



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The processed electric arc furnace ladle slag order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of processed electric arc furnace ladle slag to which 'the processed electric arc furnace ladle slag exemption 2014' applies. The requirements in this order apply in relation to the supply of processed electric arc furnace ladle slag for application to land in line with the uses described in 'the processed electric arc furnace ladle slag exemption 2014'.

1. Waste to which this order applies

1.1. This order applies to processed electric arc furnace ladle slag blended with other materials. In this order, electric arc furnace ladle slag means waste from the steelmaking process that is formed during ladle furnace and casting operations. Ladle slag is a mixture of molten oxides and silicates that provides an insulating layer on top of the liquid steel in the ladle. When casting has been completed the liquid slag is allowed to cool and solidify

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies electric arc furnace ladle slag or processed electric arc furnace ladle slag that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of processed electric arc furnace ladle slag to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Generator requirements

The EPA imposes the following requirements on any generator who supplies electric arc furnace ladle slag to a processor.

Sampling requirements

- 4.1. On or before supplying electric arc furnace ladle slag, the generator must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the electric arc furnace ladle slag.
 - 4.1.2. Undertake sampling and testing of the electric arc furnace ladle slag as required under clauses 4.2 and 4.3 below. The sampling must be carried out in accordance with the written sampling plan and Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent).
- 4.2. Where the electric arc furnace ladle slag is generated as part of a continuous process, the generator must undertake the following sampling:
 - 4.2.1. Characterisation of the electric arc furnace ladle slag by collecting 20 composite samples of the waste and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of characterisation. Characterisation must be conducted for electric arc furnace ladle slag generated and processed during each 1-year period following the commencement of the continuous process; and
 - 4.2.2. Routine sampling of the electric arc furnace ladle slag by collecting either 5 composite samples from every 2,000 tonnes (or part thereof) processed or 5 composite samples every 3 months (whichever is the lesser); and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1 other than those listed as 'not required' in Column 3. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of routine sampling. However, if characterisation sampling occurs at the same frequency as routine sampling, any sample collected and tested for the purposes of characterisation under clause 4.2.1 may be treated as a sample collected and tested for the purposes of routine sampling under clause 4.2.2.
- 4.3. Where the electric arc furnace ladle slag is not generated as part of a continuous process, the generator must undertake one-off sampling of a batch, truckload or stockpile of the electric arc furnace ladle slag, by collecting and testing 10 composite samples from every 2,000 tonnes (or part thereof) generated and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1.

Chemical and other material requirements

- 4.4. The generator must not supply electric arc furnace ladle slag to any person if, in relation to any of the chemical and other attributes of the electric arc furnace ladle slag:
 - 4.4.1. The concentration or other value of that attribute of any sample collected and tested as part of the characterisation or the routine or one-off sampling of the electric arc furnace ladle slag exceeds the absolute maximum concentration or other value listed in Column 4 of Table 1, or
 - 4.4.2. The average concentration or other value of that attribute from the characterisation or one-off sampling of the electric arc furnace ladle slag (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 1, or
 - 4.4.3. The average concentration or other value of that attribute from the

routine sampling of the electric arc furnace ladle slag (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 3 of Table 1.

- 4.5. The absolute maximum concentration or other value of that attribute in any electric arc furnace ladle slag supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4 of Table 1.

Table 1

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Maximum average concentration for routine testing (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	Not Required	1
2. Cadmium	3	3	5
3. Lead	75	75	150
4. Arsenic	5	Not Required	10
5. Beryllium	5	Not Required	10
6. Boron ¹	NA	NA	NA
7. Chromium (total)	1%	Not Required	2%
8. Copper	150	150	300
9. Molybdenum	35	35	70
10. Nickel	50	50	100
11. Selenium	2	Not Required	5
12. Zinc	3500	3500	5000
13. Leachable concentration (TCLP) of Cadmium	0.025 mg/L	0.025 mg/L	0.05 mg/L
14. Leachable concentration (TCLP) of Chromium	1 mg/L	1 mg/L	2 mg/L
15. Leachable concentration (TCLP) of Copper	0.1 mg/L	0.1 mg/L	0.2 mg/L
16. Leachable concentration (TCLP) of Molybdenum	0.1 mg/L	0.1 mg/L	0.2 mg/L
17. Leachable concentration (TCLP) of Nickel	0.25mg/L	0.25mg/L	0.5mg/L
18. Leachable concentration (TCLP) of Zinc	2 mg/L	2 mg/L	4 mg/L
19. Electrical Conductivity ¹	NA	NA	NA
20. pH ²	9 to 12.5	Not Required	8 to 13

¹ While limits are not included for boron and electrical conductivity these must be

tested in each sample and a record kept of the results.

²The ranges given for pH are for the minimum and maximum acceptable pH values in the electric arc furnace ladle slag.

Test methods

- 4.6. The generator must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.7. The generator must ensure that the chemicals and other attributes (listed in Column 1 of Table 1) in the electric arc furnace ladle slag it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
 - 4.7.1. Test method for measuring the mercury concentration:
 - 4.7.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated maximum average concentration in Table 1, Column 2 (i.e. < 0.1 mg/kg dry weight).
 - 4.7.1.2. Report as mg/kg dry weight.
 - 4.7.2. Test methods for measuring chemicals 2 - 12:
 - 4.7.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils.
 - 4.7.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of stated maximum average concentration in Table 1, Column 2 (i.e. 7.5 mg/kg dry weight for lead).
 - 4.7.2.3. Report as mg/kg dry weight.
 - 4.7.3. Test method for measuring attributes 13 - 18:
 - 4.7.3.1. USEPA SW-846 Method 1311 Toxicity characteristic leaching procedure (or an equivalent analytical method).
 - 4.7.3.2. Report as mg/L.
 - 4.7.4. Test methods for measuring the electrical conductivity and pH:
 - 4.7.4.1. Sample preparation by mixing 1 part electric arc furnace ladle slag with 5 parts distilled water.
 - 4.7.4.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.7.4.3. Report electrical conductivity in deciSiemens per metre (dS/m).

Notification

- 4.8. On or before each transaction, the generator must provide the following to each processor to whom the generator supplies the electric arc furnace ladle

slag:

- a written statement of compliance certifying that all the generator requirements set out in this order have been met;
- a copy of the electric arc furnace ladle slag exemption, or a link to the EPA website where the electric arc furnace ladle slag exemption can be found; and
- a copy of the electric arc furnace ladle slag order, or a link to the EPA website where the electric arc furnace ladle slag order can be found.

Record keeping and reporting

4.9. The generator must keep a written record of the following for a period of six years:

- the sampling plan required to be prepared under clause 4.1.1;
- all characterisation, routine and/or one-off sampling results in relation to the electric arc furnace ladle slag supplied;
- the quantity of any electric arc furnace ladle slag supplied; and
- the name and address of each person to whom the generator supplied the electric arc furnace ladle slag.

4.10. The generator must provide, on request, the most recent characterisation and sampling (whether routine or one-off or both) results for electric arc furnace ladle slag supplied to any processor or consumer of the electric arc furnace ladle slag.

4.11. The generator must notify the EPA within seven days of becoming aware that it has not complied with any requirement in clause 4.1 to 4.7.

5. Processor requirements

The EPA imposes the following requirements on any processor who supplies processed electric arc furnace ladle slag.

5.1. The processor must only blend the electric arc furnace ladle slag received from the generator with materials that are the subject of a Resource Recovery Exemption and Resource Recovery Order if that material complies with all of the chemical and other material requirements under its Resource Recovery Order, and is able to be applied to land under its Resource Recovery Exemption for the same purpose(s) described in clause 5.1.1 to 5.1.6. The electric arc furnace ladle slag must not make up greater than 30% of the resultant blend of:

- 5.1.1. sealing aggregate,
- 5.1.2. asphalt aggregate,
- 5.1.3. engineered pavements (base and sub-base course),
- 5.1.4. engineered fill,
- 5.1.5. subsoil drains, and
- 5.1.6. filter aggregate.

Notification

5.2. On or before each transaction, the processor must provide the following to each person to whom the processor supplies the processed electric arc furnace ladle slag:

- a written statement of compliance certifying that all the requirements set out in this order have been met;

- a copy of the processed electric arc furnace ladle slag exemption, or a link to the EPA website where the processed electric arc furnace ladle slag exemption can be found; and
- a copy of the processed electric arc furnace ladle slag order, or a link to the EPA website where the processed electric arc furnace ladle slag order can be found.

Record keeping and reporting

- 5.3. The processor must keep a written record of the following for a period of six years:
- the quantity of any electric arc furnace ladle slag received from the generator and the generator's name and address;
 - the quantity of any processed electric arc furnace ladle slag supplied; and
 - the name and address of each person to whom the processor supplied the processed electric arc furnace ladle slag.
- 5.4. The processor must provide, on request, the most recent characterisation and sampling (whether routine or one-off or both) results for electric arc furnace ladle slag supplied to any consumer of the processed electric arc furnace ladle slag.

6. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply, processed electric arc furnace ladle slag to land.

continuous process means a process that produces electric arc furnace ladle slag on an ongoing basis.

generator means a person who generates electric arc furnace ladle slag for supply to a processor.

processor means a person who processes, mixes, blends, or otherwise incorporates electric arc furnace ladle slag and other materials to produce processed electric arc furnace ladle slag in its final form for supply to a consumer.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of electric arc furnace ladle slag that is not repeated,
- In the case where the supplier has an arrangement with the recipient for more than one supply of electric arc furnace ladle slag the first supply of electric arc furnace ladle slag as required under the arrangement.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor and to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies electric arc furnace ladle slag should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of electric arc furnace ladle slag remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.