BAY OF PLENTY REGIONAL COUNCIL
TOI MOANA

ROTORUA LAKES COUNCIL
Te kaunihera o ngā roto o Rotorua

water NEW ZEALAND
The New Zealand Water & Wastes Association Wairora Aotearoa

On-site Effluent Treatment National Testing Program

STRAND 1

TESTING AND BENCHMARKING PROCEDURES

Trial 14 | 2018 -2019

Version 15 | August 2018

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Matter of Interest	Date
Written Confirmation of Interest for Trial participation	August 27, 2018
25% Deposit for confirmation [non-refundable] due	August 27, 2018
Site meeting for participants	November 12, 2018
Procedures confirmed	November 12, 2018
Agreements signed	November 12, 2018
Full payment due from all participants	November 12, 2018
All documents set out in Appendix IV Information to be Provided by the Manufacturer to be submitted by each trial participant	November 12, 2018
Site opened for installations (Period 1)	November 19, 2018
Installation to be completed, and plants available for detailed inspection including emergency storage check (Period 2)	November 26, 2018
Commissioning and Media Development Phase Starts (Period 3)	December 3, 2018
Treatment unit to be insulated by end of Week 10	January 18, 2019
Installation Certificate to be submitted	January 18, 2019
Compliance testing commences (Week 11) (Period 4)	January 28, 2019
Laundry Stress Test starts (Week 14)	February 18, 2019
Power Failure Stress Test starts (Week 18)	March 22, 2019
Overload Stress Test starts (Week 23)	April 22, 2019
No-Flow Stress Test starts (Week 28)	May 24-June 21, 2019
Chemical Stress Test starts (Week 36)	July 27, 2019
Surge-Flow Stress Test starts (Week 41)	August 26, 2019
Period 4 Compliance testing ends (Week 44)	September 18, 2019
Sludge Measurement occurs (Week 45) (Period 5)	September 23, 2019
Post-Trial Phase Starts (Period 6) [Optional R&D]	September 30, 2019
Period 6 [Optional R&D] ends	November 1, 2019
Removal of equipment (Period 7)	November 4-8, 2019
Penalty date for non-removal of equipment	November 15, 2019

2. INTRODUCTION

2.1 Programme Overview

The National Testing Programme (NTP) for treatment plant review, performance certification, and benchmarking the performance of on-site effluent treatment (OSET) systems against criteria relevant to New Zealand conditions was established at Rotorua in 2005, with testing based upon compliance with AS/NZS 1547 and the associated Secondary Treatment Standards set out in AS/NZS 1546.3.

In February 2017, Australia published a new Standard, AS 1546.3:2017, which supersedes AS/NZS 1546.3:2008. This standard details requirements for a National OSET testing facility, plus a detailed testing regime, and requirements for plant assessment and certification.

In March 2017, the OSET-NTP Partners Advisory Group (PAG) and Water New Zealand's Small Wastewater and Natural Systems Management and Audit Group (SWANS-MAG) acknowledged that, while the new Australian standard mirrored many of the OSET-NTP testing processes, it included a wider and more comprehensive evaluation process than was currently being undertaken. The PAG agreed to adopt AS 1546.3:2017 as the Standard defining the test facility requirements and the testing and performance evaluation standards, and further agreed to modify the National Treatment Facility to meet the requirements of AS 1546.3:2017 from Trial 14 onwards, i.e. October 2018 (within the limitations set out in Section 2.3 below).

The main changes comprise:

- the ability for OSET-NTP to test a plant at the manufacturer's stated plant capacity, rather than just at 1000 L/day;
- inclusion of seven different stress tests;
- inclusion of nutrient testing for all plants;
- inclusion of ALL test results (other than those taken during the commissioning period), including those immediately following each stress test, in the evaluation (cBOD and TSS compliance limits have not changed);
- the OSET-NTP benchmark grading schedule to be based upon ALL test results;
- manufacturers to provide Certificates of Compliance with AS/NZS 1546.1 or similar regarding: materials durability, structural integrity, and water tightness, with such results being noted in the OSET-NTP Performance Certificate;
- manufacturers to provide a Certificate of Compliance from a suitably qualified acoustic engineer regarding the noise generated at one metre from the plant;
- assessment of compliance with requirements for plant labelling, access for O&M, and alarms;
- review and assessment of the manufacturer's manuals for Installation and Operations and Maintenance.

The new annual testing programme is structured with eight defined periods (Period 6, Weeks 46 to 50, can be used by the manufacturer for research and development, which is outside the scope of the OSET-NTP testing programme, and will be at the manufacturer's cost):

Period	Action	Duration (weeks)	Week Numbers
1	Installation	1	1
2	Plant review, filling, and emergency storage check	1	2
3	Commissioning and media development	8	3 - 10
4	Compliance and benchmark testing	34	11 - 44
5	Check sludge accumulation	1	45
6	Research and Development	4	46 - 50
7	Removal	1	51
8	Contingency	1	52

2.2 Scope of Procedures

This document describes the revised National Testing Facility, modified to address AS 1546.3:2017 which lays out the procedures for testing and evaluation, the procedures for trial set-up and methodology, the pre-trial procedures, and the management of the OSET national benchmarking programme. The document provides an understanding of the roles and responsibilities of each key stakeholder group within the trial, and how the governance of the trial, along with its day-to-day operation, will proceed. The document details mechanisms by which issues arising from the trial will be dealt with, and how disputes between the various parties may be resolved.

At all times the MoU Partners Advisory Group (PAG), the Management and Audit Group (MAG), the Technical Manager, and SWANS-SIG have the ability, through discussions within these groups, to arrange for a change in procedure, or provide a ruling that is considered final. All reasonable attempts will be made, however, to follow the procedures that have been produced within this guide until the end of the trial.

2.3 Limitations of the Trial and Report

Territorial local authorities, regional councils, designers, buyers of the systems, and other end-users of the information should be aware that the OSET-NTP performance certification and benchmarking of the systems under controlled circumstances will not necessarily reflect the in-field performance of a wastewater management system that uses the tested treatment unit. The in-field performance of an on-site wastewater management system is reliant on many factors including, but not limited to, the site-specific design of the complete system, which includes the dispersal field; the way the system is installed, operated, and serviced; and the daily quantity and quality of the influent (particularly any toxic liquids and compounds).

The OSET-NTP closely aligns with the requirements of AS 1546.3:2017–*On-site domestic wastewater treatment units*, Part 3: *Secondary treatment systems*, with some departures from the requirements in the standard, including the following:

- While the Standard allows pre-screening to 10 mm, and allows the influent to be pumped to the test facility via a macerating pump, Rotorua Municipal sewage is pre-screened to 3 mm, with screenings washed, and washings returned to the flow prior to pumping to the test facility.
- Rotorua Municipal influent is weaker in strength than the Standard allows. For example:

Parameter	AS1546.3:2017 Requirement		RLC measured influent quality (Trial 12)	
	Range	Average	Range	Average
cBOD	150-750	>300	55-262	145
TSS	150-750	>300	120-615	229
Total Nitrogen (TN)	20-150	>60	34-73	56
Ammonium Nitrogen (NH_4-N)	20-80		22-55	
Total Phosphorous (TP)	6-25	>8	3-10	6
pH	6-9		7-8	

- All plants are required to be insulated to simulate normal in-ground installation, as compared to installing above-ground at the test facility.
- Sludge accumulation at the end of the trial will only be measured in the septic tank/primary chamber.

OSET-NTP will issue an Evaluation Report and OSET-NTP Performance Certificate, both of which will be based upon the requirements and standards in AS 1546.3:2017 with respect to:

- Effluent compliance criteria (AS 1546.3, Cl 2.2.2)
- Emergency storage capacity (AS 1546.3, Cl 2.3.7)
- Contamination of the effluent storage chamber (AS 1546.3, Cl 2.3.8)
- Evidence of compliance with AS/NZS 1546.1:2008

The Evaluation Report will rely on evidence provided by the manufacturer/supplier of the plant regarding compliance with:

- AS 1546.3:2017 with respect to noise (AS 1546.3, Cl 2.3.10)
- AS/NZS 1546.1:2008 - On-site Domestic Wastewater Treatment Units-Septic Tanks with respect to treatment plant construction materials, their suitability for use, and their structural integrity and design requirements.

The report will provide a review and comment with respect to compliance with AS 1546.3:2017 regarding:

- Plant markings (AS 1546.3, Cl 3)
- Mechanical and electrical equipment (AS 1546.3, Cl 2.3.9)
- Installation Manual (AS 1546.3, Cl 4.2.2 and Appendix C)
- Operating and Maintenance Manual (AS 1546.3, Cl 4.2.2 and Appendix D)

3. ORGANISATION AND MANAGEMENT

A management structure has been determined which will ensure the OSET-NTP is able to maintain the capacity to perform its technical functions satisfactorily in accordance with the requirements of NZS 17020:2000, Section 6, and general compliance with AS 1546.3:2017. Appendix I shows the OSET-NTP Operational Structure. A description of the positions and their functions is given below.

3.1 MoU Partners Advisory Group

3.1.1 Role

A Memorandum of Understanding was signed between the four main organisations that originally came together to develop the OSET trials into a national programme in 2008:

- Bay of Plenty Regional Council (BOPRC)
- Rotorua Lakes Council (RLC)
- Water New Zealand
- SWANS-SIG

This memorandum established a Partners Advisory Group (PAG) responsible for the governance of the three components of the national on-site effluent testing programme. In addition to their roles in the governing and advisory body, each of the organisations plays a specific role in the operation and administration of the national testing facility. These specific roles are explained in the sections below.

In 2016 The New Zealand Land Treatment Collective (NZLTC) was invited to attend PAG meetings.

3.1.2 Responsibilities

It is the responsibility of the PAG to define, agree, and document the responsibilities and reporting structure of the OSET-NTP.

3.1.3 Bay of Plenty Regional Council (BOPRC)

Bay of Plenty Regional Council is a member of both the PAG and the SWANS-SIG Management and Auditing Group (SWANS-MAG), and is responsible for the nomination of an internal employee to fill these roles.

3.1.4 Rotorua Lakes Council (RLC)

The Rotorua Lakes Council Wastewater Treatment Plant (WWTP) is home to Strand 1 of the national testing programme (OSET-NTP) and the national on-site effluent treatment testing facility (National Testing Facility). RLC is responsible for the nomination of an internal employee from the wastewater treatment plant to be a member of the SWANS-MAG and responsible for the logistics and day-to-day operations of the NTP. A position Description for the Operations Manager role is given in Appendix II.

Rotorua Lakes Council's WWTP facility also contains an independent and IANZ-accredited laboratory, where the NTP samples are routinely tested to accumulate the data required to assess each system's AS 1546.3:2017 and OSET benchmark performance.

3.1.5 Water New Zealand (Water NZ)

Water NZ provides the not-for-profit shell under which the OSET-NTP can operate in an independent environment. Water NZ acts as an approving authority for financial transactions that are requested through the NTP, and reports to the PAG on matters of finance, including adherence to budget and dealings in respect of any specific funding issues. In addition, Water NZ holds the role of Data and Report Reviewer, which it took up in 2018 following the withdrawal of BOPRC from this role. A position description for the Data and Report Reviewer role is given in Appendix II.

3.1.6 SWANS-SIG

SWANS-SIG provides several services to the NTP. With the agreement of the other PAG members, SWANS-SIG nominates the Technical Manager, and arranges for his/her contracted employment via Water NZ. The Technical Manager works to oversee the day-to-day technical operation of the NTP. A position description for the Technical Manager role is given in Appendix II.

SWANS-SIG also nominates and appoints, from within its own ranks or through discussion within the SWANS-SIG Management Committee, the three independent members of the Management and Auditing Group (SWANS-MAG).

SWANS-MAG is comprised of specialists with a variety of backgrounds, whose task it is to provide technical assistance to the Technical Manager regarding the plant set-up and reporting process to address AS 1546.3. The group also audits the performance of the test results and plant evaluation involved in the NTP. The final responsibility for determining the OSET-NTP performance certification and benchmarking of a system lies with SWANS-MAG.

3.1.7 New Zealand Land Treatment Collective (NZLTC)

The New Zealand Land Treatment Collective (NZLTC) was established in 1989 to support research into the treatment of wastes and waste products by land application, by providing its members with up-to-date information on land treatment technology, research, and information.

The NZLTC has members from research organisations, universities, district and regional councils, government departments, and environmental and engineering consulting companies. It covers the range of expertise from research scientists to engineers, designers and manufacturers, to operators and field service personnel.

In 2016, the NZLTC was invited to attend PAG meetings, and has done so since March 2017.

3.2 Management and Audit Group (SWANS-MAG)

3.2.1 Role

SWANS-MAG is the key decision making and auditing body of the NTP for Strand 1. SWANS-MAG provides the final certification to AS 1546.3:2017 and the benchmarking of Strand 1 testing results and interpretation.

3.2.2 Composition

SWANS-MAG is comprised of seven members, including three Trial management positions within the audit group:

- Water NZ-appointed Data and Report Reviewer
- RLC-appointed Operations Manager
- SWANS-SIG-appointed Technical Manager

These three members are the key people involved in the operation of the trial, and their understanding of the trial is a key contributor to SWANS-MAG's understanding of the trial, and of any issues that may have arisen during the trial.
The remaining four members of SWANS-MAG comprise A BOPRC-nominated representative and three independent technical advisors. The independent technical advisors are chosen for their expertise in a variety of areas relating to the ultimate requirement to audit the systems that have been involved in the OSET-NTP performance certification and benchmarking process. Typical skills considered an asset to SWANS-MAG include:

- expertise in experimental design and statistics;
- expertise in process engineering of small or on-site wastewater treatment plants;
- expertise in biochemical or biogeochemical science relating to wastewater;
- substantial work experience in the field of domestic wastewater;
- experience in testing, troubleshooting, or auditing of wastewater treatment systems; and
- other experience in on-site wastewater that is deemed important to the NTP.

While it is supposed that many of the suitably qualified people to be nominated as technical advisors would be members of SWANS-SIG or Water NZ, it is not a requirement.

The SWANS-MAG group nominates one of its members (who should be a member of SWANS-SIG) to be the Chairperson.

3.2.3 Personnel

The three technical positions associated with SWANS-MAG have been confirmed by PAG for Trial 14 and comprise:

- Technical Manager: Ray Hedgland, rh Environmental Ltd
- Operations Manager: Neil Kerrison, RLC
- Data and Report Reviewer: Lesley Smith, Water NZ

The four additional auditing members of SWANS-MAG are:

- BOPRC-appointed representative: Terry Long
- Specialist Advisor: Rob Potts, LEI Ltd
- Specialist Advisor: Andrew Dakers, ecoEng Ltd
- Specialist Advisor: Ash Deshpande, Harrison Grierson Ltd

Rob Potts has been elected the Chairperson of SWANS-MAG for Trial 14.

3.2.4 Co-opted, Non-voting Participants

With seven members, SWANS-MAG is a robust and knowledgeable team able to audit and certify the results of testing at the National Testing Facility. It is able, however, to co-opt non-voting advice from groups/individuals perceived to be expert authorities in specialist areas if required.

3.2.5 Selection Process

Selection of SWANS-MAG members will be undertaken by Water NZ and the SWANS-SIG Management Committee in conjunction with representatives from BOPRC and RLC.

3.2.6 Responsibilities

The primary responsibility of SWANS-MAG is to provide the independent audit of Strand 1 results and reports. This requires time and effort to read through the reports, understand

any issues that may have arisen during the trial, and to make objective decisions as to the performance of each of the systems that has been trialled. Should issues have arisen in the trial which may cast some doubt as to the true nature of the performance of systems, it is SWANS-MAG's responsibility to produce a decision as to the level and degree to which that issue may have affected performance within the trial, and to adjust performance rating accordingly.

SWANS-MAG members may also have additional responsibilities in determining courses of action during the trial should the Technical Manager, Operations Manager, and Data and Report Reviewer require their input regarding issues arising within the trial itself, or with climate or unusual circumstances which may affect or impact on the trial and individual treatment plant performance, as well as technical input to the design of the revised trial plant to address AS 1546.3:2017.

The key attributes of SWANS-MAG members are to be independent and knowledgeable in their field, in order to best serve the needs of territorial local authorities, regional councils, and NZ supplier/manufacturers in independently verifying the performance of systems as they move through the national testing programme.

The overall responsibilities of the Management and Auditing Group are as follows:

- to review any technical or sampling issues, equipment failures, etc, and assess their impacts on the data;
- to examine the data and reports put together by the Technical Manager and Data and Report Reviewer;
- to audit and certify individual systems that have gone through the OSET-NTP performance evaluation and benchmarking trial based on the data and reports provided by the Technical Manager and Data and Report Reviewer; and
- to review any appeal submitted by a NZ supplier/manufacturer or its representative.

In addition to the OSET Strand 1 testing, SWANS-MAG is also responsible for reviewing test reports from facilities other than OSET-NTP that undertake testing to AS 1546.3 or similar standards, and providing OSET-NTP approval for New Zealand conditions.

3.2.7 Conflict of Interest

To ensure the independence, impartiality, and integrity of the NTP, all members of SWANS-MAG must comply with NZS 17020 Annex A.

The PAG has suggested that it is considered inappropriate for NZ supplier/manufacturers to have any role in governance or auditing and certification procedures. Thus, NZ supplier/manufacturers, their representatives or employees will not be nominated for SWANS-MAG.

There will be instances where a SWANS-MAG member may feel that s/he or another member has a potential conflict of interest with respect to the auditing of a particular process or system. It is the obligation of all SWANS-MAG members to disclose any potential conflict of interest to the rest of SWANS-MAG. They may do so via either a direct, confidential approach to the Chairperson, or through a blanket declaration to the entire group. A member need not disclose the entire nature of the perceived conflict of interest if

it is deemed sensitive in nature, but must withdraw from the discussion where it pertains to the area deemed in conflict.

Where a SWANS-MAG member has more than one conflict of interest in any single trial, they will be required to withdraw from SWANS-MAG group, and will be replaced by a candidate who meets the requirements for selection (Section 3.2.2).

3.2.8 Areas beyond the purview of SWANS-MAG

SWANS-MAG is tasked to perform a specific operation within the context of the trial. This is the auditing and certification, and where applicable, the interpretation of the results from individual systems that have been subjected to the trial.

There are several areas that are beyond the purview of SWANS-MAG. Members of SWANS-MAG are advised that they are not to consider the following issues:

- The performance of the system outside the trial. Anecdotal evidence and past performance may not come into discussion.
- The influence of external variables, except where they have an immediate bearing on the trial results. For instance, the impact of a colder/warmer climate, except where climate has been deemed to have significantly influenced the system during the trial.
- Variations in influent composition between trials, except where such variation is deemed to have significantly influenced the system during the trial.

This is not an exhaustive list, as all variables cannot be anticipated at the outset of the OSET-NTP, and therefore this list provides a guideline and starting point. It is expected that additional examples will be included as observed during trials. The nature of the programme is the examination of a system under the standard conditions of the testing and benchmarking trial. The use of externalities in the auditing of the system must therefore be minimised.

3.3 Analytical Laboratory

3.3.1 Role

The role of the analytical laboratory is to act as a contracted body to provide systematic and accurate analysis and reporting of the measured constituents of both the influent sewage and the treated effluent from the OSET systems. The laboratory manager is the representative for the analytical laboratory. Compliance of the analytical laboratory roles and responsibilities is the obligation of the laboratory manager.

3.3.2 Responsibilities

The analytical laboratory is responsible for the sampling of the systems, and the chain of custody of the samples from sampling to the completion of the analytical testing. Sampling will be carried out as prescribed under Section 6.0.

The laboratory is responsible for maintaining analytical testing and quality control records in a secure environment. Record storage procedures should be in accordance with certified quality assurance procedures.

The analytical laboratory has a responsibility to ensure that it remains accredited through IANZ or another certified accreditation at all times during the trial period. The analytical

laboratory has a responsibility to ensure that analysis results are delivered to the Technical and Reporting Managers in a timely and accurate fashion.

If a systemic error is reported, the analytical laboratory has a responsibility to re-run the samples if possible. Alternatively, it has the responsibility to credit the trial with the amount of money paid for the tests that were faulty. In the event that the laboratory is unable to perform the tests in a timely manner (i.e. due to equipment breakdown), the laboratory is required to subcontract the sample analysis to a nominated laboratory which holds appropriate accreditation. This is at the laboratory's cost.

The analytical laboratory will make the Technical and Reporting Managers aware of any inconsistencies or potential problems with any of the data at the first possible opportunity.

Manufacturers may take duplicate tests during a site inspection, but they must be from sub-samples of an OSET collected sample. No other test will be viewed by OSET-NTP as 'duplicate', and OSET-NTP will not enter into any argument that results from such samples should be considered by OSET-NTP or included in the report or data assessment.

3.4 Trial Participants

3.4.1 Role

It is at the discretion of the NZ supplier/manufacturer or its representative, as trial participant, to elect to submit an on-site treatment system for OSET-NTP testing, evaluation, and performance benchmarking based on AS 1546.3:2017 within the limitations set out in Section 2.3 above. By submitting their systems to a trial, the participants agree with the NTP and its testing and evaluation procedures as set out in this document.

The trial participant is required to submit a system which is equipped, set up, and controlled in such a manner as would normally be installed in a typical domestic on-site treatment wastewater management system. The NTP makes allowance for minor modifications to be undertaken by the trial participant on its system during a limited period within the Media Development Phase. It is nevertheless expected that any system submitted is standard and fully functional.

The trial participant agrees to address all issues through the Technical Manager of the NTP, or jointly through the Technical Manager and the Operations Manager, if the nature of the matter is to be resolved on site. It is recognised that trial participants are obtaining a service (that of performance assessment and benchmarking) from OSET-NTP, and as such the Technical Manager and SWANS-MAG group have a duty to keep the trial participants duly informed of trial progress within appropriate timeframes.

3.4.2 Responsibilities

The installation and maintenance of its system is the responsibility of the NZ supplier/manufacturer or its representative. Where a trial participant elects to utilise a sub-contractor for the installation and/or maintenance, written confirmation of the contractor's details will be submitted to the Technical Manager.

At the initial site meeting for all participants, the NZ supplier/manufacturer is required to pay scheduled fees as shown in Section 1, and to submit data as set out in Appendix IV, including but not limited to:

- product specifications;
- engineering drawings;

- a statement of conformity with the engineering drawings;
- rated capacity:
  - minimum and maximum hydraulic;
- the effluent compliance criteria the plant is designed to achieve (refer AS 1546.3 Clause 2.2.2);
- design manual including:
  - hydraulic and organic loading,
  - details of the flow path through the treatment system, including items A-J set out in the standard;
- installation, operation, and maintenance instructions/manuals; and
- evidence of compliance with AS/NZS 1546.1 or similar (refer Appendix V).

It is the responsibility of the trial participant or its representative to sign in prior to all site visits, and to declare the purpose of all visits and work carried out. A written statement of the works having been undertaken, and any changes having been implemented, must be provided by the trial participant or its representative to the Operations Manager following any intervention.

The trial participant is further required to submit a completed and signed Terms of Agreement form (Appendix III) prior to any testing being carried out.

Once the trial participant's plant is installed and has passed all of the trial participant's installation and pre operational checks, and at least one week prior to the start of Period 3, the trial participant shall submit an Installation Certificate (Appendix V) confirming that the plant has been installed to its satisfaction and is ready for testing. Any intervention by OSET-NTP staff to address or attend to any failure of the plant, plant equipment, or alarm subsequent to this certificate will incur a penalty fee to recover costs.

After completion of testing, and after issue of the OSET-NTP Performance Certificate, the NZ supplier/manufacturer is required to advise the Technical Manager of any changes made to its plant if they wish to continue marketing the plant based upon the OSET-NTP Performance Certificate. OSET-NTP offers a service wherein such changes can be reviewed to determine whether they will impact on the original certificate results and, if the MAG considers there is no impact, a revised certificate which allows such changes can be issued.

3.5 Flow of Information

3.5.1 External Release of Information

The release of information from the trial is to be authorised and executed through the Technical Manager. This includes:

- Supply of specific test (analytical) results for each system, which will be restricted to the NZ supplier/manufacturer which submitted that system for testing. The NZ supplier/manufacturer shall not release that information to any other party without the Technical Manager's authorisation, including for marketing purposes, until the Final Technical Evaluation Report has been released.
- Supply of the Evaluation Report and Performance Certificate on each specific system to the NZ supplier/manufacturer which submitted that system for testing.
- Supply of the Evaluation Report and Performance Certificate for each system to the PAG and all regional and district council funding partners.

NOTES:

1.) A draft of the Evaluation Report and Performance Certificate on each specific system will be submitted to that system's NZ supplier/manufacturer for comment prior to final release.
2.) The final version of the Performance Certificate will be made available to the public through being posted on the OSET-NTP web-pages at www.waternz.org.nz/OSET.html.

Queries to the trial, be they to SWANS-MAG, the PAG, or the management team, must be in writing, and received by or forwarded to the Technical Manager.

This 'single gateway' control of information is key to the requirements of NZS 17020:2000, and ensures the trial's requirements of confidentiality are met.

3.5.2 Pre-Trial Timeline and Confirmation of Costs

The timeline for confirmation of entry to the trial up to completion of installation prior to trial commencement is set out in Section 1.0 above.

Site rental and analytical costs for the trial are confirmed by the PAG, and conveyed to each prospective trial participant in the letter of invitation sent out by the Technical Manager.

4. FACILITIES AND EQUIPMENT

4.1 OSET National Testing Facility Location and Identification

The OSET-NTP National Testing Facility is located within RLC's Sulphur Point Wastewater Treatment Plant (WWTP) site. Access to the facility is via the WWTP reception, off Te Ngae Road, Rotorua.

The National Testing Facility is an enclosed compound containing resources necessary for the operation of the OSET trial (power, raw influent supply, treated effluent discharge, etc.). Systems undergoing evaluation, performance assessment, and benchmarking are located within the National Testing Facility's locked enclosure.

4.2 National Testing Facility Description

4.2.1 Influent

Rotorua municipal sewage is predominantly domestic, with more than 90% assessed to be <4 hours old. It is pre-screened to 3 mm, with screenings washed, and washings returned to the flow prior to pumping to the testing facility. This is a departure from AS 1546.3:2017, which allows pre-screening to 10 mm only, but also allows screened influent to be pumped to the test facility via a macerating pump. RLC's 3 mm screens tend to remove bulk inorganic products rather than organic products. RLC test results for cBOD, TSS, and TN from both pre- and post-screen sites show that the screen causes very little difference in strength for these parameters. The raw screened influent is pumped to a pressure-controlled manifold in the National Testing Facility, with pressure controlled via a 3 m header pipe, and excess sewage being discharged from the header pipe back to the Rotorua Wastewater Treatment Plant.

The manifold has eight discharge tee connections: one to a sampling point, and seven to each of the test treatment sites. Each tee to a test site has an automatic ball valve connected to a mag-flow meter via the plant PLC, providing separate control to each discharge such that the discharge is controlled to either 10 Lpm or 20 Lpm (dependent upon the test plant's defined rated capacity). Each discharge is then controlled by the PLC turning off the ball valve when the required discharge volume for the specific plant is reached, in accordance with Table A2 or A3 of AS 1546.3:2017, as set out in Appendix VII: Influent Dosing Schedule.

Each discharge from this manifold is connected to separate 100 mm diameter PVC overhead pipelines, which gravitate to respective test sites.

In compliance with AS 1546.3:2017, a sampling port is provided on the manifold connected to both a grab sampler and a flow proportional sampler, with samples stored in an ice-filled chilly bin for subsequent collection and analysis by laboratory staff.

4.2.2 Test Site

Each test system has an individual site area of 3 m by 8 m (24 m^2) to occupy within the overall test enclosure, with no barriers between systems.

Each site has individual access to power, influent, and discharge connection to the sampling cisterns for outflow and drainage provided by RLC for each manufacturer to connect to. Each site has the same vertical fall for influent and effluent.

4.2.3 Discharge Connection and Sampling System

The discharge connection from each test plant supplied by RLC for the manufacturer to connect to comprises a 25 mm diameter threaded pipe connected to a mag-flow meter, which discharges into a 25mm diameter PVC pipe rising vertically to a height of 2.5 m above ground level, before a U-connection and downpipe with a free discharge to a low level horizontal pipe at ground level, prior to discharge to a gravity drain back to the Rotorua Wastewater Treatment Plant. In this way, each test plant is provided with a separate discharge mag-flow meter and the same fixed static discharge head to pump into.

In compliance with AS 1546.3:2017, the discharge has two effluent sampling ports connected to both a grab sampler and a flow proportional sampler.

The discharge downpipe at each test plant has two effluent sampling ports provided:

- one via a solenoid valve to a flow proportional sampler, with the solenoid valve controlled by the discharge meter via the PLC to collect a flow proportional sample over the test day; and
- the other to a grab sample container with a high level shut-off float valve to collect a sample from the first inflow of each test day.

Sample containers from each test plant are stored within an ice filled chilly bin for subsequent collection and analysis by laboratory staff.

4.2.4 Access to Resources and Connections

RLC will have available a supply of sand for the purpose of creating a suitable pad for the placement of the trial participant's system.

The power connection provided by RLC comprises single phase 240V supply in a terminal box located at each trial site, as shown in Photo 1. The manufacturer will require a registered electrician to make this connection.

The influent pipework provided by RLC comprises 50 mm diameter PVC wastepipe (OPTIMDWV pipe 50DN APIPE outside diameter 50 mm), as shown in Photos 1 and 2. The trial participant will require a 50 mm female push-in connection to join to this pipeline.

The discharge pipework provided by RLC for the trial participant to connect their pumped discharge to comprises a 25 mm diameter threaded wastepipe connected to the discharge mag-flow meter, followed by a 2.5 m static head. The trial participant is required to provide appropriate pipework, and to make the connection to join to this pipeline. The trial participant's discharge pump is required to discharge less than 100 Lpm through this discharge system (see Photos 1 and 3).

A potable water supply via 25 and 50 mm diameter hoses is available for use by trial participants.

Figure 1: OSET pipework

Figure 2: Connection from OSET influent pipework

Figure 3: Connection to OSET discharge pipe

4.3 Maintenance of Facility

The maintenance of the testing facility is the responsibility of the Operations Manager and RLC. Any concerns about the maintenance of the facility should be delivered, in writing, to the Technical Manager.

Maintenance of a trial participant's system remains the responsibility of the participant at all times, and this shall be in line with the maintenance requirements of the system as if installed in the field as set out in the manufacturer's Operations and Maintenance Service Manual. Alterations to the system setup, equipment, control, or operation during the trial subsequent to the commissioning period (i.e. from Week 10 onwards) are generally forbidden unless they have been submitted in writing to the Technical Manager and approved prior to implementation.

The Operations Manager has a duty to inform the Technical Manager if a participant's system is showing signs of not performing properly (e.g. odour, overflow, alarm, or physical damage of system). Such faults can only be repaired with the Technical Manager's approval. All such faults will be reported.

4.4 Security of Facility

Visitors to the site, including trial participants, will report to the RLC WWTP Reception, where they will be signed in and met by a WWTP Operations Staff Member or the OSET Operations Manager or a suitable agent. Visitors to the National Testing Facility are the responsibility of the Operations Manager. The purpose of the site visit and all actions planned by the visitor/manufacturer/agent must be discussed with one of the WWTP Operations staff BEFORE the visit.

The facility remains under lock and key at all times. The facility gate key is held by one of the WWTP operations staff. Access to the site is through contact with the Operations Manager, and between 9:00 am and 4:00 pm, Monday to Friday. Trial participants will be escorted to the site by WWTP Operations staff, and may be supervised by the Operations Manager or representative during their visits. Twenty-four hours' notice of an intended visit should be given unless in exceptional circumstances. CCTV surveillance of the OSET facility operates at all times.

Visitors must exit the facility via the RLC WWTP Reception, and ensure they are signed out. Records of visitors to the National Testing Facility will be maintained by RLC in accordance with the WWTP and OSET trial procedures. This shall include provision of a log book at Reception. Log book entries are to be made by, or overseen by, one of the WWTP Operations staff in consultation with the visitor/manufacturer/agent both BEFORE and AFTER the visit, and must detail the purpose of the visit, and all actions undertaken, in accordance with any approvals granted under section 4.3 above, in respect of the operation of the participant's trial system.

Trial participants visiting the site should, at all times, be cognisant of their responsibilities under Section 3.4.2 above and Section 4.5 below. They may only directly interact with their own system and NOT any other trial participant's system or sample collections.

4.5 Site Health and Safety

The WWTP site contains identified hazards which are managed by RLC through health and safety procedures. Trial participants must acknowledge the requirements for health and safety while on site. They are to comply with RLC instructions in this regard at all times, or risk expulsion from the site.

Within the National Testing Facility, the general RLC WWTP site health and safety rules apply and should be followed at all times. All visitors must have undertaken an RLC WWTP Health and Safety Induction prior to entering the treatment facility.

5. PROGRAMME PROCEDURES

Where applicable, inspection methods and procedures will conform to NZS 17020 Section 10. The handling of OSET systems will be in accordance with NZS 17020 Section 11.

During all phases of the procedure, trial participants are required to register their arrival at Reception of the Rotorua WWTP prior to carrying out any inspections or maintenance, all in accordance with section 4.4 above. Failure to do so may nullify the results of the trial for that system.

5.1 Installation (Period 1)

Period 1 comprises the first week of the Programme (Week 1), during which installation and commissioning occurs. Trial participants' systems are expected to arrive and be connected to the trial facility in a ready condition.

All systems must be installed on site prior to the initiation of influent dosing. It is the responsibility of the participant to arrange for the system to be situated at the site, and correctly connected to the electrical, influent, and sampling systems by the required starting date. It is the trial participant's responsibility to install its system in a manner which emulates as closely as possible its installation conditions in a standard domestic type on-site treatment field installation, but located above ground. It is the trial participant's responsibility to securely insulate its system in accordance with Section 5.3.1 prior to the end of Period 3.

The power, influent, and effluent connections provided for trial participants by RLC are set out in Section 4.2.

It is the responsibility of each participant to install and maintain its on-site system.

It is the responsibility of the participant to plumb its system to the influent and effluent lines provided at its assigned test platform. If required, the Operations Manager will advise on plumbing service companies available locally. Treated effluent from the test unit is to be discharged from the participant's effluent pump to a RLC 25 mm diameter threaded pipe at the inlet to the mag-flow meter for the specific site, followed by a 2.5 metre static head. This is to provide a standard discharge pressure for all units under test. The trial participant's effluent pump shall not exceed 100 Lpm, to ensure the RLC mag-flow meter can accurately record discharge flows.

It is the responsibility of the participant to ensure correct connection of its system to the power supply. The power supply can be controlled at each individual system site, and both participant and Operations Manager may access the individual system supply point. Under no circumstances may a participant alter the power supply of any other system.

Access to the main power supply for the facility is controlled by the Operations Manager. Prior to trial initiation, the Operations Manager will ensure that the power supply is functional and available. The combined power consumption of both aeration equipment (or any other internal electrical component) and effluent pump is recorded within the data set for the treatment unit.

During the installation period, there will be a number of participants installing their systems. Participants shall endeavour to not interrupt the installation of other trial participants'

plants. Participants may only directly interact with their own systems, and NOT any other trial participant's system.

After installation of the plant and prior to filling, the participant should ensure that any internal media is well flushed, all swarf and construction debris is removed from within the plant and discharge pump station, and any other requirements of their Installation Manual are carried out.

5.2 Plant Inspections, Fill, and Start-up Phase (Period 2)

Period 2, undertaken during Week 2, comprises plant inspections by OSET, plant filling, and start-up as follows.

5.2.1 Plant Inspections

Access to the plant must be provided to the Operations Manager to enable both internal and external inspection, and to inspect the following items as required by AS 1546.3:2017:

i. Plant labelling.
ii. Emergency storage. The primary chamber will be filled with wastewater, and the remainder of the plant filled with potable water to its operating capacity. Raw wastewater equivalent to the manufacturer's stated emergency storage capacity will then be discharged into the primary chamber over a one-hour period (as set out in AS 1546.3:2017). After 12 hours, the effluent storage chamber will be checked for contamination by partially-treated or untreated wastewater by monitoring electrical conductivity within the discharge pump station/effluent storage chamber.
iii. Access for Operations and Maintenance.
iv. Water-tightness/leaks.
v. Alarm system. Check what alarms are included, and that the visual alarm is observable from the laboratory. After the plant is filled and operational, the alarm system shall be activated to simulate a system failure to check for compliance with audio and visual requirements and muting capability, and that the alarm reactivates 24 hours after muting.
vi. Discharge pump flow rate. NB: if the discharge flow rate exceeds 100 Lpm, the participant will be required to reduce it to ≤100 Lpm before testing commences in Week 11.

5.2.2 Start-Up

Once the above inspections are complete and the plant is filled with water, the manufacturer/supplier can pre-commission the plant, and request RLC to introduce raw wastewater as scheduled in Appendix VII, followed by a formal start-up. It is the responsibility of the participant to ensure its system is filled with wastewater prior to the start date.

5.3 Commissioning and Media Development Phase (Period 3)

Period 3 comprises eight weeks (Weeks 3-10). Media development occurs during this period, and the manufacturer/supplier can attend to the plant and make minor modifications, including to the control settings, and carry out a routine maintenance service (recommended to be undertaken in Week 10).

5.3.1 Insulation

Rotorua can experience significant shifts in air temperature between summer and winter. All systems are therefore to be suitably insulated to ensure that, as far as practicable, the installation simulates conditions as if installed in the field. It is the responsibility of the participant to securely insulate its entire system. To ensure all systems are similarly

insulated, the specified insulation shall be 20 mm Xcellon sheet (either two layers of 10 mm or one layer of 20 mm), with the outer layer having foil protection. Specific attention shall be paid to secure attachment and the binding mechanism to prevent insulation failure due to weather conditions over the duration of the trial. The insulation is available from Foreman Industries (contact the Sales Manager, Mathew Bunn, 021 403 3678). Each system shall be insulated with the specified insulation prior to the commencement of the Period 4 testing phase at Week 11.

5.3.2 Maintenance Service

A maintenance service may be carried out at the end of the commissioning/media development phase, immediately prior to testing commencing in Week 11. It shall be a specified routine maintenance service in accordance with the participant's Operation and Maintenance Manual.

5.3.3 Installation Certificate

Prior to the completion of Period 3, the participant shall issue the Technical Manager with an Installation Certificate (Appendix V) which states that the plant is a standard plant, that it has been commissioned to the manufacturer's requirements, and is ready for testing in Period 4.

Note that any intervention by OSET-NTP staff to address or attend to any failure of the plant, plant equipment, or alarms subsequent to the issue of this Certificate will incur a penalty fee to recover costs.

5.4 Performance Testing Phase (Period 4)

Period 4 comprises 34 weeks (Weeks 11-44), during which testing for AS/NZS 1547 compliance, as set out in AS 1546.3:2017 and OSET-NTP Benchmark testing, is undertaken. During this period, there is limited opportunity for changes to be made to systems. Routine maintenance servicing may be carried out as detailed in 5.4.1 below. No chamber within the treatment system, including the primary chamber, shall be desludged during Period 3 or 4.

5.4.1 Maintenance Servicing

A maintenance service may be carried out by the manufacturer/supplier at a time that coincides with the system's service interval as outlined in their O&M Manual (i.e. 3, 4, or 6 months). The service may only be undertaken during a steady-state inflow week, and NOT during a stress test week or a stress test recovery week.

Maintenance shall be a specified routine maintenance in accordance with the Operations and Maintenance Manual. Such maintenance excludes modifications to the plant, including the control system and control settings. Details of the proposed maintenance shall be explained to the Operations Manager prior to commencement.

The maintenance procedures carried out, the name of the authorised service technician, and the date and time to perform the maintenance shall be recorded in the log book.

5.4.2 Plant or Equipment Failure/Changes to a System

Any failure in the plant or equipment noted by OSET-NTP staff will be conveyed to the Technical Manager, who will advise the manufacturer/supplier. No changes or modifications to a system are permitted during the test period (Weeks 11-44). If a system malfunctions or experiences a breakdown in this phase, the trial participant may repair that breakdown (with the approval of the Technical Manager), but no changes to the functioning of the system or system settings may be undertaken except for the replacement of the

malfunctioning component(s). Any remediation measure requested by the manufacturer shall be discussed with the Technical Manager, whose approval is required prior to remediation. Any malfunction by the participant's plant will be noted in the report and certificate.

To ensure that no changes are made to a system during this period, any telemetry components enabling changes must be disabled.

Note that multiple failures during the compliance testing period (Weeks 11-44) may result in serious consequences. Refer to Section 7.2 for the details.

5.5 Sludge Accumulation Test (Period 5)

Following completion of Period 4 testing, all plants shall be turned off, and all trial manufacturers shall provide access for the National Testing Facility staff to measure the level of sludge/scum accumulation in the primary chamber/septic tank. Settled sludge/scum will be recorded both as volume and as a percentage of the available capacity of the chamber.

Note that no chamber, vessel, or tank shall be desludged during the commissioning or testing periods (i.e. Periods 3 and 4).

5.6 Post-Trial Phase (Period 6)

The Post-Trial Phase is typically a six-week period following the end of the Testing Phase, which will be made available to trial participants at the discretion of OSET-NTP. It is not a guaranteed opportunity within the testing agreement, but will be made available where possible.

During this period, there is opportunity for a trial participant to undergo some research and development for its system, as media has already been developed, should it so desire. Requests for the use of this time to conduct this R&D must be submitted to the Technical Manager and Operations Manager. During this period, the manufacturer can modify its plant, and use this period for its own purposes. Results will not be overviewed, reviewed, or assessed by OSET-NTP, nor can they be commented upon within the OSET-NTP final Evaluation Report.

R&D time in the Post-Trial Phase is an additional cost not covered by the OSET-NTP trial costs. The Technical Manager will advise each manufacturer, on request, the costs of additional time in the facility. This will be assessed as a weekly charge, and will be invoiced directly by Water NZ to each participant undertaking R&D.

Further laboratory analysis also attracts an additional charge. Details of the required tests shall be discussed with the Technical Manager, who will advise the appropriate RLC laboratory charges, which will be invoiced directly by Water NZ to each participant undertaking R&D.

If the Technical Manager has not received a request for a system to remain connected during the Post-Trial Phase, that system will be disconnected immediately following the Testing Phase. The participant is responsible for draining its system, or arranging for system drainage and removal under the direction of the Operations Manager.

5.7 Removal of System (Period 7)

At the completion of testing or, if elected, the Post-Trial Phase, the manufacturer/supplier shall decommission and remove its system from the site by the date specified for system removal. If the system is not removed by the Penalty Date for Non-removal of Equipment, it will be removed for a fee of $500, and stored on the site at the WWTP for a weekly fee of $50, payable to Rotorua Lakes Council until all debts are settled.

5.8 Withdrawal of a System

Withdrawal of a system may occur for any number of reasons. It is important to note that there is no possibility of a refund, in whole or in part, of the testing fees for a withdrawal.

Trial participants may withdraw their systems at any time during the trial. The decision to withdraw should not be taken lightly.

If a system is withdrawn from testing, the following applies:

- If the system has been withdrawn within the Media Development or Testing Phases, then the system is not reported, nor is it audited.
- Data collected to the date of withdrawal will be provided to the trial participant, but will not be recognised by the National Testing Programme.
- The trial participant may opt to engage in an R&D phase to ascertain the operational reasons giving rise to the decision to withdraw, however there are certain restrictions regarding R&D periods. Such R&D is entirely an independent activity that is not part of the OSET-NTP testing and benchmarking service, and will incur additional costs as set out in Clause 5.6 above. If the trial participant is not intending to engage in R&D, the system may be disconnected at any time.
- The trial participant is not permitted to engage in R&D at the site until the Testing Phase is completed, i.e. R&D can only be undertaken in the Post Trial Phase.

SWANS-MAG or the PAG may modify the conditions of withdrawal at any time, and is required to give notice of its decision to modify the conditions to trial participants. The Technical Manager will liaise with SWANS-MAG and PAG to ensure that the conditions of withdrawal under any particular circumstance are met.

5.9 Testing Programme

5.9.1 Testing Schedule (Steady-State and Stress Tests)

The Steady-State and Stress Testing Schedule will generally be as set out in Table A5 of AS 1546.3:2017 and as refined for this specific Trial as set out in Appendix VI.

5.9.2 Steady-State Flows

Each test plant will be dosed each day with a volume of wastewater equal to the manufacturer's specified daily maximum hydraulic capacity of the system, with a daily flow profile as set out in Section 4.2.1 above and Appendix VII. This dose rate and flow profile is defined here for the test as 'steady-state flows'.

5.9.3 Stress Tests

There are six stress tests set out in AS 1546.3:2017. The OSET-NTP stress tests and associated sampling dates are set out in the Proposed Testing Schedule (Appendix VI). The stress tests comprise:

i. **Laundry day stress test**
One day with 3 wash cycle simulations. Each hour from 12 pm to 3 pm on test day having 150 L of fresh/laundry/grey water added to steady-state flow.
Each 150L dose is to simulate a clothes washing cycle consisting of one wash (50 L) and two rinse cycles (50 L each), and shall be added to the normal steady-state flow each hour over the three hours of the dosing cycle from 12 pm to 3 pm (i.e. one wash and two rinse cycles per hour). The added water will comprise fresh potable water.

ii. **Power failure stress test**
On the day of the power failure stress test, the electricity to the plants under test will be switched off at 10 am. There shall be no electricity and no wastewater flow into the test plants for 48 hours, after which time the electricity and influent dosing shall be restored. Samples will be collected after two days of normal flow and recovery.

iii. **Overload (133% capacity) stress test**
Seven days loaded at 133% of steady-state inflow.

iv. **Vacation/no flow stress test**
No inflow, but power on, for 28 days.

v. **Chemical stress test**
A mixture of 125 ml of household bleach, containing 5% sodium hypochlorite, and 100 L of potable water will be discharged into each plant's inlet pipe, in addition to the steady-state flow.

This stress test is designed to simulate a laundry tub or bathtub full of water containing bleach, which has been used to soak soiled clothing, being discharged into the plant under test.

vi. **Surge flow stress test**
200L of wastewater discharged within three minutes, together with the steady-state flow, on two consecutive days.

5.9.4 Sampling Schedule

Tests will comprise both flow proportional composite and grab sampling as noted in AS 1546.3:2017 (Tables 2.2 and 2.6) and the table in section 6.2 below. Analysis for nutrients is included for all plants tested.

The following parameters will be analysed in the OSET-NTP testing programme.

i. **Influent**
24 hour flow proportional composite sample for: cBOD, TSS, TKN, NH4-N, TP, alkalinity and fats, oils and grease.

Grab sample for: pH.

ii. **Effluent**
24-hour flow proportional composite samples for: cBOD, TSS, TKN, NH4-N, TOXN, Nitrate-N, TP, and Alkalinity.

iii. **Grab sample for:** *E. coli*, pH and Turbidity and Transmissivity, or alternatively FAC if a chlorine-based disinfection system is being tested and observation of any surface film (oil/foam).

The sampling schedule is set out in Appendix VI.

5.9.5 Non-analytical Information Collected

The trial will collect the following additional streams of information:

i. Local ambient air temperatures (daily minimum and maximum).
ii. Electricity usage (kWh/day and kWh/1000 L).
iii. Flow rate (L/min, L/hr, and L/day).
iv. Water temperature (influent and treated effluent).

5.9.6 Sludge Accumulation

On completion of the Stress Tests (i.e. in Week 45), OSET-NTP staff will check and measure the volume of any sludge accumulation in the septic tank/primary chamber. This will be recorded as both volume and a percentage of the available operational capacity of the chamber.

6. SAMPLING AND TESTING PROCEDURES

Sample collection and testing procedures will conform to those detailed in AS 1546.3:2017. In particular, proportional samples and grab samples will be taken as set out in Tables 2.3, 2.6, and A6 of AS 1546.3:2017, and as shown in the Sampling Schedule in Appendix VI, which shows the frequency of sampling.

Sample testing will be carried out in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater", APHA, AWWA, WPCF by a laboratory that is IANZ accredited for the tests being performed.

6.1 Sample collection

All sampling will be carried out to ensure there is no cross-contamination from one sample vessel to another.

Both the grab sample and proportional sample will be collected and stored in an insulated container cooled with water ice. Samples will be stored on ice or otherwise in accordance with laboratory test procedures for sample preservation during transport or storage.

After sampling, the laboratory will take representative sub-samples for the purpose of carrying out the required tests and ensuring that repeat testing, where possible, may occur if required.

6.2 Sample analysis

At OSET-NTP the Influent and the effluent from all plants will be tested for the parameters shown in Table 1 below. All test results will be included in the compliance evaluation of each of the four treatment classifications (either secondary or advanced secondary, each with or without nutrient removal) with which each plant complies.

Table 1: Schedule for Analysis of Influent and Effluent Parameters

Parameter	Influent		Effluent	
	Grab Sample	Proportional Sample	Grab Sample	Proportional Sample
pH	√		√	
cBOD		√		√
TSS		√		√
Fats, Oils and Grease		√		
Surface Film (oil/foam)			√ Observation Only	
TKN		√		√
NH_4-N		√		√
TOXN				√
Nitrite N				√
TP		√		√
Alkalinity		√		√
E.Coli			√	
Turbidity (NTU)			√	
Transmissivity			√	
Free Available Chlorine (if applicable)			√	

NOTE

1. In the effluent TN = TKN + TOXN.
2. In the influent TN = TKN, as TOXN is effectively zero in raw sewage.

6.3 Sample Re-analysis

TSS, $cBOD_5$ and *E. coli* tests will automatically be repeated by the laboratory on samples where the initial results exceed the maximum allowable limit set out in AS 1546.3 Tables 2.1 and 2.2 for the nominated compliance criteria of that plant (refer to Table 2 in Section 7.1.1).

A sub-sample will be refrigerated and stored so that a retest can be conducted for either TSS or *E. coli*. A further sub-sample will be frozen and stored for retesting of other parameters should that be necessary, provided freezing does not compromise the result.

6.4 Temperature

Influent temperature will be recorded, using a temperature probe located in the influent sample collection mag-flow meter, at the time that the grab sample is collected.

The treated effluent temperature will be recorded, using a temperature probe located in the treated effluent discharge flowmeter from each trial system, at the time that the grab sample is collected.

Ambient air temperatures will be obtained from the NIWA weather station at Edmund Rd, Rotorua. The daily maximum and minimum air temperatures on each test day will be logged and reported.

7. PRODUCT CONFORMITY EVALUATION

7.1 Effluent Quality

7.1.1 AS 1546.3:2017

AS 1546.3:2017 sets out requirements for Secondary Effluent and Advanced Secondary Effluent, both with and without nutrient removal, as set out in Table 2:

Table 2: AS 1546.3:2017 Requirements

Parameter	Secondary Effluent		Advanced Secondary Effluent	
	90% of samples	Maximum	90% of samples	Maximum
cBOD	≤20 mg/L	30 mg/L	≤10 mg/L	20 mg/L
TSS	≤30 mg/L	45 mg/L	≤10 mg/L	20 mg/L
E. coli [1]	≤10 MPN/100 mL	30 MPN/100 mL	≤10 MPN/100 mL	30 MPN/100 mL
Turbidity	NA	NA	NA	5 NTU
	Additional parameters with nutrient removal			
Total N	NA	15 mg/L	NA	15 mg/L
Total P	NA	2 mg/L	NA	2 mg/L

[1] Where disinfection is required.

At OSET-NTP, all plants will be tested for the above parameters. All test results, including those during stress tests, will be included in the evaluation for compliance with the above four classifications.

The Evaluation Report and OSET-NTP Certificate of Compliance will state compliance with either the secondary or advanced secondary requirements above, with or without nutrient removal.

7.1.2 OSET-NTP Benchmark Evaluation

OSET-NTP has developed a simple, quantitative benchmark rating system, that is transferable across all possible effluent qualities, that measures constituents, or ranked indicators, on a letter-grade system, based on the quality of effluent produced (or the quality of that particular indicator within the effluent produced) as shown in Table 3:

Table 3: OSET Benchmark Rating Indicators

Rated Indicators for Median Value unless stated otherwise	Rating Letters and Corresponding Levels				
	A+	A	B	C	D
cBOD (mg/L)	≤5	≤10	≤20	≤30	>30
TSS (mg/L)	≤5	≤10	≤20	≤30	>30
Total nitrogen (mg/L)	≤5	≤15	≤25	≤30	>30
Ammoniacal nitrogen (mg/L)	≤1	≤5	≤10	≤20	>20
Total phosphorus (mg/L)	≤1	≤2	≤5	≤7	>7
E. coli (MPN/100 ml) 90%ile	≤10	≤200	≤10,000	≤100,000	>100,000
Energy (kWh/1000 L) mean	≤1	≤2	≤3	≤5	≥5

All test results, including those during stress tests, will be used in the evaluation for Benchmark ratings. The test results for Benchmark rating of a treatment system will be examined by SWANS-MAG in terms of their means, medians, and standard deviations, and confirmed results assessed in relation to any anomalies or extreme outliers within. When assessing the trial results, SWANS-MAG will also take into consideration any external events (e.g. weather, system or test facility problems) which could have influenced the test results or the overall system operation. A letter rating will be assigned to each effluent quality median value (or in the case of *E. coli*, the 90 percentile, and for Energy the mean) and included within the Evaluation Report and OSET-NTP Certificate of Compliance.

An example of ratings assigned within the Evaluation Report and OSET-NTP Certificate of Compliance is provided in Table 3.

A range of other issues will be assessed and noted in the Evaluation Report and OSET-NTP Certificate of Compliance in accordance with requirements in AS/NZS 1547:2012 and AS 1546.3:2017.

7.2 Component Failure

The submitted treatment unit will not be awarded an OSET-NTP Performance Certificate if, during the compliance testing period (Weeks 11-44), either of the following failure events occurs:

i. There are two or more failures of the SAME component.
ii. There are three or more failures of ANY mechanical and/or electrical component.

The above criteria conform, in part, to the testing outcomes as specified in AS 1546.3:2017, Section A5.12 Table A7.

7.3 Emergency Storage

This will be recorded by SWANS-MAG in the Evaluation Report and OSET-NTP Certificate of Compliance as a pass/fail/comment. The report will additionally note the emergency storage capacity.

A pass requires that the emergency storage requirements of AS 1546.3:2017, section 2.3.7 are met. This requires that plants ≤2000 L/d have an emergency storage capacity of 1000L within the plant. For plants ≥2000L/day the emergency storage capacity should be at least 50% of the daily hydraulic capacity within the plant.

The emergency storage capacity shall be calculated from the rated treatment capacity of the plant, and shall not include:

i. the pipes draining into the plant;
ii. the pipes discharging to the land application area; or
iii. the land application system.

A pass requires that the emergency storage capacity shall be:

i. capable of being utilised during plant breakdown, blower failure, power failure, alarm activation, and maintenance periods; and
ii. above the normal operating level of the plant, i.e. above the high-water level in the treatment chambers and effluent storage chamber or tank.

7.4 Media Development

The time (in weeks) from start-up to achieving compliance with the nominated performance standard will be noted in the Evaluation Report and OSET-NTP Certificate of Compliance. It is expected to be achieved within eight weeks.

7.5 Materials Durability, Structural Capability, Design Life, and Design Requirements

This will be recorded by SWANS-MAG in the Evaluation Report and Certificate of Compliance as a pass/fail/comment/compliance status unknown.

The manufacturer/supplier is required to submit a copy of the test certificate and associated report showing that the plant being tested at OSET-NTP has been tested and passed the requirements in AS/NZS 1546.1:2008.

If the manufacturer does not hold a Certificate of Compliance with AS/NZS 1546.1:2008, the manufacturer shall confirm compliance with the design consideration and construction of tanks in AS 1546.3:2017, Sections 2.3.2 (Design Considerations) and 2.3.6 (Design and Construction of Tanks) by providing Producer Statements (PS2 Design Review and PS4 Construction Review). Producer statement documents are available through Engineering New Zealand (www.engineeringnz.org). This data will be received, noted, and commented upon by SWANS-MAG.

If the manufacturer does not hold a Certificate of Compliance with AS/NZS 1546.1, but holds an alternative certificate which they consider is of similar merit, they may submit that certificate and associated report together with their justification of compliance with AS/NZS 1546.1 requirements. This will be received and commented upon, but noted by SWANS-MAG as 'compliance status unknown'.

7.6 Noise

Due to background noise levels at the NTP, noise testing is not possible. The manufacturer/supplier is required to submit a signed and certified statement from a suitably qualified acoustic engineer that the noise level tested adjacent to the same model of plant under test at OSET-NTP is <40 dB(A) L_{eq} at a distance of one metre from the nearest item of noise-emitting equipment, including from the lid of any blower, aerator, or pump housing.

This will be recorded by SWANS-MAG in the Evaluation Report and Certificate of Compliance as a pass/fail/comment.

7.7 Marking/Signage

Plant marking/signage should comply with the requirements of AS 1546.3:2017 Section 3. The minimum information should comprise:

i. manufacturer's name or registered mark;
ii. model number and model name;
iii. date of manufacture;
iv. design hydraulic capacity in litres/day (L/d);
v. top load limitations;
vi. weight of tank; and

vii. lifting instructions.

The above information items should be permanently and legibly marked, with items i to v located in a prominent position that is readily visible after installation. The marking for items vi and vii should be adjacent to the lifting points.

Marking will be reviewed by OSET-NTP, and compliance noted as a pass/fail/comment in the Evaluation Report and OSET-NTP Certificate of Compliance.

7.8 Installation Manual

The manufacturer/supplier should submit an Installation Manual with the plant documentation. The manual will be reviewed by OSET-NTP for compliance with the requirements of AS 1546.3 Appendix C Section C4, which will be noted as a pass/fail/comment in the Evaluation Report and OSET-NTP Certificate of Compliance.

7.9 Maintenance and Operations Service Manual

The manufacturer/supplier shall submit a Maintenance and Operations Service Manual with the plant documentation. The manual will be reviewed by OSET-NTP for compliance with the requirements of AS 1546.3 Appendix D Sections D2 and D3, which will be noted as a pass/fail/comment in the Evaluation Report and OSET-NTP Certificate of Compliance.

8. REPORT

Where applicable, the production and dissemination of system testing results, reviews, auditing reports, and associated system performance certification will conform to NZS 17020 Section 13.

8.1 Report Content

An outline of the content of the Evaluation Report is included in Appendix VIII, and of the OSET-NTP Performance Certificate in Appendix IX.

8.2 Report Finalisation

An evaluation report will be issued to each trial participant for comment within a defined time frame. On receipt and evaluation of comments, SWANS-MAG will issue the final report to the manufacturer and all OSET-NTP funding agencies.

8.3 Limitations of the Trial and Report

Each evaluation report and each OSET-NTP Performance Certificate will note the limitations of both the trial and the report as set out in Section 2.3.

9. PERFORMANCE CERTIFICATE

Where applicable, the production and dissemination of the OSET-NTP Performance Certificate will conform to NZS 17020 Section 13.

9.1 Performance Certificate Content

An outline of the content of an OSET-NTP Performance Certificate is included in Appendix IX

9.2 Performance Certificate Finalisation

An evaluation report and associated OSET-NTP Performance Certificate will be issued to each trial participant for comment within a defined time frame. On receipt and evaluation of comments, SWANS-MAG will issue the final OSET-NTP Performance Certificate. It will be issued to the manufacturer, all OSET-NTP funding agencies and will be lodged on the Water NZ OSET-NTP web page.

9.3 Limitations of the Performance Certificate

Each OSET-NTP Performance Certificate will include a detailed description of the plant tested, note the limitations of both the trial and Performance Certificate as set out in Section 2.3 and note that the OSET-NTP Performance Certificate is specific to the plant as tested and described.

9.4 Duration of the Performance Certificate

The duration of validity of each Performance Certificate is 5 years from its date of issue and is subject to there being no change to the plant as tested and described in the Performance Certificate. As an additional service for a non-refundable application fee OSET-NTP offer a 3 year extension to the Performance Certificate duration, based upon a review that confirms there has been no change to the plant or that any change is not expected to result negatively on plant performance. Application documents can be obtained from the Technical Manager. The evaluation will be undertaken by the Technical Manager and reviewed by SWANS-MAG prior to issue or rejection. The SWANS-MAG decision shall be final and cannot be disputed by the manufacturer.

10. AUDITING PROCEDURES

Each system that undergoes assessment in the testing phase, and is not withdrawn, will be audited. The SWANS-MAG team is responsible for producing the audit.

The objective for this auditing is the standardisation of results, and auditing/grading of the systems based on those standardised results.

The OSET-NTP will include a professional assessment from the SWANS-MAG team, which may aid in explaining any abnormalities in the assessment, and may include the changing of a benchmark rating, up or down, for reasons of exceptional circumstances within the trial period. Reasoning behind good or poor performance of the plant, or suggestions for improvement, may not be made by SWANS-MAG. The audit is of the recorded test data, but taking into account any outside abnormalities, i.e. weather, National Testing Facility malfunctions, influent abnormalities etc.

11. RECORDS

Where applicable, management of programme records will conform to NZS 17020 Section 12.

11.1 Maintenance of Records

Records, in the form of analytical data, will be kept by the analytical laboratory, as well as within the spreadsheet or database system provided by the Reporting Manager. Both the analytical laboratory within RLC and the computer systems at Bay of Plenty Regional Council are backed up regularly. Details of RLC laboratory data management are given in the laboratory QA manual.

11.2 Storage of Records

Once collection of records is completed for the trial year, the Technical Manager shall assemble the spreadsheet database and all corresponding reports for separate additional storage on Dropbox for access by SWANS-MAG and PAG members, and for archiving by Water NZ. Details of RLC laboratory data storage are given in the laboratory QA manual.

12. DISPUTES AND APPEALS

Where applicable, complaint procedures will conform to NZS 17020 Section 15.

12.1 Dispute Protocol

Any dispute must be directly related to the operation of the facility or the running of the trial, and must be submitted in writing to the Technical Manager no more than 10 working days after the completion of the trial. The Technical Manager will determine the nature and scope of the dispute. If the dispute is deemed minor, the Technical Manager may attempt to resolve the issue alone, or with the aid of the Operations and/or Reporting Managers. Disputes which are deemed more than minor shall be referred to SWANS-MAG.

Disputes related to the analysis and interpretation and assignment of ratings to a system based on the trial results are to be submitted in writing to the Chair of SWANS-MAG within 10 working days of issue of the final audit report. The Chair will consult with SWANS-MAG members prior to proceeding with dispute resolution.

12.2 Dispute Resolution

The resolution of any technical dispute is the responsibility of SWANS-MAG. In order to assist SWANS-MAG in its task, the party concerned may provide SWANS-MAG with information that reflects its point of view. It is the duty of SWANS-MAG to test and weigh the information in light of the circumstances surrounding the technical issue.

Disputes between trial participants, or claims made against participants in the trial, will be mediated by SWANS-MAG.

SWANS-MAG has authority to refer the matter back to the Technical Manager for resolution, or up to the PAG for full and final resolution.

Resolutions may be appealed to a higher authority within the OSET Operational Structure, but these appeals must be processed by the Technical Manager.

12.3 Appeals

With respect to any appeal regarding SWANS-MAG audit report and certification, the party must submit the appeal in writing to Water NZ within 10 working days of the issue of SWANS-MAG confirmation of the final report and certification.

Water NZ will convene the PAG to consider the appeal and all supporting documentation.

12.4 Limitations

Any party involved in the resolution of a dispute or appeal, be it the Technical Manager, SWANS-MAG, or the PAG, may not:

- make any offer of financial compensation; or
- change raw analytical data within the database.

Resolutions of technical disputes may come in the form of, but are not limited to:

- explanations of technical shortcomings of a trial;

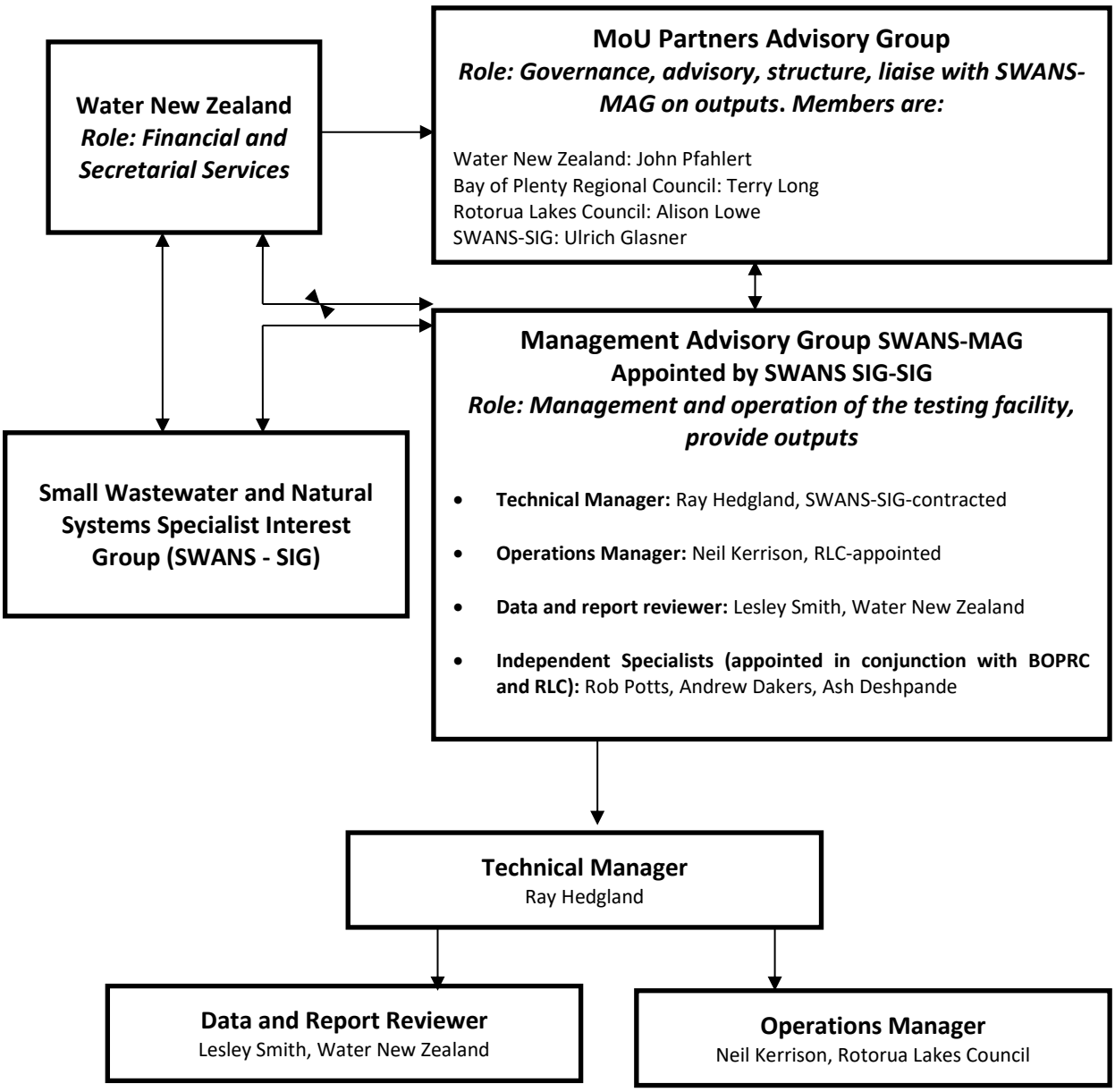
- re-examination of data based on external knowledge; and
- re-interpretation of a system's data, with more or less favourable outcomes, and an appropriate explanation as to the change in outcomes.

Resolutions of an appeal are the responsibility of the PAG, whose decision will be full and final.

13. APPENDICES

APPENDIX I: OSET-NTP Operational Structure
APPENDIX II: Position Descriptions
APPENDIX III: Terms of Agreement
APPENDIX IV: Information to be provided by the Manufacturer
APPENDIX V: Installation Certificate
APPENDIX VI: Proposed Testing Schedule
APPENDIX VII: Influent Dosing Schedule
APPENDIX VIII: Content of the Evaluation Report
APPENDIX IX: Content of OSET-NTP Performance Certificate

APPENDIX I: OSET-NTP Operational Structure



APPENDIX II: Position Descriptions

OSET TECHNICAL MANAGER

Role

The Technical Manager (TM) is the front-line contact for the trial, while also providing much of the administrative and timing functions. The TM is the gatekeeper of information and decision-making for the trial. The TM liaises with all levels of the OSET operational structure to ensure that all parties are well informed as to the progress of the trial.

Responsibilities

Key responsibilities of the Technical Manager are:

- Liaising with SWANS-MAG and PAG groups with respect to all operational aspects of the trial.
- Setting trial budgets.
- Advising PAG and SWANS-MAG of the schedule of costs.
- Arranging the timeline for the trial.
- Updating the procedural manual.
- Liaising with the Operations Manager and Data and Report Reviewer to ensure systems are installed on time, and that the data and information flow through the proper channels.
- As sole gatekeeper for all information coming out of the trial, all information and requests for information from the trial must proceed through the TM. All other groups within the trial must refer all requests for information to the TM, without processing them.
- Ensuring that SWANS-MAG and PAG are kept adequately apprised of the progress of the testing period.
- Ensuring that all trial participants or their representatives understand pre-trial procedures, trial procedures, timeline, reporting, and auditing procedures.
- Arbitrating, in the first instance, any disputes arising out of the trial, following the dispute protocol and dispute resolution procedures to the best of his/her ability.
- Ensuring that testing procedures and testing timelines are adhered to or, if they are not, immediately notifying the trial participants thereof.
- Receiving and recording the data collected by the trial, analysing it, and forwarding it to the Data and Report Reviewer for review. Updating as required.
- Preparing the draft versions of the testing results reports and Performance Certificates, and forwarding them to the Data and Report Reviewer for review. Updating as required.
- Initiating and guiding the audit process by SWANS-MAG.
- Distributing the draft audit reports and Performance Certificates to individual supplier/manufacturers for comment prior to finalising the reports.

The TM will ensure all system declarations and specifications are filled out prior to the commencement of testing, and that all costs and charges are paid prior to the beginning of testing. The TM will ensure that the Terms of Agreement (Appendix III) are signed by the NZ supplier/manufacturer prior to the commencement of testing.

OSET DATA AND REPORT REVIEWER

Role

The role of the OSET Data and Report Reviewer (DRR) is to review the data, reports, and performance certificates that have been collected, analysed, and prepared by the Technical Manager for each plant in the trial. At the end of the trial, the DRR is responsible for assisting the TM by checking the individual reports on all trial participant systems. As a member of SWANS-MAG, the DRR has a responsibility to attend SWANS-MAG meetings, and to provide insight into any issues arising from the data collation and reporting of the trial.

Responsibilities

It is a key responsibility of the DRR to ensure the integrity of the results reports prepared by the TM, by checking the information provided. To this end, the DRR must ensure that no data is permitted to be disseminated through any other portal than requests directly through the TM. The TM may authorise the DRR to release information to specific groups at any time.

OSET OPERATIONS MANAGER

Role

The Operations Manager (OM) has oversight of the day-to-day operations of the OSET-NTP located at the RLC WWTP in Rotorua. The OM is responsible for the upkeep and maintenance of the OSET-NTP, and has a duty to ensure that any malfunctioning equipment or componentry (excluding the systems being tested) is upgraded or replaced immediately to ensure a de minimis effect on the operation of the trial. The OM must ensure that the system is reporting electronically through a WWTP Scada system, and the system is running in accordance with the parameters laid down in this procedure. In order to carry out this role, the OM shall have 24-7 access to the RLC WWTP site.

Responsibilities

The OM has a responsibility to immediately report any unusual circumstance to the Technical Manager. The OM is responsible for immediately replacing any defective or faulty piece of equipment within a trial, if that will allow the trial to resume normal operations. If issues arise, such as an unusual operation or discharge into the trial, or discovery of a prolonged error, decisions on how to rectify that situation must be discussed with the Operations Manager, the Technical Manager, the Data and Report Reviewer, and potentially SWANS-MAG and/or PAG. The OM, together with the Technical Manager, also has a marketing role in ensuring that those interested in observing the system in action are allowed access to the site. The OM is responsible for the security of the site, ensuring the site is locked at all times, and that only authorised personnel have access to the system through keys. This includes supervision of NZ supplier/manufacturers or their representatives who have come to examine their systems. The OM shall maintain a log of visits to the facility, ensuring that there is a record of all people visiting, the companies they represent, and the purpose of their visits. The CCTV footage of the site shall be examined regularly.

APPENDIX III: Terms of Agreement

ON-SITE EFFLUENT TREATMENT
NATIONAL TESTING PROGRAMME

STRAND 1
TESTING and BENCHMARKING AGREEMENT

PARTIES

(1) **WATER NEW ZEALAND** [**NEW ZEALAND WATER AND WASTES ASSOCIATION INCORPORATED** (NZBN 9429042784852)], **ROTORUA LAKES COUNCIL** and **BAY OF PLENTY REGIONAL COUNCIL** (together, the "**Organisers**")

(2) **Company Name: .....** ("**Trial Participant**")

Company number .....

(Each a "**party**" and together the "**parties**")

BACKGROUND

A. The Trial Participant wishes to acquire the Services.

B. The Organisers have agreed to provide the Services on the terms of this Agreement.

AGREEMENT

The Agreement between the parties consists of the Details Table below, the General Terms, and the schedule attached.

DETAILS TABLE

1.	**Commencement Date**	**12 November 2018**
2.	**Term (clause 3.1)**	From the Commencement Date until the Trial has been completed and the Trial Participant has removed its System from the Trial Site to the Organisers' satisfaction.
3.	**Services (clause 4)**	The Organisers will test the Trial Participant's System by: (a) sampling and analysing influent and effluent under a uniform set of conditions; (b) auditing the testing results to provide a benchmark rating against defined treated effluent quality parameters; and

		(c) evaluating the System's ability to achieve effluent performance requirements as set out in AS 1546.3:2017 in accordance with the criteria specified in AS/NZS ISO/IEC 17020:2000 and as described in more detail in the "**Procedures**".
4.	**Trial Start Date**	**19 November 2018**
5.	**Relationship Managers** **(clause 12.1)**	The Trial Participant's relationship manager is: .....*(name and title of relevant person)* The Organisers' relationship manager is: .....*(name and title of relevant person)*
6.	**Service Fee (clause 8)**	**The Service Fee is a fixed fee of $30,000 + GST** **25% of the Service Fee is payable on 15 July 2018** **75% of the Service Fee is payable on 12 November 2018**
7.	**Addresses for notices (clause 19.1)**	**Organisers**: **10 Tide Place, Mount Wellington, Auckland 1060** For: **Technical Manager OSET-NTP Rotorua** Email: **ray@hedgland.co.nz** Ph: **021 626 772** **Trial Participant**: .....**(***Insert address***)** For: .....**(***job title***)** Email: **.....** Ph: .....

EXECUTED as an agreement

Trial Participant

SIGNED for and on behalf of

.....by

Signature

[Print Name]

Position

Date

Organisers

SIGNED for and on behalf of)
WATER NEW ZEALAND)
[NEW ZEALAND WATER AND WASTES ASSOCIATION INCORPORATED] by

Signature

Position

Date

SIGNED for and on behalf of)
ROTORUA LAKES COUNCIL by)

Signature

[Print Name]

Position

Date

SIGNED for and on behalf of)
BAY OF PLENTY REGIONAL COUNCIL by)

Signature

[Print Name]

Position

Date

GENERAL TERMS

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, unless the context requires otherwise:

"Agreement" means the Details Table above, the General Terms, and the Schedule attached.

"Bank Bill Bid Rate" means the average New Zealand dollar 90-day bank bill bid rate (rounded up to the nearest second decimal place) as appearing at 11.00 am or as soon as practicable thereafter on the relevant day on page BKBM of the Reuters screen (or, if such rate is no longer published, its successor or equivalent page).

"Business Day" means any day other than a Saturday, a Sunday, or a public holiday in Bay of Plenty.

"Commencement Date" means the date specified in item 1 of the Details Table.

"Confidential Information" means information disclosed by a party under this Agreement that is marked as confidential or which might reasonably be expected to be confidential in nature.

"Default Rate" means, in any month, the Bank Bill Bid Rate appearing on the first Business Day of the month plus [3] percent per annum, calculated daily and capitalised monthly.

"Details Table" means the Details Table attached to this Agreement.

"Force Majeure Event" means an extraordinary event or circumstance beyond the reasonable control of a party, such as an Act of God, but excluding lack of funds.

"Insolvency Event" means, in relation to a party, where that party ceases or threatens to cease to carry on business; is subject to any form of insolvency proceedings that are not removed within 10 Business Days; commits an act of bankruptcy or has been adjudicated bankrupt; has any of its assets seized by a creditor; enters into any compromise with a creditor; has a receiver, liquidator, administrator, statutory manager or similar official appointed; becomes insolvent or is deemed by law to be so; or suffers any analogous event.

"Intellectual Property Rights" means all intellectual property rights, whether conferred by statute, at common law, or in equity, including all copyright, rights in relation to inventions, trade secrets and know-how, rights in relation to designs, rights in relation to trademarks, business names and domain names.

"Procedures" means the 'On-Site Effluent Treatment National Testing Programme Strand 1 Testing and Benchmarking Procedures' for the Trial year noted in the Heading of this Agreement.

"Services" means the services to be provided by the Organisers under this Agreement as described in item 3 of the Details Table.

"Service Fee" has the meaning given in Clauses 8.1 and 8.2.

"System" means the wastewater treatment system that the Trial Participant submits for Trial.

"Term" means the term specified in item 2 of the Details Table.

"Trial" has the meaning given in item 3 of the Details Table.

"Trial Site" means the Rotorua Wastewater Treatment Plant.

"Trial Start Date" means the date set out in item 4 of the Details Table.

1.2 In this Agreement, unless the context requires otherwise:

i. the headings to clauses are inserted for convenience only and shall be ignored in interpreting this agreement;

i. the word 'including' and other similar words do not imply any limitation;

ii. a person includes any company or body of persons (incorporated or not);

iii. the plural includes the singular and vice versa;

iv. capitalised terms not otherwise defined in this Agreement shall have the meaning given to those terms in the Procedures; and

v. a reference to a statute includes any legislative instrument or other subordinate legislation made under it and amendments to or replacement of any of them from time to time.

2. PRECEDENCE

2.1 If there is any conflict between the body of this Agreement and the Schedule, the body of this Agreement will prevail.

2.2 If there is any conflict between this Agreement and the Procedures, the Procedures will prevail.

3. TERM

3.1 This Agreement will commence on the Commencement Date and will continue for the Term, unless terminated earlier in accordance with this Agreement.

4. SERVICES

4.1 The Organisers shall provide the Services to the Trial Participant in accordance with the terms of this Agreement.

4.2 In providing the Services, the Organisers shall:

i. act with reasonable care, skill, and diligence;

ii. provide all personnel, processes, and resources reasonably required to provide the Services in accordance with this Agreement; and

iii. comply with all applicable laws and obtain, maintain, and comply with all applicable regulatory licences and consents.

5. EXCLUSION OF WARRANTIES AND CONSUMER GUARANTEES ACT 1993

5.1 Except as expressly provided in this Agreement, all representations or warranties (statutory, express, or implied), except any which may not lawfully be excluded, are excluded.

5.2 The parties acknowledge and agree that:

i. the Services will be supplied and acquired in trade;

ii. all the parties to this Agreement are in trade;

iii. they shall contract out of the provisions of the Consumer Guarantees Act 1993; and

iv. it is fair and reasonable that the parties are bound by this clause.

6. TRIAL PARTICIPANT OBLIGATIONS

6.1 The Trial Participant shall:

i. co-operate with the Organisers in all matters relating to the Services;

ii. provide, in a timely manner, such input material and information as the Organisers may reasonably require, and ensure that it is accurate in all material respects;

iii. have installed and prepared its System to be trialled at the Trial Site prior to the Trial Start Date;

iv. supply its maintenance regime and system specifications for the System prior to the Trial Start Date;

v. undertake any maintenance of the System at its own cost;

vi. insulate its System, using insulation prescribed by the Organisers, prior to 18 January 2019;

vii. decommission and remove the System from the Trial Site within 5 Business Days of the Trial ending, and make good any damage to the Trial Site caused by the Trial Participant (at the Trial Participant's cost); and

viii. comply with all the other obligations on the Trial Participant set out in the Procedures.

6.2 If the Trial Participant fails to remove the System from the Trial Site within 10 Business Days of the relevant date set out in the Procedures document, Section 1, Key Dates and Timelines, the Organisers may arrange to have the System moved to a storage facility at the Trial Site and charge the Trial Participant a removal fee of $500 (plus GST, if any). The Organisers may also charge the Trial Participant an on-going storage fee of $50 (plus GST, if any) per week until the System is removed from the Trial Site.

7. TRIAL PARTICIPANT WARRANTIES

7.1 The Trial Participant warrants that its System is a standard, non-modified system, and is available for purchase on the open market.

8. SERVICE FEE

8.1 The fee for the Services is set out in item 6 of the Details Table ('Service Fee'). The Service Fee is inclusive of all taxation (including income tax and accident compensation levies) except GST.

8.2 In consideration of the provision of the Services and the Organisers' performance of their obligations under this Agreement, the Trial Participant shall pay the Service Fee to the Organisers in two lump sum payments on specified dates as described in item 6 of the Details Table. All Service Fee payments are non-refundable should the Trial Participant subsequently decide not to enter the trial or withdraw from the trial.

8.3 If the Trial Participant fails to comply with clause 8.2 above, the Organisers may (in addition to their other remedies under this Agreement or otherwise at law) withhold the Trial results and cease testing the System.

9. PAYMENT

9.1 The Trial Participant shall pay the Organisers the amount payable in respect of each invoice submitted to it by the Organisers on the 20th day of the month the invoice was issued or 10 Business Days after the Trial Participant receives the invoice, whichever is the latter.

9.2 If a sum required to be paid under this Agreement is not paid before or on the due date, or if any amount in dispute is later agreed or held to be due and owing, the party obliged to pay shall also pay interest on that sum at the Default Rate for the period beginning on the due date and ending on the date the sum is paid (including the period after any judgment).

9.3 All amounts due under this Agreement shall be paid in full without any set-off, counter-claim, deduction, or withholding (other than any deduction or withholding of tax as required by law).

10. INTELLECTUAL PROPERTY RIGHTS

10.1 All Intellectual Property Rights of a party or any of its licensors that are not developed, commissioned, or created under or in connection with this Agreement, but are used for the purposes of this Agreement, will remain owned by that party or the relevant licensor.

10.2 All new Intellectual Property Rights that are developed, commissioned, or created under or in connection with this Agreement will be owned by the Organisers as such rights arise. To the extent such rights vest in the Trial Participant from time to time, the Trial Participant shall, upon request of the Organisers, promptly assign such rights to the Organisers or their nominee(s) for nominal consideration.

10.3 Without limiting clause 10.2, in all cases where the Organisers do not own or are not otherwise licensed to use any Intellectual Property Rights supplied to the Organisers under this Agreement, or used by the Trial Participant in relation to the Trial, the Trial Participant grants or shall procure the grant to the Organisers of a royalty-free, non-exclusive, perpetual, transferable, and irrevocable licence or sub-licence to use, copy, and modify such Intellectual Property Rights for the Organisers' business and operational purposes.

10.4 The Organisers grant the Trial Participant a royalty-free, non-exclusive, and non-transferable licence to use all Intellectual Property Rights in the Services that are owned by the Organisers for the purposes of the Trial.

11. LIABILITY

11.1 To the extent permitted by law, the Organisers exclude all liability in respect of any claims, losses, and damages, whether arising in contract, tort (including negligence), equity, or otherwise under or in connection with this Agreement.

11.2 To the extent that the Organisers cannot at law exclude their liability under this Agreement, New Zealand Water and Wastes Association Incorporated, Rotorua Lakes Council, and Bay of Plenty Regional Council (co-obligors) shall be jointly and severally liable for the Organisers' obligations and liabilities under this Agreement. The Organisers' total aggregate liability in respect of all claims, losses, or damages, whether arising in contract, tort (including negligence),

equity, or otherwise under or in connection with this Agreement, shall in no event exceed $1,000.

12. RELATIONSHIP MANAGEMENT

12.1 Each party shall appoint, for the purposes of this Agreement, the person referred to in item 5 of the Details Table as its Relationship Manager, who will serve as the primary point of contact with the other party.

12.2 Each party may replace its Relationship Manager from time to time, provided it gives the other party not less than 20 Business Days' notice of such replacement.

13. CONFIDENTIALITY

13.1 Except as permitted by clauses 13.2 and 14, neither party will disclose the Confidential Information to any person or use the Confidential Information for any purpose other than to perform this Agreement.

13.2 Notwithstanding clause 13.1, either party may disclose any Confidential Information with the other party's prior written consent or if and to the extent disclosure is required by law (including under the Local Government Official Information and Meetings Act 1987), provided that the disclosing party gives the other party notice of the requirement as soon as practicable before such disclosure is made.

14. PUBLICATION OF TRIAL RESULTS

Neither party may publicise the Trial results of the Trial Participant's System, including information relating to influent and effluent quality, electricity use, maintenance requirements, and problems encountered until such time as a final Technical Evaluation Report has been issued to the Trial Participant.

15. TERMINATION

15.1 A party (the first party) may terminate this Agreement immediately by notice to another party if:

i. another party commits a material or persistent breach of this Agreement and fails to remedy that breach within 10 Business Days after receipt of notice by the first party requiring the breach to be remedied; or

ii. another party is subject to an Insolvency Event.

15.2 On and following termination or expiry of this Agreement for any reason:

i. the termination or expiry shall be without prejudice to either party's accrued rights and remedies; and

ii. the Trial Participant shall immediately cease using the Organisers' Intellectual Property Rights, and shall promptly return or (to the extent required by the Organisers) destroy all the Organisers' property and Confidential Information in the Trial Participant's possession or control, and certify that it has done so.

16. FORCE MAJEURE

16.1 A party shall not be liable for any breach of this Agreement to the extent such breach is due to a Force Majeure Event, provided that it keeps the other party fully informed of the situation, uses reasonable endeavours to mitigate the effect of the Force Majeure Event, and resumes full performance as soon as reasonably practicable.

17. DISPUTE RESOLUTION

17.1 Subject to clause 17.3, the parties agree that any dispute relating to this Agreement will be submitted to the Technical Manager in writing no more than ten (10) working days after the completion of the Trial.

17.2 The Technical Manager will in its sole discretion determine whether the dispute is minor, and:

i. if the dispute is deemed to be minor, the Technical Manager may attempt to resolve the dispute alone, or with the aid of the Operations and/or Reporting Managers; or

ii. if the dispute is deemed more than minor (**Key Dispute**), the dispute will be referred to SWANS-MAG for resolution.

17.3 Notwithstanding any other clause in this Agreement, disputes relating to the analysis and interpretation or assignment of ratings to a system based on the Trial results (**Technical Disputes**) are to be submitted in writing to the Chair of SWANS-MAG within ten (10) working days of issue of the final audit report. The Chair will consult with SWANS-MAG members prior to proceeding with dispute resolution.

17.4 The resolution of any Technical Dispute or Key Dispute is the responsibility of SWANS-MAG. The parties to a Technical Dispute or Key Dispute may provide SWANS-MAG with any information that reflects or evidences its point of view to aid SWANS-MAG in its task. SWANS-MAG must test and weigh the information provided by each party, in light of the circumstances surrounding the issue.

17.5 SWANS-MAG may refer any Technical Dispute or Key Dispute back to the Technical Manager for resolution, or escalate the matter to the OSET-NTP Partners Advisory Group (**PAG**) for full and final resolution.

17.6 The Trial Participant may appeal any resolution to a higher authority within the OSET Operational Structure, and these appeals will be processed by the Technical Manager.

17.7 In the resolution of any dispute under this Agreement, the Technical Manager, SWANS-MAG or the PAG will not:

iii. make any offer of financial compensation to a Trial Participant; or

iv. change raw analytical data within the Organisers database.

17.8 Resolutions of disputes may take the form of:

i. explanations of technical shortcomings of a Trial;

ii. re-examination of data based on external knowledge; and

iii. re-interpretation of a system's data, with more or less favourable outcomes, and an appropriate explanation as to the change in outcomes.

17.9 Any appeal regarding SWANS-MAG audit report and certification must be submitted in writing to Water New Zealand within ten (10) working days of the issue of SWANS-

MAG confirmation of the final report and certification. Water New Zealand will convene the PAG to consider the appeal and all supporting documentation. Resolutions of an appeal are the responsibility of the PAG whose decision will be final and no further appeals to the PAG or other authorities within the OSET Operational Structure will be considered.

17.10 The Trail Participant agrees that if it has any disputes with other trial participants, it will refer those disputes in the first instance to SWANS-MAG for mediation as per the Procedures.17.11 While any dispute remains unresolved each party shall continue to perform this Agreement to the extent practicable, but without prejudice to their respective rights and remedies.

18. SITE VISITS

18.1 The Trial Participant may visit the Trial Site from time to time subject to the Operations Manager's prior approval. The purpose of the visit and all actions planned during the visit must be approved by the Operations Manager prior to the visit.

18.2 The Trial Participant must complete a log book entry each time it visits the Trial Site. The log book entry must detail, at minimum, the name of the Trial Participant, the name of the Trial Participant's representative, and descriptions of the purpose of the visit and any work carried out.

19. NOTICES

19.1 Each notice under this Agreement shall be in writing and delivered personally or sent by post or email to the person indicated in item 7 of the Details Table. A notice is deemed to be received:

i. if delivered personally, when delivered;

ii. if posted, three Business Days after posting; or

iii. if sent by email, when actually received,

provided that any notice deemed received after 5pm on a Business Day or on a non-Business Day shall be deemed to have been received on the next Business Day.

20. GENERAL

20.1 No amendment to this Agreement will be effective unless it is in writing and signed by the parties.

20.2 No party may assign or transfer any part of this Agreement without the written consent of the other party. Consent may not be unreasonably withheld. Change in the effective control of the Trial Participant is deemed to be an assignment.

20.3 This Agreement is the entire agreement of the parties, and supersedes all prior agreements and representations given or made between the parties relating to the matters dealt with in this Agreement.

20.4 Each party shall, at its own expense, promptly sign and deliver any documents, and do all things which are reasonably required to give full effect to the provisions of this Agreement.

20.5 The parties are independent contractors, and this Agreement does not create any partnership, agency, or employment relationship between them.

20.6 The rights and remedies provided in this Agreement are cumulative, and not exclusive of any rights or remedies provided by this Agreement or law.

20.7 If any provision of this Agreement is illegal, invalid, or unenforceable, that provision shall be read down to the extent necessary to make it legal, valid, and enforceable.

20.8 Following termination or expiry of this Agreement, Clauses 10 (Intellectual Property Rights), 11 (Liability), 13 (Confidentiality), 15 (Termination), and 17 (Dispute Resolution), together with other provisions that are by their nature intended to survive, will remain in effect.

20.9 A waiver of a right under this Agreement is ineffective unless it is in writing.

20.10 This Agreement is governed by New Zealand law, and the parties irrevocably submit to the non-exclusive jurisdiction of the New Zealand court.

APPENDIX IV: Information to be provided by the Manufacturer

This Appendix sets out the information, plant specifications, drawings, and documentation regarding the trial plant required to be provided by the Manufacturer/Supplier.

DESIGN MANUAL

System name and model
Plant name
Plant model

Manufacturer and Supplier
Manufacturer name and contact details
Supplier name and contact details

Service Agent
Name and contact details

Hydraulic and inorganic loading

Rated flow (L/day)

Minimum and maximum wastewater temperature for effective operation

Treatment process/technology

- Activated sludge/submerged aerated filter/packed bed filter/sequential batch reactor
- Other

Operating volume and total volume of all tanks and chambers in litres (L)

- Primary tank
- Aeration tank
- Clarification chamber
- Final pump station

Emergency storage volume in litres (L)

Construction materials, number of chambers and predicted life

- Primary tank
- Treatment tank
- Internal baffles
- Final pump station

Primary tank effluent filter:

Air blower:

- Name

- Technical Specification
- Operational Time

Flow Distribution

- Details of components and process for even distribution

Air diffuser

- Name
- Technical specification
- Location

Media/substrate material

- Name
- Technical specification
    - Type of media or substrate material
    - Size of media particles in each layer
    - Volume and depth of each media layer or substrate surface area
    - Media uniformity coefficient
- Location

Sludge return/recirculation

- From
- To
- Recirculation ratio

Vegetation

- Species
- Age
- Planting density

Discharge pump

- Name
- Technical specification
- Predicted discharge flow rate at 3 m head

Service requirements

- Frequency
- Actions required

Drawings

- Engineering drawings
- Schematic diagram of flow path through treatment system

Manufacturer's statement of compliance with specification and drawings

CERTIFICATE OF COMPLIANCE WITH AS/NZS 1546.1:2008

The manufacturer/supplier is required to submit a copy of the test certificate and associated report showing that the plant being tested at OSET-NTP has been tested and passed the requirements in AS/NZS 1546.1:2008.

If the manufacturer does not hold a Certificate of Compliance with AS/NZS 1546.1:2008, the manufacturer shall confirm compliance with the design consideration and construction of tanks in AS 1546.3:2017, Sections 2.3.2 (Design Considerations) and 2.3.6 (Design and Construction of Tanks) by providing Producer Statements (PS2 Design Review and PS4 Construction Review). Producer statement documents are available through Engineering New Zealand (www.engineeringnz.org).

If the manufacturer holds an alternative certificate which they consider is of similar merit, they should submit that certificate and associated report together with their justification of compliance with AS/NZS 1546.1 requirements.

CERTIFICATE OF NOISE

The manufacturer/supplier is required to submit a signed and certified statement from a noise specialist that the noise level tested adjacent to the same model of plant under test at OSET-NTP is <40 dB(A) L_{eq} at a distance of one metre from the nearest item of noise-emitting equipment, including from the lid of any blower, aerator, or pump housing.

INSTALLATION MANUAL

The Installation Manual should comply with the requirements of Section 4.2.2 and Appendix C of AS 1546.3:2017. Instructions should be in clear, concise, plain English, and diagrams should be easy to interpret. Documentation may be provided in either hard copy or electronic form (e.g. installation DVDs).

Installation instructions shall give full details of the treatment plant installation procedure, including the following:

(a) Reference to installation in accordance with AS/NZS 3500.1 and AS/NZS 3500.2.

(b) Detailed step-by-step instructions.

(c) The need for special tools or training.

(d) Commissioning procedures and adjustments required.

(e) Troubleshooting guide.

(f) Contact details for after-sales service.

NB: The relevant regulatory authority may require state-based requirements to be included in the installation instructions.

OPERATING AND MAINTENANCE MANUAL

The Operating and Maintenance Manual should comply with the requirements of Section 4.2.2 and Appendix D of AS 1546.3:2017. The manual should be comprehensive and detailed. Instructions should be in clear, concise, plain English, and diagrams should be easy to interpret. Documentation may be provided in either hard copy or electronic form (e.g. DVDs).

The Operating and Maintenance Manual should include the above design information and include:

(a) a troubleshooting guide;

(b) contact details for after-sales service;

(c) instructions for operation;

(d) a detailed maintenance schedule, including frequency for system and component checks, assessments, tests, and adjustments (which includes the disinfection system if fitted), and a description of the initial and regular service procedures;

(e) the usual interval for desludging based on different sized households;

(NB: The primary settlement chamber should be inspected, and the depth of scum, liquid, and sludge measured annually. Where the combined depth of the scum and sludge layers is equal to or greater than the intervening liquid layer, the chamber should be desludged.)

(f) procedures to be taken at times of equipment failure or power failure;

(g) procedures for replacing or repairing all system components;

(h) instructions for operation during and after a period with no influent (e.g. returning from a holiday), if necessary;

(i) recommended method for collecting effluent samples;

(j) occupational health and safety procedures;

(k) warranty conditions and limitations;

(l) the manufacturer's contact information, including internet address if available;

(m) the names and telephone numbers of authorised service technicians;

(n) a list of substances or products that can adversely affect the STS;

(o) a list of the owner's and tenant's responsibilities; and

(p) frequently asked questions (FAQ).

Note that:

- Secondary treatment systems should be operated and maintained to ensure they perform continuously and without any intervention between servicing.
- Servicing should be carried out by an authorised service technician, accredited by the manufacturer or distributor, at a frequency defined in the manual.
- Disinfection apparatus should be capable of being fully operational between service periods. Where chemical disinfection is used, the apparatus should have a reserve capacity of one month greater than the service interval.

APPENDIX V: Installation Certificate

ON-SITE EFFLUENT TREATMENT
NATIONAL TESTING PROGRAMME
TRIAL 14

INSTALLATION CERTIFICATE

TRIAL PARTICIPANT: .....

PLANT NAME: .....

MODEL: .....

I confirm that the plant installed at the OSET-NTP for Trial 14 is a standard plant, that it has been commissioned to the manufacturer's requirements, and is ready for testing in Period 4.

I accept that any intervention by OSET-NTP staff to address or attend to any failure of the plant, plant equipment, or alarms subsequent to the issue of this Certificate will incur a penalty fee to recover costs.

Name: ..... Date:.....

Signature: .....

Position: .....

Company: .....

APPENDIX VI: Proposed Testing Schedule

Trial 14 Testing Schedule – 2018/2019

Week	Date commencing	Event	Testing	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	19/11/2018	**Installation**								
2	26/11/2018	**Plant Inspections, filling & Start-Up**	Steady State							
3	3/12/2018	**Commissioning & Media development**	Steady State							
4	10/12/2018		Steady State							
5	17/12/2018		Steady State							
6	24/12/2018		Steady State	I&E	Xmas	Boxing Day		I&E		
7	31/12/2018		Steady State		New Year	Day after New Year				
8	7/01/2019		Steady State					I&E		
9	14/01/2019		Steady State		I&E					
10	21/01/2019		Steady State			I&E				
11	28/01/2019	**Trial commencement**	Steady State	Auckland Anniversary		I&E				
12	4/02/2019		Steady State			Waitangi Day	I&E			
13	11/02/2019		Steady State					I&E		
14	18/02/2019	**Laundry Stress Test**	Steady State	3 wash loads	I&E	I&E	I&E			
15	25/02/2019		Steady State	I&E						
16	4/03/2019		Steady State		I&E					
17	11/03/2019		Steady State			I&E				
18	18/03/2019	**Power Failure**	Steady State				I&E	No Power	No Power	
19	25/03/2019		Steady State		I&E	I&E	I&E			
20	1/04/2019		Steady State		I&E					
21	8/04/2019		Steady State			I&E				
22	15/04/2019		Steady State				I&E	Good Friday		
23	22/04/2019	**Overload Stress Test**	Steady State + 133% Flow	Easter Monday 133%	133%	133%	ANZAC Day 133%	133%	133%	133%
24	29/04/2019		Steady State			I&E		I&E	I&E	
25	6/05/2019		Steady State		I&E					
26	13/05/2019		Steady State			I&E				
27	20/05/2019		Steady State				I&E	No Flow	No Flow	No Flow
28	27/05/2019	**No Flow Stress Test**	Steady State then No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
29	3/06/2019		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
30	10/06/2019		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow
31	17/06/2019		No Flow	No Flow	No Flow	No Flow	No Flow	No Flow		
32	24/06/2019		Steady State	I&E	I&E	I&E				
33	1/07/2019		Steady State		I&E					
34	8/07/2019		Steady State			I&E				
35	15/07/2019		Steady State				I&E			
36	22/07/2019	**Chemical Stress Test**	Steady State	Chemicals	I&E	I&E	I&E			
37	29/07/2019		Steady State	I&E						
38	5/08/2019		Steady State		I&E					
39	12/08/2019		Steady State			I&E				
40	19/08/2019		Steady State				I&E			
41	26/08/2019	**Surge Floiw Stress Test**	Surge Flow then steady state	Surge Flow	Surge Flow	I&E	I&E	I&E		
42	2/09/2019		Steady State	I&E						
43	9/09/2019		Steady State		I&E					
44	16/09/2019		Steady State			I&E				
45	23/09/2019	**Sludge Measurement**	No flow, plants off							
46	30/09/2019	R&D Option								
47	7/10/2019	R&D Option								
48	14/10/2019	R&D Option								
49	21/10/2019	R&D Option								
50	28/10/2019	R&D Option		Labour Day						
51	4/11/2019	**Plant Removal**								
52	11/11/2019	**Contingency**								

I&E — Influent and Effluent Testing Days

APPENDIX VII: Influent Dosing Schedule

Refer to Tables A2 and A3 of AS 1546.3

Note: Influent flow rates:

- 10 Lpm for plant capacities ≤ 2,000 L/day
- 20 Lpm for plant capacities 2,000 - 5,000 L/day

Start time	% of Plant Capacity	Flow in L/1000L of Plant Capacity
1.00	-	-
2.00	-	-
3.00	-	-
4.00	-	-
5.00	-	-
6.00	10%	100
7.00	10%	100
8.00	10%	100
9.00	5%	50
10.00	-	-
11.00	-	-
12.00	5%	50
13.00	5%	50
14.00	5%	50
15.00	-	-
16.00	-	-
17.00	10%	100
18.00	15%	150
19.00	10%	100
20.00	5%	50
21.00	5%	50
22.00	5%	50
23.00	-	-
24.00	-	-

APPENDIX VIII: Content of the Evaluation Report

The content of the results report may include, but is not limited to the following sections:

1.0 INTRODUCTION

2.0 PROCESS DESCRIPTION

3.0 PERFORMANCE EVALUATION

- 3.1 Description of plant evaluated
- 3.2 Time to commission and achieve the nominated effluent quality
- 3.3 Meeting effluent quality requirements as set out in AS 1546.3:2017
- 3.4 Benchmark rating

4.0 TESTING REGIME

- 4.1 Background
- 4.2 Test protocol
- 4.3 Test chronology
- 4.4 Sampling profiles

5.0 ISSUES ENCOUNTERED DURING THE TRIAL

- 5.1 Issues associated with the OSET-NTP test facility:
- 5.2 Issues associated with the [plant name] [plant modell]:
- 5.3 Manufacturer's attendance

6.0 ANALYTICAL RESULTS

- 6.1 Raw sewage influent quality
- 6.2 Effluent quality
- 6.3 Energy use
- 6.4 Other issues
- 6.5 Emergency storage
- 6.6 Alarms
- 6.7 Treatment plant marking
- 6.8 Treatment plant integrity
- 6.9 Noise
- 6.10 Mechanical and electrical equipment
- 6.11 Installation Manual
- 6.12 Maintenance and Operation Manual

APPENDIX I: SAMPLING PROGRAMME

APPENDIX II: STRESS TEST PROCEDURES

APPENDIX III: PLANT SPECIFICATIONS AND DRAWINGS

APPENDIX IV: [PLANT NAME] [PLANT MODEL] RESULTS

APPENDIX IX: Content of OSET-NTP Performance Certificate

The content of the performance certificate may include, but is not limited to the following:

- System specification to which certification applies
- Test flow rate
- Testing and evaluation procedures
- Meeting AS/NZS 1547 effluent quality requirements as set out in AS 1546.3:2017
- Benchmark rating (as per Table 3 example below)
- Issues with the plant under test during the trial
- Period for which the certification applies (generally five years)

Table 3: Example Rating Indicator Result

Indicator Parameters	**Median**	**Std Dev**	**Rating**	**Rating System**				
				A+	***A***	***B***	***C***	***D***
cBOD (mg/L)	*2*	*0*	A+	*<5*	*<10*	*<20*	*<30*	*≥30*
TSS (mg/L)	*1*	*1*	A+	*<5*	*<10*	*<20*	*<30*	*≥30*
Total Nitrogen (mg/L)	*27.6*	*6*	C	*<5*	*<15*	*<25*	*<30*	*≥30*
NH_4- Nitrogen (mg/L)	*0.04*	*2*	A+	*<1*	*<5*	*<10*	*<20*	*≥20*
Total phosphorus (mg/L)	*2.4*	*0.4*	B	*<1*	*<2*	*<5*	*<7*	*≥7*
Faecal Coliforms (MPN/100mL)	*7,600*	*6,900*	B	*<10*	*<200*	*<10,000*	*<100,000*	*≥100,000*
Energy (kWh/d) (mean)	*1.75*	*0.3*	B	*0*	*<1*	*<2*	*<5*	*≥5*

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A consistent approach across the 3 waters sector