End of Waste Code

Biosolids (ENEW07359617)

Waste Reduction and Recycling Act 2011

Queensland Government

Version history

Version	Date	Description of changes
1.00	01 January 2019	EOW Code
1.01	08 October 2019	Environmental Protection Regulation 2019 update
2.00	01 January 2020	Amendment EOW Code – approval by gazette on 20 December 2019
2.01	23 June 2023	Minor update to reflect the definition of waste moving into the *Waste Reduction and Recycling Act 2011*. This does not impact the interests of the producer or user of the resource.
2.02	28 March 2024	Updated department name to reflect machinery of government changes and the definition of serious or material harm.

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Contents

1. Explanatory Statement

This End of Waste (EOW) code for **biosolids** has been issued by the Queensland Government in accordance with section 159 of the *Waste Reduction and Recycling Act 2011* (WRR Act).

This EOW code states when the **biosolids** becomes a **resource** and any relevant requirements and/or conditions for its use. If the **resource** is not being used in accordance with the relevant requirements and/or conditions of this EOW code, or another type of permit that allows for its use, it is considered a waste under section 8AA of the WRR Act and must be disposed of appropriately at a facility that is lawfully able to receive the waste.

2. Guidance

2.1 Resource use versus activity

An EOW code states when a waste stops being a waste following any necessary processing or treatment. A waste becomes a **resource** when it has been determined to meet the requirements of an EOW code. It may be necessary to treat or process the waste prior to meeting those requirements. An Environmental Authority (EA) under the *Environmental Protection Act 1994* (EP Act) is required where an activity being undertaken triggers the threshold for any environmentally relevant activity (ERA).

This means that treating or processing the waste to meet the resource quality criteria under the EOW code may require an EA under the EP Act if the activity meets the threshold for an ERA with an exception of what is permitted under the requirements and conditions of this EOW code.

2.2 Resource versus waste

A waste that is a **resource** under an EOW code is considered a **resource** only for the use(s) approved in an EOW code. If a **resource** does not meet the requirements of the EOW code and/or is not used in accordance with the EOW code, it is not deemed a **resource**. It remains a waste and must be managed in accordance with waste management requirements under the EP Act and the WRR Act and their subordinate legislation.

A **resource** approved under an EOW code, is deemed to be a waste again, if it is disposed of at a waste disposal facility, or if it is deposited at a place in a way that would, apart from its use approved under an EOW code, constitute a contravention of the general littering provision or the illegal dumping of waste provision under the WRR Act.

2.3 Failure to comply

It is an offence under section 158(1) of the WRR Act for a **registered resource producer** to produce the **resource**, or use, sell or give away the **resource** if they do not comply with the requirements under an EOW code. Further, it is an offence under section 158(2) of the WRR Act for a **person** to use the **resource** in a way, or for a purpose, that does not comply with an EOW code. These offences carry a maximum penalty of 1,665 penalty units for an individual and 8,325 penalty units for a corporation[1].

Please refer to Appendix A of this EOW code for general obligations for all persons operating under this EOW code, which includes the **resource users**.

2.4 Lawfulness of the activity

The issuing of this EOW code for the use of the **resource** does not warrant or imply the lawfulness of the activity under all legislation, or that approvals necessary under other legislation have or will be approved. It is the responsibility of the **registered resource producer** and **resource user** to identify and obtain all other approvals necessary for the relevant activities.

[1] The value of a penalty unit is stated in the *Penalties and Sentences Regulation 2015* (Qld).

3. Period of this EOW code

This amendment EOW code takes effect from 01 January 2020 and remains in force until it is cancelled, amended or suspended[2] by the chief executive.

4. Waste to which this EOW code applies

This EOW code is limited to **biosolids** that meet the criteria in *Table 1 – Resource quality criteria* of this EOW code. The waste becomes a **resource** when the requirements and conditions under this EOW code are met.

5. Person to whom this EOW code applies

5.1 Registered resource producers of the resource

5.1.1 Prior to operating under this EOW code, the producer of the **resource** must register with the **chief executive** by giving a notice in the approved form[3] that the **person** intends to become a **registered resource producer** for this EOW code.

5.1.2 A registered resource producer for this EOW code must comply with the stated registered resource producer requirements in Section 6 – Registered Resource Producer Requirements.

5.2 Resource users

5.2.1 The **resource user** must only use the **resource** in a way, and for a purpose allowed under this EOW code.

5.2.2 The resource user must comply with the stated conditions of use in Section 7 – Conditions of Use.

5.2.3 Prior to operating under this EOW code, a **person** who intends to use the approved **resource** must notify the **chief executive** by giving a notice in the approved form[4] that the person intends to become a **resource user** for this EOW code.

[2] If an EOW code is to be amended, cancelled or suspended, the chief executive will provide an opportunity to make written submissions by providing a proposed action notice to the registered resource producers; and publishing the proposed action notice on the chief executive's website.
[3] The approved form, *Registered Resource Producer for an EOW code,* is available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2018/4082) as a search term.
[4] The approved form, *Notification of use of a resource* is available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2018/4552) as a search term.

6. Registered resource producer requirements

(6.1)	The **registered resource producer** must not use, sell or give away the **resource** unless it meets the stated criteria in *Table 1 – Resource quality criteria* for the approved use in accordance with this EOW code.

(6.2) **Table 1 – Resource quality criteria**

Resource	Criteria
Biosolids	1. Generated from a **sewage treatment plant**. 2. Meets the **biosolids** quality characteristic requirements for one or more of the classifications in *Table 2 – Biosolids classification requirements*. 3. Despite criterion 2 above, biosolids which is being transferred from the **sewage treatment plant** to the **registered resource producer** or **resource user** is considered a **resource** if: a) the stabilised biosolids being taken to the **site** of use is from a source that has met *Table 3 –Contaminant limits* in accordance with the continuous sampling procedure under the **NSW Biosolids Guidelines** for continuous operation in the last 17 samples and is awaiting contaminant analysis for compliance verification in the current monitoring event; or b) 'Stabilisation Grade B' biosolids, that also meets *Table 3 – Maximum contaminant limits* in accordance with the continuous sampling procedure under the **NSW Biosolids Guidelines** for continuous operation or with the batch sampling procedure for batch operations, is being taken to the application **site** to meet the barrier option in accordance with *Table 4 – Biosolids Stabilisation Requirement*. 4. Any **biosolids** which is determined to be non-compliant with *Requirements (6.2.2)* or *(6.2.3)*, other than biosolids awaiting reprocessing for reclassification, is considered to revert to classification as a **regulated waste** and must be taken by a **regulated waste transporter** to a facility that is lawfully permitted to accept **regulated waste**.

(6.3) **Table 2 – Biosolids classification requirements[5]**

Biosolids classification	Biosolids quality characteristics
Unrestricted use	1. The quality of the **resource** meets the following requirements: a) Contaminant limit in column 'Grade A' of *Table 3 – Contaminant limits*; b) At least one pathogen reduction requirement and one vector reduction requirement for 'Stabilisation Grade A' of *Table 4 - Biosolids stabilisation requirements*; c) Enteric viruses <1PFU per 4 grams (total dry weight); d) Helminth ova <1 per 4 grams (total dry weight); e) E-coli <100 MPN per grams (dry weight); f) Faecal coliforms <1000 MPN per gram (dry weight); and g) Salmonella species – Not detected.
Restricted use 1	2. The quality of the **resource** must meet the following requirements: a) Contaminant limit in column 'Grade B' of *Table 3 – Contaminant limits*; b) At least one pathogen reduction requirement and one vector reduction requirement

[5] Under this EOW code, it is the **registered resource producer**'s responsibility to ensure the quality of the **resource** has been determined before providing it to the **resource user**. It is the **resource user's** responsibility to ensure that biosolids are of a quality that is suitable for the site location and land application use they will be undertaking.

	for 'Stabilisation Grade A' of *Table 4 - Biosolids stabilisation requirements*; c) Enteric viruses <1PFU per 4 grams total dry weight; d) Helminth ova <1 per 4 grams total dry weight; e) E-coli <100 MPN per gram dry weight; f) Faecal coliforms <1000 MPN per gram dry weight; and g) Salmonella species – Not detected.
Restricted use 2	3. The quality of the **resource** must meet the following requirements: a) Contaminant limits in column 'Grade C' of *Table 3 – Contaminant limits*; and b) At least one pathogen reduction requirement and one vector reduction requirement for 'Stabilisation Grade B' of *Table 4 - Biosolids stabilisation requirements*.
PFU = Plaque-forming unit MPN = Most probable number	

(6.4) **Table 3 – Contaminant limits**

Quality characteristic	**Contaminant limits (dry mass) in mg/kg***		
	Grade A	**Grade B**	**Grade C**
Arsenic	20	20	20
Cadmium	3	5	20
Chromium (total)	100	250	500
Copper	150	375	2000
Lead	150	150	420
Mercury	1	4	15
Nickel	60	125	270
Selenium	5	8	50
Zinc	300	700	2500
Per and poly-fluoroalkyl substances (PFAS)	Monitoring required	Monitoring required	Monitoring required
Total Organic Fluorine (extractable)	Monitoring required	Monitoring required	Monitoring required
DDT/DDD/DDE	0.5	0.5	1.00
Aldrin	0.02	0.2	0.5
Dieldrin	0.02	0.2	0.5
Chlordane	0.02	0.2	0.5
Heptachlor	0.02	0.2	0.5
HCB	0.02	0.2	0.5
Lindane	0.02	0.2	0.5
BHC	0.02	0.2	0.5
PCBs	Not detected**	0.3	1.00

Notes:

* Contaminant limits are NOT mean values. Refer to Schedule 2 of the **NSW Biosolids Guidelines**.

**Not detected at a limit of detection of 0.1 mg/kg.

(6.5) **Table 4 – Biosolids stabilisation requirements**

Pathogen Reduction Process	Vector Attraction Reduction Requirements
Stabilisation Grade A	
Biosolids have been treated using one of the following methods: 1. Thermally treated biosolids a) **Biosolids** > 7% solids with temperature at least 50° Celsius. The equation for the time-temperature requirement is: D= (131,700,000)/ ($10^{0.1400t}$), where D = time required in days, t = temperature in degrees Celsius. This option includes pasteurisation at 70°C for 30 mins; b) **Biosolids** > 7% solids. This option includes **composting** at 55°C for 3 consecutive days. c) **Biosolids** > 7% solids that are small particles heated by contact with either warmed gases or an immiscible liquid. The temperature should be at least 50°C for at least 15 seconds using the equation above. This option includes **biosolids** in contact with a hot gas stream in a rotary drier or **biosolids** dried in a multiple-effect evaporator system. d) **Biosolids** < 7% solids and less than 30 minutes contact time. Use equation 1 for contact times > 15 seconds and < 30 minutes. e) **Biosolids** < 7% solids and > 30 minutes contact time at 50° C or higher use equation (2) below: D = (50,070 000) / ($10^{0.1400t}$) This option includes thermophilic **aerobic digestion**. 2. High pH—high temperature process The pH of the **biosolids** product is to be raised to greater than or equal to pH 12 and remain above pH 12 for 72 hours. During at least 12 hours of the 72-hour period, temperature of the **biosolids** product must be greater than 52°C. After 72 hours **biosolids** product must be air dried to a solids content of more than 50%. 3. **Biosolids** from unknown processes For **biosolids** where the history of processing is not known, the product will be subject to a program of testing for the microbiological parameters contained in Table 2.	1. Treatment in an engineered system, operating within its design envelope, able to achieve the relevant metrics through either validated mathematical simulation, or physical testing[a]. 2. **Anaerobically digested biosolids** must have no more than 17% further volatile solids reduction when incubated under anaerobic conditions in a bench scale reactor for an additional 40 days at 35-37° C. 3. Aerobically digested **biosolids** must have no more than 15% further volatile solids reduction when incubated under aerobic conditions in a bench scale reactor for an additional 30 days at 20°C. 4. As an alternative to requirement 3, specific oxygen uptake rate for **biosolids** treated by an aerobic process have been less than 1.5 mg 02/hour/g total solids at 20°C.[b] 5. The pH value of the **biosolids** have been raised to 12 and without the addition of further alkali shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours. 6. For **biosolids** which contain stabilised solids only, the proportion of dry solids must be at least 75%. 7. For **biosolids** which contain unstabilised solids generated in a primary wastewater treatment process the proportion of dry solids have been at least 90%. 8. **Biosolids** have been treated in an aerobic process for at least 14 days. During that time, the temperature of the **biosolids** have been >40°C and the average temperature >45° C. This option relates primarily to composting as a stabilization process for biosolids with the feed being unstabilised solids.
Stabilisation Grade B	

1. **Anaerobic digestion** 2. **Aerobic digestion** 3. Air drying 4. **Composting**[c] 5. Lime **stabilisation** 6. Extended aeration[d]	One of the vector attraction reduction requirements from Stabilisation A above or one of the following requirements: Process Option (for Stabilisation B only) 1. At least 20 days continuous or intermittent extended aeration including **aerobic digestion** time, or 2. At least six (6) months lagoon-based treatment (i.e., storage) at ambient temperatures. Barrier Options (for Stabilisation B only) The barrier options are intended for biosolids generated from a stabilisation process (including extended aeration), which does not otherwise meet the performance metrics noted for Grade A, but does not represent an undue risk[e]. 3. The barrier option is not be applied to **biosolids** from unstabilised solids generated in a primary wastewater treatment process. 4. **Biosolids** will be injected below the surface of the land or: 5. **Biosolids** applied to the land surface must be incorporated within six hours of application on the land.

Notes:

[a] Physical testing or validation by an **appropriately qualified person** may be used to verify that the process achieves metric 2 or metric 3 under anaerobic or aerobic digestion processes respectively. The additional volatile solids reduction (AVSR) test should be conducted with the previous month average Sludge Retention Time (SRT) or Hydraulic Retention Time (HRT) recorded. The HRT or SRT is to be chosen as the measure best representing the average time that the solids are retained under reactive conditions.

To determine the AVSR at a given HRT or SRT, the following equation may be used:

$$AVSR_2 = AVSR_1 \frac{1+kt_1-kf_d t_1}{1+kt_2-kf_d t_2}$$

Where $AVSR_2$ is the predicted additional volatile solids reduction at desired retention time t_2(d), $AVSR_1$ is the measured volatile solids reduction at retention time t_1, *k* is the apparent sludge hydrolysis coefficient (d^{-1}),.

For anaerobic processes, the default *k* value is 0.3 d^{-1}, and f_d is the sludge degradability. An f_d of 0.4 may be used for activated sludge, 0.6 for a mix of activated and primary sludge (50/50) and 0.8 for primary sludge only.

For aerobic processes (extended aeration or aerobic digestion), a default *k* value of 0.3 d^{-1}, and an f_d value of 0.6 may be used.

These parameters may be corrected where multiple tests (at different times) are taken. It should be noted that the correction equation is relatively insensitive to the f_d value.

The minimum monthly average SRT or HRT is that which achieves an AVSR according to the metric provided in the table.

[b] The method above may not be used to correct SOUR, which is regarded as an on-going test method rather than a process validation technique.

[c] The PFAS National Environmental Management Plan provides that that dilution of **PFAS** contaminated waste into compost is not permitted. If composting is used as a stabilisation process, the resulting material must be used under this code and any other extraneous material used to facilitate the composting process must not contain any material concentrations of **PFAS**.

[d] Extended aeration is nominally defined as an activated sludge treatment process with an SRT of greater than 20d (monthly average). The barrier option should be applied to solids with a shorter SRT.

[e] Undue-risk solids are those which may represent a high pathogen risk or excessive level of unstabilised solids. A process achieving the metrics outlined in the table will achieve a 1.5-2 log reduction on most indicator organisms compared with primary sewage solids. The prescribed level of undue risk is identified as those which are achieving less than 1-log reduction compared with primary sewage

solids. Examples include anaerobic digestion with a HRT of less than 7 days, or an activated sludge treatment system with an SRT of less than 12 days.	
(6.6)	The **registered resource producer** must ensure that the classification of the **resource** has been determined according to the **biosolids** quality characteristics stated in *Table 2 - Biosolids classification requirements.*
Resource monitoring	
(6.7)	The **registered resource producer** must ensure that monitoring of the quality of **resource** is conducted for per and poly-fluoroalkyl substances (PFAS), including as a minimum C_4-C_{14} perfluoroalkyl carboxylic acids, C_4 –C_{10} perfluoroalkyl sulfonic acids, perfluoroalkyl sulphonamides and n:2 flourotelomer sulfonic acids and Total Organic Fluorine (extractable using the same or similar techniques for PFAS analysis).
(6.8)	When undertaking monitoring of the quality of the **resource** for PFAS: a) quality assurance measures for Total Oxidisable Precursor (TOP) Assay in section 19.2 of the PFAS National Environmental Management Plan (prepared by the Heads of Environmental Protection Agencies) must be complied with, including checks against PFAS results for corresponding non-oxidised samples; b) analysis techniques must achieve lowest practicable limits of reporting and maximise extraction of PFAS from samples; and c) any advice from the chief executive officer concerning improvements in analysis techniques must be considered.
(6.9)	Monitoring and analysis undertaken to determine the classification of the **resource** and quality of the **resource,** including that for PFAS, must be conducted with samples[6] taken at least for every 120 dry tonnes of the **resource** to be used.
(6.10)	Where the composition of the **resource** has changed or is likely to change, more frequent monitoring must be conducted to sufficiently detect the extent of any change[6].
(6.11)	Monitoring to determine the quality of the **resource** must be carried out on samples that are representative of the **resource** to be used.
(6.12)	Prior to the initial supply of the **resource** to a **resource user** and following any variation of the quality of the supply, the **registered resource producer** must make the **resource user** aware in writing of the classification of, and contaminant analysis results applicable to, the **resource** supplied.
(6.13)	The **registered resource producer** must record details of the following: a) the determination of the classification of **resource** as required by *Requirement (6.6)* of this EOW code; and b) results of ongoing sampling and characterisation, including analysis results.
(6.14)	All analyses undertaken as a part of this EOW code must be carried out by a laboratory that has **NATA** certification, or an equivalent certification, for such analyses.
(6.15)	Sampling and analysis conducted as a requirement of this EOW code must be undertaken by an **appropriately qualified person**.

[6] Resource sampling and analysis should be conducted in accordance with the procedures detailed in *Schedule 1— Biosolids sampling and analysis procedures* and *Schedule 2— Grading, sampling and compliance procedures* of the **NSW Biosolids Guidelines.**

Transport	
(6.16)	The **resource** must be transported in a vehicle fit for purpose that ensures prevention of the release of the **resource** into the environment during transport.
Records	
(6.17)	The **registered resource producer** must keep the following **records** each time the **resource** is provided for use: a) origin of the **resource** (e.g. address, lot on plan, or GPS coordinates); b) date of dispatch of the **resource**; c) destination of the resource; d) classification of the resource and analysis results; e) information provided to the **resource user** concerning classification and quality of the **resource**; f) business name, **ABN** and address of the **person** receiving the **resource**; and g) quantity of the resource supplied (in tonnes).
(6.18)	The **registered resource producer** must keep **records** of all requirements, including monitoring requirements, under this EOW code for a period of at least five (5) years and provide the records to the **chief executive** upon request within 10 business days and in the format requested.

7. Conditions of use

Approved uses	
(7.1)	The approved **resource** is **biosolids** that comply with the quality criteria listed in *Table 1 – Resource quality criteria* and is used for the relevant uses stated in *Table 5 – Approved uses and conditions for resource users.*
(7.2)	The **resource user** must ensure that the **resource** is only applied to land as a fertiliser or soil ameliorant for the allowable land application use according to its classification stated in *Table 2 - Biosolids classification requirements*.
(7.3)	The **resource** must only be used for a stated use in *Table 5 – Approved uses and conditions for resource users* where the **resource user** complies with all of the relevant conditions for that use.
(7.4)	Where the **resource** is to be used for more than one approved use, the **resource user** must comply with all conditions for those uses in accordance with *Table 5 – Approved uses and conditions for resource users.*

(7.5) **Table 5 – Approved uses and conditions for resource users**

Biosolids classification	Allowable land application use	Biosolids quality characteristics
Unrestricted use	Home lawns and gardens	1. The quality of the resource meets the following requirements:

	Public contact sites **Urban Landscaping** **Agriculture** Forestry Soil and site rehabilitation	a) Contaminant limits in column 'Grade A' of *Table 3 - Contaminant limits*; and b) At least one pathogen reduction requirement and one vector reduction requirement for 'Stabilisation Grade A' of *Table 4 - Biosolids stabilisation requirements* c) Enteric viruses <1PFU per 4 grams (total dry weight) d) Helminth ova <1 per 4 grams (total dry weight) e) E-coli <100 MPN per grams (dry weight) f) Faecal coliforms <1000 MPN per gram (dry weight) g) Salmonella species – Not detected
Restricted use 1	**Public contact sites** **Urban Landscaping** **Agriculture** Forestry Soil and site rehabilitation	1. The quality of the resource must meet the following requirements: a) Contaminant limits in column 'Grade B' of *Table 3 - Contaminant limits*; and b) At least one pathogen reduction requirement and one vector reduction requirement for 'Stabilisation Grade A' of *Table 4 - Biosolids stabilisation requirements* c) Enteric viruses <1PFU per 4 grams total dry weight d) Helminth ova <1 per 4 grams total dry weight e) E-coli <100 MPN per gram dry weight f) Faecal coliforms <1000 MPN per gram dry weight g) Salmonella species – Not detected
Restricted use 2	**Agriculture** Forestry Soil and site rehabilitation	1. The quality of the resource must meet the following requirements: a) Contaminant limits in column 'Grade C' of *Table 3 - Maximum contaminant limits*; and b) At least one pathogen reduction requirement and one vector reduction requirement for 'Stabilisation Grade B' of *Table 4 - Biosolids stabilisation requirements*
PFU = Plaque-forming unit MPN = Most probable number		

Written Procedures	
(7.6)	The use of the **resource** must be undertaken in accordance with the **written procedures** that: a) identify potential risks of **environmental harm** from using the **resource** during routine operations and **emergencies;** and b) establish and maintain control measures that minimise the potential for **environmental harm**.
Transport	
(7.7)	The **resource** must be transported in a vehicle fit for purpose that ensures prevention of the release of the **resource** into the environment during transport.
Storage	

(7.8)	The **resource** must not be stored on the application area for a period exceeding 30 days unless the biosolids are stored within a site with a valid environmental authority for the purpose of site rehabilitation.
(7.9)	The **resource** must be stored in areas located outside the buffer distances stated in *Table 7 – 8 Minimum buffer zones to sensitive receptors*.
(7.10)	All areas used to store the **resource** must be bunded so that overland flow of stormwater is excluded from either entering or leaving the bunded area.
(7.11)	Water that is collected within bunded storage areas must only be irrigated to the **resource** application area in a manner that prevents **release** to **waters**.
Site suitability[7]	
(7.12)	The suitability of each **resource** application area must be assessed by an **appropriately qualified person** before each application.
(7.13)	The suitability assessment required by *Condition (7.12)* must include: a) an assessment of the existing soil nutrient and **contaminant** levels and determination of the assimilative capacity of the soil in accordance with the **NSW Biosolids Guidelines**; b) a determination of the soil pH level in accordance with the soil sampling procedure given in NSW Biosolids Guidelines; c) a determination of the groundwater (standing water level) during both wet and dry seasons; and d) an assessment of seasonal climate and flood risk[8].
(7.14)	The details of any assessment undertaken in accordance with *Conditions (7.11)* and *(7.12)* must be provided on request to the **chief executive** within 10 business days.
(7.15)	The **resource** must not be applied to land that: a) has a soil pH of less than $3.5_{(CaCl_2 \text{ method})}$; b) has groundwater (standing water level) located lesser than 3 metres below the surface (during either wet or dry seasons); c) has a surface rock outcrop of greater than 10% of the area to which the **resource** is applied**.**
(7.16)	Prior to initial supply of the **resource** to the application area, consultation about the application of the **resource** must be conducted with any landholders or occupiers of the neighbouring land where the **resource** application is to occur.
(7.17)	For the consultation conducted in accordance with *Condition (7.16)*, following records must be kept: a) date of consultation undertaken; and b) full name and address of the person consulted.

[7] The site suitability section covering *Requirements (7.12) to (7.17)* are not applicable when biosolids is being used on the capped area for rehabilitation in accordance with a valid environmental authority for the site.
[8] Resource application must be avoided within the identified exclusion period for identified flood risk area in accordance with council approved flood plain mapping.

Land application of the resource	
(7.18)	The application of the **resource** to land must be conducted at not more than an agronomic loading rate determined in accordance with the latest version of the **NSW Biosolids Guidelines**[9], taking into consideration the limits for the parameters listed in *Table 6 - Maximum allowable soil contaminant concentrations.*
(7.19)	The application of the **resource** to land must not result in soil **contaminant** concentrations exceeding the limits for the parameters listed in *Table 6 - Maximum allowable soil contaminant concentrations.*
(7.20)	The **resource** must be spread on land at a uniform rate and incorporated into the soil within 36 hours of spreading unless it is used within a site with a valid environmental authority for the purpose of site rehabilitation.
(7.21)	Any excess **biosolids** (following application) are considered to be **regulated waste**, and must be taken to a location lawfully able to accept the material, and must not be stored or re-applied to the application areas of each **site**.
(7.22)	The following **records** must be kept by the **resource user** for each **resource** application: a) details of the land on which the application occurs (e.g. GPS locations of the farms and blocks); b) date and time of application; c) the calculated application rate at which the **resource** is applied; d) the actual application rate; e) land use of the application including crops grown and intended to be grown, including if any are intended for human consumption; and f) whether the land will be used for grazing stock or production of plant material to be used as food for stock.
(7.23)	**Table 6 – Maximum allowable soil contaminant concentrations**

Contaminant	**Maximum allowable soil contaminant concentration (mg/kg dry weight of soil)**
Arsenic	20 or Background + 3* (whichever is greater)
Cadmium	1
Chromium (total)	100 or Background + 10* (whichever is greater)
Copper	100 or Background + 10* (whichever is greater)
Lead	150
Mercury	1
Nickel	60 or Background + 10* (whichever is greater)
Selenium	5
Zinc	200 or Background + 10* (whichever is greater)
Per and poly-fluoroalkyl substances (PFAS)	Refer *Condition (7.31)*

[9] The agronomic loading rate should be no greater than the lower of the nitrogen limited biosolids application (NLBAR) or the contaminant limited biosolids application rate (CLBAR) according to **NSW Biosolids Guidelines** as of 12 December 2018.

DDT/DDD/DDE	0.50
Aldrin	0.02
Dieldrin	0.02
Chlordane	0.02
Heptachlor and heptachlor epoxide	0.02
Hexacholorobenzene	0.02
Lindane	0.02
Benzene hexachloride	0.02
PCBs	Not detected**

Notes:

* The background value is that determined as the 'measured in-situ soil contaminant concentration' prior to the first biosolids application on the land under this approval.

**Not detected at a limit of detection of 0.1mg/kg.

(7.24) An appropriately qualified person must provide for and detail all of the following:

a) Sampling and analysis using standard and Total Oxidisable Precursor (TOP) Assay analysis to determine PFAS concentrations in soil prior to application of the **resource**.

b) The calculation of expected PFAS concentrations in soil after application of the **resource** considering:

i. the **resource**'s PFAS concentrations;

ii. existing PFAS concentrations measured in soil prior to application; and

iii. the calculated application (agronomic loading) rate determined in accordance with *Condition (7.18).*

c) Sampling and analysis of PFAS concentrations in soil after application of the **resource** and within 3 months of the application occurring.

(7.25) The **chief executive** must be notified within 24 hours in the event that PFAS concentrations are found to exceed any trigger values in *Table 7 – PFAS trigger values* after application of the **resource** to land.

(7.26) **Table 7 – PFAS trigger values**

Media	Contaminant	Trigger value
Soil	PFOS	0.001 mg/kg
	PFOS + PFHxS	0.002 mg/kg
	PFHxS	0.003 mg/kg
	PFOA	0.004 mg/kg
	PFBA, PFPeA, PFHxA	0.001 mg/kg
	Sum C_9 -C_{14} Perflouroalkyl carboxylic acids	0.01 mg/kg
	Perfluoroalkyl sulfonamides	0.001 mg/kg
	N:2 Fluorotelomer Sulfonic acids	0.004 mg/kg

Buffer distances	
(7.27)	The minimum buffer distances stated in *Table 8 - Minimum buffer zones to sensitive receptors* must be kept between all application areas and sensitive receptors.
(7.28)	**Table 8 – Minimum Buffer Zones to Sensitive Receptors**

Sensitive Receptor	**Minimum buffer distance (meters)**		
	Flat (<3% or <2°)	**Downslope[10] (>3% or >2°)**	**Upslope[11]**
Surface waters	50	100	5
Farm dams	20	30	5
Drinking water bores	250	250	250
Other bores	50	50	50
Farm driveways, forest roads & fence lines	5	5	5
Native forests & other significant vegetation types	10	10	5
Animal enclosures, property boundaries or land used for food production	25	50	25
Occupied dwelling	50	100	50
Residential zone	250	500	250

Application timeframes	
(7.29)	The r**esource** must not be applied to land within the timeframes stated in *Table 9 - Land use and harvesting timeframe restrictions*.
(7.30)	**Table 9 – Land use and harvesting timeframe restrictions**

Land use		**Timeframe in which the resource must not be applied**
Human food crops	Harvested parts do not touch the resource	30 days prior to harvesting
	Harvested parts touch the resource but are above the land surface (e.g. lettuce)	18 months prior to harvesting
	Harvested parts are below the surface of the land (e.g. carrots)	5 years prior to harvesting
Animal feed & fibre crops		30 days prior to harvesting
		30 days prior to grazing by animals Poultry and pigs must not be allowed to graze on **biosolids** application areas.

[10] Downslope refers to the situation where the sensitive receptor is at a lower point on the slope than the **biosolids** application area.
[11] Upslope refers to the situation where the sensitive receptor is at a higher point on the slope than the **biosolids** application area.

Animal withholding		90 days prior to grazing by lactating (including milk for human consumption) and new born animals
Turf		1 year prior to harvesting
Public access	Where there is high potential for public exposure	1 year prior to access
	Where there is low potential for public exposure	30 days prior to access

(7.31)	The **resource** and any contaminants in the resource must not be **released** directly or indirectly to land, air, or **waters** in a way that is not in accordance with the conditions of this EOW code and causes or may cause actual or potential environmental **nuisance** or **environmental harm**.
(7.32)	The **release** of noxious or offensive odours, or dust or any other airborne particulate matter must not cause a **nuisance** at a **sensitive place**
(7.33)	Noise generated from the use of the **resource** must not cause a **nuisance** at a **sensitive place**.
(7.34)	All complaints received regarding the use and transport of the **resource** must be recorded including investigations undertaken, conclusions formed, and action taken. This information must be made available on request to the **chief executive** within 10 business days.
(7.35)	The following **records** must be kept by the **resource user** for each **load** of the **resource** received: a) origin of the **resource**; b) quantity (in tonnes); c) date of collection; d) date of receipt; and e) destination (including the **site** address); and f) classification of the **resource** and the analysis results provided by the **registered resource producer**.
(7.36)	All **records** required by this EOW code must be kept for a period of at least five years and provided upon request to the **chief executive** within 10 business days.
Notification of **emergencies**, incidents and exceptions	
(7.37)	Any breach of a condition of this EOW code must be reported to the **chief executive** as soon as practicable and within 24 hours of becoming aware of the breach. **Records,** including full details of the breach and any subsequent actions taken, must be kept and provided to the chief executive upon request within 10 business days and in the format requested.

8. Definitions

Words and phrases used throughout this EOW code **in bold** are defined below. Where a definition for a term used in this EOW code is sought and the term is not defined within this EOW code, the definitions provided in the relevant legislation shall be used.

'aerobic digestion' means the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by micro-organisms in the presence of oxygen.

'agriculture' means the current or future use of land for agriculture which includes horticulture, turf and any purpose of husbandry. This includes keeping or breeding livestock, and growing fruit, vegetables, field crops or pastures.

'anaerobic digestion' means the biochemical decomposition of the organic matter in sewage sludge into methane gas and carbon dioxide by mirco-organisms in the absence of oxygen.

'animal enclosure' means an enclosure for intensive husbandry of livestock such as pigs, cattle and poultry; and does not include grazing purposes.

'application area' means relevant location(s) where the resource is applied in accordance with this EOW code.

'appropriately qualified person' means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

'biosolids' means treated tank sludges and residues from a **sewage treatment plant** including sedimentation tank and clarifier sludges, aerobically and anaerobically digested sludge and cake products from those sewage treatment plants.

'chief executive' means the Department of Environment, Science and Innovation or its successor.

'composting' means the aerobic, biological decomposition of the organic constituents of **biosolids** and other organic products under controlled conditions. The rate of composting is dependent upon a number of factors, but key factors include: moisture content, carbon to nitrogen ratio, aeration, temperature and microbial population.

'contaminant' (as defined in Section 11 of the *Environmental Protection Act 1994*), unless authorised under this approval means —

(a) a gas, liquid or solid; or

(b) an odour; or

(c) an organism (whether alive or dead), including a virus; or

(d) energy, including noise, heat, radioactivity and electromagnetic radiation; or

(e) a combination of contaminants.

'emergency(ies)'means a situation where either human health or safety is threatened, or serious or material environmental harm has been or is likely to be caused; and urgent action is necessary to protect the health or safety of persons, or prevent or minimise the harm, or rehabilitate or restore the environment because of the harm.

'environmental harm' means environmental harm as defined in Chapter 1 of the *Environmental Protection Act 1994.*

'load' means the volume of resource put in or on something for conveyance or transportation, carried at one time. A truck and trailer carrying the resource is considered as one load as well as multiple bins travelling by rail.

Where the resource is transported via conveyor systems, information should be recorded on a daily basis until the transfer ceases.

'NSW Biosolids Guidelines' means the New South Wales Environmental Protection Authority *Environmental Guidelines: Use and Disposal of Biosolids Products* (2000) as of October 2019.

'nuisance' means environmental nuisance as defined in Section 15 of the *Environmental Protection Act 1994 and means* unreasonable interference or likely interference with an environmental value caused by—

(a) aerosols, fumes, light, noise, odour, particles or smoke; or

(b) an unhealthy, offensive or unsightly condition because of contamination; or

(c) another way prescribed by regulation.

'occupied dwelling' means a room or suite of rooms occupied on the property receiving **biosolids** or the adjoining property.

'person(s)' means an individual or a corporation.

'public contact site(s)' means land with a high potential for contact by the public, including public parks, fields, cemeteries, plant nurseries and golf courses.

'registered resource producer(s)' means a person who sells or gives away the resource to be used under this EOW code.

'resource user(s)' means a person who has entered into a written agreement with a **registered resource producer**, unless the registered resource producer and the resource user are the same entity, to use the resource in accordance with the conditions of this EOW code, and includes a registered resource producer who uses the resource.

'regulated waste' means regulated waste as defined in Section 65 of the Environmental Protection Regulation 2008.

'regulated waste transporter' means a waste transporter authorized for carrying out environmentally relevant activity 57 (Regulated waste transport) as authorised under the *Environmental Protection Act 1994.*

'release(d)' of a contaminant into the environment, includes —

(a) to deposit, discharge, emit or disturb the contaminant; and

(b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and

(i) to allow the contaminant to escape; and

(ii) to fail to prevent the contaminant from escaping.

'residential zone' means land identified in an environmental planning instrument as being predominantly for residential use, including urban, village or living area zones, but excluding rural residential zone.

'sewage treatment plant' also called 'waste water treatment plant' means a facility licenced for carrying out environmentally relevant activity 63 (Sewage treatment) as authorised under the *Environmental Protection Act 1994* or an equivalent lawfully approved facility from another State or Territory jurisdiction that is located within 20 kilometres of the Queensland border.

'sensitive place' means –

a) a dwelling, mobile home or caravan park, residential marina or other residential place; or

b) a motel, hotel or hostel; or

c) a kindergarten, school, university or other educational institution; or

d) a medical centre or hospital; a protected area; a park or garden; or

e) a place used as an office or for business or commercial purposes and includes the curtilage of any such place; or

f) a public park or garden.

'site' means the relevant location(s) in terms of lot and plan.

'stabilisation' means the process of **biosolids** to reduce or eliminate the potential for putrefaction and which, as a result, reduces pathogens, vector attraction and offensive odours.

'urban landscaping' means landscaping undertaken for aesthetic or rehabilitation purposes within an urban environment, and includes all public landscaping but not residential areas.

'waters' includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part-thereof.

'written procedures' means a document prepared by an **appropriately qualified person** that meets the requirements of *Condition (7.6)* of this EOW code.

- END -

Appendix A — General obligation for all persons

This appendix is not intended to provide a comprehensive assessment of all obligations under Queensland law. It provides some general information and persons are encouraged to familiarise themselves with all requirements related to their specific operation.

Responsibilities under the *Environmental Protection Act 1994*

All persons within the State of Queensland must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act.

General environmental duty

Section 319 of the *Environmental Protection Act 1994* (EP Act) states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to consider:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

More information is available on the Department of Environment, Science and Innovation website www.des.qld.gov.au.

Some relevant offences under the *Environmental Protection Act 1994*

Causing serious or material environmental harm (sections 437–39)

Material and serious environmental harm are defined in sections 16 and 17 of the EP Act. Material environmental harm is when the harm is not trivial or negligible in nature. Serious environmental harm is harm that is irreversible, of a high impact or widespread, or that is caused to an area of high conservation value or special significance. Damages, or costs required to rehabilitate the environment, of over thresholds amounts in the EP Act also constitutes material or serious environmental harm. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed water contaminants include a wide variety of contaminants listed in Schedule 10 of the Environmental Protection Regulation 2019.

It is your responsibility to ensure that prescribed water contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some relevant offences under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200 litres or more) at a place. Illegal dumping can also include abandoned vehicles.

Failure to comply with EOW code (section 158)

A registered resource producer for an EOW code must not produce, use, sell or give away the resource unless the registered resource producer complies with the requirements of the EOW code relating to the resource.

A person, other than a registered resource producer, must not use a resource in a way, or for a purpose, that does not comply with an EOW code for the resource.

Approved:

17 December 2019

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