand and an associated reduction to the supply pipeline diameter may be achievable. This would not have a meaningful change to the feasibility level estimate.

It is also not considered necessary to apply any peak demand loading factors to this demand, as the peak water consumption could be scheduled to take place outside of the peak demand periods for the surrounding water users.

3.2 Proposed Water Servicing Options

3.2.1 Site 1

The DBYD assessment has identified that there is an existing water main along the northern side of North Maleny Road, which terminates approximately 325 m to the west of Site 1.

There is also a 200mm ND PVC water main on the southern side of North Maleny Road, which passes directly in front of Site 1. The previous engineering assessments in the general vicinity, as provided by SCC, identified this to be a dedicated reservoir trunk main.

Unitywater's GIS mapping confirmed the location of the north side water main. The GIS mapping also notes this as being a 100 mm diameter, asbestos cement reticulation water main with a hydrant at the termination point.

The previous engineering assessments in the general vicinity, as provided by SCC, report that "the extension of this water main may exceed its current capacity and be deemed unsuitable by Unitywater." From the available information collected, GHD are unable to infer available capacity or lack thereof at this stage.

For the purposes of this feasibility level site services connection options assessment, GHD have worked on the understanding that the water main and network will have sufficient capacity and head to provide for the bulk water needs to this aquatic facility. In order to provide adequate capacity to Site 1, the preferred connection is to the 200mm ND PVC bulk water supply water main. The proposed connection point on North Maleny Rd is located approximately 3km from the Maleny reservoir. With an elevation difference of approximately 22m between the Maleny reservoir and proposed connection point and an estimated headloss gradient of 5m/km, it is assumed that the proposed connection will not experience significantly high pressure during reservoir filling events. It would be preferable to make this connection using a 150mm ND main, to reduce friction losses as much as possible during fire flow events.

3.2.2 Site 2

Site 2 will require extension of an existing water trunk main. As with Site 1, a connection to the 200mm ND bulk supply main to Maleny reservoir is the preferred connection point to support fire flow requirements. The nearest connection point is located at the intersection of North Maleny Rd and Greenhills Esplanade.

For the purposes of this feasibility level site options assessment, GHD has worked on the understanding that the water main and network has sufficient capacity and head to provide for the bulk water needs to this aquatic facility. A 200mm trunk main extension of approximately 1,010m should be adequate (downgrade offsetting /compensating for friction headloss). No allowance has been made for routing this main through any proposed future development area. This would terminate at a metered connection as per that proposed for the Site 1 alternative.

3.3 Water Services Sustainability Considerations

There are a number of water sustainability alternatives that could be investigated and adopted for this site. They will only augment bulk water connection requirements and would not be able to replace it, particularly as the peak utilities service demand of approximately 10 L/s and the fire fighting demand of 30 L/s are of a similar magnitude.

The following water sustainability options are considered possible:

- Rainwater harvesting, for toilet use
- Backwash water harvesting for toilet flushing reuse
- Use of pool storage to supplement fire fighting demand requirements

These options have not been investigated further.

4. Bulk Wastewater Services

4.1 Indicative Wastewater Loading

Wastewater loadings are triggered by the:

- the water discharged via the backwash process for the pools
- · wastewater loading from the public amenities within the aquatic centre

The fire service water demand loading will obviously not contribute to wastewater loading.

4.1.1 Backwash loading

The pool water backwash discharge is considered to be of trade waste quality, as it will contain elevated levels of chlorine, sediments and fats (from sunscreens and similar). As noted above, dependant on the patronage and general water quality requirements, a typical public pool would require backwashing as frequently as twice per week, with each backwash consuming approximately 3% of the pool volume.

In this instance, the pool backwashing requirements will result in a discharge of approximately 3% of (750 000+130 000) x 2 = 52 800 L of backwash per week. Backwashing is required to be undertaken at high flow rates and a discharge flow rate of the order of 10-20 L/s could be expected. These loadings are dependent on the pool filtration system design and the pool water quality and are indicative only at this stage.

4.1.2 Amenities Wastewater Loading

Adopting the indicative water usage figures presented above and using then to guide the peak amenities wastewater loading, the approximate peak wastewater loadings (assuming all facilities operating simultaneously) for this facility would be as shown in the table below.

Table 4-1 Amenities - Indicative Wastewater Loadings

Description	Number of Facilities provided	Instantaneous Wastewater Loading (approximate) L/s	Maximum Instantaneous Total Wastewater Loading L/s
WC's	6	0.75	4.5
Showers	6	0.5	3
HWB	6	0.25	1.5
Urinals	2	0.25	0.5
PWD Facilities	3	0.75	2.25
TOTAL			11.75

4.1.3 Summary of Bulk Wastewater Loadings

The backwashing and amenities wastewater loadings would be scheduled not to occur simultaneously by mandating that backwashing is scheduled to occur after operating hours as a condition of the approval process. It is therefore only necessary to consider larger of the average flows from these two loadings in order to size the wastewater connection requirements.

For the purposes of this feasibility assessment, a peak wastewater discharge loading of 11.75 L/s has been adopted. These calculations should be revisited as part of detailed planning and design considerations.

4.2 Proposed Wastewater Servicing Options

4.2.1 Overview

The proposed works have been considered in isolation for the purpose of providing estimated servicing options. These servicing options will be subject to future master planning for the broader Maleny community.

Additionally, no assessment has been undertaken to evaluate the existing and planned capacity in the Maleny network. Detailed network analysis should be undertaken to determine the impacts of proposed works on the broader Maleny network.

The immediate areas surrounding both sites do not have a sewered wastewater network. The surrounding houses and the golf course use on site wastewater disposal systems. The previous engineering reports in the general vicinity, as provided by SCC, confirm this assessment.

On site wastewater disposal for this facility may be suitable for the treatment and disposal of the amenities waste. However, on site treatment may not be ideal for the disposal of the backwash waste, due to the contamination of this waste stream with fats, a high sediment load and high residual chlorine load, all of which will negatively affect the biological treatment processes of an on-site disposal system unless pre-treatment process are included in the treatment train.

GHD experience is that the capital cost of setting up an on-site backwash wastewater treatment facility which caters for the treatment and removal of the fat contaminants is generally not cost effective. This could however be investigated further as part of the detailed design considerations. This assessment will have no impact in the comparative assessment of the Site 1 or 2 bulk services connection options as considered in this report, as both options would require the same treatment considerations.

4.2.2 Site 1

There are gravity sewer network facilities servicing the residential subdivision to the west of this site. It is possible that the pump station this network is discharging to may not have adequate capacity to support the 11.75 L/s peak discharge assumed to be the critical flow. In lieu of a detailed planning exercise, a conservative assumption has been applied which allows for a sewer connection direct to the Maleny Sewage Treatment Plant. Hence, a new sewer connection of the order of 2,400m (allowing for the sewer line to skirt the existing remnant vegetated area) has been included.

Available broad interval contour information indicates that there would most likely be insufficient grade along this line alignment to allow for a gravity only sewer connection.

This should be reassessed at the detailed design stage, but for the purpose of this assessment, it is assumed that the following indicative sewer service connection regime would apply to this site:

- Internal gravity sewer reticulation within the facility to a receiving wet well lift pump station.
- Wet well and low lift pump station to the inlet works. Sizing of the wet well to allow temporary buffer storage to smooth out the peak discharge loadings should be allowed for. This will also permit the sizing of the associated pump and rising main to be reduced. A wet well volume of 10kL has been allowed for.
- An OD 110mm PE rising main length of approximately 2400m (adopting a peak discharge rate of the order of 12L/s) should be sufficient. It is proposed that the existing sewer easement to the treatment plant is used. Directional drilling will be required to cross Obi Obi Creek to reach treatment plant.
- A new purpose constructed discharge manhole to receive the peak discharge and adequately dissipate the energy.

4.2.3 Site 2

As with Site 1, there are no existing nearby gravity sewer services connections available and the site is down grade of the nearest developments.

There is a sewerage rising main within the associated easement along the northern bank of the Obi Obi Creek, approximately 150m south of this site. It may possible to connect a new rising main connection into this existing rising main. However, it is considered unlikely that Unitywater would accept this approach, when a possible gravity sewer connection option to their network is possible. This option has therefore been discounted from further assessment.

For the purposes of this assessment, a solution similar to that proposed for Site 1 is proposed. In the case of Site 2, a new transfer main to the treatment plan will be required. The following indicative connection arrangement is proposed (Refer to Figure 2):

- Internal gravity sewer reticulation within the facility to a receiving wet well lift pump station
- Wet well and low lift pump station to the inlet works. Sizing of the wet well to allow temporary buffer storage to smooth out the peak discharge loadings should be allowed for. This will also permit the sizing of the associated pump and rising main to be reduced. A wet well volume of 10kL has been allowed for. A OD110 PE rising main with an approximate length of 930m (adopting a discharge rate of the order of 12 L/s) should be sufficient
- A new purpose constructed discharge manhole to receive the peak discharge and adequately dissipate the energy.

4.3 Wastewater Services Sustainability Considerations

While on-site wastewater treatment has not been considered as part of this feasibility assessment, there are aspects of these site locations that do lend themselves to the consideration of possible sustainability considerations. These include:

- The potential to use either harvested rainwater or a proportion of the backwash water for toilet water reuse
- The potential to discharge the backwash water and any on site treated blackwater, to the golf course or the adjacent wetland area, subject to initial temporary storage to allow for residual chlorine to dissipate.

5. Bulk Electrical Services

5.1 Indicative Electrical Services Requirements

SCC have advised that:

- Lap pool and program pool will be heated. For this assessment, it has been assumed that
 this heating will be either totally via electrical sources or supplemented from solar heating
- Facility flood lighting and access lighting to allow for early morning and twilight pool use is required.

Balance of facility power requirements are for LV pool pump operation, food preparation and lighting.

In addition, our wastewater assessments have indicated that a low lift pump station will be required to allow for the discharge of the wastewater from this site.

5.2 Proposed Electrical Supply Servicing Options

These combined electrical loadings trigger the need for connection to the nearby HV supply, the provision of a padmount transformer and similar considerations.

The only meaningful difference in the provision of the electrical services connection between Site 1 and 2 would be the distance away from the HV line connection in the case of Site 2.

Enquiries with Energex have confirmed that the existing HV supply network cannot accommodate the requested supply in its current configuration and that a network upgrade is required to provide the required load. Energex are able to provide further details of the network upgrade required and it is recommended that this be undertaken as part of the detailed design. Electrical Supply Sustainability Considerations.

The following are possible sustainability options which have not been considered, but which may warrant consideration as part of the detail design:

- The use of active solar power for the pool heating
- The use of solar panels for the supplementation of the complex lighting and other power requirements.

6. Road Access

6.1 Site 1 Access

Access to Site 1 will be directly off North Maleny Road. North Maleny Road is an existing 6m wide two lane sealed road with a vegetated swale drain type shoulder on each side.

The entrance access and intersection would be an at grade intersection with adequate line of sight in both directions.

It is the current understanding of GHD that North Maleny Road is considered to have a low traffic volume. The additional traffic volume generated by this aquatic complex is also expected to be low, and are not expected to have a meaningful impact on the overall traffic volumes of the road network in this area.

However, given the existing narrow pavement width of North Maleny Road, it is considered necessary to provide a suitable safe access entrance facility. It is proposed that an appropriate design using intersection throat widening to the aquatic centre entrance should facilitate safe and quick entry and exit to this facility.

At this stage of the assessment, there is no compelling reason to consider the provision of BAL or BAR treatments on North Maleny Road (the major road).

6.2 Site 2 Access

Access to Site 2 will be along Porters Lane, with an access alignment to the east of the newly constructed Military Museum building. It was originally proposed to take the access off Parkland Drive to the west of the museum building, to provide a shorter access road length. However current assessments indicate that there is insufficient width available to avoid proximity clashes with the building and /or the building on site waste disposal system.

Porters Lane which provides access to the Golf Club, has a seal width of approximately 8m. It is the understanding that the existing traffic volumes on this road would be minimal.

A 160m long access road off Porters Lane will need to be provided to connect to the proposed aquatic centre car park. A 6m wide sealed pavement with no K & C has been adopted for the purposes of developing an indicative cost.

7. Indicative Services Connection Estimates

7.1 Estimate Basis

In developing high-level option selection engineering cost estimates, the process has targeted comparative and site specific elements of the service connections under consideration and no allowance has been made for the following:

- Site assessment costs, survey costs or similar
- Planning and design costs
- Easement survey or registration
- Contractor Preliminary and General costs
- Provision for traffic
- Erosion and sediment control, drainage considerations, site bulk or general earthworks, fencing, road lighting, pathways and similar
- Abnormal services construction costs such as excavation in rock, unsuitable material or similar
- Any of the other site construction elements (parking area, buildings, pools, and associated works)
- Services application and connection fees charged by the utility providers
- Contingencies or any other sundry costs and charges.

Estimates have been developed using industry standard rates. Where insufficient existing information is available to provide a unit rate, a provisional sum estimate is made, based on previous similar projects undertaken by GHD. No allowance has been made to provide any uplift or adjustment to any unit rates or lump sum element estimates, where these have been sourced from projects outside of the SCC delivery area.

Table 7-1 and Table 7-2 present a breakdown in costs in terms of water, sewer, power and road access for Site 1 and 2 respectively.

Table 7-1 Site 1: Services Connection Estimate

Item	Description	Unit	Quantity	Rate (\$/unit)	Total (\$)
1	Water Services Connection	Estimated works	1		25,000
2	Wastewater Services Connection	Estimated works	1		991,000
3	Electrical Services Connection	Provisional Sum	1		100,000
4	Road Access Connection	m ²	270	100.00	27,000
	TOTAL				1,143,000

Table 7-2 Site 2: Services Connection Estimate

Item	Description	Unit	Qty	Rate (\$/unit)	Total (\$)
1.1	Water Services Connection	Estimated works	+		289,000
2.1	Wastewater Services Connection	Estimated works	*		772,000
3	Electrical Services Connection (includes for extra HV connection line)	Provisional Sum	1		220,000
4	Road Access Connection (no K & C, drainage or similar allowed for)	m²	1,120	90.00	100,800
	TOTAL				1,381,800

7.2 Summary of Services Connection Cost Estimate Considerations

The provision of services connections to Site 2 is higher than the provision of equivalent service connections to Site 1 as a result of the following:

- Longer distance to bulk supply connections for water and power
- Increased road access costs
- Increased electrical connection cost as a result of the need to extend the existing HV line to the new site.

8. Conclusion

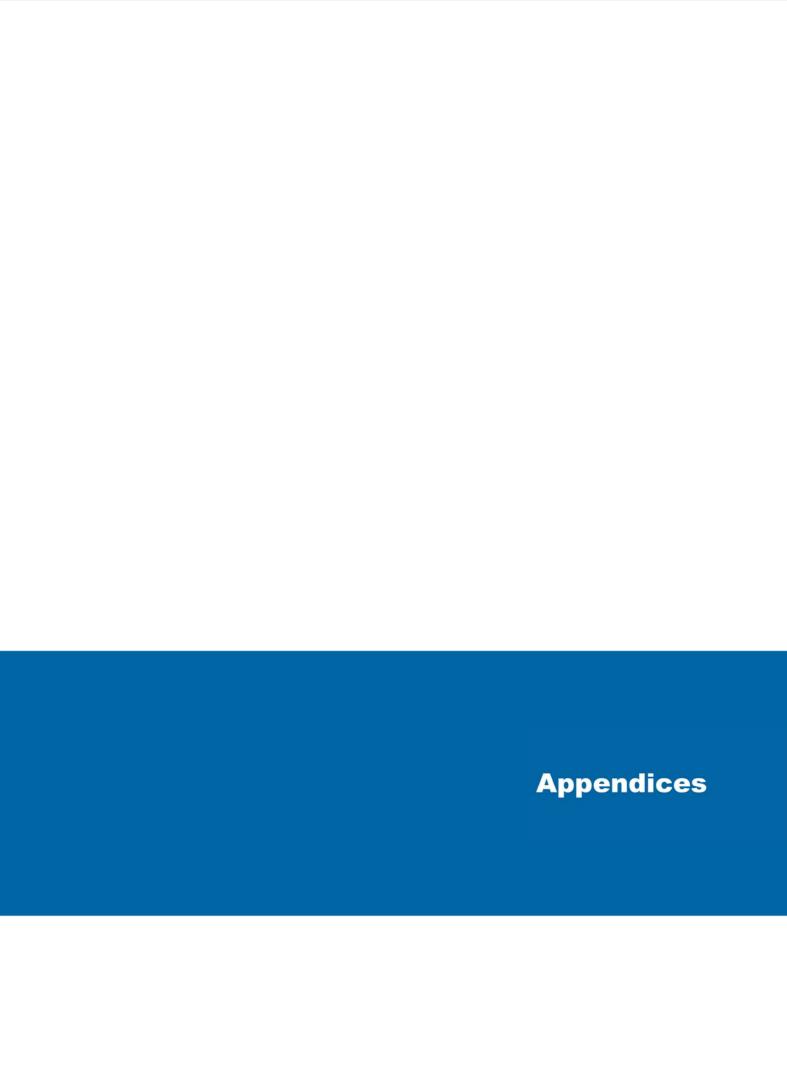
Preliminary servicing options for two potential sites for the proposed Maleny Aquatic Centre have been prepared on behalf of SCC.

These servicing options will be subject to Unitywater's future master planning for the broader Maleny community and hence future network analysis should be undertaken to determine the impact of the proposed works.

Table 8-1 provides a summary of the estimated costs to service to the proposed Maleny Aquatic Centre and an indication of the key cost differences between the two sites. The total capital costs are \$1,143,000 and \$1,381,800 for Site 1 and 2 respectively.

Table 8-1 Site 1 and 2 Services Cost Comparison

Item	Description	Site 1	Site 2
1	Water Services Connection	25,000	289,000
2	Wastewater Services Connection	991,000	772,000
3	Electrical Services Connection	100,000	220,000
4	Road Access Connection	27,000	100,800
	TOTAL	1,143,000	1,381,800



Appendix A - Figures

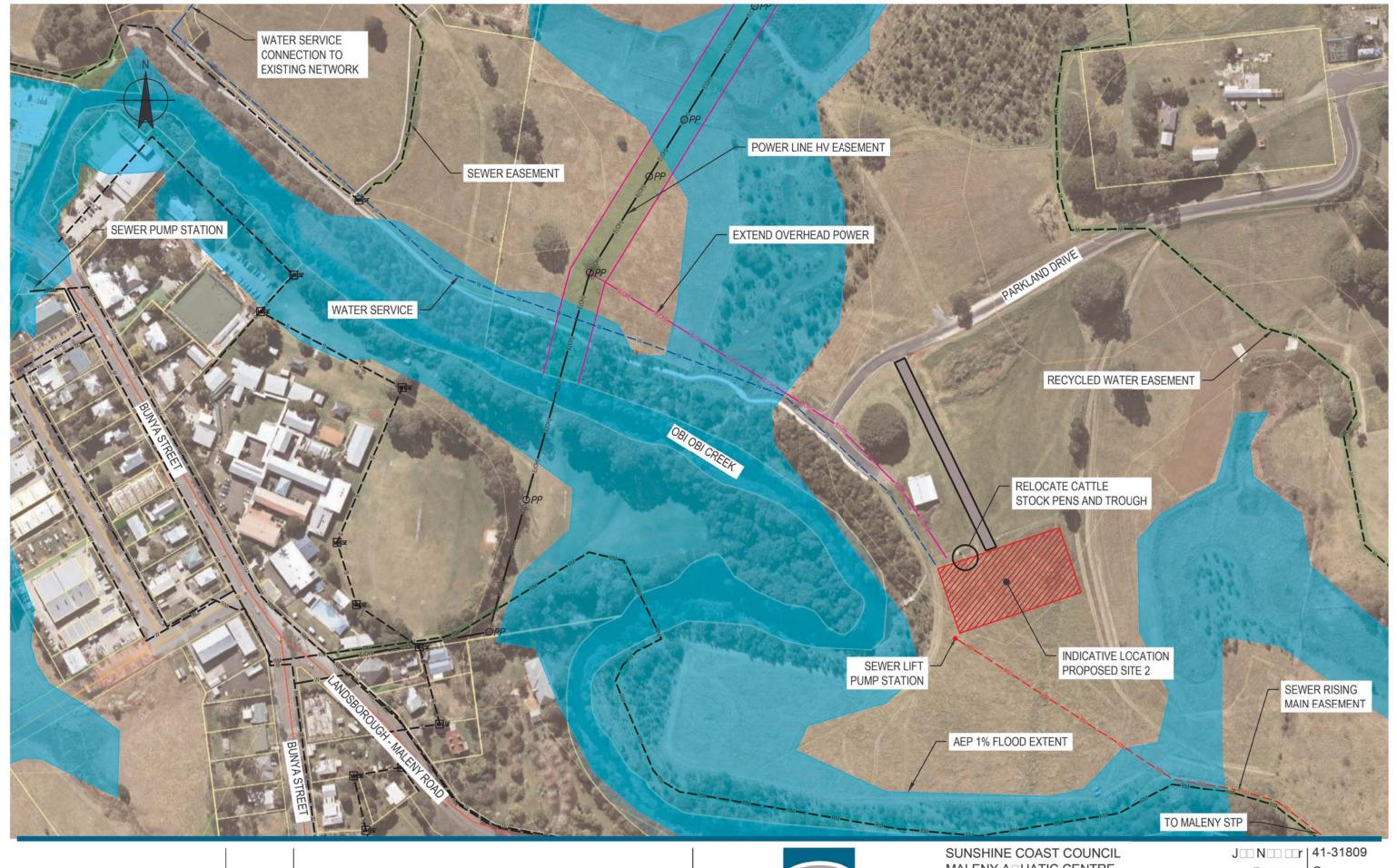






SUNSHINE COAST COUNCIL MALENY A UATIC CENTRE FEASIBILITY STUDY SCHEMATIC LAYOUT PLAN SITE 1

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MALENY A UATIC CENTRE FEASIBILITY STUDY SCHEMATIC LAYOUT PLAN SITE 2

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Appendix B – Site Photos

Appendix B – Site Photos

Site 1





View of access road to Site 1



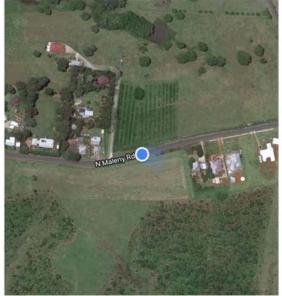
View of access road to Site 1



View of remnant vegetated area



View of access road to Site 1



View of entrance to Site 1



View of entrance to Site 1



View from northeast corner of Site 1



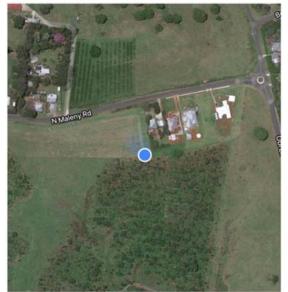
View from northeast corner of Site 1



View from northeast corner of Site 1



View from northeast corner of Site 1



View from southeast corner of Site 1



View from southeast corner of Site 1



View from northwest corner of Site 1



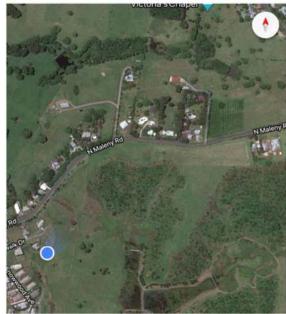
View from northwest corner of Site 1



View of Energex poles through North Maleny Road



View of Energex poles through North Maleny Road



Sanitary sewer at subdivision to west of Site 1



Sanitary sewer at subdivision to west of Site 1



Sanitary sewer at subdivision to west of Site 1

Appendix B – Site Photos

Site 2



Porters Lane view of Site 2



Porters Lane view of Site 2



Existing access road to Site 2



Porters Lane view of Site 2



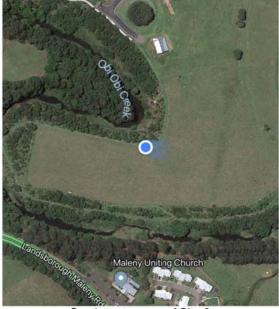
Existing access road to Site 2



Full view of Porters Lane



Full view of Porters Lane



Southwest corner of Site 2



Southwest corner of Site 2



View from northeast corner of Site 2



View from northeast corner of Site 2



View from northeast corner of Site 2



View from northeast corner of Site 2



View of Porters Lane from Site 2



View of Porters Lane from Site 2



View of existing Energex corridor



View of existing Energex corridor

Appendix C – Dial Before You Dig – Site 1

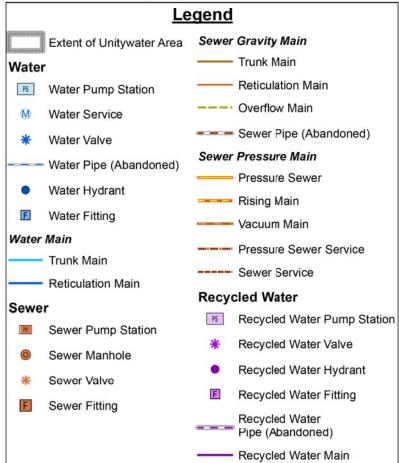


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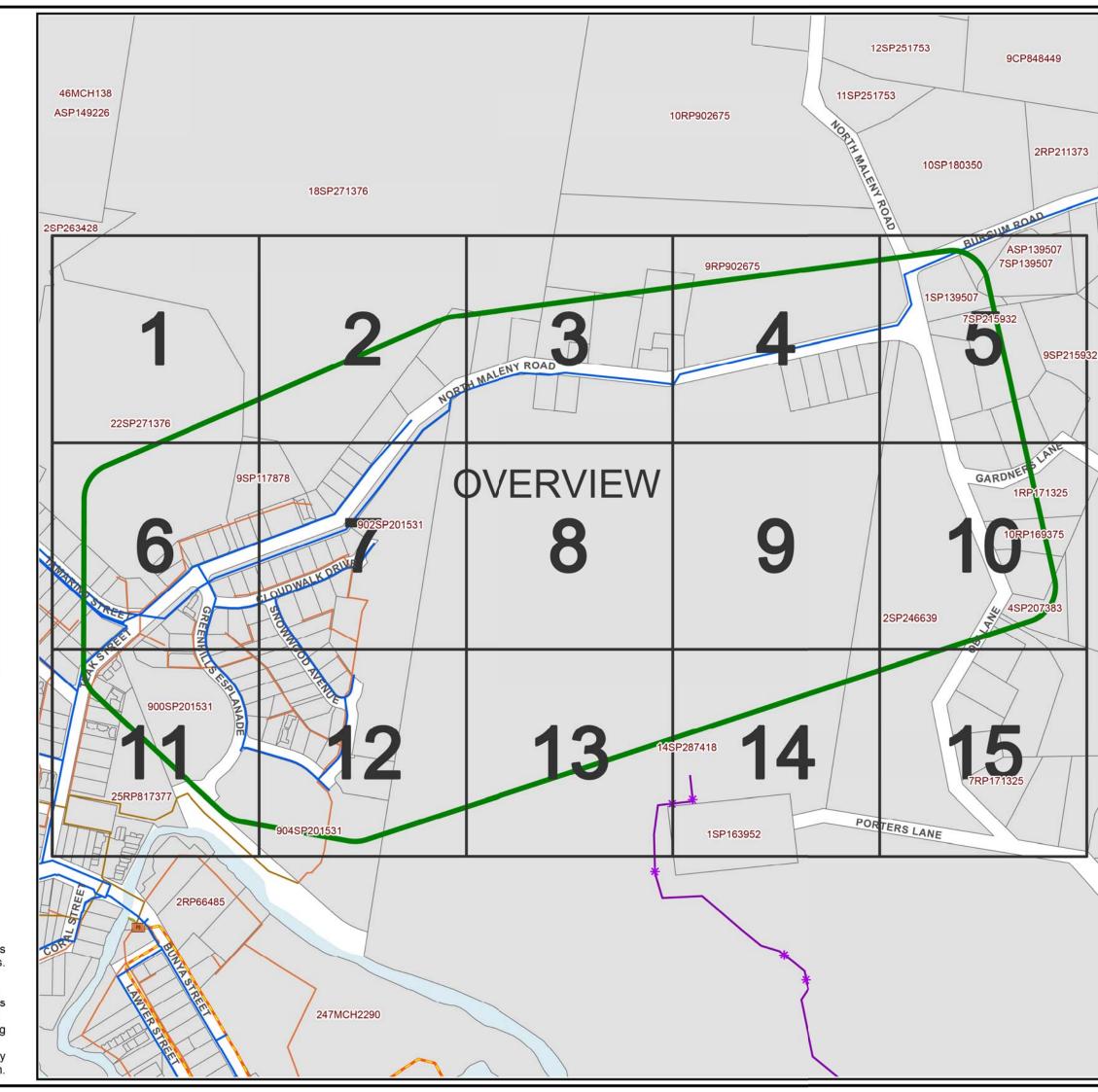
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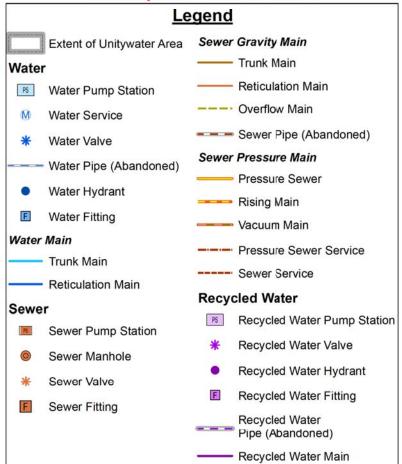
UNITYWATER DBYD MAP

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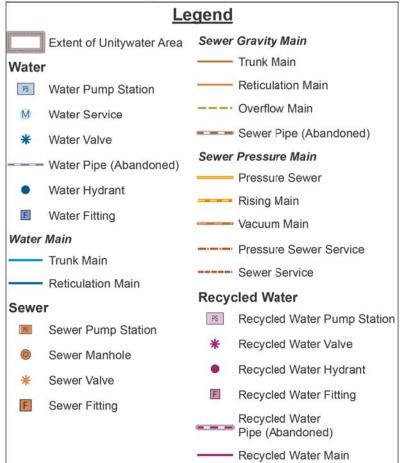
UNITYWATER DBYD MAP

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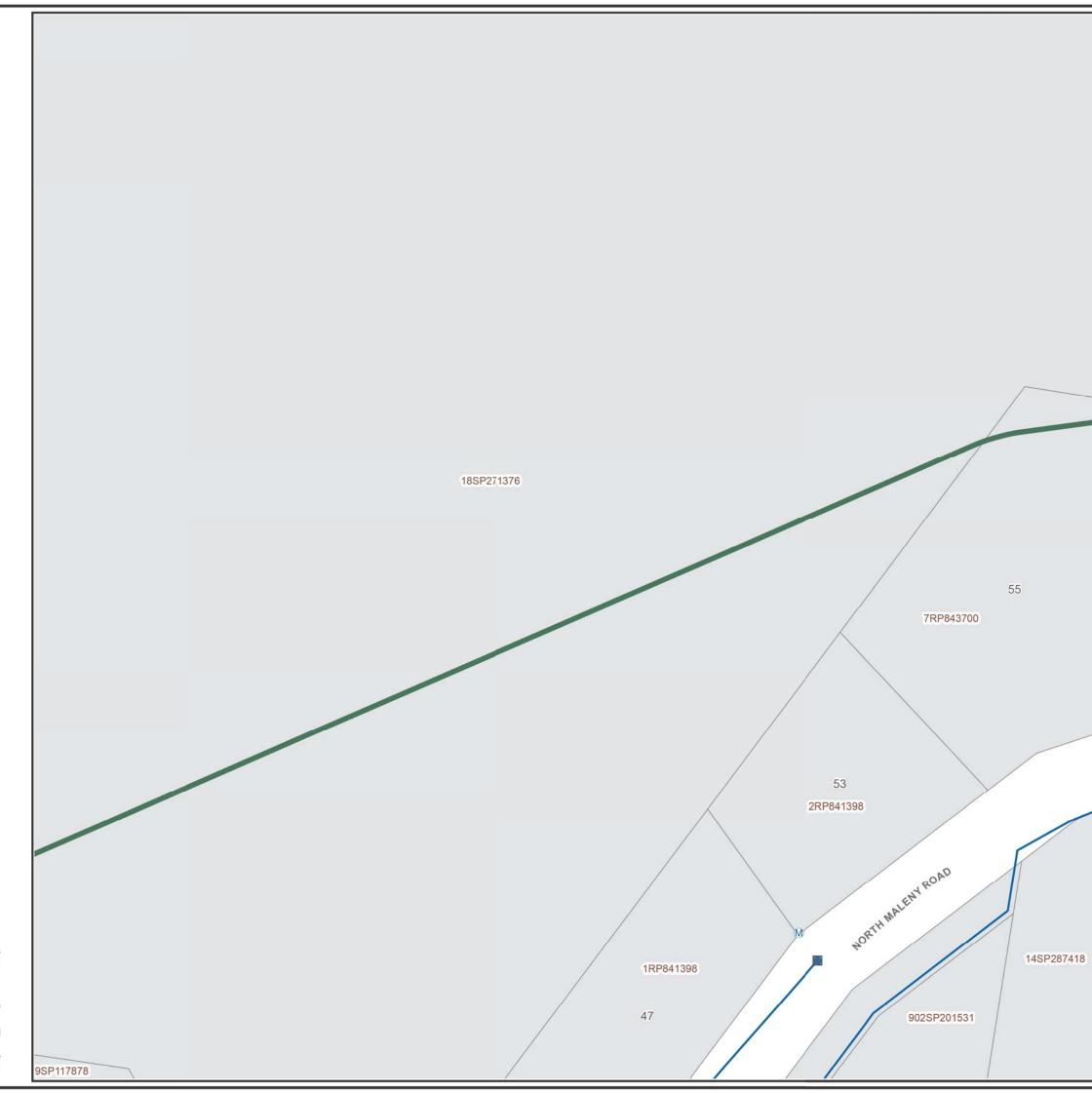
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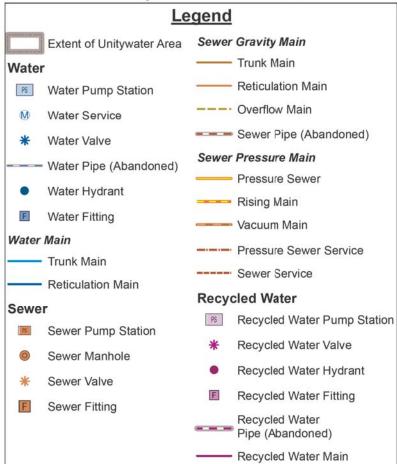
UNITYWATER DBYD MAP

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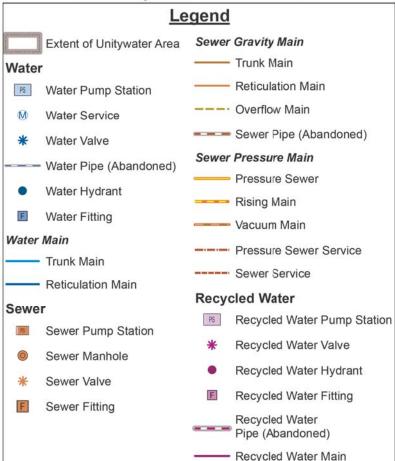


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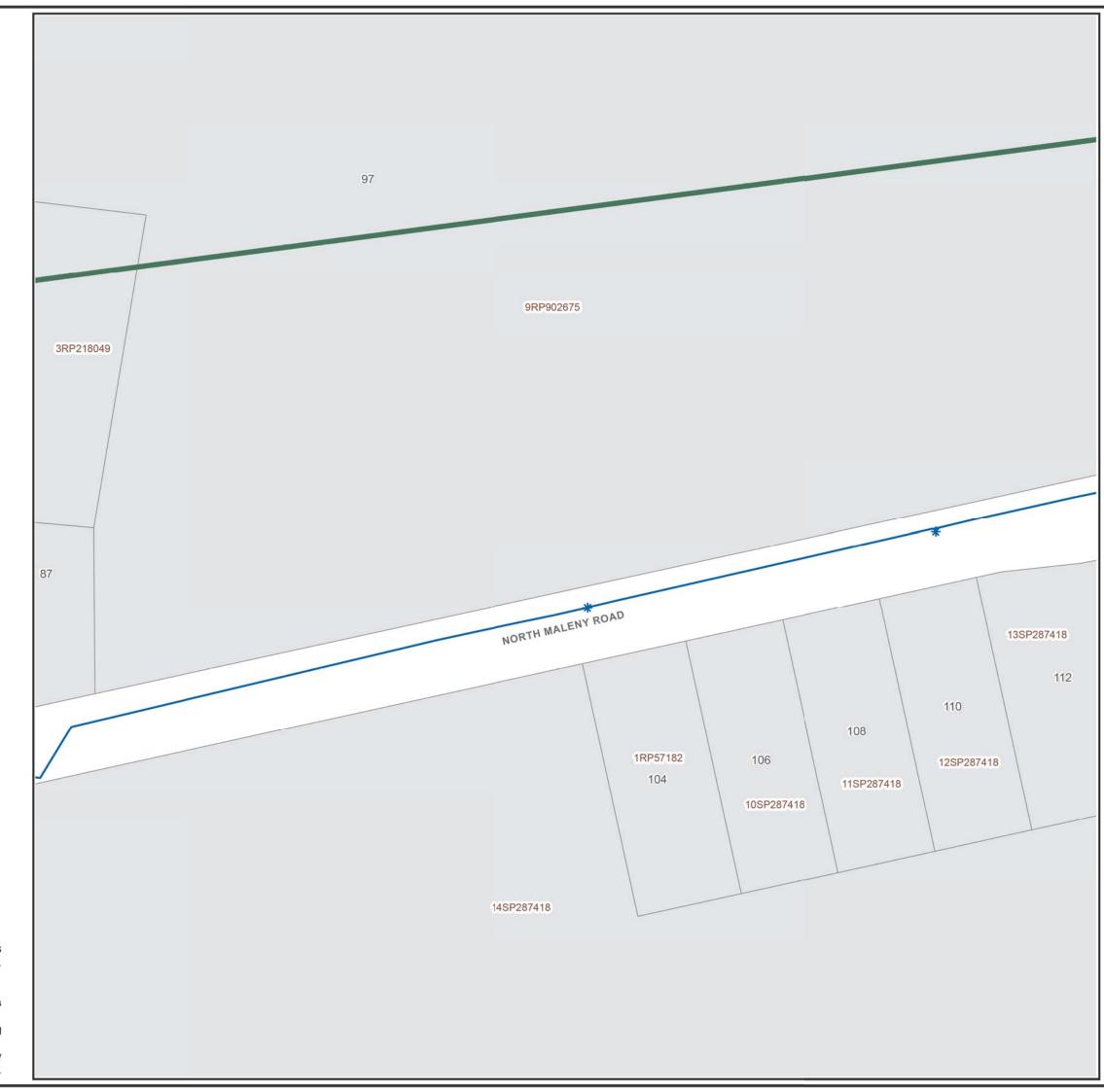
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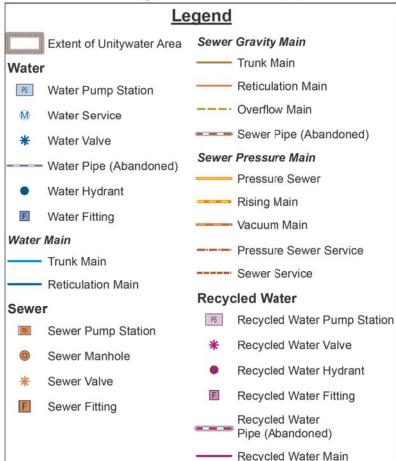


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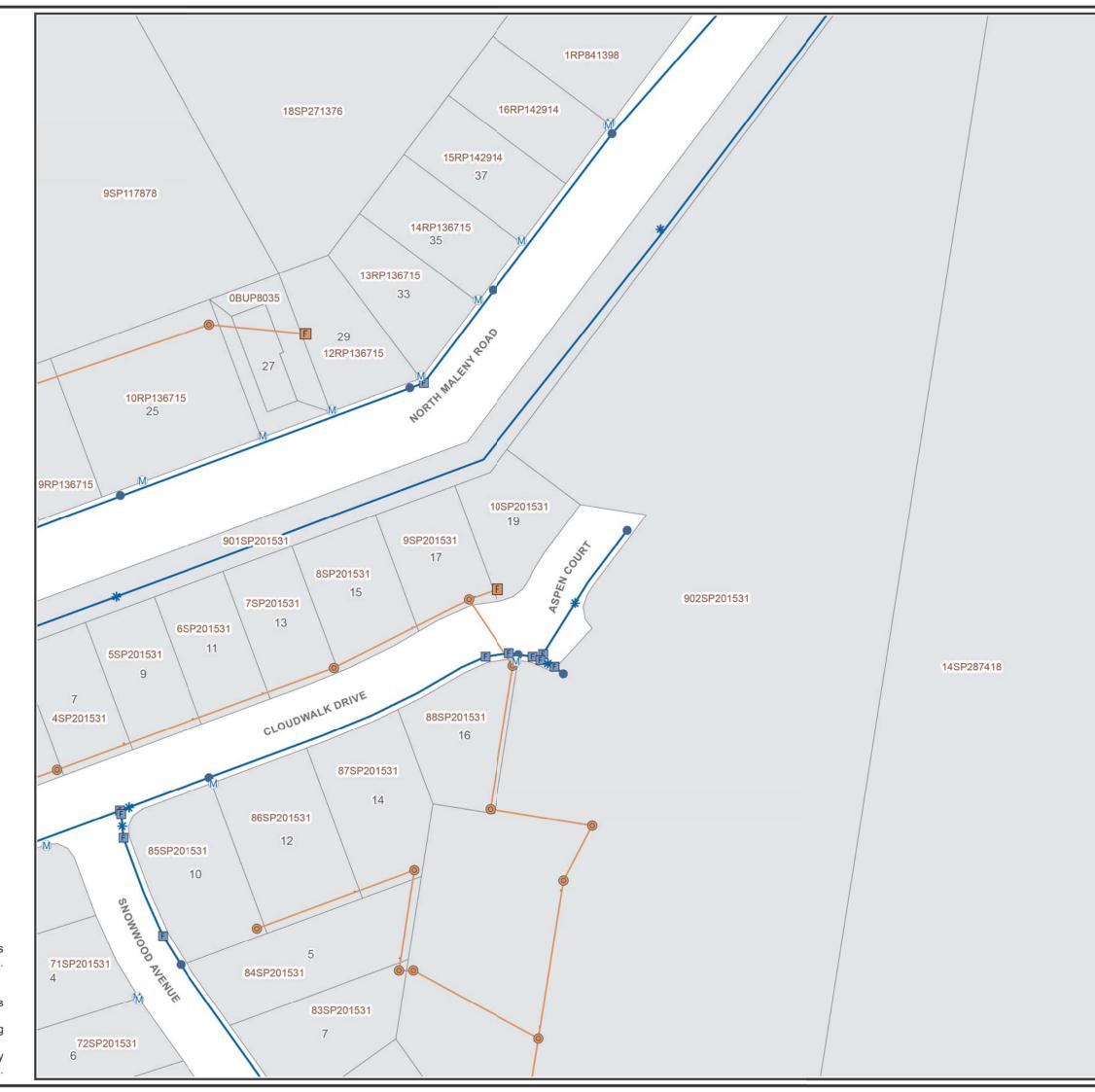
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<u>Legend</u>					
	Extent of Unitywater Area	Sewer	Gravity Main		
Water		_	Trunk Main		
PS	Water Pump Station	_	Reticulation Main		
M	Water Service		Overflow Main		
*	Water Valve		Sewer Pipe (Abandoned)		
	Water Pipe (Abandoned)	Sewer	Pressure Main		
	•		Pressure Sewer		
	Water Hydrant		Rising Main		
F	Water Fitting		Vacuum Main		
Water Main			Pressure Sewer Service		
_	Trunk Main				
	Reticulation Main		Sewer Service		
Sewer		Recycled Water			
PS	Sewer Pump Station	PS	Recycled Water Pump Station		
0	Sewer Manhole	*	Recycled Water Valve		
*	Sewer Valve	•	Recycled Water Hydrant		
F	Sewer Fitting	F	Recycled Water Fitting		
			Recycled Water Pipe (Abandoned)		
			Recycled Water Main		

Map Tile: 8 Scale: 1:1000 (If printed at 100% on A3 size paper)





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¶4SP287418

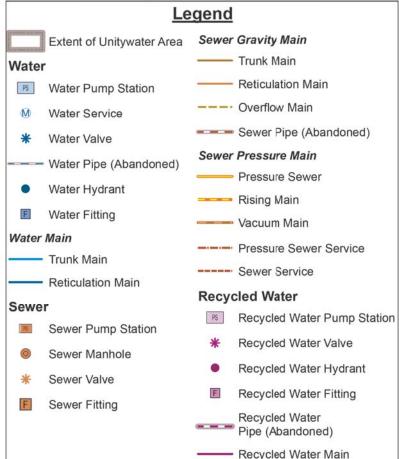
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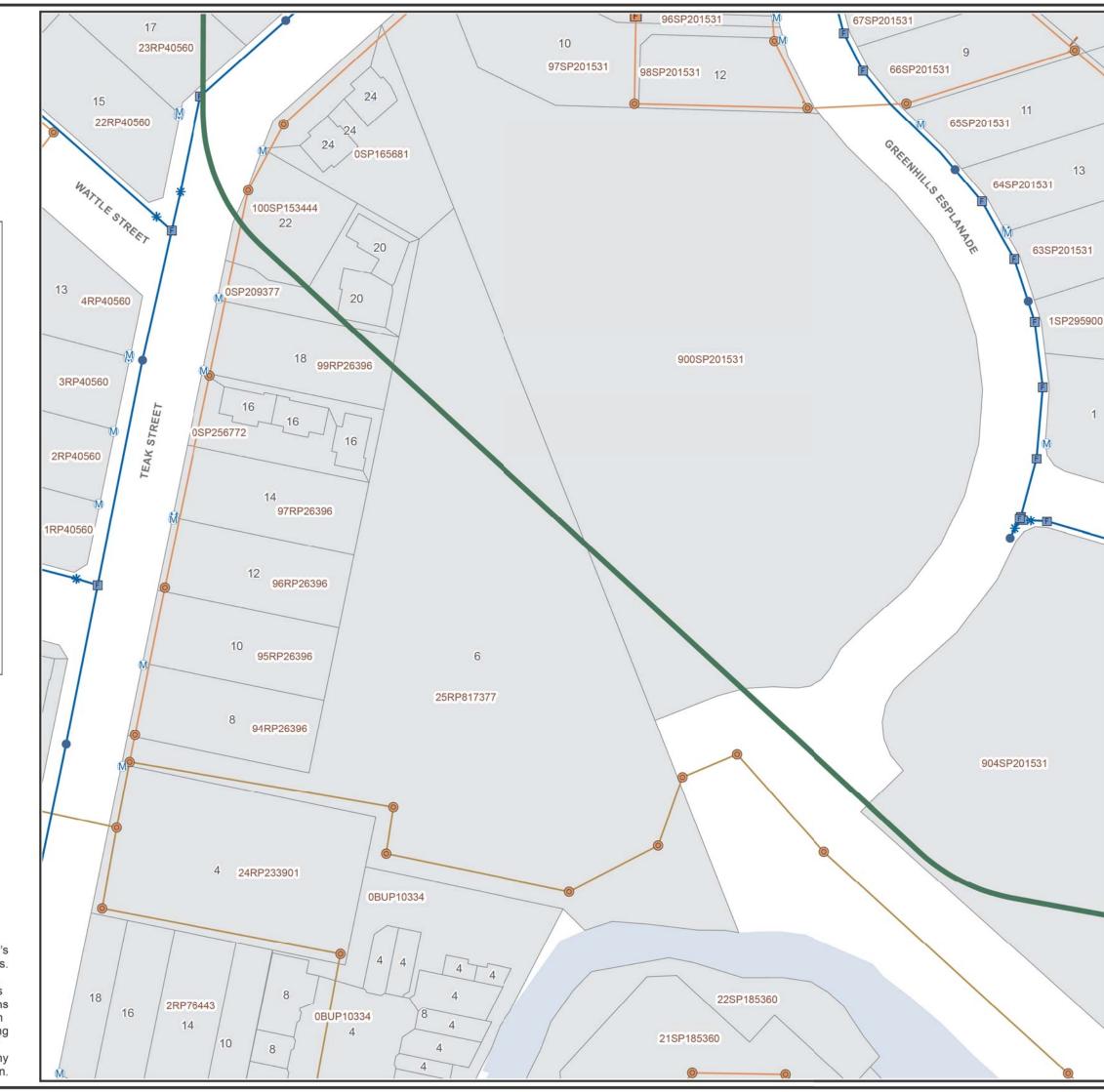
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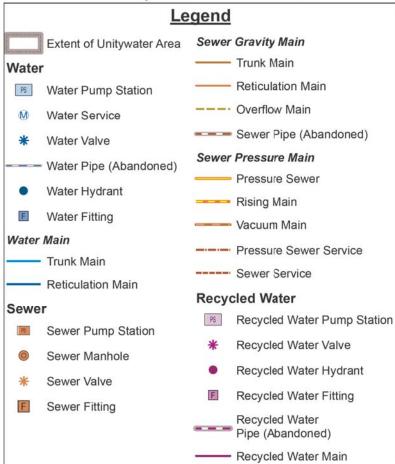


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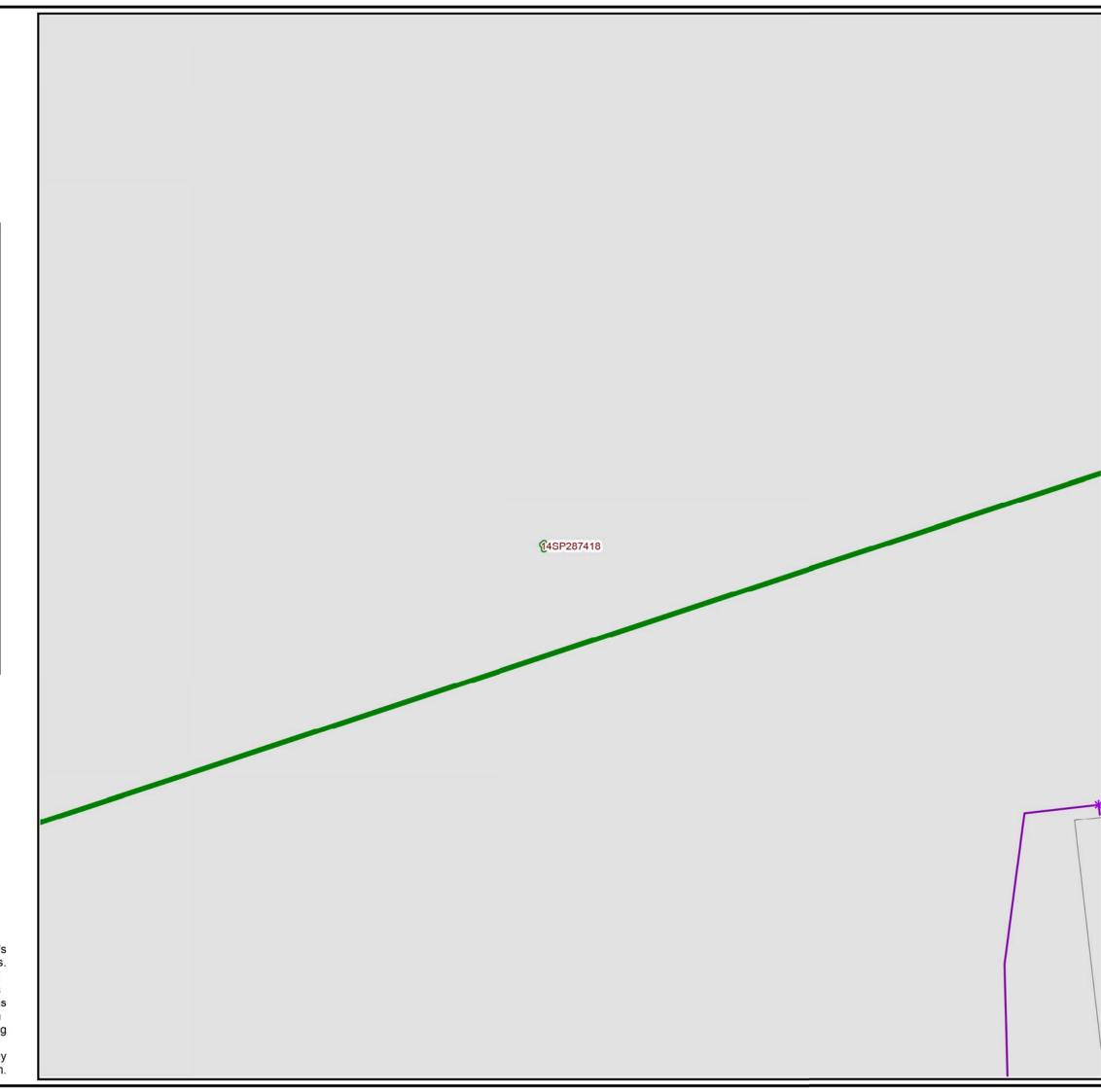


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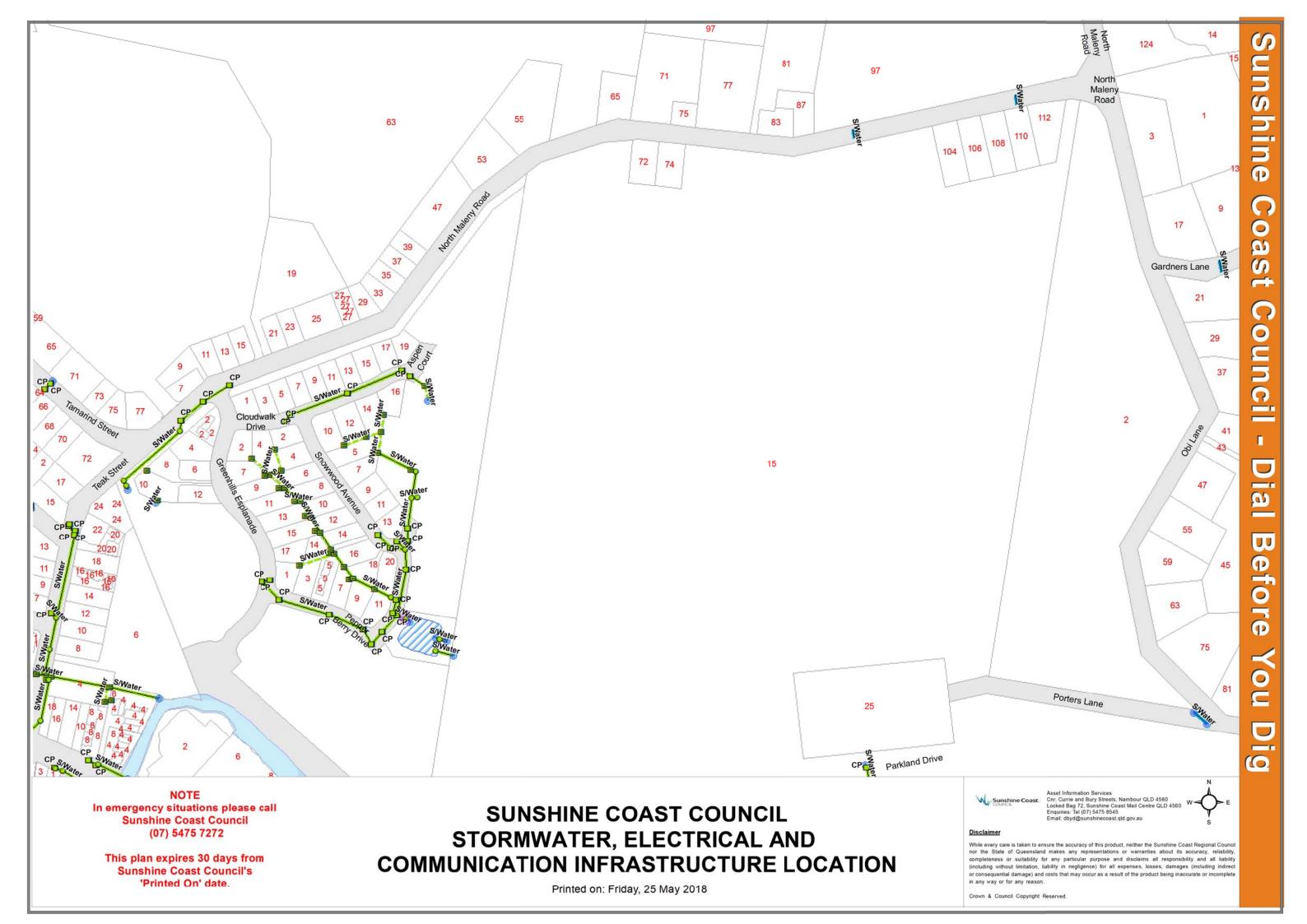
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SUNSHINE COAST COUNCIL STORMWATER, ELECTRICAL AND **COMMUNICATION INFRASTRUCTURE LOCATION**

Printed on: Friday, 25 May 2018

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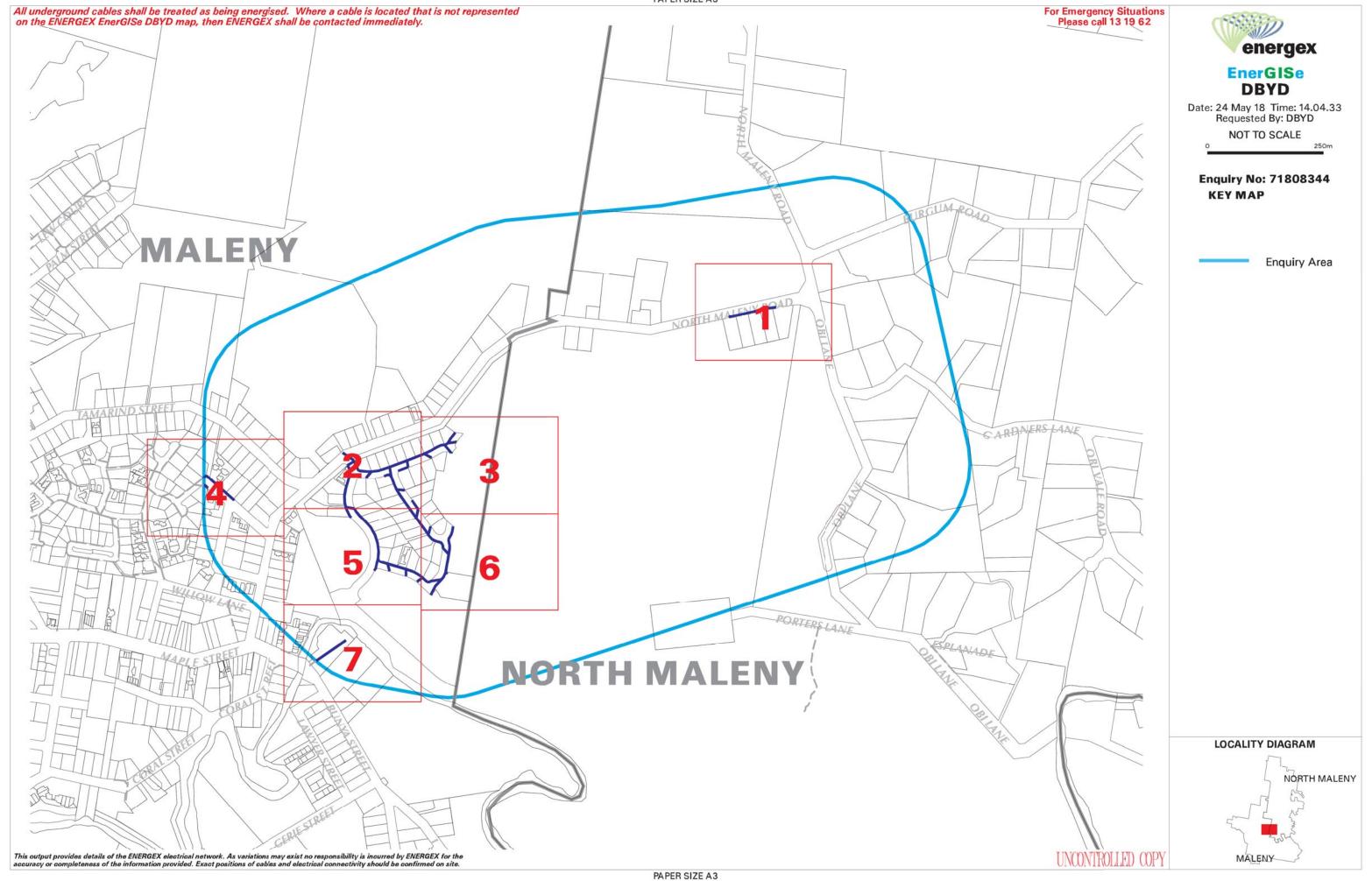
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SUNSHINE COAST COUNCIL STORMWATER, ELECTRICAL AND **COMMUNICATION INFRASTRUCTURE LOCATION**

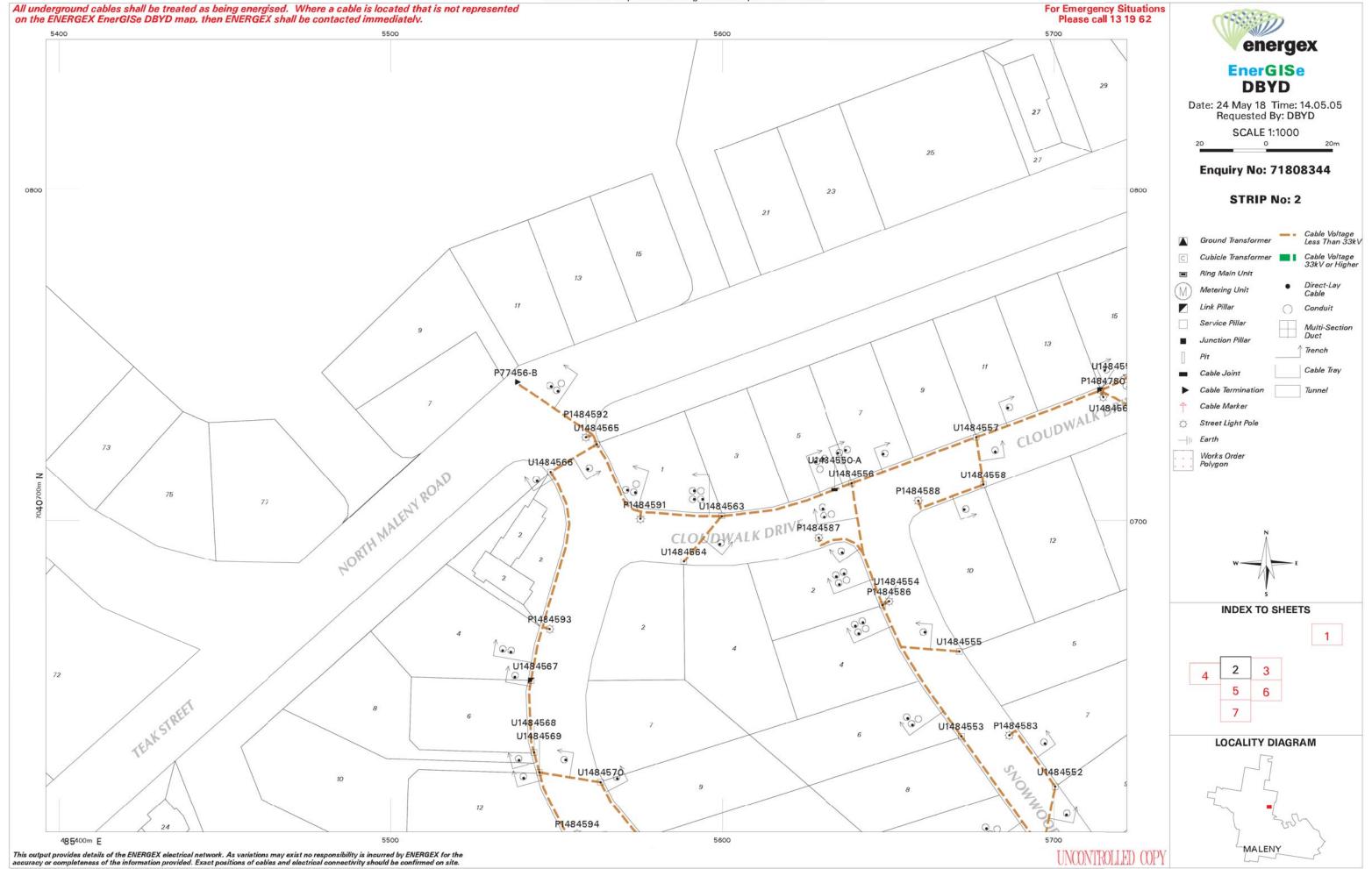
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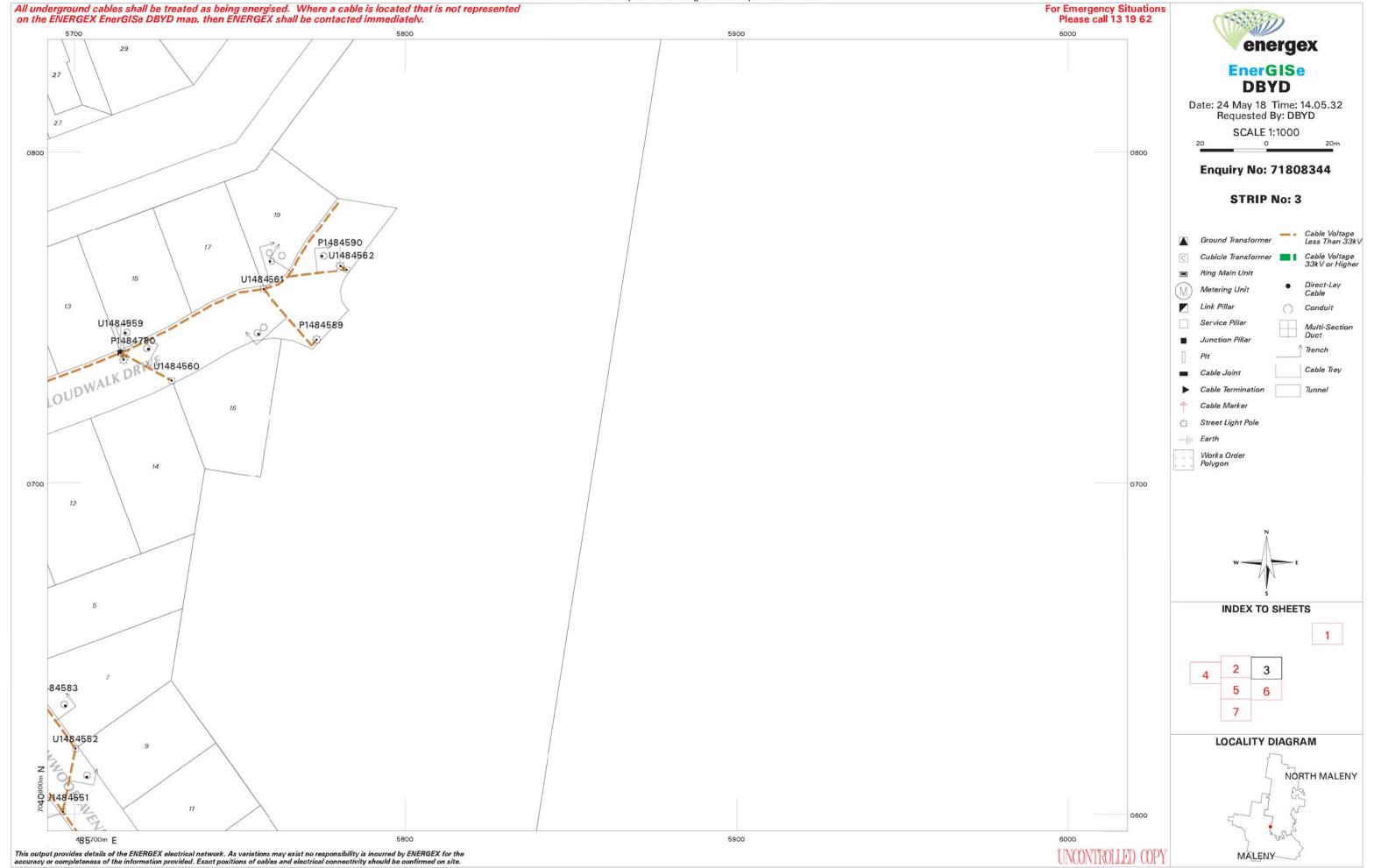
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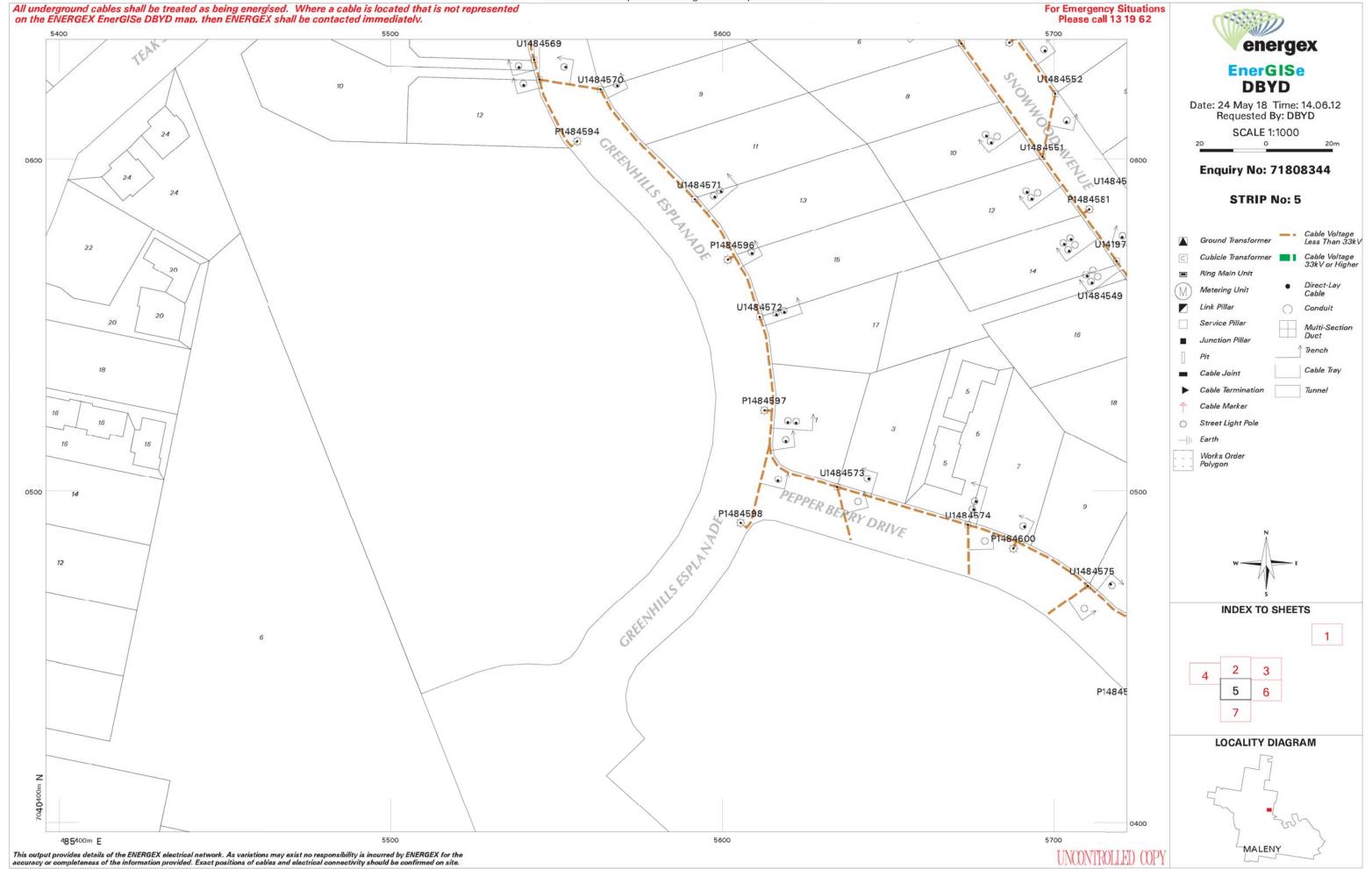


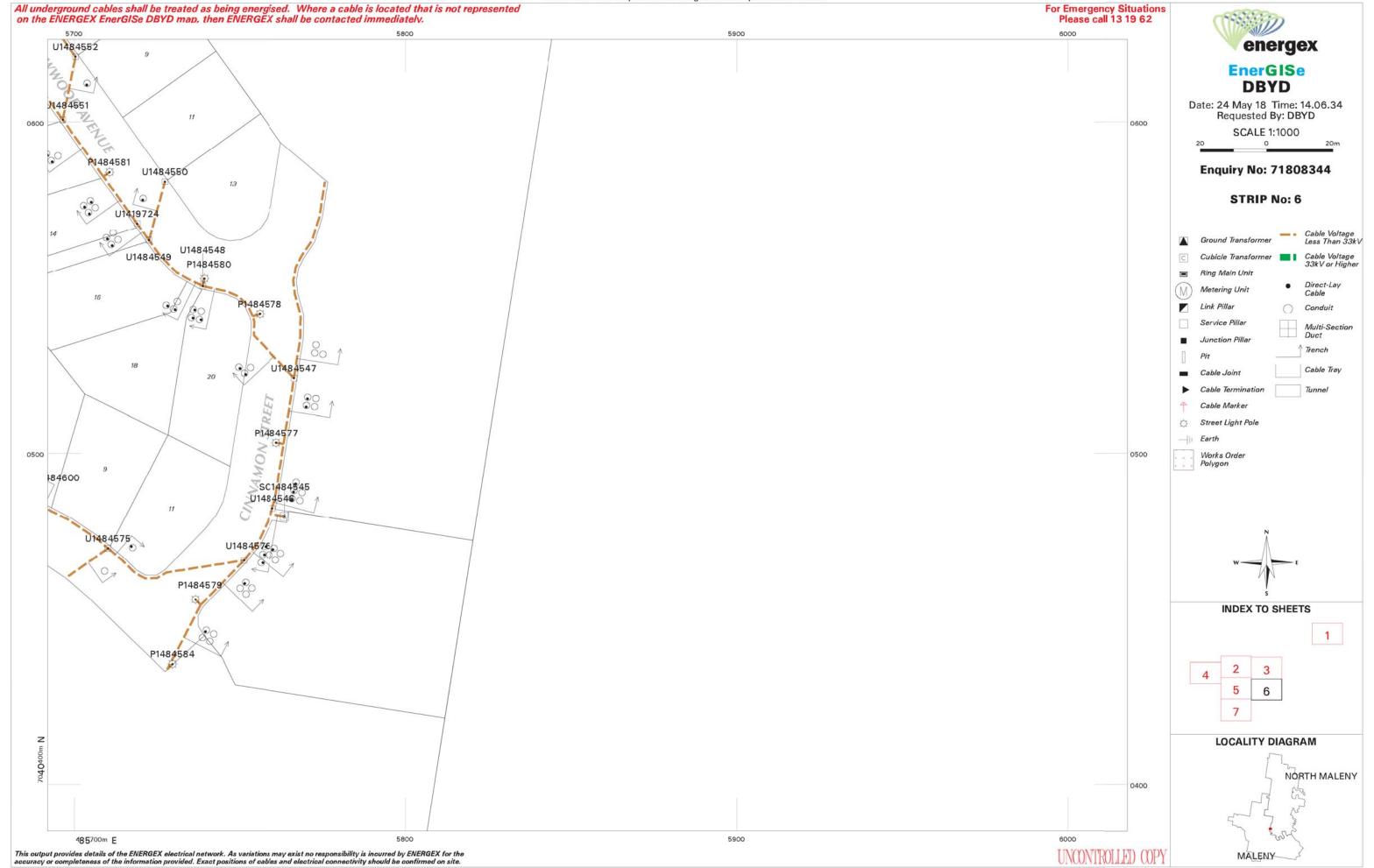


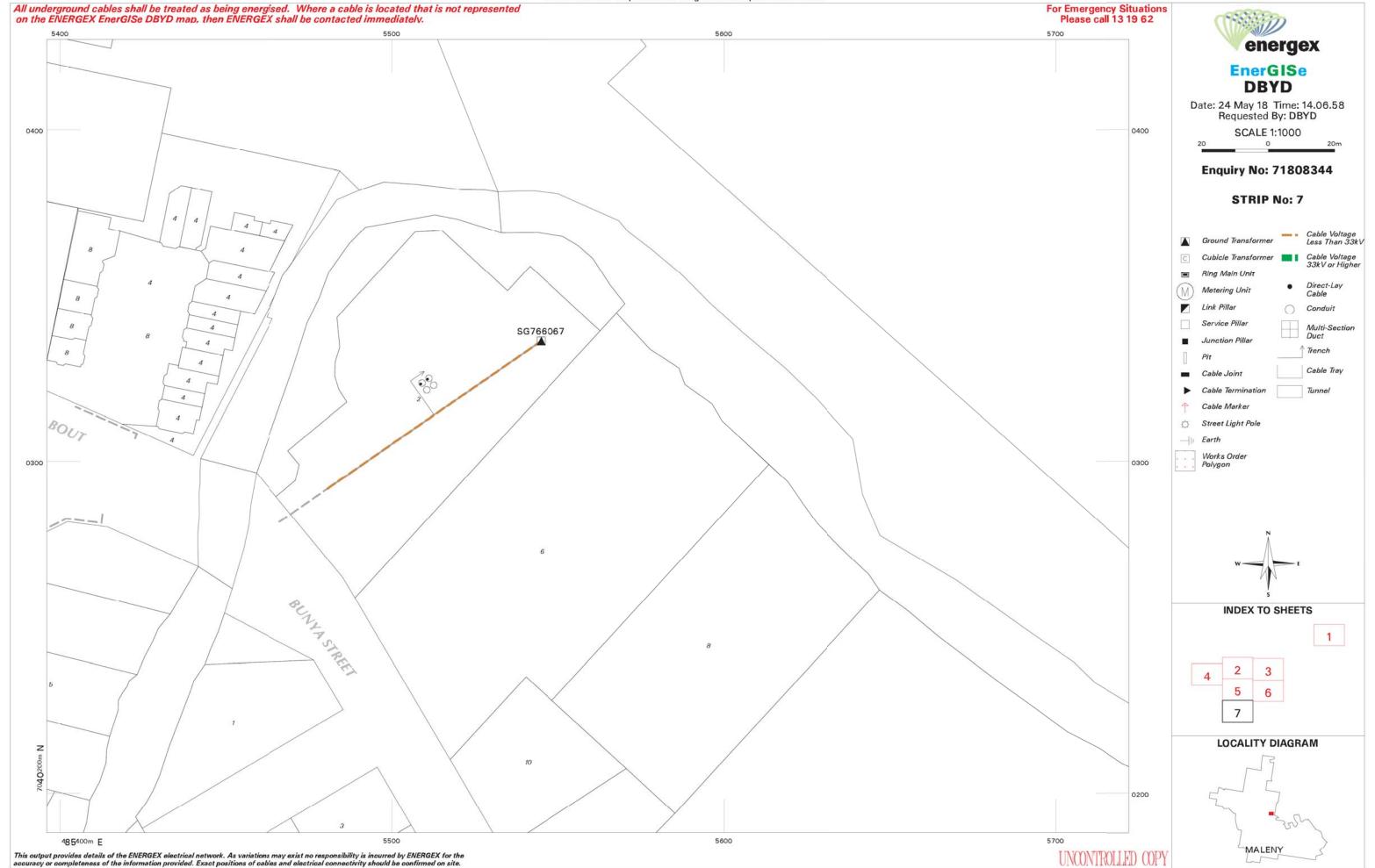














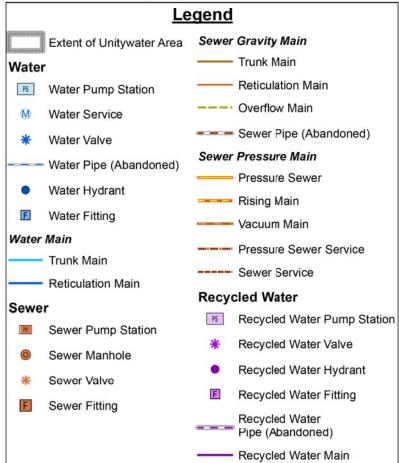


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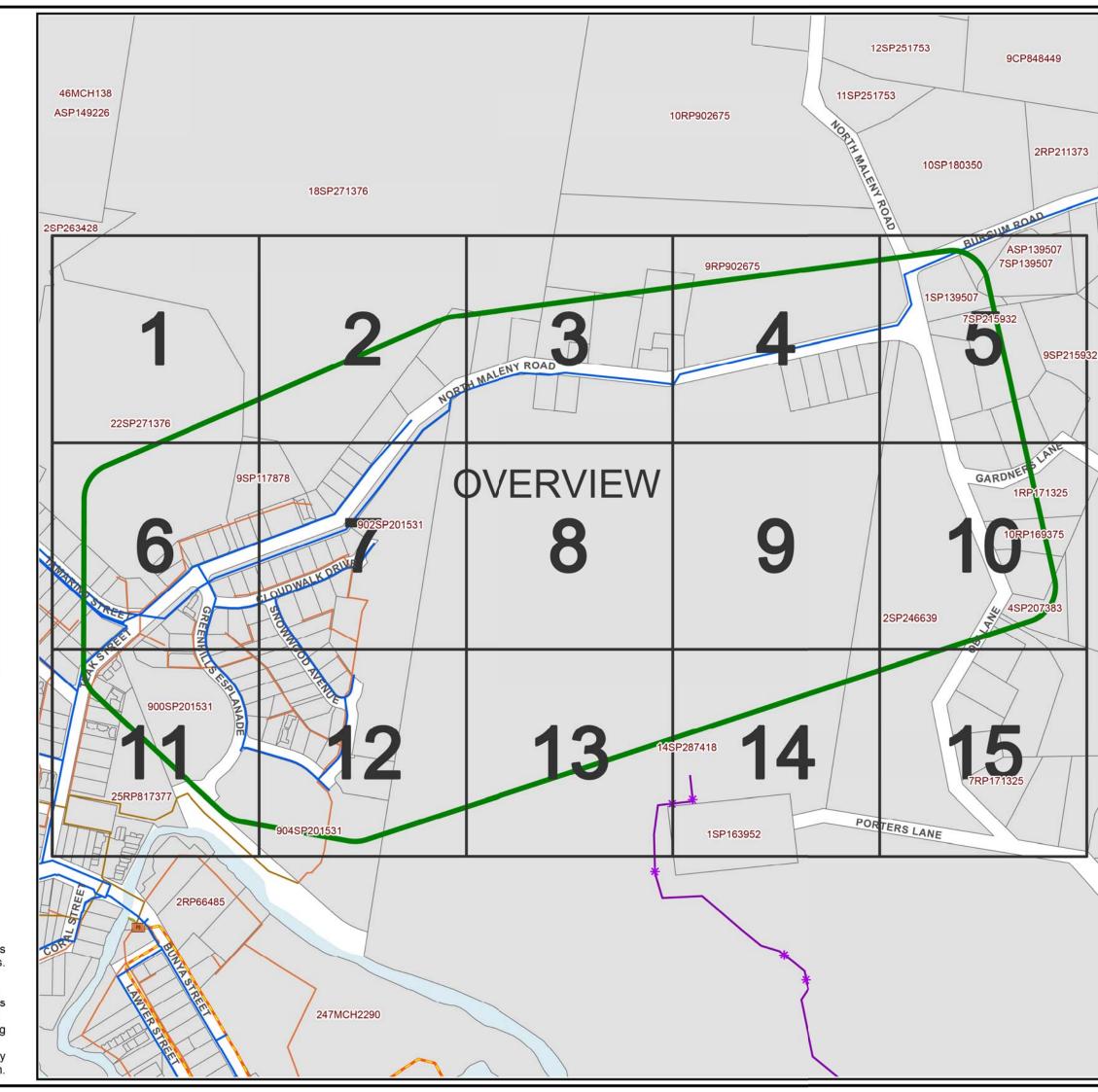
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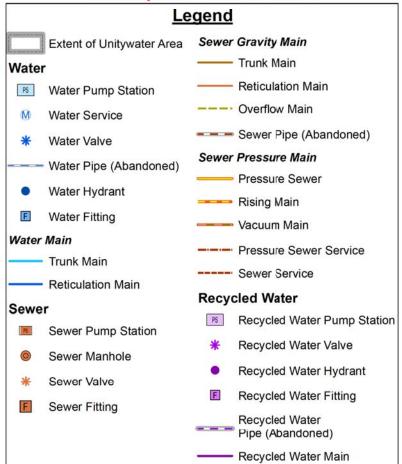


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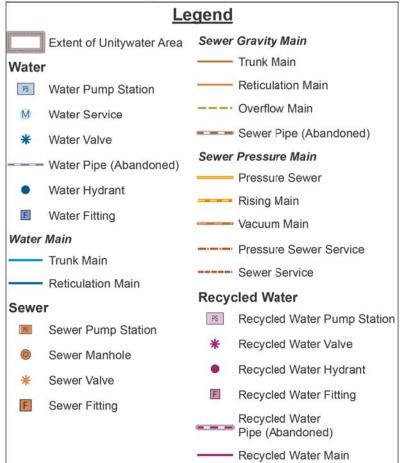


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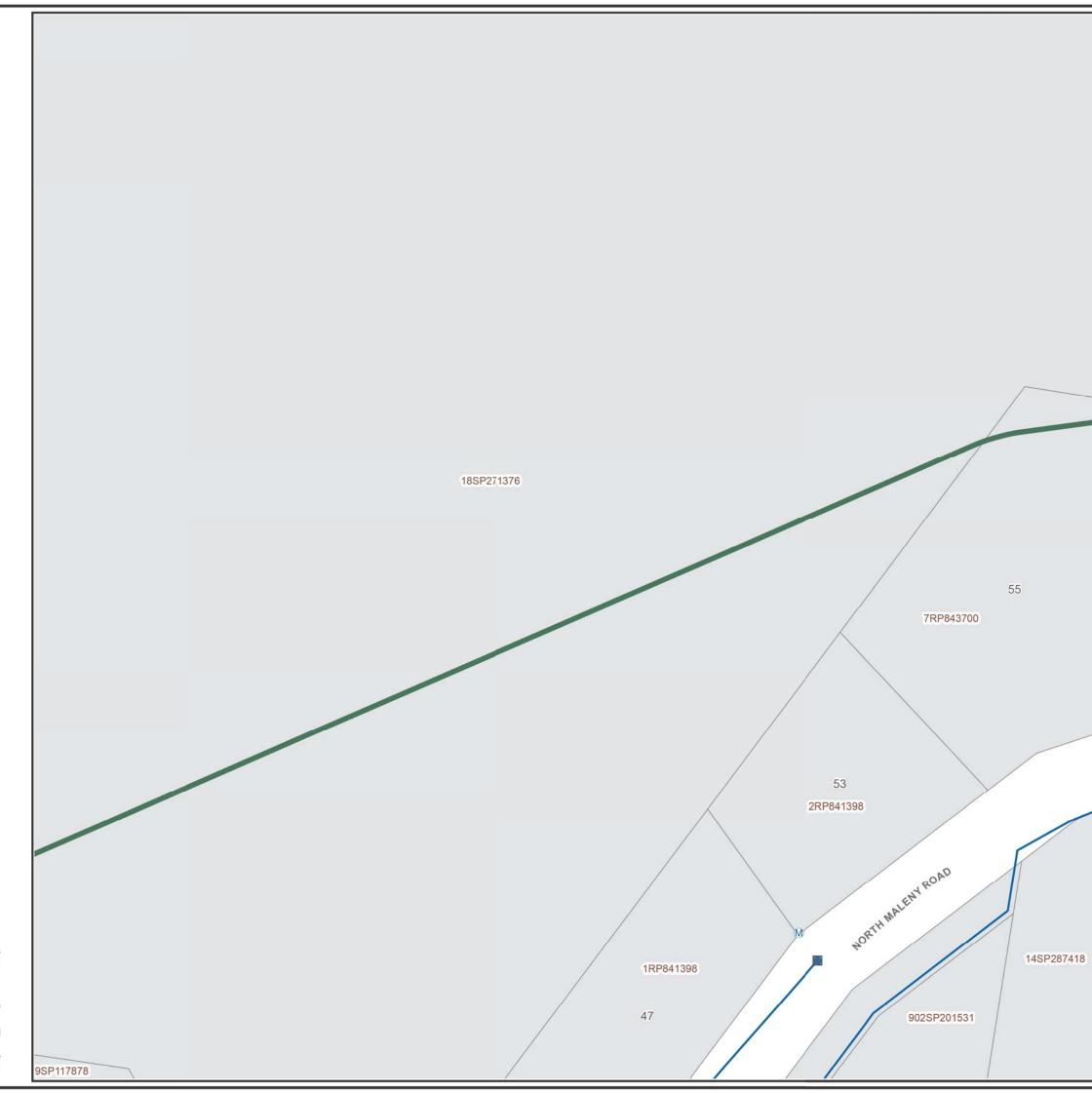
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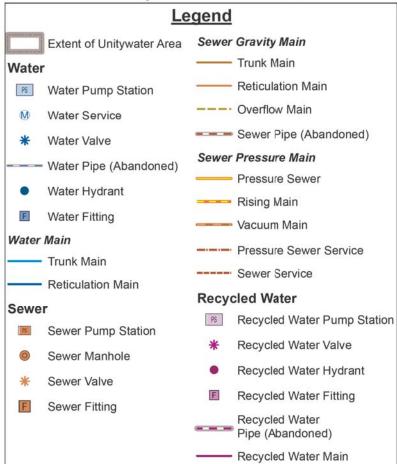


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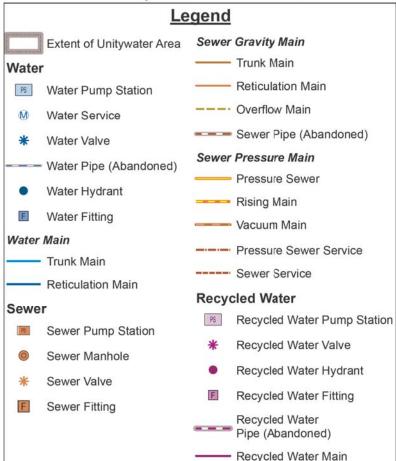


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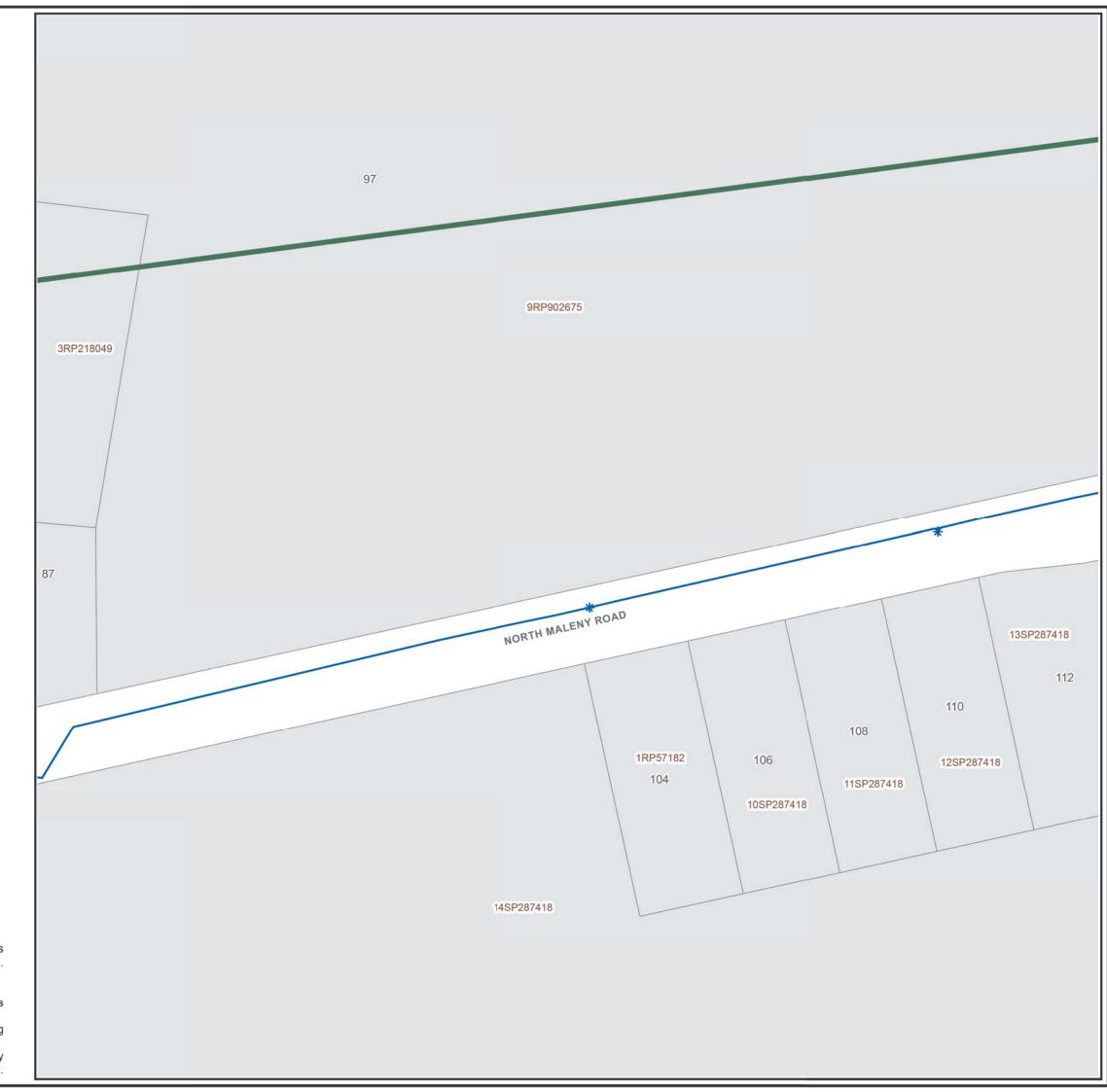
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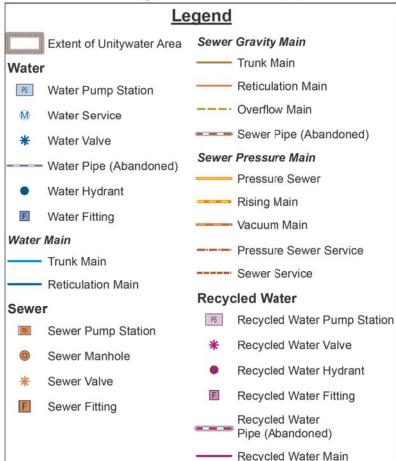


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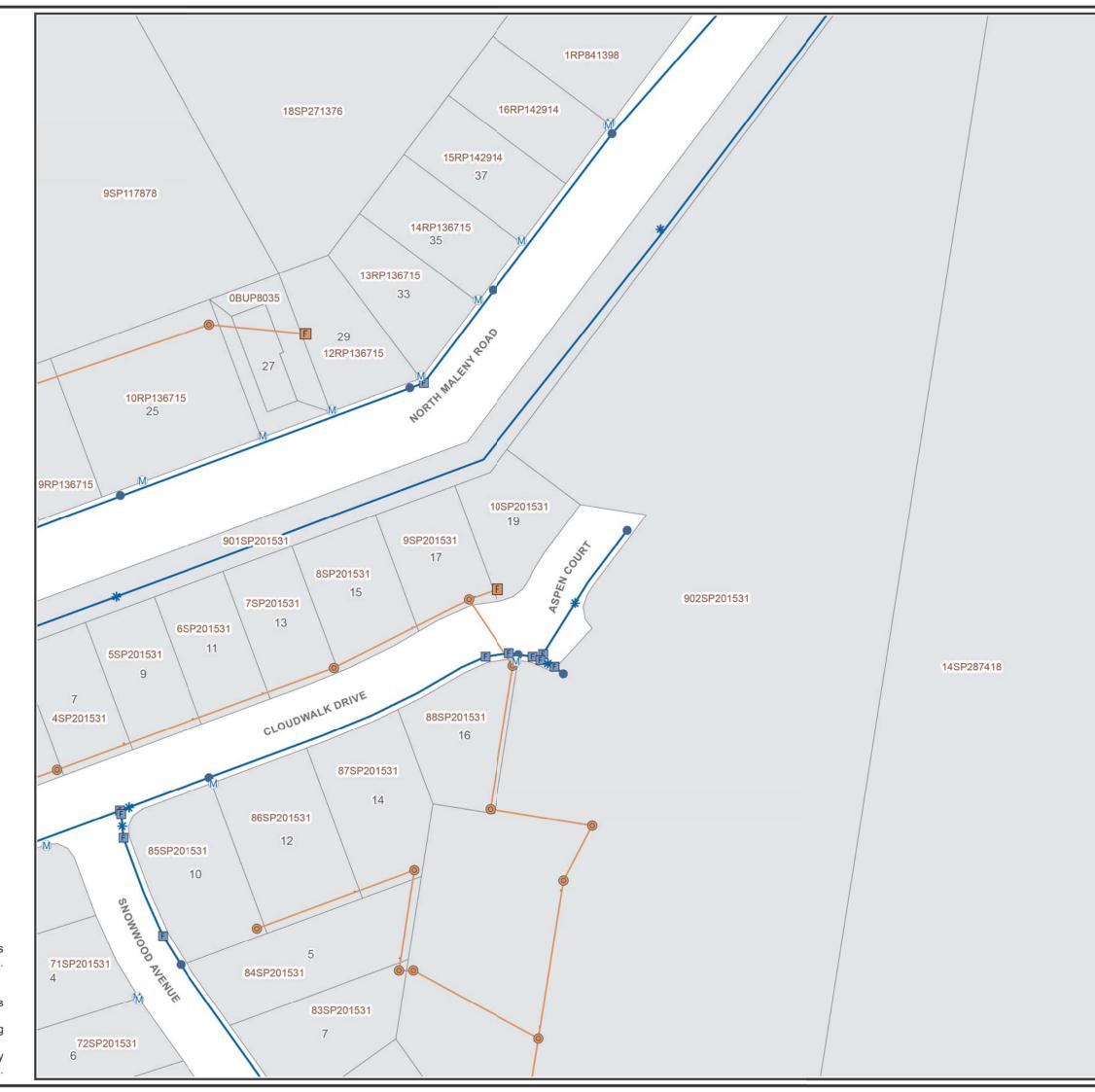
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<u>Legend</u>					
	Extent of Unitywater Area	Sewer	Gravity Main		
Water		_	Trunk Main		
PS	Water Pump Station	_	Reticulation Main		
M	Water Service		Overflow Main		
*	Water Valve		Sewer Pipe (Abandoned)		
	Water Pipe (Abandoned)	Sewer	Pressure Main		
	•		Pressure Sewer		
	Water Hydrant		Rising Main		
F	Water Fitting		Vacuum Main		
Water Main			Pressure Sewer Service		
_	Trunk Main				
	Reticulation Main		Sewer Service		
Sewer		Recycled Water			
PS	Sewer Pump Station	PS	Recycled Water Pump Station		
0	Sewer Manhole	*	Recycled Water Valve		
*	Sewer Valve	•	Recycled Water Hydrant		
F	Sewer Fitting	F	Recycled Water Fitting		
			Recycled Water Pipe (Abandoned)		
			Recycled Water Main		

Map Tile: 8 Scale: 1:1000 (If printed at 100% on A3 size paper)





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¶4SP287418

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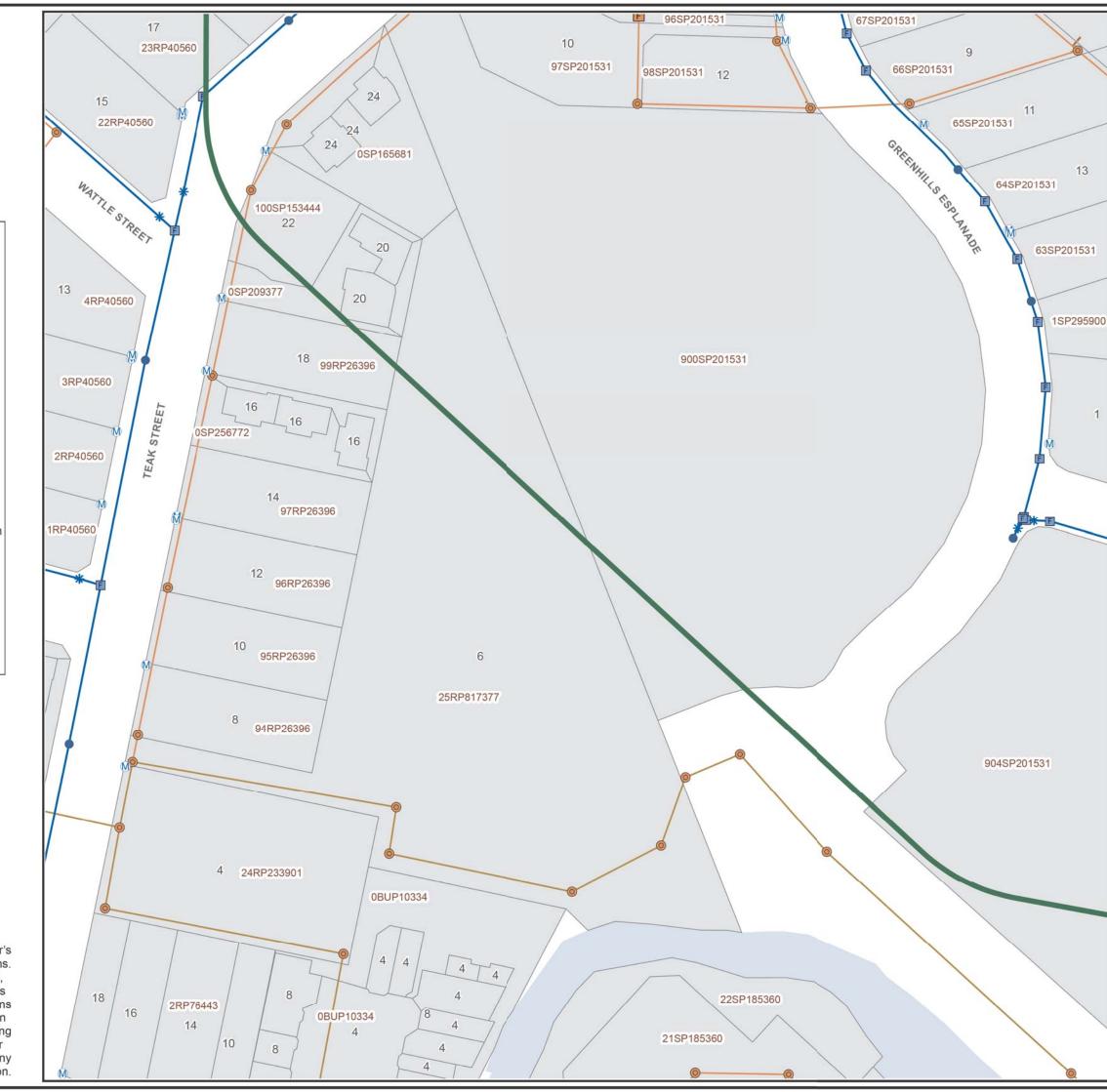
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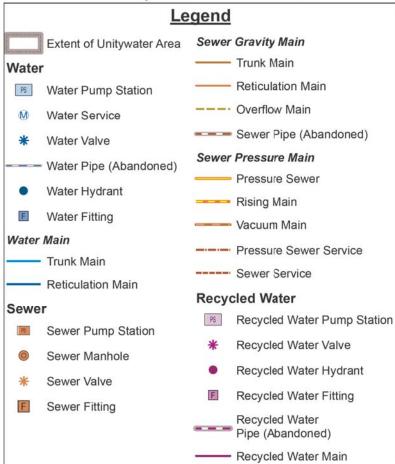


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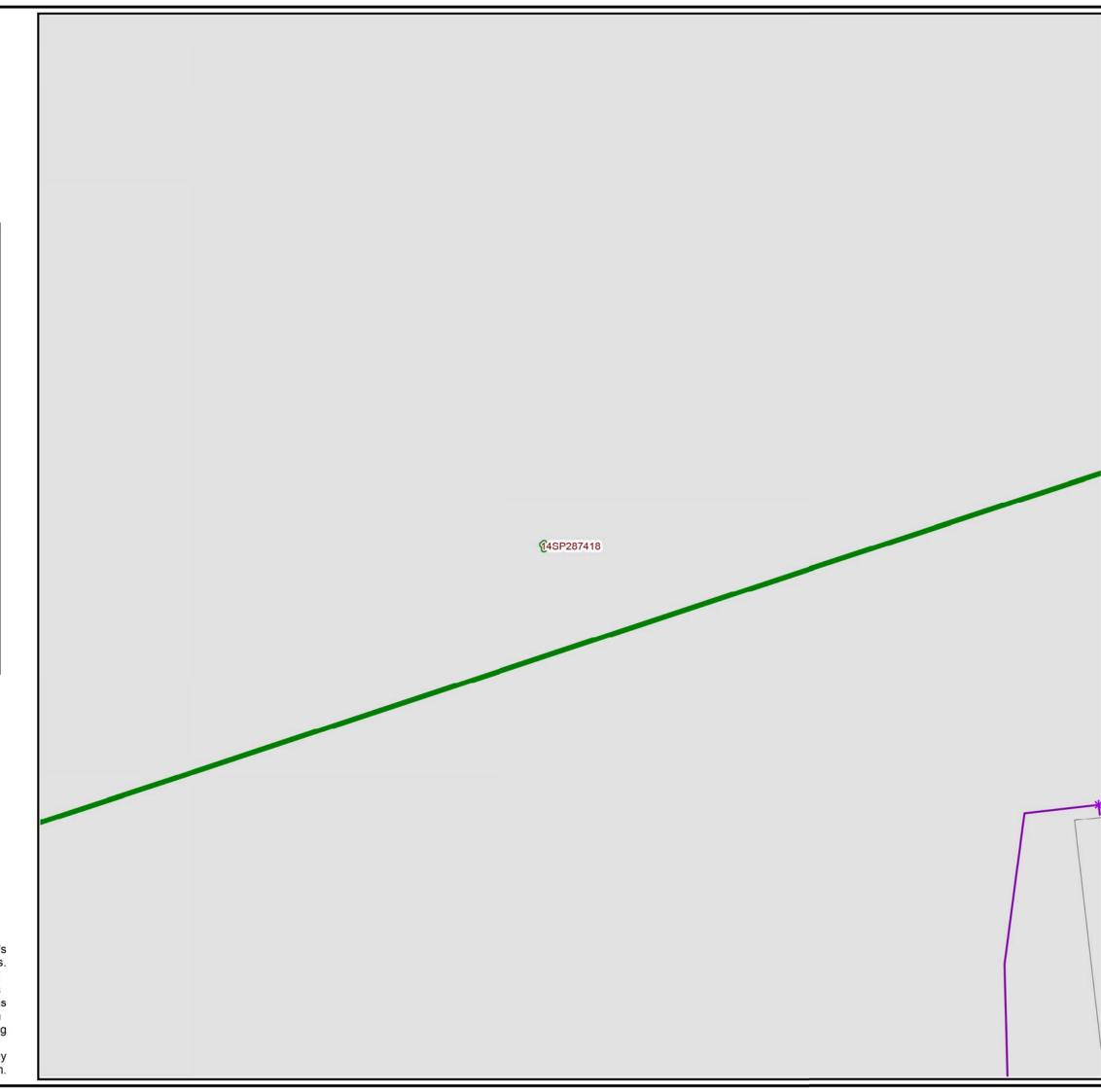


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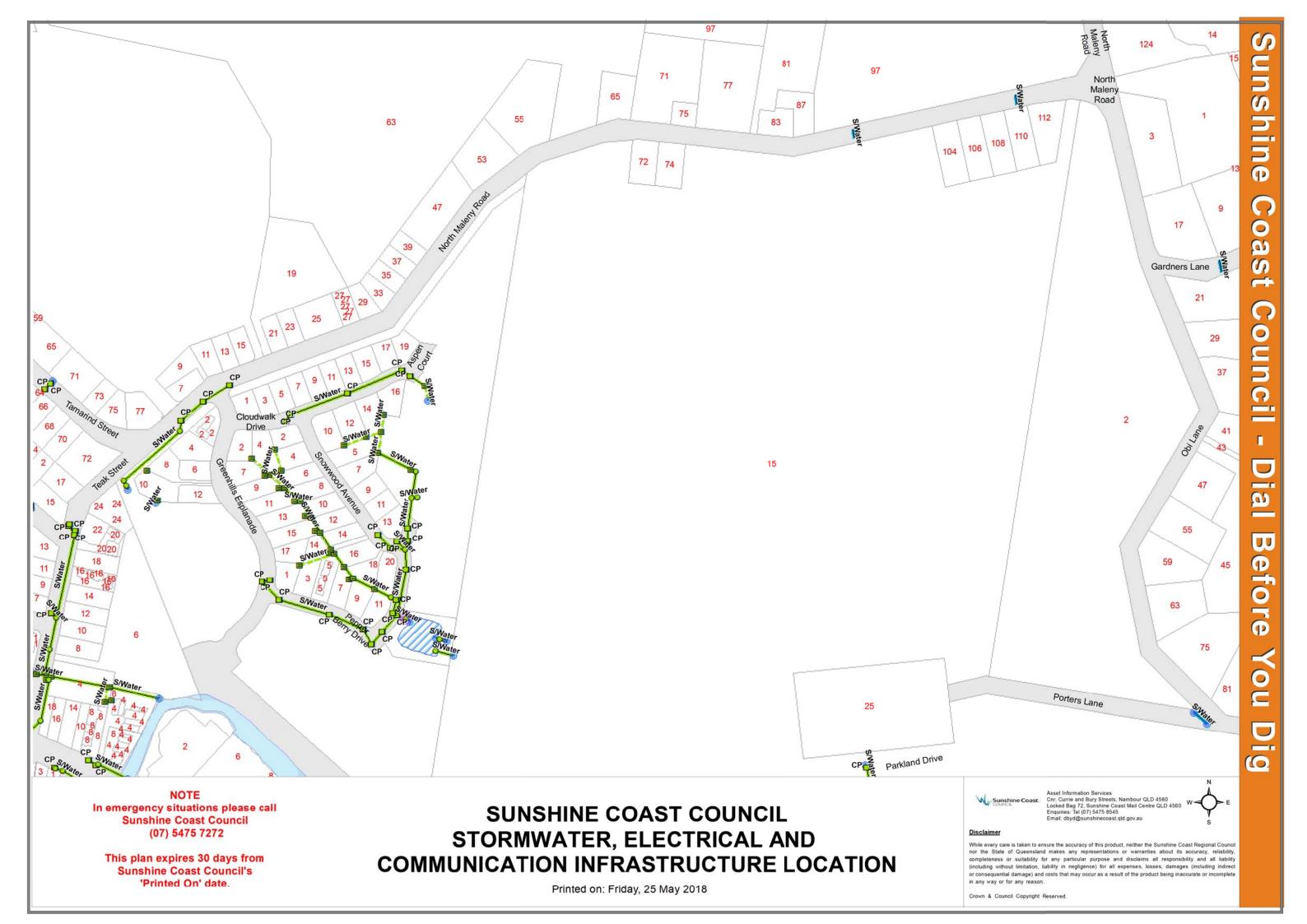
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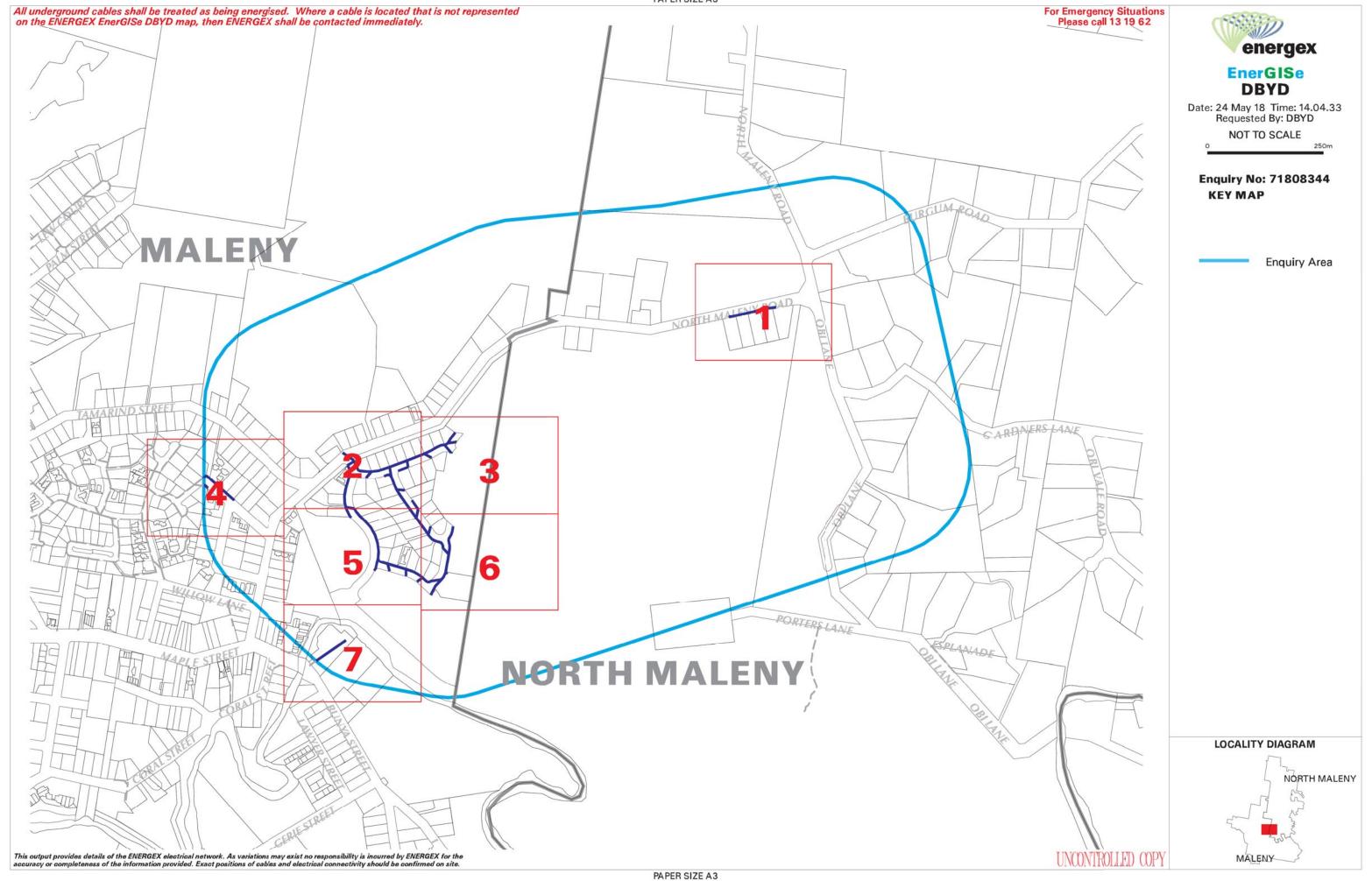
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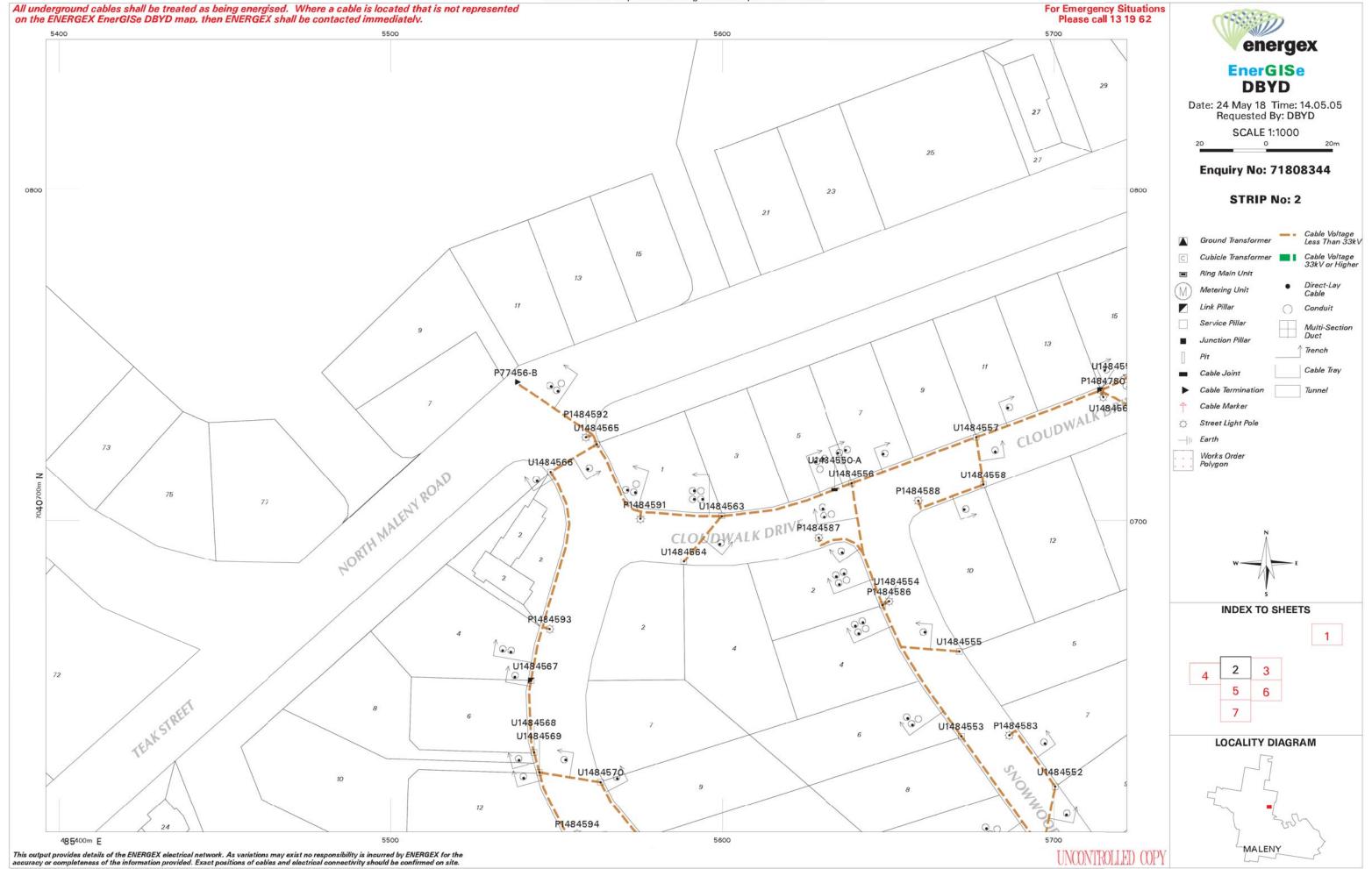
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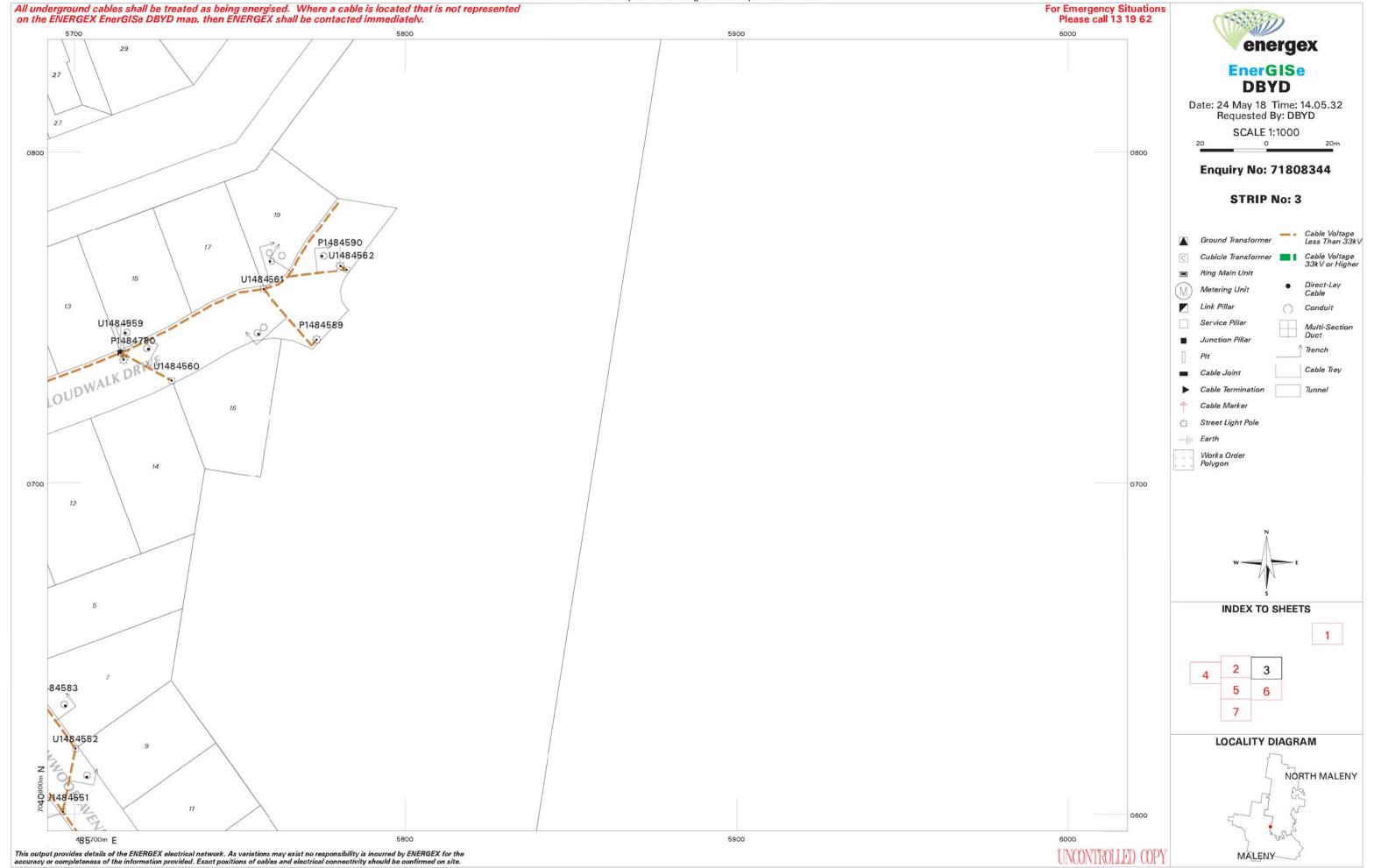
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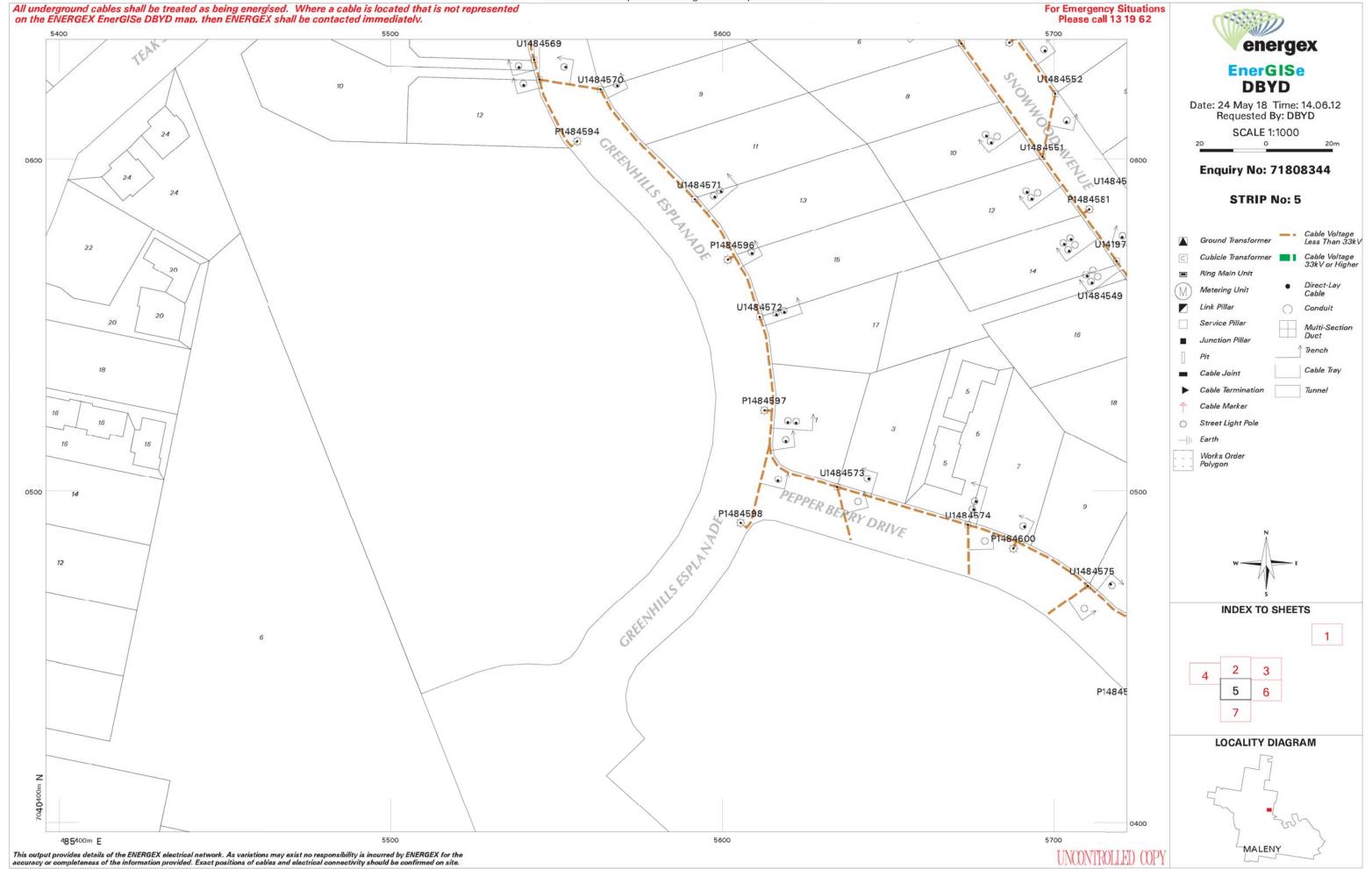


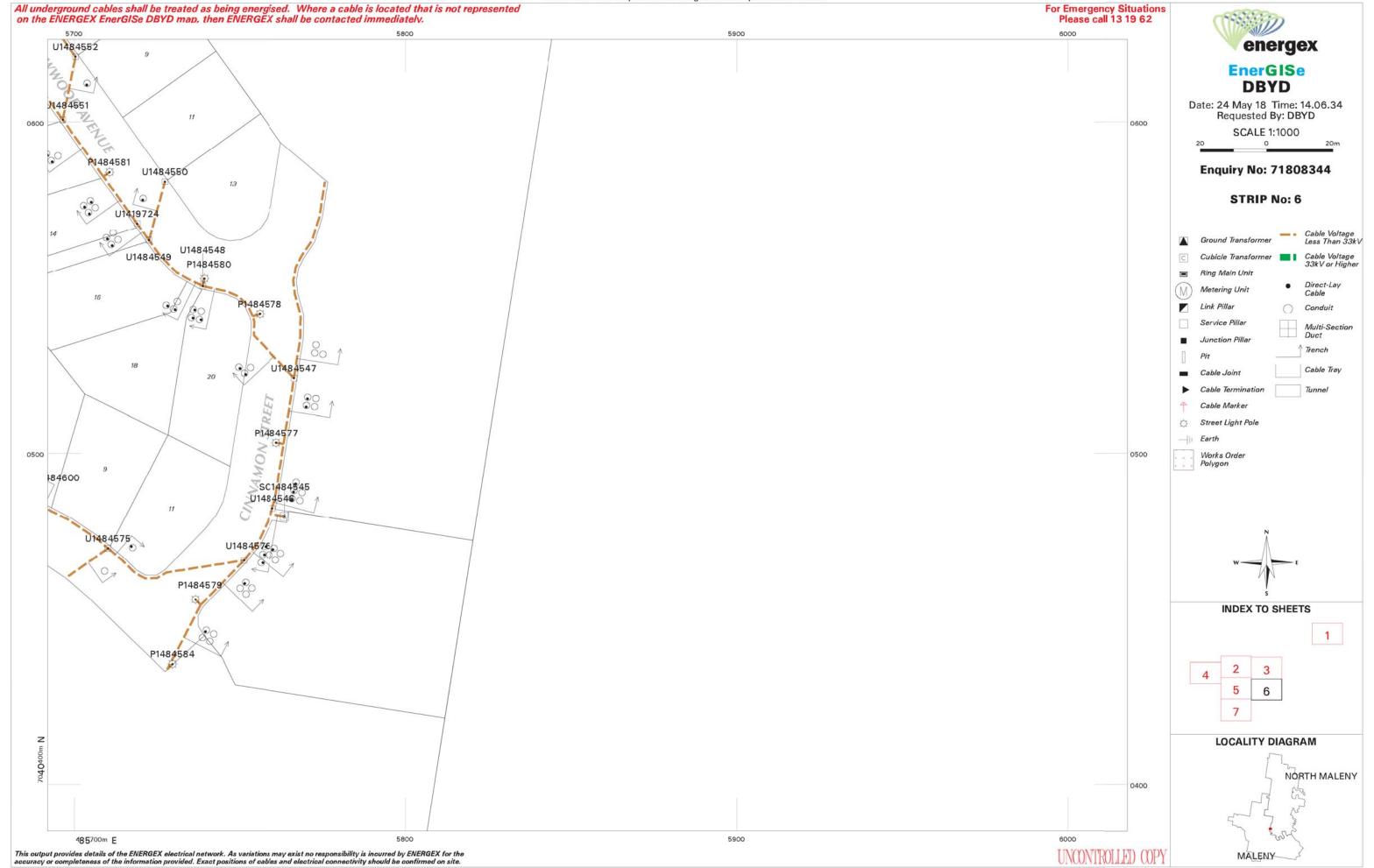


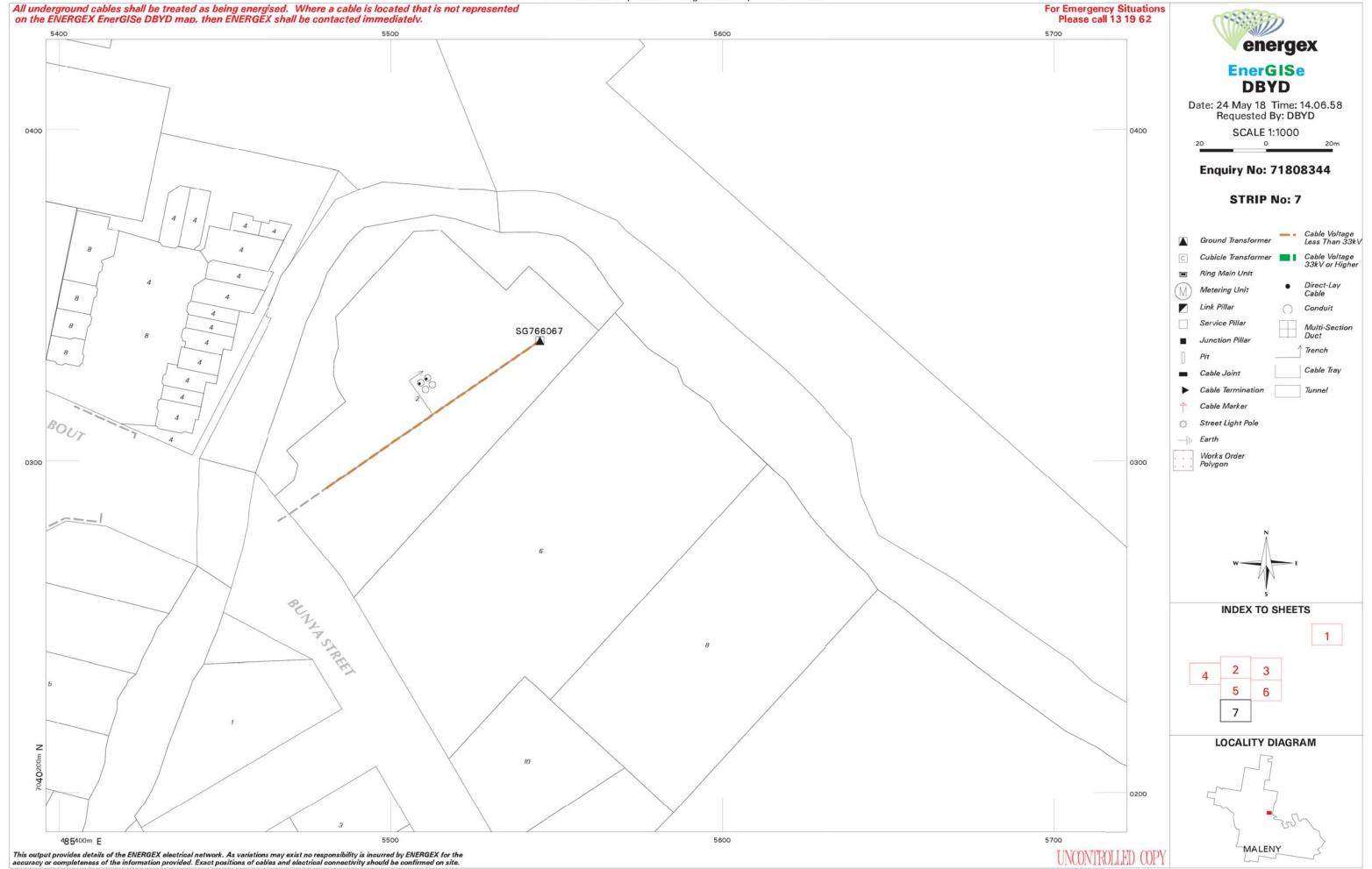














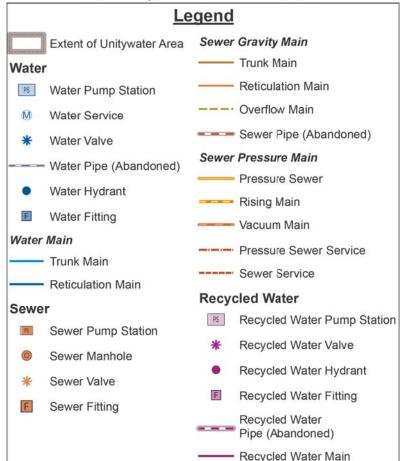
Appendix D – Dial Before You Dig – Site 2

Sequence Number: **71884480**Job Number: **14292736**

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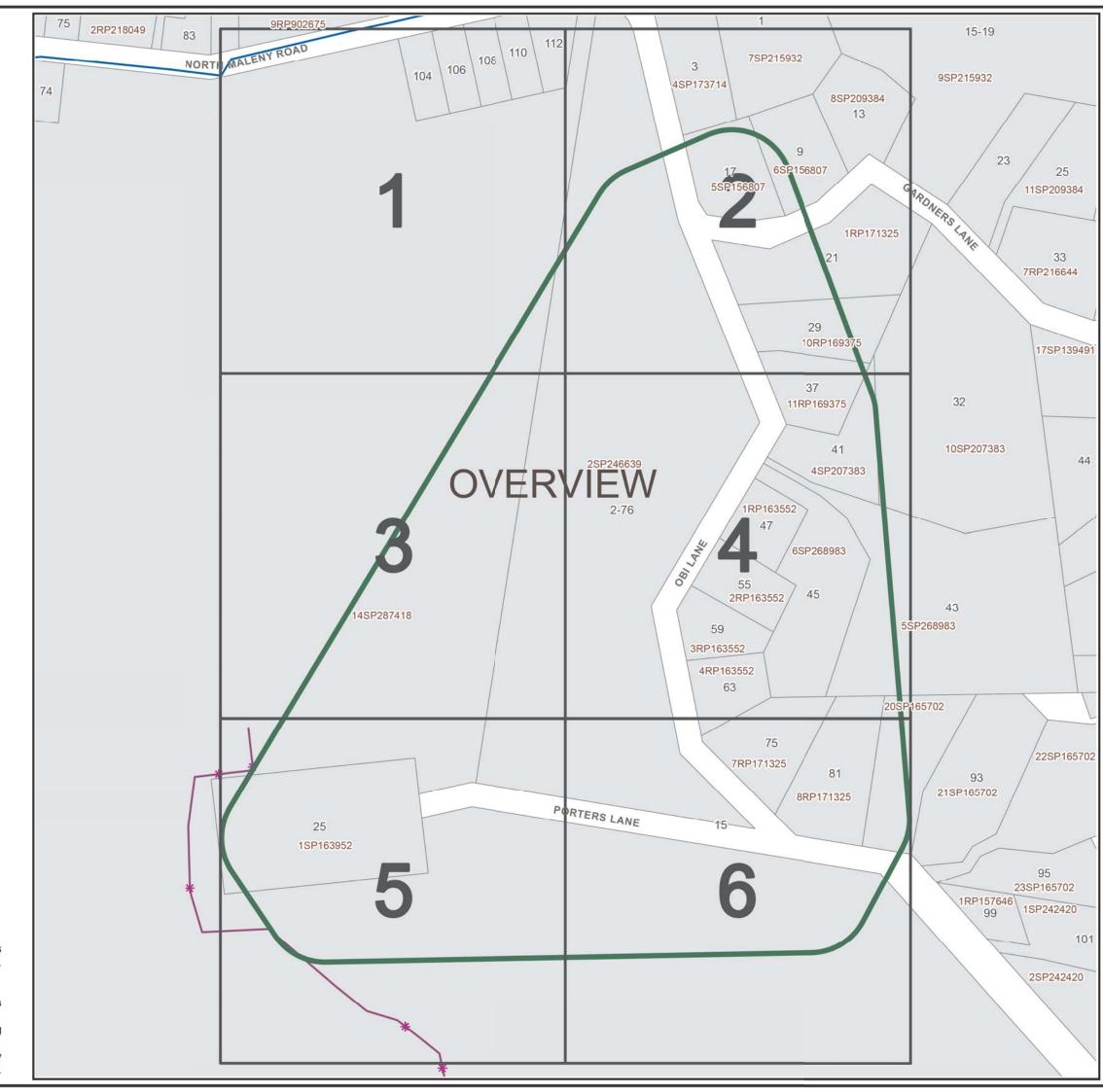
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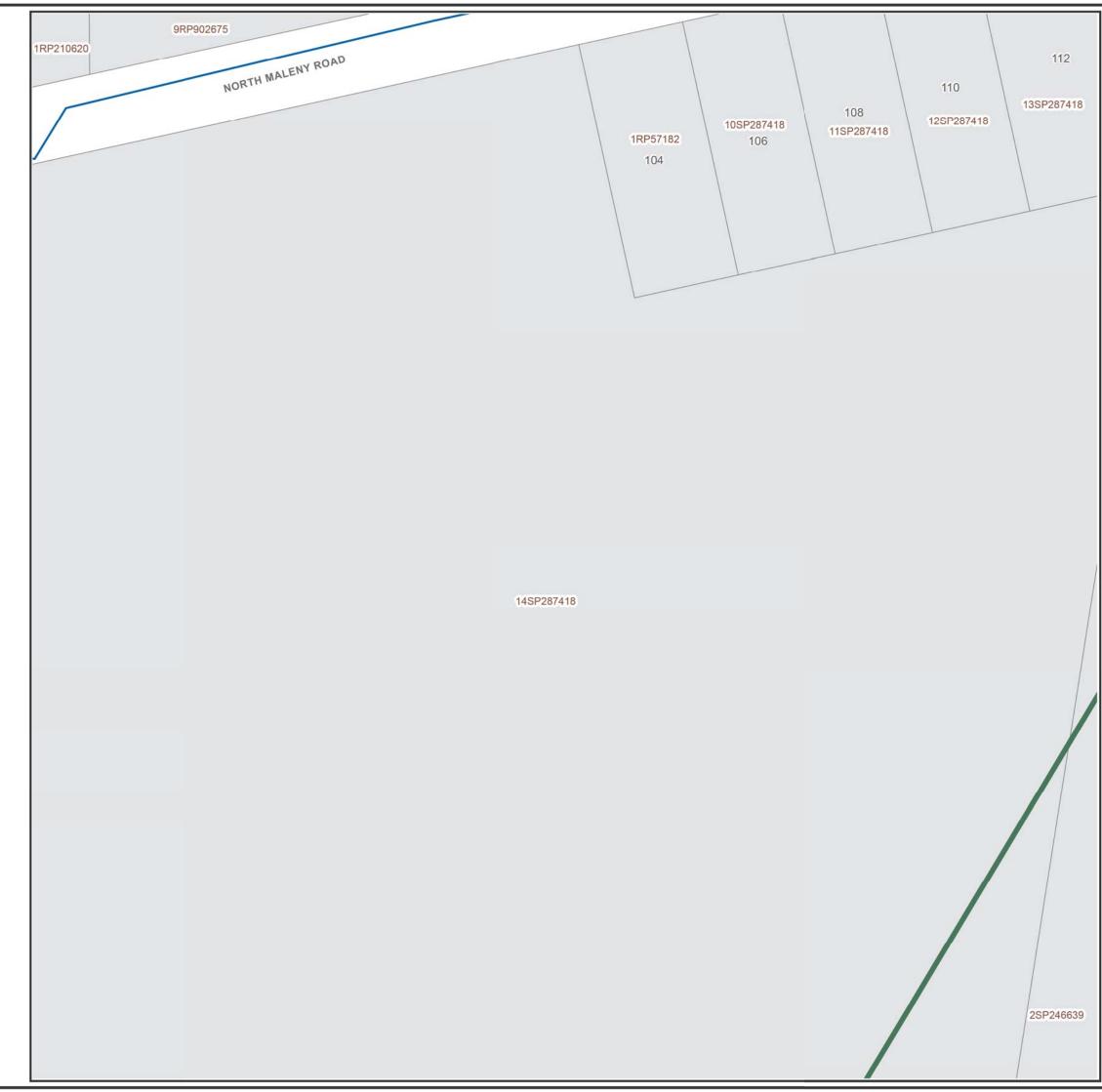


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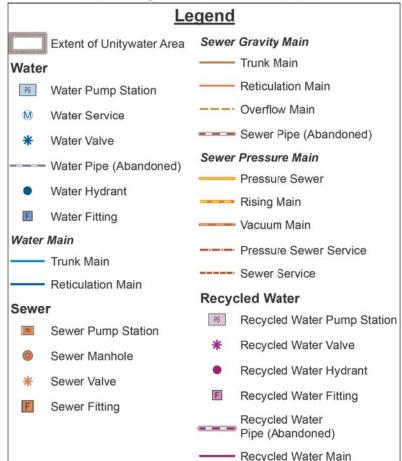


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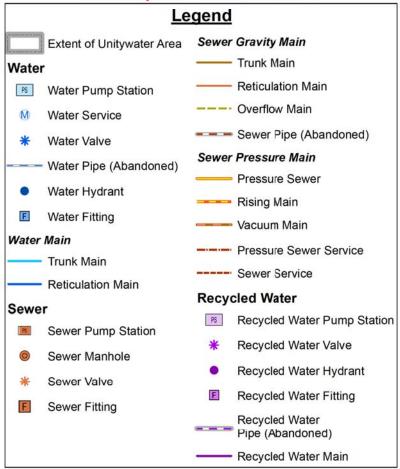


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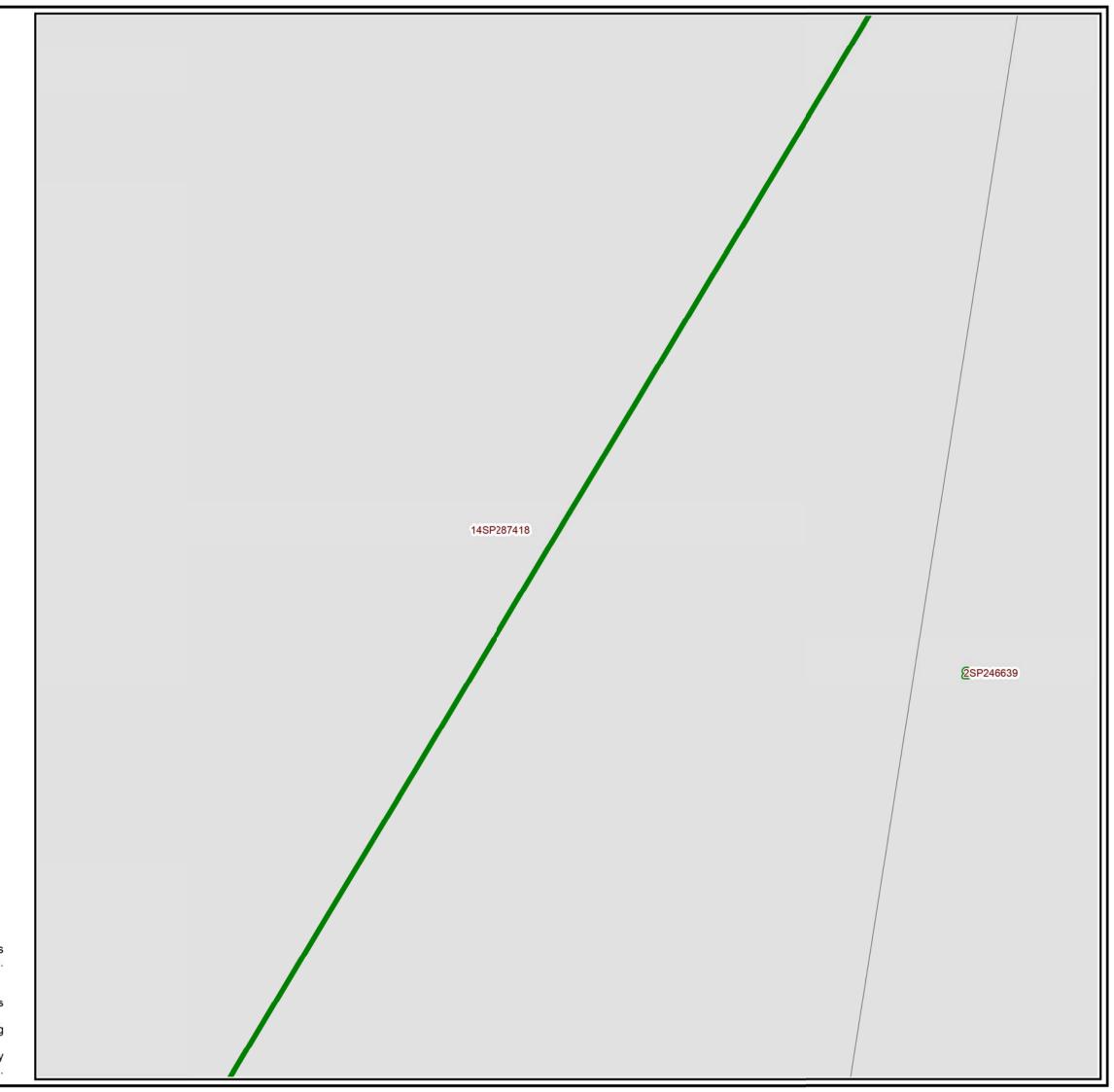


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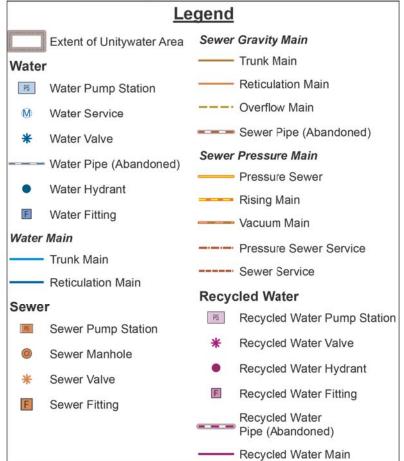
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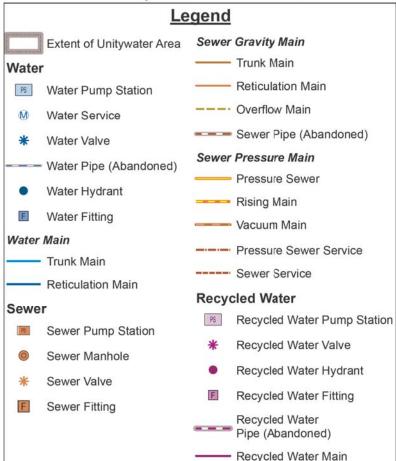


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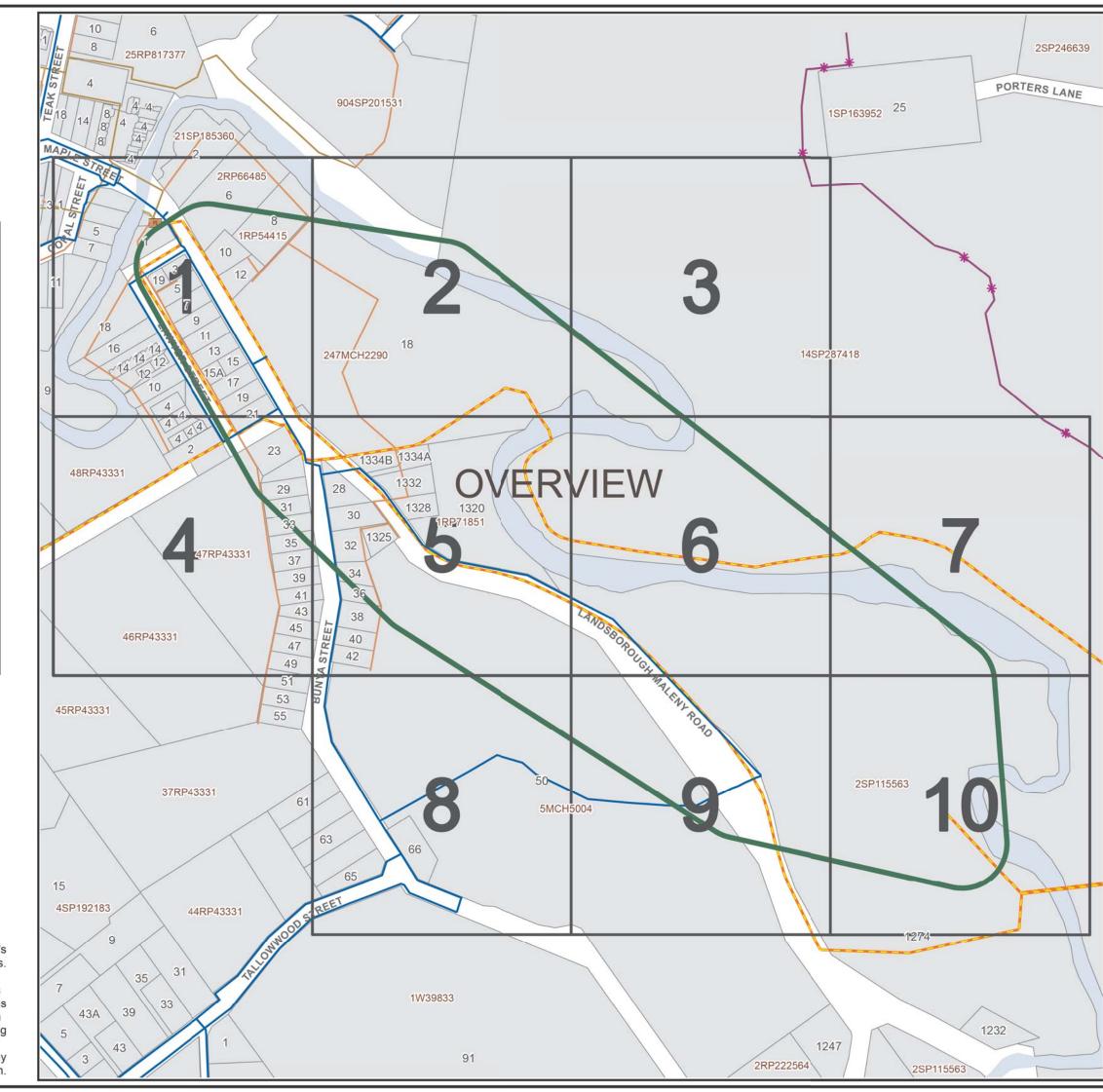
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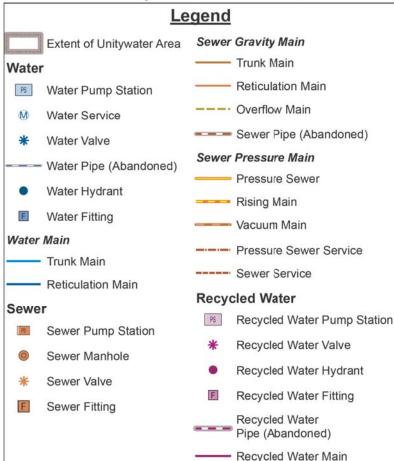


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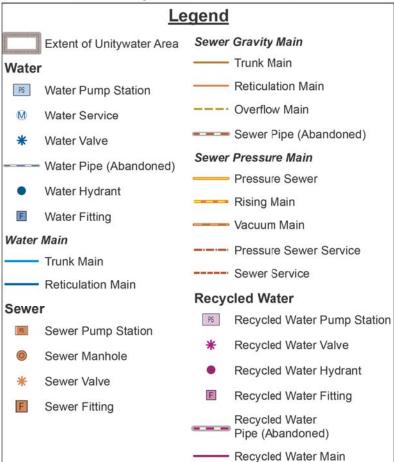


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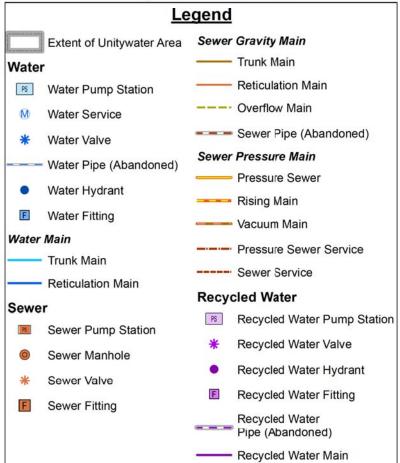


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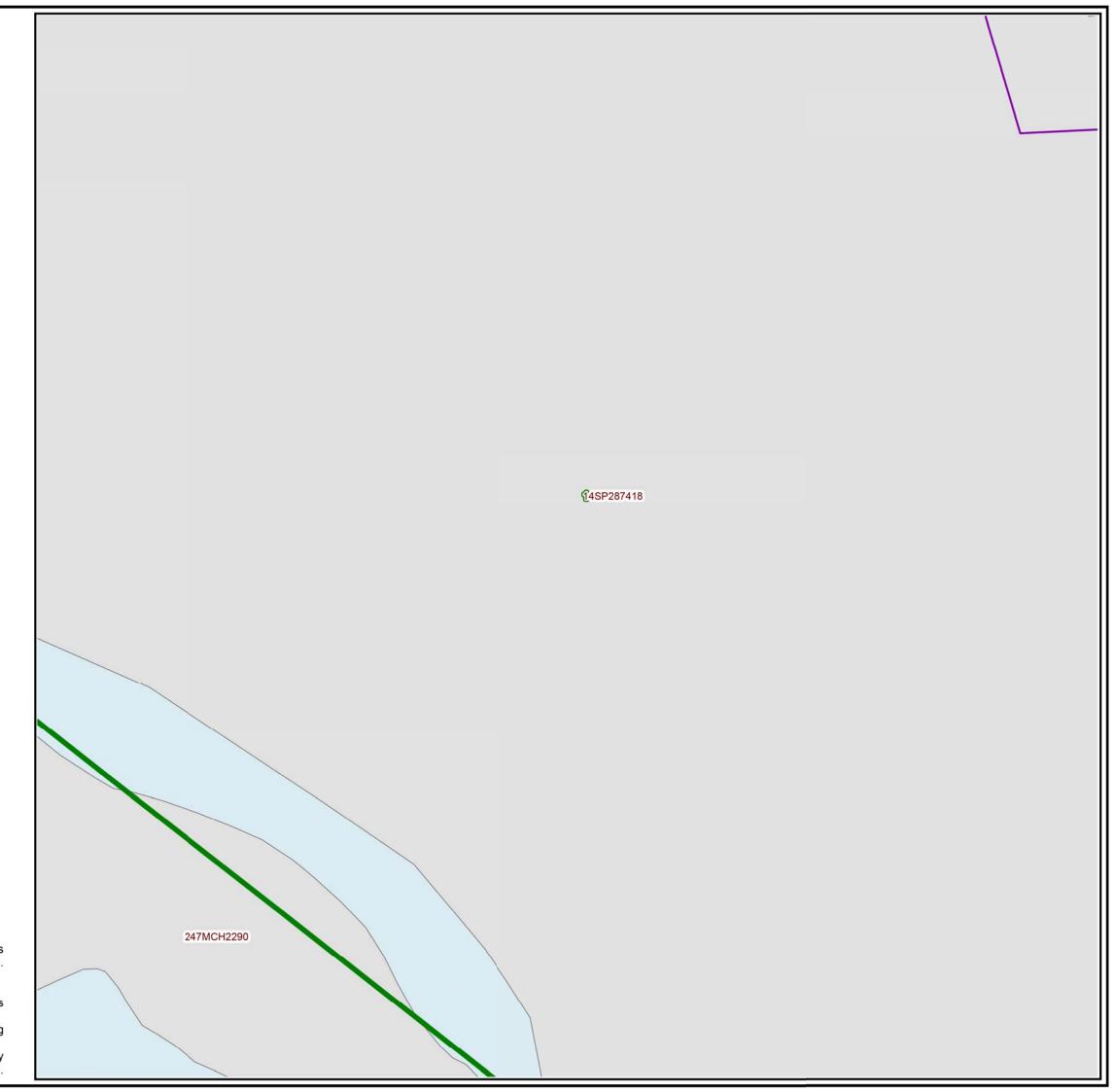
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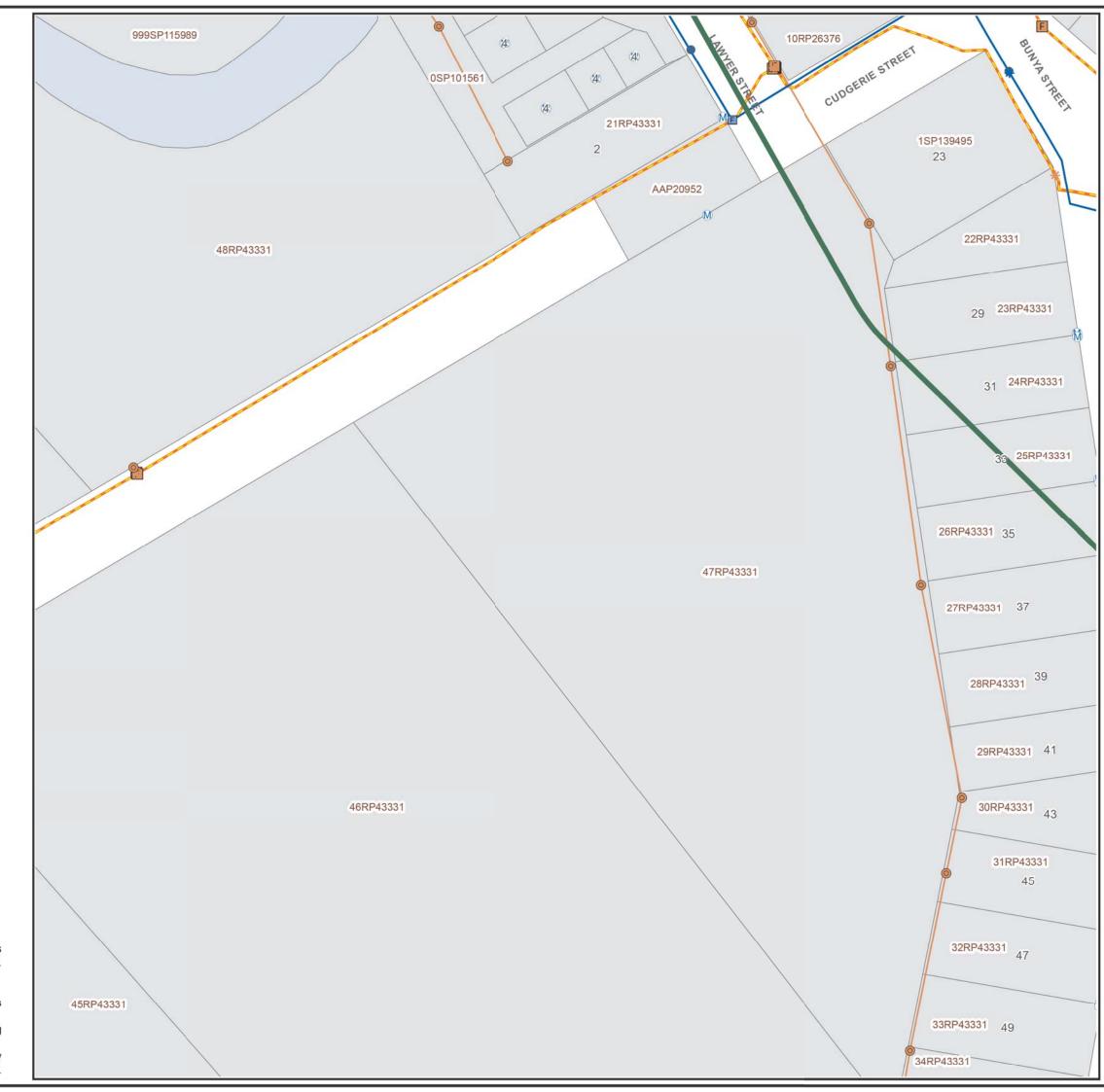
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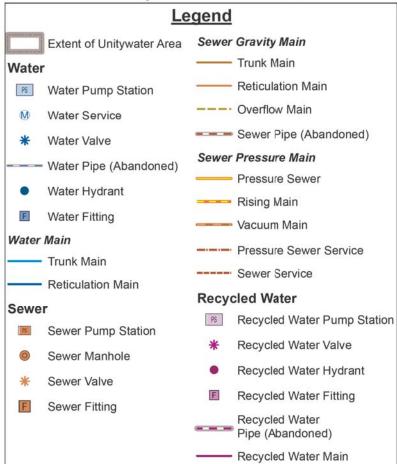


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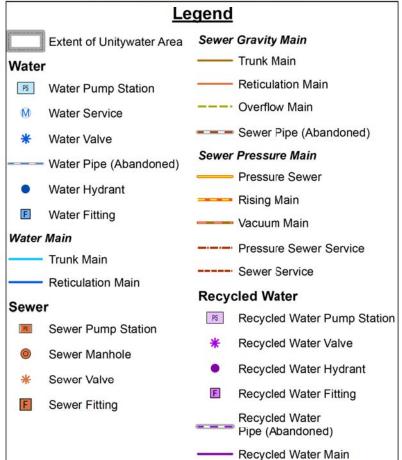


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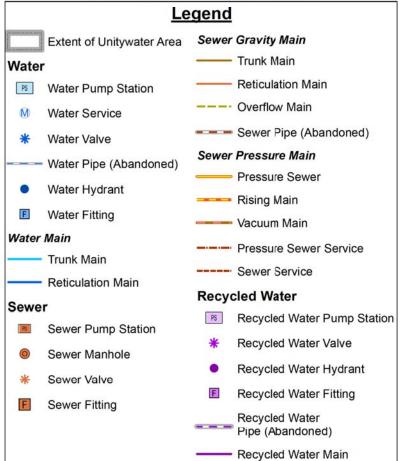


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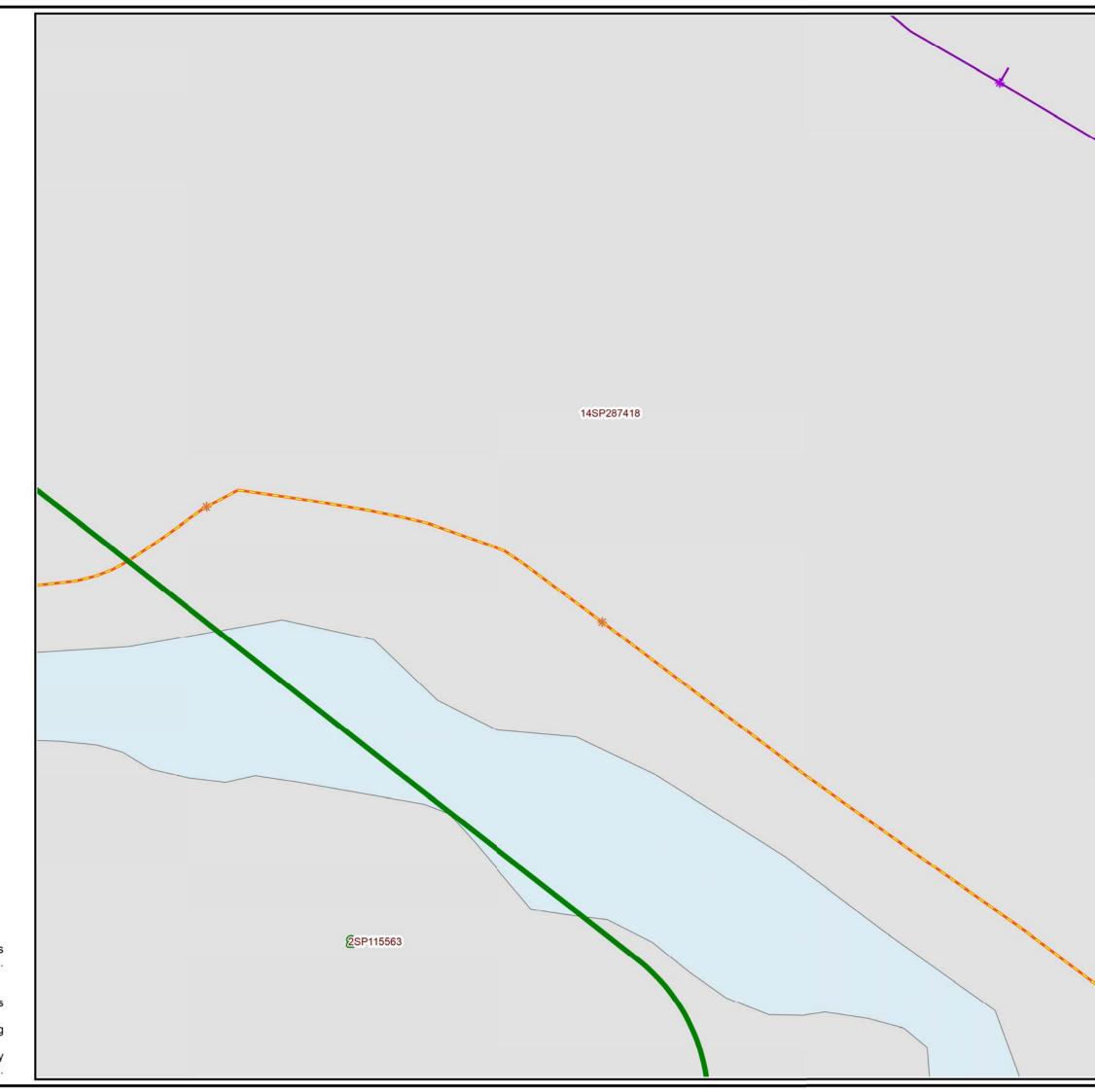


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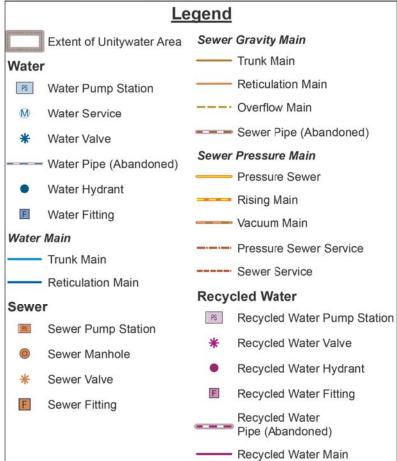


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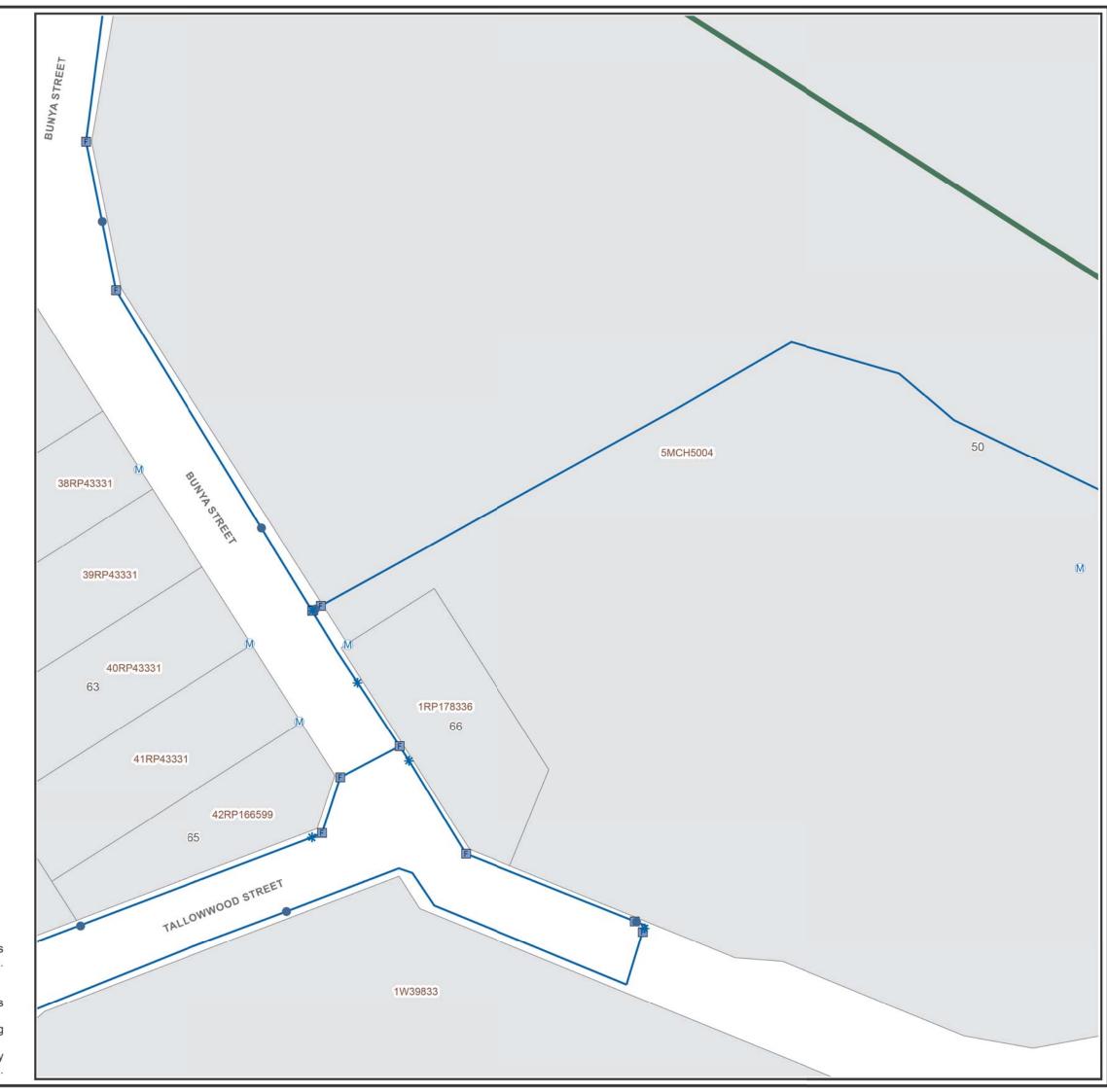
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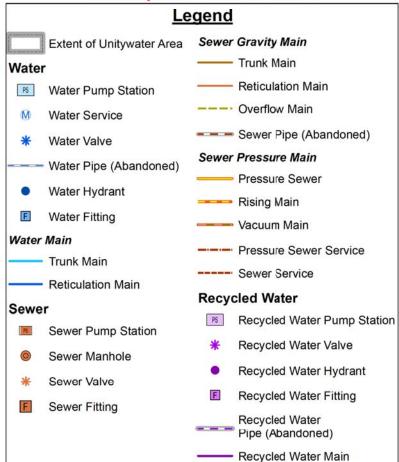


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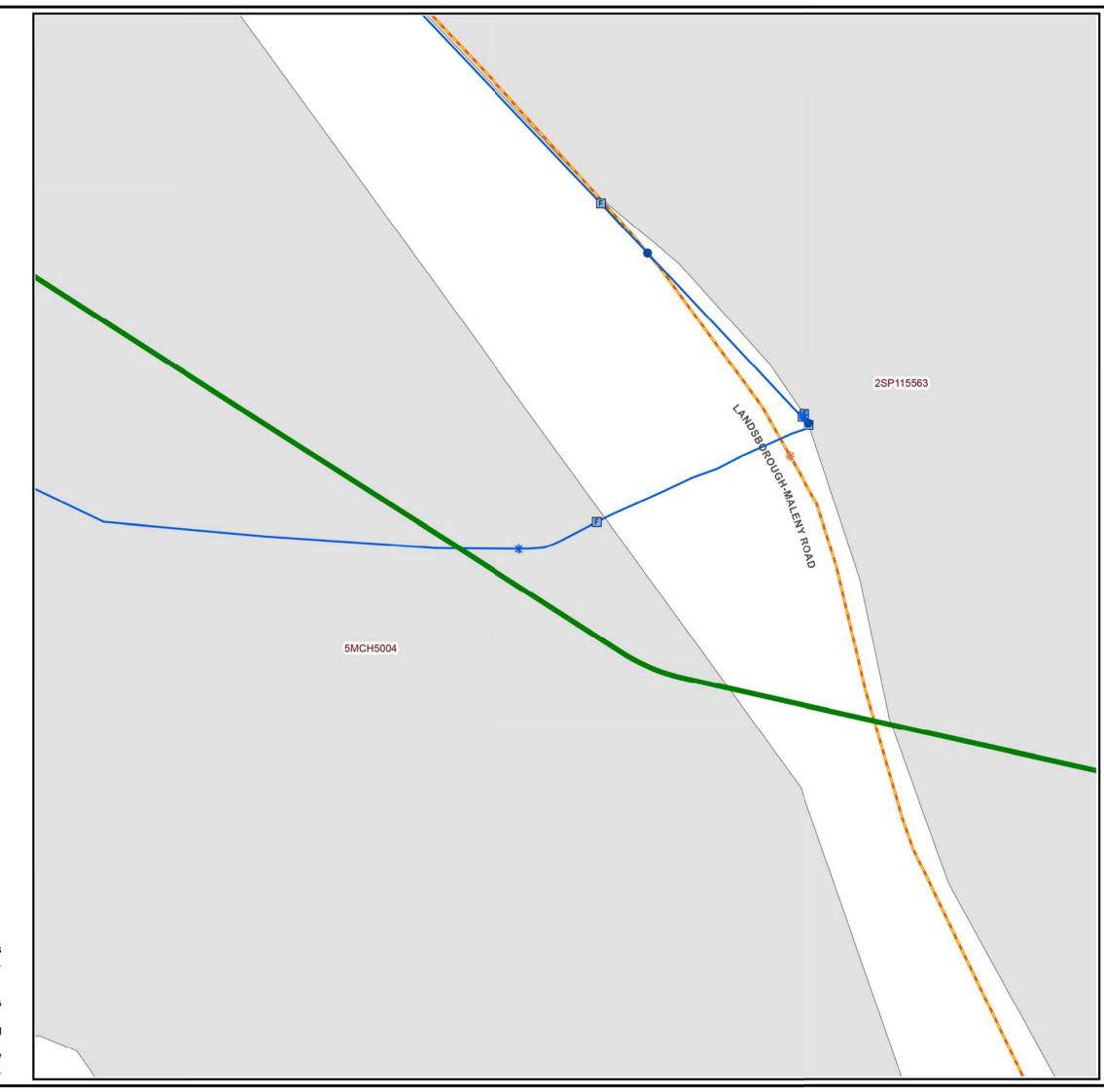
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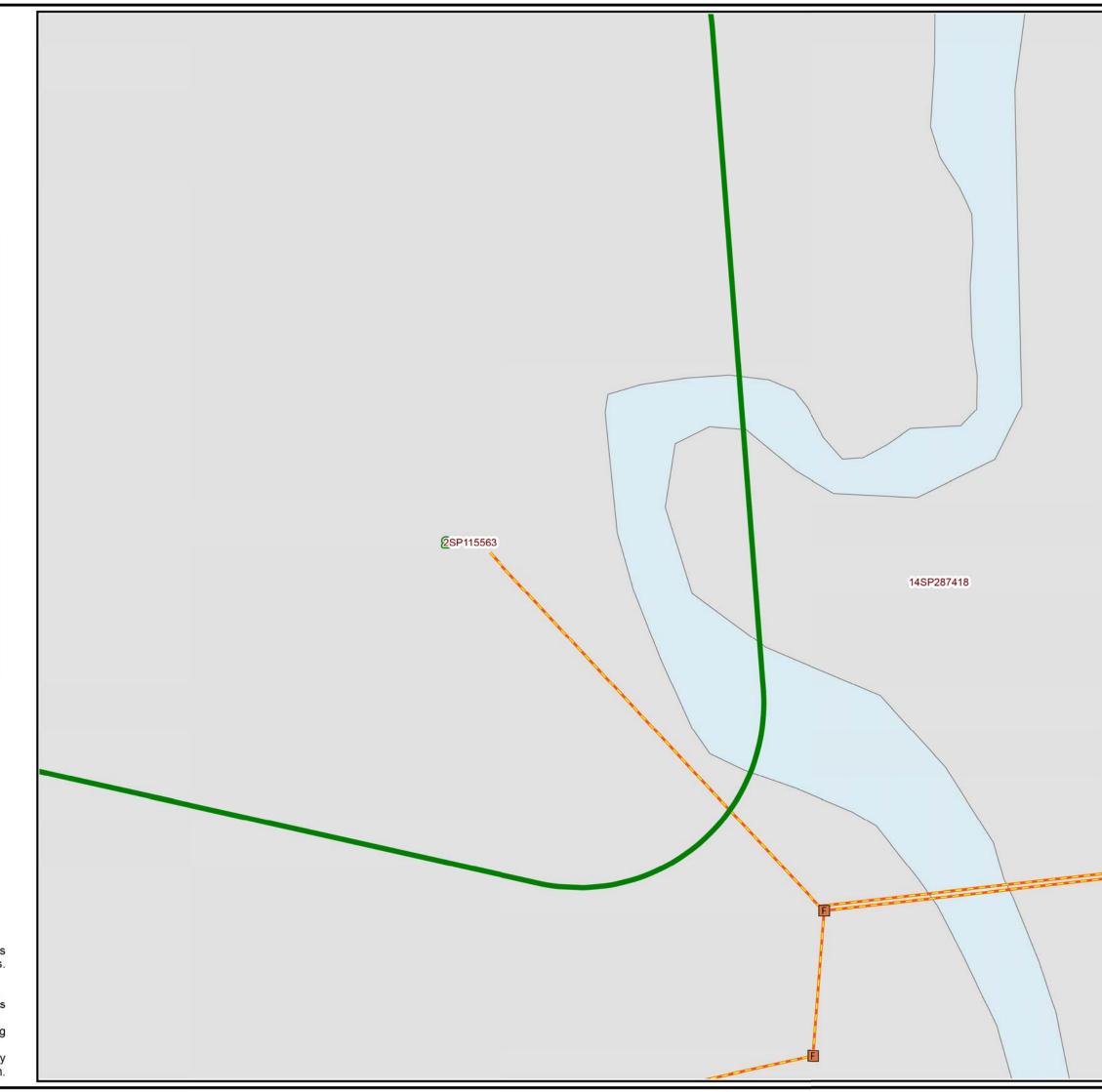
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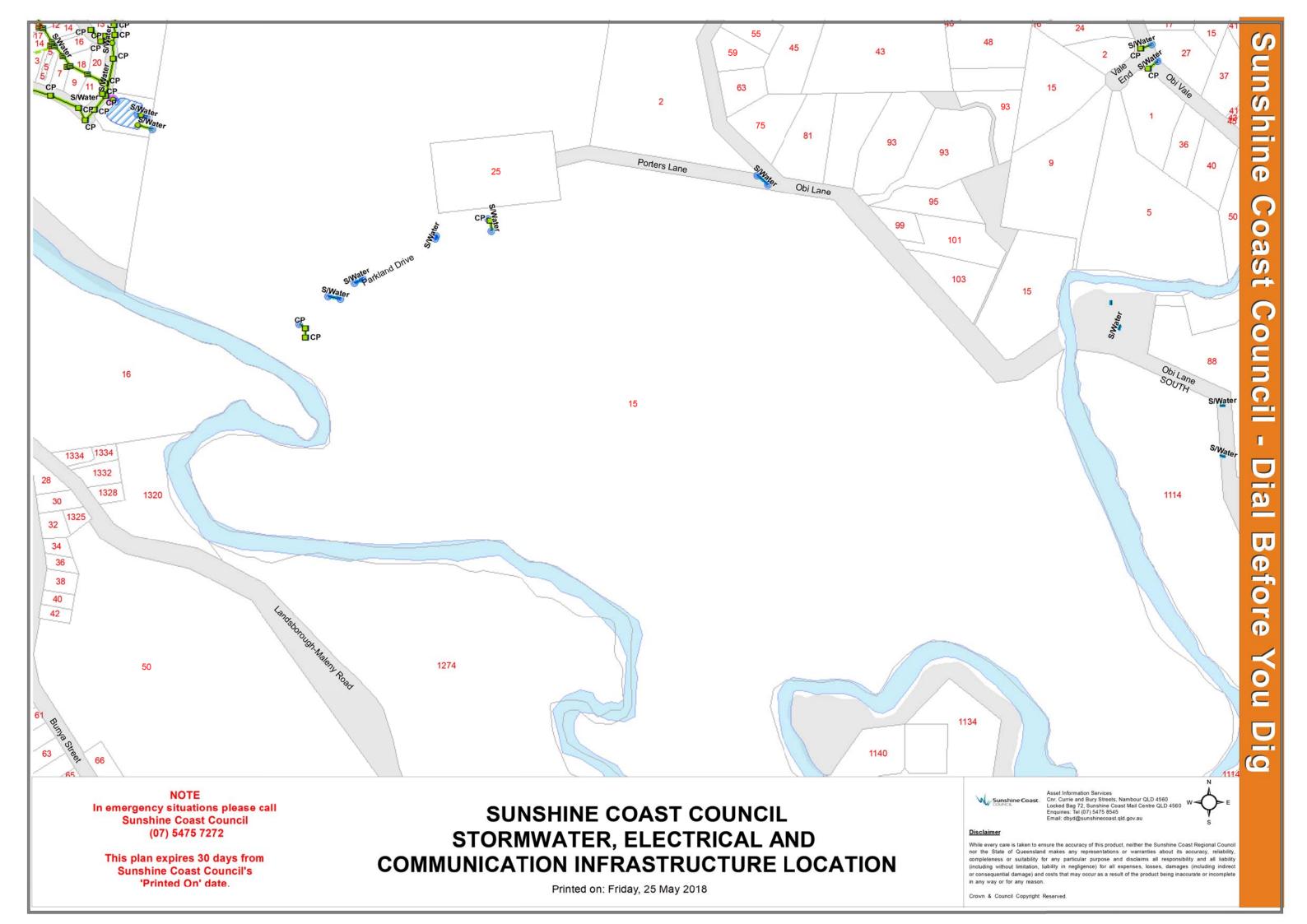
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Sunshine Coast.

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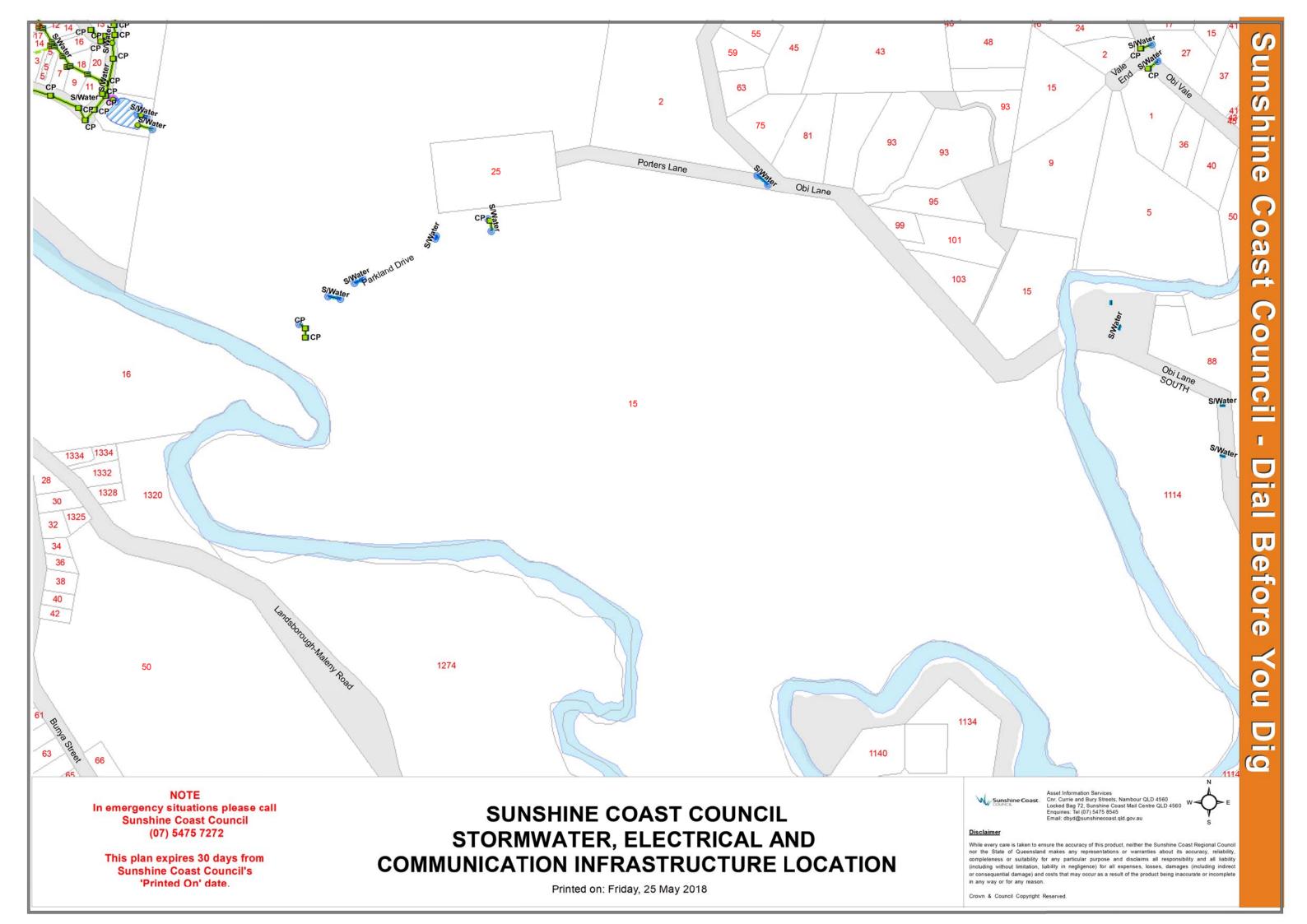
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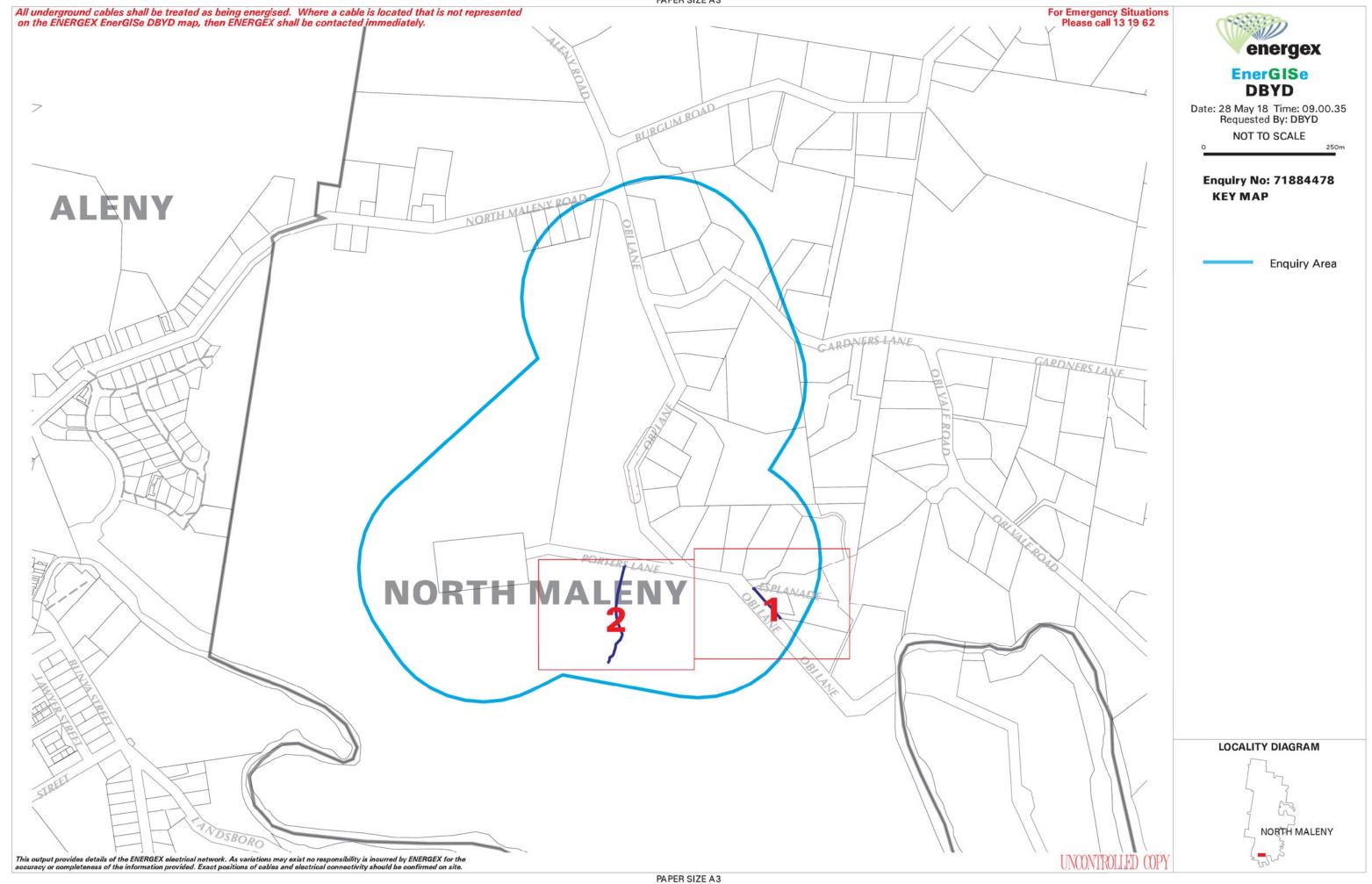
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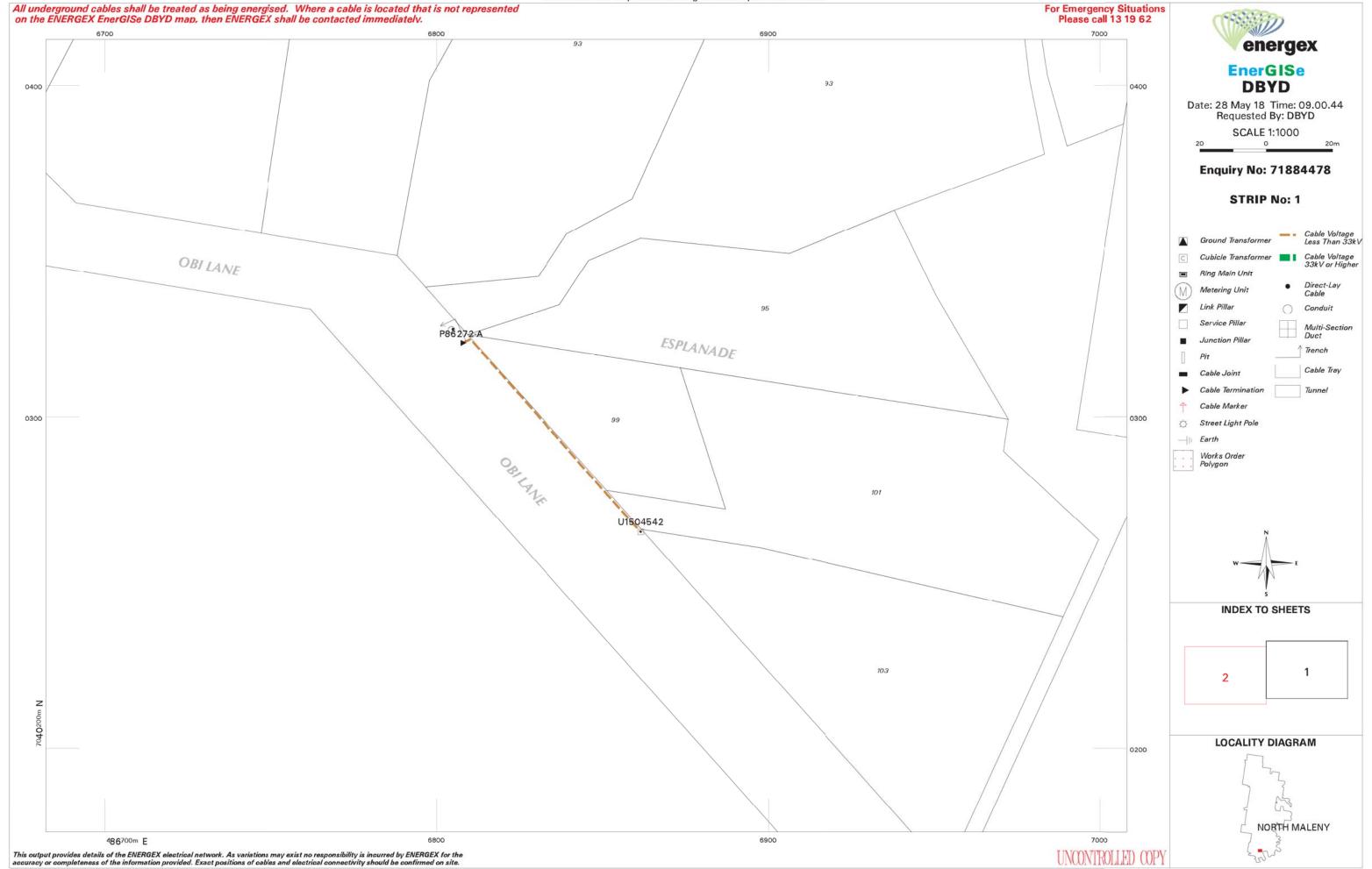
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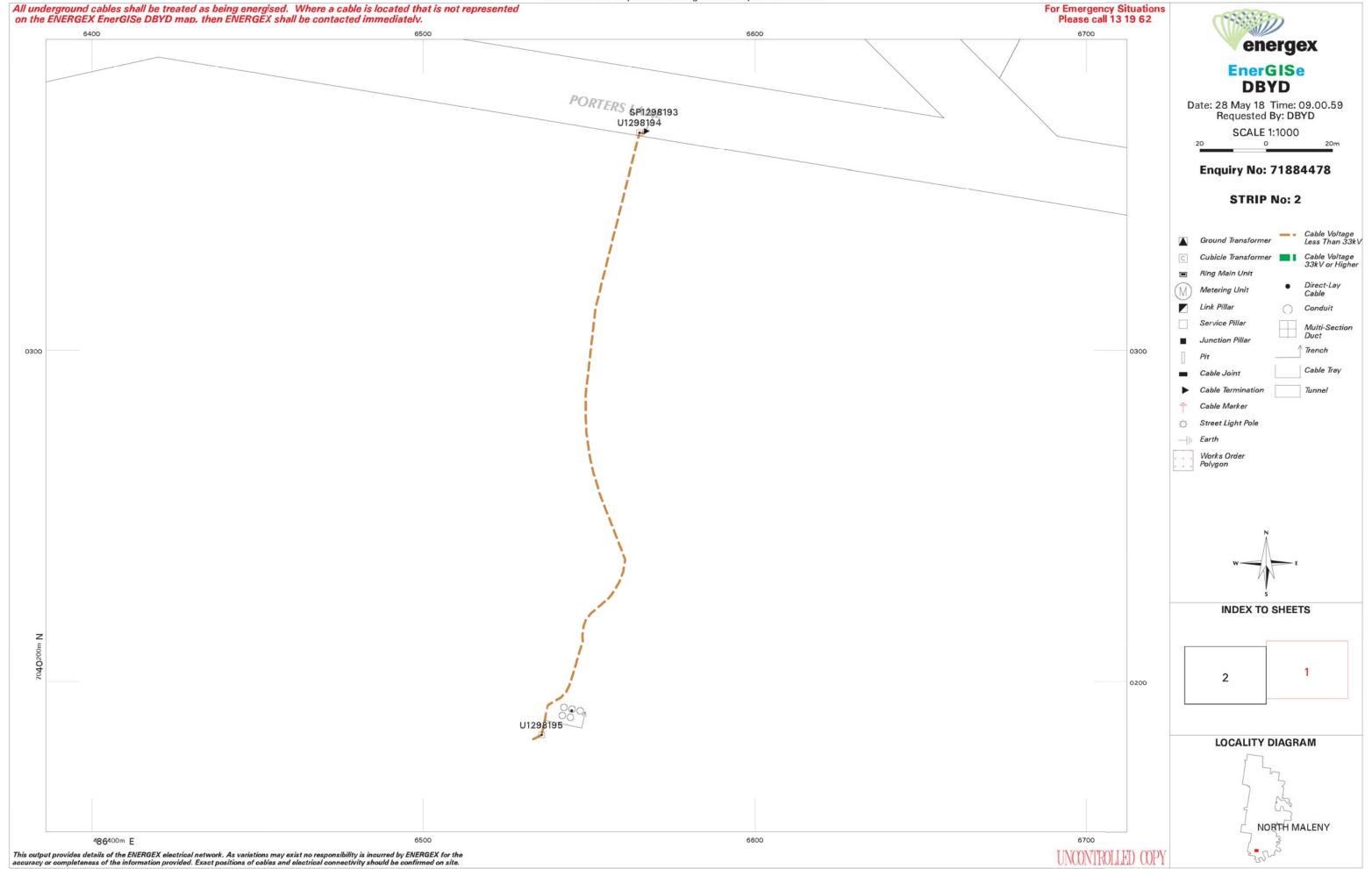
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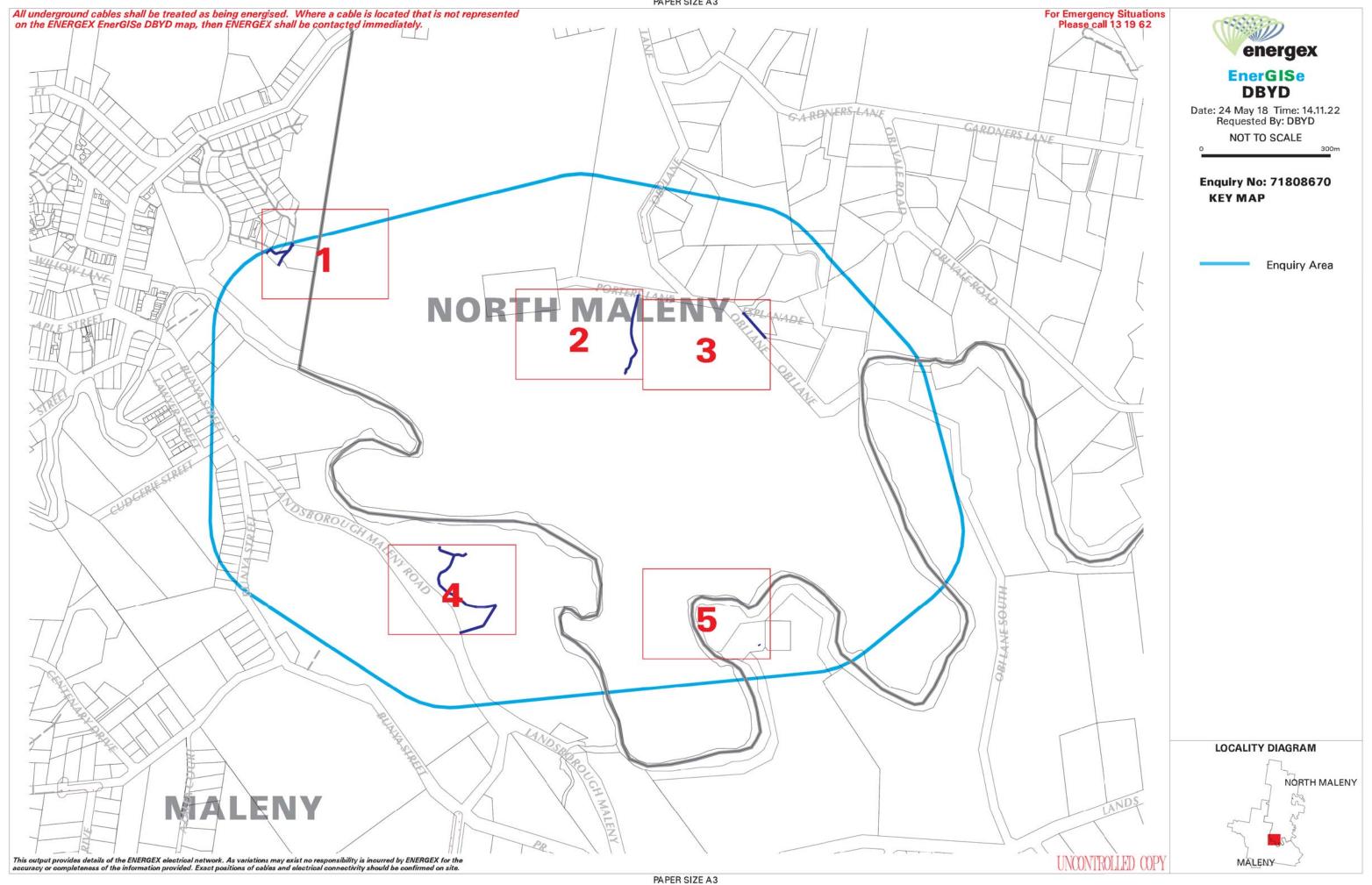
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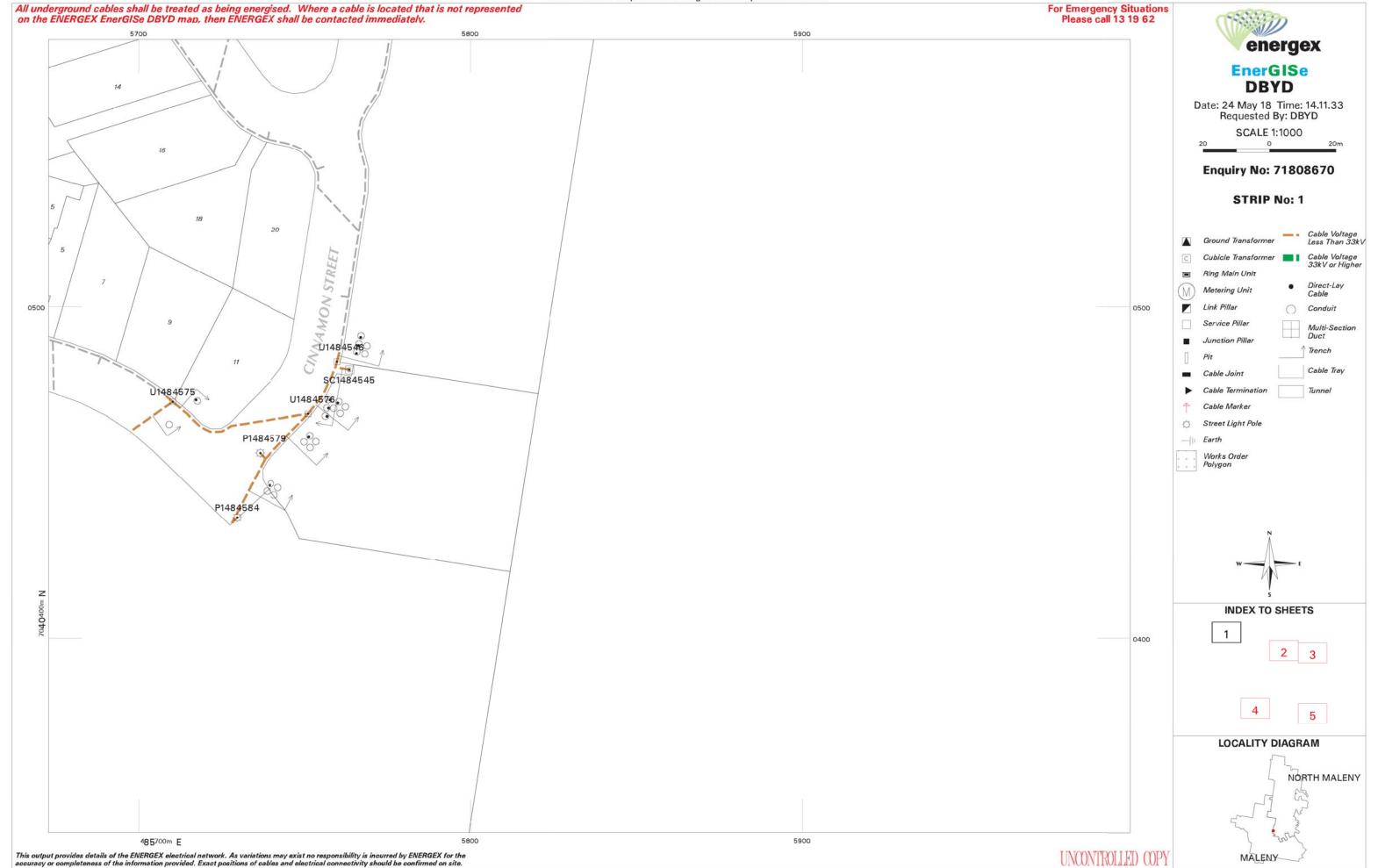


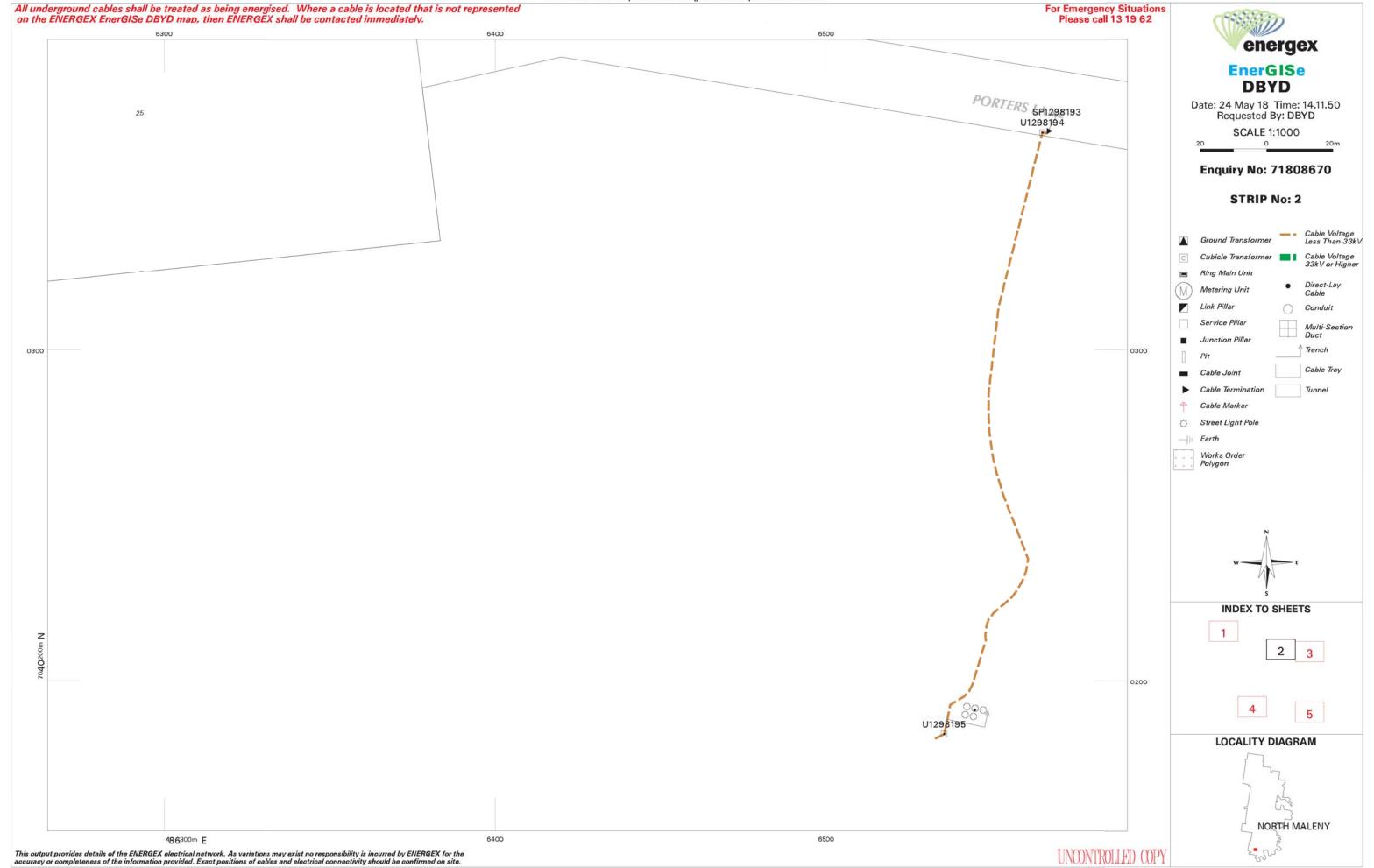


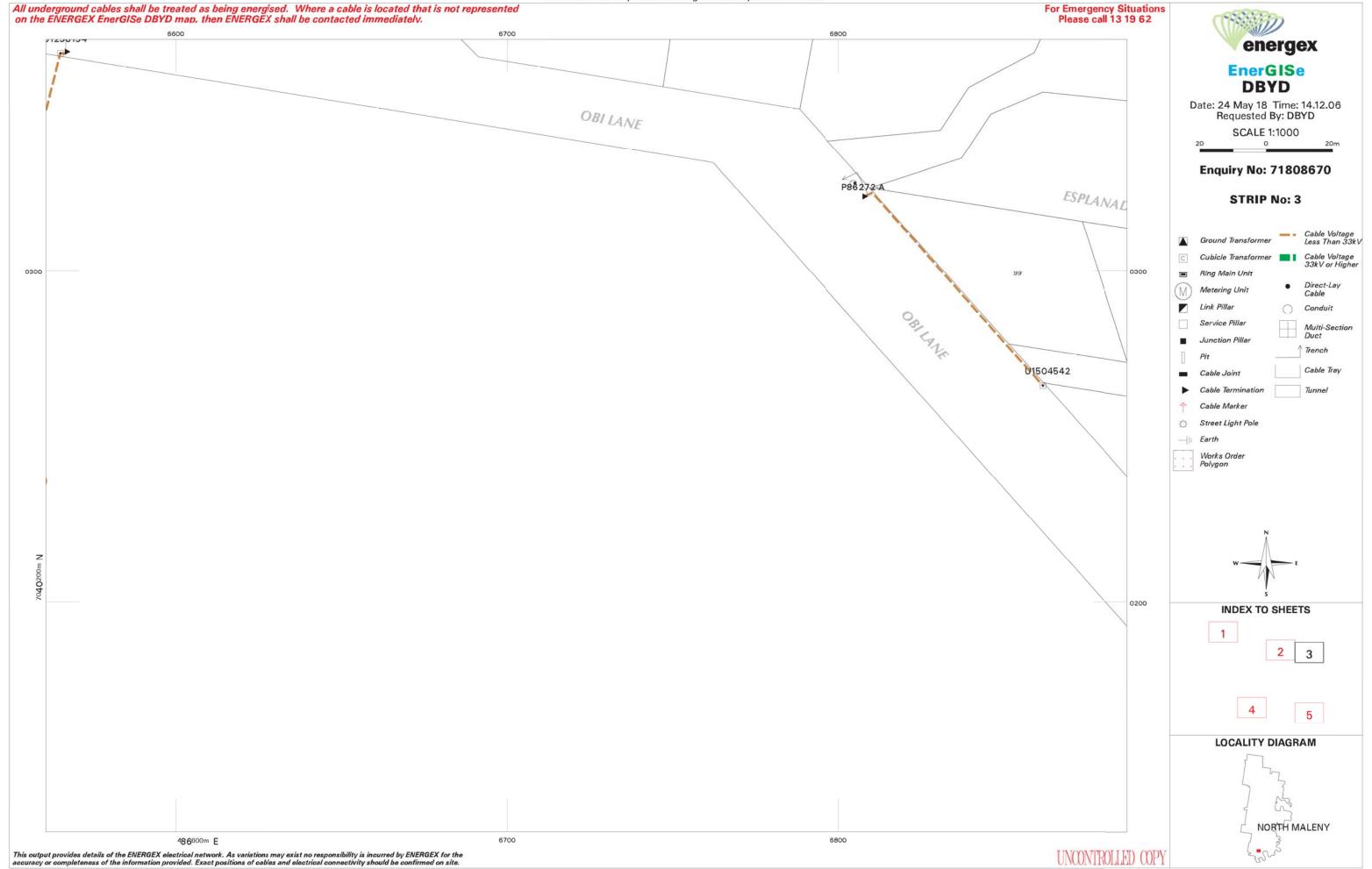


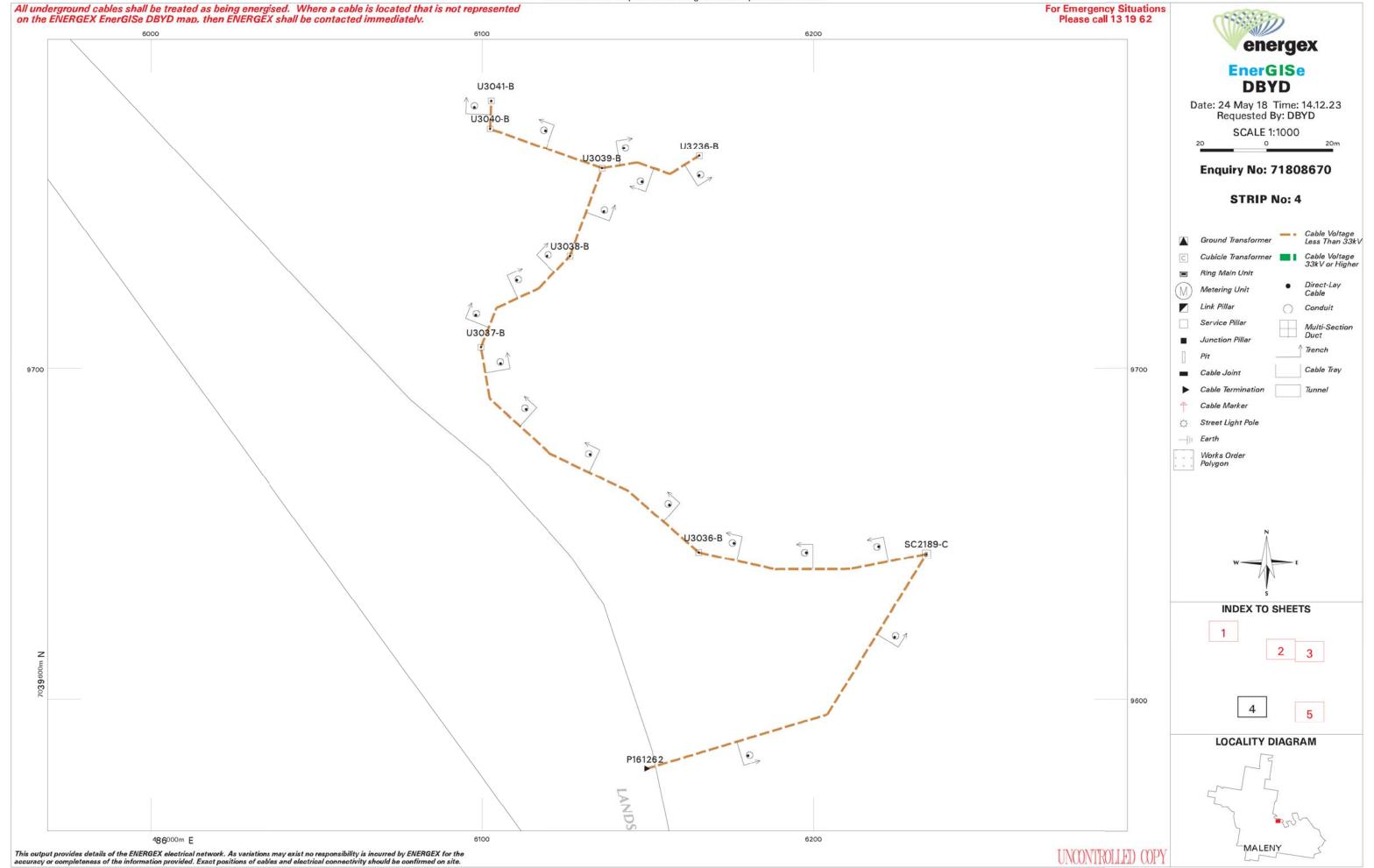














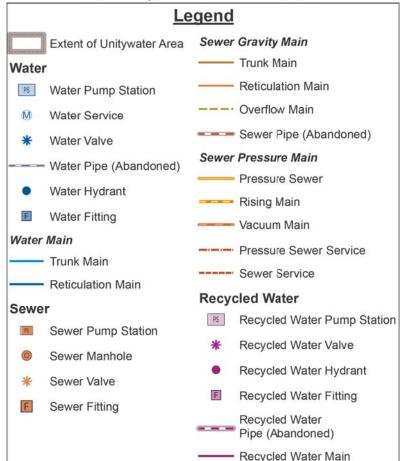


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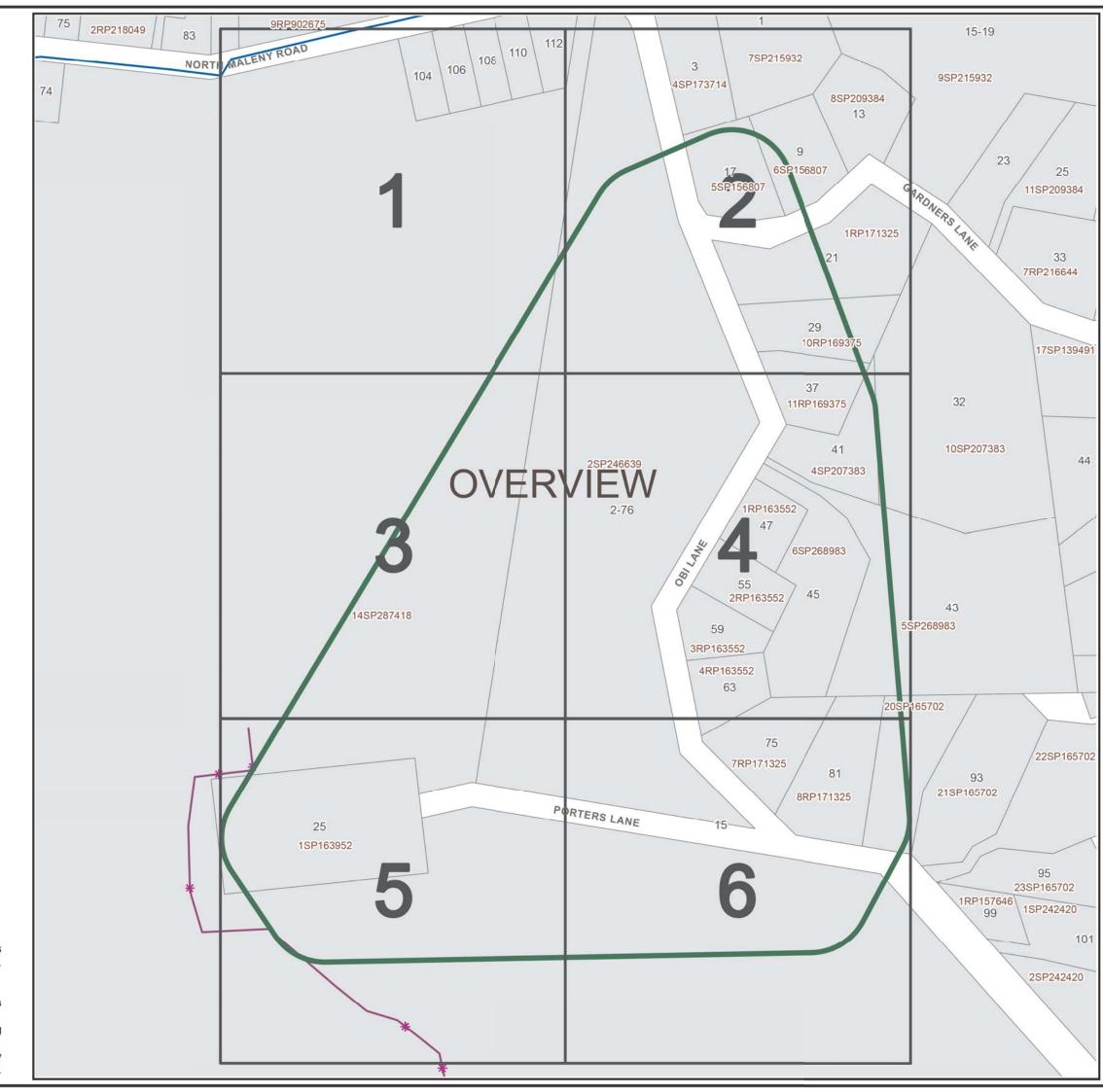
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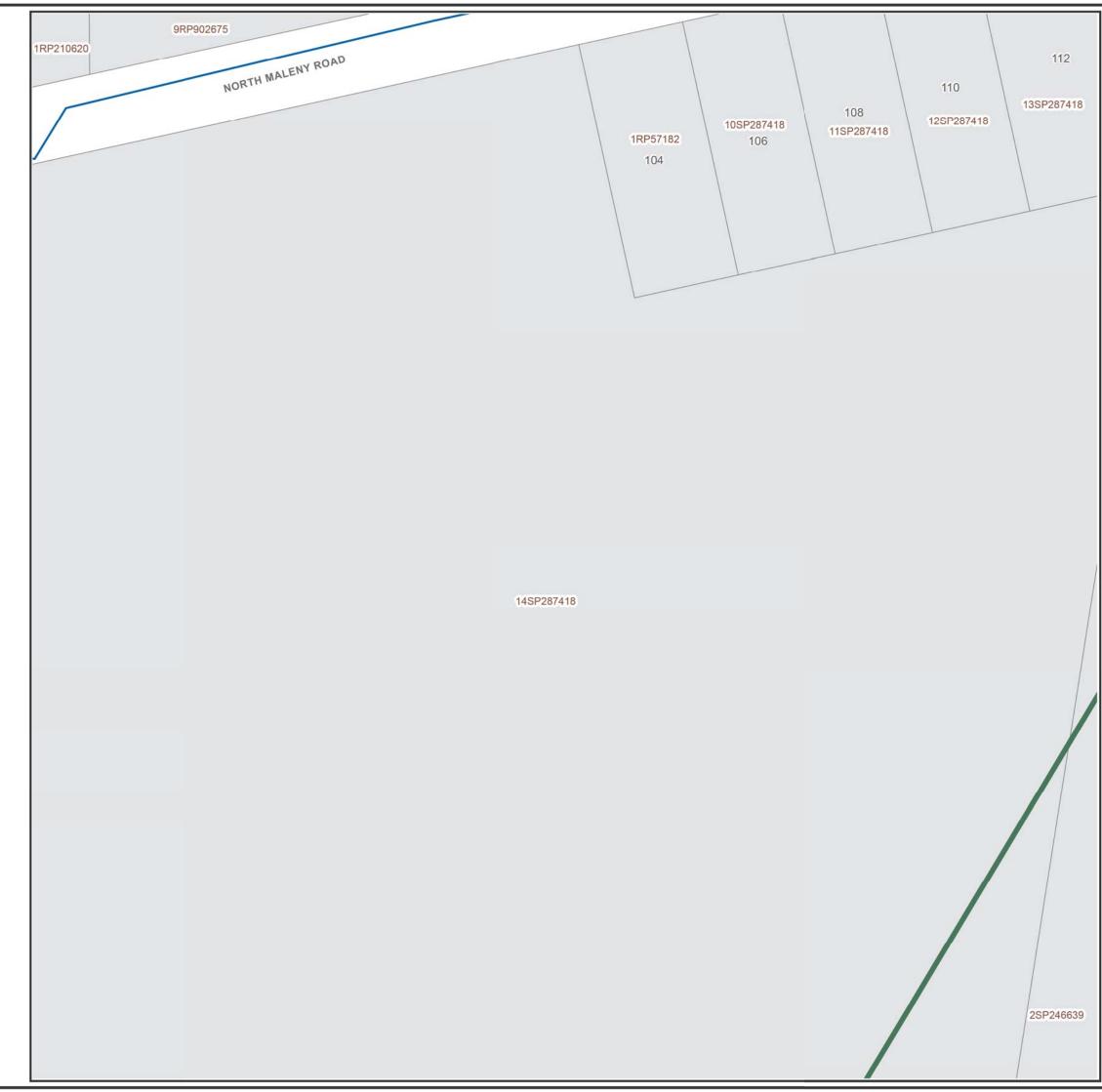


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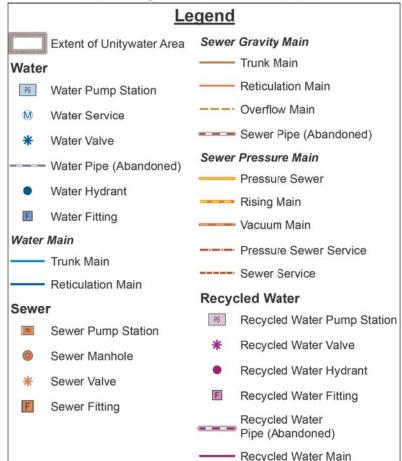


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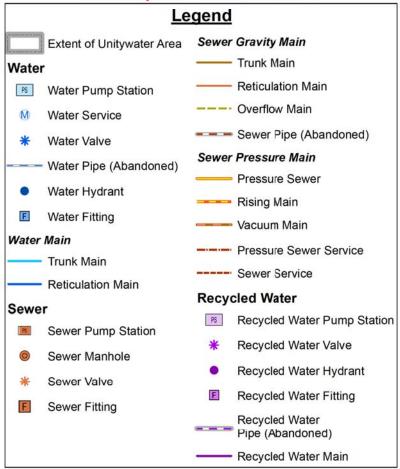


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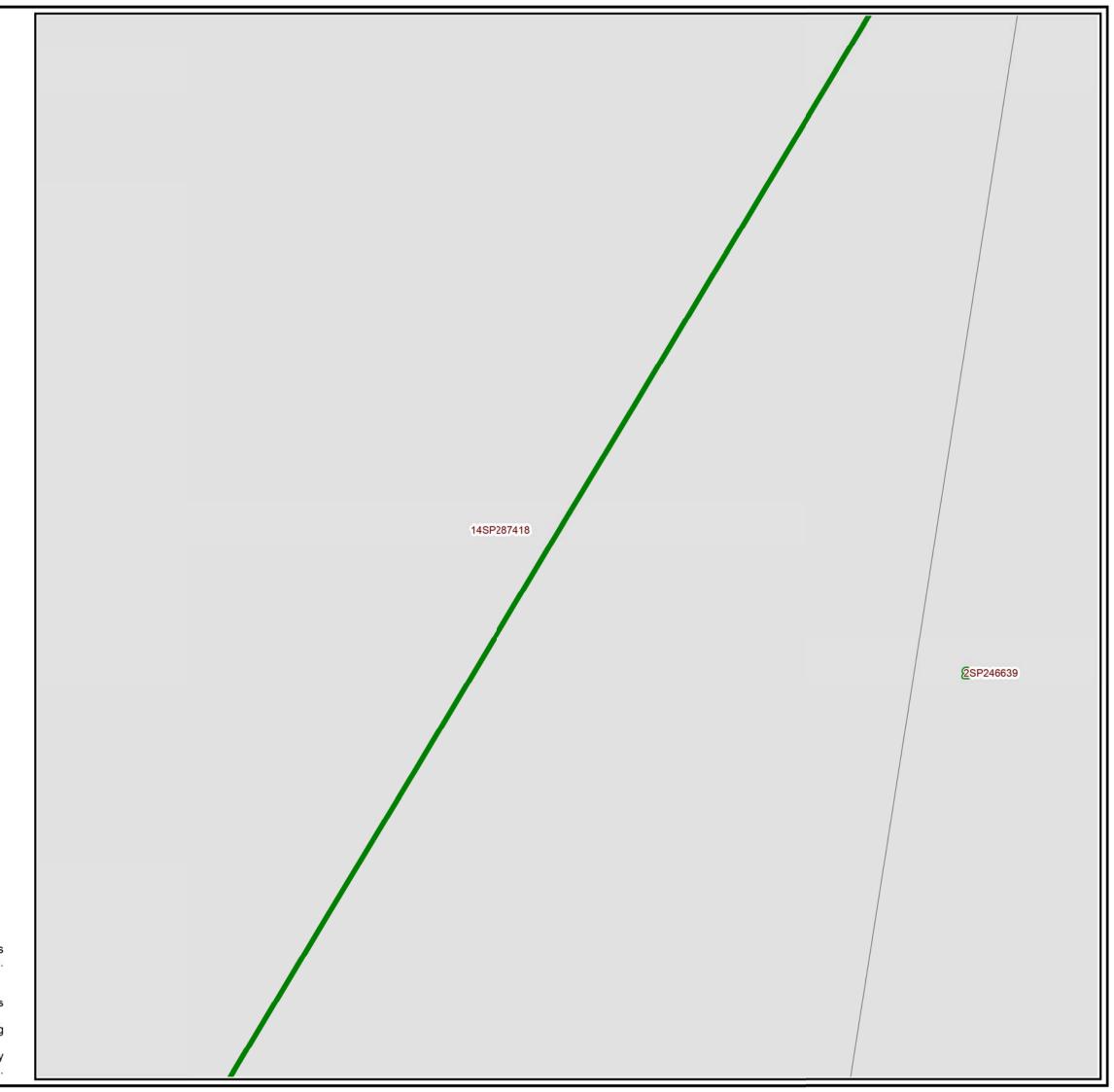


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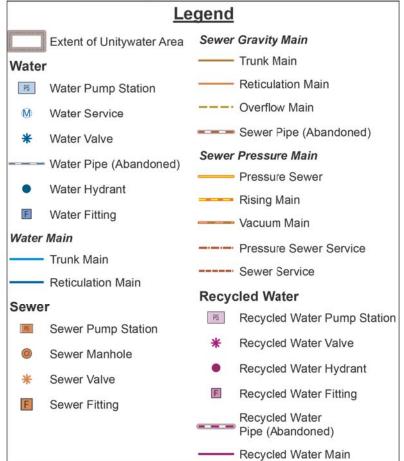
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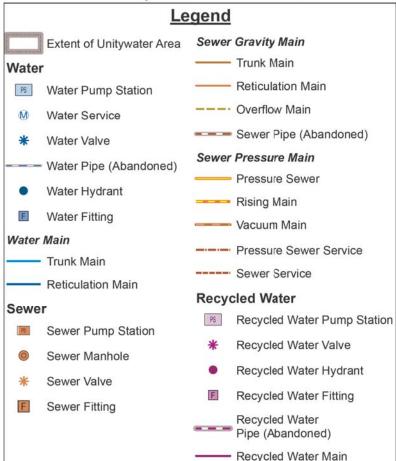


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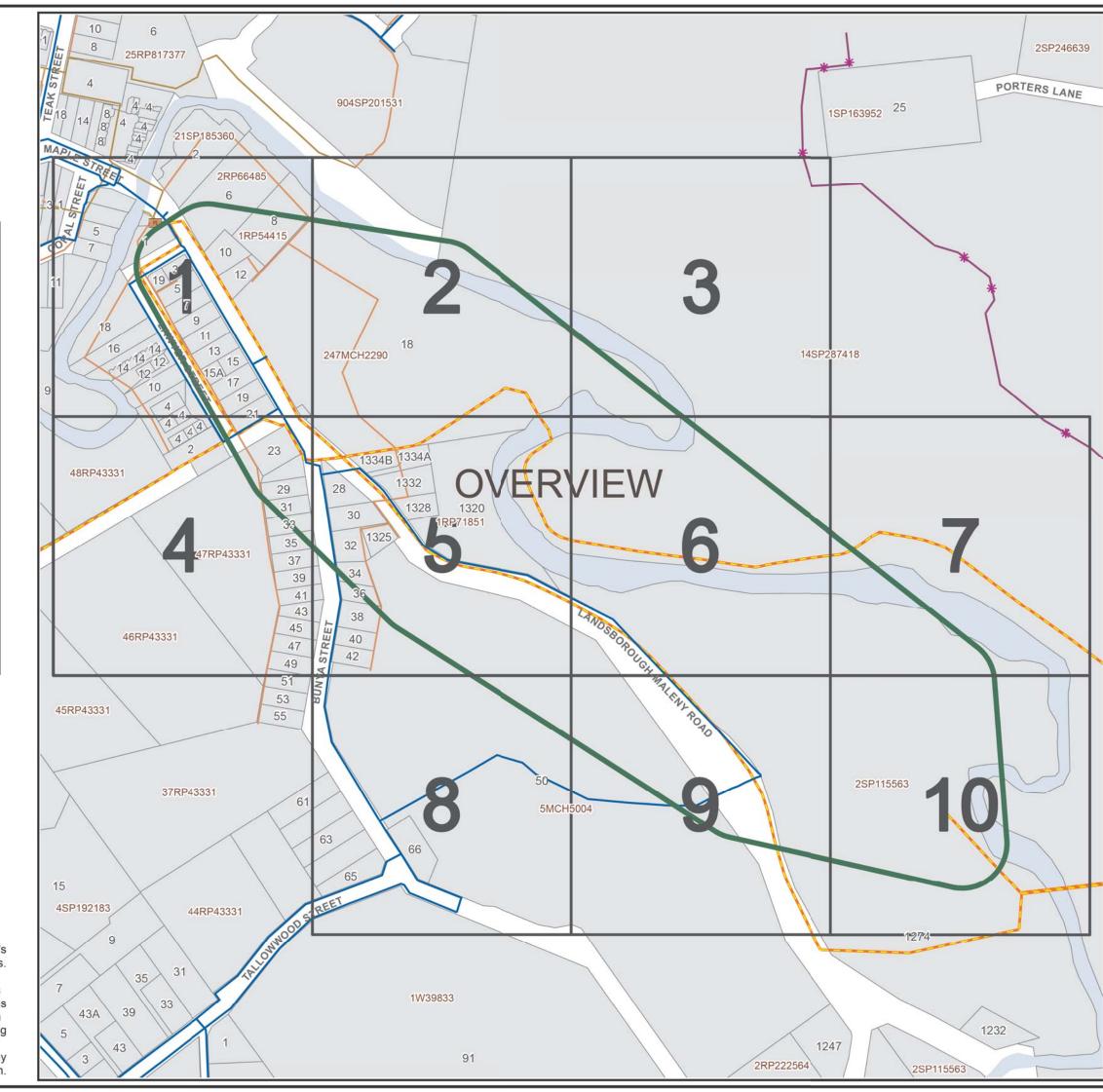
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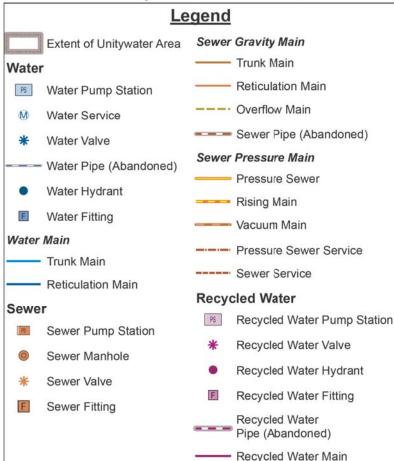


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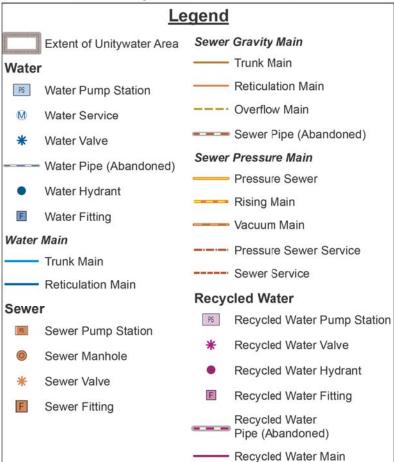


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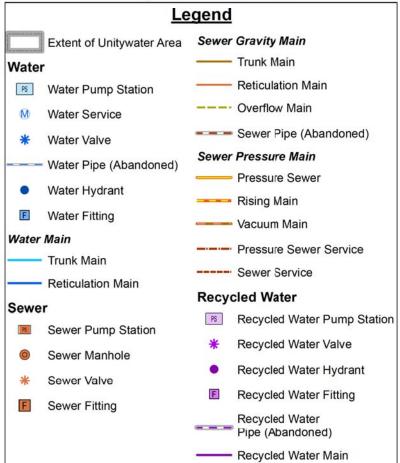


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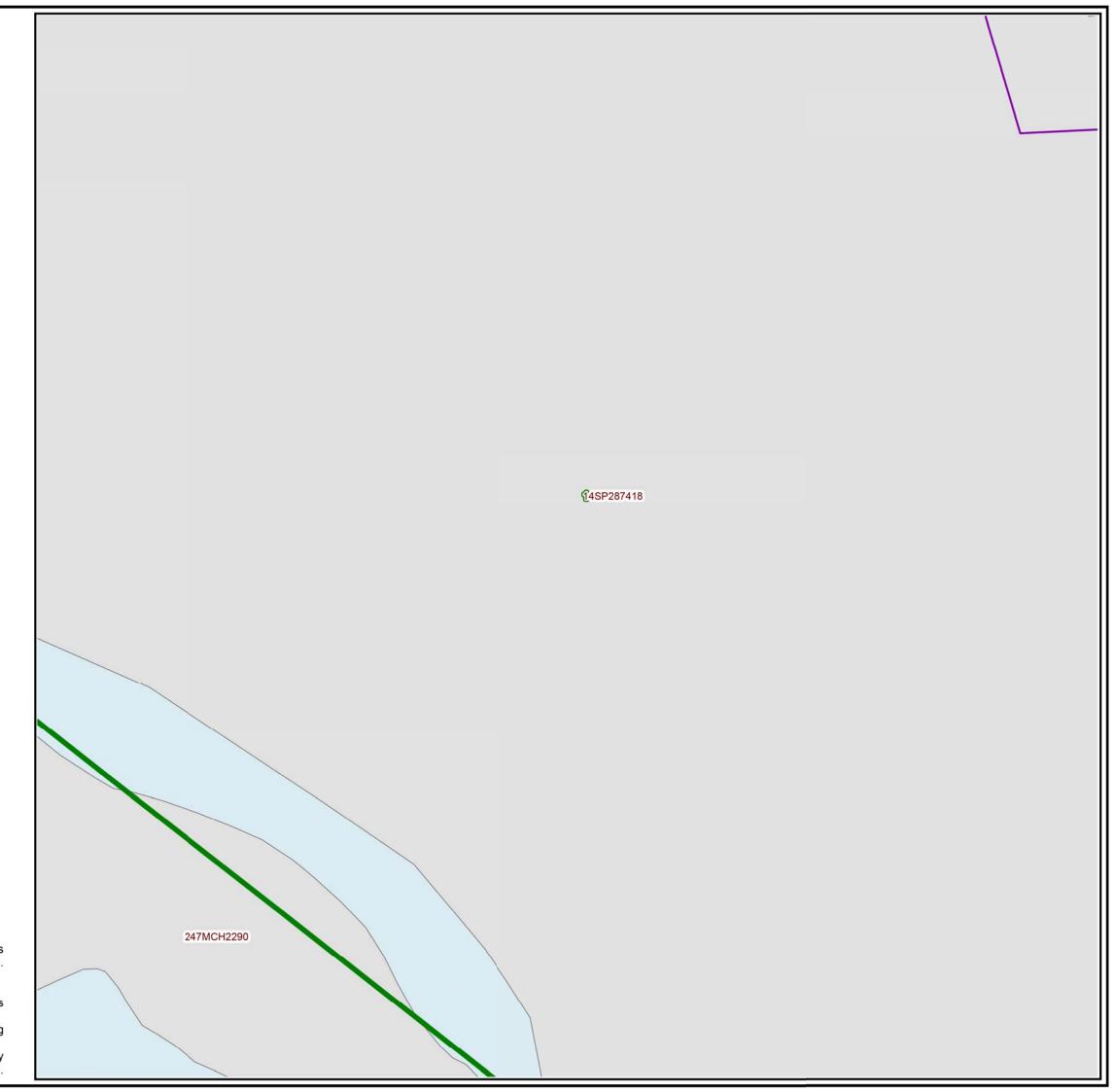
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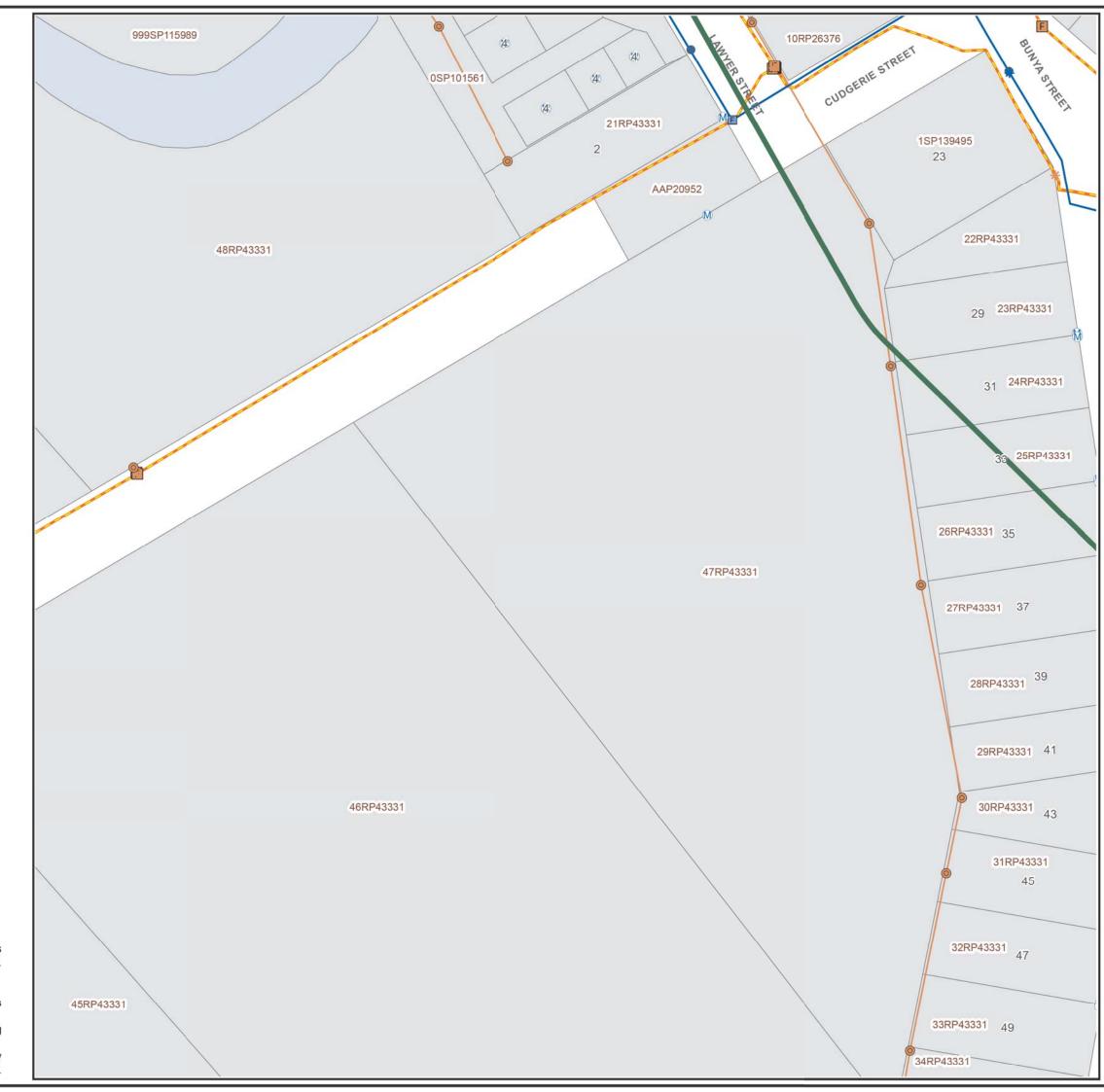
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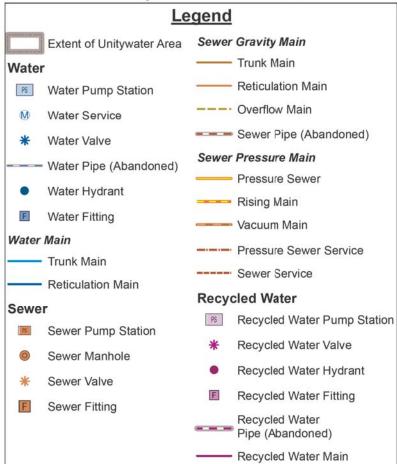


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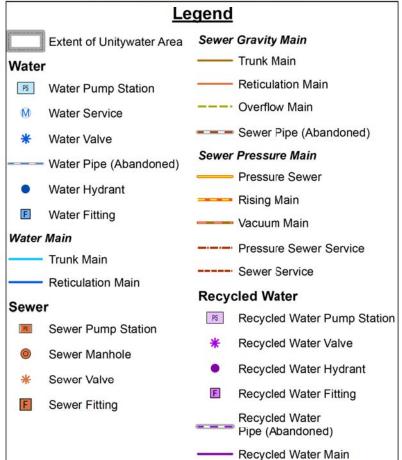


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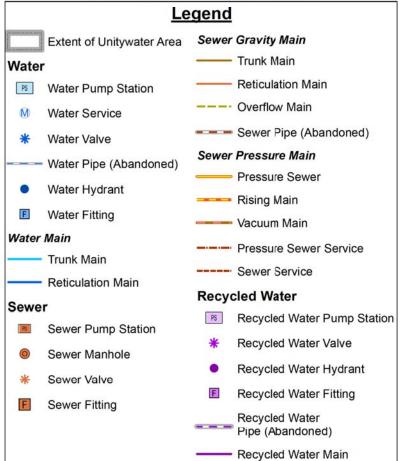


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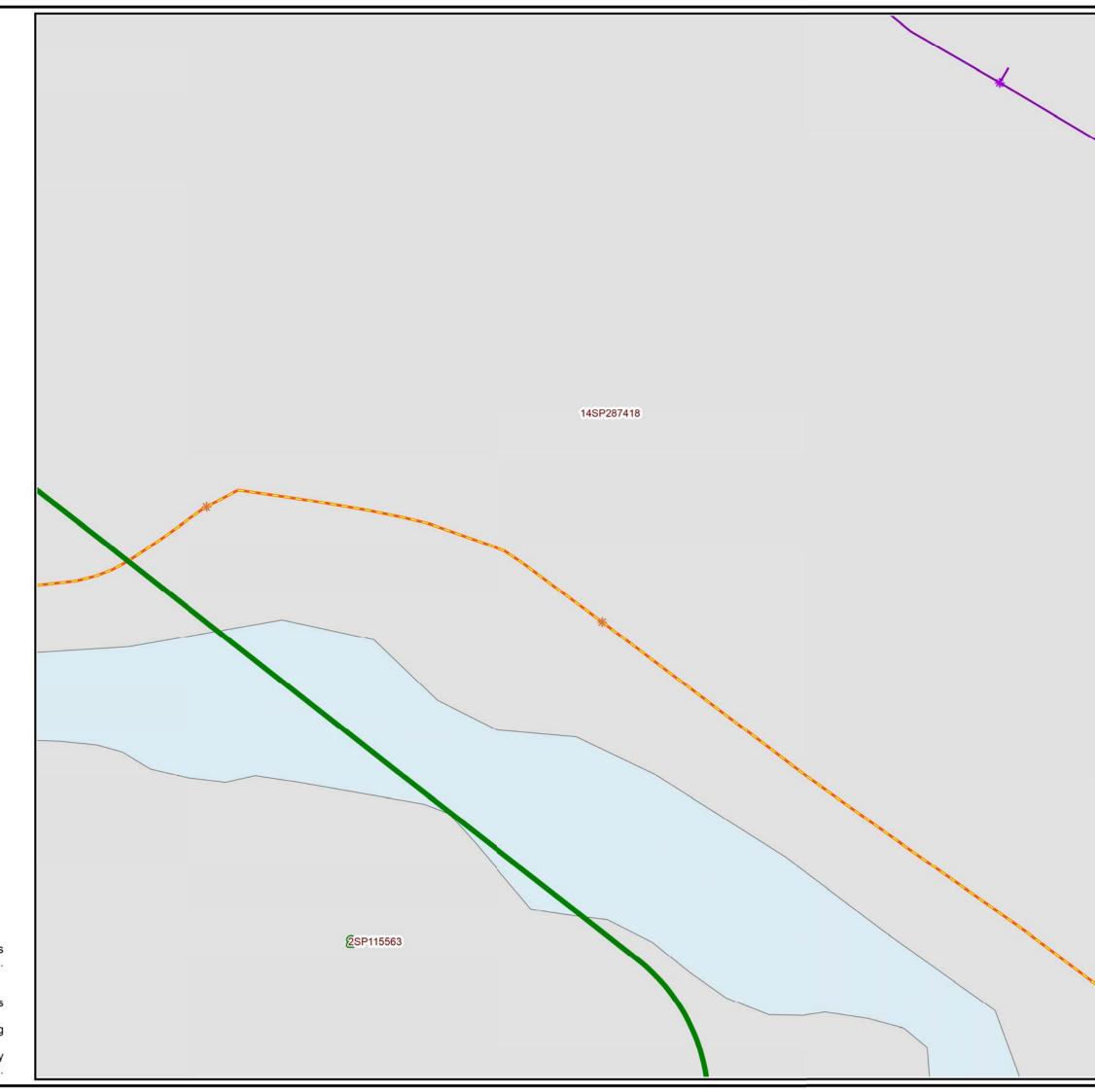


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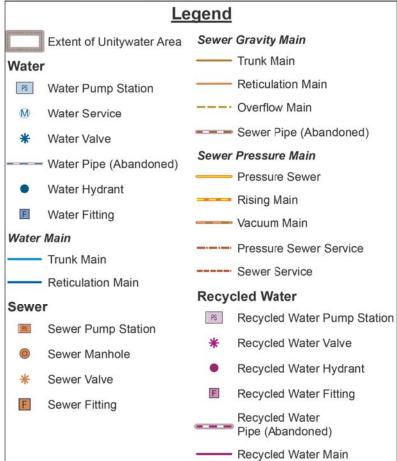


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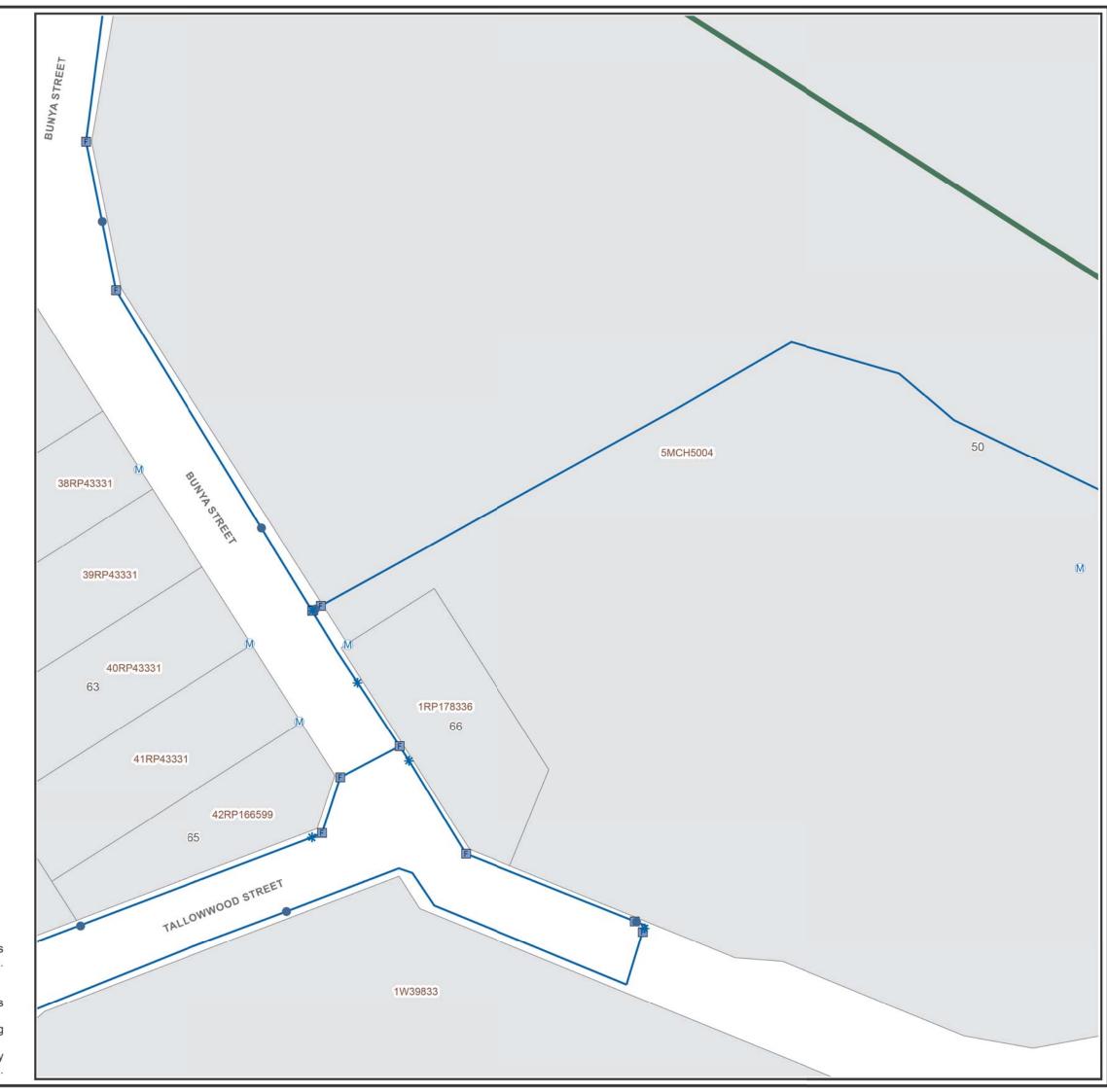
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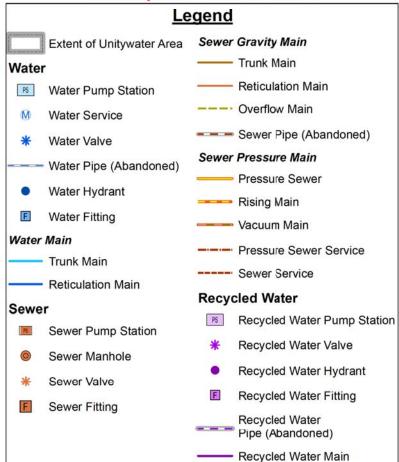


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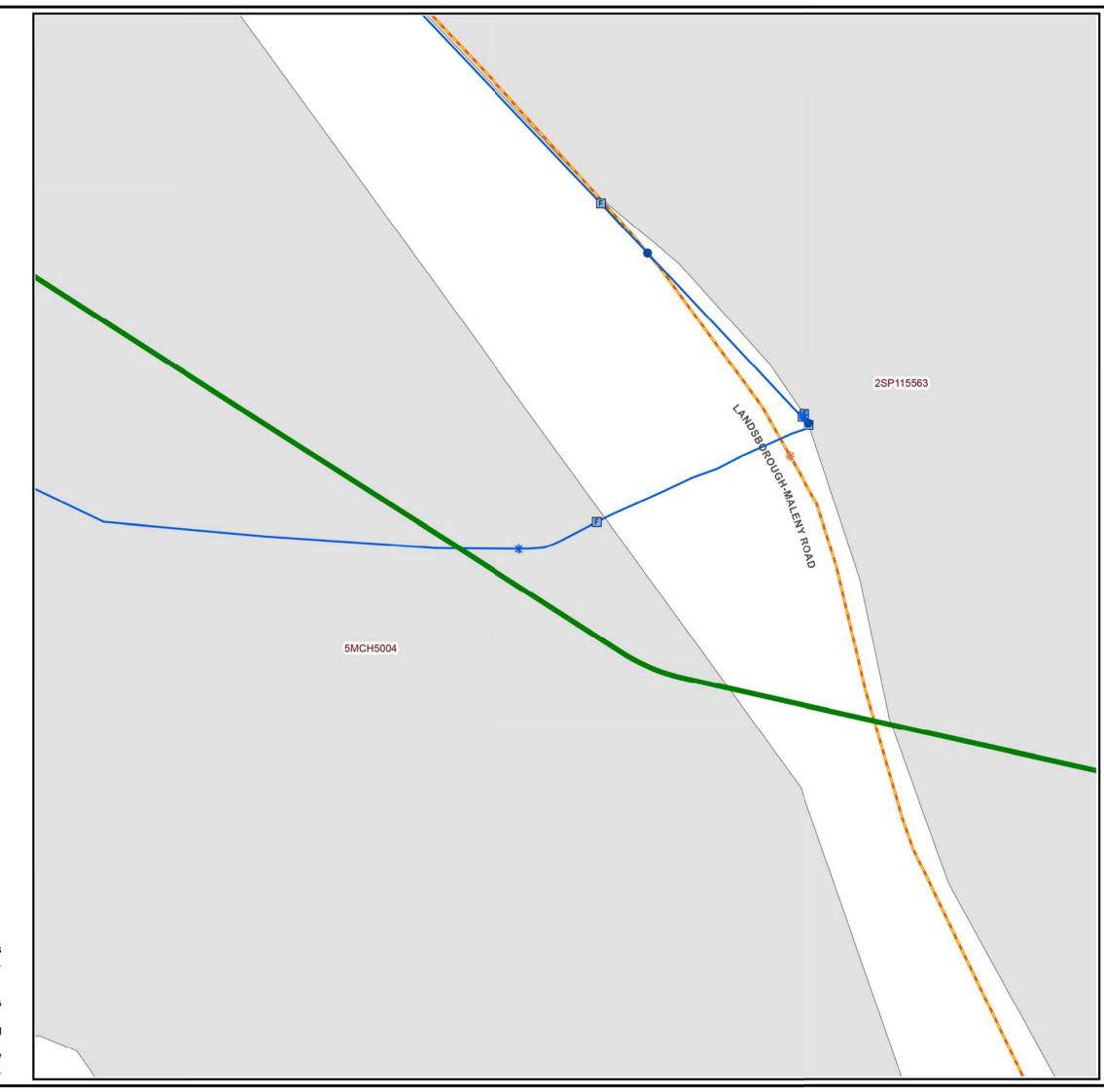
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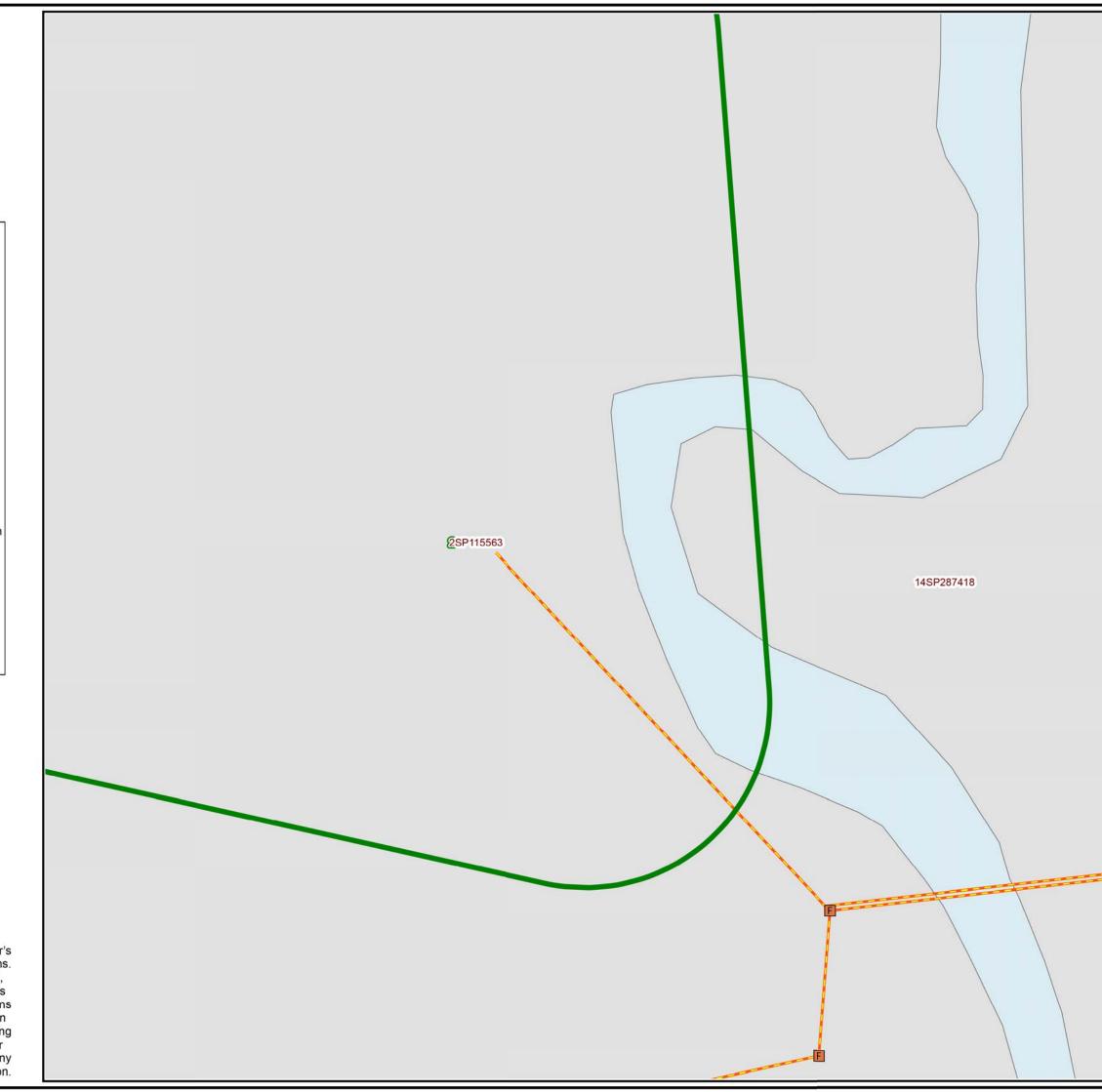
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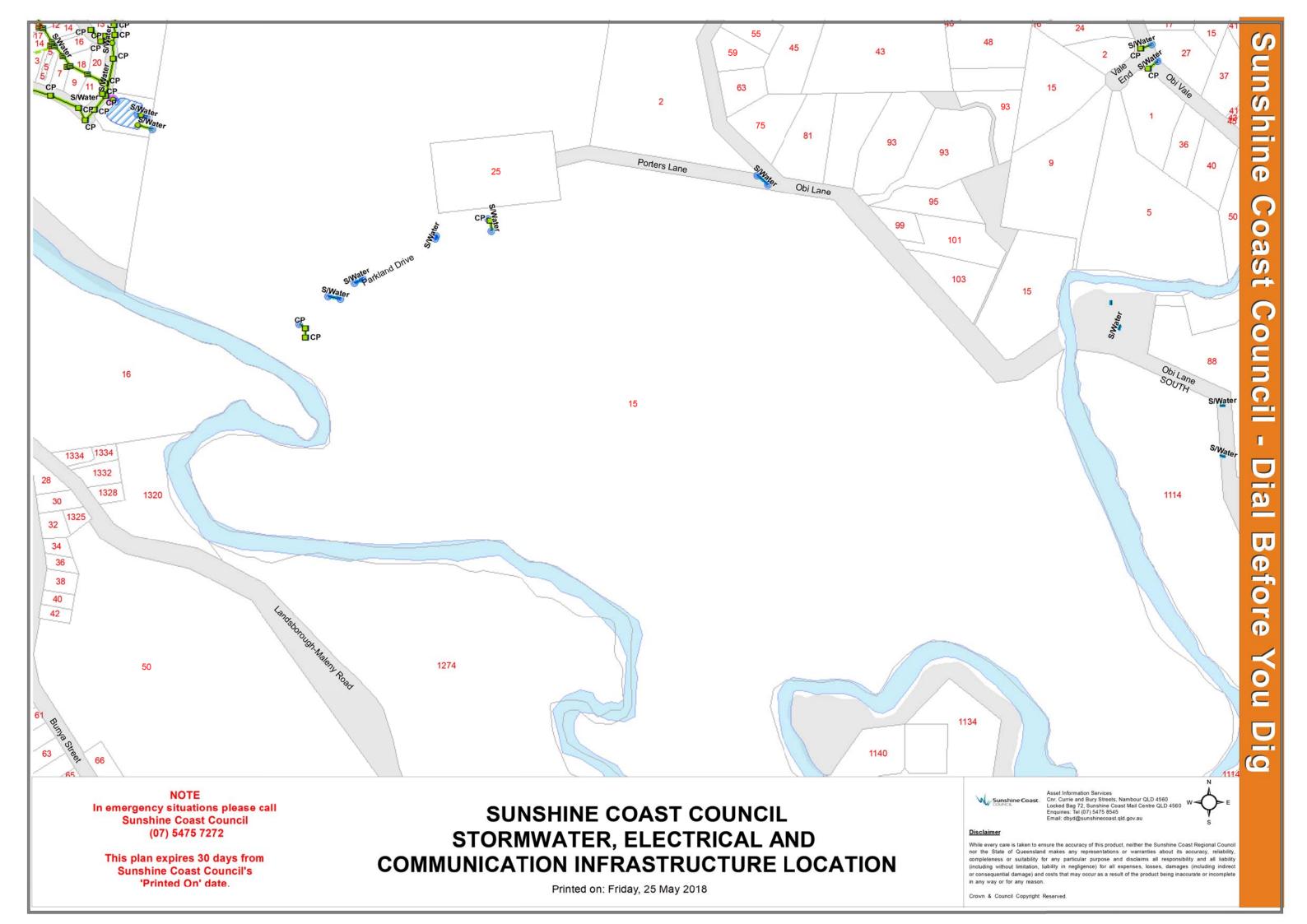
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SUNSHINE COAST COUNCIL STORMWATER, ELECTRICAL AND COMMUNICATION INFRASTRUCTURE LOCATION

Printed on: Friday, 25 May 2018

Sunshine Coast.

Asset Information Services
Cnr. Currie and Bury Streets, Nambour QLD 4560
Locked Bag 72, Sunshine Coast Mail Centre QLD 4560

W

Enquiries: 1e1 (07) 5475 8545

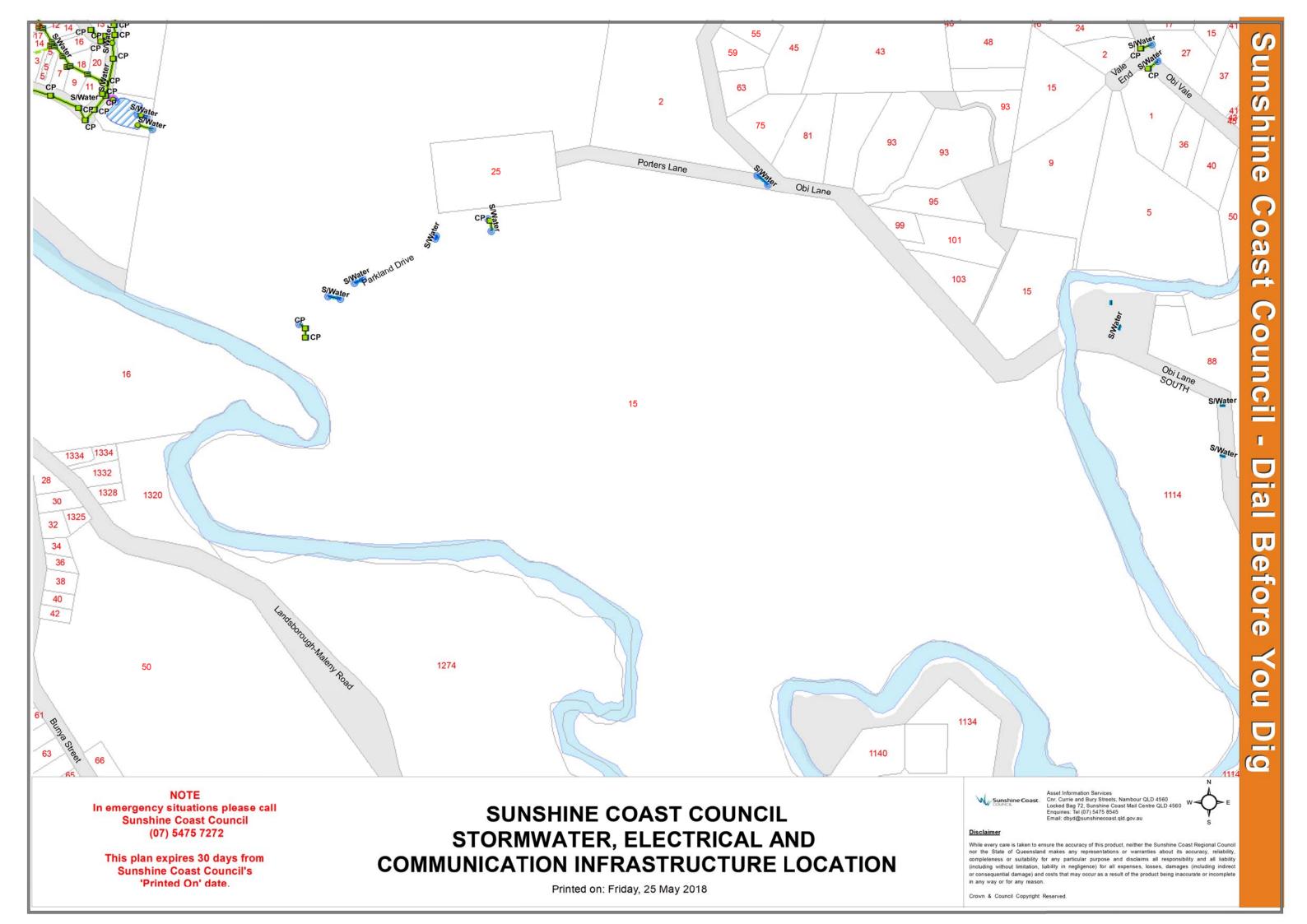
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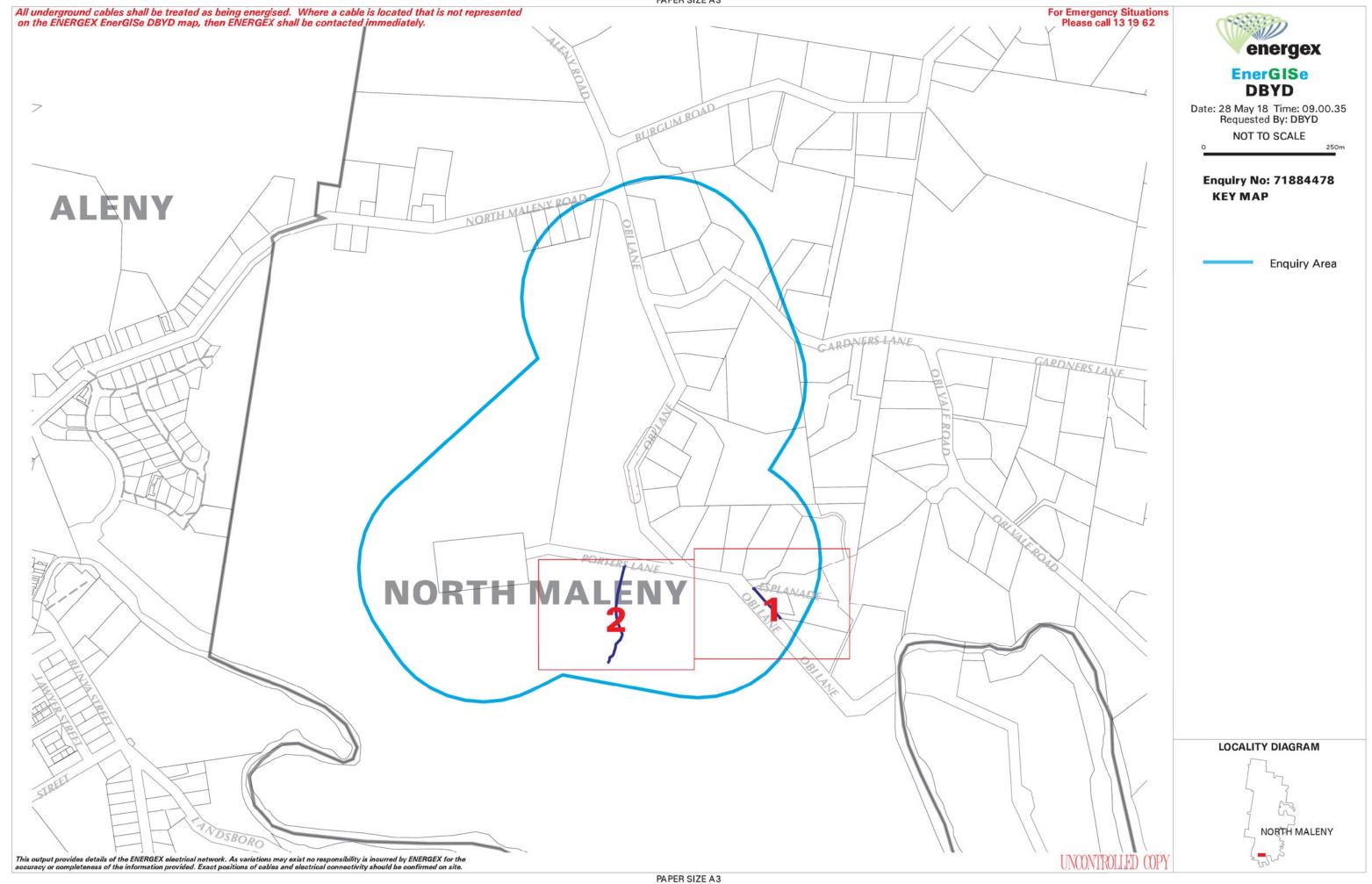
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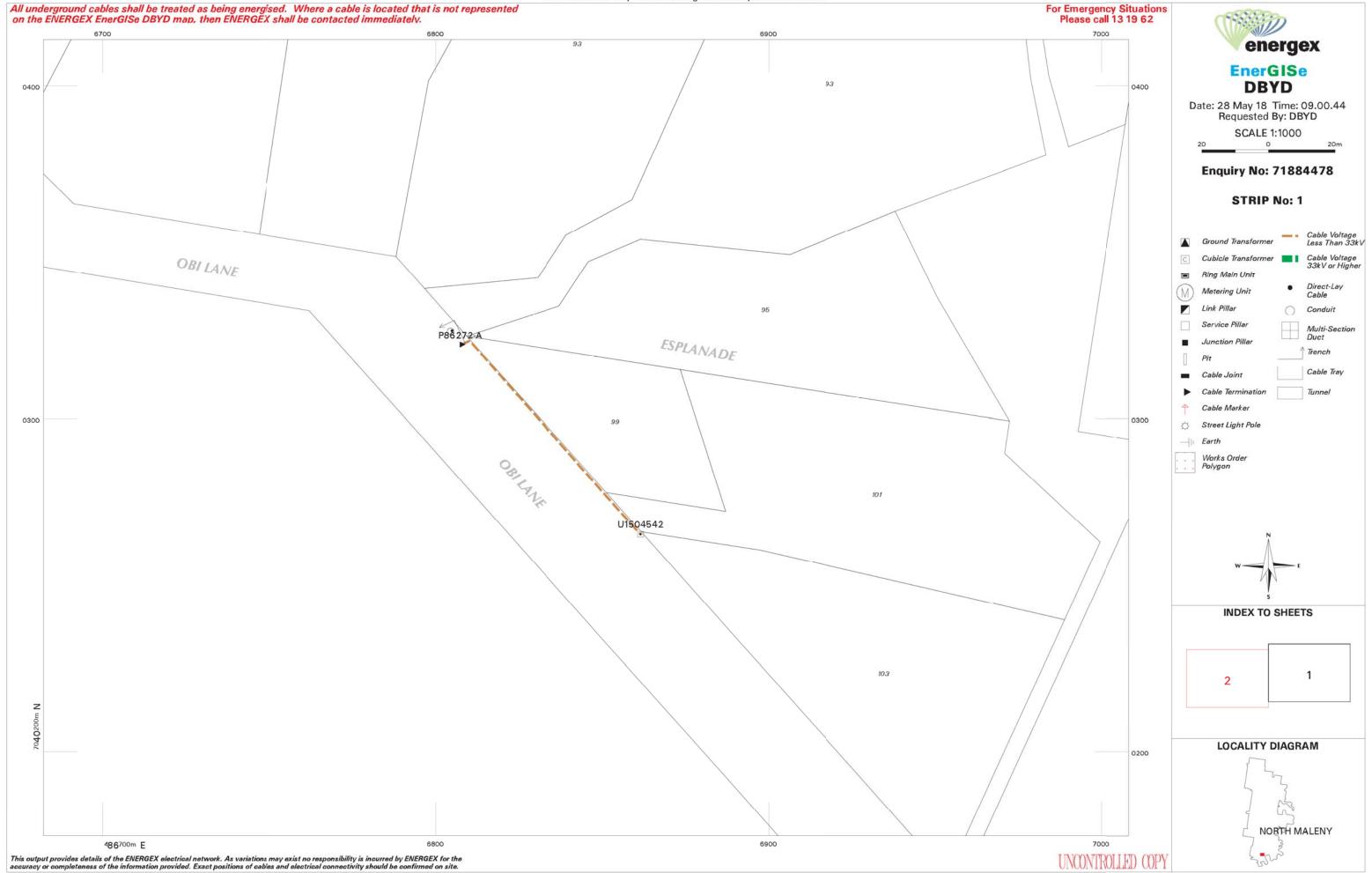
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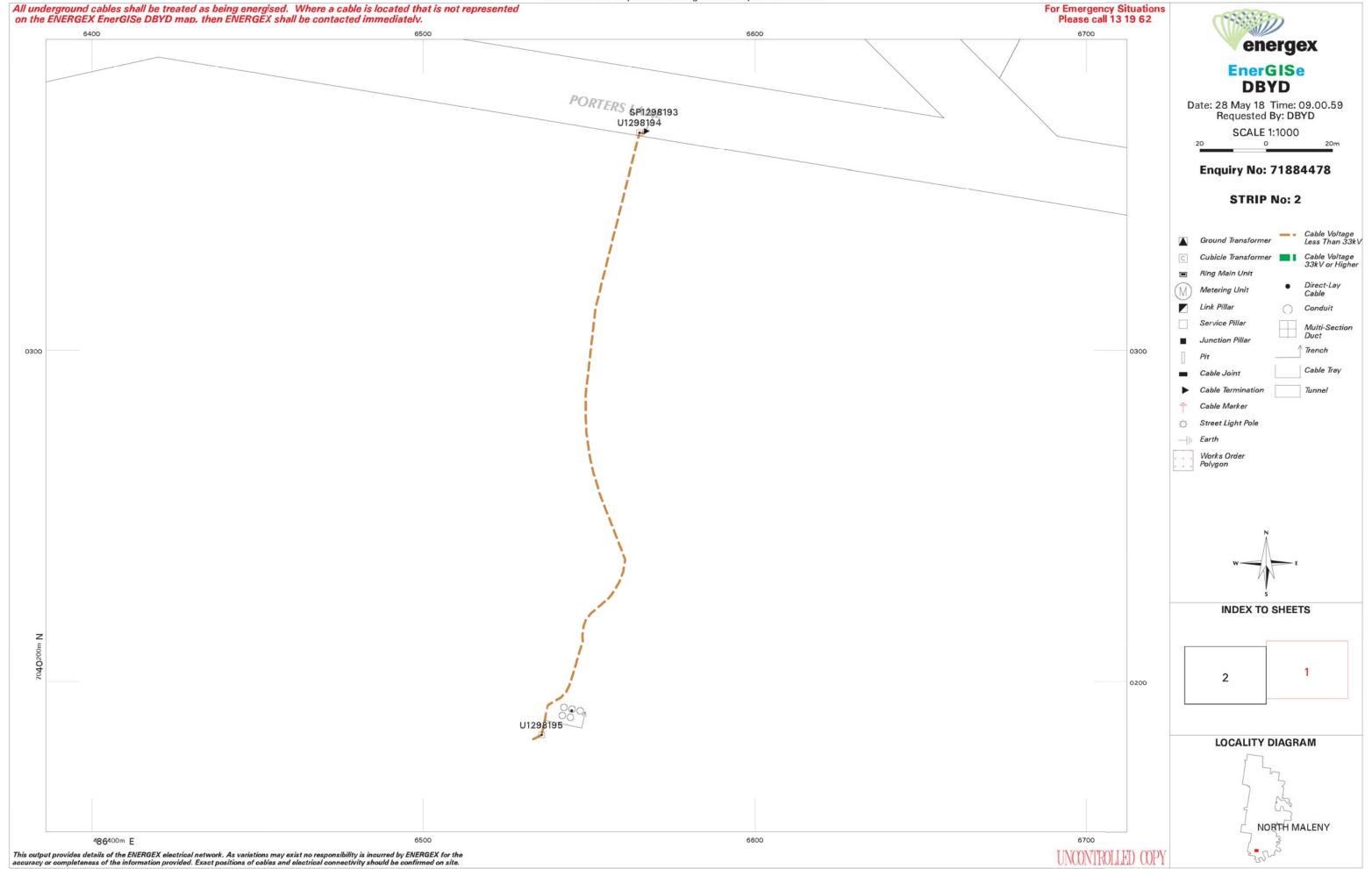
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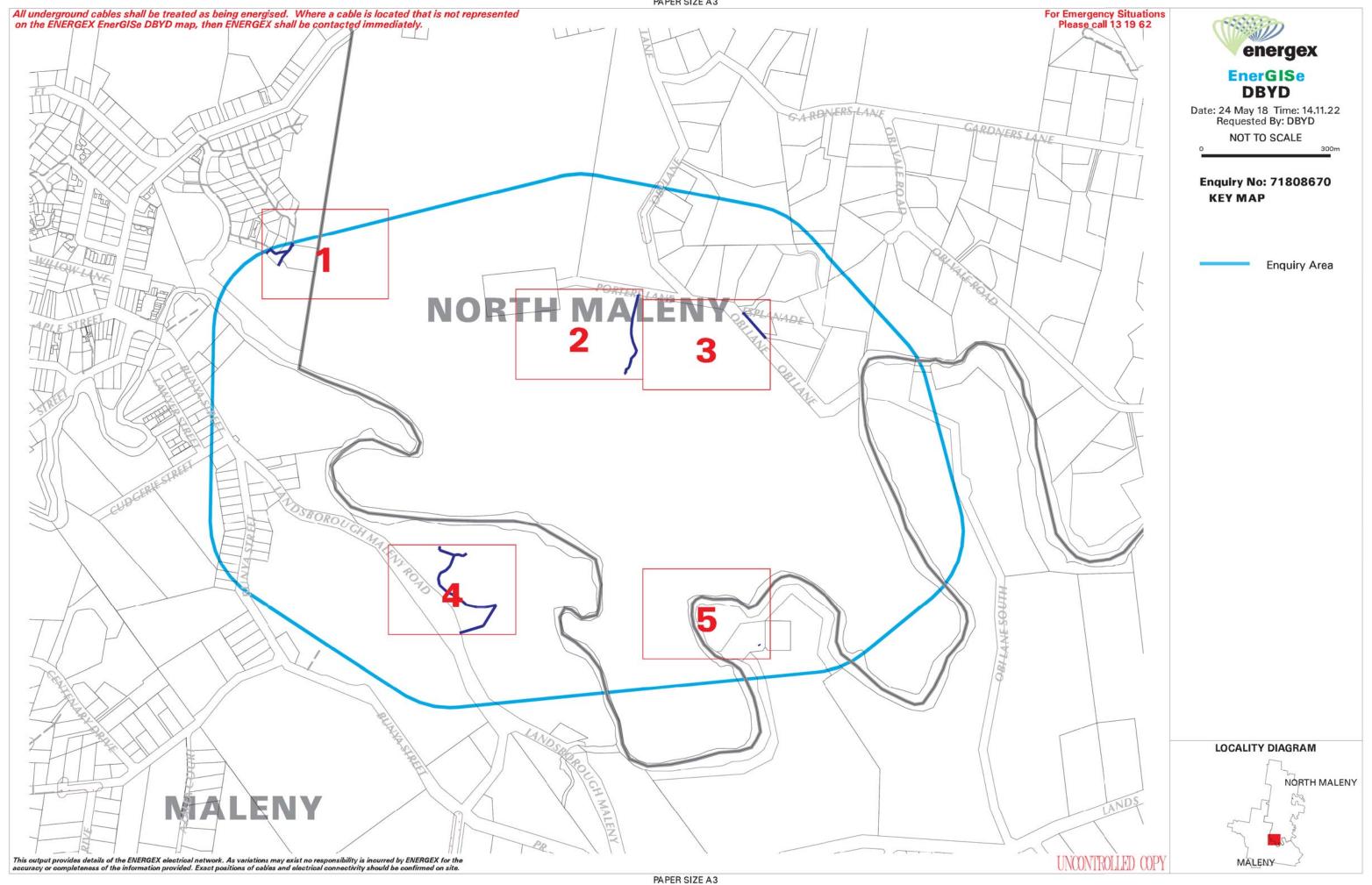
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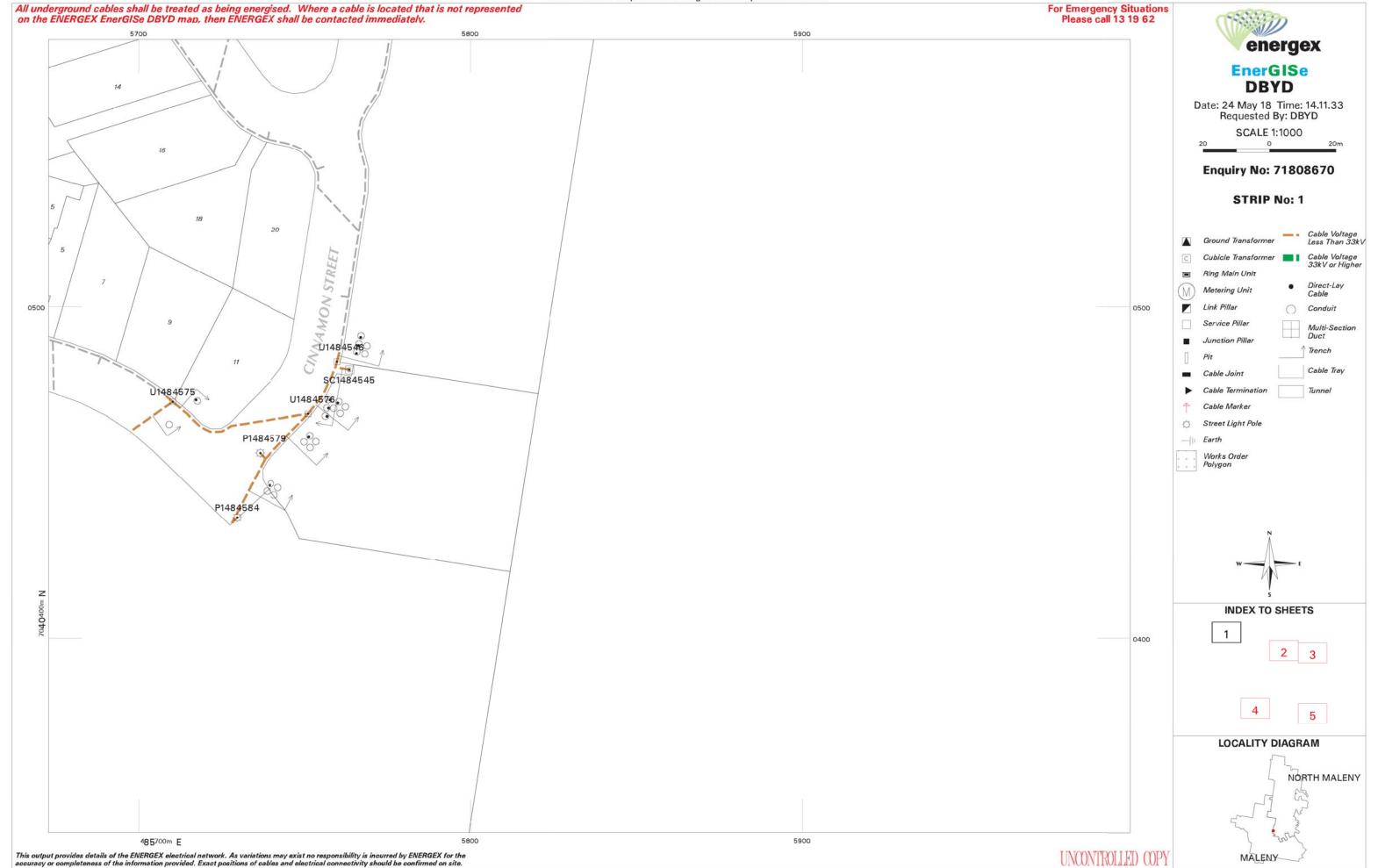


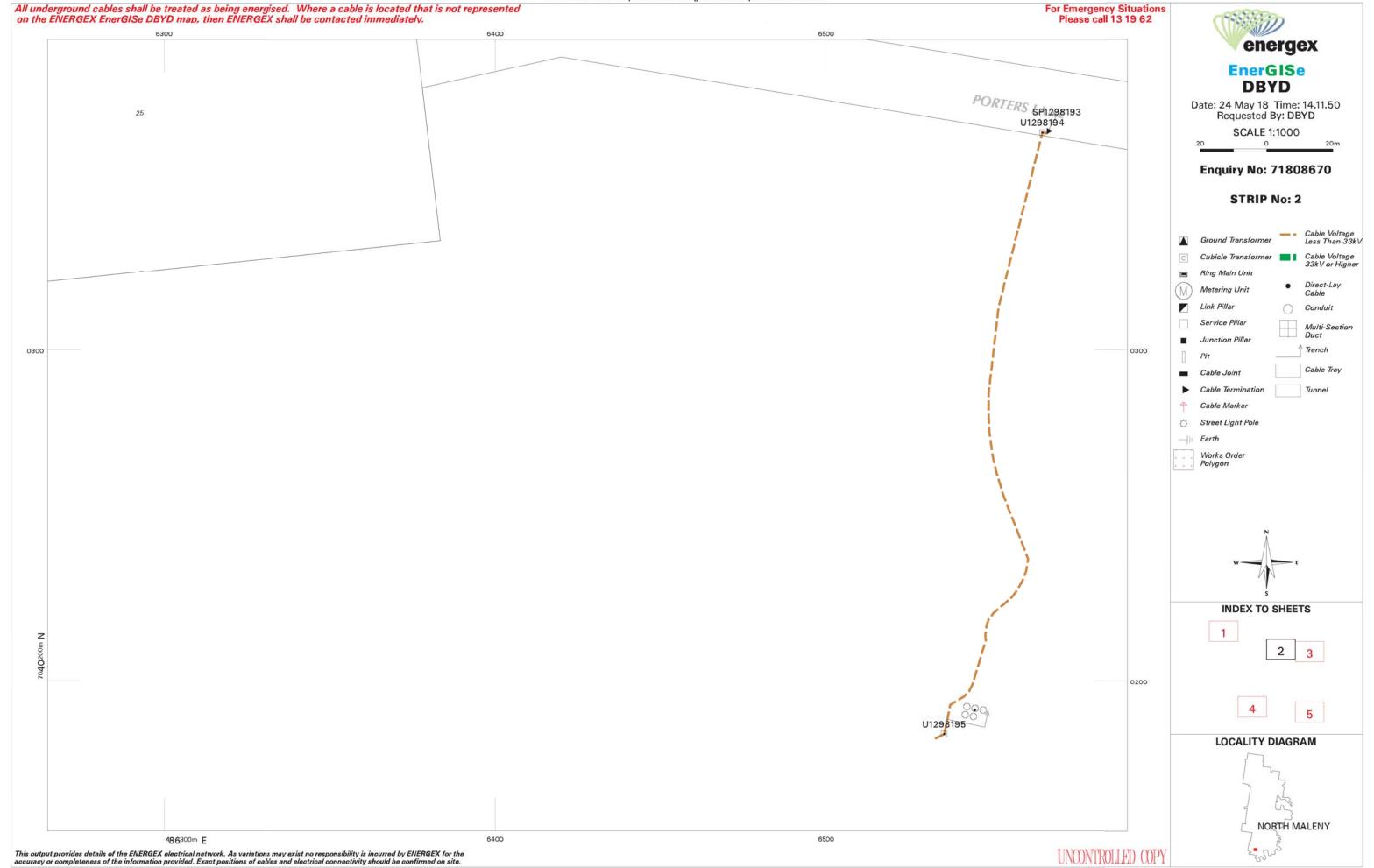


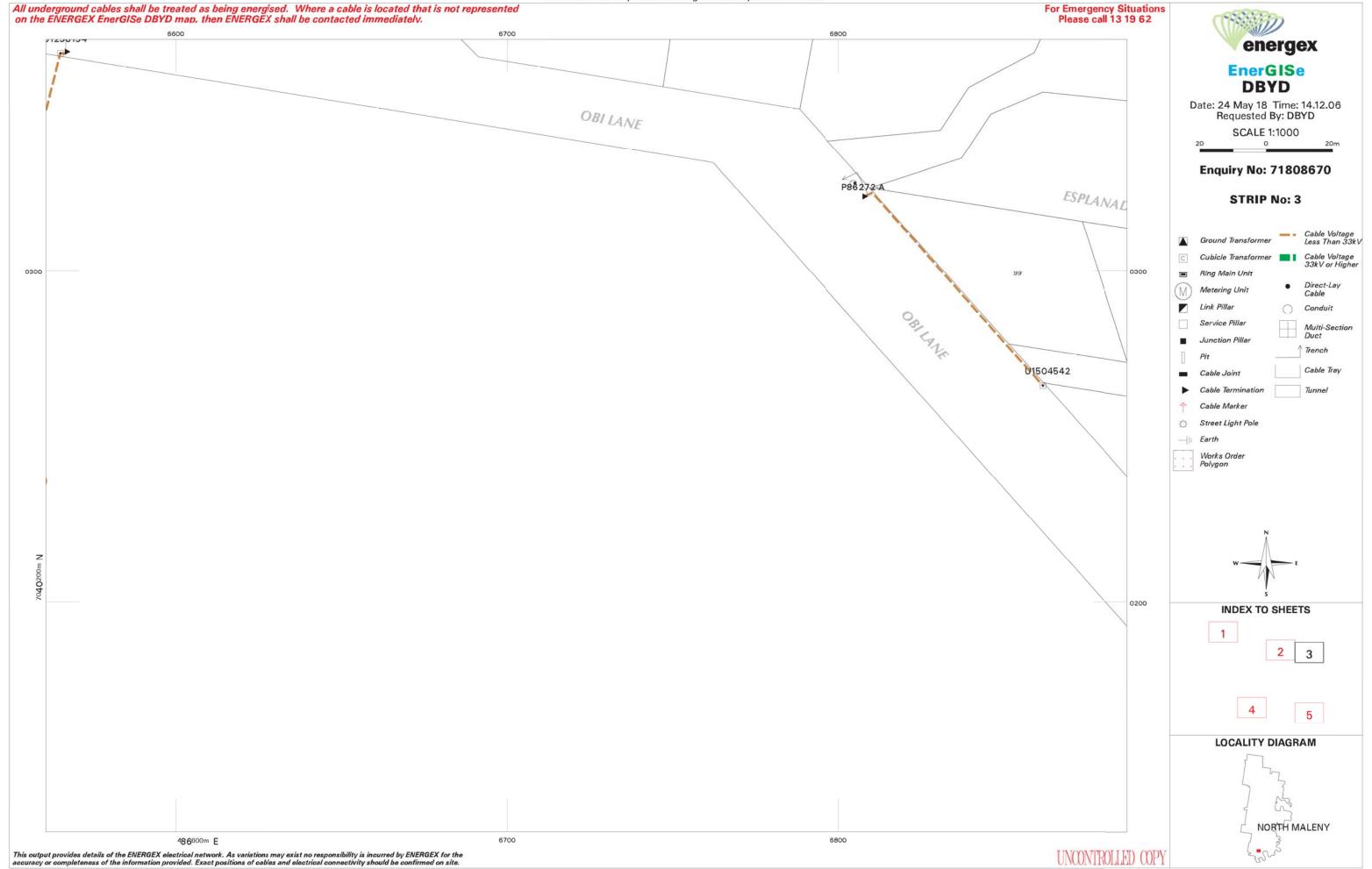


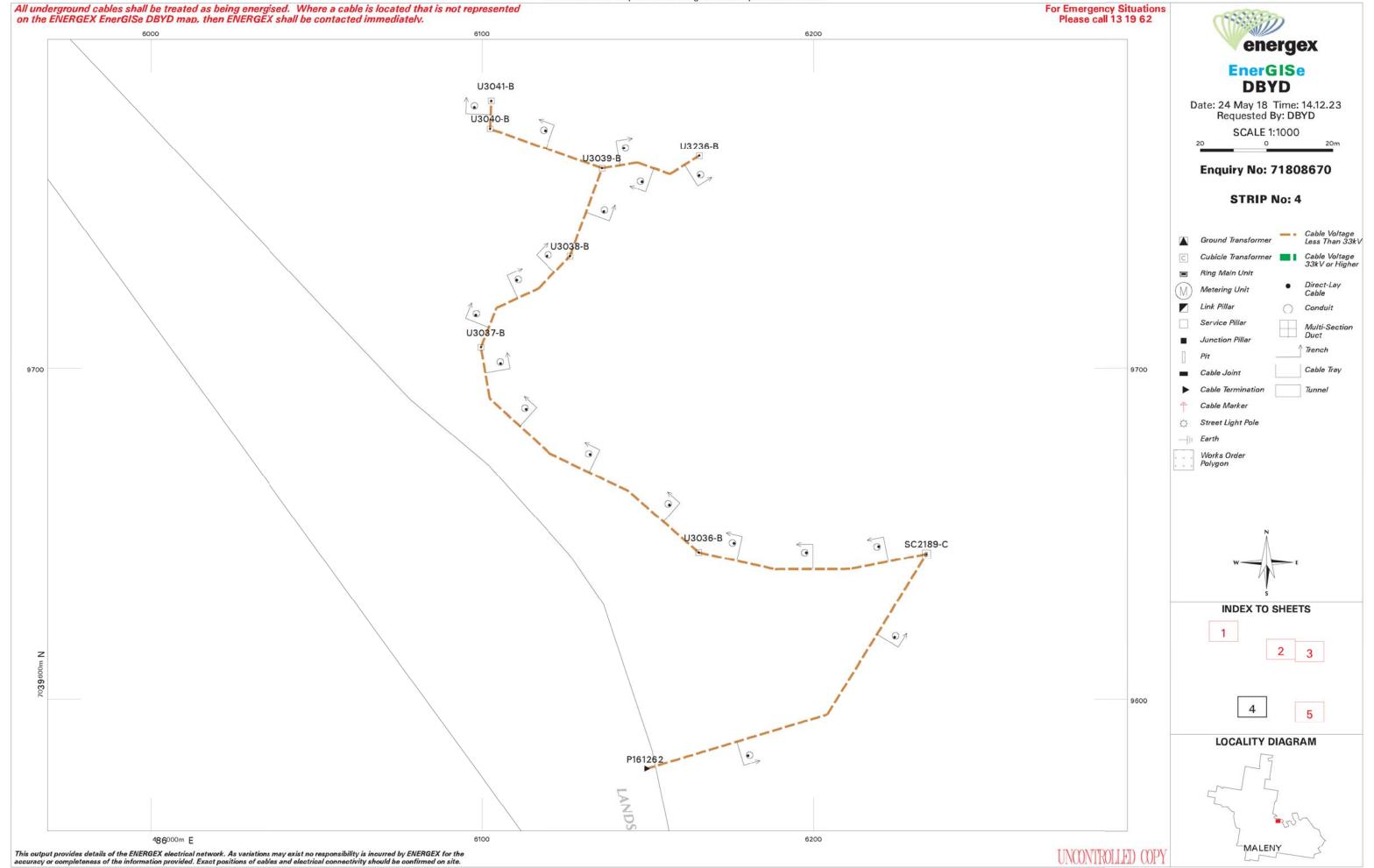
















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Regatta Lake Commercial, 4-6 Innovation Parkway Kawana Business Village

T: 61 7 5413 8100 F: 61 7 5413 8199 E: bta1mail@ghd.com

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Revision	Author	Reviewer \prec		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	Peter Hirst	James Skene/Andrew Walker		Andrew Walker	AX	31.07.2018

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