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24 May 2025

Dear Mr Beaman

Re: Comments on the WORKING DRAFT Environmental Guidelines Solid Waste Landfills 2025

Thank you for the reaching out to the Landfill Sub-Sector Working Group (Waste Management and Resource Recovery Association (WMRR) and the Australian Landfill Owners Association (ALOA)) to provide our views on the *WORKING DRAFT Environmental Guidelines Solid Waste Landfills 2025* ("the Guidelines") - a revision of the current 2016 version. We appreciate that this is a targeted consultation prefacing more broader consultation which will be sought once the Draft Landfill Guidelines are reviewed, and the group is grateful for the opportunity to provide this feedback.

As the EPA is aware, the WMRR NSW Landfill Working Group has 100+ individual members representing operators, consultants, auditors, technical suppliers and local government. The group meets each month to discuss regulatory, policy and operational issues impacting the landfill sector, and has delegates who have also been actively engaged directly with the EPA on various technical matters via EPA's Landfill Sub Sector Group. To prepare these comments, the group was afforded the opportunity to provide comment on the Guidelines, and those comments have been collated and provided in a table at [Annexure A](#).

Generally speaking, the feedback on the current NSW Landfill Guidelines is positive in terms of the document being well structured for use. The 2025 revision is anticipated by industry, with the references within the current (2016) document requiring an update, the landfill sector now having access to implement newer methods and technologies and clearer emissions monitoring needed to support the transition to net zero. However, whilst we have addressed these updates in our specific comments, it is worth noting that there are some fundamental broader issues relating to the intended use and application of the Guidelines, that the Working Group would like to see the EPA consider in finalising its draft for consultation.

From the outset, there were three (3) key issues identified in Working Group discussions about the Guidelines:

1. *Better clarification is needed to explain whether the document is intended to prescribe 'minimum standards' or act as 'guideline' on how to achieve the required outcomes.*

We stress the importance of clarifying the intention and purpose of the Landfill Guidelines in this revision, noting that the document does refer to 'required outcomes' throughout, whilst at the same time identifying itself as "*specifying a series of 'Minimum Standards'. They involve a mix of design and construction techniques, effective site operations, monitoring and reporting protocols, and post-closure management.*"

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'Guidance' to achieve the required outcome is very different to 'strict compliance' with the methods stated, and it is crucial to clarify exactly how the guidelines document should be read and applied. Given that the Landfill Guidelines are currently referenced within individual landfill licenses, the Guidelines are not only written for industry, but also for EPA officers who use the document to assess license applications, variations, and compliance. We contend that whilst at the surface it appears that the Draft Guidelines suggest a shift towards risk-based, performance driven operational requirements and site management approaches (coupled with introducing site-specific documentation requirements), this is currently implicit, rather than explicit in the document. Noting the use of the Guidelines by EPA staff who may not necessarily be subject matter experts on landfills, and have competing priorities, it is understandable that if just referencing a specific portion of the document, this nuance would be missed.

It is therefore integral that - if the intention of the EPA is to be an outcomes based regulator addressing risk- that the structure and purpose of the Guidelines (as contained within Part A) includes direct wording to clarify that achieving the *required outcomes* of the Guidelines is what will form part of the license conditions, rather than leaving wording open to the interpretation that a licensee must prescribe to the 'default' methodologies within the Guidelines.

2. Legacy landfills and closed landfills are not adequately addressed.

There are many legacy landfill sites that do not meet the minimum design/construction standards outlined in the Guidelines, The Guidelines should acknowledge that licence, and consolidated planning conditions take precedence over guideline recommendations at these sites. Also, there is much to be said about legacy site rehabilitation and operational criteria. For example, maintaining leachate levels at 300mm isn't possible in an unlined, below groundwater level landfill, and the capping of closed landfills can be a costly exercise if the techniques and processes within the Guidelines are enforced as a minimum standard (particularly when economic alternatives exist which would be more attractive to councils in particular that meet the required outcomes).

Anecdotally, it has been very problematic for some operators trying to convince EPA that certain elements of the Guidelines shouldn't be considered as 'black and white' for operational, legacy sites that were not constructed as per the current minimum standards. This ties back into the need for the revised Guidelines to clarify how it is to be applied. We note that there is new wording included in the Guidelines for smaller, unlicensed landfills stating the flexibility afforded for these landfills to meet the required outcomes. However, this approach has not been applied for legacy landfills.

The same environmental outcomes should be promoted across all landfill sites. Some commentary/ acknowledgement of this item in the revised Guidelines would be good to understand how the EPA plans to apply them to operational legacy sites. We have suggested the need for a separate chapter or alternative process to address legacy and closed landfills.

3. There should be an identified process (preferably with timelines) for proposing alternative methods

We appreciate that there are options for alternative pathways to achieve the required outcomes, however this is not clear up front in the document, with wording throughout referencing opportunities for alternative proposals. Anecdotally, we understand that risk-based alternative designs that have eventually been approved have made significant savings for operators, keeping landfill operations economically viable (particularly for council operated facilities). We would encourage the revised Guidelines to implement stronger wording from

the outset that alternatives are welcome if they meet the required outcomes, and a process for making such applications is stipulated.

Further, we note that NSW is one of the few EPAs without clear timeframes for responses. This makes it difficult to hold them accountable for a decision and can discourage consideration of viable alternatives. As pursuing an alternative pathway adds the risk of investing in reports/tests/applications and creates uncertainty for operators.

We should also point out that this review of the Landfill Guidelines has been anticipated, noting that the Victorian EPA is also undertaking a review of the BPEM, to which WMRR and ALOA have provided targeted initial feedback in recent weeks. It is apparent that both jurisdictions have taken steps to amend their current landfill guidelines to maximise landfill stability and resilience, with reference to Australia's commitment to reduce the impacts of climate change and transition to net zero. Consequently, both documents have included increased references to achieving stability across leachate / liner barrier systems and siting restrictions. This leads to the obvious opportunity to update both the NSW Landfill Guidelines and the Victorian Landfill BPEM to align on issues such as the standard and performance goals for waste coverage/capping, and the quality assurance requirements for liner and leachate systems including liner testing, leachate collection, and GCL/geomembrane installation.

The specific comments of our Working Group have been captured in a table at [Annexure A](#).

We sincerely hope our comments will be constructive and helpful in shaping the revised Landfill Guidelines and welcome the opportunity to engage further with the EPA about these matters.

Please contact the undersigned if you wish to further discuss these comments.

Yours sincerely



Gayle Sloan
Chief Executive Officer
Waste Management and Resource Recovery Association of Australia

Annexure A: Working Group Feedback

Table 2: Specific Comments on the 2025 Working Draft of the Solid Waste Landfill Guidelines (provided in Word and dated 10 April 2025)

Section	Page reference	Clause/topic	Comment	Suggested change
		General Formatting for consultation draft	For the purposes of the broader consultation draft, it is suggested that the document is provided in markup or similar format in order to highlight the changes made to the 2025 version. when compared to the current (2016) Guidelines.	Provide a public markup copy for consultation process.
Part A: General information	1	Contents	Addition of section numbers to Part A would assist in navigating and referencing the document.	Refer to comment for suggested formatting revisions.
Structure and purpose of these guidelines	1	The document states: <i>These guidelines provide guidance for the environmental management of landfills in NSW by specifying a series of 'Minimum Standards'. They involve a mix of design and construction techniques, effective site operations, monitoring and reporting protocols, and post-closure management.</i>	The document contains commentary to clarify the intention of the Guidelines 'to set the minimum standards.' We note the structure of the Guidelines states required outcomes at the start of each section. However, we feel that this approach should be incorporated up front in the preamble to the document. There is a difference between establishing minimum standards (which in this case, refers to required outcomes) and setting prescribed minimum requirements (which set out specific techniques and protocols to be followed at base level). There is some concern by industry that in applying the guidelines, EPA staff do not appreciate this nuance between outcomes and prescription. In our view, this language of 'required outcomes' provides far more clarity in terms of the intended application of the document and should be more consistently used across the document.	Amend this section to clarify upfront that the guidelines are outcomes focused (if that is in fact the case). Minimum standards have been referenced that establish the 'required outcomes, and the path followed to achieve these outcomes are not prescribed'. The sections that alternatives can be proposed is to be summarized at the outset of the document, including which sections, along with a clear procedure and expected timeframe for

Section	Page reference	Clause/topic	Comment	Suggested change
			We note required outcomes are specified throughout the document thereafter followed by lines such as "alternatives may be proposed". It would be useful if this was stated at the outset of the document and which sections this refers to, along with a clear procedure and expected timeframe for proponents to engage with the EPA. We understand anecdotally the processing time for a variation can vary depending on the complexity of the proposed changes and the completeness of the submitted application. However, an expected response timeframe would prove helpful. We note that in Victoria their EPA is mandated to process applications for landfill license variations within 42 business days from the receipt of a complete application. This timeframe is stipulated under Section 57(5) of the <i>Environment Protection Act 2017</i>. We understand their permissioning team is working on streamlining the permissioning process with checklists to ensure receipt of complete applications, and that under the BPEM, there is a filter for proposing 'major' and 'minor' variations so that low-risk techniques can be expedited. We also note that new cell notification is expected within 10 days, which provides some certainty to landfill operators. WMRR notes that on page 3, the Working Draft refers to <i>'small unlicensed landfills should be managed to achieve the required outcomes specified in these guidelines'</i> and then states that operators of unlicensed sites should <i>'engage an appropriately qualified and experienced expert. The expert should use a suitable risk assessment tool to assess the site risks and to justify the selected measures for achieving</i>	proponents to engage with the EPA.

Section	Page reference	Clause/topic	Comment	Suggested change
			<i>the required outcomes in these guidelines.</i> Including similar wording up front when explaining the purpose of the document would be helpful and should alleviate some industry angst about how the guidelines are applied and regulated.	
	1	<i>The NSW Environment Protection Authority (EPA) will use these guidelines to assess applications for new or varied landfill licenses under the Protection of the Environment Operations Act 1997 and to assess issues that arise during the operational and post-closure periods of landfills.</i>	The EPA is encouraged to consider a separate chapter addressing specifically the application of the Guidelines to legacy landfills and closed landfills. There are alternative processes and techniques available aside from those specified in the document. We particularly note that capping of closed landfills can be a costly exercise if the guidelines are required as a minimum standard using the prescribed method for these older landfills. Economic alternatives exist which meet the same outcomes that would be more attractive to councils, in particular.	Include a separate chapter specifically for legacy landfills that pre-date the guidelines and for already closed landfills (and ideally align these requirements with BEPM and other Australian jurisdictions)
The legislative context in New South Wales	2			
(a) The Protection of the Environment Operations Act 1997	3	<i>" These guidelines are intended for landfills that are licensed under the POEO Act.These small, unlicensed landfills should be managed to achieve the required outcomes specified in these guidelines. Operators of small, unlicensed sites can tailor the techniques to the scale and risk setting of the site."</i>	The use of this wording appears to confirm that the EPA will be more flexible when considering the Guidelines for smaller unlicensed landfills – and this would suggest that the EPA is concerned with achieving the ‘required outcomes’ – rather than enforcing a prescriptive technique or protocol - in terms of regulation- is this correct? WMRR appreciates that some smaller or rural landfills may be exempt from licensing if they operate below specific thresholds. However, these facilities are still subject to environmental regulations and must	Reword for clarification. The current wording has caused some debate within the stakeholder group as it highlights a 'risk-based' flexible approach for smaller landfills and potentially, a prescriptive approach for licensed landfills. Consistency of approach would be welcomed.

Section	Page reference	Clause/topic	Comment	Suggested change
			manage their operations to prevent harm to the environment and the community. Arguably, all landfills should be required to follow the Guidelines, if they are indeed, guidelines and not prescriptive minimum standards. We note that this scalability of application of the guidelines is not explicitly applied for legacy landfills. We would encourage the revision of the Guidelines to reiterate that the same environmental outcomes should be promoted across all types of landfill sites and explicitly state that the EPA will consider those alternatives which meet the required outcomes.	This circles back to the need to clarify the intention of the Guidelines. We would support ensuring that procedures are stipulated within the Guidelines for proposing alternative approaches for licensed landfills that meet the stated required outcomes.
(b) Other legislation	3 & 4	Older and Closed Landfills <i>"Contaminated sites in NSW are regulated under the Contaminated Land Management Act 1997. Older, closed landfills are sometimes managed under this Act. The EPA has published risk assessment guidelines for this purpose. These risk assessment guidelines apply to older, closed landfills that are not regulated by the EPA under the POEO Act. Active or recently closed landfills are managed through the landfill licensing process under the POEO Act and the minimum standards in these guidelines. For more information refer to Managing contaminated land in NSW at Managing contaminated land in NSW EPA"</i>	Clarity is needed as to what applies to older and closed landfills, noting that not all closed landfills will be managed under the Contaminated Management Act. As such we recommend a section in the Guidelines which includes close and older landfills. It would be useful for the "Risk Assessment Guidelines" to be linked within the text as it is unclear which guidelines are being referred to.	We recommend a section in the Guidelines which includes close and older landfills.

Section	Page reference	Clause/topic	Comment	Suggested change
Siting restrictions	5	Last sentence re 1000 metre buffer	We consider it would be more appropriate for the 1,000 metre sensitive uses buffer to apply to larger landfills receiving more than 50,000 tonnes of waste per year including putrescible waste. We suggest that a reduced buffer distance would be more appropriate to landfills receiving solid inert waste only given the typically lower amenity impacts from solid inert landfills and that this distinction may be worth incorporating.	
Impact assessment requirements	6	The guideline describes that <i>“Approval must be sought from the EPA in writing before the construction of each new waste cell at an existing licensed landfill. Applications should be submitted to the EPA far enough in advance to allow for the approval process and construction of the new cell to be completed before the existing approved disposal capacity is exhausted”</i> .	What is enough notice? We consider this wording could be less ambiguous in terms of timeframes and the document would be improved if EPA provided better guidance on the timing it requires to approve applications rather than “far enough in advance”. The Guideline should also give the time frame of EPA doing assessment and approval.	Add EPA approval timeframe in the Guideline. We note that NSW is one of the few EPAs without clear timeframes or service standards for responses.
	6	We don’t consider the guidance relating to the content of design reports should be part of the “Impact assessment requirements” content.	If there are substantial changes to an existing landfill's design—such as changes to cell construction, leachate systems, or capping—an updated design report may be required to support a license variation or modification application. It is recommended EPA’s requirements of what a design report should not be included here as it may be taken to insinuate a requirement for any impact assessment and instead should be located in a separate design-related section of the guideline.	Refer to comment for suggestion

Section	Page reference	Clause/topic	Comment	Suggested change
			(We note that in Victoria, Design Reports can be submitted to justify deviation from standard BPEM Designs and the required format for Design Reports are included in the f EPA Victoria Publication 1323.3 – Landfill Licensing Guidelines - not the BPEM itself.	
Climate Change	7		This is a new requirement. Do the new requirements also apply to new cells of existing landfill or only apply to new landfills?	To clarify.
Preparation of technical reports	7			
Major Landfill Works – Certification of Design	8			
Part B: Minimum standards for landfills	8			
1. Leachate barrier system	9	Terminology	We consider “Leachate barrier system” to be a phrase or terminology not used by the industry and that EPA consider referring to the liner system as the “Landfill liner system” as the liners serve other keys functions including containing landfill gas.	See comments
	9	Reference for alternative methods	The document states " . Alternatives may be proposed: see section 1.10 for the procedure used when proposing an alternative." Should this be section 1.12?	Confirm reference.
1.1 Design of leachate barrier system (General Solid Waste Landfills)	9	Dot point 1: <i>"a compacted sub-base 200 millimetres thick to provide a firm, stable, smooth surface of high bearing strength on which to install the liner"</i>	What is the definition of high bearing strength? It would be useful to have a value range, or some type of formula depending on the site/depth of the landfill	Clarification required

Section	Page reference	Clause/topic	Comment	Suggested change
	10	Dot point 2: <i>"for landfills receiving more than 20,000 tonnes of waste per year, the liner should include a geomembrane over the compacted clay;"</i>	Cross reference would be useful as this is detailed later in the section.	Revise to make it clear that the detailed requirements are listed in the sections below.
		Dot point 2: <i>"the base liner must have gradients of greater than 1% longitudinally and 3% in transverse directions"</i>	For clarity we suggest the wording "the base liner must have gradients of greater than 1% longitudinally and 3% in transverse directions" be changed to "The liner must have cross gradients of a minimum three per cent towards leachate collection pipes and one per cent in the direction of the sump".	Refer to comment.
	10	<i>"the clay must have high plasticity and a suitable particle-size distribution,"</i>	Cross reference would be useful as this is detailed later in the section.	Revise to make it clear that the detailed requirements are listed in the sections below.
	10	<i>"A protection or cushion geotextile is required to protect geomembranes from damage by construction equipment and overlying materials. A separation geotextile should be placed above the drainage layer to reduce the ingress of fines from the overlying waste."</i>	Cross reference would be useful as this is detailed later in the section.	Revise to make it clear that the detailed requirements are listed in the sections below.
1.1 Design of leachate barrier system (Restricted Solid Waste Landfills)	11	<i>The leakage rate through the dual barrier system must be less than 1 litre/hectare/day of leachate for a maximum level of leachate of 300 millimetres over the upper liner."</i>	Is there leakage rate requirement for general solid waste with a single lining system? We suggest that the accepted lining system for restricted solid waste landfills comprises a double composite liner potentially without the need for a leak detection layer i.e. primary geomembrane, primary GCL, secondary geomembrane and secondary GCL (or	

Section	Page reference	Clause/topic	Comment	Suggested change
			compacted clay liner). We consider that adding a leak detection layer to the lining system introduces several complications for potentially little or no benefit.	
		<i>“base gradient of greater than 2% in the longitudinal direction and greater than 3% in transverse directions”</i>	See suggested wording for clarity.	This should be reworded to “The liner must have gradients of a minimum three per cent towards the pipes and two per cent in the direction of the sump”.
Section 1.1 – Design of leachate barrier system (Asbestos Monocells)		This section allows landfilling of asbestos without a lining system.	We note that cover and capping rules under s80 of the POEO Waste Regulations (2014) would apply. However, omitting base lining if only asbestos is present is far from best practice and should be updated to require a lining system. The only scenario where we can consider this could provide an acceptable environmental outcome would be asbestos containing soils only with no other wastes.	
1.2 Subgrade	15			
1.3 Geomembranes (flexible membrane liners)	15			
Section 1.4 – Clay liners	16	The sentence “Soil must have a minimum clay content of 25% (less than or equal to 0.005mm AS1152 sieve) by weight or greater”		
Section 1.4 – Clay liners (Soil Plasticity)	16	The dot point “Soil plasticity index exceeding 10 (>17 = clay)” is unclear.	This is inconsistent with the preceding dot points presenting the required particle size distribution for clay liner material. Furthermore, the particle size for clay is less than 0.002 mm.	We would recommend the minimum particle size distribution provided in the Victorian Landfill BPBM be adopted.

Section	Page reference	Clause/topic	Comment	Suggested change
1.4 Clay liners (Carbon Exchange Capacity)	16	<i>There is a potential for the clay to degrade through clay-pollutant chemical reactions over a long period of time. To guard against this risk, long-term permeation tests should be conducted on the clay to assess any variations in intrinsic permeability over the long term. Kodikara & Rahman (1997) suggest that using a 50,000 ppm NaCl solution over two to three months should indicate any such long-term variations.</i>	This testing is not considered practical or necessary and is not required by EPAs in other states such as Victoria. Current best practice for pre-construction testing (second paragraph) includes permeability testing using both deionised water and 50,000 ppm NaCl permeant.	We suggest the following requirement is removed: <i>“long-term permeation tests should be conducted on the clay to assess any variations in intrinsic permeability over the long term. Kodikara & Rahman (1997) suggest that using a 50,000 ppm NaCl solution over two to three months should indicate any such long-term variations”.</i>
Section 1.5 – Geosynthetic Clay Liners	17	Cations (ionic strength) and assessment using RMD.	Regarding RMD, what is the appropriate value? The requirement for RMD testing the subgrade soils of landfill cells is not considered necessary and is not required by other jurisdictions such as EPA Victoria. We consider it has no technical basis for inclusion and would provide no environmental benefit.	
1.6 Gravel drainage layers	19		We suggest that the compliance of leachate drainage aggregate is based on particle size distribution rather than hydraulic conductivity due to the difficulties/limitations of testing the hydraulic conductivity of high permeability aggregates. Hydraulic conductivity testing should be required only for materials that do not meet the particle size distribution criteria.	We recommend the particle size distribution criteria provided in the Victorian Landfill BPBM be adopted.

Section	Page reference	Clause/topic	Comment	Suggested change
			We suggest the maximum particle size for leachate drainage aggregate is revised from 40 mm to 53 mm. The particle size of 53 mm, rather than 50 mm, aligns with the Australian Standard sieve size.	As per our comment above, we recommend the particle size distribution criteria provided in the Victorian Landfill BPEM be adopted.
			Remove the text “the best type of gravel is rounded and smooth-surfaced”. It is often not practical to source rounded river pebbles as shown in Figures 8 and 9, and rounded river pebbles are typically a less sustainable source of material than quarried aggregate and in some applications the lower friction angle of smooth-surfaced aggregate may not be “the best type”. The guideline already requires testing to demonstrate the suitability of the proposed aggregate and cushion geotextile to limit strain in the geomembrane.	
1.7 Collection pipework	21		We suggest pipes are specified based on the outer diameter as that is how pipes are normally specified.	
1.8 Protection geotextiles	21			
1.9 Separation geotextiles	23			
1.10 Drainage geocomposites	25		Revise the wording “overlying padding or padding or protection layer” to “overlying geotextile” as “padding” is not a term used in the geoenvironmental/landfill design industry.	See comment for suggested revision.

Section	Page reference	Clause/topic	Comment	Suggested change
Section 1.11 Leachate extraction and level-control system	25	Third dot point: <i>"being able to keep the leachate level no greater than 300 millimetres above the upper surface of the base liner"</i>	With exemptions for the site below groundwater level, is the 300mm to be applied to the lowest point of the base liner?	We recommend revising the wording from "leachate level no greater than 300 millimetres above the upper surface of the base liner" to "leachate level no greater than 300 millimetres above the lowest point of the top of the liner outside the leachate sump" to remove any ambiguity of what EPA means by this.
Section 1.12 Justification of alternative leachate barriers	26			
Section 1.13 Landfilling on closed cells	27			
Section 2. Leachate storage and disposal	29			

Section	Page reference	Clause/topic	Comment	Suggested change
Section 2.1 Leachate storage	29	Dot point 2 : “The Dam must have freeboard....”	Change the requirement for sizing leachate ponds with sufficient freeboard for a 1-in-25 year average recurrence interval rainfall event to 1-in-20 year rainfall event to align with rainfall intensity frequency duration (IFD) data from the Bureau of Meteorology that is typically used for engineering design. Wording should be included to confirm that going over freeboard due to rain shall not be considered as non-compliance, and the duration required for re-establish the freeboard shall be agreed between the operator and EPA.	Refer to comment for suggestion.
	29	Dot point 4: “ <i>Leachate storage dams must not be constructed over previously landfilled areas</i> ”	We don’t agree with the guidance that “Leachate storage dams must not be constructed over previously landfilled areas, except in exceptional circumstances”. It is current state of knowledge that leachate ponds can be safely constructed above previously landfilled areas and can be argued that leachate ponds located within the landfilled footprint is preferable with respect to environmental outcomes. This should be considered especially given the current status of NSW looking at opportunities for possible landfill capacity expansion.	
	29	Dot point 5: <i>If above-ground tanks are used, the tanks and associated connection points must be surrounded by a bund with a capacity of at least 110% of the tanks.</i>	We suggest amending this requirement to state that the bund capacity shall be 110% of the biggest tank. This should be adequate as it goes beyond the current EPA requirements for storing liquid waste to “ensure that bunds are large enough to contain at least 100% of the volume of the largest tank “.	Refer to comment.

Section	Page reference	Clause/topic	Comment	Suggested change
			Clearer requirements for the bund, including the material permeability and thickness, should be incorporated into this section.	
2.2 Leachate treatment and disposal	30	Sewer Discharge subheading, third paragraph: <i>"Another reason the discharge could be unavailable is a breakdown, blockage or some other fault preventing discharge from the landfill to the sewerage system. There must be adequate leachate storage capacity for the period needed to repair these breakdowns. Rainfall may occur during the repair period. The designer should factor in typical repair timeframes and conservative leachate generation scenarios"</i>	This will be very hard for the designer.	
	30	Evaporation	Leachate shall be treated to a certain level before entering evaporation ponds. There are other types of evaporation methods, such as thermal evaporation, solar, etc. It would be useful to include wording that alternatives can be considered subject to relevant approval pathways (if needed)	
	30/31	Irrigation	Will the irrigation area be considered as a leachate catchment area during the rain? Or clean water?	

Section	Page reference	Clause/topic	Comment	Suggested change
Section 2.3 Conducting a water balance	34	<i>"The water balance should be validated or updated from time to time by using site operational data. This is to test the accuracy of the assumptions in the original modelling and to assess whether the leachate management infrastructure will be adequate to continue to meet the requirements of these guidelines."</i>	Review the leachate generation level method referred to in the document. The first dot point indicates leachate generation in a landfill cell should be calculated by rainfall depth multiplied by surface area. This would result in a significant overestimation of leachate generation. Current accepted practice is for leachate generation to be estimated using hydrologic modelling with computer programs such as Hydrologic Evaluation of Landfill Performance (HELP) which is referred to in the subsequent dot points. We would recommend changing the requirement for modelling a 1-in-25 year average recurrence interval rainfall event to 1-in-20 year rainfall for the reasons described above.	Remove the text "rainfall depth x surface area"
Section 3.Stormwater management	36			
Section 3.1 Erosion control	36			
Section 3.2 Sediment control	37	Sediment basin design criteria: <i>"The water level is required to be drawn down to a level just above the sediment storage zone within 5 days of the end of any significant rainfall to restore the basin's capacity to contain runoff from the next rainfall event."</i>	What is the definition of significant rain?	d

Section	Page reference	Clause/topic	Comment	Suggested change
Section 4. Water quality monitoring	38	The sentence after the dot points of required outcomes which requires <i>“The charge balance error for the major cations and anions should be $\pm 5\%$ for all analysed samples”</i>	Remove. It is not clear if this is intended to be a required outcome.	We suggest this requirement be moved to another section of the Guideline relating to quality assurance of monitoring data. The requirement should be revised to require that for any samples with a charge balance error of greater than $\pm 5\%$, the representativeness of the sample is considered.
Section 4.1 Leachate monitoring	39	Table 3	This need smore defined items for group items, such as PFAS	Include a defined list of what shall be included in the tests.
Section 4.2 Stormwater monitoring	41			
Section 4.3 Ambient surface water monitoring	41			
Section 4.4 Groundwater monitoring	42	Groundwater monitoring network and the 'pollution of soil	Remove the “soil” from the first sentence below the subheading: Groundwater monitoring network. Groundwater monitoring wells are not suitable for monitoring pollution of soil and monitoring land/soil for pollution is not common practice at landfill sites.	As per comment.

Section	Page reference	Clause/topic	Comment	Suggested change
	43	Requirements for establishing a groundwater monitoring network	The fourth dot point describing the requirements for the construction of groundwater monitoring wells is considered too prescriptive. This could be less prescriptive, and a comment added that groundwater monitoring wells should be designed by an engineer or scientist with suitable qualifications and experience.	
	44	Groundwater sampling and analysis	Revise the third dot point under the heading to clarify that low flow sampling is the preferred sampling method.	
	47	Reporting and assessment of groundwater monitoring results	Under the subheading, clarify that groundwater monitoring results should typically be reported and assessed annually. To avoid confusion between regular monitoring and an assessment, consider revising the wording that “<i>A groundwater assessment report should be prepared at least once every five (5) years</i>” to require that ‘a hydrogeological assessment should be undertaken at least once every five (5) years.’ We note that in the introduction to the document describing siting restrictions it states “<i>The risk of leachate contamination increases where the site is in poor hydrogeological conditions, near sensitive water bodies such as wetlands, or near water sources used for drinking, irrigation, industrial use or stock watering.</i>” The use of the term hydrogeological in this section should be replicated here for clarity.	Refer to comment.

Section	Page reference	Clause/topic	Comment	Suggested change
Section 5.Landfill gas management and monitoring	48	The Required Outcomes currently include the state targets with the sixth required outcome in this section as: “achieve the State’s net zero targets. These include: – a 50% reduction in emissions (compared to 2005 levels) by 2030 – a 70% reduction in emissions (compared to 2005 levels) by 2035 – net zero emissions by 2050”.	We do not believe this content belongs in the guidelines document. It is not practicable to apply the statewide targets to an individual landfill. The appropriate requirements for regulating greenhouse gas emissions from landfills should be methane concentrations (i.e. limit of 500 ppm specified in Section 5.2 of the guideline) or methane flux limits.	Remove the state target from the required outcome.
Section 5.1 Landfill gas control	50	Table 14 - Update	We suggest that Figure 14 is revised to include power generation. Current best practice would typically consider the highest order use of landfill gas (where the flow rate and methane composition are sufficient) to be for power generation. This would also be consistent with current policies in place for decarbonization and climate change/ reducing GhG emissions.	Update this graphic
Section 5.1 Landfill gas control	50	We suggest the following wording (third paragraph below the Table 14) is removed or revised: <i>“Where landfill gas generation is >100 m3/hr @ 30% v/v methane the best practice is to implement active LFG extraction with thermal treatment. Where landfill gas generation is <100 m3/hr @ 30% v/v methane, best practice is provided by passive controls (biofilters or oxidation layers) for surface</i>	We consider that the current best practice for gas flow rates less than 100 m3/hr would be to implement (or consider implementation of) a gas flare. Combining flow rates and methane concentrations makes this guidance more prescriptive than it needs to be and harder for operators and practitioners to use as a best practice guidance document.	Remove or revise wording.

Section	Page reference	Clause/topic	Comment	Suggested change
		<i>emissions and may also require supplemented flaring if additional control of LFG migration or odour management is required".</i>		
Section 5.2 Landfill gas surface emissions monitoring	51	<i>"The landfill gas emissions monitoring program is required to be conducted in the following way:"</i>	Revise the wording of the first dot point "Testing should be conducted in a grid pattern" to "Testing should be conducted along transects". Grid pattern can be interpreted to mean individual measurements at each grid point, whereas the intent is to conduct landfill gas surface emissions monitoring continuously along transects.	Refer to comment for suggestion.
	51	<i>"The landfill gas emissions monitoring program is required to be conducted in the following way:"</i>	Remove the sentence in the third dot point "A flame ionisation detector is usually used for this purpose". Typical instruments currently considered best practice for monitoring methane comprise laser-based instruments.	Refer to comment for suggestion.
	51	<i>"The landfill gas emissions monitoring program is required to be conducted in the following way:"</i>	Remove the third dot point at the end of this section which reads "installation of sub-surface monitoring wells (if not already installed) to gauge the extent of any lateral migration of gas", as this does not relate to landfill gas surface emissions and therefore does not belong in this section.	Refer to comment for suggestion.
Section 5.3 Landfill Gas sub-surface monitoring	52	<i>"The following is general guidance for the establishment and conduct of a sub-surface gas monitoring program:"</i>	Remove or revise the seventh dot point relating to using groundwater monitoring wells for monitoring landfill gas. It is not best practice to use groundwater monitoring wells for monitoring landfill gas.	Refer to comment for suggestion.

Section	Page reference	Clause/topic	Comment	Suggested change
Section 5.4 Gas accumulation monitoring in enclosed structures	53	<i>"The gas accumulation monitoring program should consist of monthly methane monitoring in all buildings and other enclosed structures within 250 metres of deposited waste or leachate storage, or at frequencies and locations justified by a site-specific landfill gas risk assessment that is regularly reviewed and updated."</i>	Remove the wording "or leachate storage" from the fourth paragraph as stored leachate is not considered a source of subsurface landfill gas migration which is what this paragraph is related to.	Refer to comment for suggestion.
	53	<i>The threshold level for further investigation and corrective action is detection of methane at concentrations above 1% (volume/volume).</i>	This threshold should be qualified as relating to the measurement at the landfill boundary on-site monitoring bore. Readings in other areas offsite or within the landfill site, and especially those close to buildings and within them will need to be kept much lower. Industry feedback is that most operators have standard operating procedures requiring testing to lower levels before corrective action is triggered (considering 5% of LEL is the minimum concentration at which methane can ignite). If specific monitoring location types are not stipulated, then this threshold should be revised to 0.25% volume/volume or 5% of LEL. We note that the threshold of 1% for on site <i>boundary monitoring</i> is consistent with the BPPEM.	Clarifying the wording to avoid this requirement being unsafely misinterpreted.
Section 5.5 Emissions from combustion of landfill gas	54			

Section	Page reference	Clause/topic	Comment	Suggested change
Section 5.6 Microbiological gas treatment systems	55			
Section 5.7 Gas control measures at the receptor	58			
Section 5.8 Development adjacent to a landfill	59			
Section 6. Amenity issues: odour, dust, noise, litter and fire control	60			
Section 6.1 Odour control	61 /	Operating Practices for Odour Control The draft guidelines require operators to 'Keep the active tipping face as small as practicable. Ideally, the area of the tipping face should be no more than 600 square metres (i.e. 30 x 20 metres) where health and safety considerations allow.' Similarly at page 63 the guidelines state 'To reduce emission through the daily cover, the area of the active tipping face should be minimized. It should not exceed 600 square metres in most cases.' Tipping	A definition of tipping face should be provided to make it clear that it does not include the "tipping pad" being the area where waste vehicles unload waste and where waste is only temporarily exposed before being moved to the tipping face, the tipping face being the area where the waste is layered and compacted. Larger landfills typically require a tipping face greater than 600 square metres and allowance for this should be incorporated into the guidelines.	Refer to comment for suggestion

Section	Page reference	Clause/topic	Comment	Suggested change
		face is defined as 'the area of the landfill where waste is disposed of during daily operations.		
Section 6.2 Dust control	65			
Section 6.3 Noise control	68	Noise Monitoring	Under the subheading: Noise monitoring, provide guidance under what circumstances noise monitoring would be required or alternatively make this section less prescriptive. For example, the guideline specifies noise monitoring to be undertaken at the three most affected residences once every 12 months. In many cases this would not be required, for example where the nearest residences are located a suitable distance from the landfill to avoid noise impacts.	Revise wording as per comment.
Section 6.4 Litter and debris control	68			
Section 6.5 Fire prevention	69	Fourth dot point: <i>"Compostable materials should not exceed 75°C – if exceeded; break down and spread out hot pies to cool them"</i>	Correct "hot pies" to "hot piles".	
Section 7. Waste acceptance and site security procedures	71			
Section 8. Covering of waste	75			
Section 8.1 Daily cover	75			
Section 8.2 Intermediate cover	75			
Section 8.3 Alternative daily cover materials	76	Alternative Daily Cover Specification	Under the subheading: <i>Alternative daily cover specification: particulate waste materials</i> , we suggest using a different term to 'particulate' as this term normally relates to small airborne particles.	We suggest reviewing and rewriting this section to remove confusion to the reader.

Section	Page reference	Clause/topic	Comment	Suggested change
Section 8.4 Additional covering requirements for special wastes	79			
Section 9. Final capping and revegetation	80	Differential Settlement	In the second dot point remove “differential settlement”. It is not possible to prevent differential settlement in a landfill. Rather, management measures should be recommended to manage differential settlement such as filling any low points that form in the landfill cap to avoid ponding of stormwater on the cap.	
Section 9.1 Final capping requirements	80		Revise the specification “QA Specification 3071: Selected Material for Formation (NSW Roads and Maritime Services, December 2011)” to the latest version which is 2022 and update all other locations in the document where the specification is referred to. Having said that, we consider this standard is not a best practice reference for construction of a landfill cap, as the required material properties for construction of roads are different to the properties of the ‘seal-bearing’ surface of a landfill cap (i.e. subgrade for the compacted clay liner or GCL).	
	80	Third dot point	The third dot point refers to “VENM, ENM or clean soils”. We assume the acronym VENM refers to virgin excavated natural material which is a term used elsewhere in the guideline. We assume ENM refers to excavated natural material. The guideline should be updated throughout to be consistent when referring to soils of different classifications. The third dot point requires “<i>The Vegetation should</i>	Revise this wording as per comment.

Section	Page reference	Clause/topic	Comment	Suggested change
			<i>not have root systems that will penetrate into lower layers</i> ". This should be better worded to clarify that selected vegetation should not have root systems that will penetrate beyond the minimum 1000 mm thick revegetation soil layer (i.e. into the underlying compacted clay liner).	
	81	<i>" In capping, linear low-density polyethylene may be used instead of high-density polyethylene: it may be better able to withstand the differential settlement and strains experienced by landfill capping materials"</i>	Consider revising the following to convey current industry best practice from "In capping, linear low density polyethylene may be used instead of high-density polyethylene" to "linear low-density polyethylene must be used".	Refer to comment for suggestion.
	81	<i>"A geosynthetic clay liner may be used as an alternative to compacted clay, provided it is used in composite with a geomembrane..."</i>	In capping applications, the guideline allows a GCL to be used in place of a compacted clay liner providing that it is used in composite with a geomembrane. In capping applications, we consider that a GCL can be used directly in place of a compacted clay liner and not just in composite with a geomembrane. Based on the allowance for landfills receiving less than 20,000 tonnes of waste per year to be capped with a 600 mm thick compacted clay liner, we consider that this category of landfills could also be capped with a GCL only.	Refer to comment for suggestion.
	82	<i>"The occupier must cap completed filling areas within 12 months of the completion of landfilling."</i>	The guidelines at this section require "The occupier must cap completed filling areas within 12 months of the completion of landfilling". The timeframe for capping needs to allow for design, EPA approval of the design, tendering for construction, procurement of materials, and construction, which typically takes in the order of two years. The 12 month required outcome contradicts the two year timeframe	Refer to comment for suggestion to make consistent with two-year time reference.

Section	Page reference	Clause/topic	Comment	Suggested change
			identified earlier in the Guidelines at Part B – Minimum Standards for Landfills where it states at p 9 “Wherever possible each cell should be sized so that it can be filled within two years for subsequent rehabilitation”. In our experience capping a cell within two years from completion of filling is considered best practice.	
Section 9.2 Monitoring the cap’s integrity and performance	83	Monitoring of leachate and rainfall volumes	The fourth dot point requires monitoring of rainfall volumes. We suggest this requirement is removed as we don’t believe monitoring of rainfall volumes on site creates any environmental benefit. Rainfall data, if required, can be obtained from the nearest Bureau of Meteorology weather station.	
Section 9.3 Justification of alternative capping	83			
Section 9.4 Alternative caps: phytocaps	84	Design of phytocaps	It is not clear why the cap performance for phytocaps is a percolation at a rate not more than 5% of average annual rainfall, when the required outcome, and requirement for barrier caps, is 2% of annual rainfall. There is no logical argument that we can think of for allowing a lesser performance criteria for one cap design against another.	This should be removed or EPA explain the logic for this guidance as it does not align with best practice thinking.
Section 10.Closure	87			
Section 10.1 The closure plan	87			
Section 10.2 Certified statement of completion	88		We note that the guideline does not specify third party validation.	

Section	Page reference	Clause/topic	Comment	Suggested change
Section 10.3 Development on closed landfills	88			
Section 11 Quality Assurance	89			
Section 11.1 Construction Quality Assurance Plan (General Requirements of the Plan)	90-91	Hold and Inspection Points: The final paragraph notes that <i>"Ideally, a Construction Quality Assurance engineer should be present at the site full-time during the construction of major features such as the leachate barrier system and the final capping of completed cells"</i> .	This is not current best practice, and we recommend that this requirement is revised to require full time inspection during construction consistent with current industry best practice.	
	91	Variation are termed major and minor. <i>"The engineer should use his or her judgment to determine whether a variation is a major one in terms of the requirements of these guidelines and provide justification of the variation"</i>	EPA should provide guidance/definition of the difference between minor and major variations to assist the engineer with the determination.	Refer to comment.
Section 11.1 – Construction Quality Assurance Plan (Construction Quality Assurance: clay liners)	91	Pre-construction source testing requirements do not align to the properties of clay liner material specified in Section 1.4	In the third dot point, revise the requirements for pre-construction source testing to include all relevant material properties of clay liner material as specified in Section 1.4, i.e. particle size distribution, plasticity index, hydraulic conductivity and cation exchange capacity (cation exchange capacity not required for landfill caps).	Refer to comment.

Section	Page reference	Clause/topic	Comment	Suggested change
	92	Hydraulic conductivity testing	In the fourth dot point revise the requirement “Direct hydraulic conductivity may also be conducted to confirm that the liner meets specifications” to require that laboratory hydraulic conductivity testing of the constructed compacted clay liner must be undertaken by recovery of undisturbed samples. Remove the option for testing of the compacted clay liner with a double ring infiltrometer over several months. We do not consider that testing method is practical in the context of a landfill cell construction project.	Refer to comment for suggested revisions.
	92	Covering compacted clay liner within 7 days	In the last dot point, remove the requirement for covering the compacted clay liner within 7 days as this is may not be practical and is not necessary. The integrity of the compacted clay liner can be managed by moisture conditioning the clay liner as necessary until it is covered which is the current industry best practice and provides the contractor with flexibility in the staging of construction.	Refer to comment for suggestion to remove this requirement.
Section 11.1 – Construction Quality Assurance Plan (Construction Quality Assurance: gravel drainage layers)	93	<i>“Pipes must be laid on an even bed of material, be appropriately bedded and protected with surrounding material (at least 300 millimetres over the crown of the pipe), and be properly joined, aligned and spaced”.</i>	This requirement should be revised to note that the leachate collection pipes are installed on the completed liner (the cushion geotextile) and not on an ‘even bed of material’. Remove the requirement for minimum 300 mm depth of aggregate over the pipes. The required strength of the pipes and minimum depth of leachate collection aggregate over the pipes should be assessed by the designer.	Refer to comment.

Section	Page reference	Clause/topic	Comment	Suggested change
Section 11.1 – Construction Quality Assurance Plan (Construction Quality Assurance: geosynthetic materials)	94	Installation Procedures	Revise the seventh dot point to allow geosynthetic materials to be installed in an anchor trench, or alternative anchoring arrangement as specified by the designer.	Refer to comment
	95	Installation Procedures <i>"Wrinkles in HDPE Geomembrane liners can be caused by several factors including:"</i>	Revise the first dot point to ensure it is technically correct: <i>"Trapped Air: Geomembrane wrinkles can form when air gets trapped beneath the geomembrane during installation. The membrane may look flat initially, but the trapped air will heat up in the sunlight and expand until it pushes the geomembrane up into a wrinkle"</i> . Wrinkles in geomembrane occur due to thermal expansion of the geomembrane, not due to the temperature increase of trapped air beneath the geomembrane.	Refer to comment.
	95	Installation Procedures <i>"Geosynthetic layers must not be installed in wet weather or windy conditions and must not be left exposed for any length of time"</i>	Revise the dot point <i>"Geosynthetic layers must not be installed in wet weather or windy conditions and must not be left exposed for any length of time"</i> . This requirement should be revised to require the designer to consider and allow for the expected periods that geosynthetics will be exposed. Some materials can be left exposed for long periods (for example HDPE geomembrane) without negative impacts. Likewise it is possible to install geotextiles in wet weather with minimal issues.	Refer to comment.
	96 & 98	Figure 18: Pressure Testing Seams and Figure 19 :Leak detection of repaired HDPE liner	Figures 18 and 19 show extrusion welds which appear to have been undertaken using white extrudate, which is presumably a different formulation, to the black	Refer to comment regarding revising these photos.

Section	Page reference	Clause/topic	Comment	Suggested change
			geomembrane shown in the photos. If that is the case it is not best practice. Photos should be removed /replaced.	
	96-7	Electrical Leak Detection Survey	The guideline requires an electrical leak detection survey to be undertaken on geomembrane liners before and after the overlying leachate drainage material has been placed. It is considered that a leak detection survey is not required before the leachate drainage material has been placed, if the lining system has been constructed under fulltime inspection of the CQA Engineer.	
	99	Construction Quality Assurance: composts <i>"Regular testing must be conducted by the manufacturer or supplier in accordance with Australian Standard AS 4454-2012 Composts, Soil Conditioners and Mulches (Standards Australia, 2012) or as specified by the EPA"</i>	The wording " or as specified by the EPA" is uncertain. Consider rewording to provide more direct guidance as to the standard expected ie" most current version at the time of application of the Australian A4454 standard".	Refer to comment.
Section 11.2 Construction Quality Assurance Report	100	Independent CQA engineer engaged to provide report as to compliance with 11.1	CQA engineer statement / report must demonstrate participation on site throughout the process over several months. We do not consider that testing method is practical in the context of a landfill cell construction project.	

Section	Page reference	Clause/topic	Comment	Suggested change
Section 11.3 Schedule: Independent conformance testing for geosynthetic materials	102-104	Tables 10 and 11: Construction Quality Assurance testing requirements for HDPE and LLDPE geomembranes	CQA testing of HDPE and LLDPE geomembrane density is not an applicable test for geomembrane rolls. This testing is required to be undertaken by the resin supplier / manufacturer on the geomembrane resin prior to manufacture of the geomembrane.	
	105	Table 12: Construction Quality Assurance testing requirements for geosynthetic clay liners	CQA testing of fluid loss of bentonite is not an applicable test for GCL rolls. This testing is required to be undertaken by the manufacturer on the bentonite material prior to manufacture of the GCL rolls.	
		Table 14: Construction Quality Assurance testing requirements for separation geotextiles	Testing of pore size and permittivity of separation geotextiles should not be a requirement as this testing is not required for separation geotextiles in most applications.	
GLOSSARY	109 - onwards	Unique terms should be removed	There are terms in the glossary that do not appear elsewhere in the guideline, for example "90th percentile 5-day rainfall event".	Revise accordingly.
REFERENCES	Throughout document	Update References	In the final version of the draft, several references that refer to outdated publications should be updated, for example EPA Victoria Publications 668, 669 and 788.2, should be 668.1, 669.1 and 788.3.	Revise and update accordingly.