Government of Western Australia
Department of Water and Environmental Regulation

# Works Approval

| | |
|---|---|
| **Works approval number** | W6523/2021/1 |
| **Works approval holder** | Water Corporation |
| **Registered business address** | 629 Newcastle Street |
| **DWER file number** | DEC14838/2 |
| **Duration** | 04/01/2022 to 03/01/2027 |
| **Date of issue** | 13/12/2022 |
| **Premises details** | Alkimos Wastewater Treatment Plant<br>11 Brindabella Parkway, Alkimos WA 6038<br>Legal description<br>Lot 3000 on Deposited Plan 415979<br>Certificate of Title Volume 2968 Folio 329 |

| **Prescribed premises category description** (Schedule 1, ***Environmental Protection Regulations 1987***) | **Assessed production capacity** |
|---|---|
| Category 54: Sewage facility: premises –<br>a) On which sewage is treated (excluding septic tanks); or<br>b) From which treated sewage is discharged onto land or into waters. | 26,000 cubic metres per day |
| Category 61: Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated. | 10,000 tonnes per annual period |

This works approval is granted to the works approval holder, subject to the attached conditions, on 13 December 2022, by:

Abbie Crawford

Digitally signed by Abbie Crawford
Date: 2022.12.13 10:23:07 +08'00'

Abbie Crawford
A/MANAGER, WASTE INDUSTRIES
REGULATORY SERVICES

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

# Works approval and licence history

| Reference number | Date | Summary of changes |
|---|---|---|
| W4423/2008/1 | 28/08/2008 | Approval to construct Stage 1 of the Alkimos WWTP. |
| L8434/2010/1 | 26/05/2011 | Granted licence |
| L8434/2010/1 | 9/06/2011 | Administrative amendment; update to Table numbers in conditions and in-text references to Tables in condition wording. |
| L8434/2010/1 | 24/05/2012 | Administrative amendment; update to definition of continuous monitoring and changes to exceedance notification requirements. |
| L8434/2010/1 | 24/04/2013 | Administrative amendment; correction of premises address details in definitions section of licence. |
| L8434/2010/1 | 15/11/2016 | Amendment Notice 1<br>Removal of conditions relating to odour emissions and treated wastewater discharge to ocean. |
| W6523/2021/1 | 04/01/2022 | Works Approval for the construction and time limited operations associated with the equipping of oxidation ditch 3 and commissioning works. |
| W6523/2021/1 | 13/12/2022 | Works Approval amendment for the construction and operation of a larger volume bioselector |

# 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:

**1.** The works approval holder must ensure that the emission(s) specified in Table 1, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

**Table 1: Authorised odour discharge points during commissioning**

| Discharge point | Emission | Discharge point location |
|---|---|---|
| Discharge stack | Point source emission from the stack associated with the commissioning and time limited operations of oxidation ditches 1 and 2. | Figure 2, Schedule 1 |
| Oxidation Ditches | Passive emission from oxidation ditches 1, 2 and 3 during desludging works. | Figure 2, Schedule 1 |
| Oxidation Ditches | Passive emissions from oxidation 3 during commissioning and time limited operations. | Figure 2, Schedule 1 |

**2.** The licensee shall ensure the inlet sewer is sealed at all times, except during times that maintenance works are being undertaken.

**3.** The works approval holder must operate and maintain all odour control and monitoring equipment on the premises, to the manufacturer's specification or any effective internal management system.

**4.** The licensee shall operate and maintain an effective photo-ionisation odour control unit in accordance with the manufacturer specifications for the wastewater treatment plant.

## Construction phase

### Construction Environmental Management Plan (CEMP)

**5.** The works approval holder must submit a Construction Environmental Management Plan (CEMP) to the CEO a minimum 30 working days prior to construction activities commencing.

**6.** The CEMP specified in condition 5 should include as a minimum:

(a) details of the potential sources of:

(i) noise emissions;
(ii) odour emissions;
(iii) poor-quality treated wastewater discharge emissions;
(iv) chemicals and hydrocarbons discharges; and
(v) dust emissions;

during the construction works; and

(b) provide mitigation and management measures to reduce and prevent the potential emissions listed under condition 6(a); and

(c) demonstrate how compliance with the *Environmental Protection (Noise) Regulations 1997* will be achieved.

## Infrastructure and equipment

**7.** The works approval holder must:

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

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

(c) at the corresponding infrastructure location, as set out in Table 2.

**Table 2: Design and construction / installation requirements**

| | Infrastructure | Design and construction / installation requirements |
|---|---|---|
| 1. | Flowmeter | • Replace existing flowmeter.<br>• New infrastructure must be DN900 flowmeter or equivalent. |
| 2. | Oxidation Ditch 1 | • Replace existing surface aerators with 160 kW motor and gearboxes and propulsors.<br>• New infrastructure must be capable of aerating wastewater flow volumes of up to 26 MLD, operating up to a capacity of 2.8 kg $O_2$/kWhr and on average at least 1.5 kg $O_2$/kWhr. |
| 3. | Oxidation Ditch 2 | • Replace existing surface aerators with 160 kW motor and gearboxes and propulsors.<br>• New infrastructure must be capable of aerating wastewater flow volumes of up to 26 MLD, operating up to a capacity of 2.8 kg $O_2$/kWhr and on average at least 1.5 kg $O_2$/kWhr. |
| 4. | Oxidation Ditch 3 | • Install 2 surface aerators with 160 kW motor and gearboxes and propulsors.<br>• New infrastructure must be capable of aerating wastewater flow volumes of up to 26 MLD, operating up to a capacity of 2.8 kg $O_2$/kWhr and on average at least 1.5 kg $O_2$/kWhr. |
| 5. | Return Activated Sludge Pumps | • Replace 3 x return activated sludge pumps<br>• New infrastructure must be able to provide a maximum of 520 L/s. |
| 6. | Waste Activated Sludge Pump | • Replace 2 x waste activated sludge pumps.<br>• New infrastructure must be able to achieve 55 L/s. |
| 7. | Dissolved Air Flotation Tank | • Install polymer system to maintain thickening performance. |
| 8. | Drainage configuration | • Redirect drainage from inlet works, odour treatment, Dissolved Air Flotation Tank slab, Thickened Sludge Storage Tank slab , vehicles wash down area, administration building, Oxidation Ditches and Secondary Sedimentation Tanks to the upstream of the inlet screens for de-ragging and de-gritting. |
| 9. | Bioselector | • Extend the existing bioselector to achieve a total volume 1,300$m^3$ divided into six chambers.<br>• Existing chambers 2 and 3 must be bypassed and double isolated from chambers 1 and 4 prior to the works beginning.<br>• All bioselector odour emissions must be vented via the odour extraction point and odour pipework to the photo-ionisation unit for treatment. |

### Compliance reporting

**8.** Within 60 calendar days of completing all construction and installation activity required by condition 7, the works approval holder must:

(a) undertake an audit of their compliance with the requirements of condition 7; and

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

**9.** The Environmental Compliance Report required by condition 8, must include as a minimum the following:

(a) certification by a suitably qualified, professional engineer that the items of infrastructure or component(s) thereof, as specified in Condition 7, have been constructed in accordance with the relevant requirements specified in Condition 7;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in Condition 7; and

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

## Environmental commissioning

**10.** The works approval holder may only commence environmental commissioning of all infrastructure and equipment listed in Table 3 once the Environmental Compliance Report has been submitted in accordance with condition 8 of this works approval.

**11.** The works approval holder must notify the CEO in writing at least one (1) week prior to the commencement of commissioning.

**12.** Any environmental commissioning activities undertaken for the works approval may only be conducted for infrastructure listed in Table 3:

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

(b) for the corresponding authorised commissioning duration, as specified in Table 3.

**Table 3: Environmental commissioning requirements**

| Infrastructure | Commissioning requirements | Authorised commissioning duration |
|---|---|---|
| All works | The existing treatment process must remain operational throughout the construction, desludging and commissioning. | For a period not exceeding 18 calendar months in aggregate. |
| Pipework, fittings and pumps | Must be hydraulically tested to the required pressure and deemed fit for purpose prior to use. | For a period not exceeding 3 months in aggregate. |

| Infrastructure | Commissioning requirements | Authorised commissioning duration |
|---|---|---|
| Oxidation ditches | Two oxidation ditches must be in operation at all times during desludging of oxidation ditch 1 and 2.<br>During desludging, the oxidation ditch must be isolated from the WWTP system.<br>Odour covers from oxidation ditches 1 and 2 must be returned to the oxidation ditches as soon as possible after desludging.<br>Leachate from oxidation ditches undergoing desludging must return to the head of the works for retreatment. | For a period not exceeding 6 months in aggregate.<br>Desludging and reactivation of oxidation ditch 1 must occur within a two-month period.<br>Desludging and reactivation of oxidation ditch 2 must occur within a two-month period. |
| Oxidation ditches | Commissioning of oxidation ditches 1 and 2 must be undertaken following desludging works.<br>Biomass seeding must be undertaken prior to the introduction of wastewater inflow and treatment. | For a period not exceeding 12 months in aggregate. |

## Monitoring during environmental commissioning

**13.** The works approval holder must, prior to undertaking construction activities, install and monitor the ambient meteorological conditions at the premises in accordance with the requirements specified in Table 4 and record the results of all such monitoring.

**Table 4: Monitoring of ambient meteorological conditions**

| Parameter | Unit | Monitoring location(s) | Height | Frequency | Averaging period | Siting | Method |
|---|---|---|---|---|---|---|---|
| Wind speed | m/s | Within and outside of the WWTP depression | No higher than 10 mAHD [1] | Continuous | 1-hour average | AS/NZS 3580.1.1 | AS/NZS 3580.14 |
| Wind direction | degrees | | | | | | |
| Wind direction (standard deviation) | | | | | | | |
| Temperature | ° Celsius | | - | Continuous | 1-hour average | | |

Note 1: A lower elevation than 10 m may be implemented. Intent of this specification is to ensure that the wind effects within the basin are captured by the monitoring data.

**14.** The works approval holder must continuously monitor odour emissions during environmental commissioning works in accordance with Table 5.

**Table 5: Continuous odour monitoring requirements**

| Discharge point | Parameter | Unit | Frequency |
|---|---|---|---|
| Stack outlet | Hydrogen sulfide | ppm | Continuous, commencing within 1 week of infrastructure being installed |
| | Volumetric flow rate | $m^3/s$ at STP, dry and at STP, wet | |
| All covered/ sealed tanks and ducts | Pressure | Pa | |
| Oxidation ditch fan outlet | Hydrogen sulfide | ppm | |
| Upstream of odour stack | Hydrogen sulfide | ppm | |
| Odour treatment unit inlet | Hydrogen sulfide | ppm | |
| Odour treatment unit outlet | Hydrogen sulfide | ppm | |
| Oxidation ditches No.1 and No.2, as near to the location of de-sludging as possible | Hydrogen sulfide | ppm | Continuous during desludging works |

**15.** The works approval holder must manually monitor odour emissions during environmental commissioning works in accordance with Table 6.

**Table 6: Manual odour monitoring requirements**

| Discharge point | Parameter | Unit | Frequency | Method |
|---|---|---|---|---|
| Stack outlet | Hydrogen sulfide | $mg/m^3$ at STP, dry | Monthly during commissioning works | NATA accredited method for the measurement and analysis of hydrogen sulfide emissions from stationary sources |
| | Volumetric flow rate | $m^3/s$ at STP, dry and at STP, wet | | $m^3/s$ at STP, dry and at STP, wet |
| | Temperature | ° Celsius | | - |

**16.** The Works Approval holder must undertake an odour field assessment (OFA) during commissioning testing of all three oxidation ditches in accordance with the DWER Odour Emissions Guideline. The OFA must include:

(a) clearly established objectives;

(b) a review of operational conditions and associated odour emissions;

(c) a review of meteorological conditions;

(d) odour field survey implementation; and

(e) analysis of survey results.

### Environmental Commissioning Report

**17.** The works approval holder must submit to the CEO an Environmental Commissioning Report within 60 calendar days of the completion date of the environmental commissioning referred to in condition 12.

**18.** The works approval holder must ensure the Environmental Commissioning Report required by condition 17 includes the following:

(f) a summary of the environmental commissioning activities undertaken, including timeframes and amount of raw wastewater processed;

(g) the emissions monitoring and ambient concentrations monitoring results recorded in accordance with conditions 13 - 16;

(h) a summary of the environmental performance of each item of infrastructure or equipment as constructed or installed in accordance with condition 12, which at minimum includes records detailing the:

(i) environmental commissioning of the system;

(ii) testing the system; and

(iii) commissioning of the process control system.

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

(j) 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

### Commencement and duration

**19.** The works approval holder may only commence time limited operations for the infrastructure and equipment identified in Condition 7 where:

(a) the Environmental Compliance Report as required by condition 8 has been submitted by the works approval holder for each item of infrastructure and equipment listed under condition 7; and

(b) the Environmental Commissioning Report required by condition 17 has been submitted by the works approval holder for each item of infrastructure and equipment listed under condition 7.

**20.** The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 7 (as applicable):

(a) for a period not exceeding 90 calendar days from the day the works approval holder meets the requirements of condition 17; 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*, and only where this occurs prior to 90 calendar days from the day the works approval holder meets the requirements of condition 17 for that item of infrastructure.

## Monitoring during time limited operations

**21.** The works approval holder must monitor the ambient meteorological conditions during at the premises in accordance with the requirements specified in Table 7 and record the results of all such monitoring.

**Table 7: Monitoring of ambient meteorological conditions**

| Parameter | Unit | Monitoring location(s) | Height | Frequency | Averaging period | Method |
|---|---|---|---|---|---|---|
| Wind speed | m/s | Within and outside of the valley | 10 m – Note: A lower height than 10 m may be justified for the valley floor monitor to capture the wind effects within the basin | Continuous | 1-hour average | AS 3580.14 |
| Wind direction | degrees | | | | | |
| Wind direction (standard deviation) | | | | | | |
| Temperature | ° Celsius | | - | Continuous | 1-hour average | |

**22.** The works approval holder must continuously monitor odour emissions during environmental commissioning works in accordance with Table 8.

**Table 8: Continuous odour monitoring requirements**

| Discharge point | Parameter | Unit | Frequency |
|---|---|---|---|
| Stack outlet | Hydrogen sulfide | ppm | Continuous |
| | Volumetric flow rate | $m^3/s$ at STP, dry and at STP, wet | |
| All covered/ sealed tanks and ducts | Pressure | kPa.g | |
| Oxidation ditch fan outlet | Hydrogen sulfide | ppm | |
| Upstream of odour stack | Hydrogen sulfide | ppm | |
| Odour treatment unit inlet | Hydrogen sulfide | ppm | |
| Odour treatment unit outlet | Hydrogen sulfide | ppm | |

**23.** The works approval holder must manually monitor odour emissions during environmental commissioning works in accordance with Table 9.

**Table 9: Manual odour monitoring requirements**

| Discharge point | Parameter | Unit | Frequency | |
|---|---|---|---|---|
| Stack outlet | Hydrogen sulfide | mg/m$^3$ at STP, dry | Quarterly | NATA accredited method for the measurement and analysis of hydrogen sulfide emissions from stationary sources |
| Oxidation ditch fan outlet | Volumetric flow rate | m$^3$/s at STP, dry and at STP, wet | | m$^3$/s at STP, dry and at STP, wet |

## 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 60 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 volume of wastewater processed;

(b) a summary of monitoring results obtained during time limited operations under conditions 21, 22 and 23;

(c) the OFA report as specified in condition 16;

(d) a summary of the environmental performance of all infrastructure as constructed or installed;

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

(f) 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.

## Odour monitoring trigger levels

**26.** The works approval holder must take the specified actions in Table 10 when the corresponding specified parameters fall outside of the corresponding trigger levels.

**Table 10: Odour monitoring trigger levels**

| Discharge point | Parameter | Trigger levels | Specified actions |
|---|---|---|---|
| Odour treatment unit inlet | Hydrogen sulfide | 25 ppm | The Works Approval Holder must, as soon as possible, but no later than 24 hrs of becoming aware of a parameter value falling outside of the corresponding trigger level activate the odour control unit until such time that the parameter falls below the corresponding trigger level; |
| Stack outlet | | 1.5 ppm | |

## General Monitoring

**27.** The works approval holder must record the results of all monitoring activity required by the works approval.

**28.** The works approval holder must monitor and record the availability of the continuous monitors required by the works approval on a monthly basis;

**29.** The works approval holder must ensure that for all samples, analysis is undertaken by a holder of a current accreditation from the National Association of Testing Authorities (NATA) for the methods of sampling and analysis relevant to the corresponding parameters, unless otherwise specified in the relevant schedule.

## Records and reporting (general)

**30.** 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.

**31.** 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 condition 7;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 7;

(c) monitoring programmes undertaken in accordance with conditions 13, 14, 15, 21, 22 and 23; and

(d) complaints received under condition 30.

32. The books specified under condition 31 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) 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.

## Notifications

33. 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 licence holder to investigate or respond to any complaint.

34. The works approval holder must, within two weeks of becoming aware of an odour monitoring trigger level falling outside designated value, submit a notification to the CEO that details:

(a) the parameters that were found outside of the trigger levels; and

(b) the specified actions taken.

# Definitions

In this works approval, the terms in Table 11 have the meanings defined.

**Table 11: Definitions**

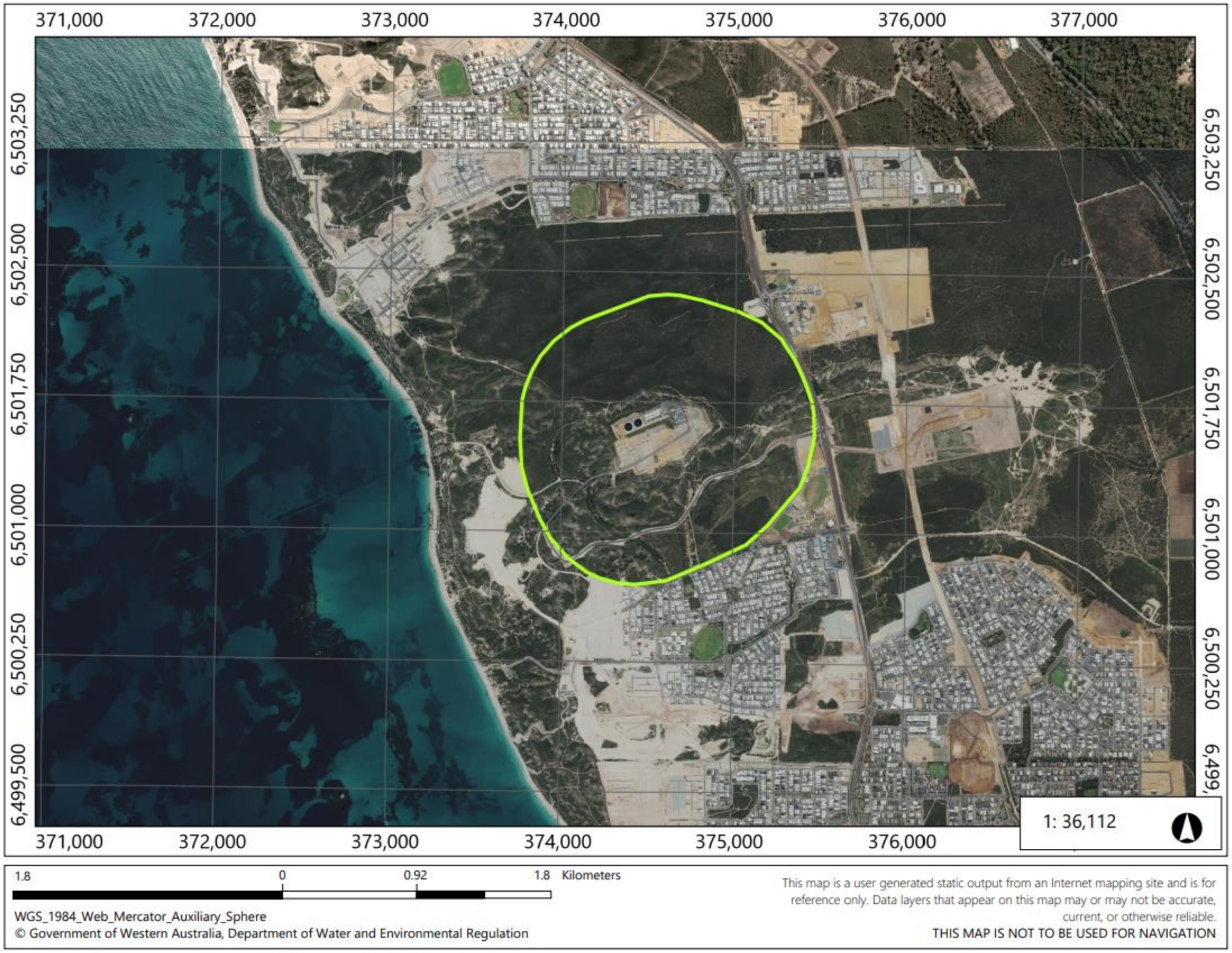
| Term | Definition |
|---|---|
| AS/NZS 3580.14 | means the Australian Standard *AS/NZS 3580.14 (2014)* Methods for sampling and analysis of ambient air Meteorological monitoring for ambient air quality monitoring applications |
| AS/NZS 4323.1 | means the Australian Standard *AS/NZS 4323.1 (1995*) Stationary source emissions – Selection of sampling positions; and • |
| AS/NZS 4323.3 | Means the Australian Standard *AS/NZS 4323.3 (2001)* Stationary source emissions – Determination of odour concentration by dynamic olfactometry. |
| books | has the same meaning given to that term under the EP Act. |
| CEO | means Chief Executive Officer.<br>CEO for the purposes of notification means:<br>Director General<br>Department administering the *Environmental Protection Act 1986*<br>Locked Bag 10<br>Joondalup DC WA 6919<br>info@dwer.wa.gov.au |
| 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. |
| 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. |
| 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). |
| m(AHD) | means metres above Australian Height Datum |

| Term | Definition |
|---|---|
| mBGL | means metres below ground level |
| monthly period | means a one-month period commencing from day 1 of a month until the last day of that month. |
| NATA | means the National Association of Testing Authorities |
| NATA accredited | means in relation to the analysis of a sample, that the laboratory is NATA accredited for the specified analysis at the time of the analysis. |
| 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. |
| quarterly | means the 4 inclusive periods from 1 July to 30 September, 1 October to 31 December, and in the following year 1 January to 31 March and 1 April to 30 June. |
| STP | Standard temperature and pressure. |
| suitably qualified professional engineer | Means a person who:<br>(a) holds a Bachelor of Engineering recognised by the Institute of Engineers; and<br>(b) has a minimum of five years of experience working in a supervisory area of civil or structural engineering; and<br>(c) is employed by an independent third party external to the works approval holder's business;<br>or is otherwise approved in writing by the CEO to act in this capacity |
| 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. |
| works | refers to the works described in condition 7, at the premises shown in Schedule 1 of this works approval to be carried out on the premises, subject to the conditions. |
| 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. |

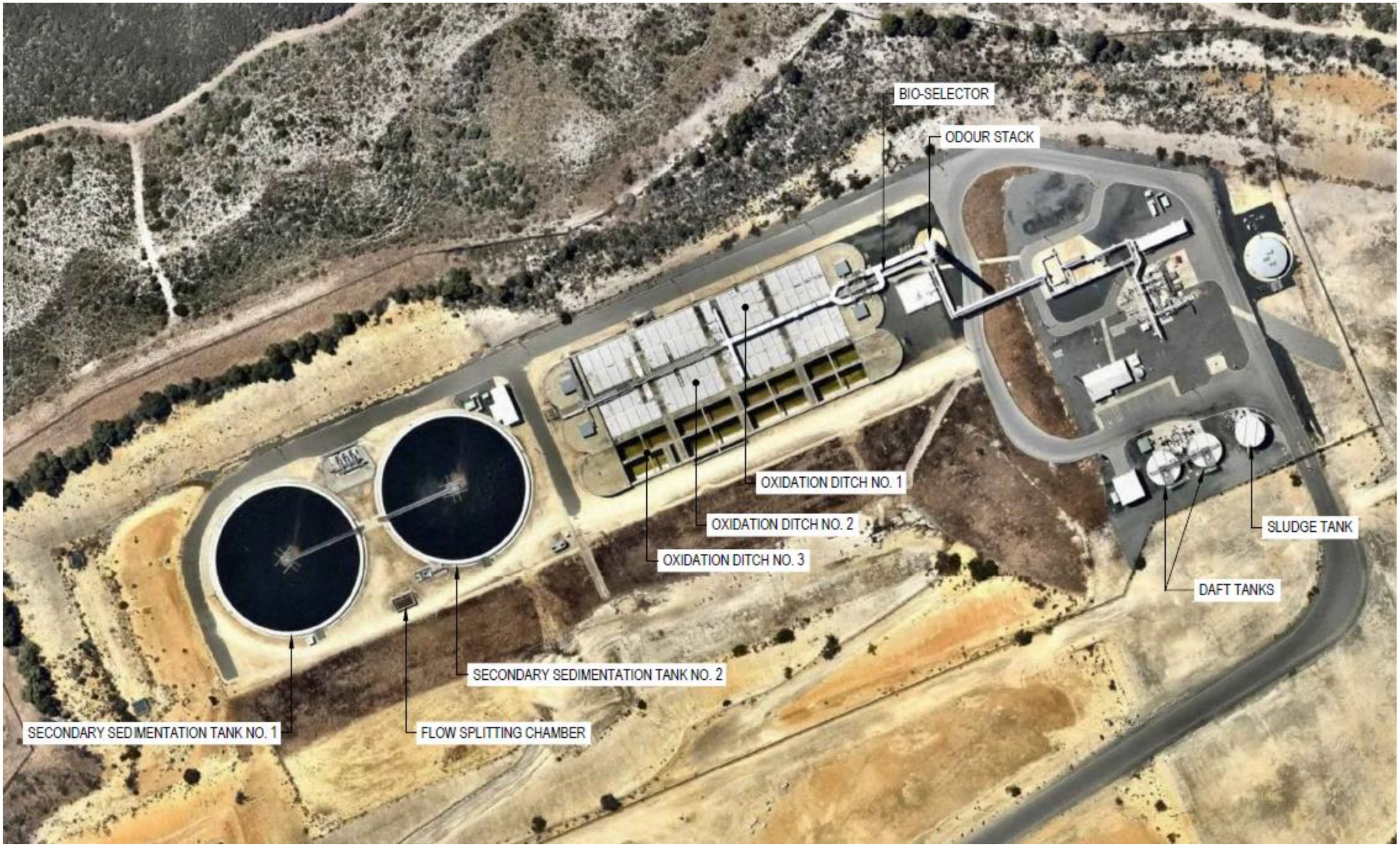
**END OF CONDITIONS**

## Schedule 1: Maps

### Figure 1: Premises map



## Figure 2: Infrastructure overview



## Figure 2: Alkimos WWTP Process Control Diagram