



Works Approval Number	W6224/2019/1
Works Approval Holder	Water Corporation
Registered business address	
File Number	629 Newcastle Street LEEDERVILLE WA 6007 DER2019/000133
Duration	23/12/2019 to 22/12/2024 (5 yrs)
Date of issue	23 December 2019
Prescribed Premises	Category 54 Sewage facility
Premises	Northam Wastewater Treatment Plant Lot 29316 on Deposited Plan 221054 Lot 500, Lot 501 and Lot 502 on Deposited Plan 76392 Legal description - Crown Reserve 25729 Crown Reserve 48146 NORTHAM WA 6401

This Works Approval is granted to the Works Approval Holder, subject to the following conditions, on 23 December 2019 by:

Tracey Hassell

A/MANAGER WASTE INDUSTRIES

REGULATORY SERVICES

an officer delegated under section 20 of the *Environmental Protection Act 1986 (WA)*

Explanatory notes

These explanatory notes do not form part of this Works Approval.

Defined terms

Definition of terms used in this Works Approval can be found at the start of this Works Approval. Terms which are defined have the first letter of each word capitalised throughout this Works Approval.

Department of Water and Environmental Regulation

The Department of Water and Environmental Regulation (DWER) is established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the *Environmental Protection Act 1986 (WA)* (EP Act). The Department also monitors and audits compliance with licences and works approvals, takes enforcement action and develops and implements licensing and industry regulation policy.

Works Approval

Section 52 of the EP Act provides that an occupier of any premises commits an offence if any work is undertaken on, or in relation to, the premises which causes the premises to become, or to become capable of being, Prescribed Premises, except in accordance with a works approval.

Section 56 of the EP Act provides that an occupier of Prescribed Premises commits an offence if Emissions are caused or increased or permitted to be caused or increased, or Waste, noise, odour or electromagnetic radiation is altered or permitted to be altered from Prescribed Premises, except in accordance with a works approval or licence.

Categories of Prescribed Premises are defined in Schedule 1 of the *Environment Protection Regulations 1987 (WA)* (EP Regulations).

This Works Approval does not authorise any activity which may be a breach of the requirements of another statutory authority including, but not limited to, the following:

- conditions imposed by the Minister for Environment under Part IV of the EP Act;
- conditions imposed by DWER for the clearing of native vegetation under Part V, Division 2 of the EP Act;
- any requirements under the *Waste Avoidance and Resource Recovery Act 2007*;
- any requirements under the *Environmental Protection (Controlled Waste) Regulations 2004*; and
- any other requirements specified through State legislation.

It is the responsibility of the Works Approval Holder to ensure that any action or activity referred to in this Works Approval is permitted by, and is carried out in compliance with, statutory requirements.

The Works Approval Holder must comply with the Works Approval. Contravening a Works Approval Condition is an offence under s.55 of the EP Act.

Responsibilities of Works Approval Holder

Separate to the requirements of this Works Approval, general obligations of Works Approval Holders are set out in the EP Act and the regulations made under the EP Act. For example, the Works Approval Holder must comply with the following provisions of the EP Act:

- the duties of an occupier under s.61; and

- restrictions on making certain changes to Prescribed Premises unless the changes are in accordance with a Works Approval, Licence, closure notice or environmental protection notice (s.53).

Strict penalties apply for offences under the EP Act.

Reporting of incidents

The Works Approval Holder has a duty to report to the Department all Discharges of Waste that have caused or are likely to cause Pollution, Material Environmental Harm or Serious Environmental Harm, in accordance with s.72 of the EP Act.

Offences and defences

The EP Act and its regulations set out a number of offences including:

- Offence of emitting an Unreasonable Emission from any Premises under s.49.
- Offence of causing Pollution under s.49.
- Offence of dumping Waste under s.49A.
- Offence of discharging Waste in circumstances likely to cause Pollution under s.50.
- Offence of causing Serious Environmental Harm (s.50A) or Material Environmental Harm (s.50B).
- Offence of causing Emissions which do not comply with prescribed standards (s.51).
- Offences relating to Emissions or Discharges under regulations prescribed under the EP Act, including materials discharged under the *Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)*.
- Offences relating to noise under the *Environmental Protection (Noise) Regulations 1997 (WA)*.

Section 53 of the EP Act provides that a Works Approval Holder commits an offence if Emissions are caused, or altered, from a Prescribed Premises unless done in accordance with a Works Approval, Licence or the requirements of a closure notice or an environmental protection notice.

Defences to certain offences may be available to a Works Approval Holder and these are set out in the EP Act. Section 74A(b)(iii) provides that it is a defence to an offence for causing Pollution, in respect of an Emission, or for causing Serious Environmental Harm or Material Environmental Harm, or for discharging or abandoning Waste in water to which the public has access, if the Works Approval Holder can prove that an Emission or Discharge occurred in accordance with a Works Approval.

This Works Approval specifies the Emissions and Discharges, and the limits and Conditions which must be satisfied in respect of specified Emissions and Discharges, in order for the defence to offence provision to be available.

Authorised Emissions and Discharges

The specified and general Emissions and Discharges from the Works authorised through this Works Approval are authorised to be conducted in accordance with the Conditions of this Works Approval.

Amendment of Works Approval

The Works Approval Holder can apply to amend the Conditions of this Works Approval under s.59 of the EP Act. An application form for this purpose is available from DWER.

The CEO may also amend the Conditions of this Works Approval at any time on the initiative of the CEO without an application being made.

Duration of Works Approval

The Works Approval will remain in force for the duration set out on the first page of this Works Approval or until it is surrendered, suspended or revoked in accordance with s.59A of the EP Act.

Suspension or revocation

The CEO may suspend or revoke this Works Approval in accordance with s.59A of the EP Act.

Definitions and interpretation

Definitions

In this Works Approval, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
Books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 JOONDALUP DC WA 6919 info@dwer.wa.gov.au
Condition	means a condition to which this Works Approval is subject under s.62 of the EP Act.
Commissioning	means the period of testing and adjustment of operation of the plant in order to establish and verify full system functionality.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
Department Request	means a request for Books or other sources of information to be produced, made by an Inspector or the CEO to the Works Approval Holder in writing and sent to the Works Approval's address for notifications, as described at the front of this Works Approval, in relation to: (a) compliance with the EP Act or this Works Approval; (b) the Books or other sources of information maintained in accordance with this Works Approval; or (c) the Books or other sources of information relating to Emissions from the Premises.
Discharge	has the same meaning given to that term under the EP Act.
DWER	Department of Water and Environmental Regulation
Emission	has the same meaning given to that term under the EP Act.
Environmental Harm	has the same meaning given to that term under the EP Act.
EP Act	means the <i>Environmental Protection Act 1986 (WA)</i> .
EP Regulations	means the <i>Environmental Protection Regulations 1987 (WA)</i> .
Implementation Agreement or Decision	has the same meaning given to that term under the EP Act.
Inspector	means an inspector appointed by the CEO in accordance with s.88 of the EP Act.
Material Environmental Harm	has the same meaning given to that term under the EP Act.
PFAS	perfluoroalkyl and polyfluoroalkyl substances
Pollution	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Works Approval applies, as specified at the front of this Works Approval and as shown on the map in Schedule 1 to this Works Approval.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Serious Environmental Harm	has the same meaning given to that term under the EP Act.

Term	Definition
Suitably qualified geotechnical engineer	means a person who: (a) holds a Bachelor of Engineering recognised by the Institute of Engineers; and (b) has a minimum of five years of experience working in a supervisory area of geotechnical engineering; and (c) Is employed by an independent third party external to the Works Approval Holder's business; or is otherwise approved in writing by the CEO to act in this capacity.
Unreasonable Emission	has the same meaning given to that term under the EP Act.
Waste	has the same meaning given to that term under the EP Act.
Works	refers to the Works described in Schedule 2, at the locations shown in Schedule 1 of this Works Approval to be carried out at the Premises, subject to the Conditions.
Works Approval	refers to this document, which evidences the grant of the works approval by the CEO under s.54 of the EP Act, subject to the Conditions.
Works Approval Holder	refers to the occupier of the Premises being the person to whom this Works Approval has been granted, as specified at the front of this Works Approval.

Interpretation

In this Works Approval:

- (a) the words 'including', 'includes' and 'include' will be read as if followed by the words 'without limitation';
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a Condition, each row in a table constitutes a separate Condition;
- (d) any reference to an Australian or other standard, guideline or code of practice in this Works Approval means the version of the standard, guideline or code of practice in force at the time of granting of this Works Approval and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the Works Approval; and
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act.

Conditions

Infrastructure and equipment

1. The Works Approval Holder must install and undertake the Works for the infrastructure and equipment:
 - (a) specified in Column 1; and
 - (b) to the requirements specified in Column 2;
 of Table 2 below.

Table 2: Infrastructure and equipment requirements table

	Column 1	Column 2
Item	Infrastructure	Requirements
1	Sewage treatment system	<ul style="list-style-type: none"> • Designed and constructed to receive and treat a sewage inflow of up to 2,000 m³ per day; and • Designed to accommodate flood events up to the 10% Annual Exceedance Probability (AEP) for a 72 hour rainfall event.
2	Inlet works	<ul style="list-style-type: none"> • To be enclosed for odour containment; and • To contain a Huber rotary screen.
3	Anaerobic Pond	<ul style="list-style-type: none"> • To be constructed to hold a volume of 3,900 m³ located within the Facultative Pond; • To be free of leaks and defects and lined with a concrete liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; and • Embankments constructed to a 2:1 embankment slope.
4	Facultative Pond	<ul style="list-style-type: none"> • Constructed to cover an area of 28,000 m²; • To be free of leaks and defects and lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • The Bituminous Geomembrane liner is to be installed in accordance with the minimum specifications as specified in the manufacturer's specifications; • Contains a 22 m by 34 m anaerobic pot within the pond footprint; • Enables a functioning facultative top layer over the anaerobic pot; • Embankments adequately constructed to provide a freeboard of 500 mm; and • Embankments constructed to a 2:5:1 embankment slope.
5	Maturation Ponds 1, 2, 3	<ul style="list-style-type: none"> • Maturation Pond 1 to cover an area of 13,105 m²; • Maturation Pond 2 to cover an area of 12,665 m²; • Maturation Pond 3 to cover an area of 11,376 m²; • Maturation Pond 3 to include a Modulating Weir Penstock; • To be free of leaks and defects and lined with a clay or geosynthetic liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • If a geosynthetic liner is used, that the liner is installed in accordance with the minimum specifications as specified in Table 7 of Schedule 2; • Embankments adequately constructed to provide a minimum

	Column 1	Column 2
Item	Infrastructure	Requirements
		<p>freeboard of 500 mm per pond; and</p> <ul style="list-style-type: none"> • Embankments constructed to a 3:1 embankment slope.
6	Storage Pond	<ul style="list-style-type: none"> • Constructed to cover an area of 851 m²; • To be free of leaks and defects and lined with a clay liner or geosynthetic liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • If a geosynthetic liner is used that a liner is installed in accordance with the minimum specifications as specified in Table 7 of Schedule 2; • Embankments adequately constructed to provide a freeboard of 500 mm; and • Embankments constructed to a 3:1 embankment slope.
7	Aluminium dosing system	<ul style="list-style-type: none"> • To be installed in pipework downstream of Maturation Pond 3.
8	Cloth media filter	<ul style="list-style-type: none"> • To include an automatic backwash system to return the backwash water to the Geobag Laydown Area.
9	Chlorination system	<ul style="list-style-type: none"> • To be installed in pipework downstream of the Storage Pond, prior to discharge to the Shire Reuse Scheme.
10	UV disinfection system	<ul style="list-style-type: none"> • Modified to receive treated wastewater from the Storage Pond, and treat via UV prior to discharge to the Avon River.
11	Overflow bypass system	<ul style="list-style-type: none"> • For transfer of overflows to bypass the UV system prior to discharge to the Avon River.
12	Geobag laydown area	<ul style="list-style-type: none"> • To be free of leaks and defects and lined with a concrete liner to achieve a permeability of $\leq 1 \times 10^{-9}$ m/sec; and • To include a return drain line for leachate to be directed back to the Facultative Pond.
13	Stormwater management	<ul style="list-style-type: none"> • Site contouring to redirect uncontaminated stormwater away from the pond embankments.

2. The Works Approval Holder must not depart from the requirements specified in Column 2 of Table 2 except:
- where such departure does not increase risks to public health, public amenity or the environment; and
 - all other Conditions in this Works Approval are still satisfied.

3. The Licence Holder must submit a Construction Compliance Document to the CEO following each stage of construction of the works (as per the stages specified in Table 3 or as otherwise agreed with the CEO) and prior to the commissioning as required under Condition 5, that:
- (a) includes a detailed description addressing how each as-constructed item of infrastructure and equipment meets the applicable specifications in Table 2 and, if applicable, Schedule 2 Table 7;
 - (b) includes a description of, and explanation for, any departure from the applicable specifications in Table 2 and, if applicable, Schedule 2 Table 7 including how the departure complies with Condition 2;
 - (c) contains as-constructed plans for the applicable stage of the works;
 - (d) contains photographs of the applicable stage of works to support the descriptions provided under (a);
 - (e) is signed by a person authorised to represent the Licence Holder and contains the printed name and position of that person within the company; and
 - (f) is accompanied by a construction quality assurance report that:
 - i. is written and certified by a suitably qualified geotechnical engineer who has undertaken construction quality assurance on the completed works; and
 - ii. confirms the details of construction requirements reported by the Works Approval Holder under (a) and (b).

Table 3: Stages of construction

Stage of Construction	Infrastructure
Construction Stage 1	Anaerobic Pond Geobag laydown area; Filter Unit Aluminium dosing system
Construction Stage 2	Facultative Pond
Construction Stage 3	Maturation Pond 1
Construction Stage 4	Maturation Ponds 2 and 3
Construction Stage 5	Gas chlorination system
Construction Stage 6	Storage Pond UV disinfection system Stormwater drainage infrastructure

Emissions

4. The Works Approval Holder must not cause any Emissions from the Works authorised through this Works Approval except for specified Emissions and general Emissions described in Column 1 of Table 4, subject to the exclusions, limitations or requirements specified in Column 2, of Table 4.

Table 4: Authorised Emissions table

Column 1	Column 2
Emission type	Exclusions/Limitations/Requirements
Specified Emissions	
Emissions to Land of treated wastewater as per required specifications while commissioning.	Subject to compliance with Condition 7
General Emissions (excluding Specified Emissions)	
Emissions which arise from undertaking the Works set out in Condition 1.	<p>Emissions excluded from General Emissions are:</p> <ul style="list-style-type: none"> • Unreasonable Emissions; or • Emissions that result in, or are likely to result in, Pollution, Material Environmental Harm or Serious Environmental Harm; or • Discharges of Waste in circumstances likely to cause Pollution; or • Emissions that result, or are likely to result in, the Discharge or abandonment of Waste in water to which the public has access; or • Emissions or Discharges which do not comply with an Approved Policy; or • Emissions or Discharges which do not comply with prescribed standard; or • Emissions or Discharges which do not comply with the conditions in an Implementation Agreement or Decision; or • Emissions or Discharges the subject of offences under regulations prescribed under the EP Act, including materials discharged under the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>.

Commissioning

5. The Works Approval Holder must notify the CEO in writing at least one (1) week prior to the commencement of each stage of commissioning.
6. The Works Approval Holder must ensure that each stage of commissioning does not exceed the commissioning period specified in Table 5.

Table 5: Stages of commissioning

Stage of Commissioning	Aspect	Commissioning Period
Commissioning Stage 1	Wastewater Treatment Plant Process Proving Period	3 months
Commissioning Stage 2	Discharges from the Premises, for the purpose of Reuse Scheme irrigation of Northam town ovals	6 weeks (maximum duration of discharge to be received at Northam town ovals).
Commissioning Stage 3	Discharges from the Premises, to the Avon River via land	6 weeks (maximum duration of discharge to be received via land at the Avon River).

7. The Works Approval Holder must undertake the monitoring specified in Table 6 during the relevant stage of commissioning period as specified in Table 5.

Table 6: Monitoring during commissioning

Commissioning Stage	Monitoring location	Parameter	Unit	Frequency	Averaging Period
Stage 1: During commissioning of anaerobic, facultative and maturation ponds	Sampling Point S2	pH ¹	-	Fortnightly	Spot Sample
		Total Dissolved Solids (TDS)	mg/L		
		Total Suspended Solids (TSS)	mg/L		
		BOD ₅	mg/L		
		BOD ₅ filtered	mg/L		
		Total Nitrogen	mg/L		
		Total Phosphorus	mg/L		
		<i>E. coli</i>	cfu/100mL		
Stage 2: During commissioning of Northam Reuse Scheme Stage 3: During commissioning of discharges to the Avon River via land	Sampling Point S3 Sampling Point S4	Volumetric flow (cumulative)	m ³ /day	Continuous	24 hours
		pH ¹	-	Fortnightly	Minimum of 6 Spot Samples
		Total Dissolved Solids (TDS)	mg/L		
		Total Suspended Solids (TSS)	mg/L		
		BOD ₅	mg/L		
		BOD ₅ filtered	mg/L		
		Total Nitrogen	mg/L		
		Total Phosphorus	mg/L		
		<i>E. coli</i>	cfu/100mL		
		Helminths and Nematodes	ova/L		
		Total Chlorine	mg/L ²		

Note 1: In-field, non-NATA accredited analysis permitted

Note 2: Guidelines for the Non-Potable Uses of Recycled Water in Western Australia (Department of Health, 2011)

8. The Works Approval Holder shall ensure that:
 - (a) all wastewater sampling is conducted in accordance with AS/NZS5667.1 and AS/NZS5667.10;
 - (b) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table;
9. The Works Approval Holder shall submit a Commissioning Report to the CEO within one (1) month of the completion of each stage of commissioning as outlined in Table 5, which shall include:
 - (a) a summary of the monitoring results recorded under Condition 7;
 - (b) the original monitoring reports submitted to the Works Approval Holder from third parties during each stage of commissioning;
 - (c) a review of performance against the Works Approval Conditions; and
 - (d) where they have not been met, measures proposed to meet the design specification and/or Works Approval Conditions, together with a timescale for implementing the proposed measures.

Record-keeping

10. The Works Approval Holder must maintain accurate Books including information, reports and data in relation to the Works, and the Books must:
 - (a) be legible;
 - (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
 - (c) be retained for at least 3 years from the date the Books were made;
 - (d) be available to be produced to an Inspector or the CEO.
11. The Works Approval Holder must comply with a Department Request within 14 days from the date of the Department Request or such other period as agreed to by the Inspector or the CEO.

Schedule 1: Maps

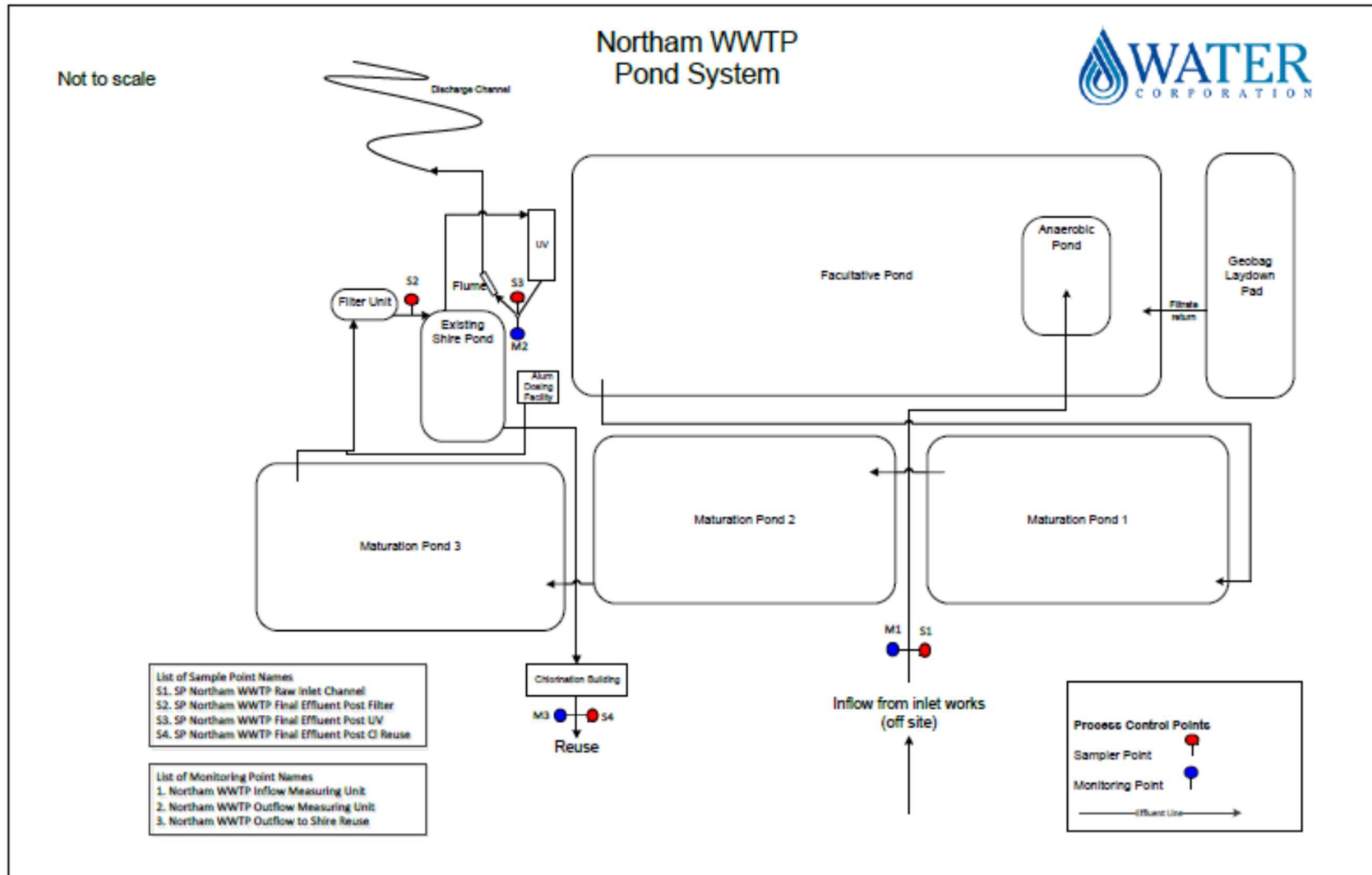
Premises map

The Premises are shown in the map below.



Flow diagram

Proposed altered process control schematic and monitoring locations.



Schedule 2 – Minimum specification for geomembrane installation

The construction works and requirements described in the following table are required to be completed on the occasion that geosynthetic liner material is used for Maturation Ponds 1, 2, and 3 and storage pond construction in accordance with Condition 1.

Table 7: Geomembrane installation requirements

	Infrastructure or Equipment	Requirements (design and construction)
1	Site preparation	<ul style="list-style-type: none"> Excavation of all unsuitable materials to a minimum depth of -300 mm from final surface level (FSL) to form a suitable subgrade, and replace with engineered fill material, moisture condition and compact to Standard Maximum Dry Density (SMDD) of 95% and Optimum Moisture Content (OMC) of -2% to +2% in 250 mm layers to FSL; If suitable material (meeting requirements for engineered fill material) exists in the cell footprint, the material shall be excavated to -250 mm of FSL, ripped and treated as per engineered fill material for moisture conditions and compaction requirements; Cut internal batters to be 3:1 (H:V); and Proof roll entire footprint including cell floor and embankments.
2	Geosynthetic liner	<ul style="list-style-type: none"> To extend over the entire pond base and up the side embankments; To be 2 mm thick, single-sided, textured, overlaying the subbase; To be supplied, tested and inspected to confirm the following: <ul style="list-style-type: none"> Resin source and manufacturer; Thickness; Standard Oxidative Induction Time (Std-OIT); High Pressure Oxidative Induction Time (HP-OIT); and Environmental Stress Crack Resistance; Shall be free of holes, blisters, blemishes, striations, bubble, roughness, contaminants and permanently attached raw materials; and Internal ballast shall be installed, if required prior to filling, at the toe of the internal embankment and across the centre of each pond floor.
3	Anchor trenches	<ul style="list-style-type: none"> To be set back 1.0 m from the crest of the perimeter embankment, cell edge bunds and interim cell edge bunds; and To be backfilled with engineered fill while liner materials are in the relaxed state, in full contact with subgrade and without wrinkles or folds.
4	Quality Assurance and Quality Control	<p>Construction and installation performance shall be measured by the following specifications:</p> <ul style="list-style-type: none"> Construction requirements (as specified by Condition 1 and this table); General requirements (as specified by the Application); Manufacturer requirements (as specified by the supplier of the geosynthetic material); Conformance testing – to show materials meet the following minimum requirements (assumed textures geomembrane will be used);

	Infrastructure or Equipment	Requirements (design and construction)				
		Property	Units	Value	Test	Testing frequency
Thickness (average)	mm	2.0	ASTM D 5994	One for every two rolls		
Minimum thickness	Mm	>1.80	ASTM D 5994			
Density (minimum)	g/cm ³	≥0.94	ASTM D 1505 or ASTM D 792	One per 3000 m ²		
Asperity Height	mm	>0.40	ASTM D 7466	Two samples		
Melt flow index	g/10 min	<1.0	ASTM D 1238	Review of manufacturer quality data		
Tensile properties in each direction - strength at break - strength at yield - elongation at break - elongation at yield	N/mm N/mm % %	≥21 >29 >100 >12	ASTM D 6693	One per 3000 m ²		
Puncture resistance	N	≥535	ASTM D 4833			
Tear resistance	N	>250	ASTM D 1004			
Carbon black - content - dispersion	% Rating	2-3 100% Cat 1	ASTM D 5596			
Oxidative Induction Time - standard - high pressure	Min Min	≥100 ≥400	ASTM D 3895 ASTM D 5885	One per resin type or manufacturing run per geomembrane type		
Oven Aging at 85 deg C - standard - high pressure	% retained after 90 days	≥55 ≥80	ASTM D 5721 ASTM D 5885	Review of manufacturer quality data		
Env. Tensile Load Crack resistance	Hr	>500	ASTM D 5397	One per resin type or manufacturing run per geomembrane type		

	Infrastructure or Equipment	Requirements (design and construction)
		<ul style="list-style-type: none"> • Quality Control Procedures; • Reports and Certificates – including: <ul style="list-style-type: none"> ○ Manufacturer and supplier certifications • Reporting requirements; • Testing requirements; • Construction Quality Assurance (CQA) procedures; • Inspection and Monitoring requirements; • Hold point requirements; • Geosynthetics Inspection and Monitoring requirements; and • Performance Indicators.