PROPOSED VISITOR ACCOMMODATION
117 CONINGHAM ROAD
CONINGHAM

SITE AND SOIL EVALUATION REPORT AND SYSTEM DESIGN FOR ON-SITE WASTEWATER MANAGEMENT

October 2024

Cover photo

View looking north over North West Bay. 117 Coningham Road is located behind the camera.
Photo: Bill Cromer, 2 June 2022

Refer to this report as

Cromer, W. C. (2024). *Site and Soil Evaluation Report, and System Design for On-site Wastewater Management, proposed visitor accommodation at 117 Coningham Road, Coningham.* Unpublished report for M. Trendall by William C. Cromer Pty. Ltd., 30 October 2024.

Important Notes

Report Distribution

This report has been prepared by William C Cromer Pty Ltd (WCCPL) for use by stakeholders (including regulators, developers, designers and architects, engineers, contractors, builders, building surveyors and owner-occupiers) involved with the residential development of the property named above. It is to be used only to assist in managing any existing or potential geotechnical issues relating to the site and its development.
This report includes certification via a Form 35 certificate for WCCPL to validate its contents.
It is a condition of certification of this report that all relevant stakeholders are provided with a copy.

Permission is hereby given by William C. Cromer as author, and the client, for this report to be copied and distributed to stakeholders, but only if it is reproduced in colour, and only distributed in full. No responsibility is otherwise taken for the contents.

This report may contain new geotechnical information. WCCPL may submit hard or electronic copies of it to Mineral Resources Tasmania to enhance the geotechnical database of Tasmania, and may upload it to his website www.williamccromer.com. The local planning or building authority is encouraged to make this report (or a reference to it) available on line.

Footings and foundations

In this report, foundations are (usually) natural materials into which man-made footings are placed to support man-made structures.

Limitations of this geotechnical report

Site investigations for geotechnical reports usually but not always involve digging test holes and taking samples, at locations thought appropriate based on site conditions and general experience. The reports only apply to the tested part(s) of the site, and if not specifically stated otherwise, results should not be extrapolated to untested areas.

The main aim of the investigations is to reasonably determine the nature of and variability in subsurface conditions at the time of inspection. The number and location of test sites, and the number and types of tests done and samples collected, will vary from site to site. Subsurface conditions may change laterally and vertically between test sites, so discrepancies may occur between what is described in the reports, and what is exposed by subsequent excavations. No responsibility is therefore accepted for (a) any differences between what is reported, and actual site and soil conditions for parts of an investigation site not assessed at the time of inspection, and (b) subsequent activities on site by others, and/or climate variability (eg rainfall), which may alter subsurface conditions at the sites from those assessed at the time of inspection.

To the extent permitted by law, WCCPL (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this document (in part or in whole) and any information or material contained in it.

SUMMARY

Visitor accommodation (a 3-bedroom house[1]) is proposed for vacant land at 117 Coningham Road, Coningham.

The property has a rainwater tank supply.

The total wastewater volume is assumed to be 600L/day.

Soils are duplex (2-layered) profiles with a Category 2 sand topsoil 0.3 – 0.55m thick over Category 6 subsoil or weathered bedrock.

Secondary-treated wastewater from an AWTS will be disposed of at a Design Irrigation Rate of 2L/day/m^2 over two land application areas (LAAs) with a combined wetted area of at least 300m^2, either or both via (a) shallow subsurface drip irrigation, or (b) mulch-covered surface drip irrigation if it is considered that trees of high conservation value might be affected by the shallowly buried system.

The LAAs are located and designed so that they constitute Acceptable Solutions A1 and A3 – A5, and Performance Criteria P2 and P6, in Section E23.10 of E23 *On-site Wastewater Management Code*.

Important
It is the responsibility of the client or the client's plumber to contact the designer at least one week before installation of the wastewater system so that if required designer inspection and certification of it can be arranged.

[1] The term "house" in this report means a dwelling for Visitor Accommodation

BACKGROUND

Purpose of this report

This site and soil evaluation report (SSER), and wastewater design based on the SSER, for wastewater management for proposed visitor accommodation (a three-bedroom house) on vacant land at 117 Coningham Road, Coningham (Attachment 1) was instigated by the owner, Mr. M. Trendall.

This report is intended to support an application to Kingborough Council for a Plumbing Permit for the wastewater system.

Previous site investigations

SEAM (undated; probably November 2018)

SEAM conducted a site and soil assessment and system design[2] for a previous owner. Soils were rated Category 6, the house was presumed to be 3-bedroom, and the daily wastewater volume 600L. An AWTS irrigating secondary-treated wastewater was proposed over a wetted area of 300m^2.

Cromer (2022)[3]

A coastal vulnerability report, and a separate house site classification report, for a new three-bedroom house were compiled for the previous owners.

Cromer (2024) and Cromer and Sharples (2024)

A house site classification report[4], and updated coastal vulnerability report[5], and visitor accommodation (a for a new house) have been compiled for the current owner.

Site investigations for current report

Site investigations were conducted by Bill Cromer of William C Cromer Pty Ltd (WCCPL) on 2 June 2022, assisted by technical consultant Richard Mackintosh.

Underground services were located by *Auslocations*.

---

[2] SEAM (2018?). Site and Soil evaluation Summary Report. For G. Ewing, 117 Coningham Road.

[3] Cromer, W. C. (2022). *Waterway and Coastal Protection, and Coastal Erosion Report, proposed new house, 117 Coningham Road, Coningham.* Unpublished report for S. Quinn and J. Risbey by William C. Cromer Pty. Ltd., 8 June 2022, and Cromer, W. C. (2022). *Geotechnical summary, site classification and wind classification, proposed new house at 117 Coningham Road, Coningham.* Unpublished report for S. Quinn and J. Risbey by William C. Cromer Pty. Ltd., 11 June 2022.

[4] Cromer, W. C. (2024). *Geotechnical summary, site classification and wind classification, proposed Visitor Accommodation, 117 Coningham Road, Coningham.* Unpublished report for M. Trendall by William C. Cromer Pty. Ltd., 7 September 2024.

[5] Cromer, W. C. and Sharples, C. (2024). *Waterway and Coastal Protection, and Coastal Erosion Report, proposed Visitor Accommodation, 117 Coningham Road, Coningham.* Unpublished report for M. Trendall by William C. Cromer Pty. Ltd., 7 September 2024.

Seven excavator test pit were dug, logged, sampled and photographed over the property. Soil samples were collected for dispersion testing.

Glen Edwards Excavations provided the 1.8t excavator, operated by Seaton Waterfield.

PART A

SITE AND SOIL EVALUATION

Location, size, zoning, topography, vegetation and drainage

The north north-easterly facing property covers about 2,000m^2, and is roughly rhombic in shape (Attachments 1 and 2).

The land slopes gently at 3 – 4^0 (relief of about 3.5m; from 8.5 – 12mASL) to a 43m frontage about 10m inland from 7 – 8m high sandstone cliffs at North West Bay.

The proposed house occupies the middle portion of the property along the slightly-higher southeastern boundary.

The property is zoned *Low Density Residential* on the Tasmanian Interim Planning Scheme Zoning map (www.thelist.tas.gov.au).

Water and power supply

Rain water tanks. Reticulated electricity available.

Assumed daily wastewater

House = 3 bedrooms = 5 people. Rainwater tanks = 120L/day/person for all wastewater. Total daily wastewater volume = 600L.

Interpretation of site geology and soils

Published geology of the property

Published geological maps[6] of the district shows the property and environs underlain mostly by Triassic-age sedimentary rocks (principally sandstone and siltstone; coloured green on the Published Geology map in Attachment 1). A small section in the southwest corner is shown as underlain by Permian-age sedimentary rocks (coloured blue), faulted against the Triassic rocks. (Attachment 1).

[6]Calver, C.R. 2007 (compiler). Digital Geological Atlas 1:25 000 Scale Series. Sheet 5223. Blackmans Bay. Mineral Resources Tasmania.

My interpretation of the geology

No bedrock exposures occur on the property, but nearby, excellent exposures of sandstone and siltstone inferred to be both Permian and Triassic in age occur in the 7 – 8m high sea cliffs. The near-vertical fault separating the two ages of bedrock is well exposed in the cliff.

Material interpreted as extremely weathered to highly weathered sandstone and claystone bedrock (Table 1) was exposed in all but one of the seven test pits.

The bedrock is variably weathered: in pits D, E and G it was extremely weathered to silty and/or clayey sand (SC, CL; Layer 4 in Table 1).

Soil

Texture and thickness

Soils across the property are duplex (two-layered), comprising:

- A1 and A2 horizons (topsoil; Layers 1 and 2 in Table 1; present in all seven pits)
  SAND (SP): dark grey; 0 – 0.45m thick
  SAND (SP): light grey; 0.1 – 0.2m thick
- B horizon (subsoil; Layer 3; present in 4 of seven pits)
  Silty CLAY (CH): olive brown, light grey and orange; 0.3 – 0.5m thick

Soil dispersion[7]

Selected samples of Layer 2 topsoil and Layer 3 subsoil were tested for dispersion. The topsoil is nondispersive (Emerson Class 7) and the Layer 3 subsoil is moderately-strongly dispersive (Emerson Classes 1 and 2).

Soil dispersion will need to be managed for wastewater disposal. See Attachment 4.

Fill

No fill was observed on site, apart from a pile of loose sandstone boulders near the northwestern boundary.

[7] Dispersive soils are sodic soils with exchangeable sodium (ESP) greater than 6%. They can cause tunnel erosion. Tunnels may locally collapse, producing a line of open channels and/or potholes. These are widespread in southern Tasmania, and particularly on soils developed on Triassic-age rocks. See the Tasmanian DPIW *Dispersive Soils and their Management*. Tunnels in dispersive soils typically result from human-caused ground disturbance. They affect soil strength, and cause erosion, undermining, sedimentation, and loss of amenity and property values. Once started, they are difficult to manage. The dispersion test on disturbed samples is a slightly modified version of the method described in Section E7 of AS/NZS1547:2012 *On-site domestic wastewater management*. In separate containers, duplicate peds of a soil sample (one set air dried, the other remoulded) are immersed in water for 24 hours and their performance assessed. The behavior of the peds may be (a) nothing (b) slaking (c) dispersion to produce Emerson Class No. 1 – 8. Estimating the degree of dispersion of a sample to obtain its Emerson Class Number can be subjective. Note also that the test as described does not distinguish between Emerson Class 4, 5 and 6. The laboratory work for dispersion testing was done in the W. C. Cromer Pty. Ltd. laboratory. The laboratory is not NATA-registered for the test. For very useful information, go to http://www.lanfaxlabs.com.au/aggregate_stability.htm

Soil selected for wastewater disposal

Existing topsoil and underlying topsoil. No imported soil is required.

The over-riding soil category is 6, due to the presence of underlying B horizon clay.

Table 1. Summary of test pits (Quinn & Risbey were the owners at the time the June 2022 site investigations were done).

Client Quinn & Risbey
Location 117 Coningham Road Coningham
Date dug 2-Jun-22

Test pit	A	B	C	D	E	F	G
Depth dug (m)	0.9	0.8	1.3	1.3	1.0	0.8	0.9
Easting (GDA94)	521782	521768	521752	521771	521772	521743	521742
Northing (GDA94)	5231050	5231045	5231035	5231033	5231020	5231020	5230997
Water inflow (depths in m)	None	None	None	None	None	None	None
Standing water level (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

				Interpretation								
No.	Layer	Details	USCS	Horizon	AS/NZS1547 soil category	Figures are depths to top and bottom of layer, in metres						
1	SAND	Dark grey; fine-medium grained; trace-some silt; D-M; MD	SP	Topsoil (A1 horizon)	2	0 to 0.2	0 to 0.3	0 to 0.45	0 to 0.4	0 to 0.25	0 to 0.2	0 to 0.15
2	SAND	Light grey; fine-medium grained; trace-some silt; D-M; MD	SP	Topsoil (A2 horizon)	3	0.2 to 0.35 D@0.3	0.3 to 0.5 D@0.4	0.45 to 0.55 D@0.5	0.4 to 0.55 D@0.55	0.25 to 0.35 D@0.3	0.2 to 0.3 D@0.3	0.15 to 0.35
3	Silty CLAY	olive brown, weakly mottled light grey and light orange; high plasticity; M<PL; VSt	CH	Subsoil (B horizon)	6	0.35 to 0.9 EAR	0.5 to 0.8 D@0.6	0.55 to 0.9 D@0.7 U50 (0.55 to 0.85)			0.3 to 0.65 D@0.6 U50 (0.3 to 0.6	
4	Silty SAND	Includes clayey sand; yellowish brown; nonplastic to low plasticity; D; D	SC, CL	CB horizon (extremely weathered bedrock	5				0.55 to 0.85 D@0.7	0.35 to 0.8 D@0.5		0.35 to 0.55
5	SANDSTONE	Yellowish orange; variably weathered (extremely to moderately); variable strength		Triassic-age bedrock	N/A		0.8 R		0.85 to 1.3 CR	0.8 to 1.0 CR	0.65 to 0.8 R	0.55 to 0.9 CR
6	CLAYSTONE	Silty; yellowish orange; highly weathered		Triassic-age bedrock	N/A			0.85 to 1.3 CR				

Notes and abbreviations

USCS = Unified Soil Classification System
Grey cells indicate a missing layer or layers in a test pit
Easting and Northing coordinates from Google Earth and hand-held GPS. Datum is GDA94.
Excavability Equipment = 1.8t excavator; 0.45m GP bucket; 4 teeth; Operator: Seaton Waterfield
EAR = end as required; NR = no refusal; CR = close to refusal; R = refusal.
Samples D = disturbed sample; U50 = Undisturbed 50mm diam drive tube sample
Weathering For rock only. F = fresh; SW = slightly weathered; MW = moderately weathered; HW = highly weathered;
EW = extremely weathered (ie soil properties; material can be remolded in the hand, with or without water)
Moisture D = dry; M = moist (M<=>PL = moisture less than, equal to or greater than Plastic Limit); W = wet.
Consistency Fb = Friable (crumbles to powder when scraped with thumbnail)
S = Soft (Easily penetrated by fist; 25 – 50kPa)
F = Firm (Easily penetrated by thumb; 50 – 100kPa)
St = Stiff (Indented with thumb; penetrated with difficulty; 100 – 200kPa)
VSt = Very stiff (Easily indented with thumbnail; 200 – 400kPa)
H = Hard (Indented by thumbnail with difficulty; >400kPa)
Rel density VL = Very loose (ravelling)
L = Loose (easy shovelling)
MD = Medium dense (hard shovelling)
D = Dense (picking)
VD = Very dense (hard picking)

Proposed wastewater management system

Method

Secondary-treated wastewater from an AWTS from the house will be disposed of via shallow subsurface irrigation into Category 6 soil profiles over two land application areas (LAAs).

Design Irrigation Rate (DIR)

Adopted as 2mm/day (ie 2/m^2/day) in accordance with Table M1 of AS/NZS1547:2012

Minimum wetted area required for wastewater disposal

The wetted area required is the daily wastewater volume divided by the DIR. This is 600L/day divided by 2L/m^2/day = 300m^2, in accordance with Section L4 of AS/NZS1547:2012.

Groundwater

No groundwater was intercepted in test pits.

Deeper, permanent groundwater probably exists in the bedrock beneath the site and environs, but at a depth which will not affect residential development – and vice versa.

The DPIPWE water bore database shows no water bores within 50m of the property.

Slope stability

Published evidence of instability

Landslide inventory

The Mineral Resources Tasmania landslide database shows no catalogued landslides within about one kilometre of the property.

Landslide Hazard Band (Area)

The property does not lie within a landslide hazard band.

Site observations of slope instability

There are no indications of slope instability on the property, and none is expected given the low slope angles and shallow presence of relatively stable bedrock.

There is a high likelihood of rockfalls/slumping on the adjacent sandstone/siltstone sea cliffs, but the cliffs are 10m away from the seaward property boundary, and the rate of coastal recession (including the possible effects of a rise in sea level of a metre or so by 2100) is estimated to be about 1m/century[8]. Accordingly, the land is judged to be at very low risk of instability, and no management plan is required to address it.

[8] See Cromer, W. C. and Sharples, C. (2024), cited in footnote 5 on page 4.

PART B

SYSTEM DESIGN AND REGULATORY COMPLIANCE

Regulatory requirements for wastewater management

Wastewater management on this property must comply with AS/NZS1547:2012 *Onsite Domestic Wastewater Management,* and the Tasmanian *On-site Wastewater Management Code* (Code E23.0 in the Kingborough Council Interim Planning Scheme 2015; the "*Code*").

In the *Code*, a wastewater design and location for the property must comply with Section E23.7 *Development Standards for Residential Development*, and E23.10 *Development Standards for Land Application Areas.*

Section E23.7 Area required for On-site wastewater management

The land application area (LAA) for wastewater disposal in Attachment 4 is sized in accordance with AS/NZS1547 which complies with Performance Criterion P1 of Section E23.7.1.

Section E23.10 Horizontal and vertical separation distances for wastewater disposal areas

Section E23.10 of the *Code* sets out Acceptable Solutions (A) and Performance Criteria (P) for horizontal and vertical separation distances for disposal systems in LAAs. These are summarised in Table 1 for the wastewater management system for the proposed house. The locations of the LAA constitutes Acceptable Solutions for separation requirements A1, A3 – A5, and Performance Criteria P2 and P5, in Section E23.10.

Table 1. System compliance of LAA with Section E23.10 of the *Code*

Separation distances to a disposal area:	Compliance of this site	Reasons for compliance	References, or relevant section of this report
Horizontal distance from a building	Complies with A1(b)(i)	LAA no less than 2m from upslope or level building	Attachment 4
Horizontal distance from downslope surface water	Complies with P2	Secondary treatment; subsurface or mulch-covered surface irrigation; >15m to surface water; average gradient c16 degrees (av gradient on property <5 degrees)	Attachment 4
Horizontal distance from a property boundary (measured at right angles to contours)	Complies with A3(b)i and iii	More than 1.5m from level and cross boundaries, and more than 1m per degree of average 2-4^0 gradient from downslope boundary	Attachment 4
Horizontal distance from a downslope bore, well or similar water supply	Complies with A4	No recorded operating water bore within 50m or so of site	See the Groundwater Information Access Portal (http://dpipwe.tas.gov.au/water/groundwater/groundwater-information-access-portal)
Vertical distance from groundwater	Complies with A5	No water table expected in surface 1.5m	General hydrogeological principles
Vertical distance from a limiting layer	Complies with P6	No limiting layer in surface 0.3 – 0.55m.	Part A of report

Summary of system design

An acceptable (and recommended) disposal option for wastewater management for the property is summarised below, with layout and design details in **Attachment 4**.

Method

Secondary treatment in an AWTS and pumped discharge to two LAAs comprising (a) shallow subsurface drip irrigation, or (b) mulch-covered surface drip irrigation if it is considered that trees of high conservation value might be affected by the shallowly buried system.

Components

AWTS
LAA

In-ground details for LAA

Wetted area	Min. 300m^2 assuming a wastewater volume of 600L/day.
Back-up Area	Available.
Design	See Attachment 4.
Cut-off drain(s)/berm	Not required
Setback(s)	See Table 1 and Attachment 4.

PART C
GENERAL NOTES

Applying for a Plumbing Permit (PP)

This document is intended to support, not replace, an application to local Council for a Plumbing Permit.

This report sizes one or more Land Application Areas (LAAs) within which wastewater must be disposed, but the proposed location of the LAA may be nominal. There may be flexibility in its location provided setback distances are satisfied, and the final location would be specified when applying for a Plumbing Permit.

Detailed design notes for some wastewater systems, and related wastewater information, are available on my website.

Appointment of designer and inspection arrangements

If required, William C Cromer Pty Ltd accepts the role of Designer for the design(s) suggested in this report. A **Form 35** is included with this document.

Depending on local government policy, the designer is required to make as many site inspections as is necessary to be able to certify to the client and the local Council that:

- the installed system conforms with the approved design, and
- the system, as installed, conforms with the currently-adopted version of AS/NZS1547.

Usually, certification is required before the dwelling can be occupied and the wastewater disposal system used.

It is the responsibility of the client or the client's agent to contact the designer before construction starts on the wastewater disposal system, in order to establish the stages of construction required to be inspected by the designer.

System, design, performance and maintenance

Depending on the type of wastewater disposal system installed, owners may be required by Council to satisfy all or some of the following, which would usually form a set of conditions of approval for a plumbing permit.

1. The system shall comply with the currently-adopted version of AS/NZS1547.

2. All tank and system openings shall be accessible at finished surface level for inspection and servicing, and adequately sealed to prevent stormwater infiltration.

3. Where pumps are fitted, and power is required for system operation, a hard-wired audible and visible (indicator light) alarm shall be installed to warn of pump failure, blower failure and power failure.

4. Where an existing disposal system is being added to or altered and the existing septic tank is going to be used, a filter will need to be retro-fitted to the existing septic tank. Owners will need to advise their plumber to ensure that this matter is taken into consideration when purchasing a new septic tank or where the filter is to be retro-fitted.

5. The minimum wetted area requirement for wastewater disposal must be installed and maintained in the approved locations as per the design by the Designer and lodged with the application for a Special Plumbing Permit.

6. All wastewater disposal (including irrigation) areas shall be completed, approved and formally signed off by the Designer as complying with AS/NZS1547 prior to commissioning of the system. Certification, in a format approved by Council; shall include a site plan to scale showing the wastewater disposal locations and areas property boundaries, infrastructure, GPS grid coordinates.

7. All pipes, pipe sleeves, identification tapes, and outlets on an irrigation system shall be coloured lilac (P23), in accordance with AS2700.

8. If one or more wastewater irrigation systems are proposed, they shall be constructed and installed in accordance with approved plans accompanying the Special Plumbing Permit, and the following:

Spray Irrigation Systems:

- The sprinklers used for distributing the wastewater must of a type that minimise formation of small droplets and aerosols. Impact and pencil type sprays shall not be used.
- A flush valve is to be installed on each irrigation area so that the lines can be flushed. The discharge from the flush valve must discharge either onto the irrigation area or piped back to a suitable chamber of the treatment system, having regard to whether the wastewater is chlorinated or not, so that the efficacy of the treatment plant is not compromised by the introduction of the flush water.
- Flush valves are to be installed in valve boxes to enable inspection and service.

Drip and sub-surface Irrigation Systems:

- Only pressure compensated drip line shall be used.
- Vacuum breaker valves are to be provided at the high point(s) of all irrigation fields. Such valves are to be installed in valve boxes to enable inspection and service.
- A flush valve is to be installed on the low point of each irrigation field with piping discharging the flush water to a suitable chamber of the treatment system, having regard to whether the wastewater is chlorinated or not, so that the efficacy of the treatment plant is not compromised by the introduction of the flush water. Flush valves are to be installed in valve boxes to enable inspection and service.

9. Unless specifically advised by the Designer as unnecessary or inappropriate, an effective surface water diversion drain or mound shall be provided and maintained on the high side of wastewater disposal (including irrigation) areas. Note that all concentrated stormwater must be retained on the property.

10. Weed matting, plastic or other materials that impede water penetration into the soil shall not be used between the irrigation system and the soil surface.

11. All wastewater irrigation areas shall be maintained in good order at all times. Such maintenance includes but may not be restricted to weeding, mowing, and replacement of mulch or plants.

12. Council shall be provided with an amended plan if the location of the irrigation area is altered or changed from the "as installed" plan. The owner shall ensure that any altered wastewater disposal (including irrigation) areas meet minimum setback distances from boundaries and buildings and any other conditions contained within this permit.

13. The wastewater treatment system shall be regularly maintained in accordance with the conditions of accreditation issued under the Tasmanian Plumbing Code.

14. Any septic tank associated with the disposal system shall be desludged at least once every five years.

15. Where required, the owner shall enter into and maintain an on-going service maintenance agreement with a person with appropriate qualifications and experience to maintain the wastewater disposal system in accordance with the Plumbing Regulations 2004 and the Tasmanian Plumbing Code. A copy of the signed agreement shall be submitted to Council before commissioning of the system.

16. Where required, effluent quality for land application shall meet the criteria specified in the installed system's certificate of accreditation or, if not specified, as follows (from AS/NZS1547:

5-day Biological Oxygen Demand (BOD5)	20mg/L
Suspended Solids (SS)	30mg/L
Thermotolerant coliforms	10 per 100mL
Free chlorine residual	0.5mg/L

17. Only when these tests indicate compliance will the unit be regarded as being commissioned. A NATA approved laboratory should conduct such tests. Testing shall be conducted as follows:

a) Commissioning phase: Mandatory testing after three months from the final installation inspection (to coincide with the normal on-going scheduled maintenance visits) but fortnightly in the event of failure to comply
b) On going operational phase: Mandatory testing for a free chlorine residue is required every three months. Remedial works should be undertaken when the minimum fire chlorine residual is not met. Random surveillance for BOD5, SS and thermotolerant coliforms shall be done at no less than once each 4 years. An authorised person may require sampling for BOD5, SS and thermotolerant coliforms or to undertake other chemical analyses to help identify operational problems.

18. Where required, monitoring details for individual on-site waste water management systems are to be recorded on a standardised form and lodged with the Council each quarter.

19. A final inspection of all installations may be conducted by a Council Environmental Health Officer following receipt of the written certification from the system designer. Plumbers and owners should be made aware that a minimum number of working days' notice is required for such inspections and the building will need to be open for inspection as required.

W. C. Cromer
Principal

This report is and must remain accompanied by the following Attachments

Attachment 1. Maps (5 pages)
- Map 1.1 Cadastre
- Map 1.2 Aerial imagery
- Map 1.3 Published geology
- Map 1.4 Hillshading

Attachment 2. Site sketch showing test pit locations and proposed buildings (2 pages)
Attachment 3. Photographs of test pits A – G (8 pages)
Attachment 4. System design for wastewater management (3 pages)
Attachment 5. Loading Certificate (2 pages)
Attachment 6. Risk assessment (2 pages)
Attachment 7. Form 35 for this project (4 pages)
Attachment 8. Documents required when applying for a plumbing permit for an on-site wastewater management system (2 pages)

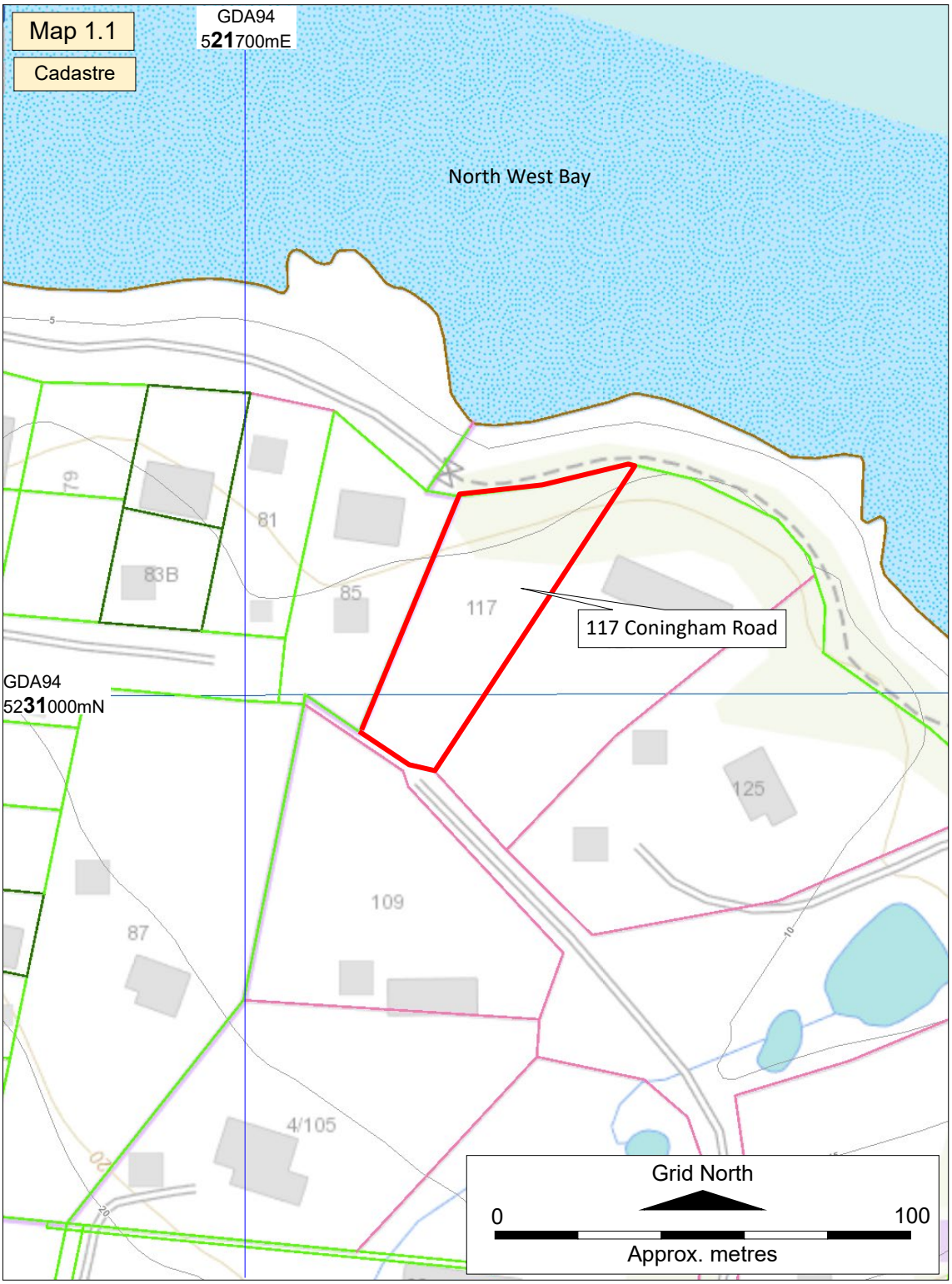
Attachment 1

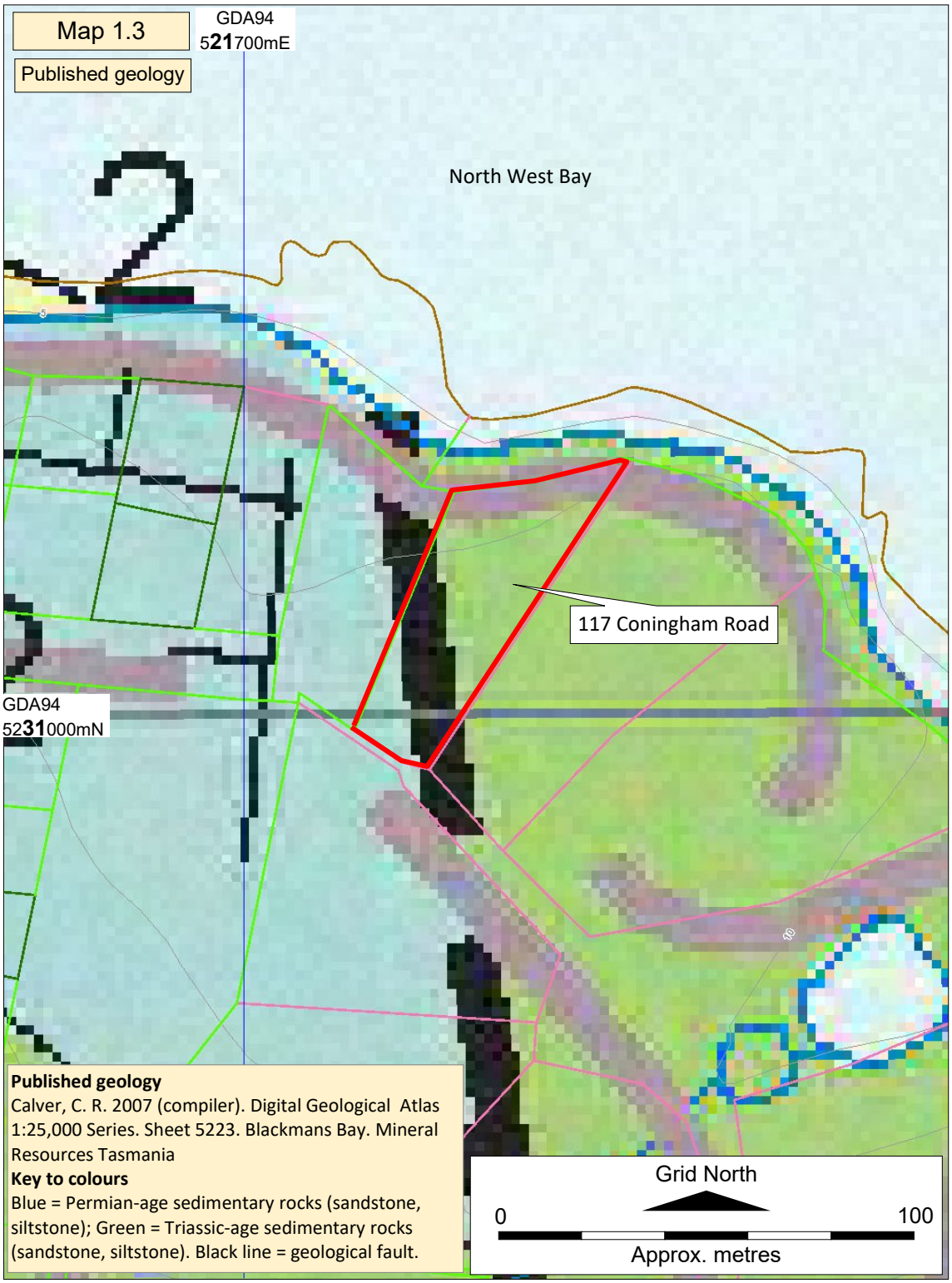
(5 pages including this page)

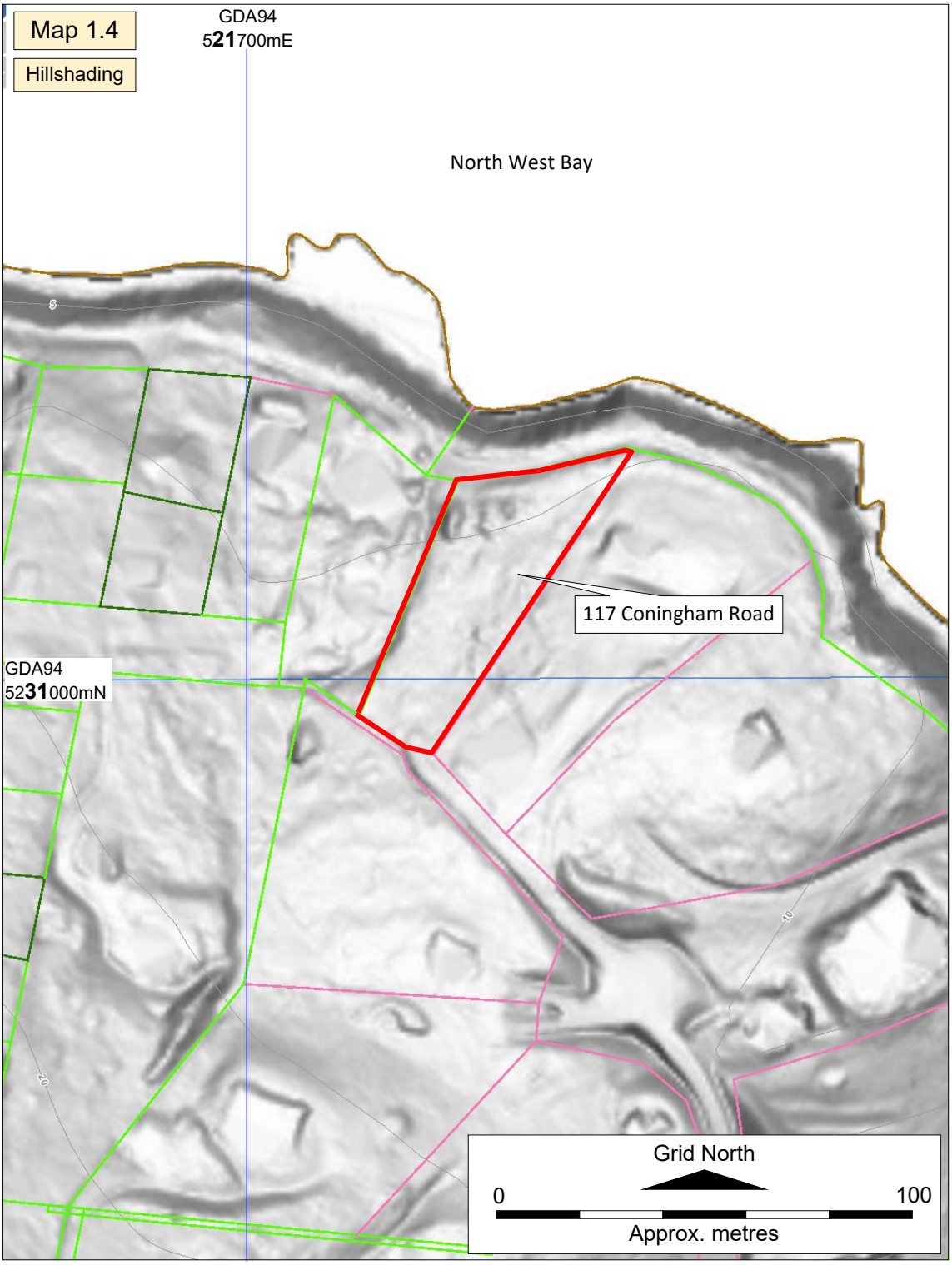
Maps

Map 1.1	Cadastre
Map 1.2	Aerial imagery
Map 1.3	Published geology
Map 1.4	Hillshading

Sources: http://maps.thelist.tas.gov.au; Mineral Resources Tasmania





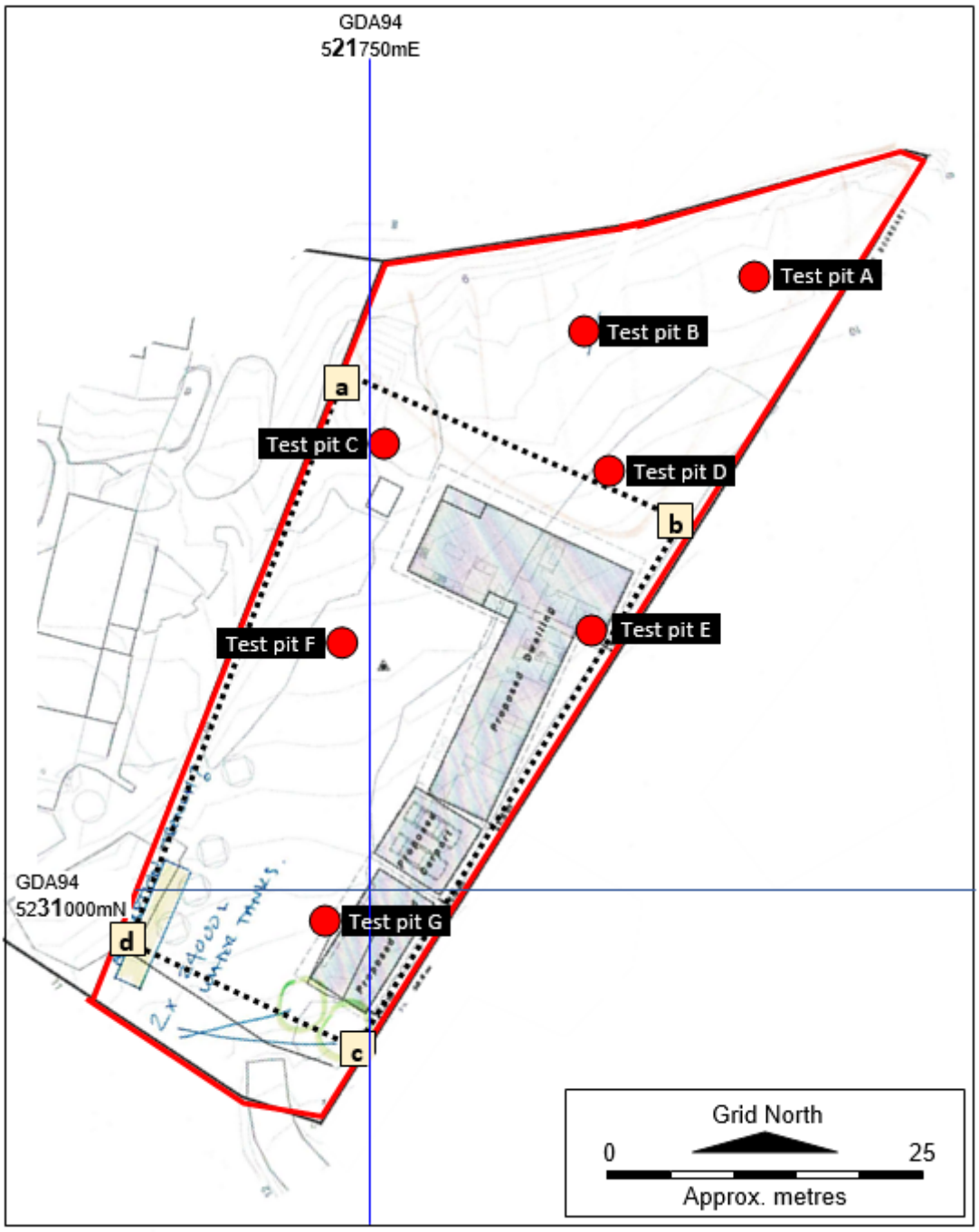


Attachment 2

(2 pages including this page)

Site sketch showing test pit locations and proposed buildings

Source for site sketch: 1+2Architecture



Attachment 3

(8 pages including this page)

Photographs of test pits A – G

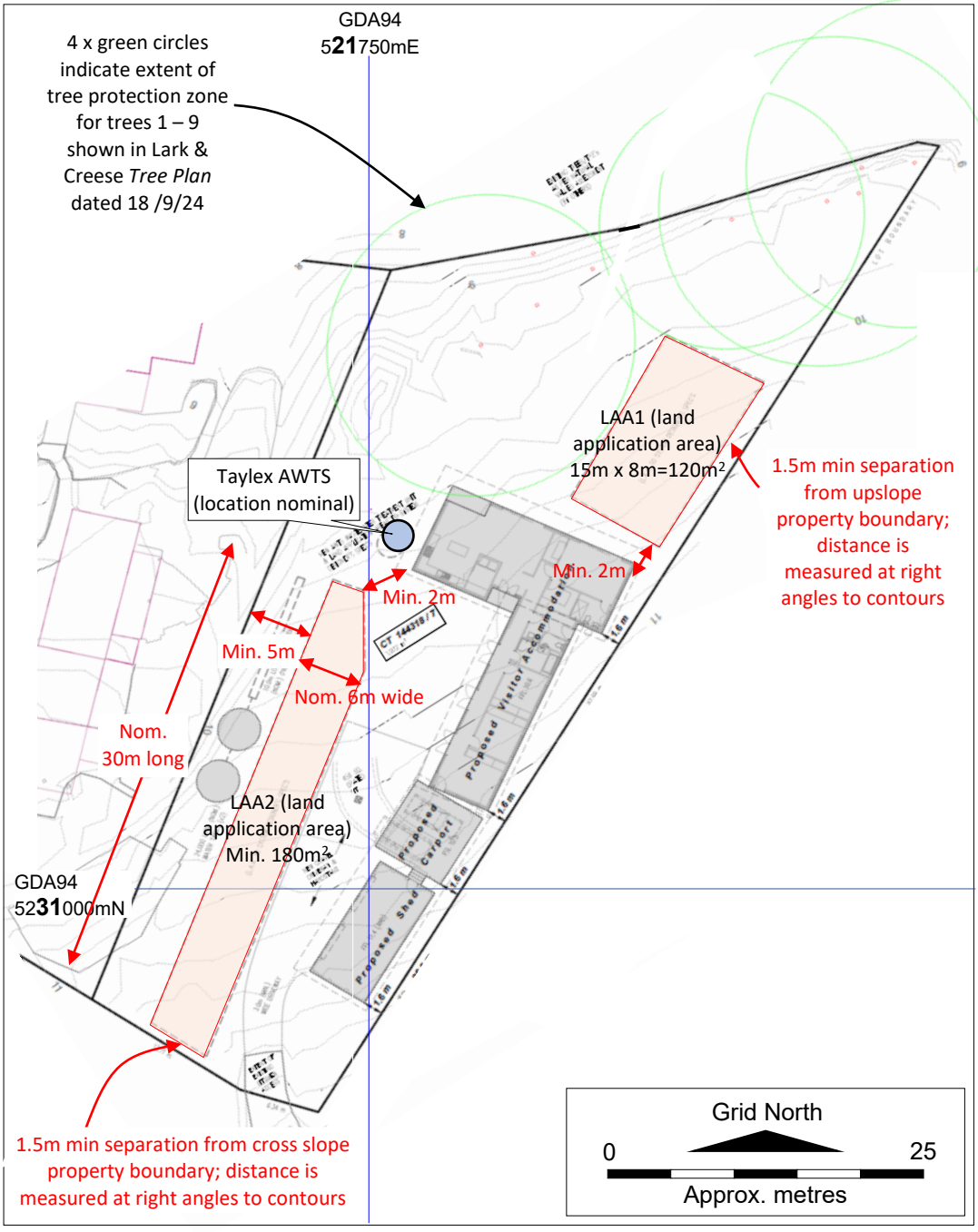
There are three photos on a single page for each test pit. The main photo shows the soil profile in the test pit, a second inset photo shows the location of the test pit relative to site features, and a third inset photo shows the materials excavated from the test pit.
The scale in the photos is graduated into red- and black-numbered segments each one metre long.
The numbers are decimetres.
See Table 1 for descriptions of Layers 1, 2, 3, etc in summary test pit logs.

Attachment 4

(3 pages including this page)

System design for wastewater management

Design variations for the following components of the wastewater system are acceptable provided they produce the same or better results.



Details of irrigation area (shown here is LAA1; LAA2 construction is similar)

Secondary-treated wastewater from an AWTS will be disposed of at a Design Irrigation Rate of 2L/day/m^2 over two land application areas (LAAs) with a combined wetted area of at least 300m^2, either or both via (a) shallow subsurface drip irrigation, or (b) mulch-covered surface drip irrigation if it is considered that trees of high conservation value might be affected by the shallowly buried system.

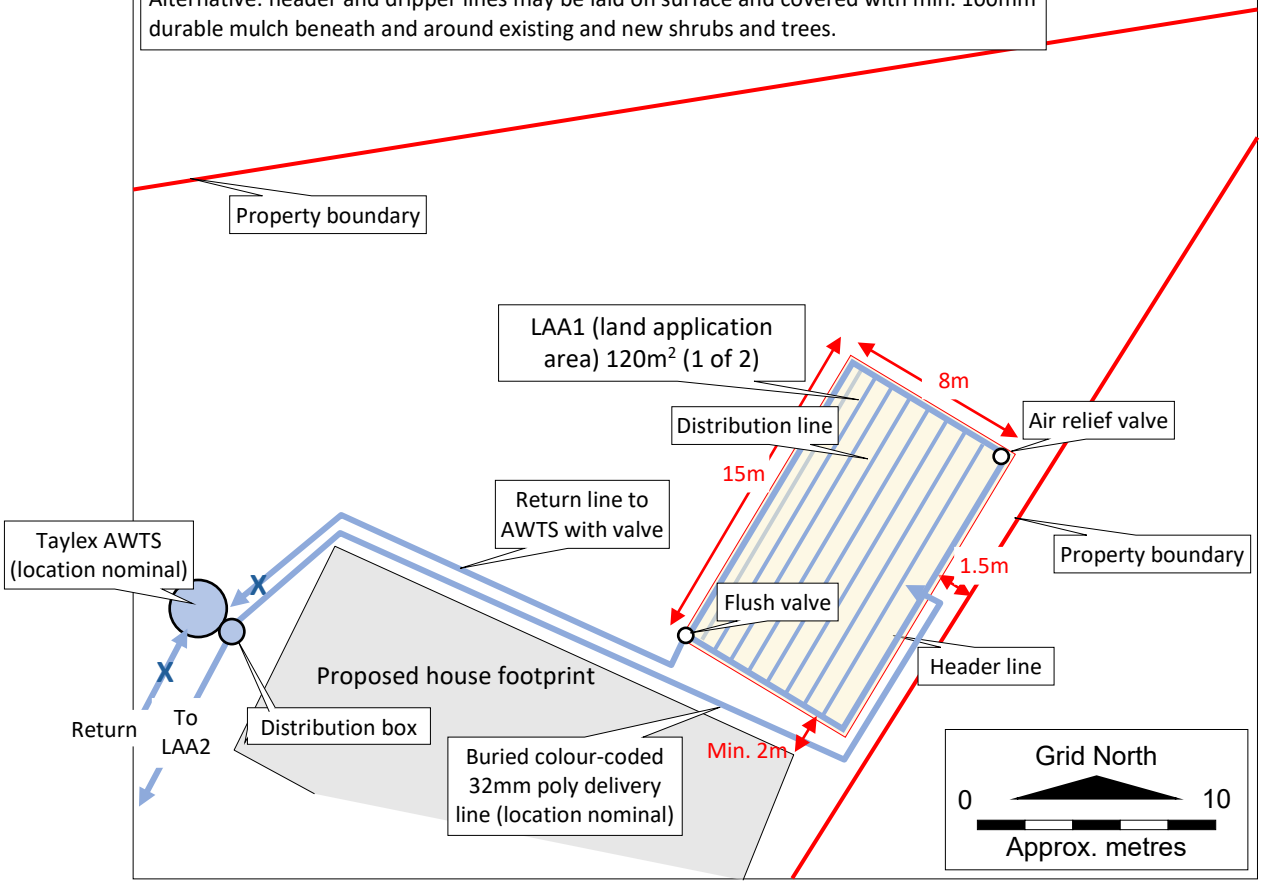
LAA1 covers a wetted area of 120m^2, and LAA2 covers 180m^2. Each includes:

- the 32mm header and return lines with air relief and flush valves,
- 19mm colour-coded poly distribution lines nom. 1m apart around contour, and
- pressure compensating drippers each 1m apart on distribution lines.

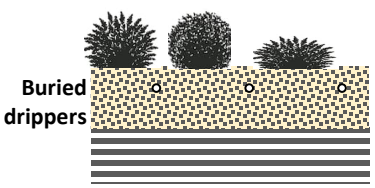
The shape and location of each LAA is nominal, provided it complies with:

- the minimum required wetted area, and
- indicated setbacks from property and building boundaries.

Alternative: header and dripper lines may be laid on surface and covered with min. 100mm durable mulch beneath and around existing and new shrubs and trees.

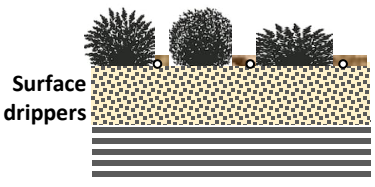


Permissible alternative LAA construction methods



Buried drippers

Lay dripper lines 0.1 – 0.15m below surface, c.1m apart and with drippers c.1m apart



Surface drippers

Lay dripper lines on surface, c.1m apart and with drippers c.1m apart
Cover dripper lines with 150mm mulch

Important (both LAAs)

1. Fully rip the footprint of the LAA to a nominal depth of 0.3.m
2. Before installing pipework, apply powered gypsum at the rate of 0.5kg/m^2 over the ripped ground.

Attachment 5

(2 pages)

Loading Certificate

Secondary wastewater treatment followed by shallow subsurface or mulch-covered surface irrigation

The owner should retain and read any certificate of accreditation, operating manual or related documents for the wastewater treatment system selected, to ensure optimal, nuisance free operation of the system with minimal environmental health impacts.

This loading certificate is provided in accordance with Clause 7.4.2(d) of AS/NZS 1547.2012.

System capacity (medium-long term)
5 people. Rainwater tanks. Wastewater generated = 600L/day.

Design criteria summary:

Effluent quality	Secondary from AWTS
Soil category	6
Land application area (LAA)	300m^2

Reserve area.
Available

Water efficient fittings etc
Design assumes use of water efficient fixtures and fittings, eg 9L/min (max) showerheads, aerator fittings on taps and clothes washing machines/dishwashers with WELSS star ratings of 4.5 stars or above. (see https://apps5a.ris.environment.gov.au/wels-public/search-product-select-load.do)

Variation from design flow
Design wastewater flow is 600L/day. The system should successfully manage additional peak loadings which may result from occasional extra people provided that this does not exceed design capacity + 25% in a 24-hour period.

Consequences of changing wastewater characteristics.
Avoid disposing of wastes which would be additional to those normally disposed of in a domestic sewerage system; in particular, increases in organic loadings such as from the use of sink-waste disposal units are to be avoided.

Use of household disinfectants or bactericides in anything more than small amounts and at recommended rates of dilution should also be avoided, as should the disposal of solvents and other chemicals or pharmaceuticals such as antibiotics or antimicrobials which may kill bacteria and other microorganisms required for effective wastewater treatment.

Consequences of overloading the system
Long term use by more than the specified number of people may result in biological and hydraulic overloading of the disposal system, surfacing of effluent, public and environmental health nuisances, pollution of surface waters etc.

Consequences of underloading the system
The system will work effectively with as few as one person in residence; however long periods of zero-occupancy may result in poor functioning of the system when normal use recommences.

Consequences of lack of operation, maintenance and monitoring attention

Maintain system in accordance with manufacturer's and installer's instructions.

Consequences of failure to observe the regular maintenance requirements may include any of the following:

- Spread of infectious diseases to family and neighbours.
- Nuisance and unpleasant odours.
- Pollution of waterways, streams, beaches and shellfish beds.
- Contamination of bores, wells and groundwater.
- Excessive and unsightly weed growth.
- Alteration of local ecology

Other relevant considerations

- Livestock should not be allowed on or near the LAA; if such animals are kept, the land application area should be fenced off to prevent system damage and/or soil compaction.
- Do not allow vehicles on or near the LAA.
- If present, keep the surface and/or sub-surface cut-off drain above or adjacent to the LAA open and clear of debris to prevent rainwater flowing into the disposal area.
- Pipe overflow from rainwater tank(s) away from LAA.

Problems may occur with systems which have not been properly maintained and where absorption areas have become blocked or clogged. The warning signs are obvious and include:

- LAA is wet or soggy with wastewater ponding on the surface of the ground.
- "Sewage" smells near septic tank (if present).

Attachment 6

(2 pages)

Risk Assessment

AWTS and shallow subsurface irrigation

Tables 6.1 and 6.2 summarise a risk management approach for the wastewater management system at this site, in general accordance with Clause A3.2 of AS/NZS1547:2012.

Table 6.1 Terminology used in risk management in this report
Table 6.2 Issues relating to the use and sustainable management of the wastewater system at this site

Table 6.1 contains subjective descriptions of likelihood and consequence. Table 6.2 is a risk assessment of the system components.

Table 6.1. Terminology used in risk management in this report

Likelihood	Consequences to property and or indicated stakeholders			
	Major	Medium	Minor	Insignificant
Almost certain	VH	VH	H	L
Likely	VH	H	M	L
Possible	H	M	L	VL
Unlikely	M	L	L	VL
Rare	L	L	VL	VL
Barely credible	VL	VL	VL	VL

Notes

1. An **issue** is a physical, chemical or environmental aspect of a particular site (as listed in Trench3) which should usually (but not necessarily always) be considered in the design of a wastewater system at the site.
2. **Likelihood** describes the possibility – if untreated – of the issue causing a hazard over the projected operational life of the on-site wastewater management system
3. A **hazard** is a physical, chemical or biological agent with the potential to cause harm.
4. **Consequence** describes the level of impact or harm caused by a hazard:

Insignificant = harm easily remedied by landowner or licenced plumber; all wastewater retained on land application area

Minor = harm requires licenced plumber to remedy; all wastewater retained on land application area

Medium = harm requires licenced plumber to remedy; some or all wastewater discharges via surface or shallow seepage off the land application area but all is retained on the property

Major = harm requires licenced plumber to remedy; some or all wastewater discharges via surface or shallow seepage off the land application area and property to one or more neighbours and/or receiving waters. Regulator serves notice to landowner.

5. **Risk** = Likelihood combined with Consequence. VL = Very Low; L = Low; M = Moderate; H = High; VH = Very High. Levels are colour-coded.
6. **Stakeholders** (Section A3.2.1 of AS/NZS1547:2012)

(the risk assessment applies to the stakeholders indicated below)

Internal stakeholders

client (property owner)
property occupier (if not owner)
site investigator
system designer
system installer
equipment supplier
servicing agent

External stakeholders

regulator
neighbouring property owners

7. The definitions of issue, likelihood, consequence and risk shown here are proposed by William C Cromer Pty Ltd, but do not have the approval of any regulatory authority. Comment and feedback are welcomed from wastewater practitioners.

Table 6.2 Issues relating to the use and sustainable management of the wastewater system. Source: The Director of Building Control *Accreditation and Maintenance of Plumbing Installations* (November 2017)

				Before treatment				After treatment			
Issue #	System component	Size, etc	Confidence level of value used	Potential hazard(s) related to use	Likelihood of this issue causing a hazard	Consequences to property and stakeholders if issue causes a hazard	Level of risk to property and stakeholders if issue creates a hazard	Recommended risk treatment (and explanatory notes)	Likelihood of this issue becoming a hazard	Consequences to property and stakeholders if issue causes a hazard	Level of risk to property and stakeholders if issue becomes a hazard
1	Taylex AWTS	To be specified	High	Malfunction of any component	Possible	Medium	Moderate	Operate in accord with manufacturer's instructions; contract for regular inspections and servicing	Possible	Minor	Low
2	Shallow subsurface or mulch-covered irrigation areas	300m2 total in 2 x LAAs	Moderate	Pipework breakage	Possible	Medium	Moderate	Buildings, access tracks, roads, parking areas, heavy-footed animals (horses, cows, etc), motor vehicles must not be located and have no access over the land application area. If necessary, fence off or otherwise isolate the area. Maintain cutoff and surface drains and vegetation around the area.	Possible	Minor	Low

Attachment 7

(4 pages including this page)

Form 35 for this project

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form 35

To: M. Trendall *Owner name*

marc@trendallbuilders.ocm.au *Address*

Suburb/postcode

Designer details:

Name: Bill Cromer
Category:
Business name: William C Cromer Pty Ltd
Phone No: 0408 122 127
Business address: 74A Channel Highway
Taroona 7053
Fax No:
Licence No: CC6184Q
Email address: billcromer@bigpond.com

Details of the proposed work:

Owner/Applicant M. Trendall
Designer's project reference No.

Address: 117 Coningham Road
Coningham

Type of work: Building work ☐ Plumbing work X *(X all applicable)*

Description of work:

On-site wastewater management system

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer or Civil Designer
	☐ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐X Plumbing design	~~Plumber-Certifier; Architect~~, Building Designer ~~or Engineer~~
	☐ Other (specify)	

Deemed-to-Satisfy: X☐ Performance Solution: X☐ *(X the appropriate box)*

Other details:

See Cromer (2024) report below

Director of Building Control - date approved: 2 August 2017 *Building Act 2016* - Approved Form No 35

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers: See Cromer (2024) report below	Prepared by:	Date:
Schedules: See Cromer (2024) report below	Prepared by:	Date:
Specifications: See Cromer (2024) report below	Prepared by:	Date:
Computations: See Cromer (2024) report below	Prepared by:	Date:
Performance solution proposals: See Cromer (2024) report below	Prepared by:	Date:
Test reports: See Cromer (2024) report below	Prepared by:	Date:

Standards, codes or guidelines (where applicable) relied on in design process:

AS/NZS1547:2012 On-site domestic wastewater management

Cromer, W. C. (1999). Trench™3.0: A computer application for site assessment and system sizing, in Patterson, R. A. (Ed.) *On-site '99 – Proceedings of the On-Site '99 Conference: Making on-site wastewater systems work.* Univ. of New England, Armidale, 13-15 Jul 1999, pp 85-88

E23.0 Tasmanian *On-site Wastewater Management Code*

The Tasmanian Director of Building Control's *Guidance for On-site Wastewater Management* Systems (Nov 2017)

The Tasmanian Director of Building Control's *Determination – Accreditation and Maintenance of Plumbing Installations* (Dec 2016)

Any other relevant documentation:

Cromer, W. C. (2024). *Site and Soil Evaluation Report, and System Design for On-site Wastewater Management, proposed visitor accommodation at 117 Coningham Road, Coningham.* Unpublished report for M. Trendall by William C. Cromer Pty. Ltd., 30 October 2024.

Attribution as designer:

I William C Cromer.....
am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance of the report and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	William C Cromer		30 October 2024
Licence No:	CC6184Q		

Director of Building Control - date approved: 2 August 2017 — *Building Act 2016* - Approved Form No 35

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [x] The works will not increase the demand for water supplied by TasWater
- [x] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [x] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [x] The works will not damage or interfere with TasWater's works
- [x] The works will not adversely affect TasWater's operations
- [x] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [x] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [x] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I .....William C Cromer..... being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.
Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at:
www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	William C Cromer		30 October 2024

Hobart, Tasmania, Australia
M +61 408 122 127 E billcromer@bigpond.com W www.williamccromer.com

Attachment 8

(2 pages)

Documents required when applying for a plumbing permit for an on-site wastewater management system

Source: Director of Building Control Director's Specified List (Part 3), September 2017 v1.2
Stakeholders should check online that this is the latest version.

The documents listed below are required to accompany an application for a plumbing permit for the installation of an on-site wastewater management system.

1.Complete drawings of the installation, drawn to a scale of not less than 1:200 or as agreed to by the Permit Authority, showing the following:

(a) the title boundaries of the land;

(b) the position of any existing or proposed buildings on the land and their use;

(c) the position of any roads or driveways on the land;

(d) the location of any water courses;

(e) the contours on the land;

(f) the position of the Wastewater treatment unit; Wastewater land application

area (absorption trenches, mound, irrigation area); Pump chamber, distribution box or other manual or automatic valve; Soil evaluation test holes.

(g) the location and size of any drains and vents;

(h) the location of any cut-off drains diverting surface water or sub-soil drains for ground water;

(i) the location of the outlets from the building;

(j) A cross section drawing demonstrating that there is sufficient gravity fall from the plumbing fixtures to the wastewater treatment unit and land application area.

(k) Operation and maintenance guidelines for the OWMS

(l) Installation instructions for the wastewater treatment unit and land application area

2. Written details of the proposed fixture unit load on the system or parts of the system.

3. A site-and-soil evaluation report completed in accordance with AS/NZS 1547:2012 clause 5.2

4. A Design report which is consistent with the Director of Building Control Onsite Wastewater Management Guidelines and includes the following;

(a) A design based on the site and soil evaluation report

(b) Design calculations for the wastewater land application system and wastewater treatment unit

(c) Specification for the wastewater treatment unit, if a unique on-site wastewater management system a design report from a suitably qualified designer demonstrating compliance with the performance requirements of the Volume 3 of the NCC.

(d) A loading certificate setting out the design criteria and the limitations associated with use of the system incorporating the following:

- System capacity (number of persons and daily flow)
- Summary of design criteria

- The location of and use of the reserve area
- Use of water efficient fittings, fixtures, or appliances
- Allowable variation from design flows (peak loading events)
- Consequences of changes in loading (due to varying wastewater characteristics)
- Consequences of overloading the system
- Consequences of underloading the system
- Consequences of lack of operation, maintenance, and monitoring attention
- Any other relevant considerations related to use of the system; and

(e) The results of the risk management process undertaken in accordance with AS/NZS 1547 Clause A3.2. if required by the Director of Building Control Onsite Wastewater Management Guidelines.

5. A written specification and construction details of the land application system to be used, including details of the following:

(a) the type of system;

(b) the trade name, if any;

(c) the manufacturer's name and address;

(d) the design capacity of the system; and

(e) a section (drawing detail) through the land application system, of not less than 1:20, specifying its construction.

(f) Pump chamber capacity, pump and supply pipe specifications (where appropriate)

(g) Distribution boxes, automatic sequencing valves, dosing syphons or other pulse dosing devices.

6. Copy of Certificate of Accreditation issued under the Building Act by the Director of Building Control for the on-site wastewater management system (if applicable).

7. Any other document or certificate required by the relevant permit authority or environmental health officer