Whitehead & Associates
Environmental Consultants

Peter Shipway
c/- Lisa Wrightson
Barker Ryan Stewart
Re: 4 Henstock Road,
Arcadia NSW 2159
(via email)

Ref: 2959_RFI letter

24 April 2023

Details of existing on-site sewage management system at 4 Henstock Road, Arcadia

The following is presented in response to a Hornsby Shire Council ("Council") RFI regarding existing on-site sewage management (OSSM) servicing the two (2) dwellings at 4 Henstock Road, Arcadia (the "Site"). This RFI was initiated in response to a Development Application (DA/1205/2022) submitted for the Site. The DA is seeking consent to host temporary functions ("events") of up to 70 patrons, and 10 support staff, within the secondary dwelling at the Site.

It is proposed that patrons will not have access to any wastewater generating facilities, with all event attendees directed to 'portable' bathroom facilities provided by the Client. Only staff will be permitted to use the bathroom facilities within the secondary dwelling, when it is unoccupied. Therefore, on this basis, no new or additional inputs to either of the OSSM systems at the Site are proposed by the DA.

Plans provided show that the DA includes the provision of car parking in the front area of the property, within close proximity to the existing spray irrigation land application area (LAA) servicing the main dwelling. This has been flagged by Council as a potential contact risk, prompting the request of the following information.

- Confirmation of the capacity of the wastewater treatment system servicing each dwelling;
- Confirmation of the size and location of the LAA servicing each dwelling; and
- Proposed alterations to the OSSM systems servicing each dwelling.

Details on the OSSM systems servicing each dwelling has been informed by a Site visit undertaken by W&A on the 19th of May 2021. This advice is proffered on the understanding that neither OSSM system has been altered since this visit, as per Client advice.

1 Main Dwelling

The (primary) main dwelling contains four (4) bedrooms. Based on a conservative occupancy rate of 1.5EP per bedroom and a wastewater generation rate of 150L/EP/day, as per 'Residential premises with reticulated water supply' (Table H1, *AS/NZS 1547:2012*), a wastewater generation rate of 900L/day has been assumed. There are no alterations proposed to the dwelling under the DA.

The layout of the OSSM system servicing the main dwelling is presented in Figure 1 of Appendix A.

1.1 Wastewater Treatment System

Wastewater generated within main dwelling currently undergoes secondary treatment in an 'Econocycle ENC10-1' Aerated Wastewater Treatment System (AWTS), located to the south west of the dwelling (Accreditation details provided in Appendix B). The AWTS no longer holds current NSW Health accreditation; however, it is understood the system is regularly serviced (3-monthly) by an approved maintenance Contractor.

During the Site inspection, the system was found to be in a good structural condition other than minor concrete chipping on the blower / pump housing. The access lids were intact and the internal components looked to be in good condition.

As a previously NSW Health accredited SMF (expired 31/12/2020), it can be assumed that the system has a minimum treatment capacity of 1,500L/day (~10EP). The assumed 'design' wastewater load from the dwelling is 900L/day, and no alteration is proposed under the DA; therefore, continued use of the AWTS to service the main dwelling is considered appropriate.

The proposed car parking conflicts with the AWTS location (refer Figure 1 of Appendix A). Relocation of the AWTS is problematic; therefore, it is recommended that the proposed car parking layout is amended to resolve this issue. Further, to comply with AS1546.3:2017, a physical barrier or buffer should be provided between trafficable areas and the AWTS.A nominal buffer of 2m is provided by the garden area surrounding the tank (refer Figure 2 of Appendix A).

1.2 Land Application Area

Secondary (disinfected) effluent is spray irrigated to a ~155m^2 LAA installed within a landscaped (garden) area near the southern property boundary, east of the driveway access (refer Figure 1, Appendix A). Distribution is achieved via multiple (wobbler) sprinkler heads installed on ~1m risers.

It is understood the original (s.68) approval for this system required 300m^2 of LAA be provided for surface irrigation. It appears the LAA has been reduced over time as a result of re-location. No signage informing effluent reuse was observed. DLG (1998) recommend a minimum setback of 6m be applied between 'surface spray irrigation' areas and driveways. Council have requested a setback of >15m is applied to car parking areas.

It is recommended that the LAA be re-instated to 300m^2, as per the original OSSM approval.

Due to the proposed (visitor) use, the LAA should be fenced or otherwise access-restricted. A minimum of two (2) warning signs, complying with AS1319:1994, should be installed to inform patrons that effluent reuse is occurring.

The existing spray irrigation LAA is located directly south of the proposed car parking area, with no available setback (refer Figure 1 of Appendix A). This does not comply with the Council specified setback requirement (15m); therefore, the LAA should be relocated.

A proposed location complying with the specified setback criteria is shown in Figure 2 of Appendix A.

2 Secondary Dwelling

The secondary dwelling contains two (2) bedrooms. Based on a conservative occupancy rate of 1.5EP per bedroom and a wastewater generation rate of 150L/EP/day, as per 'Residential premises with reticulated water supply' (Table H1, *AS/NZS 1547:2012*), a wastewater generation rate of 450L/day has been assumed for 'residential' use.

The DA proposes that (only) event support staff be allowed to use the bathroom facilities within the secondary dwelling, when it is unoccupied. Based on a wastewater generation rate of 30L/staff/day, as per 'Non-resident staff' (Table H4, *AS/NZS 1547:2012*), a wastewater generation rate of 300L/day has been assumed for 'event' use.

The layout of the OSSM system servicing the secondary dwelling has been presented in Figure 1 of Appendix A. There are no upgrades to this OSSM system proposed under the DA.

2.1 Wastewater Treatment System

Wastewater from the secondary dwelling currently undergoes primary treatment in a 3,000L 'Everhard' polymer septic tank, located to the west of the building. The tank was found to be in good structural condition, with a working baffle and both inlet and outlet T-junctions installed. A healthy scum layer was observed within the tank.

As per Table J1 of AS/NZS 1547:2012, a minimum septic tank capacity of 3,000L is considered appropriate for developments of up to three (3) bedrooms (~5EP), with an inferred treatment capacity of ≤1,000L/day and an assumed 5-year pump-out interval.

Expected wastewater generation for the proposed uses of 450L/day (residential) and 300L/day (event) are less than the available capacity; therefore, the continued use of the septic tank to service the secondary dwelling is considered appropriate.

2.2 Land Application Area

Primary effluent from the septic tank currently discharges to a subsoil absorption trench (the "operating trench") to the southeast of the tank, with a 'reserve' trench located to the northwest of the septic tank. Both trenches were investigated using ground probe and determined to have an approximate basal area of ~12m^2 each, based on measured dimensions of 20m (length) by 0.6m (width). Both trenches are of gravel-fill construction, with slotted pipe distribution.

The operating trench was observed to be working effectively at the time of inspection, with no evidence of poor performance (surface saturation) or damage.

The effective soil loading rate to the operating trench is approximately 37.5mm/day, based on the maximum hydraulic load proposed (residential). This value is higher than recommended for the observed soil conditions at the Site (Cat 5). Whilst no obvious signs of trench compromise are noted, ongoing high loading can lead to long-term performance decline.

W&A recommend the use of an effluent outlet filter to reduce the residual organic and suspended loads discharging to the trench as an appropriate mitigation strategy.

Also, it is advisable that regular inspection and maintenance of this OSSM system is undertaken by a licensed professional to ensure that problems can be promptly identified and rectified (if necessary). This can be simply achieved by adding the system to the contracted servicing schedule for the AWTS servicing the main dwelling.

The operating trench is located outside of area proposed for any development use.

To ensure potential impacts to the operating trench are avoided, it is recommended that the footprint is 'staked out' or otherwise marked, so that its location can be easily identified and sited on the surface.

Whilst the 'reserve' trench is operable, it is located within area proposed for utilisation (portable bathroom and catering / food truck area) under the event use, where it may become damaged due to vehicle movement and load placement.

It is recommended that the existing reserve trench be abandoned-in-place, and a new 'reserve area' be identified at the Site. This area is to remain set-aside from any future development, and will be used to replace or augment the operating trench if necessary.

A nominal location for a suitable reserve area is presented in Figure 2 of Appendix A.

3 Conclusion and Recommendations

This concludes the assessment of the OSSM systems servicing the two (2) dwellings at 4 Henstock Road, Arcadia, as requested by Council. To ensure sustainable OSSM at the Site, without conflicting with the current DA, W&A recommend the following:

Main Dwelling

- The existing AWTS is appropriate for continued use, with ongoing regular servicing by a licensed provider;
- Secondary treated (and disinfected) effluent should be irrigated to a newly located 300m^2 LAA, complying with minimum Council buffers , as shown in Figure 2 of Appendix A; and
- The DA plans should be amended to remove conflict between the car parking area layout and recommended setbacks to the fixed AWTS location.

Secondary Dwelling

- The existing (3,000L) septic tank is appropriate for continued use, considering both the residential and event uses proposed;
- The septic tank should be fitted with an effluent outlet filter;
- Primary effluent shall continue to discharge to the operating trench, which should be 'staked out' or otherwise marked, such that its location can be identified on the surface;
- Inspection and maintenance servicing of the OSSM should be added to the existing servicing contract for the main dwelling OSSM system;
- The existing 'reserve trench' should be abandoned-in-place; and
- A new 'reserve area' is to be identified at the Site, with this area to remain set-aside from future development.

Yours Sincerely

[redacted]

Connor Morton

Environmental Consultant
Whitehead and Associates Environmental Consultants Pty Ltd

Appendix A

Figure

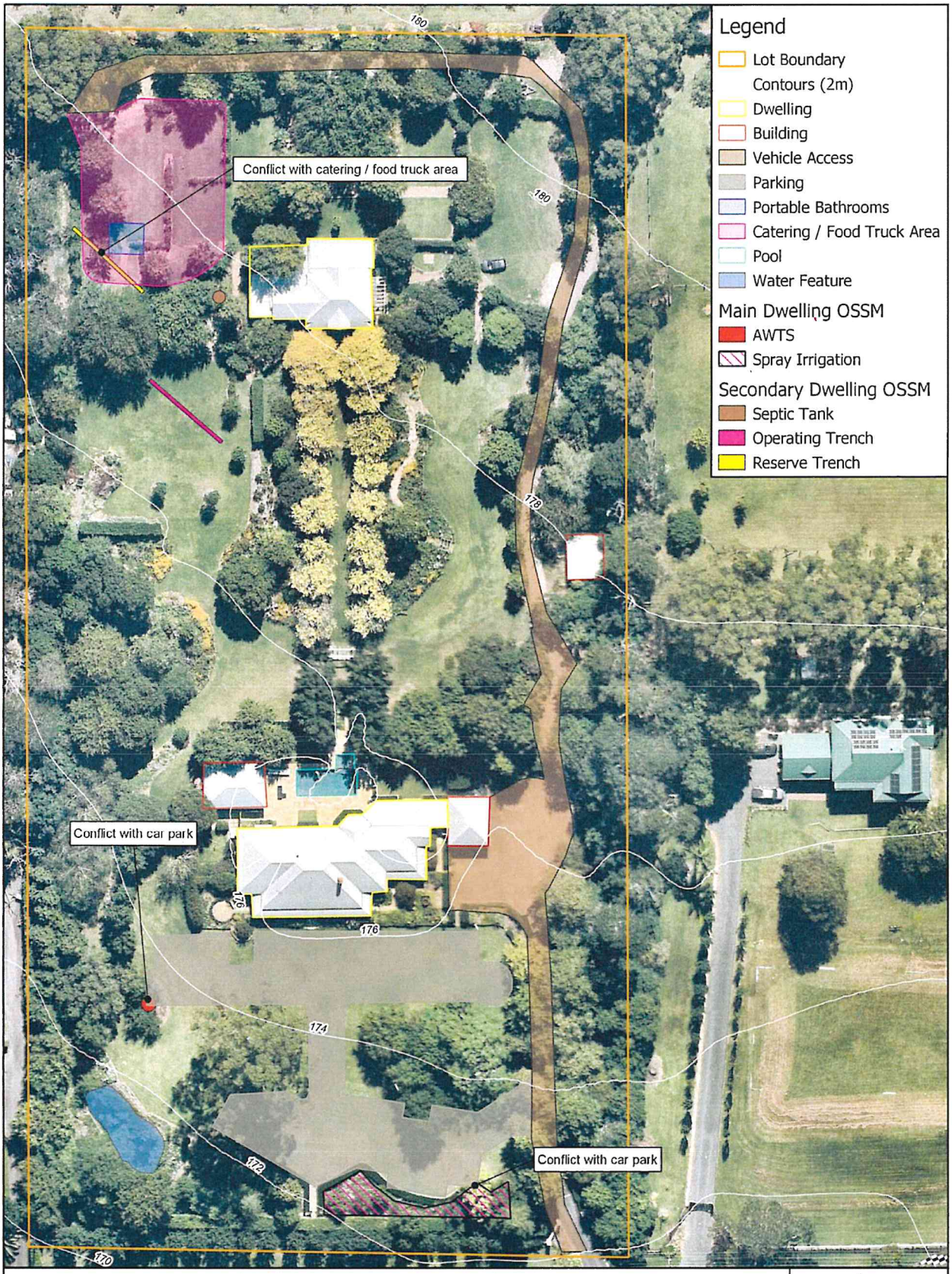

Figure 1: Site Plan Showing Existing OSSM

2959: Onsite Wastewater Management Report - 4 Henstock Road, Arcadia NSW

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Whitehead & Associates
Environmental Consultants

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(Approx Scale)

Revision	1
Drawn	CM
Approved	MS

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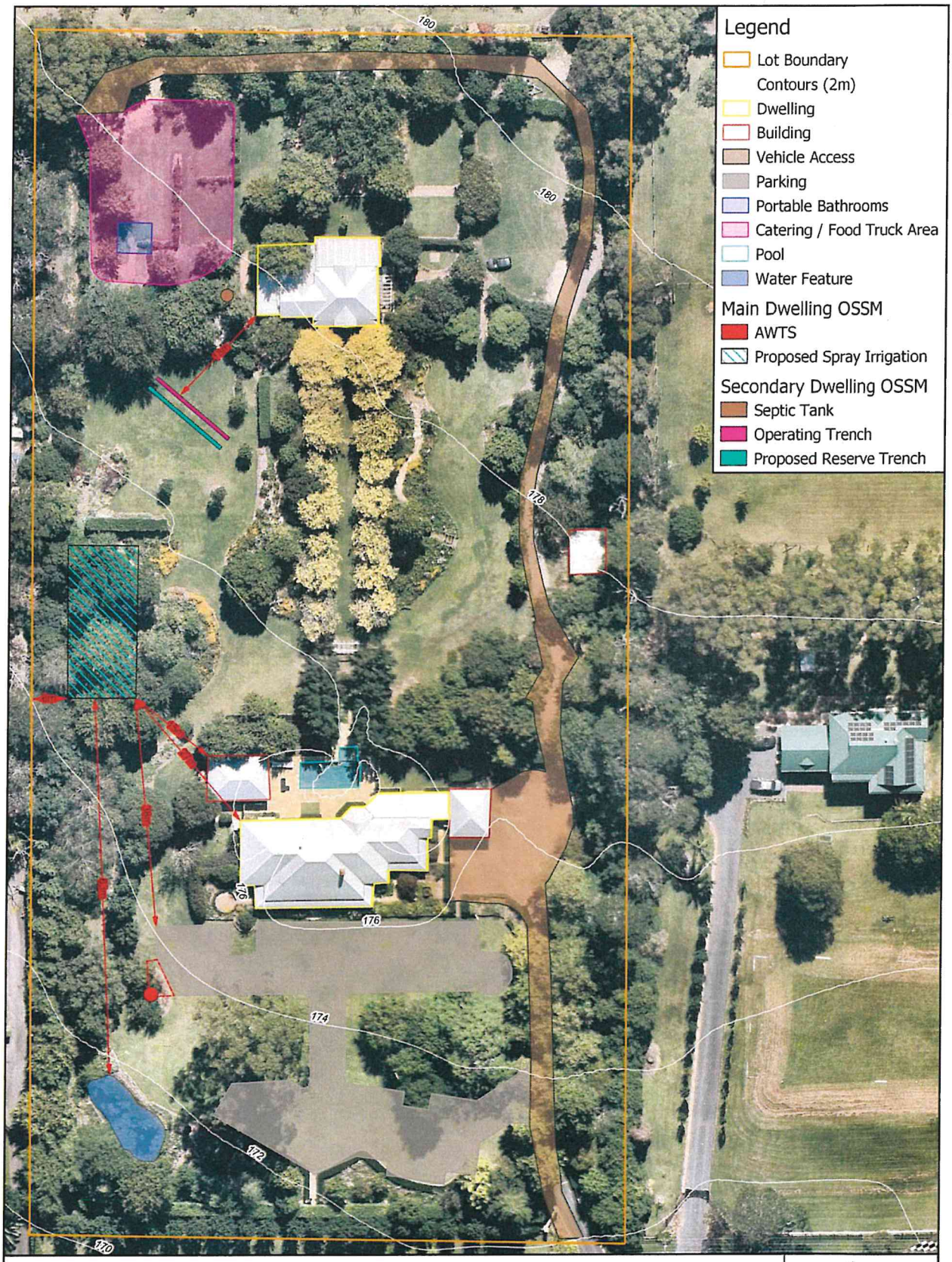

Figure 2: Site Plan Showing Proposed OSSM Alterations

2959: Onsite Wastewater Management Report - 4 Henstock Road, Arcadia NSW

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Revision	1
Drawn	CM
Approved	MS

Appendix B

Accreditation Details

197 Main Road Cardiff NSW 2285 Australia Telephone + 61 2 4954 4996
Email mail@whiteheadenvironmental.com.au Website www.whiteheadenvironmental.com.au

NSW GOVERNMENT | Health

Certificate of Accreditation

Sewage Management Facility
Aerated Wastewater Treatment System

This Certificate of Accreditation is issued by the Secretary of the NSW Ministry of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.

System: *Econocycle model ENC 10-1 AWTS*

Manufacturer: *Eco-septic Pty Ltd t/a Econocycle*

Of: *15 Econo Place, Silverdale, NSW, 2752*

The Econocycle model ENC 10-1 AWTS as described in Schedule 1, has been accredited as a sewage management facility for use in single domestic premises in NSW. This accreditation is subject to the conditions of accreditation and permitted uses specified in Schedule 2.

[redacted]

Director, Environmental Health
for Secretary (delegation PH335)

Issued: *28 September 2015*
Certificate No: *AWTS 015*
Expires: *31 December 2020*

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Schedule 1: Specification

Econocycle model ENC 10-1 Aerated Wastewater Treatment System

General Description

The Econocycle model ENC 10-1 Aerated Wastewater Treatment System (AWTS) is designed to treat the wastewater from a residential dwelling occupied by a maximum of 10 persons. The Econocycle model ENC 10-1 AWTS is contained in one vertical axis type cylindrical precast concrete collection well with a design capacity of 7000 litres. The operational water level in the aeration chamber of the system is 1440 mm. The system consist of:

- A primary sedimentation chamber with a capacity of 3050 litres;
- A contact aeration chamber with a capacity of 2500 litres, divided into two sections and each containing a block of contact filter media measuring 800 mm long x 800 mm wide x 1200 mm high with a surface area of 50 m^2;
- A sedimentation/clarifying chamber with a capacity of 420 litres;
- An irrigation pump chamber with a capacity of 420 litres incorporating a capacity of 300 litres for chlorine contact of the effluent;
- A chlorine disinfection unit installed on the outlet of the clarification filter;
- Air is supplied to the contact aeration chamber by an air blower with an output of 80 litres/minute at 1.5 m water depth;
- A submersible irrigation pump which delivers a minimum flow of 2.0 m^3/hour at a minimum head of 7 m, or better.

Schedule 2: Conditions of Accreditation

1.0 General

1.1 For each installation the owner/occupier of the premises shall make an application to the local authority to install an Econocycle model ENC 10-1 AWTS as a waste management facility in accordance with Section 68, Part C of the Local Government Act 1993 and Clause 26 of the Local Government (General) Regulation 2005.

1.2 The Econocycle model ENC 10-1 AWTS shall be supplied, constructed and installed in accordance with the design as submitted and accredited by the NSW Ministry of Health.

1.3 Any modification or variations to the accredited design of the Econocycle model ENC 10-1 AWTS shall be submitted for separate consideration and variation of the Certificate of Accreditation by the Secretary of the NSW Ministry of Health.

1.4 Each Econocycle model ENC 10-1 AWTS shall be permanently and legibly marked on a non-corrosive metal plaque or equivalent, attached to the lid with the following information:
- The brand name of the system;
- The manufacturer's name or registered trademark;
- The month and year of manufacture.

1.5 The manufacturer shall supply with each Econocycle model ENC 10-1 AWTS and owner's manual, which sets out the care, operation, maintenance and on-going management requirements of the system.

1.6 The manufacturer shall provide the following information to each local authority where it is intended to install an AWTS in their area once Ministry accreditation has been obtained:

1

- Statement of warranty
- Statement of service life
- Quality Assurance Certification
- Installation Manual
- Service Manual
- Owner's Manual
- Service Report Form
- Engineering Drawings on A3 format
- Detailed Specifications
- A4 Plans
- Accreditation documentation from NSW Health.

2.0 Installation and Commissioning

2.1 The local authority should require that on completion of the installation of the Econocycle model ENC 10-1 AWTS. the system is inspected and checked by the manufacturer or the manufacturer's agent. The manufacturer or the agent is to certify that the system has been installed and commissioned in accordance with its design, conditions of accreditation and any additional requirements of the local authority.

2.2 The local authority should require that all electrical work must be carried out by a licensed electrician and in accordance with the relevant provisions of AS/NZS 3000.

3.0 Maintenance

3.1 The local authority shall require the owner/occupier of the premises to enter into an annual service contract with a representative of Econocycle or a service contractor or company acceptable to the local authority.

3.2 The Econocycle model ENC 10-1 AWTS shall be serviced at three monthly intervals in accordance with the details set out in the owner's and service manual.

3.3 Each three monthly service shall include a check on all mechanical, electrical and functioning parts of the system including:

- The chlorinator and replenishment of the disinfectant,
- Pumps, air blower, fan or air venturi.
- The alarm system (where possible),
- Slime growth on the filter media.
- Operation of the sludge return system,
- The effluent irrigation area,
- On-site testing for free residual chlorine. pH and dissolved oxygen.

3.4 The local authority should require that a service report sheet, in triplicate, is completed for each service. The original shall be given to the owner, the duplicate forwarded to the local authority and the triplicate retained by the service contractor.

4.0 On-going Management

4.1 The owner's manual prepared by the manufacturer shall contain a plan for the on-going management of the Econocycle model ENC 10-1 AWTS. The plan shall include details of:

- the treatment process,
- procedures to be followed in the event of a system failure,
- emergency contact numbers,
- maintenance requirements,
- inspection and sampling procedures to be followed as part of the on-going monitoring program developed by the local authority.

4.2 Effluent from the Econocycle model ENC 10-1 AWTS taken in any random grab sample shall comply with the following standard:

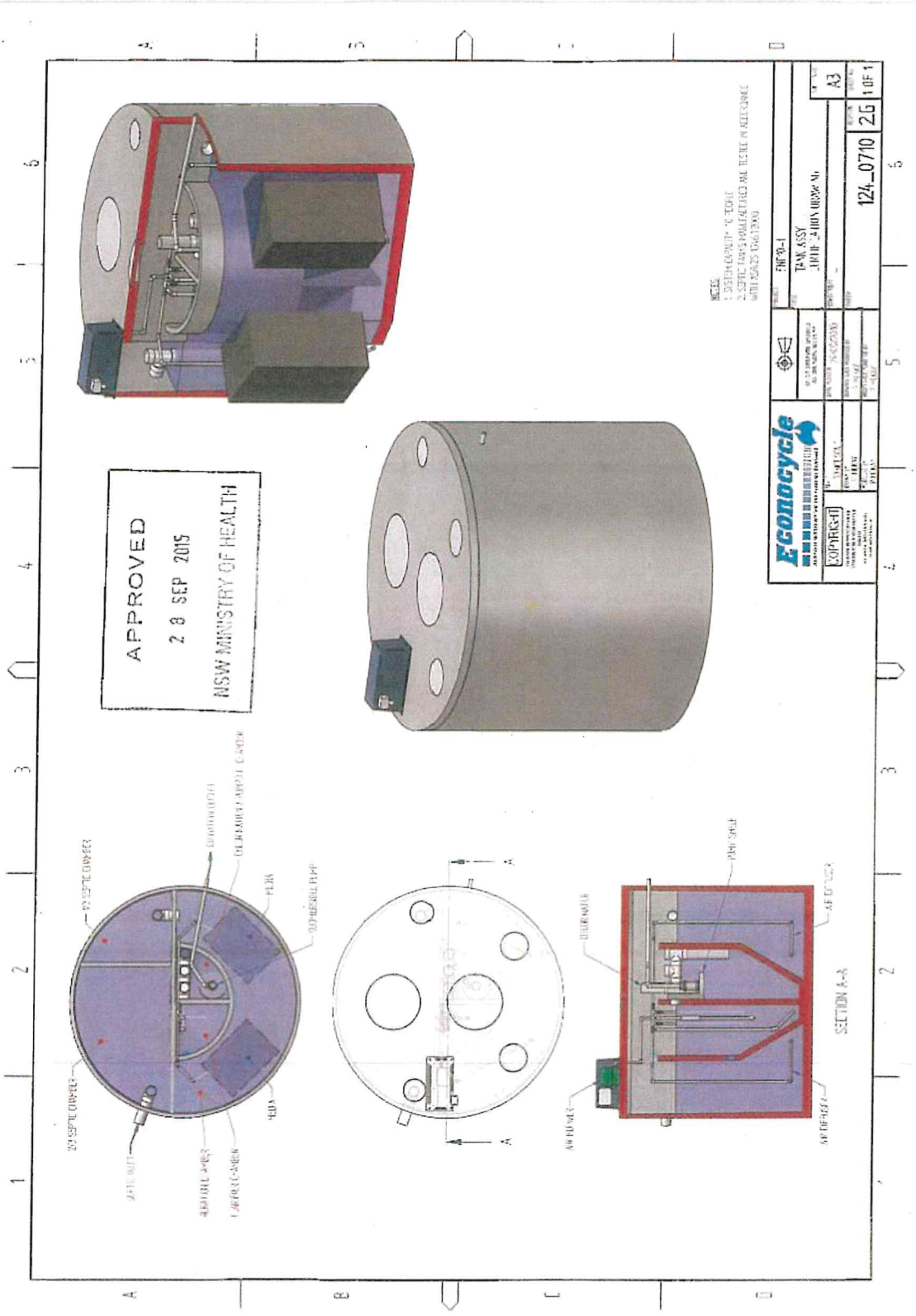
- BOD^5 (less than 30 mg/L)
- SS (less than 45 mg/L)
- E. coli (less than 100 cfu/100 ml)
- Free residual chlorine (greater than 0.2 and less than 2.0 mg/L)

5.0 Permitted uses

5.1 The effluent is suitable for re-use for garden purposes by way of any of the forms of irrigation as described in AS/NZS 1547:2000:

- above ground spray irrigation; or
- surface drip irrigation covered by mulch; or
- sub-surface drip irrigation installed at around 100 mm depth.

Each of the three forms of irrigation is subject to the approval of the local authority.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SECTION A-A