

End of Waste Code Coal Combustion Products (ENEW07359717)

Waste Reduction and Recycling Act 2011

Version history

Version	Date	Description of changes
1.0	01 January 2019	Commencement of EOW code
2.0	September 2020	Draft Amendment

Prepared by: Waste and End of Waste Assessment, Department of Environment and Science

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September 2020

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1. Explanatory Statement

This End of Waste (EOW) code for **coal combustion products** has been issued by the **chief executive** in accordance with section 159 of the *Waste Reduction and Recycling Act 2011* (WRR Act).

This EOW code states when the coal combustion products become 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 13 of the *Environmental Protection Act 1994* (EP 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

Under section 155 of the WRR Act, a waste stops being a waste and becomes a **resource** when it meets the requirements and conditions of an EOW code. Under section 159 of the WRR Act, an EOW code specifies the circumstances when a waste becomes a resource; how it must be used to be considered a resource; when it is no longer considered a resource but a waste instead; and conditions that must be complied with by resources users and registered resource producers.

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.

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. To be considered a resource under the EOW code, the material used as the resource must meet the requirements of the EOW code and be used in accordance with the conditions of the EOW code, otherwise it is considered 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** under an EOW code, is deemed to be a waste again, if it is not used in accordance with the EOW code; if it is disposed of at a waste disposal site; 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 (section 103) or the illegal dumping of waste provision (section 104) 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** unless they 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 for the **resource**. These offences carry a maximum penalty of 1,665 penalty units for an individual and 8,325 penalty units for a corporation¹.

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**.

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

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.

3. Period of this EOW code

This EOW code takes effect from the day of gazettal of this EOW code and remains in force until it is amended, cancelled or suspended by the **chief executive**².

4. Waste to which this EOW code applies

This EOW code is limited to **coal combustion products** sourced from coal fired power stations and coal fired boilers. These **coal combustion products** become 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 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.

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](#).

6. Registered resource producer requirements

Registration under this EOW code				
(6.1)	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 to become a registered resource producer for this EOW code.			
Approved resource				
(6.2)	The approved resource is coal combustion products which complies with <i>Requirement (6.3)</i> of this EOW code.			
(6.3)	The registered resource producer must not use, sell or give away the resource under this EOW code unless the resource complies with all of the following criteria and quality characteristics: a) the resource does not exceed the quality criteria stated in <i>Table 1: Resource quality criteria</i> ; and b) where biomass used as additional fuel source includes biosolids containing per- and poly-fluoroalkyl substances (PFAS) contamination, the resource has been combusted at higher than 1100°C for at least 2 seconds.			
Table 1 – Resource quality criteria				
Quality characteristics	Limits for specific uses *			
	Bound applications	Total Maximum Concentration (mg/kg dry weight unless otherwise specified)		
		Unbound applications	Soil conditioner, soil product and direct land application	
Arsenic (total)	NS	20	20	
Beryllium	NS	NS	60	
Boron	NS	100	10**	
Cadmium	NS	1	1	
Chromium (total)	NS	100	100	
Chromium (III)	NS	NS	100	
Chromium (VI)	NS	1.5	1	
Cobalt	NS	100	100	
Copper	NS	100	100	
Lead	NS	50	50	
Mercury	NS	1	1	
Molybdenum	NS	NS	10	
Nickel	NS	60	60	
Selenium	NS	10	5	

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.

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Zinc	NS	200	200
Electrical conductivity	NS	NS	10,000(uS/cm)
pH	NS	5 – 12.5 (pH units)	5 – 12.5 (pH units)
Sum of PFOS and PFHxS***	1	0.01	Refer to Table 2 – PFAS limits
PFOA***	10	0.1	Refer to Table 2 – PFAS limits

NS = Not specified (monitoring of each element is still required).

* measured using **reference test methods**

** measured using hot CaCl₂ method

*** analysis only required if the resource is resulting from combustion of biomass with potential PFAS contaminant (e.g, biosolids)

Resource monitoring

- (6.4) The **registered resource producer** must sample, measure and record the composition of the **resource** for the quality characteristics in *Table 1 - Resource quality criteria* at a minimum of the following frequency:
- annually, where statistical analysis has been undertaken that demonstrates no significant (at minimum 95% Confidence Interval) difference in the mean and standard variation of contaminant concentrations; otherwise,
 - every six months.

Monitoring for PFAS

- (6.5) Where **biomass** used as additional fuel source includes **biosolids** containing PFAS contamination, the **registered resource producer** must sample, measure and record the quality of **resource** for PFAS for at least the following parameters:
- Total Oxidisable Precursor Assay (TOPA) with a minimum:
 - C₄-C₁₄ perfluoroalkyl carboxylic acids;
 - C₄-C₁₀ perfluoroalkyl sulfonic acids;
 - perfluoroalkyl sulphonamides;
 - n:2 fluorotelomer sulfonic acids; and
 - Total Organic Fluorine Assay (TOFA).
- (6.6) When sampling, measuring and recording the quality of **resource** for PFAS in accordance with *Requirement (6.5)*:
- analysis techniques must achieve lowest practicable limits of reporting;
 - analysis techniques must achieve maximum extraction of PFAS from samples following Australian Standard Leaching Procedure (ASLP) test, *Australia Standard AS4439*;
 - quality assurance measures for TOPA and TOFA must be complied with *Section 19.2 of the PFAS National Environmental Management Plan Version 2.0 – January 2020*, unless superseded by a revised or new version of the document, including checks against PFAS results for corresponding non-oxidised samples; and

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	d) any advice from the chief executive concerning improvements in analysis techniques must be implemented.
(6.7)	All sampling and monitoring required under this EOW code must be carried out by an appropriately qualified person .
(6.8)	All analysis required under this EOW code must be carried out by a laboratory that has NATA certification, or an equivalent certification, for such analyses.
Information to be provided	
(6.9)	<p>The registered resource producer must provide the following to the resource user upon establishment of an arrangement to sell or give away the resource, and annually thereafter:</p> <ul style="list-style-type: none"> a) a copy of the EOW code for <i>Coal Combustion Products (ENEW07359717)</i>⁴; b) the registered resource producer's business name, ABN and address; c) confirmation in writing that the resource being supplied is compliant with <i>Requirement (6.3)</i> of this EOW code; d) a most recent certificate of analysis for the quality characteristics listed in <i>Table 1: Resource quality criteria</i>; and e) safety data sheet for the resource.
Records	
(6.10)	<p>The registered resource producer must keep the following records for the resource supplied to a resource user:</p> <ul style="list-style-type: none"> a) origin of the resource (e.g. address, lot on plan and/or GPS coordinates); b) quantity (in tonnes) of the resource supplied; c) quality criteria of the resource (including but not limited to the quality characteristics listed in <i>Table 1: Resource quality criteria</i>); d) date of dispatch of the resource; and e) business name, ABN and address of the person receiving the resource.
(6.11)	<p>All records required to be kept by the registered resource producer under this EOW code must be:</p> <ul style="list-style-type: none"> a) kept by the registered resource producer for a period of not less than five (5) years; and b) provided to the chief executive upon request, in the format requested and time period specified.
Notification of emergencies , incidents and breaches	
(6.12)	Any breach of a requirement of this EOW code must be reported to the chief executive within 24 hours of becoming aware of the breach.

⁴ This can be a physical copy, an electronic copy or a link to the chief executive's [website](#) where this EOW code is available.

(6.13)	Records of any breach of a requirement of this EOW code, including full details of the breach and any subsequent actions taken, must be kept and provided to the chief executive upon request, in the format requested and in the time period specified.
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7. Conditions of use

Approved uses	
(7.1)	<p>The approved resource is coal combustion products that comply with <i>Requirement (6.3)</i> of this EOW code and is used for the following purposes:</p> <ul style="list-style-type: none"> a) in bound applications in accordance with <i>Condition (7.2)</i>; b) in unbound applications in accordance with <i>Conditions (7.3)</i> and <i>(7.4)</i>; c) as a feedstock in the manufacture of soil conditioner in accordance with <i>Conditions (7.5)</i>, <i>(7.6)</i> and <i>(7.7)</i>; d) as a feedstock in the manufacture of soil product in accordance with <i>Conditions (7.5)</i>, <i>(7.6)</i> and <i>(7.8)</i>; and e) in direct land application in accordance with <i>Conditions (7.5)</i>, <i>(7.6)</i> and <i>(7.9)</i>.
Resource use in bound applications	
(7.2)	<p>The resource used in bound applications must only be used in manufacturing processes and applications which encapsulate or chemically transform and incorporate the resource into a final product that complies with relevant Australian Standards⁵ for that product. Final products for the purpose of this EOW code are limited to:</p> <ul style="list-style-type: none"> a) cementitious mixes; b) cement products; c) concrete products; d) asphalt; e) binder for road stabilisation pavements; f) rigid and composite pavements structures; g) ceramic products; h) insulators; i) varnishes, plastics, ceramics, ultra-light concrete and metal alloys; j) paints, coatings and adhesives; k) geopolymers; and l) rubbers.
Resource use in unbound applications	

⁵ In the absence of Australian Standards for the product, it is required that the final product meets any other appropriate industry standards (e.g. Registered Professional Engineer of Queensland certified technical specifications).

(7.3)	Use of the resource in unbound applications is limited to the below applications on standard areas : a) pipe bedding materials; b) sub-surface drainage; c) road pavement, base, sub-base and subgrade structures; d) select layers which act as working platforms at the top of earthworks; and e) engineered construction works ⁶ .																				
(7.4)	Resource users undertaking an unbound application must not use the resource : a) below the groundwater table; b) within 50m of a water supply bore; and c) if the site of use has pH greater than 8.																				
Resource use in the manufacturing of soil conditioner, soil product and/or in direct land application																					
(7.5)	A person who intends to use the resource in the manufacture of soil conditioner , soil product and/or in direct land application must notify the chief executive by giving a notice in the approved form ¹ at least 10 days prior to the commencement of using the resource .																				
(7.6)	Where the resource is generated from the use of biosolids containing PFAS contamination, the resource must not exceed the quality criteria stated in <i>Table 2: PFAS limits</i> for the use in manufacturing soil conditioner, soil product and/or in direct land application. Table 2 – PFAS limits <table><tr><th>Media</th><th>Contaminant</th><th>Limit</th></tr><tr><td rowspan="8">Coal combustion products for use in soil conditioner, soil product and in direct land application</td><td>PFOS</td><td>0.001 mg/kg</td></tr><tr><td>PFOS + PFHxS</td><td>0.002 mg/kg</td></tr><tr><td>PFHxS</td><td>0.003 mg/kg</td></tr><tr><td>PFOA</td><td>0.004 mg/kg</td></tr><tr><td>PFBA, PFPeA, PFHxA</td><td>0.001 mg/kg</td></tr><tr><td>Sum C₉ -C₁₄ Perfluoroalkyl carboxylic acids</td><td>0.01 mg/kg</td></tr><tr><td>Perfluoroalkyl sulfonamides</td><td>0.001 mg/kg</td></tr><tr><td>N:2 Fluorotelomer Sulfonic acids</td><td>0.004 mg/kg</td></tr></table>	Media	Contaminant	Limit	Coal combustion products for use in soil conditioner, soil product and in direct land application	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 Perfluoroalkyl carboxylic acids	0.01 mg/kg	Perfluoroalkyl sulfonamides	0.001 mg/kg	N:2 Fluorotelomer Sulfonic acids	0.004 mg/kg
Media	Contaminant	Limit																			
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	PFOA	0.004 mg/kg																			
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	N:2 Fluorotelomer Sulfonic acids	0.004 mg/kg																			
(7.7)	The resource must only be used to manufacture soil conditioner that meets the requirements of AS 4454 .																				
(7.8)	The resource must only be used to manufacture soil product that meets the requirements of AS 4419 .																				
(7.9)	Resource users undertaking direct land application of the resource must only do so in naturally acidic soils: a) to correct the identified agronomic deficiency in land to which it is applied; and																				

⁶ Use of the resource at a **facility** as fill material must be carried out in accordance with the requirements of an environmental authority that authorises Environmentally Relevant Activity (ERA) 60 as prescribed under Schedule 2 of the Environmental Protection Regulation 2019.

	b) where the final soil pH does not exceed 8 pH unit after application of the resource .
Records	
(7.10)	The resource user must record the following information for the resource received by the resource user under this EOW code: <ul style="list-style-type: none"> a) business name, ABN and address of the registered resource producer who supplied the resource; b) date the resource user received the resource; c) quantity (in tonnes) of the resource received by the resource user; and d) site of use of resource (e.g. street address, lot on plan and/or GPS coordinates).
(7.11)	All records required to be kept by the resource user under the conditions of this EOW code must be: <ul style="list-style-type: none"> a) kept by the resource user for a period of not less than five (5) years; and b) provided to the chief executive upon request, in the format requested and time period specified.
Notification of emergencies, incidents and exceptions	
(7.12)	Any breach of a condition of this EOW code must be reported to the chief executive within 24 hours of becoming aware of the breach.
(7.13)	Records of any breach of a condition of this EOW code, including full details of the breach and any subsequent actions taken, must be kept and provided to the chief executive upon request, in the format requested and time period specified.

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.

‘ABN’ means Australian Business Number which is a unique 11-digit number issued by the Australian Business Register and identifies a business in Australia.

‘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.

‘AS 4419’ means Australian Standard 4419 Soils for landscaping and garden use (2003), or its most recent version.

‘AS 4454’ means Australian Standard 4454 Composts, soil conditioners and mulches (2012), or its most recent version.

‘biomass’ means plant or animal material, such as, wood chips and/or **biosolids**.

‘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.

'cenosphere(s)' means inert, hollow, essentially thin-walled glass spheres of approximately 10–350 microns having a typical density of 0.4–0.8g/cm³, comprised largely of silica and alumina and filled with air and/or gasses which are formed from coal combustion ash when in a molten state.

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

'coal combustion products' means **fly ash**, **furnace bottom ash** or **cenosphere(s)** resulting from the burning of coal within coal fired power stations and coal fired boilers where at least 90% of the fuel source is coal and up to 10% of the fuel source can be **biomass** material (e.g. wood chip, **biosolids**), and where no other source of fuel is mixed other than petroleum based gas or liquid fuel for ignition support.

'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.

'engineered construction works' means:

- a) where the **resource user** uses the **resource** in accordance with an applicable prescribed engineering standard; and/or
- b) engineer designed civil applications that have been certified by a Registered Professional Engineer of Queensland (RPEQ) as suitable for its intended purpose.

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

'facility' means a naturally occurring or constructed hollow, pit or void (e.g. a gully, mining shaft or quarry).

'fly ash' means solid material extracted from the flue gasses of a boiler fired primarily with pulverised coal, consisting essentially of the oxides of silicon, aluminium, iron and some calcium of which particle sizes range from less than 1µm (micrometre) to 200µm and are irregular to spherical shape.

'furnace bottom ash' means the agglomerated particles formed at the bottom of the furnace. Furnace bottom ash is typically grey to black in colour, is quite angular, and has a porous surface structure.

'load' means the volume of **resource** put in or on something for conveyance or transportation, carried at one time and to one **site of use**. For example, 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.

'NATA' means the National Association of Testing Authorities.

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

'records' include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a requirement or condition of this EOW code.

'reference test methods' means the reference test methods for determining the contaminant and as described in the most recent version of the United States Environmental Protection Agency's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* [available December 2013 at www.epa.gov/epaoswer/hazwaste/test/sw846.htm, also known as SW-846].

'registered resource producer(s)' means a **person** who produces the **resource** and has registered with the **chief executive** (in accordance with *Requirement (6.1)*) to use, sell or give away the **resource** to be used under this EOW code.

'resource(s)' means **coal combustion products** that meet the criteria and quality characteristics in *Requirement (6.3)* of this EOW code.

‘resource user(s)’ means a **person** who uses the **resource** for the use approved under this EOW code and in such a manner which does not cause any **environmental harm**, and includes the producer who uses the resource. Where the **resource user** uses the **resource** in the manufacture of soil conditioner, soil product or in direct land application, notification must be made in the approved form in accordance with *Condition (7.5)* of this EOW code.

‘safety data sheet’ means a document containing data regarding the properties of the **resource** which provides information on handling or working with that substance in a safe manner; and includes information such as physical data toxicity, environmental characteristics, health effects, first aid, reactivity; and storage, disposal, protective equipment and spill handling procedures. The safety data sheet must be compliant with Safe Work Australia’s *Model Code of Practice: Preparation of safety data sheets for hazardous chemicals*.

‘site of use’ means the relevant location(s) where the **resource user** uses the **resource** in accordance with this EOW code.

‘soil conditioner’ means a substance added to soil to improve the growing conditions for plant roots by providing nutritional requirements.

‘soil product’ means general purpose soils, top dressing, topsoil and landscaping mixes manufactured in accordance with **AS 4419**.

‘standard areas’ mean land use including residential, parks, recreational play fields, open spaces and commercial and industrial sites; excluding a **facility** and **waters** and the bed and banks of waters.

‘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.

- 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* 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.

It is not an offence not to comply with the general environmental duty. However, maintaining your general environmental duty is a defence against the following acts:

- (a) an act that causes serious or material environmental harm or an environmental nuisance
- (b) an act that contravenes a noise standard
- (c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Science 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 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 \$5000 constitutes material environmental harm and damages, or costs required to rehabilitate the environment, of over \$50,000 constitutes 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.

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.

9. Approved by

sch4 Contrary to public

Signature

21 September 2020

Date

Kathrin Sherman
Director, Waste Operations
Delegate of the Chief Executive
Waste Reduction and Recycling Act 2011

Enquiries:

Waste and End of Waste Assessment
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Ph. **13 QGOV** (13 74 68)

From: sch4 Contrary to public
To: [RRS Consultation](#)
Cc: sch4 Contrary to public interest; [sha Sharma](#); [Kimberley Marian](#); [Radhika Rao](#); [Scott Blanchard](#)
Subject: CCAA feedback - draft EOW Code for Coal Combustion Products
Date: Wednesday, 18 November 2020 10:10:16 AM
Attachments: [IMAGE_1.jpeg](#)
[CCAA feedback - EoW Code draft-amendment-coal-combustion-products - November 2020.pdf](#)
Importance: High

Dear DES Waste Operations Team

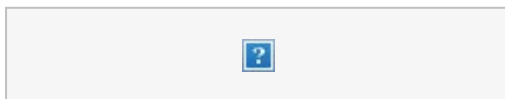
Please find attached the CCAA feedback on the draft EOW Codes for Coal Combustion Products (comments in pdf document). We thank you for the opportunity to make a submission, and please do not hesitate to contact me if you have any questions regarding the feedback.

Take care

sch4 Contrary to p

sch4 Contrary to public interest

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End of Waste Code Coal Combustion Products (ENEW07359717)

Waste Reduction and Recycling Act 2011

End of waste code
Coal Combustion Products (ENEW07359717)

Version history

Version	Date	Description of changes
1.0	01 January 2019	Commencement of EOW code
2.0	September 2020	Draft Amendment

Prepared by: Waste and End of Waste Assessment, Department of Environment and Science

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September 2020

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1. Explanatory Statement

This End of Waste (EOW) code for **coal combustion products** has been issued by the **chief executive** in accordance with section 159 of the *Waste Reduction and Recycling Act 2011* (WRR Act).

This EOW code states when the coal combustion products become 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 13 of the *Environmental Protection Act 1994* (EP 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

Under section 155 of the WRR Act, a waste stops being a waste and becomes a **resource** when it meets the requirements and conditions of an EOW code. Under section 159 of the WRR Act, an EOW code specifies the circumstances when a waste becomes a resource; how it must be used to be considered a resource; when it is no longer considered a resource but a waste instead; and conditions that must be complied with by resources users and registered resource producers.

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.

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. To be considered a resource under the EOW code, the material used as the resource must meet the requirements of the EOW code and be used in accordance with the conditions of the EOW code, otherwise it is considered 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** under an EOW code, is deemed to be a waste again, if it is not used in accordance with the EOW code; if it is disposed of at a waste disposal site; 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 (section 103) or the illegal dumping of waste provision (section 104) 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** unless they 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 for the **resource**. These offences carry a maximum penalty of 1,665 penalty units for an individual and 8,325 penalty units for a corporation¹.

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**.

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

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.

3. Period of this EOW code

This EOW code takes effect from the day of gazettal of this EOW code and remains in force until it is amended, cancelled or suspended by the **chief executive**².

4. Waste to which this EOW code applies

¹ This EOW code is limited to **coal combustion products** sourced from coal fired power stations and coal fired boilers. These **coal combustion products** become 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 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.

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](#).

Summary of Comments on Draft amendment of end of waste code

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 Number: 1 Author: CCAA Subject: Highlight Date: 17/11/2020 2:41:56 PM

CCAA suggests that this clause be more exclusive in regards to fuels that are allowed to be used by powerstations to produce CCPs compliant to the EoW. For example, considering returning details on ignition support fuels and add biomass as an alternative fuel to coal. Wording in Section 8. Definitions for Coal Combustion By-Products should be added to this clause for clarity.

Proposed amendment to first line of clause is:

This EoW code is limited to coal combustion products sourced from coal fired power stations and coal fired boilers where at least 90% of the fuel source is coal and up to 10% of the fuel source can be biomass material (e.g. wood chip, biosolids), and where no other source of fuel is mixed other than petroleum based gas or liquid fuel for ignition support.

Currently this clarification is only provided in the definitions.

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6. Registered resource producer requirements

Registration under this EOW code	
(6.1)	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 to become a registered resource producer for this EOW code.
Approved resource	
(6.2)	The approved resource is coal combustion products which complies with <i>Requirement (6.3)</i> of this EOW code.
(6.3)	<p>The registered resource producer must not use, sell or give away the resource under this EOW code unless the resource complies with ¹all of the following criteria and quality characteristics:</p> <p>a) the resource does not exceed the quality criteria stated in <i>Table 1: Resource quality criteria</i>; ²and</p> <p>³ where biomass used as additional fuel source includes biosolids containing per- and poly-fluoroalkyl substances (PFAS) contamination, the resource has been combusted at higher than 1100°C for at least 2 seconds.</p>

Table 1 – Resource quality criteria

Quality characteristics	Limits for specific uses *		
	Bound applications	Total Maximum Concentration (mg/kg dry weight unless otherwise specified)	
		Unbound applications	Soil conditioner, soil product and direct land application
Arsenic (total)	NS	20	20
Beryllium	NS	NS	60
Boron	NS	100	10**
Cadmium	NS	1	1
Chromium (total)	NS	100	100
Chromium (III)	NS	NS	100
Chromium (VI)	NS	1.5	1
Cobalt	NS	100	100
Copper	NS	100	100
Lead	NS	50	50
Mercury	NS	1	1
Molybdenum	NS	NS	10
Nickel	NS	60	60
Selenium	NS	10	5

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.

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Propose amendment:

....with either one or both of the following criteria and quality characteristics.

Currently by saying it must comply with "all" it indicates that b) must be part of creation of the 'resource'. Alternatively, include "or" after "and" between a) and b).

Status

sch4 Contra ccepted 16/11/2020 9:32:48 AM

 Number: 2 Author: CCAA Subject: Highlight Date: 16/11/2020 9:37:01 AM

Suggested amendments:

Either delete "and", or change to - "and / or".

 Number: 3 Author: CCAA Subject: Highlight Date: 16/11/2020 9:40:52 AM

New condition - to allow for biomass, including biosolids containing PFAS, as fuel source. Note that currently the condition reads that the resource must contain this. It should be amended to reflect that it may.

note - this new line item is an issue of contention with resource users, e.g. TMR. and impact to quality of fly-ash for use in concrete.

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Zinc	NS	200	200
Electrical conductivity	NS	NS	10,000(uS/cm)
pH	NS	5 – 12.5 (pH units)	5 – 12.5 (pH units)
Sum of PFOS and PFHxS***	1	0.01	Refer to Table 2 – PFAS limits
PFOA***	10	0.1	Refer to Table 2 – PFAS limits

NS = Not specified (monitoring of each element is still required).

* measured using **reference test methods**

** measured using hot CaCl₂ method

*** analysis only required if the resource is resulting from combustion of biomass with potential PFAS contaminant (e.g, biosolids)

Resource monitoring

- 15.4)** The **registered resource producer** must sample, measure and record the composition of the **resource** for the quality characteristics in *Table 1 - Resource quality criteria* at a minimum of the following frequency:
- annually, where statistical analysis has been undertaken that demonstrates no significant (at minimum 95% Confidence Interval) difference in the mean and standard variation of contaminant concentrations; otherwise,
 - every six months.

Monitoring for PFAS

- (6.5)** Where **biomass** used as additional fuel source includes **biosolids** containing PFAS contamination, the **registered resource producer** must sample, measure and record the quality of **resource** for PFAS for at least the following parameters:
- Total Oxidisable Precursor Assay (TOPA) with a minimum:
 - C₄-C₁₄ perfluoroalkyl carboxylic acids;
 - C₄-C₁₀ perfluoroalkyl sulfonic acids;
 - perfluoroalkyl sulphonamides;
 - n:2 fluorotelomer sulfonic acids; and
 - Total Organic Fluorine Assay (TOFA).
- (6.6)** When sampling, measuring and recording the quality of **resource** for PFAS in accordance with *Requirement (6.5)*:
- analysis techniques must achieve lowest practicable limits of reporting;
 - analysis techniques must achieve maximum extraction of PFAS from samples following Australian Standard Leaching Procedure (ASLP) test, *Australia Standard AS4439*;
 - quality assurance measures for TOPA and TOFA must be complied with *Section 19.2 of the PFAS National Environmental Management Plan Version 2.0 – January 2020*, unless superseded by a revised or new version of the document, including checks against PFAS results for corresponding non-oxidised samples; and

Current clause 6.4 on notification on change to resource should be added to the draft as clause 6.5.

This clause should also be extended, or an additional clause provided, to notify when biomass is used to replace coal and at what proportion.

Proposed clause 6.5 for draft EoW is:

6.5.1 Where the composition of the resource has changed or is likely to change, additional monitoring must be conducted which is sufficient to detect and characterise the extent of any change, until such time that the composition is no longer likely to change and that results demonstrate that the material is compliant with Table 1 – Resource quality criteria before it is used as a resource under this EOW code.

6.5.2 Where biomass is proposed to be used as a fuel replacement for coal the registered resource producer should notify the resource user.

Clause 6.7 in draft EoW is in PFAS section but should be included as clause 6.6 in Resource Monitoring section to clarify requirement applies to all monitoring activities.

Clause 6.8 in draft is in PFAS section but should be included as clause 6.7 in Resource Monitoring section to clarify requirement applies to all monitoring activities.

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	d) any advice from the chief executive concerning improvements in analysis techniques must be implemented.
1 (5.7)	All sampling and monitoring required under this EOW code must be carried out by an appropriately qualified person .
2 (5.8)	All analysis required under this EOW code must be carried out by a laboratory that has NATA certification, or an equivalent certification, for such analyses.
Information to be provided	
(6.9)	<p>The registered resource producer must provide the following to the resource user upon establishment of an arrangement to sell or give away the resource, and annually thereafter:</p> <ul style="list-style-type: none"> a) a copy of the EOW code for <i>Coal Combustion Products (ENEW07359717)</i>⁴; b) the registered resource producer's business name, ABN and address; c) confirmation in writing that the resource being supplied is compliant with <i>Requirement (6.3)</i> of this EOW code; d) a most recent certificate of analysis for the quality characteristics listed in <i>Table 1: Resource quality criteria</i>; and e) safety data sheet for the resource.
Records	
(6.10)	<p>The registered resource producer must keep the following records for the resource supplied to a resource user:</p> <ul style="list-style-type: none"> a) origin of the resource (e.g. address, lot on plan and/or GPS coordinates); b) quantity (in tonnes) of the resource supplied; c) quality criteria of the resource (including but not limited to the quality characteristics listed in <i>Table 1: Resource quality criteria</i>); d) date of dispatch of the resource; and e) business name, ABN and address of the person receiving the resource.
(6.11)	<p>All records required to be kept by the registered resource producer under this EOW code must be:</p> <ul style="list-style-type: none"> a) kept by the registered resource producer for a period of not less than five (5) years; and b) provided to the chief executive upon request, in the format requested and time period specified.
Notification of emergencies, incidents and breaches	
(6.12)	Any breach of a requirement of this EOW code must be reported to the chief executive within 24 hours of becoming aware of the breach.

⁴ This can be a physical copy, an electronic copy or a link to the chief executive's [website](#) where this EOW code is available.

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Clause 6.7 in draft EoW is in PFAS section but should be included as clause 6.6 in Resource Monitoring section to clarify requirement applies to all monitoring activities.

 Number: 2 Author: CCAA Subject: Highlight Date: 16/11/2020 9:42:44 AM

Clause 6.8 in draft is in PFAS section but should be included as clause 6.7 in Resource Monitoring section to clarify requirement applies to all monitoring activities.

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(6.13)	Records of any breach of a requirement of this EOW code, including full details of the breach and any subsequent actions taken, must be kept and provided to the chief executive upon request, in the format requested and in the time period specified.
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7. Conditions of use

Approved uses	
(7.1)	<p>The approved resource is coal combustion products that comply with <i>Requirement (6.3)</i> of this EOW code and is used for the following purposes:</p> <ul style="list-style-type: none"> a) in bound applications in accordance with <i>Condition (7.2)</i>; b) in unbound applications in accordance with <i>Conditions (7.3)</i> and <i>(7.4)</i>; c) as a feedstock in the manufacture of soil conditioner in accordance with <i>Conditions (7.5)</i>, <i>(7.6)</i> and <i>(7.7)</i>; d) as a feedstock in the manufacture of soil product in accordance with <i>Conditions (7.5)</i>, <i>(7.6)</i> and <i>(7.8)</i>; and e) in direct land application in accordance with <i>Conditions (7.5)</i>, <i>(7.6)</i> and <i>(7.9)</i>.
Resource use in bound applications	
(7.2)	<p>The resource used in bound applications must only be used in manufacturing processes and applications which encapsulate or chemically transform and incorporate the resource into a final product that complies with relevant ¹Australian Standards⁵ for that product. Final products for the purpose of this EOW code are limited to:</p> <ul style="list-style-type: none"> a) cementitious mixes; b) cement products; c) concrete products; d) asphalt; e) binder for road stabilisation pavements; f) rigid and composite pavements structures; g) ceramic products; h) insulators; i) varnishes, plastics, ceramics, ultra-light concrete and metal alloys; j) paints, coatings and adhesives; k) geopolymers; and l) rubbers.
Resource use in unbound applications	

⁵ In the absence of Australian Standards for the product, it is required that the final product meets any other appropriate industry standards (e.g. Registered Professional Engineer of Queensland certified technical specifications).

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Suggest that this may be amended to say:

"...with relevant Australian Standards *and industry specifications*").

Note that ash that contains biomass will not meet requirements of the Australian ash standard AS3582.1, therefore will be unable to be used as a resource regardless.

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(7.3)	Use of the resource in unbound applications is limited to the below applications on standard areas : a) pipe bedding materials; b) sub-surface drainage; c) road pavement, base, sub-base and subgrade structures; d) select layers which act as working platforms at the top of earthworks; and e) 1 engineered construction works⁶ .																				
(7.4)	Resource users undertaking an unbound application must not use the resource : a) below the groundwater table; b) within 50m of a water supply bore; and c) if the site of use has pH greater than 8.																				
Resource use in the manufacturing of soil conditioner, soil product and/or in direct land application																					
(7.5)	A person who intends to use the resource in the manufacture of soil conditioner, soil product and/or in direct land application must notify the chief executive by giving a notice in the approved form ¹ at least 10 days prior to the commencement of using the resource .																				
(7.6)	Where the resource is generated from the use of biosolids containing PFAS contamination, the resource must not exceed the quality criteria stated in <i>Table 2: PFAS limits</i> for the use in manufacturing soil conditioner, soil product and/or in direct land application. Table 2 – PFAS limits <table><tr><th>Media</th><th>Contaminant</th><th>Limit</th></tr><tr><td rowspan="8">Coal combustion products for use in soil conditioner, soil product and in direct land application</td><td>PFOS</td><td>0.001 mg/kg</td></tr><tr><td>PFOS + PFHxS</td><td>0.002 mg/kg</td></tr><tr><td>PFHxS</td><td>0.003 mg/kg</td></tr><tr><td>PFOA</td><td>0.004 mg/kg</td></tr><tr><td>PFBA, PFPeA, PFHxA</td><td>0.001 mg/kg</td></tr><tr><td>Sum C₉ -C₁₄ Perfluoroalkyl carboxylic acids</td><td>0.01 mg/kg</td></tr><tr><td>Perfluoroalkyl sulfonamides</td><td>0.001 mg/kg</td></tr><tr><td>N:2 Fluorotelomer Sulfonic acids</td><td>0.004 mg/kg</td></tr></table>	Media	Contaminant	Limit	Coal combustion products for use in soil conditioner, soil product and in direct land application	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 Perfluoroalkyl carboxylic acids	0.01 mg/kg	Perfluoroalkyl sulfonamides	0.001 mg/kg	N:2 Fluorotelomer Sulfonic acids	0.004 mg/kg
Media	Contaminant	Limit																			
Coal combustion products for use in soil conditioner, soil product and in direct land application	PFOS	0.001 mg/kg																			
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	PFOA	0.004 mg/kg																			
	PFBA, PFPeA, PFHxA	0.001 mg/kg																			
	Sum C ₉ -C ₁₄ Perfluoroalkyl carboxylic acids	0.01 mg/kg																			
	Perfluoroalkyl sulfonamides	0.001 mg/kg																			
	N:2 Fluorotelomer Sulfonic acids	0.004 mg/kg																			
(7.7)	The resource must only be used to manufacture soil conditioner that meets the requirements of AS 4454 .																				
(7.8)	The resource must only be used to manufacture soil product that meets the requirements of AS 4419 .																				
(7.9)	Resource users undertaking direct land application of the resource must only do so in naturally acidic soils: a) to correct the identified agronomic deficiency in land to which it is applied; and																				

⁶ Use of the resource at a **facility** as fill material must be carried out in accordance with the requirements of an environmental authority that authorises Environmentally Relevant Activity (ERA) 60 as prescribed under Schedule 2 of the Environmental Protection Regulation 2019.

 Number: 1 Author: CCAA Subject: Highlight Date: 16/11/2020 9:43:12 AM
Clarification required as to when ERA 60 is required to be followed for "engineered construction works".

Is this only for waste disposal facilities or all engineered fill applications?

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	b) where the final soil pH does not exceed 8 pH unit after application of the resource .
Records	
1	<p>(7.10) The resource user must record the following information for the resource received by the resource user under this EOW code:</p> <ul style="list-style-type: none"> a) business name, ABN and address of the registered resource producer who supplied the resource; b) date the resource user received the resource; c) quantity (in tonnes) of the resource received by the resource user; and d) site of use of resource (e.g. street address, lot on plan and/or GPS coordinates).
	<p>(7.11) All records required to be kept by the resource user under the conditions of this EOW code must be:</p> <ul style="list-style-type: none"> a) kept by the resource user for a period of not less than five (5) years; and b) provided to the chief executive upon request, in the format requested and time period specified.
2	Notification of emergencies, incidents and exceptions
	<p>(7.12) Any breach of a condition of this EOW code must be reported to the chief executive within 24 hours of becoming aware of the breach.</p>
	<p>(7.13) Records of any breach of a condition of this EOW code, including full details of the breach and any subsequent actions taken, must be kept and provided to the chief executive upon request, in the format requested and time period specified.</p>

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.

‘ABN’ means Australian Business Number which is a unique 11-digit number issued by the Australian Business Register and identifies a business in Australia.

‘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.

‘AS 4419’ means Australian Standard 4419 Soils for landscaping and garden use (2003), or its most recent version.

‘AS 4454’ means Australian Standard 4454 Composts, soil conditioners and mulches (2012), or its most recent version.

‘biomass’ means plant or animal material, such as, wood chips and/or **biosolids**.

‘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.

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New Records conditions for **resource users**. These will become onerous and in relation to 7.10 d) will be very difficult / impossible to comply with. Unclear as to the value this new requirement is.

Note - this is similar to the Industry argument to the same condition that was included in the aggregates EoW code.

Recommend that this condition be taken out or significantly amended. If amended propose that 7.10 d) be removed.

 Number: 2 Author: CCAA Subject: Highlight Date: 17/11/2020 3:17:15 PM

 Number: 3 Author: CCAA Subject: Sticky Note Date: 17/11/2020 3:20:33 PM

Is this a replication of clause 6.12 or does one apply to Producers and the other to Users?

 Author: Sch4 Contr Subject: Sticky Note Date: 17/11/2020 3:20:33 PM

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'cenosphere(s)' means inert, hollow, essentially thin-walled glass spheres of approximately 10–350 microns having a typical density of 0.4–0.8g/cm³, comprised largely of silica and alumina and filled with air and/or gasses which are formed from coal combustion ash when in a molten state.

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

'coal combustion products' means **fly ash, furnace bottom ash or cenosphere(s)** resulting from the burning of coal within coal fired power stations and coal fired boilers where at least 90% of the fuel source is coal and up to 10% of the fuel source can be **biomass** material (e.g. wood chip, **biosolids**)¹ and where no other source of fuel is mixed other than petroleum based gas or liquid fuel for ignition support.

'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.

'engineered construction works' means:

- a) where the **resource user** uses the **resource** in accordance with an applicable prescribed engineering standard; and/or
- b) engineer designed civil applications that have been certified by a Registered Professional Engineer of Queensland (RPEQ) as suitable for its intended purpose.

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

'facility' means a naturally occurring or constructed hollow, pit or void (e.g. a gully, mining shaft or quarry).

'fly ash' means solid material extracted from the flue gasses of a boiler fired primarily with pulverised coal, consisting essentially of the oxides of silicon, aluminium, iron and some calcium of which particle sizes range from less than 1µm (micrometre) to 200µm and are irregular to spherical shape.

'furnace bottom ash' means the agglomerated particles formed at the bottom of the furnace. Furnace bottom ash is typically grey to black in colour, is quite angular, and has a porous surface structure.

'load' means the volume of **resource** put in or on something for conveyance or transportation, carried at one time and to one **site of use**. For example, 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.

'NATA' means the National Association of Testing Authorities.

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

'records' include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a requirement or condition of this EOW code.

'reference test methods' means the reference test methods for determining the contaminant and as described in the most recent version of the United States Environmental Protection Agency's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* [available December 2013 at www.epa.gov/epaoswer/hazwaste/test/sw846.htm, also known as SW-846].

'registered resource producer(s)' means a **person** who produces the **resource** and has registered with the **chief executive** (in accordance with *Requirement (6.1)*) to use, sell or give away the **resource** to be used under this EOW code.

'resource(s)' means **coal combustion products** that meet the criteria and quality characteristics in *Requirement (6.3)* of this EOW code.

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1 **resource user(s)** means a **person** who uses the **resource** for the use approved under this EOW code and in such a manner which does not cause any **environmental harm**, and includes the producer who uses the resource. Where the **resource user** uses the **resource** in the manufacture of soil conditioner, soil product or in direct land application, notification must be made in the approved form in accordance with *Condition (7.5)* of this EOW code.

'safety data sheet' means a document containing data regarding the properties of the **resource** which provides information on handling or working with that substance in a safe manner; and includes information such as physical data toxicity, environmental characteristics, health effects, first aid, reactivity; and storage, disposal, protective equipment and spill handling procedures. The safety data sheet must be compliant with Safe Work Australia's *Model Code of Practice: Preparation of safety data sheets for hazardous chemicals*.

'site of use' means the relevant location(s) where the **resource user** uses the **resource** in accordance with this EOW code.

'soil conditioner' means a substance added to soil to improve the growing conditions for plant roots by providing nutritional requirements.

'soil product' means general purpose soils, top dressing, topsoil and landscaping mixes manufactured in accordance with **AS 4419**.

'standard areas' mean land use including residential, parks, recreational play fields, open spaces and commercial and industrial sites; excluding a **facility** and **waters** and the bed and banks of waters.

'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.

- END -

 Number: 1 Author: CCAA Subject: Highlight Date: 16/11/2020 9:44:44 AM

Proposed amendment - to include 'distribution' of the resource as part of the 'resource user' definition.

'resource user(s) means a person who uses the resources for the use approved under this EOW code, ***including distribution of the resource***, and in such a manner that does not cause environmental harm.....

This would also better cover applicability to activities relating to procurement of fly ash ('resource') from a resource producer, for the purposes of on-selling to a customer. For example, Cement Australia does not use the fly-ash to mix into a bound application (i.e. as per 7.2), our customers do this.

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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* 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.

It is not an offence not to comply with the general environmental duty. However, maintaining your general environmental duty is a defence against the following acts:

- (a) an act that causes serious or material environmental harm or an environmental nuisance
- (b) an act that contravenes a noise standard
- (c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Science 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 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 \$5000 constitutes material environmental harm and damages, or costs required to rehabilitate the environment, of over \$50,000 constitutes 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.

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:

21 September 2020

Enquiries:

Permit and Licence Management
Ph: 13 QGOV (13 74 68)
Email: palm@des.qld.gov.au

Our ref
Your ref ENEW07359717
Enquiries Wayne Roberts

Department of
Transport and Main Roads

11 November 2020

Kathrin Shermin
Department of Environment and Science (DES)
Queensland Government
Delegate of the Chief Executive
Waste Reduction and Recycling Act 2011

Proposed Amendments to the End of Waste Code ENEW07359717 for the reuse of coal combustion products as a resource.

Dear Kathrin

I am writing to you as the Deputy Chief Engineer (Structures), Queensland Department of Transport and Main Roads (TMR) to raise our concerns regarding the proposed changes to the End of Waste Code ENEW07359717 (EOW Code) for the reuse of coal combustion products as a resource which would allow co-combustion of biomass or biosolids in coal burning furnaces and power stations in QLD.

As DES are probably aware, TMR under the leadership of Alan Carse at the time, were one of the pioneers in the introduction and use of flyash in the cement and concrete industry in Queensland some 30 years ago. The use of flyash in concrete was to solve a critical technical issue with the long-term durability of concrete associated with the reaction between the alkaline cement paste and reactive silica found in many aggregates and sands. This reaction is known as alkali-silica reaction (ASR) and is currently estimated to be present in approximately 80% of concrete mixes supplied in QLD.

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Mobile sch4 Contrary to

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Email wayne.s.roberts@tmr.qld.gov.au
ABN 39 407 690 291

The use of 25 % flyash substitution for general purpose (GP) cement in concrete production is the internationally recognised best practice solution for effective long-term control of the ASR in concrete. To date no other practical, effective, or economical solution has emerged. For the effective use of flyash in concrete to control the ASR, both the chemical and physical properties of the flyash are critical. These include the absolute values and minimisation of variability in these attributes which is critical for efficient, reliable and cost-effective production of concrete, and which we believe would be adversely impacted by the proposed changes to the EOW Code. Currently, the requirements or specification for flyash for use in concrete are effectively controlled in Australia by Australian Standard AS3582.1

Supplementary Cementitious Materials Part 1 Flyash and Australian Technical Infrastructure Committee (ATIC) *Spec SP43 - Cementitious Materials for Concrete*. It should be noted that AS3582.1 definition of flyash is associated with material extracted from boilers fired only with pulverised coal. With the proposed amendment to allow co-combustion with biomass and biosolids, concrete grade flyash would then not comply with the requirements of AS3582.1 which would lead to further concrete industry issues and disruption.

We therefore have serious concerns regarding the proposed changes in the draft EOW Code for the reuse of coal combustion products in QLD. The proposed changes, which we understand would permit the burning of biomass or biosolids in coal fired furnaces and power stations from which flyash is collected for use in concrete, has the potential to significantly reduce the quality and useability (adverse impact on chemical and physical properties) of concrete grade flyash. We believe this would be to the point where concrete production in QLD could become uneconomic and /or unviable. This would lead to massive disruption in the construction industry generally and have a major impact on the QLD economy. It should also be noted that QLD flyash is recognised internationally for its quality due to the type of coal burnt in QLD and that QLD flyash is distributed and sold, for use in concrete, widely across both NSW and Victoria. Its use is also recognised as a significant contributor to the reduction in the carbon dioxide produced in relation to cement and concrete production.

Once we became aware of the proposed changes and the fact that the Ash Development Association of Australia (ADAA) were the proponents of this proposal, TMR met with the ADAA to understand the proposal and any technical basis for the proposal. It is also worth noting that the ADAA and TMR have previously met on a number of occasions to discuss flyash issues in concrete. The ADAA provided a technical presentation and paper and the following are key aspects we noted:

1. The technical paper was a literature review was dated December 2002 and appears to be based mostly on international data with little if any Australian data.
2. The technical paper appears to only support that the burning of up to 10% clean untreated wood or wood waste (not chemically treated or contaminated in anyway) with coal in a furnace of power station would give comparable flyash to coal only burning furnaces in power stations.
3. The technical paper is not clear on the effects of flyash if other forms or biomass or biosolids are burnt with coal but appears to indicate that if feasible much lower percentages may be appropriate.

4. In the technical presentation it was noted that the ADAA had campaigned unsuccessfully on more than one occasion to change AS3582.1 to allow co-combustion of biomass of biosolids in coal fired power stations from which flyash is collected.
5. Despite the ADAA being very familiar with TMR, the companies involved in collection and distribution of the flyash, and the concrete industry generally, none were consulted or informed of the proposal by the ADAA.
6. The technical information presented left TMR with very little, if any, confidence in that the quality of flyash collected from QLD power stations would still be suitable for use in concrete if the proposed EOW code amendments were accepted.

We have also consulted with the company that is responsible for the majority of the collection, distribution and technical support of flyash used in cement and concrete production in QLD (who also supply a significant proportion of the flyash used in NSW and VIC from QLD); the Cement Concrete & Aggregates Australia (CCAA) who are the peak industry body representing the cement and concrete industry in QLD, and the technical managers of two of the major concrete companies in QLD. All are generally very supportive of the department's position.

While TMR understands and acknowledges some of the drivers that are behind this proposal, we strongly recommend that the Department of Environment and Science does not make changes (permitting the burning or co combustion of biomass or biosolids) to the EOW code that could influence the chemical composition and physical properties of fly ash. TMR believes significant further research and investigation based on Australian materials to ensure that the concrete durability via the use of flyash is not adversely affected is required before changes can be made. TMR would be willing to collaborate with DES to participate in research and investigations into the potential impact to flyash used in cement and concrete production from the burning or co combustion of biomass and biosolids as a fuel source with coal.

Furthermore, TMR would also like to engage with the Department of Environment and Science to explore opportunities and mechanisms to motivate industry to start working on the technical and logistical challenges associated with reclamation and reprocessing of flyash for use in cement and concrete (and other potential applications) that is currently stored waste dams and waste storage areas at various power stations around QLD. As the reduction in coal fired electricity generating assets in Australia continues, reclamation and processing of this waste flyash will be critical for the cement and concrete industry and we believe that there is some industry support for this initiative if government can show some direction and priority for this.

We look forward to further contact and communication with DES on these issues. If you have any further technical questions on this issue please make contact with Dr Wayne Roberts, Manager (Concrete Materials) in my team.

Yours sincerely

sch4 Contrary to pul

Kenneth Jacobs



17 November 2020

Kim Marian
Environmental Officer
Waste and Contaminated Land Assessment – End of Waste
Waste Operations | Waste, Development and South-east Compliance
Department of Environment and Science
GPO Box 2454 Brisbane Q 4001

RE: EOW -Comment on the proposed amendments to the code.

Dear Kim

Thank you for providing the opportunity to comment on the draft amended EOW code for Coal Combustion Products.

Please find the following points for consideration:

Section 6. Registered resource producer requirements

We note that Section 6 of the draft amended code requires the approved resource to comply with additional requirement in 6.3 of the EOW code and includes the use of biomass and bio solids with the additional analysis of total PFAS contamination.

The suggested EOW change to include biomass as a fuel source is not likely to impact on cenospheres as a resource as they are used primarily in bound applications and are not typically used in direct land application.

Section 7 Conditions of use, and the new amendment to Records section 7.10

As the resource user, raw cenospheres received by Envirospheres from the resource producers are processed and classified into inert mineral additives for bound industrial applications.

Envirospheres presently maintain records for each load of the resource received (measured in cubic metres) as per section (7.2) of the current EOW Code (Version 1.00, Effective 01 Jan 2019) and suggests that the current requirements for record keeping remain unchanged.

Envirospheres would be happy to discuss these suggestions further with the Department if any further clarification is required.

sch4 Contrary to public interest

Anthony Caccan

sch4 Contrary

envirospheres

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From: [Karalyn Herse](#)
To: [Isha Sharma](#)
Cc: [Rosie Savoca](#); [David Drew \(DES\)](#)
Subject: RE: Draft EOW Codes for consultation - seeking clarification on draft amendments to EoW Code for CCPs
Date: Wednesday, 18 November 2020 8:15:12 AM
Attachments: [image001.png](#)
[image002.png](#)
[image005.png](#)
[image007.jpg](#)
[image009.png](#)
[image010.png](#)

Hi Isha,

Thanks for getting back to me and apologies for not following-up sooner.

Thanks for clarifying the intent. That is what we thought the footnote intended to state, but found it potentially ambiguous. As currently drafted, the footnote could be read as suggesting that CCP are a resource (and therefore not a waste) when used at a facility as fill material, as long as the ERA60 authorises the use of 'the resource' as fill (meaning that it is not waste disposal).

Engineered construction works, footnote (6), P10: *Use of the resource at a facility as fill material must be carried out in accordance with the requirements of an environmental authority that authorises Environmentally Relevant Activity (ERA) 60 as prescribed under Schedule 2 of the Environmental Protection Regulation 2019*

For your consideration, we suggest replacing 'resource' with 'coal combustion products' and explicitly stating, as per your response in the email below, that *use of CCPs in filling mine voids and any other voids either indefinitely or temporarily is not allowed under the EOW code.*

Happy to discuss further if you wish.

Also, do we need to send this suggestion as a formal submission to the RSS.Consultation@des.qld.gov.au email, or is it sufficient to raise directly with you?

Kind regards,

Karalyn

Karalyn Herse

Principal Project Officer

Office of Resource Recovery | Environmental Policy and Programs

Department of Environment and Science

(07) 3330 5813

Level 27 400 George Street Brisbane QLD 4000

GPO Box 2454 Brisbane QLD 4001

From: SHARMA Isha <Isha.Sharma@des.qld.gov.au>

Sent: Monday, 9 November 2020 10:07 AM

To: HERSE Karalyn

Cc: SAVOCA Rosie; DREW David (DES)

Subject: RE: Draft EOW Codes for consultation - seeking clarification on draft amendments to EoW Code for CCPs

Hi Karalyn,

Thanks for your email.

Yeah, I am available for a chat today. Just quickly though, the footnote is basically indicating that while use of the resource in engineered construction works is allowed under the code, its use as fill material (basically, filling a hole) will trigger ERA 60.

This means, use of CCP in filling mine void and any other void either indefinitely or temporarily is not allowed under the EOW code. This is to ensure that the EOW code is not conflicting with ERA 60 trigger.

Happy to discuss further.

Thanks and regards,

Isha Sharma

Team Leader

Waste Assessment

Waste Operations | Waste, Development & Southeast Compliance

Department of Environment and Science

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EHP Cultural capability_web graphic APPD



From: HERSE Karalyn <Karalyn.Herse@des.qld.gov.au>

Sent: Friday, 6 November 2020 10:10 AM

To: SHARMA Isha

Cc: SAVOCA Rosie; DREW David (DES)

Subject: RE: Draft EOW Codes for consultation - seeking clarification on draft amendments to EoW Code for CCPs

Hi Isha,

Thank you for your email about the draft EoW codes currently out for consultation.

The Waste Levy Implementation team are seeking clarification on our understanding on some of the text in the draft amendment EoW Code for Coal Combustion Products, in particular footnote 6 on page 10 of the. Are you free sometime Monday or Wednesday next week for a quick catch up?

Thanks,

Karalyn

Karalyn Herse

Principal Project Officer

Office of Resource Recovery | Environmental Policy and Programs

Department of Environment and Science

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Level 27 400 George Street Brisbane QLD 4000

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From: SHARMA Isha <Isha.Sharma@des.qld.gov.au>

Sent: Wednesday, 30 September 2020 7:56 AM

To: Compliance Support; HARBERT Kate; BRAIN Tim (DES); KARLE Matt; MACNAMARA Sasha; STEWART Christopher sch4 Contrary to public THOMAS Sally; BIRCH Kerynne; SUMMERVILLE Sinead; CLAYBOURN Dayna; MCCOSKER Juliana; SAVOCA Rosie

Cc: MARIAN Kimberley; ZHAO Lu; RAO Radhika; HAWAS Olga; SHERMAN Kathrin

Subject: Draft EOW Codes for consultation

Dear All,

The following three draft EOW codes and respective Notice of Proposed Action (NOPA) are available on the [department's website](#) for public consultation until **19**

November 2020.

- **Glycerol** - draft EOW code;
- **Fibre cement board** – draft EOW code; and
- **Coal combustion products (CCP)** – draft amendment EOW code and NOPA.

If you have comments/feedback on any of these consultation drafts, please let us know by the date mentioned above.

Thanks and regards,

Isha Sharma

Team Leader

Waste Assessment

Waste Operations | Waste, Development & Southeast Compliance

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