



**JACKSON**  
**ENVIRONMENT AND PLANNING**  
STRATEGY | INFRASTRUCTURE | COMPLIANCE | PROCUREMENT



**Veolia Environmental Services Pty Ltd  
Woodlawn Bioreactor (SSD MP 10\_0012)  
Independent Audit 2022  
Leachate and Water Management System**

Jackson Environment and Planning Pty Ltd  
Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060  
T: 02 8056 1849 | E: [admin@jacksonenvironment.com.au](mailto:admin@jacksonenvironment.com.au)  
W: [jacksonenvironment.com.au](http://jacksonenvironment.com.au)

This report has been prepared by the following staff of Jackson Environment and Planning Pty Ltd, Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060.

**Author 1:** Dr Mark Jackson, Director and Principal Consultant, B.Sc (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Admin., Certified Environmental Practitioner CEnvP (1542), Impact Assessment Specialist (IA11071), NSW Registered Environmental Assessment Practitioner REAP (R80020).

**Author 2:** Mark Liebman, Director Sustainability Workshop Pty Ltd, Bachelor of Economics, Bachelor of Civil and Environmental Engineering (Hons), Chartered Professional Engineer, MIEAust.

**Author 3:** Alan Parsons, Managing Director, ARP Risk Management Solutions Pty Ltd.

**We declare that:**

The report contains all available information that is relevant to the assessment of the Site and proposed development, activity or infrastructure to which the report relates, and the information contained in the report is neither false nor misleading.

| Report version | Authors                               | Date       | Reviewer   | Approved for issue | Date       |
|----------------|---------------------------------------|------------|------------|--------------------|------------|
| Draft (V1)     | Dr M. Jackson, M. Liebman, A. Parsons | 30/06/2022 | A. Parsons | Dr M.Jackson       | 01/07/2022 |
| Final (V2)     | Dr M. Jackson, M. Liebman, A. Parsons | 19/07/2022 | A. Parsons | Dr M.Jackson       | 19/07/2022 |

## Executive Summary

This report presents the findings of an Independent Environmental Audit that was conducted to assess the environmental performance of Veolia Environmental Services Australia's water and leachate management system associated with the Woodlawn Bioreactor Landfill, located at Collector Rd, Tarago.

The audit was conducted by Jackson Environment and Planning Pty Ltd and was commissioned on 15<sup>th</sup> February 2022, 12 months since the last audit. The Audit covers the period from 16<sup>th</sup> March 2021 until 15<sup>th</sup> March 2022. The scope of the Audit included an assessment of compliance with Condition 18R of Schedule 2 of Project Approval MP 10\_0012.

The audit also included an assessment of compliance with management plans in place, and a comparison of predictions in the original Environmental Impact Statement and subsequent modifications to actual performance.

An assessment of the Actions recommended in the 2021 Independent Environmental Audit conducted by SLR Consulting found that all five recommendations have been addressed and completed.

The 2022 Independent Environmental Audit found a total of four (4) non-compliances under Project Approval MP 10\_0012. These non-compliances relate to:

- NC1: The water balance of the site relative to the predictions in the approved 2017 water balance model. More specifically, this non-compliance relates to:
  - Actual inputs into dams was substantially more than predicted in the 2017 water balance model during the audit period 16 March 2021 to 15 March 2022 (NC1(a));
  - Actual mechanical evaporation losses from each dam was substantially less than predicted in the 2017 water balance model during the audit period 16 March 2021 to 15 March 2022 (NC1(b));
  - Actual rainfall was substantially higher and evaporation was substantially lower than the wettest year predictions in the 2017 water balance model (NC1(c)); and
  - Actual inputs into the treated leachate dams was substantially more than predicted in the 2017 water balance model (NC1(d));
- NC2 & NC4: Effluent quality is considered to meet EPA license limits, however there was a single exceedance of ammonia and total suspended solids during the audit period. As a result, the plant did not fully achieve effluent quality targets across the audit period; and
- NC3: The leachate treatment plant did not achieve the target throughput rate for the entire audit period though it is now achieving the target throughput.

The number of complaints has substantially increased from a total of 39 during the 2021 Audit period to 377 during the 2022 Audit period. The Audit found that the increase in complaints may be related to the increased rainfall experienced during the 2022 Audit period, which has affected the performance of the leachate treatment plant. The Auditors note that the improvement and optimization of leachate treatment capacity will help to minimise odour from the leachate management system in the medium to long-term.

During the Audit period, no notices, orders, penalty notices or prosecutions were received by Veolia. However, on 1<sup>st</sup> April 2022, DPE issued Veolia a Development Control Order to remedy a breach of the Consent and requires Veolia to develop short, medium, and long-term leachate and water management strategies. The Order was issued outside of this Audit's reporting period and therefore is excluded from the scope of the Audit. This matter will be addressed in detail in the 2023 Audit.

A series of recommendations have been proposed to address the four non-compliances. These focus on the need to develop contingency strategies should extreme rainfall events continue for the rest of 2022, and the development of a revised water balance to address more extreme climatic conditions which were not predicted as part of the original environmental assessment.

Any future water balance model and further site modifications should be considered in a modification to the consent to enable the site to operate its leachate and water management system sustainably with minimal risk to the environment.

# CONTENTS

|  |    |
|--|----|
| Executive Summary.....   | 3  |
| 1. Introduction .....  | 7  |
| 1.1. Background to the Project .....   | 7  |
| 1.2. Audit Team.....   | 7  |
| 1.3. Audit Objectives.....   | 10 |
| 1.4. Audit Scope .....   | 11 |
| 1.5. Temporal Period Covered by the Audit .....  | 11 |
| 2. Audit Methodology .....   | 14 |
| 2.1. Audit team approval .....   | 14 |
| 2.2. How the audit scope was developed .....   | 14 |
| 2.3. Audit process and compliance assessment .....   | 14 |
| 2.4. Site personnel interviewed .....  | 15 |
| 2.5. Site inspection undertaken .....  | 15 |
| 2.6. Consultation undertaken .....   | 16 |
| 2.7. Compliance status descriptions .....  | 16 |
| 3. Audit Findings .....  | 17 |
| 3.1. Approvals and documents audited .....   | 17 |
| 3.2. Summary of the compliance assessment .....  | 18 |
| 3.3. Notices, orders, penalty notices or prosecutions issued during the audit period.....                                  | 19 |
| 3.4. Summary of non-compliances .....  | 19 |
| 3.5. Previous audit recommendations.....   | 24 |
| 3.6. Adequacy of Environmental Management Plans, sub-plans and compliance documents and opportunities for improvement..... | 26 |
| 3.7. Other matters .....   | 26 |
| 3.8. Agency consultation and feedback .....  | 26 |
| 3.8.1. Water NSW.....  | 26 |
| 3.8.2. Department of Planning and Environment.....   | 27 |
| 3.8.3. NSW EPA .....   | 27 |
| 3.8.4. Consultation with Veolia’s Consultant Engaged to Develop Leachate and Water Management Strategies .....             | 27 |
| 3.9. Summary of complaints, adequacy of responses and management.....  | 31 |
| 3.10. Summary of incidents, adequacy of responses and management.....  | 32 |
| 3.11. Compliance between actual and predicted impacts.....   | 33 |
| 3.12. Evidence collected through site inspections undertaken during the audit .....  | 33 |

3.13. Evidence to support compliance assessment provided by the personnel interviewed during the audit .. 33

3.14. Continual environmental management improvement opportunities identified as part of the audit..... 33

3.15. Key strengths of the development’s environmental management and performance ..... 34

4. Recommendations and opportunities for improvement..... 35

Appendix A – Compliance Audit Tables ..... 36

Appendix B – Site Visit Photographs ..... 52

Appendix C – Audit Certification..... 56

Appendix D – Audit Team Approval Letter from DPE ..... 57

Appendix E – Audit Plan ..... 58

Appendix G – Consultation Letters ..... 59

# 1. Introduction

## 1.1. Background to the Project

Veolia Australia and New Zealand (Veolia) owns and operates the Woodlawn Bioreactor (the Bioreactor) that forms part of the 6,000 hectare Woodlawn Eco-precinct.

The Bioreactor was the first stage of the Eco Precinct developed by Veolia and has been in operation since September 2004. The Bioreactor is approved to accept a maximum input of 1.13 million tonnes of waste per annum (tpa).

Waste is deposited into the void of a remnant open cut mine, approximately 33 million cubic metres (m<sup>3</sup>) in capacity. With the use of optimal moisture and temperature conditions, the Bioreactor achieves enhanced degradation to produce landfill gas, collected through an extensive network of gas collection infrastructure within the landfill.

The Woodlawn Leachate Treatment Plant (LTP), which commenced operations in 2018, treats leachate from the Bioreactor using an ultrafiltration membrane bioreactor. Treated leachate is then transferred to the ED1 Cofferdam located within the Eco Precinct. The LTP facilitates an improvement in environmental and operational performance by:

- Allowing the extraction and treatment of greater volumes of leachate from the landfill void;
- Helping reduce the generation of odour from untreated leachate, and
- Enabling more efficient gas extraction to maximise the waste to energy benefits of the Power Station.

The Department of Planning and Environment (DPE) approved Project Approval (10\_0012) on 16 March 2012 to increase the landfill capacity and input limit from 500,000 tonnes per annum (TPA) to 1,130,000 TPA. DPE has granted a number of modifications (MODs) including the following:

- PA 10\_0012 MOD1: Modification for changing the site water and leachate management to allow the use of ED2 for the main storm water storage and ED3S for treated leachate storage;
- PA 10\_0012 MOD2: To alter surface water and leachate management in December 2017. This modification includes requirements for an LTP, Cofferdam and future volumes of existing Dams (ED1 and ED3N);
- PA 10\_0012 MOD3: Modification to enable the construction and operation of a Solid Recovered Fuel (SRF) processing area within the Woodlawn Eco Precinct; and
- PA 10\_0012 MOD4: In regard to bushfire impacted waste acceptance.

## 1.2. Audit Team

Jackson Environment and Planning Pty Ltd (JEP) has been engaged by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to undertake an Independent Leachate and Water Management System (LWMS) Audit (the Audit) associated with the Woodlawn Bioreactor Landfill (the Site), located at Collector Rd, Tarago.

DPE approved the audit team on 2<sup>nd</sup> March 2022 (see Appendix D).

Members of the audit team are outlined in Table 1.1. Mr Alan Parsons from ARP Risk Management Solutions Pty Ltd supported the audit team as the lead auditor and Mr Mark Liebman from Sustainability Workshop Pty Ltd is the civil engineering and water management specialist. The qualifications and experience of the audit team is summarised in Table 1.1.



**Table 1.1. Audit team members.**

| Name                   | Audit Role  | Qualifications   | Experience  |
|------------------------|---|--|---|
| <b>Dr Mark Jackson</b> | Auditor (waste infrastructure planning and compliance specialist) | B.Sc (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Admin., Certified Environmental Practitioner CEnvP (1542), Impact Assessment Specialist (IA11071), NSW Registered Environmental Assessment Practitioner REAP (R80020). | <p>Mark is a waste management specialist and has 26 years’ experience in the field. Mark has supported the environmental planning, approvals and licensing of some of the largest waste and recycling infrastructure projects in NSW as Director of Jackson Environment and Planning Pty Ltd for the past 7 years. He is also an experienced environmental auditor.</p> <p>For 12 years he has held senior management positions in the NSW Environment Protection Authority, leading some of the largest behaviour change, industry development and infrastructure investment programs in the country’s history to assist households and businesses reduce waste and increase recycling. Mark for five years led the EPA’s Waste and Recycling Infrastructure and Resource Recovery teams. He has also played a key role in assessing waste and recycling infrastructure developments in Government. He is a specialist in waste facility planning, environmental compliance and regulatory approvals.</p> <p>Mark has also been responsible for Annual Reports and Independent Audits for State Significant Development projects for sites operated by Veolia Environmental Services (Camellia Resource Recovery Facility, Clyde Waste Transfer Terminal and Banksmeadow Waste Transfer Terminal), Cleanaway (Erskine Park Waste Transfer Station), J.J. Richards &amp; Sons (Glendenning Liquid Waste Facility), Bingo Industries (Kembla Grange and Mortdale Resource Recovery Facilities), and regularly conducts planning and environmental compliance audits for owners and operators of waste and recycling facilities in NSW.</p> |
| <b>Mr Mark Liebman</b> | Auditor (civil engineer and water management specialist)          | Bachelor of Economics, Bachelor of Civil and Environmental Engineering (Hons), Chartered Professional Engineer, MIEAust  | <p>Mark is a Chartered Professional Engineer, is a founding Director of Sustainability Workshop with degrees in Civil and Environmental Engineering (1st Hons) (UTS) and Economics (Syd). He has developed a strong standing in the industry and is a thought leader and innovator in the water &amp; environment arena. Mark has over 25 years’ experience which has seen him working on projects in the Republic of Georgia, China, UK, Japan and Australia.</p> <p>Mark has helped to pioneer water sensitive urban design in Australia with specific fields of expertise in water quality management, hydrological and water balance modelling and design of treatment systems. Mark also specialises in industrial surface water quality management with recent projects including water cycle management for two SSDs – Borgs Panels site, and Kariong Sand and Soil (Recycling Facility).</p>  |



| Name                   | Audit Role          | Qualifications   | Experience   |
|------------------------|---------------------|--|--|
|                        |                     |  | <p>Mark also recently helped Sydney Recycling Park assess alternative leachate management strategies. Mark is part of a team that carries out the annual audit of the Sydney Intermodel Terminal development at Moorebank. Mark’s role is to audit the water cycle management infrastructure.</p> <p>Mark is also leading a \$3 million research project into biofiltration for Blacktown City Council and assisting Sydney Water in the development and design of the Mamre and Aerotropolis Precincts integrated water cycle management plans.</p> <p>Mark’s degree in Economics is frequently used while working with Councils and developers on integrated water cycle projects, economic analysis of projects and development of responsive, scientifically sound policies and implementation tools.</p>  |
| <p>Mr Alan Parsons</p> | <p>Lead auditor</p> | <p>Higher Cert Metallurgy, Lead Auditor Environmental Management &amp; Systems, Occupational Health, Safety, and Quality Management Systems.</p> | <p>Alan has extensive experience over the past 30 years in the business improvement solutions for private sector heavy and light manufacturing, logistics, maritime and service industries. Specific management experience in the development and audit of risk-based management systems for quality, safety and environmental management systems including the integration of management systems designed around core company process requirements. Initial employment was with BHP (29 years) initially in the manufacturing, technical process management, port management and stevedoring areas. During the latter years responsible of internal and 3rd party certification for BHP Transport, prior to the division being disbanded in 2001.</p> <p>Post 2001 was appointed to the national role (on contract) responsible for management systems compliance for the BlueScope Steel Processing and Logistics Division for 15 years. This included management/advising on 3rd party certification, OHS self-insurance programs and Environmental legislative compliance. This responsibility extended to the provision of advice on the implementation of risk assessment protocols for operations, project management, and OHS&amp;E program requirements. During this period Alan was contracted to other companies to provide advice and internal audit and lead auditor services on an ‘as needs’ basis for Safety, Environmental and Quality aspects including compliance to legislative/regulatory aspects.</p> <p>The use of business improvement tools to develop business systems for legislative compliance (including work cover self-insurance and EPA license compliance), second and third-party certification. Experience in environmental management and audit</p> |

| Name | Audit Role | Qualifications | Experience   |
|------|------------|----------------|--|
|      |            |                | <p>for industry has also been a deliverable over this period.</p> <p>Alan was an Exemplar Global certified lead auditor (20 years) in quality, occupational health &amp; safety, environmental management systems and environmental management (Registration Number 14045). More recently the registration was transferred to DNVGL. Alan has extensive knowledge of the requirements for compliance to ISO 9001: 2015, ISO 14001: 2015 and ISO 45001: 2018, ISO 27001: 2013 management systems standards as examples. Alan has been a qualified Lead Auditor throughout this period with these organisations.</p> |

### 1.3. Audit Objectives

The objective of the Annual Independent LWMS Audit (the Audit) is to assess its environmental performance against the assumptions and predictions in the 2017 project water balance, determine whether the leachate and water management system is achieving its intended objectives, and outline any relevant measures to improve performance.

The Audit has been prepared in accordance with the NSW Department of Planning, Industry and Environment’s *Independent Audit Post Approval Requirements* (2020). The Audit covers the period from 16 March 2021 until 15 March 2022.

In accordance with Condition 18R of Schedule 2 of Project Approval MP 10\_0012 (as modified), Veolia is to engage a suitably qualified consultant to undertake the Annual Leachate and Water Management System Audit (LWMS) at the Woodlawn Bioreactor:

**Condition 18R**

*“Within six months of commissioning the LTP and annually thereafter, unless otherwise agreed to by the Planning Secretary, the Proponent shall commission and pay the full cost of an independent assessment of the leachate and water management system. This audit must be conducted by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Planning Secretary. During the audit, this expert must:*

- a) *consult with the EPA, Water NSW and the Planning Secretary;*
- b) *assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include:*
  - i. *actual versus predicted inputs and outputs into and out of each dam;*
  - ii. *actual versus predicted mechanical evaporation from each dam;*
  - iii. *actual versus predicted rainfall and evaporation; and*
  - iv. *the actual versus predicted volume of water or treated leachate stored in each dam.*
- c) *assess actual versus predicted performance of the LTP. This must include:*
  - i. *actual versus target effluent quality; and*
  - ii. *actual versus target throughput.*
- d) *determine whether the leachate and water management system is achieving its intended objectives; and*

- e) *outline all reasonable and feasible measures that may be required to improve water and leachate management at the site.”*

## 1.4. Audit Scope

The scope of the Audit included an assessment of the following matters in accordance with the requirements of Condition 18R of Schedule 2 of Project Approval MP 10\_0012:

- The conditions of all relevant approvals;
- Management plan requirements;
- The requirements of relevant regulatory agencies;
- The status of the operation;
- The key regulatory risks, including past or future risks;
- The predictions of environmental impact assessments;
- The performance of the operation;
- Results from previous audits;
- Any incidents or community complaints;
- Feedback received from other regulatory agencies on the performance of the operation;
- Feedback received from the community / community consultative committee on the performance of the operation; and
- Agency policy or other focus areas.

An overview of the stormwater and leachate streams associated with the Woodlawn Eco-Precinct is shown in Figure 1.1. It is noted that the scope of the audit has included the management of stormwater, leachate, leachate treatment plant operations and the evaporation dams in place to manage treated leachate generated from the premises.

A flow chart showing the management of water inputs and outputs from the Woodlawn Eco-Precinct is shown in Figure 1.2.

## 1.5. Temporal Period Covered by the Audit

This Independent Audit is the fourth audit to be conducted against Condition 18R of Schedule 2 of Project Approval MP 10\_0012. The last audit was completed by SLR Consulting on 4<sup>th</sup> June 2021 for the audit period 12 March 2020 to 11<sup>th</sup> March 2021.

This Audit was commissioned by Veolia on 15<sup>th</sup> February 2022, 12 months since the last audit.

The Audit covers the period from 16<sup>th</sup> March 2021 until 15<sup>th</sup> March 2022.

Figure 1.1. Overview of the stormwater and leachate streams associated with the Woodlawn Eco-Precinct (Courtesy, Veolia Environmental Services Pty Ltd).

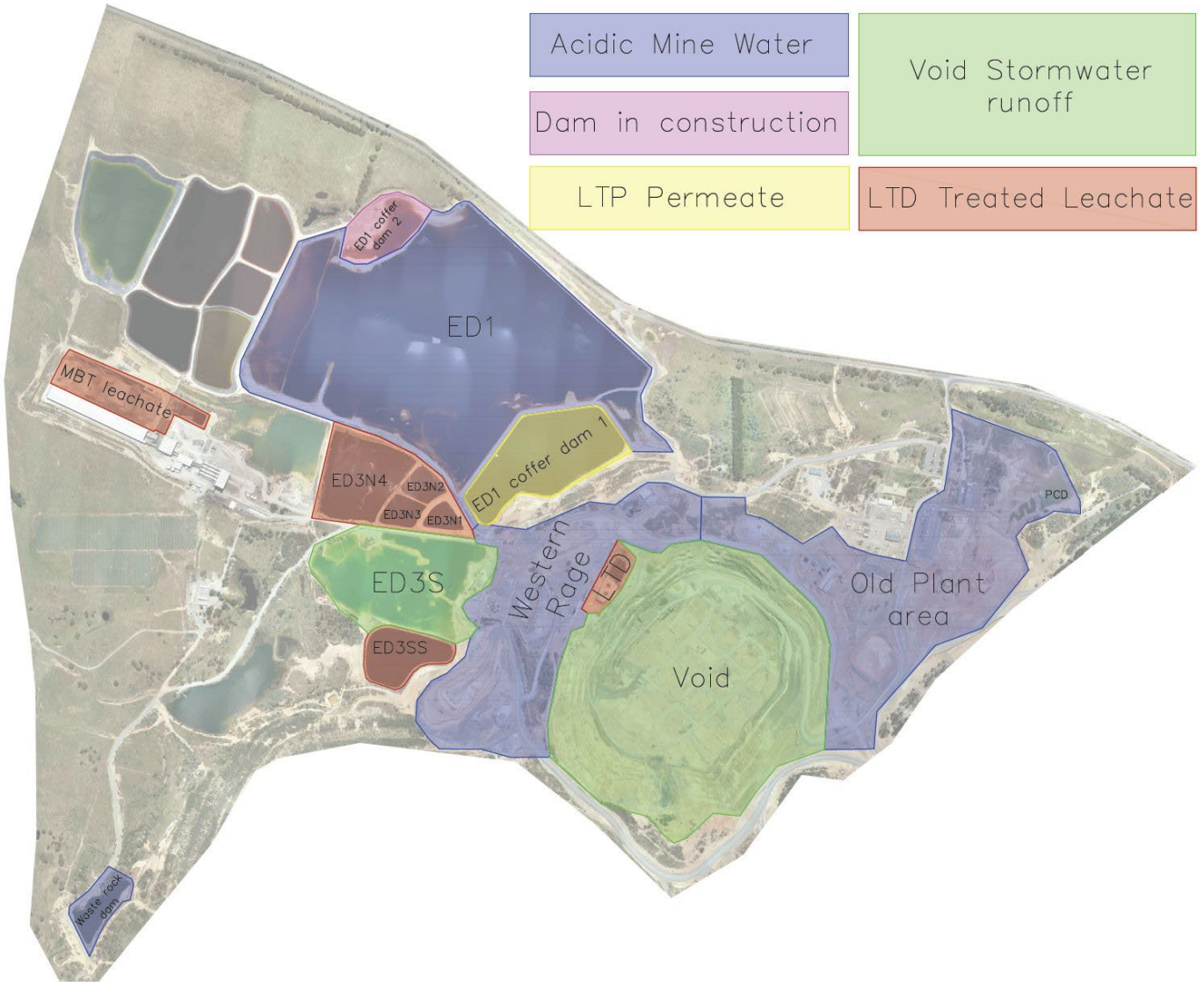
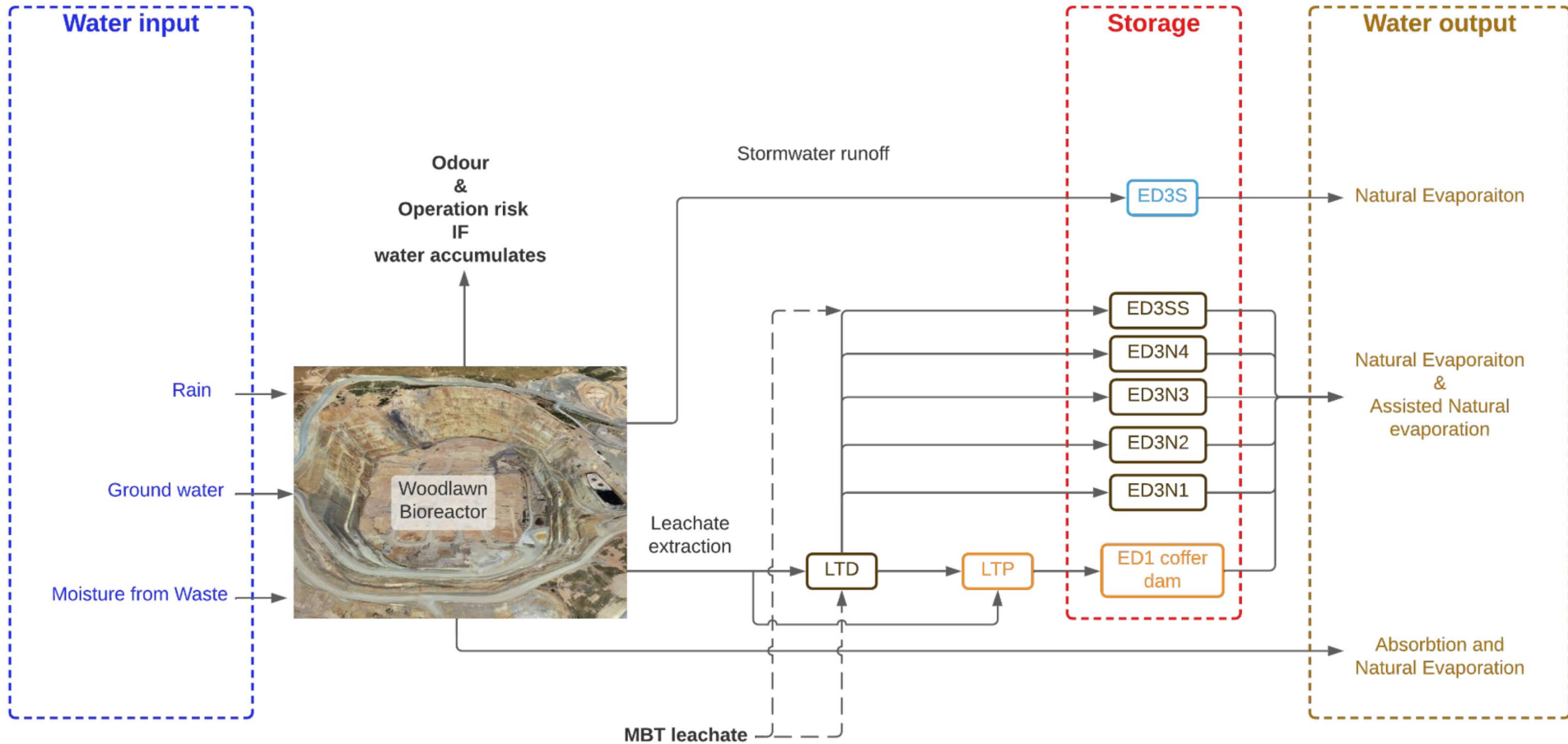


Figure 1.2. Flow chart showing how water inputs and outputs from the Woodlawn Eco-Precinct are managed under Project Approval MP10\_0012 (Courtesy, Veolia Environmental Services Pty Ltd).





## 2. Audit Methodology

### 2.1. Audit team approval

Veolia Environmental Services Pty Ltd wrote to the Department of Planning and Environment with details, qualifications and experience of the Audit team in February 2022. The Audit team was approved by the NSW Department of Planning and Environment in a letter dated 2 March 2022 (see Appendix D).

### 2.2. How the audit scope was developed

The scope of the audit as outlined in Section 1.4 was informed through an assessment of the compliance requirements of Condition 18R of Schedule 2 of Project Approval MP 10\_0012.

Environmental compliance matters relating to the operational phase of the development were considered. Any matters relating to the construction phase of the project was considered out of scope.

The audit plan focused on the compliance requirements relating to the management of the leachate and water management system for the Woodlawn Eco-Precinct only. The audit also considered key environmental compliance matters raised by the Department of Planning and Environment, Water NSW and the NSW EPA.

An audit plan was prepared in consultation with Veolia and this is provided in Appendix E.

### 2.3. Audit process and compliance assessment

The audit process outlined in *ISO 19011 Guidelines for Auditing Management Systems* (2018) has been used to inform the development of the audit plan. The Audit plan including the audit methodology is summarised in Table 2.1. The full Audit Plan is provided in Appendix E.

Three considerations relevant to the scope of this Independent Audit include that of:

- Project implementation phase;
- Documentation; and
- Spatial Scope.

A site audit meeting and inspection was held at the facility on 27<sup>th</sup> April 2022. Photographs from the site inspection are provided in Appendix B. A closeout meeting and presentation of the Audit findings was held on 8<sup>th</sup> July 2022.

**Table 2.1. Summary of the audit methodology and the audit plan.**

| No. | Audit plan task  |
|-----|--|
| 1   | <b>Letter seeking audit team approval</b> – In accordance with the NSW Department of Planning, Industry and Environment’s <i>Independent Audit Post Approval Requirements</i> (2020), a letter was prepared seeking DPE approval for the audit team.   |
| 2   | <b>Develop the Audit Plan</b> – An audit plan was developed outlining what will be audited, who will do the auditing, when it will happen and who will be audited, and how much time will be dedicated to each process in the audit. Work will also be assigned to auditors. The audit working papers were also prepared to identify what the auditors wants to verify, what questions to ask, and what they expect as evidence. The Audit Plan included the audit sequence. Consultation with relevant agencies, including EPA, Water NSW and the Planning Secretary of DPE in accordance with your consent and the <i>Independent Audit Post Approval Requirements</i> . |
| 3   | <b>Conduct the opening meeting</b> – The onsite audit begins with an opening meeting. This is to introduce the auditors, confirm the scope and extent of the audit and discuss the schedule. Site audit meeting and inspection held on 27 April 2022   |



| No. | Audit plan task   |
|-----|---|
|     | <b>Review documents</b> – After the meeting, any documents immediately presented by Veolia was reviewed to gather relevant information that might not have been available before.   |
|     | <b>Carry out the audit</b> – The auditors commenced the audit by interviews and collecting the records and observations that will demonstrate if the processes meet the Development Consent conditions and EPL requirements. Write to EPA, Water NSW and DPE and seek any feedback on the environmental performance of the development. |
|     | <b>Generate findings and conclusions</b> – Generate the audit findings and prepare any audit conclusions to be presented at the closing meeting.  |
|     | <b>Conduct the closing meeting</b> – The onsite audit finishes with a closing meeting to present the audit findings and provide Veolia with the opportunity to discuss and ask questions about the audit and findings.  |
| 4   | <b>Formalise audit findings in a report</b> – The final findings formally written and distributed in an audit report.   |

To help assess the compliance status under each part of Condition 18R of Condition 18R of Schedule 2 of Project Approval MP 10\_0012, an evidence-based evaluation approach was used. Relevant evidence was discussed during the audit meeting and site inspection to help inform the view of the Auditors as to whether the site was operating in a compliant or non-compliant manner. Evidence assessed as part of the Audit included:

- Relevant records, documents and reports (including details such as any relevant document reference, the date of the document, revision number and author);
- Interviews of relevant site personnel;
- Photographs (including the date the photograph was taken);
- GIS figures and associated shapefiles (as relevant and available);
- Site inspections of relevant locations, activities and processes;
- Monitoring data and analysis including the period covered by the monitoring data; and
- Delivery records, invoices and receipts including the record date and reference number.

## 2.4. Site personnel interviewed

We thank Veolia for providing a broad range of management and technical staff to support the audit interview and site inspection. These personnel, including names and position titles are noted in Table 2.3 below.

**Table 2.3. Veolia Environmental Services Pty Ltd representatives supporting the Audit.**

| Name               | Position  | Organisation                          |
|--------------------|---|---------------------------------------|
| Mr Justin Houghron | Woodlawn Eco-Precinct Manager                       | Veolia Environmental Services Pty Ltd |
| Ms Marea Rakete    | Woodlawn Environmental Officer                      | Veolia Environmental Services Pty Ltd |
| Mr Tobias Stanley  | Woodlawn Bioreactor and Woodlawn Bio-Energy Manager | Veolia Environmental Services Pty Ltd |
| Mr Andrew Jackson  | Environmental Compliance Manager                    | Veolia Environmental Services Pty Ltd |
| Dr Ark Du          | Woodlawn Eco-Precinct Engineering Manager           | Veolia Environmental Services Pty Ltd |
| Mr Kevin Xie       | Landfill Engineer                                   | Veolia Environmental Services Pty Ltd |
| Mr Callum Simpson  | Woodlawn LTP Operations Supervisor                  | Veolia Environmental Services Pty Ltd |

## 2.5. Site inspection undertaken

Following the audit meeting on 27<sup>th</sup> April 2022, an inspection of the leachate and water management operations of the Woodlawn Eco-Precinct was undertaken. This involved a bus tour and site inspection of the following critical elements of the site’s leachate and water management system:

- Woodlawn landfill void (from the north western viewing location at the top of the void);
- Leachate Treatment Dam;
- Dams used for the collection, storage and evaporation of stormwater (ED3S and ED3SS);
- Leachate Treatment Plant, including plant controls and physical operations;
- Treated leachate evaporation dams (ED3N1, ED3N2, ED3N3 and ED3N4);
- Leachate Treatment Plant Permeate storage dam (ED1 Cofferdam 1); and
- Acidic Mine Water Storage Dam (ED1).

Due to rain at the time of the site inspection, limited photographs were taken during the site inspection. Photos taken during the site inspection are provided in Appendix B.

## 2.6. Consultation undertaken

Consultation was undertaken in accordance with the requirements of Condition 18R(a). Consultation letters were prepared and issued to agencies on 11<sup>th</sup> April 2022 to seek feedback on key environmental matters relating to the audit.

Consultation was performed with Water NSW, DPE and NSW EPA. Copies of letters issued are provided in Appendix G. Feedback from agencies was requested by 25<sup>th</sup> April 2022.

## 2.7. Compliance status descriptions

The compliance assessment criteria as outlined by the Department of Planning and Environment in the *Independent Audit Post Approval Requirements (2020)* has been used in this Audit (see Table 2.2 below).

Please note that the compliance status of relevant conditions of consent assessed in this Audit is presented in Appendix A.

**Table 2.2. Compliance assessment criteria as per DPE (2020) *Independent Audit Post Approval Requirements*.**

| Assessment           | Criteria   |
|----------------------|--|
| <b>Compliant</b>     | The auditor has collected sufficient verifiable evidence to demonstrate that all elements of the requirement have been complied with within the scope of the audit.  |
| <b>Non-compliant</b> | The auditor has determined that one or more specific elements of the conditions or requirements have not been complied with within the scope of the audit.   |
| <b>Not triggered</b> | A requirement has an activation or timing trigger that has not been met during the temporal scope of the audit being undertaken (may be a retrospective or future requirement), therefore an assessment of compliance is not relevant. |

## 3. Audit Findings

This section provides the main findings of the Audit to address all the requirements of Condition 18R of Schedule 2 of Project Approval MP 10\_0012 (as modified).

Appendix A includes tables of findings of this Audit, the compliance status of each condition audited and recommendations.

### 3.1. Approvals and documents audited

Key documentation reviewed as part of the Audit includes the following documents. Specific items of evidence used to assess compliance to the conditions of consent under Condition 18R of Schedule 2 of Project Approval MP 10\_0012 (as modified) is outlined in the compliance audit tables in Appendix A, and also noted below.

- Project Approval MP 10\_0012, as modified;
- Woodlawn Annual Reports;
- Monitoring data including:
  - Generated leachate and treated leachate volumes between 16/03/21 to 15/03/22;
  - Bioreactor waste mass moisture content;
  - Rainfall data;
  - Water monitoring and water balance monitoring; and
  - Independent Odour Audit #9 (The Odour Unit, dated August 2021);
  - Water Balance Presentation (Veolia, dated 26/04/22);
- Monthly Reports for the Leachate Treatment Plant for EPA for months of March 2021 to February 2022 (inclusive) (LTP);
- Environmental Management Plans, including:
  - Soil and Water Management Plan;
  - Bioreactor Landfill Environmental Management Plan;
  - Bioreactor Soil and Water Management Plan;
  - Leachate Management Plan;
  - Operations and maintenance plans for the LWMS;
  - Eco-Precinct Emergency Response Plan;
  - Site inspection checklists;
  - DPE approvals for management plans;
  - Surface Water Management Plan (LandTeam, dated 13/04/2016);
- Previous Independent Leachate and Water Management System Audits (2019, 2020, and 2021);
- Status report on recommendations from the 2021 Independent Leachate and Water Management System Audit;
- Woodlawn Bioreactor Facility Water Balance Performance Review (WSP, dated 09/04/22);
- Woodlawn Bioreactor Emergency Stormwater Management – DA31-02-99 and MP10\_0012 (Veolia correspondence with DPE dated 05/01/2022);
- Woodlawn Leachate Treatment Plant October 2020 – Audit Report;
- Incident reports;
- Training register;
- Leachate Treatment Plant Training and Procedures;
- Position description for the Leachate Treatment Plant Supervisor;
- Position description for the Landfill Engineer;
- Position description for the Woodlawn Eco-Precinct Engineering Manager;

- Register of discharges;
- Veolia Assessment Management System (VAMS); and
- Complaints Register.

## 3.2. Summary of the compliance assessment












This section provides a summary of the assessment of the actual performance during the Audit period against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. A comparison is also made to the 2021 audit report in Table 3.1 below.

It is noted that extended wet weather periods and lower than predicted rates of evaporation has resulted in storage levels in dams exceeding predictions. This has in turn increased from the number of non-compliances from four (4) in 2021 to seven (7) in 2022. However, we have grouped non-compliances in relation to the water balance model into one non-compliance with four parts that relate to conditions 18(b)(i) – (iv).

Further details in relation to recommended actions to address the non-compliances are provided in Table 3.2 and further elaborated on in Appendix A.

**Table 3.1. Summary of the compliance assessment conducted as part of the 2022 Audit. A comparison to the results of the 2021 Audit is provided to help in understanding trends in compliance (tick, compliant; cross, non-compliant).**

| Consent condition   | Condition reference no. | 2021 Compliance Status | 2022 Compliance Status |
|---|-------------------------|------------------------|------------------------|
| 18R<br>Within six months of commissioning the LTP and annually thereafter, unless otherwise agreed to by the Secretary, the Proponent shall commission and pay the full cost of an independent assessment of the leachate and water management system. This audit must be conducted by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Secretary. During the audit, this expert must: | 18R                     | ☑                      | ☑                      |
| 18R(a)<br>Consult with the EPA, Water NSW and the Secretary.  | 18R(a)                  | ☑                      | ☑                      |
| 18R(b)(i)<br>Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted inputs and outputs into and out of each dam.  | 18R(b)(i)               | ☒                      | ☒ (1)                  |
| Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted mechanical evaporation from each dam.  | 18R(b)(ii)              | ☑                      | ☒ (2)                  |
| Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted rainfall and evaporation.  | 18R(b)(iii)             | ☑                      | ☒ (3)                  |
| Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: the actual versus predicted volume of water or treated leachate stored in each dam.  | 18R(b)(iv)              | ☒                      | ☒ (4)                  |
| Assess actual versus predicted performance of the LTP. This must include: actual versus target effluent quality   | 18R(c)(i)               | ☒                      | ☒                      |
| Assess actual versus predicted performance of the LTP. This must include: actual versus target throughput.  | 18R(c)(ii)              | ☒                      | ☒                      |

| Consent condition   | Condition reference no. | 2021 Compliance Status  | 2022 Compliance Status  |
|---|-------------------------|---|---|
| Determine whether the leachate and water management system is achieving its intended objectives.<br>1. Construction of a suitably sized and lined coffer dam (referred to as ED1 Cofferdam) to store and evaporate treated leachate from its leachate treatment plant from September 2018 for 4- year period without filling. | 18R(d)                  |  |  |
| 2. In accordance with Condition 18S of the Project Approval (MP 10_0012), as modified, the volume of mine water stored in ED1 must be no more than 10 ML by 31 December 2023.   | 18R(d)                  | Not triggered   | Not triggered   |
| 3. In accordance with Condition 18T of the Project Approval (MP 10_0012), as modified, ED3N must be emptied of effluent from the existing leachate system by 31 December 2022.  | 18R(d)                  | Not triggered   | Not triggered   |
| 4. Install floating evaporators in ED3N1, ED3N2, ED3N3, ED3N4 and ED3SS to manage leachate from September 2017 through to December 2019.  | 18R(d)                  |  |  |
| 5. Operate effectively without adversely impacting on the surrounding community.  | 18R(d)                  |  |  |
| 6. Minimise leachate production   | 18R(d)                  |  |  |
| 7. Effectively separate all classes of water.   | 18R(d)                  |  |  |
| Outline all reasonable and feasible measures that may be required to improve water and leachate management at the site.   | 18R(e)                  | Not reported  |  |

<sup>1</sup> It is noted that prevailing climatic conditions have not made it possible to comply with this requirement; <sup>2</sup> Condition based on an inadequate water balance. In addition to mechanical methods, Veolia continues to implement multiple methods to improve evaporation where possible. In addition, the climatic conditions have not made it possible to meet this requirement; <sup>3</sup> Condition based on an inadequate water balance. As a result of high rainfall and low evaporation, this condition could not have been met; <sup>4</sup> Condition based on an inadequate water balance. Meeting this condition has been hampered again by excessively wet conditions.

### 3.3. Notices, orders, penalty notices or prosecutions issued during the audit period

During the Audit period, no notices, orders, penalty notices or prosecutions were received by Veolia.

We note that on 1<sup>st</sup> April 2022, DPE issued Veolia a Development Control Order (Order) to remedy a breach of the Consent and requires Veolia to develop short, medium, and long-term leachate and water management strategies. Engeny Water Management (Engeny) is the consultant engaged by Veolia to prepare a Leachate and Water Management Strategy for the facility.

The Order was issued outside of this Audit’s reporting period and therefore is excluded from the scope of the Audit. This matter will be addressed in detail in the 2023 Audit.

### 3.4. Summary of non-compliances

This section provides a summary of the non-compliances found during the 2022 Audit.

As noted in Section 3.2, extended wet weather periods and lower than predicted rates of evaporation has resulted in storage levels in dams exceeding predictions. This has in turn resulted in ongoing non-compliances when compared to the 2021 Audit. The results are presented in Table 3.2.

Recommendations to address the non-compliances are summarised in Table 3.2 as well.

**Table 3.2. Summary of non-compliances from the current audit, and recommended actions to address the non-compliances. Timeframes that Veolia has committed to in addressing these non-compliances is also given. Please also refer to footnotes in Table 3.1 in relation to difficulties Veolia have experienced in meeting the requirements of the water balance model, given very wet climatic conditions during the Audit period.**

| Consent condition   | Condition reference no. | Non-compliance identification no. | Details of the non-compliance   | Auditor's recommended action to address non-compliance  | Timeframe for resolving the non-compliance (agreed to by Veolia) |
|---|-------------------------|-----------------------------------|---|---|--|
| 18R(b)(i)<br>Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted inputs and outputs into and out of each dam | 18R(b)(i)               | NC1(a)                            | <p>+ Actual inputs into dams were substantially more than predicted in the 2017 water balance model due to excessive wet conditions during the audit period 16 March 2021 to 15 March 2022.</p> <p>The 2017 water balance model correctly predicted that under the wettest conditions it would not be possible to empty the ED3N dams and line them prior to ED1 Coffey Dam spilling. By setting dates for this to occur, the consent failed to consider the possibility that wettest conditions would occur and under such conditions, compliance would be highly unlikely to occur.</p> | <p>+ The Auditors recommend the leachate and water management strategy as required under April 2022 Development Control Order be completed in 2022 as a priority, including a revised water balance model, with a development modification submitted to DPE seeking to implement the required changes to the water management system. This modification shall also seek to update the reference water balance model for future compliance assessments.</p> <p>+ The development modification shall also include a revised and practical target date(s) for emptying of ED3N lagoons and replace their liners based on an updated water balance model.</p> <p>+ A series of specific modelling recommendations are provided in Appendix A.</p> | 23/12/2022   |
| Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus  | 18R(b)(ii)              | NC1(b)                            | <p>+ Actual mechanical evaporation losses from each dam is substantially less than predicted in the 2017 water balance model due in part to overestimation of mechanical evaporation in combination with unfavorable climatic conditions during the audit period 16 March 2021 to 15 March 2022.</p>  | <p>+ The recommendation to address this non-compliance is addressed in NC1(a).</p> <p>+ A series of specific modelling recommendations are provided in Appendix A.</p>  | 23/12/2022   |



| Consent condition   | Condition reference no. | Non-compliance identification no. | Details of the non-compliance   | Auditor's recommended action to address non-compliance   | Timeframe for resolving the non-compliance (agreed to by Veolia) |
|---|-------------------------|-----------------------------------|---|--|--|
| predicted mechanical evaporation from each dam  |                         |                                   |   |  |  |
| Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted rainfall and evaporation                                   | 18R(b)(iii)             | NC1(c)                            | +Actual rainfall was substantially higher and evaporation was substantially lower than the wettest year predictions in the 2017 water balance model, due to extreme climatic conditions during the audit period 16 March 2021 to 15 March 2022. | + The WSP water balance report done in 2017 shall be updated taking into consideration worst case scenarios rainfall and evaporatory conditions based on recent weather events. This modelling is recommended to occur as part of NC1 (a). | 23/12/2022   |
| Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: the actual versus predicted volume of water or treated leachate stored in each dam | 18R(b)(iv)              | NC1(d)                            | Actual inputs into the treated leachate dams has been substantially more than predicted in the 2017 water balance model due to excessive wet conditions during the audit period 16 March 2021 to 15 March 2022.                                 | + The recommendation to address this non-compliance is addressed in NC1(a).  | 23/12/2022   |

| Consent condition   | Condition reference no. | Non-compliance identification no. | Details of the non-compliance   | Auditor's recommended action to address non-compliance  | Timeframe for resolving the non-compliance (agreed to by Veolia) |
|---|-------------------------|-----------------------------------|---|---|--|
| Assess actual versus predicted performance of the LTP. This must include: actual versus target effluent quality   | 18R(c)(i)               | NC2                               | + Effluent quality is considered to meet EPA license limits, however there was a single exceedance of ammonia and TSS during the audit period. As a result, the plant did not fully achieve effluent quality targets across the audit period.   | + Continue to improve and optimize the LTP operation with the assistance of suitably qualified experts (as required).<br>+ Ensure that the LTP has additional membrane capacity installed as planned and that the additional capacity is commissioned and operating successfully. | 31/08/2022   |
| Assess actual versus predicted performance of the LTP. This must include: actual versus target throughput.  | 18R(c)(ii)              | NC3                               | + The LTP achieved an average throughput of 3.4 L/sec during the audit period, less than the target of 4 L/sec.   | + The previous recommendation for NC2 will address this non-compliance.   | 31/08/2022   |
| Determine whether the leachate and water management system is achieving its intended objectives.<br><br>1. Construction of a suitably sized and lined coffer dam (referred to as ED1 Cofferdam) to store and evaporate treated leachate from its leachate treatment plant from September 2018 for 4- year | 18R(d)                  | NC4                               | + Veolia has optimized the mix of influent into the LTP to balance the flow of COD and nutrients into the plant. This balance requires the LTD to continue to operate and for leachate treated in the LTD to be stored in the ED3N or ED3SS lagoons for later ingestion into the LTP to help balance direct leachate feed.<br>+ Some problems with foaming have now been overcome through the use of antifoaming agents.<br>+ Effluent quality is considered to meet EPA license limits. There was a single minor exceedance of ammonia and TSS during the audit period. As a result, the plant did not fully achieve effluent quality targets across the audit period. | + Continue to improve and optimize the LTP operation with the assistance of suitably qualified experts (as required).   | 31/08/2022   |



| Consent condition       | Condition reference no. | Non-compliance identification no. | Details of the non-compliance | Auditor's recommended action to address non-compliance | Timeframe for resolving the non-compliance (agreed to by Veolia) |
|-------------------------|-------------------------|-----------------------------------|-------------------------------|--|--|
| period without filling. |                         |                                   |                               |  |  |

## 3.5. Previous audit recommendations

Table 3.2 provides a summary of the recommendations from the 2021 Independent Leachate and Water Management System Audit. The table also summarises any actions that were implemented to ensure the non-compliances are satisfactorily resolved and/or whether the recommendation is yet unresolved.

**Table 3.2. Previous audit recommendations and current status.**

| Rec No. | 2021 LWMS Audit Recommendation   | Comment  | Proposed Completion Date | Status   |
|---------|--|--|--------------------------|----------|
| 1       | Seek to develop a contingency plan to empty the dams if the revised water balance report indicates that the Project Approval (MP 10_0012) requirements will likely not be achieved. It is recommended that this contingency plan be developed in consultation with the relevant Regulators. Due the higher rainfall and lower evaporation in 2020 and 2021, the target dates for the emptying of certain dams shall be reassessed and discussed with the relevant Regulators and extension shall be considered as a contingency. | A letter was sent to EPA regarding Veolia's response to LWMS Actions.  | 21/12/2021               | Complete |
| 2       | Continue to seek opportunities to optimize the dam evaporation systems to reduce the volume of the stored leachate and legacy mine drainage (e.g. positioning of mechanical evaporators, evaporator maintenance, evaporator operational time etc.).  | A consultant has been engaged to undertake a Water Balance in which contingency planning will be reassessed to empty ED3N & ED1 if the revised water balance report indicates that the Project Approval requirements will likely not be achieved. Continuous improvement work is also underway on evaporation optimization.  | 30/06/2022               | Complete |
| 3       | Continue to improve and optimize the LTP operation with the assistance of suitably qualified experts (as required).  | Veolia will engage a third party to assess the odour potential of the effluent with higher (than the current target) COD concentration, re-assess and set more realistic effluent quality targets in consultation with the EPA, Water NSW and the Planning Secretary should the Void leachate become concentrated for an extended period causing higher than target COD. | 21/12/2021               | Complete |
| 4       | Consider engaging a suitably qualified specialist to re-assess the LTP water quality targets as there appears to be a strong case to reduce some of these targets.   | Part of this recommendation includes managing the installation of additional ultrafiltration (UF) system train to increase the throughput of the LTP   | 01/07/2022               | Complete |

| Rec No. | 2021 LWMS Audit Recommendation  | Comment   | Proposed Completion Date | Status   |
|---------|---|---|--------------------------|----------|
|         |   | <p>and continues to utilise suitably qualified experts to improve and optimize its operation. Contracts are signed, the UF unit are ordered, design documents have been received, and project scheduling has been amended to maintain the required due date.</p> <p>Veolia advised they would not engage a specialist to consider a revision to the targets due to the fact that the filtrate analytes are typically maintained below threshold levels. As a consequence, the Auditors view is that this recommendation is no longer valid and can be closed out.</p> |                          |          |
|         |   | <p>Veolia sought approval on 20/07/2021 from the EPA to discharge contaminated stormwater directly to ED3N or ED3SS in order to maintain the feed quality to LTP for a stable operation of LTP.</p>   | 31 July 2021             | Complete |
| 5       | <p>Continue to seek opportunities for leachate minimisation as the operation progresses and changes in the future (e.g. improving the void seepage containment system to minimise overflows into the void).</p> | <p>Veolia sought approval from the EPA to discharge contaminated stormwater directly to ED3N or ED3SS, to maintain the feed quality to LTP for a stable operation of LTP, and continue to work on the optimization of stormwater management to minimise leachate production. A third party consultant has been engaged to assist in the development of a long-term leachate management solution.</p>  | 31 July 2021             | Complete |

## 3.6. Adequacy of Environmental Management Plans, sub-plans and compliance documents and opportunities for improvement

The environmental management plans, sub-plans and compliance documents appear to be satisfactory in implementing the conditions of consent as approved under Condition 18R of Schedule 2 of Project Approval MP 10\_0012 (as modified). The purpose of the plans is to guide management of operations to ensure environmental impacts are minimised and the site is managed in accordance with the conditions of consent.

This Audit has found that the 2017 water balance has not been a reliable predictor of rainfall, evaporation rates and levels in dams for the Woodlawn bioreactor landfill. As a consequence, inflows into the dam systems have exceeded outflows, leading to increasing dam levels which exceed freeboard levels.

We note that in the 2021 Audit, it was recommended that a contingency plan be prepared to empty the dams if the revised water balance model report will not be achieved. The Audit also recommended that due to the higher rainfall and lower evaporation in 2020 and 2021, the target dates for the emptying of certain dams shall be reassessed and discussed with the relevant Regulators and extension shall be considered as a contingency.

On 1<sup>st</sup> April 2022 Veolia received a Development Control Order from DPE seeking the preparation of a short to medium term leachate management strategy and a long-term leachate and water management strategy due to exceedance of the 80% capacity limit and 0.5m freeboard requirements for dams as noted in the Order. Whilst the Order has been received outside of the Audit period, the non-compliances demonstrate the limitations of the existing water balance model.

As noted in Section 3.4, we recommended the leachate and water management strategy as required under the April 2022 Development Control Order be completed in 2022 as a priority, including the preparation of a revised water balance model, with a development modification submitted to DPE seeking to implement the required changes to the water management system. This modification shall also seek to update the reference water balance model for future compliance assessments.

Once this matter is resolved, it is recommended that the site's Soil and Water Management Plan be updated accordingly.

## 3.7. Other matters

Nil.

## 3.8. Agency consultation and feedback

Consultation was undertaken in accordance with the requirements of Condition 18R(a). Consultation letters were prepared and issued to agencies on 11<sup>th</sup> April 2022 to seek feedback on key environmental matters relating to the audit. Consultation was performed with Water NSW, DPE and NSW EPA. Copies of letters issued are provided in Appendix G. Feedback from agencies was requested by 25<sup>th</sup> April 2022.

### 3.8.1. Water NSW

A letter was issued to Water NSW on 11<sup>th</sup> April 2022 providing an opportunity to comment on the environmental performance of the LWMS including environmental compliance matters relating to the management of water and leachate under Development Consent MP 10\_0012.



No feedback had been received at the time of writing this report.

### 3.8.2. Department of Planning and Environment

A letter was issued to DPE on 11<sup>th</sup> April 2022 providing an opportunity to comment on the environmental performance of the LWMS including environmental compliance matters relating to the management of water and leachate under Development Consent MP 10\_0012.

An email response was provided by Ms Georgia Dragicevic on 13<sup>th</sup> April 2022 (Appendix G). The following feedback was provided:

- The Department requests that you assess the environmental performance of the Leachate and Water Management System, including the identification of any non-compliances with the relevant consent conditions and recommend any actions to bring the operation into compliance; and
- The audit report needs to be accompanied with a Veolia response to audit recommendations and timeframes for DPE consideration.

The environmental performance of the Leachate and Water Management System has been assessed in their Audit report with an assessment of compliance with the Conditions of Consent being given in Appendix A. A Veolia response to these recommendations and timeframes will be provided separately by Veolia in accordance with DPE guidelines.

### 3.8.3. NSW EPA

A letter was issued to DPE on 11<sup>th</sup> April 2022 to NSW EPA providing an opportunity to comment on the environmental performance of the LWMS including environmental compliance matters relating to the management of water and leachate under Development Consent MP 10\_0012.

NSW EPA requested that several matters be considered in the Audit in a letter dated 3<sup>rd</sup> May 2022 (Appendix G). These matters are set out in Table 3.2 along with a reference to where these comments have been addressed in the Audit report.

### 3.8.4. Consultation with Veolia's Consultant Engaged to Develop Leachate and Water Management Strategies

On 1<sup>st</sup> April 2022 the DPE issued Veolia a Development Control Order (Order) to remedy a breach of the Consent and requires Veolia to develop short, medium, and long-term leachate and water management strategies.

Engeny Water Management (Engeny) is the consultant engaged by Veolia to prepare a Leachate and Water Management Strategy for the facility.

The Order was issued outside of the Audit reporting period and therefore is excluded from the scope of the Audit.

**Table 3.2. Summary of consultation feedback from NSW EPA and how the comments have been addressed in the Audit.**

| Topic                                   | Summary of EPA comment / request (from letter dated 3 May 2022)   | Summary response   | Section addressed                                      |
|---|---|--|--|
| <b>Purpose of Audit</b>                 | The LWMS audit is important in identifying any emerging issues in leachate and water management at the Woodlawn landfill at the earliest opportunity so they can be promptly addressed. It also ensures regular validation of environmental performance and continuous improvement. The audit should be approached with this purpose in mind.   | Noted.<br><br>The Audit team has been developed and approved by DPE. Environmental performance and recommendations for improvement are the primary objectives of this Audit.                                   | Section 1.3 and 1.4.                                   |
| <b>Development Control Order</b>        | On 1 April 2022 the DPE (in discussion with the EPA) issued Veolia a Development Control Order (order) to remedy a breach of the Consent (that also relate to Veolia’s EPL requirements). In consultation with the EPA and DPE, Veolia is required to develop short, medium, and long-term leachate and water management strategies within specified timeframes. The order and the LWMS audit each have specific purposes and requirements and are not the same. The LWMS audit should be undertaken in discussion with Veolia and the engaged specialist.  | Noted.<br><br>The Audit team is aware of the Order, however the Order was issued to Veolia outside of the Audit period and therefore is out of scope of this Audit.  | Section 3.8.4.   |
| <b>Project Water Balance Assessment</b> | The audit should compare actual performance of the leachate and water management system against the assumptions and predictions made in the project water balance and assess the scale and significance of any of differences. This water balance prepared by WSP in September 2017 is the modelling on which current management plans, approvals and licence conditions are based. If there is a rationale for preparing a revised water balance this should also be fully explained (and be capable of demonstrating the site’s zero discharge objective). The audit should consider and discuss the implications of any operational changes, so that the implications can be assessed and, if necessary, compensatory or mitigative measures can be implemented. | The Audit has assessed the performance of the leachate and water management system relative to the 2017 WSP water balance.<br><br>Recommendation are made in relation to the need for a revised water balance. | Refer to Table 3.2 and Appendix A for recommendations. |
| <b>Leachate Treatment Plant</b>         | The audit should consider the requirements of Pollution Reduction Program (PRP) condition U1.5 and U1.6 attached to EPL 11436 in June 2021. A Leachate Assessment Report prepared by Earth2water was submitted by Veolia on the 6 August 2021 to address the requirements of the PRP and based on the recommendations within Report, Veolia developed a Leachate Action Plan.<br><br>The audit should consider the requirements of PRP condition U1.3 which require Veolia to submit monthly reports to the EPA detailing the progress  | Monthly reports in relation to the performance of the LTP have been considered and assessed as per Condition 18R(c)(i)) of Appendix A.   | Refer to Appendix A.                                   |

| Topic | Summary of EPA comment / request (from letter dated 3 May 2022)  | Summary response   | Section addressed |
|-------|--|--|-------------------|
|       | <p>on the commissioning and process optimisation of the LTP. This EPL condition has specific reporting requirements.</p> <p>The audit should assess compliance with these licence conditions. The EPA makes the following observations which should also be considered:</p>                  |  |                   |
|       | <p>Extraction totals from the void appear to be reported since June 2021. Under PRP U1.3 this should have commenced from 21 September 2016.</p>  | <p>Veolia note that there was some confusion with regard to the meaning behind this requirement. Veolia had reported the extraction rate from the void to the LTP as the report was LTP related. Veolia were not commenting on the bioreactor total extraction rate, only what had been pumped into the balance tank from the void (LTP's extraction rate). Veolia corrected this issued in June 21.</p> | N/A               |
|       | <p>The monthly report refers to “accumulation total from the bio system”. It is unclear what this means.</p>   | <p>Veolia had attempted to resolve this matter in previous monthly reports. Veolia advises this simply refers to how much leachate has been pumped from the balance tank into the biological system.</p>   | N/A               |
|       | <p>The LTP is designed to achieve 4L/s into the plant. LTP has been in the process proving phase since May 2019 (over 3 years).</p>  | <p>Noted.</p>  | N/A               |
|       | <p>An additional treatment train is to be installed (due by July 2022).</p>  | <p>Veolia advised that a new ultrafiltration treatment train is currently being commissioned on-site.</p>  | N/A               |
|       | <p>The monthly report refers to an internal “Process Audit Report” which was reviewed by Veolia’s Global Technical &amp; Performance Department in October 2021. The audit should review and make comments on the report’s findings.</p>   | <p>An internal audit report was conducted on the LTP and was completed in October 2021. The findings from this report have been considered as part of the compliance assessment done for the LTP in Appendix A.</p>  | Appendix A.       |
|       | <p>The auditor should consider the requirements of Veolia’s Leachate Management Plan and Soil &amp; Water Management Plan (and be capable of demonstrating the site’s zero discharge objective).</p>   | <p>Noted. This has been considered in the Audit and recommendations are made in Appendix A.</p>  | Appendix A.       |
|       | <p>The auditor should consider the requirements of the Long-Term Leachate Treatment Solution Submission Report (Veolia, July 2016) submitted by Veolia as part of an application to modify the Project Approval and Development Consent (DA 31-02-99). This included a range of measures</p> | <p>Noted. We further note that as part of the Development Control Order issued by DPE on 1st April 2022, Veolia is required to develop short, medium, and long-term leachate and water</p>   | N/A               |

| Topic                        | Summary of EPA comment / request (from letter dated 3 May 2022)  | Summary response  | Section addressed  |
|------------------------------|--|---|--------------------|
|                              | <p>that may be required to improve water and leachate management at the site, including the following (which do not appear to have been recently considered):</p> <ul style="list-style-type: none"> <li>• Develop a program to enable the application of treated leachate to land (irrigation)</li> <li>• Use of heat to aid in treated leachate volume reduction (enhance evaporation rates)</li> <li>• Community engagement on leachate and water management issues.</li> </ul> | <p>management strategies. Engeny Water Management (Engeny) is the consultant engaged by Veolia to prepare a Leachate and Water Management Strategy for the facility.</p> <p>We agree with this recommendation and this investigation is underway.</p> <p>Assessment of these measures is considered outside of scope of this Audit.</p> |                    |
| <b>Audit Recommendations</b> | <p>The audit is required to outline all reasonable and feasible measures that may be required to improve water and leachate management at the site. The previous audit makes several recommendations regarding measures, like “contingency plans” with few details. Such statements are not measurable, trackable, and auditable.</p> <p>The Audit should identify:</p>  | <p>Noted.</p>   | <p>See below.</p>  |
|                              | <p>Specific, reasonable, and feasible actions to be undertaken to improve leachate and water management.</p>   | <p>This has been completed.</p>   | <p>Appendix A.</p> |
|                              | <p>Clearly distinguish between ongoing actions from previous audits and provide additional recommended actions to be undertaken; and</p>   | <p>This has been completed.</p>   | <p>Appendix A.</p> |
|                              | <p>For each recommendation/action state timeframes for commencement and completion</p>   | <p>This has been completed.</p>   | <p>Appendix A.</p> |

## 3.9. Summary of complaints, adequacy of responses and management

During the audit period a total of 384 complaints were received by the site, comprising a mix of complaints made to the NSW EPA Environment Line or directly to Veolia via email, phone or through their Community Feedback Line. Of the complaints received, 377 were related to odour and 7 were related to road traffic. A geographic analysis of the odour complaints is provided in Table 3.3.

**Table 3.3 Analysis of the number and geographic locations of odour complaints received during the Audit period.**

| Location      | Distance from the Bioreactor landfill (km) | Direction from the Bioreactor landfill (km) | Number of complaints |
|---------------|--|---|----------------------|
| Tarago        | 7 km                                       | East  | 253                  |
| Borough       | 20.6 km                                    | South east                                  | 20                   |
| Lake Bathurst | 10 km                                      | East  | 27                   |
| Collector     | 20.6 km                                    | North west                                  | 13                   |
| Currawang     | 9.4km                                      | North west                                  | 37                   |
| Mt Fairy      | 13.3km                                     | South                                       | 17                   |
| Gundaroo      | 29km                                       | West  | 4                    |
| Oallen        | 37 km                                      | East  | 1                    |
| Not specified | Unknown                                    | Unknown                                     | 4                    |
| <b>TOTAL</b>  |  |   | <b>377</b>           |

Evidence suggests that the township and surrounding land holdings of Tarago was the main source of odour complaints, being the closest populated area located east of the Bioreactor landfill. An analysis of complaints by month during the Audit period is shown in Figure 3.1. The analysis suggests that the highest number of complaints were received in the three-month period between April and June 2021. During this period, target flow rates through the LTP were less than 4 L/sec and issues with heavy rainfall were experienced. Specific issues are summarised below:

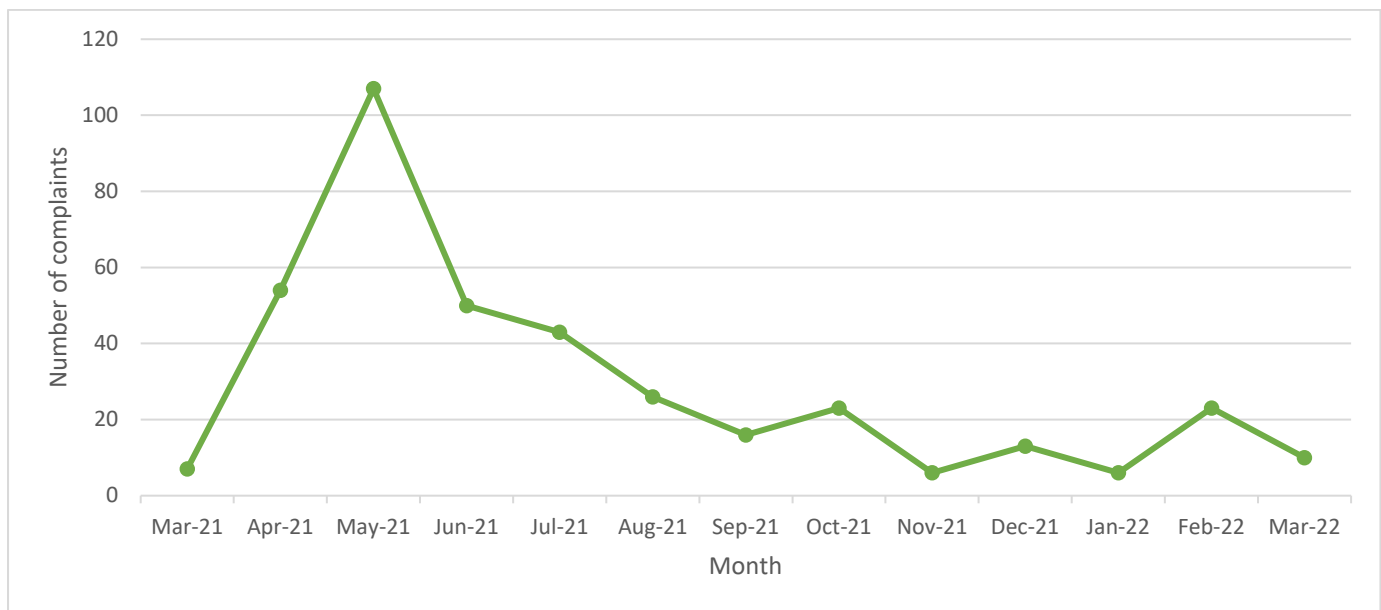
- April 2021: Heavy rainfall events in mid-March resulted in a drop in leachate concentration feeding into the LTP, resulting in temperature and stability issues. Two new membranes were installed, and two poor performing modules were removed;
- May 2021: Heavy rainfall events in mid-March and May resulted in a drop in leachate concentration feeding into the LTP, resulting in temperature and stability issues. Targeted cleaning of membranes performed to address poor performance issues; and
- June 2021: Heavy rainfall events were affecting the temperature stability of the LTP, causing biological stress and excess fouling of the membranes.

From August 2021, the LTP's throughput increased above the target level of 4 L/sec, and this coincided with a period of better LTP performance. This may explain the drop in odour complaints.

An odour audit was completed by the Odour Unit (2021) *Independent Odour Audit #9* (dated August 2021) which found:

*“Despite the significant improvement in landfill gas extraction in the Void and expansion and improvement in the leachate management system through optimisation of surface water catchments, landfill gas infrastructure design, active tipping practices and increased leachate treatment capacity via the commissioning of the LTP, the odour complaints trend appear to reflect the operational challenges associated with the high rainfall conditions over the Audit period.” (page 85)*

**Figure 3.1. Complaints received by month during the Audit period.**



We note that the number of complaints has substantially increased from a total of 39 during the 2021 Audit period. Evidence suggests that the increase in complaints appear to be related to the increased rainfall experienced during the 2022 Audit period (The Odour Unit, 2021), which impacted on the performance of the LTP. Whilst the leachate management system is one odour source from the site, the report notes that the construction of additional leachate treatment capacity (involving LTP optimization, increased contingency capacity and improvement of evaporation) will have a significant effect on the minimisation of odour from the void and leachate management system in the medium to long-term. The auditors agree with this conclusion.

Veolia note that the complaints appear to also have increased due to increased community interest in a future energy from waste proposal being considered for the site, which was announced in late April 2021.

### 3.10. Summary of incidents, adequacy of responses and management

During the Audit period, a total of 45 incidents were recorded in Veolia’s incident register for the site, which include notifiable matters which are required to be reported to the Department of Planning and Environmental and NSW EPA.

Of these incidents, 25 were related to the leachate and water management system, principally in relation to compliance with minimum freeboard levels maintained in dams on the site.

Large rainfall events have placed additional pressure of the leachate and water management system associated with the Bioreactor landfill, resulting in the need to increased reporting and compliance inspections and reporting to DPE and NSW EPA.

In relation to the adequacy of the response to these incidents, the Auditors have found that Veolia has responded and taken appropriate action, and have proactively engaged DPE and NSW EPA to identify potential compliance matters. Whilst the incidents evaluated have been closed by Veolia, the findings of this Audit as outlined in Appendix A suggest that a number of matters relating to the water balance and contingency measures for managing leachate require further assessment.

The Auditors note that no incidents were reported in the 2021 Audit period.



### 3.11. Compliance between actual and predicted impacts

The Audit found that, with the higher than predicted rainfall and lower than predicted evaporation during the Audit period, significant stress has been placed on the leachate and water management system at the Site, above that predicted as part of the environmental assessment done under Approval MP 10\_0012 in 2017.

The Auditors note that the adequacy of the existing water and leachate management system was assessed originally as part of the 2017 water balance by WSP. Whilst the site has been constructed in accordance with the modelling done as part of the original environmental assessment, the extreme rainfall events have exceeded the design parameters of the existing system, leading to higher than acceptance levels of leachate and stormwater being stored in dams on the site that have the risk of spilling.

To address this matter, DPE issued Veolia a Development Control Order (Order) to remedy a breach of the Consent and requires Veolia to develop short, medium, and long-term leachate and water management strategies. In response to this requirement, Engeny Water Management has been engaged by Veolia to prepare a Leachate and Water Management Strategy for the facility. Whilst the Order was issued outside of this Audit's reporting period and therefore is excluded from the scope of the Audit, a compliance program is in place to assist Veolia to develop additional measures to avoid potential spills. This approach will also assist in addressing odour impacts which have clearly exceeded predictions under the original assessment.

### 3.12. Evidence collected through site inspections undertaken during the audit

Due to extremely wet weather during the site audit meeting and site inspection, evidence collected during the site inspection was limited to visual observations of the water and leachate management system. This inspection was supported by Veolia staff who attended the site inspection.

Photos taken during the site inspection are provided in Appendix B.

### 3.13. Evidence to support compliance assessment provided by the personnel interviewed during the audit

A summary of the evidence collected to support our compliance assessment during the interview of Veolia staff on 27<sup>th</sup> April 2022 is provided in Section 3.1 and in Appendix A. It is noted that numerous follow up contact was made with the Veolia team post the audit meeting to supply additional records and evidence. We thank Veolia for being extremely cooperative in providing this audit evidence.

### 3.14. Continual environmental management improvement opportunities identified as part of the audit

The Audit has noted that the recent extreme wet weather conditions associated with higher than predicted levels of rainfall and lower rates of evaporation have placed increased stress on the water and leachate management systems. The increased odour complaints received by the Site during the Audit period is a symptom that the site's water management system has been under stress.

Veolia is required to develop a short, medium, and long-term leachate and water management strategy in accordance with Development Control Order issued on 1<sup>st</sup> April 2022. This investigation will provide a framework for improved management of water and leachate on the site.

In the interim, commissioning of the additional treatment capacity of the LTP should assist in further treatment of leachate and assist in reducing the potential for odour generation at the Site. Greater engagement with the community should be considered to help communicate action underway to address leachate and odour issues at the Site, to provide the community with confidence that these issues are temporary and a strategy is in place to resolve these matters.

### 3.15. Key strengths of the development's environmental management and performance

Veolia has extensive management plans in place to assist in ensuring that the development is operated in accordance with the consent. The Audit found that, with the higher than predicted rainfall events during the Audit period, significant stress has been placed on the leachate and water management system at the Site, above that predicted as part of the approval obtained in 2017.

Veolia have proactively engaged both NSW EPA and DPE on these compliance matters. We understand that Veolia is committed to working through these matters with NSW EPA and DPE to ensure that the environmental impacts of the operation are minimised.

## 4. Recommendations and opportunities for improvement

A series of recommendations and opportunities for improvement in relation to the water and leachate management system operated by Veolia for the Bioreactor landfill have been identified as part of the Audit.

The Auditors note that a detailed outline of recommendations to address non-compliances is provided in Appendix A.

These are summarised in Table 3.2 in Section 3.4 and are not repeated here.

## Appendix A – Compliance Audit Tables

**Table A.1 Planning consent table outlining compliance with leachate and water management specific conditions under MP10\_0012 (including Mods 1-4).**

| Conditions of Development Consent – MP10_0012 (Consolidated consent including Mods 1, 2, 3 and 4) |  |   |   |                            |                                      |
|---|--|---|---|----------------------------|--------------------------------------|
| Consent Condition   | Requirement  | Evidence Collected  | Independent Audit Findings and Recommendations  | Compliance Status          | Unique Identification Non-compliance |
| <b>Schedule 4 – Specific Environmental Conditions – Landfill Site</b>                             |  |   |   |                            |                                      |
| 18R   | Within six months of commissioning the LTP and annually thereafter, unless otherwise agreed to by the Secretary, the Proponent shall commission and pay the full cost of an independent assessment of the leachate and water management system. This audit must be conducted by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Secretary. During the audit, this expert must: | + Independent audit reports prepared by SLR Consulting in 2019, 2020 and 2021.      | <b>Findings:</b><br>+ This Independent Audit is the fourth audit to be conducted against this condition.<br>+ The last audit was completed by SLR Consulting on 4 June 2021 for the audit period 12 March 2020 to 11 March 2021.<br>+ This Audit was commissioned by Veolia on 15 February 2022, 12 months since the last audit.<br>+ Jackson Environment and Planning Pty Ltd are qualified, experienced and independent experts, endorsed by DPE on 2 <sup>nd</sup> March 2022 (refer to Appendix D for the DPE endorsement letter).<br><b>Recommendations:</b><br>+ Nil. | Compliant                  | -                                    |
| 18R(a)  | Consult with the EPA, Water NSW and the Secretary.   | + Letters were issued to DPE, NSW EPA and Water NSW on 11 <sup>th</sup> April 2022. | <b>Findings:</b><br>+ Responses provided by agencies are summarised in Section 3.8 of this Audit report.<br>+ Specific comments have been addressed in this Audit report as noted in Table 2.1.<br><b>Recommendations:</b><br>+ Nil.  | Compliant                  | -                                    |
| 18R(b)(i)   | Assess actual performance against the assumptions and  | Dam monthly storage levels,   | <b>Findings:</b><br>+ Inputs and outputs from each dam consists of direct rainfall and leachate pumped into the   | Non-compliant <sup>1</sup> | NC1(a)                               |

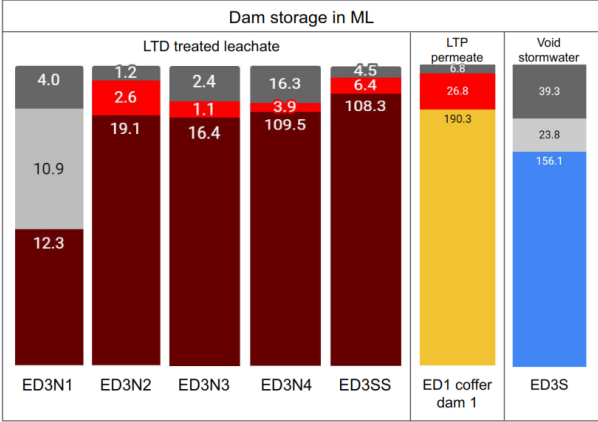
<sup>1</sup> The auditors note that Condition 18R(b) relates to the accuracy of WSP site Water Balance model undertaken in 2017 (and later updated in 2020, though for this audit, we have focused on the comparison to the 2017 model, forming part of the consent). This Water Balance (like all Water Balances) is based on a number of assumptions which are prone to change over time. In addition, many inputs and outputs are never going to be exactly the same as what was assumed within the Water Balance. As such, the auditors agree as per the findings of the 2021 audit that Condition 18R(b)

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

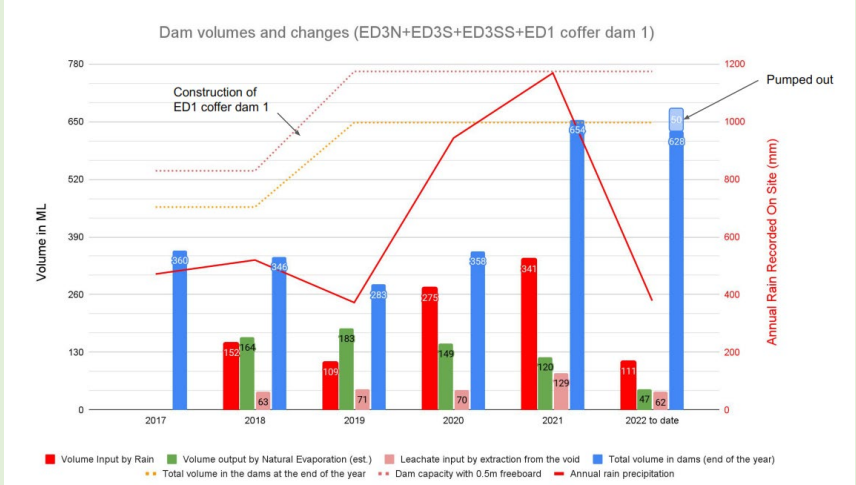
| Consent Condition | Requirement  | Evidence Collected   | Independent Audit Findings and Recommendations   | Compliance Status | Unique Identification Non-compliance |
|-------------------|--|--|--|-------------------|--------------------------------------|
|                   | <p>predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted inputs and outputs into and out of each dam.</p> | <p>LTP daily performance data, rainfall records from the site and the AWS gauge at Goulburn near the site, site evaporation records, recent water balance modelling work by WSP in 2021.</p> | <p>dam, natural and mechanically enhanced evaporation from each dam. We have assumed the liners remain waterproof and losses through the liners are negligible.</p> <ul style="list-style-type: none"> <li>+ Each of the above elements is covered below in more detail, however a basic summary of findings follows.</li> <li>+ The basis for comparison of “predicted” is the data included in the water balance prepared by WSP in its letter dated 28 September 2017 and which forms part of the consent. “Actual” is the water balance data collected during the audit period 16 March 2021 to 15 March 2022. This audit period has undoubtedly seen climatic conditions more extreme than the “wettest” conditions modelled in the original and subsequent water balance reports.</li> <li>+ The 2017 water balance and later the 2021 water balance both found that under even the wettest conditions, Veolia would be able to construct the ED1 Cofferdam, assuming leachate is diverted to the Cofferdam from September 2018. Under the condition that Heron did not take any water for mining, the ED1 Cofferdam 1 was predicted to reach freeboard level, i.e. be effectively full by June 2022 (2021 WSP Water Balance). In the 2017 water balance ED1 Cofferdam 1 (Scenario 3D) was predicted to fill by August 2022.</li> <li>+ ED1 Cofferdam 1 reached its freeboard level shortly after the 2 November 2021, at least 7 months earlier than predicted under the wettest scenario. The water balance conditions on the site, showing available headroom, i.e. storage is summarised in Figures A1 and A2 which have been provided by Veolia.</li> <li>+ The original 2017 WSP water balance predicted that ED3N1 would be empty by June 2022 under the wettest scenario. Whilst Veolia had managed to dewater ED3N1 to replace the clay liner, the commencement of a wet period has resulted in ED3N1 now being filled prematurely and without first placing a HDPE liner within. All other ED3N lagoons remain full or nearly full.</li> <li>+ Regardless of recent unprecedented heavy rainfall it is unclear how, under the wettest scenario, the concept of the scheme would be viable, i.e. to direct all leachate to ED1 Cofferdam 1, dry out the ED3N lagoons and replace their liners given that ED1 Cofferdam was predicted fill and spill by June 2022 which is before ED3N1 and 2 were predicted to be effectively dry.</li> <li>+ Moreover, there was no consideration within the proposed LWMS of the implications of “wettest period” climate conditions on constructability, i.e. being physically able to carry on construction during the wettest conditions. This has had a major impact on multiple landfill projects across the east coast of Australia and especially this project.</li> </ul> |                   |                                      |

cannot be assessed completely in accordance with the DPE Independent Audit Guidelines (May 2020) and the respective compliance status of the items within this condition should be read and interpreted in this context.

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement               | Evidence Collected | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
|-------------------|---------------------------|--------------------|---|-------------------|--------------------------------------|-------------------|----------------------|------------|-------|------|------|-----|------|-------|------|-----|-----|------|-------|------|-----|-----|------|-------|-------|-----|------|-------|-------|-------|-----|-----|-------|------------------|---|-------|-----|-------|------|---|-------|------|-------|--|--|
|                   |                           |                    | <p>+ Figure A1 implies that freeboard conditions have been reduced below 500mm for all storages which have a red bar, i.e. for all storages except ED3N1 and ED3S. The spare volume in ED1, used to store acid mine drainage, which under the consent is not to be used for leachate storage, is not shown but it is understood to have spare capacity.</p> <p>+ ED1 may need to be used as a last resort for leachate storage which may be preferential to a site discharge.</p> <p><b>Figure A1. Dam Storage Status (April 2022) (courtesy Veolia).</b></p> <div data-bbox="763 600 1653 1107" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Current storage status and short term management strategy</b></p> <p style="text-align: center;">Dam storage in ML</p>  <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Location</th> <th>LTD treated leachate (ML)</th> <th>LTP permeate (ML)</th> <th>Void stormwater (ML)</th> <th>Total (ML)</th> </tr> </thead> <tbody> <tr> <td>ED3N1</td> <td>12.3</td> <td>10.9</td> <td>4.0</td> <td>27.2</td> </tr> <tr> <td>ED3N2</td> <td>19.1</td> <td>2.6</td> <td>1.2</td> <td>22.9</td> </tr> <tr> <td>ED3N3</td> <td>16.4</td> <td>1.1</td> <td>2.4</td> <td>19.9</td> </tr> <tr> <td>ED3N4</td> <td>109.5</td> <td>3.9</td> <td>16.3</td> <td>129.7</td> </tr> <tr> <td>ED3SS</td> <td>108.3</td> <td>6.4</td> <td>4.5</td> <td>119.2</td> </tr> <tr> <td>ED1 coffer dam 1</td> <td>0</td> <td>190.3</td> <td>6.8</td> <td>197.1</td> </tr> <tr> <td>ED3S</td> <td>0</td> <td>156.1</td> <td>23.8</td> <td>179.9</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• <b>LTD treated leachate</b> <ul style="list-style-type: none"> <li>○ About 20 ML capacity left (keep 200 mm freeboard for dams)</li> </ul> </li> <li>• <b>LTP permeate</b> <ul style="list-style-type: none"> <li>○ New dam construction (50 ML)</li> </ul> </li> <li>• <b>Stormwater</b> <ul style="list-style-type: none"> <li>○ Divert about 50% of void catchment area to ED1</li> <li>○ Level monitoring for water transfer</li> </ul> </li> </ul> <p><b>Maximum evaporation for all the dams</b></p> </div> <p>+ The change in water balance between the drought which broke at the start of 2020 and this wet period highlight the significance of the weather event, most notably the difference between rainfall and evaporation has been significant. This is shown in Figure A2. In 2021 rainfall inflow was reported as 341 ML while evaporation was reported as 120 ML. This is a net inflow volume of 220 ML plus leachate input which was 129 ML giving a net inflow of 349 ML.</p> <p>+ Figure A2 clearly shows the increase in total storage, the increase in leachate extracted in 2021 and part of 2022 compared to the dry period prior, reduced evaporation levels and most importantly the change in net rainfall which starts as a negative, i.e. evaporation</p> | Location          | LTD treated leachate (ML)            | LTP permeate (ML) | Void stormwater (ML) | Total (ML) | ED3N1 | 12.3 | 10.9 | 4.0 | 27.2 | ED3N2 | 19.1 | 2.6 | 1.2 | 22.9 | ED3N3 | 16.4 | 1.1 | 2.4 | 19.9 | ED3N4 | 109.5 | 3.9 | 16.3 | 129.7 | ED3SS | 108.3 | 6.4 | 4.5 | 119.2 | ED1 coffer dam 1 | 0 | 190.3 | 6.8 | 197.1 | ED3S | 0 | 156.1 | 23.8 | 179.9 |  |  |
| Location          | LTD treated leachate (ML) | LTP permeate (ML)  | Void stormwater (ML)  | Total (ML)        |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED3N1             | 12.3                      | 10.9               | 4.0   | 27.2              |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED3N2             | 19.1                      | 2.6                | 1.2   | 22.9              |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED3N3             | 16.4                      | 1.1                | 2.4   | 19.9              |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED3N4             | 109.5                     | 3.9                | 16.3  | 129.7             |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED3SS             | 108.3                     | 6.4                | 4.5   | 119.2             |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED1 coffer dam 1  | 0                         | 190.3              | 6.8   | 197.1             |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |
| ED3S              | 0                         | 156.1              | 23.8  | 179.9             |                                      |                   |                      |            |       |      |      |     |      |       |      |     |     |      |       |      |     |     |      |       |       |     |      |       |       |       |     |     |       |                  |   |       |     |       |      |   |       |      |       |  |  |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement               | Evidence Collected                               | Independent Audit Findings and Recommendations   | Compliance Status                           | Unique Identification Non-compliance |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
|-------------------|---------------------------|--|--|---|--------------------------------------|--|---|---|--------------------------------|------|-----|-----|----|-----|------|------|-----|-----|----|-----|------|------|-----|-----|----|-----|------|------|-----|-----|----|-----|-------|------|-----|-----|-----|-----|-------|--------------|-----|----|----|-----|------|--|--|
|                   |                           |  | <p>exceeding rainfall and which in 2021 saw a substantial period of net rainfall (rainfall exceeding evaporation).</p> <p><b>Figure A2. Dam Volumes and Changes 2017-March 2022 (courtesy Veolia).</b></p>  <p><b>Figure A2 Data Summary:</b></p> <table border="1"> <thead> <tr> <th>Year</th> <th>Volume Input by Rain (ML)</th> <th>Volume Output by Natural Evaporation (est.) (ML)</th> <th>Leachate input by extraction from the void (ML)</th> <th>Total volume in dams (end of the year) (ML)</th> <th>Annual Rain Precipitation (mm)</th> </tr> </thead> <tbody> <tr> <td>2017</td> <td>360</td> <td>152</td> <td>68</td> <td>360</td> <td>~500</td> </tr> <tr> <td>2018</td> <td>152</td> <td>154</td> <td>71</td> <td>283</td> <td>~400</td> </tr> <tr> <td>2019</td> <td>109</td> <td>183</td> <td>71</td> <td>283</td> <td>~400</td> </tr> <tr> <td>2020</td> <td>275</td> <td>149</td> <td>70</td> <td>385</td> <td>~1000</td> </tr> <tr> <td>2021</td> <td>341</td> <td>120</td> <td>129</td> <td>654</td> <td>~1200</td> </tr> <tr> <td>2022 to date</td> <td>111</td> <td>47</td> <td>62</td> <td>620</td> <td>~400</td> </tr> </tbody> </table> <p>+ We note that in the 2021 Audit, it was recommended that a contingency plan be prepared to empty the dams if the revised water balance model report will not be achieved.<br/>       + The Audit also recommended that due to the higher rainfall and lower evaporation in 2020 and 2021, the target dates for the emptying of certain dams shall be reassessed and discussed with the relevant Regulators and extension shall be considered as a contingency.<br/>       + On 5th January 2022 Veolia wrote to DPE seeking approval of contingency arrangements for using ED1 for short term diversion of stormwater from landfill void walls to ED1; pump and spray off landfill to increase evaporative losses and construct additional coffer dams to store treated leachate.<br/>       + On 1st April 2022 Veolia received a Development Control Order from DPE seeking the preparation of a short to medium term leachate management strategy and a long-term leachate and water management strategy due to exceedance of the 80% capacity limit and 0.5m freeboard requirements for dams as noted in the Order. Whilst the Order has been received outside of the Audit period, the non-compliances demonstrate the limitations of the</p> | Year  | Volume Input by Rain (ML)            | Volume Output by Natural Evaporation (est.) (ML) | Leachate input by extraction from the void (ML) | Total volume in dams (end of the year) (ML) | Annual Rain Precipitation (mm) | 2017 | 360 | 152 | 68 | 360 | ~500 | 2018 | 152 | 154 | 71 | 283 | ~400 | 2019 | 109 | 183 | 71 | 283 | ~400 | 2020 | 275 | 149 | 70 | 385 | ~1000 | 2021 | 341 | 120 | 129 | 654 | ~1200 | 2022 to date | 111 | 47 | 62 | 620 | ~400 |  |  |
| Year              | Volume Input by Rain (ML) | Volume Output by Natural Evaporation (est.) (ML) | Leachate input by extraction from the void (ML)  | Total volume in dams (end of the year) (ML) | Annual Rain Precipitation (mm)       |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
| 2017              | 360                       | 152  | 68   | 360   | ~500                                 |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
| 2018              | 152                       | 154  | 71   | 283   | ~400                                 |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
| 2019              | 109                       | 183  | 71   | 283   | ~400                                 |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
| 2020              | 275                       | 149  | 70   | 385   | ~1000                                |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
| 2021              | 341                       | 120  | 129  | 654   | ~1200                                |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |
| 2022 to date      | 111                       | 47   | 62   | 620   | ~400                                 |  |   |   |                                |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |      |      |     |     |    |     |       |      |     |     |     |     |       |              |     |    |    |     |      |  |  |



Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement | Evidence Collected | Independent Audit Findings and Recommendations   | Compliance Status | Unique Identification Non-compliance |
|-------------------|-------------|--------------------|--|-------------------|--------------------------------------|
|                   |             |                    | <p>existing water balance model.</p> <p>+ In response, it is understood that Veolia has sought proposals from independent experts to prepare the strategy as required under the Development Control Order.</p> <p><b>Recommendations:</b></p> <p>+ The leachate and water management strategy as required under April 2022 Development Control Order be completed in 2022 as a priority, including a revised water balance model, with a development modification submitted to DPE seeking to implement the required changes to the water management system. This modification shall also seek to update the reference water balance model for future compliance assessments.</p> <p>+ The development modification shall also include a revised and practical target date(s) for emptying of ED3N lagoons and replace their liners based on an updated water balance model.</p> <p>+ When conducting a revised water balance consider constructability impacts of wet periods and the additional time required to allow ground conditions to enable work to commence.</p> <p>+ When revising the water balance, validate the water balance for both wet and dry years.</p> <p>+ When revising the water balance validate the water balance. This means comparing predicted storage levels and volumes against recorded storage volumes using historical rainfall. While this process was described by WSP, no evidence of it being undertaken was included in any of the water balance reports. If the validation proves a reasonably good fit between predicted and observed storage volumes then it would result in confidence in the model.</p> <p>+ If using Goldsim to revise the water balance, Veolia should obtain a Goldsim player model which enables multiple and in-depth sensitivity analysis to be undertaken. It should have as many factors/variables accessible for change by Veolia as possible including climate change factors or multipliers which would allow rainfall depths to be multiplied and evaporation to also be multiplied.</p> <p>+ Obtain all water balance models and data from the consultant that prepares the water balance and make this a condition of engagement.</p> <p>One the revised water balance is prepared:</p> <p>+ Determine the conditions under which the leachate storage dams will overflow without any additional preventative emergency action.</p> <p>+ If it is found that there is a range of conditions under which this may occur, define trigger levels to establish if these conditions are likely to occur and develop an approved contingency plan to manage this and minimise the impact of any preventative measures.</p> <p>+ If the contingency plan identifies the need for measures to create additional storage on</p> |                   |                                      |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement   | Evidence Collected                          | Independent Audit Findings and Recommendations   | Compliance Status | Unique Identification Non-compliance |
|-------------------|---|---|--|-------------------|--------------------------------------|
|                   |   |   | <p>the site, establish if it's feasible to rapidly treat mechanically, or otherwise, any of the acid mine drainage (AMD) water stored on the site to create additional storage space for leachate. This might see AMD water neutralised and stripped of harmful metals or chemicals prior to on site disposal via irrigation.</p> <ul style="list-style-type: none"> <li>+ Seek all relevant approvals for the contingency plan to be executed.</li> <li>+ Regardless of any ongoing wet weather event, assess the viability of mechanical or other forms of treatment of AMD water on site and determine if evaporation is the best method for emptying storage dams which contain AMD water.</li> <li>+ Revise the timeframe for emptying of the ED1 and ED3 dams for a range of potential conditions and ensure the water balance considers the fate of water that may need to be pumped out of one storage and into another and explain how this affects the ability to deliver the strategy under various climatic conditions.</li> <li>+ Consider how the continued operation of the LTD and need to store leachate that has passed through the LTD so that it can dilute LTP influent will impact on the time to dewater all the ED3N lagoons and install a liner in them.</li> <li>+ Reassess if a third additional coffer dam is likely to be needed and if so, seek approval to commence construction.</li> <li>+ Revisit the strategy to dispose of all ED3N leachate by evaporation and determine if its viable to safely irrigate any treated leachate on the site. If viable, this would establish protocols for irrigation driven by the need to ensure that runoff containing leachate does not leave the site and enter the drinking water catchments.</li> <li>+ Factor in realistic delays to construction programme from wet weather and disruption to supply chains or operations caused by COVID.</li> <li>+ Ensure that water balance results are meaningful – for example ensure that the predicted time to empty one storage does not overlap with the predicted time to fill an alternative storage such as making sure ED3N dams can be emptied prior to ED1 Cofferd Dam being fill and spilling under a range of scenarios and then working out how long it may take to empty under a range of subsequent conditions.</li> <li>+ Both the revised site water balance and revised management strategies should be subject to a comprehensive peer review. The peer reviewer should be involved from the commencement of the work and shall inform and agree to the scope of works, water balance methodology, final water balance model and any recommendations.</li> </ul> |                   |                                      |
| 18R(b)(ii)        | Assess actual performance against the assumptions and predictions made in the project water balance | Actual mechanical evaporation from each dam | <p><b>Findings:</b></p> <ul style="list-style-type: none"> <li>+ Actual versus predicted mechanical evaporation from each dam is assessed under this consent condition.</li> <li>+ It is not physically possible to measure the effectiveness of mechanical evaporation except</li> </ul>  | Non-compliant     | NC1(b)                               |

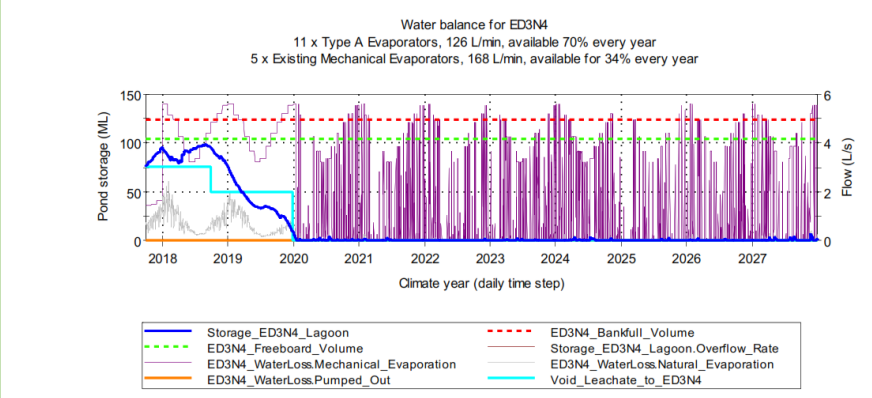
Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement   | Evidence Collected   | Independent Audit Findings and Recommendations   | Compliance Status | Unique Identification Non-compliance |
|-------------------|---|--|--|-------------------|--------------------------------------|
|                   | <p>prepared by WSP dated September 2017. This must include: actual versus predicted mechanical evaporation from each dam.</p> | <p>can only be inferred from an water balance. Predicted mechanical evaporation was based on the 2017 water balance report by WSP.</p> | <p>by inference and water balance. A calculation is used to estimate the actual mechanical evaporation from the dams as follows:<br/>           + Starting storage + leachate input + rainfall input + water transferred in – water transferred out – evaporation – storage volume at end of period = mechanical evaporation.<br/>           + Rainfall, leachate, water transferred in and out can all be easily measured. However, the conversion of pan evaporation to actual site evaporation is reliant on a correctly calibrated coefficient which was reportedly determined in 2016 via a site calibration. The adopted pan coefficient value is 0.6.<br/>           + Mechanical evaporation is therefore inferred and subject to any errors in adopted pan coefficients.<br/>           + This is considered a reasonable method for estimating mechanical evaporation. It is accepted it will have some margin of error. The error is however not likely to be material and if the pan coefficient is underestimated the mechanical evaporation is overestimated and vice versa. There is likely to be little error in estimating total evaporation being the sum of natural and mechanical evaporation. Nonetheless, if the benefit of mechanical evaporators is overestimated, as has occurred to date, the whole water balance will be in significant error and this may result in an off-site discharge and adverse impact to the drinking water catchments. The value in reasonably estimating the performance of mechanical evaporators cannot be overstated.<br/>           + Estimated evaporation for mechanical evaporators was considered to have been determined simplistically. The estimate relied on a constant performance from year to year and was independent of factors such as rainfall and relative humidity, wind direction impacting on operability.<br/>           + This recent climate condition has seen easterly winds become the dominant wind direction and this has restricted the use of the mechanical evaporators as many are located on the western side of lagoons to avoid spray drift. The assumption here is that dominant winds are always from the west.<br/>           + Actual mechanical evaporation is calculated in the table below which has been provided by Veolia (Table A1).</p> |                   |                                      |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition                    | Requirement    | Evidence Collected | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
|--------------------------------------|----------------|--------------------|---|-------------------|--------------------------------------|---------|-------|----------------|------|----------------|----------------|--------|--------|--------|---|----------------------------|----------------|--------|--------|--------|---------|-------------------|----------------|--------|--------|--------|---------|---------------------------|----------------|---|---|---|---------|---------------------------------|----------------|---|---|---|--------|---------------------|----------------|--------|--------|--------|--------|----------------------------|----------------|--------|--------|--------|--------|------------------------|----------------|---|-------|---|--------|--------------------------------------|----------------|--------|--------|---------|---------|--------------------------------------|----------------|---------|---------|---------|---------|--------------------------------------|----------------|--------|-------|--------|--------|--|--|
|                                      |                |                    | <p><b>Table A1. Calculated Mechanical Evaporation for each dam.</b></p> <table border="1"> <thead> <tr> <th></th> <th>Units</th> <th>ED3N1-4</th> <th>ED3S5</th> <th>ED1 coffer dam</th> <th>ED3S</th> </tr> </thead> <tbody> <tr> <td>Leachate input</td> <td>m<sup>3</sup></td> <td>47,727</td> <td>19,002</td> <td>93,558</td> <td>0</td> </tr> <tr> <td>Direct rain catchment area</td> <td>m<sup>2</sup></td> <td>78,627</td> <td>25,314</td> <td>73,063</td> <td>103,130</td> </tr> <tr> <td>Direct rain input</td> <td>m<sup>3</sup></td> <td>96,986</td> <td>31,225</td> <td>90,123</td> <td>127,211</td> </tr> <tr> <td>Other rain catchment area</td> <td>m<sup>2</sup></td> <td>0</td> <td>0</td> <td>0</td> <td>161,642</td> </tr> <tr> <td>Other catchment area rain input</td> <td>m<sup>3</sup></td> <td>0</td> <td>0</td> <td>0</td> <td>17,530</td> </tr> <tr> <td>Evaporation surface</td> <td>m<sup>2</sup></td> <td>53,336</td> <td>21,366</td> <td>63,896</td> <td>81,255</td> </tr> <tr> <td>Natural evaporation output</td> <td>m<sup>3</sup></td> <td>38,820</td> <td>15,551</td> <td>52,320</td> <td>73,926</td> </tr> <tr> <td>Other output (pumping)</td> <td>m<sup>3</sup></td> <td>0</td> <td>3,268</td> <td>0</td> <td>50,000</td> </tr> <tr> <td>Surveyed volume on end of March 2021</td> <td>m<sup>3</sup></td> <td>94,870</td> <td>91,254</td> <td>115,928</td> <td>144,417</td> </tr> <tr> <td>Surveyed volume on end of March 2022</td> <td>m<sup>3</sup></td> <td>147,336</td> <td>116,946</td> <td>208,970</td> <td>154,612</td> </tr> <tr> <td>Calculated assist evaporation volume</td> <td>m<sup>3</sup></td> <td>53,427</td> <td>5,716</td> <td>38,320</td> <td>10,620</td> </tr> </tbody> </table> <p>+ The extent of reliance on mechanical evaporation in predictions is significant and this is shown below with an extract from the original 2017 water balance report (Figure A3).<br/>       + Figure A3 shows the heavy reliance on mechanical evaporation. It is estimated that mechanical evaporation would result in an average of 4.5 l/s loss from the lagoon irrespective of wettest conditions prevailing. This equates to 140 ML/year loss from this storage alone.<br/>       + By comparison the calculated total mechanical evaporation loss for all four ED3N lagoons for the audit period was estimated by Veolia to be 53.4 ML and ED3N4 was practically full at the end of the audit period.<br/>       + The original water balance for the site did not state specific predicted net mechanical evaporative losses for each dam and it is considered to be beyond the scope or need of this audit to retrospectively define it.<br/>       + We conclude that estimated mechanical evaporation does not even closely reflect actual mechanical evaporation.<br/>       + Some ways to improve estimated mechanical evaporation are listed as follows:</p> <ol style="list-style-type: none"> <li>It must be linked to the variability observed with historical evaporation – in other words during wet periods evaporation is often reduced. Assuming a constant annual value is inappropriate.</li> <li>The WSP disaggregation of annual evaporation converted the 2016 calibrated data into monthly data to reflect seasonal variation. The annual total observed a loss of 28% of flow per annum. However, on inspecting the monthly loss rates adopted, the average rate was 33%.</li> </ol> |                   | Units                                | ED3N1-4 | ED3S5 | ED1 coffer dam | ED3S | Leachate input | m <sup>3</sup> | 47,727 | 19,002 | 93,558 | 0 | Direct rain catchment area | m <sup>2</sup> | 78,627 | 25,314 | 73,063 | 103,130 | Direct rain input | m <sup>3</sup> | 96,986 | 31,225 | 90,123 | 127,211 | Other rain catchment area | m <sup>2</sup> | 0 | 0 | 0 | 161,642 | Other catchment area rain input | m <sup>3</sup> | 0 | 0 | 0 | 17,530 | Evaporation surface | m <sup>2</sup> | 53,336 | 21,366 | 63,896 | 81,255 | Natural evaporation output | m <sup>3</sup> | 38,820 | 15,551 | 52,320 | 73,926 | Other output (pumping) | m <sup>3</sup> | 0 | 3,268 | 0 | 50,000 | Surveyed volume on end of March 2021 | m <sup>3</sup> | 94,870 | 91,254 | 115,928 | 144,417 | Surveyed volume on end of March 2022 | m <sup>3</sup> | 147,336 | 116,946 | 208,970 | 154,612 | Calculated assist evaporation volume | m <sup>3</sup> | 53,427 | 5,716 | 38,320 | 10,620 |  |  |
|                                      | Units          | ED3N1-4            | ED3S5   | ED1 coffer dam    | ED3S                                 |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Leachate input                       | m <sup>3</sup> | 47,727             | 19,002  | 93,558            | 0                                    |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Direct rain catchment area           | m <sup>2</sup> | 78,627             | 25,314  | 73,063            | 103,130                              |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Direct rain input                    | m <sup>3</sup> | 96,986             | 31,225  | 90,123            | 127,211                              |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Other rain catchment area            | m <sup>2</sup> | 0                  | 0   | 0                 | 161,642                              |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Other catchment area rain input      | m <sup>3</sup> | 0                  | 0   | 0                 | 17,530                               |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Evaporation surface                  | m <sup>2</sup> | 53,336             | 21,366  | 63,896            | 81,255                               |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Natural evaporation output           | m <sup>3</sup> | 38,820             | 15,551  | 52,320            | 73,926                               |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Other output (pumping)               | m <sup>3</sup> | 0                  | 3,268   | 0                 | 50,000                               |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Surveyed volume on end of March 2021 | m <sup>3</sup> | 94,870             | 91,254  | 115,928           | 144,417                              |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Surveyed volume on end of March 2022 | m <sup>3</sup> | 147,336            | 116,946   | 208,970           | 154,612                              |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |
| Calculated assist evaporation volume | m <sup>3</sup> | 53,427             | 5,716   | 38,320            | 10,620                               |         |       |                |      |                |                |        |        |        |   |                            |                |        |        |        |         |                   |                |        |        |        |         |                           |                |   |   |   |         |                                 |                |   |   |   |        |                     |                |        |        |        |        |                            |                |        |        |        |        |                        |                |   |       |   |        |                                      |                |        |        |         |         |                                      |                |         |         |         |         |                                      |                |        |       |        |        |  |  |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement  | Evidence Collected  | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |
|-------------------|--|---|---|-------------------|--------------------------------------|
|                   |  |   | <p>c) Estimates must account for wind direction and how this impacts availability. Wind roses from the adjacent wind farm may be used to inform better modelling practices.</p> <p>d) Consider adopting a conservative approach on all future modelling and adopt actual wettest period mechanical evaporation.</p> <p><b>Figure A3. ED3N4 predictions under the wettest climate scenario (Extracted from the 2017 Water Balance).</b></p>  <p><b>Recommendations:</b><br/>       + The previous recommendation for NC1 will address this non-compliance.</p> |                   |                                      |
| 18R(b)(iii)       | Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: actual versus predicted rainfall and evaporation. | As noted above actual site rainfall and evaporation data was compared with water balance rainfall and evaporation documented in the 2017 water balance. A check | <p><b>Findings:</b><br/>       + The original water balance prepared by WSP analysed three potential rainfall scenarios being dry, average and wet periods. The wet period event included the wettest year on record being 1950. Within the wettest period adopted by WSP every year apart from 1950 had net evaporation. This is shown in Table A2 below.</p>  | Non-compliant     | NC1(c)                               |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement  | Evidence Collected   | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
|-------------------|--------------|--|---|-------------------|--------------------------------------|-----------------|-----------|------|------|------|----|------|-----|------|------|------|------|------|-----|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|------|------|-----|------|-----|------|------|------|-----|------|------|------|------|------|------|--|--|
|                   |              | against a local automatic weather station at Goulburn was also undertaken. | <p><b>Table A2. Water Balance Adopted Wettest Rainfall and Net Rainfall.</b></p> <table border="1"> <thead> <tr> <th>Year</th> <th>Rainfall (1)</th> <th>Evaporation (2)</th> <th>Net (1-2)</th> </tr> </thead> <tbody> <tr><td>1950</td><td>1305</td><td>1245</td><td>60</td></tr> <tr><td>1951</td><td>704</td><td>1153</td><td>-449</td></tr> <tr><td>1952</td><td>1018</td><td>1056</td><td>-38</td></tr> <tr><td>1953</td><td>500</td><td>1078</td><td>-578</td></tr> <tr><td>1954</td><td>457</td><td>1095</td><td>-638</td></tr> <tr><td>1955</td><td>806</td><td>1324</td><td>-518</td></tr> <tr><td>1956</td><td>1123</td><td>1176</td><td>-53</td></tr> <tr><td>1957</td><td>432</td><td>1264</td><td>-832</td></tr> <tr><td>1958</td><td>575</td><td>1168</td><td>-593</td></tr> <tr><td>1959</td><td>1068</td><td>1298</td><td>-230</td></tr> </tbody> </table> <p>+ Table A2 shows that net rainfall for the wettest year on record was 60mm.<br/>           + The automatic weather station for Goulburn has recorded net rainfall for the period of June 2021 to May 2022 being 171mm net rainfall which is nearly 3 times larger than the net rainfall that occurred in 1950 of just 60mm. This is on top of an unusually wet year in 2020 and is being followed by continued wet weather into the first quarter of 2022.<br/>           + Site rainfall for the 12 months audit period is 1,243mm.<br/>           + Evaporation data for the site was estimated to be 910mm – some missing data was estimated. This accords closely with evaporation data from the Goulburn AWS gauge.</p> <p><b>Recommendations:</b></p> <p>+ The WSP water balance report done in 2017 shall be updated taking into consideration recent weather events and in accordance with the detailed recommendations included in Section 4 of this report. This modelling is recommended to occur as part of NC1.<br/>           + Veolia should revise the water balance for the site taking into consideration the following:<br/>           + To adopt the longest possible continuous time series of data instead of adopting a dry, average and wet period approach. This will see the system tested under the full range of conditions that are critical to the water balance. While the wettest period sequence adopted had the wettest rainfall year on record it may not have had the highest net rainfall on record. Moreover, some average periods can stress water storages more than “wet” periods and this was evident with water balance modelling where an average year result obtained showed a storage filling more rapidly than under the wettest year sequence.<br/>           + Make an allowance for climate change in adopted parameters to stress test the system. For example, a rainfall multiplier and separate evaporation multiplier to simulate increased</p> | Year              | Rainfall (1)                         | Evaporation (2) | Net (1-2) | 1950 | 1305 | 1245 | 60 | 1951 | 704 | 1153 | -449 | 1952 | 1018 | 1056 | -38 | 1953 | 500 | 1078 | -578 | 1954 | 457 | 1095 | -638 | 1955 | 806 | 1324 | -518 | 1956 | 1123 | 1176 | -53 | 1957 | 432 | 1264 | -832 | 1958 | 575 | 1168 | -593 | 1959 | 1068 | 1298 | -230 |  |  |
| Year              | Rainfall (1) | Evaporation (2)  | Net (1-2)   |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1950              | 1305         | 1245   | 60  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1951              | 704          | 1153   | -449  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1952              | 1018         | 1056   | -38   |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1953              | 500          | 1078   | -578  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1954              | 457          | 1095   | -638  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1955              | 806          | 1324   | -518  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1956              | 1123         | 1176   | -53   |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1957              | 432          | 1264   | -832  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1958              | 575          | 1168   | -593  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |
| 1959              | 1068         | 1298   | -230  |                   |                                      |                 |           |      |      |      |    |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |     |      |      |      |      |      |     |      |     |      |      |      |     |      |      |      |      |      |      |  |  |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement | Evidence Collected | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |
|-------------------|-------------|--------------------|---|-------------------|--------------------------------------|
|                   |             |                    | <p>rainfall combined with decreased evaporation.</p> <ul style="list-style-type: none"> <li>+ Amend the method for modelling mechanical evaporators to take account of the recommendations provided in this report as follows:               <ul style="list-style-type: none"> <li>i. It must be linked to the variability observed with historical evaporation – in other words during wet periods evaporation is often reduced. Assuming a constant annual value is inappropriate.</li> <li>ii. The WSP disaggregation of annual evaporation converted the 2016 calibrated data into monthly data to reflect seasonal variation. The annual total observed a loss of 28% of flow per annum. However, on inspecting the monthly loss rates adopted, the average rate was 33% which will overestimate the losses by about 20%.</li> <li>iii. Estimates must account for wind direction and how this impacts availability. Wind roses from the adjacent wind farm may be used to inform better modelling practices.</li> <li>iv. Consider adopting a conservative approach with appropriate joint probabilities, for example – wettest rainfall coupled with minimal evaporation.</li> </ul> </li> <li>+ Redo the site calibration to reassess the adopted pan evaporation coefficients.</li> <li>+ The site measures evapotranspiration and yet it is evaporation not evapotranspiration that is critical to the site water balance. Therefore, consider installation of a Class A pan evaporimeter with automatic refill, bird cage and telemetry. This will prevent the need to convert ET into evaporation data and eliminate one source of error on water balance modelling. Consider also measuring relative humidity as this will affect the performance of the mechanical evaporators and may enable a better long-term calibration of the mechanical evaporators.</li> <li>+ Incorporate a changing pan evaporation coefficient to take into account the age of leachate and long-term increase in salinity. It is noted the evaporation reduces as salinity increases.</li> <li>+ Amend the rainfall runoff method from the simplistic c value adopted to a method which models soil moisture stores such as the hydsum model used in MUSIC. Calibrate this model for actual site soil characteristics such as field capacity, soil depths, groundwater seepage etc. This will see rainfall runoff modelled more accurately than adopting a constant runoff coefficient of 0.1 which would have significantly underestimated the volume of runoff generated from the void surface as well as flow into ED1, into the void from outside the void and into each dam etc.</li> <li>+ If not already done, place water meters on mechanical evaporators to record actual flow through.</li> </ul> |                   |                                      |



Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement  | Evidence Collected   | Independent Audit Findings and Recommendations   | Compliance Status | Unique Identification Non-compliance |
|-------------------|--|--|--|-------------------|--------------------------------------|
|                   |  |  | + Consider how to establish a system which enables mechanical evaporators to be moved from the western side to the eastern side to avoid downtime during easterly winds.   |                   |                                      |
| 18R(b)(iv)        | Assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include: the actual versus predicted volume of water or treated leachate stored in each dam. | We compared measured dam storage levels against predicted storage levels under a wettest rainfall scenario.      | <p><b>Findings:</b></p> <p>+ This has been analysed under Condition 18R(b)(i) above. The auditors reiterate that the storage of leachate and stormwater on site has grown significantly to the point where there is a risk of site discharge if the current wet conditions prevail.</p> <p>+ Veolia is now working to maintain a 200mm freeboard across the dams. This is above the 80% limit set on storage of leachate in the coffer dams by the consent.</p> <p><b>Recommendations:</b></p> <p>+ The previous recommendation for NC1(a) will address this finding.</p>  | Non-compliant     | NC1(d)                               |
| 18R(c)(i)         | Assess actual versus predicted performance of the LTP. This must include: actual versus target effluent quality.   | Site physico/chemical output or treatment data was obtained from Veolia and compared against licence conditions. | <p><b>Findings:</b></p> <p>+ Veolia has optimised the mix of influent into the LTP to balance the flow of nutrients into the plant. This balance requires the LTD to continue to operate and for leachate treated in the LTD to be stored in the ED3N lagoons for later ingestion into the LTP to help balance direct leachate feed.</p> <p>+ Veolia carried out an internal audit (by their business support and performance department). This audit retrospectively checked the original design for the LTP against actual site conditions.</p> <p>Identified problems:</p> <ol style="list-style-type: none"> <li>1) The COD influent in the leachate was nearly double what was expected by the original designers. As a result the LTP throughput had to be reduced significantly to attain the EPL COD target in effluent.</li> <li>2) Nitrification and denitrification were being achieved but with a feed of only one third of the design.</li> <li>3) The pipes feeding and leaving the heat exchanger were undersized and would bottleneck the performance of the heat exchange through high pressure loss</li> <li>4) Loss of heat from the bioreactor tanks especially during a windy winter night would actually account for a greater loss of energy than from convection. This was not accounted for in the original design and it was noted it would have been better to build the tanks with a roof to reduce the evaporative heat loss.</li> <li>5) The centrifuge was not operating optimally.</li> <li>6) There was a spill of leachate outside of the bunded area of the LTP when the reactor</li> </ol> | Non-compliant     | NC2                                  |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement  | Evidence Collected   | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |
|-------------------|--|--|---|-------------------|--------------------------------------|
|                   |  |  | <p>overflowed during a very windy and cold night.</p> <p>Identified Solutions:</p> <ol style="list-style-type: none"> <li>1) Based on a similar site in France, it was decided to dilute the COD in feed water to the LTP. The most economical method of achieving this was to continue to operate the LTD which was achieving good reductions in nitrogen from aeration and other factors.</li> <li>2) Originally it was planned to decommission the LTD however it was realised that continuing to operate the LTD would enable leachate that passed through the LTD to be stored in the lagoons (with much lower COD than the raw leachate) and then to be mixed with raw leachate to dilute the COD of the LTP influent to better match the reactor size. This would theoretically enable the target throughput to be achieved.</li> <li>3) The heat exchanger has been replaced with a 450 KW heat exchanger and pipe diameters have been increased to 50mm to ensure no bottlenecking.</li> <li>4) Trials to insulation the top of the reactor and balance tank would be undertaken.</li> <li>5) Improved antifoaming agents would be trialed.</li> </ol> <p>+ Some problems with foaming have now been overcome through the use of antifoaming agents.</p> <p>+ Effluent quality is now consistently meeting EPA licence limits. There was however a single minor exceedance of ammonia and TSS during the audit period. Given the design objective of the LTP is to reduce odour this is not problematic.</p> <p><b>Recommendations:</b></p> <p>+ Continue to improve and optimise the LTP operation with the assistance of suitably qualified experts (as required).</p> <p>+ Ensure that the LTP has additional membrane capacity installed as planned and that the additional capacity is commissioned and operating successfully.</p> |                   |                                      |
| 18R(c)(iii)       | Assess actual versus predicted performance of the LTP. This must include: actual versus target throughput. | Site throughput data was obtained from Veolia and compared against proposed throughput | <p><b>Findings:</b></p> <p>+ The LTP has been consistently treating 4 l/s since August 2021. The average for the audit period is 3.4 l/s. It is considered that the LTP is now consistently meeting its targets though it hasn't met its target for the whole of the audit period.</p> <p>+ The coming winter period will be a testing period to see if throughput the UF membranes can be maintained under colder temperatures. It is understood that heat exchangers are on standby should they be needed. The commissioning of the additional capacity in the UF plant will ensure an ability to meet throughput targets and build some additional resilience into the system.</p>   | Non-compliant     | NC3                                  |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement   | Evidence Collected   | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |
|-------------------|---|--|---|-------------------|--------------------------------------|
|                   |   |  | <b>Recommendations:</b><br>+ The previous recommendation for NC5 will address this non-compliance.  |                   |                                      |
| 18R(d)            | Determine whether the leachate and water management system is achieving its intended objectives.<br><br>1. Construction of a suitably sized and lined coffer dam (referred to as ED1 Cofferdam) to store and evaporate treated leachate from its leachate treatment plant from September 2018 for 4- year period without filling. | Refer above for evidence collected.  | <b>Findings:</b><br>+The system is not achieving its objectives. The volume of water stored within the unlined ED3N dams has grown significantly instead of being drawn down. At the same time ED1 Cofferdam is also nearly full. This will substantially delay the installation of any new liners with ED3N dams. Dams are being operated above the 80% freeboard limit set.<br><br><b>Recommendations:</b><br>+ The previous recommendation for NC1 will address this non-compliance. | Non-compliant     | NC4                                  |
|                   | 2. In accordance with Condition 18S of the Project Approval (MP 10_0012), as modified, the volume of mine water stored in ED1 must be no more than 10 ML by 31 December 2023.   | Dam storage levels and interviews with staff on site and following the site audit. | <b>Findings:</b><br>+ It is considered premature to make any conclusive findings.<br><br><b>Recommendations:</b><br>+ Nil.  | Not triggered     | -                                    |
|                   | 3. In accordance with Condition 18T of the Project Approval (MP 10_0012), as modified, ED3N must be emptied of effluent from the existing leachate system by 31 December 2022.  | Dam storage levels and interviews with staff on site and following the site audit. | <b>Findings:</b><br>+ It is considered premature to make any conclusive findings, however, at this stage it appears very unlikely this condition will be achieved.<br><br><b>Recommendations:</b><br>+ The previous recommendation for NC1(a) will address this   | Not triggered     | -                                    |
|                   | 4. Install floating evaporators in ED3N1, ED3N2, ED3N3, ED3N4 and ED3SS to manage leachate from September 2017 through to December  | + SLR Consulting (2020). Woodlawn Bioreactor - Independent                         | <b>Findings:</b><br>+ As reported in the 2019 Audit Report by SLR consulting, it is noted floating evaporators have already been installed in ED3N2, ED3N3, ED3N4 and ED3SS. In addition, dam water inflows are sprayed into the dams to further increase evaporation rates. The operation of the floating evaporators and dam inflow spray locations are selected based on real time   | Compliant         | -                                    |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement  | Evidence Collected  | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |
|-------------------|--|---|---|-------------------|--------------------------------------|
|                   | 2019.  | Audit Leachate and Water Management System (dated 2708/2020).                       | <p>weather data including the wind direction, wind speed, temperature, humidity and the time of the day.</p> <p><b>Recommendations:</b><br/>+ Nil.</p>  |                   |                                      |
|                   | 5. Operate effectively without adversely impacting on the surrounding community. | Dam storage levels.   | <p><b>Findings:</b><br/>+There have been no adverse water quality impacts on the surrounding community thus far however the possibility of an off-site discharge remains high. This may have an adverse impact on the surrounding community and on the drinking water catchments. The level of leachate stored within the cells has been kept low to minimise odour impacts however the volume of leachate stored on site is approaching capacity of the dams.</p> <p><b>Recommendations:</b><br/>+ Revise the water balance and determine the revised risk of an off-site discharge or need to store leachate within cells.<br/>+ Ensure that risk is managed in accordance with the Soil and Water Response Plan (Section 6) of Veolia’s Soil and Water Management Plan (dated 07/09/2018).</p> | Compliant         | -                                    |
|                   | 6. Minimise leachate production  | LTP throughput, site inspection to verify surface water diversions and cell capping | <p><b>Findings:</b><br/>+Leachate production has been minimised by diverting as much run-on water as possible and by covering cells as soon as practical.</p> <p><b>Recommendations:</b><br/>+ Continue to manage and minimise run on water and continue to cover cells as soon as feasible as per Section 4.1.6 and 4.2.4 of Veolia’s Soil and Water Management Plan (dated 07/09/2018).</p>   | Compliant         | -                                    |
|                   | 7. Effectively separate all classes of water.                                    | Dam storage levels and interviews with staff on site and following the site audit.  | <p><b>Findings:</b><br/>+AMD water has thus far been kept separate from treated leachate. Rainfall falling directly onto the covered cells is also now, after approval, kept separate from leachate and this is practical and sensible and reduces the hydraulic load on the LTP.</p> <p><b>Recommendations:</b><br/>+ Continue to keep classes of water separate in accordance with Section 4.1.6 and 4.2.4 of Veolia’s Soil and Water Management Plan (dated 07/09/2018).<br/>+ Revise the water balance and assess the risk of needing to mix classes of water.<br/>+ If there is a high risk of needing to mix classes of water consider the impacts of mixing</p>  | Compliant         | -                                    |

Conditions of Development Consent – MP10\_0012 (Consolidated consent including Mods 1, 2, 3 and 4)

| Consent Condition | Requirement   | Evidence Collected   | Independent Audit Findings and Recommendations  | Compliance Status | Unique Identification Non-compliance |
|-------------------|---|--|---|-------------------|--------------------------------------|
|                   |   |  | classes of water and develop strategies to minimise and manage these impacts.   |                   |                                      |
| 18R(e)            | Outline all reasonable and feasible measures that may be required to improve water and leachate management at the site. | Dam storage levels and interviews with staff on site and following the site audit. | <p><b>Findings:</b></p> <p>+The water balance for the site is clearly not adequate and urgently needs revision. Once revised, appropriate management measures can be tested, proposed and be subject to an approval process.</p> <p><b>Recommendations:</b></p> <p>+ Urgently and within 6 months revise the water balance and as required develop alternative strategies for managing water and leachate on the site.</p> <p>+ Refer to actions under NC1.</p> | Compliant         | -                                    |

## Appendix B – Site Visit Photographs

Figure B1. Photograph of the bioreactor void (view to south).



Figure B2. Photograph of the bioreactor void (view to east).





**Figure B3. Photograph of a stormwater interception dam within the bioreactor void.**



**Figure B4. Photograph of the leachate treatment dam above the void.**





**Figure B5. Photograph of leachate storage dam EDN1.**



**Figure B6. Photograph of stormwater storage dam ED3S.**




Figure B7. Photograph an instrument panel and CCTV footage of the Leachate Treatment Plant operations.



Figure B8. Leachate Treatment Plant operations.



## Appendix C – Audit Certification

|   |   |
|---|---|
| Project Name  | Woodlawn Bioreactor Leachate and Water Management System<br>Independent Audit 2022  |
| Consent Number  | State Significant Development MP10_0012 as modified                                 |
| Description of Project  | Woodlawn Bioreactor Leachate and Water Management System                            |
| Project Address   | 619 Collector Road, Tarago NSW 2580   |
| Proponent   | Veolia Environmental Services Pty Ltd   |
| Title of Audit  | Veolia Woodlawn Bioreactor LWMS – Independent Audit 2022                            |
| Date  | 19 July 2022  |
| <p>I declare that:</p> <ul style="list-style-type: none"> <li>i. I am not related to any proponent, owner, operator or other entity involved in the delivery of the project. Such a relationship includes that of employer/employee, a business partnership, sharing a common employer, a contractual arrangement outside an Independent Audit, or that of a spouse, partner, sibling, parent, or child;</li> <li>ii. I do not have any pecuniary interest in the project, proponent or related entities. Such an interest includes where there is a reasonable likelihood or expectation of financial gain (other than being reimbursed for performing the audit) or loss to the auditor, or their spouse, partner, sibling, parent, or child;</li> <li>iii. I have not provided services (not including independent reviews or auditing) to the project with the result that the audit work performed by themselves or their company, except as otherwise declared to the Department prior to the audit;</li> <li>iv. I am not an Environmental Representative for the project; and</li> <li>v. I will not accept any inducement, commission, gift or any other benefit from auditee organisations, their employees or any interested party, or knowingly allow colleagues to do so. The audit has been undertaken in accordance with relevant condition(s) of consent and the <i>Independent Audit Compliance Requirements</i> (Department 2020);</li> </ul> <p>Notes.</p> <ul style="list-style-type: none"> <li>a) Under section 10.6 of the Environmental Planning and Assessment Act 1979 a person must not include false or misleading information (or provide information for inclusion in) in a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000; and</li> <li>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years imprisonment or 200 penalty units, or both)</li> </ul> |   |
| Name of Auditor   | Alan Parsons  |
| Signature   |  |
| Qualification   | Lead Auditor HSEQ   |
| Company   | ARP Risk Management Solutions Pty Ltd   |
| Company Address   | 1 Power Place, Jindabyne NSW 2627   |

## Appendix D – Audit Team Approval Letter from DPE





Ms Marea Rakete  
Woodlawn Environmental Officer  
Veolia Environmental Services (Australia) Pty Ltd  
619 Collector Road  
TARAGO NSW 2580

02/03/2022

Dear Ms Rakete

**Woodlawn Waste Expansion Project (MP 10\_0012)  
Annual Leachate and Water Management System Auditor 2022**

I refer to your letter of 23 February 2022 seeking approval of Dr Mark Jackson, Mr Mark Liebman and Mr Alan Parsons of Jackson Environment and Planning Pty Ltd (the audit team) for the upcoming Annual Leachate and Water Management System Audit of Woodlawn Waste Expansion Project (the project), in accordance with Schedule 4, Condition 18R of the project approval MP 10\_0012, as modified (the approval).

Having considered the qualifications and experience of the audit team, the Secretary endorses the appointment of the audit team to undertake the Annual Leachate and Water Management System Audit in accordance with Schedule 4, Condition 18R of the approval. This approval is conditional on the audit team being independent of the project.

The audit is to be conducted in accordance with AS/NZS ISO 19011 Australian/New Zealand Standard: Guidelines for quality and/or environmental management systems auditing. Auditors may wish to have regard to the Independent Audit Guideline dated May 2020. A copy of this guideline can be located at <https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/Assess-and-regulate/About-Compliance/independent-audit-post-approval-requirements-2020-05-19.pdf>.

The audit report is to include the following:

1. consultation with the relevant agencies;
2. a compliance table indicating the compliance status of each condition of approval and any relevant EPL;
3. not use the term “partial compliance”;
4. recommend actions in response to non-compliances;
5. review the adequacy of plans and programs required under this consent; and
6. identify opportunities for improved environmental management and performance.

Within three months of the commissioning of the Annual Leachate and Water Management System Audit, Veolia is to submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report and a timetable to implement the recommendations. Prior to submitting the audit report to the Secretary, it is recommended that Veolia review the report to ensure it complies with the relevant approval condition.



Department of Planning and Environment

Should you need to discuss the above, please contact Georgia Dragicevic, Senior Compliance Officer, on (02) 4247 1852 or by email to [Georgia.Dragicevic@planning.nsw.gov.au](mailto:Georgia.Dragicevic@planning.nsw.gov.au).

Yours sincerely

Katrina  
Team Leader  
Compliance  
As nominee of the Planning Secretary

O'Reilly  
Compliance

## Appendix E – Audit Plan





**SSD Independent Leachate and Water Management System Audit:  
Audit Plan and Agenda  
Veolia Environmental Services (Australia) Pty Ltd  
Woodlawn Bioreactor Landfill  
Date: 27 April 2022  
Time: 11am to 4pm**

---

**Introduction to the audit:**

Jackson Environment and Planning Pty Ltd has been engaged by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to undertake an Independent Leachate and Water Management System (LWMS) Audit (Audit) associated with the Woodlawn Bioreactor Landfill (the Site), located at Collector Rd, Tarago. This audit is required under Condition 18R of the Development Consent (MP 10\_0012), which states:

*“Within six months of commissioning the LTP and annually thereafter, unless otherwise agreed to by the Planning Secretary, the Proponent shall commission and pay the full cost of an independent assessment of the leachate and water management system. This audit must be conducted by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Planning Secretary. During the audit, this expert must:*

- a) consult with the EPA, Water NSW and the Planning Secretary;*
- b) assess actual performance against the assumptions and predictions made in the project water balance prepared by WSP dated September 2017. This must include:
  - i. actual versus predicted inputs and outputs from each dam;*
  - ii. actual versus predicted mechanical evaporation from each dam;*
  - iii. actual versus predicted rainfall and evaporation; and*
  - iv. the actual versus predicted volume of water or treated leachate stored in each dam.**
- c) assess actual versus predicted performance of the LTP. This must include:
  - i. actual versus target effluent quality; and*
  - ii. actual versus target throughput.**
- d) determine whether the leachate and water management system is achieving its intended objectives; and*
- e) outline all reasonable and feasible measures that may be required to improve water and leachate management at the site.”*

The objective of the Audit is to assess the environmental performance of the LWMS. Jackson Environment and Planning Pty Ltd (JEP) will undertake the Audit in accordance with the NSW Department of Planning, Industry and Environment’s *Independent Audit Post Approval Requirements* (2020).

Based on this, Jackson Environment and Planning Pty Ltd have been commissioned to conduct the Audit and cover the period of 16 March 2021 to 15 March 2022.

The Audit will also include the requirements of the Environmental Protection Licence (EPL) for the site (EPL 11436), which is not specifically required under Condition C18R.

The Department of Planning and Environment approved the audit team on 2<sup>nd</sup> March 2022.

## Audit team

Members of the audit team are outlined below, including site representatives from Veolia. It is noted that Mr Alan Parsons from ARP Risk Management Solutions Pty Ltd will be supporting the audit team as the lead auditor and Mr Mark Liebman from Sustainability Workshop Pty Ltd is the wastewater engineering expert.

| Name            | Position  | Organisation                              |
|-----------------|---|---|
| Ms Marea Rakete | Woodlawn Environmental Officer                      | Veolia Environmental Services (Australia) |
| Tobias Stanley  | Woodlawn Bioreactor and Woodlawn Bio-Energy Manager | Veolia Environmental Services (Australia) |
| Ark Du          | Woodlawn Eco-Precinct Engineering Manager           | Veolia Environmental Services (Australia) |
| Kevin Xie       | Landfill Engineer                                   | Veolia Environmental Services (Australia) |
| Callum Simpson  | Woodlawn LTP Operations Supervisor                  | Veolia Environmental Services (Australia) |
| Dr Mark Jackson | Director  | Jackson Environment and Planning Pty Ltd  |
| Mr Mark Liebman | Director  | Sustainability Workshop Pty Ltd           |
| Mr Alan Parsons | Director  | ARP Risk Management Solutions Pty Ltd     |

## Audit plan

The audit process outlined in ISO 19011 *Guidelines for Auditing Management Systems* (2018) has been used to inform the development of the audit plan. The audit plan including the audit methodology is summarised in Table 1.

## Audit Scope and Objectives

Three considerations relevant to the scope of this Independent Audit include that of:

- Project implementation phase;
- Documentation; and
- Spatial Scope.

### Project phase

In relation to project phase, the audit will cover the operational phase of the development. Construction related tasks are out of scope of the Audit.

### Documentation

The scope of the Audit will be limited to assessing the performance of the Leachate and Water Management System in accordance with the Development Consent MP 10\_0012 for the period 16 March 2021 to 15 March 2022.

The scope of the audit included an assessment of the following matters:

- The conditions of all relevant approvals;
- Management plan requirements;
- The requirements of relevant regulatory agencies;
- The status of the operation;
- The key regulatory risks, including past or future risks;
- The predictions of environmental impact assessments;
- The performance of the operation;
- Results from previous audits;
- Any incidents or community complaints;
- Feedback received from other regulatory agencies on the performance of the operation;
- Feedback received from the community / community consultative committee on the performance of the operation; and

- Agency policy or other focus areas.

The Audit also included environmental performance requirements under Environmental Protection Licence (11436) for the same period, however this is not specifically required under Condition 18R of MP 10\_0012.

### Spatial Scope

The Woodlawn Bioreactor Landfill located at Collector Rd, Tarago.

**Table 1. Summary of the audit methodology and the audit plan.**

| Status  | Audit plan task   |
|---|---|
| Completed   | <b>Letter seeking audit team approval</b> – In accordance with the NSW Department of Planning, Industry and Environment’s <i>Independent Audit Post Approval Requirements (2020)</i> , a letter was prepared seeking DPE approval for the audit team.   |
| Completed   | <b>Develop the Audit Plan</b> – An audit plan be developed outlining what will be audited, who will do the auditing, when it will happen and who will be audited, and how much time will be dedicated to each process in the audit. Work will also be assigned to auditors. The audit working papers will also be prepared to identify what the auditors wants to verify, what questions to ask, and what they expect as evidence. The Audit Plan will also include the audit sequence. We will also allow time for consultation with relevant agencies, including EPA, Water NSW and the Planning Secretary of DPE in accordance with your consent and the <i>Independent Audit Post Approval Requirements</i> . |
| Site audit meeting and inspection scheduled for 27 April 2022 | <b>Conduct the opening meeting</b> – The onsite audit begins with an opening meeting. This is to introduce the auditors, confirm the scope and extent of the audit and discuss the schedule.  |
|   | <b>Review documents</b> – After the meeting, any documents immediately presented by Veolia will be reviewed to gather relevant information that might not have been available before.   |
|   | <b>Carry out the audit</b> – The auditors will commence the audit by interviews and collecting the records and observations that will demonstrate if the processes meet the Development Consent conditions and EPL requirements. We will also write to EPA, Water NSW and DPE and seek any feedback on the environmental performance of the development.  |
|   | A date for the site inspection and audit meeting will be arranged.  |
|   | <b>Generate findings and conclusions</b> – JEP will generate the audit findings and prepare any audit conclusions to be presented at the closing meeting.   |
| To be completed   | <b>Conduct the closing meeting</b> – The onsite audit finishes with a closing meeting. This is to present the audit findings and provide Veolia with the opportunity to discuss and ask questions about the audit and findings.   |
|   | <b>Formalise audit findings in a report</b> – The final findings will be formally written and distributed in an audit report. The report will be provided within two (2) weeks of the on-site audit.  |

An agenda for delivery of the site audit meeting and inspection is given in Table 2.

**Table 2. Agenda for the site audit meeting and inspection, Wed 27 April 2022.**

| Agenda item | Item description   |
|-------------|--|
| 1.          | 1100 - 1115: Introductions (all)   |
| 2.          | 1115- 1130: Confirm scope of the audit (Mark)  |
| 3.          | 1130 - 1145: Overview of the Audit Plan (Mark) <ul style="list-style-type: none"><li>• Documents reviewed as part of the desktop audit</li><li>• Review of gaps in audit data / evidence needed</li><li>• Complaints data</li><li>• Timeline for providing audit data</li><li>• Timeline for preparation of draft and final report for submission to DPE</li></ul>   |
| 4.          | 1145 - 1330: Audit meeting (with a focus on seeking data where gaps exist) <ul style="list-style-type: none"><li>• Actions to close non-compliances from the last Audit report</li><li>• Environmental monitoring and reporting</li><li>• Community liaison and complaints handling</li><li>• Training, induction, communications and roles / responsibilities under the Landfill Environmental Management Plan (LEMP) and Leachate Management Plan (LMP)</li><li>• Surface water management</li><li>• Leachate management</li><li>• Groundwater management</li><li>• Incidents</li><li>• Non-compliances or exceedances during the audit period</li></ul> |
| 5.          | 1330 – 1400: Lunch   |
| 6.          | 1400 – 1530: Site inspection.  |
| 7.          | 1530 - 1600: General findings, questions and close.  |

## Appendix G – Consultation Letters



11<sup>th</sup> April 2022

Ms Katrina O'Reilly  
Team Leader Compliance  
NSW Department of Planning and Environment  
Locked Bag 5022  
Parramatta NSW 2124

By email to: [information@planning.nsw.gov.au](mailto:information@planning.nsw.gov.au)  
Cc: [Georgia.Dragicevic@planning.nsw.gov.au](mailto:Georgia.Dragicevic@planning.nsw.gov.au)

Dear Ms O'Reilly,

***Re: Agency Consultation – Independent Leachate and Water Management System Audit (Audit) – Woodlawn Bioreactor Landfill***

Jackson Environment and Planning Pty Ltd (JEP) has been engaged by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to undertake an Independent Leachate and Water Management System (LWMS) Audit (the Audit) for the Woodlawn Bioreactor Landfill, located at Collector Rd, Tarago. This audit is required under Condition 18R of the site's Development Consent (MP 10\_0012).

Our audit team for this project was approved by the Department of Planning and Environment on 2<sup>nd</sup> March 2022.

The objective of the Audit is to assess the environmental performance of the LWMS. We will undertake the Audit in accordance with the NSW Department of Planning, Industry and Environment's *Independent Audit Post Approval Requirements (2020)* and *ISO 19011 Guidelines for Auditing Management Systems (2018)*.

The Audit is required to consider the environmental performance of the LWMS for the period of 16<sup>th</sup> March 2021 to 15<sup>th</sup> March 2022.

Under Condition 18R(a) of Development Consent MP 10\_0012, Veolia is required to consult relevant agencies on key environmental issues which need to be considered in the LWMS Audit, including NSW EPA, Water NSW and the Department of Planning and Environment.

We would like to present the Department of Planning and Environment with an opportunity to comment on the environmental performance of the LWMS, and in particular,

environmental compliance matters relating to the management of water and leachate under Development Consent MP 10\_0012.

We would appreciate your return response within two weeks of the date of this letter.

Please feel free to contact me should you require any further information.

Yours sincerely,



**Dr Mark Jackson** B.Sc. (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Admin. (USYD), Certified Environmental Practitioner CEnvP (1542), Impact Assessment Specialist (IA11071)

Director

Jackson Environment and Planning Pty Ltd

Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060

T: 02 8056 1849 or M: 0411 060 478

E: [mark@jacksonenvironment.com.au](mailto:mark@jacksonenvironment.com.au)

W: [www.jacksonenvironment.com.au](http://www.jacksonenvironment.com.au)





11<sup>th</sup> April 2022

Ms Vanessa O'Keefe  
Operations Officer  
NSW Environment Protection Authority  
Locked Bag 5022,  
Parramatta NSW 2124

By email to: [info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au)  
Cc: [vanessa.okeefe@epa.nsw.gov.au](mailto:vanessa.okeefe@epa.nsw.gov.au)

Dear Ms O'Keefe,

***Re: Agency Consultation – Independent Leachate and Water Management System Audit (Audit) – Woodlawn Bioreactor Landfill***

Jackson Environment and Planning Pty Ltd (JEP) has been engaged by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to undertake an Independent Leachate and Water Management System (LWMS) Audit (the Audit) for the Woodlawn Bioreactor Landfill, located at Collector Rd, Tarago. This audit is required under Condition 18R of the site's Development Consent (MP 10\_0012).

Our audit team for this project was approved by the Department of Planning and Environment on 2<sup>nd</sup> March 2022.

The objective of the Audit is to assess the environmental performance of the LWMS. We will undertake the Audit in accordance with the NSW Department of Planning, Industry and Environment's *Independent Audit Post Approval Requirements (2020)* and *ISO 19011 Guidelines for Auditing Management Systems (2018)*.

The Audit is required to consider the environmental performance of the LWMS for the period of 16<sup>th</sup> March 2021 to 15<sup>th</sup> March 2022.

Under Condition 18R(a) of Development Consent MP 10\_0012, Veolia is required to consult relevant agencies on key environmental issues which need to be considered in the LWMS Audit, including NSW EPA, Water NSW and the Department of Planning and Environment.

We would like to present the NSW EPA with an opportunity to comment on the environmental performance of the LWMS, and in particular, environmental compliance matters relating to the management of water and leachate from the premises under EPA Licence 11436.

We would appreciate your return response within two weeks of the date of this letter.

Please feel free to contact me should you require any further information.

Yours sincerely,



**Dr Mark Jackson** B.Sc. (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Admin. (USYD), Certified Environmental Practitioner CEnvP (1542), Impact Assessment Specialist (IA11071)

Director

Jackson Environment and Planning Pty Ltd

Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060

T: 02 8056 1849 or M: 0411 060 478

E: [mark@jacksonenvironment.com.au](mailto:mark@jacksonenvironment.com.au)

W: [www.jacksonenvironment.com.au](http://www.jacksonenvironment.com.au)



11<sup>th</sup> April 2022

Mr Andrew George  
Chief Executive Officer  
Water NSW  
PO Box 398  
Parramatta NSW 2124

By email to: [Customer.Helpdesk@watersw.com.au](mailto:Customer.Helpdesk@watersw.com.au)

Dear Mr George,

***Re: Agency Consultation – Independent Leachate and Water Management System Audit (Audit) – Woodlawn Bioreactor Landfill***

Jackson Environment and Planning Pty Ltd (JEP) has been engaged by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to undertake an Independent Leachate and Water Management System (LWMS) Audit (the Audit) for the Woodlawn Bioreactor Landfill, located at Collector Rd, Tarago. This audit is required under Condition 18R of the site's Development Consent (MP 10\_0012).

Our audit team for this project was approved by the Department of Planning and Environment on 2<sup>nd</sup> March 2022.

The objective of the Audit is to assess the environmental performance of the LWMS. We will undertake the Audit in accordance with the NSW Department of Planning, Industry and Environment's *Independent Audit Post Approval Requirements* (2020) and *ISO 19011 Guidelines for Auditing Management Systems* (2018).

The Audit is required to consider the environmental performance of the LWMS for the period of 16<sup>th</sup> March 2021 to 15<sup>th</sup> March 2022.

Under Condition 18R(a) of Development Consent MP 10\_0012, Veolia is required to consult relevant agencies on key environmental issues which need to be considered in the LWMS Audit, including NSW EPA, Water NSW and the Department of Planning and Environment.

We would like to present Water NSW with an opportunity to comment on the environmental performance of the LWMS, and in particular, environmental compliance matters relating to the management of water and leachate under Development Consent MP 10\_0012.

We would appreciate your return response within two weeks of the date of this letter.

Please feel free to contact me should you require any further information.

Yours sincerely,



**Dr Mark Jackson** B.Sc. (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Admin. (USYD), Certified Environmental Practitioner CEnvP (1542), Impact Assessment Specialist (IA11071)

Director

Jackson Environment and Planning Pty Ltd

Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060

T: 02 8056 1849 or M: 0411 060 478

E: [mark@jacksonenvironment.com.au](mailto:mark@jacksonenvironment.com.au)

W: [www.jacksonenvironment.com.au](http://www.jacksonenvironment.com.au)

**From:** [Georgia Dragicevic](#)  
**To:** [Mark Jackson](#)  
**Cc:** ["Rakete, Marea"](#); [Katrina O'Reilly](#)  
**Subject:** RE: Agency Consultation - Independent Leachate and Water Management System Audit (Audit) - Woodlawn Bioreactor Landfill  
**Date:** Wednesday, 13 April 2022 8:55:59 PM

---

Hi Mark,

Thank you for consulting the Department on the upcoming Independent Leachate and Water Management System Audit for the Woodlawn Bioreactor Landfill Development.

The Department requests that you assess the environmental performance of the Leachate and Water Management System, including the identification of any non-compliances with the relevant consent conditions and recommend any actions to bring the operation into compliance.

Please remind Veolia to provide response to any audit recommendations, including the implementation timeframes, together with the audit, for the Secretary's consideration.

Thank you kindly,  
Georgia

---

**From:** Mark Jackson <mark@jacksonenvironment.com.au>  
**Sent:** Monday, 11 April 2022 3:23 PM  
**To:** DPE CSE Information Planning Mailbox <information@planning.nsw.gov.au>; Georgia Dragicevic <Georgia.Dragicevic@planning.nsw.gov.au>  
**Cc:** 'Rakete, Marea' <marea.rakete@veolia.com>  
**Subject:** Agency Consultation - Independent Leachate and Water Management System Audit (Audit) - Woodlawn Bioreactor Landfill

Dear Katrina and Georgia,

As you are aware, we are currently undertaking an independent audit of the Woodlawn Bioreactor Landfill Leachate and Water Management System (LWMS) in accordance with Condition 18R of the site's Development Consent (MP 10\_0012).

We would like to invite the Department of Planning and Environment to comment on the environmental performance of the LWMS, and in particular, environmental compliance matters relating to the management of water and leachate under Development Consent MP 10\_0012. Please refer to a letter attached with more detail.

I look forward to your response. If the Department has nil feedback at this stage, please confirm via email or return letter.

Kind regards,  
Mark

**Dr Mark Jackson** [B.Sc.](#) (Hons), PhD, Grad. Cert. Mgmt., Exec. Masters Public Adm. (USYD),  
Certified Environmental Practitioner CEnvP (1542), Impact Assessment Specialist (IA11071)

Director

Jackson Environment and Planning Pty Ltd

Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060

T: 02 8056 1849 or M: 0411 060 478

E: [mark@jacksonenvironment.com.au](mailto:mark@jacksonenvironment.com.au)

W: [www.jacksonenvironment.com.au](http://www.jacksonenvironment.com.au)





DOC22/331107-1

Jackson Environment and Planning  
Suite 102, Level 1, 25-29 Berry Street  
NORTH SYDNEY NSW 2060  
Attention: Dr Mark Jackson  
Email: mark@jacksonenvironment

3 May 2022

Dear Dr Jackson

**Woodlawn Landfill – Leachate and Water Management System (LWMS) Audit**

I am writing in response to your email on the 14 April 2022 requesting feedback and advice on the Independent Leachate and Water Management System (LWMS) Audit for Woodlawn Landfill.

In addition to the requirements of the Major Project Approval, the NSW Environment Protection Authority (EPA) has identified several matters that should be considered in this audit in the attachment to this letter (Attachment A). These relate to:

- Purpose of Audits
- Development Control Order
- Project Water Balance Assessment
- Leachate Treatment Plant (LTP)
- Audit Recommendations

If you have any questions regarding the above or would like to discuss this matter further, please contact Vanessa O’Keefe on telephone 0488 433 384 or email at [info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au).

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Peter Bloem'.

**PETER BLOEM**  
Manager Regulatory Operations

Phone 131 555  
Phone +61 2 9995 5555  
(from outside NSW)

TTY 133 677  
ABN 43 692 285 758

Locked Bag 5022  
Parramatta  
NSW 2124 Australia

4 Parramatta Square  
12 Darcy St, Parramatta  
NSW 2150 Australia

[info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au)  
[www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)



## **ATTACHMENT A**

### **Purpose of Audits**

The EPA considers the LWMS audit is important in identifying any emerging issues in leachate and water management at the Woodlawn landfill at the earliest opportunity so they can be promptly addressed. It also ensures regular validation of environmental performance and continuous improvement. The audit should be approached with this purpose in mind.

Veolia's Long-Term Leachate Treatment Solution Submission Report, Leachate Management Plan, and Soil & Water Management Plans are key components of the major project approval to increase waste inputs to the landfill (refer Condition 3 of Schedule 7 of PA\_10\_00012). The plans were supported by a detailed water balance that demonstrated that their implementation could enable the landfill to operate as a "zero discharge site" until at least 2058 (providing actual operations match the assumptions used in the water balance modelling). Maintaining the landfill as a zero-discharge site is a fundamental objective for the Woodlawn landfill, given its location in the outer catchment of Sydney's drinking water supply.

Given the importance of the water balance to these approvals and plans, the EPA recommended to Department of Planning and Environment (DPE) that Veolia be required to regularly assess the performance of water and leachate management at the premises. This recommendation formed the basis of the DPE inclusion of the LWMS Audit in its modified Project Approval (December 2017).

### **Development Control Order**

On 1 April 2022 the DPE (in discussion with the EPA) issued Veolia a Development Control Order to remedy a breach of the Consent. These breaches also relate to EPA Environment Protection Licence (EPL) requirements. The order requires Veolia to engage an independent, suitably qualified and experienced specialist(s) with expertise in the area(s) of water and leachate management. In consultation with the EPA and DPE, Veolia is required to develop short, medium, and long-term leachate and water management strategies within specified timeframes. Veolia is required to provide status updates on these matters required under the terms of Order, at regular intervals, until those matters have been completed.

The EPA has identified a range of leachate and water management issues that are required to be considered under this order and these are being provided to Veolia. The order and the audit each have specific purposes and requirements and are not the same. The LWMS audit should be undertaken in discussion with Veolia and the engaged specialist.

### **Project Water Balance Assessment**

The previous LWMS Audit Report (SLR Consulting, June 2021) makes the following claim:

*It is noted that Condition 18R b) pertains to the accuracy of the WSP site Water Balance undertaken in 2017 (updated in May 2020). This Water Balance (like all Water Balances) is based on a number of assumptions which are prone to change over time. In addition, many inputs and outputs are never going to be exactly the same as what was assumed within the Water Balance.*

*As such, SLR believes that Condition 18R b) cannot be assessed completely in accordance with the DPIE Independent Audit Guideline (June 2018) and the respective compliance status of the items within this condition should be read and interpreted in this context.*

The Independent Audit Guideline (DPIE, 2015) states:

- The guidelines are advisory (unless mandated in the major project approval).
- They reflect minimum standards expected by Government
- Where there is any inconsistency between this guideline and the conditions placed on an operation's major project approval, the major project approval conditions will prevail.

The audits should compare actual performance of the leachate and water management system against the assumptions and predictions made in the project water balance and assess the scale and significance of any of differences. This water balance prepared by WSP in September 2017 is the modelling on which current management plans, approvals and licence conditions are based. If there is a rationale for preparing a revised water balance this should also be fully explained (and be capable of demonstrating the site's zero discharge objective). The audit should consider and discuss the implications of any operational changes, so that the implications can be assessed and, if necessary, compensatory or mitigative measures can be implemented.

### **Leachate Treatment Plant**

The audit should consider the requirements of Pollution Reduction Program (PRP) condition U1.5 and U1.6 attached to EPL 11436 in June 2021. A Leachate Assessment Report prepared by Earth2water was submitted by Veolia on the 6 August 2021 to address the requirements of the PRP and based on the recommendations within Report, Veolia developed a Leachate Action Plan.

The audit should consider the requirements of PRP condition U1.3 which require Veolia to submit monthly reports to the EPA detailing the progress on the commissioning and process optimisation of the LTP. This EPL condition has specific reporting requirements.

The audit should assess compliance with these licence conditions.

The EPA makes the following observations which should also be considered:

- Extraction totals from the void appear to be reported since June 2021. Under PRP U1.3 this should have commenced from 21 September 2016.
- The monthly report refers to “accumulation total from the bio system”. It is unclear what this means.
- The LTP is designed to achieve 4L/s into the plant. LTP has been in the process proving phase since May 2019 (over 3 years).
- An additional treatment train is to be installed (due by July 2022).
- The monthly report refers to an internal “Process Audit Report” which was reviewed by Veolia's Global Technical & Performance Department in October 2021. The audit should review and make comments on the report's findings.
- The auditor should consider the requirements of Veolia's Leachate Management Plan and Soil & Water Management Plan (and be capable of demonstrating the site's zero discharge objective).
- The auditor should consider the requirements of the Long-Term Leachate Treatment Solution Submission Report (Veolia, July 2016) submitted by Veolia as part of an application to modify the Project Approval and Development Consent (DA 31-02-99). This included a range of measures that may be required to improve water and leachate management at the site, including the following (which do not appear to be have been recently considered):
  - Develop a program to enable the application of treated leachate to land (irrigation)
  - Use of heat to aid in treated leachate volume reduction (enhance evaporation rates)
  - Community engagement on leachate and water management issues.

### **Audit Recommendations**

The audit is required to outline all reasonable and feasible measures that may be required to improve water and leachate management at the site. The previous audit makes several recommendations regarding measures, like “contingency plans” with few details. Such statements are not measurable, trackable, and auditable.

The Audit should identify:

- Specific, reasonable, and feasible actions to be undertaken to improve leachate and water management
- Clearly distinguish between ongoing actions from previous audits and provide additional recommended actions to be undertaken; and
- For each recommendation/action state timeframes for commencement and completion