Submissions Consideration and Response

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1	You guys have left out Passive Disposal Systems (PDS) – Refer link to: NSW Health Advisory Note 6 (May 2021) Passive Disposal Systems (PDS)	Guidelines do not specifically mention passive disposal systems as secondary treatment systems are not always required. In the cases where secondary treatment is not required a passive system (gravity fed) can be utilised.
2	Both documents you need to define EP. You imply 1 EP = 200 L/p/day. AS/NZS1547:2012 defines 1 EP as Town Water 150 L/p/day and Tank Water 120 L/p/day. Need to include advanced passive systems such as AES and Eljen. Both achieve secondary standard.	Our interpretation of the 200l/p/day is based on 10EP and 2000l being the upper limit for domestic systems according to AS 1547, and the current Environment & Health Protection Guidelines Onsite Sewage Management for Single Households. Draft Environment & Health Protection Guidelines: Onsite Wastewater Management Council can only approve NSW Health accredited systems for secondary treatment advanced or otherwise. In NSW Secondary treatment is required prior to land application.
3	1. Proposed EP loading for residential dwellings (refer Clause 8.1) of 2 EP for first bedroom and 1.5EP for each bedroom thereafter will result in Byron having the highest EP loading rate among the northern rivers councils. What is the justification for allowing 1.5EP for each subsequent bedroom? Suggest it should be 1 EP for each additional bedroom unless proposed occupancy is known to be higher (i.e. bunkrooms). 2. Recommend the Byron OSSM model is updated. Current model necessitates secondary treatment systems for any dwelling with 3 bedrooms or larger even on very large unconstrained properties due to the nitrogen loading calculation. This is not sustainable use of resources when a simple septic tank/ETA bed system will suffice and meets all requirements of EHP guidelines and AS1547. The Byron OSSM appears to have a different nitrogen area calculation to the other northern rivers councils. The other effect of the large nitrogen LAA requirement is it forces the use of the AWTS units with accredited nitrogen reduction figures (Ozzikleen RP10A+/S+, Taylex ABSNR), when in most cases any of the other accredited AWTS would be sufficient. The effect being that Byron shire residents have higher installation costs than others in the region for the same size dwellings.	Set back distances are within the ranges expressed by the current and Draft Environment & Health Protection Guidelines Onsite Sewage Management, the Australian Standard, and neighbouring Councils. The model will be updated when our guidelines are adopted. Issues pertaining to certified N reduction is up to the manufacturer. An AWTS system with the correct setback may be used when a land application area is based on hydraulics only.
4	Onsite Sewage Management Guidelines, Section 4.7 states a different identification distance for groundwater bores for upstream vs downstream distances. In localised areas	Council recommends using a viral die off model, disinfection or setbacks as recommended in AS1547 or the current & draft

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	and dependant of rock shelves, and soils, groundwater can flow in a different direction from the surface contours resulting in a bore being uphill of a site but downstream of subsurface water flow. As such I believe it best to have a single distance of 250 m of which groundwater bores must be identified.	Environment & Health Protection Guidelines Onsite Sewage Management
5	ITEM 4.2 pg. 19 KEY COMPONENTS OF REPORT Item 8 states "sub surface irrigation reports must be designed by a qualified irrigation designer." I do not believe an irrigation designer is required to be engaged for a basic household irrigation system. A designer should be able to state pump sizes, litres per hour, duty points etc; without costing more money. This contradicts item 7.5 on pg. 36 which states a qualified irrigation designer is only required for slopes > 30% and for commercial applications. ITEM 4.7 pg. 21 GROUNDWATER BORES What happens if the OSSM does not meet these parameters? It needs to state that if setbacks to groundwater bores cannot be met, refer to item 4.11 (AS1547:2012). ITEM 4.8 pg. 21 FLOOD LEVEL REQUIREMENTS The tank lid & electrics state above 1:100, however there is nothing stated about the height of the LAA within flood zones. E.g. the base of the distribution bed above 1:50 especially in a priority oyster catchment area. Byron Shire Council needs to provide better mapping, showing flood heights for individual lots. It needs a better legend, colour coded, showing the different flood heights like Ballina Shire Council. Designers require this information so that it can be referenced in the design report. If the 1:100 flood heights are currently available, this should be referenced as to where to find this information. ITEM 4.9 pg. 21 SITE & SOIL	**Contradiction is noted. An amendment is to be made to item 7.5 page 36 of Guidelines.** Other mitigation measures will be employed when buffers aren't met such as disinfection, and evapotranspiration and the viral die-off model. AS 1547 provides advice on choosing LAA's in flood zones and depth of soil samples. Refer to page 39 for sizing of treatment components. Slope gradients already incorporated throughout guidelines (for example) site details in appendix D. **Council will review and release flood data in consultation with flood engineers.**

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	There is no minimum requirement stated for the depth of which a soil sample should be taken, e.g. 1 metre. This is the most restrictive layer/horizon that the LAA should be sized on. ITEM 4.12 pg. 24 WASTEWATER LOADINGS The very last sentence in the above item, states "refer to the sizing of treatment components." Unable to fine this; does this refer to Item 8 on page 39, SIZING OSSM COMPONENTS & CALCULATING OF WASTEWATER & EQUIVALENT POPULATION? If so, abbreviate and refer to Item 8. ITEM 5.1 pg. 24/25 PROPERTY & SITE PLANS The site plans should include contours as one of the requirements. ITEM 7 pg. 34 CHOOSING A LAND APPLICATION SYSTEM The very last sentence in the above item, states "refer to the sizing of treatment components." Unable to fine this; does this refer to Item 8 on page 39, SIZING OSSM COMPONENTS & CALCULATING OF WASTEWATER & EQUIVALENT POPULATION? If so, abbreviate and refer to Item 8. ITEM 7.5 pg. 36/37 SUB SURFACE IRRIGATION SYSTEMS This states a qualified irrigation designer is only required for slopes > 30% and for commercial applications. This contradicts item 4.2 on pg. 19 which states a qualified irrigation designer is required full stop.	
6	Review of Draft Byron Shire Revised Onsite Sewage Management and Guidelines (2023) Congratulations on achieving this important review and thank you for the opportunity to provide brief comments on the draft documents. It is gratifying that primary treatment is now allowed under the strategy for appropriate sites.	Amendments to be made to secondary treatment section that includes advanced secondary treatment.

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	The Draft OSSM strategy seems all in order, but please consider the suggested improvements to the Draft OSSM Guidelines. In section 4.5 Priority Oyster Aquaculture Area on page 20, Healthy Estuaries for Healthy Oysters Guidelines 2017. There may be a more recent version of this document. Chapter 6 does not include a section on advanced secondary treatment as per AS1546:2017. Recognition of advanced secondary treatment is important in justifying reduced setbacks as per table AS/NZS1547:2012 R2 and for sensitive sites. **Studies and bedrooms** The green print statement in section 8.1 should be revised: Times have changed and working /schooling/ farm management from home, particularly in unsewered areas, is now a common activity requiring a dedicated working area with electricity, sensitive electrical equipment (computers), and data connections points with flashing lights. Last century, a typical dwelling had 3 bedrooms. More recently, for resale value to obtain finance and meet BASIX requirements, new dwellings typically have 4 bedrooms. For a typical 4-bedroom dwelling there is generally less need to temporarily convert studies or other rooms for growing families. Is there any evidence that this is a frequent occurrence, or just the vibe? As a regulator, please consider the presumption of innocence, collective punishment, and good faith. Not all applicants will break the rules and need to be penalised in advance. It is not the role of a wastewater consultant to interpret uses contrary to plans provided in good faith. A bedroom is defined as a room for sleeping in. Some studies or rumpus rooms with open plans, have no door or privacy. Many rooms cannot fit a bed and wardrobe, have no windows, no suitable ventilation, no natural lighting, fire alarms or emergency exits or are otherwise not suitable for sleeping in. There is no provision for the design under the Robo-bedroom policy. 'Seems a crude and cruel mechanism, neither fair nor legal, makes people feel like criminals.'	Habitable room definition has been amended and is not based on Councils ET policy but rather related to the design requirements for calculating the load. Viral die-off example provided on page 58 of guidelines and other appropriate viral die-off methods may be considered by Council. Design model to be reviewed once strategy and guidelines are adopted.

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	Appendix A **Viral die back** No viral reduction target is offered for advanced secondary treatment and with accreditation testing results for some models showing less than 1cfu/100, only a 1 order of magnitude might be required. **Nitrogen** The cited authority for the nitrogen model '(HSC,1994)' does not appear to be valid. I have contacted Hornsby Shire Council to enquire about the cited 'work' but have not received a response. It is noted that the Hornsby Shire Council Onsite Sewage Strategy does not include any nitrogen or phosphorus area requirement. It is important that any 'equation (that) produces large, and therefore costly, land application areas' has a legitimate basis.	
	Strategy Section 2.5.2 (pg13) Many areas of Byron Shire consist of clay loam red krasnozem soils. Generally, these soils have demonstrated their ability to absorb primary treated wastewater for over 30 years in existing OSMS's. We recommend Council remove 'or the systems include an absorption trench,' from this paragraph. An approved OSMS utilising absorption trenching should be assessed on its performance and only be upgraded if it is found to be failing.	BSC's experience with absorption trenches indicates unknown land application areas. Section 5.2 of original *Environment & Health Protection Guidelines On-site Sewage Management* (revision now in draft. For Single Household suggests soil absorption systems to have an effective lifespan of 5 - 15 years. The condition reports Council receives do not include detail about how the investigation was conducted and adds additional cost to the owner when required to upgrade.
	Section 2.5.3 (pg14) 'Consistent with sustainability goals Council recommends that all allotments on a subdivision or sites on multiple occupancy are designed to enable passive or low-energy style OSSM systems. ' This statement is problematic. Passive OSMS's are often not achievable on flat properties due to fall between septic tanks, reed beds and disposal systems not being achievable (e.g. septic tank outlet typically 450mm below ground not being able to flow into wetland inlet being 200mm below ground). Hence this statement can be interpreted as flat properties not being suitable for development, which is not the case. Secondly, an OSMS utilising multiple wetland cells (e.g. four cells) but achieving passive flow may be more resource intensive than the use of an Aerated wastewater Treatment System	It is acknowledged that pumps will be required due to lack of slope in certain circumstances. Regarding energy efficiency/sustainability concerns, passive systems are recommended to align with Council's sustainability objectives.

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	(AWTS) which has a single tank. There is no definition provided for what constitutes a 'low energy' OSMS. We recommend this statement be removed from the Strategy.	
	Strategy Section 4.2 (pg20) 'Design reports must include a statement acknowledged by the system owner as to the reason why a passive system could not be utilised in the proposal. Proposals that do not include that statement and acknowledgment may not be accepted.' The type of OSMS installed is often chosen by the owner primarily based on cost. This is reasonable. We would recommend these statements be removed from the Strategy as it places another requirement to be met which is not a realistic requirement.	The costs and benefits of any suitable system should be explained to the client before a choice is made.
	Strategy Section 6 (pg25) '6 An owner may be required to upgrade the OSSM system in accordance with Council's Onsite Sewage Management Guidelines when an inspection reveals: a. OSSM system of unknown age; b. OSSM system with unknown approval to install status; c. the OSSM system is older than 20 years; or d. unknown land application areas.' Council's criteria above may be used unreasonably by Council staff. For example, an OSSM that is working adequately but is older than 20 years of age, or its age is unknown, may be required to be upgraded based on points A & C, when in fact the OSSM is presenting no human or environmental health risk.	A risk assessment is conducted by Council authorised officers who have the necessary skills/qualifications to apply this criterion reasonably.
	Strategy Section 2.5 (pg. 11) 'OSSM systems operating in a Rous County Council drinking water catchment area are subject to Rous County Council's On-site Wastewater Management Guidelines via a memorandum of understanding with Byron Shire Council.' As a designer, we understand Council needs to consider the Rous County Council's On-site Wastewater Management Guidelines for OSMS designs in the drinking water catchment. We think Council should have confidence in their own OSMS Guidelines in that if an OSMS design report meets the requirements of Council's OSMS Guidelines, then Council should	The drinking water catchments represent approximately 50% of the unsewered areas of the shire. Council manages the drinking water catchment for Mullumbimby, and we have adopted Rous guidelines for this catchment area. Rous guidelines to be considered in proposals for all areas of the Byron Shire however is not mandated to be used throughout all area of the shire.

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	consider that the requirements within the Rous County Council's On-site Wastewater Management Guidelines are concurrently met. 'Those guidelines should be considered in proposals to help determine an appropriate system in the Mullumbimby drinking water catchment and all other areas of the Byron Shire.' We disagree with this statement. The Rous County Council's On-site Wastewater Management Guidelines should only apply to areas within the mapped drinking water catchments within Council's LEP 2014.	
	Section 2.6 & 2.7 (pg11) 'The key role of an OSSM designer is to: . prepare a draft OSSM Operation and Maintenance Manual. OSSM installation contractors must: . compile the final Operation and Maintenance Manual based on the draft manual prepared in the OSSM Design Report and any adjustments or details arising from the installation' Has Council considered the practicality of these requirements? In what format does the designer provide the installer a draft copy of the Operation and Maintenance Manual for the installer to then edit and submit? This requirement adds a layer to the OSMS approval, installation & certification process. Otten installers are not good at providing documentation and will subsequently ask the designer to finalise the Operation and Maintenance Manual on their behalf. It would be more efficient for the designer to prepare an Operation and Maintenance Manual as part of the S68 application, and if there are any modifications to it based on changes during installation, the installer can provide a cover note or letter to Council that can be attached to the Operation and Maintenance Manual and given to the owner with the ATO. If there are no changes to the S68 approved design during installation, the designers Operation and Maintenance Manual submitted with the Section 68 should be sufficient.	Section modified to make it clearer who and when the operational and maintenance manual is provided and to whom it is provided.
	Section 3.3.4 (pg. 17) Typo in second paragraph of this section: '.. .maximum number of dwellings permissible on the development.'	Typo amended

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	Section 3.3.4 (pg18) 'New OSSM applications for secondary dwellings must also include an assessment of the condition of existing OSSM system on the property. Where the age, condition or information known about an existing system is poor or the existing system is an absorption trench then the design and application must include upgrading the existing system to meet these guidelines.' We disagree with this statement. It requires that OSMS servicing an existing dwelling which Council does not have good records of, or which use absorption trenching, must be upgraded for an existing dwelling if a secondary dwelling is proposed on the property. This is not considered reasonable for the following reasons: It may be Council's fault that their own records are poor. The owner should not be made to upgrade an approved functioning OSMS in the case where there may be a legacy of poor record keeping on Council's behalf. The existing absorption trenches may be performing adequately. Many areas of Byron shire contain red clay soils which have supported absorption trenching successfully for many years. It is considered a waste of resources for Council to apply a blanket rule for all OSMS's using absorption trenching to be upgraded when a secondary dwelling is proposed. We recommend that OSMS's servicing existing dwellings are only required to be upgraded if the following is found: 1. A OSSM is found to be failing (surcharging disposal area, strong odours, wet areas, etc); 2. Unapproved alterations or additions have been made to an approved OSSM; 3. An unapproved OSSM has been installed.	The need for information about an existing system is set out in the criteria on pg. 25 of the Strategy. BSC's experience with absorption trenches indicates unknown land application areas. Section 5.2 of *Environment & Health Protection Guidelines On-site Sewage Management for Single Household* suggests soil absorption systems to have an effective lifespan of 5 - 15 years. The condition reports Council receives do not include detail about how the investigation was conducted and adds additional cost to the owner when required to upgrade.
	Section 4.4 (pg20) 'Council will determine if the application needs to be referred to Rous County Council for assessment based on the "Suitability" assessment for the system according to the Rous County Council On-site Wastewater Management Guidelines. ' We think Council should have confidence in their own OSMS Guidelines in that if an OSMS design report meets the requirements of Council's OSMS Guidelines, then Council should consider that the requirements within the Rous County Council's On- site Wastewater Management Guidelines are concurrently met.	Byron Shire has an MOU pertaining to OSMS within drinking water catchments. Within their guidelines are the referral arrangements.

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	Section 4.7 (pg21) 'Identify the location and details of groundwater bores within 250 metres downstream (or cross-gradient) and 50 metres upstream of the proposed OSSM system.' WaterNSW's 2019 'Designing and Installing On-site Wastewater Systems' is the most up to date document on OSMS installation from the NSW Government. Table 2.6 within this document recommends a 100m setback between an OSMS and a bore or well licenced for domestic consumption. We recommend Council adopt this setback instead of 250m, and include a note that only relates to bores or wells licenced for domestic consumption (drinking and watering of edible plants), and not for bores licenced for stock watering.	Bore setback distance is consistent with neighbouring LGA's and NSW Water, Water Quality Information Requirements published February 2023
	Section 4.10 (pg22) 'if ASS materials are likely to be disturbed, laboratory analysis should be undertaken to determine whether ASS are present or absent, to delineate the lateral and vertical extent, and to quantify the quantities requiring management if disturbed' Excavations associated with OSMS installations are usually completed within 3-4 day. This limits the oxidation that will occur in exposed ASS. We would consider the requirement to take soil samples for ASS as excessive. If ASS is presumed to be present in the OSMS location, the designer should highlight that each excavation (e.g. hole for treatment tank, ETA bed excavation) should be exposed for less than 48 hours. This will result in low environmental impacts from ASS.	This section was condensed to include minor works ASS plan where / if required
	Section 4.11 (pg23) We would recommend Council retains the setbacks in their existing Guidelines (2004) as it provides a simpler way of liaising with clients. This excludes the recommended reduction in setbacks to bores and wells described in this letter. Table R1 does not include setbacks to roads. Council could retain the setback table in their existing Guidelines but put a clause in the 2023 Guidelines stating that Table R1 may be used as well and is acceptable.	Setbacks come from original Environment & Health Protection Guidelines On-site Sewage Management for Single Household, the revision, now in draft has same that reflect the AS1547. Our recommendations are based on the Australian standards that have also been adopted in the new Draft Environment & Health Protection Guidelines: Onsite Wastewater Management
	Section 5.1 (pg25) 'The OSSM Design Report will include site plans to scale which show: h. High value vegetation as defined by the following environmental layers in Council's online mapping: '~areas of High Environmental Value" and "Big Scrub Rainforest Remnants" We recommend this requirement be removed as a requirement for every OSMS plan. It should only be applied where a proposed OSMS will impact upon native vegetation.	Only when required

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	Section 5.3 (26) 'The OSSM Design Report will include an Owners Acknowledgement Statement (signed by the owner) confirming that they are aware of the type of system being nominated in the report, that a variety of treatment options have been discussed, and of the operating and maintenance schedule required to be carried out for the nominated system. ' This process generally does not work. Many Local governments have tried implementing it since the early 2005 and now do not enforce it. This is due to the difficulty in getting all owners to sign and return a page when often they do not have scanners etc.	Make acknowledgments a condition of providing a quote. Photos from mobiles phones can also be used instead of a scanner.
	Section 6.3 (pg29) 'Byron Shire Council can approve primary treatment systems, refer to the Rous County Council On-Site Wastewater Management Guidelines for guidance on situations where primary treatment systems may be approved.' The Rous guidelines are specifically for OSMS's within the water supply catchment zones. Pg 2 of the Rous County Council On-Site Wastewater Management Guidelines (2008) states: 'These guidelines therefore focus on identifying any requirements of Rous Water, forwater supply catchment zones, over and above the existing requirements of the local council.' Therefore, it is not reasonable to use these guidelines across areas outside of the water catchment zones. It is considered Council should adopt a simpler approach, and state that suitable sized and designed primary treatment systems can be approved where the following setbacks are achieved: 40m to an intermittent drainage line 100m to a permanent water course	The Rous County Council (Rous Water) guidelines provide a broader range of scenarios than just distance buffers. A distance buffer isn't appropriate if the slope is steep or the buffer is poorly vegetated, soils are poor or rainfall is high.
	Section 6.5 (pg32) 'Note: the Byron Shire Council model should not be used for commercial applications. ' Our office co designed the original design model modified and adopted by Council (see Appendix B, pg. 62). The design model uses soil inputs from AS/NZS 1547 and equations from a variety of sources which do not change answers whether the water is from a commercial or domestic development. The hydraulic, nutrient and BOD inputs can be manipulated in the design model to reflect a commercial development, and the soil data	In councils experience commercial designs based on our model have required amendments after installation. The model and our guidelines relate to an influent quality and quantity based on a domestic residence.

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	and equations built into the model are the same as those that would be used in an exclusively commercial model anyway. We think Council should allow the use of the model for commercial developments, as we are not aware of any other models which factor in nutrients, hydraulic loading and BOD (apart from those from other Local governments). If Council enforces that their adopted design model is not to be used for commercial developments, our office will have to create another spread sheet which would use the same equations and soil data as Council's model, because that soil data and those equations do not differentiate between the source of the wastewater. This would be inefficient for us and it would be harder for Council staff to review our designs due to them being unfamiliar with a new model.	
	Section 7 (pg34) "Reserve' areas, with equivalent characteristics to the land application system, shall be designated and set aside in all new applications. ' Can Council clarify whether they accept SubSurface Irrigation (SSI) fields being nominated as the reserve area as well. Lismore City Council allows reserve areas to include SSI fields based on the principle that a failed SSI field can be deep ploughed of ripped, limed, and SSI reinstalled. This removes the need for an entire separate area to be nominated as reverse which is critical on spatially constrained properties.	Follow the AS1547 guides for reserve areas. A reserve area must be based on the area (metric) of the original.
	Section 8.1 (pg39) '2 EP for the first habitable room and 1.5EP per bedroom for each habitable room after that, for example for a 4-bedroom / habitable room house = (1 x 2EP) + (3 x 1.5 EP) = 6.5 EP.' We think this modelling is excessive. 2 EP for the first habitable room and 1 EP per bedroom after is more suitable instead of 1.5 EP per bedroom after the primary bedroom. Or Council should retain their existing calculation being 1.5 EP/bedroom. Further to this, we recommend Council provide a definition of a bedroom. This will assist designers and Council to both concur on how many bedrooms are in a dwelling (e.g. Lismore City Council nominates a room that is enclosable and have a floor area of greater than 7.5m2 as a bedroom for OSMS design purposes).	Habitable room definition has been amended
	Section 8.13 (pg43)	Follow the AS1547 guides for reserve areas. A reserve area must be based on the area (metric) of the original.

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	'On sites with large areas and limited constraints, the size of the reserve area will be 100% of the design land application area. ' Reserve areas are historically based on hydraulic area requirements only. Can Council state this in the Guidelines if they support this, or alternatively make a statement that reserve area needs to be based on the most limiting factor between hydraulic and nutrient area requirements. We recommend reserve areas be based on hydraulic area requirements only.	
	APPENDIX A - VIRAL DIE-OFF METHOD '1. Determine how much time is needed for viruses in the effluent to naturally die off to acceptably low levels (the recommended target viral reductions listed above). To estimate this time (t), use Equation 1a and Equation 1b overleaf' Cromer, W. C., Gardner, E. A. and Beavers, P. D. (2001) provide Figure 1 within their paper that is used to determine time (t). We recommend Council put a copy of this Figure in the Guidelines instead of outlining equations 1 a & 1 b as this Figure is much easier to use and prevents designers from getting the equations wrong. Ballina Shire Council OSSM Guidelines includes a copy of Figure 1 in pg. 54. Critically, the draft Guidelines do not include any reference to the 'radius of influence' for a bore. Appendix A only addresses Viral die-off distance, whereas Cromer, W. C., Gardner, E. A. and Beavers, P. D. (2001) provide equations for determining the 'radius of influence of a bore, being the vertical distance a bore draws groundwater from. For circumstances where a bore is located below a proposed OSMS, both the 'radius of influence' for a bore and the viral die-off distance have to be added together to provide a suitable buffer. Where a bore is positioned upslope of a proposed OSMS, only the 'radius of influence' for a bore is required to be calculated as viral loads from the OSMS will travel away from the bore not towards it. Council needs to add details for calculating the 'radius of influence'. Appendix B from Ballina Shire Council's OSSM Guidelines (2017) provides instructions for calculating the 'radius of influence' for a bore, as does Cromer, W. C., Gardner, E. A. and Beavers, P. D. (2001).	Environment & Health Protection Guidelines: Onsite Wastewater Management (draft) : 6.7 Viral Die-Off Modelling Viral die-off modelling uses a methodology developed by Beavers and Gardner (1993) and further refined by Cromer et al. (2001) to model the transport of viruses present in effluent away from the EM and through saturated subsoil areas. The model considers the level of treatment, groundwater temperature and subsoil characteristics as factors controlling the movement of viruses. The model is a conservative approach to modelling the fate and transport of all pathogens as bacteria have shorter die-ofttimes than viruses and can therefore be assumed to be eliminated within a shorter distance. In addition, the model assumes saturated subsoil conditions where viruses will have lesser die-oft times in unsaturated subsoil conditions. A worked example is provided in Appendix 6 and includes required model parameters in detail. **Delete example and reference the model only : Cromer WC, Gardner EA and Beavers PD (2001)**
	I) in the guidelines - s1.1 - there is reference to the guidelines that they over-ride the Standards & the Silver bullet. But latter in the document there is reference to using the standard -- which is a little confusing, I'm also not sure of the legality of stating a guidelines over-rides a Australia Standard and there may be some confusion of when it does/does not. I understand the Silver bullet is also in draft format and nearly ready to release. Council's guideline doesn't indicate a date - which may allow the new guidelines to over-rule Council's	AS/NZS 1547 and the *Environment & Health Protection Guidelines On-site Sewage Management for Single Households* and the Draft in revision accept that Local Authorities can implement their own strategy and guidelines.

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	new guidelines. As the Silver bullet hasn't been released yes - I'm not sure if there may be some items of value in that document that may be suitable for use within Byron Shire. Despite this comment - I do feel that Council does have much better knowledge of their soils, conditions and the like that impact on OSWM and as such should be able to provide the over-riding decision (potentially with some agreement/liaison with the consultant).	Another appropriate viral die-off method may be considered by Council. **Comments in relation to habitable room definition noted and amendment to definition updated**
	ii) the Virus model demonstrated does not include the next step to the zone of influence to a borehole. The example provided would be one that could be used to calculate a setback to a boundary or other surface feature and is the first part of the calculation for the zone of influence. I calculate the next step for the borehole zone of influence using the example provided but allowing for a 10m thick water bearing zone and pumping for 1 day as being 9.85m.	Example will be removed and reference to model only included
	iii) the inclusion of rooms that may not be used for bedrooms is a concern as this can lead to over-sizing of a system and thereby failure. This has been experienced by clients particularly using reed beds whereby they are needing to irrigate and fertilise to keep the reeds alive. I appreciate Council's position but this is a compliance issue not a up-front design issue. The proposed new sizing is considered conservative (i.e. up from number of bedrooms times 1.5 to 2 plus 1.5 bedrooms). Would there be a better way of accommodating these rooms is that landowners/clients are aware of the restrictions on the design that could be incorporated into the Owner acknowledgment page. That is - if the proposed new dwelling will include an office (as many people work from home these day - especially post-covid) and/or a media room etc this is clearly stated on that signed acknowledgment page and thereby there is a recognition of their requirements to increase the system if they change the use of these room(s). There are many references throughout the documents about land owners responsibilities for managing their wastewater including educating tenants and the like.	See work sheet 2 wastewater volumes and EP's **habitable room definition to be amended**
	On Page 17, point c. of Section 3.3.4 says: Where a Byron shire Council LEP or DCP permits secondary dwellings or dual occupancies: the area of each allotment plus a portion of the community land equivalent to the size of the community land divided by the approved number of allotments plus one for a community facility, divided by two. I believe it should parallel the two points above it and simply say: For secondary dwellings and dual occupancies: the area of the allotment divided by two.	Page 17 of guidelines amended as per submission. Point C was removed on the basis that it must be demonstrated within any application that the allotment is capable of accepting the load from a secondary dwelling.