Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6910/2024/1
Works approval holder	Water Corporation
Registered business address	629 Newcastle Street Leederville WA 6007
DWER file number	DER2024/000093 and INS-0002809
Duration	26/08/2025 to 25/08/2030
Date of issue	26/08/2025
Premises details	Northam Water Resource Recovery Facility 3 – 5 Colebatch Street Burlong WA 6401 Legal description - Lot 29316 on Deposited Plan 221054 Certificate of Title Volume LR3158 Folio 495; Lot 500 and Lot 501 on Deposited Plan 76392 Certificate of Title Volume LR3165 Folios 372 and 373 As defined by the coordinates in Schedule 2

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed design capacity**
Sewage facility: premises — (a) on which sewage is treated (excluding septic tanks); or (b) from which treated sewage is discharged onto land or into waters.	2,000 m^3 per day

This works approval is granted to the works approval holder, subject to the attached conditions, on 26 August 2025, by:

Abbie Crawford

Digitally signed by Abbie Crawford
Date: 2025.08.26 15:14:25 +08'00'

Abbie Crawford
MANAGER, WASTE INDUSTRIES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
26/08/2025	W6910/2024/1	Works approval granted

Interpretation

In this works approval:

(a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;

(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:

(i) if dated, refers to that particular version; and

(ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

Construction phase

Infrastructure and equipment

1. The works approval holder must:

(a) construct, install and/or decommission the infrastructure and/or equipment;

(b) in accordance with the corresponding design, construction and decommissioning requirements; and

(c) at the corresponding infrastructure location,

as set out in Table 1.

Table 1: Design, construction and decommissioning requirements

	Infrastructure and equipment	Design, construction and decommissioning requirements	Infrastructure location
1.	All infrastructure and equipment upgrade works	(a) Must be constructed and installed according to the specifications in Figures 2 to 5; (b) Must be designed and installed to treat up to 2,000 m^3 of sewage per day to the following criteria: (i) TN: < 8 mg/L; (ii) TP: < 1 mg/L; (iii) BOD: < 20 mg/L; and (iv) TSS: < 20 mg/L; (c) Must be designed and installed to dispose of up to 1,900 m^3 of treated sewage per day without discharging to the ODA in December, January and February of each year; (d) Stormwater runoff must be prevented from entering all containment, treatment, storage and conveyance infrastructure; and (e) All containment, treatment, storage and conveyance infrastructure must be impermeable, unless designed to infiltrate, and be free of leaks and defects.	Figure 2
2.	Remote process control, monitoring and telemetry system	(a) A process control, monitoring and telemetry system must be installed that: (i) allows remote operation and monitoring of the treatment process; (ii) includes level sensors in all treatment infrastructure; and (iii) notifies the operator of high water levels, insufficient aeration, pump failures and other failures.	N/A

	Infrastructure and equipment	Design, construction and decommissioning requirements	Infrastructure location
3.	Flowmeters	(a) Flowmeters must be installed at the following locations: (i) at a suitable location upstream of the secondary treatment process to record all reticulated sewage and tankered waste inputs to the premises; (ii) at a suitable location to record the volume of treated sewage outputting from the ODA to the Avon River as surface flow; and (iii) at the equivalent locations to those shown schematically in Figure 5.	In accordance with the corresponding design, construction and decommissioning requirements
Primary Treatment Site			
4.	Tanker receival facility	(a) In accordance with the critical containment infrastructure requirements specified in condition 2.	New tanker receival facility as shown in Figure 3
5.	Inlet screens (x2) and conveyors		New inlet works as shown in Figure 3
6.	De-gritter		
7.	Grit classifier		
8.	Grit and screening storage		
9.	Sludge drying beds (x4)	(a) Must remain in an operational state until the upgraded treatment facilities have been constructed and commissioned; and (b) One sludge drying bed must be retained following decommissioning.	As shown in Figure 3
10.	Detritus channel	(a) Must remain in an operational state until the upgraded treatment facilities have been constructed and commissioned.	As shown in Figure 3
11.	Primary sedimentation tanks (x2)		Sedimentation tanks as shown in Figure 3
12.	Anaerobic sludge digestors (x3)		Sludge digesters as shown in Figure 3
13.	Holding bays (x3)	(a) Must remain in an operational state until the upgraded treatment facilities have been constructed and commissioned; and (b) One holding bay must be retained following decommissioning.	Storage bins and washdown slab as shown in Figure 3

	Infrastructure and equipment	Design, construction and decommissioning requirements	Infrastructure location
Secondary Treatment Site			
14.	Secondary Treatment Pond 3 (existing)	(a) Prior to decommissioning or the undertaking of earthworks to install the oxidation ditch, the works approval holder must: (i) Cease all inflow to the pond and divert that flow to secondary treatment ponds 1, 2 and 4; and (ii) Drain, dry or otherwise remove all liquid and sludge from within the pond.	As shown in Figure 4
15.	Bioselector	(a) In accordance with the critical containment infrastructure requirements specified in condition 2.	As shown in Figure 4
16.	Oxidation ditch		As shown in Figure 4
17.	Secondary clarifier		As shown in Figure 4
18.	Return activated sludge (RAS) pump station		RAS pump station as shown in Figure 4
19.	Waste activated sludge pump station		As shown in Figure 4
20.	Sludge dewatering beds		Sludge drying beds as shown in Figure 4
21.	Aluminium sulfate storage and dosing system	(a) A new aluminium sulfate storage and dosing system must be installed with a connection to the bioselector; (b) Must be provided with compacted earthen bunding with sufficient capacity to contain a 72 hr duration 20% annual exceedance probability (AEP) stormwater event; and (c) The existing aluminium sulfate storage and dosing system must remain operational and not commence decommissioning until the new system is constructed.	Alum dosing as shown in Figure 4
22.	Infiltration pond 1 (existing polishing pond 4)	(a) Sewage inflows during construction of the oxidation ditch must be diverted to and treated within existing ponds 1, 2 and 4; (b) The ponds must remain in an operational state until the oxidation ditch has been constructed and commissioning has progressed to a stage that current inflows are capable of being treated through the	As shown in Figure 4
23.	Infiltration pond 2 (existing secondary treatment pond 2)		As shown in Figure 4

	Infrastructure and equipment	Design, construction and decommissioning requirements	Infrastructure location
24.	Infiltration pond 3 (existing secondary treatment pond 1)	oxidation ditch; (c) The ponds must be drained, dried and have all liquid and sludge removed, prior to converting the ponds to infiltration ponds; (d) The existing clay liners must be entirely removed so that in-situ residual soils are exposed across the entire base and side walls of the ponds; (e) Following removal of the liners, the floor and side walls of the ponds must be inspected by an experienced and suitably qualified geotechnical engineer to: (i) ensure that all liner material is removed and in-situ soils are fully exposed; and (ii) log the residual soil types occurring across the ponds; (f) The base of the infiltration ponds must have a separation distance of more than 2 metres from the seasonal highest level of groundwater; and (g) The floor of each infiltration pond must be scarified following confirmation that the clay liner has been fully removed.	As shown in Figure 4
25.	UV disinfection facility	(a) Must be upgraded to disinfect up to 2,000 m^3 of treated sewage per day to a pathogen indicator level of less than 1,000 cfu/100 mL *Escherichia coli*, prior to discharge.	Existing UV facility as shown in Figure 4
26.	Chlorination facility	(a) Must be upgraded to disinfect up to 2,000 m^3 of treated sewage per day prior to discharge.	Chlorination building as shown in Figure 4

2. The works approval holder must:

(a) construct the critical containment infrastructure;

(b) in accordance with the corresponding design and construction requirements; and

(c) at the corresponding infrastructure location,

as set out in Table 2.

Table 2: Critical containment infrastructure design and construction requirements

	Infrastructure	Design, construction and decommissioning requirements	Infrastructure location
1.	All critical containment infrastructure upgrade works	(a) Must be constructed and installed according to the specifications in Figures 2 to 5; (b) Must be designed and constructed to treat sewage inflows of up to 2,000 m^3 per day; (c) Stormwater runoff must be prevented from entering all containment infrastructure; and (d) All containment infrastructure must be impermeable and free of leaks and defects.	Figure 2
Primary Treatment Site			
2.	Tanker receival facility	(a) Must be constructed so that waste received at the facility is input to the treatment system prior to the inlet works.	New tanker receival facility as shown in Figure 3
3.	Inlet screens (x2) and conveyors	(a) Two screens must be installed in a duty/standby arrangement; (b) Must be sufficiently designed and installed to handle a peak flow of up to 86 L/s; (c) Conveyors must be arranged so that removed screenings are deposited in the grit and screening storage bins.	New inlet works as shown in Figure 3
4.	De-gritter	(a) Must be installed downstream of the inlet screens to remove grit sized particles from sewage inflows prior to secondary treatment; (b) Must be sufficiently designed and installed to handle a peak flow of up to 86 L/s; and (c) A connecting pipeline must be installed to convey screened and de-gritted sewage to the bioselector located on the Secondary Treatment Site.	
5.	Grit classifier	(a) Must be installed downstream of the de-gritter to receive removed grit; and (b) Must be capable of separating inorganic material from organic material.	
6.	Grit and screening storage	(a) Impermeable storage bins must be provided for containment of removed grit and screenings; and (b) The grit and screening storage area must comprise a bunded hardstand or hardstand area graded to a catch pit or sump to retain any spills, overflows or contaminated stormwater.	

	Infrastructure	Design, construction and decommissioning requirements	Infrastructure location
Secondary Treatment Site			
7.	Bioselector	(b) Must be impermeable and constructed from reinforced concrete; (c) Must be sufficiently designed and installed to handle a peak flow of up to 86 L/s; (d) Must be connected to the return activated sludge pumps so that activated sludge can be input and mixed with sewage to form a mixed liquor; and (e) Must be connected to an aluminum sulfate dosing unit to provide additional phosphorus removal capability when required.	As shown in Figure 4
8.	Oxidation ditch	(a) Must be designed and installed to contain and sufficiently aerate sewage inflow volumes of up to 2,000 m^3/day and peak flow volumes up to 86 L/s; and (b) Must be impermeable and constructed from reinforced concrete; and (c) Must be connected to the bioselector to receive mixed liquor for aeration.	As shown in Figure 4
9.	Secondary clarifier	(a) Must be impermeable and constructed from reinforced concrete; (b) Must be connected to the oxidation ditch to receive oxygenated mixed liquor for settling; (c) Must include a sludge scraper, skimmer, weir, scum collector and spray wash system; and (d) Must be installed so that sludge removed by the clarifier outputs to the return activated sludge pump.	As shown in Figure 4
10.	Return activated sludge (RAS) pump station	(a) Must be installed to receive sludge from the secondary clarifier for pumping to the bioselector; and (b) Must comprise duty/standby sludge pumps and associated transfer pipelines.	RAS pump station as shown in Figure 4
11.	Waste activated sludge pump station	(a) Must be installed to receive waste sludge from the oxidation ditch and scum from the secondary clarifier for pumping to the sludge drying beds; and (b) Must comprise duty/standby sludge pumps and associated transfer pipelines.	As shown in Figure 4
12.	Sludge drying beds	(a) Must comprise a bunded hardstand or hardstand area graded to a catch pit or sump to retain any spills, overflows or contaminated stormwater; and (b) Must be provided with pipework to return sludge leachate to the oxidation ditch for treatment.	As shown in Figure 4

Environmental compliance reporting

3. The works approval holder must within 90 calendar days of all items of infrastructure or equipment required by condition 1 being constructed and/or installed:

(a) undertake an audit of their compliance with the requirements of condition 1; and

(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

4. The Environmental Compliance Report required by condition 3, must include as a minimum the following:

(a) certification by a suitably qualified engineer that the items of infrastructure or components thereof, as specified in condition 1, have been constructed in accordance with the relevant requirements specified in condition 1;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 1;

(c) logs of the residual soil type present at the infiltration pond locations; and

(d) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

5. The works approval holder must within 90 calendar days of the Critical Containment Infrastructure identified by condition 2 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 2; and

(b) prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.

6. The Critical Containment Infrastructure Report required by condition 5 must include as a minimum the following:

(a) certification by a suitably qualified engineer that each item of critical containment infrastructure or component thereof, as specified in condition 2, has been built and installed in accordance with the requirements specified in condition 2;

(b) as constructed plans and a detailed site plan showing the location and dimensions for each item of critical containment infrastructure or component thereof, as specified in condition 2;

(c) photographic evidence of the installation of the infrastructure; and

(d) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Environmental commissioning phase

Environmental commissioning commencement, duration and requirements

7. The works approval holder may only commence environmental commissioning:

(a) for an item of infrastructure listed in condition 1, once the Environmental Compliance Report as required by condition 3 has been submitted by the works approval holder for that item of infrastructure; and

(b) for an item of critical containment infrastructure listed in condition 2:

(i) once the Critical Containment Infrastructure Report as required by condition 5 has been submitted by the works approval holder for that item of infrastructure; and

(ii) the CEO has notified the works approval holder that the Critical Containment Infrastructure Report as required by condition 5 for that item of infrastructure meets the requirements of that condition; or

(iii) where at least 15 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 5 has been submitted to the CEO.

8. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 3 may only be carried out:

(a) in accordance with the corresponding commissioning requirements; and

(b) for the corresponding authorised commissioning duration

Table 3: Environmental commissioning requirements

Infrastructure	Commissioning requirements	Authorised commissioning duration
Tanker receival facility	The existing treatment process must remain operational until commissioning has progressed to a stage that current inflows are capable of being treated through the oxidation ditch.	For a period not exceeding 126 calendar days in aggregate
Inlet screens (x2) and conveyors		
De-gritter		
Grit classifier		
Grit and screening storage		
Bioselector		
Oxidation ditch		
Secondary clarifier		
Return activated sludge pump station		
Waste activated sludge pump station		
Sludge dewatering beds		
Aluminium sulfate storage and dosing system		
Infiltration pond 1		
Infiltration pond 2		
Infiltration pond 3		
UV disinfection facility		
Chlorination facility		

9. During environmental commissioning, the works approval holder must ensure that the emissions specified in Table 4 are discharged only from the corresponding discharge points and only at the corresponding discharge point locations.

Table 4: Authorised discharge points during environmental commissioning

	Emission	Discharge point	Discharge point location
1.	Treated sewage	Treated water pump station directed to Clarke St tank	As shown in Figure 4
2.		Infiltration pond 1	As shown in Figure 4
3.		Infiltration pond 2	
4.		Infiltration pond 3	
5.		Flume outflow to ODA and Avon River	Existing discharge flume as shown in Figure 6

10. During environmental commissioning, the works approval holder must ensure that the emissions from the discharge point listed in Table 5 do not exceed the corresponding limits when monitored in accordance with condition 11.

Table 5: Emission and discharge limits during environmental commissioning

	Discharge point	Parameter	Limit
1.	Infiltration pond 1	Total phosphorus	1 mg/L
2.	Infiltration pond 2		
3.	Infiltration pond 3		
4.	Flume outflow to ODA and Avon River		
		E. coli	< 1000 cfu/100mL

Monitoring during environmental commissioning

11. The works approval holder must:

(a) monitor emissions during environmental commissioning in accordance with Table 6; and

(b) record the results of all monitoring activity required by condition 11(a).

Table 6: Emissions and discharge monitoring during environmental commissioning

Monitoring location	Parameter	Unit	Frequency	Method
Field measurements				
SST SP (as shown in Figure 7)	pH[1]	-	Fortnightly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
	EC[1]	µS/cm	Monthly	
	Redox potential[1]	Eh		
Water quality parameters				
SST SP (as shown in Figure 7)	TN	mg/L	Fortnightly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
	TKN			
	NO_3 + NO_2 -N			
	NH_4 -N			
	NO_3 -N			
	NO_2 -N			
	TP			
	Reactive P as P			
	Surfactants			
	BOD_5			
	TSS			
	TDS			
Major ions				
SST SP (as shown in Figure 7)	<u>Cations</u> Ca, Mg, K, Na	mg/L	Quarterly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
	<u>Anions</u> HCO_3, Cl, SO_4			

Metals and metalloids				
SST SP (as shown in Figure 7)	Al, As, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, V and Zn	mg/L	Quarterly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
Pathogens				
Post-UV Wet Well SP when discharging to the ODA Post-chlorination SP when discharging to Shire of Northam reuse scheme (as shown in Figure 7)	*E. coli*	cfu/100mL	Fortnightly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10

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

Environmental commissioning reporting

12. The works approval holder must submit to the CEO an Environmental Commissioning Report within 90 calendar days of the completion date of environmental commissioning for each item of infrastructure specified in conditions 1 and 2.

13. The works approval holder must ensure the Environmental Commissioning Report required by condition 12 includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes and amount of sewage inflows and discharges;

(b) the discharge monitoring results recorded in accordance with condition 11;

(c) a summary of the environmental performance of each item of infrastructure or equipment as constructed or installed, which at minimum includes records detailing the:

(i) leak testing of containment, treatment, storage and conveyance infrastructure;

(ii) environmental commissioning of the upgraded sewage treatment system to achieve the design treatment and disinfection quality parameters for treated sewage; and

(iii) commissioning of the process control system;

(d) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(e) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operations phase

Time limited operations commencement, duration and requirements

14. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 1:

(a) where the item of infrastructure is not authorised to undertake environmental commissioning, the Environmental Compliance Report as required by condition 3 has been submitted by the works approval holder for that item of infrastructure; and

(b) where the item of infrastructure is authorised to undertake environmental commissioning under condition 8, the Environmental Commissioning Report for that item of infrastructure as required by condition 12 has been submitted by the works approval holder.

15. The works approval holder may only commence time limited operations for an item of critical containment infrastructure identified in condition 2:

(a) where the infrastructure does require commissioning, the Environmental Commissioning Report for that item of infrastructure as required by condition 12 has been submitted to the CEO; and

(b) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 5 meets the requirements of that condition; or

(c) where at least 15 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 5 has been submitted to the CEO.

16. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 17:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 14 or 15 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 16(a).

17. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 7 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirements set out in Table 7.

Table 7: Infrastructure and equipment requirements during time limited operations

	Infrastructure and equipment	Operational requirements	Infrastructure location
1.	All infrastructure and equipment	(a) Must be operated below the maximum treatment capacity of 2,000 m^3 per day and maintained to receive, treat and dispose of a sewage inflow of up to 1,900 m^3 per day; (b) Stormwater runoff must be prevented from entering all containment, treatment, storage and conveyance infrastructure;	Figure 1 and Figure 2

	Infrastructure and equipment	Operational requirements	Infrastructure location
		(c) All containment, treatment, storage and conveyance infrastructure must be impermeable and free from leaks and defects; and (d) All containment, treatment and storage infrastructure must be managed to prevent overflow or overtopping.	
2.	Remote process control, monitoring and telemetry system	(a) Functioning sensors and telemetry are maintained in all treatment infrastructure that allows remote operation and monitoring of the treatment process and notifies the operator of high water levels, insufficient aeration, pump failures and other failures.	N/A
3.	Flowmeters	(a) Flowmeters must be maintained at the following locations: (i) a suitable location upstream of the secondary treatment process to record all reticulated sewage and tankered waste inputs to the premises; (ii) a suitable location to record treated sewage outputting from the ODA to the Avon River; and (iii) at the equivalent locations to those shown schematically in Figure 5.	In accordance with the operational requirements
Primary Treatment Site			
4.	Tanker receival facility	(a) Waste received at the facility must be input to the treatment system prior to the inlet screens.	New tanker receival facility as shown in Figure 3
5.	Inlet screens (x2) and conveyors	(a) Removed stones, grit and screenings must be directed to the grit and screening storage bins for containment; and (b) Two inlet screens must be maintained in a duty/standby arrangement to ensure there is redundant infrastructure available in the case of failure.	New inlet works as shown in Figure 3
6.	De-gritter		
7.	Grit classifier		
8.	Grit and screening storage	(a) Grit and screening storage bins must be maintained free from leaks and defects; and (b) Any spills, overflows or contaminated stormwater must be retained and returned to the treatment process.	
Secondary Treatment Site			
9.	Bioselector	(a) Must be connected to the return activated sludge pumps so that activated sludge can be input and mixed with sewage to form a mixed liquor; and (b) Must be connected to the aluminum sulfate dosing unit to provide additional phosphorus removal capability when required.	As shown in Figure 4

	Infrastructure and equipment	Operational requirements	Infrastructure location
10.	Oxidation ditch	(a) Activated sludge that is surplus to the requirements of the treatment process must be removed from the oxidation ditch to the sludge dewatering beds.	As shown in Figure 4
11.	Secondary clarifier	(a) Clarified sludge must be removed from the clarifier for reuse; and (b) Floating solids must be removed from the clarifier to the sludge dewatering beds as waste.	As shown in Figure 4
12.	Return activated sludge (RAS) pump station	(a) Return activated sludge must be output to the start or end of the bioselector process.	RAS pump station as shown in Figure 4
13.	Waste activated sludge pump station	(a) Waste activated sludge must be collected from the oxidation ditch and pumped together with clarifier scum to the sludge drying beds for dewatering.	As shown in Figure 4
14.	Sludge dewatering beds	(a) Any leachate, spills or contaminated stormwater must be retained and returned to the treatment process.	Sludge drying beds as shown in Figure 4
15.	Aluminium sulfate storage and dosing system	(a) Compacted earthen bunding must be maintained with sufficient capacity to contain a 72 hr duration 20% annual exceedance probability (AEP) stormwater event.	Alum dosing as shown in Figure 4
16.	Infiltration pond 1	(a) A freeboard height equal to or greater than 500 mm must be maintained; and (b) Sufficient capacity must be available in the ponds prior to December in each year, so that all discharges to the ODA can be ceased in December, January and February; and (c) Vegetation, emergent or otherwise, must be prevented from growing in the pond liquids, pond floor or on the inner pond embankments.	As shown in Figure 4
17.	Infiltration pond 2		
18.	Infiltration pond 3		
19.	UV disinfection facility	(a) Must provide sufficient dosage and contact time to disinfect treated sewage to a pathogen indicator level of less than 1,000 cfu/100 mL *E. coli*, prior to discharge.	Existing UV facility as shown in Figure 4
20.	Chlorination facility	(a) Must provide sufficient dosage and contact time of chlorine gas to disinfect treated sewage prior to discharge.	Chlorination building as shown in Figure 4

18. During time limited operations, the works approval holder must only accept onto the premises waste of a waste type, which does not exceed the corresponding rate at which waste is received, and which meets the corresponding acceptance specification set out in Table 8.

Table 8: Waste acceptance during time limited operations

Waste type	Rate at which waste is received	Acceptance specification
Sewage	1,900 m^3 per day	(a) Accepted through sewer inflows or tankered onto the premises and discharged into the tanker receival facility only; (b) Tankered sewage volumes must be less than 100 tonnes per annual period

19. During time limited operations, the works approval holder must ensure that the waste types specified in Table 9 are only subjected to the corresponding processes, process limits and/or specifications.

Table 9: Waste processing

Waste type	Processes	Process limits and/or specifications
Sewage	Physical, chemical and biological treatment	(a) Sewage must be treated to the following final effluent criteria: (i) TN: < 8 mg/L; (ii) TP: < 1 mg/L; (iii) BOD: < 20 mg/L; and (iv) TSS: < 20 mg/L.
Sewage sludge	Reuse or dewatering, drying and storage prior to off-site disposal	(a) Reuse of sewage sludge in the treatment process must be prioritised so that sludge is only removed as waste where it is surplus to the requirements of the treatment process or is otherwise unsuitable; (b) Excess activated sludge removed from the process, as waste, must be contained, dewatered and temporarily stored in the sludge drying beds; and (c) Sludge leachate must be returned to the treatment process; and (d) Dried sludge must be removed offsite to an appropriately authorised facility.
Grit and screenings	Physical removal and storage prior to off-site disposal	(a) Removed material must be stored in impermeable storage bins located above a catch pit or sump; (b) Removed material must be stored on the premises for no more than 2 weeks prior to offsite disposal; and (c) Removed material must only be disposed offsite to an appropriately authorised facility.
Treated sewage	Disinfection and disposal via discharge to infiltration ponds, irrigation and/or the ODA	(a) Must be disinfected using the chlorination facility prior to supply to the Clarke St tank; (b) Must be disinfected using the UV disinfection facility prior to discharge to the ODA; (c) Must not be discharged to the ODA in December, January and February; and (d) Discharge to the ODA must only occur where: (i) treated sewage volumes are surplus to the requirements of the Shire of Northam reuse scheme; and (ii) the infiltration ponds are currently at capacity or being actively managed to provide sufficient capacity during December, January and February when discharge to the ODA is not authorised.

Time limited operations emissions and discharges

20. During time limited operations, the works approval holder must ensure that the emissions specified in Table 10, are discharged only from the corresponding discharge points and only at the corresponding discharge point locations.

Table 10: Authorised discharge points during time limited operations

	Emission	Discharge point	Discharge point location
1.	Treated sewage	Treated water pump station directed to Clarke St tank	As shown in Figure 4
2.		Infiltration pond 1	As shown in Figure 4
3.		Infiltration pond 2	
4.		Infiltration pond 3	
5.		Flume outflow to ODA and Avon River	Existing discharge flume as shown in Figure 4

21. During time limited operations, the works approval holder must ensure that the emissions from the discharge point listed in Table 11 do not exceed the corresponding limits when monitored in accordance with condition 22.

Table 11: Emission and discharge limits during time limited operations

	Discharge point	Parameter	Limit
1.	Infiltration pond 1	Total phosphorus	1 mg/L
2.	Infiltration pond 2		
3.	Infiltration pond 3		
4.	Flume outflow to ODA and Avon River		
		E. coli	< 1000 cfu/100mL

Monitoring during time limited operations

22. The works approval holder must:

(a) monitor emissions during time limited operations in accordance with Table 12; and

(b) record the results of all monitoring activity required by condition 22(a).

Table 12: Emissions and discharge monitoring during time limited operations

Monitoring location	Parameter	Unit	Frequency	Method
Field measurements				
SST SP (as shown in Figure 7)	pH[1]	-	Monthly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
	EC[1]	µS/cm	Quarterly	
	Redox potential[1]	Eh		
Water quality parameters				
SST SP (as shown in Figure 7)	TN	mg/L	Monthly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
	TKN			
	NO_3 + NO_2 -N			
	NH_4 -N			
	NO_3 -N			
	NO_2 -N			
	TP			
	Reactive P as P			
	Surfactants			
	BOD_5			
	TSS			
	TDS			
Major ions				
SST SP (as shown in Figure 7)	<u>Cations</u> Ca, Mg, K, Na	mg/L	Quarterly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
	<u>Anions</u> HCO_3, Cl, SO_4			

Monitoring location	Parameter	Unit	Frequency	Method
Metals and metalloids				
SST SP (as shown in Figure 7)	Al, As, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, V and Zn	mg/L	Quarterly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10
Pathogens				
Post-UV Wet Well SP when discharging to the ODA Post-chlorination SP when discharging to Shire of Northam reuse scheme (as shown in Figure 7)	*E. coli* [2]	cfu/100mL	Monthly	Spot sample in accordance with AS/NZS 5667.1 and AS/NZS 5667.10

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

23. During time limited operations, the works approval holder must undertake the monitoring of inputs and outputs in accordance with Table 13.

Table 13: Monitoring of inputs and outputs

Input/Output	Monitoring Point	Parameter	Unit	Averaging period	Frequency
Sewage	Inflow measuring unit	Volumetric flow rate (cumulative)	m^3/day	Monthly	Continuous
Sewage (tankered)	N/A	Weight	tonnes	N/A	Per load
Treated sewage	Outflow to Shire reuse	Volumetric flow rate (cumulative)	m^3/day	Monthly	Continuous
	Outflow to infiltration ponds				
	Flume discharge to ODA				
	Culvert discharge from ODA to Avon River				
Sludge	N/A	Weight	tonnes	N/A	Each load removed from the premises

Time limited operations reporting

24. The works approval holder must submit to the CEO a report on the time limited operations within 60 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is the sooner.

25. The works approval holder must ensure the report required by condition 24 includes the following:

(a) a summary of the time limited operations, including timeframes and amount of sewage inputs and outputs recorded under the requirements of condition 23;

(b) a summary of monitoring parameter results obtained during time limited operations under condition 22.

(c) a summary of the environmental performance of all infrastructure as constructed or installed, which includes records detailing the treated sewage quality consistently achieved by the treatment process;

(d) a review of performance and compliance against the conditions of the works approval and the Environmental Commissioning Report; and

(e) where the manufacturer's design specifications and the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

26. The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.

27. The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:

(a) the works conducted in accordance with conditions 1 and 2;

(b) any maintenance of infrastructure that is performed in the course of complying with conditions 1, 2, 8 and 17;

(c) monitoring programs undertaken in accordance with conditions 11, 22 and 23; and

(d) complaints received under condition 26.

28. The books specified under condition 27 must:

(a) be legible;

(b) if amended, be amended in such a way that the original versions and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the works approval holder for the duration of the works approval; and

(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 14 have the meanings defined.

Table 14: Definitions

Term	Definition
Al	aluminium
annual period	a 12 month period commencing from 1 July until 30 June of the immediately following year.
As	arsenic
AS/NZS 5667.1	means the Australian Standard *AS/NZS 5667.1 Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*.
AS/NZS 5667.10	means the Australian Standard *AS/NZS 5667.10 Water Quality – Sampling – Guidance on sampling of waste waters*.
BOD_5	5-day biochemical oxygen demand
books	has the same meaning given to that term under the EP Act.
Ca	calcium
Cd	cadmium
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
Cl	chloride
Co	cobalt
Cr	chromium
Cu	copper
critical containment infrastructure	means the items of infrastructure listed in condition 2.
Critical Containment Infrastructure Report	means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with the works approval.
Department	means the department 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 EP Act.
discharge	has the same meaning given to that term under the EP Act.
E. coli	*Escherichia coli*
EC	electrical conductivity
emission	has the same meaning given to that term under the EP Act.
environmental commissioning	means the sequence of activities to be undertaken to test equipment integrity and operation, or to determine the environmental performance, of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.

Term	Definition
Environmental Commissioning Report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
Fe	iron
Fortnightly monitoring	monitoring is undertaken in each fortnightly period such that there are at least 5 days in between the days on which samples are taken in successive months.
HCO_3	bicarbonate
Hg	mercury
impermeable	means less than or equivalent to the seepage loss through a 300 mm thick clay liner with a coefficient of permeability of less than 1 x 10^{-9} m/s.
K	potassium
ODA	Overland Discharge Area
Mg	magnesium
Mn	manganese
Mo	molybdenum
Monthly monitoring	monitoring is undertaken in each monthly period such that there are at least 15 days in between the days on which samples are taken in successive months.
N	nitrogen
Na	sodium
NH_4-N	ammonium as nitrogen
Ni	nickel
NO_2-N	nitrite as nitrogen
NO_3-N	nitrate as nitrogen
NO_3+NO_2-N	nitrate and nitrate as nitrogen
P	phosphorus
Pb	lead
premises	the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
Primary Treatment Site	means the area of the premises located on Lot 501 on Deposited Plan 76392.
Quarterly monitoring	monitoring is undertaken in each quarterly period such that there are at least 30 days in between the days on which samples are taken in successive quarters.

Term	Definition
Secondary Treatment Site	means the area of the premises located on Lot 29316 on Deposited Plan 221054.
SO_4	sulfate
suitably qualified engineer	means a person who: (a) holds a Bachelor of Engineering recognised by Engineers Australia; (b) has a minimum of five years of experience working in a supervisory area of civil or geotechnical engineering (as is relevant to the works); and (c) is an independent third party to the principal.
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TN	total phosphorus
TP	total nitrogen
TSS	total suspended solids
V	vanadium
waste	has the same meaning given to that term under the EP Act.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 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.
Zn	zinc

END OF CONDITIONS

Schedule 1: Maps

Premises map

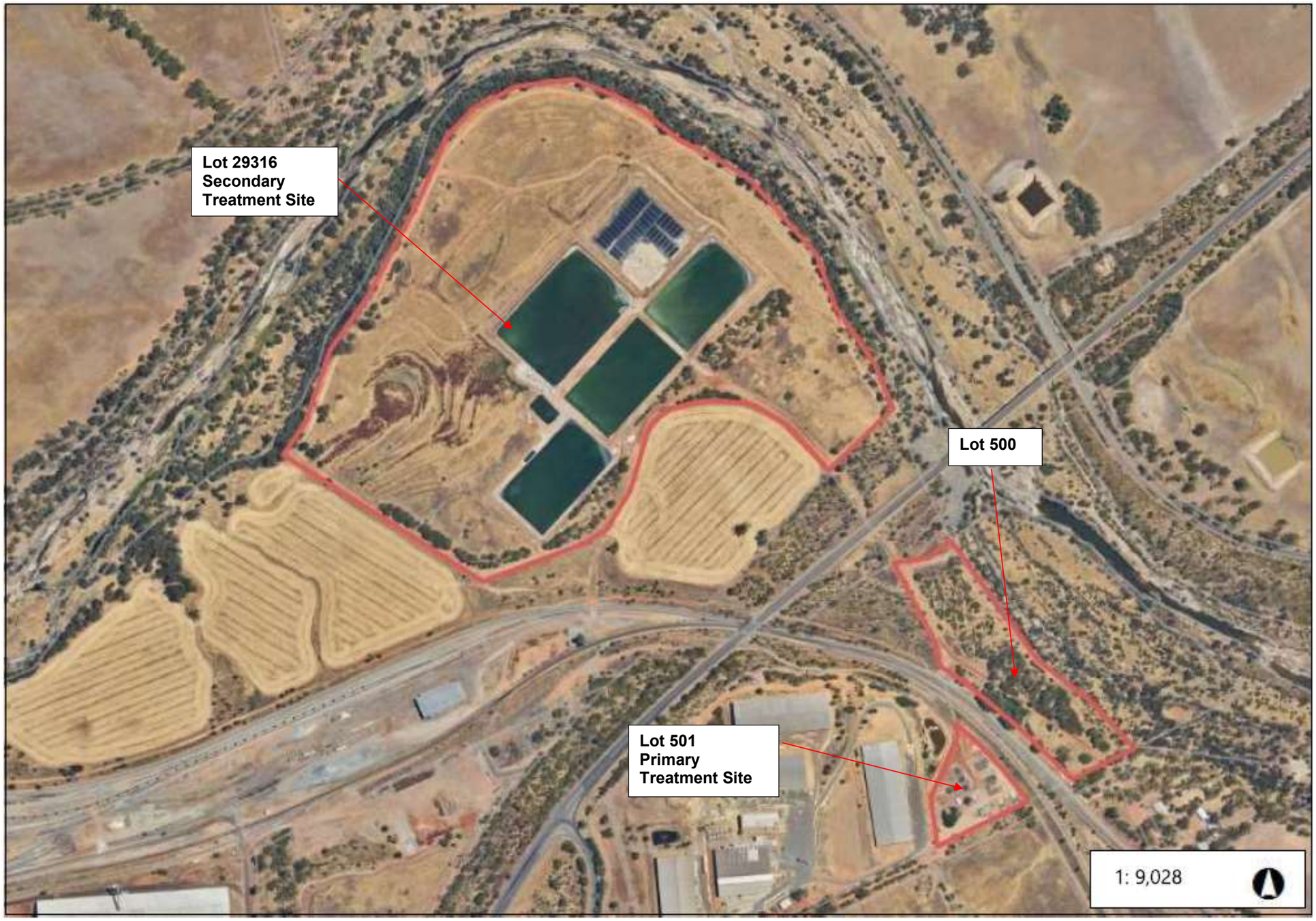


Figure 1: The boundary of the prescribed premises is shown in the map above

Schematics and site plans

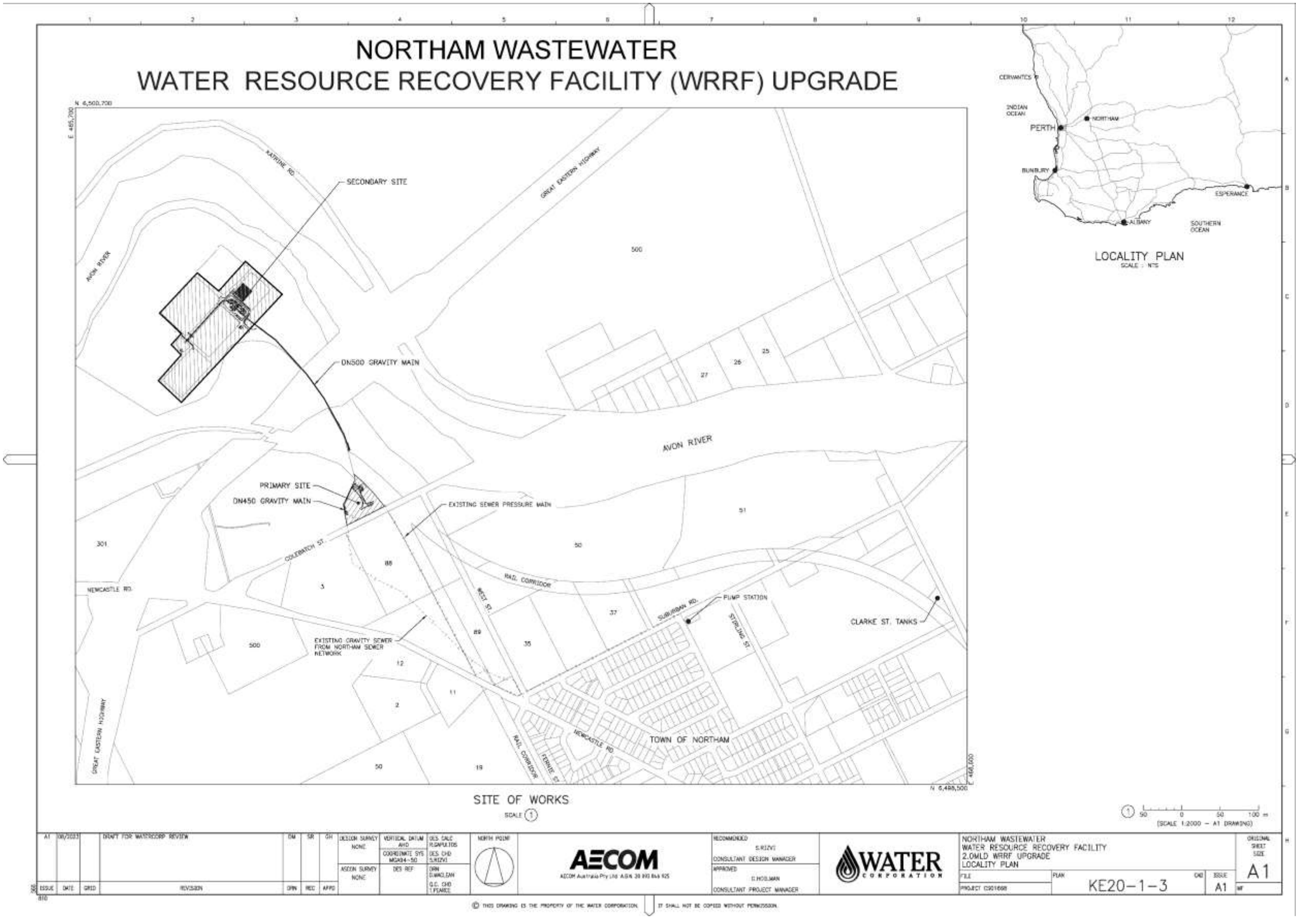


Figure 2: Overall site plan of upgrade works at the premises

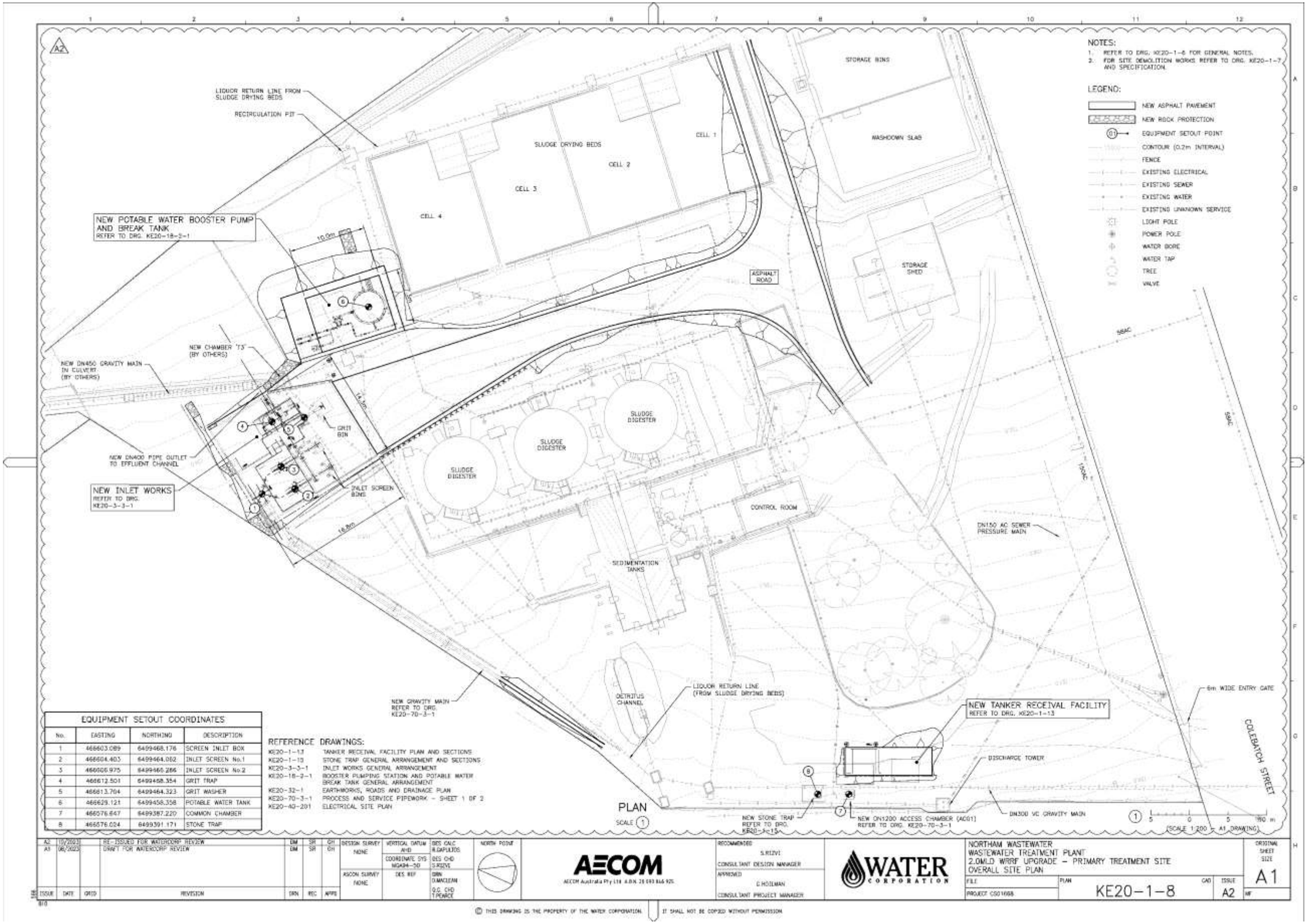


Figure 3: Site plan of upgrade works at the Primary Treatment Site

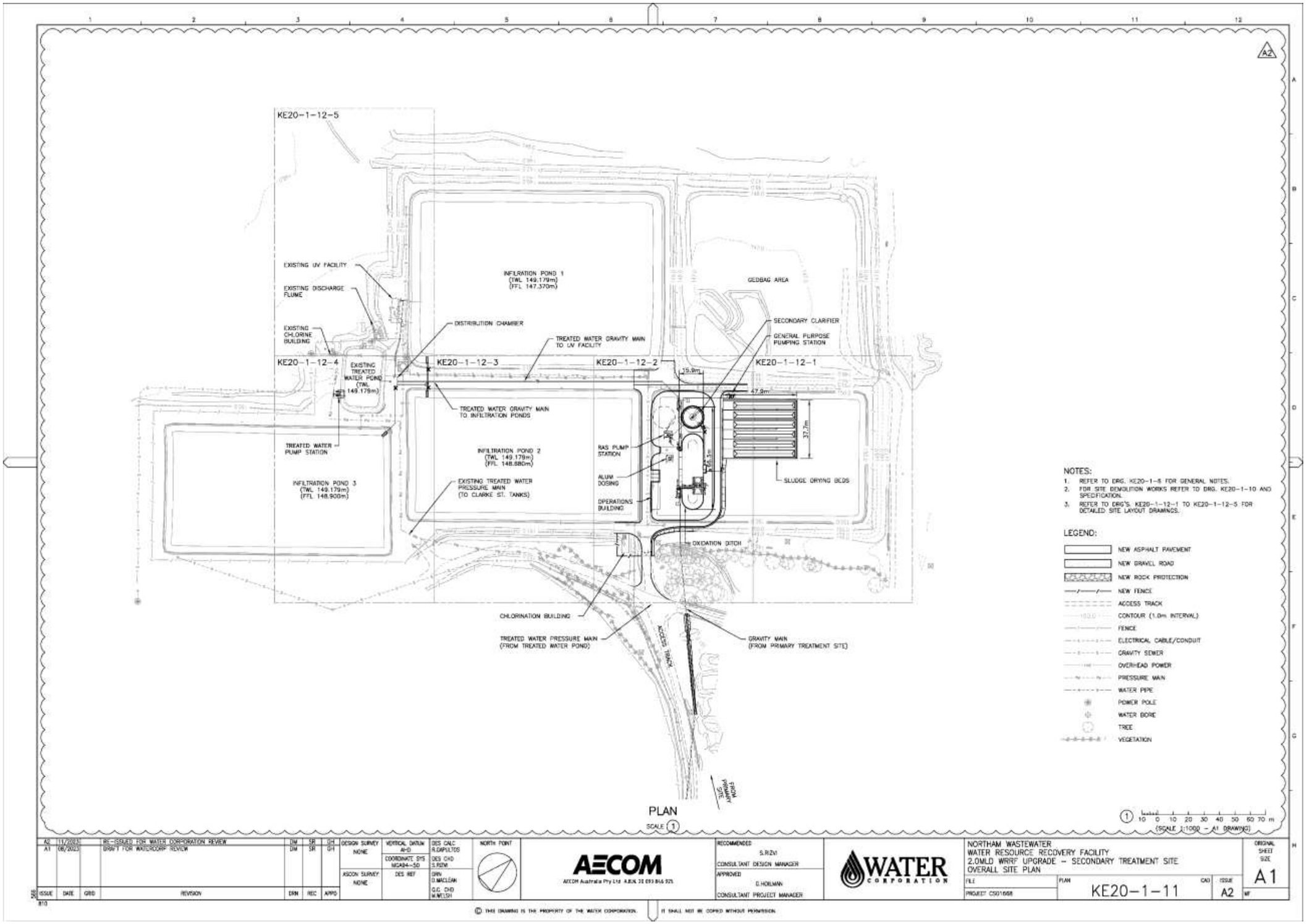
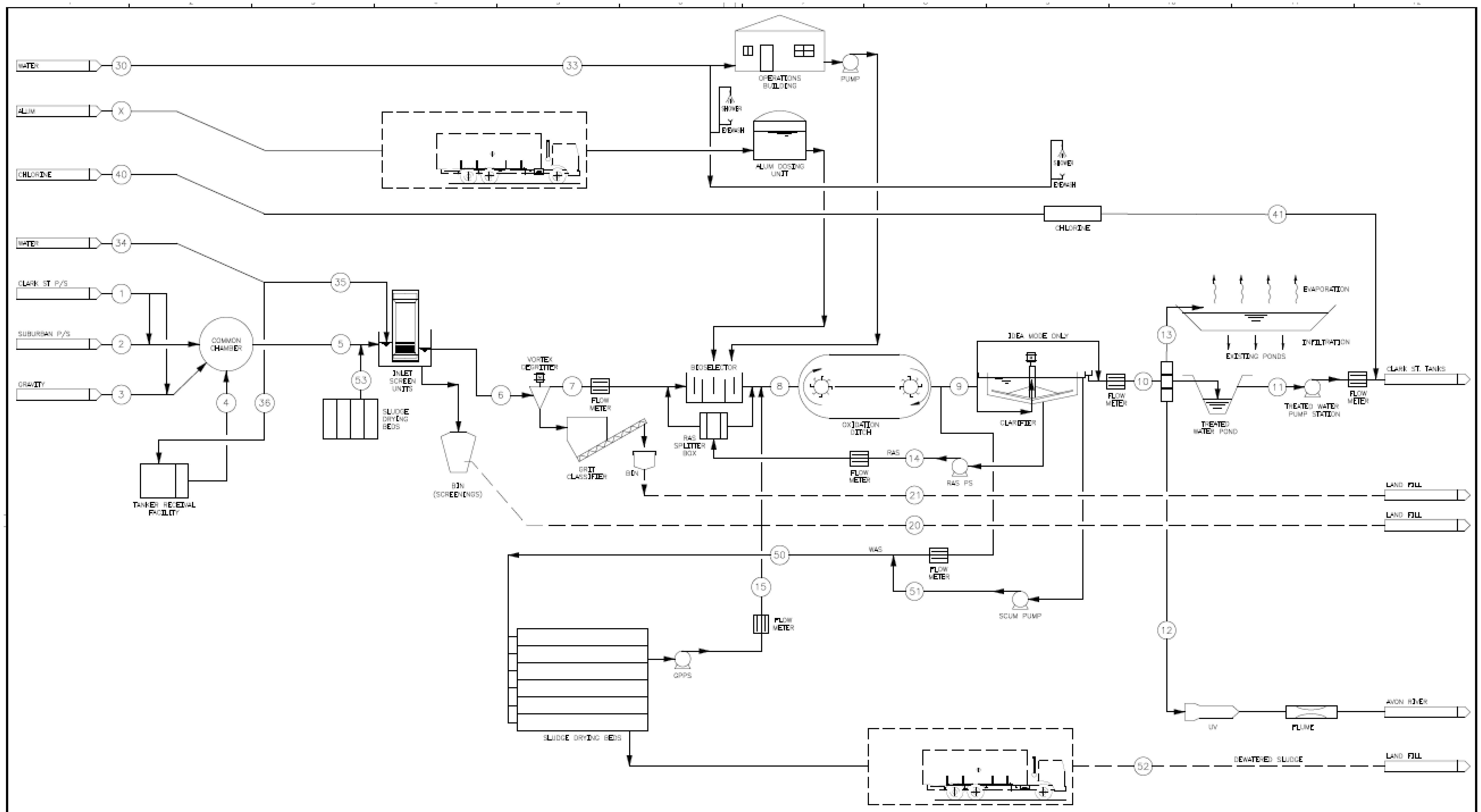


Figure 4: Site plan of upgrade works at the Secondary Treatment Site



		Main treatment train															Off site disposal			Main Site water				Inlet works site water			Chemicals				Sludge streams			
Line number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	20	21	22	30	31	32	33	34	35	36	40	41	42	43	50	51	52	53
Description	Units	Clark St P/S	Suburban P/S	Gravity flow	Tanker Receival Facility	To screens	To grit removal	To secondary treatment	To OD	To clarifier	To Treated water pond	To Shire	To UV if bypassing Treated water pond	Overflow to existing ponds	RAS	Sludge Drying Beds	Screenings (kg/d)	Grit (kg/d)	Spare	Site max demand	SPARE	SPARE	Ops bldg + Chlorine safety shower	Site max demand	Screens	Tanker Receival Facility	Gas Chlorine	Chlorine dosing	SPARE	SPARE	WAS	Scum	Dewatered sludge	Sludge Drying Beds
ADWF	L/s	12.7	7.8	2.7	0.01	23.1	23.1	24.5	47.6	47.6	23.1	24.5	23.1	–	23.1	6.4	1.3E–05	5.2E–05		1.4	–	–	1.3	4	2	2		–	–	–	1.6	0.1	0.368	–
PDWF	L/s	21.5	13.3	4.6	0.02	39.4	39.4	41.6	73.1	73.1	39.4	–	39.4	–	31.4	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
PEAK FLOW	L/s	47	29	10	0.03	86.0	86.0	88.0	86.0	86.0	86.0	–	86.0	–	0	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
TSS	mg/L	316	316	316	5000	317	309	294	391.3	391.3	20.0	20.0	20.0	–	7800	182	16	43	–	–	–	–	–	–	–	–	TBC	6	TBC	8kg/d	3,943	2000	60,000	–

Figure 5: Upgrade works process flow schematic

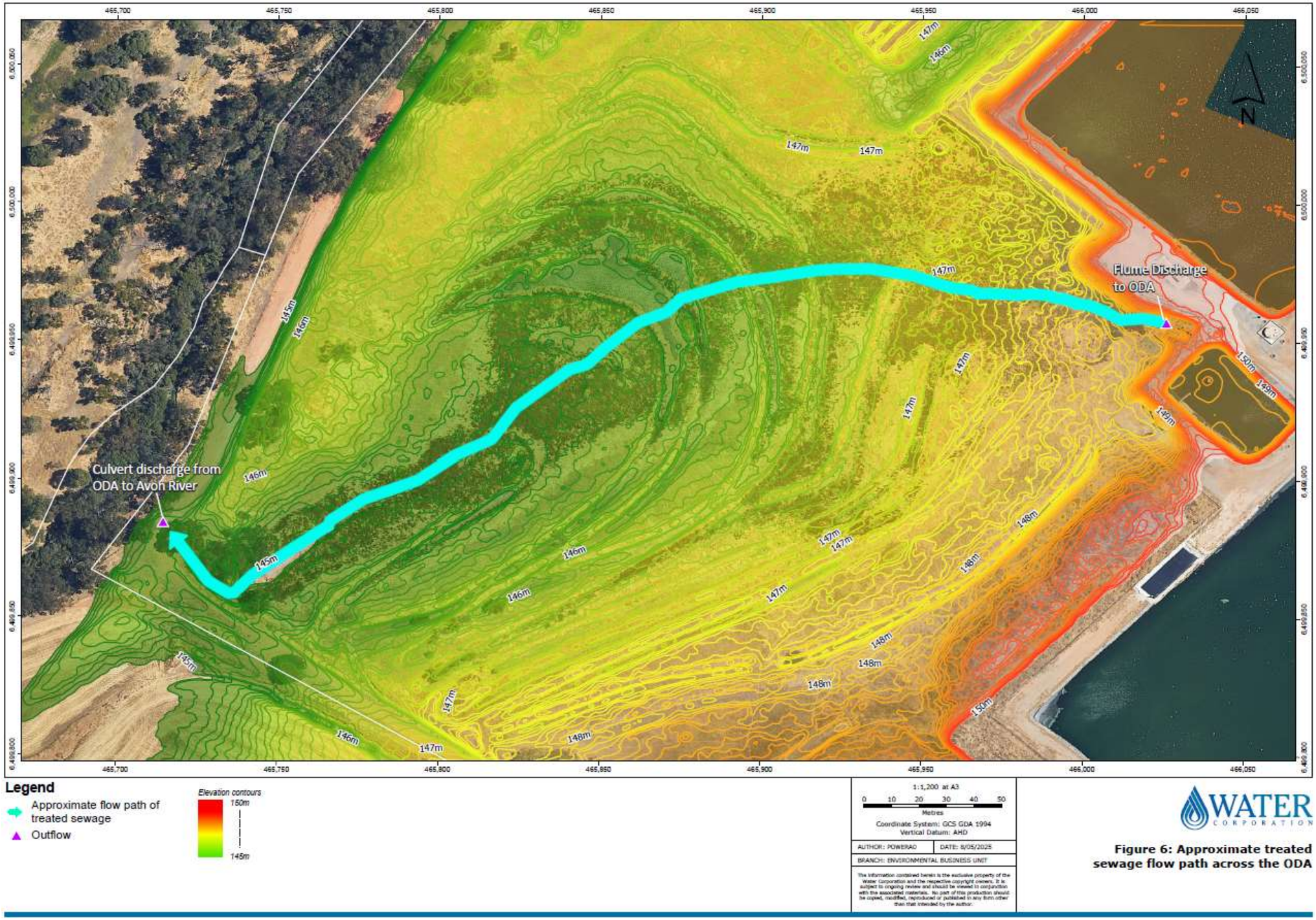


Figure 6: Overland discharge area (ODA) showing the approximate flow path of treated sewage across the ODA, the flume outflow to the ODA and the Avon River discharge point.

Figure 7: Monitoring point locations