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2 May 2025

Dear Mr Kneebone

Re: Review of the EPA Victoria's *Best Practice Environmental Management (BPEM): Siting, Design, Operation and Rehabilitation of Landfills* (Publication 788.3)

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 *Best Practice Environmental Management (BPEM): Siting, Design, Operation and Rehabilitation of Landfills* (Publication 788.3) ("Landfill BPEM") review. We appreciate that this Stage 1 consultation with Landfill Sub-Sector Working Group, Landfill Auditor Technical Group and councils is focused on generating feedback on the current uses, concerns or inaccuracies in the Landfill BPEM.

As the EPA is aware, the WMRR Victorian Landfill Working Group has nearly 80 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. Consequently, many of the high-level themes raised by this review relate to broader matters associated with the regulation of landfills – notably whether the EPA is seeking to be prescriptive or risk based, or whether the intention of the BPEM is to provide minimum enforceable standards, or guidance towards best practice. This discord is largely in effect due to the legislative and regulatory framework for Victoria significantly changing over the last 10 years, which has seen a shift away from prescriptive requirements towards outcomes focused, risk based regulation.

It is noted that following commencement of the amended *Environment Protection Act* 2017, the Landfill BPEM remains as state of knowledge guidance and is increasingly referenced in landfill licence conditions. Consequently, there is a need to have clarity on the BPEM purpose and ensure the document is much more concise to avoid duplication and confusion with other regulatory guidelines, and most importantly, to explicitly clarify the intention and purpose of the Landfill BPEM.

In the first instance, the Landfill BPEM needs an obvious update to accord with current legislation and related policies and regulations. The Landfill BPEM is currently a 125-page document for licenced landfills that sets mandatory requirements with the *Environment Protection Act* 1970, its Regulations, State Environment Protection Policies (SEPPs), and the Waste Management Policy (Landfill WMP) – all of which are now outdated with the *Environment Protection Act* 2017 ("the Act") coming into effect on 1 July 2021. This Act asserts to use a flexible and risk based approach centered on the general environmental duty (GED) – the underlying assumption being that organisations will be 'open and honest, manage risk proactively, and continually reduce

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risks to the environment'¹. The Act revoked the State Environment Protection Policies (SEPPs) and replaced them with the *Environment Reference Standard* (ERS) to cover ambient air, ambient sound, land and water. The *Waste Management Policy* (Siting, Design and Management of Landfills) ("WMP") and *Industrial Waste Management Policy* (Waste Acid Sulfate Soils) were also tied to the repealed Act and are no longer in effect. Similarly, many of the EPA Victoria publications referenced have been superseded, such as EPA Publication 168 (1991) – *Guidelines for wastewater irrigation*, EPA Publication 275 (1991) – *Construction techniques for sediment pollution control*, EPA Publication 347 (1992) – *Bunding guidelines*, and EPA Publication 508 (1996) – *Environmental guidelines for composting*. These, along with the Australian Standards referenced throughout, all obviously need to be refreshed or removed.

This leads to the obvious opportunity to update the Landfill BPEM far more concisely. It coexists alongside a number of more contemporary regulatory guidelines that have also been consulted on, such as the *Licence management guidelines*, *Landfill licensing guidelines*, *Annual performance statement guidelines*, *Licence assessment guidelines*, *Closed landfill guideline*, *Separation distance guidelines* and *Landfill buffer guidelines*. The Landfill BPEM also sets strict QA requirements for liner and leachate systems including liner testing, leachate collection, and GCL/geomembrane installation which need urgent review to ease the unnecessary administrative, operational and cost burdens on landfill operators. These items have all been explored in more detail within the targeted comments provided against the consultation questionnaire. It is noted that for many of our members, the Landfill BPEM was used for information regarding the lining system design and quality control.

However, the key to this review is that the intention of the Landfill BPEM – and in particular – how it is used with reference to enforceable licence conditions - must be made far more explicit and updated accordingly. As noted in WMRR's substantive response to the consultation questions, the BPEM is currently unsure what it is trying to be - it is part policy document, part best practice, part guidance with suggested measures, and part legal requirement. However it is to be used, it should be clear what the intent of the document is, its legal status, and if following it satisfies GED.

The consultation document describes the BPEM as "a key piece of guidance for landfills for more than 10 years". 'Guidance' to achieve the required outcome is very different to 'strict compliance' with the methods stated. Given that the Landfill BPEM is currently referenced within individual landfill licenses (and is therefore legally enforceable), it is integral that the objective includes clearer wording within its introduction to clarify that achieving the *required outcomes* of the Landfill BPEM is what will form part of the licence conditions, rather than leaving wording open to the interpretation that a licensee must prescribe to the guideline 'default' methodologies within it. For example, at page 5, the current Landfill BPEM attempts to address this idea, stating that:

"Where a landfill operator believes that, for a particular section of the guidelines, alternative means can achieve the objectives and required outcomes, a risk based assessment will be required to support the proposed alternative measure. Alternatively, if EPA believes that additional requirements are needed to protect the environment, then this will also be supported by a risk based assessment."

However, it is unclear when these risk based alternatives apply and at whose election, for example, the application of the BPEM by Officers has led to instances of referencing the Landfill BPEM as containing enforceable 'requirements' rather than providing default guidelines to achieving its 'required outcomes'. It needs to be clearer that the Landfill BPEM methodologies are prescriptive or outcomes based. Ensuring clearer wording around the required 'outcomes' would also assist the EPA to modernise the Landfill BPEM and align it with current work practices and advances in industry knowledge and will support the EPA's aim of enabling the Landfill BPEM to move forward with 'modern practices and today's knowledge in the industry'.

¹ EPA website, [What the Environment Protection Act 2017 Act means for Victorian businesses](#) | [Environment Protection Authority Victoria](#)



WMRR has captured the responses of our Working Group to the consultation questions at [Annexure A](#) and welcome the opportunity to engage further with the EPA about these matters. We sincerely hope our comments will be constructive and helpful in shaping this review and making the revised Landfill BPEM a more contemporary and useful document to both industry and regulators.

Please contact the undersigned if you wish to further discuss this submission.

Yours sincerely

Gayle Sloan

Chief Executive Officer

Waste Management and Resource Recovery Association of Australia

Annexure A: Consultation Questionnaire:

Table 1: General Views on the Landfill BPEM

General Views	
How should the BPEM be used? Compliance verification? Information provision? Both?	BPEM is currently unsure what it is trying to be - it is part policy document, part best practice, part guidance with suggested measures, and part legal requirement. However it is to be used, it should be clear what the intent of the document is, its legal status, and if following it satisfies GED.
	Suggested measures wording should be removed or clarified, especially where licence conditions refer to these sections.
General views on the Landfill BPEM	A comprehensive document covering most of the landfill design requirements and phases.
How do you currently use the BPEM?	As a designer, constructor, operator- ie all aspects of landfill development and operation.
How would you like any landfill standards, guidance or information to support you in the future?	To provide a contemporary basis for high-quality sustainable landfill, and create a level playing field, with real clarity of purpose and how this will be used by both the regulator and industry.
What is outdated?	A general comment is that all Australian Standards and references to WMP / SEPPS etc have to be reviewed and updated. There are a lot that are out of date and no longer correct/ relevant eg planning and buffers
What needs to be clarified?	Management of CO2 exceedances at perimeter of long closed landfills.
Anything else?	- The cost and time required for testing of construction materials is a significant constraint for operators. EPA has previously approved most of the testing be done at the manufacturer. This could avoid much of the heartache for operators with failed products. This should be the norm and not the exception. Please reduce frequencies. - EPA's expectations with respect to Minor Variations for landfill construction projects: Historically, EPA has accepted the consideration of 'minor non-conformances' or 'procedural non-conformances' for landfill construction projects (i.e., where a test method used for the works varies from the Design Document requirements, however is functionally the same as that specified). In some instances, EPA has advised that the degree of variation associated with any non-conformance must be determined in accordance with EPA Publication 1323.3. Consideration should be given to the update of relevant EPA guidance (i.e., the Landfill BPEM or EPA Publication 1323.3) to provide specific guidance regarding this aspect.

Table 2: Specific Views on the Landfill BPEM

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
1 Introduction	5	Legislation / policy update	4th and 6th paragraphs refer to SEPPs.	This should be replaced by ERS.
			5th and 8th paragraphs refer to the Waste Management Policy which is no longer current,	Please reword.
			The EPA will need to update all the references from SEPPs to the current Acts and policy settings. <i>The suggested measures should be used and are the default means of achieving the required outcomes.</i> This needs to be further embedded in the document so that if an applicant or operator meets and exceeds the <i>suggested measures</i> then it is not subject to further assessment at the whim / choice of the EPA. The EPA need to own this document otherwise it is useless. The next most important issue in the introduction is that "Existing Sites" are not subject to the Siting Criteria. Only new landfills or lateral expansions of existing landfills are to be subject to siting and buffer criteria	
1.1 Objectives of the Landfill BPEM	5	Legislation / policy update	4th and 5th paragraphs refers to superseded legislation	Please revise to include reference to current waste classification legislation

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
			The objectives of the BPEM are not to limit improvements which exceed the BPEM through excessive assessment and long approval processes as this will result in the BPEM being a "Low Base Standard" that is easier than adopting a higher performance standard. Examples of a landfill cap that meet the standard BPEM requirements with a deeper earth phytocap section above the composite liner will require detailed assessment.	
			The Objectives state: "Landfill operators must meet the objectives and required outcomes by implementing the relevant best-practice measures, described as suggested measures, contained herein."	"It needs to be clearer if 'suggested measures' are in fact mandatory measures that must be taken."
			This is where the purpose - compliance or guidance must be included here. This is important because it is a document referenced by licences and is therefore a compliance document. Superfluous explanation and information referenced by other guidance documents should be removed. The current document is so large. Where designs exceed BPEM this should not trigger a more difficult approval pathway.	
1.2 The Landfill BPEM's audience	6	Cross references to other guidelines Waste Management Groups	Second bullet emphasises buffer distances	Reword to refer to new landfill buffer guideline
			Fourth bullet mentions waste management groups	Please revise/remove
			Planning agencies do not need to know this level of detail	Landfill Vic
1.3 Implementation	6	Approvals process	This paragraph refers to Works Approvals	Revise with new permissions
2 Waste Management framework	7			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
2.1 Waste management hierarchy	7	Legislation / policy update	The paragraph after the bullet points refers to the 1970 EP Act	Revise for 2017 EP Act.
2.2 Statutory framework	7	Legislation / policy update	First paragraph refers to the Landfill WMP and SEPPs	Remove reference to Landfill WMP, replace SEPP reference with ERS.
			Second paragraph cites a definition from legislation which is no longer current	Update definition of landfill scheduled premises.
			The waste codes now define what each landfill can receive	Update with description of the current system.
			Section 2.2.1 discusses the 1970 EP Act	Revise for 2017 EP Act.
			Section 2.2.2 discusses SEPPs	Revise for ERS.
			Section 2.2.3 discusses Waste Management Policies	Revise / remove.
			Update and clarify how this document fits within the framework. Everyone knows you need to comply with the current legislation. How does the GED fit in? Need to explain how the RMMP fits in and State of Knowledge.	
2.3 Best-practice framework	8		First paragraph states: "The suggested measures are provided to assist with achievement of the objectives and required outcomes."	This is at odds with section 1.1, where suggested measures are described as best practice measures

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
			Second paragraph notes that evidence is required to use an alternative to suggested measures.	Some suggested measures through the document are clearly not relevant to best practice, and appear to be suggestions only, for example: eg Landfills to install and operate a gatehouse, weighbridge and waste transfer station for the public. Become involved in the local Landcare group to develop regional strategies to eradicate regional noxious weeds. Some are problematic, for example- Shred and/or bale wastes to improve landfill management.
2.4 Landfill licensing guidelines	8			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
3 Community Engagement	9		This section needs to be expanded to differentiate between Development Licences and / or Amendments to existing Licences which do not change the scope of an activity. There should be no requirement for community engagement for new cell caps, liners Risk Management and Monitoring Plans and support infrastructure that reduces operational risk. Community engagement is required for all activities that expand landfill operations (height increases) or environmental risk. A new or updated leachate treatment plant should not be pushed for engagement as the longer it takes to be constructed the higher the risk of non-conformance. Alternatively, the type of participation can be set at Inform Only for these activities.	
			This section explains what community engagement is and its benefits but offers no direction on what is best practice for different applications and circumstances. What constitutes sufficient community engagement remains subjective	
			Community should not need to be engaged with every change on site. Technical matters which do not directly impact the community should not require consultation. Degree of community engagement commensurate with and in proportion with tangible impact on community. We also assume at all times we have good neighbour engagement.	Changes within a site that meets the intent of original approval should not need to be notified.
4 Classification of landfills	10	Table 4.1 and supporting text	Table 4.1 and supporting text identify landfill type by waste grouping eg SIW, however the broad waste categorisation is now superseded by the list of allowable wastes in the Licences.	If the Type 2 / Type 3 landfill classification is to remain it needs to be amended to reflect new waste classifications.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
		Waste/ landfill classification	It is not clear where 'out of the norm' landfills fit - eg a landfill containing a single waste stream from an industrial facility or a PFAS containment facility. Is a PFAS containment facility a landfill?	
5 Best-Practice siting considerations	11	SEPPs	Second paragraph references SEPPs, this needs to reflect the ERS	Revise to describe the current process for approval of new landfill sites. There will come a point where a new landfill will be required, there needs to be a process to follow.
		RWMG	Paragraph below the first set of bullet points refers to regional waste management groups and implementation plans which no longer exist. The former Regional Waste Management Plans contained a landfill schedule and listing here was a prerequisite for new landfill applications.	
			Landfill siting is a Town Planning matter for which EPA is a referral authority. There is no need to have sections 5, 5.1 and 5.1.1 in an EPA document as the VPPs and the local government planning schemes cover siting requirements. Further the EPA has already issued Buffer Guidelines in a separate document.	
		Waste Management Groups	WMGs.	Remove discussions relating to RWMGs and RWMPs.
5.1 Screening of potential landfill sites	11	landfill types	Trench and fill and mound landfills are not considered best practice; a shortlist of sites should not include these.	
		Legislation / policy update	Reference to Waste Management Policy in the last paragraph before 5.1.1 heading.	Remove / amend
			First sentence in Section 5.1.1 refers to Regional Waste Management Groups	Amend to Recycle Victoria

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	12	Landfill types	If a trench and fill landfill is no longer considered to be an acceptable method of landfill this should be removed from the list in section 5.1.2 on p12 and the subsequent text	Remove landfill types that EPA would no longer consider approving
		Long term undisturbed depth to groundwater (multiple occurrences)	The concept of a long-term undisturbed depth to groundwater is a regulatory convenience not a scientific reality. This group has previously provided a technical report demonstrating the host of factors, some natural, some anthropomorphic, which change groundwater levels. This has been a leading cause of dispute during the approval processes which has cost the regulator and the operator dearly in recent years. This should be removed from the Code.	
		Determination of 'long term undisturbed groundwater level'	Historically, EPA has accepted the use of the '90 the percentile' for maximum groundwater levels to determine the long-term undisturbed groundwater level beneath a proposed Cell. However, in some instances, EPA has requested that 'maximum' groundwater levels are used.	Consideration should be given to the update of relevant EPA guidance (i.e., the Landfill BPEM) to provide specific guidance regarding this aspect.
	13	Landfill Separation distance guideline	Table 5.2 references buffer distances	Table 5.2 and text of 5.1.5 needs to be reworked to align with revised Landfill Separation distance guideline, replace with reference to new buffer guideline.
	14	Legislation / policy update	Buffer distances and encroachment section contains text which refers to WMP and the 1970 EP Act which is obsolete	Revision required

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
		Buffer area developments	Text refers to Planning Authorities responses to development applications. This is now the subject of a separate guideline and is not related to the relationship between the regulator and the landfill operator.	This discussion should be removed
		Buffer distances - buildings and structures	refer to comment on Buffer area developments	
	16	Various	Box references SEPP and WMP, buffers, long term undisturbed groundwater level,	Amendment required
			The section 5.1.3 needs to provide for a Risk Based approach whereby the landfill design is holistic and includes assessment fo leachate treatment capacity These is a GED in place which can be achieved. The sentiment expressed in the groundwater section is not science or engineering based but on prior experience when insufficient leachate and groundwater management existed. The states only Category B landfill has its base below the regional groundwater table. Landfills need to be permitted below water table as there are situations where water table movement is out of the operators control. There are operating landfills now that have the base below water table and impacts are successfully managed with engineering controls. Designs need to be risk based.	
6 Best-practice design	17		It is suggested to add a sect ion for sustainability assessment of the landfill design.	
6.1 Environmental assessment	17	Legislation / policy update	Box refers to Landfill Waste Management Policy.	Amendment required.
6.2 Site layout	17	Trench and fill landfills		Remove reference to these.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	Last para before Box p18	Weighbridges	some landfills do not have manned weighbridges, so inspections will not necessarily occur here.	
		Legislation / policy update	Remove reference to old EP Act.	Update with reference to relevant section of the 2017 EP Act.
	Box p18	Legislation / policy update	Refers to Landfill WMP.	Amend / remove reference
	Box p18	filling duration	In rural areas where the volume of waste is small, the need to open a new cell every two (2) years is cost prohibitive given the cost of construction approvals as is the need to immediately rehabilitate the old cell. Given the time taken to get approvals, by the time you get a cell design approved, you need to be working on the next design and trying to budget for the rehabilitation works and the construction of the next cell at the same time, in addition to paying for the design and auditing work.	
	Box p18	Transfer stations	This is outside the scope of a landfill guideline, there may be good reasons for not having a public transfer station onsite	Remove reference to transfer station.
	Box p18	Tipping area	Each independent tipping area to be sized so that it can be filled within two years for subsequent rehabilitation.	This statement should be amended to take into account laybacks.
6.3 Liner and leachate collection system	18	Legislation / policy update	All references to beneficial uses should be amended to Environmental Values in accordance with the ERS.	Amend to align with ERS.
			Generally, there is good information about liners. Some updates are needed to include the most recent findings and developments.	

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	Table 6.1	Requirement for the installation of a separation geotextile overlying the compacted clay liner (CCL) (beneath the leachate drainage aggregate (LDA)) in a Type 3 landfill.	In the schematic for a 'Type 3' landfill lining system as provided in Table 6-1 ('landfill liner performance standards and indicative liner design') of the Landfill BPEM, the requirement for the installation of a separation geotextile overlying the CCL (and underlying the LDA) is not clear (as this is an 'indicative design'), nor is this stipulated in the Landfill BPEM.	With the absence of any separation geotextile overlying the CCL, there is the potential for the LDA to 'intrude' into the CCL (and vice versa) during the construction and/or operation of the Cell. In view of this, consideration should be given to the update of the Landfill BPEM to specifically outline EPA's expectations in relation to this aspect. The concept of geotextile used for a separation function is described in Section 2.2.1 of Koerner (2005), 'Designing With Geosynthetics' (as referred to in the Landfill BPEM).
			References to clay liner performance being less than 1×10^{-9} m/s do not allow for clay to be equal to 1×10^{-9} m/s which is generally accepted by most designers, constructors and Auditors as achieving the required environmental performance outcome. The same can be said for leachate drainage aggregate being equal to or greater than 1×10^{-3} m/s.	
		Substitution of a 1 metre thick compacted clay liner (CCL) with a geosynthetic clay liner (GCL)	The substitution of a 1 metre thick CCL with a GCL represents a variation from the 'landfill liner performance standards and indicative liner design' provided in Table 6-1 of the Landfill BPEM.	Consideration should be given to update of the Landfill BPEM to specifically describe the use of a GCL as a primary clay barrier layer for Type 2 and 3 landfill lining systems.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	20		"Types of GCL" does not include extruded coated GCL.	Add extruded coated GCL
		Conflict of interest	The section on conflict of interest at the end of 6.3.3 appears to only relate to GCLs. This is in the incorrect location	Create a new section describing clearly how and where conflicts of interest are to be managed.
	21	Conflict of interest	The 2nd last paragraph on p21 states that the geotechnical inspection and testing authority (GITA) can be part of the Auditors team. This is inconsistent with EPA's position on Conflict of Interest.	Please revise/clarify
		Conflict of interest in landfill space	In emails of 19 October 2018 and 2 June 2022, EPA outlined their position on the avoidance of conflict of interest when undertaking regular functions within the landfill space. This position has not been described in relevant guidelines (i.e., the Landfill BPEM or EPA Publication 1323), nor is there consideration of this aspect in the Audit notification/scope submission process. This includes the 'conflict of interest matrix' and the limitation on three (3) consecutive operational audits at a site (which came into effect from 1 July 2020).	Consideration should be given to the: A) the provision of specific guidance regarding this aspect in relevant guidance (i.e., the updated Landfill BPEM and/or an updated revision of EPA Publication 1323); and B) the inclusion of this aspect in the Audit notification/scope submission process.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
		Conflict of interest in landfill space	Auditors are currently allowed to complete landfill construction audits where they are from the same firm as the Geotechnical Inspection and Testing Authority (GITA)/Construction Quality Assurance (CQA) Inspector. There is the potential for a conflict of interest in this scenario. In addition, there is the potential that a true independent audit of all information/data is not completed.	The GITA/CQA Inspector should be independent of the Auditor. Consideration should be given to the: A) the provision of specific guidance regarding this aspect in relevant guidance (i.e., the updated Landfill BPEM and/or an updated revision of EPA Publication 1323); and B) the inclusion of this aspect in the Audit notification/scope submission process (for example, outlining whether the Auditor has a direct relationship with the GITA/CQA Inspector, depending on EPA guidance).
	22		Can geocomposites be used on the base as a drainage layer? This is unclear.	
			The Blue Box in page 25 states a suggested measure that clay liners are not to be less than one metre thick. This is no longer a standard practice.	
6.4 Construction quality assurance	26		It is a good section which guarantees high quality materials to be used.	
6.5 Water management	28		Delete Figure 6.1 . This type of evaporation pyramid is not used in Australia, and it is likely to be an odour pyramid.	

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
6.6 Groundwater	top of p29	leachate irrigation	Irrigation of leachate over land that has not received waste is unlikely to be considered acceptable by EPA today. Could not find publication 464 on EPA website - was this replaced by 730?	Revise/update/remove.
	31	Legislation / policy update	Section 6.5.4 refers to EPA works approvals and the Water SEPP.	Update to current permissions.
			Box refers to Landfill WMP.	Update.
	31		First para refers to beneficial uses	Update
			Section 6.6.1 Liner Uplift provides for situations where the base of the liner is not two metres above the groundwater level. It is relevant for situations where the water table moves based upon changing weather conditions over time.	
	32		Box refers to Landfill WMP.	Update.
6.7 Air quality	32		References to SEPP.	Update.
	32		Section 6.7.1 references superseded NGER Solid Waste Calculator.	Update.
		LFG	LFGRAs commonly use the European risk assessment guidance, particularly BS 8485 rather than EPA Pub 1323 as it incorporates flow to give a more realistic indication of risk. This is supported by Auditors so should be acknowledged	
			If references to measurement of CO2 "above background" remain, it is necessary to provide guidance on how background levels are to be obtained.	
		Legislation / policy update	SEPP (AQM) referenced, blue Box references landfill WMP	Update
			Blue Box on pg 35 states: "Notify EPA Victoria within 24 hours of detection of any exceedance of the action levels detailed in Table 6.4, except for onsite exceedance rectified within 24 hours"	Should refer to section 5.6 of publication 1684

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	36	Waste Management Policy	Blue Box references landfill WMP	Update
6.8 Bioreactor landfills	36			
			Is this section necessary and relevant in 2025 given <i>The environmental performance and required outcomes for a bioreactor landfill are the same as for a conventional landfill (refer to 'Required outcomes' in Section 8.1) The reference to 8.1 does not appear correct as Section 8.1 deals with Rehabilitation.</i>	
6.9 Noise	38	Legislation / policy update	References to SEPP	
			Remove suggested measures as they are too general to interpret and update the references.	
6.10 Traffic considerations	39	Waste Management Policy	"Assurance that all vehicles leaving the landfill have all soil removed from the wheels and underbody before entering public roads." This should not be about assuring all trucks have soil removed, it should be about minimising mud on the roads so far as reasonably practicable.	
			Both blue Boxes on p39 contain reference to WMP	Update
6.11 Site Security and fencing	39			
6.12 Low risk rural landfills	40		Long term undisturbed groundwater criterion should be removed	
7 Best-practice operation	41			
7.1 Environmental management	41	Waste Management Policy	WMP mentioned in text and Blue Box, regional waste management plans no longer exist.	
			The requirement to develop an EIP as well as an RMMP and EMS is an unnecessary duplication.	Remove requirement for EIP.
			RMMP described in EPA publication 1323 does not describe EPA's current expectations for RMMPs.	Outline requirements of RMMP here

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
7.2 Financial assurance	41		Add reference to current requirements guideline.	
7.3 Waste minimisation	42	Legislation / policy update	Remove reference to regional waste management plans, Landfill WMP, update composting facilities guideline reference.	
			Update references to the current government policies ie <i>Circular Economy</i> .	
7.4 Waste acceptance	42		Update discussion regarding waste transport of asbestos and remove reference to Landfill WMP.	
7.5 Waste pretreatment	43		Waste pretreatment by removal of organics is largely being undertaken offsite through FOGO programs.	
			This section should not be in a landfill operation section. The suggested measures of shredding and baling are not adopted in modern landfills. Shredding and baling may lead to Lithium Battery explosions and fires.	Remove
7.6 Waste placement	43		"Keep covering waste to maintain the active tipping area at less than 30 metres x 30 metres. This is not an appropriate face size to allow a compactor to adequately compact the waste. Why is 30x30 used, what is the science behind this?"	This statement should be removed.
			The suggested measure of 30m x30m does not take into consideration HSEQ requirements and the volume of waste disposed at a landfill per day. 30m x 30m may be suitable for a regional site taking 1000 tonnes per year but is unworkable and inappropriate for large metropolitan landfills.	
			It is time for EPA to provide the scientific basis of this assertion.	
7.7 Waste cover	44		Cover mats are noted as an acceptable cover material - why is separate approval required for tarpaulin systems?	

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
			Requiring 2 weeks of cover at the tipping face for a metropolitan landfill is not practicable.	
7.8 Litter control	45		"Deposit waste in areas of the landfill that are sheltered from the wind." This is not a practical statement, this is not always feasible for landfill operators, especially once you begin filling in the upper lifts of a cell.	This statement should be removed.
			Use litter screens at least four (4) metres high to control litter at the active tipping area.	The height of litter screens should be risk based and reasonably practicable rather than specified.
		Waste Management Policy	Landfill WMP in Blue Box.	Remove reference.
7.9 Fires	46		"Construct a firebreak around the perimeter of the landfill to the satisfaction of the relevant fire authority"	This statement should be removed.
		Waste Management Policy	Landfill WMP in Blue Box.	Remove
7.10 Contingency planning	46	Waste Management Policy	Landfill WMP in Blue Box.	Remove
7.11 Management of chemicals and fuels	47		AS1940-2004 and publication 347 are now superseded.	Update
		Waste Management Policy	Landfill WMP in Blue Box	Remove
7.12 Disease vector control	47	Waste Management Policy	Landfill WMP in Blue Box	remove
7.13 Noxious weed control	48		"Become involved in the local Landcare group to develop regional strategies to eradicate regional noxious weeds." This statement is not relevant with the documents purpose of best practice management of a landfill.	This statement should be removed.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
		Waste Management Policy	Landfill WMP in blue Box, update DSE to DEECA.	Remove
7.14 Performance monitoring and reporting	48	Waste Management Policy	Landfill WMP in blue Box.	Remove
			APS have been replaced by PIPS.	Update
8 Best-practice rehabilitation and aftercare	49		Good information. Some updates is needed to include the latest updates and technologies.	
8.1 Rehabilitation	49			
			This whole section is full of generalities and many of the statements need to be cut back to add any value. The concept of onsite sampling and sending samples off site to laboratories for testing is a complete waste of resources and time as the GITA and CQA of the installation of the materials is sufficient. If we cannot accept the manufacturers testing reports for quality, why use any product sold in a supermarket without taking a sample and sending off to a laboratory for testing? <i>(This was always the most ridiculous requirement for our industry)</i>	
	S8.1.5	Compression testing - Cap/cover included	Allowance for the final cap and daily cover within the overburden pressure for compression testing is not consistently applied. Decreases the overburden pressure.	It should be considered as it contributes to the profile.
	S8.1.8		Section 8.1.8 update reference to APS.	Update
			Suggested measures - community involvement should be informed not involved. Remove Landfill WMP.	
8.2 Aftercare management	55			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
			Section 8.2.1 and 8.2.2 have been replaced by the Landfill Buffer distances guideline - replace with a reference to the new guideline.	
9 References and legislation	57			
9.1 References	57			
9.2 Legislation	57			
9.3 Codes, standards and guidelines	57			
APPENDIX A: Summary of implementation requirements	58		This serves no purpose now, this appendix can be removed.	
APPENDIX B: Technical guidance	59			
B.1 Clay properties	59	Maximum particle size of clay material used for the construction of compacted clay liner (CCL)	A maximum particle size of 50 mm is specified for CCLs in the Landfill BPEM. This does not correspond with the nearest sieve used for particle size distribution testing of clay material.	Consideration should be given to nominating a maximum particle size of 53 mm in the Landfill BPEM for clay material used for the construction of CCLs as this is in accordance with AS 1289.3.6.1 (used for particle size distribution testing of the material).

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
B.2 Installation of clay liners	59	Maximum moisture content of compacted clay liner (CCL)	A maximum moisture content of up to 3% wet of Optimal Moisture Content (OMC) is allowed for in the Landfill BPEM.	Consideration should be given increasing the maximum moisture content of CCL in the Landfill BPEM to up to 5% wet of OMC on occasions provided that the permeability requirement is achieved and there is no loss in strength of the CCL.
B.3 Drainage aggregate properties	60	Maximum particle size of leachate drainage/collection aggregate	A maximum particle size of 50 mm is specified for leachate drainage/collection aggregate in the Landfill BPEM. This does not correspond with the nearest sieve used for particle size distribution testing of leachate drainage/collection aggregate material.	Consideration should be given to nominating a maximum particle size of 53 mm in Landfill BPEM for leachate drainage/collection aggregate as this is in accordance with AS 1141.11.1 (used for particle size distribution testing of the material).
B.4 Giroud's equation	60			
B.5 Calculation of area required for evaporation of leachate	60			
B.6 Landfill gas generation	60			
B.7 Design of landfill gas monitoring bore systems	61	LFG	This would be more appropriate in the LFG monitoring guidelines.	
		LFG	The specified spacing of bores is excessively conservative for old, closed landfills.	
B7.1 Overview	61			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
B7.2 Landfill gas monitoring bore location and spacing	61			
B7.3 Landfill gas monitoring bore depth	62			
B7.4 Landfill gas monitoring bore construction design	62			
B7.5 Bore installation construction quality assurance	63			
APPENDIX C: Summary of objectives and required outcomes	54			
	Page 66, 6.7.1 LFG		"Notify EPA Victoria within 24 hours of detection of any exceedance of the action levels detailed in Table 6.4, except for onsite exceedance rectified within 24 hours."	This should be detailed in site Licences under Condition L5 and should include detail from section 5.6 of publication 1684.
APPENDIX D: Guidance on geomembrane use in landfills	71		Good information. Some of the general information may not be necessary to be included in the design guide, and can be transferred to another document.	
D.1 Introduction	71			
D.2 Background	71			
D2.1 Types of geomembranes	71			
D2.2 Selecting geomembranes	72			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
D2.3 Material key properties	73		Some updates is needed on the protection geotextile and geomembrane allowable strain.	
D.3 Minimum requirements for HDPE geomembrane for basal and sideslope liners	79		Table D3 and D4 have note stating "All testing must be performed on samples taken from the geomembrane delivered to site under the CQA consultant supervision." Sampling undertaken on site lead extended timeframes to than get material tested. Potentially leads to more handling defects when unwrapping rolls to uncover samples. This would apply all geosynthetics.	Suggest to allow CQA samples to be recovered from factory under CQA supervision following visual inspection of materials once they arrive on site for transportation damage.
			Updates needed to be in line with latest findings.	
D.4 Minimum requirements for LLDPE geomembrane liners for landfill cover systems	81		Updates needed to be in line with latest findings.	
D.5 Requirements for the installation of liners to be used in landfills	83		Updates needed to be in line with latest findings.	
D5.1 Geomembrane installation	83		Updates needed to be in line with latest findings.	
D.6 Quality	86		Updates needed to be in line with latest findings.	
D6.1 Manufacturing specifications and quality control	86			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
D6.2 Construction quality control (CQC)	86			
D6.3 Third-party CQA consultant	86	D6.3 Third-party CQA consultant	Some consultancies are using Graduates or labour hire to sign off QA documents and hold points. This is leading to Auditors being unable to sign off works as the works have not been performed correctly/per design requirements.	Please update wording to include the verifier/signatory is at least on the NER and RPEV.
D6.4 CQA plan	86			
D6.5 CQA testing	88			
			The requirements for Onsite Conformance Testing are redundant and simply a waste of time and money. All materials purchased for liner and cap construction come with the required MQA and the onsite sampling and testing is redundant and can lead to product damage through the process. This needs to be seriously discussed with all parties.	
D6.6 CQA report	88			
	Tables D3 and D4	Clarification of EPA's expectations with respect to testing of HDPE/LLDPE geomembranes for the test parameter 'oxidative induction time (OIT)' (standard and high pressure and after 'oven aging')	EPA has clarified that HDPE/LLDPE geomembranes must meet the GRI requirements for Standard and High Pressure OIT testing (including 'after oven aging'). EPA has included requirements for this in their letters providing approval of a Operating Licence-holder's intent to construct a Cell (or landfill component). However, specific guidance regarding this aspect should be provided in the Landfill BPEM.	Consideration should be given to the update of relevant EPA guidance (i.e., the Landfill BPEM) to provide specific guidance regarding this aspect. This should include information regarding EPA's expectation regarding test frequencies, timing of tests and nature of tests (i.e., MQA and/or CQA).

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
D.7 Bibliography	91		Needs an update accordingly.	
D7.1 Further reading	91		Needs an update accordingly.	
D.8 Addendum A (Standard Test Methods)	92		Needs an update accordingly.	
D8.1 ASTM Standards	92		Needs an update accordingly.	
D8.2 Geosynthetic Research Institute (GRI) test methods specifications	92		Needs an update accordingly.	
APPENDIX E: Guidance on geosynthetic clay liner use in landfills	93		Good information. Some of the general information may not be necessary to be included in the design guide and can be transferred to another document.	
E.1 Introduction	93		Some of the information may not be necessary for a design guide.	
E.2 Background	93		Some of the information may not be necessary for a design guide.	
E2.1 Types of geosynthetic clay liners	93		Updates needed to be in line with latest technologies.	
E2.2 Material key properties	98		Needs updates/ re-structuring to accommodate the most recent updates on the Material key properties and design considerations.	

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
E.3 Requirements for GCLS for basal and sideslope liners	102		Needs some revision and update to include the latest findings.	
			The tables in E3 has no caption which makes it difficult to reference.	
E.4 Minimum requirements for GCL liners for landfill cover systems	104		Needs some revision and update to include the latest findings.	
E.5 Minimum requirements for the installation of geosynthetic clay liners to be used in landfills	105		Needs some updates to include the latest findings.	
E5.1 Transportation, handling and storage	106	E5.1 Transportation, handling and storage	"....recommended maximum stack height is three (3) rolls. ". This is based on the old, styled cores not handling the pressure of higher stacks. Geofabrics stack 9 high in their warehouse with their high strength cores.	Update to say stacking of rolls should be as per manufacturers recommendations or remove "recommended maximum stack height is three rolls."
E5.2 Geosynthetic clay liner installation	106		BPEM recommends confining the GCL, however does not provide clear guidelines on confinement timelines as such there is no consensus on timeline in the industry.	BPEM to provide clarity on approach to determine timeline
E5.3 Repairs	108			
E.6 Quality	108			
	108	E6.3 Third-party CQA consultant	Some consultancies are using Graduates or labour hire to sign off QA documents and hold points. This is leading to Auditors being unable to sign off works as the works have not been performed correctly/per design requirements.	Pleas update wording to include the verifier/signatory is at least on the NER and RPEV.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
E6.1 Manufacturing specifications and quality control	108		Needs some updates to include the latest findings.	
E6.2 Construction quality control (CQC)	108		Needs some updates to include the latest findings.	
E6.3 Third-party CQA consultant	108	E6.3 Third-party CQA consultant	Some consultancies are using Graduates or labour hire to sign off QA documents and hold points. This is leading to Auditors being unable to sign off works as the works have not been performed correctly/per design requirements.	Please update wording to include the verifier/signatory is at least on the NER and RPEV.
E6.4 CQA plan	109			
E6.5 Conformance testing	110			
	Table E3	Test Frequency of GCL for the Test Parameter 'Mass Per Unit Length of Bentonite in Overlaps'	The Landfill BPEM requires independent testing of mass per unit length of bentonite in overlaps at a frequency of one test per 40 m of overlap. Such a testing procedure (i.e., testing of every GCL roll at a frequency of 1 test per 40 metres of GCL material) poses a high risk of damage to the GCL material, which would outweigh the benefit of the test and potentially invalidate results obtained (i.e., where bentonite is lost from the area of the roll unfurled for sampling).	A testing frequency of one (1) test per roll for 'mass per unit length of bentonite in overlaps' is considered to be appropriate. In view of this, consideration should be given to the update of Table F1 of the Landfill BPEM accordingly.
	Table E3		In relation to the above, this test relates to post installation testing where identified during placement as indicated with the note for "visual inspection and weighting".	This requirement should be removed.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	Table E3	Requirement for independent on-site CQA testing of GCL for the parameter 'fluid loss'	Testing of the GCL for the parameter 'fluid loss' following the manufacture of the GCL material can be problematic as the bentonite may contain impurities including geotextile fibres and oils which are used for the non-woven geotextile manufacturing process (to assist in lubricating the production looms). Therefore, testing of GCL for the parameter 'fluid loss' is not considered to be required to be undertaken as part of the independent on-site construction quality assurance (CQA) testing.	Consideration should be given to the removal of the requirement for on-site CQA testing of GCL for the parameter 'fluid loss' from Table E3 of the Landfill BPEM. This is commensurate with 'United Kingdom Environment Agency, LFE3: Using Geosynthetic Clay Liners in Landfill Engineering (version 3), June 2014'. As outlined in Table 3 of LFE3, testing of bentonite used for the manufacture of GCL for the parameter 'fluid loss' should be '...performed on the as received [bentonite] materials before fabrication into the GCL product'. In addition, as described in Table 2 of LFE3, conformance testing of GCL for 'fluid loss' following manufacture and delivery of the material to site is not required.
	Table E3	Requirement for independent on-site CQA testing of GCL for the parameter 'puncture resistance of geotextile'	Testing of the 'geotextile' component of the GCL for the parameter 'puncture resistance' following the manufacture of the GCL material is not practicable as the GCL would need to be destroyed to separate the geotextile for testing. This action would significantly damage the geotextile and therefore such IQA testing would not be representative of the puncture resistance of the geotextile bound to the GCL.	Consideration should be given to the removal of the requirement for on-site CQA testing of GCL for the parameter 'puncture resistance of geotextile' from Table E3 of the Landfill BPEM.

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
	Table E3	Test method for the testing of GCL for the parameter 'tensile strength'	Test method ASTM D4595 is specified in the Landfill BPEM for testing for the parameter 'tensile strength', however ASTM D6768 should be specified (as this method relates specifically to GCL).	Consideration should be given to the update of Table E3 of the Landfill BPEM to require testing for the parameter 'tensile strength' to be completed using ASTM D6768 rather than ASTM D4595. This is commensurate with on-site CQA test guidance for testing of GCL as provided in recent South Australian (April 2019) and NSW guidance (2016) for landfill design and construction.
	Table E3	Test method for the testing of GCL for the parameter 'moisture content'	Test method AS 1289.1.1.1 is specified in the Landfill BPEM for testing for the parameter 'moisture content', however ASTM D5993 should be specified (as this method relates specifically to GCL).	Consideration should be given to the update of Table E3 of the Landfill BPEM to require testing for the parameter 'moisture content' to be completed using ASTM D5993 rather than AS 1289.1.1.1.
E6.6 CQA report	110			
E.7 Bibliography	112			
E7.1 Further reading	113			
E.8 Addendum A (standard test methods)	113			
E8.1 Australian Standards	113			
E8.2 ASTM standards	113			
E8.3 Geosynthetic	114			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
Research Institute (GRI) test methods specifications				
APPENDIX F: Guidance on geotextile use as protection in landfills	115		Currently no Guidelines on Filter Geotextile. Currently there are no products in the market that would meet the GRI standards for flow rate and UV resistance for filter geotextile.	Add section the specifically talks to filter/separation geotextile. BPEM to provide Guidelines on filter geotextile flow rate and UV resistance inline with products available in the market.
F.1 Introduction	115			
F.2 Background	115			
F2.1 Types of geotextiles	117			
F.3 Minimum requirements for geotextile protection layer	117			
F.4 Minimum requirements for the installation of geotextile protection layers	118			
F4.1 Transportation, handling and storage	119			
F4.2 Geotextile installation	119			
F4.3 Repairs	120			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
F.5 Quality	120			
F5.1 Manufacturing specifications and quality control	120			
F5.2 Construction quality control (CQC)	121			
F5.3 Third-party CQA consultant	121 F5.3	Third-party CQA consultant	Some consultancies are using Graduates or labour hire to sign off QA documents and hold points. This is leading to Auditors being unable to sign off works as the works have not been performed correctly/per design requirements.	Pleas update wording to include the verifier/signatory is at least on the NER and RPEV.
F5.4 CQA plan	121			
F5.5 Conformance testing	122			
F5.6 CQA report	123 Table F1	Testing of Cushion Geotextile for the Parameter 'Thickness'	It is a requirement of Appendix F, Table F1 of the Landfill BPEM that cushion geotextile thickness be measured during on site CQA testing of cushion geotextile. Given that thickness is not a key property in relation to the performance of the cushion geotextile and is not a specified material property in GRI-GT12, a minimum thickness is generally not been specified and therefore measurement of the cushion geotextile thickness is generally not conducted during on-site CQA testing of the material.	Consideration should be given to the removal of the requirement for on-testing of cushion/protection geotextile for the parameter 'thickness' from Table F1 of the Landfill BPEM. This is commensurate with on-site CQA test guidance for cushion/protection geotextiles as provided in recent South Australian (April 2019) and NSW guidance (2016) for landfill design and construction.
F.6 Bibliography	124			

BPEM Section	Page reference	Clause/topic	Comment	Suggested change
F6.1 Further reading	125			
F.7 Addendum A (standard test methods)	125			
F7.1 Australian Standards	125			
F7.2 International Organization for Standardization (ISO)	125			
F7.3 Geosynthetic Research Institute (GRI) test methods specifications	125			